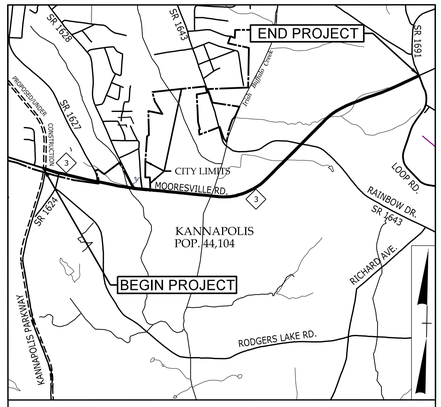
09/08/16

TIP PROJECT: U-3440

CONTRACT: C203803

SEE SHEETS 1C-1 THROUGH 1C-7 FOR CONTROL SURVEY SHEETS.
SEE SHEET 1B FOR CONVENTIONAL SYMBOLS



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

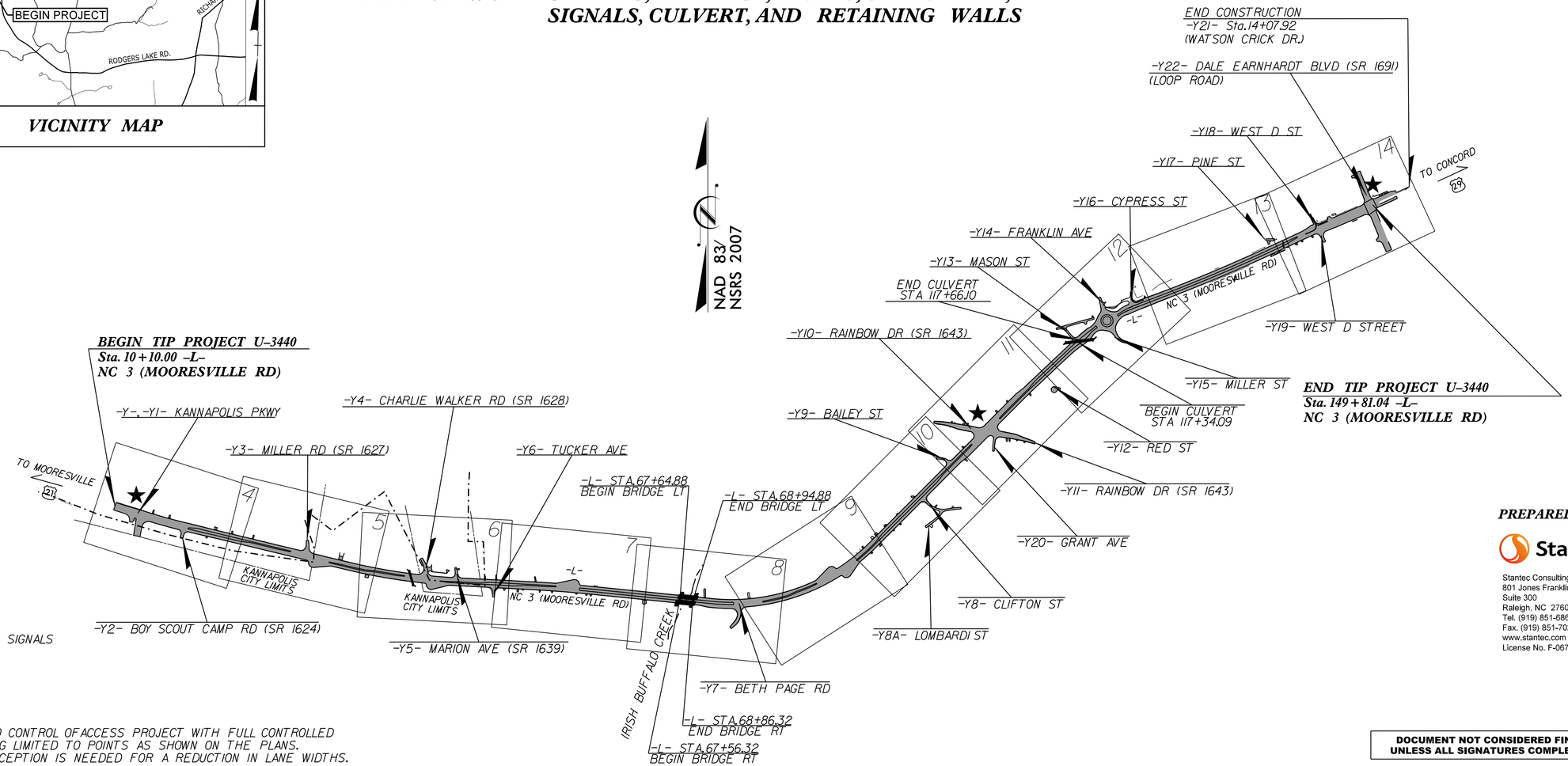
CABARRUS COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3440	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
39010.1.R2		PE
39010.2.2		R /W
39010.2.RU1		UTIL
39010.3.2		CONSTR.

LOCATION: NC 3, FROM PROPOSED WEST SIDE BYPASS TO SR 1691 (LOOP ROAD) IN KANNAPOLIS
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS, CULVERT, AND RETAINING WALLS

NAD 83/
NSRS 2007



BEGIN TIP PROJECT U-3440
Sta. 10+10.00 -L-
NC 3 (MOORESVILLE RD)

END TIP PROJECT U-3440
Sta. 149+81.04 -L-
NC 3 (MOORESVILLE RD)

★ REVISED SIGNALS

THIS IS A NO CONTROL OF ACCESS PROJECT WITH FULL CONTROLLED ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS. A DESIGN EXCEPTION IS NEEDED FOR A REDUCTION IN LANE WIDTHS.

PREPARED BY:

Stantec

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016	=	17,155
ADT 2036	=	23,900
K	=	12 %
D	=	60 %
T	=	9 % *
V	=	50 MPH
HIST. AREA V	=	40 MPH

*(TTST 7% + DUALS 2%)
FUNC CLASS = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3440	=	2.615 MILES
LENGTH STRUCTURE TIP PROJECT U-3440	=	0.031 MILE
TOTAL LENGTH TIP PROJECT U-3440	=	2.646 MILES

Prepared In the Office of Stantec:
FOR DIVISION OF HIGHWAYS
801 Jones Franklin Rd., Suite 300, Raleigh NC, 27606

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 29, 2015
LETTING DATE: NOVEMBER 15, 2016

MICHAEL LINDGREN, P.E.
PROJECT ENGINEER

MICHAEL LITTLEFIELD, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: TATIA WHITE, PE
ROADWAY DESIGN ENGINEERING COORDINATION SECTION ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR P.E.

DocuSigned by: Steven M. Bondor, PE 10/11/2016
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN P.E.

DocuSigned by: Mike Lindgren 10/11/2016
A4E473B3A471402
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

10/11/2016
U:\Roadway\Proj\U-3440_Rdy_tsh.dgn
cmozingo

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025518 MICHAEL D. LINDGREN

11/3/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-7	SURVEY CONTROL SHEETS
2A-1 THRU 2A-8	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 THRU 2B-4	INTERSECTION DETAILS
2B-5	OFFSET PROFILES FOR STRUCTURE DESIGN
2C-1	EMERGENCY VEHICLE ACCESS DETAIL
2C-2	TRANSITION FROM 2'-6" CURB & GUTTER TO 4' PAVED SHOULDER
2C-3	EXTRA DEPTH CONCRETE CATCH BASIN
2C-4	2'-9" CONCRETE CURB & GUTTER
2C-5	DETAIL OF 1'-6" TO 2'-9" CURB & GUTTER TRANSITION SECTION
2C-6	COAL COMBUSTION PRODUCT PLACEMENT DETAIL
2C-7	STRUCTURE ANCHOR UNITS, TYPE III
2C-8	STRUCTURE ANCHOR UNITS, TYPE B-77
2C-9	REINFORCED CONCRETE ENDWALL
2C-10	TB 2GI IN GRASS ISLAND
2C-11	SPECIAL FENCE ON RETAINING WALL
2C-12	SPECIAL JB 66" RCP to 5x6 RCBC WITH MH COVER
2C-13	SPECIAL JB 66" RCP to 5x6 RCBC
2C-14	METHOD FOR PLACEMENT OF DI IN CONCRETE ISLANDS
2C-15	ROUNDABOUT TRUCK APRON
2C-16	TEMPORARY STEEL PLATE COVERS
2G-1 THRU 2G-3	STANDARD TEMPORARY WALL
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3B-1 THRU 3B-2	SUMMARY OF ROADWAY QUANTITIES SUMMARY OF EARTHWORK, GUARDRAIL SUMMARY, ASPHALT PAVEMENT REMOVAL SUMMARY, AND BREAKING OF EXISTING PAVEMENT SUMMARY, PREFENCING
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3P-1 THRU 3P-2	PARCEL INDEX SHEETS
4 THRU 14	PLAN SHEETS
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PMP-1 THRU PMP-14	PAVEMENT MARKING PLANS
EC-1 THRU EC-29	EROSION CONTROL PLANS
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SIG. M1 THRU SIG. M8	STANDARD DRAWINGS FOR METAL POLES
SIG. P1 THRU SIG. P3	PEDESTRIAN PUSHBUTTON STANDARDS
SCP. 1 THRU SCP. 15	COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS
UC-1 THRU UC-28	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-14	UTILITIES BY OTHERS PLANS
X-A THRU X-B	CROSS-SECTION INDEX
X-1A THRU X-166	CROSS-SECTIONS
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C2-1 THRU C2-8	CULVERT PLANS (-L- STA. 117+50)
S1-1 THRU S1-37	STRUCTURE PLANS (LT)
S2-1 THRU S2-37	STRUCTURE PLANS (RT)
W-1 THRU W-2	RETAINING WALL #1 PLANS
W-3 THRU W-5	RETAINING WALL #2 PLANS & WALL #5 PLANS
W-6 THRU W-7	RETAINING WALL #3 PLANS
W-8 THRU W-9	RETAINING WALL #4 PLANS

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

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	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
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.01	Concrete Pavement Joints - Construction and Contraction Joints
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
852.10	Median Construction - with Curb and Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

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

GRADE LINE:

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. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

BERM DITCHES:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, PSNC, MCNC, CITY OF KANNAPOLIS, WINDSTREAM, TIME WARNER, THE WATER AND SEWER AUTHORITY OF CABARRUS COUNTY

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

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

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

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
U-3440	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil
- 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 — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

5/21/14

PROJECT REFERENCE NO.	SHEET NO.
U-3440	1 C-1
Location and Surveys	

SURVEY CONTROL SHEET

BM1 ELEVATION = 820.90
N 637472 E 1501839
Y STATION 10+49 564 RIGHT
RR SPIKE IN BASE OF 30" OAK

BM2 ELEVATION = 830.41
N 637380 E 1502919
L STATION 17+13 66 LEFT
RR SPIKE IN BASE OF POWER POLE

BM3 ELEVATION = 768.85
N 637165 E 1503953
L STATION 27+68 100 LEFT
RR SPIKE IN BASE OF 18" PINE

JAS55 ELEVATION = 713.02
N 636812 E 1505154
L STATION 40+21 7 LEFT
55 JAS

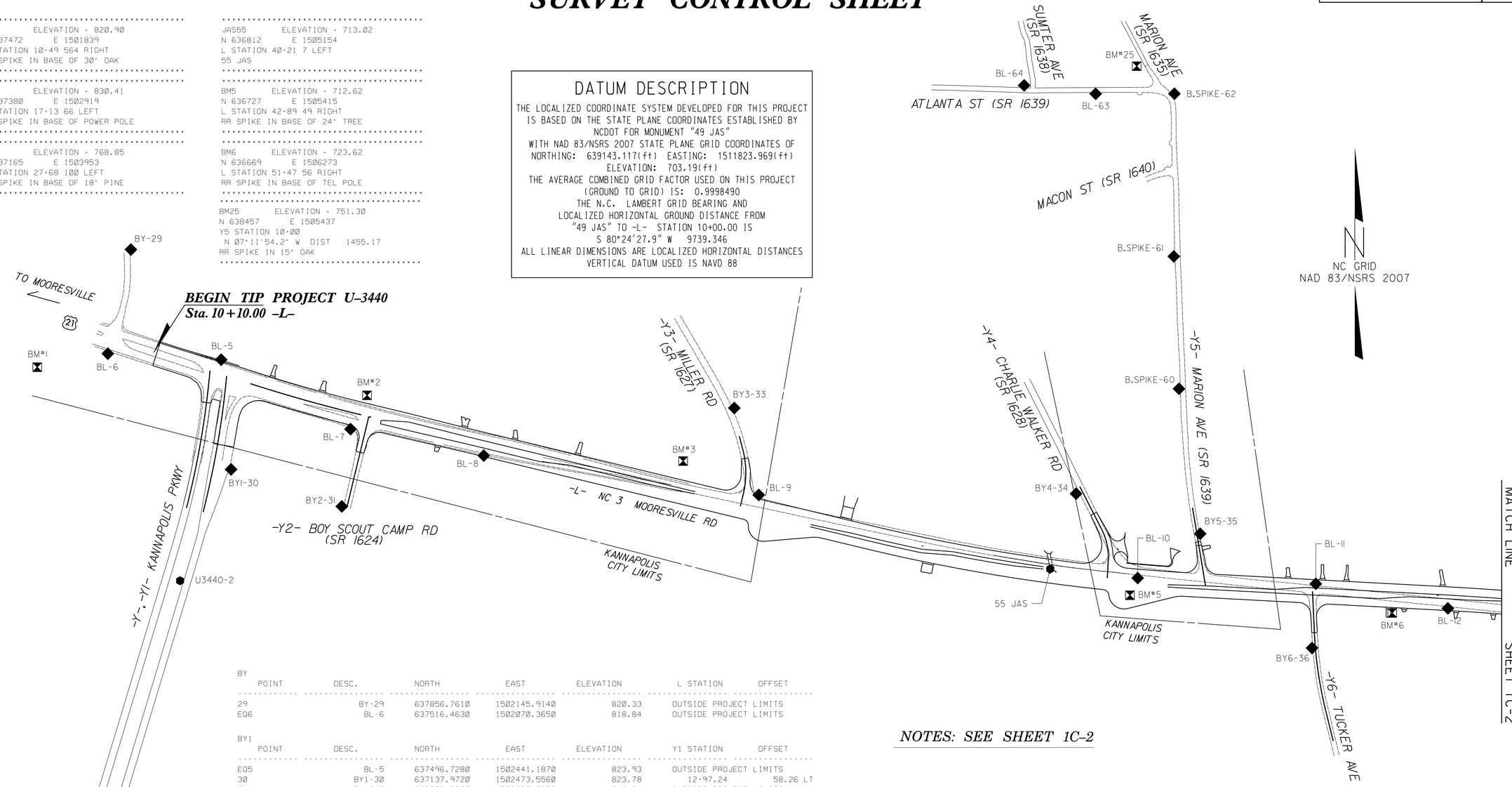
BM5 ELEVATION = 712.62
N 636727 E 1505415
L STATION 42+89 49 RIGHT
RR SPIKE IN BASE OF 24" TREE

BM6 ELEVATION = 723.62
N 636669 E 1506273
L STATION 51+47 56 RIGHT
RR SPIKE IN BASE OF TEL POLE

BM25 ELEVATION = 751.30
N 638457 E 1505437
Y5 STATION 10+00
N 07°11'54.2" W DIST 1455.17
RR SPIKE IN 15" OAK

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "49 JAS"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 639143.117(ft) EASTING: 1511823.969(ft)
ELEVATION: 703.19(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998490
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "49 JAS" TO -L- STATION 10+00.00 IS
S 80°24'27.9" W 9739.346
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88



NOTES: SEE SHEET 1C-2

BY
POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
29	BY-29	637856.7610	1502145.9140	820.33	OUTSIDE PROJECT LIMITS	
EQ6	BL-6	637516.4630	1502070.3650	818.84	OUTSIDE PROJECT LIMITS	

BY1
POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
EQ5	BL-5	637496.7280	1502441.1870	823.93	OUTSIDE PROJECT LIMITS	
30	BY1-30	637137.9720	1502473.5560	823.78	12+97.24	58.26 LT
2	U3440-2	636773.8700	1502307.0250	816.64	OUTSIDE PROJECT LIMITS	
1	U3440-1	635258.0140	1501847.8020	797.49	OUTSIDE PROJECT LIMITS	

BY2
POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
EQ7	BL-7	637269.5560	1502864.5220	825.10	10+53.70	48.47 RT
31	BY2-31	637016.8170	1502836.0820	819.23	13+06.06	16.80 RT

BY3
POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
33	BY3-33	637338.5980	1504120.3140	753.65	OUTSIDE PROJECT LIMITS	
EQ9	BL-9	637054.4130	1504200.1330	758.30	11+84.39	49.81 LT

BY4
POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
34	BY4-34	637058.3640	1505238.4550	718.63	10+15.49	21.70 RT
EQ10	BL-10	636782.6820	1505440.1260	717.05	13+14.88	99.11 LT

BY5
POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
64	BL-64	638393.6500	1505068.6140	767.46	OUTSIDE PROJECT LIMITS	
63	BL-63	638366.0070	1505302.5670	760.45	OUTSIDE PROJECT LIMITS	
62	B.SPIKE-62	638366.2670	1505560.2270	746.85	OUTSIDE PROJECT LIMITS	
61	B.SPIKE-61	637834.4670	1505558.4440	775.40	OUTSIDE PROJECT LIMITS	
60	B.SPIKE-60	637401.5680	1505575.3100	751.46	OUTSIDE PROJECT LIMITS	
35	BY5-35	636927.4730	1505644.6760	732.30	10+88.30	10.73 LT
EQU10	BL-10	636782.6820	1505440.1260	717.05	11+97.40	214.88 RT

BY6
POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
EQ11	BL-11	636763.8530	1506023.0010	729.78	OUTSIDE PROJECT LIMITS	
36	BY6-36	636553.7280	1506010.5810	726.29	11+84.68	11.11 RT

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	1 C-2

Location and Surveys

SURVEY CONTROL SHEET

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
6	BL-6	637516.4630	1502070.3650	818.84	OUTSIDE PROJECT LIMITS	
5	BL-5	637496.7280	1502441.1870	823.93	12+16.97	45.27 LT
7	BL-7	637269.5560	1502864.5220	825.10	16+86.08	53.73 RT
8	BL-8	637183.1790	1503300.4470	808.81	21+29.86	35.54 RT
9	BL-9	637054.4130	1504200.1330	758.30	30+34.68	50.03 LT
JAS55	55 JAS	636812.3010	1505154.0690	713.02	40+20.57	7.31 LT
10	BL-10	636782.6820	1505440.1260	717.05	43+08.58	9.57 LT
11	BL-11	636763.8530	1506023.0010	729.78	48+91.99	25.30 LT
12	BL-12	636683.6370	1506455.1630	717.25	53+27.94	31.61 RT
13	BL-13	636654.6540	1507086.3410	684.88	59+60.37	8.23 RT
14	BL-14	636547.1510	1507771.2200	667.34	66+52.61	45.97 RT
15	BL-15	636512.9610	1508630.2790	679.98	75+05.52	39.87 RT
16	BL-16	636679.8670	1509204.6930	713.05	80+95.92	26.56 RT
17	BL-17	637225.9410	1509926.5270	713.68	90+00.41	8.79 RT
18	BL-18	637645.4970	1510270.5790	715.95	95+40.46	43.56 LT
19	BL-19	637994.0830	1510676.7670	729.07	100+74.09	1.80 LT
20	BL-20	638286.1550	1510902.2020	735.32	104+40.11	48.21 LT
21	BL-21	638656.3750	1511333.2740	719.50	110+06.57	4.39 LT
22	BL-22	639134.2250	1511758.6660	703.11	116+43.85	59.21 LT
23	BL-23	639393.1340	1512174.8620	717.79	121+25.24	12.39 LT
24	BL-24	639505.4600	1512413.4740	727.62	123+87.90	5.46 LT
25	BL-25	639830.4990	1513150.0260	758.25	131+92.89	38.56 LT
26	BL-26	640104.3300	1513948.6150	781.93	140+34.36	35.24 RT
27	BL-27	640310.1460	1514283.8700	799.75	144+24.78	13.61 LT
28	BL-28	640517.4440	1514737.4970	823.19	149+23.43	23.73 LT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
EQ15	BL-15	636512.9610	1508630.2790	679.98	10+34.14	154.98 LT
37	BY7-37	636102.3270	1508215.3120	670.75	OUTSIDE PROJECT LIMITS	

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
EQ18	BL-18	637645.4970	1510270.5790	715.95	OUTSIDE PROJECT LIMITS	
38	BY8-38	637469.5210	1510460.0800	740.04	12+13.81	11.38 RT

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
39	BY9-39	638006.1570	1510433.4580	724.85	11+32.39	10.38 LT
EQ19	BL-19	637994.0830	1510676.7670	729.07	13+28.57	102.17 LT
55	BY19-55	637957.4880	1511005.0220	735.99	OUTSIDE PROJECT LIMITS	

BY10

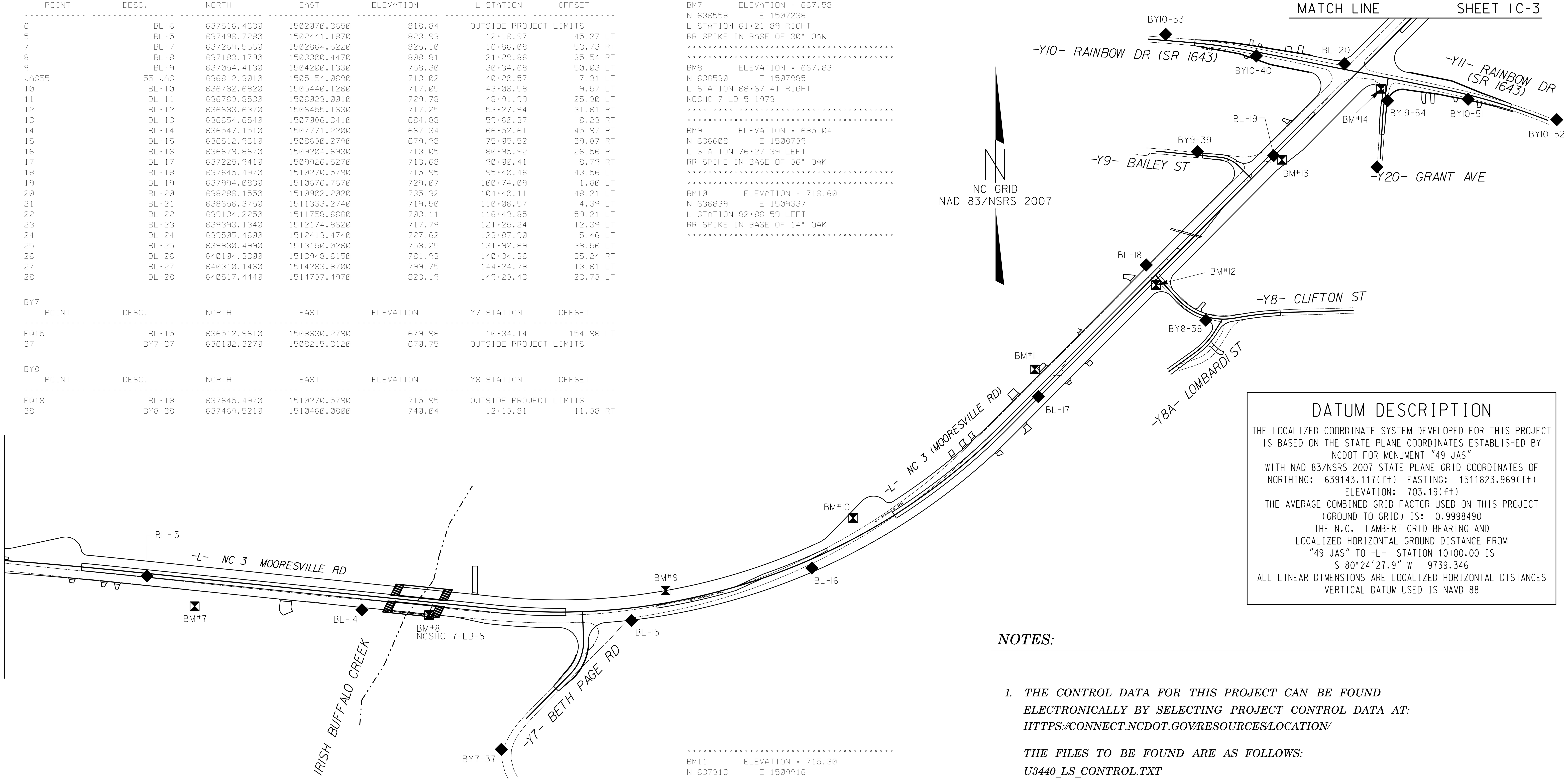
POINT	DESC.	NORTH	EAST	ELEVATION	STATION	OFFSET
53	BY10-53	638380.7180	1510332.1710	743.70	Y10 10+55.18	19.82 LT
40	BY10-40	638311.5620	1510621.4790	749.03	Y10 13+51.08	12.88 RT
EQ20	BL-20	638286.1550	1510902.2020	735.32	Y10 16+31.38	17.07 LT
54	BY19-54	638169.0640	1511039.5620	745.69	Y11 11+11.05	70.92 RT
51	BY10-51	638173.4180	1511295.8310	755.84	Y11 13+62.27	14.10 RT
52	BY10-52	638108.5900	1511578.5790	760.16	OUTSIDE PROJECT LIMITS	

BM7 ELEVATION = 667.58
N 636558 E 1507238
L STATION 61+21 89 RIGHT
RR SPIKE IN BASE OF 30" OAK

BM8 ELEVATION = 667.83
N 636530 E 1507985
L STATION 68+67 41 RIGHT
NCSHC 7-LB-5 1973

BM9 ELEVATION = 685.04
N 636608 E 1508739
L STATION 76+27 39 LEFT
RR SPIKE IN BASE OF 36" OAK

BM10 ELEVATION = 716.60
N 636839 E 1509337
L STATION 82+86 59 LEFT
RR SPIKE IN BASE OF 14" OAK



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "49 JAS"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 639143.117(ft) EASTING: 1511823.969(ft)
ELEVATION: 703.19(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998490
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "49 JAS" TO -L- STATION 10+00.00 IS
S 80°24'27.9" W 9739.346
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BM11 ELEVATION = 715.30
N 637313 E 1509916
L STATION 90+54 60 LEFT
RR SPIKE IN BASE OF POWER POLE

BM12 ELEVATION = 722.81
N 637582 E 1510302
L STATION 95+17 24 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM13 ELEVATION = 729.43
N 637981 E 1510703
L STATION 100+83 26 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM14 ELEVATION = 744.58
N 638207 E 1511019
Y11 STATION 10+84 38 RIGHT
RR SPIKE IN BASE OF POWER POLE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/*

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U3440_LS_CONTROL.TXT
   U3440_LS_LOCAL.TXT

2. *SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.*

3. *PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM, UTILIZING THE NCGS RTN SYSTEM (VRS).*

   MONUMENTS USED OR SET FOR PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT:

- ⬥ *INDICATES GEODETIC CONTROL MONUMENTS FOR HORIZONTAL & VERTICAL CONTROL*
- ◆ *INDICATES BASELINE MONUMENTS FOR HORIZONTAL PROJECT CONTROL*
- ⧓ *INDICATES BENCHMARKS FOR VERTICAL PROJECT CONTROL*

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	1 C-3
Location and Surveys	

SURVEY CONTROL SHEET

NOTES: SEE SHEET 1C-2

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
EQ21	BL-21	638656.3750	1511333.2740	719.50	OUTSIDE PROJECT LIMITS	
41	BY11-41	638687.2250	1511642.2230	753.93	12+67.39	10.39 RT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	Y13 STATION	OFFSET
42	BY12-42	639334.4300	1511856.9410	719.76	12+27.48	122.15 LT
EQ23	BL-23	639393.1340	1512174.8620	717.79	OUTSIDE PROJECT LIMITS	

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	STATION	OFFSET
44	BY14-44	639692.2530	1512041.0760	734.75	OUTSIDE PROJECT LIMITS	
EQU23	BL-23	639393.1340	1512174.8620	717.79	Y14 13+03.62	23.66 LT
43	BY13-43	639165.1800	1512252.8700	704.13	Y15 12+14.21	32.77 RT

BY15

POINT	DESC.	NORTH	EAST	ELEVATION	Y16 STATION	OFFSET
45	BY15-45	639763.0730	1512397.1740	744.52	10+45.92	11.13 RT
EQ24	BL-24	639505.4600	1512413.4740	727.62	13+05.76	6.53 LT

BY16

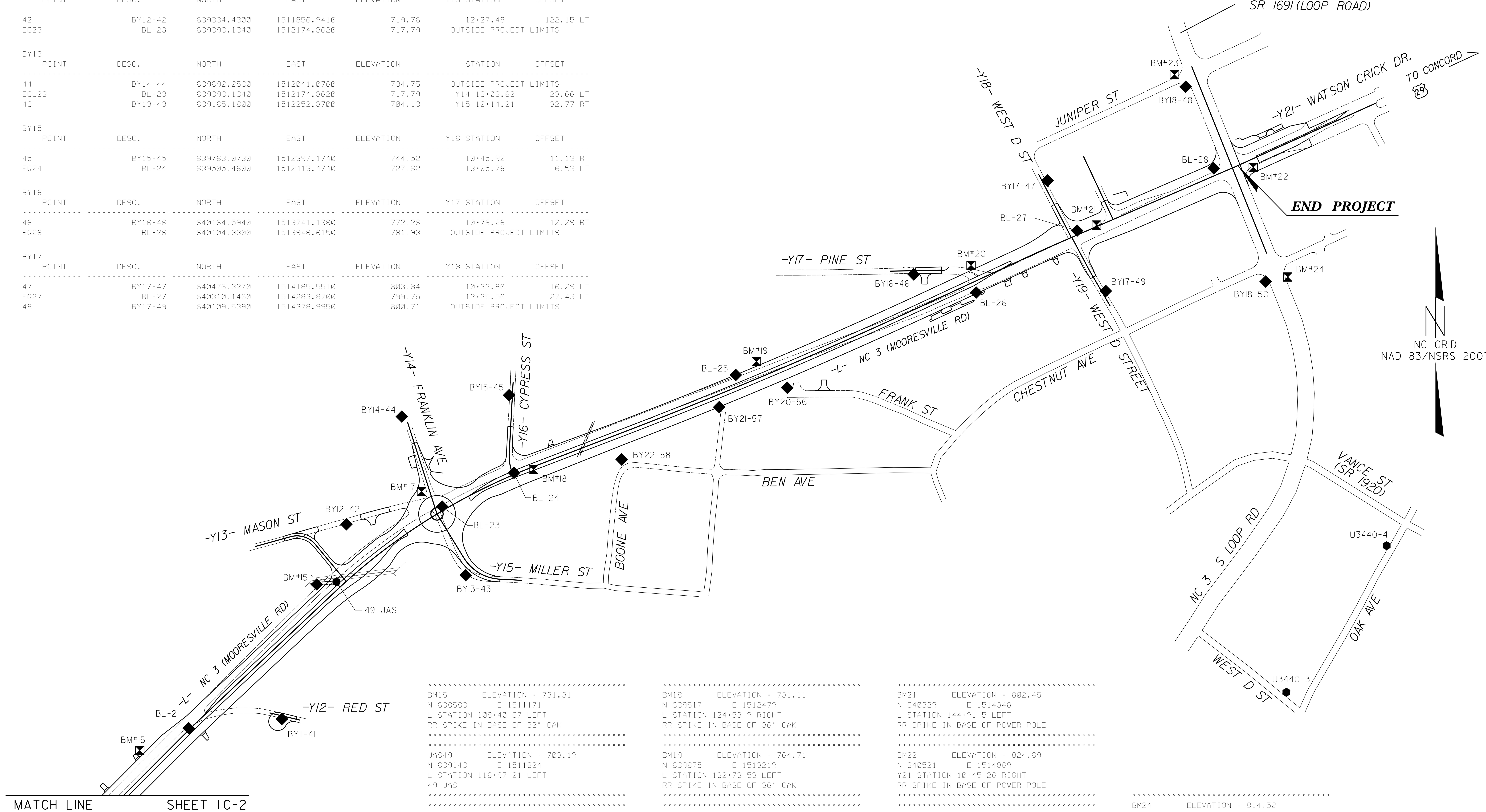
POINT	DESC.	NORTH	EAST	ELEVATION	Y17 STATION	OFFSET
46	BY16-46	640164.5940	1513741.1380	772.26	10+79.26	12.29 RT
EQ26	BL-26	640104.3300	1513948.6150	781.93	OUTSIDE PROJECT LIMITS	

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	Y18 STATION	OFFSET
47	BY17-47	640476.3270	1514185.5510	803.84	10+32.80	16.29 LT
EQ27	BL-27	640310.1460	1514283.8700	799.75	12+25.56	27.43 LT
49	BY17-49	640109.5390	1514378.9950	800.71	OUTSIDE PROJECT LIMITS	

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	Y22 STATION	OFFSET
48	BY18-48	640788.1350	1514644.5920	824.02	10+55.64	43.76 RT
EQ28	BL-28	640517.4440	1514737.4970	823.19	13+41.47	58.24 RT
50	BY18-50	640140.8970	1514910.2680	813.81	OUTSIDE PROJECT LIMITS	
4	U3440-4	639263.1600	1515311.9950	794.84	OUTSIDE PROJECT LIMITS	
3	U3440-3	638775.9640	1514979.1880	793.95	OUTSIDE PROJECT LIMITS	



BM15 ELEVATION = 731.31 N 638583 E 1511171 L STATION 108+40 67 LEFT RR SPIKE IN BASE OF 32" OAK	BM18 ELEVATION = 731.11 N 639517 E 1512479 L STATION 124+53 9 RIGHT RR SPIKE IN BASE OF 36" OAK	BM21 ELEVATION = 802.45 N 640329 E 1514348 L STATION 144+91 5 LEFT RR SPIKE IN BASE OF POWER POLE	
JAS49 ELEVATION = 703.19 N 639143 E 1511824 L STATION 116+97 21 LEFT 49 JAS	BM19 ELEVATION = 764.71 N 639875 E 1513219 L STATION 132+73 53 LEFT RR SPIKE IN BASE OF 36" OAK	BM22 ELEVATION = 824.69 N 640521 E 1514869 Y21 STATION 10+45 26 RIGHT RR SPIKE IN BASE OF POWER POLE	
BM17 ELEVATION = 719.88 N 639443 E 1512107 Y14 STATION 12+35 26 RIGHT RR SPIKE IN BASE OF 20" OAK	BM20 ELEVATION = 782.27 N 640195 E 1513932 L STATION 140+57 54 LEFT RR SPIKE IN BASE OF POWER POLE	BM23 ELEVATION = 825.48 N 640828 E 1514607 Y22 STATION 10+05 63 RIGHT RR SPIKE IN BASE OF TEL POLE	BM24 ELEVATION = 814.52 N 640156 E 1514984 Y22 STATION 16+70 S 41°46'5.8" E DIST 104.80 RR SPIKE IN BASE OF POWER POLE

NOTE: DRAWING NOT TO SCALE

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8/15/14

PROJECT REFERENCE NO.	SHEET NO.
U-3440	1 C-4
Location and Surveys	

SURVEY CONTROL SHEET
–Preliminary–

NOTE:
THE FINAL VERSION OF THIS SHEET WILL BE DISTRIBUTED AFTER THE LET.

L

TYPE	STATION	NORTH	EAST
POT	10·00.00	637520.1992	1502220.7928
PC	13·00.32	637418.2582	1502537.0873
PT	17·09.61	637316.3125	1502899.6319
PC	34·11.99	636917.3894	1504555.2294
PT	45·09.72	636759.0301	1505639.9281
PC	52·82.77	636717.6974	1506411.8748
PT	58·55.69	636673.4231	1506983.0210
PC	70·76.71	636550.0232	1508197.7965
PT	88·53.84	637128.3011	1509816.8608
PC	109·57.34	638618.5660	1511301.3858
PT	110·80.43	638704.4213	1511389.5835
PC	116·75.84	639113.1287	1511822.5748
PT	124·57.15	639526.3216	1512279.8320
PC	127·65.42	639636.6183	1512767.6956
PT	138·63.69	640064.4455	1513778.9724
PC	142·23.62	640215.9746	1514105.4518
PT	143·73.62	640277.3359	1514242.3221
POT	150·45.02	640543.9557	1514858.5170

Y

TYPE	STATION	NORTH	EAST
POT	10·00.00	637460.9161	1502404.7320
PC	10·21.42	637439.5950	1502402.6691
PT	14·55.80	637012.1370	1502327.8818

Y1

TYPE	STATION	NORTH	EAST
POT	10·00.00	637443.3314	1502459.2921
PC	10·09.17	637434.2020	1502458.4088
PT	14·52.15	636998.2848	1502382.1415

Y2

TYPE	STATION	NORTH	EAST
POT	10·00.00	637310.3826	1502924.2421
POT	13·06.23	637012.7011	1502852.3720

Y3

TYPE	STATION	NORTH	EAST
POT	10·00.00	637246.3821	1504136.7690
PC	10·44.60	637203.2426	1504148.1008
PT	11·92.60	637056.7498	1504149.5972
POT	12·33.06	637017.4121	1504140.1186

Y4

TYPE	STATION	NORTH	EAST
POT	10·00.00	637082.0394	1505250.7097
PC	11·57.10	636942.1896	1505322.2864
PT	12·62.41	636840.3752	1505343.9640
POT	13·20.32	636782.5527	1505340.8679

Y5

TYPE	STATION	NORTH	EAST
POT	10·00.00	637012.7975	1505619.5408
POT	12·58.49	636757.8409	1505662.1386

Y6

TYPE	STATION	NORTH	EAST
POT	10·00.00	636739.0904	1506012.3314
PC	11·35.49	636603.7401	1506018.4868
PT	13·91.02	636351.2551	1506055.0274
POT	14·95.54	636249.7800	1506080.0759

Y7

TYPE	STATION	NORTH	EAST
POT	10·00.00	636541.1598	1508474.1074
PC	10·88.68	636452.5404	1508477.4912
PT	12·11.35	636341.3679	1508434.2797
POT	14·10.70	636199.5890	1508294.1355

Y8

TYPE	STATION	NORTH	EAST
POT	10·00.00	637613.3459	1510300.0374
PC	11·02.96	637537.6197	1510369.7968
PT	13·01.57	637475.8984	1510550.0738
PC	13·29.26	637480.4920	1510577.3799
PT	14·76.13	637494.8091	1510723.4345
POT	16·84.04	637500.7876	1510931.2541

Y8A

TYPE	STATION	NORTH	EAST
POT	10·00.00	637305.6746	1510341.7631
PC	11·00.84	637364.5326	1510423.6428
PT	11·97.57	637434.6042	1510489.4561
POT	12·43.09	637473.1533	1510513.6568

Y9

TYPE	STATION	NORTH	EAST
POT	10·00.00	638008.4054	1510300.6830
PC	12·05.18	637988.9001	1510504.9372
PT	12·74.01	637960.2000	1510566.0050
POT	13·30.37	637920.4250	1510605.9338

Y10

TYPE	STATION	NORTH	EAST
POT	10·00.00	638365.3799	1510275.5751
PC	11·21.70	638355.6305	1510396.1867
PT	13·54.77	638323.4816	1510621.5892
POT	16·77.93	638260.3167	1510944.5164

Y11

TYPE	STATION	NORTH	EAST
POT	10·00.00	638260.3167	1510944.5164
PC	12·62.72	638248.9663	1511202.1654
PT	15·92.65	638118.1393	1511518.9668
POT	16·27.61	638105.7717	1511551.6558

Y12

TYPE	STATION	NORTH	EAST
POT	10·00.00	638696.4615	1511551.1751
PC	10·59.85	638709.1654	1511439.2628
PT	12·23.26	638707.5512	1511601.7018
POT	13·26.33	638683.6714	1511701.9679

Y13

TYPE	STATION	NORTH	EAST
POT	10·00.00	639260.2526	1511553.6872
PC	11·21.96	639292.9678	1511671.1765
PT	12·14.04	639266.9061	1511754.2671
POT	13·73.61	639143.9744	1511856.0068

Y14

TYPE	STATION	NORTH	EAST
POT	10·00.00	639675.0242	1512059.6008
POT	13·21.84	639368.5615	1512157.9003

Y15

TYPE	STATION	NORTH	EAST
POT	10·00.00	639368.5615	1512157.9003
PC	11·70.15	639223.3456	1512246.5753
PT	13·15.73	639151.7227	1512366.7861
POT	13·89.74	639147.8698	1512440.7039

Y16

TYPE	STATION	NORTH	EAST
POT	10·00.00	639808.3161	1512410.7933
PC	12·39.10	639569.5740	1512397.7201
PT	12·83.29	639525.7282	1512401.7923
POT	13·12.36	639497.4899	1512408.7003

Y17

TYPE	STATION	NORTH	EAST
POT	10·00.00	640175.3360	1513681.6567
PC	11·72.03	640178.6817	1513833.6531
PT	12·55.44	640173.3571	1513916.7923
PC	12·63.79	640172.1310	1513925.0521
PT	12·95.67	640158.0402	1513953.0541
POT	13·08.03	640149.3008	1513961.7993

Y18

TYPE	STATION	NORTH	EAST
POT	10·00.00	640498.0037	1514156.0356
POT	12·37.34	640287.1015	1514264.8916

Y19

TYPE	STATION	NORTH	EAST
POT	10·00.00	640287.7082	1514266.2939
PC	11·20.28	640181.5398	1514322.8280
PT	11·27.83	640174.9457	1514326.5006
POT	12·62.71	640058.3666	1514394.3444

Y20

TYPE	STATION	NORTH	EAST
POT	10·00.00	638241.0297	1511041.2884
PC	10·73.21	638168.7515	1511029.6295
PT	11·23.25	638119.0371	1511024.1443
POT	12·59.31	637983.2199	1511016.0054

Y21

TYPE	STATION	NORTH	EAST
POT	9·81.05	640518.2650	1514799.9282
POT	15·05.92	640734.6001	1515278.1456

Y22

TYPE	STATION	NORTH	EAST
POT	10·00.00	640856.0674	1514664.5119
POT	16·70.00	640234.1664	1514913.7891

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	25·45.36	60.00	637062.0677	1503698.6538
L	27·61.22	-60.00	637128.1636	1503936.6180
L	28·90.00	-60.00	637097.9964	1504061.8168
L	29·65.00	60.00	636963.7665	1504106.6200
L	30·65.00	120.00	636882.0109	1504189.7827
	30·90.00	-60.00	637051.1464	1504256.2521
L	32·50.00	60.00	636897.0053	1504383.6903
L	32·92.89	-60.00	637003.6192	1504453.4983
L	32·92.89	60.00	636886.9580	1504425.3883
L	34·12.00	60.00	636859.0568	1504541.1830
L	41·17.00	-62.26	636854.6614	1505256.1256
L	41·63.00	60.00	636727.9296	1505287.7701
L	42·45.00	-82.00	636860.6192	1505383.9771
L	42·60.00	123.00	636655.1223	1505379.2348
L	44·45.00	60.00	636702.9628	1505571.4674
L	44·69.00	-76.44	636837.6417	1505603.8796
L	45·10.00	60.00	636699.1009	1505637.0006
L	46·00.00	-60.00	636814.1172	1505733.2879
L	47·85.00	60.00	636684.3975	1505911.6072
L	49·75.00	60.00	636674.2388	1506101.3355
L	52·44.61	60.00	636619.8234	1506370.5645
L	52·82.77	-60.00	636777.2116	1506415.0828
L	55·00.00	-60.00	636763.9685	1506632.9676
L	57·05.00	-116.00	636803.2543	1506843.2884
L	58·00.00	-60.00	636738.6425	1506933.3943
L	58·55.69	-60.00	636733.1159	1506989.0848

SEE SHEET 1C-2 FOR NOTES

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SURVEY CONTROL SHEET
–Preliminary–

NOTE:
THE FINAL VERSION OF THIS SHEET WILL BE DISTRIBUTED AFTER THE LET.

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	70+76.71	-60.00	636609.7160	1508203.8602
L	72+65.00	73.03	636466.8044	1508385.2204
L	78+27.49	60.00	636556.7136	1508957.6256
L	81+00.00	60.00	636650.8501	1509221.8281
L	81+00.00	-60.00	636760.8850	1509173.9500
L	81+45.00	-60.00	636778.7495	1509213.7759
L	83+75.00	-122.00	636936.6928	1509378.1771
L	84+65.00	60.00	636831.3862	1509550.9986
L	84+65.00	-60.00	636930.9045	1509483.9456
L	88+53.84	60.00	637085.9567	1509859.3690
L	88+53.84	-60.00	637170.6456	1509774.3526
L	93+41.26	-60.00	637515.9724	1510118.3494
L	94+35.00	60.00	637497.6922	1510269.5187
L	96+25.00	60.00	637632.3015	1510403.6095
L	98+95.00	-75.38	637919.1327	1510498.2458
L	100+00.00	60.00	637897.9776	1510668.2624
L	100+65.00	-60.00	638028.7171	1510629.1192
L	101+00.00	70.00	637961.7672	1510745.9212
L	102+90.00	-60.00	638188.1228	1510787.9110
L	104+15.00	70.00	638184.9352	1510968.2297
L	105+05.00	-74.00	638350.3242	1510929.7267
L	106+05.00	60.00	638326.6019	1511095.2358
L	109+57.34	60.00	638576.2215	1511343.8940
L	110+80.43	60.00	638660.7890	1511430.7687
L	111+19.32	60.00	638687.4837	1511459.0496
L	112+05.00	62.59	638744.4141	1511523.1384
L	116+00.00	60.00	639017.4350	1511808.6052
L	116+75.84	80.00	639054.9490	1511877.4849
L	118+70.00	-84.68	639306.2645	1511918.1259
L	118+70.00	-120.79	639334.8087	1511895.9965
L	119+50.00	80.00	639221.9481	1512080.6446
L	120+15.00	-107.26	639413.2603	1512028.3173
L	122+25.00	-60.00	639484.0436	1512240.5389
L	122+85.00	60.00	639403.9141	1512348.1295
L	123+19.90	60.00	639418.4336	1512378.7125
L	123+25.00	-60.00	639529.4864	1512332.9605
L	123+54.48	60.00	639432.2914	1512409.2601
L	124+57.15	60.00	639470.2935	1512501.2995
L	124+70.00	-73.84	639599.8715	1512465.4108
L	127+65.42	60.00	639580.5902	1512789.1631
L	130+84.81	60.00	639698.2747	1513087.3651
L	131+14.92	77.72	639693.2669	1513122.0568
L	131+24.05	60.00	639713.1424	1513123.8362
L	133+27.83	74.26	639778.6609	1513318.2242
L	134+38.51	-60.00	639945.6690	1513367.1759
L	134+90.13	142.05	639780.9382	1513495.1019
L	135+10.00	95.00	639832.0674	1513494.6155
L	136+25.00	95.00	639878.8187	1513600.4304
L	136+65.00	60.00	639927.1858	1513622.8169
L	137+00.00	-60.00	640050.9727	1513605.4451
L	137+00.00	-51.75	640043.4543	1513608.8416
L	138+15.00	60.00	639989.5142	1513759.8718
L	138+63.72	-51.75	640111.3979	1513757.2126
L	138+80.93	63.16	640014.4157	1513821.2007
L	140+42.12	63.00	640082.4207	1513967.3469
L	140+44.32	49.07	640095.9820	1513963.4750
L	140+59.52	50.00	640101.5373	1513977.6557
L	140+65.25	-50.00	640194.6557	1513940.7533
L	142+23.62	-50.00	640261.3277	1514084.4019
L	142+23.62	50.00	640170.6215	1514126.5016
L	142+95.00	-60.00	640300.3558	1514145.8044
L	143+30.00	50.00	640214.1261	1514222.5603
L	143+45.00	-80.00	640339.1677	1514183.9499
L	144+50.00	-55.00	640358.1449	1514290.5815
L	144+85.00	68.00	640259.1578	1514371.5478
L	145+75.00	-78.00	640428.8922	1514396.1695
L	146+40.00	-52.00	640430.8422	1514466.1494
L	147+60.00	-55.00	640481.2485	1514575.0907
L	148+00.00	-65.00	640506.3105	1514607.8305
L	148+90.00	68.00	640419.9866	1514743.2454
L	149+10.00	-60.00	640545.4036	1514710.7710

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	10+75.00	29.98	637168.8570	1504124.6995
Y3	11+25.00	-34.93	637123.3021	1504192.8522

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	11+75.00	20.23	636918.3417	1505310.9527

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	11+50.00	19.74	636861.5956	1505624.7919
Y5	11+50.00	-20.26	636868.1875	1505664.2461

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y6	11+15.00	30.00	636622.8462	1505987.5869
Y6	11+15.00	-30.00	636625.5720	1506047.5250

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y7	12+50.00	20.00	636327.9391	1508392.8840

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y8	11+30.00	18.16	637505.0387	1510377.8287
Y8	11+35.00	-23.35	637534.2466	1510407.7247
Y8	11+97.30	19.86	637466.9551	1510440.5375

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y8A	10+62.23	-18.07	637356.6657	1510381.7485

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y9	11+50.00	-15.49	638009.5617	1510451.4758
Y9	11+70.00	14.47	637977.8422	1510468.5378

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y10	11+96.23	25.00	638323.4494	1510468.1204
Y10	12+12.01	-25.00	638371.1705	1510489.8348
Y10	13+54.77	40.00	638284.2531	1510619.7708
Y10	13+54.77	-30.00	638352.9030	1510633.4580
Y10	15+15.00	40.00	638252.9338	1510776.9142
Y10	15+50.00	-30.00	638314.7425	1510824.9213

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y11	11+60.00	30.00	638199.6218	1511095.5665
Y11	11+70.00	-40.00	638266.3170	1511119.0558
Y11	12+62.72	-40.00	638248.1947	1511209.9838
Y11	12+62.72	30.00	638179.5449	1511196.3016
Y11	14+00.00	-30.00	638206.4848	1511343.6427
Y11	15+00.00	-30.00	638177.4278	1511440.8837
Y11	15+00.00	-15.54	638163.6841	1511436.3997
Y11	15+00.00	30.00	638120.3869	1511422.2737
Y11	15+00.00	19.46	638130.4102	1511425.5439

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y12	12+05.00	25.00	638686.7567	1511579.2718
Y12	12+23.00	67.00	638642.4233	1511585.9726
Y12	12+90.00	63.00	638630.8027	1511652.0300
Y12	13+10.00	25.00	638663.1351	1511680.2898

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y13	11+40.50	17.82	639278.0810	1511690.1650
Y13	11+85.00	42.56	639240.4568	1511711.1235
Y13	12+09.87	-52.00	639305.2398	1511789.8066
Y13	12+85.67	-52.00	639244.8785	1511839.9961
Y13	12+86.50	45.00	639182.3957	1511765.7965

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y14	10+37.00	26.00	639631.8512	1512046.1441
Y14	10+37.00	20.00	639633.6837	1512051.8573
Y14	10+97.00	38.00	639571.0531	1512053.0432
Y14	11+50.00	44.00	639513.0398	1512065.3501
Y14	11+60.00	-20.00	639528.7784	1512127.5136
Y14	12+08.00	67.00	639456.4998	1512059.3314

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y15	11+42.00	-81.00	639289.5841	1512301.0351
Y15	11+60.00	69.20	639195.9463	1512182.2304
Y15	13+15.73	-20.96	639172.6537	1512367.8772

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y16	12+20.00	13.56	639589.3863	1512385.2290
Y16	11+50.48	-15.87	639657.1900	1512418.4152

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y17	10+75.00	20.00	640156.7984	1513737.0315

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y18	11+13.90	13.77	640390.4724	1514196.0393
Y18	11+13.90	-13.41	640402.9414	1514220.1973

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y19	11+60.00	-17.51	640155.9502	1514357.8171
Y19	11+60.12	12.29	640140.8594	1514332.1201

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y20	10+65.00	13.04	638178.9365	1511018.0590
Y20	10+85.00	-13.43	638155.2674	1511041.1976

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y21	10+50.00	59.31	640492.6430	1514887.1999
Y21	10+70.00	-60.00	640609.5951	1514856.2446
Y21	12+70.00	-60.00	640692.0283	1515038.4664
Y21	12+70.00	-53.07	640685.7118	1515041.3238

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y22	12+65.00	37.27	640596.2235	1514728.5084
Y22	12+75.00	-37.28	640614.6805	1514801.4329
Y22	14+50.00	-37.68	640452.3907	1514866.9094
Y22	14+75.00	37.41	640401.2492	1514806.5149

SEE SHEET 1C-2 FOR NOTES

PROJECT REFERENCE NO.	SHEET NO.
U-3440	1 C-6
Location and Surveys	

SURVEY CONTROL SHEET
–Preliminary–

NOTE:
THE FINAL VERSION OF THIS SHEET WILL BE DISTRIBUTED AFTER THE LET.

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	24+80.00	65.29	637072.2348	1503633.8753
L	29+00.65	-80.00	637114.9448	1504076.8571
L	30+30.00	99.01	636910.6131	1504160.6728
L	35+40.00	-65.73	636952.9443	1504694.0166
L	35+70.00	60.00	636823.7220	1504696.7971
L	35+70.00	75.00	636809.0522	1504693.6686
L	36+00.00	60.00	636817.4765	1504726.4464
L	36+00.00	75.00	636802.7911	1504723.3913
L	37+50.00	-128.00	636973.4357	1504908.8193
L	39+35.00	-125.00	636940.7862	1505086.9694
L	39+75.00	131.00	636681.6891	1505089.3346
L	39+75.00	60.00	636751.9683	1505099.4257
L	40+80.00	141.15	636657.3010	1505194.3995
L	41+07.06	115.85	636679.0210	1505224.9320
L	42+65.00	155.00	636622.7820	1505381.3020
L	42+75.00	-81.75	636857.5596	1505413.4101
L	48+20.00	-80.00	636822.3259	1505954.0425
L	48+85.00	-71.00	636809.8635	1506018.4684
L	48+95.00	-100.00	636838.2873	1506030.0046
L	49+25.00	-100.00	636836.6833	1506059.9617
L	49+25.00	-75.00	636811.7191	1506058.6250
L	49+72.00	-75.00	636809.2061	1506105.5578
L	49+87.00	-100.00	636833.3684	1506121.8730
L	50+15.00	-100.00	636831.8713	1506149.8329
L	51+28.00	-95.00	636820.8367	1506262.4040
L	52+94.06	-100.37	636817.3050	1506428.6073
L	54+95.00	-90.00	636794.2490	1506630.0889
L	59+95.00	-70.00	636728.9852	1507128.6965
L	59+95.00	-60.00	636719.0364	1507127.6858
L	60+25.00	-60.00	636716.0046	1507157.5322
L	60+25.00	-70.00	636725.9534	1507158.5429
L	63+35.00	-72.00	636696.6138	1507467.1578
L	63+35.00	-60.00	636684.6752	1507465.9451
L	63+65.00	-72.00	636693.5819	1507497.0042
L	63+65.00	-60.00	636681.6434	1507495.7915
L	65+25.00	75.43	636530.7404	1507641.2858
L	65+25.00	95.00	636511.2670	1507639.3076
L	65+50.00	-60.00	636662.9468	1507679.8443
L	65+50.00	-100.00	636702.7420	1507683.8868
L	67+65.00	108.00	636474.0786	1507876.7650
L	69+60.00	-122.00	636683.1938	1508094.0110
L	70+35.00	-121.00	636674.6193	1508168.5259
L	70+50.00	108.00	636445.2758	1508160.3059
L	73+20.00	-60.00	636600.1874	1508439.5109
L	73+20.00	-125.00	636665.1738	1508438.1844
L	76+32.00	-60.00	636629.8915	1508740.3814
L	76+32.00	-109.00	636678.1311	1508731.7821
L	76+55.00	64.49	636511.6376	1508785.5768
L	76+62.00	-120.00	636694.1173	1508757.5759
L	76+62.00	-60.00	636635.2131	1508768.9904
L	77+57.00	77.00	636521.7767	1508891.4272
L	78+50.00	80.98	636542.9833	1508985.8207
L	79+05.45	137.57	636506.1590	1509058.3840
L	79+68.00	92.00	636570.6354	1509106.2640
L	82+17.00	-82.59	636829.3318	1509266.4249
L	82+17.00	-104.00	636848.4337	1509256.7480
L	82+39.00	-105.00	636858.8479	1509274.8389
L	82+39.00	-88.89	636844.5598	1509282.2758
L	84+00.00	90.00	636769.4738	1509510.8236
L	85+56.00	-145.00	637050.1346	1509505.3493
L	85+62.74	-60.00	636985.7828	1509561.2490
L	86+00.00	98.00	636882.9053	1509686.9173
L	86+00.00	133.00	636855.2643	1509708.3876
L	86+22.00	-150.00	637091.3328	1509550.7865
L	86+22.00	133.00	636869.7591	1509726.8378
L	86+22.00	-100.00	637052.1855	1509581.8910
L	86+81.00	-73.00	637067.0609	1509642.6671
L	87+32.29	59.99	637000.0084	1509768.3664
L	87+91.00	-60.00	637128.1450	1509730.6642
L	87+91.00	-77.00	637140.5150	1509719.0031
L	88+38.00	60.00	637074.4464	1509847.8087
L	88+38.00	70.00	637067.3315	

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	88+58.00	70.00	637081.8477	1509869.3908
L	88+58.00	60.00	637088.9051	1509862.3061
L	90+00.00	-60.00	637274.1968	1509877.5049
L	90+00.00	-70.00	637281.2542	1509870.4202
L	90+05.00	75.00	637182.4641	1509976.6771
L	90+05.00	60.00	637193.0502	1509966.0500
L	90+20.00	-60.00	637288.3661	1509891.6198
L	90+20.00	-70.00	637295.4236	1509884.5351
L	90+35.00	60.00	637214.3043	1509987.2223
L	90+35.00	75.00	637203.7181	1509997.8493
L	90+88.00	-60.00	637336.5421	1509939.6102
L	90+88.00	-70.00	637343.5995	1509932.5255
L	91+06.00	-60.00	637349.2946	1509952.3135
L	91+06.00	-70.00	637356.3520	1509945.2288
L	91+84.00	60.00	637319.8663	1510092.3777
L	92+32.00	116.00	637314.3513	1510165.9276
L	92+45.00	-60.00	637447.7719	1510050.4115
L	92+45.00	-75.00	637458.3580	1510039.7845
L	92+66.00	-60.00	637462.6497	1510065.2321
L	92+66.00	-75.00	637473.2358	1510054.6050
L	93+90.00	110.00	637430.5240	1510273.1838
L	94+65.00	102.00	637489.3052	1510320.4467
L	94+65.00	86.07	637500.5476	1510309.1807
L	95+95.00	-143.00	637754.3128	1510236.6179
L	95+95.00	-75.38	637706.5917	1510286.5235
L	96+10.00	76.25	637610.2041	1510404.5380
L	96+47.00	-143.00	637791.1532	1510275.3164
L	97+00.00	-115.00	637808.9414	1510332.5579
L	97+05.00	75.00	637678.3929	1510470.6959
L	97+80.00	106.00	637709.6502	1510545.5890
L	98+20.00	106.00	637737.9890	1510573.8186
L	98+20.00	60.00	637770.4531	1510541.2290
L	104+00.00	70.00	638174.3081	1510957.6436
L	106+00.00	71.47	638314.9635	1511099.8344
L	107+61.00	-95.00	638546.5130	1511095.5186
L	107+61.00	-74.00	638531.6925	1511110.3965
L	107+82.00	-95.00	638561.3909	1511110.3392
L	107+82.00	-74.00	638546.5703	1511125.2170
L	108+45.00	95.00	638471.9337	1511289.4101
L	109+49.51	114.93	638531.9116	1511377.2923
L	109+85.00	-74.10	638690.7526	1511268.8440
L	109+85.00	-133.00	638732.6102	1511227.4018
L	110+18.75	-133.00	638757.0417	1511252.2874
L	110+45.00	90.00	638615.0914	1511428.2844
L	111+80.00	111.32	638691.8165	1511538.4079
L	112+77.66	160.00	638723.4530	1511642.8393
L	115+80.00	-91.39	639113.7985	1511690.1436
L	115+80.00	-137.00	639146.9659	1511658.8363
L	116+45.00	160.00	638975.6034	1511909.9715
L	116+80.00	125.00	639024.8991	1511911.2129
L	117+75.00	125.00	639084.3348	1511977.5305
L	119+00.00	140.00	639145.6284	1512077.9631
L	119+75.00	107.89	639212.8537	1512116.1785
L	122+09.00	-79.34	639493.4141	1512216.8637
L	122+44.00	-60.00	639493.0324	1512257.9223
L	122+44.00	-79.00	639509.9509	1512249.2755
L	122+85.00	90.00	639376.9265	1512361.2319
L	124+30.00	90.00	639432.8382	1512487.8842
L	124+85.00	-95.00	639624.9969	1512471.8472
L	125+03.00	60.00	639486.6979	1512544.1134
L	125+03.00	110.00	639440.0078	1512562.0030
L	125+40.00	120.00	639443.9081	1512600.1315
L	126+35.00	-74.10	639659.1518	1512619.3943
L	126+35.00	-95.00	639678.6656	1512611.9174
L	127+14.00	-118.00	639728.4086	1512677.4585
L	127+37.00	80.00	639551.7452	1512769.7787
L	127+37.00	60.00	639570.4212	1512762.6229
L	127+65.42	80.00	639561.9142	1512796.3189
L	128+00.00	-118.00	639759.1221	1512757.5140
L	128+55.00	-73.85	639737.7179	1512824.4440
L	128+55.00	-120.00	639780.7167	1512807.6921
L	129+45.00	-95.00	639790.1337	1512900.0383

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	130+35.00	80.00	639660.9760	1513048.4816
L	130+71.10	86.81	639668.2518	1513084.6773
L	133+90.00	-95.00	639958.7297	1513308.9921
L	133+90.00	-61.96	639928.3627	1513322.0082
L	134+30.00	-125.00	640001.9845	1513333.6315
L	135+50.00	125.00	639820.7882	1513543.5528
L	135+75.00	-120.00	640055.0183	1513467.4842
L	135+75.00	-100.00	640036.7281	1513475.5755
L	136+42.11	80.00	639899.5304	1513610.0167
L	137+00.00	-90.00	640078.3124	1513593.0943
L	137+00.00	-66.00	640056.4406	1513602.9750
L	137+79.03	-51.75	640076.0641	1513680.5536
L	137+84.97	-66.00	640091.4835	1513679.9994
L	138+60.00	80.00	639990.3198	1513809.2895
L	139+60.00	76.00	640036.0551	1513898.3287
L	140+27.00	76.00	640064.2619	1513959.1018
L	140+57.01	66.00	640085.9648	1513982.1090
L	140+65.51	-70.00	640212.9039	1513932.5638
L	142+23.62	66.00	640156.1085	1514133.2375
L	142+60.00	-70.00	640294.8662	1514109.4340
L	143+15.00	66.00	640193.4814	1514215.4707
L	144+58.00	-80.00	640384.2661	1514287.9960
L	144+90.00	93.00	640238.1990	1514386.0644
L	145+50.00	93.00	640262.0255	1514441.1307
L	145+50.00	68.00	640284.9698	1514431.2030
L	145+70.00	93.00	640269.9677	1514459.4861
L	145+70.00	68.00	640292.9120	1514449.5584
L	147+32.00	68.00	640357.2435	1514598.2374
L	147+32.00	93.00	640334.2992	1514608.1651
L	147+53.00	68.00	640365.5828	1514617.5106
L	147+53.00	93.00	640342.6385	1514627.4384
L	148+88.00	93.00	640396.2481	1514751.3375
L	149+00.00	-80.00	640559.7879	1514693.6511

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	11+70.00	-19.51	636938.2794	1505345.6954
Y4	11+70.00	-65.00	636956.3510	1505387.4385
Y4	11+95.00	-78.00	636928.8472	1505411.1479

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	11+13.00	-40.00	636907.9342	1505677.6157
Y5	11+13.00	-19.99	636904.6371	1505657.8818
Y5	11+90.00	-56.85	636834.7637	1505706.9246

MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y7	11+20.00	89.84	636436.6029	1508386.8871

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y10	13+40.00	57.00	638270.3330	1510602.3693
Y10	13+42.11	39.26	638287.3634	1510607.7370
Y10	14+50.00	69.00	638237.1981	1510707.4996
Y10	15+25.00	-58.00	638347.0890	1510805.8764
Y10	15+25.00	-30.00	638319.6290	1510800.4035
Y10	15+26.00	68.80	638222.5355	1510782.0720
Y10	15+50.00	-58.00	638342.2025	1510830.3942

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y11	11+80.00	-68.00	638291.8224	1511134.3358
Y11	11+80.00	-40.00	638264.3624	1511128.8629

SEE SHEET 1C-2 FOR NOTES

8/15/14

PROJECT REFERENCE NO.	SHEET NO.
U-3440	1 C-7
Location and Surveys	

SURVEY CONTROL SHEET
–Preliminary–

NOTE:
THE FINAL VERSION OF THIS SHEET WILL BE DISTRIBUTED AFTER THE LET.

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y13	12+46.00	45.19	639213.4699	1511739.8266

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y14	11+10.00	-40.00	639582.4977	1512131.2865
Y14	11+10.00	-20.00	639576.3891	1512112.2422
Y14	11+31.00	-20.00	639556.3926	1512118.6562
Y14	11+31.00	-40.00	639562.5012	1512137.7005

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y16	11+50.00	-50.00	639655.8066	1512452.5170

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y17	?+??.??	?.??	640212.3258	1513660.7708
Y17	10+00.10	-20.00	640195.3343	1513661.3699
Y17	11+72.03	-37.00	640215.6747	1513832.9345

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y18	10+96.00	13.65	640406.4365	1514187.9377
Y18	10+96.00	36.00	640396.1851	1514168.0762
Y18	11+23.00	41.61	640369.6182	1514175.4725
Y18	11+39.37	-41.02	640392.9677	1514256.4058

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y19	11+50.00	-44.00	640177.9160	1514375.6805

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y20	10+75.00	12.26	638168.8960	1511017.2336

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y22	12+65.00	65.00	640585.9080	1514702.7729
Y22	14+75.00	65.00	640390.9838	1514780.9046

SEE SHEET 1C-2 FOR NOTES

17-OCT-2016 11:13
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-1

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

A1	12" CONCRETE TRUCK APRON.	J3	PROPOSED 8" AGGREGATE BASE COURSE
A2	6" PORTLAND CEMENT CONCRETE PAVEMENT	K1	LIME STABILIZATION: (METHOD-SLURRY) 40% OF PROJECT; DEPTH OF 8", AT A RATE OF 20 LBS PER SQ. YD. AS DIRECTED BY THE ENGINEER. OR CEMENT STABILIZATION: 60% OF PROJECT; DEPTH OF 7", AT A RATE OF 55 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	N1	GEOTEXTILE FOR PAVEMENT STABILIZATION.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R1	1'-6" CONCRETE CURB AND GUTTER.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R2	2'-6" CONCRETE CURB AND GUTTER.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	8"x18" CONCRETE CURB.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R4	2'-9" CONCRETE CURB AND GUTTER (SEE DETAIL).
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	S1	4" CONCRETE SIDEWALK.
E2	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T1	EARTH MATERIAL.
E3	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U1	EXISTING PAVEMENT.
E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V1	MILLING ASPHALT PAVEMENT. 3" DEPTH.
J1	PROPOSED 4" AGGREGATE BASE COURSE	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS).
J2	PROPOSED 6" AGGREGATE BASE COURSE	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS).

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

ROADWAY DESIGN ENGINEER — 10/4/2016

PAVEMENT DESIGN ENGINEER — 10/7/2016

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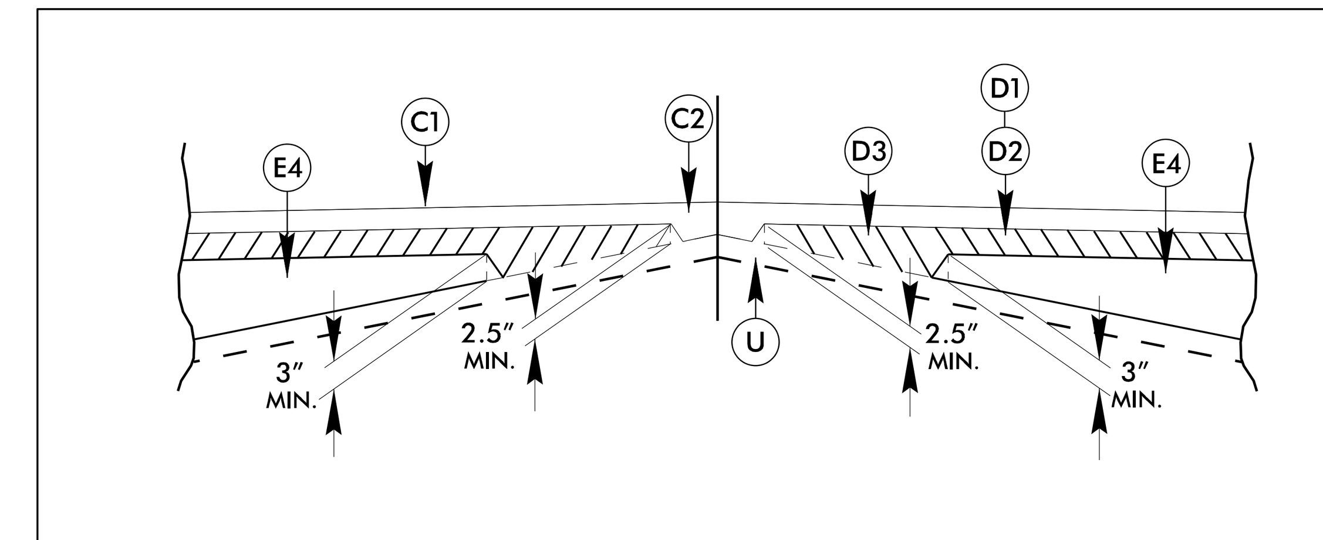
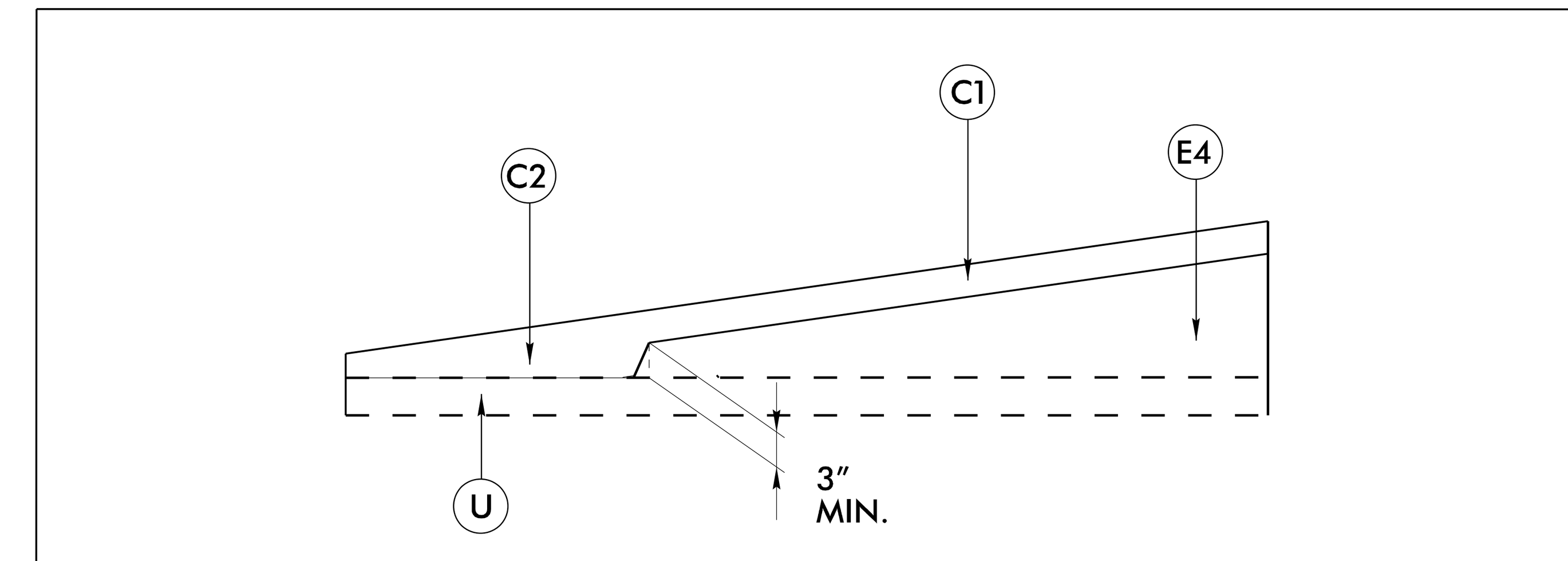
Stantec

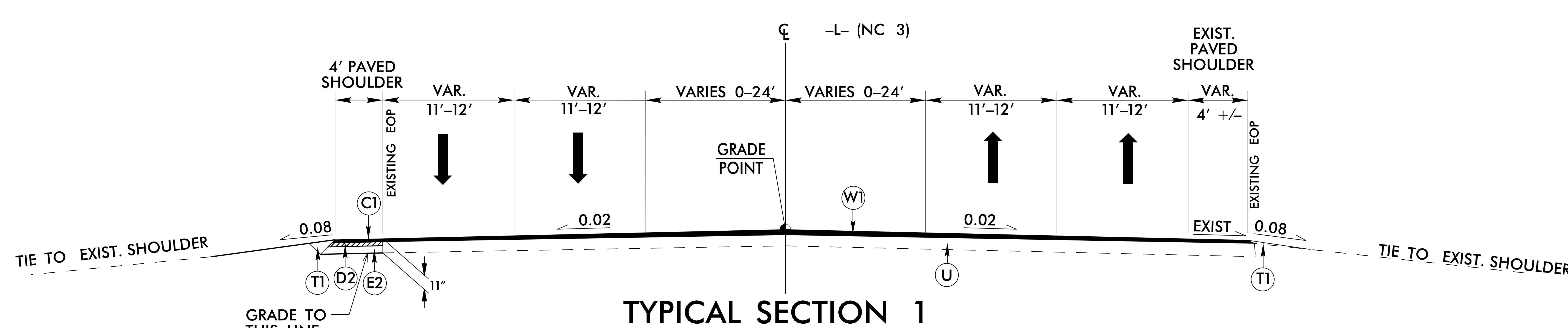
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672



W1: WEDGING DETAIL FOR RESURFACING



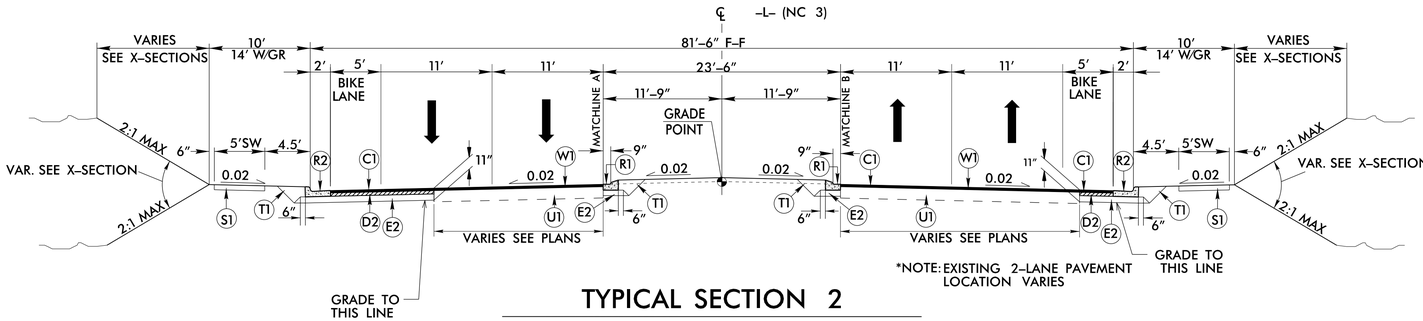
W2: WEDGING DETAIL FOR RESURFACING -DR2- ONLY



TYPICAL SECTION 1

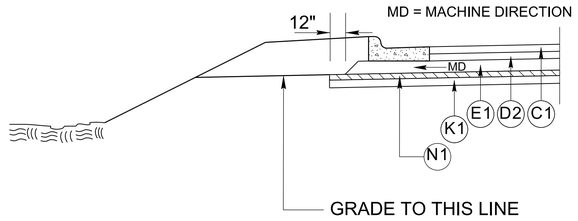
-L- STA. 10+10 TO 12+89.90

8/17/99



TYPICAL SECTION 2

–L– STA. 12+89.90 TO 25+00

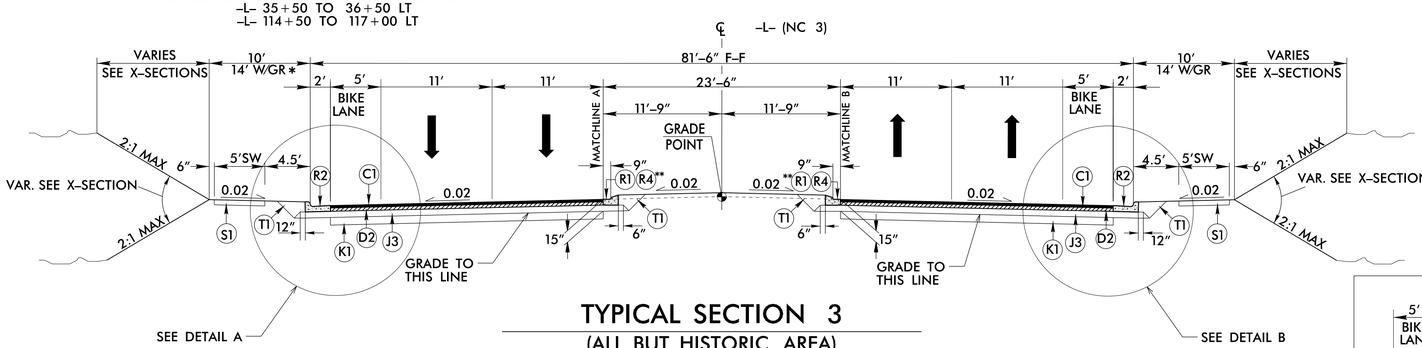


NOTE: THESE AREAS TO BE INVESTIGATED DURING CONSTRUCTION.
THESE LOCATIONS TO BE INVESTIGATED DURING CONSTRUCTION.

GEOTEXTILE FOR PAVEMENT STABILIZATION

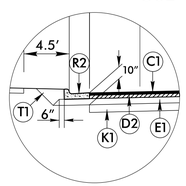
–L– STA. 40+50.00 TO 45+50.00
–L– STA. 69+00.00 TO 73+50.00
–L– STA. 85+50.00 TO 87+00.00
–L– STA. 97+25.00 TO 98+25.00
–L– STA. 117+50.00 TO 119+00.00
–L– STA. 125+25.00 TO 127+00.00

* NOTE: SEE CROSS SECTIONS FOR BERM WIDTH AND GUARDRAIL LOCATIONS FOR THESE AREAS:
–L– 35+50 TO 36+50 LT
–L– 114+50 TO 117+00 LT

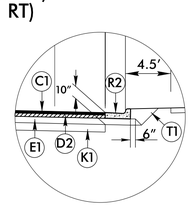


TYPICAL SECTION 3

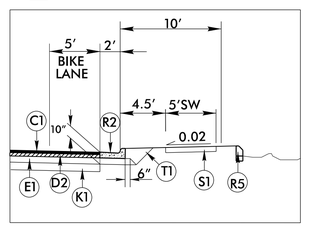
(ALL BUT HISTORIC AREA)
–L– STA. 25+00.00 TO 67+64.88 (BEG. BRIDGE LT)/67+56.32 (BEG. BRIDGE RT)
–L– STA. 68+94.88 (END BRIDGE LT)/68+86.32 (END BRIDGE RT) TO 122+93.15
–L– STA. 122+93.15 TO 124+38.69 LT
USE **R4 –L– STA. 65+79.45 TO BEGIN BRIDGE (MEDIAN LT & RT)
USE **R4 –L– END BRIDGE TO STA 70+76.71 (MEDIAN LT & RT)



ALTERNATE PAVEMENT DESIGN
'DETAIL A'



ALTERNATE PAVEMENT DESIGN
'DETAIL B'



DETAIL FOR CURB CHANNELIZATION

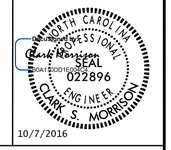
–L– STA. 42+66.83 TO 44+42.41 LT
–L– STA. 138+56.05 TO 140+17.97 RT

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-2

ROADWAY DESIGN ENGINEER

10/4/2016

PAVEMENT DESIGN ENGINEER



10/7/2016

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Stantec

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

FINAL PAVEMENT DESIGN	
A1	12" CONCRETE TRUCK APRON
A2	6" PORTLAND CEMENT CONCRETE PAVEMENT
C1	PROP. APPROX. 3", TYPE S9.5B
C2	PROP. VAR. DEPTH, TYPE S9.5B
D1	PROP. APPROX. 2.5", I19.B
D2	PROP. APPROX. 4", I19.B
D3	PROP. VAR. DEPTH, TYPE I19.0B
E1	PROP. APPROX. 3", TYPE B25.0B
E2	PROP. APPROX. 4", TYPE B25.0B
E3	PROP. APPROX. 4.5", TYPE B25.0B
E4	PROP. VAR. DEPTH, TYPE B25.0B
J1	PROPOSED 4" AGREGATE BASE COURSE
J2	PROPOSED 6" AGREGATE BASE COURSE
J3	PROPOSED 8" AGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
N1	GEOTEXTILE FOR PAVEMENT STABILIZATION
R1	1'-6" CONCRETE CURB AND GUTTER
R2	2'-6" CONCRETE CURB AND GUTTER
R3	8"x18" CONCRETE CURB
R4	2'-9" CONCRETE CURB AND GUTTER
R5	8"-12" CONCRETE CURB
S1	4" CONCRETE SIDEWALK
T1	EARTH MATERIAL
U1	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT. 3" DEPTH
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)

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

9/27/2016
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mmcclure

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-3

ROADWAY DESIGN ENGINEER

10/4/2016

PAVEMENT DESIGN ENGINEER

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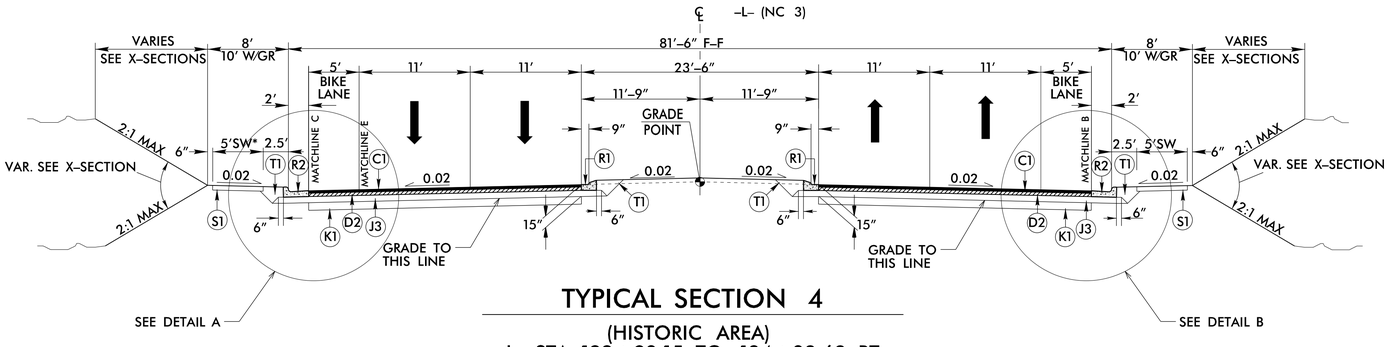
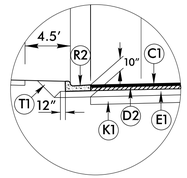
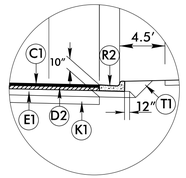


TYPICAL SECTION 4

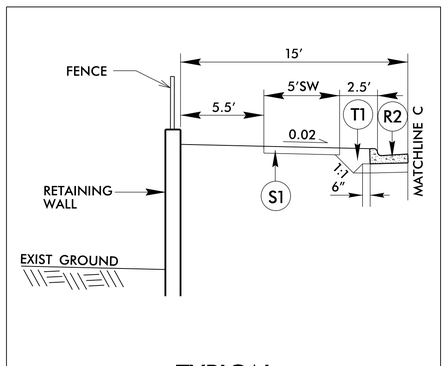
(HISTORIC AREA)
–L– STA. 122+93.15 TO 124+38.69 RT
–L– STA. 124+38.69 TO 149+42.54



ALTERNATE PAVEMENT DESIGN
'DETAIL A'

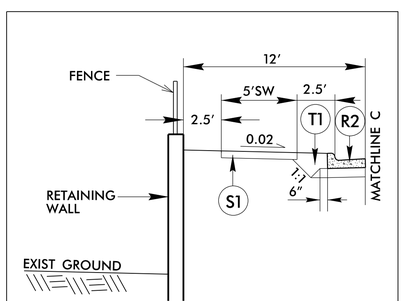


ALTERNATE PAVEMENT DESIGN
'DETAIL B'



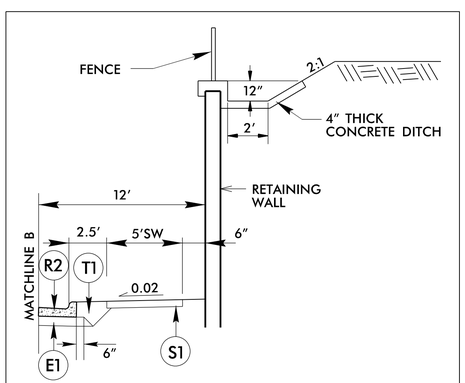
TYPICAL SECTION 4A

–L– STA. 132+90 TO 133+40 LT



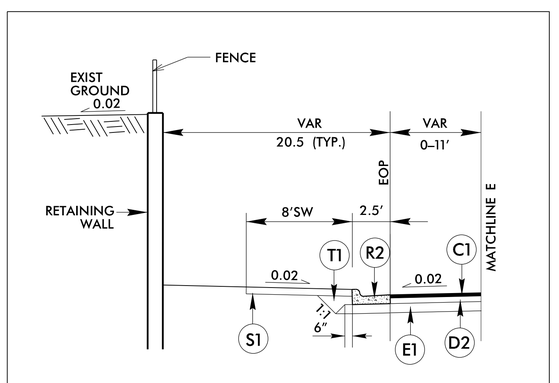
TYPICAL SECTION 4B

–L– STA. 137+00 TO 138+50 LT



TYPICAL SECTION 4C

–L– STA. 132+00 RT TO 136+25 RT



TYPICAL SECTION 4D

–Y18– STA. 11+56.70 LT TO –DR2– STA. 11+75.00 RT
–L– STA. 145+73.00 LT TO 148+50.00 LT

FINAL PAVEMENT DESIGN	
A1	12" CONCRETE TRUCK APRON
A2	6" PORTLAND CEMENT CONCRETE PAVEMENT
C1	PROP. APPROX. 3", TYPE S9.5B
C2	PROP. VAR. DEPTH, TYPE S9.5B
D1	PROP. APPROX. 2.5", I19.B
D2	PROP. APPROX. 4", I19.B
D3	PROP. VAR. DEPTH, TYPE I19.0B
E1	PROP. APPROX. 3", TYPE B25.0B
E2	PROP. APPROX. 4", TYPE B25.0B
E3	PROP. APPROX. 4.5", TYPE B25.0B
E4	PROP. VAR. DEPTH, TYPE B25.0B
J1	PROPOSED 4" AGREGATE BASE COURSE
J2	PROPOSED 6" AGREGATE BASE COURSE
J3	PROPOSED 8" AGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
N1	GEOTEXTILE FOR PAVEMENT STABILIZATION
R1	1'-6" CONCRETE CURB AND GUTTER
R2	2'-6" CONCRETE CURB AND GUTTER
R3	8"x18" CONCRETE CURB
R4	2'-9" CONCRETE CURB AND GUTTER
R5	8"-12" CONCRETE CURB
S1	4" CONCRETE SIDEWALK
T1	EARTH MATERIAL
U1	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT. 3" DEPTH
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)

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

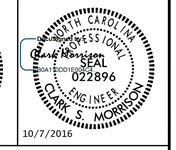
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-4

ROADWAY DESIGN ENGINEER

10/4/2016

PAVEMENT DESIGN ENGINEER



10/7/2016

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801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
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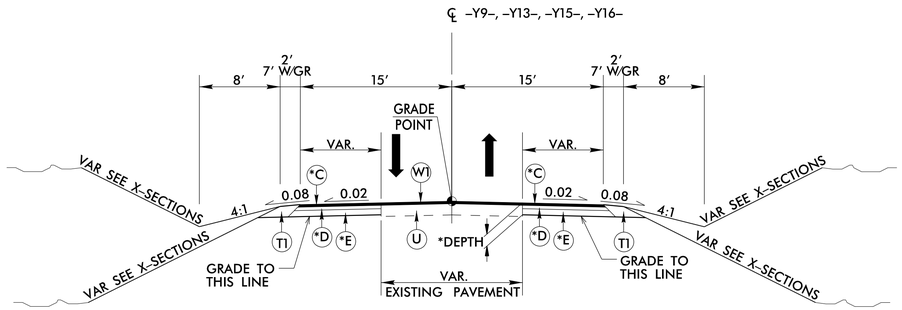
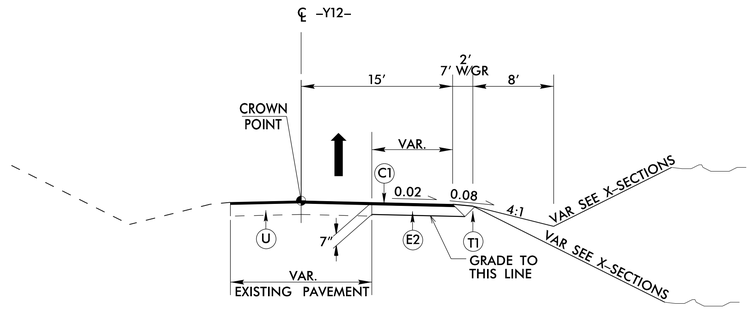


℄	*C	*D	* E	* DEPTH
–Y9–	C1	D2	E2	11″
–Y13–	C1	–	E2	7″
–Y15–	C1	D1	E2	9.5″
–Y16–	C1	D2	E2	11″

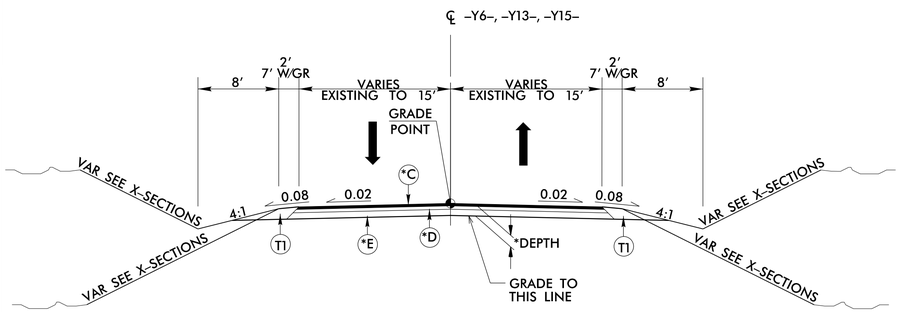
TYPICAL SECTION 5

–Y9– STA. 11+50.00 TO 12+91.62
–Y13– STA. 11+00.00 TO 11+40.00 (3″ OVERLAY AND WIDENING)
–Y15– STA. 12+70.00 TO 13+15.73
–Y16– STA. 11+50.00 TO 12+75.07



TYPICAL SECTION 6

–Y12– STA. 12+35.38 TO 13+14.50 (WIDENING ONLY–CUL DE SAC)

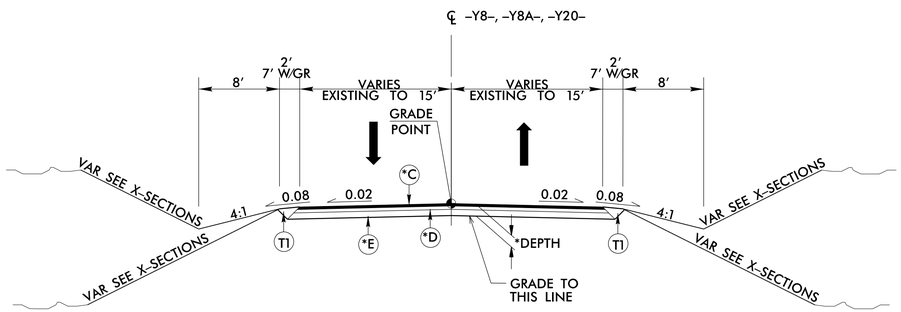


NOTE: USE GRADED SECTION WITH 11″ DEPTH

TYPICAL SECTION 7

–Y6– STA. 10+38.94 TO 11+35.00
–Y13– STA. 11+40.00 TO 13+33.56
–Y15– STA. 11+00.00 TO 12+70.00

℄	*C	*D	* E	* DEPTH
–Y6–	C1	D2	E2	11″
–Y8–	C1	–	E2	7″
–Y8A–	C1	D2	E2	11″
–Y13–	C1	–	E2	7″
–Y15–	C1	D1	E2	9.5″
–Y20–	C1	D1	E2	9.5″



NOTE: USE TRENCH SECTION WITH 7″ AND 9.5″ DEPTH

TYPICAL SECTION 7A

–Y8– STA. 10+38.78 TO 14+50.00
–Y8A– STA. 10+00.00 TO 12+32.65
–Y20– STA. 10+22.01 TO 11+80.00

FINAL PAVEMENT DESIGN	
A1	12″ CONCRETE TRUCK APRON
A2	6″ PORTLAND CEMENT CONCRETE PAVEMENT
C1	PROP. APPROX. 3″, TYPE S9.5B
C2	PROP. VAR. DEPTH, TYPE S9.5B
D1	PROP. APPROX. 2.5″, I19.B
D2	PROP. APPROX. 4″, I19.B
D3	PROP. VAR. DEPTH, TYPE I19.0B
E1	PROP. APPROX. 3″, TYPE B25.0B
E2	PROP. APPROX. 4″, TYPE B25.0B
E3	PROP. APPROX. 4.5″, TYPE B25.0B
E4	PROP. VAR. DEPTH, TYPE B25.0B
J1	PROPOSED 4″ AGREGATE BASE COURSE
J2	PROPOSED 6″ AGREGATE BASE COURSE
J3	PROPOSED 8″ AGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
N1	GEOTEXTILE FOR PAVEMENT STABILIZATION
R1	1′-6″ CONCRETE CURB AND GUTTER
R2	2′-6″ CONCRETE CURB AND GUTTER
R3	8″x18″ CONCRETE CURB
R4	2′-9″ CONCRETE CURB AND GUTTER
R5	8″-12″ CONCRETE CURB
S1	4″ CONCRETE SIDEWALK
T1	EARTH MATERIAL
U1	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT. 3″ DEPTH
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)

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

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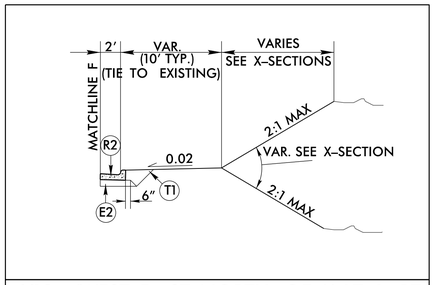
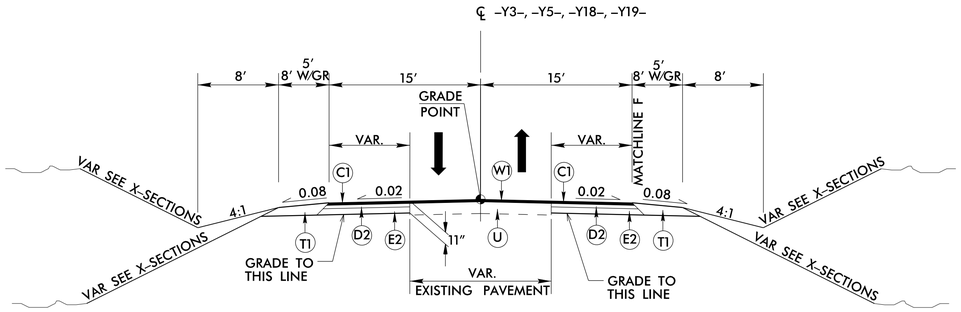
8/17/99

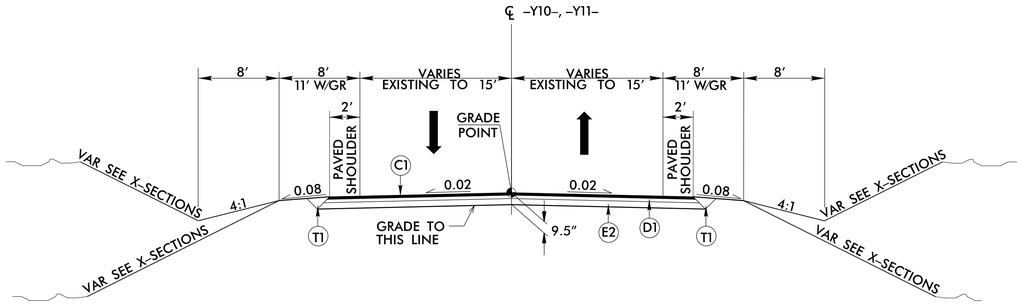


–Y18– (WEST D ST NORTH OF L) LT & RT
–Y19– (WEST D ST SOUTH OF L) LT & RT



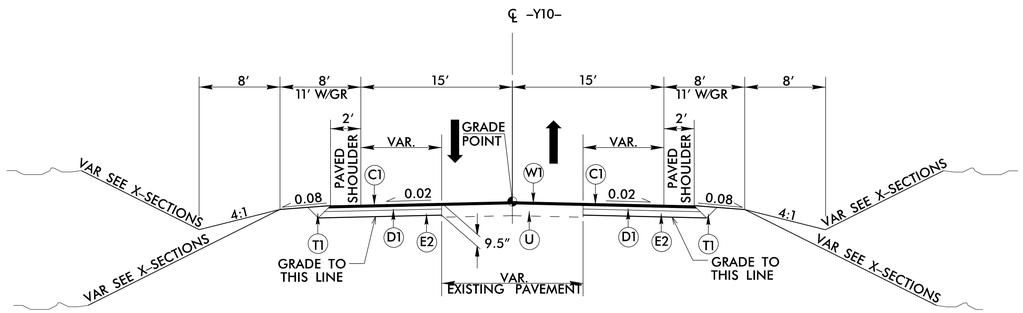
TYPICAL SECTION 8

–Y3– STA. 10+75.00 TO 11+94.31
–Y5– STA. 11+25.00 TO 12+18.79
–Y18– STA. 11+13.90 TO 11+98.50 (ONE WAY ONLY)
–Y19– STA. 10+36.67 TO 11+50.00



TYPICAL SECTION 9

–Y10– STA. 13+90.00 TO 16+31.39
–Y11– STA. 10+60.94 TO 15+00.00



TYPICAL SECTION 10

–Y10– STA. 11+50.00 TO 13+90.00

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

10/4/2016

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON

10/7/2016

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D2	PROP. APPROX. 4″, I19.B
D3	PROP. VAR. DEPTH, TYPE I19.0B
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E2	PROP. APPROX. 4″, TYPE B25.0B
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R1	1′-6″ CONCRETE CURB AND GUTTER
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S1	4″ CONCRETE SIDEWALK
T1	EARTH MATERIAL
U1	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT. 3″ DEPTH
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET NO. 2A-1)

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

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-6

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025513 MICHAEL D. LINDGREN 10/4/2016	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON 10/7/2016

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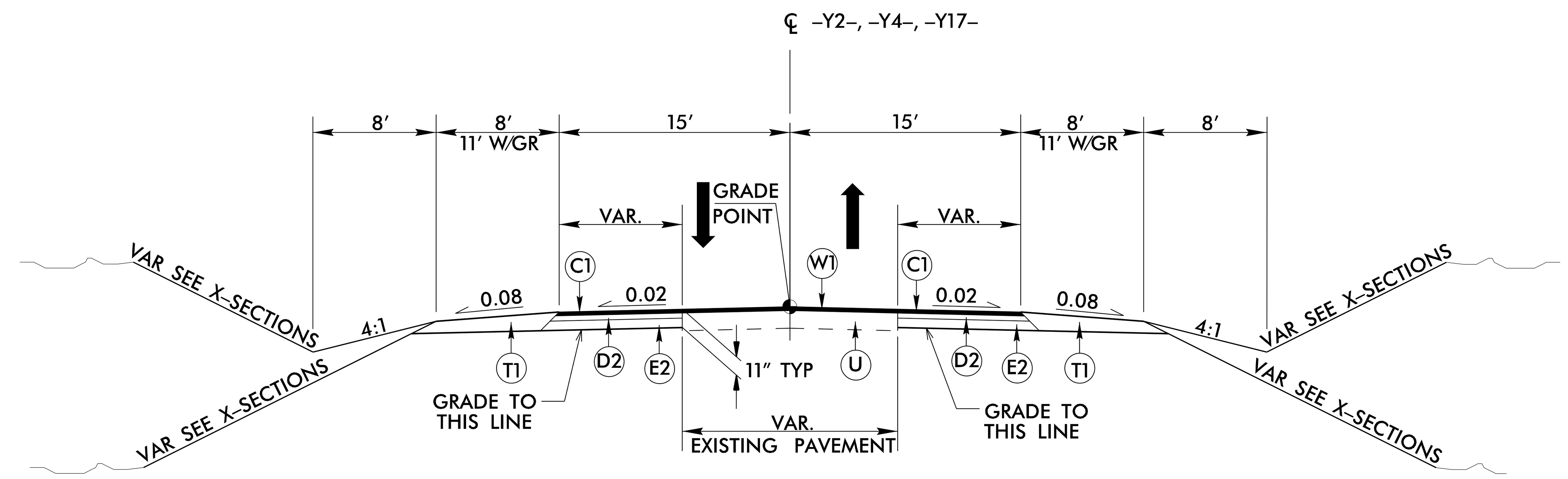
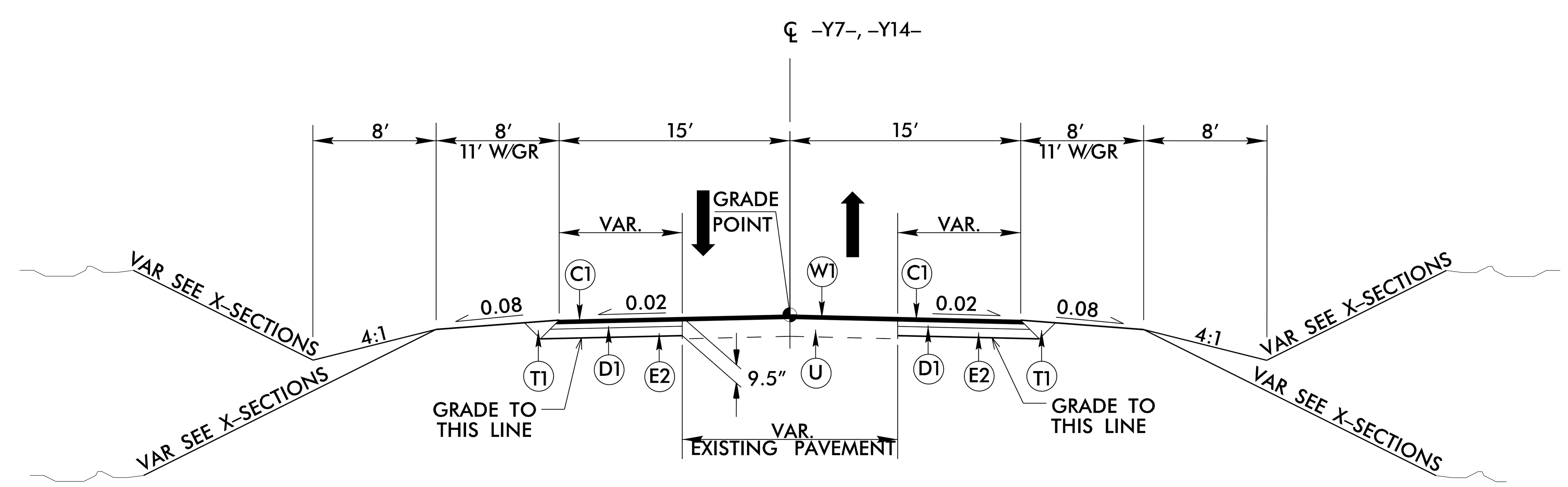


TYPICAL SECTION 11

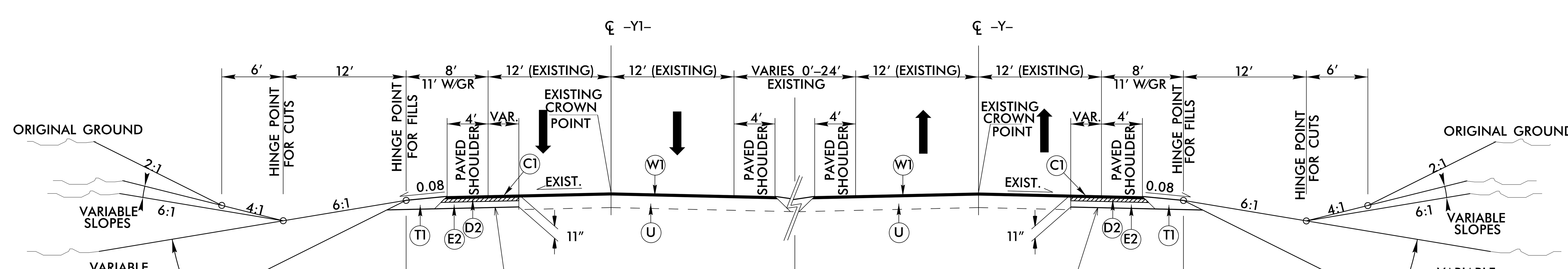
-Y2- STA. 10+40.75 TO 11+20.00
-Y4- STA. 11+00.00 TO 12+81.52

-Y17- STA. 10+86.19 TO 11+72.03 (3" MIN. OVERLAY AND WIDENING - CUL DE SAC)



TYPICAL SECTION 12

-Y7- STA. 10+38.75 TO 12+75.00
-Y14- STA. 10+75.00 TO 12+21.84



TYPICAL SECTION 13

NOTE: MATCH EXISTING PAVEMENT AND PAVED SHOULDER WIDTHS AND SLOPES SEE -L- CROSS SECTIONS STA. 11+50 TO 13+25

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A1	12" CONCRETE TRUCK APRON
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C1	PROP. APPROX. 3", TYPE S9.5B
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D1	PROP. APPROX. 2.5", I19.B
D2	PROP. APPROX. 4", I19.B
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S1	4" CONCRETE SIDEWALK
T1	EARTH MATERIAL
U1	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT. 3" DEPTH
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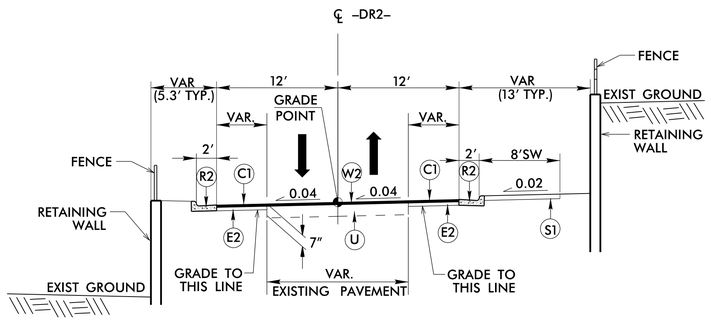
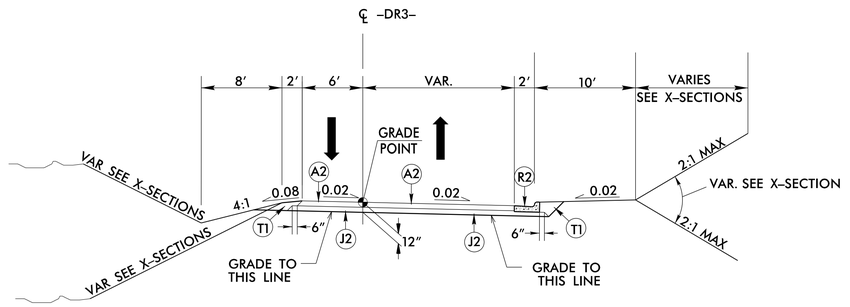
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



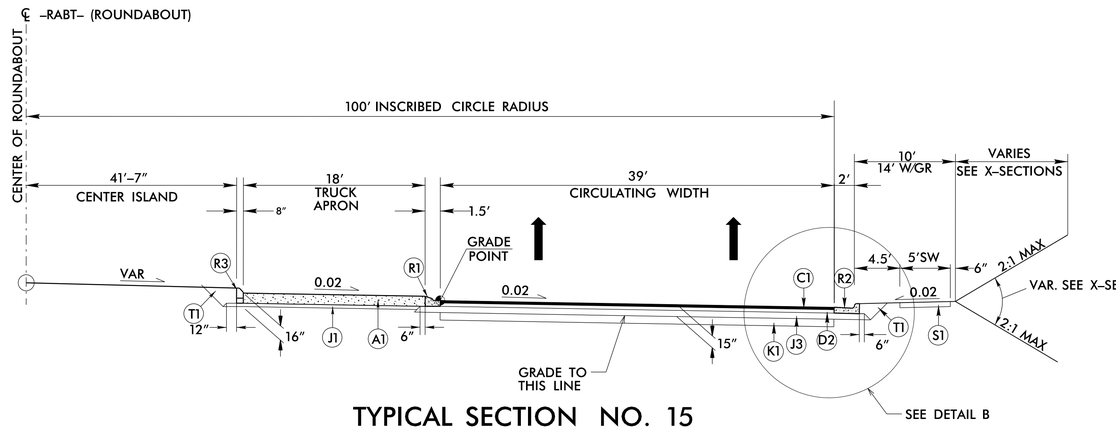
TYPICAL SECTION 14

–DR2– STA. 11+65.00 TO 11+96.39



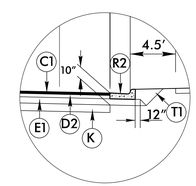
TYPICAL SECTION 14A

–DR3– STA. 10+23.63 TO 11+19.66

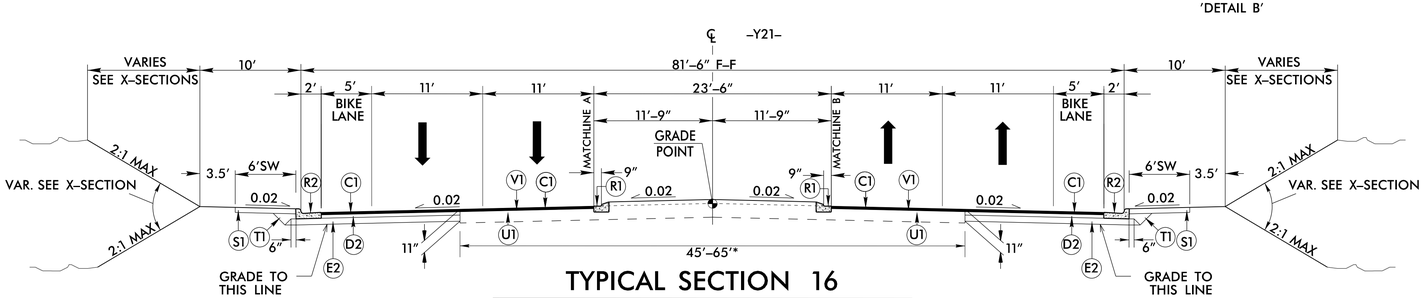


TYPICAL SECTION NO. 15

–RABT– STA. 0+00.00 TO 3+83.27



ALTERNATE PAVEMENT DESIGN
'DETAIL B'



TYPICAL SECTION 16

–Y21– STA. 10+12.00 TO 14+07.92 (OVERLAY & WIDENING—SEE CROSS SECTIONS)

*NOTE: EXISTING PAVEMENT LOCATION VARIES

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-7

ROADWAY DESIGN ENGINEER

Digitally signed by MICHAEL D. LINDGREN
DN: c=US, o=U.S. Government, ou=DOD, ou=PKI, ou=USA, cn=MICHAEL D. LINDGREN, 0.9.2342.19200300.100.1.1=12345678901234
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
10/12/2016

PAVEMENT DESIGN ENGINEER

Digitally signed by CLARK S. MORRISON
DN: c=US, o=U.S. Government, ou=DOD, ou=PKI, ou=USA, cn=CLARK S. MORRISON, 0.9.2342.19200300.100.1.1=12345678901234
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON
10/12/2016

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E3	PROP. APPROX. 4.5″, TYPE B25.0B
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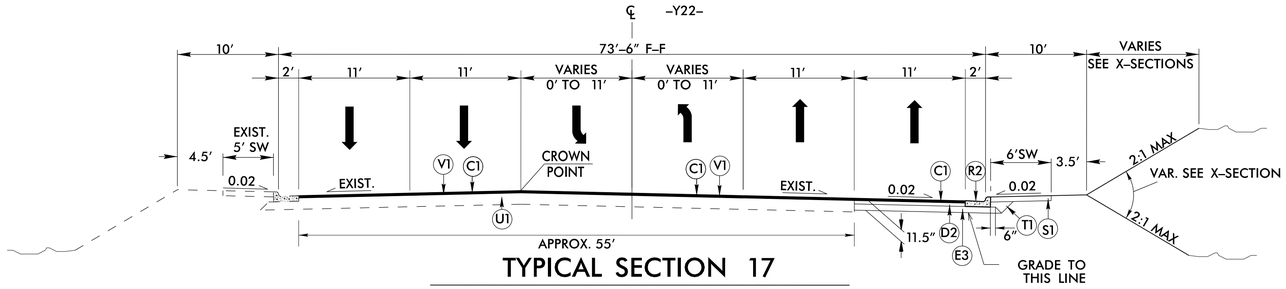
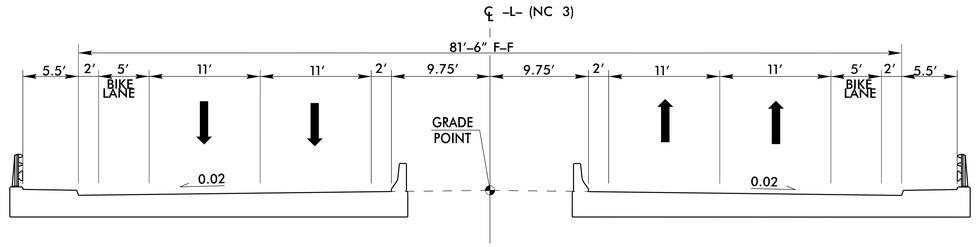
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



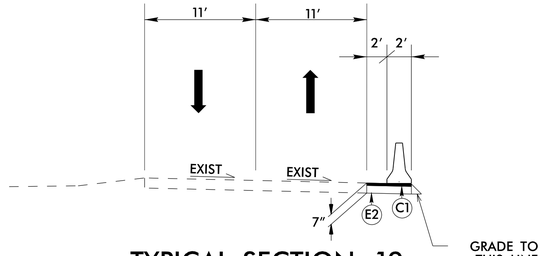
TYPICAL SECTION 17

–Y22– STA. 10+00 TO 18+50.00



TYPICAL SECTION 18

–L– BEGIN BRIDGE LT STA. 67+64.88 TO END BRIDGE LT 68+94.88
–L– BEGIN BRIDGE RT STA. 67+56.32 TO END BRIDGE RT 68+86.32



TYPICAL SECTION 19

–L– STA. 39+29 +/– TO 41+75 (SEE TMP–6)
–L– STA. 115+75 +/– TO 119+25 +/– (SEE TMP–12)

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2A-8

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDSTEN

10/4/2016

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON

10/7/2016

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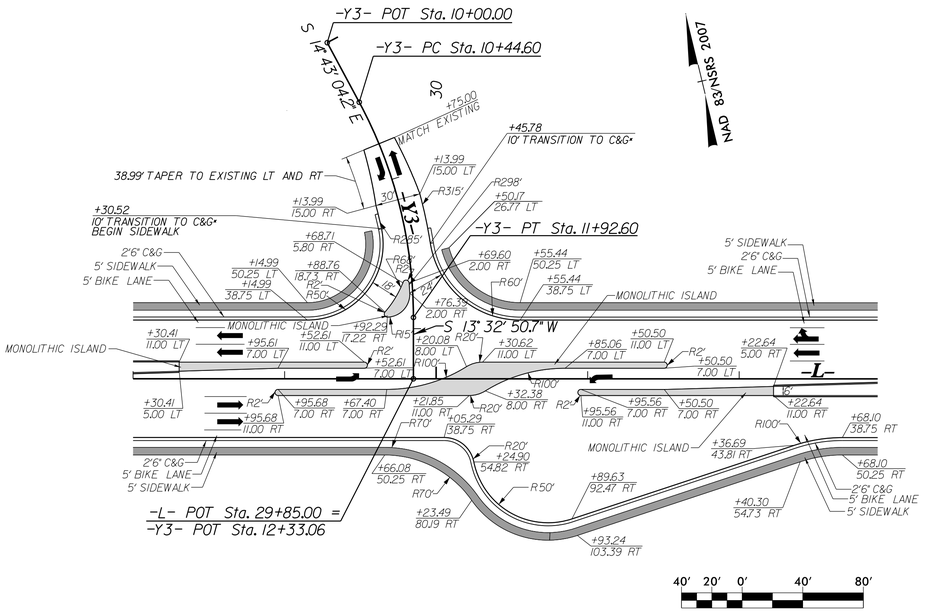
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

8/17/99

INTERSECTION DETAIL –L– AND –Y3–

NOTE: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (–L–, –Y3–) UNLESS NOTED OTHERWISE

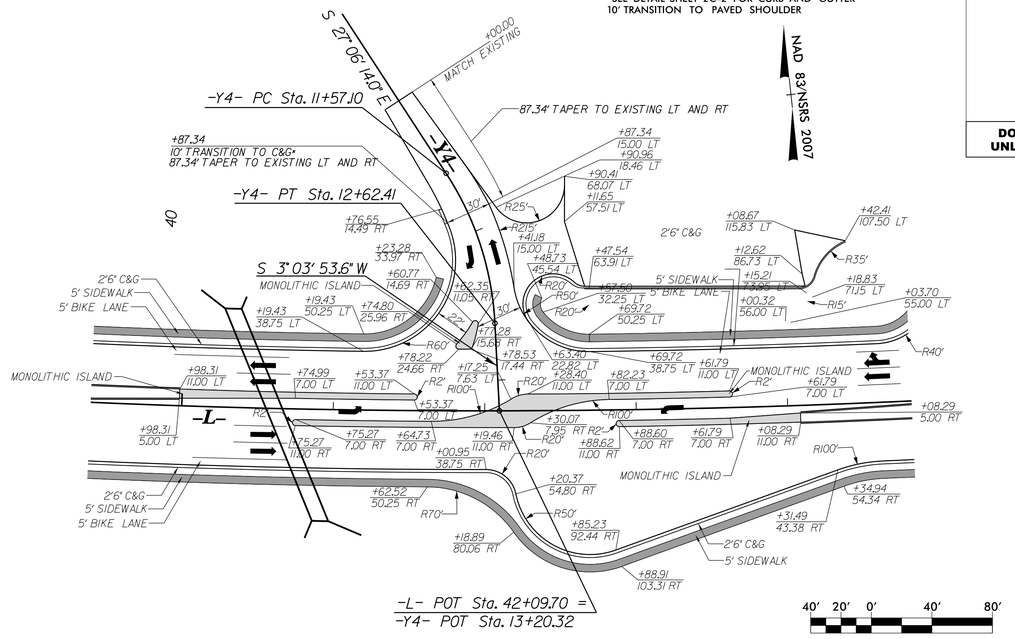
*SEE DETAIL SHEET 2C–2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER



INTERSECTION DETAIL –L– AND –Y4–

NOTE: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (–L–, –Y4–) UNLESS NOTED OTHERWISE

*SEE DETAIL SHEET 2C–2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER



PROJECT REFERENCE NO.	SHEET NO.
U-3440	2B-1
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025513 ENGINEER MICHAEL D. LINDGREN

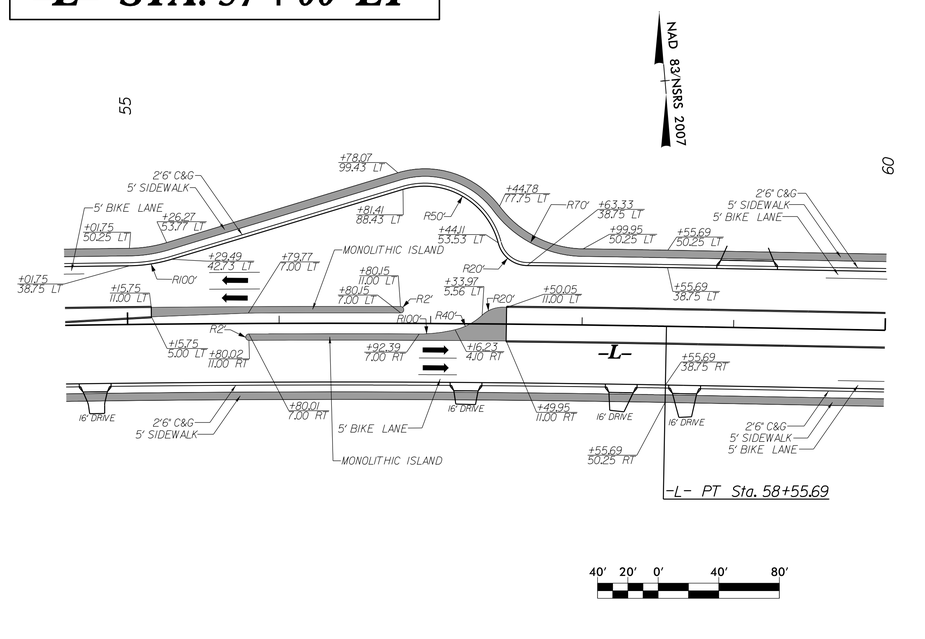
8/17/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

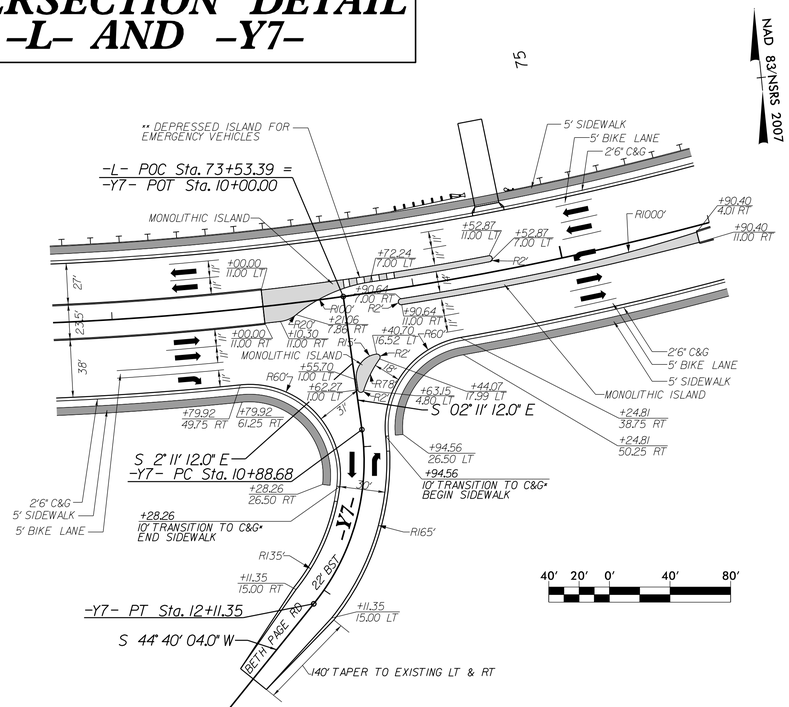
Stantec

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

BULB–OUT DETAIL –L– STA. 57+00 LT



INTERSECTION DETAIL –L– AND –Y7–



NOTE: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (–L–, –Y7–) UNLESS NOTED OTHERWISE

*SEE DETAIL SHEET 2C–2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER.

**SEE DETAIL SHEET 2C–1 FOR EMERGENCY VEHICLE ACCESS.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2B-2
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

10/5/2016

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Fax. (919) 851-7024
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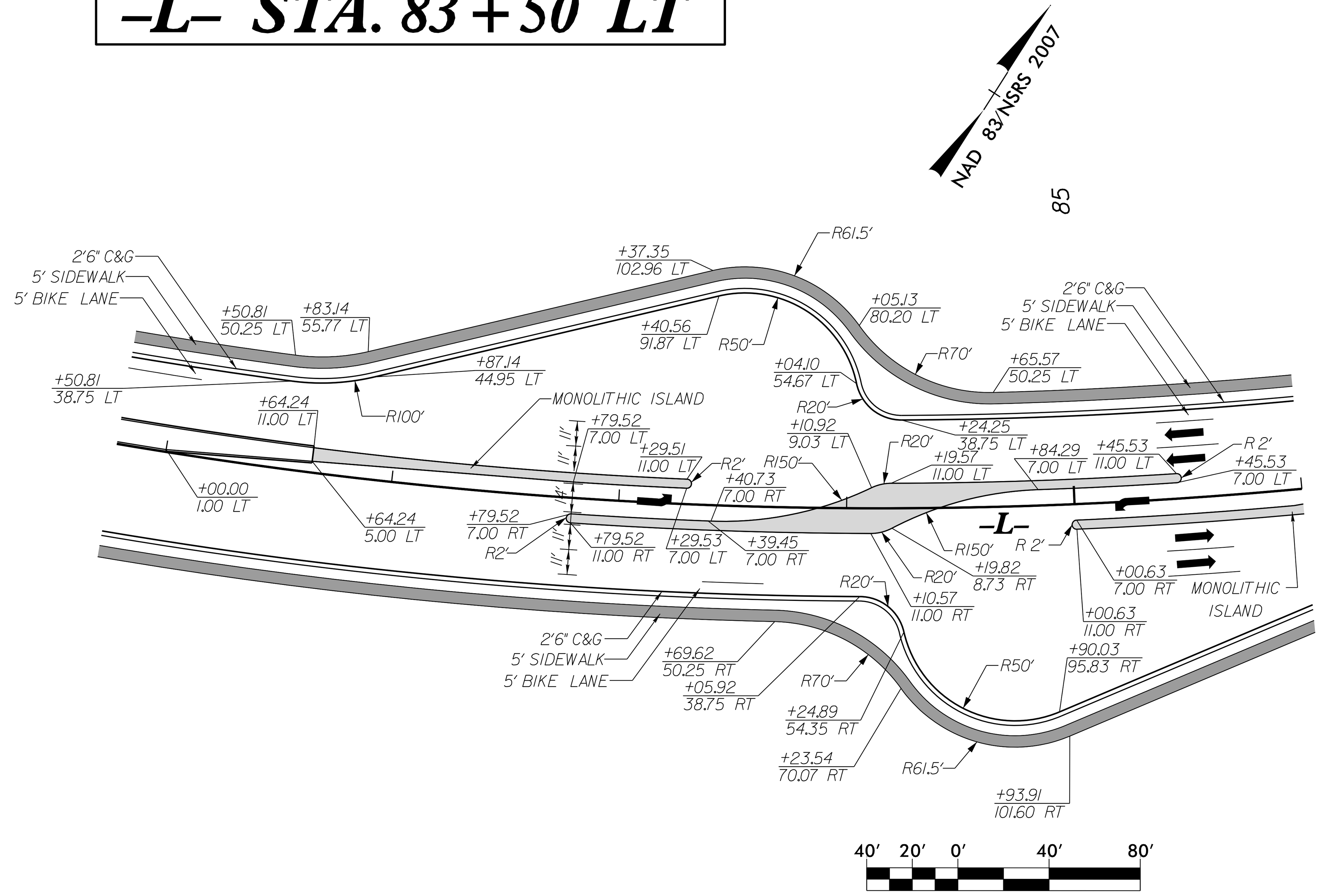
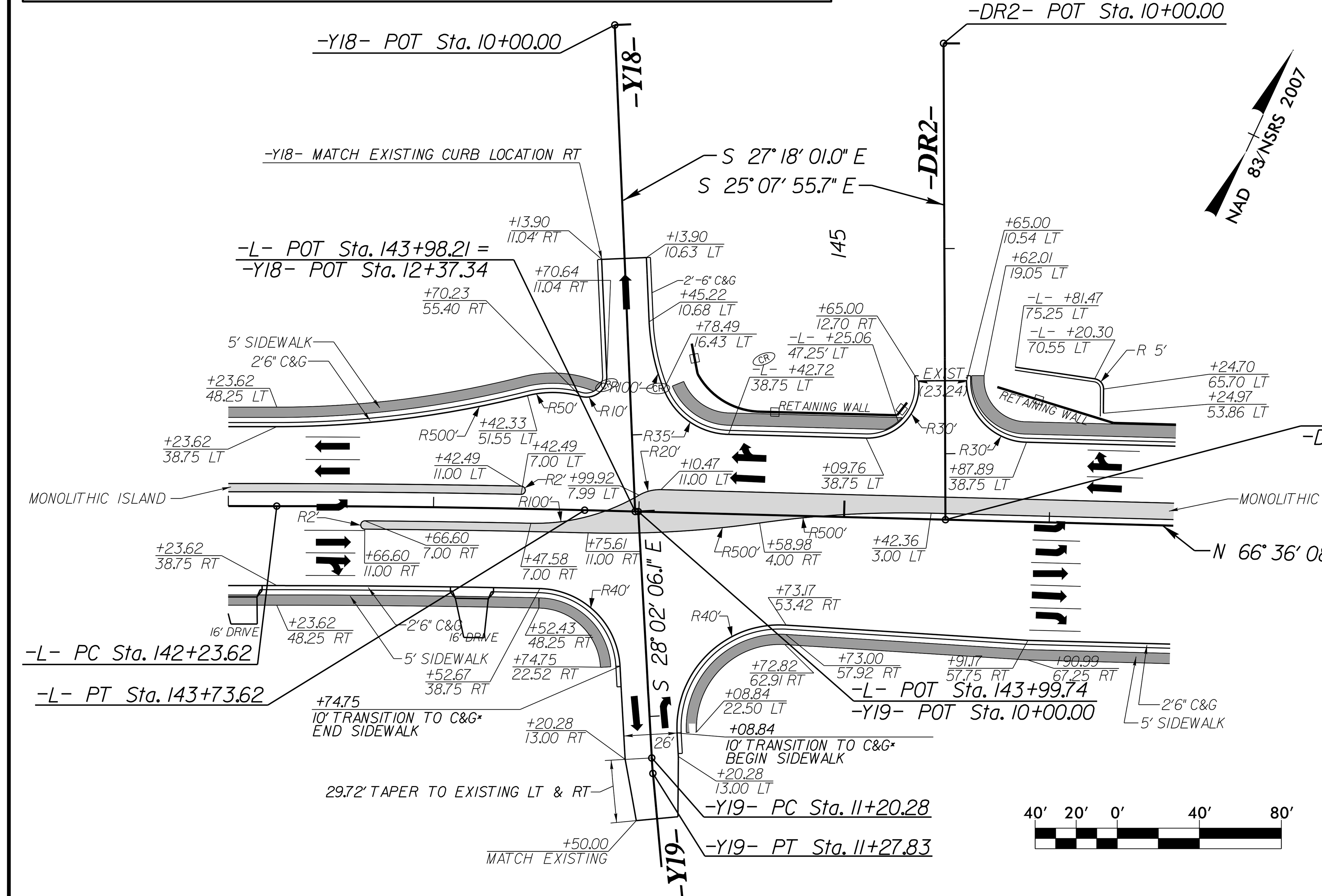
BULB-OUT DETAIL -L- STA. 83+50 LT



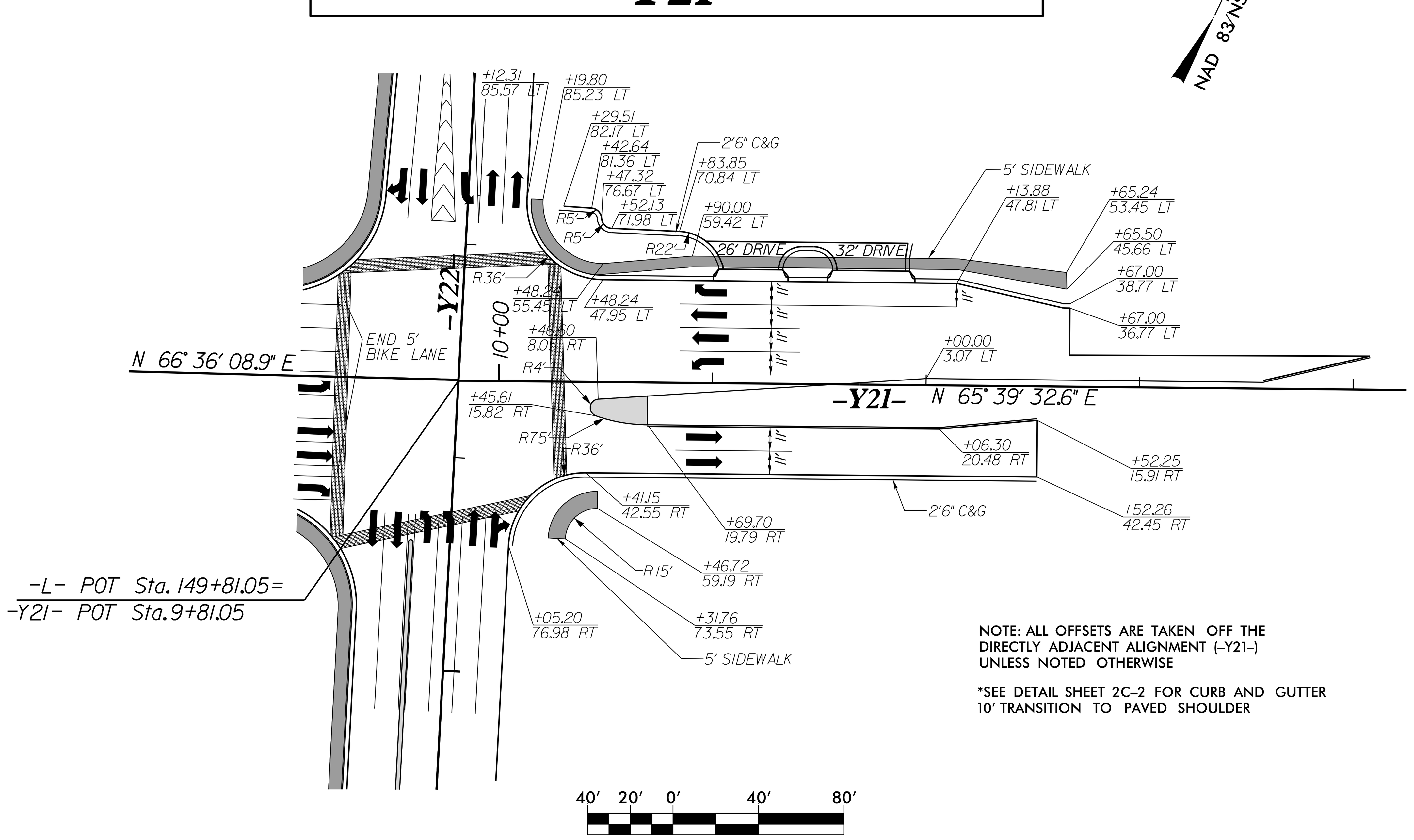
INTERSECTION DETAIL -L-, -Y18-, -Y19- AND -DR2-



NOTE: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (-L-, -Y18-, -Y19-, AND -DR2-) UNLESS NOTED OTHERWISE

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER.

INTERSECTION DETAIL -Y21-



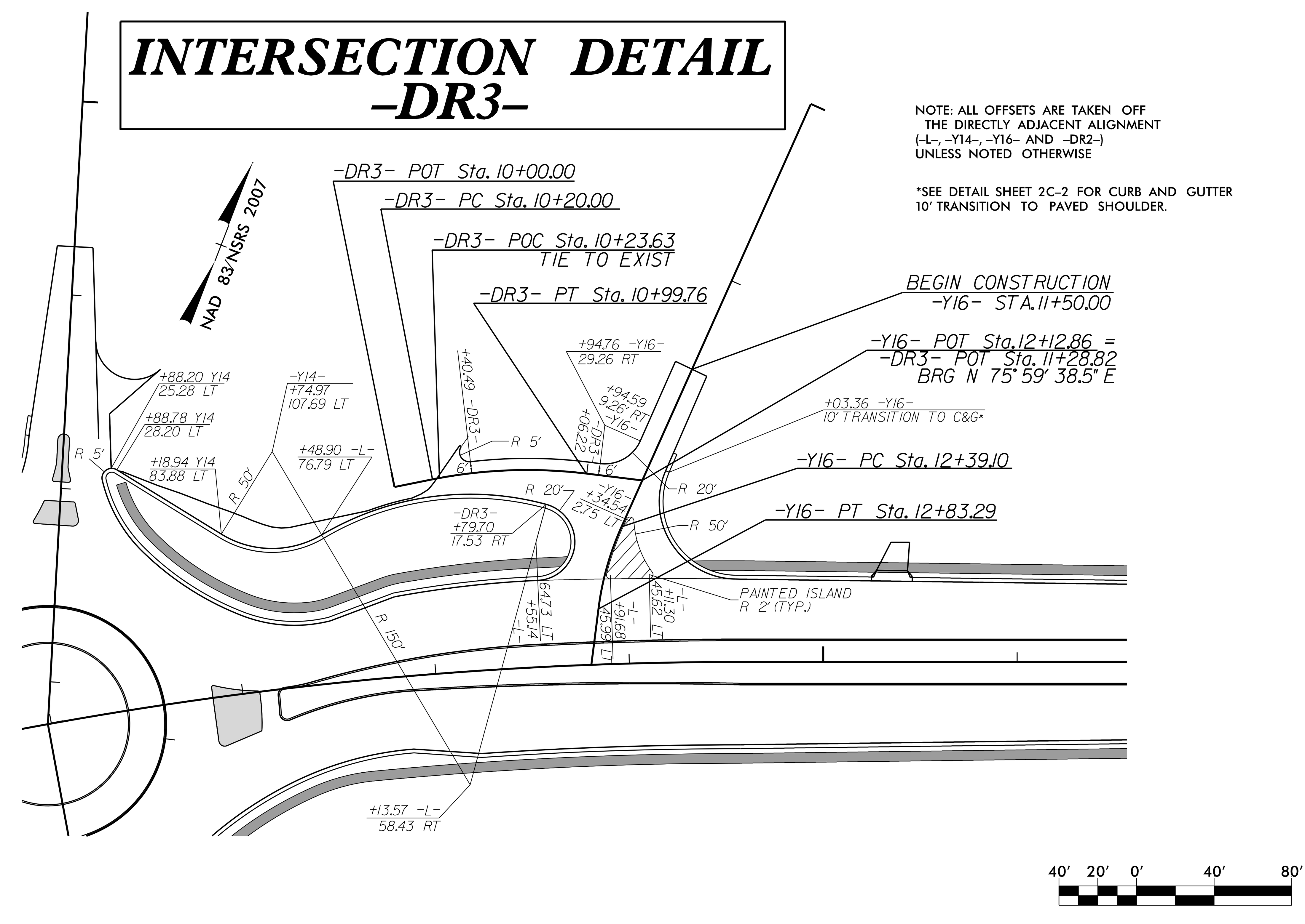
NOTE: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (-Y21-) UNLESS NOTED OTHERWISE

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

INTERSECTION DETAIL -DR3-

NOTE: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (-L-, -Y14-, -Y16- AND -DR2-) UNLESS NOTED OTHERWISE

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER.



PROJECT REFERENCE NO.	SHEET NO.
U-3440	2B-3
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

8/17/2016

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INTERSECTION DETAIL -Y12- TO -Y20-

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

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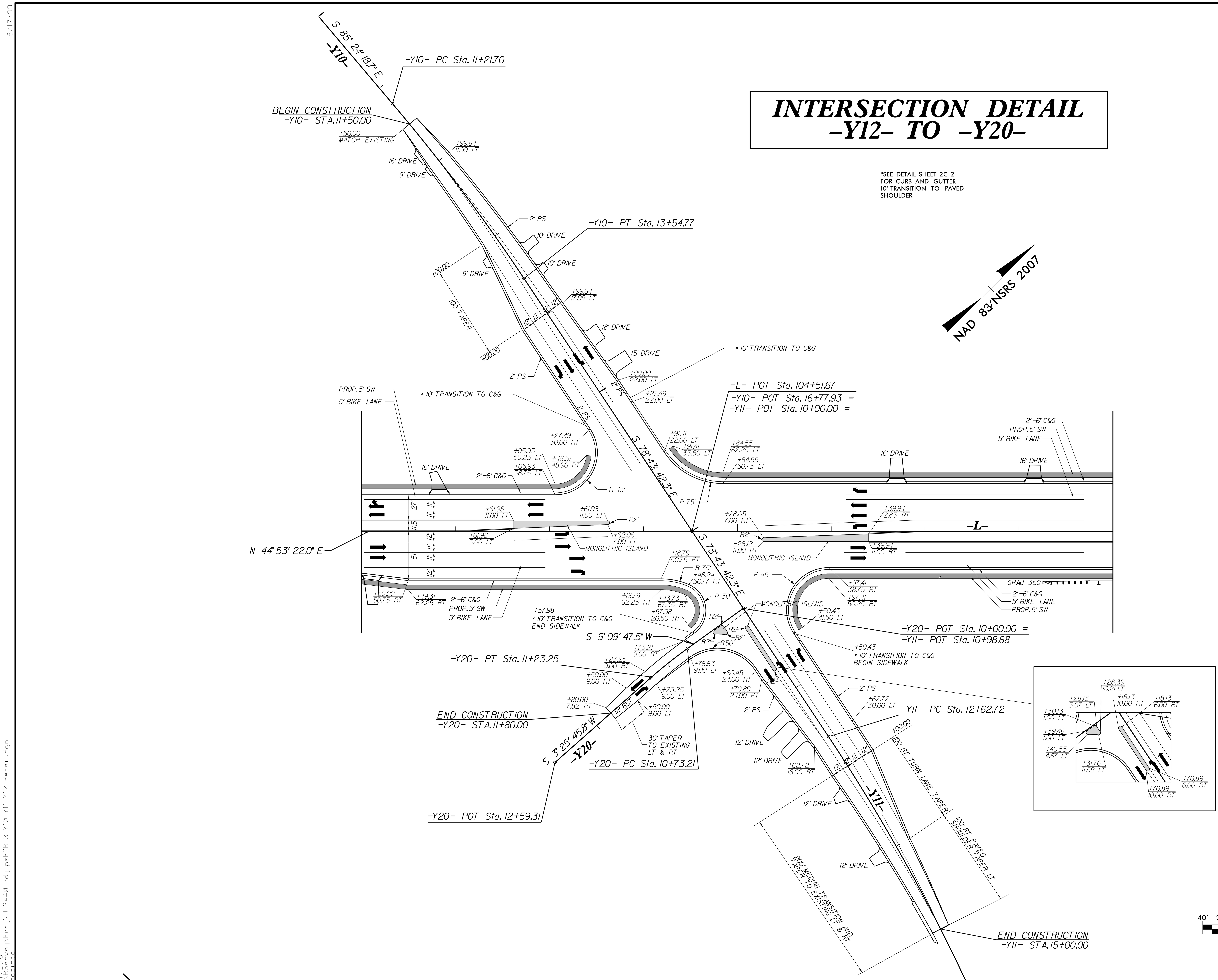

40' 20' 0' 40' 80'

8/17/99

ROUNDABOUT DETAIL –L–, –Y14–, AND –Y15–

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2B-4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN

10/6/2016

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NAD 83/NSRS 2007

S 17° 41' 02.7" E –Y14–

–Y15– POT Sta. 10+00.00 =
–L– POT Sta. 120+98.16
POT Sta. 13+21.84 –Y14– =
POC Sta. 120+98.16 –L–

–Y15– PC Sta. 11+70.15

S 31° 24' 36.0" E

*SEE DETAIL 2C–2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

NOTE 1: ALL MONOLITHIC ISLAND RADII ARE 1.0' UNLESS NOTED OTHERWISE

NOTE2: ALL OFFSETS ARE TAKEN OFF THE DIRECTLY ADJACENT ALIGNMENT (–L–, –Y14–, –Y15–) UNLESS NOTED OTHERWISE

20' 10' 0' 20' 40'

10/5/2016
U:\Roadway\Proj\U-3440_rdy_psh2B-4_ROUNDABT_Y14_Y15_detail.dgn
mlindgren

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Raleigh, NC 27606
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Fax. (919) 851-7024
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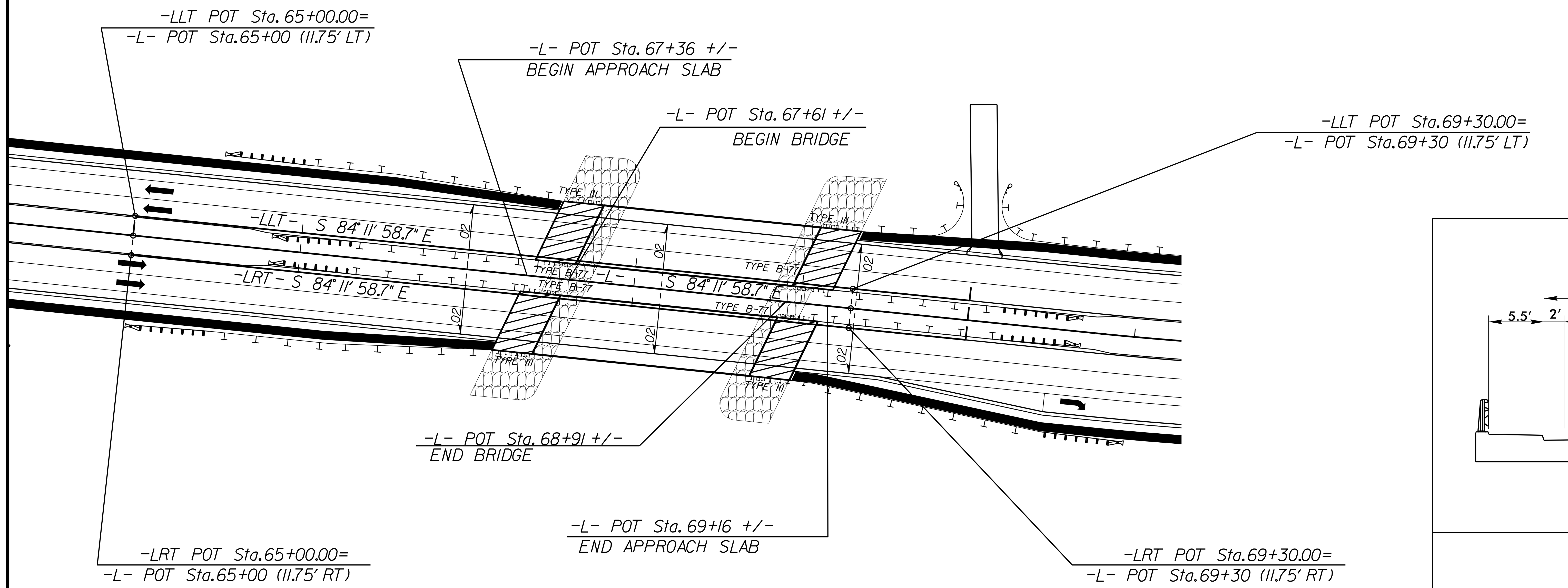
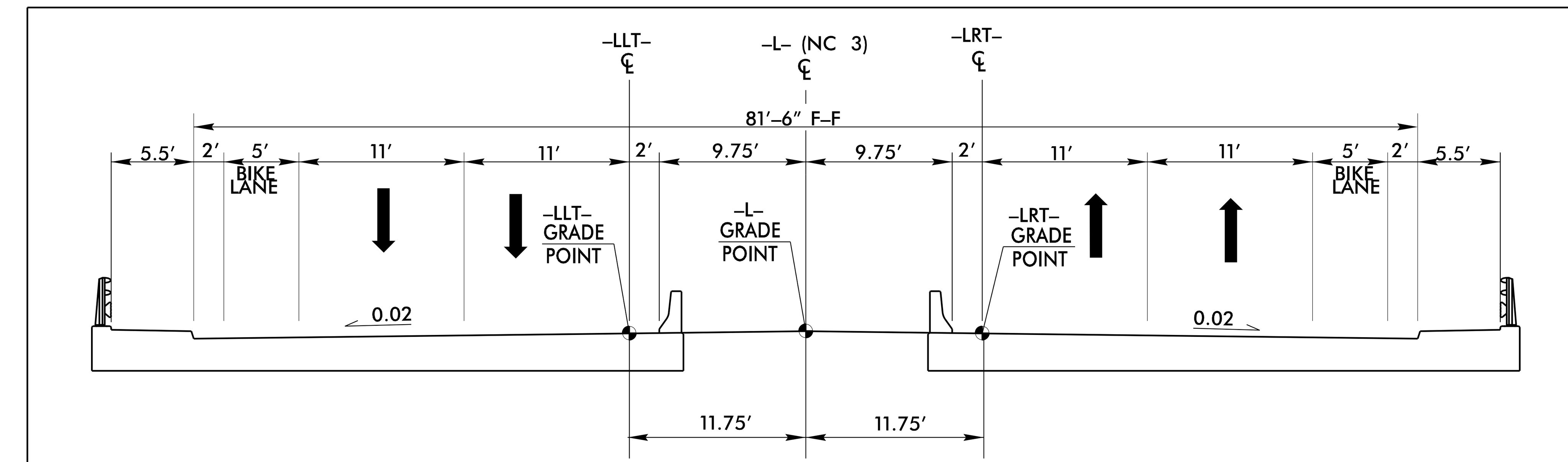
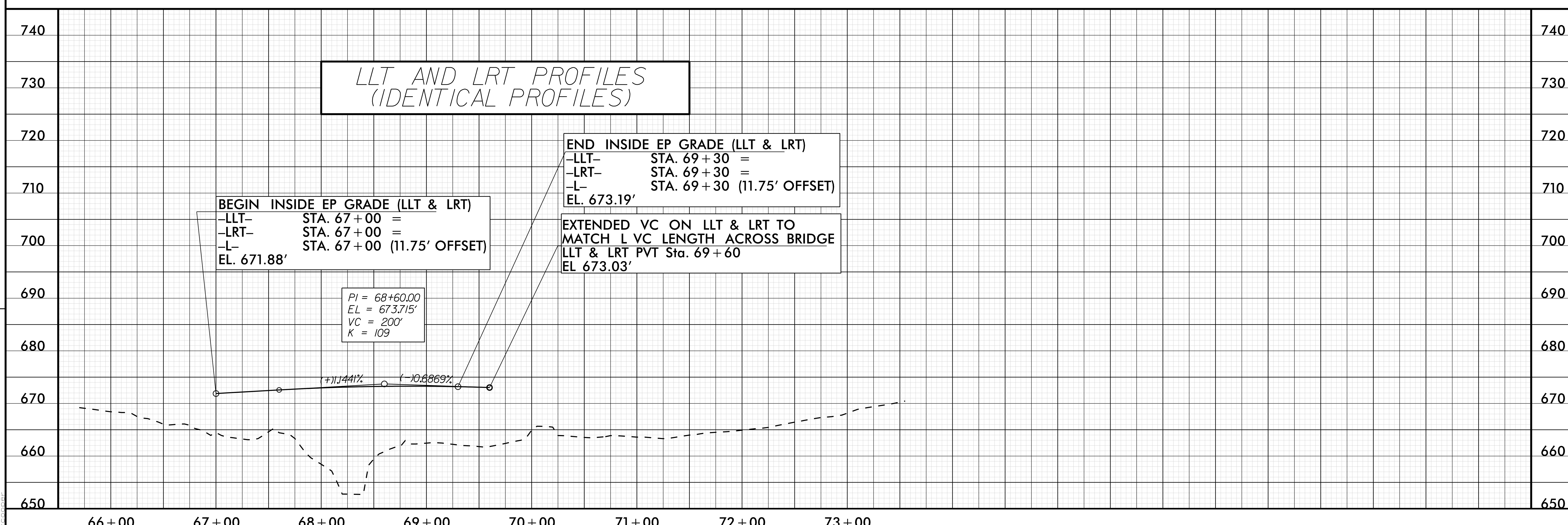
THIS SHEET FOR REFERENCE ONLY
DETAIL OF -LLT- AND -LRT- PROFILES FOR STRUCTURE DESIGN





BRIDGE TYPICAL SECTION

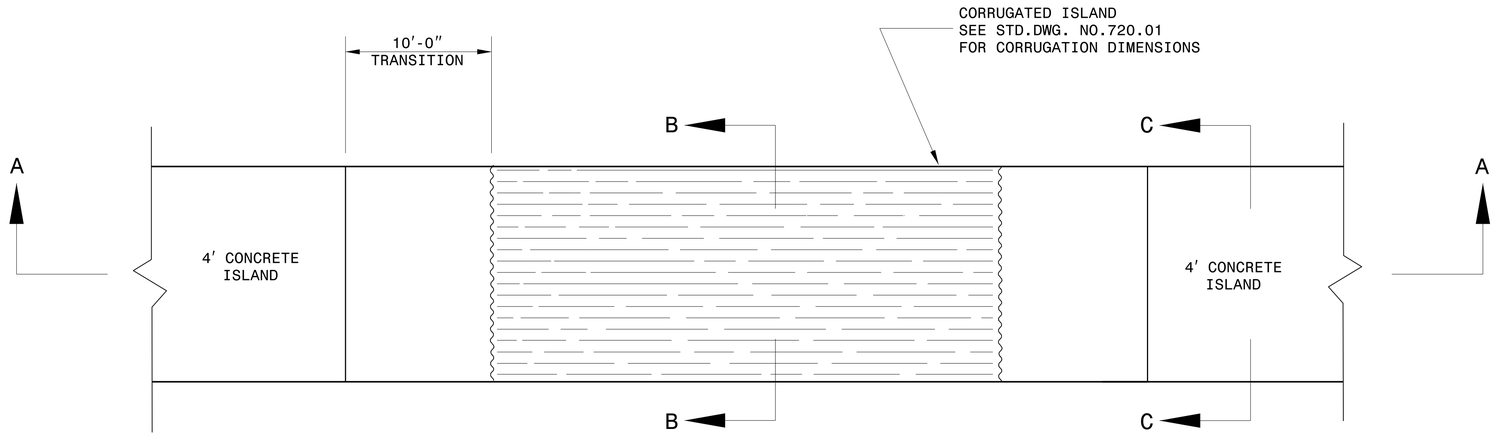


REVISIONS

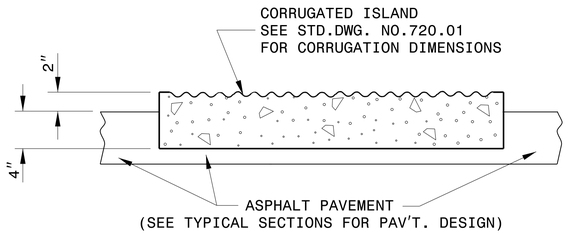
8/17/99

8/3/2016
U:\Roadway\Proj\U-3440_rdy_BridgeEOPdetail_PSH2b-5.dgn

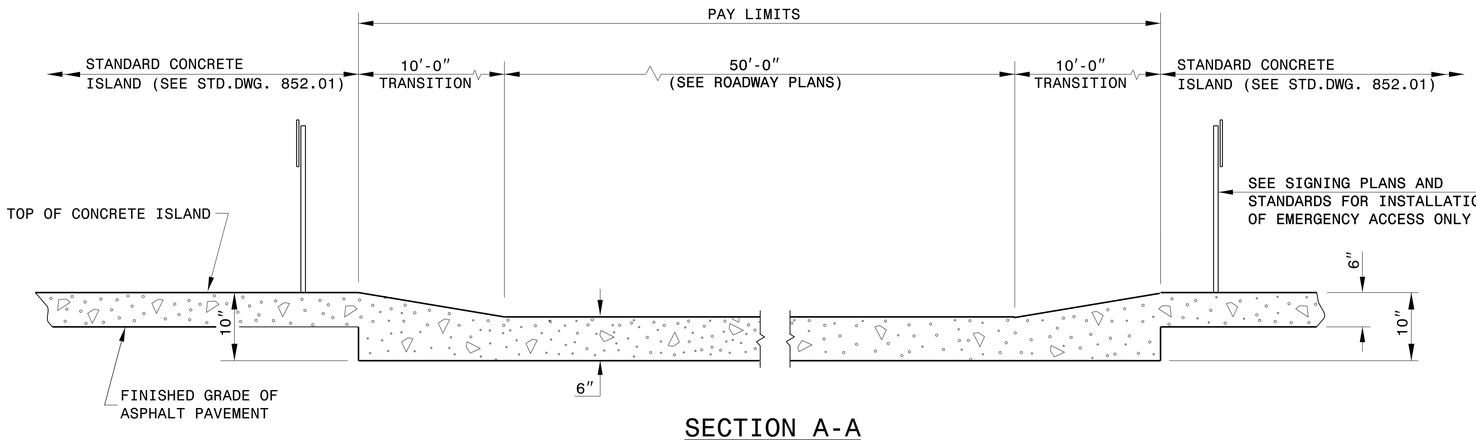
PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-1



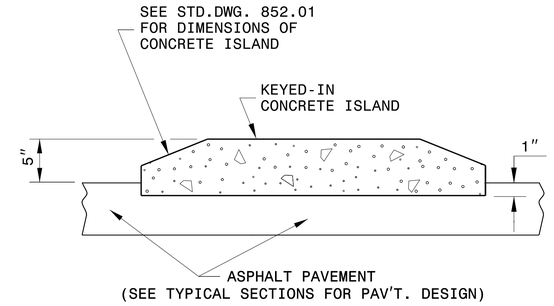
TOP VIEW



SECTION B-B



SECTION A-A



SECTION C-C

DETAIL OF EMERGENCY VEHICLE ACCESS

NOTES:

REFER TO SECTION 852 OF STANDARD SPECIFICATIONS FOR CONCRETE ISLANDS.

REFER TO STANDARD DRAWING 852.01 FOR CONTRACTION/EXPANSION JOINTS.

PLACE W6xW6 REINFORCING WIRE MESH IN THE BOTTOM 3RD OF THE EMERGENCY VEHICLE ACCESS PORTION OF THE CONCRETE ISLAND THAT MEETS SECTION 1070 OF THE STANDARD SPECIFICATIONS.

9/12/2016

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

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CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

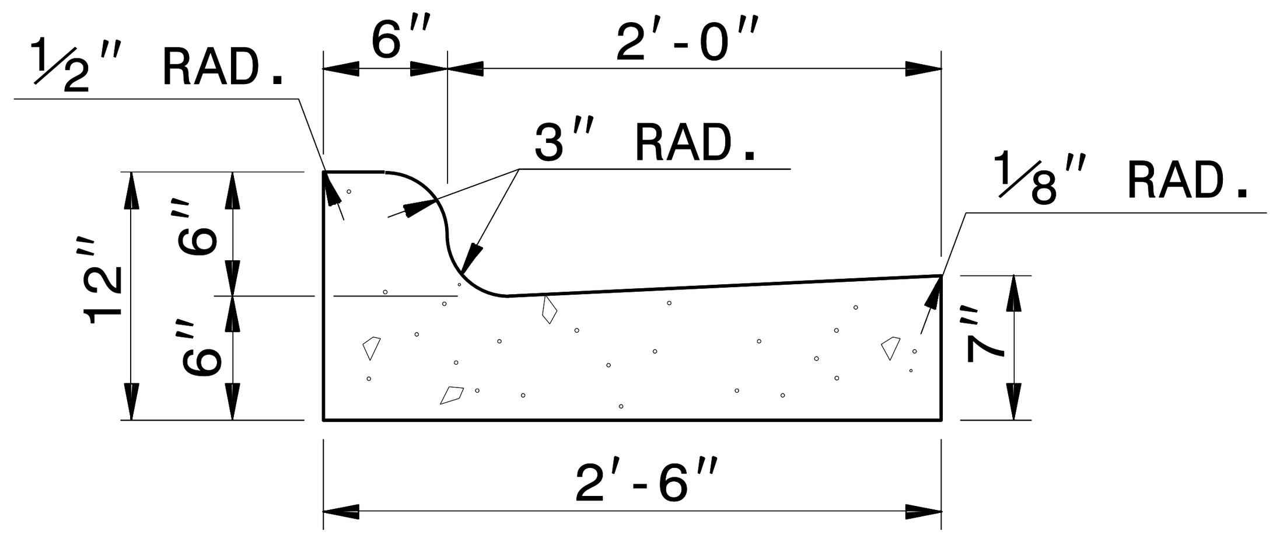
EMERGENCY VEHICLE ACCESS FOR CONCRETE ISLAND

ORIGINAL BY:	E.E. WARD	DATE:	12-99
MODIFIED BY:	T.S.SPELL	DATE:	12-05
CHECKED BY:		DATE:	
FILE SPEC.:	nbritt\metric\murban\u3613b_emergency access.dgn		

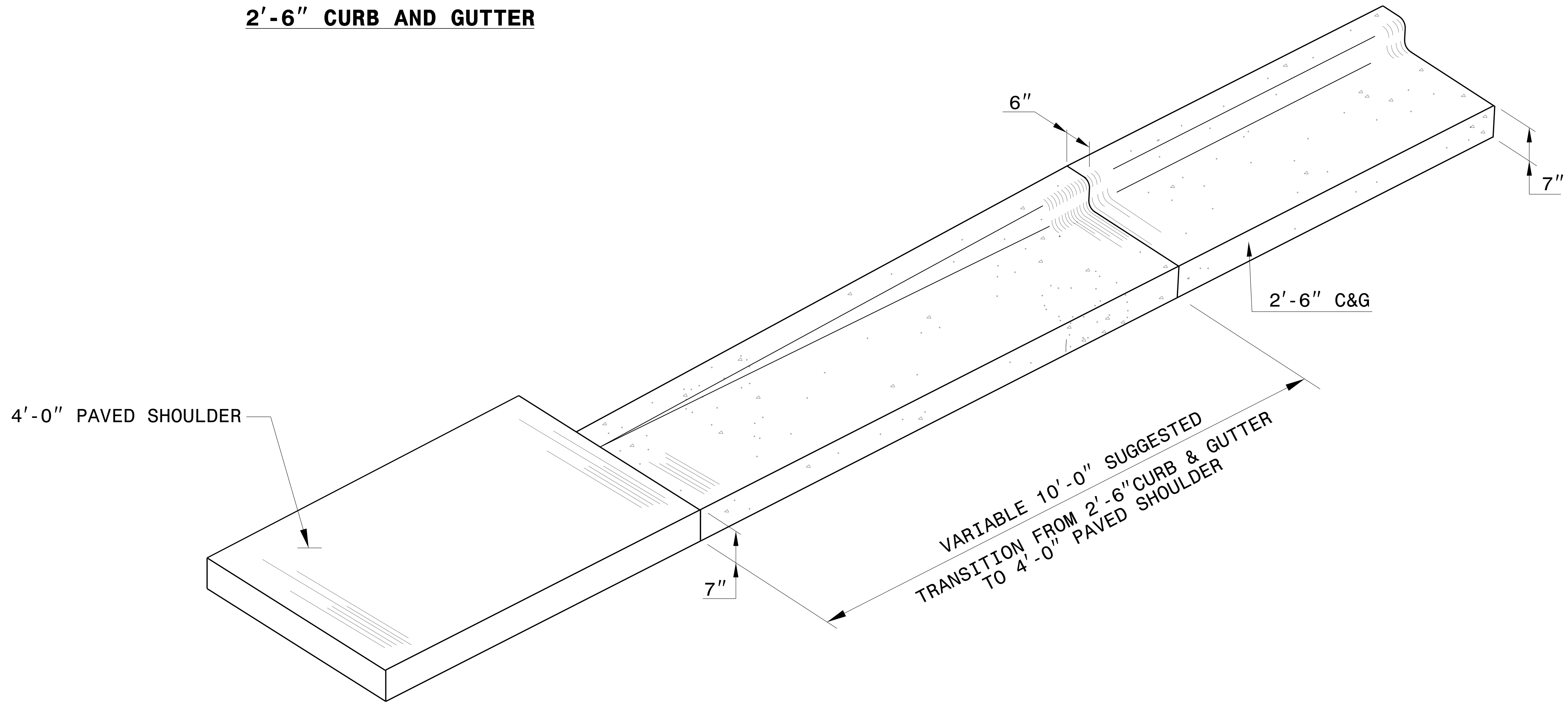
$$$$USERNAME$$$$ $$$$DGNFILE$$$$ $$$$SYSTEM$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-2

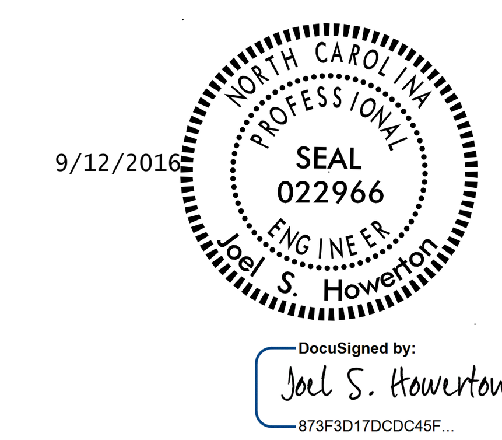
*NOTE: SEE STD. DWG. 846.01
FOR GENERAL NOTES



2'-6" CURB AND GUTTER



ISOMETRIC VIEW OF TRANSITION



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Office 919-250-4128 FAX 919-250-4119

DETAIL OF 10' TRANSITION
FROM 2'-6"CURB & GUTTER
TO 4'-0" PAVED SHOULDER

ORIGINAL BY: ______ DATE: ______
MODIFIED BY: rnbritt DATE: 04-13-2016
CHECKED BY: ______ DATE: ______
FILE SPEC.: details/nbritt/english/misc/c&g transition sections.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-3

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR EXTRA DEPTH CONCRETE CATCH BASIN 12" THRU 84" PIPE
SHEET 1 OF 2 840D02

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

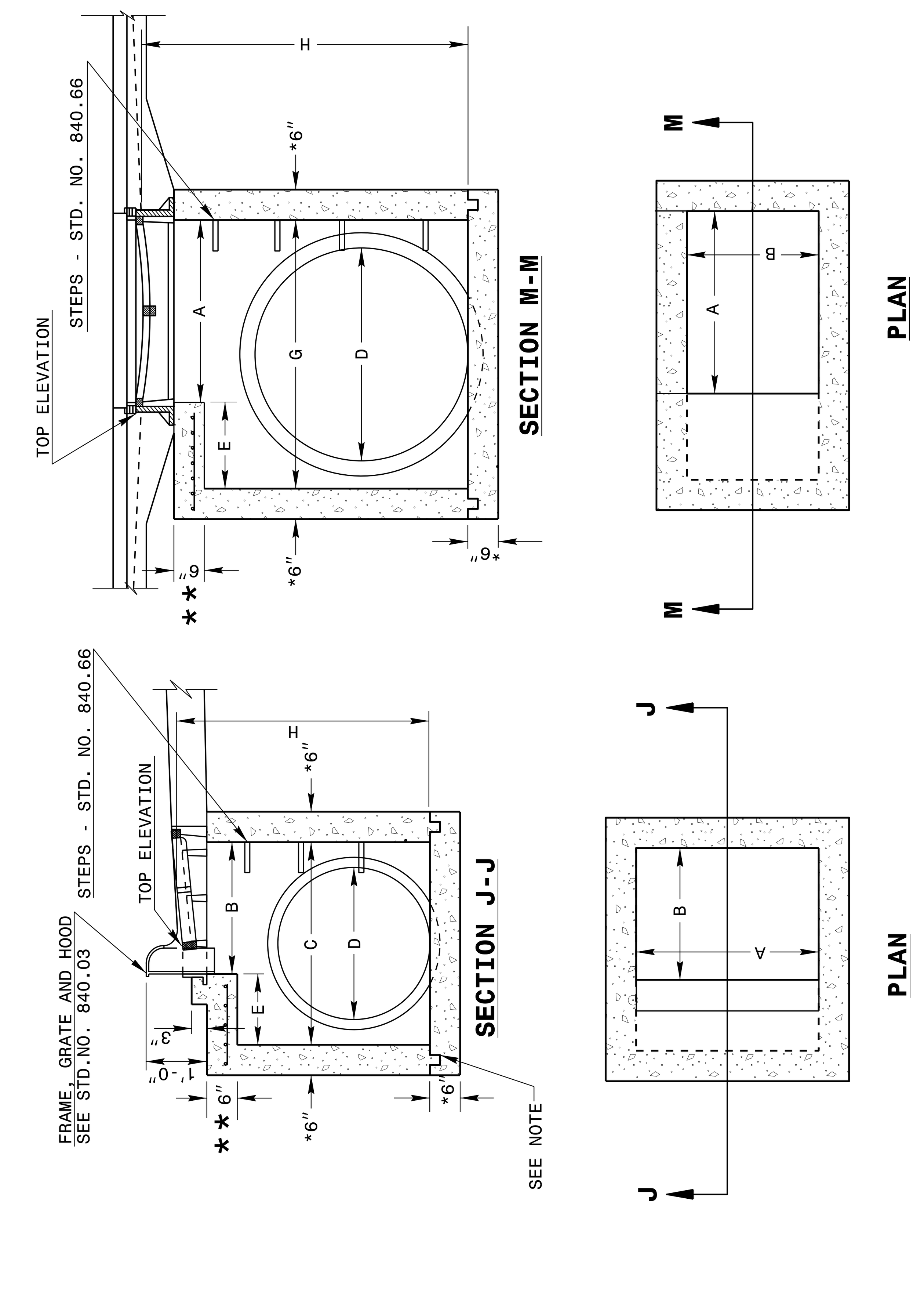
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

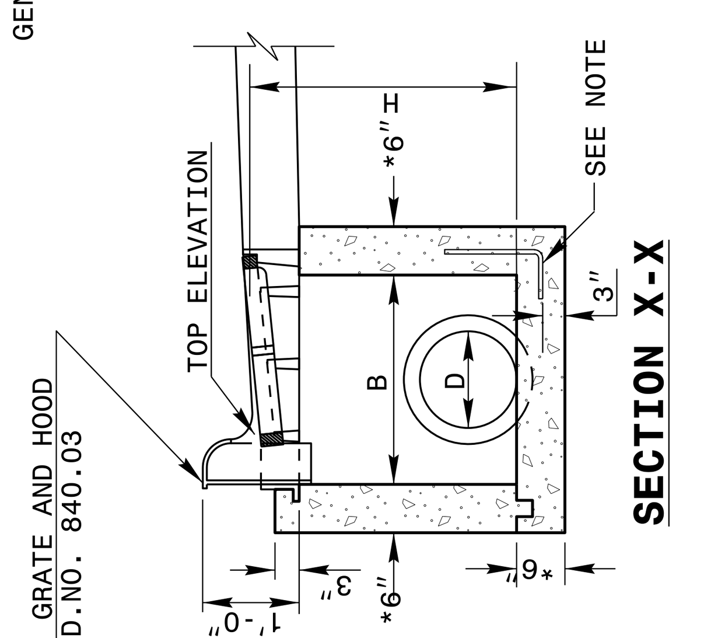
* USE 6" WALLS FOR BOXES UP TO 12' IN HEIGHT. USE 8" WALLS, 8" BOTTOM SLAB AND 8" TOP SLAB FOR BOXES GREATER THAN 12' IN HEIGHT AND UP TO 20' IN HEIGHT.

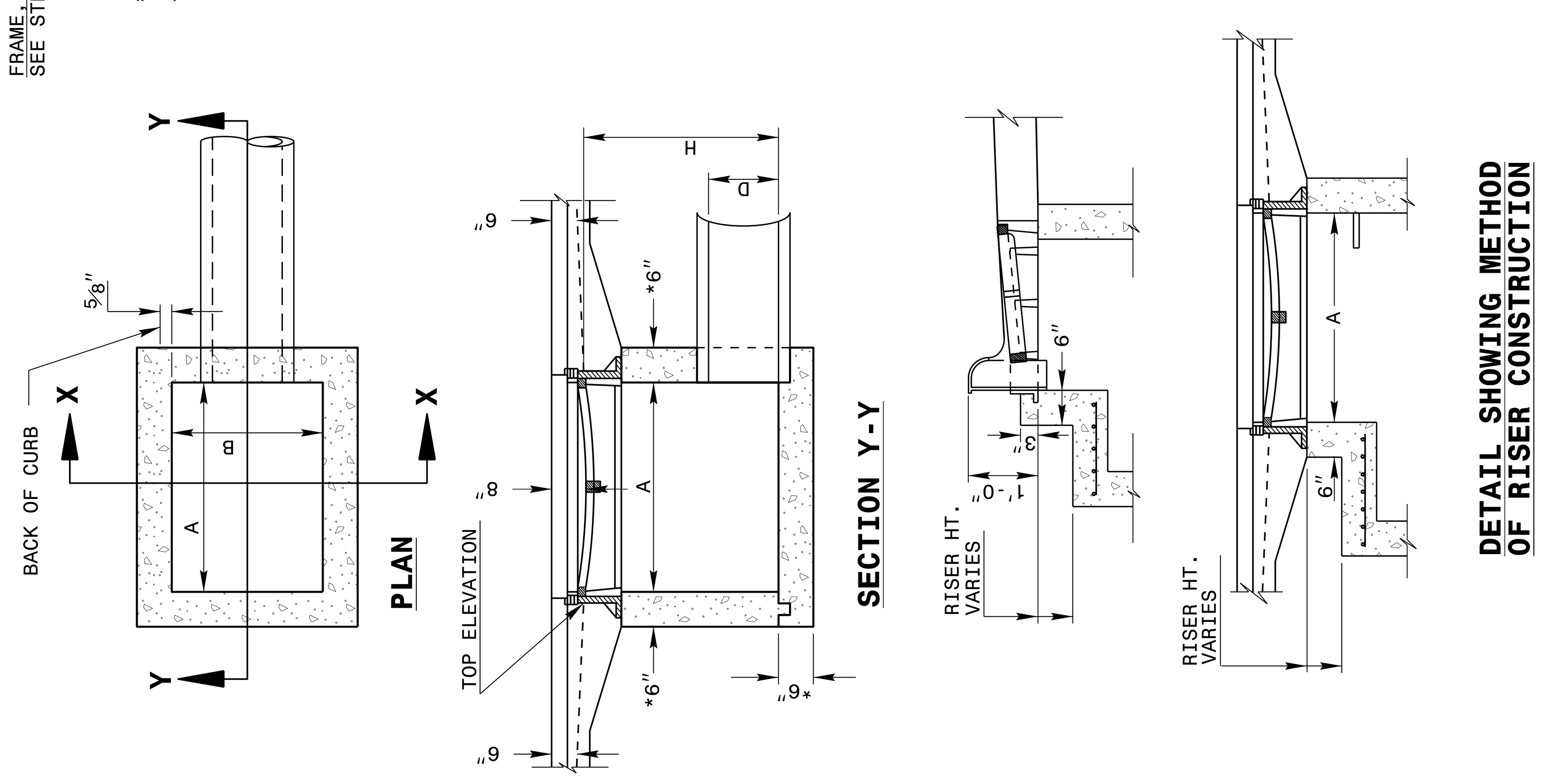
CONSTRUCT WITH PIPE CROWNS MATCHING.

CHAMFER ALL EXPOSED CORNERS 1".

** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.







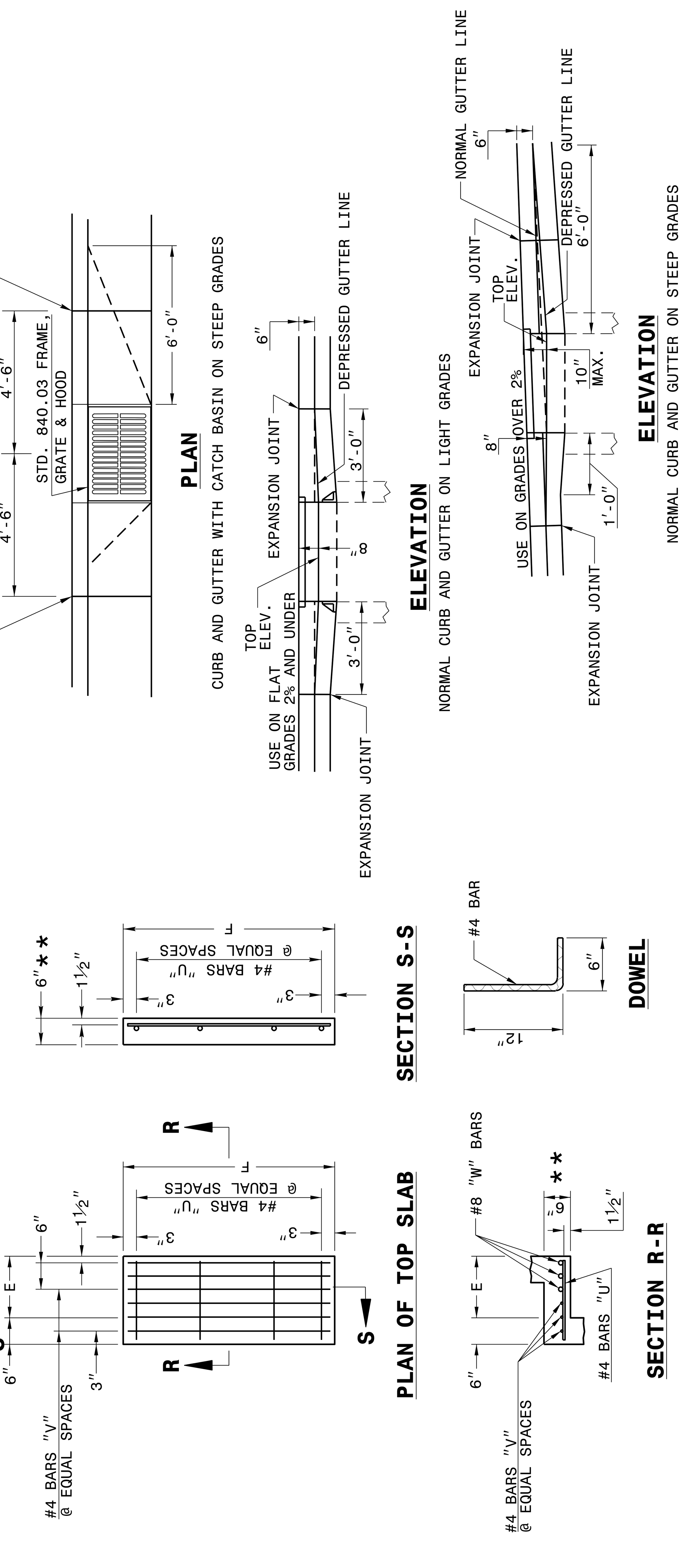
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
EXTRA DEPTH
CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 1 OF 2 **840D02**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR EXTRA DEPTH CONCRETE CATCH BASIN 12" THRU 84" PIPE
SHEET 2 OF 2 840D02

** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.



* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT	COVER DIMENSION		BARS-U		BARS-V		BARS-W		TOTAL LBS.	CU.YDS. CONC. IN BOX			DEDUCTIONS ONE PIPE	
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH		TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT, H	C.M.	R.C.
12"	3'-0"	2'-2"	--	--	2'-0"	--	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			2'-3"											0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			2'-6"											0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-1"											0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	3'-10"	1'-2"	4'-4"	4	1'-5"	2	4'-1"	3	4'-1"	39	0.123	0.347	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-6"	1'-8"	4'-10"	4	1'-11"	3	4'-7"	3	4'-7"	43	0.161	0.432	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	4'-11"	2'-2"	5'-5"	5	2'-5"	4	5'-2"	3	5'-2"	47	0.200	0.543	1.738	0.180	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-6"	2'-10"	6'-0"	5	3'-1"	4	5'-9"	3	5'-9"	51	0.235	0.667	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-0"	3'-5"	6'-7"	6	3'-8"	5	6'-4"	3	6'-4"	56	0.289	0.802	2.387	0.297	0.401
60"	3'-0"	2'-2"	6'-3"	6'-3"	6'-6"	4'-1"	7'-3"	6	4'-4"	5	7'-0"	3	7'-0"	61	0.340	0.973	2.722	0.363	0.546
66"	3'-0"	2'-2"	6'-11"	6'-11"	7'-0"	4'-9"	7'-11"	7	5'-0"	6	7'-8"	3	7'-8"	66	0.391	1.160	3.057	0.440	0.655
72"	3'-0"	2'-2"	7'-6"	7'-6"	7'-6"	5'-3"	8'-6"	7	5'-6"	6	8'-3"	3	8'-3"	72	0.442	1.340	3.392	0.524	0.774
78"	3'-0"	2'-2"	8'-1"	8'-1"	8'-0"	5'-11"	9'-1"	8	6'-2"	7	8'-10"	3	8'-10"	78	0.493	1.530	3.727	0.615	0.893
84"	3'-0"	2'-2"	8'-9"	8'-9"	8'-6"	6'-7"	9'-9"	8	6'-10"	7	9'-6"	3	9'-6"	84	0.544	1.760	4.062	0.713	1.010

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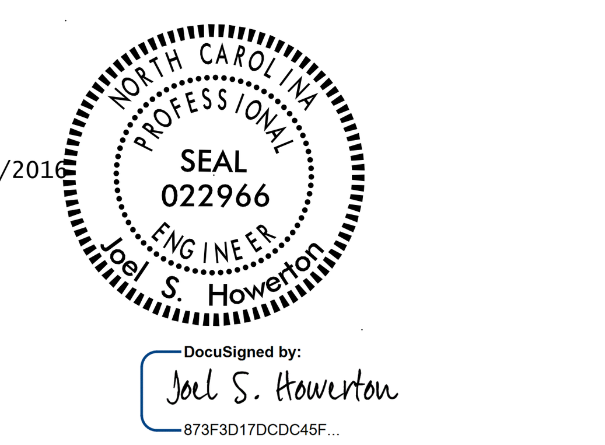
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
EXTRA DEPTH
CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 2 OF 2 **840D02**



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SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
FILE SPEC.: s:Special Details/jhowerton/840d02.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-4

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

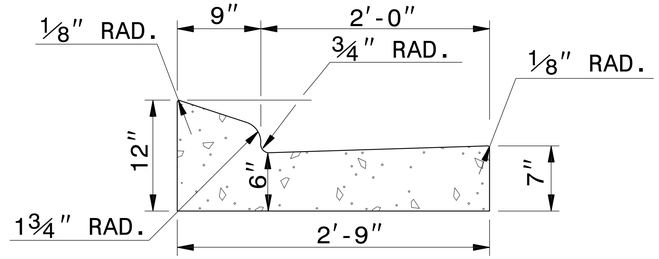
ENGLISH DETAIL DRAWING FOR

2′-9″ CONCRETE CURB & GUTTER

SHEET 1 OF 1

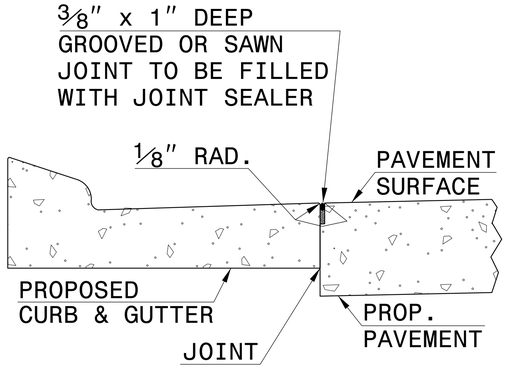
846D01

GENERAL NOTES:
- -PLACE CONTRACTION JOINTS AT 10′ INTERVALS, EXCEPT THAT A 15′ SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10′ INTERVALS.
- -JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
- -CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. MAKE NON-TEMPLATE FORMED JOINTS A MIN. OF 1½″ DEEP.
- -FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
- -SPACE EXPANSION JOINTS AT 90′ INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.
- -SEE RDWY. STD. DWG. NO. 846.01, SHEET 2 OF 3 FOR PLACEMENT IN SUPERELEVATIONS. (USE 2′-6″ CURB AND GUTTER RATES)

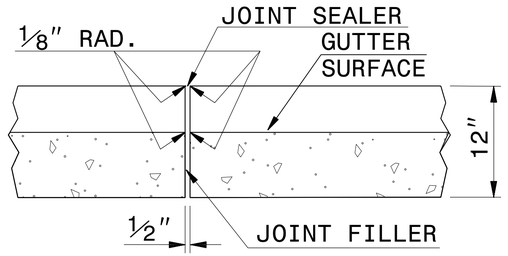


2′-9″ CURB AND GUTTER

SECTION VIEW OF CURB AND GUTTER



LONGITUDINAL JOINT



TRANSVERSE EXPANSION JOINT IN CURB AND GUTTER

SECTION VIEW OF JOINTS

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

2′-9″ CONCRETE CURB & GUTTER

SHEET 1 OF 1

846D01

9/12/2018

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

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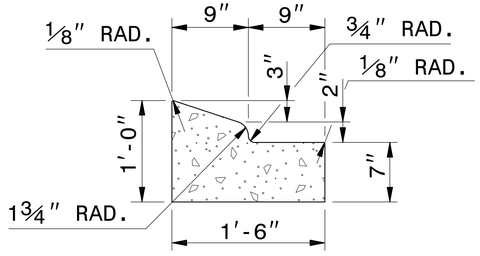
SEE PLATE FOR TITLE

ORIGINAL BY: STD. 846.01 DATE:
MODIFIED BY: E.E. WARD DATE: 8-15-00
CHECKED BY: DATE:
FILE SPEC.: /usr/details/stand/c&g2'-9".dgn

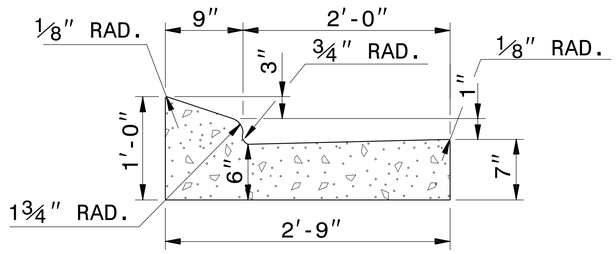
$$$$ SYSTIME $$$$
$$$$ USER $$$$
$$$$ USERNAME $$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-5



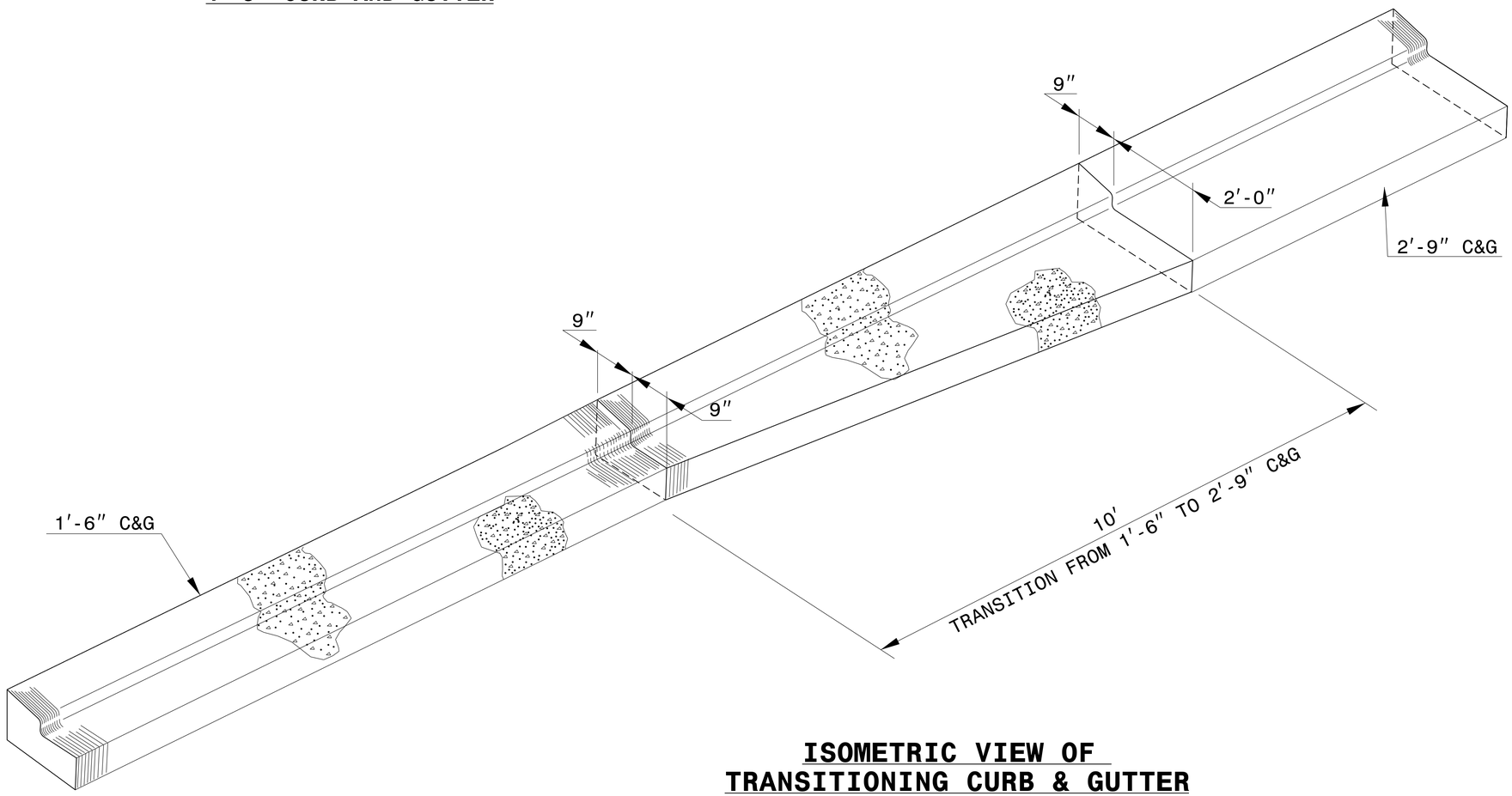
1'-6" CURB AND GUTTER



2'-9" CURB AND GUTTER

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

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER

9/12/2016

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by:
Joel S. Howerton
873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

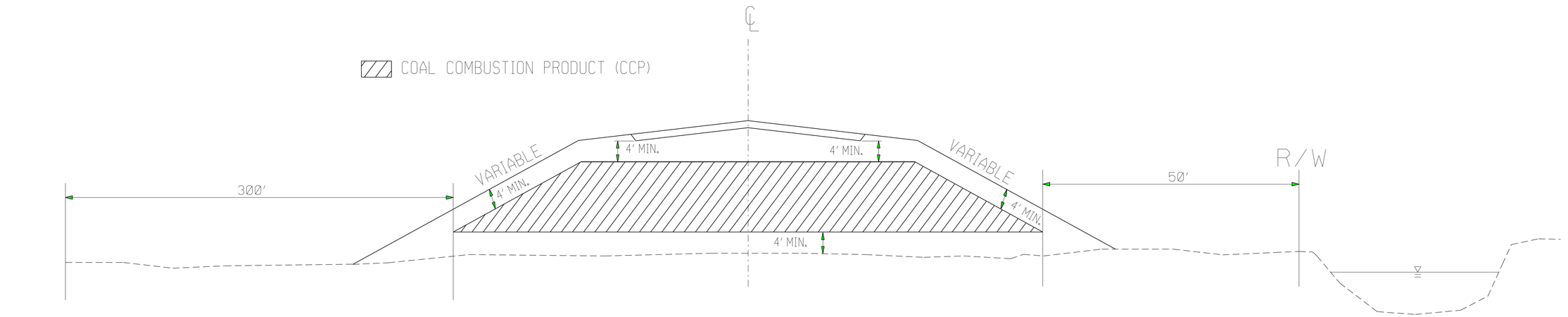
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF 1'-6" TO 2'-9" CURB & GUTTER TRANSITION SECTION

ORIGINAL BY: T.S.SPELL DATE: NOV. 26, 2001
MODIFIED BY: T.S.SPELL DATE: JAN. 23, 2007
CHECKED BY: DATE:
FILE SPEC.: DS174:/usr/details/stand/cgtransit.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-6

COAL COMBUSTION PRODUCT PLACEMENT



*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

$$$$SYSTIME$$$$
$$$$FILENAME$$$$
$$$$USERNAME$$$$

9/12/2016

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

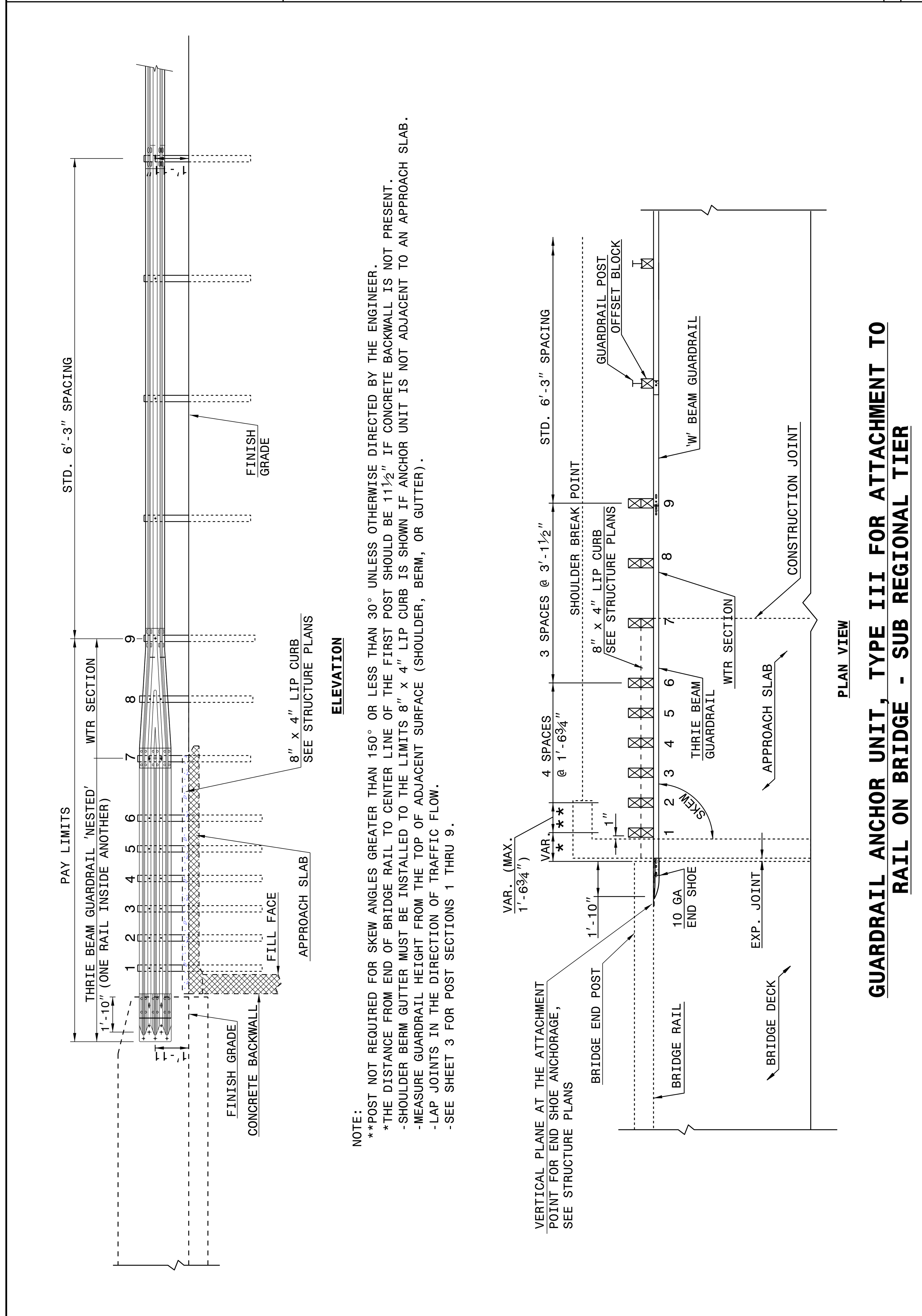
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

COAL COMBUSTION PRODUCT PLACEMENT DETAIL

ORIGINAL BY: J.S.H. DATE: 3/16/15
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: joel/coal combustion material detail.dgn

PROJECT REFERENCE NO.	SHEET NO.
U–3440	2C–7

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER — SHEET 2 OF 7 862d03

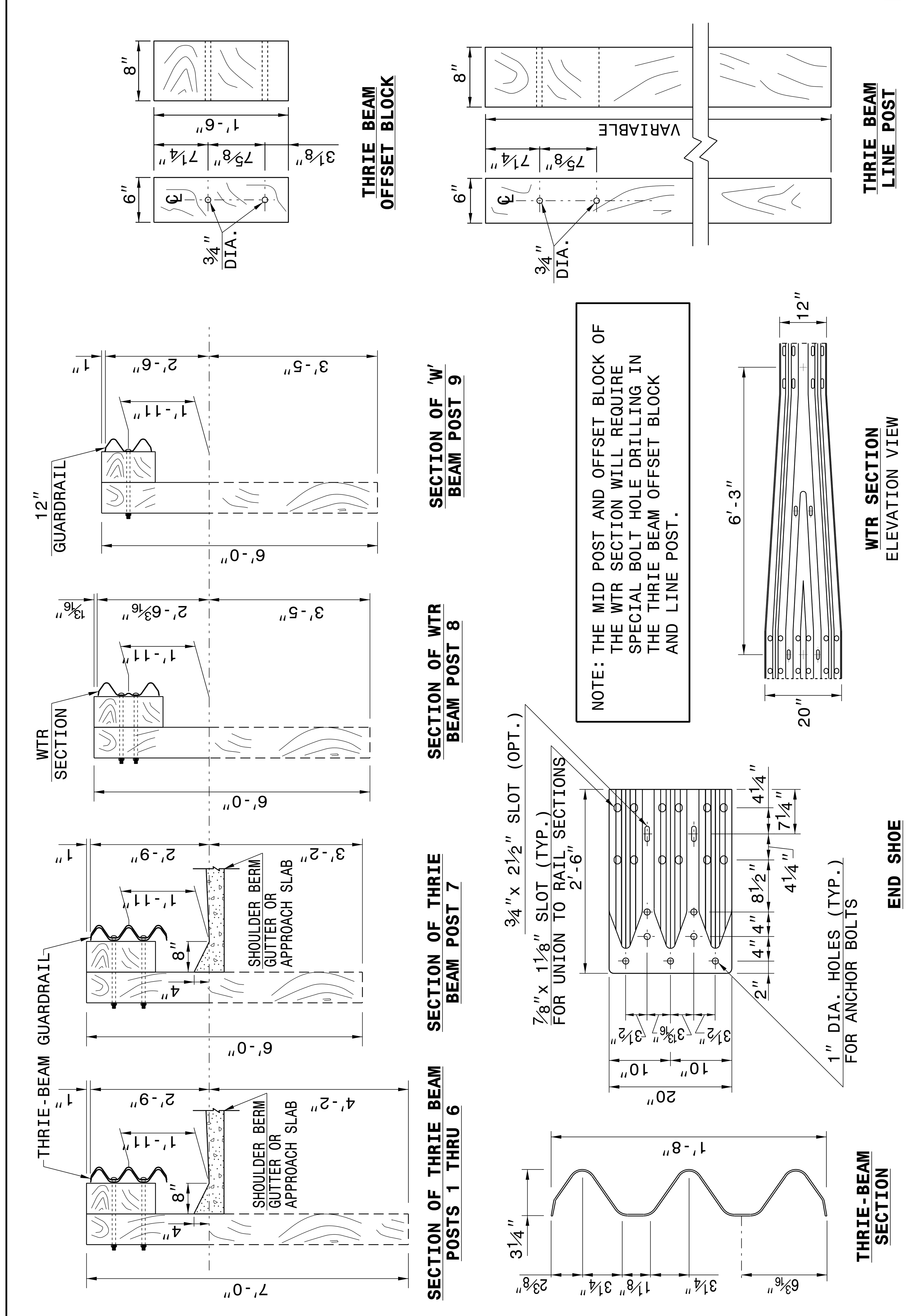


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 **862d03**

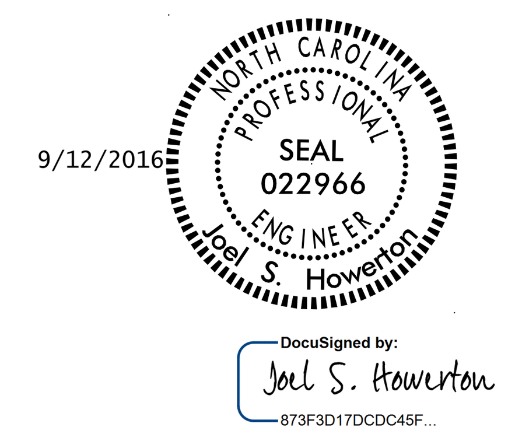
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III — SHEET 3 OF 7 862d03



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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7 **862d03**



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

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

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-8

9/12/2016

SEAL 022966 — NORTH CAROLINA PROFESSIONAL ENGINEER — Joel S. Howerton

DocuSigned by: Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

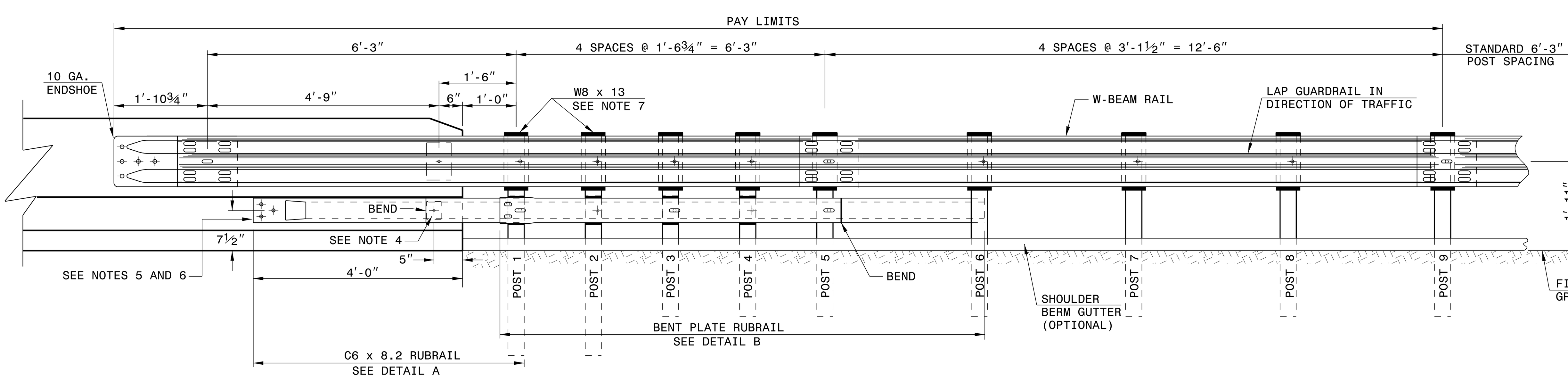
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

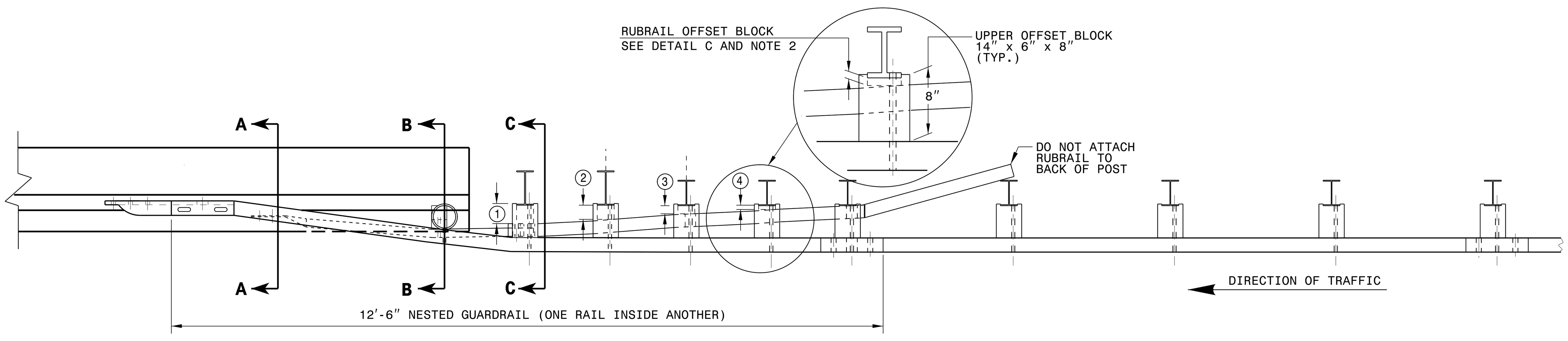
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER



ELEVATION

GENERAL NOTES:
1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
2) RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH ⅝" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A ⅝" x 4½" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH ⅝" x 1¼" LONG BUTTONHEAD BOLT AND RECTANGULAR PLATE WASHER.
4) SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE ⅜" x 3" LAG BOLT WITH FLAT WASHER.
5) SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE F SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
6) ANCHORAGE:
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR RUBRAIL USING THREE ⅝" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS IS ½".
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD DOWN PLATE (SEE STD. DWG. 862.04). A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STD. DWG. 857.01). INSTALL THE W-BEAM END SHOE BEHIND THE NESTED W-BEAM ELEMENTS.
   (c) AT NEW BRIDGE RAIL, ANCHOR THE W-BEAM END SHOE AND RUBRAIL AS DETAILED ON THE STRUCTURE PLANS.
7) POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.



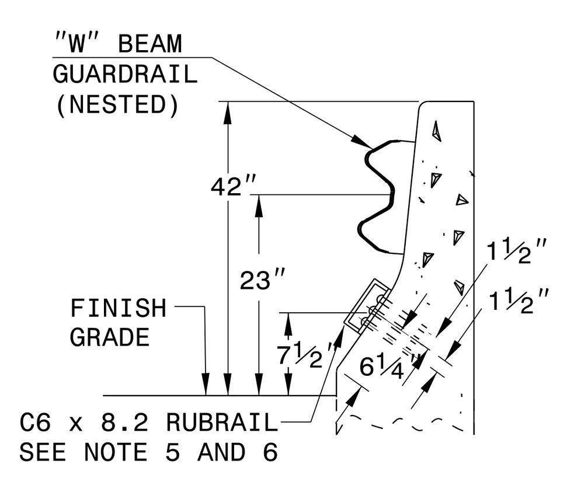
PLAN

GUARDRAIL ANCHOR UNIT TYPE B-77

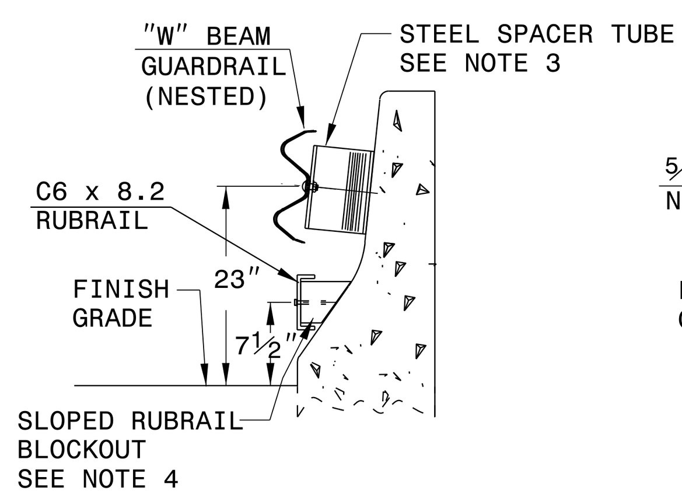
SHEET 4 OF 7
862D03

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

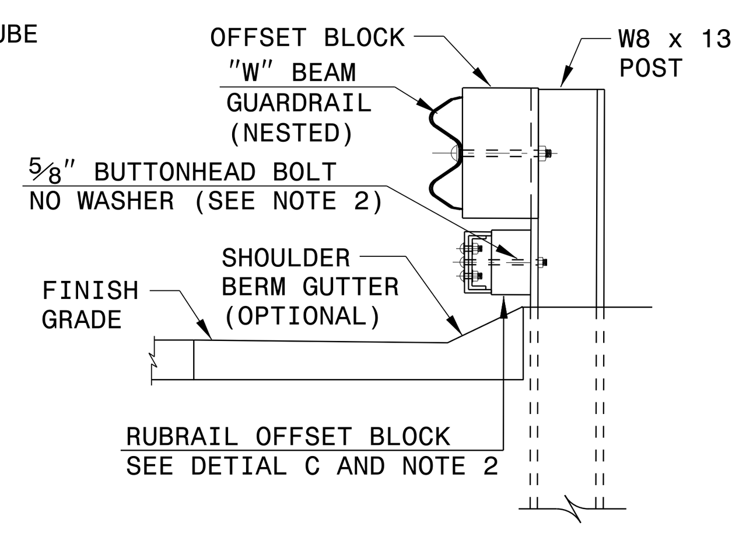
ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER



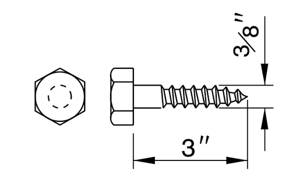
SECTION A-A



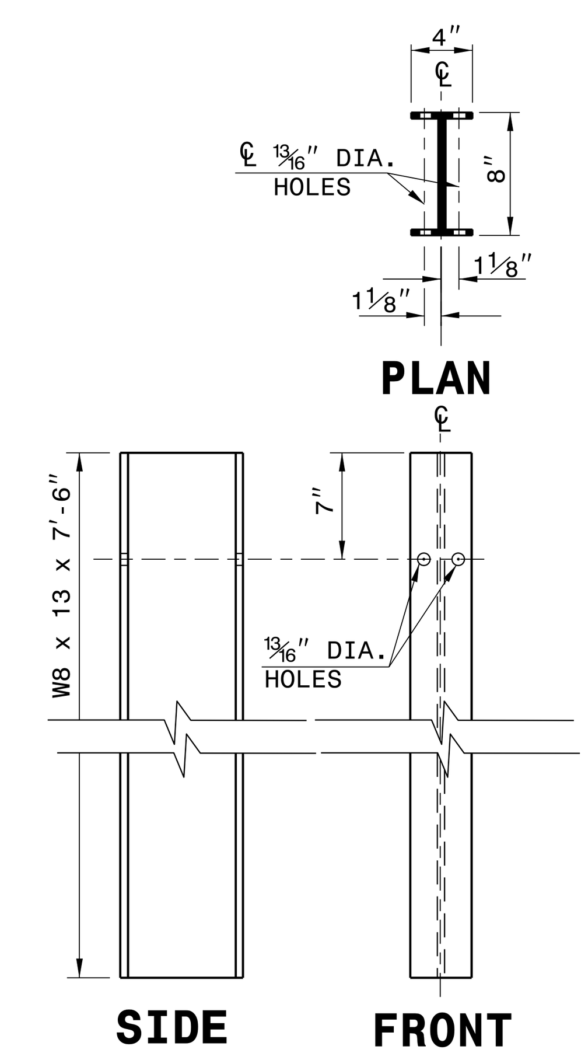
SECTION B-B



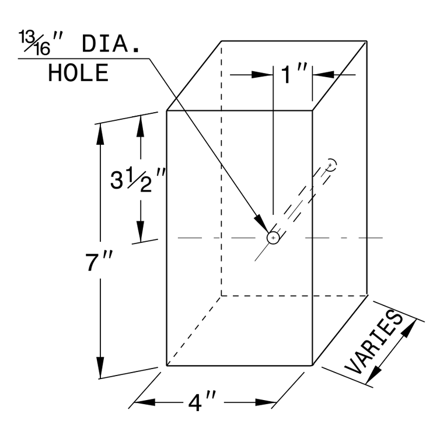
SECTION C-C



DETAIL E LAG BOLT



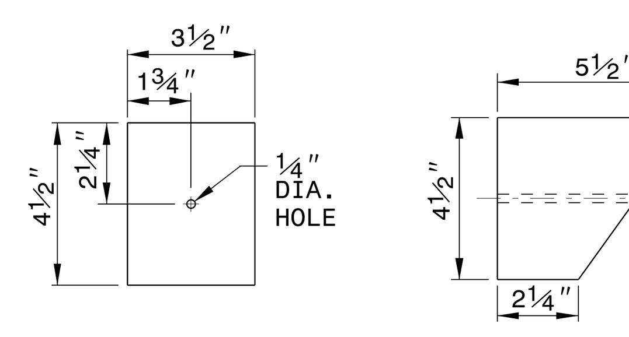
DETAIL F STEEL POST "W8 X 13 X 7'-6"



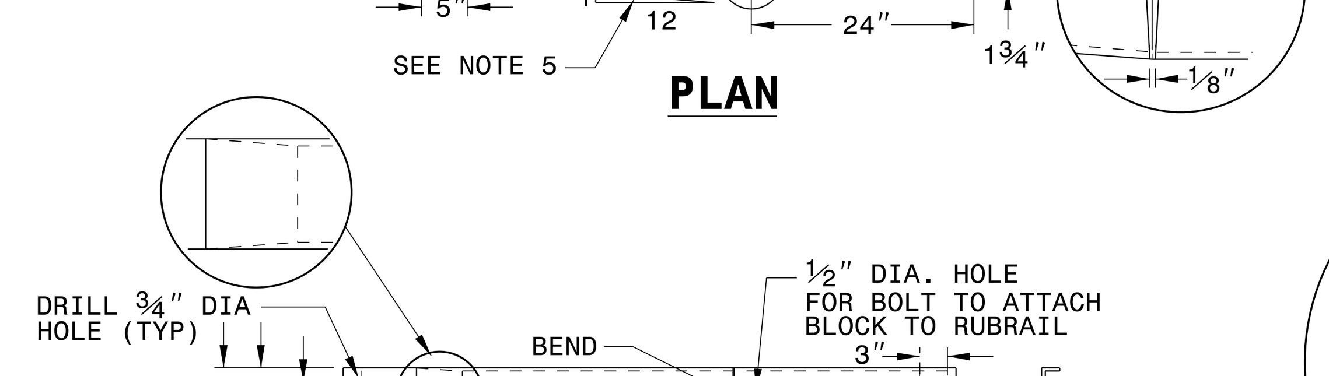
RUBRAIL BLOCKS 7" HIGH x 4" WIDE		
POST	THICKNESS	BOLT LENGTH
1	4¼"	9"
2	3¼"	5" *
3	2"	6"
4	1"	3" *

* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.

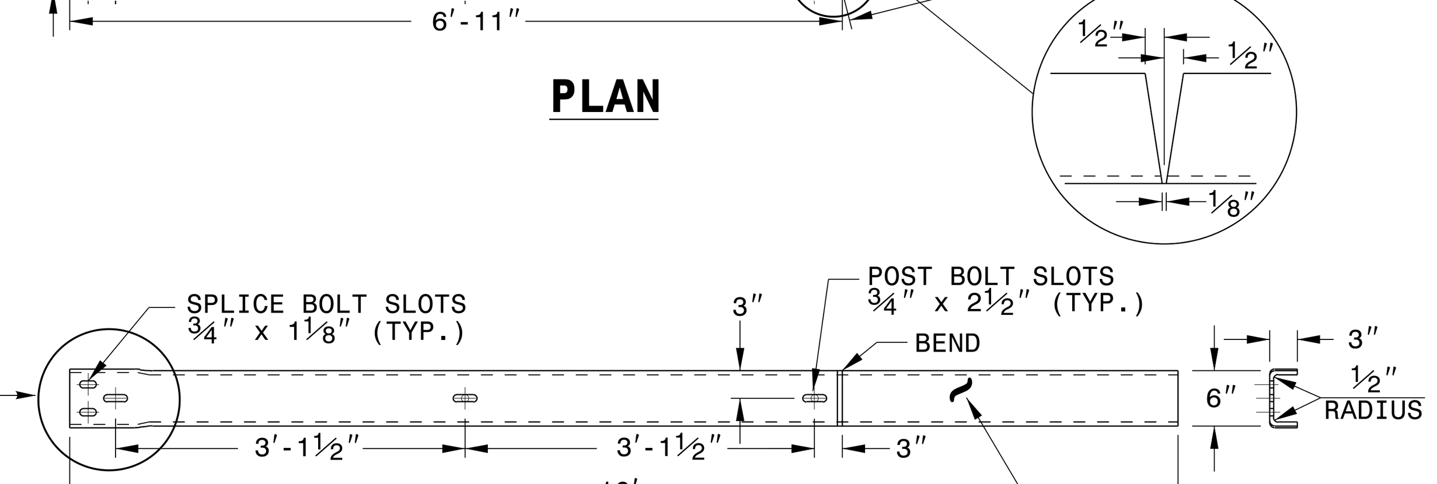
DETAIL C RUBRAIL BLOCKOUT



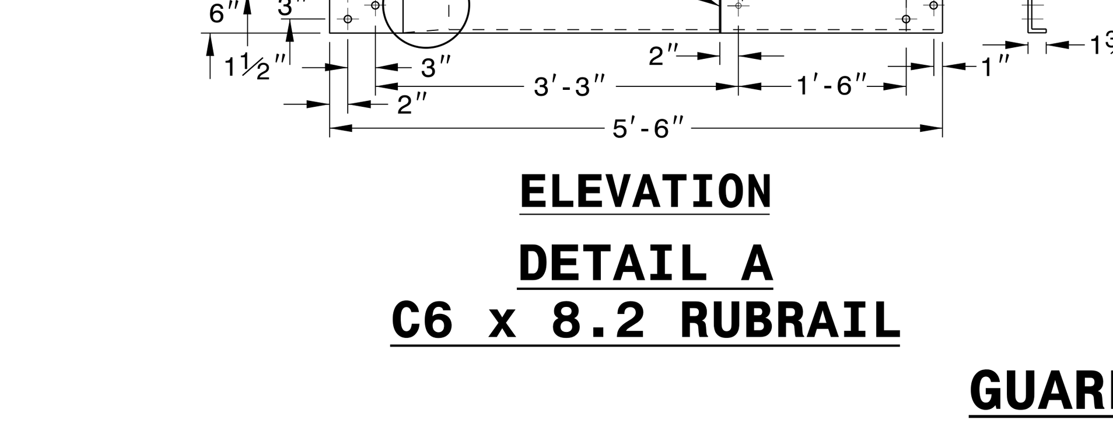
DETAIL D SLOPED RUBRAIL BLOCKOUT



PLAN

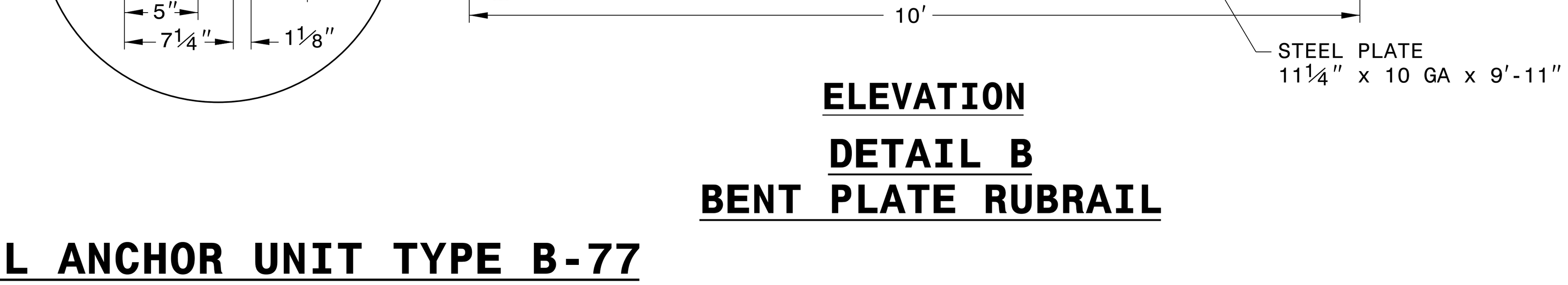


PLAN



ELEVATION

DETAIL A C6 x 8.2 RUBRAIL



ELEVATION

DETAIL B BENT PLATE RUBRAIL

GUARDRAIL ANCHOR UNIT TYPE B-77

SHEET 5 OF 7
862D03

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 5 OF 7
862D03

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

ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7
862D03

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-9

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

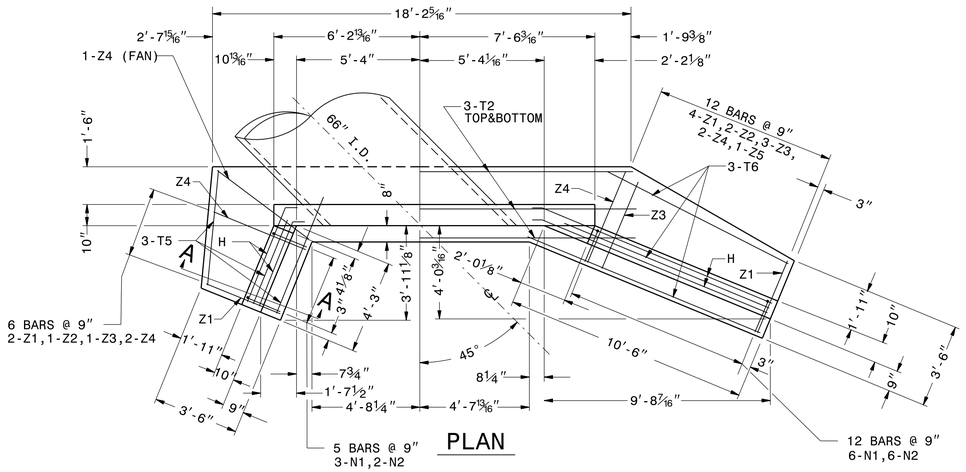
ENGLISH DETAIL DRAWING FOR

REINFORCED CONCRETE ENDWALL

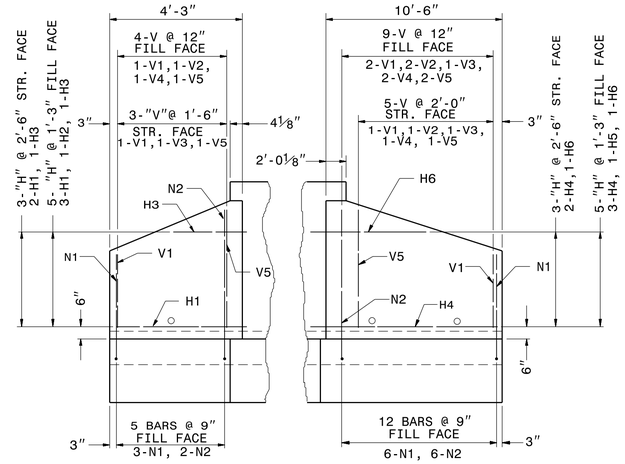
FOR SINGLE 66" PIPE 45° OR 135° SKEW

SHEET 1 OF 1

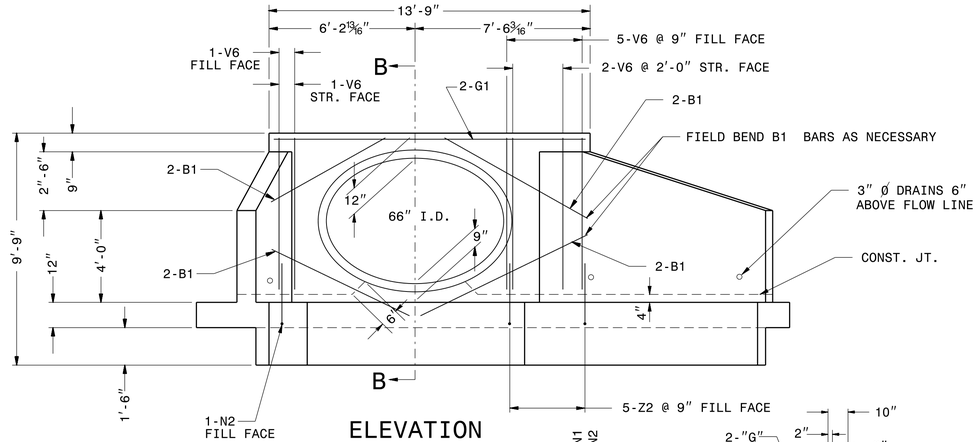
838D37



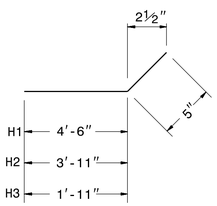
PLAN



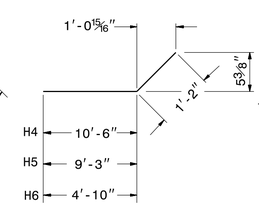
WING ELEVATION



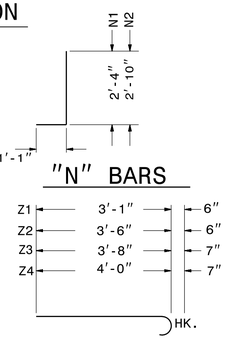
ELEVATION



"H" BARS

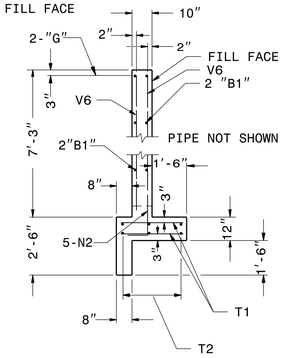


"H" BARS

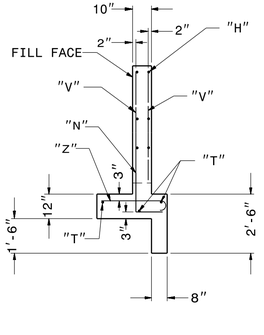


"N" BARS

"Z" BARS



SECTION - BB



SECTION - AA

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL TO BE ASTMA615-GRADE 60.

ALL REINFORCING STEEL TO BE DEFORMED BARS. WHERE SPLICING OF REINFORCMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.

THE FOOTING, CURTAIN WALL AND 4" OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.

ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".

3" DIAMETER DRAINS TO BE PLACED IN WALL AS SHOWN AND BE 6" ABOVE NORMAL FLOW LINE.

ALL MATERIAL AND WORKMANSHIP AS PER N.C.DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR ENDWALL				
REINF. STEEL			1 - PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT
Z1	#4	3'-7"	6	14
Z2	#4	4'-0"	3	8
Z3	#5	4'-3"	5	22
Z4	#5	4'-7"	5	24
N1	#4	3'-5"	9	21
N2	#5	3'-11"	14	57
V1	#4	3'-7"	5	12
V2	#4	4'-2"	4	11
V3	#4	4'-7"	3	9
V4	#4	4'-11"	4	13
V5	#4	5'-6"	5	18
V6	#4	6'-9"	9	41
H1	#4	5'-0"	5	17
H2	#4	4'-5"	1	3
H3	#4	2'-5"	2	3
H4	#4	11'-8"	5	39
H5	#4	10'-5"	1	7
H6	#4	6'-0"	2	8
T1	#4	2'-6"	54	90
T2	#4	17'-10"	6	71
T5	#4	4'-10"	3	10
T6	#4	9'-3"	3	19
B1	#4	6'-3"	8	33
G1	#7	13'-5"	2	55
REINF. STEEL LBS.				605
CONC/C.M. CU. YDS.				8.8
CONC/R.C. CU. YDS.				8.4

DRAWING NOT TO SCALE

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

ENGLISH DETAIL DRAWING FOR

REINFORCED CONCRETE ENDWALL

FOR SINGLE 66" PIPE 45° OR 135° SKEW

SHEET 1 OF 1

838D37

9/12/2016

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

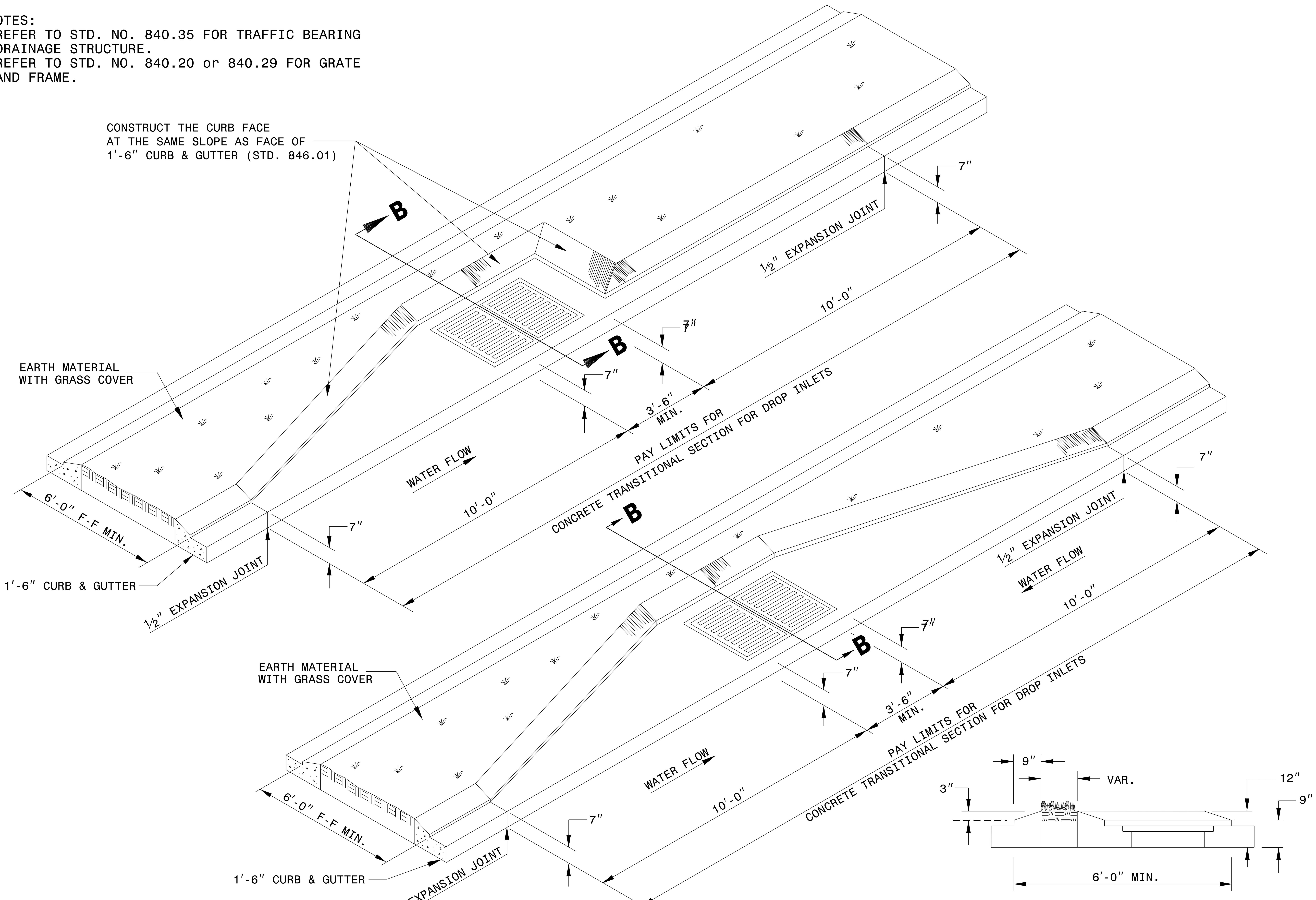
CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

DETAIL OF REINFORCED CONCRETE ENDWALL FOR 66" DIAMETER PIPE - 45° SKEW

ORIGINAL BY: R.S.WICKER DATE: 6-46
MODIFIED BY: rnbritt DATE: 06-07-10
CHECKED BY: DATE:
FILE SPEC.: details/nbritt/english/hydro/66endwall,45sk.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-10

NOTES:
- REFER TO STD. NO. 840.35 FOR TRAFFIC BEARING DRAINAGE STRUCTURE.
- REFER TO STD. NO. 840.20 or 840.29 FOR GRATE AND FRAME.



SECTION B-B

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

ENGLISH DETAIL DRAWING FOR
METHOD FOR PLACEMENT OF TRAFFIC BEARING 2GI IN GRASSED MEDIAN
(USING 1'-6" CURB & GUTTER)

SHEET 1 OF 1
852D04

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

ENGLISH DETAIL DRAWING FOR
METHOD FOR PLACEMENT OF TRAFFIC BEARING 2GI IN GRASSED MEDIAN
(USING 1'-6" CURB & GUTTER)

SHEET 1 OF 1
852D04

9/12/2016 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

DocuSigned by: Joel S. Howerton

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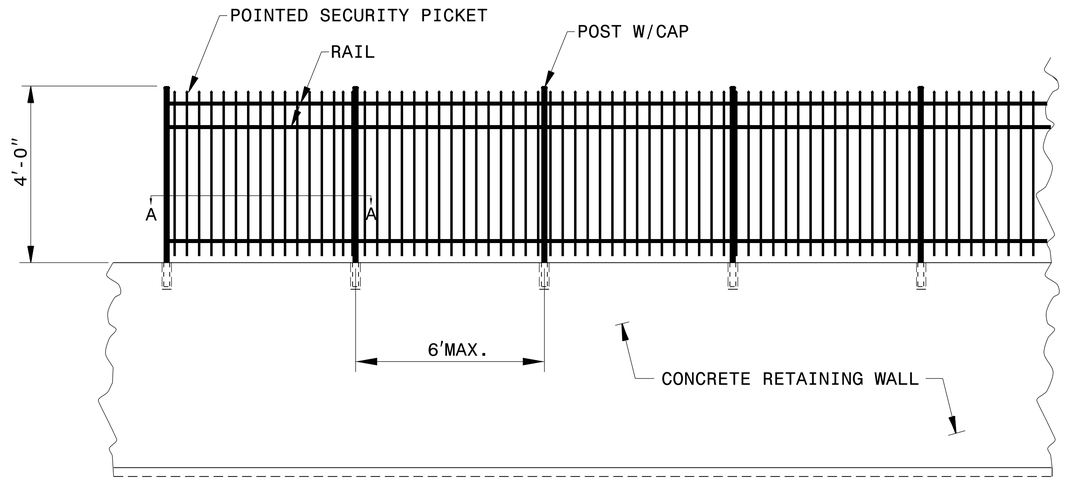
Office 919-707-6950 FAX 919-250-4119

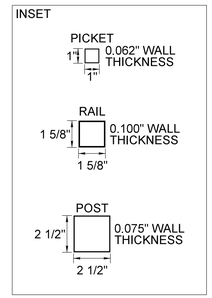
SEE TITLE PLATE

ORIGINAL BY: KKEMPF DATE: 8/2/10
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton\852d04 Traffic Bearing DI in Island.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-11





MATERIAL THICKNESS

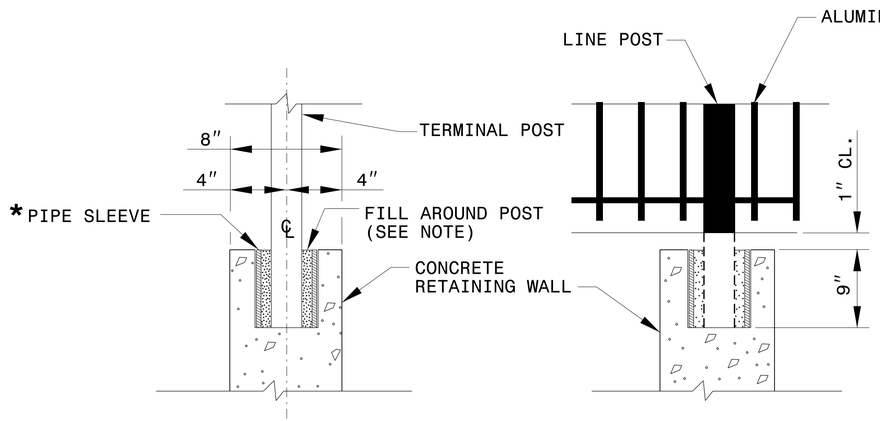
RETAINING WALL MOUNTED ALUMINUM PICKET FENCE

NOTE:

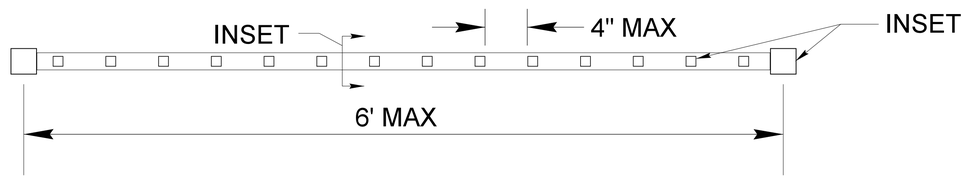
PLACEMENT OF PIPE SLEEVES SHALL CORRESPOND TO LINE POST AND TERMINAL POST AS SHOWN.

FILL SPACE BETWEEN POST AND PIPE MATERIAL ACCORDING TO FENCE INSTALLATION SPECIFICATIONS OR MATERIAL APPROVED BY ENGINEER.

* PIPE SLEEVES SHALL BE INSTALLED IN THE CONCRETE RETAINING WALL WITH ALUMINUM ALLOY POST AS INDICATED.



POST EMBEDMENT IN RETAINING WALL



SECTION A-A

NOTES:

1) SUBMIT ALTERNATE FENCE MATERIAL TO ENGINEER FOR APPROVAL.

2) SUBMIT ANY VARIATIONS IN FENCE DIMENSIONS TO ENGINEER FOR APPROVAL.

3) POST MAY BE DRIVEN IF IT CAUSES NO STRUCTURAL DAMAGE. (SEE MANUFACTURERS RECOMMENDATIONS)

9/12/2016

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

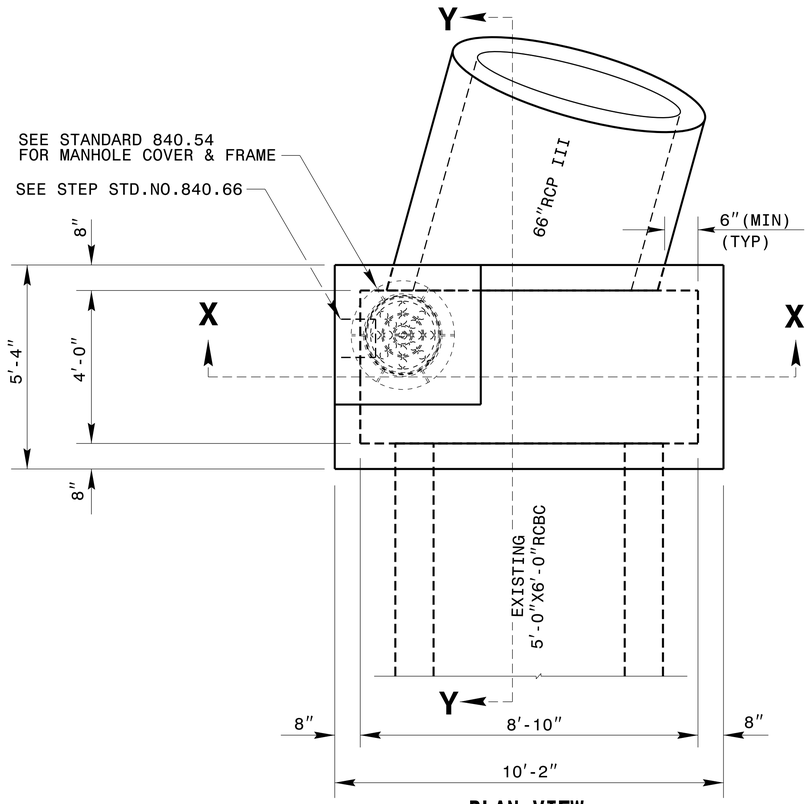
CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

RETAINING WALL ALUMINUM PICKET FENCE

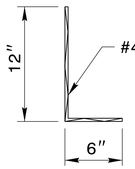
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 09-16-11
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/english/misc/aluminumfenceretwall.dgn

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

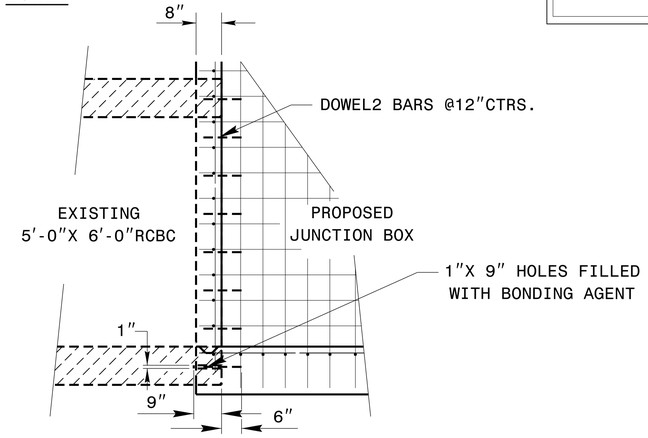
PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-12



PLAN VIEW



DOWEL



DOWEL2 BAR DETAIL

SEE NOTE

GENERAL NOTES:

USE CLASS "A" CONCRETE THROUGHOUT.

PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

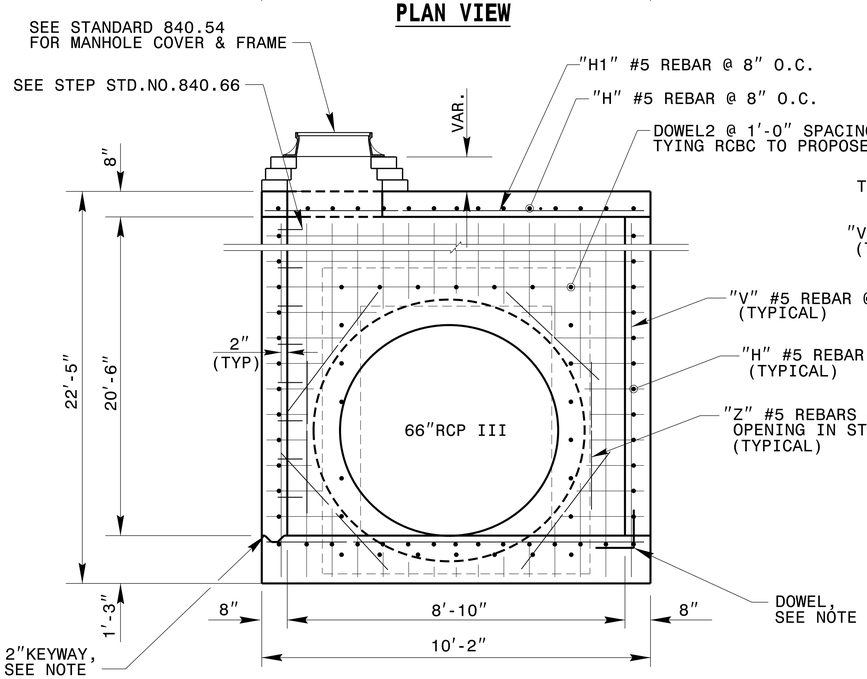
CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

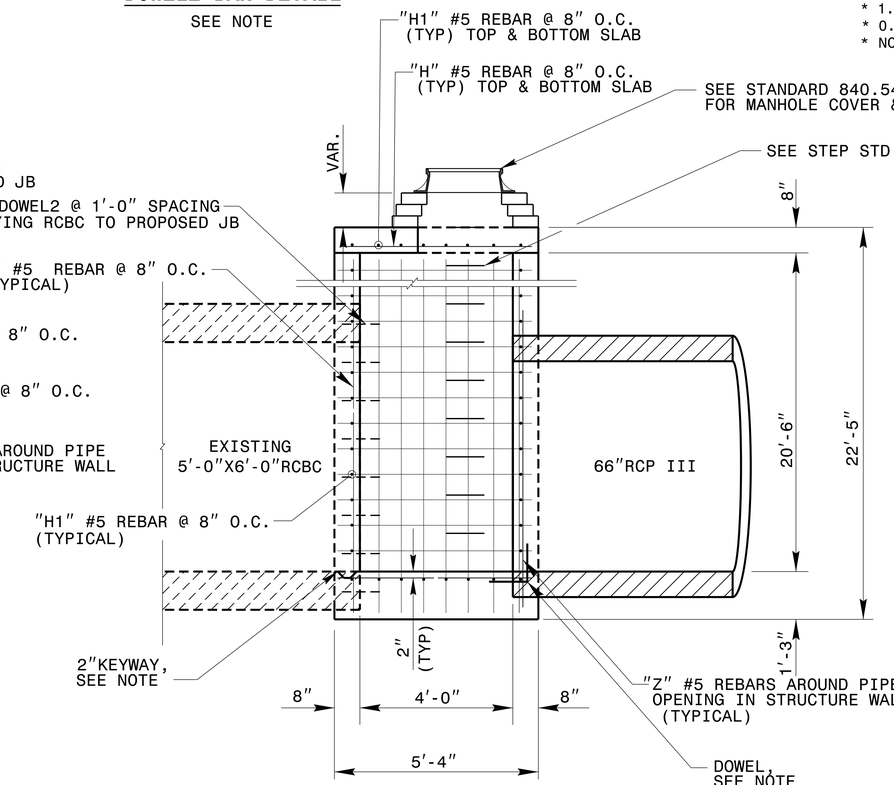
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	126	#5	5'-0"	658
H1	60	#5	9'-10"	615
V	38	#5	22'-0"	872
Z	6	#5	4'-0"	25
DOWEL				OPTIONAL
DOWEL2	24	#6	1'-0"	36
TOTAL REINF. STEEL (LBS.)				2206
TOTAL CL."A" CONC.(CU.YDS.)				18.5

* 1.04 CU. YD. DEDUCTION FOR 1-66" RC PIPE III
* 1.25 CU. YD. DEDUCTION FOR 5'X 6' RCBC
* 0.30 CU. YD. PER FOOT OF RISER HEIGHT
* NO DEDUCTION HAS BEEN MADE FOR PIPES



SECTION X-X



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

9/12/2016

DocuSigned by: Joel S. Howerton B73F3D17DCDC45F...

STRUCTURE NO.1326

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

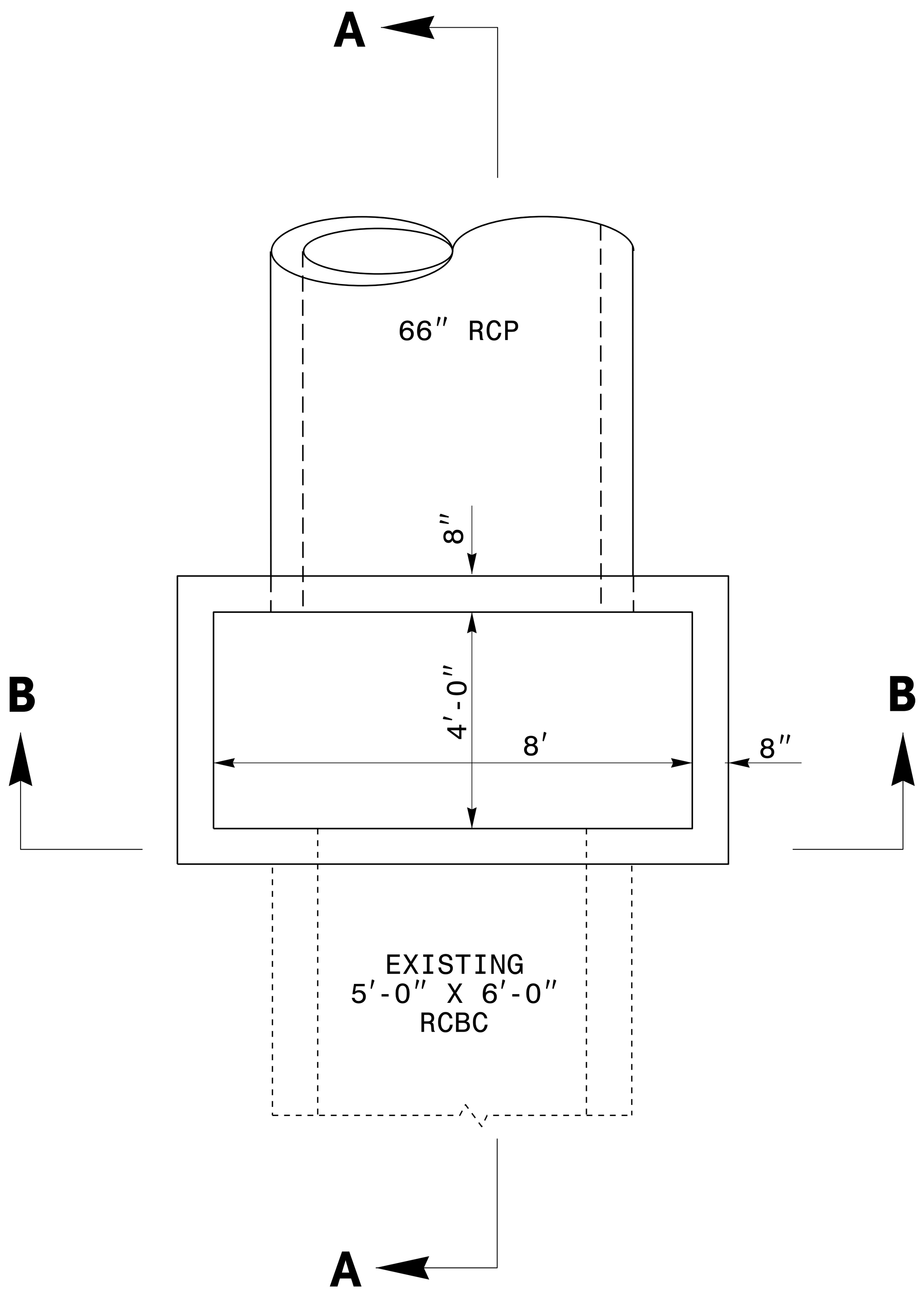
SPECIAL JUNCTION BOX 66"RCP TO 5'X 6' RCBC

ORIGINAL BY:	nbritt	DATE:	04-22-2008
MODIFIED BY:	nbritt	DATE:	08-03-2016
CHECKED BY:		DATE:	
FILE SPEC.:	detail/nbritt/english/urban/u3440 rcbc 66rcp.dgn		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

$$$$$$SYSTIME$$$$$$
$$$$$$SYSNAME$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-13



PLAN

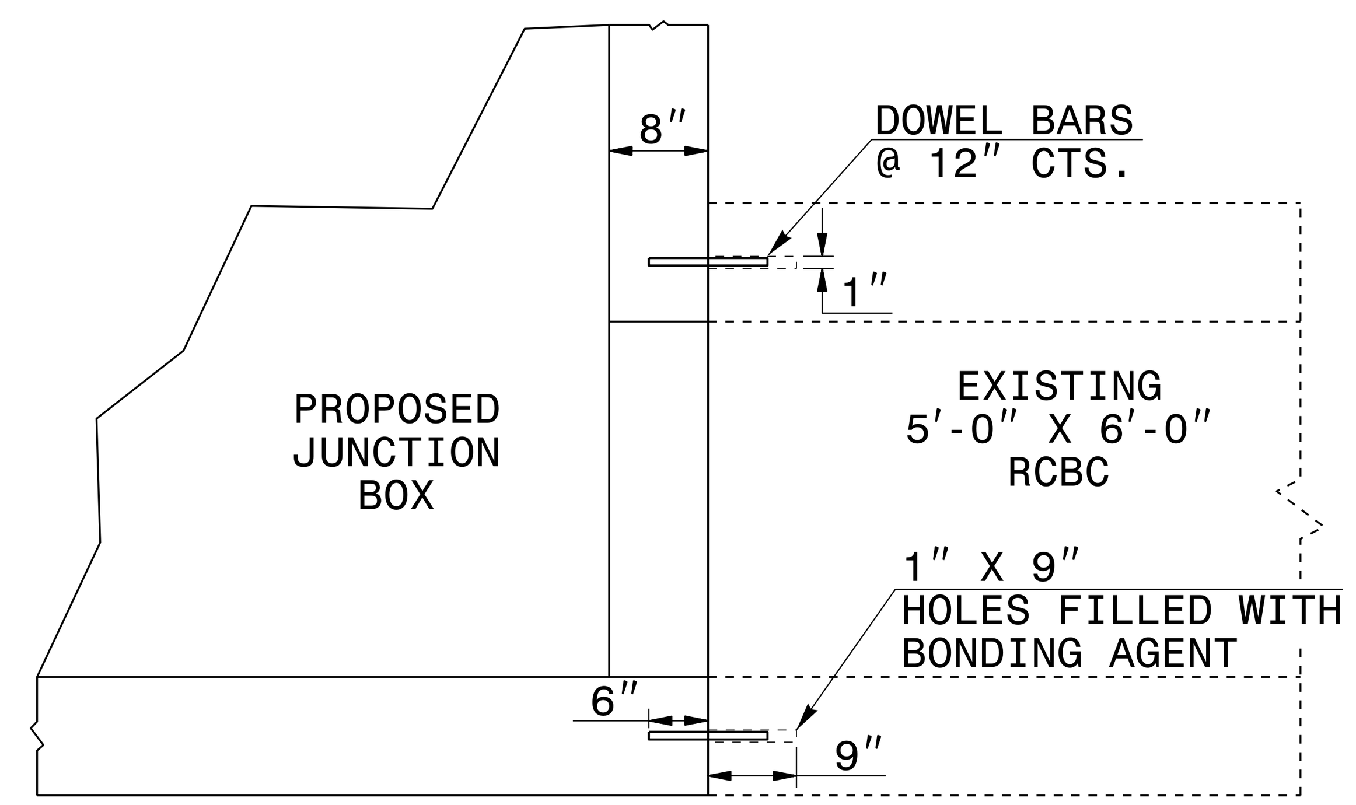
GENERAL NOTES:

1. CONSTRUCT THE BASE SLAB BY FORMING.
2. USE CLASS 'B' CONCRETE THROUGHOUT.
3. CONSTRUCTION OPTIONS: CAST-IN-PLACE; CONSTRUCTION JOINTS AT UNION OF WALLS WITH FLOOR AND/OR TOP SLAB.
4. CUT, BEND OR RELOCATE REINFORCING STEEL TO POSITION PIPE AS DIRECTED BY THE ENGINEER.
5. CHAMFER ALL EXPOSED CORNERS 1".
6. DIMENSIONS MAY BE ADJUSTED AS NECESSARY AS DIRECTED BY THE ENGINEER.

BILL OF MATERIAL

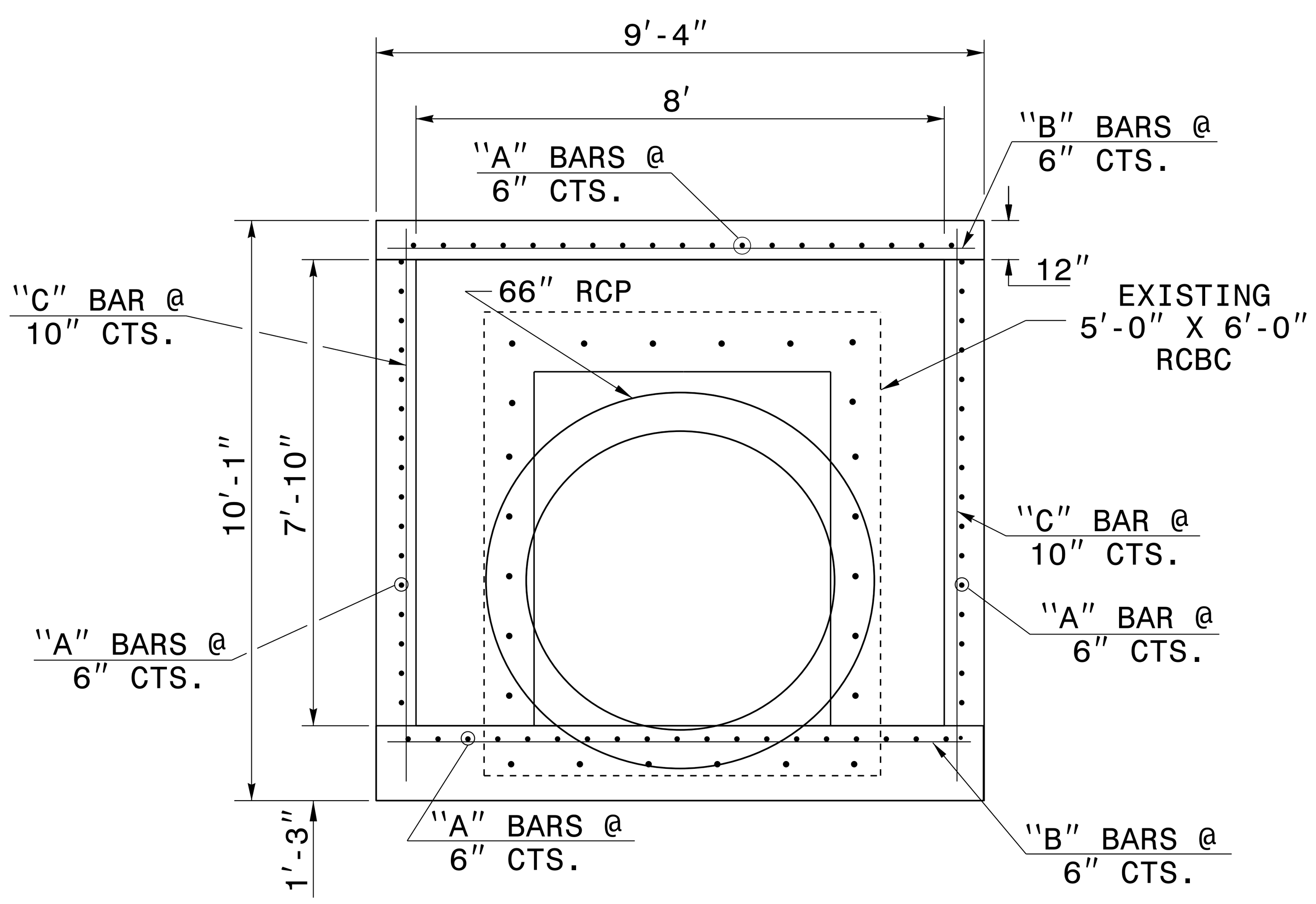
BAR NO.	SIZE	LENGTH	NUMBER	TOTAL
A	#5	5'-0"	78	407
B	#5	9'-0"	60	564
C	#5	9'-9"	38	387
DOWEL	#6	1'-0"	24	36
TOTAL WEIGHT - (LBS.)				1394
CLASS "A" CONC. - (CU. YDS.)				9.4

DEDUCTION FOR 1 66" RCP - 1.04 CY
DEDUCTION FOR 5' x 6' RCBC - 1.25 CY

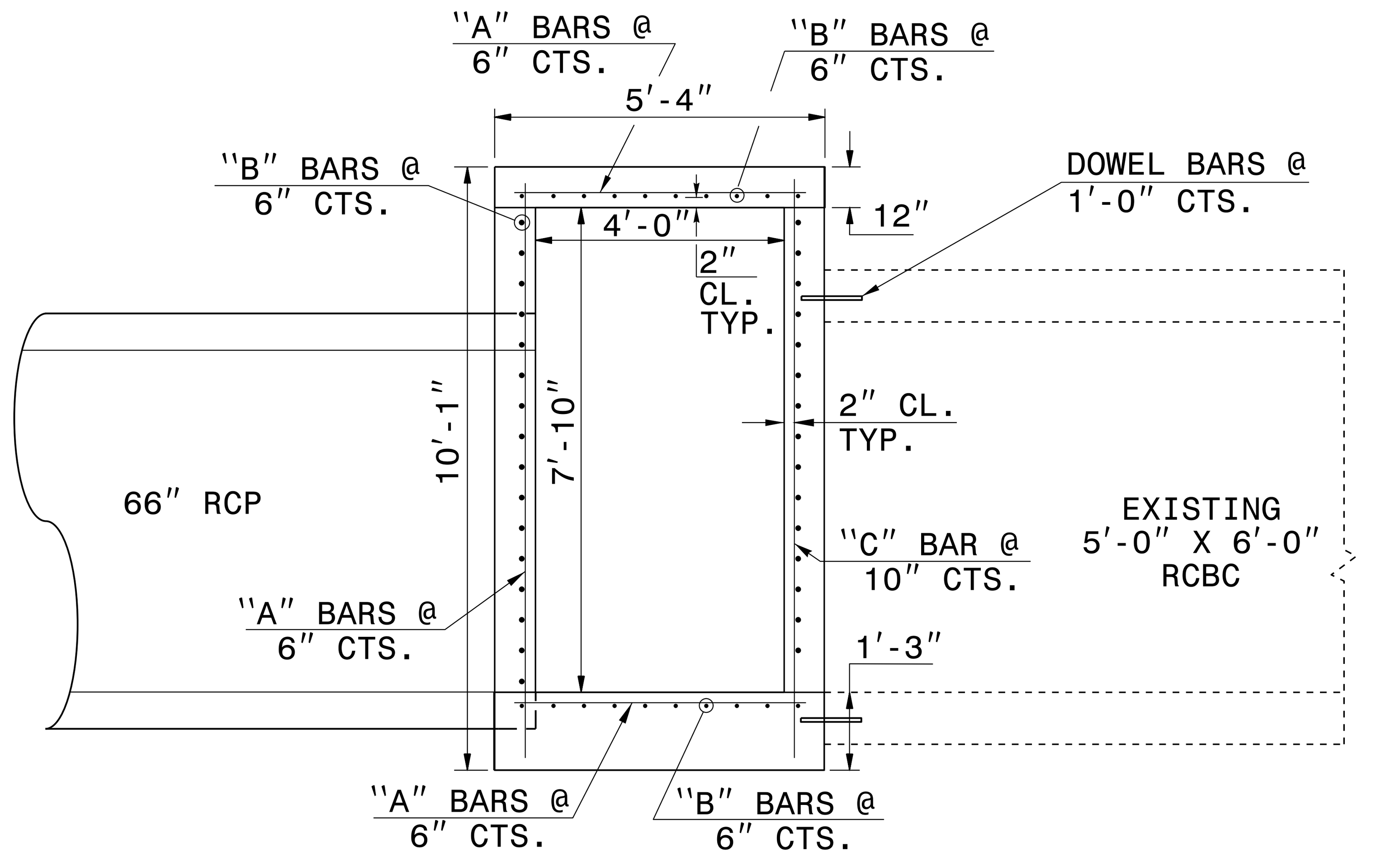


DOWEL BAR DETAIL

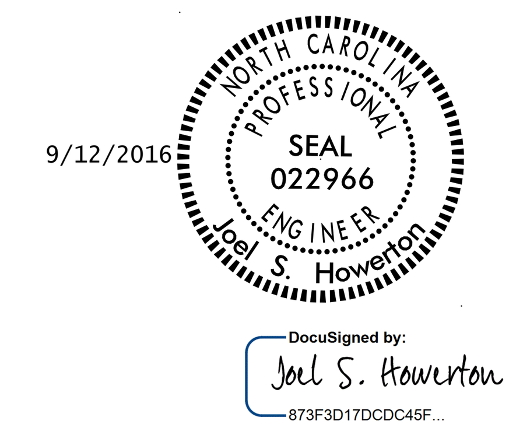
SEE NOTES



SECTION B-B



SECTION A-A



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SPECIAL JB 66" RCP TO 5'x6' RCBC

ORIGINAL BY: J. HOWERTON DATE: 8-1-16
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton/U3440 JB 66 RCP TO 5x6 RCBC

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-14

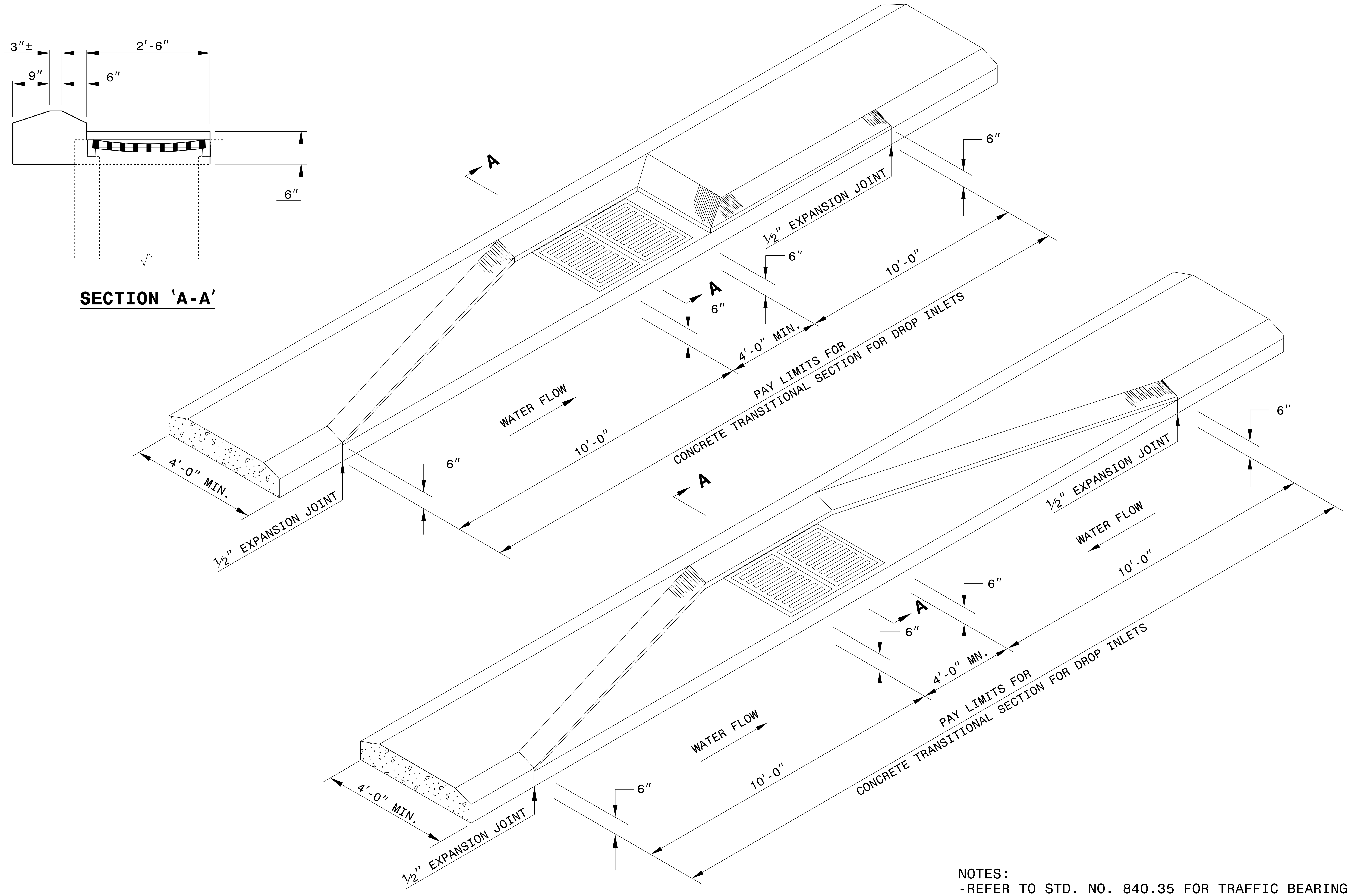
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1

852D06



NOTES:
-REFER TO STD. NO. 840.35 FOR TRAFFIC BEARING DRAINAGE STRUCTURE.
-REFER TO STD. NO. 840.20 or 840.29 FOR GRATE AND FRAME.

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

ENGLISH DETAIL DRAWING FOR
METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1
852D06

9/12/2016 NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE PLATE

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

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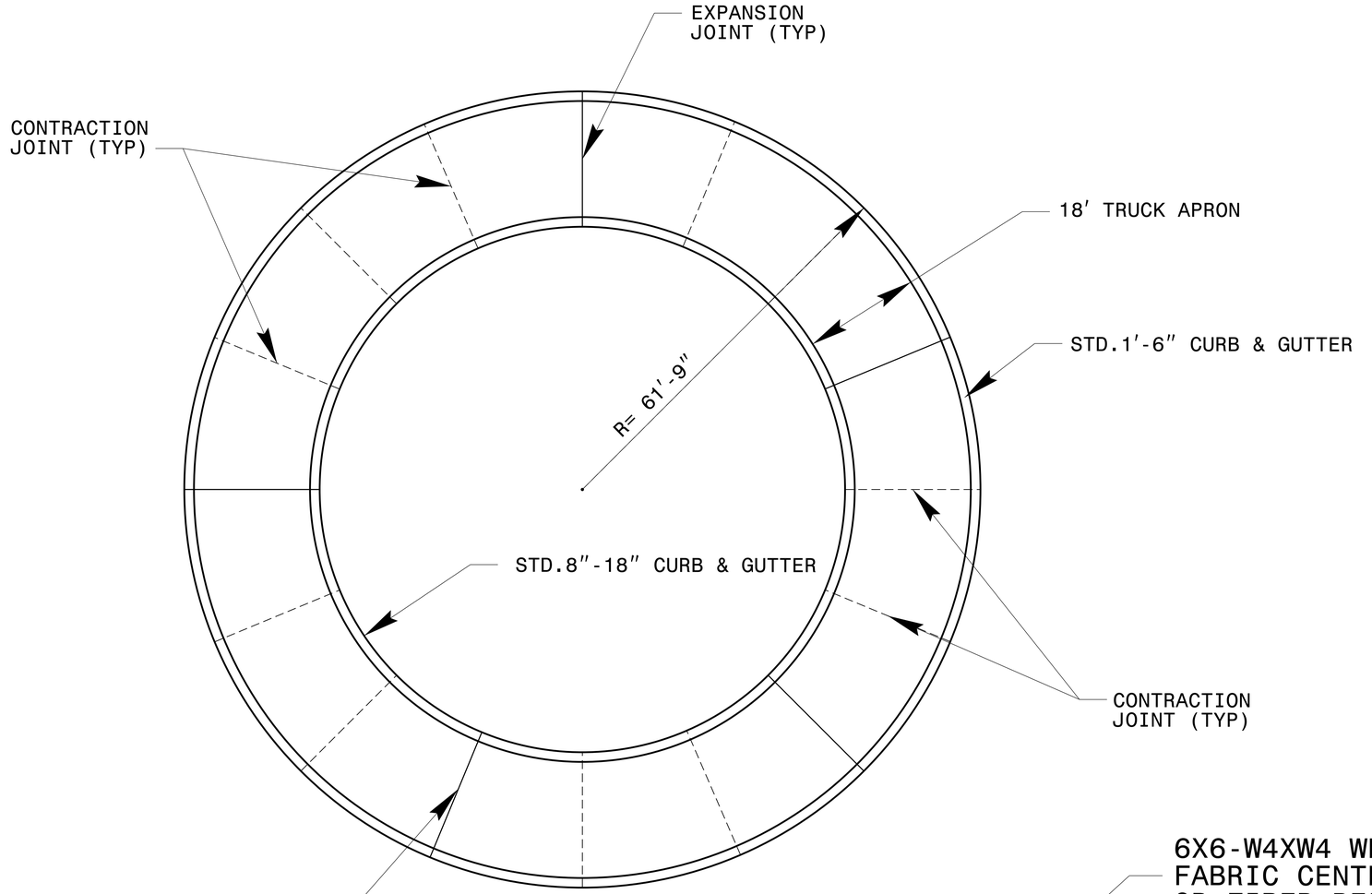
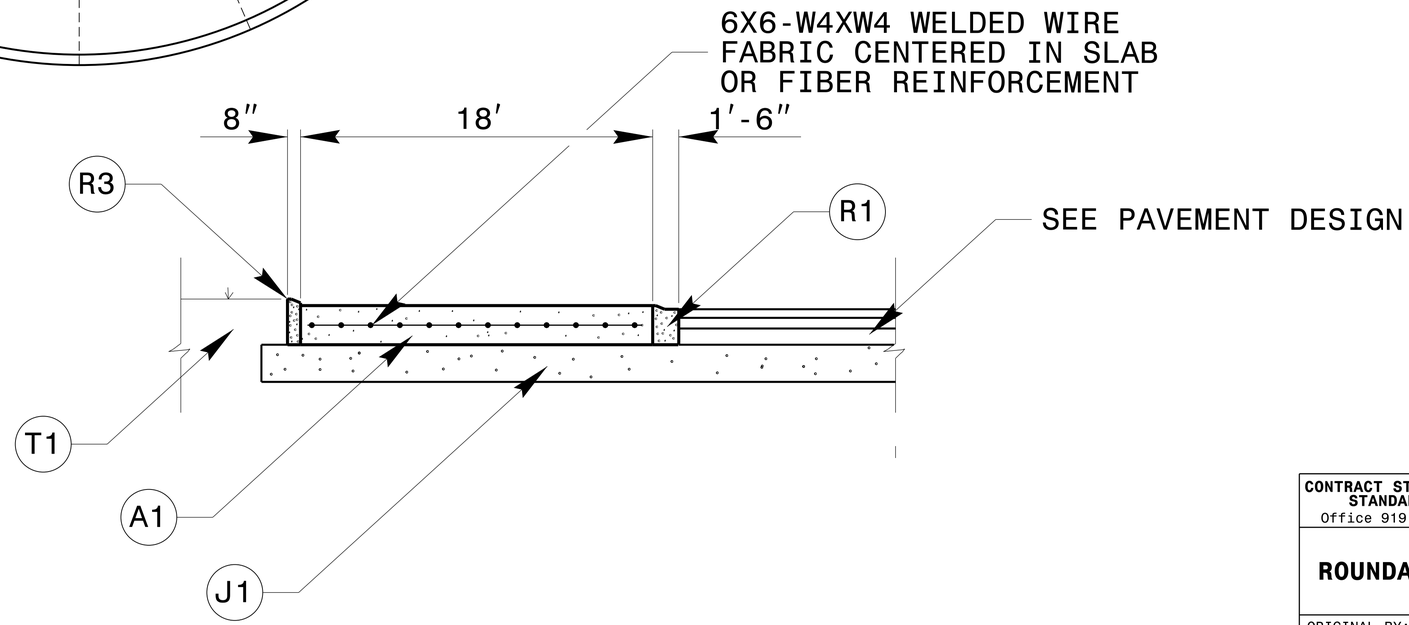
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-15



LEGEND	
A1	12″CONCRETE
J1	4″ ABC
R1	1′-6″ CURB & GUTTER
R3	8″X18″ CURB
T1	EARTH MATERIAL



9/26/2016

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

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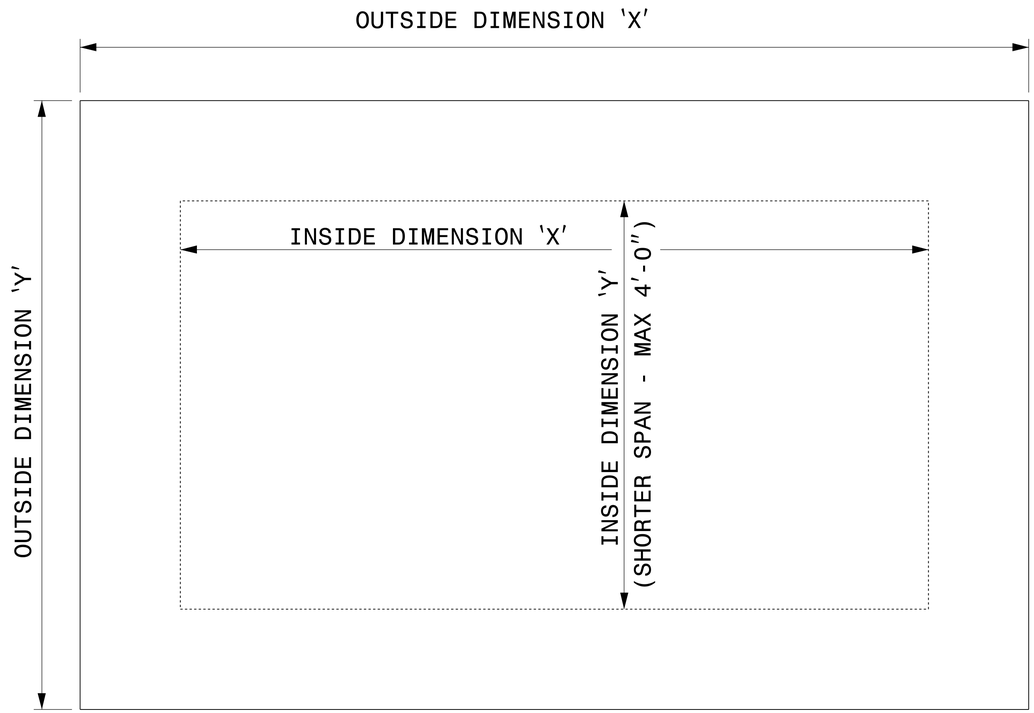
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

ROUNDABOUT TRUCK APRON

ORIGINAL BY: jhowerton DATE: 09-29-2016
MODIFIED BY: rnbritt DATE: 09-29-2016
CHECKED BY: DATE:
FILE SPEC.: details/mbritt/english/urban/roundabout truck apron.dgn

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

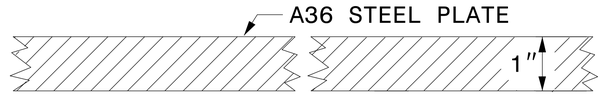
PROJECT REFERENCE NO.	SHEET NO.
U-3440	2C-16



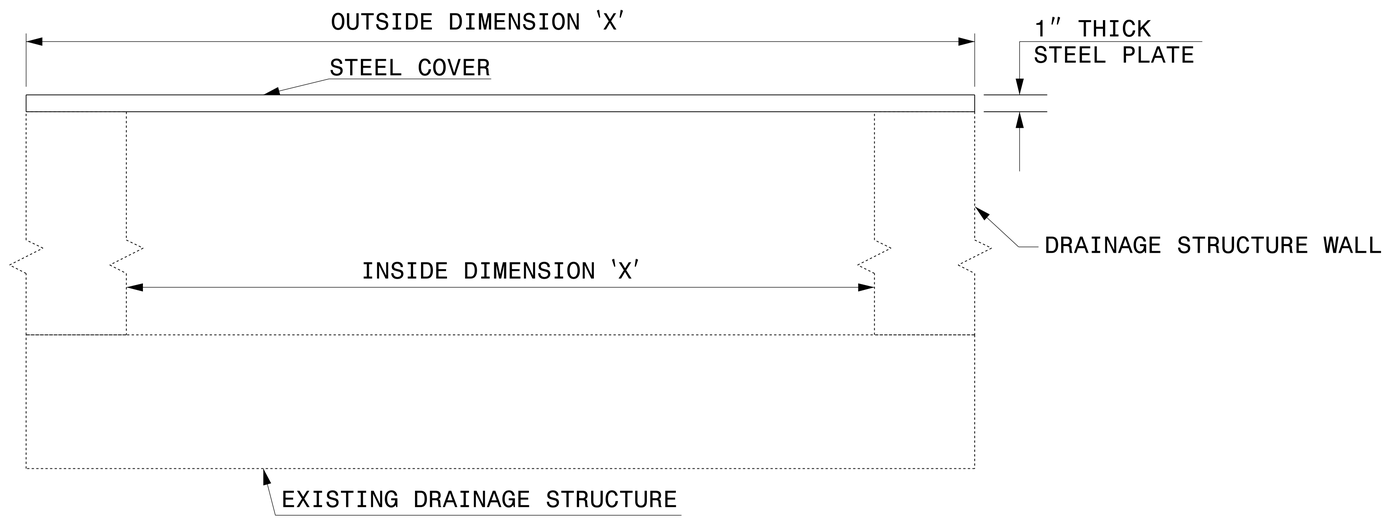
PLAN VIEWS

GENERAL NOTES:

-USE GRADE A36 STEEL
-STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
-FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
-SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
-QUANTITES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE



ELEVATION VIEWS

11/3/2016 | 5:

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel Howerton 873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE

ORIGINAL BY: E.E. WARD DATE: 2-2-98
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: eric:/usr/details/metric/stand/stlcvr2.dgn

$$$$SYSTIME$$$$
$$$$SYSNAME$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2G-1

GEOTECHNICAL ENGINEER

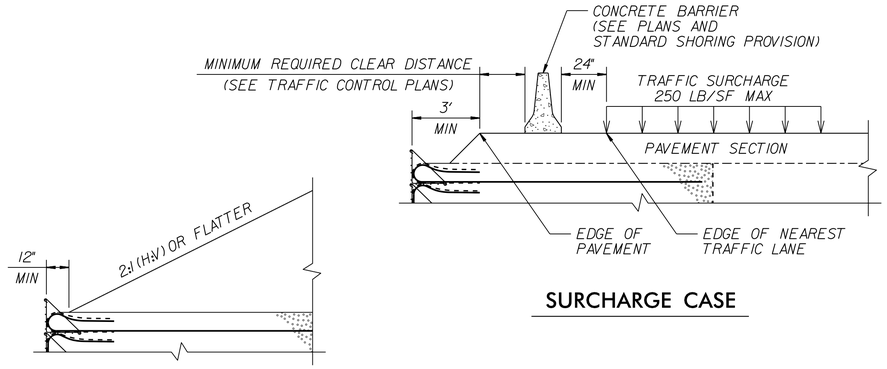
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 7/22/2016
F760CAE8986EC4D8... SIGNATURE DATE

ENGINEER

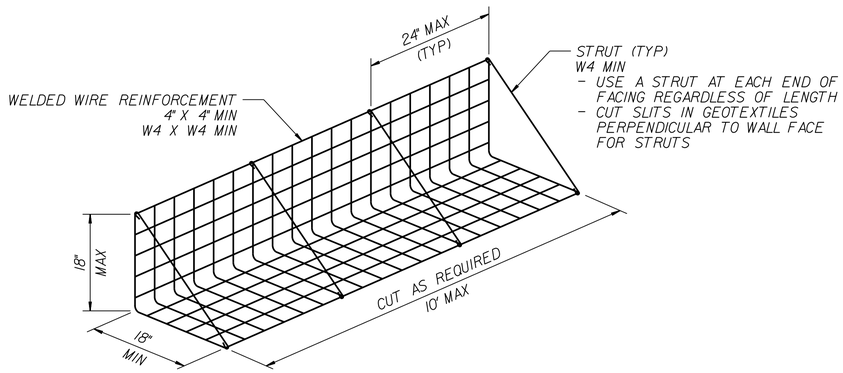
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

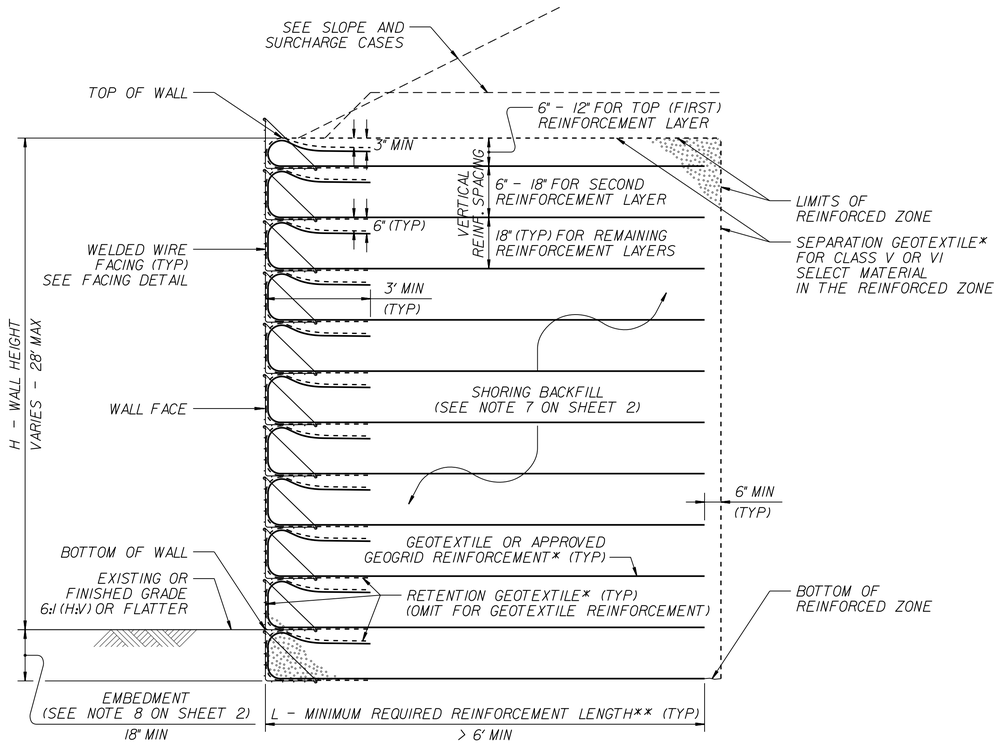


SURCHARGE CASE

SLOPE CASE

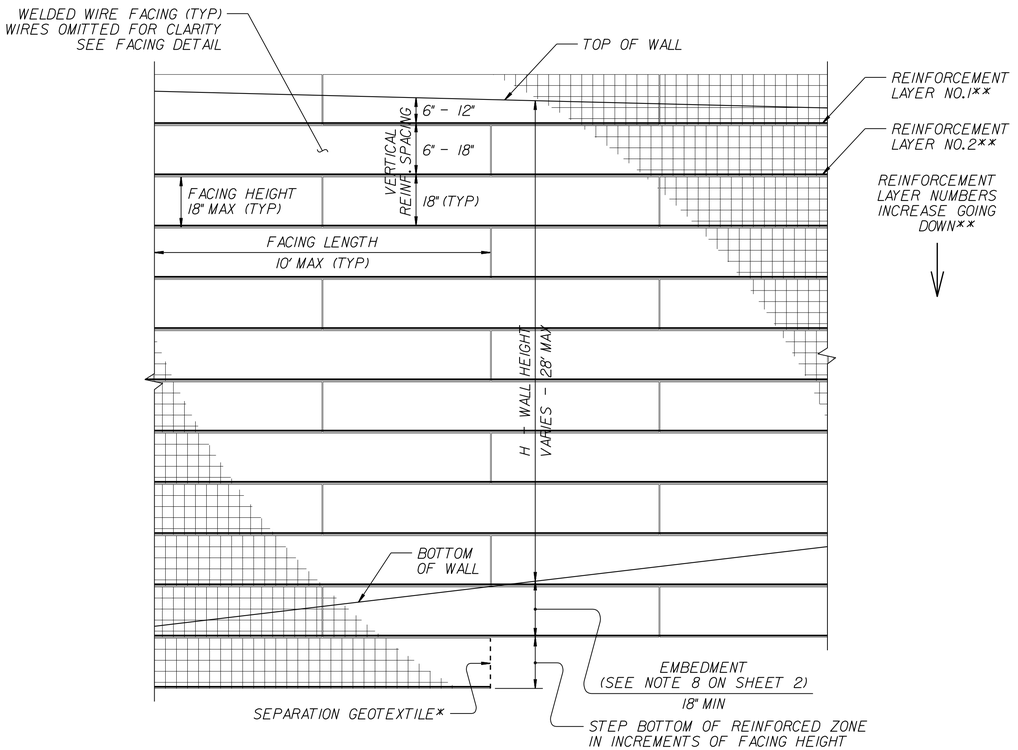


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 1 OF 3

DATE: 11-19-13

GEOTECHNICAL ENGINEER

SEAL 022246 — NORTH CAROLINA PROFESSIONAL ENGINEER — SCOTT A. HIDDEN

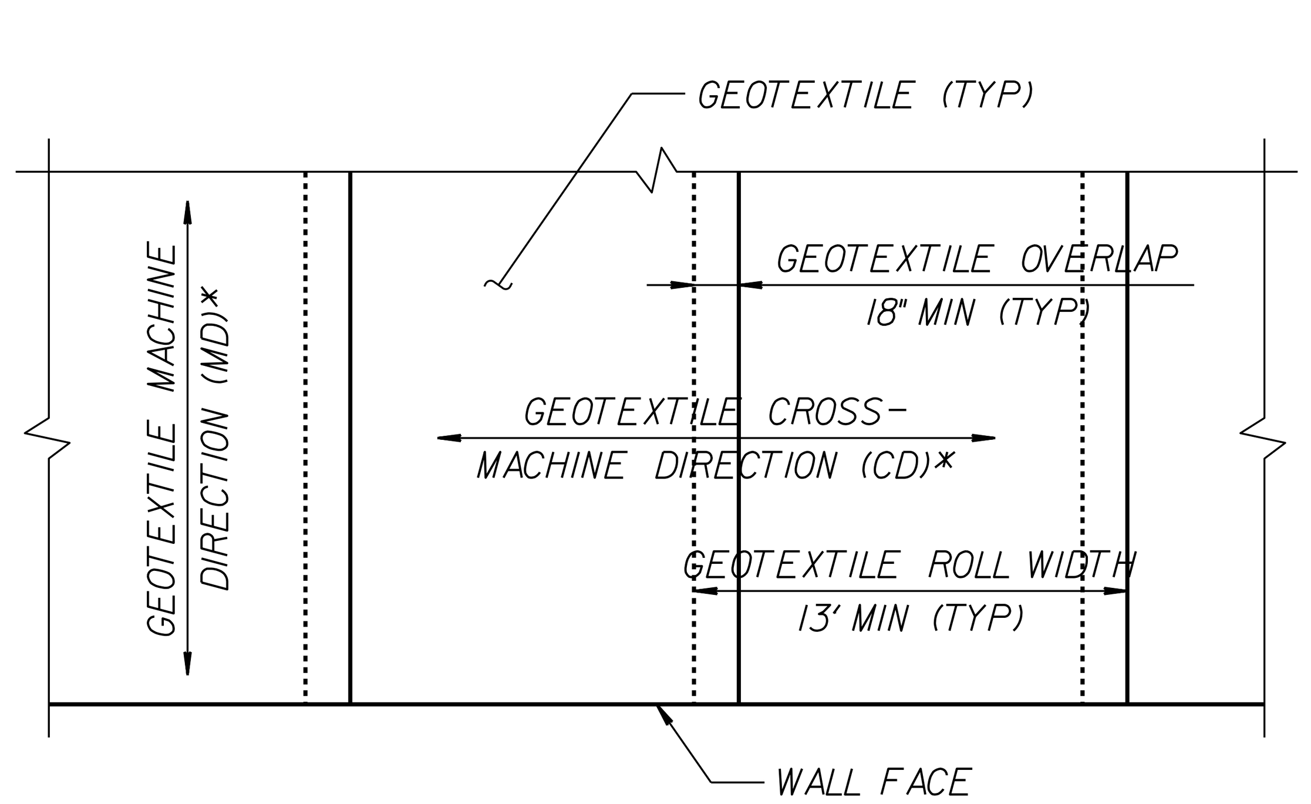
DocuSigned by: Scott A. Hidden 7/22/2016

SIGNATURE DATE

ENGINEER

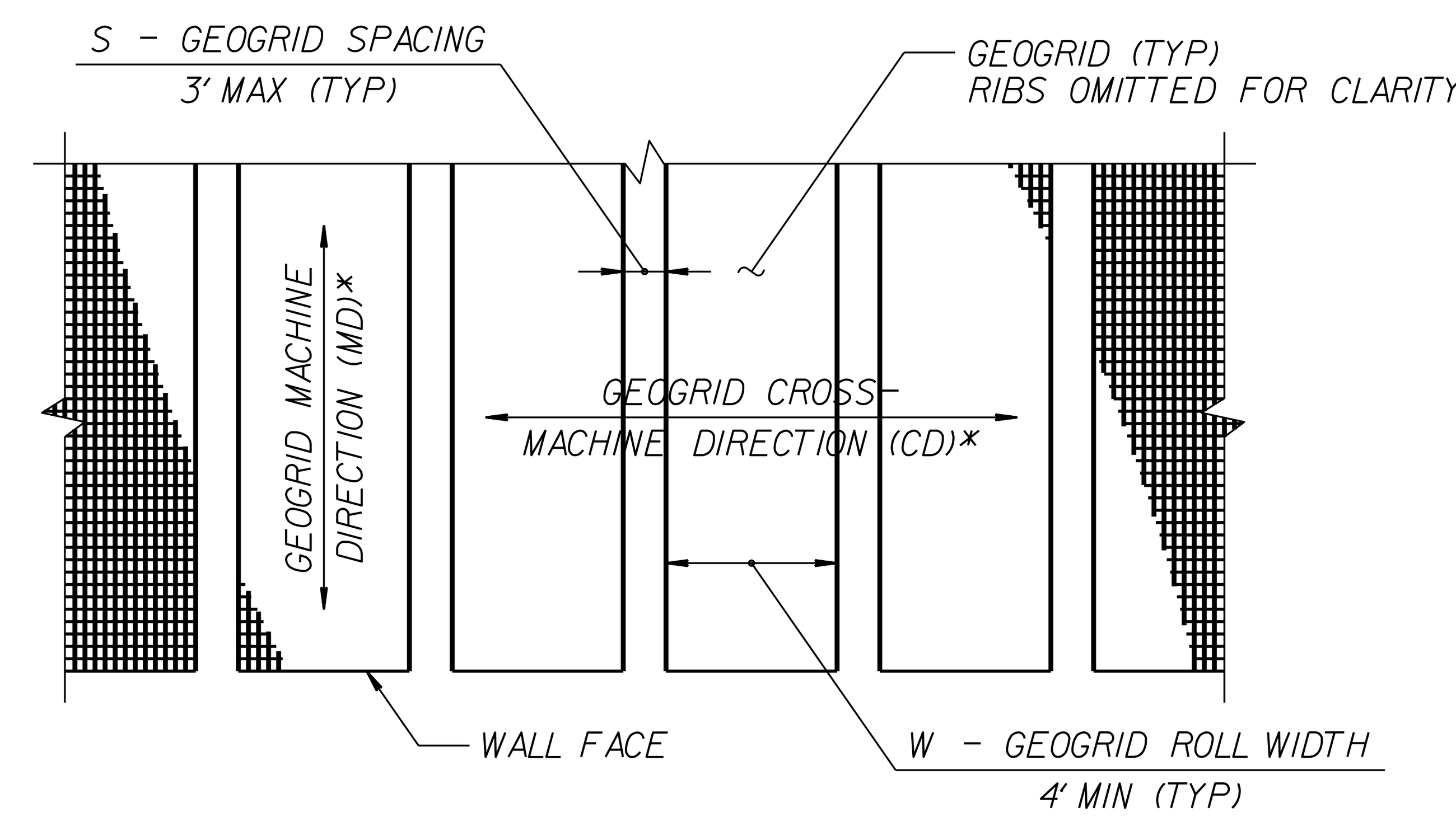
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



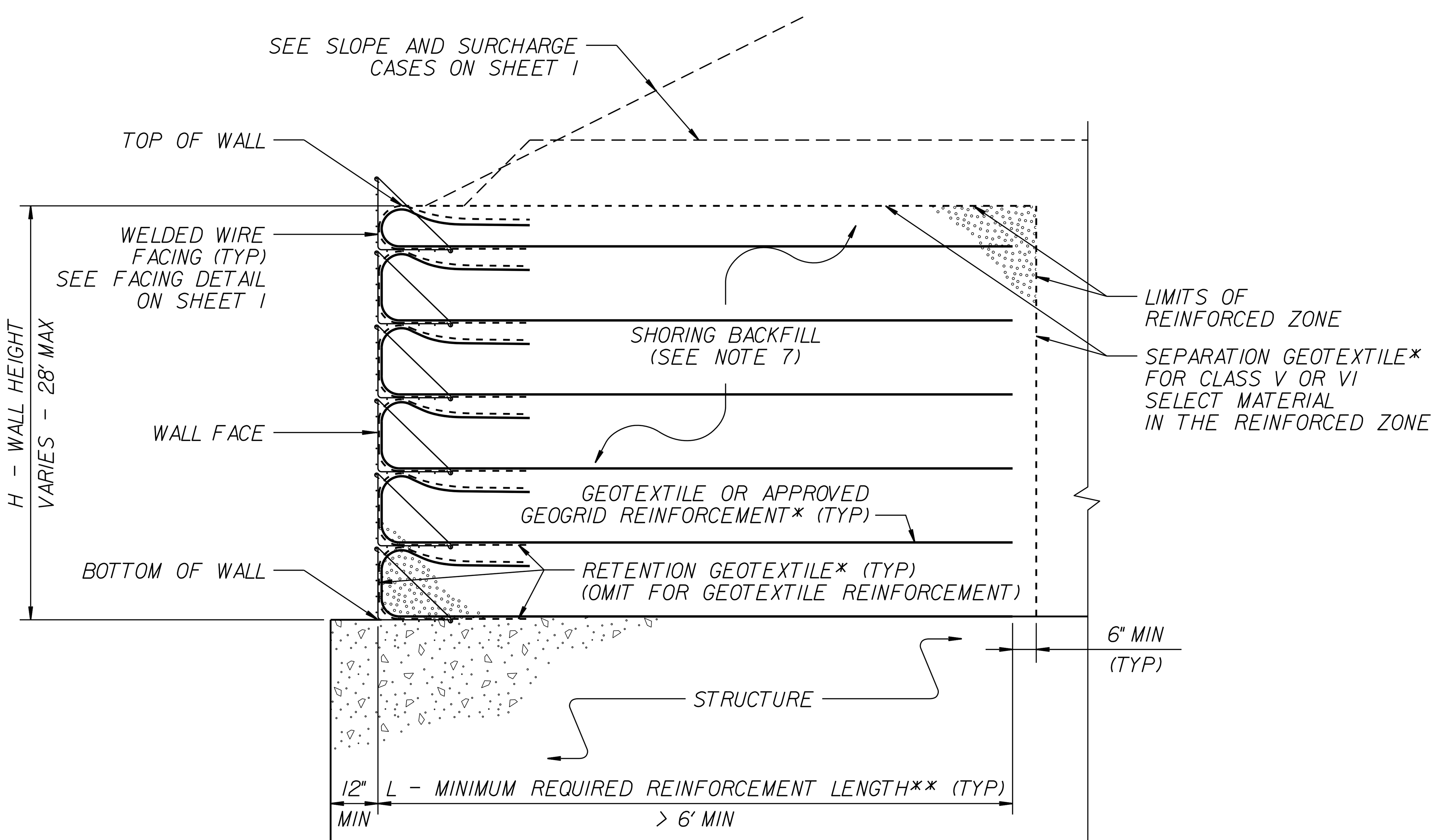
GEOGRID PLACEMENT

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

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)

*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.

**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM:
    connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) ≥ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
    connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

PROJECT REFERENCE NO.	SHEET NO.
U-3440	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 7/22/2016 F760CAEB96FC4D3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

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

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

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

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET
U-3440	2H-1

GEOENVIRONMENTAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31499 ENGINEER CYRUS F. PARKER

DocuSigned by: Cyrus F. Parker 1/22/2016
C96492AF5E824DF...

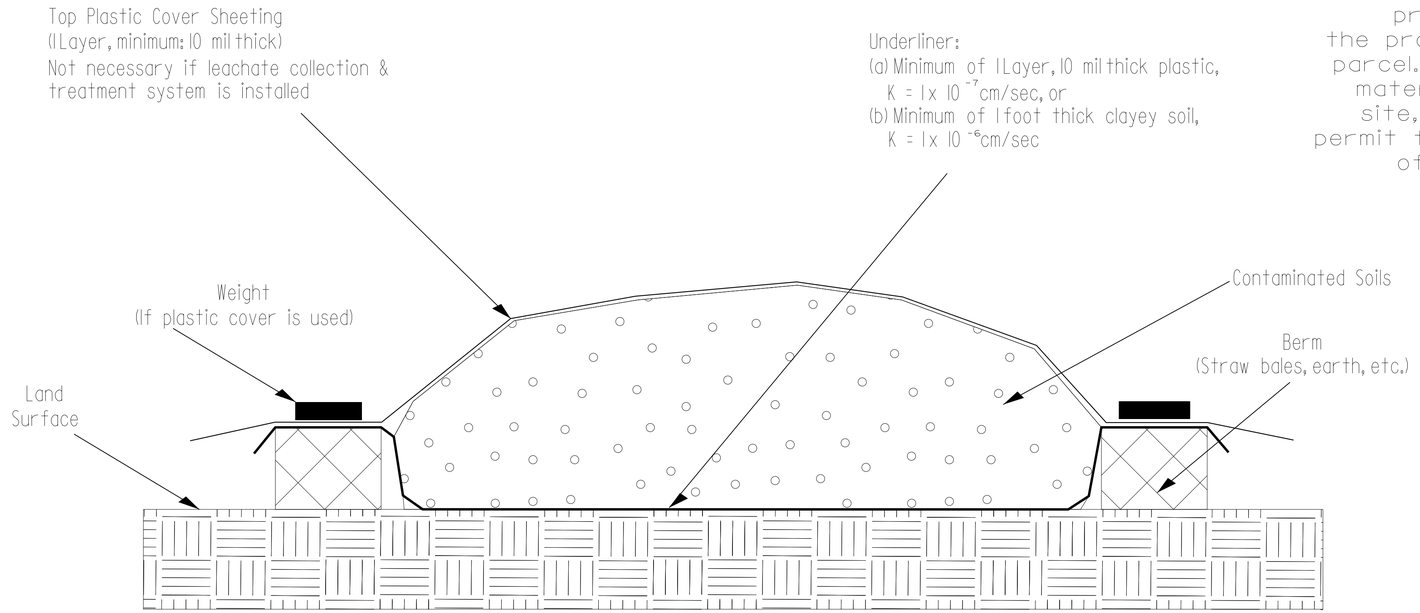
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

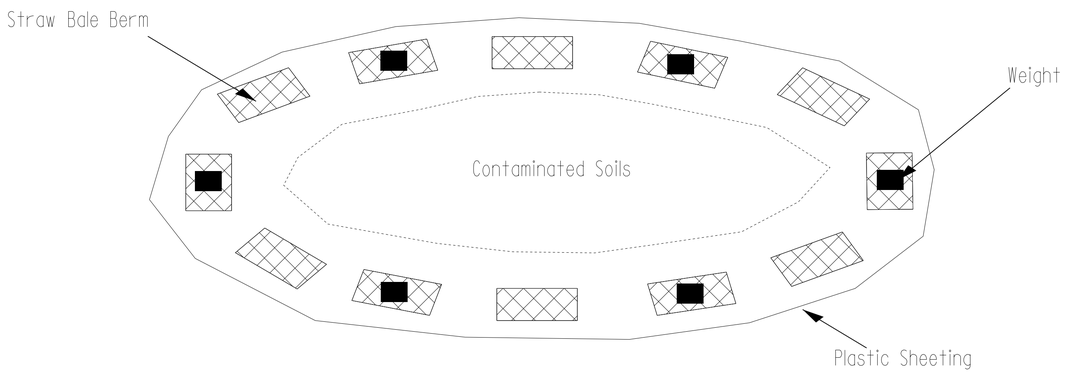
Detail for Temporary Containment of Contaminated Soil

Cross-Section View



NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDENR UST Section for off-site temporary storage.

Map View



PREPARED BY:	DATE:
REVIEWED BY:	DATE:

GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*
☐ *WESTERN REGIONAL OFFICE*
☒ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STOCKPILE CONTAINMENT DETAIL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

COMPUTED BY: ____TSJ_____ DATE: _08/08/2016_
CHECKED BY: ___CSM___ DATE: _10/07/2016_

PROJECT NO.	SHEET NO.
U-3440	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF EARTHWORK

ALTERNATIVE 1 - ABC

STATION	STATION	EXCAVATION TOTAL UNCLASS.	EMBANK. +%	BORROW TOTAL	WASTE TOTAL
-L- LT 17+50	-L- LT 39+00	1,073	5,219	4,146	
-Y3- 10+50	-Y3- 11+50	79	30		49
SUMMARY POINT #1	**SUBTOTAL**	1,152	5,249	4,146	49
-L- LT 39+00	-L- LT 67+60 (BEGIN BRIDGE)	12,163	8,424		3,739
-Y4- 11+00	-Y4- 12+50	140	347	207	
-Y5- 11+00	-Y5- 12+00	59	38		21
SUMMARY POINT #2	**SUBTOTAL**	12,362	8,809	207	3,760
-L- LT 68+90 (END BRIDGE)	-L- LT 97+50	3,481	28,448	24,967	
SUMMARY POINT #3	**SUBTOTAL**	3,481	28,448	24,967	
-L- LT 97+50	-L- LT 127+00	2,132	12,419	10,287	
-Y9- 11+50	-Y9- 12+50	34	198	164	
-Y10- 11+50	-Y10- 15+50	1,114	245		869
-Y13- 11+00	-Y13- 13+00	8	1,893	1,885	
-RABT- LT	-RABT- LT	359	4,093	3,734	
-Y14- 10+50	-Y14- 12+50	147	110		37
-Y16- 11+50	-Y16- 12+00	58	21		37
SUMMARY POINT #4	**SUBTOTAL**	3,852	18,978	16,069	943
-L- LT 127+00	-L- LT 149+81	2,991	8,856	5,865	
-Y17- 10+50	-Y17- 11+50	46			46
-Y18- 11+10	-Y18- 12+00	142	29		113
-Y22- 10+00	-Y22- 13+00	251			251
-DR2- 11+60	-DR2- 11+90	106	2		104
SUMMARY POINT #5	**SUBTOTAL**	3,536	8,887	5,865	514
-L- RT 17+50	-L- RT 39+00	17,846	3,148		14,698
-Y2- 10+40.75	-Y2- 11+50	50			50
SUMMARY POINT #6	**SUBTOTAL**	17,896	3,148		14,748
-L- RT 39+00	-L- RT 67+60 (BEGIN BRIDGE)	2,374	25,515	23,141	
-Y6- 10+50	-Y6- 11+50	230			230
SUMMARY POINT #7	**SUBTOTAL**	2,604	25,515	23,141	230
-L- RT 68+90 (END BRIDGE)	-L- RT 97+50	14,015	18,268	4,253	
-Y7- 11+00	-Y7- 13+00	291	304	13	
-Y8- 10+50	-Y8- 15+00	5,356	9		5,347
-Y8A- 10+00	-Y8A- 12+00	1,657	15		1,642
SUMMARY POINT #8	**SUBTOTAL**	21,319	18,596	4,265	6,989
-L- RT 97+50	-L- RT 127+00	35,153	28,318		6,835
-Y11- 11+50	-Y11- 15+00	4,081	2		4,079
-Y12- 12+00	-Y12- 13+00	73			73
-Y20- 10+00	-Y20- 12+00	1,915	1		1,914
-RABT- RT	-RABT- RT	304	5,121	4,817	
-Y15- 11+00	-Y15- 13+50	12	2,292	2,280	
SUMMARY POINT #9	**SUBTOTAL**	41,538	35,734	7,097	12,901
-L- RT 127+00	-L- RT 149+81	18,098	1,576		16,523
-Y19- 11+00	-Y19- 11+50	23	7		16
-Y21- 10+00	-Y21- 14+50	768	86		682
-Y22- 14+00	-Y22- 18+50	287	63		224
SUMMARY POINT #10	**SUBTOTAL**	19,176	1,732		17,444
SUMMARY POINT #1-10	**TOTAL**	126,916	155,095	85,757	57,579
MATERIAL FOR SHOULDER CONSTRUCTION			5,650	5,650	
LOSS DUE TO CLEARING & GRUBBING		-3,100		3,100	
WASTE IN LIEU OF BORROW				-22,911	-22,911
PROJECT TOTAL		123,816	160,745	71,596	34,668
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				3,580	
GRAND TOTAL		123,816	160,745	75,176	34,668
SAY		124,000		76,000	

EST. DDE = 3,680 CUBIC YARDS
EST. SHALLOW UNDERCUT = 4,000 CUBIC YARDS (PER GEOTECH RECOMMENDATIONS - JULY 29, 2014)
CLASS IV SUBGRADE STABILIZATION = 8,000 TONS (PER GEOTECH RECOMMENDATIONS - JULY 29, 2014)
EST. UNDERCUT = 2,500 CUBIC YARDS TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER (PER GEOTECH RECOMMENDATIONS JULY 29, 2014)
-L- PAVEMENT STRUCTURE VOLUME = 13,319 CUBIC YARDS

ALTERNTATIVE 2 - B25.0B

STATION	STATION	EXCAVATION TOTAL UNCLASS.	EMBANK. +%	BORROW TOTAL	WASTE TOTAL
-L- LT 17+50	-L- LT 39+00	441	5,268	4,827	
-Y3- 10+50	-Y3- 11+50	79	30		49
SUMMARY POINT #1	**SUBTOTAL**	520	5,298	4,827	49
-L- LT 39+00	-L- LT 67+60 (BEGIN BRIDGE)	10,963	8,991		1,972
-Y4- 11+00	-Y4- 12+50	140	347	207	
-Y5- 11+00	-Y5- 12+00	59	38		21
SUMMARY POINT #2	**SUBTOTAL**	11,162	9,376	207	1,993
-L- LT 68+90 (END BRIDGE)	-L- LT 97+50	2,310	28,096	25,786	
SUMMARY POINT #3	**SUBTOTAL**	2,310	28,096	25,786	
-L- LT 97+50	-L- LT 127+00	1,176	13,607	12,431	
-Y9- 11+50	-Y9- 12+50	34	198	164	
-Y10- 11+50	-Y10- 15+50	1,114	245		869
-Y13- 11+00	-Y13- 13+00	8	1,893	1,885	
-RABT- LT	-RABT- LT	319	4,229	3,910	
-Y14- 10+50	-Y14- 12+50	147	110		37
-Y16- 11+50	-Y16- 12+00	58	21		37
SUMMARY POINT #4	**SUBTOTAL**	2,856	20,302	18,389	943
-L- LT 127+00	-L- LT 149+81	2,037	9,298	7,261	
-Y17- 10+50	-Y17- 11+50	46			46
-Y18- 11+10	-Y18- 12+00	142	29		113
-Y22- 10+00	-Y22- 13+00	251			251
-DR2- 11+60	-DR2- 11+90	106	2		104
SUMMARY POINT #5	**SUBTOTAL**	2,582	9,329	7,261	514
-L- RT 17+50	-L- RT 39+00	16,418	3,663		12,755
-Y2- 10+40.75	-Y2- 11+50	50			50
SUMMARY POINT #6	**SUBTOTAL**	16,468	3,663		12,805
-L- RT 39+00	-L- RT 67+60 (BEGIN BRIDGE)	1,585	25,819	24,234	
-Y6- 10+50	-Y6- 11+50	230			230
SUMMARY POINT #7	**SUBTOTAL**	1,815	25,819	24,234	230
-L- RT 68+90 (END BRIDGE)	-L- RT 97+50	12,451	18,246	5,795	
-Y7- 11+00	-Y7- 13+00	291	304	13	
-Y8- 10+50	-Y8- 15+00	5,356	9		5,347
-Y8A- 10+00	-Y8A- 12+00	1,657	15		1,642
SUMMARY POINT #8	**SUBTOTAL**	19,755	18,574	5,808	6,989
-L- RT 97+50	-L- RT 127+00	33,669	28,856		4,813
-Y11- 11+50	-Y11- 15+00	4,081	2		4,079
-Y12- 12+00	-Y12- 13+00	73			73
-Y20- 10+00	-Y20- 12+00	1,915	1		1,914
-RABT- RT	-RABT- RT	271	5,231	4,960	
-Y15- 11+00	-Y15- 13+50	12	2,292	2,280	
SUMMARY POINT #9	**SUBTOTAL**	40,021	36,383	7,240	10,879
-L- RT 127+00	-L- RT 149+81	16,730	1,846		14,884
-Y19- 11+00	-Y19- 11+50	23	7		16
-Y21- 10+00	-Y21- 14+50	768	86		682
-Y22- 14+00	-Y22- 18+50	287	63		224
SUMMARY POINT #10	**SUBTOTAL**	17,808	2,002		15,806
SUMMARY POINT #1-10	**TOTAL**	115,297	158,840	93,751	50,208
MATERIAL FOR SHOULDER CONSTRUCTION			5,650	5,650	
LOSS DUE TO CLEARING & GRUBBING		-3,100		3,100	
WASTE IN LIEU OF BORROW				-26,916	-26,916
PROJECT TOTAL		112,197	164,490	75,585	23,292
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				3,779	
GRAND TOTAL		112,197	164,490	79,365	23,292
SAY		113,000		80,000	

EST. DDE = 3,680 CUBIC YARDS
EST. SHALLOW UNDERCUT = 4,000 CUBIC YARDS (PER GEOTECH RECOMMENDATIONS - JULY 29, 2014)
CLASS IV SUBGRADE STABILIZATION = 8,000 TONS (PER GEOTECH RECOMMENDATIONS - JULY 29, 2014)
EST. UNDERCUT = 2,500 CUBIC YARDS TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER (PER GEOTECH RECOMMENDATIONS JULY 29, 2014)
-L- PAVEMENT STRUCTURE VOLUME = 7,109 CUBIC YARDS

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

NOTE: QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RE-CROSS SECTIO THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE CROSS SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID.

COMPUTED BY: MBL DATE: 2-10-16	PROJECT NO.	SHEET NO.
CHECKED BY: CSM DATE: 8-4-16	U-3440	3B-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
L	25+00	67+60		126092.03		14010.23
L	68+90	120+00		132727.09		14747.45
L	120+00	149+53		85318.60		9479.84
Y3	11+15	11+89		400.17		44.46
Y4	11+95	12+80		2569.97		285.55
Y6	10+38	11+35		1851.02		205.67
Y7	10+36	12+75		8300.05		922.23
Y8/Y8A	10+38	14+50		12134.99		1348.33
Y9	12+21	12+93		1273.74		141.53
Y10	10+89	15+27		2734.87		303.87
Y11/Y20	10+60	15+00		12020.57		1335.62
Y12	10+00	12+53		4014.86		446.10
Y14	12+00	12+76		4638.22		515.36
Y15	10+00	13+15		6496.17		721.80
Y17	OUTSIDE OF	LIMITS		4289.30		476.59
Y18	11+70	12+37		1697.32		188.59
					TOTAL	67,156.59
					SAY	**67,160**

BREAKING OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
L	66+50	67+61	RT	2560.25		284.47
L	68+91	76+00	RT	18871.86		2096.87
L	116+00	120+00	LT	9866.40		1096.27
					TOTAL	3,477.61
					SAY	**3,480**

WOVEN WIRE FENCE, 47" FABRIC

STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
-Y16- 10+48 TO -L- 125+26	LT	284.00	1	7		8	23
-L- 128+55 TO 126+30	LT	229.00	1	2		12	8
TOTAL		513				20	31
SAY (PER MEMORANDUM 215)		**600**				**21**	**32**
ADDITIONAL BARBED WIRE		**100**					
(CONTINGENCY)							

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

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L	TOTAL SHOULDER WIDTH	LARE LENGT		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		RELAPPING GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	TYPE III	CAT-1	B-77	AT-1	TES	G	NG				
L	10+66	Y 11+05	RT																								162	
L	35+49	Y4 12+14	LT	575	62.5		40+19	36+48	14	16	6.25		4				1			1		1						-L- 35+48.68 through 37+00 N=12', T=14'
L	39+25	45+56	RT	500	175		40+25	44+56	14	16	50		1				1			1								
L	65+50	67+77	LT	237.5			66+50	67+77	13.5	15.5		50		1			1		1									
L	65+82	67+64	LT MED	187.5			65+82	67+64	2			50		1			1				1					125			
L	65+82	67+57	RT MED	175			65+82	67+57	2		50		1				1				1						52		
L	65+01	67+44	RT	237.5			66+00	67+44	13.5	15.5	50		1				1		1								51		
L	69+07	69+86	LT	62.5	37.5		69+07	N/A	7.5		6.25		4						1			1							
L	68+94	70+68	LT MED	175			68+94	70+68	2		50		1				1				1					112.5			
L	69+87	70+68	RT MED	187.5			68+87	70+68	2			50		1			1				1						91		
L	68+74	70+99	RT	237.5			68+74	70+00	12			50		1			1		1								91		
L	70+16	74+45	LT	412.5	37.5		73+45	71+33	12	14	50	6.25	1	4			1					1							
L	74+71	78+50	LT	375			77+50	75+71	12	14	50		1				1			1									
L	84+95	87+06	RT	200	25		85+95	86+06	14	16	50		1				1			1									
L	85+19	86+61	LT	137.5			85+25	86+00	14	16	50		1				1			1									
L	94+94	Y9 12+01	LT	425	75		98+12	95+93	14	16	6.25		4							1		1							
L	96+25	99+31	RT	312.5			97+25	98+31	14	16	50		1				1			1									
L	108+25	109+85	RT	162.5			109+25	109+75	14	16	50		1				1			1									
L	109+34	Y13 12+47	LT	800	50		115+75	110+33	14	16	50		1				1			1									
L	116+49	119+56	RT	287.5	25		117+49	118+31	14	16	50		1				1			1									
L	122+02	126+81	RT	475			123+00	125+80	10	12	50		1				1			1									
L	126+19	129+75	LT	362.5			128+75	127+18	10	12	50		1				1			1									
L	132+69	136+90	LT	425			135+90	133+70	10	12	50		1				1			1									
Y12	12+25			12.5																			2					
L	120+00	120+05	LT	12.5																			2					
L	131+03	131+16	RT	12.5																			2					
L	134+50	134+66	RT	25																			2					
L	139+80	139+86	LT	12.5																			2					
			SUBTOTAL	7025	487.5												19		4	13	4	4	10						
			LESS DEDUCTIONS FOR ANCHORS																										
			GRAU-350 19 @ 50' =	-950																									
			TYPE III 4 @ 18.75' =	-75																									
			B-77 4 @ 18.75' =	-75																									
			CAT-1 13 @ 6.25' =	-81.25																									
			AT-1 4 @ 6.25' =	-25																									
			PROJECT TOTALS:	5818.75	487.5																					237.5	285	162	
			SAY:	5850	500																					250	300	162.5	
			ADDITIONAL GUARDRAIL POSTS =	10																									

MOORECO

COMPUTED BY: C.MOORE DATE: 9/1/2016

CHECKED BY: S. BONDOR DATE: 9/1/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3440	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)

| LINE & STATION | OFFSET | | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE | | | | | | | | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) THICKNESS OR GAUGE | | | | | | | |

MOORECO

COMPUTED BY: C.MOORE DATE: 9/1/2016

CHECKED BY: S. BONDOR DATE: 9/1/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3440	3D-2

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109
		0601	0602		714.7	711.5	0.9						40				X	X	X	X								
L 39+47	3 LT	0602		720.4																								
		0602	0649		711.5	708.5	0.6						84				X	X	X	X								
L 36+99	0 CL	0603		730.1																								
		0603	0604		725.6	724.7	0.4			40							X	X	X	X								
		0604	0601		723.2	714.7	0.8						248				X	X										
L 36+99	41 LT	0604		729.2																								
L 41+15	41 LT	0606		717.1																								
		0606	0605		707.5	707.0							40															
L 41+41	8 RT	0607		718.2																								
		0607	0608		713.9	713.6			20								X	X	X	X								
L 41+41	10 LT	0608		717.8																								
		0608	0634		713.6	713.5			24								X	X	X	X								
L 35+86	59 RT	0609		735.3																								
		0609	0647		731.0	730.7			48								X	X	X	X								
L 41+76	82 LT	0610		716.6																								
		0610	0648		711.4	710.0				44																		
L 42+40	5 RT	0611		718.6																								
		0611	0630		714.4	714.3			24								X	X	X	X								
L 42+40	88 LT	0612		716.1																								
		0612	0633		711.6	711.4				64							X	X	X	X								
L 42+12	145 LT	0613		714.3																								
		0613	0612		712.1	711.8			68																			
L 42+69	83 LT	0614		716.7																								
		0614	0616		714.5	714.2			52																			
L 42+93	9 RT	0615		719.5																								
		0615	0616		715.3	714.2			52								X	X	X	X								
L 42+90	41 LT	0616		718.5																								
		0616	0606		712.5	707.5							176				X	X										
L 44+40	41 LT	0617		722.6																								
		0617	0616		717.4	713.5	1.0				152						X	X										
L 45+80	41 LT	0618		726.1																								
		0618	0617		721.1	717.4	3.9			140							X	X										
L 46+45	41 RT	0619		727.6																								
		0619	0645		723.3	722.8			84								X	X	X	X								
L 44+38	58 LT	0620		721.5																								
		0620	0617		718.3	718.2			20																			
L 49+01	41 LT	0621		729.3																								
		0621	0642		722.8	722.5					88						X	X										
L 50+06	41 LT	0622		728.1																								
		0622	0621		723.9	723.6			108								X	X										
L 49+97	96 LT	0623		738.4																								
		0623	0622		736.2	723.9																56						
L 44+87	134 LT	0624		729.0																								
		0624	0625		726.0	725.9					28						X	X	X	X								
L 45+16	136 LT	0625		729.0																								
		0625	0626		725.9	723.0					40																	
L 45+27	100 LT	0626		726.0																								
		0626	0627		723.0	722.8					68																	
L 45+80	55 LT	0627		728.0																								
SHEET TOTALS									500	288	376		588									56						

STRUCTURE NUMBER FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
0601	0602																								
0602																			1	3.9		1			1
0602	0649																								
0603																			1			1			1
0603	0604																								
0604	0601																								
0604																			1	1.0		1			1
0606																			1	4.6		1			1
0606	0605																								
0607																			1						
0607	0608																								
0608																			1						
0608	0634																								
0609																			1						
0609	0647																								
0610																			1	0.2		1	1		
0610	0648																								
0611																			1						
0611	0630																								
0612																			1			1			1
0612	0633																								
0613																			1						
0613	0612																								
0614																			1						
0614	0616																								
0615																			1						
0615	0616																								
0616																			1	1.0		1		1	
0616	0606																								
0617																			1	0.1		1		1	
0617	0616																								
0618																			1			1		1	
0618	0617																								
0619																			1			1			1
0619	0645																								
0620																			1						
0620	0617																								
0621																			1	1.5		1			1
0621	0642																								
0622																			1			1			1
0622	0621																								
0623																			1						
0623	0622																								
0624																			1						
0624	0625																								
0625																			1						
0625	0626																								
0626																			1						
0626	0627																								
0627																			1	0.4					
SHEET TOTALS																			25	12.7		12	1	3	8

STRUCTURE NUMBER FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0601	0602																																		
0602			1																																
0602	0649																																		
0603			1																																
0603	0604																																		
0604	0601																																		
0604																																			
0606																																			
0606	0605																																		
0607		1										1										1													
0607	0608																																		
0608		1										1										1													
0608	0634																																		
0609						1	1																												
0609	0647																																		
0610																																			
0610	0648																																		
0611		1										1										1													
0611	0630																																		
0612																																			
0612	0633																																		
0613									1							1																			
0613	0612																																		
0614									1							1																			
0614	0616																																		
0615		1										1										1													
0615	0616																																		
0616																																			
0616	0606																																		
0617																																			
0617	0616																																		
0618																																			
0618	0617																																		
0619																																			
0619	0645																																		
0620									1							1																			
0620	0617																																		
0621																																			
0621	0642																																		
0622																																			
0622	0621																																		
0623						1	1																												
0623	0622																																		
0624								1								1																			
0624	0625																																		
0625								1								1																			
0625	0626																																		
0626								1								1																			
0626	0627																																		
0627				1																															
SHEET TOTALS		4	2	1		2	2	3	3			4				6						4													

ABBREVIATIONS

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

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3440	3D-3

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
			0627	0618		722.6	721.1	1.2													
L 42+38	162	LT	0628		719.5																
			0628	0613		714.4	712.1			32											
L 43+62	8	RT	0629		721.3																
			0629	0615		717.0	715.3			72								X	X	X	X
L 42+19	9	RT	0630		718.5																
			0630	0631		714.3	713.9			68								X	X	X	X
L 41+52	8	RT	0631		718.2																
			0631	0607		713.9	713.9			12								X	X	X	X
L 39+40	3	LT	0632		720.5																
			0632	0602		714.3	713.3			12								X	X	X	X
Y4 12+25	24	RT	0633		716.6																
			0633	0610		711.4	711.4				8							X	X		
L 41+16	10	LT	0634		717.9																
			0634	0606		711.9	709.3			32											
Y6 10+83	11	RT	0635		729.7																
			0635	0637		727.6	726.0			24											
L 42+60	147	LT	0636		715.7																
			0636	0628		715.7	714.4			28											
Y6 10+92	11	LT	0638		729.7																
			0638	0635		727.7	727.6														
L 46+54	41	RT	0639		727.7																
			0639	0619		723.5	723.3			12								X	X		
L 44+40	9	RT	0640		723.6																
			0640	0629		719.4	717.0			80								X	X	X	X
L 48+06	74	LT	0641		735.0																
			0641	0642		726.4	723.3			36											
L 48+14	41	LT	0642		729.4																
			0642	0645		722.5	722.0					168						X	X		
L 49+18	91	LT	0643		738.5																
			0643	0644		735.3	735.2			20											
L 49+04	91	LT	0644		738.5																
			0644	0621		728.8	723.6	0.3													
L 46+46	41	LT	0645		727.4																
			0645	0618		722.0	721.1					68						X	X		
L 40+85	10	LT	0646		717.9																
			0646	0634		713.7	711.9			32								X	X	X	X
L 35+88	11	RT	0647		735.7																
			0647	0603		730.7	725.9	0.3			112							X	X	X	X
L 40+30	10	LT	0649		718.7																
			0649	0600		708.5	703.5	0.6						108						X	
L 52+60	75	LT	0700		729.0																
			0700	0701		724.8	716.6	3.6													
L 52+60	41	LT	0701		720.8																
			0701	0709		716.5	713.4	1.5		64								X	X		
L 52+60	41	RT	0702		720.8																
			0702	0704		716.6	691.0			448								X	X		
L 60+11	41	LT	0703		682.7																
			0703	0708		678.2	677.2	0.7			80							X	X	X	X
L 57+09	41	RT	0704		698.7																
SHEET TOTALS										972	200	236		108							

SIZE / THICKNESS OR GAUGE

LINE & STATION	FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.
	0627	0618				16																								
L 42+38	0628																											1	0.1	
	0628	0613																												
L 43+62	0629																											1		
	0629	0615																												
L 42+19	0630																											1		
	0630	0631																												
L 41+52	0631																											1		
	0631	0607																												
L 39+40	0632																											1	1.2	
	0632	0602																												
Y4 12+25	0633																											1	0.2	
	0633	0610																												
L 41+16	0634																											1	0.9	
	0634	0606																												
Y6 10+83	0635																											1		
	0635	0637																												
L 42+60	0636																													
	0636	0628																												
Y6 10+92	0638																											1		
	0638	0635															24													
L 46+54	0639																											1		
	0639	0619																												
L 44+40	0640																											1		
	0640	0629																												
L 48+06	0641																											1	3.6	
	0641	0642																												
L 48+14	0642																											1	1.9	
	0642	0645																												
L 49+18	0643																											1		
	0643	0644																												
L 49+04	0644																											1	4.7	
	0644	0621		52																										
L 46+46	0645																											1	0.4	
	0645	0618																												
L 40+85	0646																											1		
	0646	0634																												
L 35+88	0647																											1		
	0647	0603																												
L 40+30	0649																											1	5.0	0.2
	0649	0600																												
L 52+60	0700																											1		
	0700	0701		36																										
L 52+60	0701																											1		
	0701	0709																												
L 52+60	0702																											1		
	0702	0704																												
L 60+11	0703																											1		
	0703	0708																												
L 57+09	0704																											1	2.6	
SHEET TOTALS				88		16											24											24	20.6	0.2

LINE & STATION	FROM	TO	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
	0627	0618																																						
L 42+38	0628											1	1																											
	0628	0613																																						
L 43+62	0629							1										1										1													
	0629	0615																																						
L 42+19	0630							1										1										1													
	0630	0631																																						
L 41+52	0631							1										1										1													
	0631	0607																																						
L 39+40	0632		1			1			1																																
	0632	0602																																						
Y4 12+25	0633		1	1																																					
	0633	0610																																						
L 41+16	0634							1										1										1													
	0634	0606																																						
Y6 10+83	0635		1		1																																				
	0635	0637																																						
L 42+60	0636																																							
	0636	0628																																						
Y6 10+92	0638		1			1																																			
	0638	0635																																						
L 46+54	0639		1			1																																			
	0639	0619																																						
L 44+40	0640							1										1										1													
	0640	0629																																						
L 48+06	0641														1							1																			
	0641	0642																																						
L 48+14	0642		1		1																																				
	0642	0645																																						
L 49+18	0643														1							1																			
	0643	0644																																						
L 49+04	0644														1							1																			
	0644	0621																																						
L 46+46	0645		1		1																																				
	0645	0618																																						
L 40+85	0646							1										1										1													
	0646	0634																																						
L 35+88	0647		1			1			1																																
	0647	0603																																						
L 40+30	0649							1										1										1													
	0649	0600																																						
L 52+60	0700											1	1																											
	0700	0701																																						
L 52+60	0701		1			1																																			
	0701	0709																																						
L 52+60	0702		1		1																																				
	0702	0704																																						
L 60+11	0703		1		1																																				
	0703	0708																																						
L 57+09	0704		1		1																																				
SHEET TOTALS			12	1	6	5		7	2			2	2		3			7				3						7													

ABBREVIATIONS

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

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 12	15	18	24	30	36	42	48

MOORECO

COMPUTED BY: C.MOORE DATE: 9/1/2016

CHECKED BY: S. BONDOR DATE: 9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

| LINE & STATION | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP THICKNESS OR GAUGE | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. S. PIPE SIZE 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS III SIZE 12 | 15 | 18 | 24 | 30 | R. C. PIPE CLASS IV SIZE 12 | 15 | 48 | 54 | 60 | 42" WELDED STEEL PIPE 0.104" THICK GRADE B NOT IN SOIL | 42" WELDED STEEL PIPE 0.104" THICK GRADE B IN SOIL | 36" WELDED STEEL PIPE 0.104" THICK, GRADE B NOT IN SOIL | 36" WELDED STEEL PIPE 0.104" THICK, GRADE B IN SOIL | 15" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | DRAINAGE STRUCTURE MASONRY FT | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 0' THRU 5' EACH | A: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | CONCRETE BRIDGE APPROACH D.I. STD. 840.13 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | M.H. FRAME AND COVER STD. 840.54 | ADJUST MH | 15" C.S. ELBOW | 18" C.S. ELBOW | 24" C.S. ELBOW | 30" C.S. ELBOW | 36" C.S. ELBOW | 48" C.S. ELBOW | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION (SIZE / THICKNESS OR GAUGE)	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
		0923	0925		699.3	691.1	1.5			96										
L 77+57	67 RT	0925		694.3																
		0925	0928		690.8	687.2	0.4				108									
L 76+55	55 RT	0928		693.2																
		0928	0825		687.2	672.8	0.5				248									
L 87+78	67 LT	0929		714.7																
		0929	0930		713.7	713.6			28											
L 87+79	41 LT	0930		717.9																
		0930	0904		707.2	706.9									80		X	X		
L 86+31	10 LT	0931		716.3																
		0931	0903		711.9	711.8			28								X	X	X	X
L 98+94	41 LT	1000		723.7																
		1000	1003		715.8	712.0					284						X	X		
Y9 11+95	36 RT	1001		719.0																
		1001	1000		716.0	715.8														
		1003	1008		712.0	693.0	1.4													
L 96+15	41 LT	1003		717.5																
L 90+87	41 RT	1004		715.5																
		1004	1024		711.0	710.8				68							X	X		
Y8 11+00	21 RT	1005		719.1																
		1005	1006		715.9	714.6	0.6		44								X	X	X	X
Y8 10+97	21 LT	1006		718.8																
		1006	1007		714.6	712.2	0.8		84											
L 96+15	41 RT	1007		717.5																
		1007	1046		712.2	712.1					48						X	X	X	X
L 98+05	41 RT	1009		720.5																
		1009	1010		716.2	702.7	0.8													
L 94+50	81 RT	1011		728.0																
		1011	1012		725.0	712.7														
L 94+50	41 RT	1012		717.0																
		1012	1007		712.7	712.2			164								X	X		
L 92+44	99 RT	1013		738.4																
		1013	1051		734.4	712.6														
L 92+08	58 RT	1014		717.1																
		1014	1015		712.9	711.7			20											
L 92+04	41 RT	1015		715.9																
		1015	1004		711.4	711.0				120							X	X		
L 93+54	59 LT	1016		715.7																
		1016	1017		712.5	712.4			20											
L 93+54	41 LT	1017		716.6																
		1017	1019		712.4	712.1			100								X	X		
L 92+56	55 LT	1018		716.3																
		1018	1019		713.6	712.1			16											
L 92+56	41 LT	1019		716.2																
		1019	1021		712.1	711.0			164								X	X		
L 92+46	41 RT	1020		716.1																
		1020	1015		711.9	711.4			48								X	X		
L 90+96	41 LT	1021		715.5																
		1021	1022		710.3	710.2				60							X	X		
L 90+37	41 LT	1022		715.3																
							SHEET TOTALS		716	344	688				80					

FROM	TO	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
0925																											1						
0928																											1	5.0					
0929																											1						
0930																											1	5.0	0.8	1		1	
0931																											1						
1000																											1	2.9		1		1	
1001																											1						
1001	1000				68																												
1003	1008					60																											
1003																											1	0.5		1		1	
1004																											1			1		1	
1005																											1						
1006																											1						
1007																											1	0.3		1		1	
1009																											1			1			1
1009	1010		52																														
1011																											1						
1011	1012		44																														
1012																											1			1			1
1013																											1						
1013	1051		44																														
1014																											1						
1015																											1			1			1
1016																											1						
1017																											1			1		1	
1018																											1						
1019																											1			1		1	
1020																											1			1			1
1021																											1	0.1		1		1	
1022																											1	1.2		1	1		
SHEET TOTALS			140		68	60																					25	15.0	0.8	13	1	8	4

FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0925						1	1																												
0928																				1			1												
0929						1	1																												
0931																					1														
1001						1	1																												
1003	1008																											1							
1005						1	1																												
1006						1	1																												
1009	1010																								1										
1011						1	1																												
1013						1	1																												
1014						1	1																												
1016						1	1																												
1018						1	1																												
SHEET TOTALS						10	10													1	1		1		1			1							

ABBREVIATIONS

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

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
		1022	1026		709.1	707.9				28							X	X		
L 90+20	56 RT	1023		711.5																
		1023	1024		711.1	709.8														
L 90+20	41 RT	1024		715.3																
		1024	1026		709.3	709.1								80			x	x	x	x
L 90+10	60 LT	1025		713.6																
		1025	1026		711.4	711.3			24											
L 90+10	41 LT	1026		715.4																
		1026	1028		707.9	707.5									136		X	X		
L 88+78	13 RT	1027		716.7																
		1027	1028		712.5	710.2	0.7		56								X	X	X	X
L 88+78	41 LT	1028		715.8																
		1028	0930		707.5	707.2									96		X	X		
L 90+96	61 LT	1040		715.8																
		1040	1021		712.6	711.0			24											
L 88+48	57 RT	1041		718.8																
		1041	1027		715.6	712.5	0.6		56								X	X	X	X
L 90+38	13 LT	1042		716.0																
		1042	1022		712.0	709.4			24								x	x	x	x
L 92+56	12 LT	1043		716.8																
		1043	1019		712.8	712.1			28								X	X	X	X
Y8A 12+00	18 RT	1044		740.0																
		1044	1045		735.8	729.4	2.1													
L 96+15	9 LT	1046		718.6																
		1046	1003		712.1	712.0					28						X	X	X	X
Y11 10+00	376 RT	1050		717.1																
		1050	1001		717.1	716.0			16											
L92+45	54 RT	1051		719.7																
		1051	1020		712.4	711.9			16											
L 110+39	73 RT	1101		721.0																
		1101	1100		714.1	704.5	2.1													
L 110+58	41 RT	1102		718.4																
		1102	1101		714.3	714.1			40											
L 110+58	1 RT	1103		719.4																
		1103	1102		714.4	714.3			40								X	X	X	X
L109+50	98 RT	1104	1105		700.5	691.2														
L 107+73	53 LT	1107		727.8																
		1107	1106		722.5	722.0	0.8													
L 107+73	41 RT	1108		727.8																
		1108	1107		722.8	722.5					96						X	X	X	X
L 107+73	72 RT	1109		735.0																
		1109	1108		730.8	723.7	1.8													
Y11 11+66	46 LT	1110		736.3																
		1110	1111		732.1	730.0														
Y11 11+31	45 RT	1111		734.2																
		1111	1112		730.0	729.8			56								X	X	X	X
Y20 10+62	23 RT	1112		736.6																
		1112	1113		729.8	729.6			68											
L 104+00	53 RT	1113		735.0																
		1113	1114		729.3	729.0				100							X	X		
						SHEET TOTALS			448	128	124			80	232					

STRUCTURE FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT
1022	1026																									
1023																										
1023	1024						16																			
1024																										
1024	1026																									
1025																										
1025	1026																									
1026																										
1026	1028																									
1027																										
1027	1028																									
1028																										
1028	0930																									
1040																										
1040	1021																									
1041																										
1041	1027																									
1042																										
1042	1022																									
1043																										
1043	1019																									
1044																										
1044	1045		52																							
1046																										
1046	1003																									
1050																										
1050	1001																									
1051																										
1051	1020																									
1101																										
1101	1100		76																							
1102																										
1102	1101																									
1103																										
1103	1102																									
1104	1105																					112	112			
1107																										
1107	1106				16																					
1108																										
1108	1107																									
1109																										
1109	1108		32																							
1110																										
1110	1111		100																							
1111																										
1111	1112																									
1112																										
1112	1113																									
1113																										
1113	1114																									
SHEET TOTALS			260		16		16															112	112			

STRUCTURE FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28
1022	1026																	
1023																		
1023	1024																	
1024		1	1.0		1	1												
1024	1026																	
1025		1												1	1			
1025	1026																	
1026		1	2.5		1		1											
1026	1028																	
1027		1								1								
1027	1028																	
1028		1	3.3		1			1										
1028	0930																	
1040		1												1	1			
1040	1021																	
1041		1												1	1			
1041	1027																	
1042		1																
1042	1022																	
1043		1																
1043	1019																	
1044		1															1	
1044	1045																	
1046		1	1.5															
1046	1003																	
1050																		
1050	1001																	
1051		1	2.3															
1051	1020																	
1101		1	1.9											1	1			
1101	1100																	
1102		1			1			1										
1102	1101																	
1103		1								1								
1103	1102																	
1104	1105																	
1107		1	0.3		1			1										
1107	1106																	
1108		1			1			1										
1108	1107																	
1109		1												1	1			
1109	1108																	
1110		1															1	
1110	1111																	
1111		1															1	
1111	1112																	
1112		1	1.8														1	
1112	1113																	
1113		1	0.7		1			1										
1113	1114																	
SHEET TOTALS		22	15.3		7	1	1	5		2				5	5		4	

STRUCTURE FROM	TO	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
1022	1026																									
1023																										
1023	1024																									
1024																										
1024	1026																									
1025																										
1025	1026																									
1026																										
1026	1028																									
1027			1										1													
1027	1028																									
1028																										
1028	0930																									
1040																										
1040	1021																									
1041																										
1041	1027																									
1042												1														
1042	1022																									
1043												1														
1043	1019																									
1044							1																			
1044	1045															1										
1046											1															
1046	1003																									
1050																							0.3990			
1050	1001																									
1051											1			1												
1051	1020																									
1101																										
1101	1100															1										
1102																										
1102	1101																									
1103			1										1													
1103	1102																									
1104	1105																									
1107																										
1107	1106																	1								
1108																										
1108	1107																									
1109																										
1109	1108																									
1110							1																			
1110	1111																									
1111							1																			
1111	1112																									
1112							1																			
1112	1113																									
1113																										
1113	1114																									
SHEET TOTALS			2				4				2	2	2	1		2		1					0.3990			

ABBREVIATIONS

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

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-8

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION (SIZE / THICKNESS OR GAUGE)	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 103+00	53	RT	1114		734.3																
			1114	1115		729.0	728.7				92							X	X	X	X
L 103+00	41	LT	1115		734.5																
			1115	1120		728.6	725.1					224						X	X		
L 103+01	59	LT	1116		735.5																
			1116	1115		731.3	730.0	1.6													
Y10 15+35	58	RT	1117		735.7																
			1117	1116		731.5	731.3			40											
Y10 15+35	38	LT	1118		738.8																
			1118	1117		734.6	731.5			96								X	X	X	X
L 100+80	41	LT	1120		730.1																
			1120	1000		725.1	715.8					188						X	X		
L 108+29	53	LT	1121		727.0																
			1121	1107		722.8	722.5			56								X	X		
L 115+50	41	LT	1201		706.0																
			1201	1242		701.4	701.1				36							X	X	X	X
L 115+00	41	LT	1202		706.1																
			1202	1201		701.8	701.6			52								X	X		
L 116+75	11	LT	1203		707.6																
			1203	1205		703.4	701.0			56								X	X	X	X
L 115+50	42	RT	1204		705.8																
			1204	1205		700.6	700.3					124						X	X		
L 116+72	46	RT	1205		706.4																
			1205	1236		700.3	699.7	0.4				128						X	X		
L 115+00	41	RT	1206		706.1																
			1206	1204		701.6	701.2	0.3			52							X	X		
L 114+00	41	RT	1207		707.5																
			1207	1206		703.3	701.9	0.6		100								X	X		
L 114+01	125	RT	1208		747.2																
			1208	1207		743.0	703.3	0.5													
L 117+76	73	LT	1210		706.3																
			1210	1209		701.3	695.0					116						X	X	X	X
L 119+72	68	LT	1211		716.5																
			1211	1210		711.8	701.3					204									
L 119+78	49	LT	1212		718.2																
			1212	1211		713.9	712.6			24											
L 120+18	99	LT	1213		717.0																
			1213	1211		712.0	711.8					64									
L 120+69	121	LT	1214		719.5																
			1214	1213		715.2	712.7					60									
Y14 11+58	35	RT	1215		722.5																
			1215	1214		718.2	715.2				60										
Y14 10+99	27	RT	1216		725.0																
			1216	1215		719.2	718.2				60										
Y14 10+44	19	RT	1217		729.0																
			1217	1216		726.0	719.2														
Y14 11+20	29	LT	1218		723.6																
			1218	1216		719.4	719.2			64								X	X	X	X
Y15 11+49	20	RT	1220		715.6																
			1220	1221		711.1	710.3				40							X	X	X	X
SHEET TOTALS										488	340	1108									

FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
1114																											1	0.2		1			1	
1114	1115																																	
1115																											1	0.9		1		1		
1115	1120																																	
1116																											1							
1116	1115		20																															
1117																											1							
1117	1116																																	
1118																											1							
1118	1117																																	
1120																											1			1		1		
1120	1000																																	
1121																											1			1			1	
1121	1107																																	
1201																											1			1	1			
1201	1242																																	
1202																											1			1			1	
1202	1201																																	
1203																											1							
1203	1205																																	
1204																											1	0.1		1	1			
1204	1205																																	
1205																											1	1.1		1			1	
1205	1236																																	
1206																											1			1		1		
1206	1204																																	
1207																											1			1		1		
1207	1206																																	
1208																											1							
1208	1207		88																															
1210																											1							
1210	1209																																	
1211																											1							
1211	1210																																	
1212																											1			1		1		
1212	1211																																	
1213																											1							
1213	1211																																	
1214																											1							
1214	1213																																	
1215																											1							
1215	1214																																	
1216																											1	0.8						
1216	1215																																	
1217																											1							
1217	1216			56																														
1218																											1							
1218	1216																																	
1220																											1			1		1		
1220	1221																																	
SHEET TOTALS			108	56																							25	3.1		12	2	6	4	

FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
1114																																			
1114	1115																																		
1115																																			
1115	1120																																		
1116						1	1																												
1116	1115																																		
1117						1	1																												
1117	1116																																		
1118						1	1																												
1118	1117																																		
1120																																			
1120	1000																																		
1121																																			
1121	1107																																		
1201																																			
1201	1242																																		
1202																																			
1202	1201																																		
1203		1										1										1													
1203	1205																																		
1204																																			
1204	1205																																		
1205																																			
1205	1236																																		
1206																																			
1206	1204																																		
1207																																			
1207	1206																																		
1208				1																															
1208	1207																																		
1210						1	1																												
1210	1209																																		
1211						1	1																												
1211	1210																																		
1212																																			
1212	1211																																		
1213								1								1																			
1213	1211																																		
1214						1	1																												
1214	1213																																		
1215						1	1																												
1215	1214																																		
1216						1	1																												
1216	1215																																		
1217						1	1																												
1217	1216																																		
1218						1	1																												
1218	1216																																		
1220																																			
1220	1221																																		
SHEET TOTALS		1		1		10	10	1				1				1						1													

ABBREVIATIONS

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

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

MOORECO

PROJECT NO.	SHEET NO.
U-3440	3D-9

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
Y15 11+50	20	LT	1221		714.8			
			1221	1219		710.3	705.5	4.1
L 122+24	49	RT	1222		720.9			
			1222	1233		716.2	713.7	0.7
L 122+27	0	CL	1223		722.2			
			1223	1222		716.9	716.2	0.4
L 121+70	70	LT	1224		721.8			
			1224	1225		717.6	717.3	
L 122+36	73	LT	1225		727.3			
			1225	1223		717.1	716.9	
L 125+11	44	RT	1227		733.5			
			1227	1226		724.0	716.0	3.3
L 124+97	59	LT	1228		731.5			
			1228	1235		726.0	725.9	
L 125+88	43	LT	1229		736.9			
			1229	1235		731.9	725.9	
Y16 11+86	21	LT	1230		733.0			
			1230	1234		728.8	726.7	
Y16 12+47	28	RT	1231		730.9			
			1231	1234		726.9	726.7	
L 122+65	5	LT	1232		723.9			
			1232	1223		719.7	717.1	
Y15 11+06	37	LT	1233		718.2			
			1233	1221		713.7	710.3	0.8
Y16 12+28	20	LT	1234		732.5			
			1234	1235		726.7	725.9	
L 124+97	44	LT	1235		734.2			
			1235	1227		725.9	724.0	0.5
L 118+00	58	RT	1236		708.6			
			1236	1200		699.7	693.7	1.9
L 114+00	41	LT	1240		707.5			
			1240	1202		703.3	701.8	
L 115+73	41	LT	1241		706.0			
			1241	1201		701.8	701.6	
L 41+99	79931	RT	1242		704.0			
			1242	1204		701.1	700.7	
Y15 12+20	24	LT	1244	1245		699.1	698.9	
Y13 11+71	14	RT	1246	1243		717.8	716.0	
L 117+00	12	LT	1250		710.4			
			1250	1203		706.1	703.4	
L 128+31	41	LT	1302		746.9			
			1302	1301		741.6	719.0	0.6
L 128+31	41	RT	1303		746.9			
			1303	1302		741.8	741.6	
L 128+31	54	RT	1304		746.9			
			1304	1303		742.7	742.6	
			1306	1305		753.0	742.2	2.2
L 134+37	41	LT	1306		762.4			
L 134+37	41	RT	1307		762.4			
			1307	1306		754.6	754.4	

SIZE / THICKNESS OR GAUGE

Structure (From–To)	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60
1221																															
1221–1219																36															
1222																															
1222–1233			100							X	X																				
1223																															
1223–1222			52							X	X	X	X																		
1224																															
1224–1225		68																													
1225																															
1225–1223			72							X	X	X	X																		
1227																															
1227–1226																48															
1228																															
1228–1235			16																												
1229																															
1229–1235		88								X	X																				
1230																															
1230–1234		44																													
1231																															
1231–1234		52								X	X	X	X																		
1232																															
1232–1223		40								X	X	X	X																		
1233																															
1233–1221			52							X	X																				
1234																															
1234–1235		84								X	X																				
1235																															
1235–1227			88							X	X	X	X																		
1236																															
1236–1200																	52														
1240																															
1240–1202		104								X	X																				
1241																															
1241–1201		24								X	X																				
1242																															
1242–1204			52							X	X	X	X																		
1244–1245																													60		
1246–1243		68								X	X	X	X																		
1250																															
1250–1203		28								X	X	X	X																		
1302																															
1302–1301																	56														
1303																															
1303–1302				80						X	X	X	X																		
1304																															
1304–1303		16																													
1306–1305																			40												
1306																															
1307																															
1307–1306		84								X	X	X	X																		
SHEET TOTALS		700	432	80												84	108		40										60		

Structure (From–To)	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	
1221								1			1			1	
1221–1219															
1222								1			1			1	
1222–1233															
1223								1	0.3						
1223–1222															
1224								1			1	1			
1224–1225															
1225								1	5.0	0.2	1		1		
1225–1223															
1227								1	4.5		1			1	
1227–1226															
1228								1	0.5						
1228–1235															
1229								1			1		1		
1229–1235															
1230								1							
1230–1234															
1231								1			1		1		
1231–1234															
1232								1							
1232–1223															
1233								1			1			1	
1233–1221															
1234								1			1			1	
1234–1235															
1235								1	3.2		1		1		
1235–1227															
1236								1	3.9		1			1	
1236–1200															
1240								1			1			1	
1240–1202															
1241								1			1	1			
1241–1201															
1242								1							
1242–1204															
1244–1245															
1246–1243															
1250								1							
1250–1203															
1302								1	0.3		1		1		
1302–1301															
1303								1	0.1		1		1		
1303–1302															
1304								1							
1304–1303															
1306–1305															
1306								1	4.4		1		1		
1307								1	2.8		1			1	
1307–1306															
SHEET TOTALS								24	25.0	0.2	17	2	7	8	

Structure (From–To)	CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
1221																																		
1221–1219																																		
1222																																		
1222–1233																																		
1223	1				1	1																												
1223–1222																																		
1224																																		
1224–1225																																		
1225																																		
1225–1223																																		
1227																																		
1227–1226																									1									
1228			1																															
1228–1235																																		
1229																																		
1229–1235																																		
1230					1	1																												
1230–1234																																		
1231																																		
1231–1234																																		
1232	1				1	1																												
1232–1223																																		
1233																																		
1233–1221																																		
1234																																		
1234–1235																																		
1235																																		
1235–1227																																		
1236																																		
1236–1200																										1								
1240																																		
1240–1202																																		
1241																																		
1241–1201																																		
1242																			1															
1242–1204																																		
1244–1245																																		
1246–1243																																		
1250	1										1										1													
1250–1203																																		
1302																																		
1302–1301																										1								
1303																																		
1303–1302																																		
1304					1	1																												
1304–1303																																		
1306–1305																												1						
1306																																		
1307																																		
1307–1306																																		
SHEET TOTALS	3		1		4	4					1								1		1				1	2		1						

ABBREVIATIONS

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

MOORECO

COMPUTED BY: C.MOORE DATE: 9/1/2016

CHECKED BY: S. BONDOR DATE: 9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-10

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 12	15	18	24	30	36	42	48
L 136+50	41	RT	1308		766.4											
			1308	1319		759.8	756.8	0.5						80		
L 136+50	55	RT	1309		765.3											
			1309	1308		761.3	761.3					16				
L 138+60	41	RT	1310		774.2											
			1310	1308		767.8	759.8	0.4						208		
L 138+60	51	RT	1311		773.8											
			1311	1310		769.6	769.5			12						
L 139+11	41	RT	1312		776.6											
			1312	1310		770.6	767.8	0.3						48		
Y17 11+41	17	RT	1313		775.0											
Y17 10+68	14	RT	1314		771.0											
L 129+11	53	RT	1315		751.4											
			1315	1316		748.4	745.8	0.8								
L 129+11	41	RT	1316		750.0											
			1316	1303		745.8	741.9	0.7			80					
L 131+92	41	LT	1317		758.5											
			1317	1306		754.3	753.6				244					
L 136+50	41	LT	1319		766.4											
			1319	1306		756.8	753.0	0.5						216		
L 131+92	56	RT	1320		758.0											
			1320	1321		755.0	755.0									
L 131+92	39	RT	1321		758.5											
			1321	1317		755.0	754.3				80					
L 139+11	51	RT	1322		777.0											
			1322	1312		772.8	772.7				12					
L 139+85	51	RT	1323		780.7											
			1323	1324		776.4	775.7				12					
L 139+85	41	RT	1324		779.9											
			1324	1312		773.9	770.6	0.3						72		
DR2 11+83	81	LT	1400		816.0											
			1400	1422		812.0	809.5				64					
L 140+73	41	RT	1401		783.8											
			1401	1324		774.6	773.9	0.3						88		
L 140+69	41	LT	1402		783.6											
			1402	1401		776.5	776.1					80				
L 140+70	55	LT	1403		781.0											
			1403	1402		776.5	776.5					16				
L 143+47	40	RT	1404		795.8											
			1404	1418		790.8	787.2	1.8					76			
Y19 10+93	21	RT	1405		796.0											
			1405	1404		791.8	791.5				68					
Y18 11+72	13	RT	1406		798.8											
			1406	1404		794.6	791.5				108					
Y18 11+21	13	RT	1407		800.2											
			1407	1406		796.0	794.6				52					
Y18 11+15	13	LT	1408		800.5											
			1408	1407		796.3	796.0				28					
L 144+77	56	RT	1409		801.1											
			1409	1404		794.4	790.8	1.6					128			
							SHEET TOTALS			760	112	204		712		

Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) THICKNESS OR GAUGE	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
		X	X	X	X
		X	X		
		X	X		
		X	X		
		X	X		
		X	X		
		X	X		
		X	X		
		X	X		
		X	X		
		X	X	X	X
		X	X	X	X
		X	X		
		X	X	X	X
		X	X	X	X

C. S. PIPE THICKNESS OR GAUGE: 12	15	18	24	30	36	42	48
.064							
	.064						
		.064					
			.064				
				.079			
				.079			
					.109		
					.109		

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-11

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 144+73	10	LT	1410		805.4																
			1410	1409		798.0	794.4	0.8				68						X	X	X	X
L 145+60	59	RT	1411		804.6																
			1411	1409		798.7	795.2	0.8		80								X	X		
L 145+60	72	RT	1412		803.0																
			1412	1411		798.8	798.7			16											
L 147+44	60	RT	1413		813.4																
			1413	1411		808.7	798.7	0.5		184								X	X		
L 147+43	72	RT	1414		813.0																
			1414	1413		808.8	808.7			16											
Y18 11+06	30	RT	1417		801.0																
			1417	1407		796.8	796.0			24											
L 142+73	40	RT	1418		792.5																
			1418	1401		787.2	775.6	2.1				200						X	X		
L 142+50	8	LT	1419		792.4																
			1419	1420		788.2	788.1			32								X	X	X	X
L 142+73	9	RT	1420		793.2																
			1420	1418		788.1	788.0			32								X	X	X	X
L 144+32	114	RT	1421		797.5																
			1421	1405		793.3	791.8			52								X	X	X	X
Y22 17+55	7	RT	1424		813.7																
Y22 11+22	34	RT	1426		823.6																
			1426	1427		816.5	816.4														
Y22 11+21	28	RT	1427		823.7																
Y22 16+53	29	RT	1430		817.7																
Y22 17+64	28	RT	1431		812.9																
Y22 17+64	35	RT	1432		812.6																
			1432	1431		804.6	804.6														
PIPE REMOVAL																					
L 13+80	55	LT	0411	0412																	
L15+48	51	LT	0413	0414																	
L 20+27	38	LT	0415	0416																	
L 22+64	53	RT	0517	0518																	
L 36+00	59	RT	0650	0651																	
Y4 12+10	71	LT	0652	0653																	
L 44+10	96	LT	0654	0655																	
Y5 11+28	14	LT	0656	0657																	
L 45+00	48	LT	0658	0659																	
L 47-90	33	LT	0660	0661																	
L 49+80	23	LT	0662	0663																	
L 50+12	19	RT	0664	0665																	
L51+20	20	RT	0666	0667																	
L51+71	20	RT	0668	0669																	
L 42+38	162	LT	0670	0671																	
L 47+17	6	RT	0672	0673																	
L 53+20	8	LT	0714	0715																	
L 57+00	46	RT	0716	0717																	
L 58+13	46	RT	0718	0719																	
L 58+56	46	RT	0720	0721																	
SHEET TOTALS										436		268									

SIZE / THICKNESS OR GAUGE

LINE & STATION	FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT
L 144+73	1410																										
	1410	1409																									
L 145+60	1411																										
	1411	1409																									
L 145+60	1412																										
	1412	1411																									
L 147+44	1413																										
	1413	1411																									
L 147+43	1414																										
	1414	1413																									
Y18 11+06	1417																										
	1417	1407																									
L 142+73	1418																										
	1418	1401																									
L 142+50	1419																										
	1419	1420																									
L 142+73	1420																										
	1420	1418																									
L 144+32	1421																										
	1421	1405																									
Y22 17+55	1424																										
Y22 11+22	1426																										
	1426	1427									8																
Y22 11+21	1427																										
Y22 16+53	1430																										
Y22 17+64	1431																										
Y22 17+64	1432																										
	1432	1431												8													
SHEET TOTALS											8			8													

LINE & STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28
L 144+73	1410		1	2.4							1				1	1			
L 145+60	1411		1	0.9		1			1										
L 145+60	1412		1												1	1			
L 147+44	1413		1			1			1										
L 147+43	1414		1			1	1												
Y18 11+06	1417		1												1	1			
L 142+73	1418		1	0.3		1			1										
L 142+50	1419		1								1								
L 142+73	1420		1	0.1							1								
L 144+32	1421		1												1	1			
Y22 17+55	1424		1	4.0							1				1	1			
Y22 11+22	1426		1	2.1															
	1426	1427				1			1										
Y22 11+21	1427		1	2.4															
Y22 16+53	1430		1	3.9															
Y22 17+64	1431		1	3.9															
Y22 17+64	1432		1	3.0		1			1										
SHEET TOTALS			16	23.0		6	1		5		4				5	5			

All other rows (pipe runs and pipe removal) are blank in these columns.

LINE & STATION	FROM	TO	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 142+50	1419			1										1													
L 142+73	1420			1										1													
Y22 11+21	1427												1		1												
Y22 16+53	1430												1		1												
Y22 17+64	1431												1														
L 13+80	0411	0412																								30	
L15+48	0413	0414																								39	
L 20+27	0415	0416																								208	
L 22+64	0517	0518																								133	
L 36+00	0650	0651																								39	
Y4 12+10	0652	0653																								103	
L 44+10	0654	0655																								259	
Y5 11+28	0656	0657																								17	
L 45+00	0658	0659																								46	
L 47-90	0660	0661																								24	
L 49+80	0662	0663																								23	
L 50+12	0664	0665																								18	
L51+20	0666	0667																								22	
L51+71	0668	0669																								26	
L 42+38	0670	0671																								34	
L 47+17	0672	0673																								18	
L 53+20	0714	0715																								76	
L 57+00	0716	0717																								20	
L 58+13	0718	0719																								21	
L 58+56	0720	0721																								20	
SHEET TOTALS				2									3	2	2											1176	

All other rows are blank in these columns.

ABBREVIATIONS

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

COMPUTED BY: C.MOORE DATE: 9/1/2016

CHECKED BY: S. BONDOR DATE: 9/1/2016

MOORECO

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3440	3D-12

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	15" SIDE DRAIN PIPE	PIPE REMOVAL (LIN. FT.)	REMARKS
L 54+67	41	RT	0722	0723		26	
L 64+40	50	RT	0836	0837		50	
L 70+00	10	LT	0838	0839		28	
Y7 10+85	96	LT	0840	0841		63	
L 86+52	41	LT	0932	0933		23	
L 87+00	42	LT	0934	0935		22	
L 87+77	4	LT	0936	1049		40	
L 89+95	4	LT	1050	1051		19	
L 95+51	30	RT	1052	1053		159	
L 98+00	18	RT	1054	1055		82	
Y8 12+00	15	LT	1056	1057		20	
L 98+59	80	RT	1058	1059		29	
L 99+50	1	RT	1122	1123		128	
L 102+08	4	LT	1124	1125		168	
Y11 10+61	18	RT	1126	1127		58	
Y11 11+47	20	RT	1128	1129		38	
Y11 12+00	20	RT	1130	1131		29	
Y11 12+35	17	RT	1132	1133		15	
Y11 13+18	15	RT	1134	1135		18	
Y11 13+93	16	RT	1136	1137		18	
L 106+59	44	LT	1138	1139		20	
L 107+15	3	LT	1140	1141		45	
L 110 + 22	6	RT	1142	1143		52	
L 112+ 20	10	LT	1144	1145		48	
L 117+36	68	LT	1247	1248		28	
L 118+00	64	LT	1249	1263		25	
L 120+00	98	LT	1251	1252		147	
Y14 10+44	20	RT	1253	1254		382	
Y15 12+25	4	RT	1255	1256		44	
Y16 12+45	14	RT	1257	1258		89	
L 121+96	7	LT	1259	1260		26	
L 128+08	3	LT	1327	1328		24	
L 128+50	1	LT	1329	1330		160	
L 131+92	40	LT	1331	1332		33	
L 137+28	26	RT	1333	1334		16	
L 140+70	44	LT	1335	1336		111	
L 140+73	35	RT	1435	1436		76	
L 146+39	26	RT	1437	1438		389	
Y8A 11+42	18	RT	1060	1061	36		
Y8 11+80	24	LT	1062	1063	20		
Y10 11+72	14	RT	1146	1147	40		
Y10 13+08	21	RT	1148	1149	20		
Y10 13+16	25	LT	1150	1151	24		
Y10 13+ 46	25	LT	1152	1153	20		
Y10 14+34	30	LT	1154	1155	28		
Y10 14+74	30	LT	1156	1157	28		
Y11 12+12	43	RT	1158	1159	48		
Y11 13+15	26	RT	1160	1161	16		
Y11 13+90	27	RT	1162	1163	20		
SHEET TOTALS					300	2748	

Other column headings on the form (no entries on this sheet): SIZE; THICKNESS OR GAUGE; TOP ELEVATION (FT.); INVERT ELEVATION (FT.); INVERT ELEVATION (FT.); MINIMUM REQUIRED SLOPE (%); Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12, 15, 18, 24, 30, 36, 42, 48; DO NOT USE RCP; DO NOT USE CSP; DO NOT USE CAAP; DO NOT USE HDPE; DO NOT USE PVC; C. S. PIPE 12 (.064), 15 (.064), 18 (.064), 24 (.064), 30 (.079), 36 (.079), 42 (.109), 48 (.109); R. C. PIPE CLASS III 12, 15, 18, 24, 30; R. C. PIPE CLASS IV 12, 15, 48, 54, 60; 42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL; 42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL; 36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL; 36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL; ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) (CY); DRAINAGE STRUCTURE MASONRY (FT); QUANTITIES FOR DRAINAGE STRUCTURES — NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B): 0' THRU 5' (EACH), A 5' THRU 10' (LIN. FT.), B 10' AND ABOVE (LIN. FT.); C.B. STD. 840.01 OR STD. 840.02; FRAME, GRATES, AND HOOD STD. 840.03 — GRATE TYPE E, F, G; CONCRETE TRANSITIONAL SECTION — D.I. DETAIL 2C-10 OR 2C-14, C.B. STD. 852.05; OPEN THROAT C.B. STD. 840.04 OR STD. 840.05; CONCRETE BRIDGE APPROACH D.I. STD. 840.13; D.I. STD. 840.14 OR STD. 840.15; D.I. FRAME AND GRATES STD. 840.16; G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26; G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27; G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28; G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20; G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20; G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22; G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22; G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24; G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24; G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29; G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29; DRIVEWAY D.I. STD. 840.30; J.B. STD. 840.31 OR STD. 840.32; T.B.J.B. STD. 840.34; T.B.D.I. STD. 840.35; M.H. FRAME AND COVER STD. 840.54; ADJUST MH; 15" C.S. ELBOW; 18" C.S. ELBOW; 24" C.S. ELBOW; 30" C.S. ELBOW; 36" C.S. ELBOW; 48" C.S. ELBOW; FLOWABLE FILL (CY); CONCRETE COLLARS CL. "B" STD. 840.72 (CY); CONCRETE AND BRICK PIPE PLUG STD. 840.71 (CY).

ABBREVIATIONS

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

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

PROJECT NO.	SHEET NO.
U-3440	3D-13

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 119+88	108 LT	1261	1262																	
L89+76	147 LT																			
L90+58	51 LT																			
Project area																				
L69+50	32 LT																			
SHEET 3D-14 Totals																				
SHEET TOTALS																				
PROJECT TOTALS									6684	2540	4156	904	2484	80	476					

LINE & STATION	C. S. PIPE 12 / .064	15 / .064	18 / .064	24 / .064	30 / .079	36 / .079	42 / .109	48 / .109	R. C. PIPE CLASS III 12	15	18	24	30	R. C. PIPE CLASS IV 12	15	48	54	60	42" WELDED STEEL PIPE 0.1094" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE 0.1094" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	36" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	15" SIDE DRAIN PIPE
L 119+88																							24
L89+76																							
L90+58																							
Project area																							
L69+50																							
SHEET 3D-14 Totals																							
SHEET TOTALS																							24
PROJECT TOTALS		872	180	260	60	56		56	8			8			192	60			96	96	112	112	324

LINE & STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	DRAINAGE STRUCTURE MASONRY FT	QUANTITIES FOR DRAINAGE STRUCTURES 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION: D.I. DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16
L 119+88																
L89+76																
L90+58																
Project area																
L69+50				5.0	3.0											
SHEET 3D-14 Totals																
SHEET TOTALS				5.0	3.0											
PROJECT TOTALS	21.700		259	184.6		138	14	54	70		35	4	7		56	56

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

LINE & STATION	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME AND COVER STD. 840.54	ADJUST MH	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	48" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 119+88																												
L89+76																										0.116		PLUG
L90+58																										0.029		PLUG
Project area																								164				Total Project Flowable Fill
L69+50																	1											42" RCP Sanitary Sewer Manhole
SHEET 3D-14 Totals													4			2												
SHEET TOTALS													4			2	1							164		0.145		
PROJECT TOTALS	4	10			31				14				11	6	31	7	1	7	1	4	1	1	1	164	1.2920	0.145	3924	

ABBREVIATIONS

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

MOORECO

COMPUTED BY:	C.MOORE	DATE:	9/1/2016
CHECKED BY:	S. BONDOR	DATE:	9/1/2016

MOORECO

PROJECT NO.	SHEET NO.
U-3440	3D-14

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
L97+58	77	RT	1029	1030		697.1	695.1	
L97+40	17	RT	1030		701.9			
			1030	1047		695.1	692.9	
L96+92	69	LT	1047		699.7			
			1047	1048		692.9	691.5	
L126+06	22	RT	1237	1238		713.7	709.8	
			1237		737.6			
L127+27	97	LT	1325	1326		718.5	716.3	
			1326		737.7			

LINE & STATION	FROM	TO	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 54	60	66	72	78	84		DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 54	60	66	72	78	84			
L97+58	1029	1030																					
L97+40	1030																						
	1030	1047																					
L96+92	1047																						
	1047	1048																					
L126+06	1237	1238																					
	1237																						
L127+27	1325	1326																					
	1326																						
SHEET TOTALS																							
PROJECT TOTALS																							

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	48	54	60	66	72	78	84		R. C. PIPE CLASS IV 12	60	66	72	78	84		STRUCTURAL PLATE PIPE 60	66	72		
L97+58	1029	1030												88									
L97+40	1030																						
	1030	1047																					
L96+92	1047																						
	1047	1048												60									
L126+06	1237	1238												108									
	1237																						
L127+27	1325	1326					136																
	1326																						
SHEET TOTALS							136							256									
PROJECT TOTALS							136							256									

LINE & STATION	FROM	TO	66" WELDED STEEL PIPE 0.1094" THICK, GRADE B NOT IN SOIL	66" WELDED STEEL PIPE 0.1094" THICK, GRADE B IN SOIL	REINFORCED ENDWALLS SEE DETAIL SHEET 2C-9 CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I.DETAIL 2C-10 OR 2C-14	C.B. STD. 852.05
L97+58	1029	1030			8.400											
L97+40	1030					5.486										
	1030	1047	48	48												
L96+92	1047					5.486										
	1047	1048			5.900											
L126+06	1237	1238														
	1237					5.486										
L127+27	1325	1326														
	1326					5.486										
SHEET TOTALS			48	48	14.300	21.944										
PROJECT TOTALS			48	48	14.300	21.944										

LINE & STATION	FROM	TO	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	M.H. FRAME AND COVER STD. 840.54	PIPE REMOVAL LIN. FT.	REMARKS
L97+58	1029	1030																					
L97+40	1030																		1				
	1030	1047																					
L96+92	1047																		1				
	1047	1048																					
L126+06	1237	1238																					
	1237																		1		1		J.B. WITH SLAB TOP
L127+27	1325	1326																					
	1326																		1		1		
SHEET TOTALS																			4		2		
PROJECT TOTALS																			4		2		

ABBREVIATIONS

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

COMPUTED BY: J. P. Rogers DATE: 6-10-2014
CHECKED BY: _____ DATE: _____

PROJECT NO.	SHEET NO.
U-3440	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Geotextile for Pavement Stabilization

LINE	Approx. Station	Approx. Station	Location LT/RT	SY
-L-	40+50	45+50	RT	2,618
-L-	69+00	73+50	LT	1,554
-L-	85+50	87+00	RT	547
-L-	97+25	98+25	RT	438
-L-	117+50	119+00	RT	712
-L-	125+25	127+00	RT	561
			TOTAL SY:	6430

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization SY	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
DISCRETIONARY							2500		
CONTINGENCY			ASU		4000	8000	12000		
CONTINGENCY				3				500	
				TOTAL TONS:	4000	8000	14500	500	

***ASU = Aggregate Subgrade**
***AST = Aggregate Stabilization**

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Pipe Dia.	Drain Type* UD/BD/SD	LF
L	63+00	66+00	LT/RT/CL	4"	**SD**	600
L	69+00	72+00	LT/CL	6"	**SD**	300
L	84+00	89+00	LT/CL	6"	**SD**	500
L	89+00	97+00	LT/RT/CL	4"	**SD**	1600
L	114+00	119+80	LT/RT/CL	4"	**SD**	1160
CONTINGENCY				6"	**SD**	2500
					TOTAL LF:	6660

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

Note: Locations, by station range, were provided by the Hydraulics Engineer at the request of the Division.

PROJ. REFERENCE NO.	SHEET NO.
U-3440	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5,6	CALVARY BAPTIST CHURCH KANNAPOLIS INC
2	4,5	MCVAY, ROBERT K.
3	5	SHUPING, DANNY R.
4	5	LITTLE, BRANDON
4A	5,6	WEST OAKS II, LLC
5	6	BEAVER, KERRY D.
6	6	VSP BUSINESS, LLC
7	6	BARR, PAUL K.
8	6	CRAINSHAW, WAYNE M.
9	6	MARBURGER, KENNETH D.
10	6,8	ATLANTIC AMERICAN PROPERTIES INC
10A	6,7	ATLANTIC AMERICAN PROPERTIES INC
11	6	ANDERTON, TIMOTHY J.
12	6,7	WILKINSON, JIMMY R.
12A	7	WILKINSON, JIMMY R.
12B	7	WILKINSON, JIMMY R.
13	7	ALMOND, ELLEN M.
14	7,8	OVERCASH TRUSTEE, EDWARD C.
15	7	PITTS, H. M.
16	7	JACK LOTITO
17	7	NANCY J. SMOTHERS
18	7,8	WILKINSON, LESTER L.
19	8	PUBLIC SERVICE CO. OF NC INC
20	8	BAKER, JERRY H.
20A	8	CITY OF KANNAPOLIS
21	8,9	WILKINSON, LESTER L.
22	8,9	HAMMONDS, WADE L.
23	9,10	OVERCASH TRUSTEE, JOE L.
24	9	LAFFERTY, TIMOTHY S.
25	9,10	LEAR SR., JAMES C
26	9	OVERCASH TRUSTEE, JOE L.
27	9	MISENHEIMER, MARK A.
28	9,10	ALBERT V. AGRASTO and wife SUSAN J. AGRASTRO
29	10	THREATT, DAVID L.
30	10	LOVE, WILLIAM E.
31	10	VANPELT, CLARENCE R.
31A	10	UNKNOWN OWNER
32	10	BROCK, DOROTHY P. - TRUSTEE
33	10	SPRAGUE, RHONDA W.
34	10,11	BREWER, WAYNE C.
35	10,11	BICKERSTAFF, DANIEL P.
37	10	MISENHEIMER, MARK A.
38	10	BROWN, LIRCEY L.
39	10	BROWN, PHILIP L.
40	10	PRICE JR, JAMES H
41	10	MCGINNIS, JIMMIE D.
42	10,11	BCA PROPERTY MGMT, LLC
43	10	EDWARD H. SELLERS, JR.
44	10	ROBIE, DANIEL C.
45	10	MILLS, JONATHAN H.
46	10	FERGUSON, SHARON C.
47	11	MCCOLLUM, TERRY M.
48	10,11	FOREST JR, WALTER
49	11	GOODNIGHT, EVELYN B
50	11	ELDER, DAVID S.
51	11	TRITT, HARLEY D.
52	11	SYLVIA F. McMULLEN
53	11	SMULLEN, MARK A.
54	11	DEAL, VIVIAN M.
55	11	DANNY BOST, LLC

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
55A	11	MATTHEWS, DAVID G.
56	11	CRAINSHAW, RANDY C.
57	11	CARNOUSTI INVESTMENTS, LLC
58	11	MATTHEWS, JAMES E.
59	11	BAZA, TOMAS M.
60	11	NELSON, EDWARD V. and wife KASHEA BALLIET NELSON
60A	11	COXEY, BETTY S.
60B	11	LITAKER, CHRISTINE H.
61	11	FINGER, SR., JON R.
62	11	DAVID G. MATTHEWS
63	11,12	WILLIAMSON, JOSEPH E.
64	11,12	JACKSON, ROBERT A.
65	11,13	JACKSON, ROBERT A.
65A	12	ESTATE OF MINNIE B STROUD
66	12	DAVID MILLER REALTY & INVESTMENT, INC.
67	12	LINN, BOBBIE S.
68	12	DOSTER, JR, SANFORD R.
69	12	ESTATE OF DORA B. HILTON
70	12	HUGHES, JAN MARIE BIGGERSTAFF
71	12	OWNER UNKNOWN
72	12	HARRY L. SMITH
73	12,13	ESTATE OF DORA B. HILTON
74	12	NAIRN, RICHARD B.
75	12,13	POORANDEO PERSAUD
76	12	GULLEDGE, A. B.
77	12	CORRELL, KATHY A.
78	12	SELLERS JR, EDWARD H.
79	12	LINN, BOBBIE S.
80	12	DOSTER, JR, SANFORD R.
81	12	PHILLIPS, ANGELA WILLIAMS
81A	12	PHILLIPS, ANGELA WILLIAMS
82	12	PHILLIPS, ANGELA WILLIAMS
82Z	12	PHILLIPS, ANGELA WILLIAMS
83	12	WATTS, BILLY E.
84	12,13	COOPER, JIMMY R.
85	13	FOIL, FRANK E.
86	13	MOORE, NORMAN R.
87	13	UNKNOWN OWNER
88	13	ABERNATHY, JAMES E.
89	13	PHILLIPS ESTATES, J.W.
90	13	RUBINSTEIN, BRIAN
91	13	BARBER, FRANKLIN O.
92	13	MCGINNIS, JIMMIE D
93	13	WATTS, BILLY E.
94	13	FINK, LINDA W. ET. AL.
95	13,14	MURPH, MERLE D.
96	13	ESTATE OF DORA B. HILTON
97	13	MOORE, ALVIN W.
98	13	MOORE, NORMAN R.
99	13	REYNOLDS, CAROLYN P.
100	13	ISENHOUR, DENNIS C.
101	13	JENNIE M. LINGERFELT,
102	13	JACOBS, GRACE D.
103	13	ESTATE OF DORA B. HILTON
104	13	ESTATE OF DORA B. HILTON
105	13	WATTS, BILLY E.
105A	13	WATTS, BILLY E.
105B	13,14	WATTS, BILLY E.
107	13	BUTLER BUILDERS OF NORTH CAROLINA INC
108	14	WEAKS, ZELMA L.

PROJ. REFERENCE NO.	SHEET NO.
U-3440	3P-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
109	14	RATLIFF, COLLEEN H.
110	14	BUNN, JACK O.
110A	14	BUNN, JACK O.
111	14	CHISHOLM, MICHAEL W.
112	14	CITY OF KANNAPOLIS
115	14	SOUTHERN SELECT COMMUNITY CREDIT UNION
116	14	CASTLE & COOKE NORTH CAROLINA LLC
117	14	WATER COMPANY ACQUISTION CORP
118	14	PRICE, GEORGE F.
119	14	CHAPMAN, ANN P.
120	14	OFFNER, MADALINE A.
121	14	RABON, MICHAEL E.
121A	14	RABON, MICHAEL E.
122	14	SUGGS, BARRY S.
123	14	ATLANTIC AMERICAN PROPERTIES INC
123A	14	ATLANTIC AMERICAN PROPERTIES INC
124	14	CASTLE & COOKE NCRC LLC
125	14	DAVID H. MURDOCK

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
U-3440	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN — 8/17/2016

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR — 8/17/2016

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

REVISIONS 8/17/99

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

SEE SHEET 20 FOR -Y-, -YI-, & -Y2- PROFILE
NOTE: SEE SHEET 15 FOR -L- PROFILE

★ REVISED SIGNAL

DETAIL 4A
SPECIAL DITCH
(Not to Scale)
N.G. Var. 2' 2' 2:1 Fill Slope
Type of Liner = PSRM
FROM -Y2- STA. 11+20 TO 12+30 RT

BEGIN TIP PROJECT U-3440
-L- STA. 10+10.00

NAD 83/NSRS 2007

-L-
PI Sta 15+20.75
△ = 4° 18' 59.8" (LT)
D = 1° 08' 45.3"
L = 376.69'
T = 188.44'
R = 5,000.00'
RO = 96'
e = .02 RC

-L- PC Sta. 13+32.32

HOOKS, MICHEAL W.
DB 1620 PG 52
PB 20 PG 88

HOOKS, MICHEAL W.
DB 1620 PG 52

MCVAY, ROBERT K.
DB 3076 PG 230

HUIE, LINDA DAY
DB 8096 PG 165
PB 25 PG 37

COSENTINO, FRANCIS M.
DB 4229 PG 100

CORNERSTONE BAPTIST CHURCH
DB 3620 PG 297

CALVARY BAPTIST CHURCH KANNAPOLIS INC
DB 4988 PG 342
PB 53 PG 93

THIGPEN, ALTON H.
DB 405 PG 45
DB 5198 PG 114

ABC PARKWAY LLC
DB 8303 PG 122

MULLIS, VIC A.
DB 7195 PG 196

-L- POT Sta. 10+00.00

-L- POT Sta. 17+34.33 =
-Y2- POT Sta. 10+00.00
BRG S 13° 34' 24.0" W

-L- PT Sta. 17+09.01

-Y- POT Sta. 10+00.00 =
-L- POT Sta. 11+93.26
BRG S 5° 31' 35.1" W

-Y- PC Sta. 10+21.42

END CONSTRUCTION
-Y- STA. 11+05.00

-YI- POT Sta. 10+00.00 =
-L- POT Sta. 12+50.58
BRG S 5° 31' 35.1" W

-YI- PC Sta. 10+09.17

END CONSTRUCTION
-YI- STA. 12+25.00

-Y2- POT Sta. 13+06.23

END CONSTRUCTION
-Y2- STA. 12+30

10' TRANSITION FROM 4"PS TO C&G
SEE DETAIL - SHEET 2C-2
BEGIN SIDEWALK

+80.73
10' TRANSITION TO C&G•
END SIDEWALK

+98.56 (-YI-)
10' TRANSITION TO C&G•
BEGIN SIDEWALK
MATCH EXISTING PAVING LIMITS ON -YI-

200' LANE SHIFT LT & RT

200' TRANSITION

120' TAPER

39.27' TAPER TO EXISTING LT. & RT.

BEGIN 5' BIKE LANE

4' PAVED SHOULDER

4' CONC ISLAND

VAR. PS (MATCH EXISTING)

REMOVE AND RESET GUARDRAIL

KANNAPOLIS CITY LIMITS

MATCHLINE -L- STA. 22+50.00 SEE SHEET 5

-L- S 76° 27' 09.3" E

-L- S 72° 08' 09.6" E

CL. B RIP RAP
2 TONS
GEOTEXTILE 7 SY
(0405)

SPECIAL GRADE TAIL DITCH
LINE WITH PSRM
EST. 77 SY
SEE DETAIL 4A

-YI- STA. 10+85.11 (12.33' RT)
MEDIAN PAVING LIMITS
BETWEEN -Y- & -YI-

-BYI-30

-BY2-31

(FUTURE KANNAPOLIS PARKWAY)

-L- (NC 3)			
14800 / 20600	(15000)	(5400)	16000 / 22200
	(5000)		
5700 / 7000			6900 / 8200
12600 / 19800			2016 ADT / 2036 ADT

-Y- & -YI- (KANNAPOLIS PARKWAY)

-Y-	-YI-
PI Sta 12+39.04	PI Sta 12+31.09
△ = 8° 47' 42.0" (RT)	△ = 8° 47' 42.0" (RT)
D = 2° 01' 29.1"	D = 1° 59' 07.6"
L = 434.38'	L = 442.97'
T = 217.62'	T = 221.92'
R = 2,829.79'	R = 2,885.79'
RO = SEE PLANS	RO = SEE PLANS
e = SEE PLANS	e = SEE PLANS

-L- (NC 3)			
16000 / 22200			16800 / 22800
	900 / 2000	1700 / 2600	
2600 / 4600			2015 ADT / 2035 ADT

-Y2- (BOY SCOUT CAMP ROAD)

8/12/2016
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smith1580

PROJECT REFERENCE NO.	SHEET NO.
U-3440	5
RW SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN 8/17/2016	NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR 8/17/2016

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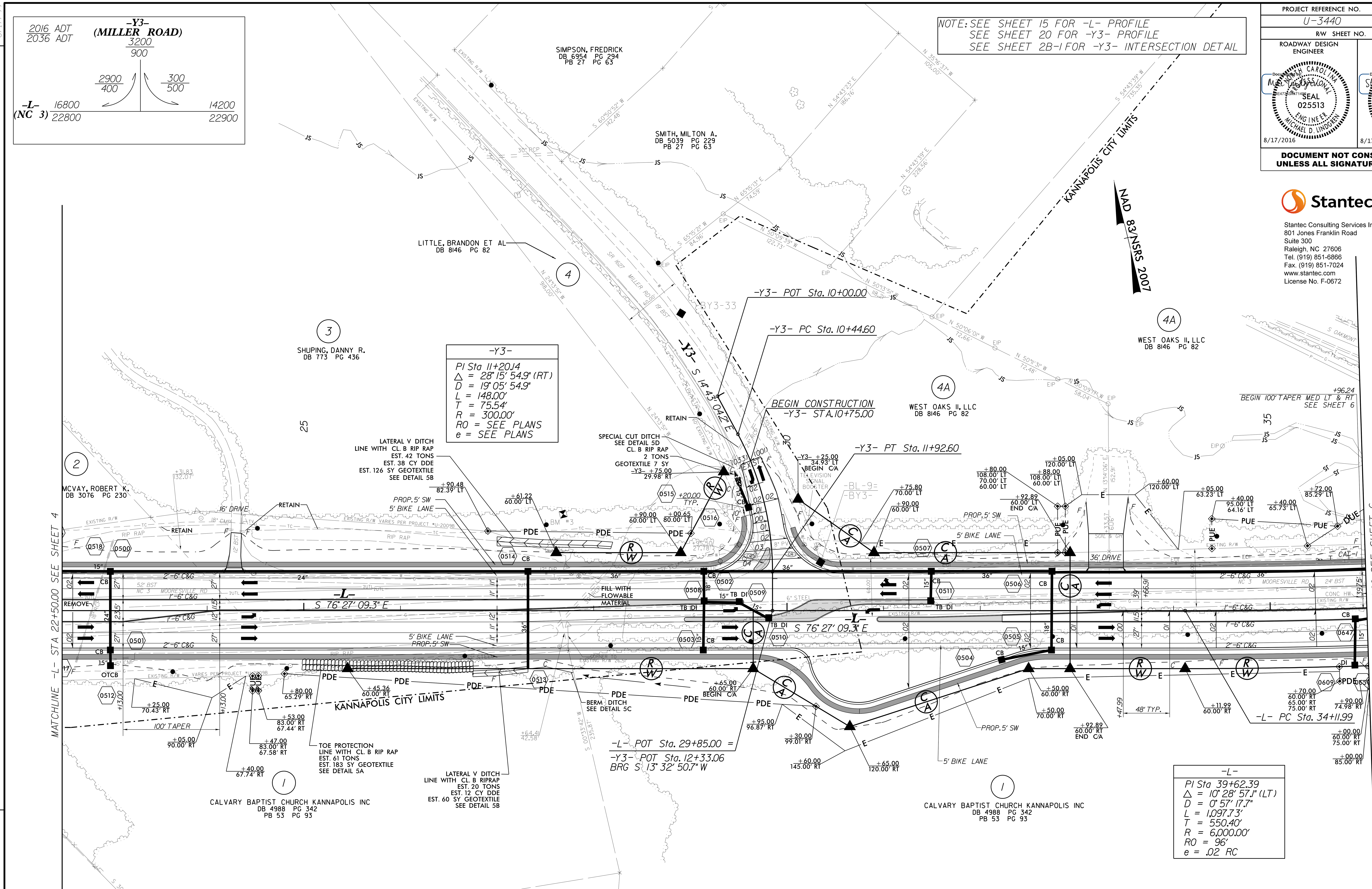
NOTE: SEE SHEET 15 FOR -L- PROFILE
SEE SHEET 20 FOR -Y3- PROFILE
SEE SHEET 2B-1 FOR -Y3- INTERSECTION DETAIL

-Y3- (MILLER ROAD)

2016 ADT
2036 ADT

-Y3-: 3200 / 900; 2900 / 400; 300 / 500

-L- (NC 3): 16800 / 22800; 14200 / 22900



-Y3-
PI Sta 11+20.14
Δ = 28° 15' 54.9" (RT)
D = 19° 05' 54.9"
L = 148.00'
T = 75.54'
R = 300.00'
RO = SEE PLANS
e = SEE PLANS

-L-
PI Sta 39+62.39
Δ = 10° 28' 57.1" (LT)
D = 0° 57' 17.7"
L = 1,097.73'
T = 550.40'
R = 6,000.00'
RO = 96'
e = .02 RC

DETAIL 5A
TOE PROTECTION
(Not to Scale)
Natural Ground; 2:1 or Flatter Fill Slope; Geotextile
d = 1.0Ft.
b = 2.0Ft.
Type of Liner = CL. B Rip-Rap
FROM -L- STA. 25+00 TO 26+75 RT

DETAIL 5B
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground; Fill Slope; Geotextile
Min. D = 1.5Ft.
Max. d = 1.0Ft.
b = 5.0Ft.
Type of Liner = CL. B Rip-Rap
FROM -L- STA. 26+75 TO 27+32 RT
FROM -L- STA. 27+00 TO 28+20 LT

DETAIL 5C
BERM 'V' DITCH
(Not to Scale)
Natural Ground; RDWY
Min. D = 1.0 Ft.
b = 5.0 Ft.
FROM -L- STA. 27+32 TO 29+00 RT

DETAIL 5D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground; 4:1 or Flatter; Front Ditch Slope
Min. D = 1 Ft.
FROM -Y3- STA. 10+66 TO 11+00 RT

REVISIONS

8/17/99

8/18/2016
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
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SEALED ONLY FOR REVISION AREA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034986 ANTHONY W. GRUBBS 10/11/2016
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025513 MICHAEL D. LINDGREN 10/11/2016
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12786 STEVEN M. BONDOR 10/11/2016

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8/17/99

NOTE: SEE SHEET 15 THRU 16 FOR -L- PROFILE
SEE SHEET 21 FOR -Y4-, -Y5-, & -Y6- PROFILE
SEE SHEET 2B-1 FOR -Y4- INTERSECTION DETAIL
SEE CULVERT SHEET C1-1 THRU C1-5

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

NOTE: DRIVEWAY RADII ARE 5FT UNLESS OTHERWISE NOTED

-Y4- (CHARLIE WALKER ROAD)
2016 ADT 3600 / 2036 ADT 2900; 1500/1100; 2100/1800; -L- (NC 3) 14200/22900; 14800/23600

-Y4-
PI Sta 12+11.01
Δ = 30° 10' 07.6" (RT)
D = 28° 38' 52.4"
L = 105.31'
T = 53.91'
R = 200.00'
RO = SEE PLANS
e = SEE PLANS

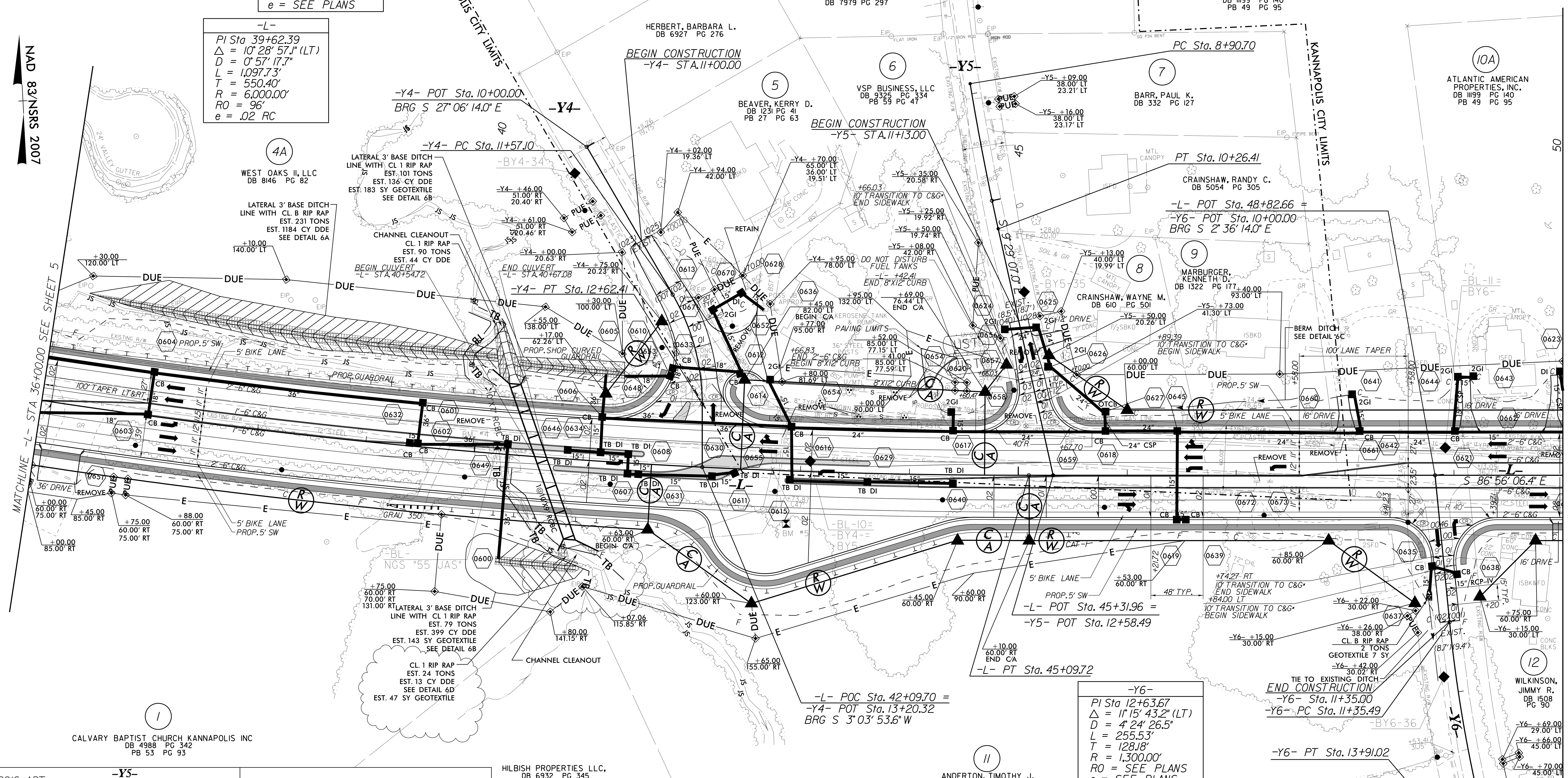
-L-
PI Sta 39+62.39
Δ = 10° 28' 57.1" (LT)
D = 0° 57' 17.7"
L = 1,097.73'
T = 550.40'
R = 6,000.00'
RO = 96'
e = .02 RC

-Y5-
PI Sta 9+58.57
Δ = 3° 14' 23.4" (LT)
D = 2° 23' 14.4"
L = 135.71'
T = 67.87'
R = 2,400.00'

-Y6-
PI Sta 12+63.67
Δ = 11° 15' 43.2" (LT)
D = 4° 24' 26.5"
L = 255.53'
T = 128.18'
R = 1,300.00'
RO = SEE PLANS
e = SEE PLANS

-Y5- (MARION AVE.)
2016 ADT 300 / 2036 ADT 400; 100/100; 200/300; -L- (NC 3) 14800/23600; 14900/23800

-L- (NC 3) 14900/23800; 15100/23900; 100/100; 200/200; 200/300
-Y6- (TUCKER AVE.) 2016 ADT / 2036 ADT



DETAIL 6A
LATERAL BASE DITCH
(Not to Scale)
Natural Ground; Fill Slope
*When B is < 6.0'
Type of Liner= CL B Rip-Rap
Min. D= 1.5Ft.
Max. d= 1.5Ft.
B= 3.0Ft.
b= 5.0Ft.
FROM -L- STA. 37+00 TO STA. 40+15 LT

DETAIL 6B
LATERAL BASE DITCH
(Not to Scale)
Natural Ground; GEOTEXTILE; Fill Slope
*When B is < 6.0'
Type of Liner= CL 1 Rip-Rap
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 3.0 Ft.
b= 5.0 Ft.
FROM -L- STA. 40+35 TO 41+31 LT
FROM -L- STA. 40+30 TO 41+05 RT

DETAIL 6C
BERM 'V' DITCH
(Not to Scale)
Natural Ground; RDWY
Min. D=1.0 Ft.
b=5.0 Ft.
FROM -L- ST.A 45+82 TO 47+57 LT

DETAIL 6D
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground; Geotextile
Type of Liner= CL 1 Rip-Rap
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=6.0 Ft.
FROM -L- STA. 40+88 TO STA. 41+09 RT

10/11/2016
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	7

RW SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 025513, MICHAEL D. LINDGREN — 10/12/2016

HYDRAULICS ENGINEER — SEAL 12786, STEVEN M. BONDOR — 10/17/2016

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Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
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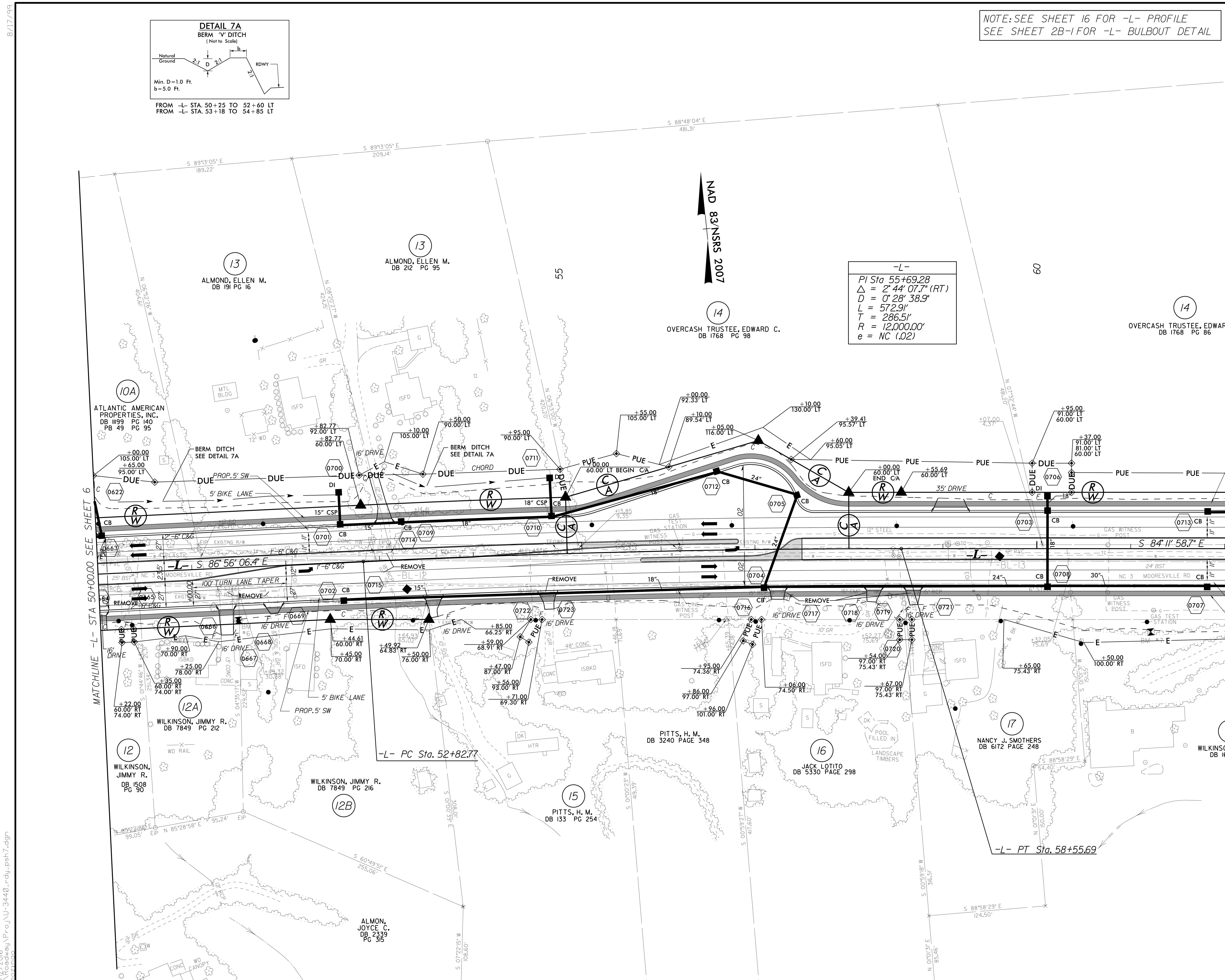
NOTE: SEE SHEET 16 FOR -L- PROFILE
SEE SHEET 2B-1 FOR -L- BULBOUT DETAIL

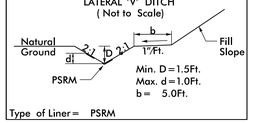


8/17/99

REVISIONS

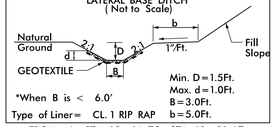
-L- 15100 13100
(NC 3) 23900 21400
2500 500
3400 900
3000
4300
2016 ADT
2036 ADT
-Y7-
(BETH PAGE RD.)

DETAIL 8A
LATERAL 'V' DITCH
(Not to Scale)



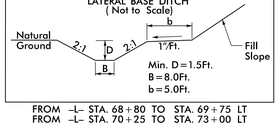
Type of Liner = PSRM
FROM -L- STA. 69+44 TO STA. 73+00 RT

DETAIL 8B
LATERAL BASE DITCH
(Not to Scale)



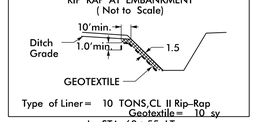
*When B is < 6.0'
Type of Liner = CL. 1 RIP RAP b = 5.0Ft.
FROM -L- STA. 65+64 TO STA. 68+50 LT
FROM -L- STA. 65+36 TO STA. 67+56 RT

DETAIL 8C
LATERAL BASE DITCH
(Not to Scale)



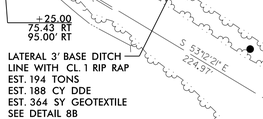
FROM -L- STA. 68+80 TO STA. 69+75 LT
FROM -L- STA. 70+25 TO STA. 73+00 LT

DETAIL 8D
RIP RAP AT EMBANKMENT
(Not to Scale)



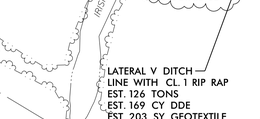
Type of Liner = 10 TONS,CL II Rip-Rap
Geotextile = 10 sy
-L- STA. 68+55 LT
-L- STA. 67+56 RT
-L- STA. 67+95 RT

DETAIL 8E
LATERAL 'V' DITCH
(Not to Scale)



Type of Liner = CL. 1 Rip-Rap
FROM -L- STA. 67+90 to 69+44 RT

DETAIL 8F
SPECIAL CUT DITCH
(Not to Scale)



FROM -Y7- STA. 11+38 TO 12+00 RT

NOTE: SEE SHEET 16 THRU 17 FOR -L- PROFILE
SEE SHEET 21 FOR -Y7- PROFILE
SEE SHEET 2B-1 FOR -Y7- INTERSECTION DETAIL
SEE STRUCTURES SHEET S1-1 THRU S1-37 FOR LEFTMOST BRIDGE PLANS
SEE STRUCTURES SHEET S2-1 THRU S2-37 FOR RIGHTMOST BRIDGE PLANS

**TRANSITION 1'-6" C&G TO 2'-9" C&G
-L- STA. 65+29.10 TO STA. 65+79.45 LT & RT
-L- STA. 70+76.71 TO STA. 71+24.71 LT & RT

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

-L-
PI Sta 80+28.76
△ = 50° 54' 39.2" (LT)
D = 2° 51' 53.2"
L = 1,777.13'
T = 952.04'
R = 2,000.00'
RO = 144'
e = .03

PROJECT REFERENCE NO.	SHEET NO.
U-3440	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
10/11/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BOWDEN
10/11/2016

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SEALED ONLY FOR REVISION AREAS

NORTH CAROLINA PROFESSIONAL SEAL 034986 ENGINEER ANTHONY W. GRUBB
10/11/2016

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-L- POC Sta. 73+53.39 = -Y7- POT Sta. 10+00.00
BRG S 2° 11' 12.0" E

-L- PC Sta. 70+76.71

NAD 83/NSRS 2007

MATCHLINE -L- STA 63+50.00 SEE SHEET 7

MATCHLINE -L- STA 76+00.00 SEE SHEET 9

-Y7- PC Sta. 10+88.68

-Y7- PT Sta. 12+11.35
BRG S 44° 40' 04.0" W

-Y7- POT Sta. 14+10.62

-Y7- PCC Sta. 14+93.76

END CONSTRUCTION
-Y7- STA. 15+50.00

-Y7- PT Sta. 16+03.16
S 27° 28' 46.1" E
-Y7- POT Sta. 16+30.01

END PAVING
-Y7- STA. 12+75.00

10 ATLANTIC AMERICAN PROPERTIES, INC.
DB 11199 PG 140
PB 49 PG 95

14 OVERCASH TRUSTEE, EDWARD C.
DB 1768 PG 86

19 PUBLIC SERVICE CO. OF NC INC
DB 309 PG 158

18 WILKINSON, LESTER L.
DB 163 PG 129

20 BAKER, JERRY H.
DB 6261 PG 261

20A CITY OF KANNAPOLIS
DB 1911 PG 252
PB 4 PG 70

21 WILKINSON, LESTER L.
DB 5012 PG 119

22 HAMMONDS, WADE L.
DB 578 PG 256

CITY OF KANNAPOLIS
DB 1911 PG 252
PB 4 PG 70

LATERAL 8' BASE DITCH
EST. 162 CY DDE
SEE DETAIL 8C

3' LATERAL BASE DITCH
LINE WITH CL. 1 RIP RAP
EST. 252 TONS
EST. 81 CY DDE
EST. 473 SY GEOTEXTILE
SEE DETAIL 8B

CL. II RIP RAP AT EMBANKMENT
EST. 15 SY GEOTEXTILE
SEE DETAIL 8D

RIP-RAP AT BRIDGES IS STRUCTURE PAY ITEM

PROP. SHOP CURVED GUARDRAIL

PLACE RIPRAP ON BANKS ONLY. KEY IN 12" BELOW DITCH BOTTOM.

LATERAL 8' BASE DITCH
EST. 297 CY DDE
SEE DETAIL 8C

CL. B RIP RAP
EST. 5 TONS
EST. 14 SY GEOTEXTILE

CL 1 RIP RAP
26 TONS
GEOTEXTILE 50 SY

PROP. EMERGENCY ACCESS SEE DETAIL 2C-1

PROP. 5' SW
5' BIKE LANE
PROP. GUARDRAIL

REMOVE

16' DRIVE

2' PAVED SHOULDER

LATERAL V DITCH
LINE WITH PSRM
EST. 176 SY
EST. 276 CY DDE
SEE DETAIL 8A

LATERAL V DITCH
LINE WITH CL. 1 RIP RAP
EST. 126 TONS
EST. 169 CY DDE
EST. 203 SY GEOTEXTILE
SEE DETAIL 8E

CL. B RIP RAP
EST. 8 TONS
EST. 21 SY GEOTEXTILE

SPECIAL CUT DITCH
SEE DETAIL 8F

TIE TO EXIST. DITCH

BEGIN BRIDGE
-L- STA 67+64.88

END BRIDGE
-L- STA 68+94.88

BEGIN APPROACH SLAB
-L- STA 67+40.76

END APPROACH SLAB
-L- STA 69+18.99

BEGIN BRIDGE
-L- STA 67+56.32

END BRIDGE
-L- STA 68+86.32

BEGIN APPROACH SLAB
-L- STA 67+32.21

END APPROACH SLAB
-L- STA 69+10.44

SKETCH SHOWING BRIDGE / PAVEMENT RELATIONSHIP

-Y7-

PI Sta 11+53.68	PI Sta 15+52.99	PI Sta 14+52.52
△ = 46° 51' 16.0" (RT)	△ = 54° 30' 21.2" (LT)	△ = 17° 38' 28.9" (LT)
D = 38° 11' 49.9"	D = 49° 49' 20.7"	D = 21° 13' 14.4"
L = 122.66'	L = 109.40'	L = 83.13'
T = 65.00'	T = 59.24'	T = 41.90'
R = 150.00'	R = 115.00'	R = 270.00'
RO = SEE PLANS		
e = SEE PLANS		

10/11/2016
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN — 10/4/2016

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR — 10/5/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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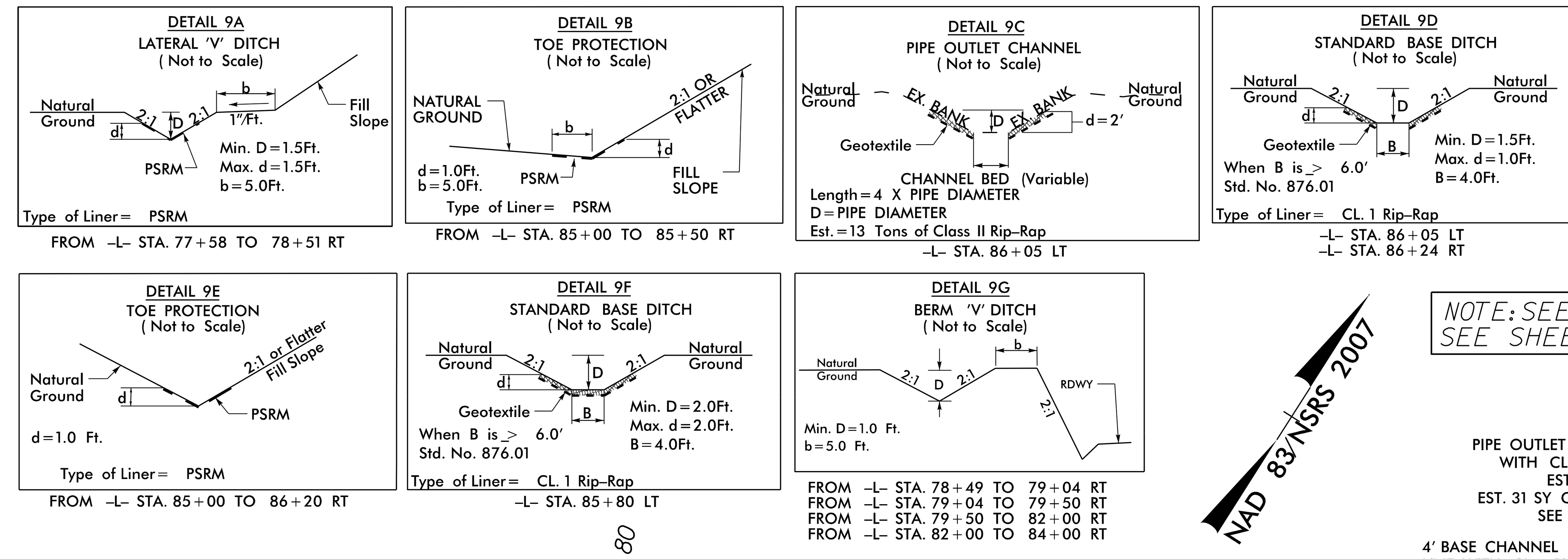
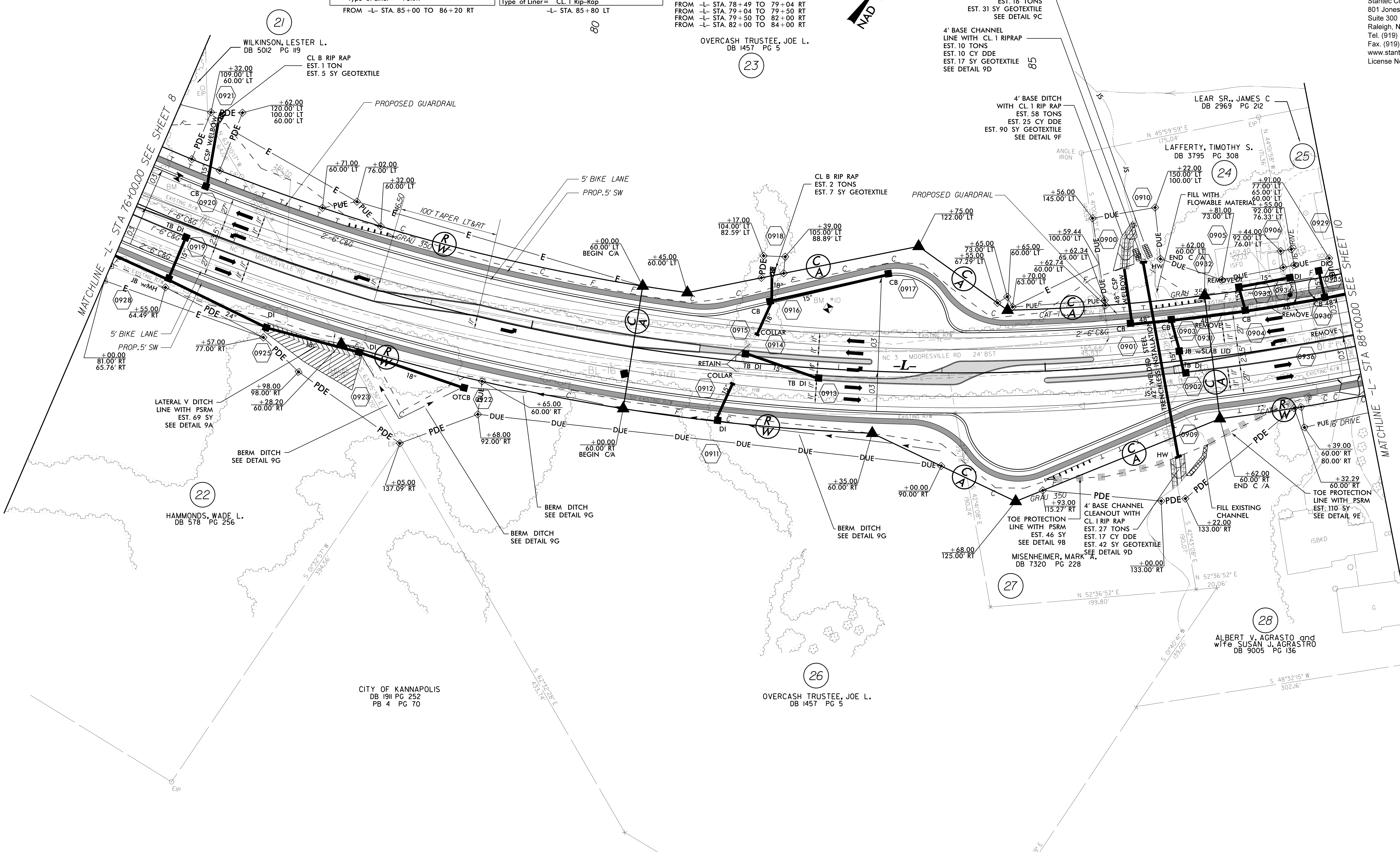
-L-

PI Sta 80+28.76
Δ = 50° 54' 39.2" (LT)
D = 2° 51' 53.2"
L = 1,777.13'
T = 952.04'
R = 2,000.00'
RO = 144'
e = .03

NOTE: SEE SHEET 17 FOR -L- PROFILE
SEE SHEET 2B-2 FOR -L- BULBOUT DETAIL





REVISIONS

8/17/99

10/4/2016 U:\Roadway\Proj\U-3440_rdy_psh9.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3440	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 025513 — MICHAEL D. LINDGREN — 10/4/2016	SEAL 12786 — STEVEN M. BONDOR — 10/5/2016

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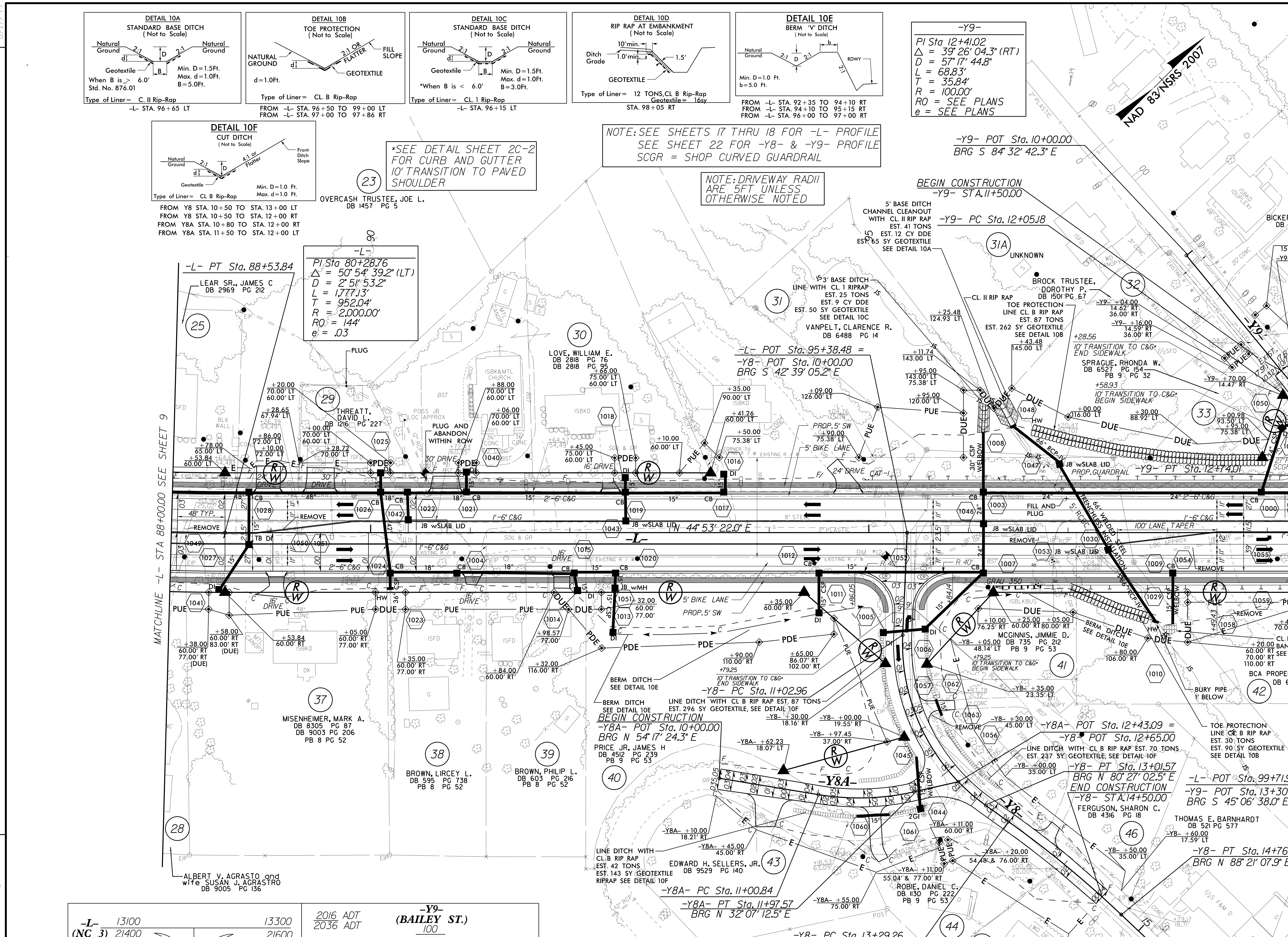
REVISIONS



-Y8-		-Y8A-
PI Sta 12+11.32	PI Sta 14+02.81	PI Sta 11+49.82
Δ = 56° 53' 52.3" (LT)	Δ = 7° 54' 05.4" (RT)	Δ = 22° 10' 11.8" (LT)
D = 28° 38' 52.4"	D = 5° 22' 47.6"	D = 22° 55' 05.9"
L = 198.61'	L = 146.87'	L = 96.73'
T = 108.36'	T = 73.55'	T = 48.98'
R = 200.00'	R = 1,065.00'	R = 250.00'
RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS
e = SEE PLANS	e = SEE PLANS	e = SEE PLANS

8/17/99
10/4/2016
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	11
R/W SHEET NO.	

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Suite 300
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ROADWAY DESIGN ENGINEER — SEAL 025513 — MICHAEL D. LINDGREN — 10/11/2016

HYDRAULICS ENGINEER — SEAL 12786 — STEVEN M. BONDOR — 10/11/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

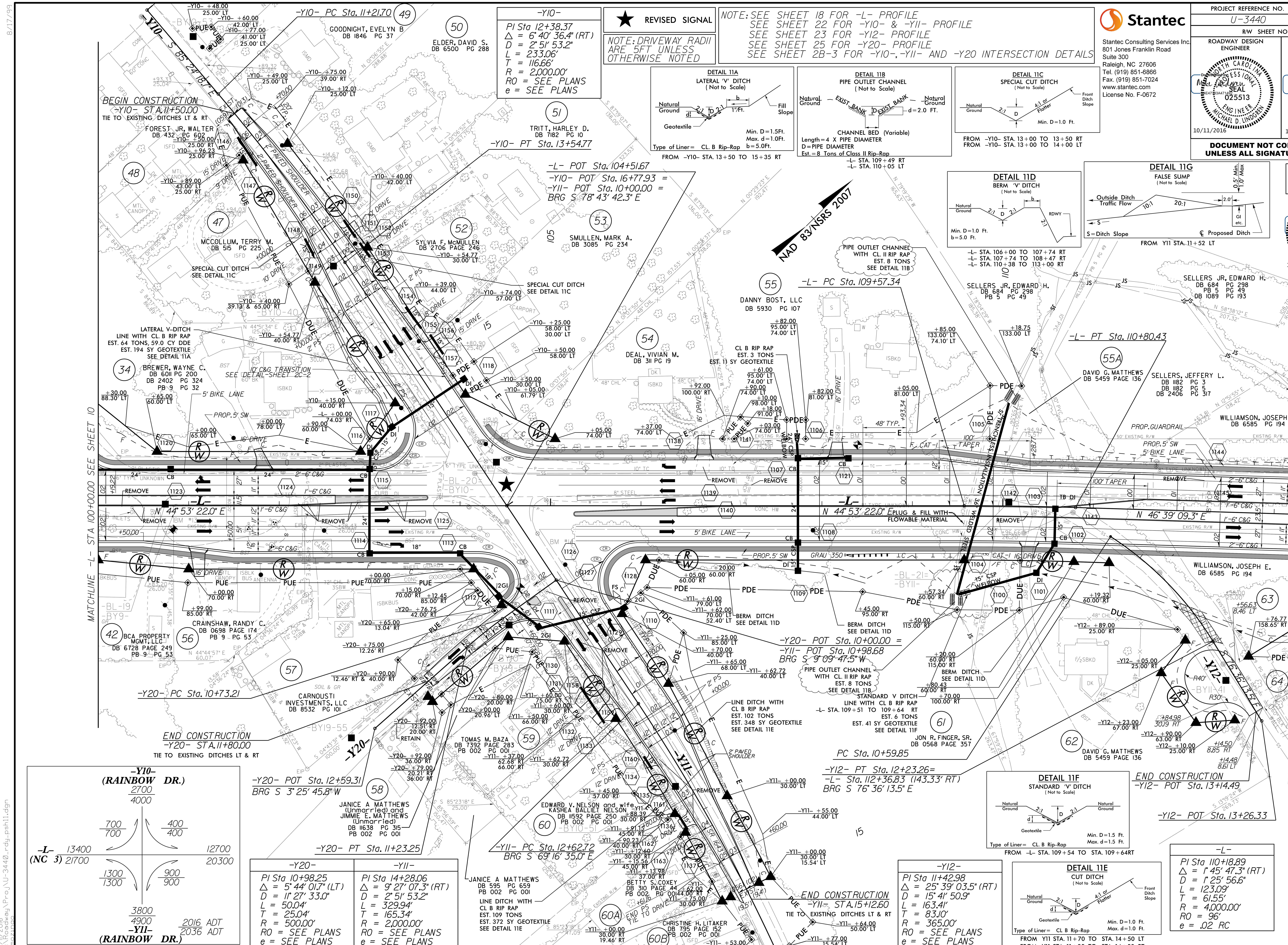
SEALED ONLY FOR REVISION AREAS

SEAL 034986 — ANTHONY W. GRUBBS — 10/11/2016

★ REVISED SIGNAL

NOTE: DRIVEWAY RADII ARE 5FT UNLESS OTHERWISE NOTED

NOTE: SEE SHEET 18 FOR -L- PROFILE
SEE SHEET 22 FOR -Y10- & -Y11- PROFILE
SEE SHEET 23 FOR -Y12- PROFILE
SEE SHEET 25 FOR -Y20- PROFILE
SEE SHEET 2B-3 FOR -Y10-, -Y11- AND -Y20 INTERSECTION DETAILS



-Y10-
PI Sta 12+38.37
Δ = 6° 40′ 36.4″ (RT)
D = 2° 51′ 53.2″
L = 233.06′
T = 116.66′
R = 2,000.00′
RO = SEE PLANS
e = SEE PLANS

-Y20-	-Y11-
PI Sta 10+98.25	PI Sta 14+28.06
Δ = 5° 44′ 01.7″ (LT)	Δ = 9° 27′ 07.3″ (RT)
D = 11° 27′ 33.0″	D = 2° 51′ 53.2″
L = 50.04′	L = 329.94′
T = 25.04′	T = 165.34′
R = 500.00′	R = 2,000.00′
RO = SEE PLANS	RO = SEE PLANS
e = SEE PLANS	e = SEE PLANS

-Y12-
PI Sta 11+42.98
Δ = 25° 39′ 03.5″ (RT)
D = 15° 41′ 50.9″
L = 163.41′
T = 83.10′
R = 365.00′
RO = SEE PLANS
e = SEE PLANS

-L-
PI Sta 110+18.89
Δ = 1° 45′ 47.3″ (RT)
D = 1° 25′ 56.6″
L = 123.09′
T = 61.55′
R = 4,000.00′
RO = 96′
e = .02 RC

-Y10- (RAINBOW DR.) 2700 / 4000
-L- (NC 3) 13400 / 21700 — 12700 / 20300
700/700 — 400/400 — 1300/1300 — 900/900
3800 / 4900
-Y11- (RAINBOW DR.)
2016 ADT
2036 ADT

MATCHLINE -L- STA 100+00.00 SEE SHEET 10
MATCHLINE -L- STA 113+25.00 SEE SHEET 12

10/11/2016
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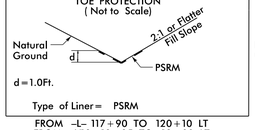
8/17/99

REVISIONS

DETAIL 12A
TOE PROTECTION
(Not to Scale)

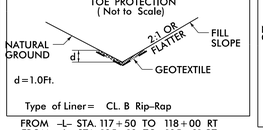


d = 1.0Ft.

Type of Liner = PSRM

FROM –L– 117+90 TO 120+10 LT
FROM –Y13– 12+25 TO 13+00 LT

DETAIL 12B
TOE PROTECTION
(Not to Scale)

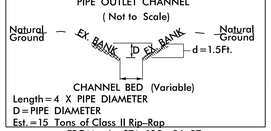


d = 1.0Ft.

Type of Liner = CL. B Rip-Rap

FROM –L– STA. 117+50 TO 118+00 RT
FROM –L– STA. 125+12 TO 125+31 RT
FROM –L– STA. 125+41 TO 127+00 RT

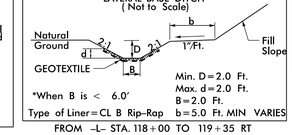
DETAIL 12C
PIPE OUTLET CHANNEL
(Not to Scale)



CHANNEL BED (Variable)
Length = 4 X PIPE DIAMETER
D = PIPE DIAMETER
Est. = 15 Tons of Class II Rip-Rap

FROM –L– STA. 125+36 RT

DETAIL 12D
LATERAL BASE DITCH
(Not to Scale)



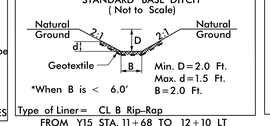
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 2.0 Ft.

*When B is < 6.0'

Type of Liner = CL B Rip-Rap b = 5.0 Ft. MIN VARIES

FROM –L– STA. 118+00 TO 119+35 RT

DETAIL 12E
STANDARD BASE DITCH
(Not to Scale)



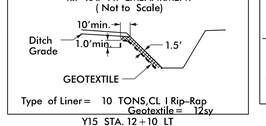
Min. D = 2.0 Ft.
Max. d = 1.5 Ft.
B = 2.0 Ft.

*When B is < 6.0'

Type of Liner = CL B Rip-Rap

FROM Y15 STA. 11+68 TO 12+10 LT

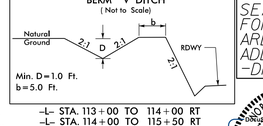
DETAIL 12F
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = 10 TONS, CL I Rip-Rap
Geotextile = 12sy

Y15 STA. 12+10 LT

DETAIL 12G
BERM 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
b = 5.0 Ft.

–L– STA. 113+00 TO 114+00 RT
–L– STA. 114+00 TO 115+50 RT

SEALED ONLY FOR REVISION AREAS & THE ADDITION OF –DR3–

NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
10/11/2016

NORTH CAROLINA PROFESSIONAL SEAL 034986 ENGINEER ANTONY W. GIBBS
10/11/2016

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BOWDEN
10/11/2016

PROJECT REFERENCE NO.	SHEET NO.
U-3440	12
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

–DR3–
PI Sta 10+60.22
△ = 18° 16' 43.5" (RT)
D = 22° 55' 05.9"
L = 79.76'
T = 40.22'
R = 250.00'
RO = N/A
e = NC (.02)

–Y16–
PI Sta 12+61.36
△ = 16° 52' 51.3" (LT)
D = 38° 11' 49.9"
L = 44.19'
T = 22.26'
R = 150.00'
RO = SEE PLANS
e = SEE PLANS

–Y13–
PI Sta 11+73.86
△ = 65° 56' 54.4" (RT)
D = 71° 37' 11.0"
L = 92.08'
T = 51.90'
R = 80.00'
RO = SEE PLANS
e = SEE PLANS

–RABT– (CIRCLE)
PI Sta 0+00.00
△ = 360° 00' 00.0" (RT)
D = 93° 55' 39.0"
L = 383.27'
T = 0.00'
R = 61.00'
RO = SEE PLANS
e = SEE PLANS

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–Y13– –L– STA 113+25.00 SEE SHEET 11

–Y13– –L– STA 126+50.00 SEE SHEET 13

–Y14– (FRANKLIN AVE.)
2400 / 3400
1900/2400 | 500/1000
–L– (NC 3) 12800 | 11800
20400 | 19400
50/50 | 200/200
200/200
–Y15– (MILLER ST.)
2016 ADT
2036 ADT

–Y13– (MASON ST.)
2016 ADT
2036 ADT
200 / 200
50/50 | 50/50
–L– (NC 3) 12800 | 11800
20400 | 19400

–L–
PI Sta 120+71.54
△ = 22° 22' 58.0" (RT)
D = 2° 51' 53.2"
L = 781.31'
T = 395.70'
R = 2,000.00'
RO = 104'
e = .025

–Y15–
PI Sta 12+49.25
△ = 55° 36' 22.2" (LT)
D = 38° 11' 49.9"
L = 145.58'
T = 79.10'
R = 150.00'
RO = SEE PLANS
e = SEE PLANS

NOTE: DRIVEWAY RADII ARE 5FT UNLESS OTHERWISE NOTED

NOTE: SEE SHEETS 18 THRU 19 FOR –L– PROFILE
SEE SHEET 23 FOR –Y13–, –Y14– & –Y15– PROFILE
SEE SHEET 24 FOR –Y16– & –DR3– PROFILE
SEE SHEET 25 FOR –RABT– PROFILE
SEE SHEET 2B-2 FOR –DR3– DETAIL
SEE SHEET 2B-4 FOR –L–, –Y14–, & –Y15– ROUNDABOUT DETAIL
SEE CULVERT SHEETS C2-1THRU C2-8

*SEE DETAIL SHEET 2C-2 FOR CURB AND GUTTER 10' TRANSITION TO PAVED SHOULDER

SCGR = SHOPCURVED GAURDRAIL

–Y16–
2016 ADT
2036 ADT
(CYPRESS AVE.)
50/50
50/50 | 50/50
–L– (NC 3) 11800 | 11800
19400 | 19400

10/11/2016
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mpatton

PROJECT REFERENCE NO.	SHEET NO.
U-3440	13

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN 10/4/2016	NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR 10/5/2016

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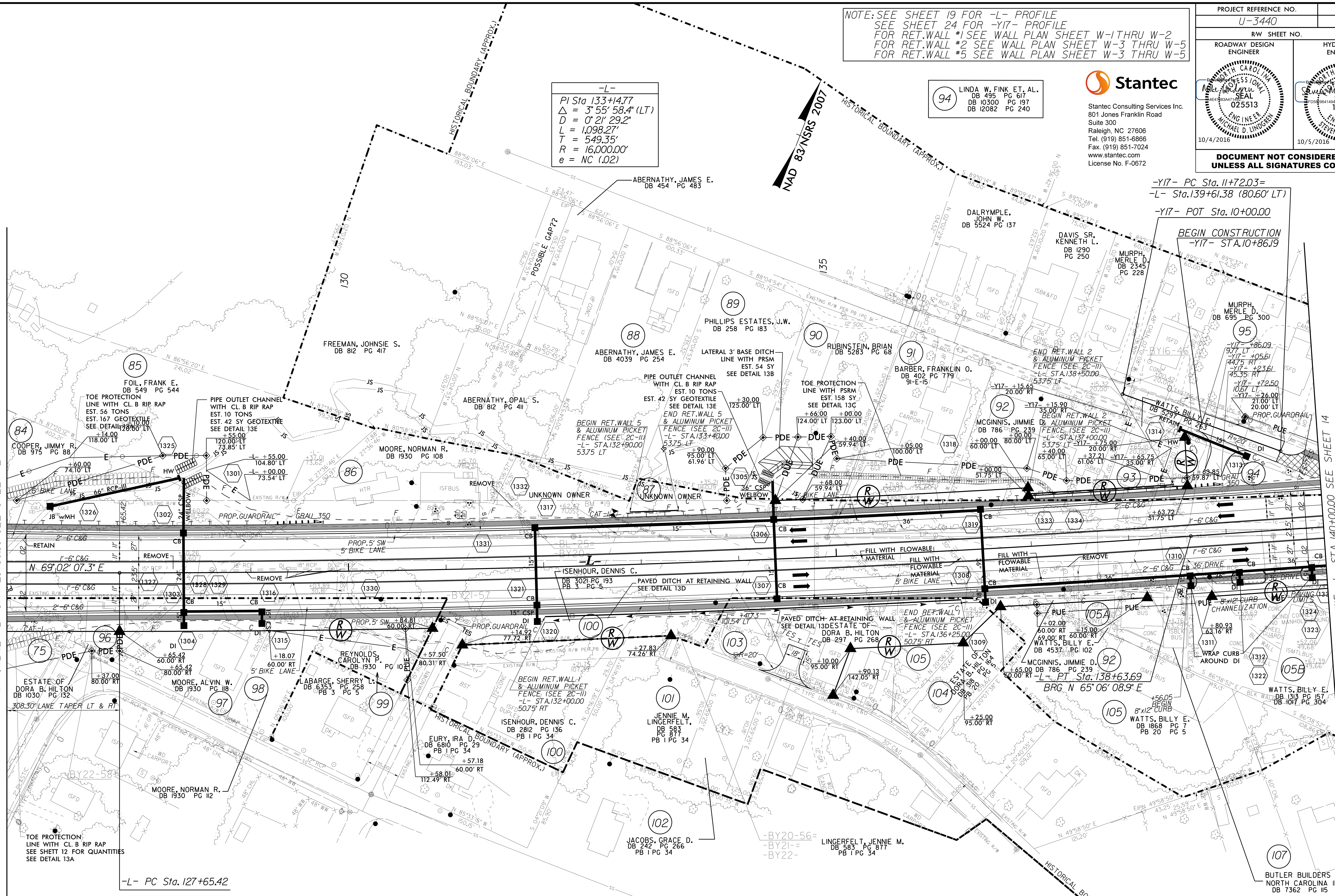
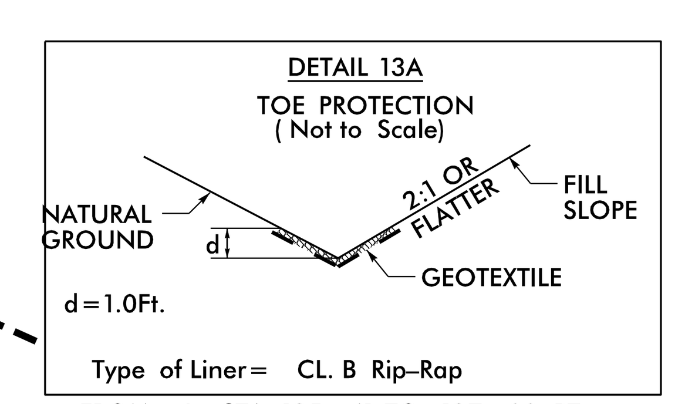
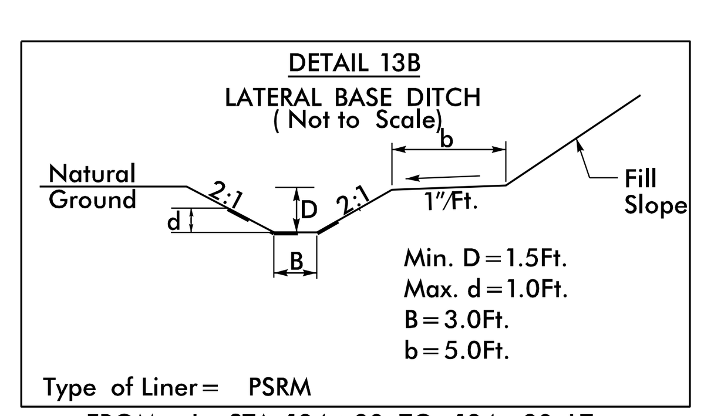
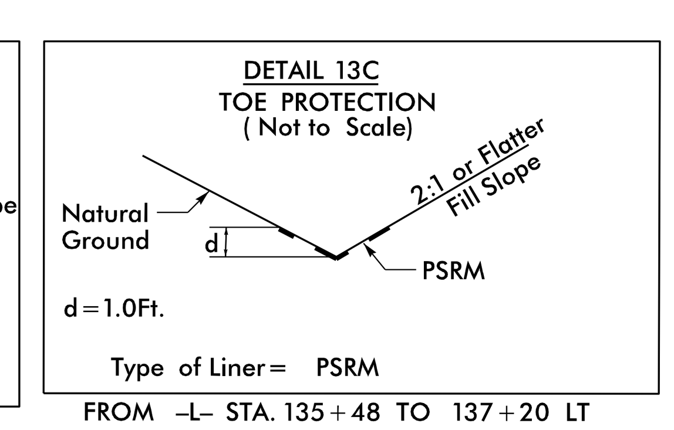
NOTE: SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 24 FOR -Y17- PROFILE
FOR RET.WALL #1 SEE WALL PLAN SHEET W-1 THRU W-2
FOR RET.WALL #2 SEE WALL PLAN SHEET W-3 THRU W-5
FOR RET.WALL #5 SEE WALL PLAN SHEET W-3 THRU W-5

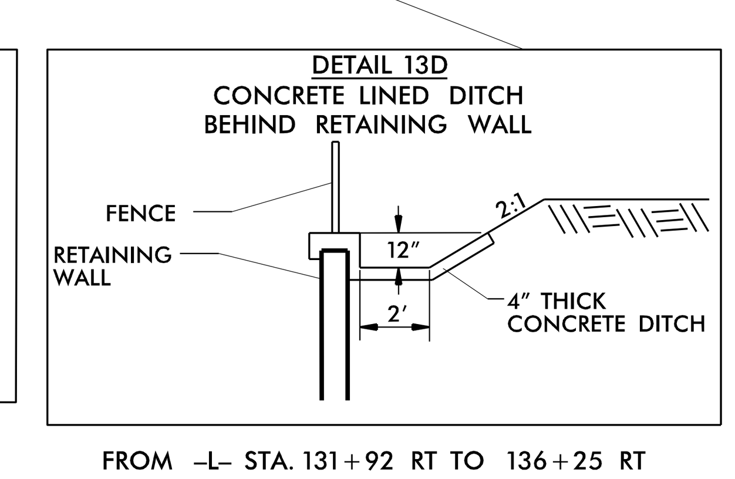
-L-
PI Sta 133+14.77
Δ = 3° 55' 58.4" (LT)
D = 0° 21' 29.2"
L = 1,098.27'
T = 549.35'
R = 16,000.00'
e = NC (.02)

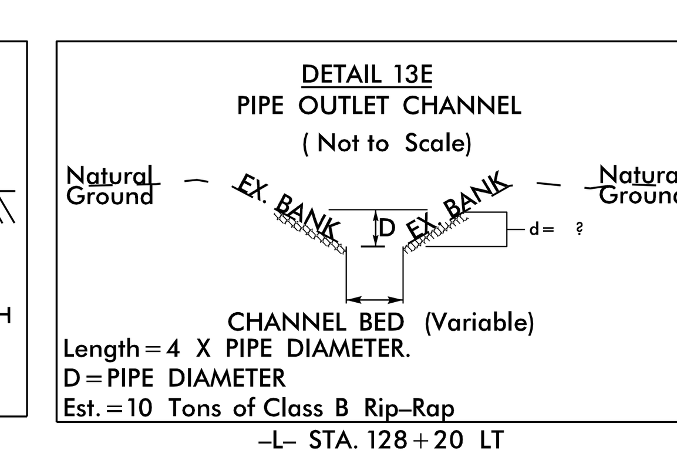












REVISIONS

8/17/99

10/4/2016
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	14
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: SEAL 025513 ENGINEER MICHAEL D. LINDGREN — 10/4/2016

HYDRAULICS ENGINEER: SEAL 12786 ENGINEER STEVEN M. BONDON — 10/5/2016

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REVISIONS 8/17/99

-Y18- (WEST D ST.) 200/300 — -L- (NC 3) 13000/21300 — 13400/21600 — -Y19- (WEST D ST.) 400/600 — 2016 ADT 2036 ADT

NOTE: SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 24 FOR -Y17-, -Y18- & -Y19- PROFILE
SEE SHEET 25 FOR -Y21-, -Y22- & -DR2- PROFILE
SEE SHEET 28-2 FOR -L-, -Y18-, -Y19-, -Y21- & -DR2- INTERSECTION DETAIL
FOR RET.WALL #3 SEE WALL PLAN SHEET W-6 THRU W-7
FOR RET.WALL #4 SEE WALL PLAN SHEET W-8 THRU W-9

★ REVISED SIGNAL

HISTORICAL BOUNDARY MARKER

NAD 83/NSRS 2007

-L-
PI Sta 142+98.62
△ = 1° 30' 00.0" (RT)
D = 1° 00' 00.0"
L = 150.00'
T = 75.00'
R = 5,729.58'
e = NC (.02)

-Y18- POT Sta. 10+00.00
BRG S 27° 18' 01.0" E

BEGIN CONSTRUCTION -Y18- STA.10+96.00

-L- POT Sta. 143+98.21 = -Y18- POT Sta. 12+37.34

BEGIN CONSTRUCTION -DR2- STA.11+65.00

-DR2- POT Sta.10+00.00

END CONSTRUCTION -Y19- STA.11+50.00

-L- PC Sta. 142+23.62

-L- PT Sta. 143+73.62

-Y19- PC Sta. 11+20.28

-Y19- PT Sta. 11+27.83 BRG S 30° 11' 50.9" E

-Y19- POT Sta. 12+62.71

-Y19- POT Sta. 10+00.00

-L- POT Sta. 145+49.41 = -DR2- POT Sta. 12+32.15

-L- POT Sta. 143+99.74 = -Y19- POT Sta. 10+00.00

-Y22- POT Sta. 10+00.00

BEGIN CONSTRUCTION -Y22- STA.10+00.00

-L- POT Sta. 149+81.04 = -Y21- POT Sta. 9+81.05 = -Y22- POT Sta. 13+63.62

END CONSTRUCTION -Y21- STA.14+07.92 TIE TO EXISTING

-Y21- N 65° 39' 32.6" E

END CONSTRUCTION -Y22- STA.18+50.00 MATCH EXISTING

END TIP PROJECT U-3440
-L- STA. 149+81.04
CASTLE & COOKE NCRC LLC
DB 8416 PG 210

MATCHLINE -L- STA.140+00.00 SEE SHEET 13

-Y22- (DALE EARNHARDT BLVD.) 22000/32700 — -L- (NC 3) 13400/21600 — 5700/22200 — -Y21- (WATSON-CRICK DRIVE) — 6400/12200, 1800/2200, 5600/7700, 1600/1800 — 21000/27800 -Y22- (DALE EARNHARDT BLVD.) — 2016 ADT 2036 ADT

STAGGERED CROSSWALK DETAIL
DETAIL SCALE 5' 0' 5' 10' 2.5'
CROSSWALK (GRASS MEDIAN) 6.0' 8.0' 6.0' (GRASS MEDIAN) CROSSWALK
-L- 140+11.43 1.00' LT
-L- 140+31.97 1.00' RT
1'-6" C&G (TYP.)
ALL RADII = 3.0'
ALL MATERIALS TO BE APPROVED BY THE ENGINEER. DECORATIVE CROSSWALK, SEE PMP

-Y19-
PI Sta 11+24.06
△ = 2° 09' 44.8" (LT)
D = 28° 38' 52.4"
L = 7.55'
T = 3.77'
R = 200.00'
RO = SEE PLANS
e = SEE PLANS

10/4/2016
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PROJECT REFERENCE NO.	SHEET NO.
U-3440	15

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDSEY
8/17/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDON
8/17/2016

–L–

BEGIN GRADE
–L– STA. 10+10.00
EL. 822.04

PI = 10+85.00
EL = 822.82'
VC = 150'
K = 164

KANAPOLIS PKWY (SB)
–L– STA. 11+93.26 =
–Y– STA. 10+00.00

PI = 12+35.00
EL = 825.75'
VC = 150'
K = 207

PI = 15+20.00
EL = 829.25'
VC = 420'
K = 151

PROPOSED GRADE

PI = 19+35.00
EL = 822.80'
VC = 410'
K = 86

PI = 23+75.00
EL = 795.00'
VC = 300'
K = 772

(+)1.0400%
(+)1.9533%
(+)1.2281%
(–)1.5542%
(–)6.3182%
(–)6.3182%
(–)5.9294%

KANAPOLIS PKWY (NB)
–L– STA. 12+50.58 =
–Y1– STA. 10+00.00

EXISTING GROUND

BOY SCOUT CAMP ROAD
–L– STA. 17+34.33 =
–Y2– STA. 10+00.00

BM #2
RR SPIKE IN BASE OF POWER POLE
66.46' LT. OF –L– STA 17+12.51
ELEV. 830.41'

FOR –L– PLAN VIEW SEE SHEETS 4 THRU 5

BEGIN LATERAL V DITCH –L– STA. 26+75.00 RT
ELEV. = 772.5

END LATERAL V DITCH –L– STA. 27+32.00 RT
ELEV. = 770.0'

PI = 26+30.00
EL = 779.88'
VC = 150'
K = 181

PI = 28+55.00
EL = 768.40'
VC = 150'
K = 173

MILLER ROAD
–L– STA. 29+85.00 =
–Y3– STA. 12+33.06

PI = 31+50.00
EL = 755.91'
VC = 150'
K = 254

PI = 34+00.00
EL = 743.85'
VC = 150'
K = 412

PROPOSED GRADE

PI = 36+50.00
EL = 732.70'
VC = 160'
K = 226

(–)5.9294%
(–)5.1022%
(–)4.40%
(–)2.20%
(–)4.00%
(+)5.00%
(–)14.2339%
(–)14.8246%
(–)14.4600%
(–)5.1667%
(–)7.80%

PI = 27+50.00
El = 767.00

PI = 28+00.00
El = 765.00

EXISTING GROUND

PI = 37+50.00
El = 709.90

PI = 38+00.00
El = 709.00

BEGIN LATERAL V DITCH –L– STA. 27+00.00 LT
ELEV. = 768.1'

END LATERAL V DITCH –L– STA. 28+20.00 LT
ELEV. = 764.0'

BM #3
RR SPIKE IN BASE OF 18" PINE
99.82' LT. OF –L– STA 27+68.37
ELEV. 768.85'

BEGIN LATERAL V DITCH –L– STA. 37+00.00 LT
ELEV. = 711.0'

FOR –L– PLAN VIEW SEE SHEETS 5 THRU 6

LATERAL V DITCH
LATERAL BASE DITCH

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smcraven

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	16

ROADWAY DESIGN ENGINEER — SEAL 025513, MICHAEL D. LINDGREN, ENGINEER, NORTH CAROLINA, 8/17/2016

HYDRAULICS ENGINEER — SEAL 12786, STEVEN M. BONDOR, ENGINEER, NORTH CAROLINA, 8/17/2016

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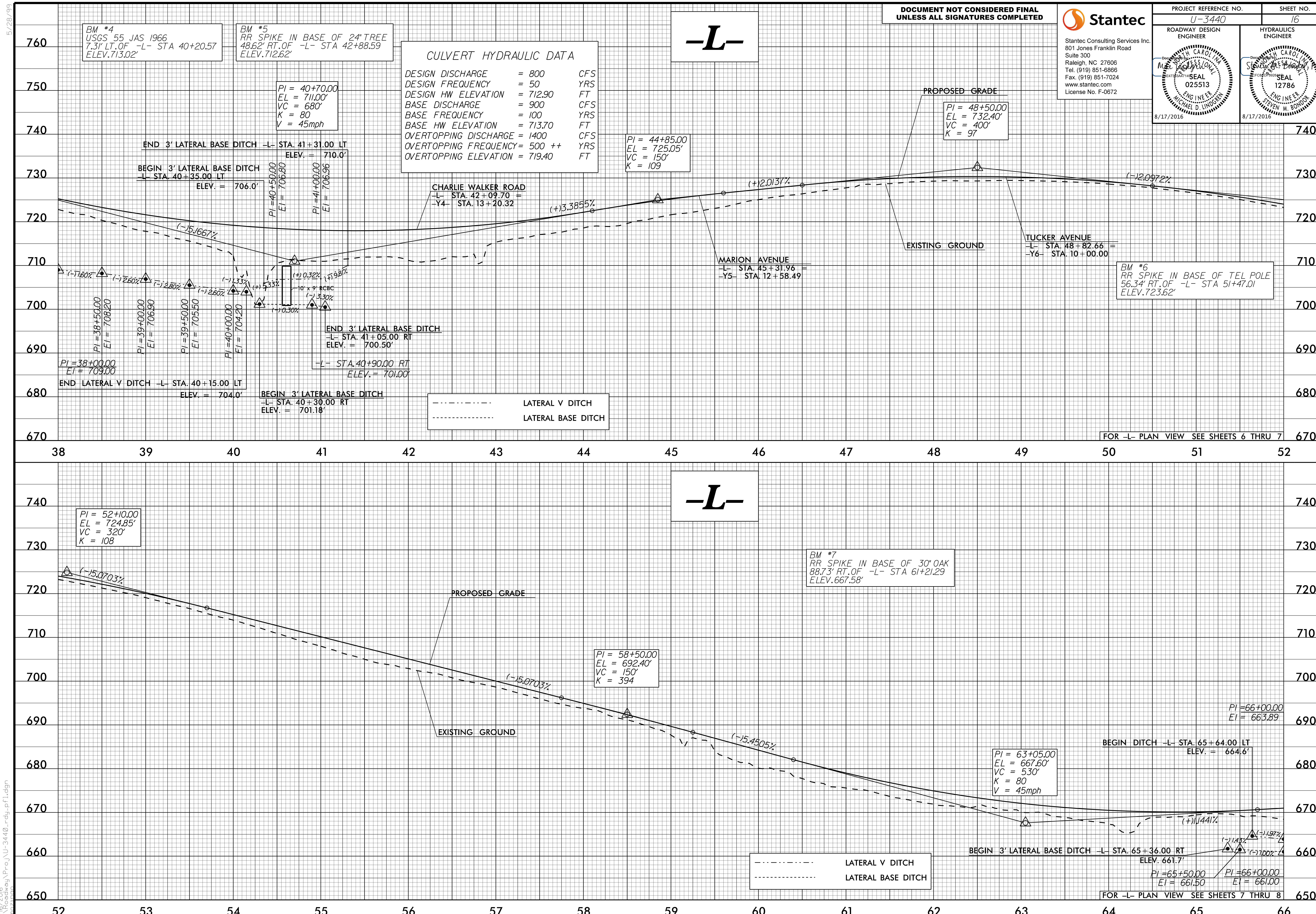
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 712.90	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 713.70	FT
OVERTOPPING DISCHARGE	= 1400	CFS
OVERTOPPING FREQUENCY	= 500 ++	YRS
OVERTOPPING ELEVATION	= 719.40	FT



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PROJECT REFERENCE NO.	SHEET NO.
U-3440	17

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
8/17/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDON
8/17/2016

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4700	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 665.4	FT
BASE DISCHARGE	= 5200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 665.86	FT
OVERTOPPING DISCHARGE	= 13200	CFS
OVERTOPPING FREQUENCY	= 500 ++	YRS
OVERTOPPING ELEVATION	= 670.5	FT
DATE OF SURVEY	= 8/10/2013	
W.S.ELEVATION AT DATE OF SURVEY	= 652.64	FT

BM #8
NCSHC 7-LB-5 1973
41.02' RT. OF -L- STA 68+67.09
ELEV. 667.83'

BM #9
RR SPIKE IN BASE OF 36" OAK
39.01' LT. OF -L- STA 76+26.55
ELEV. 685.04'

PI = 66+00.00
El = 665.89

PI = 66+50.00
El = 663.30

PI = 67+00.00
El = 660.00

PI = 67+50.00
El = 658.50

BEGIN LATERAL V DITCH -L- STA. 67+90.00 RT
ELEV. = 656.3'

-L- STA. 67+60.60
BEGIN BRIDGE

PI = 68+60.00
EL = 673.95'
VC = 200'
K = 109

END 3' LATERAL BASE DITCH
-L- STA. 68+50.00 LT
ELEV. = 655.0'

-L- STA. 68+90.60
END BRIDGE

PI = 70+00.00
El = 664.50

PI = 70+50.00
El = 665.00

PI = 71+00.00
El = 666.00

PI = 71+50.00
El = 667.50

PI = 72+00.00
El = 668.50

PI = 72+50.00
El = 669.00

END LATERAL V DITCH -L- STA. 73+00.00 RT
ELEV. = 669.17'

PI = 73+55.00
EL = 670.55'
VC = 650'
K = 85
V = 45mph

BETH PAGE ROAD
-L- STA. 73+53.39 =
-Y7- STA. 10+00.00

PROPOSED GRADE
EXISTING GROUND

PI = 79+65.00
EL = 713.20'
VC = 570'
K = 97

BEGIN LATERAL V DITCH -L- STA. 77+58.00 RT
ELEV. = 691.08

END LATERAL V DITCH -L- STA. 78+51.00 RT
ELEV. = 699.25'

PI = 66+50.00
El = 660.00

PI = 67+00.00
El = 658.50

PI = 67+50.00
El = 658.00

END 3' LATERAL BASE DITCH
-L- STA. 67+56.00 RT
ELEV. = 657.95'

PI = 68+00.00
El = 656.50

PI = 68+50.00
El = 657.50

BEGIN 8' BASE DITCH
-L- STA. 68+80.00 LT
ELEV. = 655.87'

PI = 69+00.00
El = 655.95

PI = 69+50.00
El = 661.00

BEGIN 8' BASE DITCH
-L- STA. 70+25.00 LT
ELEV. = 656.33'

END 8' BASE DITCH
-L- STA. 69+75.00 LT
ELEV. = 656.18'

PI = 71+00.000
El = 656.55'

PI = 71+50.000
El = 656.7

PI = 72+00.000
El = 656.85

PI = 72+50.000
El = 657.00

END 8' BASE DITCH
-L- STA. 73+00.00 LT
ELEV. = 657.40'

BASE DITCH
LATERAL BASE DITCH

FOR -L- PLAN VIEW SEE SHEETS 8 THRU 9

PI = 83+80.00
EL = 717.85'
VC = 260'
K = 142

PI = 86+00.00
EL = 716.30'
VC = 180'
K = 165

PROPOSED GRADE

PI = 87+80.00
EL = 717.00'
VC = 180'
K = 250

PI = 90+45.00
EL = 716.12'
VC = 160'
K = 217

PI = 92+00.00
EL = 716.75'
VC = 150'
K = 1182

PI = 93+50.00
EL = 717.55'
VC = 150'
K = 668

EXISTING GROUND

PIPE HYDRAULIC DATA
-L- Sta.86+12 (Str.0909)

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 706.1	FT
100 YEAR DISCHARGE	= 82	CFS
100 YEAR HW ELEVATION	= 706.6	FT
OVERTOPPING FREQUENCY	= 500 ++	YRS
OVERTOPPING DISCHARGE	= 210	CFS
OVERTOPPING ELEVATION	= 718.5	FT

BM #10
RR SPIKE IN BASE OF 14" OAK
58.61' LT. OF -L- STA 82+86.14
ELEV. 716.60'

BM #11
RR SPIKE IN BASE OF POWER POLE
60.33' LT. OF -L- STA 90+54.31
ELEV. 715.30'

FOR -L- PLAN VIEW SEE SHEETS 9 THRU 10

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mhazlett

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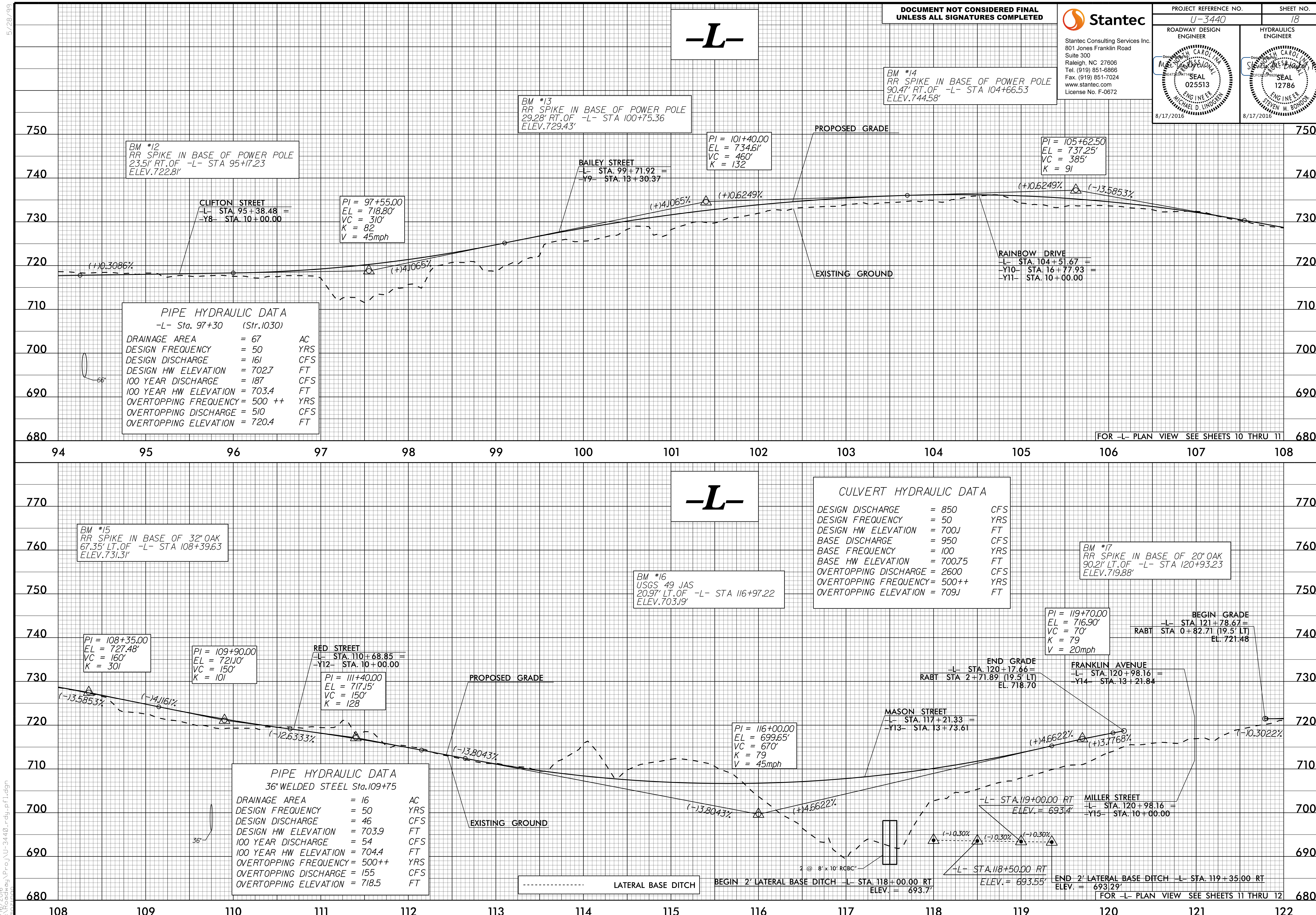
PROJECT REFERENCE NO.	SHEET NO.
U-3440	18

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN — 8/17/2016

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR — 8/17/2016

-L-



PIPE HYDRAULIC DATA
-L- Sta. 97+30 (Str.1030)

DRAINAGE AREA	=	67	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	161	CFS
DESIGN HW ELEVATION	=	702.7	FT
100 YEAR DISCHARGE	=	187	CFS
100 YEAR HW ELEVATION	=	703.4	FT
OVERTOPPING FREQUENCY	=	500 ++	YRS
OVERTOPPING DISCHARGE	=	510	CFS
OVERTOPPING ELEVATION	=	720.4	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	850	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	700.1	FT
BASE DISCHARGE	=	950	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	700.75	FT
OVERTOPPING DISCHARGE	=	2600	CFS
OVERTOPPING FREQUENCY	=	500++	YRS
OVERTOPPING ELEVATION	=	709.1	FT

PIPE HYDRAULIC DATA
36" WELDED STEEL Sta.109+75

DRAINAGE AREA	=	16	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	46	CFS
DESIGN HW ELEVATION	=	703.9	FT
100 YEAR DISCHARGE	=	54	CFS
100 YEAR HW ELEVATION	=	704.4	FT
OVERTOPPING FREQUENCY	=	500++	YRS
OVERTOPPING DISCHARGE	=	155	CFS
OVERTOPPING ELEVATION	=	718.5	FT

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	19

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDSKEN
8/17/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR
8/17/2016

BM #19
RR SPIKE IN BASE OF 36" OAK
53.27' LT. OF -L- STA 132+73.45
ELEV. 764.71'

BM #18
RR SPIKE IN BASE OF 36" OAK
8.65' RT. OF -L- STA 124+52.82
ELEV. 731.11'

PIPE HYDRAULIC DATA
66" RCP CL-IV Sta. 126+29

DRAINAGE AREA	= 42	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 111	CFS
DESIGN HW ELEVATION	= 723.1	FT
100 YEAR DISCHARGE	= 129	CFS
100 YEAR HW ELEVATION	= 723.7	FT
OVERTOPPING FREQUENCY	= 500++	YRS
OVERTOPPING DISCHARGE	= 350	CFS
OVERTOPPING ELEVATION	= 735.4	FT

PI = 122+25.00
EL = 721.34'
VC = 90'
K = 14
V = 30mph

PI = 123+50.00
EL = 728.80'
VC = 150'
K = 58
V = 40mph

PI = 125+00.00
EL = 733.85'
VC = 150'
K = 175

PI = 131+00.00
EL = 759.20'
VC = 600'
K = 199

(-)0.3022%
(+)5.9680%
(+)3.3667%
(+)4.2250%
(+)4.2250%
(+)1.2174%
(+)1.2174%
(+)4.0067%
(+)0.6717%

CYPRESS STREET
-L- STA. 123+80.39 =
-Y16- STA. 13+12.36

PROPOSED GRADE
EXISTING GROUND
66"

BEGIN 3' LATERAL BASE DITCH -L- STA. 134+30.00 LT
ELEV. = 742.5'

END 3' LATERAL BASE DITCH -L- STA. 134+80.00 LT
ELEV. = 743.5'

PI = 134+50.00
EL = 743.30

LATERAL V DITCH

FOR -L- PLAN VIEW SEE SHEETS 12 THRU 13

END GRADE
-L- STA. 149+42.54 =
-Y22- STA. 16+64.67
38.5' RT
EL. 824.10

BM #20
RR SPIKE IN BASE OF POWER POLE
53.81' LT. OF -L- STA 140+57.15
ELEV. 782.27'

BM #21
RR SPIKE IN BASE OF POWER POLE
5.60' LT. OF -L- STA 144+91.30
ELEV. 802.45'

PI = 136+75.00
EL = 766.20'
VC = 400'
K = 113

PI = 139+50.00
EL = 779.30'
VC = 150'
K = 376

PI = 146+80.00
EL = 811.16'
VC = 130'
K = 102

PI = 148+80.00
EL = 822.43'
VC = 120'
K = 41
V = 35mph

(+)1.1217%
(+)4.7636%
(+)4.3644%
(+)4.3644%
(+)5.6333%
(+)12.6803%

PROPOSED GRADE
EXISTING GROUND

PINE STREET
-L- STA. 140+65.25 =
-Y17- STA. 13+08.03

WEST D STREET
-L- STA. 143+98.21 =
-Y18- STA. 12+37.34

WEST D STREET
-L- STA. 143+99.74 =
-Y19- STA. 10+00.00

FOR -L- PLAN VIEW SEE SHEETS 13 THRU 14

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smeyers

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	20

ROADWAY DESIGN ENGINEER — SEAL 025513, MICHAEL D. LINDGREN — 8/17/2016

HYDRAULICS ENGINEER — SEAL 12786, STEVEN M. BONDOR — 8/17/2016

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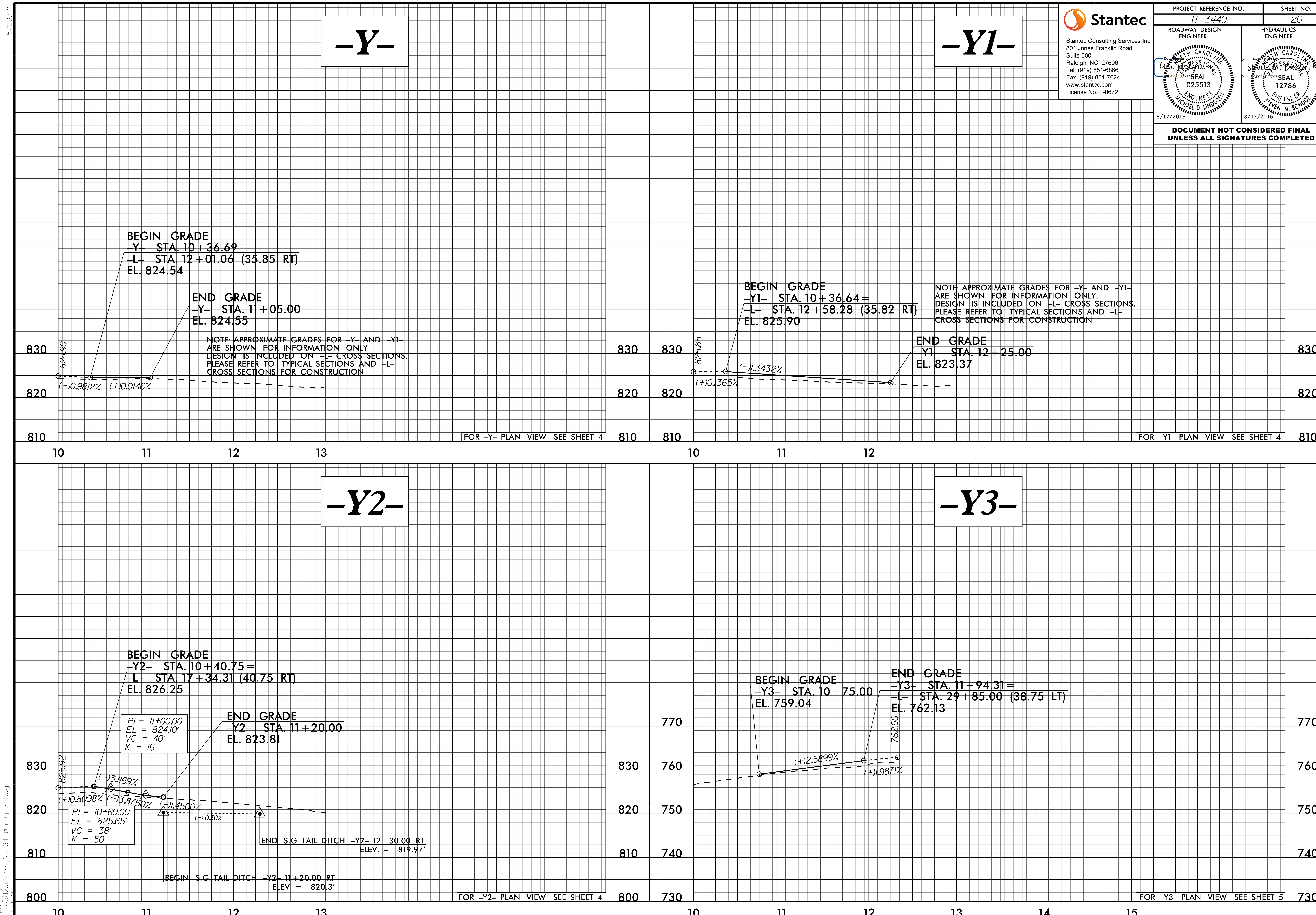

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	21

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025513 MICHAEL D. LINDGREN — 8/17/2016

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12786 STEVEN M. BONDOR — 8/17/2016

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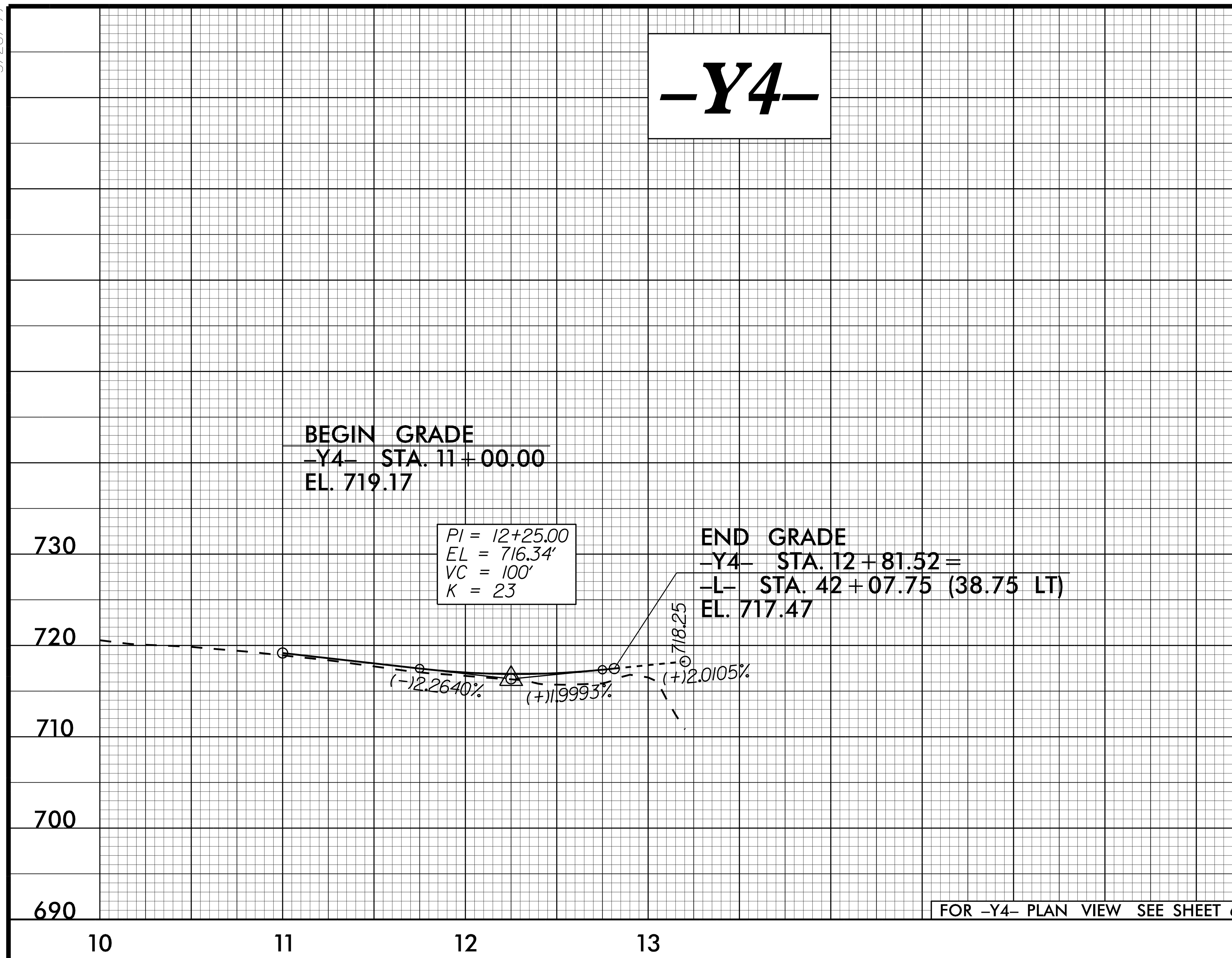

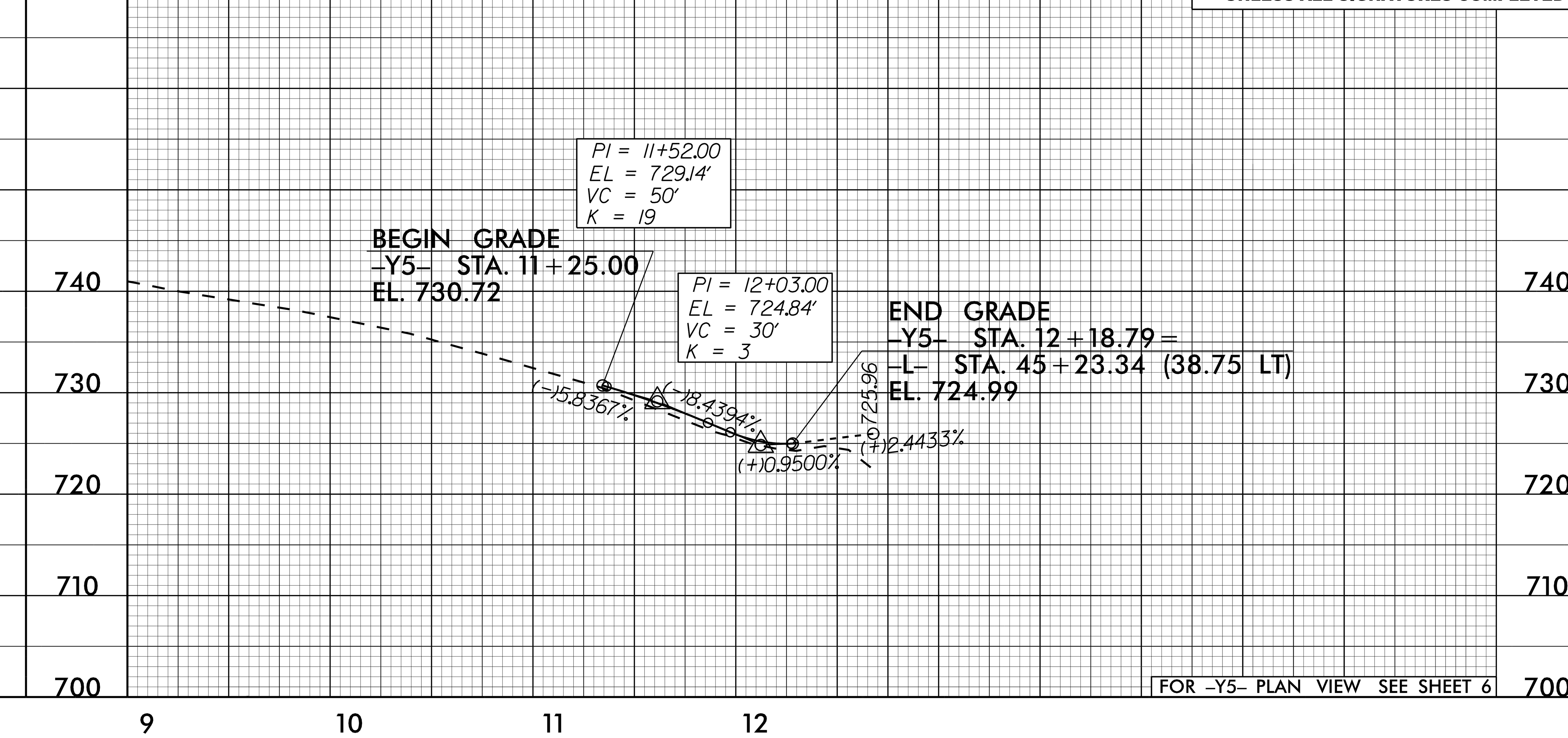

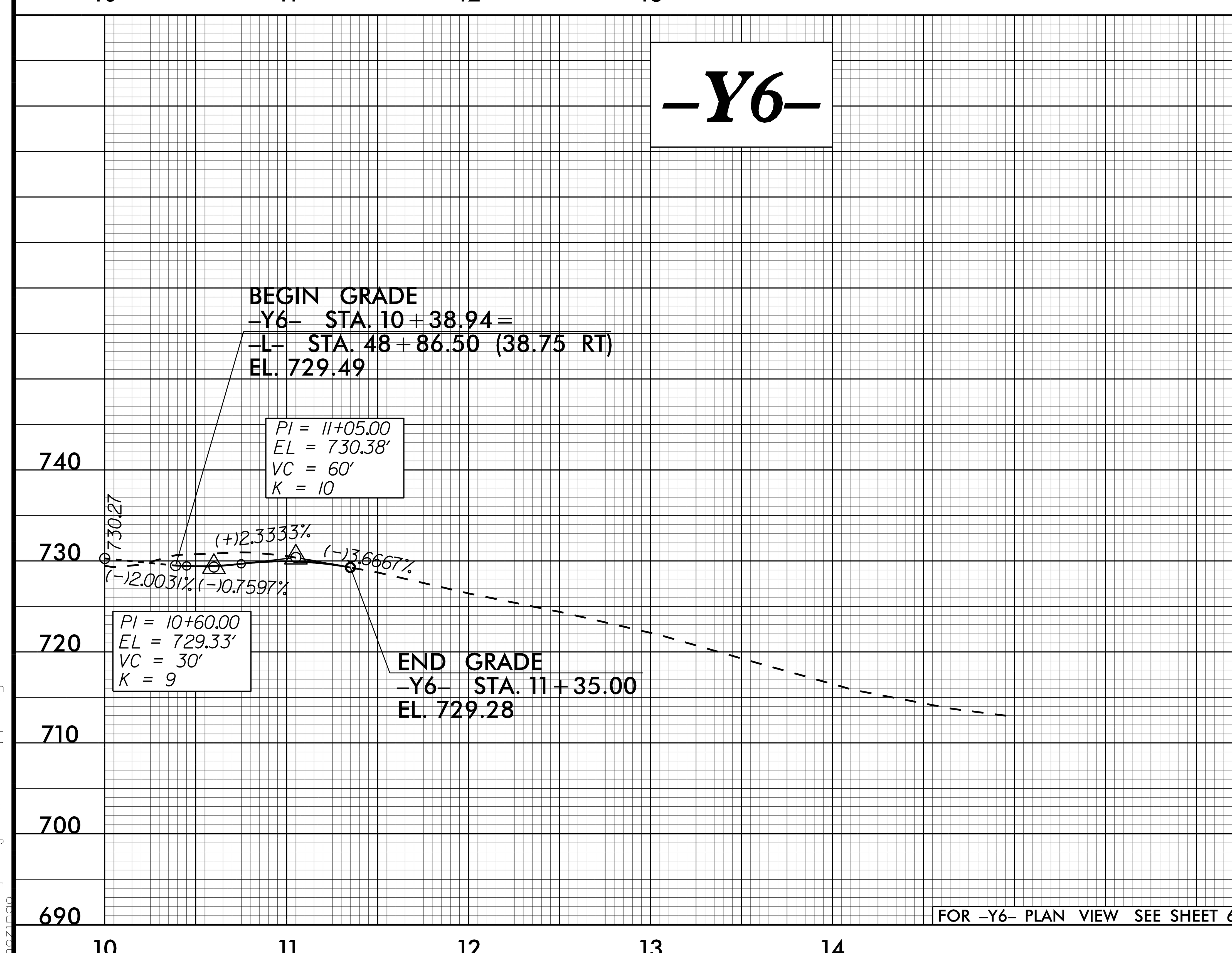

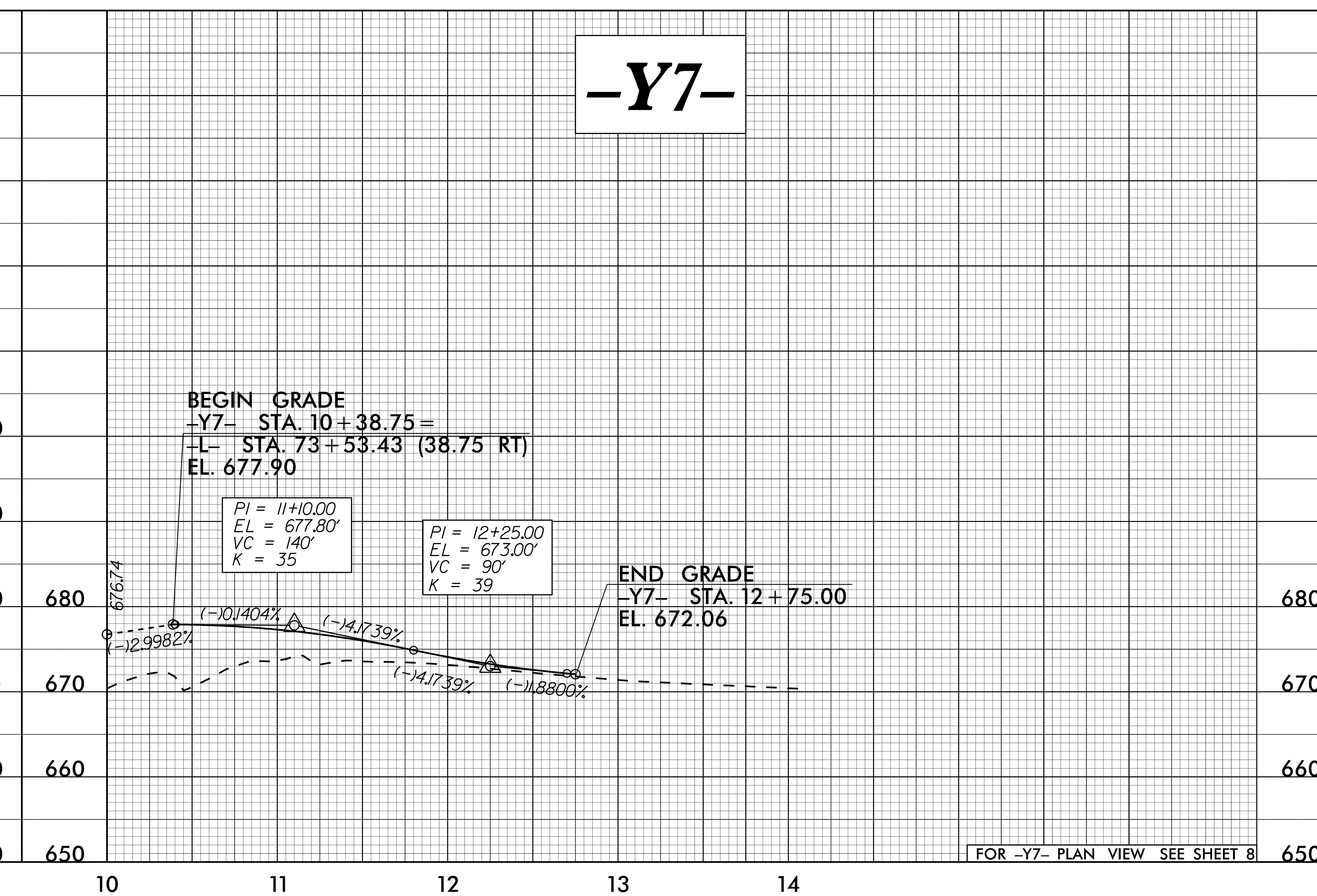

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PROJECT REFERENCE NO.	SHEET NO.
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DocuSigned by: Mike Lindgren A4E47383A471492... NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN 8/17/2016	DocuSigned by: Steven M. Bondor, PE 4CFC8CDF392644C... NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR 8/17/2016

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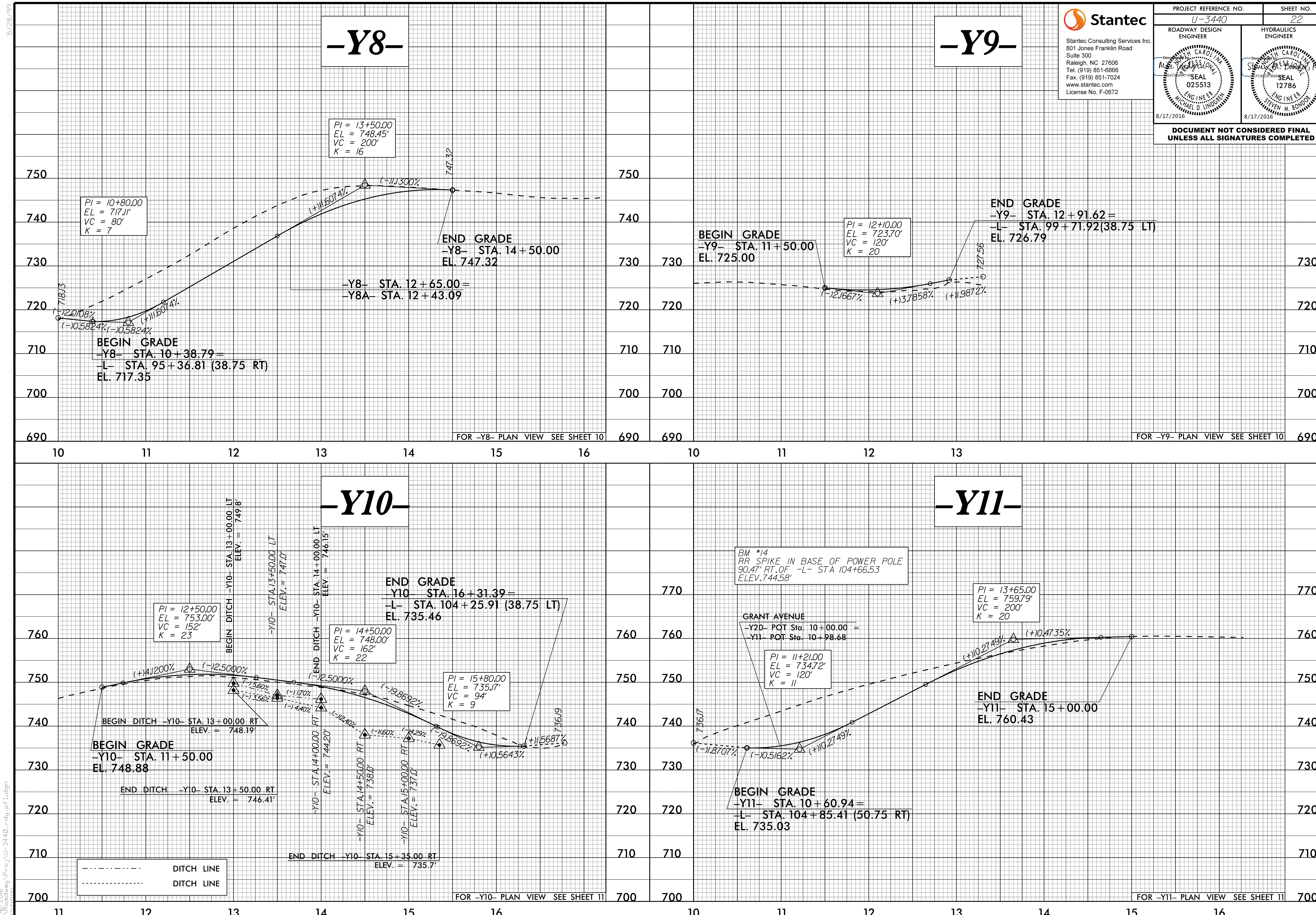

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PROJECT REFERENCE NO.	SHEET NO.
U-3440	23

ROADWAY DESIGN ENGINEER — SEAL 025513 — MICHAEL D. LINDGREN — 8/17/2016

HYDRAULICS ENGINEER — SEAL 12786 — STEVEN M. BONDOR — 8/17/2016

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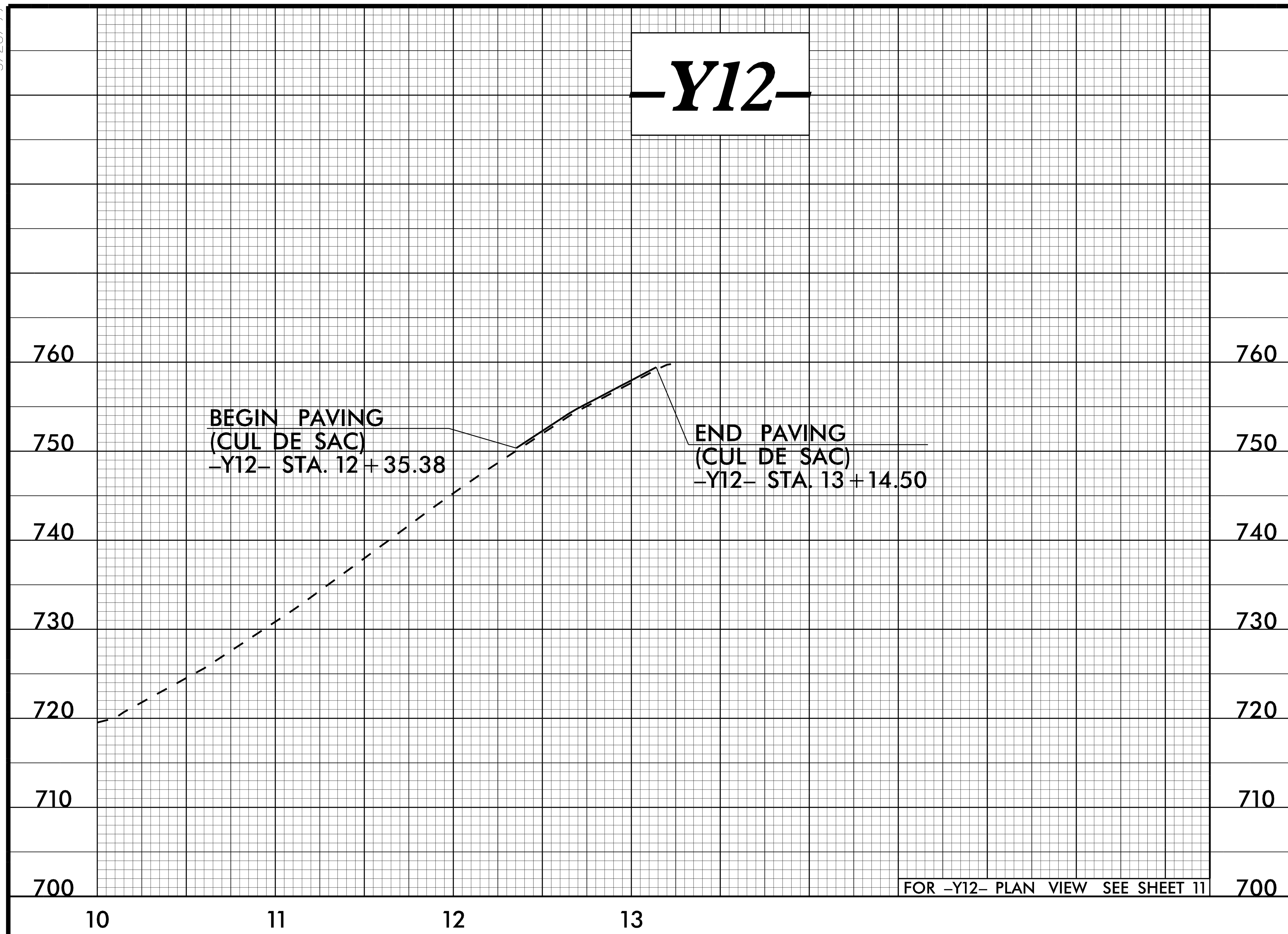

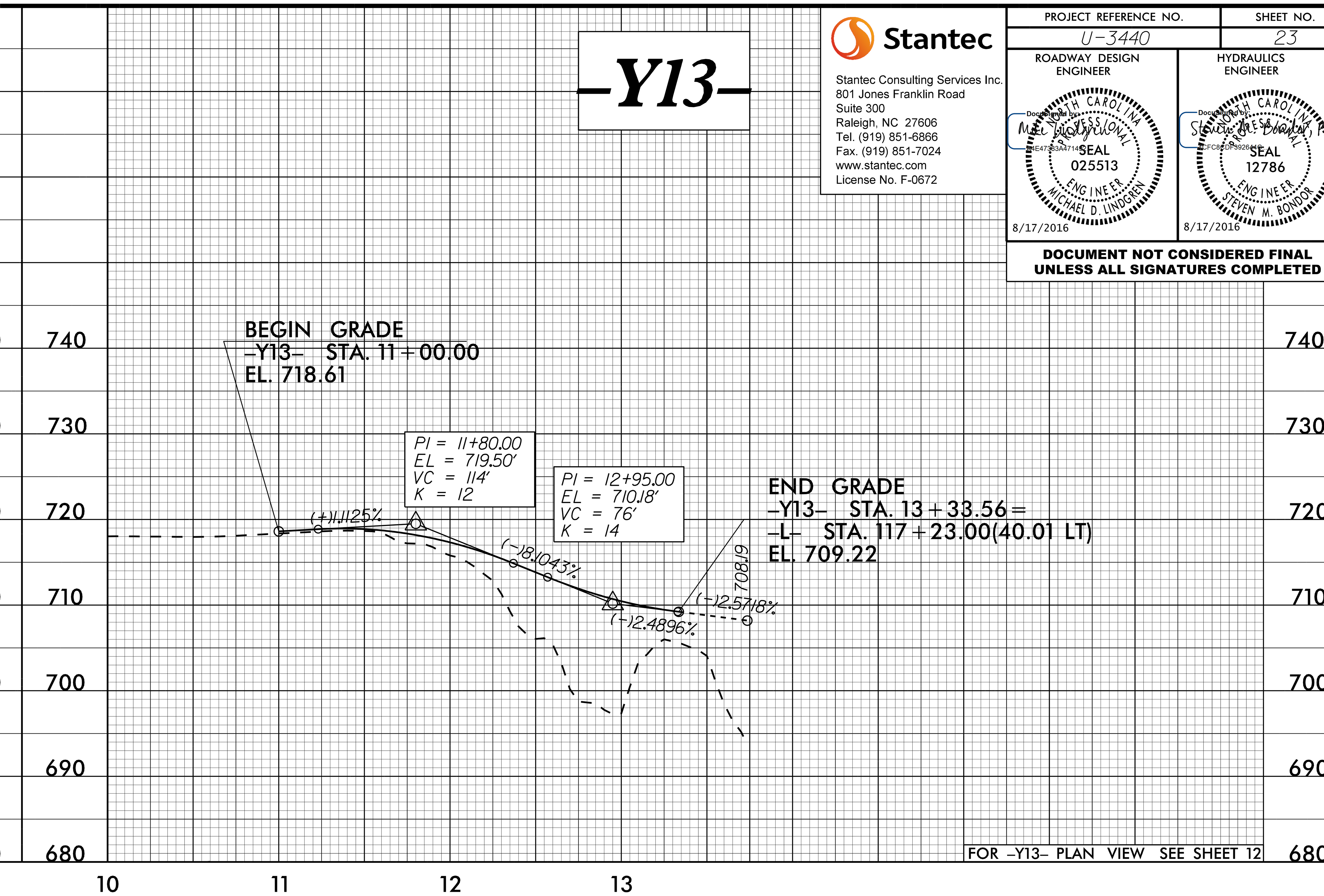

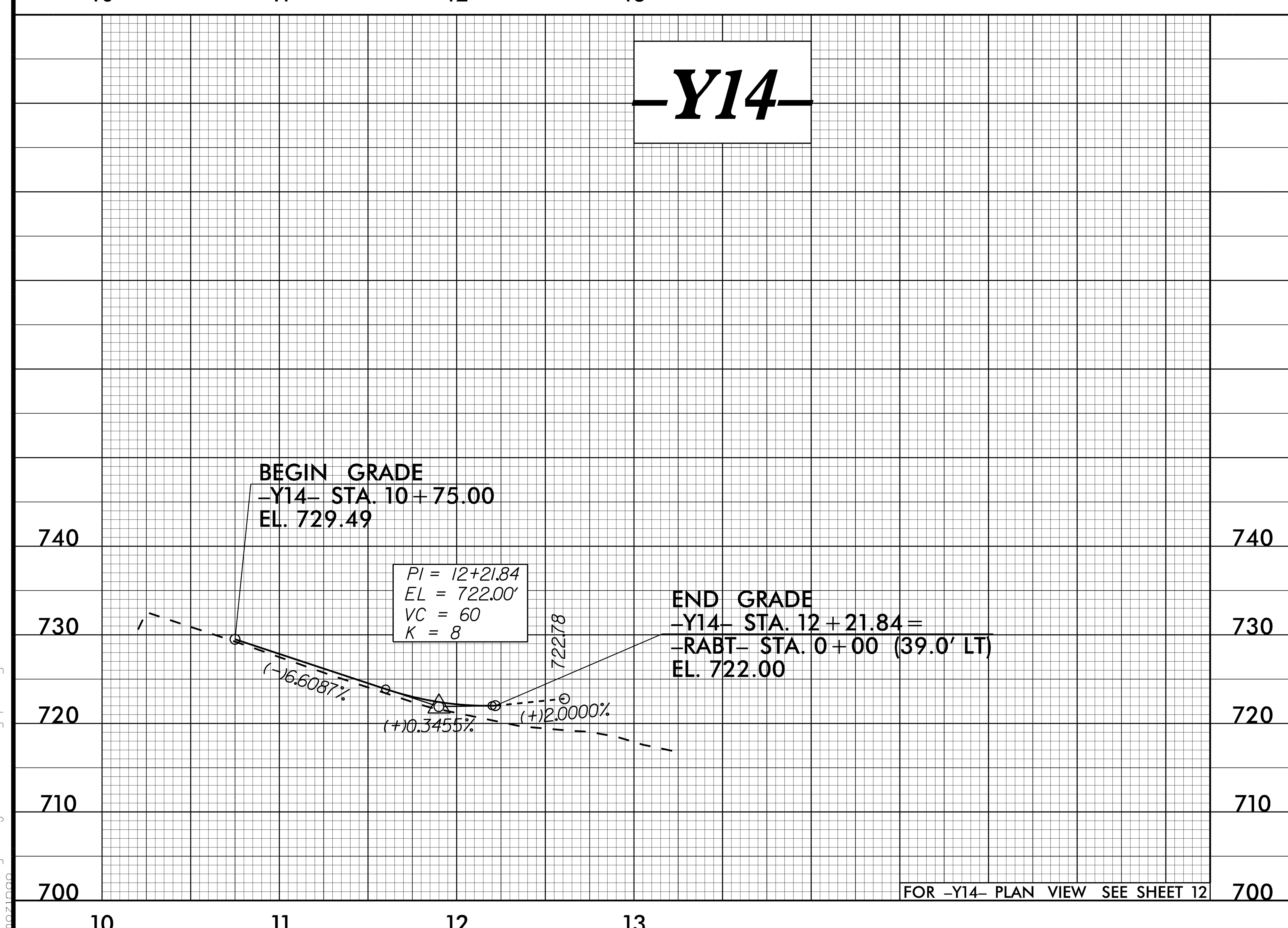

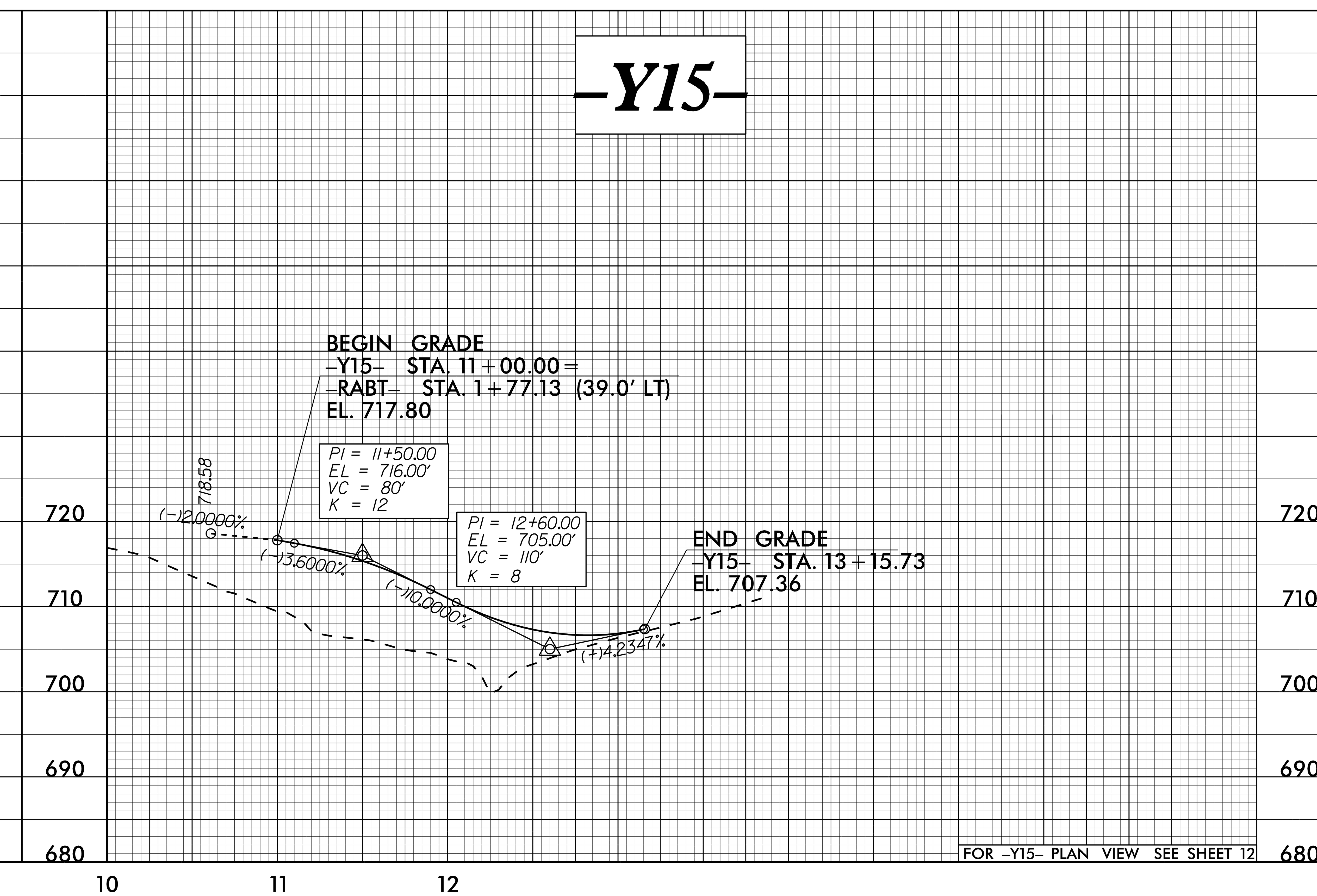

5/28/99

–Y16–

BEGIN GRADE
–Y16– STA. 11+50.00
EL. 738.66

PI = 11+85.00
EL = 736.58'
VC = 50'
K = 23

PI = 12+45.00
EL = 731.72'
VC = 45'
K = 9

–Y16– POT Sta. 12+12.86 =
–DR3– POT Sta. 11+28.82

(–)15.9429%
(–)8.1000%
(–)12.8369%
(–)3.1920%
129.65

END GRADE
–Y16– STA. 12+67.56 =
–L– STA. 123+88.36 (44.06 LT)
EL. 731.08

FOR –Y16– PLAN VIEW SEE SHEET 12

–DR3–

SEALED ONLY FOR REVISION –DR3– ADDED TO PLANS

NORTH CAROLINA PROFESSIONAL SEAL 034986 ENGINEER ANTHONY W. GRUBBS
10/11/2016

BEGIN GRADE
–DR3– STA. 10+23.63
EL. 730.50

(+)3.4824%

END GRADE
–DR3– STA. 11+19.66 =
–Y16– STA. 12+15.56 (8.75' RT)
EL. 733.84

FOR –DR3– PLAN VIEW SEE SHEET 12

–Y17–

BEGIN PAVING
–Y17– STA. 10+86.19

END PAVING
–Y17– STA. 11+72.03

FOR –Y17– PLAN VIEW SEE SHEETS 13 THRU 14

Stantec
Stantec Consulting Services Inc.
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.	SHEET NO.
U-3440	24

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDGREN
10/11/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDON
10/11/2016

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–Y18–

BEGIN GRADE
–Y18– STA. 11+13.90
EL. 800.86

PI = 11+60.00
EL = 799.81'
VC = 60
K = 39

END GRADE
–Y18– STA. 11+98.50 =
–L– STA. 143+95.57 (38.75 LT)
EL. 799.53

798.86

(–)12.2777%
(–)10.7273%
(–)11.7251%

FOR –Y18– PLAN VIEW SEE SHEET 14

–Y19–

BEGIN GRADE
–Y19– STA. 10+39.97 =
–L– STA. 144+02.97 (39.84 RT)
EL. 798.27

PI = 11+20.00
EL = 798.84'
VC = 50'
K = 34

798.93
799.49

(–)11.6512%
(+)10.7122%
(+)12.1667%

END GRADE
–Y19– STA. 11+50.00
EL. 799.49

FOR –Y19– PLAN VIEW SEE SHEET 14

–Y8A–

END GRADE
–Y8A– STA. 12+32.65 =
–Y8– STA. 12+59.83 (9.00 RT)
EL. 738.45

BEGIN GRADE
–Y8A– STA. 10+00.00
EL. 764.79

PI = 10+30.00
EL = 764.50'
VC = 60'
K = 5

PI = 12+05.00
EL = 740.25'
VC = 50'
K = 7

(–)0.9667%
(–)13.8571%
(–)13.8857%
(–)16.5099%
(+)0.5747%

FOR –Y8– PLAN VIEW SEE SHEET 10

5/28/99

–Y20–

BEGIN GRADE
–Y20– STA. 10+22.01 =
–Y11– STA. 10+99.49 (22' LT)
EL. 735.01

PI = 10+45.00
EL = 734.93'
VC = 45'
K = 4

PI = 11+32.00
EL = 743.55'
VC = 80'
K = 5

END GRADE
–Y20– STA. 11+80.00
EL. 741.34

(+)9.9080%
(–)14.6042%
(–)0.5480%
(–)11.9082%
@ 735.43'

FOR –Y20– PLAN VIEW SEE SHEET 11

–Y21–

BM #22
RR SPIKE IN BASE OF POWER POLE
26.19' RT. OF –Y21– STA 10+45.84
ELEV. 824.69'

–Y21– STA. 9+81.05 =
–Y22– STA. 13+63.93
–L– STA. 149+91.04 (0.31' LT)

NOTE: EXISTING GROUND PROFILE FOR –Y21– IS SHOWN FOR INFORMATION ONLY. DESIGN IS INCLUDED ON –L– CROSS SECTIONS. PLEASE REFER TO TYPICAL SECTIONS AND –Y21– CROSS SECTIONS FOR CONSTRUCTION.

FOR –Y21– PLAN VIEW SEE SHEET 14

–DR2–

END GRADE
–DR2– STA. 11+93.39 =
–L– STA. 145+48.33 (38.75 LT)
EL. 806.19

BEGIN GRADE
–DR2– STA. 11+65.00
EL. 808.12

PI = 11+80.00
EL = 806.65'
VC = 25'
K = 4

(–)9.8000%
(–)3.9354%
@ 805.409'

FOR –DR2– PLAN VIEW SEE SHEET 14

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Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
U-3440	25

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 025513 ENGINEER MICHAEL D. LINDSKEN
8/17/2016

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDON
8/17/2016

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–Y22–

NOTE: EXISTING GROUND PROFILE FOR –Y22– IS SHOWN FOR INFORMATION ONLY.

–Y22– STA. 13+63.93 =
–Y21– STA. 9+81.05
–L– STA. 149+81.04

–Y22– STA. 13+63.62 =
–Y21– STA. 9+81.05
–L– STA. 149+81.04

BM #23
RR SPIKE IN BASE OF TEL POLE
361.56' LT. OF –Y22– STA 10+05.63
ELEV. 825.48'

MATCHLINE SEE BELOW

–Y22–

MATCHLINE SEE ABOVE

BM #24
RR SPIKE IN BASE OF POWER POLE
405.73' LT. OF –Y22– STA 16+70.00
ELEV. 814.52'

FOR –Y22– PLAN VIEW SEE SHEET 14

–RABT–

BEGIN GRADE
–RABT– STA. 0+00 =
–Y14– STA. 12+60.84
EL. 722.78

END GRADE
–RABT– STA. 3+83.27 =
–RABT– STA. 0+00
EL. 722.78

–RABT– STA. 0+82.41 =
–L– STA. 12+59.16

PI = 0+40.00
EL = 723.58'
VC = 80'
K = 13

–RABT– STA. 1+85.12 =
–Y15– STA. 10+61.33

PI = 2+13.00
EL = 716.66'
VC = 160'
K = 20

–RABT– STA. 2+72.19 =
–L– STA. 120+37.16

PI = 3+52.77
EL = 722.17'
VC = 60'
K = 11

(+)2.0000%
(–)4.0000%
(+)3.9423%
(+)2.0000%

FOR –RABT– PLAN VIEW SEE SHEET 12

8/16/2016
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smeyers