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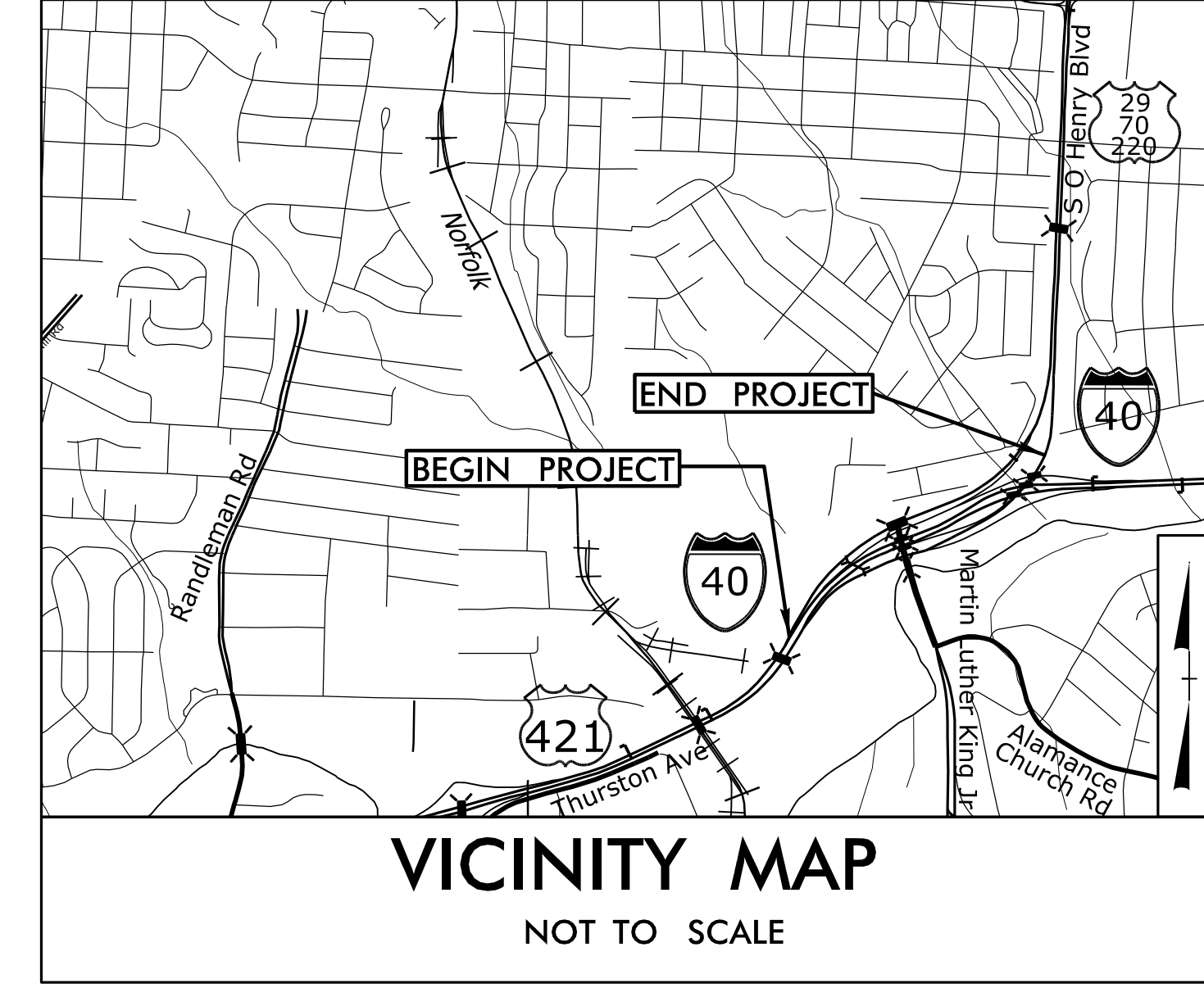
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09\_08/2019

**TIP PROJECT: U-5754**

**CONTRACT: C204466**

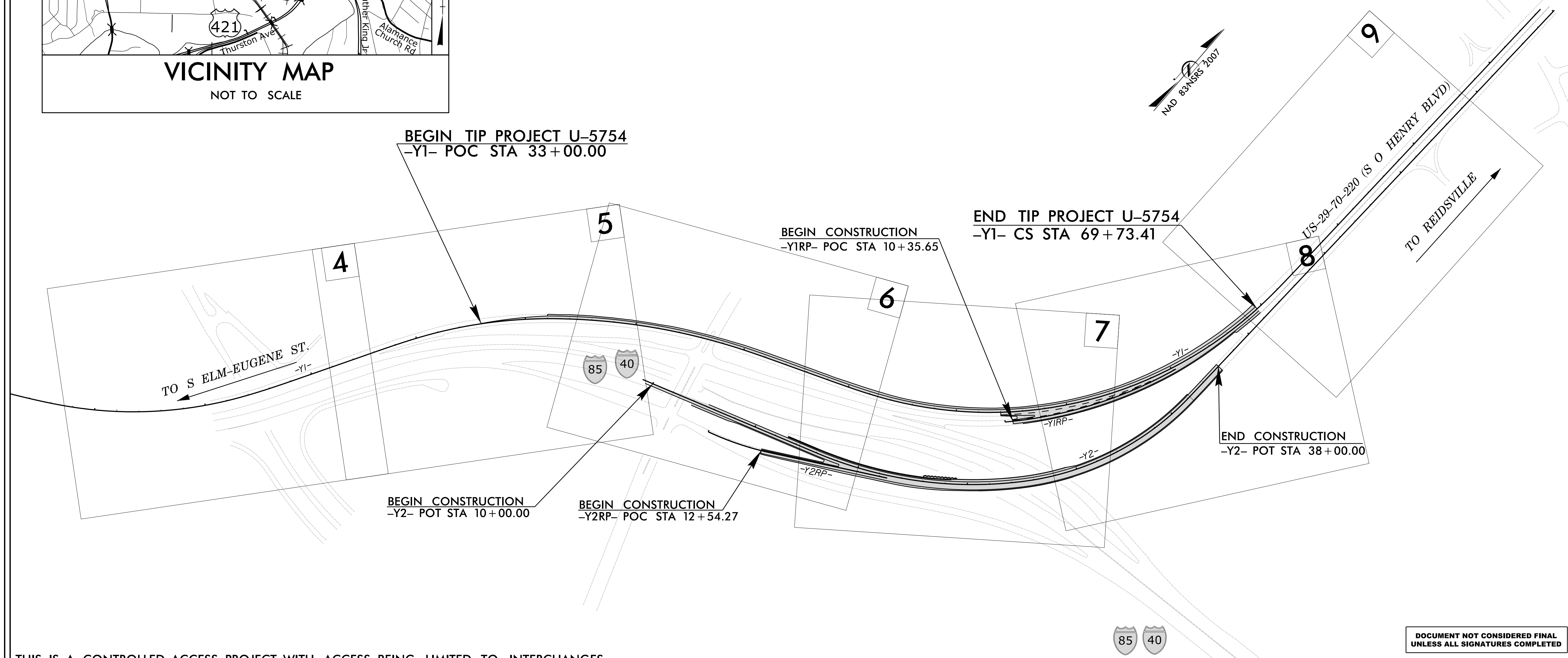
SEE SHEET 1A FOR INDEX OF SHEETS  
SEE SHEET 1B FOR CONVENTIONAL SYMBOLS  
SEE SHEET 1C-1 THRU 1C- FOR SURVEY CONTROL SHEETS



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**GUILFORD COUNTY**

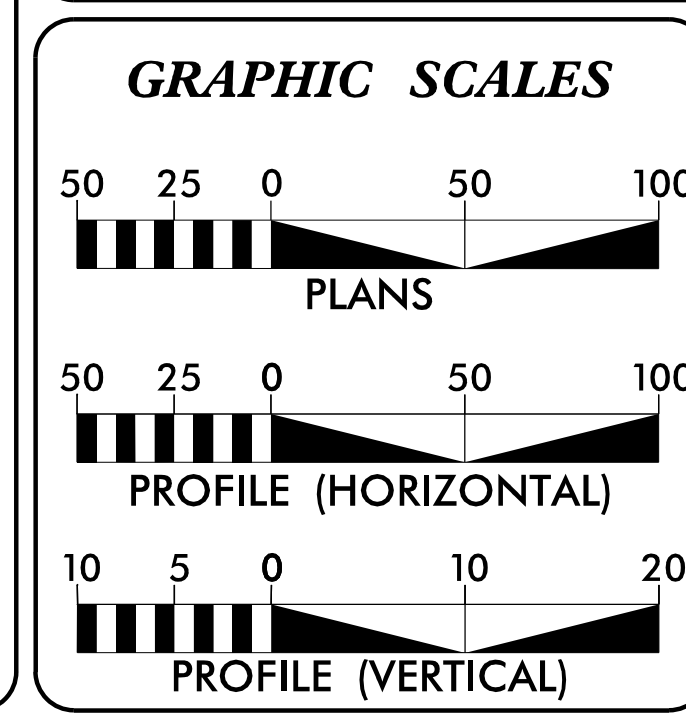
**LOCATION: US 29 /US 70 /US 220 (O'HENRY BOULEVARD) FROM I-40 / BUSINESS 85 TO SOUTH OF FLORIDA STREET IN GREENSBORO**  
**TYPE OF WORK: GRADING, PAVING, AND DRAINAGE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5754	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
54034.1.1	NHP-0029(065)	P.E.	
54034.2.1		ROW	
54034.3.1	NHP-0029(065)	CONST	



THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2020 =	26,650
ADT 2040 =	30,300
K =	8 %
D =	55 %
T =	11 % *
V =	60 MPH
* TTST = 6% DUAL = 5%	
FUNC CLASS =	
FREEWAY RAMP	
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT U-5754 =	1.018 MILES
TOTAL LENGTH OF TIP PROJECT U-5754 =	1.018 MILES

Prepared in the Office of:  
**Stantec**  
for the North Carolina Department of Transportation

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:** SEPTEMBER 28, 2018

**LETTING DATE:** JUNE 18, 2019

**MICHAEL LINDGREN, P.E.**  
PROJECT ENGINEER

**LAURA SUTTON, PE**  
NCDOT CONTACT

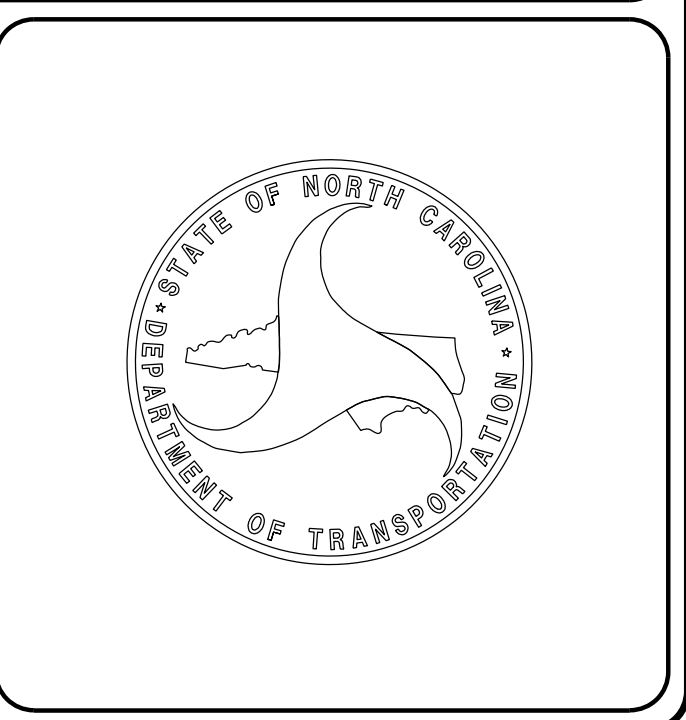
**HYDRAULICS ENGINEER**

5/15/2019

**ROADWAY DESIGN ENGINEER**

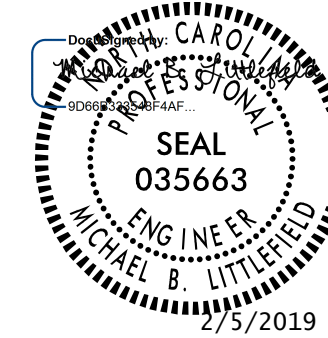
5/15/2019

Professional Engineer seals for Michael Lindgren and Laura Sutton.



5/15/2019 U:\Roadway\Proj\U5754\_Rdy\_tsh.dgn listarnee

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5754	1A
ROADWAY DESIGN ENGINEER	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

EFF. 01-16-2018  
REV.

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
RW2C-1 THRU RW2C-7	SURVEY CONTROL SHEETS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	GUARDRAIL INSTALLATION DETAIL SHEET
2G-1	STANDARD TEMPORARY SHORING DETAIL
3B-1	SUMMARY OF ROADWAY QUANTITIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 14	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-11	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-5	PAVEMENT MARKING PLANS
EC-1 THRU EC-15	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-14	SIGNING PLANS
X-1	CROSS SECTION INDEX
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-35	CROSS-SECTIONS

**GENERAL NOTES:**

2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

**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 11.

**SUPERELEVATION:**

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 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. 560.02

**SUBSURFACE DRAINS:**

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

**GUARDRAIL:**

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

**TEMPORARY SHORING:**

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

**SUBSURFACE PLANS:**

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

2018 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, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superlevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
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	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.04	Drainage Ditches with Class 'B' Rip Rap

12/2/2016

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

## BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑩ 23
Existing Fence Line	-x-x-x-
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	→
False Sump	▽

## RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

## RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	▲
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	○ R W
New Right of Way Line with Pin and Cap	○ R W ▲
New Right of Way Line with Concrete or Granite R/W Marker	▲ R W
New Control of Access Line with Concrete C/A Marker	△ C/A
Existing Control of Access	△ C/A
New Control of Access	△ C/A
Existing Easement Line	--- E ---
New Temporary Construction Easement	--- E ---
New Temporary Drainage Easement	--- TDE ---
New Permanent Drainage Easement	--- PDE ---
New Permanent Drainage / Utility Easement	--- DUE ---
New Permanent Utility Easement	--- PUE ---
New Temporary Utility Easement	--- TUE ---
New Aerial Utility Easement	--- AUE ---

## 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	--- T ---
Proposed Guardrail	--- T ---
Existing Cable Guiderail	--- T ---
Proposed Cable Guiderail	--- T ---
Equality Symbol	⊕
Pavement Removal	⊗

## VEGETATION:

Single Tree	○
Single Shrub	○

Note: Not to Scale

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

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	○
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	□
TV Tower	⊗
U/G TV Cable Hand Hole	○
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 ---

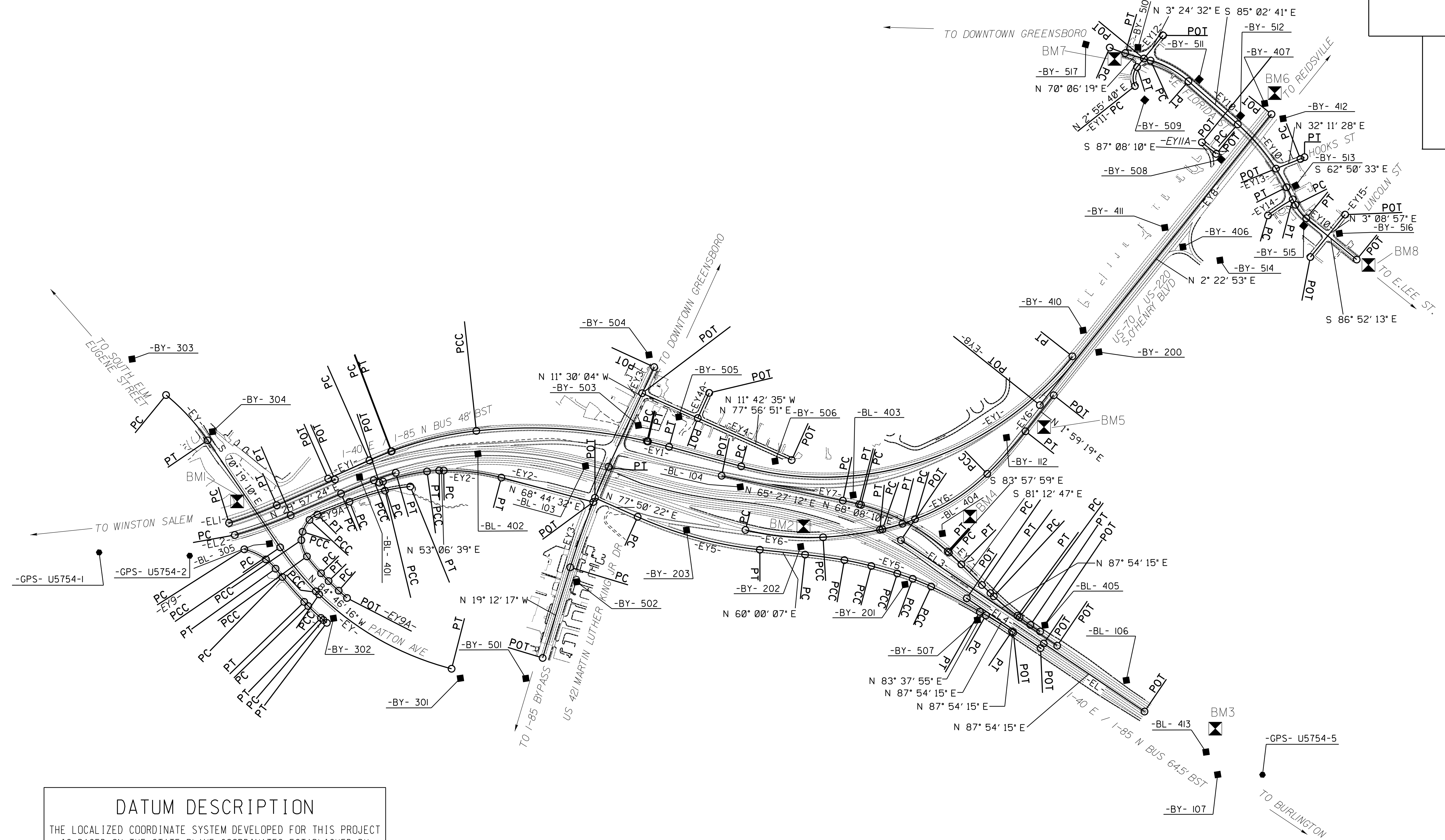
## MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line LOS B (S.U.E.*)	--- 7UTL ---
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.

# U-5754 SURVEY CONTROL SHEET

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
U5754	RW2C-1
Location and Surveys	
INSERT CONSULTANT'S NAME	
PROJECT SURVEYOR	



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BY-112"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF  
 NORTHING: 837480.9780(±) EASTING: 1772847.5360(±)  
 ELEVATION: 744.44'(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999937697

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BY-112" TO -L- EL STATION 10+00.00 IS  
 S 47° 34' 55" W 4,393.00'

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

- NOTES:**
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
  2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

07-JAN-2019 11:00  
 C:\Users\jcooper\OneDrive\Documents\U5754\U5754-1.rw2c-1.181213.dgn  
 11/18/2018 11:11:11 AM

PROJECT REFERENCE NO.	SHEET NO.
U5754	RW2C-2
<b>Location and Surveys</b>	
INSERT CONSULTANT'S NAME	

PROJECT SURVEYOR

# U-5754 SURVEY CONTROL SHEET

*W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

## BASELINE DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION
1		GPS U5754-1	833953.8140	1769112.8020	741.80
2		GPS U5754-2	834238.7380	1769534.4310	751.29
305		BL-305	834576.0562	1769858.1692	771.13
401		BL-401	835150.2645	1770055.4247	749.34
402		BL-402	835660.3667	1770501.0652	747.03
103		BL-103	835957.1104	1771032.1720	745.59
104		BL-104	836374.6346	1771803.7493	742.60
403		BL-403	836685.8085	1772332.6302	751.87
404		BL-404	836805.8001	1772872.2999	754.35
405		BL-405	836734.9406	1773639.8870	731.96
106		BL-106	836749.4355	1774195.0076	727.63
413		BL-413	836715.3712	1774794.2430	727.50
5		GPS U5754-5	836799.4310	1775125.7900	725.58
6		GPS U5754-6	836827.0040	1776181.1140	725.38

BY	POINT	DESC.	NORTH	EAST	ELEVATION
303		BY-303	834939.4351	1768621.2011	782.94
304		BY-304	834876.7400	1769226.8459	778.69
EQ305			834576.0562	1769858.1692	771.13
302		BY-302	834446.8529	1770393.8583	737.43
301		BY-301	834579.6394	1771168.1328	730.09

BY3	POINT	DESC.	NORTH	EAST	ELEVATION
501		BY-501	834796.1067	1771477.1331	728.00
502		BY-502	835401.6871	1771362.8579	726.44
EQ103			835957.1104	1771032.1720	745.59
503		BY-503	836316.9952	1771115.3267	738.76
504		BY-504	836672.1683	1770973.0031	759.26

BY4	POINT	DESC.	NORTH	EAST	ELEVATION
EQ504			836672.1683	1770973.0031	759.26
505		BY-505	836509.6487	1771292.5221	746.12
506		BY-506	836631.4640	1771873.5645	754.72

BY5	POINT	DESC.	NORTH	EAST	ELEVATION
EQA103			835957.1104	1771032.1720	745.59
203		BY-203	836001.2176	1771702.8640	737.85
202		BY-202	836285.6964	1772278.3784	732.02
201		BY-201	836499.1154	1772873.9129	744.26
507		BY-507	836582.3104	1773319.9055	739.67
EQ405			836734.9406	1773639.8870	731.96

BY8	POINT	DESC.	NORTH	EAST	ELEVATION
EQ403			836685.8085	1772332.6302	751.87
112		BY-112	837480.9780	1772847.5360	744.44
200		BY-200	838175.0514	1772963.4850	754.83
406		BY-406	838925.7027	1772992.3453	742.32
407		BY-407	839850.3066	1772933.8928	738.96
408		BY-408	840629.8513	1772965.7463	747.30
409		BY-409	841473.8665	1773003.2826	777.65
3		GPS U5754-3	841951.4150	1773008.7350	791.84
4		GPS U5754-4	842765.4030	1773112.8700	817.92

BY9	POINT	DESC.	NORTH	EAST	ELEVATION
EQ112			837480.9780	1772847.5360	744.44
410		BY-410	838220.4380	1772860.7108	755.73
411		BY-411	838959.0783	1772895.0532	741.76
EQ407			839850.3066	1772933.8928	738.96

BY10	POINT	DESC.	NORTH	EAST	ELEVATION
517		BY-517	839538.2496	1771894.0028	775.86
510		BY-510	839670.0945	1772155.0403	770.16
511		BY-511	839727.2803	1772532.1844	773.17
512		BY-512	839698.8212	1772839.4490	765.75
513		BY-513	839560.3833	1773324.9726	750.26
515		BY-515	839442.6112	1773486.8752	755.64
516		BY-516	839483.6373	1773675.2277	768.39

BY11	POINT	DESC.	NORTH	EAST	ELEVATION
EQA407			839850.3066	1772933.8928	738.96
508		BY-508	839467.3400	1772912.7233	736.74
509		BY-509	839469.4890	1772356.0952	750.49
EQ510			839670.0945	1772155.0403	770.16

BY14	POINT	DESC.	NORTH	EAST	ELEVATION
EQ513			839560.3833	1773324.9726	750.26
514		BY-514	838964.8264	1773225.3119	732.11
EQ406			838925.7027	1772992.3453	742.32

**NOTES:**

- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
- THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U5754	RW2C-3
<b>Location and Surveys</b>	
INSERT CONSULTANT'S NAME	

PROJECT SURVEYOR

# U-5754 SURVEY CONTROL SHEET

*W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

## BENCHMARK DATA

```

*****
BM1      ELEVATION = 777.73
N 834672      E 1769585
BY STATION 15+20.00 31 RIGHT
RAILROAD SPIKE SET IN 16" WILLOW OAKTREE
*****
BM2      ELEVATION = 750.80
N 836416      E 1772217
BY STATION 31+45.00
N 29+44'00.8" E      DIST 2114.79
PK NAIL SW WING WALL I-85N BRIDGE
*****
BM3      ELEVATION = 740.98
N 836852      E 1774759
BL STATION 72+96.00 134 LEFT
RAILROAD SPIKE SET IN 17" POPLAR TREE
*****
BM4      ELEVATION = 726.09
N 837002      E 1772944
BL STATION 54+66.00 202 LEFT
WEST BOLT AT BASE OF BILL BOARD SIGN
*****
    
```

```

*****
BM5      ELEVATION = 749.53
N 837700      E 1772946
BY STATION 31+45.00
N 29+40'22.5" E      DIST 3591.30
SCRIBE IN TOP CONCRETE FOUNDATION LIGHTPOLE
*****
BM6      ELEVATION = 736.97
N 839903      E 1772923
BY STATION 31+45.00
N 18+14'32.9" E      DIST 5605.29
SCRIBED "X" IN CONCRETE HEADWALL
*****
BM7      ELEVATION = 769.65
N 839573      E 1772038
BY STATION 16+27.00 5448 LEFT
SCRIBED "X" IN TOP BACK OF CURB
*****
BM8      ELEVATION = 775.85
N 839463      E 1773917
BY STATION 31+45.00
N 29+22'46.7" E      DIST 5603.92
SCRIBED "X" IN TOP BACK OF CURB
*****
    
```

**NOTES:**

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

07-JAN-2019 11:05  
 C:\Users\jcocherlee\Desktop\U5754\U5754\_1s.rw02c-3\_181213.dgn  
 USER NAME: jcocherlee

# U-5754 SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. U5754	SHEET NO. RW2C-4
<b>Location and Surveys</b>	
INSERT CONSULTANT'S NAME	

PROJECT SURVEYOR

EL

POINT	N	E	BEARING	DIST
POT	836670.269	1773698.489		
LINE			N 87°54'15.1" E	683.33
POT	836695.259	1774381.359		

EL1

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	834517.740	1769604.434							
CURVE			N 33°29'48.8" E	285.91	07°04'50.3"(LT)	02°28'29.9"	286.09	143.23	2315.00
PT	834756.162	1769762.224							
LINE			N 29°57'23.7" E	357.42					
POT	835065.830	1769940.698							

EL2

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	834482.293	1769670.542							
CURVE			N 34°24'03.5" E	332.85	07°38'02.7"(LT)	02°17'30.6"	333.10	166.80	2500.00
PT	834756.932	1769858.598							
LINE			N 30°35'02.2" E	307.70					
PC	835021.825	1770015.155							
CURVE			N 31°31'49.7" E	198.23	01°53'35.0"(RT)	00°57'17.7"	198.24	99.13	6000.00
PCC	835190.790	1770118.821							
CURVE			N 35°09'12.8" E	130.75	05°21'11.3"(RT)	04°05'33.2"	130.80	65.45	1400.00
PT	835297.696	1770194.105							

EL3

POINT	N	E	BEARING	DIST
POT	836666.073	1772708.821		
LINE			N 87°54'15.1" E	1058.80
POT	836704.795	1773766.913		

EL4

POINT	N	E	BEARING	DIST
POT	836620.005	1773199.994		
LINE			N 87°54'15.1" E	500.00
POT	836638.291	1773699.660		

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	834889.338	1768894.745							
CURVE			S 78°35'35.9" E	345.37	16°32'52.1"(RT)	04°46'28.7"	346.58	174.50	1200.00
PT	834821.033	1769233.296							
LINE			S 70°19'09.9" E	726.16					
PC	834576.479	1769917.041							
CURVE			S 75°23'33.5" E	318.34	10°08'47.3"(LT)	03°10'59.2"	318.76	159.80	1800.00
PCC	834496.194	1770225.095							
CURVE			S 81°10'26.8" E	24.72	01°24'59.1"(LT)	05°43'46.5"	24.72	12.36	1000.00
PCC	834492.401	1770249.523							
CURVE			N 83°10'44.3" E	853.09	29°52'38.7"(LT)	03°27'45.8"	862.83	441.46	1654.64
PT	834593.721	1771096.571							

EY1

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	835046.637	1769907.129							
LINE			N 29°57'23.7" E	253.62					
PC	835266.375	1770033.773							
CURVE			N 31°28'11.9" E	132.05	03°01'36.5"(RT)	02°17'30.6"	132.07	66.05	2500.00
PT	835379.006	1770102.712							
LINE			N 32°59'00.2" E	3.51					
PC	835381.949	1770104.623							
CURVE			N 40°20'00.2" E	488.66	14°42'00.0"(RT)	03°00'00.0"	490.00	246.35	1909.86
PCC	835754.449	1770420.898							
CURVE			N 57°20'00.1" E	960.44	19°18'00.0"(RT)	02°00'00.0"	965.00	487.11	2864.79
PT	836272.849	1771229.424							
LINE			N 66°59'00.1" E	5.58					
PC	836275.031	1771234.562							
CURVE			N 67°59'00.1" E	122.17	02°00'00.0"(RT)	01°38'13.3"	122.17	61.09	3500.00
PT	836320.828	1771347.819							
LINE			N 68°59'00.1" E	419.86					
PC	836471.406	1771739.748							
CURVE			N 35°28'36.7" E	1959.97	67°00'46.8"(LT)	03°13'39.0"	2076.31	1175.29	1775.24
PT	838067.511	1772877.266							

**NOTES:**

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# U-5754 SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
U5754	RW2C-5
Location and Surveys	
INSERT CONSULTANT'S NAME	

PROJECT SURVEYOR

EY2									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	835198.211	1770152.846							
LINE			N 35°48'16.4" E	21.54					
PC	835215.682	1770165.448							
CURVE			N 40°54'21.9" E	253.78	10°12'11.0"(RT)	04°00'54.4"	254.12	127.39	1427.00
PCC	835407.485	1770331.628							
CURVE			N 49°33'33.1" E	68.14	07°06'11.5"(RT)	10°25'02.7"	68.19	34.14	550.00
PT	835451.686	1770383.490							
LINE			N 53°06'38.9" E	25.68					
PC	835467.099	1770404.027							
CURVE			N 60°55'35.4" E	326.37	15°37'53.1"(RT)	04°46'28.7"	327.38	164.71	1200.00
PT	835625.692	1770689.273							
LINE			N 68°44'32.0" E	534.00					
POT	835819.303	1771186.943							

EY3									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	834944.330	1771473.939							
LINE			N 19°12'17.1" W	532.28					
PC	835446.986	1771298.849							
CURVE			N 15°21'10.7" W	604.58	07°42'12.9"(RT)	01°16'23.7"	605.04	302.98	4500.00
PT	836029.993	1771138.777							
LINE			N 11°30'04.2" W	615.41					
POT	836633.042	1771016.072							

EY4				
POINT	N	E	BEARING	DIST
POT	836474.842	1771048.261		
LINE			N 77°56'51.0" E	919.96
POT	836666.936	1771947.940		

EY4A				
POINT	N	E	BEARING	DIST
POT	836546.278	1771382.835		
LINE			N 11°42'35.4" W	155.36
POT	836698.402	1771351.304		

EY5									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	835843.779	1771180.798							
LINE			N 77°50'22.4" E	262.38					
PC	835899.048	1771437.287							
CURVE			N 68°55'14.5" E	710.68	17°50'15.8"(LT)	02°29'59.3"	713.56	359.69	2292.00
PT	836154.653	1772100.415							
LINE			N 60°00'06.6" E	255.66					
PC	836282.475	1772321.825							
CURVE			N 61°49'35.2" E	222.88	03°38'57.3"(RT)	01°38'13.3"	222.92	111.50	3500.00
PCC	836387.707	1772518.300							
CURVE			N 66°06'57.5" E	154.83	04°55'47.4"(RT)	03°10'59.2"	154.88	77.49	1800.00
PCC	836450.395	1772659.870							
CURVE			N 70°01'58.7" E	152.04	02°54'14.9"(RT)	01°54'35.5"	152.06	76.05	3000.00
PCC	836502.315	1772802.774							
CURVE			N 72°52'37.2" E	91.34	02°47'02.2"(RT)	03°02'51.5"	91.35	45.68	1880.00
PCC	836529.207	1772890.064							
CURVE			N 76°32'00.5" E	112.61	04°31'44.2"(RT)	04°01'14.7"	112.64	56.35	1425.00
PCC	836555.431	1772999.578							
CURVE			N 81°12'53.6" E	307.85	04°50'02.1"(RT)	01°34'11.1"	307.94	154.06	3650.00
PT	836602.449	1773303.817							
LINE			N 83°37'54.7" E	39.60					
PC	836606.841	1773343.175							
CURVE			N 85°46'04.9" E	171.46	04°16'20.4"(RT)	02°29'28.0"	171.50	85.79	2300.00
PT	836619.494	1773514.171							
LINE			N 87°54'15.1" E	9.22					
POT	836619.832	1773523.387							

EY6									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	836196.744	1771969.688							
CURVE			N 59°14'31.9" E	438.00	17°35'19.9"(LT)	04°00'00.0"	439.72	221.60	1432.39
PCC	836420.740	1772346.073							
CURVE			N 46°24'02.2" E	321.89	08°05'39.4"(LT)	02°30'45.0"	322.16	161.35	2280.43
PT	836642.720	1772579.181							
LINE			N 42°21'12.6" E	14.40					
PC	836653.360	1772588.881							
CURVE			N 38°09'56.4" E	116.84	08°22'32.4"(LT)	07°09'43.1"	116.95	58.58	800.00
PT	836745.225	1772661.082							
LINE			N 33°58'40.2" E	75.02					
PC	836807.435	1772703.008							
CURVE			N 21°44'38.5" E	478.90	24°28'03.4"(LT)	05°04'13.5"	482.56	245.01	1130.00
PCC	837252.258	1772880.421							
CURVE			N 05°44'58.1" E	321.39	07°31'17.4"(LT)	02°20'19.0"	321.62	161.04	2450.00
PT	837572.034	1772912.617							
LINE			N 01°59'19.4" E	257.22					
POT	837829.103	1772921.544							

**NOTES:**

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# U-5754 SURVEY CONTROL SHEET

## W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. U5754	SHEET NO. RW2C-6
<b>Location and Surveys</b>	
INSERT CONSULTANT'S NAME	

PROJECT SURVEYOR
------------------

EY7

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	836363.519	1771682.037							
LINE			N 65°27'12.4" E	695.23					
PC	836652.341	1772314.436							
CURVE			N 66°47'41.0" E	93.63	02°40'57.2"(RT)	02°51'53.2"	93.64	46.83	2000.00
PT	836689.234	1772400.491							
LINE			N 68°08'09.6" E	11.07					
PC	836693.357	1772410.765							
CURVE			S 82°05'05.4" E	552.46	27°53'51.5"(RT)	05°00'00.0"	557.95	284.62	1145.92
PT	836769.434	1772957.959							
LINE			S 83°57'58.9" E	9.75					
PC	836768.409	1772967.651							
CURVE			S 82°35'22.9" E	96.10	02°45'11.9"(RT)	02°51'53.2"	96.11	48.06	2000.00
PT	836756.015	1773062.947							
LINE			S 81°12'47.0" E	163.75					
PC	836731.001	1773224.773							
CURVE			S 82°09'16.9" E	65.74	01°52'59.7"(LT)	02°51'53.2"	65.74	32.87	2000.00
PT	836722.028	1773289.893							
LINE			S 83°05'46.7" E	26.07					
PC	836718.894	1773315.775							
CURVE			S 86°32'19.1" E	172.01	06°53'04.7"(LT)	04°00'00.0"	172.12	86.16	1432.39
PT	836708.509	1773487.474							
LINE			S 89°58'51.5" E	15.42					
PC	836708.504	1773502.896							
CURVE			N 88°57'41.8" E	73.82	02°06'53.5"(LT)	02°51'53.2"	73.82	36.92	2000.00
PT	836709.842	1773576.702							
LINE			N 87°54'15.1" E	66.56					
POT	836712.276	1773643.216							

EY8

POINT	N	E	BEARING	DIST
POT	837738.375	1772891.347		
LINE			N 02°22'52.8" E	2088.88
POT	839825.447	1772978.140		

EY9

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	834448.778	1769761.018							
CURVE			N 78°53'31.9" E	134.25	22°46'20.4"(RT)	16°51'06.1"	135.13	68.47	340.00
PCC	834474.642	1769892.749							
CURVE			S 82°17'27.1" E	75.01	14°51'41.7"(RT)	19°45'25.8"	75.22	37.82	290.00
PT	834464.579	1769967.082							
LINE			S 74°51'36.2" E	59.51					
PC	834449.037	1770024.525							
CURVE			S 77°32'05.9" E	186.68	05°20'59.3"(LT)	02°51'53.2"	186.74	93.44	2000.00
PT	834408.744	1770206.800							
LINE			S 80°12'35.5" E	32.36					
PC	834403.242	1770238.686							
CURVE			S 82°56'36.9" E	97.77	05°28'02.8"(LT)	05°35'23.4"	97.81	48.94	1025.00
PT	834391.231	1770335.719							
LINE			S 85°40'38.3" E	17.89					
PC	834389.883	1770353.559							
CURVE			S 87°23'23.9" E	25.11	03°25'31.2"(LT)	13°38'30.7"	25.11	12.56	420.00
PT	834388.739	1770378.638							

EY9A

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	834568.164	1770387.837							
LINE			N 84°46'16.4" W	62.26					
PC	834573.838	1770325.837							
CURVE			N 82°31'53.9" W	78.16	04°28'45.0"(RT)	05°43'46.5"	78.18	39.11	1000.00
PT	834583.997	1770248.344							
LINE			N 80°17'31.4" W	61.00					
PC	834594.283	1770188.216							
CURVE			N 76°07'53.3" W	123.34	08°19'16.1"(RT)	06°44'26.4"	123.45	61.83	850.00
PCC	834623.847	1770068.474							
CURVE			N 54°54'12.6" W	96.85	34°08'05.3"(RT)	34°43'29.0"	98.30	50.66	165.00
PCC	834679.533	1769989.229							
CURVE			N 28°05'22.6" W	47.40	19°29'34.8"(RT)	40°55'32.0"	47.63	24.05	140.00
PCC	834721.351	1769966.911							
CURVE			N 05°58'53.3" W	77.07	24°43'23.7"(RT)	31°49'51.6"	77.67	39.45	180.00
PCC	834798.001	1769958.879							
CURVE			N 19°21'56.8" E	53.93	25°58'16.6"(RT)	47°44'47.3"	54.39	27.67	120.00
PT	834848.879	1769976.762							
LINE			N 32°21'05.1" E	194.09					
PC	835012.845	1770080.623							
CURVE			N 36°20'26.1" E	208.70	07°58'42.0"(RT)	03°49'11.0"	208.87	104.61	1500.00
PCC	835100.958	1770204.298							
CURVE			N 44°40'39.7" E	144.04	08°41'45.2"(RT)	06°01'52.1"	144.18	72.23	950.00
PT	835283.384	1770305.579							

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# U-5754 SURVEY CONTROL SHEET

*W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

PROJECT REFERENCE NO. U5754	SHEET NO. RW2C-7
<b>Location and Surveys</b>	
INSERT CONSULTANT'S NAME	

PROJECT SURVEYOR
------------------

EY10

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	839591.616	1772023.714							
CURVE			N 73°42'17.5" E	92.57	07°11'58.0"(LT)	07°46'20.2"	92.63	46.38	737.18
PT	839617.589	1772112.565							
LINE			N 70°06'18.8" E	148.20					
PC	839668.020	1772251.918							
CURVE			N 82°31'48.8" E	242.39	24°51'00.0"(RT)	10°10'19.2"	244.30	124.10	563.27
PT	839699.531	1772492.249							
LINE			S 85°02'41.2" E	367.77					
PC	839667.765	1772858.642							
CURVE			S 73°56'36.9" E	447.47	22°12'08.6"(RT)	04°55'50.8"	450.28	228.00	1162.00
PT	839544.002	1773288.654							
LINE			S 62°50'32.6" E	110.38					
PC	839493.621	1773386.864							
CURVE			S 74°51'22.7" E	97.30	24°01'40.1"(LT)	24°30'49.2"	98.02	49.74	233.73
PT	839468.202	1773480.787							
LINE			S 86°52'12.8" E	366.02					
POT	839448.218	1773846.259							

EY11

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	839500.376	1772265.549							
CURVE			N 29°50'19.0" W	107.76	65°31'57.1"(RT)	57°33'17.2"	113.86	64.07	99.55
PT	839593.847	1772211.934							
LINE			N 02°55'39.6" E	60.94					
POT	839654.711	1772215.047							

EY11A

POINT	N	E	BEARING	DIST
POT	839467.085	1772755.741		
LINE			S 87°08'09.8" E	103.07
POT	839461.935	1772858.681		

EY12

POINT	N	E	BEARING	DIST
POT	839654.711	1772215.047		
LINE			N 03°24'31.8" E	168.49
POT	839822.905	1772225.065		

EY13

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	839593.290	1773178.937							
LINE			N 32°11'27.7" E	147.59					
PC	839718.192	1773257.564							
CURVE			N 30°34'52.0" E	25.00	03°13'11.3"(LT)	12°52'45.2"	25.00	12.50	444.87
PT	839739.712	1773270.281							

EY14

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	839354.361	1773297.289							
CURVE			N 20°46'55.8" E	165.82	07°59'24.8"(RT)	04°48'53.2"	165.95	83.11	1190.00
PT	839509.391	1773356.124							

EY15

POINT	N	E	BEARING	DIST
POT	839306.186	1773627.695		
LINE			N 03°08'56.7" E	307.85
POT	839613.572	1773644.607		

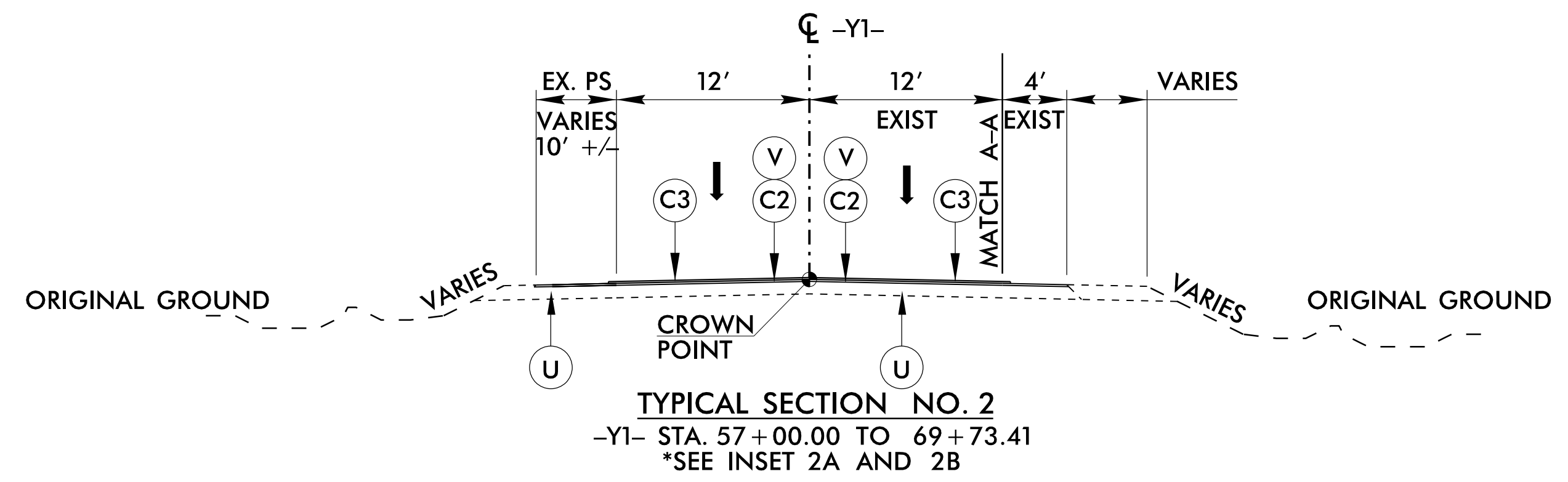
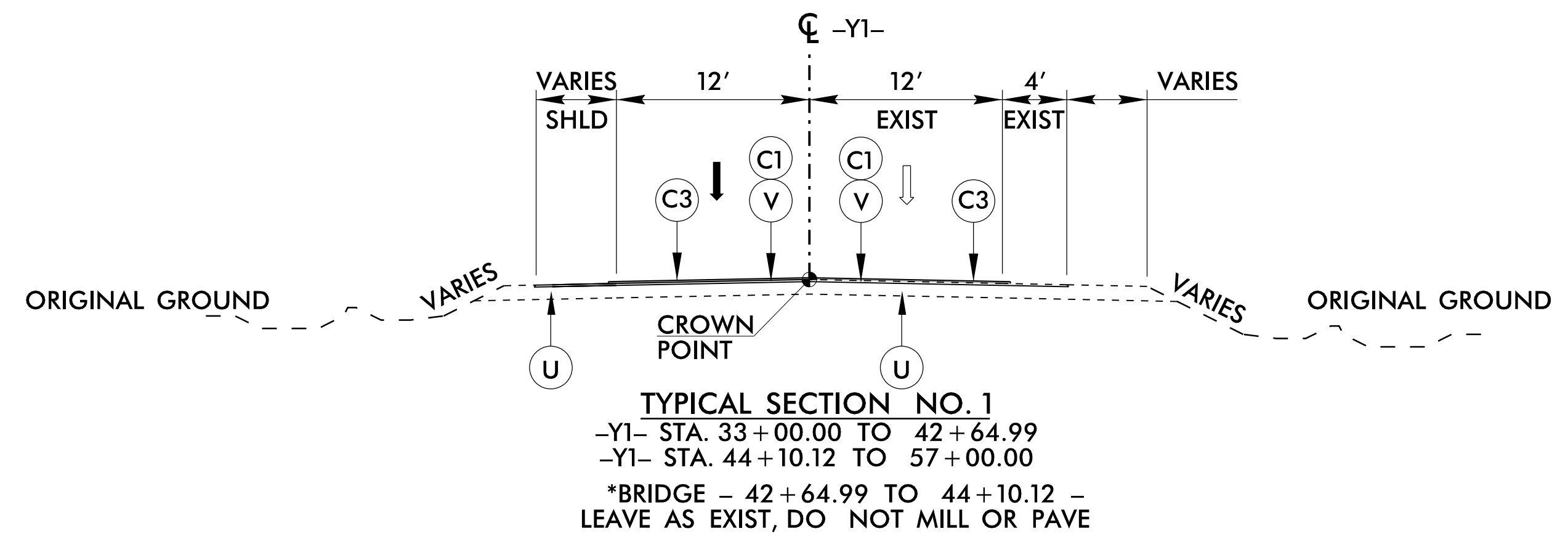
**NOTES:**

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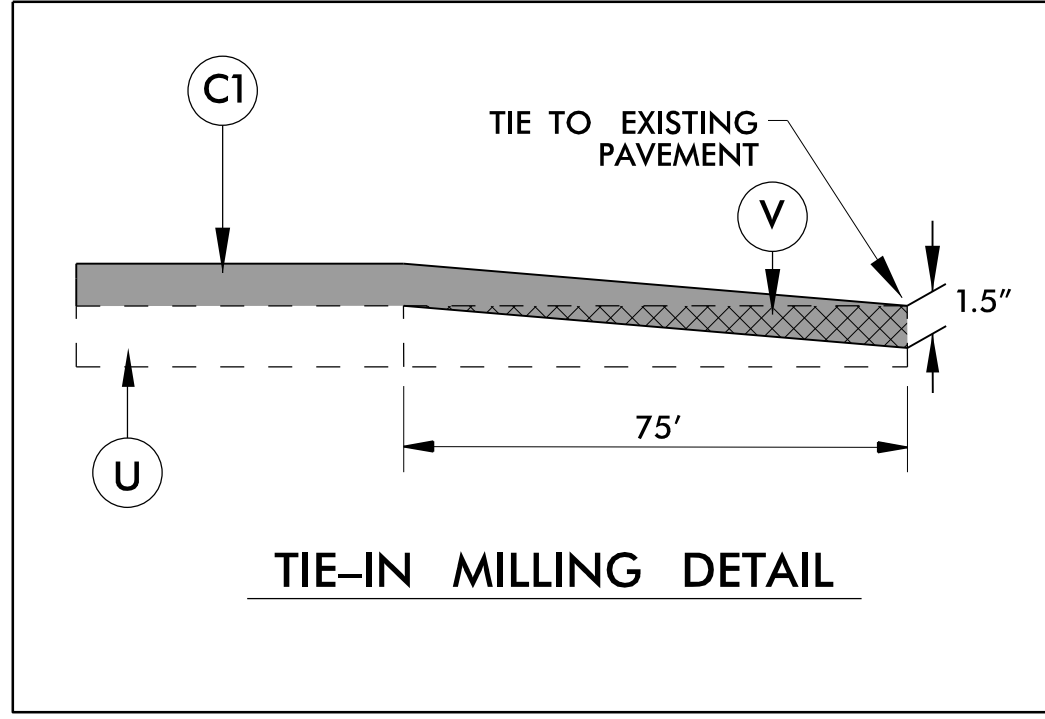
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License No. F-0672

PROJECT REFERENCE NO. U-5754	SHEET NO. 2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT ENGINEER 
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

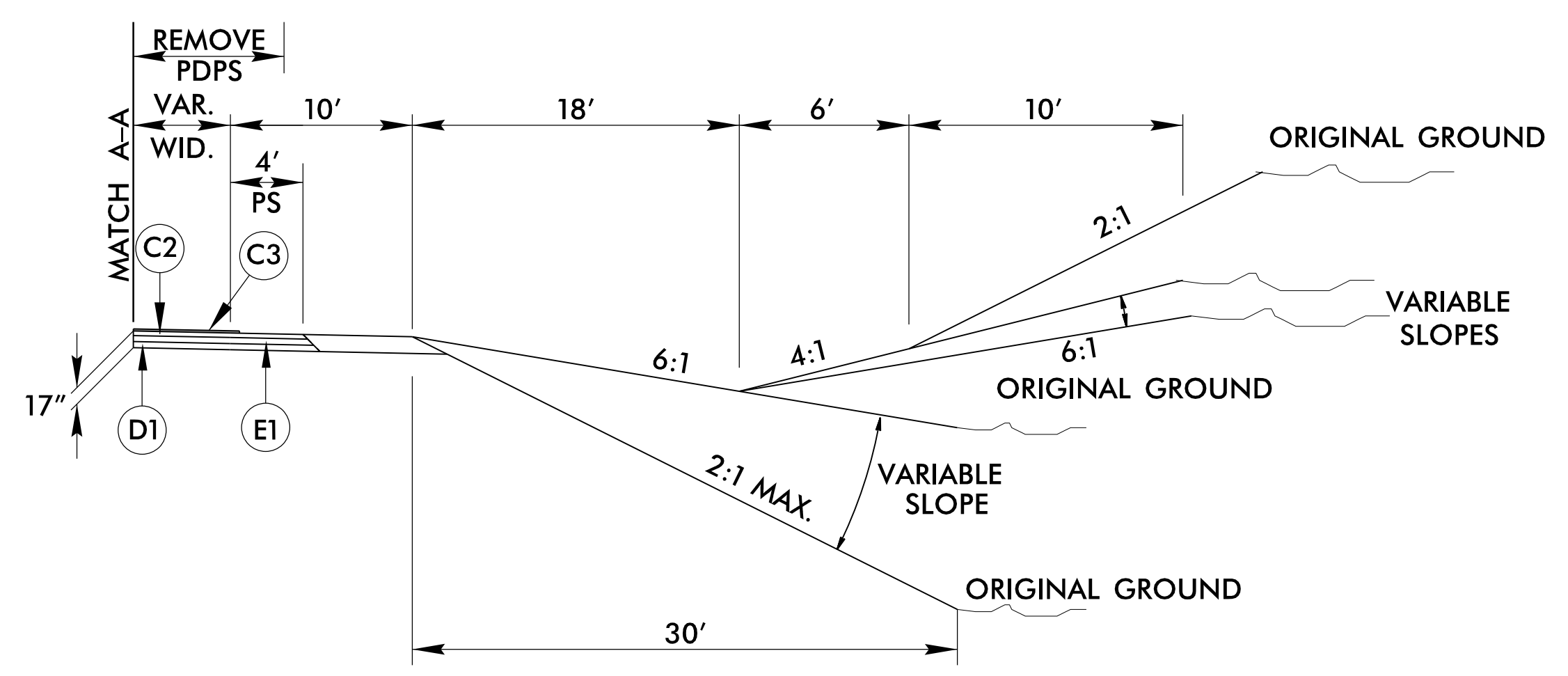
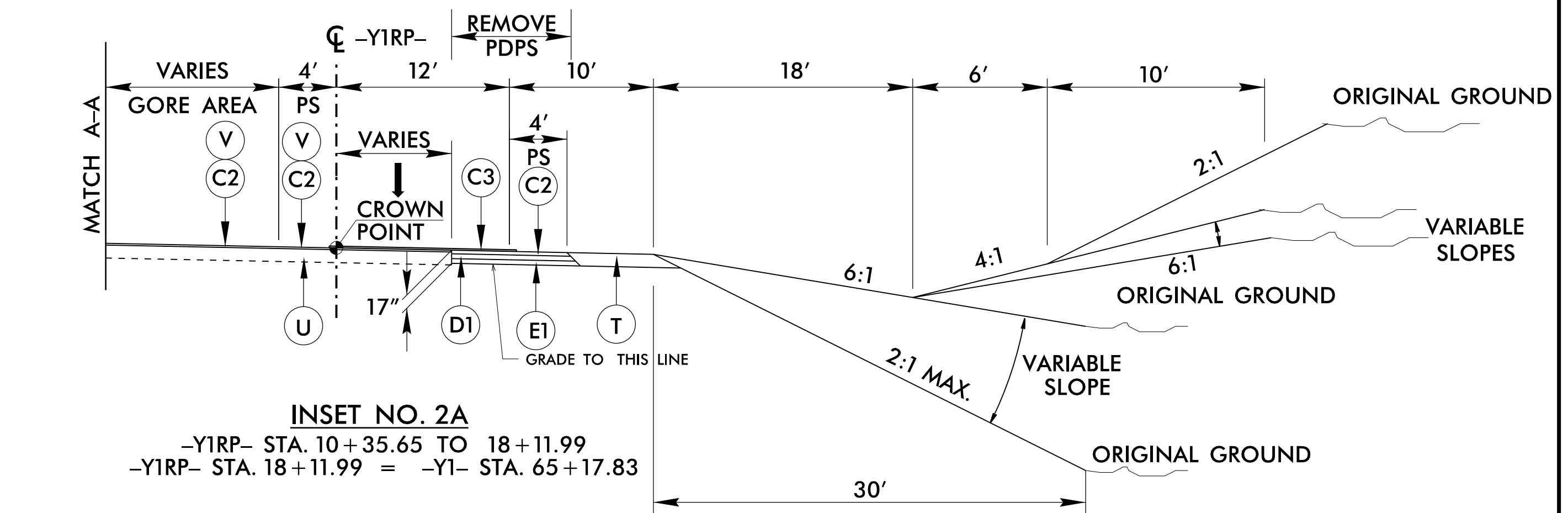
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 3/4" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS PER SQ. YD. LAYERS.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 10" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
R1	EXPRESSWAY GUTTER
R2	CONCRETE BARRIER
T	EARTHEN MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" BITUMINOUS PAVEMENT



NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. SEE PLANS FOR VARIABLE PAVED SHOULDER WIDTHS.



NOTE: MATCH EXISTING SUPERLEVATION UNLESS NOTED OTHERWISE ON PLANS

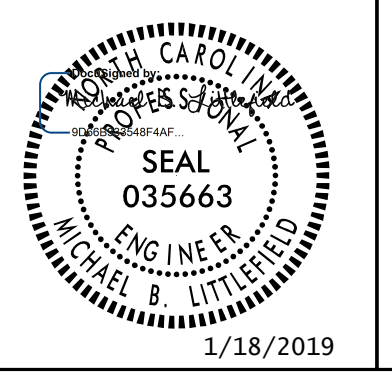
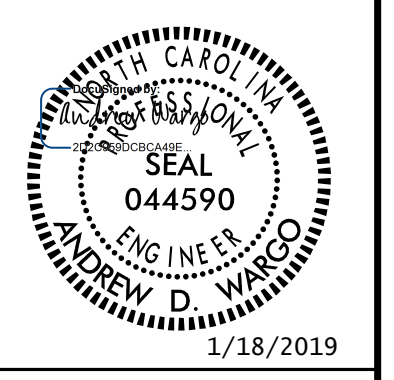


5/14/2019

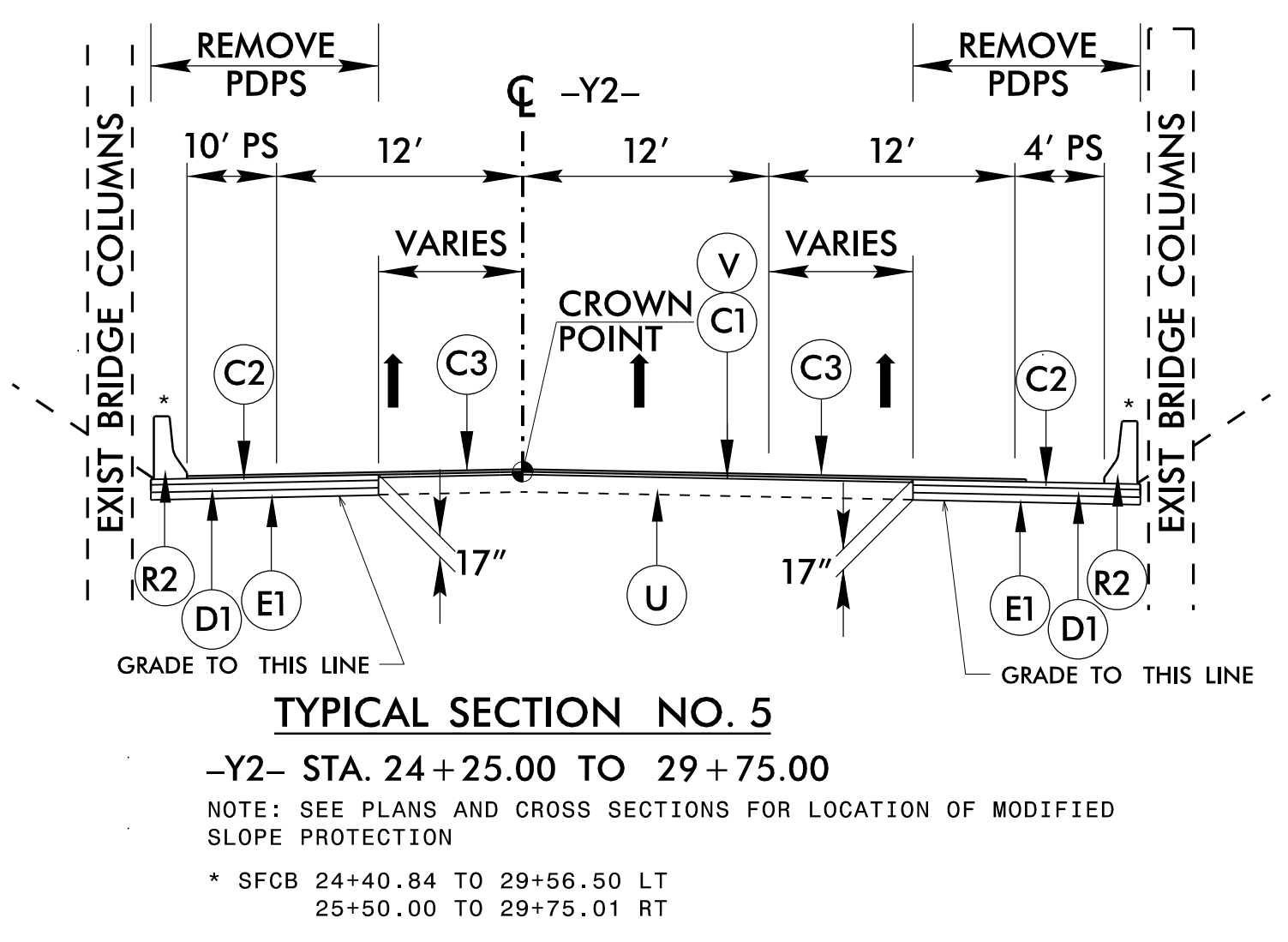
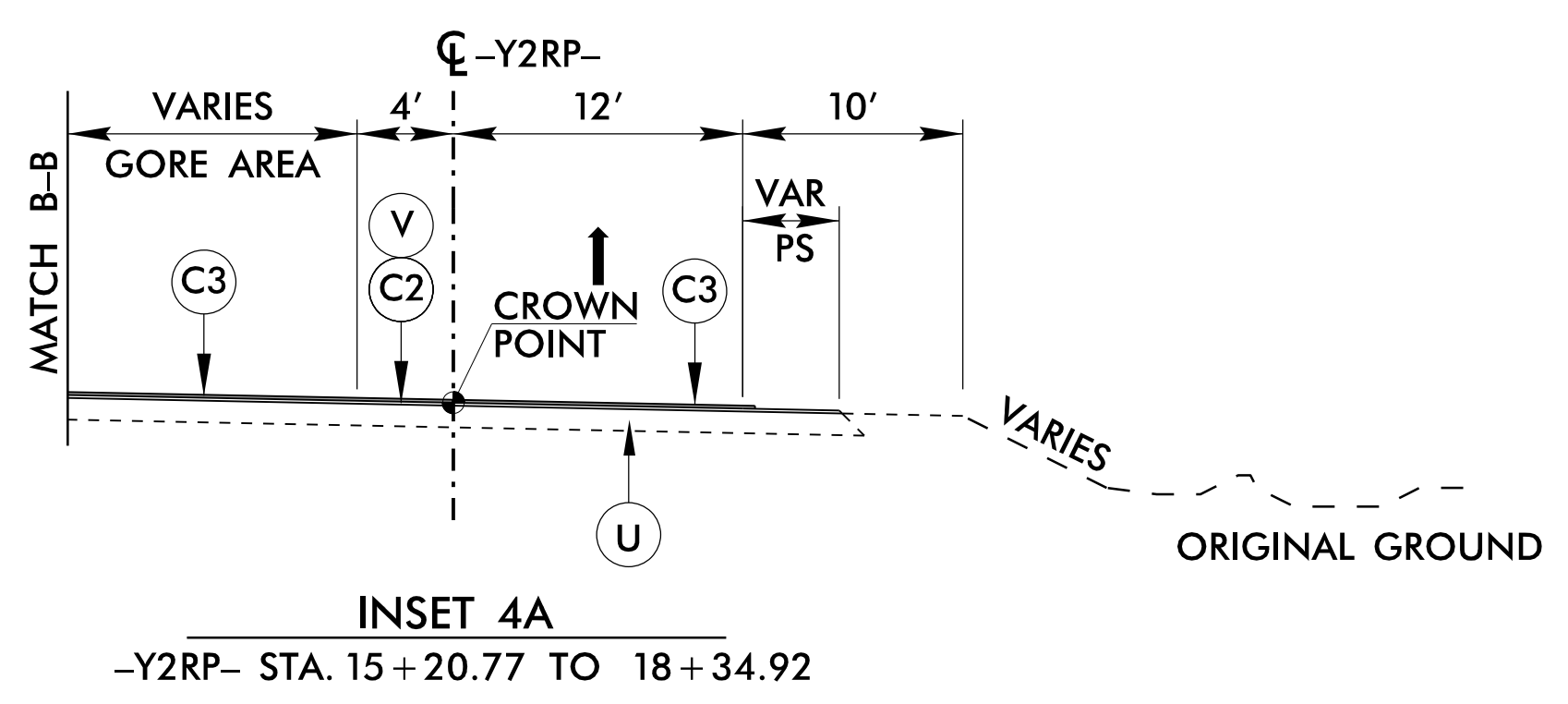
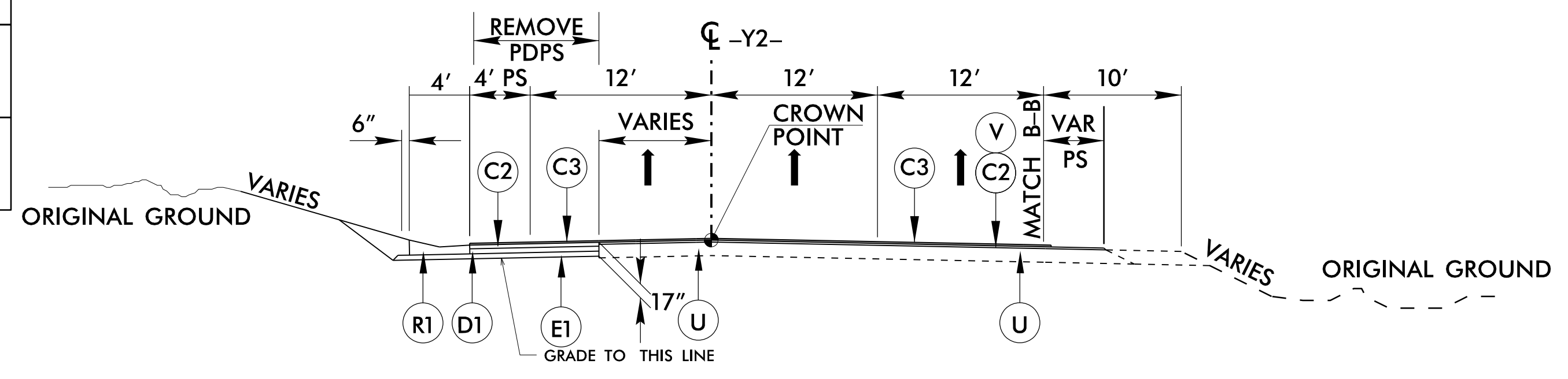
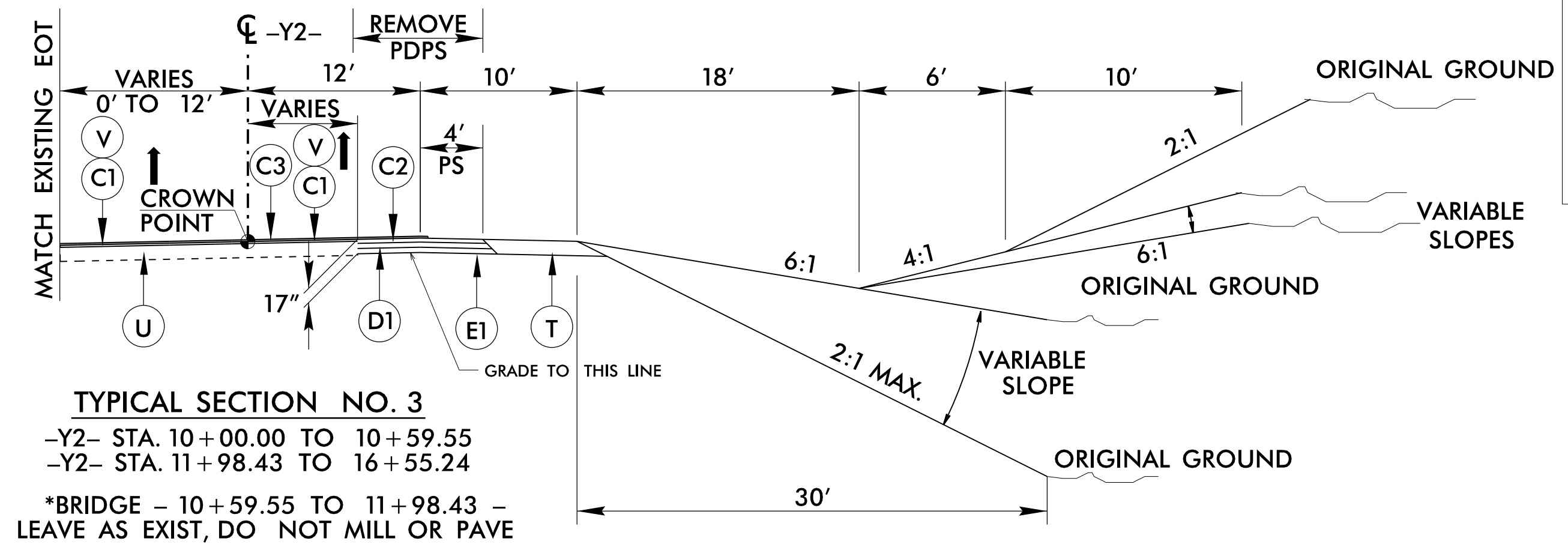
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1/18/2019



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

PROJECT REFERENCE NO. U-5754	SHEET NO. 2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT ENGINEER 
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

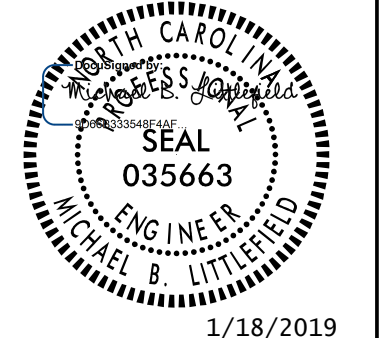
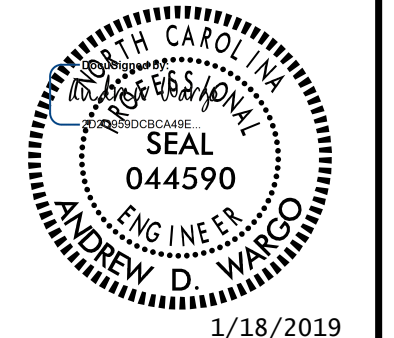
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2", TYPE S9.5D
C2	PROP. APPROX. 3", TYPE S9.5D
C3	PROP. APPROX. 3/4", FC-1
D1	PROP. APPROX. 4", TYPE I19.0C
E1	PROP. APPROX. 10", TYPE B25.0C
R1	PROP. EXPRESSWAY GUTTER
R2	CONCRETE BARRIER
T	EARTHEN MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5"



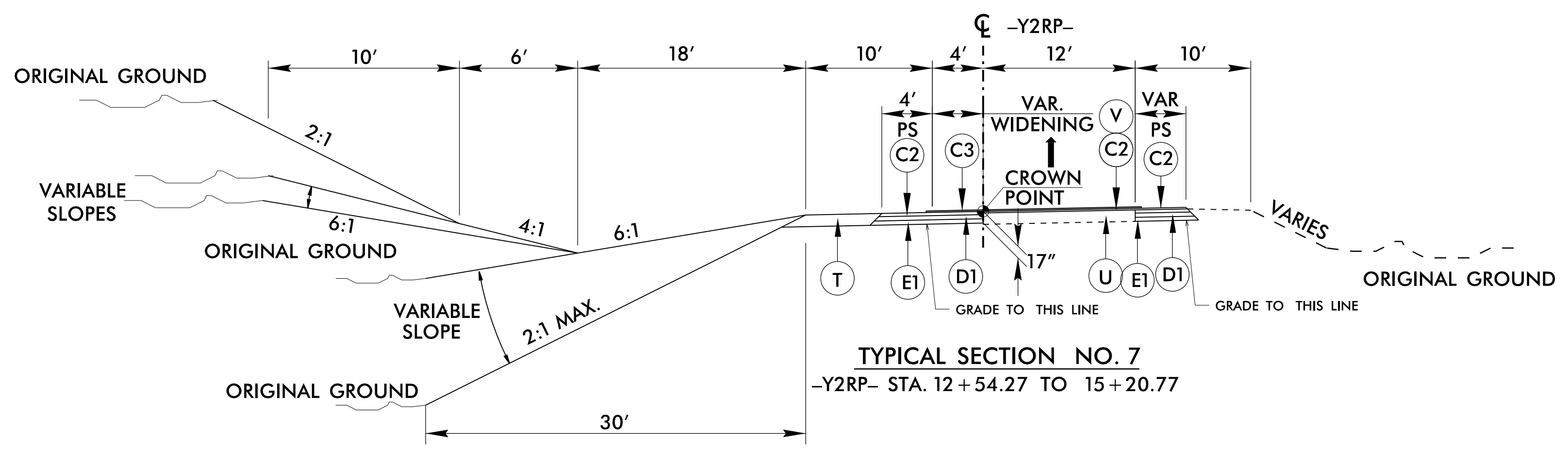
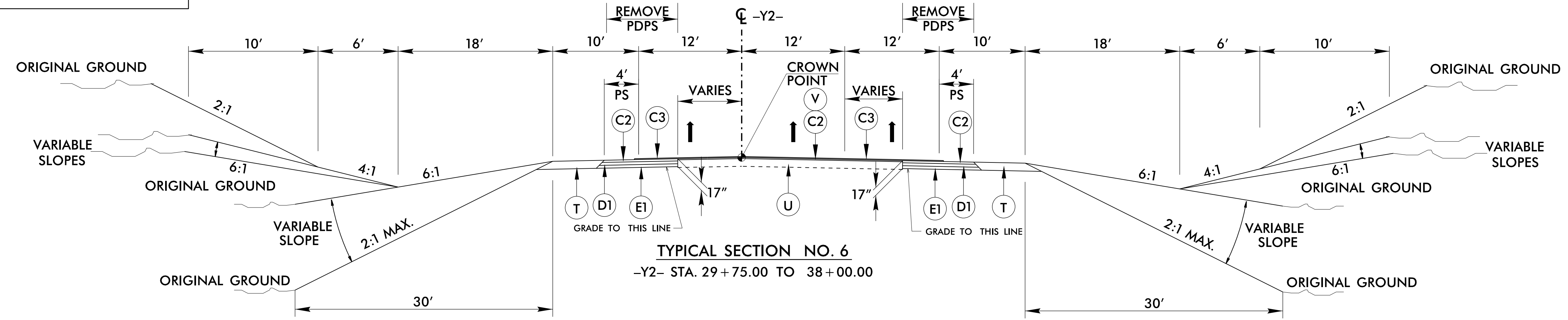
5/14/2019  
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 Michael Littlefield



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License No. F-0672

PROJECT REFERENCE NO. U-5754	SHEET NO. 2A-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT ENGINEER
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2", TYPE S9.5D
C2	PROP. APPROX. 3", TYPE S9.5D
C3	PROP. APPROX. 3/4", FC-1
D1	PROP. APPROX. 4", TYPE I19.0C
E1	PROP. APPROX. 10", TYPE B25.0C
R1	PROP. EXPRESSWAY GUTTER
R2	CONCRETE BARRIER
T	EARTHEN MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5"



5/14/2019

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

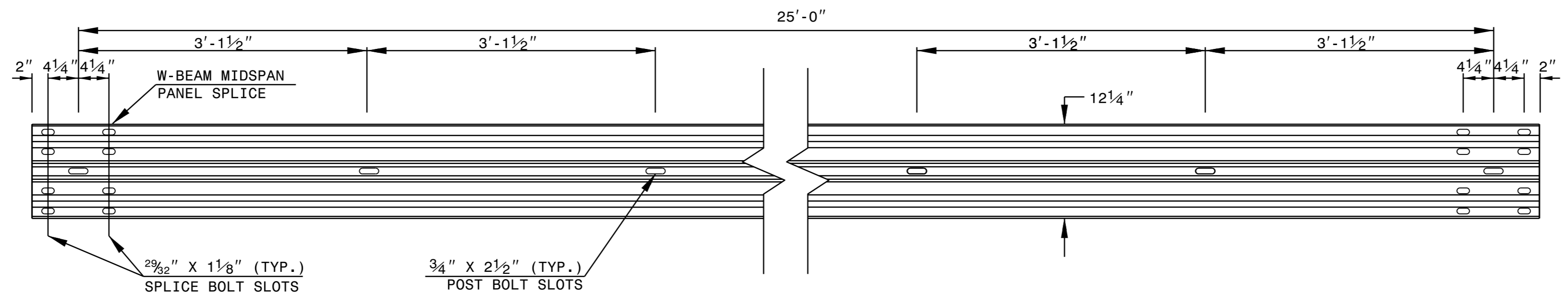
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

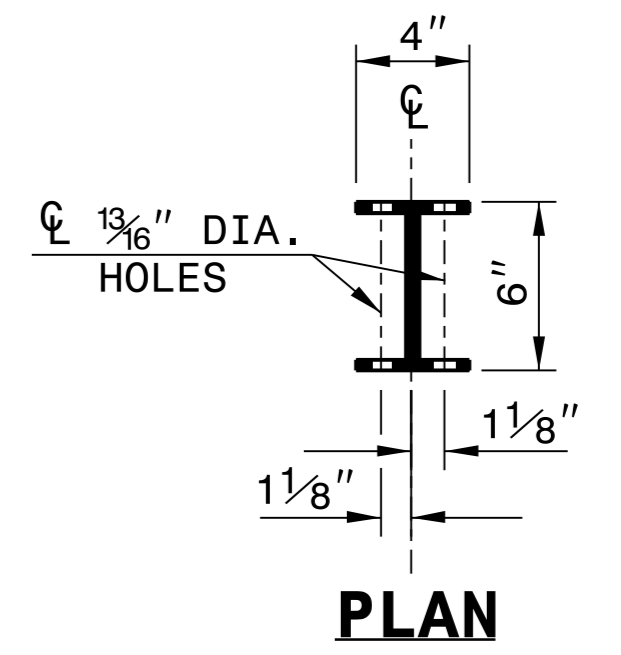
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

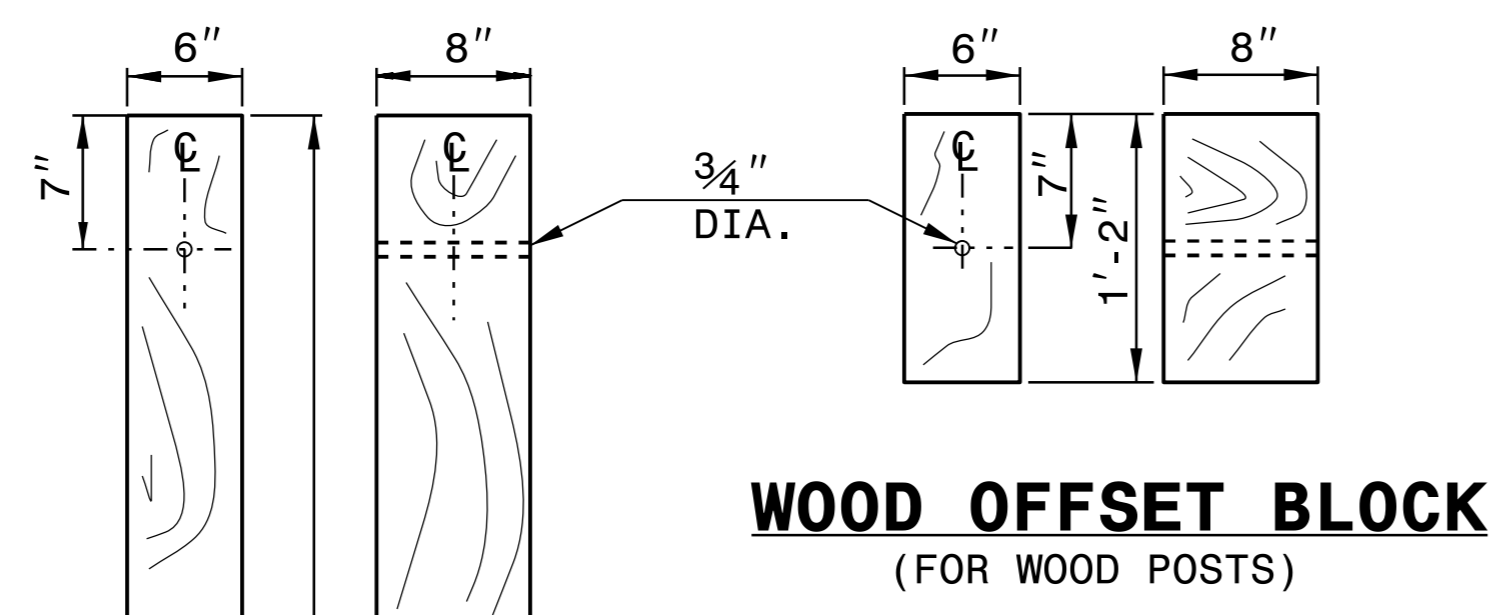
SHEET 6 OF 8  
**862D02**



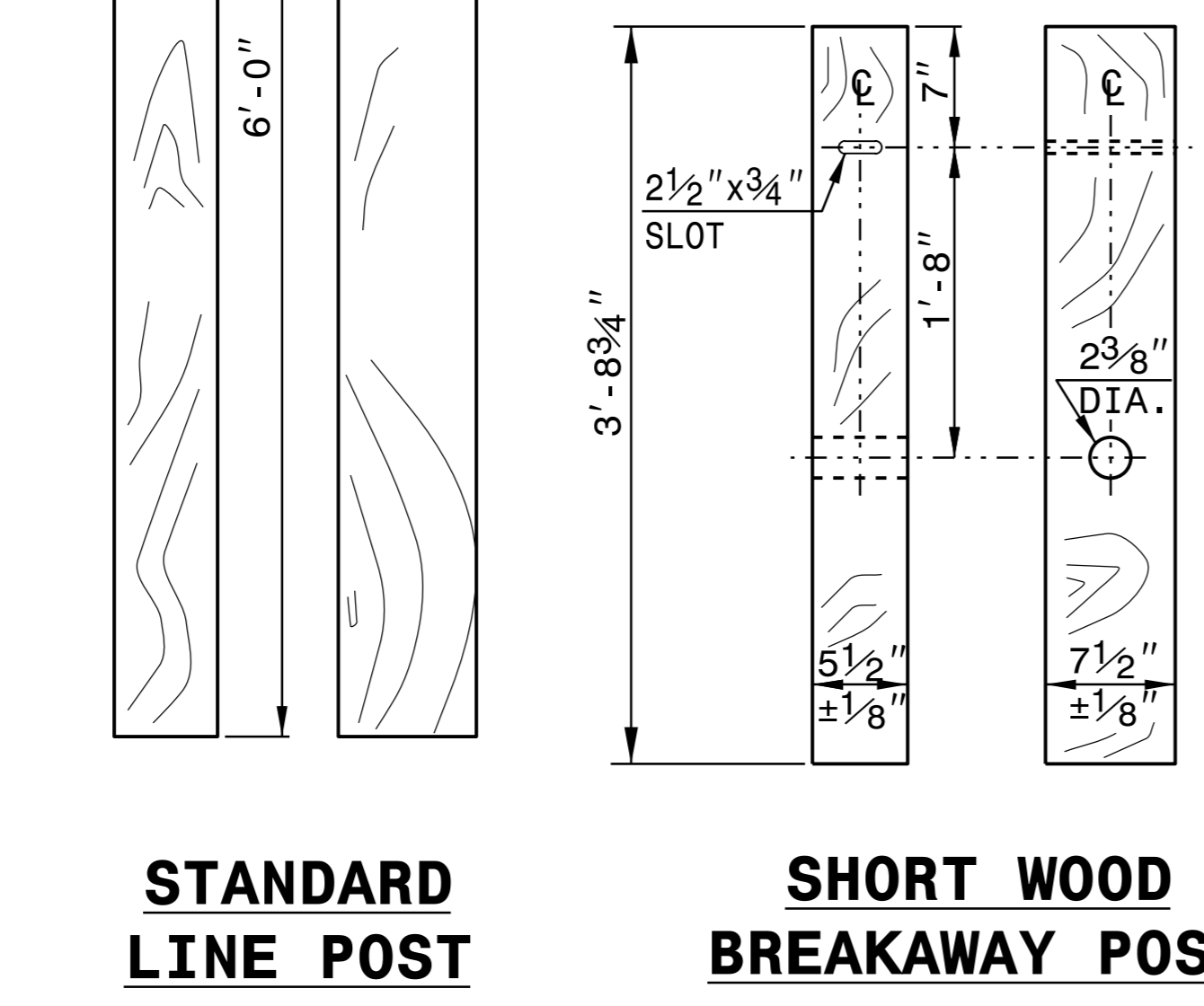
**STANDARD W-BEAM GUARDRAIL**



**PLAN**

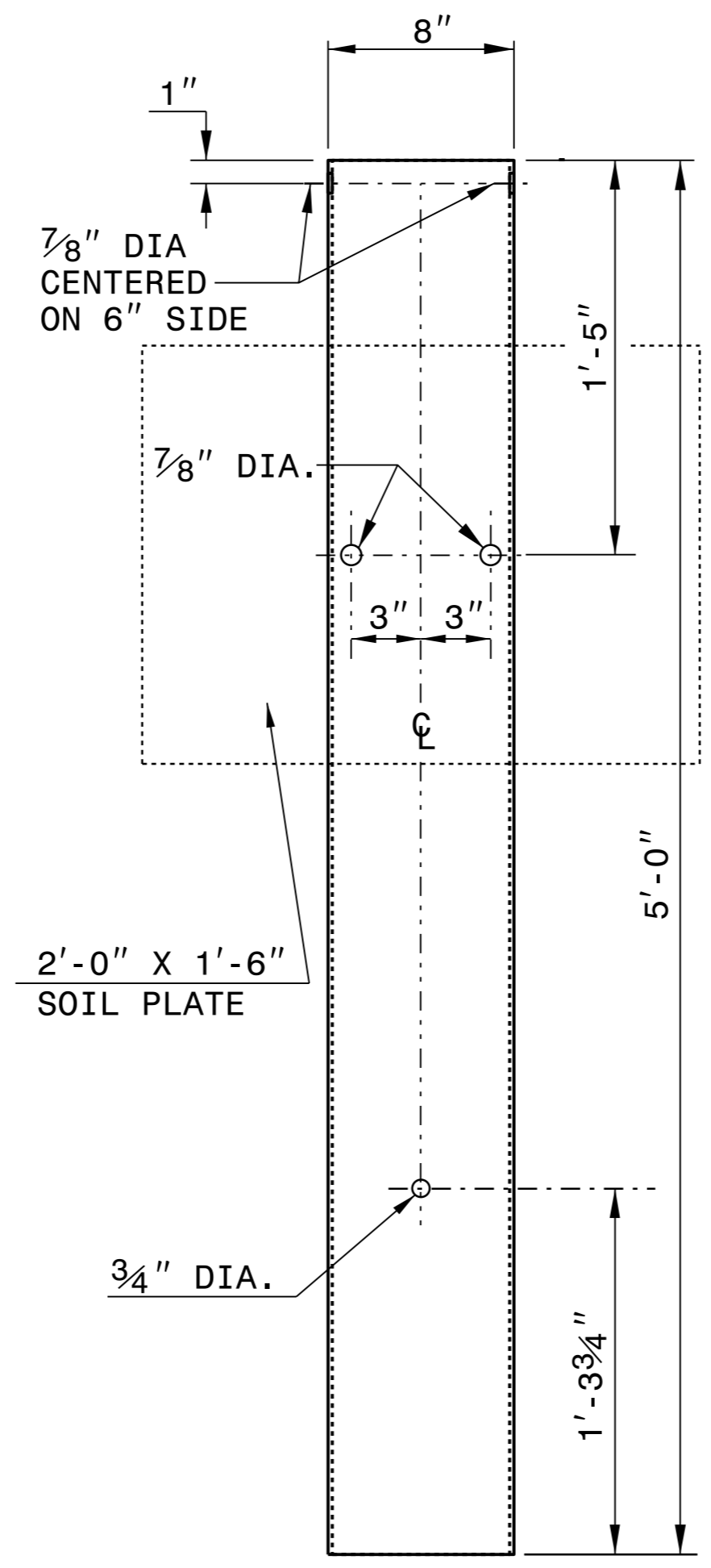


**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

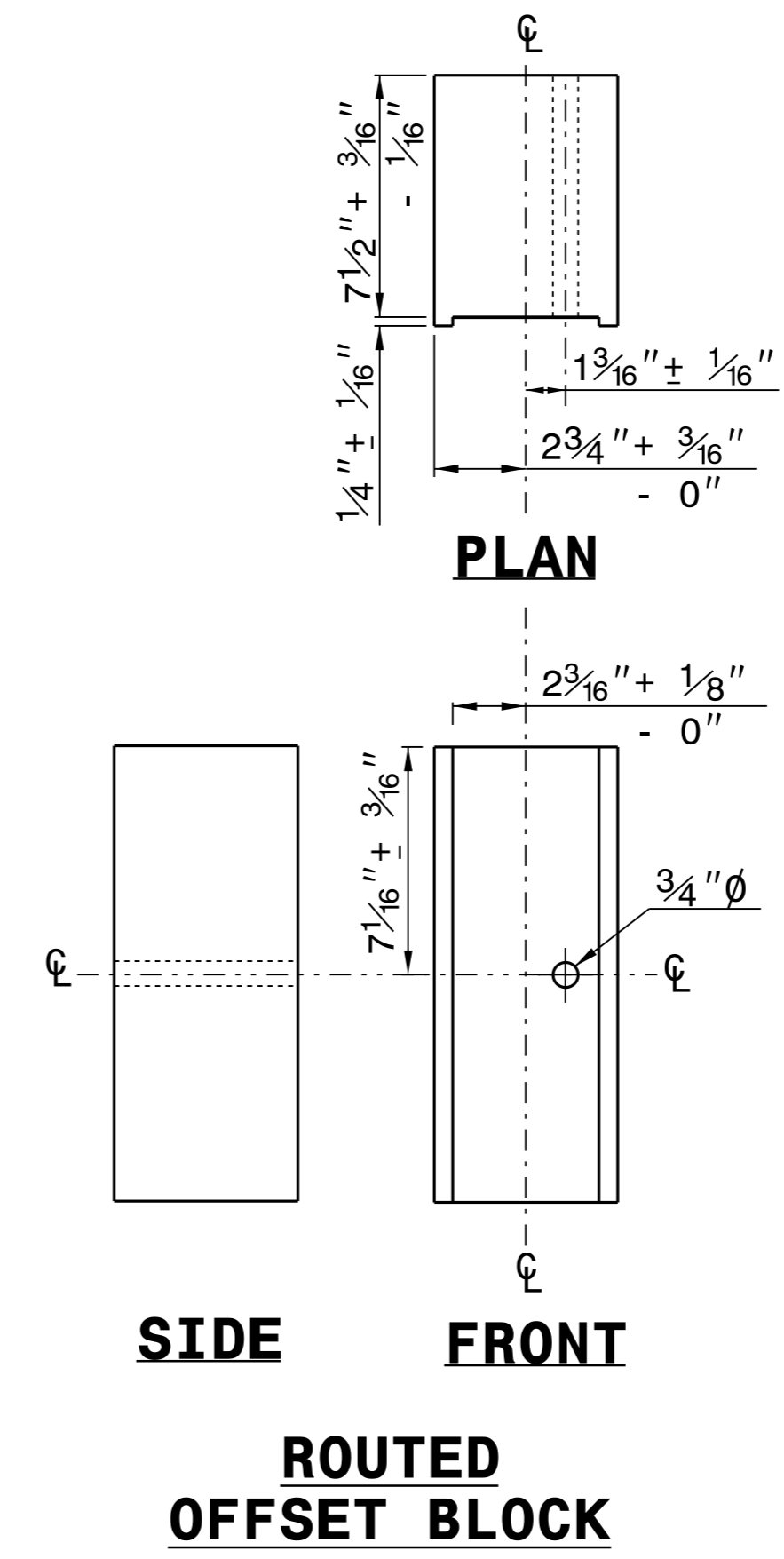


**STANDARD LINE POST**

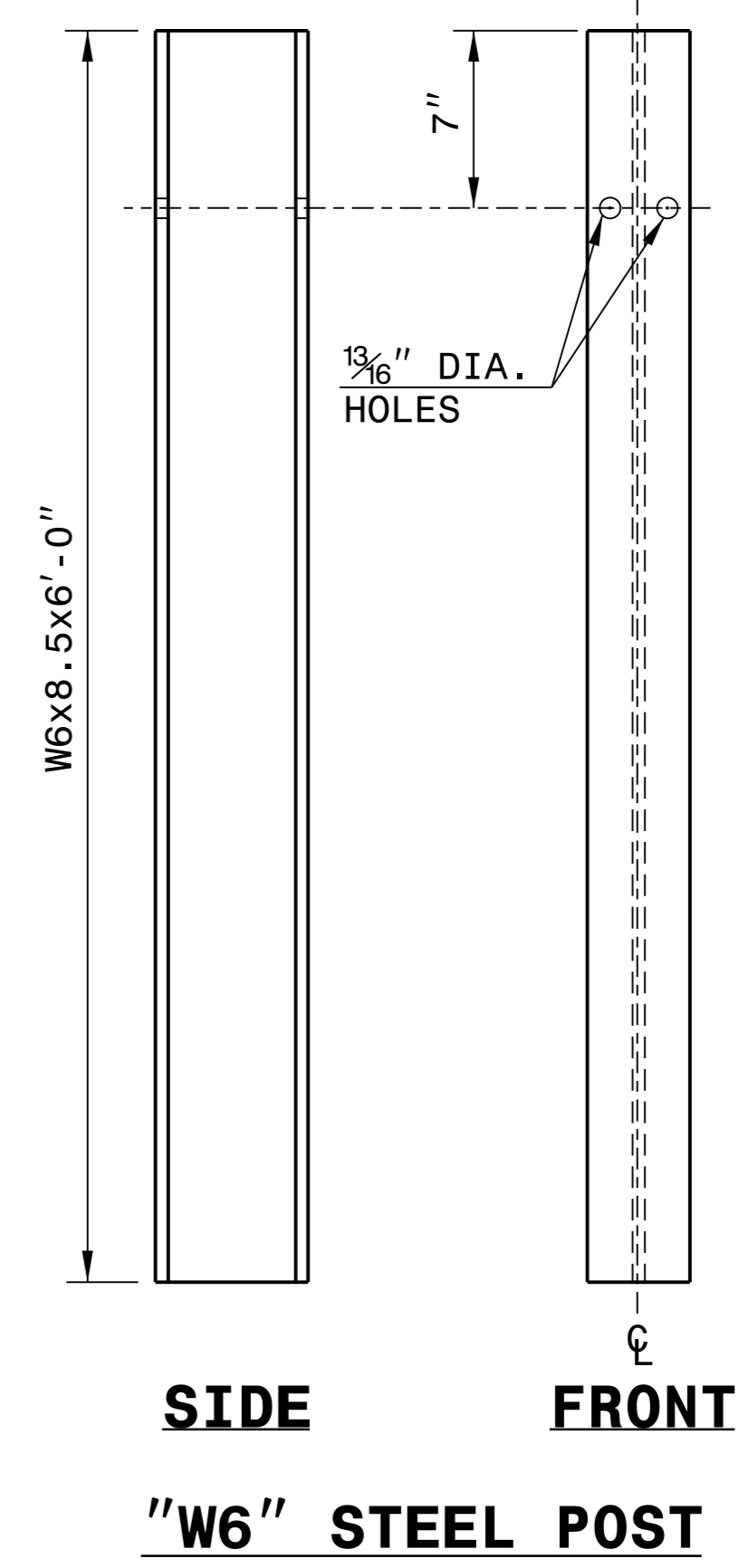
**SHORT WOOD BREAKAWAY POST**



**STEEL TUBE  
TS 6"x8"x0.1875"**

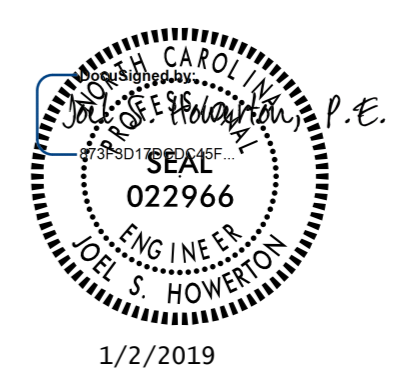


**ROUTED OFFSET BLOCK  
SIDE FRONT**



**"W6" STEEL POST  
SIDE FRONT**

**SYSTEM PARTS**

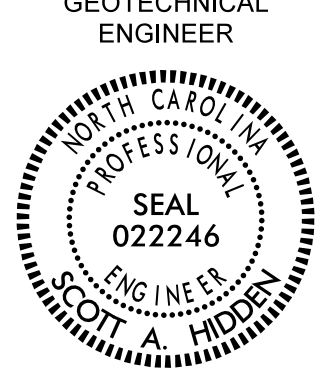


1/2/2019

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

**SEE TITLE BLOCK**

ORIGINAL BY: J. HOWERTON	DATE: 3-7-2018
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

<b>PROJECT REFERENCE NO.</b> U-5754		<b>SHEET NO.</b> 2G-1
GEOTECHNICAL ENGINEER  SEAL 022246 SCOTT A. HIDDEN ENGINEER		ENGINEER
DocuSigned by: Scott A. Hidden 1/10/2019		DATE
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		

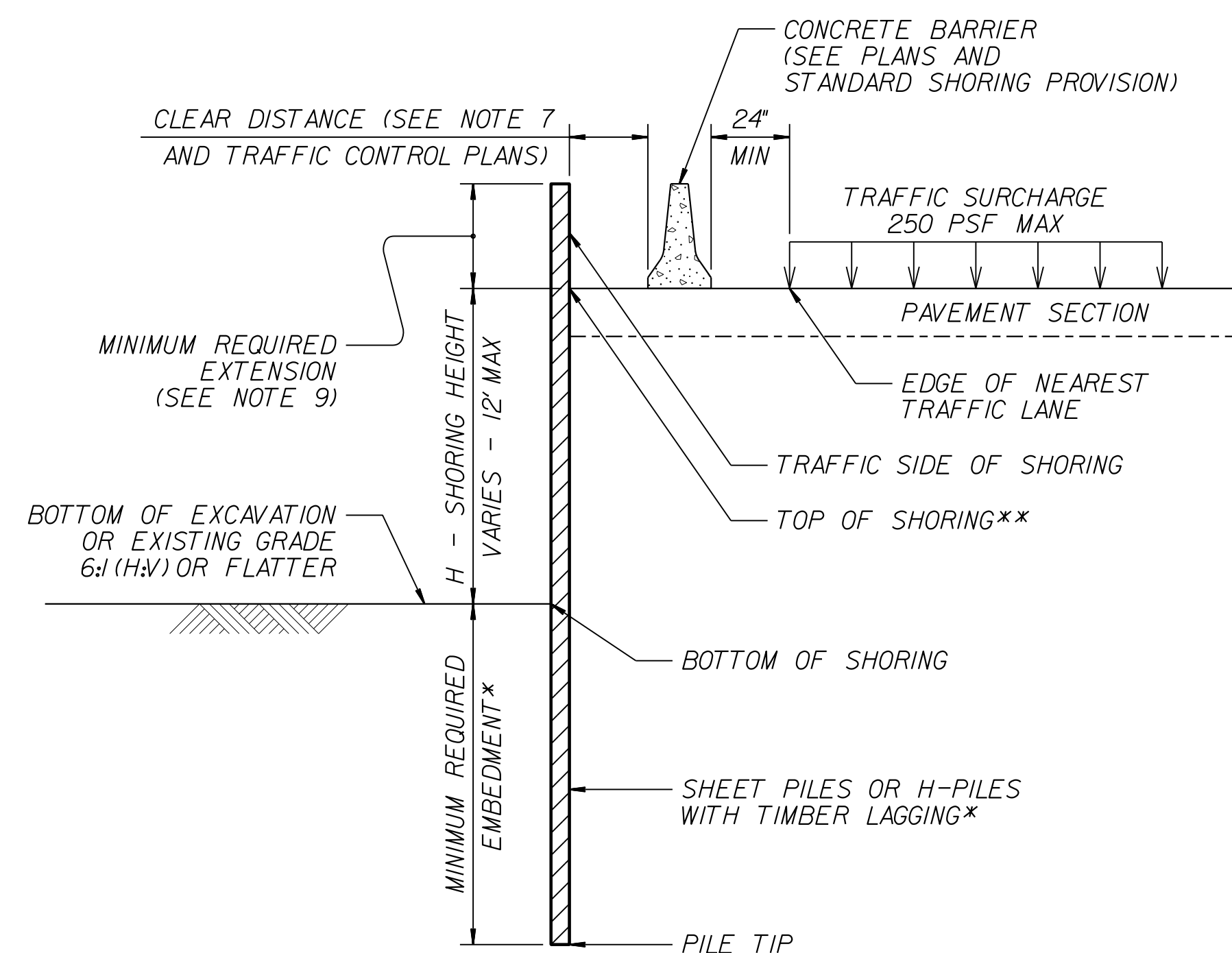
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /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**

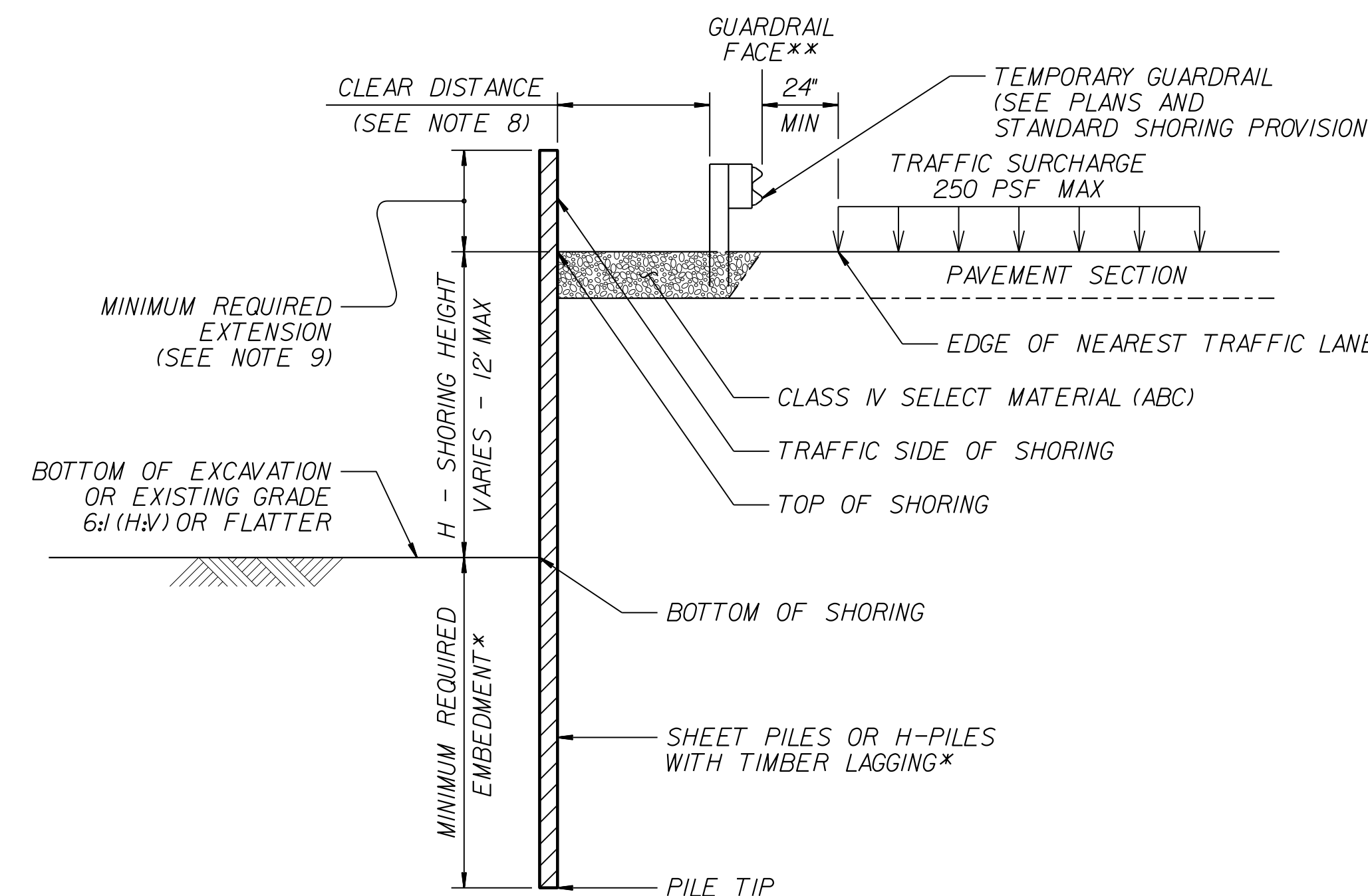
**\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**

**NOTES:**

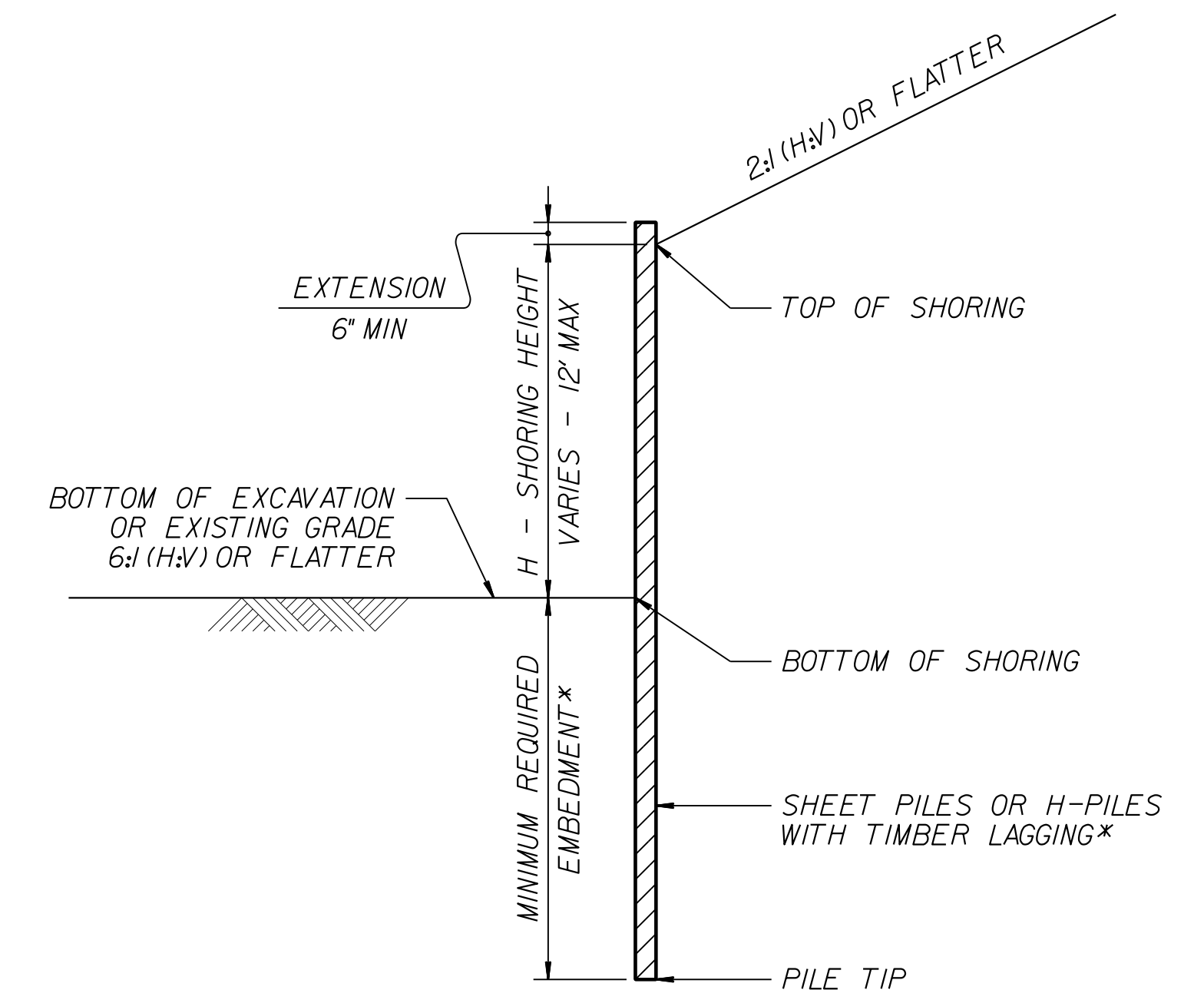
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  PCF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  PSF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- 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.
- 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".
- 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".
- MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- 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.
- 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](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



**CONCRETE BARRIER**  
**\*\*TOP OF SHORING =**  
**EDGE OF PAVEMENT**

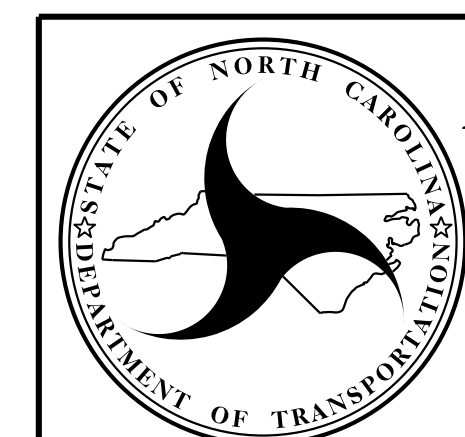


**TEMPORARY GUARDRAIL**  
**\*\*GUARDRAIL FACE =**  
**EDGE OF PAVEMENT**



**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







COMPUTED BY: DLT DATE: 12/07/2018  
 CHECKED BY: CAY DATE: 12/07/2018

(5-15-18)

PROJECT NO.  
54034.1.1 (U-5754)

SHEET NO.  
3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				<b>TOTAL LF:</b>	200

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

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	12"	100	200	300		
					<b>TOTAL CY/TONS/SY:</b>	100	200**	300**	0

\*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)  
 \*AST = Aggregate Stabilization  
 \*\*Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

8/17/19



-YI-		
PIs Sta 12+89.27	PI Sta 17+57.89	PIs Sta 22+18.60
$\theta_s = 5^\circ 58' 05.9''$	$\Delta = 21^\circ 37' 27.0''$ (LT)	$\theta_s = 5^\circ 58' 05.9''$
$L_s = 375.00'$	$D = 3^\circ 10' 59.2''$	$L_s = 375.00'$
$LT = 250.14'$	$L = 679.34'$	$LT = 250.14'$
$ST = 125.13'$	$T = 343.76'$	$ST = 125.13'$
	$R = 1,800.00'$	
	$DS = 60$ MPH	
	$SE = EXIST$	

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 Stantec Consulting Services Inc.  
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PROJECT REFERENCE NO. <i>U-5754</i>	SHEET NO. <i>04</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

REVISIONS

-YI- SC Sta. 14+14.13 5

-YI- ST Sta. 24+68.47

CITY OF GREENSBORO  
DB 3652 PG 1077

ROBERT AND SONS LLC  
DB 7568 PG 1073  
PB 127 PG 98

ROBERT AND SONS LLC  
DB 7563 PG 2714  
PB 13 PG 83

ROBERT AND SONS LLC  
DB 7563 PG 2714  
PB 13 PG 83

FMO REAL ESTATE  
LLC  
DB 7169 PG 2739  
PB 13 PG 83

CANOE COMPANY LLC  
DB 6255 PG 1498  
PB 58 PG 5

UNITEX CHEMICAL CORP.  
DB 4123 PG 681  
PB 73 PG 278

SEE SHEET 10 FOR -YI- PROFILE

MATCHLINE -YI- STA. 27 + 00.00 SEE SHEET 05

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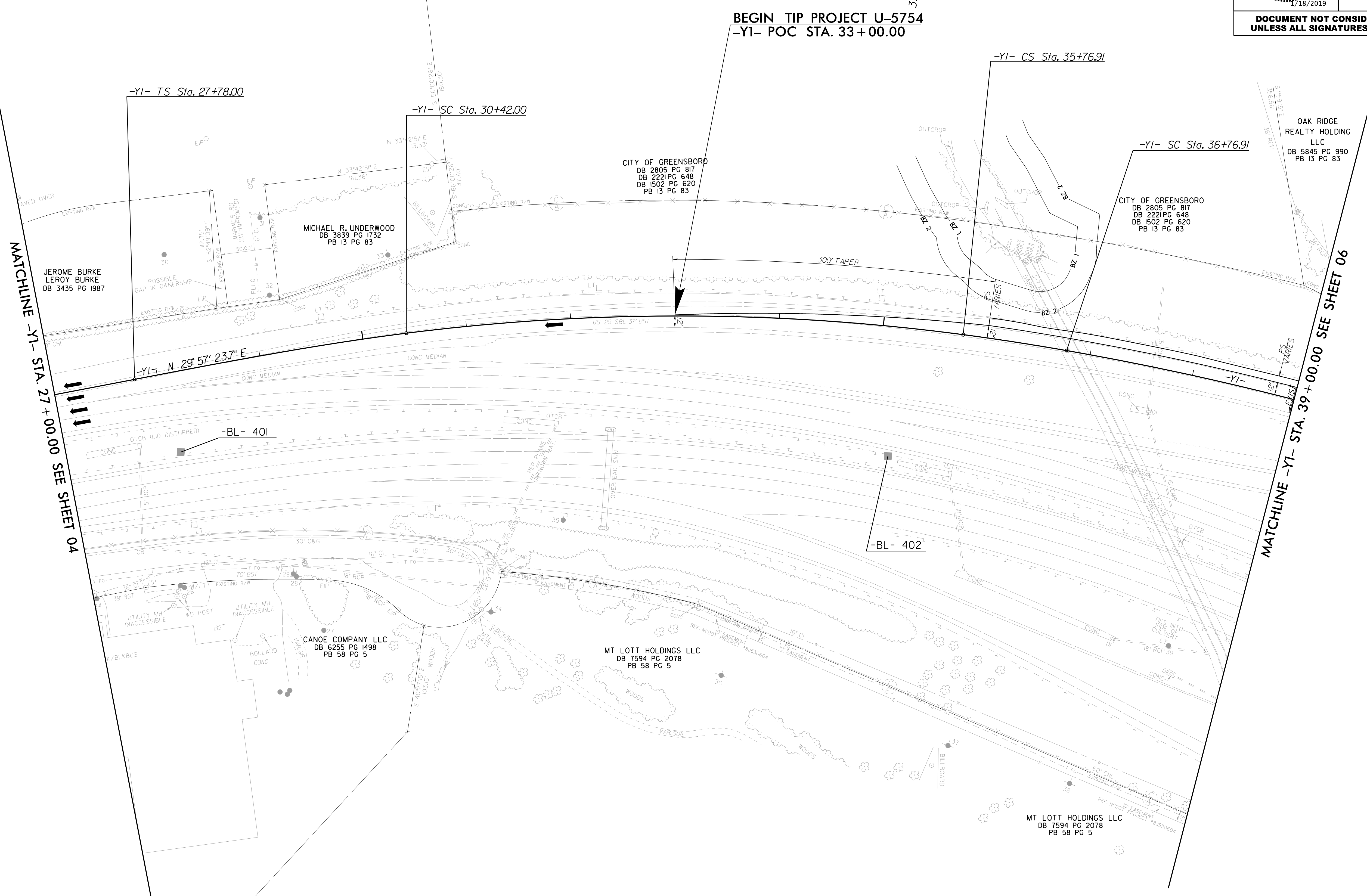
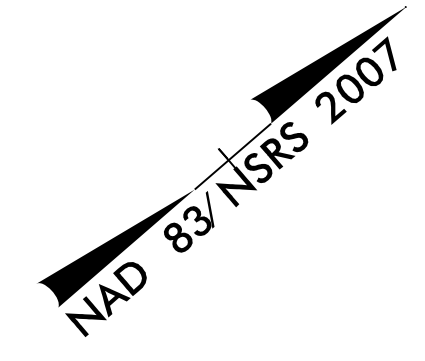
8/17/19



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License No. F-0672

PROJECT REFERENCE NO. U-5754	SHEET NO. 05
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 035663 MICHAEL B. LITTLEFIELD 1/18/2019	SEAL 026971 DANIEL G. DALTON 1/18/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-YI-			
PIs Sta 29+54.04	PI Sta 33+10.94	PIs Sta 36+24.38	PI Sta 40+77.84
Os = 3° 38' 09.9"	Δ = 14° 44' 04.3" (RT)	Os = 1° 00' 50.6"	Δ = 16° 09' 19.8" (RT)
Ls = 264.00'	D = 2° 45' 16.6"	Os = 1° 22' 38.4"	D = 2° 01' 41.4"
LT = 176.04'	L = 534.91'	Ls = 100.00'	L = 796.56'
ST = 88.03'	T = 268.94'	LT = 52.54'	T = 400.94'
	R = 2,080.00'	ST = 47.48'	R = 2,825.00'
	DS = 60 MPH		DS = 60 MPH
	SE = EXIST		SE = EXIST



REVISIONS

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11/11/2019

SEE SHEETS 10 AND 11 FOR  
-YI- PROFILE

8/17/19



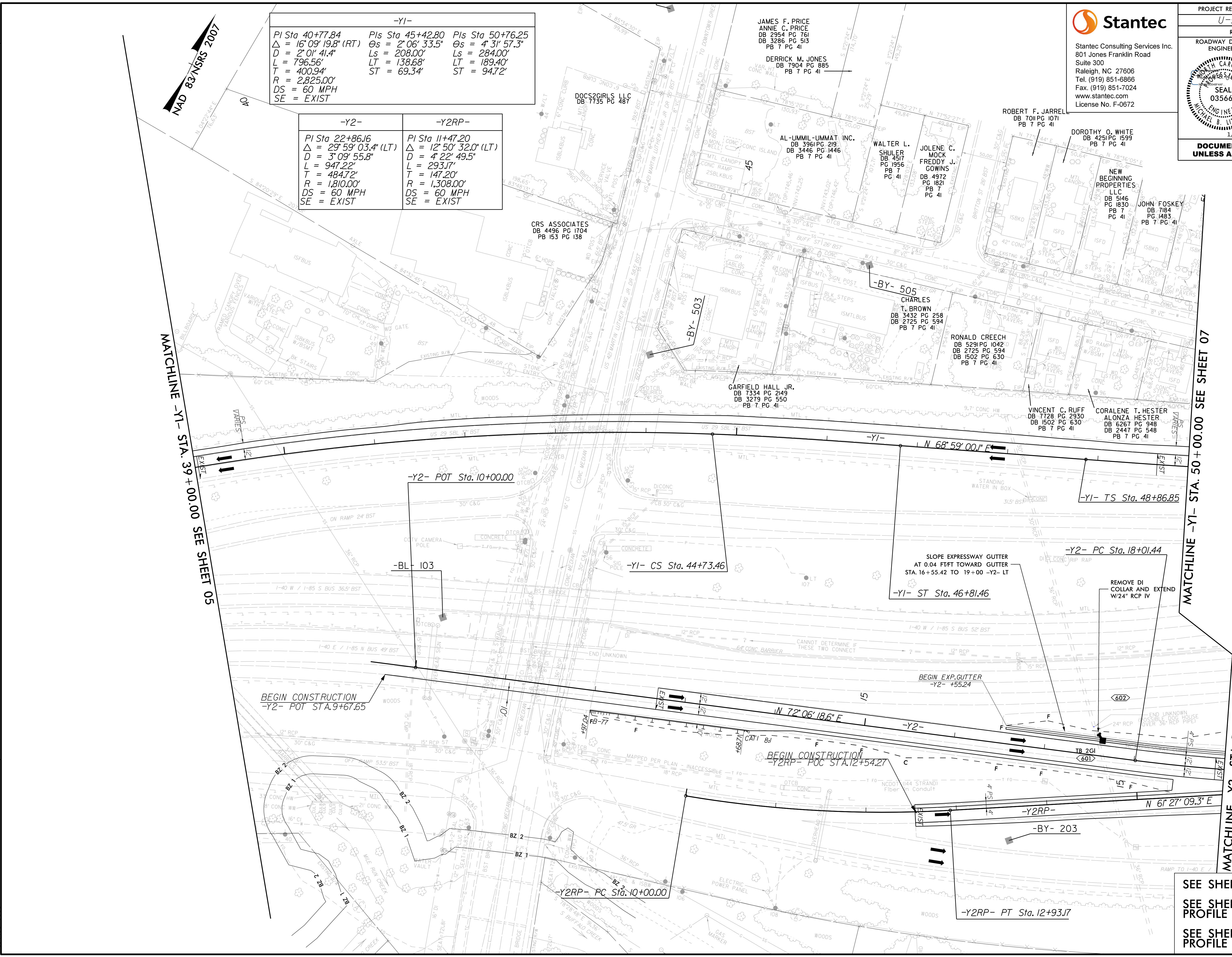
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www.stantec.com  
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PROJECT REFERENCE NO. U-5754	SHEET NO. 06
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 035663 MICHAEL B. LITTLEFIELD 1/18/2019	SEAL 026971 JOHUA G. DARTON 1/18/2019
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-Y1-

PI Sta 40+77.84 Δ = 16° 09' 19.8" (RT) D = 2° 01' 41.4" L = 796.56' T = 400.94' R = 2,825.00' DS = 60 MPH SE = EXIST	PIs Sta 45+42.80 Os = 2° 06' 33.5" Ls = 208.00' LT = 138.68' ST = 69.34'	PIs Sta 50+76.25 Os = 4° 31' 57.3" Ls = 284.00' LT = 189.40' ST = 94.72'
---	--	--

-Y2-	-Y2RP-
PI Sta 22+86.16 Δ = 29° 59' 03.4" (LT) D = 3° 09' 55.8" L = 947.22' T = 484.72' R = 1,810.00' DS = 60 MPH SE = EXIST	PI Sta 11+47.20 Δ = 12° 50' 32.0" (LT) D = 4° 22' 49.5" L = 293.17' T = 147.20' R = 1,308.00' DS = 60 MPH SE = EXIST



MATCHLINE -Y1- STA. 39+00.00 SEE SHEET 05

MATCHLINE -Y1- STA. 50+00.00 SEE SHEET 07

MATCHLINE -Y2- STA. 19+00.00 SEE SHEET 07

REVISIONS

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SEE SHEET 11 -Y1- PROFILE  
SEE SHEET 12 FOR -Y2- PROFILE  
SEE SHEET 14 FOR -Y2RP- PROFILE

8/17/19

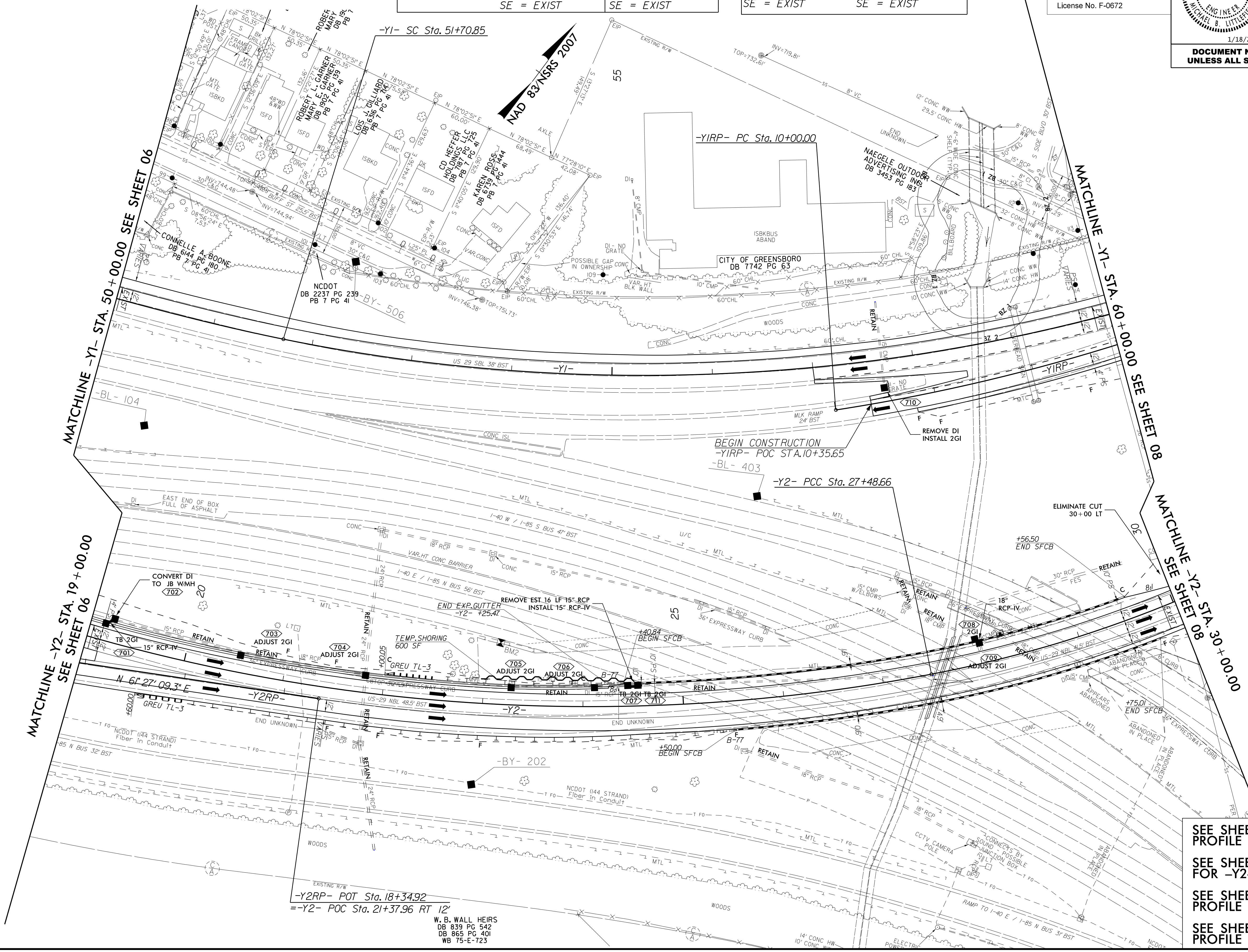
Note: For concrete barrier rail in the vicinity of -Y2- Station 23+00 to 25+00, see Special Concrete Barrier Rail Special Provision.

-Y1-		-Y1RP-		-Y2-	
PIs Sta 50+76.25	PI Sta 61+56.38	PI Sta 14+12.29	PI Sta 22+86.16	PI Sta 31+98.43	PI Sta 31+98.43
$\Delta s = 4' 31'' 57.3''$	$\Delta = 57' 32'' 12.7''$ (LT)	$\Delta = 24' 29'' 10.4''$ (LT)	$\Delta = 29' 59'' 03.4''$ (LT)	$\Delta = 39' 34'' 44.6''$ (LT)	$\Delta = 39' 34'' 44.6''$ (LT)
$Ls = 284.00'$	$D = 3' 11'' 31.1''$	$D = 3' 00'' 56.0''$	$D = 3' 09'' 55.8''$	$D = 4' 35'' 01.2''$	$D = 4' 35'' 01.2''$
$LT = 189.40'$	$L = 1,802.55'$	$L = 811.99'$	$L = 947.22'$	$L = 863.48'$	$L = 863.48'$
$ST = 94.72'$	$T = 985.52'$	$T = 412.29'$	$T = 484.72'$	$T = 449.77'$	$T = 449.77'$
	$R = 1,795.00'$	$R = 1,900.00'$	$R = 1,810.00'$	$R = 1,250.00'$	$R = 1,250.00'$
	$DS = 60$ MPH	$DS = 60$ MPH	$DS = 50$ MPH (SSD)	$DS = 50$ MPH (SSD)	$DS = 50$ MPH (SSD)
	$SE = EXIST$	$SE = EXIST$	$SE = EXIST$	$SE = EXIST$	$SE = EXIST$

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PROJECT REFERENCE NO. U-5754	SHEET NO. 07
ROADWAY DESIGN ENGINEER MICHAEL B. LITTLEFIELD SEAL 035663 1/18/2019	HYDRAULICS ENGINEER JOSHUA G. DUTTON SEAL 026971 1/18/2019
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1/18/2019

SEE SHEET 12 FOR -Y1-  
PROFILE

SEE SHEETS 12 AND 13  
FOR -Y2- PROFILE

SEE SHEET 14 FOR -Y1RP-  
PROFILE

SEE SHEET 14 FOR -Y2RP-  
PROFILE

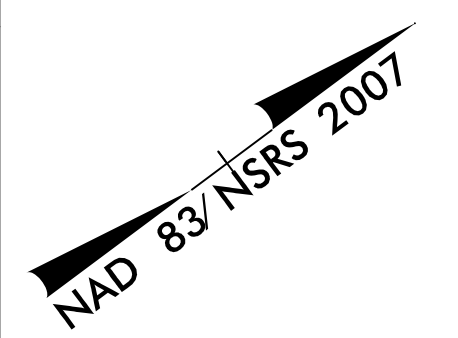
W. B. WALL HEIRS  
 DB 839 PG 542  
 DB 865 PG 401  
 WB 75-E-723

8/17/19

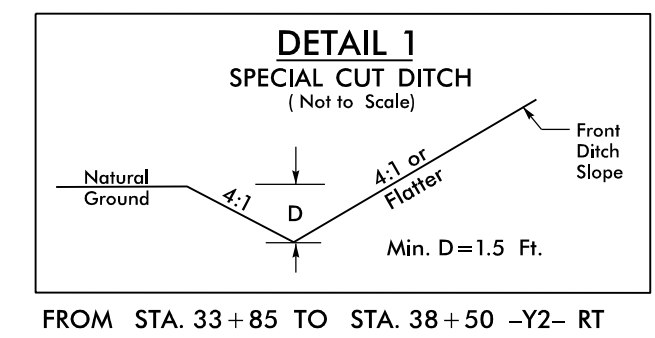
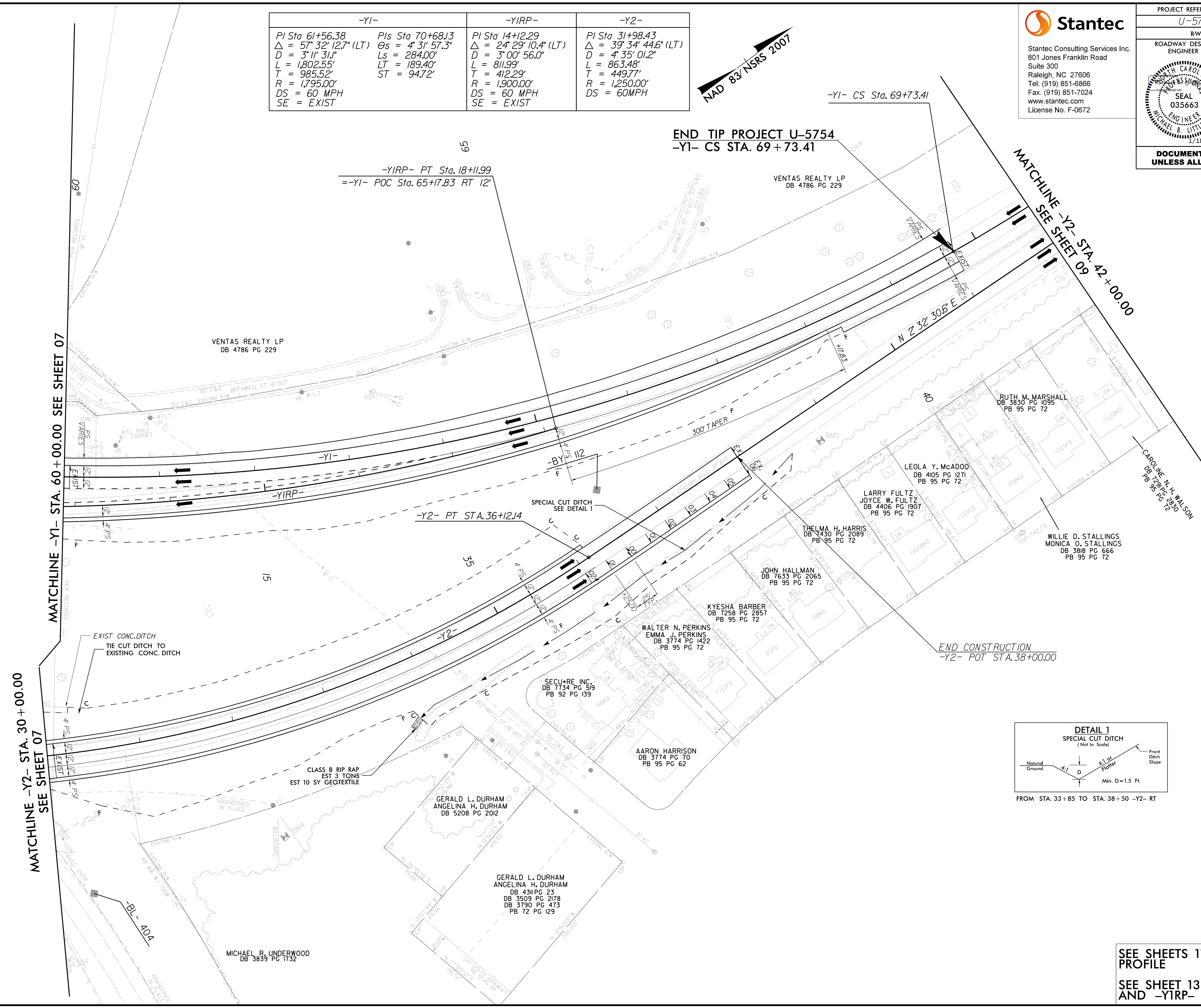
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PROJECT REFERENCE NO. <i>U-5754</i>	SHEET NO. <i>08</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
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-Y1-	-YIRP-	-Y2-
PI Sta 61+56.38	PI Sta 14+12.29	PI Sta 31+98.43
$\Delta = 57' 32" 12.7" (LT)$	$\Delta = 24' 29" 10.4" (LT)$	$\Delta = 39' 34" 44.6" (LT)$
$D = 3' 11" 31.1"$	$D = 3' 00" 56.0"$	$D = 4' 35" 01.2"$
$L = 1,802.55'$	$L = 811.99'$	$L = 863.48'$
$T = 985.52'$	$T = 412.29'$	$T = 449.77'$
$R = 1,795.00'$	$R = 1,900.00'$	$R = 1,250.00'$
$DS = 60 MPH$	$DS = 60 MPH$	$DS = 60 MPH$
$SE = EXIST$	$SE = EXIST$	$SE = EXIST$



REVISIONS



SEE SHEETS 11 AND 12 FOR -Y1- PROFILE  
 SEE SHEET 13 AND 14 FOR -Y2- AND -YIRP- PROFILES

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PROJECT REFERENCE NO. U-5754	SHEET NO. 09
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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REVISIONS



-Y1- ST Sta. 72+57.41

MATCHLINE -Y2- STA. 42+00.00  
SEE SHEET 09

5/28/99

**-Y1-**

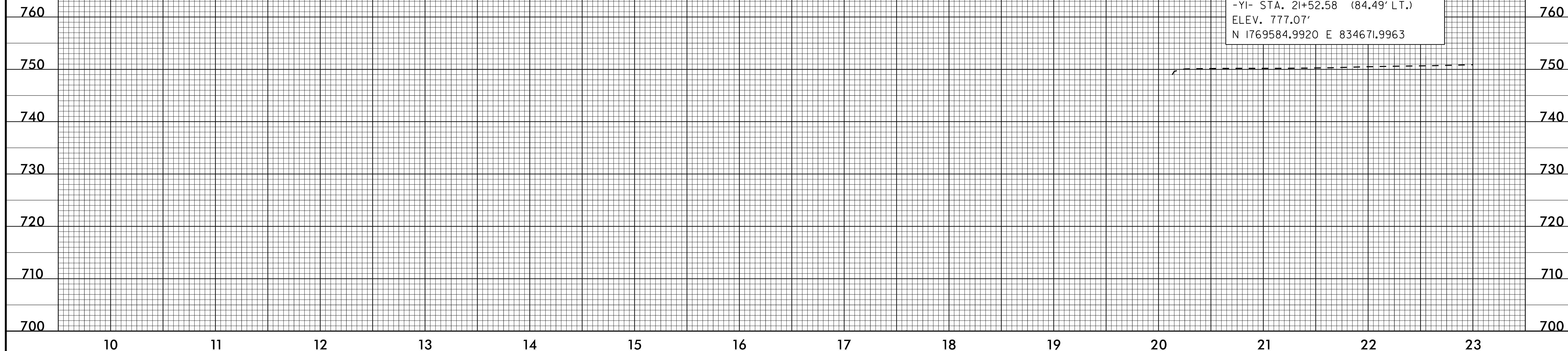


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PROJECT REFERENCE NO. <i>U-5754</i>	SHEET NO. <i>10</i>
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 

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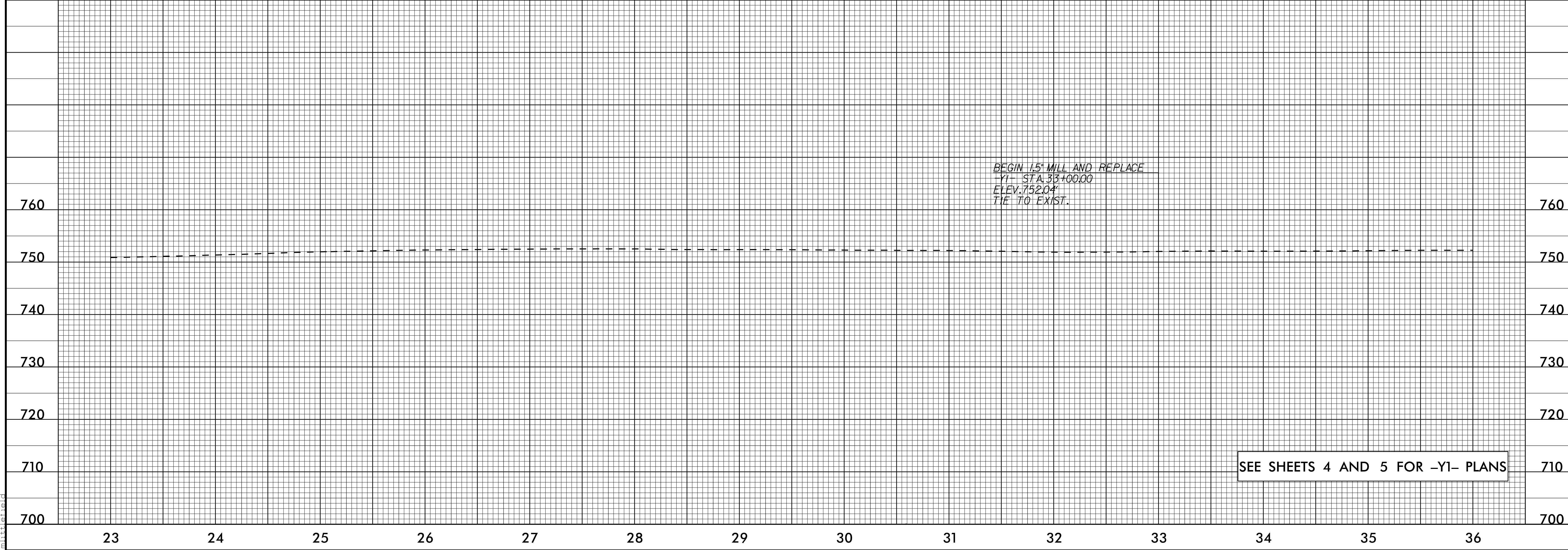
BM #1  
-Y1- STA. 21+52.58 (84.49' L.T.)  
ELEV. 777.07'  
N 1769584.9920 E 834671.9963



BEGIN 1.5" MILL AND REPLACE  
-Y1- STA. 33+00.00  
ELEV. 752.04'  
TIE TO EXIST.

SEE SHEETS 4 AND 5 FOR -Y1- PLANS

12/14/2016  
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mlittlefield



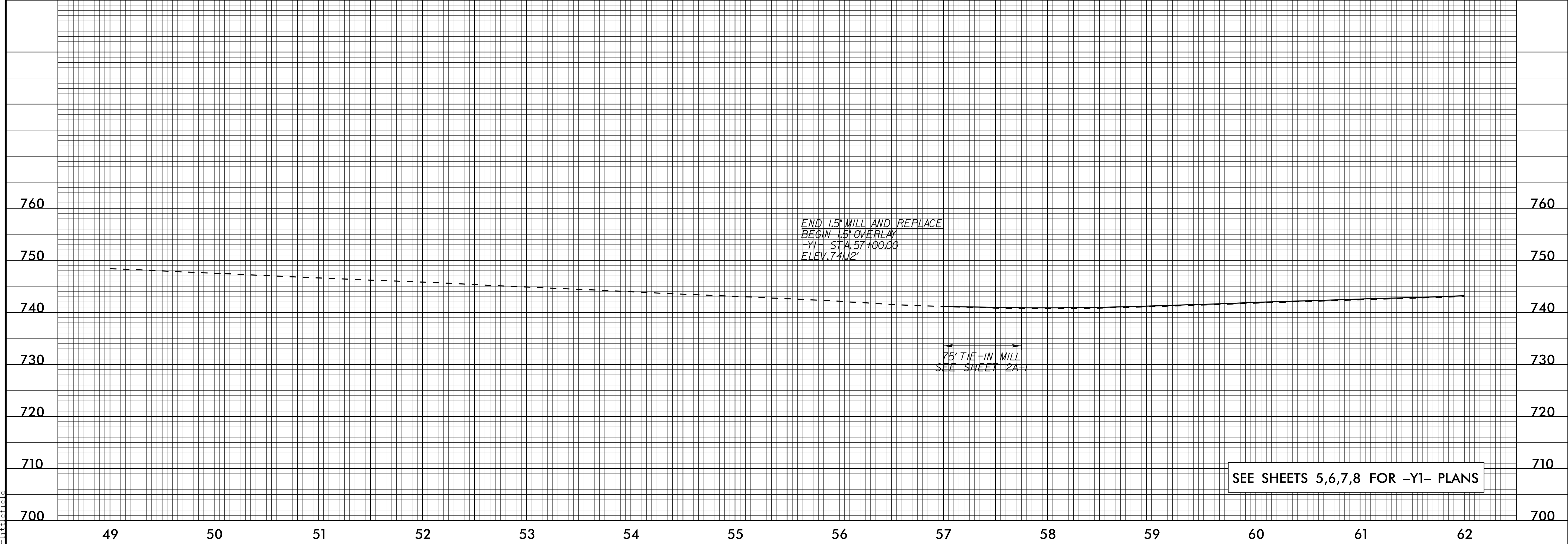
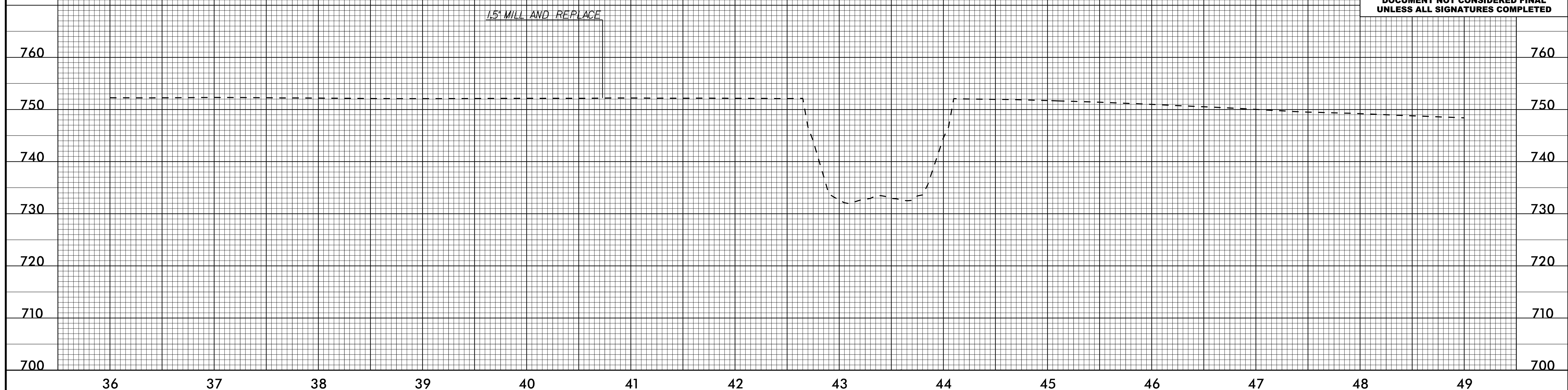
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**-Y1-**

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PROJECT REFERENCE NO. <i>U-5754</i>	SHEET NO. <i>11</i>
ROADWAY DESIGN ENGINEER <i>[Signature]</i>	HYDRAULICS ENGINEER <i>[Signature]</i>
SEAL 035663 MICHAEL B. LITTLEFIELD 1/18/2019	SEAL 026971 JUSTUA G. DILTON 1/18/2019

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SEE SHEETS 5,6,7,8 FOR -Y1- PLANS

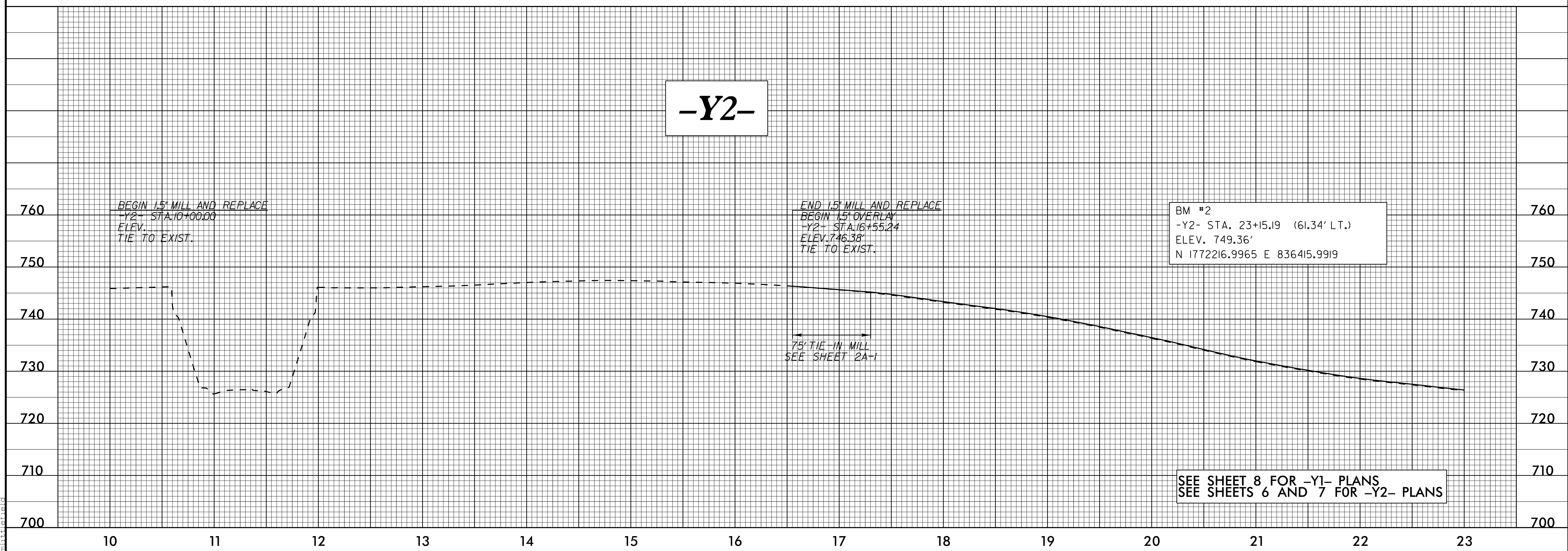
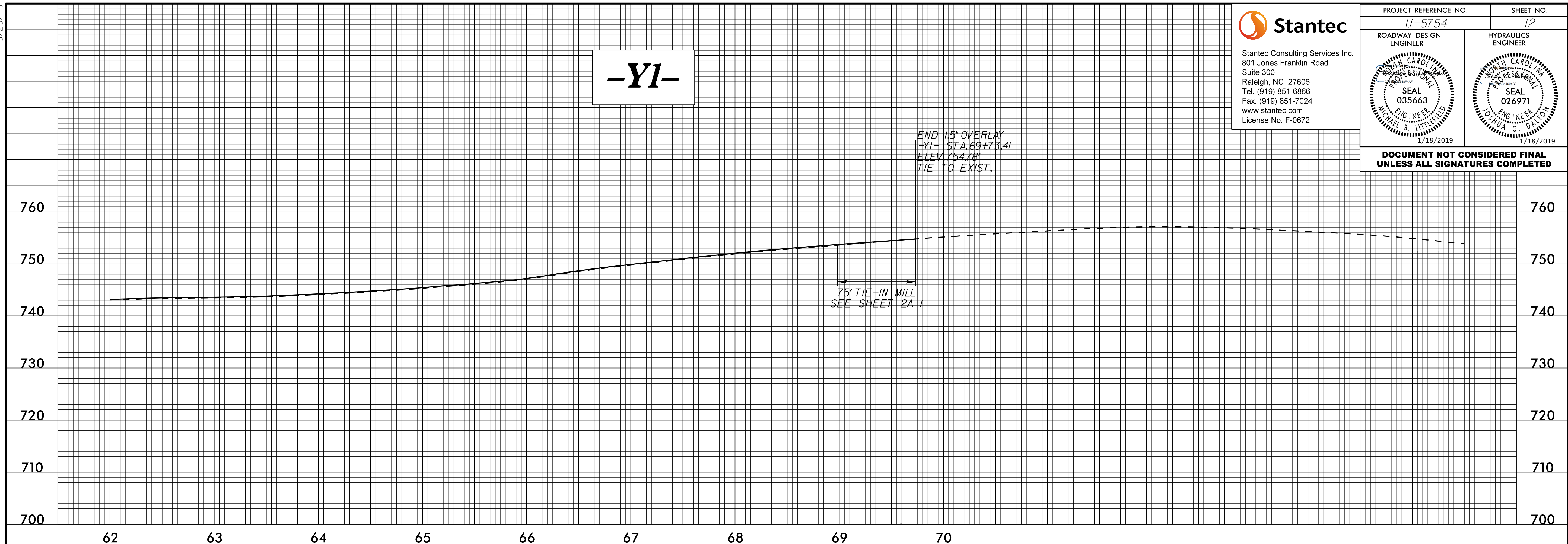
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M.LITTLEFIELD

5/28/99

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PROJECT REFERENCE NO. U-5754	SHEET NO. 12
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 

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5/28/19

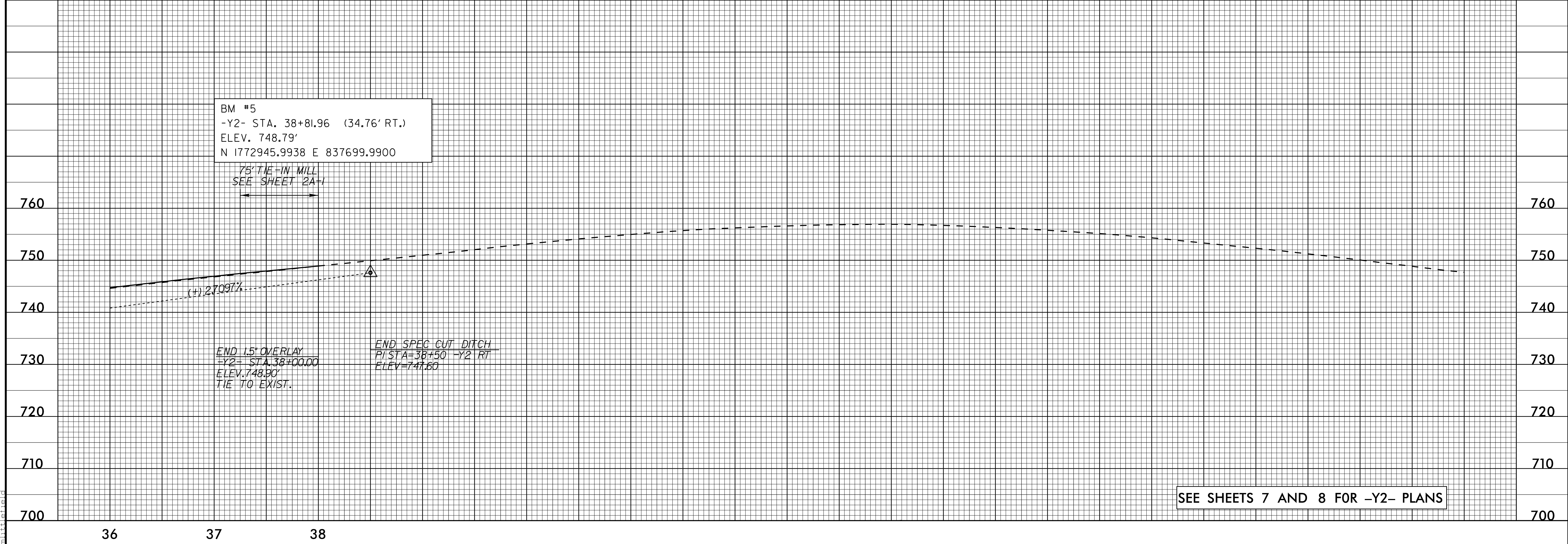
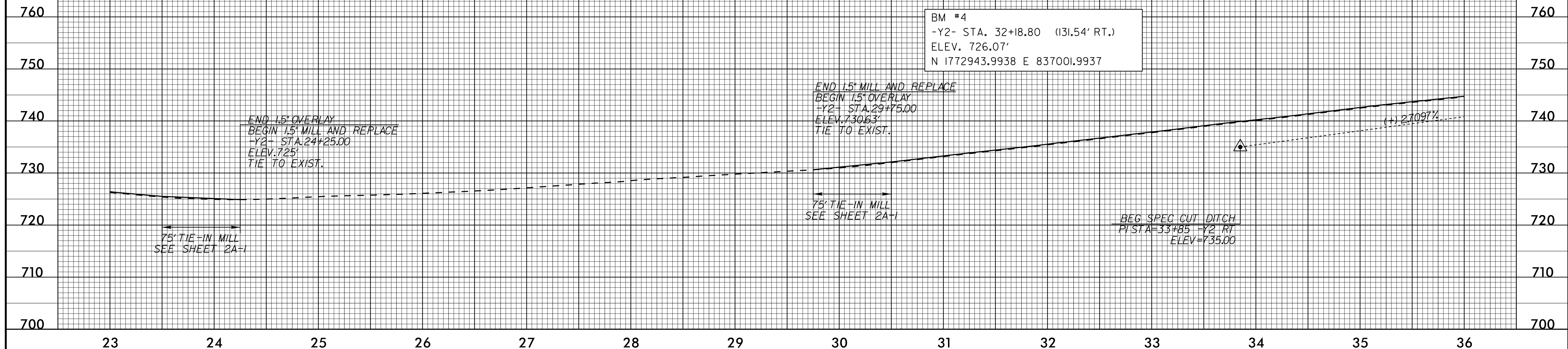


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PROJECT REFERENCE NO. U-5754	SHEET NO. 13
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**-Y2-**



SEE SHEETS 7 AND 8 FOR -Y2- PLANS

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M.LITTLEFIELD

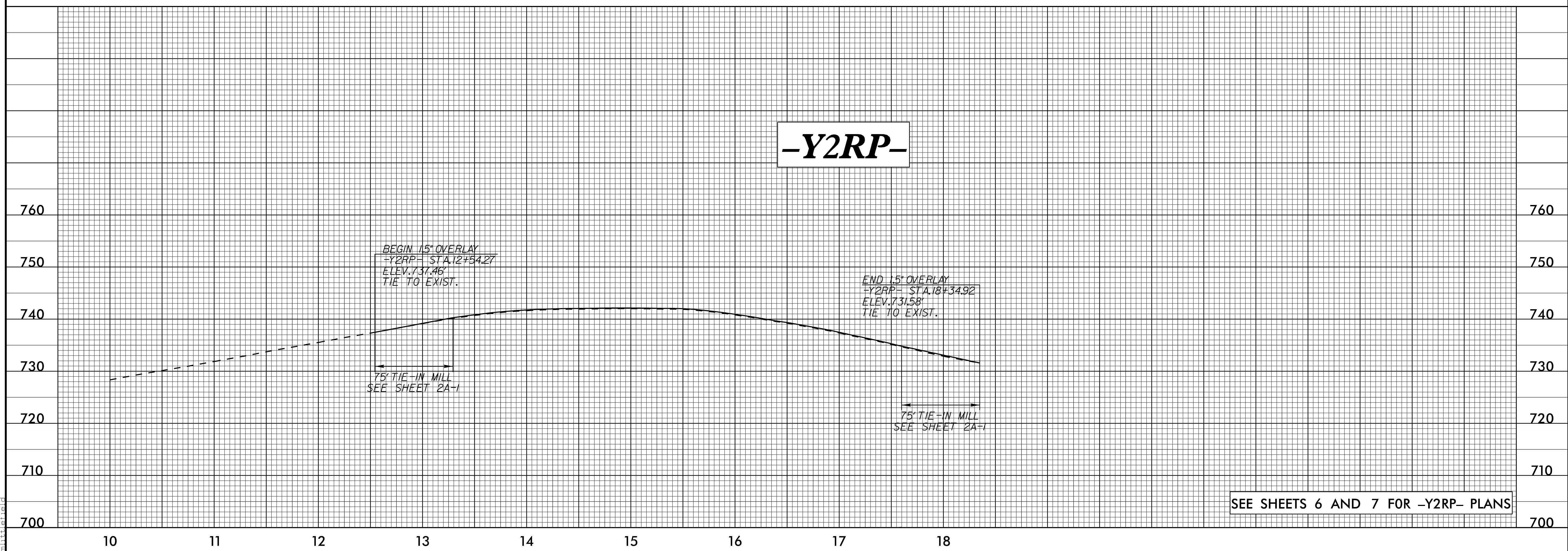
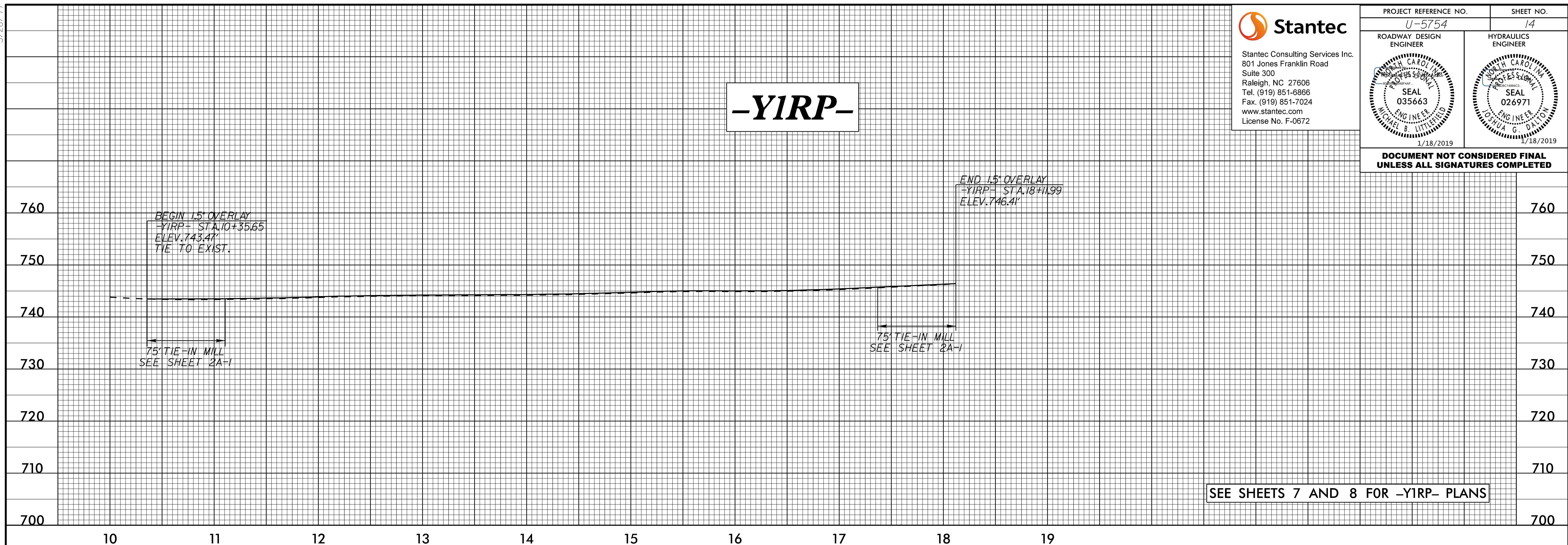
5/28/19



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PROJECT REFERENCE NO. U-5754	SHEET NO. 14
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M. Littlefield