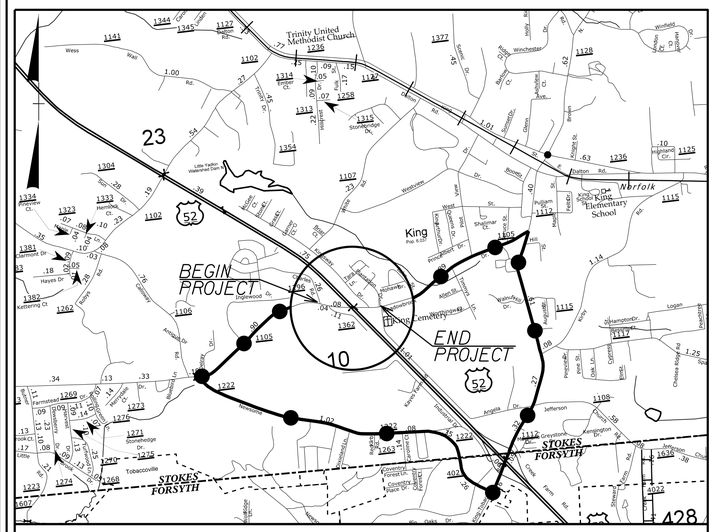
09/08/99

TIP PROJECT: BR-0047

CONTRACT: C204394

See Sheet 1A For Index of Sheets



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

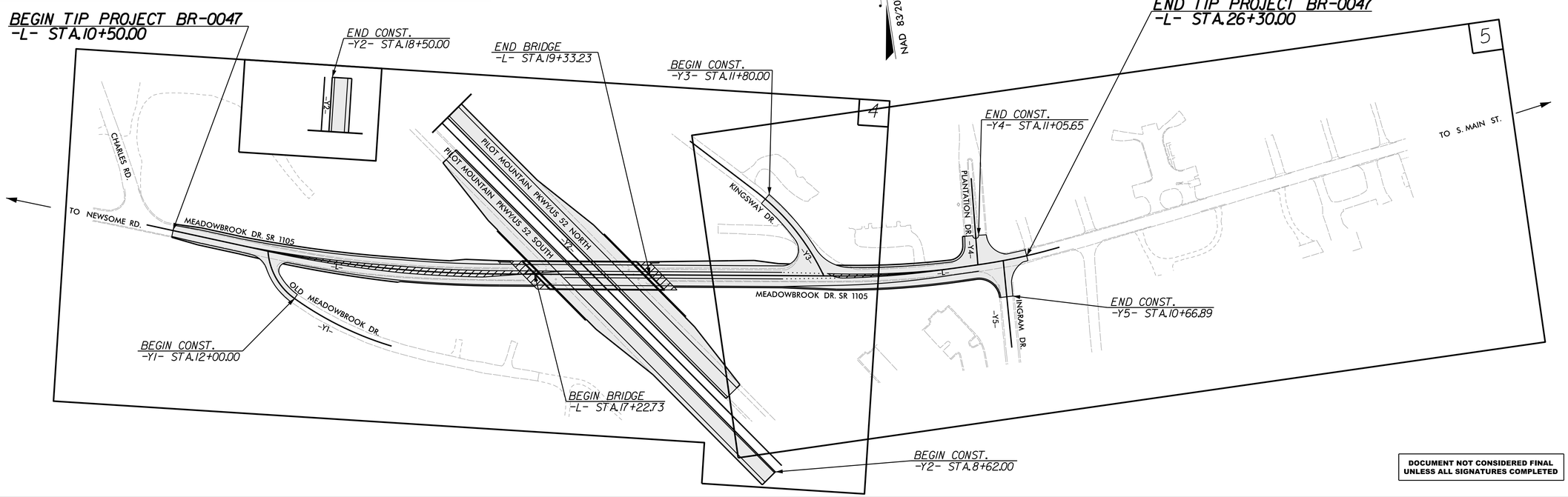
STOKES COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0047	1	

WBS PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49078.1.1	N/A	PE
49078.2.1	N/A	ROW/UTILITIES
49078.3.1	N/A	CONSTRUCTION

LOCATION: REPLACE BRIDGE 10 ON SR 1105 (MEADOWBROOK DR.) OVER U.S. 52

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



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 2020 = 4067
ADT 2040 = 4400
K = 60 %
D = 9 %
T = 8 % *
V = 50 MPH
* TTST =1% DUAL 7%
FUNC CLASS = LOCAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0047 = 0.259 MILES

LENGTH STRUCTURE TIP PROJECT BR-0047 = 0.040 MILES

TOTAL LENGTH TIP PROJECT BR-0047 = 0.299 MILES

Prepared in the Office of:
PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: August 30, 2019

LETTING DATE: June 16, 2020

DAVID STUTTS, PE
NCDOT CONTACT

CHAD ROGERS, PE
PROJECT ENGINEER

CURTIS HALL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

DocuSigned by: Kevin Higgins E898DBE48FC2444...
3/17/2020
NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by: Chad Rogers 5D3D814C627543C...
3/17/2020
NORTH CAROLINA PROFESSIONAL SEAL 029442 ENGINEER CHAD ROGERS
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	1A

ROADWAY DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277

INDEX OF SHEETS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 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 AND STD. 560.02

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

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".

SUBSURFACE PLANS:

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

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, WINDSTREAM

PNG, SPECTRUM, CITY OF KING (Water and sewage)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.04	Guide for Paving Shoulders Under Bridges - Method IV
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
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
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.04	Street Turnout
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	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
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

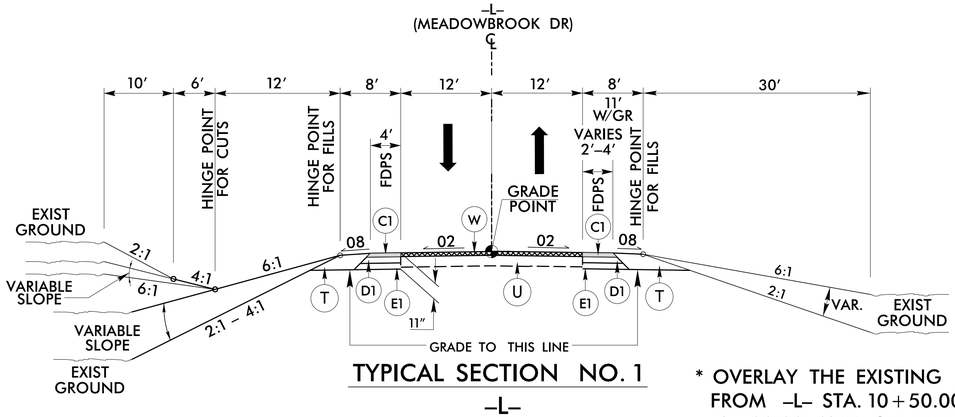
MISCELLANEOUS:

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

6/2/99

FINAL PAVEMENT SCHEDULE

B	PROP. APPROX. 3/4" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS. PER SQ. YD.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD IN EACH OF THE TWO LAYERS.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
M	MILLED RUMBLE STRIP
R1	SHOULDER BERM GUTTER
R2	2'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)



TYPICAL SECTION NO. 1

–L–

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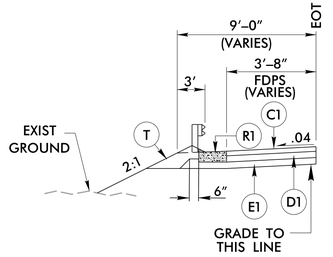
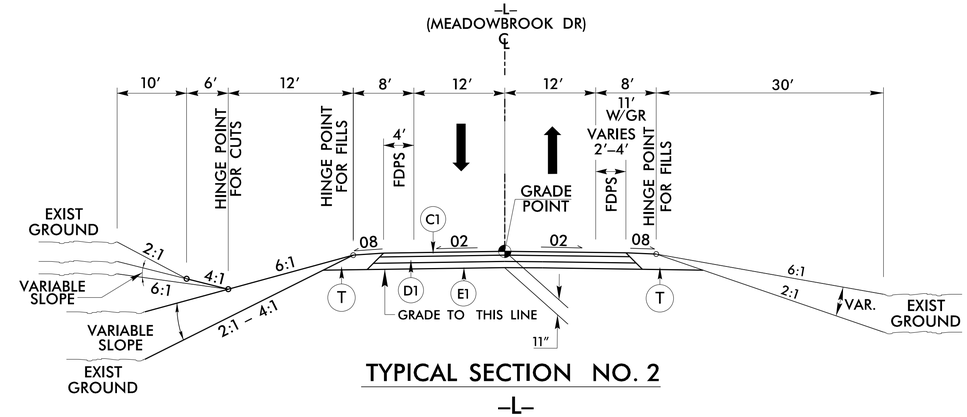


SHOULDER BERM GUTTER DETAIL NO. 1

SEE PLANS FOR LOCATION OF PROPOSED SHOULDER BERM GUTTER USE WITH –L– TYPICAL SECTION



TYPICAL SECTION NO. 2

–L–

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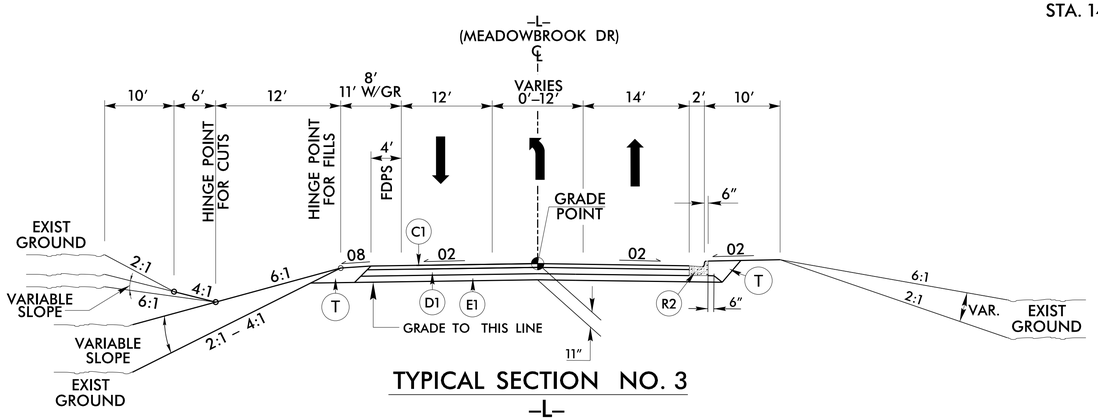

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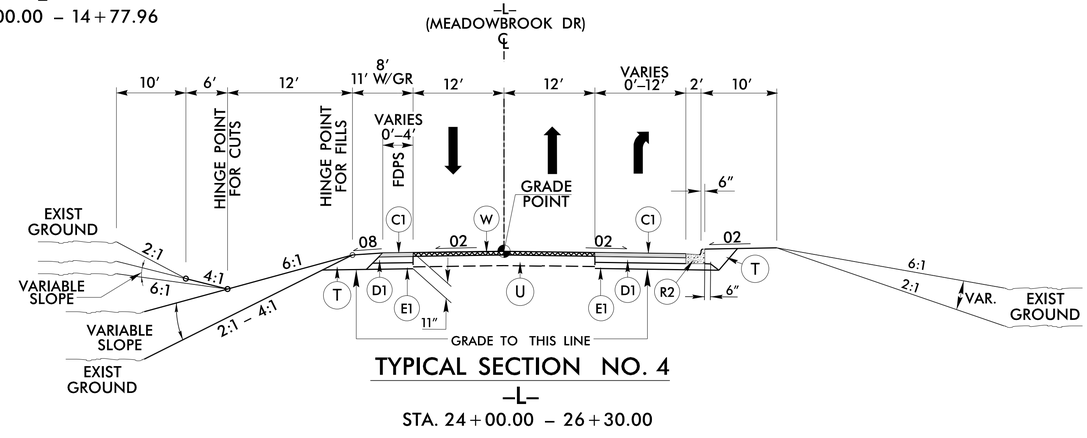
STA. 19+33.23 – 24+00.00



TYPICAL SECTION NO. 4

–L–

STA. 24+00.00 – 26+30.00

* OVERLAY THE EXISTING PAVEMENT FROM –L– STA. 25+00.00 TO 26+30.00 AND SEE DETAIL 2.

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029442 ENGINEER CHAD ROGERS

3/18/2020

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON

3/18/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277

3/19/2020
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PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
SEAL 029442 A. CHAD ROGERS 3/30/2020	SEAL 029896 CLARK S. MORRISON 3/31/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277

FINAL PAVEMENT SCHEDULE

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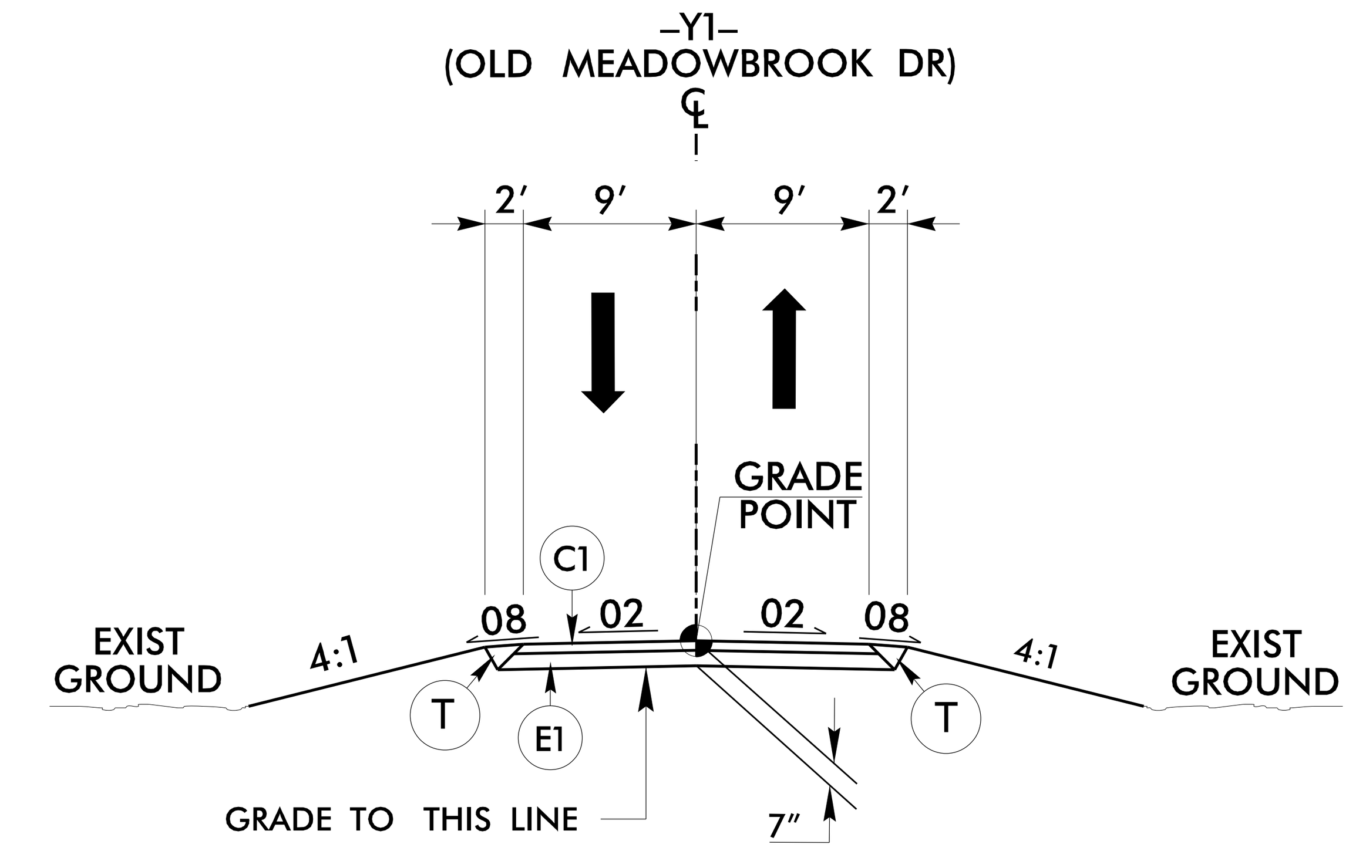
M	MILLED RUMBLE STRIP
R1	SHOULDER BERM GUTTER
R2	2'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)



TYPICAL SECTION NO. 5
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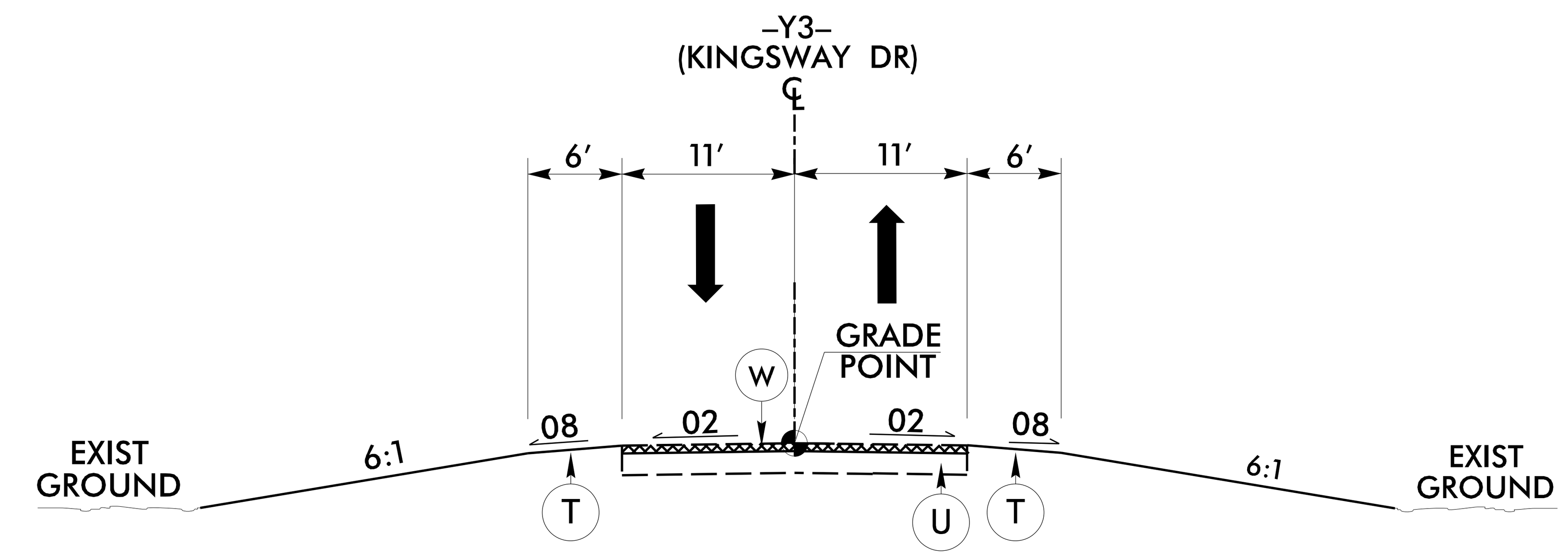
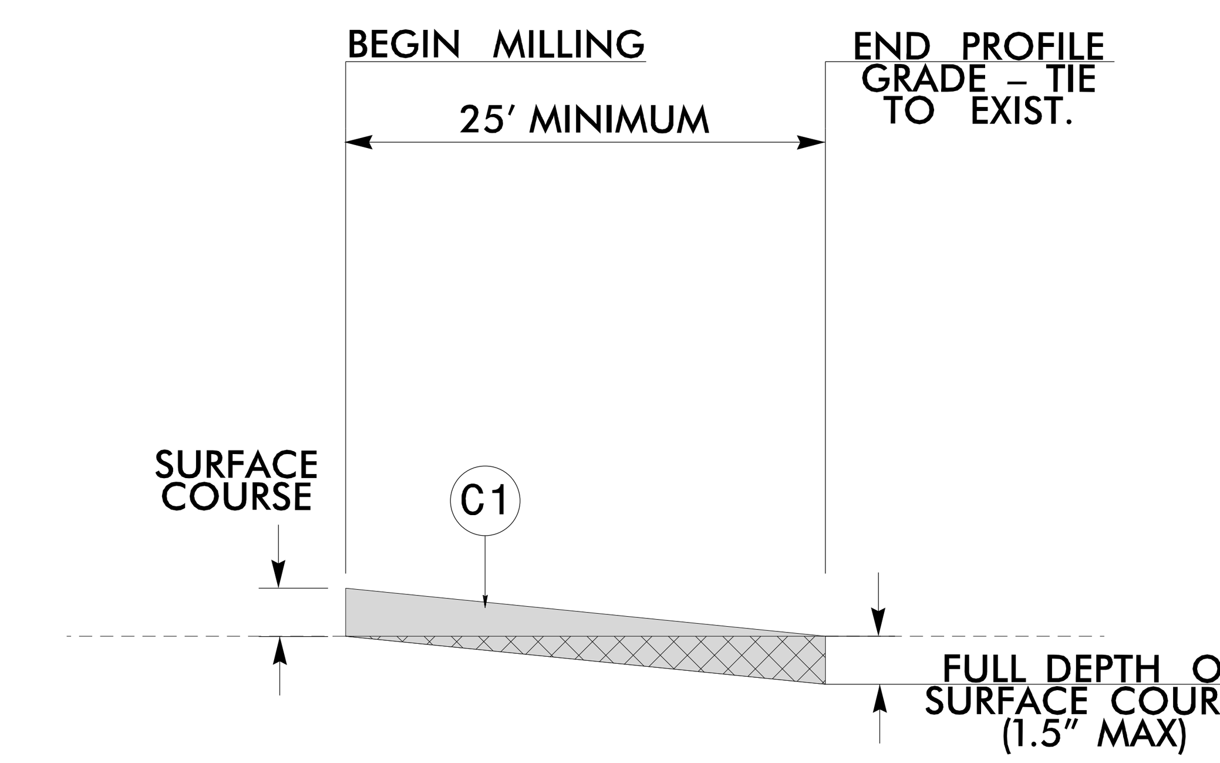
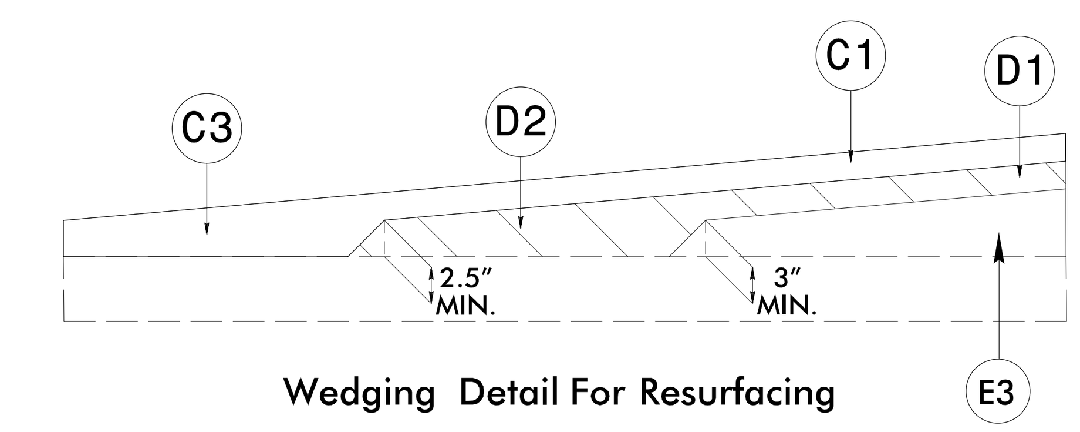


TYPICAL SECTION NO. 6
-Y3-
STA. 11+80.00 - 13+35.94

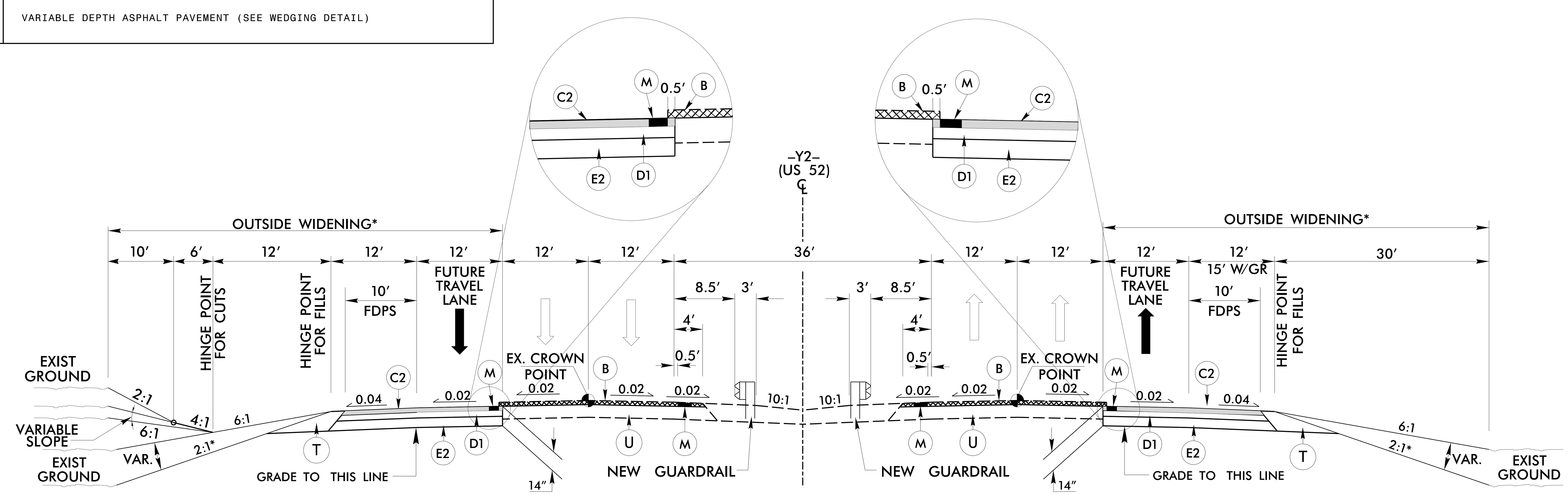


DETAIL 2
INCIDENTAL MILLING DETAIL
SEE PROFILE FOR LIMITS



Wedging Detail For Resurfacing

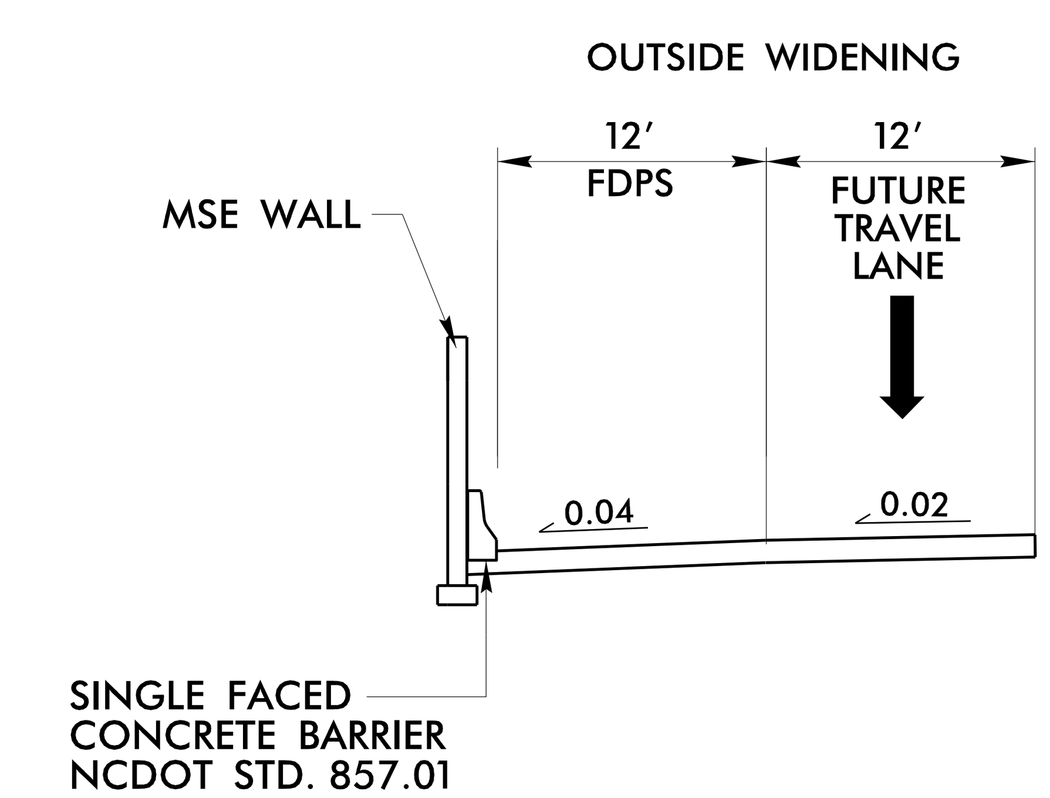
DETAIL 3



* SEE PARTIAL TYPICAL SECTION FOR MSE WALL LOCATION

** OVERLAY EXISTING PAVEMENT WITH OGAFC
SB STA. 8+62.00 - 11+47.77
NB STA. 15+52.40 - 18+50.00

TYPICAL SECTION NO. 7
-Y2-
SB STA. 8+62.00 - 16+96.77 **
NB STA. 10+21.89 - 18+50.00 **



PARTIAL TYPICAL MSE WALL AND SHOULDER DETAIL
TO BE USED AT MSE WALL LOCATIONS
(SEE PLANS FOR LOCATIONS)

SEE NCDOT STD 610.04 FOR SFCB PLACEMENT IN RELATION TO THE MSE WALL

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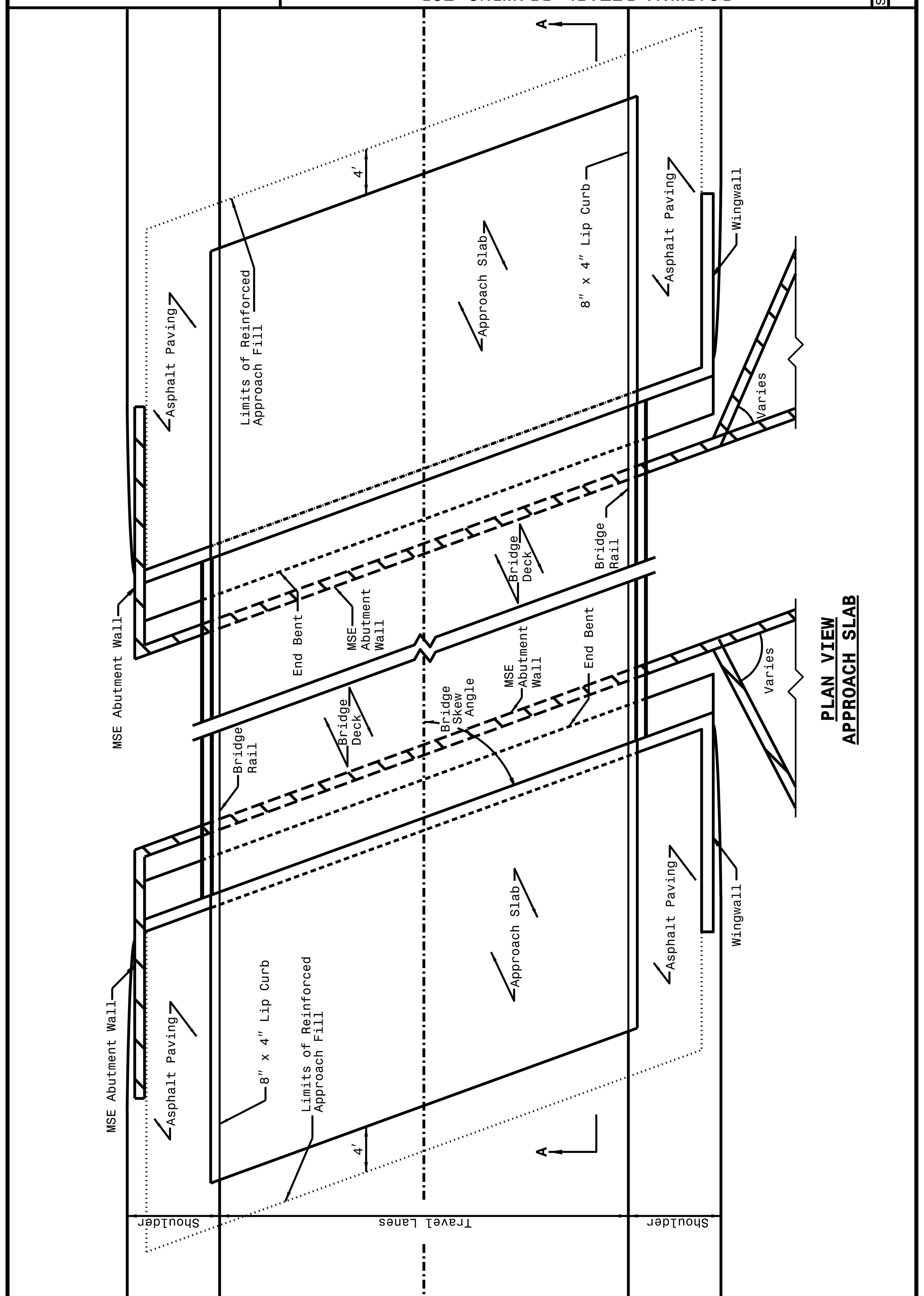
PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2C-1

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY DETAIL DRAWING FOR BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL
SHEET 1 OF 2 422D10

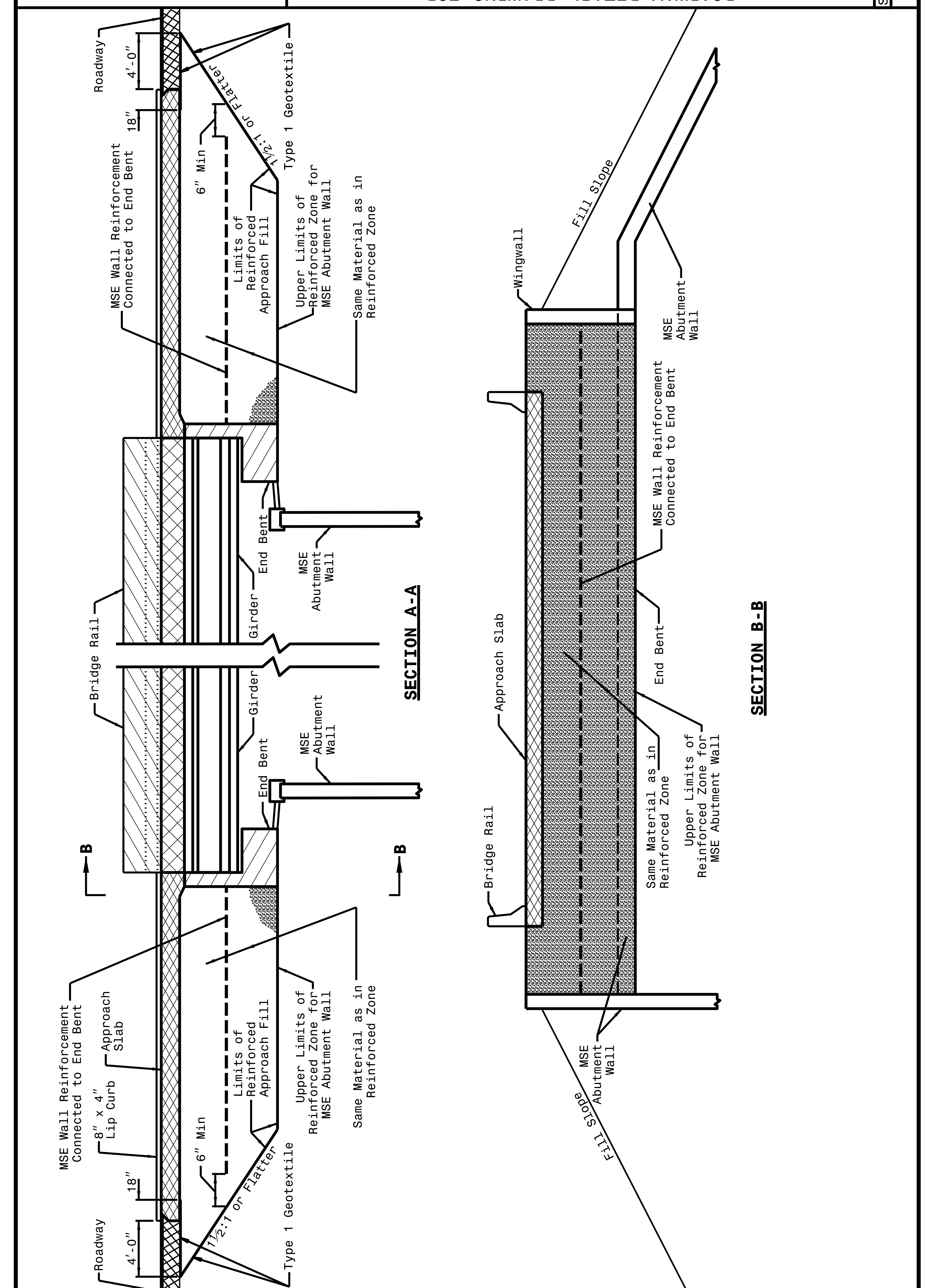


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR
MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL

SHEET 1 OF 2 422D10

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY DETAIL DRAWING FOR BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL
SHEET 2 OF 2 422D10



STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR
MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL

SHEET 2 OF 2 422D10

3/17/2020

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TYPE III REINFORCED APPROACH FILLS

ORIGINAL BY: K. A. KEMPF DATE: JULY 2017
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: 2018 standard drawings\division 422d10.dgn

10-AUG-2017 10:11
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jhowerton AT CSD-292595

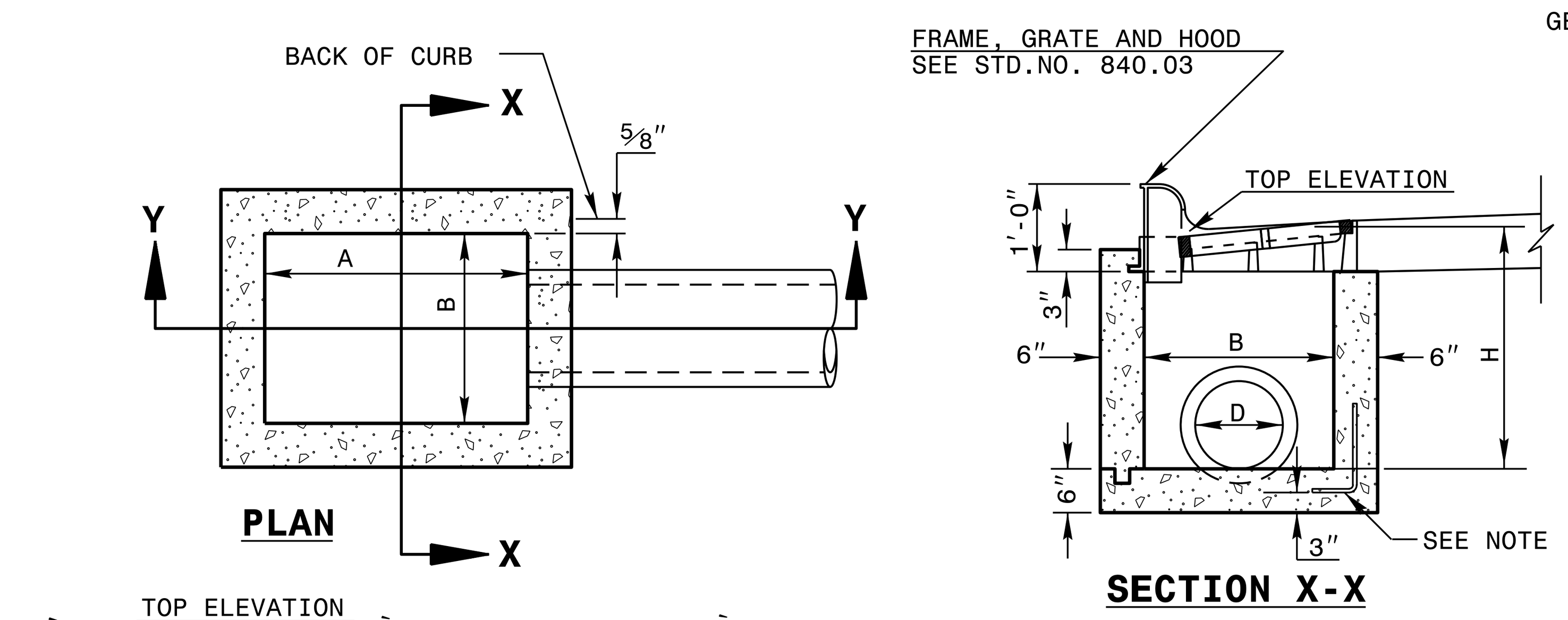
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2C-2

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

ENGLISH DETAIL DRAWING FOR
MINIMUM 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.

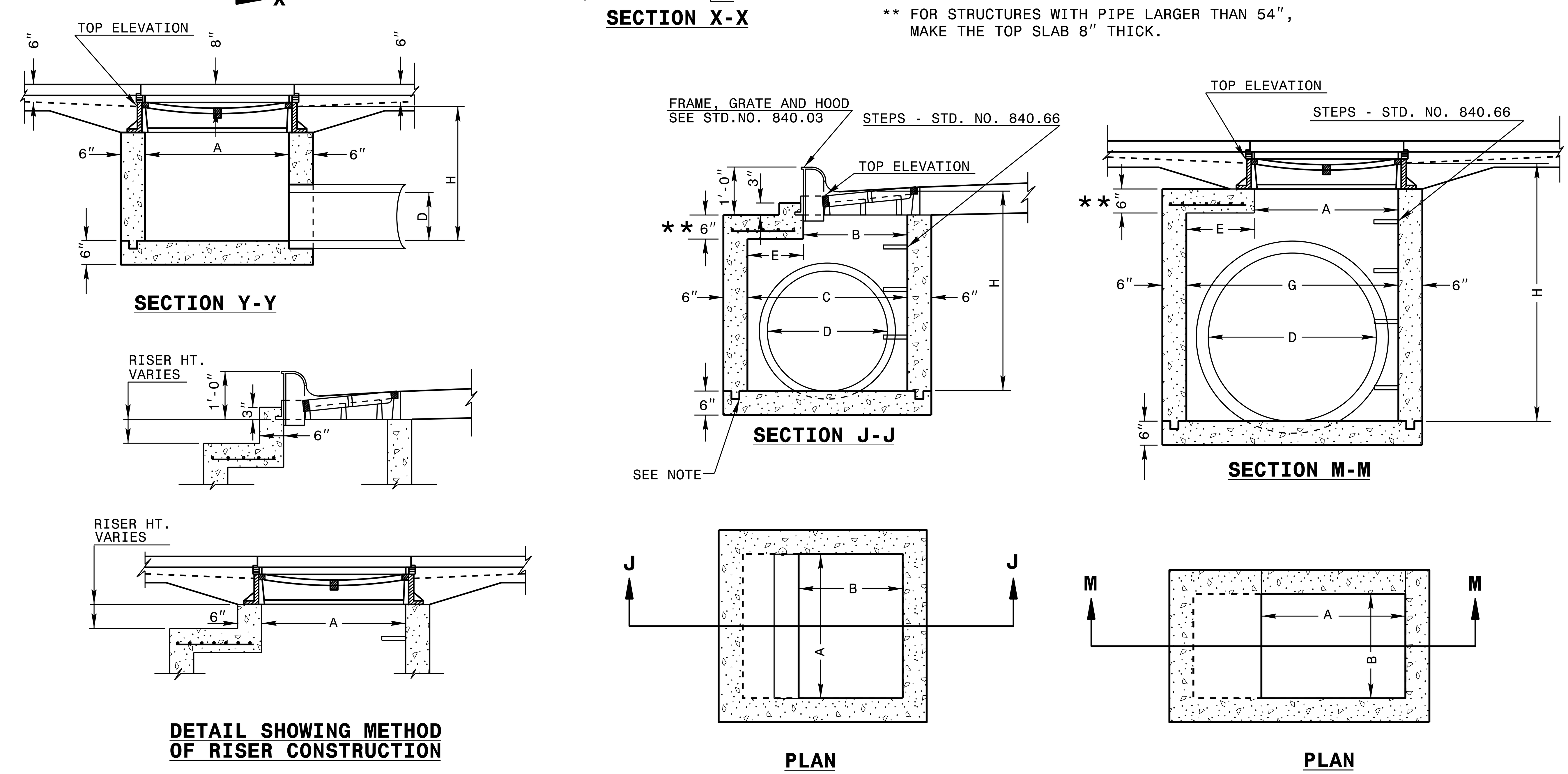
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

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
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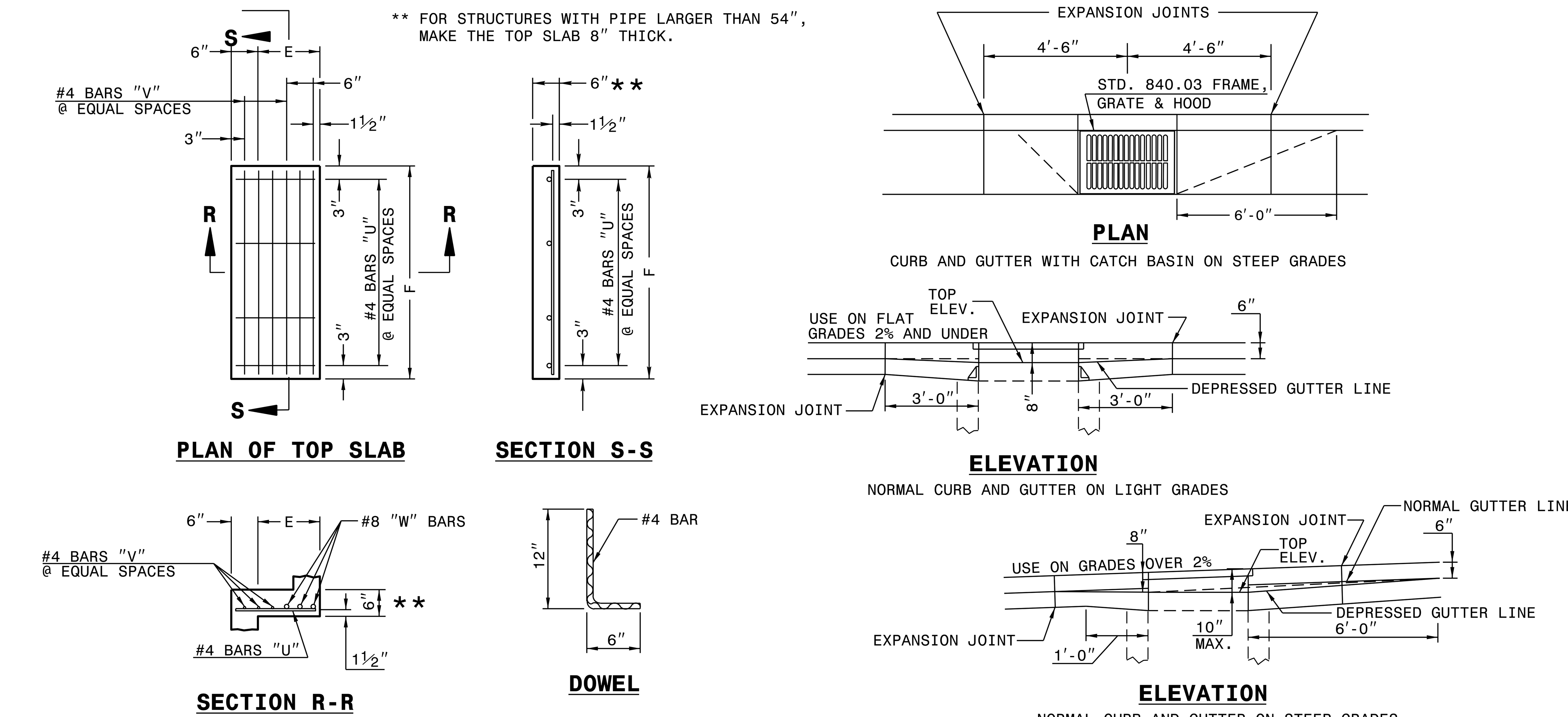
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MINIMUM 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) *

DIMENSIONS OF BOX AND PIPE						COVER DIMENSION									CU.YDS. CONC. IN BOX			DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT			BARS-U		BARS-V		BARS-W		TOTAL LBS.	TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT, H		
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH					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 NORTH CAROLINA, DEPT. OF TRANSPORTATION, DIVISION OF HIGHWAYS, RALEIGH, N.C. — SEAL 022966 — PROFESSIONAL ENGINEER — Joel S. Howerton
DocuSigned by: 873F3D17DC0C4...
3/17/2020

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ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
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24-APR-2019 07:24
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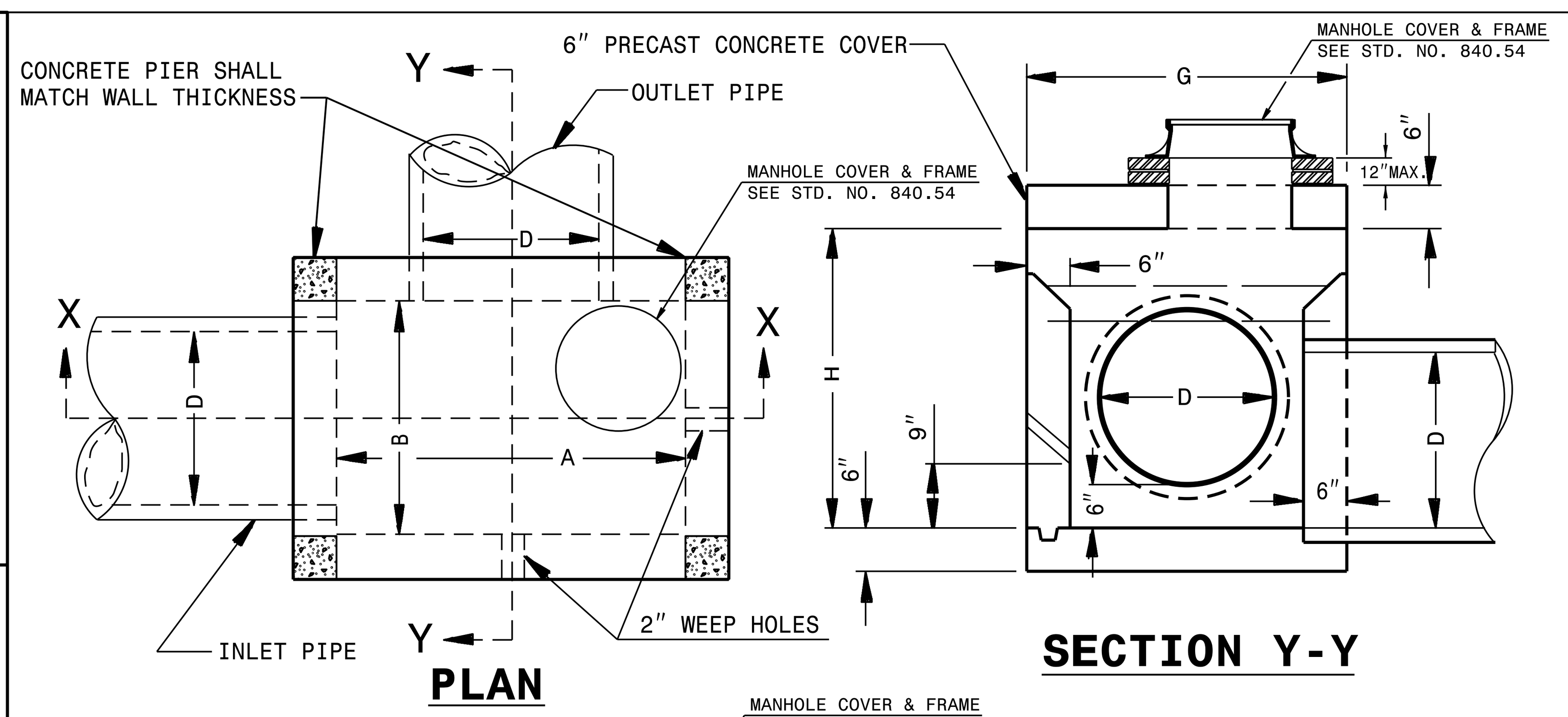
jhowerton AT CSD-292595

5/14/99

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

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

SHEET 1 OF 2
840D04

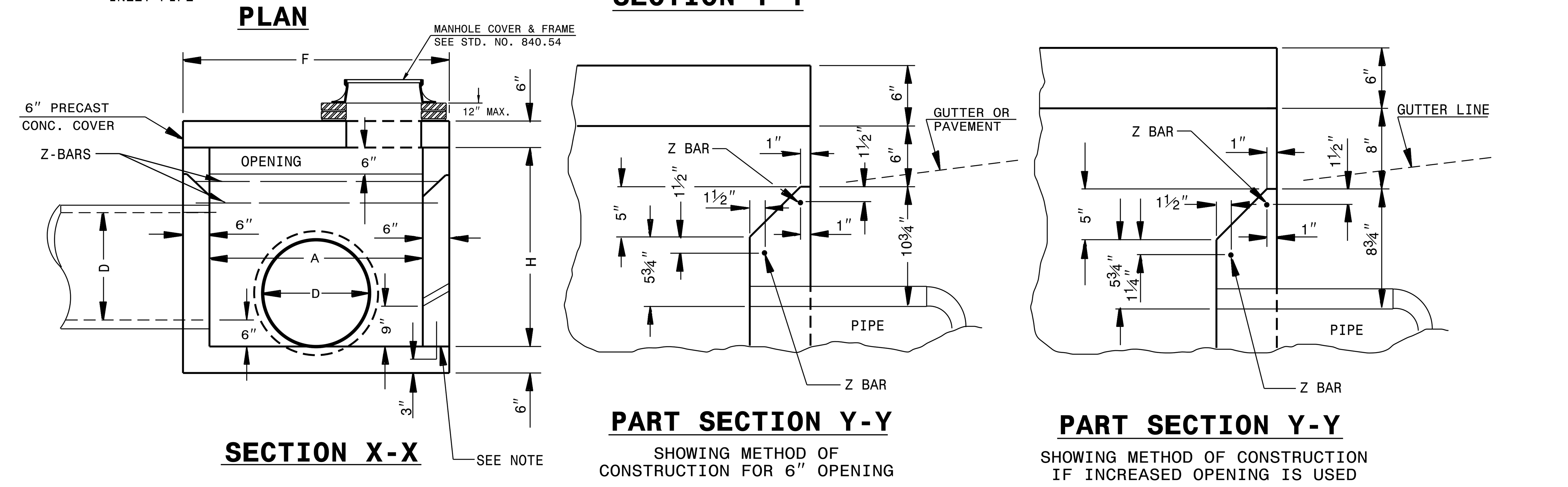


PLAN

SECTION Y-Y

GENERAL NOTES:

ALL CATCH BASINS OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. 840.66.
ALL EXPOSED CORNERS TO BE CHAMFERED 1".
CLASS "B" CONCRETE TO BE USED THROUGHOUT.
2" PIPE WEEPHOLES TO BE PLACED AS DIRECTED BY ENGINEER.
THE 6" OPENING SHOWN MAY BE INCREASED TO 8" MAXIMUM IF DEEMED TO BE NECESSARY BY THE ENGINEER.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #5 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.
A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.
FOR 8' IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB.
OVER 8' IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. QUANTITIES TO BE ADJUSTED ACCORDINGLY.
DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.



SECTION X-X

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

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

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H)																			
DIM'S OF BOX & PIPE				REINFORCING						TOP & BOT. SLAB DIMENSIONS		CU. YDS. CONC. IN BOX			TOTAL QUANTITIES BOX & SLABS		DEDUCTION ONE PIPE		DED. ONE 6" THROAT OPENING
PIPE	SPAN	WIDTH	HEIGHT	BARS - X		BARS - Y		BARS - Z											
D	A	B	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	F	G	TOP SLAB	BOT. SLAB	WALL/FT. HT.	LBS. REINF.	YD^3 (MIN H)	C.S.	R.C.	YD^3
12"	3'-6"	2'-3"	1'-10"	4	3'-0"	6	4'-3"	2	4'-3"	4'-6"	3'-3"	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15"	3'-6"	2'-3"	2'-1"	4	3'-0"	6	4'-3"	2	4'-3"	4'-6"	3'-3"	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18"	4'-0"	2'-8"	2'-4"	5	3'-5"	7	4'-9"	2	4'-9"	5'-0"	3'-8"	0.226	0.340	0.284	35	1.379	0.033	0.049	0.053
24"	4'-0"	2'-8"	2'-10"	5	3'-5"	7	4'-9"	2	4'-9"	5'-0"	3'-8"	0.226	0.340	0.284	35	1.521	0.059	0.085	0.053
30"	4'-0"	3'-6"	3'-4"	5	4'-3"	9	4'-9"	2	4'-9"	5'-0"	4'-6"	0.278	0.417	0.315	43	1.916	0.092	0.127	0.053
36"	4'-6"	4'-0"	3'-10"	5	4'-9"	10	5'-3"	2	5'-3"	5'-6"	5'-0"	0.340	0.510	0.352	51	2.390	0.132	0.178	0.059
42"	5'-0"	4'-6"	4'-4"	5	5'-3"	12	5'-9"	2	5'-9"	6'-0"	5'-6"	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	4'-10"	5	5'-9"	13	5'-9"	2	5'-9"	6'-0"	6'-0"	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066

STATE OF
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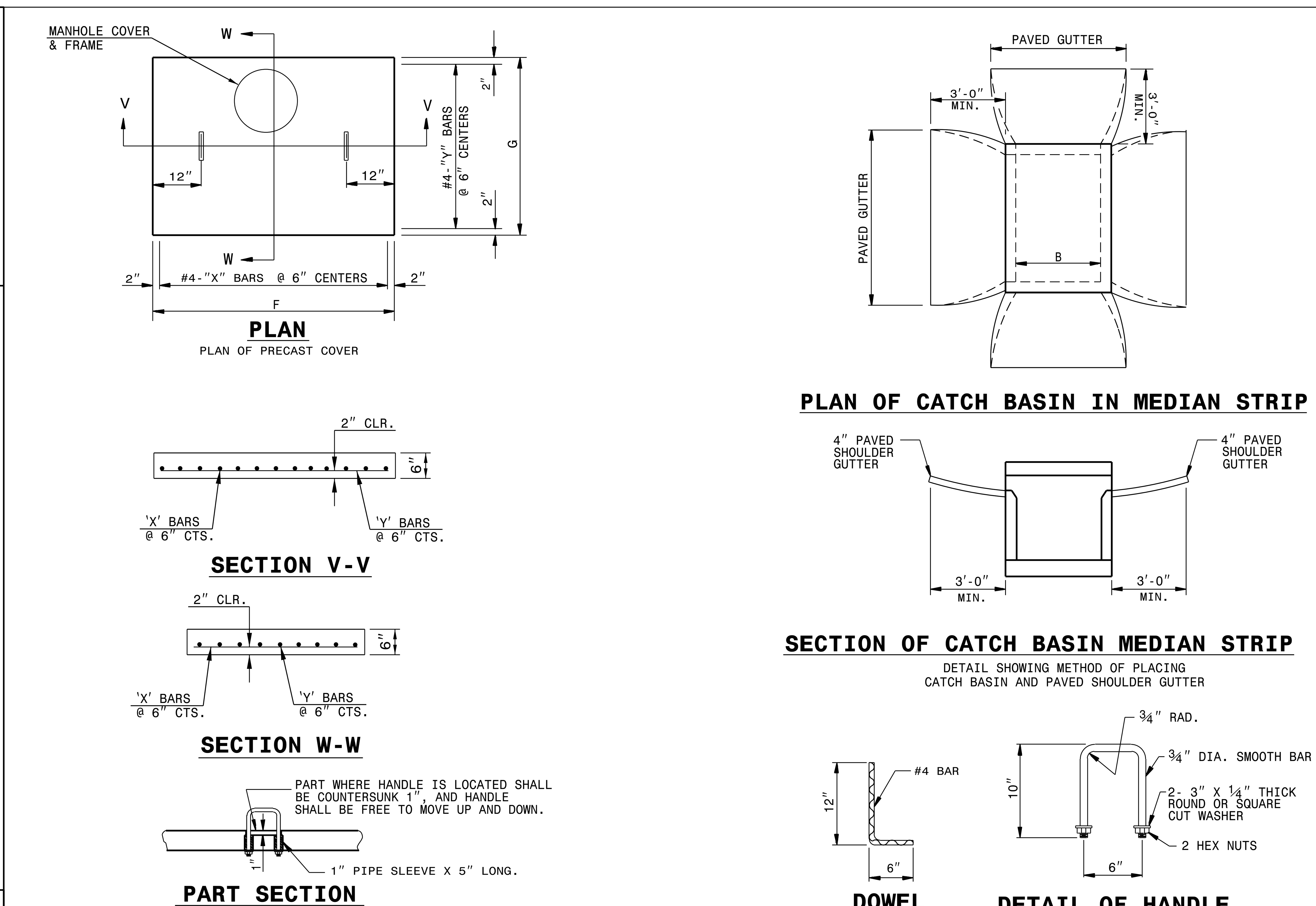
RALEIGH, N.C.

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

SHEET 1 OF 2
840D04



PLAN
PLAN OF PRECAST COVER

SECTION V-V

SECTION W-W

PART SECTION
THRU COVER SHOWING HANDLE

PLAN OF CATCH BASIN IN MEDIAN STRIP

SECTION OF CATCH BASIN MEDIAN STRIP
DETAIL SHOWING METHOD OF PLACING CATCH BASIN AND PAVED SHOULDER GUTTER

DOWEL

DETAIL OF HANDLE

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

SHEET 2 OF 2
840D04

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

SHEET 2 OF 2
840D04

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2C-3

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3/17/2020
SEAL 022966 NORTH CAROLINA PROFESSIONAL ENGINEER Joel S. Howerton

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

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2C-4

STATE OF
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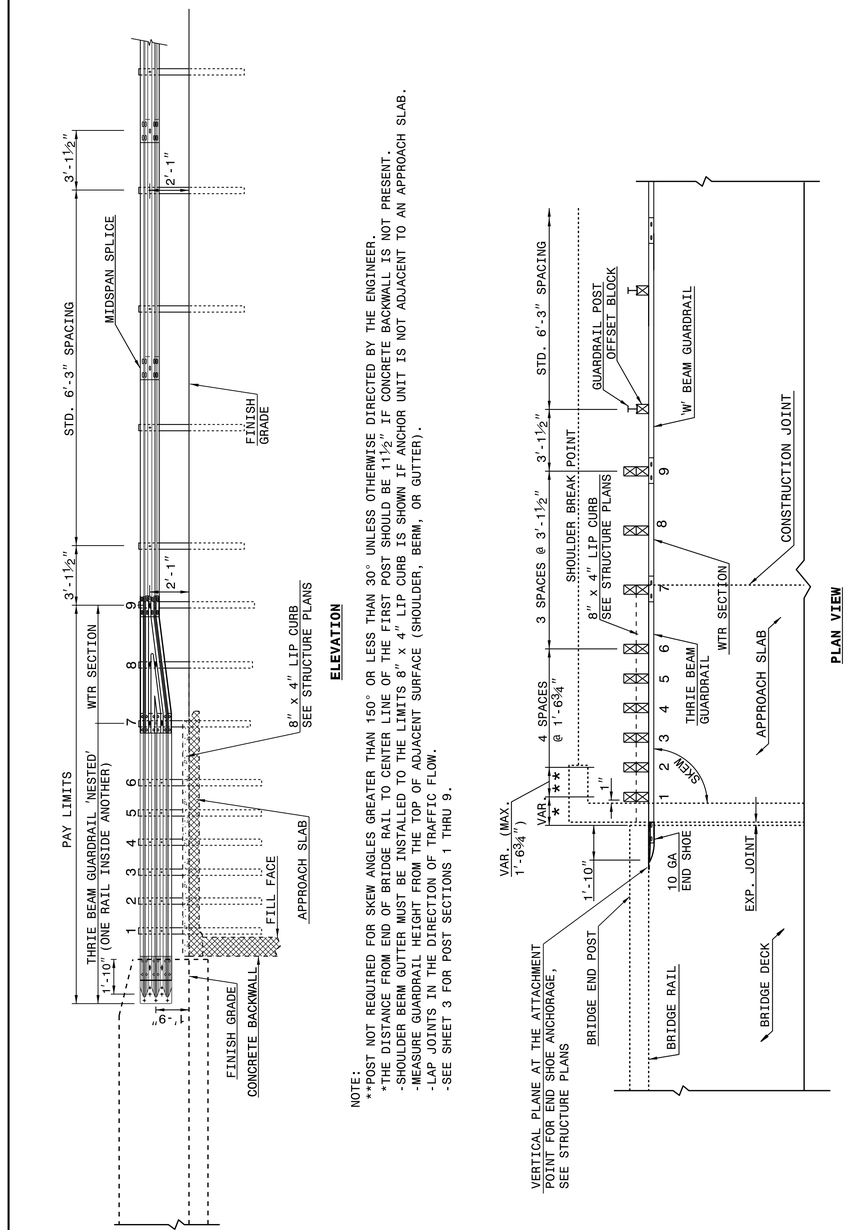
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY 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



ELEVATION

PLAN VIEW

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

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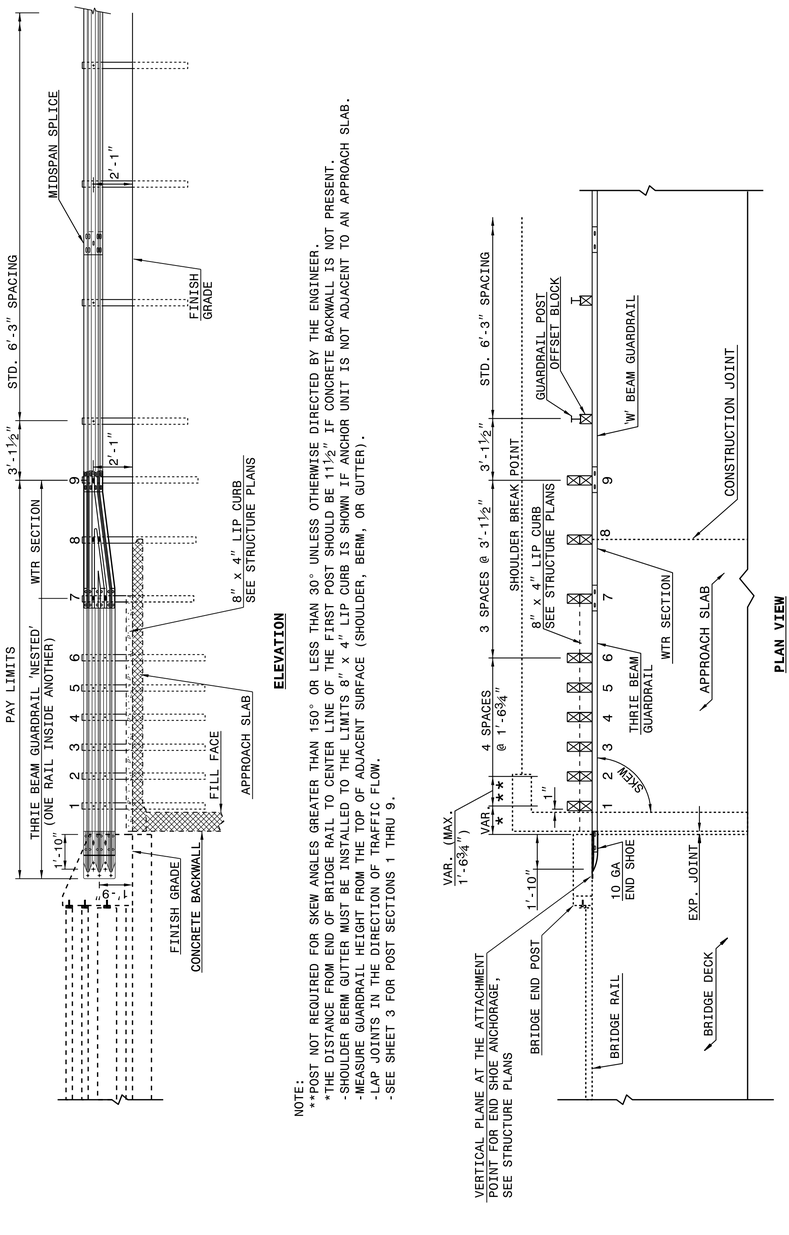
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

PLAN VIEW

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-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03

STATE OF
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ROADWAY 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

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STATE OF NORTH CAROLINA
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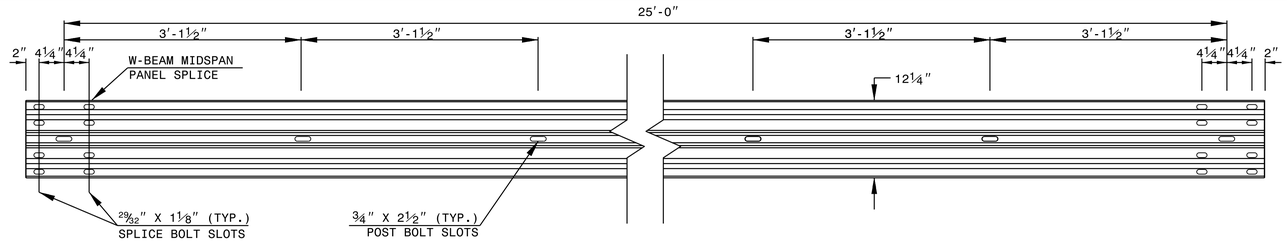
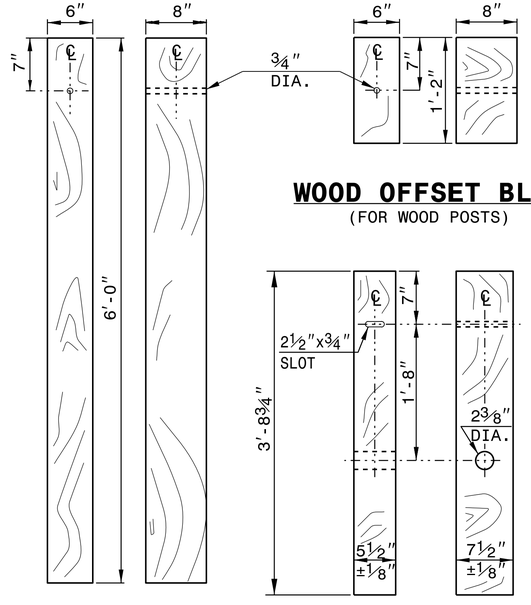
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



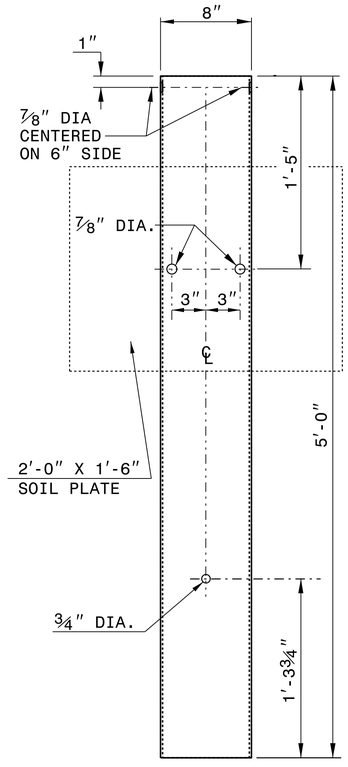
STANDARD W-BEAM GUARDRAIL



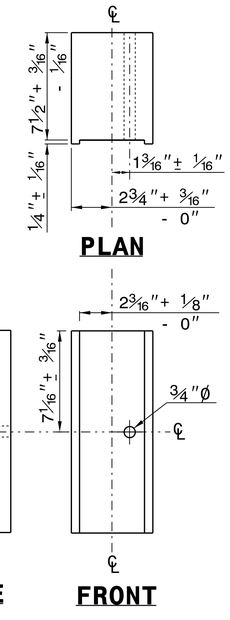
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

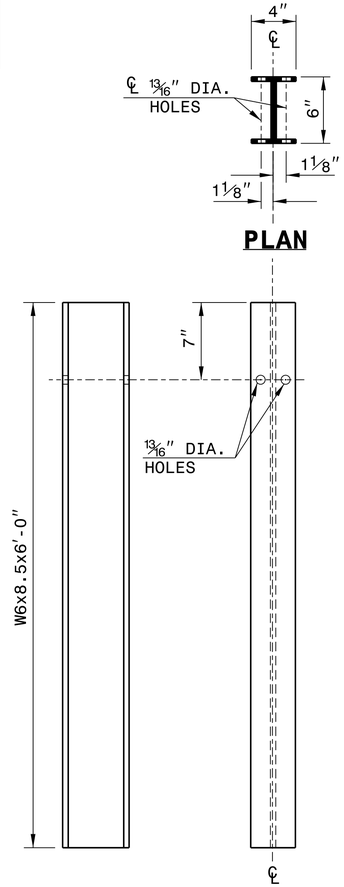
SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

DocuSigned by:
673F3D17DCDC4...
3/17/2020

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON

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

SEE TITLE BLOCK

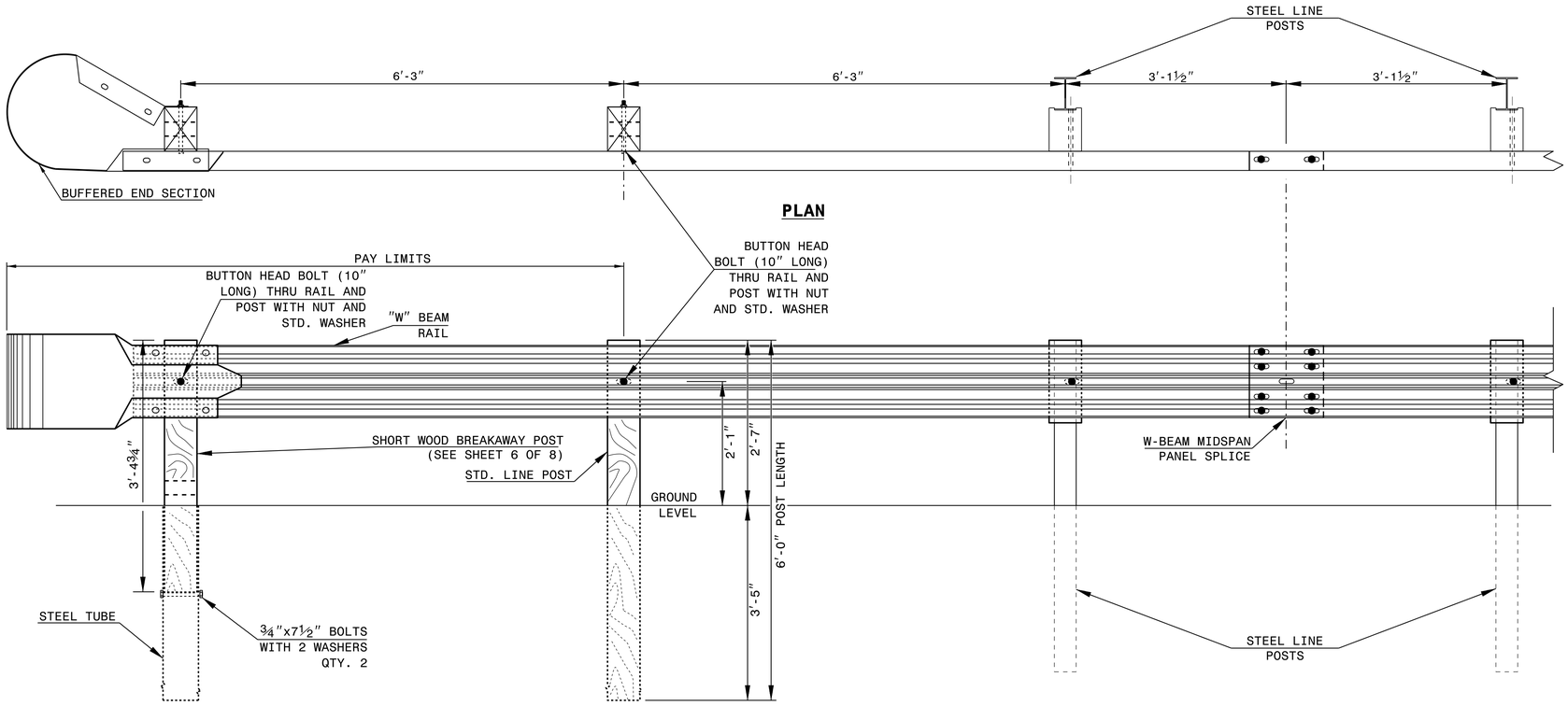
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2C-6

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

DocuSigned by:
873F3D17DCDC4...
3/17/2020

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER DAVID S. HOWERTON

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

A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

COMPUTED BY: T. KONSO	DATE: 1/27/20
CHECKED BY: K. HIGGINS	DATE: 1/27/20

PROJECT NO.	SHEET NO.
BR-0047	2D-1

HYDRAULICS ENGINEER

SEAL 036700 KEVIN P. HIGGINS 3/30/2020

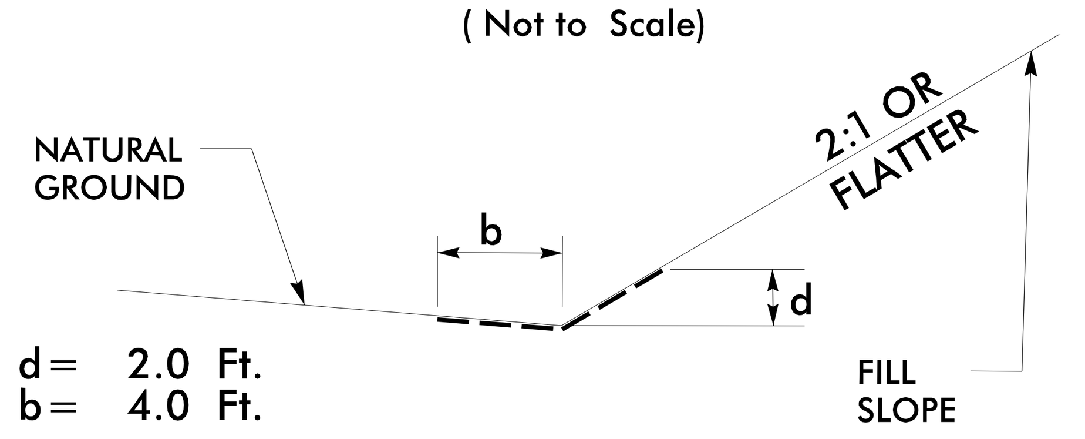
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DITCH DETAILS

DETAIL A
TOE PROTECTION
(Not to Scale)

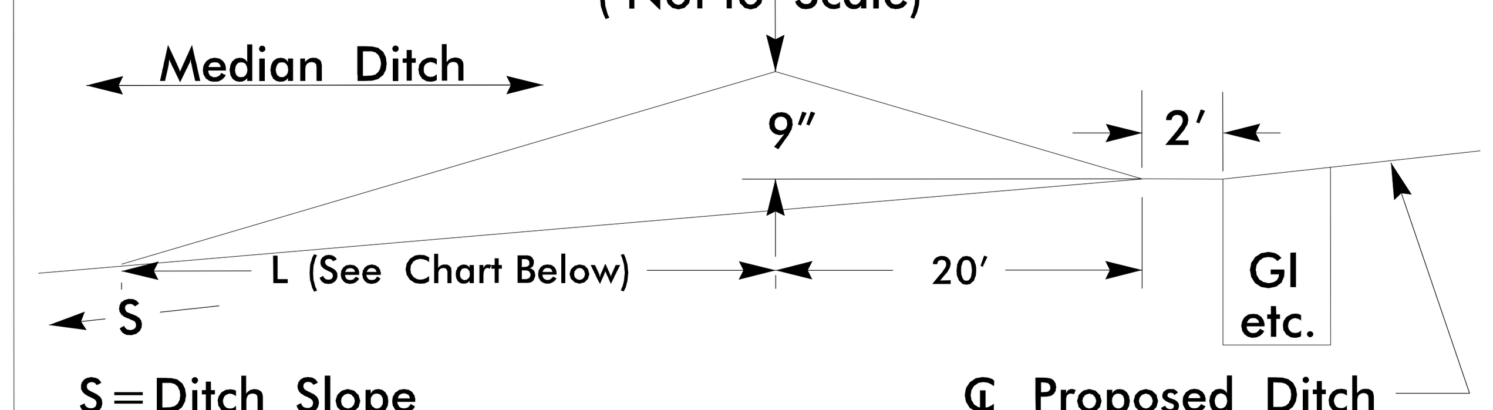


d = 2.0 Ft.
b = 4.0 Ft.

Type of Liner = PSRM

FROM STA. 20+50 TO STA. 21+85 -L- LT
FROM STA. 22+00 TO STA. 23+00 -L- RT

DETAIL B
FALSE SUMP
(Not to Scale)



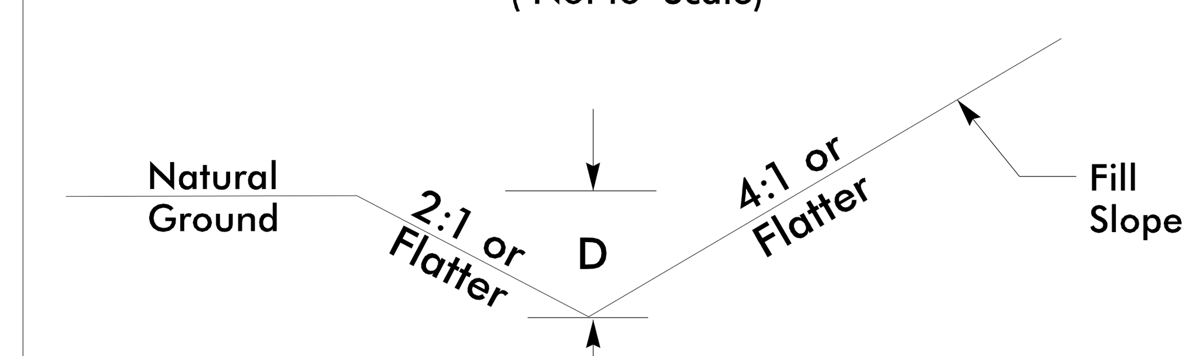
S = Ditch Slope

℄ Proposed Ditch

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

FROM STA. 12+45 TO STA. 12+87 -Y2-

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



Min. D = 2.0 Ft.

FROM STA. 12+50 TO STA. 15+00 -L- LT
FROM STA. 23+00 TO STA. 25+00 -L- LT
FROM STA. 23+50 TO STA. 25+00 -L- RT
FROM STA. 11+22 TO STA. 11+50 -Y2- RT
FROM STA. 12+00 TO STA. 13+00 -Y2- LT
FROM STA. 14+00 TO STA. 15+00 -Y2- RT
FROM STA. 15+72 TO STA. 16+95 -Y2- LT

5/28/99

3/30/2020
BR0047_Ditch_details.dgn

PROJECT REFERENCE NO.	SHEET NO.
BR-0047	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 3/20/2020
F760CAEB96EC4D3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

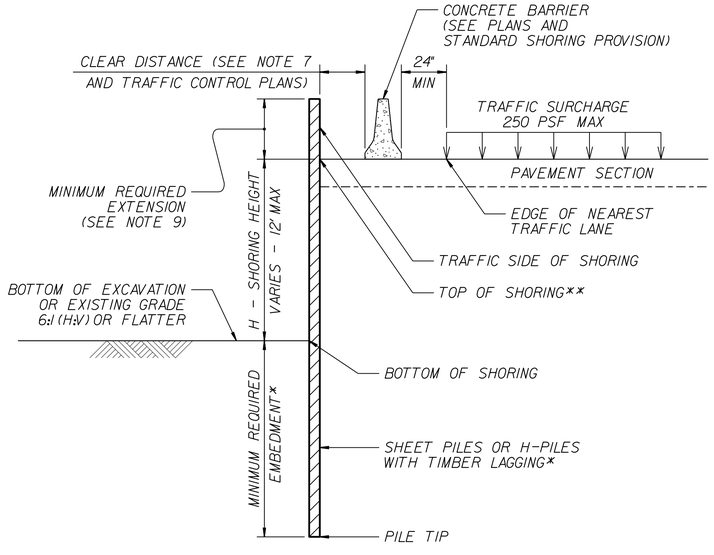
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

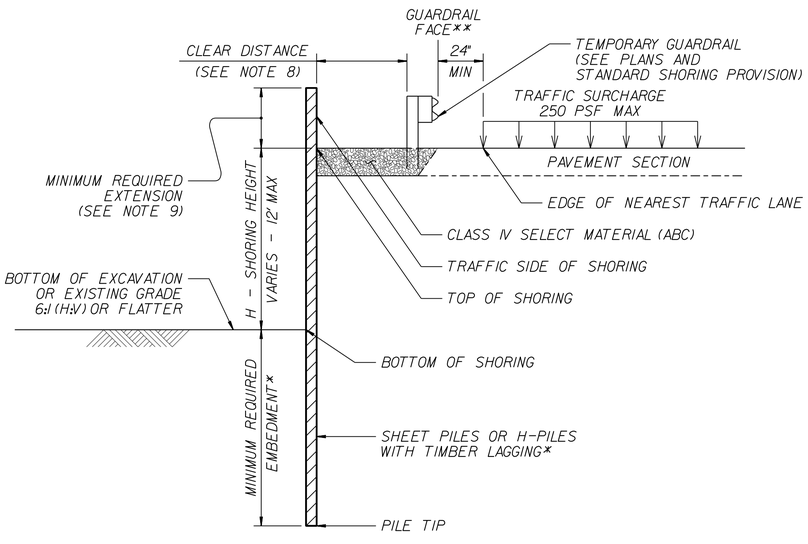
NOTES:

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



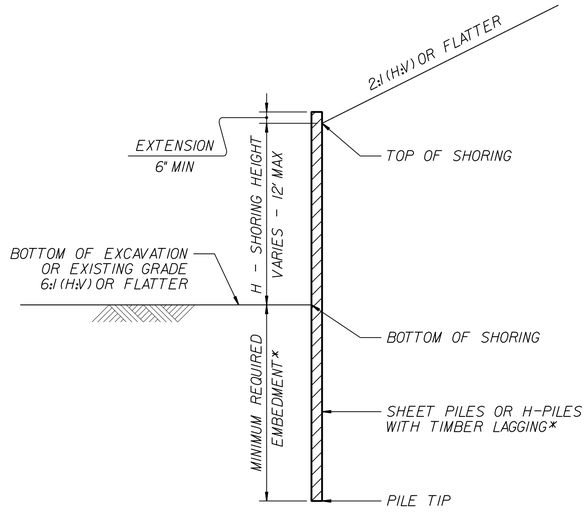
CONCRETE BARRIER

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



TEMPORARY GUARDRAIL

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



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

5/28/99

COMPUTED BY: C. HALL DATE: 1/27/20

CHECKED BY: C. ROGERS DATE: 1/27/20

PROJECT NO.	SHEET NO.
BR-0047	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS							SURVEY LINE	BEG. STA.	END STA.	LOCATION	REMOVE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	GREU, TL-3	B-77	CAT-1	AT-1	ANCHOR DEDUCTION							
-L-	15+93.35	17+00.29	LT	106.25				17+00.29	6	9		87.5		1.75	1	1				TYPE III: 4 @ 18.75' = 75'		L	16+00	16+80	LT	80	
-L-	12+97.66	17+49.07	RT	462.5	37.5		17+49.07		7.5	10.5	252.36		5.05		1				1	GREU TYPE TL-3: 7 @50' = 350'		L	16+08	17+05	RT	97	
-L-	19+09.37	21+29.12	LT	218.75			19+09.37		6	9	150		3		1	1				B-77: 3 @ 22.875' = 68.625'		L	19+46	20+45	LT	99	
-L-	19+60.57	20+67.80	RT	106.25				19+60.57	7.5	10.5		75		1.5	1	1				AT-1: 1 @ 6.25'		L	19+72	20+51	RT	79	
-Y2-	10+12.12	16+99.62	MEDIAN (LT/RT)	1335			10+12.12	16+99.62	8.5	11.5	TIE TO EXIST.		TIE TO EXIST.			2		2		CAT-1: 2@6.25 = 12.5'		Y2	10+12	16+96	LT	684	
-Y2-	10+95.26	11+80.90	RT	85.375			11+75.00		12	15						1	1			TOTAL: 512.375'		Y2	10+12	11+48	RT	136	
-Y2-	15+37.78	16+21.54	LT	85.375			15+37.78		12	15						1	1					Y2	11+78	15+20	RT	342	
-Y2-	13+95.40	15+54.95	RT	160.375				13+95.40	12	12		TIE TO EXIST.	TIE TO EXIST.				1					Y2	11+21	12+86	RT	165	
			SUBTOTAL	2559.88	37.50																	Y2	15+45	16+95	RT	150	
			ANCHOR DEDUCT.	512.38																		Y2	13+25	15+55	RT	230	
			TOTAL	2047.50	37.50																	Y2	14+28	15+57	LT	129	
			SAY	2050	50		5 ADDITIONAL GUARDRAIL POSTS																				
																									TOTAL	2191	

SHOULDER BERM GUTTER SUMMARY

LINE	STATION	STATION	LENGTH
-L-	16+55.00	16+75.21	20.2
-L-	19+32.88	19+51.00	18.1
		TOTAL:	38.3
		SAY:	39

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	12+00	15+50	CL	1318.84			
-L-	20+00	25+00	CL	1435.45			
-L-	15+50	17+00	CL		383.33		
-L-	19+57	20+00	CL		114.67		
		TOTAL:		2754.29	498		
		SAY:		2760	500		

SUMMARY OF EARTHWORK

STATION	STATION	EXCAVATION TOTAL UNCLASS.	EMBANKMENT Embank. + %	BORROW	WASTE TOTAL
-L- 10+50.00	-L- 17+22.73	36	12,221	12,185	
-L- 19+33.23	-L- 26+30.00	563	10,582	10,019	
-Y1- 12+00.00	-Y1- 12+90.34		11	11	
-Y2- 12+00.00 LT	-Y2- 16+50.00 LT	1,403	65		1,338
-Y2- 10+50.00 RT	-Y2- 15+00.00 RT	539	504		35
-Y3- 11+80.00	-Y3- 13+35.94	17	16		1
SUBTOTAL		2,558	23,399	22,215	1,374
Est. Shoulder Material			610	610	
Earth waste to repl. bor.				-1,374	-1,374
PROJECT	**TOTALS**	2,558	24,009	21,451	
Est. 5% for repl. Topsoil				1,073	
on borrow pits					
GRAND	**TOTALS**	2,558	24,009	22,524	
SAY		2,600		22,550	

EST. CONTINGENCY UNDERCUT EXCAVATION = 450 CY

EST. CONTINGENCY SELECT GRANULAR MATERIAL = 400 CY

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

4/17/2020
BR0047_QUANTITIES_SHEET.dgn
BRIDGE PM

LCURTISH

COMPUTED BY: D. SVISTUN **DATE:** 1-27-20

CHECKED BY: K. HIGGINS **DATE:** 1-27-20

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
BR-0047	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		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)				C. S. PIPE				R. C. PIPE CLASS III				R. C. PIPE CLASS IV			R. C. PIPE CLASS V			WELDED STEEL PIPE			ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STDS. 840.04, 840.05, OR 840.45	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" STDS. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STDS. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STDS. 840.19, 840.28, OR 840.45	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	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31, STD. 840.32, OR STD. 840.45	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35 OR STD. 840.46	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" C.S. ELBOW	8" HDPE ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	MINIMUM DEPTH CONCRETE C.B. STD. 840D02		FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE								12	15	18	24	12	15	18	24	12	15	18	24	12	15	18	12	15	18	18							A	B		GRATE TYPE				D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																						
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%					.064	.064	.064	.064											.25			CY	CY	MASONRY CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		E	F	G																																									CY	CY	CY	LIN. FT.	
L 16+60	23 LT	0403		1056.7																												1	5.0	2.3																						1						1																	
		0403	0404		1044.4	1030.4							68																																																							2											
L 19+45	23 LT	0405		1056.9																												1	1.4																							1						1																	
		0405	0406		1050.5	1044.5							28																																																							2											
Y2 15+31	63 LT	0407		1033.3																												1																1		1																															
		0407	0404		1030.6	1030.4												36																																																														
Y2 11+50	86 RT	0408		1032.9																												1										1																																											
		0408	0409		1028.1	1028.0													24																																																															
Y2 11+50	62 RT	0409		1037.7																												1	4.7																										1								1												
		0409	0412		1028.0	1027.6													92																																																																
Y2 12+50	86 LT	0410		1031.8																												1															1					1																													
		0410	0411		1028.8	1028.5																				88																																																									
Y2 12+45	0 CL	0411		1036.0																												1	2.5														1					1																													
		0411	0412		1028.5	1028.1																				64																																																									
Y2 12+43	63 RT	0412		1035.0																												1	2.3													1				1																															
		0412	0413		1027.6	1027.2													120																																																															
Y2 13+65	63 RT	0413		1034.5																												1	2.3													1				1																															
		0413	0414		1027.2	1026.8													88																																																															
L 25+65	48 RT	0504		1044.5																												1				1																																									1						
		0504	0505		1042.8	1042.8											4																																																																
L 18+71	45 LT																																																																													215	
L 24+30	20 LT																																																																													31	
L 25+40	20 LT																																																																													86	
L 25+82	26 RT																																																																													44	
L 24+30	40 LT	0506															28																																																																
Y2 13+26	LT																																																																											3				
Y2 13+44	RT																																																																											4				
L 25+47	30 LT	0507																				76																																																											
L 25+42	87 RT																																																																				3									5	
L 18+47	18 RT																																																																														
Y5 10+49	13 RT	0505		1044.5																																																																								0.3990			
SHEET TOTALS													96				32	36	324			76				152						10	18.2	2.3		1						1				2	2	1		3		2				2			1			2					1	4	3				1		7	0.3990		381	
PROJECT TOTALS													96				32	36	324			76				152						10	21.2			1						1				2	2	1		3		2				2			1			2					1	4	3				1		7	0.3990		381	

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. HALL	DATE: 1/27/20
CHECKED BY: C. ROGERS	DATE: 1/27/20

PROJECT NO.	SHEET NO.
BR-0047	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge 10 on SR 1105 (Meadowbrook Dr.) over U.S. 52	1	2
Bridge 10 on SR 1105 (Meadowbrook Dr.) over U.S. 52	2	2

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

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

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

5/28/99
4/27/2020 BR0047_Geo_rdy_summary_table_SHEET.dgn

5/28/99

PROJECT NO.	SHEET NO.
BR-0047	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	WILBURN LEO WHITMAN, JR.
2	4	RTB ENTERPRISES OF KING, LLC
3	4	SAMUEL F. CHAMBERLAIN AND WIFE, LORETTA
4	4	GRANDVIEW, INC.
5	4,5	CITY OF KING

1/5/2021
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PROJECT REFERENCE NO.	SHEET NO.
BR-0047	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029442 ENGINEER CHAD P. ROGERS
1/5/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KIMBERLY M. HIGGINS
1/5/2021

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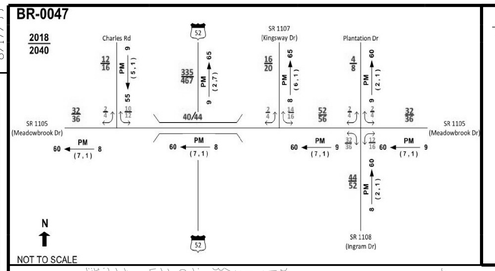
8/17/99

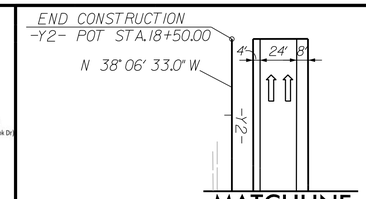
REVISIONS

BR-0047

2018
2040



END CONSTRUCTION
-Y2- POT STA.18+50.00
N 38° 06' 33.0" W



MATCHLINE STA. 17+50 THIS SHEET

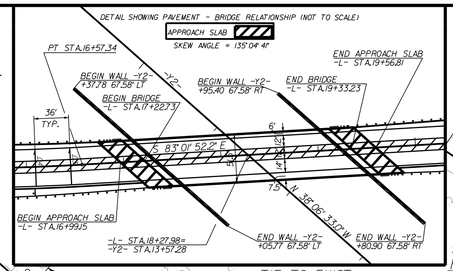
NAD 83/2011

MATCHLINE STA. 17+50 SEE INSET A THIS SHEET

INSET A

BEGIN SBG STA 16+55 -L- LT
END SBG BEGINNING OF APPROACH SLAB -L- LT

TIE TO EXIST. GUARDRAIL



POT Sta. 10+00.00
-Y3-
PI Sta 12+56.29
Δ = 26° 41' 28.1" (RT)
D = 13° 28' 52.9"
L = 197.99'
T = 100.82'
R = 425.00'
e = MATCH EXIST.

S 46° 01' 21.9" E

PC Sta. 11+55.46

BEGIN TIP BR0047
-L- STA.10+50.00

-Y1- PC STA. 13+03.53=
-L- Sta. 12+28.57

PC Sta. 11+76.67

POT Sta. 10+00.00

S 71° 03' 24.9" E

RTB ENTERPRISES OF KING, LLC
DB 633 PG 803

SPECIAL LATERAL 'V' DITCH SEE DETAIL C

GRANDVIEW, INC.
DB 464 PG 1244

BEGIN CONSTRUCTION
-Y3- STA.11+80.00

SINGLE FACE CONC. BARRIER

CL B RIP RAP
EST 5 TONS RR
EST 14 SY GT

CL I RIP RAP
EST 7 TONS RR
EST 15 SY GT

CL I RIP RAP
EST 3 TONS RR
EST 7 SY GT

REMOVE SYSTEM

BEGIN SBG
END OF APPROACH SLAB -L- LT
END SBG
STA 19+51
-L- LT

TOE PROTECTION SEE DETAIL A

PT Sta. 13+53.45

REMOVE HW

OTCB
4 SIDES OPEN

400' LT. TURN LANE

TOE PROTECTION SEE DETAIL A

FLUG AND FILL W/ FLOWABLE FILL

FS SEE DETAIL B

REMOVE HW

TRENCHLESS INSTALLATION OF 36" WELDED STEEL

GRADE TO DRAIN

SPECIAL LATERAL 'V' DITCH SEE DETAIL C

-Y3- STA.13+59.18=
-L- Sta. 22+54.05

CITY OF KING
DB 706 PG 700

PC Sta. 22+77.61

REPLACE EXIST. GUARDRAIL

TIE TO EXIST. GUARDRAIL

BEGIN CONSTRUCTION
-Y2- POT STA.8+62.00

N 36° 06' 33.0" W

MATCHLINE STA. 23+00 SEE SHT. 5

PI Sta 14+17.88
Δ = 11° 58' 27.3" (LT)
D = 2° 29' 28.0"
L = 480.68'
T = 241.22'
R = 2,300.00'
e = 4.0%
V = 50 MPH
RUNOFF = 96'/144'

PI Sta 12+55.77
Δ = 50° 39' 37.6" (RT)
D = 49° 17' 09.2"
L = 102.79'
T = 55.03'
R = 116.25'
e = MATCH EXIST.
PI Sta 11+01.30
Δ = 19° 00' 40.7" (RT)
D = 9° 28' 13.4"
L = 200.74'
T = 101.30'
R = 605.00'

WILBURN LEO WHITMAN, JR.
DB 348 PG 1068
PB 5 PG 305

SAMUEL F. CHAMBERLAIN AND WIFE, LORETTA
DB 304 PG 695
PB 5 PG 142

PCC Sta. 12+00.74

BEGIN CONST.
-Y1- STA.12+00.00

PC Sta. 10+00.00

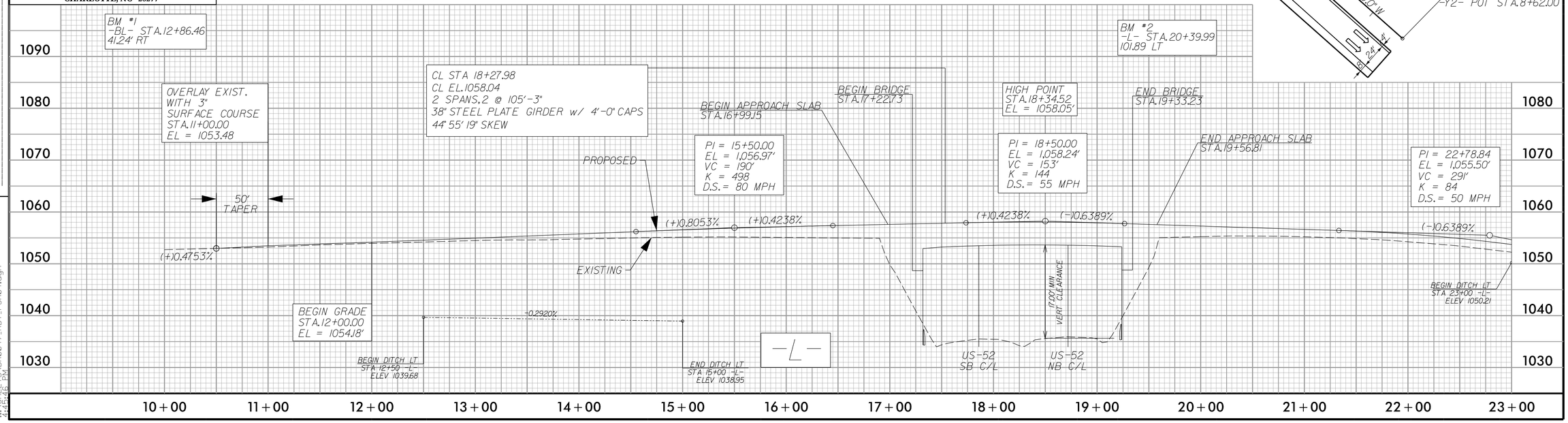
BR-0047-GPS-2
-EL- STA.24+48.67=
-L- STA.15+87.56

NOTES:

SEE SHEET 6 FOR
-Y1- & -Y3- PROFILES

SEE SHEET S-1 THRU S-39
FOR STRUCTURE PLANS

PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277



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PROJECT REFERENCE NO.	SHEET NO.
BR-0047	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029442 ENGINEER CHAD ROGERS
Digitally signed by
Date: 2020.03.17

3/17/2020

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038700 ENGINEER KEVIN P HIGGINS
Digitally signed by
Date: 2020.03.17

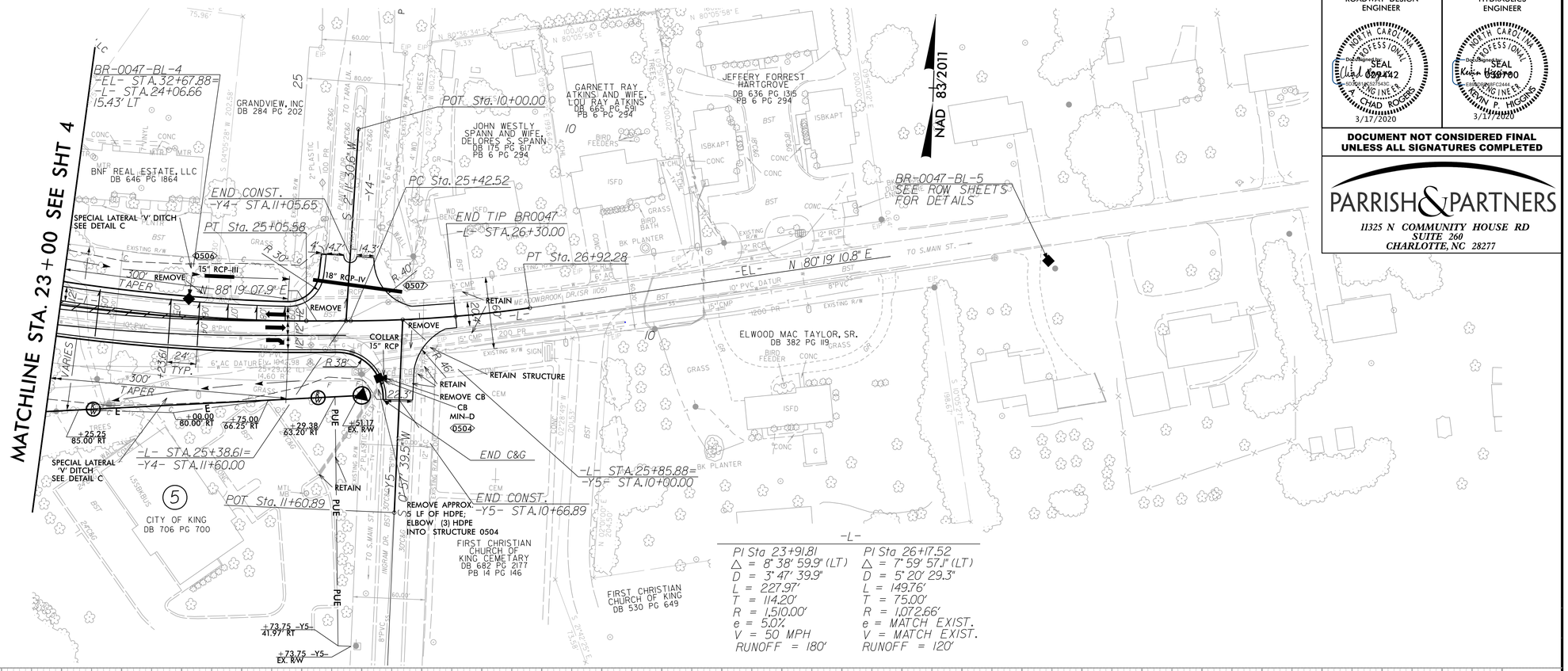
3/17/2020

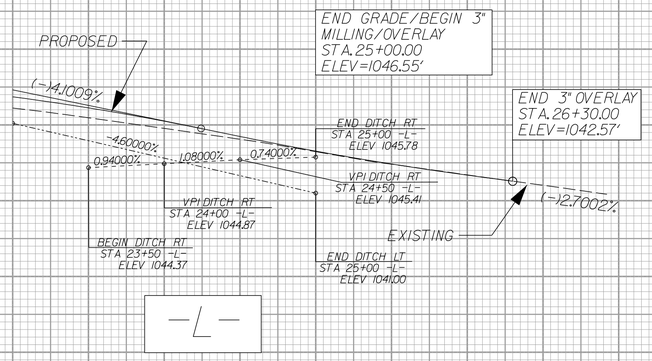
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277

REVISIONS

8/17/99





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PROJECT REFERENCE NO.	SHEET NO.
BR-0047	6

ROADWAY DESIGN ENGINEER — SEAL 029482 — A. CHAD ROGERS — 3/17/2020

HYDRAULICS ENGINEER — SEAL 023700 — KEVIN P. HIGGINS — 3/17/2020

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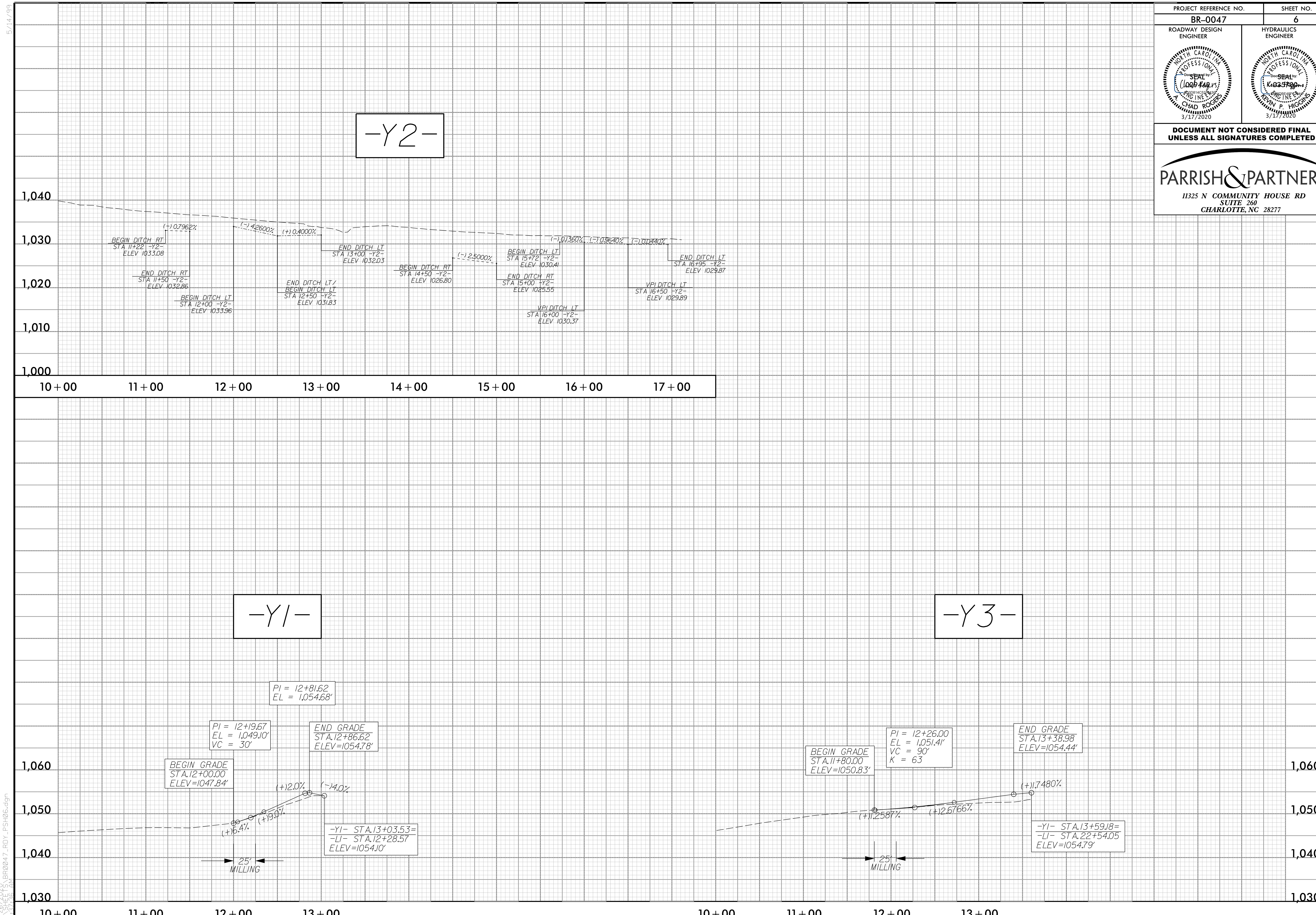
PARRISH & PARTNERS
11325 N COMMUNITY HOUSE RD
SUITE 260
CHARLOTTE, NC 28277


-Y2-
1,040
1,030
1,020
1,010
1,000
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
(-) 0.7962%
(-) 4.2600%
(+) 0.4000%
(-) 2.5000%
(-) 0.1360%
(-) 0.9640%
(-) 0.0440%
BEGIN DITCH RT STA 11+22 -Y2- ELEV 1033.08
END DITCH RT STA 11+50 -Y2- ELEV 1032.86
BEGIN DITCH LT STA 12+00 -Y2- ELEV 1033.96
END DITCH LT/ BEGIN DITCH LT STA 12+50 -Y2- ELEV 1031.83
END DITCH LT STA 13+00 -Y2- ELEV 1032.03
BEGIN DITCH RT STA 14+50 -Y2- ELEV 1026.80
END DITCH RT STA 15+00 -Y2- ELEV 1025.55
BEGIN DITCH LT STA 15+72 -Y2- ELEV 1030.41
VPI DITCH LT STA 16+00 -Y2- ELEV 1030.37
VPI DITCH LT STA 16+50 -Y2- ELEV 1029.89
END DITCH LT STA 16+95 -Y2- ELEV 1029.87
-Y1-
PI = 12+81.62 EL = 1,054.68'
PI = 12+19.67 EL = 1,049.10' VC = 30'
BEGIN GRADE STA.12+00.00 ELEV=1047.84'
END GRADE STA.12+86.62 ELEV=1054.78'
(+)12.0%
(-)14.0%
(+)6.4%
(+)19.0%
-Y1- STA.13+03.53= -L1- STA.12+28.57 ELEV=1054.10'
25' MILLING
1,060
1,050
1,040
1,030
10+00
11+00
12+00
13+00
-Y3-
BEGIN GRADE STA.11+80.00 ELEV=1050.83'
PI = 12+26.00 EL = 1,051.41' VC = 90' K = 63
END GRADE STA.13+38.98 ELEV=1054.44'
(+)1.7480%
(+)1.2587%
(+)2.6766%
-Y1- STA.13+59.18= -L1- STA.22+54.05 ELEV=1054.79'
25' MILLING
1,060
1,050
1,040
1,030
10+00
11+00
12+00
13+00