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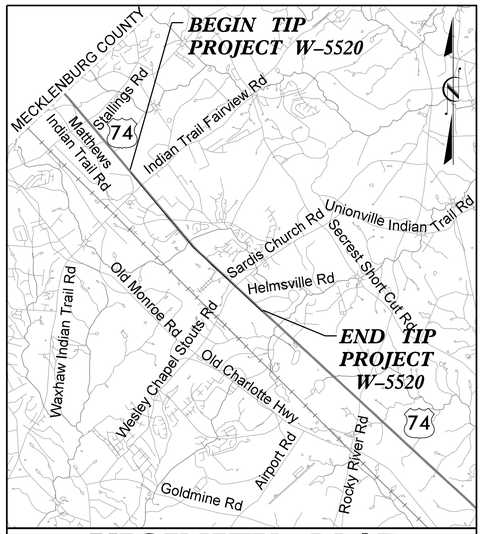
09/08/99

TIP PROJECT: W-5520

CONTRACT: C203788

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See 1C Sheet Series For Survey Control



VICINITY MAP

NOT TO SCALE

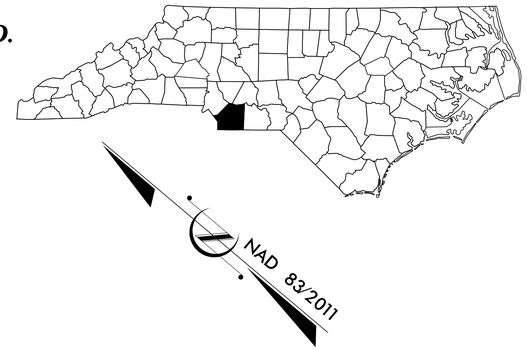
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

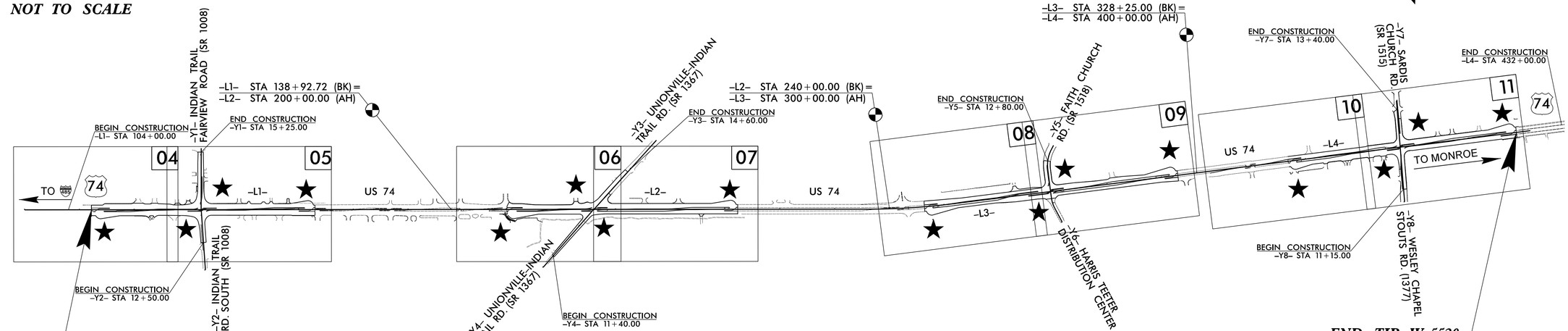
UNION COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5520	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50092.1.FS1	HSIP-0074(156)	P.E.
50092.2.1	HSIP-0074(156)	R/W & UTIL
50092.3.1	HSIP-0074(156)	CONSTRUCTION

LOCATION: US 74
FROM 1100 FEET WEST OF INDIAN TRAIL-FAIRVIEW ROAD TO 1200 FEET EAST OF SARDIS CHURCH ROAD.
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, AND RETAINING WALL



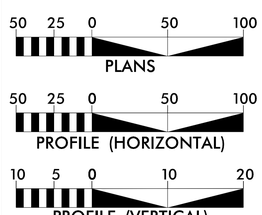


THIS PROJECT USES NCDOT R-R-R GUIDELINES
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

★ PROPOSED SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2012 = 53,000
ADT 2035 = N/A
K = 7.3 %
D = 53 %
T = 10 % *
V = 60 MPH
* TTST = 6% DUAL 4%
FUNC CLASS = PRINCIPAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5520 = 2.471 MILES
TOTAL LENGTH TIP PROJECT W-5520 = 2.471 MILES

PLANS PREPARED BY:

DRMP ENGINEERS · PLANNERS · SCIENTISTS
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289
NC LICENSE NO. C-2213

FOR DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FEBRUARY 24, 2016
LETTING DATE: APRIL 18, 2017

JAMES E. BECK, P.E.
PROJECT ENGINEER
MICHAEL D. HAGE, P.E.
PROJECT DESIGN ENGINEER
NCDOT CONTACT:
TIM BOLAND, P.E.
DIVISION 10 PROJECT MANAGER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027876 ENGINEER RANA STANSELL
Rana Stansell P.E.
SIGNATURE:
2/1/2017

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK
James E. Beck P.E.
SIGNATURE:
2/1/2017

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nwright

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-5520	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK

2/14/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS 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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE UNION COUNTY, DUKE ENERGY,

UNION POWER, TIME WARNER CABLE, WINDSTREAM, PIEDMONT NATURAL GAS (PNG)

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 OTHERS.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

EFF. 01-17-2012
REV. 02-29-2016

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
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.04	Method of Obtaining Superelevation - Two Lane Pavement
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	
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
840.14	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
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide 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
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
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
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
852.06	Method for Placement of Drop Inlets in Concrete Islands
852.10	Median Construction - with Curb and Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

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04/06/15

PROJECT REFERENCE NO.	SHEET NO.
W-5520	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

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 (EIP)
- Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- 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)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign (S)
- Well (W)
- Small Mine
- 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 (FLOW)
- False Sump

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (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 C/A 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 (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
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (HH)
- U/G Telephone Cable LOS B (S.U.E.*) (T)
- U/G Telephone Cable LOS C (S.U.E.*) (T)
- U/G Telephone Cable LOS D (S.U.E.*) (T)
- U/G Telephone Conduit LOS B (S.U.E.*) (TC)
- U/G Telephone Conduit LOS C (S.U.E.*) (TC)
- U/G Telephone Conduit LOS D (S.U.E.*) (TC)
- U/G Fiber Optics Cable LOS B (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS C (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS D (S.U.E.*) (T FO)

WATER:

- Water Manhole (W)
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) (W)
- U/G Water Line LOS C (S.U.E*) (W)
- U/G Water Line LOS D (S.U.E*) (W)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (C)
- TV Tower
- U/G TV Cable Hand Hole (HH)
- U/G TV Cable LOS B (S.U.E.*) (TV)
- U/G TV Cable LOS C (S.U.E.*) (TV)
- U/G TV Cable LOS D (S.U.E.*) (TV)
- U/G Fiber Optic Cable LOS B (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS C (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS D (S.U.E.*) (TV FO)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (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)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (?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 LOS A (S.U.E.*)
- Abandoned According to Utility Records (AATUR)
- End of Information (E.O.I.)

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
W-5520	1C-1
Location and Surveys	

SURVEY CONTROL SHEET W-5520

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO NATIONAL GEODETIC SURVEY CONTROL STATIONS, WHICH ARE BASED ON THE NAD83(2011 ADJUSTMENT) THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*

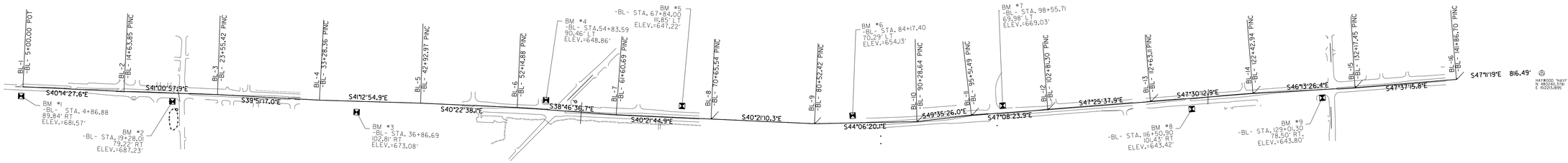
   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   W-5520_LS_GPSCALIB_08-15-14.HTML
   W-5520_LS_WGS84_08-15-14.TXT
   W-5520_LS_LOCAL_08-15-14.TXT
   W-5520_LS_CONTROL_08-15-14.TXT

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

© *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NAD 83/2011



L73
STA. 116+67.55
223.25 RT.
N 487476.0756
E 1500816.0391

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY THE NATIONAL GEODETIC SURVEY FOR MONUMENT "HAYWOOD" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 480240.3781(ft) EASTING: 1512213.1895(ft) ELEVATION: 652.40(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999845581
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HAYWOOD" TO -BL- 16 STATION 141+86.70 IS N47°11'18.75"W 816.4900'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Point	North	East	Elevation	"LI" Station	Offset	Description
L73	487476.0756	1500816.0391		116+67.55	3222.93' RT.	CONC. MONUMENT W/DISK STAMPED "L 73 1934 696.980"
BL1	490747.3982	1502255.1915	684.5575	101+00.00	11.16' RT.	SET 5/8 I.R. W/ DRMP INC. TRAV. CAP LB 2648
BL2	490011.6582	1502877.8432	691.4182	110+63.85	11.12' RT.	SET 5/8 I.R. W/ DRMP INC. TRAV. CAP LB 2648
BL3	489338.9458	1503462.9548	684.5384	119+55.34	0.98' LT.	SET 5/8 I.R. W/ DRMP INC. TRAV. CAP LB 2648
BL4	488592.0506	1504086.4541	673.7350	129+28.25	5.53' RT.	SET 5/8 I.R. W/ DRMP INC. TRAV. CAP LB 2648
BL5	487866.4311	1504722.0269	670.0686	138+92.72	10.51' LT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
Point	North	East	Elevation	"L2" Station	Offset	Description
BL6	487164.1204	1505319.2592	651.2661	209+21.91	13.14' LT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL7	486426.7779	1505911.6078	645.5444	218+67.41	10.99' RT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL8	485737.3175	1506497.6066	644.0330	227+72.26	9.03' RT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL9	484985.2399	1507136.6085	647.0008	OUT OF CHAIN		SET 5/8 I.R. WITH CAP TRAV. LB 2648
Point	North	East	Elevation	"L3" Station	Offset	Description
BL10	484284.2609	1507816.0366	667.9600	307+35.25	8.58' RT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL11	483945.3223	1508214.1551	674.0140	312+57.70	11.85' LT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL12	483448.9010	1508749.1162	656.1590	319+87.52	8.24' LT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
Point	North	East	Elevation	"L4" Station	Offset	Description
BL13	482784.6834	1509472.1360	641.3800	401+44.32	7.92' LT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL14	482122.7624	1510194.5870	639.0614	411+24.15	9.70' LT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL15	481448.5575	1510898.2313	644.3604	420+98.45	10.28' RT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
BL16	480795.2549	1511614.2174	648.5179	430+67.69	6.52' RT.	SET 5/8 IR. W/ DRMP INC. TRAV. CAP LB 2648
HAYI	480240.3781	1512213.1895		OUT OF CHAIN		CONCRETE MONUMENT WITH DISK STAMPED "HAYWOOD 1965"

NOTE: DRAWING NOT TO SCALE

BENCH MARKS

BM1 ELEVATION - 681.57
N 490,699.2680 E 1,502,178.1250
BL- STA 4+86.88 89.84 RT.
FND. BRIDGE SPIKE IN THE
E. FACE OF A 12" DIA. WOOD PP

BM2 ELEVATION - 687.23
N 489,609.4500 E 1,503,122.6850
BL- STA 19+28.01 79.2182 RT.
POURED MONUMENT W/DISK
STAMPED "DRMP INC. W_5520-BM2

BM3 ELEVATION - 673.08
N 488,254.7560 E 1,504,245.2180
BL- STA 36+86.69 102.8114 RT.
XCUT/OM\

BM4 ELEVATION - 648.86
N 487,011.2870 E 1,505,558.0680
BL- STA 54+83.59 95.4553 LT.
POURED MONUMENT W/DISK
STAMPED "DRMP INC. W_5520-BM4

BM5 ELEVATION - 647.22
N 486,024.2763 E 1,506,400.5044
BL- STA 67+84.00 111.8523 LT.
SET BRIDGE SPIKE IN PP

BM6 ELEVATION - 654.13
N 484,772.0916 E 1,507,441.0980
BL- STA 84+17.40 70.2938 LT.
SET X-CUT IN CONC. MEDIAN

BM7 ELEVATION - 669.03
N 483,789.6841 E 1,508,484.7496
BL- STA 98+55.71 69.9754 LT.
SET PMON W/ ALUM. DISK
"DRMP INC. W-5520 BM7"

BM8 ELEVATION - 643.42
N 482,447.9277 E 1,509,689.5458
BL- STA 116+50.90 101.4267 RT.
SET BRIDGE SPIKE IN PP

BM9 ELEVATION - 643.80
N 481,610.6016 E 1,510,615.6415
BL- STA. 129+01.30 78.5032 RT.
SET PMON W/ ALUM. DISK
"DRMP INC. W-5520 BM9"

11/2/2015 12:58:40 PM
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awright

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5520	IC-2
R/W SHEET NO.	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-L1-

TYPE	STATION	NORTH	EAST
POT	100+00.00	490830.9410	1502199.1107
POT	138+92.72	487859.3852	1504713.7006

-L2-

TYPE	STATION	NORTH	EAST
POT	200+00.00	487859.3852	1504713.7006
PC	238+01.24	484957.6617	1507169.1971
PT	240+00.00	484807.9900	1507299.9591

-L3-

TYPE	STATION	NORTH	EAST
PC	300+00.00	484807.9900	1507299.9591
PT	305+83.27	484393.5371	1507710.0724
POT	314+79.63	483786.2448	1508369.3600
POT	328+25.00	482876.5621	1509360.5645

-L4-

TYPE	STATION	NORTH	EAST
POT	400+00.00	482876.5439	1509360.5477
POT	430+67.70	480800.0563	1511618.6348

-Y1-

TYPE	STATION	NORTH	EAST
POT	10+00.00	489600.8494	1503240.0388
POT	15+60.00	489962.0487	1503667.9817

-Y2-

TYPE	STATION	NORTH	EAST
POT	10+00.00	489217.2717	1502845.7950
POT	15+50.00	489600.2421	1503240.5528

-Y3-

TYPE	STATION	NORTH	EAST
POT	10+00.00	486864.8464	1505555.2993
POT	18+50.00	486835.7787	1506404.8021

-Y4-

TYPE	STATION	NORTH	EAST
POT	10+00.00	486877.8079	1504853.6358
POT	17+00.00	486866.9124	1505553.5510

-Y5-

TYPE	STATION	NORTH	EAST
POT	10+00.00	483786.2448	1508369.3600
PC	12+05.00	483937.2795	1508507.9729
PT	13+87.09	484027.1153	1508663.1500
POT	14+33.10	484037.2160	1508708.0450

-Y6-

TYPE	STATION	NORTH	EAST
POT	10+00.00	483527.0229	1508225.3814
PC	11+42.54	483659.5732	1508277.8119
PT	12+43.16	483744.3662	1508330.9258
POT	13+00.00	483786.2448	1508369.3600

-Y7-

TYPE	STATION	NORTH	EAST
POT	10+00.00	481610.2705	1510737.5632
POT	14+25.00	481909.9999	1511038.8724

-Y8-

TYPE	STATION	NORTH	EAST
POT	10+00.00	481257.9460	1510382.7852
POT	15+00.00	481610.2705	1510737.5632

-DRV1-

TYPE	STATION	NORTH	EAST
POT	5+00.00	487466.2759	1505007.7127
PC	5+34.86	487434.5043	1504993.3759
PT	5+93.87	487377.1368	1504992.5675
POT	6+33.38	487340.6812	1505007.7967

-WALL1-

TYPE	STATION	NORTH	EAST
PC	5+00.00	487422.8016	1505001.7395
PT	5+60.33	487366.1318	1505013.2019
POT	6+60.27	487302.3239	1505090.1223
POT	7+01.87	487270.5657	1505116.9968

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	15+30.00	-31.23	489966.5676	1503624.9099
Y1	15+30.00	-40.00	489973.2661	1503619.2562
Y1	13+90.00	-40.00	489882.9663	1503512.2705
Y1	13+90.00	-56.00	489895.1932	1503501.9505
Y1	12+95.00	-56.00	489833.9183	1503429.3531
Y1	12+95.00	-42.00	489823.2197	1503438.3831
Y1	11+50.00	-42.00	489729.6949	1503327.5764
Y1	10+99.71	-71.54	489719.8309	1503270.0886

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y8	13+50.00	-36.44	481530.4287	1510605.4530
Y8	13+95.44	-91.08	481601.2184	1510599.1902

PERMANENT DRAINAGE EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L2	222+15.00	-100.03	486233.1537	1506220.8839
L2	222+15.00	-115.00	486242.8265	1506232.3144
L2	224+15.00	-115.00	486090.1542	1506361.5087
L2	224+15.00	-100.04	486080.4879	1506350.0858

PERMANENT DRAINAGE EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L4	426+50.00	-99.55	481156.0655	1511378.5576
L4	426+50.00	-110.00	481163.7592	1511385.6325
L4	427+40.00	-110.00	481102.8392	1511451.8803
L4	427+75.00	-130.00	481093.8699	1511491.1810
L4	428+30.83	-150.00	481070.7998	1511545.8156
L4	428+30.97	-99.50	481033.5362	1511511.7387

PERMANENT UTILITY EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	13+05.00	-29.95	489451.1440	1503043.8502
Y2	13+05.00	-54.00	489468.4042	1503027.1054
Y2	12+85.00	-54.00	489454.4780	1503012.7506
Y2	12+85.00	-29.94	489437.2090	1503029.5040
Y2	12+85.00	30.06	489394.1445	1503071.2826
Y2	12+85.00	60.00	489372.6555	1503092.1299
Y2	13+05.00	55.00	489390.1704	1503103.0031
Y2	13+05.00	30.05	489408.0795	1503085.6288
Y2	12+25.82	55.00	489335.0397	1503046.1756
Y2	12+27.52	30.10	489354.0983	1503030.0549
Y2	12+05.00	55.00	489320.5394	1503031.2290
Y2	12+05.00	30.11	489338.4042	1503013.8977

PERMANENT UTILITY EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	14+17.00	-36.21	486886.7771	1505973.2937
Y3	13+97.02	-57.00	486908.2360	1505954.0374
Y3	14+17.00	-57.00	486907.5528	1505974.0046
Y3	13+97.43	-37.13	486888.3670	1505953.7677
Y3	13+05.00	-70.00	486924.3753	1505862.5147
Y3	12+85.00	-70.00	486925.0592	1505842.5264
Y3	12+85.00	-38.19	486893.2669	1505841.4385
Y3	13+05.00	-37.95	486892.3395	1505861.4185
Y3	13+33.32	29.03	486824.4344	1505887.4322
Y3	13+08.00	28.73	486825.5963	1505862.1365
Y3	13+08.00	50.00	486804.3429	1505861.4093
Y3	13+33.07	50.00	486803.4854	1505886.4672

BL1

POINT	DESC.	NORTH	EAST	ELEVATION	L1 STATION	OFFSET
BL1	SET 5/8 I.R. W/	490747.3982	1502255.1915	684.56	101+00.00	11.16 RT
BL2	SET 5/8 I.R. W/	490011.6582	1502877.8432	691.42	110+63.85	11.12 RT
BL3	SET 5/8 I.R. W/	489338.9458	1503462.9548	684.54	119+55.34	0.98 LT
BL4	SET 5/8 I.R. W/	488592.0506	1504086.4541	673.74	129+28.25	5.53 RT
BL5	SET 5/8 IR. W/	487866.4311	1504722.0269	670.07	138+92.72	10.91 LT

BL1

POINT	DESC.	NORTH	EAST	ELEVATION	L2 STATION	OFFSET
BL5	SET 5/8 IR. W/	487866.4311	1504722.0269	670.07	200+00.00	10.91 LT
BL6	SET 5/8 IR. W/	487164.1204	1505319.2592	651.27	209+21.91	13.14 LT
BL7	SET 5/8 IR. W/	486426.7779	1505911.6078	645.54	218+67.41	10.99 RT
BL8	SET 5/8 IR. W/	485737.3175	1506497.6066	644.03	227+72.26	9.03 RT
BL9	SET 5/8 I.R. W1	484985.2399	1507136.6085	647.00	237+59.14	7.06 RT

BL1

POINT	DESC.	NORTH	EAST	ELEVATION	L3 STATION	OFFSET
BL10	SET 5/8 IR. W/	484284.2609	1507816.0366	667.96	307+35.25	8.58 RT
BL11	SET 5/8 IR. W/	483945.3223	1508214.1551	674.01	312+57.70	11.85 LT
BL12	SET 5/8 IR. W/	483448.9010	1508749.1162	656.16	319+87.52	8.24 LT

BL1

POINT	DESC.	NORTH	EAST	ELEVATION	L4 STATION	OFFSET
BL13	SET 5/8 IR. W/	482784.6834	1509472.1360	641.38	401+44.32	7.92 LT
BL14	SET 5/8 IR. W/	482122.7624	1510194.5870	639.06	411+24.15	9.70 LT
BL15	SET 5/8 IR. W/	481448.5575	1510898.2313	644.36	420+98.45	10.28 RT
BL16	SET 5/8 IR. W/	480795.2549	1511614.2174	648.52	430+67.69	6.52 RT

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PROJECT REFERENCE NO.	SHEET NO.
W-5520	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026815 JAMES E. BECK 2/2/2017

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032896 CLARK S. MORRISON 2/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

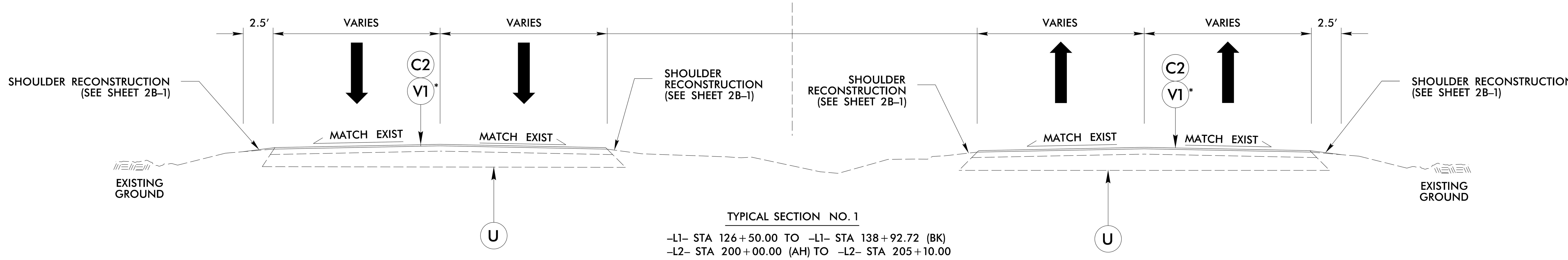
PLANS PREPARED BY: DRMP ENGINEERS • PLANNERS • SCIENTISTS

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	R5	CONCRETE MOUNTABLE MEDIAN (SEE SHEET No. 2C-3 FOR SPECIAL DETAILS).
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E3	PROP. APPROX. 11" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	S	4" CONCRETE SIDEWALK.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD IN EACH OF TWO LAYERS.	E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	T	EARTH MATERIAL.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.	R1	2'-6" CONCRETE CURB & GUTTER.	U	EXISTING PAVEMENT.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	4" CONCRETE ISLAND COVER.	V1	1½" MILLING.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R3	5" MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED).	V2	VARIABLE MILLING (MAXIMUM 2"). SEE SHEET No. 2B-1 FOR VARIABLE DEPTH MILLING DETAILS AND LOCATIONS.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1).

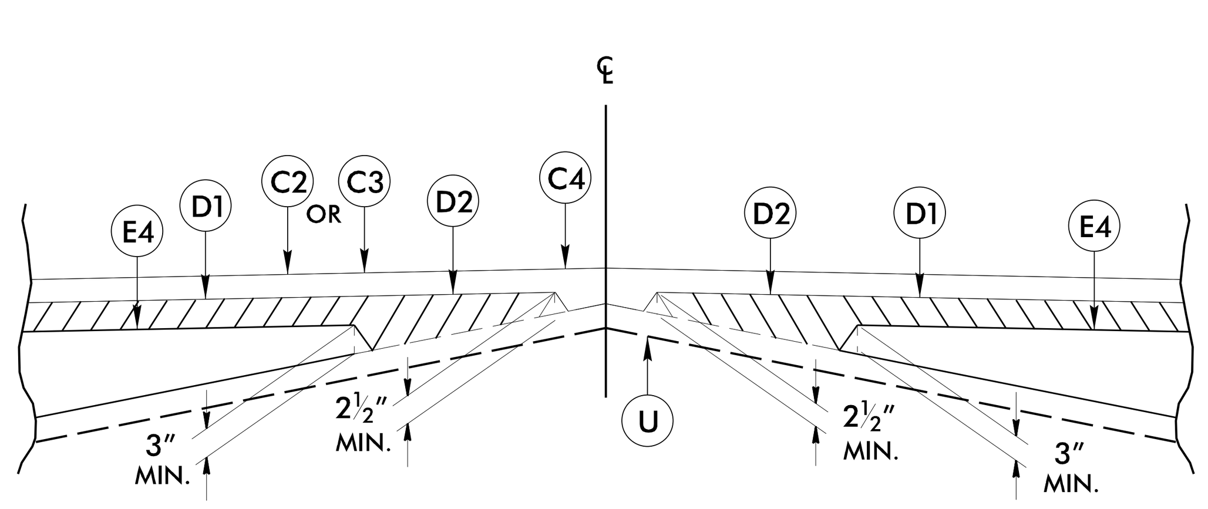
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



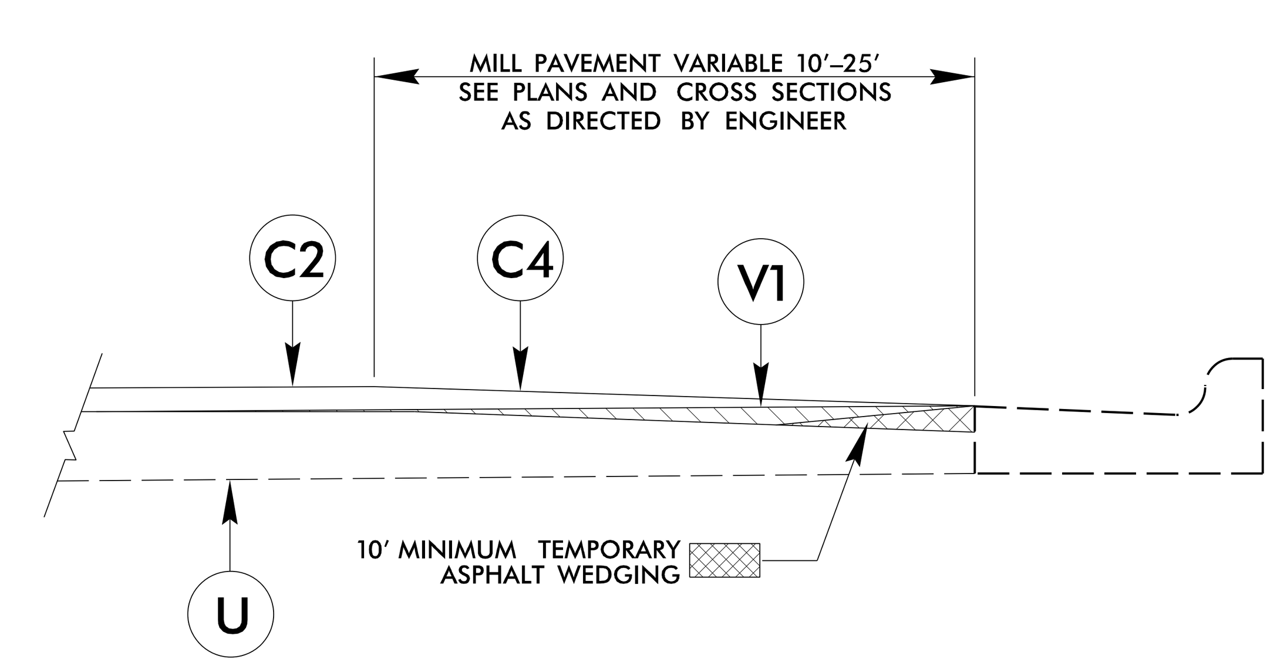
*NOTE: MILLING REQUIRED ADJACENT TO EXISTING CURB AND GUTTER

TYPICAL SECTION NO. 1

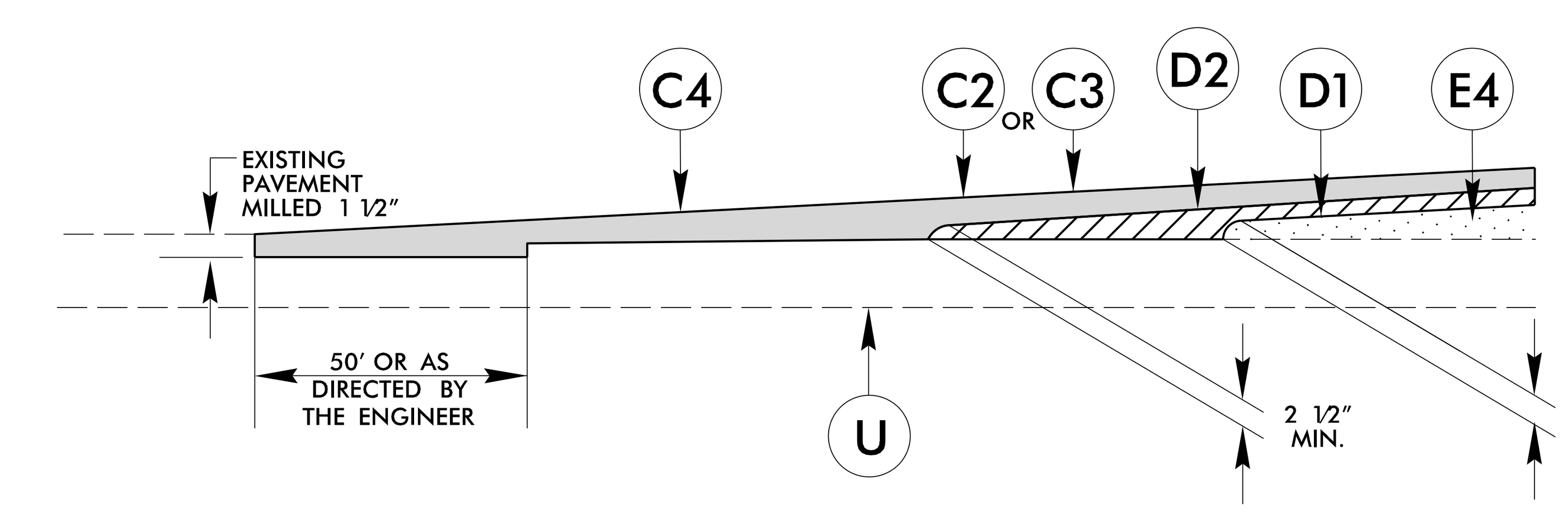
-L1- STA 126+50.00 TO -L1- STA 138+92.72 (BK)
-L2- STA 200+00.00 (AH) TO -L2- STA 205+10.00
-L2- STA 226+15.00 TO -L2- STA 240+00.00 (BK)
-L3- STA 300+00.00 (AH) TO -L3- 303+20.00
-L3- STA 326+50.00 TO -L3- STA 328+25.00 (BK)
-L4- STA 400+00.00 (AH) TO -L4- STA 401+20.00



STANDARD WEDGING DETAIL



MILLING DETAIL FOR ADJACENT TO EXISTING CURB



MILLING DETAIL FOR PROFILE CONNECTIONS

-L1- STA 106+10.00, -Y1- STA 15+25.00,
-Y2- STA 12+50.00, -Y3- STA 14+60.00,
-Y4- STA 11+40.00, -Y5- STA 12+80.00,
-Y7- STA 13+40.00, -Y8- STA 11+15.00,
-L4- STA 429+40.00

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2A-2

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 024918 ENGINEER JAMES E. BECK — 2/2/2017

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 047896 ENGINEER CLARK S. MORRISON — 2/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

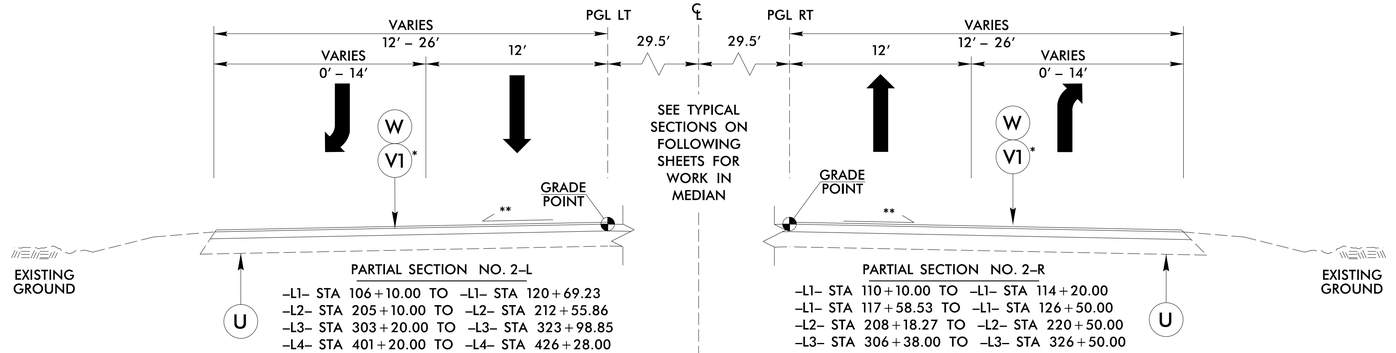
PLANS PREPARED BY:

DRMP

ENGINEERS · PLANNERS · SCIENTISTS

DRMP, INC.
1900 PARKWOOD CIRCLE, SUITE 320
CHARLOTTE, NC 28270
NC LICENSE NO: C-2213 • (704) 332-2289

–L1– US 74
–L2– US 74
–L3– US 74
–L4– US 74

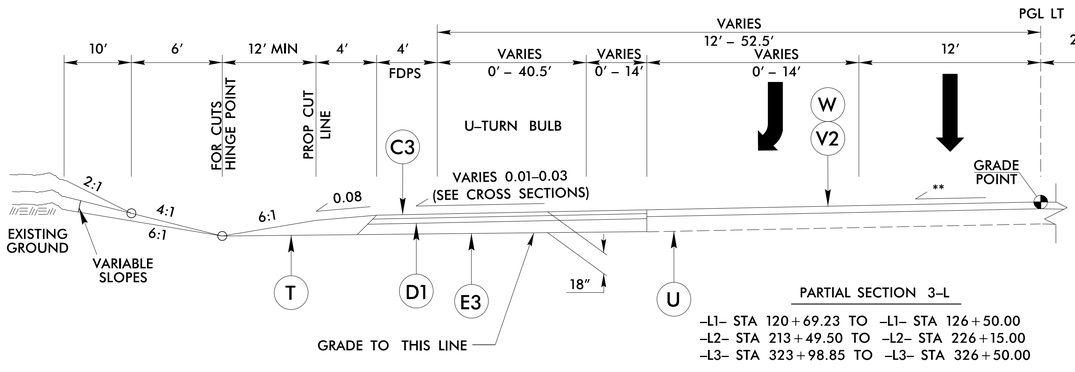


PARTIAL SECTION NO. 2–L

–L1– STA 106+10.00 TO –L1– STA 120+69.23
–L2– STA 205+10.00 TO –L2– STA 212+55.86
–L3– STA 303+20.00 TO –L3– STA 323+98.85
–L4– STA 401+20.00 TO –L4– STA 426+28.00

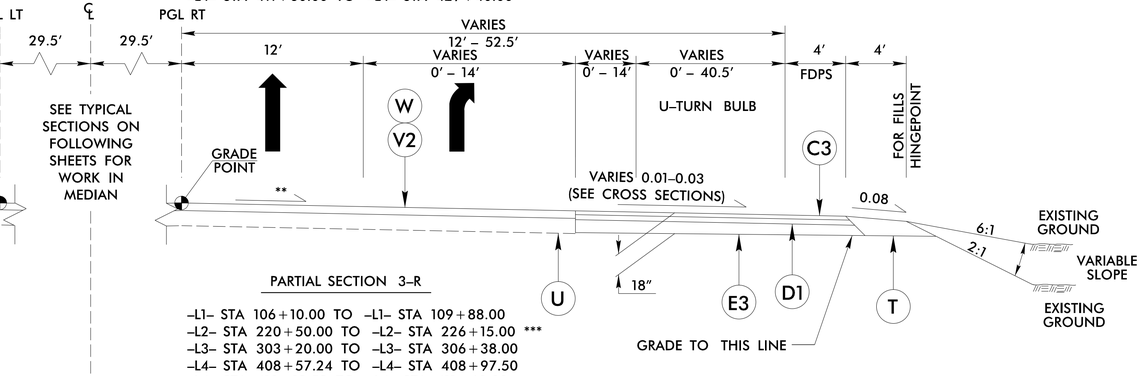
PARTIAL SECTION NO. 2–R

–L1– STA 110+10.00 TO –L1– STA 114+20.00
–L1– STA 117+58.53 TO –L1– STA 126+50.00
–L2– STA 208+18.27 TO –L2– STA 220+50.00
–L3– STA 306+38.00 TO –L3– STA 326+50.00
–L4– STA 401+20.00 TO –L4– STA 408+57.24
–L4– STA 411+60.00 TO –L4– STA 429+40.00



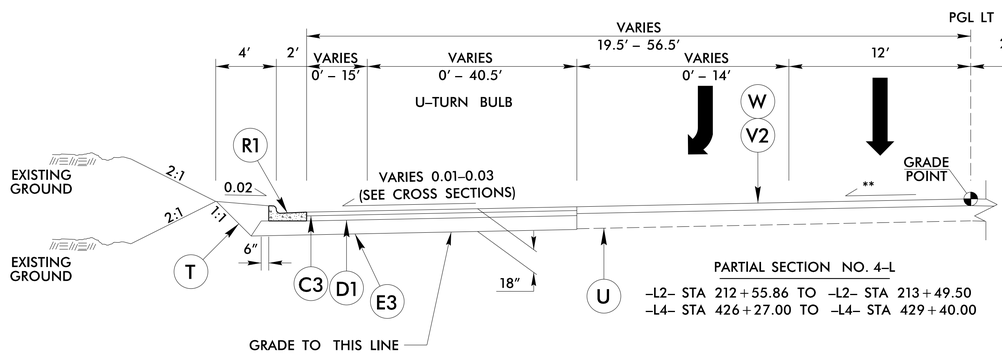
PARTIAL SECTION 3–L

–L1– STA 120+69.23 TO –L1– STA 126+50.00
–L2– STA 213+49.50 TO –L2– STA 226+15.00
–L3– STA 323+98.85 TO –L3– STA 326+50.00



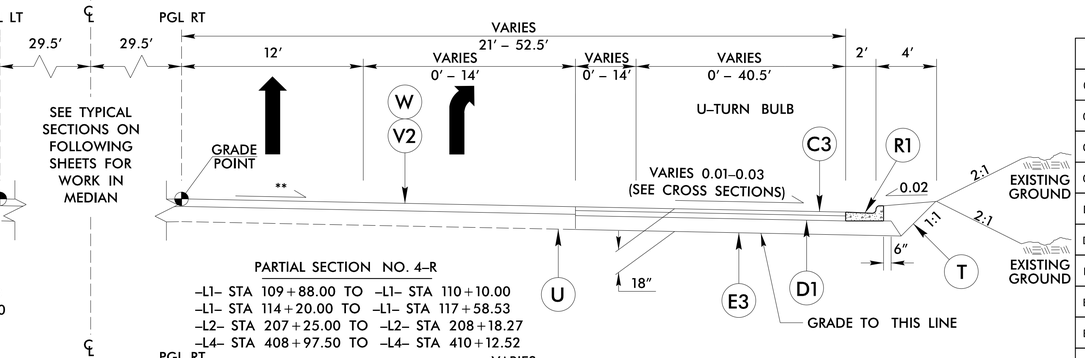
PARTIAL SECTION 3–R

–L1– STA 106+10.00 TO –L1– STA 109+88.00
–L2– STA 220+50.00 TO –L2– STA 226+15.00 ***
–L3– STA 303+20.00 TO –L3– STA 306+38.00
–L4– STA 408+57.24 TO –L4– STA 408+97.50
–L4– STA 410+12.52 TO –L4– STA 411+60.00



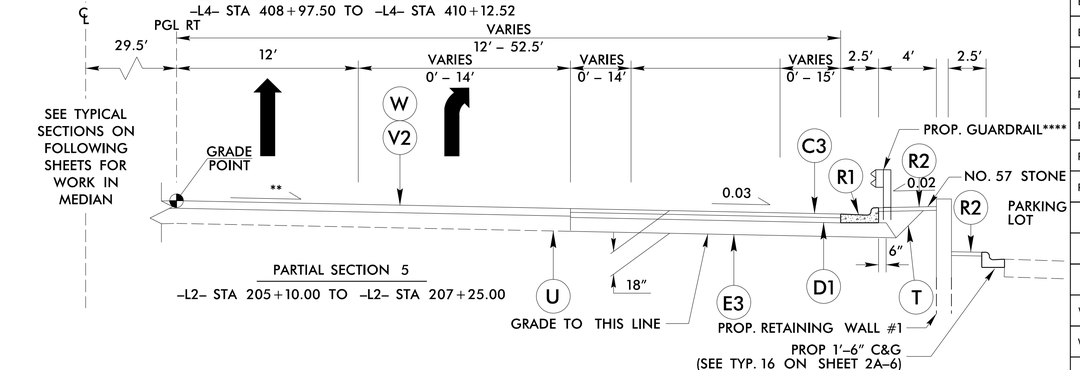
PARTIAL SECTION NO. 4–L

–L2– STA 212+55.86 TO –L2– STA 213+49.50
–L4– STA 426+27.00 TO –L4– STA 429+40.00



PARTIAL SECTION NO. 4–R

–L1– STA 109+88.00 TO –L1– STA 110+10.00
–L1– STA 114+20.00 TO –L1– STA 117+58.53
–L2– STA 207+25.00 TO –L2– STA 208+18.27
–L4– STA 408+97.50 TO –L4– STA 410+12.52



PARTIAL SECTION 5

–L2– STA 205+10.00 TO –L2– STA 207+25.00

*NOTE:	MILLING REQUIRED ADJACENT TO EXISTING CURB AND GUTTER
**NOTE:	L1 AND L2 PROP. CROSS SLOPE = 1.5% L3 AND L4 PROP. CROSS SLOPE = 2.0%
***NOTE:	MULTIPLE ASPHALT LIFTS REQUIRED IN THIS SECTION TO CORRECT CROSS SLOPE.
****NOTE:	6′–3″ POST SPACING W/ 8′ POSTS

PAVEMENT SCHEDULE — FINAL PAVEMENT DESIGN	
C1	3″ SF9.5A
C2	1½″ S9.5C
C3	3″ S9.5C
C4	VAR. S9.5C
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	11″ B25.0C
E4	VAR. B25.0C
R1	2′-6″ C & G
R2	4″ ISLAND COVER
R3	5″ MCI (SURF.)
R4	5″ MCI (KEYED)
R5	MOUNTABLE MEDIAN
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½″ MILLING
V2	VAR. MILLING
W	WEDGING

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2A-3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026815 ENGINEER JAMES E. BECK

2/2/2017

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042896 ENGINEER CLARK S. MORRISON

2/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

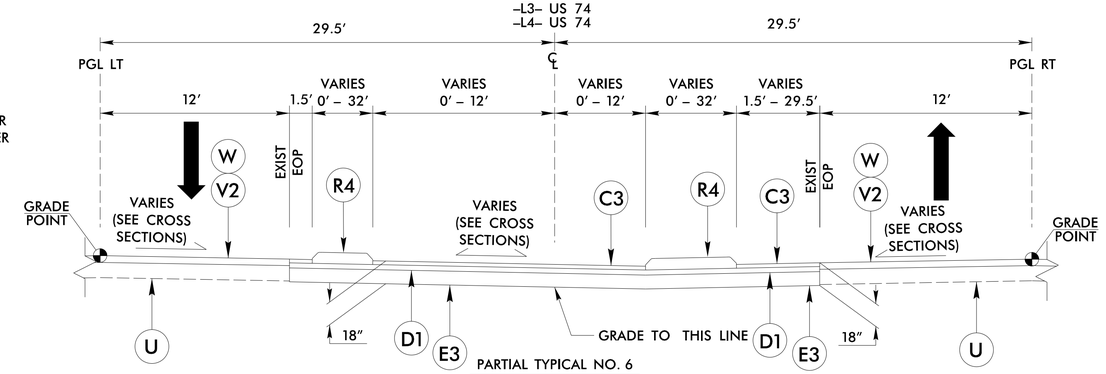
DRMP

ENGINEERS · PLANNERS · SCIENTISTS

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO: C-2213 • (704) 332-2289

SEE TYPICAL SECTION ON SHEET 2A–2 FOR WORK IN OUTER LANES AND SHOULDERS

–L1– US 74
–L2– US 74
–L3– US 74
–L4– US 74

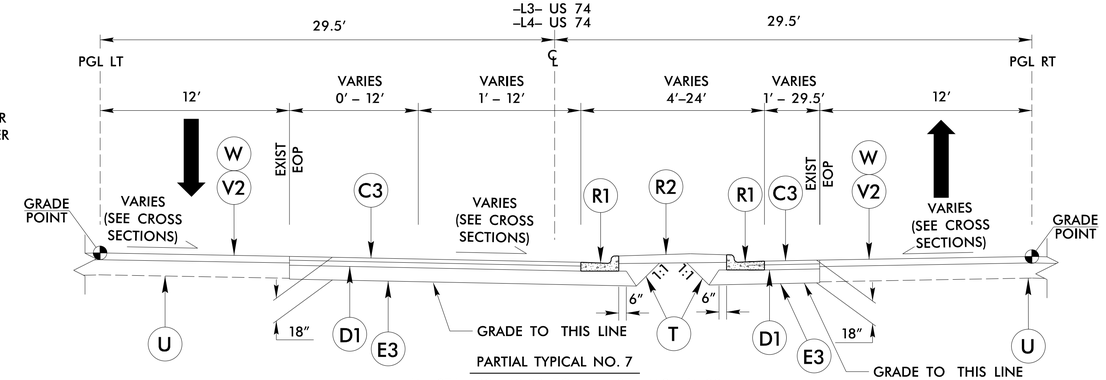


PARTIAL TYPICAL NO. 6

–L1– STA 106+30.00 TO	–L1– STA 108+43.00	–L3– STA 311+00.00 TO	–L3– STA 316+00.00
–L1– STA 113+65.00 TO	–L1– STA 118+50.00	–L3– STA 324+50.00 TO	–L3– STA 326+50.00
–L1– STA 124+57.00 TO	–L1– STA 126+50.00	–L4– STA 404+45.00 TO	–L4– STA 405+40.00
–L2– STA 205+10.00 TO	–L2– STA 214+25.00	–L4– STA 408+40.00 TO	–L4– STA 409+60.00
–L2– STA 224+95.00 TO	–L2– STA 226+15.00	–L4– STA 417+25.00 TO	–L4– STA 420+50.00
–L3– STA 303+20.00 TO	–L3– STA 304+50.00	–L4– STA 427+50.00 TO	–L4– STA 429+40.00

SEE TYPICAL SECTION ON SHEET 2A–2 FOR WORK IN OUTER LANES AND SHOULDERS

–L1– US 74
–L2– US 74
–L3– US 74
–L4– US 74

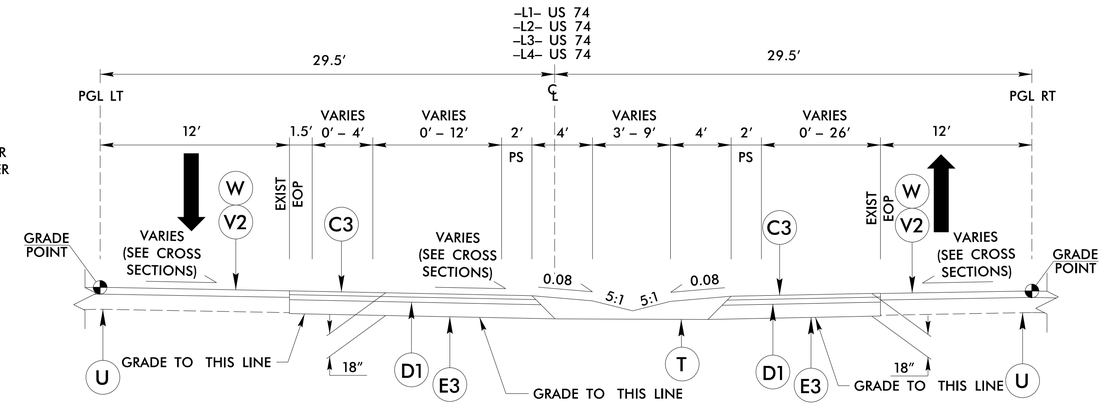


PARTIAL TYPICAL NO. 7

–L1– STA 108+43.00 TO	–L1– STA 113+65.00
–L1– STA 118+50.00 TO	–L1– STA 124+57.00
–L3– STA 304+50.00 TO	–L3– STA 305+07.00
–L4– STA 413+19.67 TO	–L4– STA 417+25.00
–L4– STA 420+50.00 TO	–L4– STA 427+50.00

SEE TYPICAL SECTION ON SHEET 2A–2 FOR WORK IN OUTER LANES AND SHOULDERS

–L1– US 74
–L2– US 74
–L3– US 74
–L4– US 74



PARTIAL TYPICAL NO. 8

–L2– STA 214+25.00 TO	–L2– STA 224+95.00
–L3– STA 305+09.00 TO	–L3– STA 311+00.00
–L3– STA 316+00.00 TO	–L3– STA 324+50.00
–L4– STA 401+20.00 TO	–L4– STA 404+45.00
–L4– STA 405+40.00 TO	–L4– STA 408+40.00
–L4– STA 409+60.00 TO	–L4– STA 413+19.67

*NOTE: SAWCUT EXISTING EDGE OF PAVEMENT 1′ FROM CONCRETE CURB AND GUTTER

PAVEMENT SCHEDULE *FINAL PAVEMENT DESIGN*	
C1	3″ SF9.5A
C2	1½″ S9.5C
C3	3″ S9.5C
C4	VAR. S9.5C
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	11″ B25.0C
E4	VAR. B25.0C
R1	2′-6″ C & G
R2	4″ ISLAND COVER
R3	5″ MCI (SURF.)
R4	5″ MCI (KEYED)
R5	MOUNTABLE MEDIAN
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½″ MILLING
V2	VAR. MILLING
W	WEDGING

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mwright

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2A-4

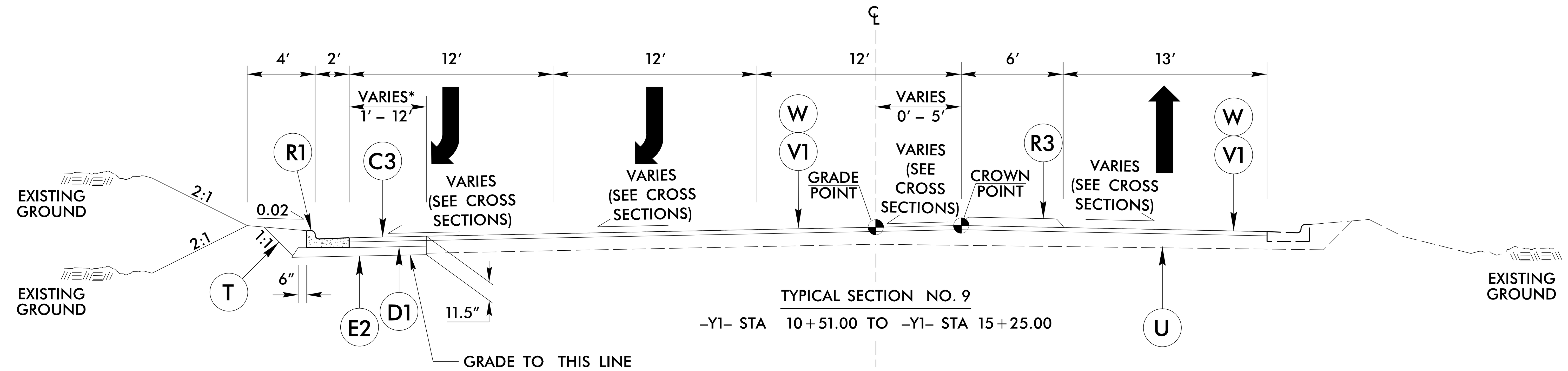
ROADWAY DESIGN ENGINEER — SEAL 026815, JAMES E. BECK, 2/2/2017

PAVEMENT DESIGN ENGINEER — SEAL 022896, CLARK S. MORRISON, 2/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: DRMP — ENGINEERS • PLANNERS • SCIENTISTS

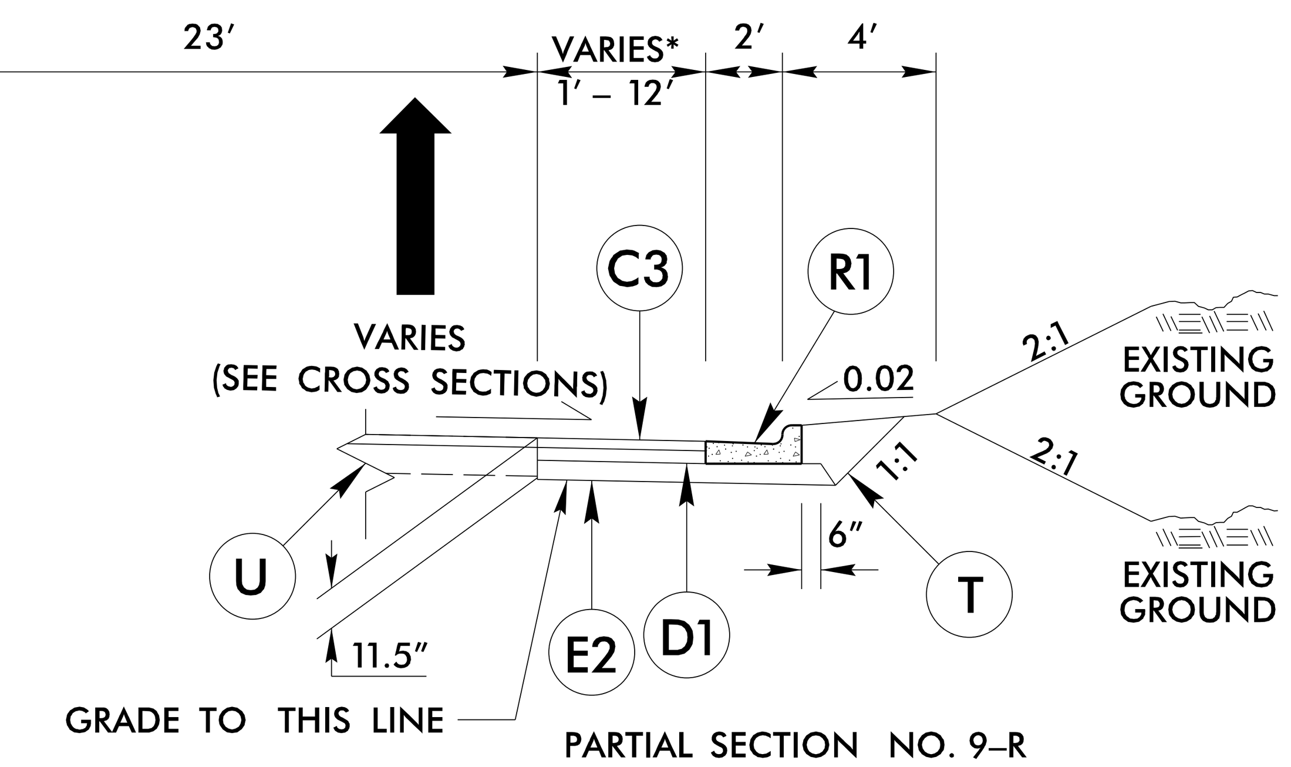
-Y1- INDIAN TRAIL-FAIRVIEW RD



TYPICAL SECTION NO. 9

-Y1- STA 10+51.00 TO -Y1- STA 15+25.00

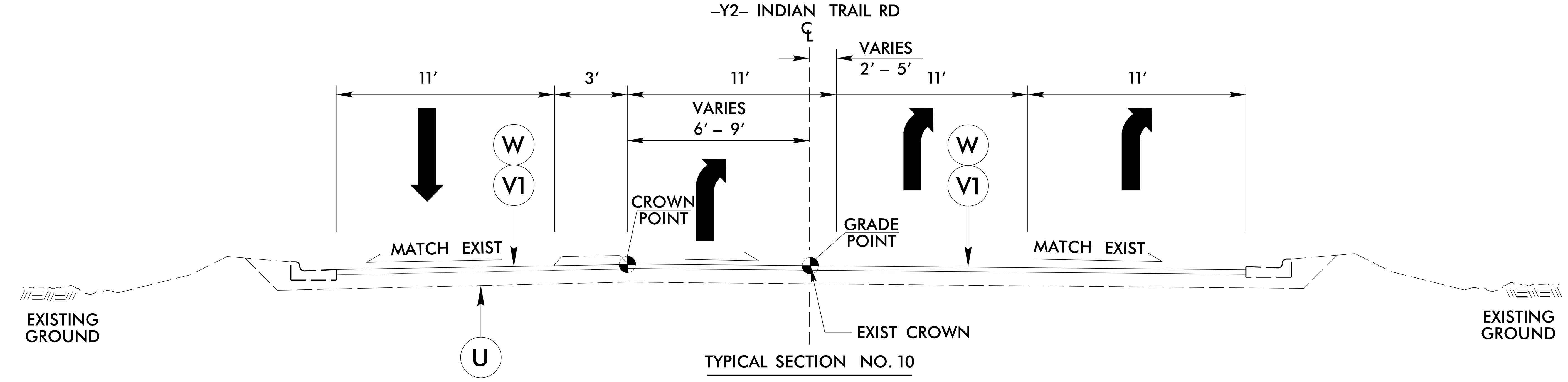
*NOTE: SAWCUT EXISTING EDGE OF PAVEMENT 1′ FROM CONCRETE CURB AND GUTTER



PARTIAL SECTION NO. 9-R

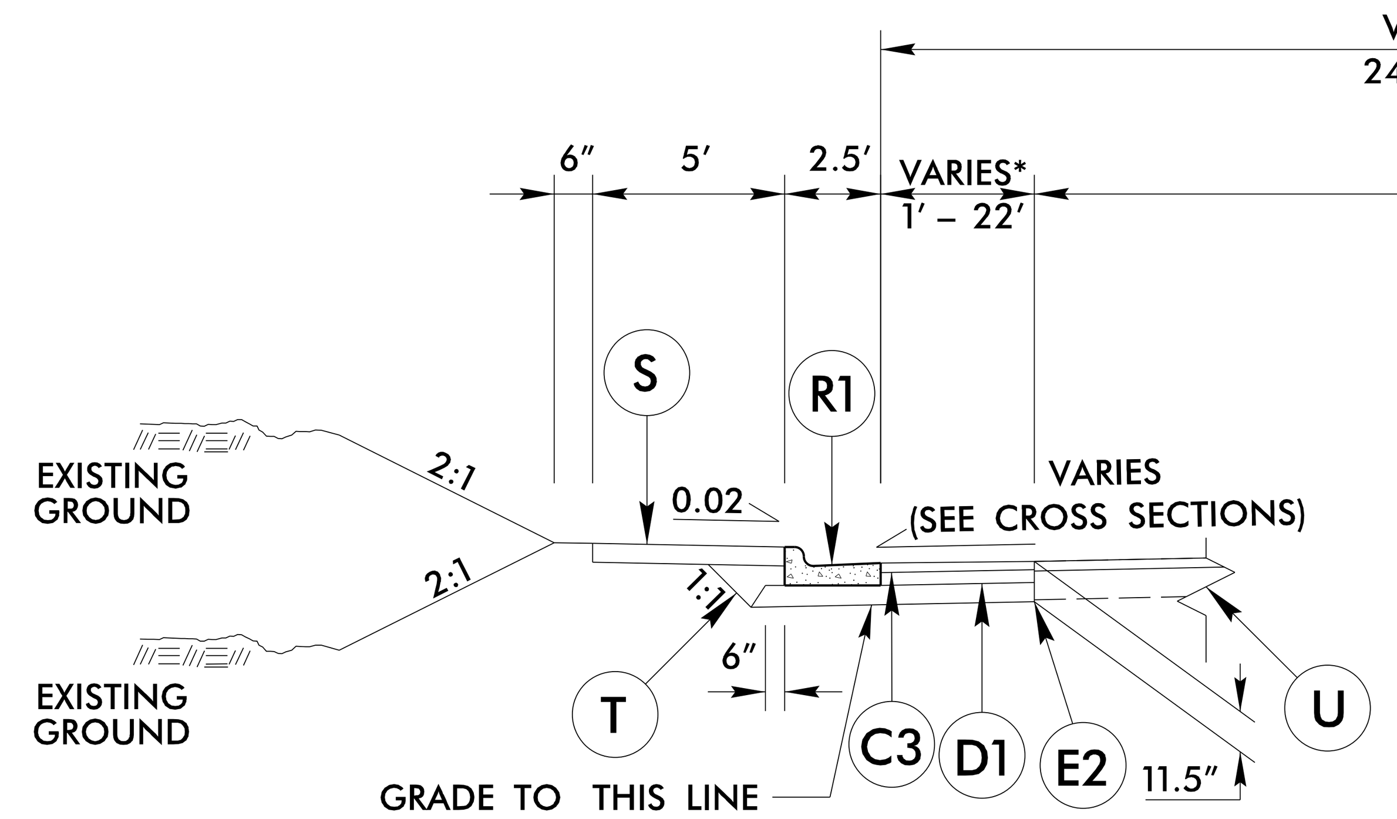
-Y1- STA 10+51.00 TO -Y1- STA 11+85.00

-Y2- INDIAN TRAIL RD



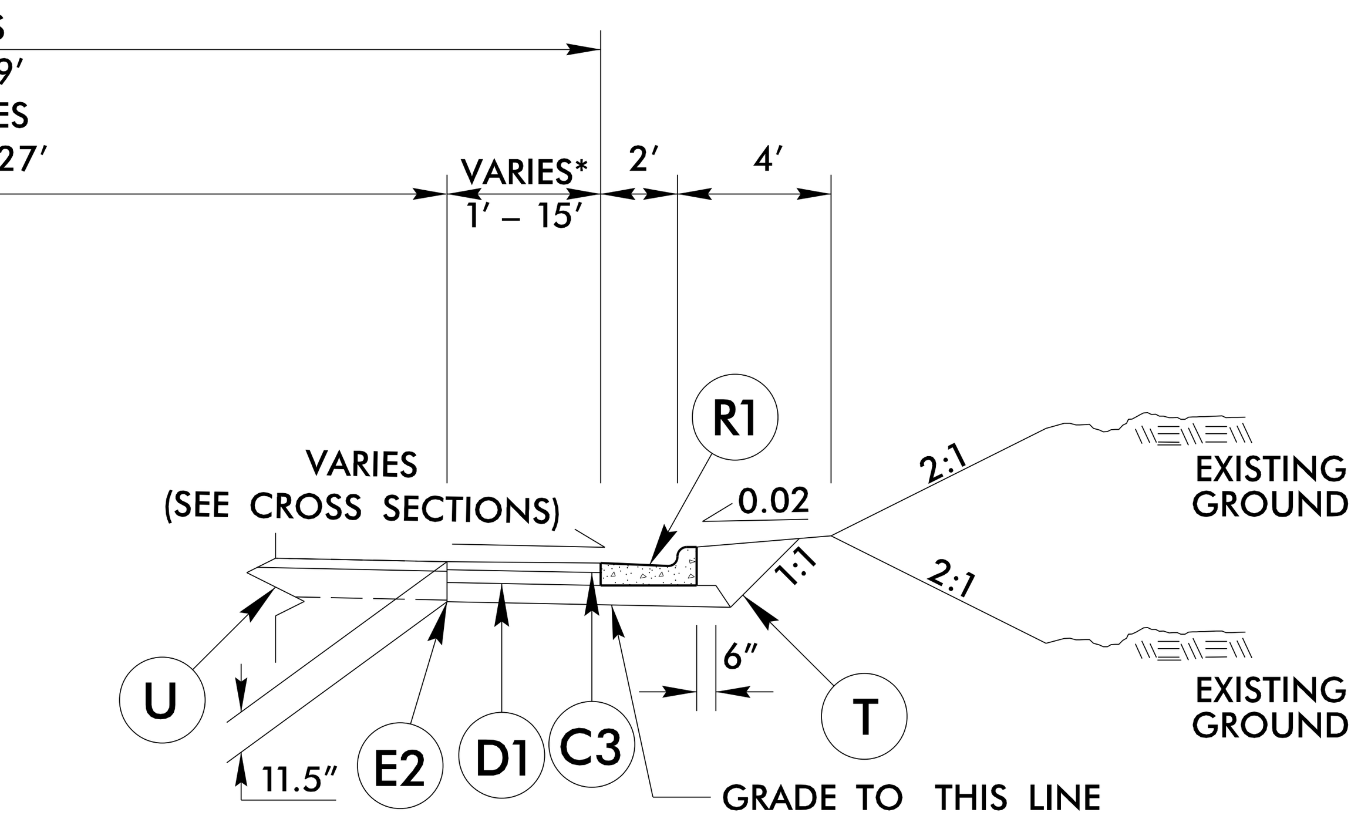
TYPICAL SECTION NO. 10

-Y2- STA 12+50.00 TO -Y2- STA 15+00.00



PARTIAL SECTION 10-L

-Y2- STA 13+42.92 TO -Y2- STA 15+00.00



PARTIAL SECTION 10-R

-Y2- STA 14+20.00 TO -Y2- STA 15+00.00

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

C1	3″ SF9.5A
C2	1½″ S9.5C
C3	3″ S9.5C
C4	VAR. S9.5C
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	11″ B25.0C
E4	VAR. B25.0C
R1	2′-6″ C & G
R2	4″ ISLAND COVER
R3	5″ MCI (SURF.)
R4	5″ MCI (KEYED)
R5	MOUNTABLE MEDIAN
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½″ MILLING
V2	VAR. MILLING
W	WEDGING

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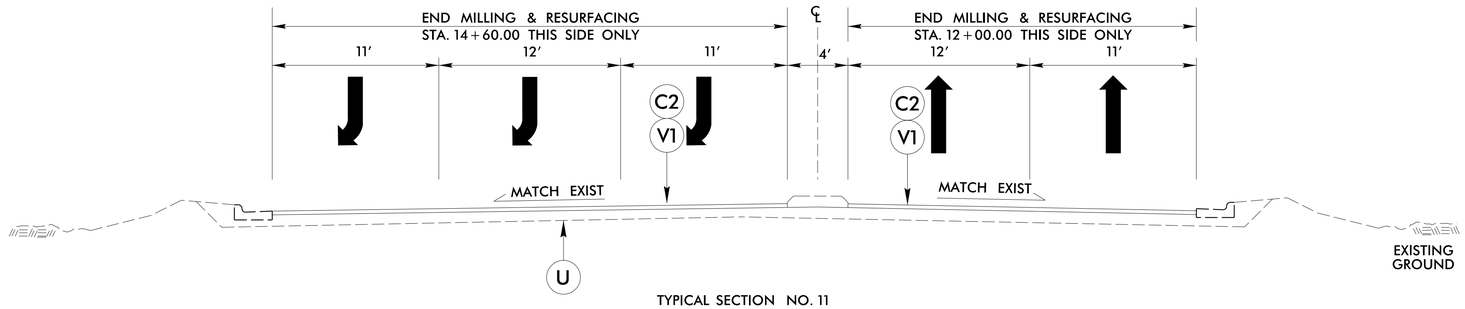
6/2/99

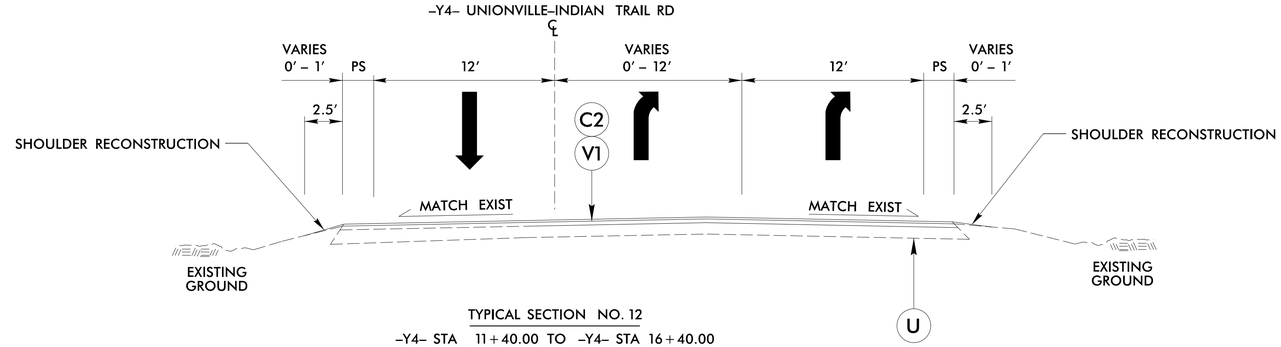
–Y3– UNIONVILLE–INDIAN TRAIL RD



TYPICAL SECTION NO. 11

–Y3– STA 10 + 68.00 TO –Y3– STA 14 + 60.00

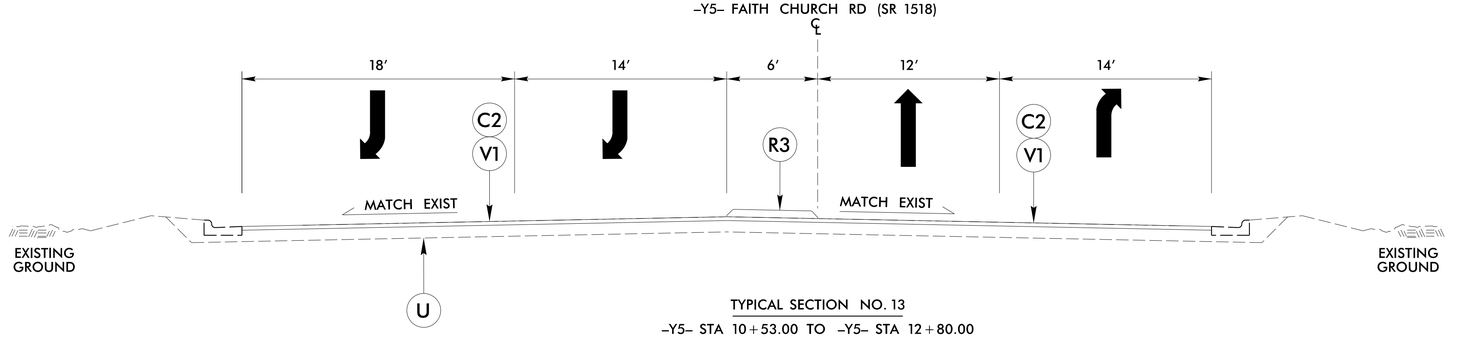
–Y4– UNIONVILLE–INDIAN TRAIL RD



TYPICAL SECTION NO. 12

–Y4– STA 11 + 40.00 TO –Y4– STA 16 + 40.00

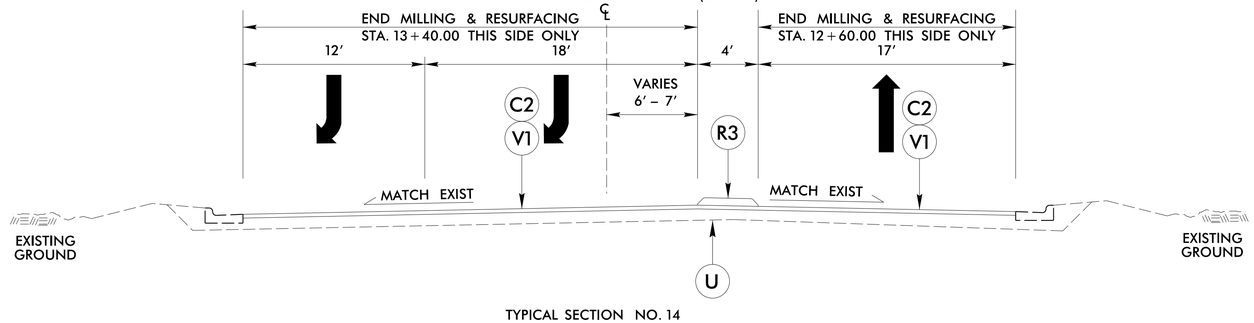
–Y5– FAITH CHURCH RD (SR 1518)



TYPICAL SECTION NO. 13

–Y5– STA 10 + 53.00 TO –Y5– STA 12 + 80.00

–Y7– SARDIS CHURCH RD (SR 1515)



TYPICAL SECTION NO. 14

–Y7– STA 10 + 90.00 TO –Y7– STA 13 + 40.00

PROJECT REFERENCE NO.	SHEET NO.
W–5520	2A–5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032812 ENGINEER JAMES E. BECK

2/2/2017

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 50122 ENGINEER CLARK S. MORRISON

2/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP

ENGINEERS • PLANNERS • SCIENTISTS

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO: C-2213 • (704) 332-2289

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN	
C1	3″ SF9.5A
C2	1½″ S9.5C
C3	3″ S9.5C
C4	VAR. S9.5C
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	11″ B25.0C
E4	VAR. B25.0C
R1	2′-6″ C & G
R2	4″ ISLAND COVER
R3	5″ MCI (SURF.)
R4	5″ MCI (KEYED)
R5	MOUNTABLE MEDIAN
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½″ MILLING
V2	VAR. MILLING
W	WEDGING

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PROJECT REFERENCE NO.	SHEET NO.
W-5520	2A-6

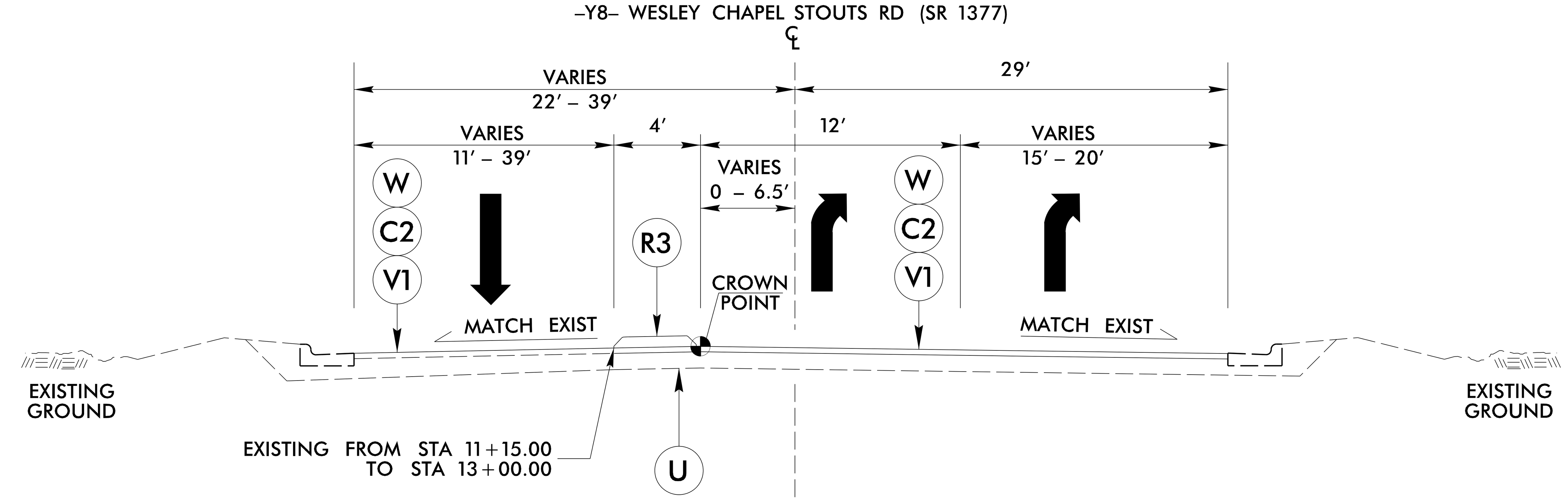
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024915 JAMES E. BECK — 2/2/2017

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022286 CLARK S. MORRISON — 2/10/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

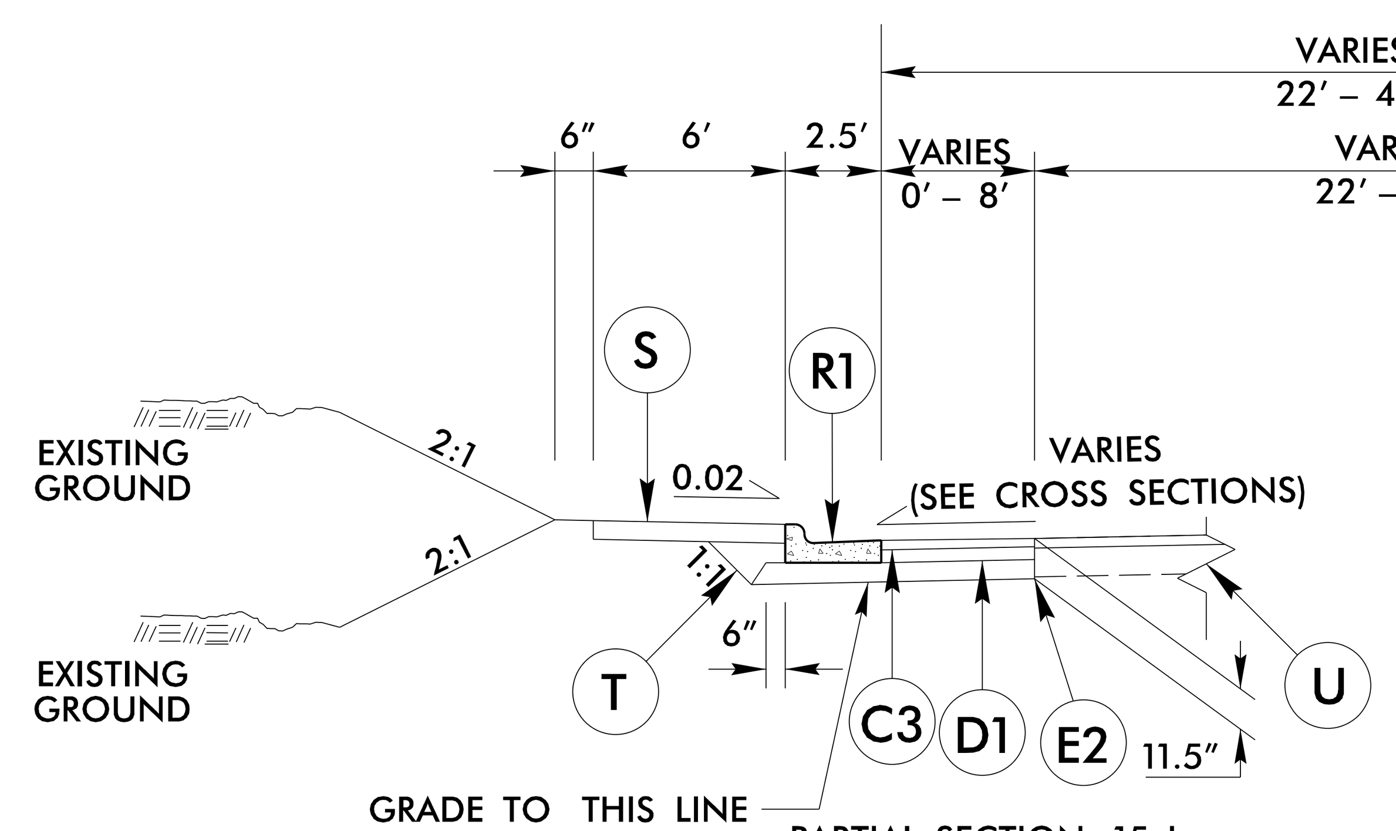
PLANS PREPARED BY: DRMP ENGINEERS • PLANNERS • SCIENTISTS

*NOTE: SAWCUT EXISTING EDGE OF PAVEMENT 1′ FROM CONCRETE CURB AND GUTTER



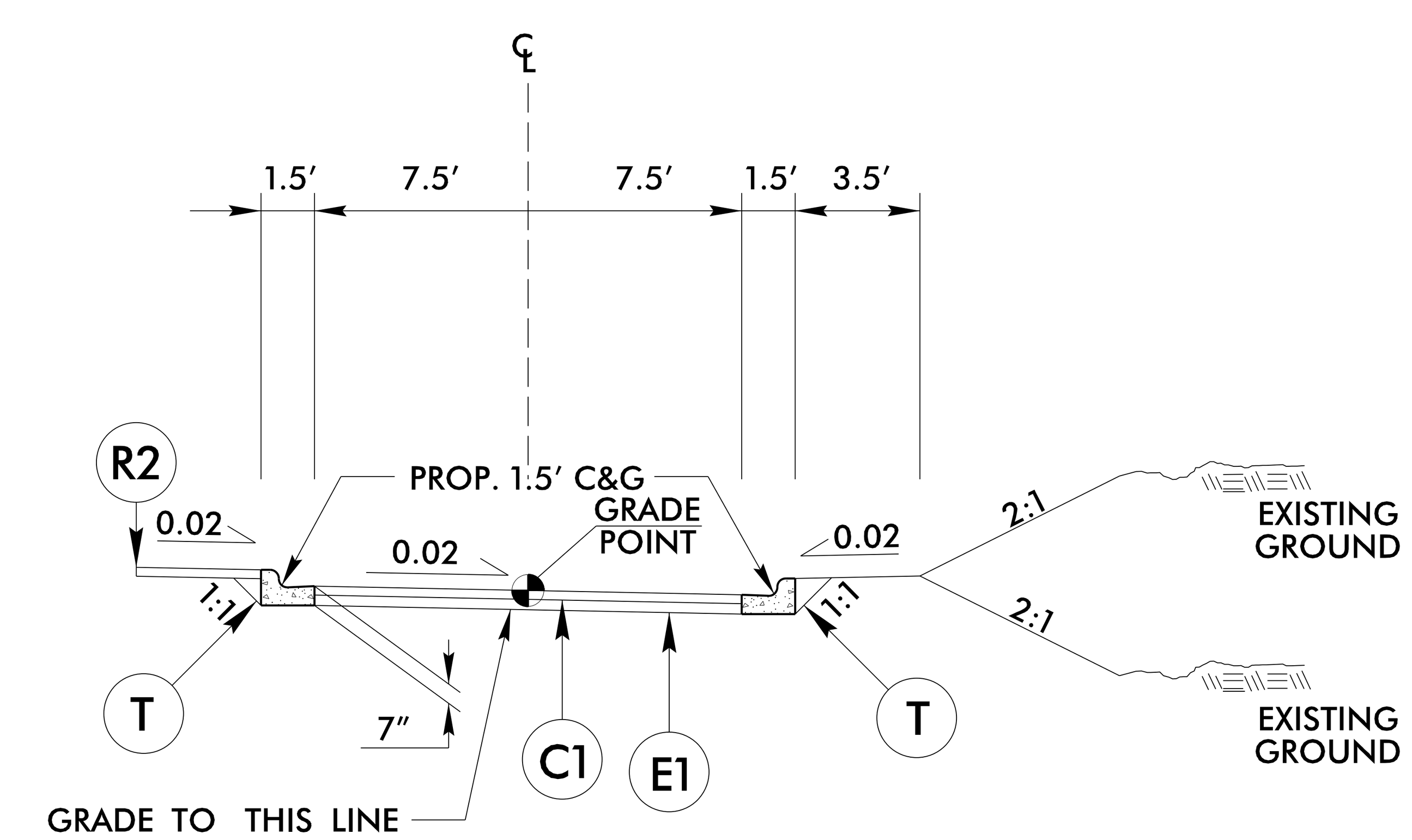
TYPICAL SECTION NO. 15

-Y8- STA 11+15.00 TO -Y8- STA 14+32.00



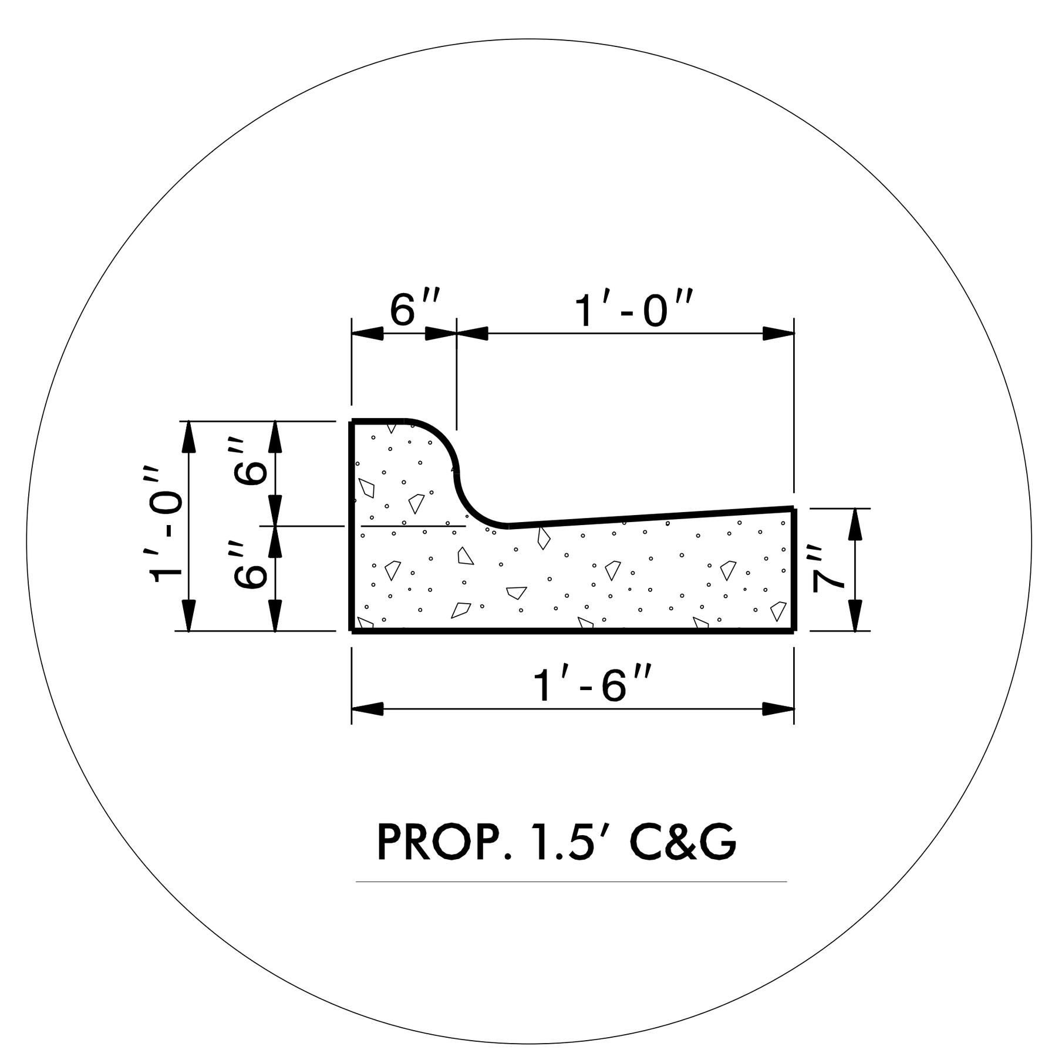
PARTIAL SECTION 15-L

-Y8- STA 13+01.62 TO -Y8- STA 14+32.00



TYPICAL SECTION 16

-DRV1- STA 5+00.00 TO -DRV1- STA 6+25.00



PROP. 1.5′ C&G

PAVEMENT SCHEDULE	
C1	3″ SF9.5A
C2	1½″ S9.5C
C3	3″ S9.5C
C4	VAR. S9.5C
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	11″ B25.0C
E4	VAR. B25.0C
R1	2′-6″ C & G
R2	4″ ISLAND COVER
R3	5″ MCI (SURF.)
R4	5″ MCI (KEYED)
R5	MOUNTABLE MEDIAN
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	1½″ MILLING
V2	VAR. MILLING
W	WEDGING

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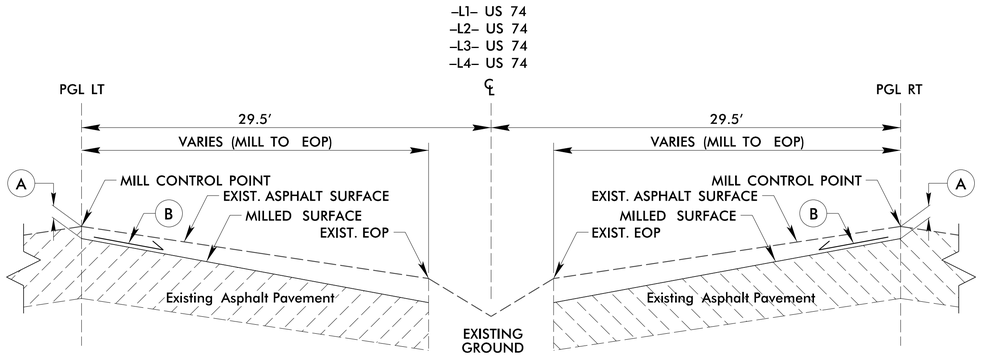
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2B-1

PLANS PREPARED BY:

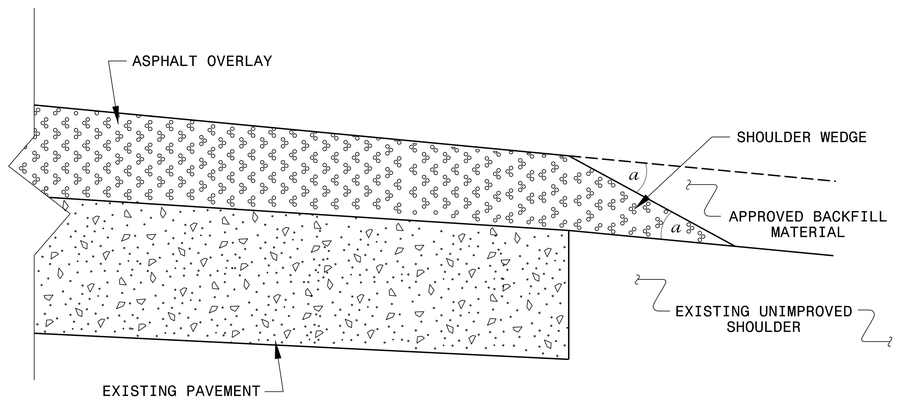
DRMP
ENGINEERS - PLANNERS - SCIENTISTS
DRMP, INC.
6800 FAIRVIEW ROAD, SUITE 300
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 • (704) 332-2289



Alignment	Side	Begin	End	(A) Depth (Inches)	(B) Milling Cross Slope (%)
-L1-	LT	106+10	126+50	1.50	1.5
	RT	106+10	126+50	1.75	1.5
-L2-	LT	205+00	213+50	1.50	1.5
	LT	218+50	223+50	0.00	1.5
	RT	205+00	213+00	1.50	1.5
	RT	213+00	221+25	1.25	1.5
-L3-	LT	307+50	318+50	1.00	2.0
	LT	322+00	326+50	1.00	2.0
	RT	308+00	326+50	0.00	2.0
-L4-	LT	408+40	429+40	1.00	2.0
	RT	408+40	411+50	1.50	2.0
	RT	411+50	429+40	0.00	2.0

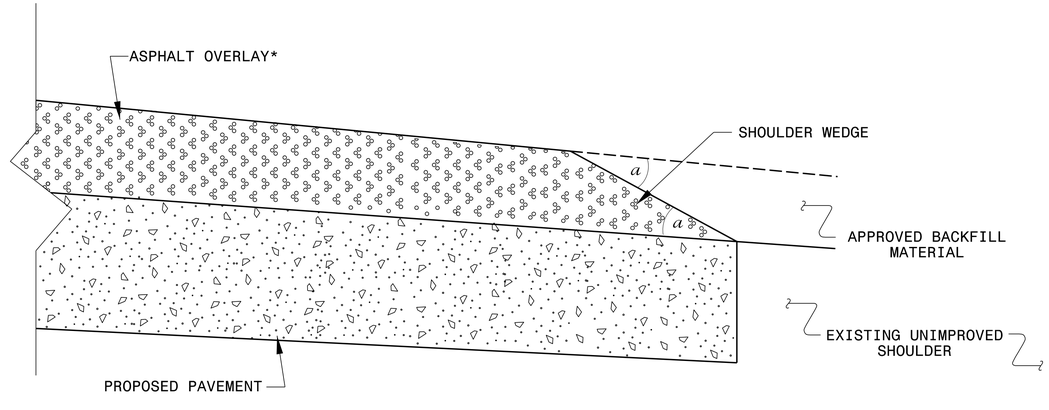
NOTES:
1. VARIABLE MILLING SET FROM CONTROL POINT TO INSIDE EDGE OF PAVEMENT USING MILLING DEPTH AND CROSS SLOPE.
2. REFER TO TABLE FOR MILLING LIMITS, DEPTHS, AND CROSS SLOPES.
3. DO NOT EXCEED A DIFFERENCE OF 2" IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC.
4. SEE ROADWAY PLANS FOR MILLING SECTIONS OUTSIDE OF LIMITS SHOWN IN DETAIL.

VARIABLE DEPTH MILLING



SHOULDER WEDGE DETAIL

(Resurfacing Sections w/ NO Widening)



SHOULDER WEDGE DETAIL

(Resurfacing Sections w/ Widening or with Existing Paved Shoulder having no dropoffs)

- SHOULDER WEDGE ANGLE = 30°

NOTES:
1. DETAIL DOES NOT APPLY TO OGAFC AND ULTRA-THIN BONDED WEARING COURSE.
2. BACKFILL SHOULDER WITH APPROVED MATERIAL.
3. THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.

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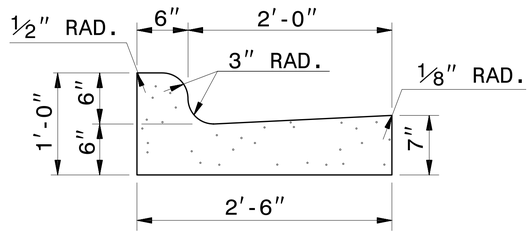
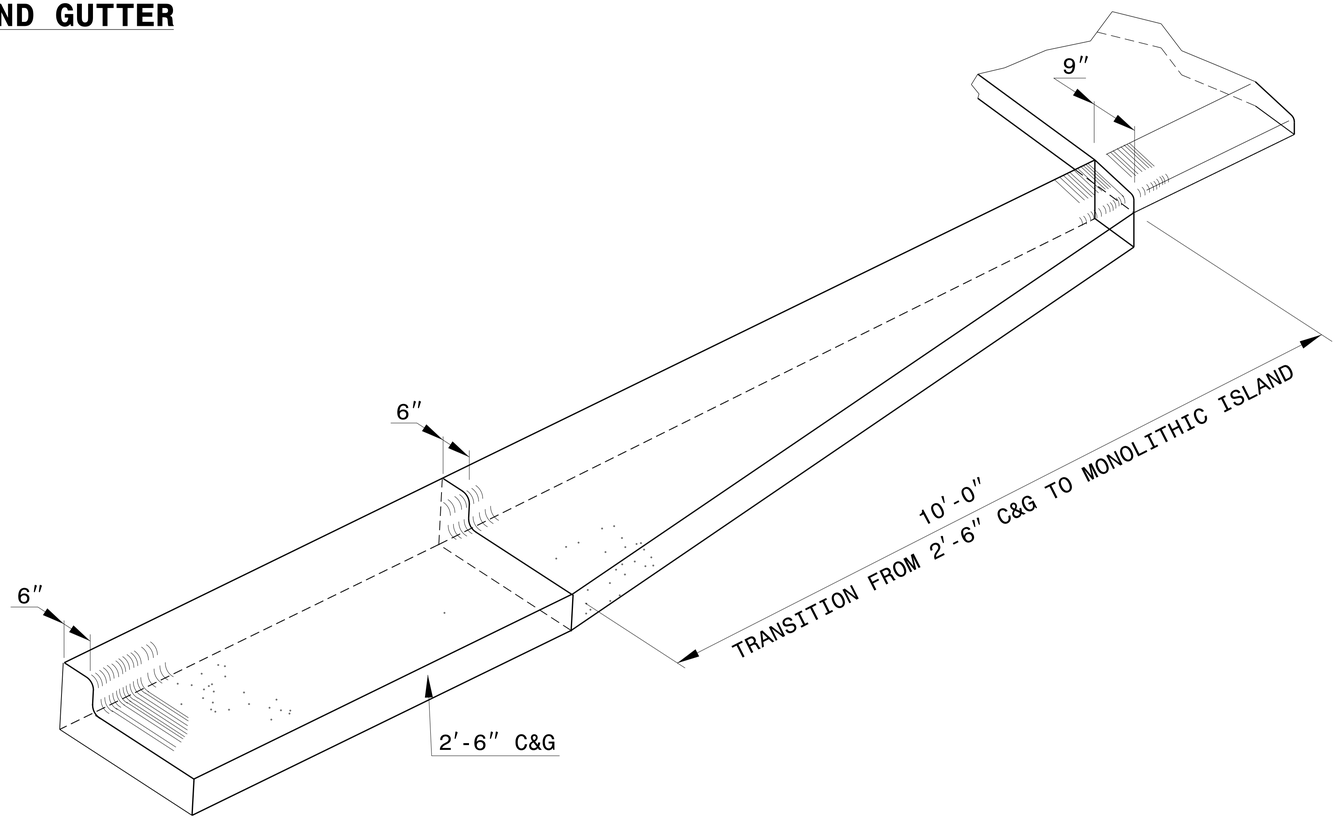
PROJECT REFERENCE NO.	SHEET NO.
W-5520	2C-1



2'-6" CURB AND GUTTER

NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER

NORTH CAROLINA PROFESSIONAL SEAL 22964 ENGINEER JOEL Y. HOWERTON
2/2/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

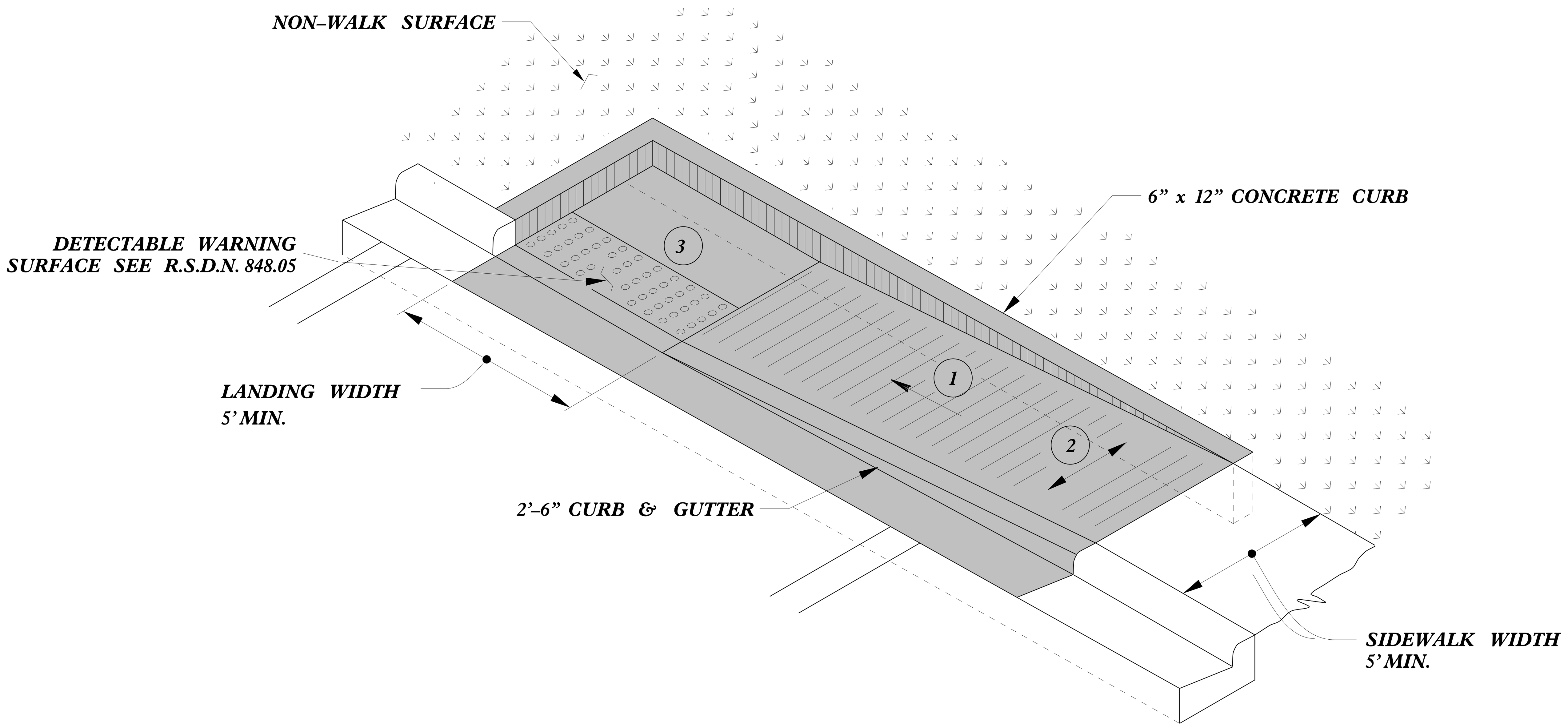
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF 2'-6" CURB & GUTTER TRANSITION SECTION

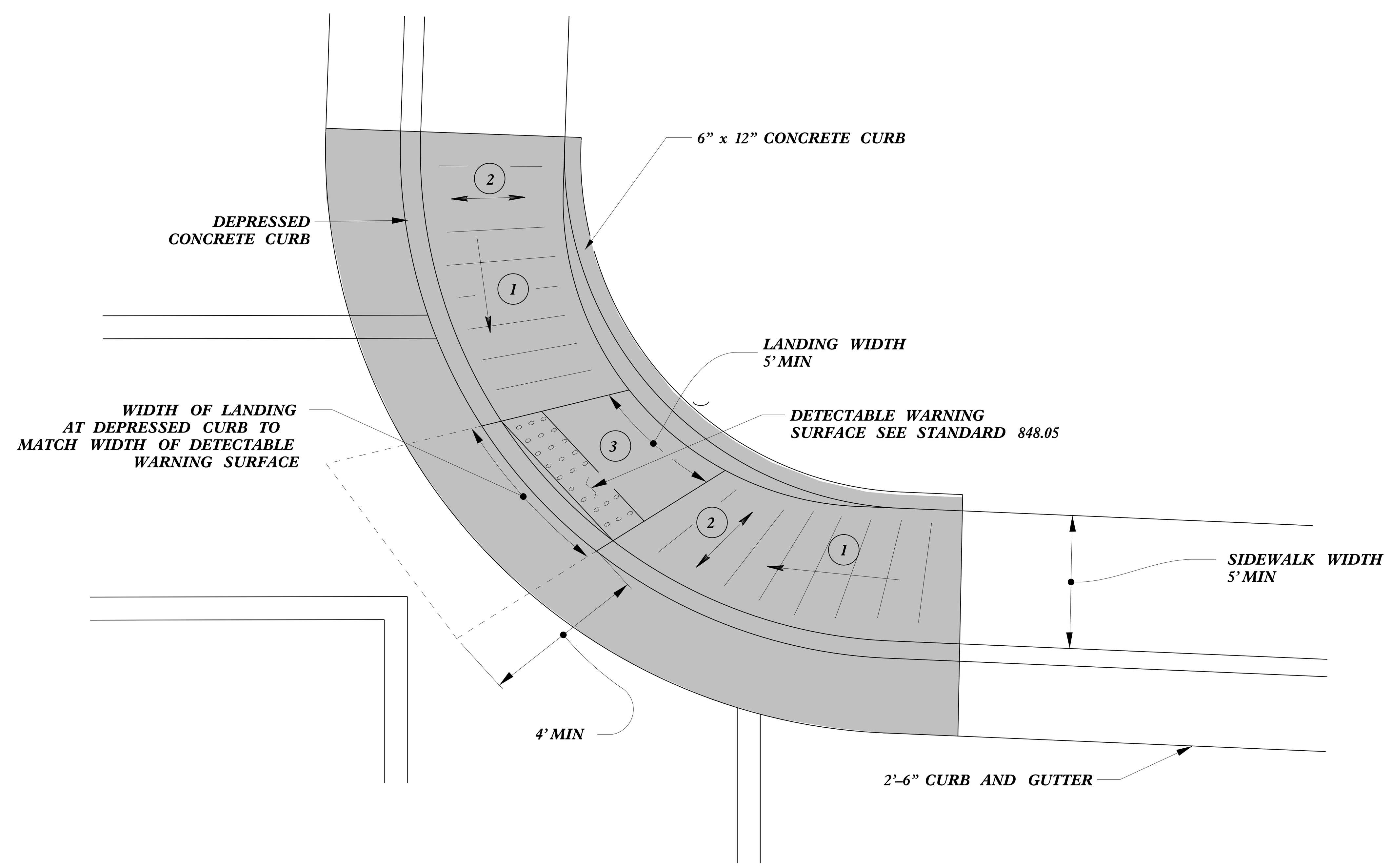
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: KKEMPF DATE: 09-24-14
CHECKED BY: _____ DATE: _____
FILE SPEC.: kkempf/english/curb gutter tansition.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2C-2

PAY LIMITS FOR 1 CURB RAMP



TYPE 1A



TYPE 2A

1. *8.33% (12:1) MAX RAMP SLOPE*
2. *CROSS SLOPE: 2.00%*
3. *CURB RAMPS REQUIRE A (4'–0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER Joel S. Howerton 2/2/2017

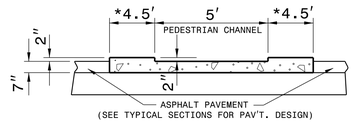
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

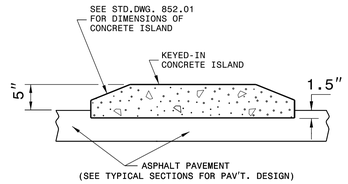
CURB RAMPS

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

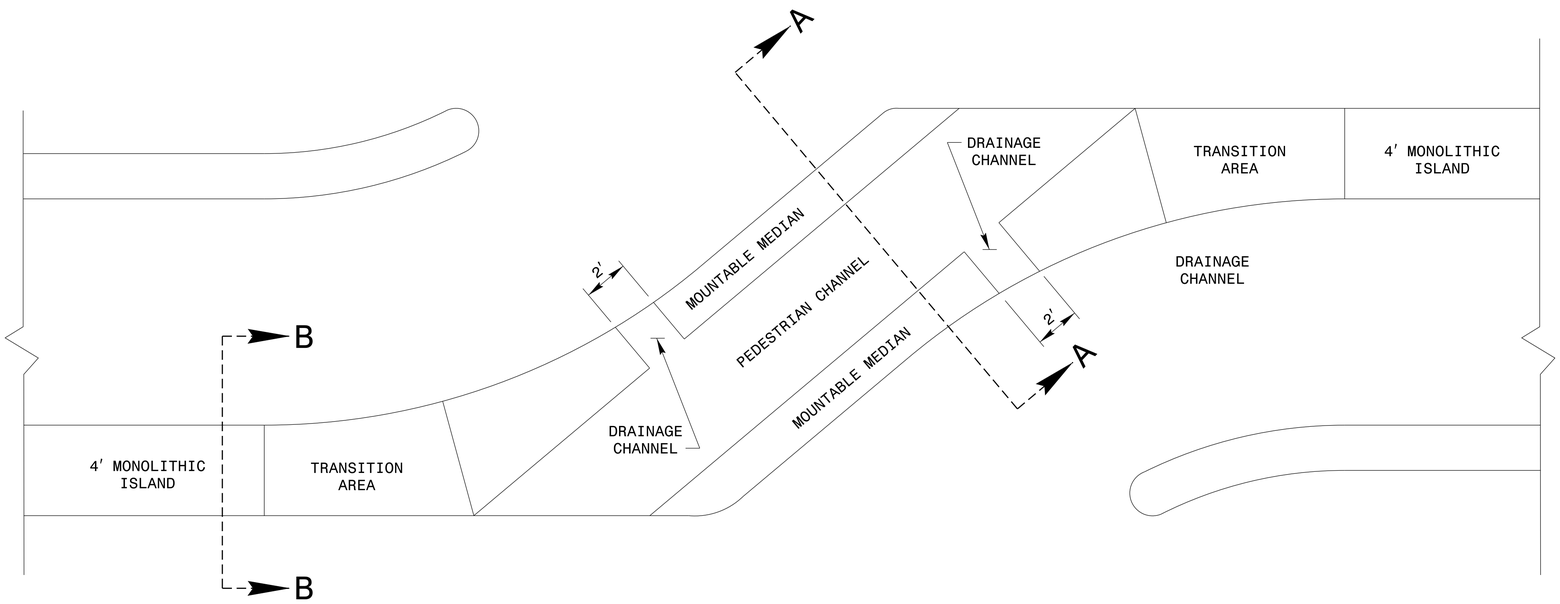
PROJECT REFERENCE NO.	SHEET NO.
W-5520	2C-3



SECTION A-A



SECTION B-B



EMERGENCY VEHICLE ACCESS FOR CONCRETE ISLAND

NOTES:

REFER TO SECTION 852 OF STANDARD SPECIFICATIONS FOR CONCRETE ISLANDS.

REFER TO STANDARD DRAWING 852.01 FOR CONTRACTION/EXPANSION JOINTS.

PLACE 6″X6″ W5xW5 REINFORCING WIRE MESH IN THE BOTTOM 3RD OF THE EMERGENCY VEHICLE ACCESS PORTION OF THE CONCRETE ISLAND THAT MEETS SECTION 1070 OF THE STANDARD SPECIFICATIONS.

LOCATE DRAINAGE CHANNELS PER DIMENSIONS ON INTERSECTION DETAILS OR AS DIRECTED BY THE ENGINEER.

PLACE TRUNCATED DOMES AT EACH ENTRY POINT OF THE PEDESTRIAN CHANNEL. (SEE ROADWAY STANDARD DRAWING NO.848.05 FOR PLACEMENT AND SIZING)

*ISLAND WIDTH VARIES THRU THE LENGTH OF THE ISLAND.

NORTH CAROLINA PROFESSIONAL SEAL 027266 ENGINEER Joel S. Howerton
2/2/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

EMERGENCY VEHICLE ACCESS FOR CONCRETE ISLAND

ORIGINAL BY: E.E. WARD DATE: 12-99
MODIFIED BY: rnbritt DATE: 07-20-2016
CHECKED BY: DATE:
FILE SPEC.: nbritt\english\w\w5520 emergency access.dgn

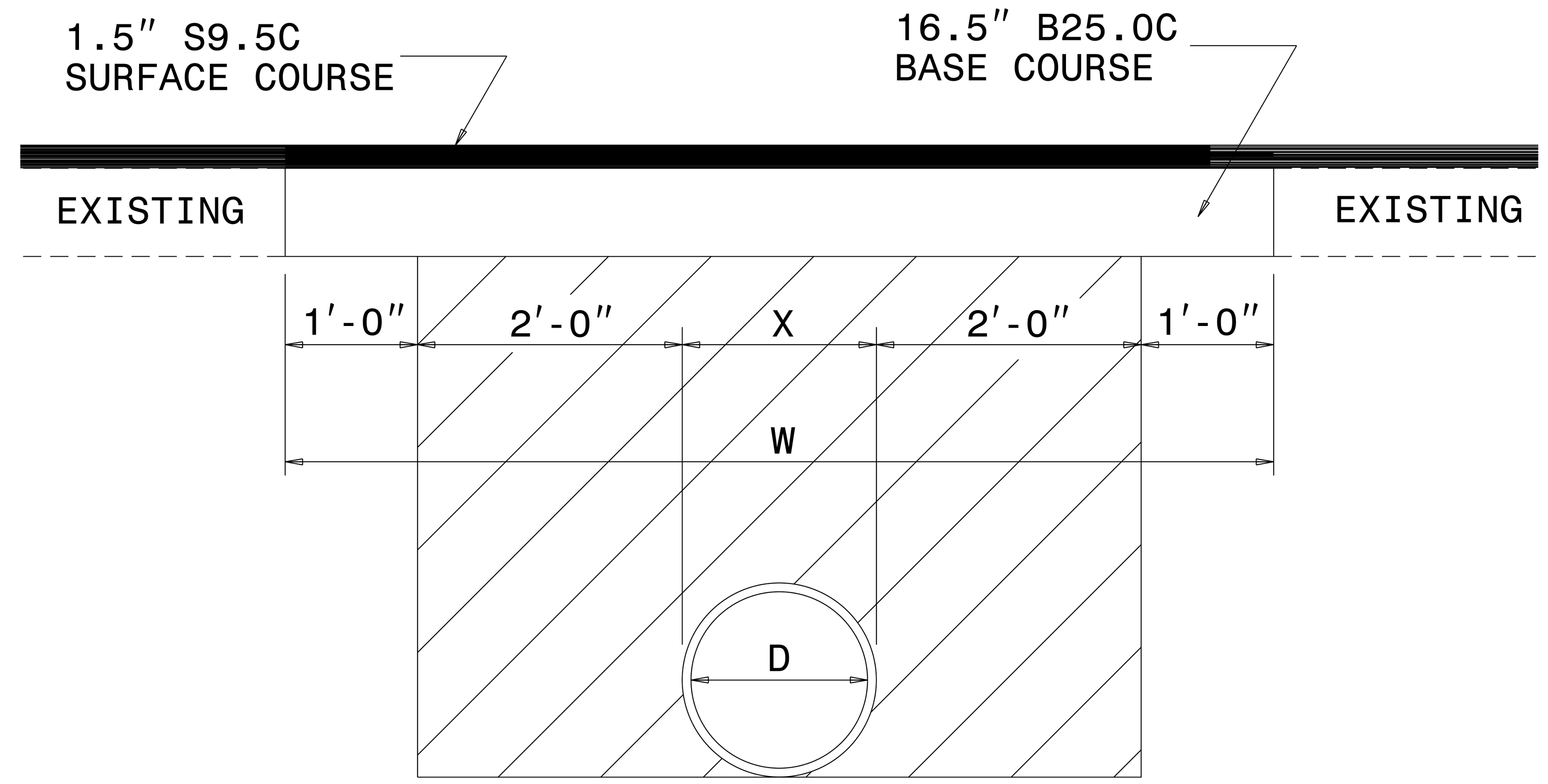
$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGNS$$$$

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

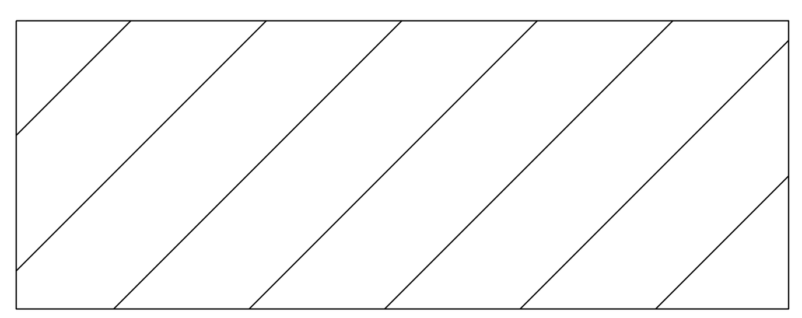
ENGLISH DETAIL DRAWING FOR
PAVEMENT REPAIRS
FOR SUPERPAVE MIX TYPES

SHEET 1 OF 1
654D01

D	X	W
12″	1′-4″	7′-4″
15″	1′-7″	7′-7″
18″	1′-10″	7′-10″
24″	2′-6″	8′-6″
30″	3′-1″	9′-1″
36″	3′-8″	9′-8″
42″	4′-5″	10′-5″
48″	5′-0″	11′-0″



PAVEMENT REPAIRS ON ROADS TO BE RESURFACED (PIPE IS PLACED UNDER EXISTING PAVEMENT)



SELECT MATERIAL CLASS II, TYPE 1

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

ENGLISH DETAIL DRAWING FOR
PAVEMENT REPAIRS
FOR SUPERPAVE MIX TYPES

SHEET 1 OF 1
654D01

NORTH CAROLINA PROFESSIONAL SEAL 028861 ENGINEER JOEL S. HOWERTON
2/2/2017

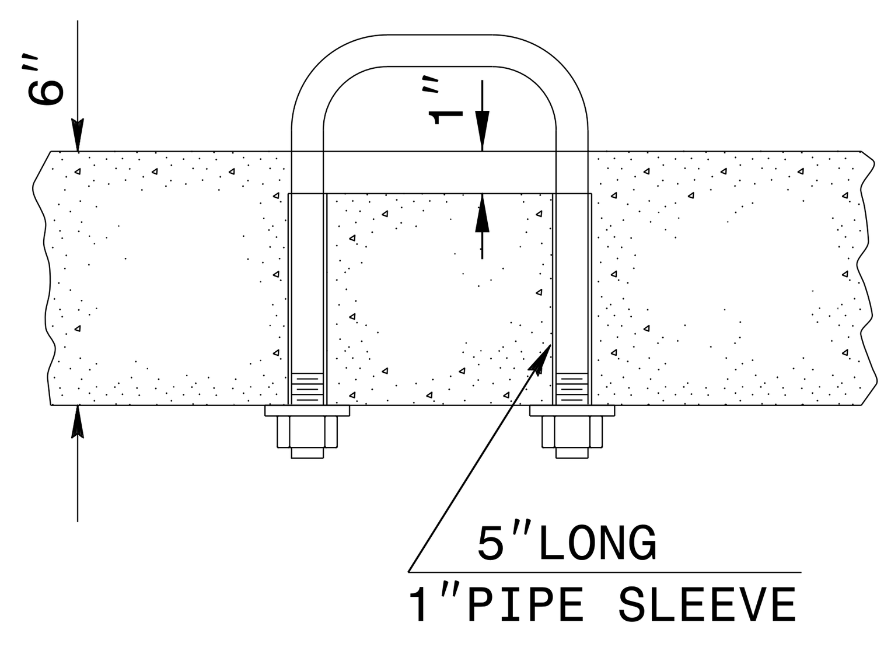
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

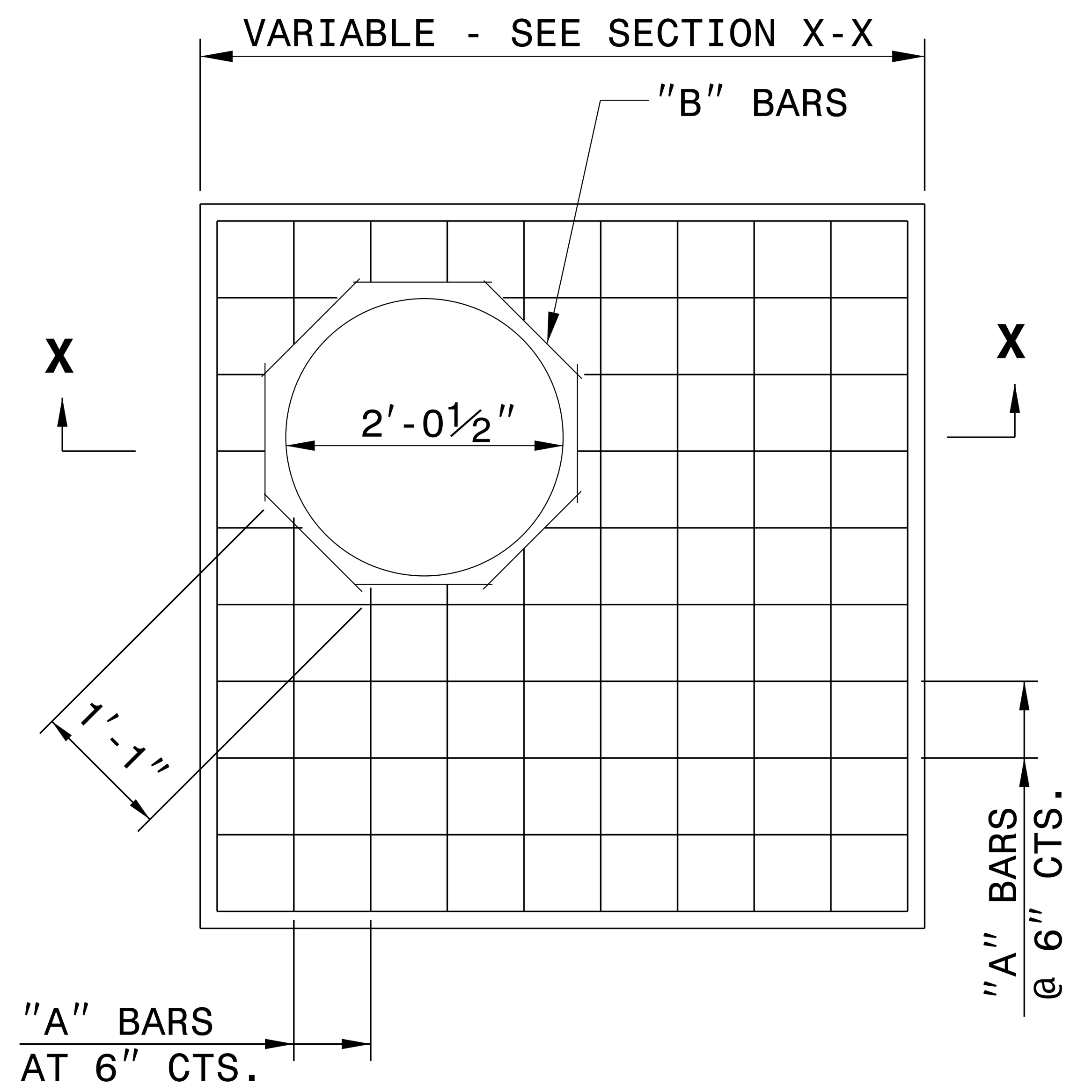
SEE TITLE BLOCK

ORIGINAL BY: DATE:
MODIFIED BY: K. KEMPF DATE: SEP. 2016
CHECKED BY: DATE:
FILE SPEC.: details\kkempf\english\W5520_640D0101.dgn

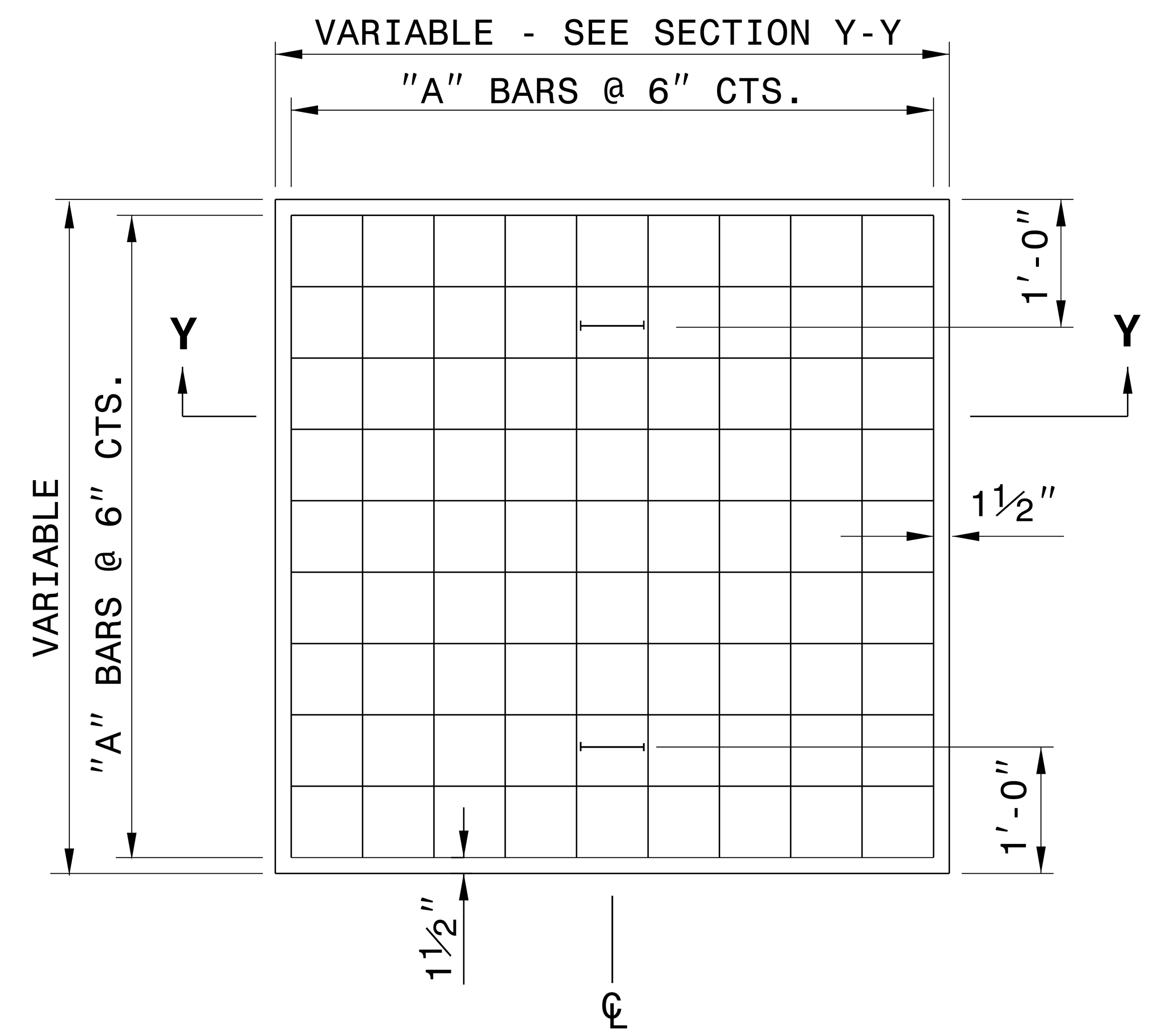
PROJECT REFERENCE NO.	SHEET NO.
W-5520	2C-5



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

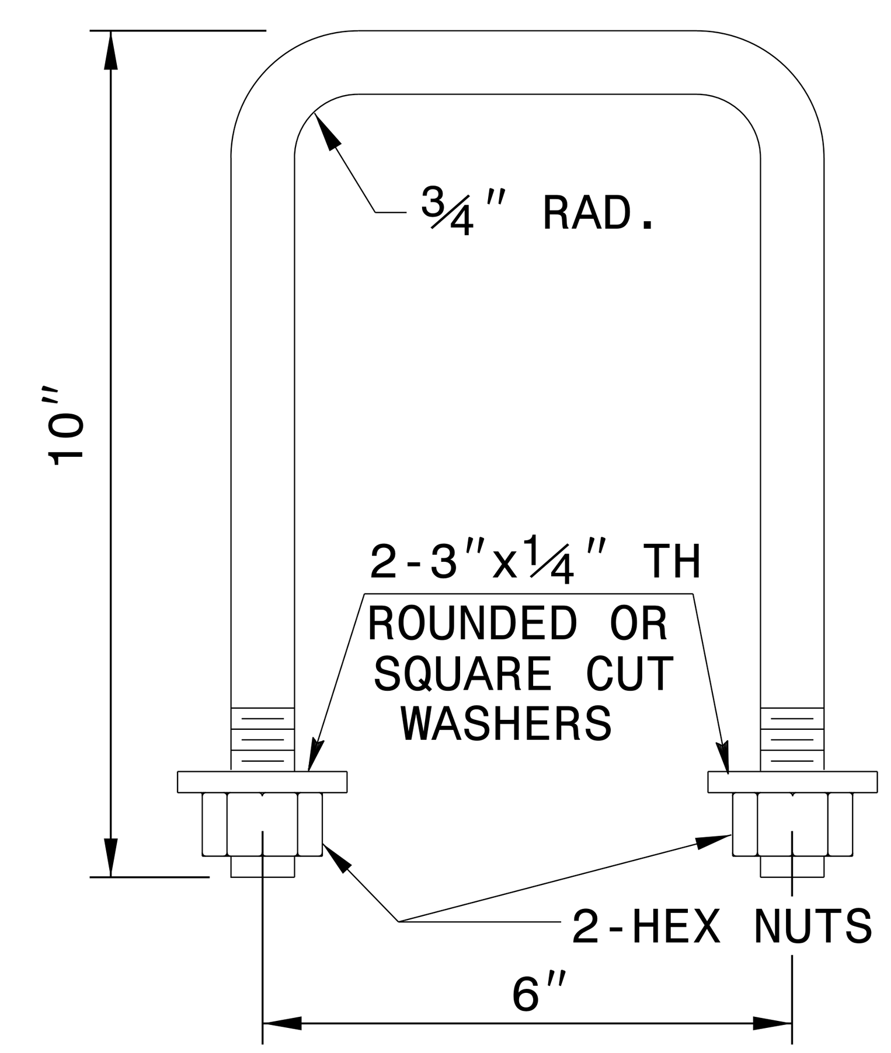
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS

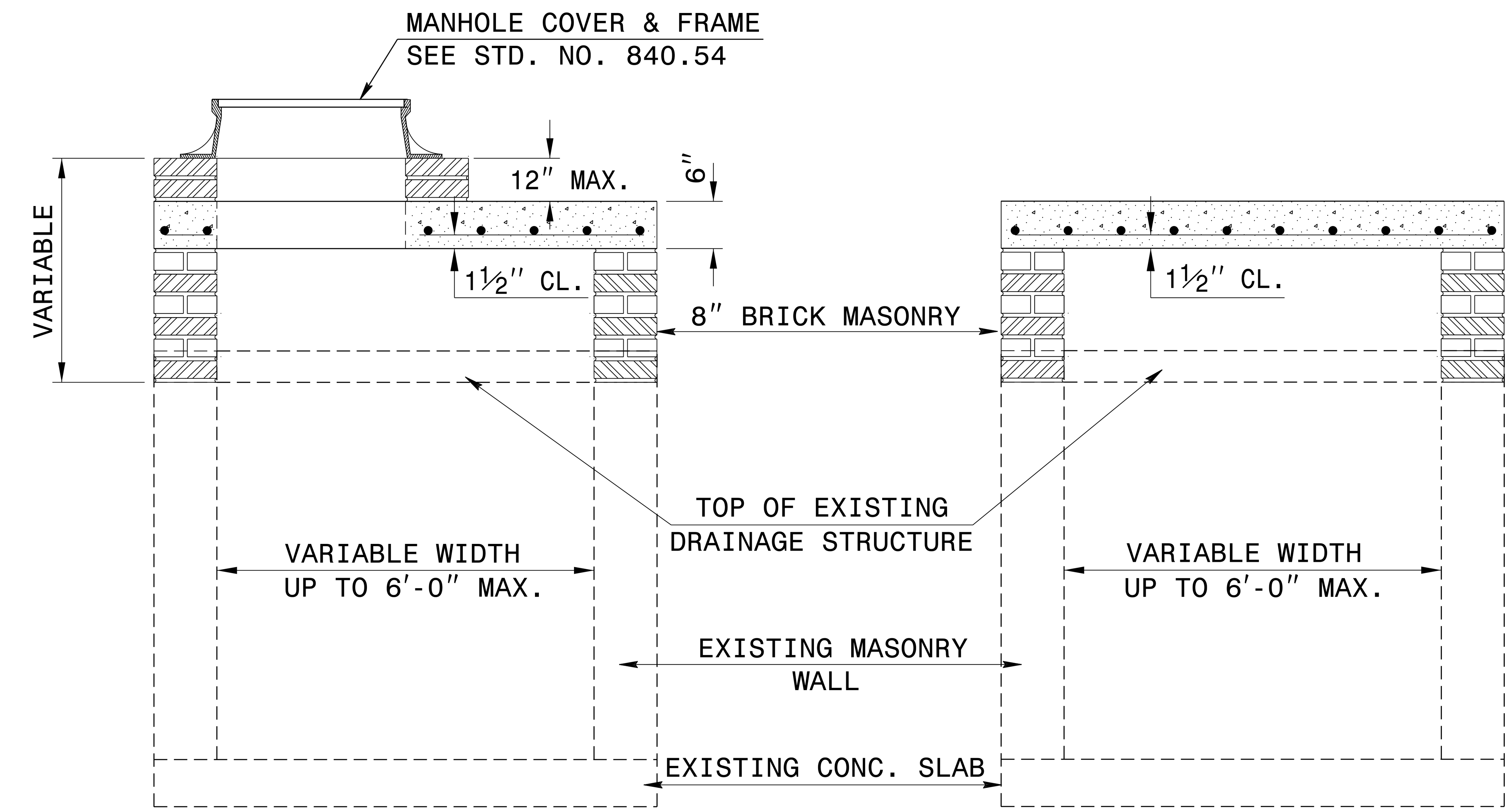
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.4326 *
BRICK MASONRY PER FT HT (MIN)	.4111

*** NOTE:**
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



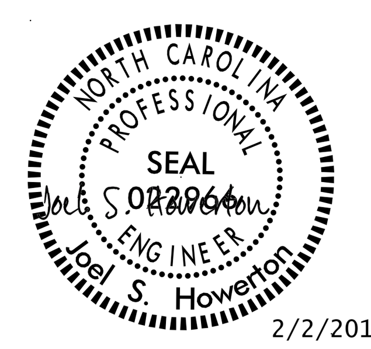
DETAIL OF HANDLE



SECTION X-X

SECTION Y-Y

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



2/2/2017

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

DETAIL TO CONVERT EXISTING DI, CB, OTCB or GI TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: T.S.S. DATE: FEB.2000
CHECKED BY: DATE:
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

$$$$$$SYSTIME$$$$$ $$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2C-6

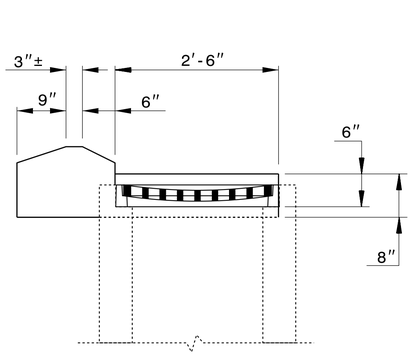
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1

852D06



SECTION 'A-A'

NOTES:
-REFER TO STD. NO. 840.19 AND 840.28 FOR DRAINAGE STRUCTURE.
-REFER TO STD. NO. 840.20 FOR GRATE AND FRAME.

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

ENGLISH DETAIL DRAWING FOR

METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1

852D06

NORTH CAROLINA PROFESSIONAL SEAL 022064 ENGINEER Joel S. Howerton
2/2/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE PLATE

ORIGINAL BY: KKEMPF DATE: 8/2/10
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: KKEMPF\ENGLISH\852D0601.DGN

$$$$USERNAME$$$$ $$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$SYSTIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2C-7

GENERAL NOTES:

USE CLASS "AA" CONCRETE THROUGHOUT.

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

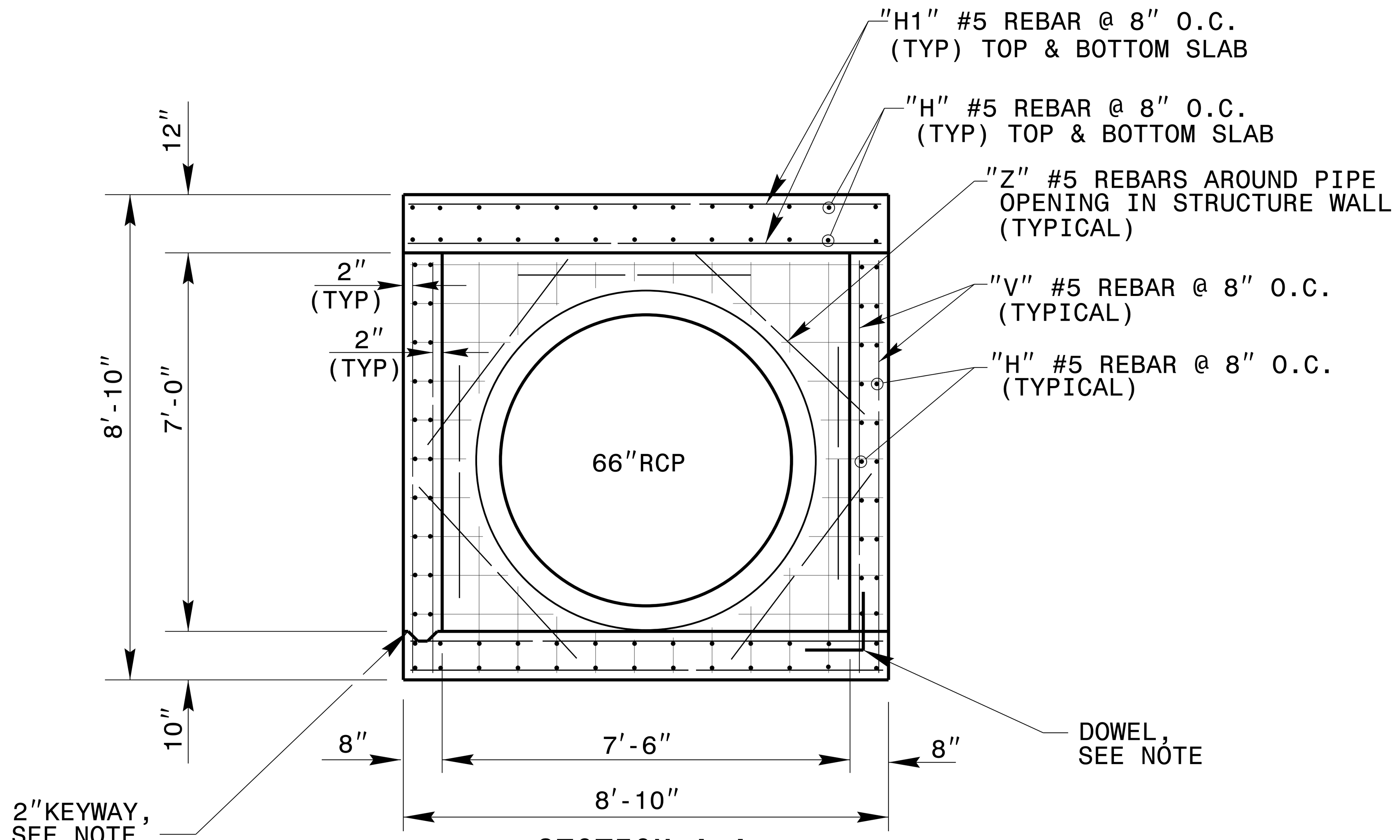
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

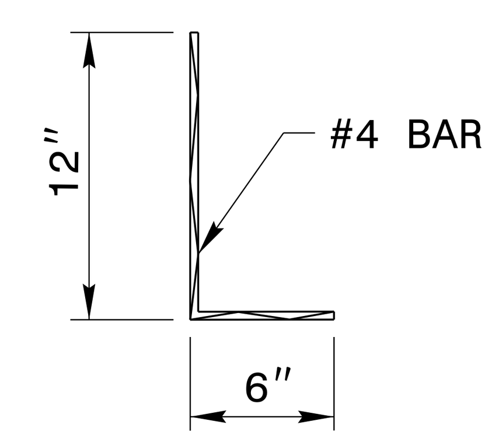
CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

HEIGHT DIMENSIONS MAY BE ADJUSTED DOWN FOR SMALLER PIPES AS DIRECTED BY THE ENGINEER.



SECTION A-A

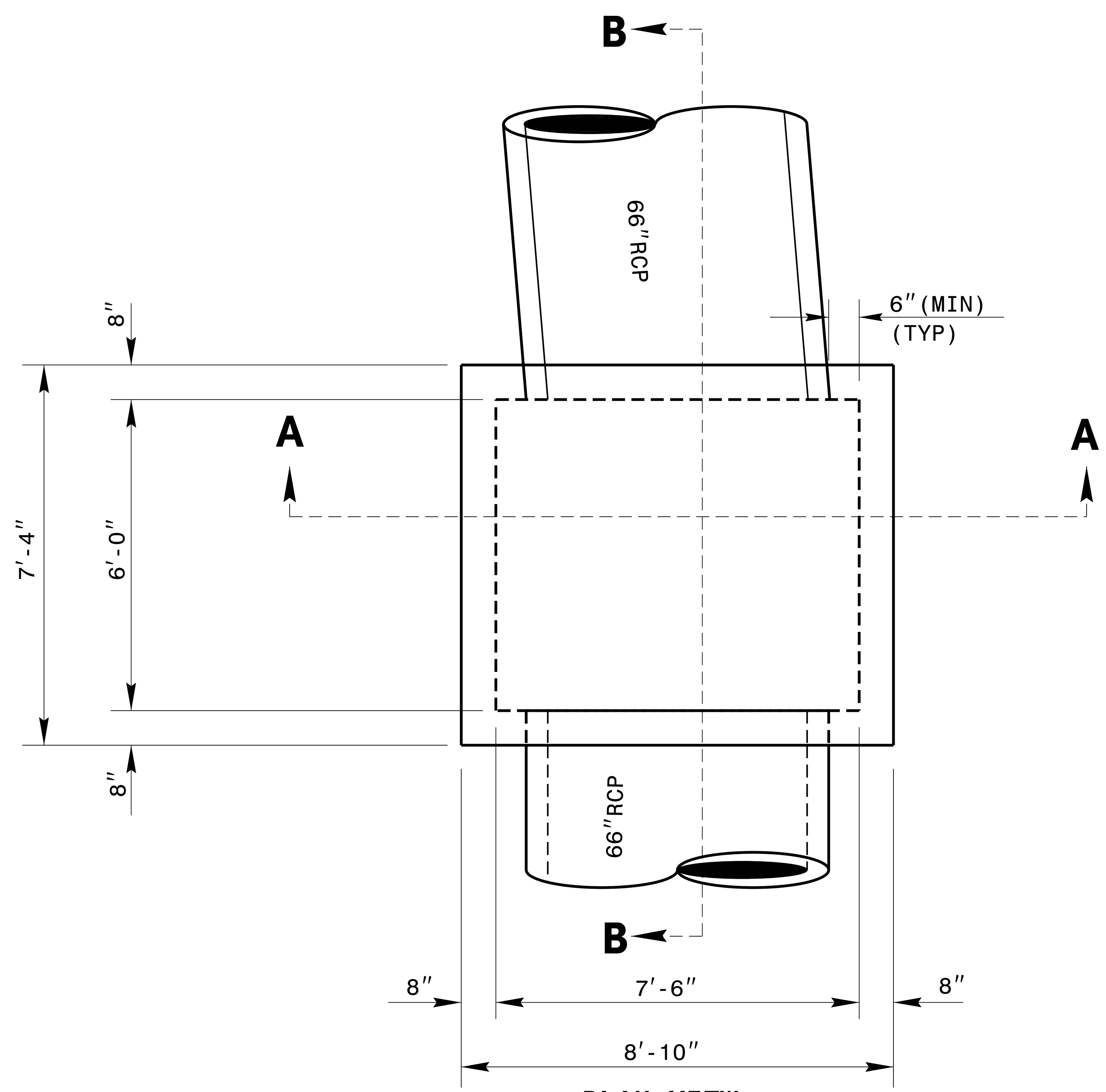


DOWEL

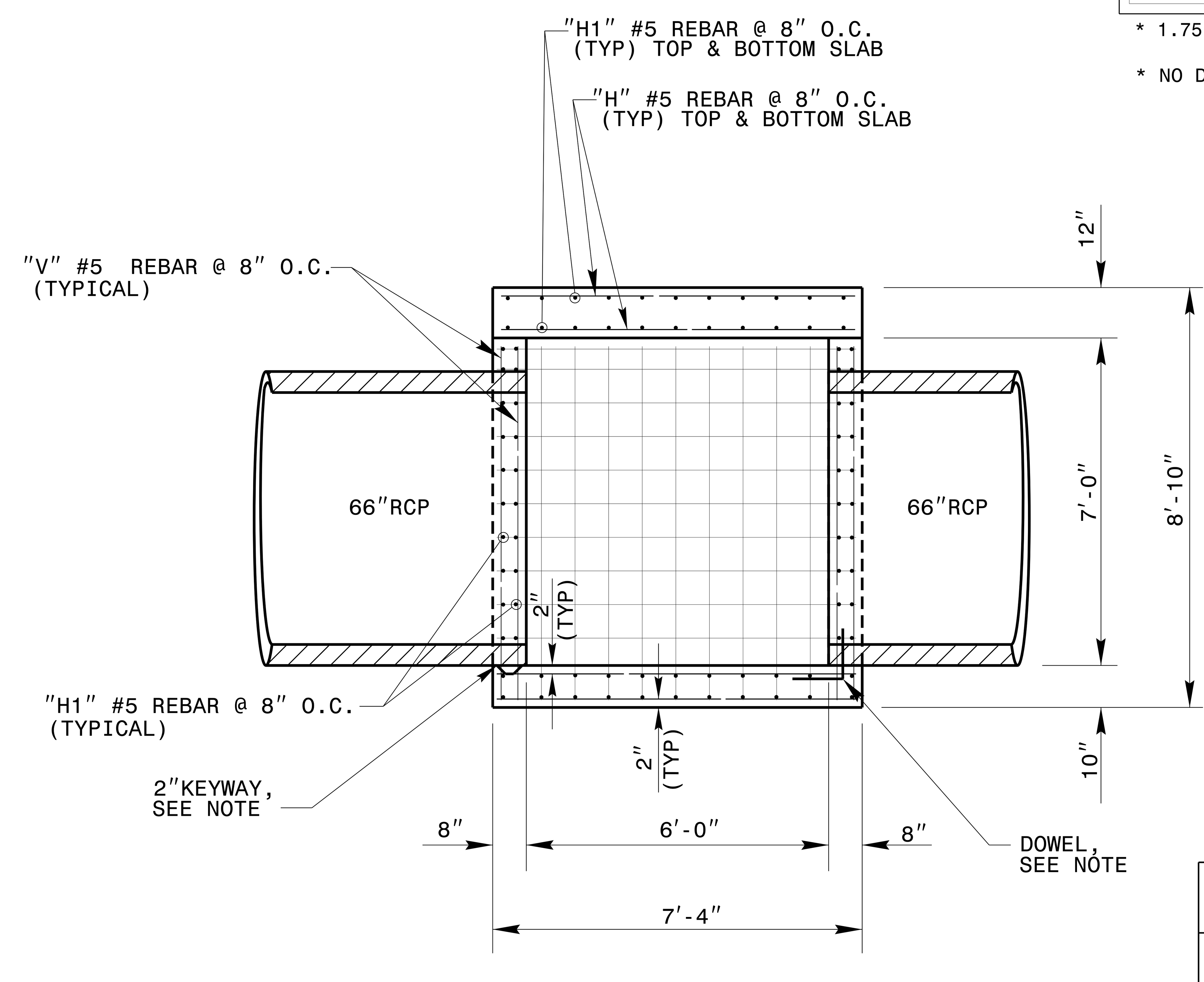
BILL OF MATERIALS				
BAR	NO.	SIZE	LENGTH	WEIGHT
H	92	#5	7'-0"	672
H1	84	#5	8'-6"	745
V	92	#5	7'-6"	720
Z	14	#5	4'-0"	59
TOTAL REINF. STEEL (LBS.)				2196
TOTAL CL."AA" CONC.(CU.YDS.)				9.6

* 1.75 CU. YD. DEDUCTION FOR 2-66" RC PIPE

* NO DEDUCTION HAS BEEN MADE FOR PIPES



PLAN VIEW



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 028964 ENGINEER Joel S. Howerton 2/2/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TRAFFIC BEARING JUNCTION BOX

DRAWING NOT TO SCALE

ORIGINAL BY: DATE:
MODIFIED BY: nbritt DATE: 04/22/08
CHECKED BY: DATE:
FILE SPEC.: detail/nbritt/english/hydro/66 tbjb.dgn

$$$$SYSTIME$$$$ $$$$DGN$$$$ $$$$USERNAME$$$$

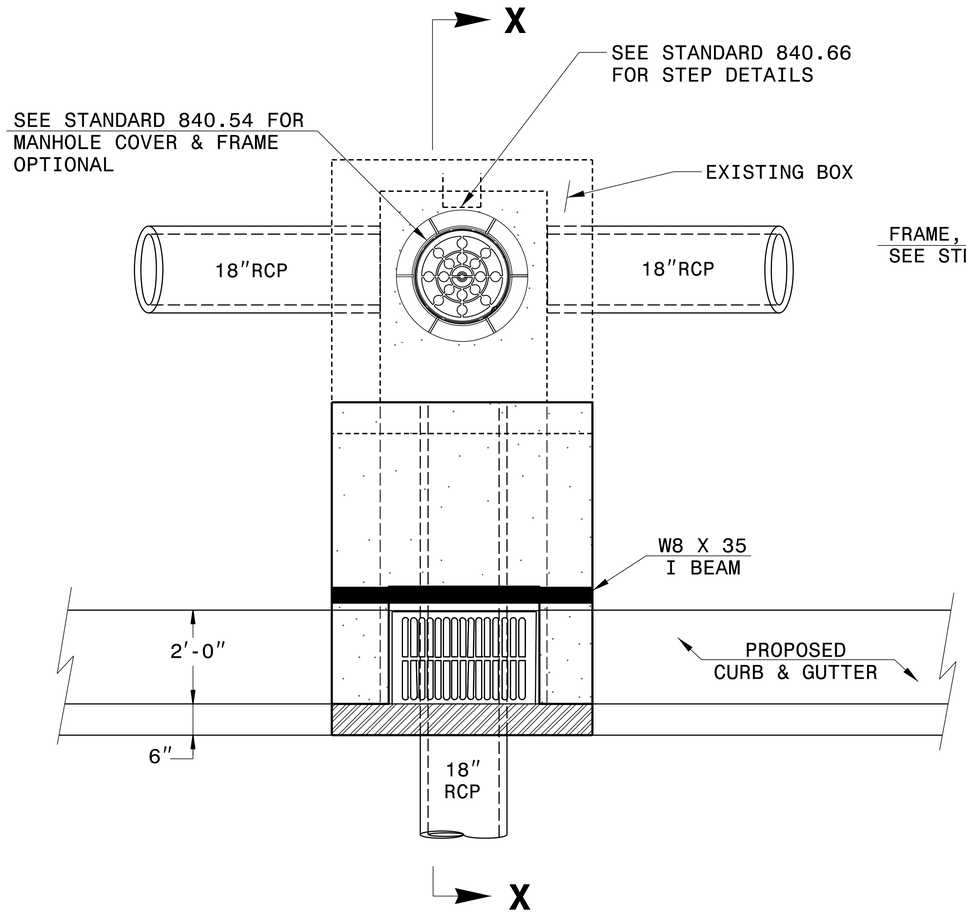
PROJECT REFERENCE NO.	SHEET NO.
W-5520	2D-1

HYDRAULICS ENGINEER

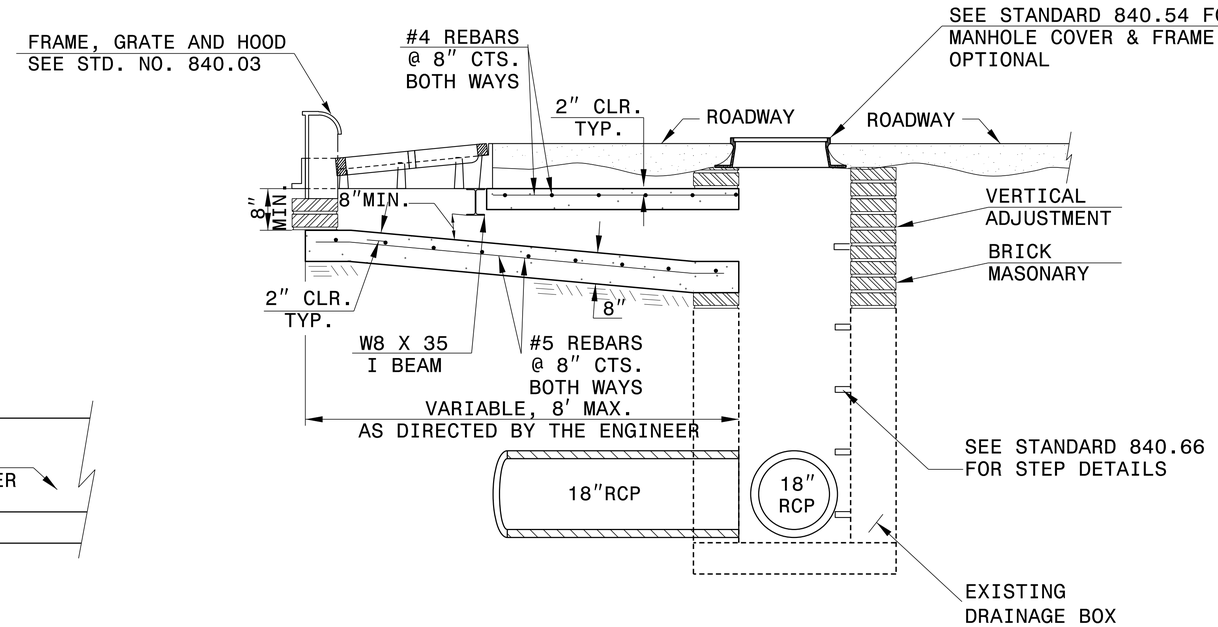
NORTH CAROLINA PROFESSIONAL SEAL 027876 ENGINEER KANA STANSELL

2/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN



SECTION X-X

NOTES:

MORTAR JOINTS ½" TO ¼" THICK.

USE CLASS "B" CONCRETE THROUGHOUT.

USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.

CHAMFER ALL EXPOSED CORNERS 1".

ALL CONVERSIONS SHALL BE ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING NO. 840.66.

DRAWING NOT TO SCALE.

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

CONVERSION OF EXISTING DRAINAGE BOX TO CATCH BASIN - DETAIL AA

ORIGINAL BY:	E.E. WARD	DATE:	1-24-02
MODIFIED BY:	VMD	DATE:	4-08-15
CHECKED BY:		DATE:	
FILE SPEC.:	nbritt/english/hydro/edb to offsetcb.dgn		

12/1/2016 9:04:48 AM
N:\Roadway\Proj\W5520_Rdy_psh_02D1.dgn
mright

PROJECT REFERENCE NO.	SHEET NO.
W-5520	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 037845 ENGINEER LUIS A. CAMPOS

Luis A. Campos 2/2/2017

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

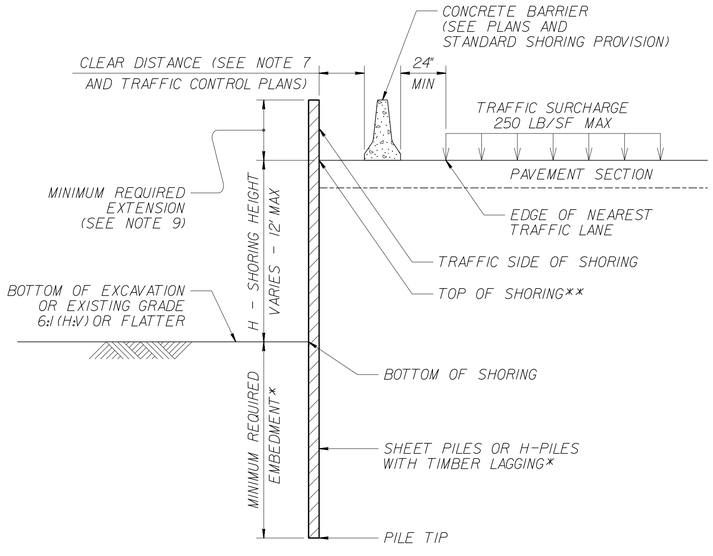
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

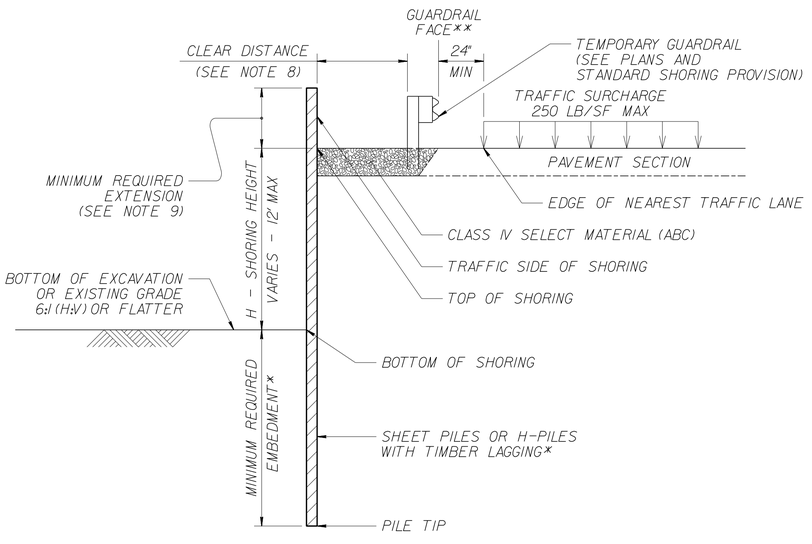
NOTES:

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



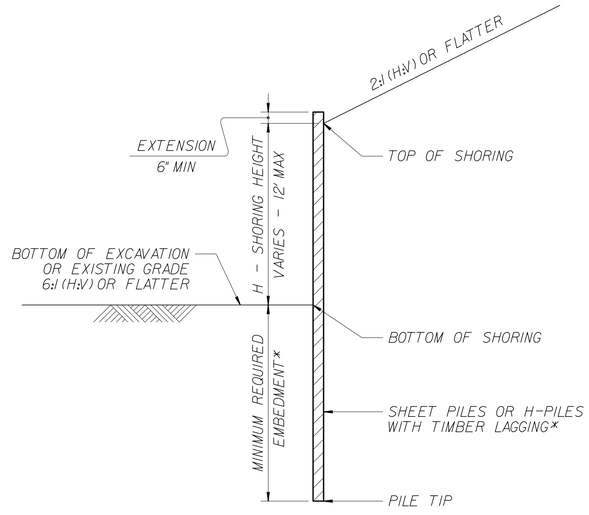
CONCRETE BARRIER

****TOP OF SHORING = EDGE OF PAVEMENT**



TEMPORARY GUARDRAIL

****GUARDRAIL FACE = EDGE OF PAVEMENT**



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERY OWNER NAMES	TOTAL AREA (SF)	AREA TAKEN	AREA REMAINING RT	AREA REMAINING LT	TEMP. CONST. EASE.	PERM. DRAIN. EASE.	PERM. EASE.	TEMP. DRAIN. EASE.
4	SF PROPERTIES 3 LLC	4,706.10	2,466.10		2,240.00	2,240.00			
6	ARC CAFEHLD001 LLC	1,002.48	1,002.48						
8	LEMMOND, REA NELSON	3,570.66		3,570.66		3,570.66			
10	MCCAULEY AND MCDONALD INVESTMENTS INC.	5,786.95	2,992.37		2,794.59	2,794.59			
16	MARSH DOUGLAS IVORY	1,968.33			1,968.33	1,968.33			
17	SIR JAKE LLC	2,647.86		481.08	2,166.78	2,166.78		481.08	
19	SAMS'S REAL ESTATE HOLDING-GEORGIA	548.92		548.92				548.92	
20	JIM CHERRY INTERESTS INC.	539.63		539.63				539.63	
29	SAKRON LLC	638.65			638.65			638.65	
31	THOMPSON REALTY INVESTMENTS LLC	8,414.58		8,414.58		8,414.58			
34	SUNTRUST BANK	401.86			401.86			401.86	
35	S L & E INVESTMENTS LLC	532.12			851.11			532.12	318.99
37	STORE MASTER FUNDING III LLC	180.62			180.62				180.62
38	WASH ONE LLC	1,138.73			1,138.73		1,138.73		
39	INTERNATIONAL MEGE VENTURES II LLC	8,014.06			8,014.06	6,158.99	1,855.07		
49	GROUP 10 LLC	8,974.99		8,974.99		8,974.99			
50	EIG UNION TOWN LLC	3,027.81			3,027.81	3,027.81			
65	GUY PROPERTIES LLC	1,375.83		1,375.83		1,375.83			
74	SOUTHMARK INVESTMENTS LLC	3,922.46			3,922.46		3,922.46		
75	TT OF EAST CHARLOTTE LLC	4,366.28			4,366.28	4,366.28			
76	SAM'S INVESTMENTS II LLC	1,336.95	1,336.95						

COMPUTED BY: MDH DATE: 12/20/16
CHECKED BY: CKH DATE: 12/20/16

PROJECT NO.	SHEET NO.
W-5520	3B-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	G	NG				
-L2-	205+15	207+25	RT	162.50'	50.00'		205+15	207+25	2	0										2								GUARDRAIL TO BE PLACED NEXT TO RETAINING
																												WALL WITH 8' POSTS WITH 6'-3" SPACING
			SUBTOTAL	162.50'	50.00'										TOTALS:					2							(SEE TYPICAL NO. 5, SHEET 2A-2)
			LESS ANCHORS	-12.50'											ANCHOR DEDUCTIONS:													
															CAT-1 @ 6.25' EACH			12.5'										
			TOTAL	150.00'	50.00'												TOTAL	12.5'											

ADDITIONAL EXTRA LENGTH GUARDRAIL POSTS (8' STEEL) = 5 EA

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
L1	110+36	110+59	CL			25.89	
L1	126+39	126+60	CL			18	
L2	205+10	205+25	CL			42.46	
L2	205+35	206+56	RT	207.88			
L2	209+26	211+18	CL			97.75	
L2	211+23	211+92	CL			35.98	
L2	211+97	212+17	CL			9.91	
L2	212+23	212+29	CL			2.75	
L2	212+01	212+35	LT			19.43	
L3	312+71	314+20	CL			68.64	
L3	321+78	323+99	LT	118.58			
L4	408+69	408+99	RT	57.84			
L4	410+04	414+84	CL	183.27			
L4	417+97	418+18	LT			24.65	
L4	417+82	418+08	RT			20.48	
		TOTAL:		567.57		365.94	
		SAY:		570		370	

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-L1- 106+10 RT	-L1- 109+50 RT	86	264	631	545	264
-L1- 114+00 RT	-L1- 118+50 RT	96	0	306	210	0
-Y2- 12+50	-Y2- 14+50	56	0	6	0	50
SUBTOTALS:		**238**	**264**	**943**	**755**	**314**
-L1- 115+00 LT	-L1- 115+50 LT	91	0	17	0	74
-L1- 120+50 LT	-L1- 127+00 LT	634	142	1,149	515	142
-Y1- 11+00.00	-Y1- 15+00.00	419	0	28	0	391
SUBTOTALS:		**1,144**	**142**	**1,194**	**515**	**607**
-L1- 106+10.00 CL	-L1- 115+50.00 CL	1,479	0	0	0	1,479
SUBTOTALS:		**1,479**	**0**	**0**	**0**	**1,479**
-L1- 116+00.00 CL	-L1- 127+00.00 CL	1,519	0	37	37	1,519
SUBTOTALS:		**1,519**	**0**	**37**	**37**	**1,519**
-L2- 205+00.00 RT	-L2- 208+50.00 RT	90	276	699	609	276
-L2- 221+00.00 RT	-L2- 226+15.00 RT	87	0	82	0	5
SUBTOTALS:		**177**	**276**	**781**	**609**	**281**
-L2- 214+50.00 LT	-L2- 226+15.00 LT	1,392	344	1,082	0	654
SUBTOTALS:		**1,392**	**344**	**1,082**	**0**	**654**
-L2- 205+00.00 CL	-L2- 212+50.00 CL	1,106	0	20	20	1,106
SUBTOTALS:		**1,106**	**0**	**20**	**20**	**1,106**
-L2- 213+50.00 CL	-L2- 226+00.00 CL	937	0	107	107	937
SUBTOTALS:		**937**	**0**	**107**	**107**	**937**
-L3- 303+20.00 RT	-L3- 306+50.00 RT	2,473	383	440	0	2,416
SUBTOTALS:		**2,473**	**383**	**440**	**0**	**2,416**
-L3- 323+50.00 LT	-L3- 326+50.00 LT	64	112	859	795	112
SUBTOTALS:		**64**	**112**	**859**	**795**	**112**

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Asphalt Pavement will be paid for at the contract lump sum price for grading.

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-L3- 303+20.00 CL	-L3- 314+50.00 CL	1,150	0	112	112	1,150
SUBTOTALS:		**1,150**	**0**	**112**	**112**	**1,150**
-L3- 315+00.00 CL	-L3- 326+50.00 CL	933	0	296	296	933
SUBTOTALS:		**933**	**0**	**296**	**296**	**933**
-L4- 408+40.00 RT	-L4- 412+00.00 RT	396	0	51	0	345
SUBTOTALS:		**396**	**0**	**51**	**0**	**345**
-L4- 426+00.00 LT	-L4- 429+65.00 LT	102	0	751	649	0
SUBTOTALS:		**102**	**0**	**751**	**649**	**0**
-L4- 401+50.00 CL	-L4- 418+50.00 CL	1,377	0	122	122	1,377
SUBTOTALS:		**1,377**	**0**	**122**	**122**	**1,377**
-L4- 419+00.00 CL	-L4- 429+50.00 CL	951	0	75	75	951
SUBTOTALS:		**951**	**0**	**75**	**75**	**951**
TOTAL:		**15,438**	**1,521**	**6,870**	**4,092**	**14,181**
LOSS DUE TO CLEARING AND GRUBBING		-200	0	0	200	0
ADDITIONAL UNDERCUT		0	500	575	575	500
MATERIAL FOR SHOULDER CONSTRUCTION		0	0	3,243	3,243	0
ADDITIONAL UNSUITABLE WASTE		0	0	0	0	0
WASTE IN LIEU OF BORROW		0	0	0	-3,008	-3,008
PROJECT TOTALS:		**15,238**	**2,021**	**10,688**	**5,102**	**11,673**
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT		0	0	0	255	0
GRAND TOTALS:		**15,238**	**2,021**	**10,688**	**5,357**	**11,673**
SAY:		**15,300**			**5,400**	

EST. DDE = 120 CY
SHALLOW UNDERCUT = 200 CY (PER GEOTECH RECOMMENDATIONS - JUNE 15, 2016)
CLASS IV SUBGRADE STABILIZATION = 300 TONS

CHA-LOANER-W7

COMPUTED BY: RS DATE: 8/9/2016

CHECKED BY: MH DATE: 9/8/2016

PROJECT NO.	SHEET NO.
W-5520	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

| LINE & STATION | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 12 | 15 | 18 | 24 | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. S. PIPE THICKNESS OR GAUGE: 12 (.064) | 15 (.064) | 18 (.064) | 24 (.064) | 30 (.079) | 36 (.079) | 42 (.109) | 48 (.109) | R. C. PIPE CLASS III: 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS IV: 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL | 15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL | 18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL | 18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL | 42" WELDED STEEL PIPE 0.625" THICK, GRADE BNOT | ENDWALLS STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 0' THRU 5' EACH | A: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE: E | F | G | CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06 | SPECIAL DETAIL W/ G.D.I. "D" | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 OR STD. 840.46 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | CONVERT EXISTING D.I. TO J.B. W/ M.H. | CONVERT EXISTING J.B. TO D.I./2GI | CONVERT EXISTING D.I. TO J.B. | ADJUSTMENT OF DROP INLETS | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | PREFORMED SCOUR HOLE (PER EACH) | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | PIPE REMOVAL LIN. FT. | REMARKS |
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CHA-LOANER-W7

COMPUTED BY: RS DATE: 8/9/2016

CHECKED BY: MH DATE: 9/8/2016

PROJECT NO.	SHEET NO.
W-5520	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

| LINE & STATION | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 12 | 15 | 18 | 24 | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. S. PIPE THICKNESS OR GAUGE: 12 | .064 | 15 | .064 | 18 | .064 | 24 | .079 | 30 | .079 | 36 | .109 | 42 | .109 | 48 | R. C. PIPE CLASS III 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL | 15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL | 18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL | 18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL | 42" WELDED STEEL PIPE 0.625" THICK, GRADE BNOT | ENDWALLS STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 0' THRU 5' EACH | A: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | SPECIAL DETAIL W/ G.D.I. "D" | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 OR STD. 840.46 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | CONVERT EXISTING D.I. TO J.B. W/ M.H. | CONVERT EXISTING J.B. TO D.I./2GI | CONVERT EXISTING D.I. TO J.B. | ADJUSTMENT OF DROP INLETS | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | PREFORMED SCOUR HOLE (PER EACH) | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | PIPE REMOVAL LIN. FT. | REMARKS |
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CHA-LOANER-W7

COMPUTED BY:	VMD	DATE:	8/9/2016
CHECKED BY:	MDH	DATE:	9/8/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5520	3D-3

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L2 207+92	46 RT	0601		653.2												
		0601	0602		650.2	645.9										
L2 205+08	10 LT	0603		659.8												
		0603	0604		654.4	653.5										
L2 206+08	13 LT	0605		657.0												
		0605	0603		654.7	654.4										
L2 206+47	15 LT	0606		656.7												
		0606	0605		654.8	654.7										
L2 207+78	13 RT	0607		653.5												
		0607	0608		650.3	648.5										
L2 209+00	3 RT	0608		651.7												
		0608	0609		648.5	648.3										
L2 209+18	7 RT	0609		651.5												
		0609	0610		648.3	647.4										
L2 210+15	4 LT	0610		650.6												
		0610	0611		647.4	647.2										
L2 210+45	1 RT	0611		650.3												
		0611	0611A		647.2	646.7										
L2 211+50	4 LT	0612		649.8												
		0612	0615		646.5	645.6										
L2 211+88	2 LT	0613		649.4												
		0613	0625		646.2	646.0										
L2 212+47	7 LT	0614		649.2												
		0614	0616		645.9	645.6										
L2 212+73	11 LT	0616		648.8												
		0616	0618		645.6	645.2										
L2 213+52	8 RT	0617		648.3												
		0617	0620		645.2	644.8										
L2 213+56	14 LT	0618		648.7												
		0618	0619		645.2	644.9										
L2 214+23	14 LT	0619		648.4												
		0619	0620		644.9	644.8										
L2 214+23	4 RT	0620		648.4												
		0620	0622		644.8	644.7										
L2 214+23	14 RT	0621		648.2												
		0621	0620		645.1	644.8										
L2 214+50	10 RT	0622		647.6												
		0622	0717		644.7	644.1										
L2 207+07	62 RT	0623		654.7												
		0623	0601		651.7	650.2										
L2 212+28	3 LT	0625		649.2												
		0625	0614		646.0	645.9										
L2 217+00	7 RT	0701		645.9												
		0701	0718		642.5	641.8										
L2 219+61	6 RT	0702		644.7												
L2 220+25	4 RT	0703		643.6												
		0703	0702		640.8	640.5										
L2 218+50	85 LT	0705														
		0705	0706		640.2	637.2										
L2 220+30	74 LT	0706		643.0												

FROM	TO	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B NOT IN SOIL
0601																															
0601	0602		40																												
0603																															
0603	0604																			48											
0605																															
0605	0603																		100												
0606																															
0606	0605																		36												
0607																															
0607	0608																		120												
0608																															
0608	0609																		16												
0609																															
0609	0610																		96												
0610																															
0610	0611																		32												
0611																															
0611	0611A																		72												
0612																															
0612	0615																		68												
0613																															
0613	0625																		40												
0614																															
0614	0616																		24												
0616																															
0616	0618																		80												
0617																															
0617	0620																		68												
0618																															
0618	0619																		64												
0619																															
0619	0620																		16												
0620																															
0620	0622																		24												
0621																															
0621	0620																		8												
0622																															
0622	0717																		100												
0623																															
0623	0601																		84												
0625																															
0625	0614																		16												
0701																															
0701	0718																		148												
0702																															
0703																															
0703	0702																		60												
0705																															
0705	0706														180																
0706																															
SHEET TOTALS			40												180				1272	48											

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	SPECIAL DETAIL W/ G.D.I. "D"	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34 OR STD. 840.46	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I./2GI	CONVERT EXISTING D.I. TO J.B.	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW		PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0601					1			1		1																														
0601	0602																													2										
0603					1	0.4							1		1	1																								
0603	0604																																							
0605					1									1					1	1																				See Detail Sheet 2C-6
0605	0603																																							
0606					1									1					1	1																				See Detail Sheet 2C-6
0606	0605																																							
0607					1								1		1	1																								
0607	0608																																							
0608					1								1		1	1																								
0608	0609																																							
0609					1								1		1	1																								
0609	0610																																							
0610					1								1		1	1																								
0610	0611																																							
0611					1								1		1	1																								
0611	0611A																																							
0612					1								1		1	1																								
0612	0615																																							
0613					1								1		1	1																								
0613	0625																																							
0614					1								1		1	1																								
0614	0616																																							
0616					1								1		1	1																								
0616	0618																																							
0617					1								1		1	1																								
0617	0620																																							
0618					1								1		1	1																								
0618	0619																																							
0619					1								1		1	1																								
0619	0620																																							
0620					1								1		1	1																								
0620	0622																																							
0621					1								1		1	1																								
0621	0620																																							
0622					1													1			1																			
0622	0717																																							
0623					1			1		1																														
0623	0601																																							
0625					1								1		1	1																								
0625	0614																																							
0701					1													1			1																			
0701	0718																																							
0702					1													1			1																			
0703					1													1			1																			
0703	0702																																							
0705		3.602																																						
0705	0706																																							
0706					1	0.8											1				1																			
SHEET TOTALS		3.602			25	1.2		2		2			16	2	16	16	1	4	2	2	5									2										

ABBREVIATIONS

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

COMPUTED BY:	VMD	DATE:	8/9/2016
CHECKED BY:	MDH	DATE:	9/8/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5520	3D-4

CHA-LOANER-W7

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

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
			0706	0707		637.2	636.8	
L2 221+32	74	LT	0707		642.9			
			0707	0720		636.8	635.1	
L2 223+38	95	LT	0708	709A		636.8	636.6	
L2 223+38	8	LT	0709		645.2			
			0709	0709B		636.2	636.1	
L2 224+56	9	LT	0711		643.5			
			0711	0709		640.3	637.4	
L2 225+85	2	RT	0713		645.2			
			0713	0711		642.0	640.3	
L2 222+90	101	LT	0715					
			0715	0707		639.0	636.8	
L2 215+50	9	RT	0717		646.8			
			0717	0701		644.1	642.5	
L2 218+50	7	RT	0718		645.2			
			0718	0702		641.8	641.2	
L2 221+00	1	LT	0719		644.6			
			0719	0703		641.8	640.8	
L2 211+17	0	LT	0611A		649.8			
			0611A	0612		646.7	646.5	
L2 217+59	78	LT	0721			643.6	640.2	
L2 223+17	92	LT	0722			640.0	637.0	
L2 215+67	3	RT						
L2 211+57	11	LT						
L2 212+07	11	LT						
L2 221+90	71	LT						
L2 222+69	67	LT						
L2 223+06	66	LT						
L2 217+57	72	LT						
L2 219+44	73	LT						
L2 211+95	8	LT						
L2 212+05	1	LT						

LINE & STATION	FROM	TO	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109
	0706	0707																	
L2 221+32	0707																		
	0707	0720																	
L2 223+38	0708	709A																	
L2 223+38	0709																		
	0709	0709B																	
L2 224+56	0711																		
	0711	0709																	
L2 225+85	0713																		
	0713	0711																	
L2 222+90	0715																		
	0715	0707																	
L2 215+50	0717																		
	0717	0701																	
L2 218+50	0718																		
	0718	0702																	
L2 221+00	0719																		
	0719	0703																	
L2 211+17	0611A																		
	0611A	0612																	
L2 217+59	0721			80															
L2 223+17	0722			36															
SHEET TOTALS				116															
L2 TOTALS				116									40						

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
	0706	0707						100										
L2 221+32	0707																	
	0707	0720																
L2 223+38	0708	709A					32											
L2 223+38	0709																	
	0709	0709B													8			
L2 224+56	0711																	
	0711	0709		116														
L2 225+85	0713																	
	0713	0711										128						
L2 222+90	0715																	
	0715	0707						160										
L2 215+50	0717																	
	0717	0701										148						
L2 218+50	0718																	
	0718	0702										108						
L2 221+00	0719																	
	0719	0703										72						
L2 211+17	0611A																	
	0611A	0612										36						
SHEET TOTALS				116			32	260				492			8			
L2 TOTALS				116			32	440				1764	48		8			

LINE & STATION	FROM	TO	15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
	0706	0707																	
L2 221+32	0707											1	1.1						
	0707	0720					68	68											
L2 223+38	0708	709A																	
L2 223+38	0709											1	4.1						
	0709	0709B																	
L2 224+56	0711											1							
	0711	0709																	
L2 225+85	0713											1							
	0713	0711																	
L2 222+90	0715								3.602										
	0715	0707																	
L2 215+50	0717											1							
	0717	0701																	
L2 218+50	0718											1							
	0718	0702																	
L2 221+00	0719											1							
	0719	0703																	
L2 211+17	0611A											1							
	0611A	0612																	
SHEET TOTALS							68	68	3.602			8	5.2						
L2 TOTALS							68	68	7.204			33	6.4		2		2		

LINE & STATION	FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	SPECIAL DETAIL W/ G.D.I. "D"	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34 OR STD. 840.46	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I./2GI	CONVERT EXISTING D.I. TO J.B.	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW		PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
	0706	0707																												
L2 221+32	0707						1				1																			
	0707	0720																												Trenchless Installation
L2 223+38	0708	709A																									0.6560			
L2 223+38	0709				1	1																								
	0709	0709B																									0.6560			
L2 224+56	0711				1	1																								
	0711	0709																												
L2 225+85	0713		1		1	1																								
	0713	0711																												
L2 222+90	0715																													
	0715	0707																												
L2 215+50	0717							1			1																			
	0717	0701																												
L2 218+50	0718							1			1																			
	0718	0702																												
L2 221+00	0719							1			1																			
	0719	0703																												
L2 211+17	0611A		1		1	1																								
	0611A	0612																												
L2 217+59	0721																													
L2 223+17	0722																													
L2 215+67																										3				
L2 211+57																													73	
L2 212+07																													23	
L2 221+90																													112	
L2 222+69																													47	
L2 223+06																													18	
L2 217+57																													80	
L2 219+44																													171	
L2 211+95																													6	
L2 212+05																													18	
SHEET TOTALS			2		4	4	1	3			4															3	1.3120		548	
L2 TOTALS			18	2	20	20	2	7	2	2	9									2						3	1.3120		548	

CHA-LOANER-W7

COMPUTED BY: RS DATE: 8/9/2016

CHECKED BY: MDH DATE: 9/8/2016

PROJECT NO.	SHEET NO.
W-5520	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
								Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) THICKNESS OR GAUGE								
L3 303+50	3 LT	0802		659.9												
		0802	0801		656.7	656.5										
L3 304+00	14 RT	0803		661.8												
		0803	0802		657.4	656.7										
L3 305+61	8 RT	0804		664.0												
		0804	0805		660.3	660.1										
L3 305+61	2 LT	0805		665.3												
L3 308+61	6 RT	0807		670.4												
		0807	0808		666.9	666.8										
L3 308+61	2 LT	0808		671.5												
L3 313+41	13 LT	0810		673.6												
		0810	0902		670.2	670.1										
L3 306+00	63 RT	0811			664.8	663.9			30							
L3 314+40	1 RT	0901		672.7												
		0901	0927		667.8	666.8										
L3 313+60	15 LT	0902		674.1												
		0902	0903		670.1	670.0										
L3 313+60	15 RT	0903		674.0												
		0903	0904		670.0	669.2										
L3 314+21	15 RT	0904		673.2												
		0904	0905		669.2	668.5										
L3 314+40	12 RT	0905		672.5												
		0905	0901		668.5	667.8										
L3 315+07	11 LT	0906		671.5												
		0906	0907		666.7	666.1										
L3 315+96	14 LT	0907		669.7												
		0907	0912		666.1	665.0										
L3 315+96	3 RT	0908		669.5												
		0908	0907		666.1	666.1										
L3 315+97	14 RT	0909		669.7												
		0909	0908		666.2	666.1										
L3 317+60	7 RT	0913		663.8												
L3 321+63	0 CL	0916		650.9												
L3 323+00	5 LT	0918		648.3												
		0918	0919		644.3	642.6										
L3 324+00	7 LT	0919		646.6												
		0919	0920		642.6	639.7										
L3 325+17	5 LT	0920		645.6												
		0920	0925		639.7	639.1										
L3 325+60	14 LT	0921		645.6												
		0921	0920		639.9	639.7										
L3 326+15	5 RT	0922		644.6												
		0922	0921		640.2	639.9										
L3 326+30	14 RT	0923		644.8												
		0923	0922		640.3	640.2										
L3 324+56	89 LT	0924		641.5												
		0924	0925		639.2	639.1			64				x	x	x	x
L3 325+57	93 LT	0925		643.0												
		0925	0926		639.1	638.5			116				x	x	x	x
L3 315+04	10 RT	0927		671.7												
SHEET TOTALS									210							

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	C. S. PIPE SIZE 12	15	18	24	30	36	42	48	R. C. PIPE CLASS III SIZE 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV SIZE 12	15	18	24	30	36	42	48
				THICKNESS OR GAUGE .064	.064	.064	.064	.079	.079	.109	.109																		
L3 303+50	3 LT	0802																										
		0802	0801																		48							
L3 304+00	14 RT	0803																										
		0803	0802																		56							
L3 305+61	8 RT	0804																										
		0804	0805																		12							
L3 305+61	2 LT	0805																										
L3 308+61	6 RT	0807																										
		0807	0808																		8							
L3 308+61	2 LT	0808																										
L3 313+41	13 LT	0810																										
		0810	0902																		20							
L3 306+00	63 RT	0811																										
L3 314+40	1 RT	0901																										
		0901	0927																		68							
L3 313+60	15 LT	0902																										
		0902	0903																		32							
L3 313+60	15 RT	0903																										
		0903	0904																		64							
L3 314+21	15 RT	0904																										
		0904	0905																		20							
L3 314+40	12 RT	0905																										
		0905	0901																		12							
L3 315+07	11 LT	0906																										
		0906	0907																		92							
L3 315+96	14 LT	0907																										
		0907	0912																		52							
L3 315+96	3 RT	0908																										
		0908	0907																		20							
L3 315+97	14 RT	0909																										
		0909	0908																		12							
L3 317+60	7 RT	0913																										
L3 321+63	0 CL	0916																										
L3 323+00	5 LT	0918																										
		0918	0919																		104							
L3 324+00	7 LT	0919																										
		0919	0920																		120							
L3 325+17	5 LT	0920																										
		0920	0925																					43	43			
L3 325+60	14 LT	0921																										
		0921	0920																		44							
L3 326+15	5 RT	0922																										
		0922	0921																		60							
L3 326+30	14 RT	0923																										
		0923	0922																		20							
L3 324+56	89 LT	0924																										
		0924	0925																									
L3 325+57	93 LT	0925																										
		0925	0926																									
L3 315+04	10 RT	0927																										
SHEET TOTALS																					856	8			43	43		

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 OR STD. 852.04	SPECIAL DETAIL W/ G.D.I. "D"
L3 303+50	3 LT	0802					1								1	
		0802	0801													
L3 304+00	14 RT	0803					1								1	
		0803	0802													
L3 305+61	8 RT	0804					1									
		0804	0805													
L3 305+61	2 LT	0805														
L3 308+61	6 RT	0807					1									
		0807	0808													
L3 308+61	2 LT	0808														
L3 313+41	13 LT	0810					1								1	
		0810	0902													
L3 306+00	63 RT	0811														
L3 314+40	1 RT	0901					1									
		0901	0927													
L3 313+60	15 LT	0902					1								1	
		0902	0903													
L3 313+60	15 RT	0903					1								1	
		0903	0904													
L3 314+21	15 RT	0904					1								1	
		0904	0905													
L3 314+40	12 RT	0905					1								1	
		0905	0901													
L3 315+07	11 LT	0906					1								1	
		0906	0907													
L3 315+96	14 LT	0907					1								1	
		0907	0912													
L3 315+96	3 RT	0908					1								1	
		0908	0907													
L3 315+97	14 RT	0909					1								1	
		0909	0908													
L3 317+60	7 RT	0913					1									
L3 321+63	0 CL	0916														1
L3 323+00	5 LT	0918					1									
		0918	0919													
L3 324+00	7 LT	0919					1									
		0919	0920													
L3 325+17	5 LT	0920					1	1.0							1	
		0920	0925													
L3 325+60	14 LT	0921					1	0.7							1	
		0921	0920													
L3 326+15	5 RT	0922					1								1	
		0922	0921													
L3 326+30	14 RT	0923					1								1	
		0923	0922													
L3 324+56	89 LT	0924					1									
		0924	0925													
L3 325+57	93 LT	0925					1									
		0925	0926													
L3 315+04	10 RT	0927					1									
SHEET TOTALS							24	1.7							15	

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 OR STD. 852.04	SPECIAL DETAIL W/ G.D.I. "D"	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34 OR STD. 840.46	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I./2GI	CONVERT EXISTING D.I. TO J.B.	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L3 303+50	3 LT	0802			1	1	1																						
		0802	0801																										
L3 304+00	14 RT	0803			1	1	1																						
		0803	0802																										
L3 305+61	8 RT	0804							1			1																	
		0804	0805																										
L3 305+61	2 LT	0805																									0.3990		
L3 308+61	6 RT	0807							1			1																	
		0807	0808																										
L3 308+61	2 LT	0808																									0.4465		
L3 313+41	13 LT	0810			1	1	1																						
		0810	0902																										
L3 306+00	63 RT	0811																											
L3 314+40	1 RT	0901													1		1												
		0901	0927																										
L3 313+60	15 LT	0902			1	1	1																						
		0902	0903																										
L3 313+60	15 RT	0903			1	1	1																						
		0903	0904																										
L3 314+21	15 RT	0904			1	1	1																						
		0904	0905																										
L3 314+40	12 RT	0905			1	1	1																						
		0905	0901																										
L3 315+07	11 LT	0906			1	1	1																						
		0906	0907																										
L3 315+96	14 LT	0907			1	1	1																						
		0907	0912																										
L3 315+96	3 RT	0908			1	1	1																						
		0908	0907																										
L3 315+97	14 RT	0909			1	1	1																						
		0909	0908																										
L3 317+60	7 RT	0913							1			1																	
L3 321+63	0 CL	0916																				1							ADJUST 2 GI
L3 323+00	5 LT	0918							1			1																	
		0918	0919																										
L3 324+00	7 LT	0919							1			1																	
		0919	0920																										
L3 325+17	5 LT	0920			1	1	1																						
		0920	0925																										Trenchless Installation
L3 325+60	14 LT	0921			1	1	1																						
		0921	0920																										
L3 326+15	5 RT	0922			1	1	1																						
		0922	0921																										
L3 326+30	14 RT	0923			1	1	1																						
		0923	0922																										
L3 324+56	89 LT	0924				1	1																						
		0924	0925												1		1												
L3 325+57	93 LT	0925													1		1												
		0925	0926													1	1												
L3 315+04	10 RT	0927														1	1												
SHEET TOTALS					15	16	16	5		5	1	2	3			1										0.8455			

ABBREVIATIONS

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

COMPUTED BY:	RS	DATE:	8/9/2016
CHECKED BY:	MDH	DATE:	9/8/2016

CHA-LOANER-W7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5520	3D-6

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
		0927	0906		666.8	666.7	
L3 303+31	84 RT						
L3 313+92	7 LT						
L3 314+16	2 LT						
L3 325+60	8 LT						
L3 315+07	15 LT						
SHEET TOTALS							
L3 TOTALS							

LINE & STATION	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L3 303+31									
L3 313+92									
L3 314+16									
L3 325+60									
L3 315+07									
SHEET TOTALS									
L3 TOTALS		210							

LINE & STATION	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48
L3 303+31																
L3 313+92																
L3 314+16																
L3 325+60																
L3 315+07																
SHEET TOTALS																
L3 TOTALS																

LINE & STATION	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B NOT IN SOIL
		24												
L3 303+31														
L3 313+92														
L3 314+16														
L3 325+60														
L3 315+07														
SHEET TOTALS		24												
L3 TOTALS		880	8						43	43				

LINE & STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	SPECIAL DETAIL W/ G.D.I. "D"
L3 303+31													
L3 313+92													
L3 314+16													
L3 325+60													
L3 315+07													
SHEET TOTALS													
L3 TOTALS				24	1.7							15	

LINE & STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34 OR STD. 840.46	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I./2GI	CONVERT EXISTING D.I. TO J.B.	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW		PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L3 303+31																									41	
L3 313+92																									8	
L3 314+16																						2				
L3 325+60																						3			9	
L3 315+07																						4				
SHEET TOTALS																						9			58	
L3 TOTALS	16	16		5			5	1	2		3				1							9	0.8455		58	

ABBREVIATIONS

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

CHA-LOANER-W7

COMPUTED BY:	VMD	DATE:	8/9/2016
CHECKED BY:	MDH	DATE:	9/8/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5520	3D-7

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

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

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L4 402+45	5	LT	1001		640.2												
			1001	1002		637.4	636.0										
L4 404+25	8	LT	1002		638.8												
			1002	1004		636.0	635.7	0.4									
L4 405+00	7	LT	1004		639.9												
			1004	1006		635.7	635.5	0.4									
L4 405+37	14	LT	1006		639.9												
			1006	1007		635.5	635.4	0.5									
L4 405+50	8	RT	1007		639.0												
			1007	1008		635.4	634.4	0.5									
L4 407+53	4	RT	1008		637.6												
L4 408+44	14	LT	1012		639.1												
			1012	1008		635.6	634.4										
L4 408+44	14	RT	1013		639.2												
			1013	1012		636.0	635.6										
L4 408+78	6	LT	1014		638.9												
			1014	1012		635.8	635.6										
L4 409+07	86	RT	1015		638.4												
			1015	1009		635.2	634.2										
L4 409+75	73	RT	1016		638.8												
			1016	1015		635.5	635.2										
L4 410+84	7	RT	1017		638.8												
			1017	1017A		634.5	634.4										
L4 413+26	3	LT	1020		640.8												
			1020	1019		637.1	633.1										
L4 413+26	9	RT	1021		641.0												
			1021	1020		637.2	637.1	0.5									
L4 414+69	4	LT	1022		642.2												
			1022	1021		637.9	637.2	0.4									
L4 410+00	83	RT	1023		638.4												
			1023	1016		635.7	635.5										
L4 415+82	1	RT	1101		642.5												
			1101	1022		638.4	637.9	0.4									
L4 417+94	6	LT	1102		643.7												
			1102	1103		639.5	639.3										
L4 417+52	4	LT	1103		643.5												
			1103	1101		639.3	638.4										
L4 417+54	14	RT	1104		643.9												
			1104	1103		640.0	639.9										
L4 418+25	14	RT	1105		644.2												
			1105	1104		640.3	640.0										
L4 419+18	13	LT	1106		644.0												
			1106	1108		640.8	640.7										
L4 419+04	15	LT	1107		644.3												
			1107	1106		641.1	640.8										
L4 419+32	7	RT	1108		644.4												
			1108	1102		640.7	639.5										
L4 419+81	5	RT	1109		644.6												
			1109	1108		641.0	640.7										
L4 420+02	3	RT	1110		644.3												
SHEET TOTALS																	

FROM	TO	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
1001																									
1001	1002										180														
1002																									
1002	1004																		72						
1004																									
1004	1006																		36						
1006																									
1006	1007																		24						
1007																									
1007	1008										200														
1008																									
1012																									
1012	1008																		92						
1013																									
1013	1012																		28						
1014																									
1014	1012																		32						
1015																									
1015	1009																		200						
1016																									
1016	1015																		68						
1017																									
1017	1017A																			8					
1020																									
1020	1019																								
1021																									
1021	1020																			16					
1022																									
1022	1021																			144					
1023																									
1023	1016																		28						
1101																									
1101	1022																			112					
1102																									
1102	1103																		40						
1103																									
1103	1101																			168					
1104																									
1104	1103																		16						
1105																									
1105	1104																		68						
1106																									
1106	1108																		24						
1107																									
1107	1106																		12						
1108																									
1108	1102																		136						
1109																									
1109	1108																		48						
1110																									
SHEET TOTALS											380								924	448					

FROM	TO	15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
1001																		
1001	1002																	
1002											1							
1002	1004																	
1004											1							
1004	1006																	
1006											1							
1006	1007																	
1007											1							
1007	1008																	
1008											1	5.0	0.2					
1012											1							
1012	1008																	
1013											1							
1013	1012																	
1014											1							
1014	1012																	
1015											1			1			1	
1015	1009																	
1016											1			1			1	
1016	1015																	
1017											1							
1017	1017A																	
1020											1			1			1	
1020	1019			32	32													
1021											1			1		1		
1021	1020																	
1022											1			1		1		
1022	1021																	
1023											1							
1023	1016																	
1101											1			1		1		
1101	1022																	
1102											1							
1102	1103																	
1103											1							
1103	1101																	
1104											1							
1104	1103																	
1105											1							
1105	1104																	
1106											1							
1106	1108																	
1107											1							
1107	1106																	
1108											1							
1108	1102																	
1109											1							
1109	1108																	
1110											1							
SHEET TOTALS				32	32						25	5.0	0.2	6		3	3	

FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	SPECIAL DETAIL W/ G.D.I. "D"	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34 OR STD. 840.46	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I./2GI	CONVERT EXISTING D.I. TO J.B	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW		PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
1001																		1											Adjust 2GI
1001	1002																												
1002							1			1																			
1002	1004																												
1004		1		1	1																								
1004	1006																												
1006		1		1	1																								
1006	1007																												
1007							1			1																			
1007	1008																												
1008						1				1																			
1012		1		1	1																								
1012	1008																												
1013		1		1	1																								
1013	1012																												
1014		1		1	1																								
1014	1012																												
1015																													
1015	1009																												
1016																													
1016	1015																												
1017							1			1																			
1017	1017A																									0.4465			
1020																													
1020	1019																												Trenchless Installation
1021																													
1021	1020																												
1022																													
1022	1021																												
1023							1			1																			
1023	1016																												
1101																													
1101	1022																												
1102		1		1	1																								
1102	1103																												
1103		1		1	1																								
1103	1101																												
1104		1		1	1																								
1104	1103																												
1105		1		1	1																								
1105	1104																												
1106		1		1	1																								
1106	1108																												
1107		1		1	1																								
1107	1106																												
1108		1		1	1																								
1108	1102																												
1109		1		1	1																								
1109	1108																												
1110		1		1	1																								
SHEET TOTALS		14		14	14	1	4			5								1								0.4465			

ABBREVIATIONS

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

COMPUTED BY: VMD DATE: 8/9/2016

CHECKED BY: MDH DATE: 9/8/2016

PROJECT NO.	SHEET NO.
W-5520	3D-8

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
			1110	1109		641.1	641.0	0.4
L4 421+55	4	LT	1111		644.7			
			1111	1110		641.7	641.1	0.4
L4 421+55	4	RT	1112		644.9			
			1112	1111		641.9	641.7	
L4 422+75	4	RT	1113		645.5			
			1113	1112		642.5	641.9	
Y8 13+74	28	LT	1114		644.8			
L4 423+34	15	LT	1115		645.9			
			1115	1113		642.8	642.5	
L4 424+00	1	RT	1116		646.1			
			1116	1115		643.1	642.8	
L4 425+25	7	LT	1117		646.6			
			1117	1116		643.6	643.1	
L4 425+75	16	LT	1118		647.1			
			1118	1117		643.9	643.6	
L4 426+50	8	LT	1119		647.2			
			1119	1118		644.2	643.9	
L4 427+98	13	LT	1120		648.7			
			1120	1125		645.4	644.5	
L4 427+98	15	RT	1121		648.8			
			1121	1120		645.5	645.4	
L4 428+38	13	RT	1122		648.9			
			1122	1121		645.7	645.5	
L4 426+55	56	LT	1123		647.2			
			1123	1124		644.2	644.0	
L4 428+07	77	LT	1125		647.5			
			1125	1126		644.5	635.8	
L4 418+44	10	RT	1127		643.6			
			1127	1105		640.4	640.3	
L4 428+47	83	LT	1130					
L4 414+35	30	RT						
L4 423+34	39	LT						
L4 406+31	3	LT						
L4 408+40	69	RT						
L4 410+93	60	RT						
L4 414+26	3	LT						
L4 421+43	3	RT						
L4 428+47	67	LT						

SIZE / THICKNESS OR GAUGE

LINE & STATION	FROM	TO	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109
	1110	1109																	
L4 421+55	1111																		
	1111	1110																	
L4 421+55	1112																		
	1112	1111																	
L4 422+75	1113																		
	1113	1112																	
Y8 13+74	1114																		
L4 423+34	1115																		
	1115	1113																	
L4 424+00	1116																		
	1116	1115																	
L4 425+25	1117																		
	1117	1116																	
L4 425+75	1118																		
	1118	1117																	
L4 426+50	1119																		
	1119	1118																	
L4 427+98	1120																		
	1120	1125																	
L4 427+98	1121																		
	1121	1120																	
L4 428+38	1122																		
	1122	1121																	
L4 426+55	1123																		
	1123	1124																	
L4 428+07	1125																		
	1125	1126											48						
L4 418+44	1127																		
	1127	1105																	
L4 428+47	1130																		
L4 414+35																			
L4 423+34																			
L4 406+31																			
L4 408+40																			
L4 410+93																			
L4 414+26																			
L4 421+43																			
L4 428+47																			
SHEET TOTALS													48						
PROJECT TOTALS				442	40								110						

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
	1110	1109										20						
L4 421+55	1111																	
	1111	1110										152						
L4 421+55	1112																	
	1112	1111										8						
L4 422+75	1113																	
	1113	1112										120						
Y8 13+74	1114																	
L4 423+34	1115																	
	1115	1113										64						
L4 424+00	1116																	
	1116	1115										68						
L4 425+25	1117																	
	1117	1116										124						
L4 425+75	1118																	
	1118	1117										52						
L4 426+50	1119																	
	1119	1118										76						
L4 427+98	1120																	
	1120	1125										60						
L4 427+98	1121																	
	1121	1120										28						
L4 428+38	1122																	
	1122	1121										36						
L4 426+55	1123																	
	1123	1124		44														
L4 428+07	1125																	
	1125	1126																
L4 418+44	1127																	
	1127	1105										16						
L4 428+47	1130																	
L4 414+35																		
L4 423+34																		
L4 406+31																		
L4 408+40																		
L4 410+93																		
L4 414+26																		
L4 421+43																		
L4 428+47																		
SHEET TOTALS				44								824						
PROJECT TOTALS				540			32	440				6004	688		8			

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

LINE & STATION	FROM	TO	15" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	15" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B IN SOIL	18" WELDED STEEL PIPE 0.250" THICK, GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.625" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
	1110	1109																	
L4 421+55	1111											1			1			1	
	1111	1110																	
L4 421+55	1112											1			1		1		
	1112	1111																	
L4 422+75	1113											1			1		1		
	1113	1112																	
Y8 13+74	1114																	1	
L4 423+34	1115											1			1			1	
	1115	1113																	
L4 424+00	1116											1			1		1		
	1116	1115																	
L4 425+25	1117											1			1		1		
	1117	1116																	
L4 425+75	1118											1			1			1	
	1118	1117																	
L4 426+50	1119											1			1		1		
	1119	1118																	
L4 427+98	1120											1							
	1120	1125																	
L4 427+98	1121											1							
	1121	1120																	
L4 428+38	1122											1							
	1122	1121																	
L4 426+55	1123											1			1		1		
	1123	1124																	
L4 428+07	1125											1			1		1		
	1125	1126																	
L4 418+44	1127											1							
	1127	1105																	
L4 428+47	1130																		
L4 414+35																			
L4 423+34																			
L4 406+31																			
L4 408+40																			
L4 410+93																			
L4 414+26																			
L4 421+43																			
L4 428+47																			
SHEET TOTALS												14			10		7	4	
PROJECT TOTALS			43	43	32	32	68	68	7.204			135	15.7		33		18	16	

CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06; SPECIAL DETAIL W/ G.D.I. "D"

LINE & STATION	FROM	TO	D.I. STD. 852.04 OR STD. 852.06	SPECIAL DETAIL W/ G.D.I. "D"	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34 OR STD. 840.46	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I./2GI	CONVERT EXISTING D.I. TO J.B	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW		PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
	1110	1109																												
L4 421+55	1111																													
	1111	1110																												
L4 421+55	1112																													
	1112	1111																												
L4 422+75	1113																													
	1113	1112																												
Y8 13+74	1114														1	1														Exist Box to Offset CB - See 2D-1
L4 423+34	1115																													
	1115	1113																												
L4 424+00	1116																													
	1116	1115																												
L4 425+25	1117																													
	1117	1116																												
L4 425+75	1118																													
	1118	1117																												
L4 426+50	1119																													
	1119	1118																												
L4 427+98	1120		1		1	1																								
	1120	1125																												
L4 427+98	1121		1		1	1																								
	1121	1120																												
L4 428+38	1122		1		1	1																								
	1122	1121																												
L4 426+55	1123																													
	1123	1124																												
L4 428+07	1125																													
	1125	1126																		2										
L4 418+44	1127		1		1	1																								
	1127	1105																												
L4 428+47	1130																	1												
L4 414+35																										4				
L4 423+34																										4				
L4 406+31																													354	
L4 408+40																													265	
L4 410+93																													236	
L4 414+26																													21	
L4 421+43																													259	
L4 428+47																													31	
SHEET TOTALS			4		4	4									1	1		1		2						8			1166	
PROJECT TOTALS			69	2	73	73	3	16	2	2	19	1	7		12	4		1	2	6						23	2.6040	0.045	2251	

ABBREVIATIONS

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

CHA-LOANER-W7

COMPUTED BY: VMD DATE: 8/9/2016

CHECKED BY: MDH DATE: 9/8/2016

CHA-LOANER-W7

PROJECT NO.	SHEET NO.
W-5520	3D-9

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	Side Drain Pipe 15	Side Drain Pipe 18	Side Drain Pipe 24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	C. S. PIPE 24 .064	C. S. PIPE 30 .079	C. S. PIPE 36 .079	C. S. PIPE 42 .109	C. S. PIPE 48 .109	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES 0' THRU 5' EACH	5' THRU 10' (A) LIN. FT.	10' AND ABOVE (B) LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	SPECIAL DETAIL W/ G.D.I. "D"	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. (SEE DETAIL SHEET 2C-7)	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B. W/ M.H.	CONVERT EXISTING J.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	ADJUSTMENT OF DROP INLETS	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW		PREFORMED SCOUR HOLE (PER EACH)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L4 427+83	CL	1129																																																	9.600																			1																	T.B.J.B (See Detail Sheet 2C-7)
SHEET TOTALS																																																			9.600																			1																	
PROJECT TOTALS																																																			9.600																			1																	

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

ABBREVIATIONS

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

COMPUTED BY: NDD DATE: 6/21/16 CHECKED BY: CNS DATE: 6/21/16	(2-16-16)	PROJECT NO. W-5520	SHEET NO. 3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU		200	300	400		
			TOTAL CY/TONS/SY:		200	300	400**	0	0

*ASU = Aggregate Subgrade
*AST = Aggregate Stabilization
**Total square yards of "Geotextile for Soil Stabilization" is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

PROJ. REFERENCE NO.	SHEET NO.
W-5520	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	GRIFFIN LAND HOLDINGS LLC
2	4	ROGERS DENNIS J. & WIFE PHYLLIS P.
3	4	COOK OUT INDIAN TRAIL ET AL
4	4	SF PROPERTIES 3 LLC
5	4	HILLCREST FOOD INC.
6	4	ARC CAFEHLD001 LLC
7	4	LEMMOND, MARY D. BIVENS HEIRS
8	4	LEMMOND, REA NELSON
9	4	BRANFUL LLC
4	5	S & C USA LLC
6	5	ARC CAFEHLD001 LLC
10	5	MCCAULEY AND MCDONALD INVESTMENTS INC.
11	5	MARATHIA PROPERTIES LLC
12	5	MARATHIA PROPERTIES LLC
13	5	BEST AUTO DEALS LLC
14	5	ROYAL MEGA VENTURES LLC
15	5	MARSH DOUGLAS IVORY
16	5	MARSH DOUGLAS IVORY
17	5	SIR JAKE LLC
18	5	WELBORN, MARION G. & JEWELL W.
19	5	SAMS'S REAL ESTATE HOLDING-GEORGIA
20	5	JIM CHERRY INTERESTS INC.
21	5	BRADY, HOWARD P.
22	5	FFC LIMITED PARTNERSHIP
23	5	LIQUID MANAGEMENT LLC
24	5	TKC XCVIL LLC
25	6	CHAMI LLC
26	6	INDIAN PARTNERS LLC
27	6	74 INDIAN TRAIL DONUTS LLC
28	6	WAL-MART REAL ESTATE BUSINESS TRUST
29	6	SAKRON LLC
30	6	RIVER OAKS I LLC
31	6	THOMPSON REALTY INVESTMENTS LLC
32	6	WALTERS, ELAINE R.
33	6	ASPEN ASSETT GROUP LLC
29	7	SAKRON LLC
34	7	SUNTRUST BANK
35	7	S L & E INVESTMENTS LLC
37	7	STORE MASTER FUNDING III LLC
38	7	WASH ONE LLC
39	7	INTERNATIONAL MEGE VENTURES II LLC
40	7	SAM J. & PERRY V
33	7	ASPEN ASSETT GROUP LLC
41	7	ASPEN ASSETT GROUP LLC
42	7	PLYLER, HUGH MACK HEIRS
43	7	UNION COUNTY
44	7	UNION COUNTY WIN-WIN LLC
45	7	PLYLER, JACK HARVEY & LYNETTE C.
46	8	DOROTHY HALL PROPERTIES LLC
47	8	BENDERSON DEVELOPMENT CO. INC. ET AL
48	8	BETHEL CEMETERY
49	8	GROUP 10 LLC
47	9	BENDERSON DEVELOPMENT CO. INC. ET AL
50	9	EIG UNION TOWN LLC
51	9	SMBC LEASING AND FINANCE INC.
49	9	GROUP 10 LLC
52	9	HARRIS TEETER INC.
53	9	DUKE POWER- DUKE ENERGY CORPORATION
54	9	JIM CHERRY INTEREST INC.

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
55	10	MARTIN PAUL RICHARD
56	10	MARTIN, MARGARET H. TRUSTEE
57	10	MARTIN, MARGARET HURST TRUSTEE
58	10	JACOBS, LARRY G. FAYE LEIGH
59	10	JACOBS, LARRY G. FAYE LEIGH
60	10	JACOBS, LARRY G. FAYE LEIGH
61	10	JACOBS, LARRY G. FAYE LEIGH
62	10	RIGGINS, BENJAMIN A
63	10	AUTO SELECT BROKERS INVESTMENTS LLC
64	10	SUN VALLEY MARKETPLACE LILLC
65	10	GUY PROPERTIES LLC
66	10	GUY PROPERTIES LLC
67	10	LOWE'S HOME CENTERS INC.
68	10	SUN VALLEY MARKETPLACE LILLC
69	11	NISBET OIL CO.
70	11	QTI054 LLC
71	11	SARDIS CORNERS LLC
72	11	PS NC III LP
73	11	HILL CONSTRUCTION OF MATTHEWS INC.
74	11	SOUTHMARK INVESTMENTS LLC
75	11	TT OF EAST CHARLOTTE LLC
68	11	SUN VALLEY MARKETPLACE LILLC
76	11	SAM'S INVESTMENTS II LLC
67	11	LOWE'S HOME CENTERS INC.
77	11	WC & C INC.
78	11	KEFFER PROPERTIES LIMITED

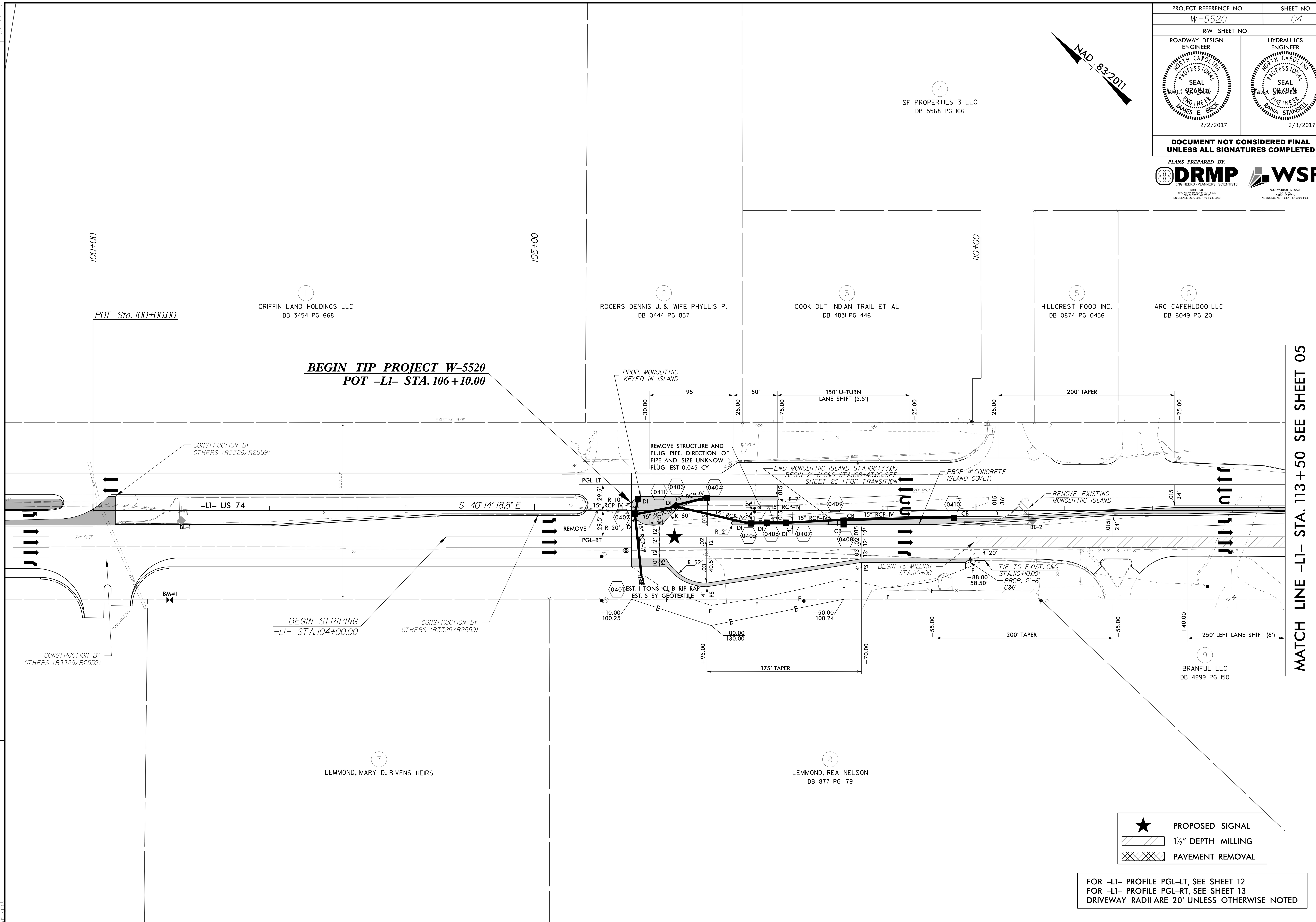
PROJECT REFERENCE NO.	SHEET NO.
W-5520	04
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 027615 — JAMES E. BECK — 2/2/2017

HYDRAULICS ENGINEER — SEAL 027876 — RANA STANSELL — 2/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: DRMP ENGINEERS • PLANNERS • SCIENTISTS — WSP



NAD 83/2011
REVISIONS
100+00
105+00
110+00
POT Sta. 100+00.00
BEGIN TIP PROJECT W-5520
POT -L1- STA. 106+10.00
① GRIFFIN LAND HOLDINGS LLC
DB 3454 PG 668
② ROGERS DENNIS J. & WIFE PHYLLIS P.
DB 0444 PG 857
③ COOK OUT INDIAN TRAIL ET AL
DB 4831 PG 446
④ SF PROPERTIES 3 LLC
DB 5568 PG 166
⑤ HILLCREST FOOD INC.
DB 0874 PG 0456
⑥ ARC CAFEHLD001LLC
DB 6049 PG 201
⑦ LEMMOND, MARY D. BIVENS HEIRS
⑧ LEMMOND, REA NELSON
DB 877 PG 179
⑨ BRANFUL LLC
DB 4999 PG 150
-L1- US 74
S 40° 14' 18.8" E
CONSTRUCTION BY OTHERS (R3329/R2559)
BEGIN STRIPING -L1- STA.104+00.00
PROP. MONOLITHIC KEYED IN ISLAND
REMOVE STRUCTURE AND PLUG PIPE. DIRECTION OF PIPE AND SIZE UNKNOW. PLUG EST 0.045 CY
END MONOLITHIC ISLAND STA.108+33.00
BEGIN 2'-6" C&G STA.108+43.00.SEE SHEET 2C-1 FOR TRANSITION
PROP 4" CONCRETE ISLAND COVER
REMOVE EXISTING MONOLITHIC ISLAND
150' U-TURN LANE SHIFT (5.5')
200' TAPER
175' TAPER
250' LEFT LANE SHIFT (6')
BEGIN 1.5" MILLING STA.110+00
TIE TO EXIST. C&G STA.110+10.00
PROP. 2'-6" C&G
EST. 1 TONS CL B RIP RAP
EST. 5 SY GEOTEXTILE
PGL-LT
PGL-RT
REMOVE
BL-1
BL-2
BM#1
15" RCP-IV
MATCH LINE -L1- STA. 113+50 SEE SHEET 05

★	PROPOSED SIGNAL
(hatched)	1½" DEPTH MILLING
(cross-hatched)	PAVEMENT REMOVAL

FOR -L1- PROFILE PGL-LT, SEE SHEET 12
FOR -L1- PROFILE PGL-RT, SEE SHEET 13
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

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PROJECT REFERENCE NO.	SHEET NO.
W-5520	05

R/W SHEET NO.

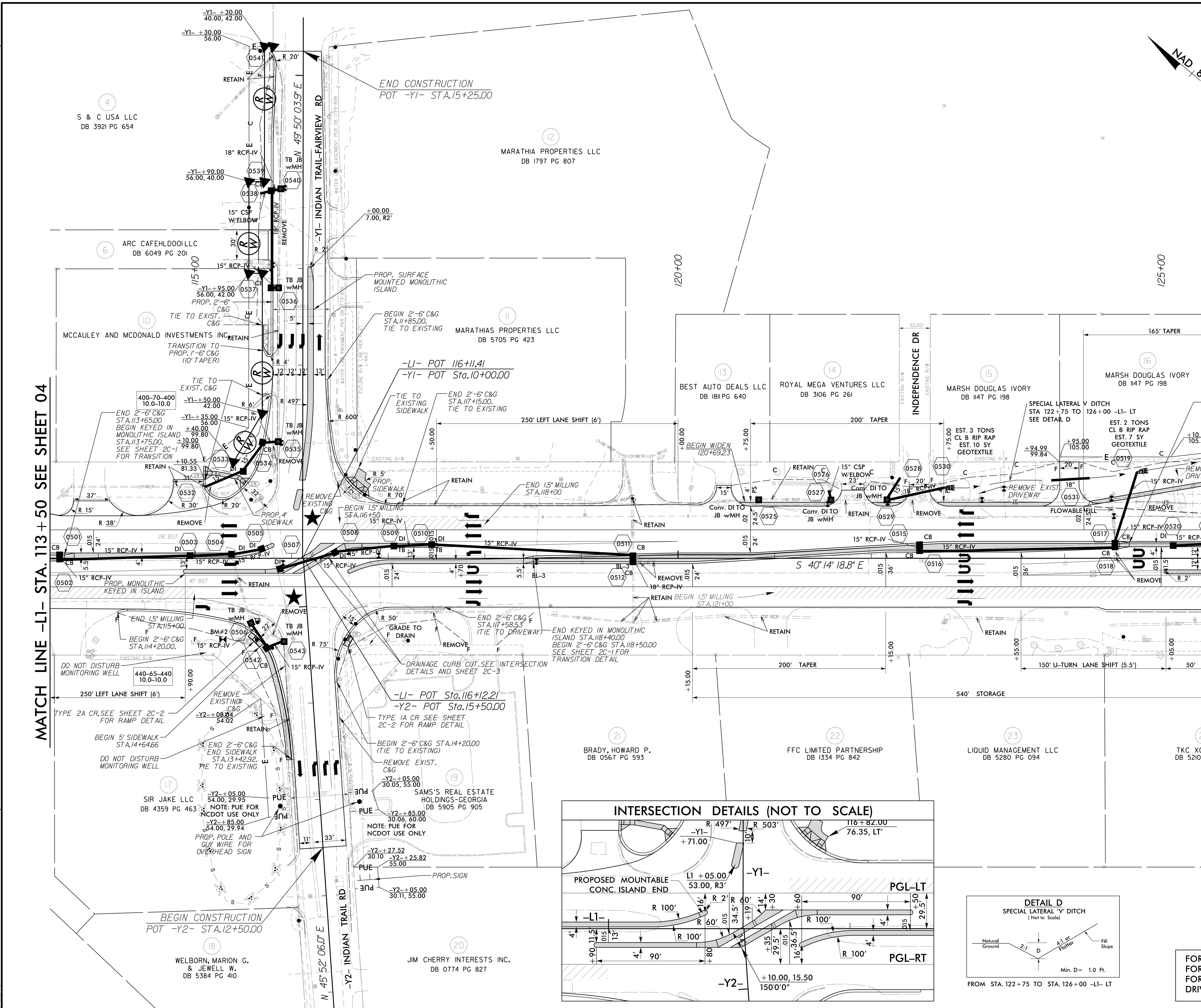
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026851 JAMES E. BECK 2/2/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027976 RANA STANSELL 2/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP ENGINEERS • PLANNERS • SCIENTISTS

WSP



NAD 83/2011
MATCH LINE -L1- STA. 113+50 SEE SHEET 04
REVISIONS
END CONSTRUCTION POT -Y1- STA.15+25.00
BEGIN CONSTRUCTION POT -Y2- STA.12+50.00
-Y1- INDIAN TRAIL-FAIRVIEW RD
N 49° 50' 03.9" E
-Y2- INDIAN TRAIL RD
N 45° 52' 06.0" E
-L1- US 74
S 40° 14' 18.8" E
-L1- POT 116+11.41
-Y1- POT Sta.10+00.00
-L1- POT Sta.116+12.21
-Y2- POT Sta.15+50.00
INDEPENDENCE DR
UNITED ENTRANCE
S & C USA LLC DB 3921 PG 654
ARC CAFEHLDOOI LLC DB 6049 PG 201
MCCAULEY AND MCDONALD INVESTMENTS INC
MARATHIA PROPERTIES LLC DB 1797 PG 807
MARATHIAS PROPERTIES LLC DB 5705 PG 423
BEST AUTO DEALS LLC DB 1811 PG 640
ROYAL MEGA VENTURES LLC DB 3106 PG 261
MARSH DOUGLAS IVORY DB 1147 PG 198
SIR JAKE LLC DB 4359 PG 463
SAMS'S REAL ESTATE HOLDINGS-GEORGIA DB 5905 PG 905
BRADY, HOWARD P. DB 0567 PG 593
FFC LIMITED PARTNERSHIP DB 1334 PG 842
LIQUID MANAGEMENT LLC DB 5280 PG 094
TKC XCVII LLC DB 5210 PG 029
LR & FR LLC DB 1750 PG 001
WELBORN, MARION G. & JEWELL W. DB 5384 PG 410
JIM CHERRY INTERESTS INC. DB 0774 PG 827
250' LEFT LANE SHIFT (6')
200' TAPER
150' U-TURN LANE SHIFT (5.5')
540' STORAGE
165' TAPER
END GRADE POT -L1- STA.126+50.00
INTERSECTION DETAILS (NOT TO SCALE)
PROPOSED MOUNTABLE CONC. ISLAND END
PGL-LT
PGL-RT
DETAIL D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D= 1.0 Ft.
FROM STA. 122+75 TO STA. 126+00 -L1- LT

Symbol	Description
★	PROPOSED SIGNAL
(hatched)	1½" DEPTH MILLING
(cross-hatched)	PAVEMENT REMOVAL

FOR -L1- PROFILE PGL-LT, SEE SHEET 12
FOR -L1- PROFILE PGL-RT, SEE SHEET 13
FOR -Y1- & -Y2- PROFILES, SEE SHEET 20
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

1/31/2017 1:50:36 PM
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PROJECT REFERENCE NO.	SHEET NO.
W-5520	06
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEAL 026815 — JAMES E. BECK — 2/2/2017

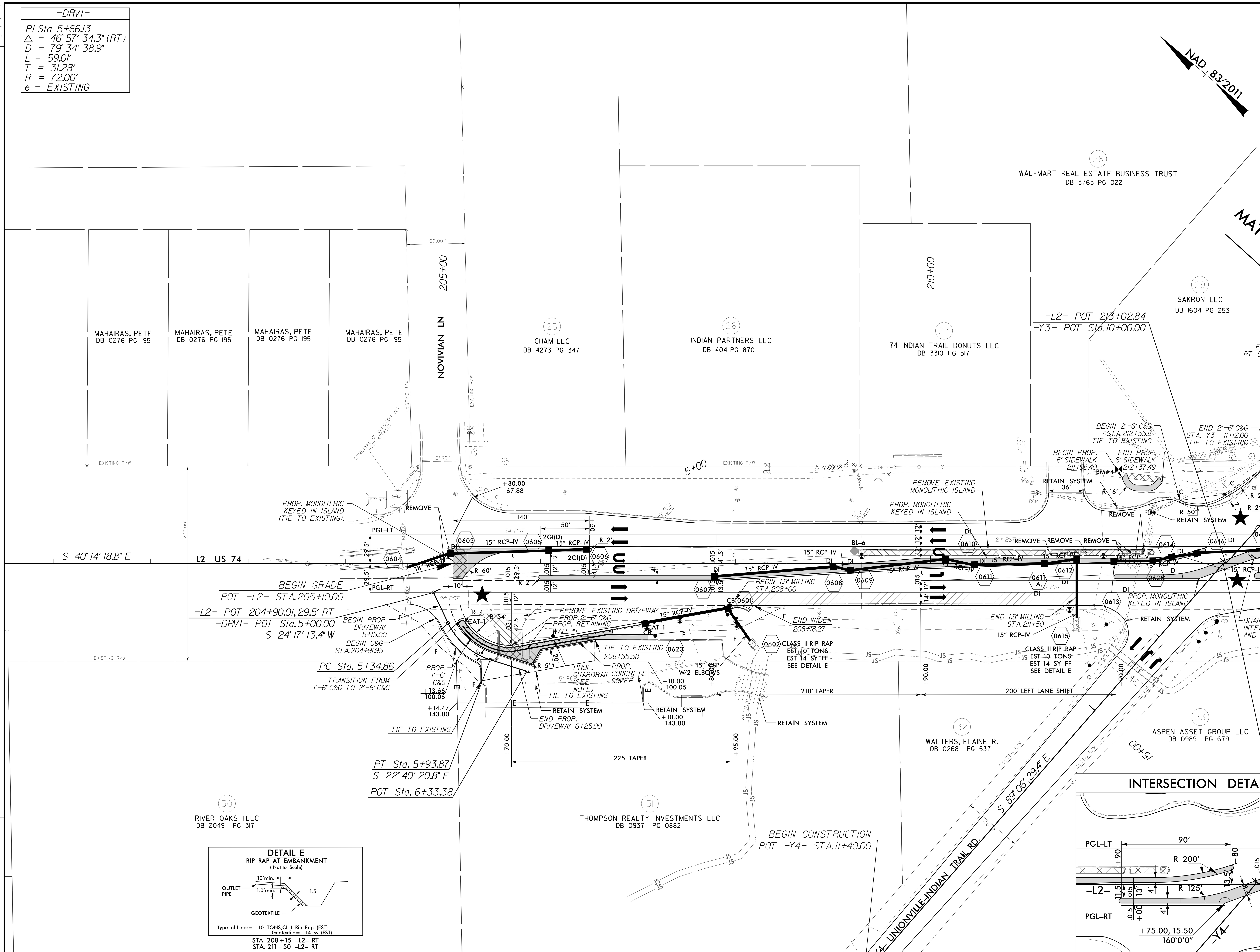
SEAL 027874 — DANA STANSEL — 2/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: DRMP — WSP

REVISIONS

-DRV1-
PI Sta 5+66.13
Δ = 46° 57' 34.3" (RT)
D = 79° 34' 38.9"
L = 59.01'
T = 31.28'
R = 72.00'
e = EXISTING



INTERSECTION DETAILS (NOT TO SCALE)

DETAIL E
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner = 10 TONS, CL II Rip-Rap (EST) Geotextile = 14 sy (EST)
STA. 208+15 -L2- RT
STA. 211+50 -L2- RT

NOTE: GUARDRAIL TO BE PLACED ON RETAINING WALL #1 AS 8' POSTS WITH 6'-3" SPACING (SEE TYPICAL NO. 5, SHEET 2A-2).

Legend	
★	PROPOSED SIGNAL
(hatched)	1½" DEPTH MILLING
(cross-hatched)	PAVEMENT REMOVAL

FOR -L2- PROFILE PGL-LT, SEE SHEET 14
FOR -L2- PROFILE PGL-RT, SEE SHEET 15
FOR -DRV1- PROFILE, SEE SHEET 20
FOR WALL #1 PLANS, SEE SHEETS W-1 AND W-2
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

PROJECT REFERENCE NO.	SHEET NO.
W-5520	07
RW SHEET NO.	

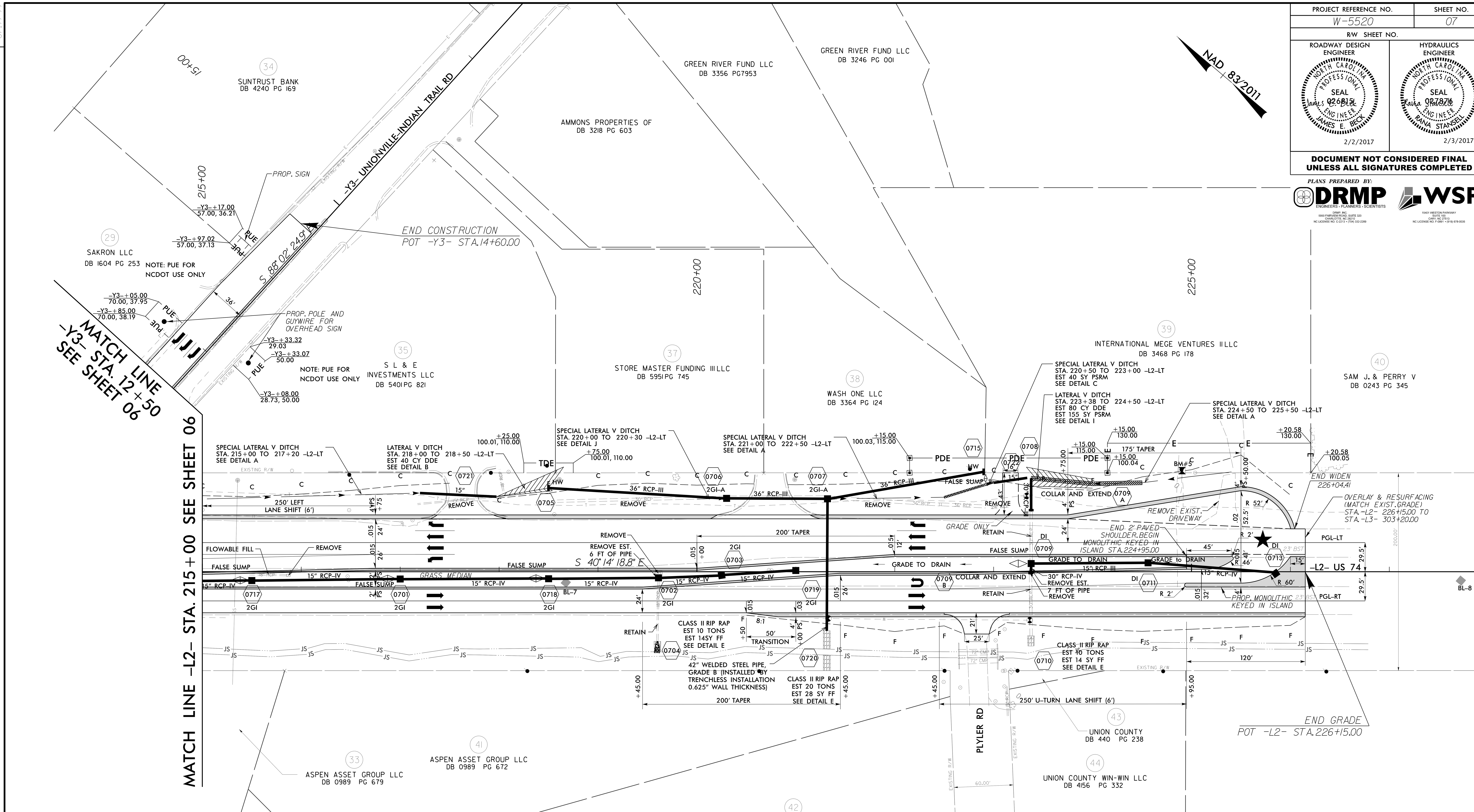
ROADWAY DESIGN ENGINEER — SEAL 026815 — JAMES E. BECK — 2/2/2017

HYDRAULICS ENGINEER — SEAL 027874 — RANA STANSELL — 2/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: DRMP ENGINEERS • PLANNERS • SCIENTISTS; WSP

REVISIONS


NAD 83/2011
MATCH LINE -Y3- STA. 12+50 SEE SHEET 06
MATCH LINE -L2- STA. 215+00 SEE SHEET 06
-Y3- UNIONVILLE-INDIAN TRAIL RD
END CONSTRUCTION POT -Y3- STA.14+60.00
S 88° 02' 24.9"
SUNTRUST BANK DB 4240 PG 169
SAKRON LLC DB 1604 PG 253
NOTE: PUE FOR NCDOT USE ONLY
GREEN RIVER FUND LLC DB 3356 PG7953
GREEN RIVER FUND LLC DB 3246 PG 001
AMMONS PROPERTIES OF DB 3218 PG 603
S L & E INVESTMENTS LLC DB 5401PG 821
STORE MASTER FUNDING III LLC DB 5951PG 745
WASH ONE LLC DB 3364 PG 124
INTERNATIONAL MEGE VENTURES II LLC DB 3468 PG 178
SAM J. & PERRY V DB 0243 PG 345
ASPEN ASSET GROUP LLC DB 0989 PG 679
ASPEN ASSET GROUP LLC DB 0989 PG 672
UNION COUNTY DB 440 PG 238
UNION COUNTY WIN-WIN LLC DB 4156 PG 332
PLYLER, HUGH MACK HEIRS DB 0173 PG 417
PLYLER, JACK HARVEY & LYNETTE C. DB 0384 PG 207
PLYLER RD
-L2- US 74
END GRADE POT -L2- STA.226+15.00
END WIDEN 226+04.41
OVERLAY & RESURFACING (MATCH EXIST. GRADE) STA. -L2- 226+15.00 TO STA. -L3- 303+20.00
250' LEFT LANE SHIFT (6')
250' U-TURN LANE SHIFT (6')
200' TAPER
175' TAPER
42" WELDED STEEL PIPE, GRADE B (INSTALLED BY TRENCHLESS INSTALLATION 0.625" WALL THICKNESS)
CLASS II RIP RAP EST 10 TONS EST 14SY FF SEE DETAIL E
CLASS II RIP RAP EST 20 TONS EST 28 SY FF SEE DETAIL E
SPECIAL LATERAL V DITCH STA. 215+00 TO 217+20 -L2-LT SEE DETAIL A
LATERAL V DITCH STA. 218+00 TO 218+50 -L2-LT EST 40 CY DDE SEE DETAIL B
SPECIAL LATERAL V DITCH STA. 220+00 TO 220+30 -L2-LT SEE DETAIL J
SPECIAL LATERAL V DITCH STA. 221+00 TO 222+50 -L2-LT SEE DETAIL A
SPECIAL LATERAL V DITCH STA. 220+50 TO 223+00 -L2-LT EST 40 SY PSRM SEE DETAIL C
LATERAL V DITCH STA. 223+38 TO 224+50 -L2-LT EST 80 CY DDE EST 155 SY PSRM SEE DETAIL I
SPECIAL LATERAL V DITCH STA. 224+50 TO 225+50 -L2-LT SEE DETAIL A
END 2' PAVED SHOULDER. BEGIN MONOLITHIC KEYED IN ISLAND STA.224+95.00
PROP. MONOLITHIC KEYED IN ISLAND
REMOVE EXIST. DRIVEWAY
30" RCP-IV REMOVE EST. 7 FT OF PIPE REMOVE
REMOVE EST. 6 FT OF PIPE
S 40° 14' 18.8" E

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

Min. D= 1.5 Ft.

FROM STA. 215+00 TO STA. 217+20 -L2- LT
FROM STA. 221+32 TO STA. 222+50 -L2- LT
FROM STA. 224+50 TO STA. 225+50 -L2- LT

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

Min. D= 1.5 Ft.
b= 2.0 Ft.

FROM STA. 218+00 TO STA. 218+50 -L2- LT

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

Min. D= 1.0 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM STA. 222+50 TO STA. 223+00 -L2- LT

DETAIL D
FALSE SUMP (Not to Scale)

S = Ditch Slope — ℄ Proposed Ditch

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

FROM STA. 215+38 -L2- MD
FROM STA. 216+87 -L2- MD
FROM STA. 218+37 -L2- MD
FROM STA. 223+25 -L2- MD

DETAIL E
RIP RAP AT EMBANKMENT (Not to Scale)

Type of Liner= 10 TONS,CL II Rip-Rap (EST) Geotextile= 14 sy (EST)

STA. 219+60 -L2- RT
STA. 221+31 -L2- RT
STA. 223+38 -L2- RT

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

Min. D= Ft.
Max. d= Ft.
b= Ft.

Type of Liner= PSRM

FROM STA. 223+38 TO STA. 224+50 -L2- LT

DETAIL J
SPECIAL LATERAL "V" DITCH (Not to Scale)

Min. D= 1.0 Ft.

FROM STA. 220+00 TO STA. 220+30 -L2- LT

★ PROPOSED SIGNAL
1½" DEPTH MILLING
PAVEMENT REMOVAL

FOR -L2- PROFILE PGL-LT, SEE SHEET 14
FOR -L2- PROFILE PGL-RT, SEE SHEET 15
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

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PROJECT REFERENCE NO.	SHEET NO.
W-5520	08

RW SHEET NO.

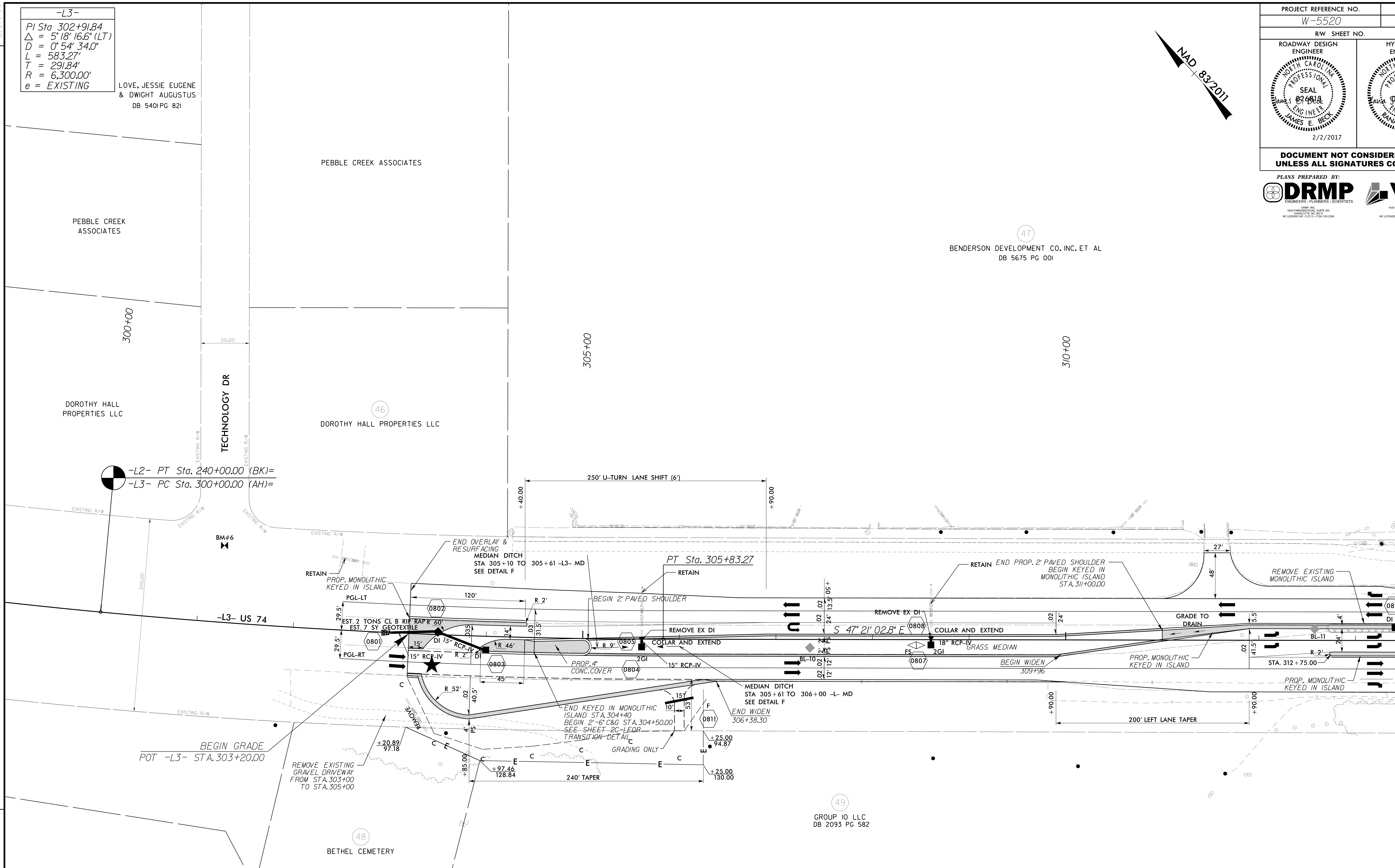
ROADWAY DESIGN ENGINEER — SEAL 024815 — JAMES E. BECK — 2/2/2017

HYDRAULICS ENGINEER — SEAL 027876 — DANA STANSEL — 2/3/2017

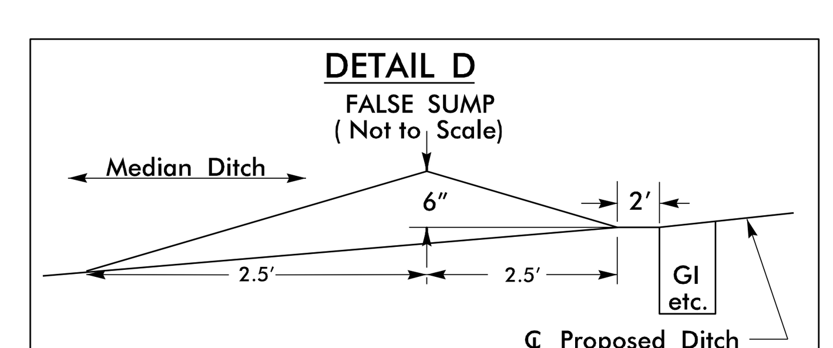
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: DRMP — WSP

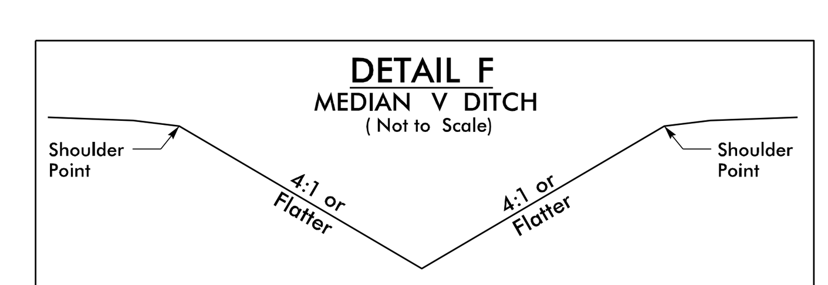
REVISIONS



-L3-
PI Sta 302+91.84
△ = 5° 18' 16.6" (LT)
D = 0° 54' 34.0"
L = 583.27'
T = 291.84'
R = 6,300.00'
e = EXISTING
LOVE, JESSIE EUGENE & DWIGHT AUGUSTUS DB 5401 PG 821
PEBBLE CREEK ASSOCIATES
PEBBLE CREEK ASSOCIATES
BENDERSON DEVELOPMENT CO. INC. ET AL DB 5675 PG 001
NAD 83/2011
300+00
305+00
310+00
TECHNOLOGY DR
DOROTHY HALL PROPERTIES LLC
DOROTHY HALL PROPERTIES LLC
-L2- PT Sta. 240+00.00 (BK)=
-L3- PC Sta. 300+00.00 (AH)=
250' U-TURN LANE SHIFT (6')
BM#6
-L3- US 74
PT Sta. 305+83.27
S 47° 21' 02.8" E
END OVERLAY & RESURFACING
MEDIAN DITCH STA 305+10 TO 305+61 -L3- MD SEE DETAIL F
BEGIN 2' PAVED SHOULDER
REMOVE EX DI
COLLAR AND EXTEND
EST. 2 TONS CL B RIP RAP
EST. 7 SY GEOTEXTILE
PROP. MONOLITHIC KEYED IN ISLAND
PROP. 4" CONC. COVER
15" RCP-IV
18" RCP-IV
GRASS MEDIAN
BL-10
BL-11
END PROP. 2' PAVED SHOULDER BEGIN KEYED IN MONOLITHIC ISLAND STA. 311+00.00
REMOVE EXISTING MONOLITHIC ISLAND
GRADE TO DRAIN
PROP. MONOLITHIC KEYED IN ISLAND
BEGIN WIDEN 309+96
STA. 312+75.00
200' LEFT LANE TAPER
MEDIAN DITCH STA 305+61 TO 306+00 -L- MD SEE DETAIL F
END WIDEN 306+38.30
END KEYED IN MONOLITHIC ISLAND STA. 304+40
BEGIN 2'-6" C&G STA. 304+50.00 SEE SHEET 2C-1 FOR TRANSITION DETAIL
GRADING ONLY
BEGIN GRADE
POT -L3- STA. 303+20.00
REMOVE EXISTING GRAVEL DRIVEWAY FROM STA. 303+00 TO STA. 305+00
240' TAPER
GROUP 10 LLC DB 2093 PG 582
BETHEL CEMETERY
MATCH LINE -L3- STA. 313+50 SEE SHEET 09



STA. 308+50 -L3- MD



FROM STA. 305+10 TO STA. 305+61 -L3- MD
FROM STA. 305+61 TO STA. 306+00 -L3- MD

★	PROPOSED SIGNAL
(hatched)	1½" DEPTH MILLING
(crosshatched)	PAVEMENT REMOVAL

FOR -L3- PROFILE PGL-LT, SEE SHEET 16
FOR -L3- PROFILE PGL-RT, SEE SHEET 17
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

PROJECT REFERENCE NO.	SHEET NO.
W-5520	09
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 026815 — JAMES E. BECK — 2/2/2017

HYDRAULICS ENGINEER — SEAL 027878 — DANA STANSEL — 2/3/2017

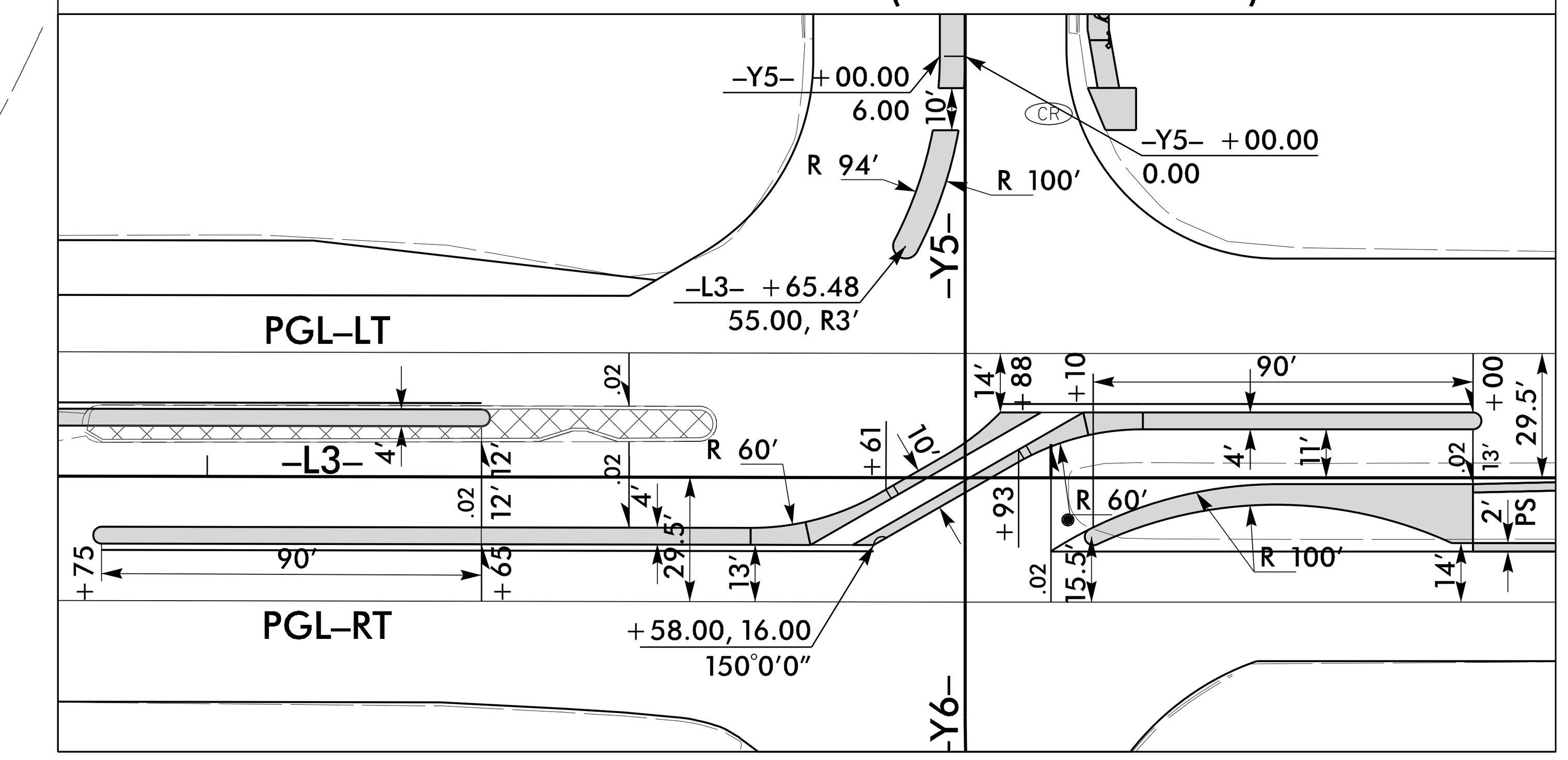
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: DRMP ENGINEERS • PLANNERS • SCIENTISTS / WSP

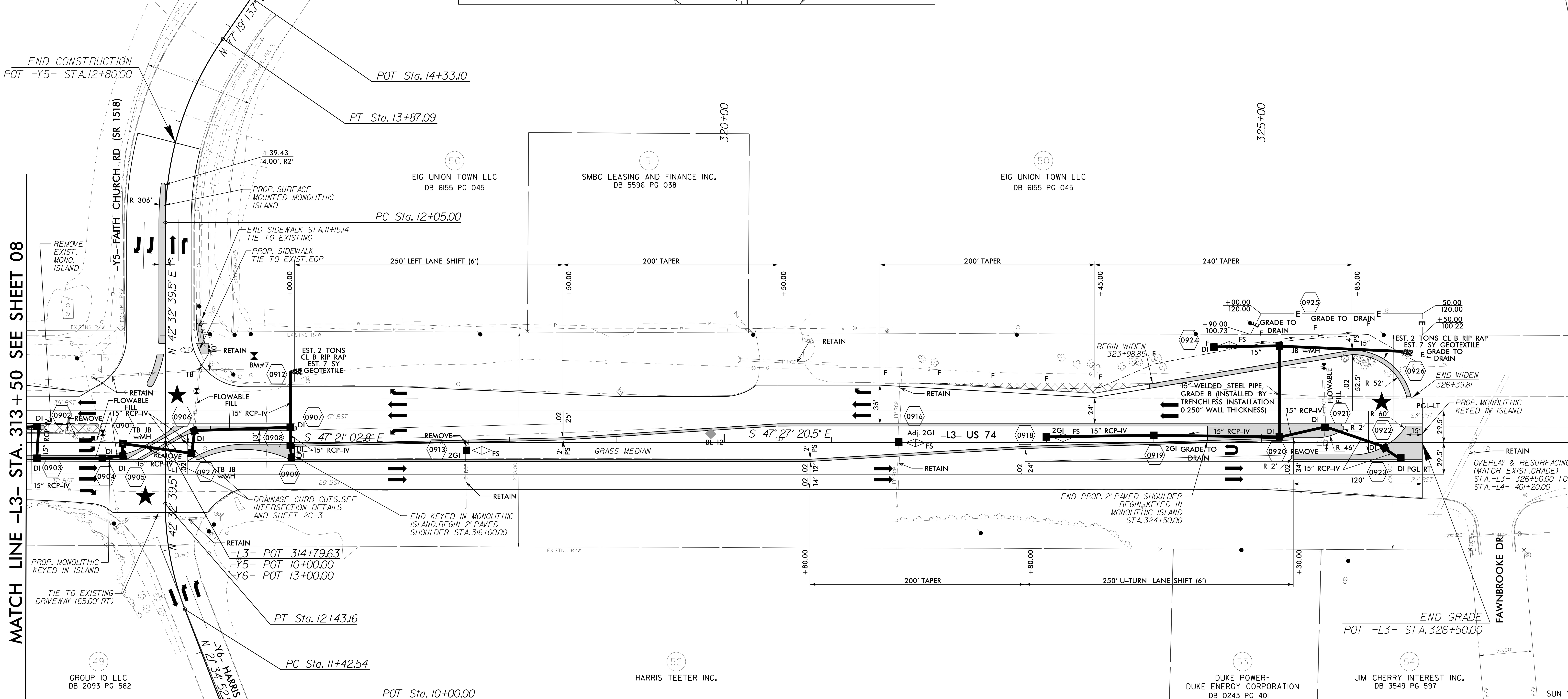
REVISIONS

-Y5-	-Y6-
PI Sta 12+98.95	PI Sta 11+93.42
△ = 34° 46' 34.2" (RT)	△ = 20° 57' 46.6" (RT)
D = 19° 05' 54.9"	D = 20° 50' 05.4"
L = 182.09'	L = 100.61'
T = 93.95'	T = 50.88'
R = 300.00'	R = 275.00'
e = EXISTING	e = EXISTING

INTERSECTION DETAILS (NOT TO SCALE)



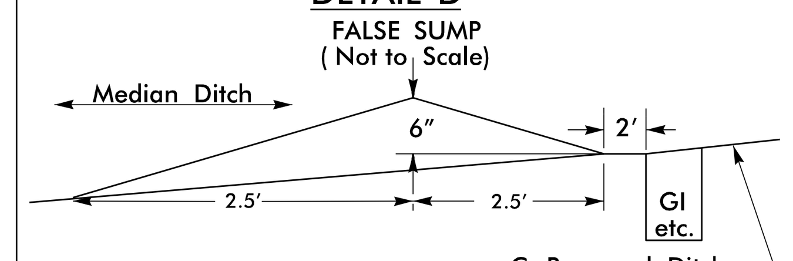
NAD 83/2011



END CONSTRUCTION
POT -Y5- STA.12+80.00
POT Sta. 14+33.10
PT Sta. 13+87.09
N 77° 19' 13.7" E
315+00
320+00
325+00
-Y5- FAITH CHURCH RD (SR 1518)
BENDERSON DEVELOPMENT CO. INC. ET AL
DB 5675 PG 001
EIG UNION TOWN LLC
DB 6155 PG 045
SMBC LEASING AND FINANCE INC.
DB 5596 PG 038
EIG UNION TOWN LLC
DB 6155 PG 045
+39.43
4.00', R2'
R 306'
PROP. SURFACE MOUNTED MONOLITHIC ISLAND
PC Sta. 12+05.00
END SIDEWALK STA.11+15.14 TIE TO EXISTING
PROP. SIDEWALK TIE TO EXIST. EOP
REMOVE EXIST. MONO. ISLAND
250' LEFT LANE SHIFT (6')
200' TAPER
200' TAPER
240' TAPER
N 42° 32' 39.5" E
RETAIN
BM#7
EST. 2 TONS CL B RIP RAP EST. 7 SY GEOTEXTILE
FLOWABLE FILL
15" RCP-IV
S 47° 21' 02.8" E
S 47° 27' 20.5" E
-L3- US 74
GRASS MEDIAN
BL-12
BEGIN WIDEN 323+98.85
15" WELDED STEEL PIPE, GRADE B (INSTALLED BY TRENCHLESS INSTALLATION 0.250" WALL THICKNESS)
GRADE TO DRAIN
EST. 2 TONS CL B RIP RAP EST. 7 SY GEOTEXTILE GRADE TO DRAIN
END WIDEN 326+39.81
PROP. MONOLITHIC KEYED IN ISLAND
PGL-LT
PGL-RT
OVERLAY & RESURFACING (MATCH EXIST. GRADE) STA. -L3- 326+50.00 TO STA. -L4- 401+20.00
DRAINAGE CURB CUTS. SEE INTERSECTION DETAILS AND SHEET 2C-3
END KEYED IN MONOLITHIC ISLAND. BEGIN 2' PAVED SHOULDER STA. 316+00.00
END PROP. 2' PAVED SHOULDER BEGIN KEYED IN MONOLITHIC ISLAND STA. 324+50.00
-L3- POT 314+79.63
-Y5- POT 10+00.00
-Y6- POT 13+00.00
PROP. MONOLITHIC KEYED IN ISLAND
TIE TO EXISTING DRIVEWAY (65.00' RT)
PT Sta. 12+43.16
PC Sta. 11+42.54
POT Sta. 10+00.00
200' TAPER
250' U-TURN LANE SHIFT (6')
END GRADE
POT -L3- STA. 326+50.00
FAWNBROOKE DR
GROUP 10 LLC
DB 2093 PG 582
HARRIS TEETER INC.
DUKE POWER-DUKE ENERGY CORPORATION
DB 0243 PG 401
JIM CHERRY INTEREST INC.
DB 3549 PG 597
SUN VAL
-Y6- HARRIS TEETER DISTRIBUTION CENTER
N 21° 34' 52.9" E

MATCH LINE -L3- STA. 313+50 SEE SHEET 08

DETAIL D



STA. 317+70 -L3- MD
STA. 321+74 -L3- MD
STA. 323+10 -L3- MD
STA. 324+67 -L3- LT

★ PROPOSED SIGNAL
1½" DEPTH MILLING
PAVEMENT REMOVAL

FOR -L3- PROFILE PGL-LT, SEE SHEET 16
FOR -L3- PROFILE PGL-RT, SEE SHEET 17
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

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PROJECT REFERENCE NO.	SHEET NO.
W-5520	10
RW SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026815 JAMES E. BECK 2/2/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027874 DANA STANSEL 2/3/2017

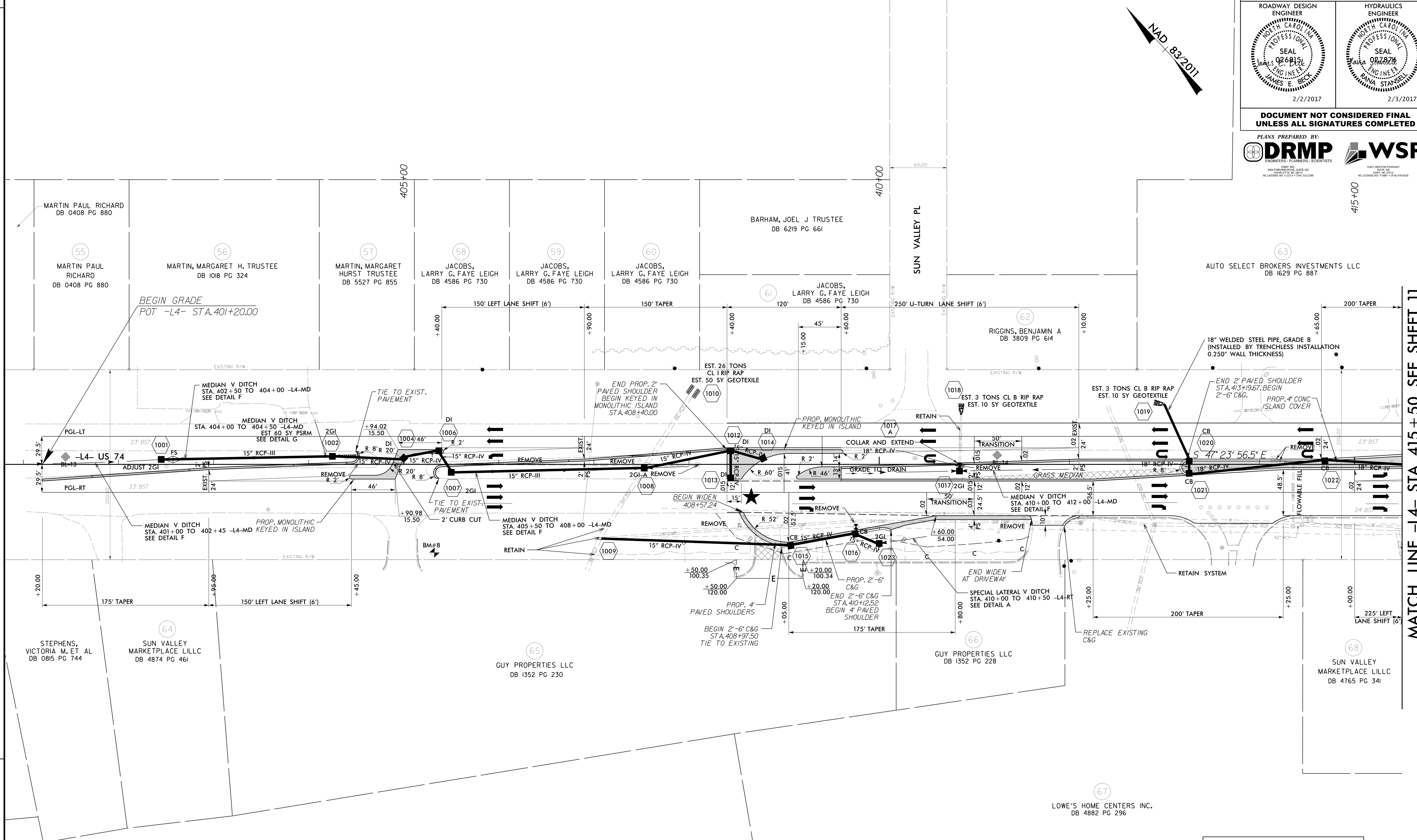
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

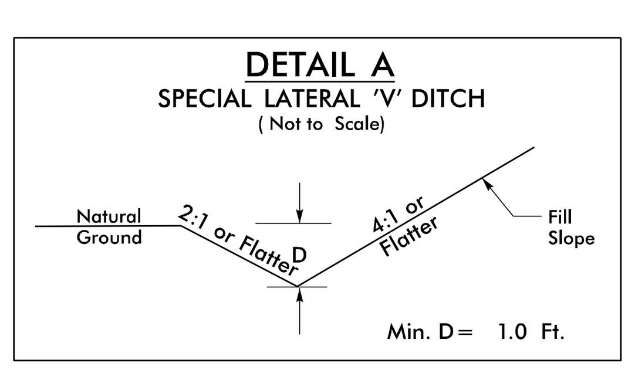
PLANS PREPARED BY:

DRMP ENGINEERS • PLANNERS • SCIENTISTS

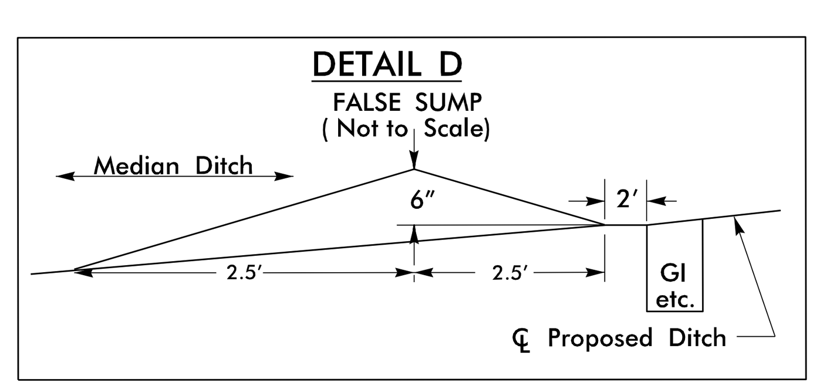
WSP

REVISIONS

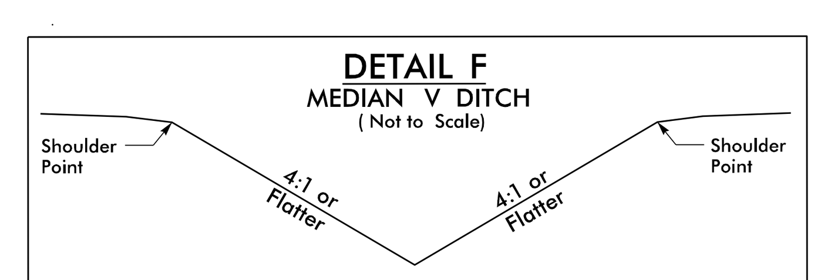




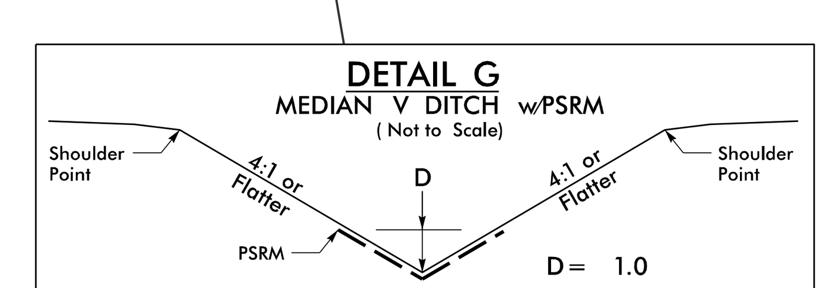
FROM STA. 410+00 TO STA. 410+50 -L4- RT



STA. 402+48 -L4- MD



FROM STA. 401+00 TO STA. 402+45 -L4- MD
FROM STA. 402+50 TO STA. 404+00 -L4- MD
FROM STA. 405+50 TO STA. 408+00 -L4- MD
FROM STA. 410+00 TO STA. 412+00 -L4- MD



FROM STA. 404+00 TO STA. 404+50 -L4- MD

Symbol	Legend
★	PROPOSED SIGNAL
(hatched)	1½" DEPTH MILLING
(crosshatched)	PAVEMENT REMOVAL

FOR -L4- PROFILE PGL-LT, SEE SHEET 18
FOR -L4- PROFILE PGL-RT, SEE SHEET 19
DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED

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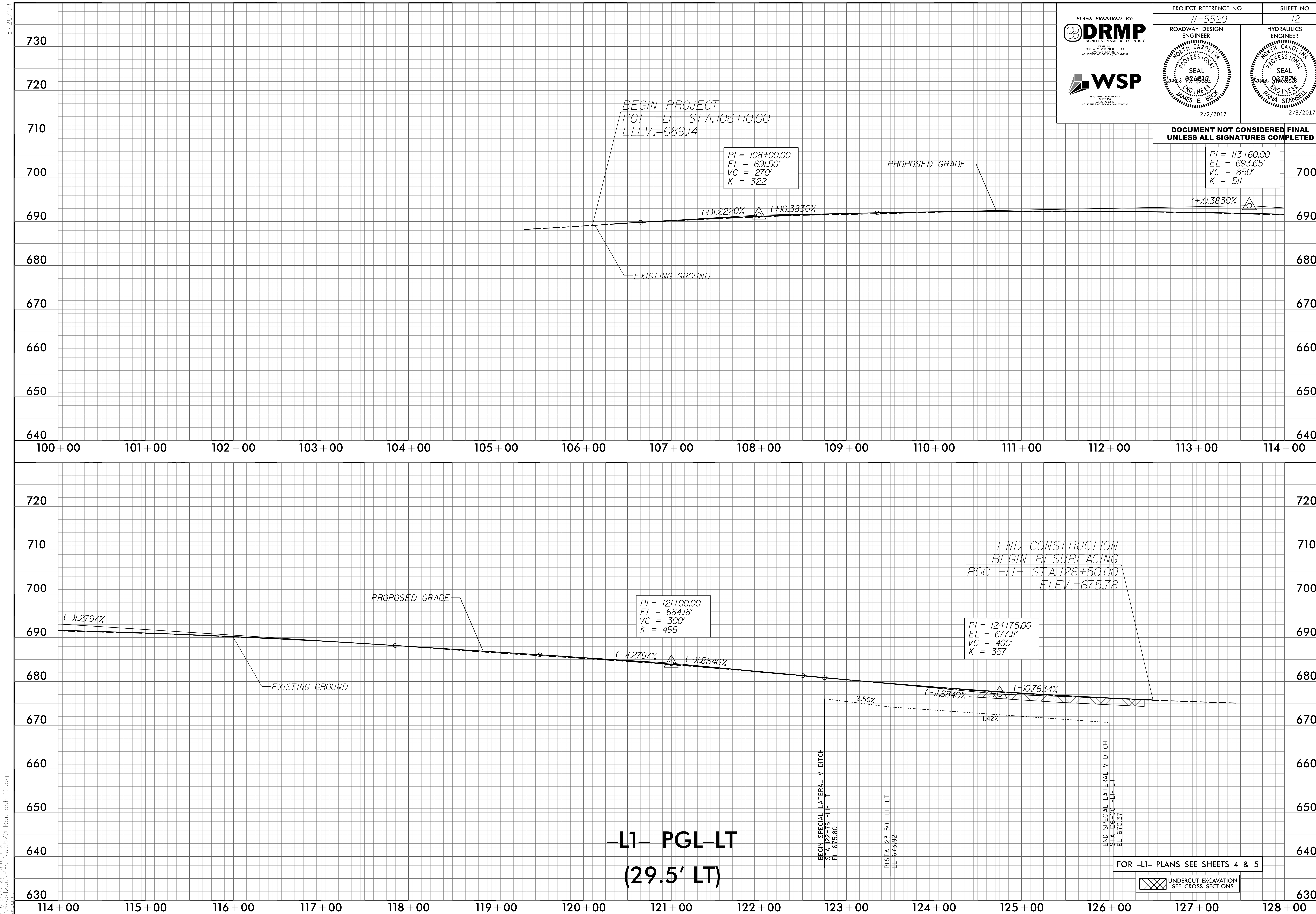

5/28/99

PLANS PREPARED BY:
DRMP
ENGINEERS • PLANNERS • SCIENTISTS
5960 FAIRVIEW ROAD, SUITE 300
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 • (704) 333-2289

WSP
15401 WESTON PARKWAY
SUITE 150
CARY, NC 27513
NC LICENSE NO. P-0051 • (919) 678-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	13

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022612 ENGINEER JAMES E. BECK
2/2/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038676 ENGINEER NINA STANSEL
2/3/2017

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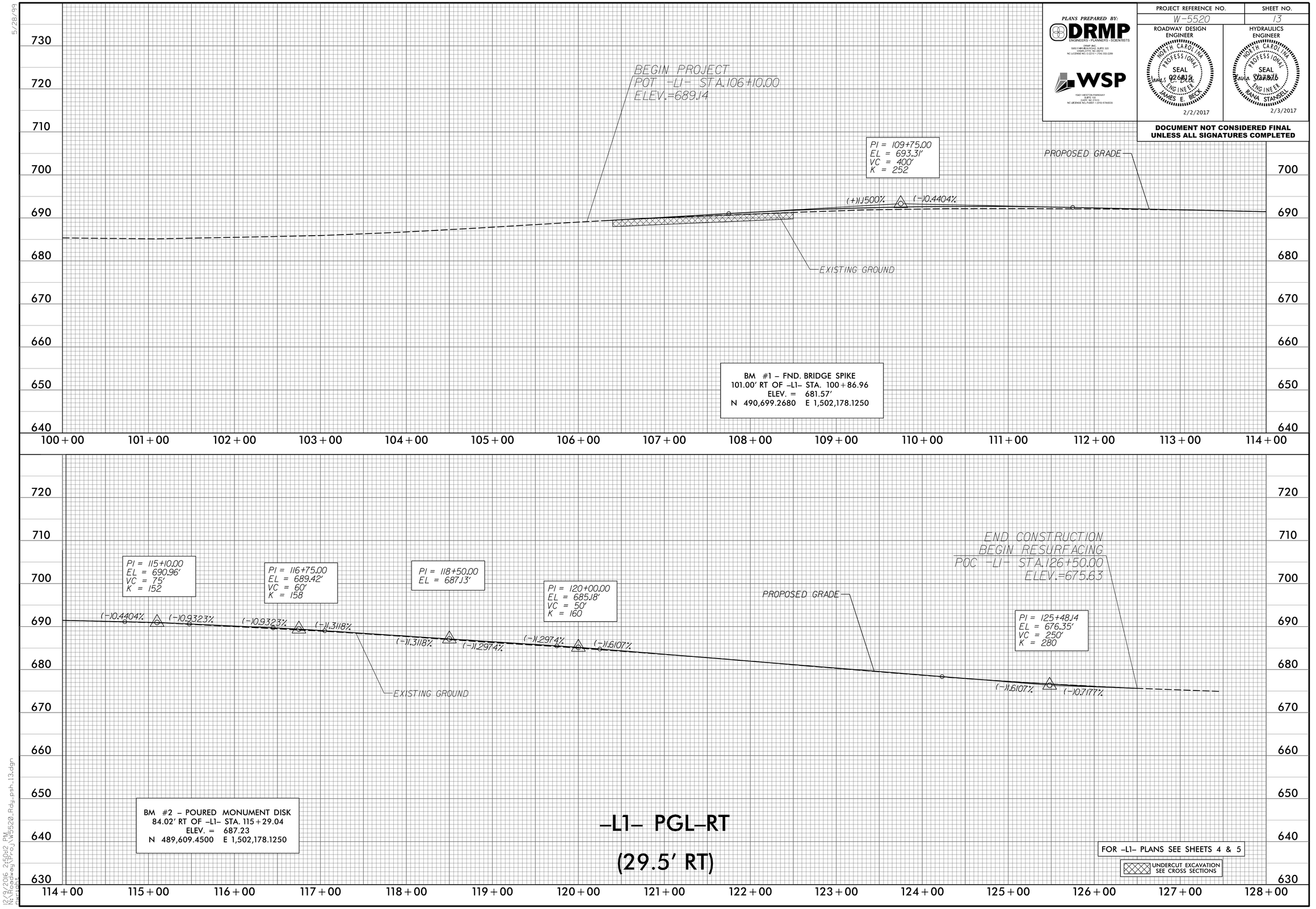

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jwelch

5/28/99

PLANS PREPARED BY:
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ENGINEERS • PLANNERS • SCIENTISTS
5960 FAIRVIEW RD, SUITE 300
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 • (704) 333-2289

WSP
15401 WESTON PARKWAY
SUITE 150
CARY, NC 27513
NC LICENSE NO. P-0051 • (919) 678-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	14

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032612 ENGINEER JAMES E. BECK
2/2/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 037676 ENGINEER DANA STAINSEL
2/3/2017

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END RESURFACING
BEGIN CONSTRUCTION
POT –L2– STA. 205+10.00
ELEV. = 659.96

EXISTING GROUND

PROPOSED GRADE

PI = 208+85.00
EL = 651.69'
VC = 350'
K = 217

PI = 211+65.00
EL = 650.03'
VC = 50'
K = 352

PI = 213+00.00
EL = 649.04'
VC = 80'
K = 190

(–)2.2052%
(–)0.5913%
(–)0.5913%
(–)0.7334%
(–)0.7334%
(–)0.3128%

–L2– PGL–LT
(29.5' LT)

BM #4 – POURED MONUMENT DISK
96.73' LT OF –L2– STA. 211+92.84
ELEV. = 648.86'
N 487,011.2870 E 1,505,558.0680

200+00 201+00 202+00 203+00 204+00 205+00 206+00 207+00 208+00 209+00 210+00 211+00 212+00 213+00 214+00

690 680 670 660 650 640 630 620 610 600

BM #5 – BRIDGE SPIKE IN PP
102.21' LT OF –L2– STA. 224+90.48
ELEV. = 647.22'
N 486,024.2763 E 1,506,400.5044

END CONSTRUCTION
BEGIN RESURFACING
POC –L2– STA. 226+15.00
ELEV. = 645.52

PROPOSED GRADE

PI = 214+50.00
EL = 648.57'
VC = 50'
K = 391

PI = 218+25.00
EL = 646.92'
VC = 100'
K = 361

PI = 219+40.00
EL = 646.10'
VC = 60'
K = 144

PI = 222+17.00
EL = 645.26'
BVC = 245'
KI = 1019

PI = 222+17.00
EL = 645.26'
AVC = 160'
K2 = 434

PI = 224+55.00
EL = 646.00'
VC = 150'
K = 246

(–)0.3128%
(–)0.4408%
(–)0.4408%
(+)0.7174%
(–)0.7174%
(–)0.3000%
(–)0.3000%
(+)0.3089%
(+)0.3089%
(–)0.3000%
(–)0.3000%

245.00'
160.00'

0.90000%
0.30000%
0.63333%
5.02000%
4.88764%
0.30000%

BEGIN SPECIAL LATERAL V DITCH STA.215+00.00–L2–LT EL=645.61'
END SPECIAL LATERAL V DITCH STA.217+20.00–L2–LT EL=643.63'
BEGIN LATERAL V DITCH STA.218+00.00–L2–LT EL=640.39'
END LATERAL V DITCH STA.218+50.00–L2–LT EL=640.24'
BEGIN SPECIAL LATERAL V DITCH STA.220+00.00–L2–LT EL=643.18'
END SPECIAL LATERAL V DITCH STA.220+30.00–L2–LT EL=642.99'
BEGIN SPECIAL LATERAL V DITCH STA.221+32.00–L2–LT EL=642.86'
PI STA.222+50.00–L2–LT EL=642.51'
END SPECIAL LATERAL V DITCH STA.223+00.00–L2–LT EL=640.00'
BEGIN LATERAL V DITCH STA.223+38.18–L2–LT EL=636.77'
END LATERAL V DITCH
BEGIN SPECIAL LATERAL V DITCH STA.224+50.00–L2–LT EL=642.25'
END SPECIAL LATERAL V DITCH STA.225+50.00–L2–LT EL=642.55'

EXISTING GROUND

FOR –L2– PLANS SEE SHEETS 6 & 7

UNDERCUT EXCAVATION SEE CROSS SECTIONS

214+00 215+00 216+00 217+00 218+00 219+00 220+00 221+00 222+00 223+00 224+00 225+00 226+00 227+00 228+00

690 680 670 660 650 640 630 620 610 600

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jwright

PROJECT REFERENCE NO.	SHEET NO.
W-5520	15

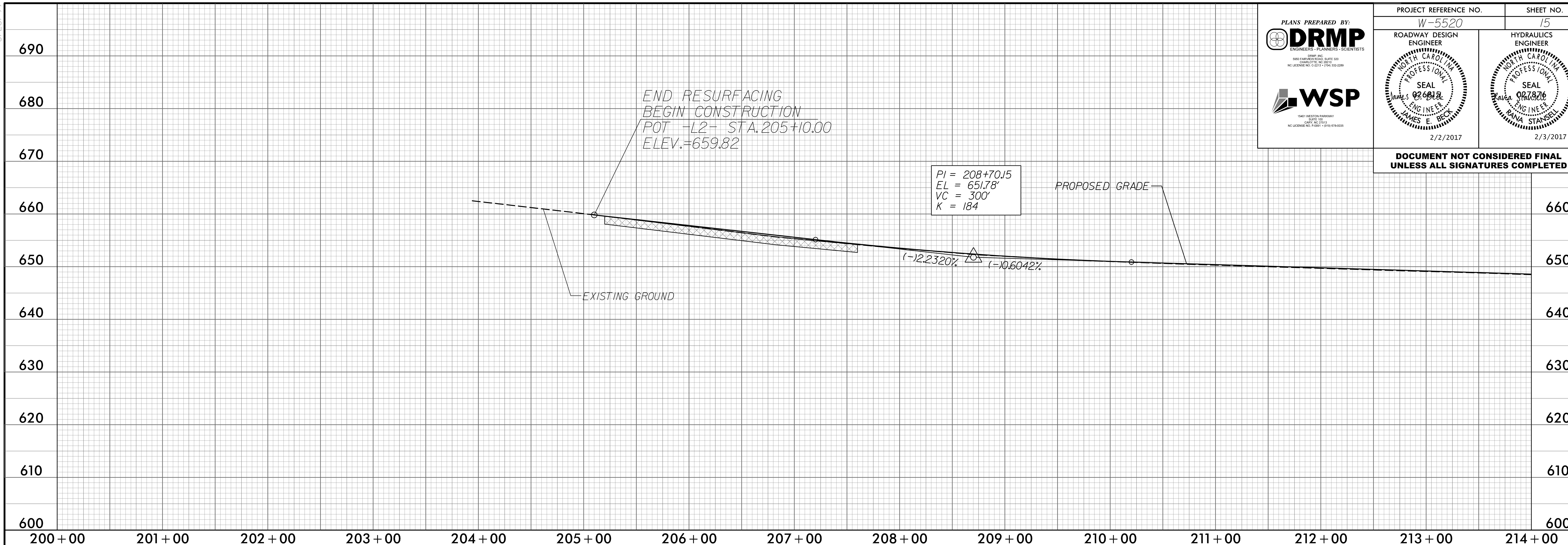
PLANS PREPARED BY: DRMP — ENGINEERS • PLANNERS • SCIENTISTS

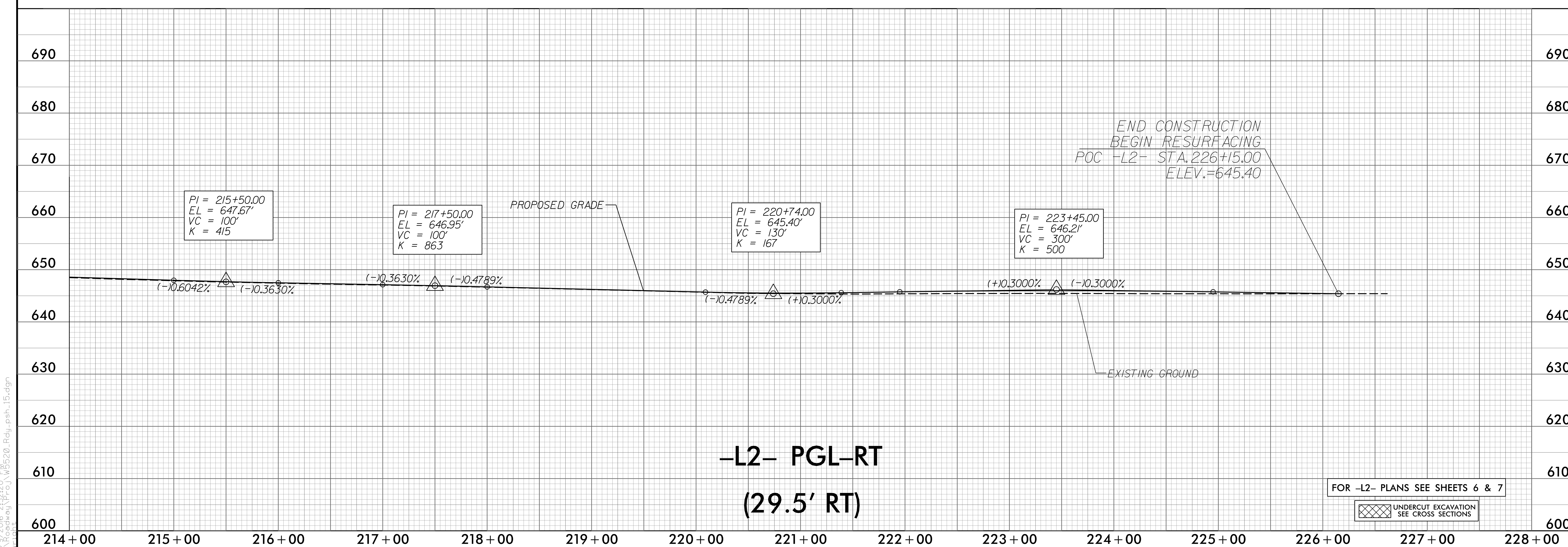
WSP

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026818 JAMES E. BECK — 2/2/2017

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027876 RANA STANSEL — 2/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





-L2- PGL-RT

(29.5' RT)

FOR -L2- PLANS SEE SHEETS 6 & 7

UNDERCUT EXCAVATION SEE CROSS SECTIONS

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PLANS PREPARED BY:
DRMP
ENGINEERS - PLANNERS - SCIENTISTS
8000 FAIRVIEW RD, SUITE 300
CHARLOTTE, NC 28210
NC LICENSE NO. C-0213 • (704) 333-3289

WSP
15401 WESTON PARKWAY
CARY, NC 27513
NC LICENSE NO. P-0051 • (919) 674-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	16

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032815 ENGINEER JAMES E. BECK
2/2/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 037976 ENGINEER DONNA STANSSEL
2/3/2017

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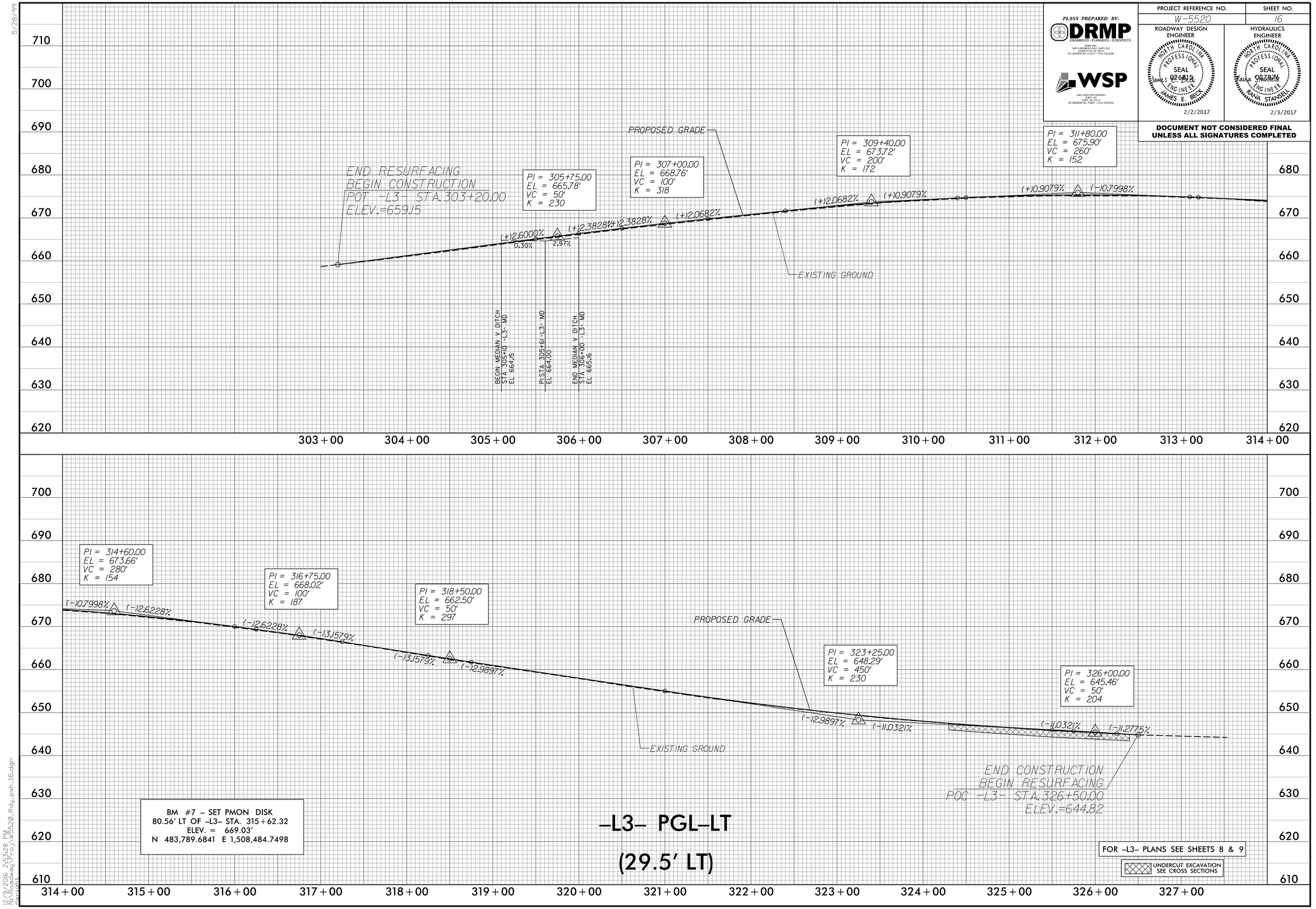

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jwelch

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5960 FAIRVIEW RD, SUITE 300
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 • (704) 333-2289

WSP
15401 WESTON PARKWAY
SUITE 150
CARY, NC 27513
NC LICENSE NO. P-0051 • (919) 678-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	17

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 024015 ENGINEER JAMES E. BECK
2/2/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027376 ENGINEER BINA STANSEL
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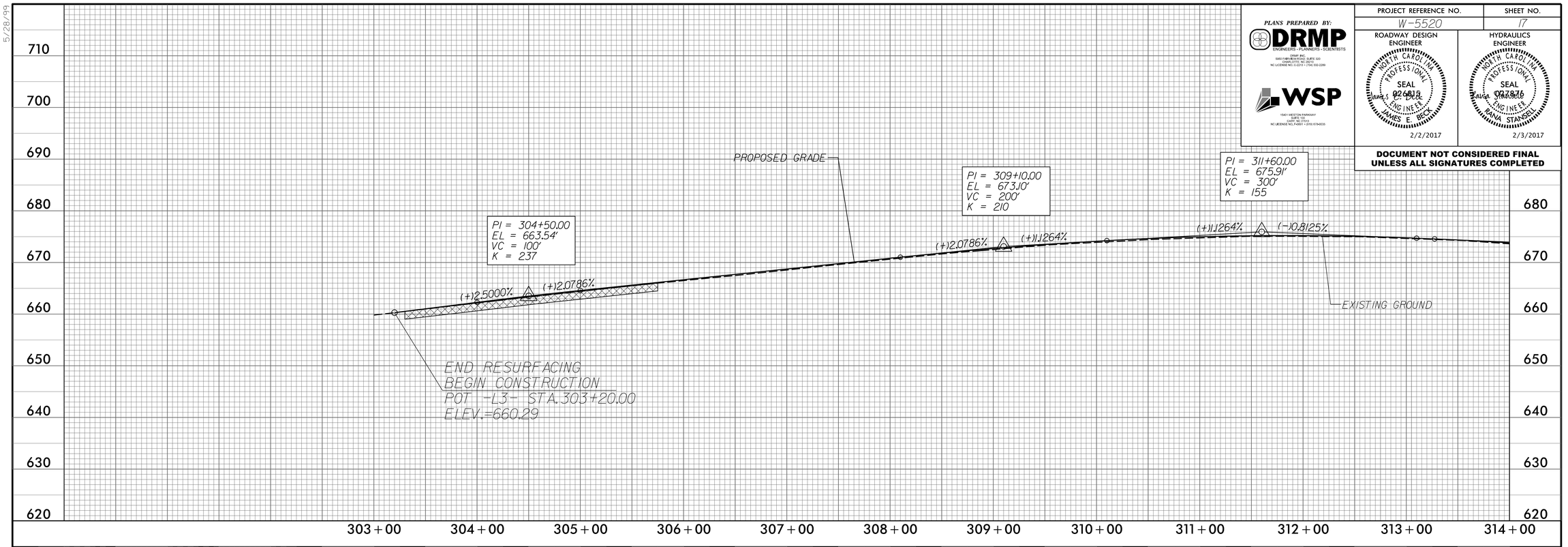

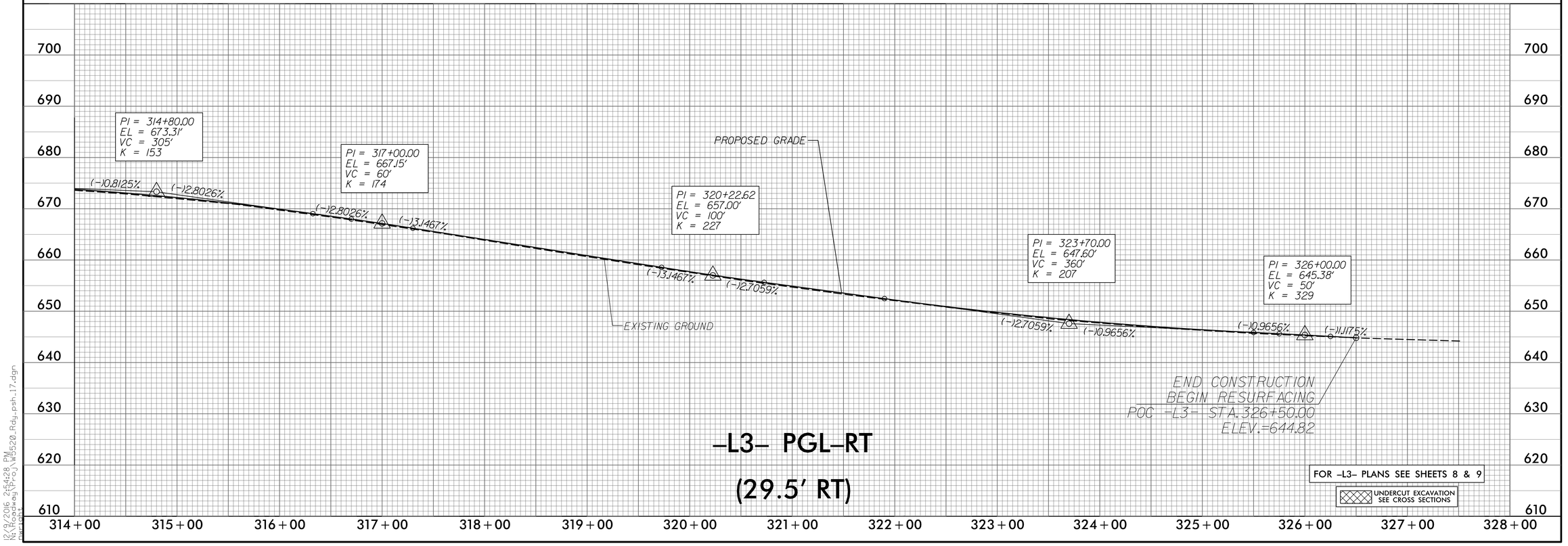

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NC LICENSE NO. C-2213 • (704) 333-2289
WSP
15401 WESTON PARKWAY
SUITE 150
CARY, NC 27513
NC LICENSE NO. P-0051 • (919) 678-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	18

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032512 ENGINEER JAMES E. BECK
2/2/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047876 ENGINEER RINA STANSEL
2/3/2017

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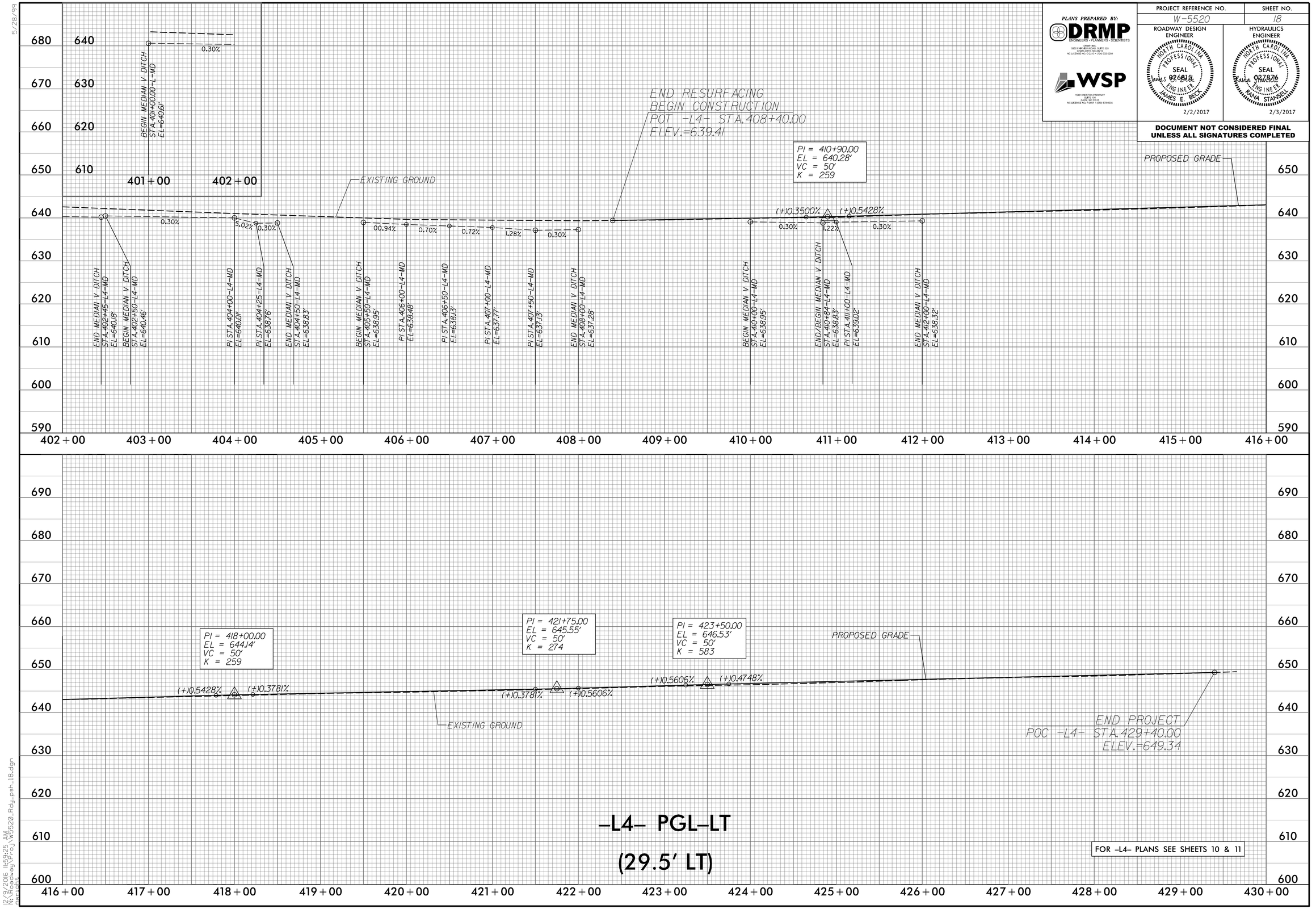

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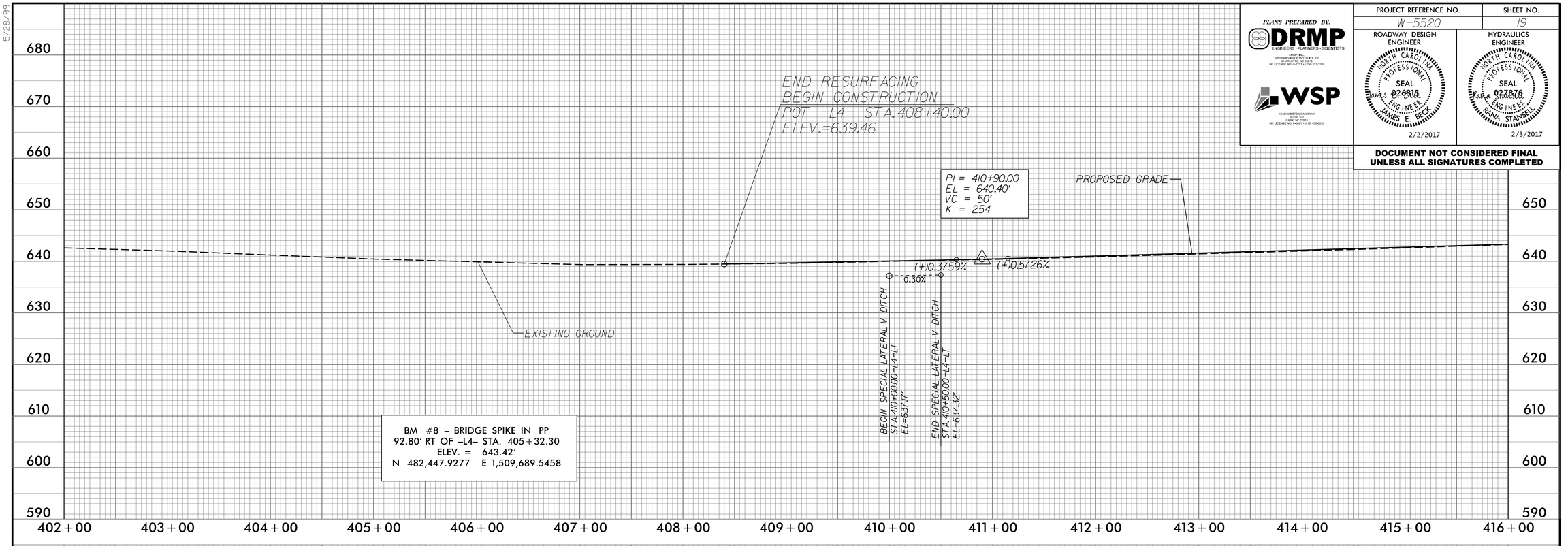

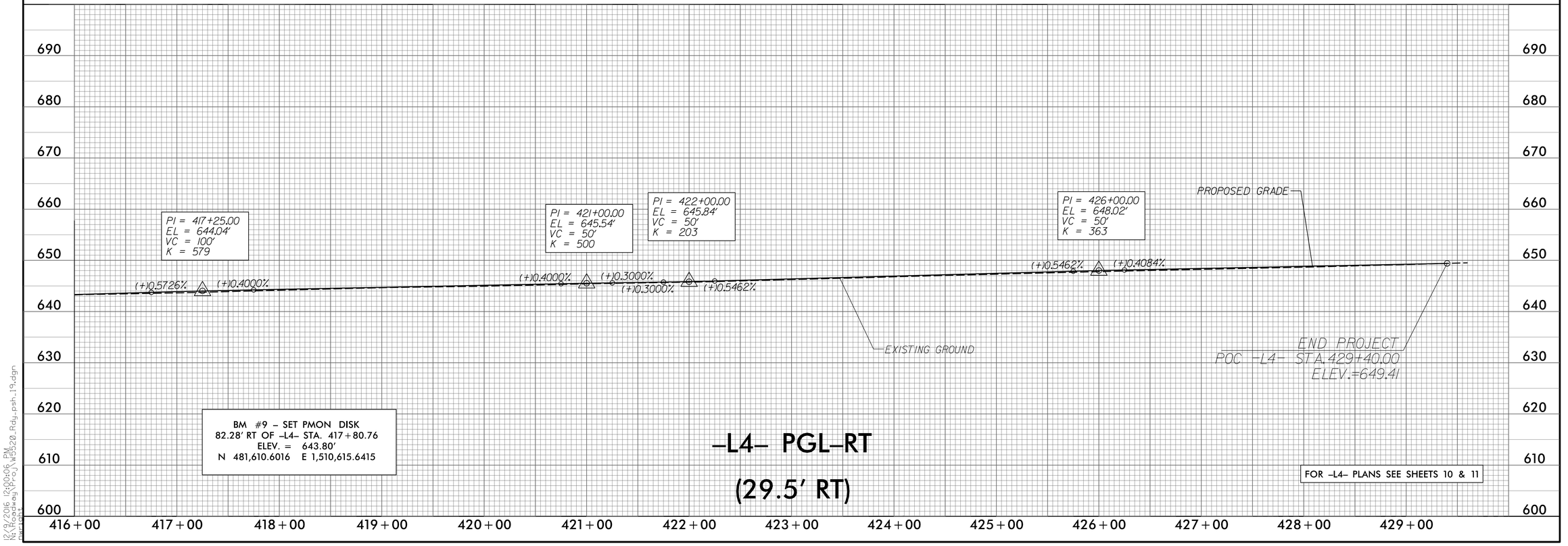

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WSP
15401 WESTON PARKWAY
SUITE 150
CARY, NC 27513
NC LICENSE NO. P-0051 • (919) 674-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	19

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 024818 ENGINEER JAMES E. BECK
2/2/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027870 ENGINEER RINA STANSEL
2/3/2017

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PLANS PREPARED BY:

DRMP

ENGINEERS - PLANNERS - SCIENTISTS

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 • (704) 332-2289

WSP

15421 WESTON PARKWAY
SUITE 100
CARY, NC 27513
NC LICENSE NO. F-0891 • (919) 678-0035

PROJECT REFERENCE NO.	SHEET NO.
W-5520	20

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026819 ENGINEER JAMES E BECK

2/2/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047876 ENGINEER RANA STANSEL

2/3/2017

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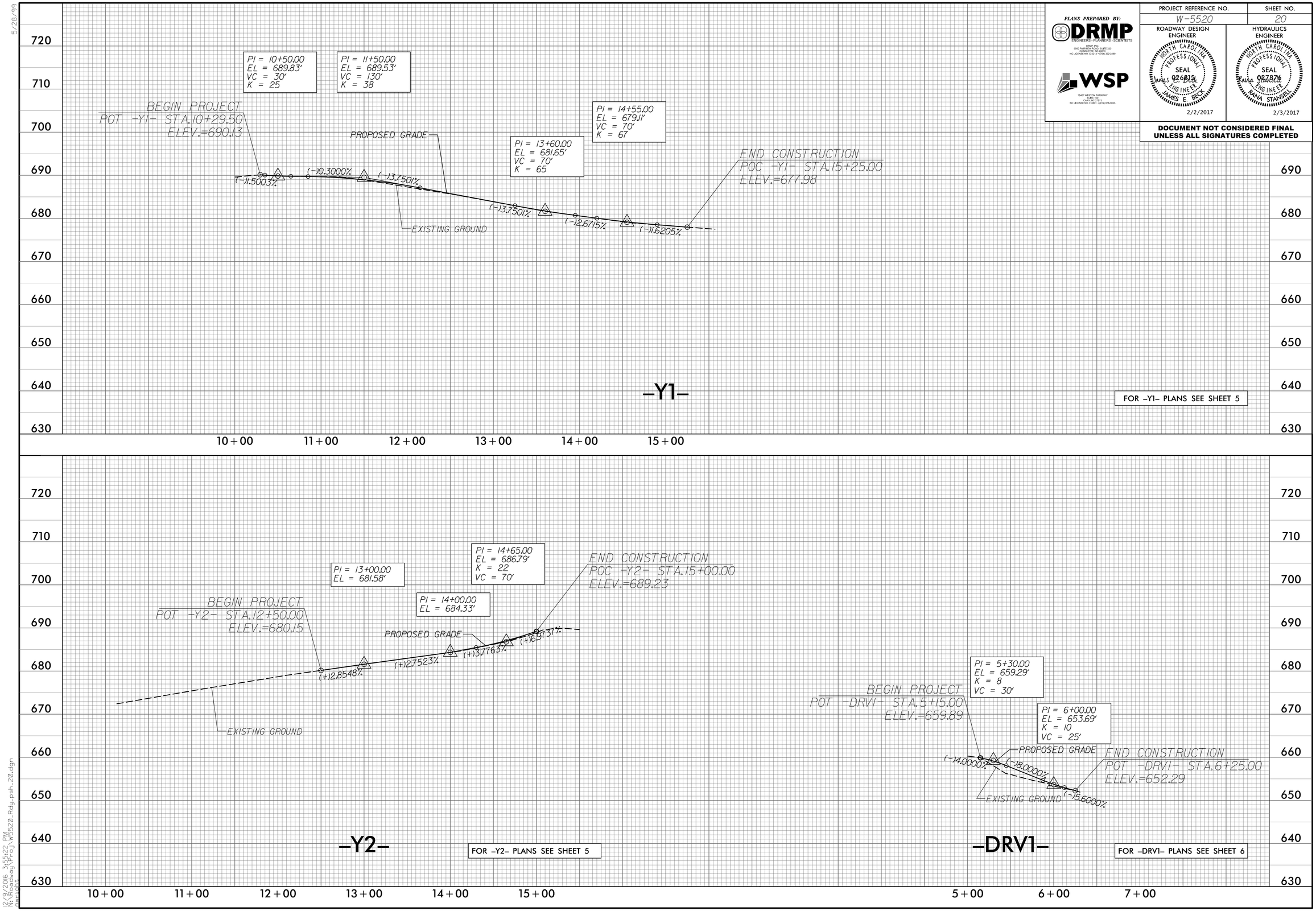

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