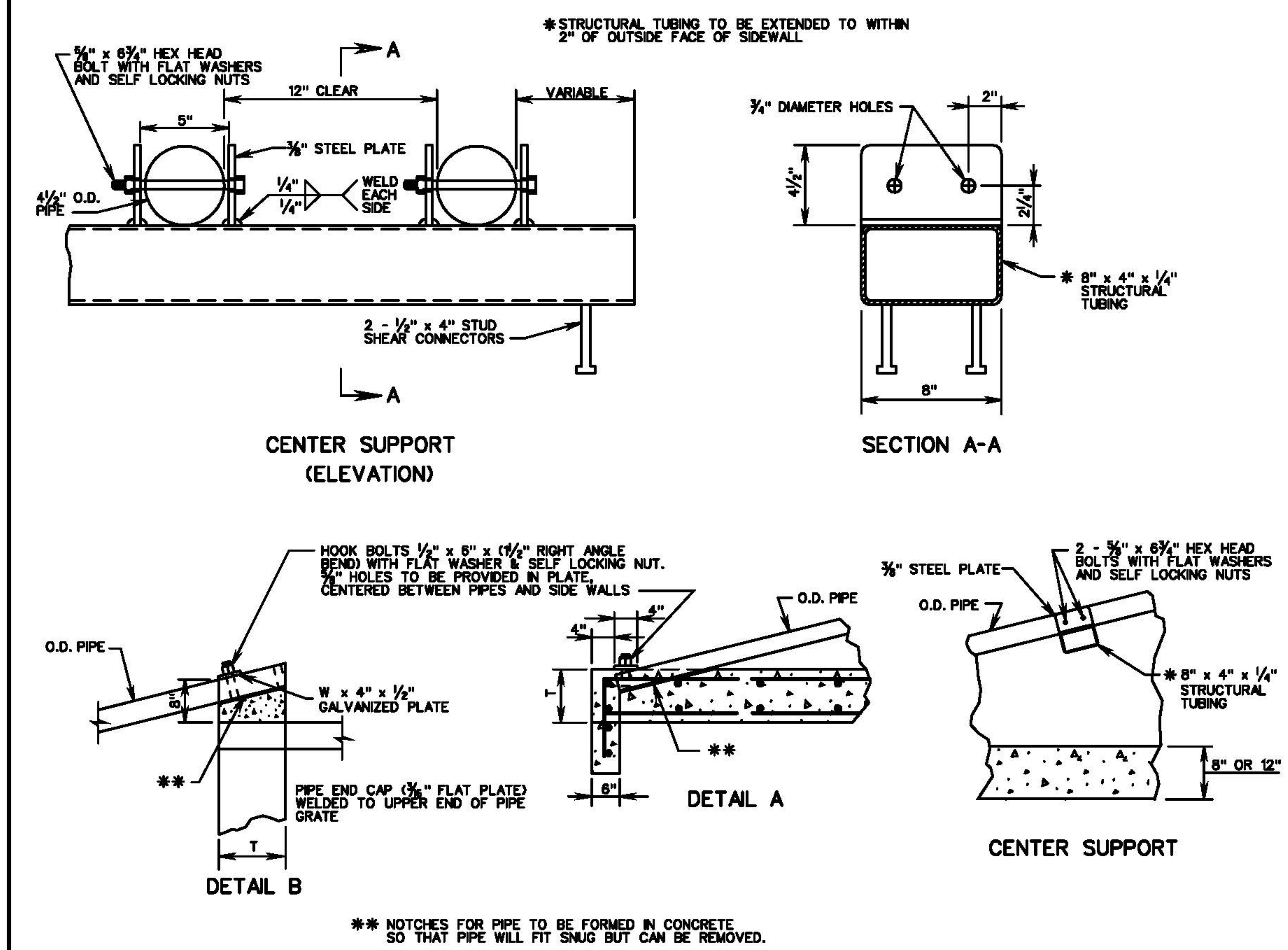
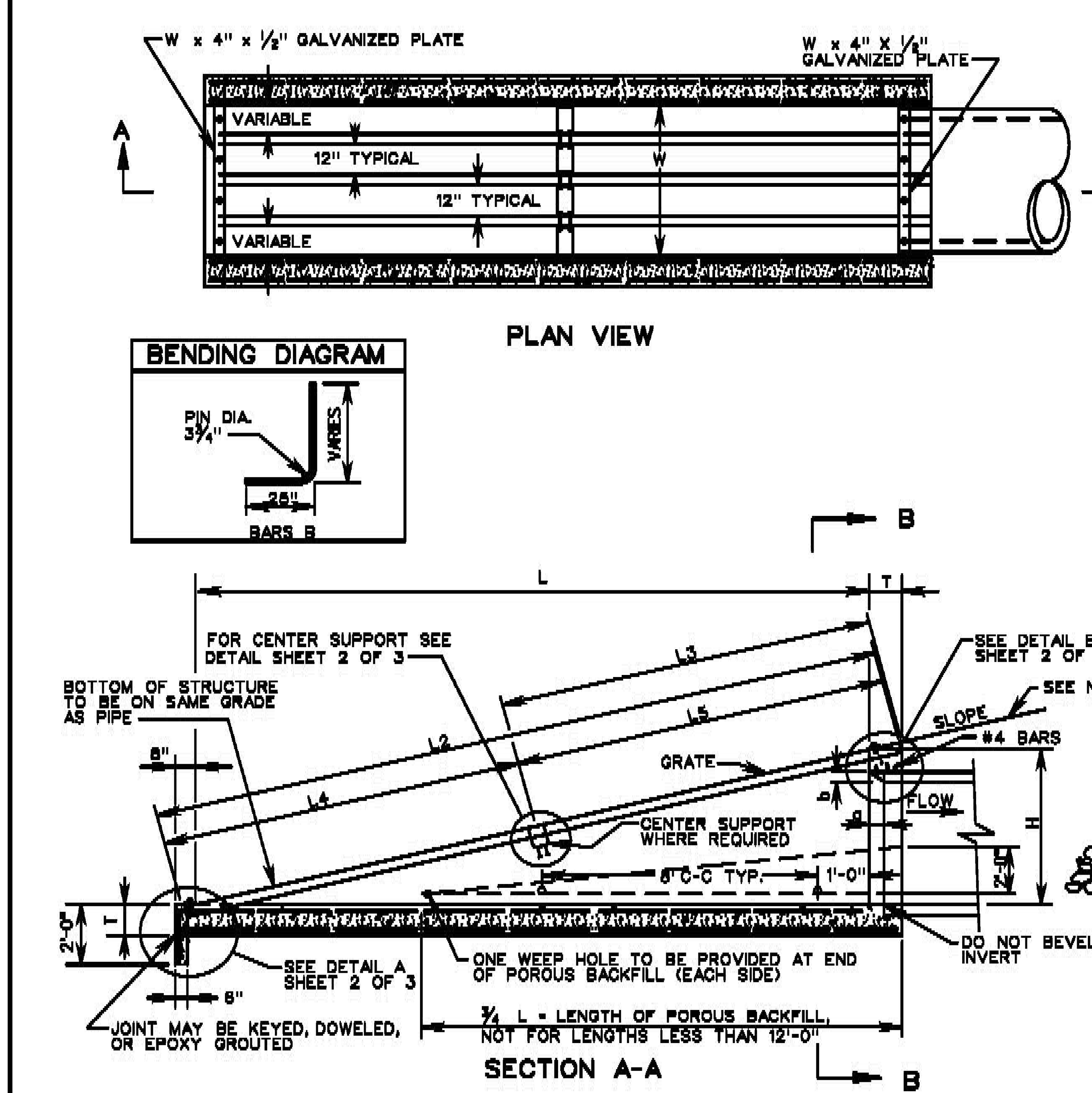
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2C-17

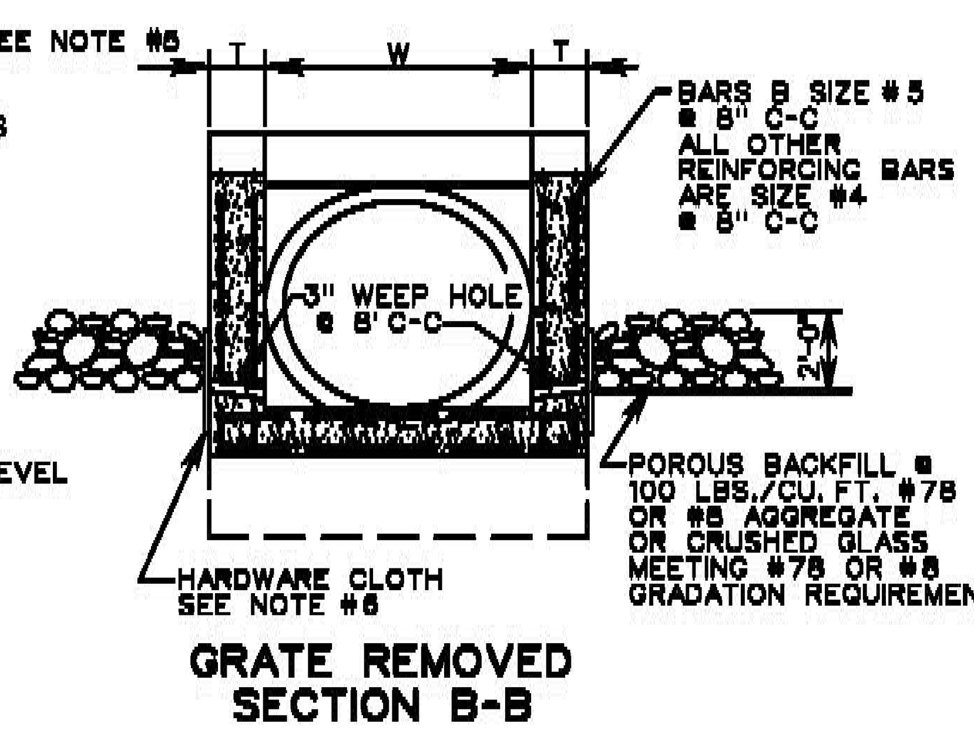


PIPE ENDWALL WITH LOAD-CARRYING GRATE
12" - 60" CIRCULAR PIPES



NOTES:

1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE. ALL CAST CONCRETE TO BE CLASS A3, FOR PRECAST USE 4000 PSI MINIMUM. REINFORCING STEEL TO HAVE A MINIMUM 1/2" COVER.
2. FOR TABULATION OF DIMENSIONS AND QUANTITIES SEE SHEET 3 OF 3.
3. ALL PIPE FOR GRATE, STRUCTURAL TUBING, AND RELATED HARDWARE TO BE GALVANIZED.
4. STANDARD EW-11 TO BE INSTALLED SO THE GRATE CONFIGURATION IS ALWAYS PERPENDICULAR TO THE EDGE OF THE SHOULDER.
5. SLOPE AS SPECIFIED ON TYPICAL SECTION.
6. WEEP HOLE WITH 12" X 12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE, MINIMUM WIRE DIAMETER 0.03" NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY OUTSIDE OF STRUCTURE.
7. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALLS OCCUR.
8. BEVEL EDGE IS REQUIRED ON THE HEADWALL OF THE INLET END OF THE CULVERT (WHERE THE FLOW ENTERS THE CULVERT).
9. HEADWALL AT THE OUTLET END OF THE CULVERT MAY BE EITHER SQUARE EDGE OR BEVEL EDGE.
10. 3/4" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.
11. IN NO CASE SHALL THE TOP OF THE ENDWALL PROJECT ABOVE FILL SLOPE, DITCH SLOPE OR SHOULDER



PIPE ENDWALL WITH LOAD-CARRYING GRATE
12" - 60" CIRCULAR PIPES

PIPE GRATE

TYPE I - 3 1/2" O.D.
TYPE II - 4" O.D.
TYPE III - 4 1/2" O.D.

LENGTH OF GRATE TO BE DETERMINED BY L_2 x NUMBER OF PIPES REQUIRED

4 : 1 SLOPE

PIPE SIZE	H	L	W	T	PIPE O.D.	NO. PIPES REQUIRED	L_2	L_3	L_4	L_5
12"	1'-10"	7'-4"	2'-0"	8"	3 1/2"	1	8'-6 3/4"	NO CENTER SUPPORT REQUIRED		
15" or 18"	2'-4 1/2"	9'-6"	2'-0"	8"	3 1/2"	1	10'-9 1/2"			
21" or 24"	2'-11"	11'-8"	3'-0"	8"	4"	2	13'-0 1/4"			
27" or 30"	3'-5 1/2"	13'-10"	3'-0"	8"	4"	2	15'-3"			
33" or 36"	4'-0"	16'-0"	4'-0"	8"	4 1/2"	3	17'-6"			
42"	4'-6 1/2"	18'-2"	4'-0"	12"	4 1/2"	3	19'-8 3/4"			
48"	5'-1"	20'-4"	5'-0"	12"	4 1/2"	3	22'-2 5/8"	10'-5 1/4"	11'-10 1/2"	10'-4 1/4"
54"	5'-7 1/2"	22'-6"	6'-0"	12"	4 1/2"	4	24'-5 11/32"	12'-8 1/8"	11'-10 11/32"	12'-7 1/8"
60"	6'-2"	24'-8"	6'-0"	12"	4 1/2"	4	26'-8 1/2"	14'-11"	11'-10 1/2"	14'-10"

DIMENSIONS FOR BEVEL ON HEADWALL

PIPE I.D.	a	b
12"	0'-1 1/4"	0'-1"
15" or 18"	0'-2"	0'-1 1/2"
21" or 24"	0'-2 1/2"	0'-2"
27" or 30"	0'-3 1/4"	0'-2 1/2"
33" or 36"	0'-3 3/4"	0'-3"
42"	0'-4 1/2"	0'-3 1/2"
48"	0'-5"	0'-4"
54"	0'-5 3/4"	0'-4 1/2"
60"	0'-6 1/4"	0'-5"

6 : 1 SLOPE

PIPE SIZE	H	L	W	T	PIPE O.D.	NO. PIPES REQUIRED	L_2	L_3	L_4	L_5
12"	1'-10"	11'-0"	2'-0"	8"	3 1/2"	1	12'-1 3/4"	NO CENTER SUPPORT REQUIRED		
15" or 18"	2'-4 1/2"	14'-3"	2'-0"	8"	4"	1	15'-5 1/4"			
21" or 24"	2'-11"	17'-6"	3'-0"	8"	4 1/2"	2	18'-9"			
27" or 30"	3'-5 1/2"	20'-9"	3'-0"	8"	4 1/2"	2	22'-0"	4'-8 1/8"	17'-4 1/2"	4'-7 1/2"
33" or 36"	4'-0"	24'-0"	4'-0"	8"	4 1/2"	3	25'-3 3/8"	7'-11 5/8"	17'-4 1/2"	7'-11"
42"	4'-6"	27'-3"	4'-0"	12"	4 1/2"	3	28'-11"	11'-7 1/4"	17'-4 1/2"	11'-6 1/2"
48"	5'-1"	30'-6"	5'-0"	12"	4 1/2"	3	32'-2"	14'-10 3/4"	17'-4 1/2"	14'-10 1/8"
54"	5'-7 1/2"	33'-9"	6'-0"	12"	4 1/2"	4	35'-6"	18'-2 1/4"	17'-4 1/2"	18'-1 1/2"
60"	6'-2"	37'-0"	6'-0"	12"	4 1/2"	4	38'-9 1/2"	19'-5 1/2"	19'-4 3/4"	19'-4 3/4"

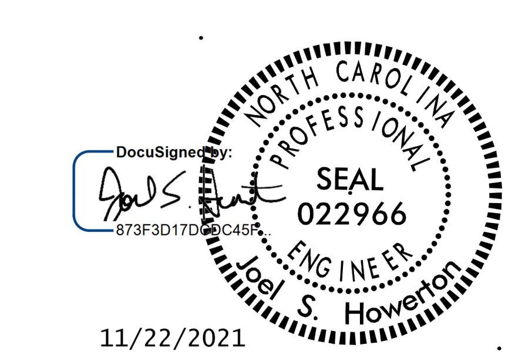
3 : 1 SLOPE

PIPE SIZE	H	L	W	T	PIPE GRATE: PIPE O.D.	PIPE GRATE: NO. PIPES REQUIRED	PIPE GRATE: L_2	
12"	1'-10"	5'-6"	2'-0"	8"	3 1/2"	1	6'-9 1/2"	NO CENTER SUPPORT REQUIRED
15" or 18"	2'-4 1/2"	7'-1 1/2"	2'-0"	8"	3 1/2"	1	8'-6 1/4"	
21" or 24"	2'-11"	8'-9"	3'-0"	8"	3 1/2"	2	10'-2 3/4"	
27" or 30"	3'-5 1/2"	10'-4 1/2"	3'-0"	8"	3 1/2"	2	11'-11 1/4"	
33" or 36"	4'-0"	12'-0"	4'-0"	8"	4"	3	13'-7 3/4"	
42"	4'-6 1/2"	13'-7 1/2"	4'-0"	12"	4"	3	15'-4 1/4"	
48"	5'-1"	15'-3"	5'-0"	12"	4 1/2"	3	17'-0 1/2"	
54"	5'-7 1/2"	16'-10 1/2"	6'-0"	12"	4 1/2"	4	18'-9 1/2"	
60"	6'-2"	18'-6"	6'-0"	12"	4 1/2"	4	20'-6"	

APPROXIMATE QUANTITIES

PIPE SIZE	3:1 CONCRETE CUBIC YARDS CONC. PIPE	3:1 C.M. PIPE	3:1 lbs. REINF. STEEL	PIPE SIZE	4:1 CONCRETE CUBIC YARDS CONC. PIPE	4:1 C.M. PIPE	4:1 lbs. REINF. STEEL	PIPE SIZE	6:1 CONCRETE CUBIC YARDS CONC. PIPE	6:1 C.M. PIPE	6:1 lbs. REINF. STEEL
12"	.95	.97	240	12"	1.17	1.18	308	12"	1.64	1.66	443
15" or 18"	1.27	1.29	328	15" or 18"	1.59	1.61	425	15" or 18"	2.28	2.31	618
21" or 24"	2.30	2.35	483	21" or 24"	2.44	2.49	628	21" or 24"	3.55	3.59	917
27" or 30"	2.38	2.44	608	27" or 30"	3.01	3.01	788	27" or 30"	4.35	4.41	1157
33" or 36"	3.28	3.38	809	33" or 36"	4.20	4.29	1059	33" or 36"	6.01	6.09	1556
42"	6.27	6.46	1050	42"	8.05	8.22	1368	42"	11.59	11.76	1997
48"	8.07	8.29	1327	48"	10.29	10.50	1647	48"	14.84	15.04	2514
54"	10.02	10.29	1612	54"	12.80	13.06	2105	54"	18.47	18.73	3094
60"	11.18	11.50	1826	60"	14.36	14.68	2391	60"	20.82	21.14	3517

PIPE ENDWALL WITH LOAD-CARRYING GRATE
12" - 60" CIRCULAR PIPES



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1089ADBC14994C3...

SEAL 26971 NORTH CAROLINA PROFESSIONAL ENGINEER JOSHUA G. DALTON

11/22/2021

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DETAIL 1
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 581+86 TO STA. 584+00 -L1- RT
FROM STA. 656+50 TO STA. 658+40 -L1- RT
FROM STA. 694+65 TO STA. 695+50 -L1- LT
FROM STA. 713+50 TO STA. 718+00 -L1- LT
FROM STA. 28+50 TO STA. 31+00 -SR6- LT
FROM STA. 48+00 TO STA. 50+00 -Y30- RT
FROM STA. 14+50 TO STA. 16+00 -Y30RPA- RT
FROM STA. 22+00 TO STA. 24+00 -Y30RPA- RT
FROM STA. 23+00 TO STA. 25+00 -Y30RPC- RT
FROM STA. 24+50 TO STA. 25+50 -Y31- LT

DETAIL 2
LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 3:1, D, b, 1'/Ft., Fill Slope
Min. D=1.5 Ft.
b=5.0 Ft.

FROM STA. 726+00 TO STA. 728+70 -L1- LT
FROM STA. 17+60 TO STA. 20+15 -Y30RPC- RT

DETAIL 2A
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 4:1, D, 6:1, Fill Slope
Min. D=1.0 Ft.

FROM STA. 695+50 TO STA. 700+50 -L1- LT

DETAIL 3
SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, 4:1 or Flatter, Fill Slope
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.
Type of Liner=Class B Rip-Rap

FROM STA. 21+50 TO STA. 23+75 -SR6- LT
FROM STA. 19+50 TO STA. 21+50 -SR6- RT

DETAIL 3A
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=2.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 659+00 TO STA. 661+90 -L1- RT

DETAIL 4
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Fill Slope
Min. D=1.0 Ft.

FROM STA. 10+50 TO STA. 13+50 -SR4- RT
FROM STA. 10+30 TO STA. 12+50 -SR4- LT
FROM STA. 21+50 TO STA. 24+75 -SR4- RT
FROM STA. 23+50 TO STA. 24+75 -SR4- LT
FROM STA. 25+00 TO STA. 27+65 -SR4- RT
FROM STA. 25+00 TO STA. 27+65 -SR4- LT
FROM STA. 19+50 TO STA. 21+25 -SR5- LT
FROM STA. 17+80 TO STA. 19+75 -Y38- RT
FROM STA. 23+15 TO STA. 24+50 -Y38- RT
FROM STA. 23+18 TO STA. 25+00 -Y38- LT
FROM STA. 20+00 TO STA. 22+00 -Y31- LT
FROM STA. 10+50 TO STA. 11+40 -Y42- LT
FROM STA. 10+50 TO STA. 11+40 -Y42- RT

DETAIL 5
SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, 3:1 to 6:1 Transition, Fill Slope
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
Type of Liner=Class I Rip-Rap

FROM STA. 23+00 TO STA. 24+00 -Y30- RT

DETAIL 5A
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=1.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

FROM STA. 663+00 TO STA. 671+50 -L1- LT
FROM STA. 25+00 TO STA. 31+00 -SR7- LT
FROM STA. 13+10 TO STA. 15+00 -Y31RPA- RT

DETAIL 6
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 4:1, D, 6:1, Fill Slope
Min. D=1.0 Ft.

FROM STA. 700+50 TO STA. 703+50 -L1- RT
FROM STA. 704+00 TO STA. 705+70 -L1- RT
FROM STA. 9+00 TO STA. 11+00 -Y31LPC- LT

DETAIL 6A
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 4:1, d, D, 6:1, Geotextile, Fill Slope
Min. D=1.0 Ft.
Max. d=1.0 Ft.
Type of Liner=Class B Rip-Rap

FROM STA. 24+00 TO STA. 25+00 -Y30- LT

DETAIL 7
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, Natural Ground
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.
*When B is < 6.0'
Type of Liner=Class B Rip-Rap

FROM STA. 22+80 TO STA. 23+40 -Y30- LT

DETAIL 8
STANDARD 'V' DITCH (Not to Scale)
Natural Ground, 3:1, D, Natural Ground
Min. D=1.0 Ft.

STA. 27+65 -SR4- LT & RT

DETAIL 9
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=2.0 Ft.

FROM STA. 20+00 TO STA. 21+50 -SR6- LT
FROM STA. 13+00 TO STA. 15+00 -SR5- LT
FROM STA. 16+00 TO STA. 19+00 -SR5- LT
FROM STA. 40+50 TO STA. 47+00 -Y31- LT
FROM STA. 17+00 TO STA. 19+50 -SR6- RT
FROM STA. 22+00 TO STA. 23+50 -SR6- RT

DETAIL 10
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, Natural Ground
Min. D=2.0 Ft.
B=2.0 Ft.

FROM STA. 21+03 TO STA. 21+50 -SR6- RT
FROM STA. 59+00 TO STA. 60+25 -Y30- RT
FROM STA. 11+40 TO STA. 13+00 -Y42- LT
FROM STA. 13+50 TO STA. 14+30 -Y42- LT
STA. 16+00 -SR7- RT
STA. 16+00 -SR5- RT
STA. 54+00 -Y30- LT
STA. 680+00 -L1- LT

DETAIL 11
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, Natural Ground
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner=Class B Rip-Rap

FROM STA. 13+50 TO STA. 14+17 -Y30RPA- LT

DETAIL 12
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, GEOTEXTILE, b, 1'/Ft., Fill Slope
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner=Class B Rip-Rap

FROM STA. 17+00 TO STA. 24+00 -Y30RPA- LT

DETAIL 13
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

FROM STA. 635+50 TO STA. 642+75 -L1- RT
FROM STA. 11+00 TO STA. 18+50 -Y31RPB- LT
FROM STA. 12+00 TO STA. 13+50 -Y30RPA- LT
FROM STA. 601+40 TO STA. 604+00 -L1- RT

DETAIL 14
FALSE SUMP (Not to Scale)
Median Ditch, 9", 2', L (See Chart Below), 20', S, GI etc.
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'

DETAIL 15
SPECIAL CUT BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.
Type of Liner=Coir Fiber Matting

FROM STA. 24+00 TO STA. 28+50 -Y30- RT

DETAIL 16
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, Natural Ground
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.
*When B is < 6.0'
Type of Liner=CL I Rip-Rap

FROM STA. 10+55 TO STA. 10+83 -SR5- LT
STA. 672+20 -L1- LT

DETAIL 17
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=3.0 Ft.
B=6.0 Ft.
b=5.0 Ft.

FROM STA. 54+65 TO STA. 57+00 -Y30- LT

DETAIL 18
SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground, 4:1, D, B, 6:1, Fill Slope
Min. D=2.0 Ft.
B=4.0 Ft.

FROM STA. 57+00 TO STA. 59+50 -Y30- LT

DETAIL 19
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, Natural Ground
Min. D=3.0 Ft.
B=4.0 Ft.

FROM STA. 20+50 TO STA. 21+50 -SR5- RT
FROM STA. 13+36 TO STA. 14+45 -Y31RPA- RT
STA. 28+75 -Y31- RT
FROM STA. 24+87 TO STA. 25+37 -Y30RPC- RT

DETAIL 20
SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground, 4:1, D, B, 6:1, Fill Slope
Min. D=1.0 Ft.
B=4.0 Ft.

FROM STA. 693+75 TO STA. 700+00 -L1- RT

DETAIL 21
LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 3:1, D, b, 1'/Ft., Fill Slope
Min. D=1.5 Ft.
b=5.0 Ft.

FROM STA. 726+00 TO STA. 728+70 -L1- LT
FROM STA. 10+50 TO STA. 16+50 -SR7- LT
FROM STA. 28+20 TO STA. 28+80 -Y31- LT
FROM STA. 733+00 TO STA. 735+50 -L1- LT

DETAIL 22
SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground, 4:1, D, B, 6:1, Fill Slope
Min. D=1.5 Ft.
B=4.0 Ft.

FROM STA. 748+00 TO STA. 760+50 -L1- RT

DETAIL 23
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, Natural Ground
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner=Class I Rip-Rap

STA. 15+15 -Y30RPD- RT
STA. 5+50 -Y30RPB- LT

DETAIL 24
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=1.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 578+00 TO STA. 581+86 -L1- RT
FROM STA. 677+50 TO STA. 683+00 -L1- LT
FROM STA. 28+50 TO STA. 33+00 -Y30- RT
FROM STA. 50+00 TO STA. 54+00 -Y30- RT
FROM STA. 11+00 TO STA. 12+40 -Y31LPC- LT
FROM STA. 07+00 TO STA. 14+00 -Y30RPA- RT

DETAIL 25
STANDARD BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, Natural Ground
Min. D=2.0 Ft.
B=3.0 Ft.

STA. 693+50 -L1- RT
STA. 694+50 -L1- LT

DETAIL 26
PIPE OUTLET CHANNEL (Not to Scale)
Natural Ground, Existing Bank, d, Channel Bed (2.0'), Natural Ground
Length=20 Ft.
d=2.0 Ft.
Est.=20 Tons of Class I Rip-Rap

STA. 22+80 -Y30- LT

DETAIL 27
CHANNEL CHANGE (Not to Scale)
Natural Ground, 3:1, d, D, B, GEOTEXTILE, b, 1'/Ft., Proposed Fill Slope, Natural Ground, Exist. Channel
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
b=N/A
Type of Liner=Class I Riprap, Keyed-In

STA. 649+20 -L1- LT

DETAIL 28
CHANNEL CHANGE (Not to Scale)
Natural Ground, 3:1, d, D, B, GEOTEXTILE, b, 1'/Ft., Proposed Fill Slope, Natural Ground, Exist. Channel
Min. D=2.5 Ft.
Max. d=2.5 Ft.
B=6.0 Ft.
b=N/A
Type of Liner= Class I Riprap, Keyed-In

642+45 -L1- LT

DETAIL 29
RIP RAP AT EMBANKMENT (Not to Scale)
10'min., 1.0'min., 1.5', Ditch Grade, GEOTEXTILE
Type of Liner= CL I RIPRAP

STA. 26+50 -SR6- LT
STA. 642+75 -L1- RT

DETAIL 30
PIPE OUTLET CHANNEL (Not to Scale)
Natural Ground, Existing Bank, d, Channel Bed (4.0'), Natural Ground
Length=24 Ft.
d=3.0 Ft.
Est.=33 Tons of Class I Rip-Rap (Ea. Location)

STA. 724+60 -L1- RT
STA. 17+75 -Y31RPC- RT

DETAIL 31
TOE PROTECTION (Not to Scale)
Natural Ground, d, b, 3:1 or Flatter Fill Slope, Geotextile
d=1.0 Ft.
b=4.0 Ft.
Type of Liner=Class B Rip-Rap

FROM STA. 15+25 TO STA. 18+00 -SR4- RT
FROM STA. 11+00 TO STA. 12+50 -SR5- LT
FROM STA. 31+00 TO STA. 37+50 -SR6- RT
FROM STA. 31+00 TO STA. 39+00 -SR7- RT
FROM STA. 607+60 TO STA. 611+70 -L1- RT
FROM STA. 612+10 TO STA. 614+00 -L1- RT
FROM STA. 612+60 TO STA. 617+00 -L1- LT
FROM STA. 623+00 TO STA. 626+50 -L1- RT
FROM STA. 623+50 TO STA. 628+00 -L1- LT
FROM STA. 631+50 TO STA. 632+80 -L1- LT
FROM STA. 659+90 TO STA. 663+50 -L1- LT
FROM STA. 672+50 TO STA. 674+50 -L1- LT
FROM STA. 683+00 TO STA. 689+00 -L1- LT
FROM STA. 709+36 TO STA. 711+90 -L1- LT
FROM STA. 709+40 TO STA. 713+20 -L1- RT
FROM STA. 712+30 TO STA. 714+00 -L1- LT
FROM STA. 718+50 TO STA. 722+50 -L1- LT
FROM STA. 756+00 TO STA. 759+50 -L1- LT
FROM STA. 789+00 TO STA. 796+00 -L1- RT
FROM STA. 801+50 TO STA. 806+50 -L1- RT
FROM STA. 803+50 TO STA. 807+20 -L1- LT
FROM STA. 809+50 TO STA. 814+00 -L1- RT
FROM STA. 822+50 TO STA. 824+00 -L1_NORTH- RT
FROM STA. 826+00 TO STA. 830+50 -L1_NORTH- LT
FROM STA. 832+00 TO STA. 836+00 -L1_NORTH- RT
FROM STA. 823+00 TO STA. 825+00 -L1_NORTH- LT
FROM STA. 826+50 TO STA. 829+50 -L1_NORTH- RT
FROM STA. 841+00 TO STA. 851+00 -L1_NORTH- LT
FROM STA. 15+75 TO STA. 17+50 -Y30RPA- LT
FROM STA. 08+85 TO STA. 19+70 -Y30RPD- LT
FROM STA. 18+50 TO STA. 19+50 -Y31- LT
FROM STA. 30+75 TO STA. 34+00 -Y31- LT
FROM STA. 08+12 TO STA. 10+00 -Y31RPC- RT
FROM STA. 19+45 TO STA. 20+50 -Y30RPD- RT
FROM STA. 07+00 TO STA. 20+50 -Y32RPB1- RT
FROM STA. 23+50 TO STA. 24+82 -Y19- RT
FROM STA. 37+50 TO STA. 40+00 -Y32- LT

DETAIL 32
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Fill Slope
Min. D=1.5 Ft.

FROM STA. 38+50 TO STA. 46+50 -Y31- RT
FROM STA. 11+50 TO STA. 14+50 -Y19- LT
FROM STA. 18+30 TO STA. 21+00 -Y30- RT

DETAIL 33
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, b, 1'/Ft., Fill Slope
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner=PSRM

FROM STA. 26+50 TO STA. 28+50 -SR6- LT

DETAIL 34
CHANNEL CHANGE (Not to Scale)
Natural Ground, 2:1, d, D, B, b, 1'/Ft., Proposed Fill Slope, Natural Ground, Exist. Channel
Min. D=4.0 Ft.
Max. d=Top of Bank
B=12.0 Ft.
b=Varies
Type of Liner=Class I Riprap

FROM STA. 656+05 TO STA. 658+60 -L1- LT

DETAIL 35
CHANNEL CHANGE (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Proposed Fill Slope, Natural Ground, Exist. Channel
Min. D=2.5 Ft.
B=5.0 Ft.
b=10.0 Ft.

FROM STA. 661+85 TO STA. 664+00 -L1- RT

DETAIL 35A
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Fill Slope
Min. D=2.0 Ft.

FROM STA. 27+50 TO STA. 34+00 -Y19- LT

DETAIL 36
CHANNEL CHANGE (Not to Scale)
Natural Ground, 3:1, D, B, Backfill Ex. Channel to Nat. Grnd., Natural Ground, Exist. Channel
Min. D=Match Exist. Channel
B=6.0 Ft.

FROM STA. 23+20 TO STA. 25+40 -Y38- LT

DETAIL 37
INLET & OUTLET CHANNEL DETAIL (NOT TO SCALE)
NG, FLOODPLAIN BENCH, NG, CL 'I' RIPRAP OUTLET ONLY, CL 'I' RIPRAP, 1', 12', 12', CL 'I' RIPRAP OUTLET ONLY

STA. 712+00 -L1- LT
STA. 713+00 -L1- RT

DETAIL 38
OUTLET CHANNEL (Not to Scale)
Natural Ground, 3:1, D, B, Natural Ground
Length=90 Ft.
Min. D=2.0 Ft.
B=6.0 Ft.

STA. 612+50 -L1- LT

DETAIL 39
LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, D, B, b, 1'/Ft., Fill Slope
Min. D=3.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

FROM STA. 40+32 TO STA. 44+35 -Y30- RT
FROM STA. 46+15 TO STA. 47+25 -Y30- RT
FROM STA. 17+00 TO STA. 18+00 -Y32RPB1- RT

DETAIL 39A
SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground, 3:1, d, D, B, Geotextile, 4:1 or Flatter, Fill Slope
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
Type of Liner=Class B Rip-Rap

FROM STA. 19+20 TO STA. 20+00 -Y31- LT

DETAIL 39B
CHANNEL CHANGE (Not to Scale)
Natural Ground, 3:1, D, B
Length=55 Ft.
Min. D=2 Ft.
B=varies 6 to 12 Ft.

STA. 15+40 -Y30RPA- LT

DETAIL 40
INLET & OUTLET CHANNEL DETAIL (NOT TO SCALE)
NG, FLOODPLAIN BENCH, NG, CL 'I' RIPRAP ON CHANNEL BANKS, CL 'I' RIPRAP ON CHANNEL BANKS, CL 'I' RIPRAP w/ NATIVE MATERIAL PLACED ON TOP TO FILL VOIDS, 12', 2', 24' @ INLET & OUTLET

STA. 19+75 -Y38- LT
STA. 19+85 -Y38- RT

DETAIL 41
INLET CHANNEL DETAIL (NOT TO SCALE)
NG, FLOODPLAIN BENCH, NG, CL 'I' RIPRAP ON CHANNEL BANKS, CL 'I' RIPRAP ON CHANNEL BANKS, CL 'I' RIPRAP w/ NATIVE MATERIAL PLACED ON TOP TO FILL VOIDS, 12', 3', 23' @ INLET

STA. 662+00 -L1- RT

DETAIL 42
INLET/OUTLET CHANNEL BANK STABILIZATION (Not to Scale)
Natural Ground, Existing Bank, d, Channel Bed (varies 6' to 12'), Rip-Rap Lined Banks, Natural Ground
In Length=25 Ft.
Out Length=45 Ft.
d=2.0 Ft.
Est.= 40 Tons of Class 'I' Rip-Rap (Inlet)
Est.= 72 Tons of Class 'I' Rip-Rap (Outlet)

STA. 19+10 -Y30RPD- RT
STA. 19+85 -Y30RPD- LT

DETAIL 43
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground, 3:1, d, D, Geotextile, 4:1 or Flatter, Fill Slope
Min. D=2.0 Ft.
Max. d=1.5 Ft.
Type of Liner=Class B Rip-Rap

FROM STA. 16+50 TO STA. 17+80 -Y38- RT

DETAIL 44
INLET CHANNEL BANK STABILIZATION (Not to Scale)
Natural Ground, Existing Bank, d, Channel Bed (varies 6' to 12'), Rip-Rap Lined Banks, Natural Ground
Length=30 Ft.
d=2.0 Ft.
Est.= 44 Tons of Class 'I' Rip-Rap

STA. 611+85 -L1- RT

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2D-2

R/W SHEET NO.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DocuSigned by: Joshua G. Dalton 1089ADBC14294C5...

11/22/2021

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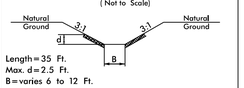
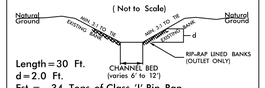
DETAIL 45
OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length = 35 Ft.
Max. d = 2.5 Ft.
B = varies 6 to 12 Ft.
Est. = 66 Tons of Class 'I' Rip–Rap

STA. 612 + 40 –L1– LT

DETAIL 46
OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length = 30 Ft.
d = 2.0 Ft.
Est. = 34 Tons of Class 'I' Rip–Rap

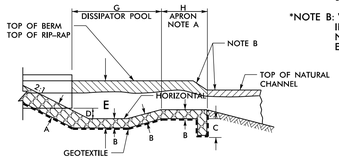
STA. 26 + 40 –SR6– LT

DETAIL 47
RIP–RAPPED ENERGY DISSIPATOR BASIN

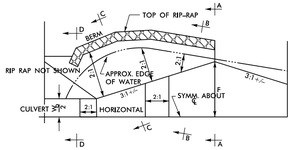
*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des/CROSS SECTION AREA AT SEC. A–A) = SPECIFIED VELOCITY.

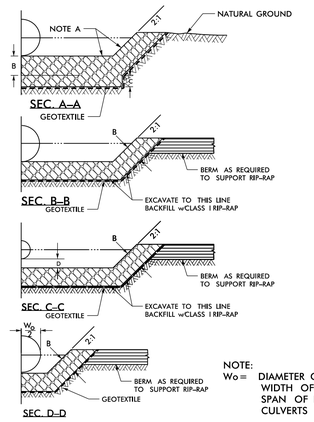
*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL TOP OF RIP–RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

℄ SECTION



HALF PLAN





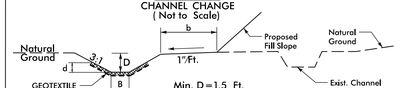
DIM.	RIP RAP BASIN #							
	1	2	3	4	5	6	7	8
A	2.5	2.5						
B	1.7	1.7						
C	1.7	1.7						
D	0.7	0.3						
E	6.1	4.7						
F	8.3	7.3						
G	13.5	12.0						
H	4.5	4.0						

*ALL DIMENSIONS APPROXIMATE IN FEET (FT)

BASIN #	LOCATION (AT OUTLET)
1	–Y30– 46 + 88 LT
2	–L1– 677 + 37 RT
3	
4	
5	
6	
7	
8	

5/05

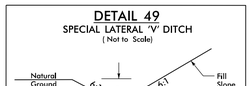
DETAIL 48
CHANNEL CHANGE
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = N/A
B = 4.0 Ft.
b = 10 Ft.
Type of Liner = Vegetation

FROM STA. 787 + 50 TO STA. 788 + 50 –L1– RT

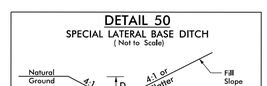
DETAIL 49
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.

FROM STA. 231 + 00 TO STA. 232 + 00 –Y40– RT

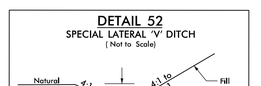
DETAIL 50
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
B = 2.0 Ft.

FROM STA. 235 + 00 TO STA. 237 + 20 –Y40– RT

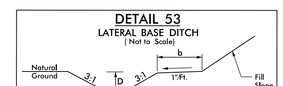
DETAIL 52
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 2.0 Ft.

FROM STA. 12 + 00 TO STA. 15 + 00 –Y32– LT

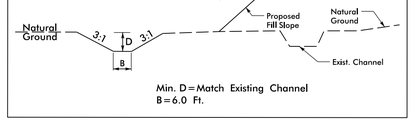
DETAIL 53
LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.

FROM STA. 15 + 00 TO STA. 18 + 30 –Y32– LT

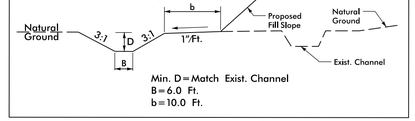
DETAIL 54
CHANNEL CHANGE
(Not to Scale)



Min. D = Match Existing Channel
B = 6.0 Ft.

FROM STA. 18 + 30 TO STA. 21 + 90 –Y32– LT

DETAIL 55
CHANNEL CHANGE
(Not to Scale)



Min. D = Match Exist. Channel
B = 6.0 Ft.
b = 10.0 Ft.

FROM STA. 26 + 00 TO STA. 31 + 65 –Y32– LT

DETAIL 56
STANDARD BASE DITCH
(Not to Scale)

Min. D = 2.5 Ft.
B = 4.0 Ft.

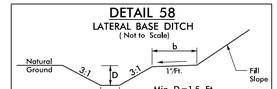
STA. 677 + 00 –L1– RT

DETAIL 57
STANDARD BASE DITCH
(Not to Scale)

Min. D = 2.0 Ft.
B = 4.0 Ft.

FROM STA. 21 + 00 TO STA. 21 + 75 –Y32RPB1– RT

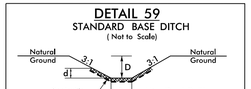
DETAIL 58
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.

FROM STA. 646 + 50 TO STA. 654 + 50 –L1– RT

DETAIL 59
STANDARD BASE DITCH
(Not to Scale)



Min. D = 4.0 Ft.
Max. d = 4.0 Ft.
B = 6.0 Ft.
*When B is < 6.0'
Type of Liner = Class I Rip–Rap

STA. 50 + 35 –Y19– RT

DETAIL 60
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Min. D = 1.5 Ft.

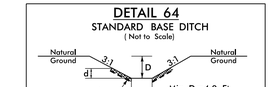
FROM STA. 17 + 00 TO STA. 23 + 50 –Y19– LT

DETAIL 62
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Min. D = 3.0 Ft.

FROM STA. 41 + 00 TO STA. 48 + 12 –Y32– LT

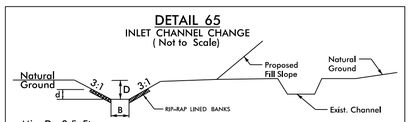
DETAIL 64
STANDARD BASE DITCH
(Not to Scale)



Min. D = 4.0 Ft.
Max. d = 4.0 Ft.
B = 6.0 Ft.
When B is > 6.0'
Std. No. 876.01
Type of Liner = Class I Rip–Rap

STA. 18 + 10 –Y32RPB1–

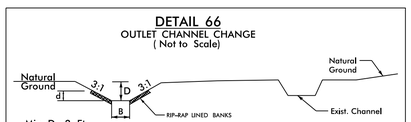
DETAIL 65
INLET CHANNEL CHANGE
(Not to Scale)



Min. D = 3.5 Ft.
Max. d = 3.5 Ft.
B = 8.0 Ft.
Est. = 202 Tons of Class 'I' Rip–Rap

STA. 18 + 40 –Y32– LT

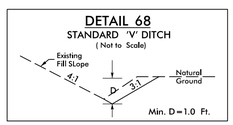
DETAIL 66
OUTLET CHANNEL CHANGE
(Not to Scale)



Min. D = 2 Ft.
Max. d = 2 Ft.
B = 8.0 Ft.
Est. = 105 Tons of Class 'I' Rip–Rap

STA. 25 + 00 –Y19– RT

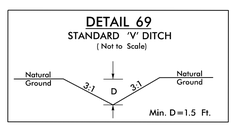
DETAIL 68
STANDARD 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.

FROM STA. 12 + 50 TO STA. 13 + 00 –Y43– LT

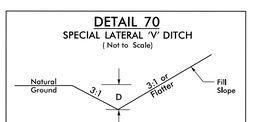
DETAIL 69
STANDARD 'V' DITCH
(Not to Scale)



Min. D = 1.5 Ft.

BRICKYARD RD. CUL–DE–SAC

DETAIL 70
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.

FROM STA. 19 + 20 TO STA. 20 + 40 –SR4– RT

HYDRAULICS ENGINEER

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12786 STEVEN M. BONDOR
11/22/2021

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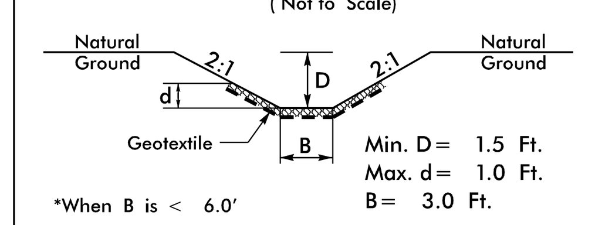
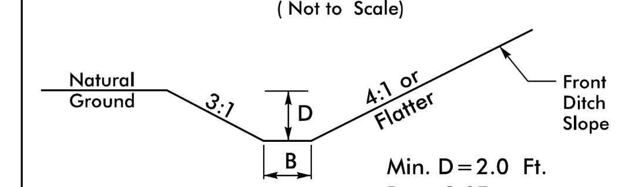
DETAIL 33A
STANDARD BASE DITCH
(Not to Scale)



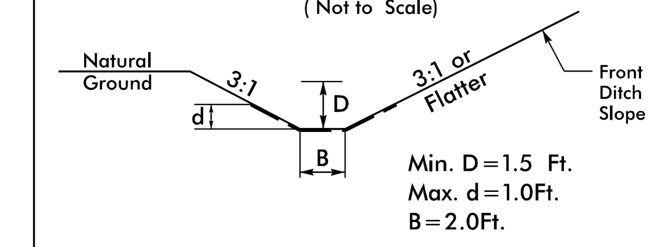
Type of Liner = CL I Rip-Rap
STA. -L- 228+70 LT

DETAIL 25A
SPECIAL CUT BASE DITCH
(Not to Scale)



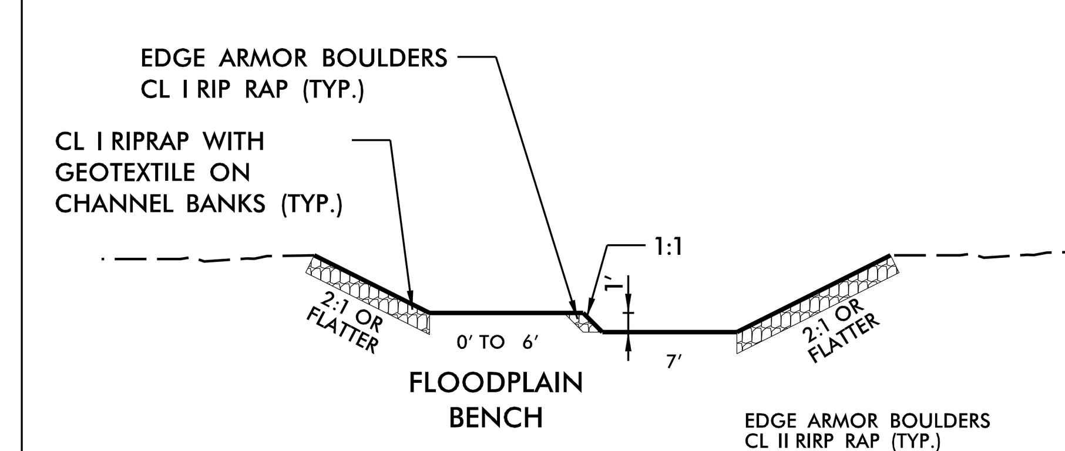
L FROM STA. 279+85 TO STA. 280+65 LT

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

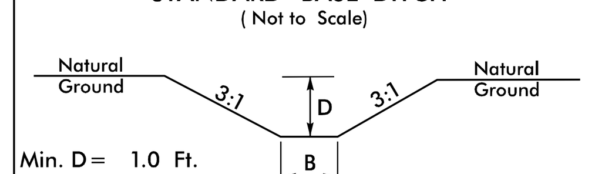


FROM -L- STA. 308+24 TO STA. 309+00 LT

DETAIL 28 A
INLET/OUTLET CHANNEL DETAIL
(NOT TO SCALE)

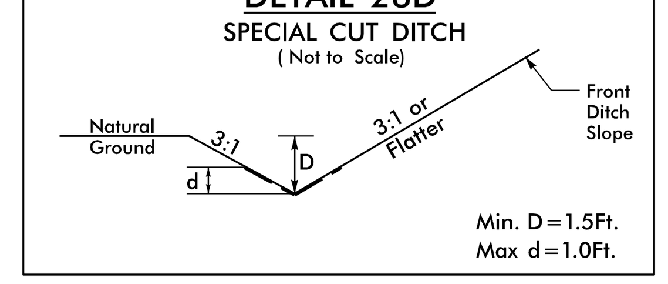


DETAIL 28C
STANDARD BASE DITCH
(Not to Scale)



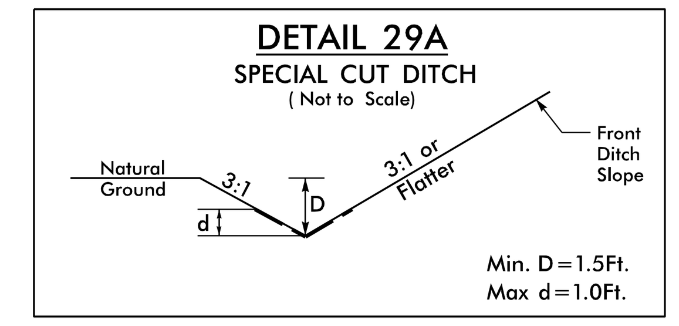
FROM -LLT- STA. 320+00

DETAIL 28D
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 323+43 TO STA. 330+00 LT
FROM -LRT- STA. 320+40 TO STA. 325+50 RT

DETAIL 29A
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 322+50 TO STA. 330+00 LT
FROM -LRT- STA. 320+40 TO STA. 325+50 RT

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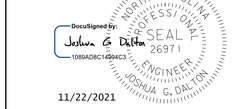
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2D-4
R/W SHEET NO.	

HYDRAULICS ENGINEER



11/22/2021

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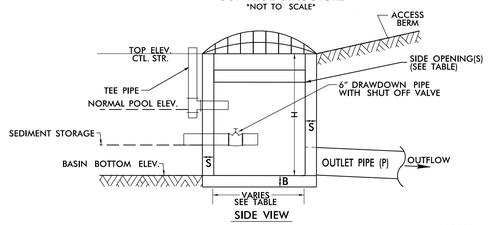
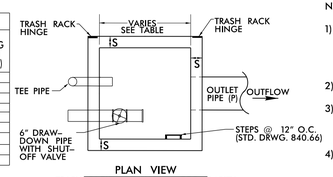
DETAIL P–1
WET DETENTION OUTLET CONTROL STRUCTURE
NOT TO SCALE



SIDE VIEW

SIDE OPENING DIMENSIONS

STRUCTURE NUMBER	# OF SIDES w/ OPENING	INVERT ELEV. (FEET)	OPENING WIDTH (INCHES)	OPENING HEIGHT (INCHES)
2356	2	42.5′	60″	6″



PLAN VIEW
TRASH RACK NOT SHOWN FOR CLARITY

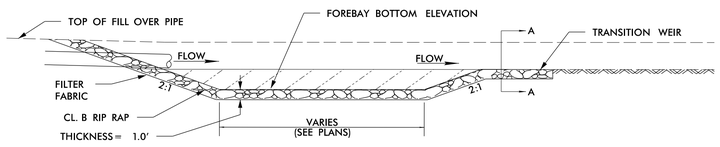
NOTES

1) NO BEDDING MATERIAL TO BE USED. THERFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
2) ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE.
3) SHUT OFF VALVE MAY BE A GATE VALVE, BALL VALVE, SHEAR GATE, ETC. SHUT OFF VALVE IS TO REMAIN CLOSED DURING NORMAL OPERATON.
4) PAYMENT FOR TRASH RACKS ARE INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

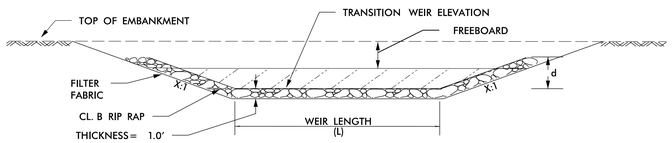
MINIMUM DIMENSIONS FOR WET DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	SIDE WALLS (INCHES)	BASE B (INCHES)	CTL. STR. DIMENSIONS W	CTL. STR. DIMENSIONS L	CTL. STR. DIMENSIONS H	TOP ELEVATION CONTROL STRUCTURE	BASIN BOTTOM ELEV.	TEE PIPE DIAMETER INCHES	TEE PIPE INV. ELEV. (NORMAL POOL)	DRAWDOWN PIPE INVERT	OUTLET PIPE INVERT	OUTLET PIPE DIAMETER(P) INCHES	OUTLET PIPE MATERIAL
L1_N 869+04 LT	2356	6″	18″	5.0′	5.0′	4.0′	43.5′	38.5′	3.0″	41.5′	39.5′	39.5′	42″	RCP–IV

DETAIL P–2
FOREBAY
(Not to Scale)



PROFILE VIEW



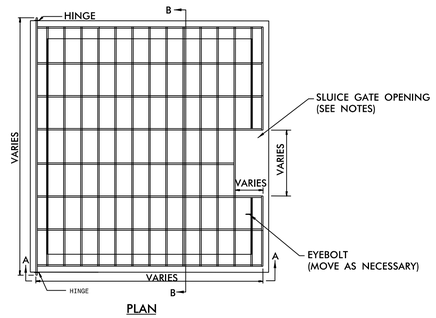
SECTION A–A
"TRANSITION BERM CROSS–SECTION"

MINIMUM DIMENSIONS FOR FOREBAY

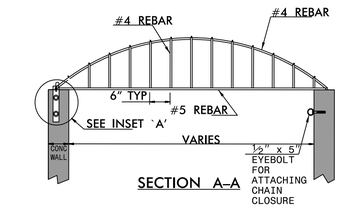
LOCATION	FOREBAY BOTTOM ELEV.	TRANSITION WEIR ELEV.	TRANSITION WEIR LENGTH (L)	WEIR SIDE SLOPES (X:1)	d
L1_N 866+50 LT	39.0′	42.0′	38′	3	1.0′
Y32 39+75 RT	39.0′	42.0′	56′	3	1.0′
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?

DETAIL P–3
REBAR & ORIFICE TRASH RACKS
(N.T.S.)

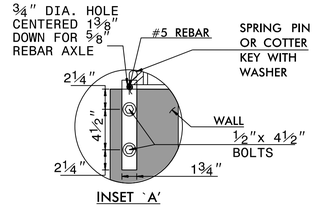
RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A "' BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE, IF APPLICABLE, ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.
6. PAYMENT FOR TRASH RACKS ARE INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.



PLAN



SECTION A–A



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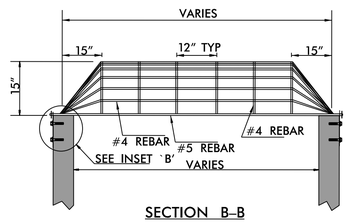
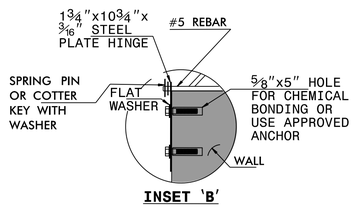
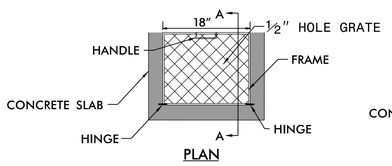


SECTION B–B

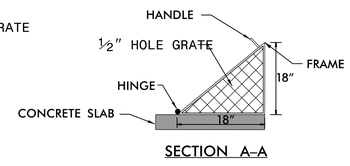


INSET 'B'

REBAR TRASH RACK
NOT TO SCALE



PLAN



SECTION A–A

ORIFICE TRASH RACK
NOT TO SCALE

ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A "' BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A–153.

5/14/99

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2D-5
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA C. DALTON

DocuSigned by: Joshua C Dalton 1089ADBC14B94C5...

11/22/2021

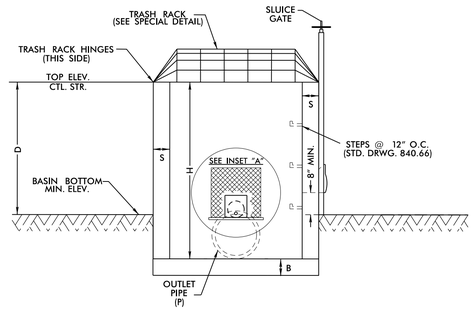
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL P–4

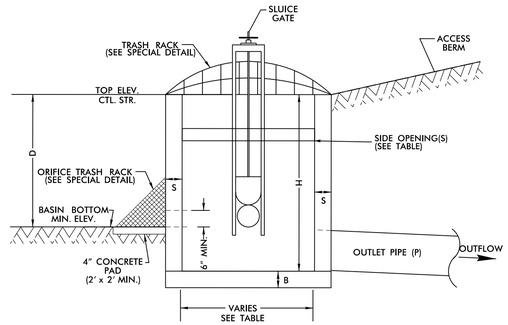
DRY DETENTION DRAWDOWN STRUCTURE w/SLUICE GATE

NOT TO SCALE

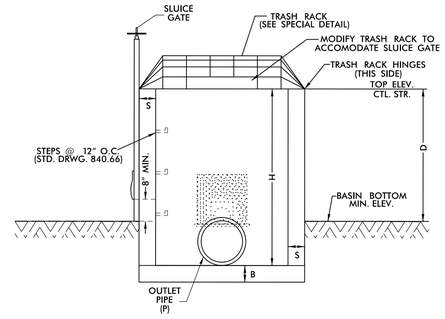
DRY DET. STR. LINE ITEMS	QTY.
OUTLET STRUCTURE #2333	(SEE DSS)
OUTLET PIPE, 48" CAAP	(SEE DSS)
8" SLUICE GATE	1 EA



SIDE 1



SIDE 2



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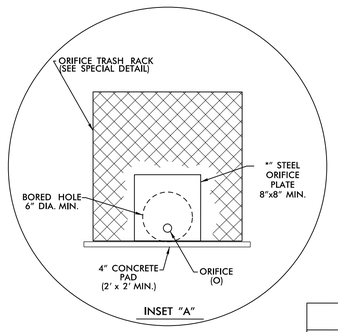
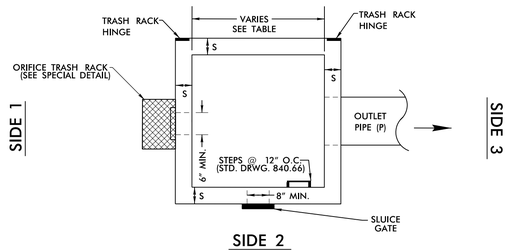


INSET "A"



SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
2. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
3. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
4. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
5. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION.
6. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
7. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
8. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
9. PAYMENT FOR TRASH RACKS ARE INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

SIDE OPENING DIMENSIONS

STRUCTURE NUMBER	# OF SIDES w/ OPENING	INVERT ELEV. (FEET)	OPENING WIDTH (INCHES)	OPENING HEIGHT (INCHES)
2333	1	43.5'	60"	6"

MINIMUM DIMENSIONS FOR DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
-Y32- 29+23 RT	2333	6.0	18.0	43.0	45.0	2.0	40.0	5' x 5' x 5'	4.0	43.0	48"

5/14/99

WET DET. BASIN DETAILS

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2D-6

R/W SHEET NO.

HYDRAULICS ENGINEER

DocuSigned by: Joshua G Dalton
1089AD8C14994C3...
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
11/22/2021

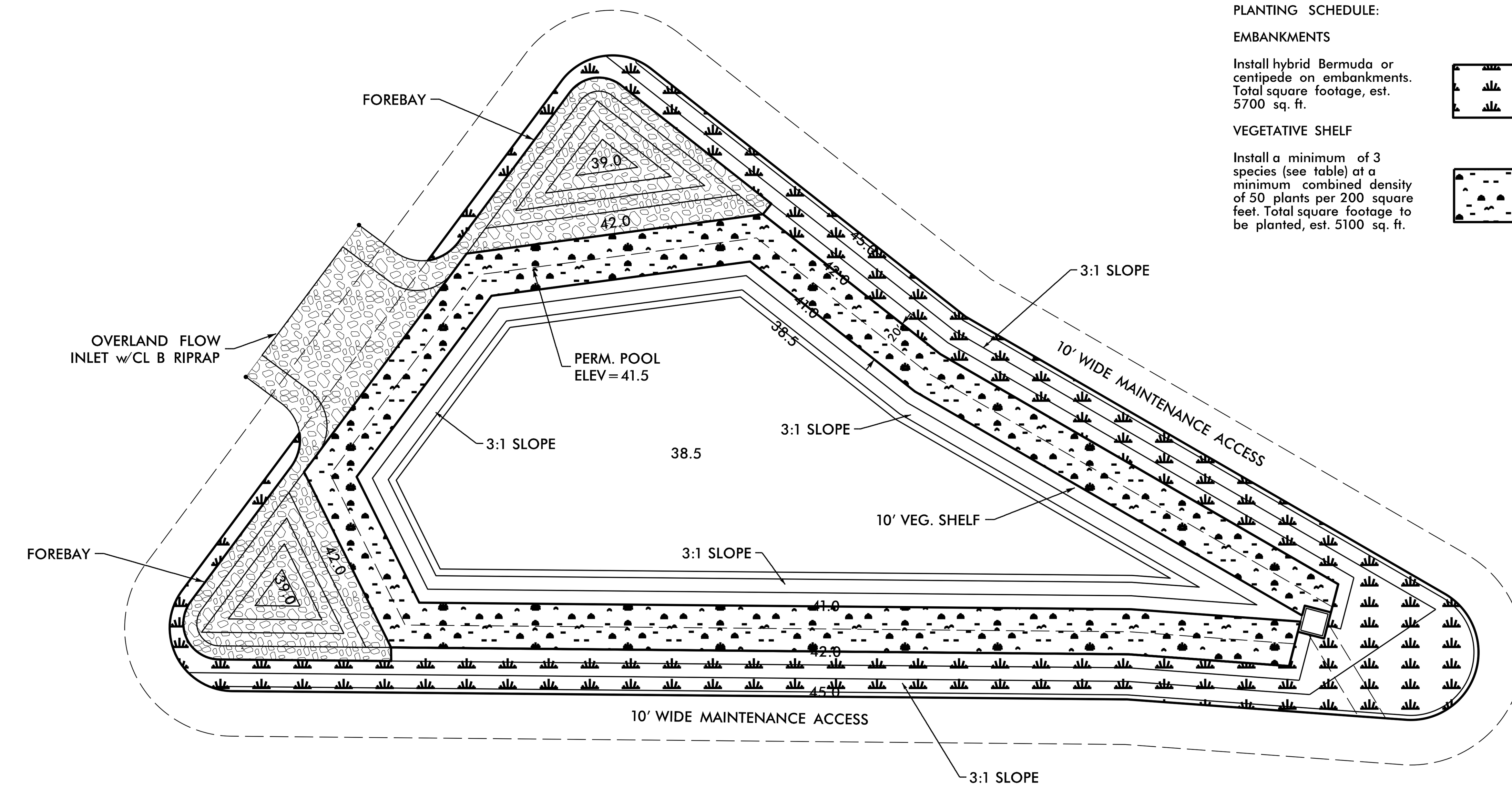
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WET POND LINE ITEMS	QTY.
GEOTEXTILE FOR DRAINAGE	471 SY
OUTLET STRUCTURE #2356	(SEE DSS)
OUTLET PIPE, 42" RCP-IV	(SEE DSS)
RIP RAP, CLASS B	209 TONS
UNCLASSIFIED EXCAVATION	3500 CY
6" VALVE	1 EA
SEEDING & MULCHING	0.13 AC
VEGETATIVE SHELF PLANTING	5100 SF

OPERATION AND MAINTENANCE PROVISIONS

BMP element:	Potential problems:	How to remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the wet pond	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
The outlet device / The receiving water	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.
Floating wetland island (if applicable)	Weeds or volunteer trees are growing on the mat.	Remove the weeds or trees.
	The anchor cable is damaged, disconnected or missing.	Restore the anchor cable to its design state.

WET DET. BASIN -L1_NORTH- 868+00 LT - PLANTING PLAN



PLANTING SCHEDULE:

EMBANKMENTS

Install hybrid Bermuda or centipede on embankments. Total square footage, est. 5700 sq. ft.

VEGETATIVE SHELF

Install a minimum of 3 species (see table) at a minimum combined density of 50 plants per 200 square feet. Total square footage to be planted, est. 5100 sq. ft.

Landscape Plan:

1. Embankment slopes of the pond shall be vegetated with non-clumping turf grass, perennial grasses such as hybrid Bermuda or centipede are recommended; trees and woody shrubs shall not be allowed; and

2. The vegetated shelf shall be planted with a minimum of three diverse species of herbaceous, native vegetation at a minimum density of 50 plants per 200 square feet of shelf area. Species shall be selected from the table of Plants for Submerged and Partially Submerged Vegetative Shelves, shown below. Wetland seed mixes shall not be used.

3. Trees and woody shrubs shall not be planted on the embankment slopes and any volunteers should be removed as part of regular maintenance actives.

PLANTS FOR SUBMERGED AND PARTIALLY SUBMERGED VEGETATIVE SHELVES

Botanical Name	Common Name
Asclepias incarnata	Swamp Milkweed
Carex spp.	Sedges
Carex tenera	Quill sedge
Eupatoriadelphus dubius	Dwarf Joe Pye Weed
Eupatoriadelphus fistulosus	Joe Pye Weed
Eupatoriadelphus maculatus	Spotted trumpetweed
Hibiscus coccineus	Scarlet rose mallow
Hibiscus laevis	Halberdleaf rosemallow
Juncus effuses	Rush
Kosteletzkya virginica	Seashore Mallow
Lobelia cardinalis	Cardinal flower
Pontederia cordata	Pickerelweed
Rhynchospora spp.	Beakrush
Saccharum baldwinii	Narrow plumegrass
Sagittaria latifolia	Duck Potato
Saururus cernuus	Lizardtail
Scirpus cyperinus	Woolgrass
Scirpus spp.	Bulrush

Maintenance Plan:

1. Immediately after the wet pond is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).

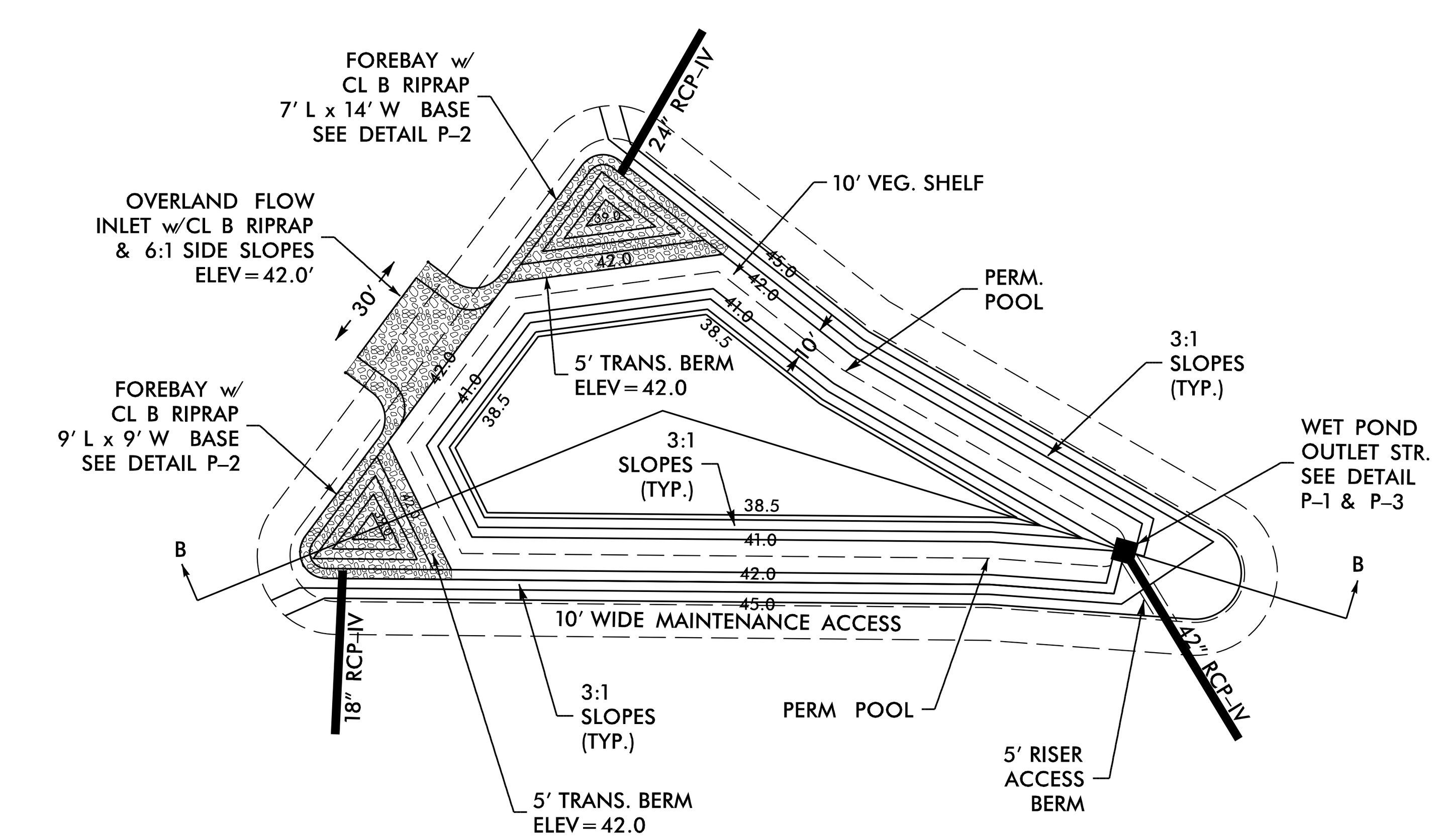
2. No portion of the wet pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.

3. Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet pond.

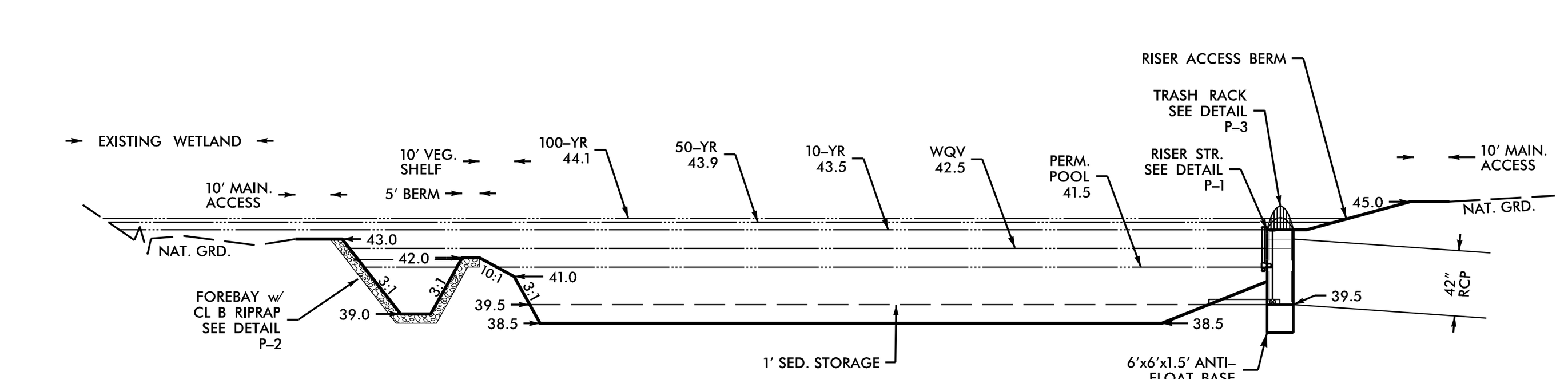
4. If the pond must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized as much as possible.

WET DET. BASIN -L1_NORTH- 868+00 LT - PLAN & PROFILE

PLAN VIEW



SECTION B-B



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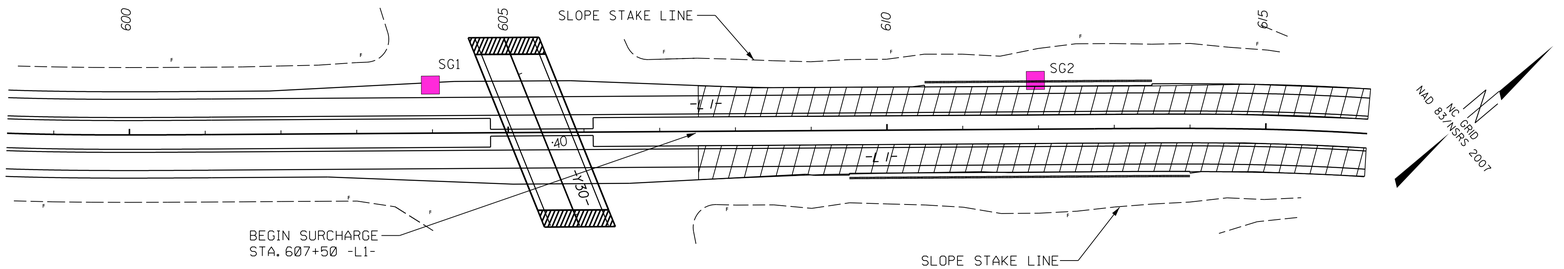
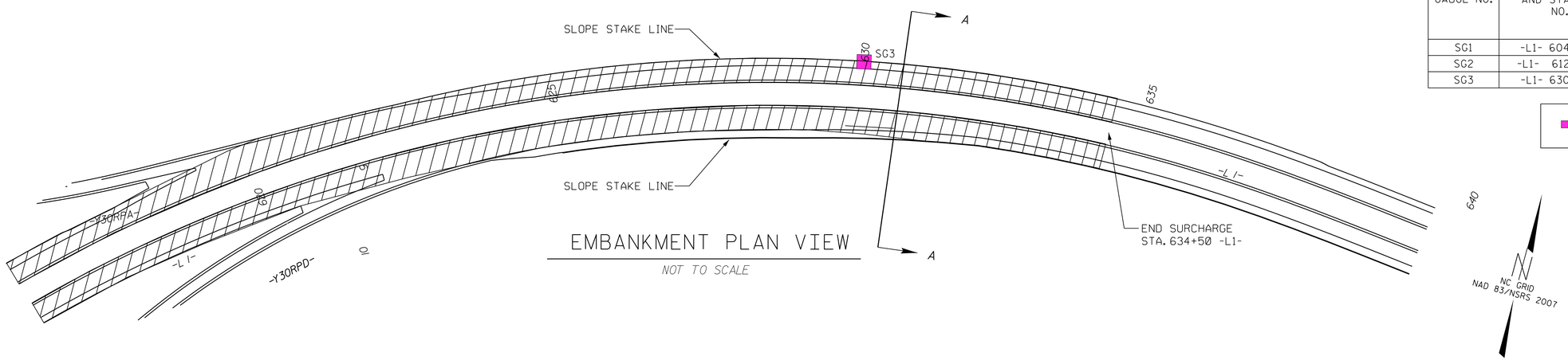


EMBANKMENT PLAN VIEW

NOT TO SCALE

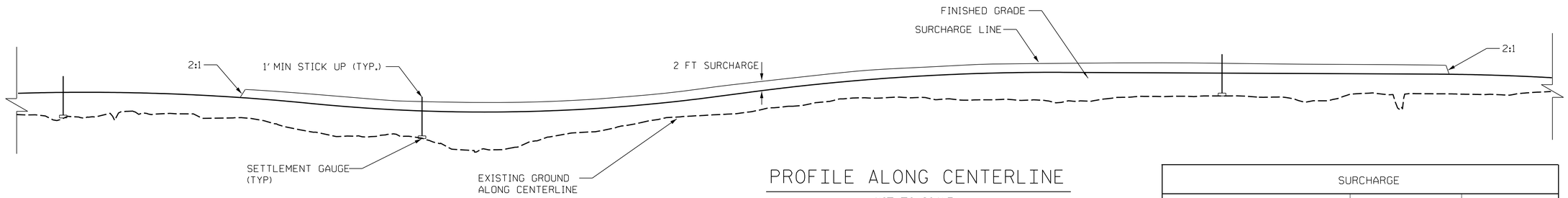


EMBANKMENT PLAN VIEW

NOT TO SCALE

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG1	-L1- 604+00	62	LT
SG2	-L1- 612+00	60	LT
SG3	-L1- 630+00	60	LT

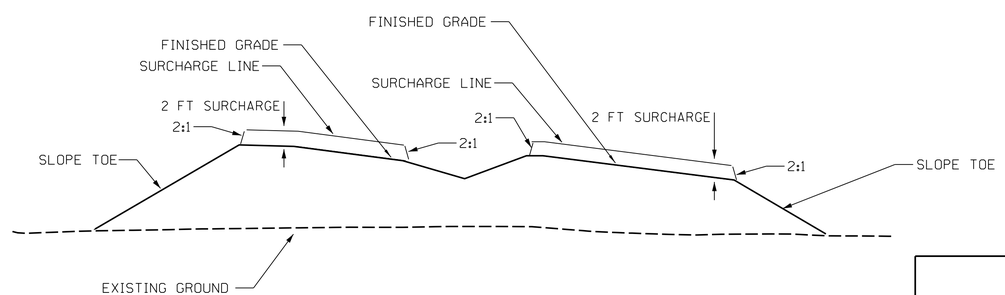
■ SETTLEMENT GAUGES (SG)



PROFILE ALONG CENTERLINE

NOT TO SCALE

SURCHARGE		
STATIONS	SURCHARGE HEIGHT	WAITING TIME
-L1- 607+50 TO -L1- 619+50	2 FT	5 MO
-L1- 619+50 TO -L1- 634+50	2 FT	7 MO



CROSS SECTION A-A (TYP)

NOT TO SCALE

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YANHUI LIU

DocuSigned by: Yanhui Liu 10/20/2021

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 604+00 to 634+50 -L1 -

SHEET 1 OF 16

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

Prepared in the Office of:

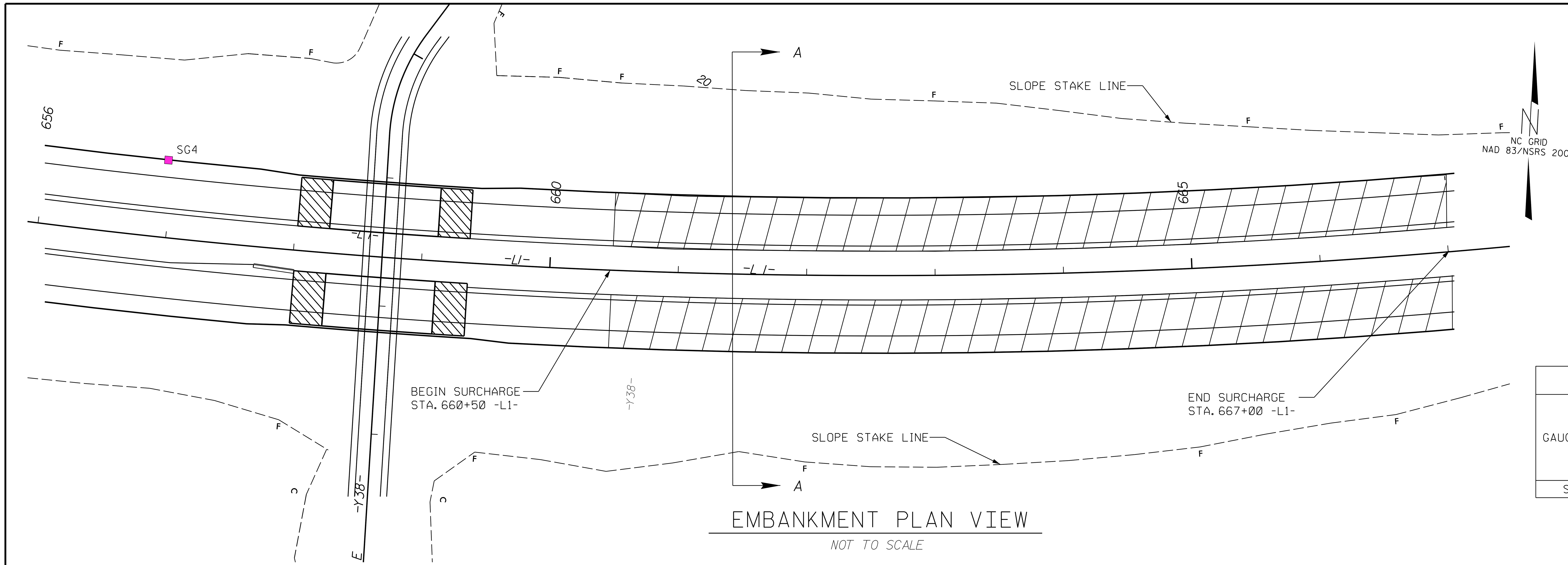
CATLIN Engineers and Scientists
Wilmington, North Carolina

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

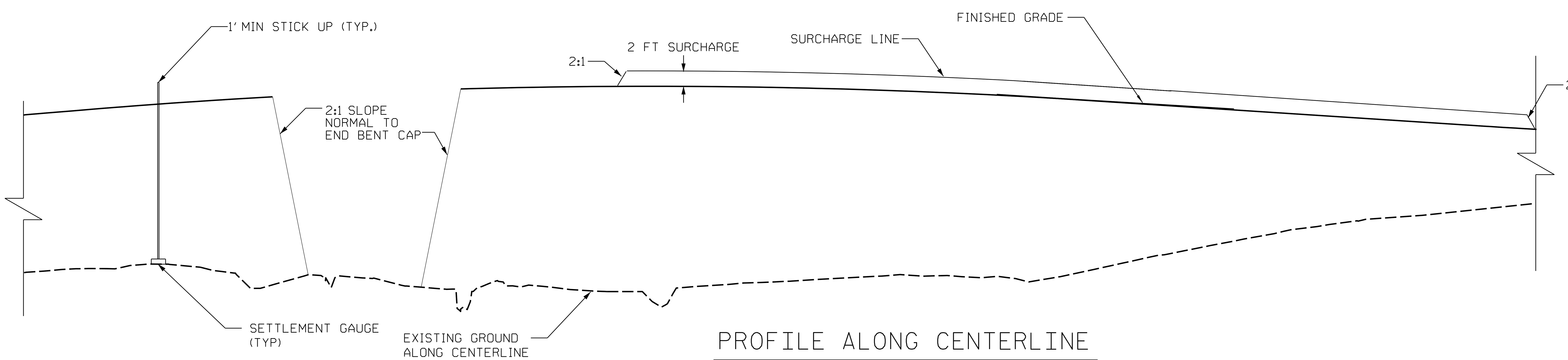
GROUND IMPROVEMENT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			2G-1
2			4			



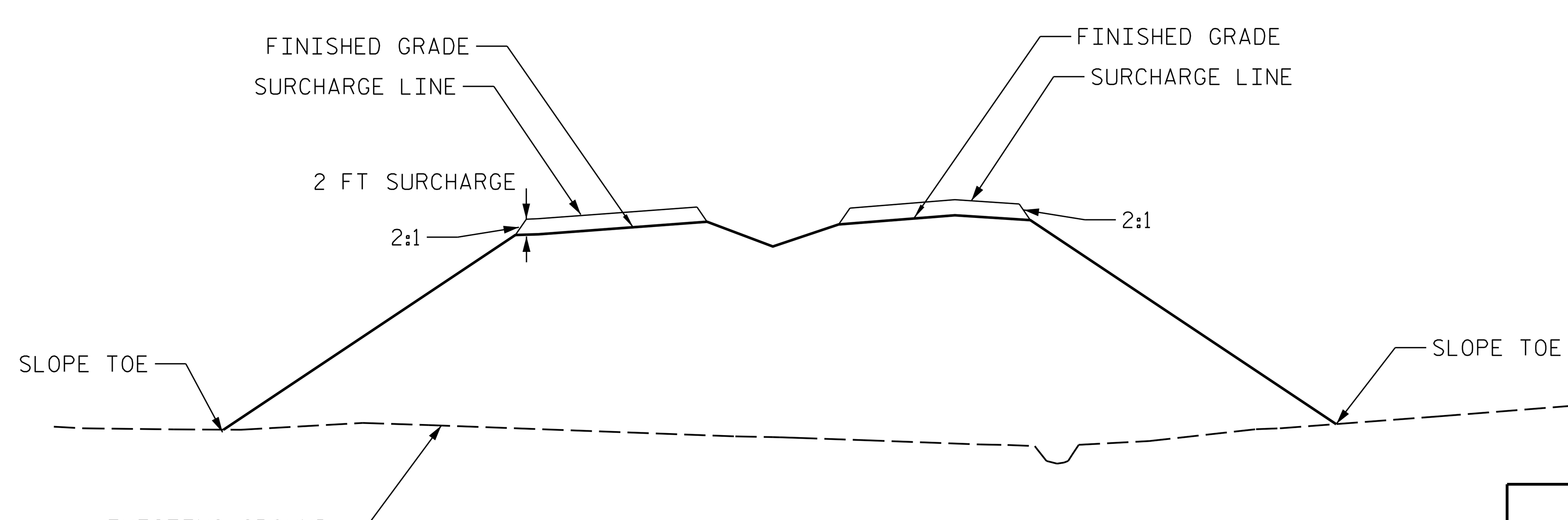
EMBANKMENT PLAN VIEW

NOT TO SCALE



PROFILE ALONG CENTERLINE

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

GEOTECHNICAL ENGINEER

SEAL 034020

Yinhui Liu 10/20/2021

ENGINEER

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■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET DISTANCE FT	OFFSET DIRECTION LT/RT
SG4	-L1- 657+00	60	LT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING TIME
-L1- 660+50 TO -L1- 667+00	2 FT	7 MO

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 656+00 to 667+00 -L1-

SHEET 2 OF 16

Prepared in the Office of:

CATLIN Engineers and Scientists
Wilmington, North Carolina

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			2G-2
2			4			

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YINHUI LIU

DocuSigned by: Yinhui Liu 10/20/2021
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SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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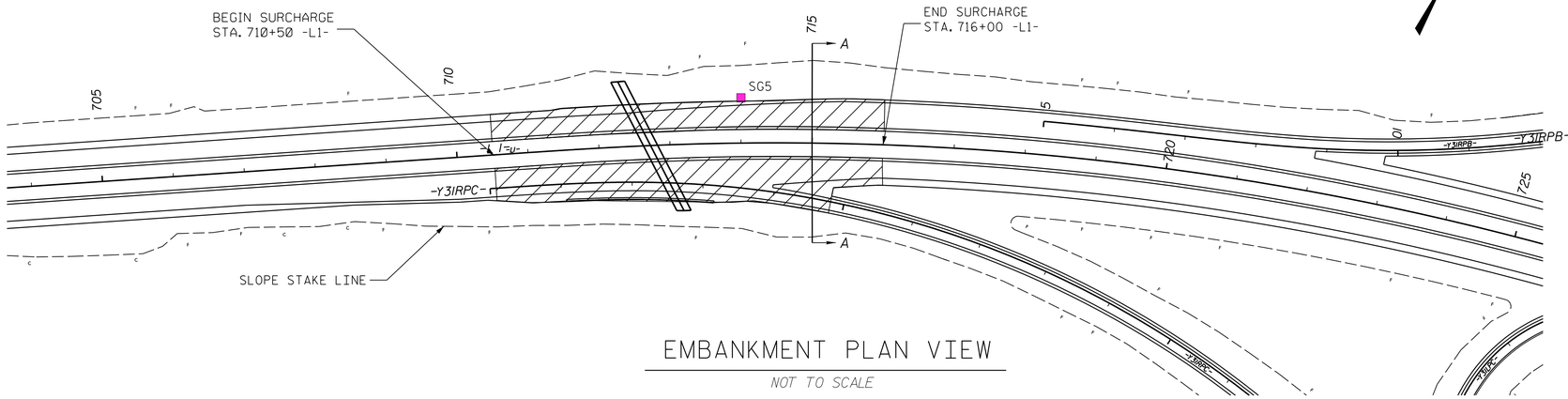
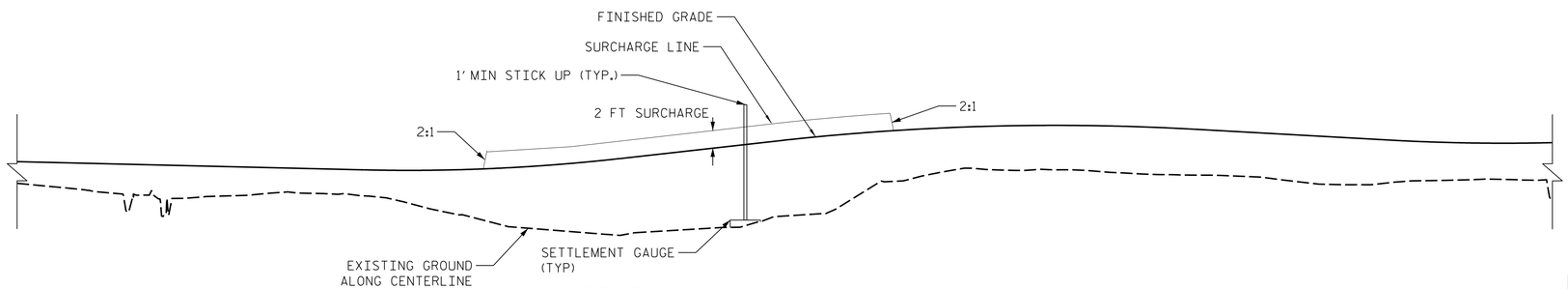


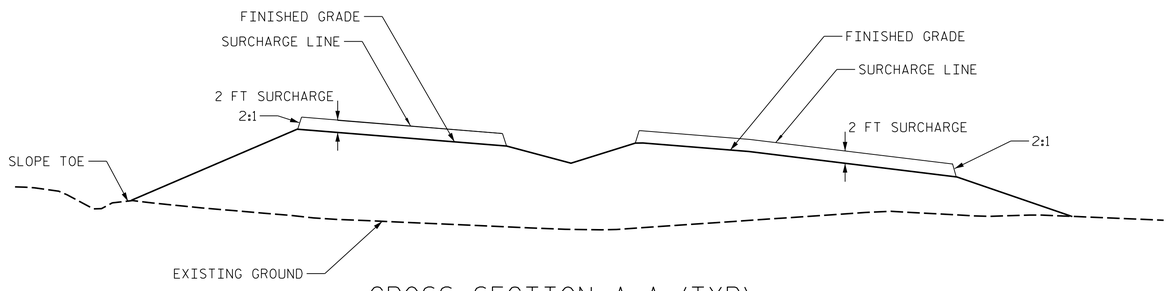
EMBANKMENT PLAN VIEW

NOT TO SCALE



PROFILE ALONG CENTERLINE

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG5	-L1- 714+00	65	LT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING TIME
-L1- 710+50 TO -L1- 716+00	2 FT	4.5 MO

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 710+50 to 716+00 -L1-

SHEET 3 OF 16

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

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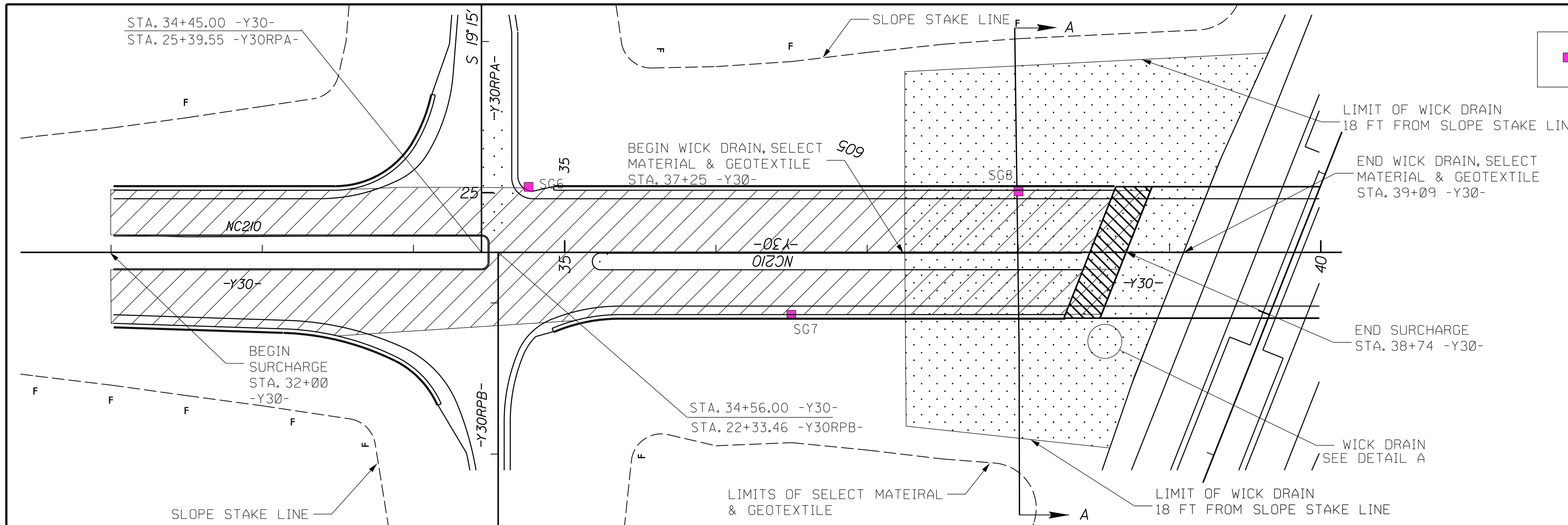
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			2G-3
2			4			



EMBANKMENT PLAN VIEW

NOT TO SCALE

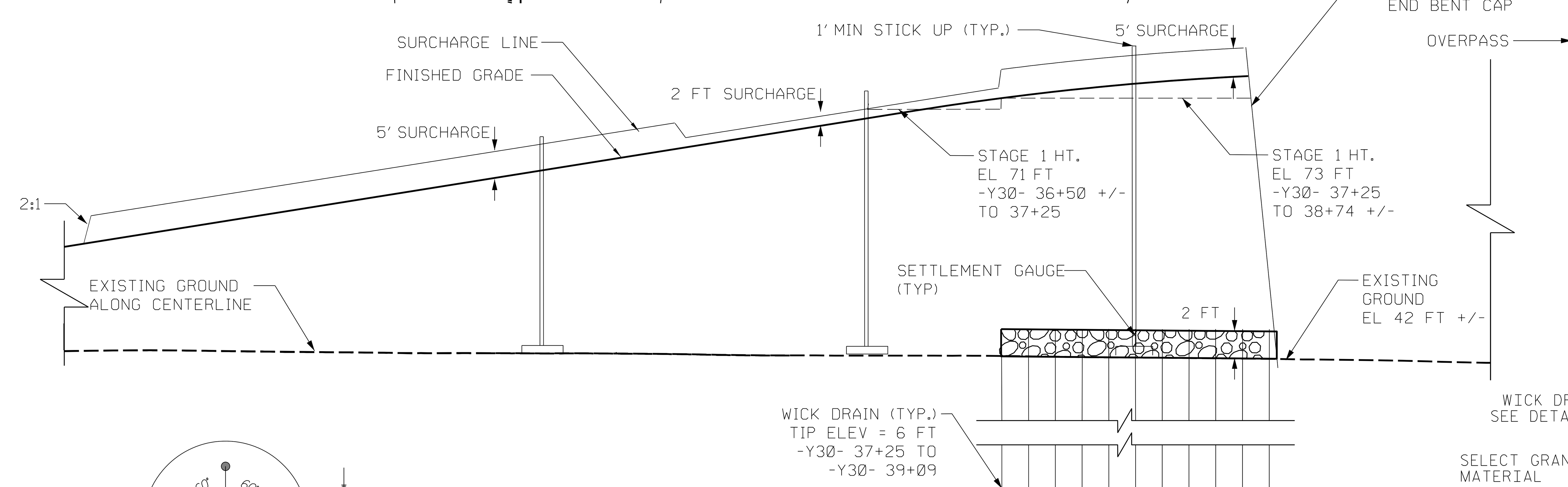
■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET DISTANCE FT	OFFSET DIRECTION LT/RT
SG6	-Y30- 34+75	43	LT
SG7	-Y30- 36+50	42	RT
SG8	-Y30- 38+00	40	LT

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
-Y30- 36+50 TO 37+25	STAGE 1	71	4.5 MO.
	STAGE 2	FINISHED GRADE +2	9.5 MO.
-Y30- 37+25 TO 38+74	STAGE 1	73	3 MO.
	STAGE 2	FINISHED GRADE +5	3 MO.

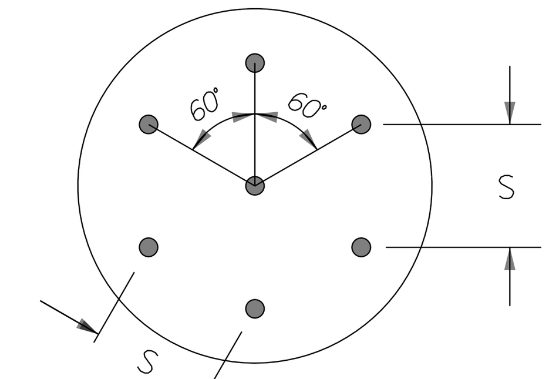
* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y30- 32+00 TO 35+25	5 FT	18 MO.
-Y30- 35+25 TO 36+50	2 FT	8 MO.
-Y30- 36+50 TO 37+25	2 FT	9.5 MO.
-Y30- 37+25 TO 38+74	5 FT	3 MO.



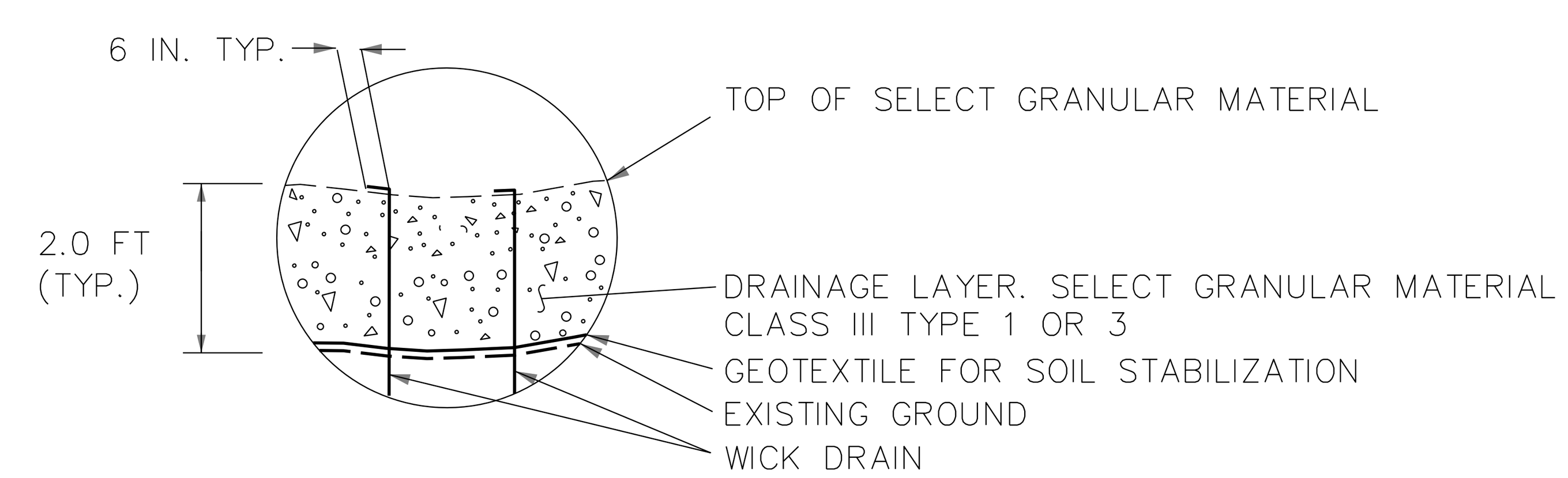
PROFILE ALONG CENTERLINE

NOT TO SCALE



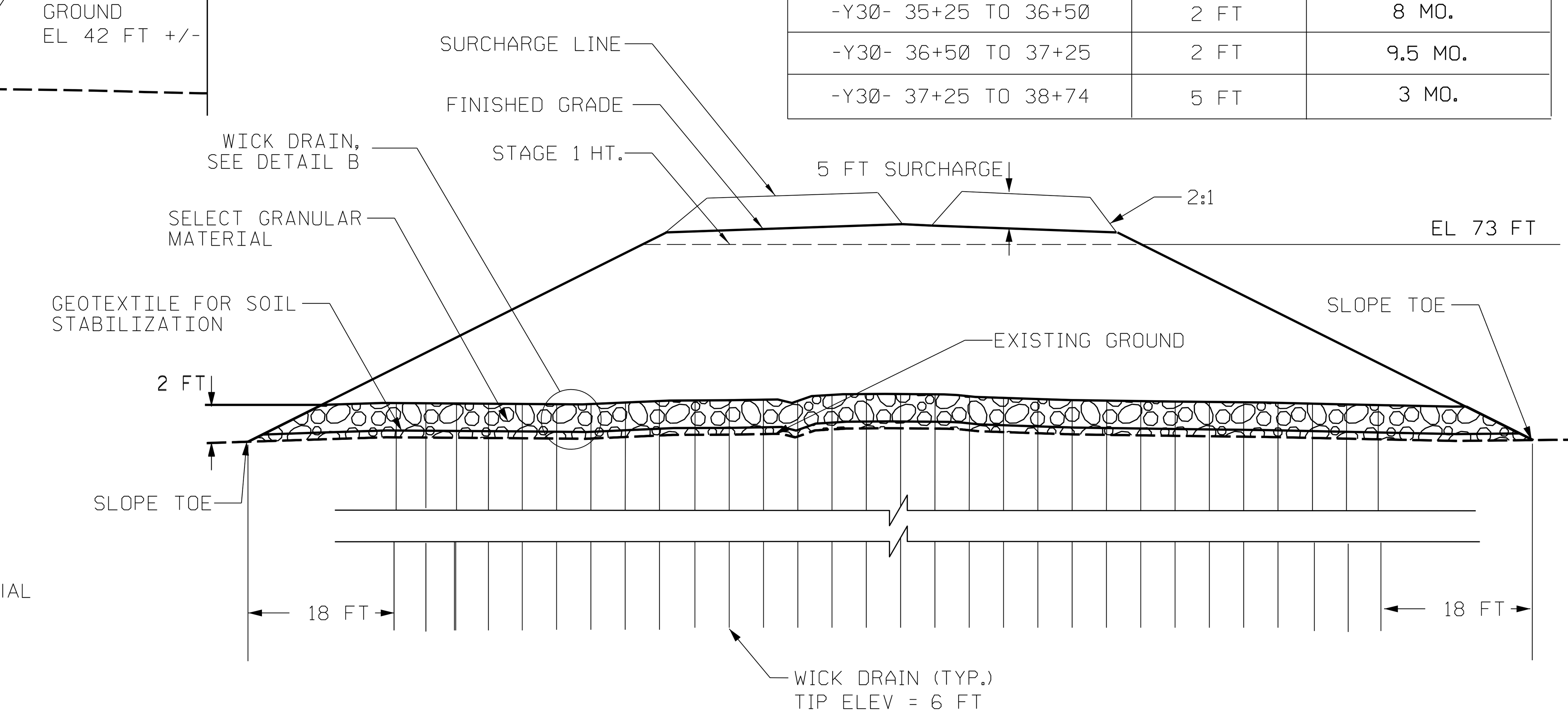
DETAIL A
WICK DRAIN (TYP.)

NOT TO SCALE



DETAIL B - WICK DRAIN (TYP.)

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

WICK DRAINS		
STATIONS	SPACING, S	TIP ELEV.
-Y30- 37+25+/- TO 39+09	3 FT	6 FT

GEOTECHNICAL ENGINEER — SEAL 034020 — NORTH CAROLINA PROFESSIONAL ENGINEER — YINHUI LIU — Yinhui Liu 10/20/2021

ENGINEER

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PROJECT NO.: R-3300B
PENDER COUNTY
STATION: 34+00 to 38+74 -Y30-
SHEET 4 OF 16

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Wilmington, North Carolina

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GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			2G-4
2			4			

PREPARED BY: Y. LIU — DATE: 07/2020
REVIEWED BY: B. LACKEY — DATE: 07/2020

GEOTECHNICAL ENGINEER | ENGINEER

SEAL 034020 — NORTH CAROLINA PROFESSIONAL ENGINEER — YINHUI LIU

DocuSigned by: Yinhui Liu 10/20/2021

SIGNATURE DATE | SIGNATURE DATE

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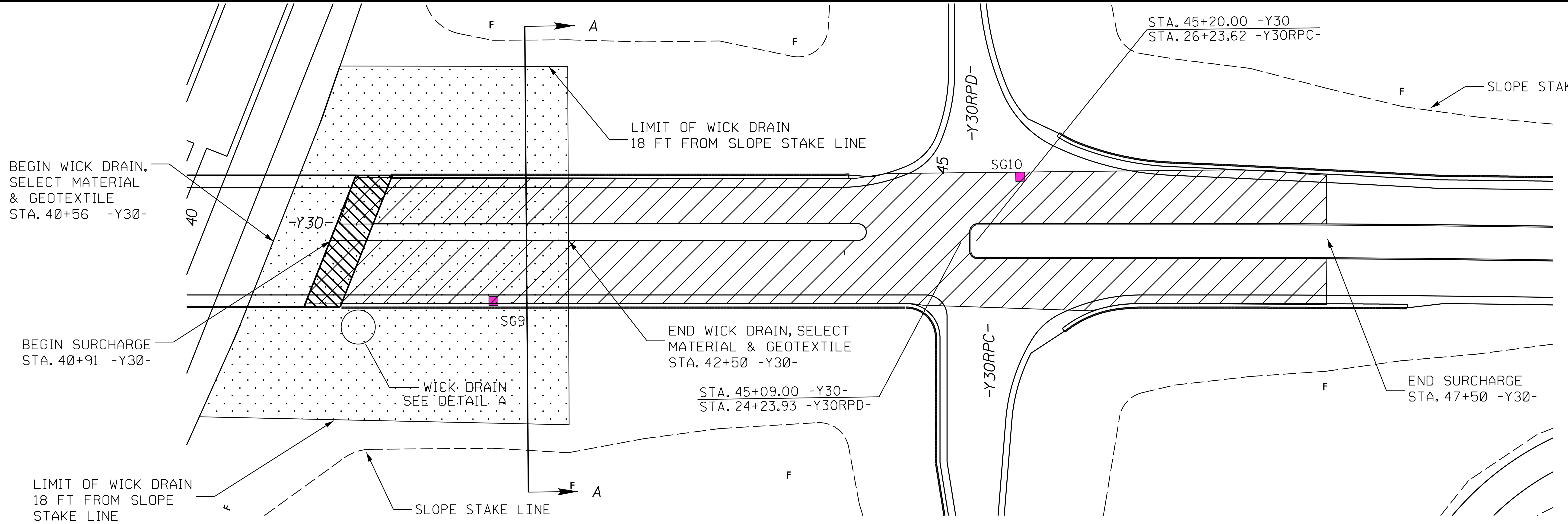
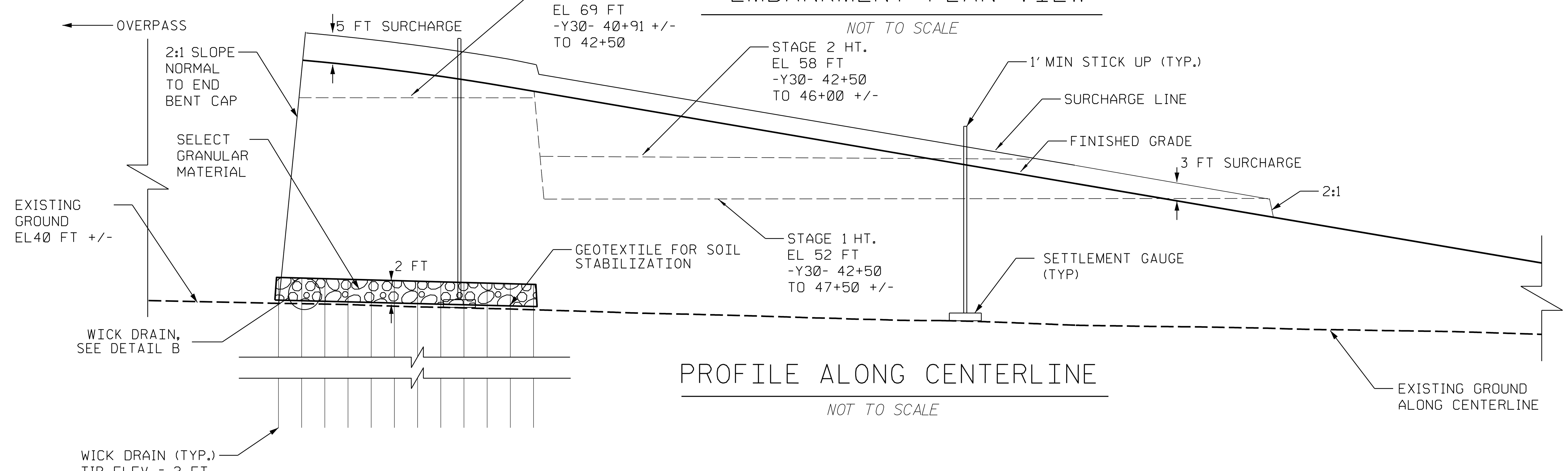


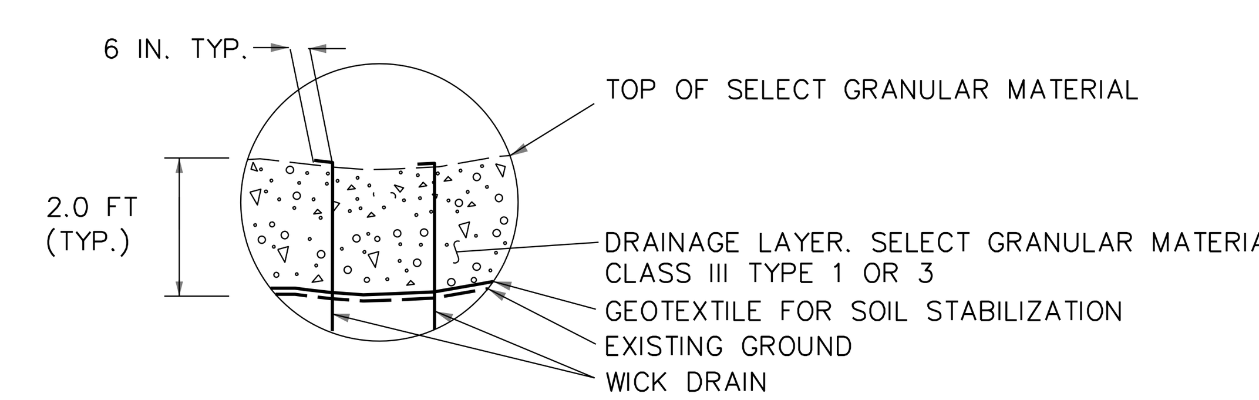
EMBANKMENT PLAN VIEW

NOT TO SCALE



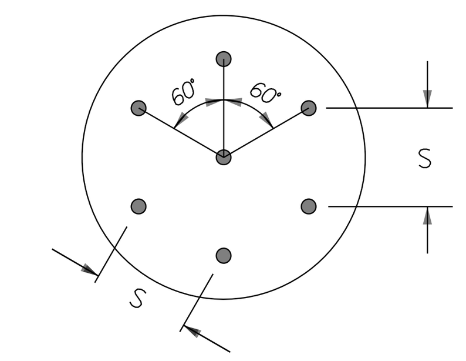
PROFILE ALONG CENTERLINE

NOT TO SCALE



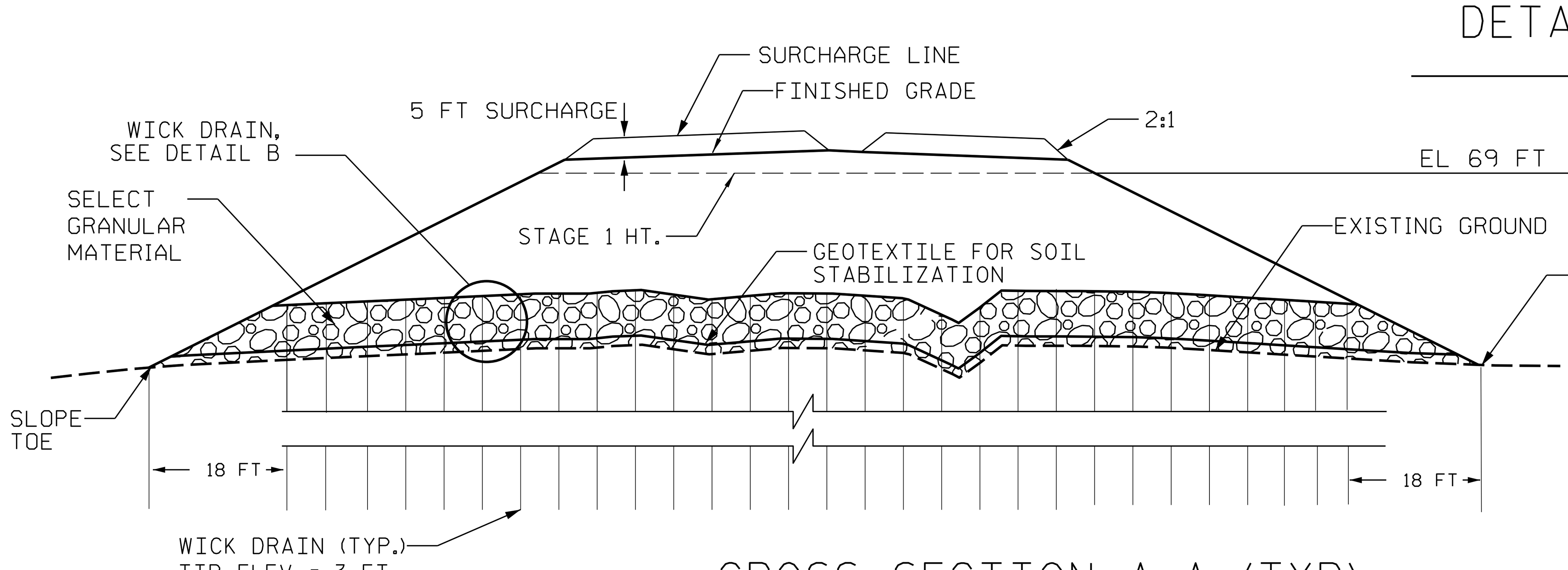
DETAIL B - WICK DRAIN (TYP.)

NOT TO SCALE



DETAIL A - WICK DRAIN (TYP.)

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG9	-Y30- 42+00	40	RT
SG10	-Y30- 45+50	42	LT

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
-Y30- 40+91 to 42+50	STAGE 1	69 FT	2.5 MO.
	STAGE 2	FINISHED GRADE+5	2.5 MO.
-Y30- 42+50 to 46+00	STAGE 1	52 FT	7 MO.
	STAGE 2	58 FT	7 MO.
	STAGE 3	FINISHED GRADE+3	2 MO.
-Y30- 46+00 to 47+50	STAGE 1	52 FT	7 MO.
	STAGE 2	FINISHED GRADE+3	9 MO

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y30- 40+91 TO 42+50	5 FT	2.5 MO.
-Y30- 42+50 TO 46+00	3 FT	2 MO.
-Y30- 46+00 TO 47+50	3 FT	9 MO.

WICK DRAINS		
STATIONS	SPACING, S	TIP ELEV.
-Y30- 40+56 TO 42+50	4 FT	3 FT

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 41+00 to 47+50 -Y30 -

SHEET 5 OF 16

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

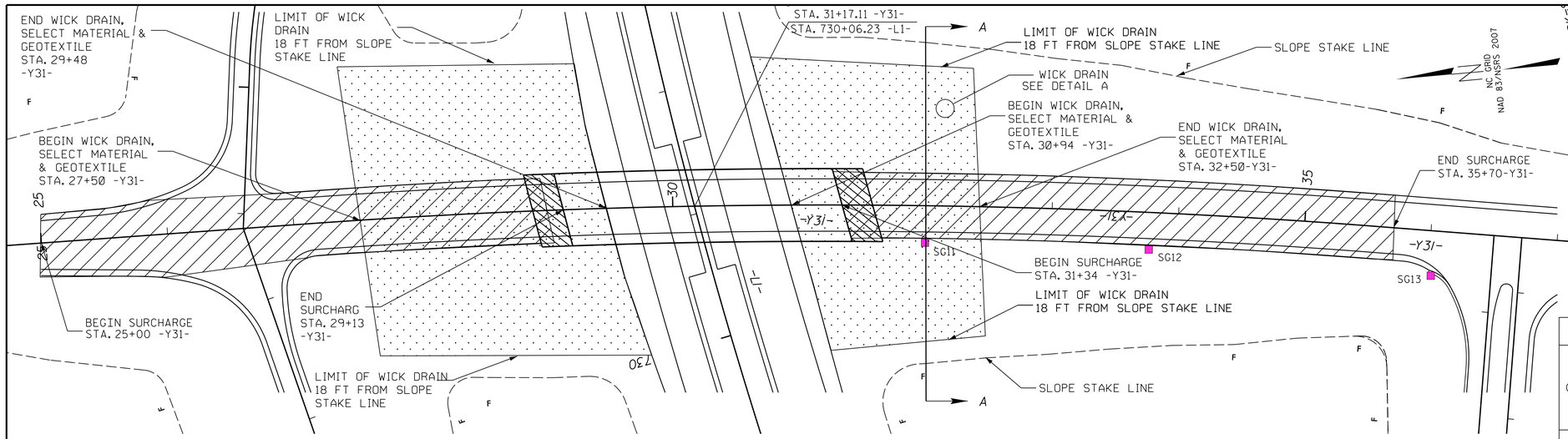
GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GROUND IMPROVEMENT

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		
1			3				2G-5
2			4				

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

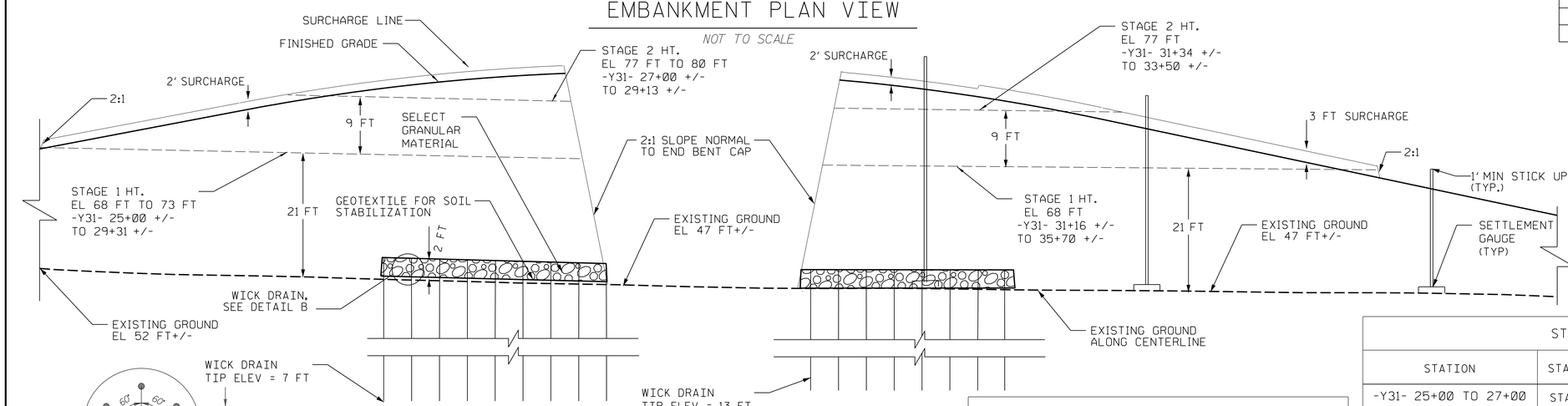


EMBANKMENT PLAN VIEW

NOT TO SCALE

SETTLEMENT GAUGES (SG)

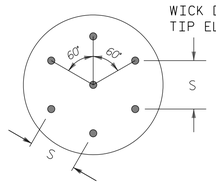
SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG11	-Y31- 32+00	30	RT
SG12	-Y31- 33+75	30	RT
SG13	-Y31- 36+00	35	RT



PROFILE ALONG CENTERLINE

NOT TO SCALE

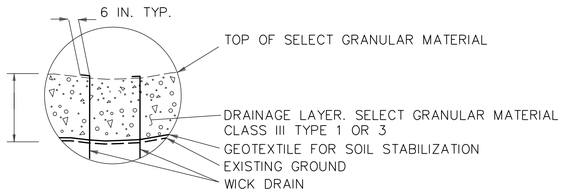
SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y31- 25+00 TO 27+00	2 FT	3 MO.
-Y31- 27+00 TO 29+13 -Y31- 31+34 TO 32+50	2 FT	1 MO.
-Y31- 32+50 TO 33+50	3 FT	0.5 MO.
-Y31- 33+50 TO 35+70	3 FT	3.5 MO.



DETAIL A WICK DRAIN (TYP.)

NOT TO SCALE

WICK DRAINS		
STATIONS	SPACING, S	TIP ELEV.
-Y31- 27+50 TO 29+48	3 FT	7 FT
-Y31- 30+94 TO 32+50	4 FT	13 FT

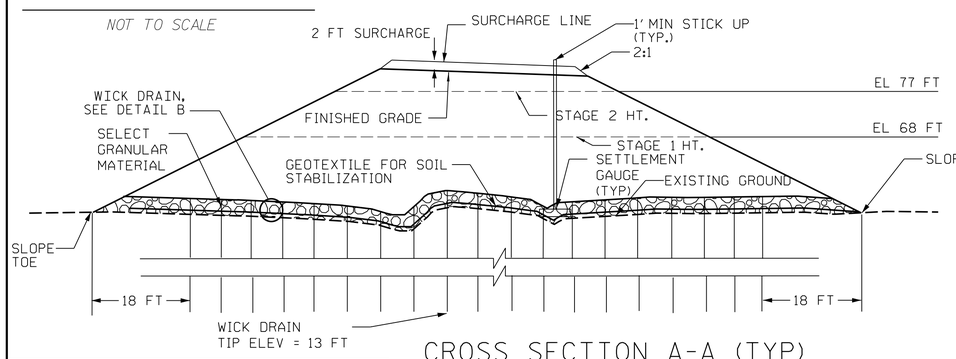


DETAIL B - WICK DRAIN (TYP.)

NOT TO SCALE

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
-Y31- 25+00 TO 27+00	STAGE 1	71 FT TO 73 FT	4 MO.
	STAGE 2	FINISHED GRADE+2	3 MO.
-Y31- 27+00 TO 29+13 -Y31- 31+34 TO 32+50	STAGE 1	68 FT TO 71 FT	2.5 MO.
	STAGE 2	77 FT TO 80 FT	2.5 MO.
	STAGE 3	FINISHED GRADE+2	1 MO.
-Y31- 32+50 TO 33+50	STAGE 1	68 FT	4.5 MO.
	STAGE 2	77 FT	4.5 MO.
	STAGE 3	FINISHED GRADE+3	0.5 MO.
-Y31- 33+50 TO 35+70	STAGE 1	68 FT	4.5 MO.
	STAGE 2	FINISHED GRADE+3	3.5 MO.

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE



CROSS SECTION A-A (TYP)

NOT TO SCALE

PROJECT NO.: R-3300B
PENDER COUNTY
STATION: 25+00 to 36+50 -Y31 -
SHEET 6 OF 16

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

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Wilmington, North Carolina

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			2G-6
2			4			

GEOTECHNICAL ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER
DocuSigned by: Yinhui Liu 10/20/2021
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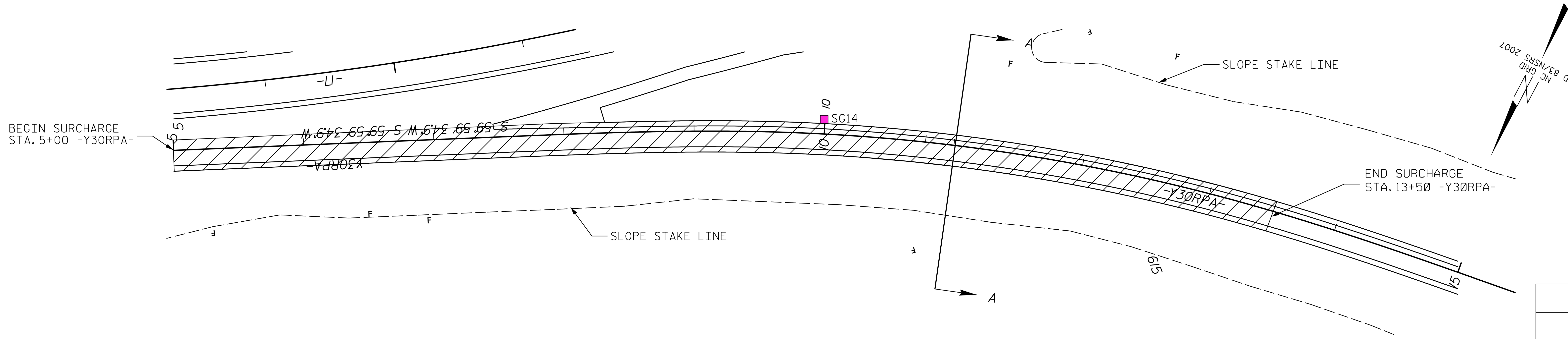
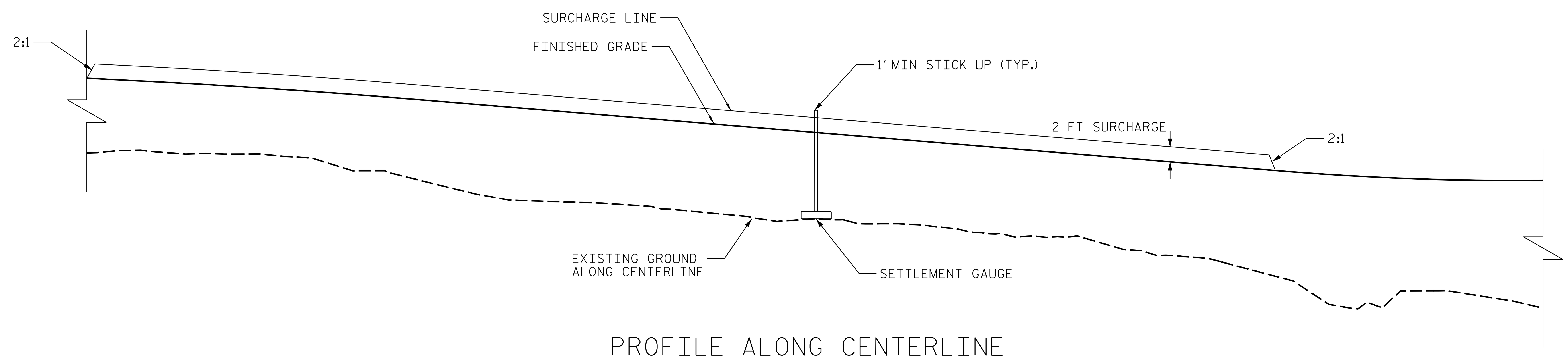


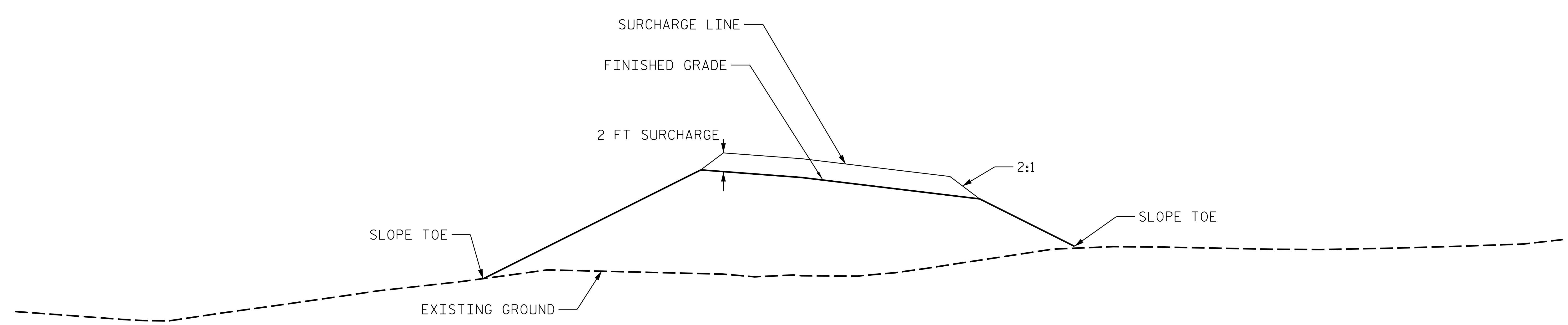
EMBANKMENT PLAN VIEW

NOT TO SCALE



PROFILE ALONG CENTERLINE

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

GEOTECHNICAL ENGINEER

SEAL 034020 — NORTH CAROLINA PROFESSIONAL ENGINEER — YINHUI LIU

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■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG14	-Y30RPA- 10+00	11	LT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y30RPA- 5+00 TO 13+50	2 FT	5 MO.

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 5+00 to 12+50 -Y30RPA -

SHEET 7 OF 16

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Wilmington, North Carolina

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			2G-7
2			4			

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

GEOTECHNICAL ENGINEER	ENGINEER
SEAL 034020 — NORTH CAROLINA PROFESSIONAL ENGINEER — YINHUI LIU; DocuSigned by: Yinhui Liu, 10/20/2021 (SIGNATURE / DATE)	SIGNATURE / DATE

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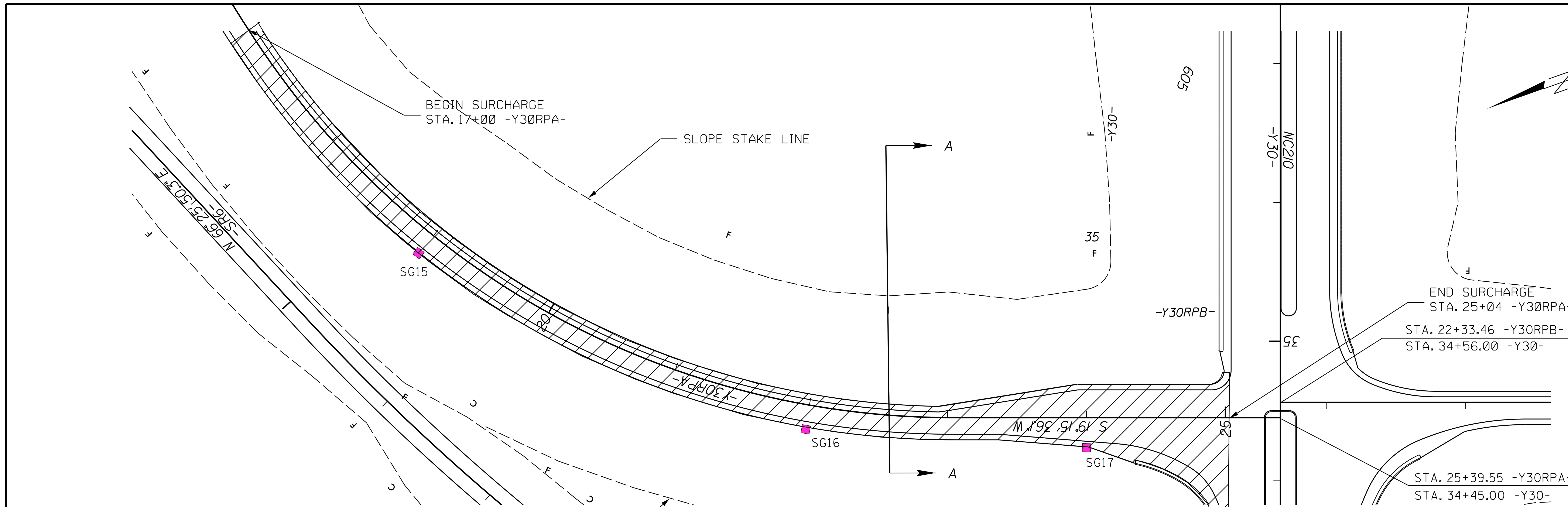


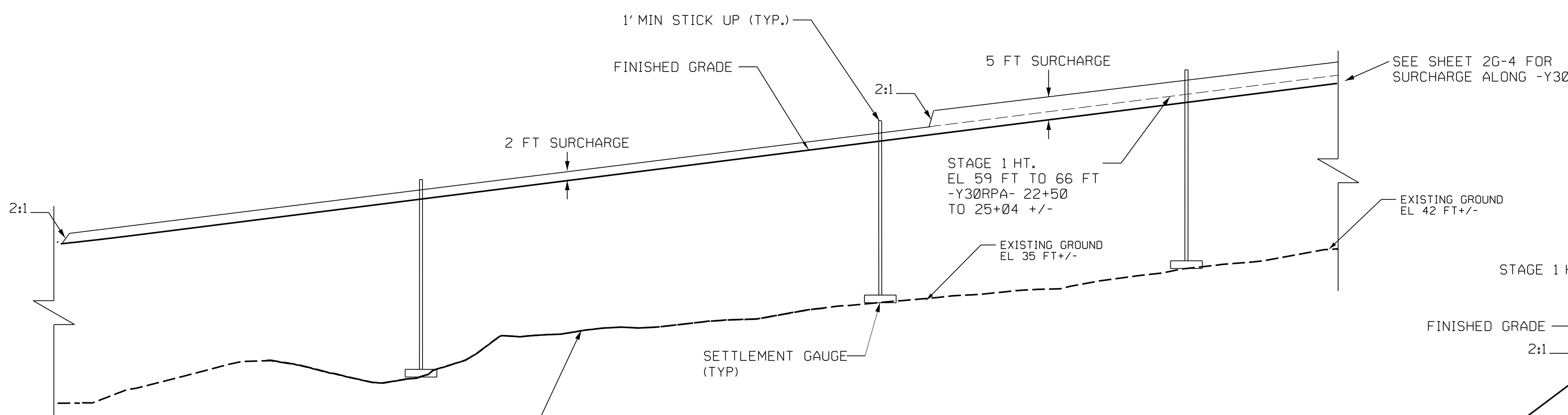
EMBANKMENT PLAN VIEW

NOT TO SCALE

■ SETTLEMENT GAUGES (SG)

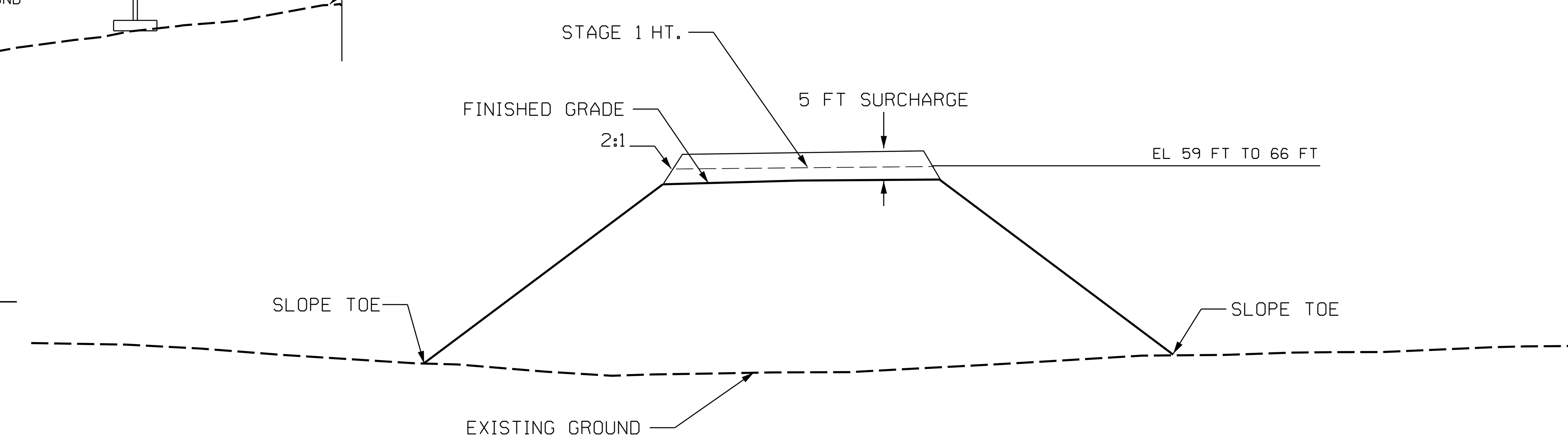
SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG15	-Y30RPA- 19+00	25	RT
SG16	-Y30RPA- 22+00	25	RT
SG17	-Y30RPA- 24+00	30	RT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y30RPA- 17+00 TO 22+50	2 FT	12 MO.
-Y30RPA- 22+50 TO 25+04	2 FT + 3 FT	10 MO. + 8 MO.



PROFILE ALONG CENTERLINE

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

STAGE CONSTRUCTION		
STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
STAGE 1 -Y30RPA- STA. 22+50 TO 25+04	FINISHED GRADE+2	10 MO.
STAGE 2 -Y31RPA- STA. 22+50 TO 25+04	FINISHED GRADE+5	8 MO.

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT STAGE 1 HEIGHT AND STAGE 2 HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 19+00 to 24+00 -Y30RPA -

SHEET 8 OF 16

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

REVISIONS							SHEET NO.
NO.	BY	DATE	NO.	BY	DATE		2G-8
1			3				
2			4				

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YANHUI LIU

DocuSigned by: Yanhui Liu 10/20/2021
ADB720F52880ADFF...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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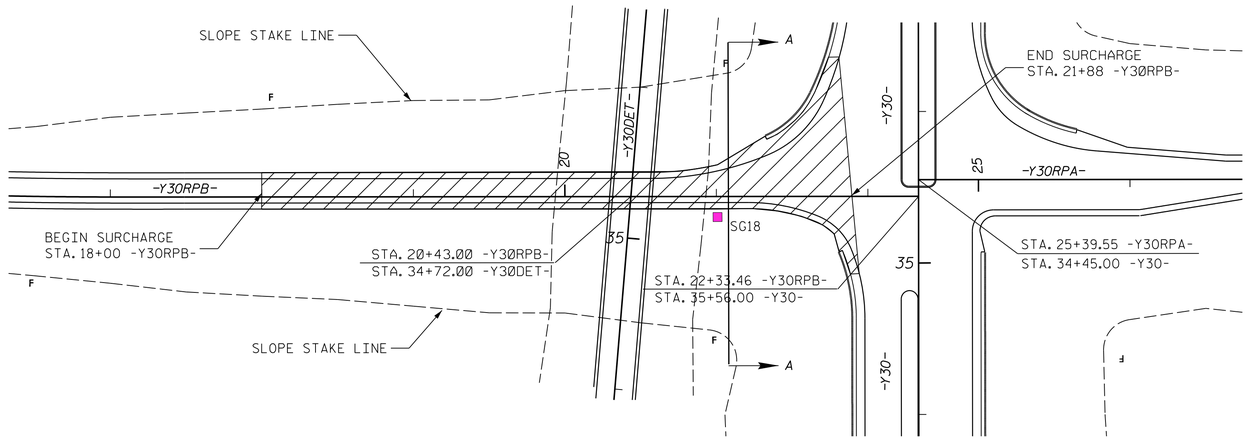


EMBANKMENT PLAN VIEW

NOT TO SCALE

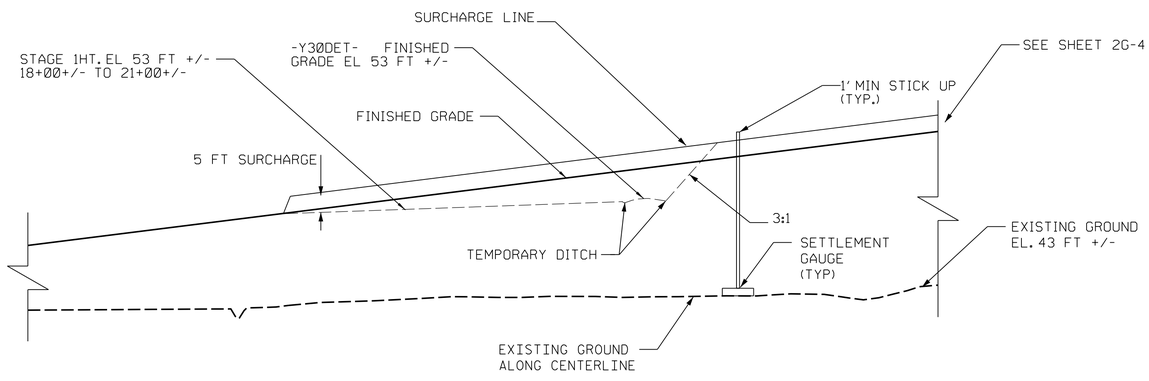
■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG18	-Y30RPB- 21+00	15	RT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING TIME
-Y30RPB- 18+00 TO 21+88	5 FT	2 MO.

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
-Y30RPB- 18+00 TO 21+00	STAGE 1	53 FT	16 MO.***
	STAGE 2	FINISHED GRADE+5	2 MO.

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE.
*** STAGE 1 WAITING PERIOD CAN BE ENDED AFTER 16 MO. OR AFTER TRAFFIC IS SHIFTED FROM -Y30DET- TO -Y30-, WHICHEVER IS LONGER.

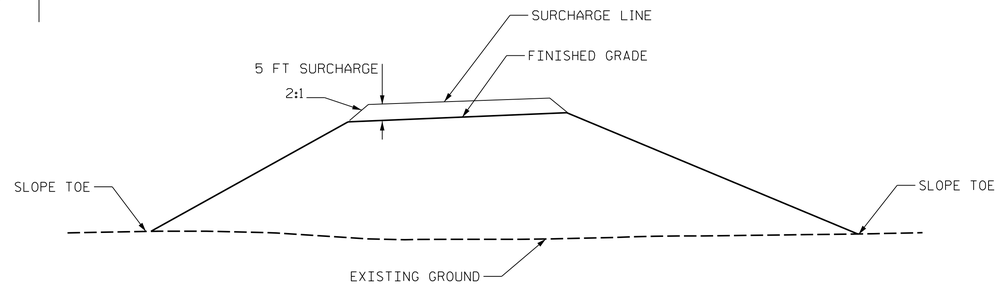


PROFILE ALONG CENTERLINE

NOT TO SCALE

NOTES

* -Y30DET- CAN BE PAVED WITHOUT WAITING PERIOD.
** TEMPORARY DITCH SHALL BE INSTALLED AT BOTH SIDES OF -Y30DET- CROSSING -Y30RPB- DURING STAGE 1.



CROSS SECTION A-A (TYP)

NOT TO SCALE

PROJECT NO.: R-3300B
PENDER COUNTY
STATION: 18+00 to 21+88 -Y30RPB -
SHEET 9 OF 16

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

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Wilmington, North Carolina

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

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1			3			2G-9
2			4			

GEOTECHNICAL ENGINEER | ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034020 YINHUI LIU

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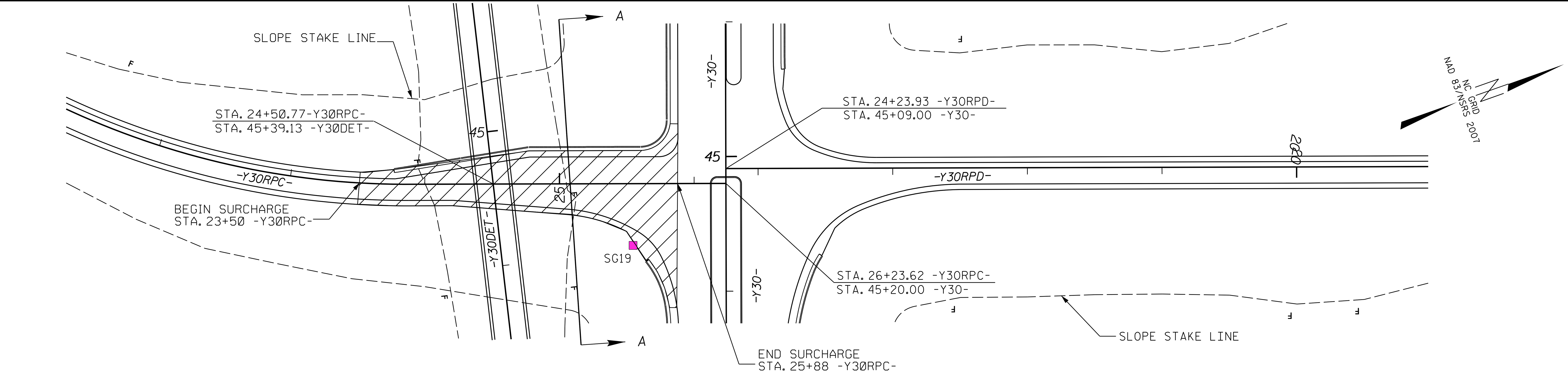
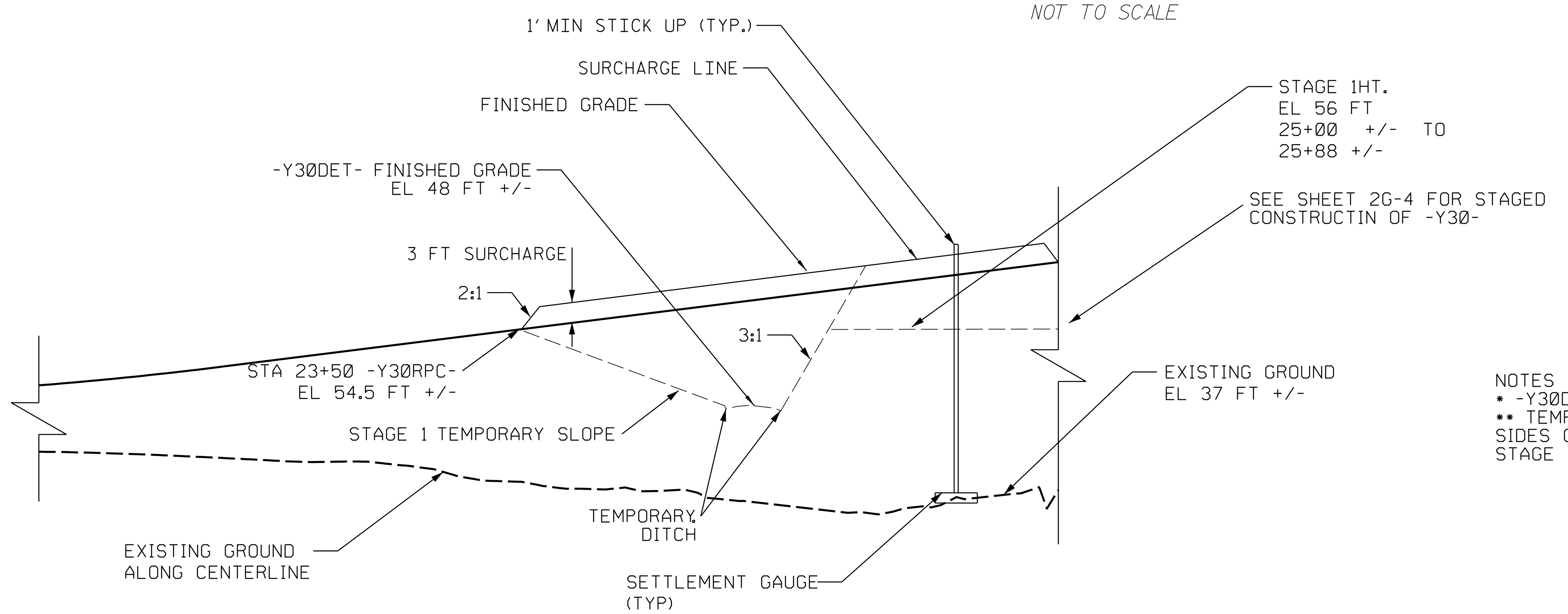


SETTLEMENT GAUGES (SG)

EMBANKMENT PLAN VIEW

NOT TO SCALE

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG19	-Y30RPC- 25+50	45	RT

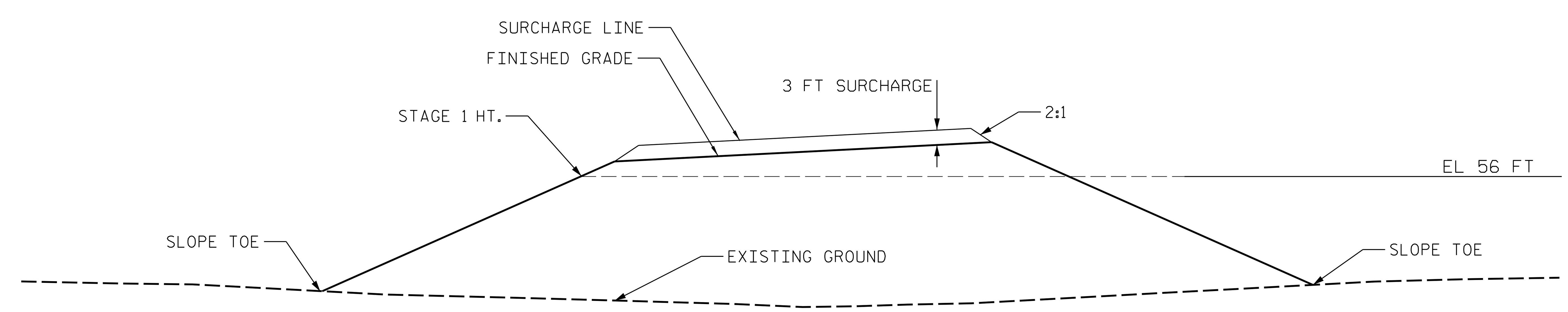


PROFILE ALONG CENTERLINE

NOT TO SCALE

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y30RPC- 23+50 TO 25+00	3 FT	2 MO.
-Y30RPC- 25+00 TO 25+88	3 FT	9 MO.

NOTES
* -Y30DET- CAN BE PAVED WITHOUT WAITING PERIOD.
** TEMPORARY DITCH SHALL BE INSTALLED AT BOTH SIDES OF -Y30DET- CROSSING -Y30RPC- DURING STAGE 1.



CROSS SECTION A-A (TYP)

NOT TO SCALE

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
-Y30RPC- 23+50 TO 25+00	STAGE 1	48 TO 54.5 FT	14 MO. ***
	STAGE 2	FINISHED GRADE+3	2 MO.
-Y30RPC- 25+00 TO 25+88	STAGE 1	56 FT	7 MO.
	STAGE 2	FINISHED GRADE+3	9 MO.

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE
*** STAGE 1 WAITING PERIOD CAN BE ENDED AFTER 14 MO. OR AFTER TRAFFIC IS SHIFTED FROM -Y30DET- TO -Y30-, WHICHEVER IS LONGER.

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 23+50 to 25+88 -Y30RPC-

SHEET 10 OF 16

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REVIEWED BY: B. LACKEY	DATE: 07/2020

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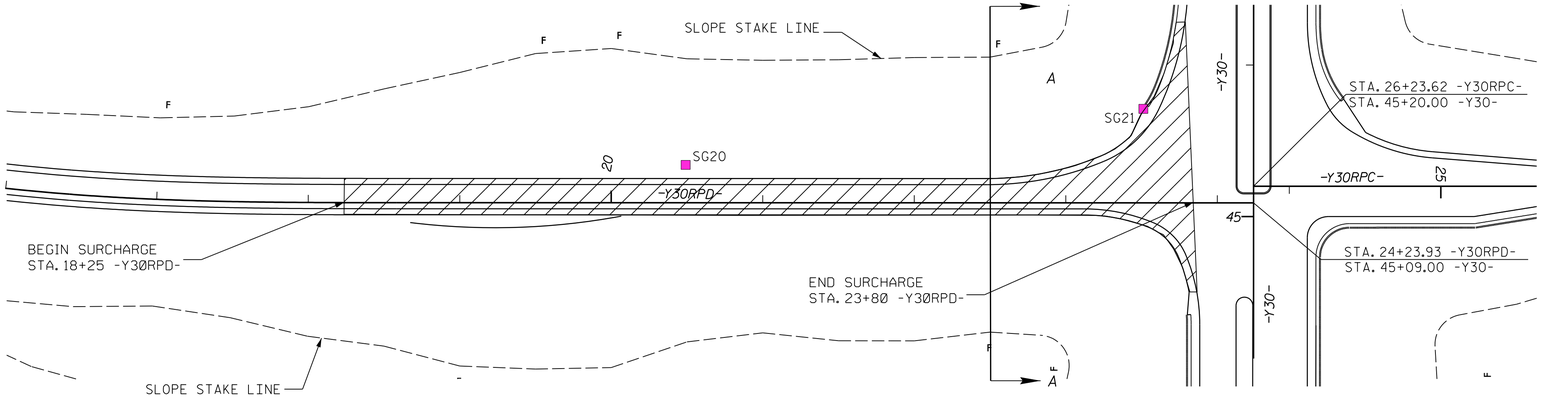
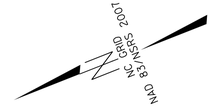
1			3					2G-10
2			4					



EMBANKMENT PLAN VIEW

NOT TO SCALE



GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YINHUI LIU	
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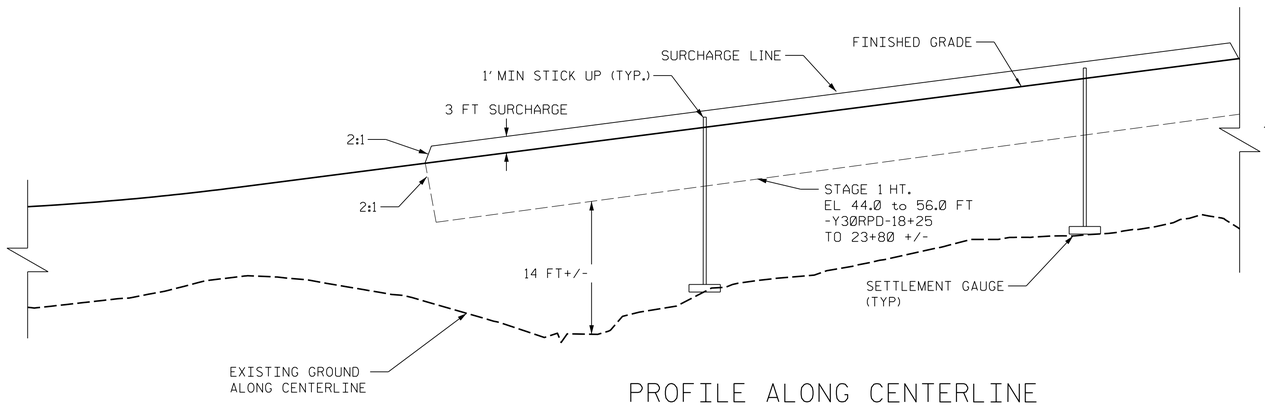
■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG20	-Y30RPD- 20+50	25	LT
SG21	-Y30RPD- 23+50	62	LT



SEE SHEET 2G-4 FOR STAGED CONSTRUCTIN OF -Y30-

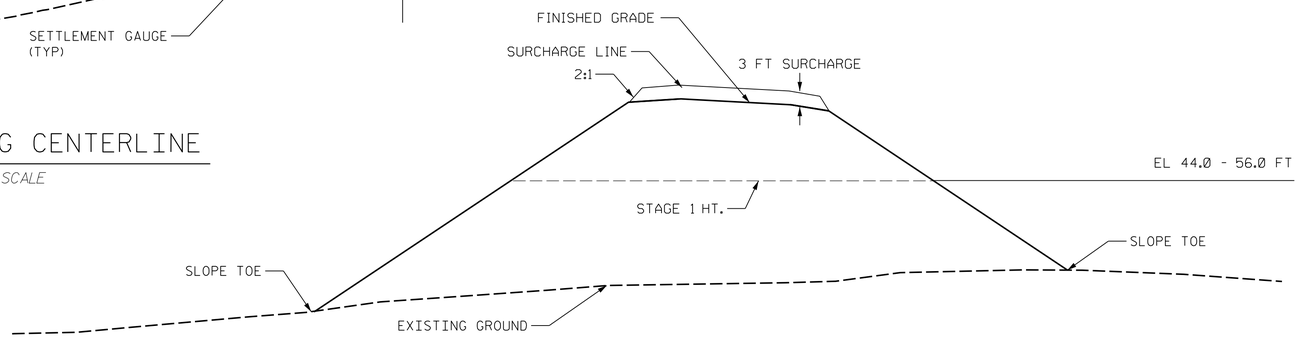
PROFILE ALONG CENTERLINE

NOT TO SCALE

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y30RPD- 18+25 TO 23+80	3 FT	9 MO.

STAGE CONSTRUCTION		
STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
STAGE 1 -Y30RPD- 18+25 to 23+80	44 to 56 FT	7 MO.
STAGE 2 -Y30RPD- 18+25 to 23+80	FINISHED GRADE + 3	9 MO.

** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE



CROSS SECTION A-A (TYP)

NOT TO SCALE

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 18+25 to 23+80 -Y30RPD -

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

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GROUND IMPROVEMENT

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NO.	BY	DATE	NO.	BY	DATE	
1			3			2G-11
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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YINHUI LIU

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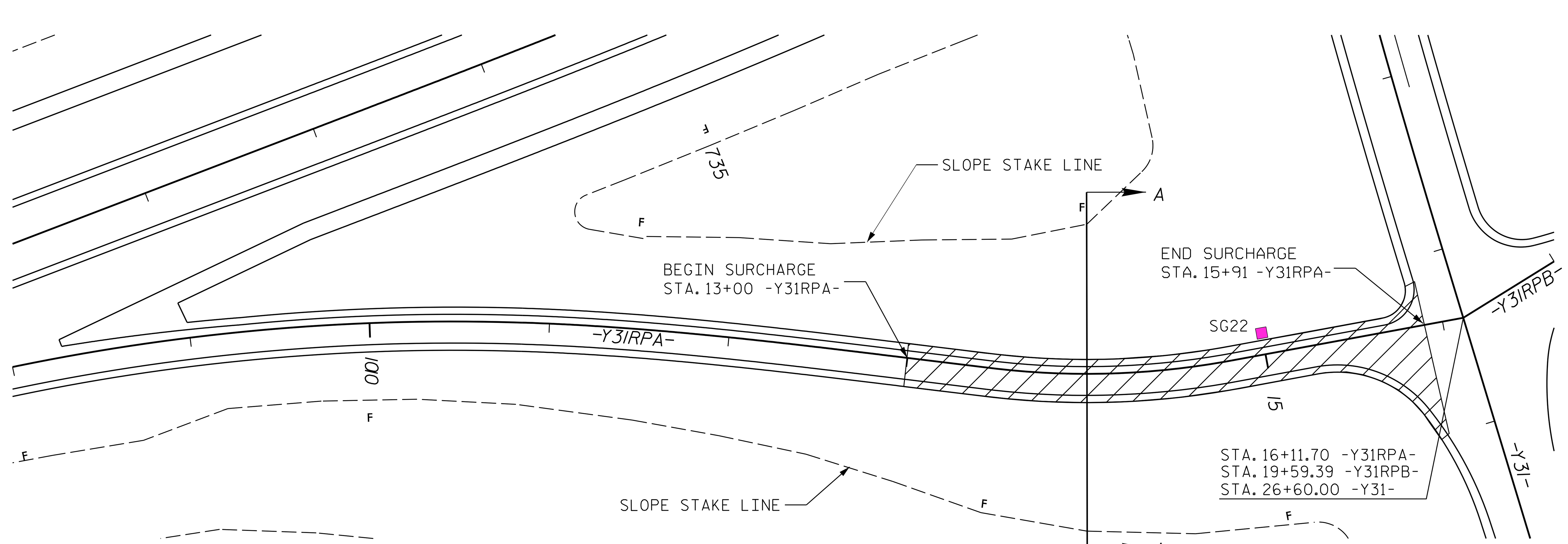
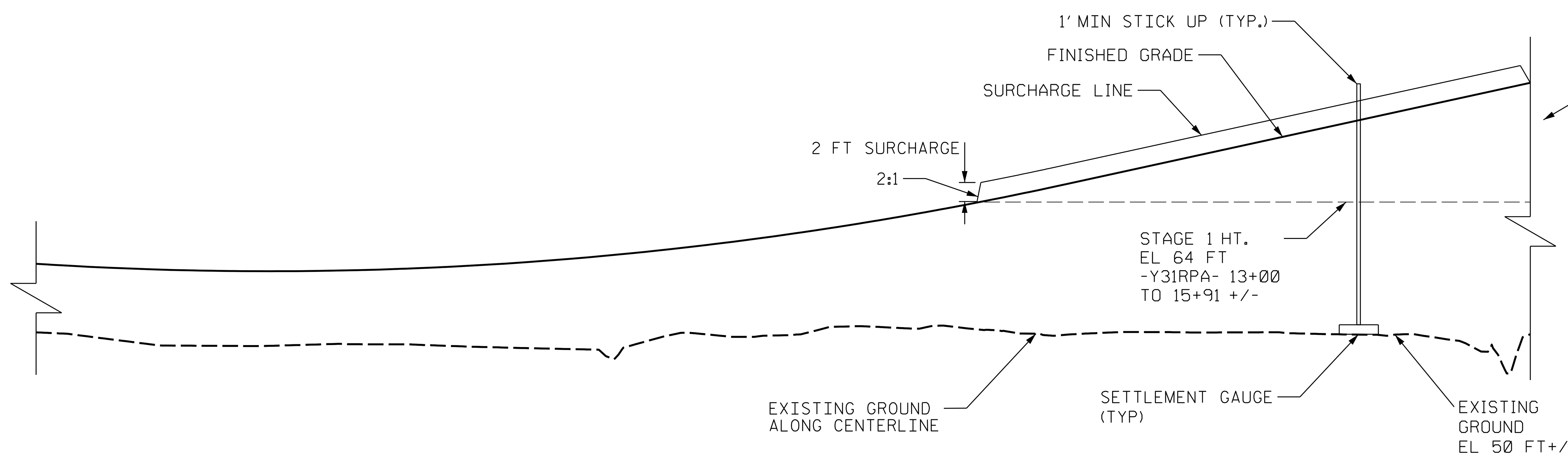


EMBANKMENT PLAN VIEW

NOT TO SCALE

■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG22	-Y31RPA- 15+00	12	LT



SEE SHEET 2G-6 FOR STAGED CONSTRUCTIN OF -Y31-

STAGE CONSTRUCTION		
STAGE	EMBANKMENT ELEVATIONS✻	WAITING PERIOD✻✻
STAGE 1 -Y31RPA- STA. 13+00 TO 15+91	64 FT	2.5 MO.
STAGE 2 -Y31RPA- STA. 13+00 TO 15+91	FINISHED GRADE+2	4.5 MO.

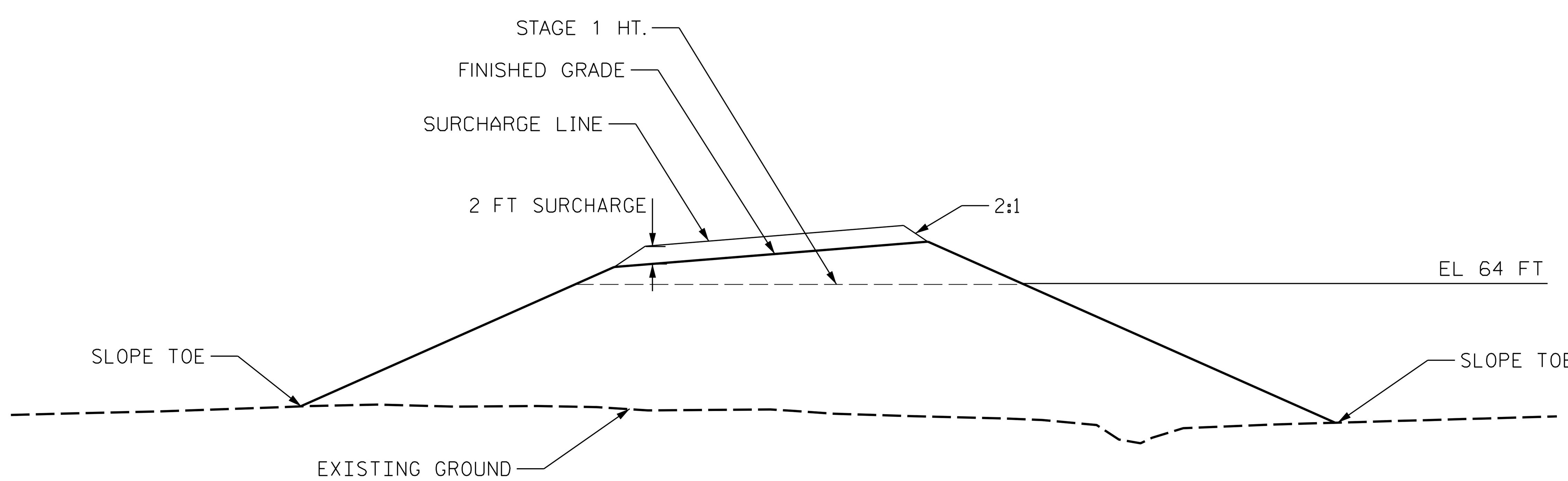
✻ SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.

✻✻ BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE

PROFILE ALONG CENTERLINE

NOT TO SCALE

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y31RPA- 13+00 TO 15+91	2 FT	4.5 MO.



CROSS SECTION A-A (TYP)

NOT TO SCALE

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 13+00 to 15+91 -Y31RPA -

SHEET 12 OF 16

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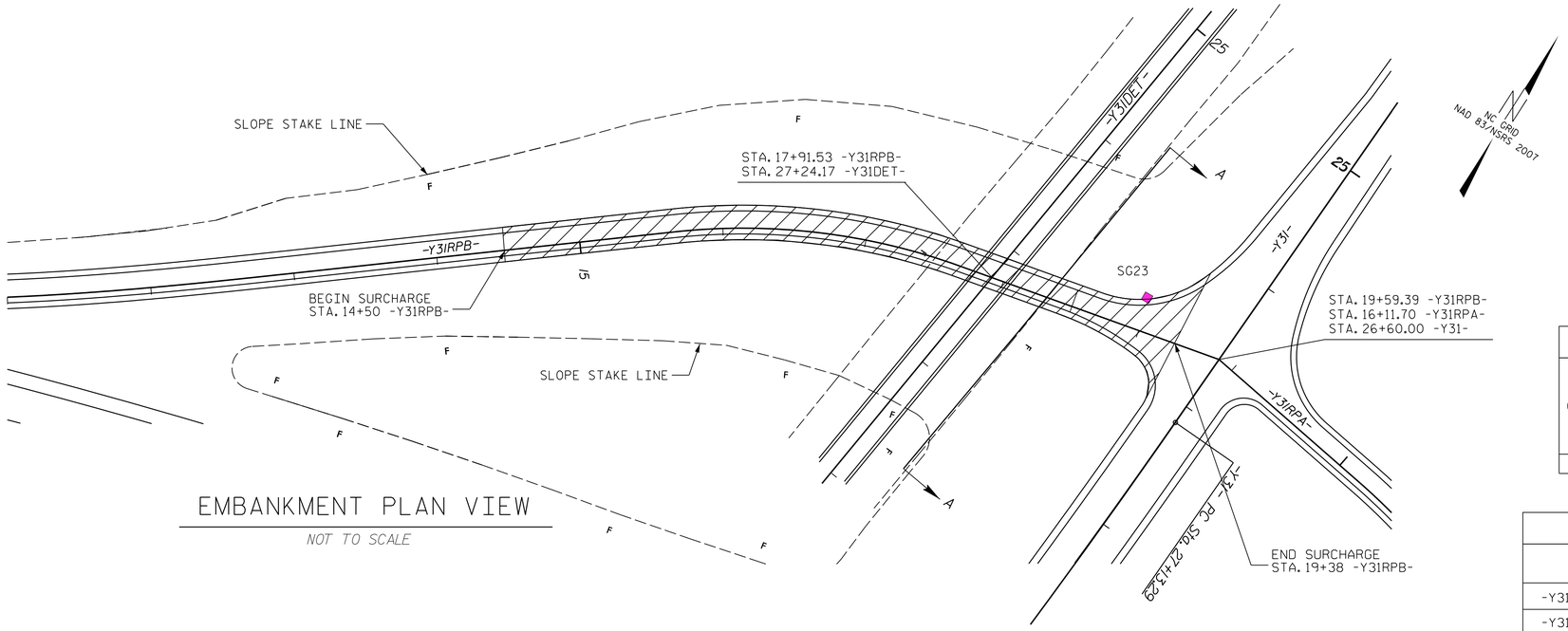
PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020



EMBANKMENT PLAN VIEW

NOT TO SCALE

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER

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10/20/2021

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ENGINEER

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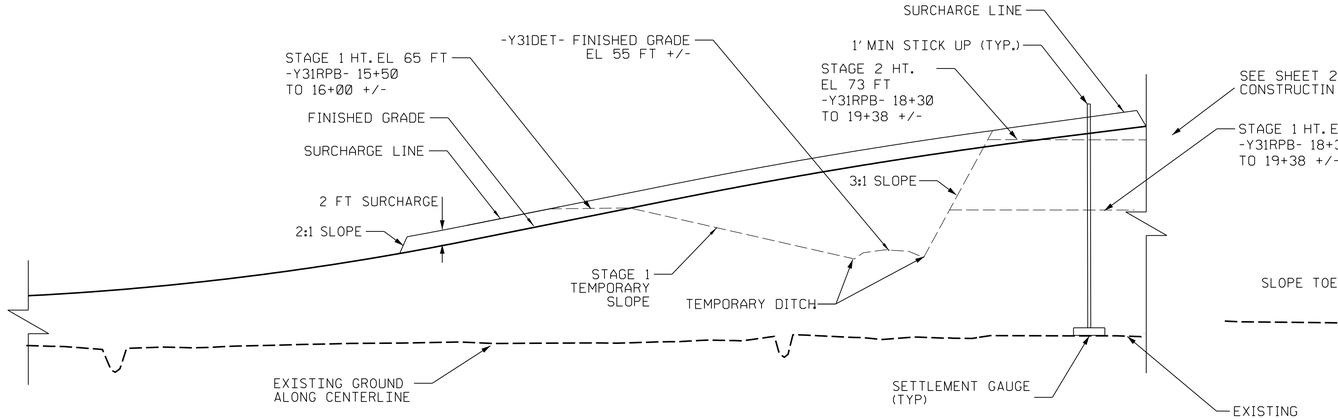
■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG23	-Y31RPB- 19+00	34	LT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y31RPB- 14+50 TO 15+50	2 FT	10 MO.
-Y31RPB- 15+50 TO 18+30	2 FT	2 MO.
-Y31RPB- 18+30 TO 19+38	2 FT	1 MO.



PROFILE ALONG CENTERLINE

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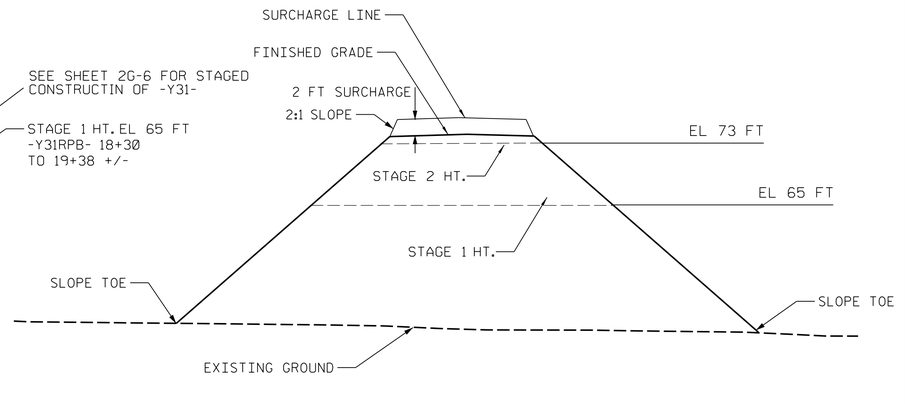

CROSS SECTION A-A (TYP)

NOT TO SCALE

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD**
-Y31RPB- 15+50 TO 18+30	STAGE 1	55+/- TO 65+/- FT	8 MO.***
	STAGE 2	FINISHED GRADE+2	2 MO.
-Y31RPB- 18+30 TO 19+38	STAGE 1	65 FT	4.5 MO.
	STAGE 2	73 FT	4.5 MO.
	STAGE 3	FINISHED GRADE+2	1 MO.

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE.
*** STAGE 1 WAITING PERIOD CAN BE ENDED AFTER 8 MO. OR AFTER TRAFFIC IS SHIFTED FROM -Y31DET- TO -Y31-, WHICHEVER IS LONGER.

NOTES

•-Y31DET- CAN BE PAVED WITHOUT WAITING PERIOD.
••TEMPORARY DITCH SHALL BE INSTALLED AT BOTH SIDES OF -Y31DET- CROSSING -Y31RPB- DURING STAGE 1.

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 14+50 to 19+38 -Y31RPB -

SHEET 14 OF 17

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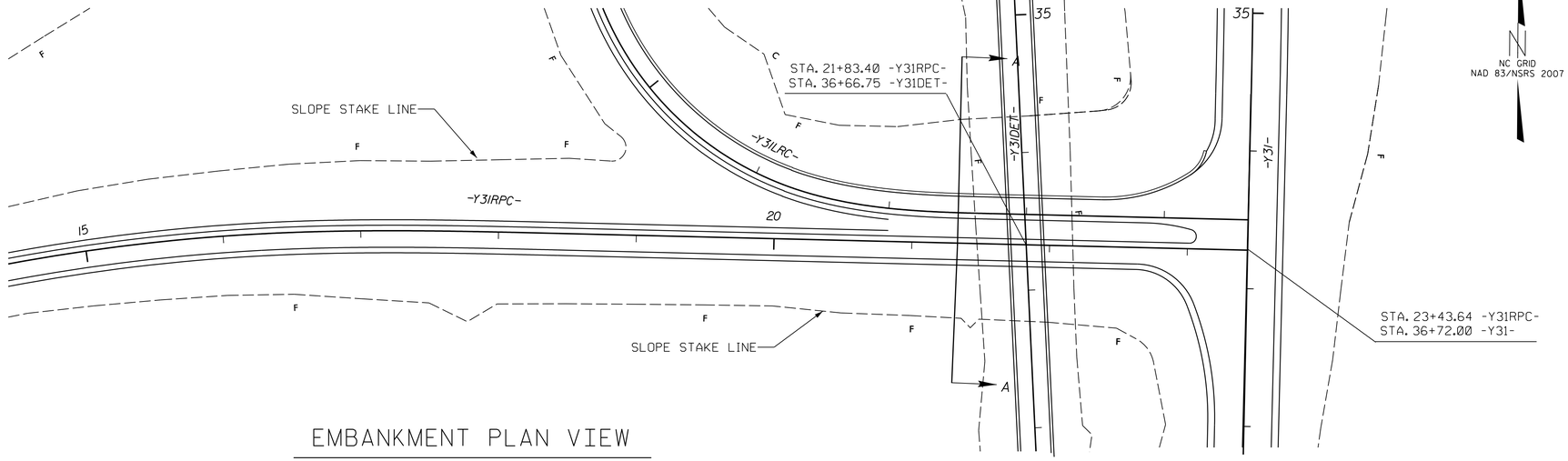
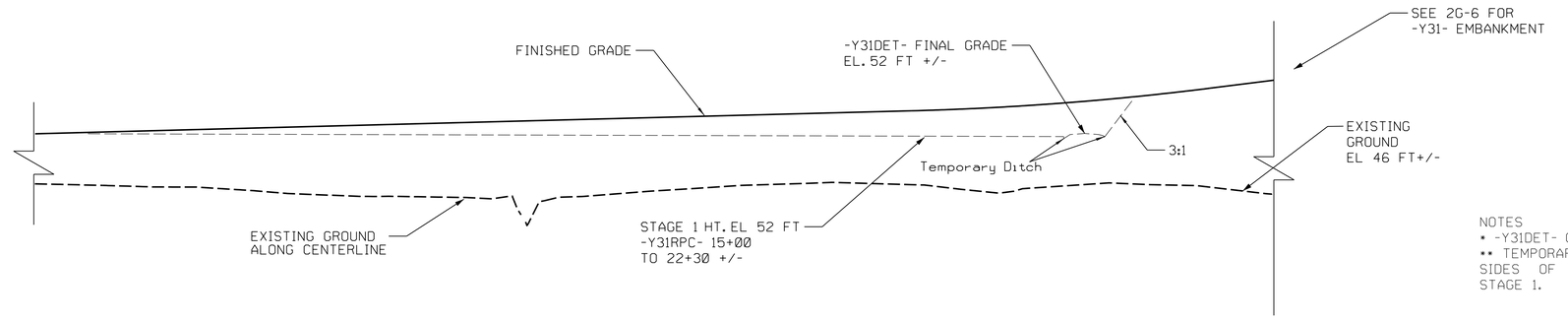


EMBANKMENT PLAN VIEW

NOT TO SCALE



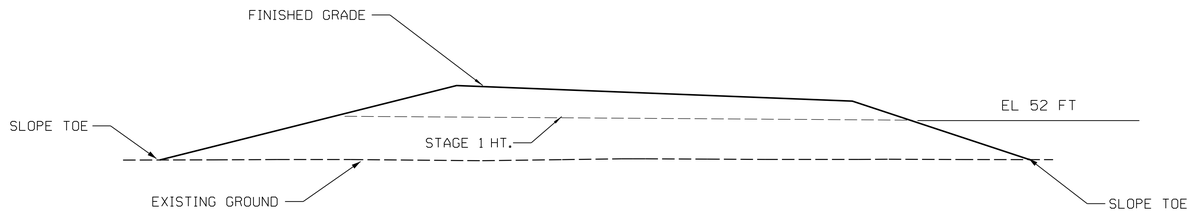
NOTES
• -Y31DET- CAN BE PAVED WITHOUT WAITING PERIOD.
•• TEMPORARY DITCH SHALL BE INSTALLED AT BOTH SIDES OF -Y31DET- CROSSING -Y31RPC- DURING STAGE 1.

PROFILE ALONG CENTERLINE

NOT TO SCALE

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATIONS*	WAITING PERIOD•
-Y31RPC- 15+00 TO 22+30	STAGE 1	52 FT	7.5 MO. ••
	STAGE 2	FINISHED GRADE	2 MO.

• BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE.
•• STAGE 1 WAITING PERIOD CAN BE ENDED AFTER 7.5 MO. OR AFTER TRAFFIC IS SHIFTED FROM -Y31DET- TO -Y31-, WHICHEVER IS LONGER.



CROSS SECTION A-A (TYP)

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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YINHUI LIU

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PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 15+00 to 23+23 -Y31RPC

SHEET 14 OF 16

PREPARED BY: Y. LIU	DATE: 07/2020
REVIEWED BY: B. LACKEY	DATE: 07/2020

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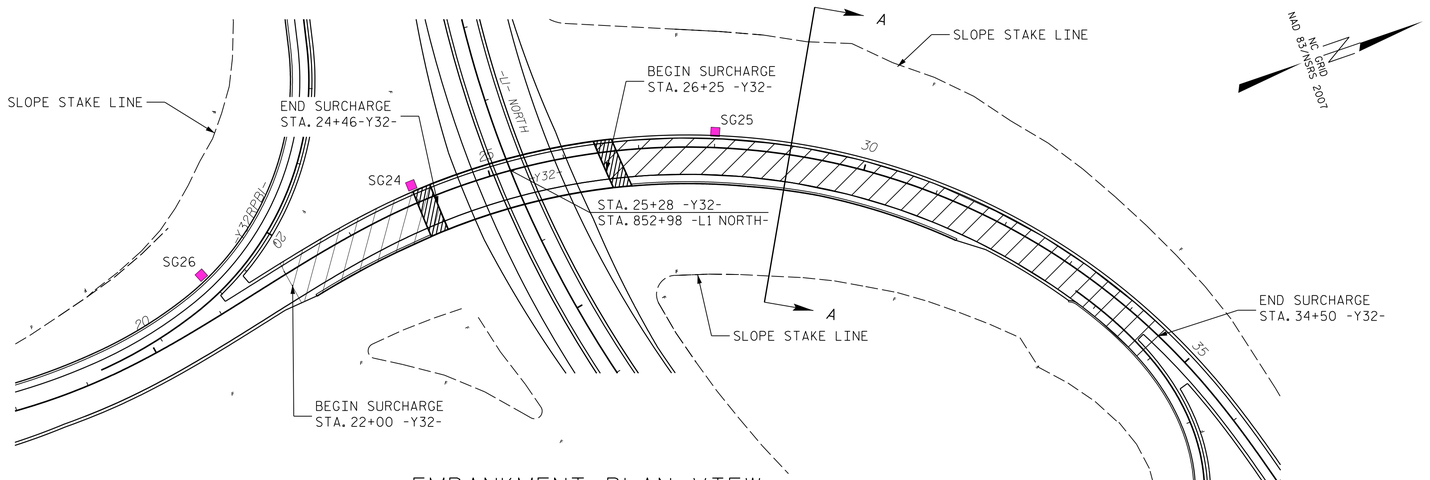
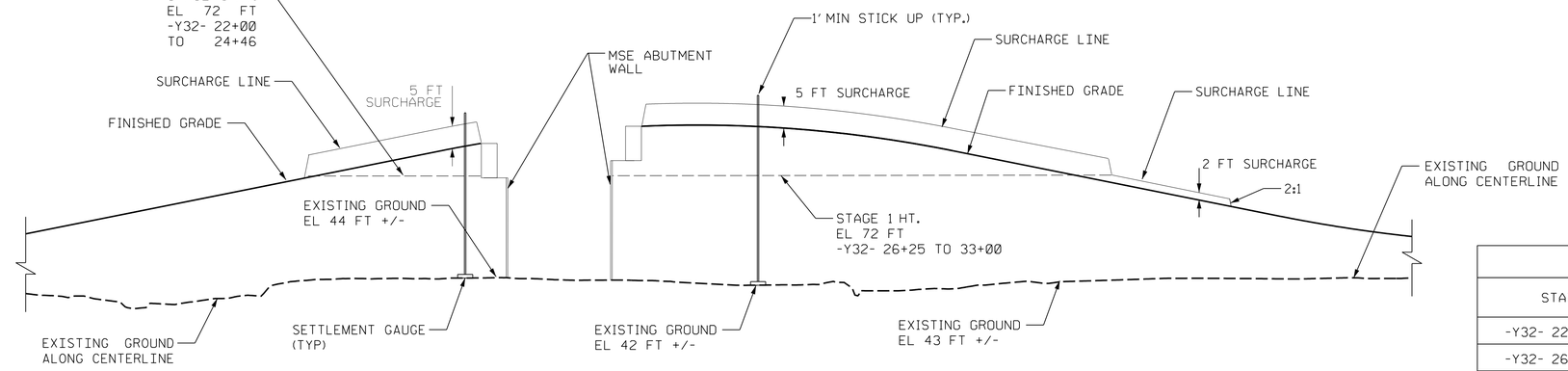


EMBANKMENT PLAN VIEW

NOT TO SCALE



PROFILE ALONG CENTERLINE

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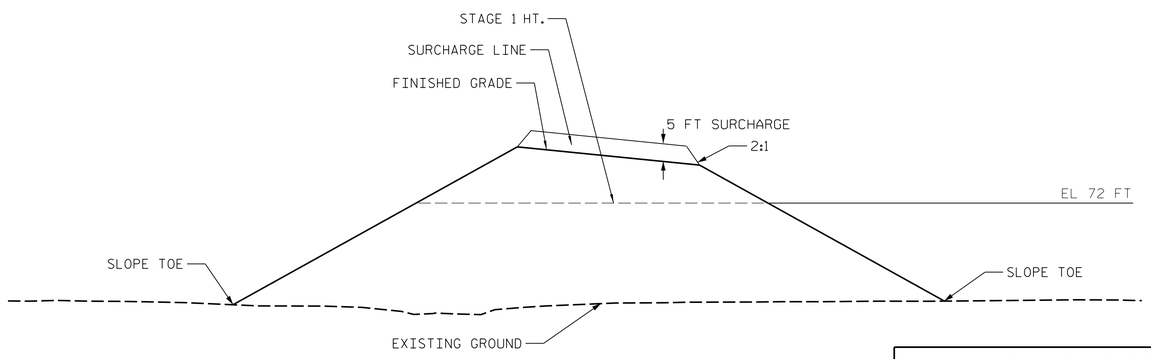

CROSS SECTION A-A (TYP)

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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER YINHUI LIU

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■ SETTLEMENT GAUGES (SG)

SETTLEMENT GAUGES			
GAUGE NO.	LINE AND STATION NO.	OFFSET	
		DISTANCE FT	DIRECTION LT/RT
SG24	-Y32- 24+00	25	LT
SG25	-Y32- 28+00	20	LT
SG26	-Y32RPB1- 21+00	25	LT

SURCHARGE		
STATION NO.	SURCHARGE HEIGHT	WAITING PERIOD
-Y32- 22+00 TO 24+46	5 FT	4 MO.
-Y32- 26+25 TO 33+00	5 FT	4 MO.
-Y32- 33+00 TO 34+50	2 FT	5.5 MO.

STAGE CONSTRUCTION			
STATION	STAGE	EMBANKMENT ELEVATION*	WAITING PERIOD**
-Y32- 22+00 TO 24+46	STAGE 1	72 FT	2 MO.
	STAGE 2	FINISHED GRADE+5	4 MO.
-Y32- 26+25 TO 33+00	STAGE 1	72 FT	2 MO.
	STAGE 2	FINISHED GRADE+5	4 MO.

* SURCHARGE LOAD SHOULD BE ADDED TO THE EMBANKMENT AT LAST STAGE HEIGHT.
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE

PROJECT NO.: R-3300B

PENDER COUNTY

STATION: 19+00 to 34+50 -Y32 -

SHEET 15 OF 16

PREPARED BY: Y. LIU	DATE: 05/2020
REVIEWED BY: B. LACKEY	DATE: 05/2020

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GROUND IMPROVEMENT

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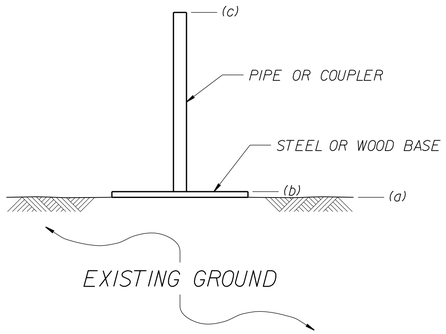
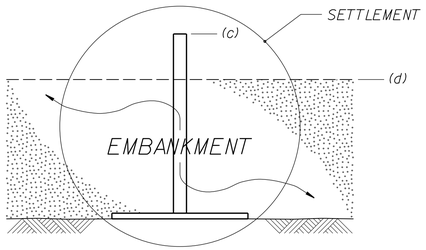
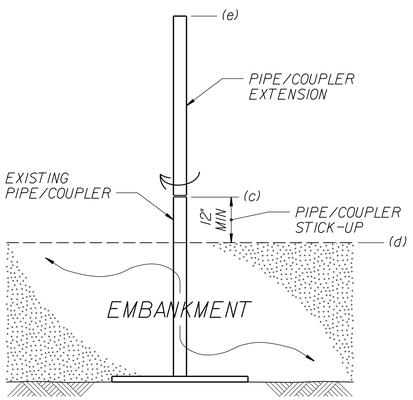
EMBANKMENT MONITORING SEQUENCE



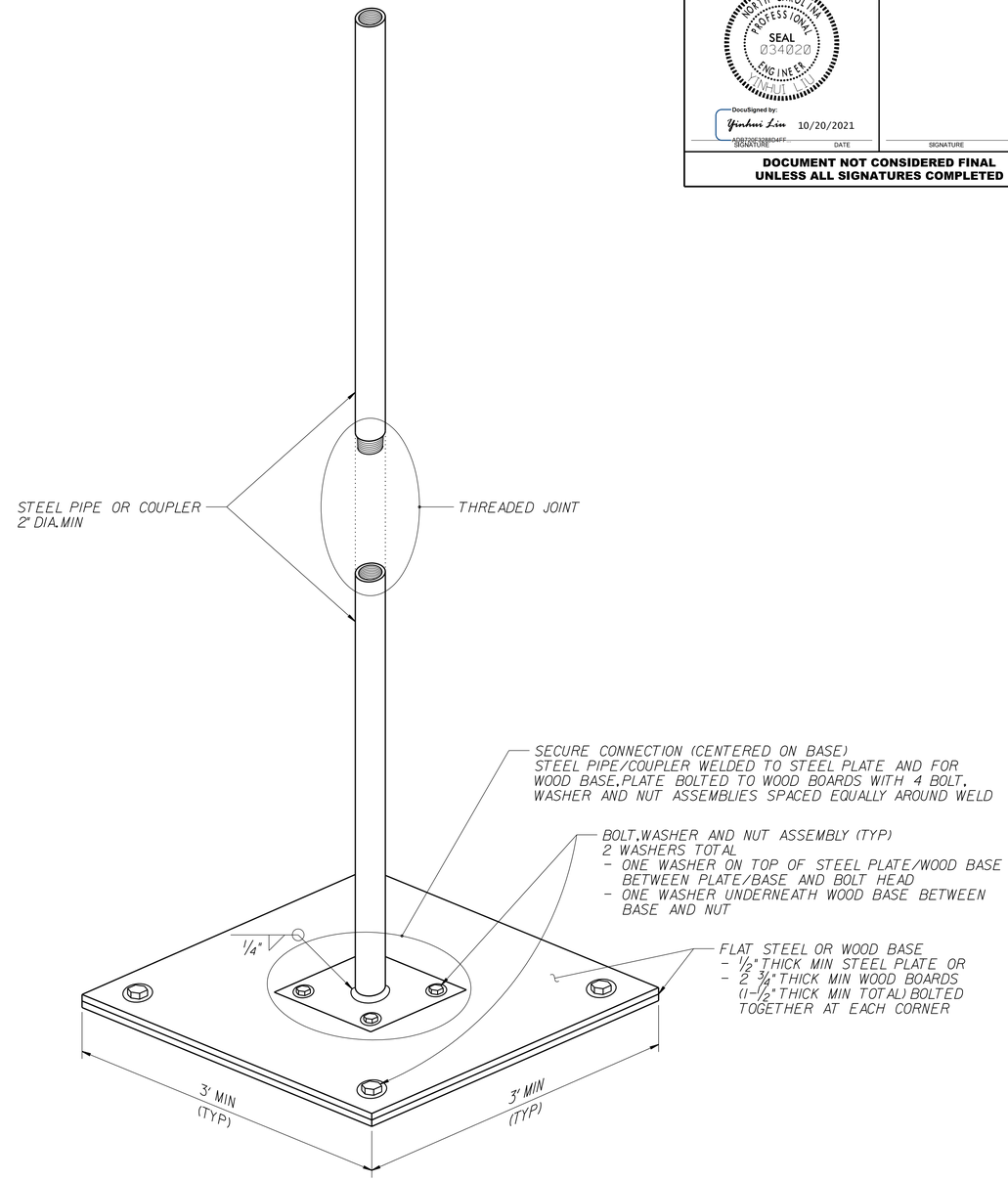
1. PLACE STEEL/WOOD BASE AT APPROXIMATE GAUGE LOCATIONS SHOWN IN THE PLANS AS DETERMINED BY THE ENGINEER.
2. SET BASE ON LEVEL GROUND SO PIPE/COUPLER IS PLUMB.
3. BEFORE CONSTRUCTING EMBANKMENT, NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (a) EXISITING GROUND ELEVATION,
   (b) TOP OF BASE ELEVATION AND
   (c) TOP OF PIPE ELEVATION.



4. MAKE SETTLEMENT GAUGE HIGHLY VISIBLE SO GAUGE IS NOT HIT OR DAMAGED.
5. PLACE AND COMPACT FILL MATERIAL AROUND SETTLEMENT GAUGE WITHOUT DISTURBING GAUGE.
6. NOTIFY ENGINEER WEEKLY TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION AND
   (d) EMBANKMENT ELEVATION.



7. CONNECT PIPE/COUPLER EXTENSION TO EXISTING PIPE/COUPLER AS NEEDED TO MAINTAIN A PIPE/COUPLER STICK-UP OF AT LEAST 12" WHILE MONITORING SETTLEMENT.
8. SCREW PIPES/COUPLERS TOGETHER HAND TIGHT AND THEN TIGHTEN 2 TO 3 FULL TURNS WITH A WRENCH.
9. NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION,
   (d) EMBANKMENT ELEVATION AND
   (e) TOP OF EXTENSION ELEVATION.
10. RETURN TO STEP 4 WITH NEW TOP OF PIPE ELEVATION EQUAL TO TOP OF EXTENSION ELEVATION.



SETTLEMENT GAUGE

NOTES:

1. SEE ROADWAY SUMMARY SHEETS AND GROUND IMPROVEMENT PLAN SHEET FOR APPROXIMATE SETTLEMENT GAUGE LOCATIONS.
2. FOR EMBANKMENT MONITORING, SEE SECTION 235 OF THE STANDARD SPECIFICATION
3. INSTALL SETTLEMENT GAUGES AFTER CLEARING AND GRUBBING GAUGE LOCATIONS AND BEFORE CONSTRUCTING EMBANKMENTS WITH EMBANKMENT MONITORING.

PREPARED BY: Y. LIU	DATE: 05/2020
REVIEWED BY: B. LACKEY	DATE: 05/2020

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034020 ENGINEER

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PROJECT NO.: R-3300B

PENDER COUNTY

STATION:

SHEET 16 OF 16

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

EMBANKMENT MONITORING DETAIL

REVISIONS						SHEET NO.
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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2G-17

GEOTECHNICAL ENGINEER — SEAL 034020, NORTH CAROLINA PROFESSIONAL ENGINEER, YINHUI LIU — DocuSigned by: Yinhui Liu — 11/22/2021

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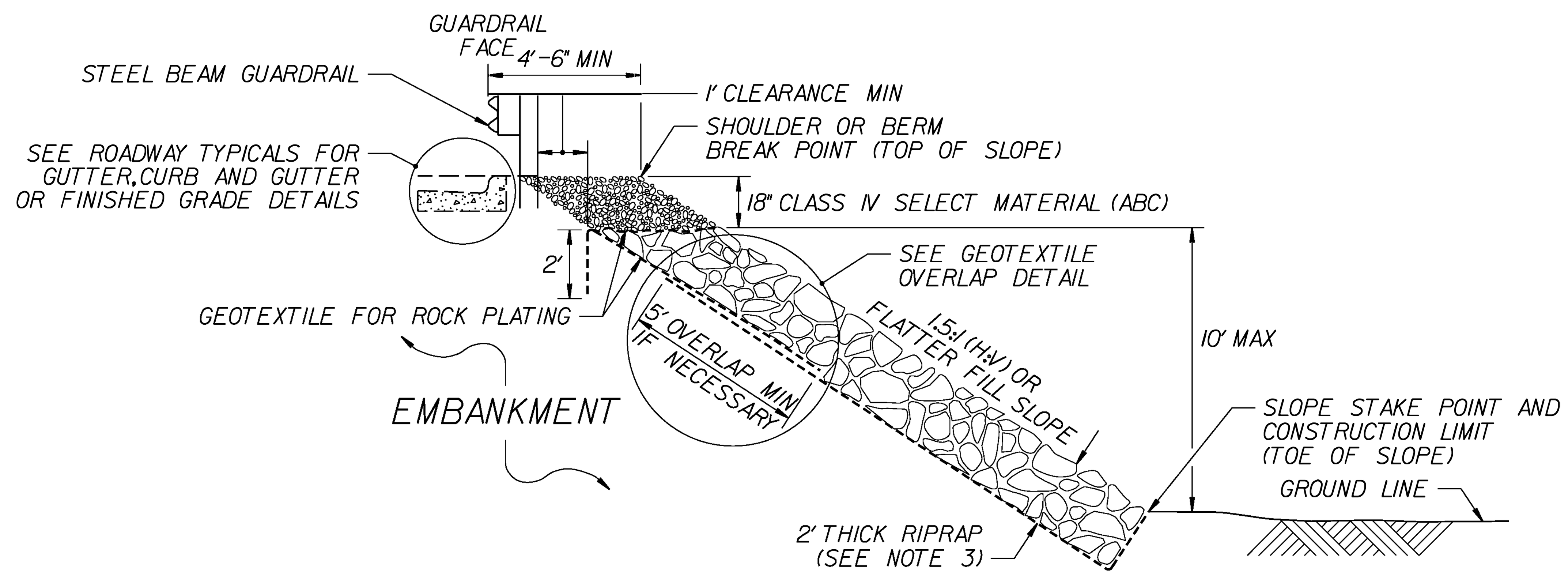
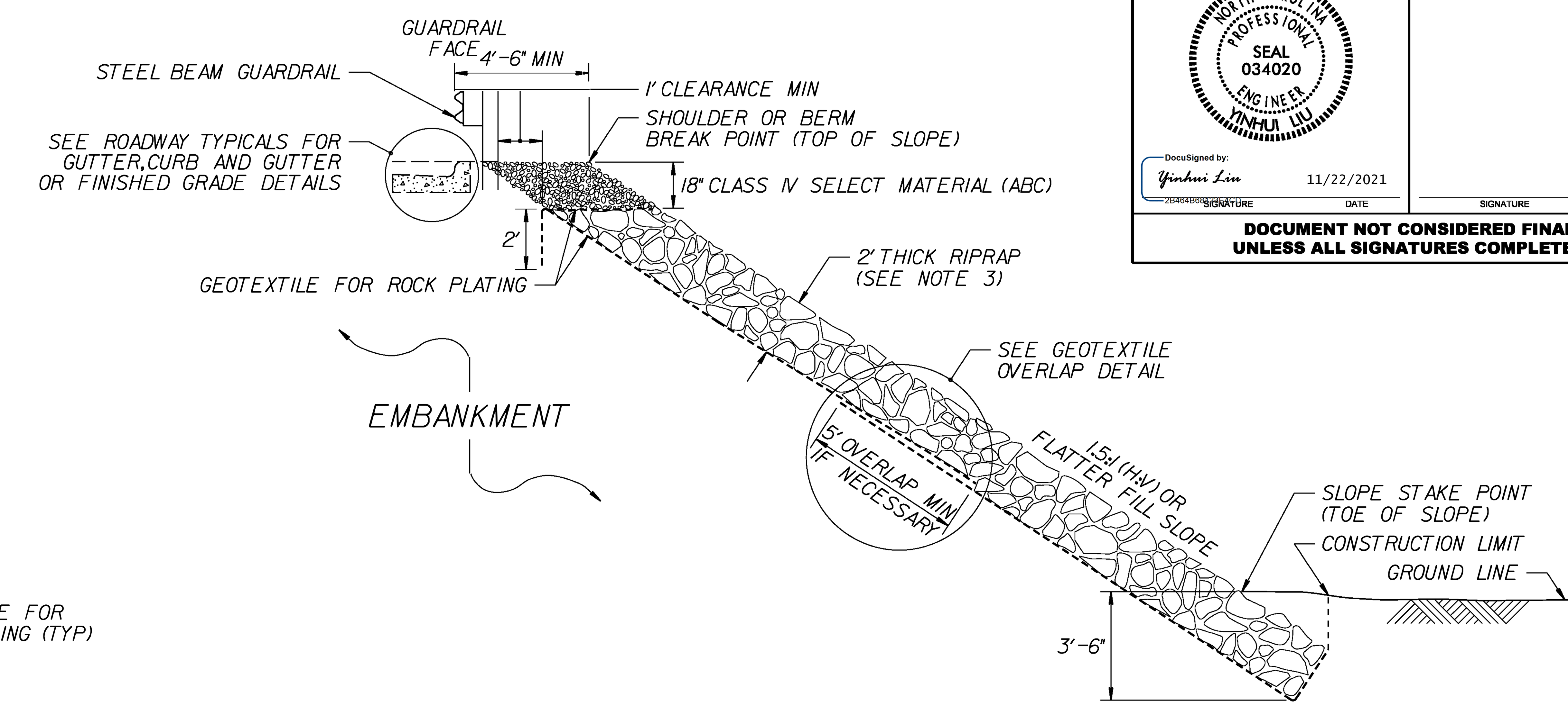
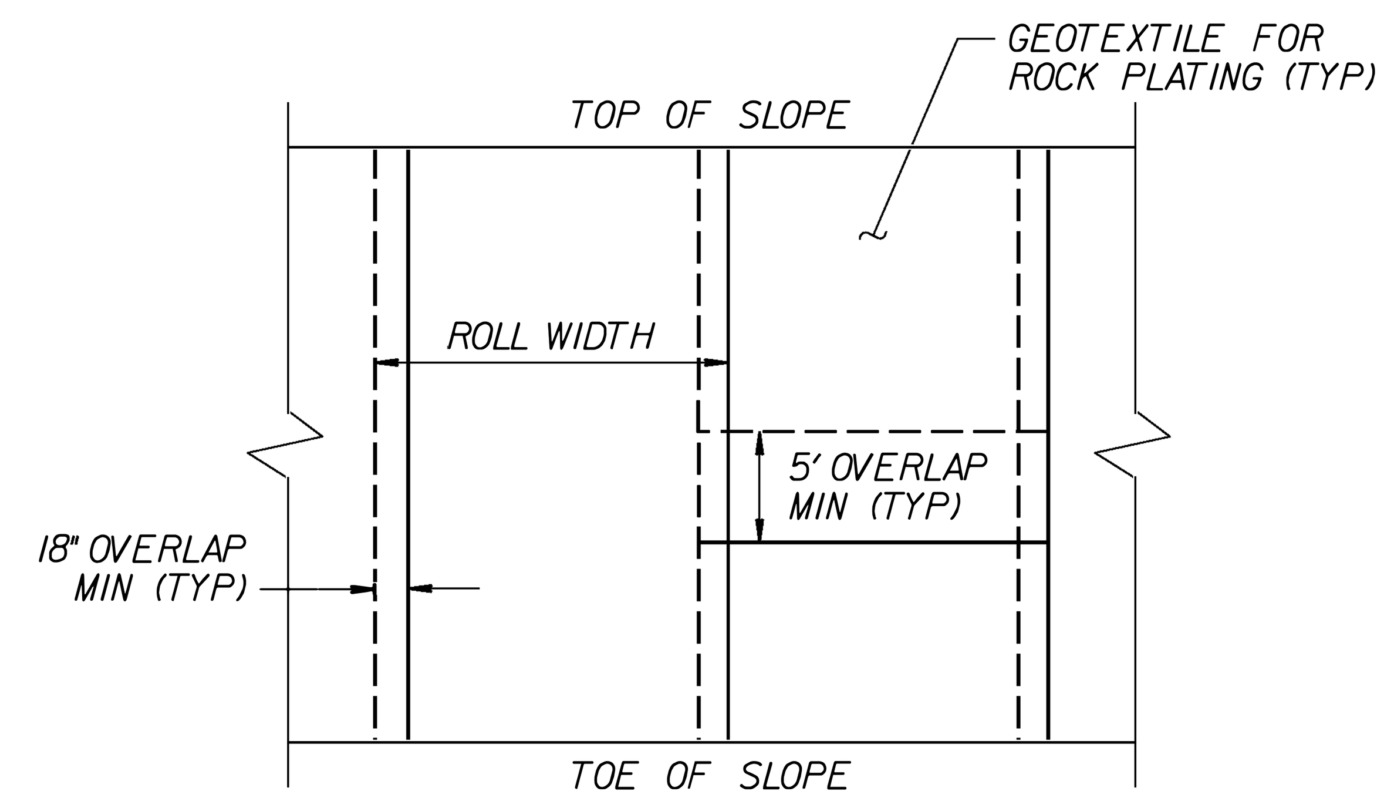


ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION

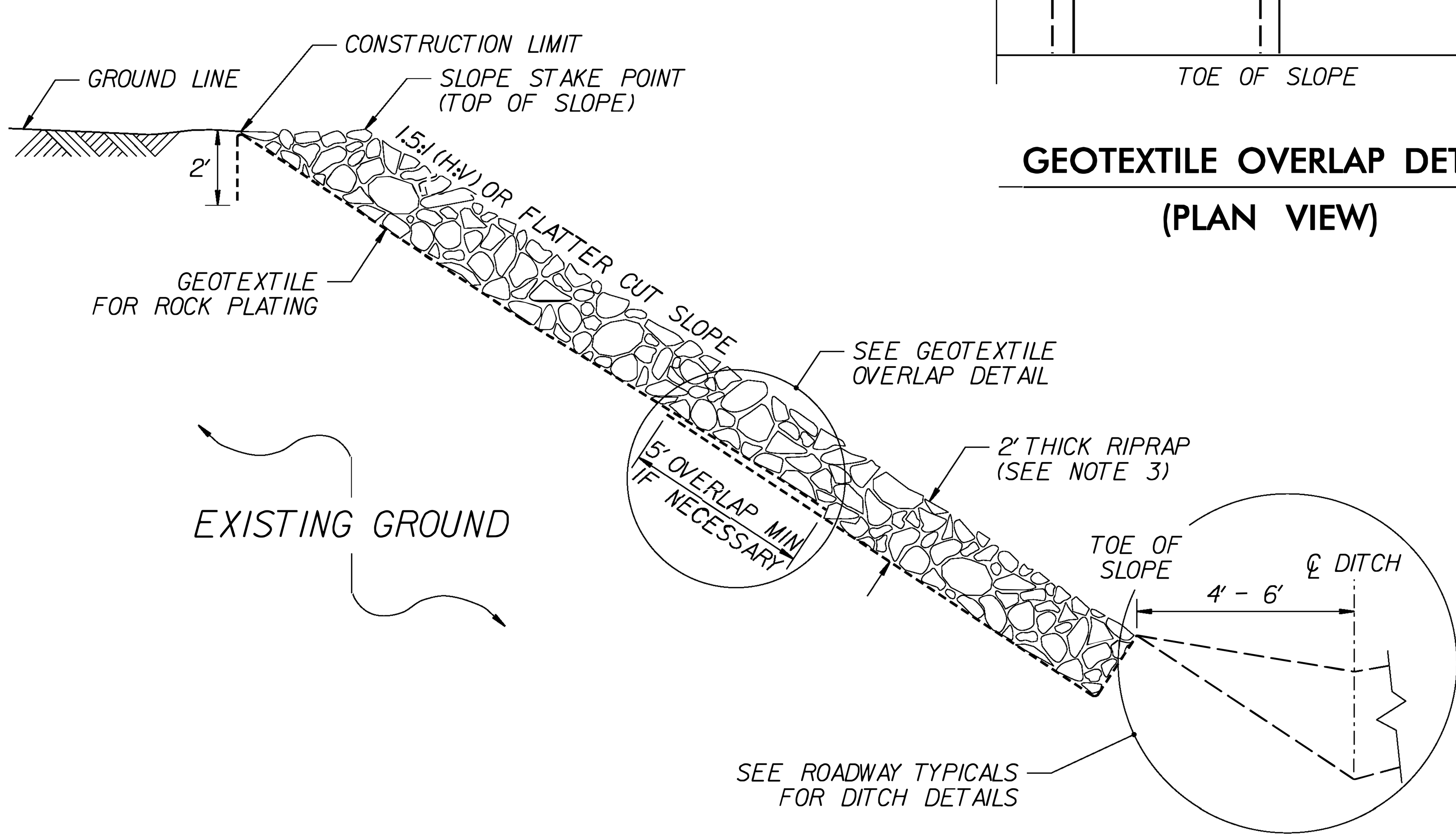


ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION

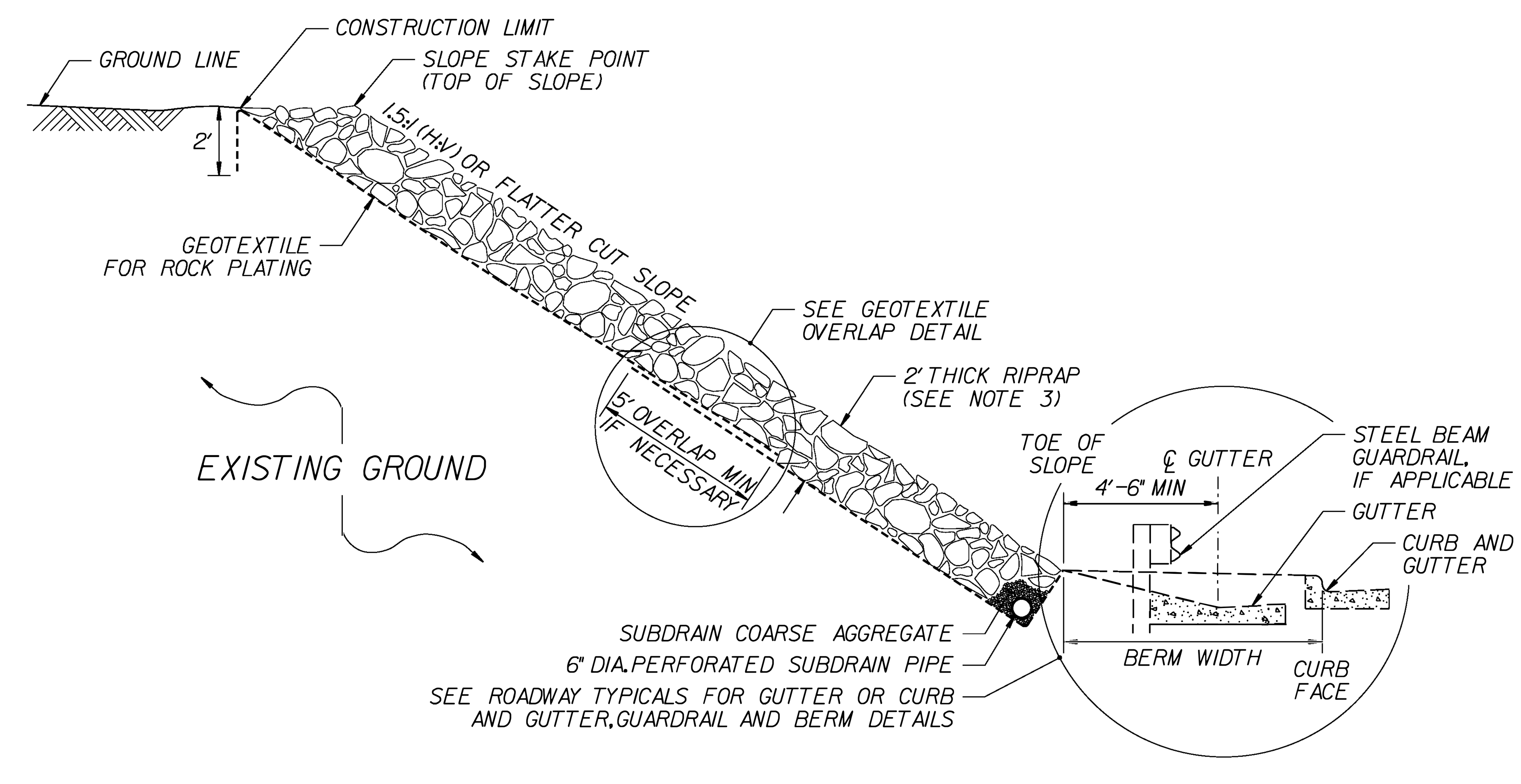


GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS 1, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD ROCK PLATING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2G-18

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

DocuSigned by: Jeremy R Hamm 11/22/2021
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ENGINEER

SIGNATURE DATE

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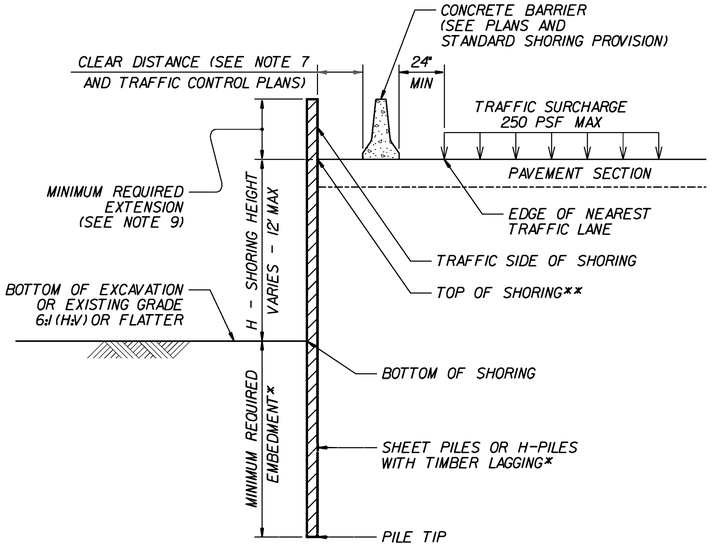
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (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 "--".**

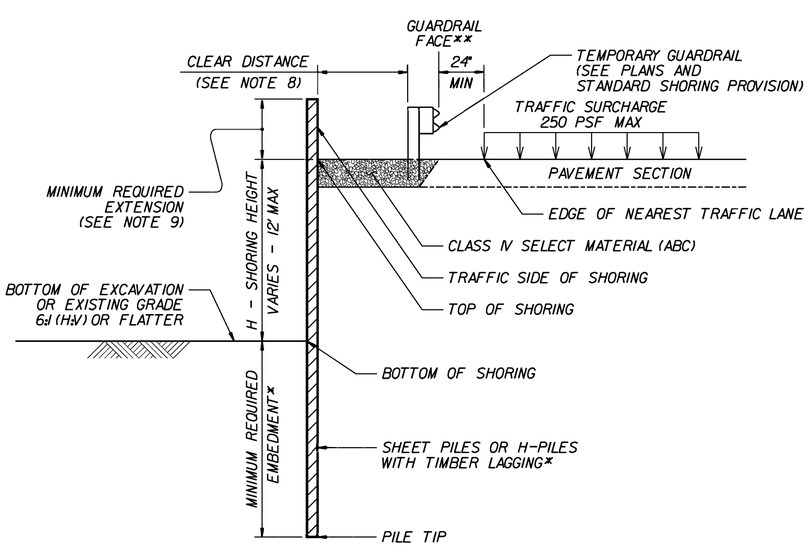
NOTES:

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.



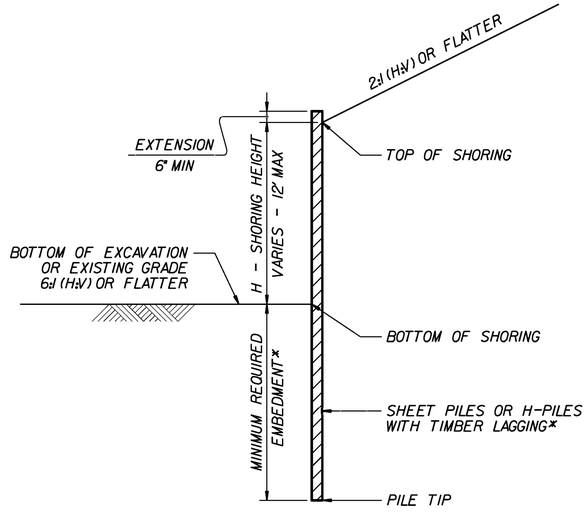
CONCRETE BARRIER

****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.**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2G-19

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

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SIGNATURE DATE

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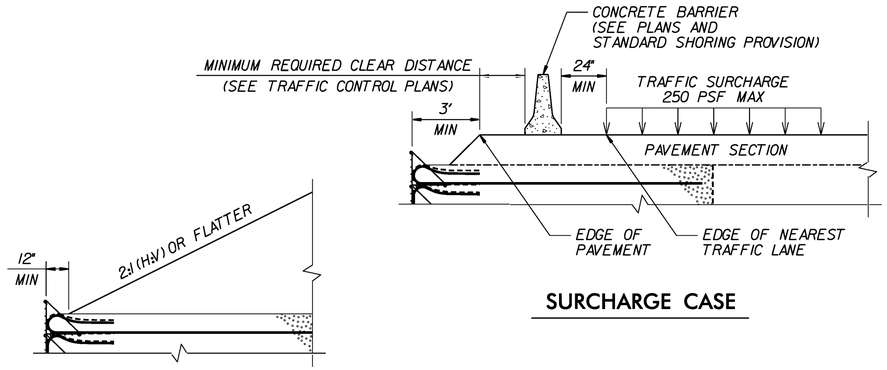
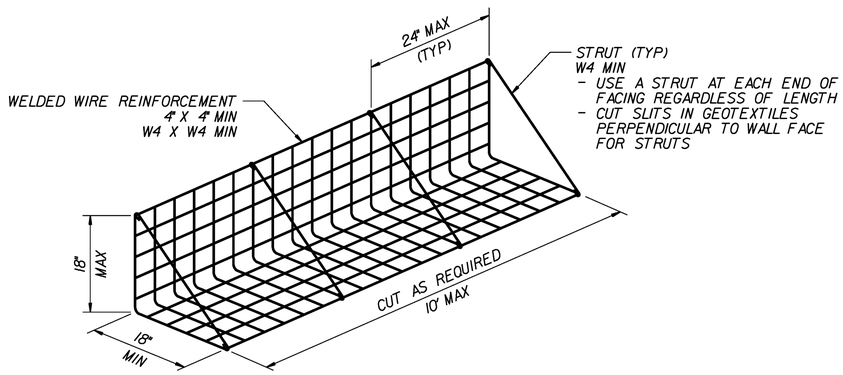
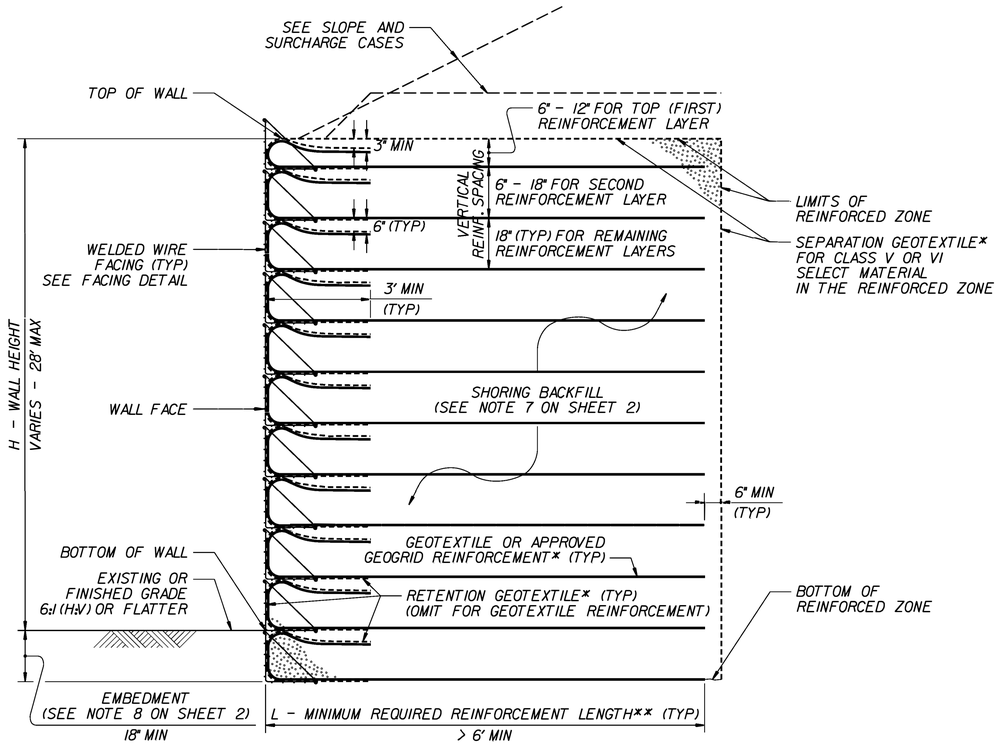


SURCHARGE CASE

SLOPE CASE

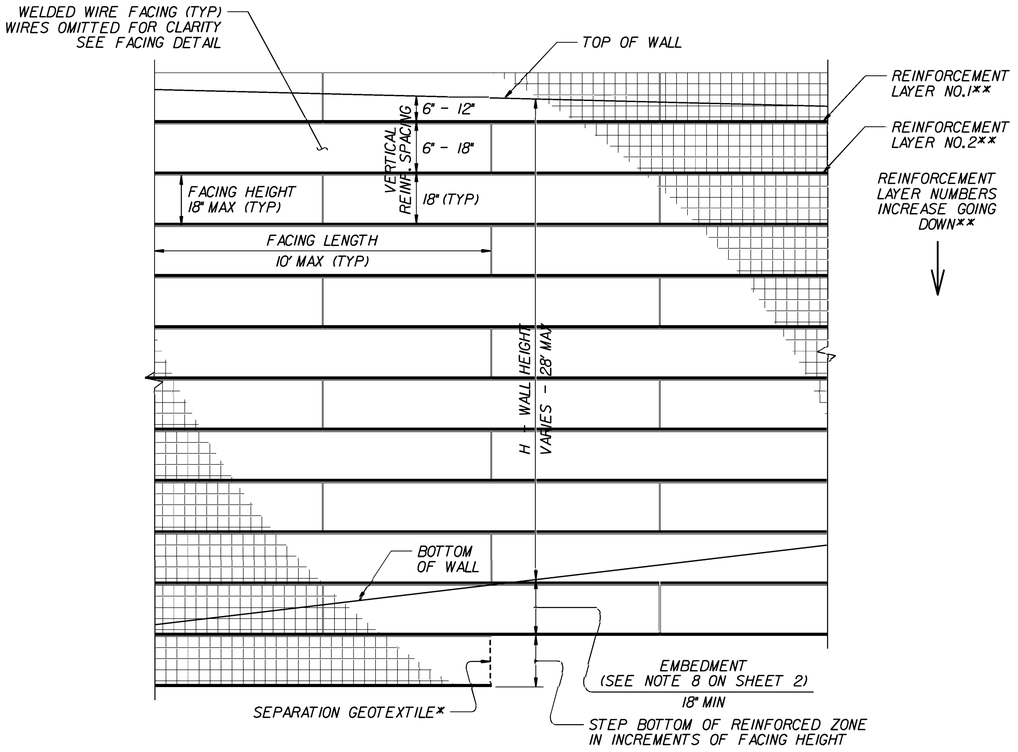


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2G-20

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

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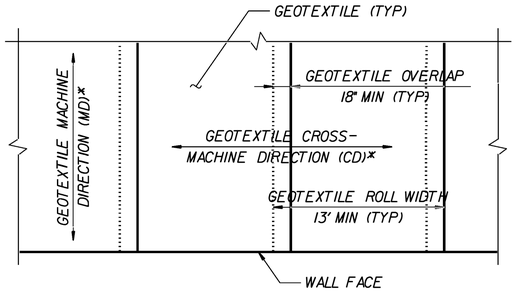
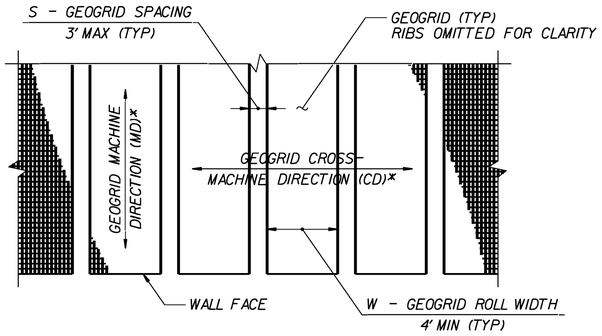


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

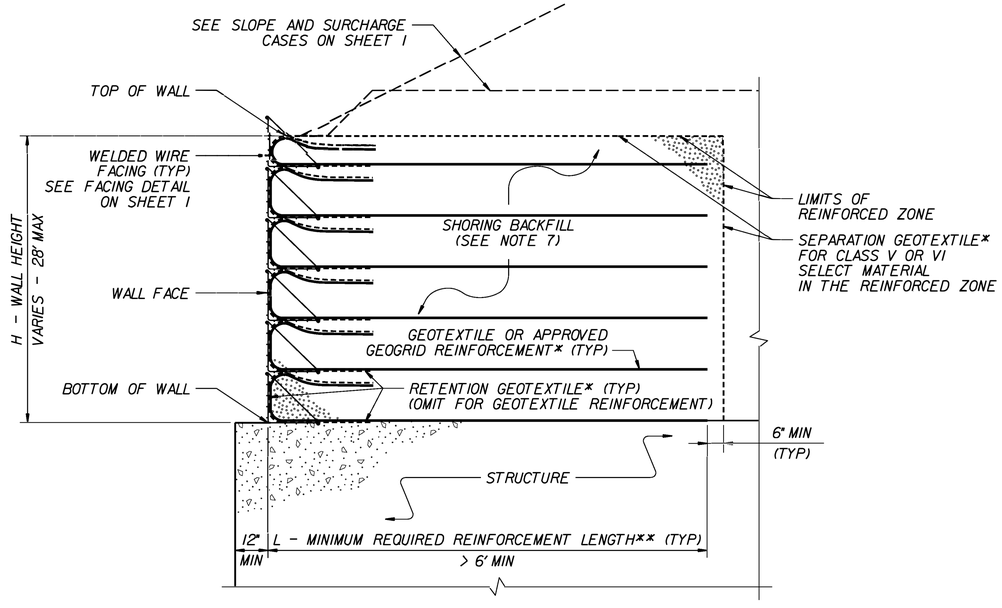


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 ≥ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
***SEE NOTE 12.**



TEMPORARY WALL ON STRUCTURE DETAIL

***SEE GEOSYNTHETIC PLACEMENT DETAILS.**
****SEE REINFORCEMENT TABLES ON SHEET 3.**

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE 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 WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) ≥ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2G-21

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

DocuSigned by: Jeremy R Hamm 11/22/2021

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT SHORT-TERM DESIGN STRENGTH (LB/FT)

(SEE NOTE 10 ON SHEET 2.)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-1
R/W SHEET NO.	

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50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PLAN AND PROFILE OF NOISE WALL 9/11

NAD 83/NSRS 2007

620 625 630

-Y30RPA-

-LI-

-Y30RPD-

15" RCP-IV

24" RCP-IV

15" RCP-IV ELBOWS

30" RCP-IV

PROP U/G CATV CABLES

PROP O/H POW LINES

0601 0602 0603 0604 0606 0607 0702

2GI

FS

NOISE WALL 9/11

BEGIN NOISE WALL 9/11
Sta. 623+71.35 -LI-

MATCHLINE
STA 631+85.18 -LI-
SEE SHEET 2

NOTES: FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.

PANEL NUMBER	1-26	27-54
TOP ELEVATION	74'	73'
PANEL(S) LENGTH	380'	410'

MINIMUM WALL HEIGHT
(SEE NOISE REPORT FOR ADDITIONAL DETAILS)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54

BEGIN NOISE WALL 9/11
Sta. 623+71.35

PROPOSED GROUND AT FRONT FACE OF WALL

PROP. 15" RCP-IV

PROP. 24" RCP-IV

EXISTING GROUND

PROP. 15" W/ELBOWS

PROP. 30" RCP-IV

MATCHLINE
STA 631+85.18 -LI-
SEE SHEET 2

80 70 60 50 40 30 20

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50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PLAN AND PROFILE OF NOISE WALL 9/11

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-2
R/W SHEET NO.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

635

635

NOISE WALL 10

MATCHLINE -L1- STA 631+85.18 SEE SHEET 1

MATCHLINE NW9/11 STA 644+60.97 -L1- SEE SHEET 3

0703 30" RCP-IV

0706 36" RCP-IV

0707 2GI FS

0708 18" W ELBOWS

0709 2GI FS

0710 15" W ELBOWS

0711 2GI 15" W ELBOWS

0712 2GI 18" RCP-IV

0713 2GI 15" RCP-IV

0714

0801 3GI-A 15" RCP-IV

0802 3GI-A 18" RCP-IV

0803 3GI-A 18" W ELBOWS

0804

0805 54" RCP-IV (BORED)

-L1-

MAINTENANCE ACCESS PANEL

HW

HW

NOISE WALL 9/11

BEGIN SOUND ABSORPTIVE WALL SURFACE Sta.638+10.79 -L1-

SOUND ABSORPTIVE WALL SURFACE (SEE NOTE)

NOTES: 1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

PANEL NUMBER	55-58	59-76	77-84	85-94	95-100	101-104	105-109	110-140
TOP ELEVATION	73'	72'	71'	70'	69'	68'	67'	66'
PANEL(S) LENGTH	60'	255'	120'	145'	85'	60'	70'	465'

MATCHLINE STA 631+85.18 -L1- SEE SHEET 1

55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140

MATCHLINE NW9/11 STA 644+60.97 -L1- SEE SHEET 3

REMOVABLE WALL PANEL

MINIMUM WALL HEIGHT (SEE NOISE REPORT FOR ADDITIONAL DETAILS)

PROP. 15" RCP

PROP. 36" RCP-IV

PROP. 18" W/ELBOWS

PROPOSED GROUND AT FRONT FACE OF WALL

EXISTING GROUND

PROP. 15" W/ELBOWS

PROP. 18" W/ELBOWS

PROP. 54" RCP-IV

80 70 60 50 40 30 20

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50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PLAN AND PROFILE OF NOISE WALL 9/11

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-3
R/W SHEET NO.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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650

655

OVERHEAD SIGN STRUCTURE 'A', STA.651+12 -LI-, -71.50 LT. SEE DETAIL "A"

NOISE WALL 10

0808 0809 0810 0811 0812 0814 0806 0807

3GI-A 2GI

15" RCP-IV 18" RCP-IV 30" RCP-IV

54" RCP-IV (BURIED 1.0') HW

30" w/ ELBOWS

FS

-LI-

MAINTENANCE ACCESS PANEL

NOISE WALL 9/11

OVERHEAD SIGN STRUCTURE 'B', STA.654+20 -LI-, 71.50 RT. SEE DETAIL "A"

MATCHLINE STA 644+60.97 -LI- SEE SHEET 2

MATCHLINE STA 657+11.83 -LI- SEE SHEET 4

SOUND ABSORPTIVE WALL SURFACE (SEE NOTE)

SOUND ABSORPTIVE WALL SURFACE (SEE NOTE)

℄ NOISE WALL ACCESS DOOR

NOISE WALL ACCESS DOOR

3'-0"

A

NOISE WALL

5'-0" TYP.

0'-0" (MIN.)

8'-0" (MAX.)

1" EXP.JT. MATERIAL

10'-0"

3'-0" TYP.

4" CONCRETE SLOPE PROTECTION

℄ SIGN STRUCTURE FOUNDATION

1" EXP.JT.MATERIAL AROUND SIGN STRUCTURE FOUNDATION

SIGN STRUCTURE FOUNDATION

DETAIL "A"

SEE SEE SPECIAL PROVISIONS FOR ADDITIONAL ACCESS DOOR REQUIREMENTS.
OVERHEAD SIGN STRUCTURE 'B' SHOWN, SIGN STRUCTURE 'A' SIMILAR BY ROTATION

NOISE WALL

10'-0"

5'-0"

1" EXP.JT. MATERIAL

SIGN STRUCTURE FOUNDATION

1" EXP.JT.MATERIAL

2%

4" CONCRETE SLOPE PROTECTION

3:1

WELDED WIRE FABRIC 6x6 - W1.4xW1.4

SECTION A-A
LOOKING NORTH

NOTES:
1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

PANEL NUMBER	141-159	160-191	192-194	195-197	198-200	201-203	204-205	206	207-208	209-211	212-214	215-217	218-225
TOP ELEVATION	66'	65'	66'	67'	68'	69'	70'	64'	71'	72'	73'	74'	75'
PANEL(S) LENGTH	285'	460'	45'	45'	45'	45'	30'	15'	30'	45'	45'	45'	120'

80 70 60 50 40 30

REMOVABLE WALL PANEL

MINIMUM WALL HEIGHT (SEE NOISE REPORT FOR ADDITIONAL DETAILS)

OVERHEAD SIGN STRUCTURE LOCATION

MATCHLINE STA 644+60.97 -LI- SEE SHEET 2

141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225

MATCHLINE STA 657+11.83 -LI- SEE SHEET 4

PROPOSED GROUND AT FRONT FACE OF WALL

EXISTING GROUND

PROP. 30" w/ ELBOWS

PROP. 54" RCP-IV (BURIED 1.0')

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PLAN AND PROFILE OF NOISE WALL 9/11

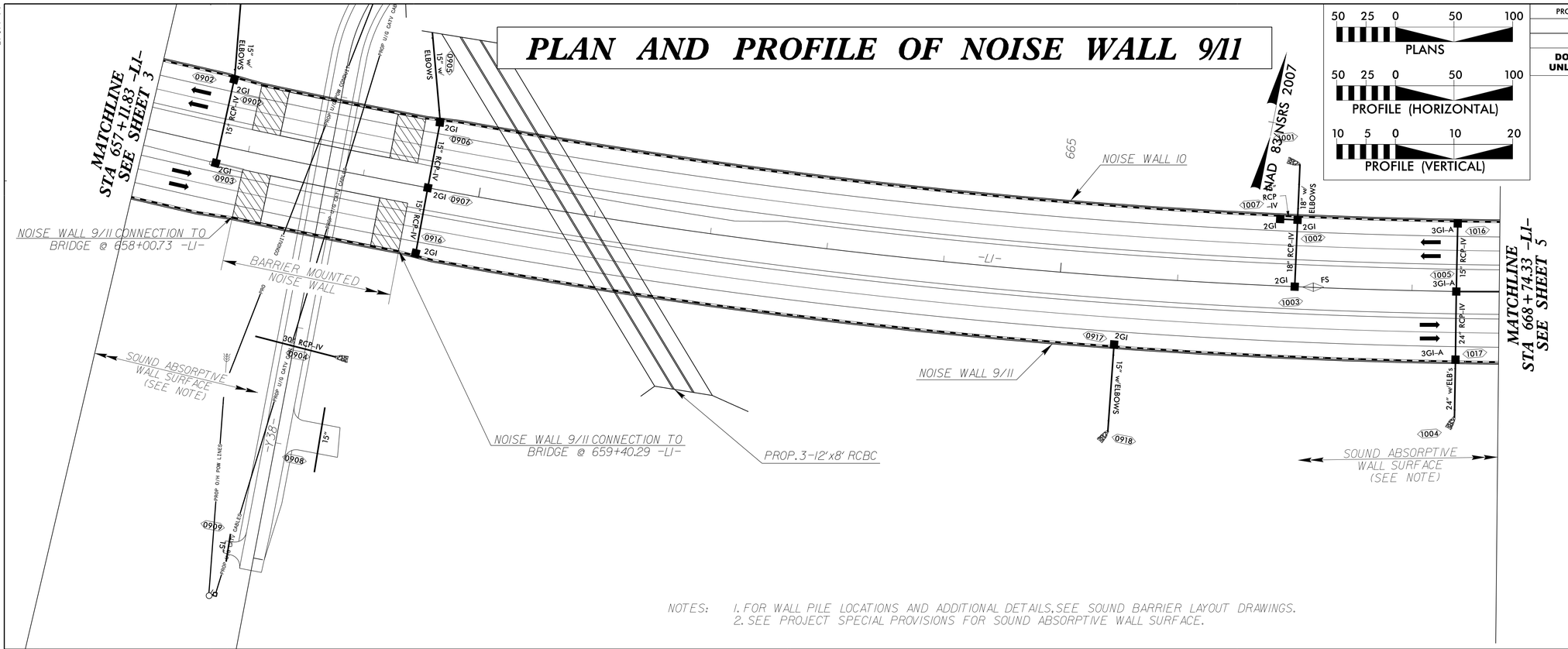
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-4
R/W SHEET NO.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50 25 0 50 100 PLANS

50 25 0 50 100 PROFILE (HORIZONTAL)

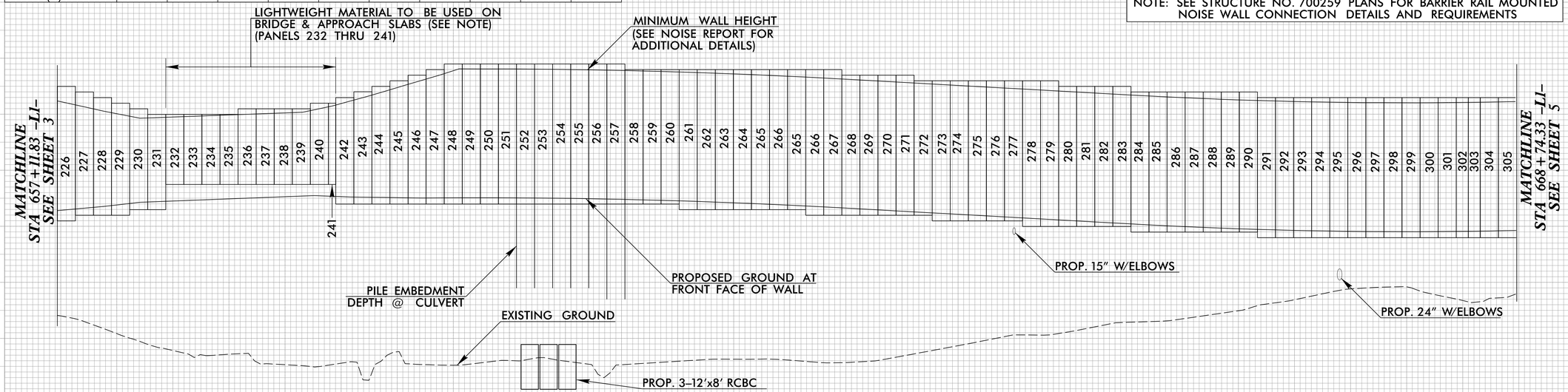
10 5 0 10 20 PROFILE (VERTICAL)



NOTES: 1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

PANEL NUMBER	226	227	228	229	230	231-235	236-239	240-241	242	243	244
TOP ELEVATION	75'	74'	73'	72'	71'	70'	71'	72'	73'	74'	75'
PANEL(S) LENGTH	15'	15'	15'	15'	15'	75'	60'	21.1	15'	15'	15'
PANEL NUMBER	245	246	247	248-257	258-267	268-271	272-279	280-283	284-290	291-305	
TOP ELEVATION	76'	77'	78'	79'	78'	77'	76'	75'	74'	73'	
PANEL(S) LENGTH	15'	15'	15'	150'	150'	60'	120'	60'	105'	205'	

NOTE: SEE STRUCTURE NO. 700259 PLANS FOR BARRIER RAIL MOUNTED NOISE WALL CONNECTION DETAILS AND REQUIREMENTS



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PLAN AND PROFILE OF NOISE WALL 9/11

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-5
R/W SHEET NO.	___

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50 25 0 50 100 PLANS

50 25 0 50 100 PROFILE (HORIZONTAL)

10 5 0 10 20 PROFILE (VERTICAL)

670 675 680

MATCHLINE STA 668+74.33 -L1- SEE SHEET 4

MATCHLINE STA 681+19.82 -L1- SEE SHEET 6

NOISE WALL 10

NAD 83/NSRS 2007

HW

-L1-

15" RCP-IV FS 2GI 1006

30" 1012 1018 2GI-A 30" RCP-IV 1013 2GI-A 24" 1011

42" RCP-IV 1014 2GI-A 15" RCP-IV FS 1008 2GI 2GI

42" RCP-IV 2GI-A 1019 42" RCP-IV 1015

ELB'S 15" W 1021 1020 2GI

MAINTENANCE ACCESS PANEL

54" RCP-IV (BURIED 1.01') 1010

ELB'S 15" W 1022 2GI 1023

NOISE WALL 9/11

END SOUND ABSORPTIVE WALL SURFACE Sta. 676+92.70 -L1-

OVERHEAD SIGN STRUCTURE 'C', STA. 650+55 -L1-, 71.50 RT. SEE DETAIL "A"

℄ NOISE WALL ACCESS DOOR

NOISE WALL ACCESS DOOR

NOISE WALL

3'-0"

5'-0" TYP.

0'-0" (MIN.) 8'-0" (MAX.)

1" EXP. JT. MATERIAL

10'-0"

3'-0" TYP.

4" CONCRETE SLOPE PROTECTION

℄ SIGN STRUCTURE FOUNDATION

1" EXP. JT. MATERIAL AROUND SIGN STRUCTURE FOUNDATION

SIGN STRUCTURE FOUNDATION

A

A

DETAIL "A"

SEE SEE SPECIAL PROVISIONS FOR ADDITIONAL ACCESS DOOR REQUIREMENTS.

NOISE WALL

10'-0"

5'-0"

1" EXP. JT. MATERIAL

2%

SIGN STRUCTURE FOUNDATION

1" EXP. JT. MATERIAL

4" CONCRETE SLOPE PROTECTION

3:1

WELDED WIRE FABRIC 6x6 - W1.4xW1.4

SECTION A-A

LOOKING NORTH

SOUND ABSORPTIVE WALL SURFACE (SEE NOTE)

NOTES: 1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

PANEL NUMBER	306-315	316-329	330-345	346-358	359-373	374-386	387	388-390
TOP ELEVATION	73'	74'	75'	76'	77'	78'	72'	78'
PANEL(S) LENGTH	150'	210'	230'	195'	225'	195'	15'	45'

80 70 60 50 40 30

MATCHLINE STA 668+74.33 -L1- SEE SHEET 4

306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390

MATCHLINE STA 681+19.82 -L1- SEE SHEET 6

REMOVABLE WALL PANEL

MINIMUM WALL HEIGHT (SEE NOISE REPORT FOR ADDITIONAL DETAILS)

OVERHEAD SIGN STRUCTURE LOCATION

PROP. 15" W/ELBOW

PROPOSED GROUND AT FRONT FACE OF WALL

PROP. 42" RCP-IV

EXISTING GROUND

PROP. 54" RCP-IV

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PLAN AND PROFILE OF NOISE WALL 9/11

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-6
R/W SHEET NO.	____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

NAD 83/NSRS 2007

685

690

MATCHLINE
STA 681+19.82 –L1–
SEE SHEET 5

1101
2GI
FS
15" RCP-IV
3GI-A
1102
18" RCP-IV
3GI-A
1104
18"
1103
1105
36" RCP-IV
1201
36" RCP-IV
36" RCP-IV
HW

NOISE WALL 9/11

MATCHLINE
STA 694+42.85 –L1–
SEE SHEET 7

NOTE: FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.

PANEL NUMBER	391-400	401-451	452-454	455-458	459-460	461-465	466-467	468-470	471-473	474-476	477-479	480
TOP ELEVATION	78'	77'	76'	75'	74'	73'	72'	71'	70'	69'	68'	67'
PANEL(S) LENGTH	150'	760'	45'	60'	30'	75'	30'	45'	45'	40'	45'	15'

80
70
60
50
40
30

MATCHLINE
STA 681+19.82 –L1–
SEE SHEET 5

391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480

MINIMUM WALL HEIGHT
(SEE NOISE REPORT FOR ADDITIONAL DETAILS)

PROPOSED GROUND AT FRONT FACE OF WALL

PROP. 18" RCP–IV

EXISTING GROUND

PROP. 36" RCP–IV

PROP. 36" RCP–IV

MATCHLINE
STA 694+42.85 –L1–
SEE SHEET 7

80
70
60
50
40
30

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50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

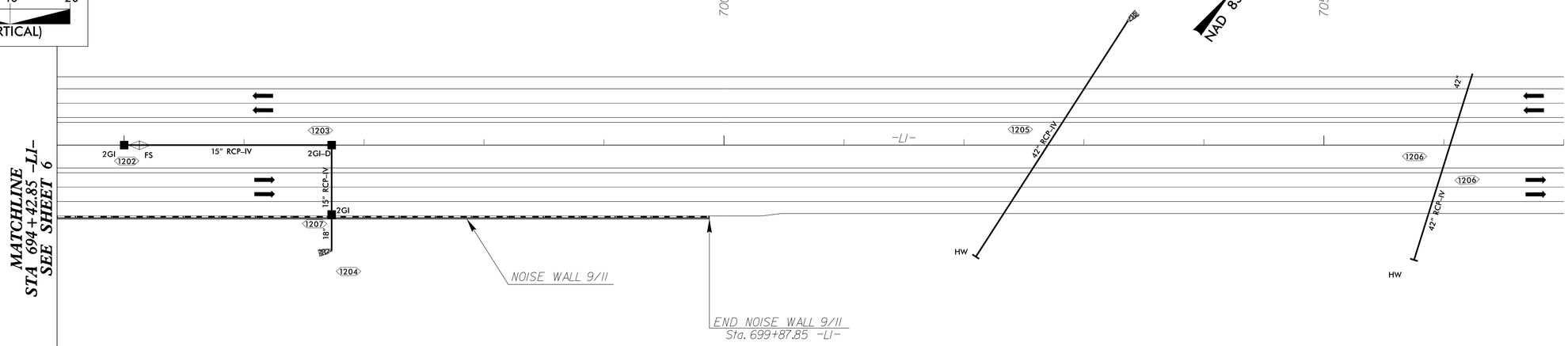
PLAN AND PROFILE OF NOISE WALL 9/11

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-7
R/W SHEET NO.	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

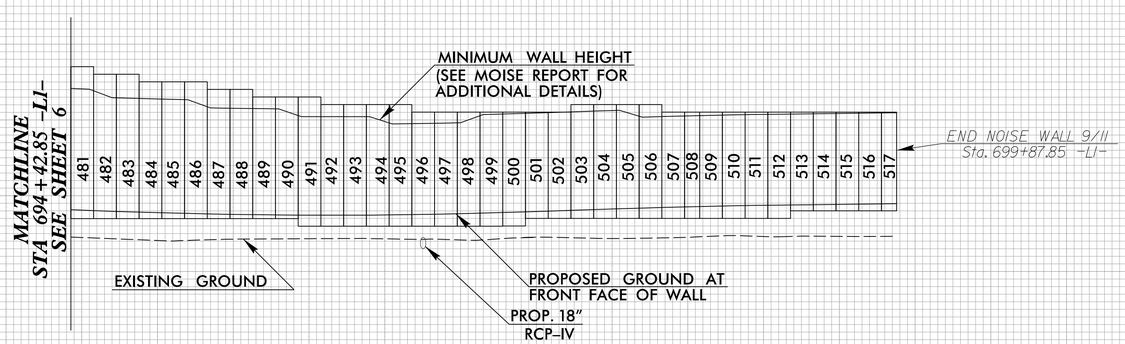
NAD 83/NSRS 2007

700 705



NOTE: FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.

PANEL NUMBER	481	482-483	484-486	487-488	489-491	492-495	496-502	503-506	507-517
TOP ELEVATION	67'	66'	65'	64'	63'	62'	61'	62'	61'
PANEL(S) LENGTH	15'	30'	45'	30'	45'	60'	105'	60'	155'



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8/17/99

50 25 0 50 100
PLANS

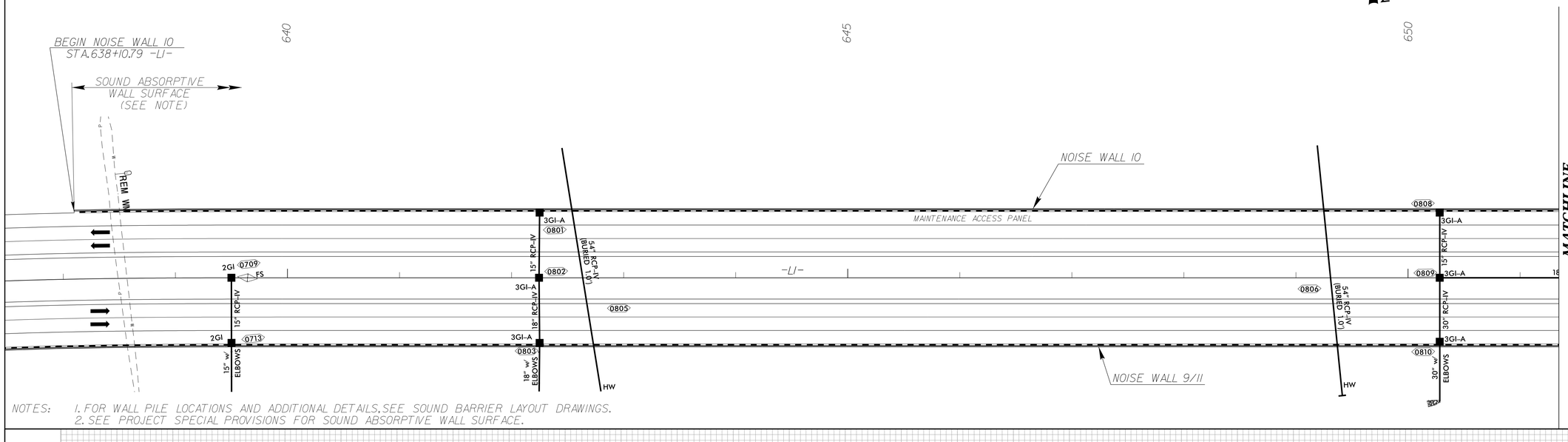
50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-8
R/W SHEET NO.	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

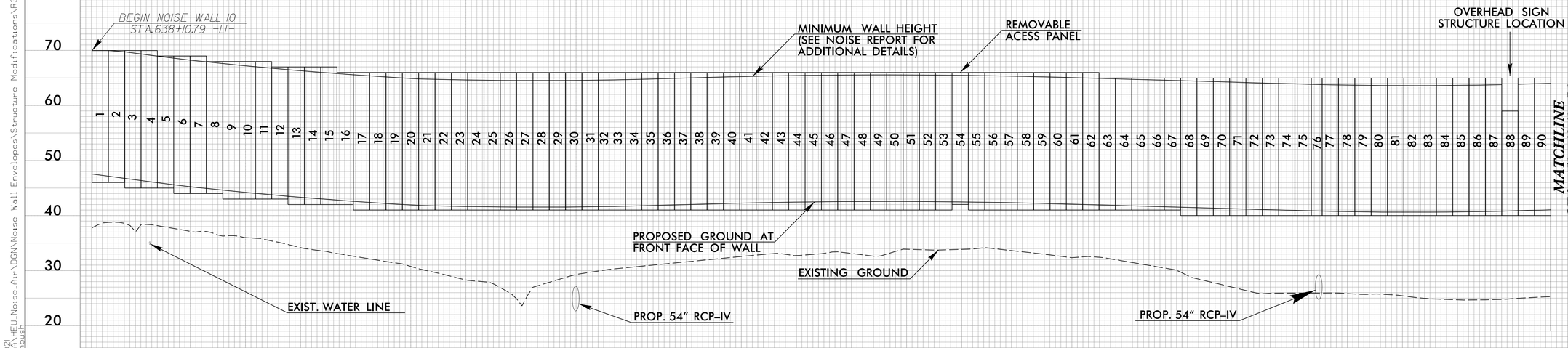
PLAN AND PROFILE OF NOISE WALL 10

NAD 83/NSRS 2007



NOTES: 1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

PANEL NUMBER	1-4	5-7	8-11	12-15	16-62	63-87	88	89-90
TOP ELEVATION	70'	69'	68'	67'	66'	65'	59'	65'
PANEL(S) LENGTH	60'	45'	60'	60'	700'	370'	15'	30'



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-9
R/W SHEET NO.	____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLAN AND PROFILE OF NOISE WALL 10

NOTES:
1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

PANEL NUMBER	91-97	98-101	102-105	106-109	110-112	113-115	116-118	119-121	122-127	128	129	130	131
TOP ELEVATION	65'	66'	67'	68'	69'	70'	71'	72'	73'	72'	71'	70'	69'
PANEL(S) LENGTH	105'	60'	60'	60'	45'	45'	45'	45'	90'	15'	15'	15'	15'
PANEL NUMBER	132	133-138	139-142	143-144	145	146	147	148	149	150	151-167	168-174	175-178
TOP ELEVATION	68'	67'	68'	69'	70'	71'	72'	73'	74'	75'	76'	75'	74'
PANEL(S) LENGTH	15'	90'	60'	21.1'	10'	15'	15'	15'	15'	15'	255'	105'	60'

NOTE: SEE STRUCTURE NO. 700258 PLANS FOR BARRIER RAIL MOUNTED NOISE WALL CONNECTION DETAILS AND REQUIREMENTS

9/8/2021
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8/17/99

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

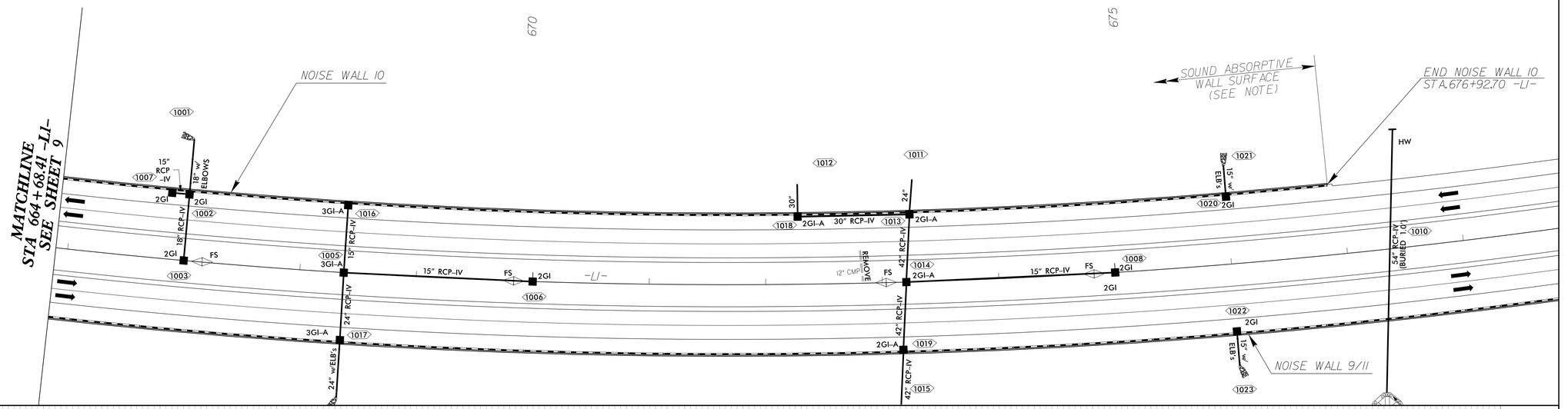
PLAN AND PROFILE OF NOISE WALL 10

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-10
R/W SHEET NO.	

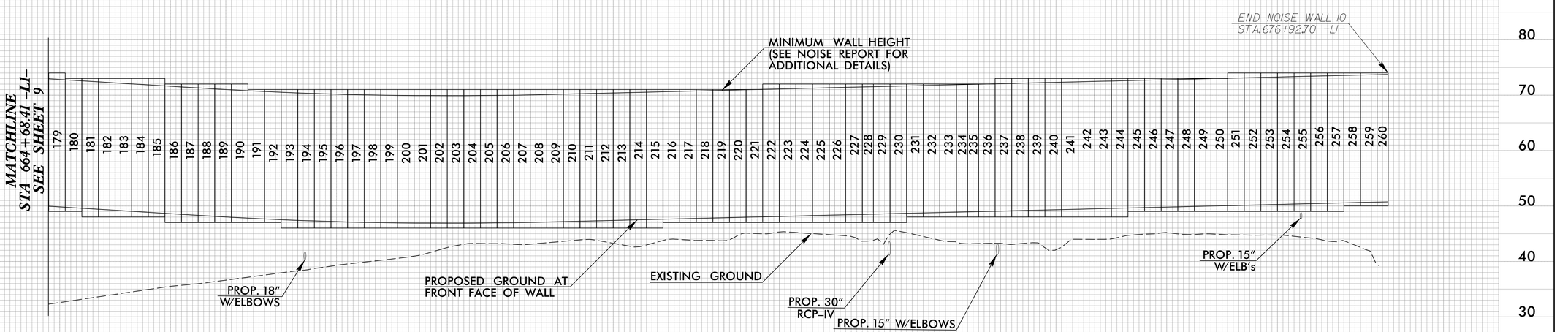
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES: 1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. SEE PROJECT SPECIAL PROVISIONS FOR SOUND ABSORPTIVE WALL SURFACE.

NAD 83/NSRS 2007



PANEL NUMBER	179	180-185	186-190	191-221	222-236	237-250	251-260
TOP ELEVATION	74'	73'	72'	71'	72'	73'	74'
PANEL(S) LENGTH	15'	90'	75'	450'	210'	210'	145'



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2N-11
R/W SHEET NO.	

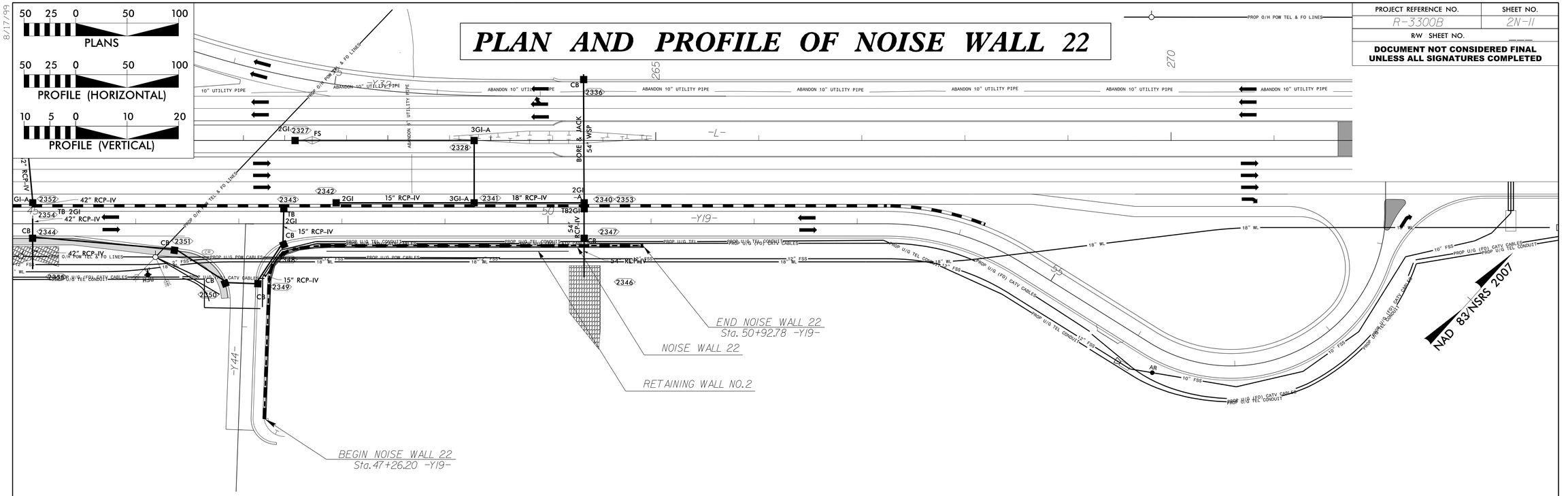
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

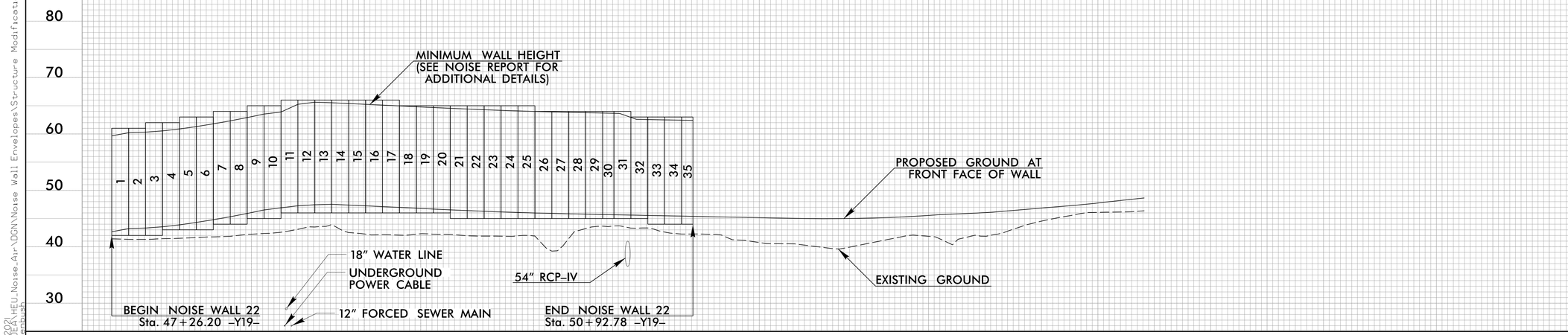
10 5 0 10 20
PROFILE (VERTICAL)

PLAN AND PROFILE OF NOISE WALL 22



NOTES: 1. FOR WALL PILE LOCATIONS AND ADDITIONAL DETAILS, SEE SOUND BARRIER LAYOUT DRAWINGS.
2. FOR UTILITY INFORMATION, SEE UTILITY PLANS.

PANEL NUMBER	1-2	3-4	5-6	7-8	9-10	11-17	18-25	26-31	32-35
TOP ELEVATION	61'	62'	63'	64'	65'	66'	65'	64'	63'
PANEL(S) LENGTH	30'	30'	30'	30'	30'	105'	120'	85'	55'



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COMPUTED BY: KSH DATE: MAY 2020
CHECKED BY: __CSM___ DATE: _____MAY 2020_____
REVISED BY: __KH___ DATE: _____SEPT 2021_____

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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.

Note: Earthwork quantities are calculated by Stantec. These earthwork quantities are based in part on subsurface data provided by the Falcon & Catlin.

EST. DDE = 37,600 CY
EST. UNDERCUT = 166,400 CY
EST. SHALLOW UNDERCUT = 1,100 CY
PAVEMENT STRUCTURE VOL = 7,700 CY

Summary of Earthwork

Volumes in Cubic Yards

STATION	STATION	TOTAL UNCLASS.	UNDERCUT	EMBANK. +% 0%	BORROW	WASTE
578+00.00 -L1-	608+00.00		1,530	168,061	168,061	1,530
16+72.60 -Y30DET-	46+50.00	269	994	73,536	73,452	1,180
46+50.00 -Y30DET-	62+57.50	544	225	8,196	7,653	225
22+25.00 -Y30-	38+74.22	3,734		123,805	120,071	
40+90.55 -Y30-	59+00.00	690	1,527	140,306	139,616	1,527
12+50.00 -Y30RPB-	21+50.00		2,919	37,359	37,359	2,919
11+00.00 -Y30RPC-	25+50.00		1,283	48,178	48,178	1,283
10+50.00 -SR4-	27+65.10	650	143	26,835	26,185	143
10+00.00 -DRW2-	12+00.00	1		1,636	1,635	
10+50.00 -SR5-	21+20.00	601	443	4,086	3,485	443
	SUBTOTAL	**6,489**	**9,063**	**631,998**	**625,695**	**9,249**
608+00.00 -L1-	638+00.00			227,986	227,986	
11+00.00 -Y30RPA-	25+00.00		673	124,482	124,482	673
13+00.00 -Y30RPD-	23+50.00		3,613	82,913	82,913	3,613
10+50.00 -SR6-	39+89.31	1,083	443	15,918	14,835	443
	SUBTOTAL	**1,083**	**4,729**	**451,300**	**450,217**	**4,729**
638+00.00 -L1-	658+22.00		10,025	213,808	213,808	10,025
10+00.00 -Y38DET-	17+62.67	71	1,090	5,993	5,922	1,090
17+15.00 -Y38-	25+00.00	1,724		3,598	1,874	
	SUBTOTAL	**1,795**	**11,115**	**223,398**	**221,603**	**11,115**
659+19.00 -L1-	689+00.00		5,482	283,380	283,380	5,482
	SUBTOTAL		**5,482**	**283,380**	**283,380**	**5,482**
689+00.00 -L1-	719+00.00	1,639	8,836	141,651	140,012	8,836
	SUBTOTAL	**1,639**	**8,836**	**141,651**	**140,012**	**8,836**
719+00.00 -L1-	749+00.00	196	19,156	175,779	175,583	19,156
18+20.70 -Y31DET-	47+13.23	735	184	29,638	28,903	184
18+20.70 -Y31-	29+13.36	407		102,015	101,608	
31+33.86 -Y31-	46+00.00	1,671		96,069	94,398	
11+00.00 -Y31RPA-	15+50.00			32,786	32,786	
12+00.00 -Y31RPB-	19+00.00			55,223	55,223	
11+50.00 -Y31RPC-	23+00.00			25,044	25,044	
7+00.00 -Y31LPC-	14+00.00	110		14,040	13,930	
10+50.00 -SR7-	28+50.00		940	27,291	27,291	940
	SUBTOTAL	**3,119**	**20,280**	**557,884**	**554,765**	**20,280**
749+00.00 -L1-	779+00.00	1,729		143,696	141,967	
28+50.00 -SR7-	57+20.00	6	876	27,600	27,594	876
	SUBTOTAL	**1,735**	**876**	**171,296**	**169,561**	**876**
779+00.00 -L1-	809+00.00		50,198	264,918	264,918	50,198
	SUBTOTAL		**50,198**	**264,918**	**264,918**	**50,198**
809+00.00 -L1-	820+00.00		27,230	108,516	108,516	27,230
	SUBTOTAL		**27,230**	**108,516**	**108,516**	**27,230**
820+00.00 -L1_NORTH-	850+00.00		17,269	299,838	299,838	17,269
16+59.24 -Y32RPB1-	20+62.96			65,103	65,103	
	SUBTOTAL		**17,269**	**364,940**	**364,940**	**17,269**
850+00.00 -L1_NORTH-	874+60.24	874		162,590	161,716	
867+50.00 -L1_NORTH-	WET DETENTION BASIN	3,500				3,500
10+64.25 -DET2REV-	21+43.73	1,445		890		555
10+00.00 -Y32-	24+45.00	1,641		139,228	137,587	
26+25.20 -Y32-	42+93.00	1,024		269,571	268,547	
8+09.86 -Y32LP2A-	11+10.99			7,569	7,569	
237+16.16 -Y40-	246+38.34	13		117,968	117,955	
	SUBTOTAL	**8,497**		**697,814**	**693,372**	**4,055**

Summary of Earthwork

Volumes in Cubic Yards

STATION	STATION	TOTAL UNCLASS.	UNDERCUT	EMBANK. +% 0%	BORROW	WASTE
220+33.00 -L-	231+00.00	980		2,545	1,565	
12+17.08 -DET1REV-	28+86.37	587		2,211	1,624	
10+55.00 -Y19-	37+67.24	596		18,991	18,395	
10+11.24 -Y20-	11+09.89	31		41	10	
10+20.00 -Y41-	11+30.00	16		280	264	
10+15.00 -Y42-	11+40.00	1,186		414		772
	SUBTOTAL	**3,396**		**24,483**	**21,858**	**772**
264+00.28 -L_LT-	294+00.00	1,749		7,630	5,881	
	SUBTOTAL	**1,749**		**7,630**	**5,881**	
294+00.00 -L_LT-	307+44.00	711		2,876	2,165	
10+80.00 -Y35-	11+62.88	279		44		235
	SUBTOTAL	**990**		**2,920**	**2,165**	**235**
264+50.00 -L_RT-	294+00.00	2,320		8,484	6,164	
10+00.00 -DET3-	17+00.00	514		840	326	
54+50.00 -Y19-	59+26.97	80		953	873	
	SUBTOTAL	**2,914**		**10,276**	**7,362**	
294+00.00 -L_RT-	307+44.00	367		5,103	4,736	
	SUBTOTAL	**367**		**5,103**	**4,736**	
307+44.00 -LLT-	332+50.00	1,254		9,994	8,740	
	SUBTOTAL	**1,254**		**9,994**	**8,740**	
307+44.00 -LRT-	332+50.00	1,889		11,195	9,306	
10+26.05 -Y26-	12+25.00	169		20		149
10+20.00 -Y43-	11+10.00	151		21		130
10+13.00 -Y44-	12+00.00	14		786	772	
	SUBTOTAL	**2,223**		**12,021**	**10,078**	**279**
309+50.00 -LDET6-	325+50.00	1,111		1,908	797	
310+50.00 -LDET7-	325+50.00	575		450		125
	SUBTOTAL	**1,686**		**2,358**	**797**	**125**
Detour Removals						
-DET1REV-	12+17.08 TO 28+86.37	2,211		734		1,478
-DET2REV-		890		1,806	916	
-DET3-	10+00 TO 17+00	840		643		198
-LDET6-	309+50 TO 325+50	1,908		1,389		519
-LDET7-	310+50 TO 325+50	450		719	269	
	SUBTOTAL	**6,299**		**5,290**	**1,185**	**2,194**
TOTAL		**45,235**	**155,077**	**3,977,168**	**3,939,780**	**162,923**
MATERIAL FOR SHOULDER CONSTRUCTION				61,250	61,250	
LOSS DUE TO CLEARING & GRUBBING		-5,000			5,000	
ADDITIONAL UNDERCUT			12,400	15,500	15,500	12,400
SURCHARGE -GEOTECH		61,700		77,125	77,125	61,700
WASTE IN LIEU OF BORROW					-5,466	-5,466
PROJECT TOTAL		**101,934**	**167,477**	**4,131,043**	**4,093,189**	**231,557**
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					204,659	
GRAND TOTAL		**101,934**	**167,477**	**4,131,043**	**4,297,848**	**231,557**
SAY		**104,500**	**168,000**		**4,405,300**	

COMPUTED BY:	KSH	DATE:	10/28/2019
CHECKED BY:	CSM	DATE:	06/12/2020
REVISED BY:	KH	DATE:	8/28/2021

"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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

GUARDRAIL SUMMARY

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

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 TL-3		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	AT-1	G	NG		
-L1-/-Y30RPC-	586+75.12	10+00.00	RT/RT	687.500			588+48.66 (-L1-)	9+06.35 (-Y30RPC-)	12'	15'	50		1				1		1					
-Y30RPC-/-Y30-	21+51.92	48+63.25	RT/RT	613.950	111.050		22+52.92 (-Y30RPC-)	47+69.51 (-Y30-)	12'/8'	15'/11'	50		1				1		1					
-Y30RPC-/-Y30-	23+03.39	40+82.26	LT/RT	630.000	20.000		24+03.39 (-Y30RPC-)	40+73.34 (-Y30-)	7'/8'	10'/11'	50		1			1	1							
-Y30RPB-/-Y30-	21+22.10	38+47.49	RT/RT	375.000	50.000			38+57.01 (-Y30-)	12'/8'	15'/11'						1				1				
-Y30-/-Y30RPB-	28+43.54	16+50.70	RT/LT	1032.250	42.750		29+43.54 (-Y30-)	17+50.70 (-Y30RPB-)	8'	11'	50		1				1		1					
-SR4-	13+90.44	16+60.41	LT	262.500			14+97.44		4'	7'	25	25	1	1				2						
-SR4-	15+03.35	17+36.23	RT	225.000			16+49.87		4'	7'	25	25	1	1				2						
-L1-	604+03.82	606+86.75	MED LT	150.000			604+95.35	605+93.35	18.5'							2					1			GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L1-	604+03.82	606+86.75	MED RT	150.000			605+93.35	604+95.35	18.5'							2					1			GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-Y30-/-Y30RPA-	28+86.58	11+55.14	LT/RT	1749.250	113.250		29+86.58 (-Y30-)	12+55.14 (-Y30RPA-)	8'/12'	11'/15'	50		1				1		1					
-Y30RPA-/-Y30-	23+29.67	38+82.51	LT/LT	543.600	31.400		38+91.43 (-Y30-)		10'/8'	13'/11'	50		1			1	1							
Y30-/-Y30RPD-	41+17.28	23+16.01	LT/RT	362.500	62.500			41+07.76	8'	11'			1			1				1				
-Y30RPD-/-Y30-	17+50.50	50+55.40	LT/LT	1037.500	62.500		18+50.50 (-Y30RPD-)	49+55.40 (-Y30-)	12'/8'	15'/11'	50		1				1		1					
-Y30RPA-/-L1-	8+66.05	638+15.43	RT/LT	2050.000			7+65.30 (-Y30RPA-)	638+15.43 (-L1-)	12'	15'						1			1					GUARDRAIL COMES BEFORE A LONG STRETCH OF NOISE WALL
-Y30RPD-	8+53.38	7+64.57	LT	87.500			7+64.57		12'	15'	50		1			1	1							GUARDRAIL COMES BEFORE A LONG STRETCH OF NOISE WALL
-L1-	655+22.66	658+22.66	MED RT	300.000				658+22.66	12	15	50		1			1	1							
-L1-	659+19.30	662+19.36	MED LT	300.000			659+19.30				50		1			1	1							
-L1-	676+92.70	681+43.64	LT	450.000				676+92.70	12'	15'		50	1			1	1							
-L1-	699+87.85	700+37.85	RT	50.000				699+87.85	12'	15'						1			1					
-Y38-	18+19.31	20+86.51	LT	175.000	75.000		19+74.40		6'	9'	25	25	1	1				2						
-Y38-	18+58.47	20+81.07	RT	225.000			19+85.63		6'	9'	25	25	1	1				2						
-Y31RPC-	5+56.43	8+22.47	RT	262.500			7+75.21		12'	15'	50		1				1		1					
-L1-	711+43.79	715+49.92	LT	412.500			712+31.19		12'	15'	50		1				1		1					
-Y31RPB-/-Y31-	13+22.94	23+91.80	LT/RT	725.000	125.000		14+22.94 (-Y31RPB-)	24+91.80 (-Y31-)	12'/8'	15'/11'	50		1				1		1					
-Y31RPB-/-Y31-	18+32.69	29+19.88	RT/RT	250.000	50.000		29+19.88		10'/8'	13'/11'					1				1					
-Y31-/-Y31LPC-	31+41.99	13+46.33	RT/LT	425.000	112.500		31+41.99		8'	11'					1				1					
-Y31RPC-/-Y31-	20+34.92	38+05.67	RT/RT	312.500	50.000		21+34.92 (-Y31RPC-)	37+05.67 (-Y31-)	12'/8'	15'/11'	50		1				1		1					
-Y31-	31+26.04	38+11.33	LT	687.500				31+26.04	8'	11'		50	1		1		1							
-Y31RPA-/-Y31-	14+75.77	29+07.12	LT/RT	287.500	37.500			29+07.12	10'/8'	13'/11'	50		1		1		1							
-Y31RPA-/-Y31-/-SR7-	10+99.17	11+64.57	RT/LT/RT	737.500	100.000		11+99.17 (-Y31RPA-)	10+63.79 (SR7)	12'/8'/4'	15'/11'/7'	50	25	1	1			1	1						
-SR7-	16+16.70	18+08.30	RT	187.500					4'	7'	50	50	1	1				2						
-L1-	796+98.06	805+06.25	RT	812.500			797+98.06	804+06.25	12'	15'	50		1				1		1					
-L1-	799+87.13	807+50.49	LT	762.500			800+87.23	806+50.40	12'	15'	50		1				1		1					
-L1-	729+81.33	732+30.22	MED LT	137.500			730+72.01	731+39.45								2					1			GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L1-	729+81.33	732+30.22	MED RT	137.500			730+72.01	731+39.45								2					1			GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L1-	807+52.88	809+65.83	MED LT	150.000			808+45.39	808+73.39	18.5'							2					1			GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L1-	807+54.59	809+61.86	MED RT	150.000			808+45.39	808+73.39	18.5'							2					1			GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L1_NORTHERN-/-Y32RPB1-/-Y32-	825+43.40	16+16.97	RT/RT/LT	3275.000			832+50.00 (-L1_NORTHERN-)	18+30.00 (-Y32-)	12'/12'/10'	15'/15'/13'	50		1				1		1					
-L1_NORTHERN-	826+84.22	847+39.58	LT	2125.000			827+84.22	846+39.58	12'	15'	50		1				1		1					
-Y32-	21+87.37	24+45.97	LT	262.500			24+45.97		4'	7'						1			1					
-Y32-	19+54.14	24+46.57	RT	487.500				24+46.57	10'	13'	50		1			1	1							
-Y32-	26+40.20	33+12.62	RT	637.500			26+40.20		12'/10'	15'/13'						1			1					
-Y32-	26+20.98	41+77.07	LT	1575.000				26+20.98	4'/12'	7'/15'	50		1			1	1							
-Y40-	247+72.86	249+62.70	RT	200.000			249+60.00		11.5'	14.5	50		1			1	1							GUARDRAIL COMES BEFORE RETAINING WALL
-Y19-	22+83.11	25+92.29	LT	312.500			24+25.07		6'	9'	50	50	1	1			2							
-Y19-	54+20.00	54+66.18	LT	50.000			54+20.00		4'	7'	50		1				1							
-LRT-	316+39.32	320+64.29	RT	425.000			319+14.29	319+64.29			50		1				1		1					
-LLT-	320+07.15	324+28.71	LT	425.000			321+05.46	321+55.37				50		1			1		1					
-L-	238+95.07	241+17.06	LT																				223	
-L-	238+03.55	239+68.12	RT																				165	
-LRT-	317+75.01	320+66.85	RT																				290	
-LLT-	325+08.88	329+35.85	LT																				428	
-L-	231+73.62	234+11.12	RT	237.500			233+44.00		8'	11'	50		1				1		1					OVERHEAD SIGN STRUCTURE "E" -L- STA 233+44
-L-	262+82.75	265+17.25	MEDLT	200.000			264+00.28														1			OVERHEAD SIGN STRUCTURE "F" -L- STA 264+00/ GUARDRAIL LENGTH DOESN'T
-L-	262+82.75	265+17.25	MEDRT	200.000			264+00.28														1			OVERHEAD SIGN STRUCTURE "F" -L- STA 264+00/ GUARDRAIL LENGTH DOESN'T
-L-	278+32.75	280+67.25	MEDLT	200.000			279+50.00														1			OVERHEAD SIGN STRUCTURE "G" 279+50 / GUARDRAIL LENGTH DOESN'T INCLUDE
-L-	278+32.75	280+67.25	MEDRT	200.000			279+50.00														1			OVERHEAD SIGN STRUCTURE "G" 279+50 / GUARDRAIL LENGTH DOESN'T INCLUDE
-L1_NORTHERN-	836+12.12	838+71.30	RT	262.500			838+15.14		6'	10'	50		1				1		1					OVERHEAD SIGN STRUCTURE "D" 838+15
-L-	313+60.00	316+40.00	LT	475.000			315+00.00														2			DMS / GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L1_NORTHERN-	851+43.39	855+05.81	LT	87.500	25.000				25.5'	28.5'						2			2					
-L1_NORTHERN-	851+26.63	854+39.55	RT	175.000					25.5'	28.5'						2	1		1					
-Y19-	37+50.00	41+55.55	LT																					BARRIER IN FRONT OF RETAINING WALL
-Y44-/-Y19-	12+04.84	55+56.17	LT/RT	56.250	25.000		11+88.66 (-Y44-)	55+06.18 (-Y19-)	11.5	14.5	4	50		1			1			1				NOISE WALL IN FRONT OF RETAINING WALL
-L1-	670+38.75	673+11.25	MEDLT	475.000			671+75.00														2			DMS / GUARDRAIL LENGTH DOESN'T INCLUDE ATTENUATORS
-L-/-Y20-	221+20.00	10+12.00	LT/RT	575.000					2	10		25		1				1	1					ADJACENT TO TOPSAIL ELEMENTARY PLAYGROUND AREA
			SUBTOTAL =	30,812.800	1093.450										4	31	34	12	27	3	0	6	8	1106	
LESS DEDUCTIONS FOR ANCHORS		GREU, TL-3	34 @50' EA=	-1700.000																				
		GREU, TL-2	12 @25' EA=	-300.000																				
		TYPE III	4 @18.75' EA=	-75.000																				
		B-77	31 @22.875' EA=	-709.125																				
		CAT-1	27 @6.25' EA=	-168.750																				
		AT-1	3 @6.25' EA=	-18.750																				
	25' CLEAR SPAN REDUCTION		1@25' EA=	-25.000																				
			PROJECT TOTALS =	27,816.175	1,093.45																			
			SAY =	**27,837.50**	**1,112.50**		**ADDITIONAL POSTS=**	**20**																

COMPUTED BY: KSH DATE: 10/28/2016
CHECKED BY: AGI DATE: 01/24/2020
REVISED BY: KH DATE: 09/01/2021

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TEMPORARY 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						SINGLE FACED CONCRETE BARRIER	DOUBLE FACED CONCRETE BARRIER	REMARKS
				STRAIGHT	SHOP CURVED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU, TL-2	CAT-1	AT-1	TEMP TL-2	TEMP TL-3	IA-MASH TL-3			
-DET2REV-	15+09.64	19+25.36	LT	325.000		16+58.71	16+54.73	8'	11'	50	50	1	1					2				TEMPORARY GUARDRAIL, SEE -DET2REV- ON SHEET 2B-9
-Y19-/-DET3-	50+75.00	11+25.39	RT	312.500		51+75.00 (-Y19-)	10+25.39 (-DET3-)	5'	8'	50	50	1	1					2				TEMPORARY GUARDRAIL, SEE -DET3- ON SHEET 2B-10
-Y38DET-	12+34.50	15+53.46	LT	312.500		13+09.51	14+78.46	4'	7'	25	25	1	1				2					TEMPORARY GUARDRAIL, SEE -Y38DET- ON SHEET 2B-11
-Y38DET-	11+35.03	14+82.68	RT	337.500		12+10.03	14+07.68	4'	7'	25	25	1	1				2					TEMPORARY GUARDRAIL, SEE -Y38DET- ON SHEET 2B-11
-Y30DET-	42+00.00	47+00.00	LT	500.000		42+30.00	46+00.00	5	8	50	50	1	1					2				TEMPORARY GUARDRAIL, SEE -Y30DET- ON SHEET 2B-2
-Y31DET-	17+50.00	22+00.00	RT	450.000		18+50.00	21+00.00	5	8	50	50	1	1					2				TEMPORARY GUARDRAIL, SEE -Y31DET- ON SHEET 2B-5
			SUBTOTAL =	2,237.500	0.000												4	8				
LESS DEDUCTIONS FOR ANCHORS		TEMP GREU TL-2	4 @25' EA=	-100.000																		
		TEMP GREU TL-3	8 @50' EA=	-400.000																		
			PROJECT TOTALS =	1,737.500	0.000																	
			SAY =	**1,750.000**	**0.000**	**ADDITIONAL POSTS =**	**10**															

"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

CABLE GUIDERAIL SUMMARY

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		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	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-	578+00.00	598+23.94	MED	2,004											1	1						
-L1-	597+76.06	603+85.92	MED	612											1	1						
-L1-	607+02.58	627+23.92	MED	2,026											1	1						
-L1-	626+76.08	647+24.00	MED	2,029												2						
-L1-	646+76.00	657+75.34	MED	1,100											1	1						
-L1-	659+45.04	670+19.59	MED	1,079											2							
-L1-	673+30.00	679+68.96	MED	642											1	1						
-L1-	679+21.04	699+69.00	MED	2,052												2						
-L1-	699+21.00	719+68.95	MED	2,052												2						
-L1-	719+21.05	729+57.73	MED	1,040											1	1						
-L1-	732+55.25	752+79.25	MED	2,026											1	1						
-L1-	752+31.00	772+78.96	MED	2,051												2						
-L1-	772+31.04	792+78.96	MED	2,053												2						
-L1-	792+31.04	812+30.00	MED	2,003												2						
-L1-/-L1NORTHERN-	811+82.00	830+09.00	MED	1,830												2						
-L1NORTHERN-	829+61.09	849+99.00	MED	2,050												2						
-L1NORTHERN-	849+61.07	861+23.87	MED	1,081											1	1						
			SUBTOTAL =	27,729											**10**	**24**						
		LESS DEDUCTIONS FOR ANCHORS		34 @25' =	-850																	
			PROJECT TOTAL =	26,879																		
			SAY =	**26,900**		**ADDITIONAL POSTS =**	**10**															

COMPUTED BY: KSH DATE: MAY 2020
CHECKED BY: __CSM___ DATE: _____MAY 2020_____
REVISED BY: __KH___ DATE: _____SEPT 2021_____

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

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 (SEE WALL PLANS)	DOUBLE FACED TYPE III (SEE WALL PLANS)	DOUBLE FACED BARRIER TYPE II	TRANSITION FROM MOMENT SLAB - TYPE T2 (SEE WALL PLANS)
								(STRUCTURE PAY ITEM)
-L1-	604+95.35	605+93.35	MED LT	98				
-L1-	604+95.35	605+93.35	MED RT	98				
-L1-	638+10.79	657+99.35	LT	1,985				
-Y30RPD-/-L1-	7+64.57	657+98.60	RT	3,394				
-L1-	659+43.57	676+92.70	LT	1,729				
-L1-	659+17.50	699+87.85	RT	4,084				
-L1-	730+72.01	731+39.45	MED LT	67.5				
-L1-	730+72.01	731+39.45	MED RT	67.5				
-L1-	808+45.39	808+73.39	MED LT	28				
-L1-	808+45.39	808+73.39	MED RT	28				
-L1_NORTH-	851+87.54	854+57.16	LT	255				
-L1_NORTH-	852+07.99	853+99.91	RT	202				
-Y40-	249+62.70	256+19.51	RT	660				
-Y40-	255+89.65	256+19.51	RT					29.86
-Y40-	256+19.51	256+49.30	RT					29.79
-L1_NORTH-	866+44.17	866+63.70	RT					19.53
-L1_NORTH-	866+63.70	867+22.53	RT		59			
-L1_NORTH-	867+22.53	867+81.89	RT			59		
-L1_NORTH-	867+81.89	-Y19- 54+20.00	RT/LT				1,101	
-Y19-	37+50.00	41+55.55	LT	404				
-Y44-/-Y19-	11+88.66	55+06.18	LT/RT	916				
			TOTALS	14,016	59	59	1,101	79
			SAY	**14,020**	**59**	**59**	**1,110**	

SHOULDER BERM GUTTER SUMMARY

LINE	Station	Station	LENGTH *LENGTH IN FEET*
-Y30-	28+92.83	34+14.41	557.39
-Y30-	28+93.54	34+16.77	541.71
-Y30-	34+92.74	38+66.37	373.64
-Y30-	34+91.00	38+33.08	345.32
-Y30-	41+31.38	44+35.00	304.00
-Y30-/ -Y30RPC-	40+98.13	23+77.26	593.92
-Y30-	45+72.55	50+05.56	437.42
-Y30-	45+76.10	48+63.24	290.30
-L1-	657+70.00	657+98.60	28.75
-Y31-	25+46.29	26+46.51	122.01
-Y31-	24+94.00	26+57.70	180.72
-Y31-	28+80.00	28+95.05	14.98
-Y31-	31+65.63	36+01.00	437.02
-Y31-	36+93.67	37+99.53	131.39
-Y31RPC-	6+06.72	8+16.11	206.59
-L1-	799+93.46	807+00.70	706.31
-L1-	802+50.00	805+00.00	250.00
-L1-_NORTHERN-	825+93.40	838+26.91	1181.18
-Y32RPB1-	5+00.00	12+57.77	742.24
-Y32RPB1-/-Y32-	16+85.41	16+23.50	865.10
-Y32-	22+20.02	24+21.03	193.44
-Y32-	26+66.16	33+06.01	608.26
-Y32-	37+52.84	41+09.00	353.17
-Y19-	23+34.72	24+30.00	93.59
		TOTAL:	9,558.45
		SAY:	**9,580**

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP
-Y30-	22+25.00	34+50.00	CL	3458	
-Y30-	34+50.00	38+41.00	CL		1173
-Y30-	38+41.00	41+20.00	CL	769	
-Y30-	41+20.00	45+15.00	CL		1147
-Y30-	45+15.00	59+00.00	CL	3877	
-L1-	638+57.00		CL	950	
-Y31-	18+20.00	20+00.00	CL	404	
-Y31-	20+00.00	28+91.46	CL		1952
-Y31-	28+87.00	31+60.00	CL	581	
-Y31-	31+60.00	40+25.00	CL		1858
-Y31-	40+25.00	45+98.00	CL	1226	
-L1_NORTHERN-	865+27.00	872+00.00	LT		812
-L1_NORTHERN-	861+00.00	872+00.00	LT		3551
-Y32-	13+50.00	14+00.00	MED	1951	
-Y32-	14+00.00	17+45.04	CL		1779
-L-/-Y19-	228+12.00	15+12.00	RT/LT	582	
-L-	231+00.00	235+00.00	CL	2499	
-L-	236+45.00	252+90.00	CL	9519	
-L-	252+70.00	264+00.00	CL	3374	
-L-	261+40.00	264+00.28	LT	577	
-L-	261+40.00	264+00.28	RT	524	
-L-	264+00.28	271+58.00	MED	2960	
-L-	272+58.00	281+77.00	MED	2423	
-L-	288+59.00	304+74.00	MED	3847	
-L-	308+10.00	326+04.00	MED	2712	
-L-	326+77.00	332+54.00	MED	434	
-L-	331+79.00	332+18.00	MED	5	
-L-	312+00.00	326+33.00	LT	511	
-L-	291+23.00	291+59.00	RT	74	
-L-	324+55.00	325+75.00	RT	18	
-L-	326+89.00	327+69.00	RT	38	
-L-	327+51.00	328+57.00	RT	149	
-L-	328+40.00	329+90.00	RT	95	
-L-	330+82.00	332+54.00	RT	102	
-Y26-	10+17.00	10+53.00	LT	22	
-Y19-	11+11.00	11+21.00	LT	2	
-Y19-	14+92.00	15+64.00	CL	185	
-Y41-	10+54.00	11+02.00	LT	8	
-Y41-	10+04.00	10+47.00	RT	40	
-Y44-	10+00.00	10+81.00	CL		389
-Y30DET-	16+72.00	62+57.00	CL	13223	
-Y38DET-	10+00.00	17+62.00	CL	1991	
-Y31DET-	18+20.00	47+13.00	CL	7520	
-DET1REV-	12+17.00	28+86.00	CL	3466	
-DET2REV-	10+64.00	21+43.00	CL	3720	
-DET3-	10+96.00	17+00.00	CL	1650	
-LDET6-	308+69.00	328+45.00	CL	2,986	
-LDET7-	308+63.00	325+97.00	CL	1,984	
		TOTAL:		80456	12661
		SAY:		**80,460**	**12,700**

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021

CHECKED BY: JGD DATE: 2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 15	18	24	30	36	42	48
DET3 10+03	0 CL	DET3A	DET3B		41.9	31.0			72					
DET6 315+87	50 LT	D6-1		42.0										
DET6 319+64	45 LT	D6-3		41.5										
DET6 320+32	22 RT												60	
DET6 323+93	10 LT	D6-8		43.0										
DET6 325+11	11 RT	D6-7		42.5										
		D6-7	D6-8		40.3	39.9								
DET7 319+67	25 RT	D7-1		42.5										
		D7-1	D7-2		39.0	38.1								
DET7 320+92	24 RT	D7-4		42.5										
		D7-4	D7-5		39.0	38.7								
DET 7 323+89	36 LT	D7-7		42.3										
Y30DET 19+75	0 CL	0201			23.8	23.2			80					
Y30DET 19+74	32 RT	0202			23.8	23.2				36				
Y30DET 36+18	0 CL	0203			40.5	40.3					112			
Y30DET 39+39	1 RT	0204			39.9	39.4						112		
Y30DET 42+65	1 RT	0205			38.5	37.9						116		
Y30DET 45+38	3 LT	0206			37.7	35.0				120				
Y30DET 47+55	5 LT	0207			37.9	37.3					96			
Y30DET 54+49	0 CL	0208			34.5	33.5			84					
Y30DET 56+53	2 LT	0209			32.5	31.0					72			
Y30DET 58+12	1 RT	0210			32.3	32.0								
Y30DET 61+81	27 RT	0211							28					
Y38DET 16+49	26 LT	0213						44						
Y31DET 21+50	0 CL	0214			46.8	46.5			72					
Y31DET 34+56	4 LT	0215			44.1	43.9								
Y31DET 38+03	9 RT	0216			43.6	43.4								
Y31DET 40+89	3 RT	0217			43.4	43.1			84					
Y31DET 43+38	3 RT	0218			42.8	42.4								
DET1REV 20+53	43 LT	0219			35.3	35.2				44				
DET1REV 22+81	20 RT	0221			33.5	33.4								
DET2REV 16+51	23 LT	0222			34.0	33.8								
Y38 20+35	37 RT	0223			20.6	20.5								108
DET2REV 13+51	50 LT	0224			37.8	37.2				100				
DET1REV 22+03	11 LT	0225												
DET1REV 22+47	9 LT	0226												
DET1REV 23+52	5 LT	0227												
DET1REV 24+66	0 LT	0228												
L1 581+66	0 CL	0401		43.0										
		0401	0404		33.5	32.0								
L1 581+85	100 RT	0402		38.0										
		0402	0401		35.0	33.5								
L1 583+16	0 CL	0407		42.6										
		0407	0401		38.6	38.2								
L1 590+42	0 CL	0408			41.8	38.8								
L1 586+00	0 CL	0410		44.1										
		0410	0412		41.3	40.9								
L1 587+41	0 CL	0412		45.0										
		0412	0411		35.7	34.3								
				SHEET TOTALS				44	420	300	184	324	60	108

	C. A. A. PIPE SIZE: 42	48	R. C. PIPE CLASS III: 15	18	24	30	36	42	48	R. C. PIPE CLASS IV: 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V: 12	18	30	36	42
	THICKNESS OR GAUGE: .109	.109																				
DET3 10+03																						
DET6 315+87																						
DET6 319+64																						
DET6 320+32																						
DET6 323+93																						
DET6 325+11																						
DET7 319+67																						
DET7 320+92																						
DET 7 323+89																						
Y30DET 19+75																						
Y30DET 19+74																						
Y30DET 36+18																						
Y30DET 39+39																						
Y30DET 42+65																						
Y30DET 45+38																						
Y30DET 47+55																						
Y30DET 54+49																						
Y30DET 56+53																						
Y30DET 58+12																	128					
Y30DET 61+81																						
Y38DET 16+49																						
Y31DET 21+50																						
Y31DET 34+56							96															
Y31DET 38+03																						
Y31DET 40+89																						
Y31DET 43+38											68											
DET1REV 20+53																						
DET1REV 22+81																		56				
DET2REV 16+51																		120				
Y38 20+35																						
DET2REV 13+51																						
DET1REV 22+03																						
DET1REV 22+47																						
DET1REV 23+52																						
DET1REV 24+66																						
L1 581+66																						
							100															
L1 581+85																						
							104															
L1 583+16																						
								148															
L1 590+42							244															
L1 586+00																						
								140															
L1 587+41																						
										108													
SHEET TOTALS			288	104		300	244		108		152	68			128				176				

	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS 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.	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	D.I. FRAME AND COVER STD. 840.17 OR STD. 840.26	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
DET3 10+03																																													72	DETOUR 3 PIPE
DET6 315+87											1																																		TEMPORARY INLET
DET6 319+64											1																																		TEMPORARY INLET
DET6 320+32																																													60	2@42" TEMPORARY PIPES
DET6 323+93											1																																		TEMPORARY JB
DET6 325+11											1																																			TEMPORARY INLET
																																													116	TEMPORARY PIPE
DET7 319+67											1																																			TEMPORARY INLET
																																													20	TEMPORARY PIPE
DET7 320+92											1																																			TEMPORARY INLET
																																													16	TEMPORARY PIPE
DET 7 323+89											1																																			TEMPORARY INLET
Y30DET 19+75																																														80	Temporary Pipe
Y30DET 19+74																																														36	Temporary Pipe
Y30DET 36+18																																														112	Temporary Pipe
Y30DET 39+39																																														112	Temporary Pipe
Y30DET 42+65																																														116	Temporary Pipe
Y30DET 45+38																																														120	Temporary Pipe
Y30DET 47+55																																														96	Temporary Pipe
Y30DET 54+49																																														84	Temporary Pipe
Y30DET 56+53																																														72	Temporary Pipe
Y30DET 58+12																																														128	2@36" Temporary Pipes
Y30DET 61+81																																														28	Temporary Pipe
Y38DET 16+49																																														44	Temporary Pipe
Y31DET 21+50																																														72	Temporary Pipe
Y31DET 34+56																																														96	Temporary Pipe
Y31DET 38+03																																														104	Temporary Pipe
Y31DET 40+89																																														84	Temporary Pipe
Y31DET 43+38																																														68	Temporary Pipe
DET1REV 20+53																																														44	Temporary Pipe
DET1REV 22+81																																														56	2 @ 42" Temporary RCP-V
DET2REV 16+51																																														120	2 @ 42" Temporary RCP-V
Y38 20+35																																														108	3 @ 48" Temporary Pipe
DET2REV 13+51																																														100	Temporary Pipe
DET1REV 22+03																																														1	
DET1REV 22+47																																														1	
DET1REV 23+52																																														1	
DET1REV 24+66																																														1	
L1 581+66											1	4.5														1				1																
							100																																							SEE DETAIL ON PLAN SHEET 2C-17
L1 581+85																																														SEE DETAIL ON PLAN SHEET 2C-17
							104																																							
L1 583+16											1															1				1	1															
								148																																							
L1 590+42							244																																							SEE DETAIL ON PLAN SHEET 2C-17
L1 586+00											1															1				1																
								140																																							
L1 587+41											1	4.3														1				1																
										108																																					SEE DETAIL ON PLAN SHEET 2C-17
SHEET TOTALS			288	104		300	244		108		11	8.8														3	6	1		7	4					1	2	1		1	4			3.8380	2164	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021

CHECKED BY: JGD DATE: 2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)							DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE / THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	15	18	24	30	36	42	48						42 .109	48 .109		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42				CY	CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															CY	CY	LIN. FT.	
L1 587+61	114 RT	0413		41.6																																										6.000																																													
		0413	0412		36.8	35.7																							48																																																															
L1 588+45	0 CL	0414		45.8																																												1	2.8											1						1																										
		0414	0412		38.0	37.7																			104																																																																			
L1 588+91	116 RT	0415		42.0																																																																																									
		0415	0414		38.4	38.0																			124																																																																			
Y30RPC 23+79	10 LT	0501		54.3																																												1														1			1																										
		0501	0502		51.3	39.7	0.4	56							x	x																																																																					2							
Y30RPB 13+95	1 RT	0503			40.9	40.0																													72																																															1												SEE DETAIL ON PLAN SHEET 2C-17
Y30RPB 14+75	2 RT	0504			40.7	40.7																													76																																															1												SEE DETAIL ON PLAN SHEET 2C-17
L1 594+50	0 CL	0505		46.5																																												1														1					1																								
		0505	0506		43.7	42.3																	104																																																																				
		0506	0507		42.3	41.5	0.4																84																																																																					
L1 595+50	0 CL	0506		46.3																																												1												1					1	1																								
L1 596+51	0 CL	0508			41.9	41.9																													180																																																											
Y30RPC 13+00	4 LT	0509			42.0	42.0																					100																																																									1												SEE DETAIL ON PLAN SHEET 2C-17
Y30RPB 17+70	3 RT	0510			39.8	39.8																					124																																																																			
		0512	0513		44.2	41.5																	84																																																																					
L1 598+00	0 CL	0512		46.9																																												1														1					1																								
Y30RPC 17+94	5 RT	0516			40.1	40.1																					96																																																								1												SEE DETAIL ON PLAN SHEET 2C-17
Y30RPC 19+71	9 RT	0519			40.1	40.1																													104																																															1												SEE DETAIL ON PLAN SHEET 2C-17
Y30 32+35	49 RT	0524		56.2																																												1														1			1																										
		0524	0592		53.4	46.1																									232																																																																	
Y30 32+35	42 LT	0525		56.3																																												1														1			1																										
		0525	0593		53.6	46.1																									232																																																																
Y30 35+06	56 RT	0527		64.6																																												1	3.8													1			1																										
		0527	0526		55.8	42.9	1.6	84							x	x																																																																					2							
Y30 34+96	42 LT	0528		64.7																																												1														1			1																										
		0528	0529		61.9	61.9																									12																																																																	
Y30 35+06	42 LT	0529		65.0																																												1														1			1																										
		0529	0527		61.9	61.6																									100																																																																	
Y30 35+76	3 LT	0530			40.3	37.0																														268										4.500																																														
		0531	0532		58.3	58.2																									32																																																																	
Y30RPA 24+40	1 LT	0531		61.6																																												1								1			1	1																																	
Y30RPA 24+38	32 RT	0532		61.2																																												1														1			1																										
		0532	0533		58.0	38.5		80							x	x																																																																					2							
Y30 38+20	42 RT	0535		73.8																																												1														1			1																										
		0535	0534		70.8	41.8		108							x	x																																																																					2							
Y30 38+55	42 LT	0536		74.3																																												1														1			1																										
		0536	0537		71.3	41.3		104							x	x																																																																						2							
L1 604+00	0 CL	0538		48.6																																												1														1					1																								
		0538	0539		45.6	37.1																	132																																																																					
Y30 41+10	42 RT	0541		73.1																																												1														1			1																										
		0541	0540		70.2	37.3		116							x	x																																																																					2							
Y30 41+40	42 LT	0542		72.5																																												1														1			1																										
		0542	0543		69.5	42.0		104							x	x																																																																					2							
Y30 44+00	42 RT	0545		64.2																																												1														1			1																										
		0545	0544		61.2	36.1	0.3	92							x	x																																																																					2							
Y30 44+28	47 LT	0546		63.1																																												1														1			1																										
		0546	0547		60.2	39.1		80							x	x																																																																					2							
							SHEET TOTALS	824															404		228		320		48		608				432	268										10.500		19	6.6						1			1	1	2	16			13	1	5												5					18							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**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, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 42 .109	C. A. A. PIPE 48 .109		R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	18	30	36	42
Y30RPC 24+99	5	RT	0548			36.0	35.4																							196													
SR6 21+73	1	RT	0557			31.0	30.2																			96																	
SR6 23+50	29	RT	0558		27.0																																						
			0558	0559		24.3	24.0																	96																			
SR6 24+50	15	RT	0559		27.4																																						
			0559	0560		24.0	23.8																									44											
SR6 27+25	2	LT	0564			22.5	22.0																		88																		
L1 611+00	0	CL	0567		39.6																																						
			0567	0569		36.9	28.6																	112																			
L1 613+93	0	CL	0574		37.1																																						
			0574	0571		33.1	27.4																	108																			
Y30RPD 15+15	4	RT	0576			30.2	26.8																												112								
L1 615+27	13	LT	0577			26.5	24.4																					244															
L1 616+50	0	CL	0581		38.6																																						
			0581	0580		35.6	34.0	1.4																108																			
L1 619+00	0	CL	0582		43.5																																						
			0582	0581		40.7	35.9	0.8																248																			
Y30RPA 13+50	8	LT	0583			26.4	23.4																			156																	
Y30RPD 17+04	57	LT	0584			32.5	30.7																																				
SR6 19+44	29	RT	0585			39.0	37.2																																				
Y30RPC 21+00	5	RT	0588			41.9	41.9																													88							
SR4 20+31	2	RT	0589			40.8	40.5																		84																		
Y30 29+00	42	LT	0590		45.6																																						
			0590	0593		42.9	42.6																									100											
Y30 29+00	42	RT	0591		45.6																																						
			0591	0592		42.9	42.6																									100											
Y30 30+00	42	RT	0592		48.8																																						
			0592	0593		42.3	42.1																		84																		
Y30 30+00	42	LT	0593		48.8																																						
			0593	0594		41.6	40.0	0.5			68						x																										
SR4 24+75	0	CL	0595			41.5	41.5																													68							
L1 621+00	0	CL	0601		47.6																																						
			0601	0582		44.9	40.7	0.3																196																			
L1 626+46	7	LT	0602			42.2	38.3																			240																	
L1 628+50	70	RT	0603		49.7																																						
			0603	0604		47.0	43.0		32							x	x																										
L1 623+85	0	CL	0606		50.7																																						
			0606	0605		46.4	42.7																	120																			
L1 623+85	74	RT	0607		49.9																																						
			0607	0606		47.2	46.4																									72											
L1 631+50	0	CL	0702		48.9																																						
			0702	0701		45.9	41.7	0.5																100																			
L1 632+14	8	LT	0703			37.5	33.0																				272																
L1 633+75	12	LT	0706			36.0	34.0																					212															
L1 637+00	0	CL	0707		45.5																																						
			0707	0712		42.5	42.3																										56										
L1 639+50	0	CL	0709		41.7																																						
			0709	0713		38.9	37.7																	60																			
L1 633+00	58	RT	0711		48.9																																						
			0711	0714		46.1	43.3		28							x	x																										
								SHEET TOTALS	60		68													1148	256	492	272	456		196		316	56		112	156							

NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

LINE & STATION	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	QUANTITIES FOR DRAINAGE STRUCTURES 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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y30RPC 24+99	0548					6.000																																												
SR6 21+73	0557																																																	
SR6 23+50	0558							1													1					1																								
	0558	0559																																																
SR6 24+50	0559						5.000	1																		1						1																		
	0559	0560																																																
SR6 27+25	0564																																																	
L1 611+00	0567							1													1			1																										
	0567	0569																																																
L1 613+93	0574							1												1					1	1																								
	0574	0571																																																
Y30RPD 15+15	0576																																				1													SEE DETAIL ON PLAN SHEET 2C-17
L1 615+27	0577					3.400																																												
L1 616+50	0581							1													1					1																								
	0581	0580																																																
L1 619+00	0582							1													1					1																								
	0582	0581																																																
Y30RPA 13+50	0583																																																	
Y30RPD 17+04	0584		60																																															
SR6 19+44	0585				60																																													
Y30RPC 21+00	0588																																					1												SEE DETAIL ON PLAN SHEET 2C-17
SR4 20+31	0589																																																	
Y30 29+00	0590							1													1			1																										
	0590	0593																																																
Y30 29+00	0591							1													1			1																										
	0591	0592																																																
Y30 30+00	0592							1	1.5												1			1																										
	0592	0593																																																
Y30 30+00	0593							1	2.2												1			1																										
	0593	0594																																																
SR4 24+75	0595																																																	
L1 621+00	0601							1													1					1																								
	0601	0582																																																
L1 626+46	0602																																																	
L1 628+50	0603							1													1			1																										
	0603	0604																																								2							
L1 623+85	0606							1													1					1																								
	0606	0605																																																
L1 623+85	0607							1													1			1																										
	0607	0606																																																
L1 631+50	0702							1													1					1																								
	0702	0701																																																
L1 632+14	0703																																																	
L1 633+75	0706					3.400																																												
L1 637+00	0707							1													1					1																								
	0707	0712																																																
L1 639+50	0709							1													1					1																								
	0709	0713																																																
L1 633+00	0711							1													1			1																										
	0711	0714																																								2							
SHEET TOTALS			60		60	12.800	5.000	18	3.7											1	16			8	1	10						1					1	1					4							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE
SIZE THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42 .109	48 .109		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42			
L1 637+00	58 RT	0712		46.6																																									
		0712	0708		42.3	37.0	0.4		40						x	x																													
L1 639+50	58 RT	0713		43.5																																									
		0713	0710		37.7	31.2		48							x	x																													
L1 638+11	187 RT	0715																																											32
L1 639+08	185 RT	0716																																										32	
L1 642+25	58 LT	0801		41.6																																									
		0801	0802		37.6	35.8																									56														
L1 642+25	0 CL	0802		39.8																																									
		0802	0803		35.5	35.3																		56																					
L1 642+25	58 RT	0803		41.6																																									
		0803	0804		35.3	27.6	2.0		56						x	x																													
L1 650+28	58 LT	0808		40.7																																									
		0808	0809		36.7	34.8	0.4																								56														
L1 650+28	0 CL	0809		38.8																																									
		0809	0810		33.6	33.4																				60																			
L1 650+28	57 RT	0810		40.7																																									
		0810	0807		33.4	27.2	0.7				56				x	x																													
L1 652+66	0 CL	0811		40.4																																									
		0811	0809		37.4	34.6	0.5																	236																					
L1 652+66	57 LT	0812		42.3																																									
		0812	0811		39.5	37.6																									56														
L1 652+66	58 RT	0814		42.8																																									
		0814	0811		40.0	37.6																									60														
L1 657+75	57 LT	0902		51.2																																									
		0902	0901		44.7	25.5	0.3	96							x	x																													
L1 657+75	16 RT	0903		52.3																																									
		0903	0902		46.0	44.9																	72																						
Y38 23+16	1 LT	0904			25.4	24.0																												72											
L1 659+56	57 LT	0906		52.8																																									
		0906	0905		47.8	23.0	0.3	76							x	x																													
L1 659+56	0 CL	0907		51.0																																									
		0907	0906		48.3	48.1																									56														
Y38 23+91	36 LT	0908																																									56		
Y38 24+95	23 RT	0909																																									24		
Y38 17+80	38 RT	0910		28.6																																									
		0910	0911		25.7	25.5	0.4			40						x																													
Y38 18+20	38 RT	0911		30.0																																									
		0911	0912		25.5	25.3	0.5			36						x																													
L1 655+28	116 RT	0913		32.5																																									
		0913	0914		30.6	29.5		92								x																													
L1 656+14	124 RT	0914		31.4																																									
		0914	0915		29.5	29.2	0.5	40								x																													
L1 659+56	57 RT	0916		54.9																																									
		0916	0907		52.1	48.3																									56														
L1 665+50	58 RT	0917		51.2																																									
		0917	0918		48.5	29.0		76							x	x																													
L1 667+00	57 LT	1002		47.5																																									
		1002	1001		42.6	36.0	1.9		48						x	x																													
L1 667+00	0 CL	1003		45.8																																									
							SHEET TOTALS	428	144	76	56												72	292		60					340			72									80	32	32

LINE & STATION	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
			CY	CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															CY	CY	LIN. FT.	
L1 637+00	0712				1													1			1																										
	0712	0708																																							2						
L1 639+50	0713				1	0.8												1			1																										
	0713	0710																																						2							
L1 638+11	0715																																														
L1 639+08	0716																																														
L1 642+25	0801				1												1			1	1																										
	0801	0802																																													
L1 642+25	0802				1												1					1	1																								
	0802	0803																																													
L1 642+25	0803				1	1.2											1			1	1																										
	0803	0804																																							2						
L1 650+28	0808				1												1			1	1																										
	0808	0809																																													
L1 650+28	0809				1	0.3											1					1	1																								
	0809	0810																																													
L1 650+28	0810				1	2.2											1			1	1																										
	0810	0807																																									2				
L1 652+66	0811				1													1					1																								
	0811	0809																																													
L1 652+66	0812				1													1			1																										
	0812	0811																																													
L1 652+66	0814				1													1			1																										
	0814	0811																																													
L1 657+75	0902				1	1.5												1			1																										
	0902	0901																																						2							
L1 657+75	0903				1	1.3												1			1																										
	0903	0902																																													
Y38 23+16	0904																																														
L1 659+56	0906				1													1			1																										
	0906	0905																																						2							
L1 659+56	0907				1													1					1																								
	0907	0906																																													
Y38 23+91	0908																																														
Y38 24+95	0909																																														
Y38 17+80	0910																																														
	0910	0911																																													
Y38 18+20	0911				1											1	1																														
	0911	0912																																													
L1 655+28	0913				1														1					1																							
	0913	0914																																													
L1 656+14	0914				1														1					1																							
	0914	0915																																													
L1 659+56	0916				1													1			1																										
	0916	0907																																													
L1 665+50	0917				1													1			1																										
	0917	0918																																						2							
L1 667+00	1002				1													1			1																										
	1002	1001																																							2						
L1 667+00	1003				1													1					1																								
SHEET TOTALS					22	7.3									1	1	6	13	2	4	14	2	5	2																8	6		2				

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**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	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE		
SIZE									15	18	24	30	36	42	48						42	48	
THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%								DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	.109	.109	
			1003	1002		42.8	42.6																
L1 668+38	0	CL	1005		45.3																		
			1005	1017		40.6	40.4																
L1 670+00	0	CL	1006		45.8																		
			1006	1005		43.1	41.3																
L1 666+85	57	LT	1007		47.7																		
			1007	1002		44.9	44.8																
L1 675+00	0	CL	1008		48.2																		
			1008	1014		45.5	41.7	0.3															
L1 673+28	88	LT	1011		50.0																		
			1011	1013		42.0	40.7				32						X						
L1 672+28	86	LT	1012		48.0																		
			1012	1018		42.0	41.1					28					x						
L1 673+25	58	LT	1013		49.0																		
			1013	1014		40.7	39.4																
L1 673+21	0	CL	1014		47.4																		
			1014	1019		39.4	38.0																
L1 668+38	58	LT	1016		46.9																		
			1016	1005		42.9	41.3																
L1 668+38	58	RT	1017		49.1																		
			1017	1004		40.4	35.0				48					x	x						
L1 672+28	58	LT	1018		48.6																		
			1018	1013		41.1	40.7																
			1019	1015		38.0	36.7																
L1 673+17	58	RT	1019		51.2																		
L1 676+00	58	LT	1020		50.4																		
			1020	1021		47.6	44.4		28							x	x						
L1 676+00	58	RT	1022		52.5																		
			1022	1023		49.8	45.2		32							x	x						
L1 685+00	0	CL	1101		49.4																		
			1101	1102		46.7	45.0																
L1 686+56	0	CL	1102		49.0																		
			1102	1104		43.5	43.3																
L1 686+56	58	RT	1104		52.9																		
			1104	1103		43.3	43.1	0.4		36							x						
L1 689+73	0	CL	1105			42.0	42.0																
L1 694+18	4	LT	1201			41.8	41.2																
L1 695+00	0	CL	1202		46.5																		
			1202	1203		43.8	43.2																
L1 696+73	0	CL	1203		45.6																		
			1203	1207		43.2	43.0																
L1 702+73	5	LT	1205			41.4	40.7																
L1 706+05	0	CL	1206			39.3	38.6																
L1 696+73	58	RT	1207		47.3																		
			1207	1204		43.0	42.6	0.5		32							x						
L1 707+50	0	CL	1301		45.7																		
			1301	1303		43.0	41.7																
L1 709+36	0	CL	1303		44.4																		
			1303	1302		40.9	39.7	0.7															
L1 711+50	0	CL	1306		45.6																		
SHEET TOTALS									60	68	80	28											

LINE & STATION	FROM	TO	R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS
			15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42				CY	CY
	1003	1002										56															
L1 668+38	1005																										
	1005	1017			56																						
L1 670+00	1006																										
	1006	1005	160																								
L1 666+85	1007																										
	1007	1002									12																
L1 675+00	1008																										
	1008	1014	176																								
L1 673+28	1011																										
	1011	1013																									
L1 672+28	1012																										
	1012	1018																									
L1 673+25	1013																										
	1013	1014						56																			
L1 673+21	1014																										
	1014	1019						56																			
L1 668+38	1016																										
	1016	1005									56																
L1 668+38	1017																										
	1017	1004																									
L1 672+28	1018																										
	1018	1013												56													
	1019	1015														48											
L1 673+17	1019																										
L1 676+00	1020																										
	1020	1021																									
L1 676+00	1022																										
	1022	1023																									
L1 685+00	1101																										
	1101	1102	152																								
L1 686+56	1102																										
	1102	1104		60																							
L1 686+56	1104																										
	1104	1103																									
L1 689+73	1105						248																				
L1 694+18	1201														220											3.400	
L1 695+00	1202																										
	1202	1203	172																								
L1 696+73	1203																										
	1203	1207									56																
L1 702+73	1205															236										4.500	
L1 706+05	1206															204										4.500	
L1 696+73	1207																										
	1207	1204																									
L1 707+50	1301																										
	1301	1303	184																								
L1 709+36	1303																										
	1303	1302		88																							
L1 711+50	1306																										
SHEET TOTALS			844	148	56		248	112			124	56		56	220	488										12.400	

LINE & STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29
			EACH	LIN. FT.	LIN. FT.																		
	1003	1002																					
L1 668+38	1005		1												1					1	1		
	1005	1017																					
L1 670+00	1006		1													1					1		
	1006	1005																					
L1 666+85	1007		1													1			1				
	1007	1002																					
L1 675+00	1008		1													1					1		
	1008	1014																					
L1 673+28	1011																						
	1011	1013																					
L1 672+28	1012																						
	1012	1018																					
L1 673+25	1013		1	3.3											1				1				
	1013	1014																					
L1 673+21	1014		1	3.0											1						1		
	1014	1019																					
L1 668+38	1016		1												1			1	1				
	1016	1005																					
L1 668+38	1017		1	3.7											1			1	1				
	1017	1004																					
L1 672+28	1018		1	2.5											1				1				
	1018	1013																					
	1019	1015																					
L1 673+17	1019		1	5.0	3.2										1				1				
L1 676+00	1020		1													1			1				
	1020	1021																					
L1 676+00	1022		1													1			1				
	1022	1023																					
L1 685+00	1101		1													1					1		
	1101	1102																					
L1 686+56	1102		1	0.5											1					1	1		
	1102	1104																					
L1 686+56	1104		1	4.6											1			1	1				
	1104	1103																					
L1 689+73	1105																						
L1 694+18	1201																						
L1 695+00	1202		1													1					1		
	1202	1203																					
L1 696+73	1203		1														1				1		
	1203	1207																					
L1 702+73	1205																						
L1 706+05	1206																						
L1 696+73	1207		1													1			1				
	1207	1204																					
L1 707+50	1301		1													1					1		
	1301	1303																					
L1 709+36	1303		1													1					1		
	1303	1302																					
L1 711+50	1306		1													1					1		
SHEET TOTALS			21	22.6	3.2										9	11	1	3	10	2	11		

LINE & STATION	FROM	TO	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
																					CY	CY	LIN. FT.	
	1003	1002																						
L1 668+38	1005																							
	1005	1017																						
L1 670+00	1006																							
	1006	1005																						
L1 666+85	1007																							
	1007	1002																						
L1 675+00	1008																							
	1008	1014																						
L1 673+28	1011																							
	1011	1013																						
L1 672+28	1012																							
	1012	1018																						
L1 673+25	1013																							
	1013	1014																						
L1 673+21	1014																							
	1014	1019																						
L1 668+38	1016																							
	1016	1005																						
L1 668+38	1017																							
	1017	1004																	2					
L1 672+28	1018																							
	1018	1013																						
	1019	1015																						
L1 673+17	1019																							
L1 676+00	1020																							
	1020	1021															2							
L1 676+00	1022																							
	1022	1023															2							
L1 685+00	1101																							
	1101	1102																						
L1 686+56	1102																							
	1102	1104																						
L1 686+56	1104																							
	1104	1103																						
L1 689+73	1105											1												SEE DETAIL ON PLAN SHEET 2C-17
L1 694+18	1201											1												SEE DETAIL ON PLAN SHEET 2C-17
L1 695+00	1202																							
	1202	1203																						
L1 696+73	1203																							
	1203	1207																						
L1 702+73	1205																							
L1 706+05	1206																							
L1 696+73	1207																							
	1207	1204																						
L1 707+50	1301																							
	1301	1303																						
L1 709+36	1303																							
	1303	1302																						
L1 711+50	1306																							
SHEET TOTALS												2					4		2					

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021
CHECKED BY: JGD DATE: 2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS
SIZE		FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42					
THICKNESS OR GAUGE				FT.	FT.	FT.	%													.109	.109																									CY	CY
		1306	1303		42.6	41.4	0.4																	212																							
Y31RPC 06+15	23 RT	1307		47.1																																											
		1307	1306		44.4	42.9																									72																
L1 722+50	0 CL	1403		50.0																																											
		1403	1404		43.5	43.0																					180																				
L1 724+34	0 CL	1404		49.2																																											
		1404	1468		43.0	42.9																					28																				
L1 724+68	174 LT	1406		47.0																																										6.000	
		1406	1468		41.5	41.0																							176																		
Y31RPC 21+34	18 LT	1408			43.4	43.0																							160																	6.000	
Y31LPC 11+00	14 LT	1409		51.3																																											
		1409	1410		48.1	43.8		48								x																															
		1411	1412		45.7	44.2	0.6	48								x																															
Y31LPC 08+83	14 LT	1411		49.0																																											
L1 726+25	0 CL	1413		50.0																																											
		1413	1414		47.0	45.0																	96																								
L1 738+01	16 LT	1415			48.5	48.5																													224												
L1 728+43	5 RT	1417			44.2	43.6																							212																	6.000	
L1 729+50	0 CL	1419		51.2																																											
		1419	1418		48.2	47.1																	96																								
Y31 31+76	28 RT	1421		79.2																																											
		1421	1420		76.3	47.3		100							x	x																															
		1422	1421		77.1	76.5																									36																
Y31 31+67	7 LT	1422		80.3																																											
Y31 35+85	31 RT	1424		63.5																																											
		1424	1423		60.6	46.3		64							x	x																															
		1425	1426		56.2	55.5																									36																
Y31LPC 13+86	9 RT	1425		59.5																																											
Y31RPC 22+68	23 RT	1426		58.1																																											
		1426	1427		55.3	46.4		40							x	x																															
Y31 37+94	28 RT	1429		54.8																																											
		1429	1428		51.8	45.4		32							x	x																															
Y31 35+50	7 LT	1430		65.9																																											
		1430	1431		62.4	42.8		88							x	x																															
Y31 34+00	7 LT	1432		72.2																																											
		1432	1433		68.7	47.3		100							x	x																															
		1435	1434		49.4	47.2																	92																								
L1 732+50	0 CL	1435		52.4																																											
Y31 28+88	28 RT	1437		80.9																																											
		1437	1436		74.4	47.0		108							x	x																															
		1438	1437		74.7	74.6																	24																								
Y31 28+84	5 RT	1438		81.4																																											
Y31 27+34	5 RT	1439		78.4																																											
		1439	1438		75.1	74.7																									148																
Y31 28+48	1 RT	1440			45.0	44.2																																				288				4.500	
Y31RPB 18+86	25 LT	1441		73.9																																											
		1441	1442		71.0	45.9		92							x	x																															
Y31 25+00	28 RT	1444		69.2																																											
		1444	1443		66.3	48.6		68							x	x																															
Y31 25+50	26 LT	1445		71.2																																											
SHEET TOTALS								788															308	212			208		548		292				224							288				22.500	

LINE & STATION	FROM	TO	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
	1306	1303																																											
Y31RPC 06+15	1307		1													1			1																										
	1307	1306																																											
L1 722+50	1403		1	1.5											1						1																								
	1403	1404																																											
L1 724+34	1404		1	1.2											1					1	1																								
	1404	1468																																											
L1 724+68	1406																																												
	1406	1468																																											
Y31RPC 21+34	1408																																												
Y31LPC 11+00	1409		1			1		1																																					
	1409	1410																																											
	1411	1412																																											
Y31LPC 08+83	1411		1			1	1																																						
L1 726+25	1413		1													1					1																								
	1413	1414																																											
L1 738+01	1415																																1												SEE DETAIL ON PLAN SHEET 2C-17
L1 728+43	1417																																												
L1 729+50	1419		1													1					1																								
	1419	1418																																											
Y31 31+76	1421		1													1			1																										
	1421	1420																																			2							
	1422	1421																																											
Y31 31+67	1422		1							1			1	1																															
Y31 35+85	1424		1													1			1																										
	1424	1423																																			2							
	1425	1426																																											
Y31LPC 13+86	1425		1							1			1	1																															
Y31RPC 22+68	1426		1													1			1																										
	1426	1427																																			2							
Y31 37+94	1429		1													1			1																										
	1429	1428																																			2							
Y31 35+50	1430		1							1			1	1																															
	1430	1431																																			2							
Y31 34+00	1432		1							1			1	1																															
	1432	1433																																			2							
	1435	1434																																											
L1 732+50	1435		1													1					1																								
Y31 28+88	1437		1	1.6												1			1																										
	1437	1436																																			2							
	1438	1437																																											
Y31 28+84	1438		1	1.8						1			1	1																															
Y31 27+34	1439		1							1			1	1																															
	1439	1438																																											
Y31 28+48	1440																																												
Y31RPB 18+86	1441		1													1			1																										
	1441	1442																																			2							
Y31 25+00	1444		1													1			1																										
	1444	1443																																			2							
Y31 25+50	1445		1													1			1																										
SHEET TOTALS			22	6.1		2	1	1		6			6	6	2	12			9	1	5												1					18							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021

CHECKED BY: JGD DATE: 2/4/2020

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300B	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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V				
SIZE		FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42
THICKNESS OR GAUGE				FT.	FT.	FT.	%													.109	.109																					
		1445	1446		68.2	47.0		80							x	x																										
Y31RPA 15+45	26 RT	1448		73.6																																						
		1448	1447		70.6	46.9		88							x	x																										
Y31RPA 13+25	3 RT	1449			45.8	45.3																					152															
SR7 16+00	1 RT	1450			49.0	46.1																			104																	
SR7 11+28	14 RT	1451		61.6																																						
		1451	1452		58.9	48.0		64							x	x																										
SR7 19+18	2 RT	1453			49.2	49.2																					80															
SR7 20+86	2 RT	1454			50.5	50.5																					72															
		1455	1457		50.5	48.2																	92																			
L1 735+00	0 CL	1455		53.5																																						
		1458	1460		52.8	48.4																	100																			
L1 739+50	0 CL	1458		55.8																																						
Y31 46+42	40 LT	1463																																24								
Y31 44+90	43 LT	1464																																								
Y31 42+40	44 LT	1465																																								
Y31 40+96	5 RT	1467		46.9																																						
		1467	1466		43.6	43.5																									36											
L1 724+64	0 CL	1468		49.3																																						
		1468	1405		41.0	40.6																							104													
L1 722+25	121 LT	1469		48.5																																						
		1469	1403		44.4	44.0																					124															
SR7 12+72	43 LT	1470																																								
Y31 42+81	40 RT	1471																																								
Y31 40+48	44 RT	1472																																								
SR7 30+91	1 RT	1501			50.6	50.2																				80																
L1 749+00	0 CL	1502		57.2																																						
		1502	1503		54.5	53.7																	160																			
L1 750+63	0 CL	1503		56.5																																						
		1503	1504		53.7	53.0																	232																			
L1 753+00	0 CL	1504		57.2																																						
		1504	1505		53.0	52.7																	88																			
L1 755+73	2 LT	1506			50.5	49.8																							196													
SR7 35+83	1 LT	1507			49.6	49.3																															68					
SR7 40+96	0 CL	1602			51.6	51.3																		60																		
SR7 46+01	1 RT	1603			51.0	51.0																													52							
SR7 47+00	1 RT	1604			51.1	51.1																													48							
SR7 47+85	0 CL	1605			50.7	50.5																														56						
L1 772+00	0 CL	1607			53.4	52.4																					180															
SR7 50+50	1 RT	1608			51.8	51.8																													48							
SR7 49+50	1 RT	1609			51.8	51.8																													48							
L1 765+00	0 CL	1610		57.4																																						
		1610	1611		54.7	52.7																	216																			
L1 767+19	0 CL	1611		56.8																																						
		1611	1612		52.5	51.9																		192																		
L1 769+15	0 CL	1612		57.6																																						
		1612	1606		51.3	50.9																						100														
L1 771+75	0 CL	1613		59.0																																						
		1613	1612		56.2	53.6																	256																			
L1 769+58	89 RT	1614		55.7																																						
SHEET TOTALS								232															1144	252	104	80	608	100	300		36			24	196	56	68					

LINE & STATION	OFFSET	STRUCTURE NUMBER		15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
		FROM	TO				CY	CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															CY	CY	LIN. FT.	
		1445	1446																																									2							
Y31RPA 15+45	26 RT	1448							1													1			1																										
		1448	1447																																									2							
Y31RPA 13+25	3 RT	1449					3.400																																												
SR7 16+00	1 RT	1450																																																	
SR7 11+28	14 RT	1451							1																1								1																		
		1451	1452																																									2							
SR7 19+18	2 RT	1453																																																	
SR7 20+86	2 RT	1454																																																	
		1455	1457																																																
L1 735+00	0 CL	1455							1													1					1																								
		1458	1460																																																
L1 739+50	0 CL	1458							1													1					1																								
Y31 46+42	40 LT	1463																																																	
Y31 44+90	43 LT	1464				20																																													
Y31 42+40	44 LT	1465				24																																													
Y31 40+96	5 RT	1467							1							1			1	1																															
		1467	1466																																																
L1 724+64	0 CL	1468							1	3.3											1						1																								
		1468	1405																																																
L1 722+25	121 LT	1469					3.400																																												
		1469	1403																																																
SR7 12+72	43 LT	1470		52																																															
Y31 42+81	40 RT	1471		28																																															
Y31 40+48	44 RT	1472		24																																															
SR7 30+91	1 RT	1501																																																	
L1 749+00	0 CL	1502							1													1					1																								
		1502	1503																																																
L1 750+63	0 CL	1503							1												1					1	1																								
		1503	1504																																																
L1 753+00	0 CL	1504							1													1					1																								
		1504	1505																																																
L1 755+73	2 LT	1506					6.000																																		1										SEE DETAIL ON PLAN SHEET 2C-17
SR7 35+83	1 LT	1507					6.000																																												
SR7 40+96	0 CL	1602																																																	
SR7 46+01	1 RT	1603																																																	
SR7 47+00	1 RT	1604																																																	
SR7 47+85	0 CL	1605					4.500																																												
L1 772+00	0 CL	1607																																					2												SEE DETAIL ON PLAN SHEET 2C-17
SR7 50+50	1 RT	1608																																																	
SR7 49+50	1 RT	1609																																																	
L1 765+00	0 CL	1610							1													1					1																								
		1610	1611																																																
L1 767+19	0 CL	1611							1												1					1	1																								
		1611	1612																																																
L1 769+15	0 CL	1612							1	1.3											1						1																								
		1612	1606																																																
L1 771+75	0 CL	1613							1													1					1																								
		1613	1612																																																
L1 769+58	89 RT	1614					4.500																																												
SHEET TOTALS				104		44	27.800		13	4.6						1			1	1	4	7			2	2	10						1						2		1			6							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300B	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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42 .109	48 .109		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42				CY	CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															CY	CY	LIN. FT.	
		1614	1612		51.7	51.3																						100																																																														
L1 776+00	3 RT	1701			53.6	53.6																					188																																																						2												SEE DETAIL ON PLAN SHEET 2C-17
SR7 53+60	0 CL	1702			52.2	52.2																														48																																																									
SR7 54+50	0 CL	1703			52.3	52.3																														56																																																									
L1 778+73	89 LT	1704		52.1																																																																												1													SEE DETAIL ON PLAN SHEET 2C-17
		1704	1707		48.6	48.3																				96																																																															
L1 782+00	0 CL	1705			53.8	53.8																														180																																											2												SEE DETAIL ON PLAN SHEET 2C-17
L1 779+00	0 CL	1707		61.1																																												1	5.0	2.8										1						1																									
		1707	1706		48.3	48.0																				100																																																			1													SEE DETAIL ON PLAN SHEET 2C-17
L1 781+50	0 CL	1708		60.1																																												1													1					1																								
		1708	1707		57.4	56.6																			248																																																																			
L1 784+00	0 CL	1709			53.9	53.9																														180																																											2												SEE DETAIL ON PLAN SHEET 2C-17
L1 784+31	0 CL	1710		59.2																																												1													1					1																								
		1710	1801		56.4	55.6																			268																																																																			
L1 787+00	0 CL	1801		60.3																																												1													1					1																								
		1801	1802		55.6	53.0	0.4																										100																																																												
L1 795+00	0 CL	1803		61.7																																												1													1					1																								
		1803	1806		56.7	56.4																												92																																																										
L1 796+28	0 CL	1804		61.4																																												1												1					1	1																								
		1804	1803		57.1	56.7	0.3																	124																																																																				
L1 797+50	0 CL	1805		61.8																																												1													1					1																								
		1805	1804		59.0	57.4	0.5																120																																																																					
L1 790+77	2 RT	1807			54.7	54.7																					240																																																								2												SEE DETAIL ON PLAN SHEET 2C-17
L1 798+00	4 RT	1808			53.8	53.8																						188																																																								2											SEE DETAIL ON PLAN SHEET 2C-17
L1 786+80	131 RT	1809			52.2	52.0																													32																																																										
		1901	1903		57.6	55.0																		96																																																																				
L1 806+00	0 CL	1901		64.7																																												1	2.2												1					1																								
L1 807+50	0 CL	1902		64.0																																												1												1					1	1																								
		1902	1901		60.0	57.8																	148																																																																					
L1 800+32	4 RT	1908			53.7	53.7																					216																																																																			
L1 802+50	1 RT	1909			53.0	53.0																					216																																																																			
L1 809+72	0 CL	1913		65.1																																												1													1					1																								
		1913	1914		60.6	56.4																	96																																																																					
L1 806+79	58 LT	1915		66.3																																												1													1			1																										
		1915	1916		63.6	63.3																									76																																																													
L1 806+00	58 LT	1916		66.6																																												1													1			1																										
		1916	1901		63.3	57.8																									56																																																													
L1 804+96	58 RT	1917		67.1																																												1													1			1																										
		1917	1918		64.3	62.4																									56																																																													
L1 804+96	0 CL	1918		65.2																																												1													1					1																								
		1918	1901		62.4	57.8																	104																																																																					
L1 800+00	0 CL	1919		64.4																																												1													1					1																								
		1919	1805		61.7	59.0																	248																																																																					
L1 800+00	58 LT	1920		66.1																																												1													1			1																										
		1920	1919		63.3	61.7																									56																																																														
L1_N 820+00	0 CL	2003		63.9																																												1													1					1																								
		2003	2004		61.2	58.8																	128																																																																					
		2004	2007		58.8	58.5																	96																																																																					
L1_N 821+30	0 CL	2004		63.4																																												1												1					1	1																								
		2005	2006		59.9	59.6																	92																																																																					
SHEET TOTALS																							1548	220		196	860	288			244	100	92	32	464													18	7.2	2.8											4	14			4	3	14											2	8	2											

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	**DATE:**	10/29/2021
CHECKED BY:	JGD	**DATE:**	2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE		
SIZE			FROM	TO	FT.	FT.	FT.	%	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48	
THICKNESS OR GAUGE																					.109	.109	
L1_N 824+00	0	CL	2005		64.8																		
L1 812+61	1	RT	2008			57.4	57.4																
L1 819+58	0	CL	2009			57.8	57.8																
L1_N 823+23	3	RT	2010			57.5	57.5																
L1 816+00	0	CL	2011			57.7	57.7																
L1_N 829+00	0	CL	2101		67.7																		
			2101	2112		65.0	63.0																
L1_N 831+00	0	CL	2102		68.8																		
			2102	2111		65.8	65.6	0.3															
L1_N 827+50	2	LT	2105			58.4	58.4																
L1_N 834+75	70	RT	2106		70.6																		
			2106	2113		67.9	60.3		36							x	x						
L1_N 834+04	1	LT	2107			59.8	59.0																
L1_N 826+04	58	RT	2108		68.0																		
			2108	2109		65.3	59.9		28							x	x						
L1_N 832+50	0	RT	2110		69.7																		
			2110	2102		67.0	66.1																
L1_N 831+00	62	RT	2111		69.0																		
			2111	2103		65.6	61.0	0.7		28						x	x						
L1_N 829+00	58	RT	2112		69.2																		
			2112	2104		63.0	59.2		36							x	x						
L1_N 843+00	0	CL	2201		65.4																		
			2201	2202		52.9	52.0																
L1_N 846+00	0	CL	2202		56.6																		
			2202	2203		52.0	45.3																
L1_N 846+00	96	RT	2203		50.0																		
			2203	2307		45.3	41.3	0.4															
L1_N 843+00	114	LT	2204		56.1																		
			2204	2201		53.2	52.9																
Y32RPB1 12+10	23	RT	2205		60.7																		
			2205	2208		55.7	48.2		40							x	x						
Y32RPB1 09+17	23	RT	2206		63.9																		
			2206	2207		58.9	54.8	0.6	32							x	x						
L1_N 850+39	0	CL	2301		48.8																		
			2301	2306		44.8	39.0	0.5															
L1_N 849+00	0	CL	2302		49.6																		
			2302	2301		46.9	44.8																
L1_N 849+00	105	RT	2303		42.5																		
			2303	2306		38.1	37.4																
Y32 21+65	0	CL	2305			42.0	35.5																
L1_NORTHERN 850+3	102	RT	2306		43.1																		
			2306	2308		37.4	36.3																
L1_N 847+50	105	RT	2307		44.8																		
			2307	2303		41.3	39.1	0.6															
L1_N 854+25	0	CL	2309		50.0																		
			2309	2310		47.2	47.0																
L1_N 855+00	0	CL	2310		50.2																		
			2310	2316		47.0	42.8	0.5															
Y32 23+90	47	RT	2312		76.3																		
			2312	2334		67.9	42.7	0.5	108							x	x						
								SHEET TOTALS	280	28													

LINE & STATION	FROM	TO	R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE		
			15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42				CY	CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		E	F	G
L1_N 824+00	2005																											1						
L1 812+61	2008						188																											
L1 819+58	2009						200																											
L1_N 823+23	2010						216																											
L1 816+00	2011						184																											
L1_N 829+00	2101																											1						
	2101	2112	56																															
L1_N 831+00	2102																											1						
	2102	2111										64																						
L1_N 827+50	2105						188																											
L1_N 834+75	2106																											1						
	2106	2113																																
L1_N 834+04	2107						244																											
L1_N 826+04	2108																											1						
	2108	2109																																
L1_N 832+50	2110																											1						
	2110	2102	148																															
L1_N 831+00	2111																											1						
	2111	2103																																
L1_N 829+00	2112																											1	1.2					
	2112	2104																																
L1_N 843+00	2201																											1	5.0	2.6				
	2201	2202			296																													
L1_N 846+00	2202																											1						
	2202	2203			96																													
L1_N 846+00	2203																											1						
	2203	2307			144																													
L1_N 843+00	2204																																	
	2204	2201			116																													
Y32RPB1 12+10	2205																											1						
	2205	2208																																
Y32RPB1 09+17	2206																											1						
	2206	2207																																
L1_N 850+39	2301																											1						
	2301	2306	100																															
L1_N 849+00	2302																											1						
	2302	2301	136																															
L1_N 849+00	2303																											1						
	2303	2306					144																											
Y32 21+65	2305																				320					3.400								
L1_NORTHERN 850+3	2306																											1	0.7					
	2306	2308													216																			
L1_N 847+50	2307																											1						
	2307	2303			148																													
L1_N 854+25	2309																											1						
	2309	2310	76																															
L1_N 855+00	2310																											1						
	2310	2316	108																															
Y32 23+90	2312																											1	3.4					
	2312	2334																																
SHEET TOTALS			624		800		1364					64			216						320					3.400		21	10.3	2.6				

LINE & STATION	FROM	TO	CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
			D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															CY	CY	LIN. FT.	
L1_N 824+00	2005								1					1																								
L1 812+61	2008																									2												SEE DETAIL ON PLAN SHEET 2C-17
L1 819+58	2009																									2												SEE DETAIL ON PLAN SHEET 2C-17
L1_N 823+23	2010																									2												SEE DETAIL ON PLAN SHEET 2C-17
L1 816+00	2011																									2												SEE DETAIL ON PLAN SHEET 2C-17
L1_N 829+00	2101								1					1																								
	2101	2112																																				
L1_N 831+00	2102								1					1																								
	2102	2111																																				
L1_N 827+50	2105																																					
L1_N 834+75	2106								1			1																										
	2106	2113																													2							
L1_N 834+04	2107																																					
L1_N 826+04	2108								1			1																										
	2108	2109																													2							
L1_N 832+50	2110								1					1																								
	2110	2102																																				
L1_N 831+00	2111								1			1																										
	2111	2103																														2						
L1_N 829+00	2112								1			1																										
	2112	2104																													2							
L1_N 843+00	2201							1						1																								
	2201	2202																																				
L1_N 846+00	2202							1						1																								
	2202	2203																																				
L1_N 846+00	2203							1						1																								
	2203	2307																																				
L1_N 843+00	2204																																					
	2204	2201																																				
Y32RPB1 12+10	2205								1			1																										
	2205	2208																													2							
Y32RPB1 09+17	2206								1			1																										
	2206	2207																													2							
L1_N 850+39	2301							1					1	1																								
	2301	2306																																				
L1_N 849+00	2302								1					1																								
	2302	2301																																				
L1_N 849+00	2303							1						1																								
	2303	2306																																				
Y32 21+65	2305																																					
L1_NORTHERN 850+3	2306							1						1																								
	2306	2308																																				
L1_N 847+50	2307							1						1																								
	2307	2303																																				
L1_N 854+25	2309								1					1																								
	2309	2310																																				
L1_N 855+00	2310								1					1																								
	2310	2316																																				
Y32 23+90	2312								1			1																										
	2312	2334																													2							
SHEET TOTALS								7	14			7	1	14												8						12	2					

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021

CHECKED BY: JGD DATE: 2/4/2020

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**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)

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE								15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42							A	B		GRATE TYPE			D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																		
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%													.109	.109																									CY	CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		E	F	G																																	CY	CY	LIN. FT.	
Y32 23+90	14 RT	2313		78.2																																												1							1			1	1																															
		2313	2312		74.9	73.5																									32																																																											
Y32 23+00	14 RT	2314		74.9																																												1							1			1	1																															
		2314	2335		71.6	70.9																									32																																																											
Y32 22+23	14 RT	2315		72.1																																												1							1			1	1																															
		2315	2325		68.9	68.7																									32																																																											
Y40 235+29	29 LT	2318		44.4																																												1							1			1	1																															
		2318	3313		41.1	40.5																									72																																																											
Y40 237+50	41 LT	2319		50.3																																												1							1			1	1																															
		2319	2329		46.5	44.2																									52																																																												
		2320	2389		45.4	43.3	1.0	28								x																																																																											
Y32LPA2 08+60	14 LT	2320		49.2																																												1			1	1																																												
Y32LPA2 11+33	14 LT	2321		52.9																																												1			1		1																																										
		2321	2390		48.3	43.3		56								x																																																																													
Y32 33+20	14 RT	2322		67.5																																												1							1			1	1																															
		2322	2324		64.2	62.5																									172																																																											
Y32 31+45	45 RT	2323		72.6																																												1	5.0	0.3												1			1																											
		2323	2339		62.3	43.8	1.9	92							x	x																																																																					2							
Y32 31+45	14 RT	2324		74.5																																												1	5.0	2.0					1			1	1																															
		2324	2323		62.5	62.3																									32																																																												
Y32 22+23	45 RT	2325		71.5																																												1													1			1																											
		2325	2335		68.7	68.3																									72																																																												
L1_N 864+00	0 CL	2326		51.0																																												1													1					1																								
		2326	2357		48.0	45.8																		248																																																																			
L1_N 872+10	0 CL	2327		44.6																																												1													1					1																								
		2327	2328		41.8	40.2																	172																																																																				
L1_N 873+84	0 CL	2328		44.2																																												1												1					1	1																								
		2328	2341		40.2	40.0																									60																																																												
Y32 16+30	33 LT	2329		46.9																																												1													1			1																											
		2329	2332		43.4	36.5	4.8	40							x	x																																																																				2							
Y32 17+00	33 LT	2330		49.5																																												1													1			1																											
		2330	2329		46.8	44.2	0.4																								64																																																												
		2333	2311		40.0	38.0															340																																																																							
Y32 29+23	168 RT	2333		45.0																																												1									1													1																				Dry Detention Drawdown Str., See Sht. 2D-5
Y32 23+00	46 RT	2335		73.6																																												1	0.3												1			1																											
		2335	2312		68.3	67.9																									84																																																												
L1_N 873+84	61 RT	2341		44.8																																												1												1			1	1																										
		2341	2452		39.8	36.5																										104																																																										
L1_N 872+50	61 RT	2342		45.4																																												1													1			1																											
		2342	2341		42.6	40.8																									132																																																											
		2343	2348		44.5	44.0																									32																																																												
Y19 47+44	16 LT	2343		47.2																																												1																				1				1																		
Y19 45+00	14 RT	2344		49.3																																												1	5.0	0.5	1		1																																								
		2344	2355		38.8	38.7																														32																																																														
L1_N 869+50	0 CL	2345		47.0																																												1	2.9											1						1																								
		2345	2352		39.1	39.0																							60																																																																
Y19 47+44	20 RT	2348		47.0																																												1			1		1																																										
		2348	2349		44.0	42.3																	44																																																																					
Y44 10+58	14 LT	2349		45.5																																												1			1			1																																								
		2349	2350		42.3	42.2																									28																																																												
SHEET TOTALS								216													340		216	248				60			896	104				32												25	18.2	2.8	5	1	3	1	7		1	7	7	3	8		1	7	1	4		1		1		1											4							

RHOWARD-NEW

COMPUTED BY: RCH **DATE:** 10/29/2021

CHECKED BY: JGD **DATE:** 2/4/2020

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300B	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 48 INCHES & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
Y44 10+59	18 RT	2350		45.3			
		2350	2351		42.2	42.0	
Y19 46+38	26 RT	2351		47.8			
		2351	2344		42.0	41.5	
L1_N 869+56	61 RT	2352		48.3			
		2352	2354		39.0	38.9	
		2354	2344		38.9	38.8	
Y19 45+00	16 LT	2354		49.5			
L1_N 868+92	116 LT	2356		43.5			
		2356	2345		39.5	39.1	
L1_N 866+50	0 CL	2357		50.3			
		2357	2361		45.8	42.0	0.4
Y32RPB1 17+15.5	23 RT	2358		65.5			
		2358	2369		62.7	36.2	
		2359	2371		36.3	35.8	
Y19 27+70	14 RT	2359		41.1			
Y19 31+22	14 RT	2360		43.0			
		2360	2363		40.0	38.2	
Y19 28+00	37 LT	2362		39.9			
		2362	2359		36.9	36.3	
Y43 10+65	18 RT	2364		43.3			
		2364	2365		41.1	40.7	
Y43 10+70	26 LT	2365		43.0			
		2365	2394		40.7	39.1	0.5
Y19 38+27	20 RT	2366		47.2			
		2366	2393		44.2	43.0	
		2367	2366		44.8	44.2	
Y19 38+27	22 LT	2367		47.5			
		2368	2367		45.9	44.8	
Y19 39+67	18 LT	2368		48.7			
		2371	2372		35.8	34.7	
Y19 27+20	14 RT	2371		41.1			
Y19 26+00	14 RT	2372		41.6			
		2372	2374		34.7	34.1	
Y19 26+00	29 LT	2373		40.2			
		2373	2372		37.5	37.2	
Y19 25+36	14 RT	2374		41.9			
		2374	2375		34.1	33.5	
Y32 39+62	7 RT	2376			42.4	42.0	
Y32 19+00	35 LT	2377		57.5			
		2377	2378		52.5	34.4	1.0
Y32 41+05	23 LT	2379		47.7			
		2379	2380		43.7	41.7	0.4
Y19 24+25	18 LT	2381		42.7			
		2381	2382		33.9	33.8	
Y19 24+25	14 RT	2382		42.6			
		2382	2383		33.8	33.3	
Y19 24+25	44 LT	2384		38.1			
		2384	2381		34.0	33.9	
Y19 37+00	16 RT	2393		46.0			

STRUCTURE NUMBER FROM	TO	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)							DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE		R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE
		15	18	24	30	36	42	48						42 .109	48 .109	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42			
2350																																						
2350	2351															60																						
2351																																						
2351	2344															136																						
2352																																						
2352	2354																				4																	
2354	2344																				28																	
2354																																						
2356																																						
2356	2345																				128																	
2357																																						
2357	2361																108																					
2358																																						
2358	2369	96							x	x																												
2359	2371																										48											
2359																																						
2360																																						
2360	2363																							52														
2362																																						
2362	2359																										60											
2364																																						
2364	2365																							44														
2365																																						
2365	2394																							128														
2366																																						
2366	2393															124																						
2367	2366																							40														
2367																																						
2368	2367																							136														
2368																																						
2371	2372																										116											
2371																																						
2372																																						
2372	2374																										60											
2373																																						
2373	2372																							40														
2374																																						
2374	2375				32					x																												
2376																		116																				
2377																																						
2377	2378	72							x	x																												
2379																																						
2379	2380	28								x																												
2381																																						
2381	2382																		28																			
2382																																						
2382	2383																		60																			
2384																																						
2384	2381																		28																			
2393																																						
SHEET TOTALS		196			32											320	108	116		116	160			440			284											

STRUCTURE NUMBER FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS 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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
2350				1			1		1																																					
2350	2351																																													
2351				1	0.8		1		1																																					
2351	2344																																													
2352				1	4.3											1				1																										
2352	2354																																													
2354	2344																																													
2354				1	5.0	0.6																		1				1																		
2356				1									1														1																			Wet Detention Outlet Control Str., See Sht. 2D-4
2356	2345																																													
2357				1													1					1																								
2357	2361																																													
2358				1												1				1																										
2358	2369																																					2								
2359	2371																																													
2359				1			1	1																																						
2360				1			1			1																																				
2360	2363																																													
2362																																														
2362	2359																																													
2364				1			1		1																																					Min Depth CB, See Sht. 2C-6
2364	2365																																													
2365				1			1			1																																				Min Depth CB, See Sht. 2C-6
2365	2394																																													
2366				1			1			1																																				
2366	2393																																													
2367	2366																																													
2367				1													1							1																						
2368	2367																																													
2368				1													1							1																						
2371	2372																																													
2371				1	0.3		1	1																																						
2372				1	1.9		1		1																																					
2372	2374																																													
2373				1													1					1																								
2373	2372																																													
2374				1	2.9		1		1																																					
2374	2375																																													
2376																																														
2377				1													1			1																										
2377	2378																																					2								
2379				1													1			1																										
2379	2380																																													
2381				1	3.8															1								1																		
2381	2382																																													
2382				1	3.7		1		1																																					
2382	2383																																													
2384		3.400																																												
2384	2381																																													
2393				1			1			1																																				
SHEET TOTALS		3.400		23	22.7	0.6	12	2	6	4			1			2	6			5		2		3			1	2												4						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021

CHECKED BY: JGD DATE: 2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-12

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 42 .109	48 .109		R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	18	30	36	42	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS 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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
		2393	2365		43.0	40.7																	68																																																																			
Y43 12+00	23 LT	2394		41.4																																											1			1			1																																					Min Depth CB, See Sht. 2C-6
		2394	2370		39.1	38.7	0.6																								52																																																								
Y32 41+81	6 RT	2396			41.5	40.5					132					x	x		x																																																																				132	Temporary Pipe
Y32 14+99	65 LT	2398																																		44																																																							
L 265+98	95 RT	2410		44.3																																											1			1	1																																						
		2410	2414		41.3	40.9																									80																																																									
L 265+98	60 RT	2411		45.5																																											1													1			1																												
		2411	2410		42.8	41.3																									32																																																									
L 265+50	59 LT	2413		45.3																																											1			1		1																																					
		2413	2415		41.8	39.8	0.6																								100																																																									
L 265+15	95 RT	2414		44.6																																											1			1			1																																				
		2414	2430		40.9	40.5	0.3																								28																																																									
L 264+50	59 LT	2415		45.0																																											1	0.5		1		1																																					
		2415	2406		39.5	38.0	0.3																	40																																																																	
Y19 53+42	13 RT	2418		45.3																																											1	2.3		1			1																																				
		2418	2427		38.0	37.0																	48																																																																		
L 272+81	59 LT	2423		49.5																																											1			1			1																																				
		2423	2420		46.5	46.4																									40																																																										
L 272+80	13 LT	2424		50.7																																																		1																		1	1																TBDI in Conc Island, See Sht. 2C-16
		2424	2423		46.9	46.5																									48																																																									
L 268+50	82 RT	2425		43.8																																											1													1					1																										
		2425	2426		40.5	39.8	1.2																44																																																																		
L 268+31	121 RT	2426		49.4																																											1	4.7		1			1																																				
		2426	2429		39.7	38.0	1.4																92																																																																			
L 267+50	59 LT	2428		46.2																																											1			1		1																																					
		2428	2413		43.2	41.9																									200																																																									
L 267+43	96 RT	2429		45.3																																											1	2.3		1			1																																				
		2429	2418		38.0	38.0	0.3																8																																																																			
L 275+61	56 RT	2431		46.5																																											1			1		1																																					
		2431	2506		43.0	41.7	0.5																								76																																																										
L 274+00	56 RT	2432		48.1																																											1			1		1																																					MIN DEPTH CB, SEE SHT. 2C-6
		2432	2433		45.8	45.7																									28																																																								
L 276+53	59 LT	2501		45.4																																											1			1			1																																				
		2501	2502		41.7	39.7	0.4																								168																																																										
L 278+23	59 LT	2502		43.5																																											1			1			1																																				
		2502	2505		39.4	38.8																										112																																																						
L 278+24	56 RT	2505		43.5																																											1			1		1																																					
		2505	2528		38.8	37.7	1.5																	108																																																																	
L 276+37	56 RT	2506		45.4																																											1			1		1																																					
		2506	2533		41.7	40.3																									148																																																										
L 280+21	59 LT	2507		42.0																																											1			1	1																																						
		2507	2508		38.2	37.1																										16																																																						
L 280+39	59 LT	2508		42.0																																											1	0.4		1		1																																					
		2508	2510		36.6	36.2	0.4																													112																																																					
L 281+89	59 LT	2509		42.9																																											1			1		1																																					
		2509	2534		38.9	38.2	0.7																									52																																																						
L 280+39	56 RT	2510		42.1																																											1	1.1		1			1																																				
		2510	2512		36.2	36.1	0.7																				28																																																													
SHEET TOTALS											132												260	148			28				1000	180			156														22	11.3		20	2	9	9	1						2			1		1							1	1															132	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-13

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V				
SIZE								15	18	24	30	36	42	48						42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%								DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	.109	.109																					
L 280+23	56 RT	2511		42.0																																						
		2511	2510		36.3	36.2	0.4																		16																	
L 280+39	76 LT	2513		39.0																																						
		2513	2508		39.0	36.6																					32															
L 281+89	81 LT	2514		40.0																																						
		2514	2509		40.0	38.9	0.5																	24																		
L 284+74	82 LT	2517		38.5																																						
		2517	2518		38.5	38.0																													24							
L 284+75	59 LT	2518		42.8																																						
		2518	2519		38.0	36.3																													44							
L 284+76	12 LT	2519		44.1																																						
		2519	2522		36.3	36.0																					80															
L 286+63	14 LT	2520		43.5																																						
		2520	2519		36.9	36.3	0.3																	184																		
L 286+53	68 RT	2521		42.1																																						
		2521	2527		38.7	38.5																	28																			
L 284+77	68 RT	2522		43.0																																						
		2522	2526		36.0	35.5																					28															
L 279+33	56 RT	2528		42.5																																						
		2528	2511		37.2	36.3	0.4																		88																	
L 279+32	59 LT	2529		42.5																																						
		2529	2507		38.5	38.2																										88										
L 288+50	14 LT	2530		43.3																																						
		2530	2520		39.9	37.2																									188											
L 287+07	113 LT	2531		40.8																																						
		2531	2520		37.4	37.2	0.7																								108											
L 287+31	68 RT	2532		41.9																																						
		2532	2521		38.9	38.7																									76											
L 277+86	56 RT	2533		44.0																																						
		2533	2505		40.0	38.8	0.4																									36										
L 281+35	59 LT	2534		42.7																																						
		2534	2508		38.2	37.1	0.8																									96										
L 288+50	47 LT	2535		42.3																											80											
		2535	2600		39.3	39.0																																				
L 289+33	47 LT	2600		42.5																																						
		2600	2605		39.0	38.8																									152											
L 289+32	56 RT	2603		42.5																																						
		2603	2606		39.5	39.1																									152											
L 290+84	45 LT	2605		42.9																																						
		2605	2611		38.5	37.8																										224										
L 290+84	56 RT	2606		42.9																																						
		2606	2607		39.1	38.6																									108											
L 291+92	56 RT	2607		43.5																																						
		2607	2609		38.6	38.4																	116																			
L 293+08	56 RT	2609		45.0																																						
		2609	2615		37.1	36.9	0.8																			32																
L 293+08	47 LT	2611		43.3																																						
		2611	2609		37.8	37.1	0.7																											100								
L 293+93	47 LT	2612		43.1																																						
		2612	2611		39.1	38.8																										84										
SHEET TOTALS																							144	208	104	32	140				864	528		100	68							

LINE & STATION	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS 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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 280+23	2511							1	0.7		1	1																																						
	2511	2510																																																
L 280+39	2513					4.500																																												
	2513	2508																																																
L 281+89	2514																																																	
	2514	2509																																																
L 284+74	2517					4.500																																												
	2517	2518																																																
L 284+75	2518							1			1			1																																				
	2518	2519																																																
L 284+76	2519														1																			1	1																TBDI in Conc Island, See Sht. 2C-16
	2519	2522																																																
L 286+63	2520														1																			1	1																TBDI in Conc Island, See Sht. 2C-16
	2520	2519																																																
L 286+53	2521							1			1		1																																					
	2521	2527																																																
L 284+77	2522							1	2.0		1		1																																					
	2522	2526																																																
L 279+33	2528							1	0.3		1		1																																					
	2528	2511																																																
L 279+32	2529							1			1			1																																				
	2529	2507																																																
L 288+50	2530														1																			1	1																TBDI in Conc Island, See Sht. 2C-16
	2530	2520																																																
L 287+07	2531							1			1	1																																						
	2531	2520																																																
L 287+31	2532							1			1		1																																					
	2532	2521																																																
L 277+86	2533							1			1		1																																					
	2533	2505																																																
L 281+35	2534							1			1		1																																					
	2534	2508																																																
L 288+50	2535							1			1		1																																					
	2535	2600																																																
L 289+33	2600							1			1		1																																					
	2600	2605																																																
L 289+32	2603							1			1			1																																				
	2603	2606																																																
L 290+84	2605							1			1		1																																					
	2605	2611																																																
L 290+84	2606							1			1			1																																				
	2606	2607																																																
L 291+92	2607							1			1			1																																				
	2607	2609																																																
L 293+08	2609							1	2.9		1		1																																					
	2609	2615																																																
L 293+08	2611							1	0.5		1			1																																				
	2611	2609																																																
L 293+93	2612							1			1			1																																				
	2612	2611																																																
SHEET TOTALS						9.000		19	6.4		19	2	10	7	3																			3	3															

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-14

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)											C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42						0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																		
THICKNESS OR GAUGE				FT.	FT.	FT.	%													.109	.109																									CY	CY	EACH	LIN. FT.	LIN. FT.																																						CY	CY	LIN. FT.	
L 293+93	70 LT	2613		39.5																																																																																						
		2613	2612		39.5	39.1																		24																																																														
L 293+10	72 LT	2614		38.5																																																																																				
		2614	2611		38.5	37.8	0.4																			28																																																														
L 297+93	47 LT	2616		41.9																																												1			1	1																																								
		2616	2627		36.8	38.4	0.4																									28																																																									
L 297+50	47 LT	2617		42.2																																												1			1			1																																						
		2617	2616		38.7	38.6																										40																																																							
L 299+35	47 LT	2618		42.4																																												1			1		1																																							
		2618	2619		38.0	37.8																											72																																																					
L 300+08	47 LT	2619		42.8																																												1	0.1		1		1																																							
		2619	2620		37.8	37.5																													84																																																		
L 300+95	47 LT	2620		43.2																																												1	0.7		1		1																																							
		2620	2624		37.5	37.4																														44																																																	
L 303+01	44 RT	2621		44.5																																												1			1			1																																						
		2621	2623		41.4	41.3																									24																																																											
L 300+98	44 RT	2622		45.6																																												1	3.3		1			1																																						
		2622	2634		37.3	37.2																							36																																																													
L 300+95	2 LT	2624		44.5																																												1	2.1		1		1																																							
		2624	2622		37.4	37.3																							44																																																											
L 297+82	1 RT	2625		43.3																																												1			1			1																																						
		2625	2626		39.2	39.2	0.5																								12																																																									
L 297+93	1 RT	2626		43.3																																												1			1	1																																							
		2626	2646		39.2	38.3	0.9																								140																																																									
L 298+22	47 LT	2627		42.2																																												1			1		1																																							
		2627	2618		38.4	38.0	0.5																									112																																																								
L 298+22	63 LT	2628		40.5																																																																																							
		2628	2627		40.5	38.7																	16																																																																				
L 300+04	71 LT	2629		39.6																																																																																							
		2629	2619		39.6	37.8																					28																																																													
L 300+92	70 LT	2630		39.0																																																																																							
		2630	2620		39.0	38.0																					24																																																													
L 296+50	47 LT	2636		42.5																																												1			1			1																																						
		2636	2617		39.5	39.0																									100																																																										
L 297+55	2 RT	2637		43.4																																												1			1			1																																						
		2637	2625		39.4	39.2	0.5																								24																																																										
L 296+23	4 RT	2640		43.9																																												1			1			1																																						
		2640	2637		39.8	39.4																									132																																																										
L 294+72	7 RT	2643		44.4																																												1			1			1																																						
		2643	2640		40.2	39.8																									152																																																										
L 299+35	2 LT	2646		43.8																																												1	0.5		1		1																																							
		2646	2624		38.3	37.8	0.5																	160																																																																		
L 308+25	45 RT	2702		42.8																																												1	0.2		1		1																																							
		2702	2722		37.6	37.3	1.0																		28																																																																	
L 306+91	45 RT	2711		43.2																																												1			1		1																																							
		2711	2702		38.7	38.3																	132																																																																				
L 307+14	13 LT	2712		44.0																																																			1																		1	1																TBDI in Conc Island, See Sht. 2C-16
		2712	2715		40.0	38.8																									44																																																									
LLT 308+25	17 LT	2714		42.7																																												1			1		1																																							
		2714	2718		38.5	38.4	0.6																										12																																																						
					SHEET TOTALS																		148	184	28	28	52	80			628	180	84		84	44												19	6.9		19	2	9	8	1																		1	1															

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	**DATE:**	10/29/2021
CHECKED BY:	JGD	**DATE:**	2/4/2020

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300B	3D-15

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, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 42 .109	48 .109	
L 307+13	55 LT	2715		42.7																		
		2715	2714		38.8	38.5	0.4															
L 307+08	79 LT	2716		42.0																		
		2716	2715		38.9	38.8																
LLT 308+25	4 LT	2718		38.4																		
L 308+24	77 LT	2719		38.7																		
		2719	2714		38.7	38.5	0.3															
L 308+40	45 RT	2720		42.7																		
		2720	2702		38.3	38.3																
LRT 309+02	28 RT	2721		42.8																		
		2721	2720		38.5	38.3																
LRT 312+69	28 RT	2725		43.2																		
		2725	2728		39.6	38.0																
L 312+81	32 RT	2726		43.2																		
		2726	2725		39.7	39.6																
L 309+00	48 LT	2730		42.6																		
		2730	2714		39.0	38.5																
L 309+11	48 LT	2731		42.6																		
		2731	2730		39.1	39.0																
L 310+71	53 LT	2732		43.0																		
		2732	2731		39.5	39.1																
L 305+01	67 LT	2733		43.1																		
		2733	2734		39.1	39.0																
L 305+03	46 LT	2734		43.8																		
		2734	2735		39.8	38.8																
L 301+71	47 LT	2735		43.4																		
		2735	2620		38.8	38.0	0.7															
L 301+71	71 LT	2736		42.0																		
		2736	2735		39.0	38.8																
L 310+00	41 RT	2737		43.1																		
		2737	2721		40.1	38.5																
L 306+00	45 RT	2738		43.6																		
		2738	2711		40.6	38.7																
L 308+25	30 RT	2739		38.3																		
		2739	2702		38.3	38.3																
LRT 314+49	28 RT	2801		43.6																		
		2801	2802		40.9	39.0																
L 315+87	82 LT	2803		44.5																		
LRT 318+76	28 RT	2805		43.9																		
		2805	2806		40.9	40.7	0.3															
LRT 318+86	28 RT	2806		43.9																		
		2806	2820		40.7	40.0																
L 320+72	86 LT	2808		44.2																		
		2808	2813		39.5	37.5	0.5															
L 320+83	86 LT	2809		44.3																		
		2809	2808		40.4	39.5																
L 321+99	86 LT	2810		44.5																		
		2810	2809		40.7	40.4																
LLT 318+82	16 LT	2811		44.7																		
		2811	2812		40.7	38.0																
							SHEET TOTALS															

FROM	TO	R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	18	30	36	42	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY
2715																										
2715	2714									112																
2716																										
2716	2715									24																
2718																										
2719																										
2719	2714			32																						
2720																										
2720	2702	16																								
2721																										
2721	2720	60																								
2725																										
2725	2728	28																								
2726																										
2726	2725									12																
2730																										
2730	2714									76																
2731																										
2731	2730									12																
2732																										
2732	2731									160																
2733																										
2733	2734	20																								
2734																										
2734	2735									332																
2735																										
2735	2620									76																
2736																										
2736	2735									24																
2737																										
2737	2721									104																
2738																										
2738	2711									92																
2739																										
2739	2702											16														
2801																										
2801	2802									28																
2803																										
2805																										
2805	2806									8																
2806																										
2806	2820									100																
2808																										
2808	2813	32																								
2809																										
2809	2808									8																
2810																										
2810	2809									116																
2811																										
2811	2812	32																								
SHEET TOTALS		188		32						1284		16														

FROM	TO	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
2715		1			1	1																																						
2715	2714																																											
2716		1										1	1																															
2716	2715																																											
2718																																									0.5526		
2719																																												
2719	2714																																											
2720		1			1	1																																						
2720	2702																																											
2721		1			1		1																																					
2721	2720																																											
2725		1			1	1																																						
2725	2728																																											
2726		1			1			1																																				
2726	2725																																											
2730		1			1	1																																						
2730	2714																																											
2731		1			1		1																																					
2731	2730																																											
2732		1			1		1																																					
2732	2731																																											
2733		1										1	1																															
2733	2734																																											
2734		1			1			1																																				
2734	2735																																											
2735		1	0.4		1		1																																					
2735	2620																																											
2736		1										1	1																															
2736	2735																																											
2737		1			1	1																																						
2737	2721																																											
2738		1			1	1																																						
2738	2711																																											
2739																																									0.5526		
2739	2702																																											
2801		1			1			1																																				
2801	2802																																											
2803		1	0.7		1		1																																					
2805		1			1	1																																						
2805	2806																																											
2806		1			1	1																																						
2806	2820																																											
2808		1			1	1																																						
2808	2813																																											
2809		1			1		1																																					
2809	2808																																											
2810		1			1			1																																				
2810	2809																																											
2811		1			1			1																																				
2811	2812																																											
SHEET TOTALS		23	1.1		20	9	6	5				3	3																												1.1052		

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-16

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**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, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 42 .109	48 .109		R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	18	30	36	42	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS 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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
LRT 322+99	28 RT	2814		44.1																																												1			1			1																																				
		2814	2821		40.4	40.1																										96																																																											
LRT 324+29	28 RT	2815		44.3																																												1			1			1																																				
		2815	2814		41.0	40.4																										128																																																											
LRT 321+90	28 RT	2816		44.0																																												1			1	1																																						
		2816	2817		40.1	39.9																	28																																																																								
LLT 313+21	15 LT	2818		43.7																																												1			1			1																																				
		2818	2819		40.7	40.6																										40																																																											
LRT 319+76	28 RT	2820		44.0																																												1			1			1																																				
		2820	2807		40.0	39.5																20																																																																									
LRT 322+03	28 RT	2821		44.0																																												1			1			1																																				
		2821	2816		40.1	40.1	0.4																							12																																																											
LLT 214+52	16 LT	2822		44.5																																												1			1			1																																				
		2822	2818		41.5	40.7																										128																																																											
LRT 315+50	27 RT	2823		44.0																																												1			1			1																																				
		2823	2801		41.0	40.9																										100																																																												
LLT 320+00	0 CL	2826	2827		39.0	38.7																														100										4.500																																																		
LRT 322+47	61 RT	2824							56							X	X																																																																										
LRT 324+09	63 RT	2825							28							X	X																																																																										
LLT 319+62	86 LT	2828		44.6																																												1			1			1																																				
		2828	2811		41.6	40.7																										80																																																												
LRT 327+58	41 RT	2901		45.0																																												1																						1							1														
		2901	2902		41.4	41.3																16																																																																									
LRT 327+52	16 RT	2902		44.9																																												1			1		1																																					
		2902	2924		41.3	40.2																										100																																																												
LRT 328+88	26 RT	2903		44.4																																												1			1		1																																					
		2903	2905		40.1	39.2																											88																																																									
LRT 328+88	45 RT	2904		43.5																																												1									1	1																																
		2904	2903		40.1	40.1																20																																																																									
LRT 329+78	27 RT	2905		44.0																																												1			1		1																																					
		2905	2910		39.2	39.1																												112																																																										
LRT 329+79	22 RT	2906		39.4																																																																																						0.4465		
		2906	2905		39.4	39.2																											8																																																										
LRT 329+79	31 LT	2907		46.0																																																																						1						1								
LRT 332+06	36 LT	2908		42.9																																												1												1						1																								
LRT 330+91	21 RT	2910		44.1																																												1			1			1																																				
LRT 331+17	20 RT	2917		44.7																																																																						1						1								
LLT 325+28	16 LT	2918		44.6																																												1			1	1																																						
		2918	2920		40.8	38.7																40																																																																									
LLT 325+39	16 LT	2919		44.7																																												1			1		1																																					
		2919	2918		40.9	40.8																										12																																																											
LRT 327+30	49 RT	2921		44.0																																												1									1	1																																
		2921	2901		41.5	41.4																										28																																																												
L 328+45	39 RT	2923		41.1																																																																																						0.3990		
		2923	2924		41.1	40.2																										16																																																											
LRT 328+51	26 RT	2924		44.6																																												1																						1							1														
		2924	2903		40.2	40.1																										40																																																												
SR4 10+28	0 CL	3001			22.8	22.6																																			48																																																										
SHEET TOTALS									84														96	28							780	96	112			100			48							4.500		20			15	2	4	9				2	2		1						1		2							4						2						0.8455		

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-17

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 42 .109	48 .109		R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	18	30	36	42	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS 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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
SR4 11+09	18	RT	3002																																										64																																																
Y30 23+22	2	LT	3003			26.0	24.0																													120											3.400																																																	
SR6 10+64	0	CL	3004			27.5	26.5																											68																																																															
SR4 15+74	4	RT	3005			30.4	26.0																					196																																																																								
SR5 21+18	6	RT	3102			39.0	38.6																												40																																																														
Y30 48+00	42	RT	3104		50.6																																												1													1			1																															
			3104	3103		47.6	38.7		44							x	x																																																																						2							
Y30 49+87	42	LT	3106		44.2																																												1													1			1																															
			3106	3105		41.2	37.6	0.9	24							x	x																																																																						2							
SR5 17+12	32	LT	3107																																									32																																																		
SR5 14+53	29	LT	3108																																									36																																																	
SR5 13+50	2	RT	3109			34.0	32.5																		64																																																																										
Y30 54+00	0	CL	3110			32.0	31.0																												116																																																															
SR5 10+95	21	LT	3112			32.6	32.4																												40																																																															
Y30 57+81	51	LT	3113																																			44																																																											
SR5 16+27	3	RT	3114			36.5	36.0																		84																																																																									
Y30 49+67	42	LT	3115		44.9																																												1													1			1																															
			3115	3106		42.1	41.4																									20																																																																		
Y30 58+75	4	LT	3116			33.5	33.0																																		96																																																									
Y19 11+30	26	LT	3301		39.4																																												1			1			1																																													
			3301	3302		36.3	36.0																									36																																																																		
			3302	3303		36.0	34.7	1.6	28								x																																																																																	
Y19 11+78	26	LT	3302		39.1																																												1			1	1																																														
Y19 12+40	26	LT	3304		39.3																																												1			1		1																																												
			3304	3302		36.3	36.0																									44																																																																		
Y19 12+50	54	LT	3305		37.0																																																																																													
			3305	3306		34.5	34.2																											116																																																														
Y41 10+87	28	LT	3306		36.9																																												1														1					1																												
			3306	3309		34.2	34.0																											48																																																													
Y41 10+98	21	RT	3307			35.5	34.5			36							x																														1.000																																																		
Y41 11+17	23	LT	3308		37.9																																																																																														
			3308	3306		35.6	34.7																		32																																																																								
Y41 10+79	18	RT	3309		37.5																																										1.500																																																		
Y19 15+80	14	RT	3310		44.7																																												1			1			1																																													
			3310	3311		40.9	39.6		28								x																																																																																		
Y40 234+17	26	LT	3312		43.6																																												1							1			1	1																																							
			3312	3327		40.3	37.0																									76																																																																		
Y40 234+54	27	LT	3313		43.8																																												1							1			1	1																																							
			3313	3312		40.5	40.3																									36																																																																		
Y19 19+41	14	RT	3315		44.4																																												1			1		1																																													
			3315	3316		40.6	39.0		32								x																																																																																		
Y42 11+40	0	CL	3317			32.0	31.6																										76																																																																
Y42 10+75	14	RT	3319		39.9																																												1			1		1																																													
			3319	3320		36.9	34.0		32								x																																																																																		
Y19 17+46	43	LT	3321																																									40																																																		
Y19 20+05	42	LT	3322																																									40																																																		
Y42 13+45	4	LT	3323			31.1	29.9																										56																																																															
Y40 231+00	34	RT	3324		40.0																																												1										1	1																																							
			3324	3325		37.7	37.4		100								x																																																																																		
Y40 232+00	34	RT	3325		40.8																																												1										1	1																																							
SHEET TOTALS									288	36															180		196					212	132	232	196	120		44			96			148	64		5.900		14			6	1	3	2	2			4	4		3	1		3			1																4							

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300B	3D-18

**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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)											C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42						0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																		
THICKNESS OR GAUGE				FT.	FT.	FT.	%													.109	.109																									CY	CY	EACH	LIN. FT.	LIN. FT.																																					CY	CY	LIN. FT.	
		3325	3326		37.3	36.7			148							x																																																																										
Y40 233+50	45 RT	3326		39.2																																												1										1	1																															
		3326	3327		36.7	36.4	0.4		64							x																																																																										
Y40 234+15	50 RT	3327		39.2																																												1										1	1																															
		3327	2392		36.2	35.9				88						x																																																																										
L 224+47	45 LT	3350		40.1																																												1	0.8		1	1																																						
		3350	3351		34.3	34.1																													80																																																							
L 223+67	47 LT	3351		40.3																																												1	1.2		1			1																																				
		3351	3355		34.1																														224																																																							
L 224+46	56 RT	3352		40.0																																												1			1	1																																						
		3352	3353		36.8	36.1																										84																																																										
L 223+64	49 RT	3353		40.4																																												1			1		1																																					
		3353	3354		36.1	33.6																										24																																																										
L 221+43	50 LT	3355		40.0																																												1	1.6		1			1																																				
		3355	3391		33.4	32.8																													108																																																							
L 226+85	35 LT	3356		41.7																																												1	1.7		1		1			1																																		
		3356	3371		35.0	34.7																													108																																																							
L220+37	57 LT	3357		35.1																																																																																					0.7640	
		3357	3391		35.1	32.8																																																																																				
L 220+35	36 RT	3358		40.5																																															1			1																																				
L 220+35	54 RT	3359		32.7																																																																																					0.8856	
		3359	3360		32.7	32.7																														12																																																						
L 221+43	80 LT	3361		37.9																																												1									1																																	
		3361	3355		34.2	33.9																											28																																																									
L 220+36	70 LT	3362		37.0																																																																																						
		3362	3357		37.0	35.2																													16																																																							
L 227+16	57 RT	3363		41.7																																												1			1			1																																				
		3363	3376		37.2	37.0																										64																																																										
L 225+38	56 RT	3365		40.4																																												1			1			1																																				
		3365	3352		37.1	36.8																										92																																																										
L 225+79	69 LT	3366		41.9																																												1										1	1																															
		3366	3371		37.2	36.5																									28																																																											
L 228+71	71 LT	3367		38.0																																										3.400																																												
		3367	3368		38.0	36.6																													20																																																							
L 228+69	51 RT	3368		42.4																																												1	0.8		1		1																																					
		3368	3373		36.6	36.2																													120																																																							
L 225+79	44 LT	3371		41.1																																												1	1.4		1			1																																				
		3371	3350		34.7	34.3																													132																																																							
L 227+64	20 RT	3372		42.5																																												1	0.5						1			1	1																															
		3372	3373		36.8	36.7																										76																																																										
L 226+87	36 LT	3373																																														1	0.3		1		1																																					
		3373	3356		36.2	35.0																													68																																																							
L 227+52	78 LT	3374		41.1																																												1										1	1																															
		3374	3373		38.8	38.0																									20																																																											
Y20 10+13	25 RT	3375		42.5																																												1			1			1																																				
		3375	3378		39.2	39.1																									28																																																											
L 227+64	48 RT	3376		42.0																																												1	0.1		1			1																																				
		3376	3372		36.9	36.8																										50																																																										
Y20 10+13	27 LT	3377		42.5																																												1			1		1																																					
SHEET TOTALS									212	88																					76	390	28		876	12										3.400		20	8.4		15	2	5	8	1	1	1	5	5																														1.6496	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	**DATE:**	10/29/2021
CHECKED BY:	JGD	**DATE:**	2/4/2020

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300B	3D-19

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE								15	18	24	30	36	42	48						42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42							A	B																																							
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%								DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	.109	.109																									CY	CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																															CY	CY	LIN. FT.	
		3377	3375		39.5	39.2																								52																																																									
Y20 10+43	26 RT	3378		42.1																																									1			1			1																																						
		3378	3366		39.1	37.2																								80																																																											
L 220+35	30 LT	3390																																																																																								
L 220+36	42 LT	3391		40.6																																									1	2.8		1		1																																							
		3391	3390		32.8	32.7																												12																																																								
SR4 10+23	0 CL	0000																																																																																							21	
L1 601+73	226 RT	0000																																																																																							52	
L1 602+66	220 RT	0000																																																																																							171	
L1 604+21	157 RT	0000																																																																																						157	
L1 603+22	125 RT	0000																																																																																						137	
L1 612+58	208 LT	0000																																																																																						25	
L1 638+26	121 RT	0000																																																																																						21	
L1 638+53	182 RT	0000																																																																																						58	
L1 638+85	201 RT	0000																																																																																						26	
Y38 23+89	22 LT	0000																																																																																						30	
Y38 24+75	22 LT	0000																																																																																					30	
Y38 23+11	24 RT	0000																																																																																					21	
Y38 20+39	5 LT	0000																																																																																					51	
Y38 20+44	4 LT	0000																																																																																					51	
Y38 20+50	2 LT	0000																																																																																					51	
L1 672+82	15 LT	0000																																																																																						26	
L1 702+92	91 LT	0000																																																																																						18	
Y31 39+72	24 RT	0000																																																																																						24	
Y31 41+19	25 RT	0000																																																																																					28	
Y31 42+83	24 RT	0000																																																																																					18	
Y31 38+75	26 RT	0000																																																																																					25	
Y31 42+39	26 LT	0000																																																																																					18	
Y31 44+89	25 LT	0000																																																																																					25	
Y31 46+42	27 LT	0000																																																																																					22	
Y31 41+58	26 LT	0000																																																																																					23	
Y31 35+33	40 LT	0000																																																																																					16	
Y31 35+56	24 LT	0000																																																																																					26	
Y31 26+80	32 LT	0000																																																																																					30	
Y31 23+81	22 RT	0000																																																																																					23	
Y31 23+65	21 LT	0000																																																																																					23	
Y31 22+14	21 RT	0000																																																																																					16	
Y30 55+33	3 LT	0000																																																																																			10			
Y30 55+37	4 LT	0000																																																																																			10			
Y30 57+80	33 LT	0000																																																																																					20	
Y30 56+87	27 RT	0000																																																																																					25	
Y30 54+92	27 RT	0000																																																																																					15	
Y30 53+41	28 RT	0000																																																																																					18	
Y30 49+55	26 RT	0000																																																																																					18	
Y30 46+06	2 RT	0000																																																																																			6			
Y30 44+76	21 LT	0000																																																																																					40	
Y30 48+35	26 LT	0000																																																																																					40	
Y30 50+81	28 LT	0000																																																																																					20	
Y30 40+36	63 RT	0000																																																																																					58	
SHEET TOTALS																														132				12												2	2.8		2		1	1																																	26		1517	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	**DATE:**	10/29/2021
CHECKED BY:	JGD	**DATE:**	2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-20

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)												C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42						0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																		
THICKNESS OR GAUGE				FT.	FT.	FT.	%													.109	.109																									CY	CY	EACH	LIN. FT.	LIN. FT.																																						CY	CY	LIN. FT.	
Y30 40+88	29 RT	0000																																																																																							52	
Y30 37+91	28 RT	0000																																																																																							46	
Y30 37+08	28 RT	0000																																																																																						38	
Y30 35+43	27 RT	0000																																																																																						87	
Y30 34+15	27 RT	0000																																																																																						99	
Y30 28+38	29 RT	0000																																																																																						20	
Y30 23+18	0 CL	0000																																																																																					61	
SR6 10+27	1 RT	0000																																																																																					49	
Y30 26+11	28 LT	0000																																																																																					19	
Y30 27+99	26 LT	0000																																																																																					20	
Y30 32+99	24 LT	0000																																																																																					59	
Y30RPB 05+48	125 LT	0000																																																																																					30	
L1 677+00	238 RT	0000																																																																																					66	
L1 701+87	48 RT	0000																																																																																						81	
L1 702+01	25 LT	0000																																																																																					31	
L1 680+07	181 LT	0000																																																																																					22	
Y32 45+36	50 LT	0000																																																																																					45	
Y32 45+02	95 LT	0000																																																																																					96	
Y19 49+93	54 RT	0000																																																																																					21	
Y19 11+33	33 LT	0000																																																																																				19	
Y32 12+54	21 LT	0000																																																																																					12	
L 233+60	1 RT	0000																																																																																					62	
Y40 233+67	1 LT	0000																																																																																					17	
Y40 234+07	10 LT	0000																																																																																				77	
L 235+39	32 RT	0000																																																																																				188	
L 237+68	33 RT	0000																																																																																				271	
L 239+18	33 RT	0000																																																																																				29	
L 236+34	1 RT	0000																																																																																				61	
L 239+21	31 LT	0000																																																																																				32	
L 239+76	30 LT	0000																																																																																				65	
L 240+65	30 LT	0000																																																																																				113	
L 239+73	32 RT	0000																																																																																				69	
L 240+09	32 RT	0000																																																																																			3	
L 240+66	32 RT	0000																																																																																				112	
L 241+23	32 RT	0000																																																																																				3	
L 243+28	32 RT	0000																																																																																				406	
L 245+32	1 RT	0000																																																																																				62	
L 246+37	30 LT	0000																																																																																				207	
Y32 15+37	47 LT	0000																																																																																				25	
Y32 15+74	53 LT	0000																																																																																				50	
Y32 15+63	28 LT	0000																																																																																				56	
Y32 18+85	24 RT	0000																																																																																				33	
L 250+74	58 RT	0000																																																																																				72	
L 251+59	32 RT	0000																																																																																				117	
L 252+19	0 CL	0000																																																																																				61	
L 256+04	85 LT	0000																																																																																				20	
L 257+32	70 LT	0000																																																																																				40	
L 257+53	0 CL	0000																																																																																				62	
L 258+81	31 LT	0000																																																																																				255	
SHEET TOTALS																																																																																									3541	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021
CHECKED BY: JGD DATE: 2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)											C. A. A. PIPE			R. C. PIPE CLASS III							R. C. PIPE CLASS IV								R. C. PIPE CLASS V					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	42	48		15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	18	30	36	42						0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		GRATE TYPE			D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																		
THICKNESS OR GAUGE				FT.	FT.	FT.	%													.109	.109																									CY	CY	EACH	LIN. FT.	LIN. FT.		E	F	G																																	CY	CY	LIN. FT.	
L 260+10	6 RT	0000																																																																																									72	
L 263+58	42 RT	0000																																																																																							19	
L 263+88	32 RT	0000																																																																																							57	
L 263+58	0 CL	0000																																																																																							60	
L 263+86	31 LT	0000																																																																																							52	
L 262+80	31 LT	0000																																																																																						153	
L 261+96	31 LT	0000																																																																																						8	
L 262+01	45 LT	0000																																																																																						25	
L 261+91	58 LT	0000																																																																																						17	
L 261+87	74 LT	0000																																																																																						40	
L 262+38	59 LT	0000																																																																																						71	
L 262+77	65 LT	0000																																																																																							10	
L 258+79	43 LT	0000																																																																																							22	
Y40 234+45	2 RT	0000																																																																																							18	
L 220+91	36 LT																																																																																										106	
L 222+61	40 LT																																																																																										222	
L 224+90	34 LT																																																																																										217	
L 223+64	40 RT																																																																																									21	
L 225+87	37 LT																																																																																								13	
L 226+37	32 LT																																																																																								144	
L 227+29	10 LT																																																																																								88	
L 228+02	38 LT																																																																																							140	
L 228+69	51 LT																																																																																								16	
L 266+03	31 RT																																																																																								400	
L 267+59	0 CL																																																																																								63	
L 278+22	0 CL																																																																																								60	
L 279+21	32 RT																																																																																								211	
L 280+43	31 RT																																																																																								7	
L 280+39	0 CL																																																																																								81	
L 281+35	31 LT																																																																																								434	
L 284+77	0 CL																																																																																								108	
L 284+83	31 RT																																																																																								9	
L 285+75	31 LT																																																																																								247	
L 287+26	15 RT																																																																																								72	
L 290+77	30 RT																																																																																								10	
L 290+84	0 CL																																																																																								61	
L 292+03	32 LT																																																																																							221	
L 293+09	0 CL																																																																																							106	
L 293+55	52 LT																																																																																							80	
L 297+92	31 LT																																																																																							191	
L 298+29	43 LT																																																																																							19	
L 300+08	40 LT																																																																																							14	
L 300+53	32 LT																																																																																							82	
L 300+96	0 CL																																																																																							105	
L 301+57	52 LT																																																																																							20	
L 303+25	32 LT																																																																																							384	
L 304+80	40 LT																																																																																							13	
LLT 307+44	10 LT																																																																																							14	
SHEET TOTALS																																																																																												4603	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY: RCH DATE: 10/29/2021

CHECKED BY: JGD DATE: 2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-22

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 15	18	24	30	36	42	48
									THICKNESS OR GAUGE: DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC		
LLT 307+68	2	LT													
LRT 307+74	13	RT													
LRT 308+26	20	RT													
LLT 310+18	15	LT													
LLT 315+88	2	RT													
LRT 317+60	48	RT													
LRT 318+20	27	RT													
LLT 319+64	0	CL													
LLT 320+88	0	CL													
LLT 323+89	0	CL													
LRT 322+48	38	RT													
LRT 324+15	40	RT													
LRT 330+24	2	RT													
LRT 329+79	25	RT													
LRT 329+28	21	RT													
LRT 328+88	35	RT													
LRT 328+88	27	RT													
LRT 328+36	21	RT													
LRT 327+57	28	RT													
SHEET TOTALS															
PROJECT TOTALS									3416	992	612	432	324	60	108

C. A. A. PIPE SIZE: 42	48	R. C. PIPE CLASS III SIZE: 15	18	24	30	36	42	48	R. C. PIPE CLASS IV SIZE: 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V SIZE: 12	18	30	36	42	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY
THICKNESS OR GAUGE: .109	.109																								
340		7752	2588	1960	1164	4644	800	1200	8424	1954	564	876	3352	1000	112	48	96	320	464	392	96	136	115.600	5.000	352

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.	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	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	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/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	J.B. STD. 840.31 OR STD. 840.32	8" SLUICE GATE (EA)	SHUT OFF VALVE (EA)	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	T.B.J.B. STD. 840.34	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	CONVERT C.B. TO T.B.J.B.	CONVERT EXISTING D.I. TO J.B.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
																																											128	
																																											131	
																																											18	
																																											32	
																																											42	
																																											33	
																																											11	
																																											76	
																																											75	
																																											61	
																																											50	
																																											49	
																																											107	
																																											9	
																																											87	
																																											5	
																																											6	
																																											128	
																																											18	
129	5	8	83	21	85	4	4	2	1	1	5	5	1	4	5	28	2	2	4	2	82	8	2	2	26	7.4383	13023	

SHEET TOTALS 1066

PROJECT TOTALS 135 | 24 | 57 | 54 | 23 | 1 | 3 | 30 | 30 | 43 | 129 | 5 | 8 | 83 | 21 | 85 | 4 | 4 | 2 | 1 | 1 | 5 | 5 | 1 | 4 | 5 | 28 | 2 | 2 | 4 | 2 | 82 | 8 | 2 | 2 | 26 | 7.4383 | 13023

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RHOWARD-NEW

COMPUTED BY:	RCH	DATE:	10/29/2021
CHECKED BY:	JGD	DATE:	2/4/2020

PROJECT NO.	SHEET NO.
R-3300B	3D-23

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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, CSP, CAAP, HDPE, or PVC) 54	60	66	72	78	84		DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
Y38DET 13+66	3	LT	0212			21.7	21.2			184								X		X
Y30 46+88	13	LT	0599			35.1	31.2													
L1 642+62	7	LT	0805			23.4	22.6													
L1 649+30	6	LT	0806			25.8	24.4													
L1 677+35	10	RT	1010			37.7	33.5													
Y31RPC 17+96	4	RT	1407			39.2	38.8													
L1_N 851+00	122	RT	2304			36.0	34.8													
Y32 47+42	43	LT	2450		42.9															
			2450	2451		37.0	36.9													
L 264+30	59	LT	2451		44.9															
			2451	2452		36.9	36.5													
L 264+30	61	RT	2452		44.9															
			2452	2453		36.5	36.5													
Y19 50+35	16	LT	2453		45.0															
			2453	2454		36.5	36.3													
Y19 50+35	14	RT	2454		44.8															
			2454	2455		36.3	36.1													
Y30 56+64	5	LT	3111			29.9	29.5													
SHEET TOTALS										184										
PROJECT TOTALS										184										

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 54	60	66	72	78	84		R. C. PIPE CLASS IV 54	60	66	72	78	84		54" WELDED STEEL PIPE 0.750" THICK, GRADE B IN SOIL	54" WELDED STEEL PIPE 0.750" THICK, GRADE B NOT IN SOIL	##" WELDED STEEL PIPE ##" THICK, GRADE B (UNDER RR)	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	
Y38DET 13+66	0212																													
Y30 46+88	0599		220																		5.200									
L1 642+62	0805		224																		5.200									
L1 649+30	0806		228																		5.200									
L1 677+35	1010		228																		5.200									
Y31RPC 17+96	1407		128																		5.200									
L1_N 851+00	2304													428							8.000									
Y32 47+42	2450																				5.000									
	2450	2451	28																											
L 264+30	2451																					2.000				1		1		
	2451	2452															60	60												
L 264+30	2452																					2.100								
	2452	2453	4																											
Y19 50+35	2453																					2.100								
	2453	2454	28																											
Y19 50+35	2454																					2.100				1		1		
	2454	2455	40																											
Y30 56+64	3111												232								8.700									
SHEET TOTALS			1128										232		428		60	60			47.700	8.300				2		2		
PROJECT TOTALS			1128										232		428		60	60			47.700	8.300				2		2		

LINE & STATION	FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION 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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34
Y38DET 13+66	0212																							
Y30 46+88	0599																							
L1 642+62	0805																							
L1 649+30	0806																							
L1 677+35	1010																							
Y31RPC 17+96	1407																							
L1_N 851+00	2304																							
Y32 47+42	2450																							
	2450	2451																						
L 264+30	2451																							
	2451	2452																						
L 264+30	2452							1				1												
	2452	2453																						
Y19 50+35	2453																	1						
	2453	2454																						
Y19 50+35	2454																							
	2454	2455																						
Y30 56+64	3111																							
SHEET TOTALS									1				1						1					
PROJECT TOTALS									1				1						1					

LINE & STATION	FROM	TO	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	##" SPRING BOX PIPE	SPRING BOX STD. 840.41		54" PIPE ENDWALL w/ LOAD CARRYING GRATE	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN		FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y38DET 13+66	0212																	184	2@60" TEMPORARY PIPES
Y30 46+88	0599												1						
L1 642+62	0805																		
L1 649+30	0806																		
L1 677+35	1010												1						
Y31RPC 17+96	1407									1									SEE DETAIL ON PLAN SHEET 2C-17
L1_N 851+00	2304																		
Y32 47+42	2450																		
	2450	2451																	
L 264+30	2451																		
	2451	2452																	
L 264+30	2452																		
	2452	2453																	
Y19 50+35	2453		1																TBDI for 54" Pipe, See Sht. 2C-15
	2453	2454																	
Y19 50+35	2454																		
	2454	2455																	
Y30 56+64	3111																		2@66" PIPES
SHEET TOTALS			1							1			2					184	
PROJECT TOTALS			1							1			2					184	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: Lee Stone, PG DATE: 10/18/21
CHECKED BY: Cindy Liu, PE DATE: 10/18/21

(12-17-19)

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
VARIES				SD	5200
CONTINGENCY				SD	4000
				TOTAL LF:	9200

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

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

Line	Begin Station (±)	End Station (±)	Surcharge Height (ft)	Total Waiting (Mo.)
-L1-	607+50	619+50	2	5
-L1-	619+50	634+50	2	7
-L1-	640+50	660+50	-	3
-L1-	660+50	667+00	2	7
-L1-	667+00	710+50	-	3
-L1-	710+50	716+00	2	4.5
-L1-	716+00	721+00	-	3
-Y30-	32+00	35+25	5	18
-Y30-	35+25	36+50	2	8
-Y30-	36+50	37+25	2	14*
-Y30-	37+25	38+74	5	6*
-Y30-	40+91	42+50	5	5*
-Y30-	42+50	46+00	3	16*
-Y30-	46+00	47+50	3	16*
-Y30RPA-	5+00	13+50	2	5
-Y30RPA-	17+00	22+50	2	12
-Y30RPA-	22+50	25+04	5	18*
-Y30RPB-	18+00	21+00	5	18*
-Y30RPB-	21+00	21+88	5	18
-Y30RPC-	22+00	23+50	-	16
-Y30RPC-	23+50	25+88	3	16*
-Y30RPD-	8+00	16+00	-	4
-Y30RPD-	16+00	18+25	-	12
-Y30RPD-	18+25	23+80	3	16*
-Y31-	25+00	27+50	2	7*
-Y31-	27+50	29+13	2	6*
-Y31-	31+34	32+50	2	6*
-Y31-	32+50	33+50	3	9.5*
-Y31-	33+50	35+70	3	8*
-Y31RPA-	13+00	15+91	2	7*
-Y31RPB-	14+50	15+50	2	10
-Y31RPB-	15+50	19+38	2	10*
-Y31RPC-	15+00	22+30	-	9.5*
-Y32-	19+00	22+00	-	5
-Y32-	22+00	24+46	5	6*
-Y32-	26+25	33+00	5	6*
-Y32-	33+00	34+50	2	5.5
-Y32RPB1-	15+50	22+88	-	5

*** Waiting Period With Staged Construction, See Roadway Detail Sheets 2G-4 and 2G-5 for -Y30-, 2G-6 for -Y31-, 2G-8 for -Y30RPA-, 2G-9 for -Y30RPB-, 2G-10 for -Y30RPC-, 2G-11 for -Y30RPD-, 2G-12 for -Y31RPA-, 2G-13 for -Y31RPB-, 2G-14 for -Y31RPC-, and 2G-15 for -Y32-**

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 Soil 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 Soil 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 SETTLEMENT GAUGES

Guage No.	Alignment	Station	Offset
SG-1	-L1-	604+00	62 ft Left
SG-2	-L1-	612+00	60 ft Left
SG-3	-L1-	630+00	60 ft Left
SG-4	-L1-	657+00	60 ft Left
SG-5	-L1-	714+00	65 ft Left
SG-6	-Y30-	34+75	43 ft Left
SG-7	-Y30-	36+50	42 ft Right
SG-8	-Y30-	38+00	40 ft Left
SG-9	-Y30-	42+00	40 ft Right
SG-10	-Y30-	45+50	42 ft Left
SG-11	-Y31-	32+00	30 ft Right
SG-12	-Y31-	33+75	30 ft Right
SG-13	-Y31-	36+00	35 ft Right
SG-14	-Y30RPA-	10+00	11 ft Left
SG-15	-Y30RPA-	19+00	25 ft Right
SG-16	-Y30RPA-	22+00	25 ft Right
SG-17	-Y30RPA-	24+00	30 ft Right
SG-18	-Y30RPB-	21+00	15 ft Right
SG-19	-Y30RPC-	25+50	45 ft Right
SG-20	-Y30RPD-	20+50	25 ft Left
SG-21	-Y30RPD-	23+50	62 ft Left
SG-22	-Y31RPA-	15+00	12 ft Left
SG-23	-Y31RPB-	19+00	34 ft Left
SG-24	-Y32-	24+00	25 ft Left
SG-25	-Y32-	28+00	20 ft Left
SG-26	-Y32RPB1-	21+00	25 ft Left

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 257 on -Y30- over -L1-	EB1	6
Bridge No. 257 on -Y30- over -L1-	EB2	5
Bridge No. 258 & 259 on -L1- over -Y38-	EB1	3
Bridge No. 258 & 259 on -L1- over -Y38-	EB2	3
Bridge No. 16 on -Y31- over -L1-	EB1	6
Bridge No. 16 on -Y31- over -L1-	EB2	6
Bridge No. 262 on -Y32- over -L1_Northern-	EB1	6
Bridge No. 262 on -Y32- over -L1_Northern-	EB2	6

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-LLT-	2:1	319+50	2:1	324+00	LT	1		263
-LRT-	2:1	319+50	2:1	321+00	RT	1		200
-Y19-	2:1	44+83	2:1	45+15	RT	1		86
-Y19-	2:1	51+00	2:1	54+00	RT	1		784
-Y30DET-	2:1	42+50	2:1	46+00	LT	1		856
-Y31DET-	2:1	18+50	2:1	21+00	RT	1		44
-DET3-	2:01	10+00	2:1	10+50	RT	1		163
							TOTAL SY:	2396

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5	2479 HIGHWAY 210 W, LLC.
2	5	CLOVERLEAF ESTATES, LLC.
3	5	HARDISON RENTALS, LLC
4	5	VALY, LLC.
5	5	J & J PROPERTY INVESTMENTS, LLC.
6	OMITTED	OMITTED
7	5	NOELLE HOLDINGS, LLC.
8	5	JERRY E. PARKER
9	OMITTED	OMITTED
10	OMITTED	OMITTED
11	5	JIMMY M. BURNS, ET UX
12	5	JOHNIE C. GARRASON, ET UX
13	OMITTED	OMITTED
14	7	JUDY L. PRIDGEN, ET VIR
15	5	FRANCIS M. REDDY
16	OMITTED	OMITTED
17	5,31	RICHARD B. GRIFFITH
18	5	PHILIP J. WHITTY, ET UX
19	31	PAUL E. HOLT
20	31	MARTIN J. EVANS, ET UX
21	31	WILLIAM D. STORCKS, ET UX
22	31	EFFIE BELL
23	31	RICHARD H. LEWIS, ET UX
24	31	FLOYD L. ELAM, JR.
25	31	REBECCA F. DRISH, ET VIR
26	31	AMANDA B. WHITLEY
27	31	JOSH M. BLANTON, ET UX
28	5	DEPARTMENT OF TRANSPORTATION
29	5,6,7,30,31	JOHNIE C. GARRASON, ET UX
30	30	MARITECH, LLC.
31	30	LOFTIN A. MCCULLEN, SR., ET UX
32	30	CARSON H. SMITH, SR., LIFE ESTATE, ET ALS
32A	OMITTED	OMITTED
33	30	KEITH J. KING
34	30	DAVID RICHARTZ, ET AL
35	5,30	RONNIE D. ADAMS
36	7	FRANK R. KRYNICK, ET UX
37	7	WILLIAM D. STORCKS, ET UX
38	7,8	MICHAEL D. VICKERY, ET UX
39	7	MICHAEL R. DESHAIRES
40	4A,4B,4C,4D,4,5,30	GERALD D. HARDISON, JR., & HARDISON RENTALS, LLC.
41	7,8	KATIE POSTHUMA, ET AL
42	8	PAMELA S. WARNER
43	8	RANDY W. APONTE, ET UX
44	8,9	FRANK GOVERNALE, ET UX
45	9	MAUREEN C. MAUS
46	9	DENNIS J. PASTOR, ET UX, TRUSTEE
47	9	JAMES P. CAIN, ET UX
48	9	BARBARA J. ROBERTS
49	9	BARBARA Z. GRAYBILL, ET AL
50	9	LOTS N LAND, INC.
51	9	JOHN W. HONEYCUTT, ET UX
52	9	STELLA M. HONEYCUTT
53	9,10	LANCE M. PHELAN, ET UX
54	10	ELIZABETH A. MOBLEY
55	14	THOMAS E. MCFEE, ET AL, TRUSTEES
56	10	JOSHUA D. PENNINGTON
57	10,11,12	RALPH S. PENNINGTON, ET UX
58	12	PATRICK W. ADAMS
59	12	HARRY M. SAGE
60	12,13	NORMA C. MOORE
61	13	GREGORY K. BECK, ET UX
62	13	ALBERT W. SPILLER
63	13,14	ELAINE B. SPILLER
64	14	ELAINE S. BROWN
65	14	PROFESSIONAL POWER GROUP INC.
66	14	TOM H. JONES, ET AL
67	14	SANDRA K. POWELL
68	14	HERMAN J. BARANOWSKI, ET AL
69	14	MARK D. KING, ET AL
70	14	HOOVER ROAD INVESTMENT LLC
71	14	MICHAEL NADEAU, ET UX
72	14	GEORGE R. GAINES, ET UX
73	14	RACHEL P. GAINES
74	14	ROSE S. BRYANT, ET AL
75	14	ERNEST D. BRYANT, JR., ET UX
76	14	CHARLES E BRYANT
77	14	ELAINE S. BROWN
78	14,15,16	PENDER PARTNERS, LLC.
79	16,17	PRD PROPERTIES, LLC.
80	17,18,19	BRYCE MORRISON
81	17,18	DUKE ENERGY PROGRESS, INC.
82	19,20,21,22,22A,32	JAMESTOWN PENDER, LP
83	OMITTED	OMITTED
84	32, 32A	JAMESTOWN PENDER, LP
85	OMITTED	OMITTED
86	OMITTED	OMITTED
87	22,23	JAMESTOWN PENDER, LP
88	23,33	ROCKY POINT TOPSAIL WATER & SEWER DISTRICT
89	23	ANDREWS MORTUARY, INC.
90	23,33	JENNIFER P. HEYWOOD
91	23,33	ANDREWS PROPERTIES, INC.
92	23	C.M.H. HOMES, INC.
93	23	CAROLINE S. BALDWIN, ET AL
94	23	CARY BRUTON
95	23	PATRICIA W. GREEN
96	23	COASTAL MINI STORAGE OF CAPE FEAR, LLC.
97	23	J.L. MORRIS, ET UX
98	23	J.L. MORRIS ENTERPRISES
99	23	CAROLINE S. BALDWIN
100	31	SUSAN D. LORUSSO
101	OMITTED	OMITTED
102	32	AMOS SHEPARD
103	9	FRANCIS M. ROBERTS
104	9	LARRY M. ELLIS, ET UX
105	14	HILDUR C. SWAIN
106	14	ANTHONY LILLEY, ET UX
107	33	LASHONDA N. ARMSTRONG
108	OMITTED	OMITTED
109	23,33	JEFFERY L. MORRIS, ET UX
110	33	DEL-RAE D. DOPPELHEUER
111	33	NANCY L. JONES TRUSTEE
112	7	TRACY F. H. FESTA
113	7	BRICKYARD RD; C/O: MARK A. STOCKS, ET UX
114	9	HOLIDAY DRIVE; C/O: MARK A. STOCKS, ET UX
115	23	LEEWARD LANE; C/O: BELVEDERE PLANTATION HOA
116	33	VISTA LANE; C/O: THOMAS R AMBROGI
117	22A,32	HAMPSTEAD 504, LLC., ET AL
118	9	JOHN W. HONEYCUTT, ET UX
175	20,21,22,32A,33	PENDER COUNTY BOARD OF EDUCATION

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	3P-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
184	24	WEATHERSBEE PROPERTIES, INC.
185	25,26	F. JOSEPH GOSSMAN, BISHOP
186	25	BELVEDERE UTILITY, CO.
187	25	COUNTRY CLUB ROAD ASSEMBLAGE, LLC.
188	25,26	PATRICIA W. GREEN
189	26	PRATISHTHA GRAG
190	26,27	PENDER LAND HOLDINGS, INC.
191	27	TOPSAIL BAPTIST CHURCH
192	27	PENDER MARINA HOLDINGS, INC.
193	27	SUE N. AVERY, LIFE ESTATE C/O KELLI A. DOVE
194	27,28	MARY C. NORTHROP, LIFE ESTATE C/0 KELLI A. DOVE
195	28,29	PINNACLE RIDGE, HOA, INC.
196	28	JEANETTE S. EDENS, ET AL
197	28,29	IVON D. ROHRER, JR. PROPERITES, LLC.
198	29	HOLT REAL ESTATE ENTERPRISES, INC.
199	29	J.L. ANDERSON CO. INC.
218	19,20, 32A	PENDER COUNTY
227	27,28	STATE OF NORTH CAROLINA

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

THIS SHEET IS FOR RIGHT OF WAY PURPOSES ONLY.

NAD 83/NSRS 2007

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27609
NC COA No. C-0890

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

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

Docusigned by: Mike Lindgren 1A4E4...

11/22/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

PARKS FAMILY FORESTRY, LLC
DB 4618 PG 2619

HARDISON RENTALS, LLC.
DB 1446 PG 270
MB 47 PG 77
MB 17 PG 80
MB 24 PG 226

545

550

555

40

N 21°09'10" E
108.00'

-LIREV-
+75.42
150.00'

-LIREV-
+22.88
150.00'

-LIREV-
+11.78
150.00'

-LIREV-
+20.00
150.00'

-LIREV- CS Sta. 551+47.41

-LIREV-
+47.41
150.00'

CHORD

-LIREV- ST Sta 554+17.41 BK =
-LI- POT Sta 554+42.49 AH

+42.49
150.00'

-LI-

-LIREV-

MATCHLINE -LI- STA 555+00.00 SEE SHEET 4B

-LIREV- ST Sta. 554+17.41

HARDISON RENTALS, LLC.
DB 1446 PG 270
MB 47 PG 77
MB 17 PG 80
MB 24 PG 226

-LIREV-

PI Sta 541+88.86	PIs Sta 552+37.43
△ = 33° 16' 27.3" (RT)	θs = 2° 16' 29.9"
D = 1° 41' 06.6"	Ls = 270.00'
L = 1,974.53'	LT = 180.01'
T = 1,015.98'	ST = 90.01'
R = 3,400.00'	
SE = .06	
RO = 270	

11/18/2021
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Kelly