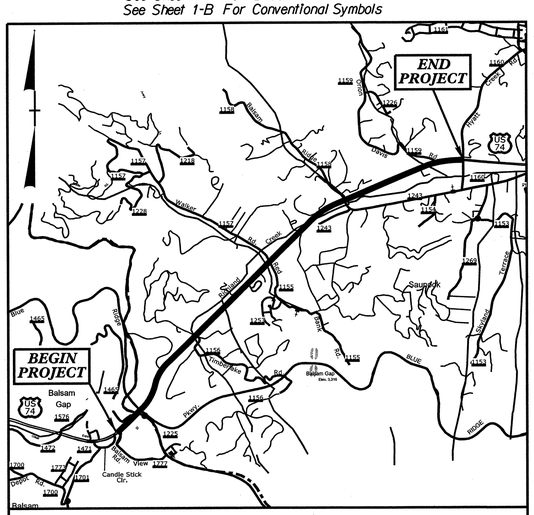
09/08/99

TIP PROJECT: W-5315

CONTRACT: C203194

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

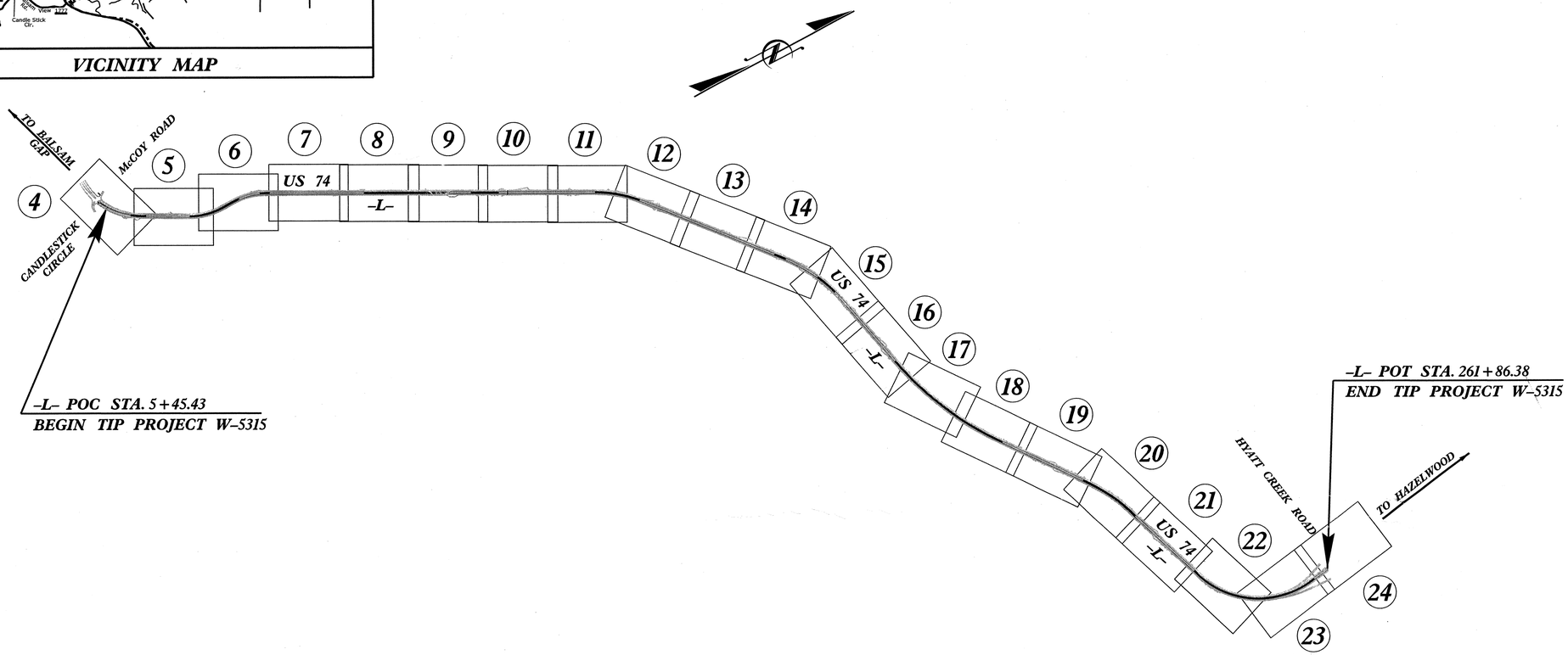
HAYWOOD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5315	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46138.1.1	STP-NHS-0074(117)	P.E.
46138.3.FS1	STP-NHS-0074(117)	CONST.

LOCATION: US 74 FROM EXIT 98 IN HAYWOOD COUNTY TO 0.1 MILES WEST OF THE JACKSON-HAYWOOD COUNTY LINE

TYPE OF WORK: MEDIAN GUARDRAIL, DRAINAGE, GRADING & PAVING



-L- POC STA. 5+45.43
BEGIN TIP PROJECT W-5315

-L- POT STA. 261+86.38
END TIP PROJECT W-5315

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2015 = 29,538

STATEWIDE TIER DESIGN

PROJECT LENGTH

TOTAL LENGTH STATE PROJECT = 4.856 MILES

Prepared In the Office of:

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-0258

ARCADIS
G & M of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448 NC License No. C-1869

for the North Carolina Department of Transportation

2012 STANDARD SPECIFICATIONS

LETTING DATE:
OCTOBER 15, 2013

STEVE SMALLWOOD, P.E.
PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
7/11/13 P.E.
SIGNATURE:

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022037 STEPHEN T. SMALLWOOD
SEAL NOT VALID UNLESS SIGNED AND DATED P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

7/9/2013
R:\Roadway\Proj\W5315_rdy_tsh.dgn
User:dpetry

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5315	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

SEAL NOT VALID UNLESS SIGNED AND DATED

INDEX OF SHEETS

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01-17-12
REVISED: 11/01/11

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02.

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

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

225.02 Guide for Grading Subgrade – Secondary and Local

DIVISION 3 – PIPE CULVERTS

300.01 Method of Pipe Installation

DIVISION 5 – SUBGRADE, BASES AND SHOULDERS

560.02 Method of Shoulder Construction – High Side of Superelevated Curve – Method II

DIVISION 8 – INCIDENTALS

840.00 Concrete Base Pad for Drainage Structures
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
840.19 Concrete Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.28 Brick Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.29 Frames and Narrow Slot Flat Grates
840.35 Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.45 Precast Drainage Structures
840.66 Drainage Structure Steps
846.01 Concrete Curb, Gutter and Curb & Gutter
846.04 Drop Inlet Installation in Shoulder Berm Gutter
852.01 Concrete Islands
852.06 Method for Placement of Drop Inlets in Concrete Islands
862.01 Guardrail Placement
862.02 Guardrail Installation
862.03 Structure Anchor Units
862.04 Anchoring End of Guardrail – B-77 and B-83 Anchor Units

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

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
W-5315	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- 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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

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 Marker — RW
- 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
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (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
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
W-5315	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022031 ENGINEER STEPHEN T. SMALLWOOD
9/14/13

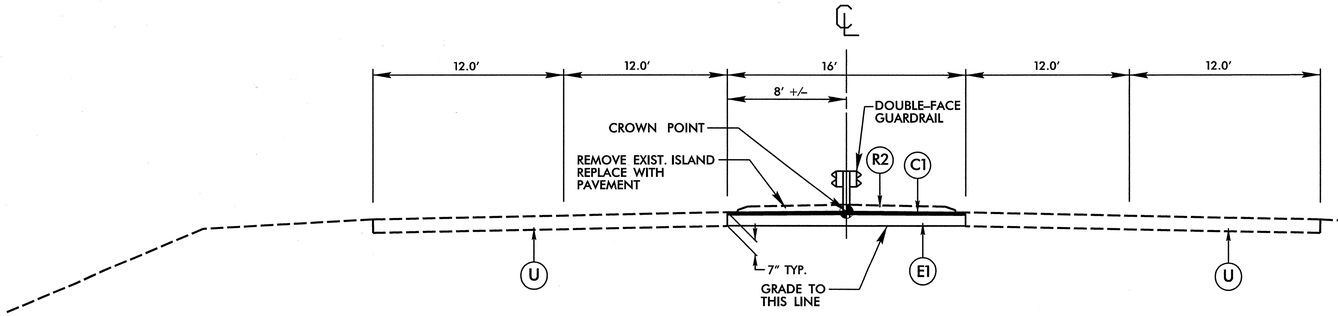
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22898 ENGINEER CLARK S. MORRISON
9/20/13

SEAL NOT VALID UNLESS SIGNED AND DATED

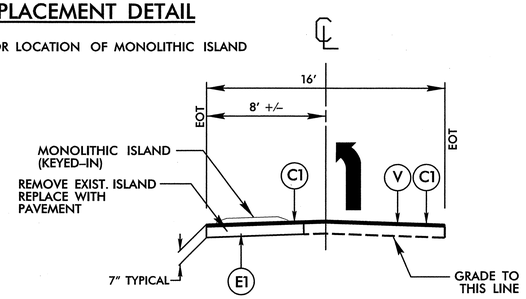
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" OR LESS THAN 3" IN DEPTH.
R1	SHOULDER BERM GUTTER
R2	EXISTING CONCRETE ISLAND(APPROXIMATELY 7")
U	EXISTING PAVEMENT
V	MILL 1.5"

Note: Pavement Edge Slopes are 1:1 Unless Shown Otherwise



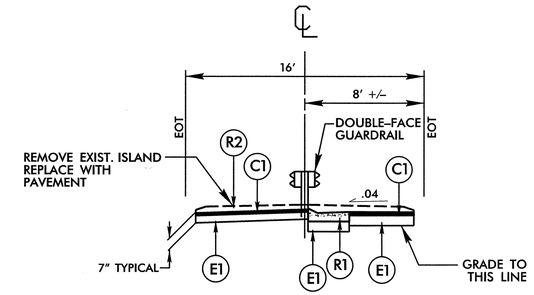
GUARDRAIL PLACEMENT DETAIL

SEE PLAN SHEET FOR LOCATION OF MONOLITHIC ISLAND



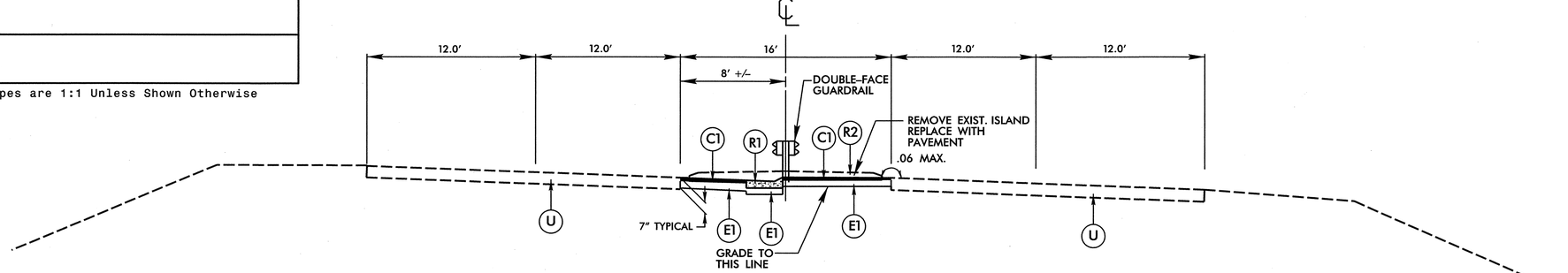
PARTIAL DETAIL FOR LOCATION OF MONOLITHIC ISLAND

SEE PLANS FOR LOCATION OF MONOLITHIC ISLAND



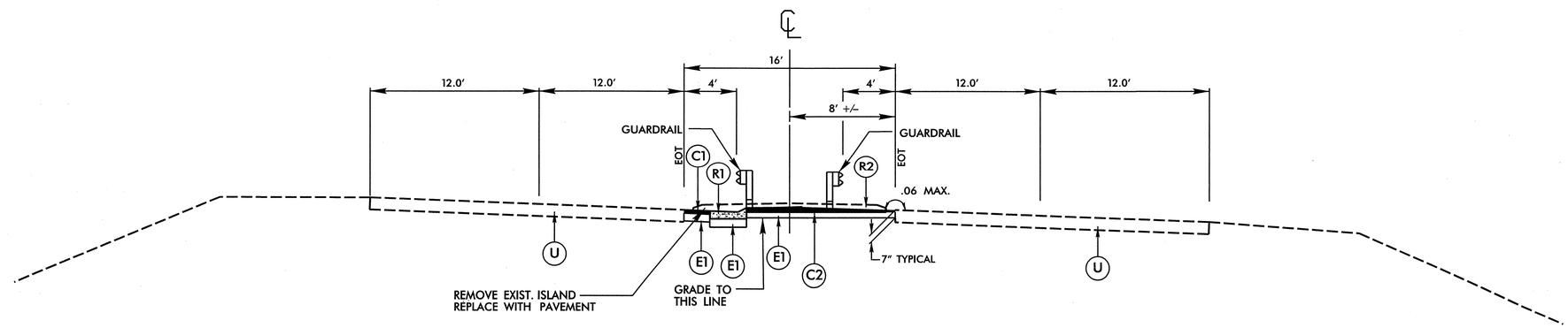
PARTIAL DETAIL FOR LOCATION OF SHOULDER BERM GUTTER WITH CROSS SLOPE

STA. 54+80 TO 70+85 -L- MED RT
STA. 74+30 TO 80+10 -L- MED RT



GUARDRAIL PLACEMENT DETAIL

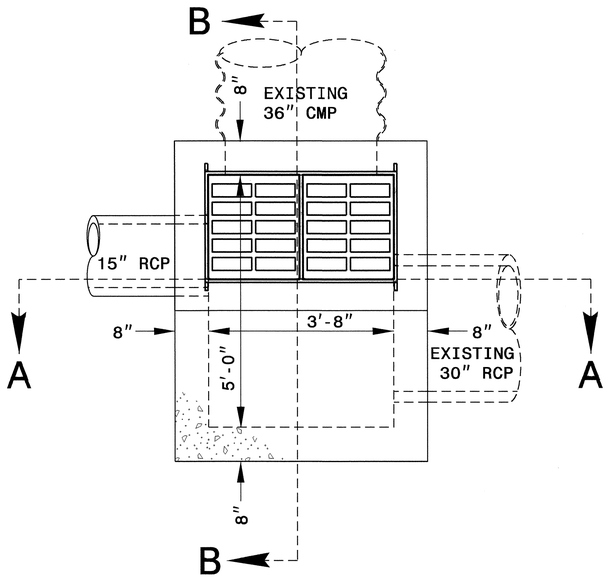
SEE PLAN SHEET FOR LOCATION OF SHOULDER BERM GUTTER



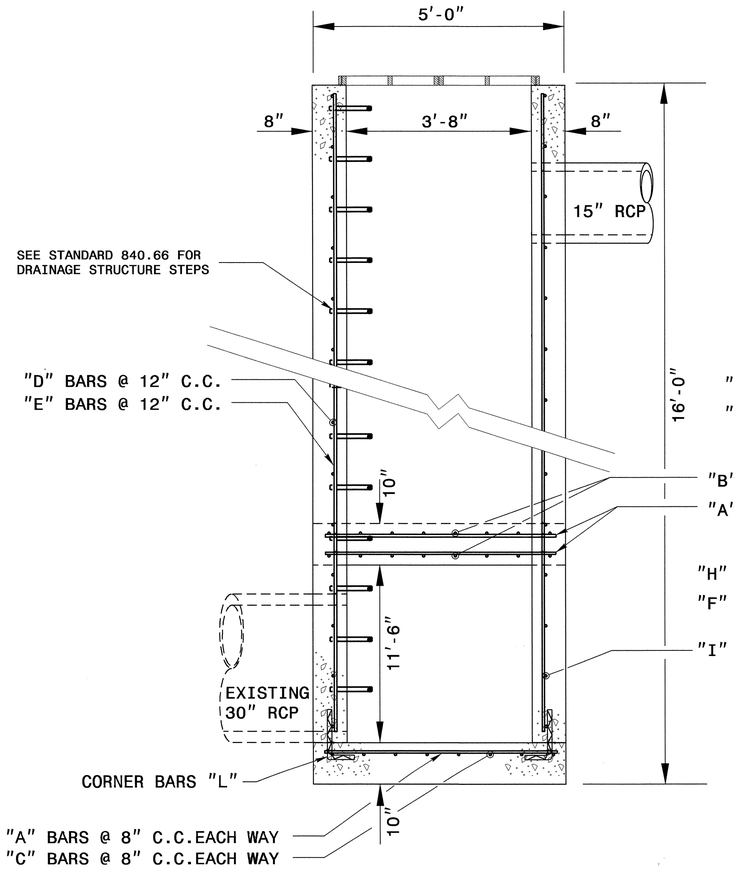
GUARDRAIL PLACEMENT DETAIL

SEE PLAN SHEET FOR LOCATION
STA. 234+00 TO STA. 261+89.88(BRIDGE)

PROJECT REFERENCE NO.	SHEET NO.
W-5315	2-A



PLAN VIEW



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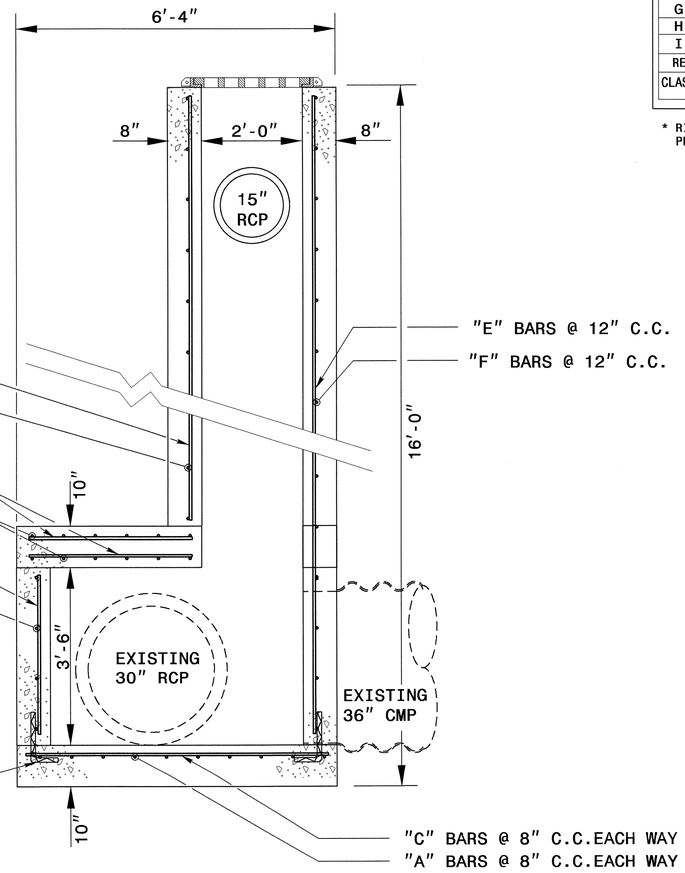
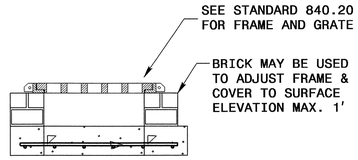


SECTION B-B



BRICK RISER

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.

NO DEDUCTIONS HAVE BEEN MADE FOR PIPES.

CHAMFER ALL EXPOSED CORNERS 1".

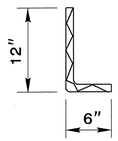
DRAWING NOT TO SCALE.

DIMENSIONS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

BILL OF MATERIAL FOR CATCH BASIN

REINF. STEEL			1 PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
A	#5	4'-8"	22	107
B	#5	3'-4"	16	56
C	#5	6'-0"	8	50
D	#4	2'-4"	22	34
E	#4	14'-10"	10	99
F	#4	4'-0"	30	80
G	#4	10'-6"	5	35
H	#4	3'-2"	5	11
I	#4	5'-4"	8	29
REINF. STEEL LBS.				501
CLASS "B" CONCRETE			CU. YDS.	7.2

* RISER HAS 0.321 CUBIC YARDS OF BRICK MASONRY PER FOOT HEIGHT



DOWEL

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOE S HOWARD

STRUCTURE #607

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

EXTRA DEPTH TRAFFIC BEARING 2-GI

ORIGINAL BY: K. KEMPF DATE: 7-23-12
MODIFIED BY: DATE:
CHECKED BY: DATE: 1/23/13
FILE SPEC.: kkempf\english\no607_TB2GI_15deep.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5315	2-B

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

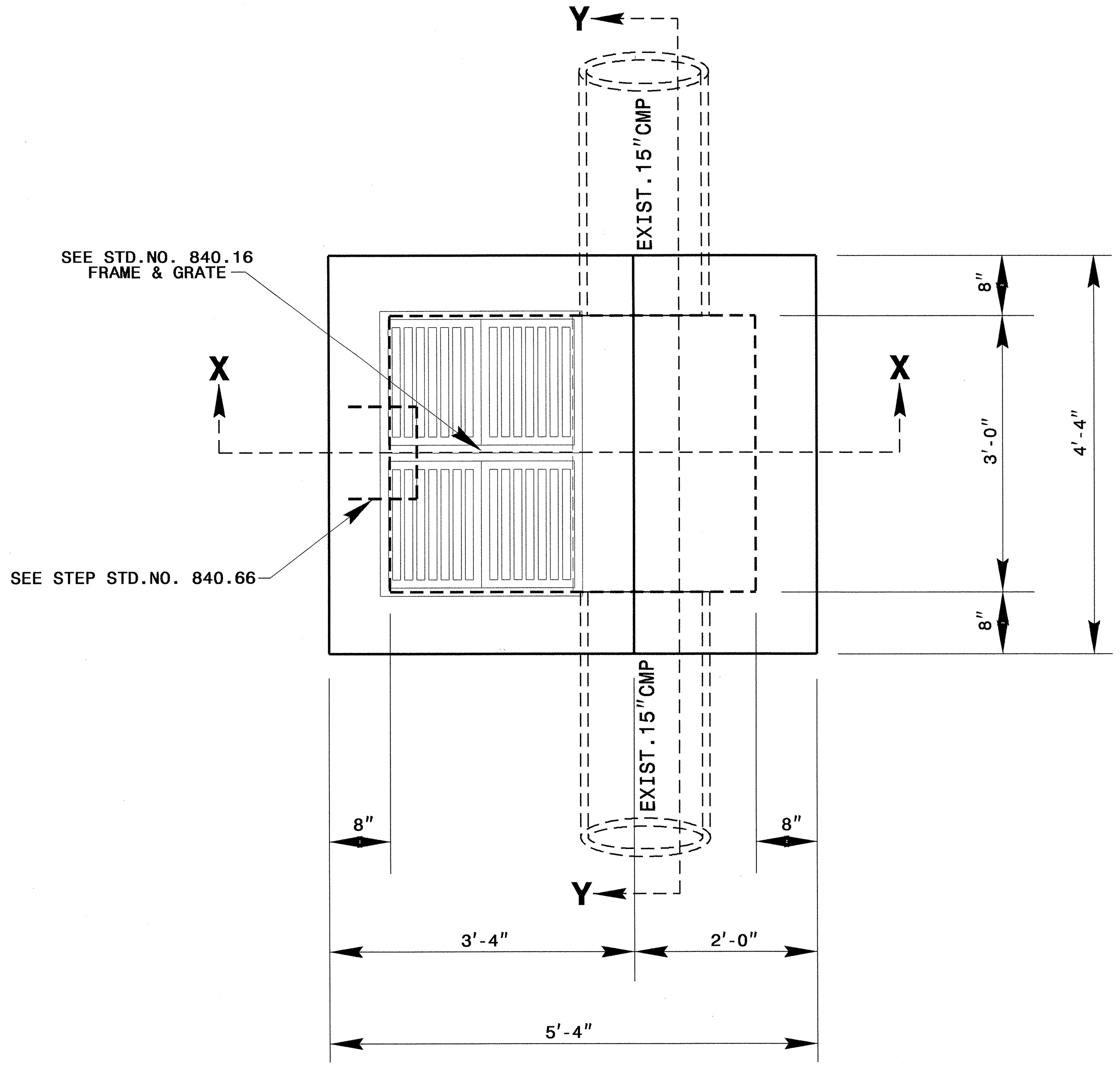
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

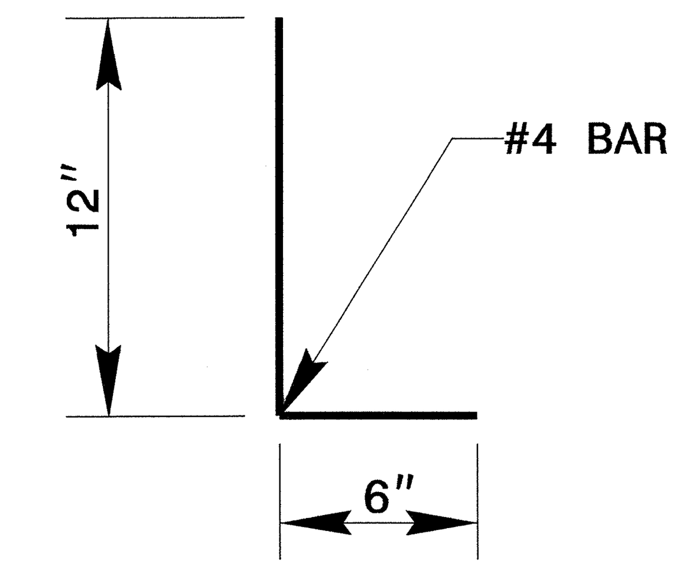
INSTALL GRATE AND FRAME IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.



PLAN VIEW

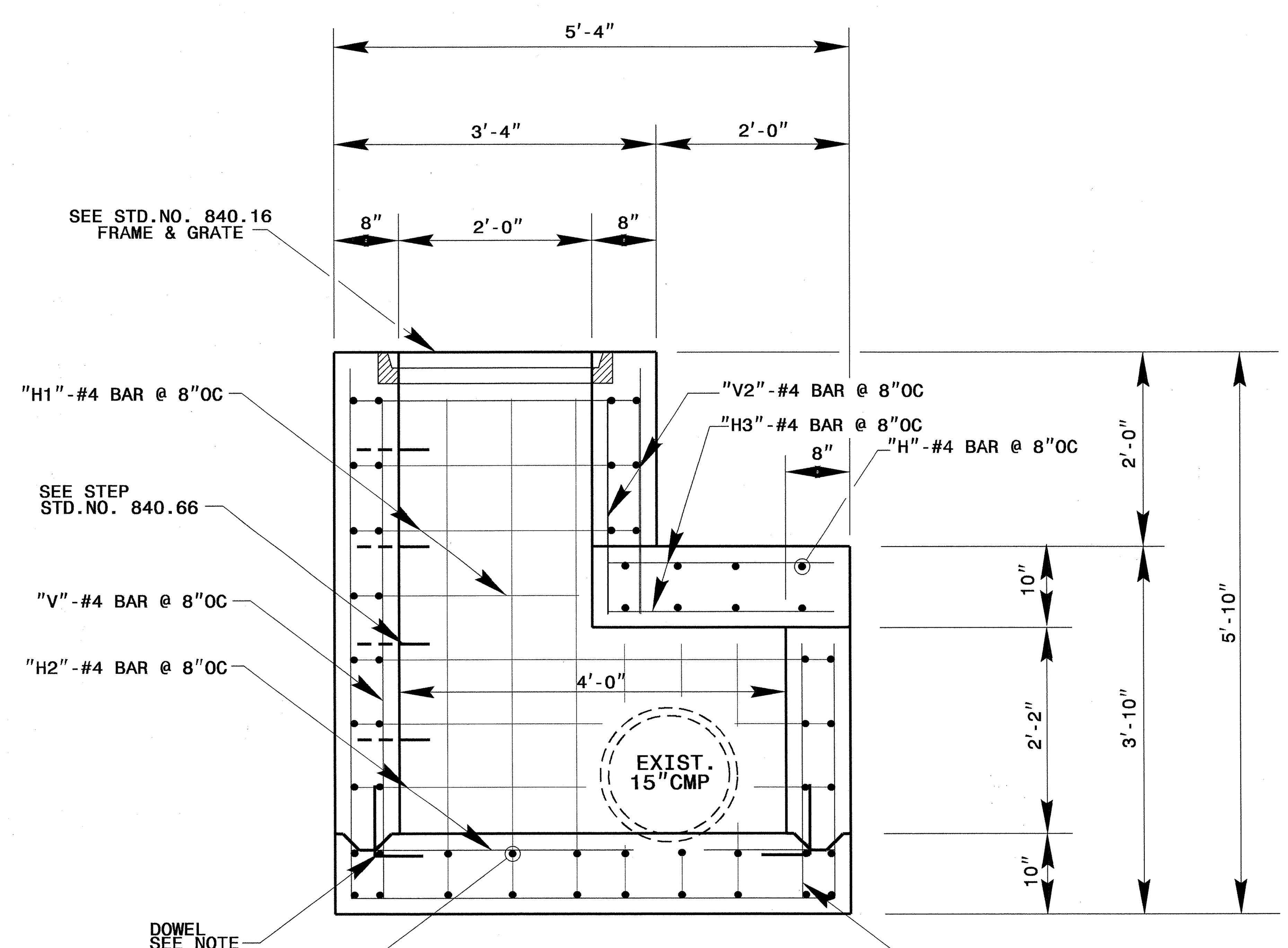


DOWEL

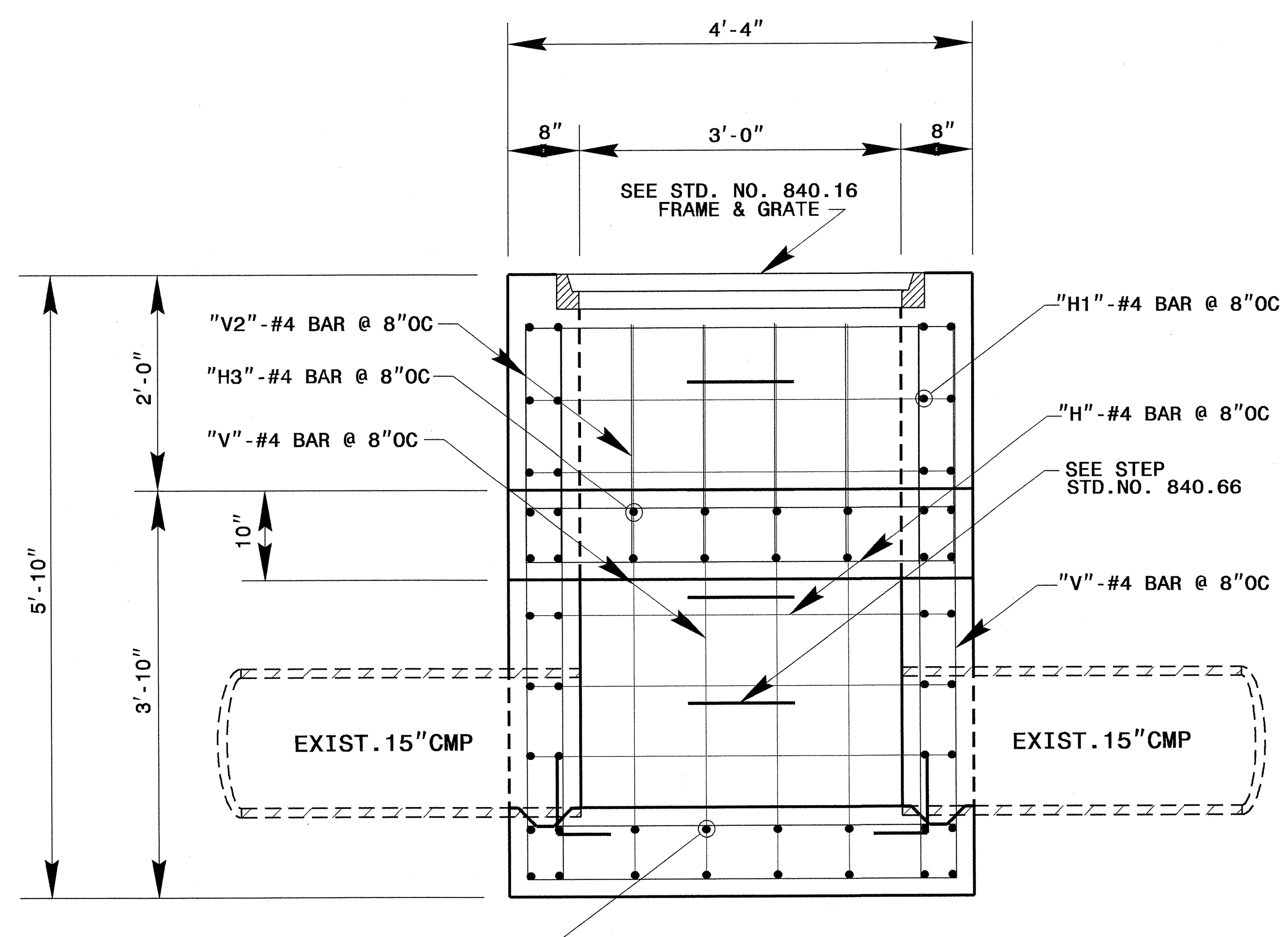
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	54	#4	4'-0"	145
H1	28	#4	3'-0"	57
H2	28	#4	5'-0"	94
H3	16	#4	2'-4"	25
V	28	#4	5'-6"	103
V1	28	#4	2'-8"	50
V2	16	#4	2'-4"	25
TOTAL REINF. STEEL (LBS.)				499
TOTAL CONC. (CU. YDS.)				2.6
DEDUCTION FOR 2-15" EX.CMP				-0.1
TOTAL CONC. (CU. YDS.)				2.5

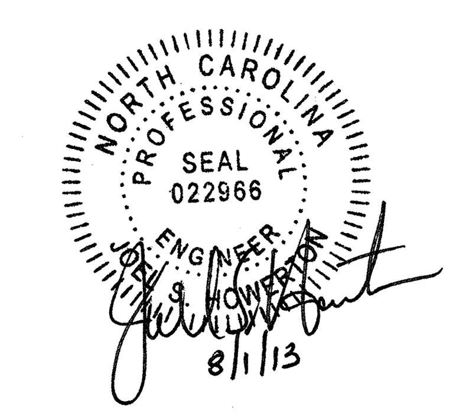
* 0.30 CU. YD. PER FOOT OF RISER HEIGHT



SECTION X-X



SECTION Y-Y



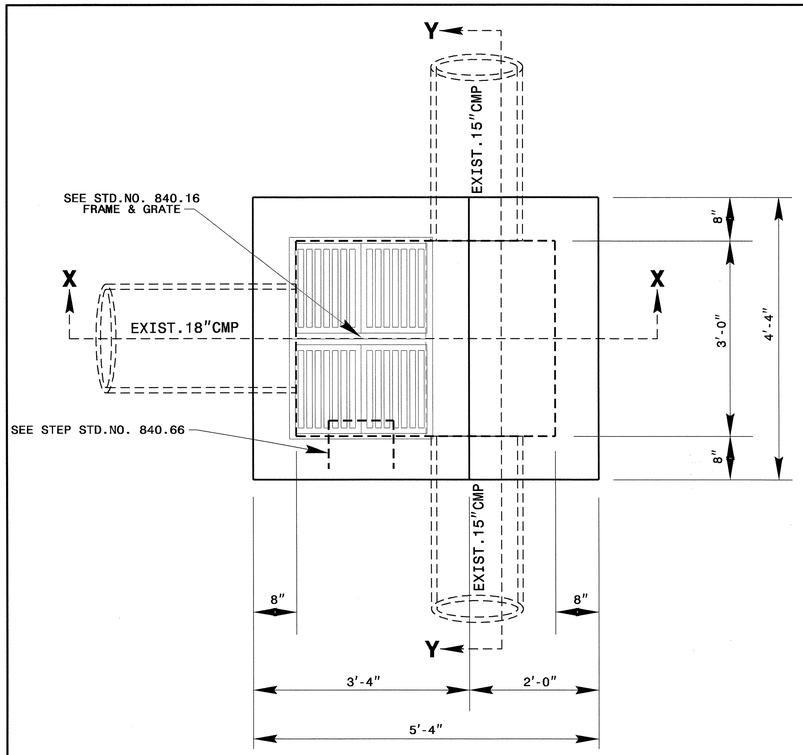
STRUCTURE NO. 601

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6900 FAX 919-250-4119

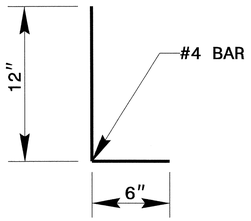
SPECIAL TRAFFIC BEARING DROP INLET

ORIGINAL BY: nbritt DATE: 07/19/13
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/13
FILE SPEC.: special details/nbritt/english/hydro/w5315 special di.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5315	2-C



PLAN VIEW



DOWEL

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

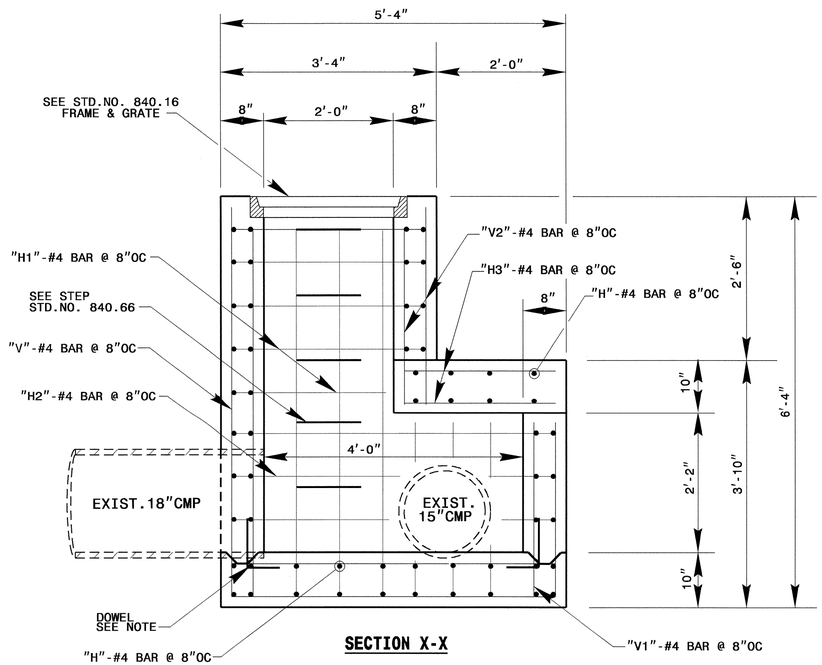
CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

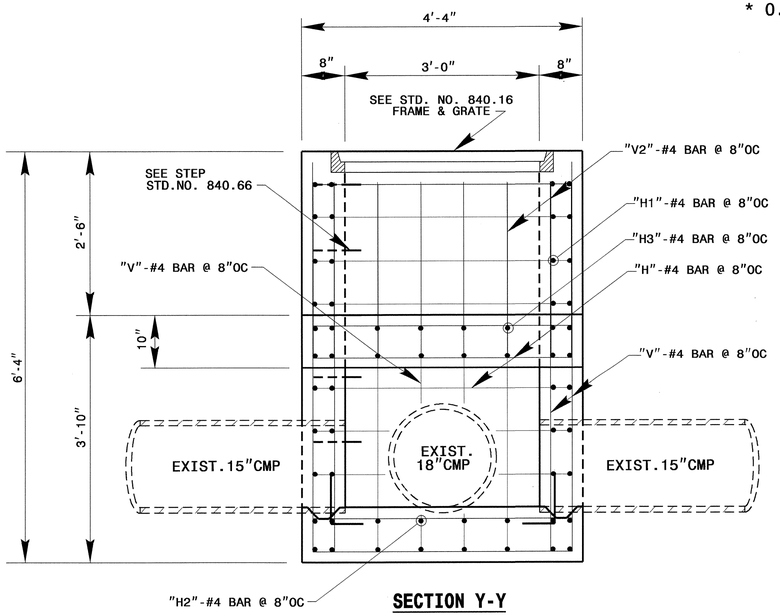
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	58	#4	4'-0"	155
H1	32	#4	3'-0"	65
H2	28	#4	5'-0"	94
H3	16	#4	2'-4"	25
V	28	#4	6'-0"	113
V1	28	#4	2'-8"	50
V2	16	#4	2'-4"	25
TOTAL REINF. STEEL (LBS.)				527
TOTAL CONC. (CU. YDS.)				2.8
DEDUCTION FOR 2-15" EX.CMP				-0.1
DEDUCTION FOR 1-18" EX.CMP				-0.1
TOTAL CONC. (CU. YDS.)				2.6

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT



SECTION X-X



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOSEPH A. HARTZOG 8/1/13

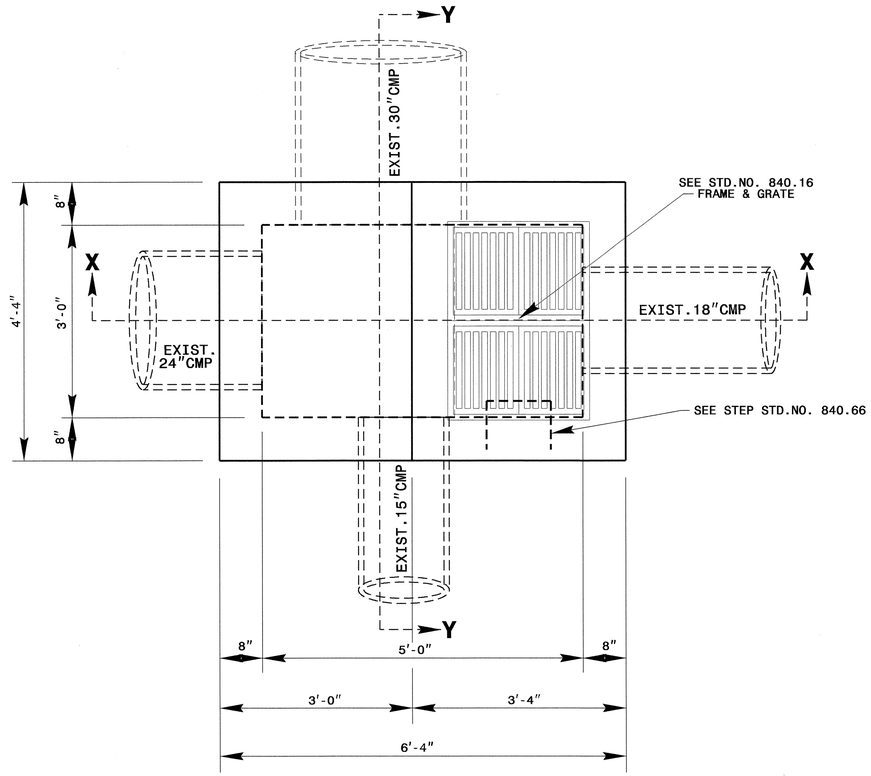
STRUCTURE NO. 603

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6900 FAX 919-250-4119

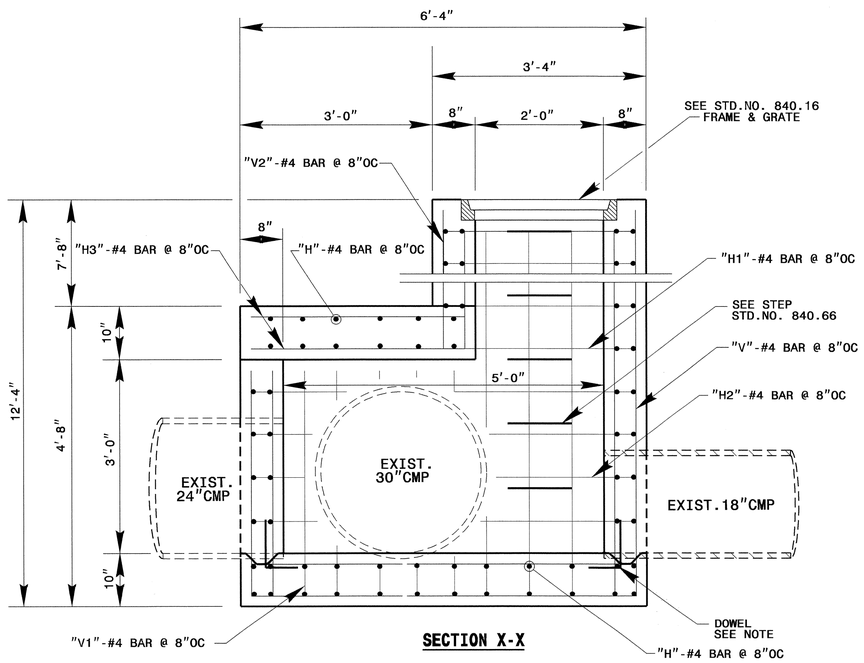
SPECIAL TRAFFIC BEARING DROP INLET

ORIGINAL BY: nbritt DATE: 07/19/13
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/13
FILE SPEC.: special details/nbritt/english/hydro/w5315 special di.dgn

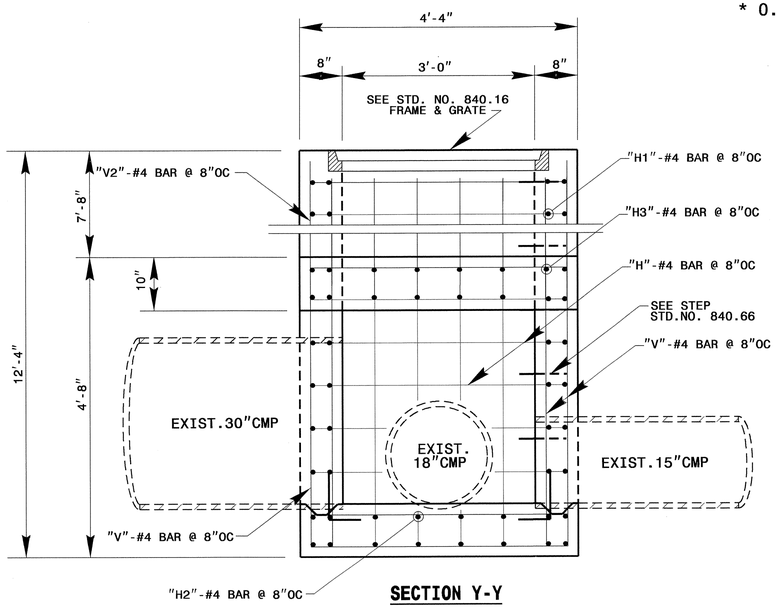
PROJECT REFERENCE NO.	SHEET NO.
W-5315	2-D



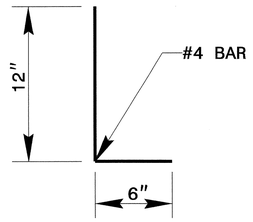
PLAN VIEW



SECTION X-X



SECTION Y-Y



DOWEL

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

INSTALL GRATE AND FRAME 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	100	#4	4'-0"	268
H1	52	#4	3'-0"	105
H2	32	#4	6'-0"	129
H3	16	#4	3'-4"	36
V	28	#4	12'-0"	225
V1	36	#4	3'-6"	85
V2	16	#4	8'-2"	88
TOTAL REINF. STEEL (LBS.)				936
TOTAL CONC. (CU. YDS.)				5.5
DEDUCTION FOR 1-15" EX.CMP				-0.04
DEDUCTION FOR 1-18" EX.CMP				-0.05
DEDUCTION FOR 1-24" EX.CMP				-0.10
DEDUCTION FOR 1-30" EX.CMP				-0.14
TOTAL CONC. (CU. YDS.)				5.2

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWARD
8/1/13

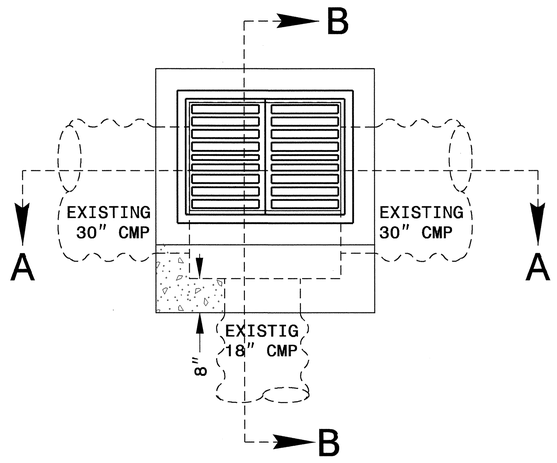
STRUCTURE NO. 604

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6900 FAX 919-250-4119

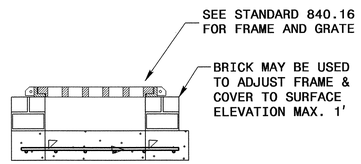
SPECIAL TRAFFIC BEARING DROP INLET

ORIGINAL BY: nbritt DATE: 07/19/13
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/13
FILE SPEC.: special details/nbritt/english/hydro/w5315 special di.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5315	2-E



PLAN VIEW



BRICK RISER

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.

NO DEDUCTIONS HAVE BEEN MADE FOR PIPES.

CHAMFER ALL EXPOSED CORNERS 1".

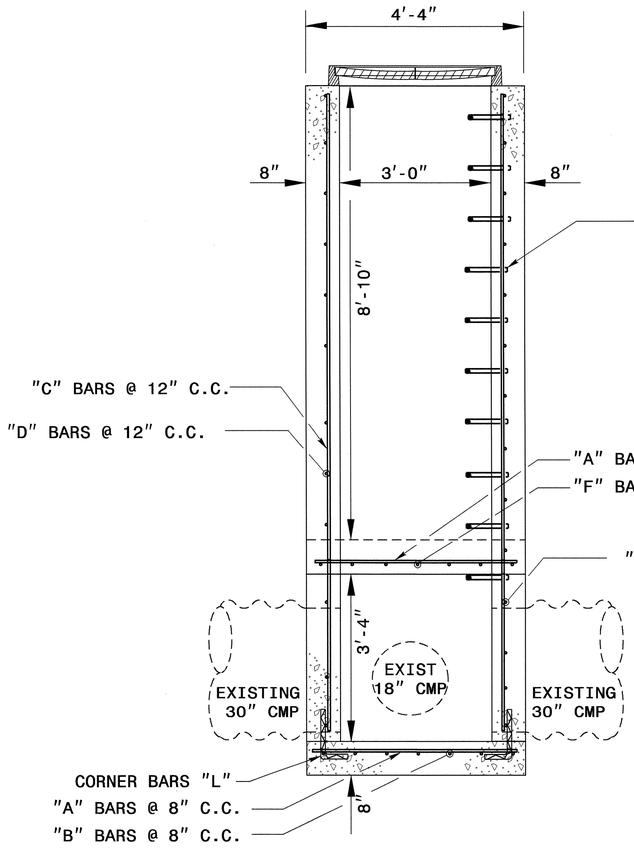
DRAWING NOT TO SCALE.

DIMENSIONS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

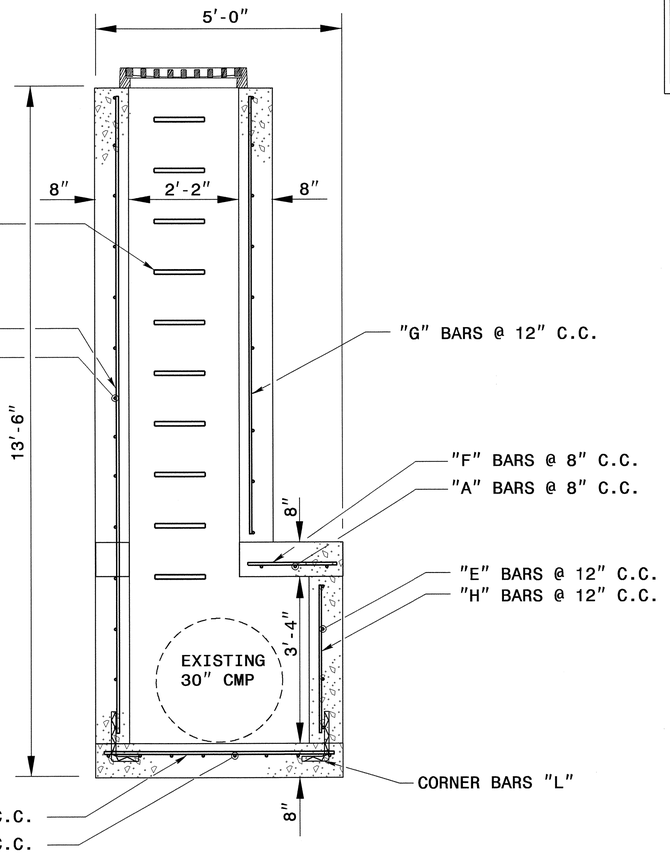
BILL OF MATERIAL FOR CATCH BASIN

REINF. STEEL			1 PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
A	#5	4'-0"	10	42
B	#5	4'-8"	6	29
C	#4	12'-6"	4	33
D	#4	3'-2"	9	8
E	#4	4'-0"	22	59
F	#5	1'-10"	6	7
G	#4	8'-10"	4	24
H	#4	3'-0"	4	8
I	#4	3'-8"	8	20
REINF. STEEL LBS.				230
CLASS "B" CONCRETE			CU. YDS.	5.0

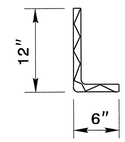
* RISER HAS 0.321 CUBIC YARDS OF BRICK MASONRY PER FOOT HEIGHT



SECTION A-A



SECTION B-B



DOWEL

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. THOMPSON
8/1/13

STRUCTURE #605

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

EXTRA DEPTH DROP INLET

ORIGINAL BY: K. KEMPF DATE: 7-17-13
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/24/13
FILE SPEC.: kkempf\english\no605_DI_13'deep.dgn

23-JUL-2013 12:37
C:\Projects\Contracts\Special Details\kkempf\english\no605_DI_13'deep.dgn
$$$$USERNAME$$$$

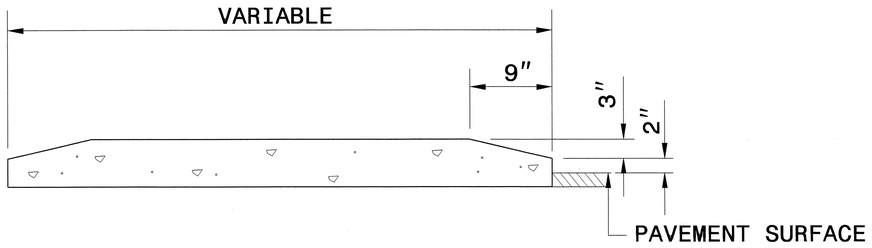
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5315	2-F

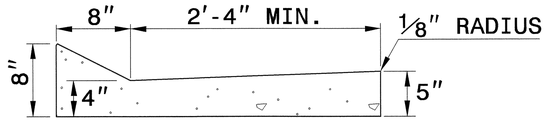
NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.

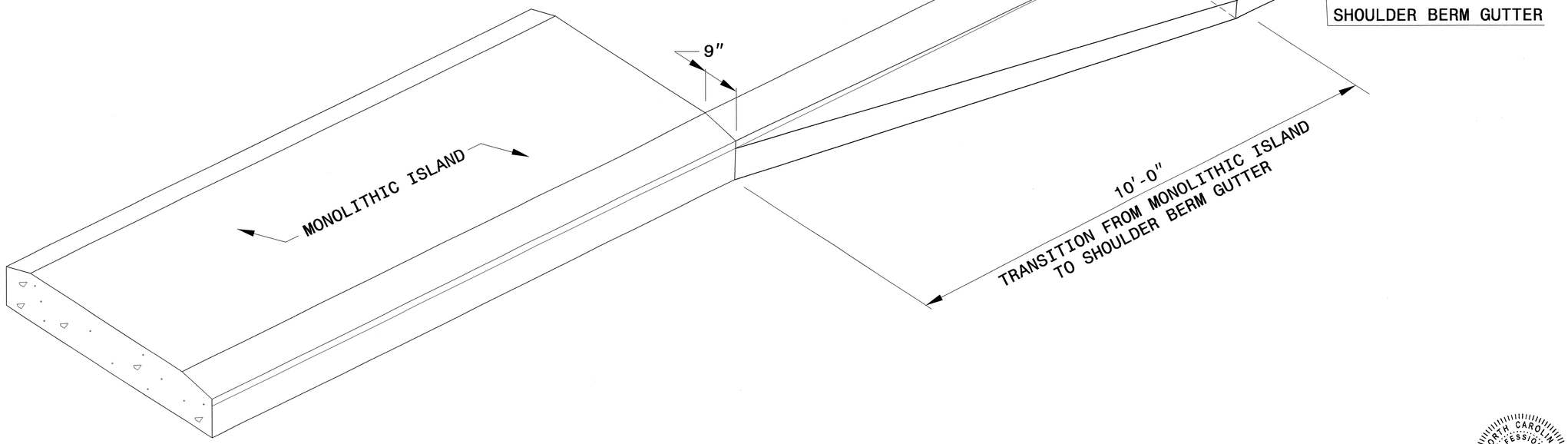
SEE STD. DWG. 852.01 FOR ADDITIONAL MONOLITHIC ISLAND INFORMATION.



MONOLITHIC ISLAND



SHOULDER BERM GUTTER



ISOMETRIC VIEW OF TRANSITION

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN H. HUNNICUTT 8/1/13

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

DETAIL OF MONOLITHIC ISLAND TO SHOULDER BERM GUTTER TRANSITION SECTION

ORIGINAL BY: E.E. WARD DATE: 11-21-03
MODIFIED BY: nbritt DATE: 08-01-13
CHECKED BY: DATE: 8/1/13
FILE SPEC.: /details/nbritt/english/misc/mono island to shou berm.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203194

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0043000000-N	226	Lump Sum		GRADING
0196000000-E	270	19,000	SY	GEOTEXTILE FOR SOIL STABILIZATION
0318000000-E	300	200	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
0320000000-E	300	630	SY	FOUNDATION CONDITIONING GEOTEXTILE
0448200000-E	310	1,788	LF	15" RC PIPE CULVERTS, CLASS IV
0582000000-E	310	32	LF	15" CS PIPE CULVERTS, 0.064" THICK
0588000000-E	310	48	LF	18" CS PIPE CULVERTS, 0.064" THICK
0594000000-E	310	8	LF	24" CS PIPE CULVERTS, 0.064" THICK
0600000000-E	310	4	LF	30" CS PIPE CULVERTS, 0.079" THICK
0986000000-E	SP	466	LF	GENERIC PIPE ITEM 15" CURED-IN-PLACE PIPE
0986000000-E	SP	1,698	LF	GENERIC PIPE ITEM 18" CURED-IN-PLACE PIPE
0986000000-E	SP	234	LF	GENERIC PIPE ITEM 24" CURED-IN-PLACE PIPE
0986000000-E	SP	143	LF	GENERIC PIPE ITEM 30" CURED-IN-PLACE PIPE
0986000000-E	SP	131	LF	GENERIC PIPE ITEM 36" CURED-IN-PLACE PIPE
0995000000-E	340	936	LF	PIPE REMOVAL
1099500000-E	505	9,250	CY	SHALLOW UNDERCUT
1099700000-E	505	18,600	TON	CLASS IV SUBGRADE STABILIZATION
1297000000-E	607	7,500	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/2")
1489000000-E	610	7,300	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1519000000-E	610	4,100	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B

SUMMARY OF QUANTITIES - W-5315

ItemNumber	Sec #	Quantity	Unit	Description
1575000000-E	620	570	TON	ASPHALT BINDER FOR PLANT MIX
2286000000-N	840	47	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	5	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	10	EA	FRAME WITH TWO GRATES, STD 840.16
2364200000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.20
2367000000-N	840	36	EA	FRAME WITH TWO GRATES, STD 840.29
2451000000-N	852	7	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLET
2556000000-E	846	11,350	LF	SHOULDER BERM GUTTER
2655000000-E	852	1,700	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)
3000000000-N	SP	24	EA	IMPACT ATTENUATOR UNIT, TYPE 350
3030000000-E	862	7,275	LF	STEEL BM GUARDRAIL
3060000000-E	862	14,675	LF	STEEL BM GUARDRAIL, DOUBLE FACED
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	2,169	LF	REMOVE EXISTING GUARDRAIL
4400000000-E	1110	928	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	347	SF	WORK ZONE SIGNS (PORTABLE)
4415000000-N	1115	2	EA	FLASHING ARROW BOARD
4420000000-N	1120	4	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4430000000-N	1130	612	EA	DRUMS
4455000000-N	1150	240	DAY	FLAGGER
4480000000-N	1165	2	EA	TMA
4485000000-E	1170	20,695	LF	PORTABLE CONCRETE BARRIER
4500000000-E	1170	33,900	LF	RESET PORTABLE CONCRETE BARRIER
4510000000-N	SP	40	HR	LAW ENFORCEMENT
4725000000-E	1205	24	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	66,065	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4805000000-N	1205	1	EA	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV)
4847000000-E	1205	52,684	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE ELEMENTS)
4850000000-E	1205	290	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4875000000-N	1205	1	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4905000000-N	1253	317	EA	SNOWPLOWABLE PAVEMENT MARKERS
6000000000-E	1605	100	LF	TEMPORARY SILT FENCE
6012000000-E	1610	520	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6036000000-E	1631	5,000	SY	MATTING FOR EROSION CONTROL
6042000000-E	1632	2,580	LF	1/4" HARDWARE CLOTH
6084000000-E	1660	1	ACR	SEEDING & MULCHING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL

NC01D-MJKFHCX

COMPUTED BY: DAP	DATE: 8/14/2012	PROJECT NO.	SHEET NO.
CHECKED BY: STS	DATE: 4/20/2013	W-5315	3-A

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)

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC)													C.S. PIPE								R.C. PIPE CLASS III								R.C. PIPE CLASS IV							
SIZE								8"	12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE		FROM	TO																		.064	.064	.064	.064	.079	.079	.109	.109																
-L- 10+35	RT.	0401		3308.7																		4																						
-L- 25+60	RT.	0601		3337.0																																								
-L- 28+20	RT.	0602		3332.1																																								
-L- 28+20	RT.	0602	0603		3329.4	3327.9																																48						
-L- 27+70	RT.	0603		3333.1																																								
-L- 31+08	LT.	0604		3325.8																																								
-L- 33+92	LT.	0605		3319.6																																								
-L- 36+52	LT.	0606		3314.2																																								
-L- 36+52	LT.	0606	0607		3311.5	3310.4																																48						
-L- 37+03	LT.	0607		3313.1																																								
-L- 51+80	CL	0801		3258.5																					4																			
-L- 53+95	LT.	0802		3247.7																																								
-L- 53+95	LT.	0802	0803		3241.7	3231.5																																200						
-L- 56+00	RT.	0803		3237.5																																								
-L- 56+00	RT.	0803	0804		3231.5	3211.3																																400						
-L- 60+05	RT.	0804		3217.0																			4																					
-L- 63+50	RT.	0805		3200.3																																								
-L- 66+60	RT.	0901		3183.9																			4																					
-L- 70+75	RT.	0902		3163.1																																								
-L- 70+75	RT.	0902	0903		3160.4	3159.3																																64						
-L- 70+10	RT.	0903		3166.3																			4																					
-L- 79+85	RT.	1001		3127.6																																								
-L- 79+85	RT.	1001	1002		3124.9	3123.5																																16						
-L- 80+00	RT.	1002		3127.2																																								
-L- 99+75	LT.	1101		3051.7																																								
-L- 99+75	LT.	1101	1102		3049.0	3041.8																																176						
-L- 101+54	LT.	1102		3044.5																			4																					
-L- 105+52	LT.	1201		3029.0																			4																					
-L- 107+50	LT.	1202		3022.5																																								
-L- 107+50	LT.	1202	1203		3019.3	3016.4																																112						
-L- 108+63	LT.	1203		3019.6																			4																					
-L- 137+50	LT.	1401		2956.4																																								
-L- 137+50	LT.	1401	1402		2953.2	2949.2																																156						
SHEET TOTALS																						4	24		4													1220						

STATION	** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" WELDED STEEL PIPE, 0.500" THK. (TRENCHLESS INSTALLATION) IN SOIL	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS		QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND TWO GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.20	15" CURED-IN-PLACE PIPE	18" CURED-IN-PLACE PIPE	24" CURED-IN-PLACE PIPE	30" CURED-IN-PLACE PIPE	36"CURED-IN-PLACE PIPE	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	MANHOLE FRAME & COVER STD. 840.54		Special Drainage Structure (See Detail)	TRAFFIC BEARING GRATED DROP INLET STD. 840.35	C.S. PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	
						R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN																						REMARKS
-L- 10+35								1																67					1				1					REMOVE EXIST. DI, 15" CSP W/ BAND AND
																																						SLEEVE GASKET
-L- 25+60								1										1														1						See Detail Sheet 2-B
-L- 28+20								1																					1				1					
-L- 28+20																																						
-L- 27+70								1										1														1						REMOVE EXIST. DI, See Detail 2-C
-L- 31+08								1										1														1						See Detail Sheet 2-D
-L- 33+92								1							X			1														1						See Detail Sheet 2-E
-L- 36+52								1																					1				1					
-L- 36+52																																						
-L- 37+03								1																								1						See Detail Sheet 2-A
-L- 51+80								1							X		1	1									143											REMOVE EXIST. DI, EXTEND EXIST. 30" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 53+95								1	1.0						X		1	1																				REMOVE EXIST. DI.
-L- 53+95																																					607	
-L- 56+00								1	1.0																				1				1					
-L- 56+00																																						
-L- 60+05								1																	118				1				1					REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 63+50								1																				131	1				1					
																																						W/ BAND AND SLEEVE GASKET
-L- 66+60								1																	118				1				1					REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 70+75								1																	129				1				1					
-L- 70+75																																						
-L- 70+10								1	2.0																				1				1					REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 79+85								1																	60				1				1					
-L- 79+85																																						
-L- 80+00								1																					1				1				7	REMOVE EXIST. DI AND +/- 7'- 18" CMP
-L- 99+75								1																					1				1					
-L- 99+75																																						
-L- 101+54								1																	68				1				1					REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 105+52								1																	157				1				1					REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 107+50								1							X		1	1																				
-L- 107+50																																						
-L- 108+63								1							X		1	1							130													REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
																																						W/ BAND AND SLEEVE GASKET
-L- 137+50								1							X		1	1																				
-L- 137+50																																						
SHEET TOTALS								24	4.7						6		5	9						67	780		143	131	14			5	14				614	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

RAL-CMOORE2

COMPUTED BY: DAP DATE: 8/14/2012

CHECKED BY: STS DATE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5315	3-B

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)

STATION	LOCATION (LT. RT. OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	SIDE DRAIN PIPE THICKNESS OR GAUGE	C.S. PIPE SIZE	C.S. PIPE THICKNESS OR GAUGE	R.C. PIPE CLASS III SIZE	R.C. PIPE CLASS IV SIZE	** R.C. PIPE (CLASS V)	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" WELDED STEEL PIPE, 0.500" THK. (TRENCHLESS INSTALLATION) IN SOIL	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES 'TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND TWO GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.20	15" CURED-IN-PLACE PIPE	18" CURED-IN-PLACE PIPE	24" CURED-IN-PLACE PIPE	30" CURED-IN-PLACE PIPE	36" CURED-IN-PLACE PIPE	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	MANHOLE FRAME & COVER STD. 840.54	Special Drainage Structure (See Detail)	TRAFFIC BEARING GRATED DROP INLET STD. 840.35	C.S. PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-L- 139+10	LT.	1402		2952.4						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
-L- 144+75	LT.	1501		2938.4						4	.064										1																						W/ BAND AND SLEEVE GASKET
-L- 168+14	RT.	1701		2898.2						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 15" CMP
-L- 172+11	RT.	1702		2892.5						4	.064										1																						W/ BAND AND SLEEVE GASKET
-L- 175+46	RT.	1703		2887.8						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
-L- 179+10	RT.	1704		2882.5						4	.064										1																						W/ BAND AND SLEEVE GASKET
-L- 182+08	RT.	1801		2877.9																	1																						REMOVE EXISTING DI
-L- 185+07	RT.	1802		2873.6																	1																						REMOVE EXISTING DI
-L- 190+00	RT.	1803		2866.7																	1																						
-L- 190+00	RT.	1803	1804		2864.8	2864.1							12"							96																						
-L- 189+06	RT.	1804		2868.0																	1																						REMOVE EXISTING DI
-L- 211+74	LT.	2001		2832.6						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 24" CMP
-L- 215+10	LT.	2002		2826.8						4	.064										1																						W/ BAND AND SLEEVE GASKET
-L- 218+00	LT.	2003		2822.2																	1																						REMOVE EXIST. DI, EXTEND EXIST. 15" CMP
-L- 218+00	LT.	2003	2004		2819.5	2817.6							12"							68																						W/ BAND AND SLEEVE GASKET
-L- 218+72	LT.	2004		2821.2						4	.064										1																						
-L- 237+23	RT.	2201		2799.9						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
-L- 239+82	RT.	2202		2796.6						4	.064										1																						W/ BAND AND SLEEVE GASKET
-L- 243+00	RT.	2203		2794.3																	1																						REMOVE EXIST. DI, EXTEND EXIST. 15" CMP
-L- 243+00	RT.	2203	2204		2791.6	2791.2							12"							44																						W/ BAND AND SLEEVE GASKET
-L- 242+52	RT.	2204		2794.3						4	.064										1																						
-L- 246+00	RT.	2205		2797.8						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 15" CMP
-L- 248+95	RT.	2301		2802.1						4	.064										1																						W/ BAND AND SLEEVE GASKET
-L- 255+00	RT.	2302		2803.3																	1																						REMOVE EXISTING DI
-L- 258+70	RT.	2401		2798.8																	1																						
-L- 258+70	RT.	2401	2402		2796.1	2795.9							12"							60																						
-L- 258+05	RT.	2402		2799.8						4	.064										1																						REMOVE EXIST. DI, EXTEND EXIST. 18" CMP
-L- 258+05	RT.	2402	2302		2797.5	2789.0							12"							300																						W/ BAND AND SLEEVE GASKET
SUBTOTALS										28	24	8								568		23				1		1	1		1		399	918	234		22		21			322	
TOTALS										32	48	8	4							1788		47	4.7			7		6	10		1	1	466	1698	234	143	131	36	5	35			936	
																					SAY	5																						

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT) JUNCTION BOX
J.B.	MANHOLE
M.H.	TRAFFIC BEARING
T.B.D.I.	DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

RD244542

COMPUTED BY: DAP DATE: 8/14/2012
CHECKED BY: STS DATE: 4/23/2013

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
W-5315	3-C

"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 SHOUL WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	TYPE III	AT-1	B-77	EACH	G	NG				
-L-	5+45.43	12+32.93	LT.	687.5								50'					1										915'		TIE TO DOUBLE FACED GUARDRAIL
-L-	5+45.43	12+32.93	RT.	687.5							50'						1												TIE TO DOUBLE FACED GUARDRAIL
-L-	12+32.23	14+32.23	CL			200.0																		1		X			
-L-	18+12.35	19+99.85	CL	150		112.5																	2	1		X		422'		TIE TO EXISTING PRECAST BARRIER
-L-	20+29.21	31+16.71	CL	150		937.5																	2	1		X		97'		TIE TO EXISTING PRECAST BARRIER
-L-	35+24.67	48+74.67	CL			1350.0																		2		X				
-L-	54+79.85	70+92.35	CL			1612.5																		2		X				
-L-	74+75.44	80+12.94	CL			537.5																		2		X				
-L-	85+89.31	89+51.81	CL			362.5																		2		X				
-L-	98+06.21	106+81.21	CL			875.0																		2		X				
-L-	114+00.00	124+75.00	CL			1075.0																		2		X				
-L-	129+39.59	136+27.09	CL			687.5																		2		X				
-L-	143+11.50	148+49.00	CL	150		462.5																	2	1		X		435'		TIE TO EXISTING PRECAST BARRIER
-L-	148+65.00	158+15.00	CL	150		875.0																	2	1		X				TIE TO EXISTING PRECAST BARRIER
-L-	164+70.28	197+57.78	CL			3287.5																		2		X				
-L-	204+36.20	220+61.20	CL			1625.0																		2		X				
-L-	227+39.88	234+02.38	CL			662.5																		1		X				
-L-	234+02.38	261+89.88	RT.	2787.5																	1							150'		TIE TO EXISTING BRIDGE TYPE III ANCHOR
-L-	234+02.38	261+89.88	LT.	2787.5																	1							150'		TIE TO EXISTING BRIDGE TYPE III ANCHOR
	SUBTOTAL			7,550.00		14662.5																								
		ANCHOR DEDUCTIONS																												
	GRAU-350	2 @ 50'	=	100																										
	TYPE III	2 @ 18.75'	=	37.5																										
	B-77	8 @ 18.75	=	150																										
	TOTAL ANCHOR DEDUCTIONS			287.5																										
	TOTAL			7,262.50		14,662.50											2				2		8	24				2,169'		
	SAY			**7,275.0**		**14,675**																								

ADDITIONAL GUARDRAIL POSTS 10 EACH

COMPUTED BY: Doug Petry	DATE: 7/5/2013
CHECKED BY: Steve Smallwood	DATE: 8/16/2013

PROJECT NO.	SHEET NO.
W-5315	3-D

PAVEMENT REMOVAL SUMMARY
IN SQUARE YARDS

Survey Line	Station	Station	Location LT/RT/CL	Asphalt Removal	Asphalt Breakup	Concrete Removal	Concrete Breakup
-L-	10+12.00	16+94.98	LT. & RT.	153.00			
-L-	21+21.13	33+95.34	LT. & RT.	260.00			
-L-	35+00.00	49+01.64	LT. & RT.	314.00			
-L-	49+58.28	54+00.00	LT. & RT.	100.00			
-L-	54+55.03	71+28.60	LT. & RT.	375.00			
-L-	71+68.88	79+96.36	LT. & RT.	185.00			
-L-	80+24.61	80+60.35	LT. & RT.	10.00			
-L-	80+82.75	85+15.60	LT. & RT.	97.00			
-L-	85+56.20	92+96.99	LT. & RT.	165.00			
-L-	93+20.51	93+39.80	LT. & RT.	10.00			
-L-	93+61.24	109+69.09	LT. & RT.	358.00			
-L-	109+88.26	110+38.16	LT. & RT.	10.00			
-L-	110+56.73	128+58.01	LT. & RT.	401.00			
-L-	129+00.00	139+16.28	LT. & RT.	228.00			
-L-	140+21.96	147+40.39	LT. & RT.	160.00			
-L-	149+64.10	161+16.59	LT. & RT.	257.00			
-L-	161+65.57	200+81.81	LT. & RT.	880.00			
-L-	201+32.48	223+86.81	LT. & RT.	500.00			
-L-	224+35.49	260+25.16	LT. & RT.	800.00			
		TOTAL		5,263.00			
		SAY		**5,270**			

ESTIMATED VOLUME OF UNCLASSIFIED EXCAVATION = 5,500 CY.

THE EXCAVATION QUANTITY INCLUDES REMOVAL OF EXISTING ISLAND, SAW CUTTING AND REMOVAL OF 1' PAVEMENT ADJACENT TO ISLAND, AND REMOVAL OF STONE UNDERNEATH THE EXISTING ISLAND AS NECESSARY TO PLACE THE PROPOSED PAVEMENT AND SHOULDER BERM GUTTER IN THE MEDIAN.

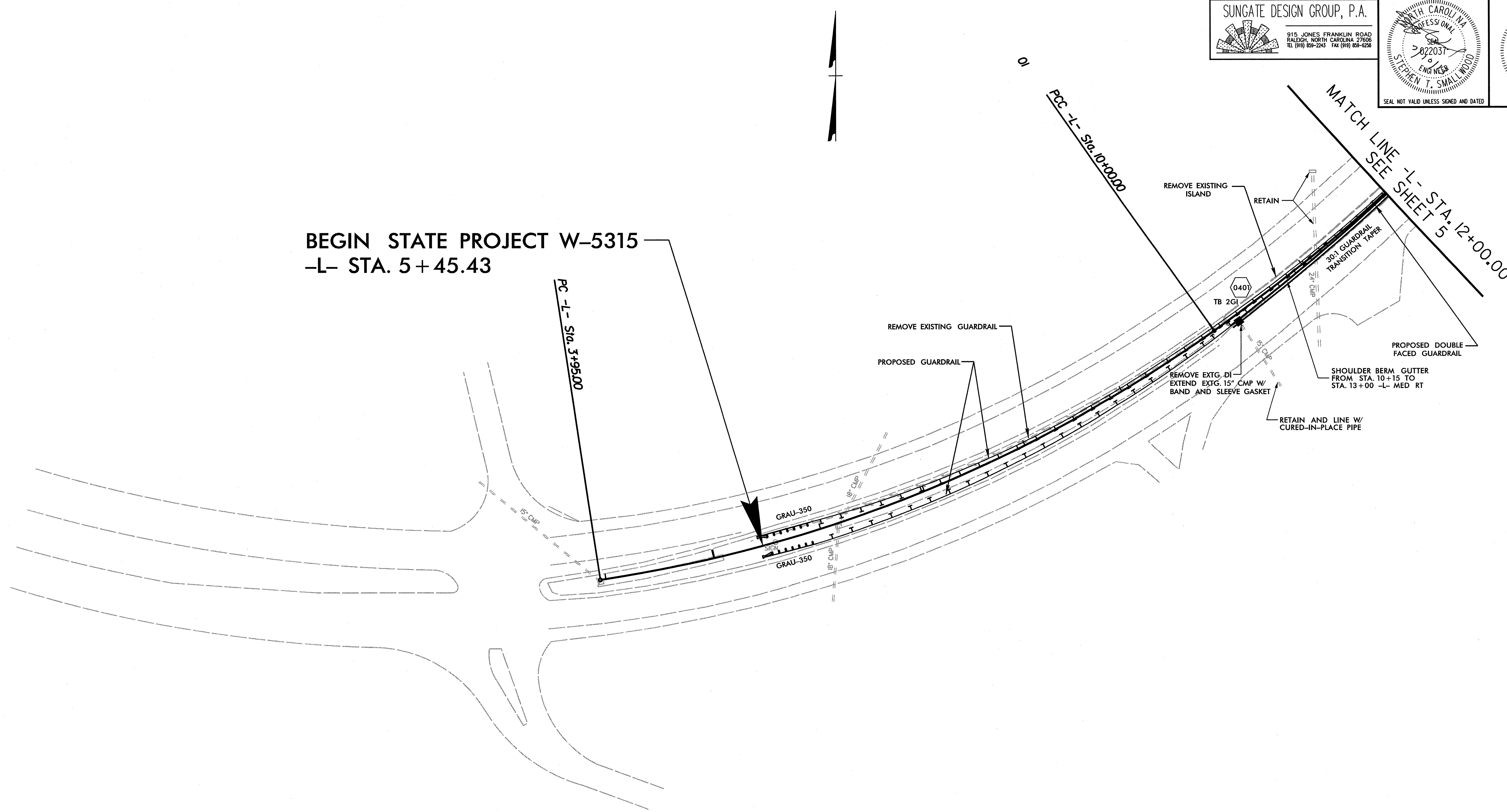
QUANTITIES APPROXIMATE ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

ARCADIS
G & M of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448 NC License No. C-1869

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258

PROJECT REFERENCE NO.	SHEET NO.
W-5315	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEAL NOT VALID UNLESS SIGNED AND DATED



SIGNING TO BE HANDLED BY NCDOT, COORDINATED WITH NCDOT PRIOR TO THE BEGINNING OF CONSTRUCTION.

-L- CURVE DATA	-L- CURVE DATA
PI Sta 7+03.08	PI Sta 11+16.69
Δ = 26° 39' 52.5" (LT)	Δ = 8° 43' 52.7" (LT)
D = 4° 24' 26.5"	D = 3° 44' 54.3"
L = 605.00'	L = 232.93'
T = 308.08'	T = 116.69'
R = 1,300.00'	R = 1,528.54'

5/14/99
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

5/14/99

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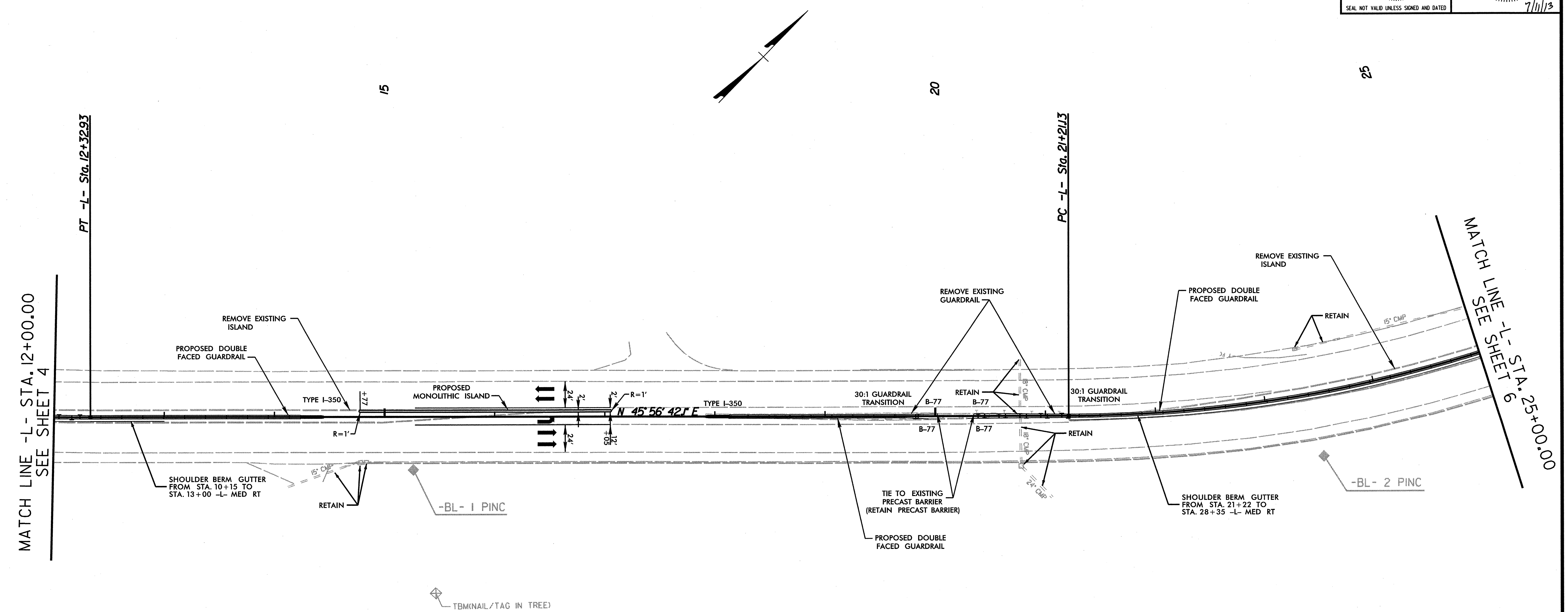
PROJECT REFERENCE NO.	SHEET NO.
W-5315	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 7/11/13
SEAL NOT VALID UNLESS SIGNED AND DATED	



-L- CURVE DATA

PI Sta 24+47.40
Δ = 29° 31' 40.9" (LT)
D = 4° 37' 40.4"
L = 638.05'
T = 326.28'
R = 1,238.05'

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

5/14/99

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RALEIGH, NORTH CAROLINA 27606
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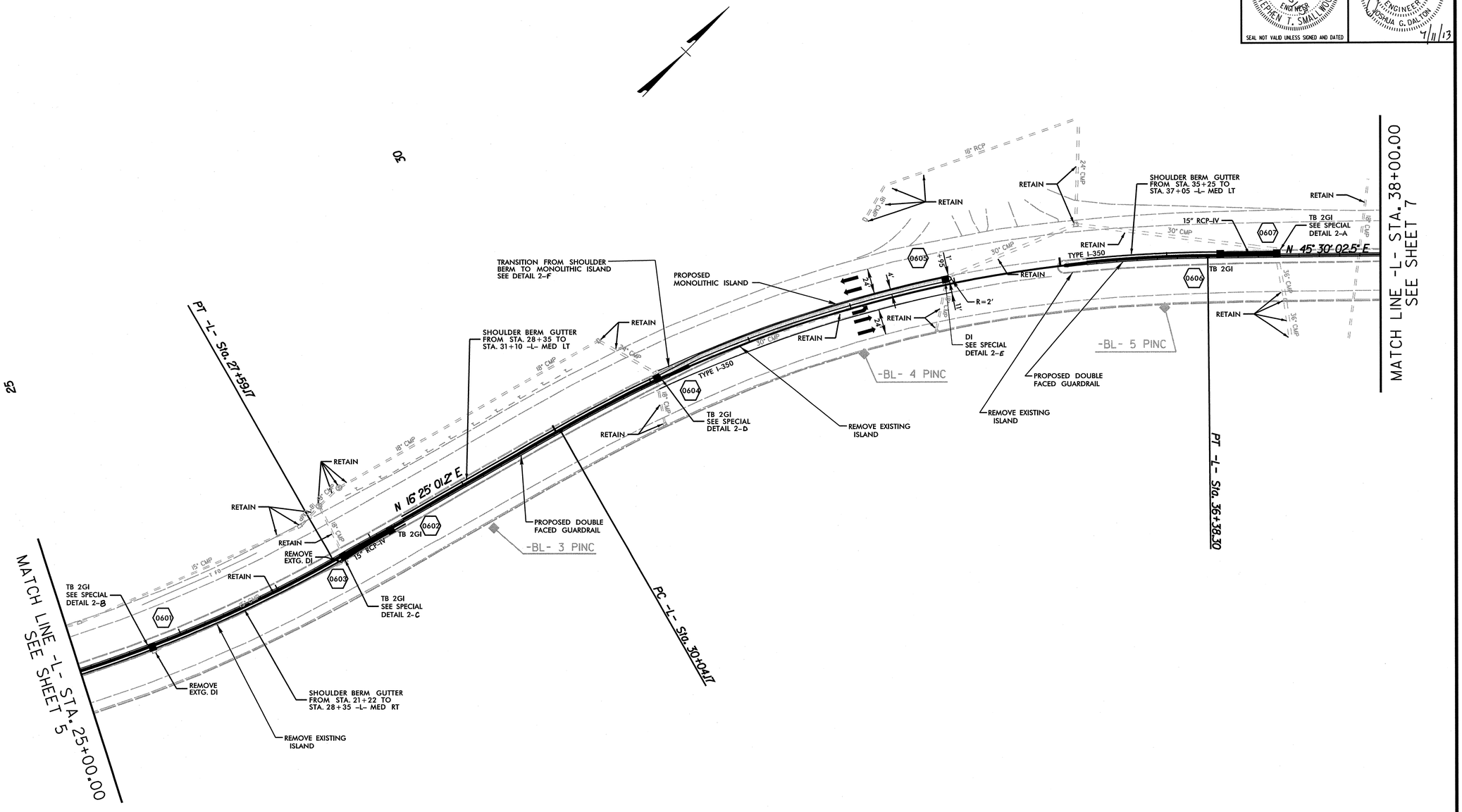
PROJECT REFERENCE NO.	SHEET NO.
W-5315	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022057 ENGINEER STEPHEN T. SMALLWOOD
SEAL NOT VALID UNLESS SIGNED AND DATED

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
4/11/13



-L- CURVE DATA

PI Sta 24+47.40	PI Sta 33+28.22
Δ = 25° 31' 40.9" (LT)	Δ = 29° 05' 01.3" (RT)
D = 4° 37' 40.4"	D = 4° 35' 11.1"
L = 638.05'	L = 634.12'
T = 326.28'	T = 324.05'
R = 1,238.05'	R = 1,249.25'

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$FILENAME$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$

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915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606

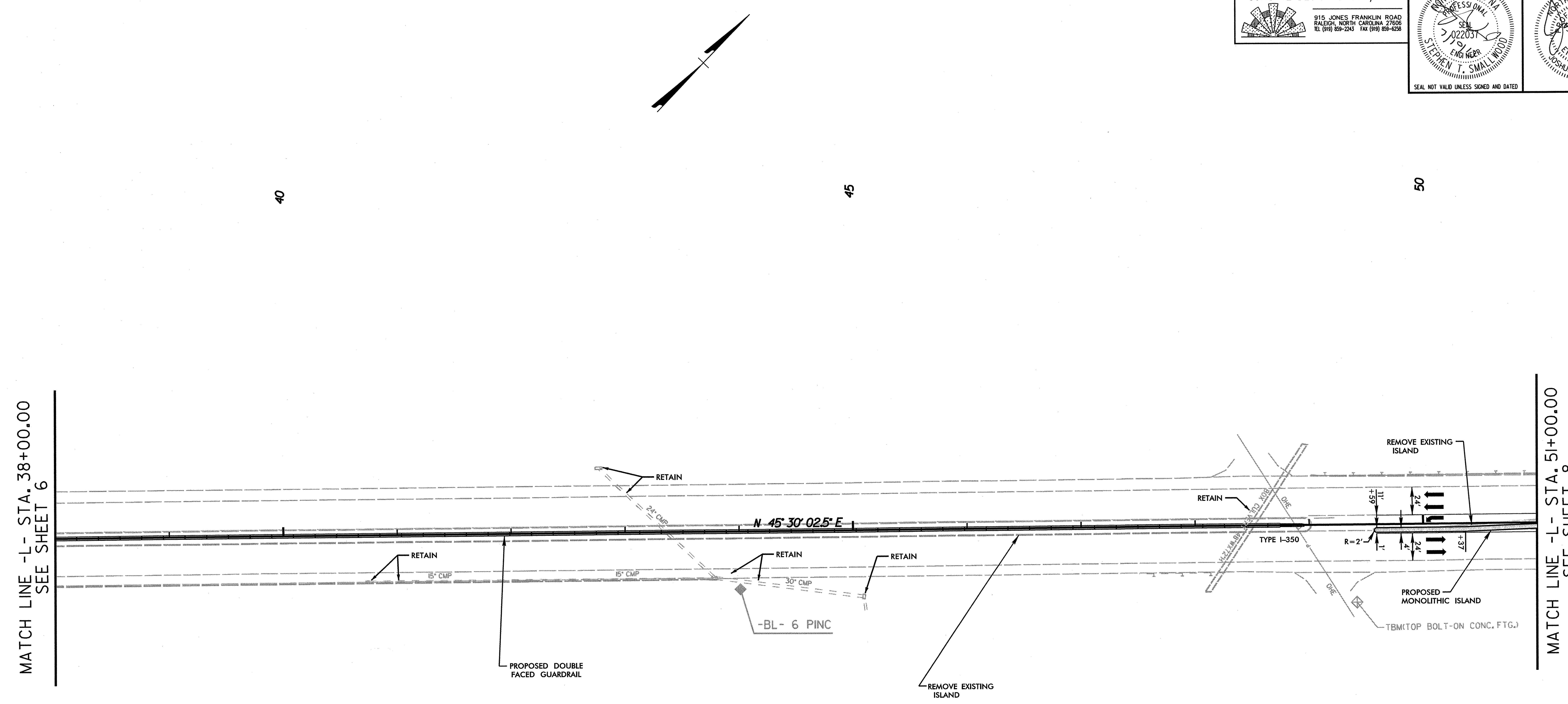
PROJECT REFERENCE NO.	SHEET NO.
W-5315	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022031 ENGINEER STEPHEN T. SMALLWOOD

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED



5/14/99

5/14/99

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258

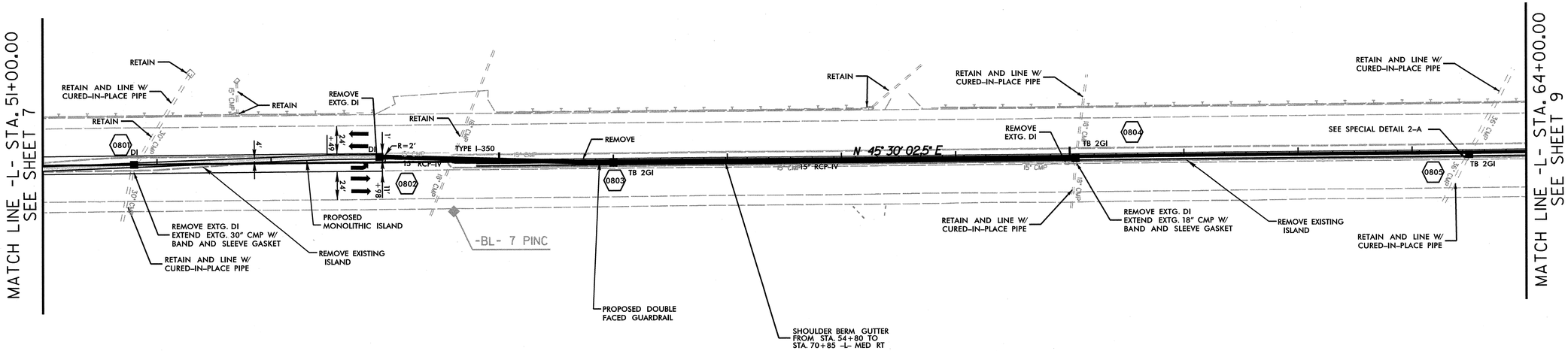
PROJECT REFERENCE NO.	SHEET NO.
W-5315	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD
SEAL NOT VALID UNLESS SIGNED AND DATED

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/11/13

55

60



$$$$$$SYSTIME$$$$$$
$$$$$$DGN$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$

5/14/99

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SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6208

PROJECT REFERENCE NO.	SHEET NO.
W-5315	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD
SEAL NOT VALID UNLESS SIGNED AND DATED

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/11/13

65 70 75

MATCH LINE -L- STA. 64+00.00
SEE SHEET 8

-BL- 8 PINC

RETAIN

RETAIN AND LINE W/ CURED-IN-PLACE PIPE

REMOVE EXTG. DI EXTED EXTG. 18" CMP W/ BAND AND SLEEVE GASKET

0901 TB 2GI

18" CMP

15" CMP

N 45° 30' 02.5" E

REMOVE EXISTING ISLAND

RETAIN AND LINE W/ CURED-IN-PLACE PIPE

0903 TB 2GI

18" CMP

REMOVE EXTG. DI EXTEND EXTG. 18" CMP W/ BAND AND SLEEVE GASKET

0902 TYPE I-350

15" RCP IV

TB 2GI

R=1'

12'

+69

24'

2'

24'

2'

50' CMP

RETAIN

TYPE I-350

REMOVE EXISTING ISLAND

RETAIN

18" CMP

RETAIN AND LINE W/ CURED-IN-PLACE PIPE

18" CMP

RETAIN

PROPOSED DOUBLE FACED GUARDRAIL

SHOULDER BERM GUTTER FROM STA. 54+80 TO STA. 70+85 -L- MED RT

TRANSITION FROM SHOULDER BERM TO MONOLITHIC ISLAND SEE DETAIL 2-F

PROPOSED MONOLITHIC ISLAND

SHOULDER BERM GUTTER FROM STA. 74+90 TO STA. 80+10 -L- MED RT

MATCH LINE -L- STA. 77+00.00
SEE SHEET 10

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

5/14/99

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TEL (919) 859-2243 FAX (919) 859-6258

PROJECT REFERENCE NO.	SHEET NO.
W-5315	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
STEPHEN T. SMALLWOOD 022037 7/10/13	JOSHUA G. DALTON 26971 7/11/13
SEAL NOT VALID UNLESS SIGNED AND DATED	

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

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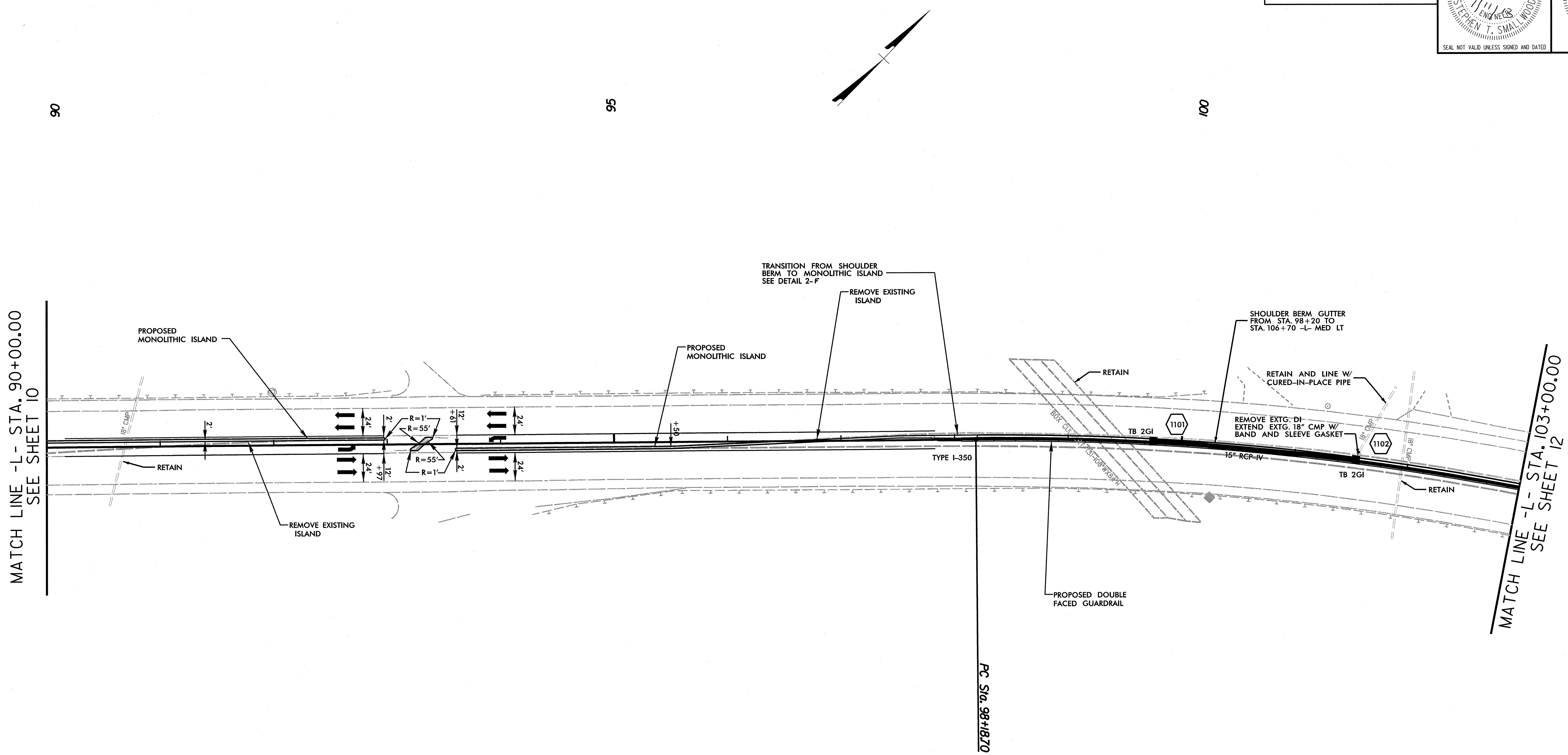
PROJECT REFERENCE NO.	SHEET NO.
W-5315	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD 7/11/13

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED



-L- CURVE DATA
PI Sta 102+83.86
Δ = 2° 50' 09.4" (RT)
D = 2° 22' 33.4"
L = 919.04'
T = 465.17'
R = 2,411.50'

5/14/99
$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	12

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
STEPHEN T. SMALLWOOD 022051	JOSHUA G. DALTON 26971 7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED

-L- CURVE DATA
PI Sta 102+83.86
Δ = 21° 50' 09.4" (RT)
D = 2° 22' 33.4"
L = 919.04'
T = 465.17'
R = 2,411.50'

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	13
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED

120

125

MATCH LINE -L- STA. 116+00.00
SEE SHEET 12

REMOVE EXISTING ISLAND

N 67° 20' 11.9" E

RETAIN

24" CMP

PROPOSED MONOLITHIC ISLAND

R=1'

TYPE I-350

2'

12'

+22

2'

2'

24"

24"

+17

12"

R=1'

-BL- 14 PINC

PROPOSED DOUBLE FACED GUARDRAIL

MATCH LINE -L- STA. 129+00.00
SEE SHEET 14

$$$$$$SYSTIME$$$$$
$$$$$$FILENAME$$$$DGN$$$$$$$$$$$$$$$$$$$$

5/14/99

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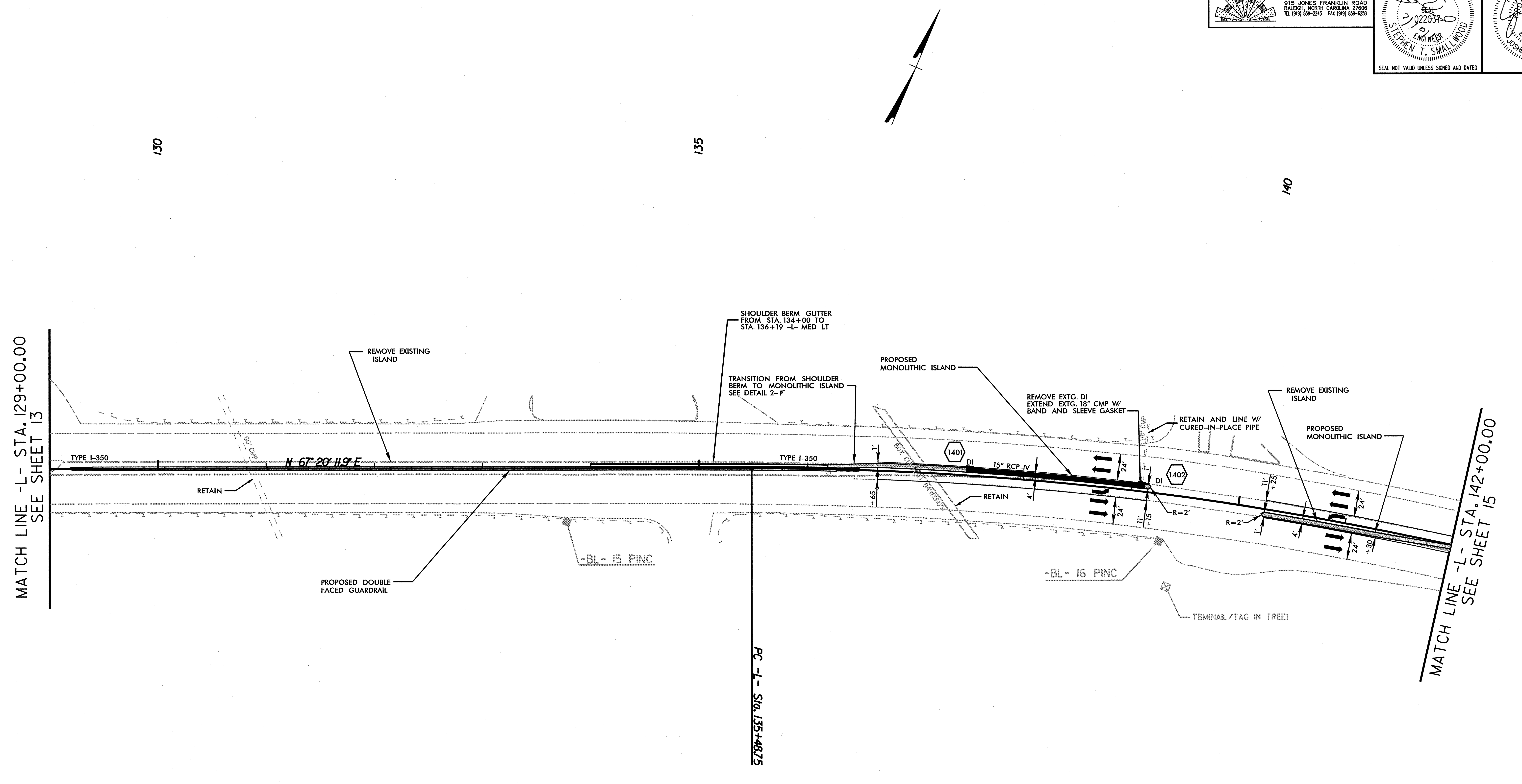
PROJECT REFERENCE NO.	SHEET NO.
W-5315	14
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED



-L- CURVE DATA

PI Sta 142+67.86
Δ = 27° 27' 09.6" (RT)
D = 1° 56' 46.2"
L = 1,410.61'
T = 719.12'
R = 2,944.05'

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

5/14/99

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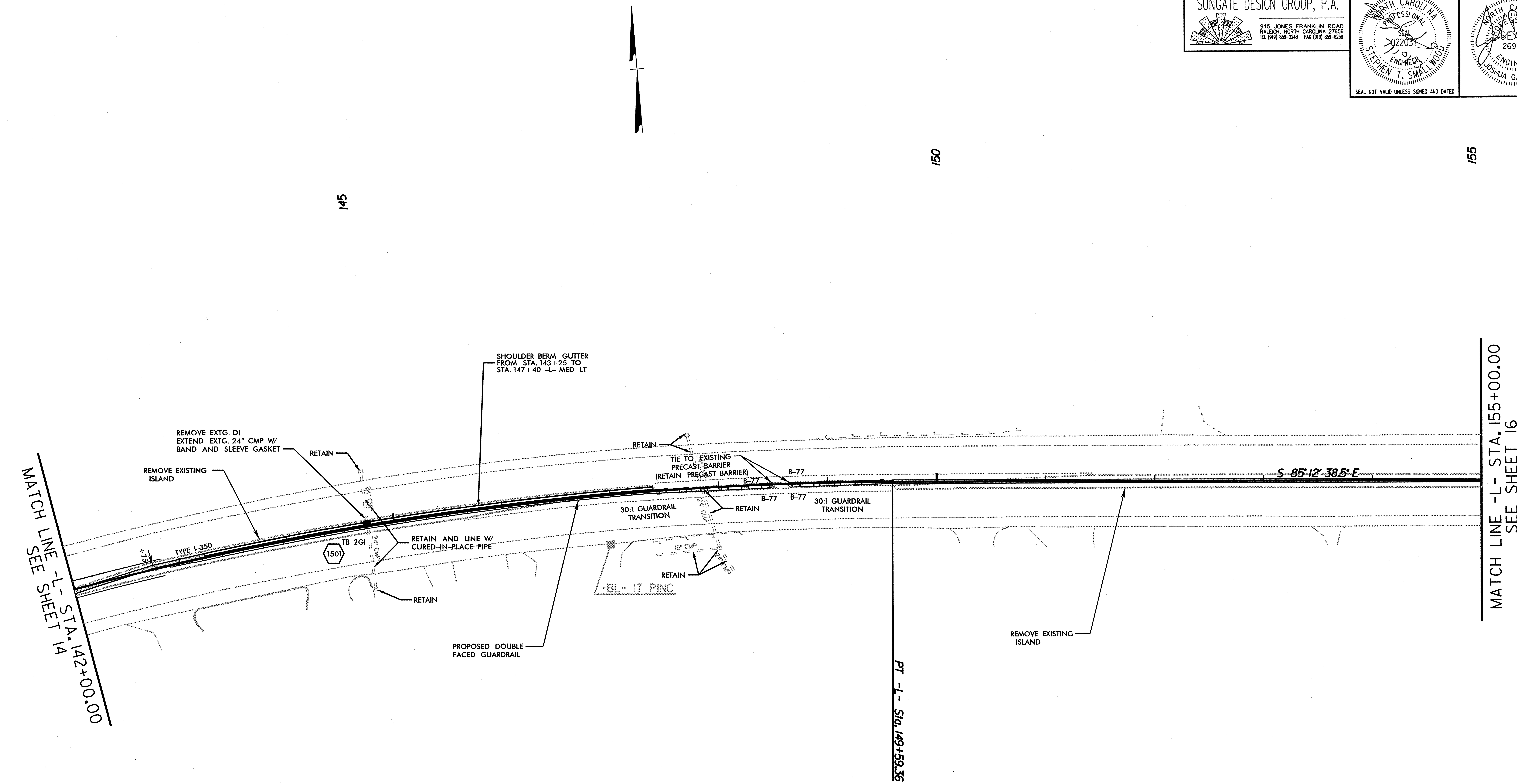
PROJECT REFERENCE NO.	SHEET NO.
W-5315	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED



145
150
155
SHOULDER BERM GUTTER FROM STA. 143+25 TO STA. 147+40 -L- MED LT
REMOVE EXTG. DI EXTEND EXTG. 24" CMP W/ BAND AND SLEEVE GASKET
RETAIN
REMOVE EXISTING ISLAND
TYPE I-350
TB 2GI
1501
RETAIN AND LINE W/ CURED-IN-PLACE PIPE
RETAIN
24" CMP
TIE TO EXISTING PRECAST BARRIER (RETAIN PRECAST BARRIER)
B-77
30:1 GUARDRAIL TRANSITION
16" CMP
-BL- 17 PINC
PROPOSED DOUBLE FACED GUARDRAIL
S 85° 12' 38.5" E
PT -L- Sta. 149+59.36
REMOVE EXISTING ISLAND
MATCH LINE -L- STA. 142+00.00 SEE SHEET 14
MATCH LINE -L- STA. 155+00.00 SEE SHEET 16

-L- CURVE DATA

PI Sta 142+67.86
Δ = 27° 27' 09.6" (RT)
D = 1° 56' 46.2"
L = 1,410.61'
T = 719.12'
R = 2,944.05'

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

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	16
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
022037 STEPHEN T. SMALLWOOD	26971 JOSHUA G. DALTON
SEAL NOT VALID UNLESS SIGNED AND DATED	7/11/13

-L- CURVE DATA
PI Sta 177+39.19
Δ = 23° 26' 23.5" (LT)
D = 1° 00' 08.5"
L = 2,338.47'
T = 1,185.82'
R = 5,716.10'

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

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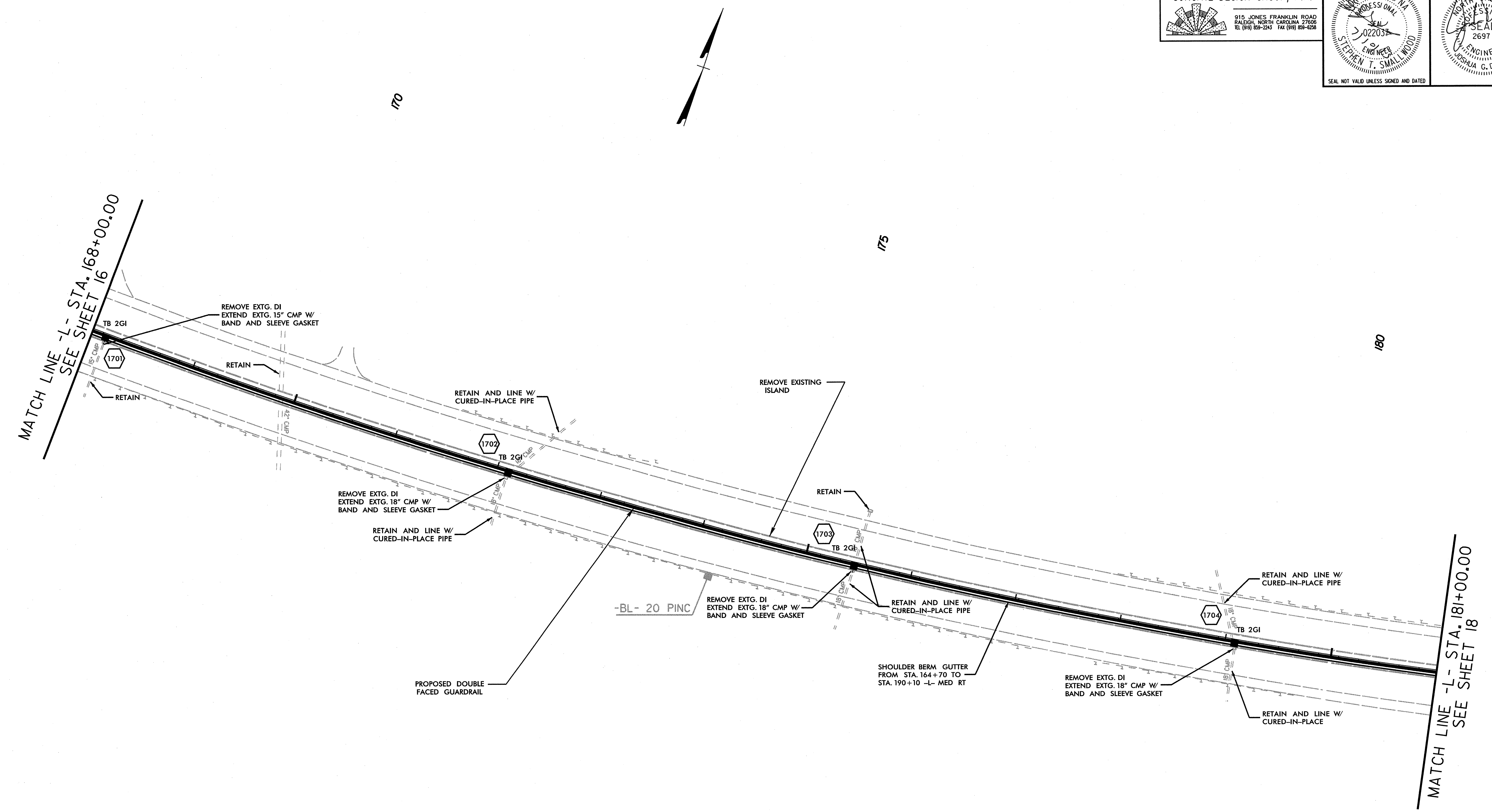
PROJECT REFERENCE NO.	SHEET NO.
W-5315	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEAL NOT VALID UNLESS SIGNED AND DATED



-L- CURVE DATA

PI Sta 177+39.19
Δ = 23° 26' 23.5" (LT)
D = 1° 00' 08.5"
L = 2,338.47'
T = 1,185.82'
R = 5,716.10'

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	18
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 7/11/13

SEAL NOT VALID UNLESS SIGNED AND DATED

185

190

PT -L- Sta. 188+91.84

MATCH LINE -L- STA. 181+00.00
SEE SHEET 17

REMOVE EXISTING ISLAND

RETAIN AND LINE W/ CURED-IN-PLACE PIPE

RETAIN AND LINE W/ CURED-IN-PLACE PIPE

RETAIN AND LINE W/ CURED-IN-PLACE PIPE

REMOVE EXISTING ISLAND

18" CMP

TB 2GI (1801)

REMOVE EXTG. DI

TB 2GI (1802)

REMOVE EXTG. DI

-BL- 21 PINC

PROPOSED DOUBLE FACED GUARDRAIL

SHOULDER BERM GUTTER FROM STA. 164+70 TO STA. 190+10 -L- MED RT

18" CMP

TB 2GI (1804)

N 71° 20' 58.0" E

REMOVE EXTG. DI

15" RCP-IV

TB 2GI (1803)

TBM(NAIL/TAG IN GUY POLE)

MATCH LINE -L- STA. 194+00.00
SEE SHEET 19

-L- CURVE DATA

PI Sta 177+39.19
Δ = 23° 26' 23.5" (LT)
D = 1° 00' 08.5"
L = 2,338.47'
T = 1,185.82'
R = 5,716.10'

$$$$SYSTIME$$$$
$$$$FILENAME$$$$

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	19
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

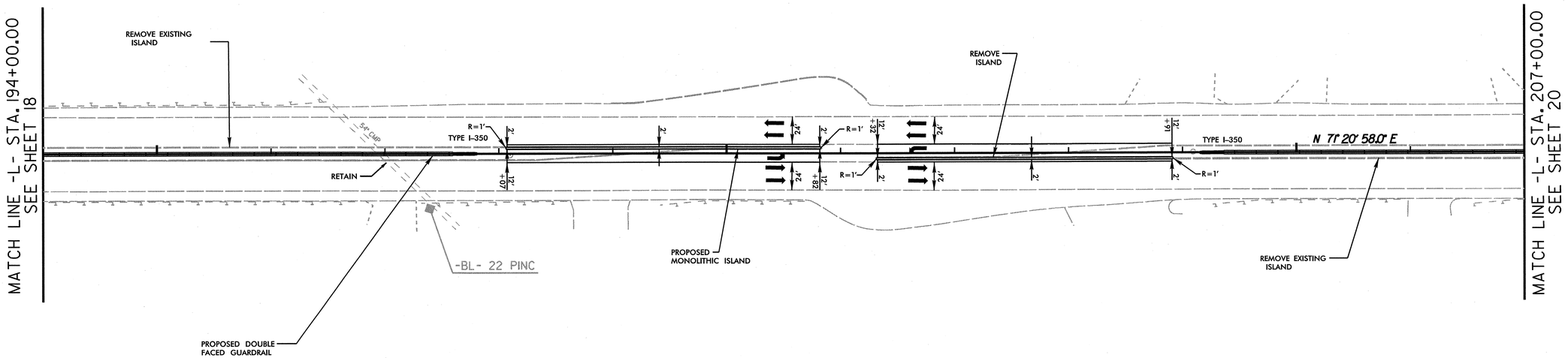
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

SEAL NOT VALID UNLESS SIGNED AND DATED

7/11/13

195 200 205



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

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	20
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 022037 STEPHEN T. SMALLWOOD	SEAL 26971 JOSHUA G. DALTON 7/11/13
SEAL NOT VALID UNLESS SIGNED AND DATED	

-L- CURVE DATA
PI Sta 212+96.32
Δ = 17° 13' 08.6" (RT)
D = 1° 54' 19.7"
L = 903.67'
T = 455.26'
R = 3,006.92'

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

5/14/99

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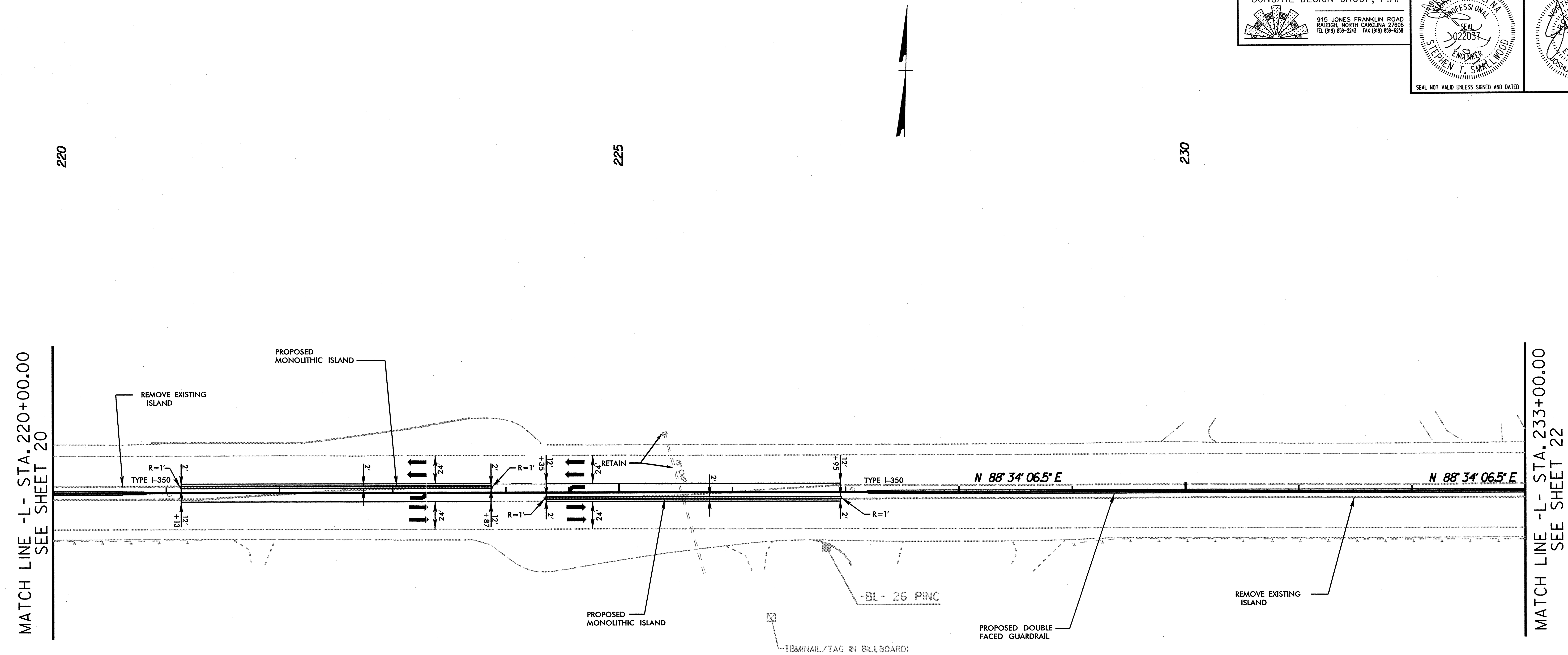
PROJECT REFERENCE NO.	SHEET NO.
W-5315	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
SEAL NOT VALID UNLESS SIGNED AND DATED	7/11/13



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

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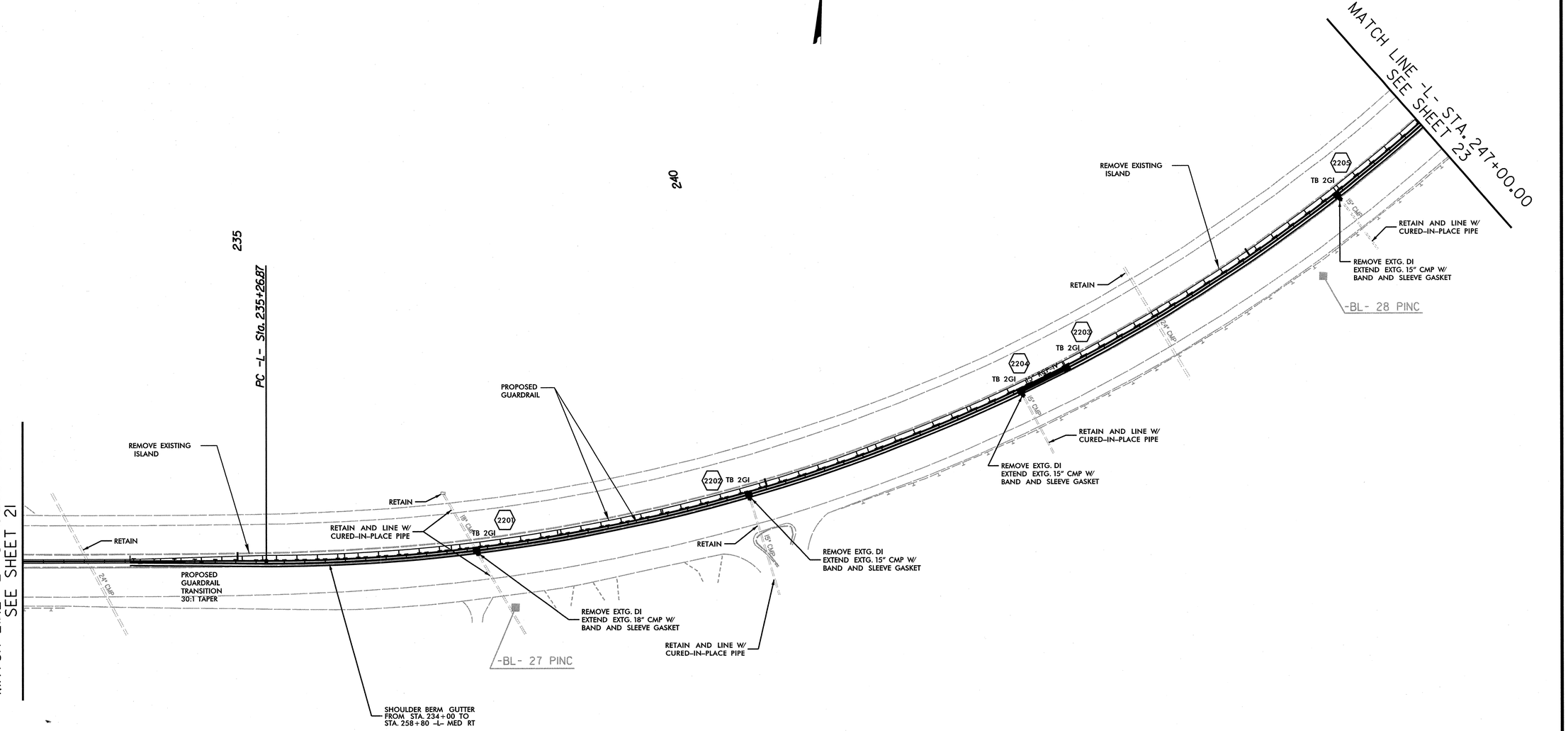
PROJECT REFERENCE NO.	SHEET NO.
W-5315	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 022037 STEPHEN T. SMALLWOOD 8/21/13	SEAL 26971 JOSHUA G. DALTON 8/21/13
SEAL NOT VALID UNLESS SIGNED AND DATED	

5/14/99



-L- CURVE DATA

PI Sta 248+69.26
Δ = 79° 00' 30.2" (LT)
D = 3° 31' 08.3"
L = 2,245.22'
T = 1,342.39'
R = 1,628.20'

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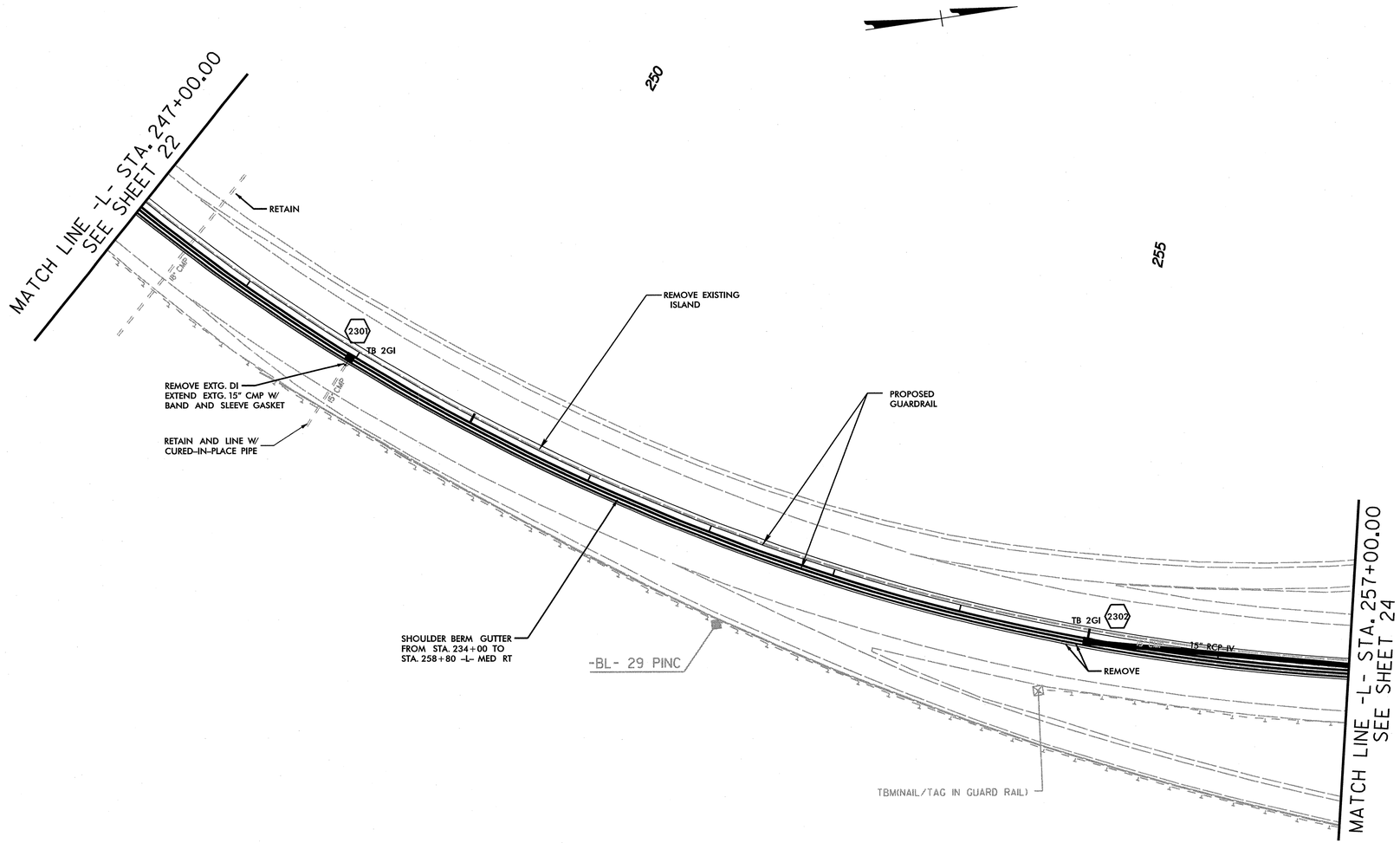
PROJECT REFERENCE NO.	SHEET NO.
W-5315	23
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 022037 STEPHEN T. SMALLWOOD	SEAL 26971 JOSHUA G. DALTON 7/11/13
SEAL NOT VALID UNLESS SIGNED AND DATED	



-L- CURVE DATA
PI Sta 248+69.26
Δ = 79° 00' 30.2" (LT)
D = 3° 31' 08.3"
L = 2,245.22'
T = 1,342.39'
R = 1,628.20'

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PROJECT REFERENCE NO.	SHEET NO.
W-5315	24

RW SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
SEAL NOT VALID UNLESS SIGNED AND DATED	7/11/13

-L- CURVE DATA
PI Sta 248+69.26
Δ = 79°00' 30.2" (LT)
D = 3°31' 08.3"
L = 2,245.22'
T = 1,342.39'
R = 1,628.20'

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