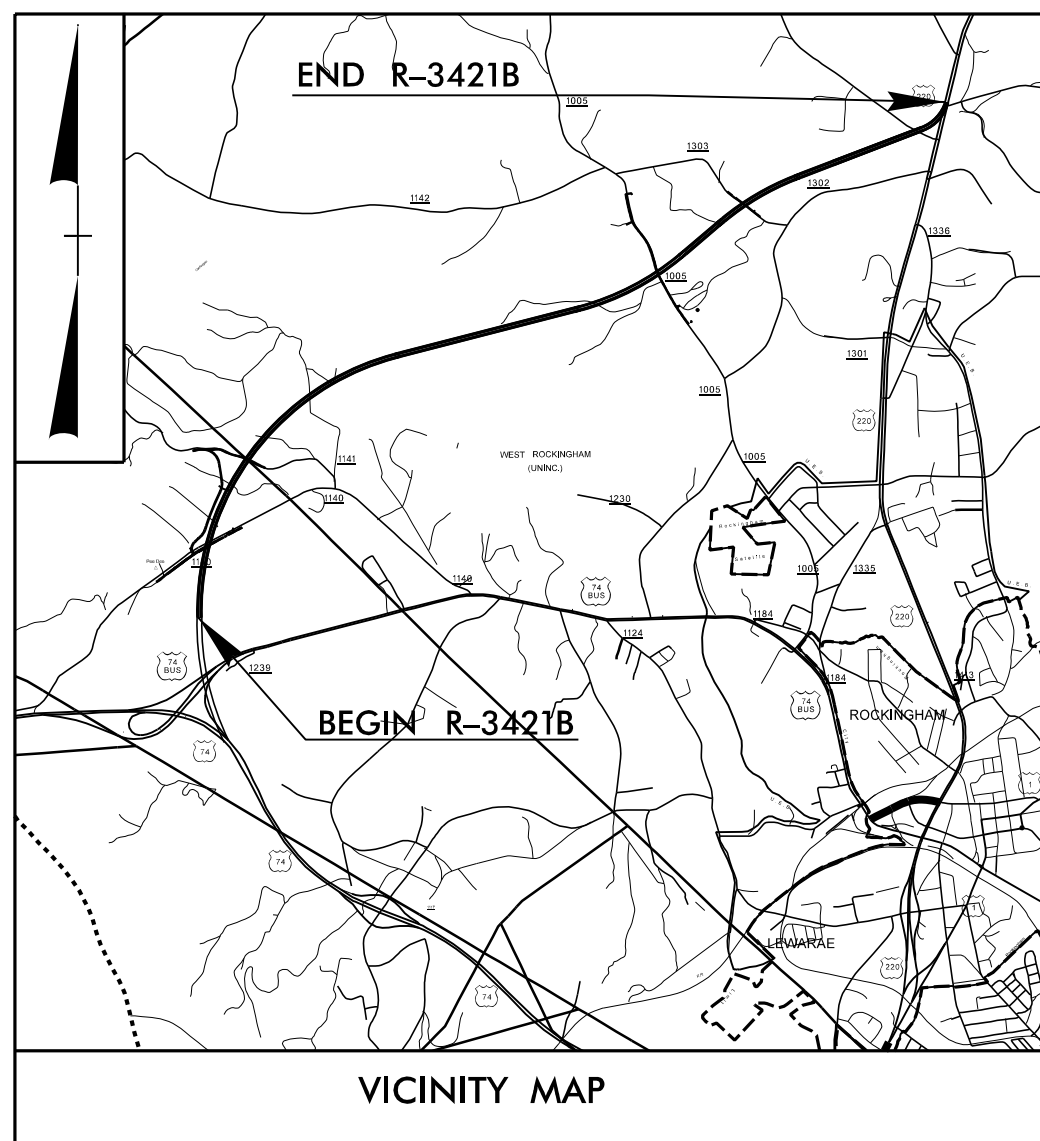


See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RICHMOND COUNTY

LOCATION: I-73/74 FROM 0.3 MILES SOUTH OF SR 1140 (OLD CHARLOTTE HIGHWAY) TO NORTH OF OF SR 1304 (HARRINGTON ROAD)

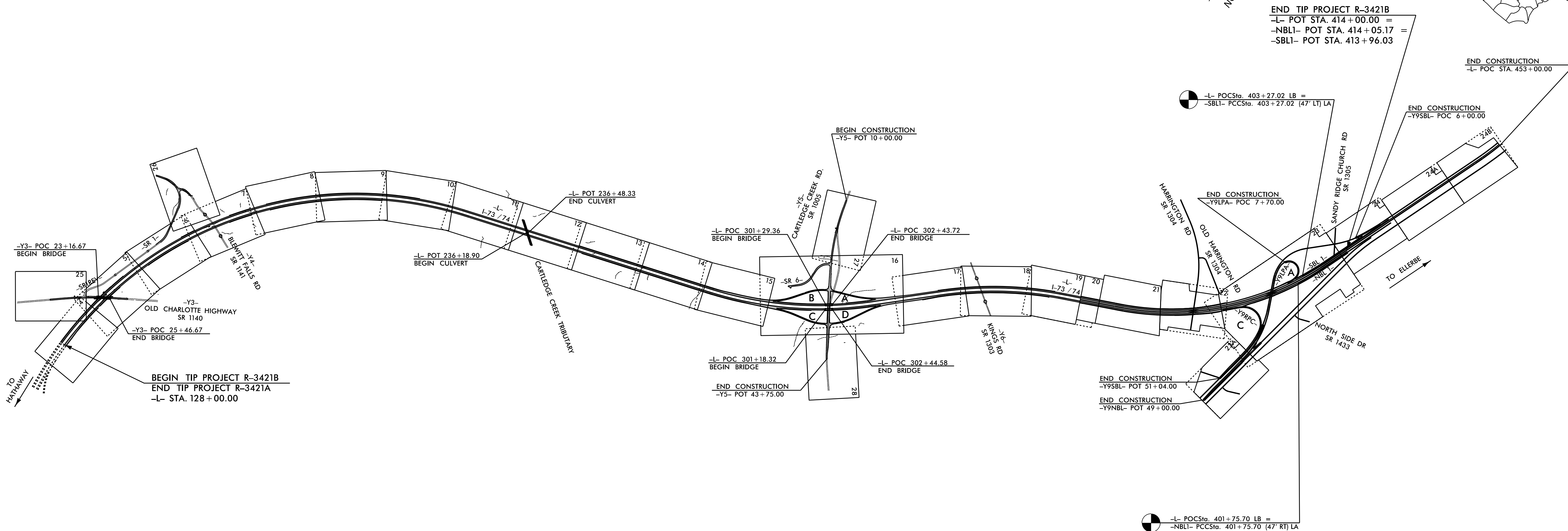
TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERTS & STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3421B	1	
WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
34542.1.FR3	NHF-0220(76)	P.E.	
34542.2.3	NHF-0220(43)	R /W & UTIL.	
34542.3.7		CONST.	

PART 1 OF 2

TIP PROJECT: R-3421B

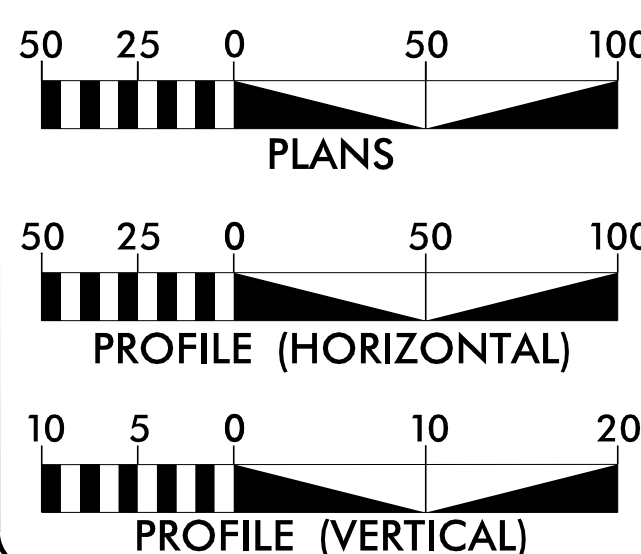
CONTRACT: C204368



NOTE:
THIS PROJECT IS A CONTROLLED ACCESS PROJECT
WITH ACCESS LIMITED TO THE INTERCHANGE.

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 18,910
ADT 2040 = 32,820
K = 10 %
D = 60 %
T = 26 % *
V = 70 MPH
* 17% TTST + 9% DUAL
FUNC CLASS =
INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3421B = 5.388 MILES
LENGTH STRUCTURES TIP PROJECT R-3421B = 0.029 MILES
TOTAL LENGTH TIP PROJECT R-3421B = 5.417 MILES



FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 23, 2009

LETTING DATE:
OCTOBER 15, 2019

NCDOT CONTACT: GREGORY S. DAVIS, PE
PROJECT MANAGER

JOHNNY BANKS
CALYX E & C
PROJECT MANAGER

STEPHEN C. BROWDE, PE
CALYX E & C
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

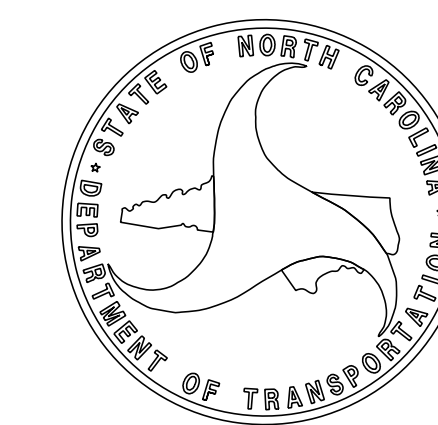
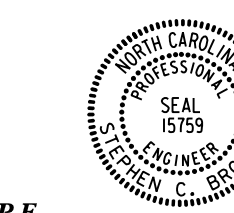
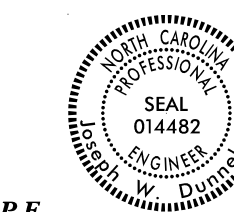
8/12/2019

DocuSigned by:
Joseph W. Durancho
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

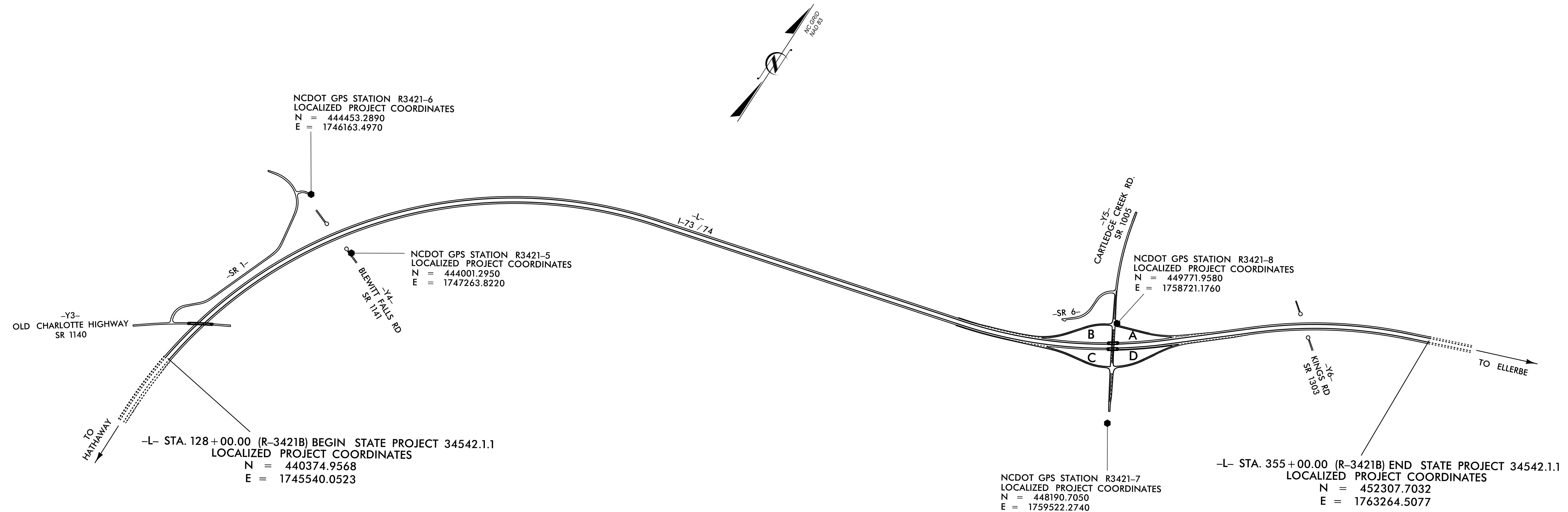
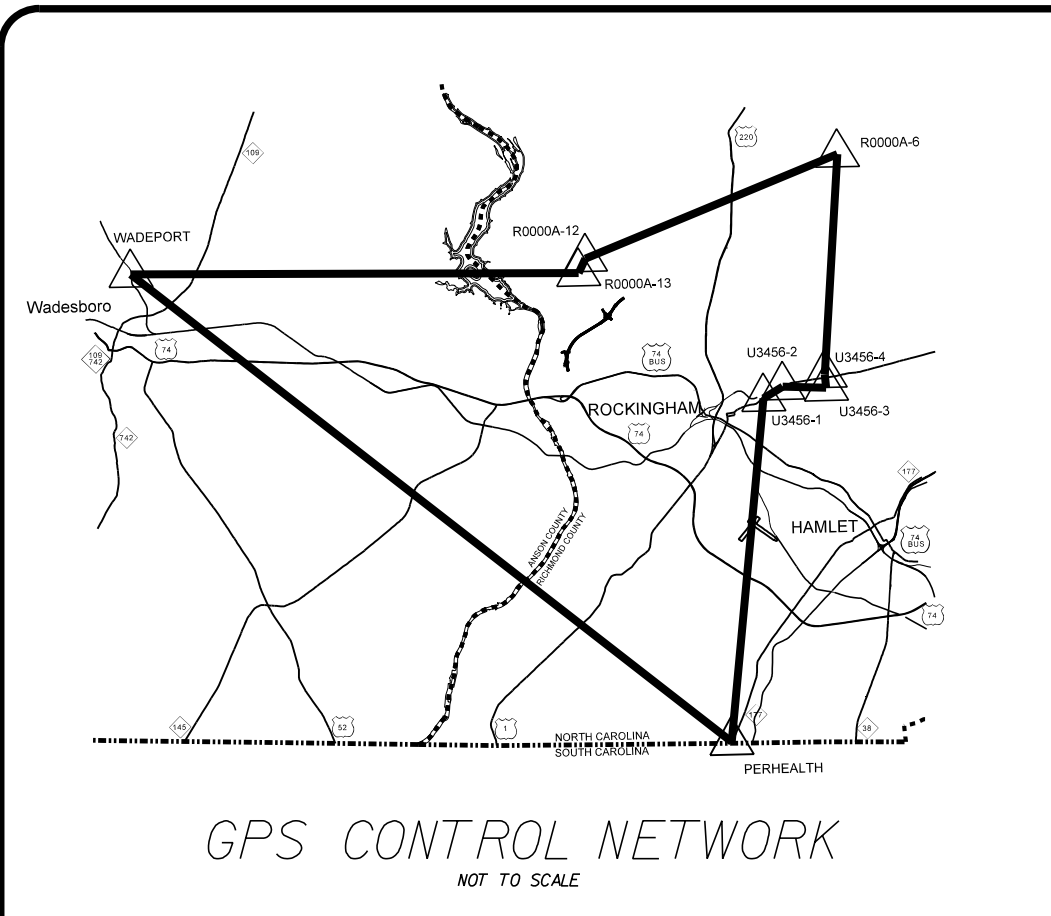
8/13/2019

DocuSigned by:
Stephen C. Browde
SIGNATURE: P.E.



SURVEY CONTROL SHEET

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3421B	1C-1	
<i>LOCATION AND SURVEYS</i>			



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R3421-11" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 438375.9441(ft) EASTING: 1746551.2575(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987565 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R3421-11" TO -L- STATION 128+00.00 N 26°49'57.62" W 2240.221'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

● INDICATES CONTROL MONUMENTS SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.

SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTES

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL BASE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:

 R3421B.LS.GPSCALIB_04I124.HTML
 R3421B.LS.WGS84_04I124.TXT
 R3421B.LS.LOCAL_04I124.TXT
 R3421B.LS.CONTROL_04I124.TXT

 THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET R-3421B

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
	120	BL-120	440833.7770	1745594.5470	367.98	132+62.12	0.01 RT
	121	BL-121	441253.3730	1745666.0840	382.30	136+87.72	3.15 LT
	122	BL-122	441442.5660	1745758.2090	386.07	138+92.92	45.97 RT
	123	BL-123	441669.3510	1745752.8110	380.45	141+12.07	14.36 LT
	124	BL-124	441970.6910	1745792.3710	381.87	144+11.21	59.40 LT
	125	BL-125	442158.2770	1745886.7810	372.04	146+17.57	27.21 LT
	126	BL-126	442322.5930	1745967.4230	336.64	147+98.94	5.56 LT
	127	BL-127	442426.5790	1746009.1020	355.43	149+10.87	2.84 LT
	128	BL-128	442632.0950	1746095.4900	340.40	151+33.75	1.41 RT
	129	BL-129	442819.0540	1746173.8180	379.44	153+36.46	0.61 LT
	130	BL-130	443182.6120	1746346.2150	399.10	157+38.80	2.02 LT
	131	BL-131	443330.5110	1746493.6040	393.16	159+39.16	59.28 RT
	132	BL-132	443580.0900	1746569.2260	385.37	161+94.62	2.01 RT
	133	BL-133	443785.7630	1746692.5770	364.00	164+34.48	0.15 RT
	134	BL-134	444130.9960	1746917.5050	301.08	168+46.40	5.30 LT
	135	BL-135	444383.8590	1747112.5430	361.90	171+65.61	0.61 RT
	136	BL-136	444561.1500	1747256.9500	374.82	173+94.32	2.71 RT
	137	BL-137	445796.1220	1748544.0860	420.23	191+82.75	2.14 RT
	138	BL-138	445989.7840	1748808.7120	DESTROYED	195+10.74	0.21 RT
	139	BL-139	446378.5820	1749436.4450	385.50	202+49.48	1.34 RT
	140	BL-140	446528.0520	1749716.1230	337.25	205+66.65	0.12 RT
	141	BL-141	446671.0560	1750017.3000	338.93	209+00.09	0.48 RT
	142	BL-142	446757.8460	1750220.0460	342.88	211+20.66	1.29 RT
	143	BL-143	446870.9410	1750493.7200	289.71	214+16.71	3.92 LT
	144	BL-144	446947.5170	1750719.5760	243.60	216+55.11	0.95 LT
	145	BL-145	447059.3190	1751078.7740	264.65	220+31.27	1.95 LT
	146	BL-146	447115.1520	1751296.5520	260.23	222+56.06	0.10 RT
	147	BL-147	447211.7760	1751680.1050	214.37	226+51.60	1.21 LT
	148	BL-148	447240.7690	1751797.3200	228.30	227+72.34	1.14 LT
	149	BL-149	447313.2100	1752090.2050	207.95	230+74.05	0.97 LT
	150	BL-150	447358.5460	1752276.0390	222.91	232+65.34	0.25 LT
	151	BL-151	447427.0910	1752551.1650	194.94	235+48.87	0.57 LT
	152	BL-152	447470.2790	1752724.3320	195.90	237+27.34	0.81 LT
	153	BL-153	447560.2460	1753087.0910	228.48	241+01.09	0.83 LT
	154	BL-154	447646.0160	1753430.5960	251.31	244+55.14	1.41 LT
	155	BL-155	447711.7880	1753698.3080	280.92	247+30.82	0.83 LT
	156	BL-156	447788.2330	1754008.7950	296.48	250+50.57	0.30 LT
	157	BL-157	447871.2230	1754329.0840	324.60	253+81.42	3.77 LT
	158	BL-158	447914.8870	1754513.4000	319.98	255+70.83	1.79 LT
	159	BL-159	447976.1930	1754762.1240	293.10	258+27.00	1.44 LT
	160	BL-160	448050.3920	1755071.2620	318.43	261+44.91	0.94 RT
	161	BL-161	448130.4720	1755387.7220	332.18	264+71.34	0.63 LT
	162	BL-162	448210.0580	1755705.3570	334.28	267+98.79	1.43 LT
	163	BL-163	448283.1780	1756007.6510	331.28	271+09.80	0.35 RT
	164	BL-164	448382.2650	1756404.7760	311.57	275+19.10	0.26 LT
	165	BL-165	448468.8080	1756743.0060	326.25	278+68.22	0.77 RT
	166	BL-166	448589.2840	1757139.3220	339.97	282+82.40	2.81 RT
	167	BL-167	448731.4490	1757524.7920	367.98	286+93.14	3.10 RT
	168	BL-168	448847.6340	1757786.2720	387.12	289+79.22	2.19 LT
	169	BL-169	448970.2860	1758050.6960	366.02	292+70.79	1.28 LT
	170	BL-170	449134.8480	1758367.6350	338.29	296+27.98	0.92 LT
	171	BL-171	449441.6000	1758890.3230	330.28	302+33.93	6.49 RT
	172	BL-172	449588.5870	1759088.4830	322.37	304+80.42	3.24 LT
	173	BL-173	449790.3000	1759367.3610	336.18	308+24.67	0.61 RT
	174	BL-174	450035.6180	1759670.1810	349.02	312+14.38	1.06 RT
	175	BL-175	450284.5660	1759968.4600	358.90	316+02.90	0.45 RT
	176	BL-176	450711.0110	1760480.2710	381.16	322+69.09	0.04 LT
	177	BL-177	450963.7910	1760790.4710	412.09	326+69.27	2.91 RT
	178	BL-178	451165.8570	1761046.3510	441.42	329+95.36	0.75 LT
	179	BL-179	451382.3600	1761353.4400	439.77	333+71.07	1.80 LT
	180	BL-180	451541.2710	1761603.7230	449.84	336+67.50	1.33 LT
	181	BL-181	451721.5630	1761921.0290	446.77	340+32.47	1.33 RT
	182	BL-182	451964.4550	1762387.4120	421.25	345+58.20	6.27 LT
	183	BL-183	452104.4800	1762723.9960	406.07	349+22.56	1.45 LT
	184	BL-184	452204.2790	1762983.2200	359.39	352+00.31	1.44 LT
	185	BL-185	452282.4320	1763201.8420	361.34	354+32.45	1.77 RT
	186	BL-186	452355.5490	1763392.2070	386.61	356+36.37	0.18 LT
	187	BL-187	452472.1320	1763699.0050	407.52	359+64.56	2.15 LT
	188	BL-188	452642.9680	1764136.4990	435.09	364+34.33	8.07 LT
	189	BL-189	452732.6480	1764349.0750	436.95	366+65.40	9.02 LT
	190	BL-190	452948.4500	1764826.0330	382.25	371+88.71	9.85 RT
	191	BL-191	453129.5200	1765106.2480	368.36	375+21.94	2.84 LT
	192	BL-192	453317.7320	1765383.2820	370.13	378+57.10	3.76 LT
	193	BL-193	453574.6600	1765734.5770	352.75	382+92.03	9.18 RT

BY5	POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
	211	BY5-211	451740.4450	1757932.4290	368.00	OUTSIDE PROJECT LIMITS	
	212	BY5-212	450846.9550	1758146.9280	366.41	16+91.96	8.28 RT
	213	BY5-213	450196.1650	1758647.2070	351.30	25+03.91	201.58 LT
	8	R3421-8	449771.9580	1758721.1742	348.60	29+14.63	62.18 LT
	171	BL-171	449441.6000	1758890.3230	330.28	32+85.60	50.77 LT
	7	R3421-7	448190.7047	1759522.2750	318.92	46+83.79	34.53 RT
	214	BY5-214	447917.5480	1759742.4460	311.82	OUTSIDE PROJECT LIMITS	

BY6	POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
	215	BY6-215	451663.4820	1761053.3870	419.77	10+03.03	12.84 LT
	179	BL-179	451382.3600	1761353.4400	439.77	14+12.59	25.02 RT
	216	BY6-216	451113.3380	1761756.1890	444.78	18+95.42	13.22 LT

.....

BM11 ELEVATION + 394.77
N 442117 E 1746713
L STATION 148+68 765 RIGHT
RR SPIKE IN BASE OF POWER POLE
.....

BM12 ELEVATION + 374.71
N 442463 E 1746211
L STATION 150+19 172 RIGHT
RR SPIKE IN BASE OF 6" SWEET GUM
.....

BM13 ELEVATION + 338.21
N 443956 E 1747471
L STATION 170+38 545 RIGHT
RR SPIKE IN BASE OF 8" PINE
.....

BM14 ELEVATION + 364.76
N 444763 E 1747747
L STATION 178+77 238 RIGHT
RR SPIKE IN BASE OF 15" PINE
.....

BM15 ELEVATION + 343.75
N 446274 E 1749806
L STATION 205+32 267 RIGHT
RR SPIKE IN BASE OF 24" OAK
.....

BM16 ELEVATION + 286.08
N 446817 E 1751114
L STATION 219+98 241 RIGHT
RR SPIKE IN BASE OF 15" PINE
.....

BM17 ELEVATION + 251.45
N 447107 E 1752320
L STATION 232+47 254 RIGHT
RR SPIKE IN BASE OF 10" PINE
.....

BM18 ELEVATION + 252.50
N 447853 E 1753300
L STATION 243+78 234 LEFT
RR SPIKE IN BASE OF 8" PINE
.....

BM19 ELEVATION + 333.30
N 448163 E 1754480
L STATION 255+98 251 LEFT
RR SPIKE IN BASE OF 15" SWEET GUM
.....

BM20 ELEVATION + 343.28
N 448401 E 1755489
L STATION 266+35 239 LEFT
RR SPIKE IN BASE OF 15" PINE
.....

BM21 ELEVATION + 326.41
N 448635 E 1756407
L STATION 275+82 245 LEFT
RR SPIKE IN BASE OF 15" ELM
.....

BM22 ELEVATION + 355.28
N 448515 E 1757550
L STATION 286+38 214 RIGHT
RR SPIKE IN BASE OF 6" PINE
.....

BM23 ELEVATION + 319.85
N 448839 E 1759294
L STATION 302+39 732 RIGHT
RR SPIKE IN BASE OF 12" PINE
.....

BY3	POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
	208	BY3-208	440782.7550	1744467.0310	390.79	OUTSIDE PROJECT LIMITS	
	123	BL-123	441669.3510	1745752.8110	380.45	24+31.96	20.82 LT
	209	BY3-209	442154.1070	1746756.7820	393.58	OUTSIDE PROJECT LIMITS	

BY4	POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
	210	BY4-210	444419.0620	1745346.3970	270.41	OUTSIDE PROJECT LIMITS	
	6	R3421-6	444453.2875	1746163.4960	277.09	12+45.71	16.61 LT
	134	BL-134	444130.9960	1746917.5050	301.08	20+66.50	30.37 RT
	5	R3421-5	444001.2938	1747263.8217	315.46	24+36.11	13.62 LT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R3421-11" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 438375.9441(ft) EASTING: 1746551.2575(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987565 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R3421-11" TO L- STATION 133+00.00 N 20°51'48.0" W 2670.378' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL BASE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
 - THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R3421B_LLS_GPSCALIB_04I124.HTML
R3421B_LLS_WGS84_04I124.TXT
R3421B_LLS_LOCAL_04I124.TXT
R3421B_LLS_CONTROL_04I124.TXT
- THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

SURVEY CONTROL SHEET FINAL

Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPD and YSRPC.

Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPD.

Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

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Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPD.

Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPC.

Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

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Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPD.

Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPC.

Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

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Table with columns: TYPE, STATION, NORTH, EAST. Data for YSRPD.

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Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

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Table with columns: ALIGN, STATION, OFFSET, NORTH, EAST. Data for ROW MARKER IRON PIN AND CAP.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R3421-11"

INDICATES CONTROL MONUMENTS SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.

SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

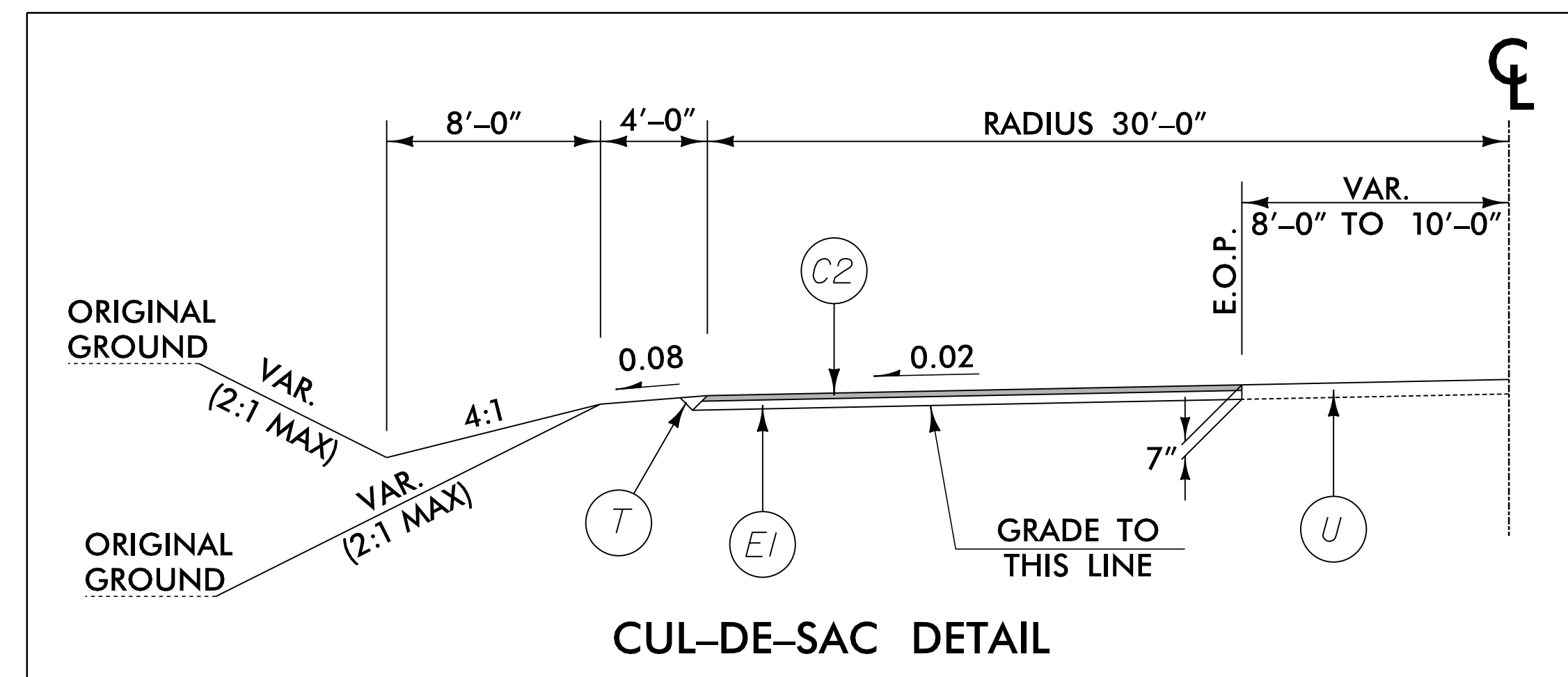
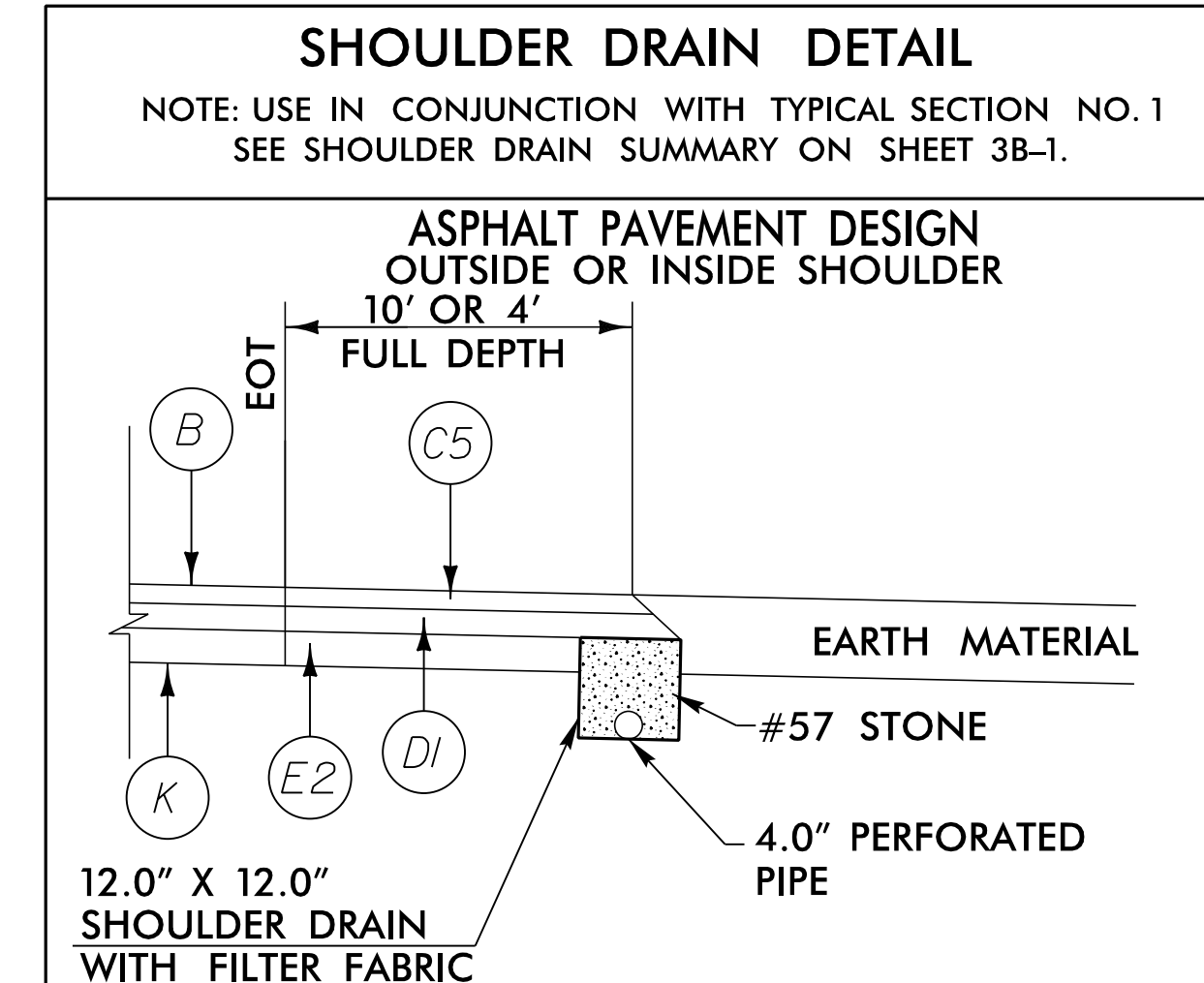
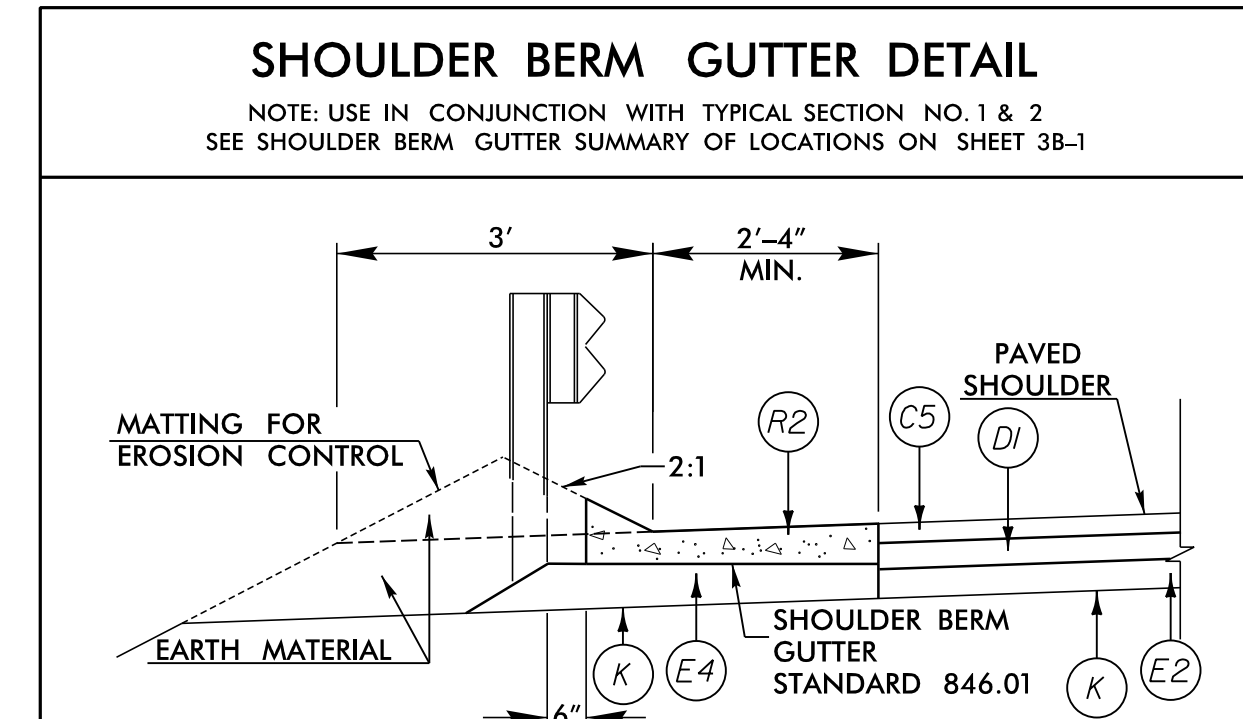
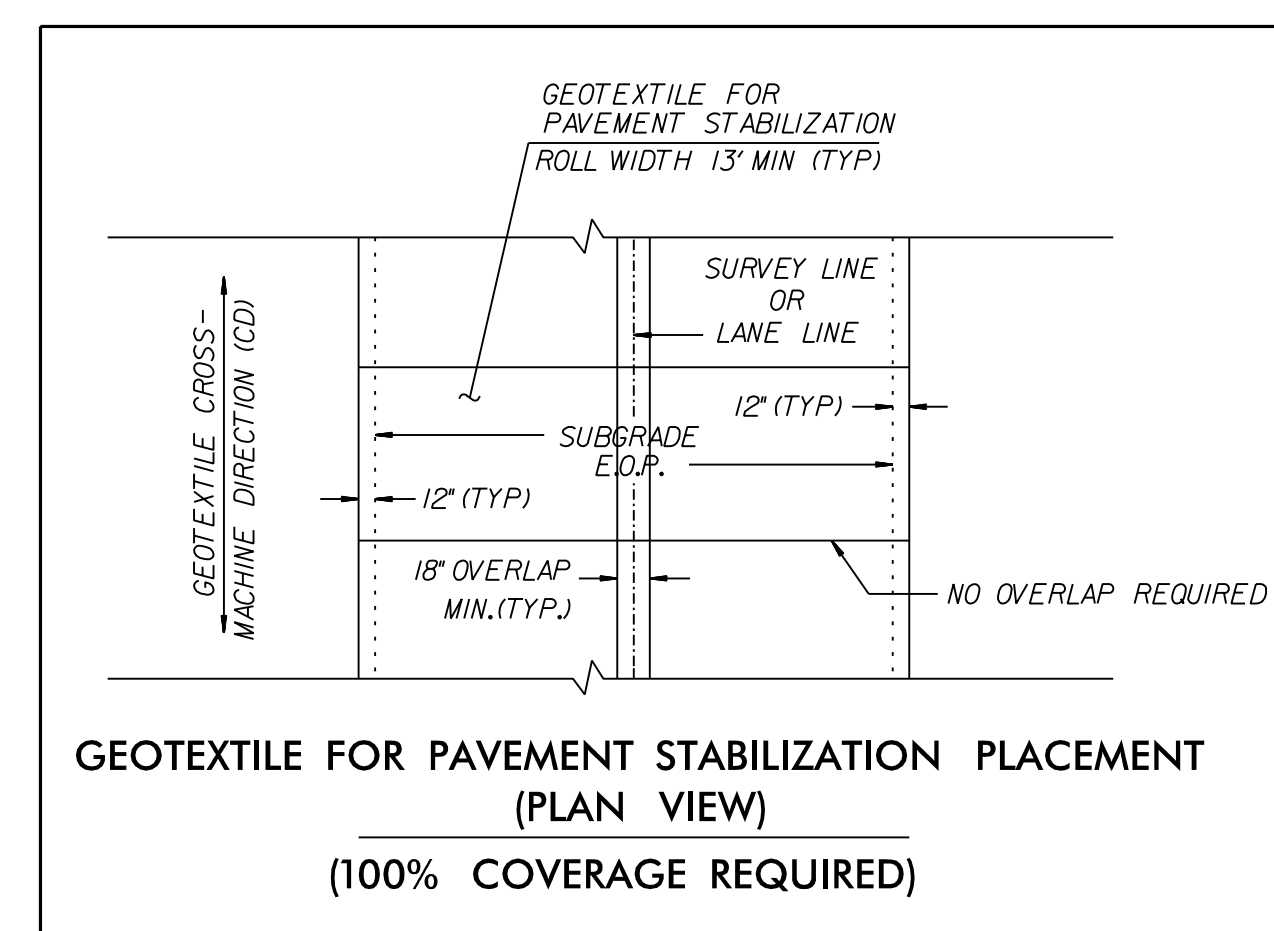
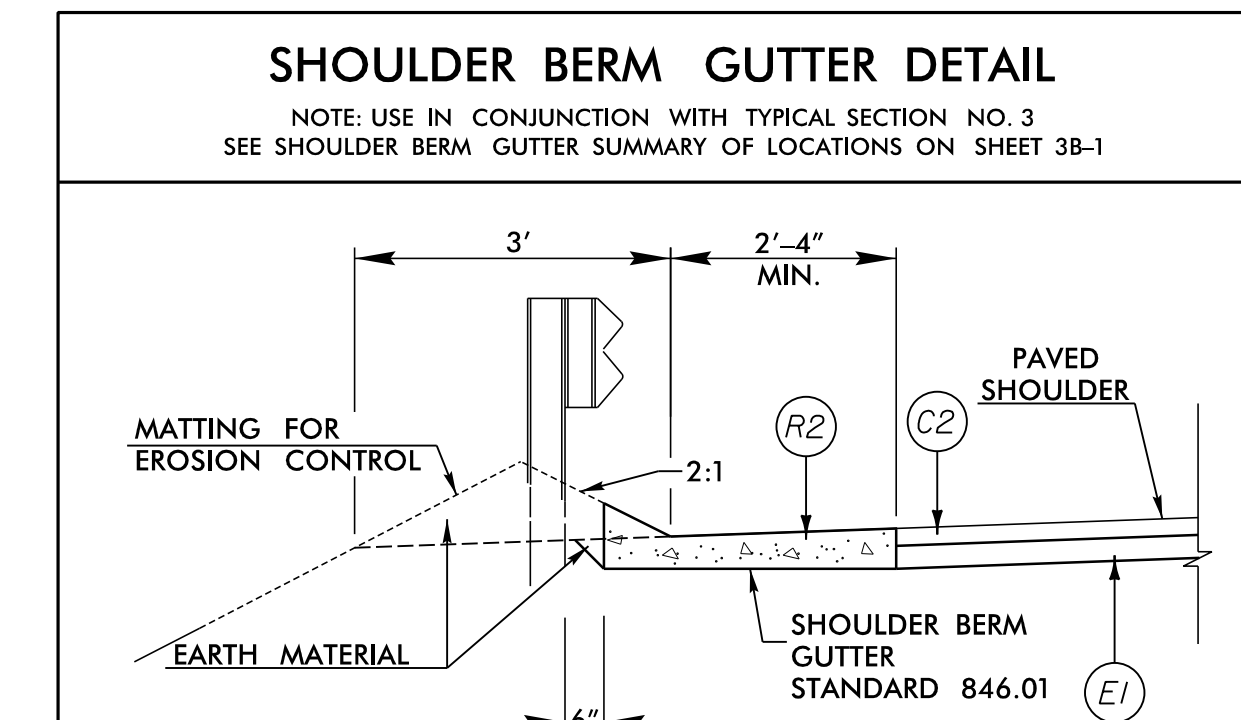
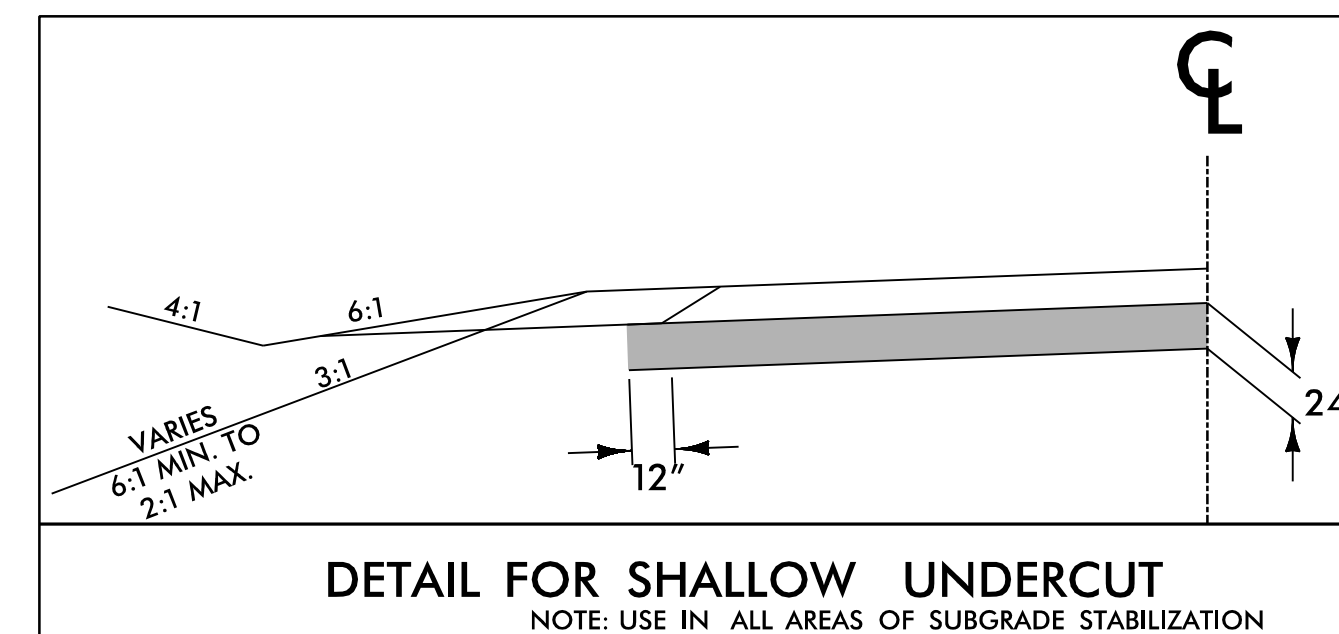
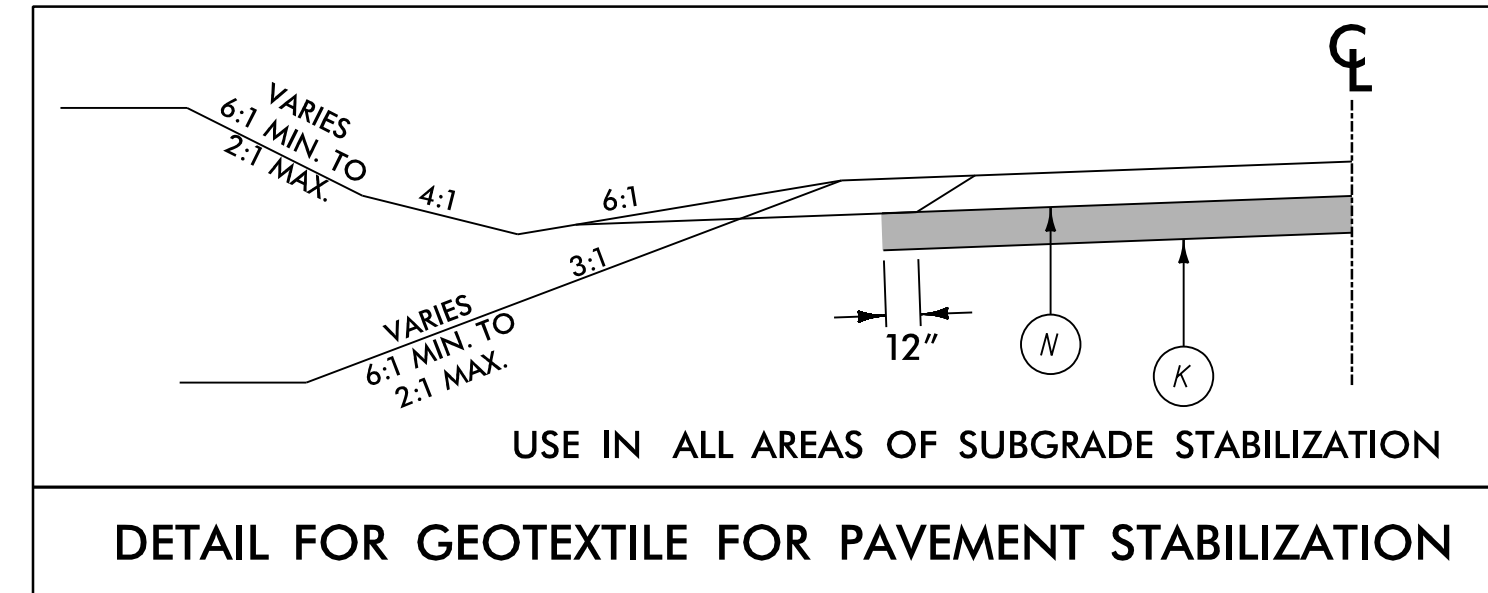
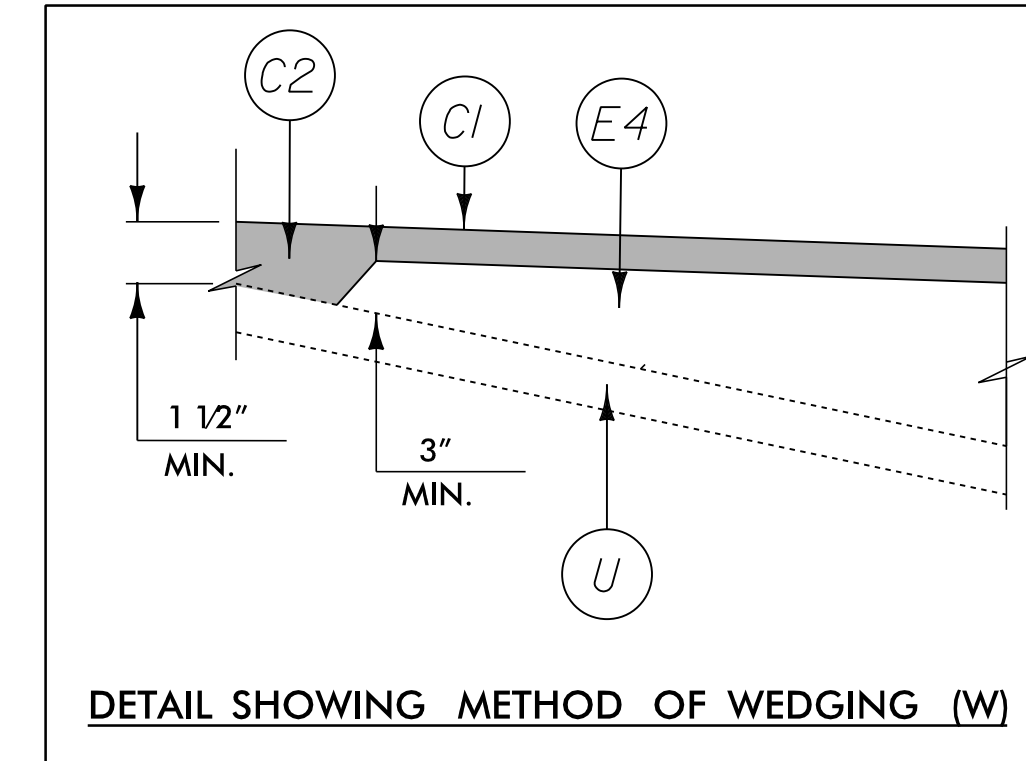
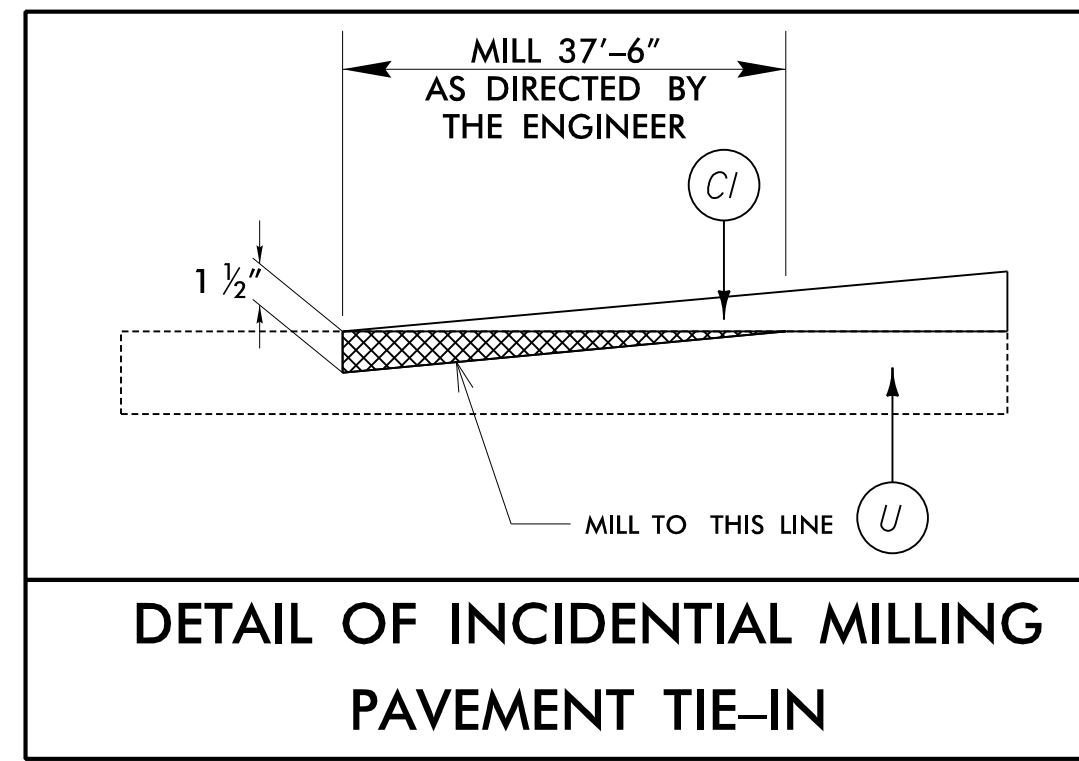
NOTE: DRAWING NOT TO SCALE

NOTES

- 1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT...

FINAL PAVEMENT SCHEDULE (MAY 8TH, 2019)	
B	PROP. OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS PER SQ. YARD.
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C4	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C5	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E3	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
J1	PROP. 8" AGGREGATE BASE COURSE.
K	PROP. 8" LIME STABILIZATION (METHOD SLURRY) AT RATE OF 24 LBS. PER SQ. YD. OR PROP 7" CEMENT STABILIZATION AT A RATE OF 56 LBS. PER SQ. YD.
M	RUMBLE STRIP.
N	GEOTEXTILE FOR PAVEMENT STABILIZATION
P1	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
R1	2'-6" CURB AND GUTTER.
R2	3'-0" SHOULDER BERM GUTTER.
R3	4'-0" CONCRETE EXPRESSWAY GUTTER.
R4	5" MONOLITHIC CONCRETE ISLAND. (KEYED IN).
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	1.5" MILLING DEPTH.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.



USE DETAIL AS FOLLOWS:
 FROM -Y4- STA. 17+44.75 TO 18+20 LT. & RT. FROM -Y4- STA. 23+13.60 TO 23+89.98 LT. & RT.
 FROM -Y6- STA. 11+23.24 TO 12+00 LT. & RT. FROM -Y6- STA. 16+57.57 TO 17+33.96 LT. & RT.

CALYX
 ENGINEERS + CONSULTANTS
 6750 TRYON ROAD
 CARY, NC 27518
 phone: 919.851.9112
 CALYXengineers.com
 NC License # F-1333

PROJECT REFERENCE NO. R-3421B	SHEET NO. 2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 8/7/2019 Stephen C. Browde	PAVEMENT DESIGN ENGINEER 8/7/2019 Shihai Zhang

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

8/16/2019
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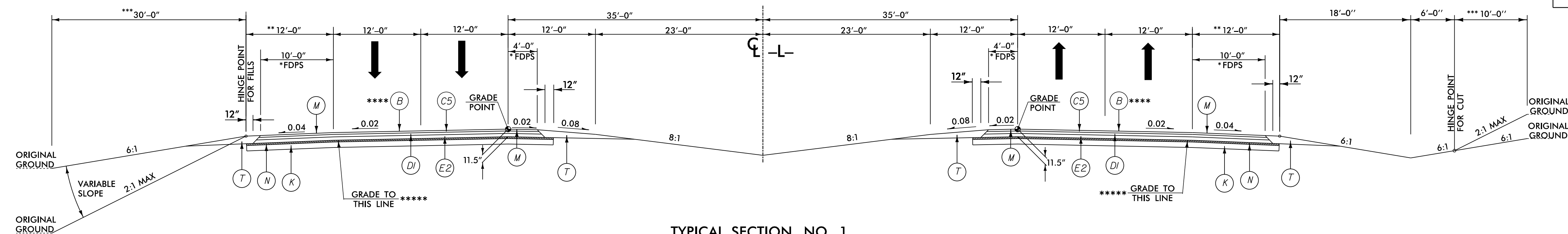
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ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
PHONE: 919.851.1912
CALYXengineers.com
NC License # F-1333

PROJECT REFERENCE NO. **R-3421B** SHEET NO. **2A-2**
RW SHEET NO.

ROADWAY DESIGN ENGINEER **STEPHEN C. BROUDE** 3/3/2020
PAVEMENT DESIGN ENGINEER **SHILAI ZHANG** 3/3/2020

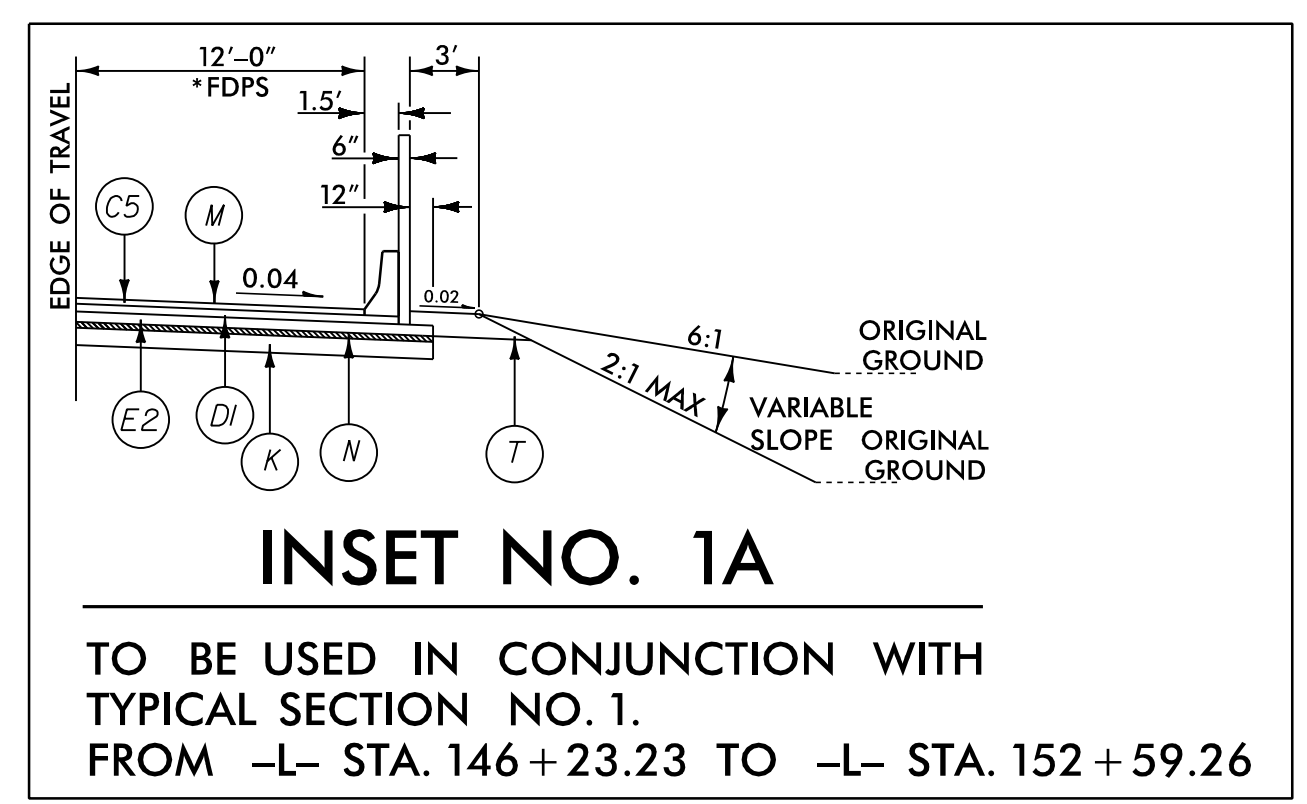
SEAL 15759
SEAL 038176

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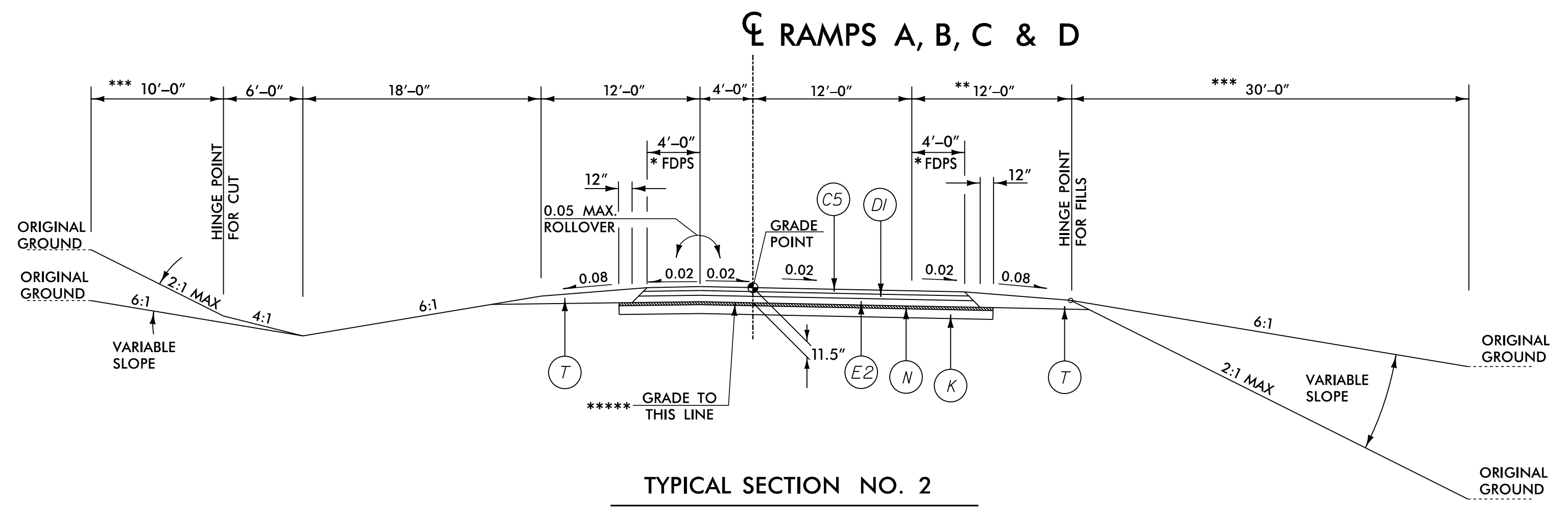
TYPICAL SECTION NO. 1

USE TYPICAL SECTION No. 1 AS FOLLOWS:
FROM -L- STA. 128+00 TO -L- STA. 301+18.32 BEGIN BRIDGE (NBL)
FROM -L- STA. 302+44.58 END BRIDGE (NBL) TO -L- STA. 355+00



INSET NO. 1A

TO BE USED IN CONJUNCTION WITH
TYPICAL SECTION NO. 1.
FROM -L- STA. 146+23.23 TO -L- STA. 152+59.26



RAMP A, B, C & D

TYPICAL SECTION NO. 2

USE TYPICAL SECTION No. 2 AS FOLLOWS:
(RAMP AT -Y5-)
RAMP A STA. 0+00 TO RAMP A STA. 13+82.68
RAMP B STA. 0+00 TO RAMP B STA. 15+03.92
RAMP C STA. 0+00 TO RAMP C STA. 15+12.68
RAMP D STA. 0+00 TO RAMP D STA. 14+70.48

PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" B25.0C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	3'-0" SH. BERM GUTTER
R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

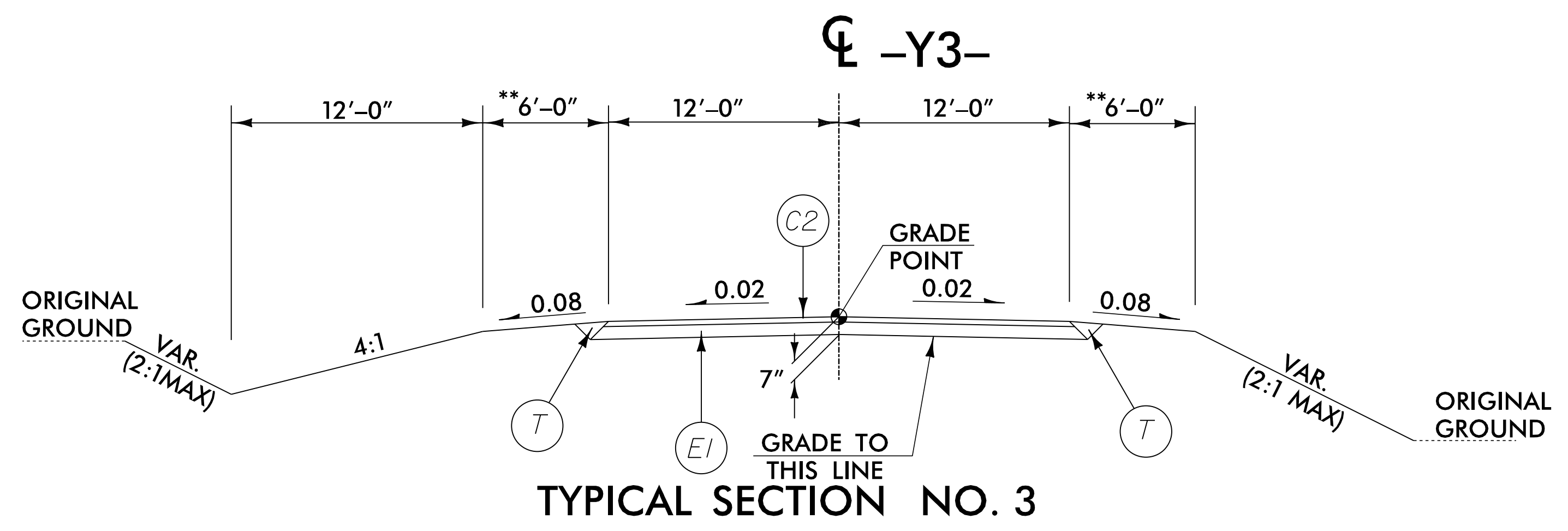
REVISIONS
CONSTRUCTION REVISION #1 - 2/28/2020 - NOISE WALL (-NWT-) TYPICAL DETAIL ADDED.

3/3/2020
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ovest

- * FDPS = FULL DEPTH PAVED SHOULDER
- ** ADD 3'-0" FOR GUARDRAIL
- *** WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS OF 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.
- **** OGFC TO BE PLACED AT EDGE OF RUMBLE STRIP TO EDGE OF RUMBLE STRIP NOT TO COVER RUMBLE STRIPS. STOP OGFC ON RAMPS AT BACK OF GORE AREA.
- ***** SEE SHEET 3G-1 FOR LOCATIONS OF GEOTEXTILE FOR PAVEMENT STABILIZATION.

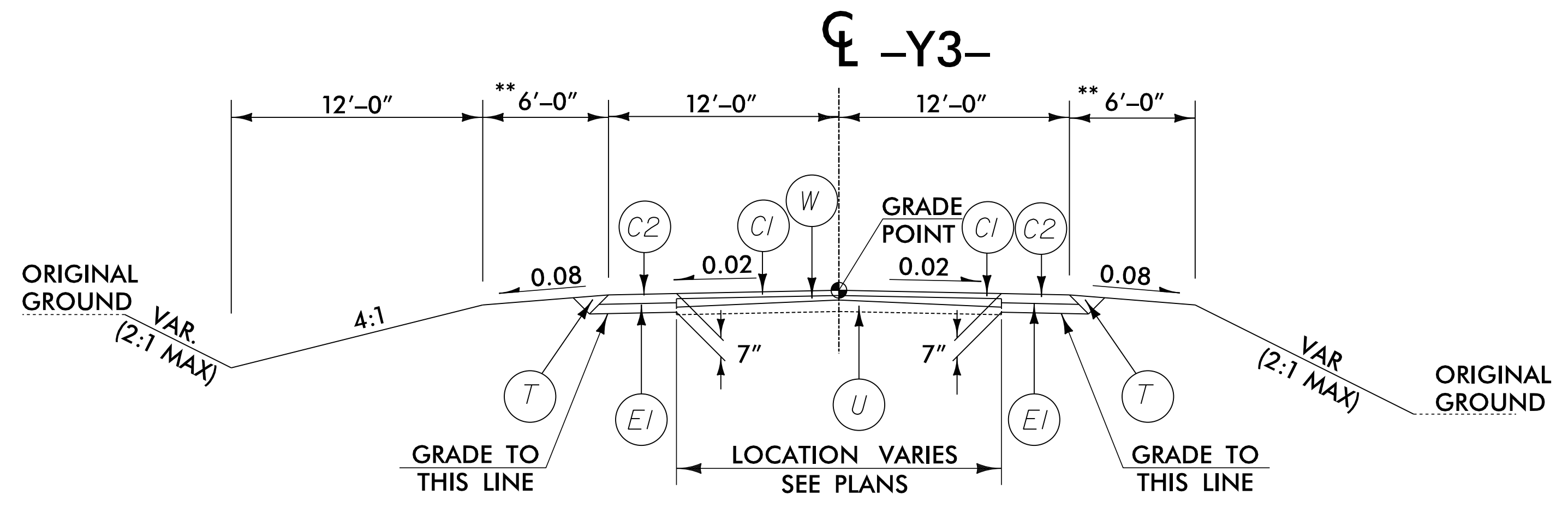
CALYX
ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXengineers.com
NC License # F-1333

PROJECT REFERENCE NO. **R-3421B** SHEET NO. **2A-3**
RW SHEET NO.
ROADWAY DESIGN ENGINEER 7/11/2019
PAVEMENT DESIGN ENGINEER 7/11/2019
STEPHEN C. BROWNE
SEAL 15759
SHIHAI ZHANG
SEAL 038176
DESIGNED BY: Stephen C. Browne
CHECKED BY: Shihai Zhang
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



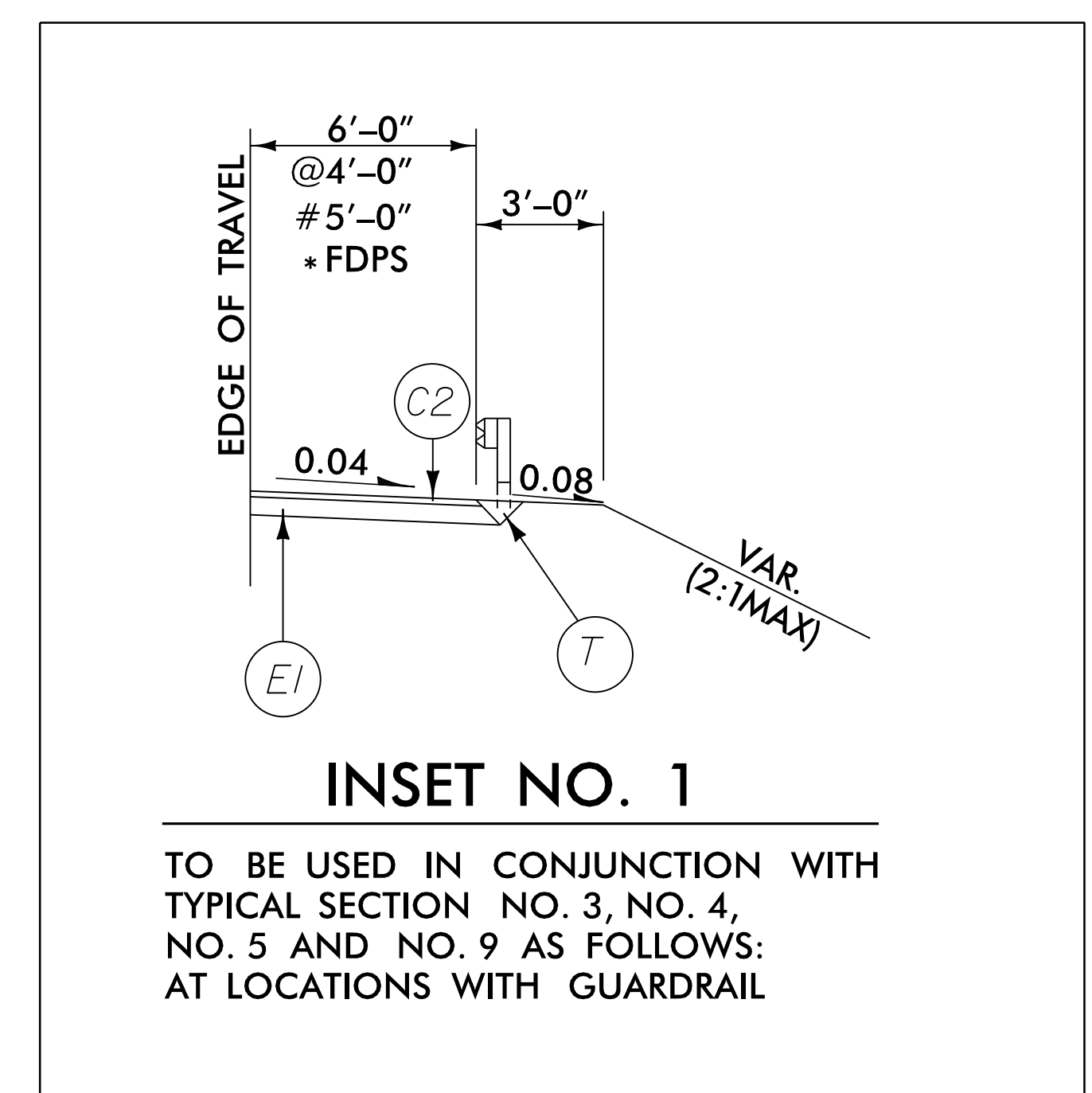
USE TYPICAL SECTION No. 3 AS FOLLOWS:
FROM -Y3- STA. 20+50 TO -Y3- STA. 23+16.67 BEGIN BRIDGE
FROM -Y3- STA. 25+46.67 END BRIDGE TO -Y3- STA. 26+50

SEE INSET NO. 1

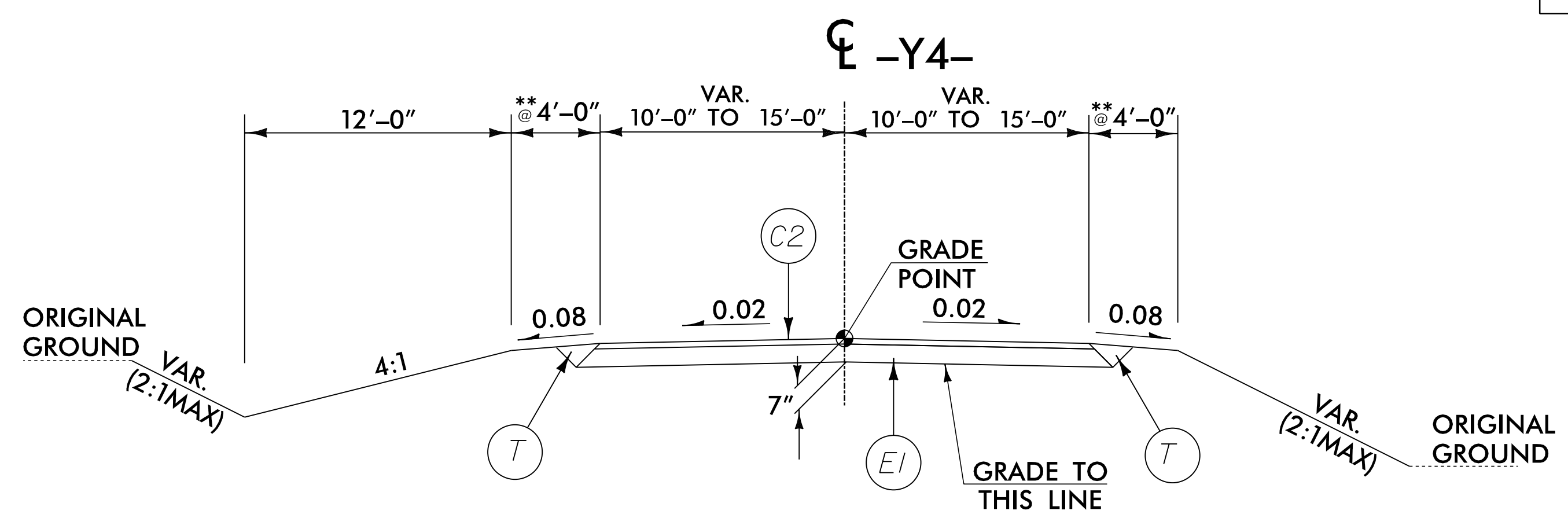


USE TYPICAL SECTION No. 4 AS FOLLOWS:
FROM -Y3- STA. 13+00 TO -Y3- STA. 20+50
FROM -Y3- STA. 26+50 TO -Y3- STA. 29+30

SEE INSET NO. 1



TO BE USED IN CONJUNCTION WITH
TYPICAL SECTION NO. 3, NO. 4,
NO. 5 AND NO. 9 AS FOLLOWS:
AT LOCATIONS WITH GUARDRAIL



USE TYPICAL SECTION No. 5 AS FOLLOWS:
FROM -Y4- STA. 9+75.26 TO -Y4- STA. 13+00

SEE INSET NO. 1

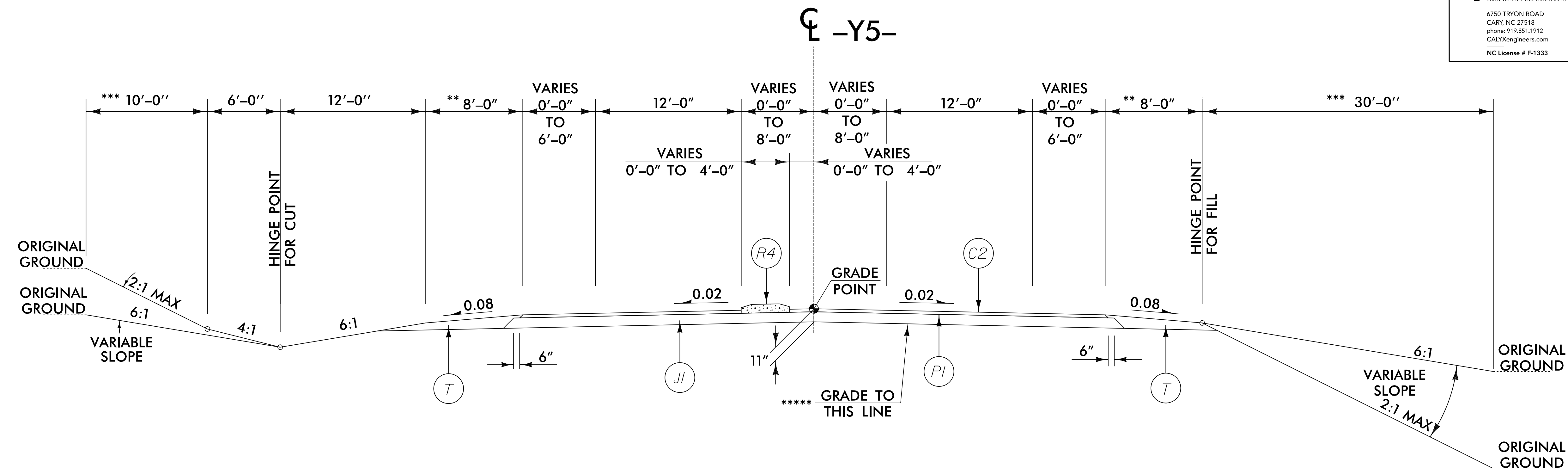
PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" B25.0C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	3'-0" SH. BERM GUTTER
R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

REVISIONS

7/31/2019
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Gougsbourg

* FDPS = FULL DEPTH PAVED SHOULDER
** ADD 3'-0" FOR GUARDRAIL

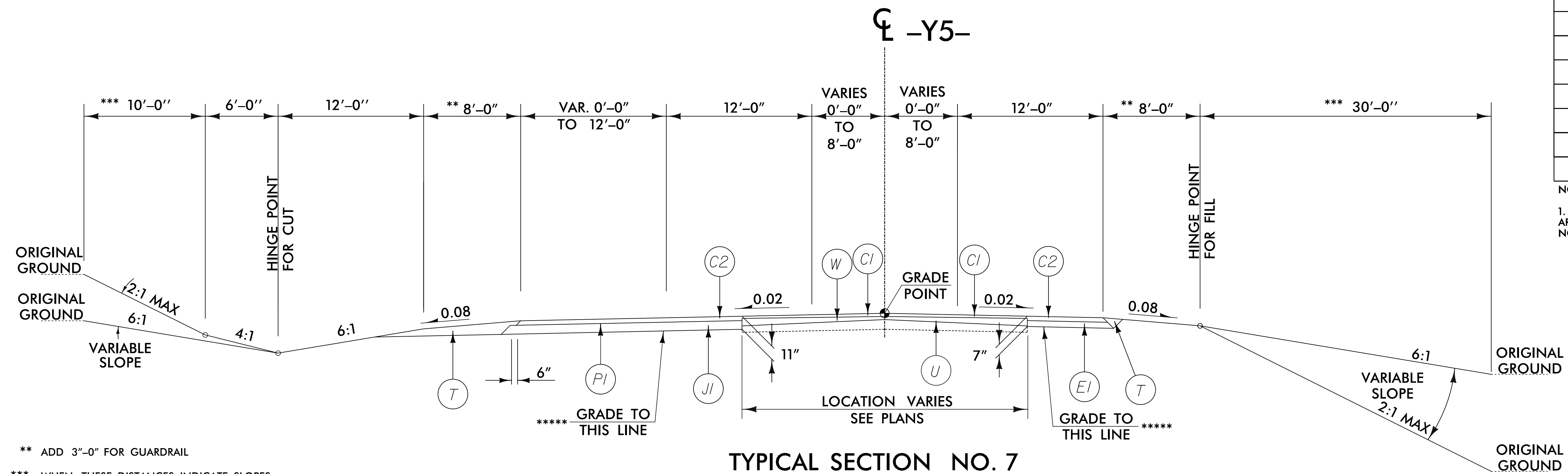


TYPICAL SECTION NO. 6

USE TYPICAL SECTION No. 6 AS FOLLOWS:
FROM -Y5- STA. 16+50 TO -Y5- STA. 33+00
SEE INSET NO. 2

PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" B25.0C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	3'-0" SH. BERM GUTTER
R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED



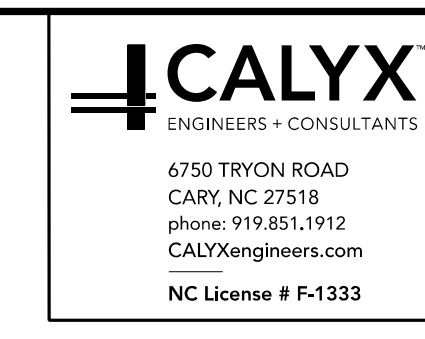
TYPICAL SECTION NO. 7

USE TYPICAL SECTION No. 7 AS FOLLOWS:
FROM -Y5- STA. 10+00 TO -Y5- STA. 16+50
FROM -Y5- STA. 33+00 TO -Y5- STA. 43+75

** ADD 3'-0" FOR GUARDRAIL
*** WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS OF 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.
***** SEE SHEET 3G-1 FOR LOCATIONS OF GEOTEXTILE FOR PAVEMENT STABILIZATION.

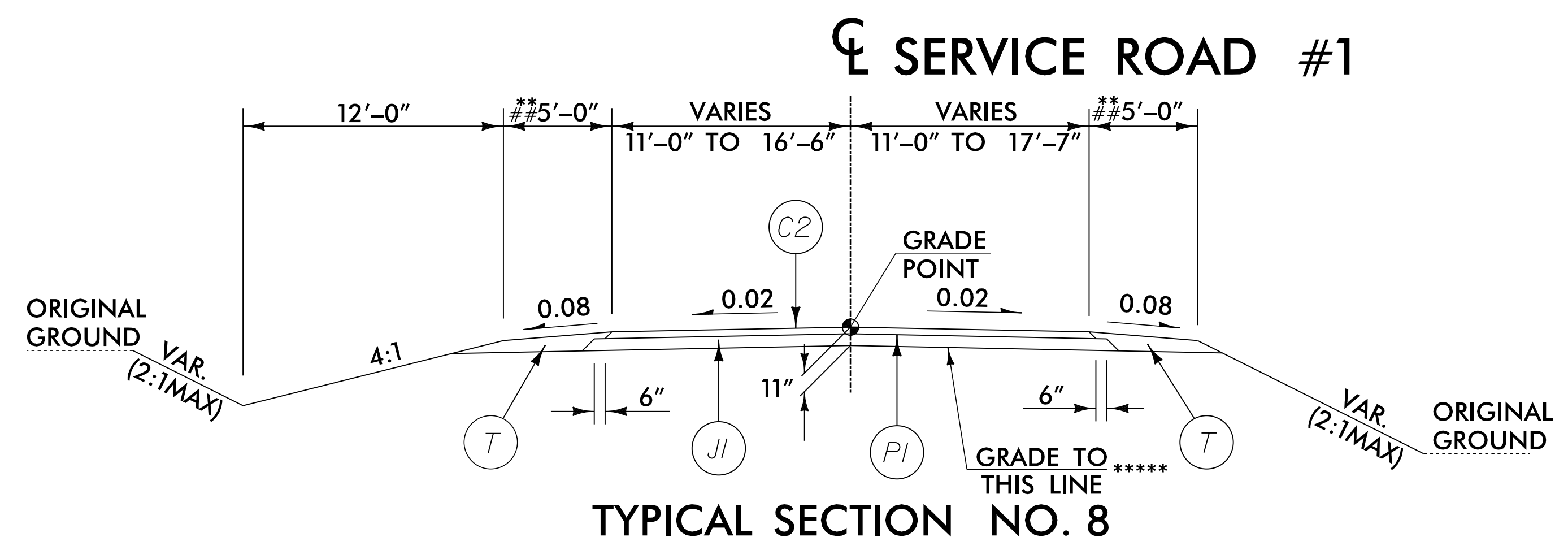
REVISIONS

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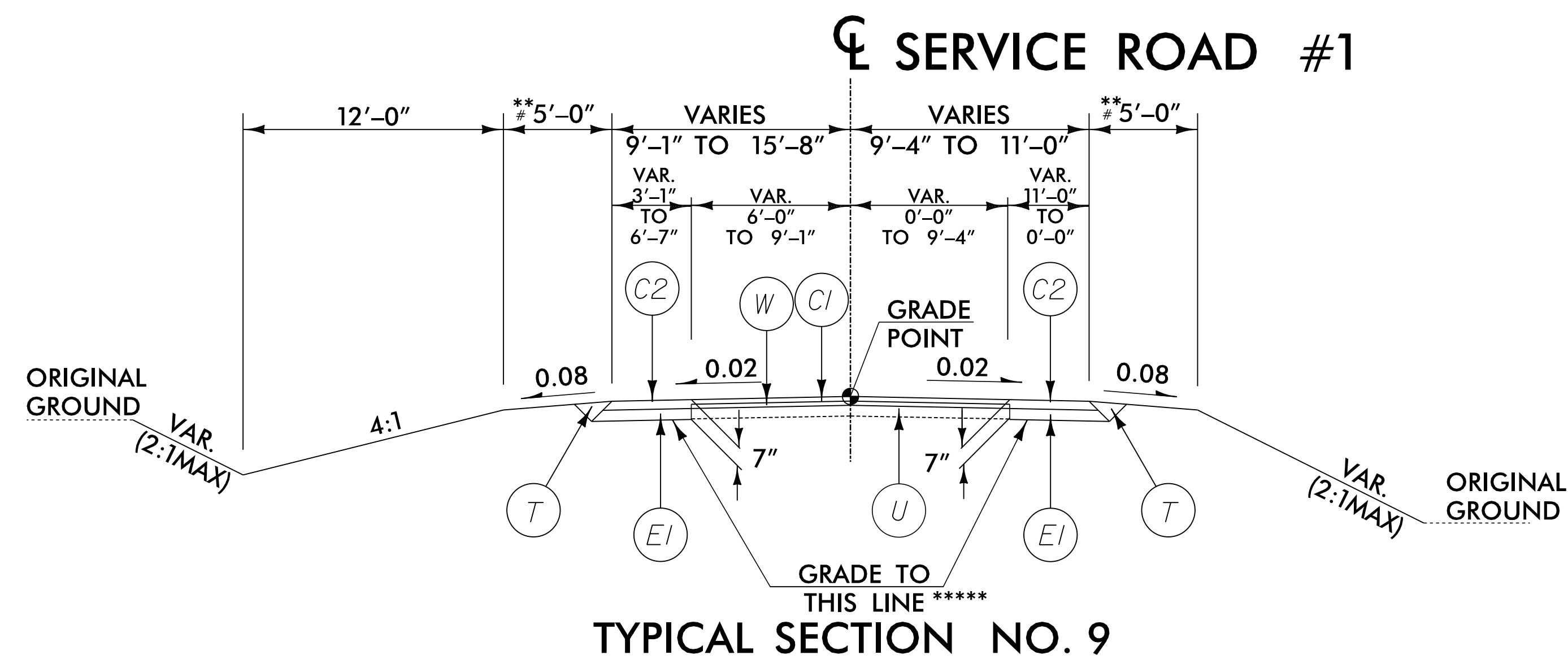


PROJECT REFERENCE NO. R-3421B	SHEET NO. 2A-5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 7/11/2019	PAVEMENT DESIGN ENGINEER 7/11/2019

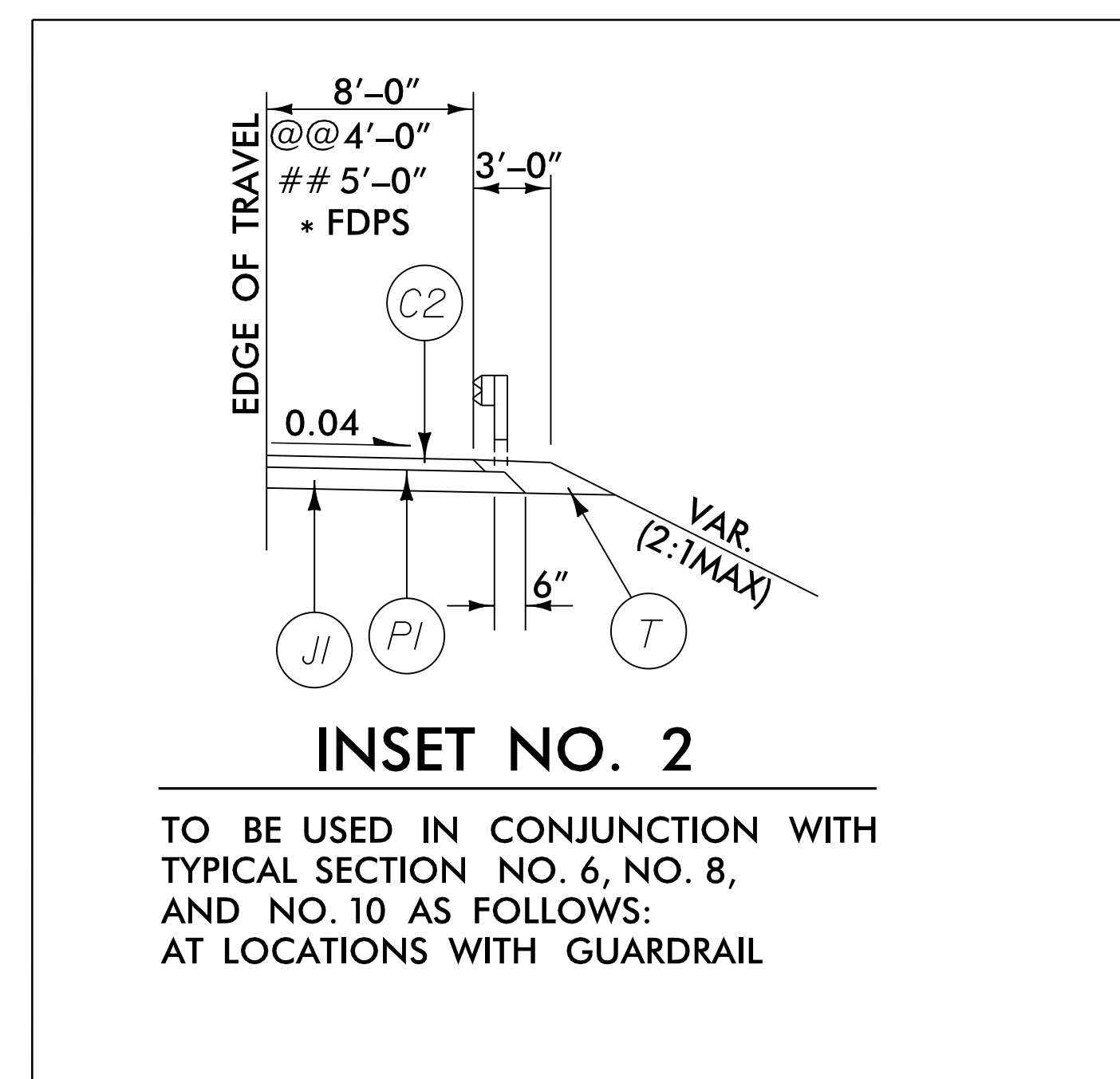
DESIGNED BY: Stephen C. Browde
 CHECKED BY: Shihai Zhang
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



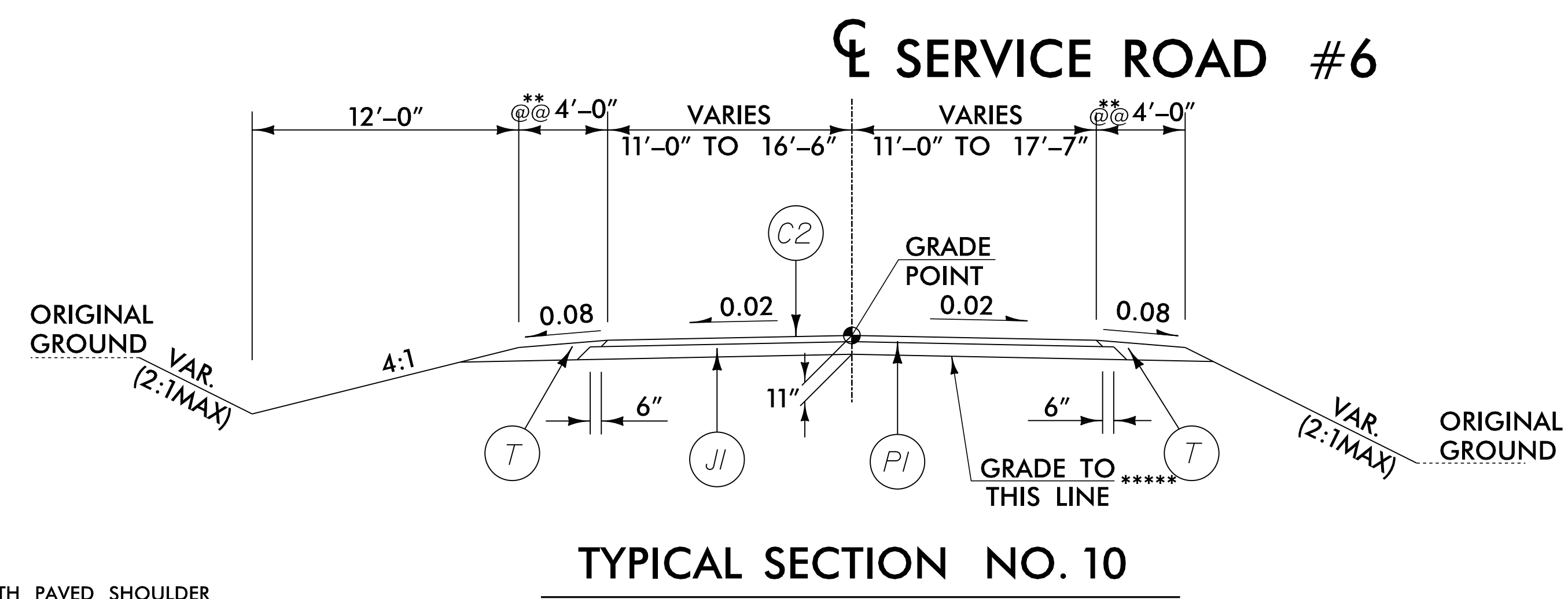
TYPICAL SECTION NO. 8
 USE TYPICAL SECTION No. 8 AS FOLLOWS:
 FROM -SR1REV- STA. 10+12.16 TO -SR1REV- STA. 17+53.73 (LB) =
 FROM -SR1- STA. 18+56.51 (LA) TO -SR1- STA. 45+50
 SEE INSET NO. 2



TYPICAL SECTION NO. 9
 USE TYPICAL SECTION No. 9 AS FOLLOWS:
 FROM -SR1- STA. 45+50 TO -SR1- STA. 49+00
 SEE INSET NO. 1



INSET NO. 2
 TO BE USED IN CONJUNCTION WITH
 TYPICAL SECTION NO. 6, NO. 8,
 AND NO. 10 AS FOLLOWS:
 AT LOCATIONS WITH GUARDRAIL



TYPICAL SECTION NO. 10
 USE TYPICAL SECTION No. 10 AS FOLLOWS:
 FROM -SR6- STA. 10+00 TO -SR6- STA. 20+21.48
 SEE INSET NO. 2

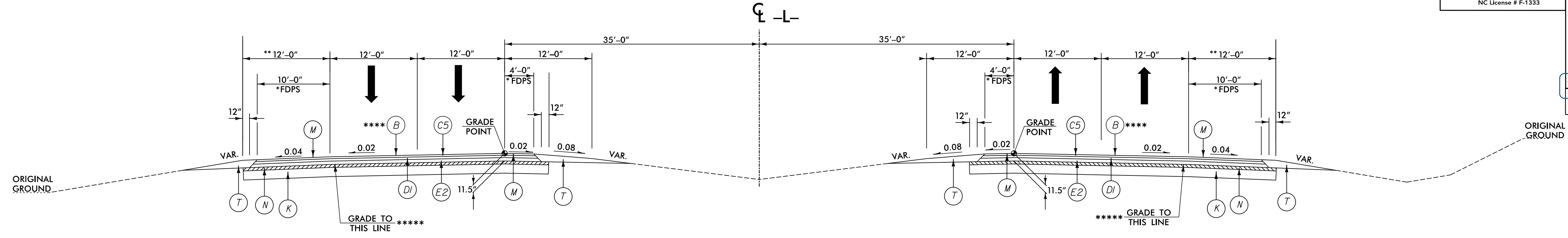
PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" B25.0C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	3'-0" SH. BERM GUTTER
R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
 1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

- * FDPS = FULL DEPTH PAVED SHOULDER
- ** ADD 3"-0" FOR GUARDRAIL
- ***** SEE SHEET 3G-1 FOR LOCATIONS OF GEOTEXTILE FOR PAVEMENT STABILIZATION.

REVISIONS

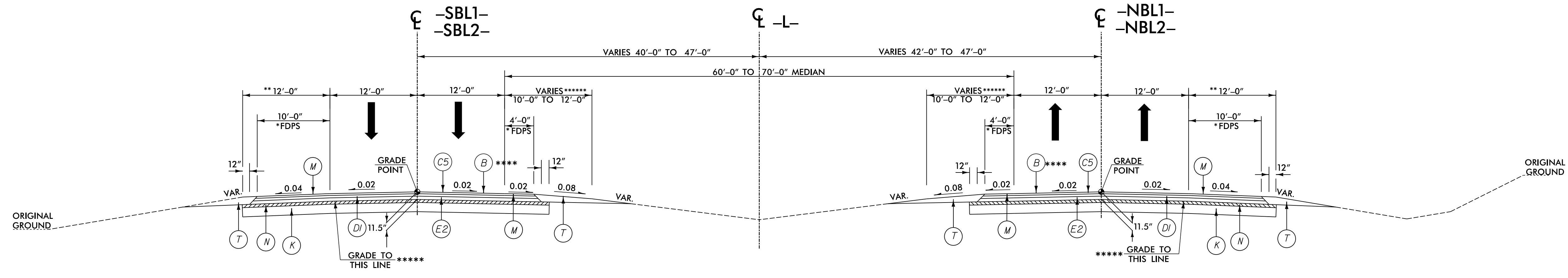
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 RHP



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11:
FROM -L- STA. 355+00.00 LT TO STA. 403+27.02 LT (-SBL1- STA. 403+27.02)
FROM -L- STA. 355+00.00 RT TO STA. 401+75.70 RT (-NBL1- STA. 401+75.70)

GRADE SHOULDERS AND DITCH LINES TO DRAIN TO EXISTING DRAINAGE STRUCTURES.



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12
WITH THE FULL WIDTH NEW PAVEMENT SECTION
ON BOTH SIDES OF THE -L- TYPICAL SECTION:

FROM -SBL1- STA. 403+27.02 TO STA. 414+00.00 (-L- STA. 414+00.00)
FROM -NBL1- STA. 401+75.70 TO STA. 414+00.00 (-L- STA. 414+00.00)

GRADE SHOULDERS AND DITCH LINES TO DRAIN TO EXISTING DRAINAGE STRUCTURES.

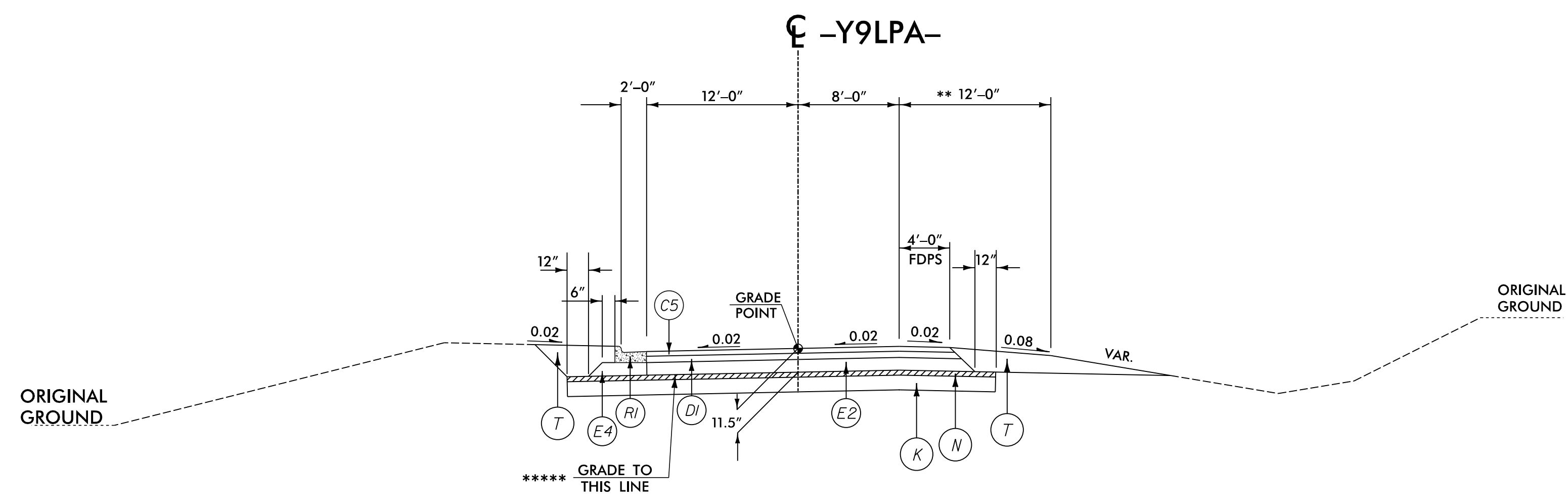
PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	3'-0" SH. BERM GUTTER
R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

- * FDPS = FULL DEPTH PAVED SHOULDER
- ** ADD 3'-0" FOR GUARDRAIL
- **** OGFC TO BE PLACED AT EDGE OF RUMBLE STRIP TO EDGE OF RUMBLE STRIP NOT TO COVER RUMBLE STRIPS. STOP OGFC ON RAMP AT BACK OF GORE AREA.
- ***** SEE SHEET 3G-1 FOR LOCATIONS OF GEOTEXTILE FOR PAVEMENT STABILIZATION.
- ***** TRANSITION 12' MEDIAN SHOULDER TO 10' MEDIAN SHOULDER:
FROM -SBL1- STA. 403+27.02 TO STA. 404+27.02
FROM -NBL1- STA. 401+75.70 TO STA. 402+75.70

7/11/2019 R:\Roadway\Projects\3421b_rdlj_typ.dgn

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

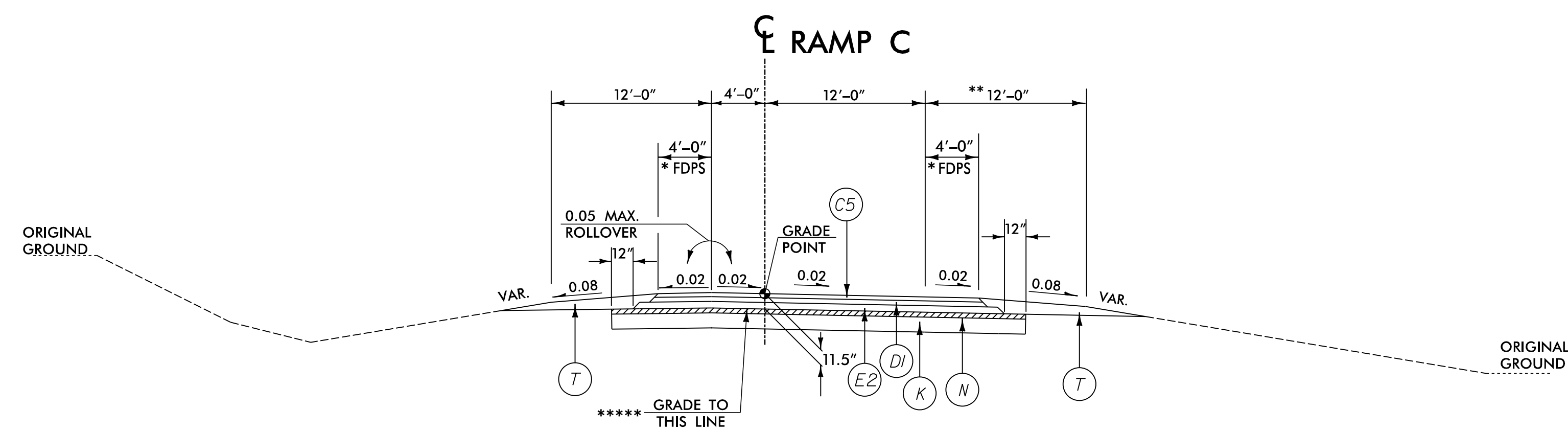


TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO.13:
FROM -Y9LPA- STA. 2+31.65 TO STA. 7+70.00
GRADE SHOULDERS AND DITCH LINES TO DRAIN TO EXISTING DRAINAGE STRUCTURES.

PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
R2	3'-0" SH. BERM GUTTER
R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

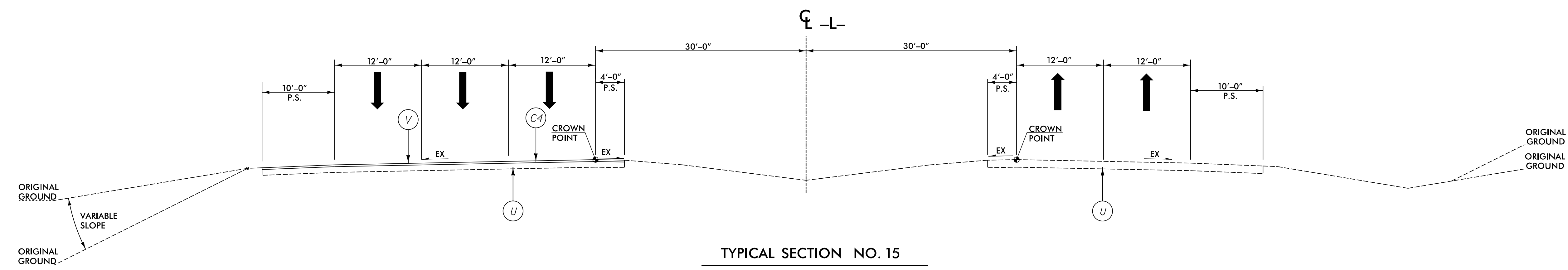


TYPICAL SECTION NO. 14

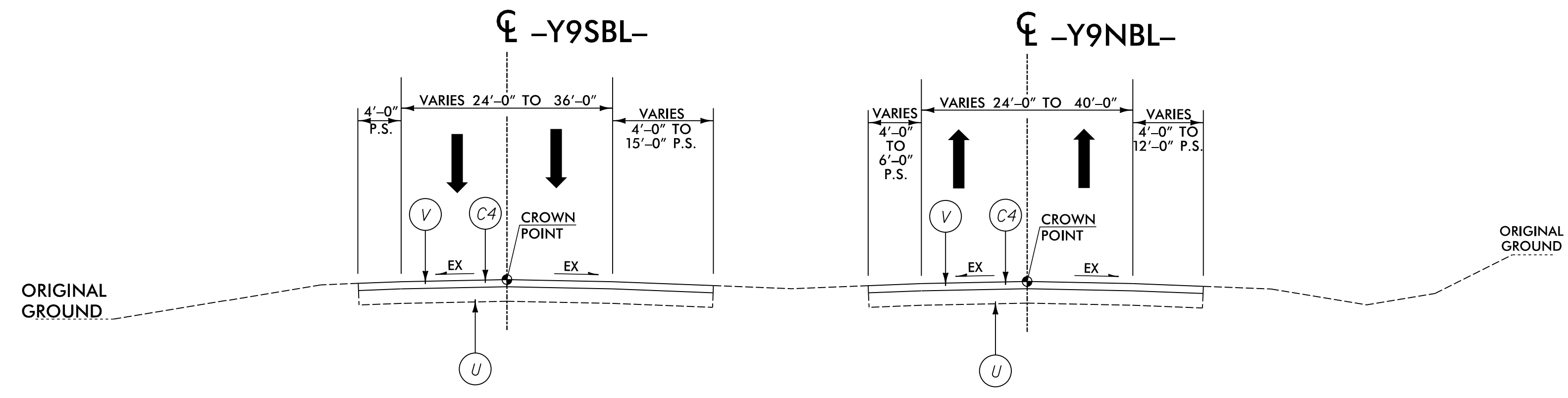
USE TYPICAL SECTION No. 14 AS FOLLOWS:
(RAMPS AT -Y9-)
RAMP C STA. 0+00 TO RAMP C STA. 10+00.00
GRADE SHOULDERS AND DITCH LINES TO DRAIN TO EXISTING DRAINAGE STRUCTURES.

- * FDPS = FULL DEPTH PAVED SHOULDER
- ** ADD 3'-0" FOR GUARDRAIL
- ***** SEE SHEET 3G-1 FOR LOCATIONS OF GEOTEXTILE FOR PAVEMENT STABILIZATION.

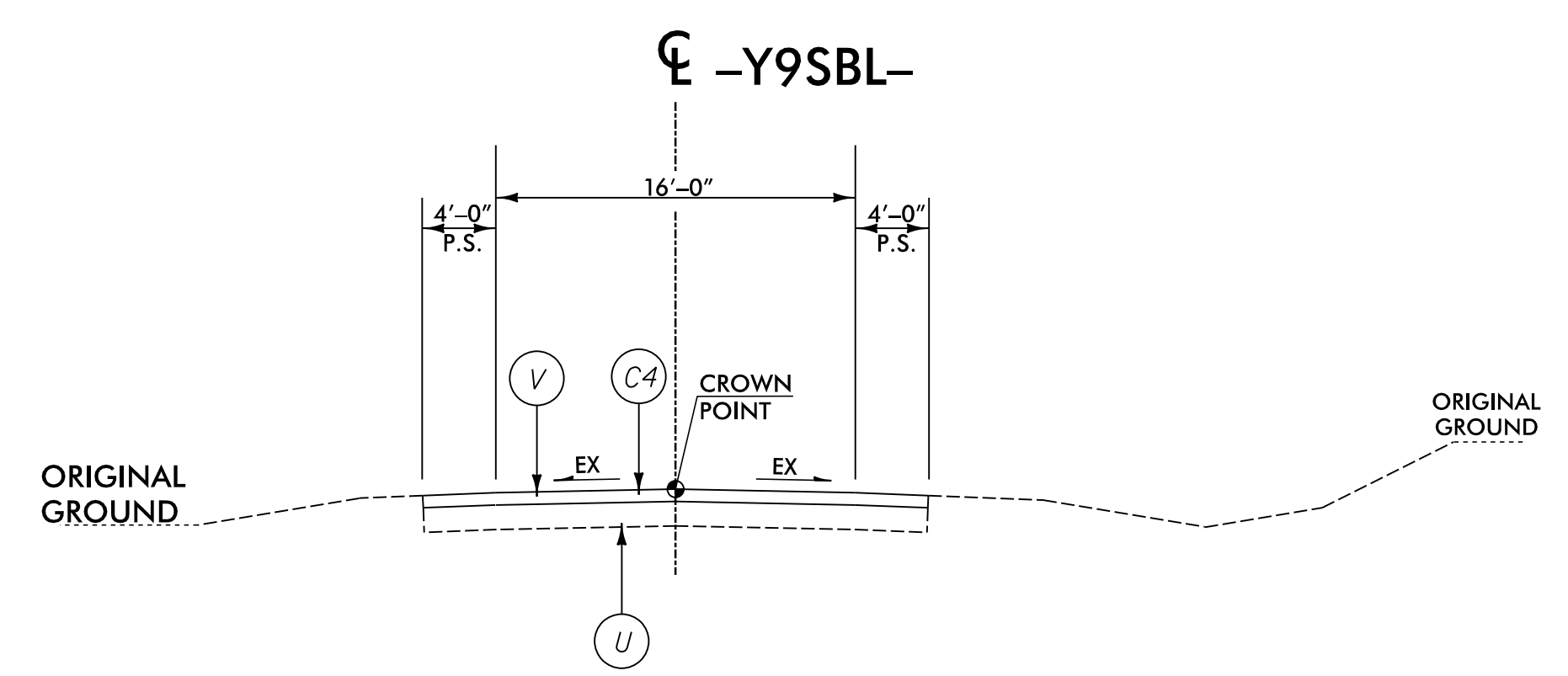
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7/10/2019
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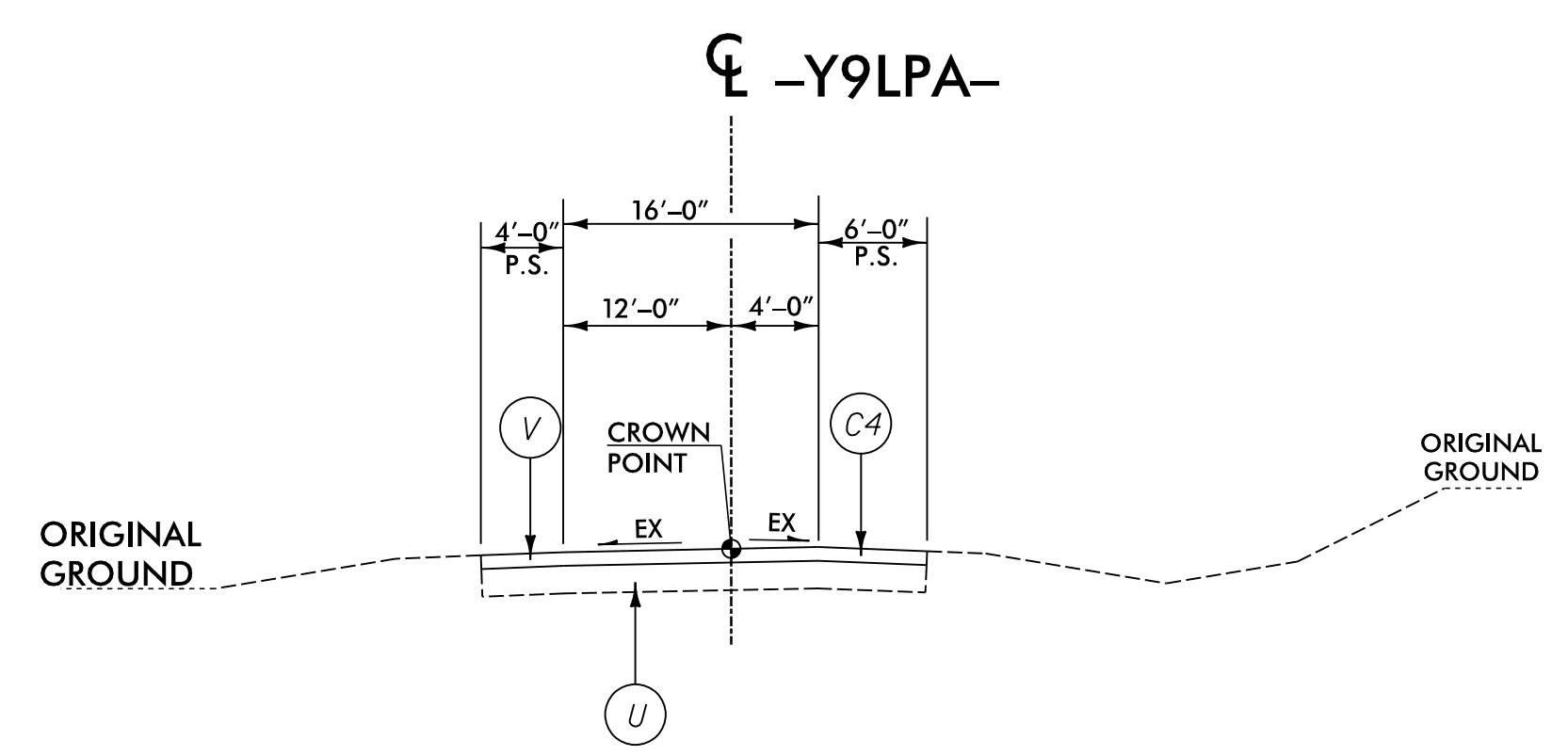
TYPICAL SECTION NO. 15
USE TYPICAL SECTION No. 15 AS FOLLOWS:
-L- STA. 414+00 TO -L- STA. 453+00.00



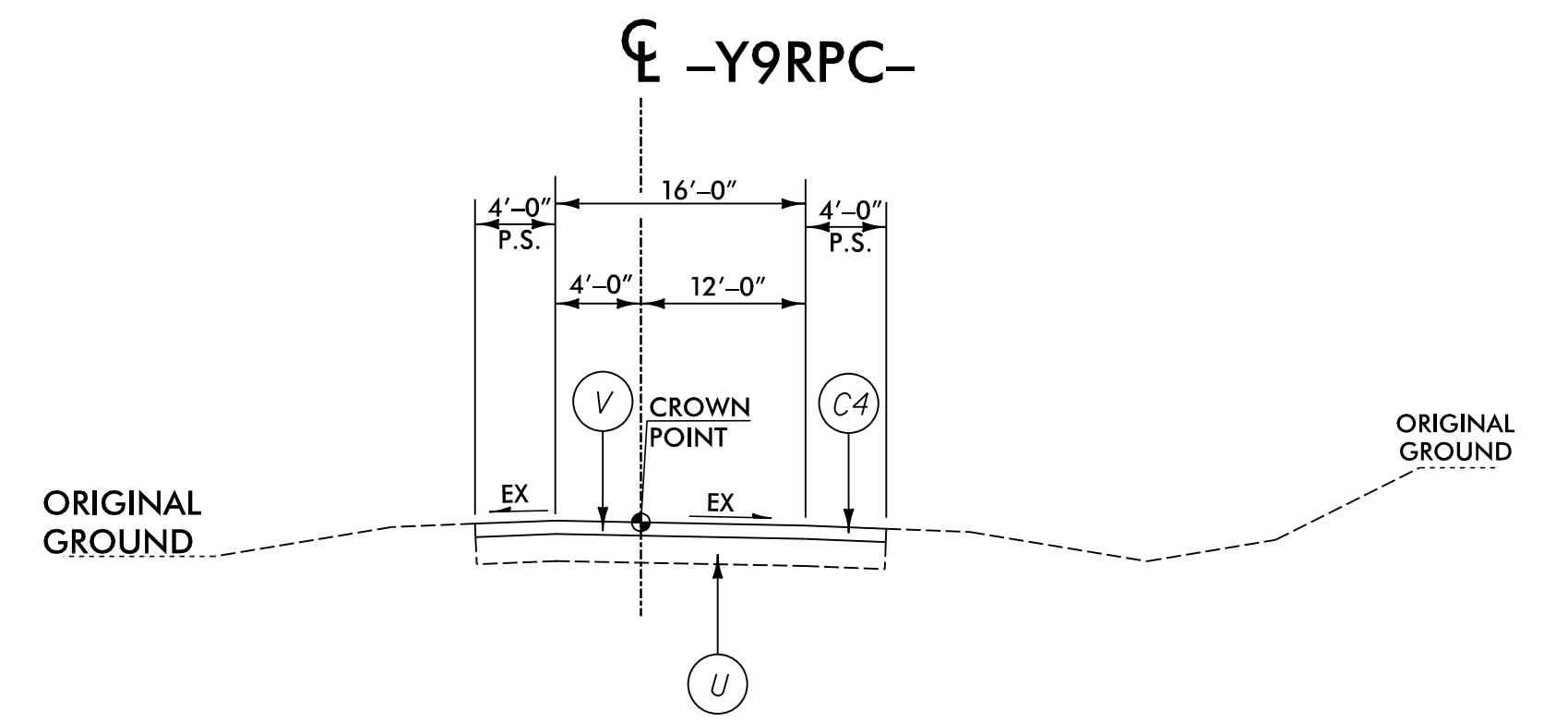
TYPICAL SECTION NO. 16
USE TYPICAL SECTION No. 16 AS FOLLOWS:
-Y9NBL- STA. 32+00 TO -Y9NBL- STA. 49+00
-Y9SBL- STA. 36+50 TO -Y9SBL- STA. 51+04



TYPICAL SECTION NO. 17
USE TYPICAL SECTION No. 17 AS FOLLOWS:
-Y9SBL- STA. 4+51.10 TO -Y9SBL- STA. 6+00



TYPICAL SECTION NO. 18
USE TYPICAL SECTION No. 18 AS FOLLOWS:
-Y9LPA- STA. 26+00 TO -Y9LPA- STA. 27+34.74

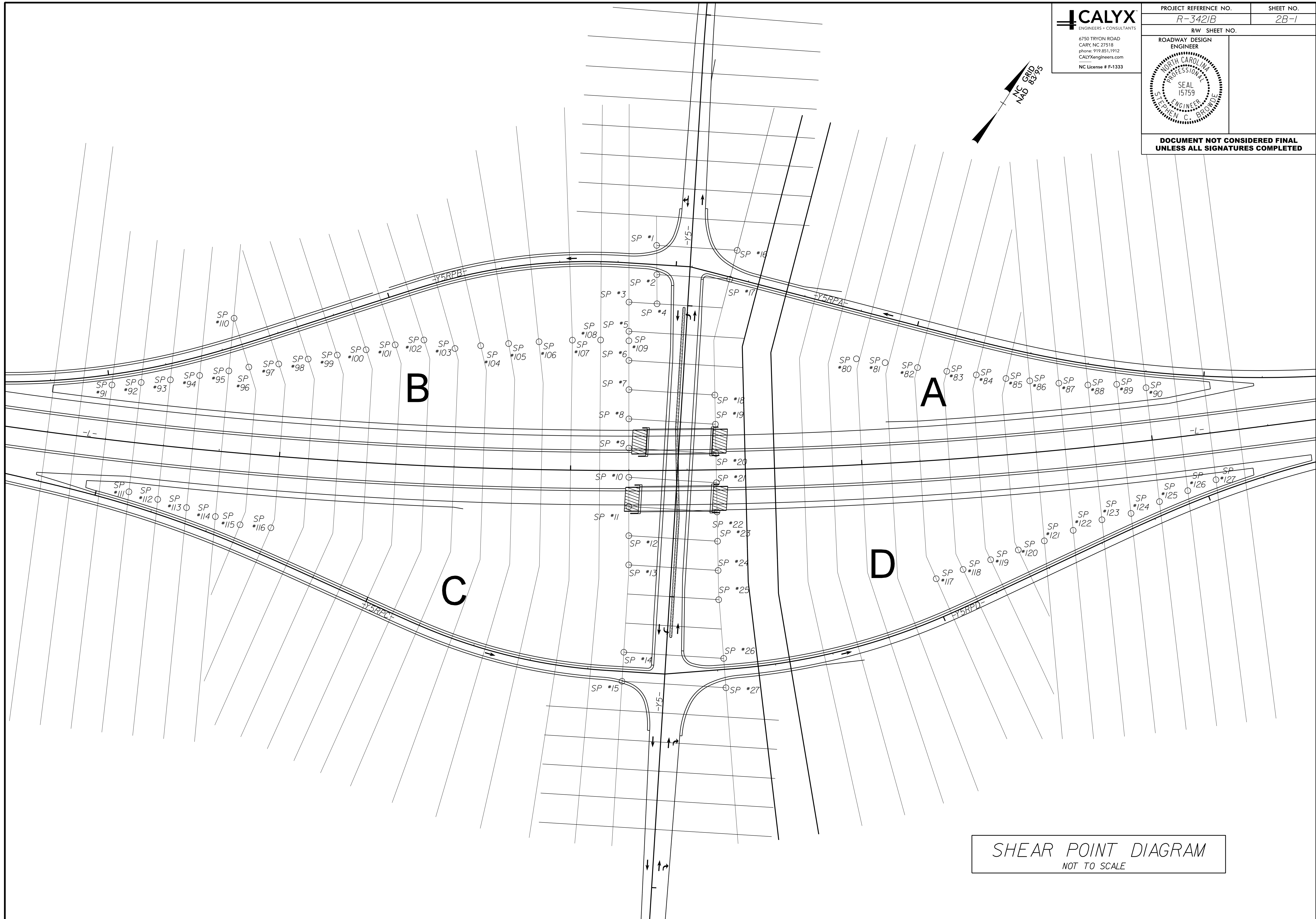
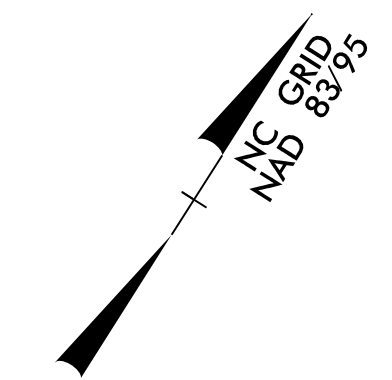


TYPICAL SECTION NO. 19
USE TYPICAL SECTION No. 19 AS FOLLOWS:
-Y9RPC- STA. 10+00 TO -Y9RPC- STA. 10+83.48

PAVEMENT SCHEDULE	
B	OPEN-GRADED ASPHALT FC
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3" S9.5C
C6	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4.5" B25.0C
E3	5.5" C
E4	VAR. B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE
K	SOIL-CEMENT/LIME-TREATED SOIL
M	RUMBLE STRIPS
N	GEOTEXTILE FOR PAVEMENT STAB
P1	PRIME COAT
R1	2'-6" CURB AND GUTTER
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R3	4'-0" EXPR. GUTTER
R4	5" MONOLITHIC CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
W	WEDGING

NOTE:
1. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

7/12/19
7/11/2019
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SHEAR POINT DIAGRAM
NOT TO SCALE

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

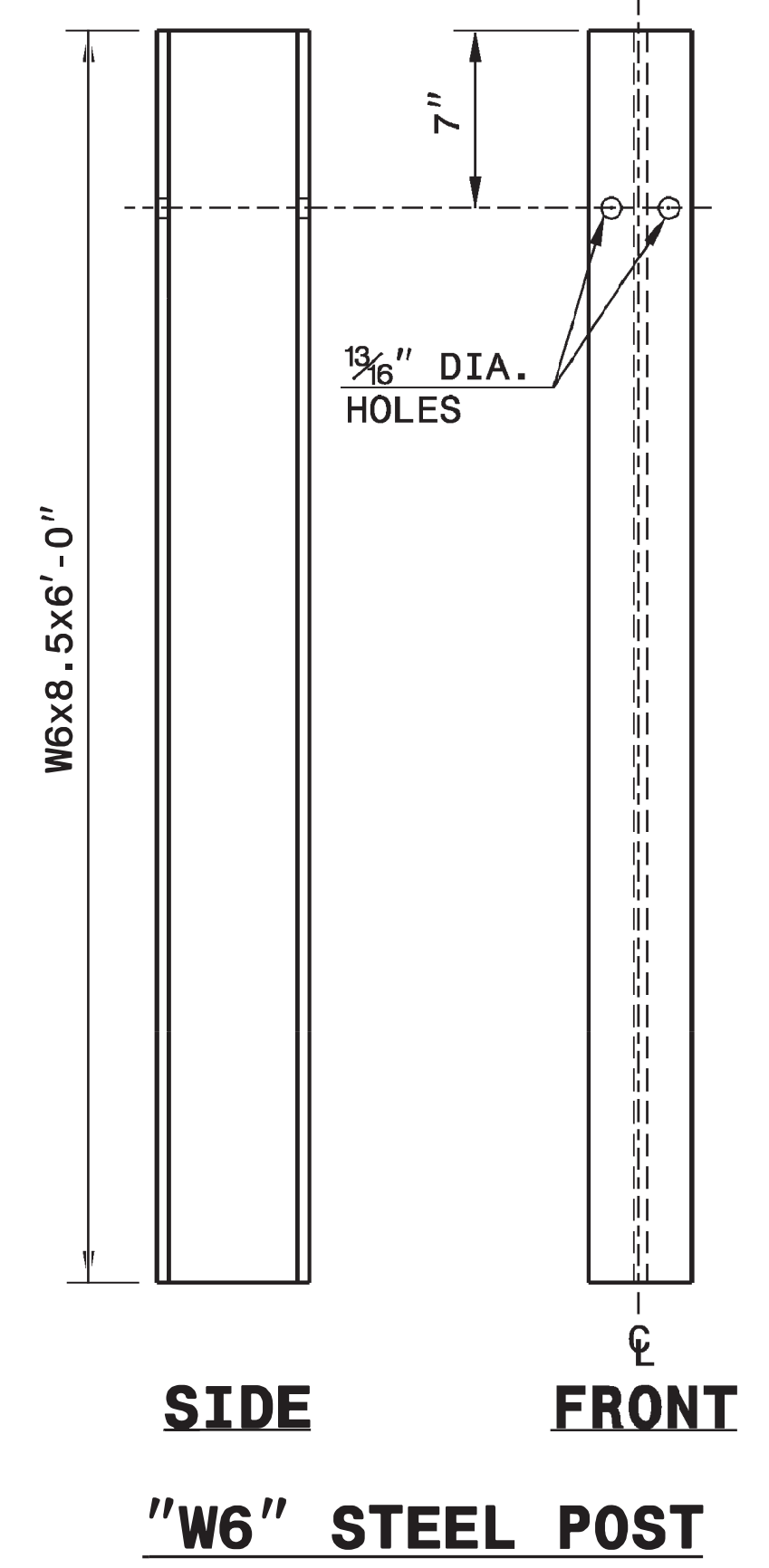
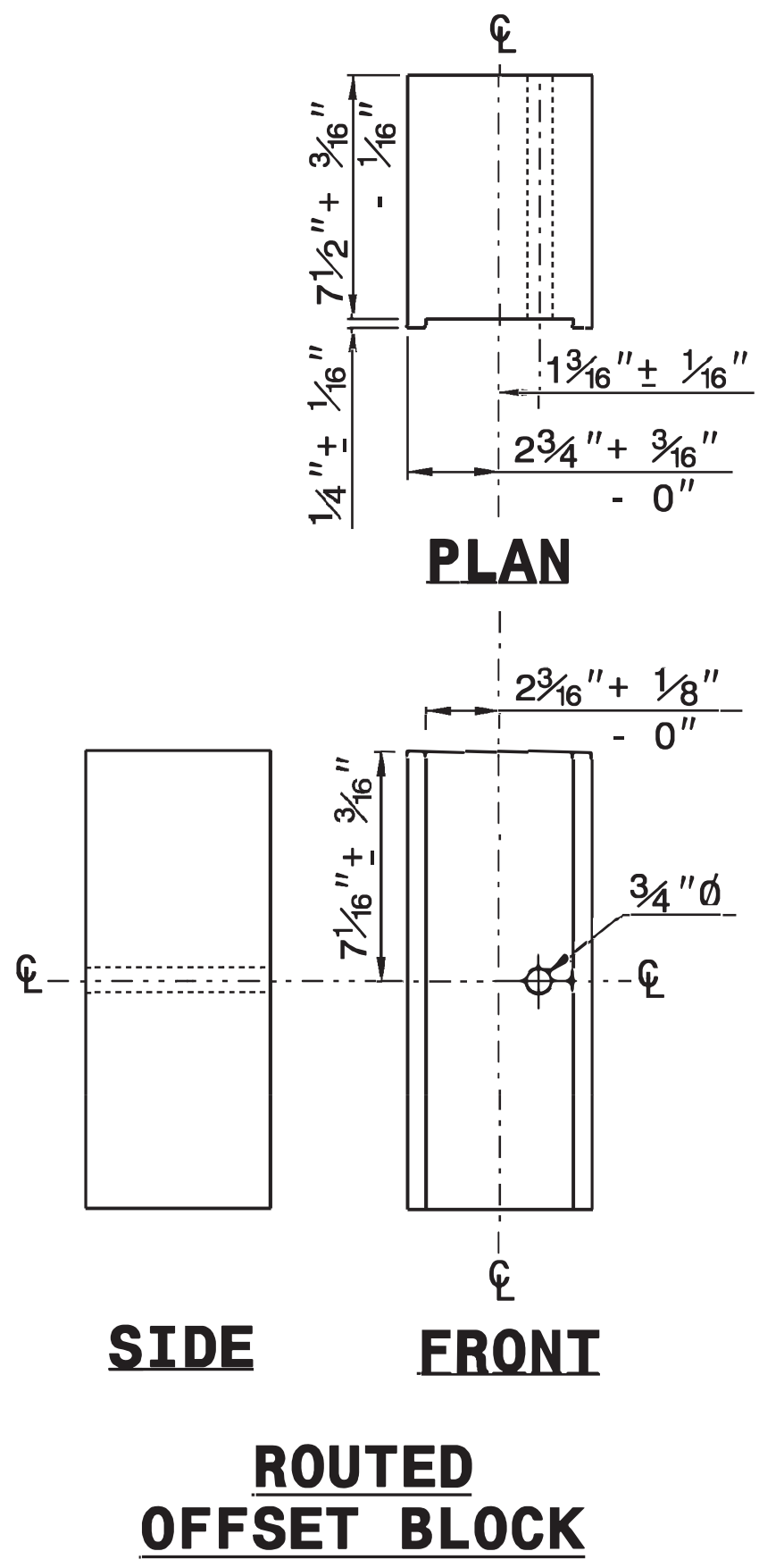
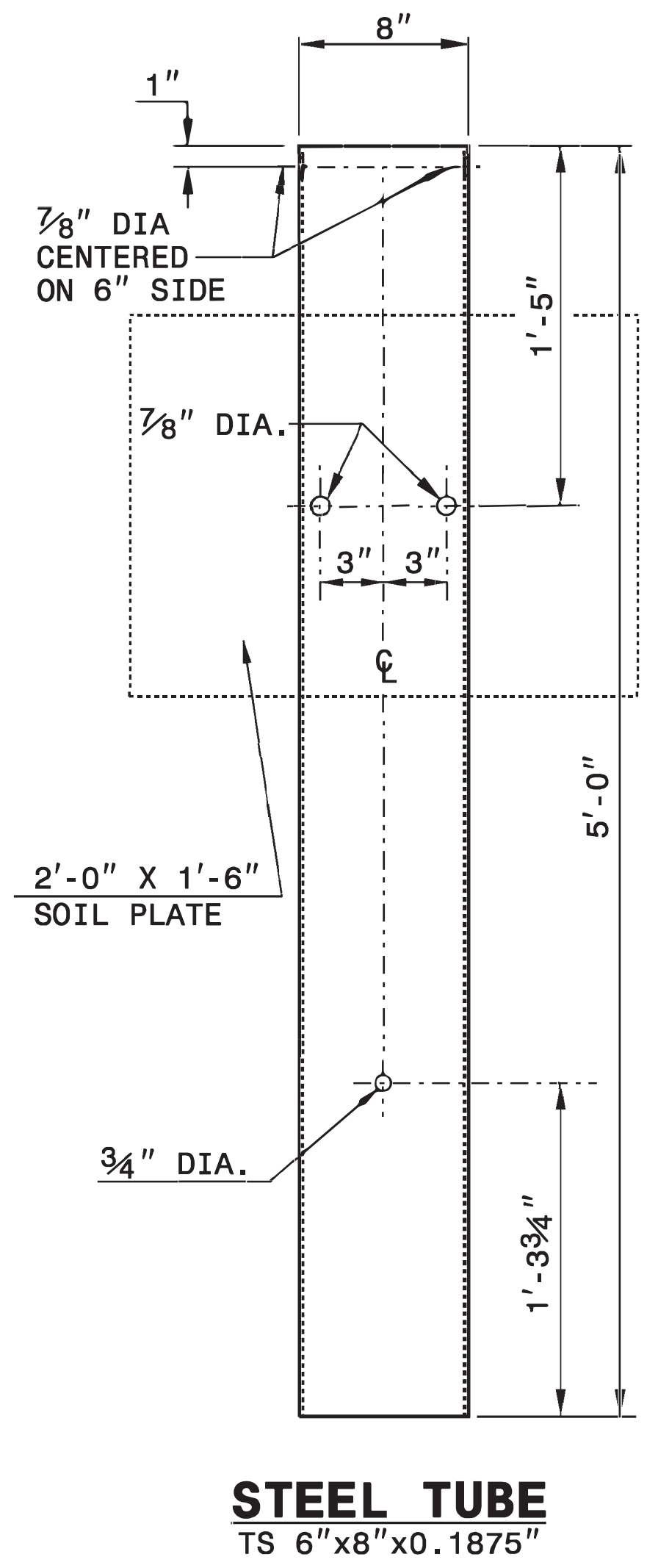
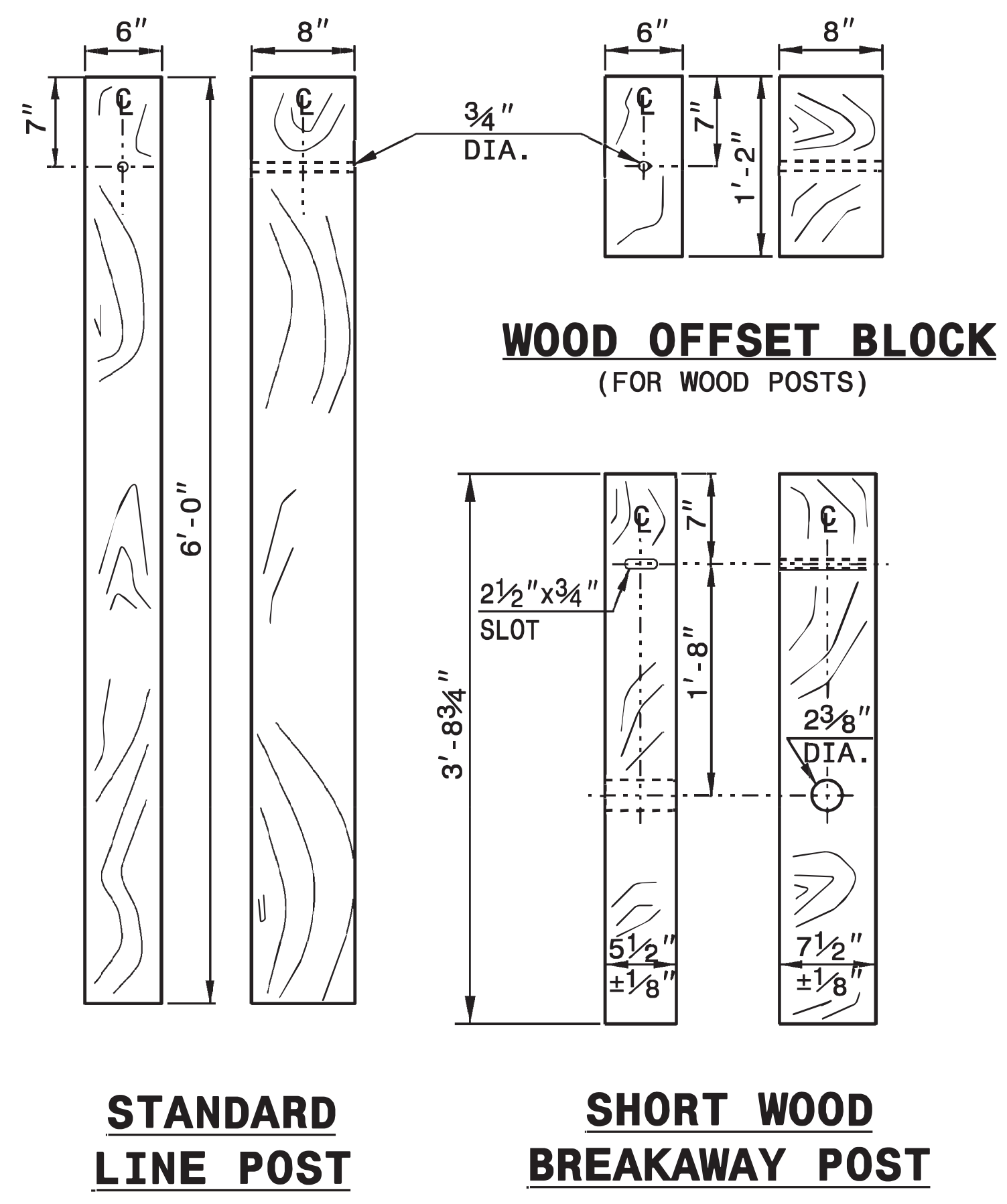
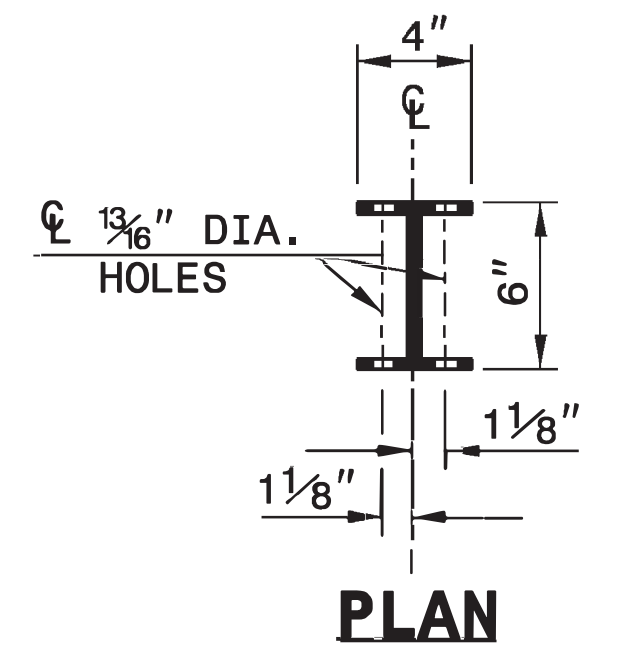
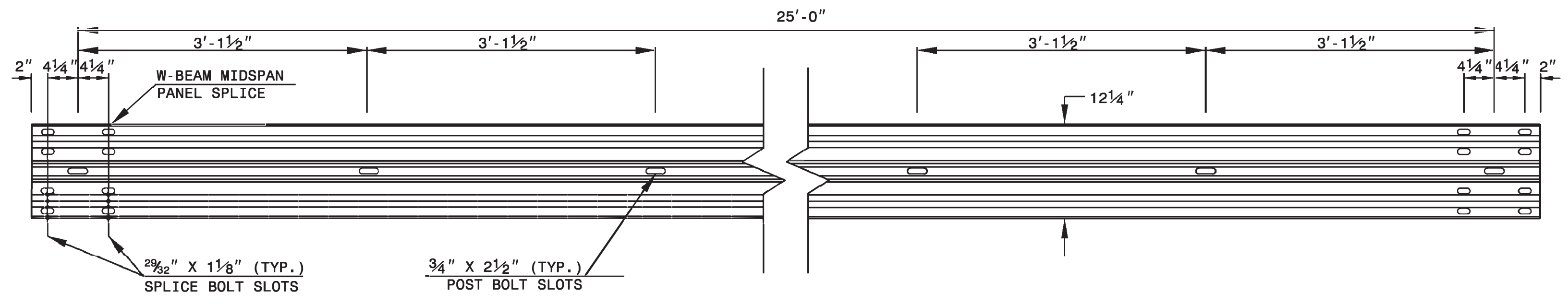
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

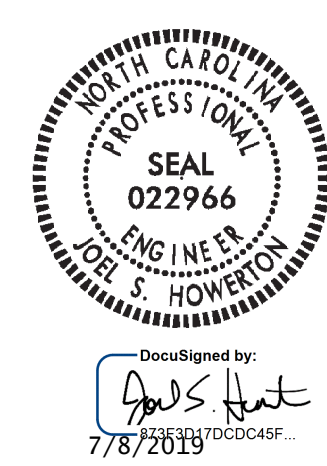
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



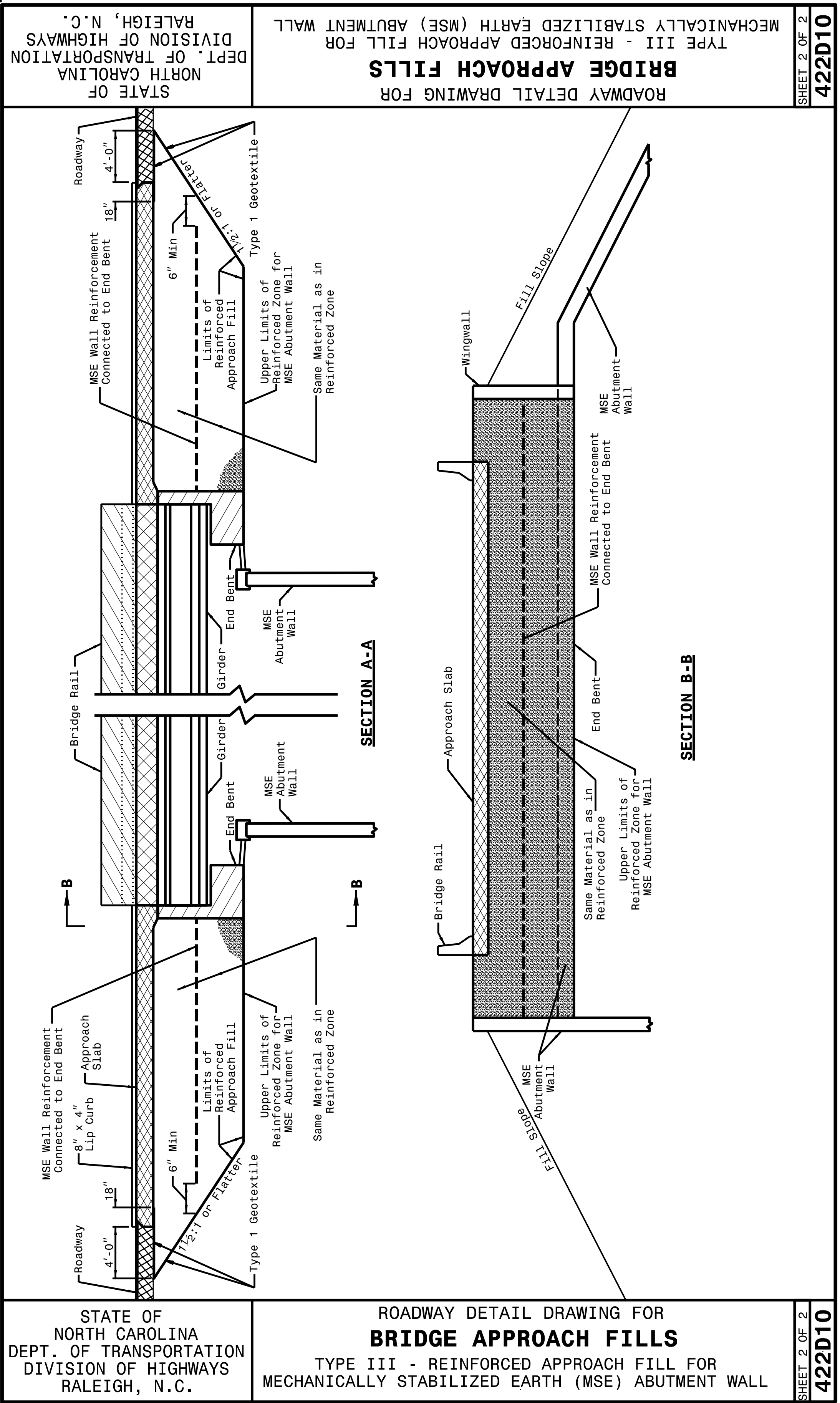
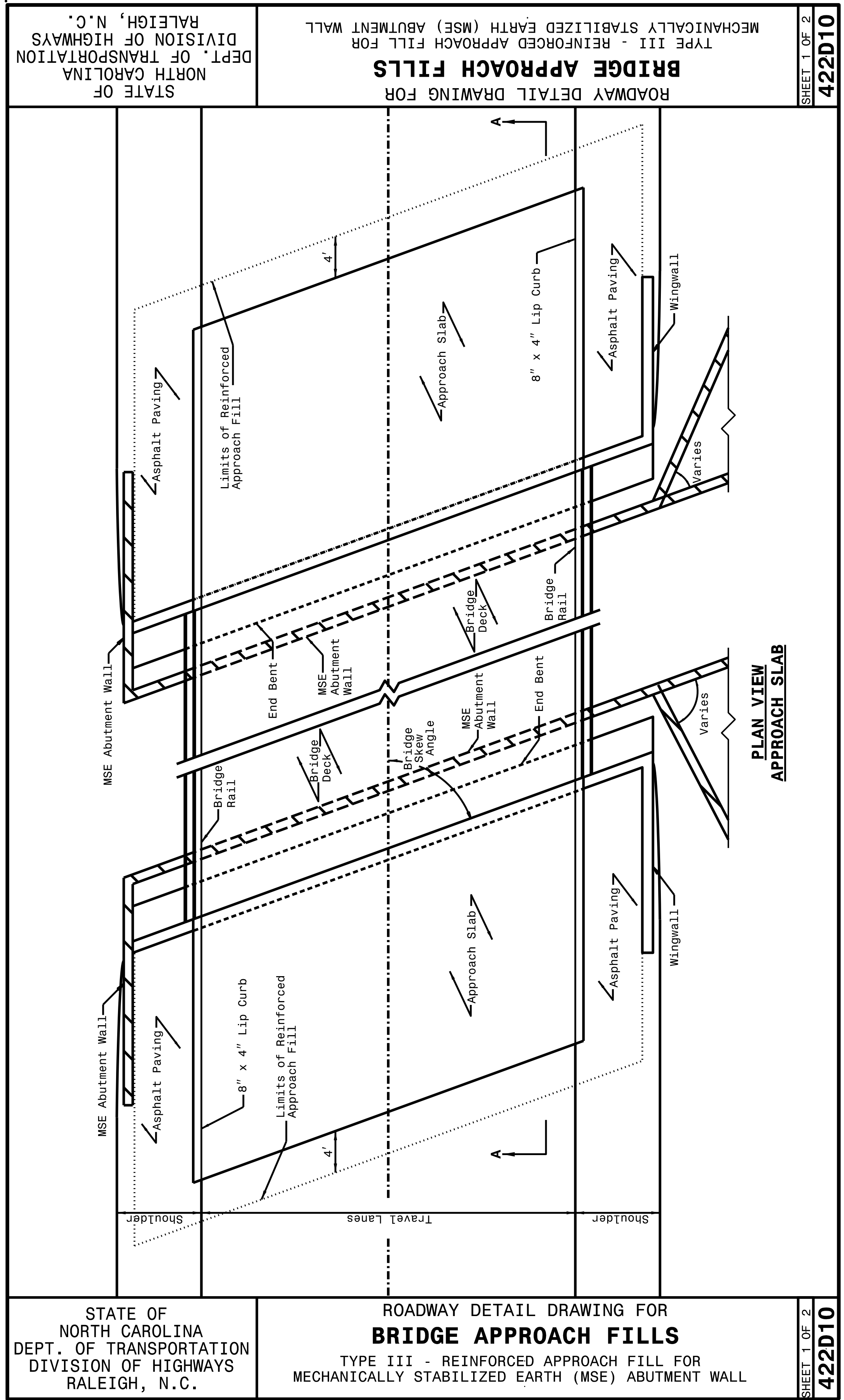
SYSTEM PARTS



CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	



7/8/2019



DocuSigned by:
J. S. Howerton
873F3D17D55C45F

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**TYPE III
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APPROACH FILLS**

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CHECKED BY: DATE:
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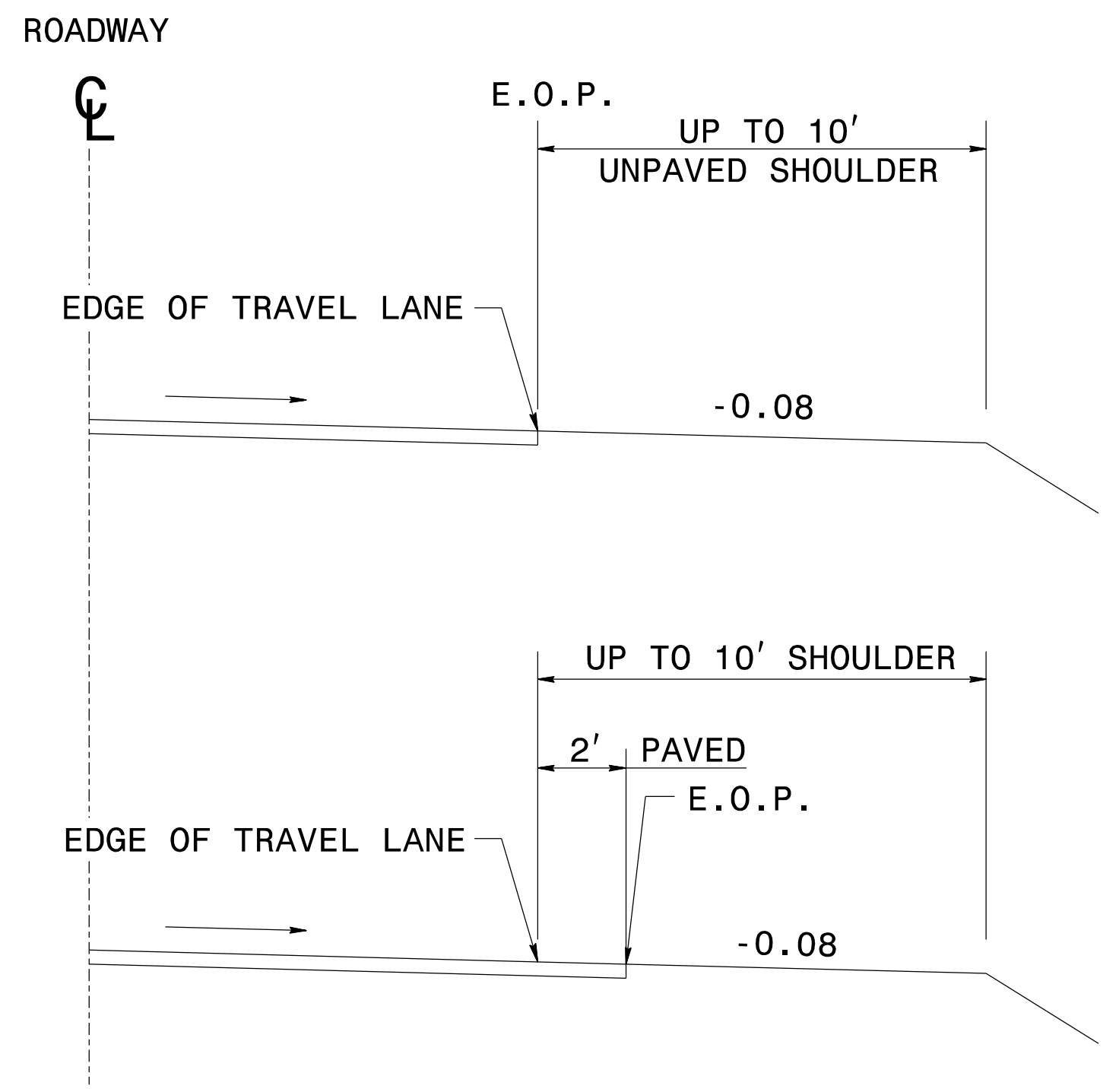
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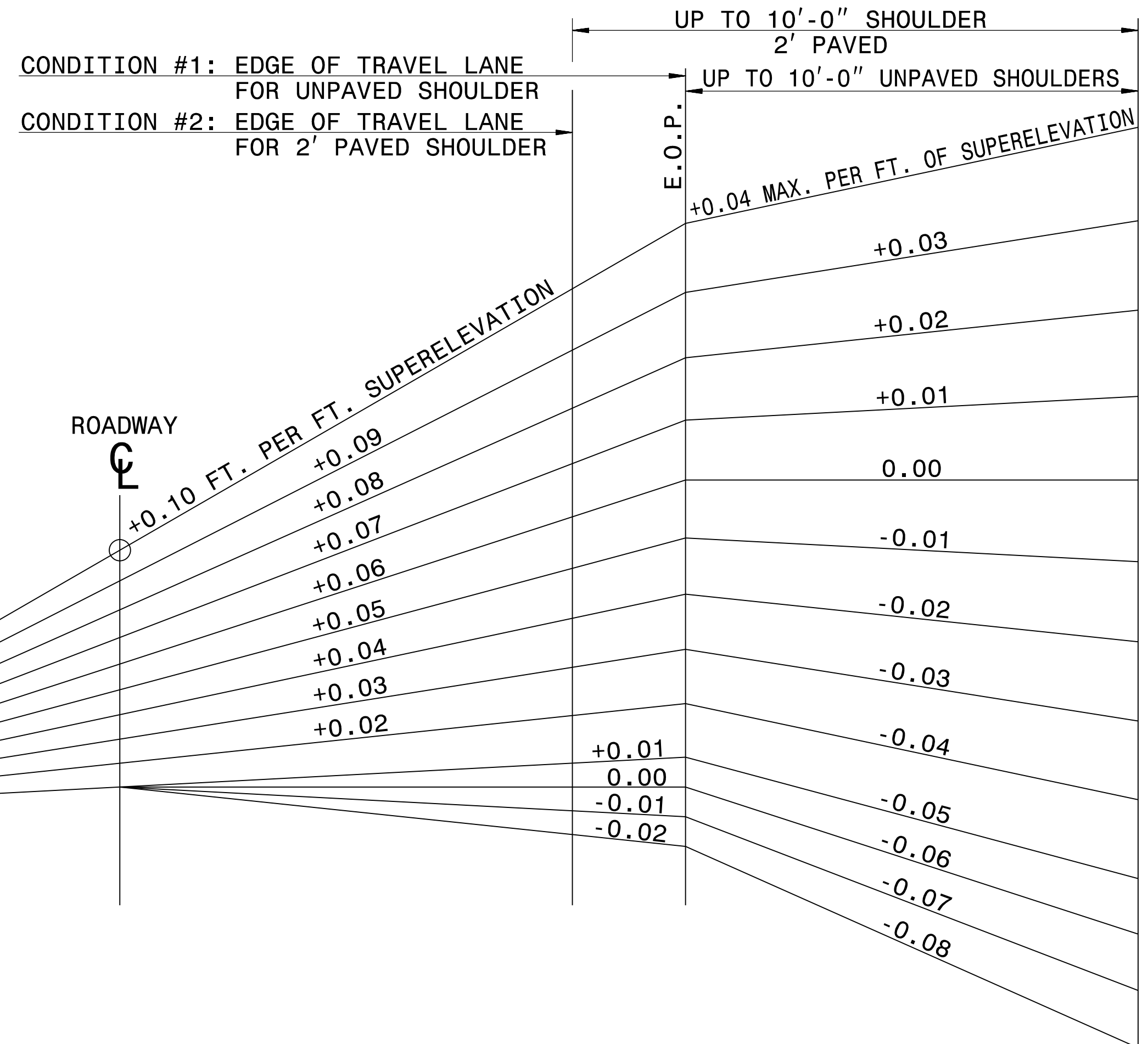
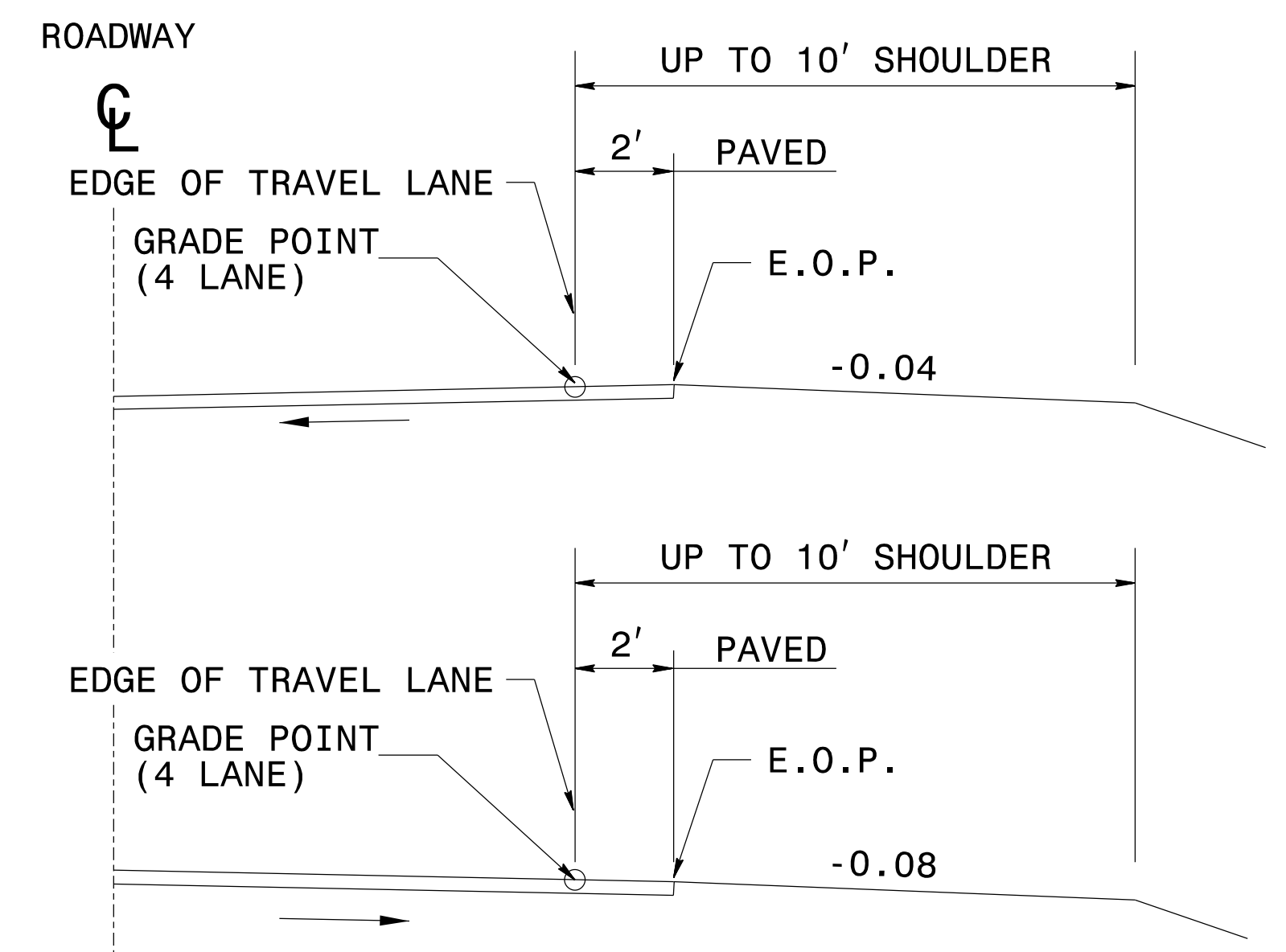
ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10')

SHEET 1 OF 2 560D01

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES

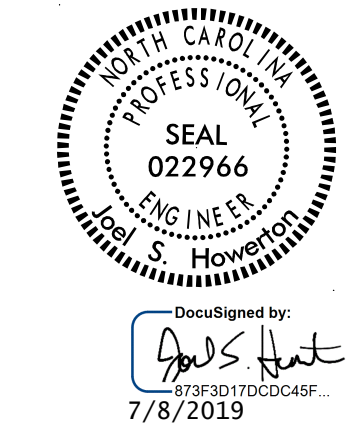


NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.
NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF TRAVEL LANE.

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

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10')

SHEET 1 OF 2 560D01



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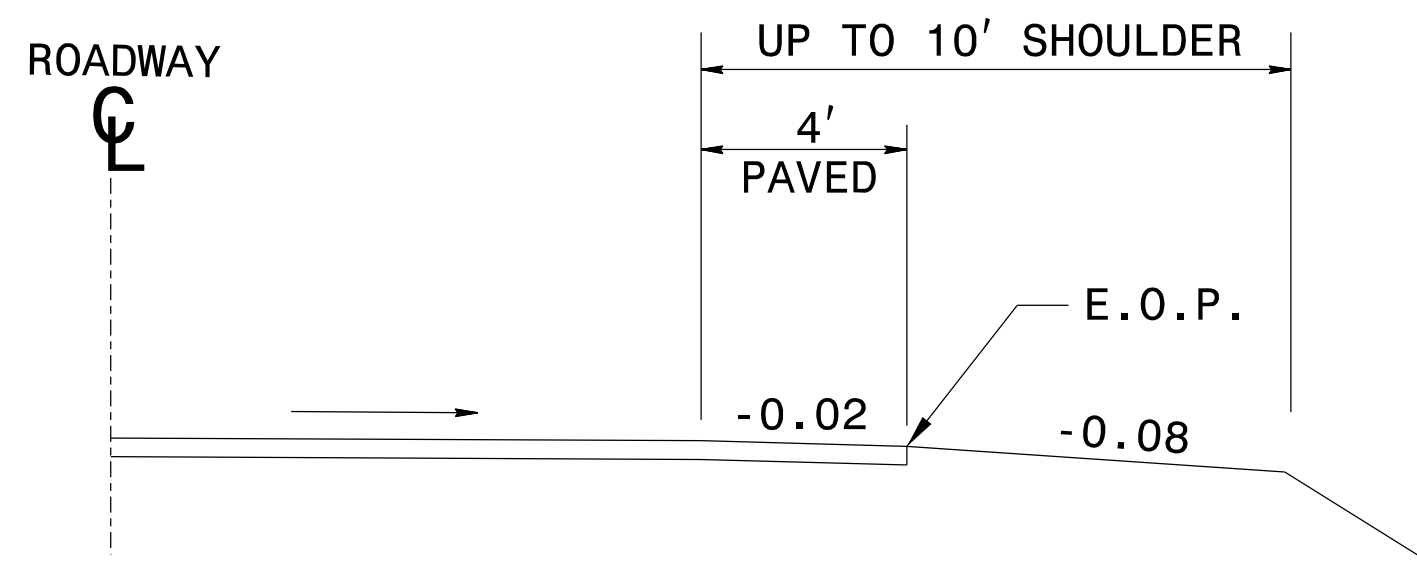
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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10')

SHEET 2 OF 2 560D01

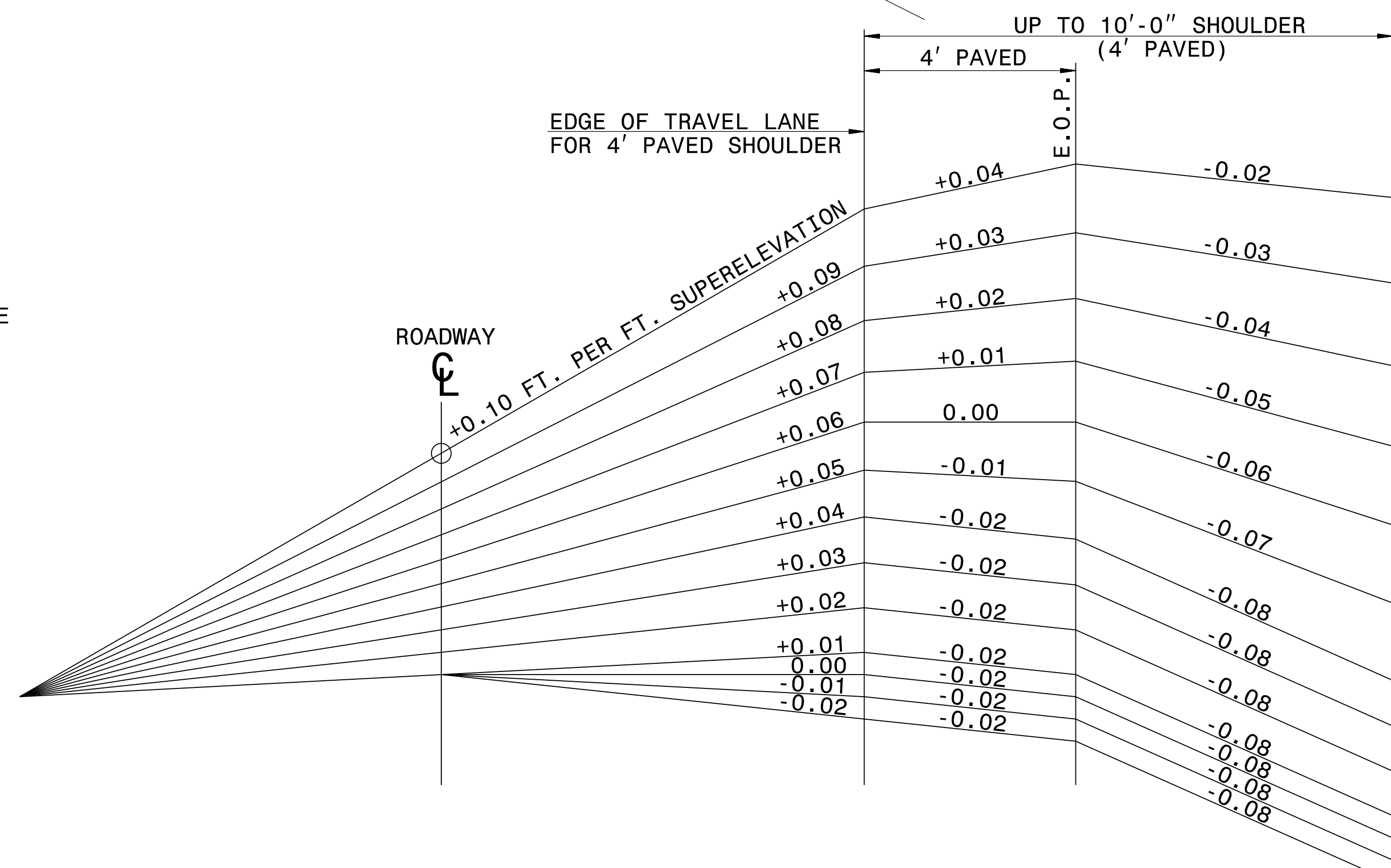
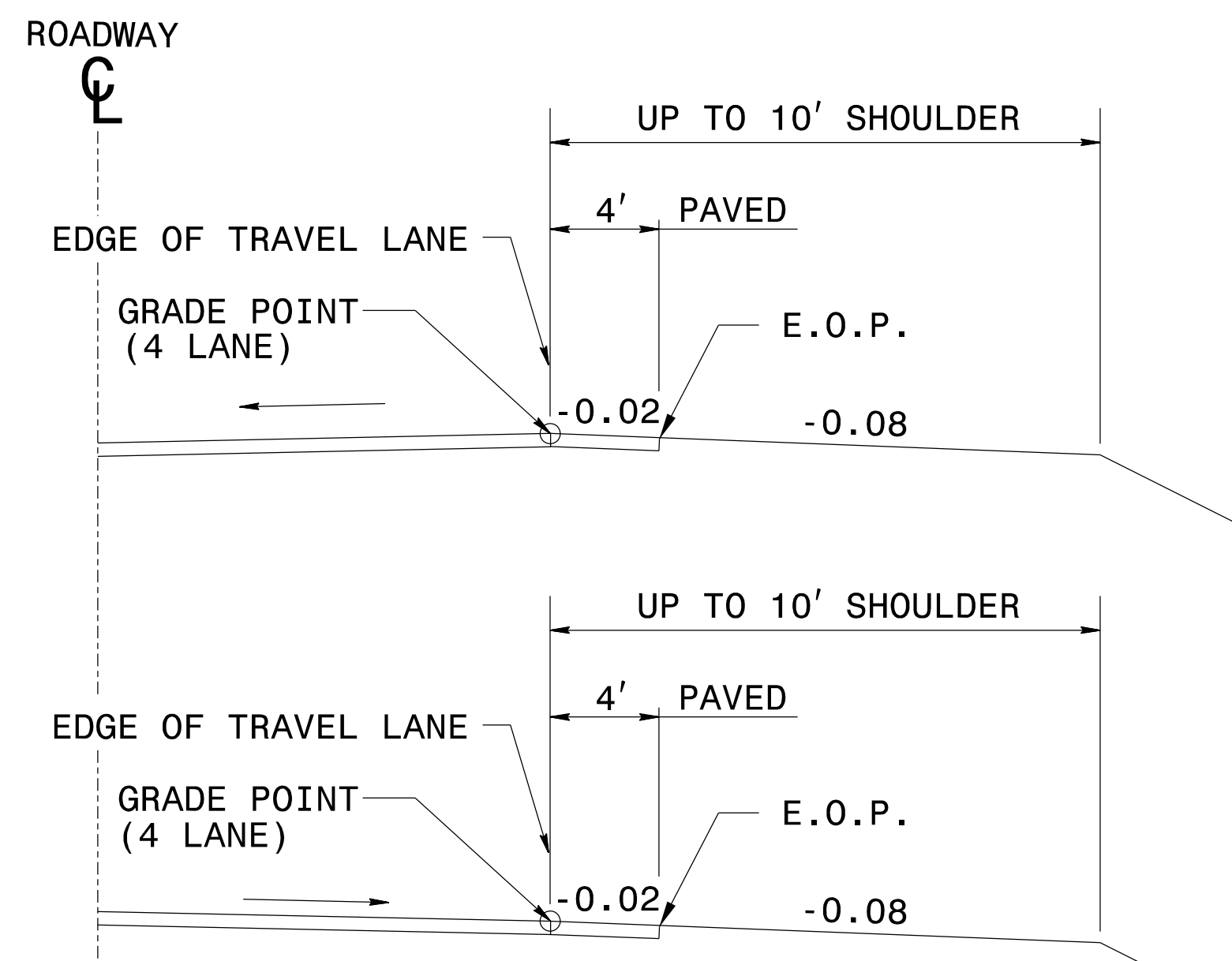
NORMAL OUTSIDE SHOULDER SLOPES



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

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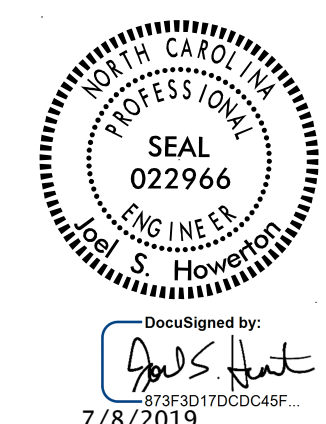
NORMAL MEDIAN SHOULDER SLOPES



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

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10')

SHEET 2 OF 2 560D01



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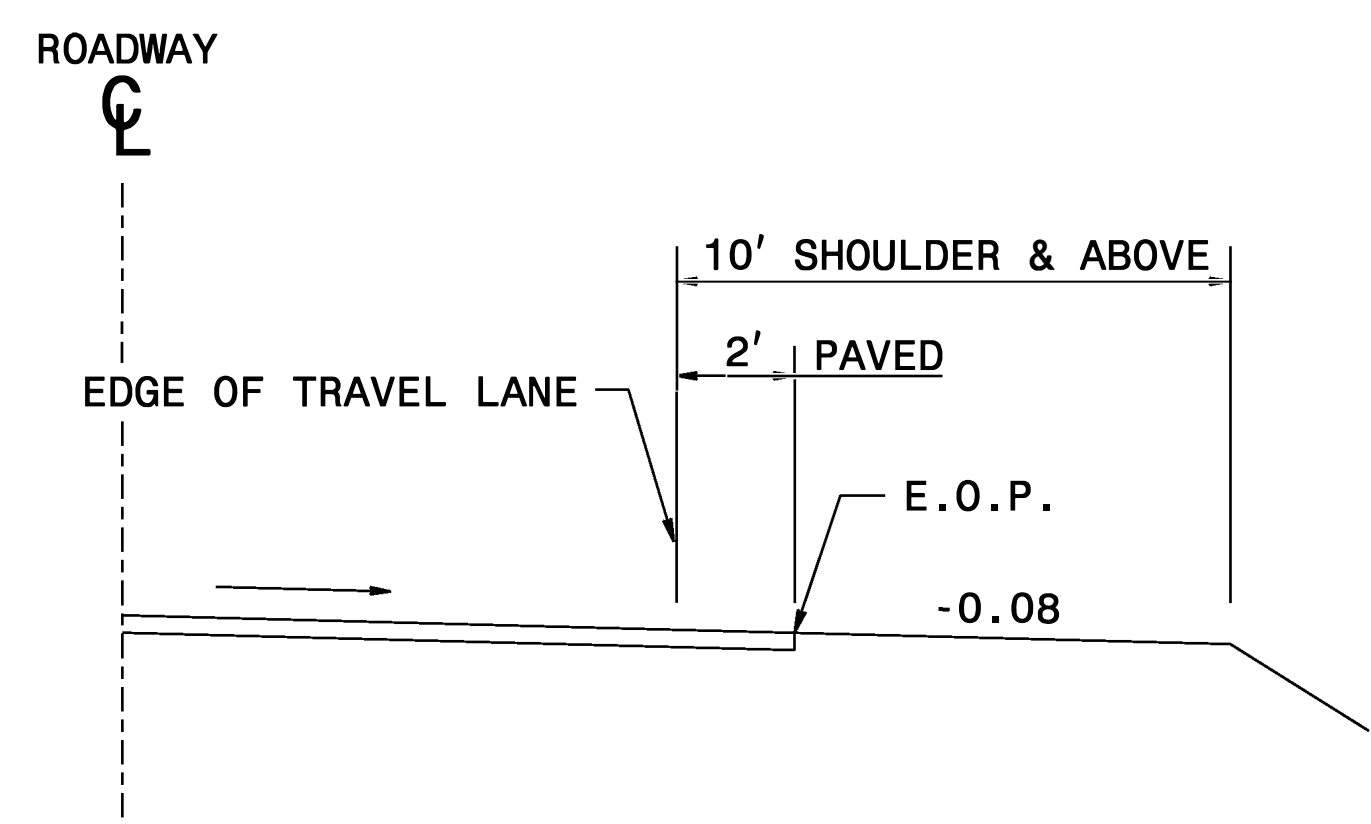
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

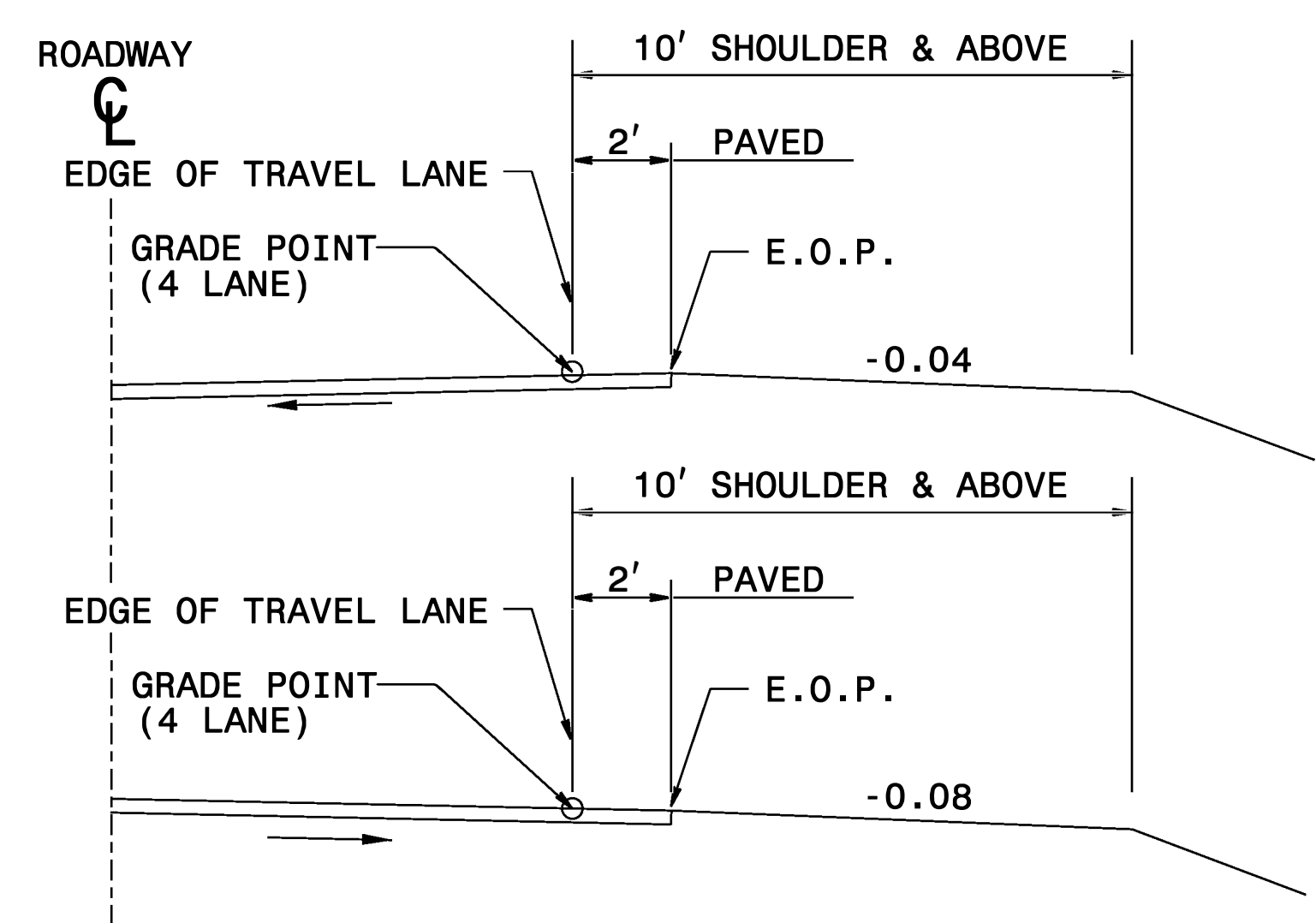
ENGLISH DETAIL DRAWING FOR
METHOD OF SHOULDER CONSTRUCTION
HIGH SIDE OF SUPERELEVATED CURVE
METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 1 OF 4
560D02

NORMAL OUTSIDE SHOULDER SLOPES

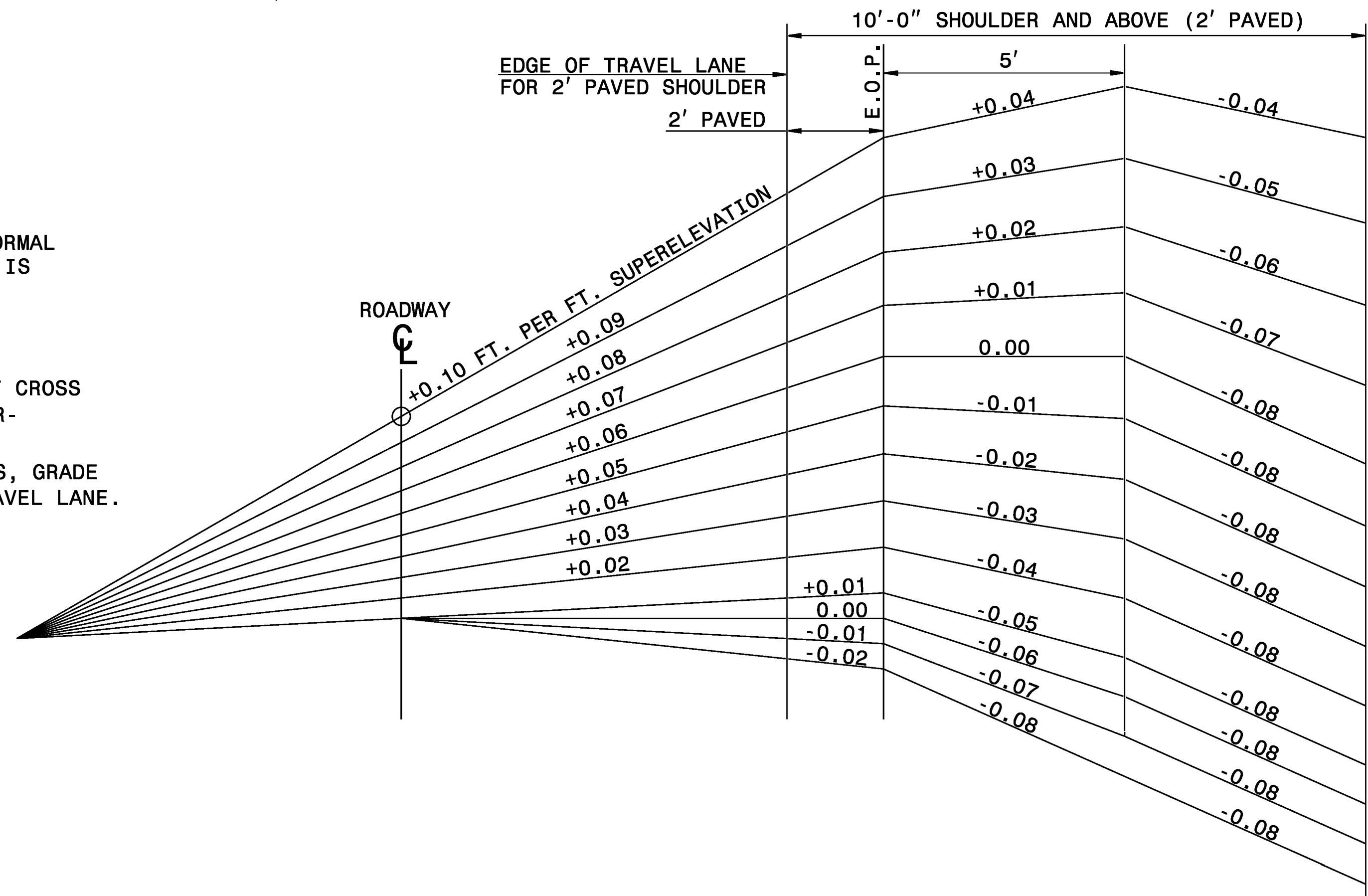


NORMAL MEDIAN SHOULDER SLOPES



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

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DEPT. OF TRANSPORTATION
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
METHOD OF SHOULDER CONSTRUCTION
HIGH SIDE OF SUPERELEVATED CURVE
METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 1 OF 4
560D02

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Howerton AT CSD-292595



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Michael S. Howerton
7/8/2019

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Office 919-707-6950 FAX 919-250-4119

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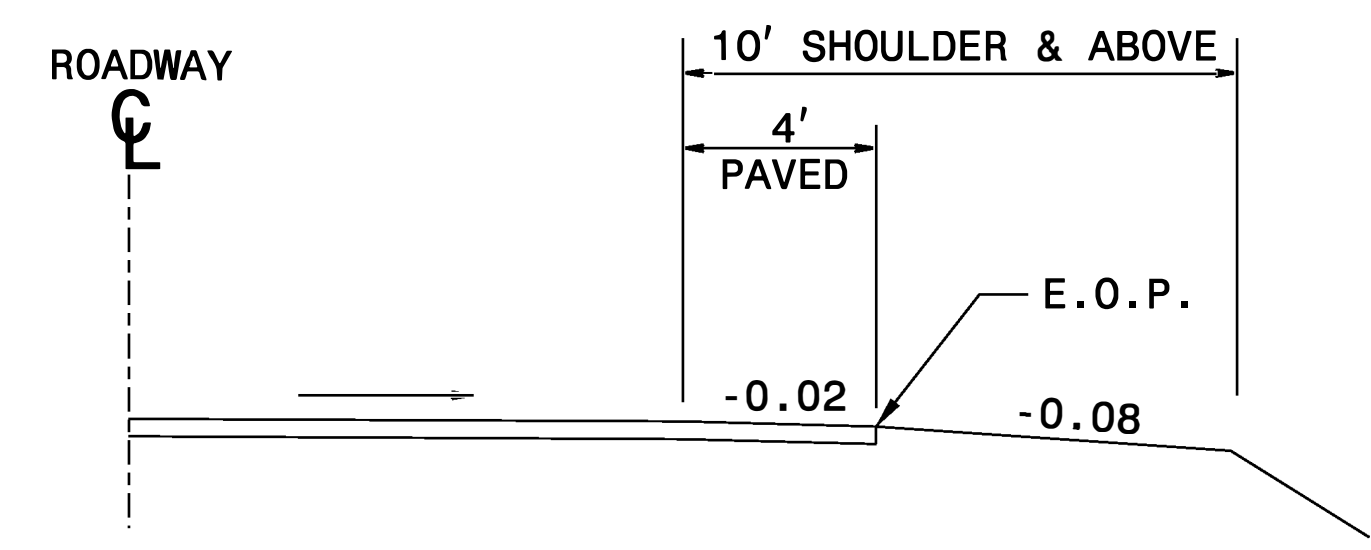
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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 2 OF 4 560D02

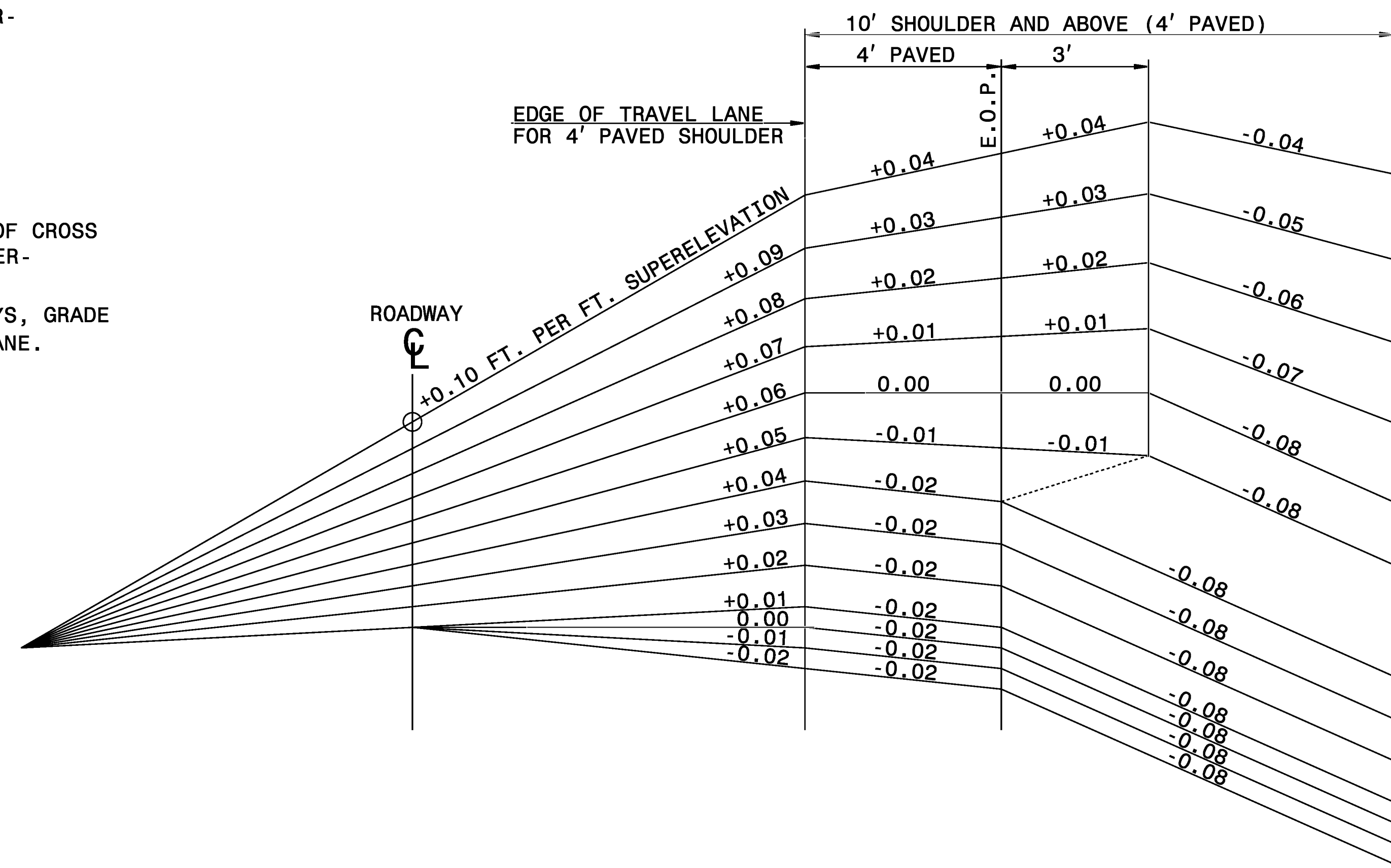
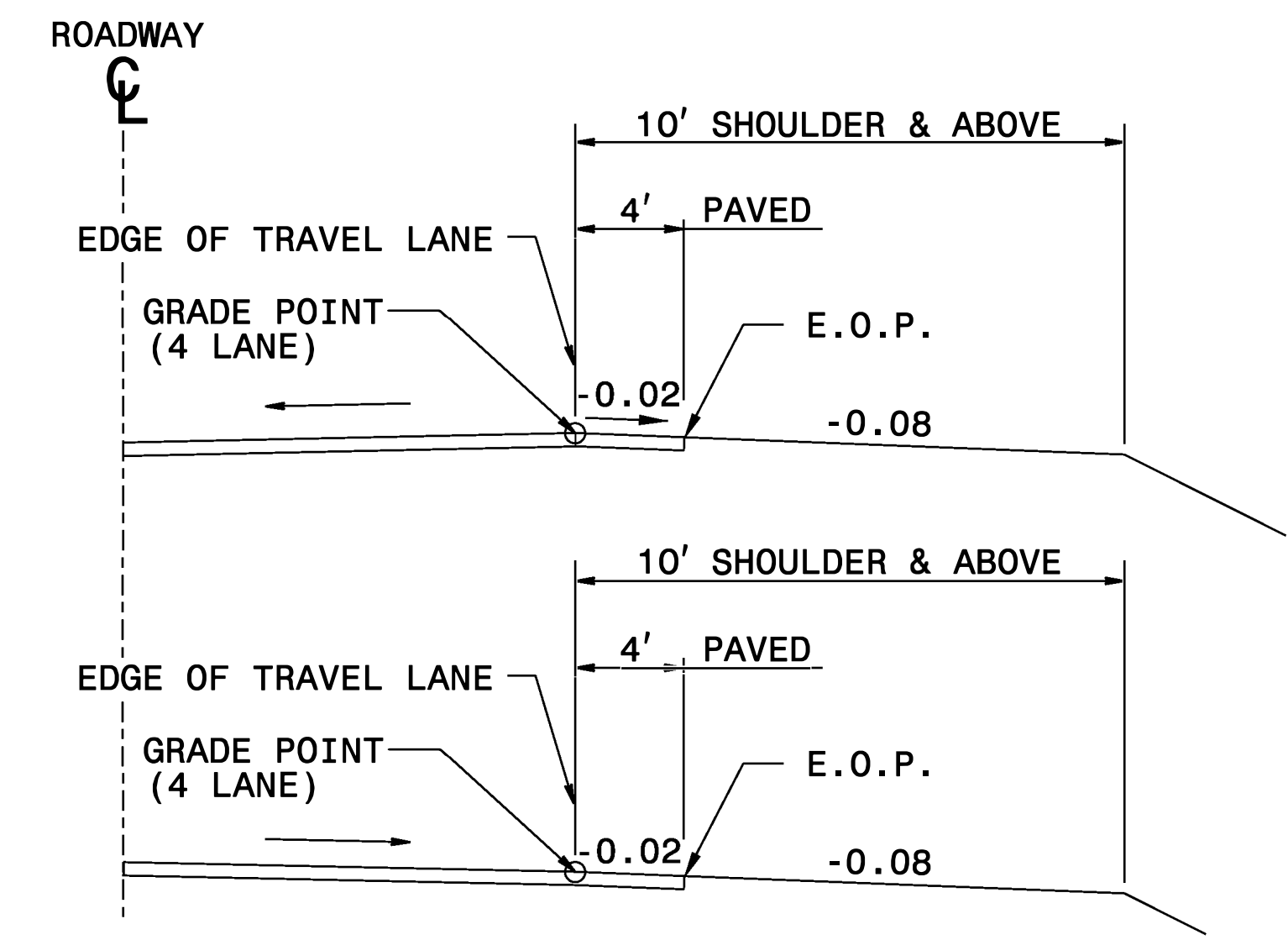
NORMAL OUTSIDE SHOULDER SLOPES



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

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NORMAL MEDIAN SHOULDER SLOPES



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

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 2 OF 4 560D02

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CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119

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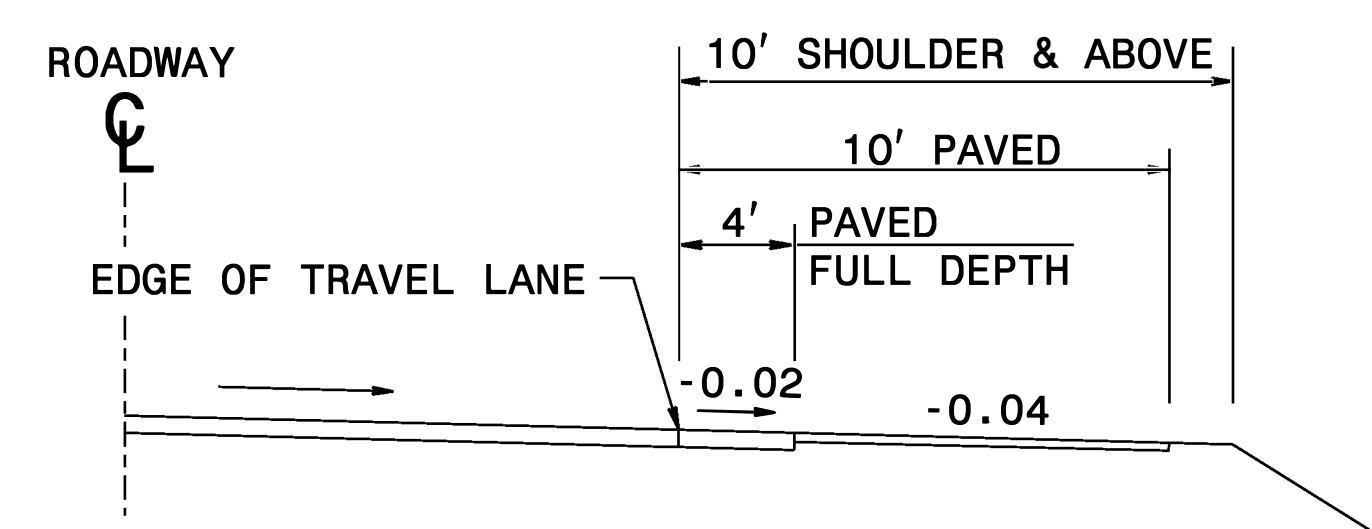
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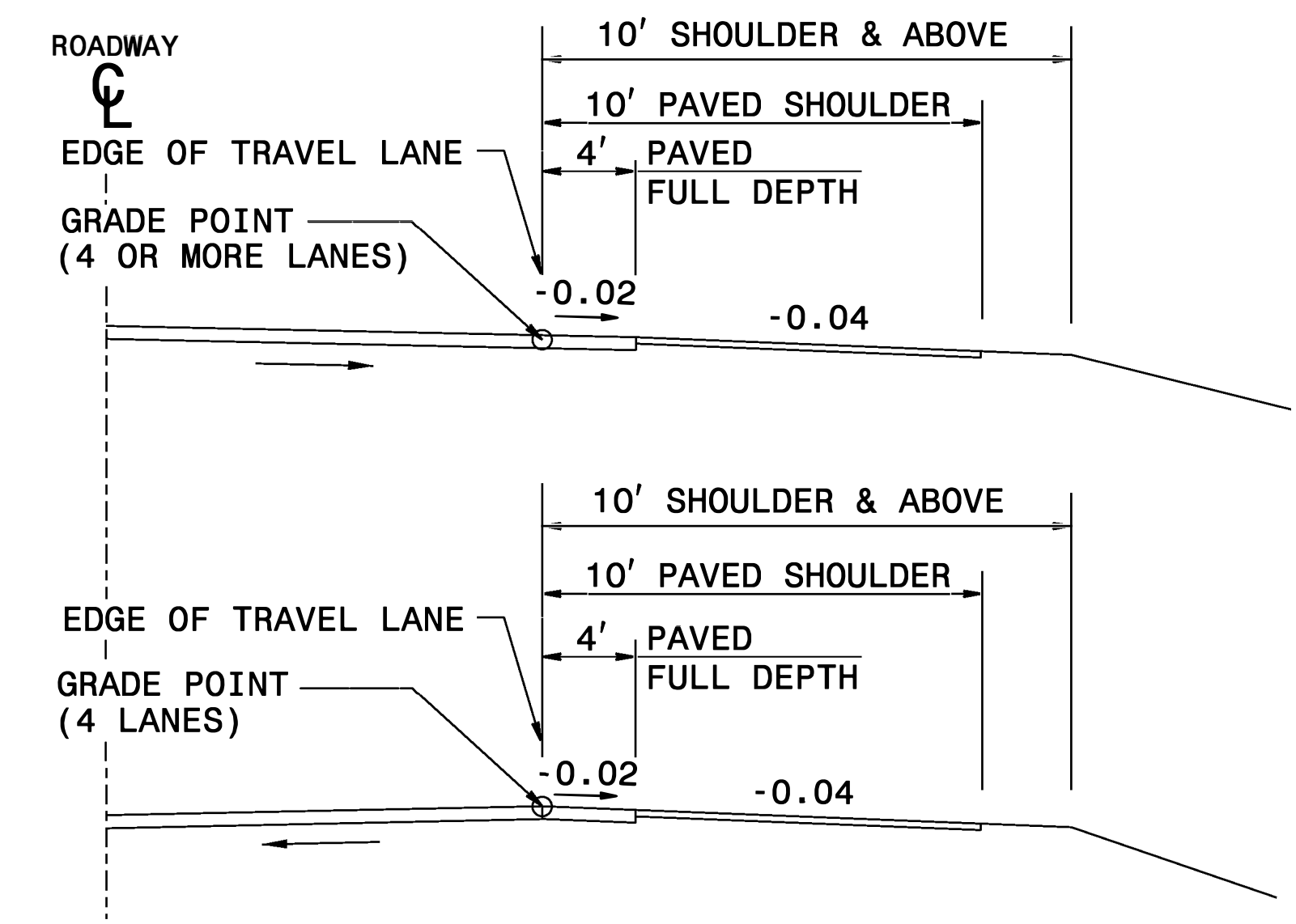
ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 3 OF 4 560D02

NORMAL OUTSIDE SHOULDER SLOPES

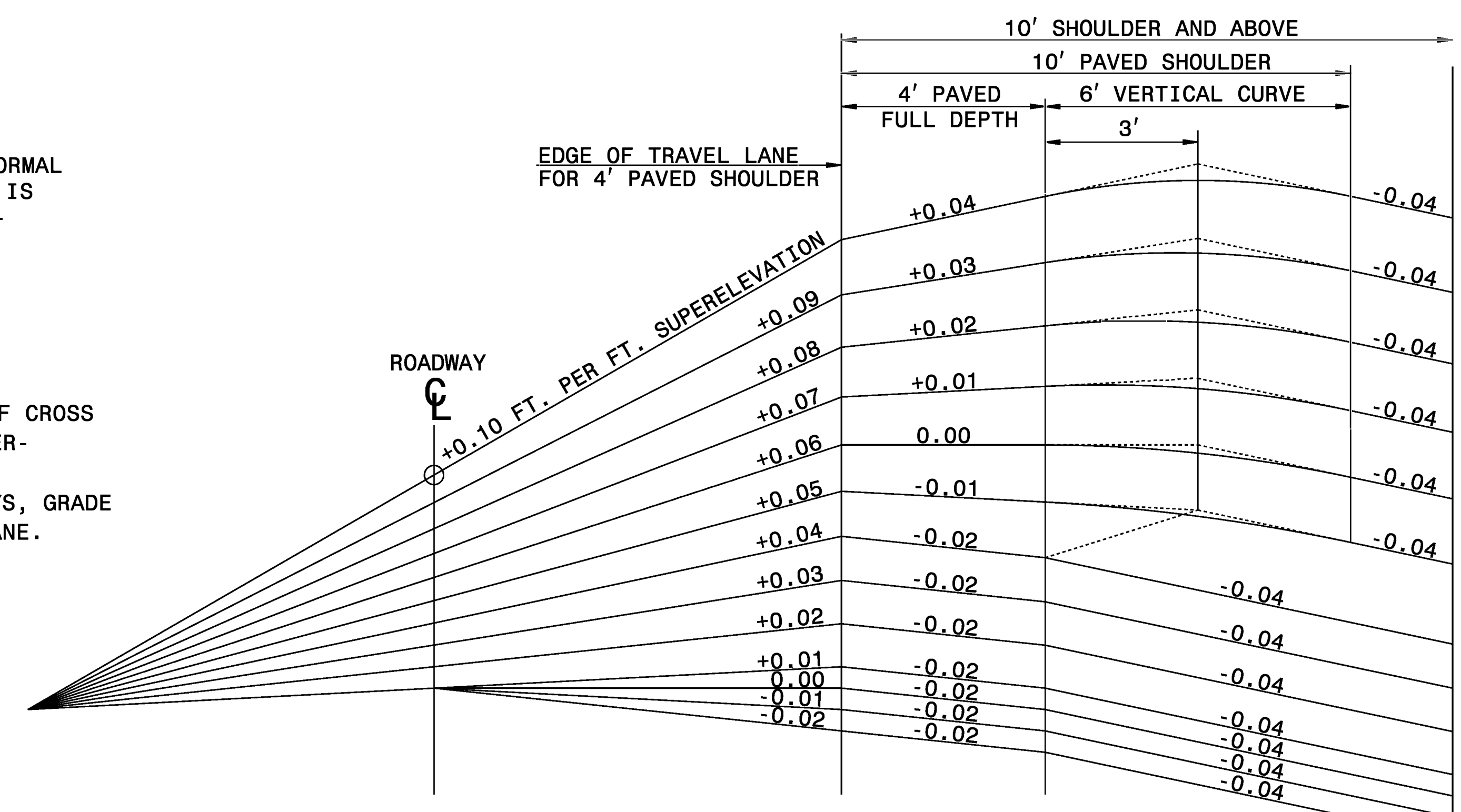


NORMAL MEDIAN SHOULDER SLOPES



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

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD II (SHOULDERS 10' AND ABOVE)

SHEET 3 OF 4 560D02

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DocuSigned by: Daniel S. Howerton 7/8/2019

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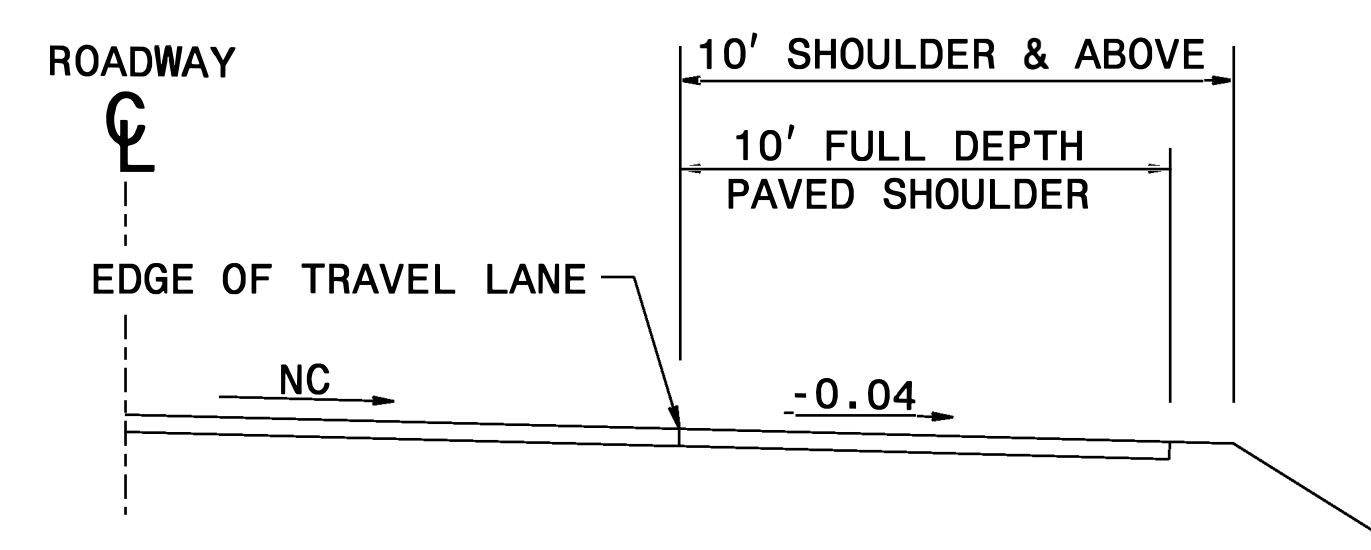
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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

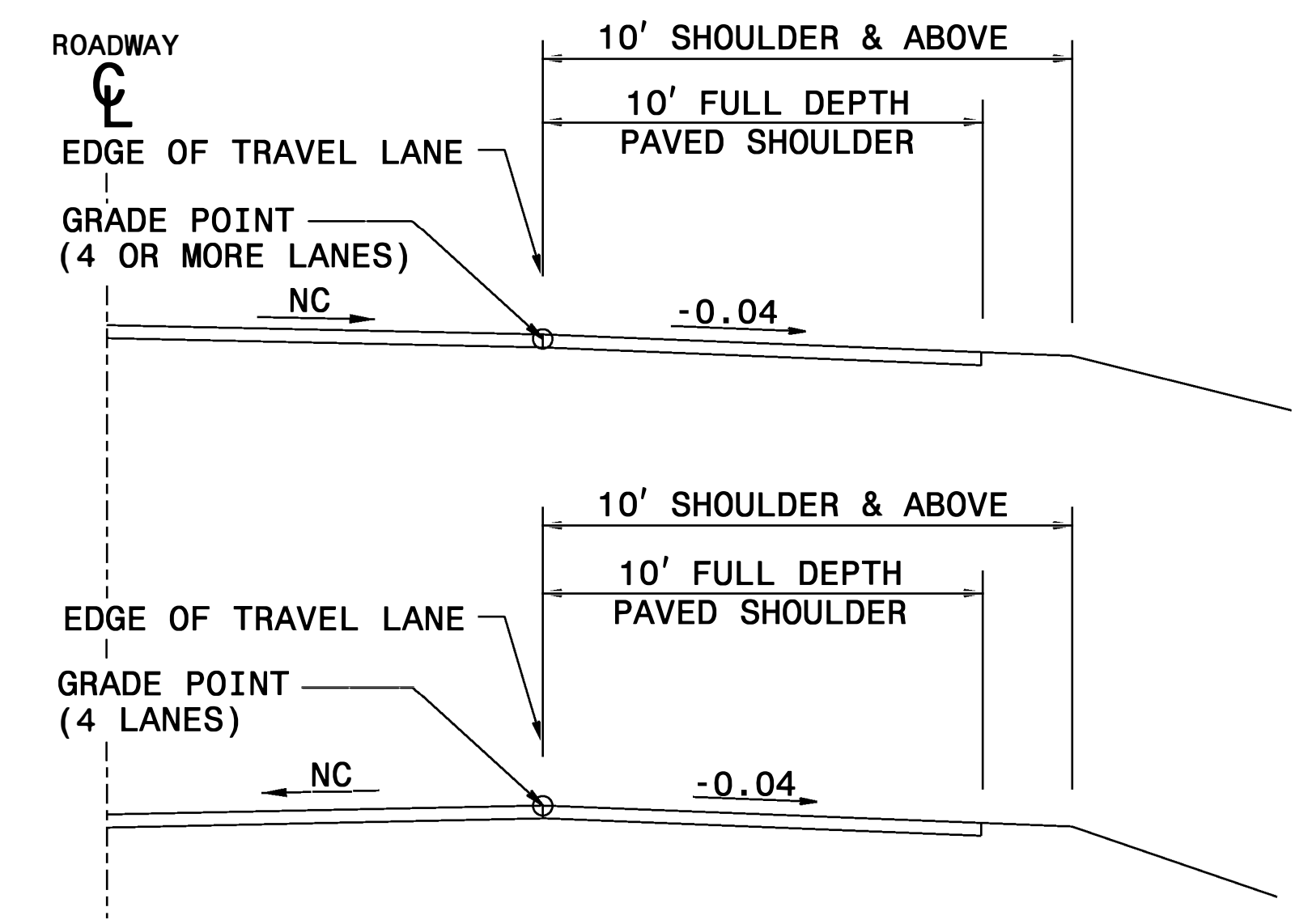
ENGLISH DETAIL DRAWING FOR
METHOD OF SHOULDER CONSTRUCTION
HIGH SIDE OF SUPERELEVATED CURVE
METHOD II (FULL DEPTH SHOULDERS 10' AND ABOVE)

SHEET 4 OF 4
560D02

NORMAL OUTSIDE SHOULDER SLOPES

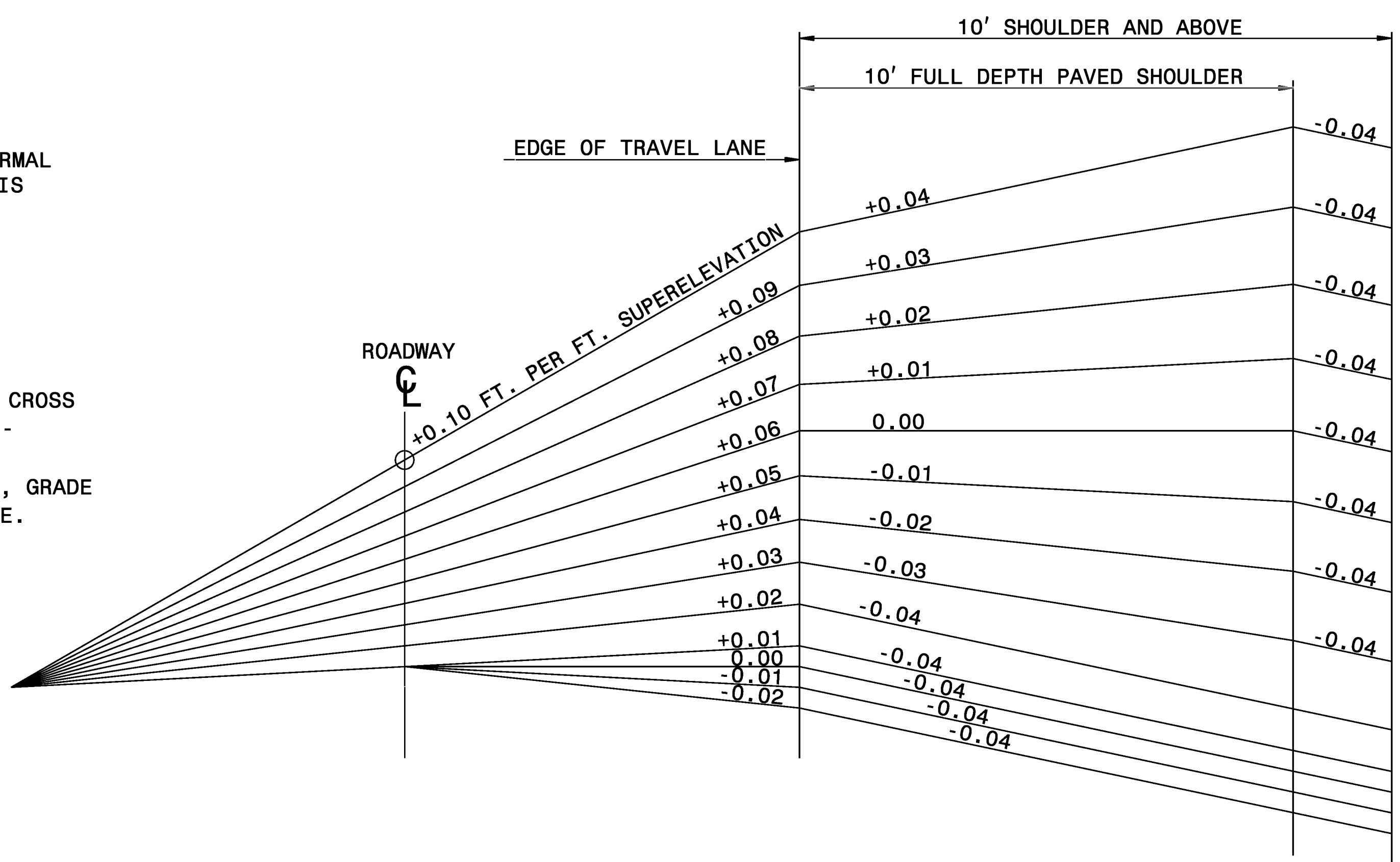


NORMAL MEDIAN SHOULDER SLOPES



NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

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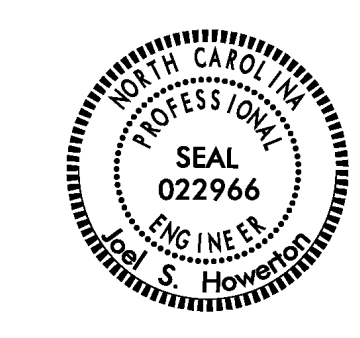


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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
METHOD OF SHOULDER CONSTRUCTION
HIGH SIDE OF SUPERELEVATED CURVE
METHOD II (FULL DEPTH SHOULDERS 10' AND ABOVE)

SHEET 4 OF 4
560D02

30-MAY-2019 09:17 S:\Contracts\Special Details\Howerton\Standard Drawings\2002stds\english\di\05\0560020204.dgn Howerton AT USD-292595



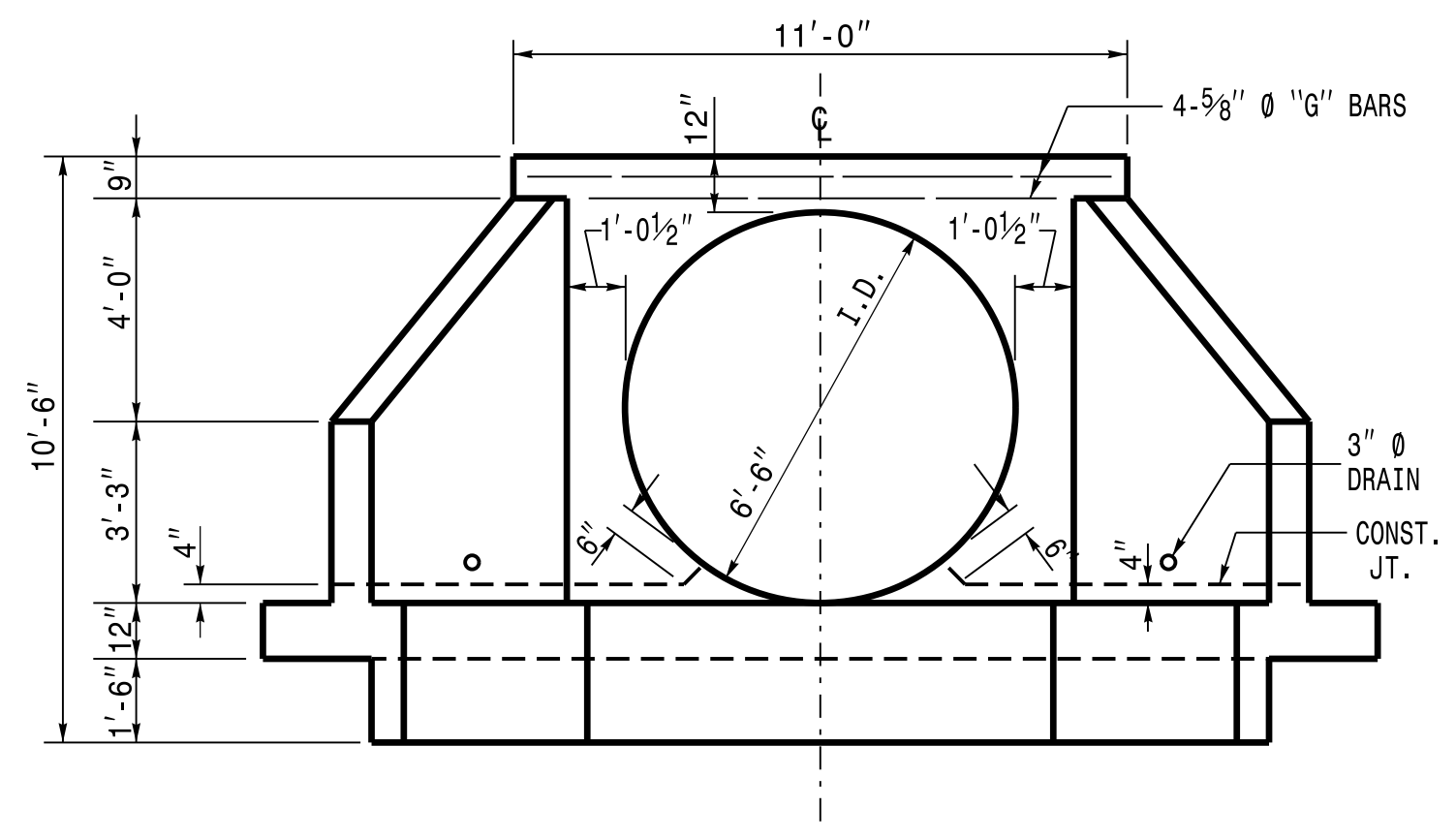
DocuSigned by:
Michael S. Howerton
673F3D170C045F...
7/8/2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

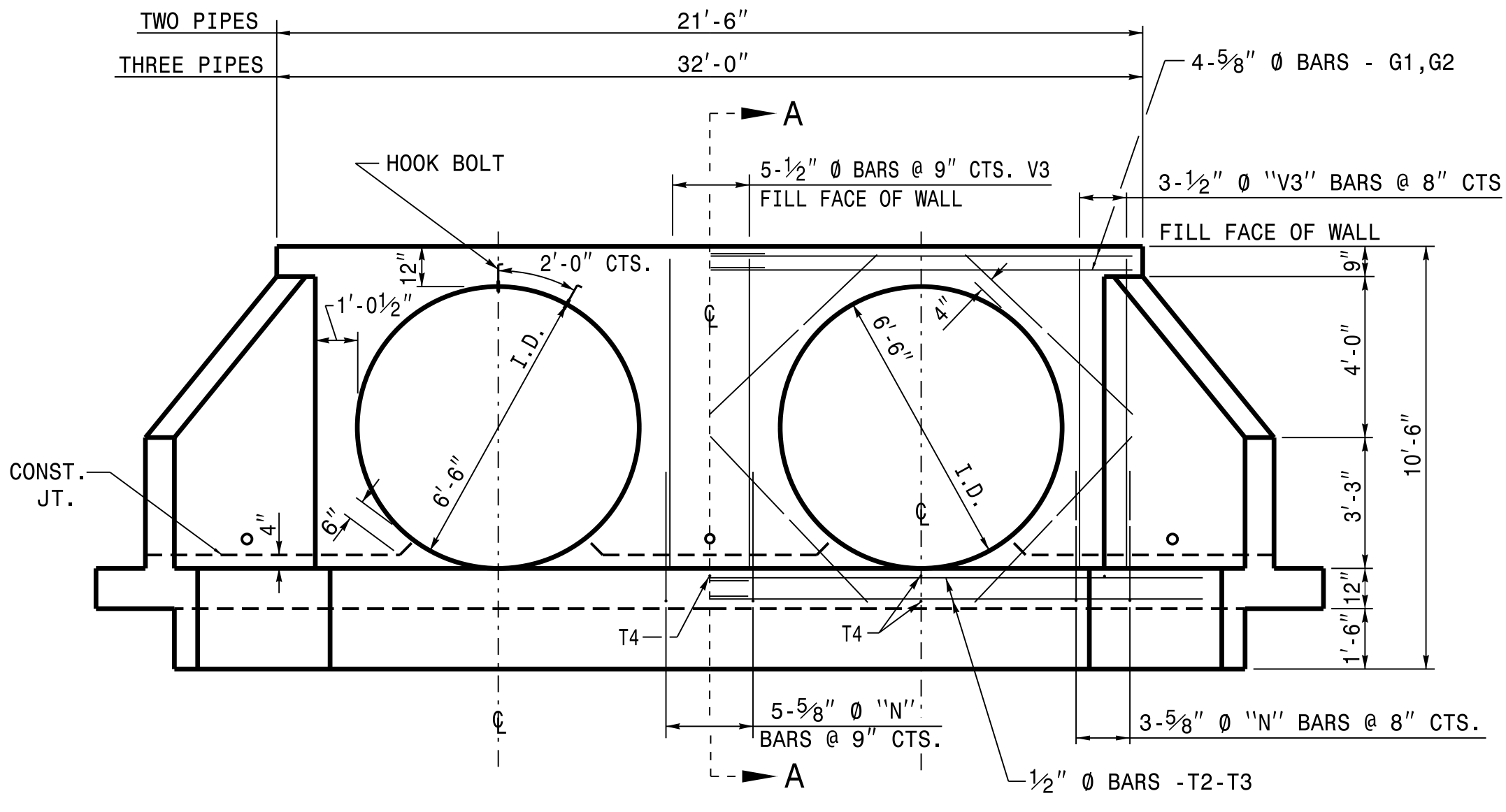
**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

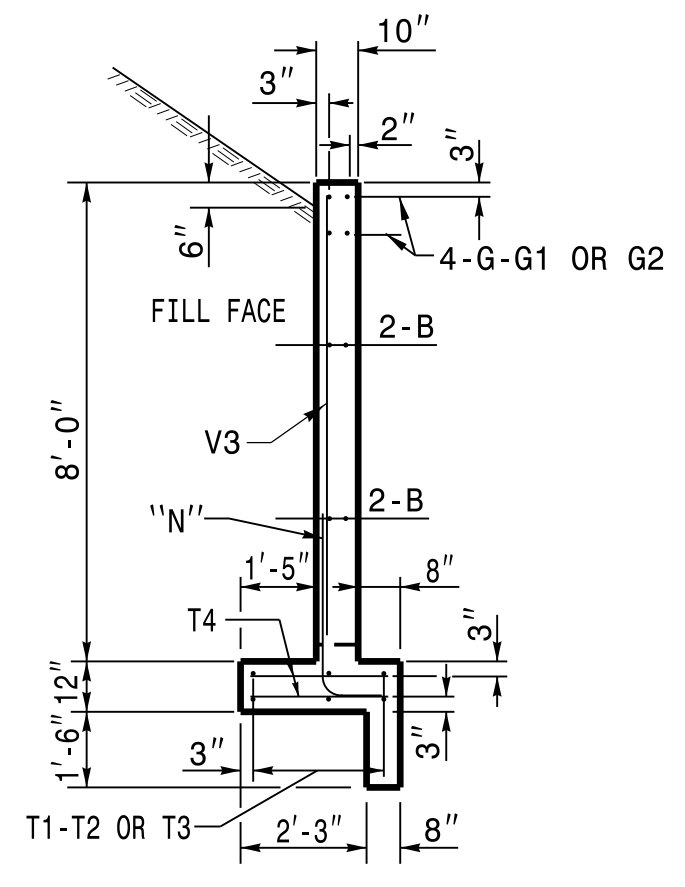
ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC: g:\ward\stds\stdstodetails\30001\0300d01.dgn



END ELEVATION



END ELEVATION



SECTION A-A FOR ALL ENDWALLS

NOTES:

USE CLASS 'A' CONCRETE.

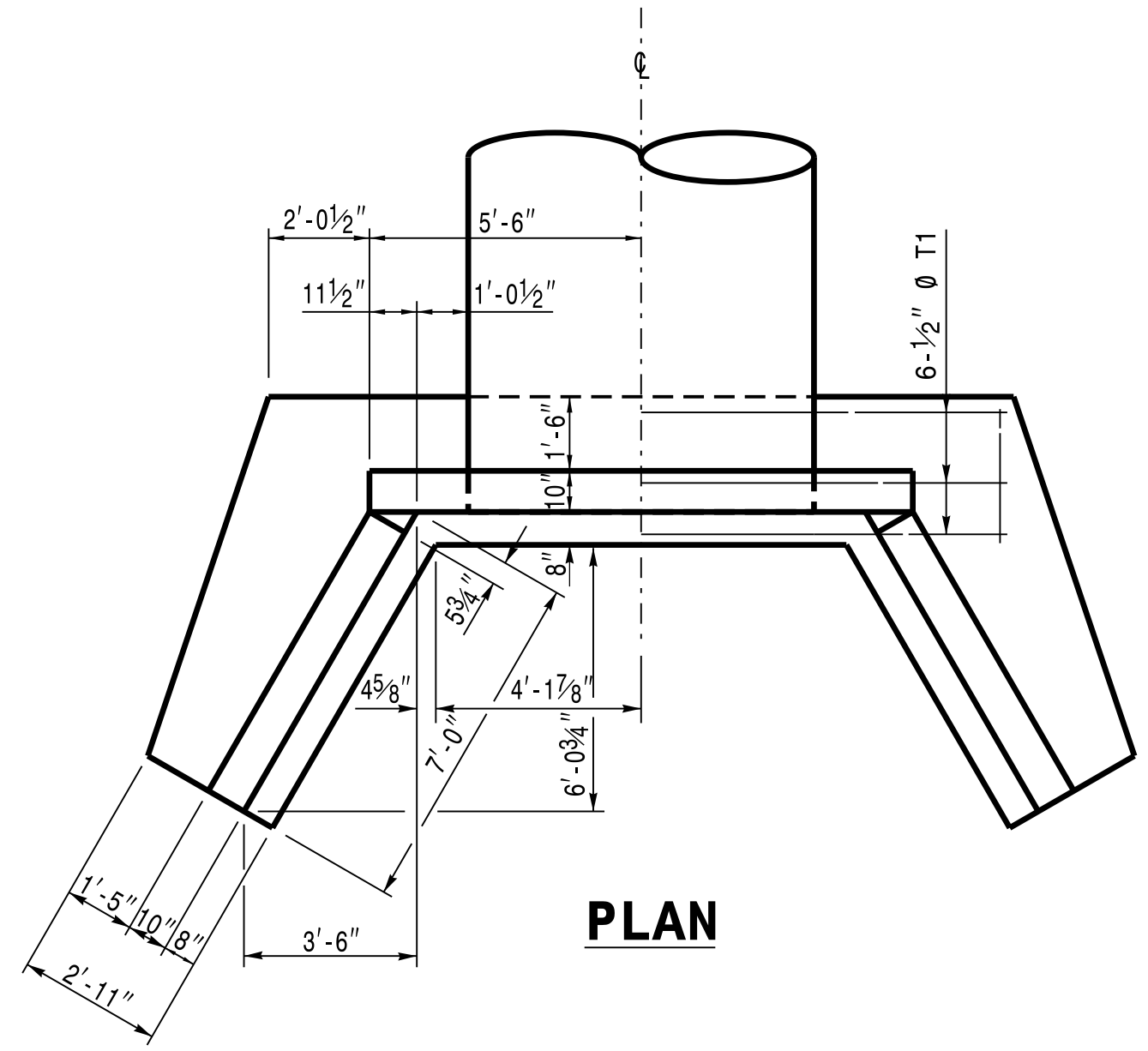
USE ASTM A615-GRADE 60 REINFORCING STEEL.

USE DEFORMED BARS FOR ALL REINFORCING STEEL. WHERE SPLICING OF REINFORCEMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.

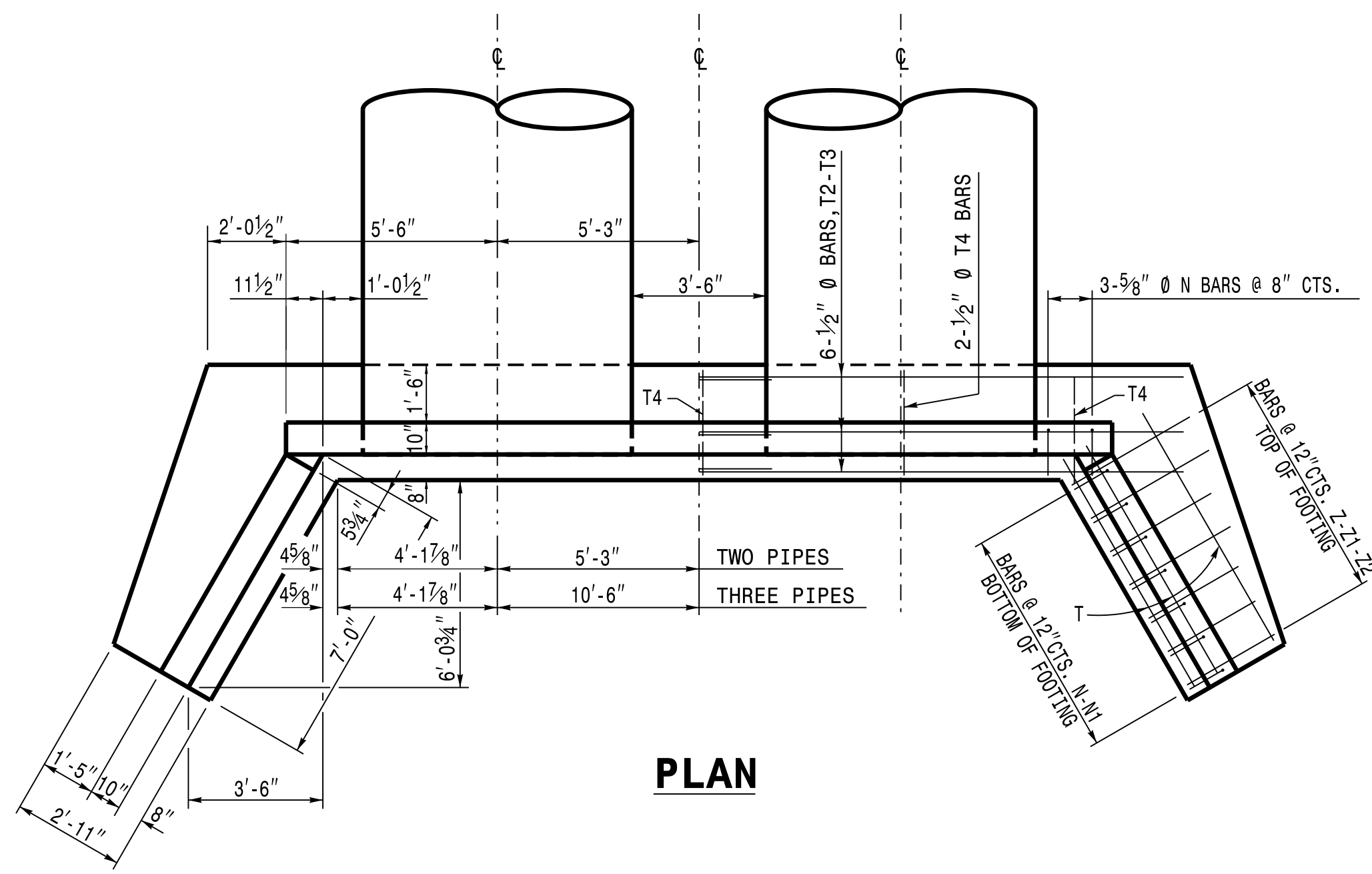
THE FOOTING, CURTAIN WALL AND 4" OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. POUR THE REMAINING WALL IN ONE OPERATION.

CHAMFER ALL EXPOSED CORNERS 1".

PLACE 3" DIAMETER DRAINS IN WALL AS SHOWN 6" ABOVE NORMAL FLOW LINE.



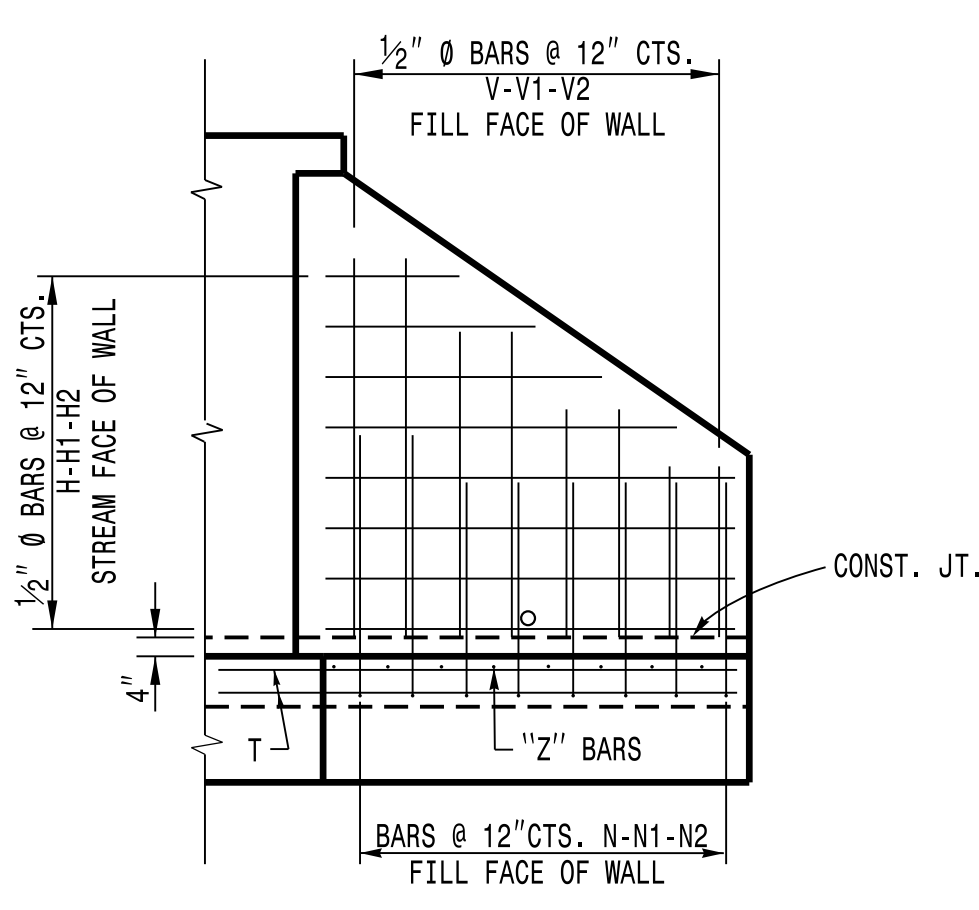
PLAN



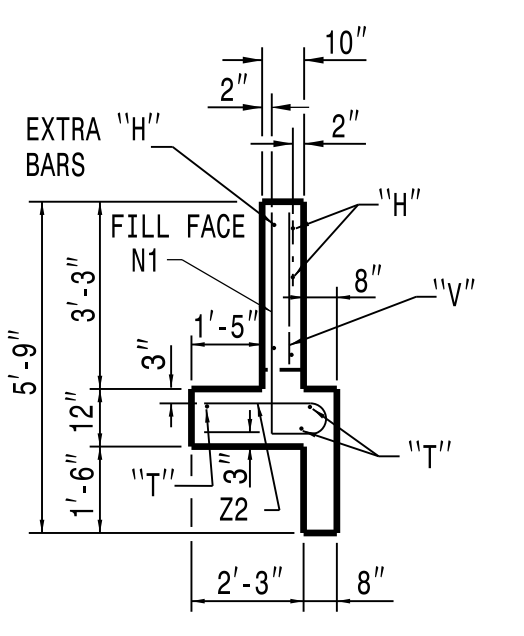
PLAN

BILL OF MATERIAL FOR ONE ENDWALL

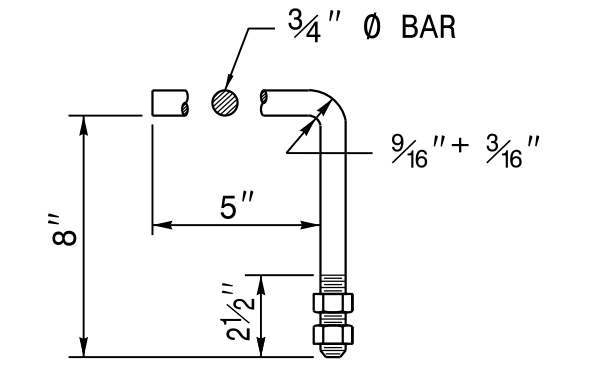
REINFORCING STEEL	1 PIPE	2 PIPES	3 PIPES
BAR #4	NO. 8	NO. 16	NO. 24
WEIGHT	32	64	96
G #5	NO. 4	NO. 8	NO. 8
LENGTH	10'-9"	11'-9"	17'-0"
WEIGHT	45	98	142
H #4	NO. 10	NO. 10	NO. 10
LENGTH	9'-0"	7'-0"	3'-9"
WEIGHT	60	28	10
H1 #4	NO. 6	NO. 6	NO. 6
LENGTH	7'-0"	3'-9"	3'-9"
WEIGHT	28	10	10
N #5	NO. 10	NO. 15	NO. 20
LENGTH	4'-6"	4'-1"	4'-1"
WEIGHT	47	27	27
T #4	NO. 6	NO. 6	NO. 6
LENGTH	6'-6"	15'-0"	13'-9"
WEIGHT	26	60	110
T1 #4	NO. 6	NO. 12	NO. 12
LENGTH	6'-6"	19'-0"	2'-9"
WEIGHT	26	110	13
T2 #4	NO. 6	NO. 7	NO. 7
LENGTH	13'-9"	2'-9"	2'-9"
WEIGHT	110	13	10
T3 #4	NO. 6	NO. 6	NO. 6
LENGTH	19'-0"	5'-9"	4'-6"
WEIGHT	152	23	20
T4 #4	NO. 4	NO. 8	NO. 8
LENGTH	2'-9"	2'-9"	3'-6"
WEIGHT	13	15	11
V #4	NO. 6	NO. 6	NO. 6
LENGTH	5'-9"	4'-6"	4'-3"
WEIGHT	23	18	11
V1 #4	NO. 6	NO. 8	NO. 8
LENGTH	4'-6"	2'-9"	2'-9"
WEIGHT	18	15	15
V2 #4	NO. 6	NO. 6	NO. 6
LENGTH	2'-9"	7'-6"	3'-6"
WEIGHT	15	55	20
V3 #4	NO. 6	NO. 4	NO. 4
LENGTH	7'-6"	4'-3"	3'-6"
WEIGHT	16	11	4
Z #5	NO. 4	NO. 4	NO. 4
LENGTH	4'-9"	4'-3"	3'-6"
WEIGHT	20	11	4
Z1 #4	NO. 4	NO. 6	NO. 6
LENGTH	4'-3"	3'-6"	2'-9"
WEIGHT	11	14	14
Z2 #4	NO. 6	NO. 6	NO. 6
LENGTH	3'-6"	14	14
WEIGHT	14	14	14
TOTAL REINF. STEEL (lbs.)	473	662	834
CLASS "A" CONC. (cu. yds.)	7.9	10.8	13.8



ELEVATION OF WING SHOWING REINFORCEMENT

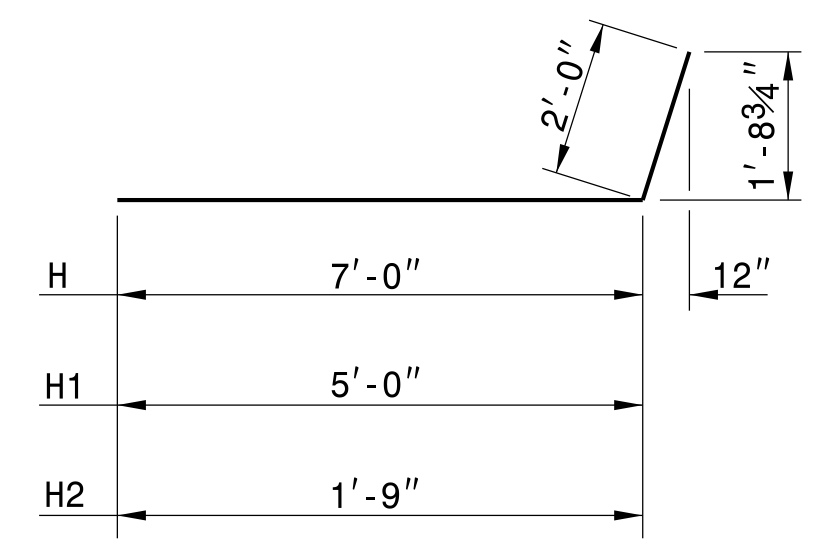


END OF WING

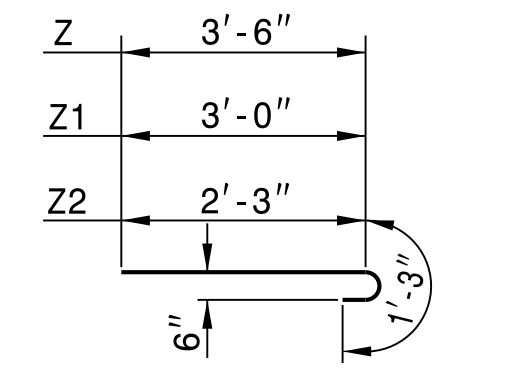


HOOK BOLT

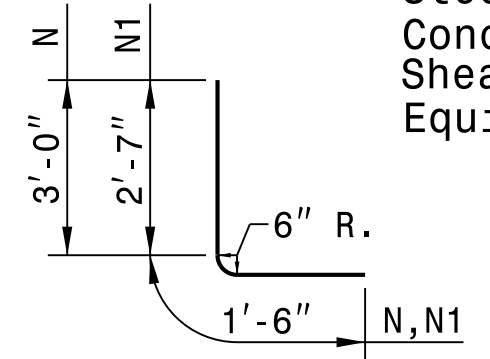
HOOK BOLTS (CONSTRUCT ANCHORS AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 6'-6" CSP. EMBED THE HOOK BOLTS IN THE CONCRETE ENDWALL 8" IN DEPTH. THE GALVANIZED 3/4" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.



BARS H-H1-H2



BARS Z-Z1-Z2



BARS N-N1



7/8/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

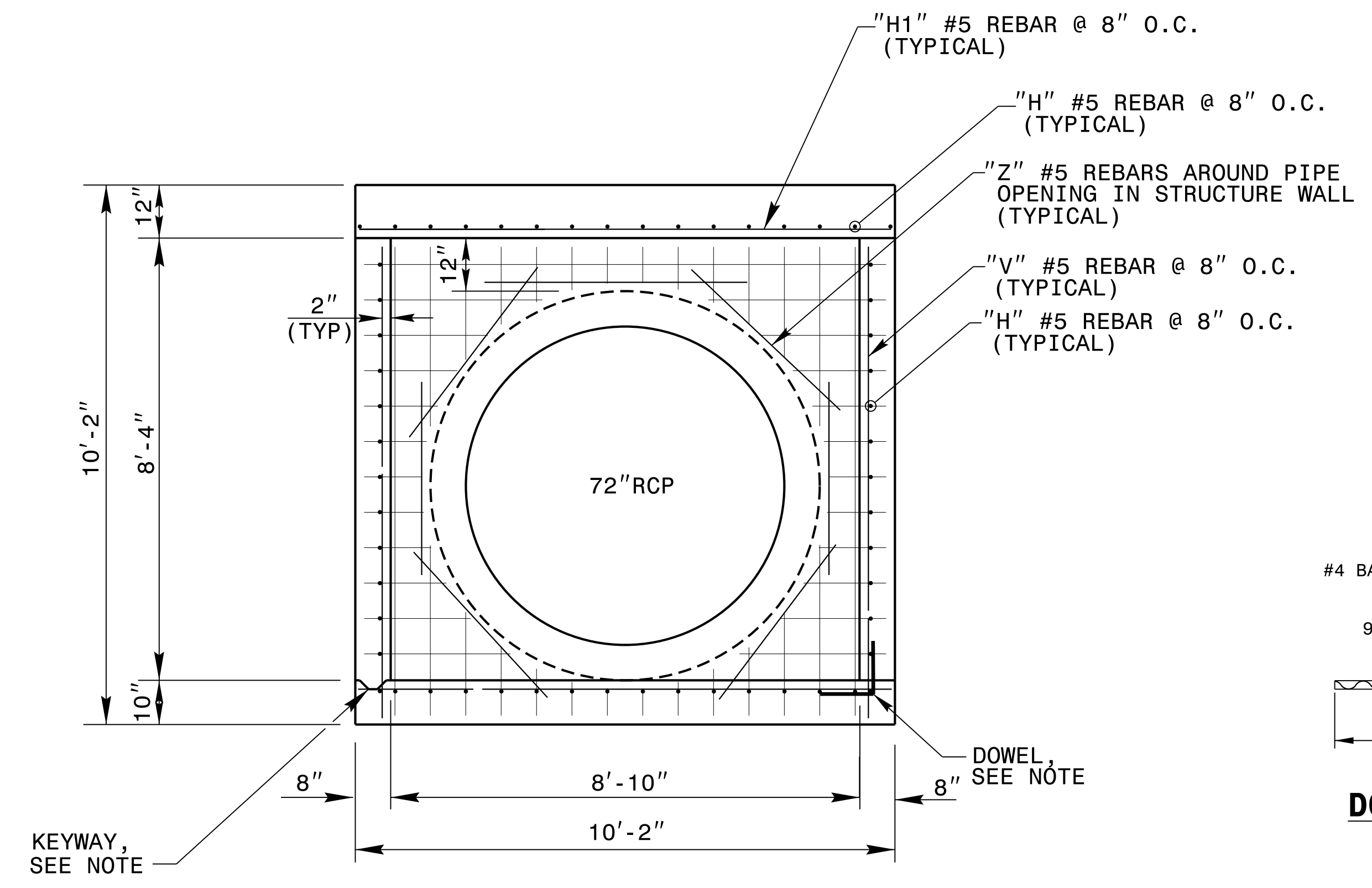
DESIGN DATA

Specifications A.A.S.H.T.O. (1977)
 Steel in tension 20,000 LBS. PER SQ. IN.
 Concrete in compression 1,200 LBS. PER SQ. IN.
 Shear Class "A" Concrete SEE A.A.S.H.T.O.
 Equiv. fluid pressure of earth 30 LBS. PER CU. FT.

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DETAIL OF REINFORCED CONCRETE ENDWALL FOR 78" DIAMETER PIPE - 90° SKEW

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: R.E.D.&T.S.S. DATE: 6-96 & 5-00
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: w:details\stand\endwpip84sk90.dgn



GENERAL NOTES:

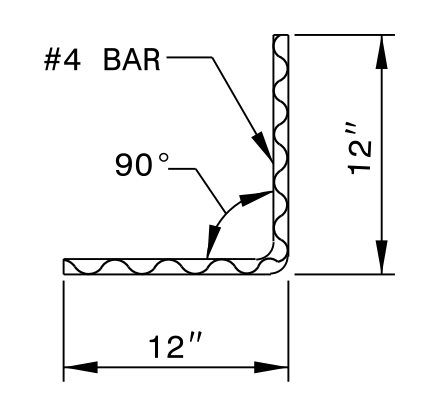
USE CLASS "B" CONCRETE THROUGHOUT.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS OR BRICK/BLOCK WALLS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

BOX DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.



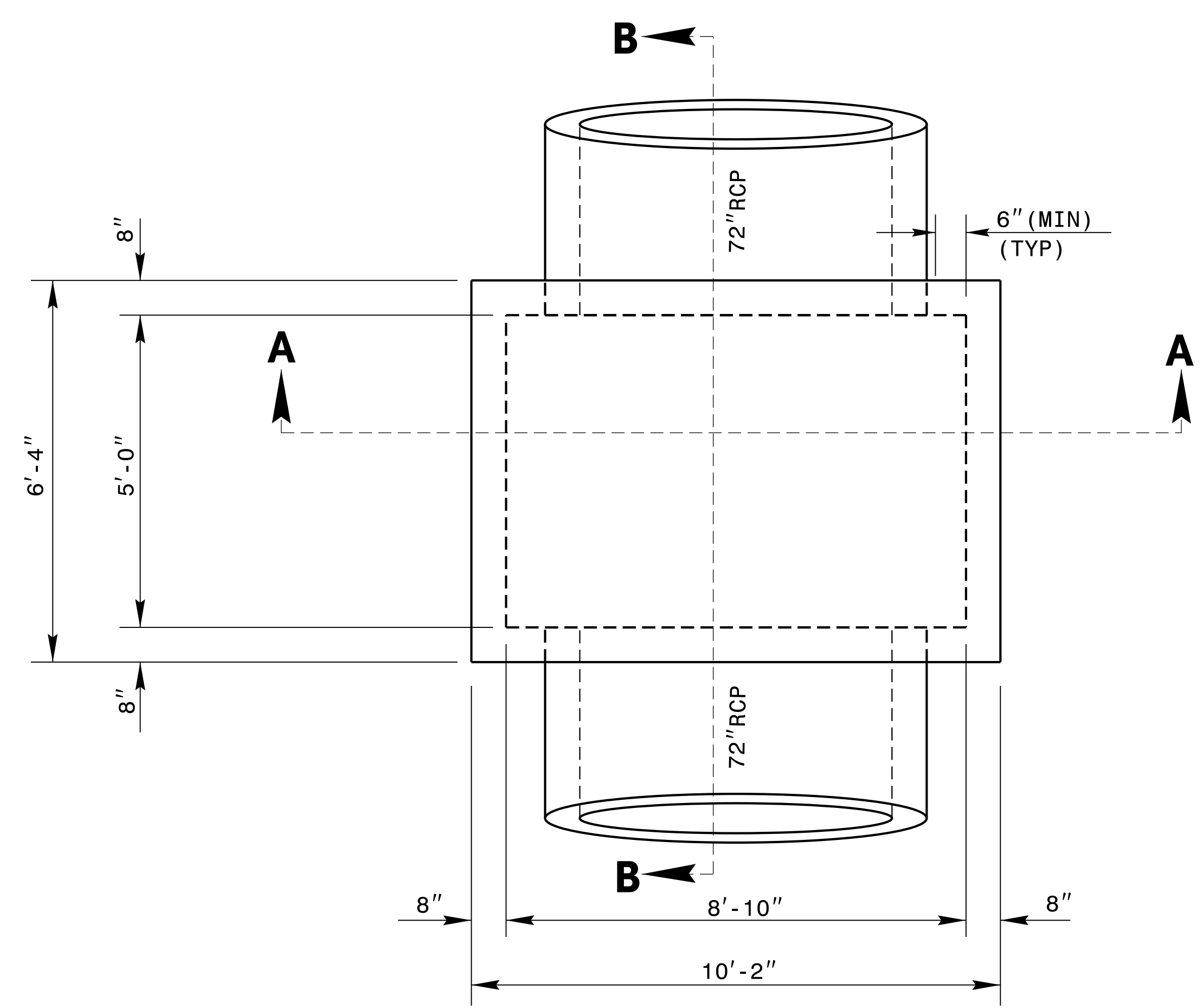
DOWEL

BILL OF MATERIALS				
BAR	NO.	SIZE	LENGTH	WEIGHT
H	42	#5	8'-10"	387
H1	48	#5	8'-6"	426
V	54	#5	7'-6"	423
Z	14	#5	5'-0"	74
TOTAL REINF. STEEL (LBS.)				1310
TOTAL CONC. (CU. YDS.)				* 11.8

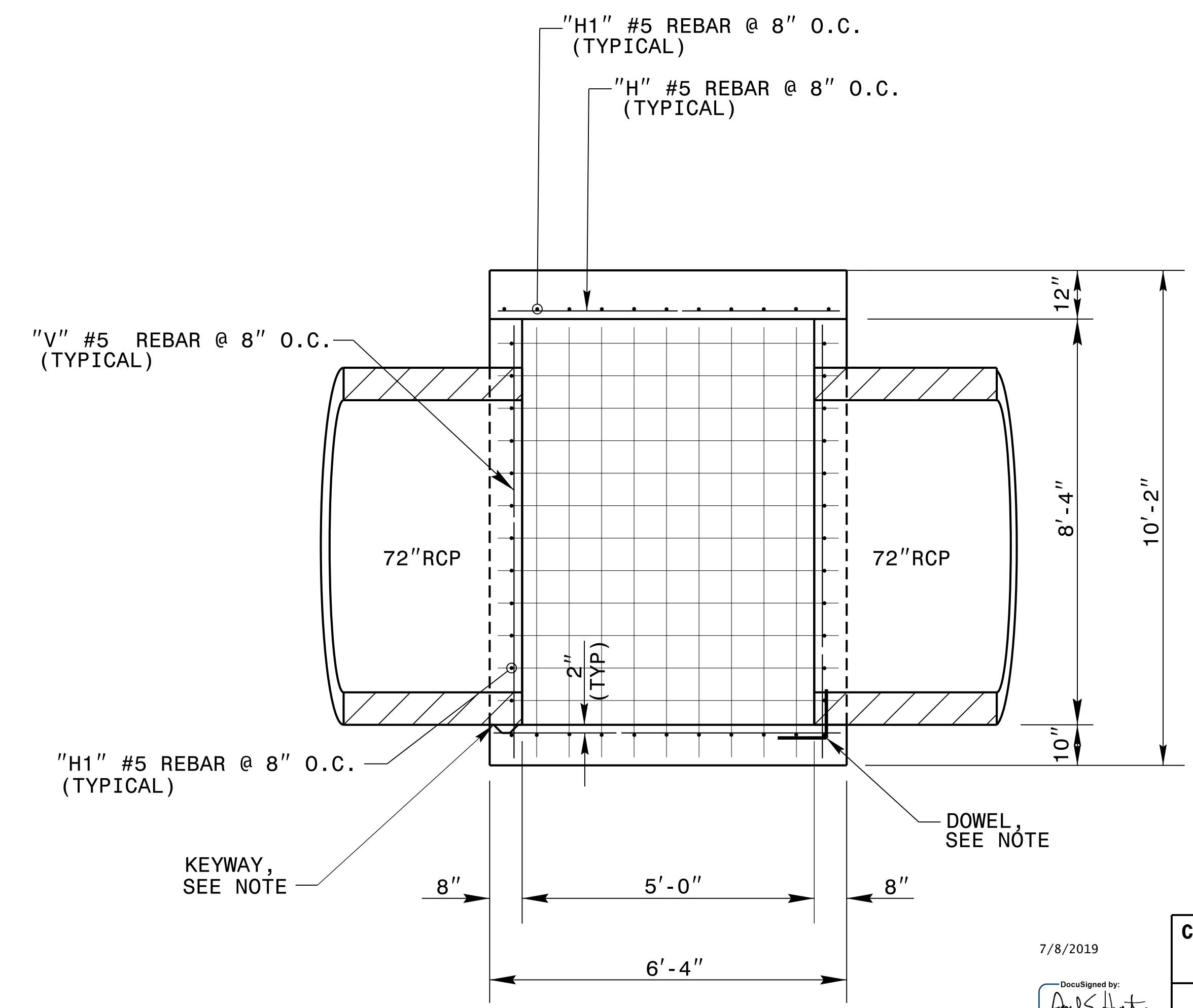
* NO DEDUCTION HAS BEEN MADE FOR PIPES

* 2.00 CU. YD. DEDUCTION FOR 2-72" RC PIPE

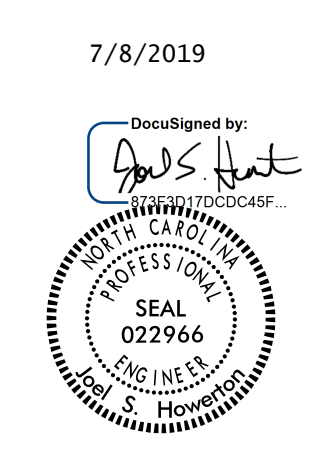
SECTION A-A



PLAN VIEW



SECTION B-B



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**CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN**
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**SPECIAL JUNCTION BOX
WITH SLAB LID**

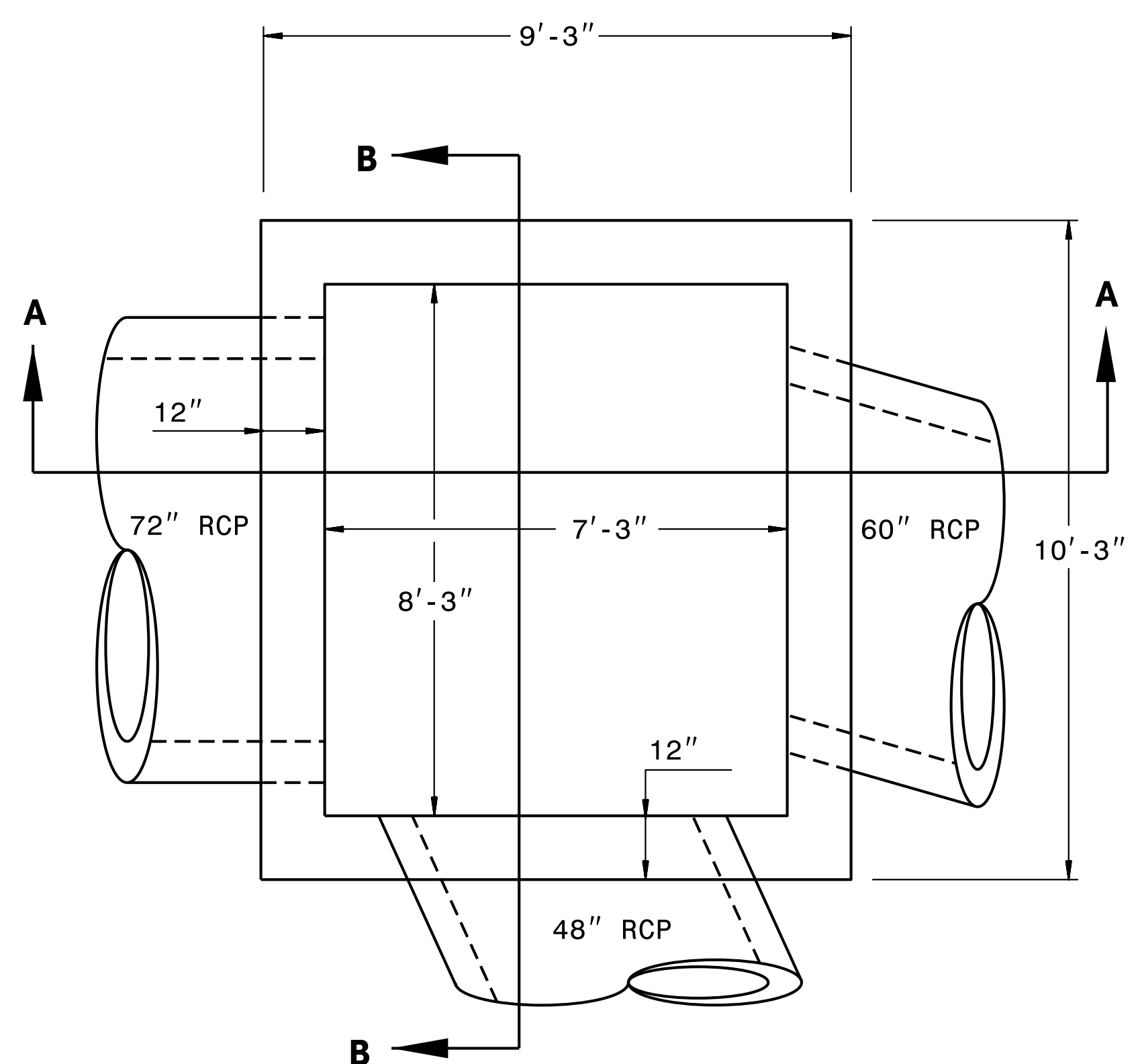
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 MODIFIED BY: nbritt DATE: 04/17/09
 CHECKED BY: _____ DATE: _____
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26-JAN-2018 10:05
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 J:\overton AT_CSD-292595

5/14/99

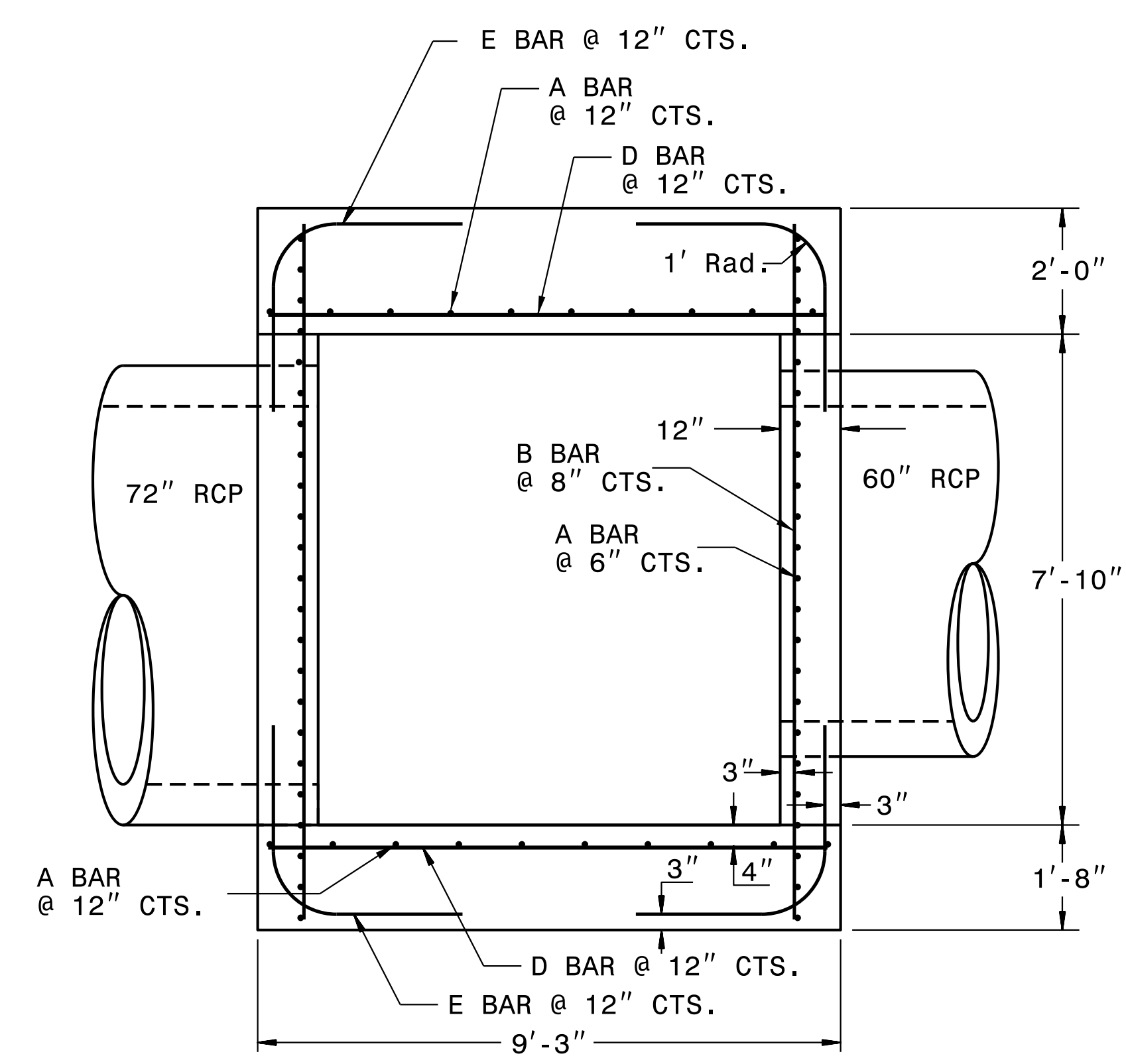


DocuSigned by:
Joel S. Howerton
7/8/2019

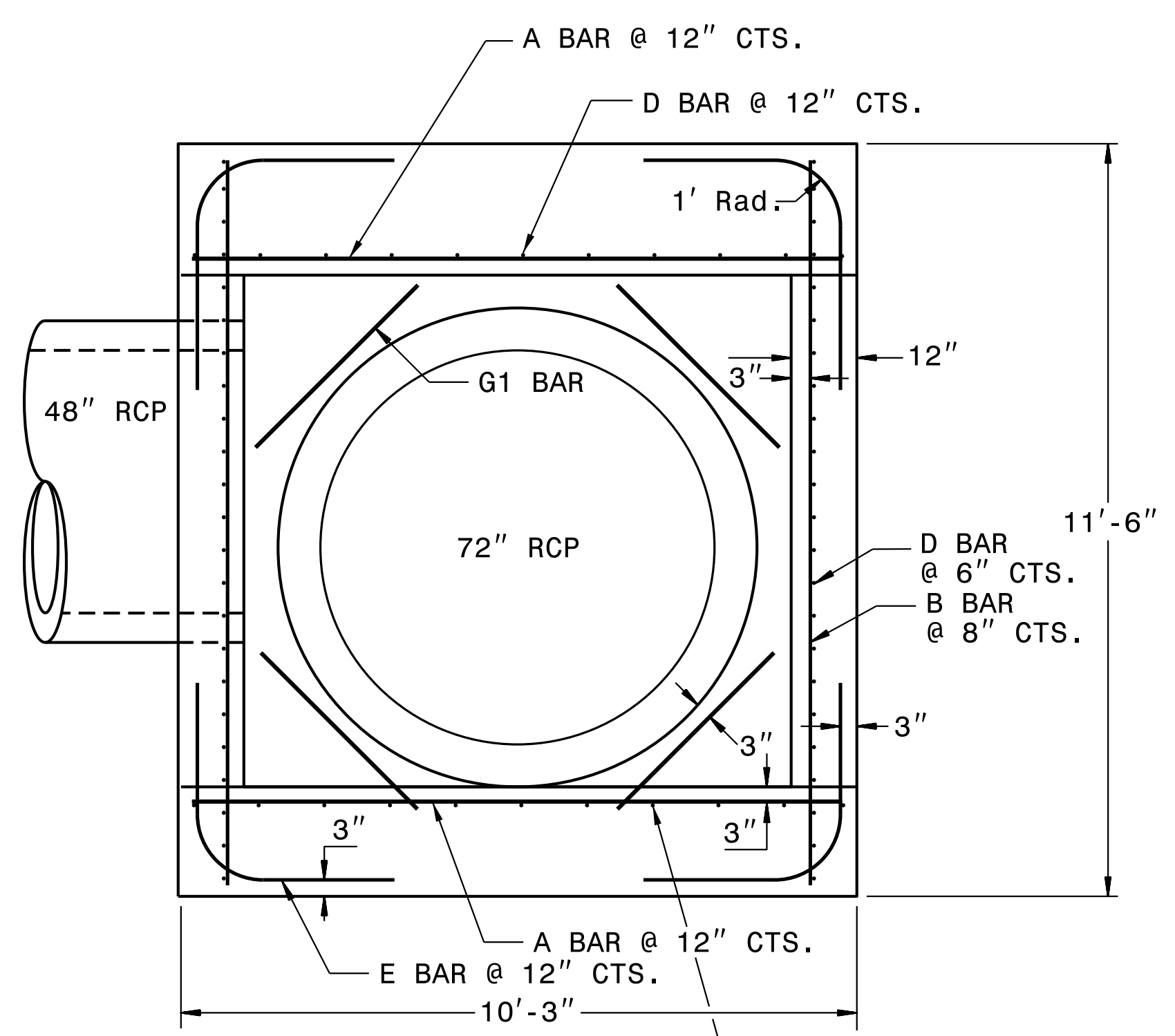


PLAN VIEW

GENERAL NOTES:
 CHAMFER ALL EXPOSED CORNERS 1".
 USE CLASS "B" CONCRETE THROUGHOUT.
 IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE SLAB AS SHOWN ON STANDARD DRAWING 840.00.
 INCLUDE THE COST OF REINFORCING STEEL BARS IN THE UNIT PRICE BID PER CUBIC YARD OF "REINFORCED CONCRETE DRAINAGE STRUCTURE."
 CUT, BEND OR RELOCATE REINFORCING STEEL TO POSITION PIPE AS DIRECTED BY THE ENGINEER.
 CUT, BEND OR RESHAPED REBARS CROSSING PIPE OPENINGS OR PASSING WITHIN 2" OF A PIPE TO CLEAR THE OPENING.
 POSITION JUNCTION BOX AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.



SECTION 'A-A'



SECTION 'B-B'

BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	WEIGHT
A	66	5	9'-9"	671.2
B	54	5	11'-0"	619.5
D	68	5	8'-9"	620.6
E	42	5	4'-8"	208.1
G1	12	5	3'-6"	43.8
			TOTAL STEEL (lbs.)	2163.2
			CLASS "B" CONCRETE (cu.yds.)	23.0

NO DEDUCTIONS HAVE BEEN MADE FOR PIPES.

CONTRACT STANDARDS AND DEVELOPMENT UNIT
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DETAIL OF JUNCTION BOX FOR 72" RCP, 48" RCP, 60" RCP UNDER 65' FILL

ORIGINAL BY: L.E. Robinson & T.L. Stephenson DATE: Aug. 1993
 MODIFIED BY: K. Kempf DATE: May. 2019
 CHECKED BY: DATE:
 FILE SPEC.: s:k Kempf\72 48 60 JB under 65ft of fill.dgn

29-MAY-2019 15:36
 S:\Contract\2019\20190525\Special Details\k Kempf\english\72 48 60 JB under 65 ft. of fill.dgn
 k Kempf AT CSD-202596



DocuSigned by:
Shane C. Clark 10/11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ESTIMATED QUANTITIES	
SLOPE HEIGHT, H (FT)	SQUARE YDS
< 20	7500
20-40	7500
40 +	89000

SLOPE HEIGHT, H (FT)	MIN. ULTIMATE TENSILE STRENGTH (---)	PRIMARY GEOGRID LENGTH (FT)	SECONDARY GEOGRID LENGTH (FT)
< 20 **	600	10	5
20-40	900	15	5
40+	1200	25	10

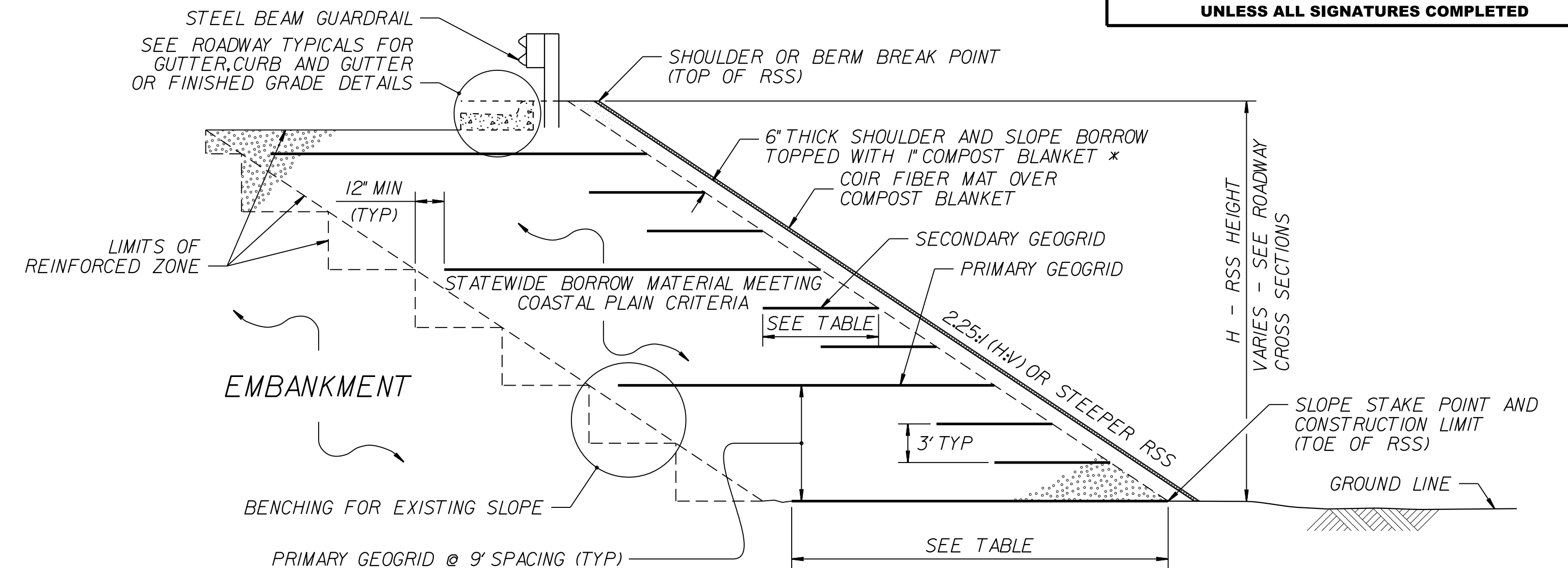
** - SLOPES 10 FT OR LESS IN HEIGHT USE SECONDARY GEOGRIDS ONLY

LTDS - MINIMUM REQUIRED LONG-TERM DESIGN STRENGTH (LB/FT)

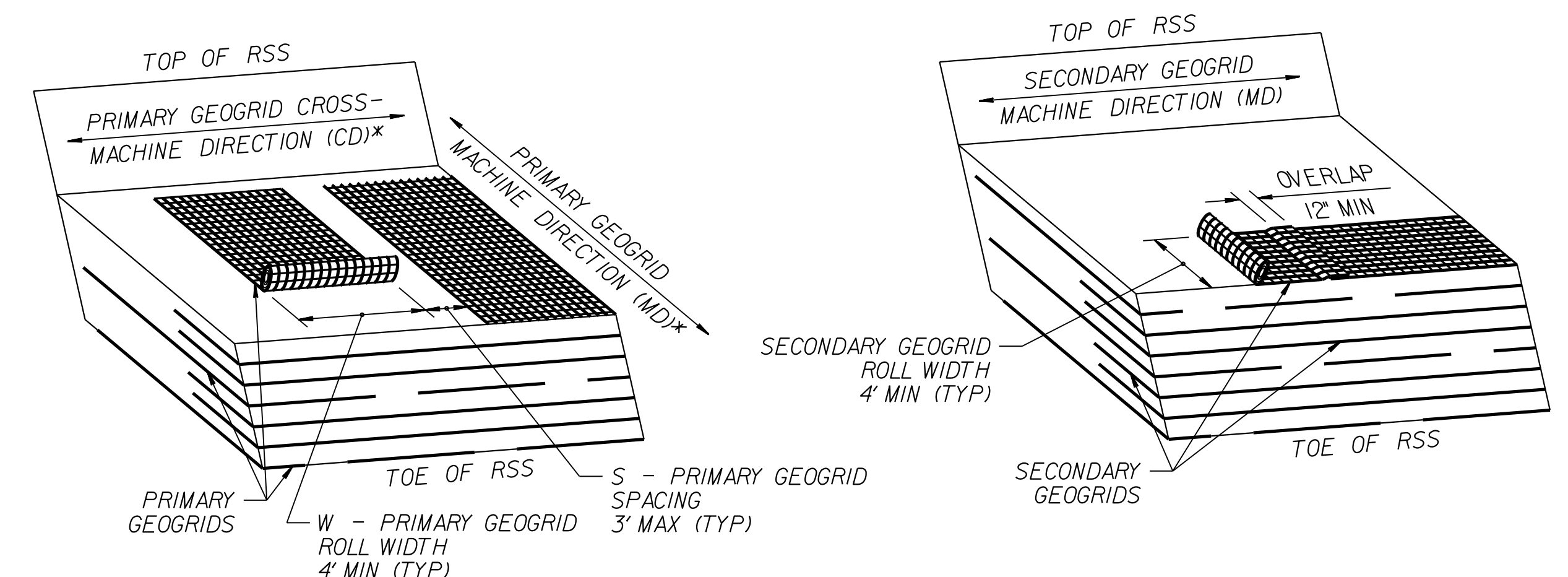
(LTDS IS BASED ON 100% COVERAGE FOR PRIMARY GEOGRID. SEE NOTE 9 FOR LESS THAN 100% COVERAGE.)

NOTES:

- SEE EROSION CONTROL AND ROADWAY PLANS AND SUMMARY SHEETS FOR REINFORCED SOIL SLOPE (RSS) AND SLOPE EROSION CONTROL LOCATIONS.
- FOR REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR STEEL BEAM GUARDRAIL, SEE SECTION 862 OF THE STANDARD SPECIFICATIONS.
- FOR SHOULDER AND SLOPE BORROW, SEE ARTICLE 1019-2 OF THE STANDARD SPECIFICATIONS. FOR COIR FIBER MAT, MATTING FOR EROSION CONTROL AND COMPOST BLANKET, SEE EROSION CONTROL PROVISIONS, SECTION 1631 OF THE STANDARD SPECIFICATIONS AND ROADWAY STANDARD DRAWING NO. 1631.01. FOR COMPOST BLANKET SEE COMPOST BLANKET PROVISION.
- RSS SLOPE DESIGNS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 10$ PSF
- GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR LONG-TERM DESIGN STRENGTHS FOR A 75-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-Material.aspx
- CONSTRUCT EMBANKMENT SLOPES WITH COASTAL PLAIN MATERIALS MEETING THE STATEWIDE BORROW CRITERIA AS DEFINED IN CURRENT ISSUE OF THE ROADWAY STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
- IF THE WEBSITE DOES NOT LIST A LONG-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID IN THE MD, DO NOT USE THE GEOGRID FOR PRIMARY GEOGRID. IF THE WEBSITE DOES NOT LIST A LONG-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID IN THE CD, USE A LONG-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 7 FOR THE SECONDARY GEOGRID.
- DO NOT OVERLAP PRIMARY GEOGRIDS IN THE MD SO OVERLAPS ARE PARALLEL TO THE TOE OF RSS. POLYOLEFIN (e.g., HDPE OR PP) GEOGRIDS MAY BE SPLICED ONCE PER PRIMARY GEOGRID LENGTH IN ACCORDANCE WITH THE GEOGRID MANUFACTURER'S INSTRUCTIONS. USE POLYOLEFIN GEOGRID PIECES AT LEAST 4' LONG. DO NOT SPLICE POLYESTER TYPE (PET) GEOGRIDS.
- FOR PRIMARY GEOGRIDS WITH 100% COVERAGE, PLACE PRIMARY GEOGRIDS SO GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CD. FOR PRIMARY GEOGRIDS WITH 75% TO LESS THAN 100% COVERAGE,
 $MINIMUM\ REQUIRED\ LONG-TERM\ DESIGN\ STRENGTH = LTDS\ BASED\ ON\ 100\% \ COVERAGE \times (W + S) / W$
- SEE TABLE FOR LTDS BASED ON 100% COVERAGE AND GEOGRID PLACEMENT DETAILS FOR PRIMARY GEOGRID ROLL WIDTH (W) AND SPACING (S). FOR PRIMARY GEOGRIDS WITH LESS THAN 100% COVERAGE, STAGGER PRIMARY GEOGRIDS SO GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW. DO NOT USE LESS THAN 75% COVERAGE FOR PRIMARY GEOGRIDS.
- DO NOT PLACE ANY GEOGRIDS UNTIL EXCAVATION DIMENSIONS AND IN-SITU MATERIAL ARE APPROVED.
- FOR SLOPE EROSION CONTROL, USE COIR FIBER MATTING ON SLOPE FACES OF RSS AS SHOWN IN THE DETAILS.



MATTING WITH SHOULDER AND SLOPE BORROW

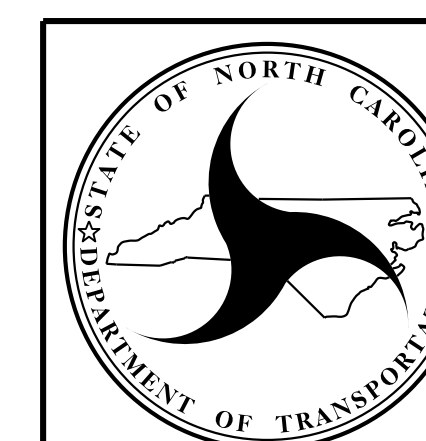


GEOGRID PLACEMENT DETAILS

$(\% \ COVERAGE = \frac{W}{W+S} \times 100 \geq 75\%)$

*SEE NOTES 8 AND 9 ON SHEET 2.

PREPARED BY: MHS	DATE: 6-10-13
REVIEWED BY: SCC	DATE: 6-12-19

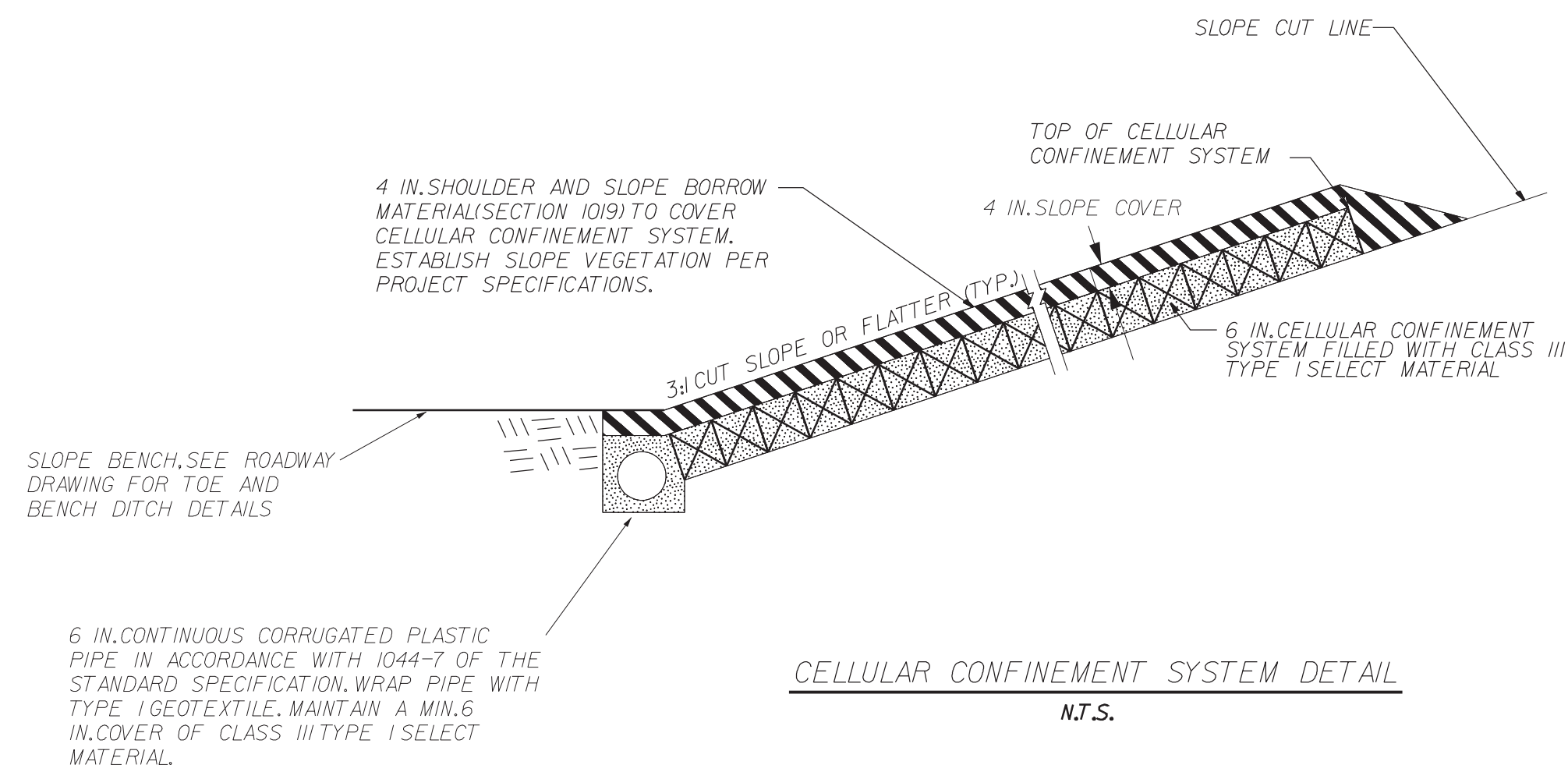


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

**REINFORCED SOIL
SLOPE (RSS) DETAILS
FOR SLOPES 2.25:1 OR STEEPER**

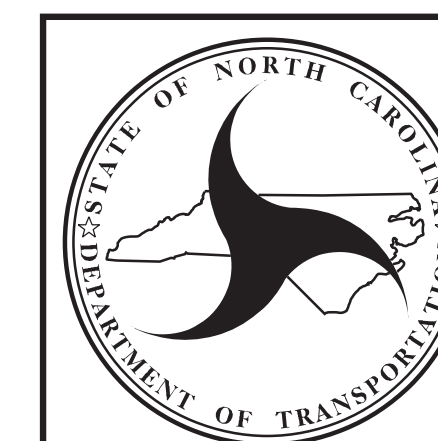
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	SCC	10/11/19	3		
2			4		



<u>PAY ITEM</u>	
6 IN. CELLULAR CONFINEMENT SYSTEM 2,000 SY

- NOTES:
- 1) INSTALL CELLULAR CONFINEMENT SYSTEM IN ACCORDANCE WITH SPECIAL PROVISIONS.
 - 2) INSTALL CELLULAR CONFINEMENT SYSTEM ANCHORS TO MINIMUM EMBEDMENT OF 12 IN. BELOW THE CELLULAR CONFINEMENT SYSTEM.

PREPARED BY: CBJ	DATE: 3/6/16
REVIEWED BY: BDK	DATE: 3/6/16



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

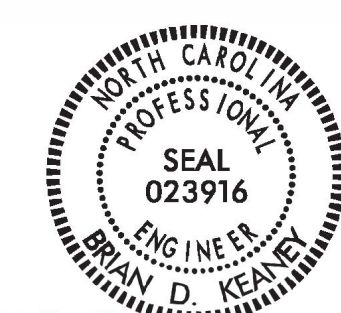
**GEOTECHNICAL
ENGINEERING UNIT**

**CELLULAR CONFINEMENT
SYSTEM**

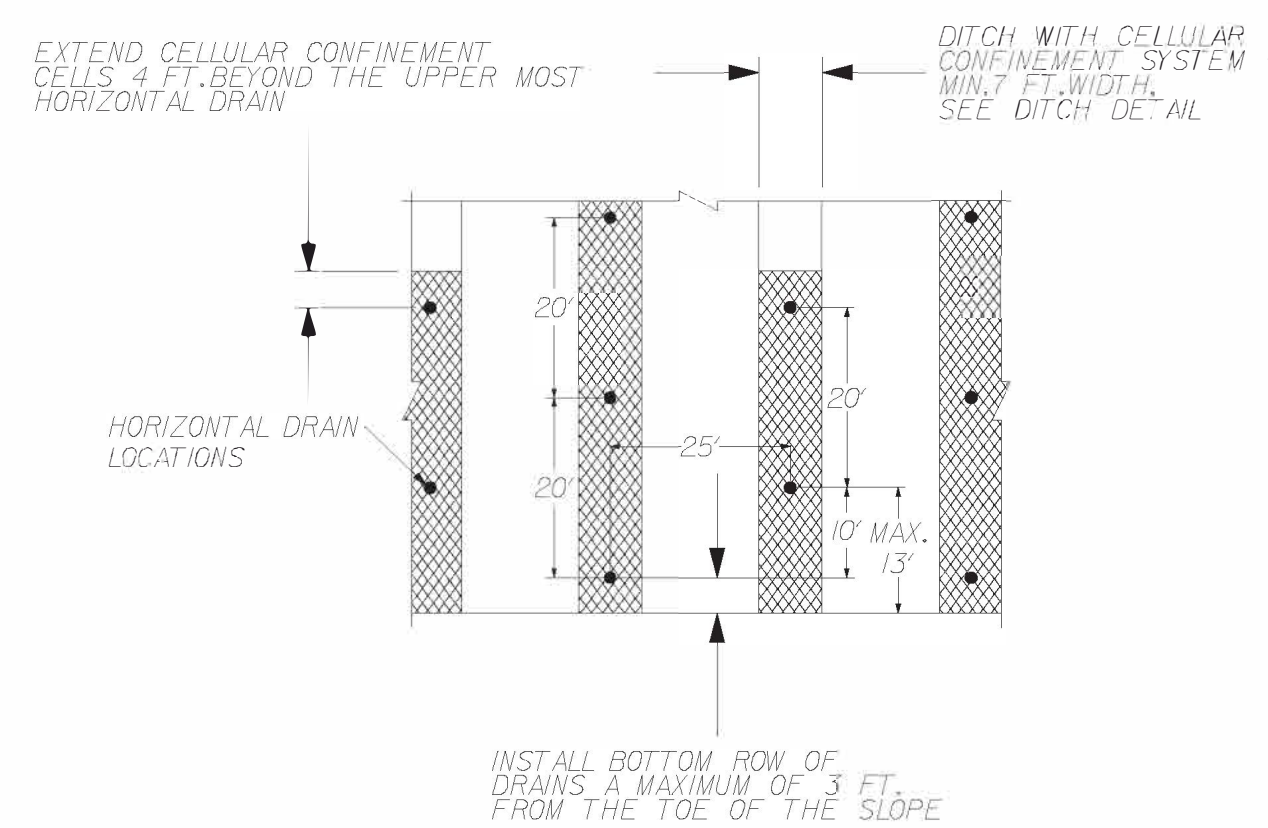
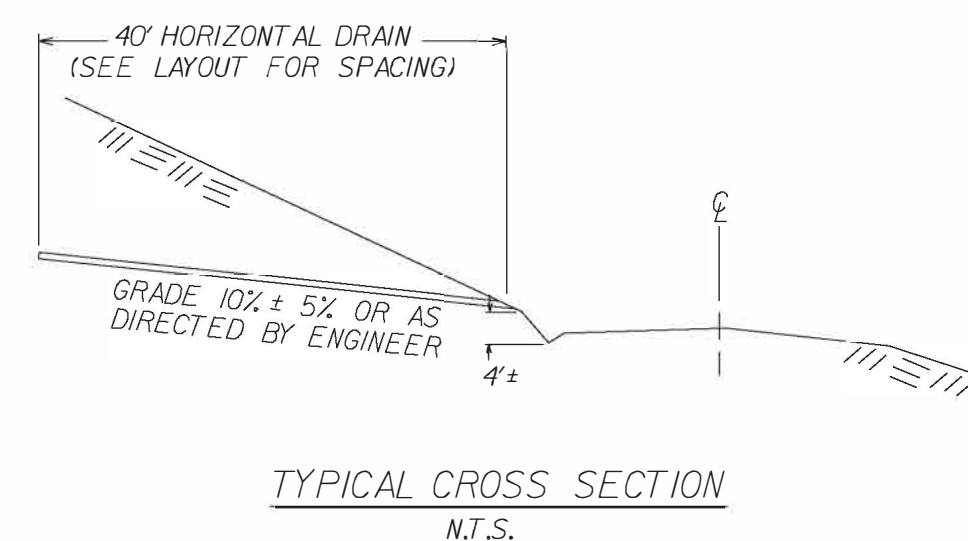
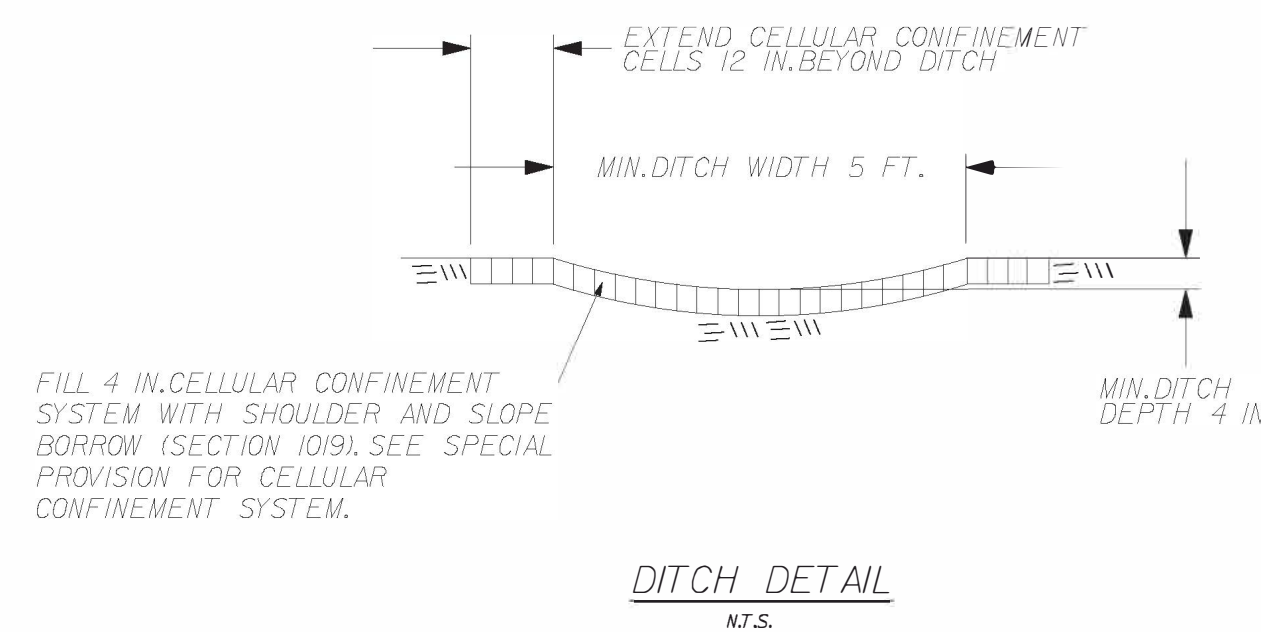
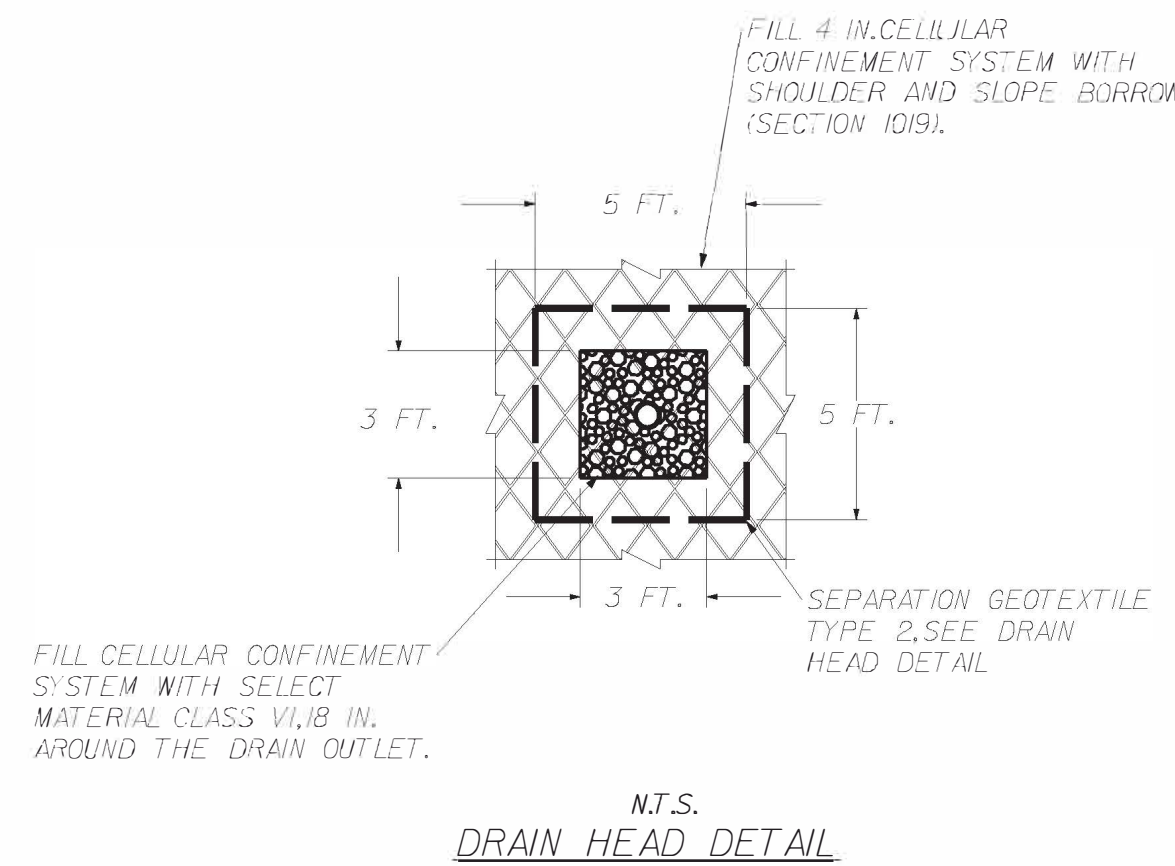
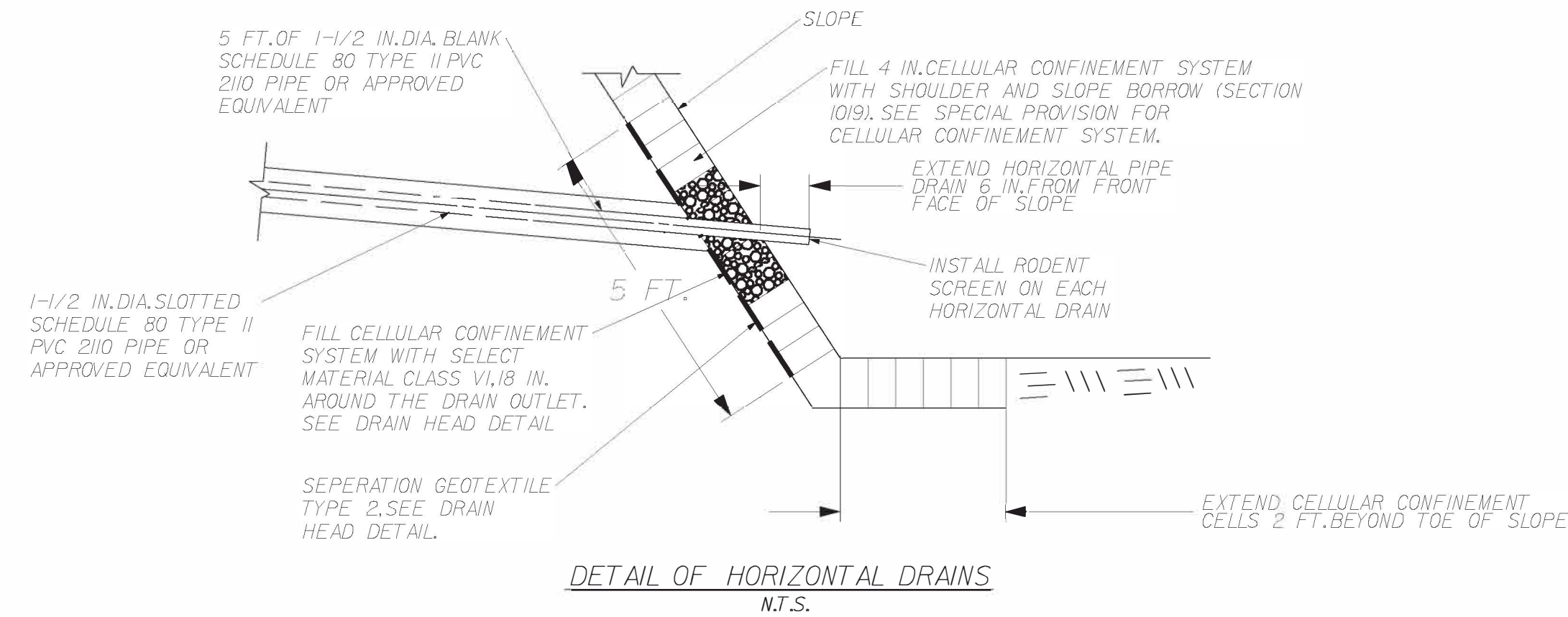
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

GEOTECHNICAL ENGINEER

ENGINEER



DocuSigned by:
 Brian D. Keaney
 7/21/2016



HORIZONTAL SLOPE DRAIN LOCATIONS

ALIGNMENT	START STATION	END STATION	NUMBER OF DRAINS
L	182+50	197+00	186
L	200+50	203+50	26
L	285+50	287+00	28
RAMP B	0+00	10+50	54
RAMP C	0+00	5+50	23
SR1	28+00	33+00	70
CONTINGENCY (20%)			78
TOTAL			465

ESTIMATED QUANTITIES

HORIZONTAL DRAIN BOREHOLE.....	19,100 LF
1-1/2" SLOTTED PVC 2110 PIPE, TYPE II.....	16,300 LF
1-1/2" UNSLOTTED PVC 2110 PIPE, TYPE II.....	2,800 LF
4" CELLULAR CONFINEMENT SYSTEM.....	6,450 SY
GEOTEXTILE, TYPE II.....	1,300 SY
SELECT MATERIAL CLASS VI.....	55 CY

PAY ITEMS

HORIZONTAL SLOPE DRAIN.....	465 EA
4 IN. CELLULAR CONFINEMENT SYSTEM.....	6,450 SY

NOTES:

- 1) INSTALL HORIZONTAL SLOPE DRAINS IN ACCORDANCE WITH SPECIAL PROVISIONS.
- 2) CONTRACTOR TO INSTALL PIEZOMETERS IN SLOPES WHERE HORIZONTAL SLOPE DRAINS ARE REQUIRED PRIOR TO EXCAVATING THE SLOPES, TO DETERMINE DRAIN LOCATIONS.
- 3) INSTALL 4 IN. CELLULAR CONFINEMENT SYSTEM IN ACCORDANCE WITH SPECIAL PROVISION.

PREPARED BY: CBJ DATE: 3/6/16
 REVIEWED BY: BDK DATE: 3/6/16



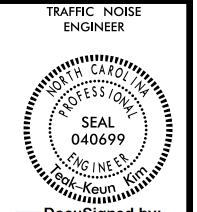
NORTH CAROLINA
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 DIVISION OF HIGHWAYS

GEOTECHNICAL
 ENGINEERING UNIT

HORIZONTAL SLOPE DRAINS

REVISIONS

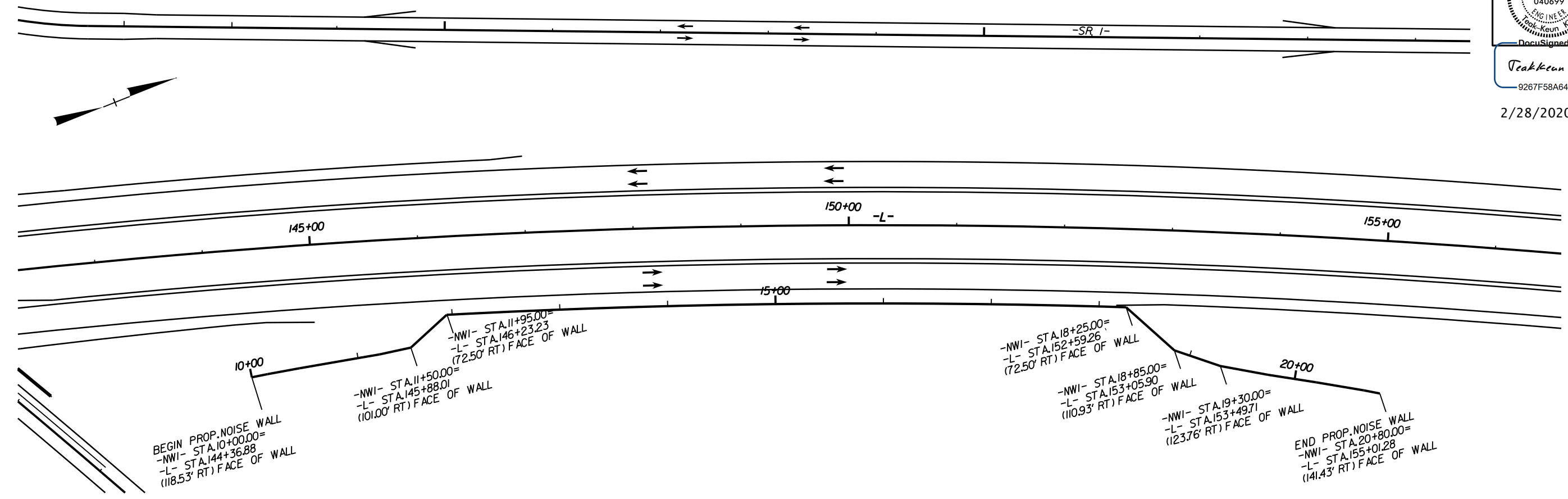
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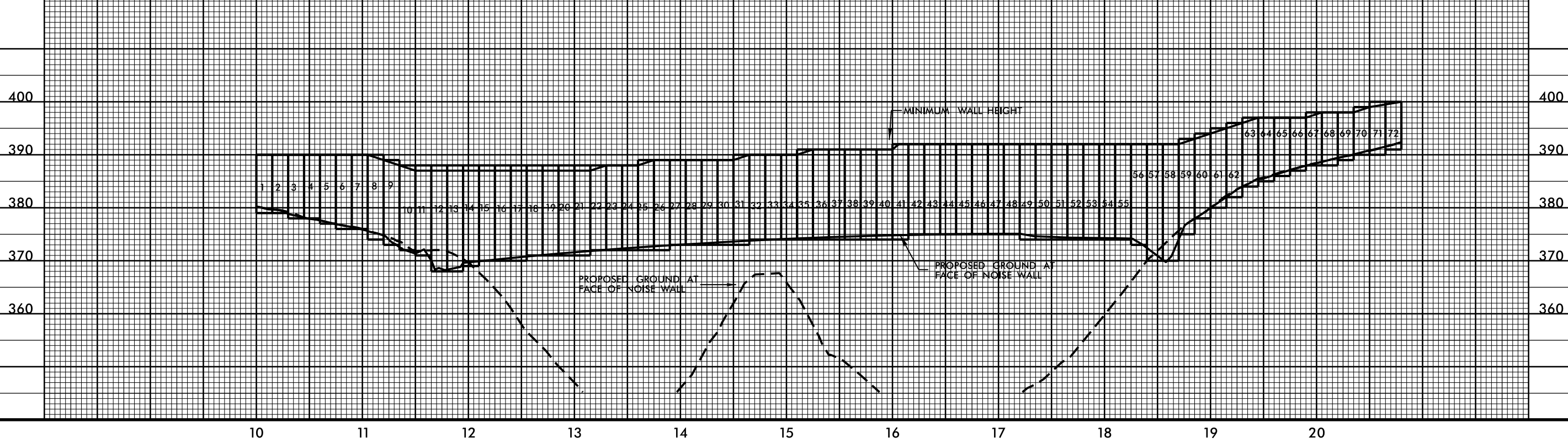
DocuSigned by:
Trakkeun Kim
9267F58A64E84CF

2/28/2020

PLAN AND PROFILE OF NOISE WALL 1



NOISE WALL 1 DESIGN DATA															
PANEL NUMBER	1-8	9	10-24	25-30	31-34	35-40	41-58	59	60	61	62	63-66	67-69	70	71-72
TOP ELEVATION	390'	389'	388'	389'	390'	391'	392'	393'	394'	395'	396'	397'	398'	399'	400'
PANEL LENGTH	120'	15'	225'	90'	60'	90'	270'	15'	15'	15'	15'	60'	45'	15'	30'



8/6/13
28-FEB-2020 12:13
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NCCAR-HARRIS

COMPUTED BY: ESM DATE: 5-2-19
CHECKED BY: AEV DATE: 5-10-19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. SHEET NO.
R-3421B 3D-9

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

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

Table with columns for LINE & STATION, OFFSET, STRUCTURE NUMBER, DRAINAGE PIPE (HDPE), R. C. PIPE CLASS V, R. C. PIPE CLASS IV, CONTRACTOR DESIGN, ENDWALLS, REINFORCED ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRAPE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

COMPUTED BY: CBJ DATE: 6-27-16
 CHECKED BY: BDJ DATE: 6-27-16
 UPDATED BY: SCC DATE: 6-12-19

(6-27-16)

PROJECT NO. SHEET NO.
 R-3421B 36-1

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

Alignment	Begin Station	End Station	Length (feet)	Multiplier	Drain Type* UD/BD/SD	Linear Feet of Underdrains
-L-	173+00	177+00	400	2	SD	800
-L-	181+00	205+00	2,500	2	SD	5,000
-L-	260+00	274+00	1400	2	SD	2800
-L-	277+00	295+00	1,800	2	SD	3,600
Contingency						2,000
-RPB-	0+00	15+00	1,500 (Left Side)	1	UD	1,500
-RPC-	0+00	8+00	800 (Right Side)	1	UD	800
-SR1-	27+00	41+00	1,400	2	UD	2,800
-Y5-	32+00	40+00	800	2	UD	1,600
Contingency						4,000
Total:						24,900

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

HORIZONTAL SLOPE DRAINS

For Horizontal Slope Drains see detail for locations and quantity estimates.

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No 244	EB 1/2	1
Bridge No 245	EB 1/2	1

CELLULAR CONFINEMENT SYSTEM

For Cellular Confinement System see detail for locations and quantity estimates.

EMBANKMENT DENSITY TESTING FREQUENCY

We recommend increasing the density testing frequency to the following requirements:

1 density test per 40,000 sq. ft. of 1 ft. lift placed
1 density test per 20,000 sq. ft. of 1 ft. placed within 5 ft. of subgrade
1 density test per foot of fill placed within 100 ft. of a structure

REINFORCED SOIL SLOPES

We recommend reinforcing all embankment slopes that are steeper than 2.25:1 as shown in the Reinforced Soil Slope Detail Sheet. The estimated quantities are provided below. For actual location see the Roadway Cross Section.	
< 20 ft	7500 Sq Yds
20 ft to 40 ft	7500 Sq Yds
40 ft +	89000 Sq Yds

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
-L-	146+50	153+00	5,778	
-L-	164+00	171+50	6,667	
-L-	177+00	181+35	3,867	
-L-	205+00	208+00	2,667	
-L-	274+50	246+75	30,889	
-L-	294+50	275+75	1,111	
-L-	294+50	301+00	5,778	
-L-	302+70	324+00	18,933	
-L-	349+10	357+50	7,467	
-SR1REV-	12+00	14+75	794	
-SR1-	21+20	26+85	1,632	
-SR1-	41+00	43+50	1,000	
-Y4-	9+86	10+25	130	
-Y5-	18+50	25+00	2,889	
-RPA-	0+00	12+00	3,733	
-RPC-	8+75	11+00	700	
-RPD-	5+00	14+00	2,800	
-SR6-	17+00	21+00	1,244	
CONTINGENCY			0	20,000
TOTAL CY/TONS/SY:			98,079	*20,000

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-L-	135+70	145+65	ASU	24	6500	12350	8844		
-L-	199+30	205+10	ASU	24	3000	5700	4711		
-L-	247+00	267+50	ASU	24	8700	16530	18222		
-L-	282+45	295+15	ASU	24	9000	17100	11289		
-SR1-	15+40	19+70	ASU	24	1000	1900	1433		
-SR1-	32+50	35+60	ASU	24	750	1425	1033		
-Y5-	25+50	35+50	ASU	24	4150	7885	4000		
-RPA-	11+50	14+00	ASU	24	300	570	889		
-RPB-	0+00	8+00	ASU	24	2600	4940	2844		
-RPB-	13+50	15+25	ASU	24	350	665	622		
-RPC-	0+00	7+50	ASU	24	2900	5510	2667		
CONTINGENCY			ASU		2500	4750	23000		
CONTINGENCY			AST	3					500
TOTAL CY/TONS/SY:					41750	79500	83000	0	500

ASU = Aggregate Subgrade, AST = Aggregate Stabilization
 *Total square

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



PROJECT REFERENCE NO. R-3421B
SHEET NO. 3P-1

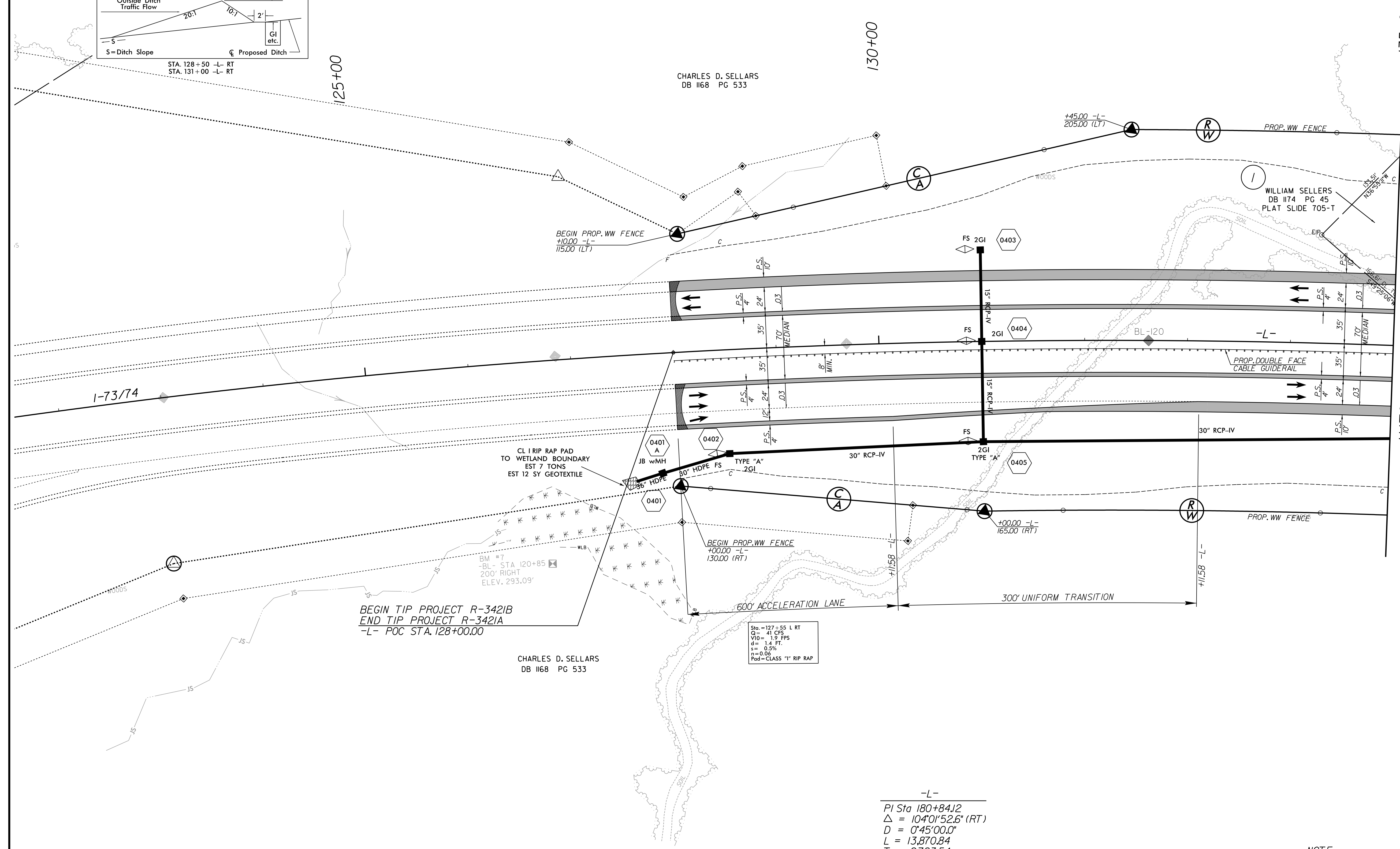
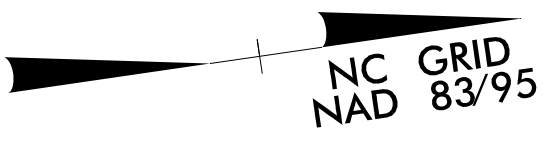
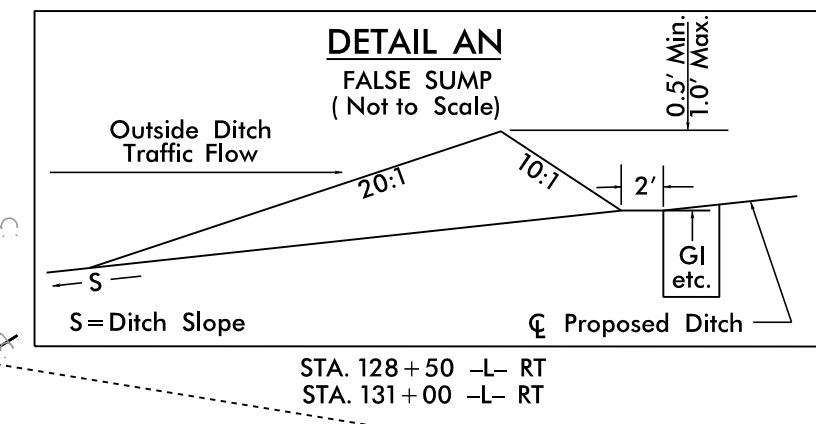
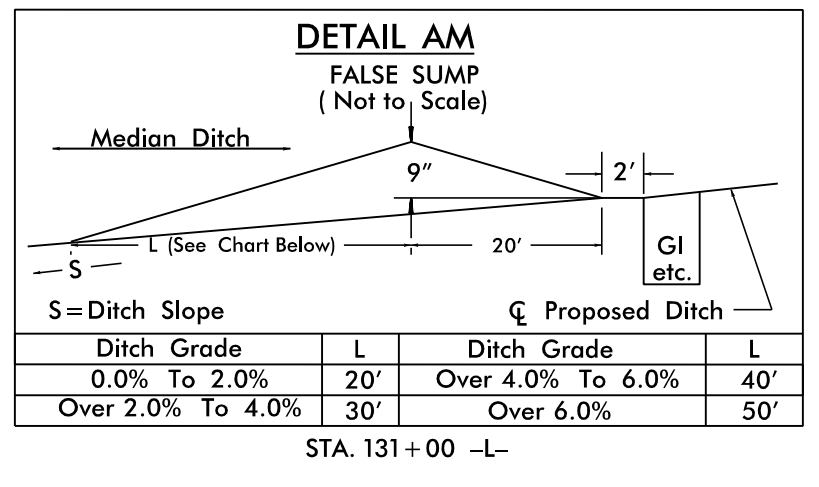
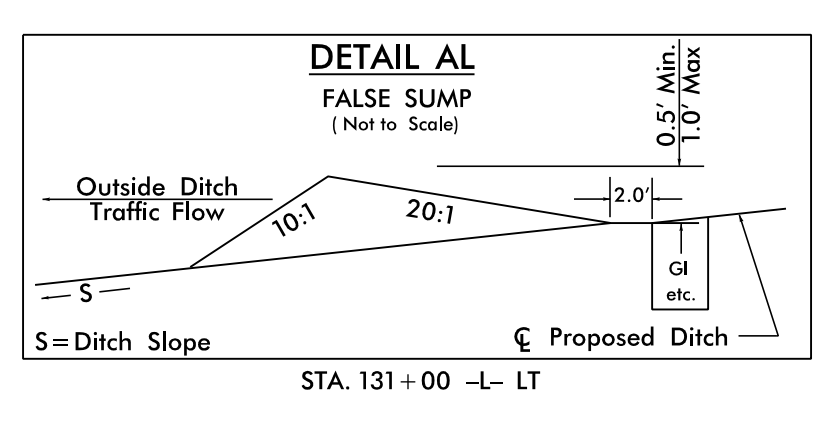
PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
R-3421B - 1	4,5	WILLIAM SELLERS
R-3421B - 1A	5	CHARLES D. SELLERS, JR. & MARTHA SELLERS
R-3421B - 2	5	TAMMY & JONATHAN LYFORD
R-3421B - 3	5	JAMES R. McLAUGHLIN
R-3421B - 4	5	CAROLYN E. McLAUGHLIN
R-3421B - 5	5	WILLIAM A. HARRELSON
R-3421B - 6	5, 6, 7, 8, 9, 10, 26	JOHN G. & IRENE BLACKMON LIMITED PARTNERSHIP
R-3421B - 7	5	JAMES E. SELLERS, SR.
R-3421B - 8	25	JAMES E. SELLERS, SR.
R-3421B - 8	5	CHARLES R. EZZELL
R-3421B - 9	5	PAUL V. SCHOLL III
R-3421B - 10	5	PAUL V. SCHOLL, JR.
R-3421B - 11	5	MARK R. BACHMAN
R-3421B - 12	11, 12	AMSOUTH TIMBER COMPANY
R-3421B - 13	10, 11	B.V. HEDRICK GRAVEL AND SAND COMPANY
R-3421B - 14	12, 13, 14, 15, 16, 28	COLEY FARMS LIMITED PARTNERSHIP
R-3421B - 15	16	CARL A. McDUFFIE
R-3421B - 16	16, 17, 18, 27	C. KRESS GOODWIN TIMBER CO., INC.
R-3421B - 17	16, 17	STUART KING
R-3421B - 18	27	MELVERTA S. COVINGTON
R-3421B - 19	27	EUGENE T. HUDSON
R-3421B - 20	27	NINA C. MCDUFFIE AND MARTHA NELL LEWIS
R-3421B - 20A	27	NINA C. MCDUFFIE
R-3421B - 21	16, 27	JAMES M. McDUFFIE
R-3421B - 22	18, 19	MCRAE FAMILY, LLC
R-3421C - 1	20	MCRAE FAMILY, LLC
R-3421C - 2	20, 21	DEBRA B. WALLACE ET AL
R-3421C - 2A	21	RICHMOND COUNTY
R-3421C - 3	21, 22	DAN LEWIS ALLEN, JR. ET AL
R-3421C - 4	21	FREDERICK T. BROWN
R-3421C - 5	21, 22, 23	DAN L ALLEN III, ROGER H ALLEN, GREGORY B ALLEN

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
R-3421C - 6	22	SANTONIA L. ROBINSON
R-3421C - 7	23	ALLEN BROTHERS TIMBER COMPANY
R-3421C - 8	23	FAYE P. ATKINSON
R-3421C - 9	23, 24	JOHN B. GARRETT
R-3421C - 11	23	PHYLLIS P. WATERS
R-3421C - 11A	23	PHYLLIS P. WATERS, FAYE P. ATKINSON, CARL W. ATKINSON
R-3421C - 11B	23	CHERYL SPEIGHT
R-3421C - 12	23	WILLIAM WINDLEY
R-3421C - 13	23	WILLIAM WINDLEY
R-3421C - 16	23	HUMANE SOCIETY OF RICHMOND COUNTY, INC
R-3421C - 17	23, 24	MARIA ROSS
R-3421C - 18	23, 24	TRENDEE BOSTICK
R-3421C - 19	24	DELPHINA C. YATES
R-3421C - 20	24	ANNA THOMAS
R-3421C - 21	24	LORENZA NICHOLSON
R-3421C - 23	24	SUE SPENCER
R-3421C - 24	24	SHARNETTE STANBACK
R-3421C - 25	24	JAMES M. McDUFFIE
R-3421C - 26	24, 24A	GUY C. BRYANT
R-3421C - 27	24	MCRAE FAMILY, LLC
R-3421C - 28	24	NATHANIEL H. THOMAS
R-3421C - 29	24, 24A	COMMUNITY INVESTMENT NETWORK, LLC
R-3421C - 30	24A, 24B	VICTOR GOODMAN ESTATE
R-3421C - 31	24A	MATTIE C. THOMAS
R-3421C - 32	24A	MILES WORTH
R-3421C - 33	24A	HAROLD M. HINES
R-3421C - 34	24A, 24B	SAMARITAN COLONY, INC
R-3421C - 35	24B	FRANCIS M. PARKER
R-3421C - 36	24B	BRUCE LUTHER
R-3421C - 37	24B	STEVE R. WILLIAMS
R-3421C - 39	24, 24A	CARLYE HAYWOOD

CALYX
ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
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CALYXengineers.com
NC License # F-1333

PROJECT REFERENCE NO. R-3421B	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 8/13/2019	HYDRAULICS ENGINEER 8/12/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE TO SHEET 5
-L- STATION 135+00

BEGIN TIP PROJECT R-3421B
END TIP PROJECT R-3421A
-L- POC STA. 128+00.00

Sta. = 127+55 L RT
Ct = 41 CFS
Vt = 1.9 FPS
d = 1.4 FT
s = 0.5%
n = 0.06
Pad = CLASS "I" RIP RAP

-L-
PI Sta 180+84.12
Δ = 10401'52.6" (RT)
D = 0'45'00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
Se = 0.03
D.S. = 70 mph

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL
STREAMS ARE TO BE BURIED 20% OF PIPE
DIAMETER UP TO 1 FT OF DEPTH
SEE SHEET 29 FOR -L- PROFILE



PROJECT REFERENCE NO. R-3421B SHEET NO. 5

RW SHEET NO.

ROADWAY DESIGN ENGINEER 9/30/2022

HYDRAULICS ENGINEER 9/30/2022

SEAL 017265

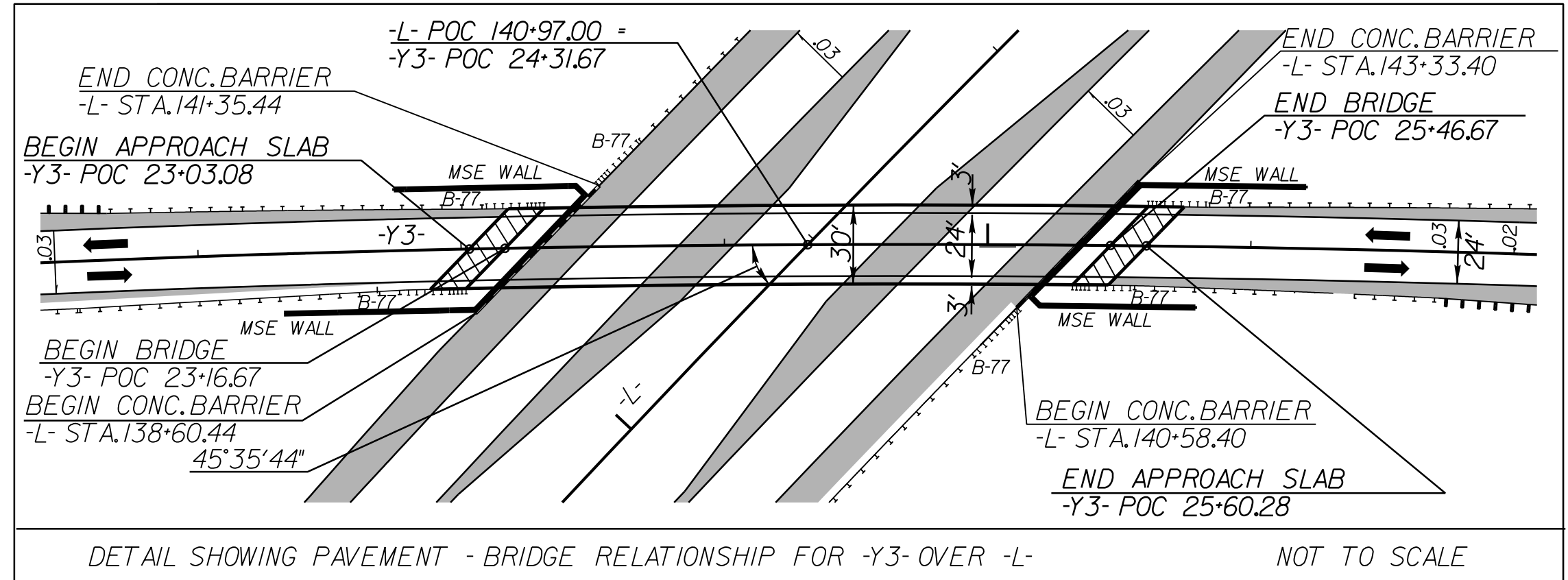
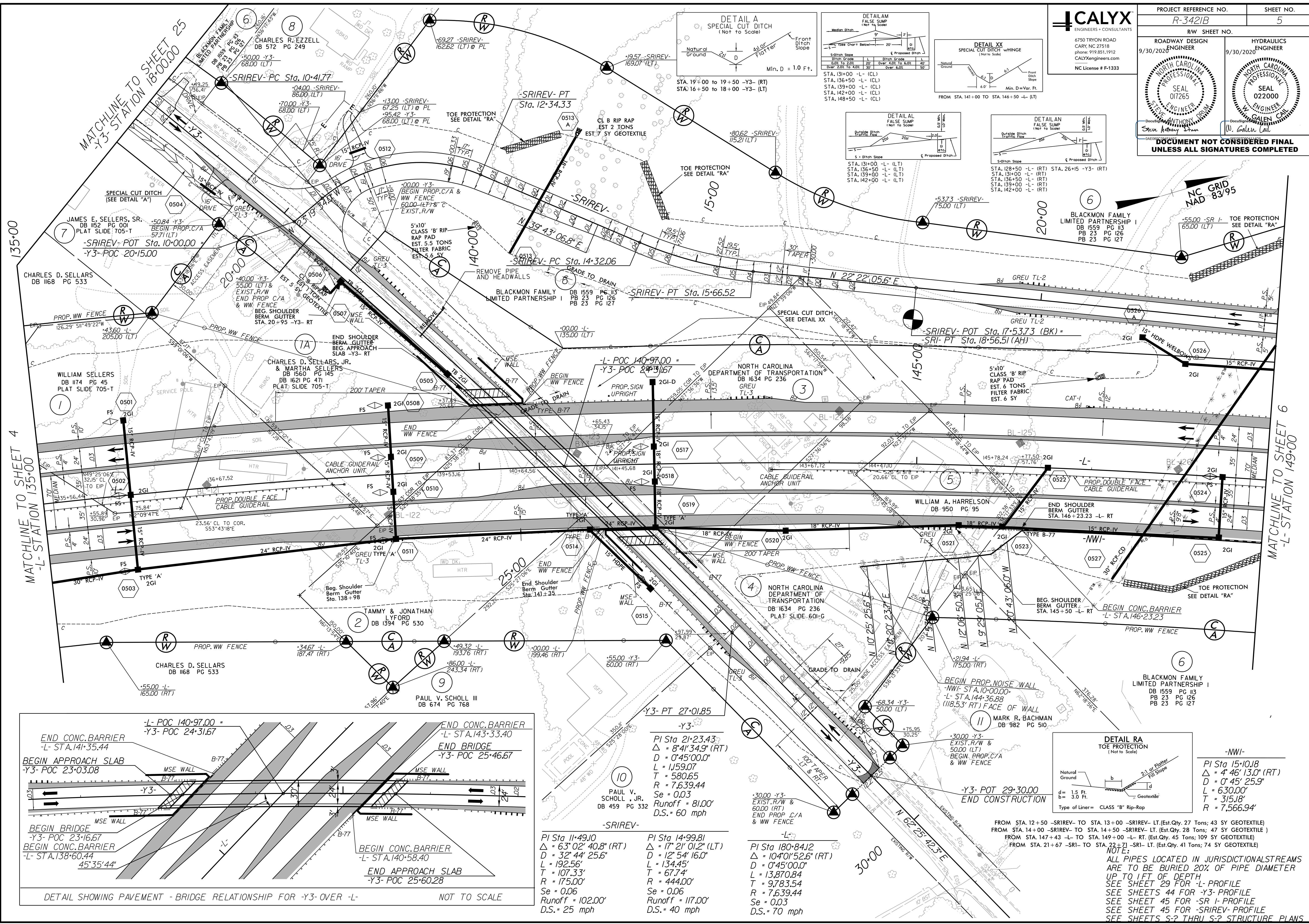
SEAL 022000

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

CONSTRUCTION REVISION #1 - 2/28/2020 - NOISE WALL (N/W) ADDED

CONSTRUCTION REVISION #2 - 9/29/2020 - REVISED DITCH XX AND INLET INVERT ELEVATIONS ON DRAINAGE STRUCTURES 0516, 0517, 0518 AND 0519. REVISED SYSTEM PIPES TO 18" RCP-IV FROM 0517 TO 0518 TO 0519.



DETAIL A SPECIAL CUT DITCH (Not to Scale)

DETAIL AM FALSE SLUMP (Not to Scale)

DETAIL XX SPECIAL CUT DITCH w/HINGE (Not to Scale)

DETAIL AL FALSE SLUMP (Not to Scale)

DETAIL AN FALSE SLUMP (Not to Scale)

DETAIL RA TOE PROTECTION (Not to Scale)

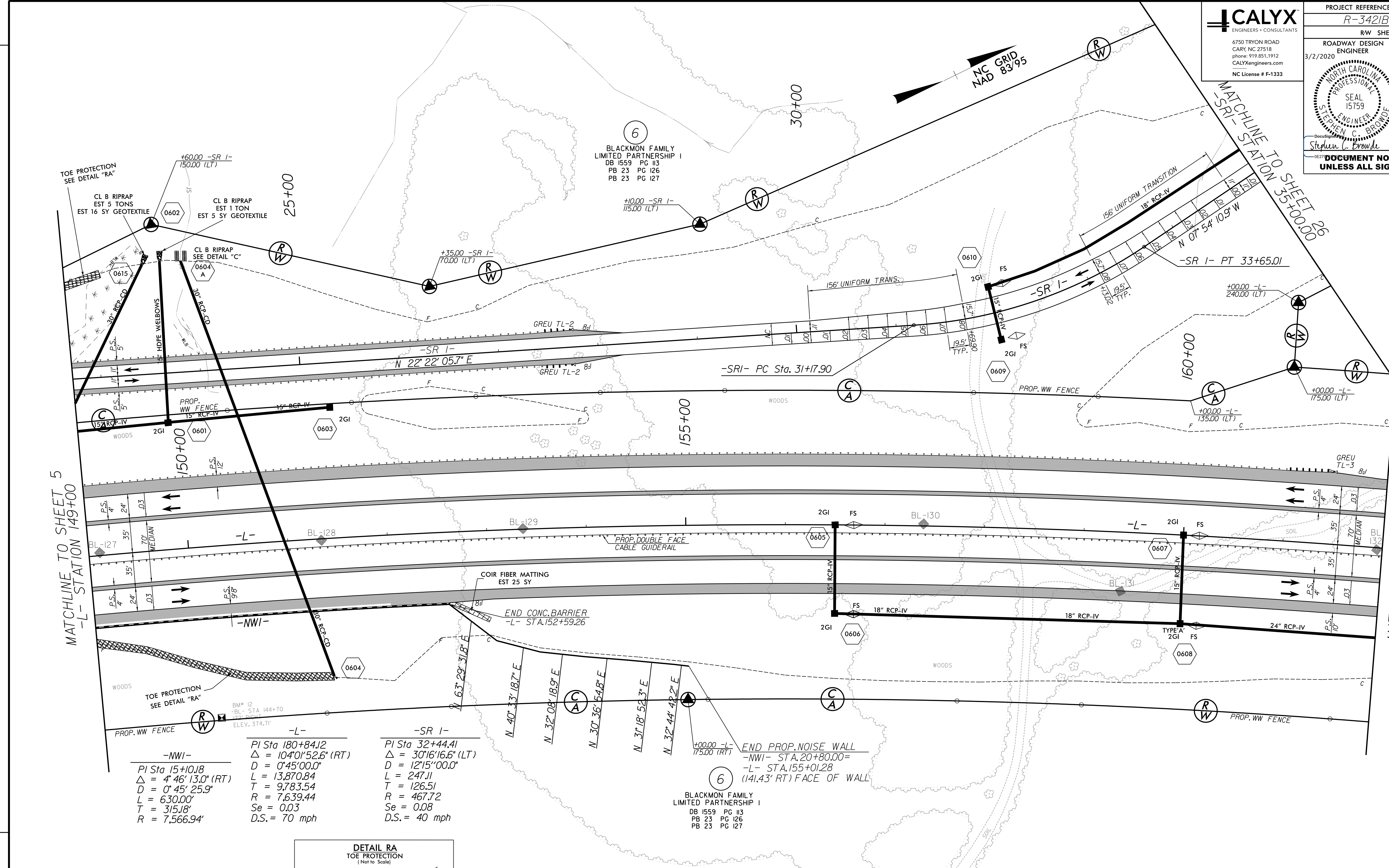
PI Sta 21+23.43
 $\Delta = 8'41'34.9" (RT)$
 $D = 0'45'00.0"$
 $L = 1,159.07$
 $T = 580.65$
 $R = 7,639.44$
 $Se = 0.03$
 $Runoff = 81.00'$
 $D.S. = 60 mph$

PI Sta 14+99.81
 $\Delta = 17'21'01.2" (LT)$
 $D = 12'54'16.0"$
 $L = 134.45'$
 $T = 67.74'$
 $R = 444.00'$
 $Se = 0.06$
 $Runoff = 117.00'$
 $D.S. = 40 mph$

PI Sta 180+84.2
 $\Delta = 1040'52.6" (RT)$
 $D = 0'45'00.0"$
 $L = 13,870.84$
 $T = 9,783.54$
 $R = 7,639.44$
 $Se = 0.03$
 $D.S. = 70 mph$

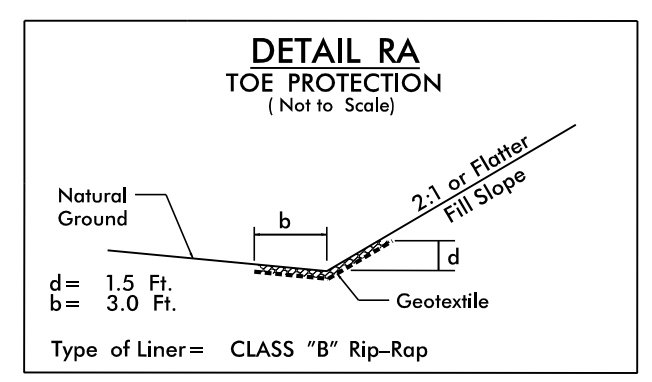
FROM STA. 14+00 -SRIREV- TO STA. 14+50 -SRIREV- LT. (Est.Qty. 28 Tons; 47 SY GEOTEXTILE)
 FROM STA. 147+43 -L- TO STA. 149+00 -L- RT. (Est.Qty. 45 Tons; 109 SY GEOTEXTILE)
 FROM STA. 21+67 -SRI- TO STA. 22+71 -SRI- LT. (Est.Qty. 41 Tons; 74 SY GEOTEXTILE)

NOTE:
 ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH.
 SEE SHEET 29 FOR -L- PROFILE
 SEE SHEETS 44 FOR -Y3- PROFILE
 SEE SHEET 45 FOR -SR I- PROFILE
 SEE SHEET 45 FOR -SR IREV- PROFILE
 SEE SHEETS S-2 THRU S-2 STRUCTURE PLANS

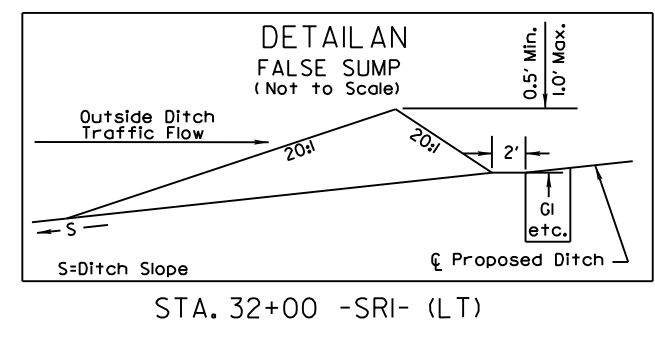
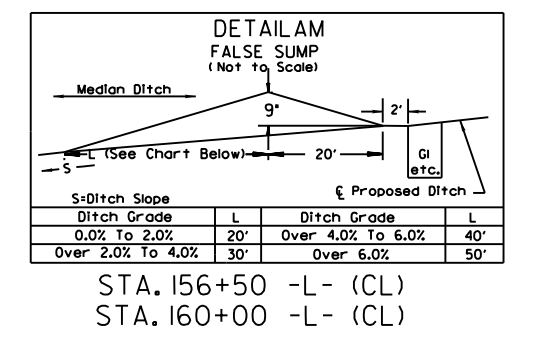
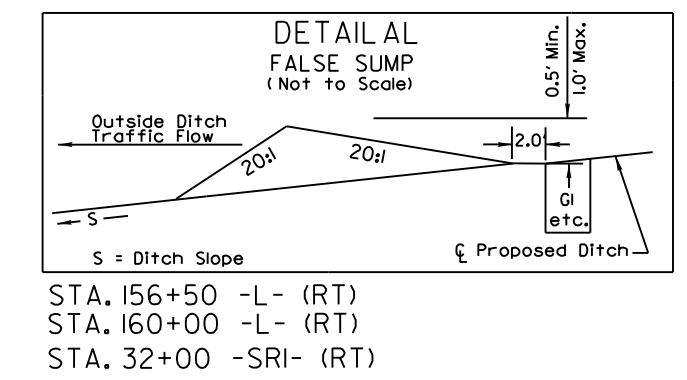
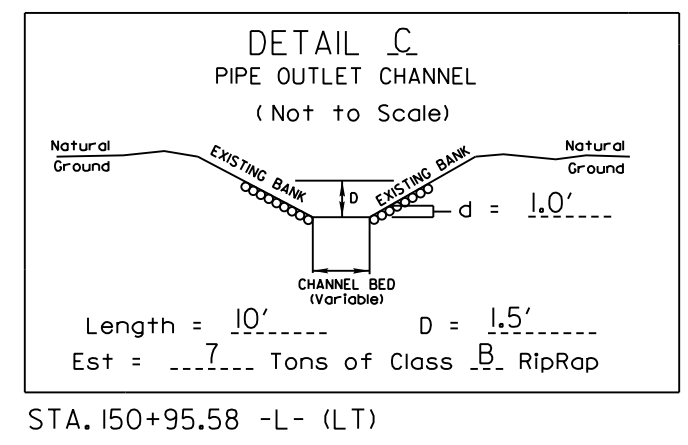


REVISIONS
CONSTRUCTION REVISION - 2282020 - NOISE WALL (-NWI-) ADDED.

-NWI-	-L-	-SR I-
PI Sta 15+10.18	PI Sta 180+84.12	PI Sta 32+44.41
$\Delta = 4' 46" 13.0" (RT)$	$\Delta = 104' 01" 52.6" (RT)$	$\Delta = 30' 16" 16.6" (LT)$
$D = 0' 45" 25.9"$	$D = 0' 45" 00.0"$	$D = 12' 15" 00.0"$
$L = 630.00'$	$L = 13,870.84'$	$L = 247.11'$
$T = 315.18'$	$T = 9,783.54'$	$T = 126.51'$
$R = 7,566.94'$	$R = 7,639.44'$	$R = 467.72'$
	$Se = 0.03$	$Se = 0.08$
	$D.S. = 70 \text{ mph}$	$D.S. = 40 \text{ mph}$



FROM STA. 149+00 -L- TO STA. 151+35 -L- RT.
(Est. Qty. 70 Tons; 161 SY GEOTEXTILE)
FROM STA. 22+71 -SR I- TO STA. 23+05 -SR I- LT.
(Est. Qty. 41 Tons; 24 SY GEOTEXTILE)

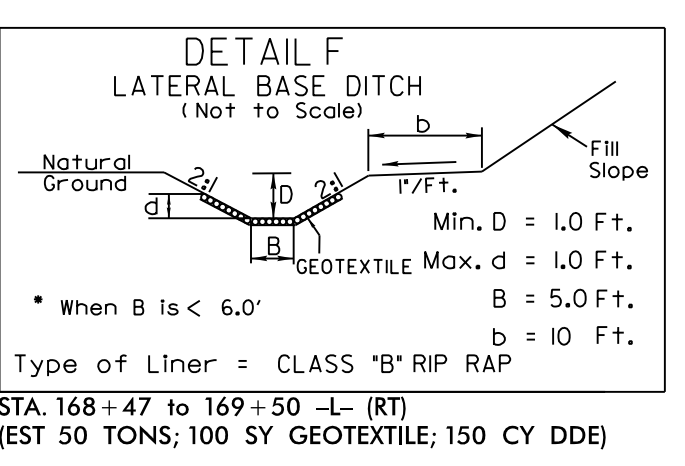
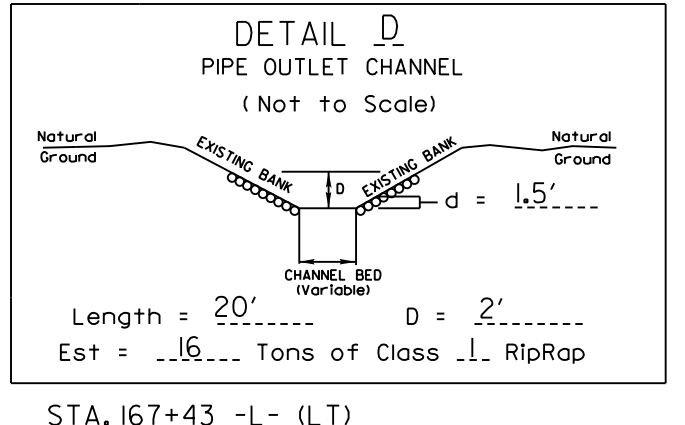
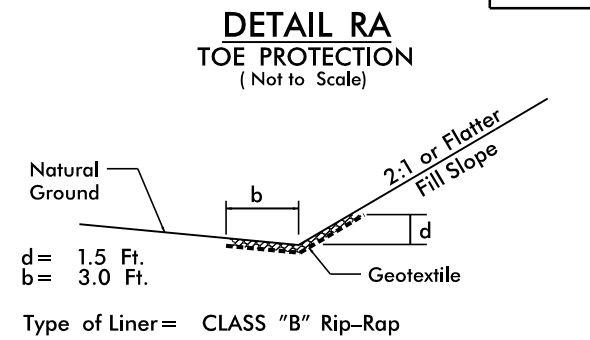
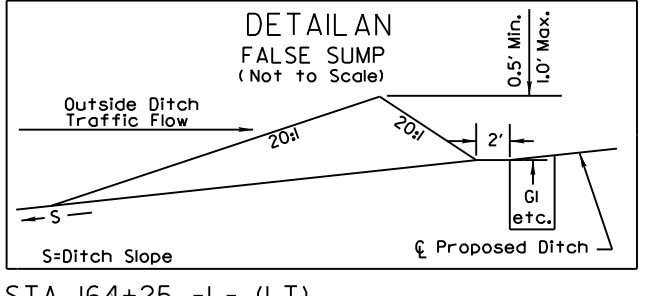
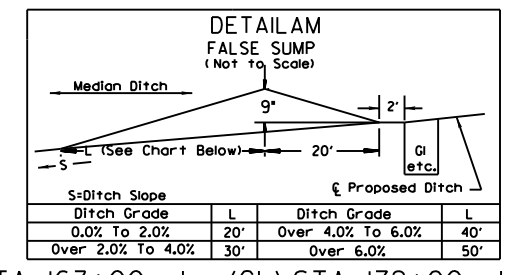
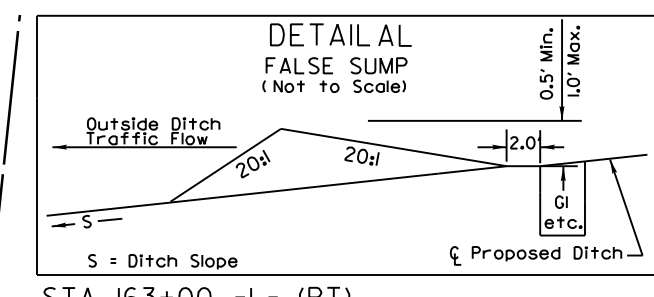
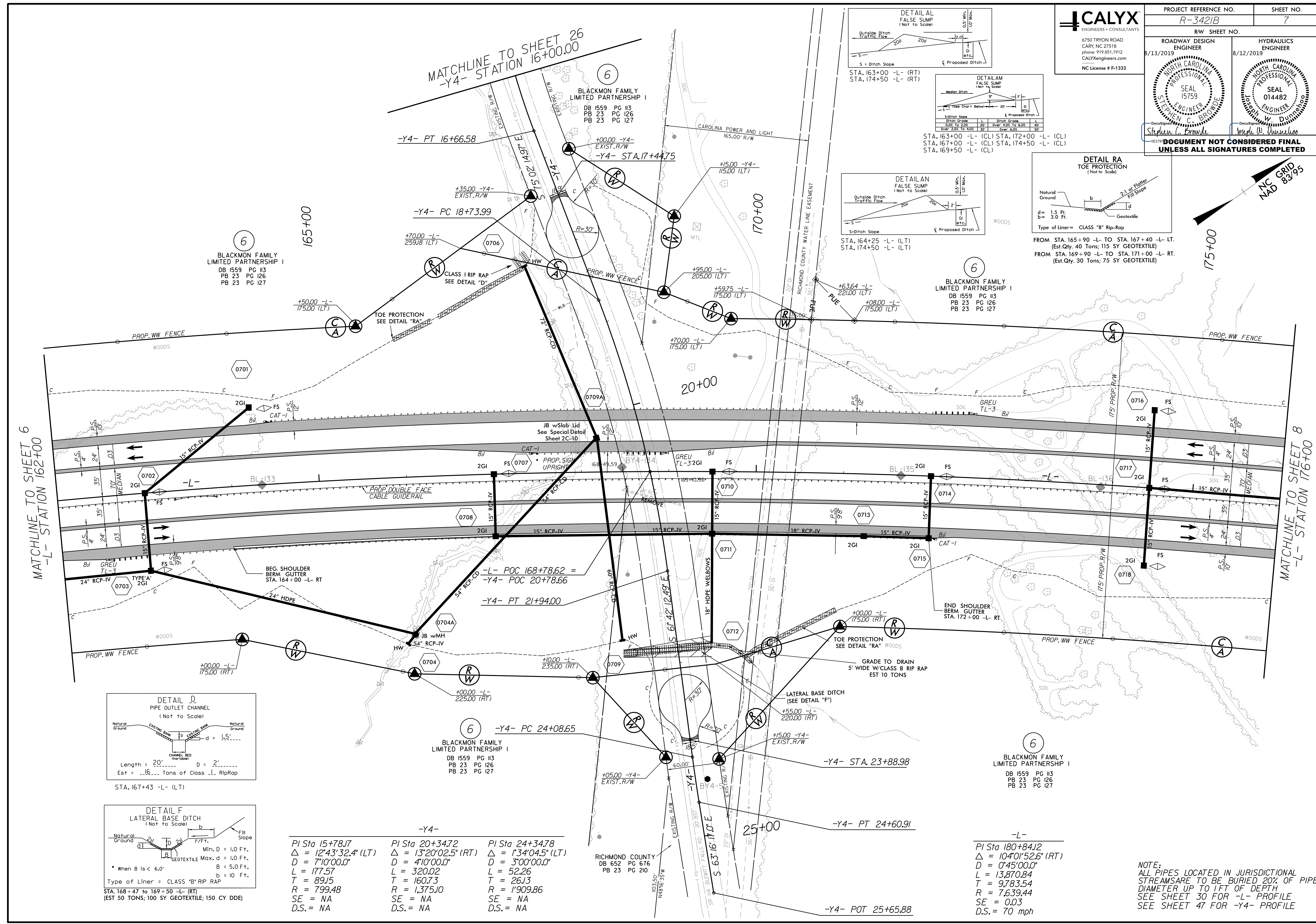
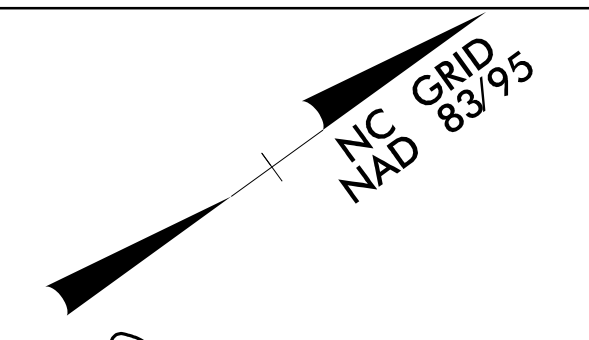


NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
SEE SHEET 30 FOR -L- PROFILE
SEE SHEET 46 & 47 FOR -SR I- PROFILE



PROJECT REFERENCE NO. R-3421B		SHEET NO. 7	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 8/13/2019		HYDRAULICS ENGINEER 8/13/2019	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

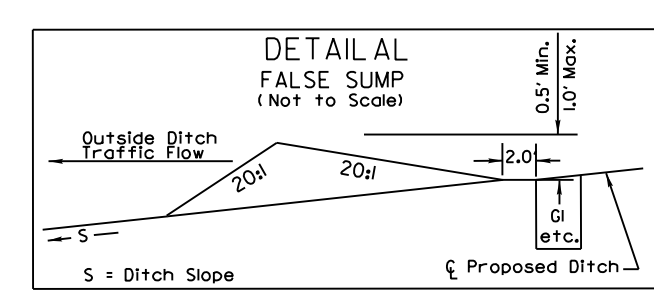


-Y4-		
PI Sta 15+78.17	PI Sta 20+34.72	PI Sta 24+34.78
$\Delta = 12'43'32.4''$ (LT)	$\Delta = 13'20'02.5''$ (RT)	$\Delta = 1'34'04.5''$ (LT)
D = 7'10'00.0"	D = 4'10'00.0"	D = 3'00'00.0"
L = 177.57	L = 320.02	L = 52.26
T = 89.15	T = 160.73	T = 26.13
R = 799.48	R = 1'909.86	R = 1'909.86
SE = NA	SE = NA	SE = NA
D.S. = NA	D.S. = NA	D.S. = NA

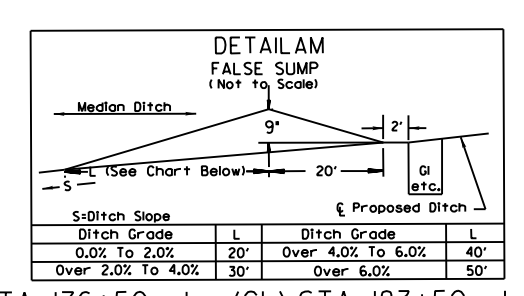
-L-	
PI Sta 180+84.12	$\Delta = 10'40'52.6''$ (RT)
D = 0'45'00.0"	L = 13,870.84
T = 9,783.54	R = 7,639.44
SE = 0.03	D.S. = 70 mph

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
SEE SHEET 30 FOR -L- PROFILE
SEE SHEET 47 FOR -Y4- PROFILE

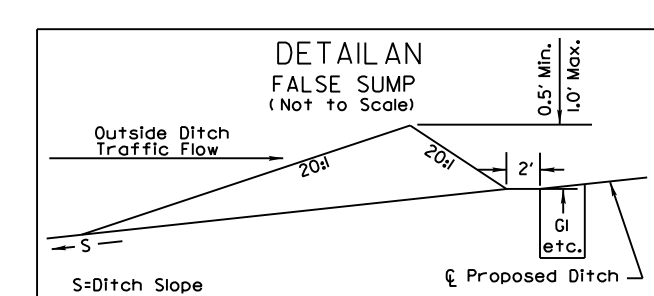
8/9/2019
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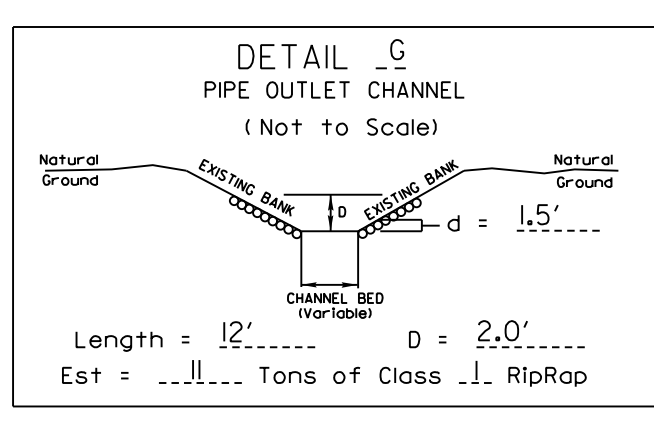
STA. 176+50 -L- (RT) STA. 190+00 -L- (RT)
STA. 183+50 -L- (RT)
STA. 187+00 -L- (RT)



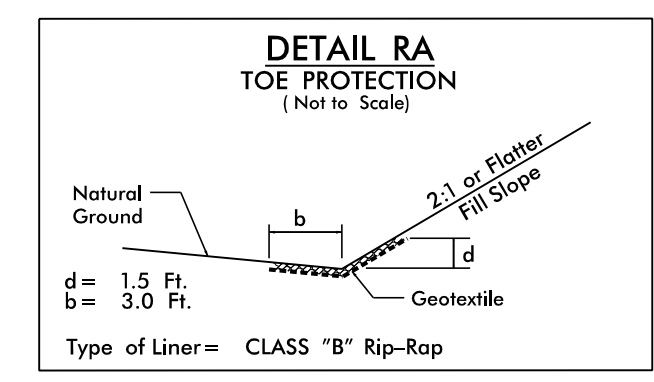
STA. 176+50 -L- (CL) STA. 183+50 -L- (CL)
STA. 179+00 -L- (CL) STA. 187+00 -L- (CL)
STA. 181+00 -L- (CL) STA. 190+00 -L- (CL)



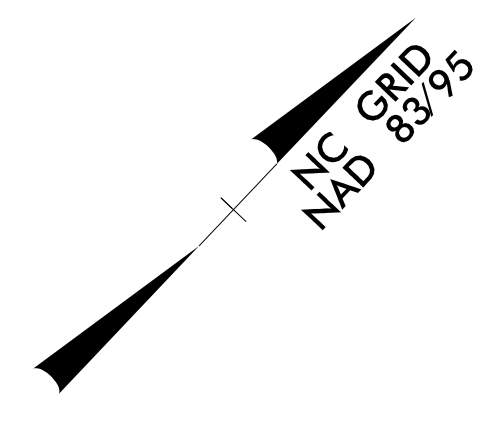
STA. 176+50 -L- (LT) STA. 190+00 -L- (LT)
STA. 183+50 -L- (LT)
STA. 187+00 -L- (LT)



STA. 178+71.06 -L- (LT)
STA. 179+59 -L- (RT) (-25' long)



FROM STA. 178+00 -L- TO STA. 180+00 -L- LT.
(Est. Qty. 70 Tons; 147 SY GEOTEXTILE)
FROM STA. 178+25 -L- TO STA. 179+45 -L- RT.
(Est. Qty. 30 Tons; 84 SY GEOTEXTILE)



83+95

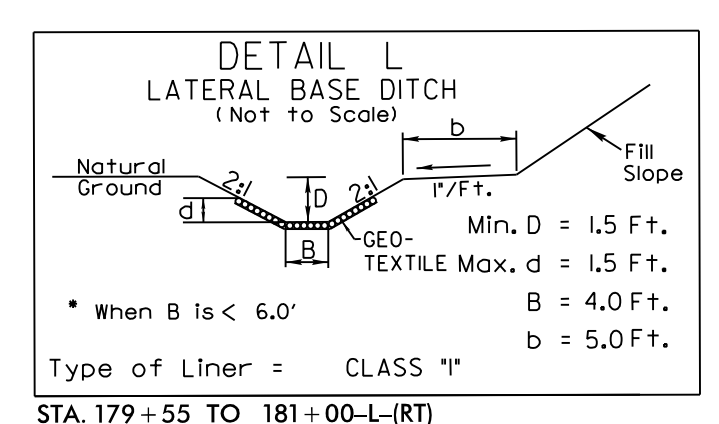
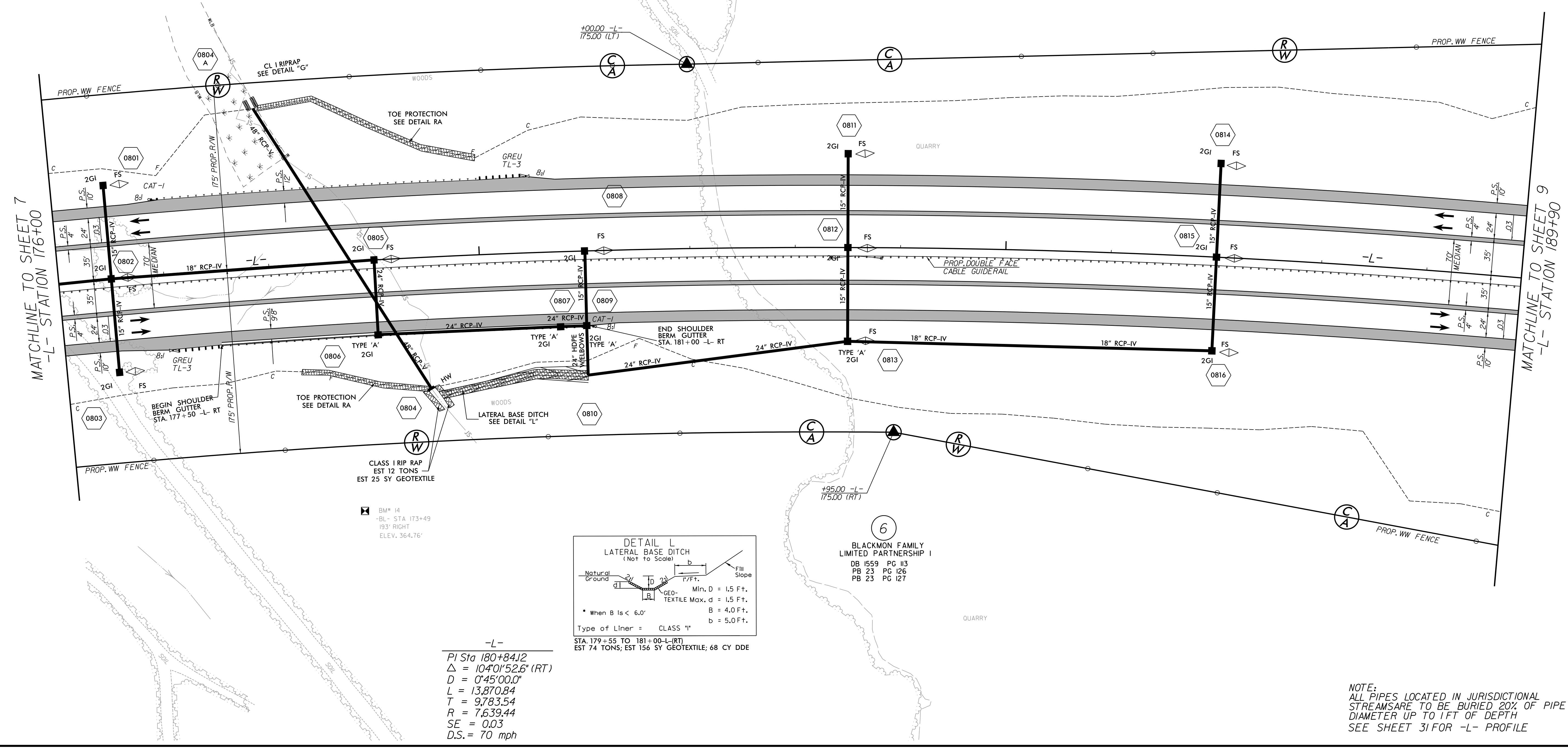
180+00

6

BLACKMON FAMILY LIMITED PARTNERSHIP I
DB 1559 PG 113
PB 23 PG 126
PB 23 PG 127

185+00

190+00



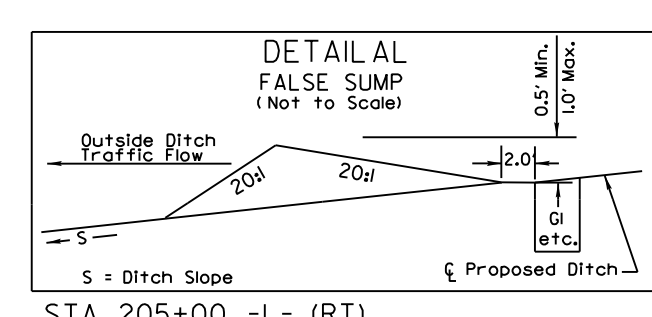
STA. 179+55 TO 181+00 -L- (RT)
EST 74 TONS; EST 156 SY GEOTEXTILE; 68 CY DDE

-L-
PI Sta 180+84.2
 $\Delta = 104^{\circ}01'52.6''$ (RT)
D = 0'45''00.0"
L = 13,870.84
T = 9,783.54
R = 7,639.44
SE = 0.03
D.S. = 70 mph

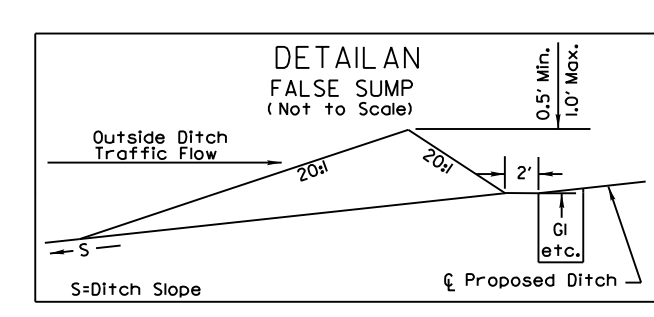
NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
SEE SHEET 31 FOR -L- PROFILE

CALYX
ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
PHONE: 919.851.1912
CALYXENGINEERS.COM
NC LICENSE # F-1333

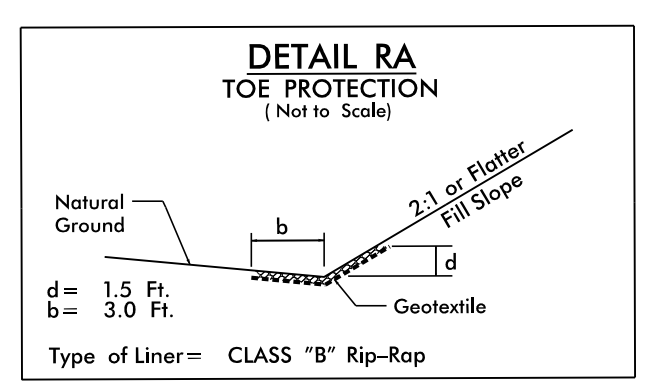
PROJECT REFERENCE NO. R-3421B	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 8/13/2019	HYDRAULICS ENGINEER 8/12/2019
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	



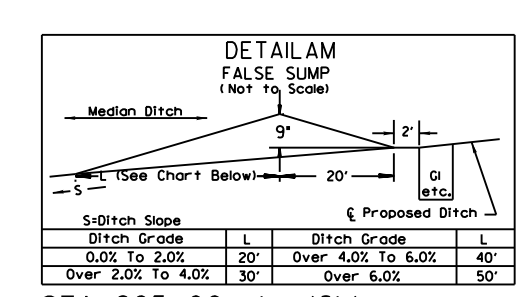
STA. 205+00 -L- (RT)
STA. 211+50 -L- (RT)



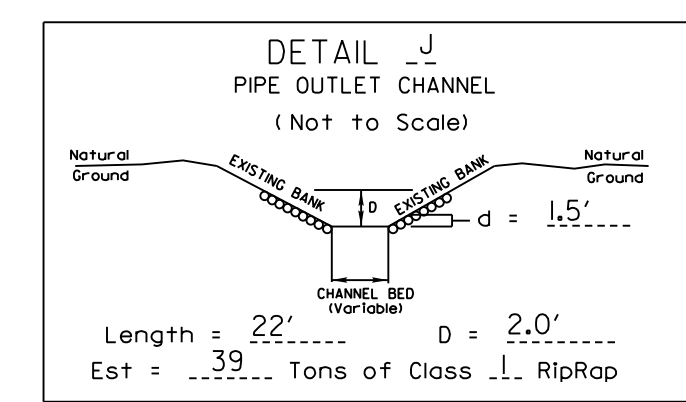
STA. 205+00-L- (LT)
STA. 211+50 -L- (LT)



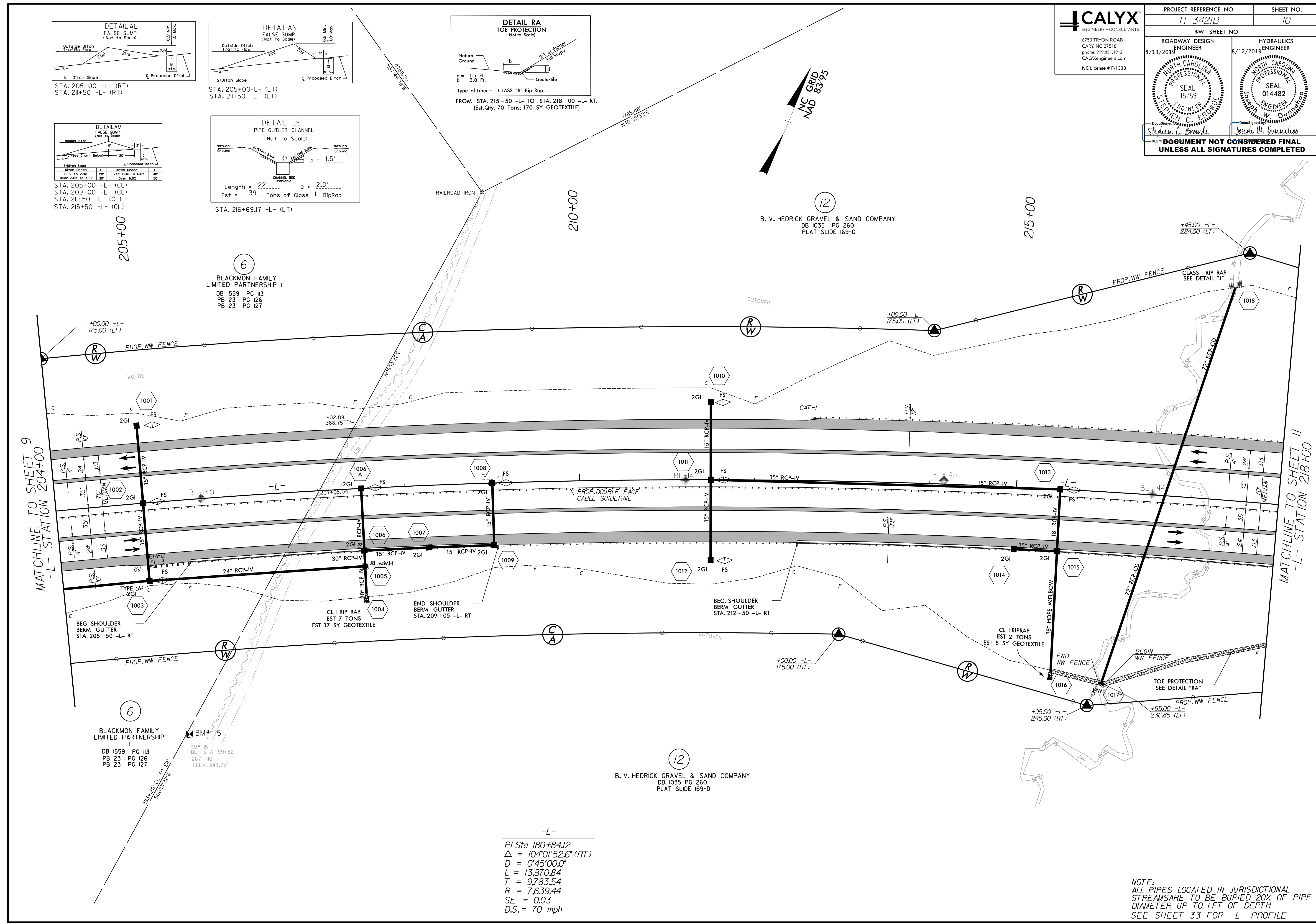
FROM STA. 215+50 -L- TO STA. 218+00 -L- RT.
(Est. Qty. 70 Tons; 170 SY GEOTEXTILE)



STA. 205+00 -L- (CL)
STA. 209+00 -L- (CL)
STA. 211+50 -L- (CL)
STA. 215+50 -L- (CL)



STA. 216+69.17 -L- (LT)



MATCHLINE TO SHEET 9
-L- STATION 204+00

MATCHLINE TO SHEET 11
-L- STATION 218+00

6
BLACKMON FAMILY LIMITED PARTNERSHIP
DB 1559 PG 113
PB 23 PG 126
PB 23 PG 127

BM# 15
-BL- STA 199+82
267' RIGHT
ELEV. 343.75'

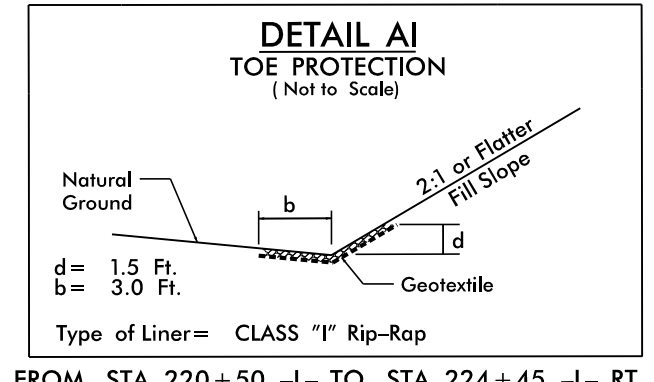
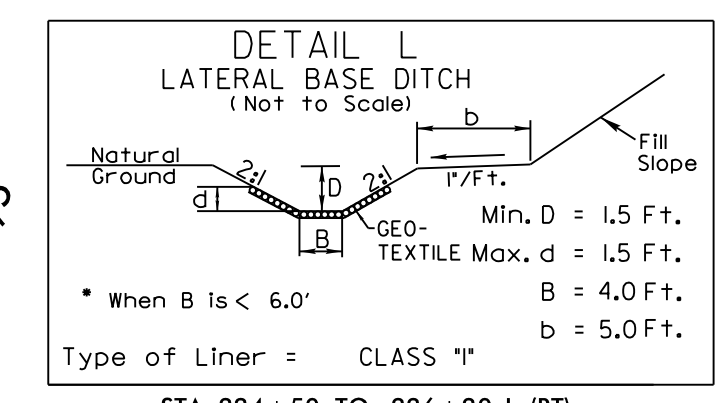
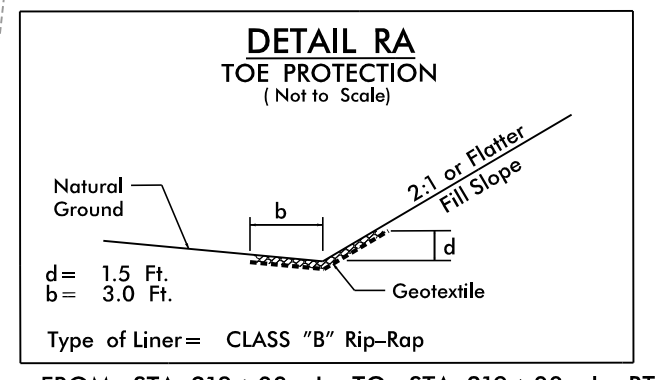
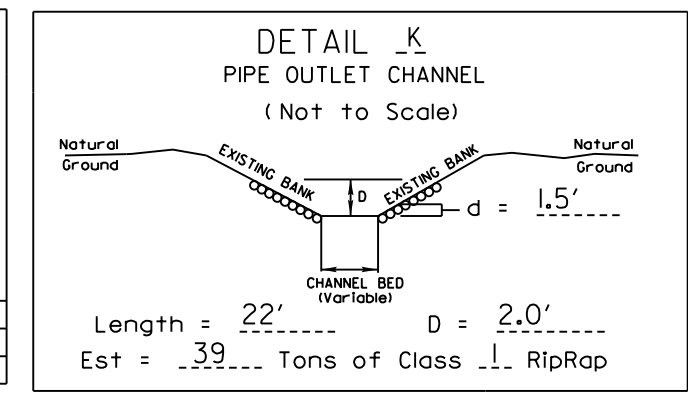
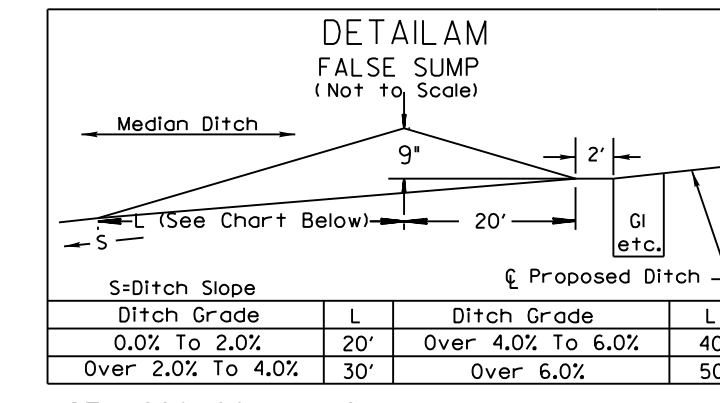
12
B. V. HEDRICK GRAVEL & SAND COMPANY
DB 1035 PG 260
PLAT SLIDE 169-D

-L-
PI Sta 180+84.12
 $\Delta = 1040'52.6'' (RT)$
 $D = 0'45'00.0''$
 $L = 13,870.84$
 $T = 9,783.54$
 $R = 7,639.44$
 $SE = 0.03$
 $D.S. = 70 \text{ mph}$

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
SEE SHEET 33 FOR -L- PROFILE

CALYX
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CALYXengineers.com
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PROJECT REFERENCE NO. R-3421B	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN 8/13/2019 ENGINEER	HYDRAULICS 8/12/2019 ENGINEER
<p>Documented by: <i>Stephen C. Proulx</i> <i>Joseph W. Danneloo</i></p> <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	



-L-
PI Sta 180+84.12 Pls Sta 222+38.09
 $\Delta = 104^{\circ}0'53" (RT)$ $\Theta_s = 0^{\circ}45'00.0"$
D = 0'45"00.0" Ls = 200.00
L = 13,870.84 T = 9,783.54
R = 7,639.44 ST = 66.67
SE = 0.03 LT = 133.33
D.S. = 70 mph

STA. 220+00 -L- (CL)
STA. 224+00 -L- (CL)
STA. 227+50 -L- (CL)
STA. 231+00 -L- (CL)

B. V. HEDRICK GRAVEL & SAND COMPANY
DB 1035 PG 260
PLAT SLIDE 169-D

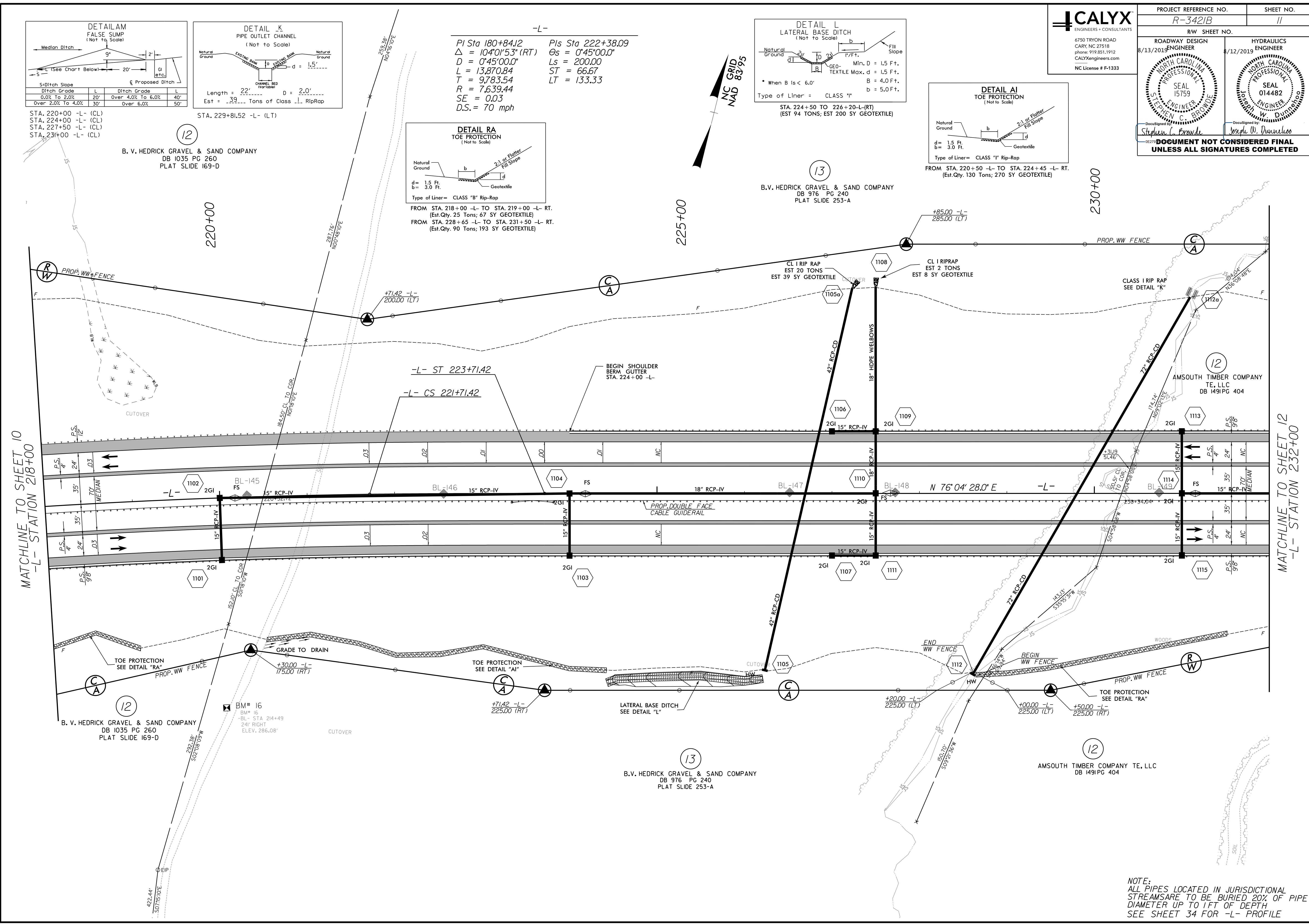
FROM STA. 218+00 -L- TO STA. 219+00 -L- RT.
(Est. Qty. 25 Tons; 67 SY GEOTEXTILE)
FROM STA. 228+65 -L- TO STA. 231+50 -L- RT.
(Est. Qty. 90 Tons; 193 SY GEOTEXTILE)

B.V. HEDRICK GRAVEL & SAND COMPANY
DB 976 PG 240
PLAT SLIDE 253-A

FROM STA. 220+50 -L- TO STA. 224+45 -L- RT.
(Est. Qty. 130 Tons; 270 SY GEOTEXTILE)

MATCHLINE TO SHEET 10
-L- STATION 218+00

MATCHLINE TO SHEET 12
-L- STATION 232+00



B. V. HEDRICK GRAVEL & SAND COMPANY
DB 1035 PG 260
PLAT SLIDE 169-D

B.V. HEDRICK GRAVEL & SAND COMPANY
DB 976 PG 240
PLAT SLIDE 253-A

AMSOUTH TIMBER COMPANY TE, LLC
DB 1491 PG 404

NOTE:
ALL PIPES LOCATED IN JURISDICTIONAL STREAMS ARE TO BE BURIED 20% OF PIPE DIAMETER UP TO 1 FT OF DEPTH
SEE SHEET 34 FOR -L- PROFILE