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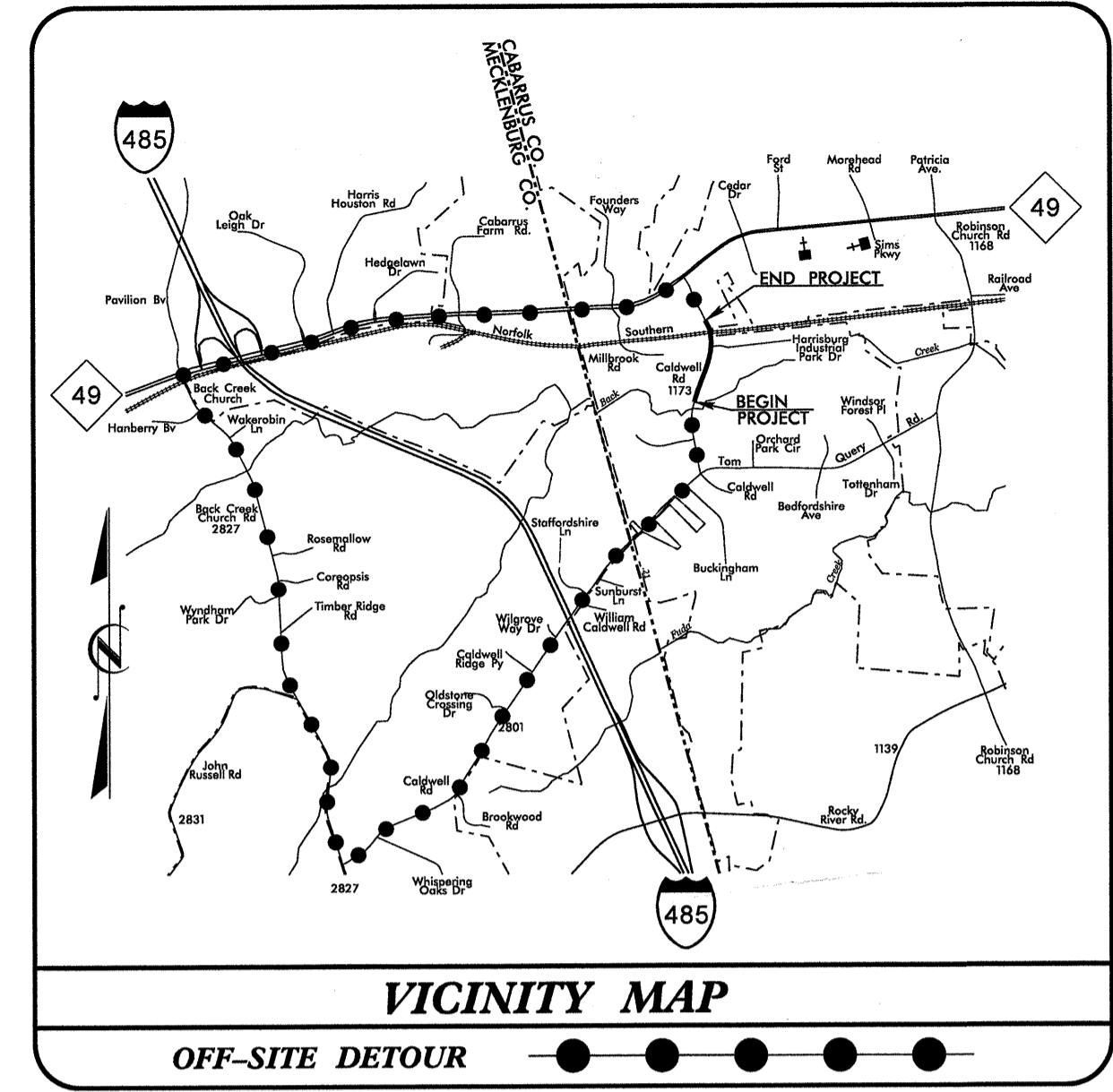
See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Plan Sheet Symbols

# STATE OF NORTH CAROLINA NCDOT RAIL DIVISION



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5208F	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50000.1.STR22T1B		PE, UTIL PE	
50000.1.STR24T3		PE, UTIL PE	
43219.2.STR09P5208F		RW	
50000.3.STR06T4A	FRA-FR-HSR-0006-10-01-00	UTIL CONST., CONST.	

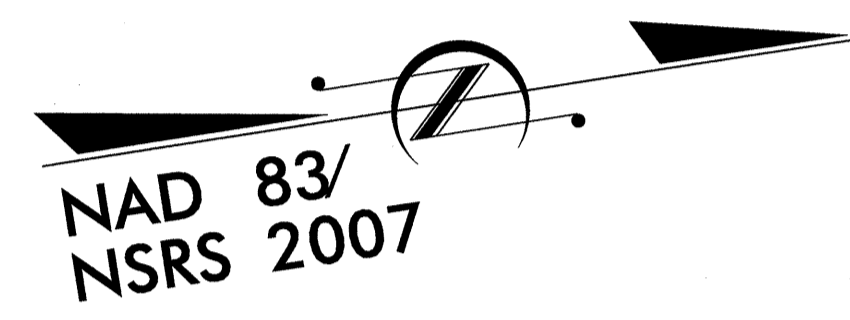
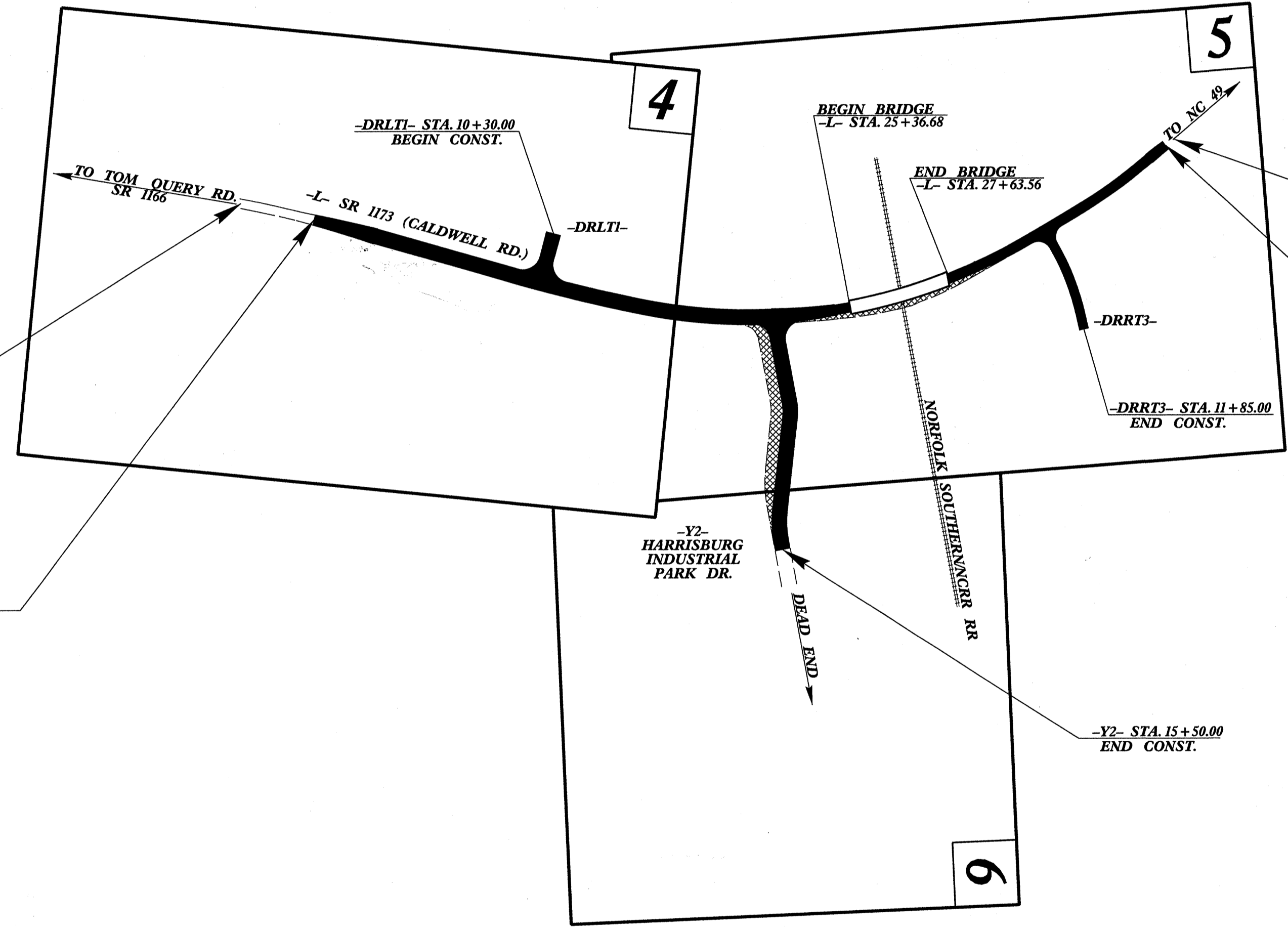
TIP PROJECT: P-5208F



## CABARRUS COUNTY

**LOCATION: PROPOSED CALDWELL ROAD (SR 1173) GRADE SEPARATION OVER THE NSNCRR RAILROAD IN HARRISBURG**

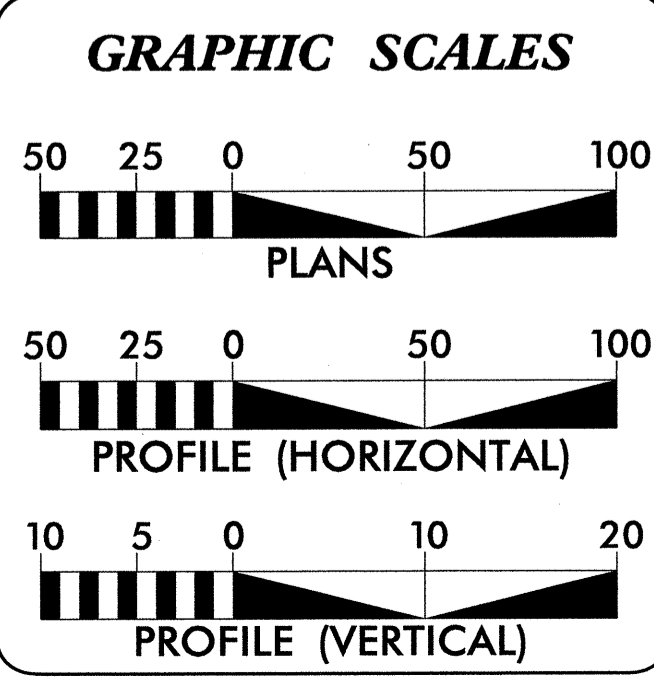
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE AND CURB & GUTTER**



**BEGIN TIP PROJECT P-5208F**  
-L- STA. 12 + 50.00

**END TIP PROJECT P-5208F**  
-L- STA. 33 + 75.00

CONTRACT: C203147



**DESIGN DATA**

ADT 2013 =	6910
ADT 2035 =	12100
DHV =	9 %
D =	60 %
T =	4 % *
V =	50 MPH
* TTST =	1% DUAL = 3%
FUNC CLASS =	
COLLECTOR	
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT P-5208F =	0.359 MI.
LENGTH STRUCTURE TIP PROJECT P-5208F =	0.043 MI.
TOTAL LENGTH TIP PROJECT P-5208F =	0.402 MI.

Prepared for the North Carolina Department of Transportation in the Office of:  
559 JONES FRANKLIN ROAD, SUITE 164, RALEIGH, N.C. 27706  
License No. F-0377, Fax: 919 851 8077

**WETHERILL ENGINEERING**

2012 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:** APRIL 30, 2012

**LETTING DATE:** MAY 21, 2013

**NCDOT CONTACT:** SANDRA A. STEPNEY, PE, CPM  
PLANNING & DEVELOPMENT, SENIOR PROJECT ENGINEER

**EDWARD G. WETHERILL, PE**  
PROJECT ENGINEER

**BOB A. MAY, PE**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

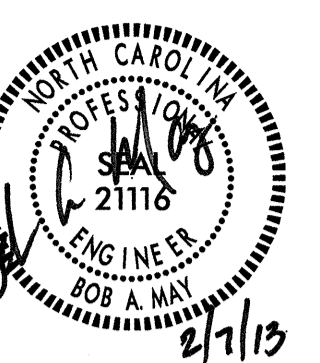
**ROADWAY DESIGN ENGINEER**

Seals and signatures for Edward G. Wetherill, PE and Bob A. May, PE.

NC DEPARTMENT OF TRANSPORTATION  
**RAIL DIVISION**  
PLANNING AND DEVELOPMENT

CAPITAL YARD  
100 RAIL SERVICE CENTER  
RALEIGH, NC 27604

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# GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS  
EFFECTIVE: 01-17-12  
REVISED: 07/30/12

GRADE LINE:  
GRADING AND SURFACING:  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

SUPERELEVATION:  
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:  
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:  
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

GUARDRAIL:  
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:  
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:  
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:  
UTILITY OWNERS ON THIS PROJECT ARE TOWN OF HARRISBURG  
PSNC, WINDSTREAM, DUKE ENERGY & TIME WARNER CABLE  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:  
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

# LIST OF ROADWAY STANDARD DRAWINGS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.56	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

# INDEX OF SHEETS

Sheet Number	Sheet
1	Title Sheet
1-A	Index of Sheets, General Notes and list of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
1-D	Table of Right of Way/Easement Points
1-E	CENTERLINE COORDINATE LIST
2 Thru 2-A	Typical Sections, Pavement Schedule
2-B	Detail for Temporary Pavement
2-C Thru 2-E	Detail for Standard Temporary Wall
3	Summary of Quantities
3A Thru 3-B	Summary of Drainage, Summary of Guardrail, Summary of Earthwork, Summary of Pavement Removal, Summary of Breaking of Existing Asphalt, Parcel Index and Shoulder Berm Gutter Summary
4 Thru 9	Plan and Profile Sheets
TMP-1 Thru TMP-13	Transportation Management Plans
SD-1 Thru SD-2	Details for Special Signs
PMP-1 Thru PMP-4	Pavement Marking Plans
EC-1 Thru EC-9	Erosion Control Plans
SIGN-1 Thru SIGN-2	Signing Plans
UC-1 Thru UC-6	Utility Construction Plans
UD-1 Thru UD-4	Utilities by Others Plans
XSC-INDEXT	Cross-Section Index
X-1A	Cross-Section Summary Sheet
X-1 Thru X-25	Cross-Sections
S-1 Thru S-39	Structure Plans
SN	Structure Standard Notes

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2/7/2013





STATE OF NORTH CAROLINA  
RAIL DIVISION

# CONVENTIONAL PLAN SHEET SYMBOLS

**Note: Not to Scale**

\*S.U.E. = *Subsurface Utility Engineering*

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	----- 
Property Corner	----- x
Property Monument	----- 
Parcel/Sequence Number	----- (123)
Existing Fence Line	----- x-x-x-x
Proposed Woven Wire Fence	----- o
Proposed Chain Link Fence	----- □
Proposed Barbed Wire Fence	----- ◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB
Known Soil Contamination: Area or Site	----- ☠ ☠
Potential Soil Contamination: Area or Site	----- ? ?

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	----- ○
Sign	----- S
Well	----- W
Small Mine	----- X
Foundation	----- □
Area Outline	----- □
Cemetery	----- †
Building	----- □
School	----- □
Church	----- □
Dam	----- ▽

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
Jurisdictional Stream	----- JS
Buffer Zone 1	----- BZ 1
Buffer Zone 2	----- BZ 2
Flow Arrow	----- ←
Disappearing Stream	----- >
Spring	----- ○
Wetland	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	----- ◆
Existing Right of Way Marker	----- △
Existing Right of Way Line	-----
Proposed Right of Way Line	----- (RW)
Proposed Right of Way Line with Iron Pin and Cap Marker	----- (RW) ▲
Proposed Right of Way Line with Concrete or Granite R/W Marker	----- (RW) ●
Proposed Control of Access Line with Concrete CA Marker	----- (CA) ●
Existing Control of Access	----- (CA) ●
Proposed Control of Access	----- (CA) ●
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
Proposed Permanent Utility Easement	----- PUE
Proposed Temporary Utility Easement	----- TUE
Proposed Aerial Utility Easement	----- AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	----- ◆

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Curb Ramp	----- (CR)
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	-----
Pavement Removal	-----

### VEGETATION:

Single Tree	-----
Single Shrub	-----
Hedge	-----
Woods Line	-----

Orchard	-----
Vineyard	-----

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW
MINOR:	
Head and End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	----- CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	----- S
Storm Sewer	----- S

### UTILITIES:

POWER:	
Existing Power Pole	----- ●
Proposed Power Pole	----- ○
Existing Joint Use Pole	----- ●
Proposed Joint Use Pole	----- ○
Power Manhole	----- P
Power Line Tower	-----
Power Transformer	-----
U/G Power Cable Hand Hole	-----
H-Frame Pole	-----
Recorded U/G Power Line	----- P
Designated U/G Power Line (S.U.E.*)	----- P

### TELEPHONE:

Existing Telephone Pole	----- ●
Proposed Telephone Pole	----- ○
Telephone Manhole	----- T
Telephone Booth	-----
Telephone Pedestal	-----
Telephone Cell Tower	-----
U/G Telephone Cable Hand Hole	-----
Recorded U/G Telephone Cable	----- T
Designated U/G Telephone Cable (S.U.E.*)	----- T
Recorded U/G Telephone Conduit	----- TC
Designated U/G Telephone Conduit (S.U.E.*)	----- TC
Recorded U/G Fiber Optics Cable	----- T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	----- T FO

### WATER:

Water Manhole	-----
Water Meter	-----
Water Valve	-----
Water Hydrant	-----
Recorded U/G Water Line	----- W
Designated U/G Water Line (S.U.E.*)	----- W
Above Ground Water Line	----- A/G Water

### TV:

TV Satellite Dish	-----
TV Pedestal	-----
TV Tower	-----
U/G TV Cable Hand Hole	-----
Recorded U/G TV Cable	----- TV
Designated U/G TV Cable (S.U.E.*)	----- TV
Recorded U/G Fiber Optic Cable	----- TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	----- TV FO

### GAS:

Gas Valve	-----
Gas Meter	-----
Recorded U/G Gas Line	----- G
Designated U/G Gas Line (S.U.E.*)	----- G
Above Ground Gas Line	----- A/G Gas

### SANITARY SEWER:

Sanitary Sewer Manhole	-----
Sanitary Sewer Cleanout	-----
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
Recorded SS Forced Main Line	----- FSS
Designated SS Forced Main Line (S.U.E.*)	----- FSS

### MISCELLANEOUS:

Utility Pole	-----
Utility Pole with Base	-----
Utility Located Object	-----
Utility Traffic Signal Box	-----
Utility Unknown U/G Line	----- UTL
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	----- (UST)
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	-----
U/G Test Hole (S.U.E.*)	-----
Abandoned According to Utility Records	----- AATUR
End of Information	----- E.O.I.

04/16/11

# SURVEY CONTROL SHEET

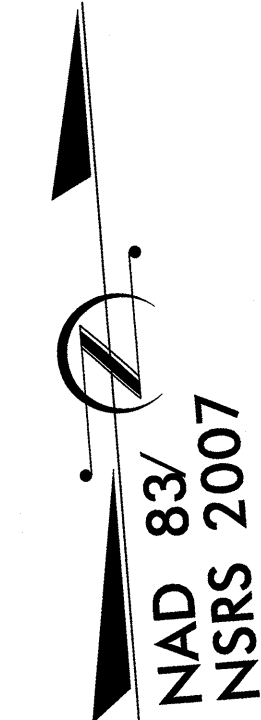
PROJECT REFERENCE NO.	SHEET NO.
P-5208F	1-C
Location and Surveys	

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P3414-15" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 572927.0137(FT) EASTING: 1490817.4654(FT) ELEVATION: 700.64(FT)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998439800  
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "P3414-15" TO -L- STATION 10+00.00 IS  
S 84°01'51.6" E 9995.329'

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



BL2 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL-F5	BL-F5	573874.1983	1500999.0037	672.99	30+61.95	28.41 RT
E011	P3414-11	573520.1777	1501138.6901	648.83	26+87.36	32.59 RT
BL-F4	BL-F4	573131.3088	1501171.0561	639.84	23+05.67	34.47 RT
BL-F3	BL-F3	572742.5686	1501025.1103	625.10	19+96.00	24.65 LT
BL-F2	BL-F2	572373.7576	1500881.2505	615.35	14+99.17	33.91 LT
BL-F1	BL-F1	572024.8982	1500775.0431	604.30	11+36.39	28.37 LT

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
E0F4	BL-F4	573131.3088	1501171.0561	639.84	10+26.30	53.70 RT
BL-F6	BL-F6	573185.6688	1501467.8690	636.32	13+31.50	0.93 LT

BL1 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
E075	BL-75	573671.1494	1494112.6689	690.19	10+34.03	6880.83 LT
BL-G10	BL-G10	573398.0936	1494301.2020	673.64	29+78.77	6719.98 LT
BL-G11	BL-G11	572994.2484	1494441.2191	666.48	29+78.77	6616.36 LT
1	P5208G-1	572782.7490	1494757.7390	680.34	29+78.77	6332.31 LT
BL-G12	BL-G12	572455.7883	1495011.3208	676.43	29+78.77	6144.53 LT
BL-G13	BL-G13	572496.2715	1495611.0366	679.49	35+33.56	5432.54 LT
BL-G14	BL-G14	572494.2410	1495806.4282	672.09	35+21.48	5154.89 LT
BL-G15	BL-G15	572571.9256	1496035.4607	679.90	35+25.10	5007.11 LT
BL-G16	BL-G16	572674.6537	1496206.7481	674.27	35+30.14	4811.31 LT
BL-G17	BL-G17	572704.8268	1496464.0926	670.03	35+22.39	4588.82 LT
BL-G18	BL-G18	572760.5864	1496789.2725	654.32	35+13.86	4234.50 LT
BL-G19	BL-G19	572785.8526	1497059.7621	637.23	35+02.83	3973.11 LT
BL-G20	BL-G20	572696.2458	1497365.7555	641.15	34+71.16	3725.58 LT
BL-G21	BL-G21	572690.9597	1497530.7240	632.88	34+59.08	3577.70 LT
BL-G22	BL-G22	572679.3552	1497656.2637	647.22	10+03.94	3201.77 LT
BL-G23	BL-G23	572712.5581	1497879.9189	672.19	10+50.96	2993.75 LT
BL-G24	BL-G24	572536.7499	1498033.7864	668.25	33+94.31	3202.88 LT
BL-G25	BL-G25	572440.3200	1498236.8693	665.59	33+59.16	3080.29 LT
BL-G26	BL-G26	572392.7282	1498419.9921	659.87	33+31.81	2955.19 LT
BL-G27	BL-G27	572315.8039	1498552.7952	650.87	OUTSIDE PROJECT LIMITS	
BL-G28	BL-G28	572284.6489	1498701.2792	628.47	OUTSIDE PROJECT LIMITS	
BL-G29	BL-G29	571954.4284	1498800.4331	606.73	OUTSIDE PROJECT LIMITS	
BL-G30	BL-G30	571813.3951	1499034.9332	625.68	OUTSIDE PROJECT LIMITS	
BL-G31	BL-G31	571677.2834	1499161.6212	645.29	OUTSIDE PROJECT LIMITS	
BL-G32	BL-G32	571325.7264	1499348.4001	667.65	OUTSIDE PROJECT LIMITS	
6	P5208G-6	571170.4500	1499478.8570	675.81	OUTSIDE PROJECT LIMITS	
5	P5208G-5	570974.9730	1499859.5800	680.64	OUTSIDE PROJECT LIMITS	
BL-G33	BL-G33	570953.5003	1500325.2135	648.60	OUTSIDE PROJECT LIMITS	
BL-G34	BL-G34	571088.8002	1500700.1983	630.43	OUTSIDE PROJECT LIMITS	
BL-G35	BL-G35	571473.2545	1500676.7101	608.81	OUTSIDE PROJECT LIMITS	
E0F1	BL-F1	572024.8982	1500775.0431	604.30	11+36.39	28.37 LT

BM4 ELEVATION - 610.31  
N 572125 E 1500771  
L STATION 12+30 54 LEFT  
RR SPIKE IN 14' OAK

BM5 ELEVATION - 637.97  
N 572892 E 1501035  
L STATION 20+44 59 LEFT  
RR SPIKE IN 9' OAK

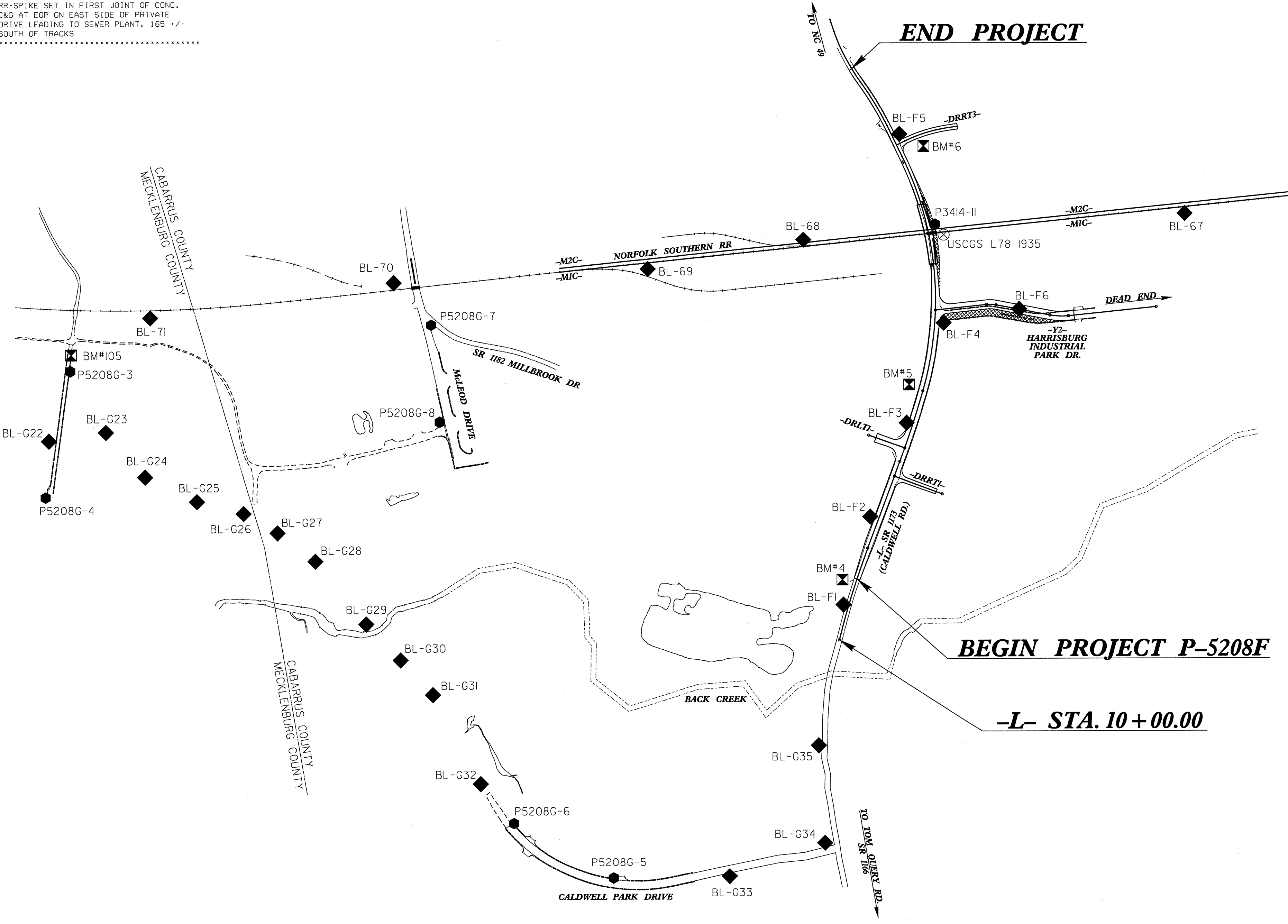
BM6 ELEVATION - 669.30  
N 573828 E 1501094  
L STATION 29+78 94 RIGHT  
RR SPIKE IN 10' ELM

L78 ELEVATION - 644.64  
N 573478 E 1501172  
L STATION 26+41 57 RIGHT  
USCGS L78 1935

BM105 ELEVATION - 664.51  
N 573014 E 1497744  
L STATION 11+85 3208 LEFT  
RR-SPIKE SET IN FIRST JOINT OF CONC.  
C&G AT EOP ON EAST SIDE OF PRIVATE  
DRIVE LEADING TO SEWER PLANT. 165' +/-  
SOUTH OF TRACKS

**NOTES:**

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION](https://connect.ncdot.gov/resources/location)  
  
THE FILES TO BE FOUND ARE AS FOLLOWS:  
P5208F\_LS\_CONTROL.TXT  
P5208F\_LS\_LOCAL.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM, UTILIZING THE NCGS RTN SYSTEM (VRS).  
  
MONUMENTS USED OR SET FOR PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT:  
  - INDICATES GEODETIC CONTROL MONUMENTS FOR HORIZONTAL CONTROL
  - INDICATES BASELINE MONUMENTS FOR HORIZONTAL PROJECT CONTROL
  - ⊠ INDICATES BENCHMARKS FOR VERTICAL CONTROL
  - ⊕ INDICATES NGS GEODETIC MONUMENTS USED FOR HORIZONTAL CONTROL
  - ⊗ INDICATES USGS BENCHMARKS



NOTE: DRAWING NOT TO SCALE

2/18/13  
6:19:17 AM 11/10/4/01 P-5208F-Roadway\Proj\p5208f\_1s\_1c.dgn 2/18/2013



# SURVEY CONTROL SHEET

Design Alignments & Right of Way

**-Final-**

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	571887.5970	1500758.6025
PT	13+79.76	572250.0171	1500871.4161
PC	17+43.32	572590.7825	1500998.1363
PCC	20+34.32	572867.0624	1501089.2988
PT	29+78.77	573786.9756	1501009.9155
PC	31+13.64	573908.2107	1500950.8176
PRC	33+14.29	574079.4877	1500846.8381
PT	35+37.43	574276.3400	1500743.6786
POT	35+87.43	574323.6786	1500727.5833

Y2

TYPE	STATION	NORTH	EAST
POT	10+00.00	573181.8839	1501139.1561
PC	12+02.00	573203.5226	1501339.9937
PT	12+39.59	573201.9991	1501377.4204
PC	14+55.07	573161.5807	1501589.0730
PT	15+28.07	573158.4756	1501661.7426
POT	18+74.07	573194.1490	1502005.8987

DRLT1

TYPE	STATION	NORTH	EAST
POT	10+00.00	572694.2807	1500876.1658
POT	11+50.00	572644.0469	1501017.5043

DRRT3

TYPE	STATION	NORTH	EAST
POT	10+00.00	573882.4657	1500963.3674
POT	12+00.01	573984.9274	1501135.1363

M1C

TYPE	STATION	NORTH	EAST
POT	10323+05.28	580886.2760	1516341.3125
TS	10344+15.66	579787.8823	1514539.3059
SC	10347+87.66	579590.7934	1514223.8275
CS	10356+47.32	579066.4891	1513543.6139
ST	10360+19.32	578811.5880	1513272.6968
POT	10360+19.32	578811.5880	1513272.6968
TS	10409+19.40	575414.7330	1509741.0949
SC	10413+22.40	575139.9644	1509446.3417
PC	10413+22.40	575139.9644	1509446.3417
PT	10437+68.53	574124.1996	1507257.2334
CS	10437+68.53	574124.1996	1507257.2334
ST	10441+71.53	574076.5357	1506857.1016
POT	10514+00.00	573333.8091	1499666.8947

M2C

TYPE	STATION	NORTH	EAST
POT	10323+05.28	580898.4397	1516333.9031
TS	10344+16.11	579799.8132	1514531.5145
SC	10347+88.11	579602.7243	1514216.0362
CS	10356+47.77	579078.4200	1513535.8226
ST	10360+19.77	578823.5189	1513264.9055
POT	10360+19.77	578823.5189	1513264.9055
POT	10380+78.11	577396.6282	1511781.4043
POT	10384+90.06	577111.4427	1511484.1294
TS	10409+17.26	575428.8512	1509734.7927
SC	10413+20.26	575154.0826	1509440.0395
PC	10413+20.26	575154.0826	1509440.0395
PT	10437+66.39	574138.3178	1507250.9312
CS	10437+66.39	574138.3178	1507250.9312
ST	10441+69.39	574090.6539	1506850.7994
POT	10513+93.05	573348.4215	1499665.3767

ROW MARKER

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+50.00	-45.00	572141.6957	1500785.7229
L	12+50.00	30.82	572117.9216	1500857.7167
L	12+50.00	43.00	572114.1016	1500869.2847
L	12+50.00	-29.18	572136.7358	1500800.7427
L	12+80.00	52.00	572139.3031	1500887.2182
L	13+79.76	-61.00	572271.2786	1500814.2414
L	14+00.00	-69.00	572293.0389	1500813.7981
L	14+50.00	-58.00	572336.0694	1500841.5358
L	14+50.00	55.00	572296.6833	1500947.4496
L	15+50.00	-55.00	572428.7528	1500879.2026
L	15+50.00	53.00	572391.1095	1500980.4300
L	17+18.98	60.63	572546.8334	1501046.4794
L	17+60.00	-70.00	572630.5436	1500938.2015
L	18+61.00	-68.00	572723.4497	1500973.0606
L	19+41.00	-60.00	572795.7665	1501005.0876
L	19+45.00	84.27	572756.2949	1501143.9109
L	20+34.32	-64.00	572884.8358	1501027.8162
L	21+50.00	-70.00	572992.8004	1501047.6596
L	21+55.00	88.00	572967.9925	1501203.7808
L	23+27.69	-81.00	573160.0080	1501057.1463
L	24+00.00	-78.00	573227.7394	1501061.8377
L	24+70.00	120.00	573304.8585	1501257.5103
L	25+54.90	118.72	573397.1317	1501247.8408
L	25+59.17	-73.68	573377.3807	1501056.4068
L	27+42.00	98.70	573592.0795	1501188.6673
L	27+74.00	102.00	573626.1345	1501182.2437
L	27+76.00	-89.12	573572.4924	1500998.7951
L	29+00.00	90.00	573749.5640	1501125.4031
L	30+50.00	-65.00	573822.5230	1500920.2759
L	31+13.64	-50.00	573886.3018	1500905.8732
L	31+50.00	65.00	573971.0359	1500991.7892
L	33+14.29	-39.00	574056.2705	1500815.5018
L	33+75.00	27.24	574144.0450	1500835.9697
L	33+75.00	-33.01	574112.3843	1500784.7146
L	33+75.00	44.00	574152.8539	1500850.2303

ROW MARKER

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	10+75.00	96.00	573094.4705	1501224.0082
Y2	11+52.00	-87.00	573284.6658	1501280.9618
Y2	11+75.00	112.00	573089.2747	1501325.1468
Y2	12+30.00	-71.00	573273.9873	1501375.9531
Y2	13+12.00	56.84	573132.5912	1501437.8795
Y2	14+23.57	-41.50	573208.2502	1501565.9118
Y2	15+09.00	-29.26	573186.4852	1501641.9302

PERMANENT EASEMENT MARKER

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+75.00	-127.00	571993.8550	1500655.3207
L	10+85.00	-144.00	572008.4054	1500641.7127
L	11+19.00	-120.45	572035.9154	1500674.0047
L	11+30.00	-137.00	572051.4888	1500661.2991
L	11+63.00	-67.00	572064.0637	1500738.0790
L	11+80.00	-140.00	572102.1327	1500673.3792
L	12+82.00	-69.00	572180.1592	1500773.3069
L	18+41.00	-79.00	572708.4233	1500956.3192
L	21+00.00	-89.00	572950.9110	1501019.2678
L	23+68.00	-96.00	573198.0751	1501043.5629
L	25+60.33	-117.24	573372.9080	1501013.0603
L	27+36.00	138.26	573596.1946	1501228.5525
L	27+49.00	140.00	573610.5452	1501226.3919
L	27+79.59	-105.98	573570.7289	1500981.6993
L	27+83.00	113.76	573638.9105	1501190.6246
L	29+74.00	92.00	573822.6903	1501094.8439
L	30+50.00	-80.00	573815.9504	1500906.7925
L	31+13.64	-65.00	573879.7292	1500892.3898
L	31+25.12	66.78	573948.3897	1501005.4516
L	31+25.85	77.44	573953.8617	1501014.6341
L	33+40.00	-50.00	574072.0996	1500790.6945
L	33+40.00	-35.79	574080.1438	1500802.4035

SEE SHEET 1C FOR NOTES.

2/18/13

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2/19/2013

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CENTERLINE COORDINATE LIST**

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	10+00.00	571887.5970	1500758.6025
2	L	10+50.00	571935.9840	1500771.1983
3	L	11+00.00	571984.1861	1500784.4841
4	L	11+50.00	572032.1935	1500798.4572
5	L	12+00.00	572079.9964	1500813.1146
6	L	12+50.00	572127.5851	1500828.4534
7	L	13+00.00	572174.9497	1500844.4704
8	L	13+50.00	572222.0808	1500861.1624
9	L	14+00.00	572268.9890	1500878.4712
10	L	14+50.00	572315.8536	1500895.8987
11	L	15+00.00	572362.7181	1500913.3261
12	L	15+50.00	572409.5826	1500930.7536
13	L	16+00.00	572456.4471	1500948.1811
14	L	16+50.00	572503.3116	1500965.6085
15	L	17+00.00	572550.1762	1500983.0360
16	L	17+50.00	572597.0427	1501000.4581
17	L	18+00.00	572644.0469	1501017.5043
18	L	18+50.00	572691.2657	1501033.9464
19	L	19+00.00	572738.6915	1501049.7818
20	L	19+50.00	572786.3164	1501065.0079
21	L	20+00.00	572834.1326	1501079.6223
22	L	20+50.00	572882.1497	1501093.5607
23	L	21+00.00	572930.5953	1501105.9181
24	L	21+50.00	572979.4850	1501116.3815
25	L	22+00.00	573028.7447	1501124.9353
26	L	22+50.00	573078.2999	1501131.5663
27	L	23+00.00	573128.0755	1501136.2645
28	L	23+50.00	573177.9962	1501139.0229
29	L	24+00.00	573227.9864	1501139.8373
30	L	24+50.00	573277.9704	1501138.7064
31	L	25+00.00	573327.8727	1501135.6319
32	L	25+50.00	573377.6175	1501130.6186
33	L	26+00.00	573427.1297	1501123.6739
34	L	26+50.00	573476.3343	1501114.8084
35	L	27+00.00	573525.1567	1501104.0355
36	L	27+50.00	573573.5231	1501091.3716
37	L	28+00.00	573621.3603	1501076.8357
38	L	28+50.00	573668.5958	1501060.4500
39	L	29+00.00	573715.1581	1501042.2392
40	L	29+50.00	573760.9768	1501022.2308
41	L	30+00.00	573806.0601	1501000.6125
42	L	30+50.00	573851.0046	1500978.7036
43	L	31+00.00	573895.9490	1500956.7948
44	L	31+50.00	573940.6217	1500934.3438
45	L	32+00.00	573984.2584	1500909.9431
46	L	32+50.00	574026.7304	1500883.5670
47	L	33+00.00	574067.9481	1500855.2712
48	L	33+50.00	574108.6935	1500826.3011
49	L	34+00.00	574151.2237	1500800.0298
50	L	34+50.00	574195.4744	1500776.7730
51	L	35+00.00	574241.2321	1500756.6428
52	L	35+50.00	574288.2416	1500739.6320
53	L	35+87.43	574323.6786	1500727.5833
54	Y2	10+00.00	573181.8839	1501139.1561
55	Y2	10+50.00	573187.2400	1501188.8684
56	Y2	11+00.00	573192.5961	1501238.5807
57	Y2	11+50.00	573197.9522	1501288.2929
58	Y2	12+00.00	573203.3083	1501338.0052
59	Y2	12+50.00	573200.0473	1501387.6409
60	Y2	13+00.00	573190.6685	1501436.7534
61	Y2	13+50.00	573181.2897	1501485.8659
62	Y2	14+00.00	573171.9109	1501534.9784
63	Y2	14+50.00	573162.5321	1501584.0909
64	Y2	15+00.00	573157.1533	1501633.7215
65	Y2	15+50.00	573160.7369	1501683.5587
66	Y2	16+00.00	573165.8920	1501733.2922
67	Y2	16+50.00	573171.0472	1501783.0258
68	Y2	17+00.00	573176.2023	1501832.7593
69	Y2	17+50.00	573181.3574	1501882.4929
70	Y2	18+00.00	573186.5125	1501932.2264
71	Y2	18+50.00	573191.6677	1501981.9599
72	Y2	18+74.07	573194.1490	1502005.8987
73	DR LT1	10+00.00	572694.2807	1500876.1658
74	DR LT1	10+50.00	572677.5361	1500923.2786
75	DR LT1	11+00.00	572660.7915	1500970.3914
76	DR LT1	11+50.00	572644.0469	1501017.5043
77	DR RT3	10+00.00	573830.9111	1500988.4985
78	DR RT3	10+50.00	573852.6657	1501033.5166
79	DR RT3	11+00.00	573871.5148	1501079.8112

Point #	Chain	Station	Northing (Y)	Easting (X)
80	DR RT3	11+50.00	573886.3431	1501127.5459
81	DR RT3	12+00.00	573897.0424	1501176.3721
82	DR RT3	12+50.00	573904.5377	1501225.8057
83	DR RT3	12+51.22	573904.7158	1501227.0145

Point #	Chain	Station	Northing (Y)	Easting (X)
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Point #	Chain	Station	Northing (Y)	Easting (X)
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Point #	Chain	Station	Northing (Y)	Easting (X)
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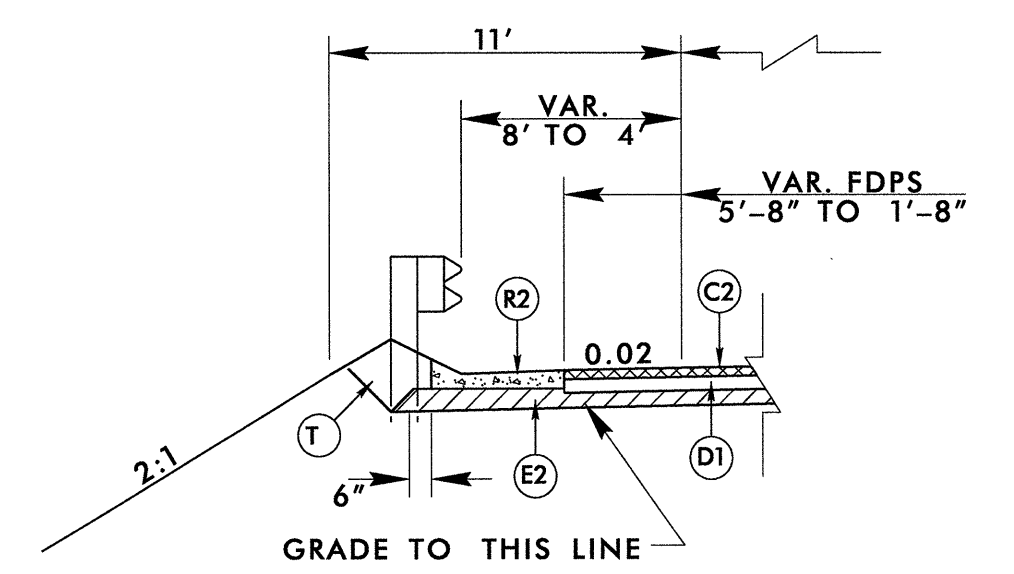
0515DEL P2162

# PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'x6" CONCRETE CURB & GUTTER.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R2	SHOULDER BERM GUTTER
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	INCIDENTAL MILLING
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, 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 5½" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2-A)
J	10" AGGREGATE BASE COURSE		

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

PROJECT REFERENCE NO. P-5208F	SHEET NO. 2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
 559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	



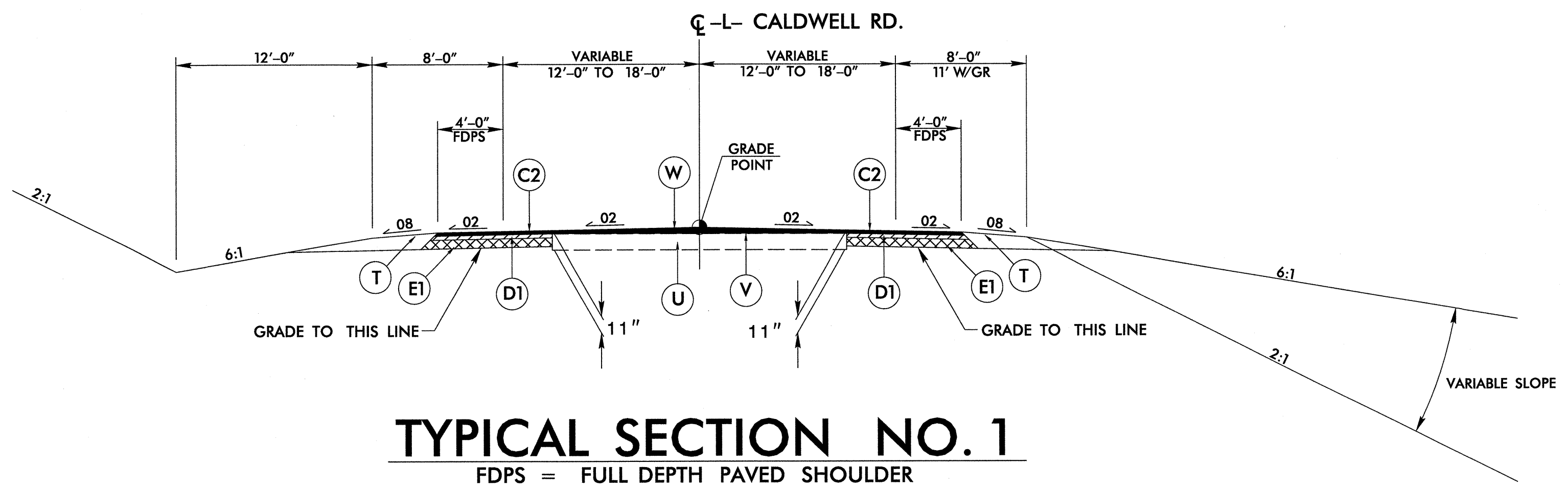
## PARTIAL TYPICAL SECTION

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2  
 FDPS = FULL DEPTH PAVED SHOULDER  
 -L- STA. 19+48.00 TO -L- STA. 25+12.52 LT  
 -L- STA. 27+90.31 TO -L- STA. 31+56.00 LT

NOTE: INCIDENTAL MILLING TO BE USED TO MAKE PAVEMENT TIE-INS:  
 -L- STA. 12+50.00 TO -L- STA. 12+72.50  
 -L- STA. 33+62.88 TO -L- STA. 33+75.00

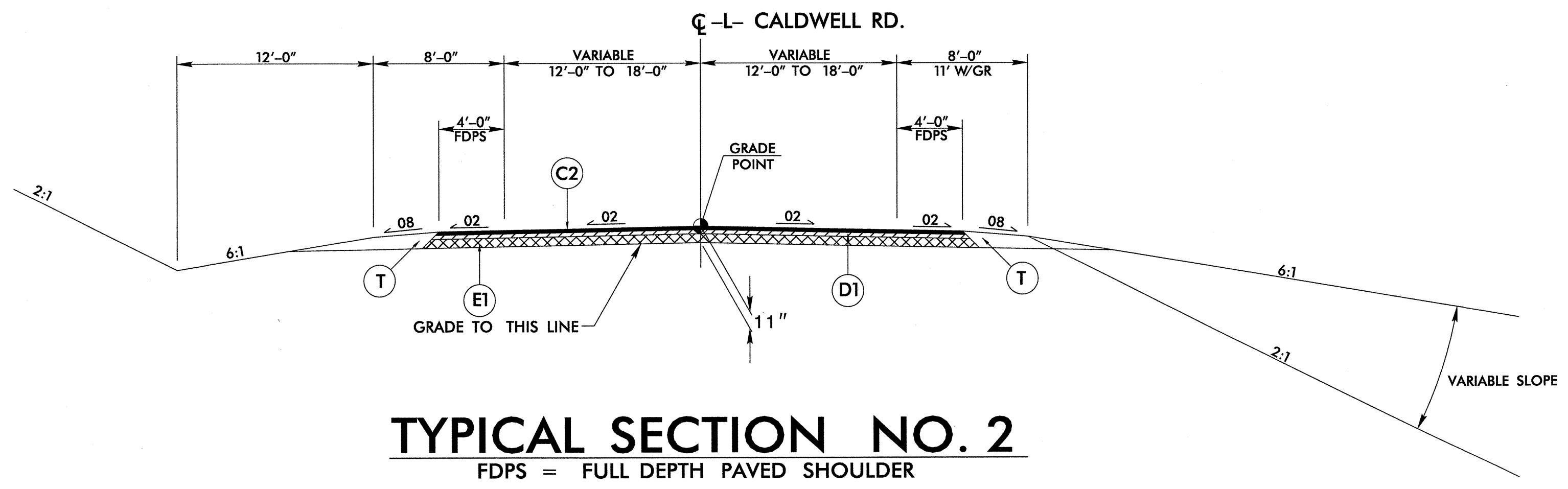
USE TYPICAL SECTION NO. 1  
 -L- STA. 12+50.00 TO -L- STA. 14+70.33  
 -L- STA. 32+84.05 TO -L- STA. 33+75.00

USE TYPICAL SECTION NO. 2  
 -L- STA. 14+70.33 TO -L- STA. 25+36.68 (BEGIN BRIDGE)  
 -L- STA. 27+63.56 (END BRIDGE) TO -L- STA. 32+84.05



## TYPICAL SECTION NO. 1

FDPS = FULL DEPTH PAVED SHOULDER



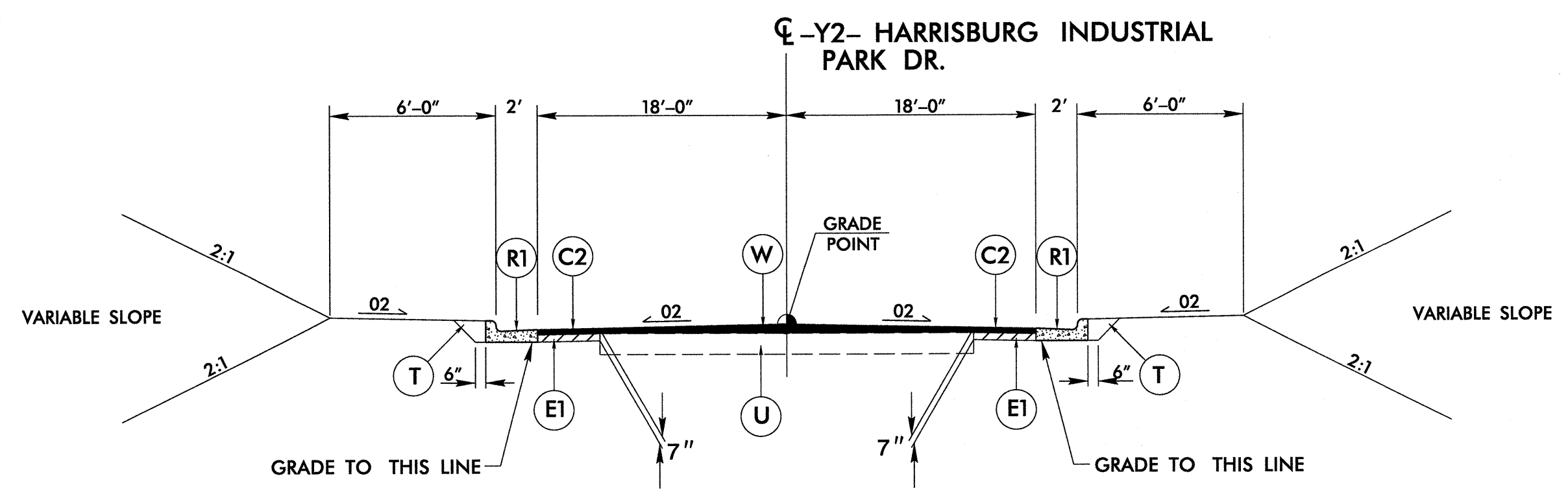
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FDPS = FULL DEPTH PAVED SHOULDER

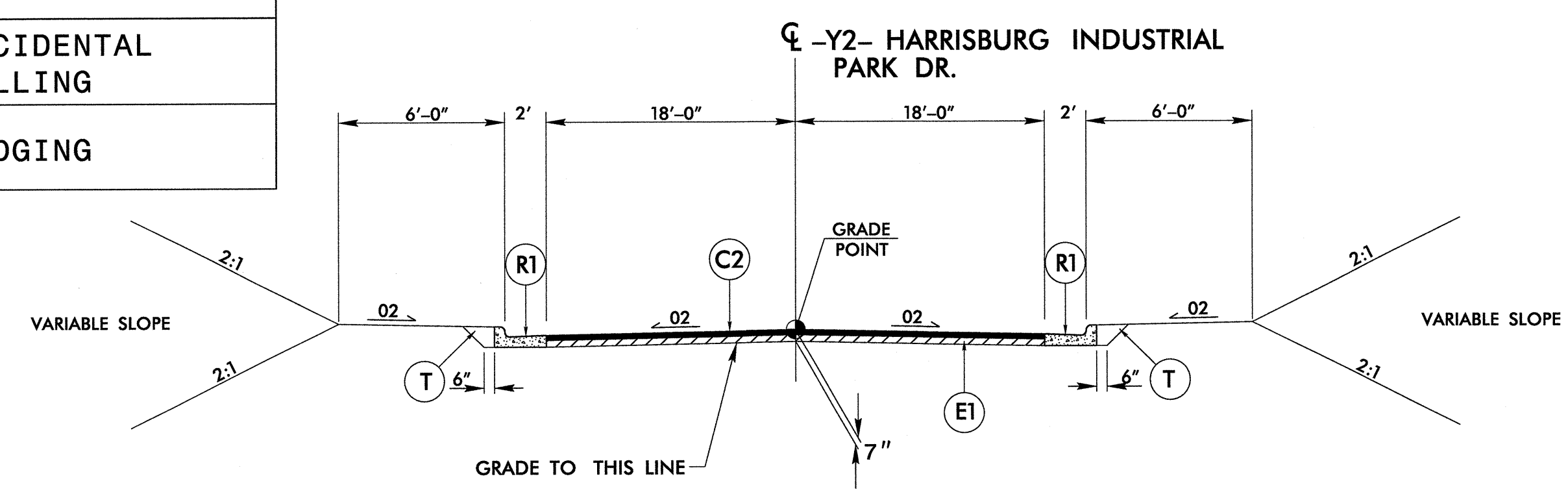
311\11104.dwg 11/21/2013 11:54 AM Roadway\Proj\PE5208F\_Rdy.tup.dgn

PROJECT REFERENCE NO. P-5208F	SHEET NO. 2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
559 Jones Franklin Rd. Suite 104 Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	

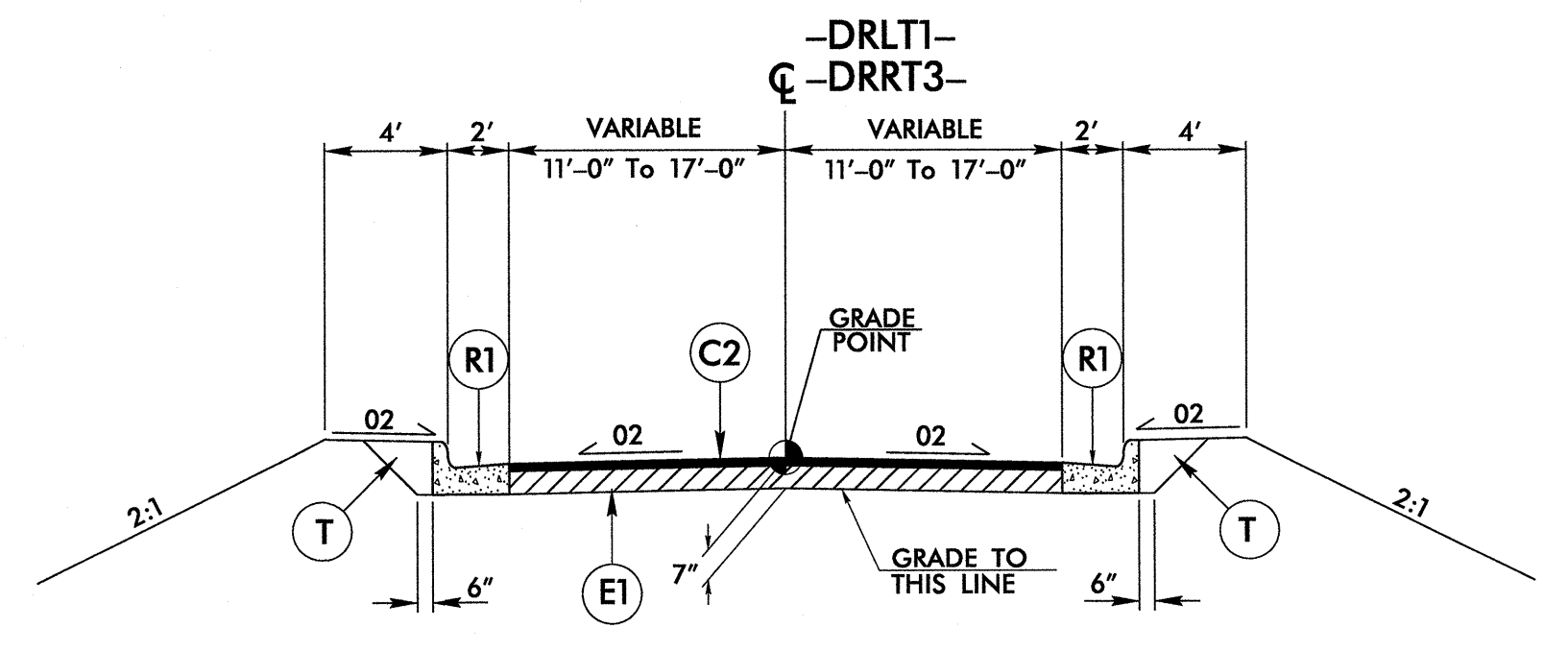
0515DEL P21a2	PAVEMENT SCHEDULE	
	C1	1 1/2" S9.5B
	C2	3" S9.5B
	C3	VAR. S9.5B
	D1	4" I19.0B
	D2	VAR. I19.0B
	E1	4" B25.0B
	E2	VAR. B25.0B
	J	10" ABC
	P	PRIME COAT
	R1	2'-6" C & G
	R2	SHOULDER BERM GUTTER
	T	EARTH MATERIAL
U	EXIST. PAVEMENT	
V	INCIDENTAL MILLING	
W	WEDGING	



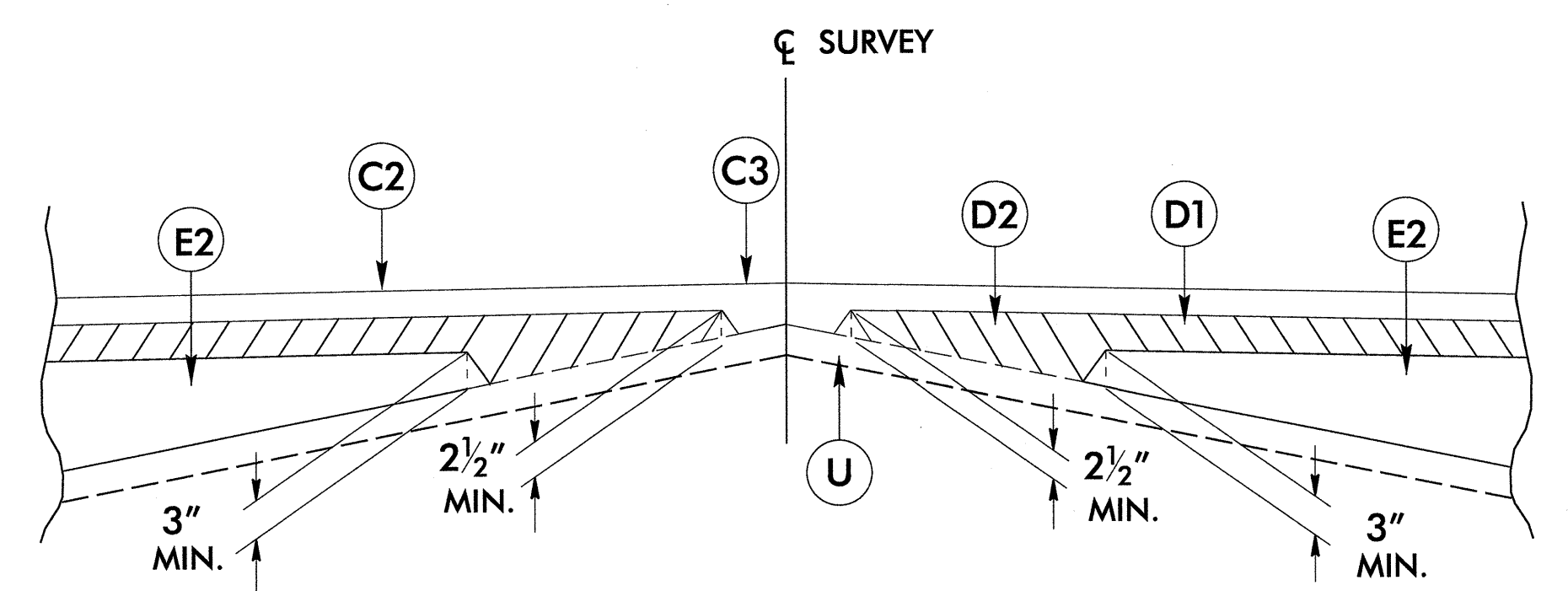
**TYPICAL SECTION NO. 3**  
 USE TYPICAL SECTION NO. 3  
 -Y2- STA. 14+08.42 TO -Y- STA. 15+50.00



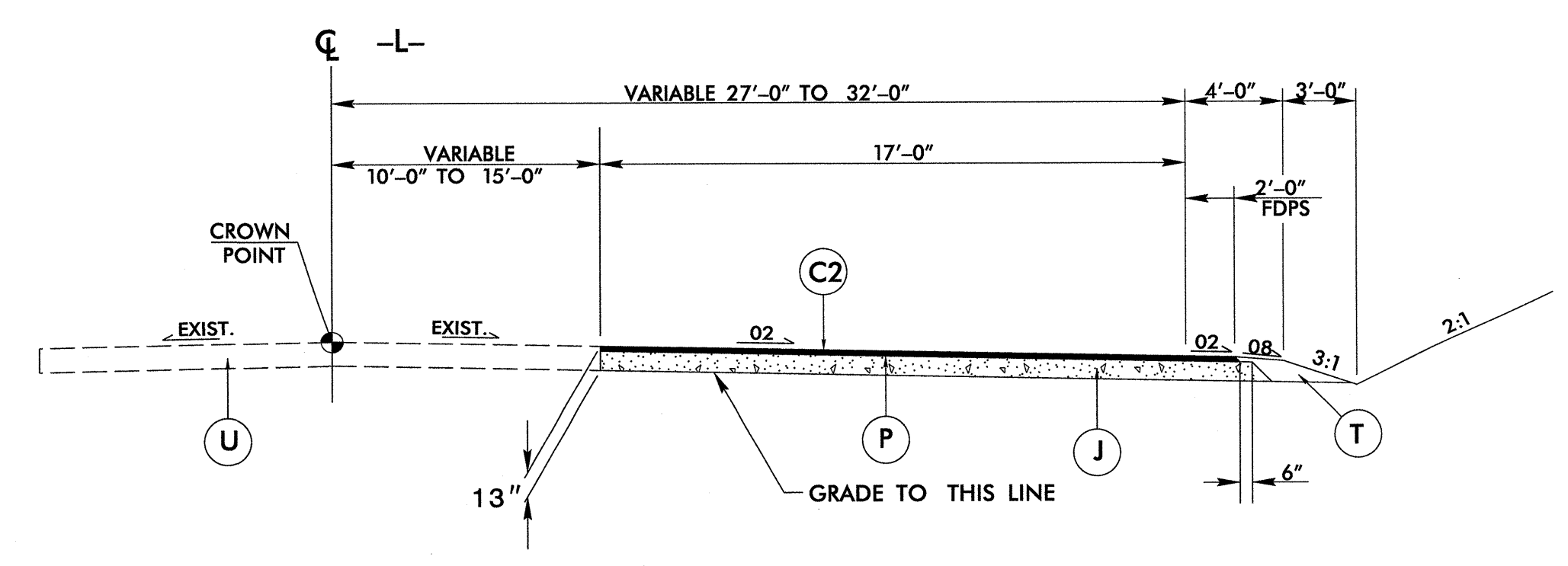
**TYPICAL SECTION NO. 4**  
 USE TYPICAL SECTION NO. 4  
 -Y2- STA. 10+62.41 TO -Y2- STA. 14+08.42



**TYPICAL SECTION NO. 5**  
 USE TYPICAL SECTION NO. 5  
 -DRLT1- STA. 10+30.00 TO -DRLT1- STA. 10+91.17  
 -DRRT3- STA. 10+45.56 TO -DRRT3- STA. 11+85.00



**Detail Showing Method of Wedging**



**TYPICAL SECTION NO. 6**  
 FDPS = FULL DEPTH PAVED SHOULDER  
 USE TYPICAL SECTION NO. 6  
 -L- STA. 12+04+/- TO -L- STA. 23+18+/- RT.

NOTE: UTILIZE TYPICAL SECTION NO. 6 FOR TEMPORARY PAVEMENT LOCATIONS

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0515DEL P21a2

NAD 83/NSRS 2007

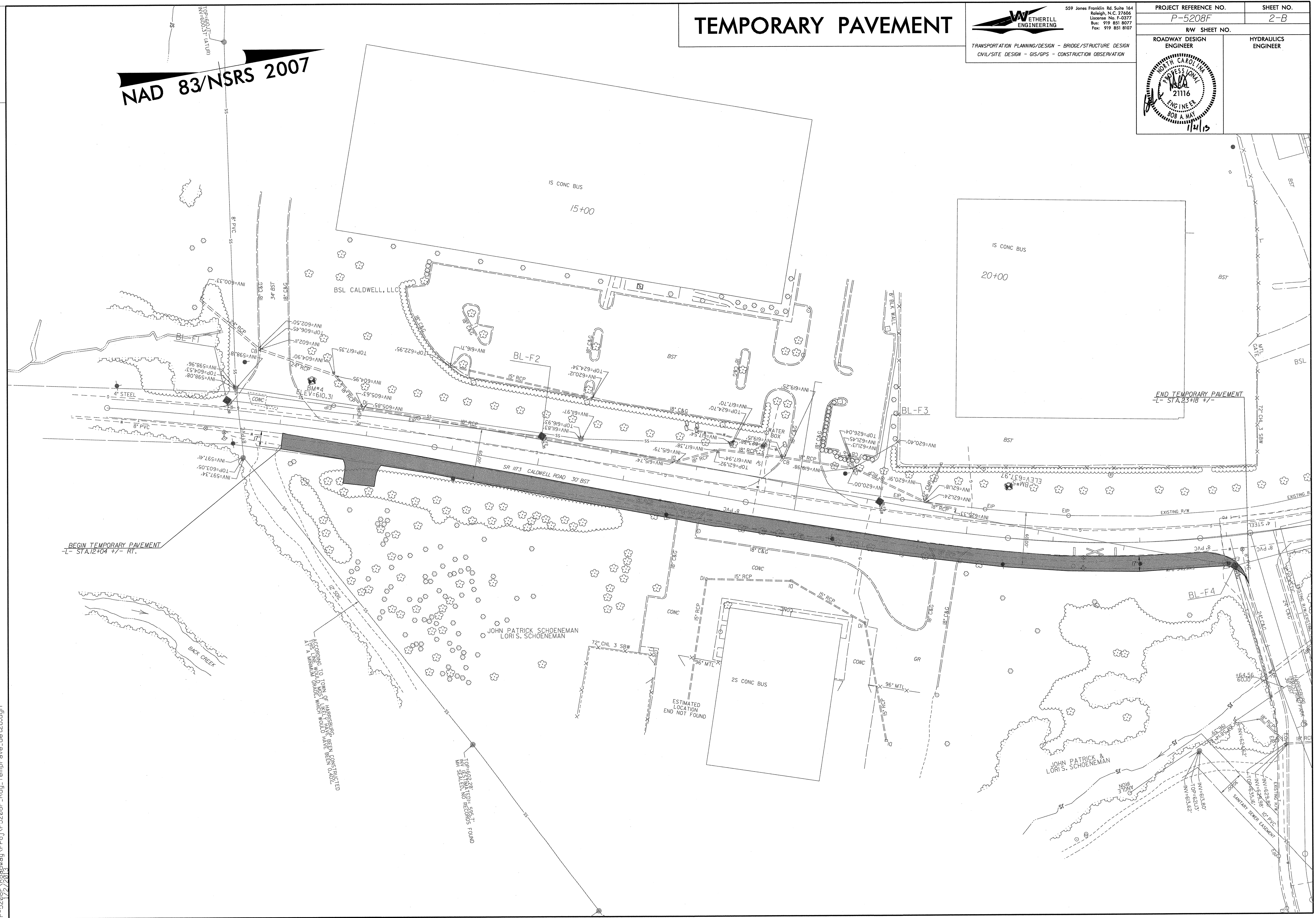
# TEMPORARY PAVEMENT

ETHERILL ENGINEERING  
 559 Jones Franklin Rd. Suite 164  
 Raleigh, N.C. 27606  
 License No. E-0377  
 Bus: 919 851 8077  
 Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. P-5208F	SHEET NO. 2-B
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

Professional Engineer Seal:  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 BOB A. MA...  
 21116  
 11/1/13



BEGIN TEMPORARY PAVEMENT  
L- STA. 12+04 +/- RT.

END TEMPORARY PAVEMENT  
L- STA. 23+18 +/- RT.

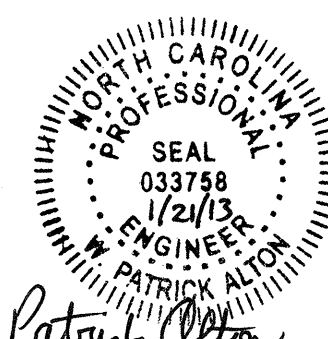
PORTION TO TOWN OF HARRINGTON BEEN CONSTRUCTED  
AT A MINIMUM GRADE WHICH WOULD HAVE BEEN O.K.

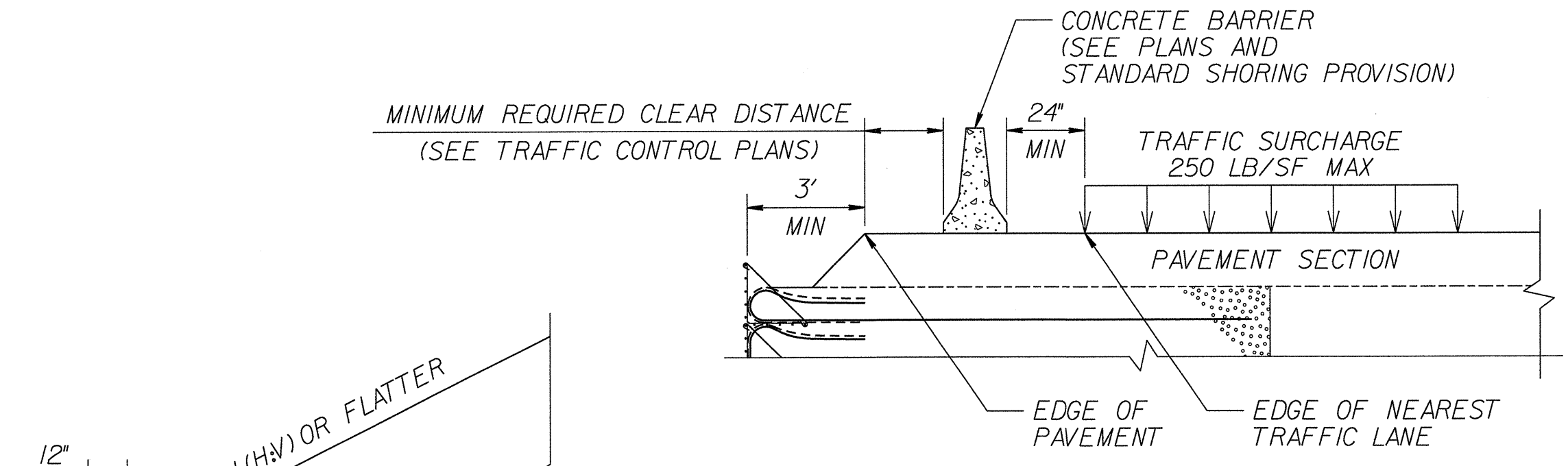
ESTIMATED LOCATION  
END NOT FOUND

TOP OF 24\"/> IN SEALEN  
FOR RECORDS ROUND

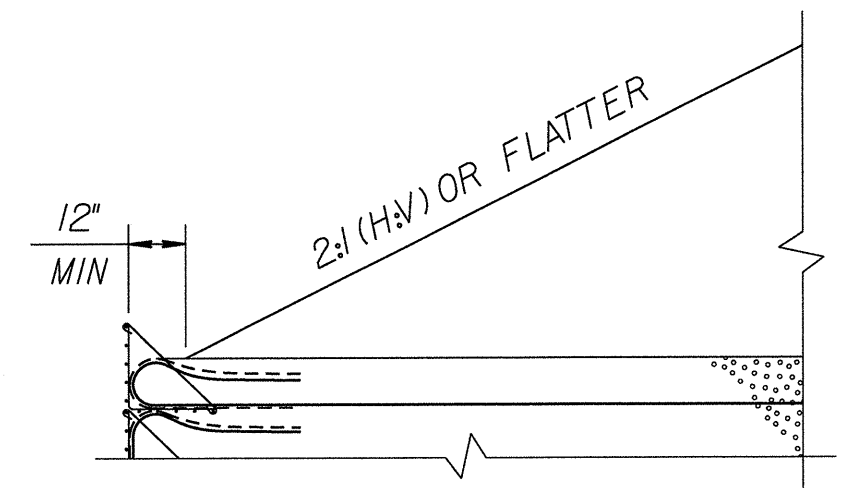
14.01 P-5208F Roadway\Proj\5208F\_Rdy\_TempPave\_det2b.dgn  
7/2/13 12:56 AM

0515DEL\_P21a2

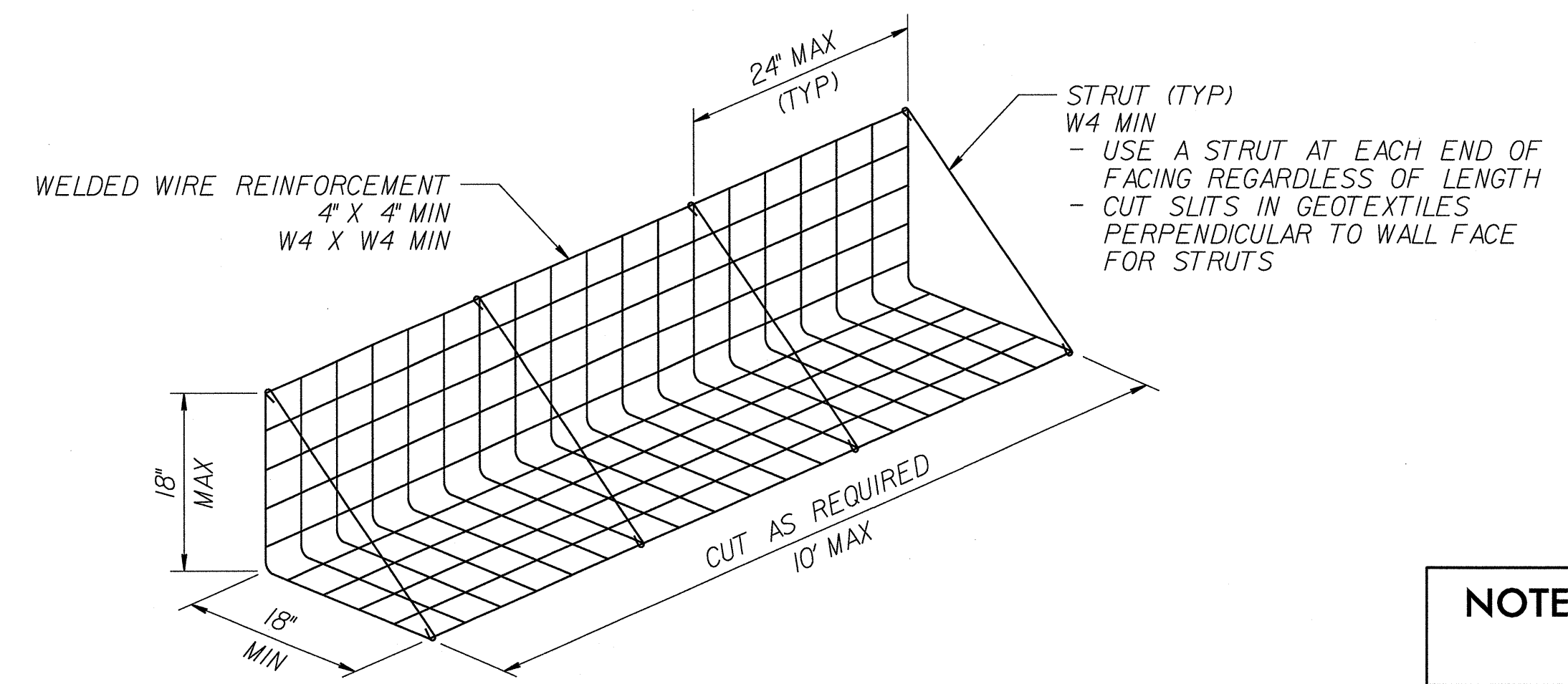
<b>PROJECT REFERENCE NO.</b>		<b>SHEET</b>
P-5208F		2-C
GEOTECHNICAL ENGINEER  SIGNATURE: Patrick Alton	ENGINEER SIGNATURE: _____ DATE: _____	



**SURCHARGE CASE**

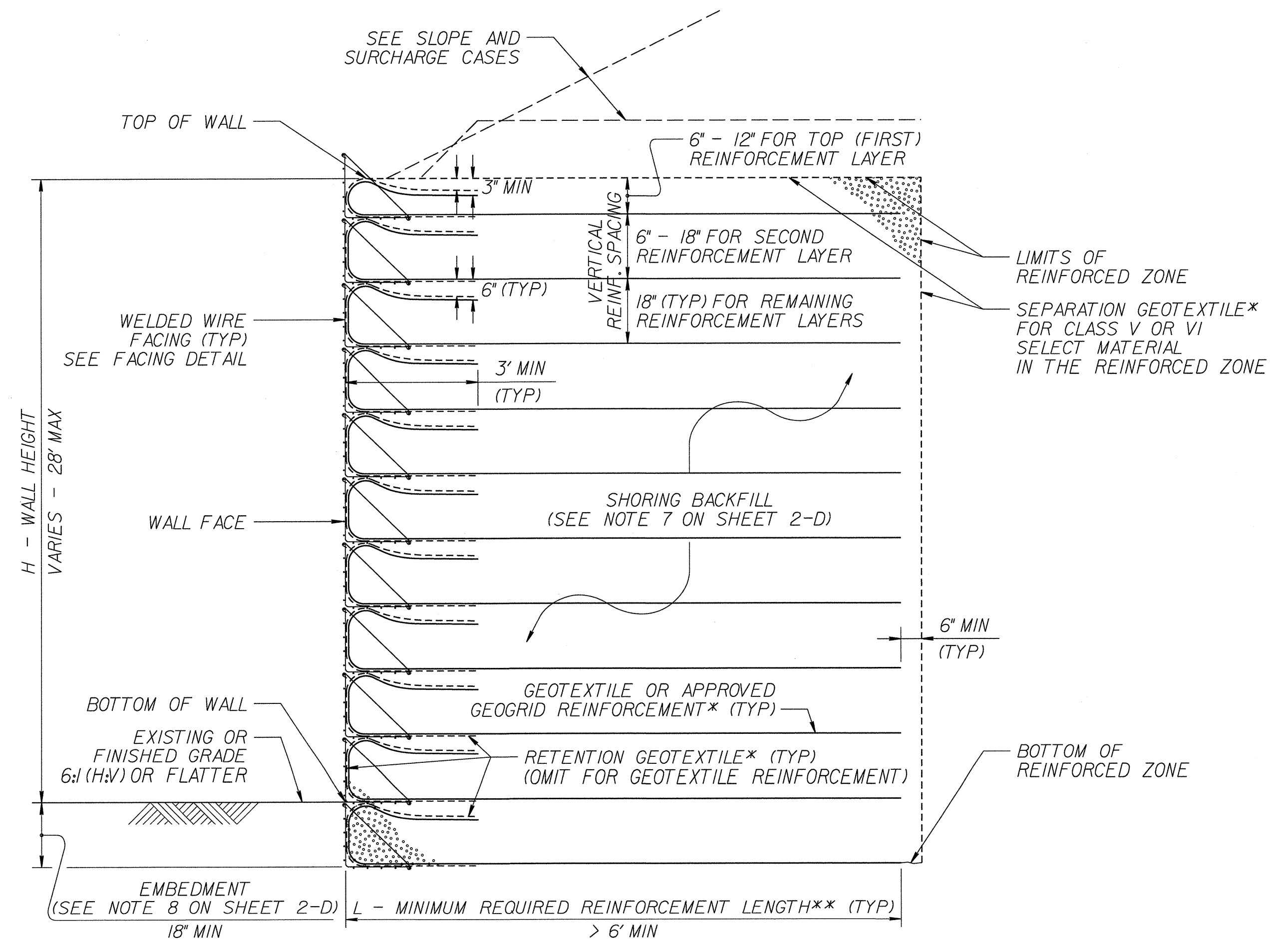


**SLOPE CASE**



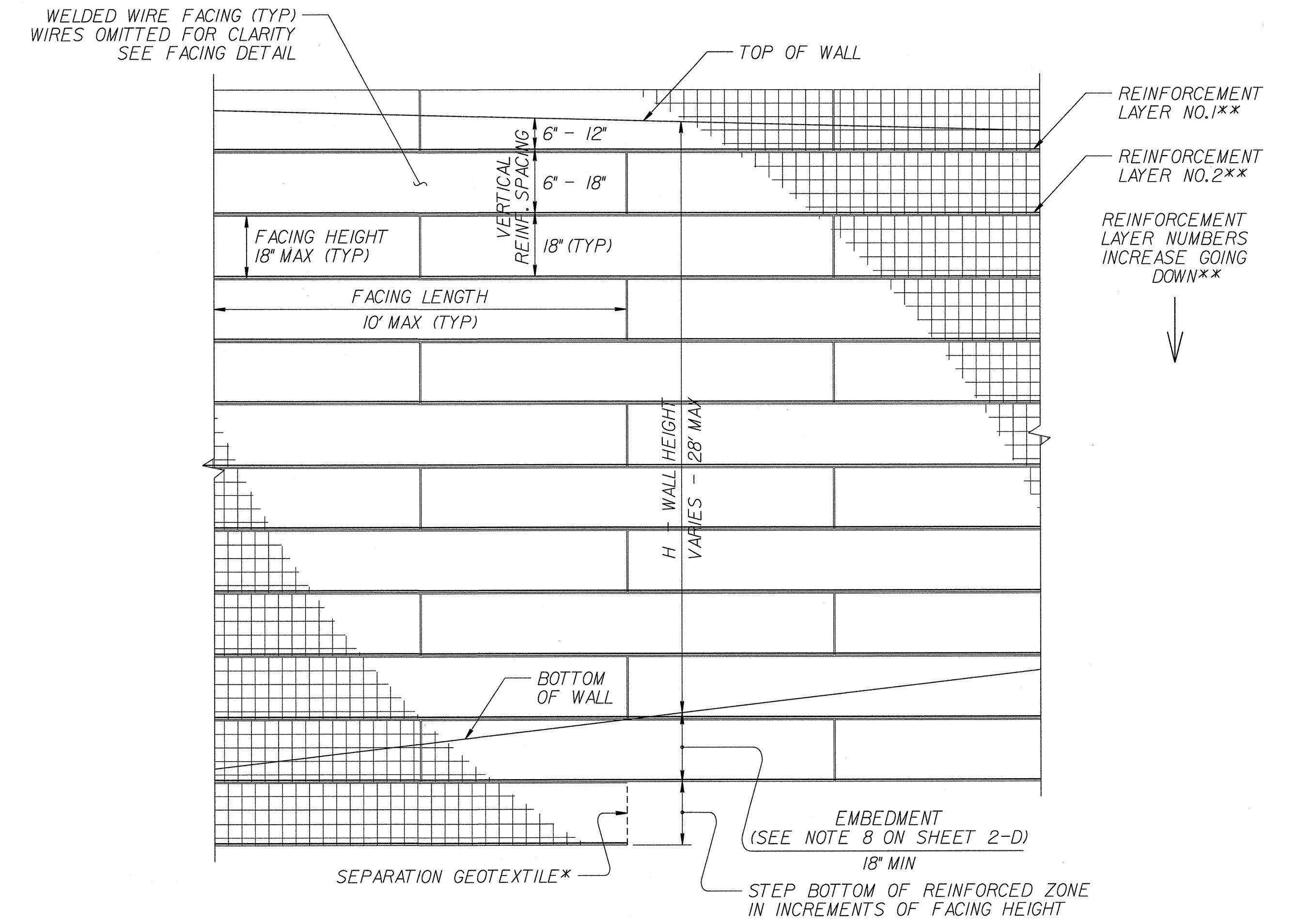
**FACING DETAIL**

**NOTE: SEE TMP-5, TMP-8 & TMP-9 FOR WALL LOCATIONS.**



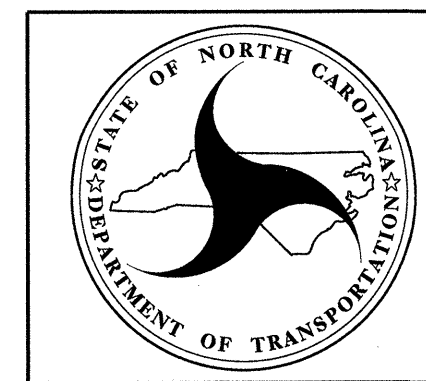
**STANDARD TEMPORARY WALL**

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



**STANDARD TEMPORARY WALL - PARTIAL ELEVATION**

\*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2-D.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 2-E.



**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

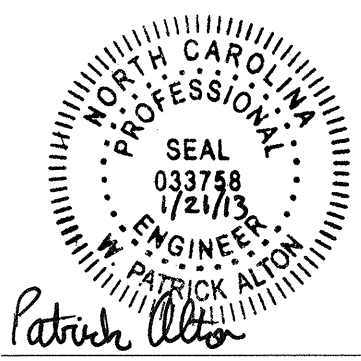
STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL  
 Sheet 1 of 3

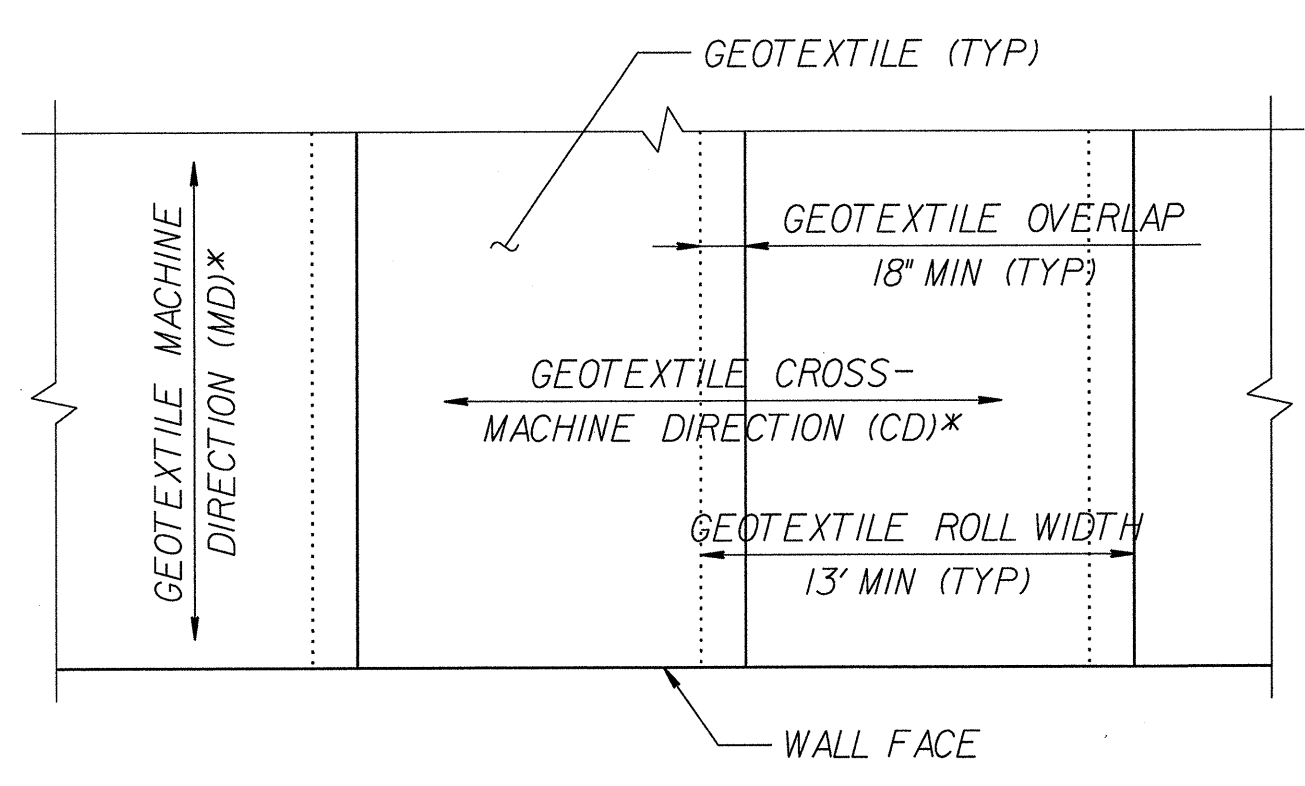
DATE: 11-20-12



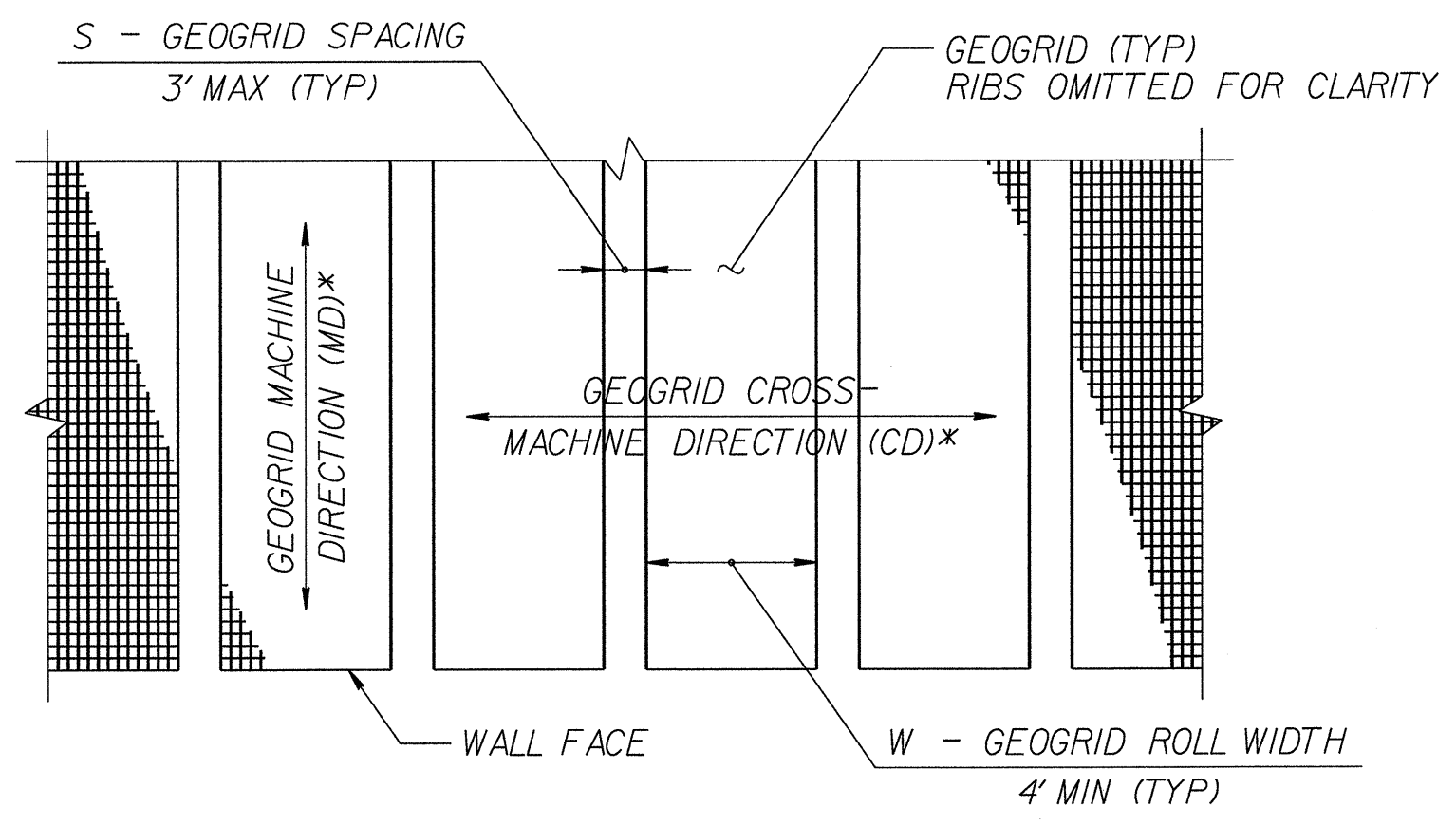
DCN 0515DEL\_P21a2

<b>PROJECT REFERENCE NO.</b>		<b>SHEET</b>
P-5208F		2-D
GEOTECHNICAL ENGINEER		ENGINEER
		
SIGNATURE	DATE	SIGNATURE DATE

**NOTE: SEE TMP-5, TMP-8 & TMP-9 FOR WALL LOCATIONS.**

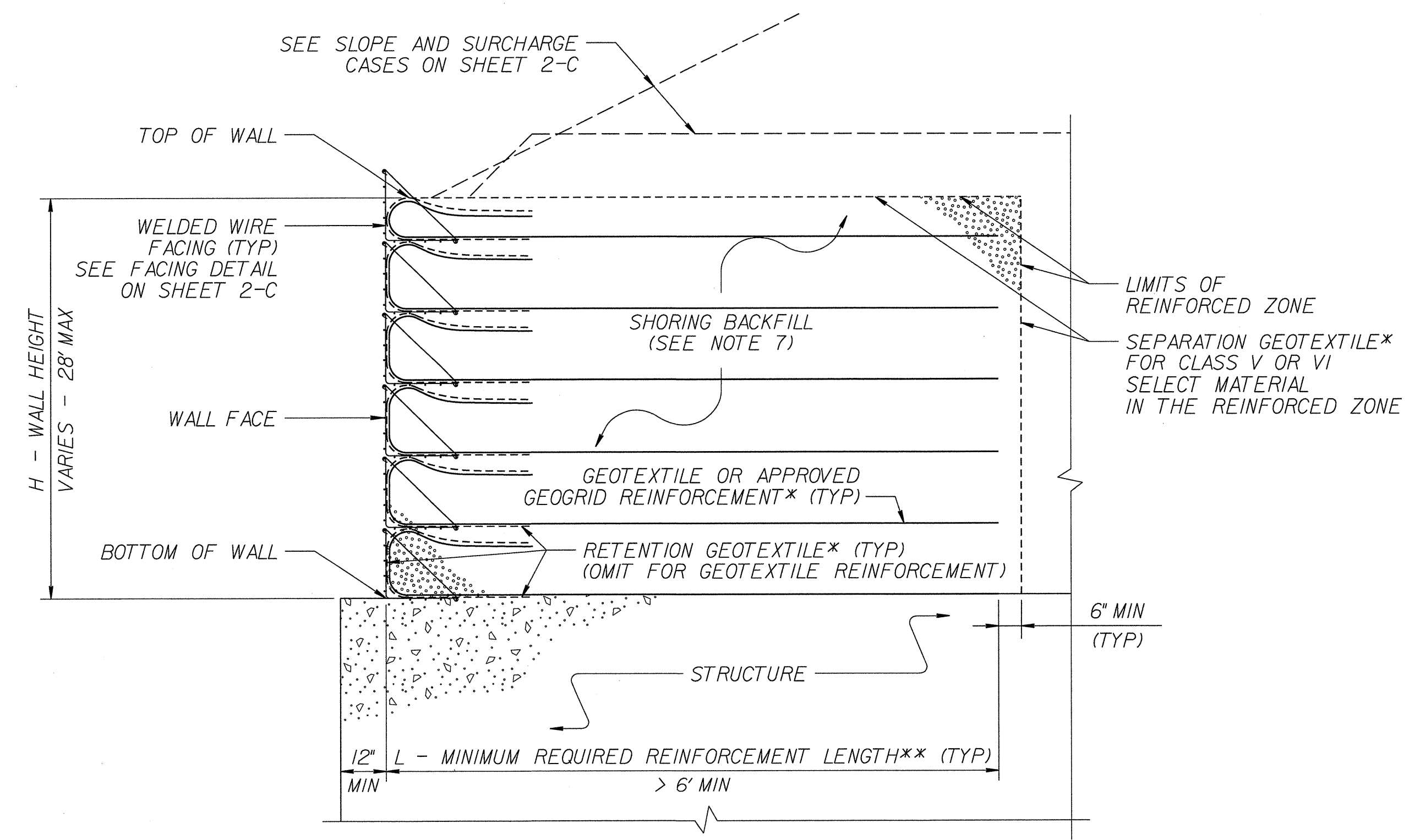


**GEOTEXTILE PLACEMENT**  
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



**GEOGRID PLACEMENT**  
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT -  
 $\frac{W}{W+S} \times 100 \geq 80\%$ ,  
SEE NOTE 11)

**GEOSYNTHETIC PLACEMENT DETAILS**  
(PLAN VIEW)  
\*SEE NOTE 12.



**TEMPORARY WALL ON STRUCTURE DETAIL**  
\*SEE GEOSYNTHETIC PLACEMENT DETAILS.  
\*\*SEE REINFORCEMENT TABLES ON SHEET 2-E.


**NOTES:**

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  LB/CF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  LB/SF
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
- DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS ARE APPROVED FOR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) BASED ON MATERIAL TYPE. FOR DETAILS OF APPROVED GEOGRIDS AND SHORT-TERM DESIGN STRENGTHS, SEE [www.ncdot.org/dob/operations/materials/soils/gep.html](http://www.ncdot.org/dob/operations/materials/soils/gep.html). DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

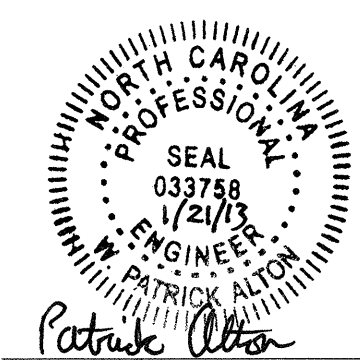
MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
- AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH THE FOLLOWING CONDITIONS OCCUR:  
-  $W$  (REINFORCEMENT ROLL WIDTH)  $\geq L$  (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND  
- REINFORCEMENT STRENGTH IN CD  $\geq$  MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
- SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION.
- DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
- DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
- CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
- FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
- FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH



STANDARD DRAWING NO. 1801.02  
**STANDARD TEMPORARY WALL**  
Sheet 2 of 3  
DATE: 11-20-12

<b>PROJECT REFERENCE NO.</b>		<b>SHEET</b>
P-5208F		2-E
GEOTECHNICAL ENGINEER		ENGINEER
		
SIGNATURE	DATE	SIGNATURE DATE

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

**L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)**  
(FOR ALL REINFORCEMENT TYPES)

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

\*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 2-C.

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

**GEOTEXTILE REINFORCEMENT  
ULTIMATE TENSILE STRENGTH (LB/FT)**

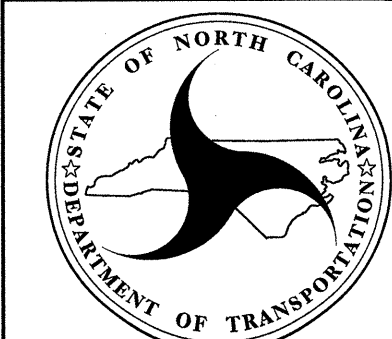
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2-D)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL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

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

(SEE NOTE 10 ON SHEET 2-D.)

**MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD**

(SEE NOTE 9 ON SHEET 2-D.)  
\*SEE PARTIAL ELEVATION ON SHEET 2-C FOR REINFORCEMENT LAYER NUMBERING.



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RALEIGH

NOTE: SEE TMP-5, TMP-8 & TMP-9 FOR WALL LOCATIONS.

STANDARD DRAWING NO. 1801.02

STANDARD  
TEMPORARY WALL  
Sheet 3 of 3



STATE OF NORTH CAROLINA  
RAIL DIVISION

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203147

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	2556000000-E	846	950	LF	SHOULDER BERM GUTTER	5801000000-E	1530	2,163	LF	ABANDON 8" UTILITY PIPE
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING	2619000000-E	850	11	SY	4" CONCRETE PAVED DITCH	5802000000-E	1530	574	LF	ABANDON 10" UTILITY PIPE
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (26+57.04)	2830000000-N	858	1	EA	ADJUSTMENT OF MANHOLES	5828000000-N	1530	1	EA	REMOVE UTILITY MANHOLE
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING	2845000000-N	858	5	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES	5838000000-E	1540	200	LF	18" ENCASMENT PIPE
0057000000-E	226	450	CY	UNDERCUT EXCAVATION	3030000000-E	862	1,875	LF	STEEL BM GUARDRAIL	5872000000-E	1550	25	LF	TRENCHLESS INSTALLATION OF 18" NOT IN SOIL
0063000000-N	SP	Lump Sum		GRADING	3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS	6000000000-E	1605	2,000	LF	TEMPORARY SILT FENCE
0106000000-E	230	147,000	CY	BORROW EXCAVATION	3210000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	6006000000-E	1610	450	TON	STONE FOR EROSION CONTROL, CLASS A
0134000000-E	240	410	CY	DRAINAGE DITCH EXCAVATION	3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	6009000000-E	1610	2,000	TON	STONE FOR EROSION CONTROL, CLASS B
0192000000-N	260	3	HR	PROOF ROLLING	3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77	6012000000-E	1610	1,150	TON	SEDIMENT CONTROL STONE
0196000000-E	270	300	SY	GEOTEXTILE FOR SOIL STABILIZATION	3572000000-E	867	190	LF	CHAIN LINK FENCE RESET	6015000000-E	1615	12	ACR	TEMPORARY MULCHING
0199000000-E	SP	20,500	SF	TEMPORARY SHORING	3628000000-E	876	53	TON	RIP RAP, CLASS I	6018000000-E	1620	350	LB	SEED FOR TEMPORARY SEEDING
0318000000-E	300	600	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	3649000000-E	876	43	TON	RIP RAP, CLASS B	6021000000-E	1620	3	TON	FERTILIZER FOR TEMPORARY SEEDING
0320000000-E	300	1,020	SY	FOUNDATION CONDITIONING GEOTEXTILE	3656000000-E	876	435	SY	GEOTEXTILE FOR DRAINAGE	6024000000-E	1622	1,500	LF	TEMPORARY SLOPE DRAINS
0335200000-E	305	1,416	LF	15" DRAINAGE PIPE	4025000000-E	901	6.25	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)	6029000000-E	SP	100	LF	SAFETY FENCE
0335300000-E	305	92	LF	18" DRAINAGE PIPE	4072000000-E	903	14	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	6030000000-E	1630	3,000	CY	SILT EXCAVATION
0335400000-E	305	864	LF	24" DRAINAGE PIPE	4102000000-N	904	1	EA	SIGN ERECTION, TYPE E	6036000000-E	1631	10,440	SY	MATTING FOR EROSION CONTROL
0335850000-E	305	6	EA	*** DRAINAGE PIPE ELBOWS (15")	4155000000-N	907	5	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	6037000000-E	SP	100	SY	COIR FIBER MAT
0344000000-E	310	40	LF	18" SIDE DRAIN PIPE	4400000000-E	1110	566	SF	WORK ZONE SIGNS (STATIONARY)	6038000000-E	SP	2,375	SY	PERMANENT SOIL REINFORCEMENT MAT
0448000000-E	310	336	LF	**** RC PIPE CULVERTS, CLASS IV (48")	4405000000-E	1110	272	SF	WORK ZONE SIGNS (PORTABLE)	6042000000-E	1632	500	LF	1/4" HARDWARE CLOTH
0448200000-E	310	72	LF	15" RC PIPE CULVERTS, CLASS IV	4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6048000000-E	SP	25	SY	FLOATING TURBIDITY CURTAIN
0448400000-E	310	156	LF	24" RC PIPE CULVERTS, CLASS IV	4422000000-N	1120	14	DAY	PORTABLE CHANGEABLE MESSAGE SIGN (SHORT TERM)	6071012000-E	SP	100	LF	COIR FIBER WATTLE
0588000000-E	310	24	LF	18" CS PIPE CULVERTS, 0.064" THICK	4430000000-N	1130	94	EA	DRUMS	6071020000-E	SP	15	LB	POLYACRYLAMIDE (PAM)
0636000000-E	310	2	EA	*** CS PIPE ELBOWS, ***** THICK (18", 0.064")	4445000000-E	1145	136	LF	BARRICADES (TYPE III)	6071030000-E	1640	2,000	LF	COIR FIBER BAFFLE
0995000000-E	340	1,200	LF	PIPE REMOVAL	4455000000-N	1150	124	DAY	FLAGGER	6071050000-E	SP	2	EA	*** SKIMMER (1-1/2")
1121000000-E	520	1,400	TON	AGGREGATE BASE COURSE	4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS	6084000000-E	1660	12	ACR	SEEDING & MULCHING
1220000000-E	545	1,000	TON	INCIDENTAL STONE BASE	4470000000-N	1160	1	EA	RESET TEMPORARY CRASH CUSHION	6087000000-E	1660	6	ACR	MOWING
1275000000-E	600	850	GAL	PRIME COAT	4480000000-N	1165	1	EA	TMA	6090000000-E	1661	150	LB	SEED FOR REPAIR SEEDING
1330000000-E	607	90	SY	INCIDENTAL MILLING	4485000000-E	1170	1,420	LF	PORTABLE CONCRETE BARRIER	6093000000-E	1661	1	TON	FERTILIZER FOR REPAIR SEEDING
1489000000-E	610	2,840	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	4490000000-E	1170	475	LF	PORTABLE CONCRETE BARRIER (ANCHORED)	6096000000-E	1662	500	LB	SEED FOR SUPPLEMENTAL SEEDING
1498000000-E	610	1,990	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	4650000000-N	1251	51	EA	TEMPORARY RAISED PAVEMENT MARKERS	6108000000-E	1665	15	TON	FERTILIZER TOPDRESSING
1519000000-E	610	2,360	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	4770000000-E	1205	1,650	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	6114500000-N	1667	10	MHR	SPECIALIZED HAND MOWING
1575000000-E	620	365	TON	ASPHALT BINDER FOR PLANT MIX	4795000000-E	1205	10	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (24") (IV)	6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
1693000000-E	654	50	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	4810000000-E	1205	31,465	LF	PAINT PAVEMENT MARKING LINES (4")					
2000000000-N	806	38	EA	RIGHT OF WAY MARKERS	4820000000-E	1205	500	LF	PAINT PAVEMENT MARKING LINES (8")					
2209000000-E	838	9	CY	ENDWALLS	4835000000-E	1205	12	LF	PAINT PAVEMENT MARKING LINES (24")					
2264000000-E	840	1	CY	PIPE PLUGS	4845000000-N	1205	4	EA	PAINT PAVEMENT MARKING SYMBOL					
2275000000-E	SP	20	CY	FLOWABLE FILL	4850000000-E	1205	1,426	LF	REMOVAL OF PAVEMENT MARKING LINES (4")					
2286000000-N	840	23	EA	MASONRY DRAINAGE STRUCTURES	4900000000-N	1251	47	EA	PERMANENT RAISED PAVEMENT MARKERS					
2308000000-E	840	4	LF	MASONRY DRAINAGE STRUCTURES	5319000000-E	1505	3	CY	CLASS B CONCRETE FOR ENCASING UTILITY LINES					
2364000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.16	5325800000-E	1510	2,172	LF	8" WATER LINE					
2367000000-N	840	10	EA	FRAME WITH TWO GRATES, STD 840.29	5546000000-E	1515	4	EA	8" VALVE					
2374000000-N	840	4	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	5571800000-E	1515	3	EA	8" TAPPING VALVE					
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	5648000000-N	1515	2	EA	RELOCATE WATER METER					
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	5656810000-E	1515	1	EA	RELOCATE 8" RPZ BACKFLOW PREVENTION ASSEMBLY					
2396000000-N	840	2	EA	FRAME WITH COVER, STD 840.54	5672000000-N	1515	2	EA	RELOCATE FIRE HYDRANT					
2535000000-E	846	250	LF	***X*** CONCRETE CURB (8" X 18")	5678600000-E	1515	3	EA	8" LINE STOP					
2542000000-E	846	40	LF	1'-6" CONCRETE CURB & GUTTER	5691400000-E	1520	617	LF	10" SANITARY GRAVITY SEWER					
2549000000-E	846	1,425	LF	2'-6" CONCRETE CURB & GUTTER	5776000000-E	1525	3	EA	5' DIA UTILITY MANHOLE					
					5782000000-E	1525	2.25	LF	UTILITY MANHOLE WALL, 5' DIA					

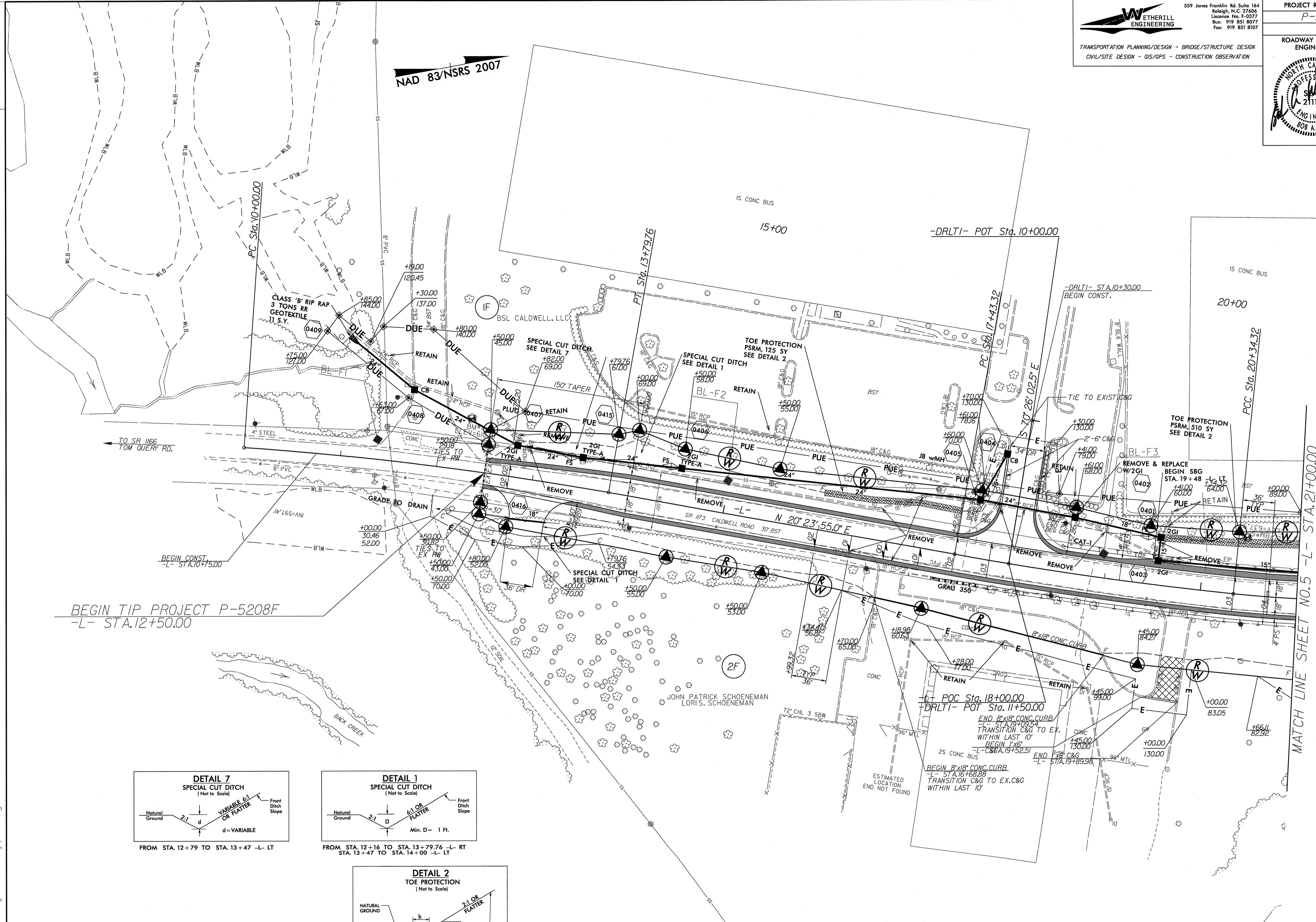
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 1/2/2013





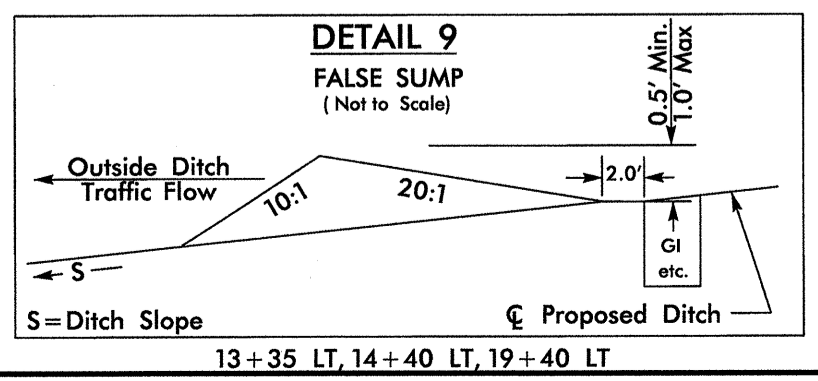
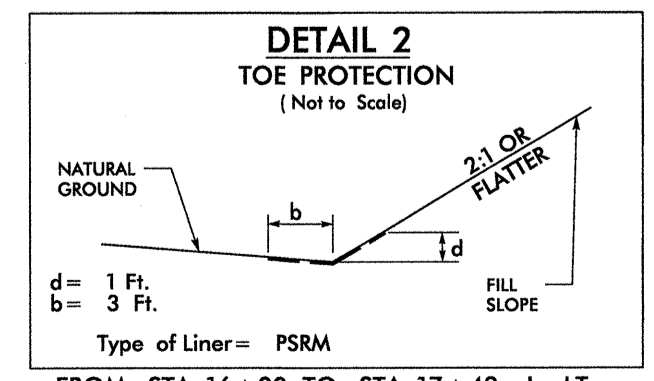
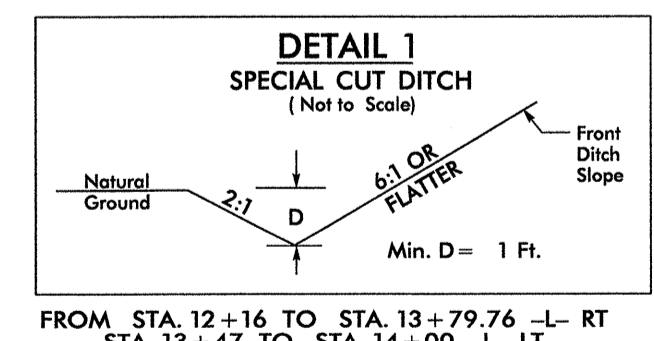
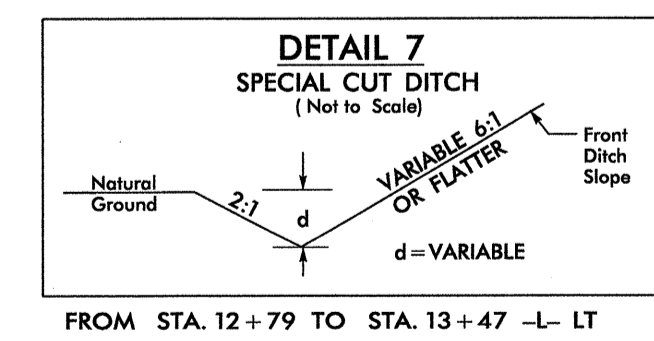


0515DEL P21a2



BEGIN TIP PROJECT P-5208F  
 -L- STA.12+50.00

MATCH LINE SHEET NO.5 -L- STA.21+00.00



-L-		
PI Sta 11+90.07	PI Sta 18+88.89	PI Sta 25+29.02
Δ = 6' 13" 00.2" (RT)	Δ = 4' 16" 30.5" (LT)	Δ = 42' 06" 40.1" (LT)
D = 1' 38" 13.3"	D = 1' 28" 08.8"	D = 4' 27" 31.7"
L = 379.76'	L = 291.00'	L = 944.45'
T = 190.07'	T = 145.57'	T = 494.70'
R = 3,500.00'	R = 3,900.00'	R = 1,285.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS

PAVEMENT REMOVAL

SEE SHEET 7 FOR -L- PROFILE  
 SEE SHEET 9 FOR -DRLTI- PROFILE

I:\111104\_01\111104\_01\_P\Roadway\N\Proj\N\5208F\_Rdy\psh04.dgn







0515DEL P21a2

PCN

559 Jones Franklin Rd. Suite 164  
Raleigh, N.C. 27606  
License No. F-0377  
Bus: 919 851 8077  
Fax: 919 851 8107



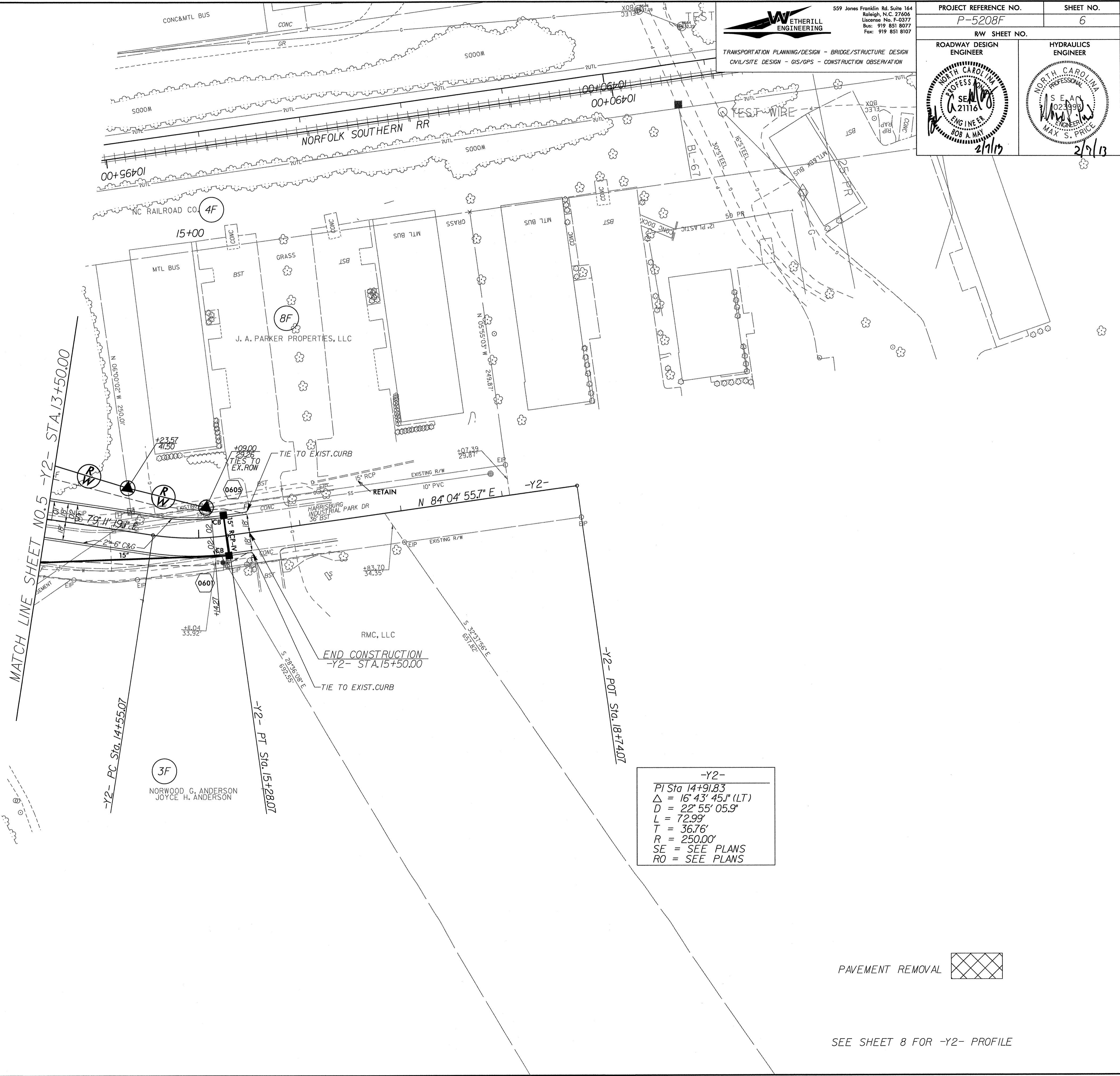
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. P-5208F SHEET NO. 6

RW SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
2/7/13	2/7/13

NAD 83/NSRS 2007



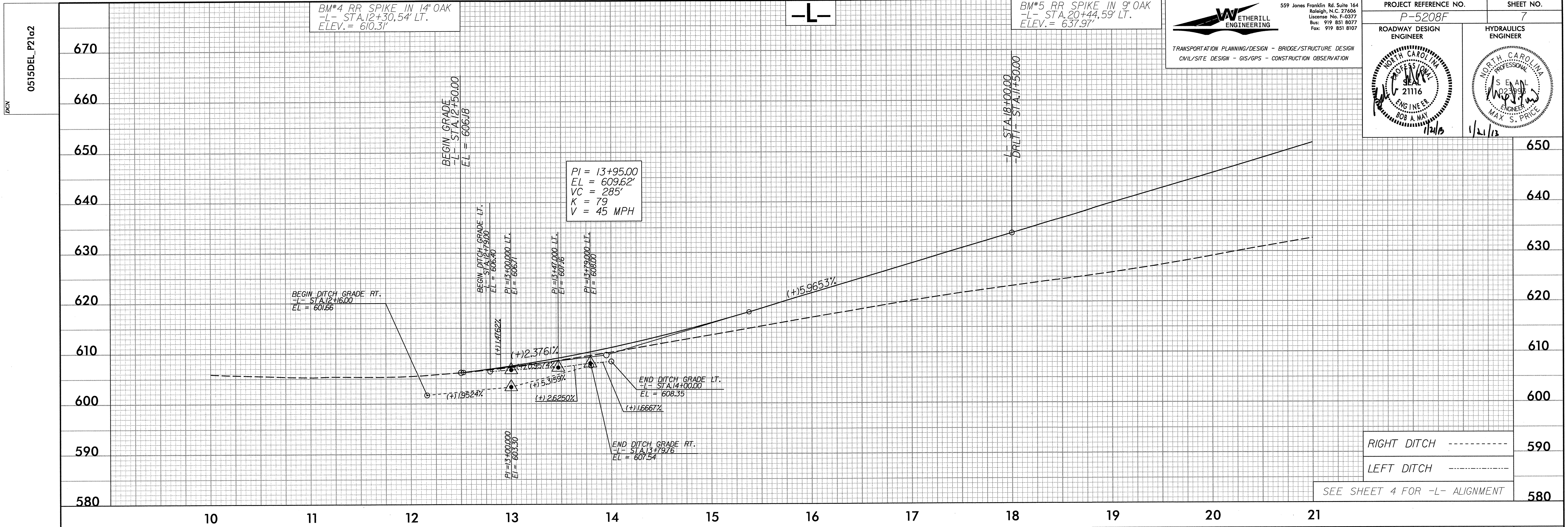
-Y2-
PI Sta 14+91.83
$\Delta = 16^{\circ} 43' 45.1''$ (LT)
$D = 22^{\circ} 55' 05.9''$
$L = 72.99'$
$T = 36.76'$
$R = 250.00'$
SE = SEE PLANS
RO = SEE PLANS

PAVEMENT REMOVAL

SEE SHEET 8 FOR -Y2- PROFILE

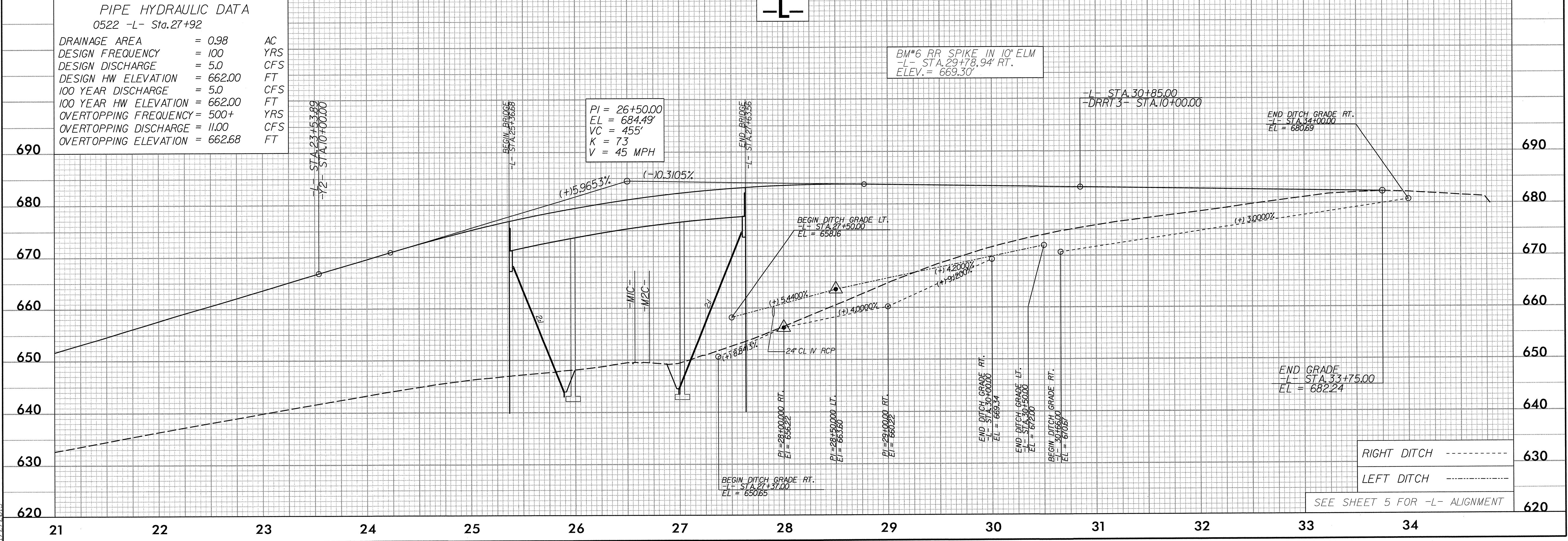
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2/7/2013





**PIPE HYDRAULIC DATA**  
0522 -L- Sta. 27+92

DRAINAGE AREA	= 0.98	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 5.0	CFS
DESIGN HW ELEVATION	= 662.00	FT
100 YEAR DISCHARGE	= 5.0	CFS
100 YEAR HW ELEVATION	= 662.00	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 11.00	CFS
OVERTOPPING ELEVATION	= 662.68	FT



0515DEL\_P2162

7:46:22 AM  
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1/22/2013

**ETHERILL ENGINEERING**  
559 Jones Franklin Rd. Suite 164  
Raleigh, N.C. 27605  
License No. F-0377  
Bus: 919 851 8077  
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. P-5208F	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>(Signature)</i> 2/1/13	<i>(Signature)</i> 1/21/13

RIGHT DITCH -----  
LEFT DITCH -----  
SEE SHEET 4 FOR -L- ALIGNMENT

RIGHT DITCH -----  
LEFT DITCH -----  
SEE SHEET 5 FOR -L- ALIGNMENT



0515DEL\_P21a2

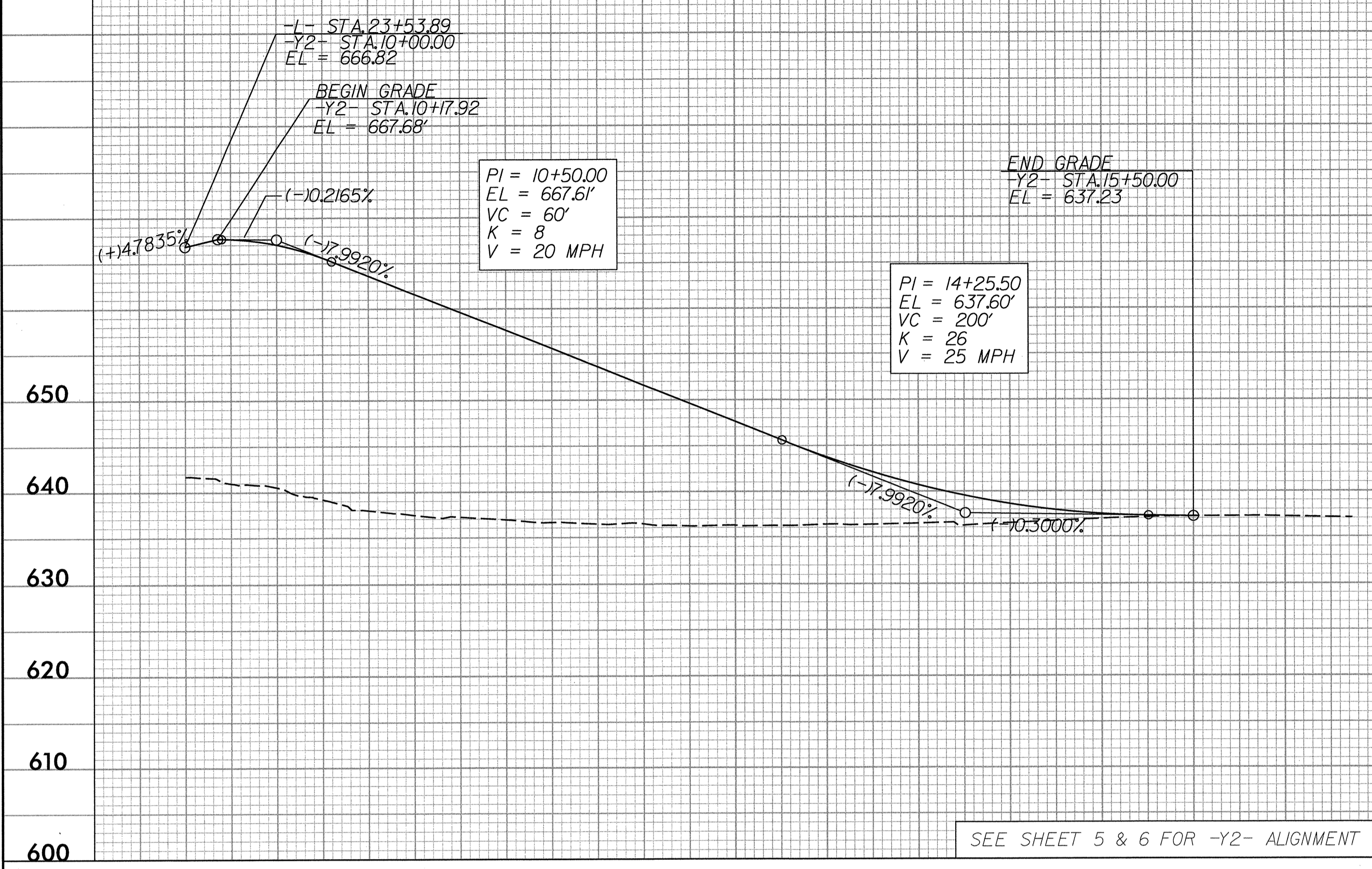
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**ETHERILL ENGINEERING**  
 559 Jones Franklin Rd. Suite 164  
 Raleigh, N.C. 27606  
 License No. F-43377  
 Bus: 919 851 8077  
 Fax: 919 851 8107

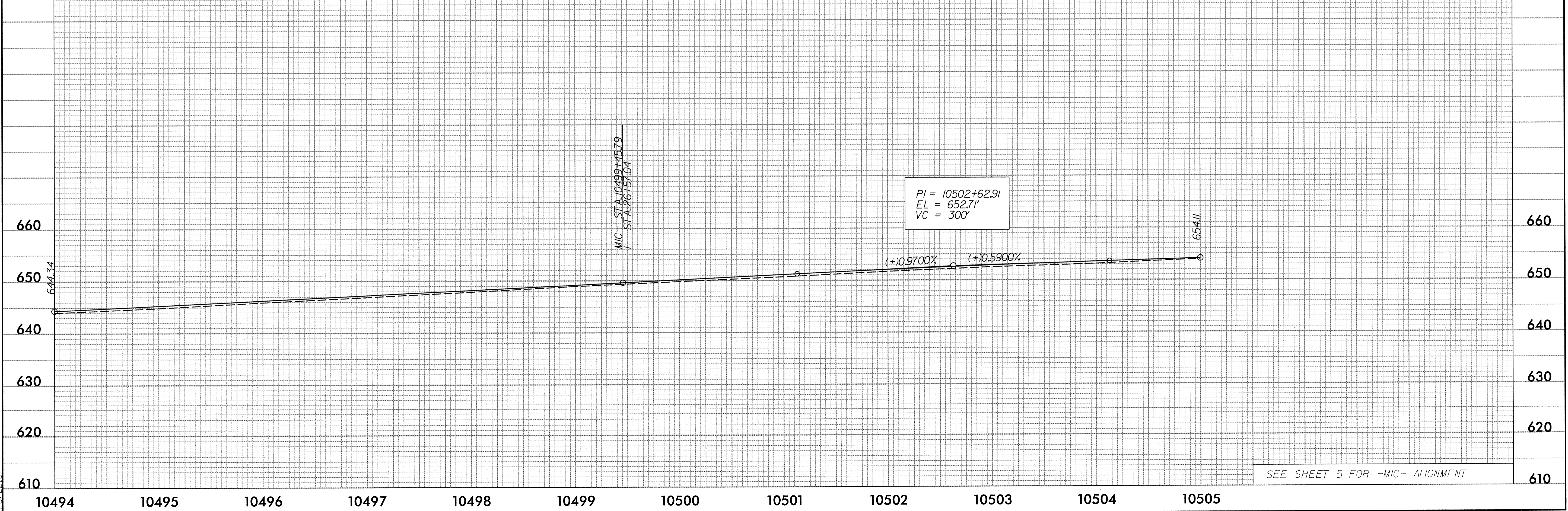
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 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. <b>P-5208F</b>	SHEET NO. <b>8</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
11/21/13	1/13/13

### -Y2-



### -MIC-



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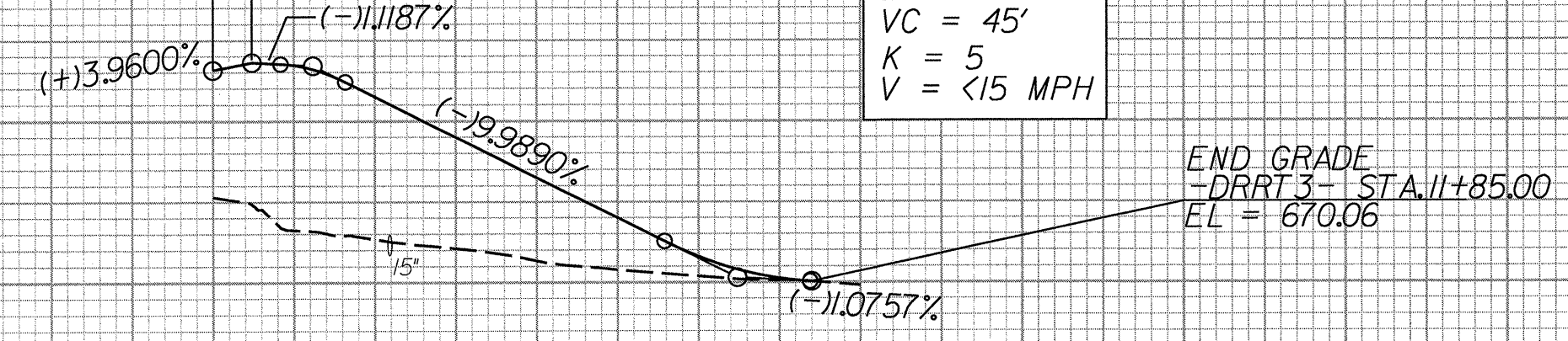
0515DEL P2162

PI = 10+30.91  
EL = 683.40'  
VC = 20'  
K = 2  
V = <15 MPH

### -DRRT3-

PI = 11+62.00  
EL = 670.31'  
VC = 45'  
K = 5  
V = <15 MPH

END GRADE  
-DRRT3- STA. 11+85.00  
EL = 670.06



PIPE HYDRAULIC DATA  
0510 -DRRT3- Sta. 10+62

DRAINAGE AREA	= 0.37	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 1.7	CFS
DESIGN HW ELEVATION	= 671.4	FT
100 YEAR DISCHARGE	= 1.9	CFS
100 YEAR HW ELEVATION	= 671.44	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 3.9	CFS
OVERTOPPING ELEVATION	= 671.9	FT

SEE SHEET 5 FOR -DRRT3- ALIGNMENT

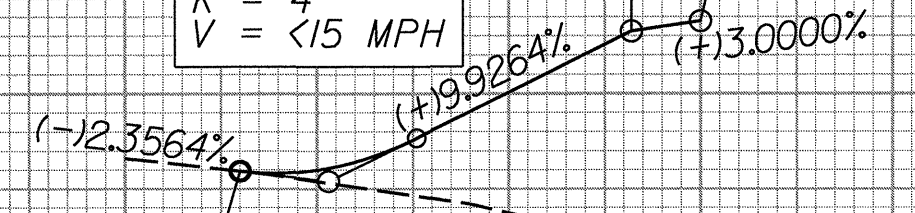
### -DRLT1-

PI = 10+53.00  
EL = 625.40'  
VC = 46'  
K = 4  
V = <15 MPH

END GRADE  
-DRLT1- STA. 11+32.00  
EL = 633.24'

-L- STA. 18+00.00  
-DRLT1- STA. 11+50.00  
EL = 633.18

BEGIN GRADE  
-DRLT1- STA. 10+30.00  
EL = 625.94



SEE SHEET 4 FOR -DRLT1- ALIGNMENT

**WETHERILL ENGINEERING**  
559 Jones Franklin Rd. Suite 164  
Raleigh, N.C. 27606  
License No. F-6377  
Elic: 919 851 8077  
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN  
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO. **P-5208F** SHEET NO. **9**

ROADWAY DESIGN ENGINEER  
**ROB A. MAY**  
1/21/13

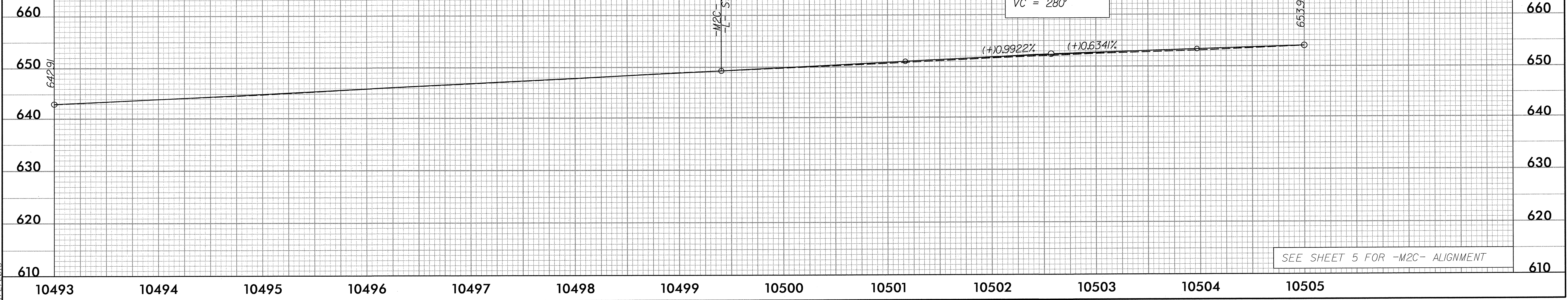
HYDRAULICS ENGINEER  
**MAX S. PRICE**  
1/21/13

### -M2C-

PI = 10502+50.00  
EL = 652.40'  
VC = 280'

-M2C- STA. 10499+40.39  
EL = 642.91

(+)0.9922% (+)0.6341%



SEE SHEET 5 FOR -M2C- ALIGNMENT

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