

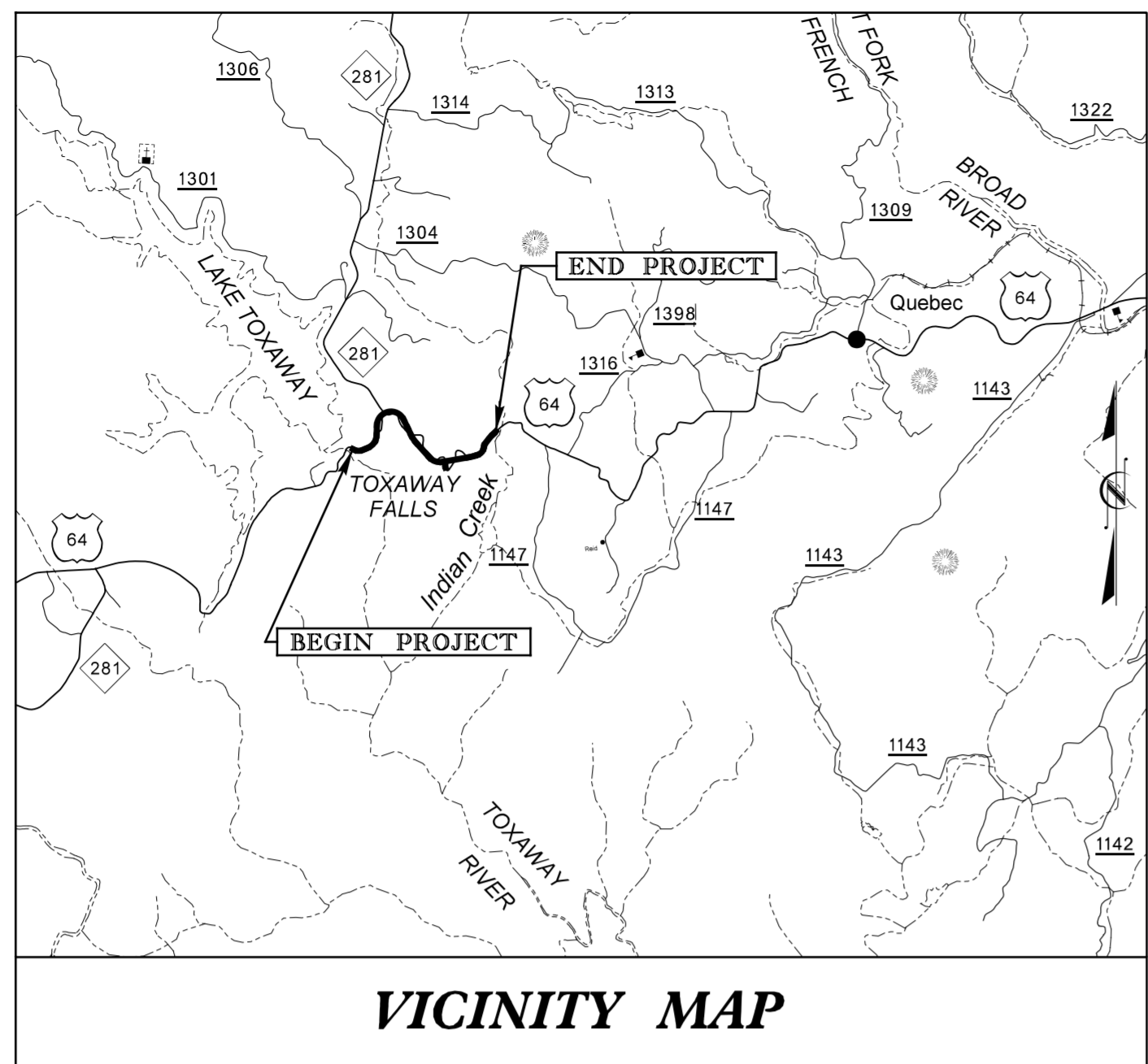
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**This file or an individual page
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09/08/09

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY

LOCATION: US 64 from LAKE TOXAWAY to INDIAN CREEK

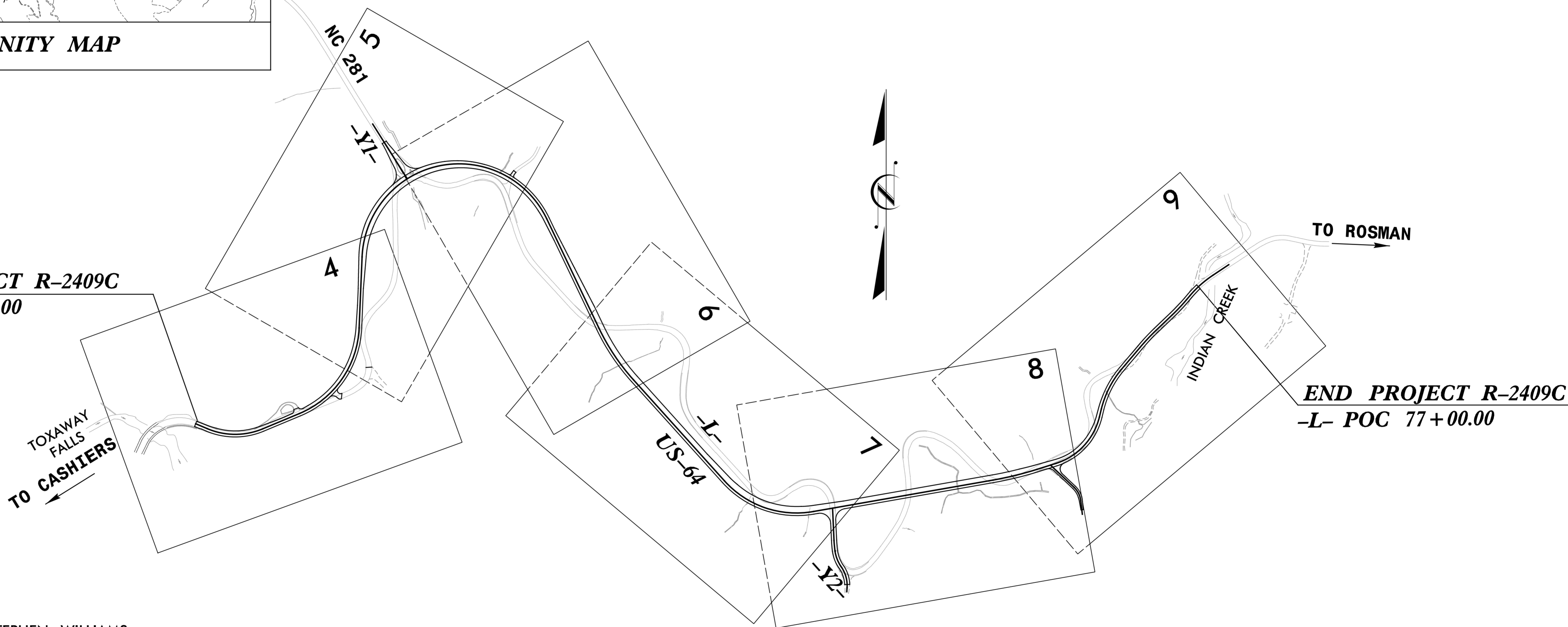
TYPE OF WORK: GRADING, DRAINAGE, PAVING & RETAINING WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2409C	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34428.1.2		P.E.	
34428.2.FR3	HPP-0064(115)	R/W	
34428.3.FR4	HPP-0064(115)	CONST.	

TIP PROJECT: R-2409C

CONTRACT: C202582

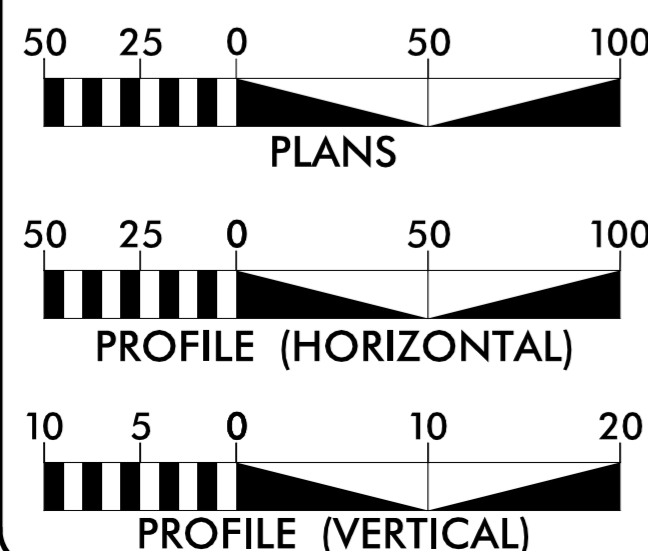
BEGIN PROJECT R-2409C
-L- POT 10+05.00



END PROJECT R-2409C
-L- POC 77+00.00

NCDOT CONTACT: STEPHEN WILLIAMS,
DIVISION DESIGN CONSTRUCTION ENGINEER

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 6,300
ADT 2035 = 10,100
DHV = 10 %
D = 60 %
T = 10 % *
V = 40 MPH
* TTST = 5% DUAL = 5%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2409C = 1.268 MI.
LENGTH STRUCTURES TIP PROJECT R-2409C = 0.000 MI.
TOTAL LENGTH OF TIP PROJECT R-2409C = 1.268 MI.

Prepared In the Office of:



For the North Carolina Department of Transportation

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 20, 2013

LETTING DATE:
DECEMBER 15, 2015

DAVID C. WALLER, P.E.
PROJECT ENGINEER

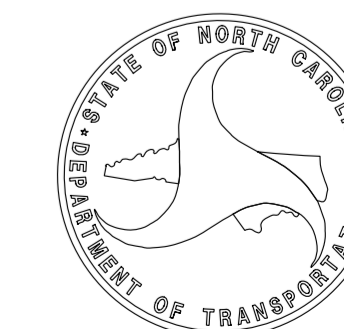
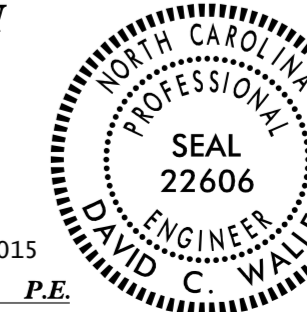
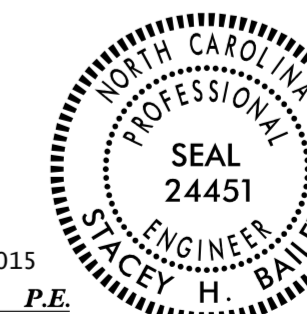
ALEXANDER D. SNIDER, P.E.
PROJECT DESIGN ENGINEER

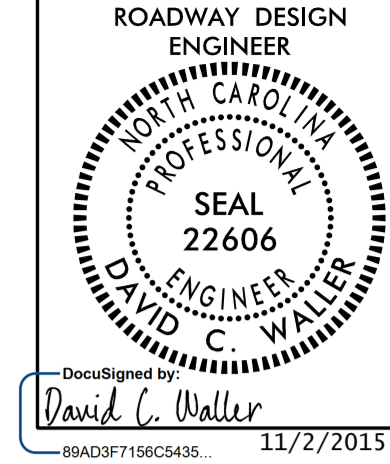
HYDRAULICS
ENGINEER

STACEY H. BAILEY
10/23/2015
P.E.

ROADWAY DESIGN
ENGINEER

DAVID C. WALLER
10/22/2015
P.E.





SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
1D-1	CENTERLINE COORDINATE SHEET
2A-1 THRU 2A-5	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 THRU 2B-3	ROADWAY DETAILS
2C-1 THRU 2C-2	SPECIAL DETAILS
3B-1	GUARDRAIL SUMMARY
3B-2	SUMMARY OF EARTHWORK
3B-3	ROADWAY SUMMARIES
3D-1 THRU 3D-4	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 18	PLAN AND PROFILE SHEETS
TMP-1 THRU TMP-18	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-7	PAVEMENT MARKING PLANS
EC-1 THRU EC-19	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UO-1 THRU UO-7	UTILITY BY OTHERS PLANS
W-1 THRU W-10	WALL PLANS
X-1 THRU X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-215	CROSS-SECTIONS

INDEX OF SHEETS

GENERAL NOTES: 2012 SPECIFICATIONS
 EFFECTIVE: 01-17-2012
 REVISED: 10-31-2014

GRADING AND SURFACING OR RESURFACING AND WIDENING:
 THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 II.

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.

BERM DITCHES:
 BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:
 SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:
 UTILITY OWNERS ON THIS PROJECT ARE Haywood EMC, Compurium, Morris Broadband.
 ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
838.33	Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.63	Reinforced Brick Endwall - for Single 66" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
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
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
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
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
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
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units (Beg. March 2013 Letting use detail in lieu of Standard)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

EFF. 01-17-2012
 REV. 10-30-2012

04/16/11

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

Table listing symbols for boundaries and property: State Line, County Line, Township Line, City Line, Reservation Line, Property Line, Existing Iron Pin, Property Corner, Property Monument, Parcel/Sequence Number, Existing Fence Line, Proposed Woven Wire Fence, Proposed Chain Link Fence, Proposed Barbed Wire Fence, Existing Wetland Boundary, Proposed Wetland Boundary, Existing Endangered Animal Boundary, Existing Endangered Plant Boundary, Known Soil Contamination: Area or Site, Potential Soil Contamination: Area or Site.

BUILDINGS AND OTHER CULTURE:

Table listing symbols for buildings and other culture: Gas Pump Vent or U/G Tank Cap, Sign, Well, Small Mine, Foundation, Area Outline, Cemetery, Building, School, Church, Dam.

HYDROLOGY:

Table listing symbols for hydrology: Stream or Body of Water, Hydro, Pool or Reservoir, Jurisdictional Stream, Buffer Zone 1, Buffer Zone 2, Flow Arrow, Disappearing Stream, Spring, Wetland, Proposed Lateral, Tail, Head Ditch, False Sump.

RAILROADS:

Table listing symbols for railroads: Standard Gauge, RR Signal Milepost, Switch, RR Abandoned, RR Dismantled.

RIGHT OF WAY:

Table listing symbols for right of way: Baseline Control Point, Existing Right of Way Marker, Existing Right of Way Line, Proposed Right of Way Line, Proposed Right of Way Line with Iron Pin and Cap Marker, Proposed Right of Way Line with Concrete or Granite R/W Marker, Proposed Control of Access Line with Concrete CA Marker, Existing Control of Access, Proposed Control of Access, Existing Easement Line, Proposed Temporary Construction Easement, Proposed Temporary Drainage Easement, Proposed Permanent Drainage Easement, Proposed Permanent Drainage / Utility Easement, Proposed Permanent Utility Easement, Proposed Temporary Utility Easement, Proposed Aerial Utility Easement, Proposed Permanent Easement with Iron Pin and Cap Marker.

ROADS AND RELATED FEATURES:

Table listing symbols for roads and related features: Existing Edge of Pavement, Existing Curb, Proposed Slope Stakes Cut, Proposed Slope Stakes Fill, Proposed Curb Ramp, Existing Metal Guardrail, Proposed Guardrail, Existing Cable Guiderail, Proposed Cable Guiderail, Equality Symbol, Pavement Removal.

VEGETATION:

Table listing symbols for vegetation: Single Tree, Single Shrub, Hedge, Woods Line.

Table listing symbols for orchard and vineyard.

EXISTING STRUCTURES:

Table listing symbols for existing structures: MAJOR: Bridge, Tunnel or Box Culvert, Bridge Wing Wall, Head Wall and End Wall; MINOR: Head and End Wall, Pipe Culvert, Footbridge, Drainage Box: Catch Basin, DI or JB, Paved Ditch Gutter, Storm Sewer Manhole, Storm Sewer.

UTILITIES:

Table listing symbols for utilities: POWER: Existing Power Pole, Proposed Power Pole, Existing Joint Use Pole, Proposed Joint Use Pole, Power Manhole, Power Line Tower, Power Transformer, U/G Power Cable Hand Hole, H-Frame Pole, Recorded U/G Power Line, Designated U/G Power Line (S.U.E.*); TELEPHONE: Existing Telephone Pole, Proposed Telephone Pole, Telephone Manhole, Telephone Booth, Telephone Pedestal, Telephone Cell Tower, U/G Telephone Cable Hand Hole, Recorded U/G Telephone Cable, Designated U/G Telephone Cable (S.U.E.*), Recorded U/G Telephone Conduit, Designated U/G Telephone Conduit (S.U.E.*), Recorded U/G Fiber Optics Cable, Designated U/G Fiber Optics Cable (S.U.E.*).

Table listing symbols for water: Water Manhole, Water Meter, Water Valve, Water Hydrant, Recorded U/G Water Line, Designated U/G Water Line (S.U.E.*), Above Ground Water Line.

Table listing symbols for TV: TV Satellite Dish, TV Pedestal, TV Tower, U/G TV Cable Hand Hole, Recorded U/G TV Cable, Designated U/G TV Cable (S.U.E.*), Recorded U/G Fiber Optic Cable, Designated U/G Fiber Optic Cable (S.U.E.*).

Table listing symbols for gas: Gas Valve, Gas Meter, Recorded U/G Gas Line, Designated U/G Gas Line (S.U.E.*), Above Ground Gas Line.

Table listing symbols for sanitary sewer: Sanitary Sewer Manhole, Sanitary Sewer Cleanout, U/G Sanitary Sewer Line, Above Ground Sanitary Sewer, Recorded SS Forced Main Line, Designated SS Forced Main Line (S.U.E.*).

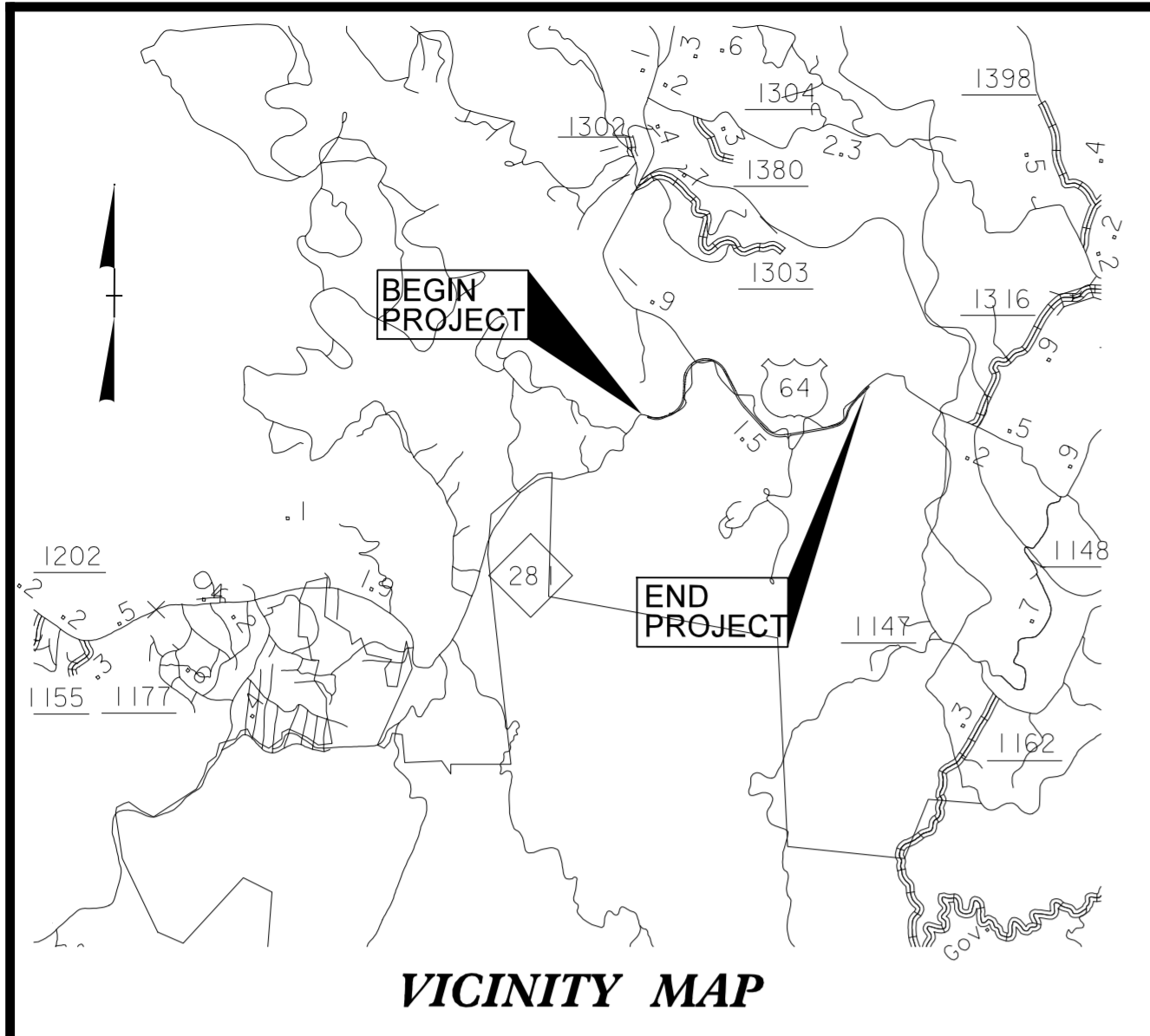
Table listing symbols for miscellaneous: Utility Pole, Utility Pole with Base, Utility Located Object, Utility Traffic Signal Box, Utility Unknown U/G Line, U/G Tank; Water, Gas, Oil, Underground Storage Tank, Approx. Loc., A/G Tank; Water, Gas, Oil, Geoenvironmental Boring, U/G Test Hole (S.U.E.*), Abandoned According to Utility Records, End of Information.

SURVEY CONTROL SHEET

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
R2409C_LS_CONTROL.TXT
R2409C_LS_LOCAL.TXT
 2. SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION & SURVEYS UNIT.
 3. PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING (NON-HARN) MONUMENTATION. SEE SURVEY CONTROL SHEET 1E FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.
- ▲ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND/OR VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION & SURVEYS UNIT.
 - ◆ INDICATES BASELINE TRAVERSE MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION & SURVEYS UNIT.
 - ▼ INDICATES BENCHMARKS USED OR SET FOR VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION & SURVEYS UNIT.

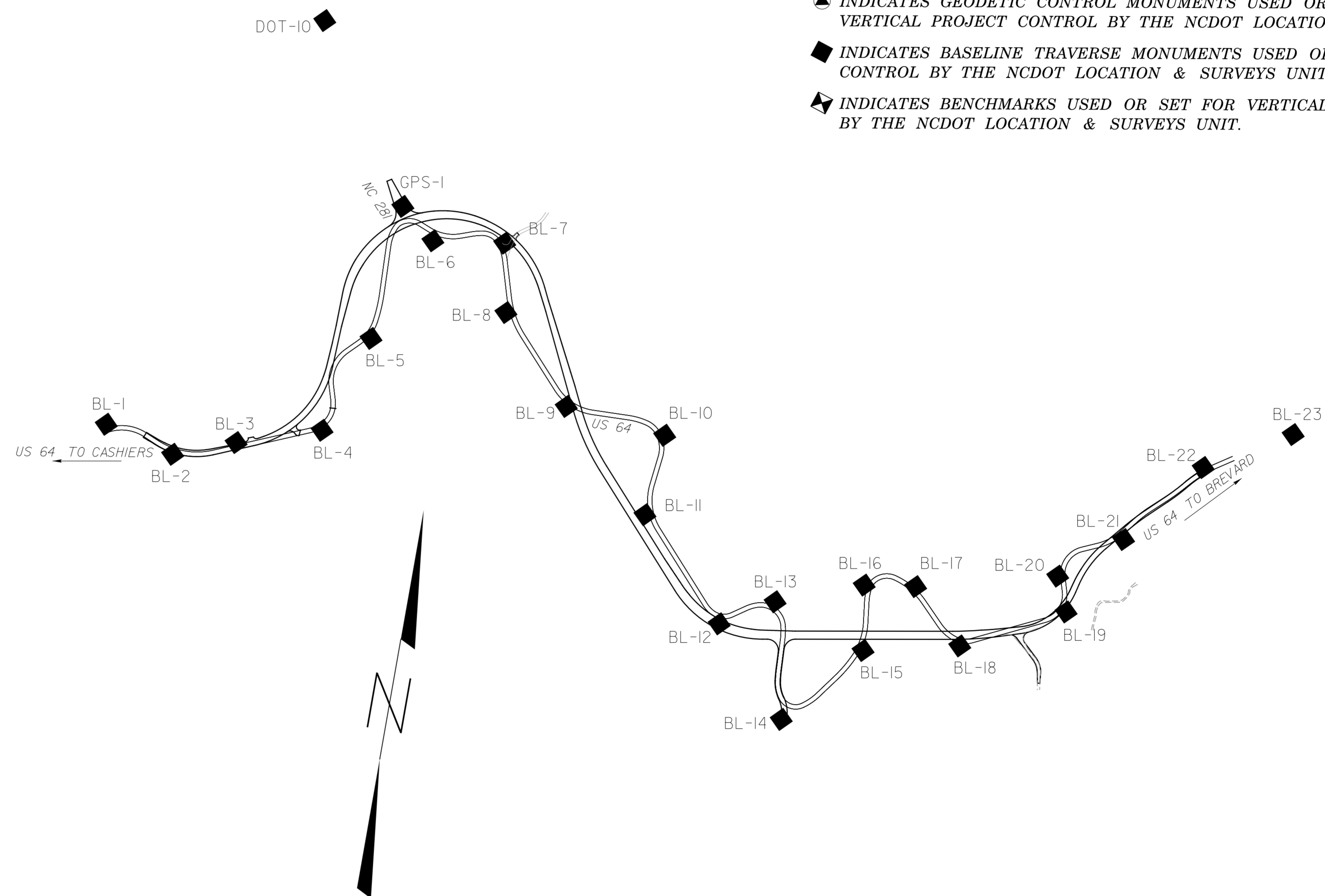


DATUM DESCRIPTION

PROJECT COORDINATES FOR THIS PROJECT ARE CONSISTENT WITH THE COORDINATES FROM THE DIVISION 14 DDC PROJECT DONE IN 1997 OR 1998. NO DATUM DESCRIPTION RECORD WAS FOUND IN THE OLD NCDOT RECORDS. GPS POINTS R2409-1, R2409-2, AND R2409-3 WERE USED FOR CONTROL. R2409-4 WAS FOUND AND TIED BUT HAD BEEN DISTURBED AND WAS NOT USED.

A GPS SITE CALIBRATION WOULD BE NEEDED BEFORE ANY CONSTRUCTION SURVEYS ARE COMPLETED WITH GPS EQUIPMENT.

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES



NOTE: DRAWING NOT TO SCALE

8/17/15

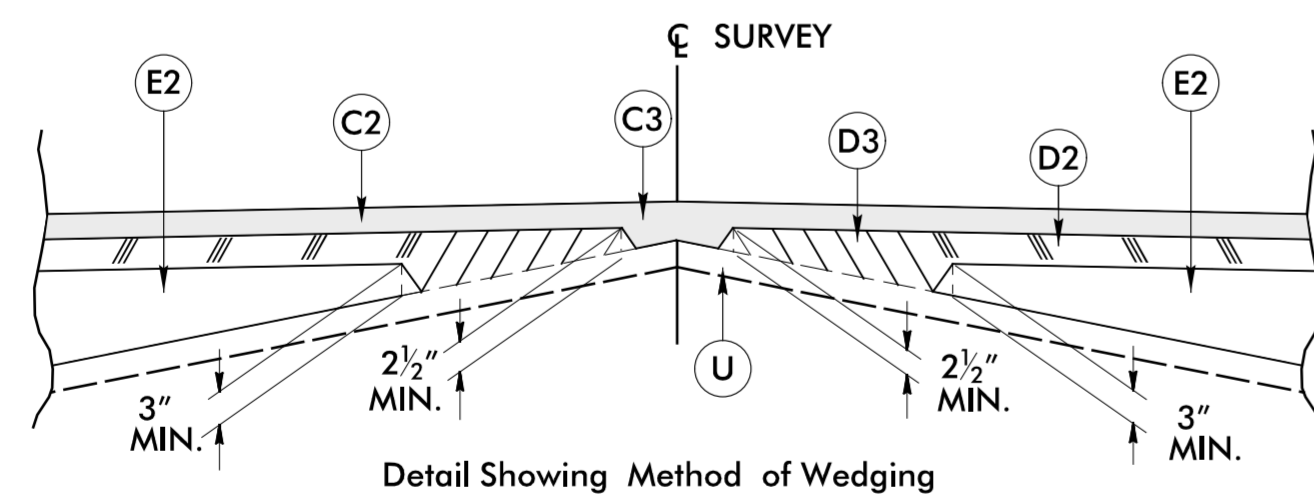
PAVEMENT SCHEDULE
(8/27/15)

C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. 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.
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.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D3	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 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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 5 1/2" IN DEPTH.
J	PROP. APPROX. 8" AGGREGATE BASE COURSE
N	GEOTEXTILE FOR PAVEMENT STABILIZATION
P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YARD
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS PAGE.)

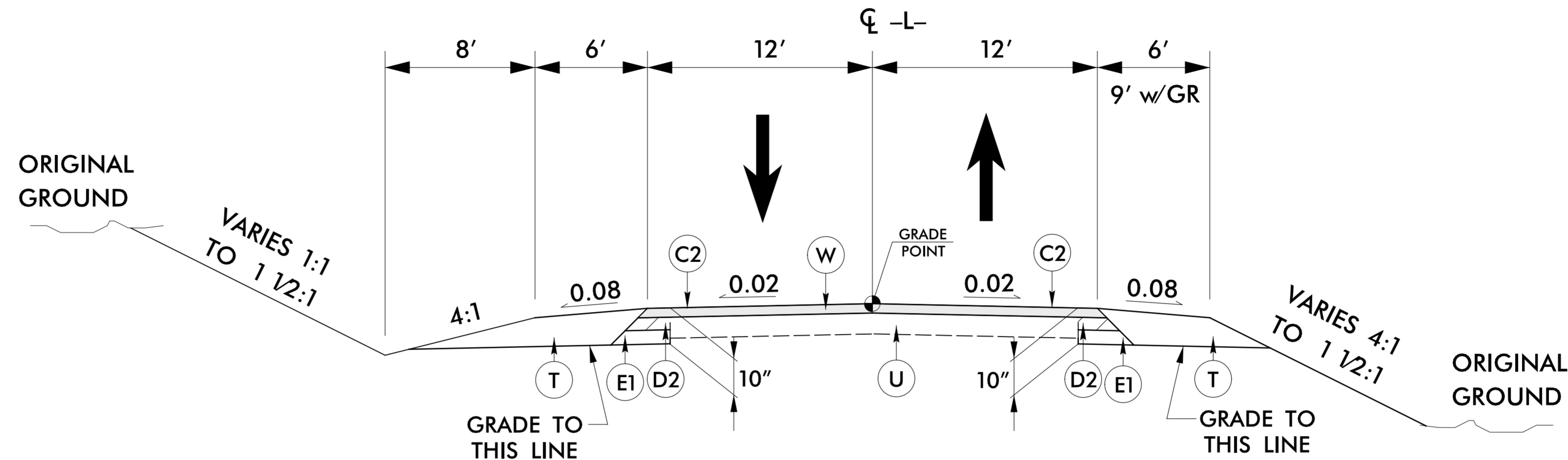
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

NOTE:

SEE PLANS FOR PAVEMENT WIDTH FOR:
ADDITIONAL PAVEMENT FOR CURVES
CENTER TURN LANE AT NC 281

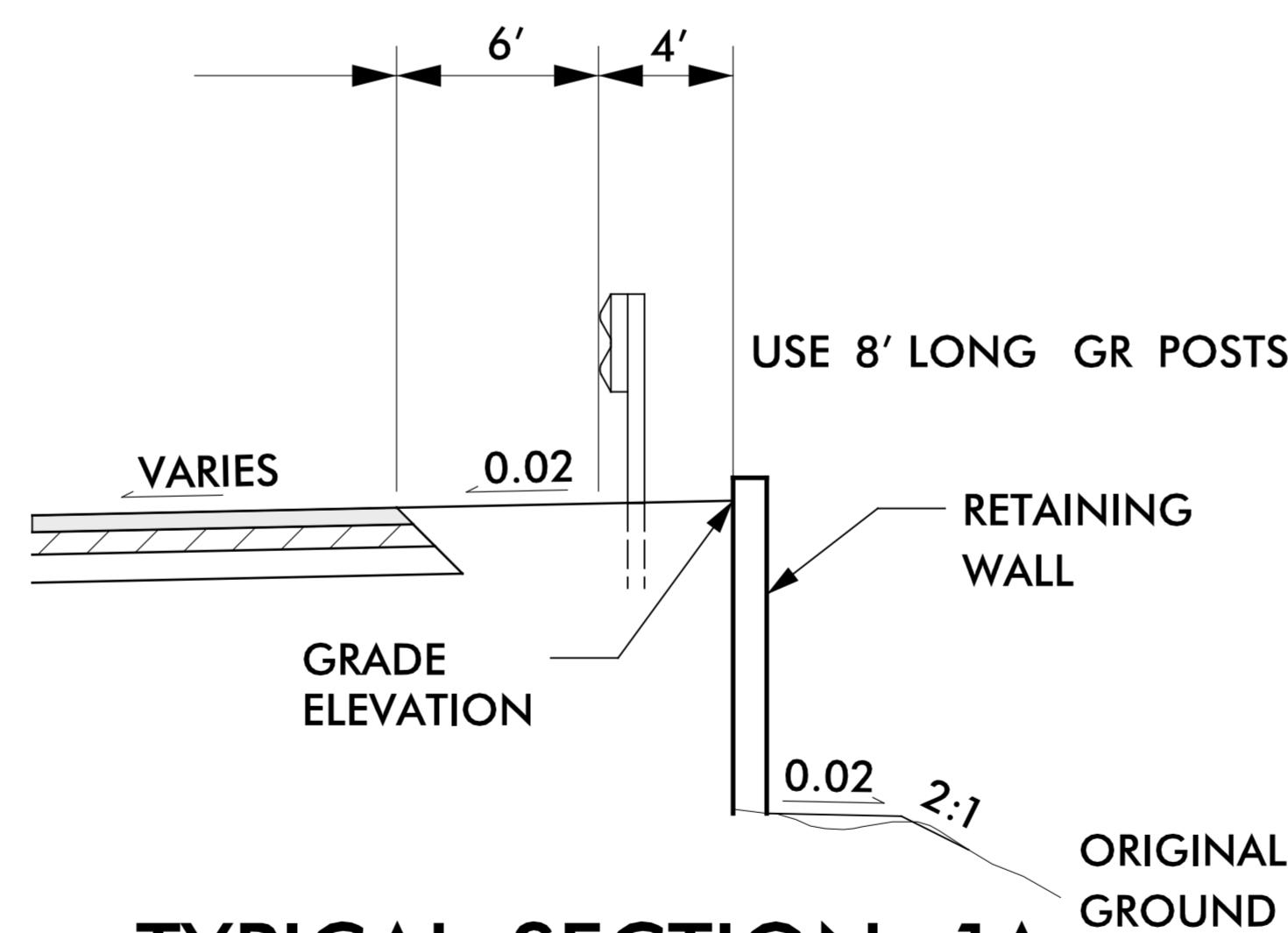


PROJECT REFERENCE NO. R-2409C	SHEET NO. 2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: David C. Waller 08A03F156C5435 10/22/2015	DocuSigned by: Clark S. Morrison 086238016E4F400 10/23/2015



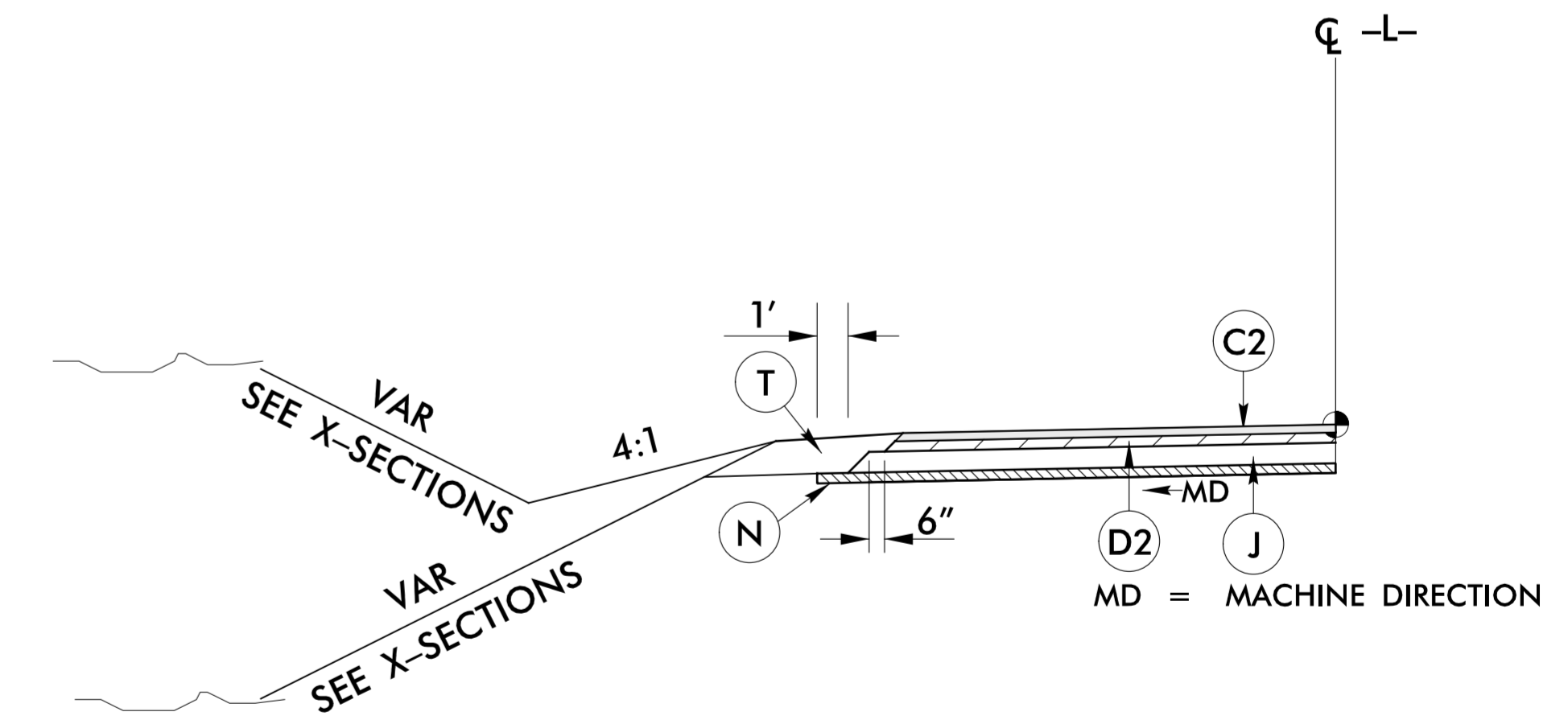
TYPICAL SECTION 1

- L- STA 10+05 TO -L- STA 16+45
- L- STA 19+55 TO -L- STA 20+45
- L- STA 27+00 TO -L- STA 28+45
- L- STA 71+55 TO -L- STA 77+00



TYPICAL SECTION 1A

- L- STA 10+75 TO -L- STA 16+50 RT



INSET A

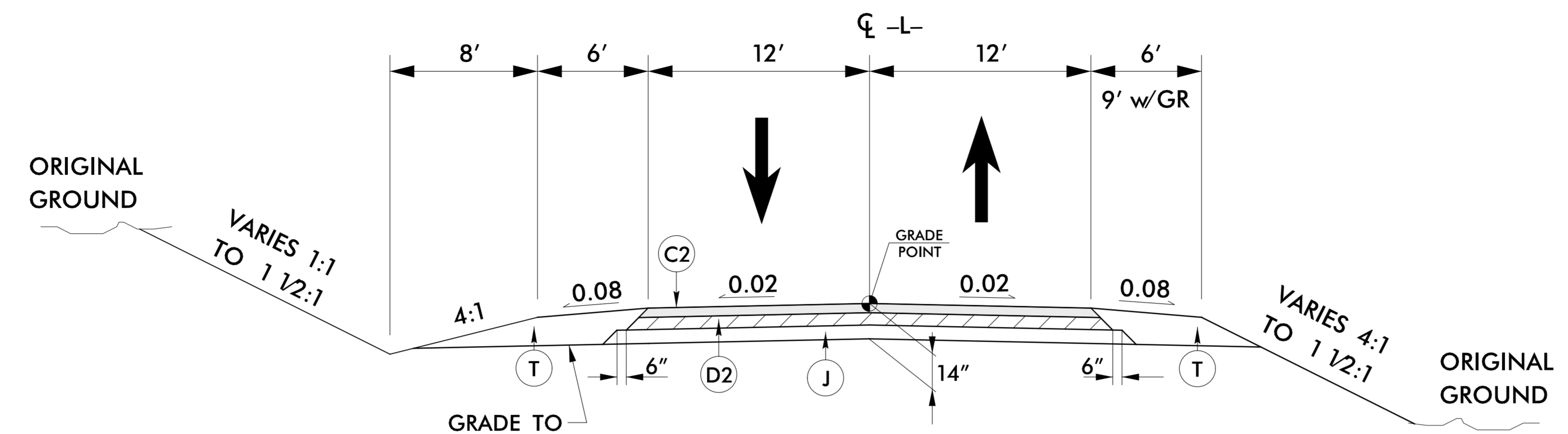
USE GEOTEXTILE FOR PAVEMENT STABILIZATION
(LOCATIONS TO BE INVESTIGATED DURING CONSTRUCTION)

8/17/09

C1	2" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	VAR I19.0B
E1	4" B25.0B
E2	VAR B25.0B
J	8" ABC
N	GEOTEXTILE
P	PRIME COAT
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	VAR WEDGING

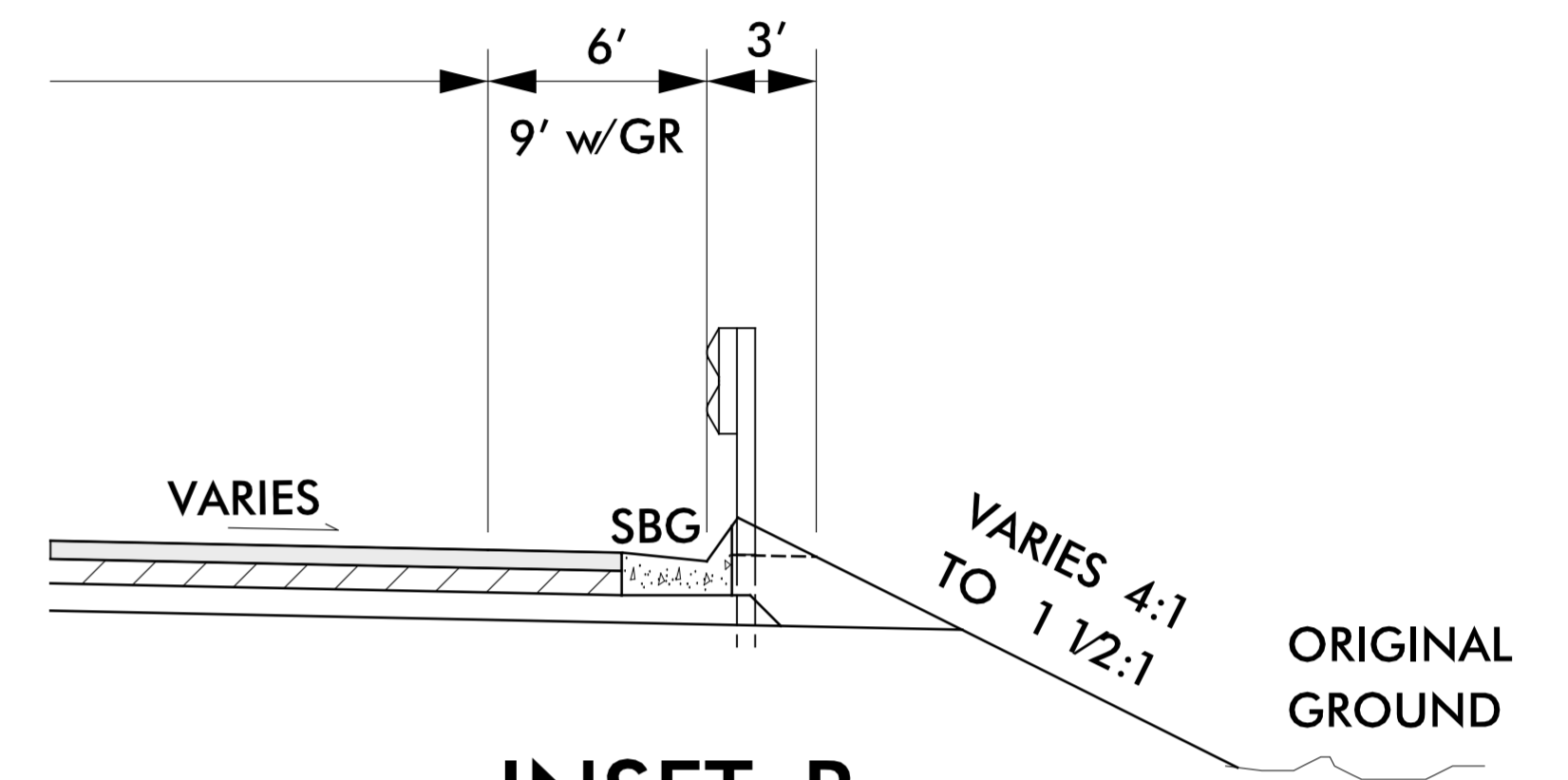


PROJECT REFERENCE NO. R-2409C	SHEET NO. 2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: David C. Waller 88AD3F7156C5435... 10/22/2015	DocuSigned by: Clark S. Morrison 096238016E4F400... 10/23/2015



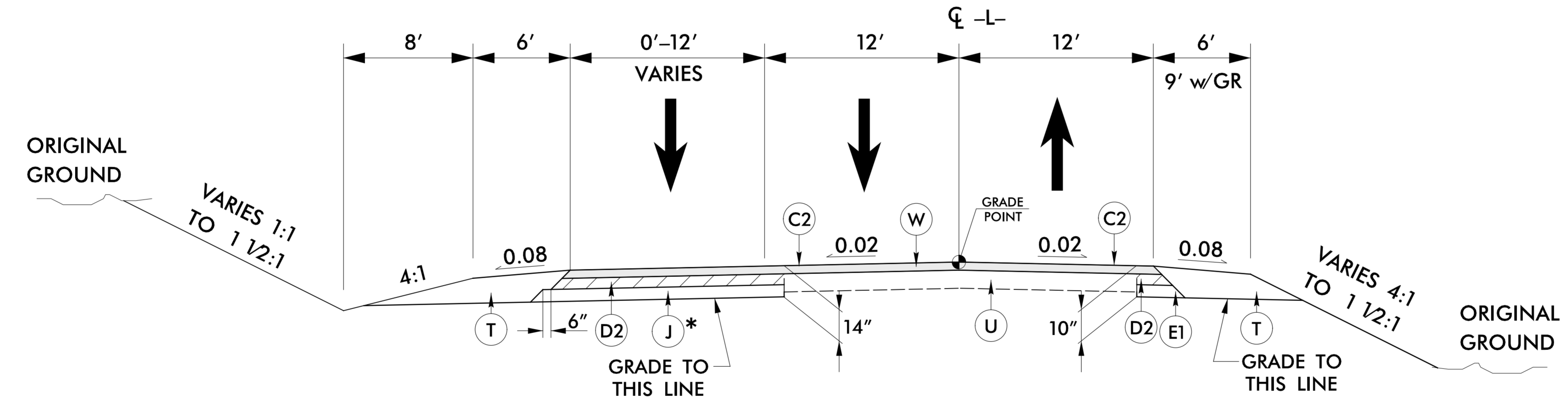
TYPICAL SECTION 2

- L- STA 16+45 TO -L- STA 19+55
- L- STA 20+45 TO -L- STA 27+00
- L- STA 28+45 TO -L- STA 40+75
- L- STA 69+00 TO -L- STA 71+55



INSET B

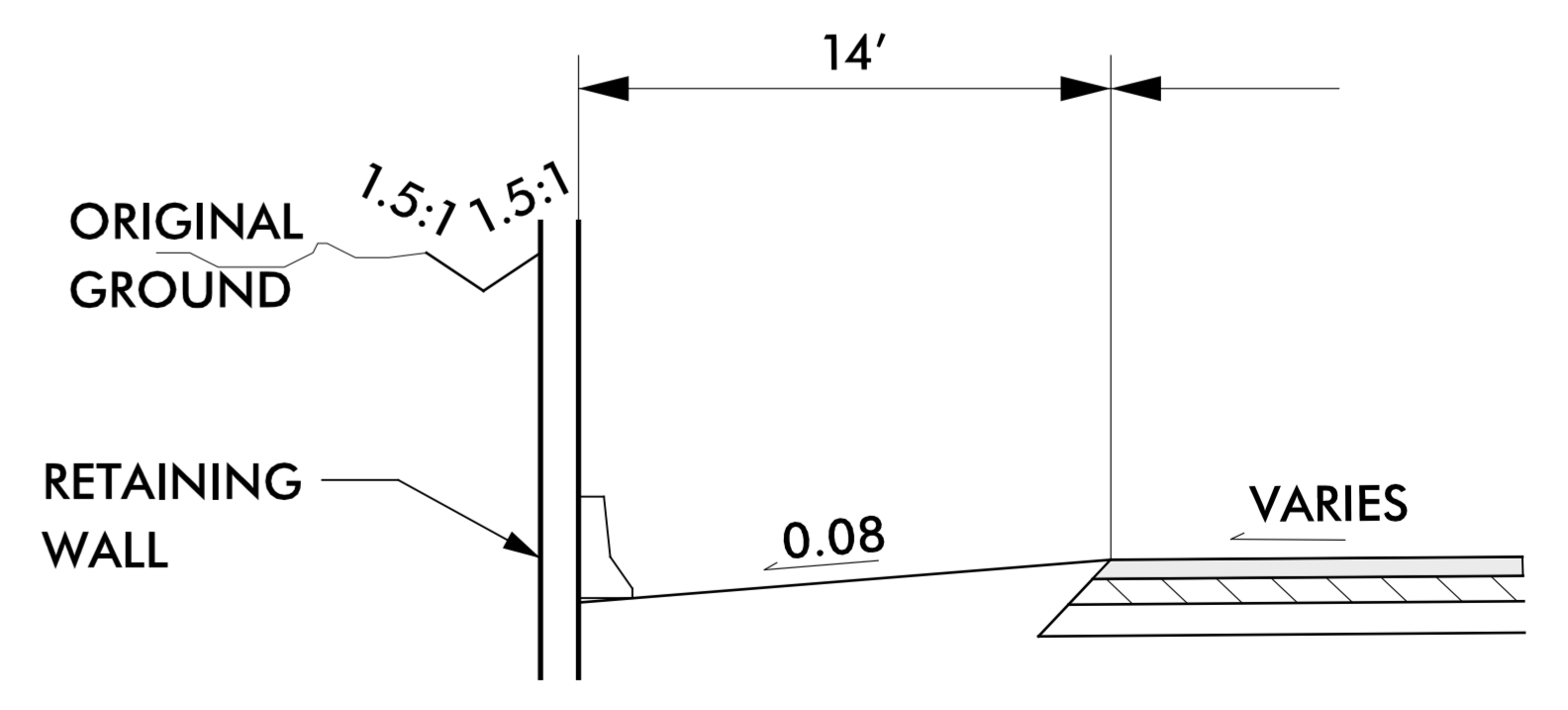
- L- STA 26+50 TO -L- STA 28+50 RT
- L- STA 41+30 TO -L- STA 46+50 LT
- L- STA 44+73 TO -L- STA 49+30 RT
- L- STA 59+60 TO -L- STA 62+85 LT
- L- STA 59+62.50 TO -L- STA 62+85 RT
- L- STA 68+66.61 TO -L- STA 69+05 LT
- L- STA 69+49 TO -L- STA 75+11 RT



TYPICAL SECTION 3

- L- STA 40+75 TO -L- STA 41+15
- L- STA 62+70 TO -L- STA 69+00

* USE E1 FOR WIDENING LESS THAN 6'



INSET C

- L- STA 67+53 TO -L- STA 68+66.61 LT

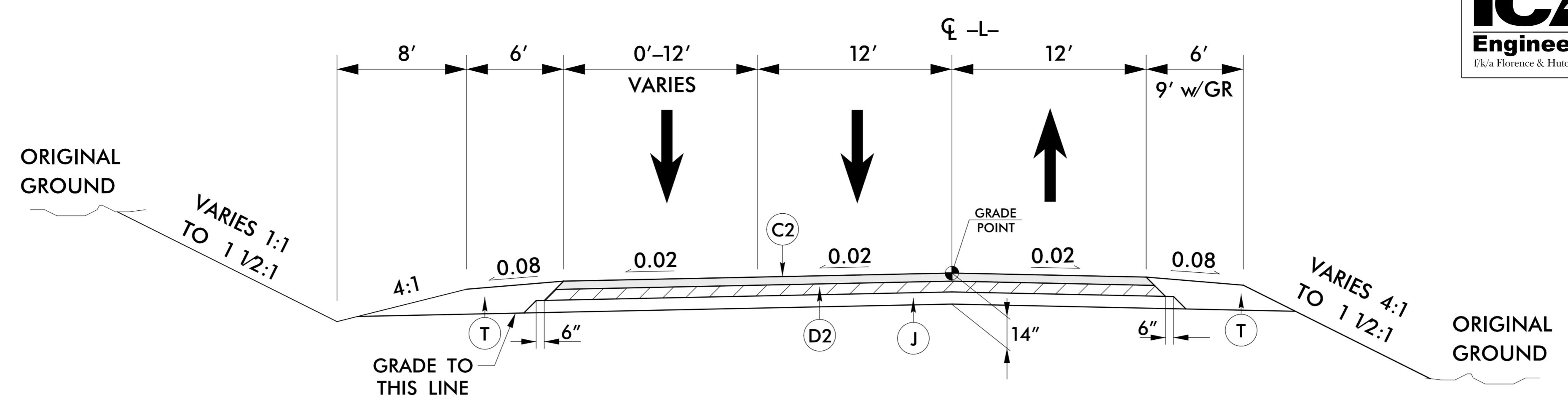
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8/17/09

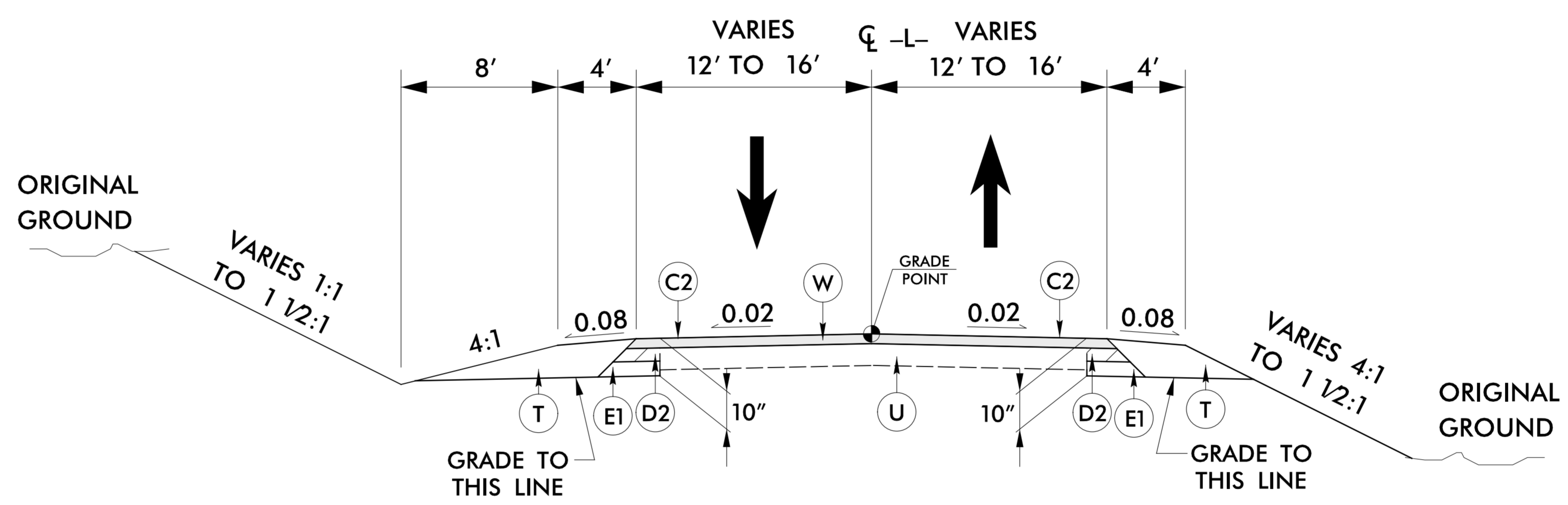
C1	2" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	VAR I19.0B
E1	4" B25.0B
E2	VAR B25.0B
J	8" ABC
N	GEOTEXTILE
P	PRIME COAT
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	VAR WEDGING



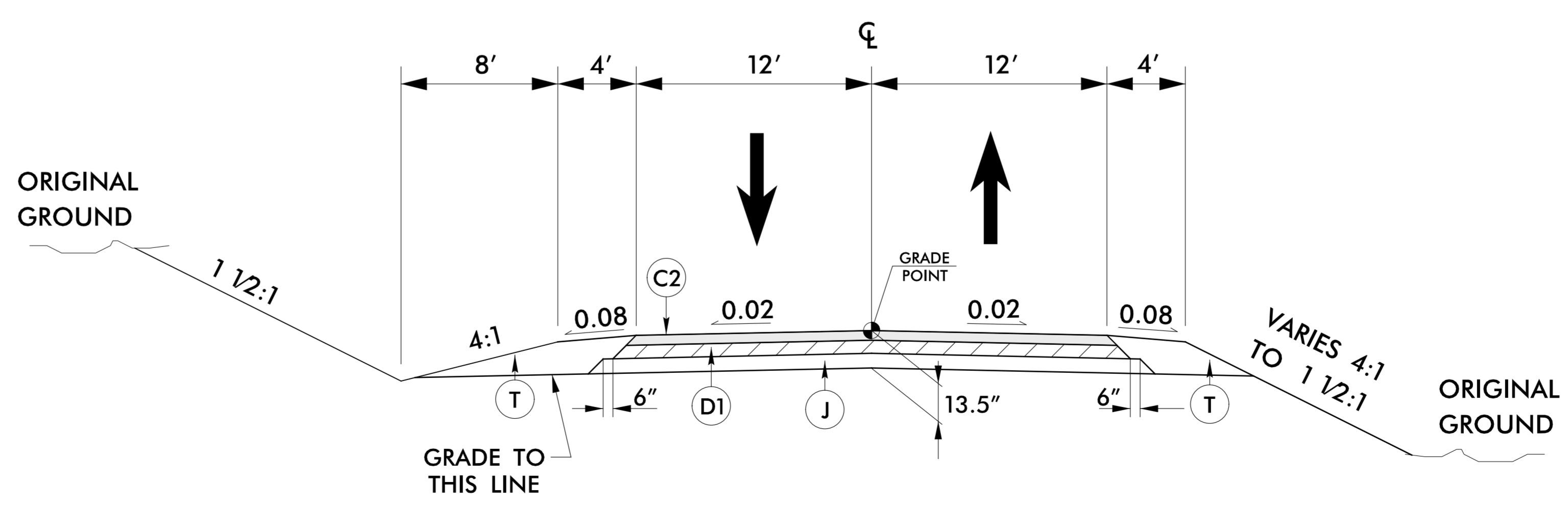
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: David C. Waller 09AD9F7156C5435... 10/22/2015	DocuSigned by: Clark S. Morrison 066238016E4F400... 10/23/2015



TYPICAL SECTION 4
-L- STA 41+15 TO -L- STA 62+70



TYPICAL SECTION 5
-Y1- STA 11+00.00 TO -Y1- STA 12+50



TYPICAL SECTION 6
-Y2- STA 10+01.20 TO -Y2- STA 13+55

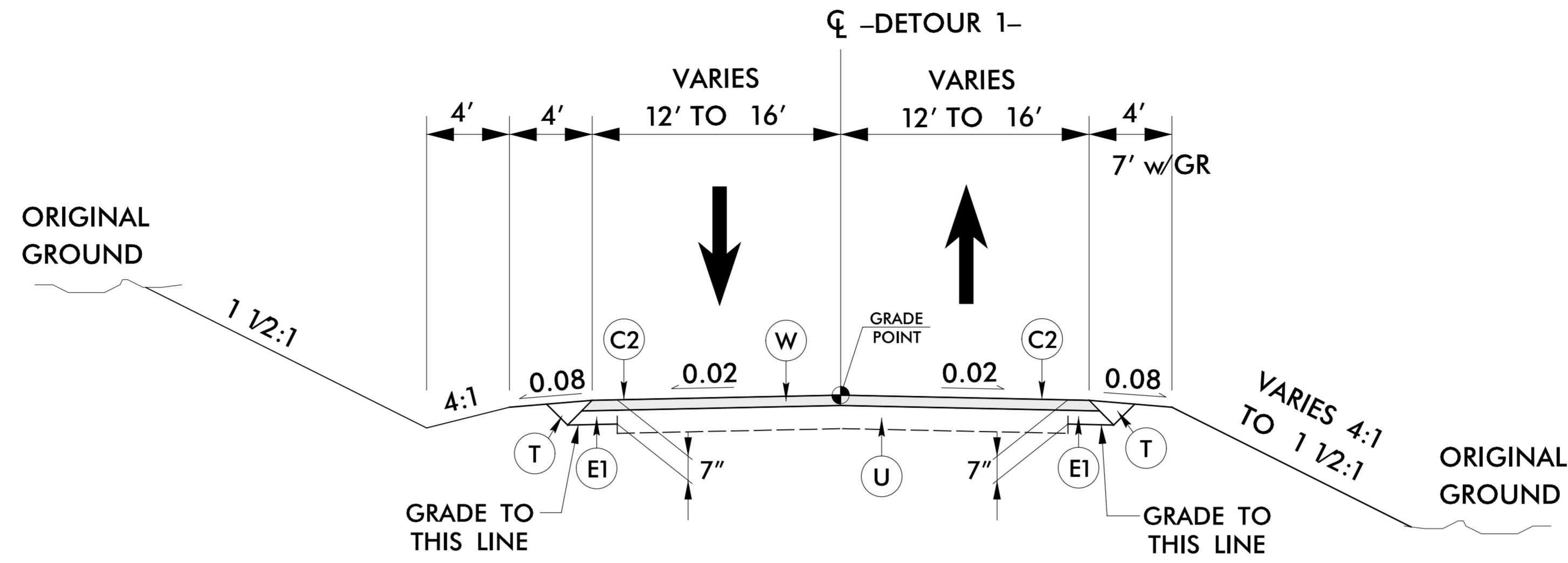
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8/17/09

C1	2" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	VAR I19.0B
E1	4" B25.0B
E2	VAR B25.0B
J	8" ABC
N	GEOTEXTILE
P	PRIME COAT
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	VAR WEDGING

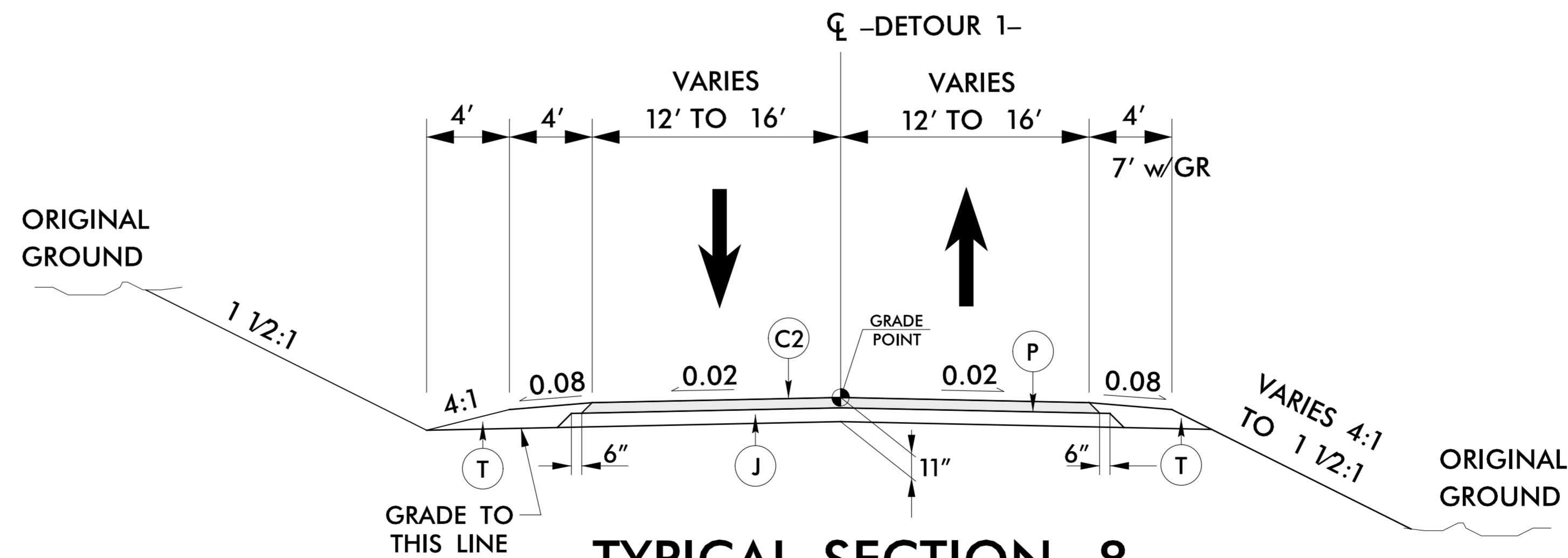


PROJECT REFERENCE NO. R-2409C	SHEET NO. 2A-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: David C. Waller 59AD3F7156C5455 10/22/2015	DocuSigned by: Clark S. Morrison 066238016E4F400 10/23/2015



TYPICAL SECTION 7

-DETOUR 1- STA 11+15.20 TO -DETOUR 1- STA 13+35
 -DETOUR 1- STA 20+85 TO -DETOUR 1- STA 21+44.83
 -DETOUR 1- TEMPORARY TIE



TYPICAL SECTION 8

-DETOUR 1- STA 13+35 TO -DETOUR 1- STA 20+85

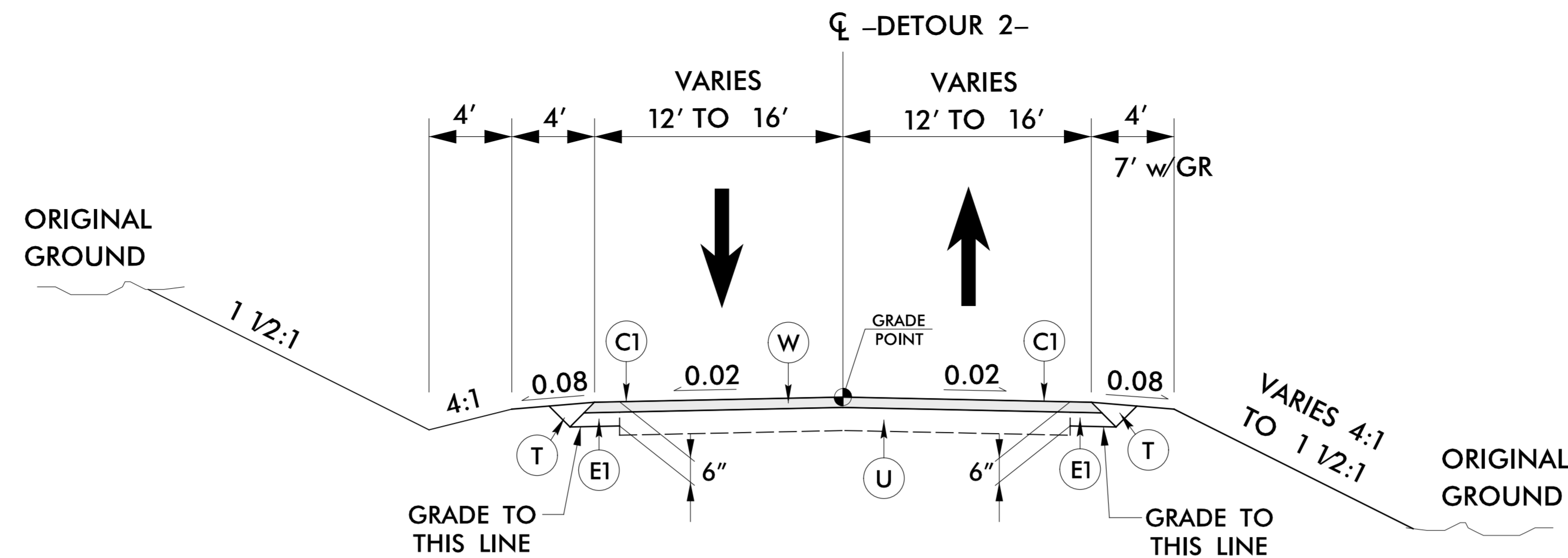
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8/17/09

C1	2" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
D1	2 1/2" I19.0B
D2	3" I19.0B
D3	VAR I19.0B
E1	4" B25.0B
E2	VAR B25.0B
J	8" ABC
N	GEOTEXTILE
P	PRIME COAT
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	VAR WEDGING

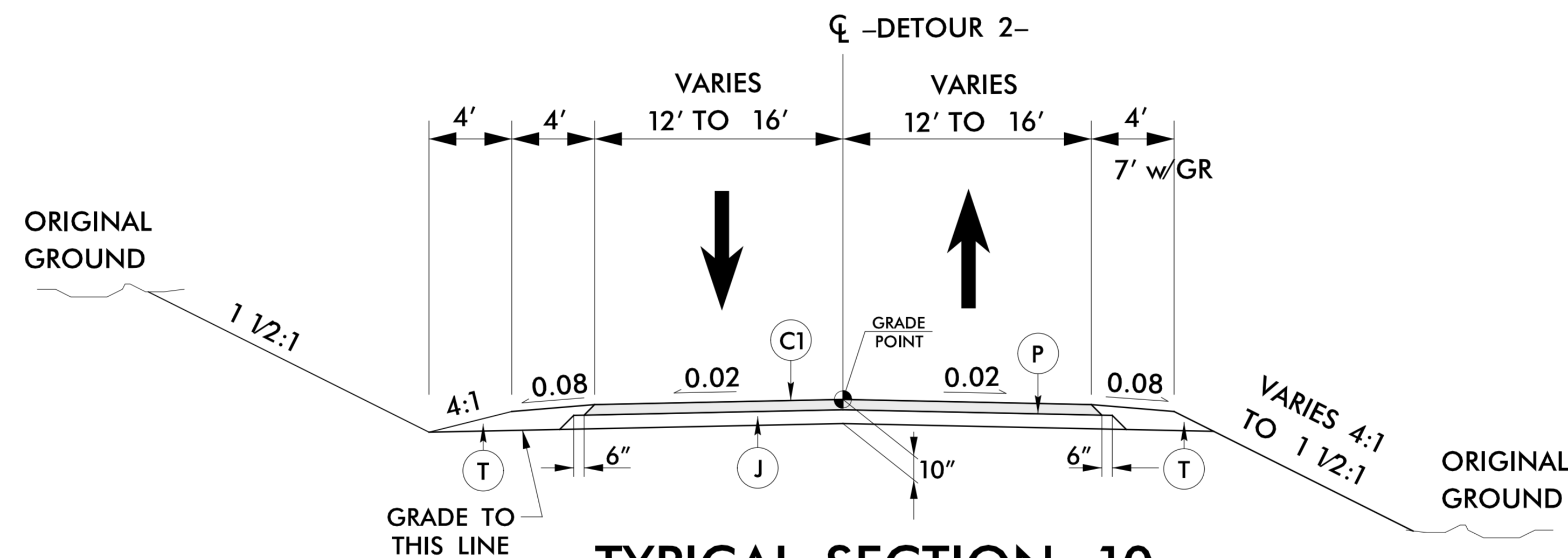


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ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DocuSigned by: David C. Waller 98AD3F156C5435 10/22/2015	DocuSigned by: Clark S. Morrison 068238016E4F400 10/23/2015



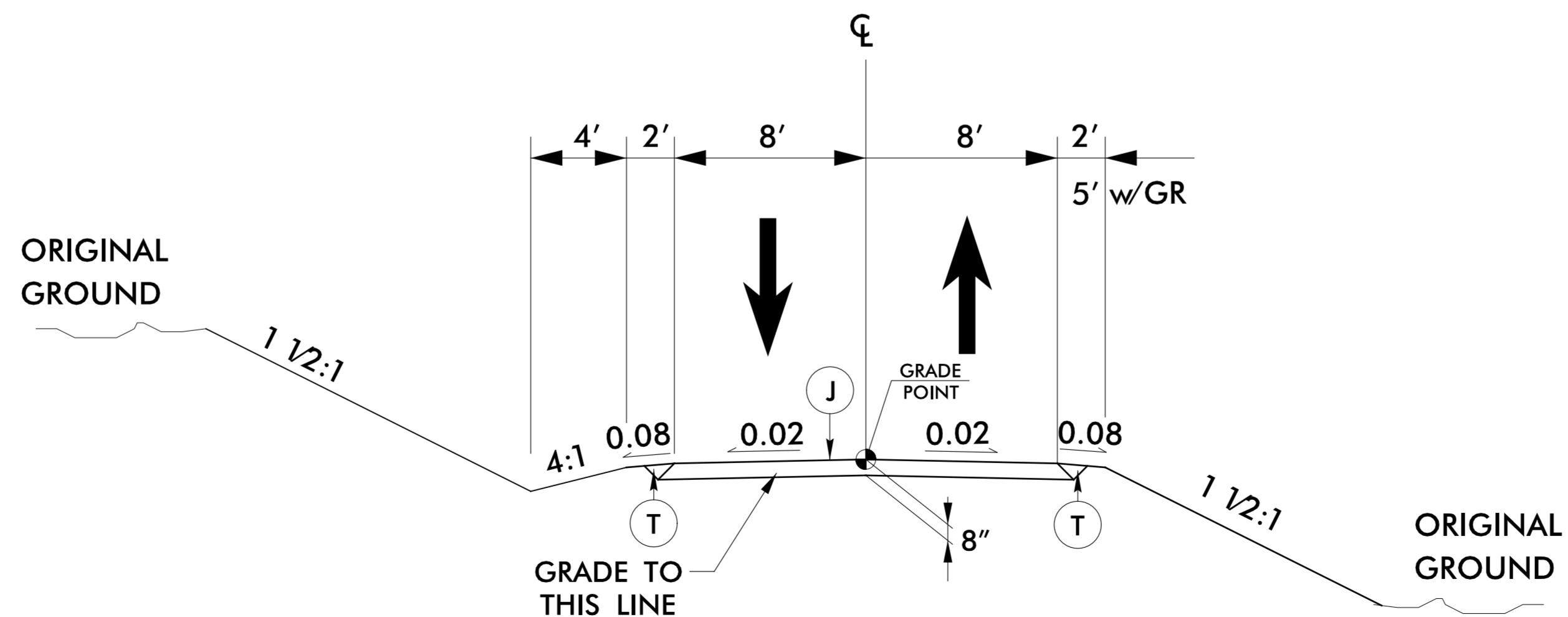
TYPICAL SECTION 9

-DETOUR 2- STA 11+58.36 TO -DETOUR 2- STA 12+56
-DETOUR 2- STA 14+75 TO -DETOUR 2- STA 16+00



TYPICAL SECTION 10

-DETOUR 2- STA 12+56 TO -DETOUR 2- STA 14+75



TYPICAL SECTION 11

-DR1- STA 10+00 TO -DR1- STA 12+80.59
-DR2- STA 10+13.74 TO -DR2- STA 12+60

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8/17/09

-DETOUR 2-

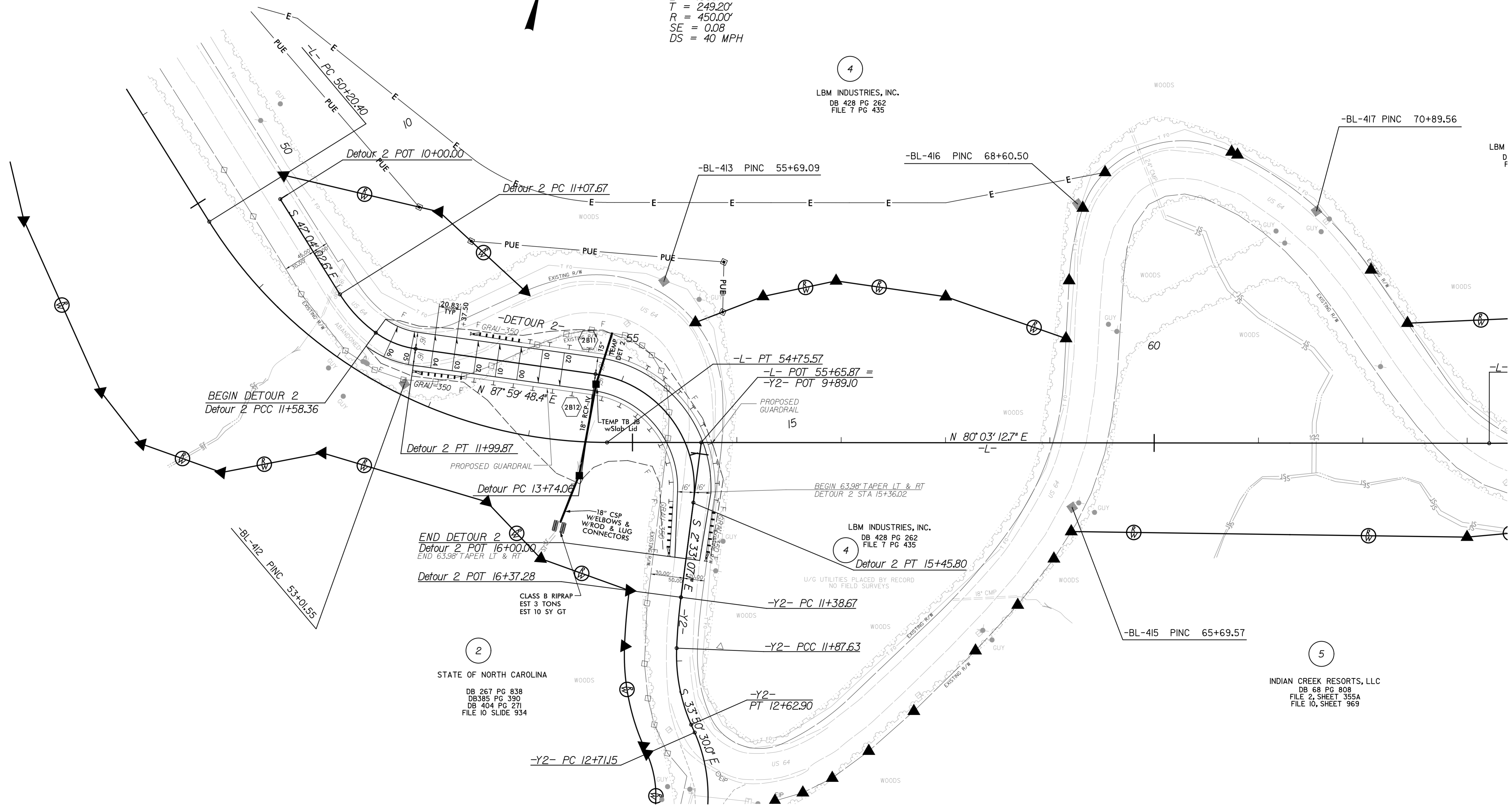
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22606 10/22/2015	HYDRAULICS ENGINEER STACEY H. BAILEY NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24451 10/23/2015

Detour 2
 PI Sta 11+33.33
 $\Delta = 27^{\circ} 57' 14.0''$ (LT)
 $D = 43' 18'' 43.4''$
 $L = 50.69'$
 $T = 25.66'$
 $R = 132.29'$

Detour 2
 PI Sta 11+79.54
 $\Delta = 27^{\circ} 58' 54.9''$ (LT)
 $D = 67' 24'' 24.5''$
 $L = 41.5'$
 $T = 21.18'$
 $R = 85.00'$

Detour 2
 PI Sta 14+83.01
 $\Delta = 89^{\circ} 27' 04.5''$ (RT)
 $D = 52' 05'' 13.5''$
 $L = 171.73'$
 $T = 108.95'$
 $R = 110.00'$

-L-
 PI Sta 52+69.61
 $\Delta = 57^{\circ} 57' 13.8''$ (LT)
 $D = 12' 43'' 56.6''$
 $L = 455.17'$
 $T = 249.20'$
 $R = 450.00'$
 $SE = 0.08$
 $DS = 40$ MPH



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2
 STATE OF NORTH CAROLINA
 DB 267 PG 838
 DB385 PG 390
 DB 404 PG 271
 FILE 10 SLIDE 934

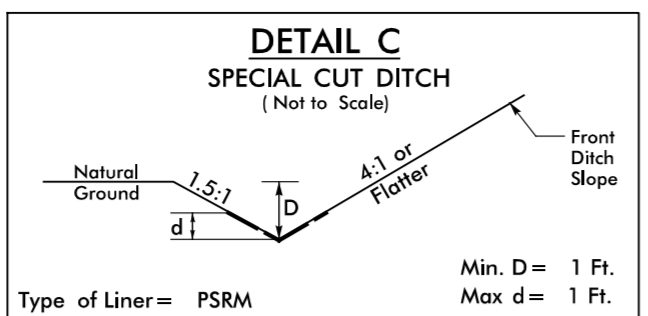
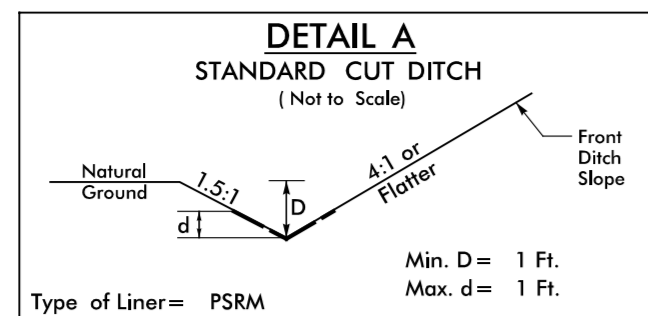
4
 LBM INDUSTRIES, INC.
 DB 428 PG 262
 FILE 7 PG 435

5
 INDIAN CREEK RESORTS, LLC
 DB 68 PG 808
 FILE 2, SHEET 355A
 FILE 10, SHEET 969

PROJECT REFERENCE NO. R-2409C	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER STACEY H. BAILEY SEAL 24451 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: David C. Waller 10/22/2015	DocuSigned by: Stacey H. Bailey 10/23/2015

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No. F-0288
f/k/a Florence & Hutcheson, Inc.

-DETOUR 1-



FROM STA. 11+25 TO STA. 20+00 -DETI- LT
FROM STA. 17+00 TO STA. 20+00 -DETI- RT

FROM STA. 20+00 TO STA. 21+50 -DETI- LT
FROM STA. 20+00 TO STA. 20+50 -DETI- RT

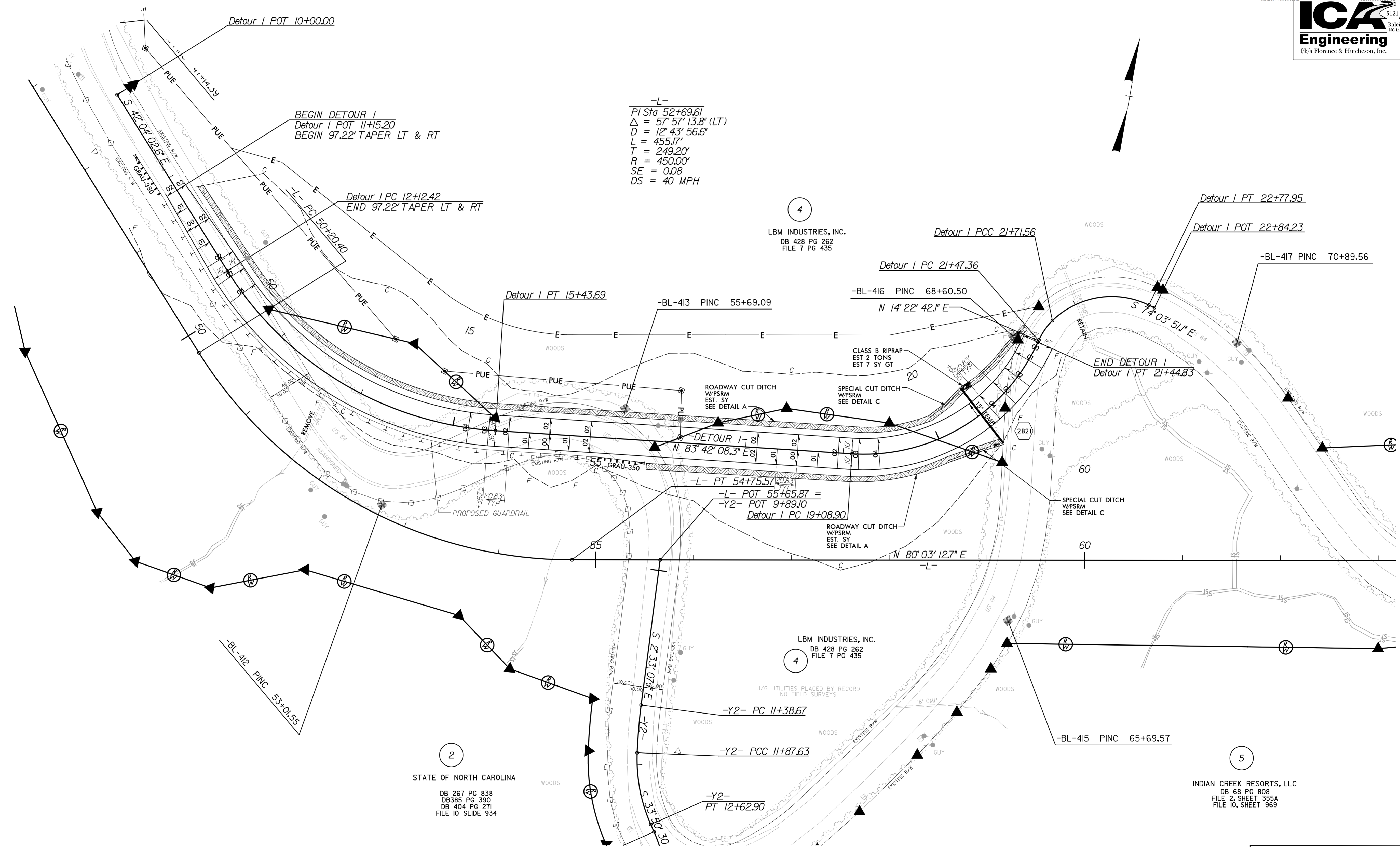
Detour 1
PI Sta 13+91.64
 $\Delta = 54^{\circ} 13' 49.1''$ (LT)
D = 16' 22' 12.8"
L = 331.27'
T = 179.22'
R = 350.00'

Detour 1
PI Sta 20+43.73
 $\Delta = 69^{\circ} 19' 26.1''$ (LT)
D = 29' 22' 56.8"
L = 235.94'
T = 134.83'
R = 195.00'

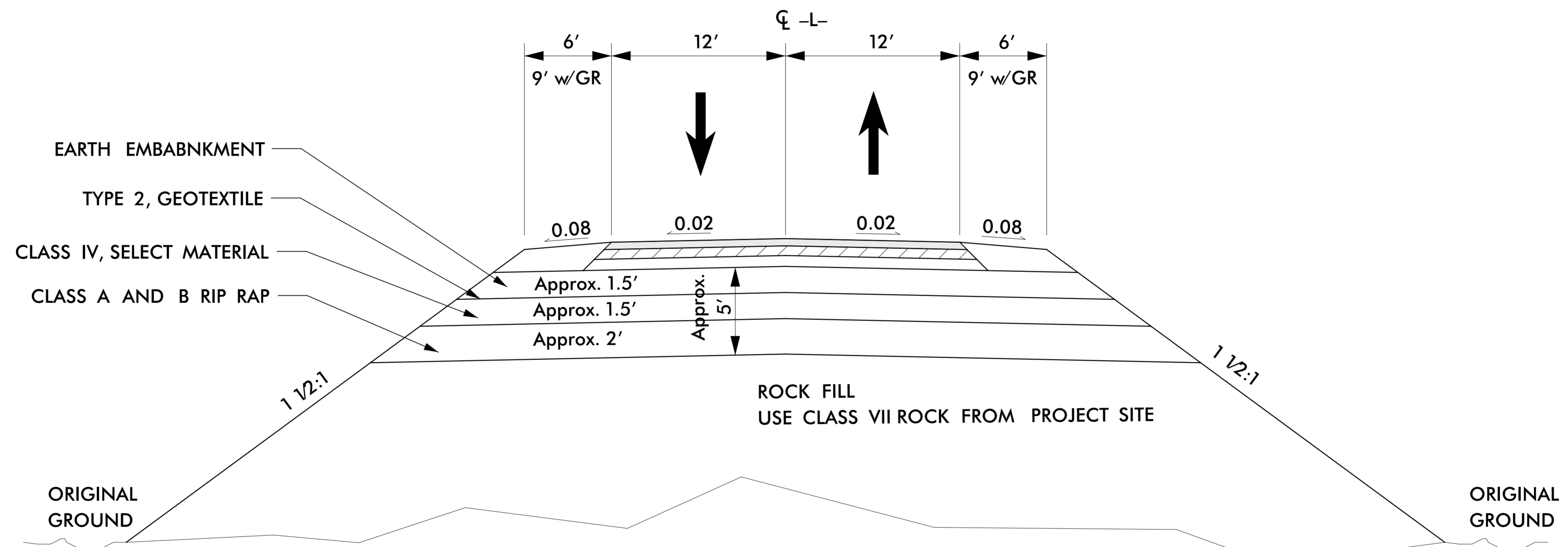
Detour 1
PI Sta 21+59.60
 $\Delta = 21^{\circ} 19' 37.7''$ (RT)
D = 88' 08' 50.5"
L = 241.9'
T = 12.24'
R = 65.00'

Detour 1
PI Sta 22+32.59
 $\Delta = 70^{\circ} 13' 49.0''$ (RT)
D = 66' 00' 46.0"
L = 106.39'
T = 61.03'
R = 86.80'

-L-
PI Sta 52+69.61
 $\Delta = 57^{\circ} 57' 13.8''$ (LT)
D = 12' 43' 56.6"
L = 455.17'
T = 249.20'
R = 450.00'
SE = 0.08
DS = 40 MPH



8/17/19
10/21/2015
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D:\Engineering\2409C_Rdwy_DTL_2B-2.dgn

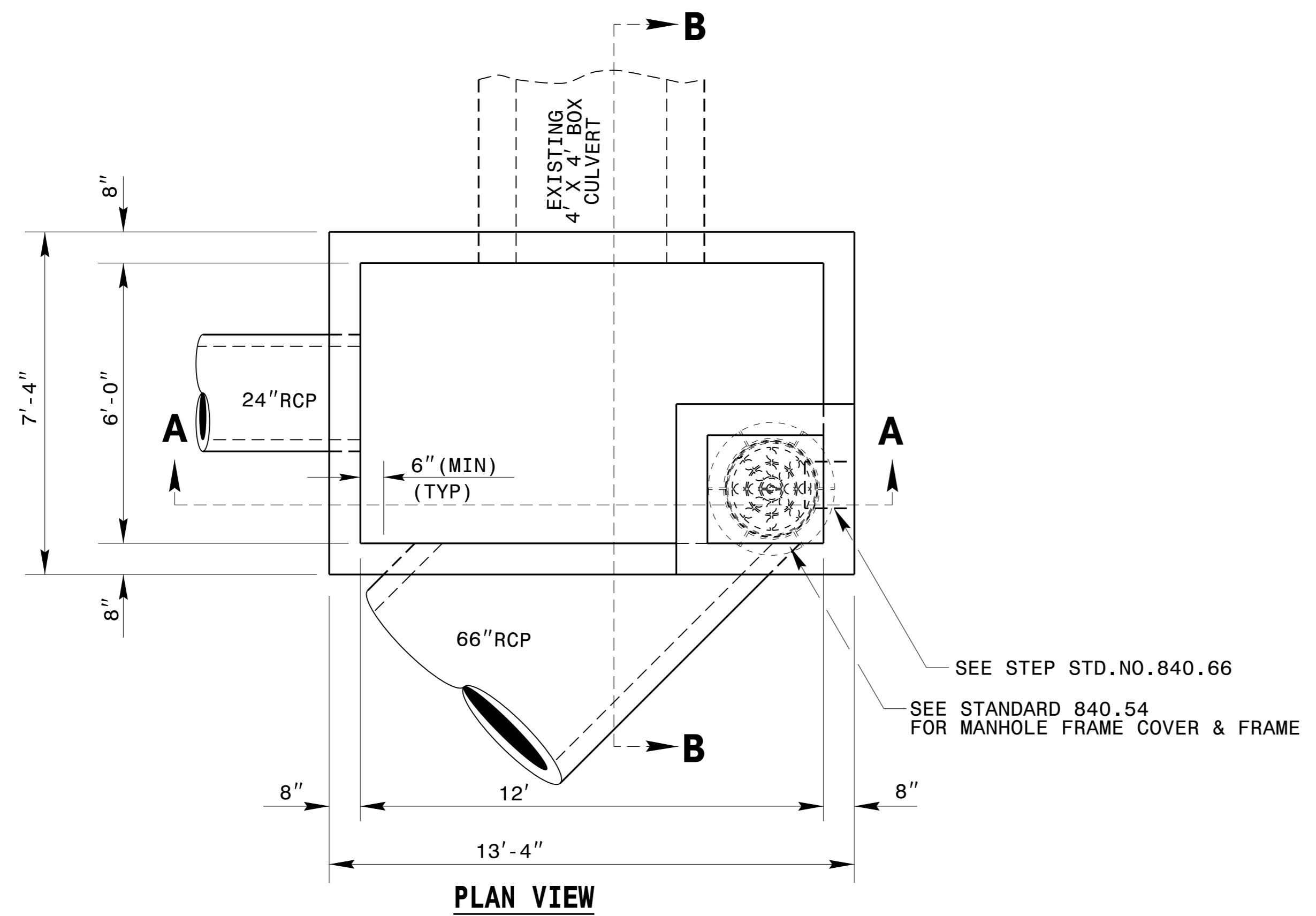


ROCK FILL DETAIL

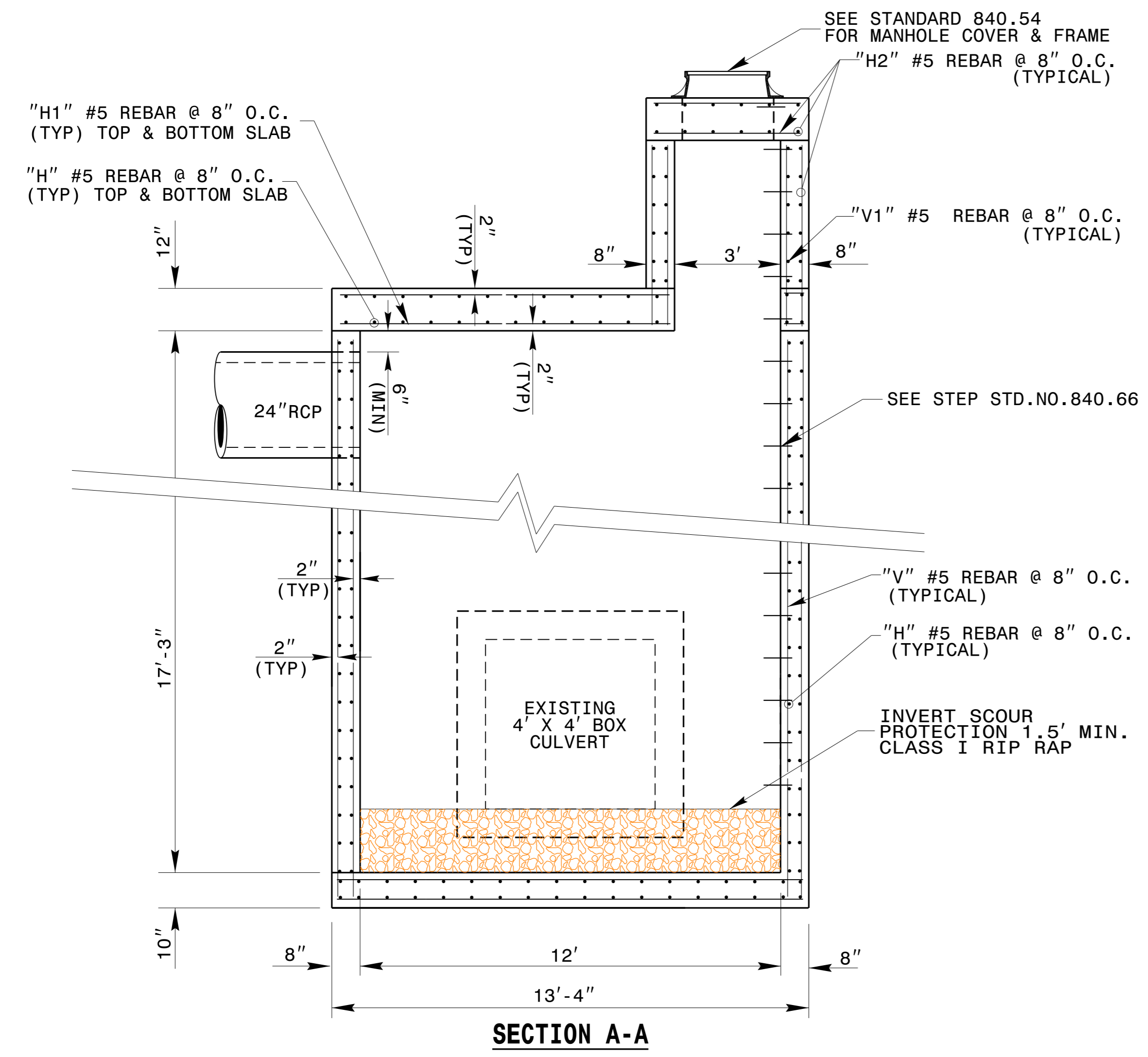
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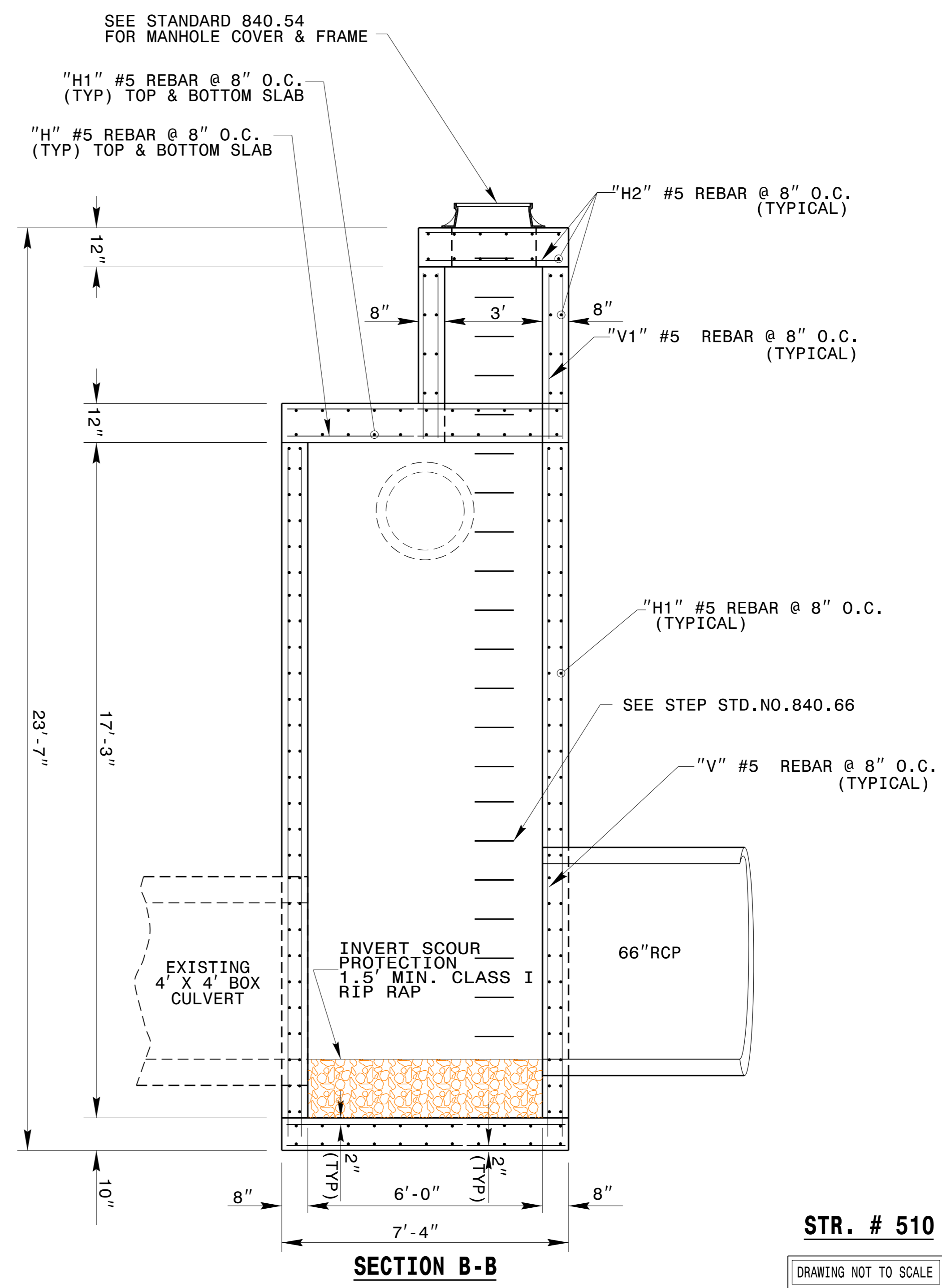
GENERAL NOTES:
 USE CLASS "B" CONCRETE THROUGHOUT.
 PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
 OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
 USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.
 CHAMFER ALL EXPOSED CORNERS 1".
 2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.
 HEIGHT DIMENSIONS MAY BE ADJUSTED DOWN FOR SMALLER PIPES AS DIRECTED BY THE ENGINEER.



PLAN VIEW



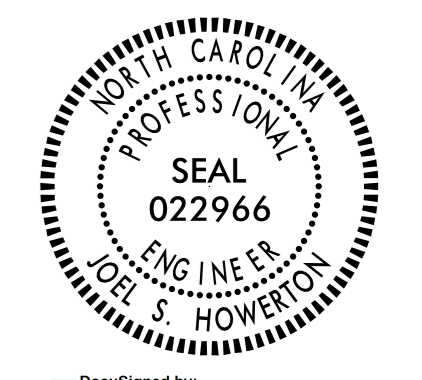
SECTION A-A



SECTION B-B

BILL OF MATERIALS				
BAR	NO.	SIZE	LENGTH	WEIGHT
H	180	#5	7'-0"	1314
H1	152	#5	10'-11"	1731
H2	42	#5	4'-0"	165
V	116	#5	17'-9"	2148
V1	48	#5	4'-2"	209
Z	14	#5	4'-0"	58
TOTAL REINF. STEEL (LBS.)				5625
TOTAL CONC. (CU. YDS.)				22.5

* 0.88 CU. YD. DEDUCTION FOR 1-66" RC PIPE
 * 0.30 CU. YD. PER FOOT OF RISER HEIGHT
 * NO DEDUCTION HAS BEEN MADE FOR PIPES



DocuSigned by:
 Joel S. Howerton
 873F9D17DCDC48F...
 11/5/2015

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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

TRAFFIC BEARING JUNCTION BOX WITH INVERT SCOUR PROTECTION AND MANHOLE

STR. # 510

DRAWING NOT TO SCALE

ORIGINAL BY: KKEMPF DATE: 09/30/15
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: detail/kkempff/english/66_4x4_jb.dgn

5/14/99
 TIME
 USER

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA
SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- STA 10+05 TO 28+00	212,217		5,641		206,576
SUBTOTAL #1	212,217		5,641		206,576
-L- STA 28+00 TO 52+00	180,511		111,446		69,065
-DET2- STA 11+75 TO 16+00	7		15,579	15,572	
SUBTOTAL #2	180,518		127,025	15,572	69,065
-L- STA 52+00 TO 77+00	109,037		61,399		47,638
-DET1- STA 11+15 TO 21+45	88,869		1,046		87,823
-Y2- STA 9+89.10 TO 13+55	12,018				12,018
-DR1- STA 10+75 TO 12+75	20		366	346	
SUBTOTAL #3	209,944		62,810	346	147,479
TOTAL	602,679		195,477	15,918	423,120
LOSS DUE TO CLEARING & GRUBBING	-8,000				-8,000
ADJUST FOR CLASS VI SELECT MATERIAL			-4,530	-4,530	
ROCK WASTE TO REPLACE BORROW				-7,922	-7,922
ADJUST FOR ROCK SWELL			-1,981	-1,981	
ADJUST FOR SHRINKAGE			-1,486	-1,486	
ADJUST FOR ROCK WASTE SWELL					31,034
ADJUST FOR UNCOMPACTED ROCK WASTE					23,275
PROJECT TOTAL	594,679		187,480	0	461,507
GRAND TOTAL	594,679		187,480	0	461,507
SAY	595,000				

DDE (CY) = 770
 SHOULDER BORROW (CY) = 3750
 UNDERCUT (CY) = 5000
 CLASS IV SUBGRADE STABILIZATION (TONS) = 3000
 PAVEMENT STRUCUTRE VOLUME (CY) = 6600

NOTE: These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

NC10477

COMPUTED BY: ADS DATE: 3/20/15
CHECKED BY: SHB DATE: 9/29/15

PROJECT NO. R-2409C SHEET NO. 3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

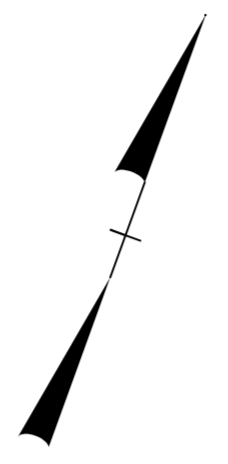
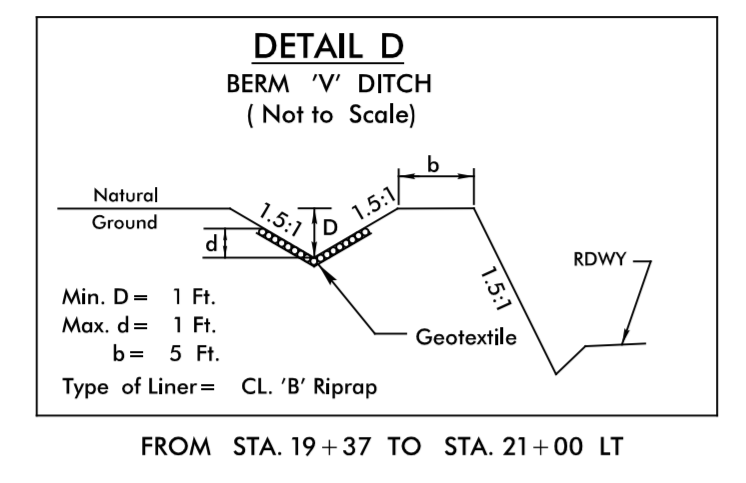
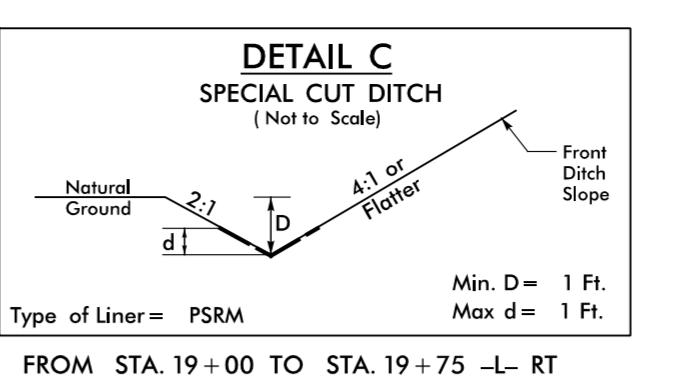
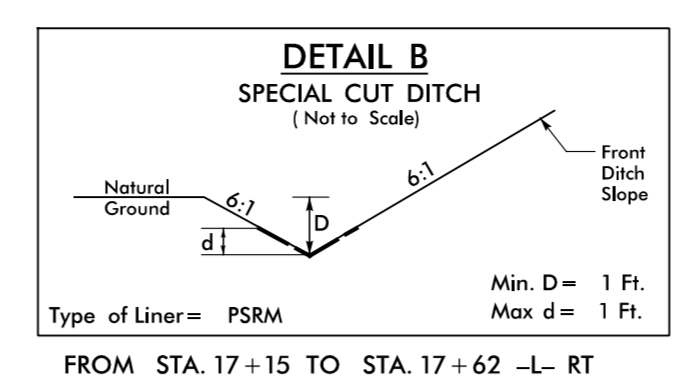
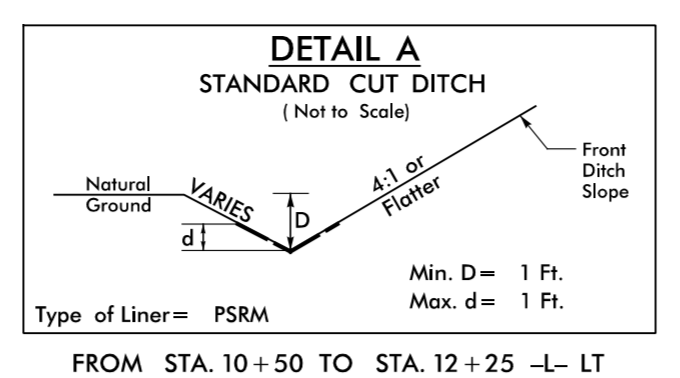
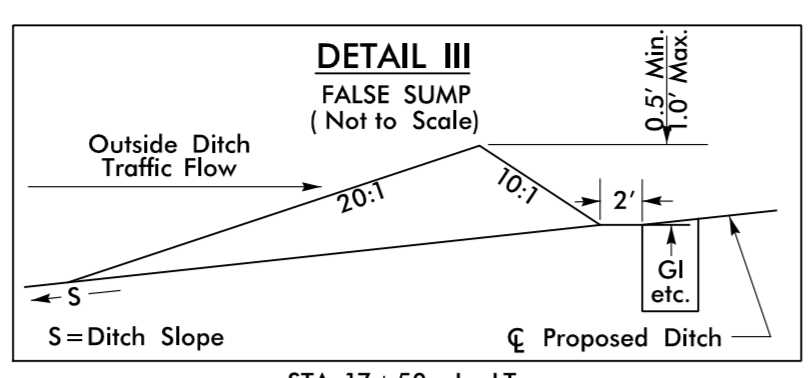
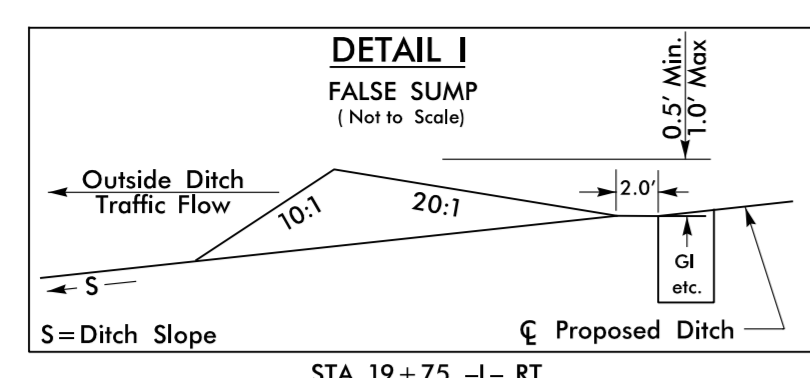
Main data table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Drainage Pipe, C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Quantities for Drainage Structures, Frame, Grates, and Hood, and Remarks. Includes sub-totals for SHEET TOTALS and PROJECT TOTALS.

ABBREVIATIONS table listing codes like C.A.A., C.B., C.S., D.I., G.D.I., H.D.P.E., J.B., M.H., N.S., P.V.C., R.C., T.B.D.I., T.B.J.B., W.S. and their corresponding material descriptions.

REMARKS

SHEET TOTALS and PROJECT TOTALS summary rows showing counts for various pipe and grate types across the sheet and project.

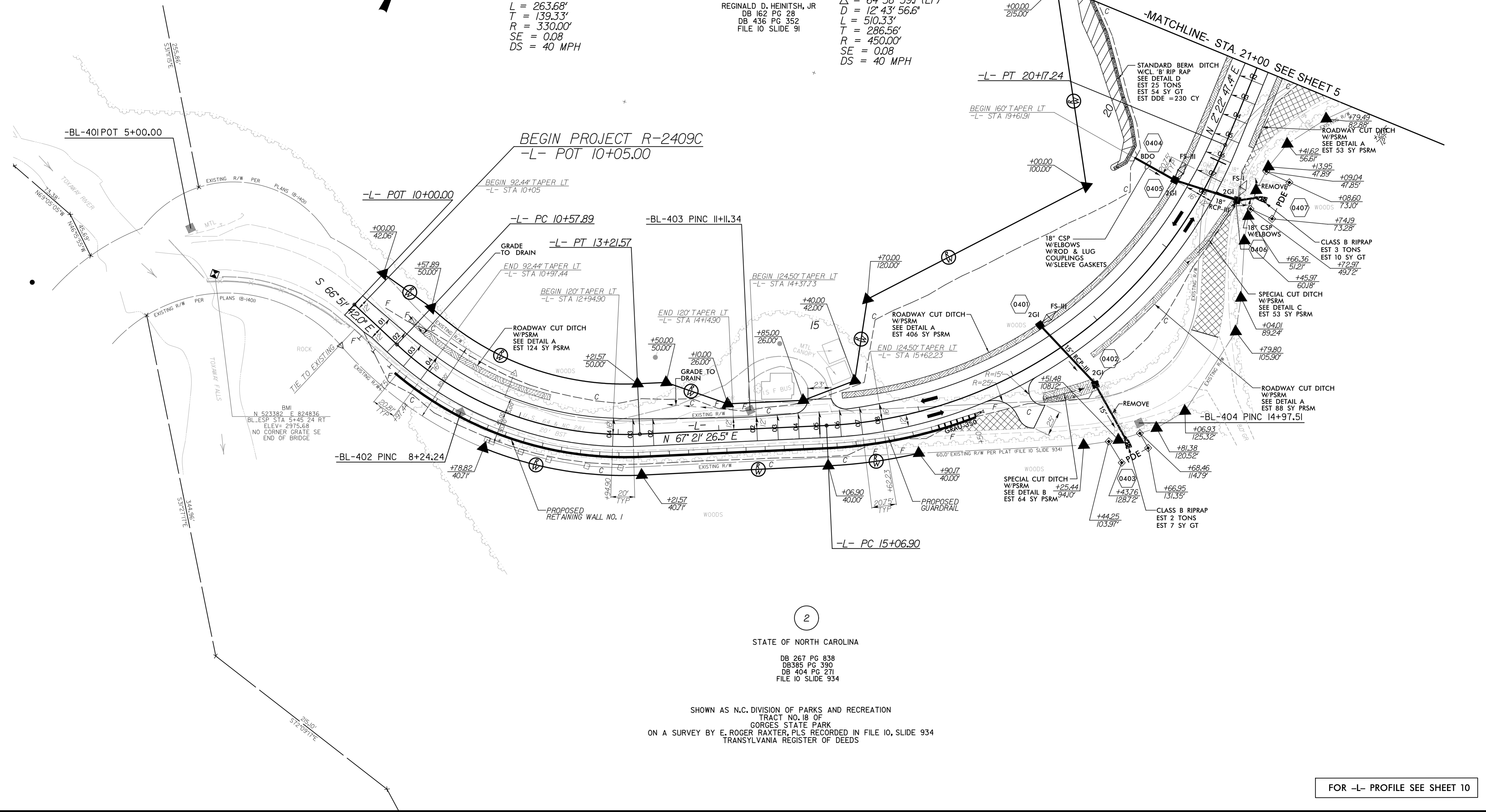
8/17/09



-L-
 PI Sta 11+97.22
 $\Delta = 45^\circ 46' 51.5''$ (LT)
 $D = 17^\circ 21' 44.5''$
 $L = 263.68'$
 $T = 139.33'$
 $R = 330.00'$
 $SE = 0.08$
 $DS = 40$ MPH

REGINALD D. HEINITSH, JR
 DB 162 PG 28
 DB 436 PG 352
 FILE 10 SLIDE 91

-L-
 PI Sta 17+93.46
 $\Delta = 64^\circ 58' 39.1''$ (LT)
 $D = 12^\circ 43' 56.6''$
 $L = 510.33'$
 $T = 286.56'$
 $R = 450.00'$
 $SE = 0.08$
 $DS = 40$ MPH



2

STATE OF NORTH CAROLINA

DB 267 PG 838
 DB 385 PG 390
 DB 404 PG 271
 FILE 10 SLIDE 934

SHOWN AS N.C. DIVISION OF PARKS AND RECREATION
 TRACT NO. 18 OF
 GORGES STATE PARK
 ON A SURVEY BY E. ROGER RAXTER, PLS. RECORDED IN FILE 10, SLIDE 934
 TRANSYLVANIA REGISTER OF DEEDS

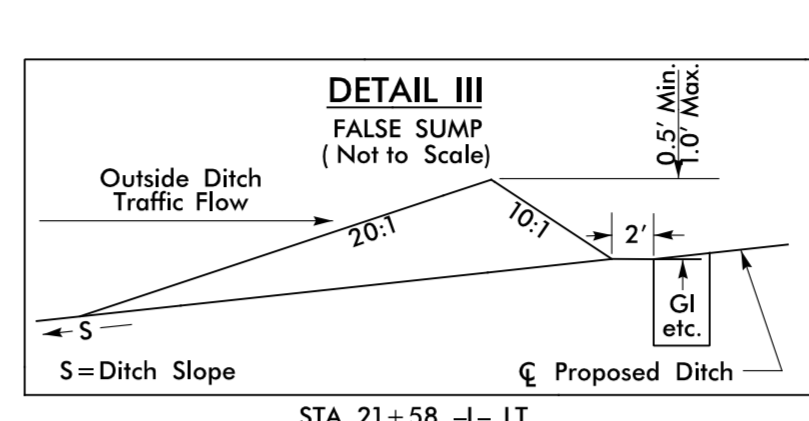
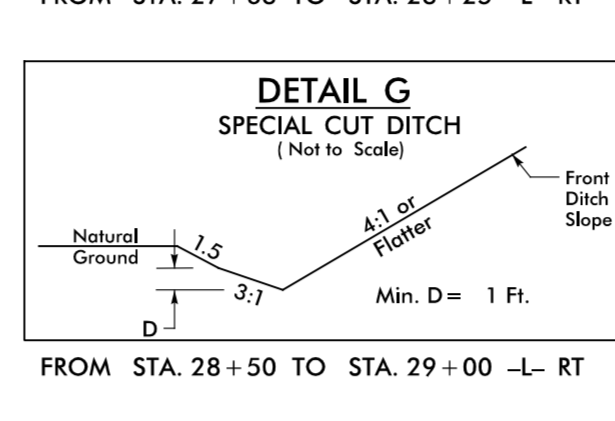
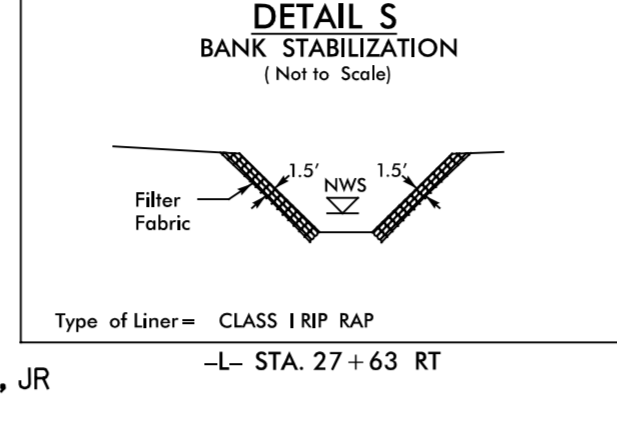
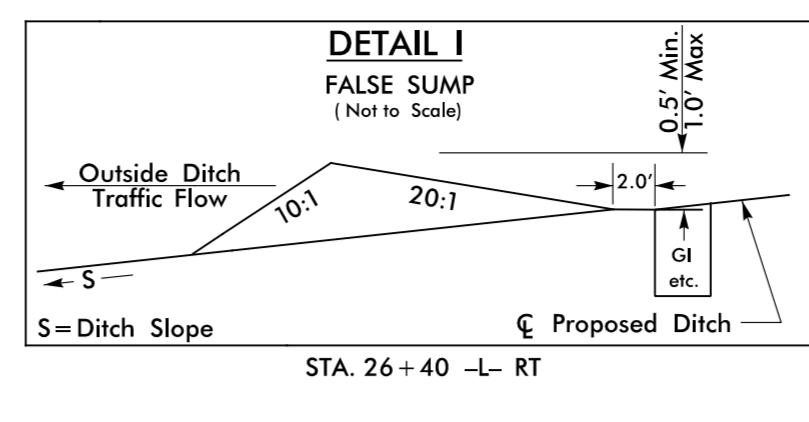
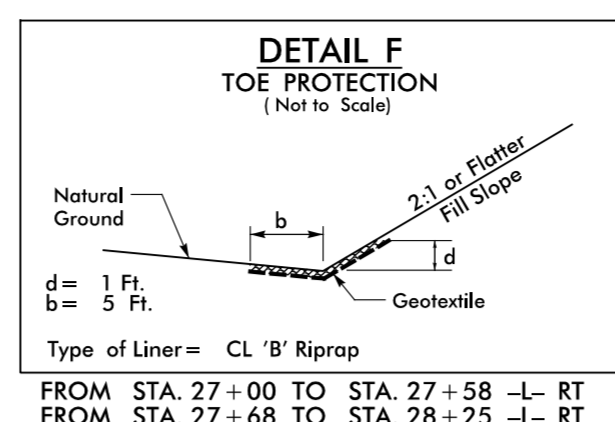
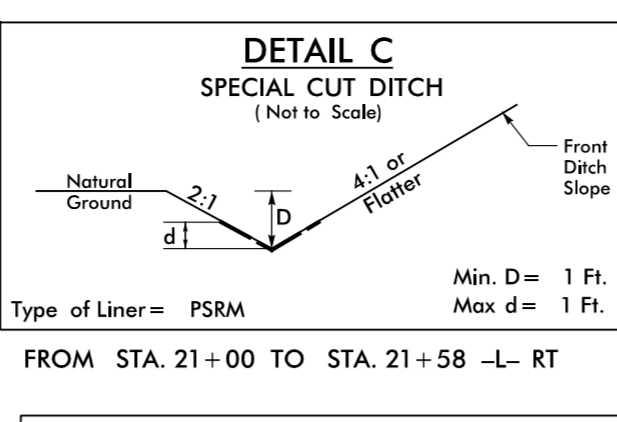
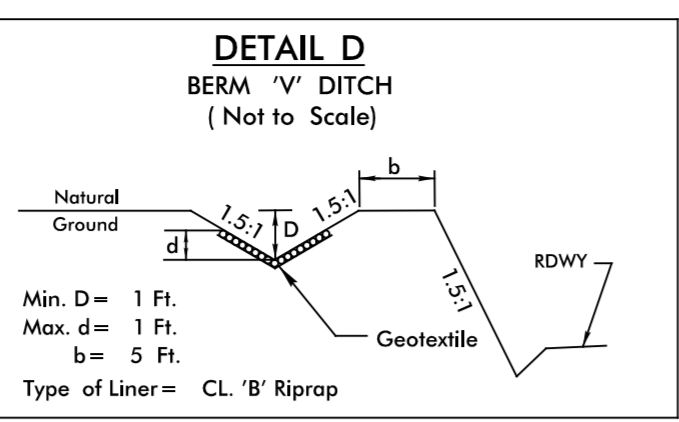
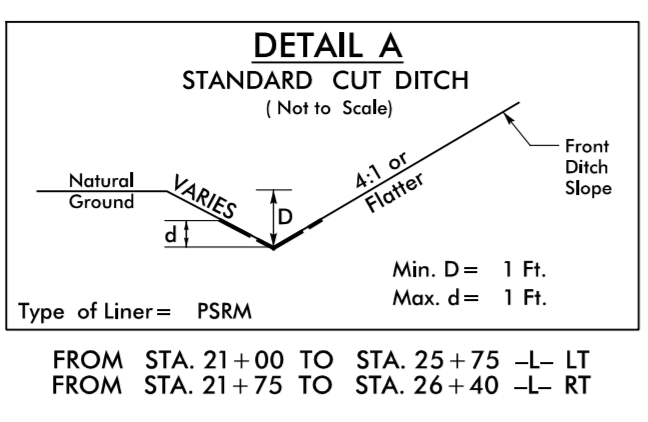
FOR -L- PROFILE SEE SHEET 10



PROJECT REFERENCE NO. R-2409C	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606	HYDRAULICS ENGINEER STACEY H. BAILEY SEAL 24451
DocuSigned by: David C. Waller 10/22/2015	DocuSigned by: Stacey H. Bailey 10/23/2015

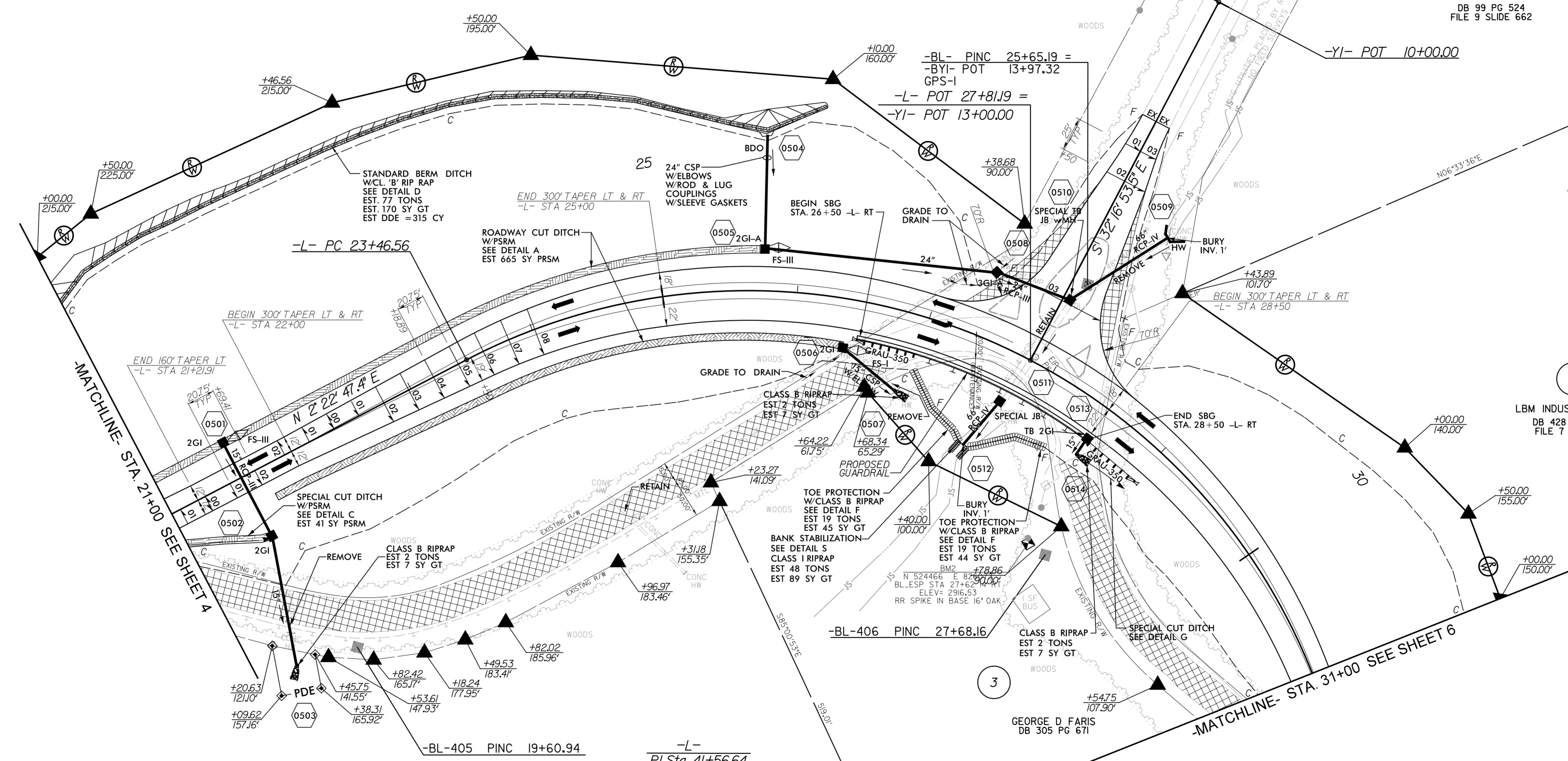
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8/17/09



PROJECT REFERENCE NO. R-2409C	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 10/22/2015	HYDRAULICS ENGINEER STACEY H. BAILEY SEAL 24451 10/23/2015

REGINALD D. HEINITSH, JR
DB 162 PG 28
DB 436 PG 352
FILE 10 SLIDE 91



-L-
PI Sta 41+56.64
Δ = 152' 04' 39.7" (RT)
D = 12' 43' 56.6"
L = 1,194.42'
T = 1,810.08'
R = 450.00'
SE = 0.08
DS = 40 MPH

STATE OF NORTH CAROLINA
DB 267 PG 838
DB385 PG 390
DB 404 PG 271
FILE 10 SLIDE 934

SHOWN AS N.C. DIVISION OF PARKS AND RECREATION
TRACT NO. 18 OF
GORGES STATE PARK
ON A SURVEY BY E. ROGER RAXTER, PLS RECORDED IN FILE 10, SLIDE 934
TRANSYLVANIA REGISTER OF DEEDS

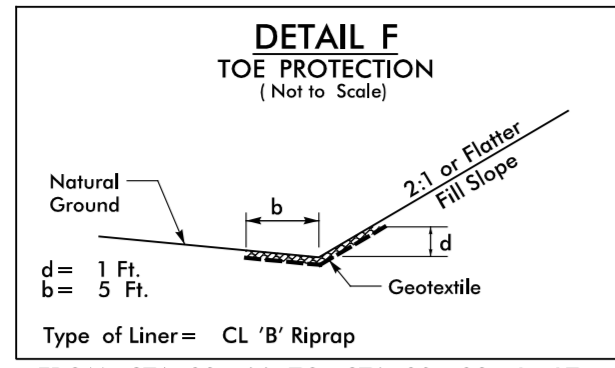
FOR -L- PROFILE SEE SHEET 11

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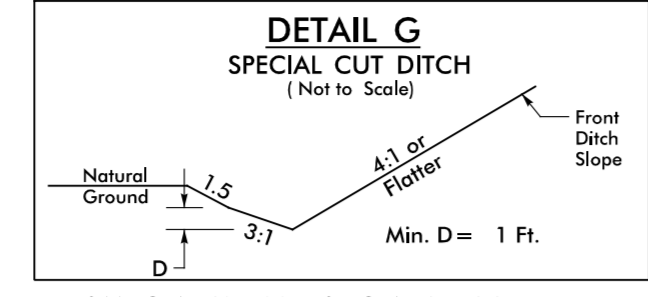
8/17/09



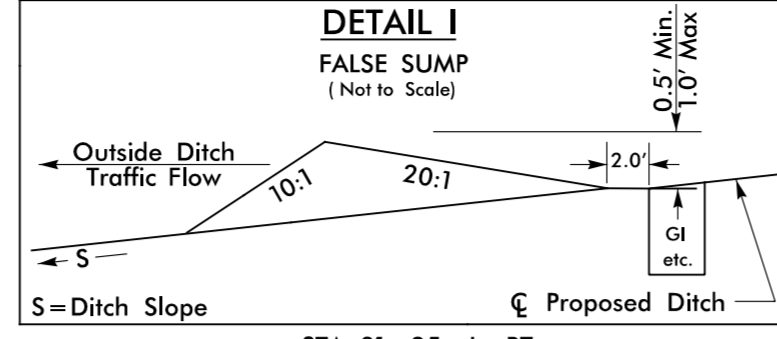
PROJECT REFERENCE NO. R-2409C	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER	HYDRAULICS ENGINEER STACEY H. BAILEY SEAL 24451 NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: David C. Waller 10/22/2015	DocuSigned by: Stacey H. Bailey 10/23/2015



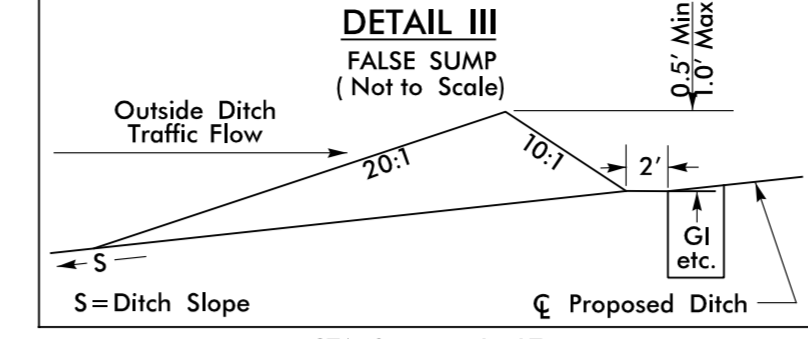
FROM STA. 32+00 TO STA. 32+38 -L- LT
 FROM STA. 32+43 TO STA. 32+75 -L- LT
 FROM STA. 41+00 TO STA. 42+50 -L- RT
 FROM STA. 41+50 TO STA. 42+50 -L- LT



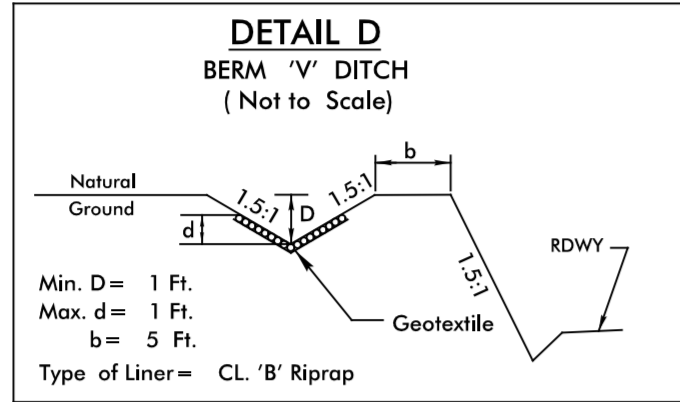
FROM STA. 40+00 TO STA. 41+34 -L- LT



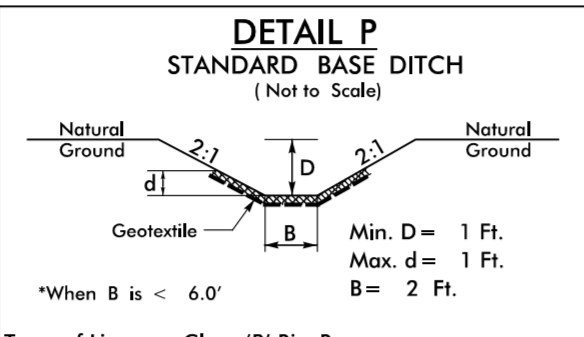
STA. 31+25 -L- RT
 STA. 37+80 -L- LT



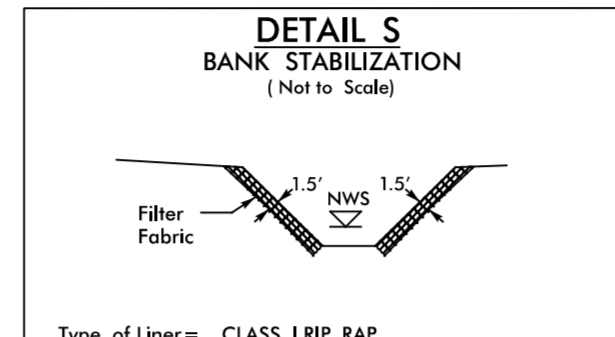
STA. 31+75 -L- LT
 STA. 33+25 -L- RT
 STA. 37+85 -L- LT



FROM STA. 37+50 TO STA. 38+00 LT



FROM STA. 38+00 -L- RT

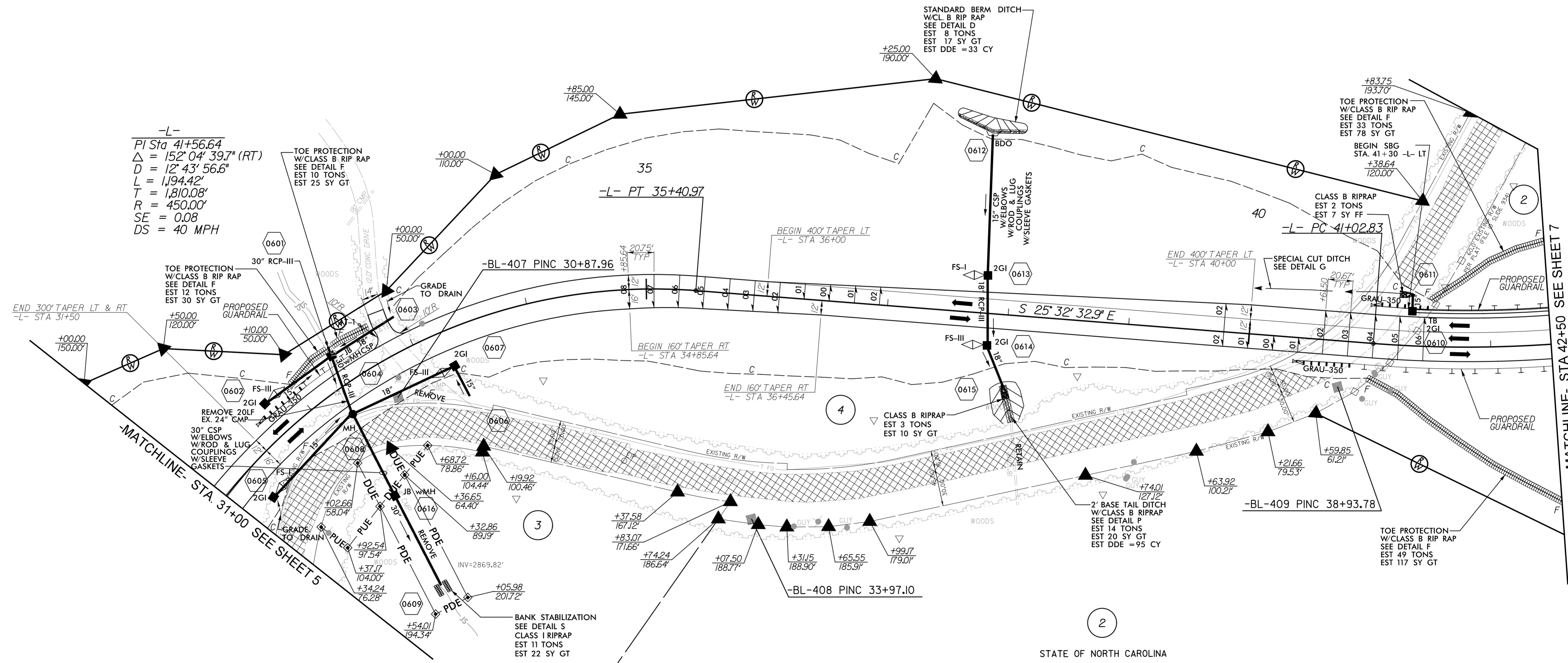


-L- STA. 31+88 RT

4

LBM INDUSTRIES, INC.
 DB 428 PG 262
 FILE 7 PG 435

-L-
 PI Sta 42+47.38
 $\Delta = 16' 27' 00.6''$ (LT)
 $D = 5' 43' 46.5''$
 $L = 287.1'$
 $T = 144.55'$
 $R = 1,000.00'$
 $SE = 0.06$
 $DS = 40$ MPH



-L-
 PI Sta 41+56.64
 $\Delta = 152' 04' 39.7''$ (RT)
 $D = 12' 43' 56.6''$
 $L = 1,194.42'$
 $T = 1,810.08'$
 $R = 450.00'$
 $SE = 0.08$
 $DS = 40$ MPH

-MATCHLINE- STA. 31+00 SEE SHEET 5

-MATCHLINE- STA 42+50 SEE SHEET 7

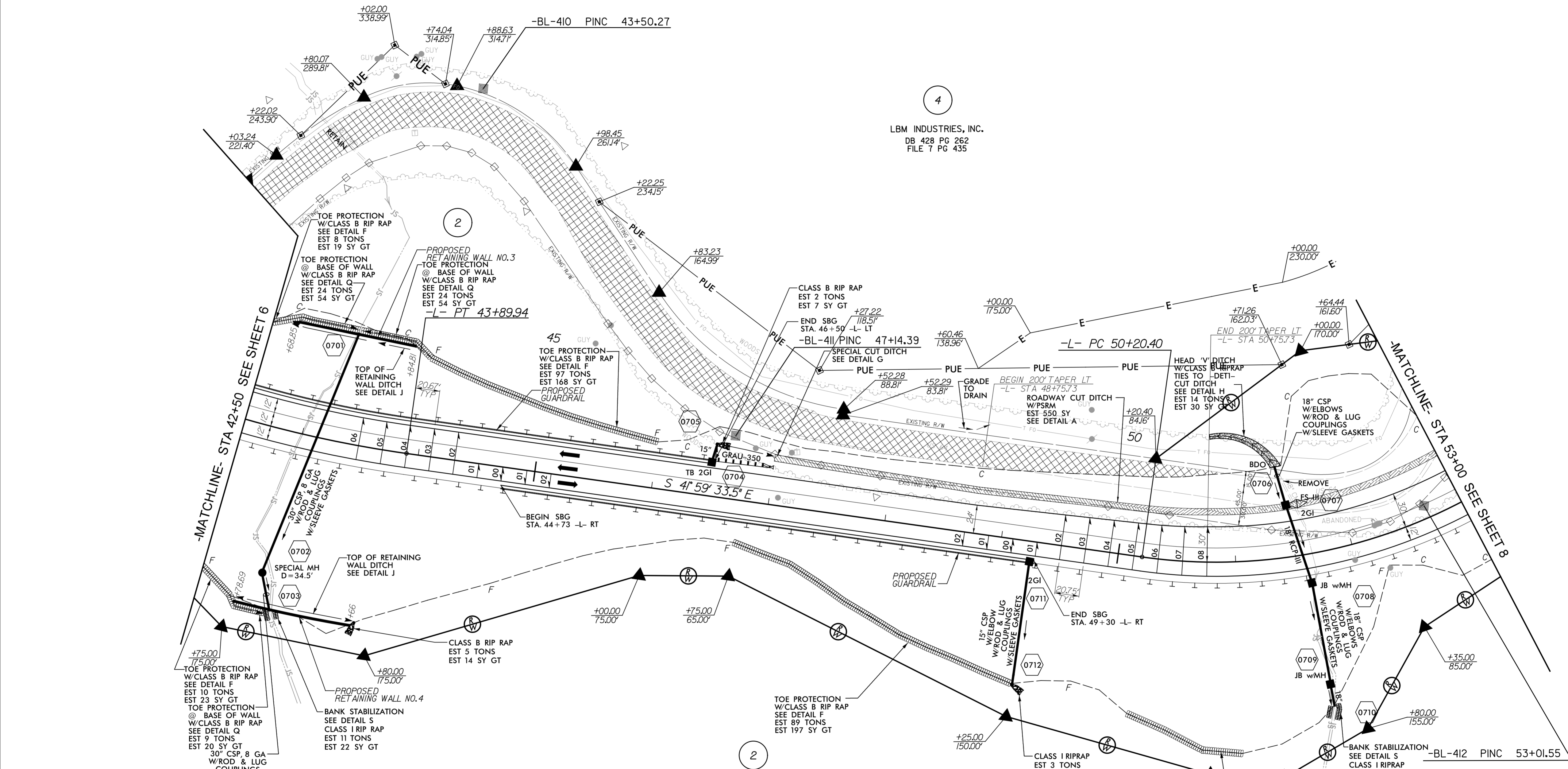
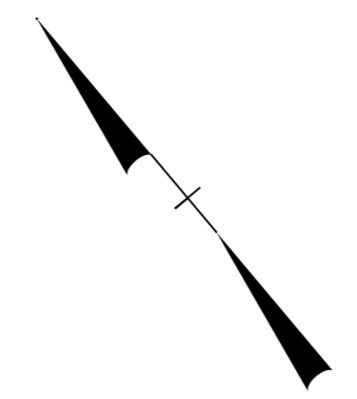
STATE OF NORTH CAROLINA
 DB 267 PG 838
 DB385 PG 390
 DB 404 PG 271
 FILE 10 SLIDE 934

SHOWN AS N.C. DIVISION OF PARKS AND RECREATION
 TRACT NO. 18 OF
 GORGES STATE PARK
 ON A SURVEY BY E. ROGER RAXTER, PLS. RECORDED IN FILE 10, SLIDE 934
 TRANSYLVANIA REGISTER OF DEEDS

FOR -L- PROFILE SEE SHEET 12

10/21/2015
 P:\R2409C_Rdwy_psh_06.dgn
 ICA ENGINEERING, INC.

-L-
 PI Sta 42+47.38
 $\Delta = 16' 27'' 00.6'' (LT)$
 $D = 5' 43'' 46.5''$
 $L = 287.11'$
 $T = 144.55'$
 $R = 1,000.00'$
 $SE = 0.06$
 $DS = 40 \text{ MPH}$

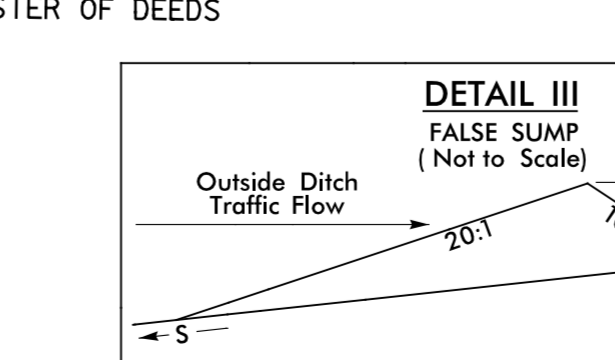
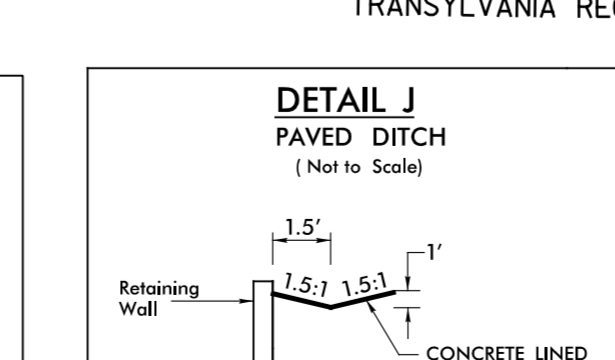
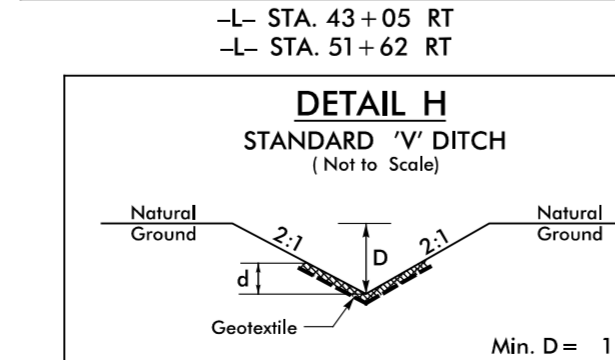
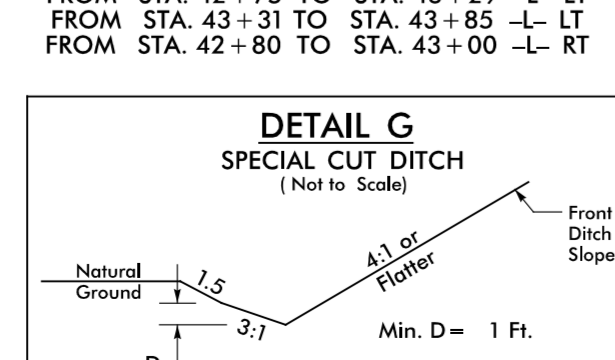
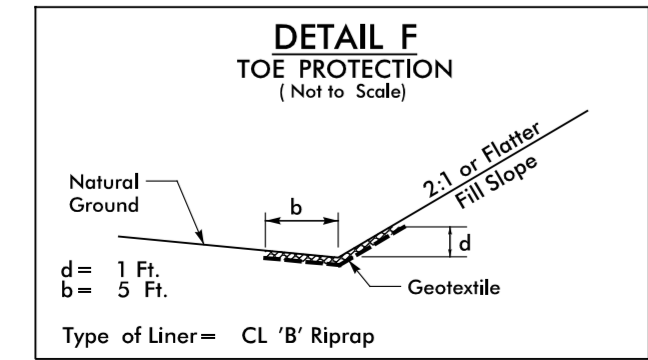
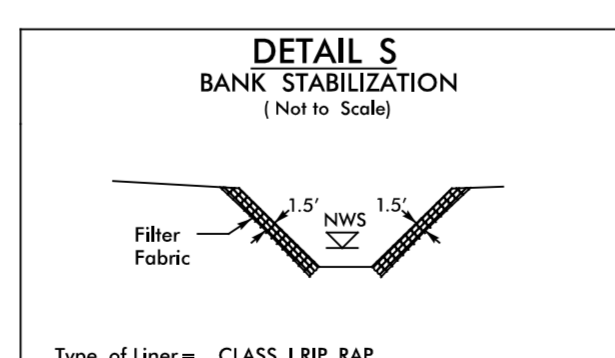
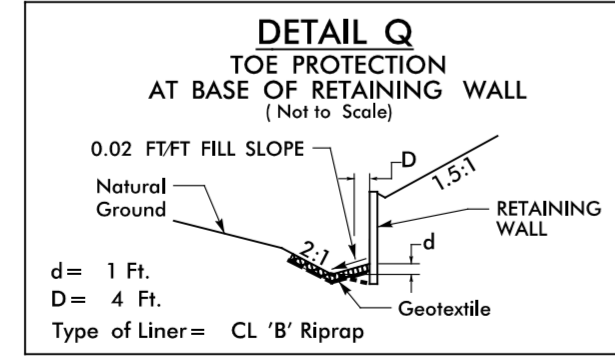
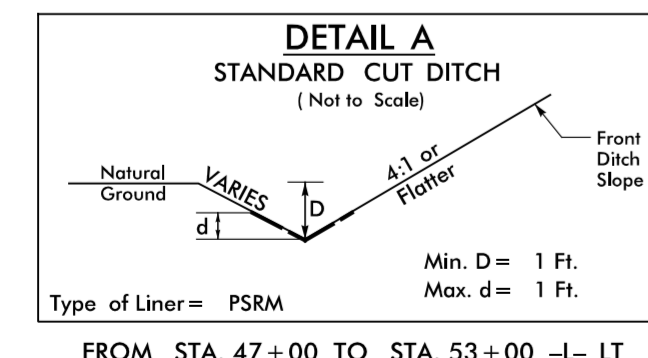


4
 LBM INDUSTRIES, INC.
 DB 428 PG 262
 FILE 7 PG 435

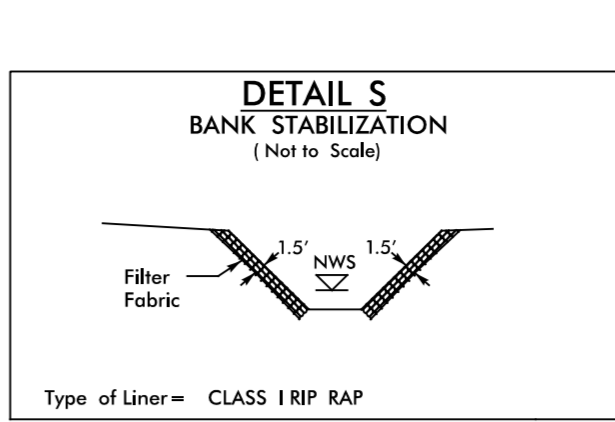
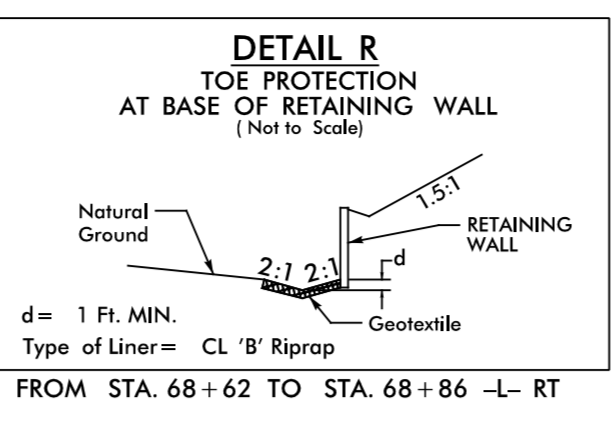
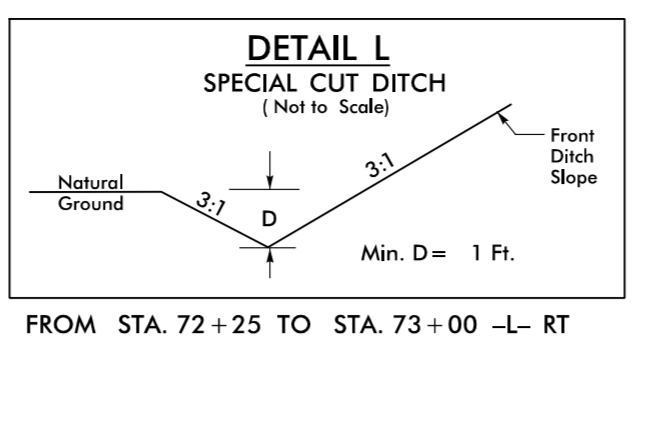
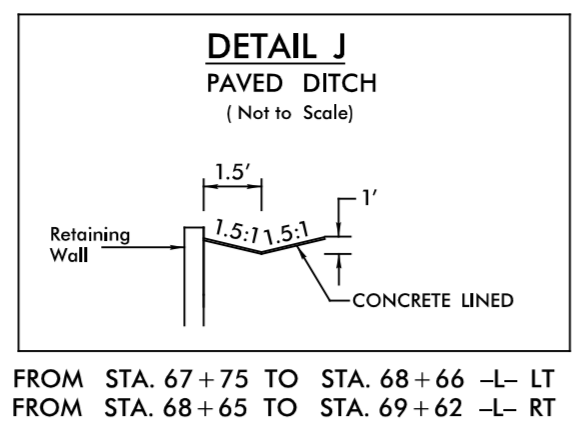
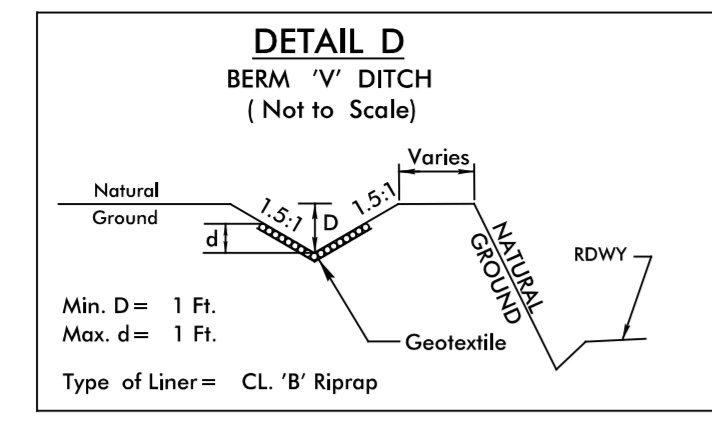
STATE OF NORTH CAROLINA
 DB 267 PG 838
 DB 385 PG 390
 DB 404 PG 271
 FILE 10 SLIDE 934

SHOWN AS N.C. DIVISION OF PARKS AND RECREATION
 TRACT NO. 18 OF
 GORGES STATE PARK
 ON A SURVEY BY E. ROGER RAXTER, PLS RECORDED IN FILE 10, SLIDE 934
 TRANSYLVANIA REGISTER OF DEEDS

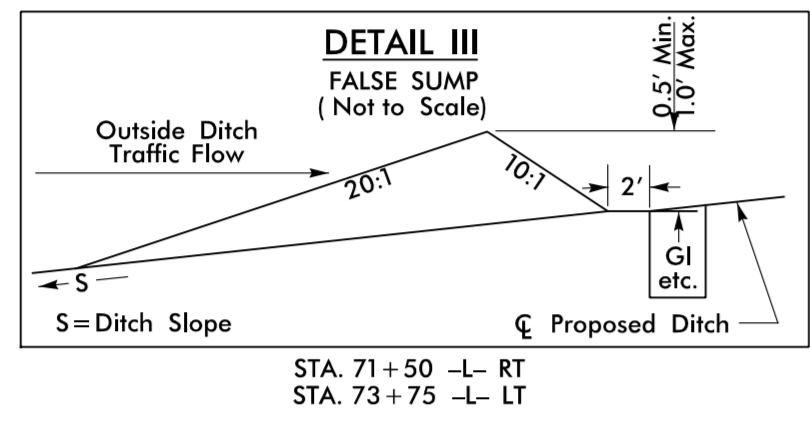
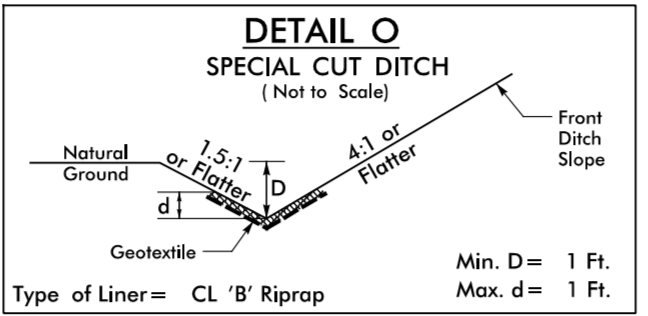
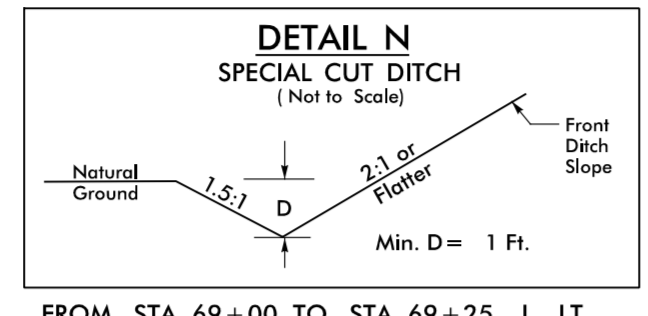
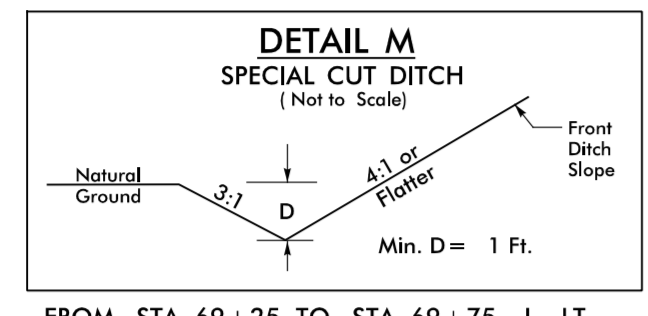
-L-
 PI Sta 52+69.61
 $\Delta = 57' 57'' 13.8'' (LT)$
 $D = 12' 43'' 56.6''$
 $L = 455.17'$
 $T = 249.20'$
 $R = 450.00'$
 $SE = 0.08$
 $DS = 40 \text{ MPH}$



FOR -L- PROFILE SEE SHEET 13



PROJECT REFERENCE NO. R-2409C	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 22606 DAVID C. WALLER	SEAL 24451 STACEY H. BAILEY
DocuSigned by: David C. Waller 10/22/2015	DocuSigned by: Stacey H. Bailey 10/23/2015

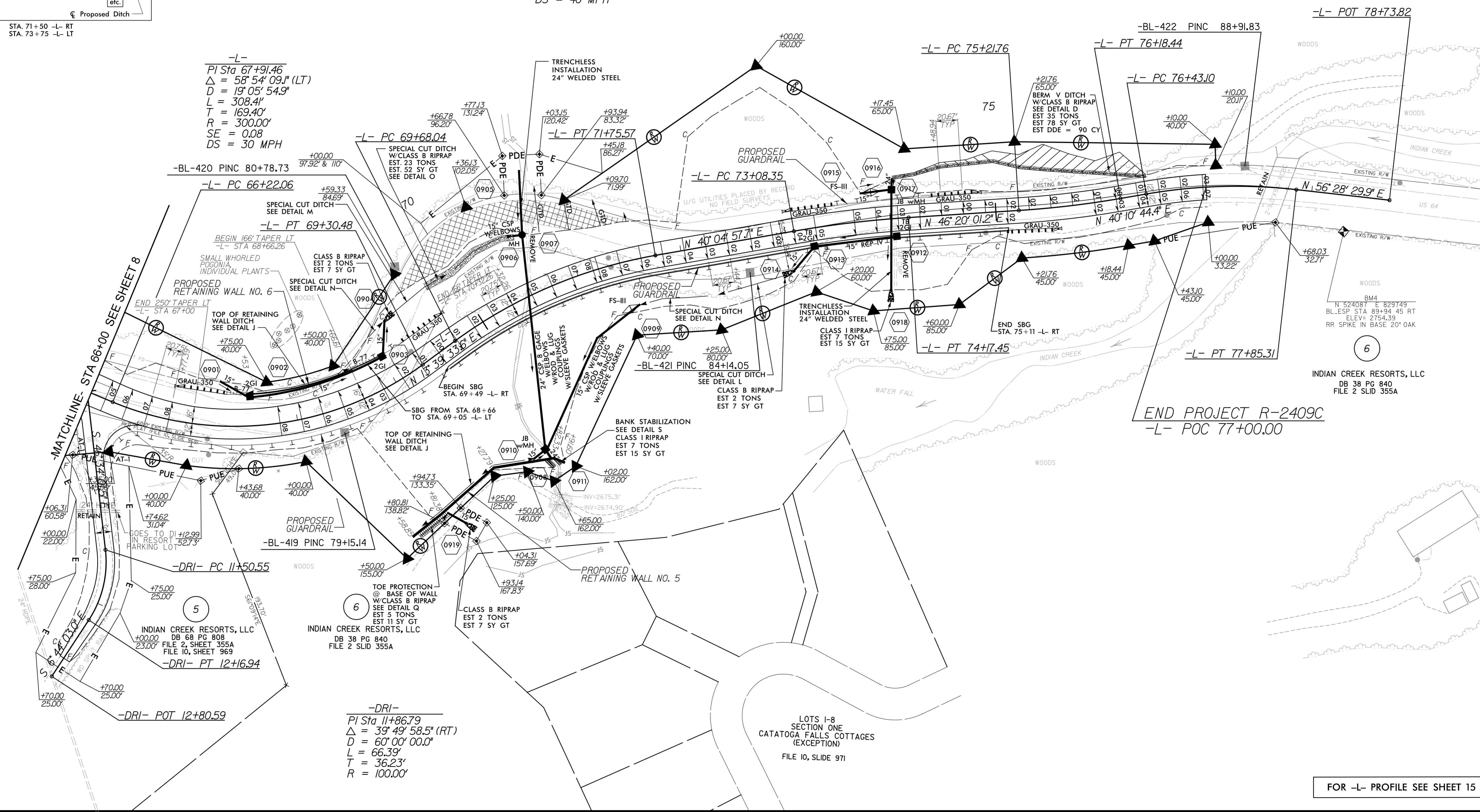


4
LBM INDUSTRIES, INC.
DB 428 PG 262
FILE 7 PG 435

-L-
PI Sta 73+62.95
Δ = 6' 15' 03.5" (RT)
D = 5' 43' 46.5"
L = 109.10'
T = 54.60'
R = 1,000.00'
SE = 0.06
DS = 40 MPH

-L-
PI Sta 75+70.15
Δ = 6' 09' 16.9" (LT)
D = 6' 21' 58.3"
L = 96.68'
T = 48.39'
R = 900.00'
SE = 0.06
DS = 40 MPH

-L-
PI Sta 77+4.69
Δ = 16' 17' 45.5" (RT)
D = 11' 27' 33.0"
L = 142.21'
T = 71.59'
R = 500.00'
SE = 0.08
DS = 40 MPH



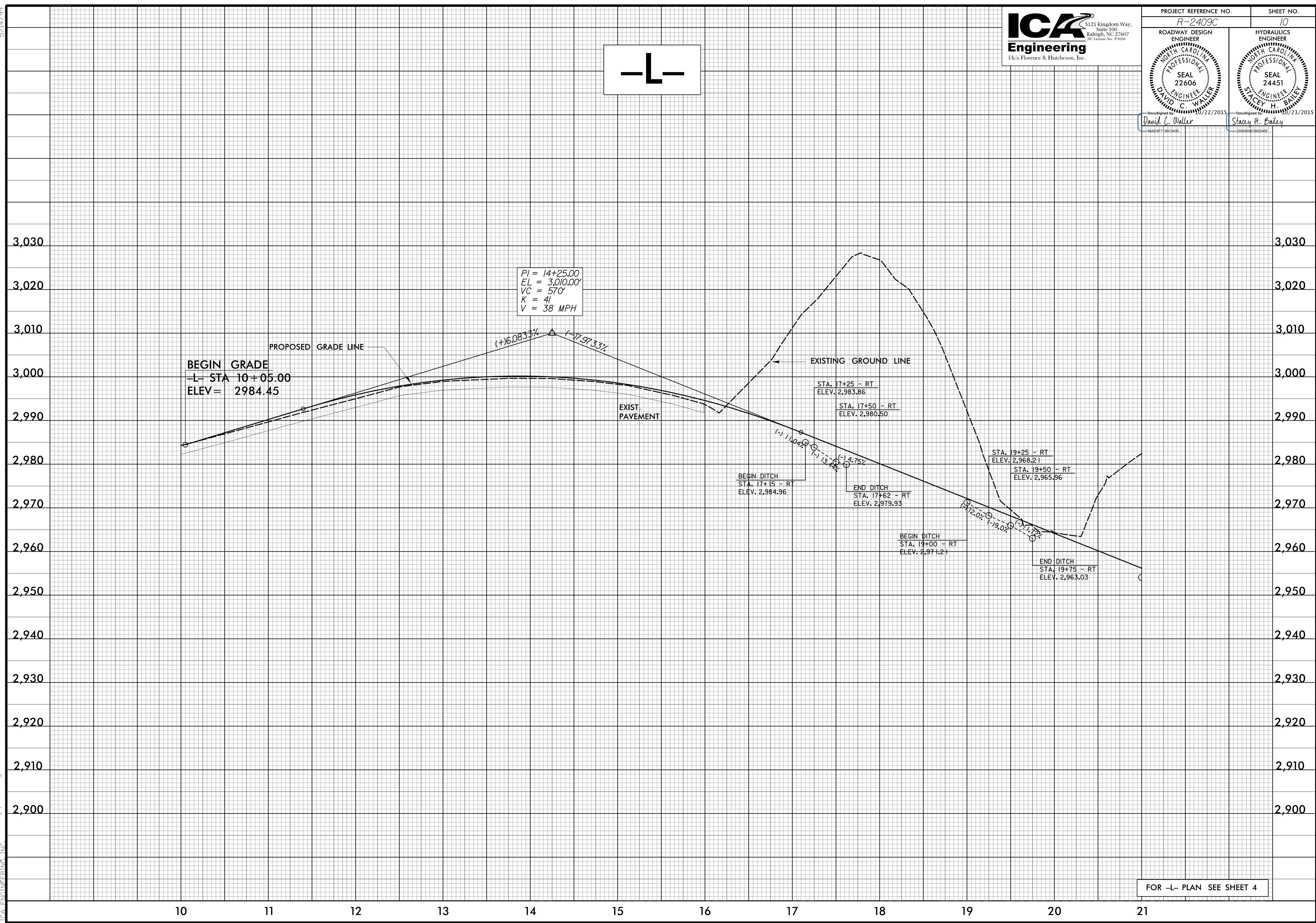
10/21/2015
P:\Projects\2409C_Rd4_psh_09.dgn
DAVID WALLER, INC.

5/14/19



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>10</i>
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER DocuSigned by: David C. Waller 09AD3F7196C3455 05/22/2015	HYDRAULICS ENGINEER STACEY H. BAILEY SEAL 24451 NORTH CAROLINA PROFESSIONAL ENGINEER DocuSigned by: Stacey H. Bailey 0B8888C39E646E 05/23/2015

-L-



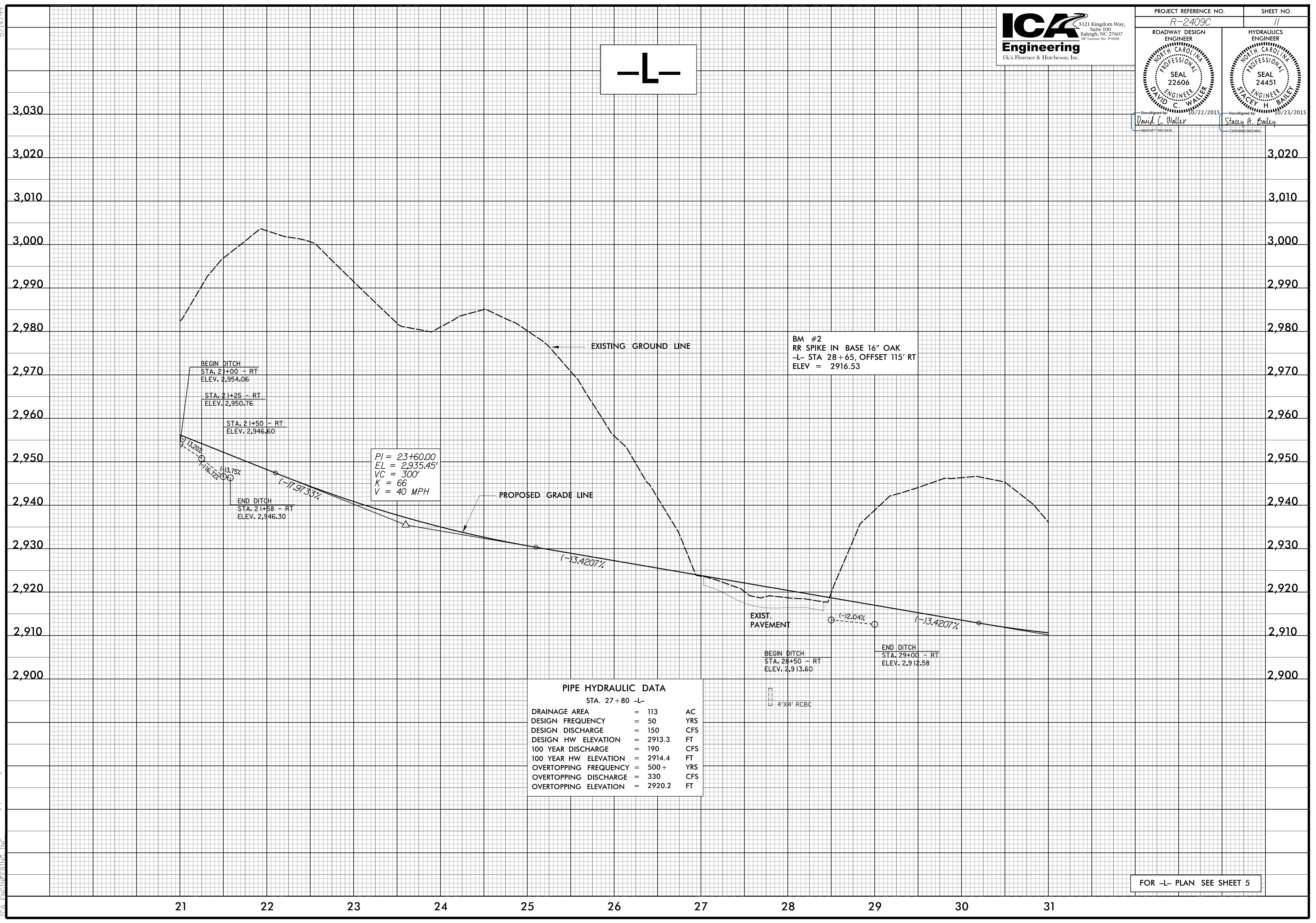
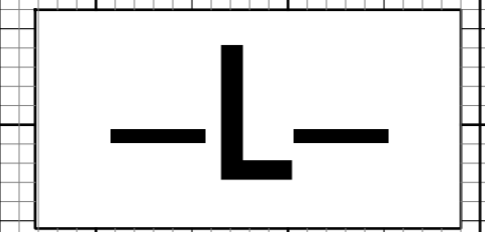
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FOR -L- PLAN SEE SHEET 4

5/14/19



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>11</i>
ROADWAY DESIGN ENGINEER DAVID C. WALLER PROFESSIONAL SEAL 22606 10/22/2015	HYDRAULICS ENGINEER STACEY H. BAILEY PROFESSIONAL SEAL 24451 10/23/2015



D:\2015\Projects\2409C\rdy\cf1.11.dgn

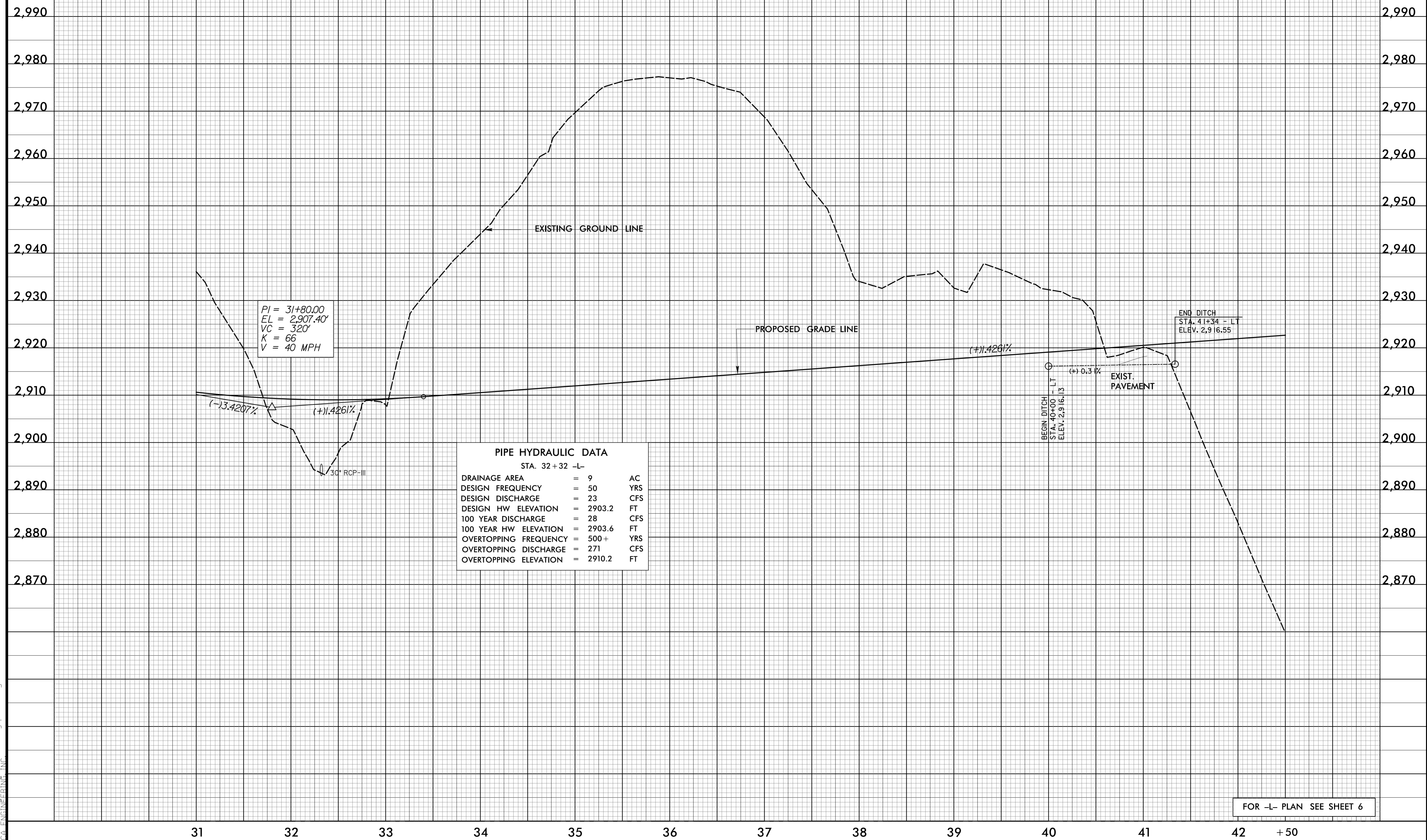
FOR -L- PLAN SEE SHEET 5

5/14/19



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>12</i>
ROADWAY DESIGN ENGINEER DAVID C. WALLER PROFESSIONAL SEAL 22606 NORTH CAROLINA ENGINEERS DocuSigned by: David C. Waller 05/14/2015 10:22:00 AM	HYDRAULICS ENGINEER STACEY H. BAILEY PROFESSIONAL SEAL 24451 NORTH CAROLINA ENGINEERS DocuSigned by: Stacey H. Bailey 05/14/2015 10:23:00 AM

-L-



$P_i = 31+80.00$
 $EL = 2,907.40'$
 $VC = 320'$
 $K = 66$
 $V = 40 \text{ MPH}$

PIPE HYDRAULIC DATA		
STA. 32+32 -L-		
DRAINAGE AREA	= 9	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 2903.2	FT
100 YEAR DISCHARGE	= 28	CFS
100 YEAR HW ELEVATION	= 2903.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 271	CFS
OVERTOPPING ELEVATION	= 2910.2	FT

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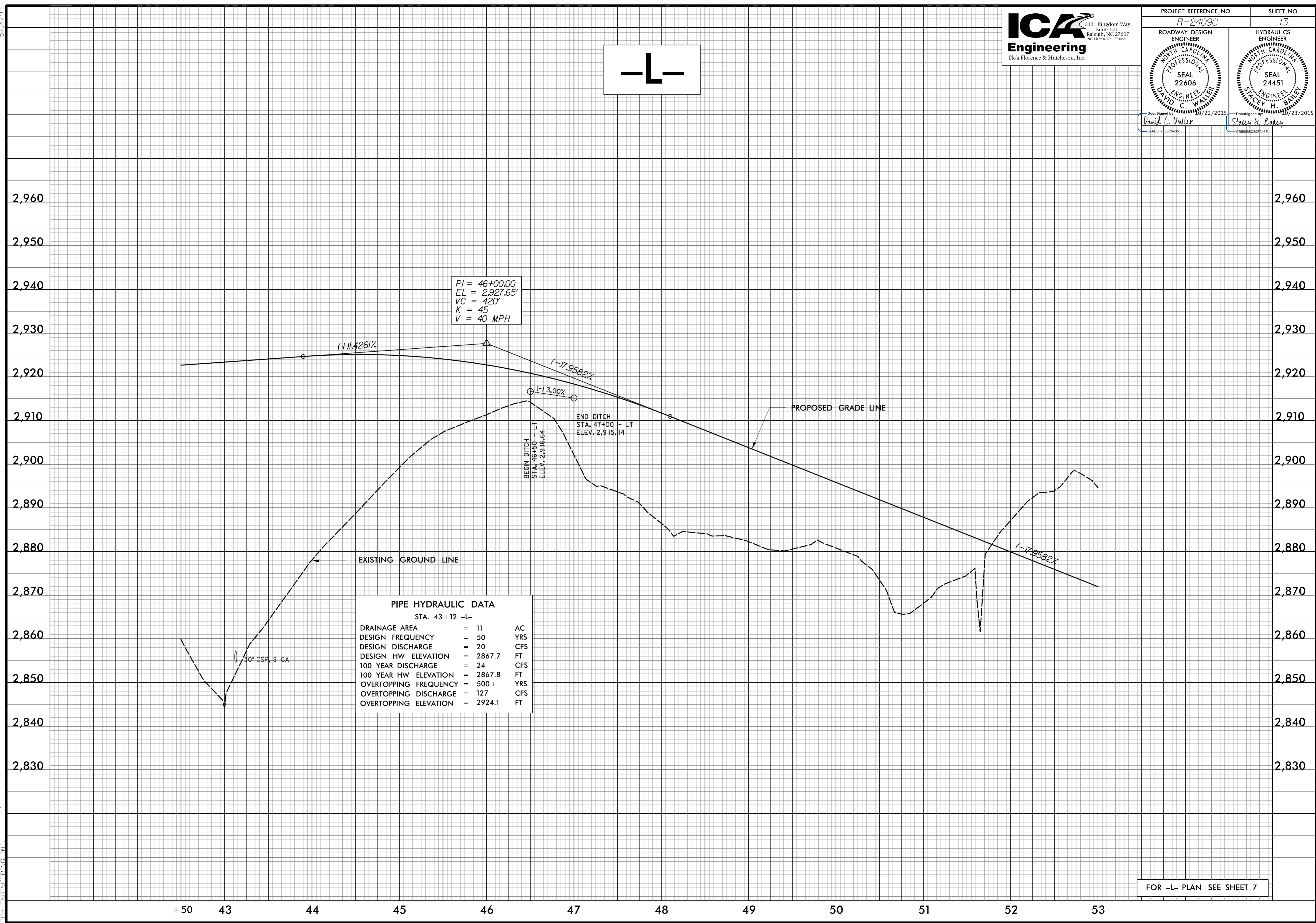
FOR -L- PLAN SEE SHEET 6

5/14/15



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>13</i>
ROADWAY DESIGN ENGINEER DAVID C. WALLER PROFESSIONAL SEAL 22606 NORTH CAROLINA ENGINEERS 10/22/2015	HYDRAULICS ENGINEER STACY H. BAILEY PROFESSIONAL SEAL 24451 NORTH CAROLINA ENGINEERS 10/23/2015

-L-



$PI = 46+00.00$
 $EL = 2,927.65'$
 $VC = 420'$
 $K = 45$
 $V = 40 \text{ MPH}$

BEGIN DITCH
 STA. 46+50 - LT
 ELEV. 2,916.64

END DITCH
 STA. 47+00 - LT
 ELEV. 2,915.14

PIPE HYDRAULIC DATA
STA. 43+12 -L-

DRAINAGE AREA	= 11	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 20	CFS
DESIGN HW ELEVATION	= 2867.7	FT
100 YEAR DISCHARGE	= 24	CFS
100 YEAR HW ELEVATION	= 2867.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 127	CFS
OVERTOPPING ELEVATION	= 2924.1	FT

30" CSP, 8' GA.

FOR -L- PLAN SEE SHEET 7

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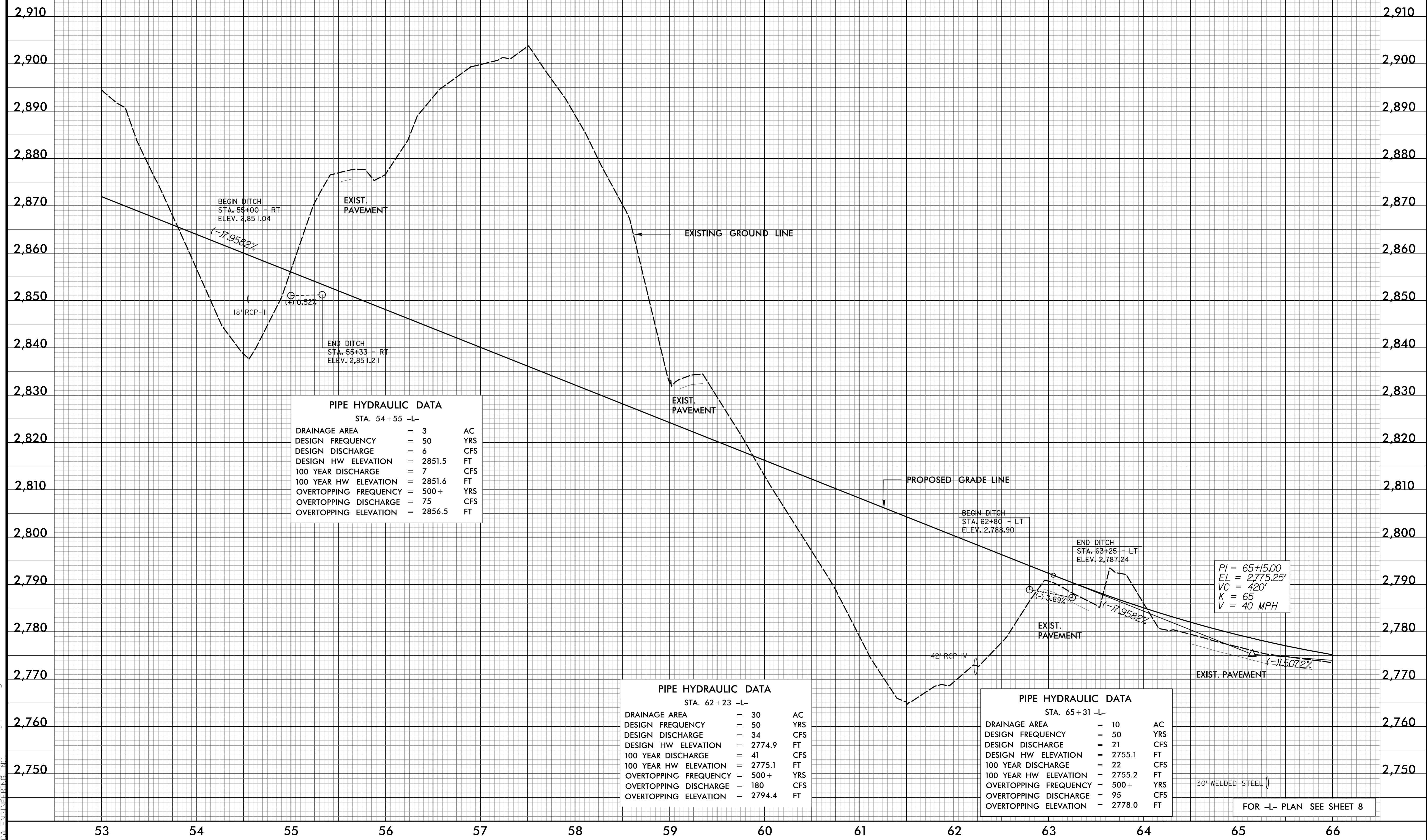
5/14/19



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>14</i>
ROADWAY DESIGN ENGINEER <i>DAVID C. WALLER</i>	HYDRAULICS ENGINEER <i>STACEY H. BAILEY</i>
PROFESSIONAL SEAL 22606 DAVID C. WALLER	PROFESSIONAL SEAL 24451 STACEY H. BAILEY
DocuSigned by: <i>David C. Waller</i> 05/14/2015 10:22:23 AM	DocuSigned by: <i>Stacey H. Bailey</i> 05/14/2015 10:23:23 AM

-L-

BM #3
RR SPIKE IN BASE 12" OAK
-L- STA 56+03, OFFSET 372' RT
ELEV = 2866.40



PIPE HYDRAULIC DATA
STA. 54+55 -L-

DRAINAGE AREA	= 3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6	CFS
DESIGN HW ELEVATION	= 2851.5	FT
100 YEAR DISCHARGE	= 7	CFS
100 YEAR HW ELEVATION	= 2851.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 75	CFS
OVERTOPPING ELEVATION	= 2856.5	FT

PIPE HYDRAULIC DATA
STA. 62+23 -L-

DRAINAGE AREA	= 30	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 34	CFS
DESIGN HW ELEVATION	= 2774.9	FT
100 YEAR DISCHARGE	= 41	CFS
100 YEAR HW ELEVATION	= 2775.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 180	CFS
OVERTOPPING ELEVATION	= 2794.4	FT

PIPE HYDRAULIC DATA
STA. 65+31 -L-

DRAINAGE AREA	= 10	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 21	CFS
DESIGN HW ELEVATION	= 2755.1	FT
100 YEAR DISCHARGE	= 22	CFS
100 YEAR HW ELEVATION	= 2755.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 95	CFS
OVERTOPPING ELEVATION	= 2778.0	FT

PI = 65+15.00
EL = 2,775.25'
VC = 420'
K = 65
V = 40 MPH

30" WELDED STEEL

FOR -L- PLAN SEE SHEET 8

D:\2015\Projects\2409C\rdw\p14.dgn

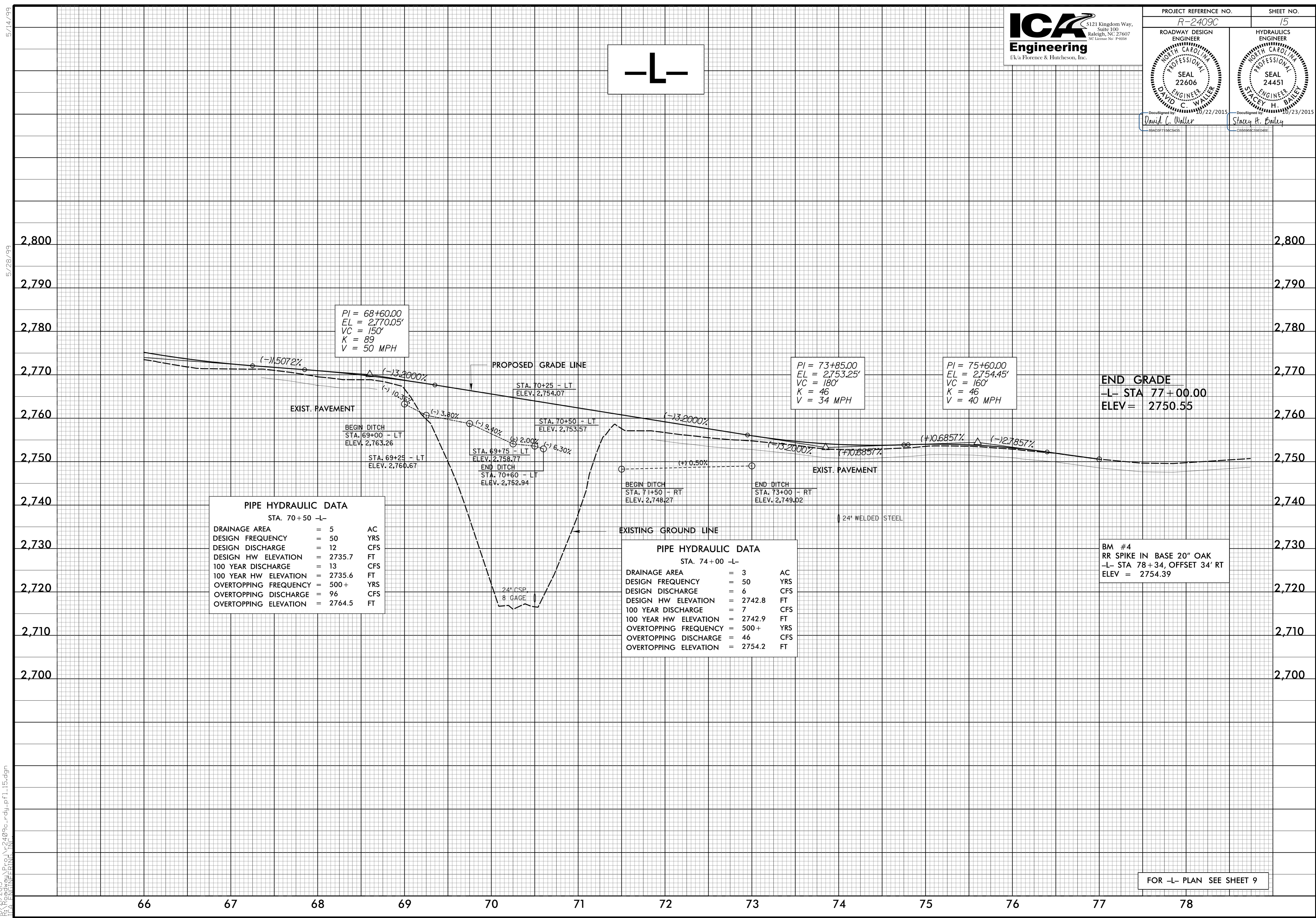
5/14/99

5/28/99



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>15</i>
ROADWAY DESIGN ENGINEER <i>DAVID C. WALLER</i>	HYDRAULICS ENGINEER <i>STACEY H. BAILEY</i>
PROFESSIONAL SEAL 22606 DAVID C. WALLER 10/22/2015	PROFESSIONAL SEAL 24451 STACEY H. BAILEY 10/23/2015

-L-



$PI = 68+60.00$
 $EL = 2,770.05'$
 $VC = 150'$
 $K = 89$
 $V = 50 \text{ MPH}$

$PI = 73+85.00$
 $EL = 2,753.25'$
 $VC = 180'$
 $K = 46$
 $V = 34 \text{ MPH}$

$PI = 75+60.00$
 $EL = 2,754.45'$
 $VC = 160'$
 $K = 46$
 $V = 40 \text{ MPH}$

PIPE HYDRAULIC DATA		
STA. 70+50 -L-		
DRAINAGE AREA	= 5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 2735.7	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 2735.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 96	CFS
OVERTOPPING ELEVATION	= 2764.5	FT

PIPE HYDRAULIC DATA		
STA. 74+00 -L-		
DRAINAGE AREA	= 3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6	CFS
DESIGN HW ELEVATION	= 2742.8	FT
100 YEAR DISCHARGE	= 7	CFS
100 YEAR HW ELEVATION	= 2742.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 46	CFS
OVERTOPPING ELEVATION	= 2754.2	FT

BM #4
 RR SPIKE IN BASE 20" OAK
 -L- STA 78+34, OFFSET 34' RT
 ELEV = 2754.39

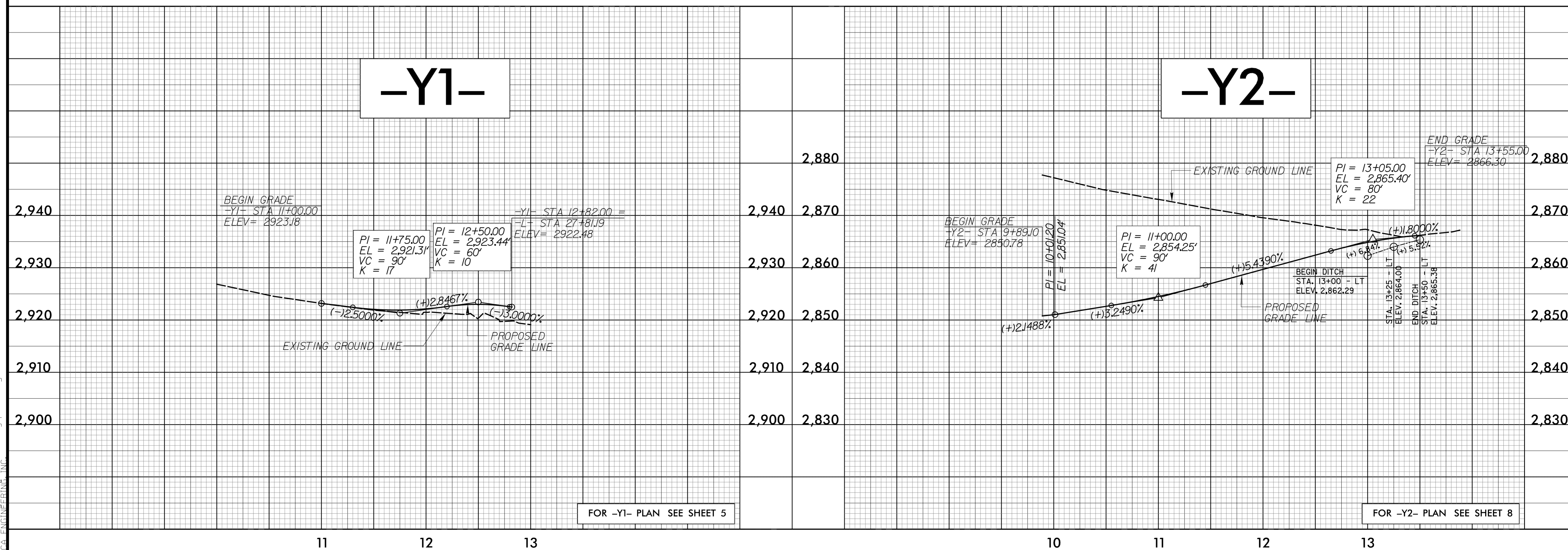
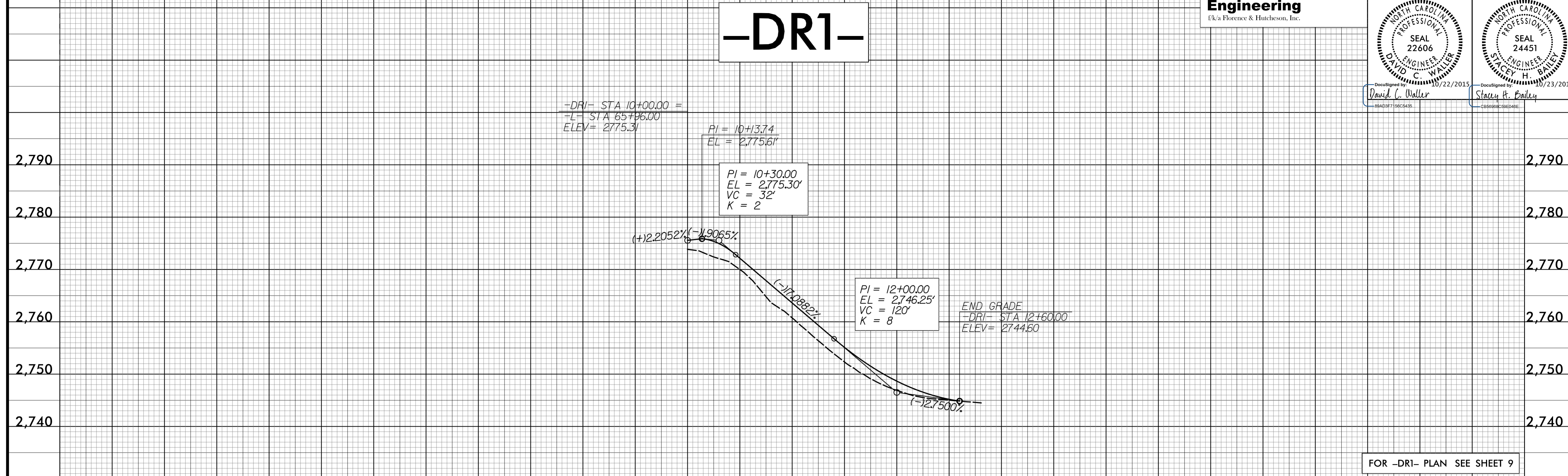
FOR -L- PLAN SEE SHEET 9

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5/28/09



PROJECT REFERENCE NO. R-2409C	SHEET NO. 16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 22606 DAVID C. WALLER	SEAL 24451 STACEY H. BAILEY
DocuSigned by: David C. Waller 05/22/2015 #B4DF715E24E5	DocuSigned by: Stacey H. Bailey 05/23/2015 #B58908C5E646E



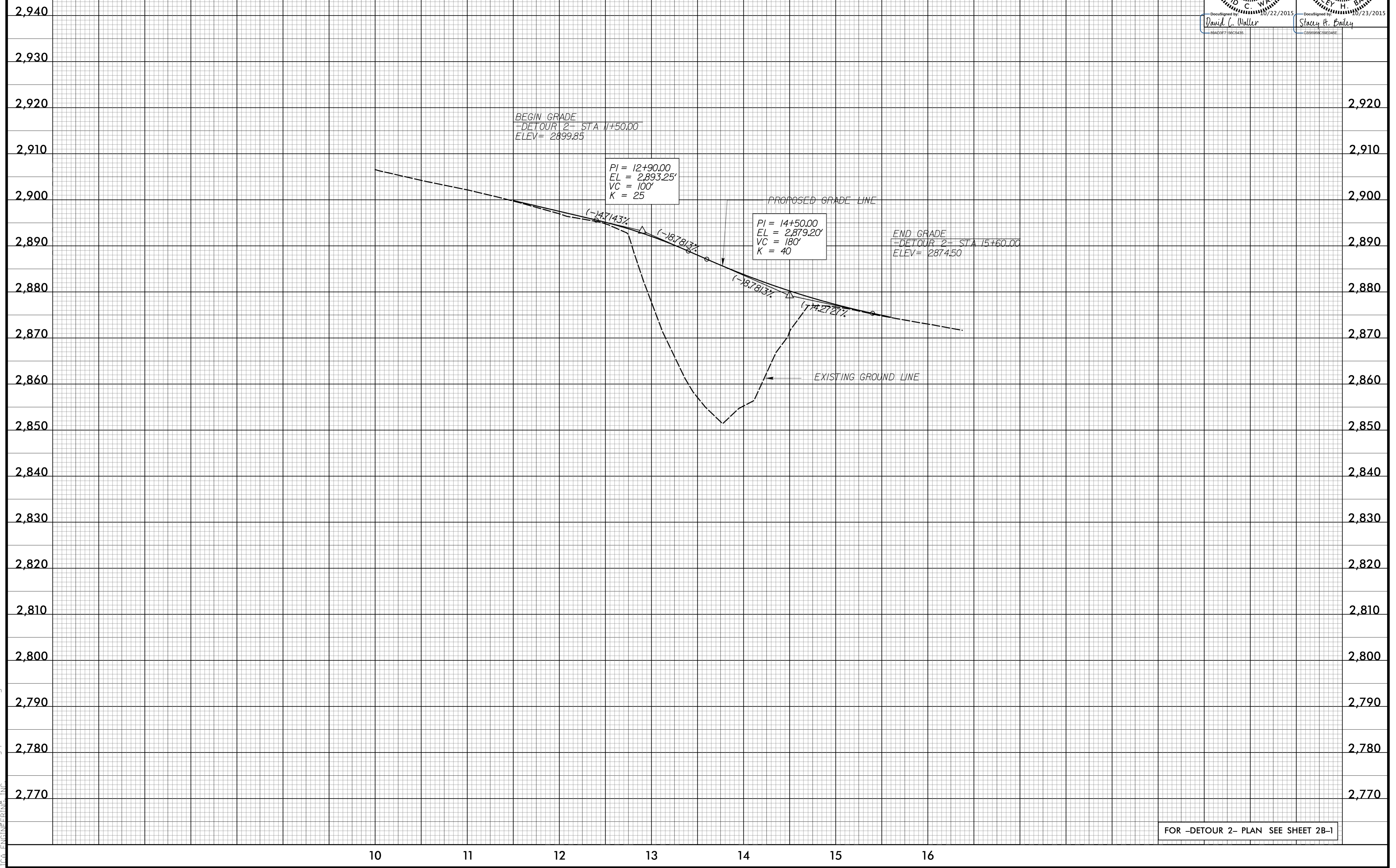
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5/14/19



PROJECT REFERENCE NO. R-2409C	SHEET NO. 17
ROADWAY DESIGN ENGINEER DAVID C. WALLER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEER DocuSigned by: David C. Waller #BAPDF156C345 02/22/2015	HYDRAULICS ENGINEER STACEY H. BAILEY SEAL 24451 NORTH CAROLINA PROFESSIONAL ENGINEER DocuSigned by: Stacey H. Bailey #BAPDF156C345 02/23/2015

-DETOUR 2-



FOR -DETOUR 2- PLAN SEE SHEET 2B-1

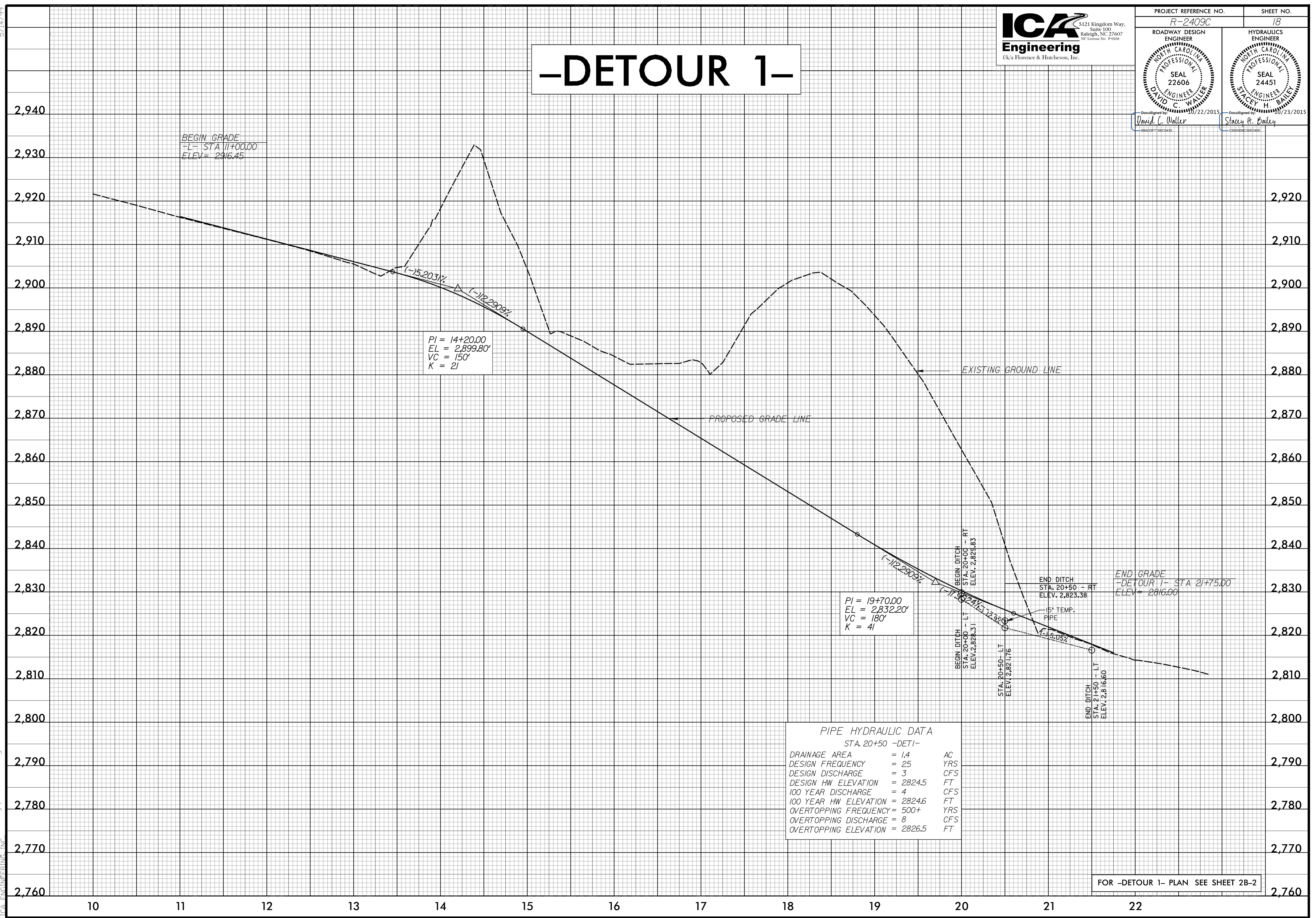
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5/14/19



PROJECT REFERENCE NO. <i>R-2409C</i>	SHEET NO. <i>18</i>
ROADWAY DESIGN ENGINEER <i>DAVID C. WALLER</i> SEAL 22606 PROFESSIONAL ENGINEER NORTH CAROLINA 10/22/2015	HYDRAULICS ENGINEER <i>STACEY H. BAILEY</i> SEAL 24451 PROFESSIONAL ENGINEER NORTH CAROLINA 10/23/2015

-DETOUR 1-



D:\2015\Projects\2409C\2409C_rdy.plt.dwg

FOR -DETOUR 1- PLAN SEE SHEET 2B-2