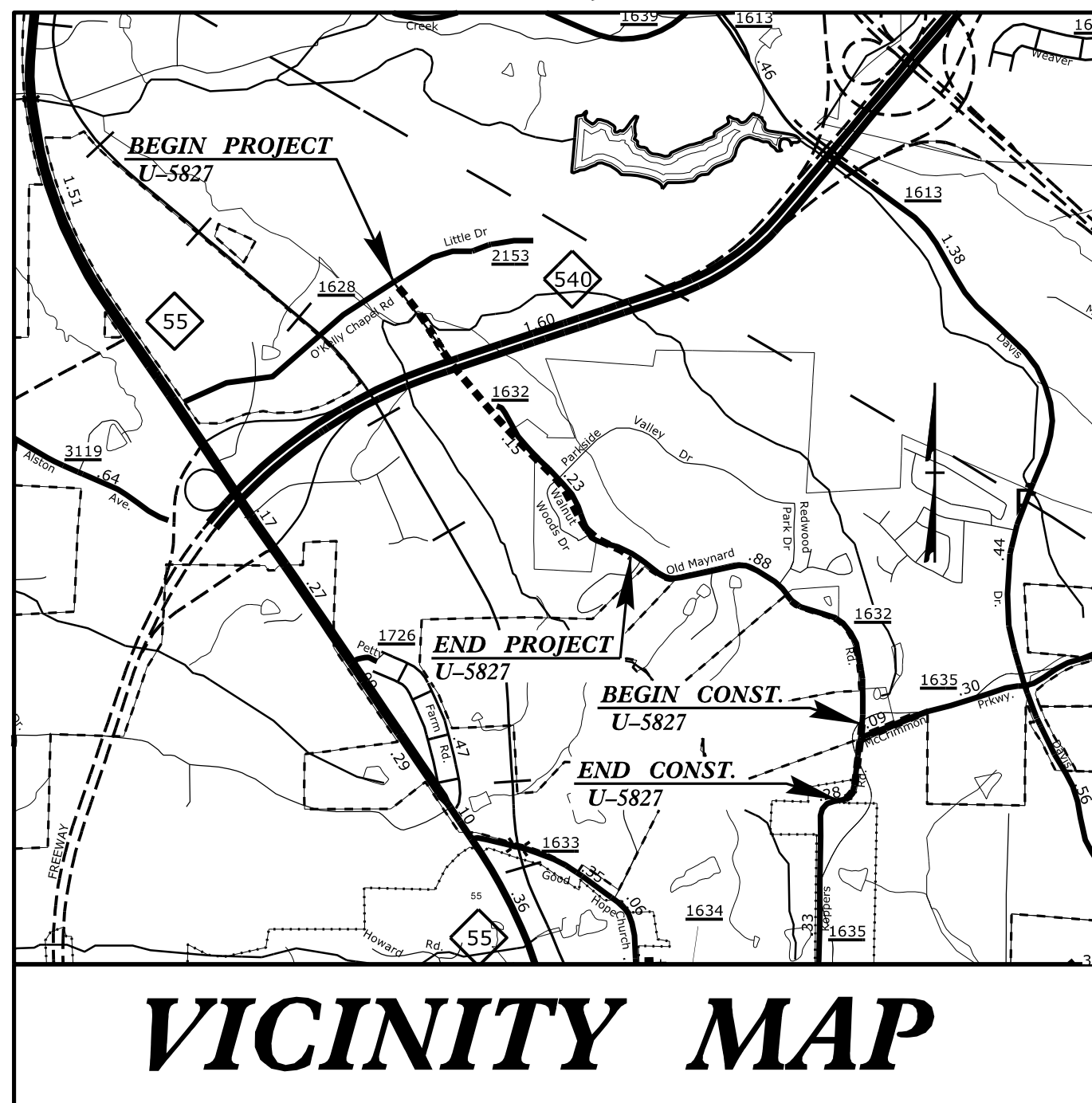


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See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

**LOCATION: LOUIS STEPHENS DRIVE EXTENSION (SR 1632)
FROM O'KELLY CHAPEL ROAD (SR 1628)/LITTLE
DRIVE (SR 2153) IN RESEARCH TRIANGLE PARK
TO POPLAR PIKE LANE IN MORRISVILLE**

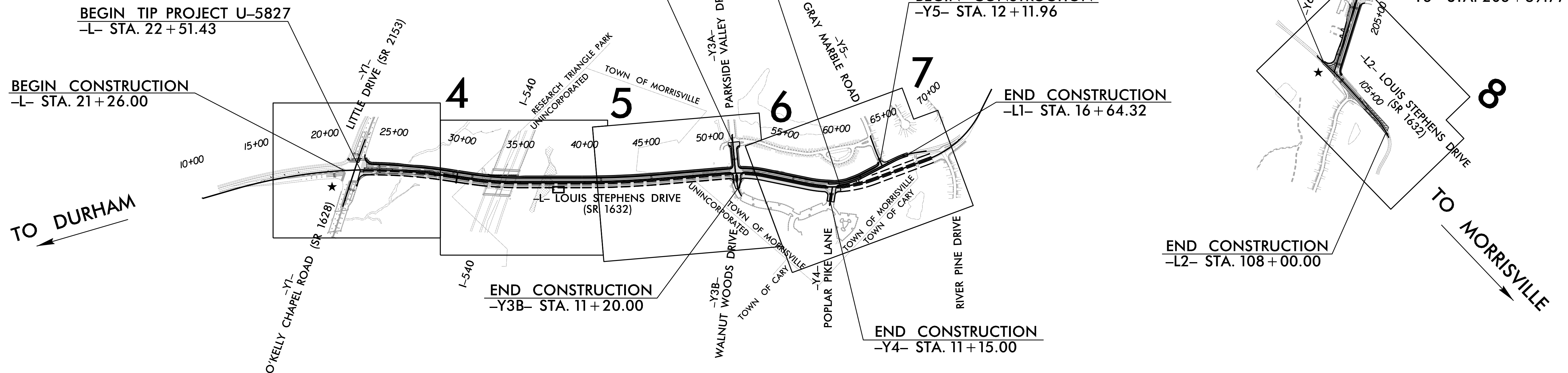
TYPE OF WORK: GRADING, PAVING, DRAINAGE, RETAINING WALL & SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5827	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44400.1.1		PE	
44400.2.1		RW & UTIL	
44400.3.1		CONST	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

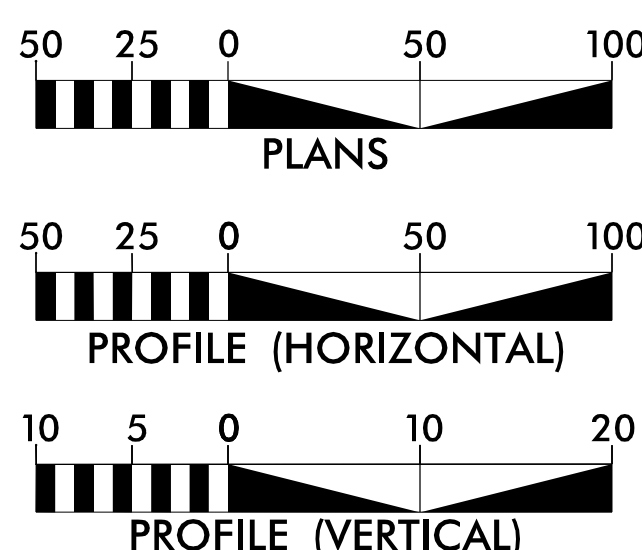
TIP PROJECT: U-5827

CONTRACT: C204429



★ PROPOSED SIGNAL

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 6,700
ADT 2039 = 9,900
K = 10 %
D = 65 %
T = 4 %
V = 40 / 50 MPH
TTST = 1% DUALS = 3%
FUNC CLASS =
URBAN COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT U-5827 = 0.710 MILES

NCDOT CONTACT: S. REID DAVIDSON, PE
DIVISION 5 - PROJECT DELIVERY UNIT
PH: 919-220-4600

Prepared in the Office of:
RAMEY KEMP ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100 - Raleigh, North Carolina 27609
Phone: 919-872-5115 - www.rameykemp.com
NC License No. C-0910

2018 STANDARD SPECIFICATIONS

JUNE 8, 2018
RIGHT OF WAY DATE:
SEPTEMBER 17, 2019
LETTING DATE:

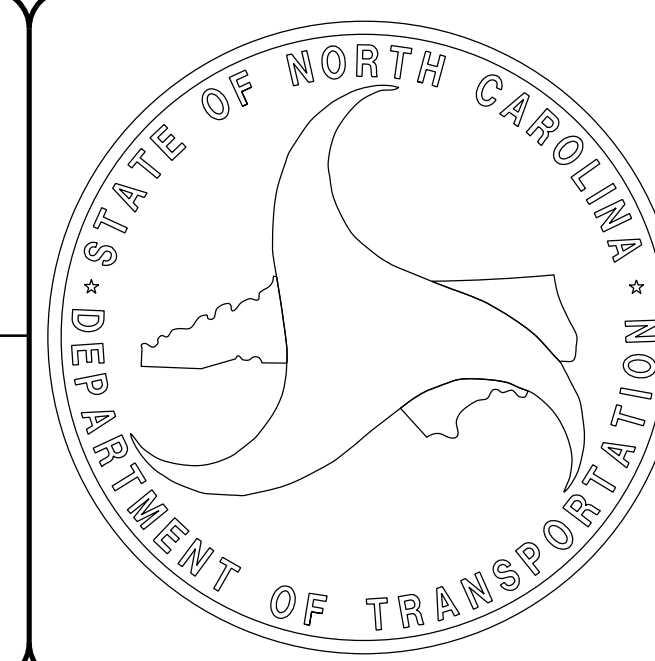
CLAUDETTE M.K. ROQUE, PE
PROJECT ENGINEER
HERB RIDGEWAY IV
PROJECT DESIGNER

HYDRAULICS ENGINEER

DocuSigned by:
Kara Heffer
SIGNATURE: [Signature]
7/3/2019

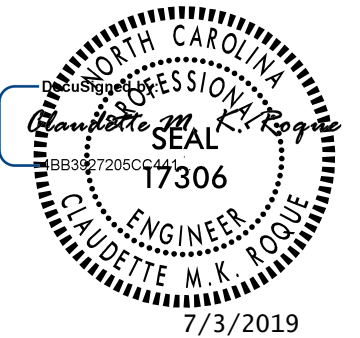

ROADWAY DESIGN ENGINEER

DocuSigned by:
Claudette M.K. Roque
SIGNATURE: [Signature]
7/3/2019



STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

**INDEX OF SHEETS, GENERAL NOTES AND
2018 ROADWAY ENGLISH STANDARD DRAWINGS**

PROJECT REFERENCE NO.	SHEET NO.
U-5827	1A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
	
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 RAMEY KEMP & ASSOCIATES, INC. Transportation Engineers 5808 Faringdon Place, Suite 100 Raleigh, North Carolina 27609 Phone: 919-872-5115 www.rameykemp.com NC License No. C-0910	

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-5	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	INTERSECTION DETAILS
2C-1	W-BEAM RAIL SECTION DETAIL
2C-2	PROPOSED BIKE/PED SAFETY RAIL DETAIL
2C-3	DIRECTIONAL CURB RAMP DETAILS
2C-4	IMPACT ATTENUATORS DETAIL
2C-5	CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT)
2C-6	MEDIAN OR TURN LANE ISLANDS CURB RAMP DETAILS
3B-1	EARTHWORK, PAVEMENT REMOVAL, GUARDRAIL SUMMARIES, HANDRAIL SUMMARY, AND PARCEL INDEX
3D-1 THRU 3D-3	DRAINAGE SUMMARY SHEETS
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 8	PLAN SHEETS
9 THRU 12	PROFILE SHEETS
RW02C-1 THRU RW02C-7	SURVEY CONTROL SHEETS - EXISTING CENTERLINE ALIGNMENTS
RW02D-1	PROPOSED ALIGNMENT CONTROL SHEET
TMP-1 THRU TMP-9	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-6	PAVEMENT MARKING PLANS
EC-1 THRU EC-13	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
SIGN-1 THRU SIGN-7	SIGNING PLANS
SIG-1.0 THRU SIG-4.1	SIGNAL PLANS
SCP-1 THRU SCP-4	SYSTEM COMMUNICATION PLANS
UC-1 THRU UC-8	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-6	UTILITY BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-33	CROSS-SECTIONS
W-1 THRU W-2	RETAINING WALL PLANS

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

GENERAL NOTES (CONTINUED): 2018 SPECIFICATIONS

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.

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Duke Energy, AT&T, PSNC, Time Warner Cable/Charter Communications/Spectrum, Google Fiber, Town of Cary, NC Transit Authority

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

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.

ROCK

ROCK IS ANTICIPATED BETWEEN -L- STA 34+75 TO STA 36+75 AND -L- STA 40+25 TO STA 45+00. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

EFF. 01-16-2018
REV.
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	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
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	
610.02	Guide for Paving Shoulders Under Bridges - Method II
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
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
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
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
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

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

RAILROADS:

Standard Gauge	
RR Signal Milepost	
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	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite R/W Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage / Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	
Single Shrub	

Note: Not to Scale *S.U.E. = *Subsurface Utility Engineering*

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	
U/G Gas Line LOS C (S.U.E.*)	
U/G Gas Line LOS D (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

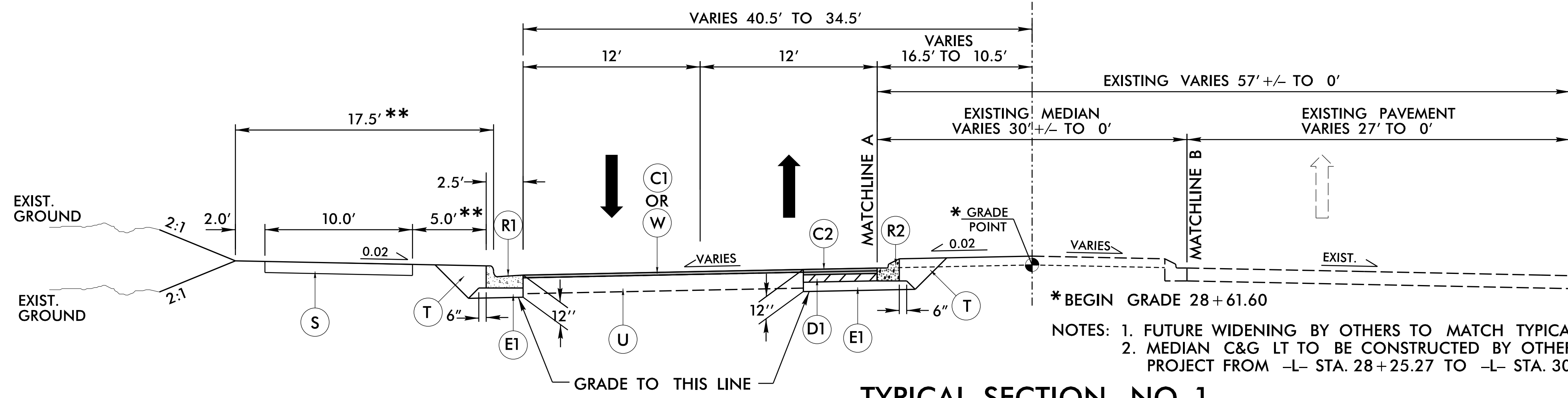
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Forced Main Line LOS B (S.U.E.*)	
SS Forced Main Line LOS C (S.U.E.*)	
SS Forced Main Line LOS D (S.U.E.*)	

MISCELLANEOUS:

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

8/17/99

☒ -L- SR 1632 (LOUIS STEPHENS DR.)



** REDUCE TO 2.0' (14.5' BERM) FROM -L- STA. 25+94.25 TO -L- STA. 26+64.25

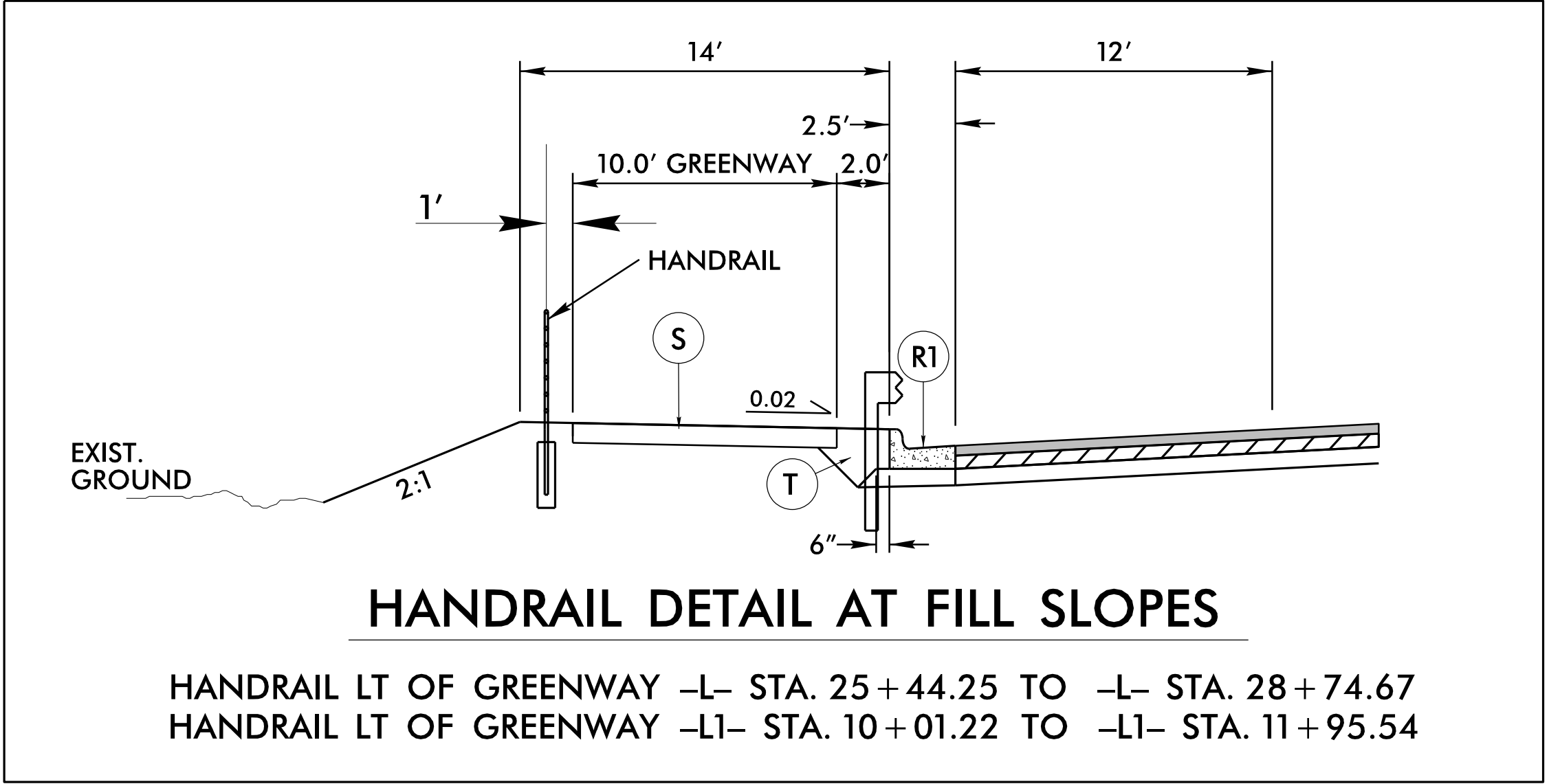
TYPICAL SECTION NO. 1

-L- STA. 22+51.43 TO -L- STA. 30+24.72
 WIDEN AND RESURFACE FROM -L- STA. 22+51.43 TO -L- STA. 28+61.60
 BEGIN GRADE (WIDEN AND WEDGING) FROM -L- STA. 28+61.60 TO -L- STA. 30+24.72
 PLACE FACE OF GUARDRAIL FLUSH WITH FACE OF CURB FROM -L- STA. 26+02.00 TO -L- STA. 29+78.00 LT

- NOTES: 1. FUTURE WIDENING BY OTHERS TO MATCH TYPICAL SECTION NO. 2
 2. MEDIAN C&G LT TO BE CONSTRUCTED BY OTHERS DURING FUTURE WIDENING PROJECT FROM -L- STA. 28+25.27 TO -L- STA. 30+24.72

- NOTES:
 1. SEE PLANS FOR LOCATION OF TURN LANES AND TAPERS.
 2. SEE PLANS FOR RADII TURNOUTS AT INTERSECTIONS.
 3. SEE PLANS FOR LOCATION OF SIDEWALK/GREENWAY TRANSITIONS.

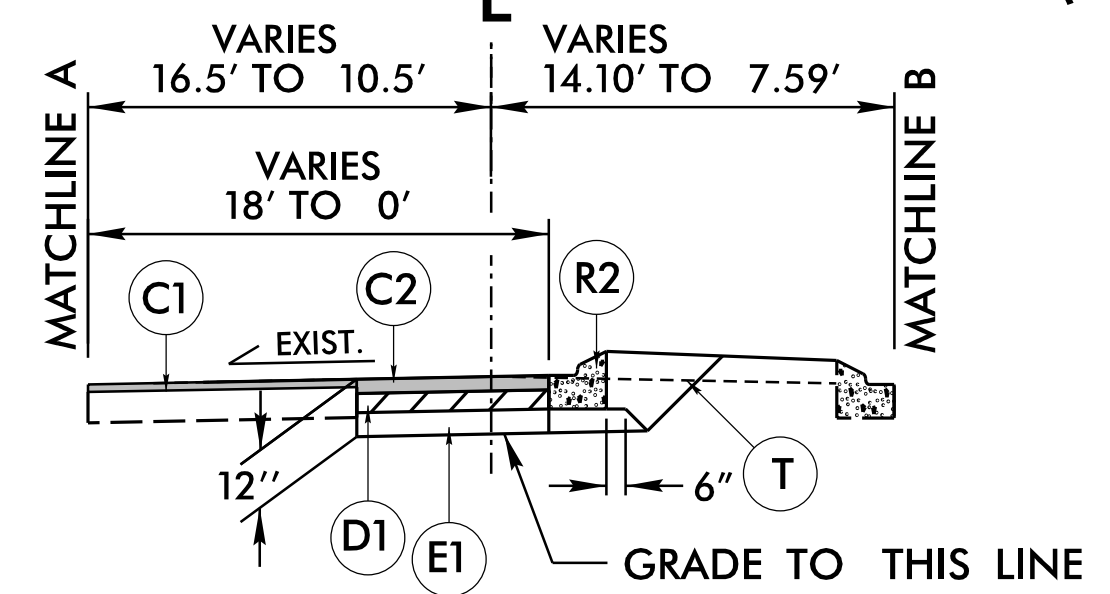
PROJECT REFERENCE NO. U-5827	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER <i>Cheryl M. Ramey</i> SEAL 17306 5/1/2019	PAVEMENT DESIGN ENGINEER <i>Cheryl M. Ramey</i> SEAL 030459 5/1/2019
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<p>RAMEY KEMP ASSOCIATES, INC. Transportation Engineers 5808 Faringdon Place, Suite 100 Raleigh, North Carolina 27609 Phone: 919-872-5115 www.rameykemp.com NC License No. C-0910</p>	



HANDRAIL DETAIL AT FILL SLOPES

HANDRAIL LT OF GREENWAY -L- STA. 25+44.25 TO -L- STA. 28+74.67
 HANDRAIL LT OF GREENWAY -L1- STA. 10+01.22 TO -L1- STA. 11+95.54

☒ -L- SR 1632 (LOUIS STEPHENS DR.)

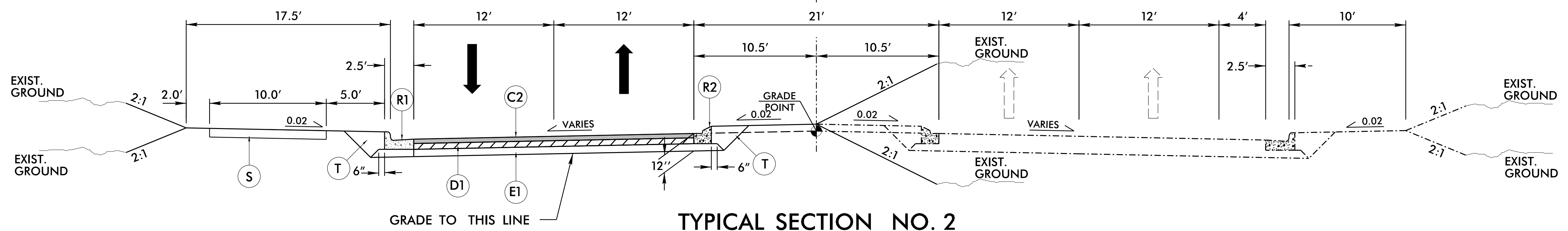


PARTIAL TYPICAL SECTION NO. 1A

LEFT TURN BAY -L- STA. 22+75.00 TO -L- STA. 26+90.00

☒ -L- SR 1632 (LOUIS STEPHENS DR.)

FUTURE BY OTHERS



TYPICAL SECTION NO. 2

-L- STA. 30+24.72 TO -L- STA. 32+31.75
 -L- STA. 34+87.43 TO -L- STA. 52+48.22
 PLACE FACE OF GUARDRAIL FLUSH WITH FACE OF CURB FROM -L- STA. 31+54.00 TO -L- STA. 35+91.50 LT

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1.0" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4.0" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
R1	2'-6" CURB AND GUTTER
R2	1'-6" CURB AND GUTTER
S	6" CONCRETE GREENWAY
S1	4" CONCRETE SIDEWALK.
T	COMPACTED EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
V1	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON SHEET 2A-3)

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

5/1/2019
 I:\Roadway\Proj\U5827_Rdy_tjyp.dgn
 User: KWI

8.17.19

PROJECT REFERENCE NO. U-5827	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER

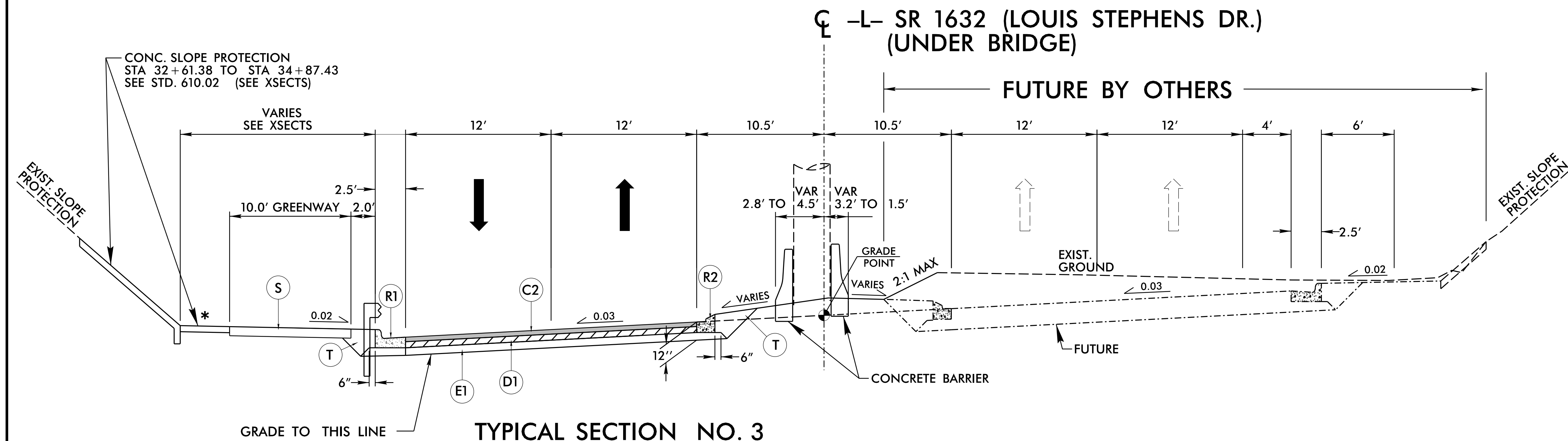
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PAVEMENT SCHEDULE

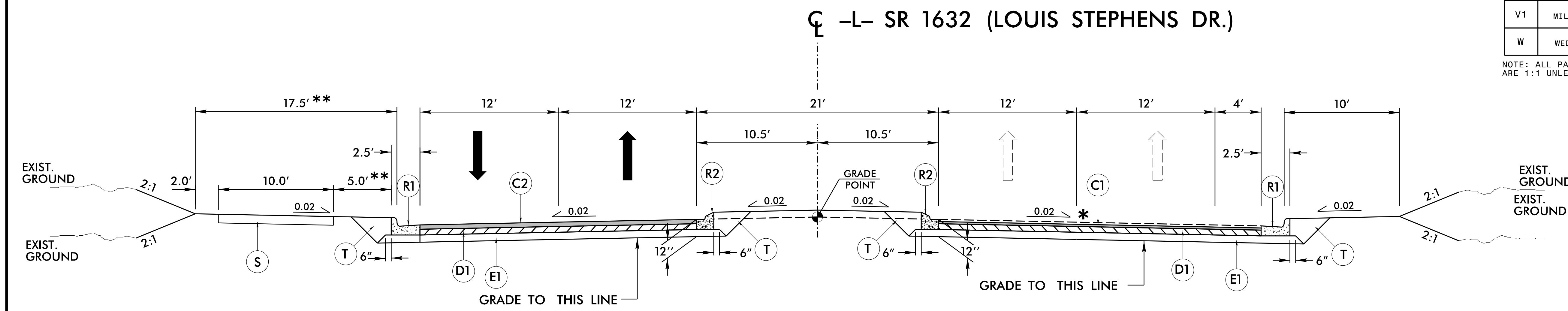
C1	1.5" S9.5C
C2	3" S9.5C
C3	VAR. DEPTH S9.5C
D1	4" I19.0C
D2	VAR. DEPTH I19.0C
E1	5" B25.0C
E2	VAR. DEPTH B25.0C
R1	2'-6" CURB AND GUTTER
R2	1'-6" CURB AND GUTTER
S	6" CONCRETE GREENWAY
S1	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (1.5")
V1	MILLING (INCIDENTAL)
W	WEDGING

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



TYPICAL SECTION NO. 3
 * RETAINING WALL FROM -L- STA. 32+41.00 TO -L- STA. 33+50.00 LT
 -L- STA. 32+31.75 TO -L- STA. 34+87.43

PLACE FACE OF GUARDRAIL FLUSH WITH FACE OF CURB FROM
 -L- STA. 31+54.00 TO -L- STA. 35+91.50 LT



TYPICAL SECTION NO. 4
 ** REDUCE TO 2.0' (14.5' BERM) FROM -L- STA. 59+57.72 TO -L- STA. 60+00.05

TYPICAL SECTION NO. 4
 -L- STA. 52+48.22 TO -L- STA. 60+00.05

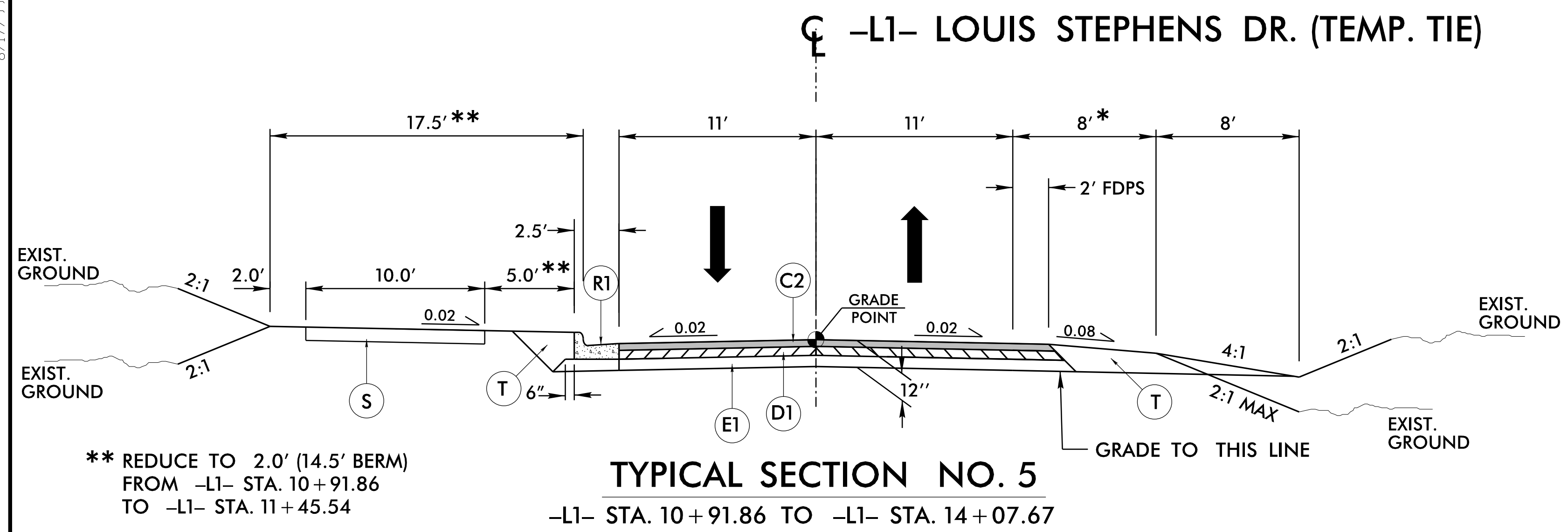
* NOTE: PAVE UP TO FINAL LAYER OF SURFACE COURSE.

PLACE FACE OF GUARDRAIL FLUSH WITH FACE OF CURB FROM
 -L- STA. 55+00.00 TO -L- STA. 57+00.00 RT
 -L- STA. 58+54.10 TO -L- STA. 60+00.05 LT

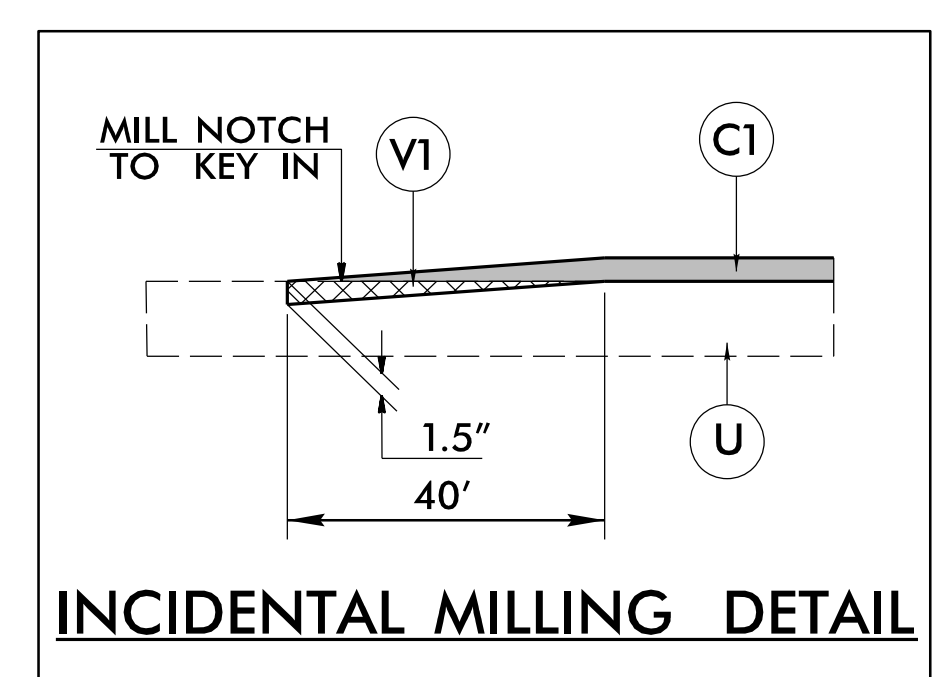
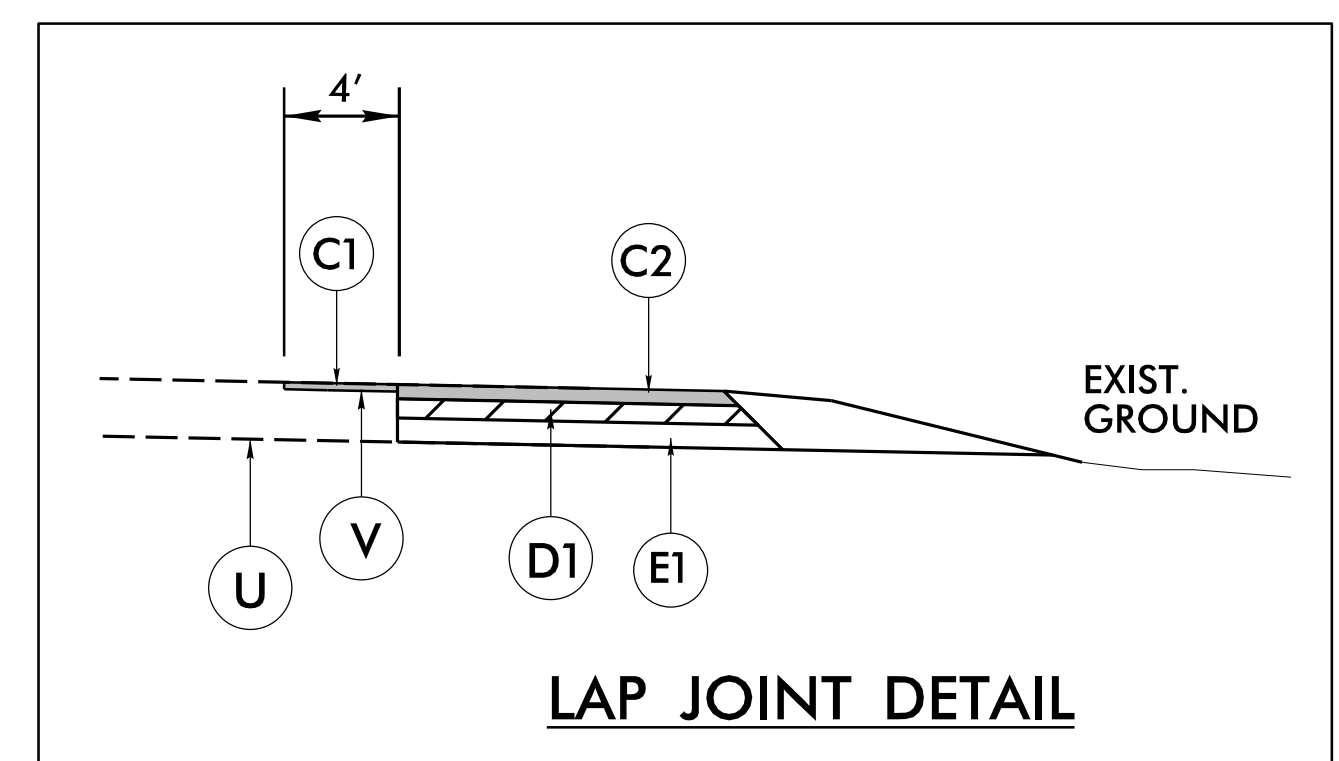
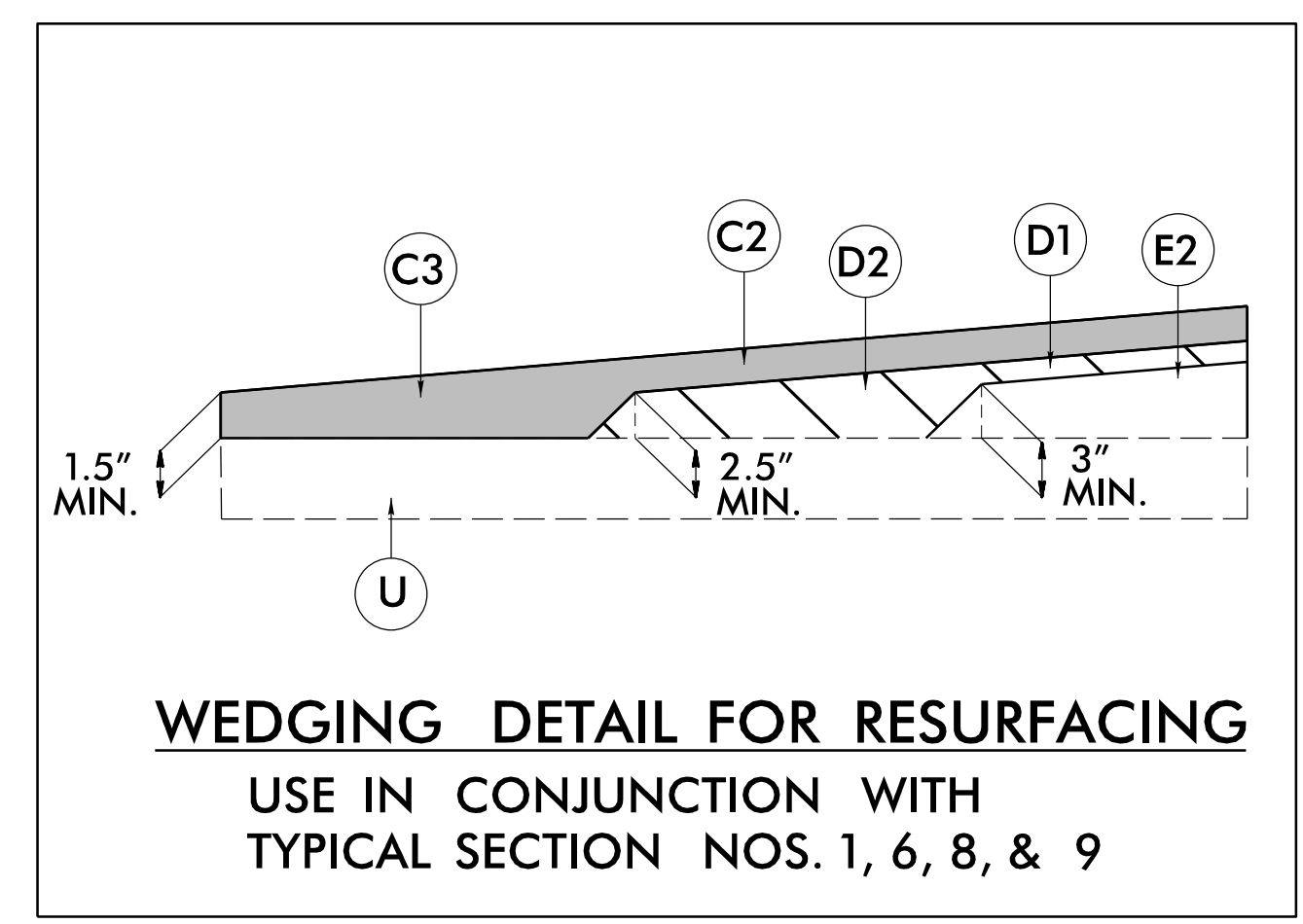
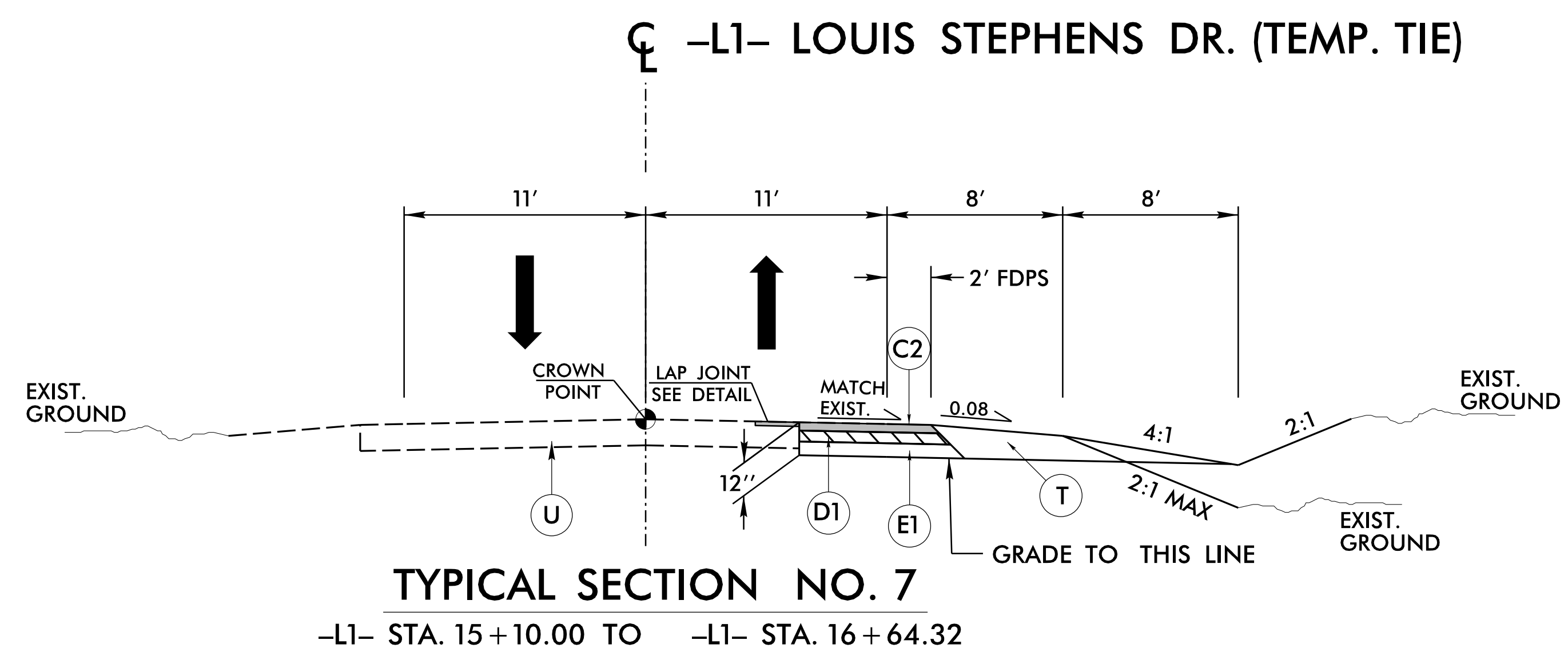
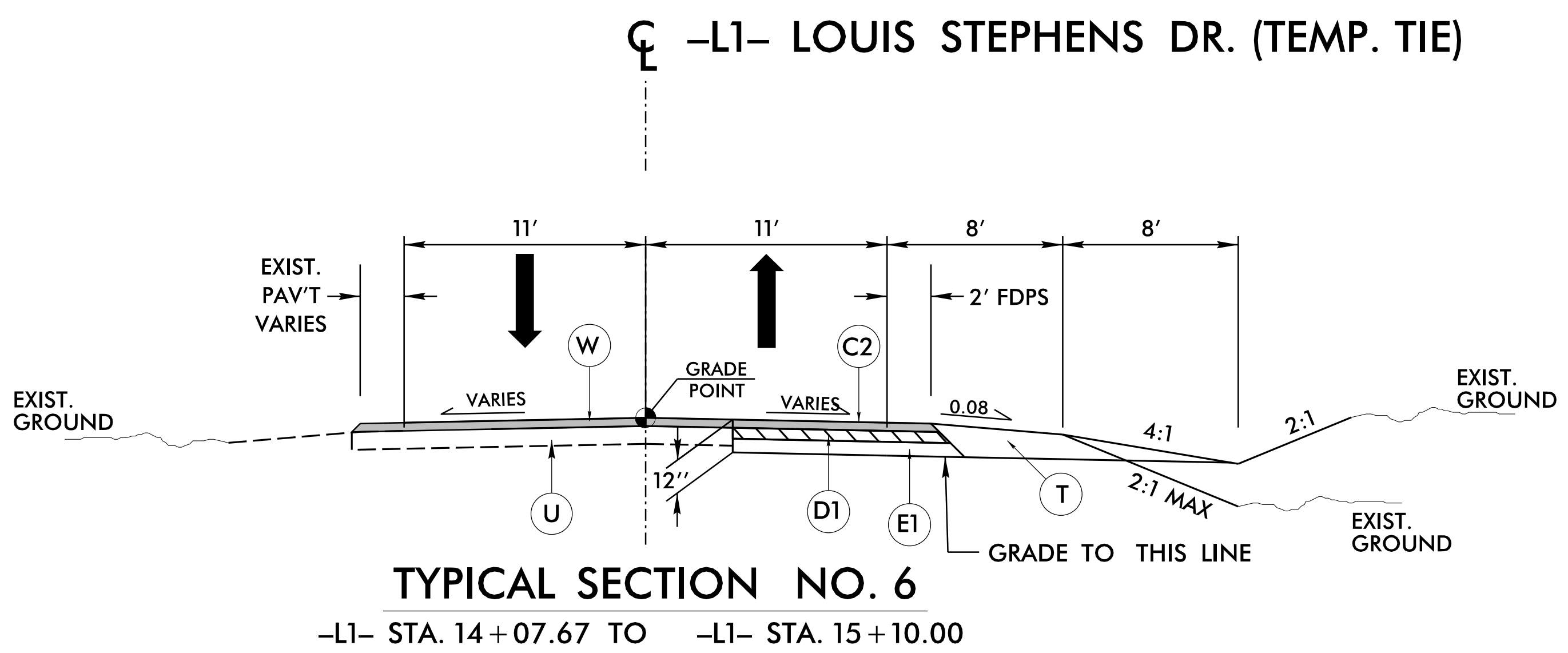
- NOTES:**
1. SEE PLANS FOR LOCATION OF TURN LANES AND TAPERS.
 2. SEE PLANS FOR RADII TURNOUTS AT INTERSECTIONS.
 3. SEE PLANS FOR LOCATION OF SIDEWALK/GREENWAY TRANSITIONS.

5/1/2019
 I:\Roadway\Proj\U5827_Rdy_tjyp.dgn
 User: KWISE

8/17/99



* USE 6' SHOULDER AND 2:1 SLOPES FROM -L1- STA. 10+91.86 TO -L1- STA. 13+35.00. SEE X-SECTIONS
PLACE FACE OF GUARDRAIL FLUSH WITH FACE OF CURB FROM -L1- STA. 10+91.86 TO -L1- STA. 12+46.87 LT



PROJECT REFERENCE NO. U-5827	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER <i>[Signature]</i> 17306	PAVEMENT DESIGN ENGINEER <i>[Signature]</i> 030459

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

RAMEY KEMP ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
Phone: 919-872-5115
www.rameykemp.com
NC License No. C-0910

PAVEMENT SCHEDULE	
C1	1.5" S9.5C
C2	3" S9.5C
C3	VAR. DEPTH S9.5C
D1	4" I19.0C
D2	VAR. DEPTH I19.0C
E1	5" B25.0C
E2	VAR. DEPTH B25.0C
R1	2'-6" CURB AND GUTTER
R2	1'-6" CURB AND GUTTER
S	6" CONCRETE GREENWAY
S1	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (1.5")
V1	MILLING (INCIDENTAL)
W	WEDGING

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

- NOTES:**
1. SEE PLANS FOR LOCATION OF TURN LANES AND TAPERS.
 2. SEE PLANS FOR RADII TURNOUTS AT INTERSECTIONS.
 3. SEE PLANS FOR LOCATION OF SIDEWALK/GREENWAY TRANSITIONS.

5/1/2019 11:10 Roadway\Proj\U5827_Rdy_tjyp.dgn User: KWISE

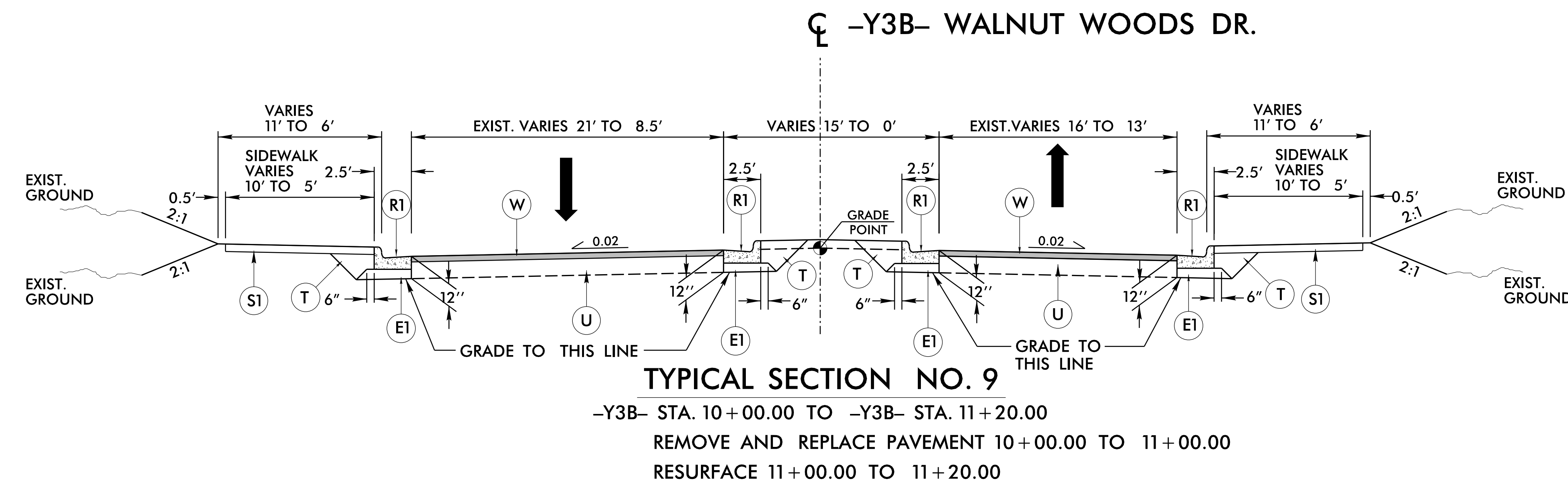
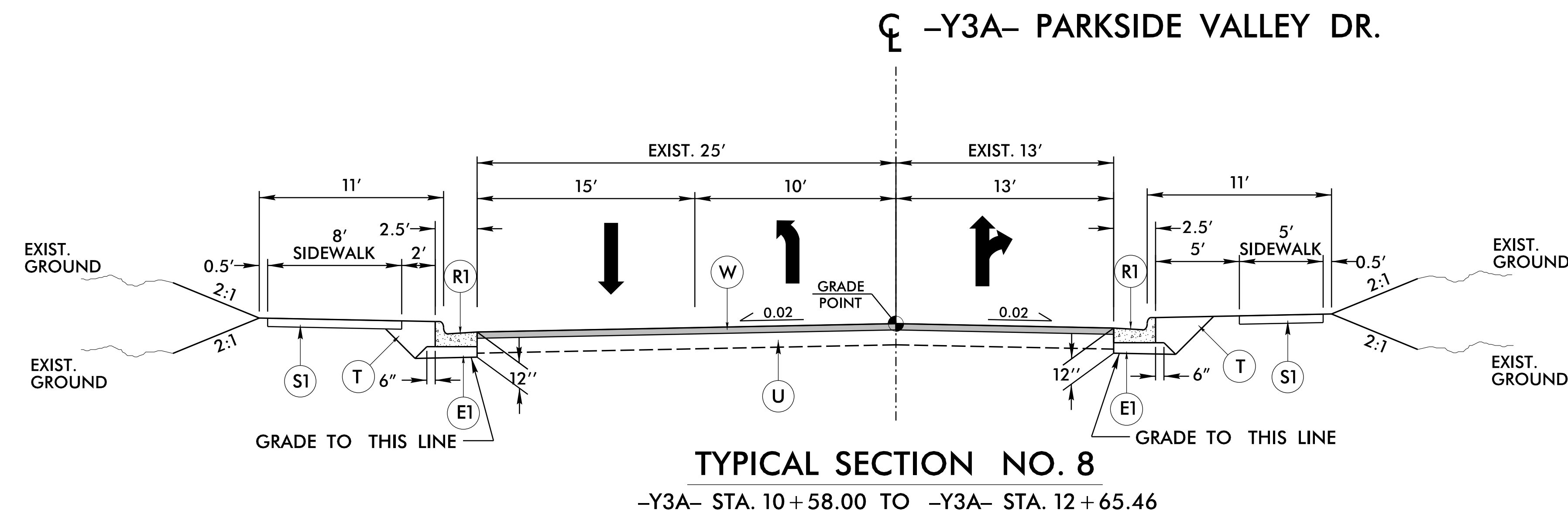
PROJECT REFERENCE NO. U-5827	SHEET NO. 2A-4
ROADWAY DESIGN ENGINEER <i>[Signature]</i> 17306	PAVEMENT DESIGN ENGINEER <i>[Signature]</i> 030459

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 5808 Faringdon Place, Suite 100
 Raleigh, North Carolina 27609
 Phone: 919-872-5115
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 NC License No. C-0910

PAVEMENT SCHEDULE	
C1	1.5" S9.5C
C2	3" S9.5C
C3	VAR. DEPTH S9.5C
D1	4" I19.0C
D2	VAR. DEPTH I19.0C
E1	5" B25.0C
E2	VAR. DEPTH B25.0C
R1	2'-6" CURB AND GUTTER
R2	1'-6" CURB AND GUTTER
S	6" CONCRETE GREENWAY
S1	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (1.5")
V1	MILLING (INCIDENTAL)
W	WEDGING

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



- NOTES:**
1. SEE PLANS FOR LOCATION OF TURN LANES AND TAPERS.
 2. SEE PLANS FOR RADII TURNOUTS AT INTERSECTIONS.
 3. SEE PLANS FOR LOCATION OF SIDEWALK/GREENWAY TRANSITIONS.

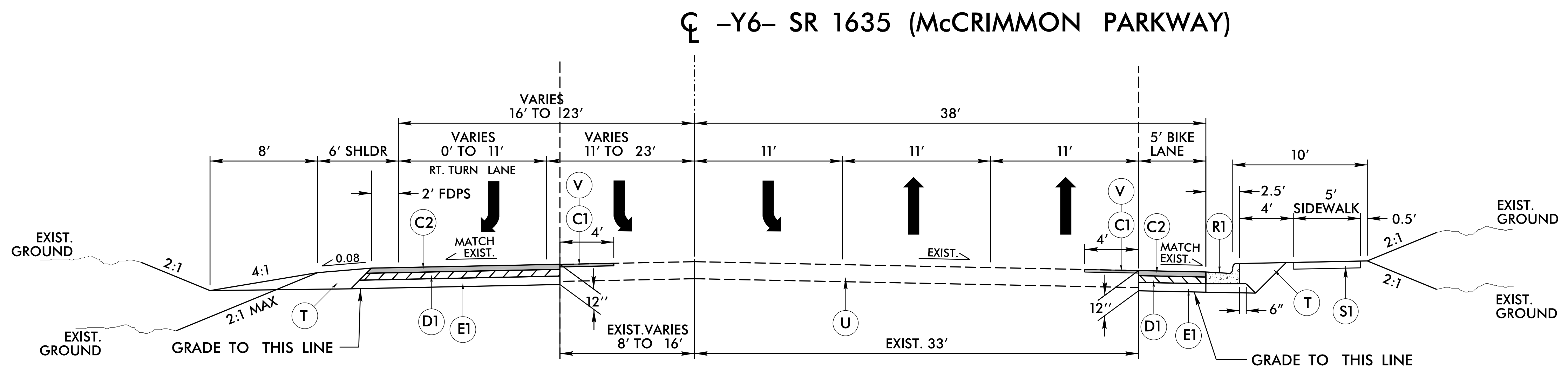
PROJECT REFERENCE NO. U-5827	SHEET NO. 2A-5
ROADWAY DESIGN ENGINEER <i>[Signature]</i> 17306	PAVEMENT DESIGN ENGINEER <i>[Signature]</i> 030459

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

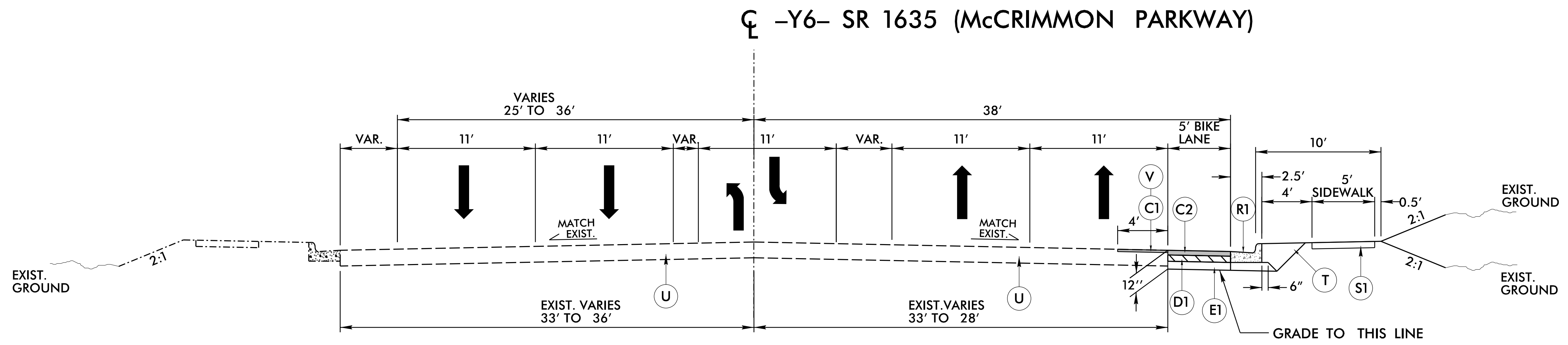
RAMEY KEMP ASSOCIATES, INC.
 Transportation Engineers
 5808 Faringdon Place, Suite 100
 Raleigh, North Carolina 27609
 Phone: 919-872-5115
 www.rameykemp.com
 NC License No. C-0910

PAVEMENT SCHEDULE	
C1	1.5" S9.5C
C2	3" S9.5C
C3	VAR. DEPTH S9.5C
D1	4" I19.0C
D2	VAR. DEPTH I19.0C
E1	5" B25.0C
E2	VAR. DEPTH B25.0C
R1	2'-6" CURB AND GUTTER
R2	1'-6" CURB AND GUTTER
S	6" CONCRETE GREENWAY
S1	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (1.5")
V1	MILLING (INCIDENTAL)
W	WEDGING

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



TYPICAL SECTION NO. 11
 -Y6- STA. 200+00.00 TO -Y6- STA. 203+97.11

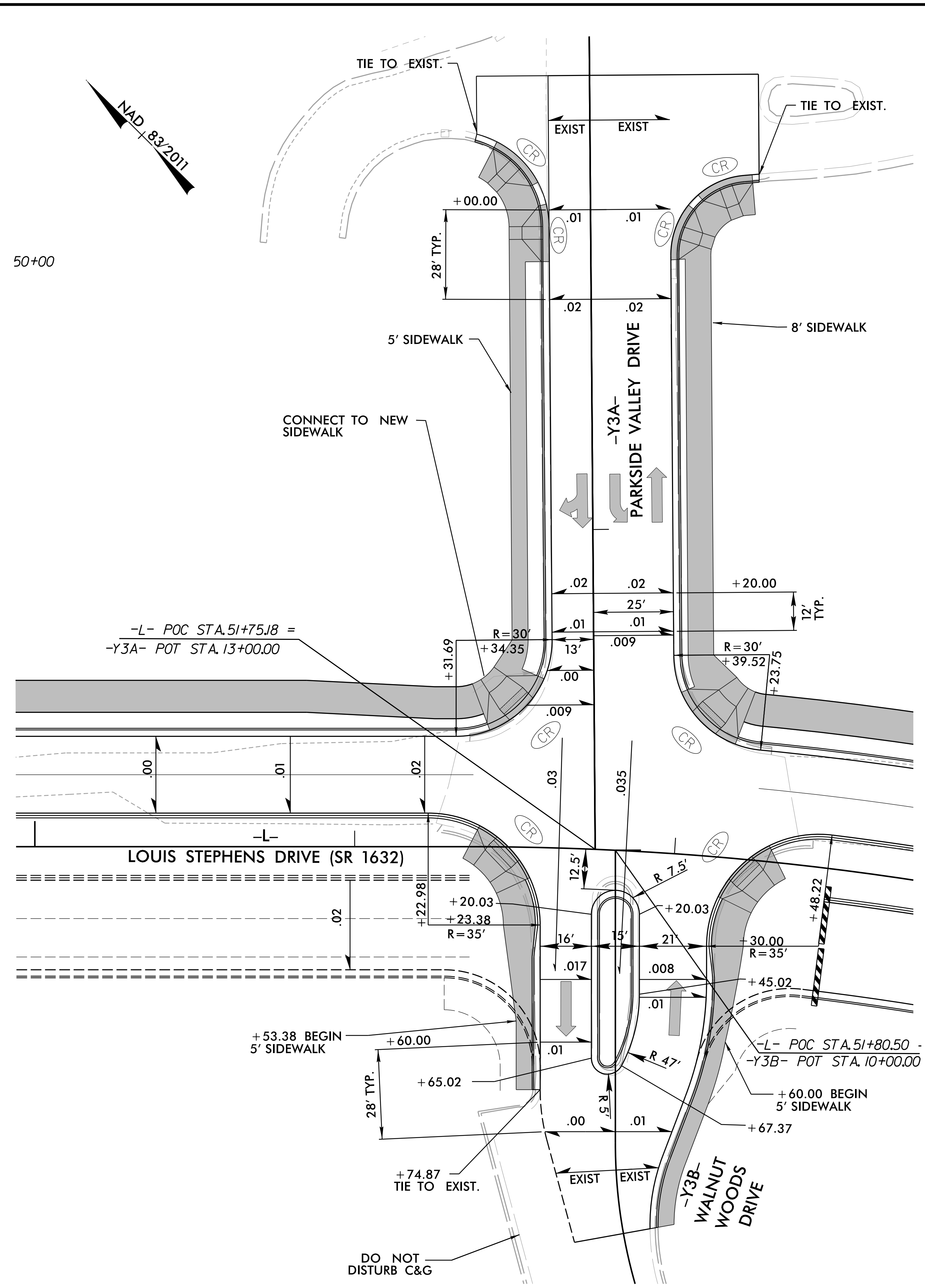


TYPICAL SECTION NO. 12
 -Y6- STA. 203+97.11 TO -Y6- STA. 205+83.96
 NOTE: TRANSITION FROM EXISTING SHOULDER TO EXISTING CURB & GUTTER
 -Y6- STA. 203+97.11 TO -Y6- STA. 204+43.00 LT

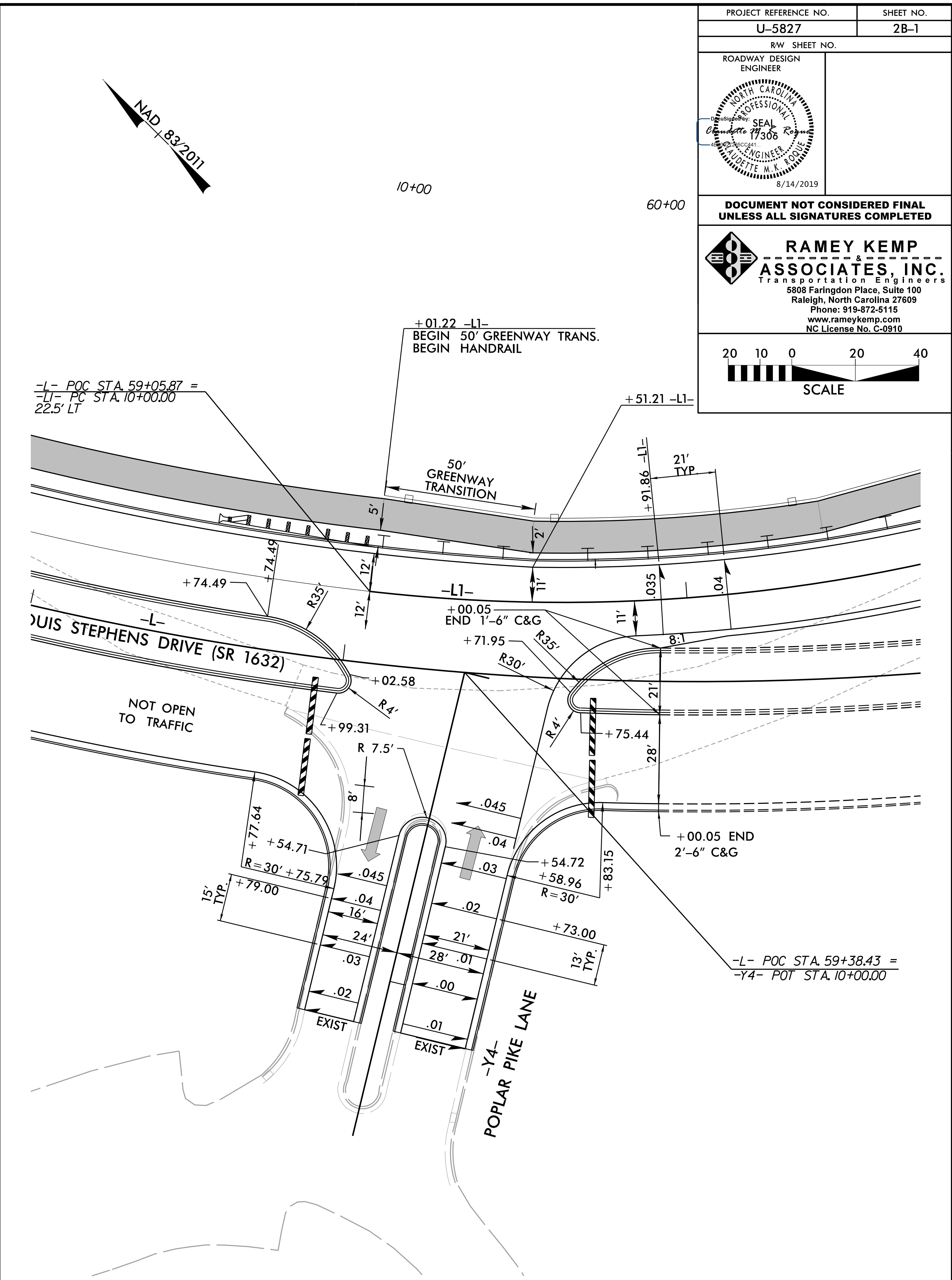
- NOTES:
1. SEE PLANS FOR LOCATION OF TURN LANES AND TAPERS.
 2. SEE PLANS FOR RADII TURNOUTS AT INTERSECTIONS.
 3. SEE PLANS FOR LOCATION OF SIDEWALK/GREENWAY TRANSITIONS.

8/17/19

PROJECT REFERENCE NO. U-5827	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	
<p>RAMEY KEMP ASSOCIATES, INC. Transportation Engineers 5808 Faringdon Place, Suite 100 Raleigh, North Carolina 27609 Phone: 919-872-5115 www.rameykemp.com NC License No. C-0910</p>	
<p>SCALE</p>	



FOR -Y3A- & -Y3B- PLANS, SEE SHEET 6



INTERSECTION DETAILS

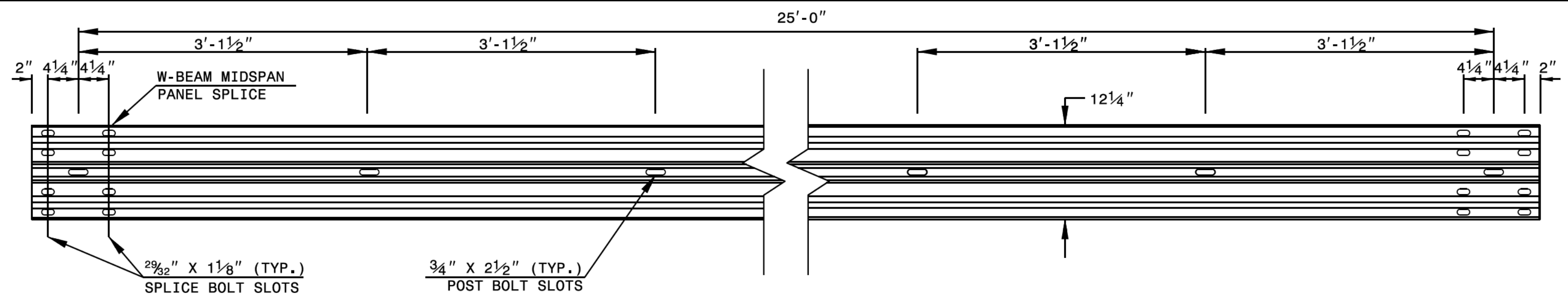
FOR -Y4- PLAN, SEE SHEET 7

5/1/2019 11:11 AM I:\Projects\U5827_Rdwy\2B-1.dgn User: KM/ISE

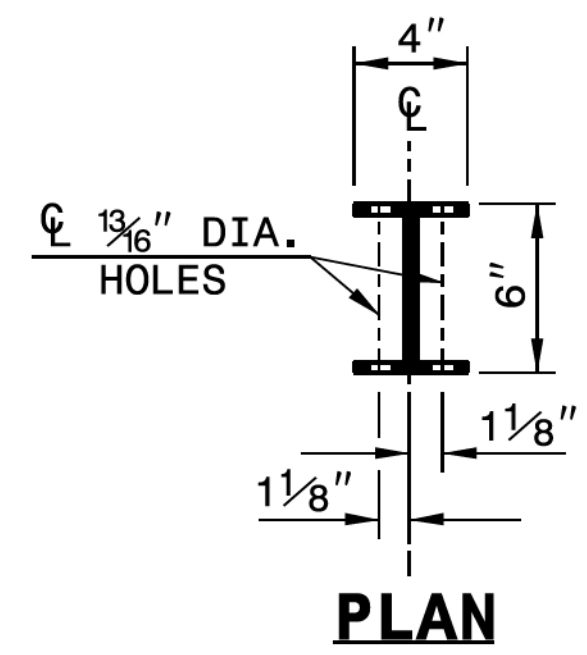
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

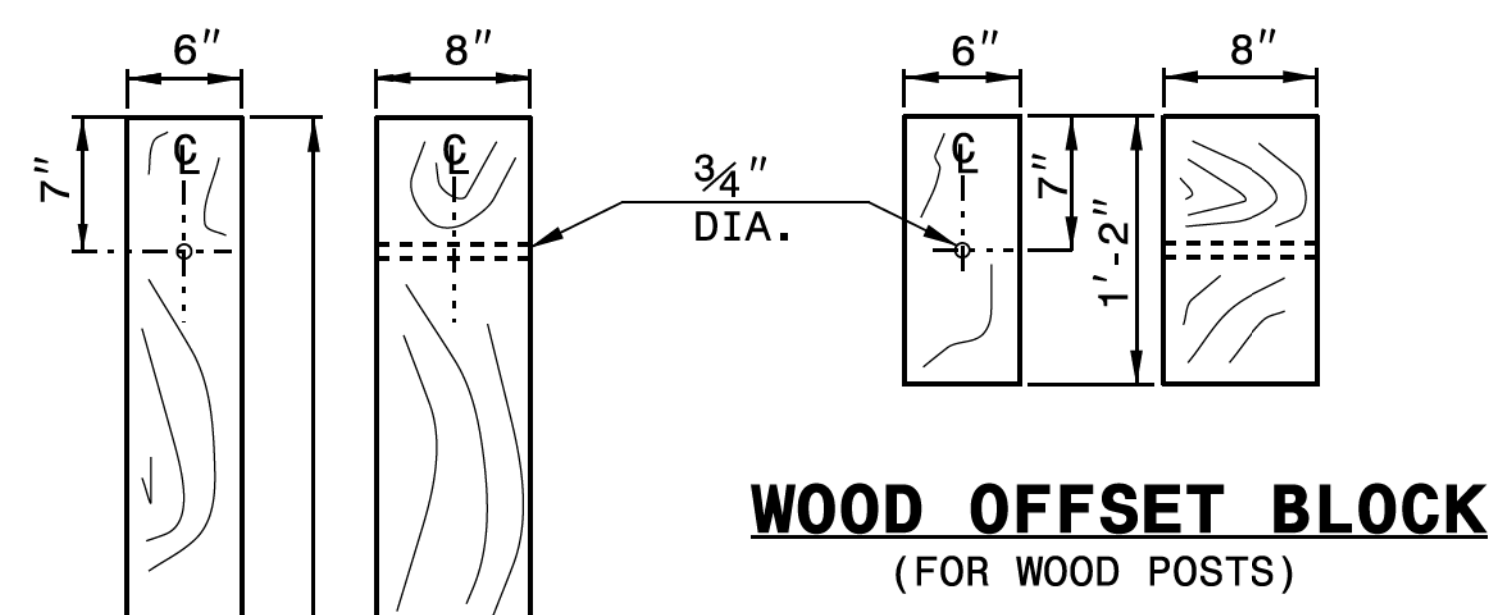
SHEET 6 OF 8
862D02



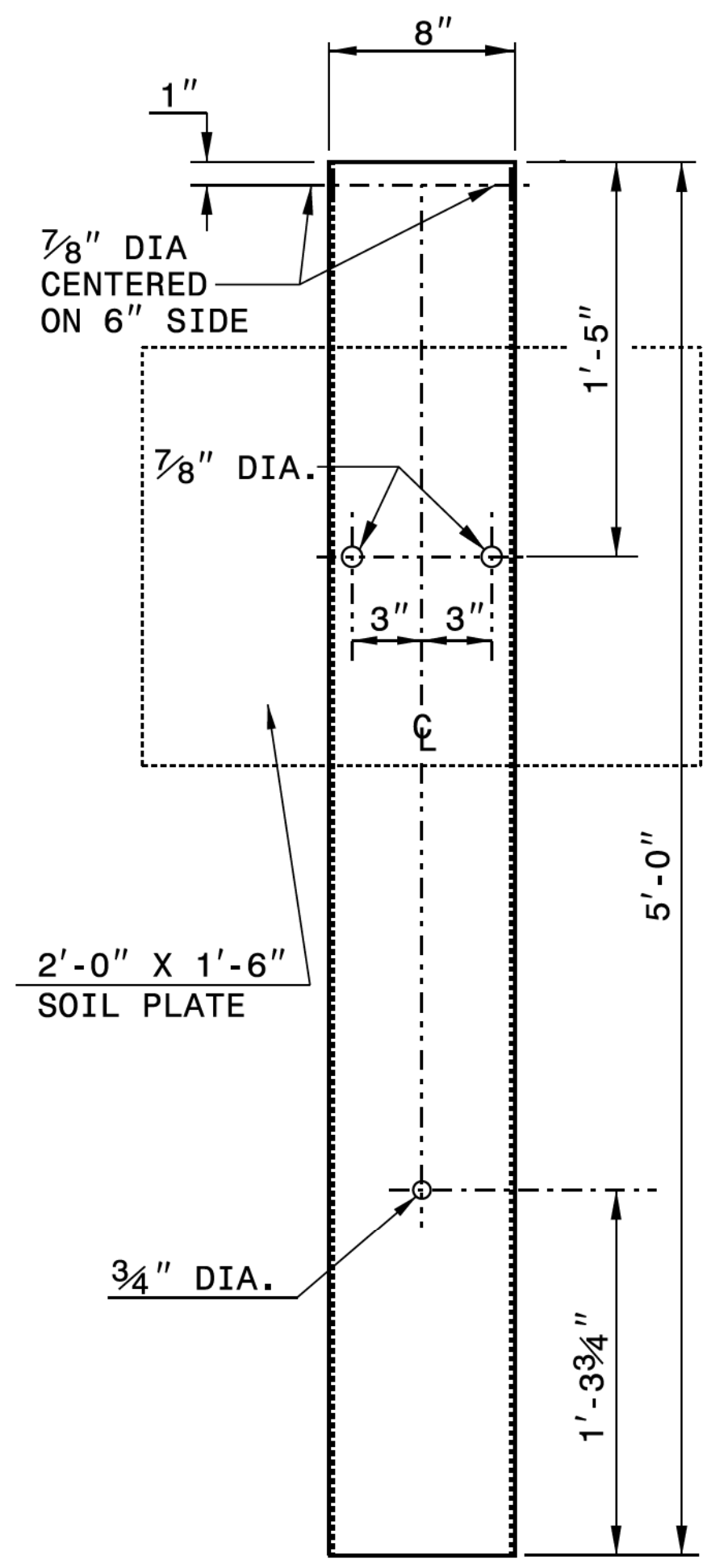
STANDARD W-BEAM GUARDRAIL



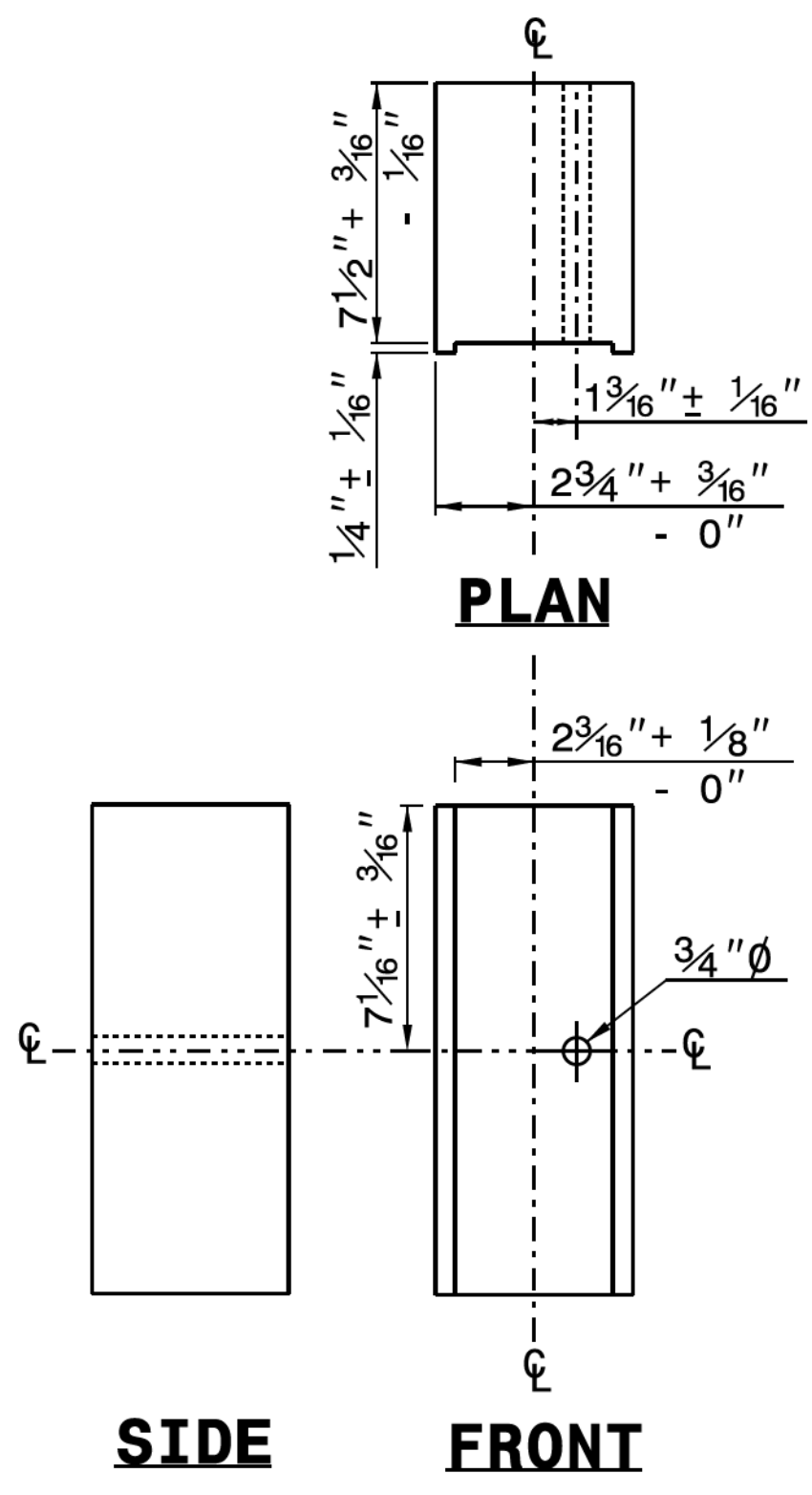
PLAN



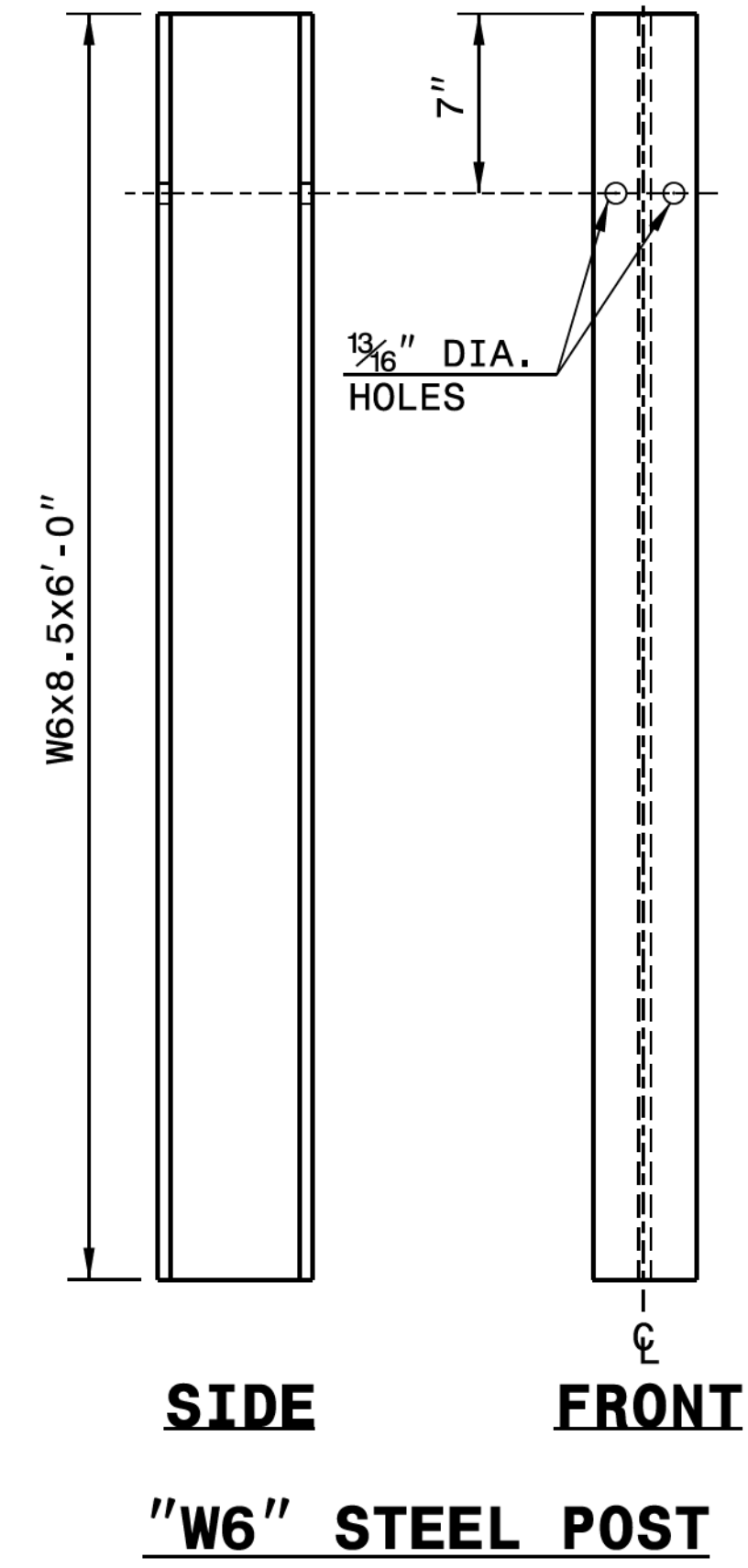
**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**



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



**ROUTED
OFFSET BLOCK**



"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

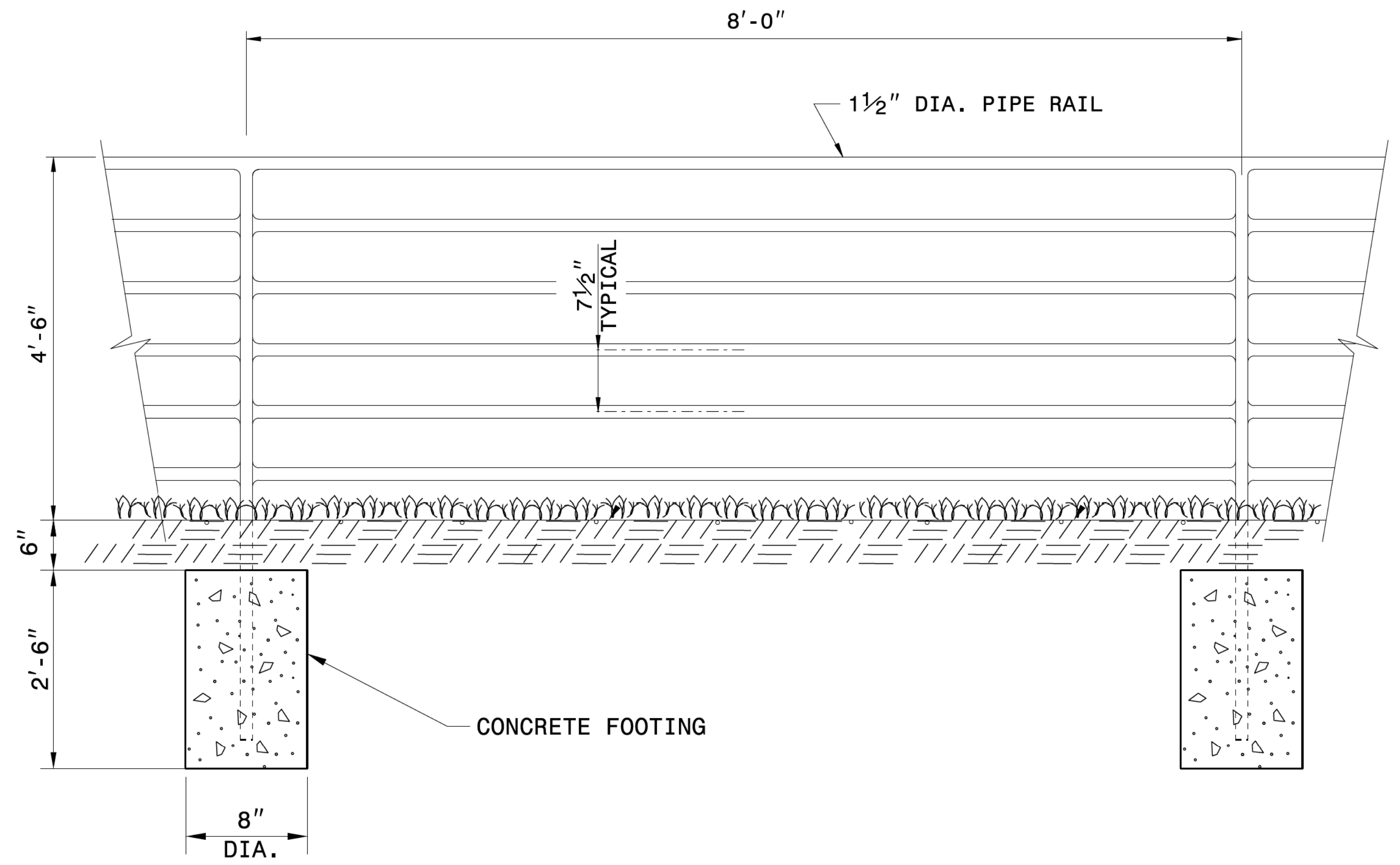
SHEET 6 OF 8
862D02



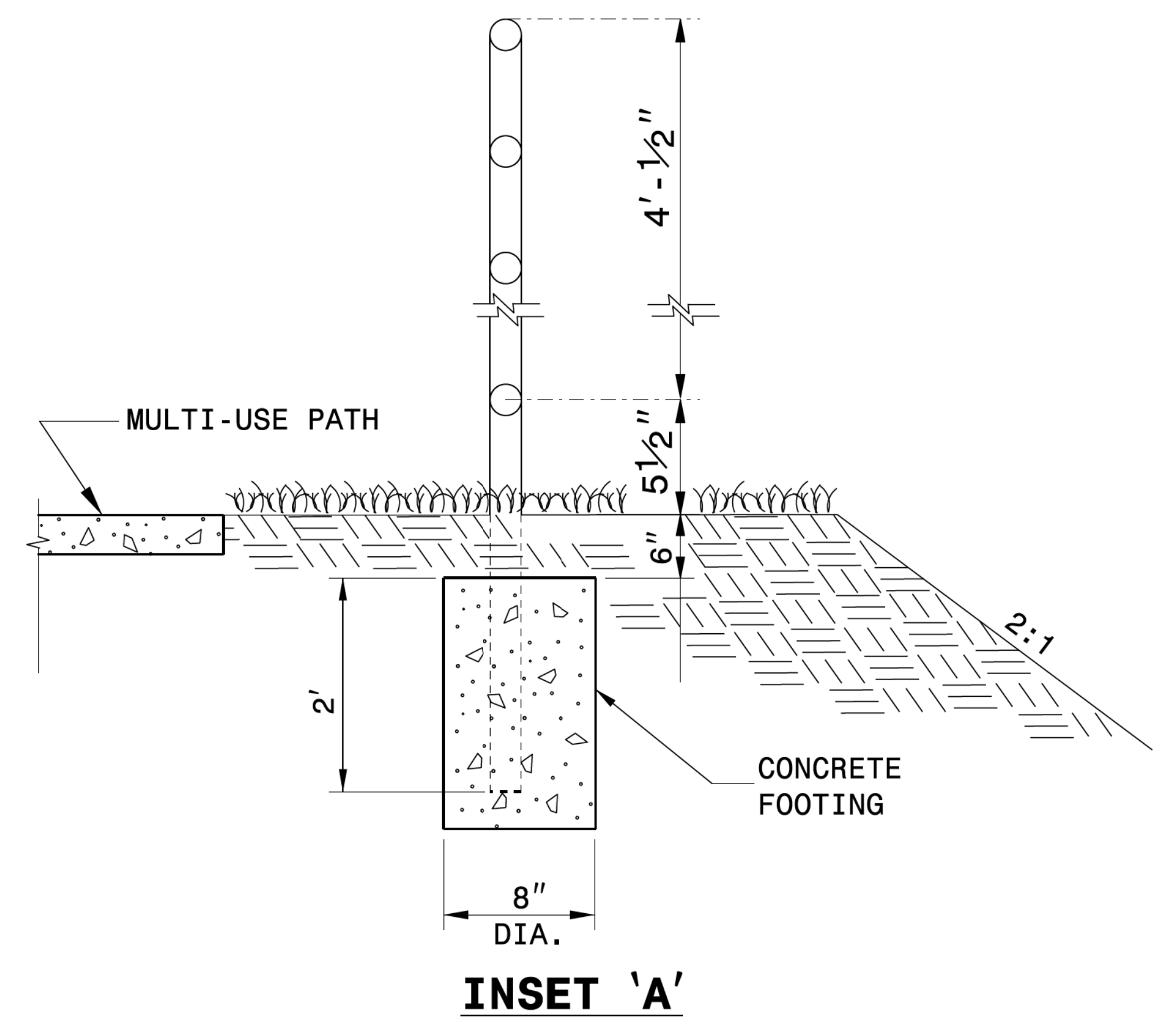
**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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



ELEVATION OF HANDRAIL



NOTES:

CONSTRUCT PROPOSED STEEL PIPE RAIL OF 1 1/2" DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.

REPAIR GALVANIZING IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS.

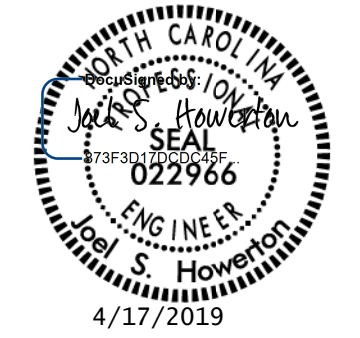
PAINT, IF REQUIRED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 1080 OF THE STANDARD SPECIFICATIONS.

WELD IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.

USE CLASS 'B' CONCRETE FOR HANDRAIL FOOTINGS.

PLACEMENT OF HANDRAIL IN RELATION TO SHOULDER BREAK POINT AND PATH MAY BE MODIFIED AS DIRECTED BY THE ENGINEER.

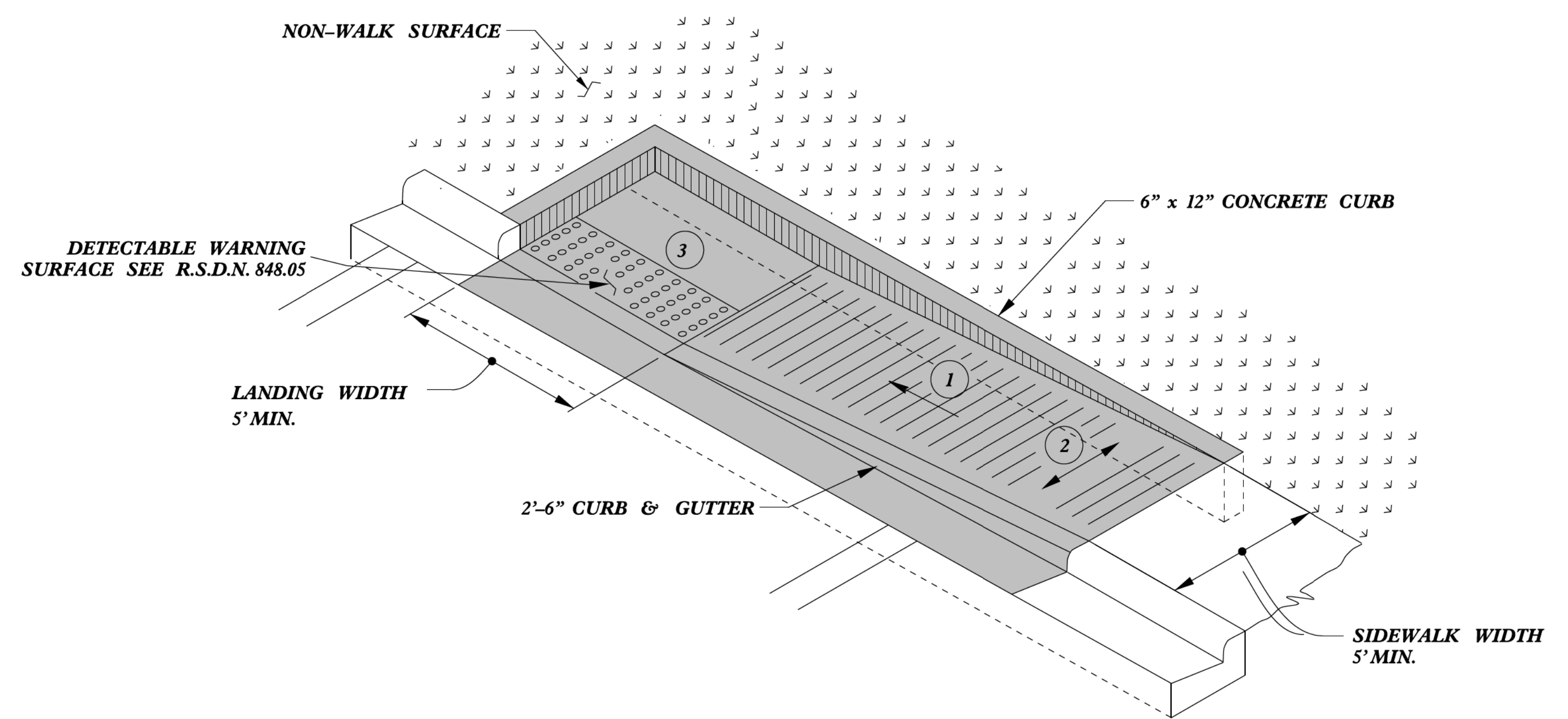
25-JAN-2018 07:30 S:\Contracts\Special Details\Howerton\Handrail Adjacent to Sidewalk.dgn jhowerton AT CSD-292595



CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
PROPOSED BIKE/PED SAFETY RAIL	
ORIGINAL BY: E.E. WARD	DATE: 12-99
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: jhowerton/handrail adjacent to sidewalk.dgn	

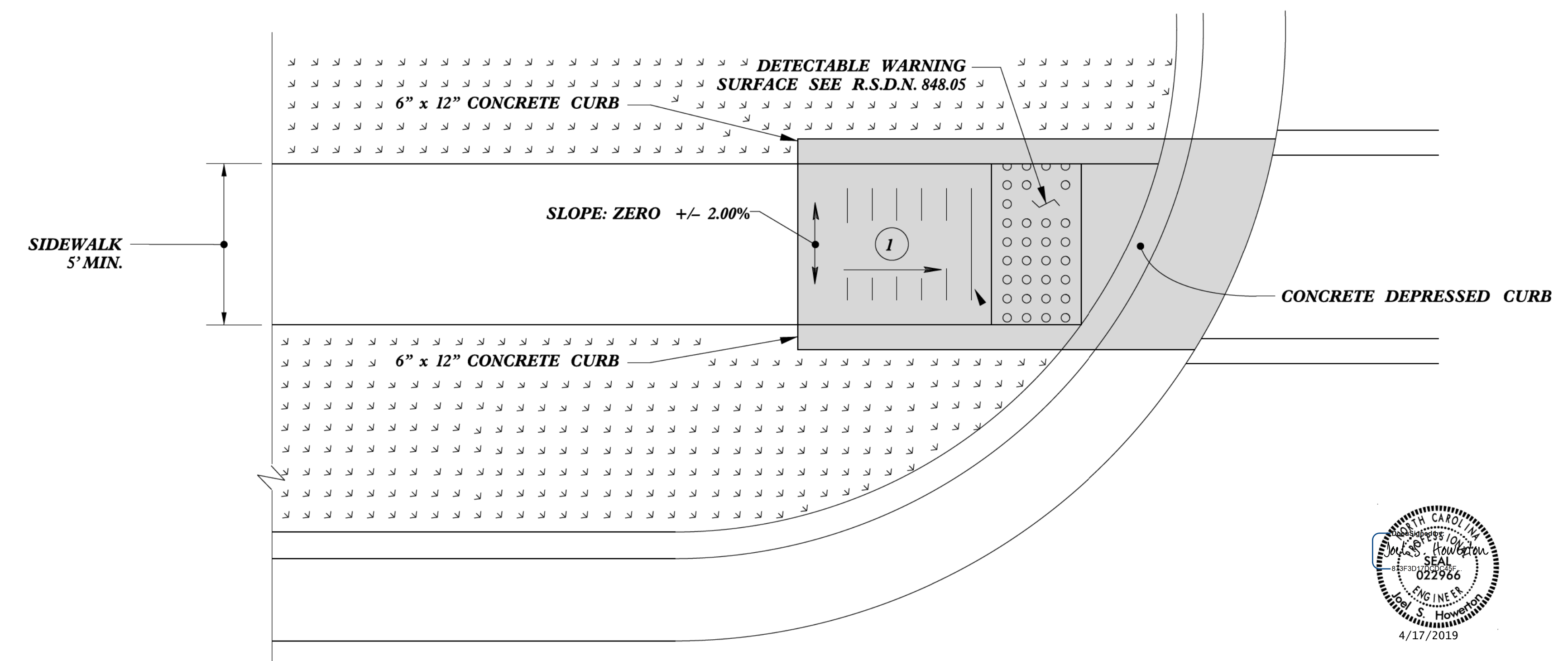
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99



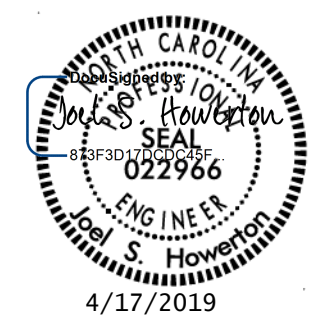
PAY LIMITS FOR 1 CURB RAMP

TYPE 1A



TYPE 1 Modified

- 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.



CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
CURB RAMPS	
Directional Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC: .stds/2012CurbRamp/CurbRampDetails.dgn	

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

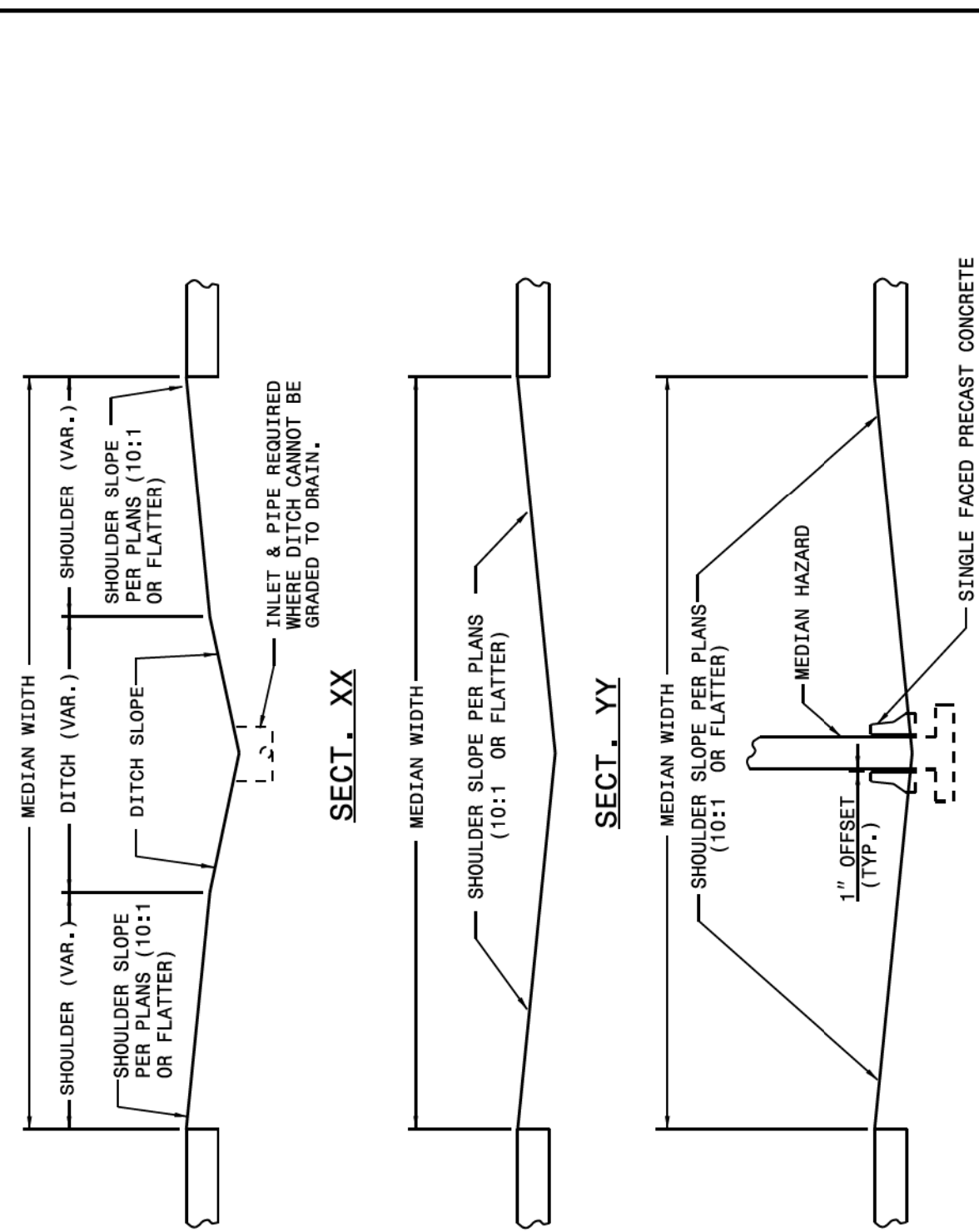
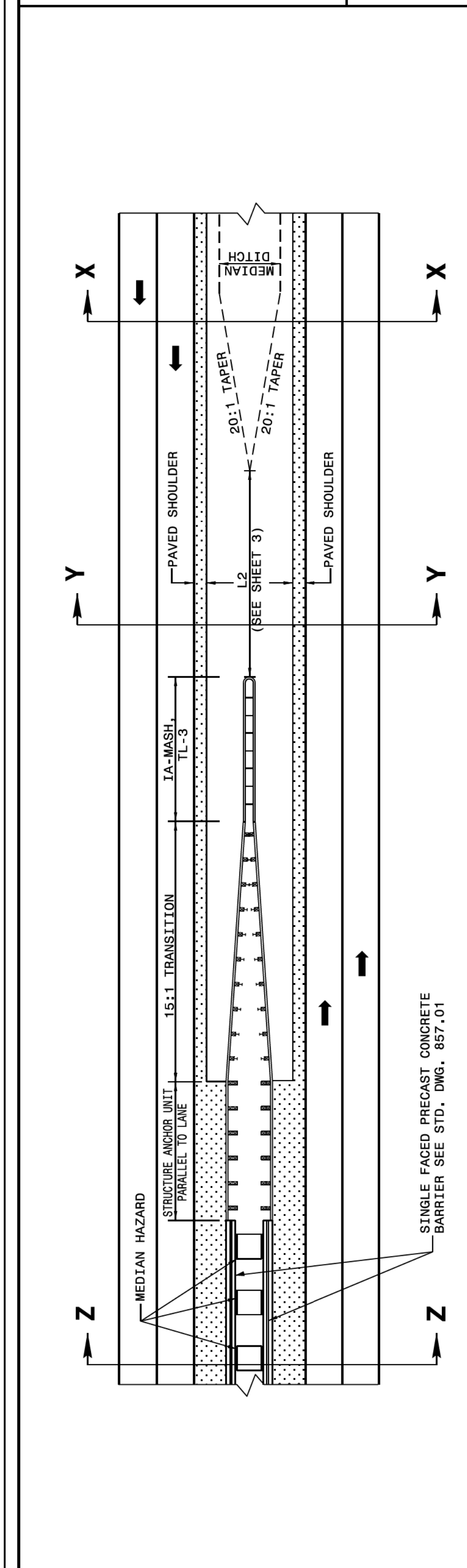
SYSTEM GENERATED USER NAME

Q4_SEF-2018_0831
 S:\Contracts\2018\Special Details\Howerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\862D01 Impact Attenuator- Sheets 1 and 2.dgn
 Howerton

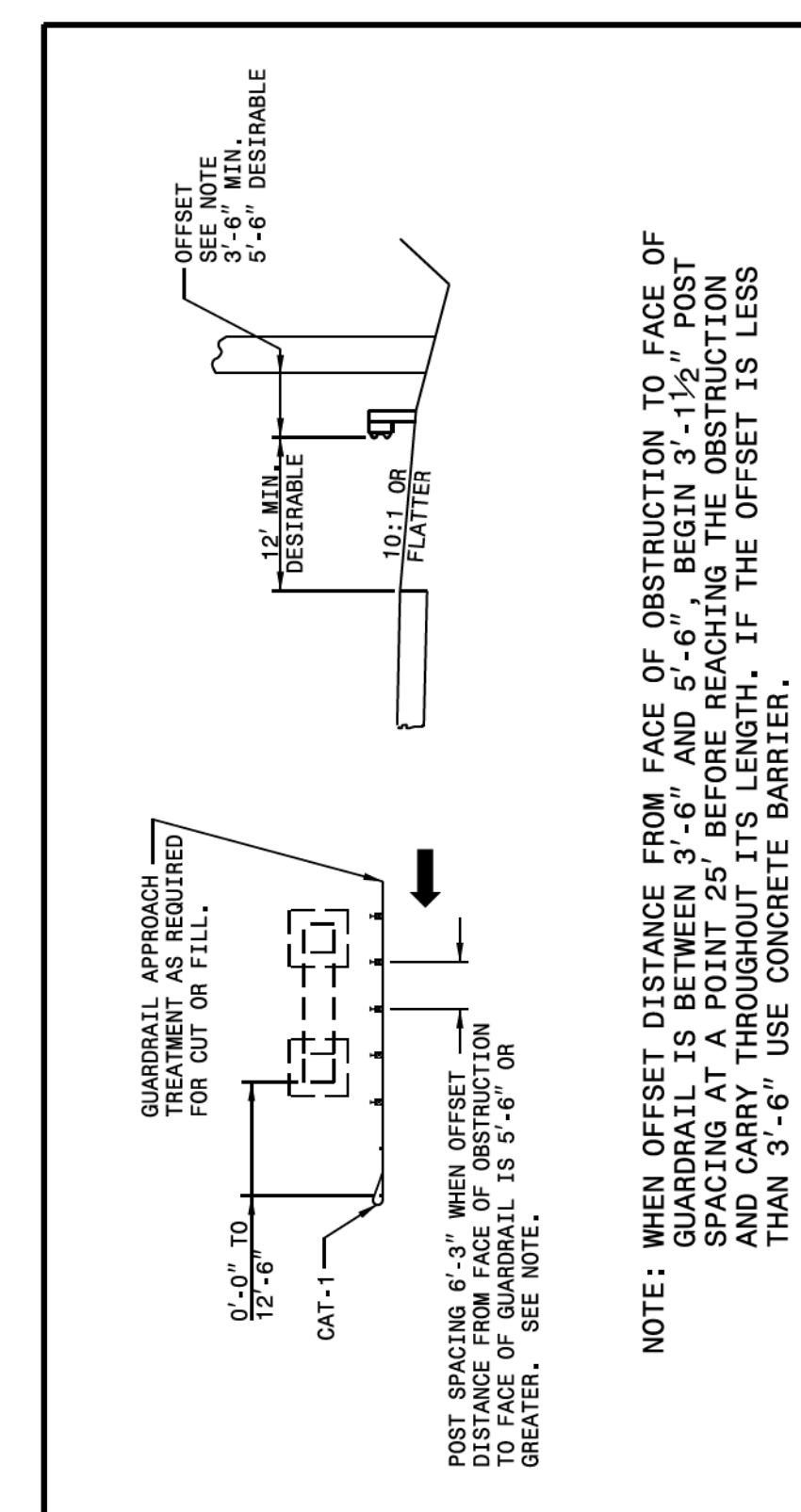
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01



DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS



DETAIL OF MEDIAN TREATMENT AT UNDERPASS

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

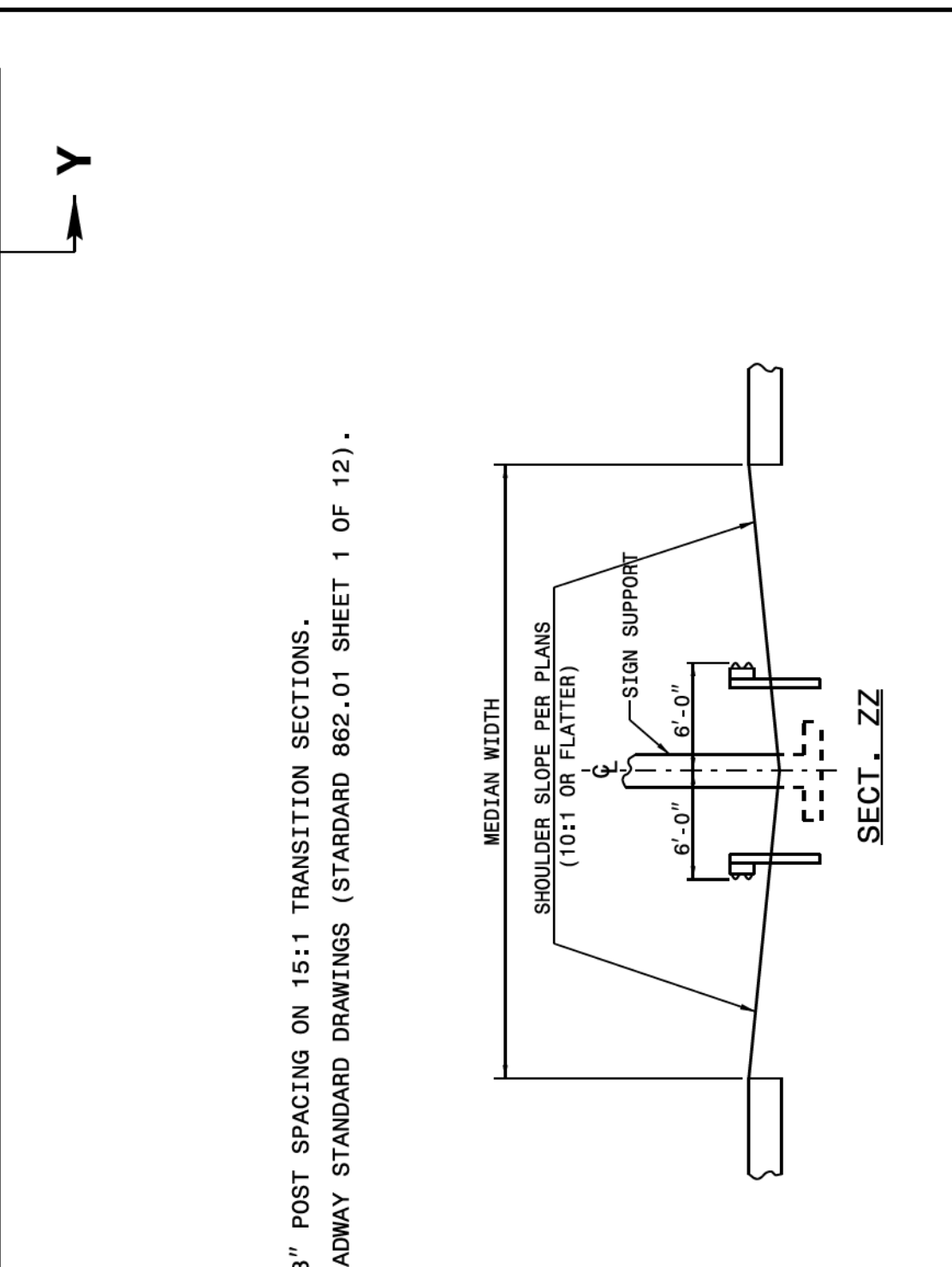
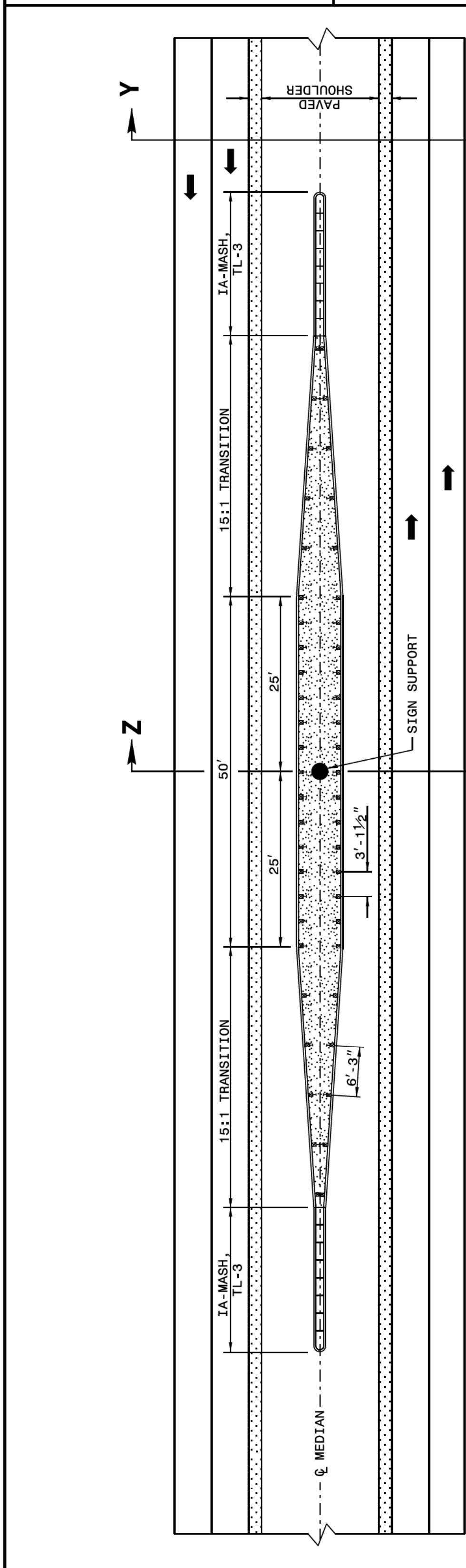
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01



DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

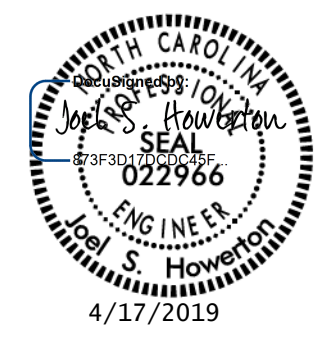
SHEET 2 OF 11
862D01

DOCUMENT NOT CONSIDERED FINAL
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**CONTRACT STANDARDS
 AND DEVELOPMENT UNIT**
 Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

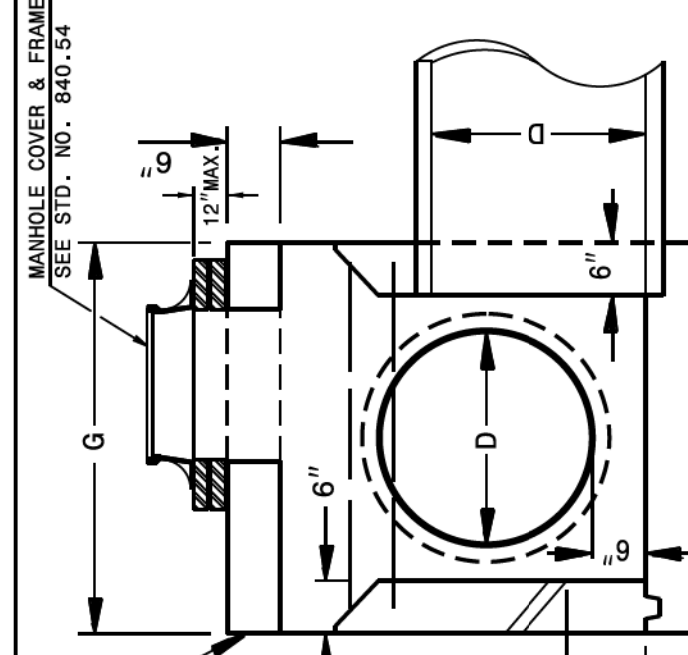
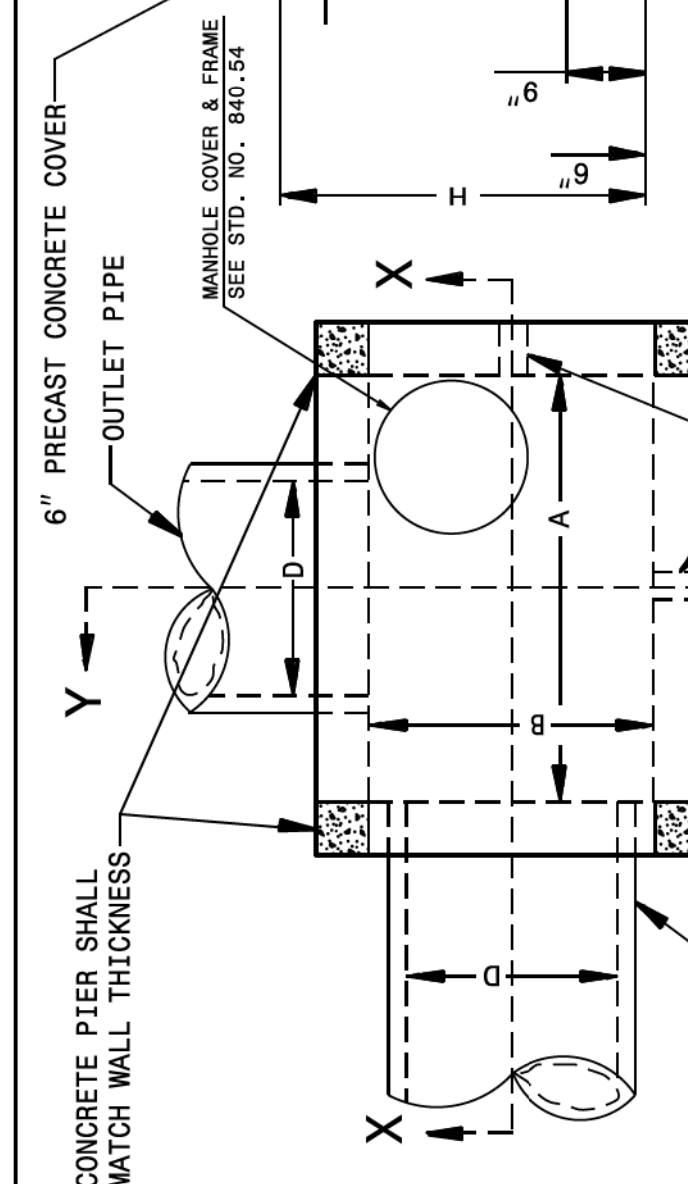
ORIGINAL BY: J. HOWERTON DATE: 08-23-18
 MODIFIED BY: DATE: _____
 CHECKED BY: DATE: _____
 FILE SPEC.: _____



24-APR-2019 07:24
 S:\Contracts\Contractors\Spec\01 Details\h0verton\840d04 3 or 4 side OTC.dgn
 h0verton AT CSU-292595

5/14/99

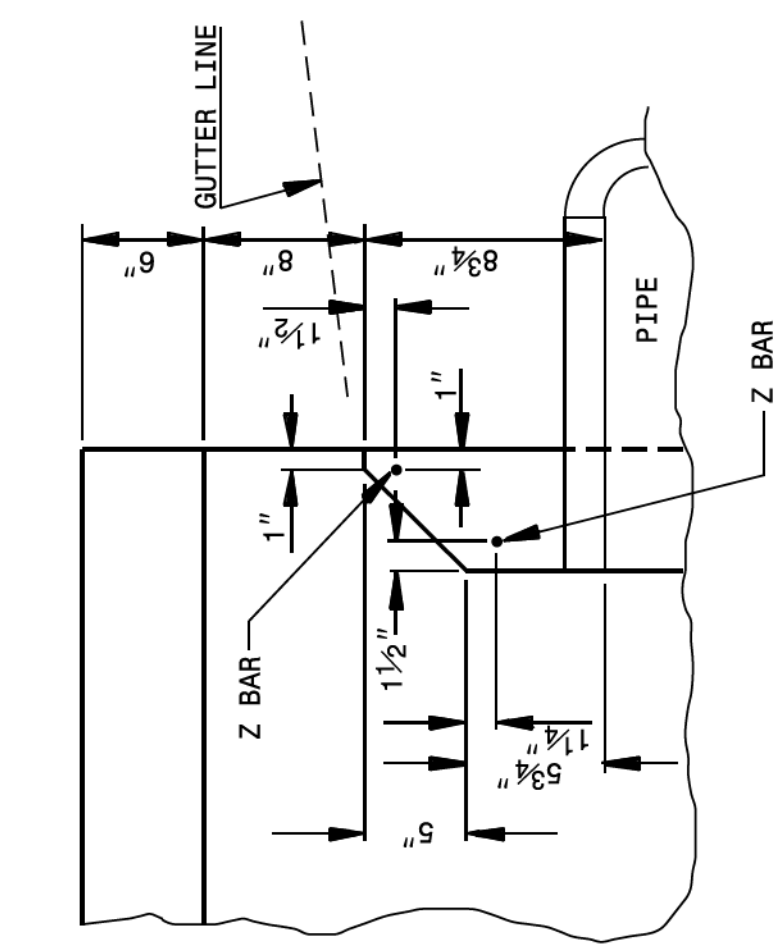
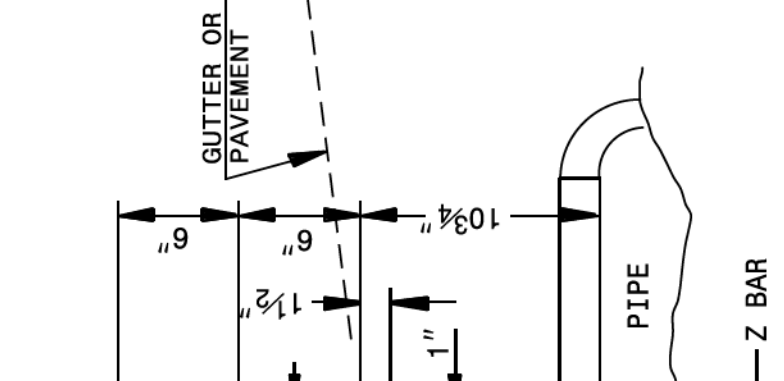
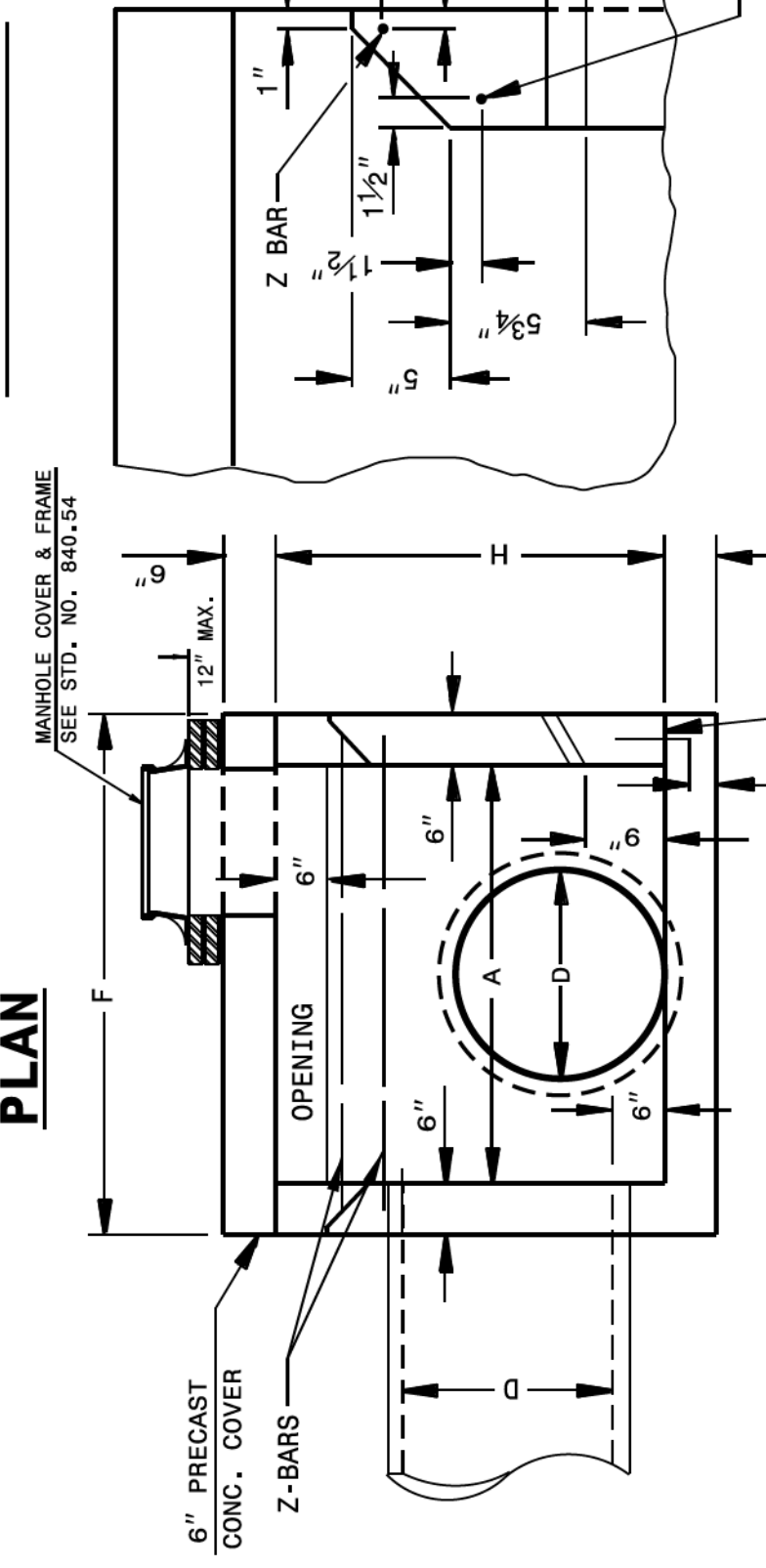
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.



GENERAL NOTES:
 ALL CATCH BASINS OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. 840.86. ALL EXPOSED CORNERS TO BE CHAMFERED 1". CLASS "B" CONCRETE TO BE USED THROUGHOUT.
 2" PIPE WEEPHOLES TO BE PLACED AS DIRECTED BY ENGINEER. THE 6" OPENING SHOWN MAY BE INCREASED TO 8" MAXIMUM IF DEEMED TO BE NECESSARY BY THE ENGINEER.
 OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #5 BAR DOWELS FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.
 A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE. FOR 8" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. QUANTITIES TO BE ADJUSTED ACCORDINGLY.
 DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

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

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
 (3 OR 4 SIDE OPEN THROAT)
 (MANHOLE OPTIONAL)



PART SECTION Y-Y
 SHOWING METHOD OF CONSTRUCTION FOR 6" OPENING

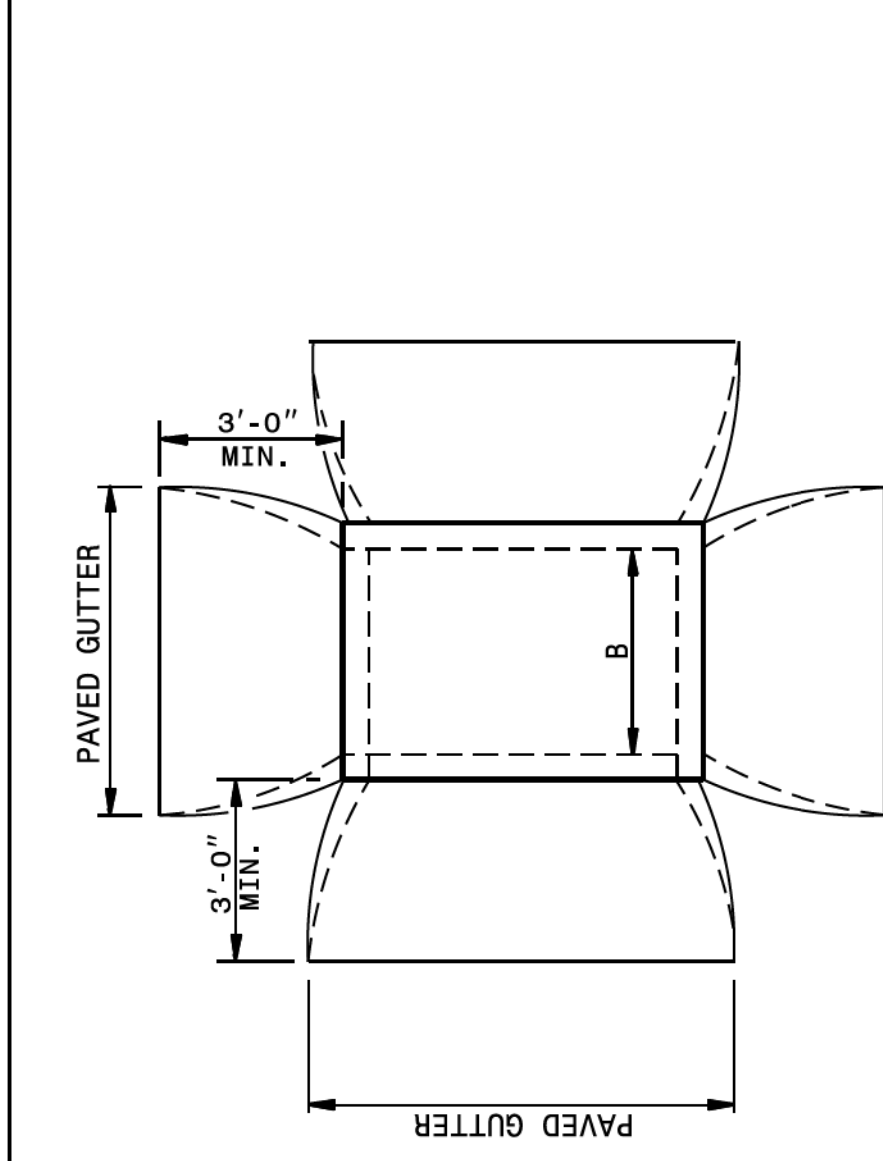
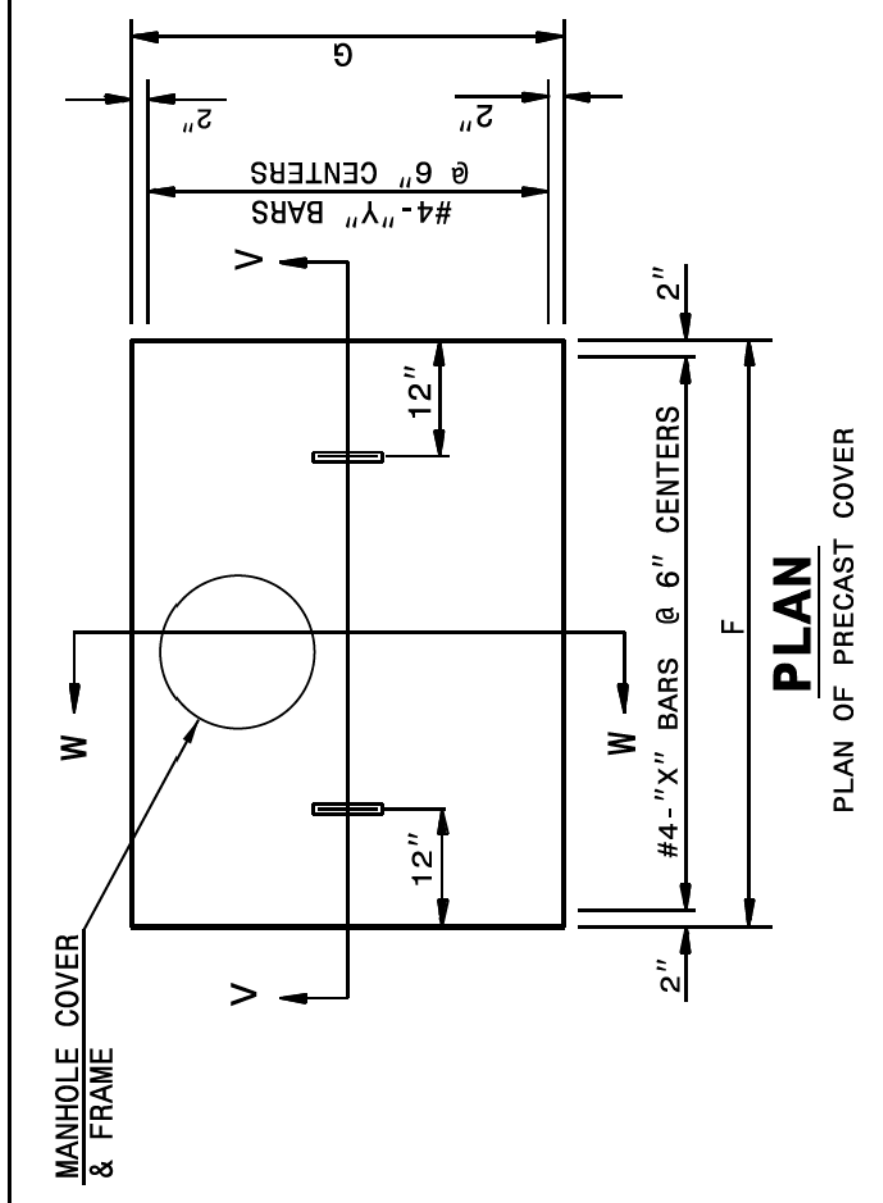
PART SECTION Y-Y
 SHOWING METHOD OF CONSTRUCTION IF INCREASED OPENING IS USED

PIPE DIM'S OF BOX & PIPE	MIN. DIMENSIONS AND REINFORCING		TOP & BOT. SLAB DIMENSIONS		CU. YDS. CONC. IN BOX		TOTAL QUANTITIES BOX & SLABS		DEDUCTION ONE PIPE		DED ONE 6" THROAT OPENING					
	SPAN	WIDTH	NO.	LENGTH	NO.	LENGTH	CU. YDS.	REINFC. (LBS.)	REINFC. (SQ. FT.)	R. O.		R. O.				
12"	3'-6"	2'-3"	4	3'-0"	6	4'-3"	2	4'-3"	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15"	3'-6"	2'-3"	4	3'-0"	6	4'-3"	2	4'-3"	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18"	4'-0"	2'-8"	5	3'-5"	7	4'-9"	2	4'-9"	0.226	0.340	0.284	35	1.379	0.033	0.049	0.063
24"	4'-0"	2'-8"	5	3'-5"	7	4'-9"	2	4'-9"	0.226	0.340	0.284	35	1.521	0.059	0.085	0.063
30"	4'-0"	3'-6"	5	4'-3"	9	4'-9"	2	4'-9"	0.278	0.417	0.315	43	1.916	0.092	0.127	0.063
36"	4'-6"	4'-0"	5	4'-9"	10	5'-3"	2	5'-3"	0.340	0.510	0.362	51	2.390	0.132	0.178	0.066
42"	5'-0"	4'-6"	5	5'-3"	12	5'-9"	2	5'-9"	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	5	5'-9"	13	5'-9"	2	5'-9"	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066

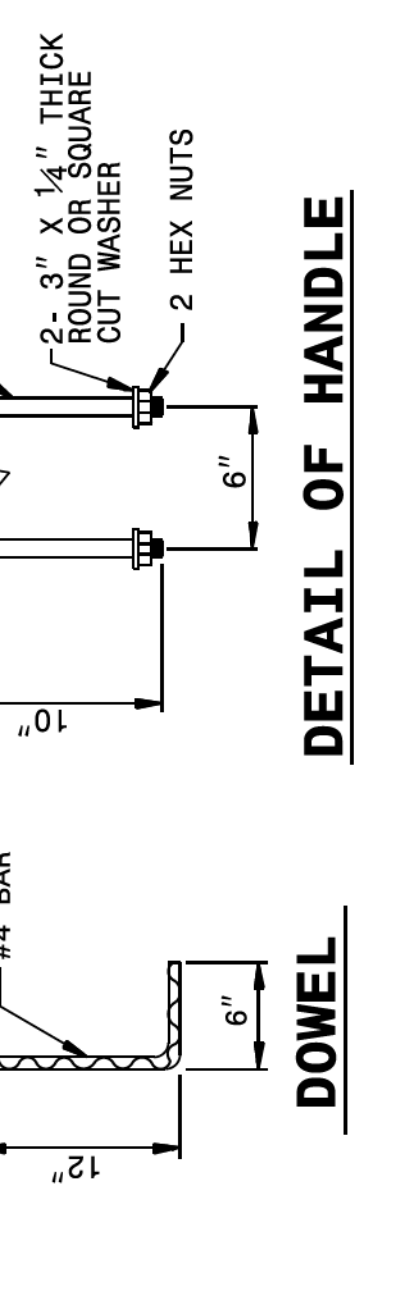
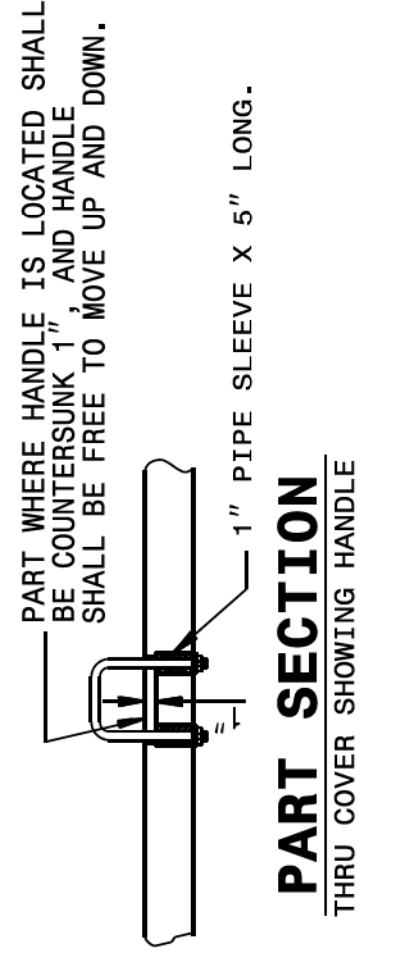
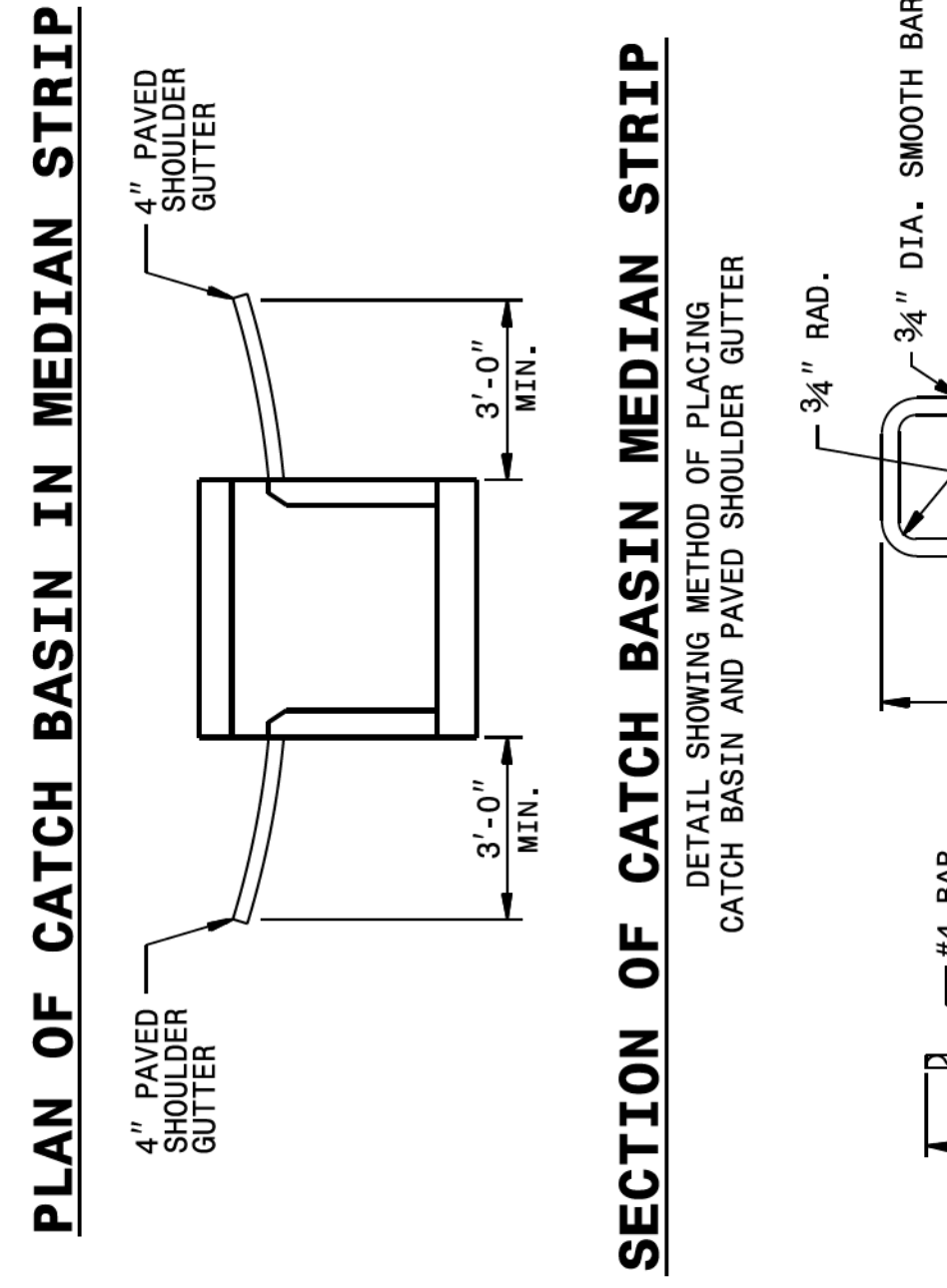
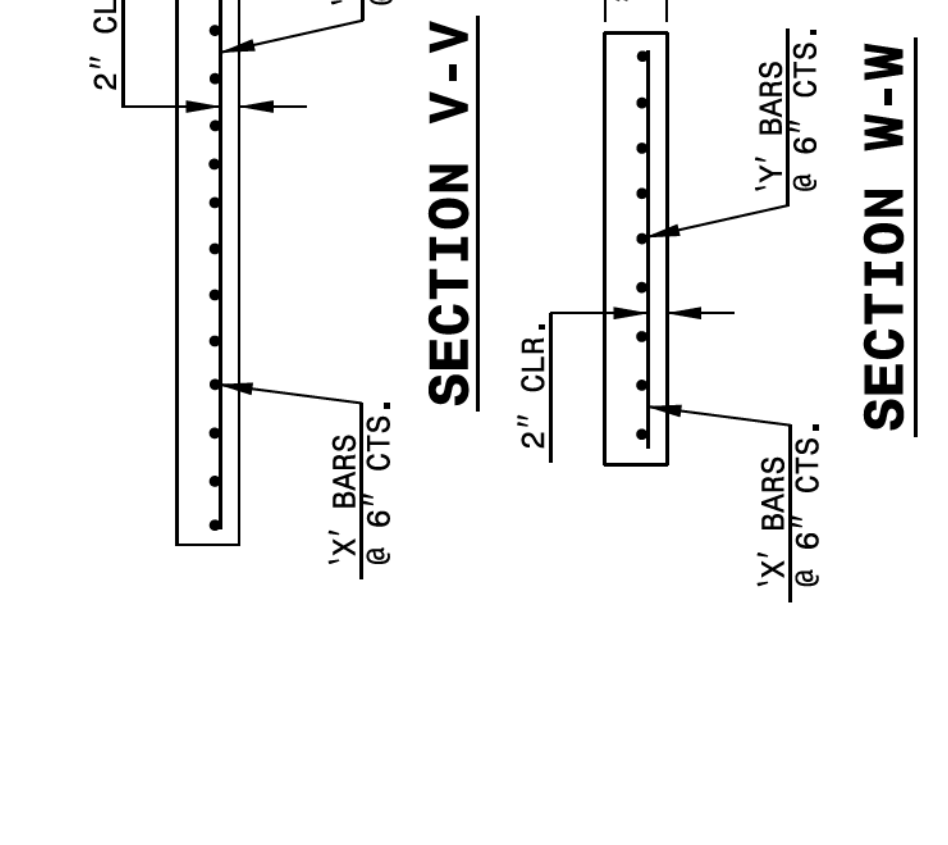
SHEET 1 OF 2
840D04

SHEET 1 OF 2
840D04

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



ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
 (3 OR 4 SIDE OPEN THROAT)
 (MANHOLE OPTIONAL)



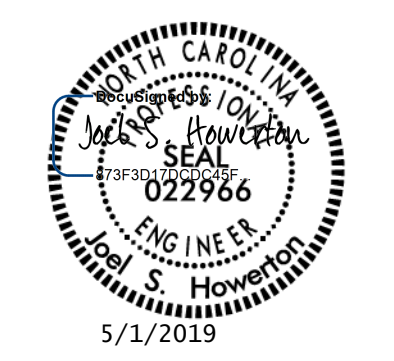
SHEET 2 OF 2
840D04

SHEET 2 OF 2
840D04

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

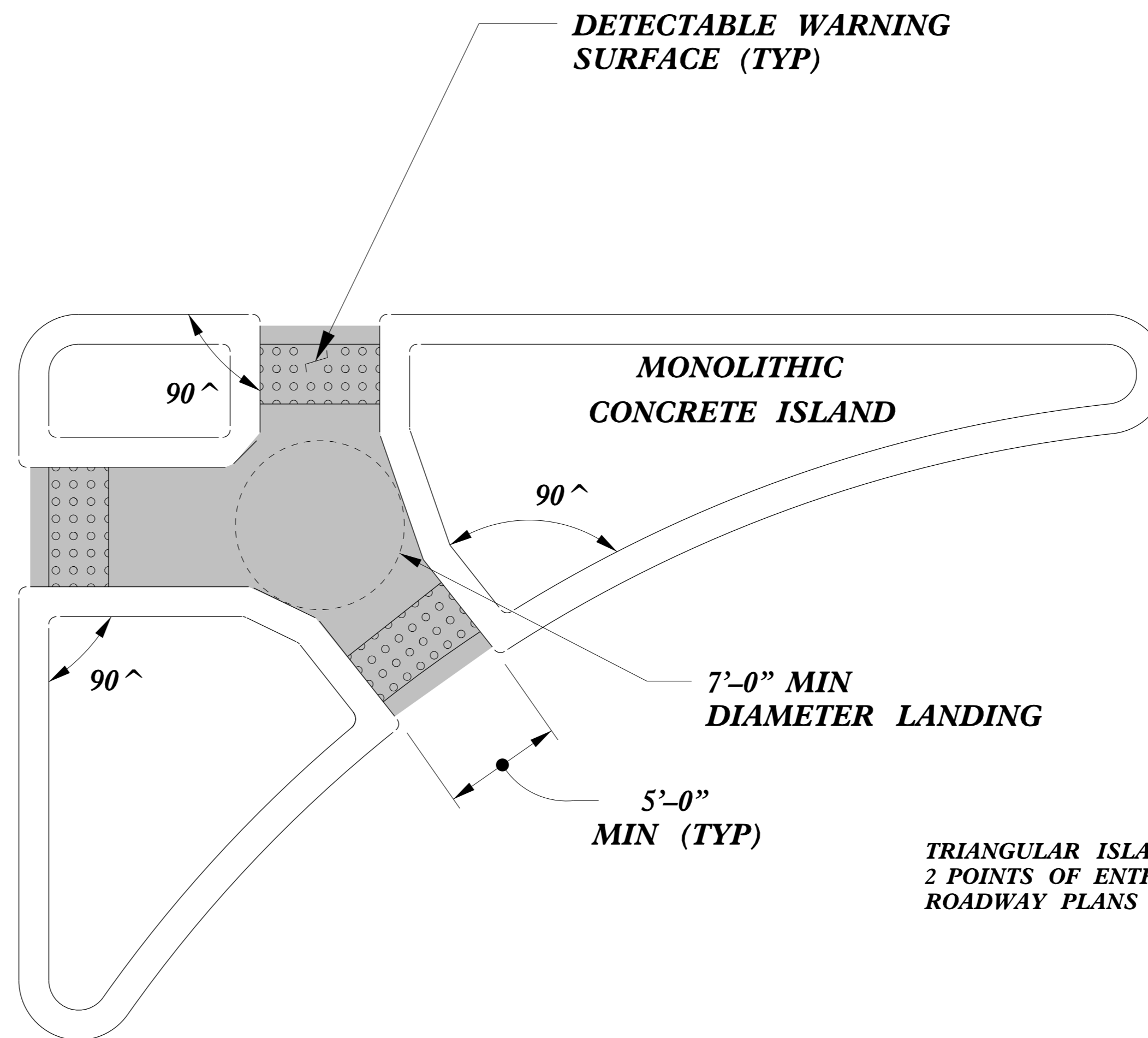
SEE PLATE FOR TITLE

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: rnbritt DATE: 07-03-2014
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/rnbritt/english/hydro/840d04.dgn



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

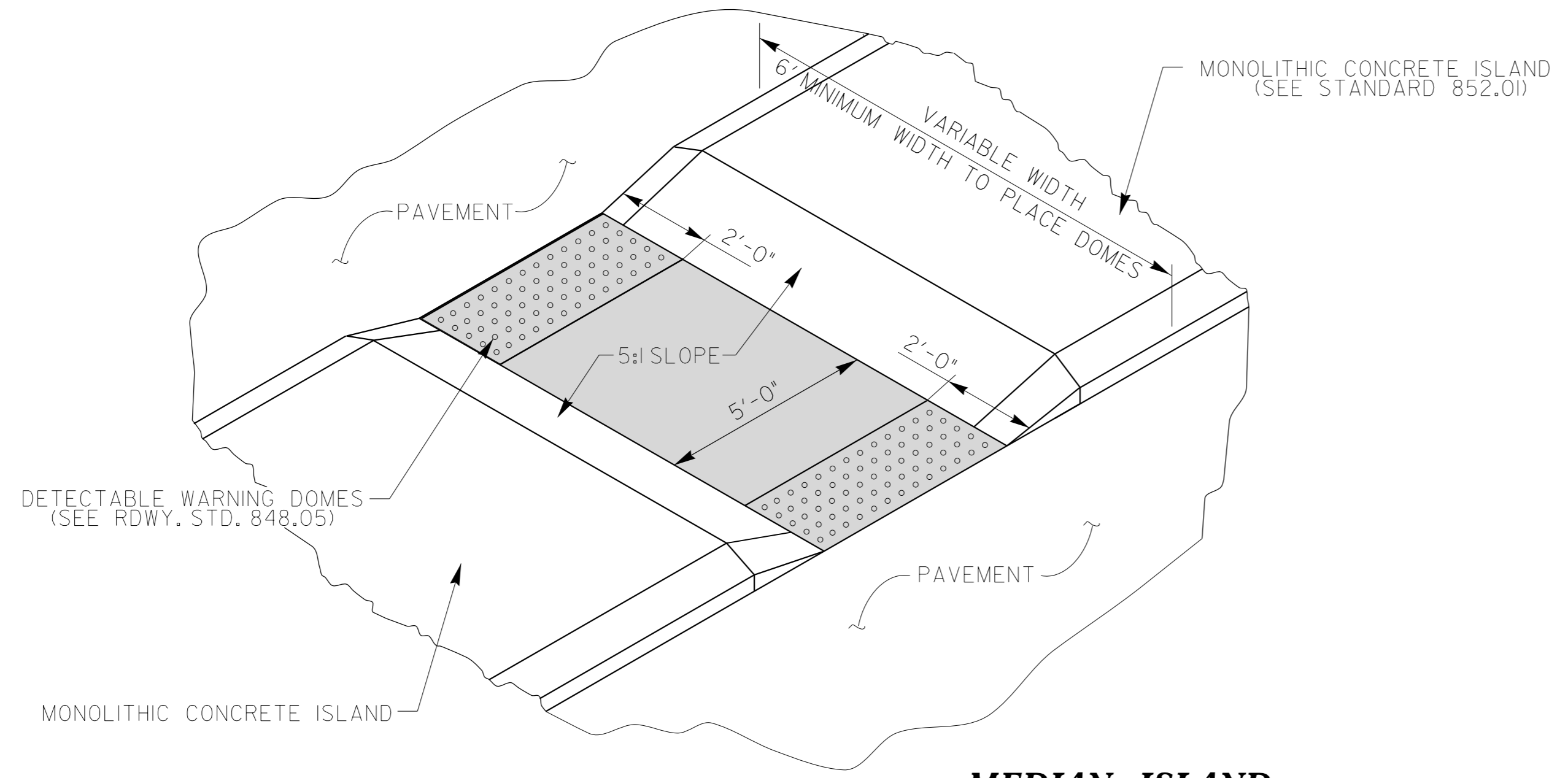
5/14/99



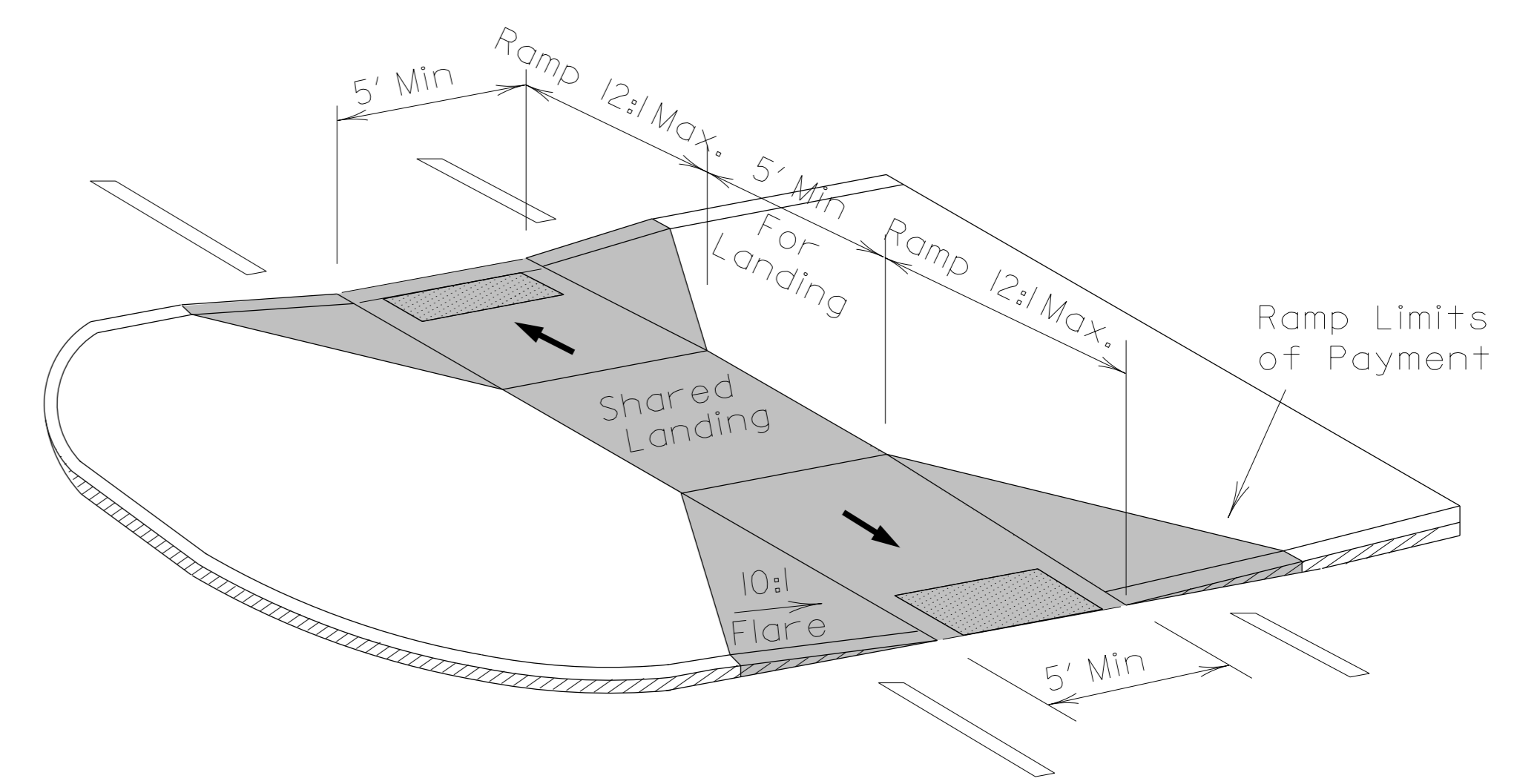
PAY LIMITS FOR 2 OR 3 CURB RAMPS (CALCULATE BASED ON NUMBER OF SETS OF TRUNCATED DOMES)

TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

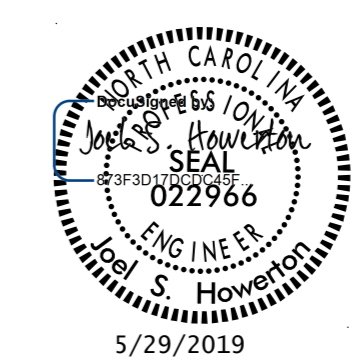
TRIANGULAR ISLAND WITH CUT THROUGH



MEDIAN ISLAND WITH CUT THROUGH



MEDIAN ISLAND CURB RAMPS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CURB RAMPS	
Median or Turn Lane Islands	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn	

TIME: 5/29/2019 10:29:58 AM
 USER: JHOWERTON
 PLOT: 5/29/2019 10:29:58 AM
 PLOTNAME: J:\Projects\2012\2012CurbRamp\CurbRampDetails.dgn

R/W REV. 1: 1/17/19 REVISED PUE ON PARCELS 4,6, & 7. REMOVED PUE ON PARCEL 8. ADDED PUE ON PARCEL 11. ADDED PARCEL 13.
R/W REV. 2: 6/24/19 REVISED R/W, PDE, AND TCE ON PARCEL 2.

COMPUTED BY: Karen Hefner, PE DATE: 06/20/2019
CHECKED BY: Andrew Nottingham, PE DATE: 06/20/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U-5827 SHEET NO. 3D-1

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

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

Main data table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Pipe Types (Drainage, C.S., R.C. Class III, IV, V, Structural Plate), Quantities for Drainage Structures, Frame/Grates, and Remarks. Includes a SHEET TOTALS row at the bottom.

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

REMARKS

RAA/PALDES-14

COMPUTED BY: Karen Hefner, PE DATE: 06/20/2019
CHECKED BY: Andrew Nottingham, PE DATE: 06/20/2019

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. U-5827 SHEET NO. 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)

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, R.C. Pipe Class V, Structural Plate Pipe, Quantities for Drainage Structures, Frame, Grates, and Hood, Concrete Transitional Section, Energy Dissipation Basin, Flowable Fill, Concrete Collars, Concrete and Brick Pipe Plug, and Pipe Removal. Includes a grid for data entry and a summary table at the bottom.

ABBREVIATIONS table listing materials and components such as 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.

SHEET TOTALS and PROJECT TOTALS summary table. SHEET TOTALS: 40, 16, 8, 2, 3.1, 1, 1, 0.5526, 44. PROJECT TOTALS: 64, 16, 88, 1244, 92, 1908, 1088, 48, 46.5, 41, 5, 20, 16, 16, 1, 2, 1, 1, 2, 1, 2, 3, 1, 1.1052, 123.

SAY 1.5 SAY 130

COMPUTED BY: Neil Roberson DATE: June 5, 2019
 CHECKED BY: cmkr DATE: July 3, 2019

PROJECT NO.	SHEET NO.
U-5827	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	1500
				TOTAL LF:	1500

*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 Type 1		200	400	600		
TOTAL CY/TONS/SY:					200	400**	600**	0	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.

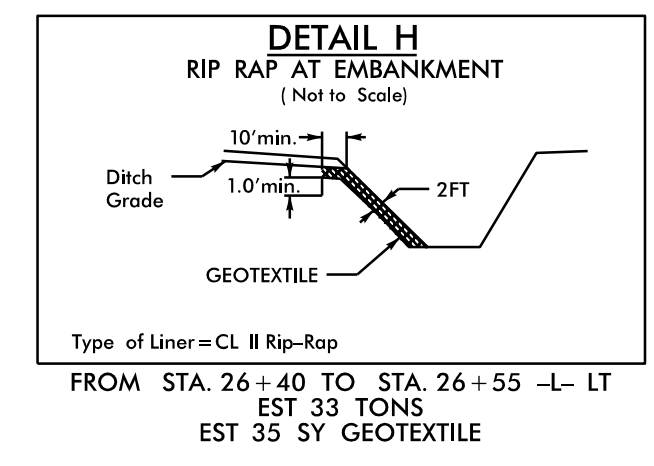
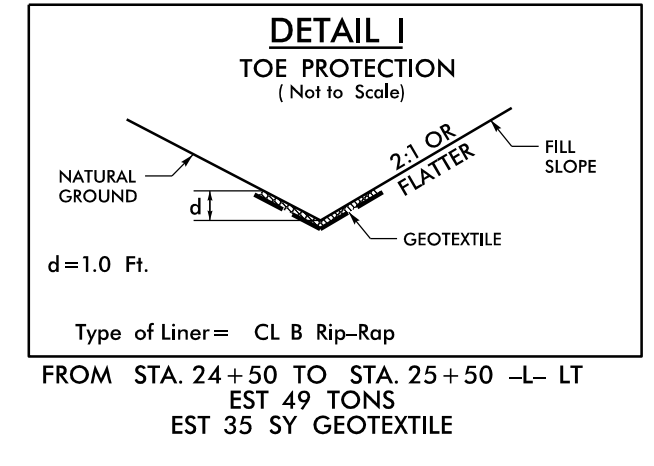
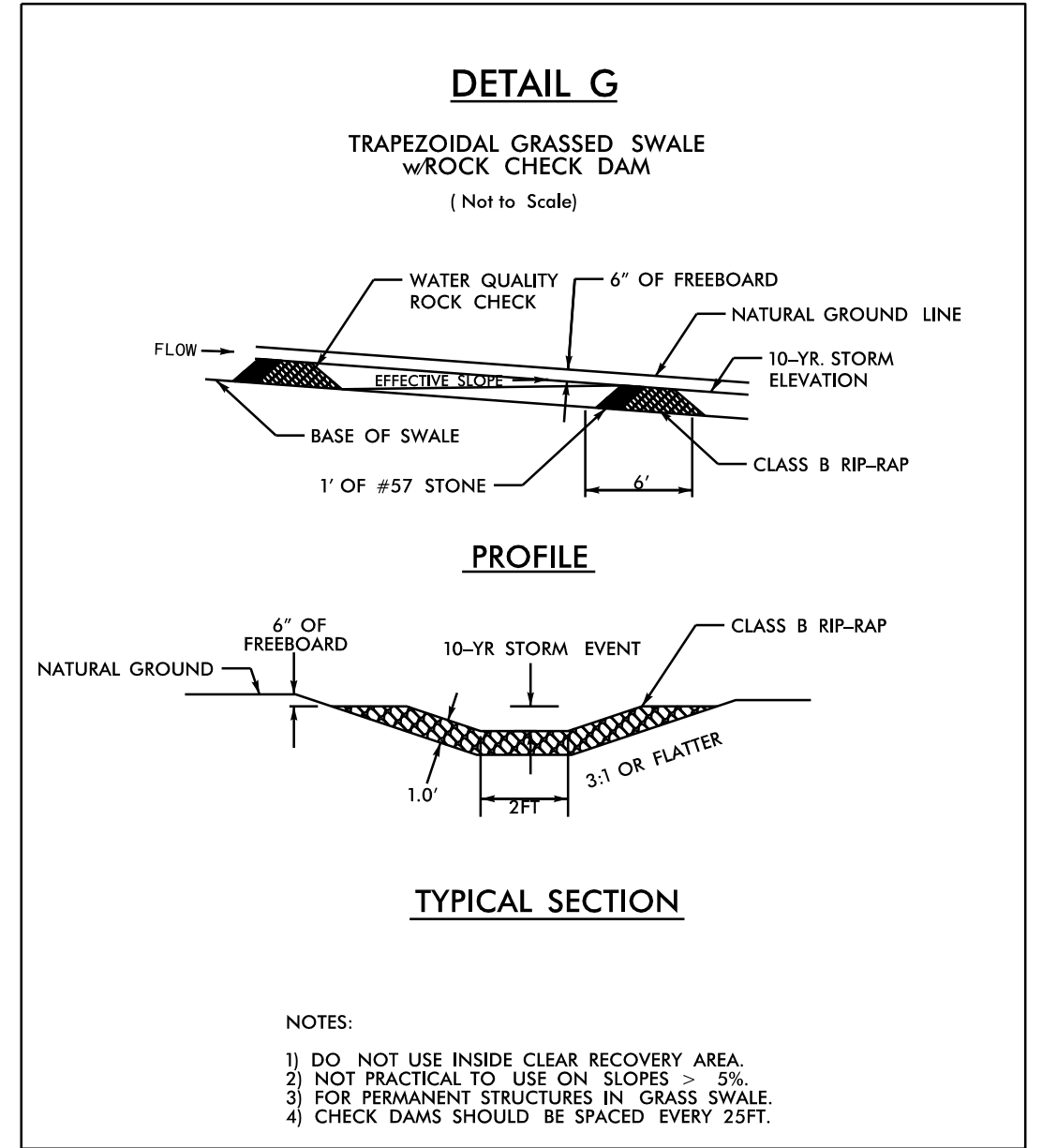
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 Transportation Engineers
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 Phone: 919-872-5115
 www.rameykemp.com
 NC License No. C-0910

-L-
 PI Sta 20+95.82 Δ = 23°17'59.4" (RT)
 D = 1'30'00.0" L = 1553.32'
 T = 787.54' R = 3,819.72'
 e = exist.

-YI-
 PI Sta 28+97.60 Δs = 0°48'36.0"
 Ls = 108.00' LT = 72.00'
 ST = 36.00' Runoff = 144

-YI-
 PI Sta 10+95.45 Δ = 2°51'46.3" (LT)
 D = 1'30'00.0" L = 190.86'
 T = 95.45' R = 3,819.72'



CULVERT #1
TWO BARRELS

	NORTH	EAST	ELEV.
CUL1	763102.49	2035787.26	260.57
CUL2	763093.77	2035793.49	260.56
CUL3	763092.98	2035793.91	261.56
CUL4	763084.23	2035800.76	261.55
CE1	763100.05	2035789.09	267.56
HW1	763068.18	2035658.56	269.40
CUL5	763072.33	2035655.70	260.19
CUL6	763063.51	2035661.91	260.19
CUL7	763062.80	2035662.43	261.19
CUL8	763054.08	2035668.80	261.17
CE2	763059.87	2035664.89	267.18
HW2	763059.83	2035664.67	269.39

FROM STA. 26+65 TO STA. 27+50 -L- LT (3 CHECK DAMS)
 FROM STA. 28+00 TO STA. 50 -L- LT (2 CHECK DAMS)
 EST 117 TON CLASS B RIP RAP per EACH
 EST 0.33 TON #57 STONE per EACH

BEGIN TIP PROJECT U-5827
 -L- STA. 22+51.43

-L- POC STA. 22+06.21 =
 -YI- POT STA. 12+54.33

BEGIN CONSTRUCTION
 -L- STA. 21+53.00

-YI- STA. 13+67.90
 BEGIN FUTURE CONSTRUCTION

-YI- POT STA. 15+54.33

SEE DETAIL F
 BASE GRASSED SWALE
 STA 26+65 - 27+50 -L- LT
 SLOPE=0.47%
 DDE=75 CY

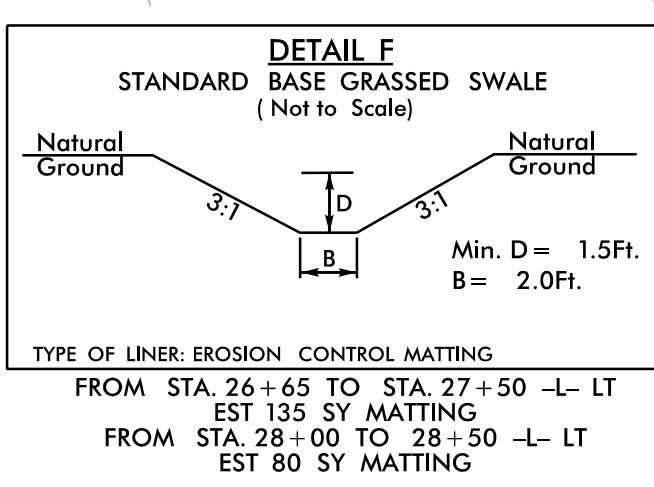
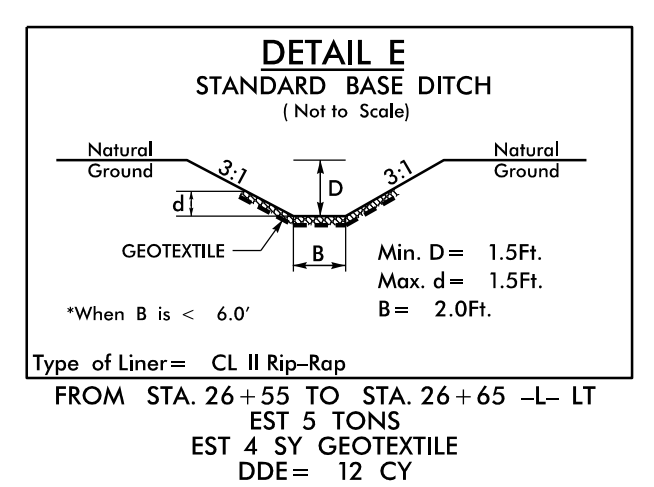
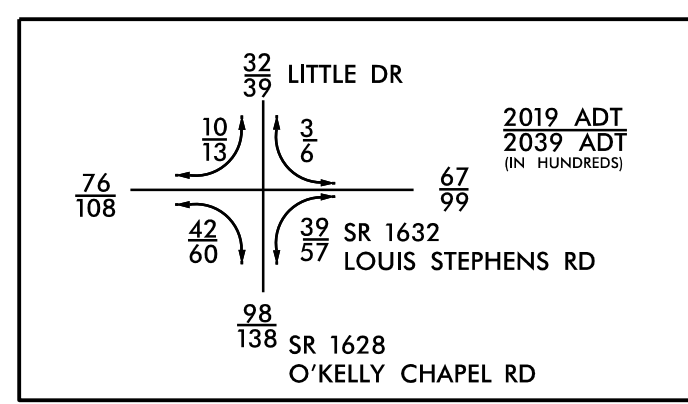
SEE DETAIL E
 2FT STD BASE DITCH
 W/CL II RIP RAP
 STA 26+55 - 26+65 -L- LT

SEE DETAIL H
 CL II RIP RAP AT EMBANKMENT
 STA 26+40 - 26+55 -L- LT

REMOVE & RESET
 EX GUARDRAIL
 TO FACE OF CURB
 -L- STA. 26+02
 TO STA. 29+78

EXTEND BACK SLOPE OF
 DITCH TO TIE TO FILL
 SLOPE TO ACT AS FALSE SUMP

SEE DETAIL F
 BASE GRASSED SWALE
 STA 28+00 - 28+50 -L- LT
 SLOPE=2.28%
 DDE=55 CY



FOR -L- PROFILE VIEW, SEE SHEET 9

REVISIONS

7/16/2019
U:\Projects\U5827_Rd\psh04.dgn
Insert.crc

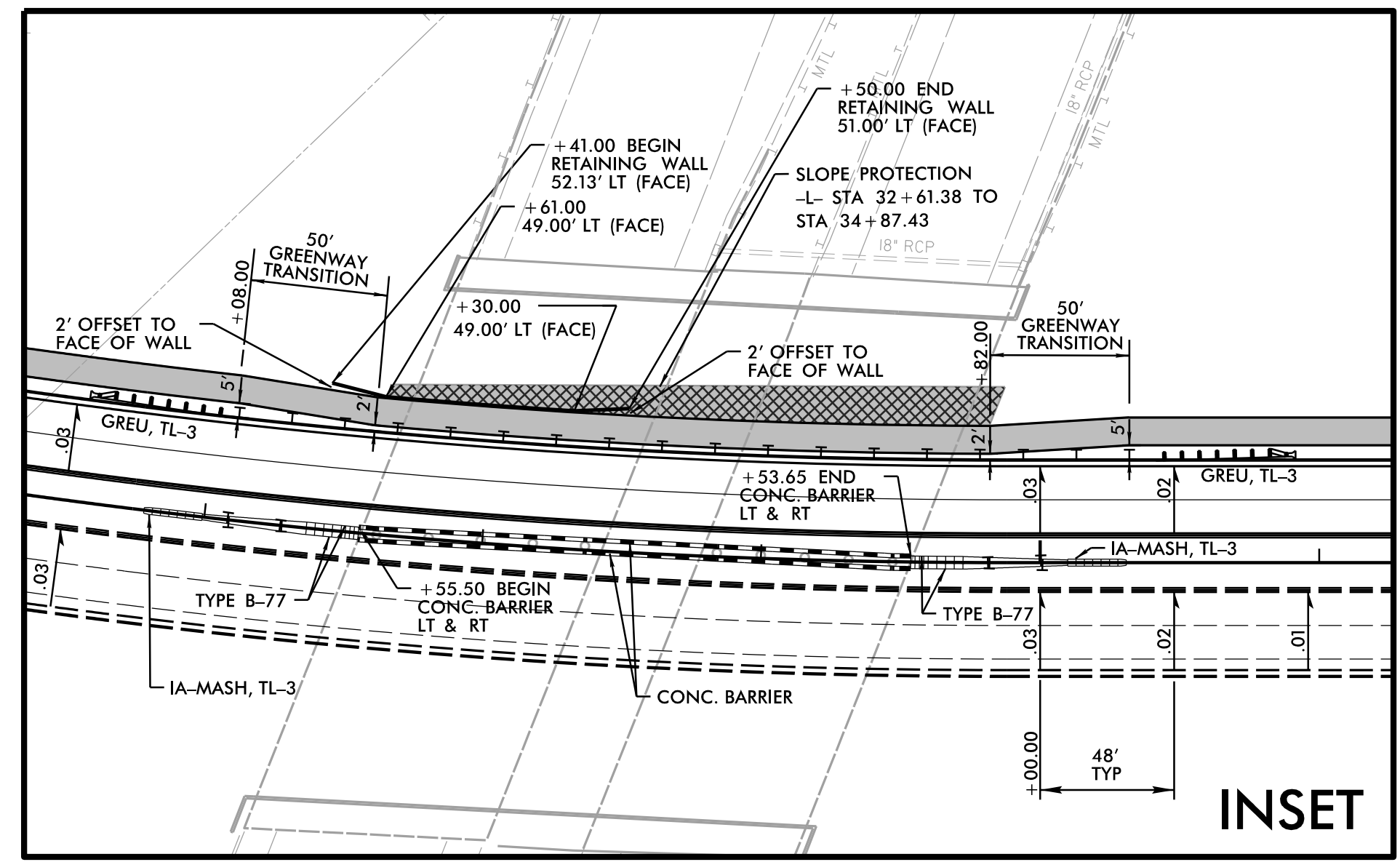
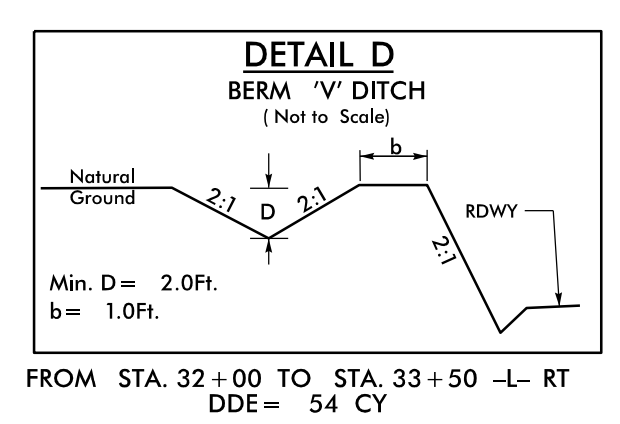
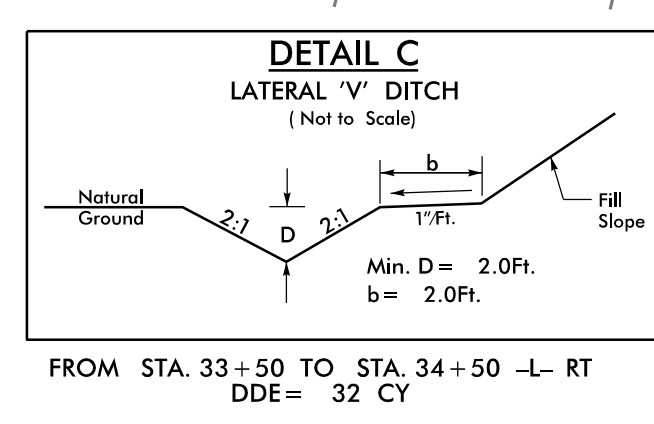
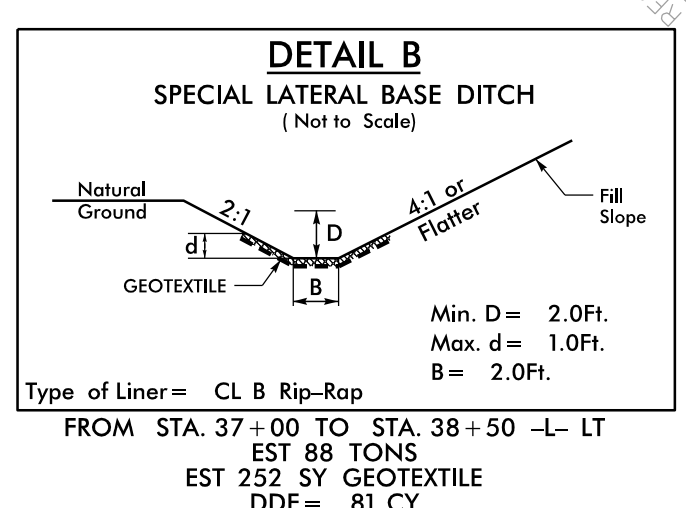
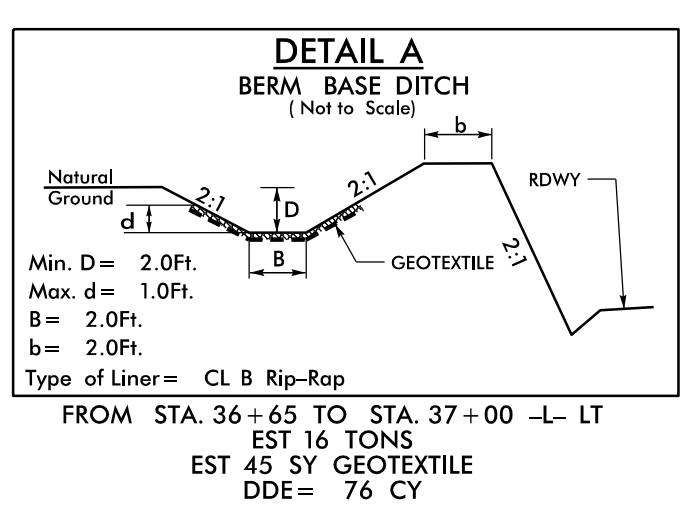
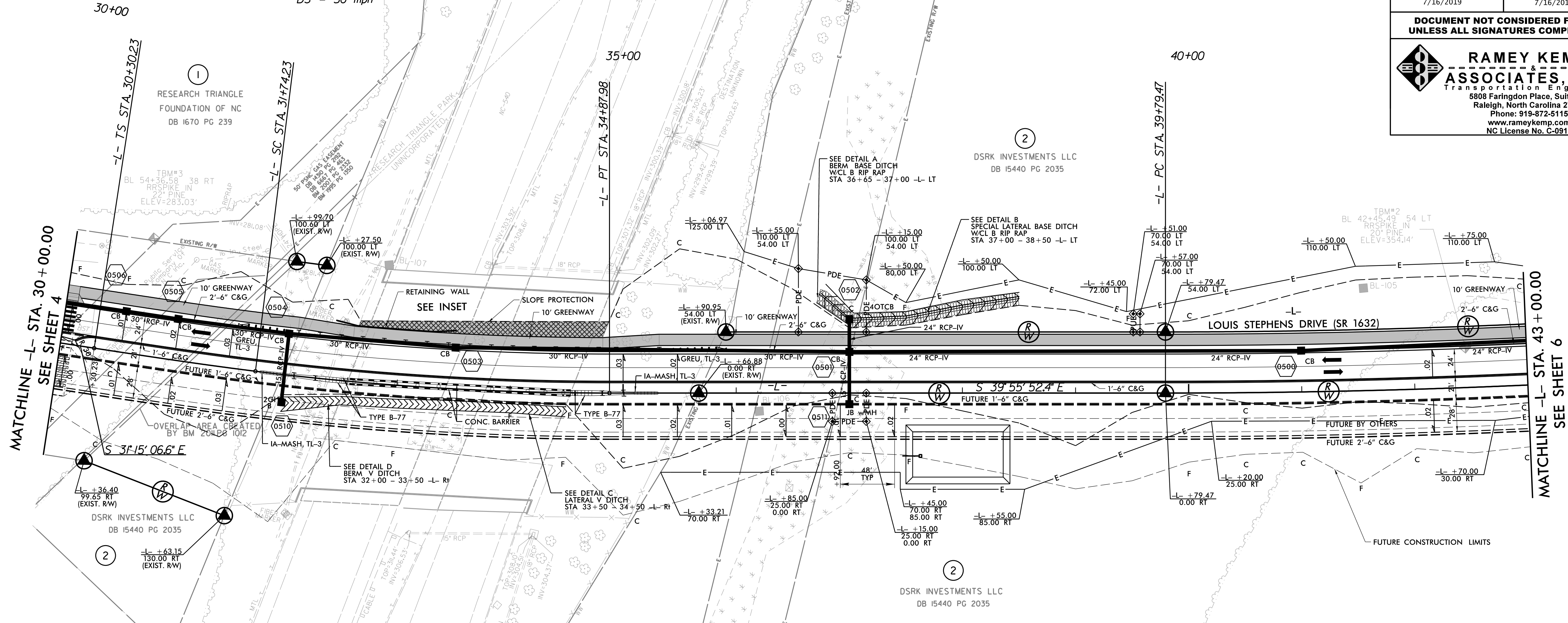
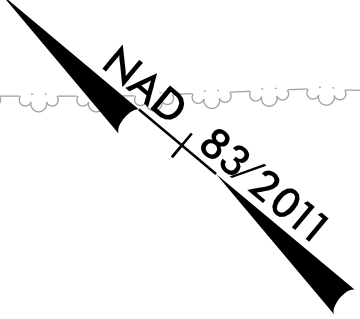
PROJECT REFERENCE NO. U-5827	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER

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-L-

PI Sta 31+26.23 Os = 1' 37" 12.0" Ls = 144.00' LT = 96.00' ST = 48.00'	PI Sta 33+31.31 Δ = 7' 03" 33.9" (LT) D = 2' 15" 00.0" L = 313.75' T = 157.07' R = 2,546.48' e = 0.03 Runoff = 144 DS = 50 mph	PI Sta 42+83.71 Δ = 4' 49" 32.6" (LT) D = 0' 47" 36.9" L = 608.10' T = 304.23' R = 7,220.00' e = NC DS = 50 mph
--	--	--



FOR RETAINING WALL PLANS, SEE SHEETS W-1 & W-2

FOR -L- PROFILE VIEW, SEE SHEET 9

REVISIONS

7/16/2019
U5827-Rdw_psh05.dgn
User: craque

PROJECT REFERENCE NO. U-5827		SHEET NO. 6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

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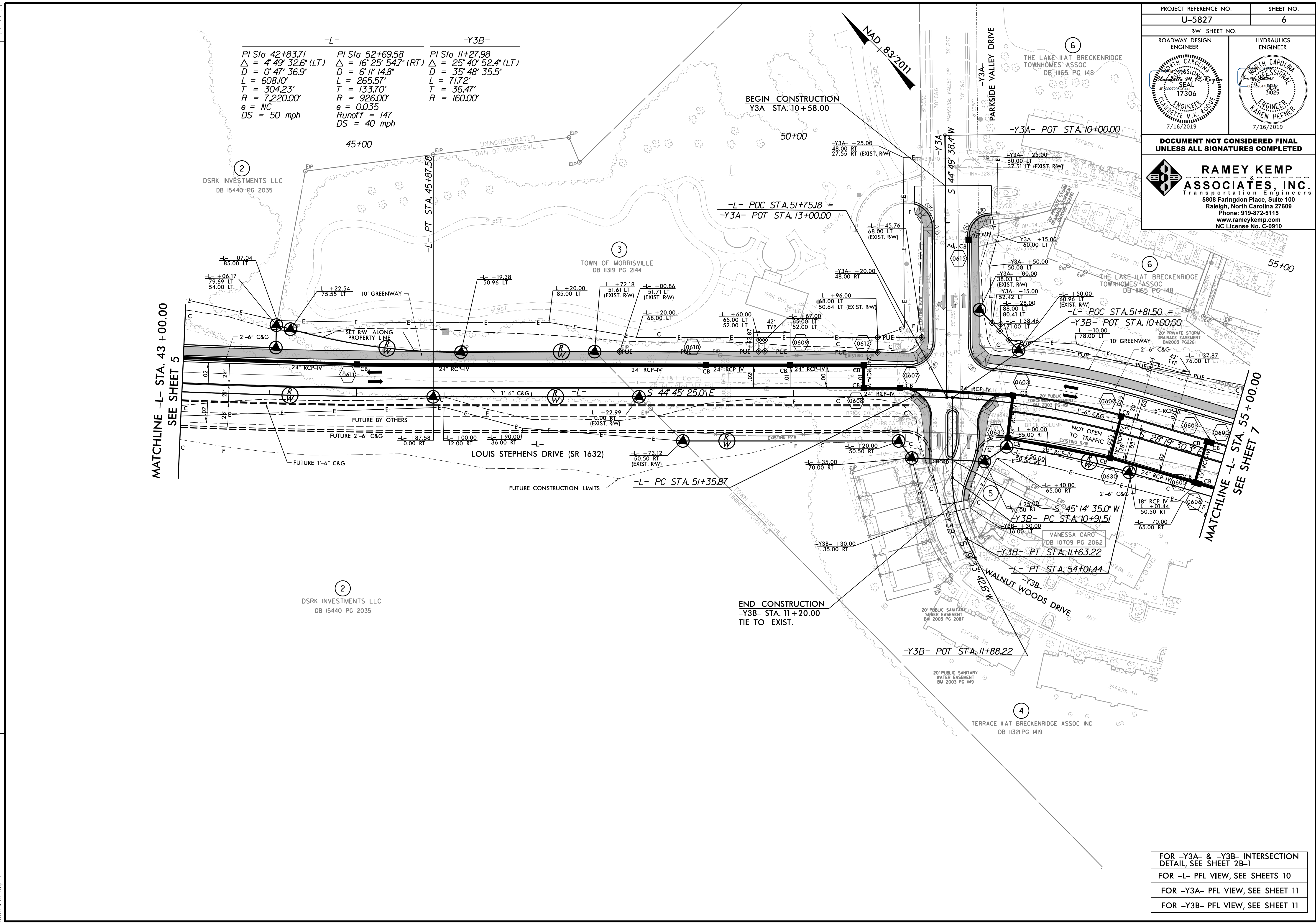
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 Transportation Engineers
 5808 Faringdon Place, Suite 100
 Raleigh, North Carolina 27609
 Phone: 919-872-5115
 www.rameykemp.com
 NC License No. C-0910

-L-	-Y3B-	-Y3A-
PI Sta 42+83.71	PI Sta 52+69.58	PI Sta 11+27.98
$\Delta = 4' 49" 32.6" (LT)$	$\Delta = 16' 25" 54.7" (RT)$	$\Delta = 25' 40" 52.4" (LT)$
$D = 0' 47" 36.9"$	$D = 6' 11" 14.8"$	$D = 35' 48" 35.5"$
$L = 608.10'$	$L = 265.57'$	$L = 71.72'$
$T = 304.23'$	$T = 133.70'$	$T = 36.47'$
$R = 7,220.00'$	$R = 926.00'$	$R = 160.00'$
$e = NC$	$e = 0.035$	
$DS = 50 \text{ mph}$	$Runoff = 147$	
	$DS = 40 \text{ mph}$	

MATCHLINE -L- STA. 43+00.00
SEE SHEET 5

MATCHLINE -L- STA. 55+00.00
SEE SHEET 7

REVISIONS



7/16/2019
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FOR -Y3A- & -Y3B- INTERSECTION DETAIL, SEE SHEET 2B-1
FOR -L- PFL VIEW, SEE SHEETS 10
FOR -Y3A- PFL VIEW, SEE SHEET 11
FOR -Y3B- PFL VIEW, SEE SHEET 11

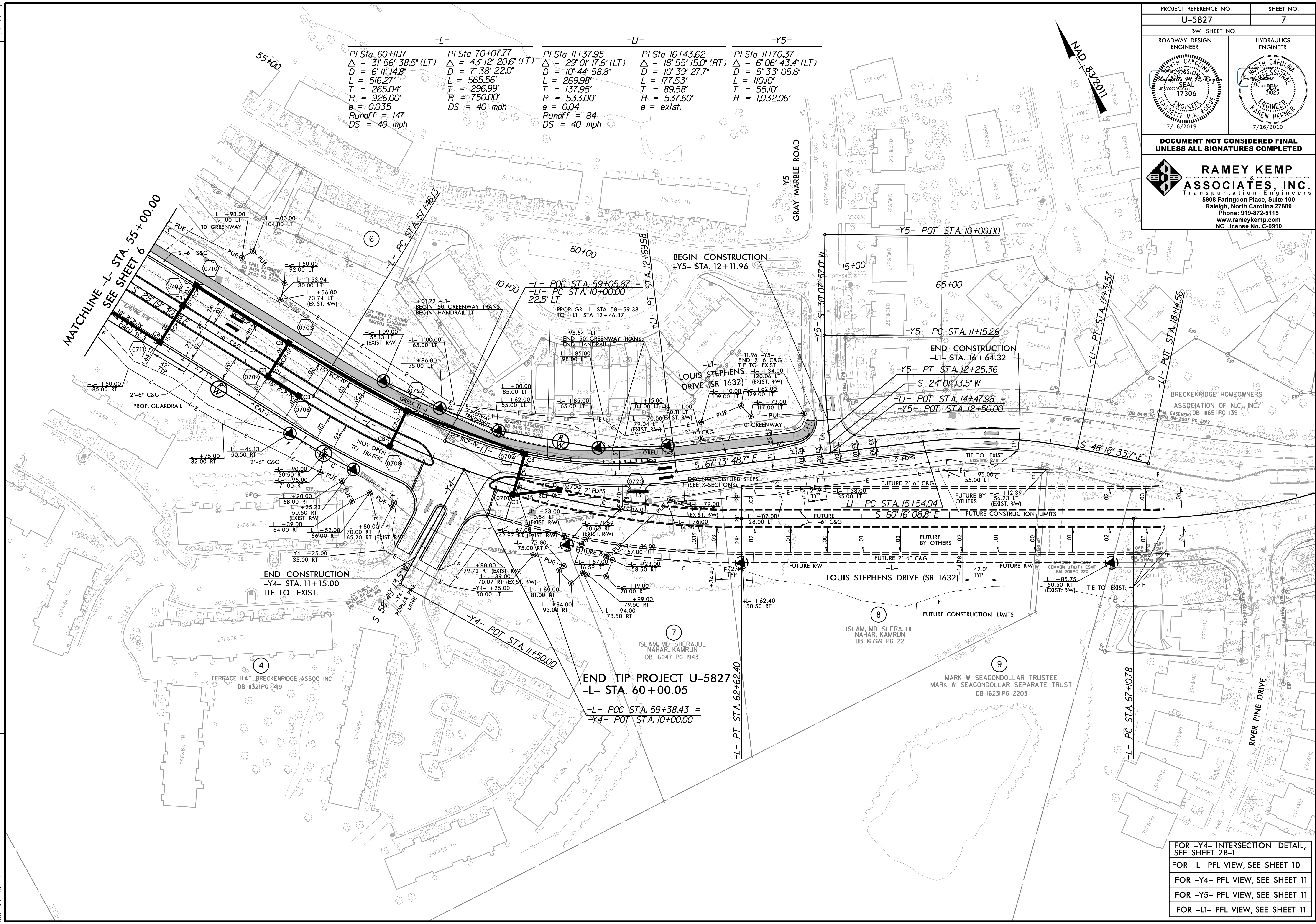
PROJECT REFERENCE NO. U-5827	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
7/16/2019	7/16/2019

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 Transportation Engineers
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REVISIONS

7/16/2019
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 User: craque



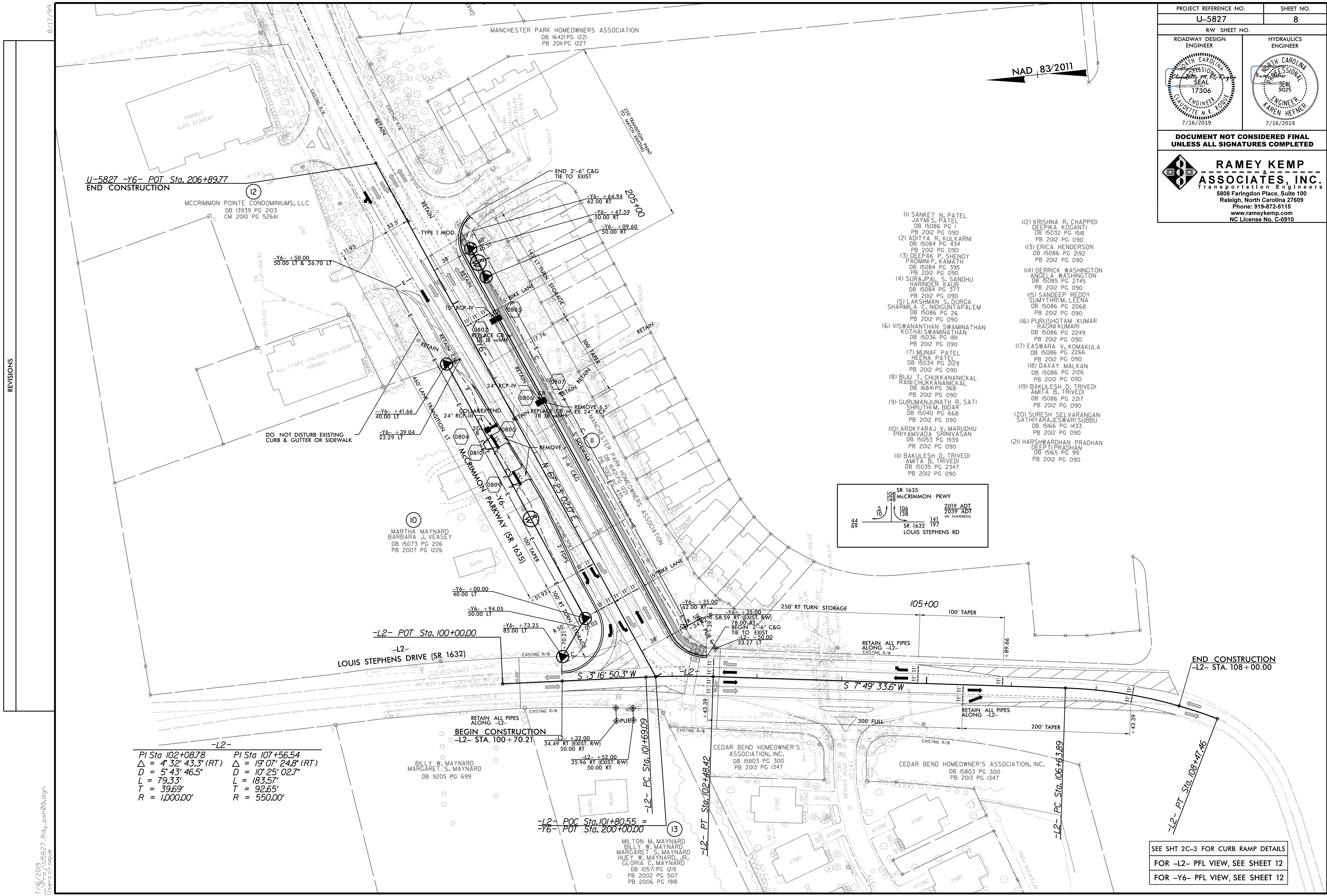
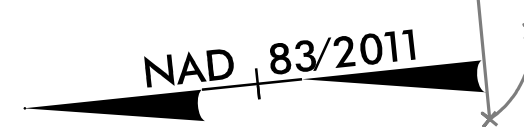
-L-	-LI-	-Y5-
PI Sta 60+11.7 Δ = 31° 56' 38.5" (LT) D = 6' 11" 14.8" L = 516.27' T = 265.04' R = 926.00' e = 0.035 Runoff = 147 DS = 40 mph	PI Sta 70+07.77 Δ = 43° 12' 20.6" (LT) D = 7' 38" 22.0" L = 565.56' T = 296.99' R = 750.00' DS = 40 mph	PI Sta 11+37.95 Δ = 29° 01' 17.6" (LT) D = 10' 44" 58.8" L = 269.98' T = 137.95' R = 533.00' e = 0.04 Runoff = 84 DS = 40 mph
PI Sta 16+43.62 Δ = 18° 55' 15.0" (RT) D = 10' 39" 27.7" L = 177.53' T = 89.58' R = 537.60' e = exist.	PI Sta 11+70.37 Δ = 6° 06' 43.4" (LT) D = 5' 33" 05.6" L = 110.10' T = 55.10' R = 1,032.06'	

- FOR -Y4- INTERSECTION DETAIL, SEE SHEET 2B-1
- FOR -L- PFL VIEW, SEE SHEET 10
- FOR -Y4- PFL VIEW, SEE SHEET 11
- FOR -Y5- PFL VIEW, SEE SHEET 11
- FOR -L1- PFL VIEW, SEE SHEET 11

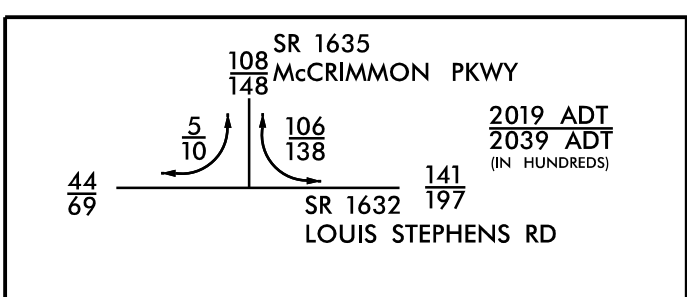
PROJECT REFERENCE NO. U-5827	SHEET NO. 8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
Phone: 919-872-5115
www.rameykemp.com
NC License No. C-9910



- (1) SANKET N. PATEL
JAYMI S. PATEL
DB 15086 PG 1
PB 2012 PG 090
- (2) ADITYA R. KULKARNI
DB 15084 PG 434
PB 2012 PG 090
- (3) DEEPAK P. SHENOY
PADMINI P. KAMATHI
DB 15084 PG 395
PB 2012 PG 090
- (4) SURAJPAL S. SANDHU
HARINDER KALUR
DB 15084 PG 377
PB 2012 PG 090
- (5) LAKSHMAN S. DURGA
SHARMILA C. NIDIGUNTAPELEM
DB 15086 PG 26
PB 2012 PG 090
- (6) VISWANATHAN SWAMINATHAN
KOTHA SWAMINATHAN
DB 15036 PG 181
PB 2012 PG 090
- (7) MUNAF PATEL
HEENA PATEL
DB 15034 PG 2129
PB 2012 PG 090
- (8) BIJU T. CHUKKANANICKAL
RANI CHUKKANANICKAL
DB 1684 PG 368
PB 2012 PG 090
- (9) GURUMANJUNATH R. SATI
SHRUTHI M. BIDAR
DB 15040 PG 668
PB 2012 PG 090
- (10) AROKYARAJ V. MARUDHU
PRIYAMVADA SRINIVASAN
DB 15053 PG 1939
PB 2012 PG 090
- (11) BAKULESH D. TRIVEDI
AMITA B. TRIVEDI
DB 15035 PG 2347
PB 2012 PG 090
- (12) KRISHNA R. CHAPPIDI
DEEPIKA KOGANTI
DB 15032 PG 1518
PB 2012 PG 090
- (13) ERICA HENDERSON
DB 15086 PG 2192
PB 2012 PG 090
- (14) DERRICK WASHINGTON
ANGEL A. WASHINGTON
DB 15085 PG 2745
PB 2012 PG 090
- (15) SANDEEP REDDY
SUMYTHIRI M. LEEENA
DB 15086 PG 2068
PB 2012 PG 090
- (16) PURUSHOTAM KUMAR
RAGINI KUMARI
DB 15086 PG 2249
PB 2012 PG 090
- (17) EASWARA V. KOMAKULA
DB 15086 PG 2266
PB 2012 PG 090
- (18) DAXAY MALKAN
DB 15086 PG 2126
PB 2012 PG 090
- (19) BAKULESH D. TRIVEDI
AMITA B. TRIVEDI
DB 15086 PG 2217
PB 2012 PG 090
- (20) SURESH SELVARANGAN
SATHYARAJESWARI SUBBU
DB 15166 PG 1433
PB 2012 PG 090
- (21) HARSHWARDHAN PRADHAN
DEEPIKA KOGANTI
DB 15165 PG 99
PB 2012 PG 090



-L2-
 PI Sta 102+08.78 PI Sta 107+56.54
 $\Delta = 4' 32'' 43.3''$ (RT) $\Delta = 19' 07'' 24.8''$ (RT)
 $D = 5' 43'' 46.5''$ $D = 10' 25'' 02.7''$
 $L = 79.33'$ $L = 183.57'$
 $T = 39.69'$ $T = 92.65'$
 $R = 1,000.00'$ $R = 550.00'$

SEE SHT 2C-3 FOR CURB RAMP DETAILS
 FOR -L2- PFL VIEW, SEE SHEET 12
 FOR -Y6- PFL VIEW, SEE SHEET 12

REVISIONS

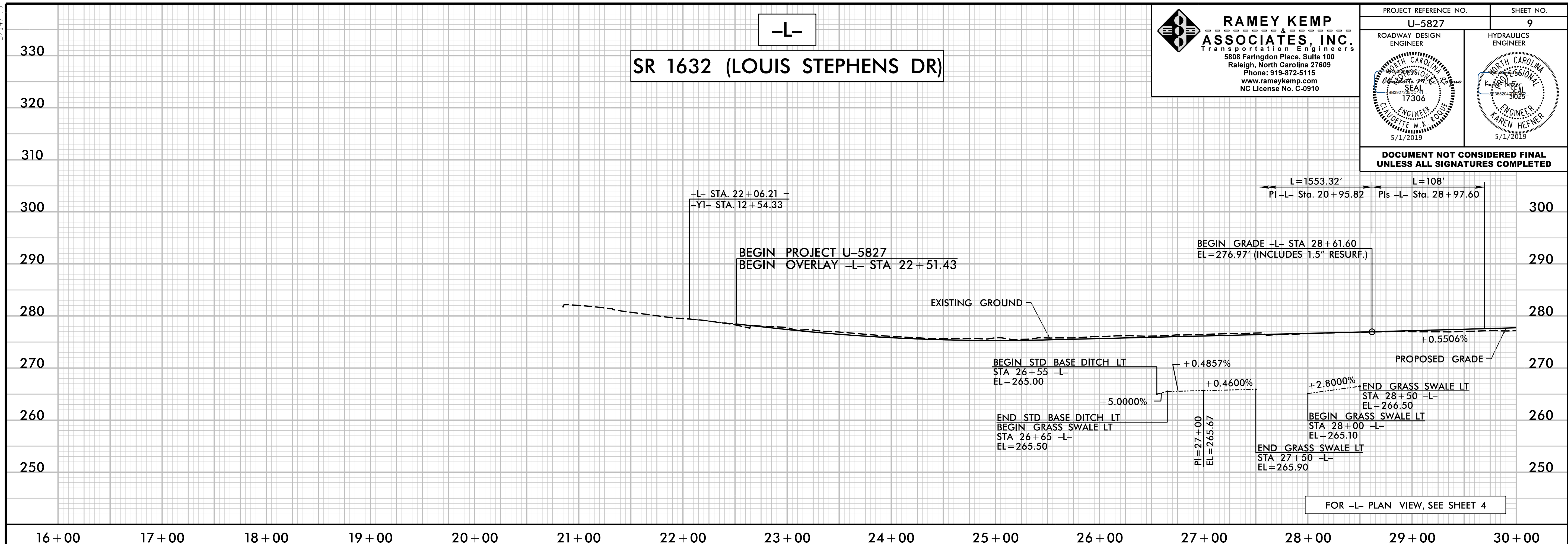
7/15/2019
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5/14/19

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 Raleigh, North Carolina 27609
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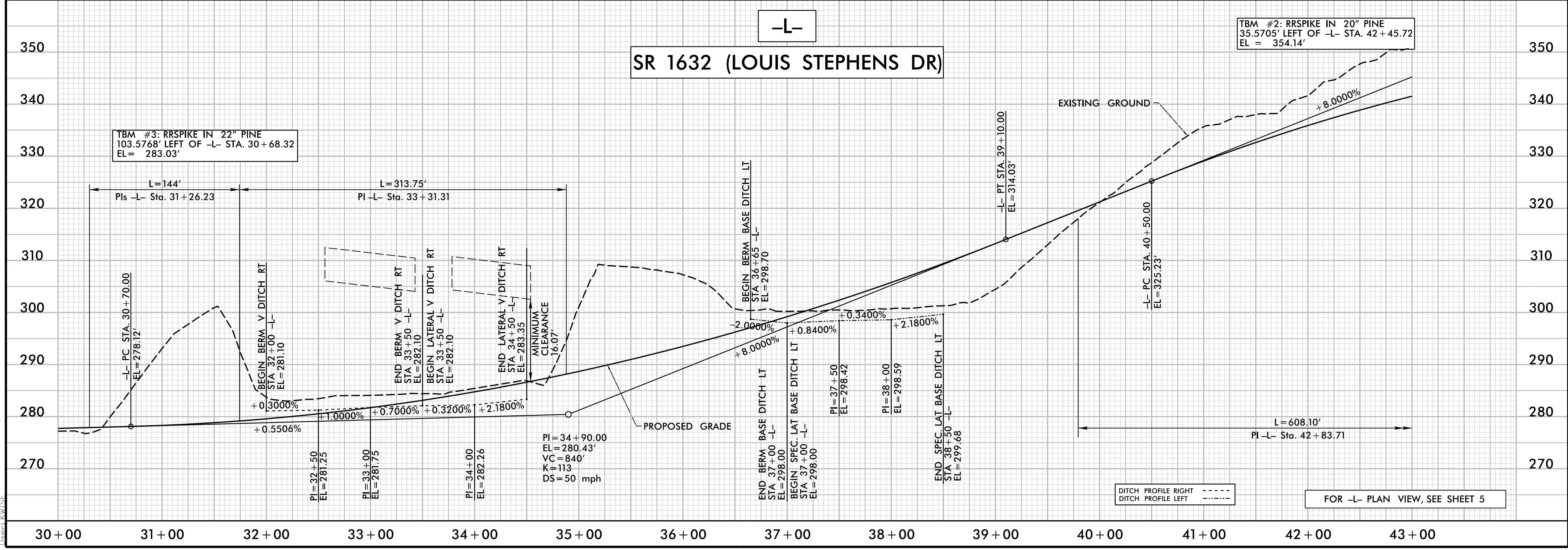
PROJECT REFERENCE NO. U-5827	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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FOR -L- PLAN VIEW, SEE SHEET 4

5/14/2019 U5827_Rdy_of109.dgn



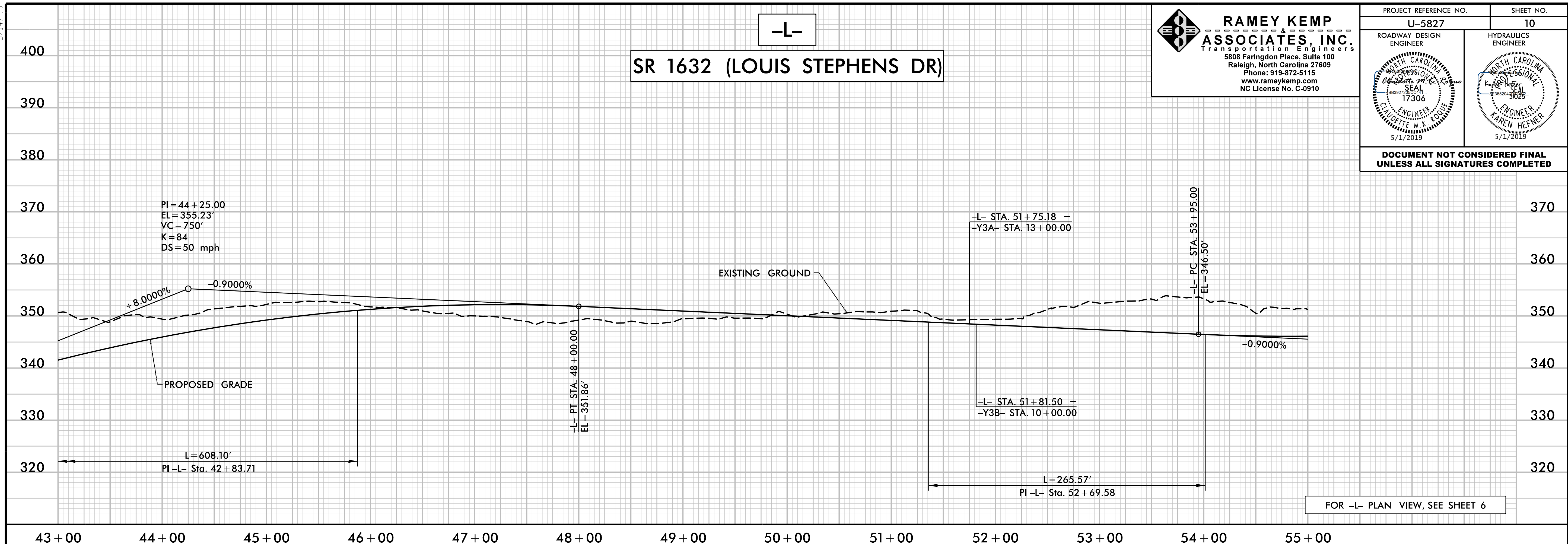
FOR -L- PLAN VIEW, SEE SHEET 5

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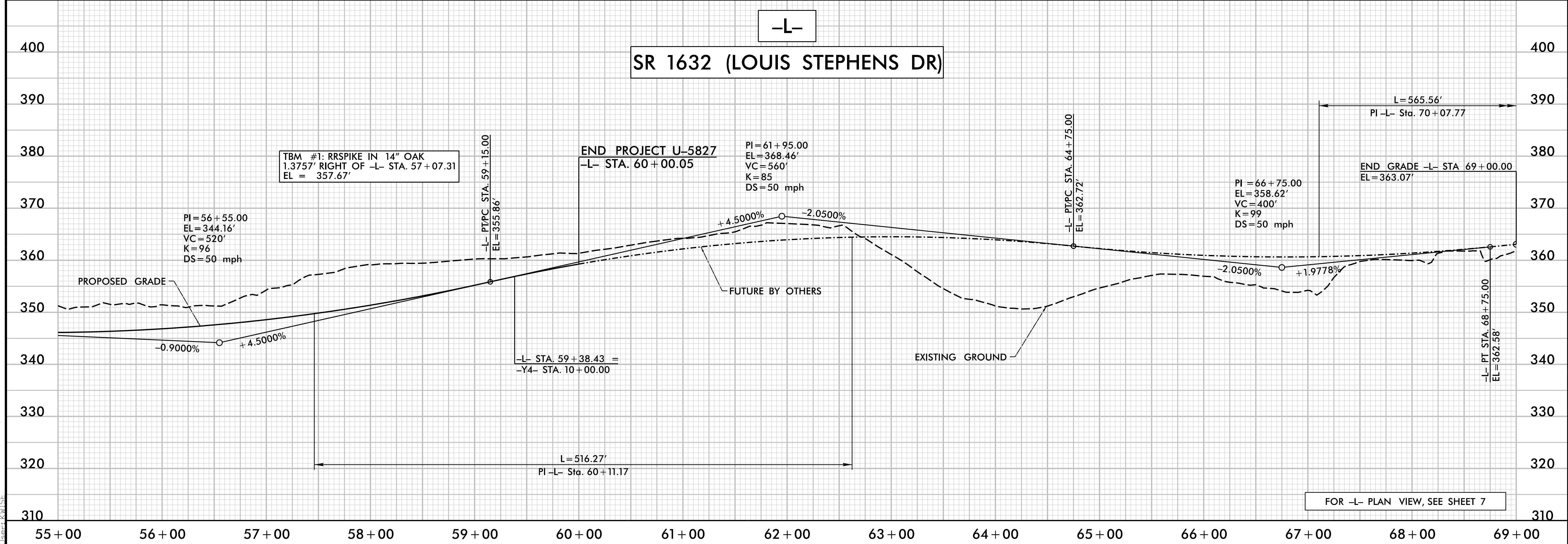
PROJECT REFERENCE NO. U-5827	SHEET NO. 10
ROADWAY DESIGN ENGINEER <i>[Signature]</i>	HYDRAULICS ENGINEER <i>[Signature]</i>
Professional Engineer Seal 17306 5/1/2019	Professional Engineer Seal 3025 5/1/2019

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FOR -L- PLAN VIEW, SEE SHEET 6

5/14/2019 U-5827_Rd.dwg

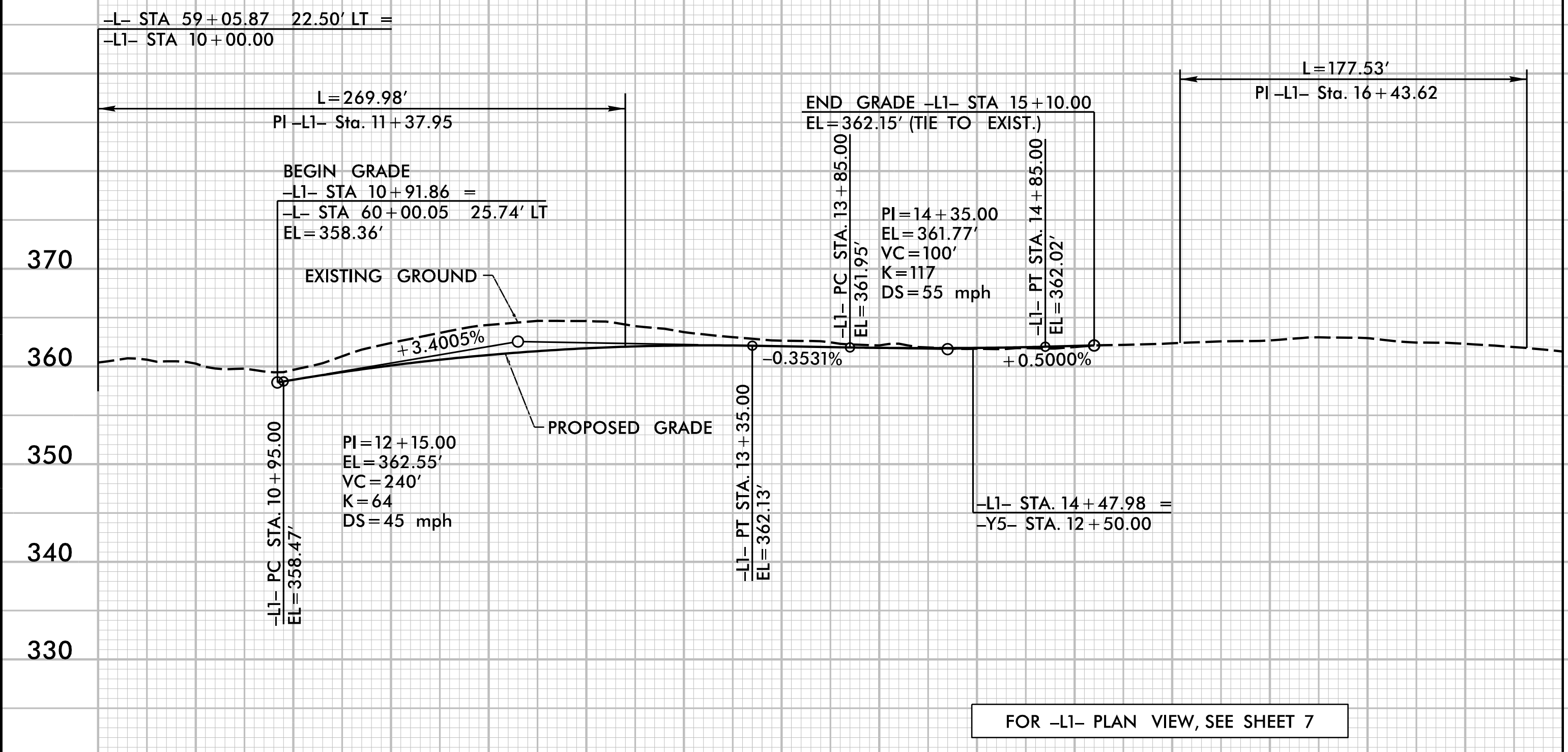


FOR -L- PLAN VIEW, SEE SHEET 7

5/14/19

-L1-

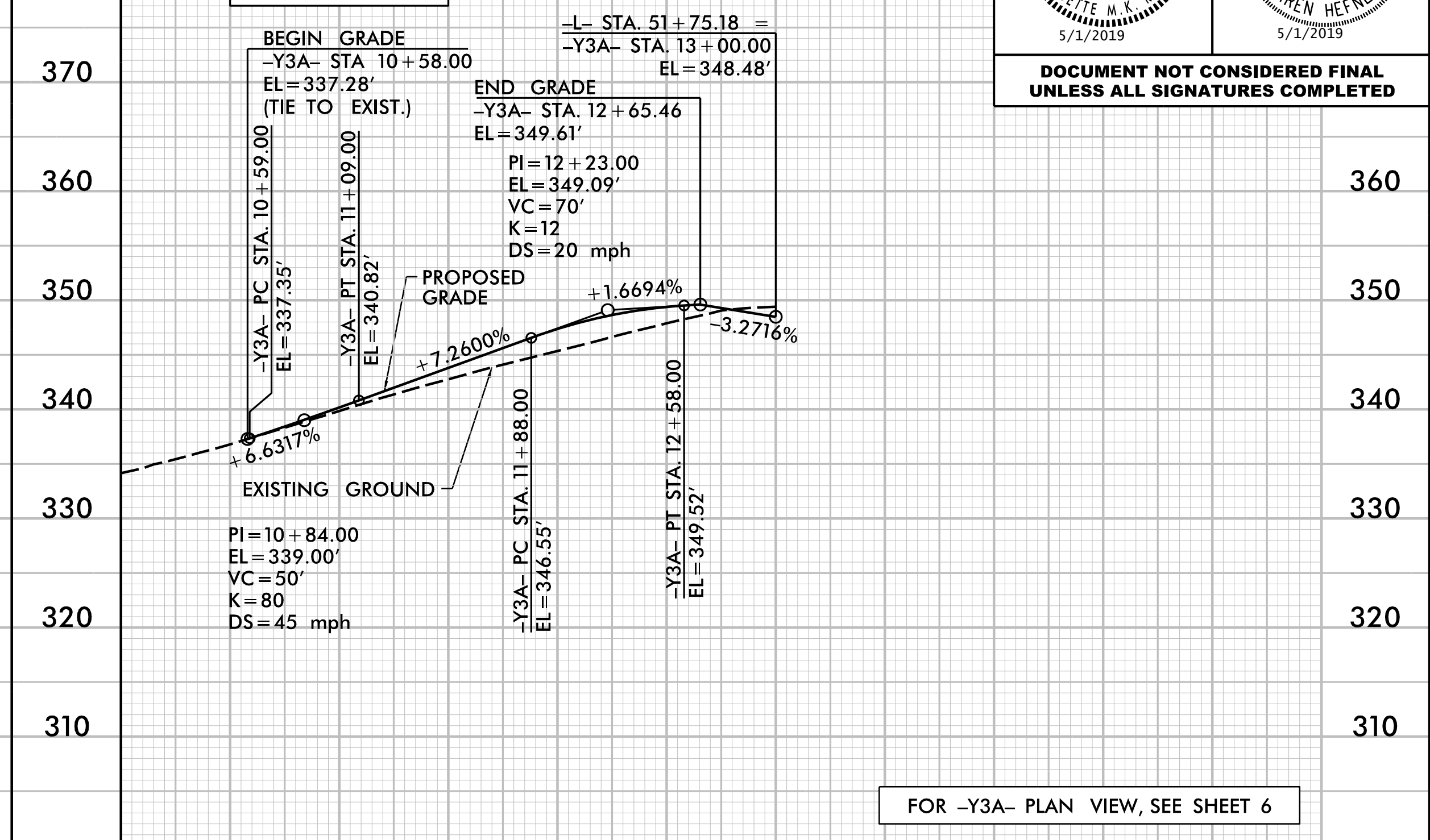
SR 1632 (LOUIS STEPHENS DR)



FOR -L1- PLAN VIEW, SEE SHEET 7

-Y3A-

PARKSIDE VALLEY DR



FOR -Y3A- PLAN VIEW, SEE SHEET 6

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PROJECT REFERENCE NO. U-5827	SHEET NO. 11
ROADWAY DESIGN ENGINEER <i>[Signature]</i>	HYDRAULICS ENGINEER <i>[Signature]</i>
Professional Engineer Seal 17306 5/1/2019	Professional Engineer Seal 3025 5/1/2019

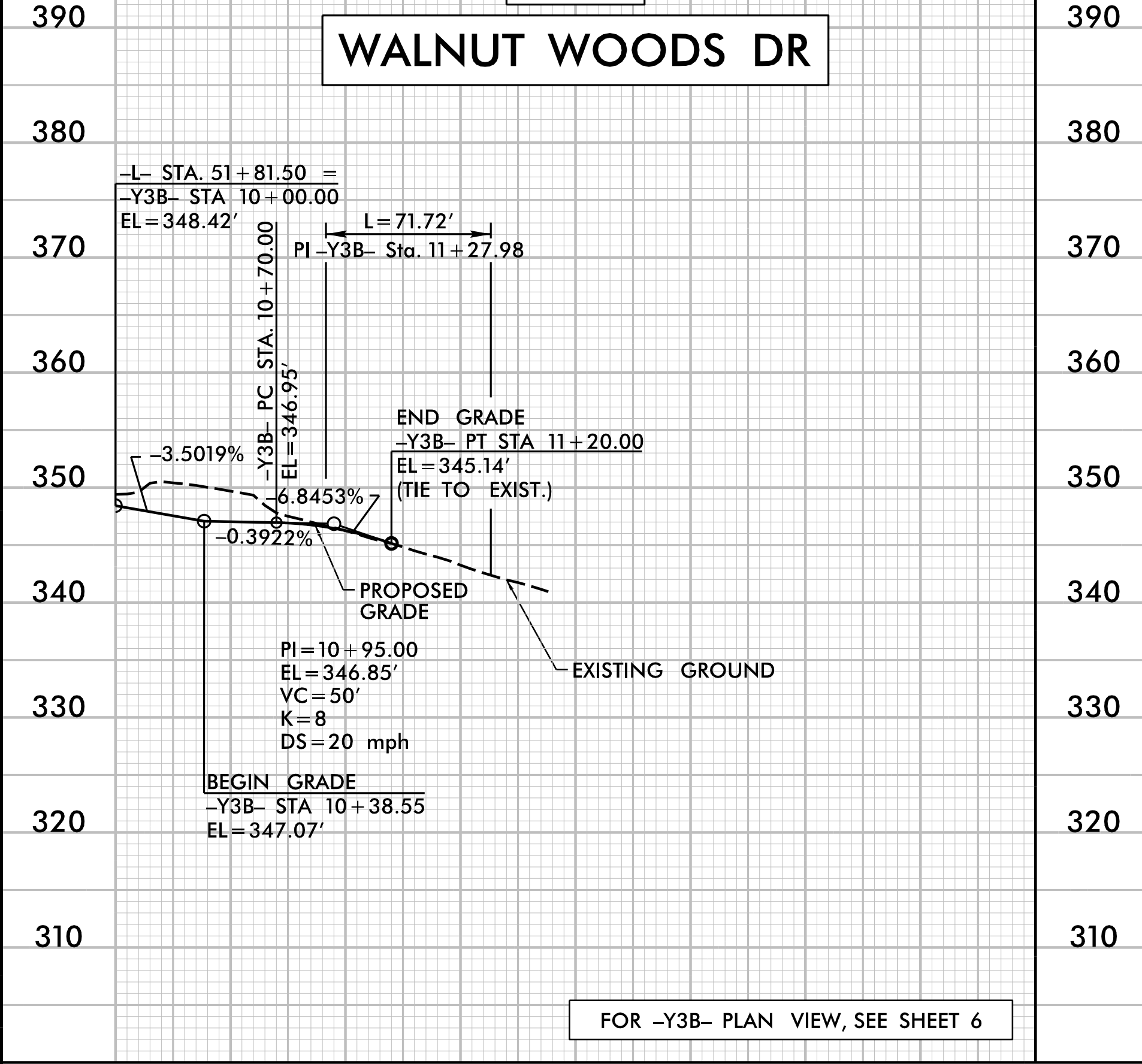
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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-Y3B-

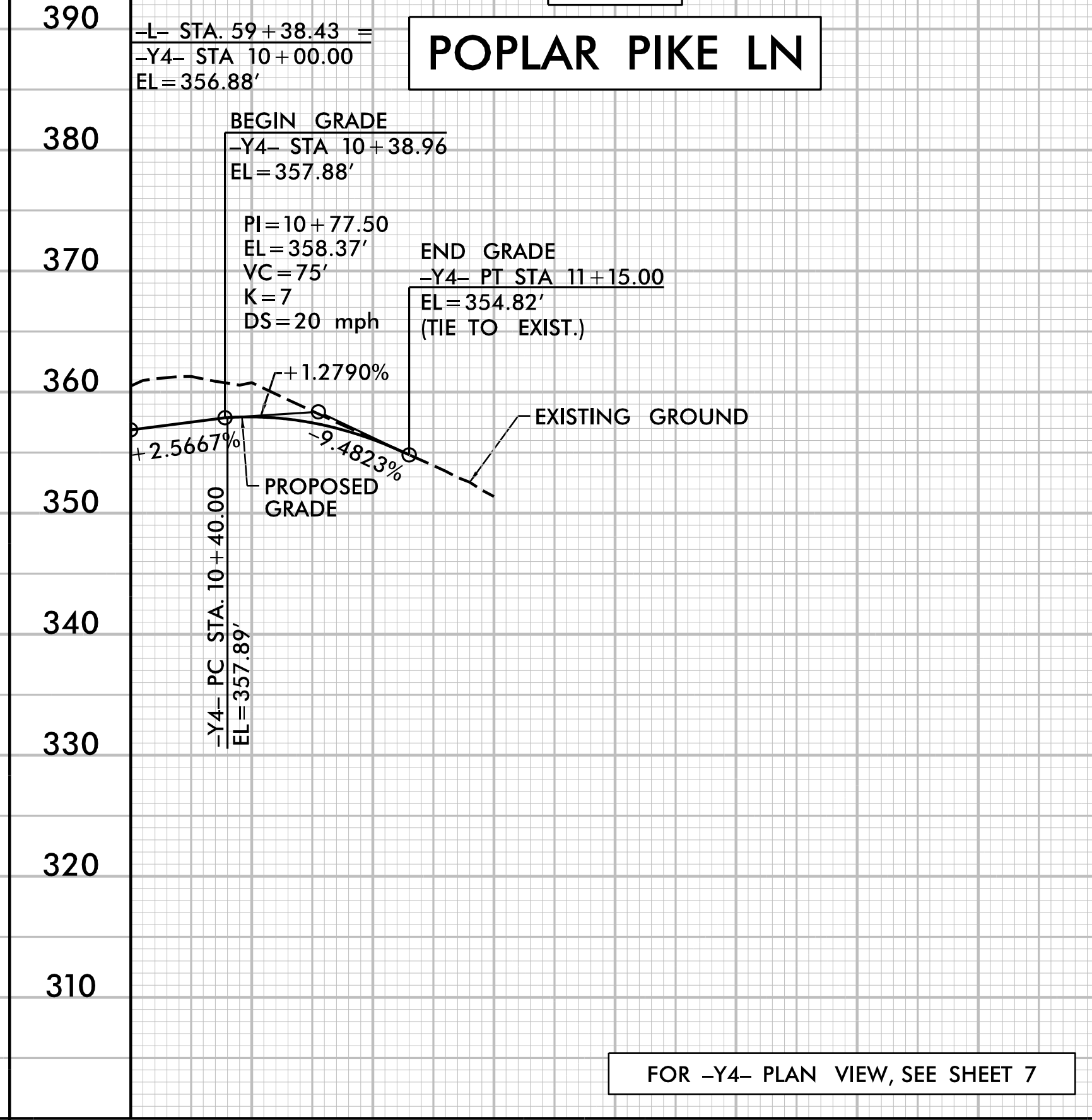
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FOR -Y3B- PLAN VIEW, SEE SHEET 6

-Y4-

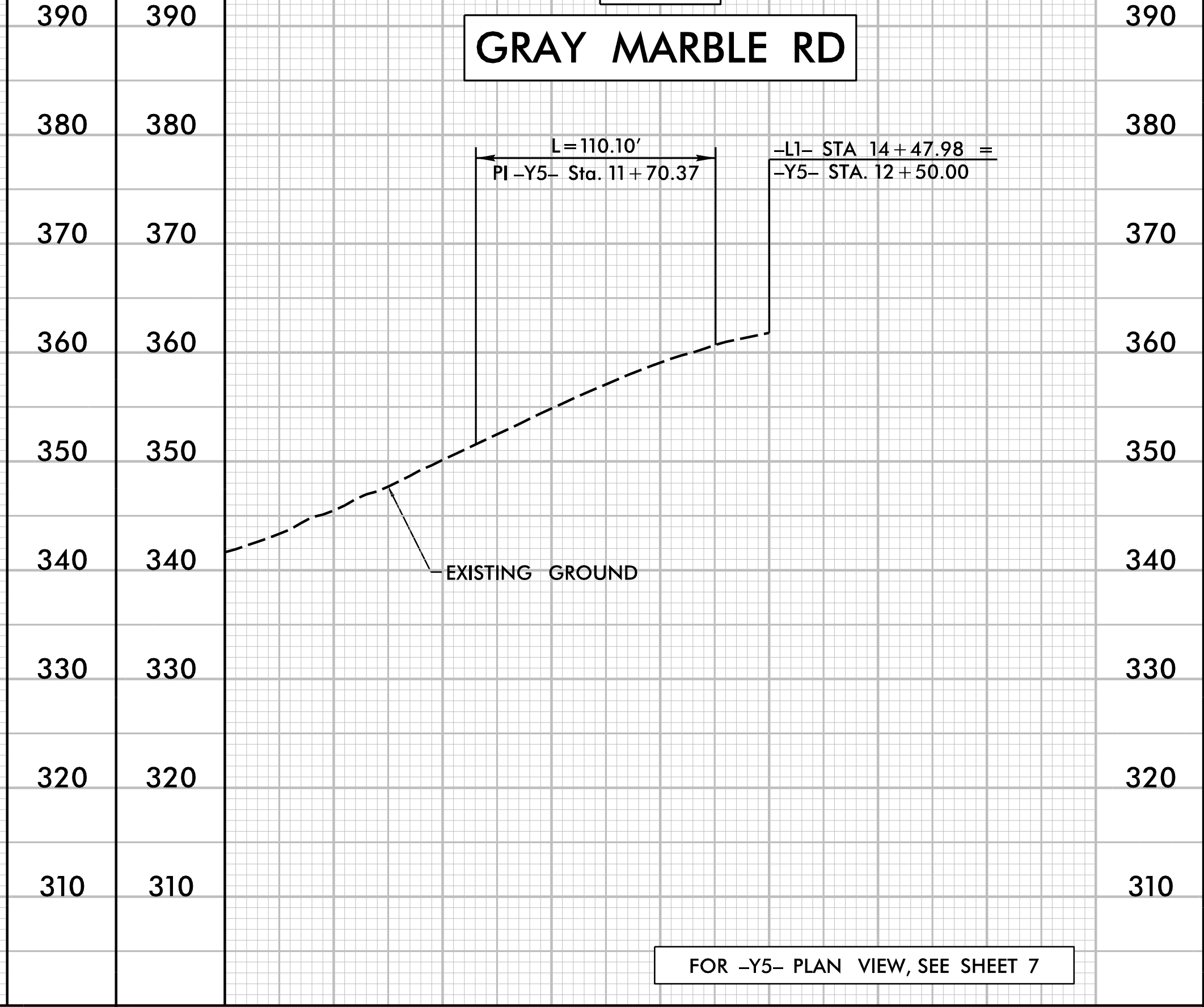
POPLAR PIKE LN



FOR -Y4- PLAN VIEW, SEE SHEET 7

-Y5-

GRAY MARBLE RD



FOR -Y5- PLAN VIEW, SEE SHEET 7

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10+00 11+00

10+00 11+00 12+00

5/14/2019 U5827_Rdw_of111.dgn

5/14/19

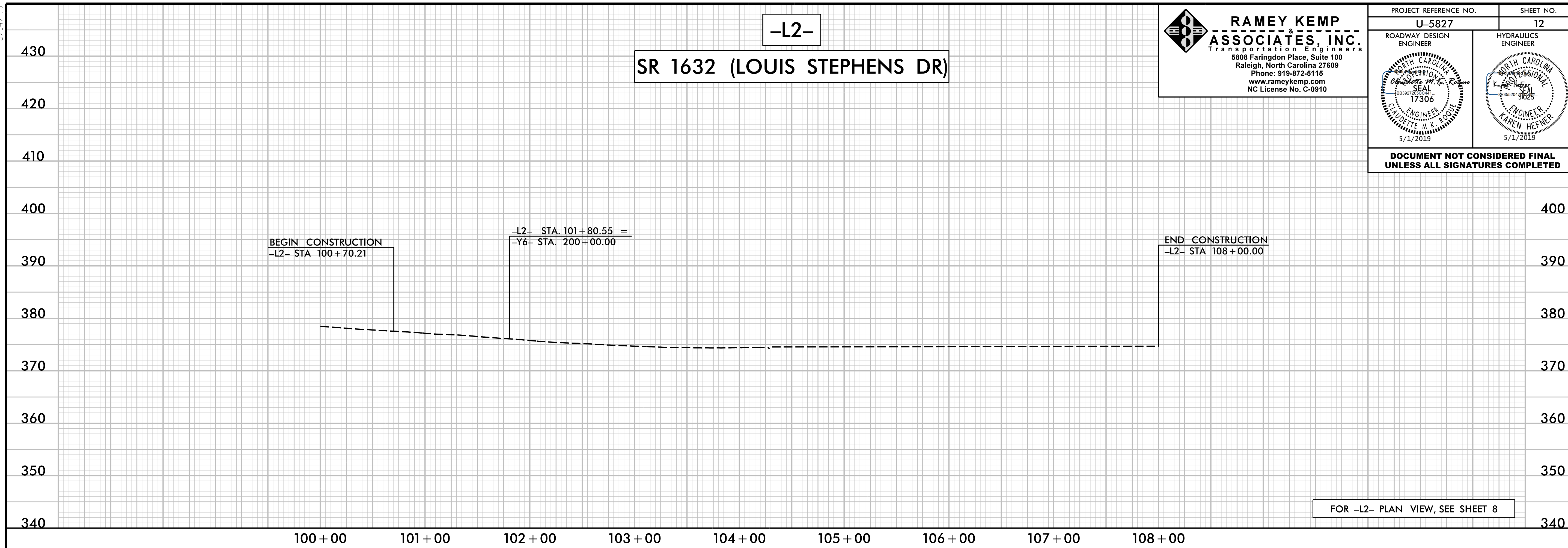
-L2-

SR 1632 (LOUIS STEPHENS DR)

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PROJECT REFERENCE NO. U-5827	SHEET NO. 12
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER

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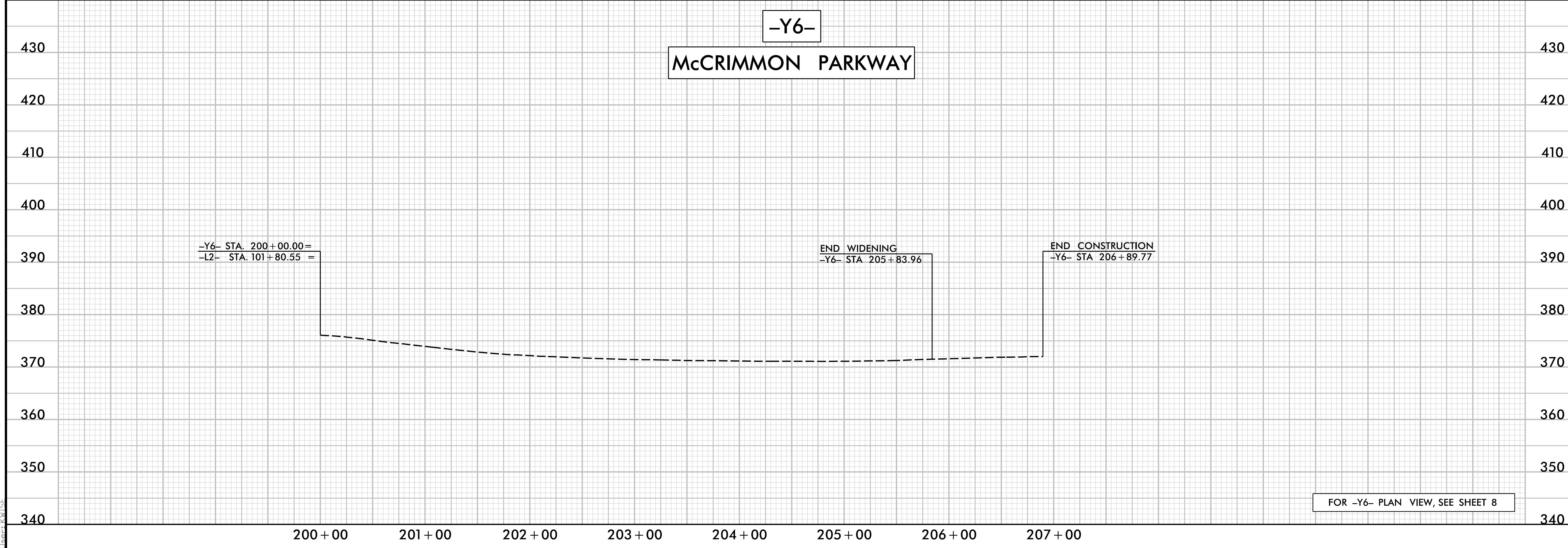


FOR -L2- PLAN VIEW, SEE SHEET 8

-Y6-

McCRIMMON PARKWAY

5/14/2019 U-5827_Rd.dwg



FOR -Y6- PLAN VIEW, SEE SHEET 8