09/08/99

TIP PROJECT: W–5600

CONTRACT: C204359

VICINITY MAP

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

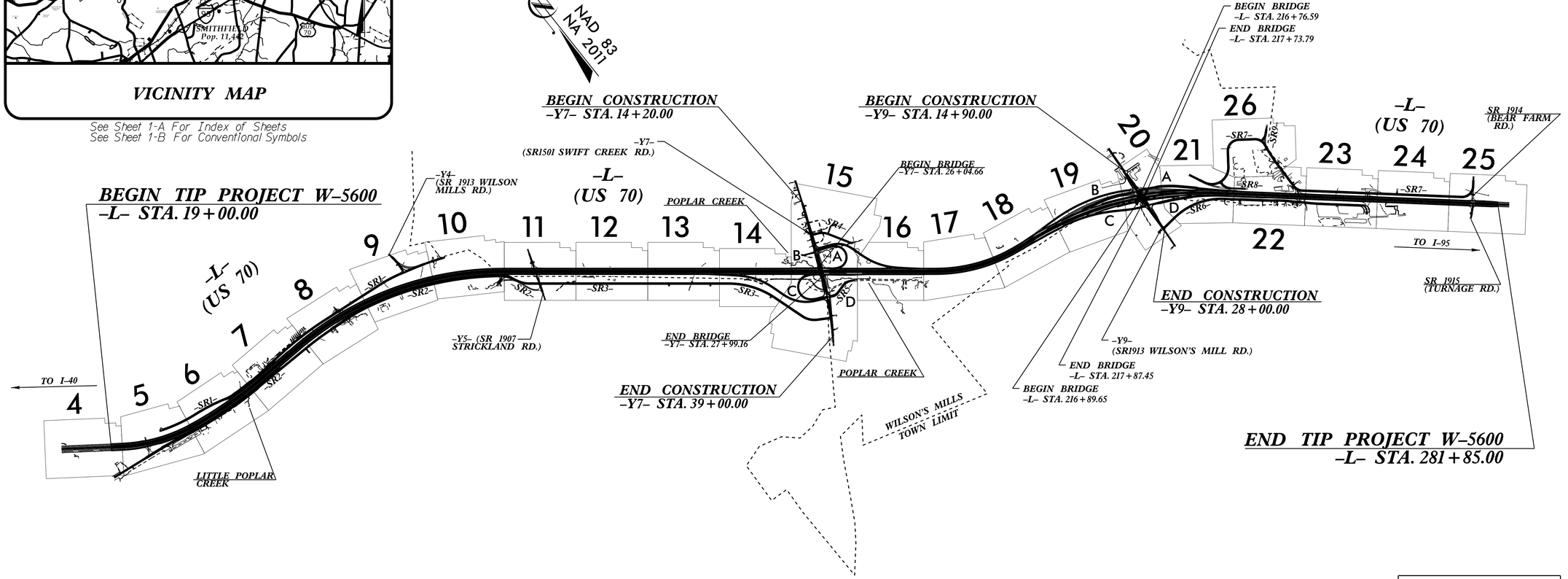
JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W–5600	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50056.1.1	HSIP–0070(163)	PE
50056.2.1	HSIP–0070(163)	ROW
50056.2.2	HSIP–0070(163)	UTIL.
50056.3.1	HSIP–0070(163)	CONST.

LOCATION: US 70 FROM EAST OF US 70 BUSINESS TO WEST OF NEUSE RIVER.

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS, & CULVERTS.



THIS IS A CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 2020 = 30,700
ADT 2040 = 45,400
K = 8 %
D = 55 %
T = 14 % *
V = 70 MPH
* TTST = 8% DUAL = 6%
FUNC. CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W–5600 = 4.959 MILES
LENGTH STRUCTURE TIP PROJECT W–5600 = 0.019 MILES

TOTAL LENGTH TIP PROJECT W–5600 = 4.978 MILES

UTILIZED RIGHT LANE TO DETERMINE PROJECT LENGTH

Prepared in the Office of:
WETHERILL ENGINEERING
1223 Jones Franklin Rd. Raleigh, N.C. 27606
License No. F-0377
Bus: 919.851.8077 Fax: 919.851.8107

Prepared for:
DIVISION OF HIGHWAYS DIVISION 4
509 Ward Boulevard Wilson NC, 27895

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 2, 2018

LETTING DATE: MARCH 16, 2021

BOB A. MAY, PE
PROJECT ENGINEER

JONATHAN HEFNER, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: ADDISON GAINEY, PE
DIVISION PROJECT MANAGER

HYDRAULICS ENGINEER
12/15/2020 | 08:46:23 PST
NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B LAFFORD
Docusigned by: K. B. Lafford
SIGNATURE:

ROADWAY DESIGN ENGINEER
12/15/2020 | 12:18:25 PST
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C HEFNER
Docusigned by: Jonathan C. Hefner
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

12/15/2020
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USER:JHefner

8/17/99

REVISIONS

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
12/15/2020 07:18:25 PST

NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. PFEIFER

Docusigned by:
Jonathan C. Pfeifer

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
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1D-1	CENTERLINE COORDINATE LIST
1E-1 THRU 1E-4	RIGHT-OF-WAY CONTROL SHEETS
2A-1 THRU 2A-5	TYPICAL SECTIONS AND PAVEMENT SCHEDULE
2C-1	TYPE III REINFORCED APPROACH FILLS
2C-2	COAL COMBUSTION PRODUCT PLACEMENT DETAIL
2C-3	CONCRETE ENDWALL FOR TRIPLE AND QUADRUPLE PIPE CULVERTS (15" THRU 48" PIPE - 90° SKEW)
2C-4	CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS (15" THRU 48" PIPE - 60° OR 120° SKEW)
2C-5	CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS (15" THRU 48" PIPE - 45° OR 135° SKEW)
2C-6	DETAIL OF REINFORCED CONCRETE ENDWALL FOR SINGLE 72" DIAMETER PIPE - 60° SKEW
2C-7	DETAIL OF REINFORCED CONCRETE ENDWALL FOR SINGLE 72" DIAMETER PIPE - 45° SKEW
2C-8	CONCRETE OPEN THROAT CATCH BASIN (3 OR 4 SIDE OPEN THROAT) (MANHOLE OPTIONAL)
2C-9	DETAIL TO CONVERT EXISTING DI, CB, OTCB, OR GI TO JUNCTION BOX (MANHOLE OPTIONAL)
2C-10	SPECIAL JUNCTION BOX WITH SLAB LID
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2C-12	GUARDRAIL - W-BEAM RAIL SECTION
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C2-1 THRU C2-7	CULVERT 2 PLANS
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W-1 THRU W-6	RETAINING WALL PLANS

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
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	
610.02	Guide for Paving Shoulders Under Bridges - Method II
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.04	Conc. Endwall for Single & Double Pipe Culverts - 17"x13" thru 71"x47" Arch 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	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
840.31	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
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
854.02	Double Faced Concrete Barrier - Types 'T', 'T1' and 'T2'
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
865.01	Cable Guiderail
866.02	Woven Wire Fence - with Wood Post
866.03	Woven Wire Fence - with Steel Post
866.04	Barbed Wire Fence with Wood Posts (2 - 7 Strands)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES

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. 225.04 & STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

BERM DITCHES:

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

SUBSURFACE DRAINS:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:
- Duke Energy - Power Distribution and Transmission
- Charter / Spectrum - Communications
- Centurylink - Communications
- AT&T - Communications
- Colonical Pipeline - Gas
- PNG - Gas
- Johnston County - Water and Sewer

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

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

12/15/2020
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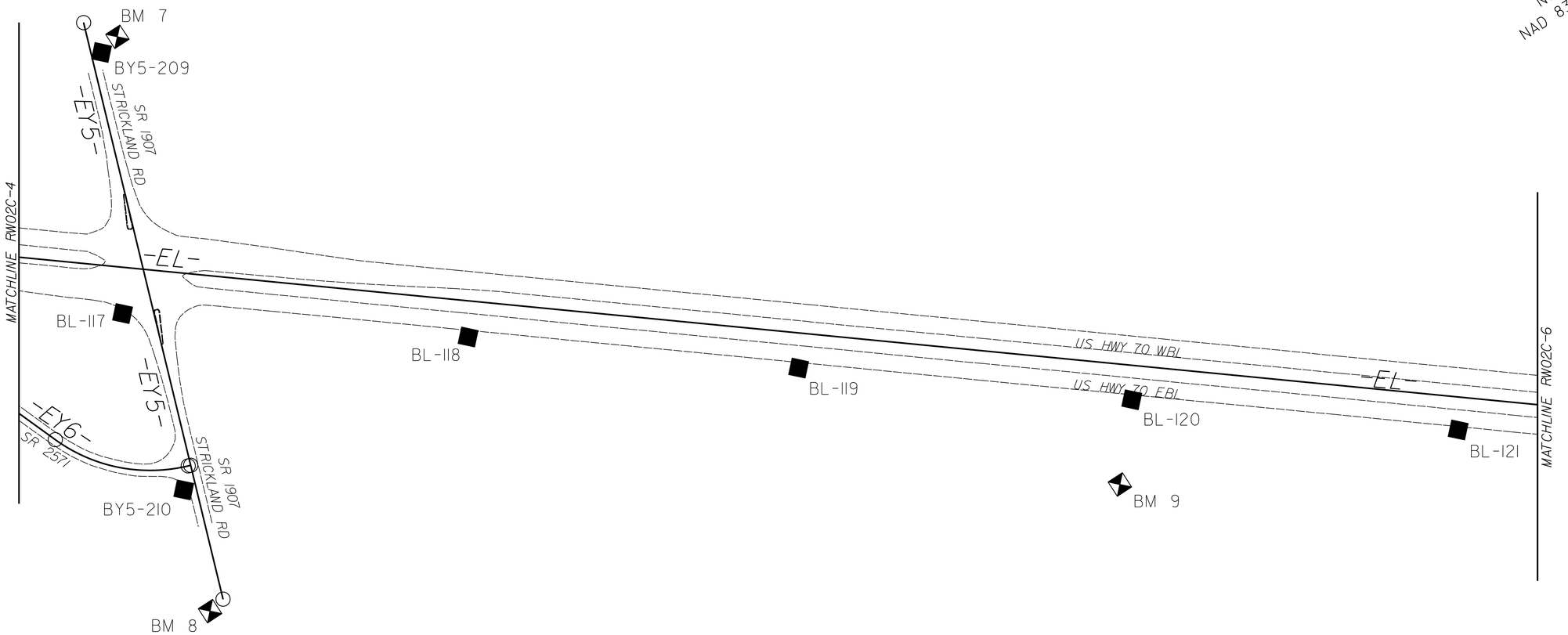
USER:JPfeifer

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-5
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W-5600-3"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 666326.104(ft) EASTING: 2188577.710(ft)
ELEVATION: 203.964(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988457
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "W-5600-3" TO -L- STATION 9+99.84 IS
N65°13'59.09"W 13,283.31 FT
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

REVISIONS

6/2/99

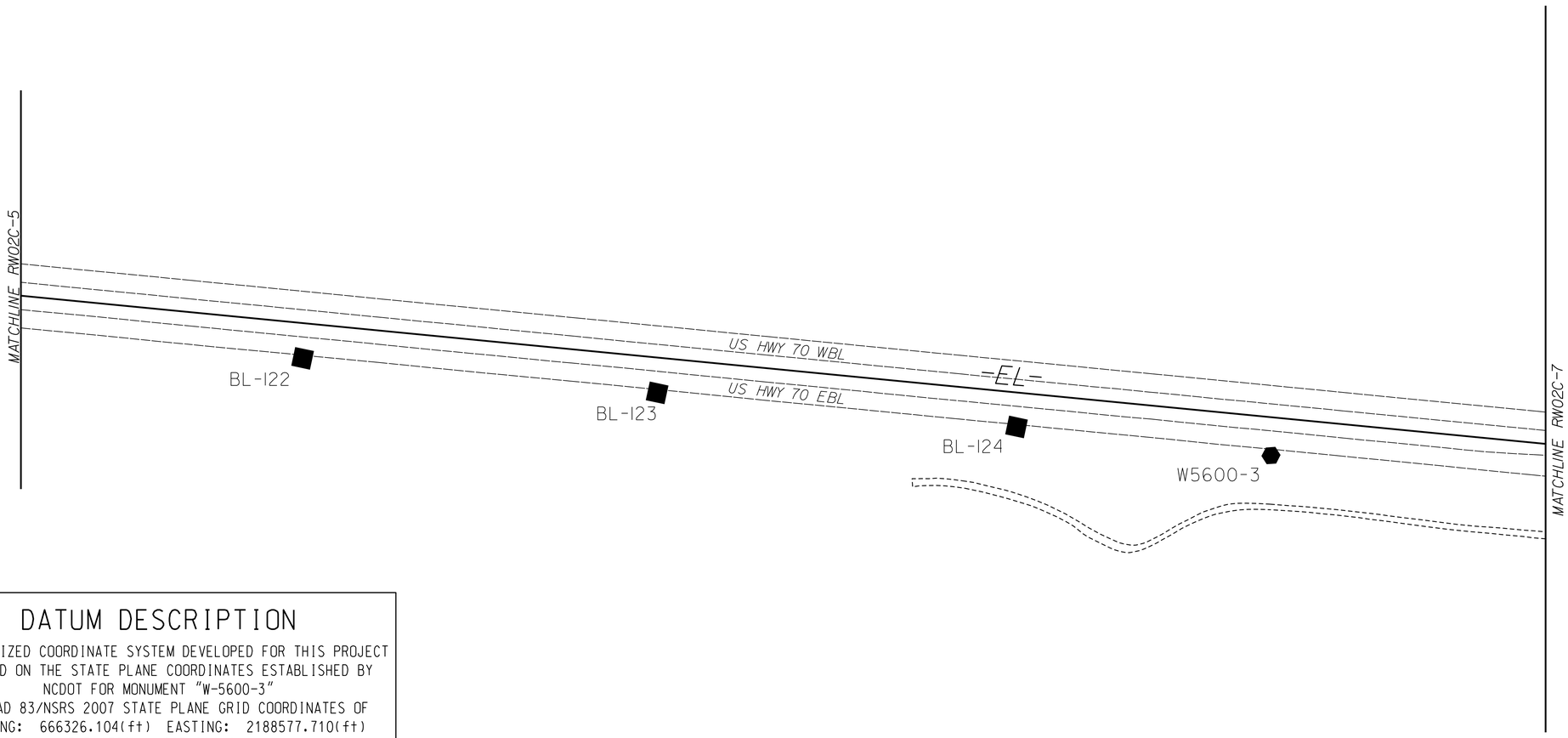
12/4/2020
W-5600_w5600_rdy_psh_01c-5.dgn
USER:HeFinn

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-6
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

NC GRID
NAD 83 NA 2011



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REVISIONS
6/2/99

12/14/2020
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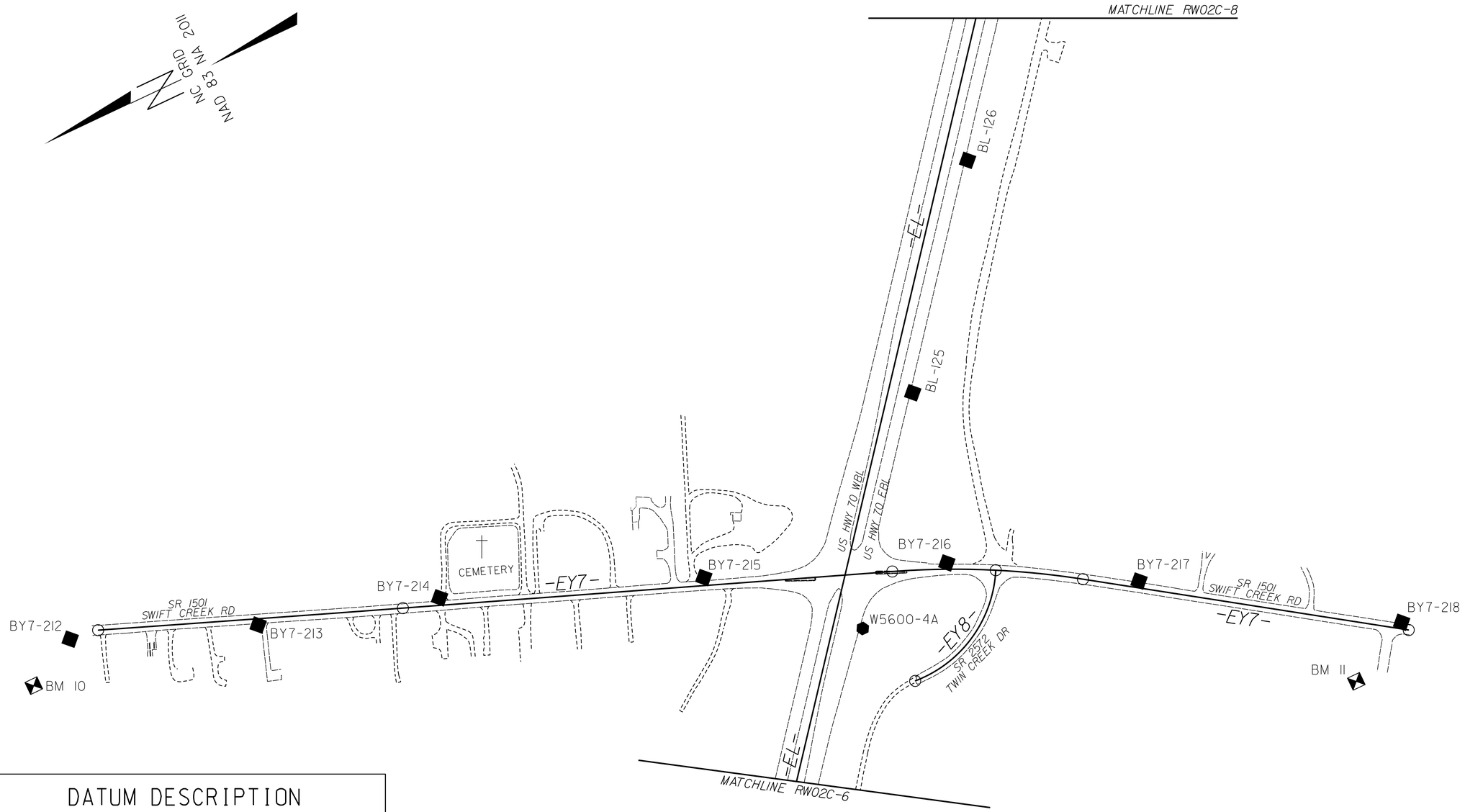
USER:jtaylor

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-7
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



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REVISIONS

6/2/99

12/14/2020
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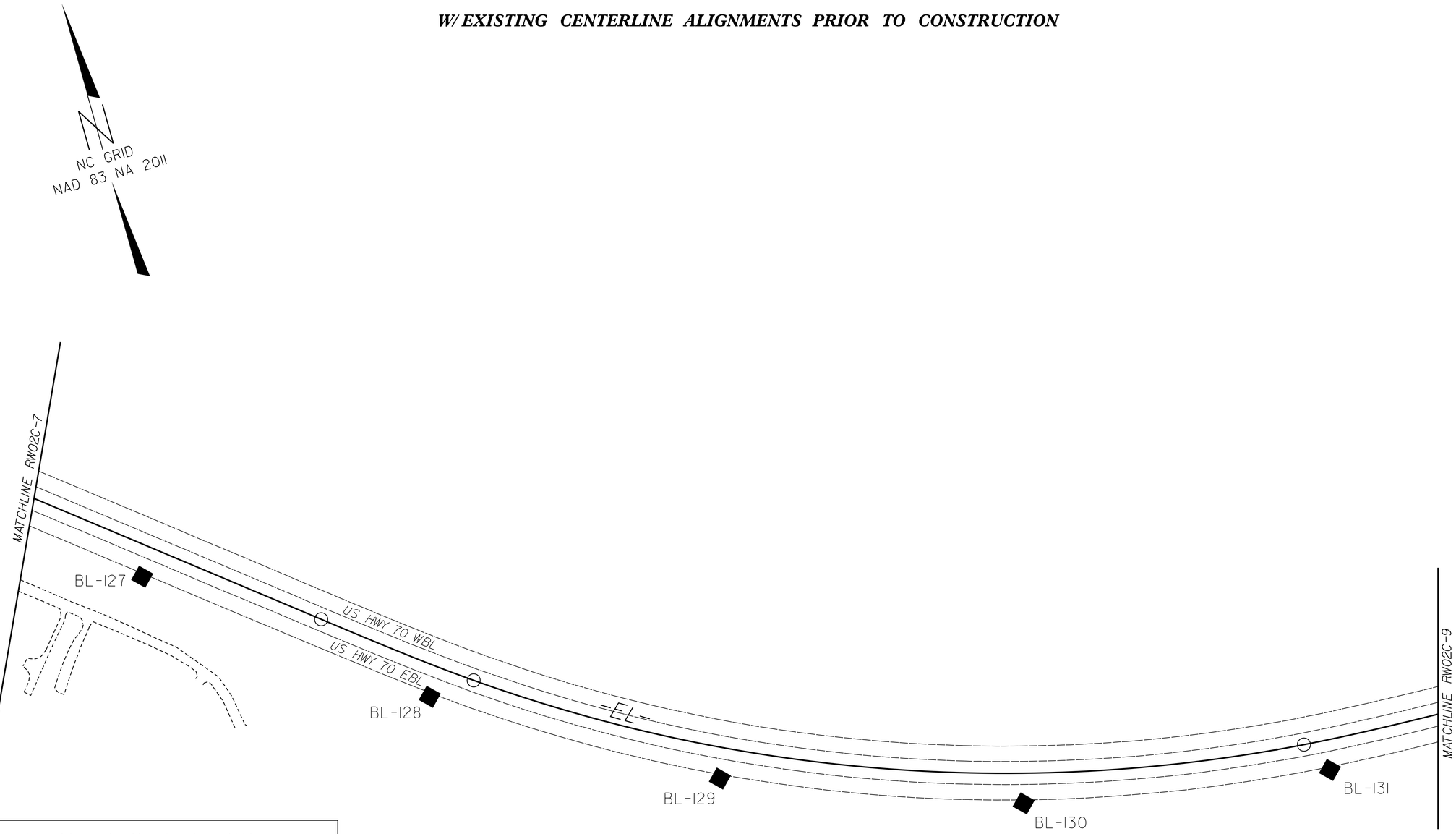
USER:thefner

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-8
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



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REVISIONS

6/2/99

12/14/2020
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USER:jtaylor

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-9
Location and Surveys	

SURVEY CONTROL SHEET

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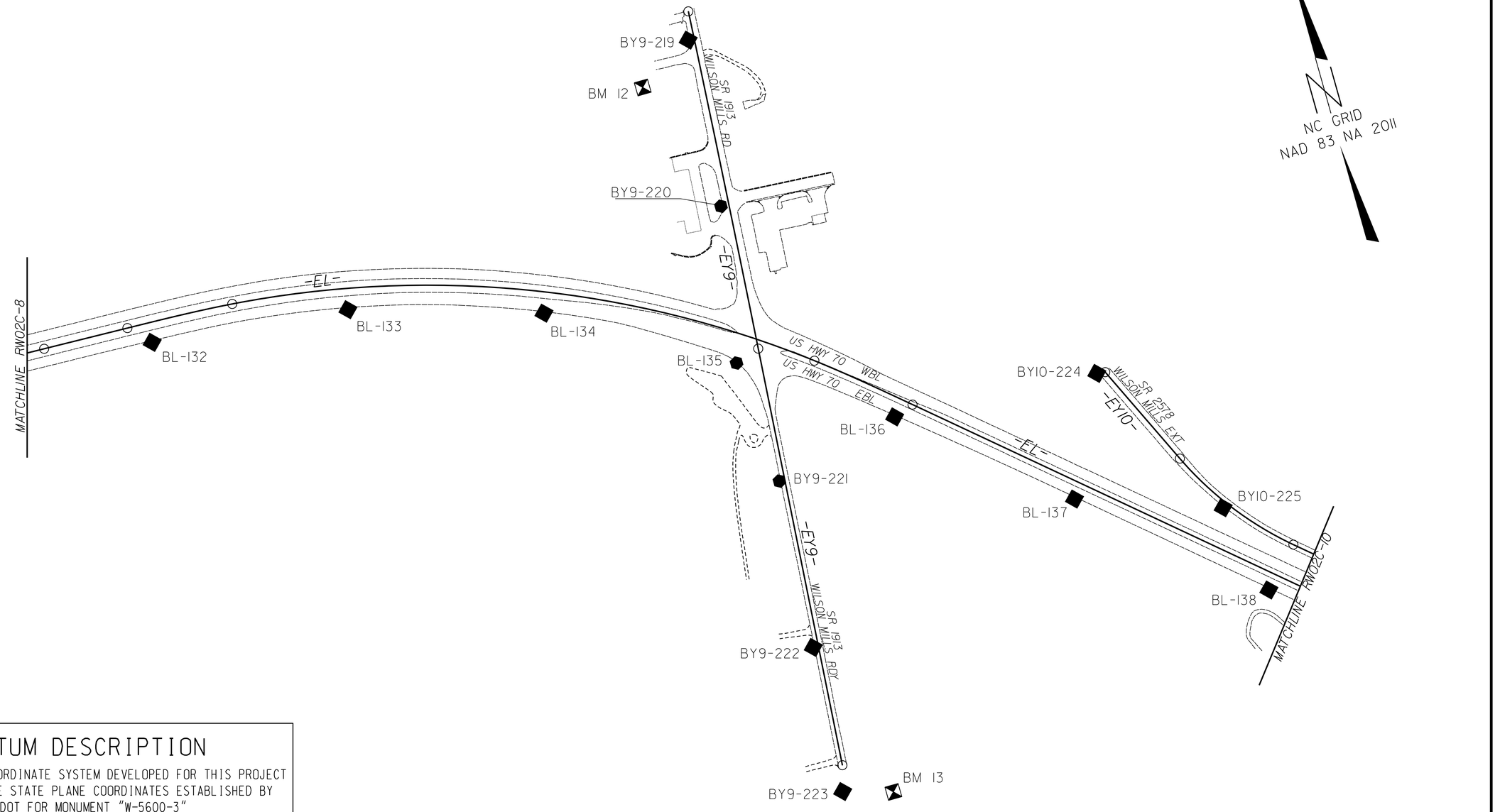

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REVISIONS
6/2/99

12/14/2020
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USER:pthigpen

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-10
Location and Surveys	

SURVEY CONTROL SHEET

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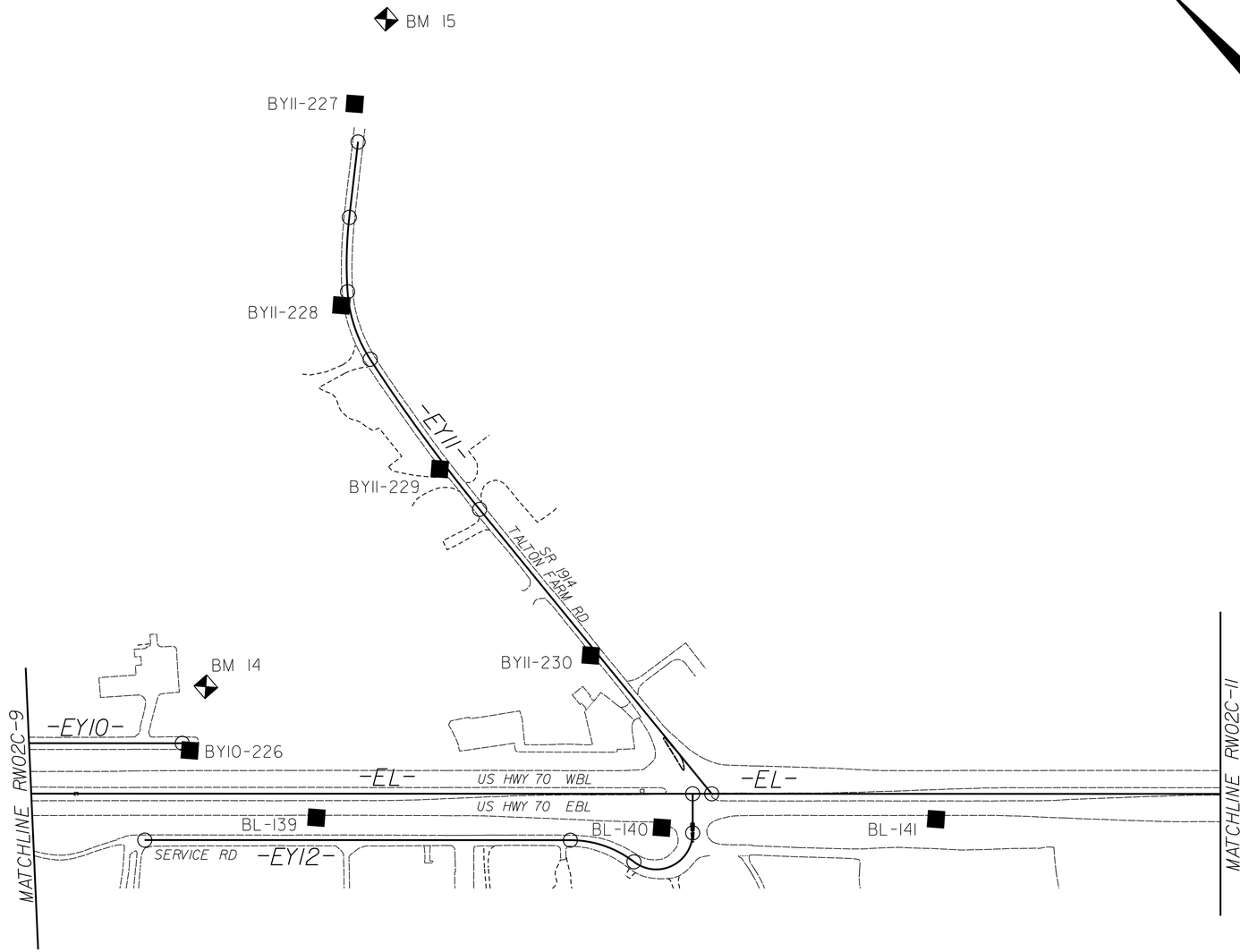

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THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W-5600-3"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 666326.104(ft) EASTING: 2188577.710(ft)
ELEVATION: 203.964(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988457
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "W-5600-3" TO -L- STATION 9+99.84 IS
N65°13'59.09"W 13,283.31 FT
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

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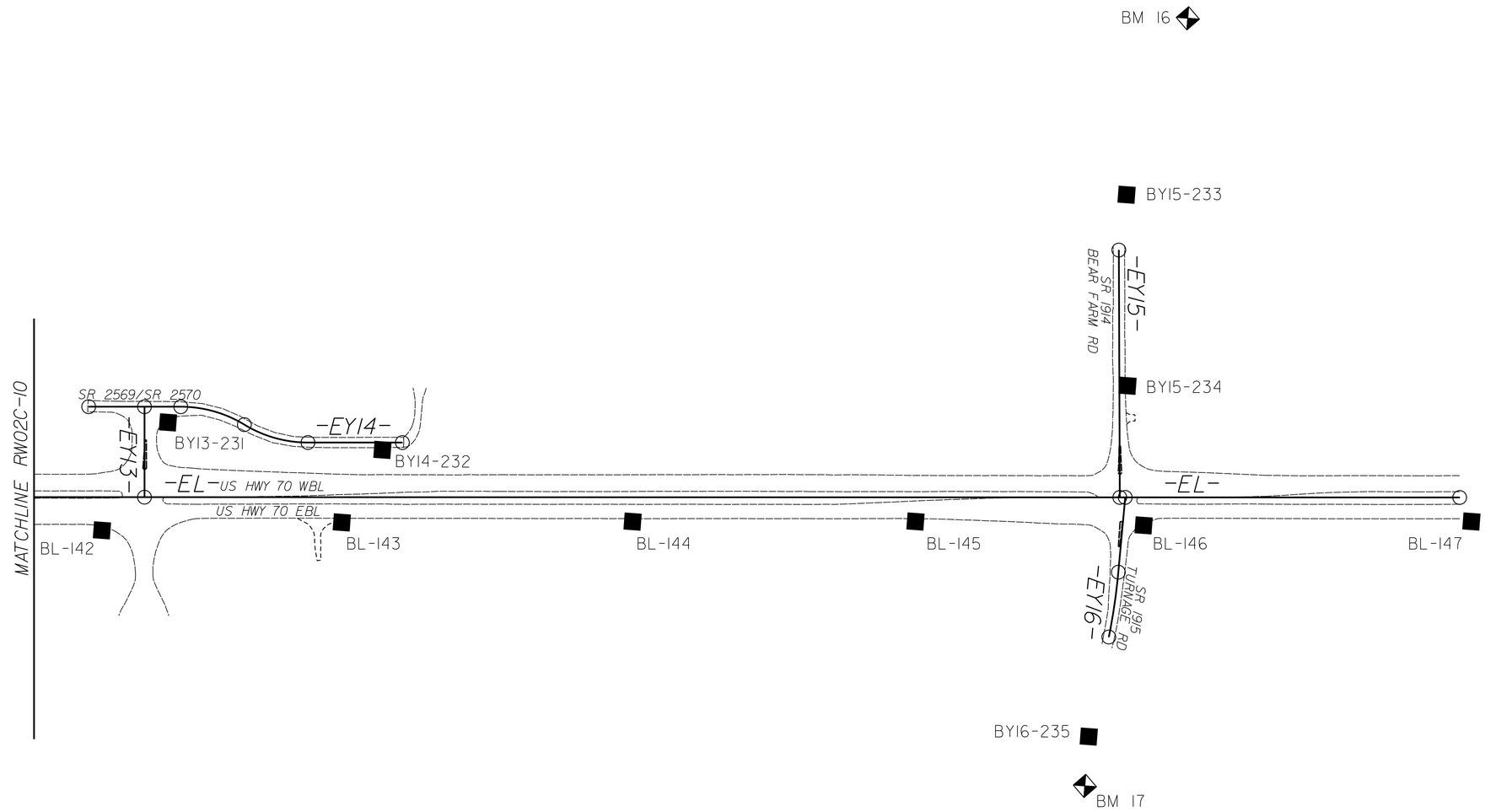
USER:thefner

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-11
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

NC GRID
NAD 83 NA 2011



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W-5600-3"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
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N65°13'59.09"W 13,283.31 FT
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REVISIONS

6/2/99

12/14/2020
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USER:jtaylor

6/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-12
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	W5600-1	672411.0640	2175678.7030	258.38
2	W5600-2	672041.5960	2176193.6960	256.32
101	BL-101	671729.5740	2176611.4400	254.60
102	BL-102	671406.0800	2177055.0740	258.10
103	BL-103	670963.7570	2177704.2840	265.46
104	BL-104	670804.7430	2178110.0070	264.90
105	BL-105	670661.8190	2178658.4590	260.02
106	BL-106	670594.9170	2179238.6610	250.74
107	BL-107	670569.4340	2179831.0780	246.93
108	BL-108	670587.0550	2180401.8550	259.10
109	BL-109	670609.7290	2180960.2200	262.13
110	BL-110	670609.8370	2181461.9150	258.23
111	BL-111	670538.3850	2182107.3450	251.46
112	BL-112	670429.5840	2182650.0720	245.00
113	BL-113	670259.8620	2183185.9120	242.94
114	BL-114	670043.0880	2183694.3260	241.81
115	BL-115	669770.2560	2184190.0370	240.62
116	BL-116	669439.0560	2184672.3010	239.74
117	BL-117	669017.6500	2185165.7210	238.08
118	BL-118	668667.5310	2185632.8950	236.85
119	BL-119	668320.4360	2186071.8300	235.82
120	BL-120	667970.0390	2186513.9500	233.95
121	BL-121	667627.9090	2186947.8590	231.89
122	BL-122	667271.2060	2187397.4630	229.62
123	BL-123	666926.5810	2187830.4230	225.51
124	BL-124	666578.3880	2188270.0070	215.25
3	W5600-3	666326.1040	2188577.7100	203.96
4	W5600-4A	665822.0780	2189197.8770	192.88
125	BL-125	665487.6250	2189637.3090	194.92
126	BL-126	665146.3290	2190065.3720	196.67
127	BL-127	664798.6550	2190503.3010	198.87
128	BL-128	664445.7190	2190949.6620	202.75
129	BL-129	664158.6880	2191419.4410	205.08
130	BL-130	663964.9090	2191941.2270	204.49
131	BL-131	663872.3940	2192496.3060	203.17
132	BL-132	663851.2570	2193057.4750	199.77
133	BL-133	663791.2980	2193607.6000	198.13
134	BL-134	663634.0020	2194131.1640	200.78
135	BL-135	663354.9350	2194610.6160	200.72
136	BL-136	663090.8610	2194994.3220	199.80
137	BL-137	662734.5240	2195414.9670	197.80
138	BL-138	662343.6290	2195868.2590	194.67
139	BL-139	661937.7220	2196339.6730	188.21
140	BL-140	661490.4690	2196828.8270	180.19
141	BL-141	661158.8880	2197237.7070	175.37
142	BL-142	660703.0510	2197740.7880	164.06
143	BL-143	660408.1310	2198106.2930	162.31
144	BL-144	660037.6310	2198538.1710	164.47
145	BL-145	659676.0240	2198957.4430	165.63
146	BL-146	659378.5660	2199290.6160	166.68
147	BL-147	658965.2350	2199781.2250	166.97
148	BL-148	658624.7040	2200236.8310	152.33
5	W5600-5	658203.5970	2200857.4660	134.19
6	W5600-6	657783.4040	2201479.2000	132.57

BY

POINT	DESC.	NORTH	EAST	ELEVATION
103	BL-103	670963.7570	2177704.2840	265.46
201	BY-201	670852.4610	2177452.3780	264.40
202	BY-202	670907.3210	2176997.9330	258.20

BY1

POINT	DESC.	NORTH	EAST	ELEVATION
203	BY1-203	670766.9270	2180413.4860	254.76
204	BY1-204	670788.3860	2181265.4030	262.21
205	BY1-205	670748.4120	2181824.1220	256.22
111	BL-111	670538.3850	2182107.3450	251.46

BY4

POINT	DESC.	NORTH	EAST	ELEVATION
206	BY4-206	670827.8340	2183352.6720	243.96
207	BY4-207	670456.5950	2183563.4350	241.16
208	BY4-208	670292.9060	2184131.1650	241.96
115	BL-115	669770.2560	2184190.0370	240.62

BY5

POINT	DESC.	NORTH	EAST	ELEVATION
209	BY5-209	669406.2640	2185375.4910	238.35
117	BL-117	669017.6500	2185165.7210	238.08
210	BY5-210	668711.9980	2185090.4980	235.20

BY6

POINT	DESC.	NORTH	EAST	ELEVATION
210	BY5-210	668711.9980	2185090.4980	235.20
211	BY6-211	669227.3610	2184801.4820	239.26

BY7

POINT	DESC.	NORTH	EAST	ELEVATION
212	BY7-212	667475.1760	2189951.8040	222.67
213	BY7-213	667071.8820	2189797.0480	225.57
214	BY7-214	666669.0910	2189675.6600	219.35
215	BY7-215	666101.5700	2189458.8640	201.40
4	W5600-4A	665822.0780	2189197.8770	192.88
216	BY7-216	665583.5390	2189251.1130	195.15
217	BY7-217	665202.9770	2189025.4630	208.28
218	BY7-218	664699.0170	2188682.7170	221.97

BY9

POINT	DESC.	NORTH	EAST	ELEVATION
219	BY9-219	664258.5500	2194724.3200	203.42
220	BY9-220	663787.8090	2194687.1100	202.22
135	BL-135	663354.9350	2194610.6160	200.72
221	BY9-221	663005.3960	2194636.6480	200.09
222	BY9-222	662533.0500	2194601.7850	200.28
223	BY9-223	662123.8670	2194571.9850	197.47

BY10

POINT	DESC.	NORTH	EAST	ELEVATION
224	BY10-224	663055.0890	2195569.7710	199.74
225	BY10-225	662599.1350	2195807.5760	198.82
226	BY10-226	662194.0040	2196240.1060	193.58
139	BL-139	661937.7220	2196339.6730	188.21

BY11

POINT	DESC.	NORTH	EAST	ELEVATION
227	BY11-227	662926.2460	2197289.7540	179.38
228	BY11-228	662650.3040	2197017.8230	180.47
229	BY11-229	662289.4320	2196955.7010	179.09
230	BY11-230	661829.5810	2196941.3590	176.22
140	BL-140	661490.4690	2196828.8270	180.19

BY13

POINT	DESC.	NORTH	EAST	ELEVATION
231	BY13-231	660778.5920	2197976.5670	161.00
142	BL-142	660703.0510	2197740.7880	164.06

BY14

POINT	DESC.	NORTH	EAST	ELEVATION
232	BY14-232	660463.6260	2198259.2470	161.96
231	BY13-231	660778.5920	2197976.5670	161.00

BY15

POINT	DESC.	NORTH	EAST	ELEVATION
233	BY15-233	659890.3010	2199688.0170	164.63
234	BY15-234	659606.0490	2199445.3240	162.77
146	BL-146	659378.5660	2199290.6160	166.68

BY16

POINT	DESC.	NORTH	EAST	ELEVATION
146	BL-146	659378.5660	2199290.6160	166.68
235	BY16-235	659135.8380	2198939.2330	162.14

BM1 ELEVATION = 246.85
N 671614 E 2176545
BM1 BENCH TIE NAIL SET IN 18" POPLAR

BM2 ELEVATION = 254.96
N 670956 E 2176849
BM2 BENCH TIE NAIL SET IN 14" PINE

BM3 ELEVATION = 258.83
N 670403 E 2180067
BM3 BENCH TIE NAIL SET IN 18" PINE

BM4 ELEVATION = 257.67
N 670235 E 2182005
BM4 BENCH TIE NAIL SET IN 36" POPLAR

BM5 ELEVATION = 247.22
N 670972 E 2183399
BM5 BENCH TIE NAIL SET IN 24" PINE

BM6 ELEVATION = 248.84
N 669815 E 2183884
BM6 BENCH TIE NAIL SET IN BILLBOARD POST

BM7 ELEVATION = 238.07
N 669414 E 2185412
BM7 BENCH TIE NAIL SET IN 32" OAK

BM8 ELEVATION = 234.51
N 668517 E 2185017
BM8 BENCH TIE NAIL SET IN 18" HARDWOOD

BM9 ELEVATION = 230.56
N 667861 E 2186420
BM9 BENCH TIE NAIL SET IN 8" PINE

BM10 ELEVATION = 225.46
N 667596 E 2188991
BM10 BENCH TIE NAIL SET IN 12" PINE

BM11 ELEVATION = 223.89
N 664851 E 2188605
BM11 BENCH TIE NAIL SET IN 18" PINE

BM12 ELEVATION = 203.88
N 664166 E 2194567
BM12 BENCH TIE NAIL SET IN 18" SWEET GUM

BM13 ELEVATION = 196.23
N 662085 E 2194708
BM13 BENCH TIE NAIL SET IN 14" OAK

BM14 ELEVATION = 196.34
N 662267 E 2196343
BM14 BENCH TIE NAIL SET IN 16" PINE

BM15 ELEVATION = 178.94
N 663010 E 2197442
BM15 BENCH TIE NAIL SET IN 11" PINE

BM16 ELEVATION = 157.05
N 660074 E 2200005
BM16 BENCH TIE NAIL SET IN 18" SWEETGUM

BM17 ELEVATION = 164.02
N 659068 E 2198871
BM17 BENCH TIE NAIL SET IN 15" PINE

NOTES:

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12/14/2020
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PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-13
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R	DELTA S	Ls	LT	ST
POT	671890.851	2176516.209											
LINE			S 53°51'23.3" E	950.00									
TS	671330.531	2177283.374											
SPIRAL			S 54°51'23.2" E	299.96						03°00'00.0"(LT)	300.00	200.03	100.03
SC	671157.864	2177528.658											
CURVE			S 68°21'40.1" E	1142.75	23°00'33.7"(LT)	02°00'00.0"	1150.47	583.09	2864.79				
CS	670736.468	2178590.877											
SPIRAL			S 81°51'56.6" E	299.94						02°59'59.3"(LT)	299.98	200.02	100.02
ST	670694.028	2178887.803											
LINE			S 82°51'56.3" E	84.99									
TS	670683.473	2178972.135											
SPIRAL			S 83°11'56.3" E	200.00						01°00'00.0"(LT)	200.00	133.34	66.67
SC	670659.789	2179170.725											
CURVE			S 87°05'01.9" E	643.31	06°26'11.2"(LT)	01°00'00.0"	643.64	322.16	5729.58				
CS	670627.061	2179813.198											
SPIRAL			N 89°01'52.7" E	199.99						00°59'59.8"(LT)	199.99	133.33	66.67
ST	670630.442	2180013.156											
LINE			N 88°41'52.7" E	93.92									
PC	670632.576	2180107.057											
CURVE			N 88°09'03.7" E	328.16	01°05'38.0"(LT)	00°20'00.0"	328.17	164.09	17188.73				
PT	670643.164	2180435.048											
LINE			N 87°36'14.7" E	437.70									
TS	670661.462	2180872.365											
SPIRAL			N 87°56'14.7" E	199.99						00°59'59.8"(RT)	199.99	133.33	66.67
SC	670668.660	2181072.223											
CURVE			S 71°56'30.4" E	3816.51	38°54'30.1"(RT)	01°00'00.0"	3890.84	2023.80	5729.58				
CS	669485.606	2184700.736											
SPIRAL			S 51°49'15.4" E	199.99						00°59'59.8"(RT)	199.99	133.33	66.67
ST	669361.990	2184857.942											
LINE			S 51°29'15.5" E	7590.37									
TS	664635.594	2190797.204											
SPIRAL			S 52°29'15.4" E	299.96						03°00'00.0"(LT)	300.00	200.03	100.03
SC	664452.937	2191035.141											
CURVE			S 69°52'47.3" E	1520.77	30°47'03.7"(LT)	02°00'00.0"	1539.22	788.67	2864.79				
CS	663929.806	2192463.104											
SPIRAL			S 87°16'18.8" E	299.94						02°59'59.3"(LT)	299.98	200.02	100.02
ST	663915.530	2192762.708											
LINE			S 88°16'18.5" E	239.18									
TS	663908.317	2193001.779											
SPIRAL			S 87°16'18.6" E	299.96						03°00'00.0"(RT)	300.00	200.03	100.03
SC	663894.039	2193301.403											
CURVE			S 68°44'02.1" E	1630.92	33°04'32.7"(RT)	02°00'00.0"	1653.79	850.65	2864.79				
CS	663302.505	2194821.267											
SPIRAL			S 50°11'46.2" E	299.94						02°59'59.3"(RT)	299.98	200.02	100.02
ST	663110.493	2195051.695											
LINE			S 49°11'46.5" E	6265.92									
POT	659015.898	2199794.701											

EY1

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	670749.397	2180342.717							
LINE			N 87°36'14.5" E	525.50					
PC	670771.365	2180867.755							
CURVE			S 87°33'55.6" E	983.48	09°39'39.7"(RT)	00°58'52.2"	984.65	493.50	5839.58
PCC	670729.589	2181850.352							
CURVE			N 72°41'50.0" E	58.21	49°08'08.5"(LT)	81°51'04.0"	60.03	32.00	70.00
PCC	670746.901	2181905.926							
CURVE			S 66°56'15.9" E	126.81	129°51'56.8"(RT)	81°51'04.0"	158.66	149.66	70.00
PT	670697.224	2182022.605							
LINE			S 02°00'17.5" E	85.00					
POT	670612.276	2182025.578							

EYA

POINT	N	E	BEARING	DIST
POT	671014.857	2177773.300		
LINE			S 14°16'03.0" W	222.71
POT	670799.017	2177718.414		

EYB

POINT	N	E	BEARING	DIST
POT	670776.435	2177905.399		
LINE			N 83°06'50.1" W	971.18
POT	670892.875	2176941.226		

EY2

POINT	N	E	BEARING	DIST
POT	670612.276	2182025.578		
LINE			S 02°00'17.5" E	209.50
POT	670402.904	2182032.907		

EY3

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	670481.856	2182030.144							
LINE			S 87°59'42.5" W	81.97					
PC	670478.988	2181948.224							
CURVE			N 67°14'28.0" W	58.64	49°31'38.9"(RT)	81°51'04.0"	60.51	32.29	70.00
PCC	670501.674	2181894.147							
CURVE			N 62°58'34.9" W	49.03	40°59'52.6"(LT)	81°51'04.0"	50.09	26.17	70.00
PCC	670523.950	2181850.473							
CURVE			N 87°14'26.3" W	738.07	07°31'50.2"(LT)	01°01'10.5"	738.60	369.83	5619.58
PT	670523.950	2181850.473							

NOTES:

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REVISIONS

6/2/99

12/14/2020
18:50:05
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USER:Heffner

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1C-14
Location and Surveys	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EY4

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	670962.116	2183346.383							
CURVE			S 10°46'22.7" E	123.11	07°23'29.2"(RT)	06°00'00.0"	123.19	61.68	954.93
PT	670841.181	2183369.394							
LINE			S 07°04'38.1" E	90.14					
PC	670751.723	2183380.500							
CURVE			S 40°03'29.0" E	389.87	65°57'41.8"(LT)	16°00'00.0"	412.26	232.38	358.10
PCC	670453.321	2183631.405							
CURVE			S 70°02'26.4" E	513.74	05°59'47.1"(RT)	01°10'00.0"	513.98	257.22	4911.07
PT	670453.321	2183631.405							

EY5

POINT	N	E	BEARING	DIST
POT	669464.936	2185377.677		
LINE			S 19°22'25.5" W	1000.00
POT	668521.562	2185045.948		

EY6

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	668740.585	2185122.965							
LINE			N 70°37'34.5" W	4.22					
PC	668741.985	2185118.984							
CURVE			N 45°52'33.9" W	228.45	49°30'01.1"(RT)	21°00'00.0"	235.72	125.78	272.84
PT	668901.037	2184954.992							
LINE			N 21°07'33.4" W	213.33					
PC	669100.029	2184878.104							
CURVE			N 36°18'24.4" W	142.89	30°21'42.1"(LT)	21°00'00.0"	144.58	74.03	272.84
PT	669215.181	2184793.495							
LINE			N 51°29'15.5" W	33.26					
PC	669235.892	2184767.470							
CURVE			N 55°57'37.3" W	106.94	08°56'43.6"(LT)	08°21'22.6"	107.05	53.63	685.66
PT	669235.892	2184767.470							

EY7

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	667408.555	2189943.270							
CURVE			S 21°09'33.0" W	700.50	00°17'35.0"(LT)	00°02'30.6"	700.50	350.25	136961.50
PT	666755.279	2189690.416							
LINE			S 21°00'45.5" W	1125.14					
PC	665704.957	2189286.969							
CURVE			S 27°35'15.5" W	437.37	13°09'00.0"(RT)	03°00'00.0"	438.33	220.13	1909.86
PT	665317.313	2189084.420							
LINE			S 34°09'45.5" W	755.80					
POT	664691.932	2188660.008							

EY8

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	665489.295	2189188.359							
CURVE			N 28°38'37.2" W	313.94	66°27'00.0"(RT)	20°00'00.0"	332.25	187.65	286.48
PT	665489.295	2189188.359							

EY9

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	664335.721	2194746.673							
CURVE			S 03°59'22.3" W	960.86	00°35'42.5"(RT)	00°03'43.0"	960.87	480.44	92504.82
PT	663377.186	2194679.822							
LINE			S 04°17'13.5" W	1185.57					
POT	662194.931	2194591.196							

EY10

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	663052.161	2195593.547							
LINE			S 25°05'55.3" E	318.38					
PC	662763.847	2195728.596							
CURVE			S 37°07'45.7" E	397.24	24°03'40.7"(LT)	06°00'46.0"	400.17	203.08	952.90
PT	662447.141	2195968.374							
LINE			S 49°09'36.0" E	356.66					
POT	662213.906	2196238.198							

EY11

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	662866.835	2197247.068							
LINE			S 47°24'47.5" W	145.66					
PC	662768.264	2197139.823							
CURVE			S 42°07'38.1" W	142.60	10°34'18.8"(LT)	07°24'11.4"	142.80	71.60	773.94
PCC	662662.504	2197044.170							
CURVE			S 22°18'47.9" W	136.74	29°03'21.8"(LT)	21°01'19.7"	138.22	70.63	272.55
PCC	662536.002	2196992.254							
CURVE			S 04°40'40.2" W	356.23	06°12'53.5"(LT)	01°44'37.6"	356.40	178.38	3285.75
PT	662180.959	2196963.203							
LINE			S 01°34'13.5" W	704.26					
POT	661476.968	2196943.902							

EY12

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	661500.837	2196916.252							
LINE			S 40°48'13.5" W	75.00					
PC	661444.066	2196867.242							
CURVE			N 75°24'37.7" W	125.60	127°34'17.6"(RT)	81°51'04.0"	155.86	142.17	70.00
PCC	661475.704	2196745.691							
CURVE			N 30°24'37.7" W	128.81	37°34'17.6"(LT)	28°38'52.4"	131.15	68.03	200.00
PT	661586.794	2196680.487							
LINE			N 49°11'46.5" W	816.53					
POT	662120.371	2196062.415							

EY13

POINT	N	E	BEARING	DIST
POT	660831.868	2197962.020		
LINE			S 40°48'13.5" W	177.00
POT	660697.887	2197846.356		

EY14

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	660449.042	2198298.348							
LINE			N 49°11'46.5" W	184.86					
PC	660569.844	2198158.417							
CURVE			N 33°29'15.1" W	129.27	31°25'02.7"(RT)	24°00'00.0"	130.91	67.14	238.73
PCC	660677.658	2198087.090							
CURVE			N 33°29'15.1" W	129.27	31°25'02.7"(LT)	24°00'00.0"	130.91	67.14	238.73
PT	660785.472	2198015.763							
LINE			N 49°11'46.5" W	180.21					
POT	660903.230	2197879.357							

EY15

POINT	N	E	BEARING	DIST
POT	659818.317	2199606.024		
LINE			S 40°33'40.9" W	484.10
POT	659450.540	2199291.230		

EY16

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	659443.618	2199299.248							
LINE			S 46°03'06.9" W	146.92					
PC	659341.654	2199193.469							
CURVE			S 49°08'16.5" W	128.28	06°10'19.2"(RT)	04°48'32.5"	128.34	64.23	1191.42
PT	659341.654	2199193.469							

NOTES:

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

REVISIONS

6/2/99

12/14/2020
W-5600_rdy_psh_01c-14.dgn
USER:Heather

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1D-1
Location and Surveys	

L

TYPE	STATION	NORTH	EAST
POT	09+99.84	671890.8512	2176516.2092
TS	19+49.84	671330.5314	2177283.3743
SC	22+49.84	671157.8643	2177528.6581
CS	33+40.23	670747.6569	2178531.8605
SC	34+90.23	670721.2520	2178679.5096
CS	48+89.09	670629.7253	2180073.2194
ST	50+39.09	670635.2865	2180223.1155
TS	56+96.35	670661.9040	2180879.8387
SC	58+96.35	670668.8407	2181079.7156
CS	97+79.68	669485.6123	2184700.7277
ST	99+79.68	669361.9898	2184857.9422
TS	175+70.05	664635.5944	2190797.2040
SC	178+70.05	664452.9368	2191035.1415
CS	191+55.84	663961.8320	2192211.7907
SRS	194+55.84	663921.1402	2192508.9812
SC	196+55.84	663896.3307	2192707.4338
CS	228+98.35	662604.7938	2195635.7171
ST	230+98.35	662474.9736	2195787.8542
POT	283+91.75	659015.8983	2199794.7006

Y04

TYPE	STATION	NORTH	EAST
PC	10+00.00	670962.1163	2183346.3829
PT	13+39.43	670625.4102	2183371.6153
POT	14+35.28	670530.0763	2183361.7679

Y07

TYPE	STATION	NORTH	EAST
PC	09+99.96	667408.5550	2189943.2697
PRC	15+01.75	666940.7260	2189761.8039
PT	17+05.43	666752.4146	2189684.2165
PC	29+96.00	665570.5901	2189165.6978
PT	38+18.59	664851.6293	2188768.3858
POT	40+11.59	664691.9321	2188660.0078

Y09

TYPE	STATION	NORTH	EAST
PC	10+00.00	664335.7208	2194746.6728
PT	19+60.87	663377.1856	2194679.8218
POT	31+46.44	662194.9310	2194591.1955

LPA-Y07

TYPE	STATION	NORTH	EAST
TS	10+00.00	665774.5494	2189441.4552
SC	12+08.00	665676.1604	2189621.8835
CS	16+83.85	665995.8852	2189810.6524
ST	18+91.85	666106.3429	2189637.3496
POT	21+08.55	666189.6314	2189437.2986

LPC-Y07

TYPE	STATION	NORTH	EAST
TS	10+00.00	665850.4409	2189195.1292
SC	12+24.00	665957.9335	2189001.4114
CS	17+56.35	665605.4617	2188779.3580
ST	19+80.35	665477.1406	2188959.9541
POT	21+27.96	665412.6448	2189092.7272

RPA-Y07

TYPE	STATION	NORTH	EAST
POT	10+00.00	664840.5241	2190615.1659
TS	11+38.52	664932.3319	2190511.4412
SC	14+26.52	665131.5558	2190303.7209
CS	18+13.90	665457.3419	2190097.2566
SRS	21+01.90	665730.2330	2190005.7780
SC	23+09.90	665923.5699	2189930.7743
CS	24+59.03	666034.0707	2189831.9110
ST	26+67.03	666130.0397	2189648.0778
POT	28+84.03	666213.4449	2189447.7466

RPA-Y09

TYPE	STATION	NORTH	EAST
POT	10+00.00	662372.7238	2195965.9775
TS	17+93.38	662921.8938	2195393.3834
SC	19+53.38	663031.0871	2195276.4510
PT	25+55.09	663356.6290	2194773.1058
POT	26+55.71	663397.9953	2194681.3794

RPB-Y09

TYPE	STATION	NORTH	EAST
POT	10+00.00	663843.2260	2193253.0382
TS	16+66.04	663691.5886	2193901.5836
SC	18+26.04	663653.0900	2194056.8711
CS	20+53.99	663579.9791	2194272.6560
ST	22+13.99	663516.1576	2194419.3638
POT	25+01.42	663397.9953	2194681.3794

RPC-Y07

TYPE	STATION	NORTH	EAST
POT	10+00.00	667008.6323	2187739.7280
TS	13+00.00	666809.7978	2187964.3718
SC	15+88.00	666610.5739	2188172.0921
CS	19+68.98	666290.6692	2188376.0272
SRS	22+56.98	666018.2701	2188468.9605
SC	24+52.98	665833.3556	2188533.4257
PT	29+35.85	665494.7492	2188864.1993
POT	31+77.21	665389.2900	2189081.3010

RPC-Y09

TYPE	STATION	NORTH	EAST
CS	10+00.00	663751.6947	2193231.6371
SC	12+80.00	663678.6878	2193501.8771
CS	18+22.20	663461.8928	2193997.7788
SRS	21+02.20	663315.0098	2194236.1172
SC	22+62.20	663230.4442	2194371.9296
PT	24+74.93	663132.8116	2194560.8129
POT	25+81.78	663088.8625	2194658.2080

RPD-Y09

TYPE	STATION	NORTH	EAST
TS	10+00.00	662313.6815	2195915.0068
SC	12+00.00	662443.0731	2195762.5093
CS	21+20.23	662937.3795	2194988.8395
ST	23+20.23	663021.3812	2194807.3419
POT	24+83.92	663088.8625	2194658.2080

SR01

TYPE	STATION	NORTH	EAST
PC	10+00.00	671042.5259	2178110.8331
PRC	17+15.63	670872.5158	2178803.8196
PRC	23+24.82	670753.0644	2179400.3489
PCC	25+84.86	670712.4698	2179656.4619
PCC	31+44.83	670718.9768	2180216.2520
PRC	33+66.91	670737.4025	2180437.5261
PT	46+38.95	670746.0640	2181707.0257
PC	58+24.95	670625.1914	2182886.8554
PT	62+50.88	670545.9855	2183304.8302
PC	64+74.63	670485.7722	2183520.3293
PT	71+04.33	670277.9527	2184114.2902

SR02

TYPE	STATION	NORTH	EAST
POT	10+00.00	670892.8753	2176941.2265
PC	19+34.00	670780.8929	2177868.4871
PRC	23+64.71	670709.5358	2178293.0948
PT	40+36.97	670543.6627	2179953.5101
PC	52+18.63	670559.8222	2181135.0660
PT	57+45.31	670542.3541	2181661.2569
PC	61+19.38	670512.4433	2182034.1304
PCC	65+45.02	670448.4736	2182454.5830
PCC	90+41.00	669387.3494	2184691.3417
PT	92+60.69	669218.8743	2184829.5745
PC	93+67.35	669123.6495	2184877.6372
PT	95+82.95	668957.7064	2185012.6616
POT	97+69.34	668841.6476	2185158.5029

SR03

TYPE	STATION	NORTH	EAST
POT	9+78.80	668841.6476	2185158.5029
PC	44+02.58	666709.7183	2187837.5182
PT	52+90.97	665988.3990	2188333.6475
PC	58+90.97	665416.3371	2188514.6040
PT	61+80.79	665193.8704	2188690.3591
POT	64+30.79	665065.3582	2188904.7993

SR04

TYPE	STATION	NORTH	EAST
POT	10+00.00	666459.7742	2189555.8222
PC	11+26.83	666408.8168	2189671.9660
PT	13+16.95	666284.0953	2189811.2411
PC	17+47.58	665911.1605	2190026.5551
PT	17+80.69	665889.8210	2190051.0775
POT	18+19.26	665875.3368	2190086.8192

SR05

TYPE	STATION	NORTH	EAST
POT	10+00.00	665400.9592	2189087.0310
PC	11+05.00	665355.0808	2189181.4777
PT	12+12.10	665345.1158	2189285.8410
PC	13+78.54	665388.1952	2189446.6154
PT	15+44.92	665363.3812	2189606.3197
POT	16+09.13	665328.7274	2189660.3744

SR06

TYPE	STATION	NORTH	EAST
POT	10+00.00	662579.2923	2194620.0087
PC	12+89.37	662608.0974	2194907.9425
PT	22+63.61	662322.4003	2195811.5595
PC	29+37.65	661881.9390	2196321.7712
PRC	31+65.59	661738.3505	2196498.7527
PT	34+35.16	661562.8019	2196703.1339
PC	37+89.49	661316.5863	2196957.9380
PT	40+66.62	661129.7065	2197162.5196
PC	47+66.62	660672.2774	2197692.3862
PT	49+23.70	660531.2352	2197702.7344
POT	49+83.70	660485.8180	2197663.5262

SR07

TYPE	STATION	NORTH	EAST
POT	10+00.00	663052.1606	2195593.5474
PC	13+11.24	662770.3065	2195725.5697
PT	19+30.70	662718.7182	2196238.1074
PC	22+18.97	662950.1668	2196409.9583
PT	25+33.17	662991.4902	2196689.7957
PC	28+28.81	662815.2020	2196927.1176
PRC	30+47.67	662622.3053	2197005.2234
PT	34+91.35	662180.9595	2196963.2026
PC	39+62.57	661709.9159	2196950.2885
PT	41+39.78	661553.0443	2197019.5193
PC	70+31.98	659663.0776	2199208.7767
PT	73+46.99	659684.4157	2199491.4128
POT	75+23.24	659818.3173	2199606.0238

SR08

TYPE	STATION	NORTH	EAST
POT	10+00.00	662599.7253	2195961.2656
PC	10+27.11	662572.8107	2195958.0144
PT	12+22.75	662397.5178	2196025.7812
POT	15+03.53	662213.9058	2196238.1979

SR09

TYPE	STATION	NORTH	EAST
POT	10+00.00	662866.8346	2197247.0681
PC	11+51.85	662764.0750	2197135.2662
PT	12+21.96	662730.1871	2197074.6264
POT	12+99.21	662709.1388	2197000.2908

DR01

TYPE	STATION	NORTH	EAST
POT	10+00.00	669375.3561	2184706.0822
PC	10+23.25	669357.6021	2184691.0674
PT	10+73.24	669330.1021	2184650.0910
POT	12+05.20	669289.4252	2184524.5589

DR02

TYPE	STATION	NORTH	EAST
POT	10+00.00	666171.3166	2189429.2631
PC	12+20.62	666259.9556	2189227.2343
PT	12+49.73	666278.5444	2189205.3676
POT	12+70.00	666295.5548	2189194.3403

NOTES:

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

6/2/99

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1E-1
Location and Surveys	

PROJECT SURVEYOR

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	28+20.00	-225.00	671104.5344	2178117.1721
L	28+20.00	-125.00	671011.6471	2178080.1322
L	154+89.12	-125.00	666029.1605	2189246.7713
L	174+00.00	-125.00	664839.2887	2190741.9826
L	176+10.00	-125.68	664709.1359	2190906.6389
L	177+50.00	-175.00	664663.3900	2191045.0823
L	183+75.00	-125.00	664310.1716	2191523.4703
L	195+50.00	111.99	663798.7265	2192588.7910
L	197+50.00	140.00	663744.4360	2192779.4107
L	197+65.00	195.00	663687.8561	2192785.4029
L	198+25.00	-167.68	664036.3772	2192902.2277
L	198+50.00	-210.00	664073.8132	2192934.7244
L	201+20.00	-230.00	664039.7969	2193213.5858
L	201+25.00	170.00	663648.0409	2193132.6385
L	201+50.00	-285.00	664086.6983	2193256.0938
L	202+00.00	-233.34	664024.6738	2193295.4628

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y04	10+75.00	50.00	670880.1786	2183313.0070
Y04	10+75.00	30.00	670883.6408	2183332.7050
Y04	13+00.00	50.00	670667.7880	2183324.9510

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y05	17+75.00	-50.00	668717.2343	2185167.7553

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y07	14+20.00	-60.00	666995.3557	2189847.2153
Y07	14+20.00	50.00	667035.0090	2189744.6112
Y07	14+20.00	30.00	667027.7993	2189763.2665
Y07	14+20.00	-30.00	667006.1702	2189819.2324
Y07	15+01.75	-60.00	666919.1303	2189817.7827
Y07	15+01.75	50.00	666958.7224	2189715.1549
Y07	17+05.43	50.00	666772.5033	2189638.4296
Y07	17+05.43	-60.00	666728.3081	2189739.1608
Y07	17+81.31	-60.00	666658.8221	2189708.6742
Y07	17+81.77	-38.37	666667.0912	2189688.6787
Y07	19+91.48	-48.17	666471.1159	2189613.4012
Y07	20+00.00	50.00	666502.7565	2189520.0797
Y07	20+70.00	60.00	666442.6725	2189482.7980
Y07	22+85.00	90.00	666257.8420	2189368.9443
Y07	24+00.00	125.00	666166.5942	2189290.6893
Y07	33+00.00	-115.00	665243.3359	2189136.2033
Y07	34+00.00	-100.00	665160.1860	2189074.6068
Y07	35+00.00	-70.00	665086.2397	2188998.3654
Y07	35+00.00	-50.00	665096.2718	2188981.0635
Y07	37+00.00	75.00	664991.0847	2188770.5297
Y07	38+18.59	75.00	664893.7451	2188706.3272
Y07	38+18.59	-50.00	664823.5521	2188809.7581
Y07	39+20.00	-50.00	664739.6372	2188752.8095
Y07	39+20.00	-30.00	664750.8681	2188736.2606
Y07	39+26.49	30.00	664779.1892	2188682.9684
Y07	39+26.55	75.00	664804.4093	2188645.6998

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y09	14+50.00	-55.00	663882.9184	2194771.4723
Y09	14+50.00	-30.00	663884.6496	2194746.5323
Y09	14+50.00	30.00	663888.8043	2194686.6763
Y09	14+50.00	60.00	663890.8817	2194656.7483
Y09	16+75.00	60.00	663666.5865	2194640.9053
Y09	17+00.00	-55.00	663633.3939	2194753.8134
Y09	18+48.83	-101.75	663481.4351	2194789.5996
Y09	23+50.00	75.00	662994.7488	2194575.9424
Y09	27+70.00	75.00	662575.9240	2194544.5458
Y09	27+70.00	30.00	662572.5601	2194589.4198
Y09	28+06.48	-30.00	662531.6954	2194646.5248

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA-Y07	10+00.00	105.00	664919.1495	2190684.7580
RPA-Y07	11+38.52	105.00	665010.9572	2190581.0333
RPA-Y07	13+50.00	105.00	665149.8146	2190430.7004
RPA-Y07	15+00.00	70.00	665231.1498	2190311.7179
RPA-Y07	17+00.00	70.00	665388.3257	2190208.3586
RPA-Y07	18+50.00	90.00	665523.7307	2190167.3010
RPA-Y07	20+00.00	65.00	665651.6600	2190096.8914
RPA-Y07	21+60.00	70.00	665806.8405	2190055.9477
RPA-Y07	22+34.18	148.97	665912.2489	2190102.2358

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA-Y09	19+53.38	90.00	663098.4807	2195336.1008
RPA-Y09	24+46.22	90.00	663389.1005	2194912.4951

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPB-Y09	14+15.00	-216.18	663959.2446	2193706.3573
RPB-Y09	15+90.00	-225.00	663927.9911	2193878.7697
RPB-Y09	19+55.00	-190.00	663794.2381	2194242.2960
RPB-Y09	17+25.00	-217.00	663889.0902	2194009.5256
RPB-Y09	20+25.00	-178.68	663757.2793	2194310.1668
RPB-Y09	22+72.00	-162.38	663640.3340	2194538.9958

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPC-Y09	10+00.00	95.00	663659.1896	2193210.0083
RPC-Y09	11+50.00	95.00	663623.5307	2193352.3200
RPC-Y09	12+80.00	75.00	663607.2141	2193479.1502
RPC-Y09	18+22.20	75.00	663396.6728	2193960.7470
RPC-Y09	22+62.20	75.00	663165.7432	2194333.9983
RPC-Y09	24+74.93	75.00	663064.4494	2194529.9647

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
DR02	11+80.00	30.00	666271.1083	2189276.4834
DR02	11+80.00	-40.00	666207.0066	2189248.3592

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR01	11+00.00	-60.00	671064.4505	2178224.3935
SR01	11+00.00	-40.00	671045.5693	2178217.7978
SR01	17+15.63	-40.00	670912.2825	2178808.1330
SR01	21+50.00	-40.00	670837.1489	2179240.8406
SR01	22+00.00	-85.00	670868.5646	2179301.0955
SR01	25+00.00	-50.00	670768.0561	2179577.4251
SR01	25+84.86	-75.00	670787.4421	2179658.4997
SR01	28+00.00	-75.00	670784.8304	2179871.3823
SR01	29+00.00	-50.00	670760.7805	2179970.7501
SR01	31+44.83	-50.00	670768.9132	2180213.7320
SR01	32+46.11	-53.16	670778.5792	2180313.0614
SR01	33+66.91	-50.00	670787.0680	2180431.7521
SR01	33+66.91	-46.07	670783.1678	2180432.2055
SR01	46+38.95	-50.00	670795.8036	2181712.1215
SR01	48+23.51	-50.00	670776.9936	2181895.7251
SR01	49+65.10	-40.00	670752.6153	2182035.5601
SR01	56+00.00	-40.00	670687.9094	2182667.1502
SR01	58+24.95	-70.00	670694.8269	2182893.9895
SR01	62+00.00	-70.00	670626.9655	2183273.1513

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

12/14/2020
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REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1E-2
Location and Surveys	

PROJECT SURVEYOR

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR02	19+34.00	50.00	670731.2536	2177862.4923
SR02	23+64.71	50.00	670660.6637	2178282.5343
SR02	35+00.00	50.00	670505.9285	2179413.8500
SR02	37+40.00	80.00	670465.6016	2179654.4472
SR02	38+00.00	115.00	670429.2442	2179714.4372
SR02	39+00.00	75.00	670468.0609	2179816.1820
SR02	40+36.97	50.00	670493.6674	2179954.1938
SR02	52+18.63	50.00	670509.8268	2181135.7497
SR02	57+45.31	50.00	670492.5142	2181657.2588
SR02	59+68.01	50.00	670474.7067	2181879.2504
SR02	61+64.55	50.00	670458.7182	2182074.3831
SR02	65+45.02	70.00	670380.1904	2182439.1752
SR02	65+45.02	50.00	670399.6999	2182443.5774
SR02	72+30.00	55.00	670205.8000	2183093.4769
SR02	72+30.00	70.00	670191.6750	2183088.4287
SR02	89+50.00	55.00	669398.9919	2184586.0383
SR02	90+70.00	120.65	669278.2738	2184633.9144

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR03	11+00.00	50.00	668727.0538	2185222.2056
SR03	30+00.00	50.00	667543.9551	2186708.9058
SR03	44+02.58	50.00	666670.5946	2187806.3840
SR03	52+90.97	50.00	665973.3193	2188285.9757
SR03	56+00.00	50.00	665678.6805	2188379.1768
SR03	58+90.97	85.00	665390.7016	2188433.5619
SR03	61+80.79	85.00	665120.9607	2188646.6650
SR03	63+00.00	85.00	665059.6786	2188748.9226

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR04	12+93.32	-99.67	666360.5500	2189880.7600
SR04	13+31.42	-40.00	666291.5693	2189853.1140
SR04	17+47.58	-40.00	665931.1605	2190061.1961
SR04	18+19.24	-21.19	665894.9827	2190094.7634

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR05	11+30.00	60.00	665288.5067	2189187.8696
SR05	12+12.10	60.00	665287.1603	2189301.3702
SR05	13+78.54	60.00	665330.2396	2189462.1445
SR05	15+44.92	60.00	665312.8698	2189573.9376
SR05	16+09.13	60.00	665278.2161	2189627.9923
SR05	16+09.13	-40.74	665363.0236	2189682.3612

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR06	12+89.37	50.00	662558.3457	2194912.9197
SR06	16+88.05	50.00	662533.1084	2195292.3960
SR06	17+03.10	37.00	662542.3089	2195309.5621
SR06	22+63.61	37.00	662294.3931	2195787.3811
SR06	29+37.65	37.00	661853.9318	2196297.5928
SR06	31+65.59	37.00	661708.9189	2196476.3299
SR06	34+32.99	34.34	661539.5989	2196677.7325
SR06	34+33.44	37.00	661537.3771	2196676.1984
SR06	36+48.47	40.00	661385.8120	2196828.7340
SR06	37+23.59	-18.56	661375.7318	2196923.4431
SR06	37+77.32	40.00	661296.2777	2196921.3914

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR07	13+11.24	50.00	662749.0976	2195680.2908
SR07	13+11.24	-50.00	662791.5155	2195770.8486
SR07	17+00.00	50.00	662552.2062	2196054.0819
SR07	19+30.70	50.00	662688.9112	2196278.2514
SR07	19+30.70	-50.00	662748.5252	2196197.9634
SR07	22+18.97	50.00	662920.3598	2196450.1023
SR07	22+18.97	-75.00	662994.8773	2196349.7423
SR07	22+18.97	-50.00	662979.9738	2196369.8143
SR07	25+33.17	50.00	662951.3524	2196659.9804
SR07	25+33.17	-75.00	663051.6970	2196734.5187
SR07	28+28.81	-75.00	662875.4087	2196971.8406
SR07	28+28.81	50.00	662775.0641	2196897.3023
SR07	30+47.67	-70.00	662610.9844	2197074.3019
SR07	30+47.67	60.00	662632.0089	2196946.0133
SR07	32+00.00	60.00	662478.4165	2196924.4846
SR07	32+00.00	50.00	662477.2583	2196934.4173
SR07	34+91.35	-70.00	662179.0411	2197033.1763
SR07	34+91.35	50.00	662182.3298	2196913.2214
SR07	37+00.00	50.00	661973.7607	2196907.5032
SR07	37+50.00	30.00	661923.2314	2196926.1255
SR07	37+65.00	-70.00	661905.4964	2197025.6768
SR07	37+65.00	-38.00	661906.3734	2196993.6888
SR07	37+95.00	50.00	661878.7964	2196904.8997
SR07	38+20.00	-38.00	661851.3941	2196992.1815
SR07	38+50.00	-50.00	661821.0765	2197003.3548
SR07	39+62.57	-50.00	661708.5456	2197000.2697
SR07	39+62.57	-40.00	661708.8196	2196990.2735
SR07	40+10.96	57.50	661649.6231	2196898.6167
SR07	41+39.78	-40.00	661583.3224	2197045.6581
SR07	42+43.08	-40.00	661515.8184	2197123.8519
SR07	42+48.03	-50.00	661520.1560	2197134.1303
SR07	51+87.49	-50.00	660906.2448	2197845.2590
SR07	55+55.21	-50.00	660665.9545	2198123.6011
SR07	70+31.98	-50.00	659700.9252	2199241.4503
SR07	72+35.00	71.45	659555.3735	2199420.4500
SR07	72+45.00	97.00	659535.7737	2199442.1278
SR07	72+66.00	110.00	659536.4072	2199476.5188
SR07	72+75.00	50.00	659595.4242	2199459.9690
SR07	72+75.00	105.00	659547.2346	2199486.4786
SR07	73+46.99	-50.00	659716.9288	2199453.4273
SR07	73+46.99	50.00	659651.9026	2199529.3983
SR07	74+65.00	-50.00	659806.5837	2199530.1661
SR07	74+65.00	-30.00	659793.5785	2199545.3603
SR07	74+65.00	50.00	659741.5575	2199606.1371
SR07	74+65.00	30.00	659754.5628	2199590.9429

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR08	11+00.00	-60.00	662514.9718	2196020.7258
SR08	12+22.75	-60.00	662442.9102	2196065.0181
SR08	12+67.43	-60.00	662413.6967	2196098.8145
SR08	12+69.65	-30.00	662389.5440	2196080.8811

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR09	10+50.00	-30.00	662810.9117	2197230.5566
SR09	10+50.00	-50.00	662796.1867	2197244.0908
SR09	10+50.00	30.00	662855.0869	2197189.9542
SR09	10+50.00	50.00	662869.8120	2197176.4201
SR09	11+51.85	50.00	662800.8877	2197101.4309

NOTES:

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2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

12/4/2020
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REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1E-3
Location and Surveys	

PROJECT SURVEYOR

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	168+50.00	190.00	664935.2854	2190115.4767
L	168+50.00	125.00	664986.1462	2190155.9511
L	168+70.00	300.00	664836.7597	2190062.6310
L	169+00.00	300.00	664818.0792	2190086.1052
L	169+10.00	145.00	664933.1358	2190190.4459
L	169+10.00	210.00	664882.2750	2190149.9714
L	172+00.00	145.00	664752.5575	2190417.3633
L	173+60.00	128.94	664665.4961	2190552.5605
L	173+60.00	125.00	664668.5776	2190555.0127
L	174+40.00	135.00	664610.9382	2190611.3838
L	174+40.00	125.00	664618.7630	2190617.6106
L	174+95.00	125.00	664584.5154	2190660.6467
L	174+95.00	135.00	664576.6906	2190654.4199
L	193+00.00	124.43	663816.9781	2192337.8610
L	193+00.00	150.00	663791.6307	2192334.4762
L	193+65.00	123.26	663809.7079	2192403.6261
L	193+65.00	150.00	663783.1755	2192400.3346
L	195+85.00	136.00	663770.6219	2192620.1348
L	198+19.00	224.00	663650.9653	2192832.1916
L	198+20.00	207.00	663667.5797	2192835.9184
L	198+42.00	226.00	663645.3402	2192853.6650
L	198+42.00	210.00	663661.1150	2192856.3398

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPA-Y09	19+43.00	123.00	663115.8819	2195366.1891
RPA-Y09	19+43.00	107.00	663103.9542	2195355.5246
RPA-Y09	19+63.00	107.00	663117.9094	2195339.7628
RPA-Y09	19+63.00	123.00	663129.9413	2195350.3095

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
RPC-Y09	13+37.00	93.00	663572.8330	2193525.8859
RPC-Y09	17+87.00	93.00	663397.5790	2193922.2306

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR01	14+62.00	-49.00	670959.6645	2178563.1540
SR01	14+71.00	-40.00	670949.0831	2178570.0378
SR01	14+77.00	-63.00	670970.4807	2178580.3229
SR01	14+99.00	-40.00	670943.7795	2178597.1082
SR01	25+40.00	-62.79	670777.3235	2179616.1824
SR01	25+40.00	-86.00	670800.4707	2179617.8527
SR01	25+67.00	-87.00	670800.0262	2179642.5327
SR01	25+77.00	-109.00	670821.6473	2179652.4258
SR01	25+97.00	-92.00	670804.1202	2179670.9451
SR01	25+97.00	-101.00	670813.1173	2179671.1745
SR01	27+91.00	-92.00	670801.8124	2179862.4522
SR01	27+91.00	-108.00	670817.8124	2179862.4300
SR01	28+13.00	-91.00	670800.8758	2179884.1761
SR01	28+13.00	-107.00	670816.8756	2179884.1051
SR01	29+90.00	-50.00	670762.8119	2180060.1029
SR01	29+90.00	-61.00	670773.8073	2180059.7843
SR01	32+70.00	-60.00	670787.3569	2180335.8951
SR01	32+70.00	-52.03	670779.4193	2180336.5893
SR01	33+15.00	-60.00	670791.4997	2180379.9061
SR01	33+15.00	-49.54	670781.0919	2180380.9553
SR01	39+30.00	-50.00	670825.3723	2180998.1544
SR01	39+30.00	-53.00	670828.3718	2180998.0965
SR01	39+50.00	-53.00	670828.7269	2181018.2749
SR01	39+50.00	-50.00	670825.7273	2181018.3225
SR01	51+17.00	-79.00	670775.9316	2182190.6399
SR01	51+17.00	-40.00	670737.1347	2182186.6652
SR01	51+41.00	-79.00	670773.4856	2182214.5149
SR01	51+41.00	-40.00	670734.6887	2182210.5402

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR02	29+00.00	50.00	670566.0264	2178812.9509
SR02	29+00.00	60.00	670556.1247	2178811.5524
SR02	29+25.00	60.00	670552.6422	2178836.5138
SR02	29+45.00	80.00	670530.0970	2178853.8149
SR02	29+65.00	65.00	670542.2893	2178875.8204
SR02	31+40.00	80.00	670506.3025	2179049.4806
SR02	31+40.00	65.00	670521.2154	2179051.0946
SR02	31+61.00	80.00	670504.0485	2179070.5881
SR02	31+61.00	65.00	670518.9659	2179072.1597
SR02	36+09.00	74.00	670476.2845	2179522.3782
SR02	36+09.00	85.00	670465.2953	2179521.8912
SR02	36+29.00	91.00	670458.4322	2179541.8534
SR02	36+60.00	69.10	670479.0806	2179574.0295
SR02	36+60.00	85.00	670463.1894	2179573.4352
SR02	37+10.00	75.81	670470.6609	2179624.2629
SR02	37+10.00	85.00	670461.4704	2179623.9815
SR02	50+91.00	65.00	670493.0828	2181008.3347
SR02	50+91.00	50.00	670508.0814	2181008.1296
SR02	51+12.00	64.00	670494.3699	2181029.3190
SR02	51+14.00	84.00	670474.3992	2181031.5924
SR02	51+32.00	62.00	670496.6432	2181049.2898
SR02	51+34.00	82.00	670476.6725	2181051.5631
SR02	51+52.00	61.00	670497.9167	2181069.2743
SR02	51+52.00	50.00	670508.9156	2181069.1239
SR02	61+54.86	64.82	670444.8489	2182063.5379
SR02	62+32.00	68.00	670433.8026	2182138.2200
SR02	65+02.00	75.00	670384.2527	2182397.0894
SR02	65+02.00	50.00	670408.7160	2182402.2419
SR02	89+10.00	160.00	669338.6141	2184491.5976
SR02	89+20.00	180.00	669316.7871	2184487.3965

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR06	10+60.00	73.00	662512.6275	2194686.9774
SR06	12+26.00	69.00	662533.1319	2194851.7547
SR06	12+89.37	74.00	662534.4649	2194915.3088
SR06	13+85.00	50.00	662563.8272	2195004.3757
SR06	13+85.00	78.00	662535.8328	2195004.9362
SR06	14+74.00	75.00	662537.4087	2195088.2824
SR06	18+72.00	64.00	662466.5526	2195454.8884
SR06	19+16.00	73.00	662441.9652	2195489.4936
SR06	19+16.00	37.00	662474.7999	2195504.2546
SR06	24+82.00	37.00	662151.6842	2195952.6890
SR06	25+25.00	80.00	662091.0361	2195957.1387
SR06	25+80.00	37.00	662087.6441	2196026.8703
SR06	26+05.00	115.00	662012.2651	2195994.8235
SR06	26+20.00	85.00	662025.1716	2196025.7819

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR07	13+00.00	50.00	662759.2781	2195675.5221
SR07	30+21.00	88.00	662651.3951	2196919.8090
SR07	30+21.00	68.19	662650.8194	2196939.6082
SR07	30+53.00	93.00	662631.9404	2196912.5663
SR07	30+57.00	76.00	662625.1781	2196928.6941
SR07	32+70.00	50.00	662406.5890	2196926.9390
SR07	33+00.00	-103.00	662363.1686	2197076.6344
SR07	33+00.00	-70.00	662365.9915	2197043.7554
SR07	33+21.48	-102.47	662342.4708	2197074.3960
SR07	33+21.48	-70.00	662345.0381	2197042.0254
SR07	37+10.00	-125.00	661958.9685	2197082.1635
SR07	37+10.00	-70.00	661960.4758	2197027.1841
SR07	37+65.00	-125.00	661903.9891	2197080.6562
SR07	47+50.00	-50.00	661192.1328	2197514.0985
SR07	47+80.00	-100.00	661210.3763	2197569.4806
SR07	48+10.00	-50.00	661152.9246	2197559.5156
SR07	48+20.00	-85.00	661172.8832	2197589.9566
SR07	71+35.00	-105.00	659721.3069	2199320.8699
SR07	71+85.00	-50.00	659664.6781	2199347.4062
SR07	72+30.00	-130.00	659747.1542	2199358.6762
SR07	72+60.00	-50.00	659677.9939	2199401.7187

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

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USER:Heffner

6/2/99

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
W-5600	1E-4
Location and Surveys	

PROJECT SURVEYOR

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SR09	10+80.00	68.00	662862.7633	2197142.1518
SR09	11+62.23	67.80	662810.2969	2197085.0686

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y07	13+85.00	-30.00	667038.8082	2189831.8507
Y07	13+85.00	-45.00	667033.3974	2189845.8408
Y07	14+05.00	-60.00	667009.3407	2189852.6210
Y07	15+43.00	50.00	666920.7289	2189700.2972
Y07	15+43.00	95.00	666937.3098	2189658.4634
Y07	15+45.00	-60.00	666878.3137	2189801.8106
Y07	15+45.00	-74.00	666873.1494	2189814.8233
Y07	15+65.00	-60.00	666859.4930	2189794.2928
Y07	15+65.00	-74.00	666854.2709	2189807.2824
Y07	15+74.00	95.00	666909.1381	2189647.1850
Y07	15+74.00	50.00	666892.2693	2189688.9036
Y07	17+37.00	-60.00	666699.4004	2189726.4777
Y07	17+37.00	-80.00	666691.3649	2189744.7925
Y07	17+40.00	50.00	666740.8484	2189624.5412
Y07	17+54.00	80.00	666740.0814	2189591.4442
Y07	17+56.00	95.00	666744.2765	2189576.9045
Y07	17+58.00	-80.00	666672.1344	2189736.3552
Y07	17+78.00	50.00	666706.0504	2189609.2737
Y07	17+78.00	95.00	666724.1303	2189568.0655
Y07	17+81.18	-66.00	666656.5286	2189714.2200
Y07	19+46.00	95.00	666570.2862	2189500.5673
Y07	19+46.00	50.00	666552.2063	2189541.7755
Y07	19+77.00	50.00	666523.8184	2189529.3205
Y07	19+77.00	95.00	666541.8983	2189488.1123
Y07	19+84.00	-75.00	666467.1864	2189640.9754
Y07	19+84.00	-90.00	666461.1598	2189654.7115
Y07	19+84.00	-47.82	666478.1063	2189616.0864
Y07	19+90.59	-90.00	666455.1267	2189652.0645
Y07	21+66.00	73.40	666360.1435	2189431.9610
Y07	21+66.00	95.00	666368.8237	2189412.1768
Y07	21+98.00	77.86	666332.6339	2189415.0153
Y07	21+98.00	95.00	666339.5201	2189399.3200
Y07	32+67.84	-128.00	665266.7006	2189162.9278
Y07	33+16.00	-143.00	665215.7594	2189153.3621
Y07	33+16.00	-128.00	665222.7467	2189140.0889
Y07	33+36.00	-143.00	665197.5209	2189143.7090
Y07	33+36.00	-127.00	665205.0369	2189129.5842
Y07	38+70.00	-50.00	664781.0096	2188780.8867
Y07	38+97.00	90.00	664837.2847	2188649.8825
Y07	38+97.00	75.00	664828.8615	2188662.2942
Y07	39+18.00	90.00	664819.9083	2188638.0901

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y09	18+21.05	-93.00	663509.8057	2194782.9183
Y09	23+42.00	107.00	663005.1186	2194544.6300
Y09	26+78.00	107.00	662670.0587	2194519.5127
Y09	26+97.00	120.00	662652.0837	2194505.1287
Y09	27+13.00	101.00	662634.7081	2194522.8795
Y09	27+38.00	101.00	662609.7781	2194521.0106
Y09	27+38.00	75.00	662607.8345	2194546.9379
Y09	28+17.00	30.00	662525.6916	2194585.9064
Y09	28+24.00	64.00	662521.2528	2194551.4783
Y09	28+38.00	30.00	662504.7503	2194584.3366
Y09	28+40.00	-30.00	662498.2707	2194644.0192
Y09	28+40.00	-60.00	662496.0281	2194673.9352
Y09	28+44.00	60.00	662501.0097	2194553.9720

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
DR01	11+40.00	-40.00	669271.4711	2184598.9131

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

12/4/2020
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USER:hlehner

6/2/99

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-1

ROADWAY DESIGN ENGINEER
2/22/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Docusigned by: Jonathan C. Hefner

PAVEMENT DESIGN ENGINEER
2/22/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARD
Docusigned by: Andrew D. Ward

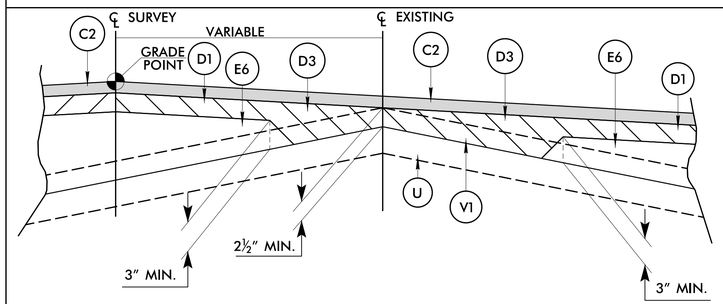
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

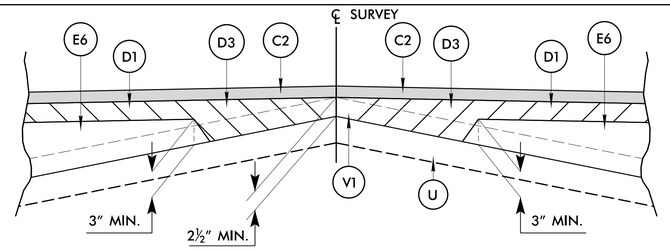
PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	DOUBLE FACE CONCRETE BARRIER
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	T	EARTH MATERIAL.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E4	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, TO BE PLACED IN TWO LAYERS: -FIRST LAYER 4" AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. -SECOND LAYER 3" AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
C5	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 TO EXCEED 1½" IN DEPTH	E5	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	V1	MILLING ASPHALT PAVEMENT, 2½" DEPTH.
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V2	VARIABLE MILLING ASPHALT PAVEMENT, 2½" TO 4" DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	J1	PROP. 8" AGGREGATE BASE COURSE.	W1	WEDGING (VARIABLE DEPTH ASPHALT PAVEMENT, SEE DETAIL ON THIS SHEET)
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER.	W2	WEDGING (VARIABLE DEPTH ASPHALT PAVEMENT, SEE DETAIL ON THIS SHEET)
D3	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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R2	5" MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED)	Y	MILLED RUMBLE STRIPS

WEDGING DETAIL W1





DETAIL SHOWING METHOD OF WEDGING FOR:
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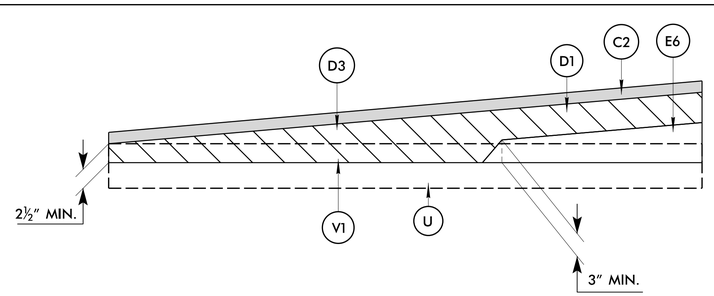
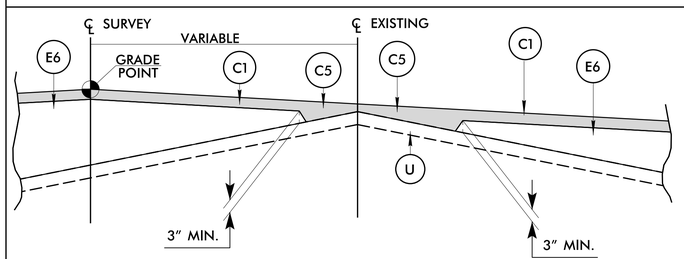
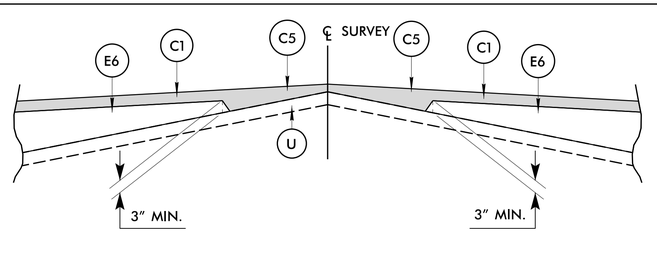
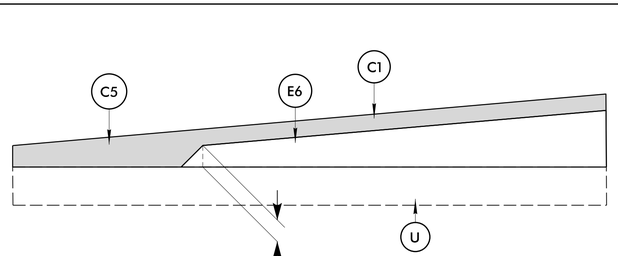


WEDGING DETAIL W2





DETAIL SHOWING METHOD OF WEDGING FOR:
SR1, SR2, SR3, SR4, SR5, SR6, SR7, SR8, SR9, Y4, Y5, Y7, Y9



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6/2/99

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
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Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-1

ROADWAY DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Docusigned by: Jonathan C. Hefner

PAVEMENT DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARP
Docusigned by: Andrew D. Warp

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

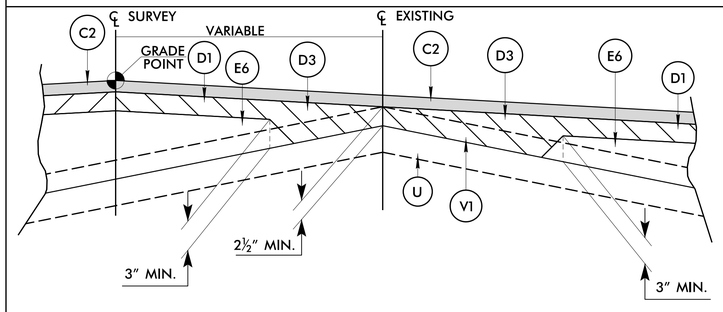
PAVEMENT SCHEDULE

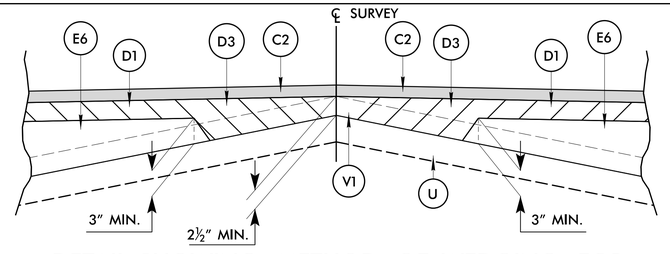
FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	DOUBLE FACE CONCRETE BARRIER
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	T	EARTH MATERIAL.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E4	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, TO BE PLACED IN TWO LAYERS: -FIRST LAYER 4" AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. -SECOND LAYER 3" AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
C5	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E5	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	V1	MILLING ASPHALT PAVEMENT, 2½" DEPTH.
C6	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 TO EXCEED 1½" IN DEPTH	E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V2	VARIABLE MILLING ASPHALT PAVEMENT, 2½" TO 4" DEPTH.
C7	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J1	PROP. 8" AGGREGATE BASE COURSE.	W1	WEDGING (VARIABLE DEPTH ASPHALT PAVEMENT, SEE DETAIL ON THIS SHEET)
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER.	W2	WEDGING (VARIABLE DEPTH ASPHALT PAVEMENT, SEE DETAIL ON THIS SHEET)
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	5" MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED)	Y	MILLED RUMBLE STRIPS
D3	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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.				

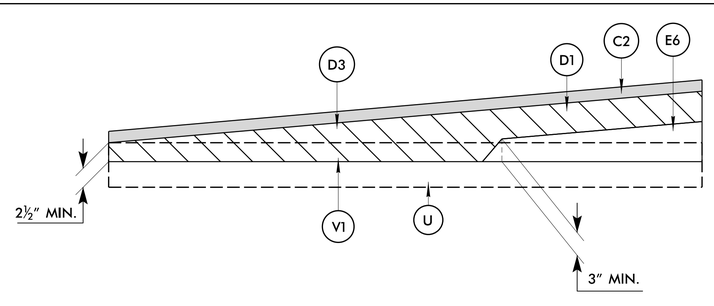
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

WEDGING DETAIL W1

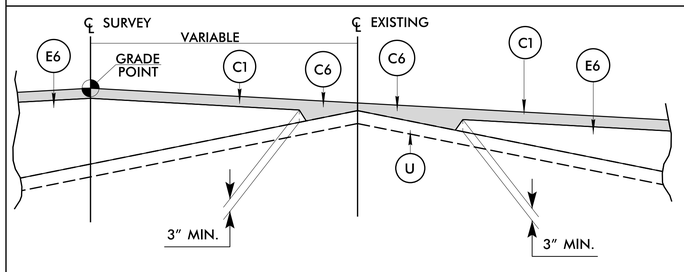


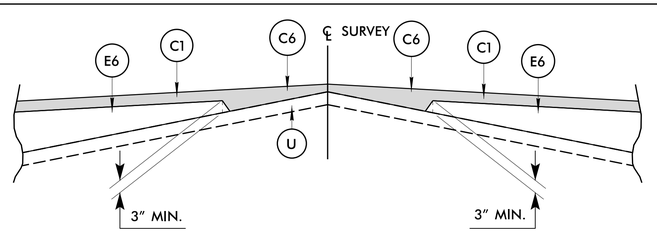


DETAIL SHOWING METHOD OF WEDGING FOR:
L

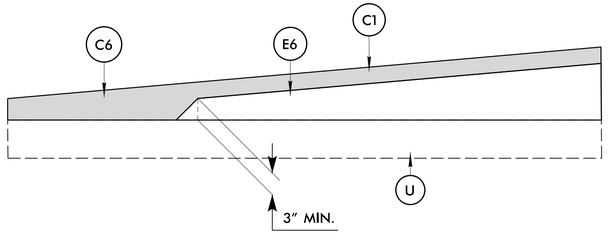


WEDGING DETAIL W2

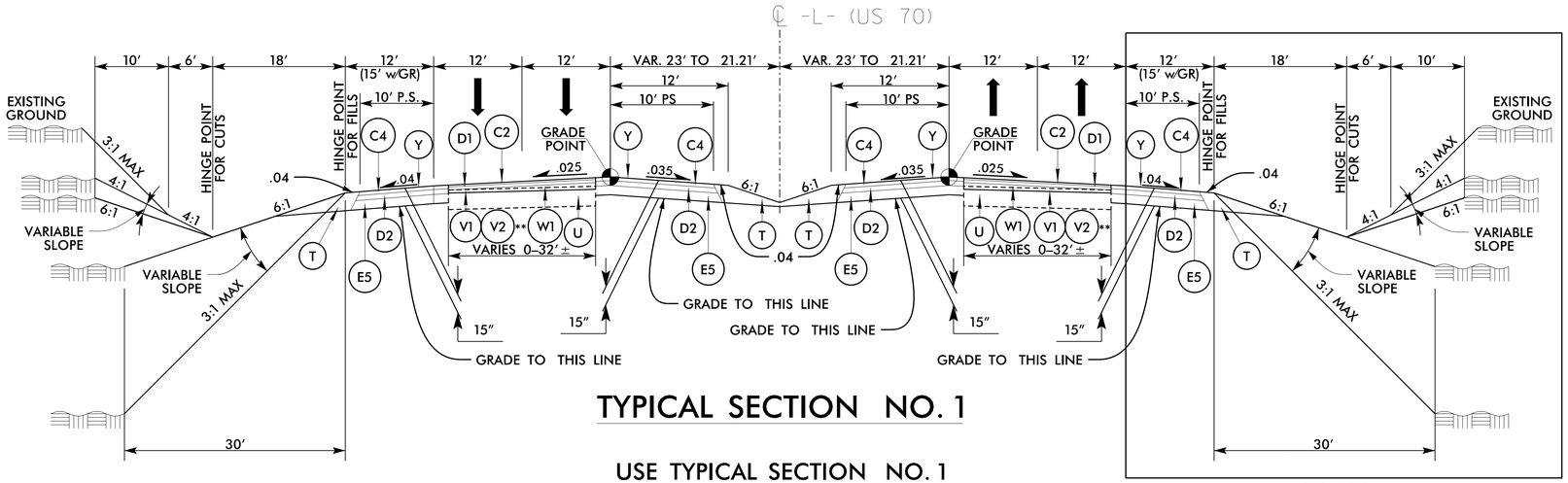




DETAIL SHOWING METHOD OF WEDGING FOR:
SR1, SR2, SR3, SR4, SR5, SR6, SR7, SR8, SR9, Y4, Y5, Y7, Y9



6/2/99



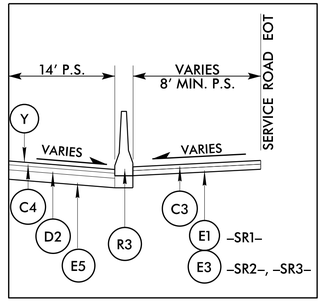
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–L– STA. 19+00.00 TO –L– STA. 209+75.00

** USE (V2) IN THE FOLLOWING LOCATIONS:

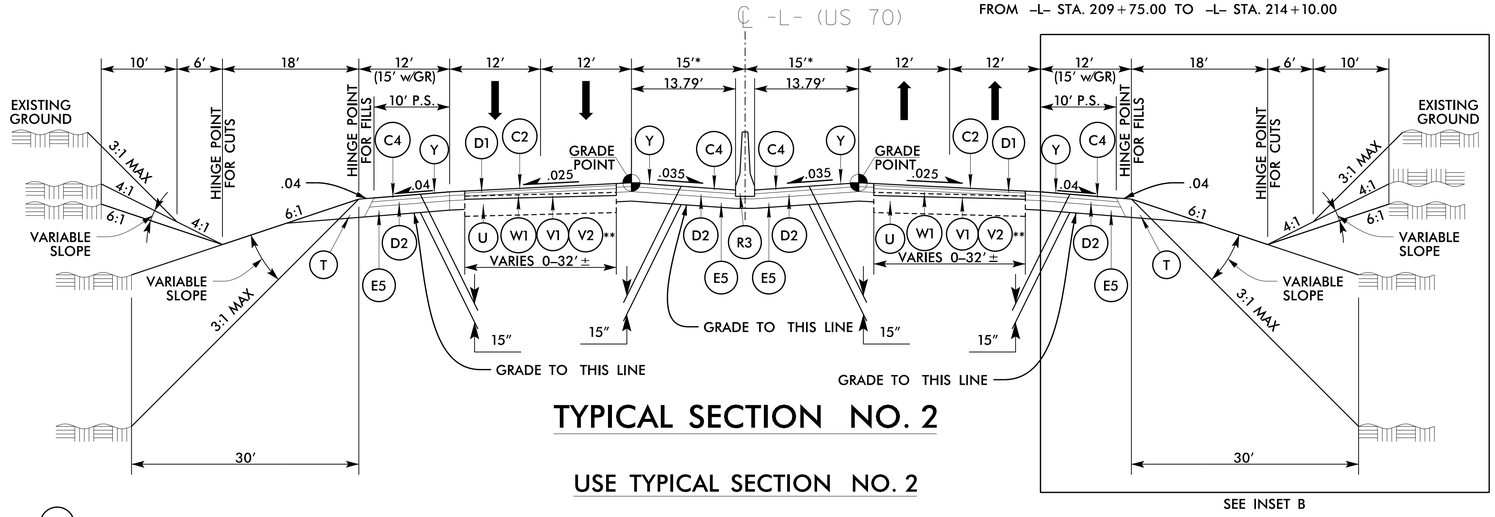
–L– 19+00.00 TO 22+00.00 LT & RT



INSET A

USE INSET A IN CONJUNCTION WITH TYPICAL SECTION NO. 1

–L– STA. 31+10.00 TO –L– STA. 52+45.00 RT
–L– STA. 43+10.00 TO –L– STA. 52+60.00 LT
–L– STA. 69+35.00 TO –L– STA. 99+40.00 RT



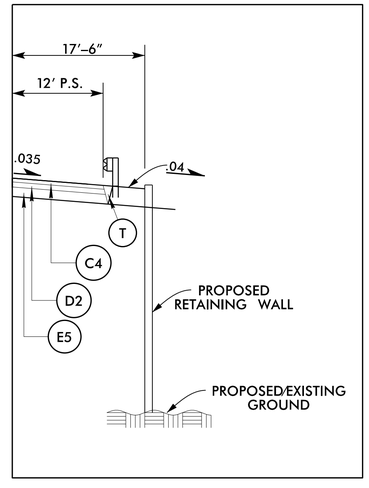
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 209+75.00 TO –L– STA. 216+76.59 LT. (BEGIN BRIDGE)
–L– STA. 217+73.79 (END BRIDGE) TO –L– STA. 281+85.00 LT.
–L– STA. 209+75.00 TO –L– STA. 216+89.65 RT. (BEGIN BRIDGE)
–L– STA. 217+87.45 (END BRIDGE) TO –L– STA. 281+85.00 RT.

** USE (V2) IN THE FOLLOWING LOCATIONS:

–L– 244+50.00 TO 281+85.00 LT
–L– 253+50.00 TO 255+50.00 RT
–L– 274+50.00 TO 281+85.00 RT



INSET B

USE INSET B IN CONJUNCTION WITH TYPICAL SECTION NO. 2

–L– STA. 212+50.00 TO –L– STA. 217+15.62 RT.
–L– STA. 210+00.00 TO –L– STA. 216+65.38 LT.
–L– STA. 217+99.81 TO –L– STA. 224+00.00 RT.
–L– STA. 217+47.60 TO –L– STA. 224+50.00 LT.

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-2

ROADWAY DESIGN ENGINEER
2/22/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Docusigned by: Jonathan C. Hefner

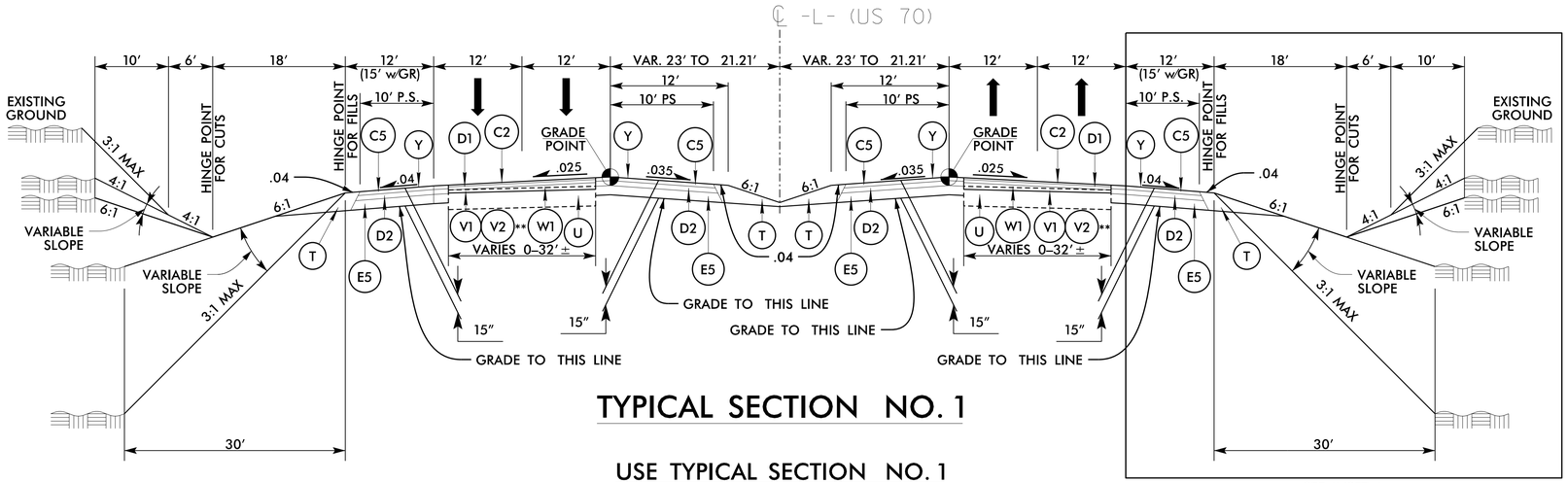
PAVEMENT DESIGN ENGINEER
2/22/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARGO
Docusigned by: Andrew D. Wargo

PAVEMENT SCHEDULE
FINAL PAVEMENT DESIGN

C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5D
C5	VAR. S9.5B
C6	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
E6	VAR. B25.0C
J1	8″ ABC
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

2/22/2021
W-5600_rdy_psh_02a-02_typ.dgn
USER: Heather

6/2/99



TYPICAL SECTION NO. 1

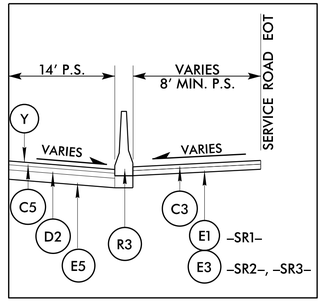
USE TYPICAL SECTION NO. 1

–L– STA. 19+00.00 TO –L– STA. 209+75.00

SEE INSET A

** USE (V2) IN THE FOLLOWING LOCATIONS:

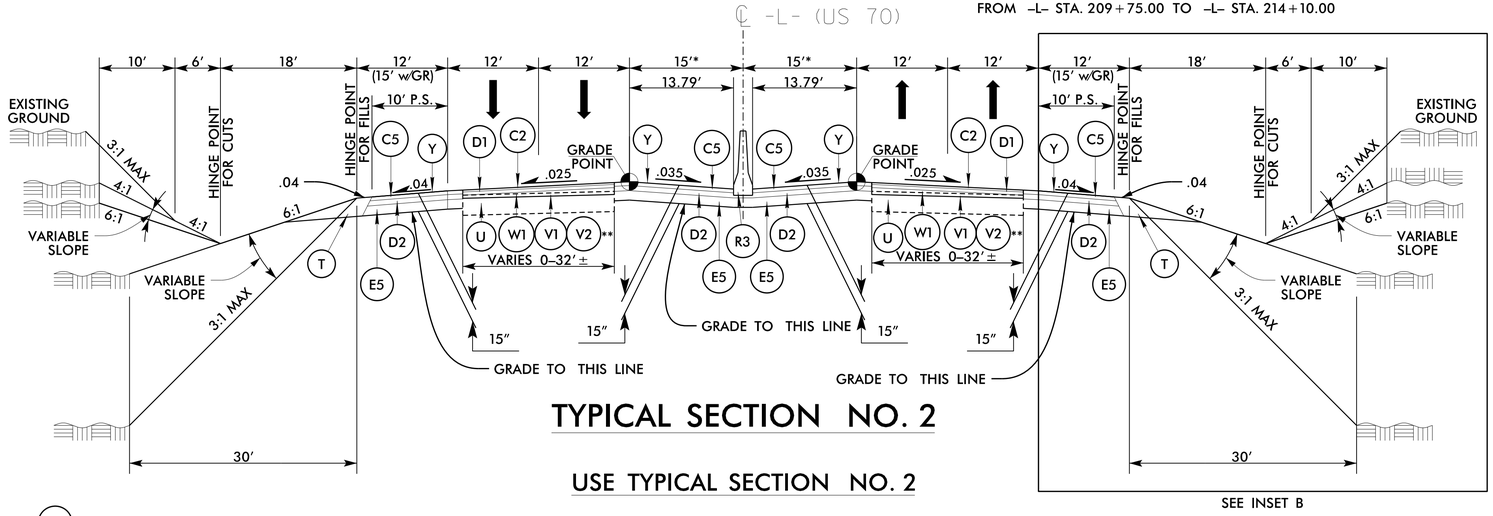
–L– 19+00.00 TO 22+00.00 LT & RT



INSET A

USE INSET A IN CONJUNCTION WITH TYPICAL SECTION NO. 1

–L– STA. 31+10.00 TO –L– STA. 52+45.00 RT
–L– STA. 43+10.00 TO –L– STA. 52+60.00 LT
–L– STA. 69+35.00 TO –L– STA. 99+40.00 RT



TYPICAL SECTION NO. 2

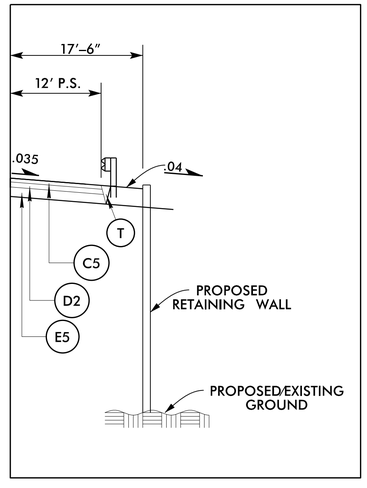
USE TYPICAL SECTION NO. 2

–L– STA. 209+75.00 TO –L– STA. 216+76.59 LT. (BEGIN BRIDGE)
–L– STA. 217+73.79 (END BRIDGE) TO –L– STA. 281+85.00 LT.
–L– STA. 209+75.00 TO –L– STA. 216+89.65 RT. (BEGIN BRIDGE)
–L– STA. 217+87.45 (END BRIDGE) TO –L– STA. 281+85.00 RT.

SEE INSET B

** USE (V2) IN THE FOLLOWING LOCATIONS:

–L– 244+50.00 TO 281+85.00 LT
–L– 253+50.00 TO 255+50.00 RT
–L– 274+50.00 TO 281+85.00 RT



INSET B

USE INSET B IN CONJUNCTION WITH TYPICAL SECTION NO. 2

–L– STA. 212+50.00 TO –L– STA. 217+15.62 RT.
–L– STA. 210+00.00 TO –L– STA. 216+65.38 LT.
–L– STA. 217+99.81 TO –L– STA. 224+00.00 RT.
–L– STA. 217+47.60 TO –L– STA. 224+50.00 LT.

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License No. F-0377
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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-2

ROADWAY DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Digitally signed by: Jonathan C. Hefner

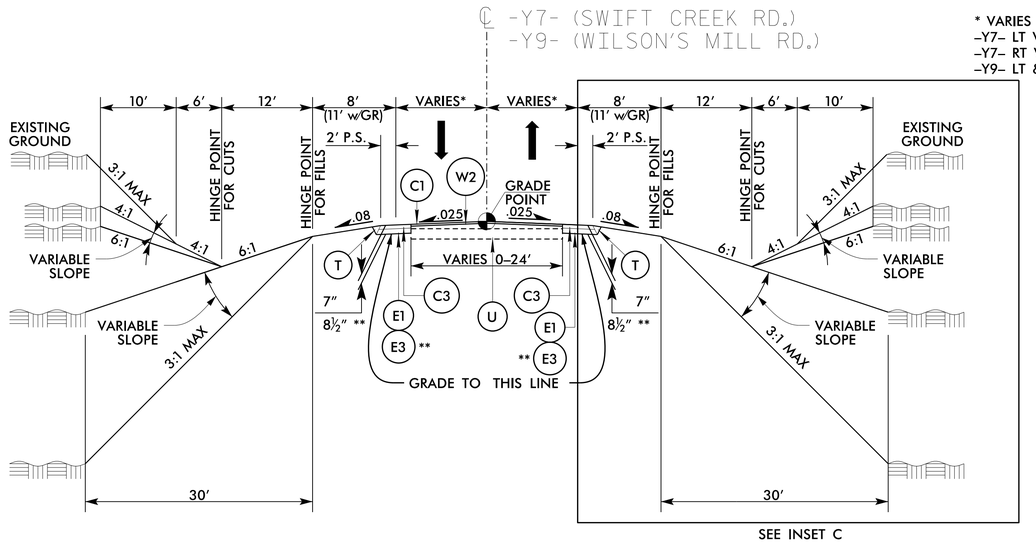
PAVEMENT DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARD
Digitally signed by: Andrew D. Ward

PAVEMENT SCHEDULE
FINAL PAVEMENT DESIGN

C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5C
C5	3″ S9.5D
C6	VAR. S9.5B
C7	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
E6	VAR. B25.0C
J1	8″ ABC
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

3/9/2021
W-5600_rdy_psh_02A-02_typ.dgn
USER: Heather

6/2/99

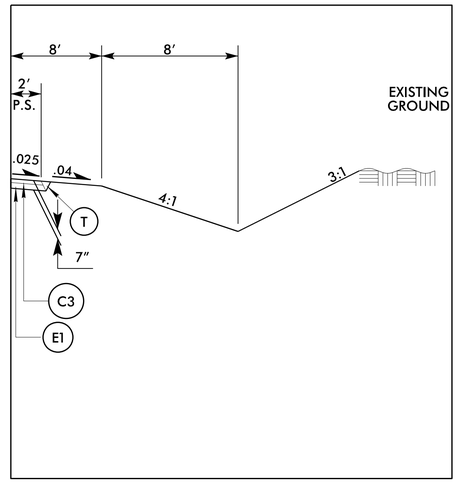


* VARIES AS FOLLOWS:
–Y7– LT VARIES FROM 12′ TO 20′
–Y7– RT VARIES FROM 12′ TO 32′
–Y9– LT & RT VARIES FROM 12′ TO 38′

TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

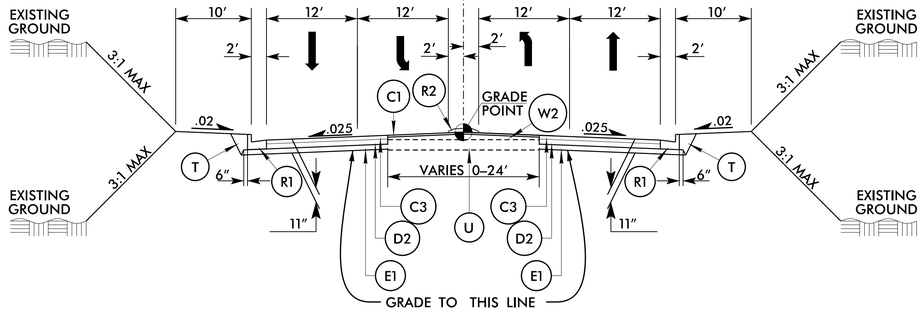
–Y7– STA. 14+20.00 TO –Y7– STA. 26+04.66 (BEGIN BRIDGE)
–Y7– STA. 27+99.16 (END BRIDGE) TO –Y7– STA. 39+00.00
**–Y9– STA. 14+90.00 TO –Y9– STA. 19+31.79
**–Y9– STA. 22+58.24 TO –Y9– STA. 28+00.00



INSET C

USE INSET C IN CONJUNCTION WITH TYPICAL SECTION NO. 3

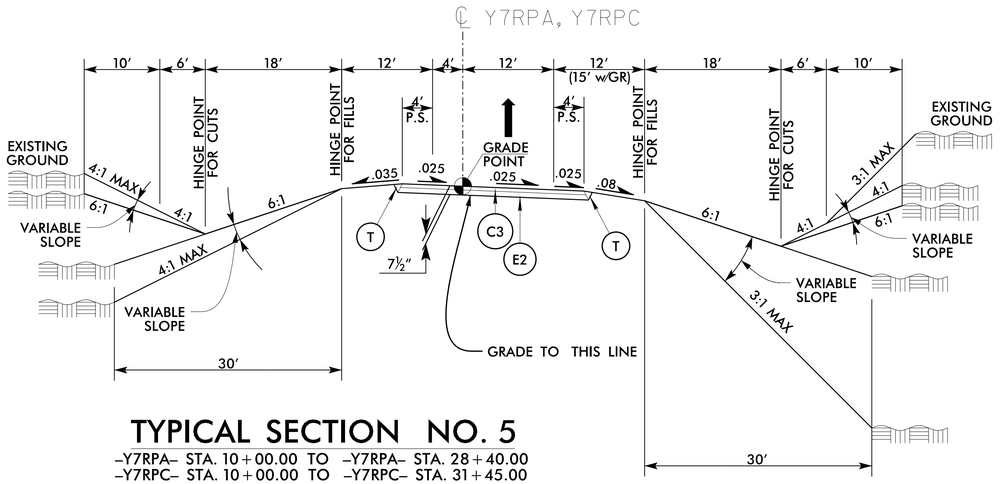
–Y7– STA. 14+20.00 TO –Y7– STA. 19+50.00 RT SIDE ONLY



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

–Y9– STA. 19+31.79 TO –Y9– STA. 22+58.24



TYPICAL SECTION NO. 5

–Y7RPA– STA. 10+00.00 TO –Y7RPA– STA. 28+40.00
–Y7RPC– STA. 10+00.00 TO –Y7RPC– STA. 31+45.00

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PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-3

ROADWAY DESIGN ENGINEER
2/23/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
DocuSigned by: Jonathan C. Hefner

PAVEMENT DESIGN ENGINEER
2/23/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARD
DocuSigned by: Andrew D. Ward

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5D
C5	VAR. S9.5B
C6	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
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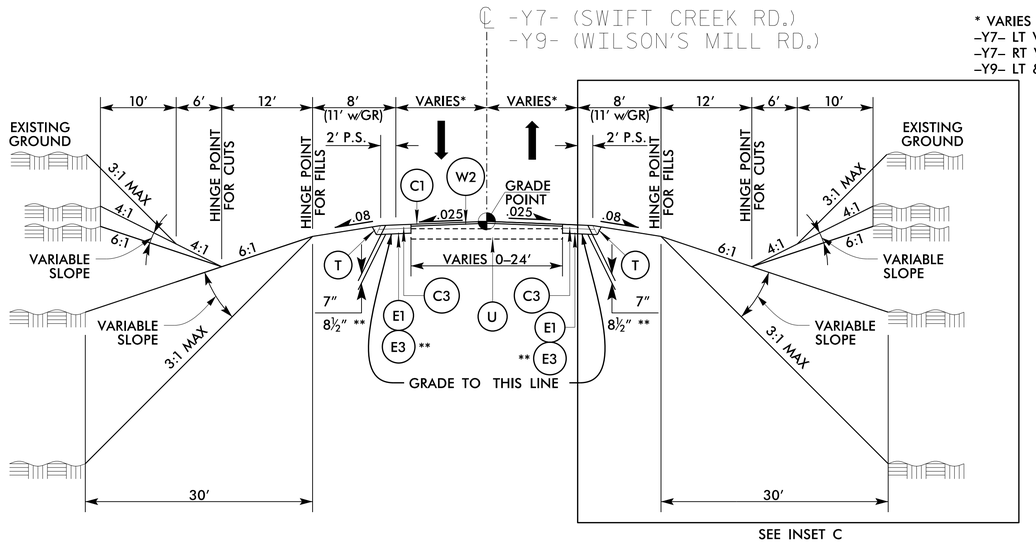
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

2/23/2021
w5600-dy_psh_02A-03_typ.dgn
USER:Hefner

6/2/99



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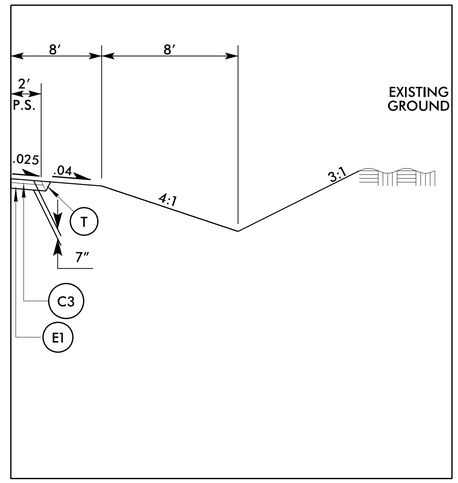
–Y7– LT VARIES FROM 12′ TO 20′
–Y7– RT VARIES FROM 12′ TO 32′
–Y9– LT & RT VARIES FROM 12′ TO 38′

TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

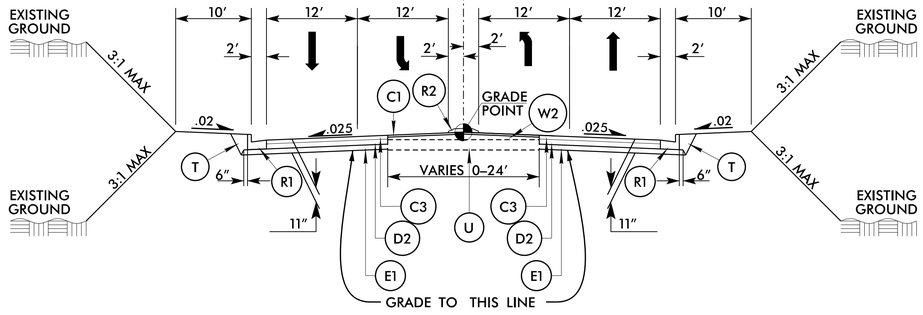
–Y7– STA. 14+20.00 TO –Y7– STA. 26+04.66 (BEGIN BRIDGE)
–Y7– STA. 27+99.16 (END BRIDGE) TO –Y7– STA. 39+00.00
**–Y9– STA. 14+90.00 TO –Y9– STA. 19+31.79
**–Y9– STA. 22+58.24 TO –Y9– STA. 28+00.00



INSET C

USE INSET C IN CONJUNCTION WITH TYPICAL SECTION NO. 3

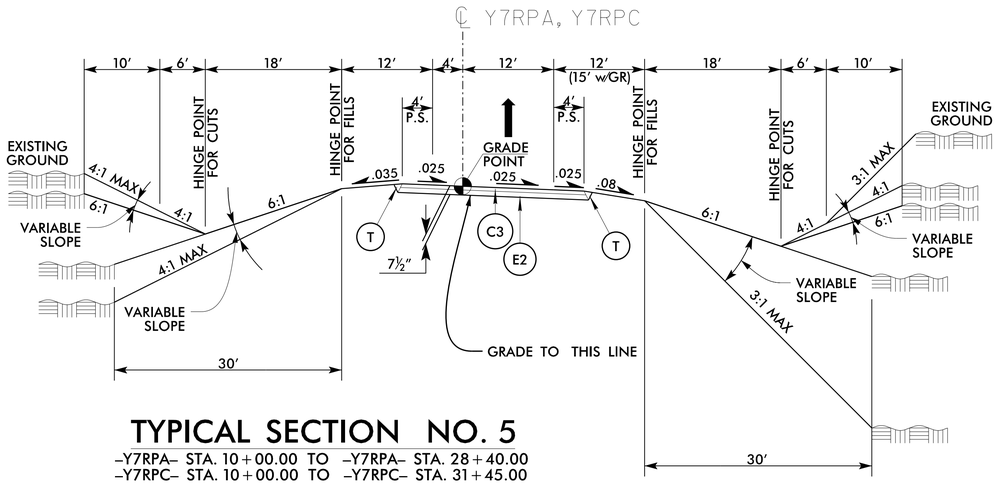
–Y7– STA. 14+20.00 TO –Y7– STA. 19+50.00 RT SIDE ONLY



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

–Y9– STA. 19+31.79 TO –Y9– STA. 22+58.24



TYPICAL SECTION NO. 5

–Y7RPA– STA. 10+00.00 TO –Y7RPA– STA. 28+40.00
–Y7RPC– STA. 10+00.00 TO –Y7RPC– STA. 31+45.00

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PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-3

ROADWAY DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Documented by Jonathan C. Hefner

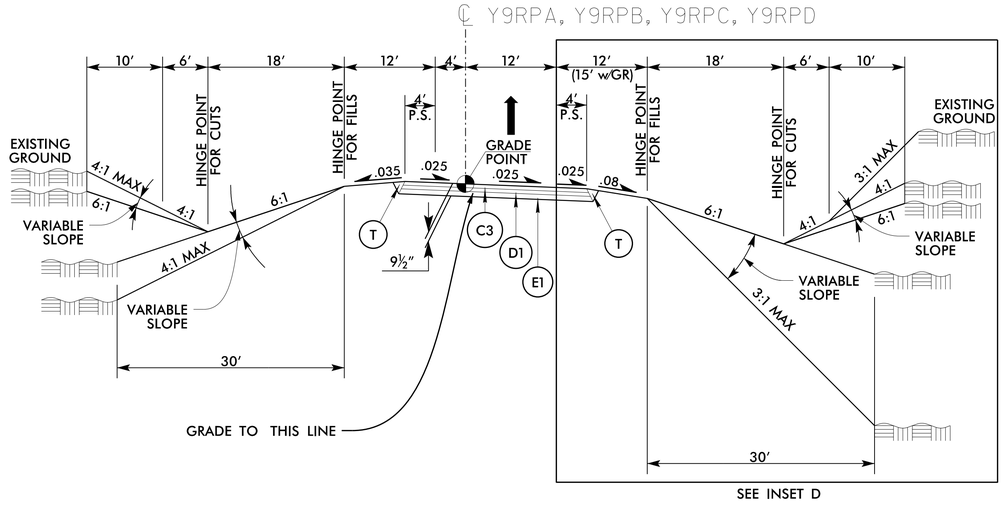
PAVEMENT DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARGO
Documented by Andrew D. Wargo

PAVEMENT SCHEDULE
FINAL PAVEMENT DESIGN

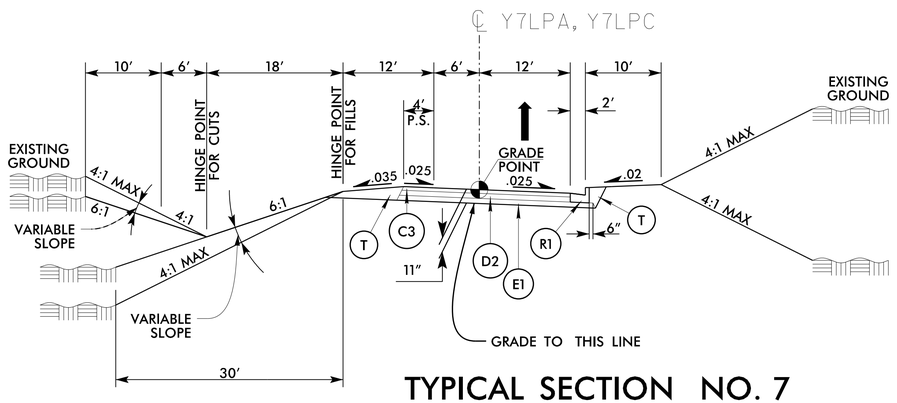
C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5C
C5	3″ S9.5D
C6	VAR. S9.5B
C7	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
E6	VAR. B25.0C
J1	8″ ABC
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

3/9/2021
W-5600-rdy_psh_02A-03_typ.dgn
jhefner

6/2/99



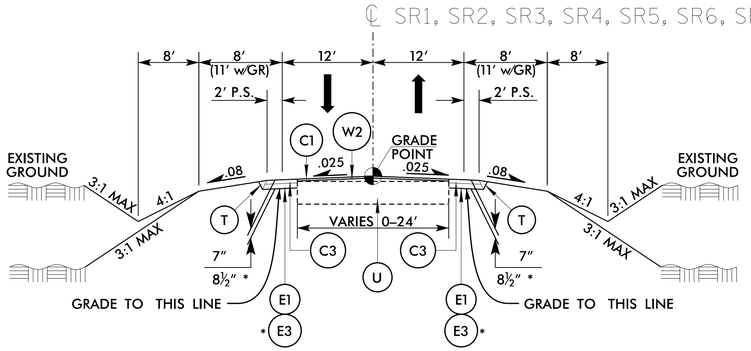
TYPICAL SECTION NO. 6



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

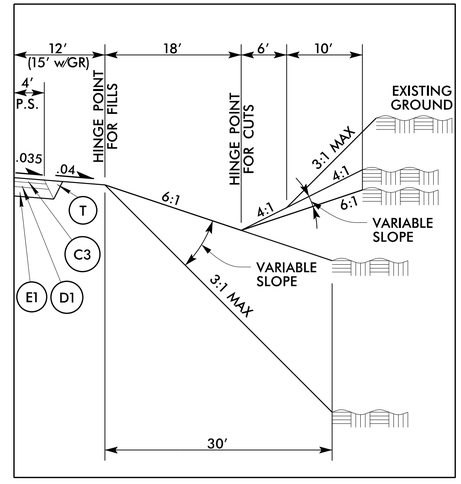
–Y7LPA– STA. 10+00.00 TO –Y7LPA– STA. 20+65.00
–Y7LPC– STA. 10+00.00 TO –Y7LPC– STA. 20+70.00



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8

–SR1– STA. 10+00.00 TO –SR1– STA. 67+00.00
*–SR2– STA. 16+80.00 TO –SR2– STA. 97+69.34
*–SR3– STA. 9+78.80 TO –SR3– STA. 64+00.00
–SR4– STA. 10+26.50 TO –SR4– STA. 18+00.00
–SR5– STA. 10+34.57 TO –SR5– STA. 15+75.00
*–SR6– STA. 10+16.13 TO –SR6– STA. 49+40.00
–SR7– STA. 12+00.00 TO –SR7– STA. 74+60.00
–SR8– STA. 10+21.00 TO –SR8– STA. 12+30.00
–SR9– STA. 10+50.00 TO –SR9– STA. 12+80.00
–Y4– STA. 10+75.00 TO –Y4– STA. 14+03.43
–Y5– STA. 16+73.40 TO –Y5– STA. 18+20.00



INSET D

USE INSET D IN CONJUNCTION WITH TYPICAL SECTION NO. 6

–Y9RPB– STA. 10+00.00 TO –Y9RPB– STA. 24+25.00 LT SIDE ONLY

USE TYPICAL SECTION NO. 6

–Y9RPA– STA. 10+00.00 TO –Y9RPA– STA. 26+20.00
–Y9RPB– STA. 10+00.00 TO –Y9RPB– STA. 24+60.00 (REVERSE TYPICAL)
–Y9RPC– STA. 10+00.00 TO –Y9RPC– STA. 25+40.00
–Y9RPD– STA. 10+00.00 TO –Y9RPD– STA. 24+10.00 (REVERSE TYPICAL)

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PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-4

ROADWAY DESIGN ENGINEER
2/23/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HERNER
Designed by: Jonathan C. Herner

PAVEMENT DESIGN ENGINEER
2/23/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARD
Designed by: Andrew D. Ward

PAVEMENT SCHEDULE
FINAL PAVEMENT DESIGN

C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5D
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E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
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R1	2′-6″ C & G
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V1	2½″ MILLING
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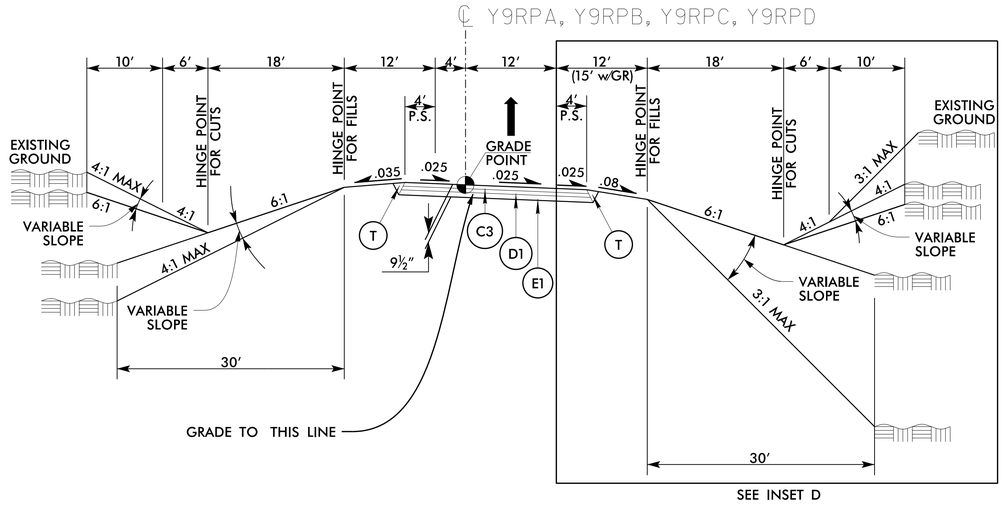
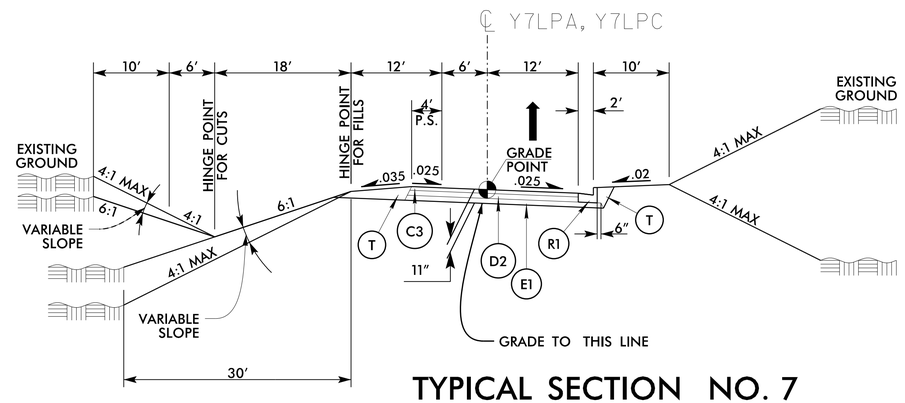
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

2/23/2021
W-5600
typ-dy_psh_02A-04_typ.dgn
USER:Herner

6/2/99



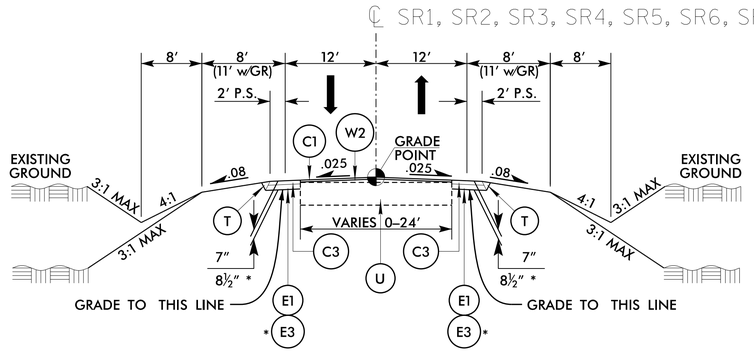
TYPICAL SECTION NO. 6



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

–Y7LPA– STA. 10+00.00 TO –Y7LPA– STA. 20+65.00
–Y7LPC– STA. 10+00.00 TO –Y7LPC– STA. 20+70.00



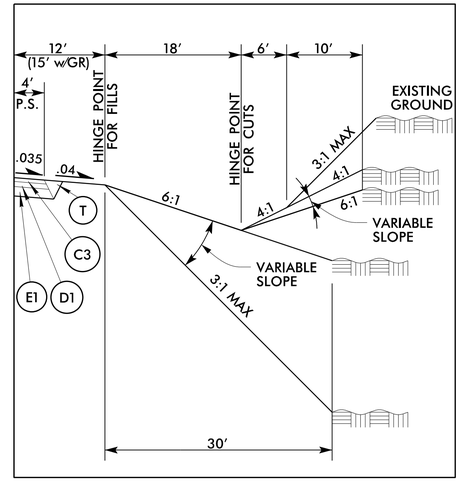
TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8

–SR1– STA. 10+00.00 TO –SR1– STA. 67+00.00
*–SR2– STA. 16+80.00 TO –SR2– STA. 97+69.34
*–SR3– STA. 9+78.80 TO –SR3– STA. 64+00.00
–SR4– STA. 10+26.50 TO –SR4– STA. 18+00.00
–SR5– STA. 10+34.57 TO –SR5– STA. 15+75.00
*–SR6– STA. 10+16.13 TO –SR6– STA. 49+40.00
–SR7– STA. 12+00.00 TO –SR7– STA. 74+60.00
–SR8– STA. 10+21.00 TO –SR8– STA. 12+30.00
–SR9– STA. 10+50.00 TO –SR9– STA. 12+80.00
–Y4– STA. 10+75.00 TO –Y4– STA. 14+03.43
–Y5– STA. 16+73.40 TO –Y5– STA. 18+20.00

USE TYPICAL SECTION NO. 6

–Y9RPA– STA. 10+00.00 TO –Y9RPA– STA. 26+20.00
–Y9RPB– STA. 10+00.00 TO –Y9RPB– STA. 24+60.00 (REVERSE TYPICAL)
–Y9RPC– STA. 10+00.00 TO –Y9RPC– STA. 25+40.00
–Y9RPD– STA. 10+00.00 TO –Y9RPD– STA. 24+10.00 (REVERSE TYPICAL)



INSET D

USE INSET D IN CONJUNCTION WITH TYPICAL SECTION NO. 6

–Y9RPB– STA. 10+00.00 TO –Y9RPB– STA. 24+25.00 LT SIDE ONLY

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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-4

ROADWAY DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Docusigned by: Jonathan C. Hefner

PAVEMENT DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARP
Docusigned by: Andrew D. Warp

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5C
C5	3″ S9.5D
C6	VAR. S9.5B
C7	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
E6	VAR. B25.0C
J1	8″ ABC
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

3/9/2021
5600_rdy_psh_02A-04_typ.dgn
USER:Hefner

6/2/99

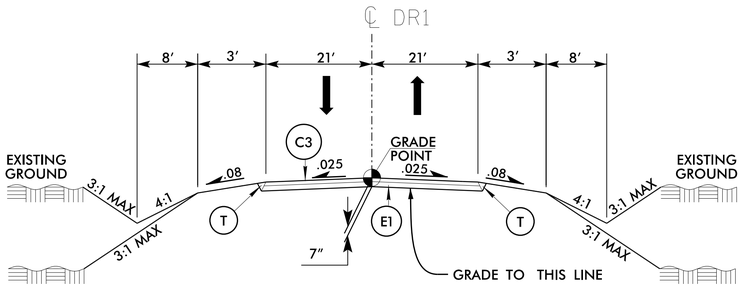
WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-5

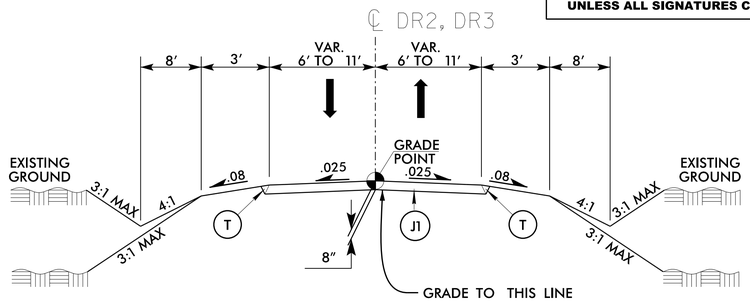
ROADWAY DESIGN ENGINEER
2/22/2021
SEAL 35016 — NORTH CAROLINA PROFESSIONAL ENGINEER — JONATHAN C. HERNER
Documents signed by: Jonathan C. Herner

PAVEMENT DESIGN ENGINEER
2/22/2021
SEAL 44590 — NORTH CAROLINA PROFESSIONAL ENGINEER — ANDREW D. WARP
Documents signed by: Andrew D. Warp



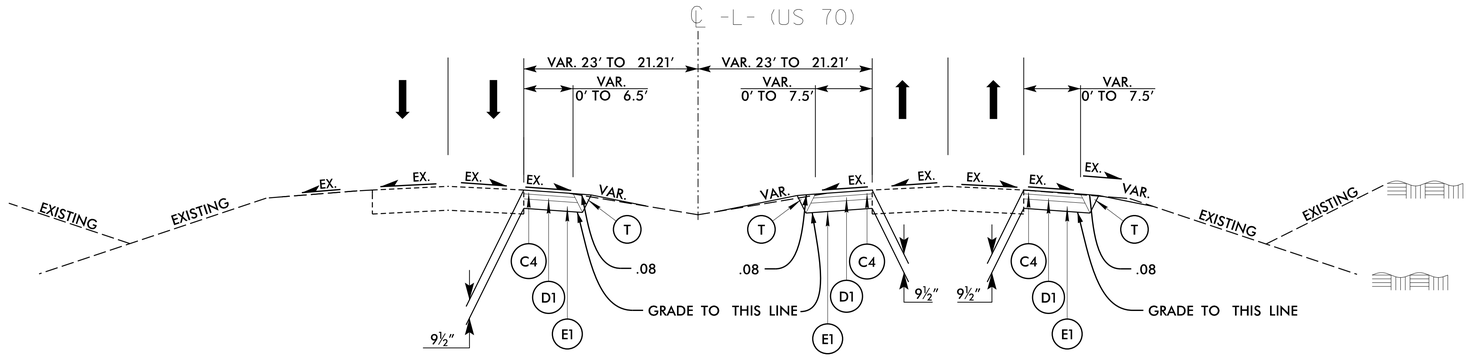
TYPICAL SECTION NO. 9
USE TYPICAL SECTION NO. 9

–DR1– STA. 10+12.00 TO –DR1– STA. 11+40.00



TYPICAL SECTION NO. 10
USE TYPICAL SECTION NO. 10

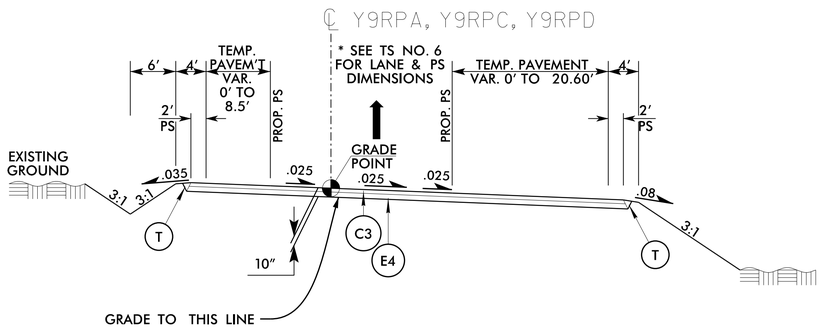
–DR2– STA. 10+20.00 TO –DR2– STA. 12+70.00
–DR3– STA. 10+12.00 TO –DR3– STA. 12+00.00



TYPICAL SECTION NO. 11
TEMPORARY PAVEMENT LOCATIONS

USE TYPICAL SECTION NO. 11

–L– STA. 26+00 +/–TO –L– STA. 67+74 +/– MED LT.
–L– STA. 69+04 +/– TO –L– STA. 103+84 +/– MED LT.
–L– STA. 105+45 +/– TO –L– STA. 152+00 +/– MED LT.
–L– STA. 173+40 +/– TO –L– STA. 200+00 +/– MED LT.
–L– STA. 236+51 +/– TO –L– STA. 245+38 +/– MED LT.
–L– STA. 281+30 +/– TO –L– STA. 285+30 +/– MED LT.
–L– STA. 26+57 +/– TO –L– STA. 67+76 +/– MED RT.
–L– STA. 69+02 +/– TO –L– STA. 103+83 +/– MED RT.
–L– STA. 105+44 +/– TO –L– STA. 152+00 +/– MED RT.
–L– STA. 173+40 +/– TO –L– STA. 205+13 +/– MED RT.
–L– STA. 219+57 +/– TO –L– STA. 245+40 +/– MED RT.
–L– STA. 246+30 +/– TO –L– STA. 257+78 +/– MED RT.
–L– STA. 258+54 +/– TO –L– STA. 272+28 +/– MED RT.
–L– STA. 277+63 +/– TO –L– STA. 283+92 +/– MED RT.
–L– STA. 233+00 +/– TO –L– STA. 243+55 +/– RT.



TYPICAL SECTION NO. 12
TEMPORARY PAVEMENT LOCATIONS

USE TYPICAL SECTION NO. 12

–Y9RPA– STA. 22+88 +/– TO –Y9RPA– STA. 26+55.71 RT.
–Y9RPC– STA. 21+00 +/– TO –Y9RPC– STA. 25+51 +/– RT.
–Y9RPC– STA. 22+60 +/– TO –Y9RPC– STA. 25+48 +/– LT
–Y9RPD– STA. 22+50 +/– TO –Y9RPD– STA. 23+90 +/– LT. (REVERSE TYPICAL)
–Y9RPD– STA. 10+00 +/– TO –Y9RPD– STA. 16+84 +/– LT. (REVERSE TYPICAL)

PAVEMENT SCHEDULE
FINAL PAVEMENT DESIGN

C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5D
C5	VAR. S9.5B
C6	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
E6	VAR. B25.0C
J1	8″ ABC
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

2/22/2021
W-5600
USER:jherner
c:\projects\w-5600\w-5600-dy_psh_02A-05_typ.dgn

6/2/99

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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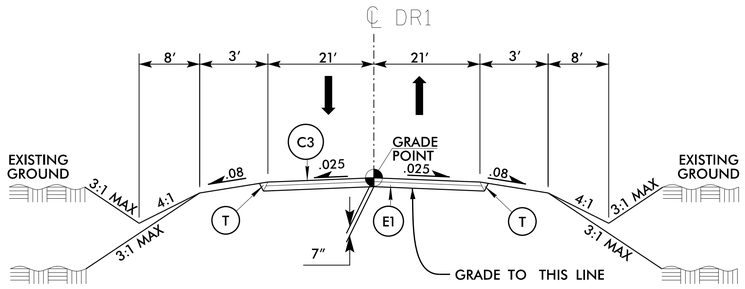
PROJECT REFERENCE NO.	SHEET NO.
W-5600	2A-5

ROADWAY DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 35016 ENGINEER JONATHAN C. HEFNER
Docusigned by: Jonathan C. Hefner

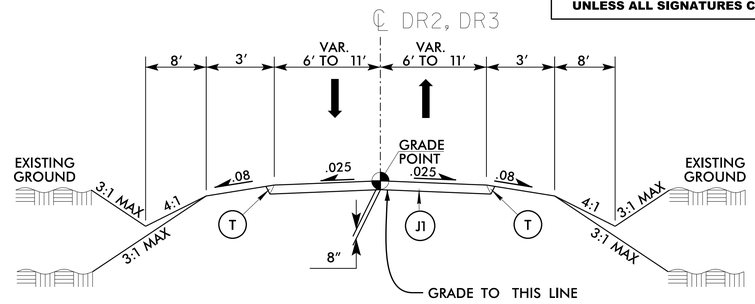
PAVEMENT DESIGN ENGINEER
3/9/2021
NORTH CAROLINA PROFESSIONAL SEAL 44590 ENGINEER ANDREW D. WARD
Docusigned by: Andrew D. Ward



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9

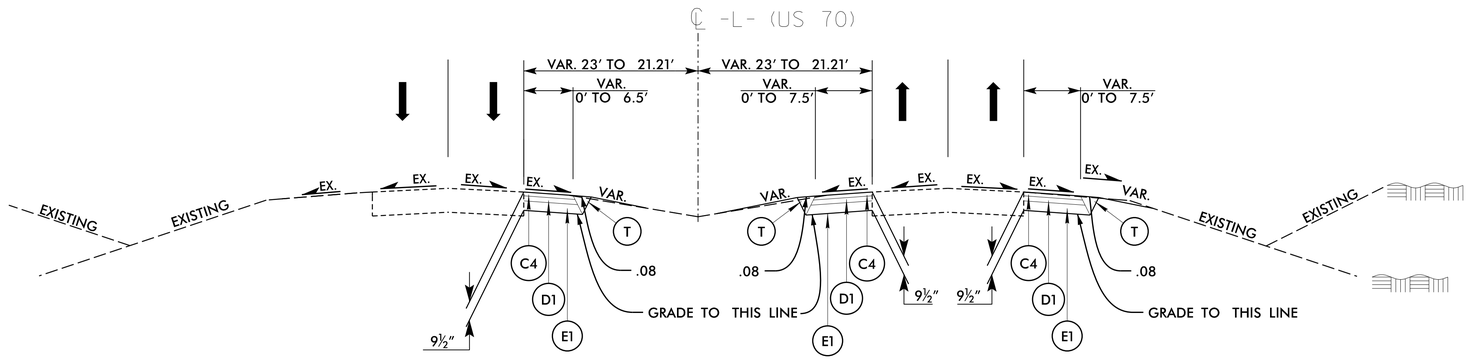
–DR1– STA. 10+12.00 TO –DR1– STA. 11+40.00



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10

–DR2– STA. 10+20.00 TO –DR2– STA. 12+70.00
–DR3– STA. 10+12.00 TO –DR3– STA. 12+00.00

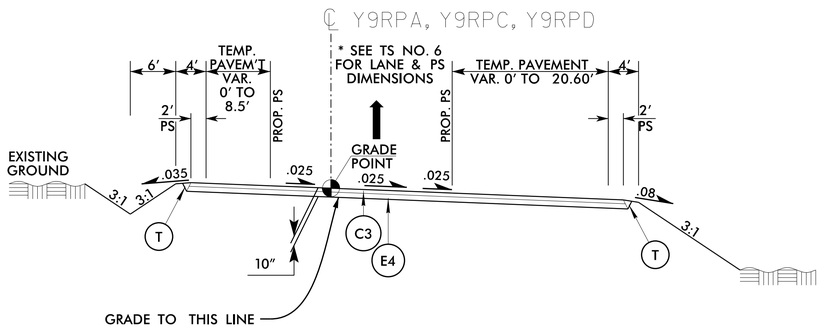


TYPICAL SECTION NO. 11

TEMPORARY PAVEMENT LOCATIONS

USE TYPICAL SECTION NO. 11

–L– STA. 26+00 +/–TO –L– STA. 67+74 +/– MED LT.
–L– STA. 69+04 +/– TO –L– STA. 103+84 +/– MED LT.
–L– STA. 105+45 +/– TO –L– STA. 152+00 +/– MED LT.
–L– STA. 173+40 +/– TO –L– STA. 200+00 +/– MED LT.
–L– STA. 236+51 +/– TO –L– STA. 245+38 +/– MED LT.
–L– STA. 281+30 +/– TO –L– STA. 285+30 +/– MED LT.
–L– STA. 26+57 +/– TO –L– STA. 67+76 +/– MED RT.
–L– STA. 69+02 +/– TO –L– STA. 103+83 +/– MED RT.
–L– STA. 105+44 +/– TO –L– STA. 152+00 +/– MED RT.
–L– STA. 173+40 +/– TO –L– STA. 205+13 +/– MED RT.
–L– STA. 219+57 +/– TO –L– STA. 245+40 +/– MED RT.
–L– STA. 246+30 +/– TO –L– STA. 257+78 +/– MED RT.
–L– STA. 258+54 +/– TO –L– STA. 272+28 +/– MED RT.
–L– STA. 277+63 +/– TO –L– STA. 283+92 +/– MED RT.
–L– STA. 233+00 +/– TO –L– STA. 243+55 +/– RT.



TYPICAL SECTION NO. 12

TEMPORARY PAVEMENT LOCATIONS

USE TYPICAL SECTION NO. 12

–Y9RPA– STA. 22+88 +/– TO –Y9RPA– STA. 26+55.71 RT.
–Y9RPC– STA. 21+00 +/– TO –Y9RPC– STA. 25+51 +/– RT.
–Y9RPC– STA. 22+60 +/– TO –Y9RPC– STA. 25+48 +/– LT
–Y9RPD– STA. 22+50 +/– TO –Y9RPD– STA. 23+90 +/– LT. (REVERSE TYPICAL)
–Y9RPD– STA. 10+00 +/– TO –Y9RPD– STA. 16+84 +/– LT. (REVERSE TYPICAL)

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

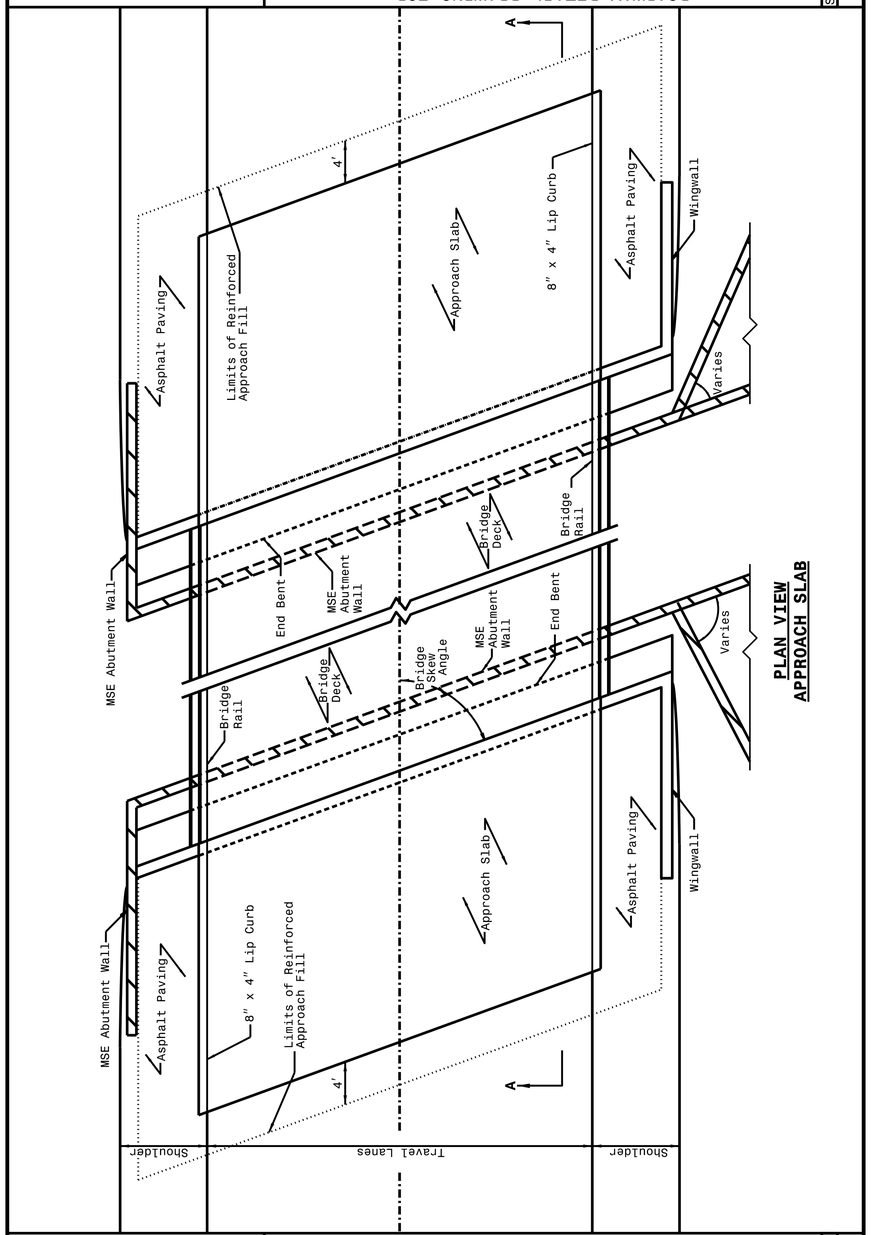
C1	1½″ S9.5B
C2	1½″ S9.5D
C3	3″ S9.5B
C4	3″ S9.5C
C5	3″ S9.5D
C6	VAR. S9.5B
C7	VAR. S9.5D
D1	2½″ I19.0C
D2	4″ I19.0C
D3	VAR. I19.0C
E1	4″ B25.0C
E2	4½″ B25.0C
E3	5½″ B25.0C
E4	7″ B25.0C
E5	8″ B25.0C
E6	VAR. B25.0C
J1	8″ ABC
R1	2′-6″ C & G
R2	5″ MCI
R3	DOUBLE FACE CONC. BARRIER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	2½″ MILLING
V2	2½″ TO 4″ VAR. MILLING
W1	WEDGING
W2	WEDGING
Y	MILLED RUMBLE STRIPS

PROJECT REFERENCE NO.	SHEET NO.
W-5600	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

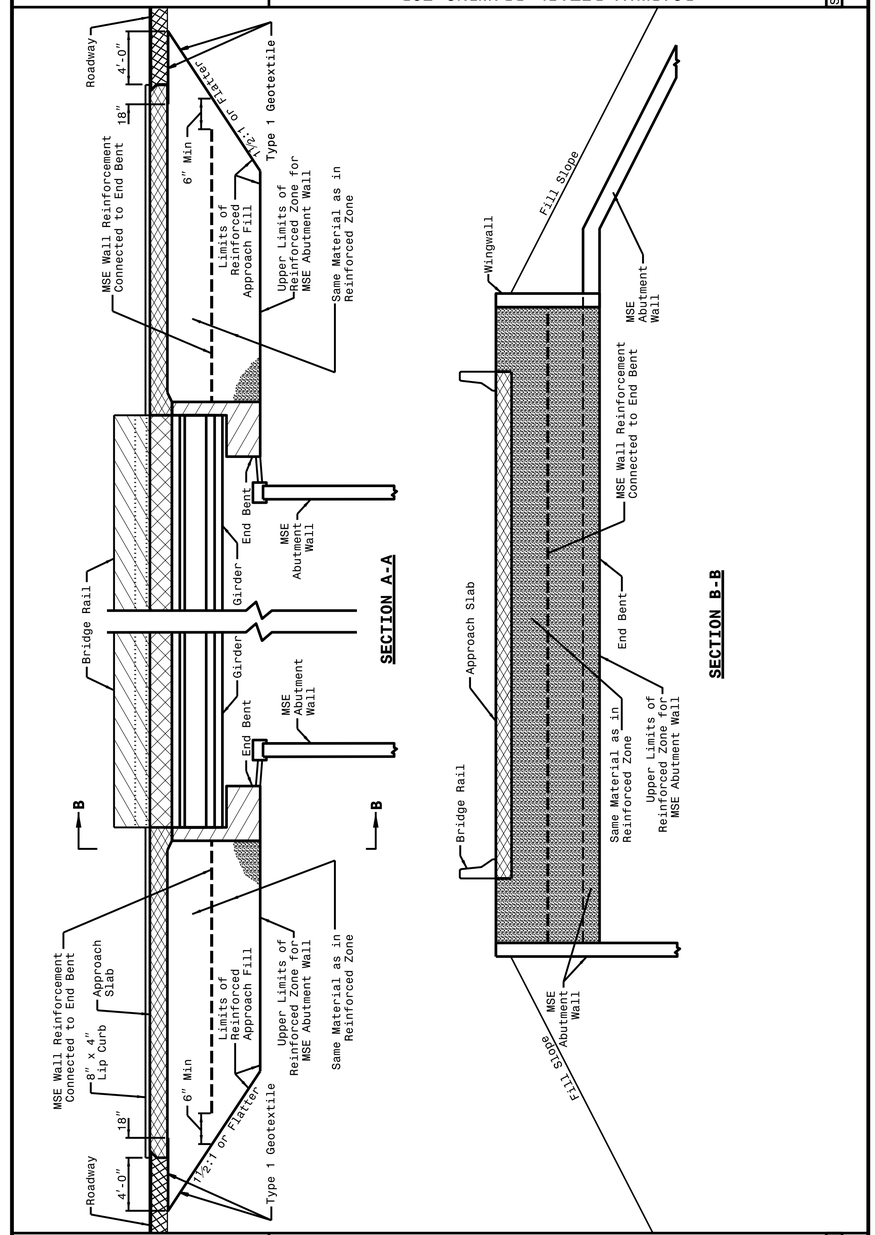


PLAN VIEW
APPROACH SLAB

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



SECTION A-A

SECTION B-B

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

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

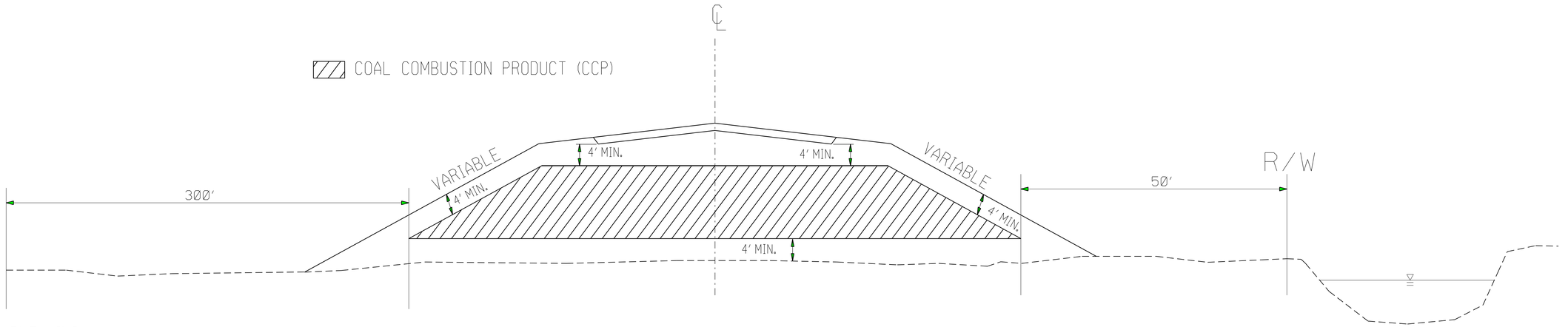
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

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

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-2

COAL COMBUSTION PRODUCT PLACEMENT



*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

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

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

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

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

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

COAL COMBUSTION PRODUCT PLACEMENT DETAIL

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

07-SEP-2017 08:21
S:\Contracts\Special Details\jhowerton\Coal Combustion Product Detail.dgn
jhowerton AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-3

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

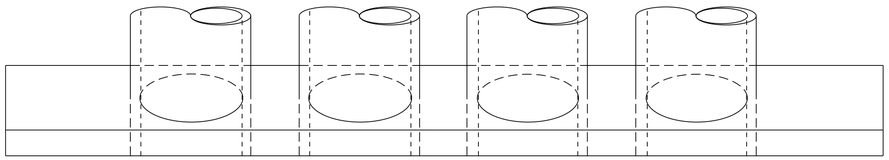
ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR TRIPLE AND QUADRUPLE PIPE CULVERTS

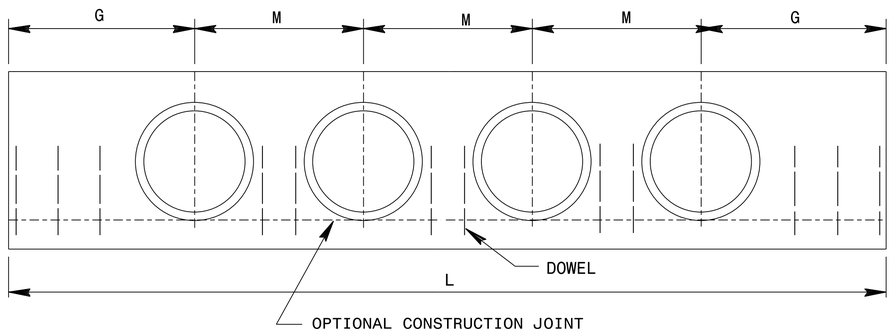
15″ THRU 48″ PIPE - 90° SKEW

SHEET 1 OF 3

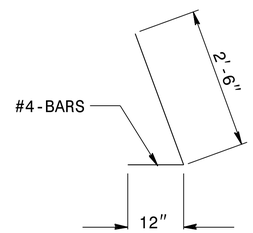
838D01



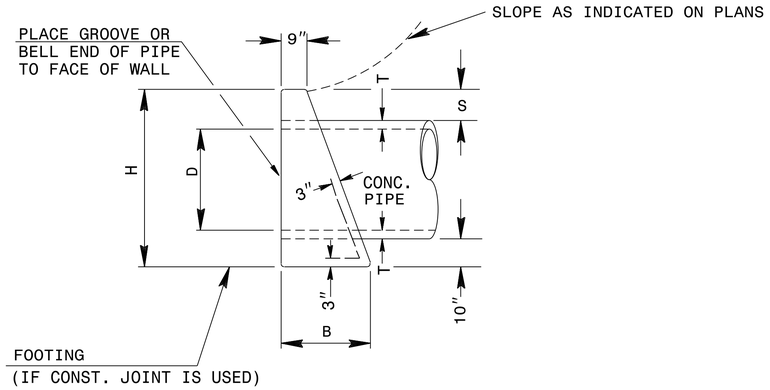
PLAN



ELEVATION



DOWEL
BAR-"X"



END ELEVATION

DIMENSIONS AND CONCRETE QUANTITIES USING CONCRETE PIPE										
	COMMON DIMENSIONS					TRIPLE PIPE		QUADRUPLE PIPE		
D	H	B	G	T	S	L	YD^3	L	YD^3	M
15″	3′-3″	1′-8″	2′-9″	2¼″	9½″	9′-10″	1.3	12′-0″	1.6	2′-2″
18″	3′-7″	1′-10″	3′-2″	2½″	10″	11′-6″	1.6	14′-1″	1.9	2′-7″
24″	4′-2″	2′-1″	4′-0″	3″	10″	14′-10″	2.5	18′-3″	3.0	3′-5″
30″	5′-0″	2′-6″	4′-7″	4¼″	11½″	17′-8″	3.9	21′-11″	4.7	4′-3″
36″	5′-8″	2′-8″	5′-6″	4¾″	12½″	21′-0″	5.6	26′-0″	6.7	5′-0″
42″	6′-2″	3′-1″	6′-4″	5¼″	11½″	24′-4″	7.5	30′-2″	9.0	5′-10″
48″	6′-9″	3′-5″	7′-2″	5¾″	11½″	27′-8″	10.0	34′-4″	12.0	6′-8″

* NOTE: SEE ROADWAY STANDARD DRAWING 838.01 SHEET 3 OF 3 FOR GENERAL NOTES

DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE																	
	PIPE	TRIPLE PIPE									QUADRUPLE PIPE								
LOC.	DIA.	15″	18″	24″	30″	36″	42″		48″		15″	18″	24″	30″	36″	42″		48″	
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*
G	QTY.	2	2	3	3	4	4		5		2	2	3	3	4	4		5	
M(s)	QTY.	2	2	4	4	4	4	2	6	2	3	3	6	6	6	6	2	9	2
G	QTY.	2	2	3	3	4	4		5		2	2	3	3	4	4		5	
TOTAL LBS.		14	14	23	23	28	100		119		17	17	28	28	33	122		147	

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

ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR TRIPLE AND QUADRUPLE PIPE CULVERTS

15″ THRU 48″ PIPE - 90° SKEW

SHEET 1 OF 3

838D01

12/15/2020 | 11:58:18 EST

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE:
MODIFIED BY: K.A. Kempf DATE:
CHECKED BY: DATE:
FILE SPEC.: details/kkempf/english/838d0101.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-4

ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS

15″ THRU 48″ PIPE 60° OR 120° SKEW

838d02s1 SHEET 1 OF 2

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

END ELEVATION

DOWEL
BAR- "X"

DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE

LOC.	PIPE DIA.	SINGLE PIPE 15″	18″	24″	30″	36″	42″	48″	DOUBLE PIPE 15″	18″	24″	30″	36″	42″	48″
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*
G1	QTY.	2	2	2	3	3		4	2	2	2	2	3		4
S	QTY.	-	-	-	-	-	2	- 2				2	2	2	3 2
G2	QTY.	3	4	4	5	6	6	7	3	4	5	6	6		7
	TOT. lbs.	11.7	13.9	13.9	16.3	20.9	60.4	70.3	11.7	13.9	13.9	20.9	25.6	85.3	102.1

DOWELS IN ENDWALL WITH CORRUGATED STEEL PIPE

LOC.	PIPE DIA.	SINGLE PIPE 16″	18″	24″	32″	36″	40″	48″	DOUBLE PIPE 16″	18″	24″	32″	36″	40″	48″
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*	"X"	"X"	"X"	"X"	"X"	"X" Y*	"X" Y*
G1	QTY.	2	2	2	3	3	4	4	2	2	2	2	3	3 4	4
S	QTY.	-	-	-	-	-	-	2					2	2 2	2
G2	QTY.	3	3	4	5	5	6	7	3	3	4	5	5	6 7	7
	TOT. lbs.	11.7	11.7	13.9	16.3	18.5	57.4	67.0	11.7	5.3	13.9	16.3	23.1	80.7	92.8

DIMENSIONS AND CONCRETE QUANTITIES

USING CONCRETE PIPE

D	COMMON DIMS. H	B	T	SINGLE PIPE G1	G2	L 30	YD³	DOUBLE PIPE S	G1	G2	S	S 30	L 30	YD³
15″	3′-4″	1′-8″	1⅞″	2′-9″	3′-2″	5′-11″	0.792	2′-2″	2′-9″	3′-2″	2′-2″	2′-6″	5′-11″	0.792
18″	3′-7″	1′-10″	2″	3′-2″	3′-8″	6′-10″	1.023	2′-7″	3′-2″	3′-8¼″	2′-7″	2′-11½″	6′-10″	1.023
24″	4′-2″	2′-1″	2½″	4′-0″	4′-8″	8′-8″	1.613	3′-5″	4′-0″	4′-8″	3′-5″	3′-11½″	8′-8″	1.613
30″	4′-9″	2′-5″	2¾″	4′-7″	5′-4″	9′-11″	2.289	4′-3″	4′-7″	5′-4″	4′-3″	4′-10¾″	9′-11″	2.289
36″	5′-3″	2′-8″	3″	5′-6″	6′-4″	11′-10″	3.220	5′-0″	5′-6″	6′-4⅜″	5′-0″	5′-9¼″	11′-10″	3.220
42″	5′-10″	2′-11″	3½″	6′-4″	7′-4″	13′-8″	4.375	6′-4″	6′-4″	7′-4″	6′-4″	6′-8¾″	13′-8″	4.375
48″	6′-5″	3′-3″	4″	7′-2″	8′-3″	15′-5″	5.580	7′-2″	7′-2″	8′-3¼″	7′-2″	7′-6¾″	15′-5″	5.580

USING CORRUGATED STEEL PIPE

D	COMMON DIMS. H	B	SINGLE PIPE G1	G2	L 30	YD³	DOUBLE PIPE G1	G2	S	S 30	L 30	YD³
16″	3′-4″	1′-8″	2′-6″	2′-11″	5′-5″	0.616	2′-6″	2′-11″	2′-0″	2′-4″	7′-9″	0.848
18″	3′-7″	1′-8″	2′-11″	3′-4″	6′-3″	0.816	2′-11⅛″	3′-4⅜″	2′-3½″	2′-8″	8′-11″	1.109
24″	4′-2″	2′-1″	3′-8″	4′-3″	7′-11″	1.282	3′-8¼″	4′-3¼″	3′-0″	3′-5½″	11′-5″	1.747
30″	4′-9″	2′-2″	4′-5″	5′-1″	9′-6″	1.868	4′-5⅛″	5′-1⅛″	3′-8″	4′-2¾″	13′-9″	2.531
36″	5′-3″	2′-5″	5′-2″	6′-0″	11′-2″	2.621	5′-2⅜″	6′-0⅜″	4′-3″	4′-10¾″	16′-5″	3.596
42″	5′-10″	2′-8″	5′-11″	6′-10″	12′-9″	3.517	5′-11¼″	6′-10⅛″	5′-3″	6′-0¾″	18′-10″	4.820
48″	6′-5″	2′-11″	6′-8″	7′-8″	14′-4″	4.591	6′-8⅜″	7′-6⅞″	6′-0″	6′-11¼″	21′-4″	6.320

*SEE SHEET 2

ELEVATION

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS** 15″ THRU 48″ PIPE 60° OR 120° SKEW	SHEET 1 OF 2 838d02s1

GENERAL NOTES:

* ALL CORNERS TO BE CHAMFERED 1".
* THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 - #6 BARS "Y" IN THE TOP OF ALL ENDWALLS FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL.
* FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
* WALL THICKNESS (T) SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT ARE USED ONLY IN COMPUTING ENDWALL QUANTITIES.
* IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR X (DOWELS SHALL BE PLACED IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS TO BE APPROXIMATELY 12" CENTERS UNLESS ENGINEER DIRECTS OTHERWISE.
* WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPERATELY, THE TOP BASE SHALL BE LEFT ROUGH.
* WHEN SKEW ANGLE OF PIPE IS OVER/UNDER 30° USE G-1 DIMENSION FOR 30° PLUS/MINUS 3" FOR EACH 5° OVER/UNDER 30°. G2 DIMENSION WILL BE THE NEW DIMENSION DIVIDED BY THE COSINE OF THE ANGLE OF PIPE SKEW.
* CLASS "B" CONCRETE SHALL BE USED.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS** 15″ THRU 48″ PIPE	SHEET 2 OF 2 838d02s1

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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MODIFIED BY: T.S. SPELL DATE: 12-10-08
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jhowerton
AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-5

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

ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS

15″ THRU 48″ PIPE 45° OR 135° SKEW

SHEET 1 OF 2 — 838D03

DOWEL
BAR- "X"

END ELEVATION

DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE

LOC.	PIPE DIA.	SINGLE PIPE 15″	18″	24″	30″	36″	42″	48″	DOUBLE PIPE 15″	18″	24″	30″	36″	42″	48″
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*
G1	QTY.	2	2	2	3	3		3	2	2	2	3	3		3
S	QTY.	-	-	-	-	-	2	- 2				2	2	2	3 2
G2	QTY.	5	5	6	7	8	9	10	5	5	6	7	8	9	10
	TOT. LBS.	16	16	19	21	26	73	81	19	19	21	26	30	96	117

DIMENSIONS AND CONCRETE QUANTITIES

USING CONCRETE PIPE

D	COMMON DIMS. H	B	T	SINGLE PIPE G1	G2	L 45	CU.YD.	DOUBLE PIPE G1	G2	S	S 45	L 45	CU.YD
15″	3'-4″	1'-8″	1⅞″	2'-9″	3'-11″	6'-8″	0.872	2'-9⅜″	3'-11⅜″	2'-3″	3-2¼″	9'-0″	0.977
18″	3'-7″	1'-10″	2″	3'-2″	4'-6″	7'-8″	1.134	3'-2⅛″	4'-6⅛″	2'-7″	3'-7¾″	10'-8″	1.335
24″	4'-2″	2'-1″	2½″	4'-0″	5'-8″	9'-8″	1.770	4'-0″	5'-8″	3'-5″	4'-10″	13'-1″	1.975
30″	4'-9″	2'-5″	2¾″	4'-7″	6'-6″	11'-1″	2.509	4'-7″	6'-6″	4'-3″	6'-0″	17'-2¼″	2.927
36″	5'-3″	2'-8″	3″	5'-6″	7'-9″	13'-3″	3.533	5'-6⅝″	7'-9⅝″	5'-1″	7'-2¼″	20'-6″	4.076
42″	5'-10″	2'-11″	3½″	6'-4″	8'-11″	15'-3″	4.772	6'-4″	8'-11″	5'-10″	8'-3″	23'-6″	5.442
48″	6'-5″	3'-3″	4″	7'-2″	10'-2″	17'-4″	6.432	7'-2¼″	10'-2¼″	6'-9″	9'-6½″	26'-7″	7.142

DOUBLE PIPE

LOC.	PIPE DIA.	SINGLE PIPE 15″	18″	24″	30″	36″	42″	48″	DOUBLE PIPE 15″	18″	24″	30″	36″	42″	48″
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*	"X"	"X"	"X"	"X"	"X"	"X"	"X" Y*
G1	QTY.	2	2	2	3			3	2	2	2	2	3		3
S	QTY.	-	-	-	-	2		- 2				2	2	2	3 2
G2	QTY.	4	5	6	7	8	9	10	4	5	6	7	8	9	10
	TOT. LBS.	14	16	19	21	23	69	77	16	19	21	23	28	96	107

DIMENSIONS AND CONCRETE QUANTITIES

USING CORRUGATED METAL PIPE

D	COMMON DIMS. H	B	SINGLE PIPE G1	G2	L 30	CU.YD.	DOUBLE PIPE G1	G2	S	S 45	L 45	CU.YD
15″	3'-0″	1'-6″	2'-6″	3'-6″	6'-0″	0.626	2'-6⅜″	3'-6⅜″	2'-1″	2'-11¼″	9'-0″	0.977
18″	3'-3″	1'-8″	2'-11″	4'-2″	7'-1″	0.916	2'-11⅛″	4'-2⅛″	2'-7″	3'-7¾″	10'-8″	1.335
24″	3'-9″	1'-11″	3'-8″	5'-2″	8'-10″	1.412	3'-8″	5'-2″	3'-0″	4'-3″	13'-1″	1.975
30″	4'-3″	2'-2″	4'-5″	6'-3″	10'-8″	2.066	4'-5″	6'-3″	3'-10″	5'-5″	16'-1″	2.927
36″	4'-9″	2'-5″	5'-2″	7'-4″	12'-6″	2.885	5'-2⅜″	7'-4⅜″	4'-6″	6'-4¼″	18'-11″	4.076
42″	5'-3″	2'-8″	5'-11″	8'-4″	14'-3″	3.856	5'-11″	8'-4″	5'-3″	7'-5″	21'-8″	5.442
48″	6'-0″	3'-0″	6'-8″	9'-5″	16'-1″	5.052	6'-8¼″	9'-5¼″	6'-0″	8'-5½″	24'-7″	7.142

*SEE SHEET 2

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

ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS

15″ THRU 48″ PIPE

SHEET 2 OF 2 — 838D03

GENERAL NOTES:

ALL CORNERS TO BE CHAMFERED 1".

* THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 - #6 BARS "Y" IN THE TOP OF ALL ENDWALLS FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL.

FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

WALL THICKNESS (T) SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT ARE USED ONLY IN COMPUTING ENDWALL QUANTITIES.

IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR X (DOWELS SHALL BE PLACED IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS TO BE APPROXIMATELY 12" CENTER UNLESS ENGINEER DIRECTS OTHERWISE.

WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPERATELY, THE TOP BASE SHALL BE LEFT ROUGH.

WHEN SKEW ANGLE OF PIPE IS OVER 45° USE G-1 DIMENSION FOR 45° PLUS 6" FOR EACH 5° OVER 45°. G2 DIMENSION WILL BE THE NEW DIMENSION DIVIDED BY THE COSINE OF THE ANGLE OF PIPE SKEW.

CLASS "B" CONCRETE SHALL BE USED.

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

ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS

15″ THRU 48″ PIPE

SHEET 2 OF 2 — 838D03

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Digitally signed by Joel S. Howerton

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02-MAY-2018 08:24
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jhowerton
AT CSD-292595

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

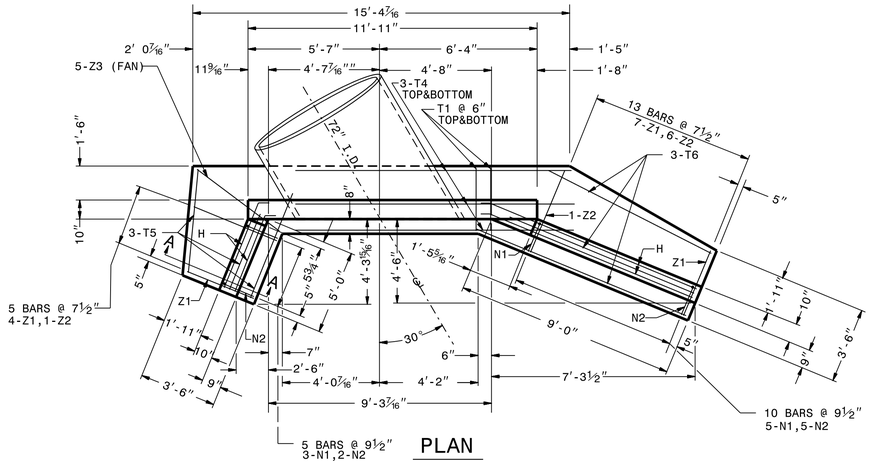
ENGLISH DETAIL DRAWING FOR

REINFORCED CONCRETE ENDWALL

FOR SINGLE 72" PIPE 60° OR 120° SKEW

SHEET 1 OF 1

838D41



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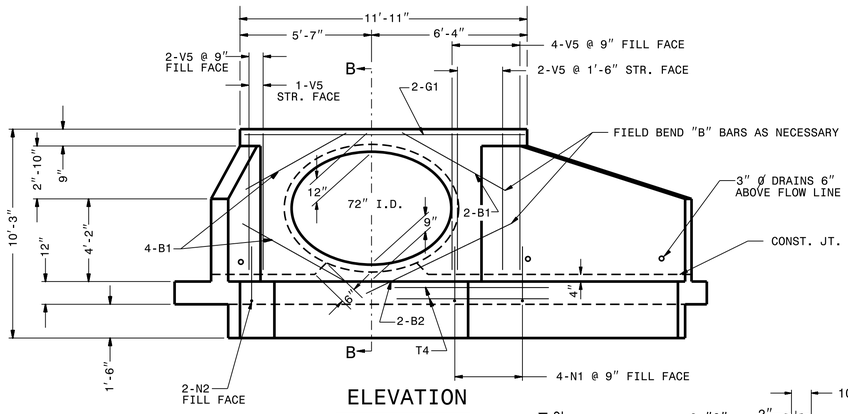

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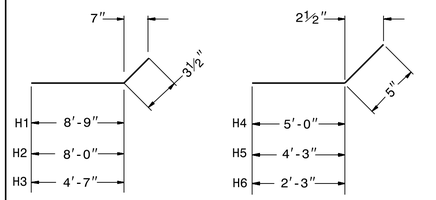
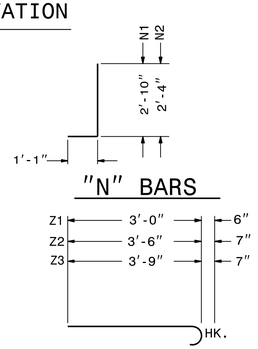


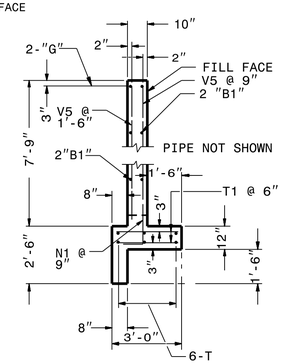
"H" BARS

"H" BARS



"N" BARS

"Z" BARS



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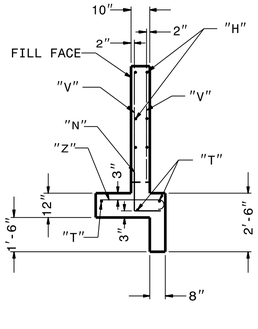

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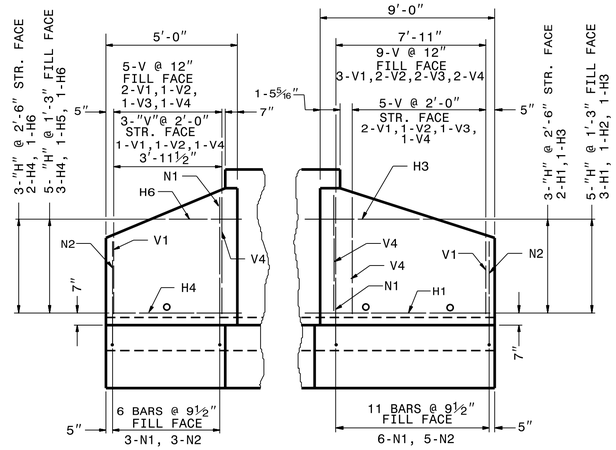

WING ELEVATION

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL TO BE ASTMA615-GRADE 60.

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

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

ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".

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

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

BILL OF MATERIAL FOR ENDWALL				
REINF. STEEL			1 - PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
Z1	#4	3'-6"	11	26
Z2	#5	4'-1"	7	30
Z3	#5	4'-4"	2	9
N1	#5	3'-11"	15	61
N2	#4	3'-5"	8	18
V1	#4	3'-8"	8	20
V2	#4	4'-9"	5	16
V3	#4	5'-6"	4	15
V4	#4	6'-3"	5	21
V5	#4	7'-1"	9	43
H1	#4	9'-1"	5	31
H2	#4	8'-4"	1	6
H3	#4	4'-11"	2	7
H4	#4	5'-5"	5	18
H5	#4	4'-8"	1	3
H6	#4	2'-8"	2	4
G1	#7	11'-5"	2	47
T1	#4	2'-6"	48	80
T4	#4	15'-0"	6	60
T5	#4	5'-6"	3	11
T6	#4	8'-8"	3	17
B1	#4	6'-6"	6	26
B2	#4	8'-0"	2	11
REINF. STEEL LBS.				580
CONC/C.M. CU. YDS.				8.2
CONC/R.C. CU. YDS.				7.8

DRAWING NOT TO SCALE

12/15/2020 | 11:58:18 EST

STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

REINFORCED CONCRETE ENDWALL

FOR SINGLE 72" PIPE 60° OR 120° SKEW

SHEET 1 OF 1

838D41

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton

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

DETAIL OF REINFORCED CONCRETE ENDWALL FOR SINGLE 72" DIAMETER PIPE - 60° SKEW

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 06-23-10
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/english/hydro/72endwall,60sk.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-7

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

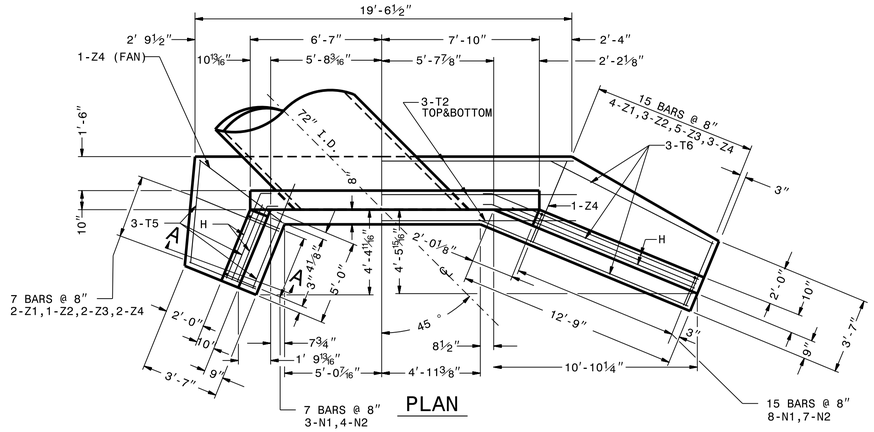
ENGLISH DETAIL DRAWING FOR

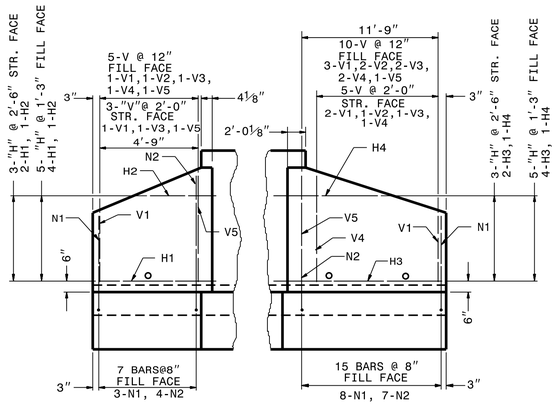
REINFORCED CONCRETE ENDWALL

FOR SINGLE 72" PIPE 45° OR 135° SKEW

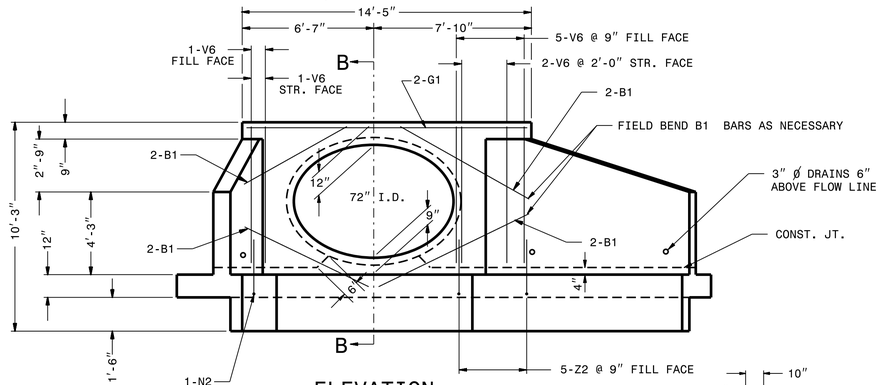
SHEET 1 OF 1

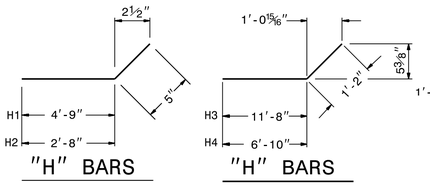
838D43

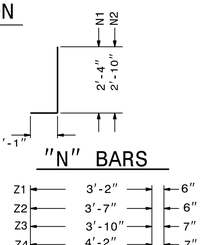


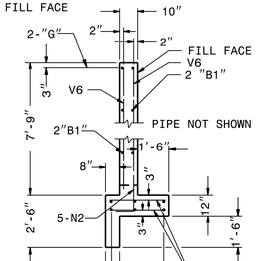


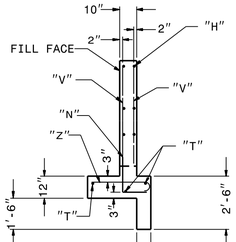
WING ELEVATION











DRAWING NOT TO SCALE

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL TO BE ASTMA615-GRADE 60.

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

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

ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".

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

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

BILL OF MATERIAL FOR ENDWALL				
REINF. STEEL			1 - PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT
Z1	#4	3'-8"	6	15
Z2	#4	4'-1"	4	11
Z3	#5	4'-5"	7	32
Z4	#5	4'-9"	6	30
N1	#4	3'-5"	11	25
N2	#5	3'-11"	17	69
V1	#4	3'-10"	7	10
V2	#4	4'-6"	4	12
V3	#4	5'-1"	5	17
V4	#4	5'-8"	4	15
V5	#4	6'-3"	3	13
V6	#4	7'-3"	9	44
H1	#4	5'-3"	6	21
H2	#4	3'-2"	2	4
H3	#4	12'-10"	6	51
H4	#4	8'-0"	2	11
G1	#7	14'-1"	2	58
T1	#4	2'-6"	56	94
T2	#4	19'-2"	6	77
T5	#4	5'-3"	3	11
T6	#4	10'-0"	3	20
B1	#4	6'-6"	8	35
REINF. STEEL LBS.				683
CONC/C.M. CU. YDS.				10.0
CONC/R.C. CU. YDS.				9.4

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Digitally signed by Joel S. Howerton

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

ENGLISH DETAIL DRAWING FOR

REINFORCED CONCRETE ENDWALL

FOR SINGLE 72" PIPE 45° OR 135° SKEW

SHEET 1 OF 1

838D43

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

DETAIL OF REINFORCED CONCRETE ENDWALL FOR 72" DIAMETER PIPE - 45° SKEW

ORIGINAL BY: R.S.WICKER DATE: 6-46
MODIFIED BY: rnbritt DATE: 05-28-10
CHECKED BY: DATE:
FILE SPEC.: details/nbritt/english/hydro/72endwall,45sk.dgn

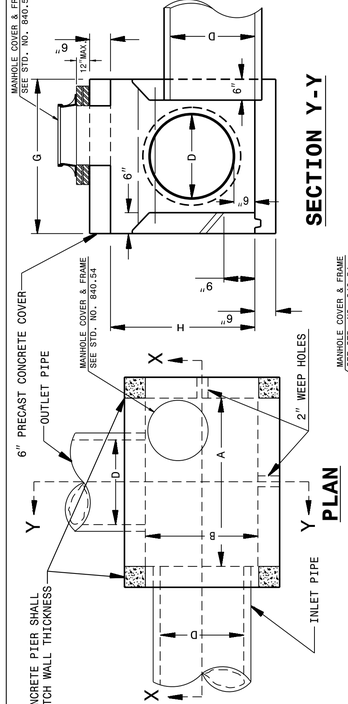
PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-8

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

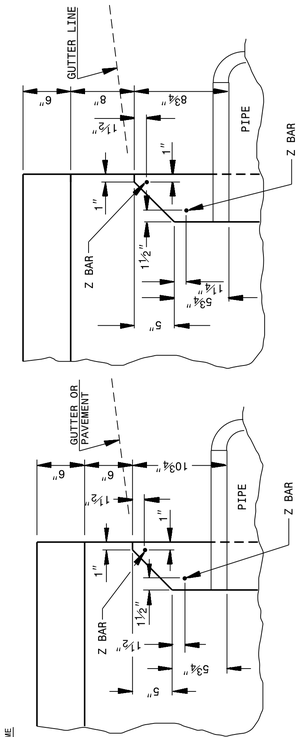
ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
(3 OR 4 SIDE OPEN THROAT)
(MANHOLE OPTIONAL)

SHEET 1 OF 2 — **840D04**

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 Y-Y



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

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

SECTION X-X

SEE NOTE

DIM'S OF BOX & PIPE / *MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H)*

PIPE	SPAN	WIDTH	HEIGHT	REINFORCING BARS – X		REINFORCING BARS – Y		TOP & BOT. SLAB DIMENSIONS		CU. YDS. CONC. IN BOX		TOTAL QUANTITIES BOX & SLABS		DEDUCTION ONE PIPE		DED. ONE (1) THROAT OPENING
D	A	B	H	NO.	LENGTH	NO.	LENGTH	TOP SLAB	BOT. SLAB	WALL/FT.	HT.	LBS. REINF.	YD³ (MIN H)	C.S.	R.C.	YD³
12"	3'-6"	2'-3"	1'-10"	4	3'-0"	6	4'-3"	2'-3"	3'-3"	0.181	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'-3"	3'-3"	0.181	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'-9"	4'-0"	0.226	0.340	35	1.379	0.033	0.049	0.053
24"	4'-0"	2'-8"	2'-10"	5	3'-5"	7	4'-9"	2'-9"	4'-0"	0.226	0.340	35	1.521	0.059	0.085	0.053
30"	4'-0"	3'-6"	3'-4"	5	4'-3"	9	4'-9"	3'-3"	4'-6"	0.278	0.417	43	1.916	0.092	0.127	0.053
36"	4'-6"	4'-0"	3'-10"	5	4'-9"	10	5'-3"	3'-9"	5'-0"	0.340	0.510	51	2.390	0.132	0.178	0.059
42"	5'-0"	4'-6"	4'-4"	5	5'-3"	12	5'-9"	4'-3"	5'-6"	0.407	0.611	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	4'-10"	5	5'-9"	13	5'-9"	4'-3"	6'-0"	0.444	0.666	68	3.298	0.235	0.317	0.066

STATE OF
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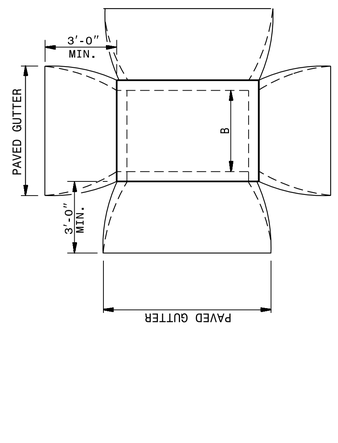
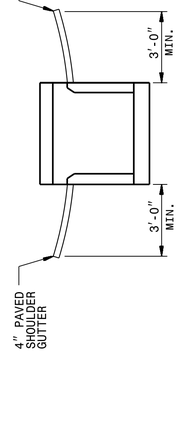
RALEIGH, N.C.

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

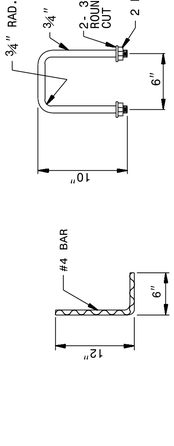
SHEET 2 OF 2 — **840D04**

PLAN OF CATCH BASIN IN MEDIAN STRIP

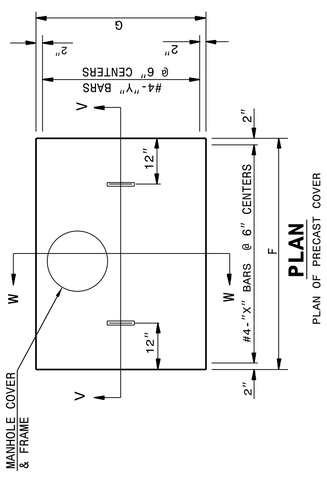




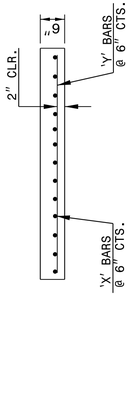
SECTION OF CATCH BASIN MEDIAN STRIP
DETAIL SHOWING METHOD OF PLACING CATCH BASIN AND PAVED SHOULDER GUTTER



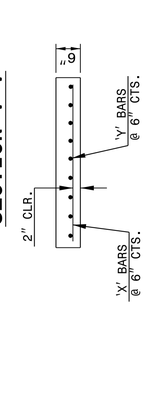
DETAIL OF HANDLE



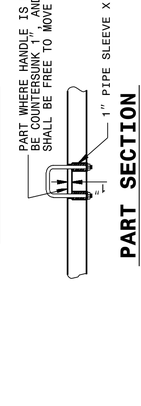
PLAN
PLAN OF PRECAST COVER



SECTION V-V



SECTION W-W



PART SECTION
THRU COVER SHOWING HANDLE

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton
Docusigned by: Joel S. Howerton 87B7301703C04EF...

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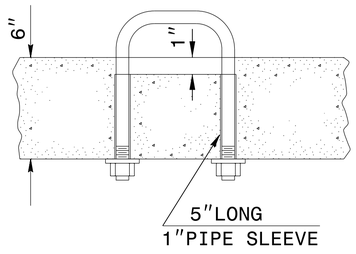
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

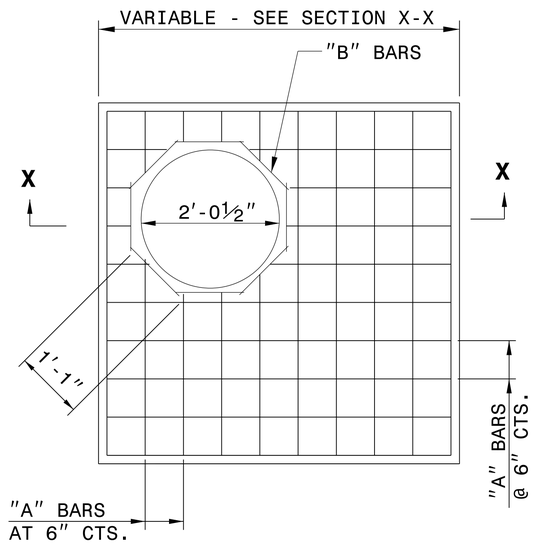
SEE PLATE FOR TITLE

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

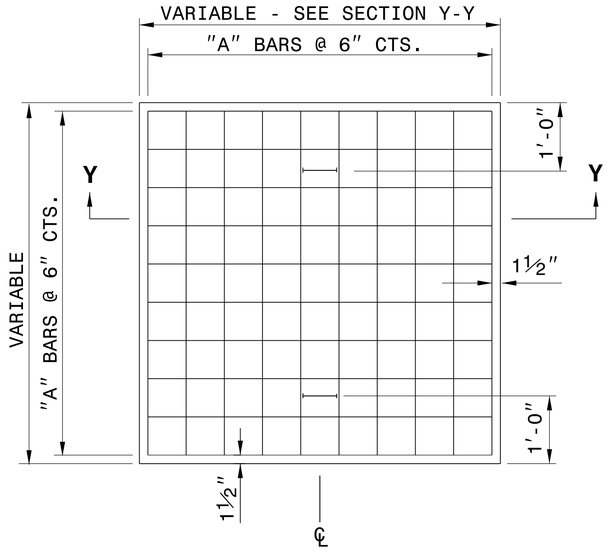
PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-9



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

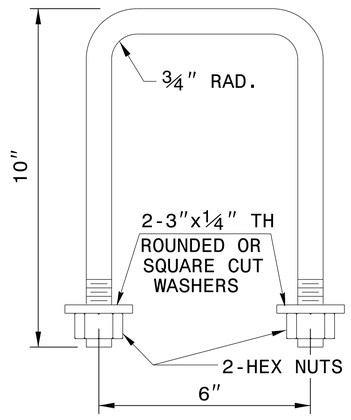
BILL OF MATERIALS

REINFORCING STEEL

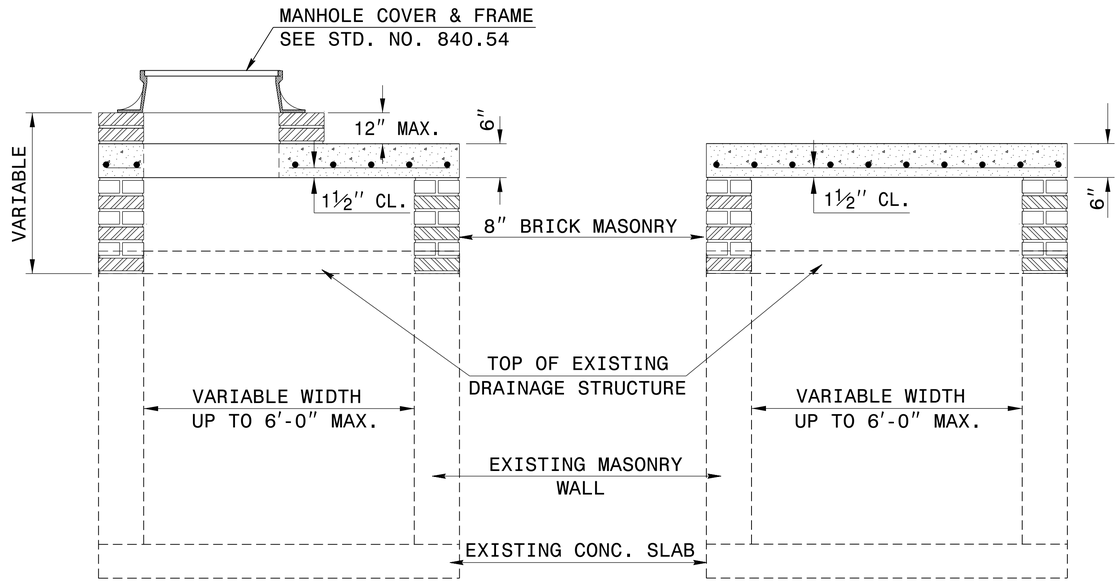
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.4326 *
BRICK MASONRY PER FT HT (MIN)	.4111

* NOTE:
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



DETAIL OF HANDLE



SECTION X-X

SECTION Y-Y

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton

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

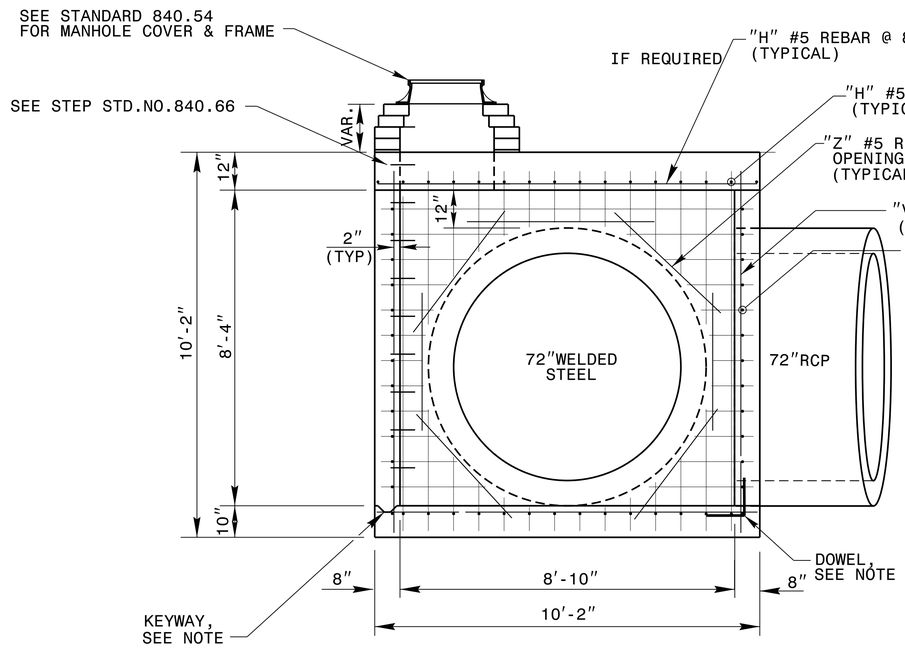
DETAIL TO CONVERT EXISTING DI, CB, OTCB or GI TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: T.S.S. DATE: FEB.2000
CHECKED BY: DATE:
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

DGN: ds174
TIME: 12:58:18
USER NAME: jhowerton

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-10



SECTION A-A

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

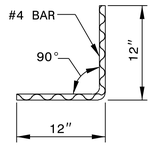
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS OR BRICK/BLOCK WALLS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

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



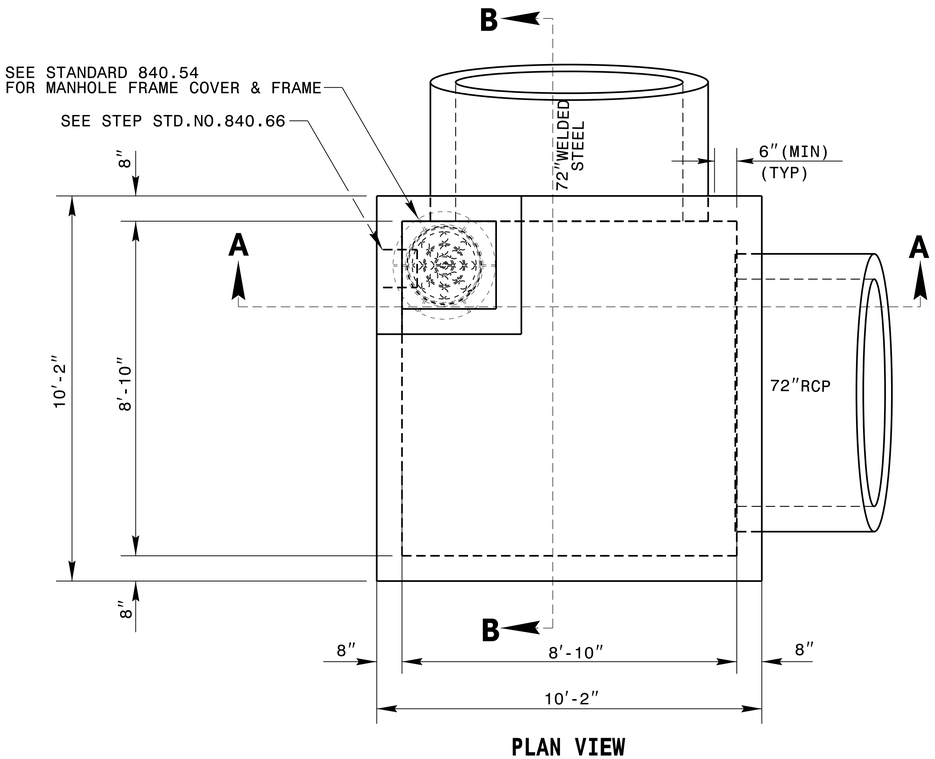
DOWEL

BILL OF MATERIALS

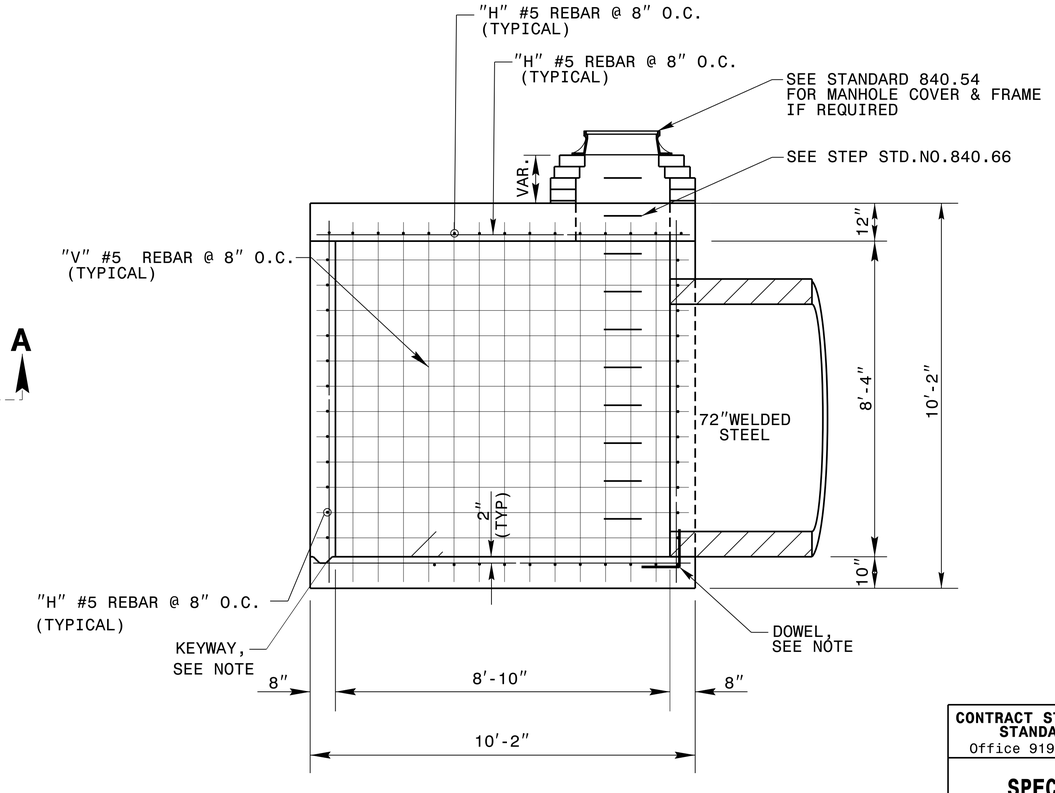
BAR	NO.	SIZE	LENGTH	WEIGHT
H	84	#5	9'-6"	833
V	70	#5	9'-2"	670
Z	14	#5	5'-0"	74
TOTAL REINF. STEEL (LBS.)				1577
TOTAL CONC. (CU. YDS.)				* 15.2

* NO DEDUCTION HAS BEEN MADE FOR PIPES

* 2.00 CU. YD. DEDUCTION FOR 2-72" RC PIPE



PLAN VIEW



SECTION B-B

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
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SPECIAL JUNCTION BOX WITH SLAB LID

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: nbritt DATE: 04/17/09
CHECKED BY: _____ DATE: _____
FILE SPEC.: detail/nbritt/english/rural/r2417c72jb.dgn

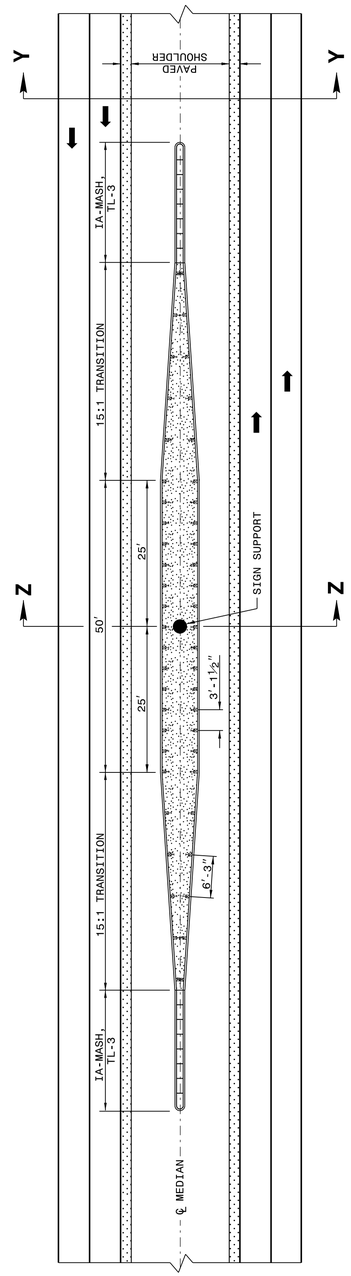
14-FEB-2018 13:14
S:\Contracts\Special Details\nbritt\english\rural\r2417c 72 jb.dgn
jhowerton AT CSD-292595

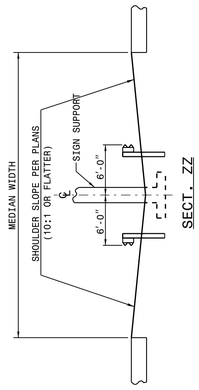
PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-11

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

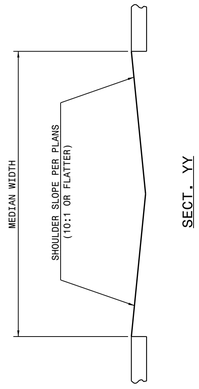
SHEET 2 OF 11
862D01





NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-1½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862.01 SHEET 1 OF 12).



DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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

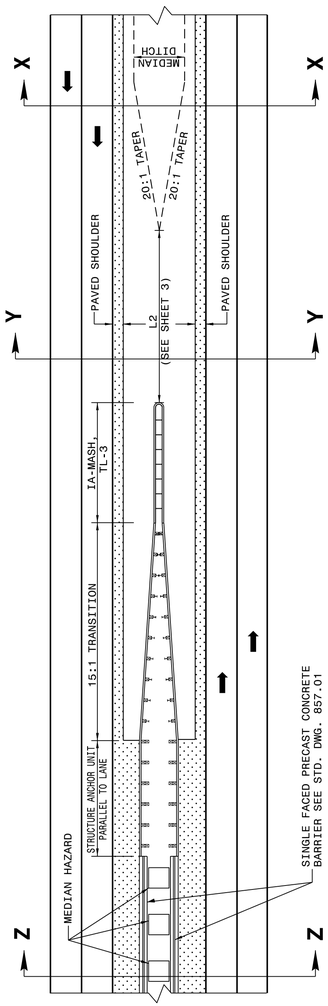
SEE TITLE BLOCK

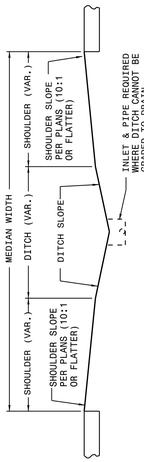
ORIGINAL BY: J HOWERTON DATE: 08-23-18
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

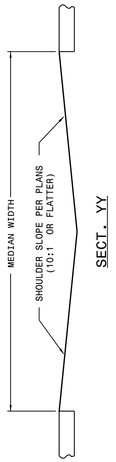
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

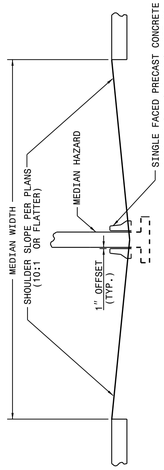
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

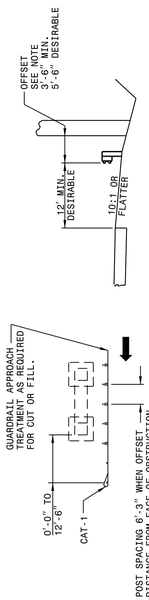








DETAIL OF MEDIAN TREATMENT AT UNDERPASS



NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

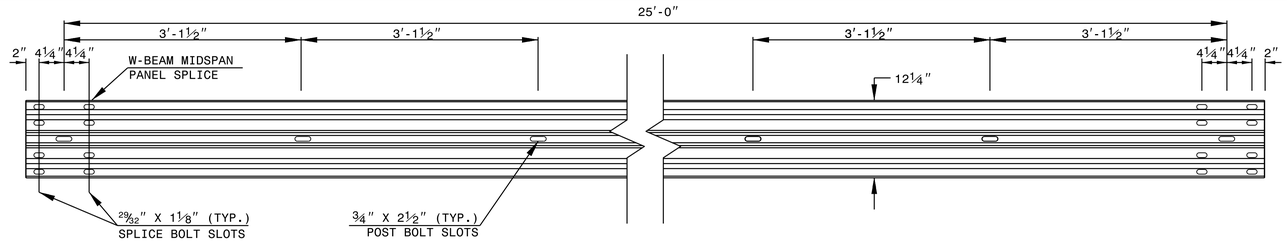
04-SEP-208 08:31
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\862D01 Impact Attenuator Sheets 1 and 2.dgn
jhowerton AT CSD-292695

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-12
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

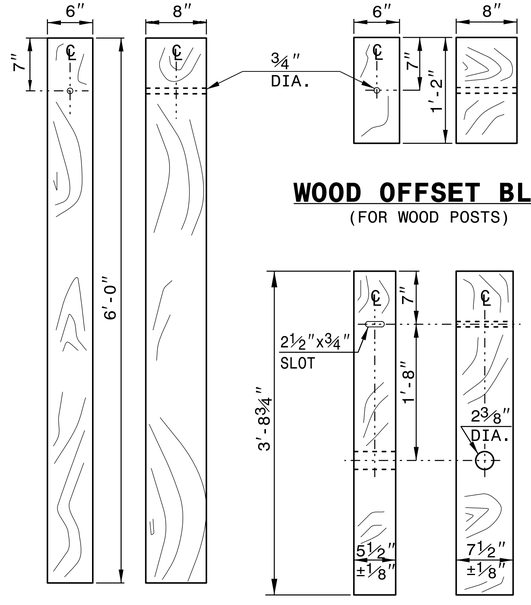
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



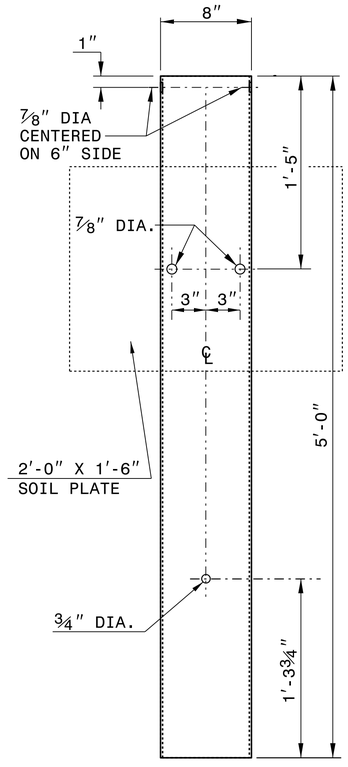
STANDARD W-BEAM GUARDRAIL



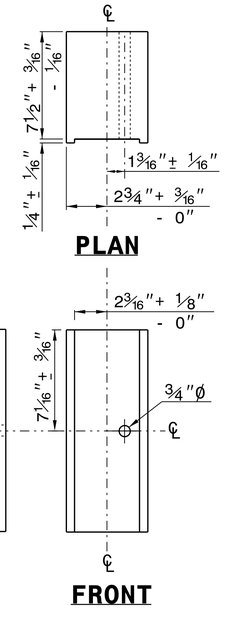
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



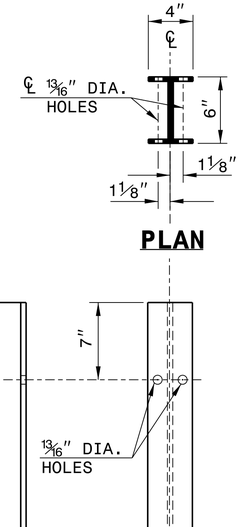
STEEL TUBE
TS 6"x8"x0.1875"



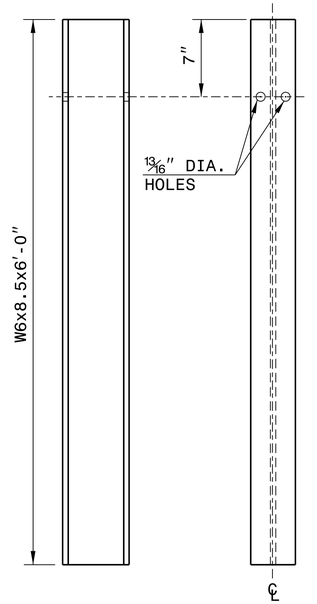
PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



PLAN



SIDE **FRONT**

"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

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON

Digitally signed by John S. Howerton

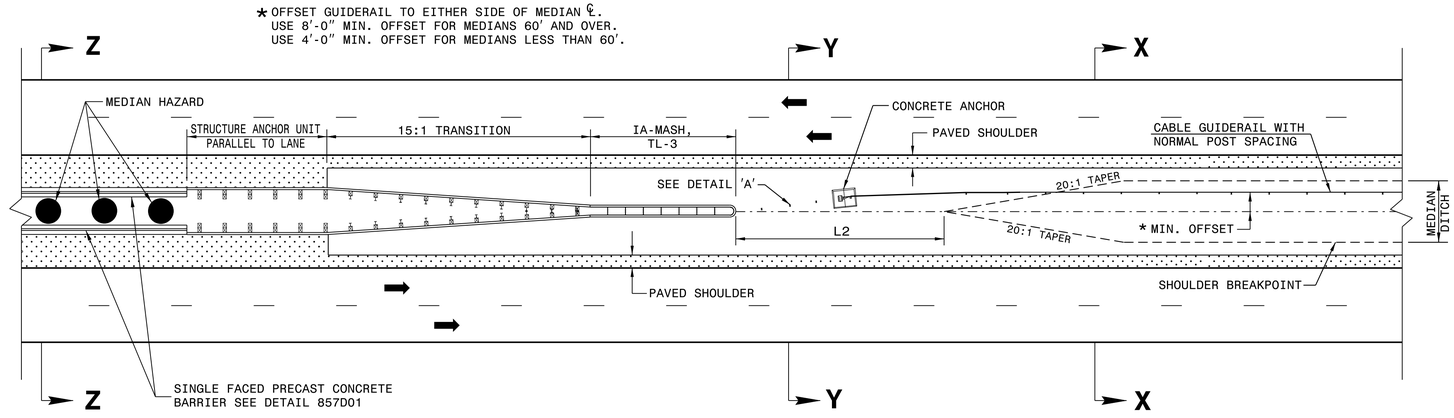
CONTRACTS STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
SEE TITLE BLOCK	
ORIGINAL BY: J.HOWERTON	DATE: 3-7-2018
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

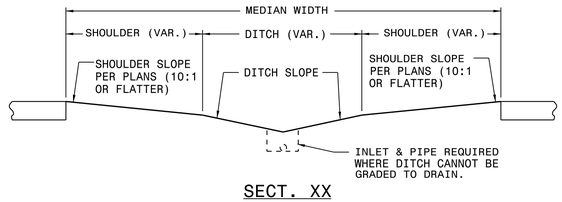
PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-13

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

ROADWAY DETAIL DRAWING FOR
CABLE GUIDERAIL
MEDIAN HAZARD GUIDERAIL LAYOUT

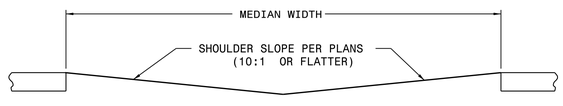
SHEET 1 OF 12
865D01



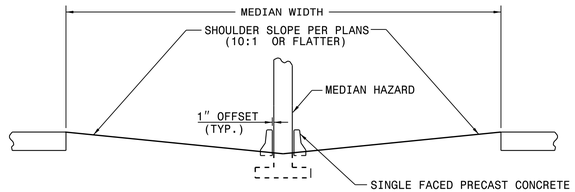


SECT. XX

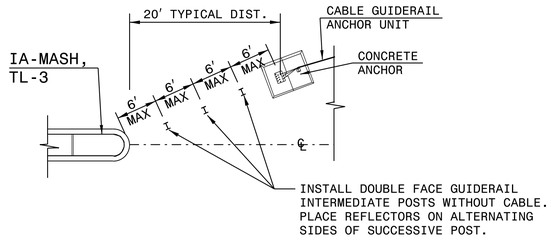
LIMITS OF -L2-	
MEDIAN WIDTH	-L2- DIMENSION
30'	80.0'
36'	60.0'
40' & ABOVE	40.0'



SECT. YY



SECT. ZZ



NOTE: POSTS WILL ONLY BE PLACED IN ONE OF THE TWO OPENINGS AT EACH MEDIAN HAZARD UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

DETAIL 'A'

DETAIL OF TREATMENT AT MEDIAN HAZARDS

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

ROADWAY DETAIL DRAWING FOR
CABLE GUIDERAIL
MEDIAN HAZARD GUIDERAIL LAYOUT

SHEET 1 OF12
865D01

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Docusigned by: Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

31-JAN-2019 10:43
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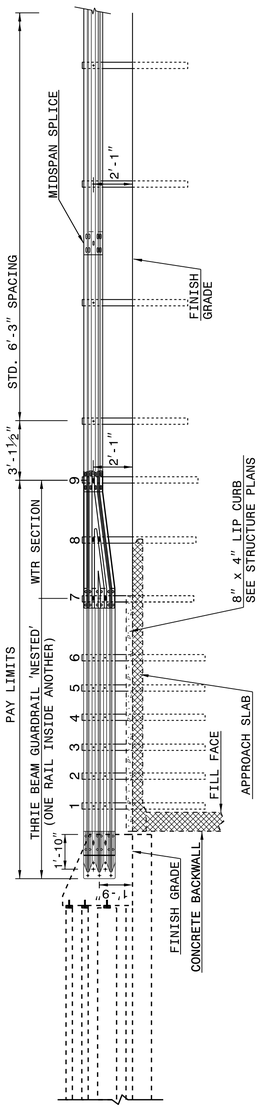
jhowerton AT CSD-21295

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2C-14

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

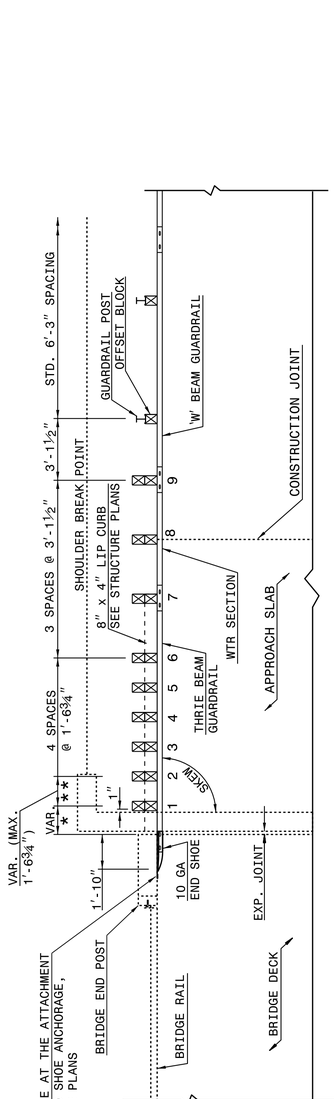
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

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.



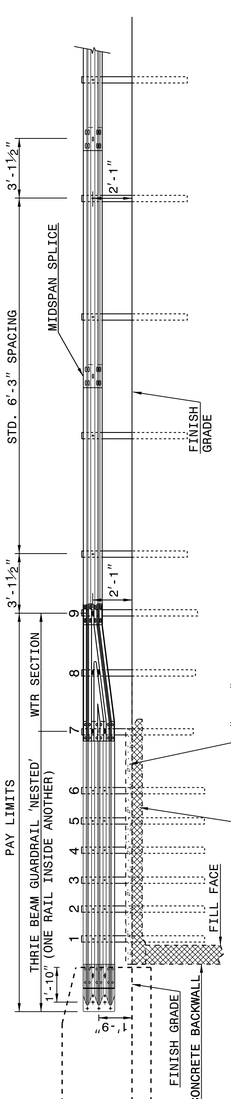
PLAN VIEW

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

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

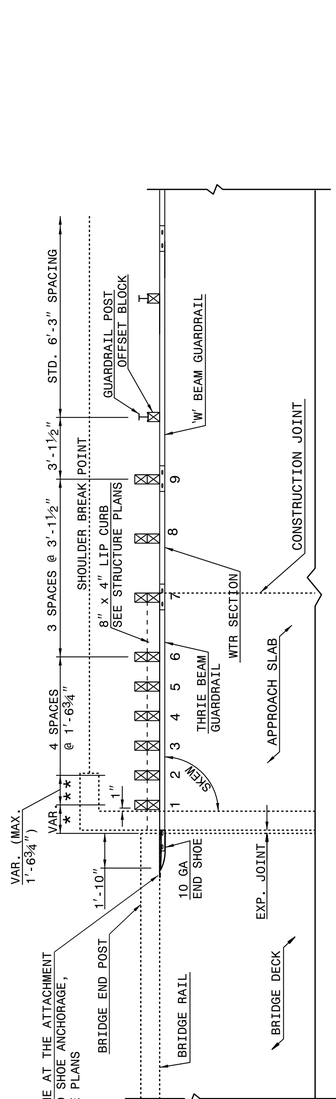
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

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.



PLAN VIEW

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

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

14-DEC-2017 10:36
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\0862d0301.dgn
jhowerton AT CSD-2425965

8/17/99

DRAINAGE DETAILS
(NOT TO SCALE)

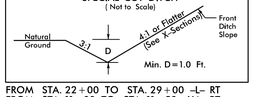
WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2D-1
R/W SHEET NO.	

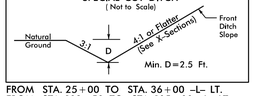
HYDRAULICS ENGINEER
12/15/2020 10:46:23 PST
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN ALFORD
Docusigned by: Kevin Alford
DocuSigned by: 5B5A3B5F4D4E4B5...

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



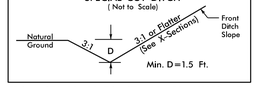
FROM STA. 22+00 TO STA. 29+00 –L– RT
FROM STA. 11+00 TO STA. 11+50 –Y4– RT
FROM STA. 12+35 TO STA. 13+00 –Y5– RT.
FROM STA. 12+35 TO STA. 13+00 –Y5– LT.
FROM STA. 19+00 TO STA. 23+00 ––Y7– RT.
FROM STA. 34+00 TO STA. 36+00 ––Y7– LT.
FROM STA. 33+00 TO STA. 34+00 ––Y7– RT.
FROM STA. 36+10 TO STA. 38+50 ––Y7– RT.
FROM STA. 14+90 TO STA. 16+00 –Y9– RT
FROM STA. 16+50 TO STA. 19+00 –Y9– LT
FROM STA. 24+20 TO STA. 25+90 –Y9RPA– RT
AT STA 23+70.48 –Y9RPB– LT
FROM STA. 23+85 TO STA. 25+20 –Y9RPC– RT
FROM STA. 66+25 TO STA. 66+70 –SR1– LT
FROM STA. 55+18 TO STA. 58+28 –SR2– RT
FROM STA. 92+50 TO STA. 96+87 –SR2– RT
FROM STA. 10+40 TO STA. 17+00 –SR3– RT
FROM STA. 13+50 TO STA. 16+00 –SR3– LT.
FROM STA. 52+00 TO STA. 56+50 –SR3– LT.
FROM STA. 54+00 TO STA. 56+50 –SR3– RT
FROM STA. 60+80 TO STA. 63+00 –SR3– LT
FROM STA. 63+00 TO STA. 63+85 –SR3– RT
FROM STA. 13+25 TO STA. 15+40 –SR7– RT
FROM STA. 16+50 TO STA. 17+50 –SR7– RT
FROM STA. 20+50 TO STA. 23+00 –SR7– RT
FROM STA. 21+00 TO STA. 22+00 –SR7– LT.
FROM STA. 38+20 TO STA. 40+25 –SR7– LT
FROM STA. 41+10 TO STA. 43+07 –SR7– LT
FROM STA. 72+48 TO STA. 74+60 –SR7– RT
FROM STA. 10+60 TO STA. 11+14 –SR8– RT
FROM STA. 11+00 TO STA. 12+55 –SR9– LT
FROM STA. 11+25 TO STA. 12+55 –SR9– RT
FROM STA. 10+55 TO STA. 11+40 ––DR1– RT.
FROM STA. 10+50 TO STA. 10+95 ––DR1– LT.

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



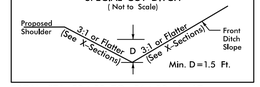
FROM STA. 25+00 TO STA. 36+00 –L– LT.
FROM STA. 103+50 TO STA. 105+00 –L– LT
FROM STA. 91+64 TO STA. 92+50 –SR2– RT

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



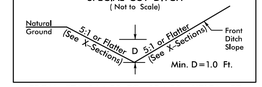
FROM STA. 19+10 TO STA. 20+50 –Y9RPB– LT
FROM STA. 18+00 TO STA. 20+90 –SR2– LT

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)



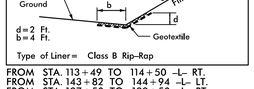
FROM STA 53+50 TO 56+00 –L– LT
FROM STA 23+20 TO 24+25 –Y9RPB– RT

DETAIL E
SPECIAL CUT DITCH
(Not to Scale)



FROM STA 14+50 TO 15+50 –Y7LPA– RT

DETAIL F
TOE PROTECTION
(Not to Scale)



d = 2 Ft.
b = 4 Ft.
Type of Liner = Class B Rip–Rap

FROM STA. 113+49 TO 114+50 –L– RT.
FROM STA. 143+82 TO 144+94 –L– LT.
FROM STA. 197+50 TO 199+50 –L– RT.
FROM STA. 200+50 TO 202+00 –L– RT.
FROM STA. 18+00 TO STA. 22+80 –Y7RPA LT.–
FROM STA. 21+35 TO STA. 22+50 –Y7RPA RT.–
FROM STA. 16+75 TO 17+06 –Y9– RT.
FROM STA. 24+69 TO 26+60 –SR1– LT.
FROM STA. 26+96 TO 27+62 –SR1– LT.
FROM STA. 51+32 TO 52+27 –SR1– RT.
FROM STA. 36+24 TO 38+15 –SR2– RT.
FROM STA. 38+55 TO 38+88 –SR2– RT.
FROM STA. 75+13 TO 75+59 –SR2– RT.
FROM STA. 17+00 TO 28+82 –SR3– RT.
FROM STA. 18+10 TO 28+32 –SR3– LT.
FROM STA. 46+71 TO 50+26 –SR3– RT.
FROM STA. 47+00 TO 50+20 –SR3– LT.

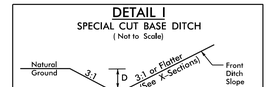
DETAIL G
SPECIAL CUT DITCH
(Not to Scale)

FROM STA 54+00 TO 58+00 –L– RT
FROM STA 66+50 TO 69+00 –L– RT

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)

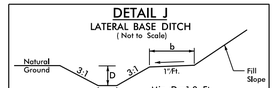
FROM STA. 24+65 TO STA. 27+76 –Y7RPA– RT.
FROM STA. 22+00 TO STA. 23+30 –Y9RPD– LT.

DETAIL I
SPECIAL CUT BASE DITCH
(Not to Scale)



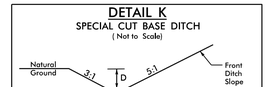
FROM STA. 262+00 TO STA. 275+50 –L– RT
FROM STA. 278+10 TO STA. 280+00 –L– RT
FROM STA. 22+00 TO STA. 24+20 –Y9RPA– RT
FROM STA. 75+60 TO STA. 76+29 –SR2– RT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)



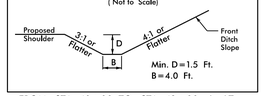
FROM STA. 28+30 TO STA. 32+00 –SR3– LT.

DETAIL K
SPECIAL CUT BASE DITCH
(Not to Scale)



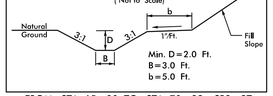
FROM STA 36+00 TO STA 40+00 –L– LT

DETAIL L
SPECIAL CUT BASE DITCH
(Not to Scale)



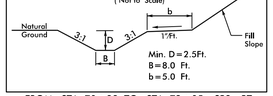
FROM STA 40+00 TO STA 42+00 –L– LT
FROM STA 256+50 TO STA 257+22 –L– RT

DETAIL M
LATERAL BASE DITCH
(Not to Scale)



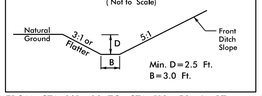
FROM STA. 65+90 TO STA. 70+38 –SR2– RT.

DETAIL N
LATERAL BASE DITCH
(Not to Scale)



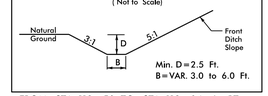
FROM STA. 70+38 TO STA. 72+05 –SR2– RT.

DETAIL O
SPECIAL CUT BASE DITCH
(Not to Scale)



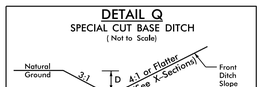
FROM STA 101+00 TO STA 112+50 –L– RT

DETAIL P
SPECIAL CUT BASE DITCH
(Not to Scale)



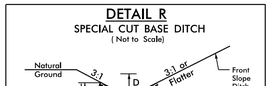
FROM STA. 112+50 TO STA. 113+04 –L– RT.

DETAIL Q
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA 63+00 –SR3– LT TO STA 34+00 –Y7– RT

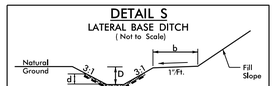
DETAIL R
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = Class B Rip–Rap

FROM STA. 32+47 TO STA. 34+00 –Y7– LT.

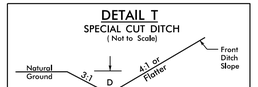
DETAIL S
LATERAL BASE DITCH
(Not to Scale)



*When B is > 6.0'
Std. No. 876.01
Type of Liner = Class I Rip–Rap

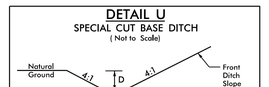
FROM STA. 29+94 TO STA. 31+16 –Y7– LT.

DETAIL T
SPECIAL CUT DITCH
(Not to Scale)



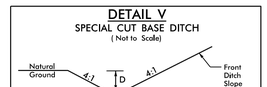
FROM STA. 161+23 TO STA. 162+00 –L– LT
FROM STA. 262+00 TO STA. 275+50 –L– RT
FROM STA. 280+00 TO STA. 281+50 –L– RT
FROM STA 76+29 TO STA 80+70 –SR2– RT
FROM STA 87+13 TO STA 91+64 –SR2– RT
FROM STA 42+48 TO STA 44+20 –SR6– RT
FROM STA 35+50 TO STA 37+03 –SR7– RT
FROM STA 38+00 TO STA 41+12 –SR7– RT

DETAIL U
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 162+00 TO STA. 162+90 –L– LT.

DETAIL V
SPECIAL CUT BASE DITCH
(Not to Scale)

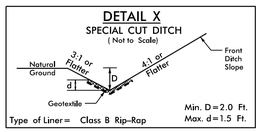


FROM STA 163+60 TO STA 166+00 –L– LT

DETAIL W
SPECIAL CUT DITCH wHINGE
(Not to Scale)

FROM STA. 173+00 TO STA. 174+50 –L– LT.
FROM STA. 175+50 TO STA. 181+50 –L– LT.
FROM STA. 188+00 TO STA. 191+00 –L– LT.
FROM STA 19+69 TO STA 29+48 –Y7RPC– RT

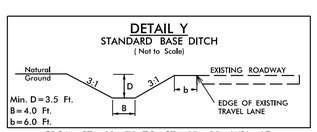
DETAIL X
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner = Class B Rip–Rap

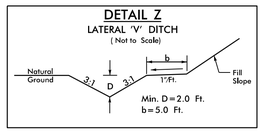
FROM STA. 160+50 TO STA. 161+23 –L– LT.
FROM STA. 191+00 TO STA. 192+00 –L– LT.
FROM STA. 193+00 TO STA. 193+50 –L– LT.
FROM STA. 44+20 TO STA. 47+30 –SR6– LT.

DETAIL Y
STANDARD BASE DITCH
(Not to Scale)



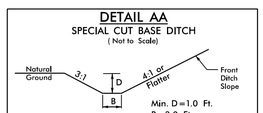
FROM STA. 10+70 TO STA. 13+80 –WBL– LT.
FROM STA. 17+20 TO STA. 27+05 –WBL– LT.

DETAIL Z
LATERAL 'V' DITCH
(Not to Scale)



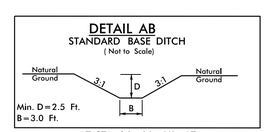
FROM STA. 16+05 TO STA. 19+10 –Y9RPB– LT

DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)



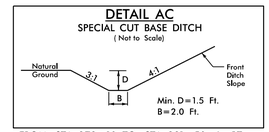
FROM STA. 18+50 TO STA. 19+50 –Y7RPA– RT.
FROM STA. 26+00 TO STA. 26+50 –Y9– RT.

DETAIL AB
STANDARD BASE DITCH
(Not to Scale)



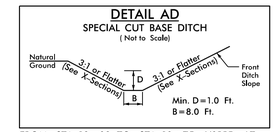
AT STA 26+00 –Y9– LT

DETAIL AC
SPECIAL CUT BASE DITCH
(Not to Scale)



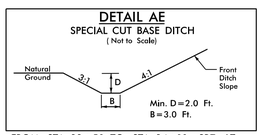
FROM STA. 278+10 TO STA. 281+50 –L– RT.
FROM STA. 10+49 TO STA. 12+75 –SR8– LT.

DETAIL AD
SPECIAL CUT BASE DITCH
(Not to Scale)



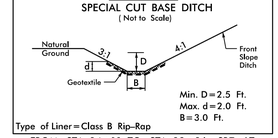
FROM STA. 18+92 TO STA. 19+75 –Y9RPD– LT.
FROM STA. 20+80 TO STA. 21+50 –Y9RPD– LT.
FROM STA. 27+63 TO STA. 28+12 –SR1– LT.

DETAIL AE
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 22+50 TO STA. 24+10 –SR7– LT.

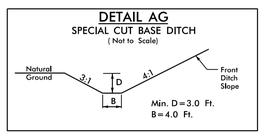
DETAIL AF
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = Class B Rip–Rap

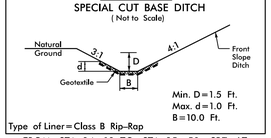
FROM STA. 24+10 TO STA. 29+26 –SR7– LT.

DETAIL AG
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA 259+45 TO STA 260+57 –L– RT
FROM STA 29+94 TO STA 34+18 –SR7– LT

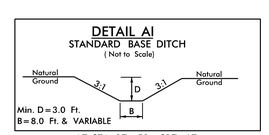
DETAIL AH
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = Class B Rip–Rap

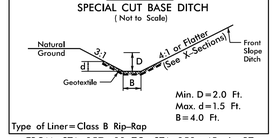
FROM STA. 34+18 TO STA. 35+50 –SR7– LT.

DETAIL AI
STANDARD BASE DITCH
(Not to Scale)



AT STA. 37+52 –SR7– LT.

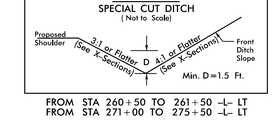
DETAIL AJ
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = Class B Rip–Rap

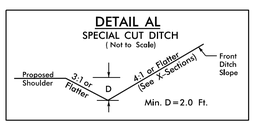
FROM STA 257+22 TO STA 259+45 –L– RT

DETAIL AK
SPECIAL CUT DITCH
(Not to Scale)



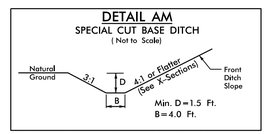
FROM STA 260+50 TO 261+50 –L– LT
FROM STA 271+00 TO 275+50 –L– LT

DETAIL AL
SPECIAL CUT DITCH
(Not to Scale)



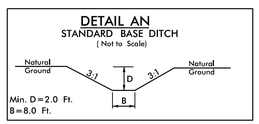
FROM STA 275+50 TO STA 276+00 –L– LT

DETAIL AM
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA 278+10 TO STA 279+96 –L– LT

DETAIL AN
STANDARD BASE DITCH
(Not to Scale)



STA. 72+56 –SR7–

DETAIL AO
SPECIAL CUT DITCH
(Not to Scale)

FROM STA 235+50 TO 245+00 –L– RT

DETAIL AP
SPECIAL CUT DITCH
(Not to Scale)

FROM STA 246+50 TO 250+61 –L– RT

DETAIL AQ
SPECIAL CUT BASE DITCH
(Not to Scale)

Type of Liner = Class B Rip–Rap

FROM STA. 18+00 TO STA. 18+50 –Y7RPA– RT.

DETAIL AR
PIPE OUTLET CHANNEL @ JS STREAM
(Not to Scale)

T = 18" (Class I Rip Rap)
Length = 4 X D

AT STA. 134+77 –L– LT
AT STA. 144+57 –L– LT
AT STA. 155+00 –L– RT
AT STA. 165+15 –L– RT
AT STA. 193+44 –L– RT
AT STA. 197+94 –L– RT
AT STA. 260+48 –L– RT
AT STA. 20+11 –Y7RPA– LT
AT STA. 59+00 –SR1– RT
AT STA. 75+08 –SR2– RT
AT STA. 37+42 –SR3– LT

12/14/2020
I:\5600\2d-dy.psh.02D-01_DitchDetails.dgn
USER:kfor

8/17/99

REVISIONS

DRAINAGE DETAILS
(NOT TO SCALE)

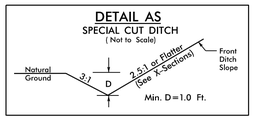
WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2D-2
R/W SHEET NO.	

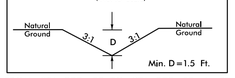
HYDRAULICS ENGINEER
12/15/2020 11:46:23 PST
NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B ALFORD
DocuSigned by:

DETAIL AS
SPECIAL CUT DITCH
(Not to Scale)



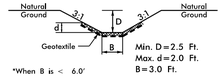
FROM STA 28+62 TO STA 31+23 –SR1– LT
FROM STA 41+65 TO STA 44+70 –SR1– LT
FROM STA 56+85 TO STA 58+98 –SR1– LT
FROM STA 19+67.59 –Y7– LT TO STA 10+50 –SR4– LT
FROM STA 11+00 TO STA 13+00 –SR5– RT
FROM STA 11+00 TO STA 12+00 –DR3– RT
FROM STA 11+00 TO STA 12+00 –DR3– LT

DETAIL AT
STANDARD 'V' DITCH
(Not to Scale)



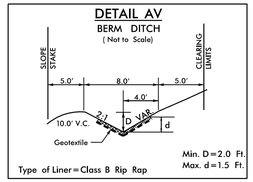
FROM STA 277+50 TO STA 278+10 –L– RT
FROM STA 10+95 –DR1– LT TO STA 93+50 –SR2– RT
AT STA. 11+50 –DR1– LT

DETAIL AU
STANDARD BASE DITCH
(Not to Scale)



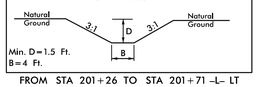
FROM STA 168+75 TO STA 170+00 –L– RT
FROM STA 173+00 TO STA 174+50 –L– RT
AT STA 18+79 –Y7RPA– LT

DETAIL AV
BERM DITCH
(Not to Scale)



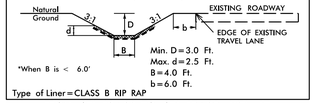
FROM STA. 10+40 TO STA. 11+02 –Y7RPA– RT.
FROM STA. 11+54 TO STA. 12+24 –Y7RPA– RT.
FROM STA. 13+32 TO STA. 14+67 –Y7RPA– RT.

DETAIL AW
STANDARD BASE DITCH
(Not to Scale)



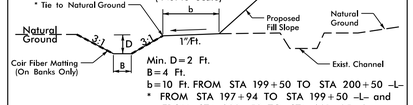
FROM STA 201+26 TO STA 201+71 –L– LT

DETAIL AX
STANDARD BASE DITCH
(Not to Scale)



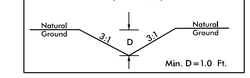
FROM STA. 13+80 TO STA. 17+20 –WBL– LT.

DETAIL AY
CHANNEL CHANGE
(Not to Scale)



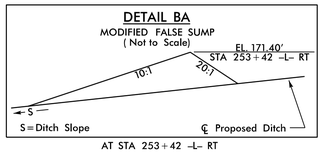
FROM STA 197+94 (171.0' RT) TO STA 201+05 (145.6' RT) –L–

DETAIL AZ
STANDARD 'V' DITCH
(Not to Scale)



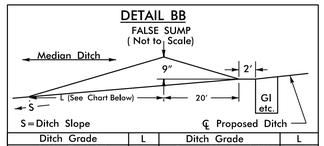
FROM STA 54+07 TO STA 54+40 –SR7– LT

DETAIL BA
MODIFIED FALSE SUMP
(Not to Scale)



AT STA 253+42 –L– RT

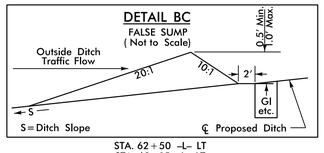
DETAIL BB
FALSE SUMP
(Not to Scale)



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'

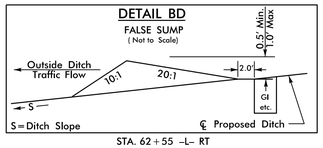
STA. 21+10 –L– MED
STA. 32+35 –L– MED
STA. 36+40 –L– MED
STA. 40+65 –L– MED
STA. 48+10 –L– MED
STA. 51+50 –L– MED
STA. 62+45 –L– MED
STA. 68+15 –L– MED
STA. 73+15 –L– MED
STA. 95+65 –L– MED
STA. 99+50 –L– MED
STA. 102+50 –L– MED
STA. 109+90 –L– MED
STA. 114+40 –L– MED
STA. 118+55 –L– MED
STA. 124+55 –L– MED
STA. 129+55 –L– MED
STA. 134+60 –L– MED
STA. 139+65 –L– MED
STA. 144+70 –L– MED
STA. 147+75 –L– MED
STA. 151+05 –L– MED
STA. 153+80 –L– MED

DETAIL BC
FALSE SUMP
(Not to Scale)



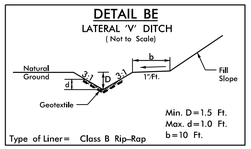
STA. 62+50 –L– LT
STA. 68+15 –L– LT
STA. 10+70 –Y7LPA– LT
STA. 11+85 –Y9RPC– RT
STA. 14+30 –Y9RPC– RT
STA. 17+25 –Y9RPC– RT
STA. 22+15 –Y9RPD– RT
STA. 44+45 –SR2– RT
STA. 13+55 –SR4– LT
STA. 15+50 –SR4– LT
STA. 16+65 –SR4– LT

DETAIL BD
FALSE SUMP
(Not to Scale)



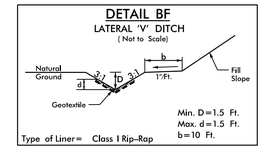
STA. 62+55 –L– RT
STA. 148+15 –L– RT
STA. 230+15 –L– RT
STA. 13+10 –Y7LPA– RT
STA. 16+40 –Y7LPA– RT
STA. 11+65 –Y7RPA– RT
STA. 14+90 –Y7RPA– RT
STA. 18+05 –Y7RPC– RT
STA. 18+50 –Y7RPC– LT
STA. 21+65 –Y9RPA– LT
STA. 22+90 –Y9RPC– LT
STA. 22+90 –Y9RPC– RT
STA. 12+85 –Y9RPD– LT
STA. 34+26 –SR2– RT
STA. 60+65 –SR2– RT
STA. 65+55 –SR2– RT
STA. 16+65 –SR4– RT

DETAIL BE
LATERAL 'V' DITCH
(Not to Scale)



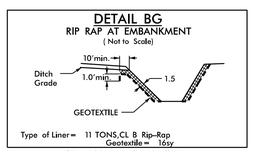
FROM STA 24+00 TO STA 25+50 –Y7– RT

DETAIL BF
LATERAL 'V' DITCH
(Not to Scale)



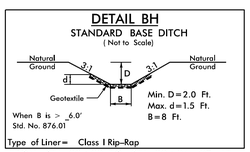
FROM STA 25+50 TO STA 25+64 –Y7– RT

DETAIL BG
RIP RAP AT EMBANKMENT
(Not to Scale)



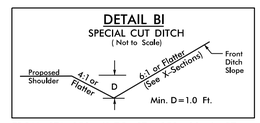
STA. 198+00 (175' RT) –L–

DETAIL BH
STANDARD BASE DITCH
(Not to Scale)



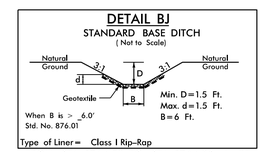
FROM STA 29+32 TO STA 29+94 –Y7– LT

DETAIL BI
SPECIAL CUT DITCH
(Not to Scale)



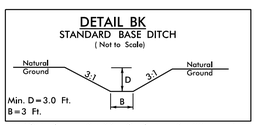
FROM STA 250+61 TO STA 252+00 –L– RT
FROM STA 252+00 TO STA 254+00 –L– LT
FROM STA 17+53 TO STA 18+53 –Y9RPA– LT
FROM STA 22+17 TO STA 25+50 –Y9RPA– LT
FROM STA 20+79 TO STA 24+89 –Y9RPC– LT
FROM STA 22+00 TO STA 24+00 –Y9RPD– RT

DETAIL BJ
STANDARD BASE DITCH
(Not to Scale)



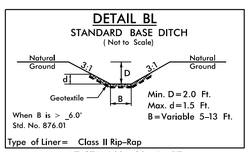
FROM STA 174+50 TO STA 174+86 –L– RT

DETAIL BK
STANDARD BASE DITCH
(Not to Scale)



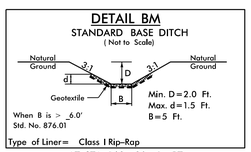
FROM STA 170+00 TO STA 173+00 –L– RT

DETAIL BL
STANDARD BASE DITCH
(Not to Scale)



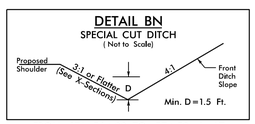
AT STA 168+80 –L– RT

DETAIL BM
STANDARD BASE DITCH
(Not to Scale)



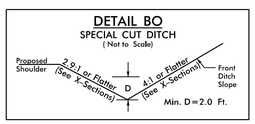
AT STA 168+80 –L– RT

DETAIL BN
SPECIAL CUT DITCH
(Not to Scale)



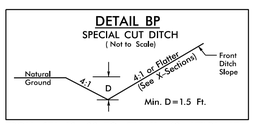
FROM STA 56+00 TO STA 57+50 –L– LT
FROM STA 58+50 TO STA 61+00 –L– LT

DETAIL BO
SPECIAL CUT DITCH
(Not to Scale)



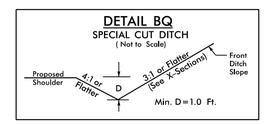
FROM STA 252+09.08 TO 254+50 –L– RT

DETAIL BP
SPECIAL CUT DITCH
(Not to Scale)



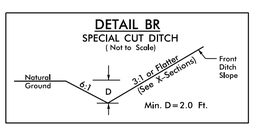
FROM STA 10+00 TO STA 11+49 –Y7LPA– LT

DETAIL BQ
SPECIAL CUT DITCH
(Not to Scale)



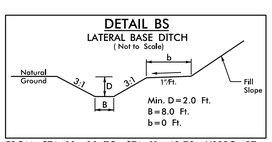
FROM STA 15+52 TO STA 16+52 –Y9RPA– LT

DETAIL BR
SPECIAL CUT DITCH
(Not to Scale)



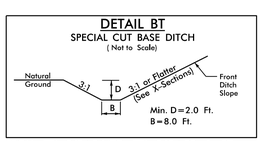
FROM STA 12+01 TO STA 16+05 –Y9RPB– LT

DETAIL BS
LATERAL BASE DITCH
(Not to Scale)



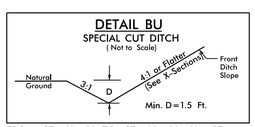
FROM STA 10+00 TO STA 11+48.78 –Y9RPC– RT

DETAIL BT
SPECIAL CUT DITCH
(Not to Scale)



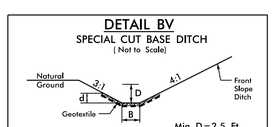
FROM STA 261+34 TO STA 262+00 –L– RT
FROM STA 22+19 TO STA 24+69 –SR1– LT

DETAIL BU
SPECIAL CUT DITCH
(Not to Scale)



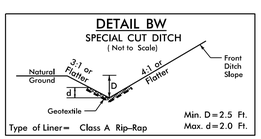
FROM STA. 11+50 TO STA. 13+80 –Y4– RT
FROM STA. 23+00 TO STA. 25+50 –Y9– RT
FROM STA. 58+98 TO STA. 62+60 –SR1– LT
FROM STA. 48+88 TO STA. 55+18 –SR2– RT
FROM STA. 63+98 TO STA. 65+45 –SR2– RT
FROM STA. 80+70 TO STA. 84+67 –SR2– RT
FROM STA. 92+99 TO STA. 97+30 –SR2– LT
FROM STA. 96+87 –SR2– RT TO STA. 18+20 –Y5– RT
FROM STA. 10+40 –SR3– RT TO STA. 17+50 –Y5– LT
FROM STA. 10+02 TO STA. 13+50 –SR3– LT
FROM STA. 56+50 TO STA. 63+00 –SR3– RT
FROM STA. 31+00 TO STA. 40+49 –SR6– RT
FROM STA. 47+30 TO STA. 49+40 –SR6– RT
FROM STA. 14+13 TO STA. 17+00 –SR7– LT
FROM STA. 23+00 TO STA. 27+00 –SR7– RT
FROM STA. 29+00 TO STA. 31+00 –SR7– RT
FROM STA. 56+60 TO STA. 57+57 –SR7– LT
FROM STA. 70+96 TO STA. 72+40 –SR7– LT

DETAIL BV
SPECIAL CUT DITCH
(Not to Scale)



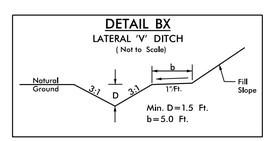
FROM STA. 35+50 TO STA. 37+44 –SR7– LT.

DETAIL BW
SPECIAL CUT DITCH
(Not to Scale)



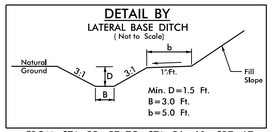
FROM STA. 31+50 TO STA. 35+50 –SR7– RT

DETAIL BX
LATERAL 'V' DITCH
(Not to Scale)



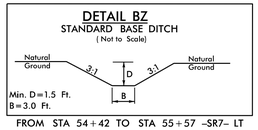
FROM STA 47+57 TO STA 51+07 –SR7– LT

DETAIL BY
LATERAL BASE DITCH
(Not to Scale)



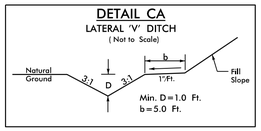
FROM STA 55+57 TO STA 56+60 –SR7– LT

DETAIL BZ
STANDARD BASE DITCH
(Not to Scale)



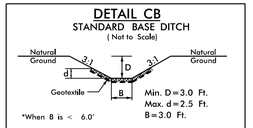
FROM STA 54+42 TO STA 55+57 –SR7– LT

DETAIL CA
LATERAL 'V' DITCH
(Not to Scale)



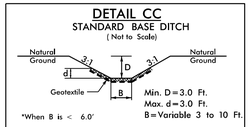
FROM STA 51+07 TO STA 54+07 –SR7– LT

DETAIL CB
STANDARD BASE DITCH
(Not to Scale)



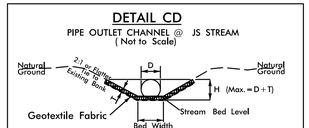
FROM STA 54+18 TO STA 54+41 –SR7– LT

DETAIL CC
STANDARD BASE DITCH
(Not to Scale)



FROM STA 54+41 TO STA 54+52 –SR7– LT

DETAIL CD
PIPE OUTLET CHANNEL @ JS STREAM
(Not to Scale)



AT STA 66+55 –SR1– RT

8/17/99

REVISIONS

DRAINAGE DETAILS
(NOT TO SCALE)

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

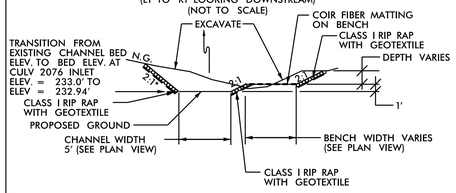
PROJECT REFERENCE NO.	SHEET NO.
W-5600	2D-3
R/W SHEET NO.	

HYDRAULICS ENGINEER
12/15/2020 10:46:23 PST

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B ALLRED

DocuSigned by:
K. B Allred
4A0F1B0B0B0F4C4...

DETAIL 2076A
INLET CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)

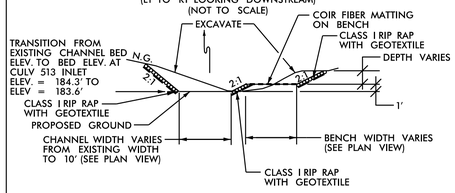


*LAID BACK RIP RAPPED SLOPED WHERE CHANNEL WORK DIVERGES FROM EXISTING (SEE PLAN VIEW EXTENTS)

Est Cl I RR – 17 Tons; Est GeoTextile Fabric – 42 sq. yd.
Est DDE – 22 cu. yd.; Est Coir Fiber Matting – 17 sq. yd.

FROM 20 FT. US OF PROPOSED INLET CULVERT 2076 TO PROPOSED INLET CULVERT 2076

DETAIL 513A
INLET CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)



Est Cl I RR – 55 Tons; Est GeoTextile Fabric – 130 sq. yd.
Est DDE – 65 cu. yd.; Est Coir Fiber Matting – 28 sq. yd.

FROM 42 FT. US OF PROPOSED INLET CULVERT 513 TO PROPOSED INLET CULVERT 513

DETAIL 500514
(NOT TO SCALE)
SKEWED MULTI–BARREL CULVERT LOW FLOW CHANNEL,SILLS AND FLOOD PLAIN

*NOTES:

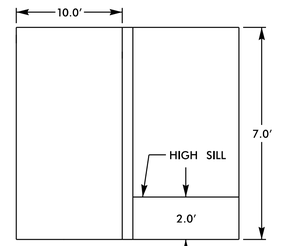
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP–RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP–RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

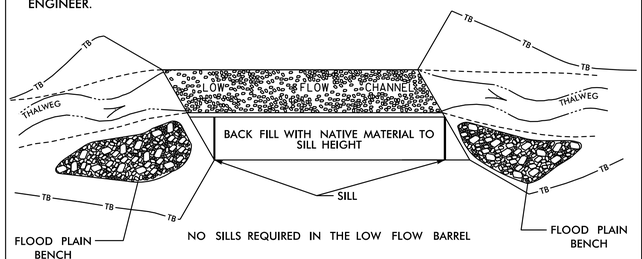
2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.

5) NUMBER OF SILLS DETERMINED BY THE ENGINEER.

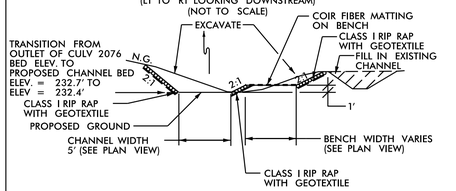




PLAN VIEW

9/13

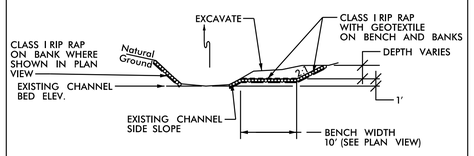
DETAIL 2076B
OUTLET CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)



Est Cl I RR – 43 Tons; Est GeoTextile Fabric – 102 sq. yd.
Est DDE – 62 cu. yd.; Est Coir Fiber Matting – 26 sq. yd.
Est Fill – 49 cu. yd.

FROM PROPOSED OUTLET CULVERT 2076 TO 46 FT. D/S OF PROPOSED OUTLET CULVERT 2076

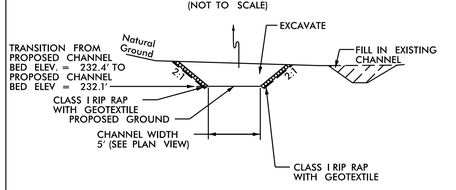
DETAIL 513B
CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)



Est Cl I RR – 283 Tons; Est GeoTextile Fabric – 400 sq. yd.
Est DDE – 450 cu. yd.

FROM OUTLET CULVERT 513 TO 108 Ft. DOWNSTREAM

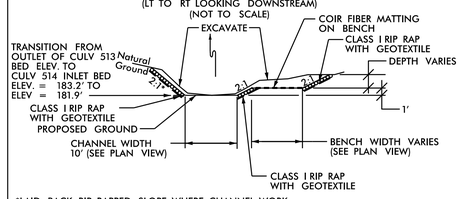
DETAIL 2076C
OUTLET CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)



Est Cl I RR – 34 Tons; Est GeoTextile Fabric – 71 sq. yd.
Est DDE – 55 cu. yd.; Est Fill – 10 cu. yd.

FROM 46 FT. D/S OF PROPOSED OUTLET CULVERT 2076 TO 81 FT. D/S OF PROPOSED OUTLET CULVERT 2076

DETAIL 514A
CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)

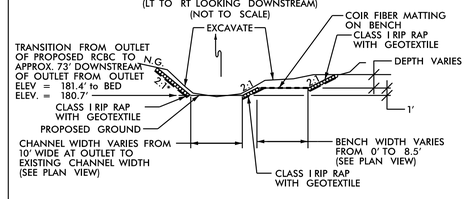


*LAID BACK RIP RAPPED SLOPE WHERE CHANNEL WORK DIVERGES FROM EXISTING (SEE PLAN VIEW EXTENTS)

Est Cl I RR – 162 Tons; Est GeoTextile Fabric – 278 sq. yd.
Est DDE – 354 cu. yd.; Est Coir Fiber Matting – 57 sq. yd.

FROM 108 Ft. DOWNSTREAM OF CULVERT 513 OUTLET TO INLET CULVERT 514

DETAIL 514B
OUTLET CHANNEL TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(NOT TO SCALE)



*NOTE TRANSITION ALONG EXTENTS 2:1 SLOPE TO EXISTING BANK SLOPE

Est Cl I RR – 192 Tons; Est GeoTextile Fabric – 393 sq. yd.
Est DDE – 736 cu. yd.; Est Coir Fiber Matting – 40 sq. yd.

FROM CULVERT 514 OUTLET TO APPROXIMATELY 73' DOWNSTREAM

12/14/2020
12/14/2020 dy psh 02D-03_DitchDetails.dgn
USER:Heather

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5600	2G-1

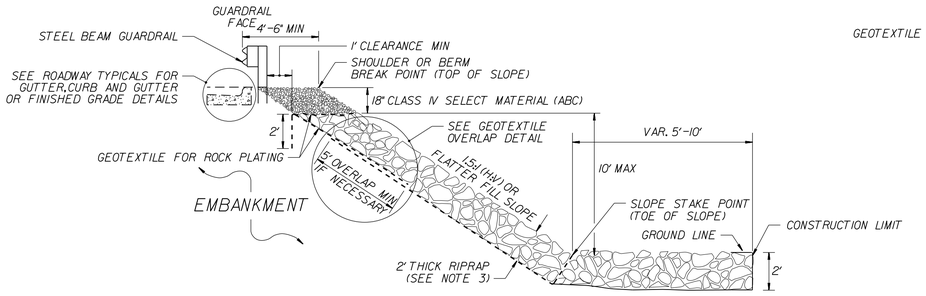
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

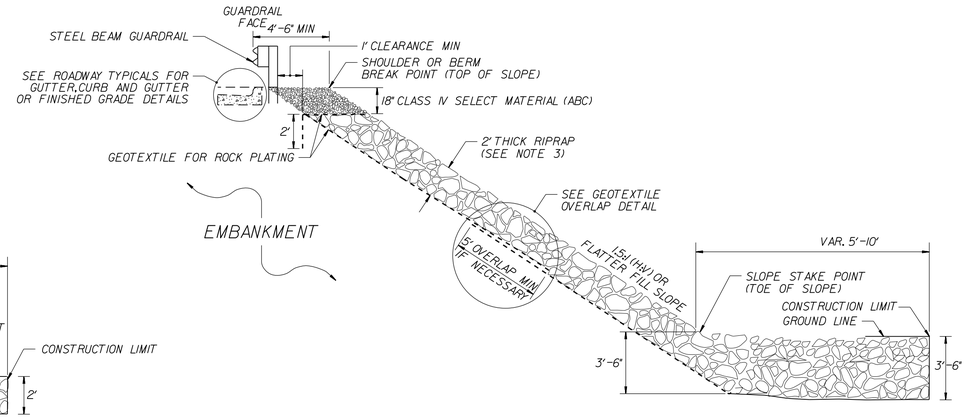
ROCK PLATING

SHEET 1 OF 1

275D01



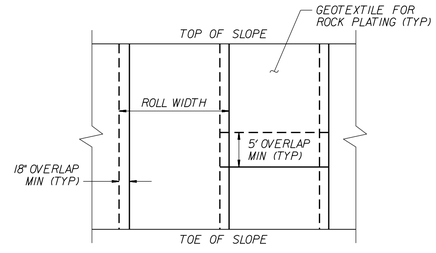
ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR ROCK PLATING,SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS I,2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)

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

ROADWAY DETAIL DRAWING FOR

ROCK PLATING

SHEET 1 OF 1

275D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

12/15/2020 | 11:58:18 EST

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

Joel S. Howerton

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

SEE TITLE BLOCK

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

04-FEB-2019 10:54
S:\Contracts\Special Details\jhowerton\Rock Plating Detail.dgn
jhowerton
AT CSD-292595

6/2/99

COMPUTED BY: SMM DATE: 4/3/2020
CHECKED BY: JCH DATE: 4/4/2020

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
W-5600	3B-1

WETHERILL ENGINEERING
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Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUMMARY OF EARTHWORK

IN CUBIC YARDS

CHAIN	STATION	STATION	TOTAL UNCLASS.	UNDERCUT	EMBANK. +%	BORROW	WASTE
	Phase 1A & 1B Left		0		0	0	0
-L- LT	19+00.00	44+00.00	6,856		418	0	6,438
-L- LT	44+00.00	69+00.00	693		1,056	363	0
-L- LT	69+00.00	104+00.00	803		1,269	466	0
-L- LT	104+00.00	147+00.00	2,744		414	0	2,330
-L- LT	179+00.00	195+50.00	5,922		1,178	0	4,744
-L- LT	227+00.00	254+00.00	2,139		1,931	0	208
-L- LT	254+00.00	281+85.00	3,973		1,090	0	2,883
-Y4-	10+75.00	14+00.00	281		1,083	802	0
-Y9-	14+90.00	20+00.00	900		520	0	380
-Y9RPA-	10+00.00	25+90.00	3,915		41,528	37,613	0
-Y9RPB-	10+00.00	16+05.02	971		9,328	8,357	0
-SR1-	10+00.00	30+09.94	1,126		15,141	14,015	0
-SR1-	30+09.94	67+00.00	1,230		11,940	10,710	0
-SR7-	12+00.00	40+25.00	11,900	1,110	3,793	0	9,217
-SR7-	40+25.00	54+06.67	344	530	4,614	4,381	641
-SR7-	54+06.67	74+60.00	2,109	895	2,466	732	1,270
-SR8-	10+30.00	12+30.00	214	207	274	257	404
-SR9-	10+50.00	12+60.00	876		185	0	691
			0		0	0	0
		SUBTOTAL	46,996	2,742	98,228	77,696	29,206
	Phase 1A & 1B Right		0		0	0	0
-L- RT	19+00.00	44+00.00	988		760	0	228
-L- RT	44+00.00	69+00.00	879		1,854	975	0
-L- RT	69+00.00	104+00.00	1,819		301	0	1,518
-L- RT	104+00.00	147+00.00	6,297		856	0	5,441
-L- RT	179+00.00	202+00.00	4,364		26,970	22,606	0
-L- RT	195+50.00	202+00.00	0		2,574	2,574	0
-L- RT	202+00.00	217+00.00	510		67,525	67,015	0
-L- RT	226+00.00	254+00.00	1,940		3,256	1,316	0
-L- RT	254+00.00	281+85.00	5,347		551	0	4,796
-Y7LPC-	13+90.00	20+70.00	31,771	1,791	840	0	32,722
Y7RPC-	10+00.00	31+19.32	72,661	4,031	1,391	0	75,301
-Y9-	21+50.00	28+00.00	2,951		995	0	1,956
-Y9RPC-	10+00.00	25+20.00	6,397		7,678	1,281	0
-Y9RPD-	10+00.00	24+00.00	1,397		28,863	27,466	0
-SR2-	16+80.00	36+64.55	2,906		8,030	5,124	0
-SR2-	36+64.55	61+02.99	1,566		13,816	12,250	0
-SR2-	61+02.99	97+30.47	8,447		16,009	8,388	826
-SR3-	9+78.00	41+50.00	1,017		27,299	26,282	0
-SR3-	41+50.00	64+00.00	17,413		5,405	0	12,008
-SR6-	10+30.00	49+40.00	2,446		11,676	9,230	0
-DR1-	10+30.00	11+40.00	306		41	0	265
			0		0	0	0
		SUBTOTAL	171,422	5,822	226,690	184,507	135,061
	Phase 1C LT		0		0	0	0
-L- LT	147+00.00	156+00.00	463		795	332	0
-L- LT	158+00.00	179+00.00	7,312		2,388	0	4,924
-Y7-	14+20.00	20+50.00	1,600	239	285	0	1,554
-SR4-	10+50.00	18+00.00	1,883	1,122	506	0	2,499
-DR2-	10+50.00	12+70.00	3		2,269	2,266	0
-Y7LPA-	10+00.00	20+65.00	2,106		9,295	7,189	0
-Y7RPA-	10+00.00	28+40.98	6,683		25,081	18,398	0
			0		0	0	0
		SUBTOTAL	20,050	1,361	40,619	28,185	8,977
	Phase 1C RT		0		0	0	0
-L- RT	147+00.00	156+00.00	6,672		126	0	6,546
-L- RT	158+00.00	179+00.00	2,484		2,720	236	0
-Y7LPC-	10+10.00	13+90.00	11,865		106	0	11,759
-SR5-	10+50.00	15+75.00	932		5,959	5,027	0
			0		0	0	0
		SUBTOTAL	21,953	0	8,911	5,263	18,305
	Phase 2		0		0	0	0
-L- MED	168+00.00	202+00.00	2,475		9,920	7,445	0
-L-	218+00.00	227+00.00	0		85,831	85,831	0
-L- MED	227+00.00	254+00.00	2,223		4,385	2,162	0
-L- MED	254+00.00	281+85.00	2,613		10	0	2,603
-Y9-	20+00.00	21+50.00	0		484	484	0
-Y9RPB-	16+05.02	24+25.00	1,393		21,371	19,978	0
			0		0	0	0
		SUBTOTAL	8,704	0	122,001	115,900	2,603
	Phase 3		0		0	0	0
-L- LT	156+00.00	158+00.00	270		0	0	270
-L- MED	19+00.00	44+00.00	1,788		1,184	0	604
-L- MED	44+00.00	69+00.00	1,359		2,213	854	0
-L- MED	69+00.00	97+00.00	1,241		799	0	442
-L- MED	114+00.00	137+00.00	2,242		34	0	2,208
-L- MED	137+00.00	157+00.00	2,227		51	0	2,176
-L- MED	157+00.00	168+00.00	1,144		31	0	1,113
-Y7-	20+50.00	25+99.00	96	4	25,120	25,032	12
-Y7-	28+05.00	39+00.00	4,249		37,345	33,096	0
			0		0	0	0
		SUBTOTAL	14,616	4	66,777	58,982	6,825
	Phase 4		0		0	0	0
-L- MED	97+00.00	114+00.00	1,607		74	0	1,533
-L- RT	156+00.00	158+00.00	143		0	0	143
-Y5-	12+30.00	12+70.00	49		69	20	0
-Y5-	16+90.00	18+20.00	123		95	0	28
			0		0	0	0
		SUBTOTAL	1,922	0	238	20	1,704
		TOTAL	285,663	9,929	563,464	470,553	202,681
		MATERIAL FOR SHOULDER CONSTRUCTION			29,173	29,173	0
		LOSS DUE TO CLEARING & GRUBBING	-2,000		0	2,000	0
		ADDITIONAL UNDERCUT CONTINGENCY		3,250	4,063	4,063	3,250
		WASTE IN LIEU OF BORROW	0			-139,722	-139,722
		PROJECT TOTAL	283,663	13,179	596,699	366,066	66,209
		EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				18,303	
		GRAND TOTAL	283,663	13,179		384,369	
		SAY	300,000	14,450		400,000	

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.

Pavement Structure Volume (CY)= 147,611

EST. DDE = 35,000 CUBIC YARDS
EST. SHALLOW UNDERCUT = 1,000 CUBIC YARDS
EST.SHALLOW UNDERCUT BY STATIONS = 150 CUBIC YARDS
TOTAL SHALLOW UNDERCUT = 1,150 CUBIC YARDS
CLASS IV SUBGRADE STABILIZATION = 2,300 TONS

12/4/2020
C:\SUP\projects\w5600\roddy.psh.03B-01.Earthwork Summary.dgn
USER:Rodney Roddy

COMPUTED BY: SMM DATE: 6/1/2020
CHECKED BY: JCH DATE: 1/4/2021

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
W-5600	3B-2

ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

"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 MASH TL-3
NG = NON-GATING IMPACT ATTENUATOR MASH TL-3

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHLD. WIDTH	FLARE LENGTH		W		ANCHORS					IMPACT ATTENUATOR MASH, TL-3			REMOVE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMARKS
																					PERMITTED				
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APP. END	TRAIL END			APP. END	TRAIL END	APP. END	TRAIL END	Type III	B-77	GREU TL-3	CAT-1	TES	NO.	G	NG			
L	19+00.00	24+87.50	LT	587.5					13	16	50		1				1						587.5		Replace Existing Guardail
L	19+00.00	22+29.00	RT	331.25					10	13								1					331.25		Replace Existing Guardail
L	19+61.00	22+92.00	MED LT & RT																				652		
L	41+20.00	54+26.00	MED LT & RT																				2602		
L	94+50.00	95+65.00	LT																				115		
L	154+35.00	155+89.00	LT																				159		
L	153+45.00	155+45.00	RT																				200		Left and right of existing Y7
Y7	28+00.00	30+05.00	LT/RT																				415		
L	158+39.00	168+93.00	RT																				1058		
L	191+63.00	201+83.00	RT																				1033		
WBL	12+25.00	16+00.00	LT																				378		
L	221+60.00	242+05.00	MED LT & RT																				4075		
L	250+21.00	254+08.00	MED LT & RT																				750		
L	262+60.00	273+04.00	MED LT & RT																				2054		
L	281+06.00	281+85.00	MED LT & RT																				131		
L	27+94.92	31+60.00	RT	372.875			31+60.00		14	17	50		1			1	1								
SR2	20+47.64	24+06.75	LT	360.375				21+70.00	8	11		50		1		1	1								
SR2	35+50.00	40+36.45	RT	487.5			36+75.00	39+11.45	8	11	50	50	1	1			2								
SR1	25+20.00	28+45.88	LT	325			26+45.00	27+20.88	8	11	50	50	1	1			2								
L	52+60.00	56+20.37	LT	360.375			52+60.00		14	17	50		1			1	1								
SR2	58+06.00	60+68.50	LT	262.5			58+56.00	58+56.00	8	11	50	50	1	1			2								
L	66+85.00	69+35.00	RT	247.875			69+35.00		14	17	50		1			1	1								
Y5	12+74.00		LT/RT	75																					
L	154+43.75	158+00.00	LT	356.25			155+20.00		5.8125	12	50		1				1	1							RDY STD 610.02 for GR. underneath -Y7- bridge.
L	12+00.00 (-Y7LPC-)	175+08.00	RT	2143.75			10+75.00 (-Y7LPC-)		12	15	250		5				1	1							RDY STD 610.02 for GR. underneath -Y7- bridge, use 50:1 taper to reach "N".
L	155+23.69	157+46.31	Median	241.5			Bridge Pier		19.58							4				2	X	X			RDY STD. 865.01 SHEET 1 OF 12. SEE CONC BARRIER SUMMARY
Y7	23+68.54	25+97.78	RT	231.25			Bridge		6	9	50		1		1		1								
Y7	27+92.19	29+66.57	RT	175				Bridge	6	9					1			1							
Y7	23+93.20	26+11.93	LT	218.75				Bridge	7.5	10.5		50		1	1		1								
Y7	28+06.53	30+25.09	LT	218.75			Bridge		7.5	10.5	50		1		1		1								
L	193+50.00	201+63.19	RT	806.25			195+00.00		12	15	50		1				1	1							
Y9RPB	14+71.78	20+50.00	LT	581.25			20+00.00		12	15	50		1				1	1							
L	209+62.14	216+59.84	LT	704.125			209+62.14		12	15						1		1							
L	210+48.79	217+02.46	RT	647.875			212+50.00		12	15	50		1			1	1								
L	217+60.63	226+01.14	LT	847.875			224+50.00		12	15	50		1			1	1								
L	218+05.31	224+02.14	RT	591.625			Bridge		12	15						1		1							
Y9RPA	16+00.00	22+76.43	RT	681.25			17+00.00		12	15	50		1				1	1							
Y9RPD	16+90.72	22+50.00	LT	556.25			20+50.00		12	15	50		1				1	1							
Y9	19+45.00	21+38.75	RT	193.75			20+02.00		Face of Curb		50		1				1	1							
Y9	20+26.25	22+45.00	LT	218.75			21+61.74		Face of Curb		50		1				1	1							
L	233+00.00	234+45.00	LT	143.75			23+00.00		12	15	50		1				1	1							
L	276+50.00	279+43.75	LT	293.75			276+50.00		12	15	50		1				1	1							
L	279+66.25	281+85.00	Median RT	222.875			279+66.25		13.79							1									Tie to Existing Guardrail
L	279+66.25	281+85.00	Median LT	218.75					13.79									1							Tie to Existing Guardrail
Y16	11+70.00		LT/RT	37.5																					
			SUBTOTAL	13741.125																					
	ANCHOR UNIT DEDUCTIONS																								
	Type	Quantity	Deduction																						
	III	4	18.75	75																					
	B-77	13	22.875	297.375																					
	GREU-TL3	26	50	1300																					
	CAT-1	15	6.25	93.75																					
			TOTAL	11975											4	13	26	15		2			14540.75		
			SAY	12000											4	13	26	15		2			14550		
							ADDITIONAL GUARDRAIL POSTS: SAY 10 EA																			

CABLE GUIDERAIL SUMMARY

SURVEY LINE	BEGIN STATION	END STATION	LENGTH DOUBLE FACED	END ANCHOR UNIT	INTERMEDIATE ANCHOR UNIT	ADDITIONAL GUIDERAIL POSTS	REMOVE EXISTING GUIDERAIL
-L-	19+70.00	155+12.00	13544.84	2	12	6	9975
-L-	157+58.00	209+58.00	5208.89	2	4	6	5516
		SUBTOTAL:	18753.73	4	16	12	15491
		LESS END ANCHOR UNITS - 4 @25'	-100				
		GRAND TOTAL:	18653.73	4	16	12	15491
		SAY:	18700	4	16	12	15500

SUMMARY OF CONCRETE BARRIER

LINE	BEGIN STATION	END STATION	LOCATION	DOUBLE FACED TYPE T (FT)	SINGLE FACED CONCRETE BARRIER (FT)	CONC. BARRIER TRANSITION SECTION (EA)
-L-	31+60.00	34+90.23	RT			1
-L-	34+90.23	52+45.00	RT	1,754.77		
-L-	43+10.00	52+60.00	LT	945.00		
-L-	69+35.00	99+40.00	RT	2,975.00		
-L-	156+05.00	156+65.00	MED LT		60.00	
-L-	156+05.00	156+65.00	MED RT		60.00	
-L-	209+75.00	214+68.00	MED	494.00		
-L-	214+68.00	216+58.00	MED			1*
-L-	218+10.00	219+05.00	MED			1*
-L-	219+05.00	279+66.25	MED	6,061.25		
			TOTAL:	12,230.02	120.00	3
			SAY:	12,300.00	130.00	3

* Transition from Type T Barrier to Conc Barrier on Approach Slab

1/4/2021
12:50:00 PM
USER: jchan
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COMPUTED BY: SMM DATE: 6/6/2020
CHECKED BY: JCH DATE: 6/7/2020

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
W-5600	3B-3

WETHERILL ENGINEERING
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WOVEN WIRE FENCE, 47" FABRIC

E = [A - (8B + 16C + 16D)] - (B + C + D)
14 2

F = (2B + 3C + 3D)

SURVEY LINE	BEGIN STATION	END STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
-L-	25+28.00	25+59.00	LT	30.00				2	
-L-	23+53.98	31+10.00	RT	800.00	2	1	2	50	13
-L-	20+10.00 (SR1)	43+10.00	LT	425.00	1		2	26	8
-L-	52+60.00	74+70.00	LT	2,250.00	1	2	8	143	32
-L-	52+45.00	69+35.00	RT	1,680.00	2		6	108	22
-L-	99+40.00	101+50.00	RT	220.00	1		1	13	5
-L-	104+03.00	105+88.00	RT	185.00				13	
-L-	103+38.00	105+18.00	LT	180.00				13	
-Y7RPC-	10+00.00	61+80.79 (SR3)	RT	2,135.00	1	3	7	135	32
-SR3-	61+80.79	39+26.55 (Y7)	RT	420.00	2	2		25	10
-SR5-	12+12.10	35+00.00 (Y7)	RT	395.00	2	1	1	23	10
-Y7-	30+06.00	12+12.10 (SR5)	LT	190.00	1	1		11	5
-Y7-	20+70.00	11+80.00 (DR2)	RT	315.00	2	1		19	7
-DR2-	11+80.00	154+89.12 (L)	LT	205.00	1	2		10	8
-Y7-	20+70.00	174+00.00 (L)	LT	2,050.00	1	7	6	124	41
-L-	176+10.00	183+75.00	LT	745.00	2	1	2	46	13
-L-	195+50.00	27+00.00 (Y9)	RT	2,580.00	1	9	6	159	47
-L-	198+25.00	202+00.00	LT	470.00		5		25	15
-Y9RPB-	14+15.00	20+25.00	LT	645.00			2	43	6
-Y9RPB-	22+72.00	16+75.00 (Y9)	LT	110.00	1	1		5	5
-Y9-	17+00.00	18+48.83	LT	160.00	1	1		9	5
-Y9RPA-	24+46.22	12+50.00 (SR8)	RT	1,540.00		3	8	92	33
-SR6-	11+50.00	260+75.00 (L)	LT	4,490.00	1	10	16	277	80
-L-	244+77.69	277+96.70	LT	3,360.00		4	11	215	45
-L-	276+30.00	278+06.00	RT	180.00			2	10	6
			TOTAL:	25,760.00				1595	448
			SAY:	25,800				1600	450

BREAKING OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-Y7-	20+00	25+99	LT	14442.00		1604.67
-Y7-	28+05	34+00	LT	18092.00		2010.22
-L-	200+00	213+00	EXEBL	45218.00		5024.22
-L-	223+00	229+00	EX-US70	34589.00		3843.22
					TOTAL	12,482.33
					SAY	12,490

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	19+50	31+50	MEDIAN	15627.00		1736.33
-L-	23+55	26+65	RT	14328.00		1592.00
-SR2-	19+75	27+65	RT	29892.00		3321.33
-SR1-	32+68	36+35	LT	4259.00		473.22
-L-	62+25	74+18	MEDIAN	17635.00		1959.44
-L-	66+43	71+96	LT	13215.00		1468.33
-L-	64+23	69+74	RT	15582.00		1731.33
-Y4-/-SR1-	11+10 (-Y4-)	65+88 (-SR1-)	LT	10336.00		1148.44
-SR2-	89+79	97+69	RT	17122.00		1902.44
-L-	98+60	110+50	MEDIAN	18370.00		2041.11
-L-	103+60	108+20	LT	10152.00		1128.00
-L-	101+00	105+90	RT	13060.00		1451.11
-Y7-	16+54	20+00	LT	2514.00		279.33
-Y7-	25+99	26+43	LT	4964.00		551.56
-L-	151+07	163+86	MEDIAN	16853.00		1872.56
-Y7-	27+87	29+59	LT	6387.00		709.67
-Y7-	28+70	30+29	RT	3745.00		416.11
-Y7-	34+00	36+84	LT	2073.00		230.33
-L-	195+00	200+00	EX-EBL	12137.00		1348.56
-L-	196+00	213+00	EX-WBL	47357.00		5261.89
-L-	213+00	223+00	EX-US 70	90959.00		10106.56
-L-	229+00	230+00	EX-US70	5710.00		634.44
-SR7-/-SR8-	13+11 (-SR7-)	12+02 (-SR8-)	EX-SR2578	7424.00		824.89
-L-	244+71	249+69	LT	11267.00		1251.89
-L-	240+00	252+00	MEDIAN	13839.00		1537.67
-L-	241+63	246+69	RT	14804.00		1644.89
-L-	257+09	262+93	LT	22205.00		2467.22
-L-	252+47	264+29	MEDIAN	13642.00		1515.78
-L-	251+97	259+35	RT	16552.00		1839.11
-L-	276+73	279+98	LT	10285.00		1142.78
-L-	271+75	281+63	MEDIAN	12585.00		1398.33
-L-	273+48	278+03	RT	9028.00		1003.11
-SR9- / -SR7-	11+68 (-SR9-)	31+05 (-SR7-)	LT	3203.00		355.89
TEMPORARY PAVEMENT - MAINLINE						
-L-	26+00	67+74	MED. LT	20000.42		2222.27
-L-	69+04	103+84	MED. LT	16675.00		1852.78
-L-	105+45	152+00	MED. LT	22305.21		2478.36
-L-	173+40	200+00	MED. LT	15405.83		1711.76
-L-	236+51	245+38	MED. LT	2476.21		275.13
-L-	281+30	285+30	MED. LT	1916.67		212.96
-L-	26+57	67+76	MED. RT	19736.88		2192.99
-L-	69+02	103+83	MED. RT	16679.79		1853.31
-L-	105+44	152+00	MED. RT	22310.00		2478.89
-L-	173+40	205+13	MED. RT	15203.96		1689.33
-L-	219+57	245+40	MED. RT	12376.88		1375.21
-L-	246+30	257+78	MED. RT	5500.83		611.20
-L-	258+54	272+28	MED. RT	6583.75		731.53
-L-	277+63	283+92	MED. RT	3013.96		334.88
-L-	233+00	243+55	MED. RT	5318.96		591.00
TEMPORARY PAVEMENT -RAMPS						
-Y9RPA-	22+88	26+56	RT	4235.00		470.56
-Y9RPC-	21+00	25+51	RT	4694.00		521.56
-Y9RPC-	22+60	25+48	LT	1294.00		143.78
-Y9RPD-	22+50	23+90	LT	573.00		63.67
-Y9RPD-	10+00	16+84	LT	7163.00		795.89
					TOTAL:	78,952.70
					SAY:	80,000

INCIDENTAL MILLING

LINE	STATION	STATION	LOCATION	LENGTH	AREA FROM CADD OR WIDTH	SQUARE FEET
-Y4-	10+75.00	11+50.00	CL		1,862.78	1,862.78
-Y5-	12+30.00	12+70.00	CL		1,291.09	1,291.09
-Y5-	17+50.00	18+20.00	CL		1,710.93	1,710.93
-Y7-	14+20.00	15+50.00	CL		2,810.08	2,810.08
-Y7-	36+80.00	39+00.00	CL		4,939.31	4,939.31
-Y9-	14+90.00	15+50.00	CL		3,089.57	3,089.57
-Y9-	26+50.00	28+00.00	CL		3,478.16	3,478.16
-SR1-	66+25.00	67+00.00	CL		2,292.90	2,292.90
-SR2-	16+80.00	18+70.00	CL		6,012.97	6,012.97
-SR6-	49+00.00	49+40.00	CL		3,374.96	3,374.96
-SR7-	12+00.00	12+90.00	CL		2,830.64	2,830.64
-SR7-	74+00.00	74+60.00	CL		1,357.65	1,357.65
-SR8-	11+90.00	12+30.00	CL		944.38	944.38
-SR9-	10+50.00	11+30.00	CL		1,624.26	1,624.26
					TOTAL IN FT^2	37,619.68
					TOTAL IN YD^2	4,179.96
					SAY	4,200.00

MILLING 2.5" DEPTH

LINE	STATION	STATION	LOCATION	LENGTH	AREA FROM CADD OR WIDTH	SQUARE FEET
-L-	19+70.00	197+50.00	LT	17,780.00	24.00	426,720.00
-L-	19+70.00	23+30.00	RT	360.00	36.00	12,960.00
-L-	23+30.00	26+30.00	RT	300.00	30.00	9,000.00
-L-	26+30.00	197+00.00	RT	17,070.00	24.00	409,680.00
-L-	230+00.00	281+85.00	LT	5,185.00	24.00	124,440.00
-L-	230+00.00	281+85.00	RT	5,185.00	24.00	124,440.00
					TOTAL IN FT^2	1,107,240.00
					TOTAL IN YD^2	123,026.67
					SAY	125,000.00

4" CONCRETE SIDEWALK

LINE	STATION	STATION	LOCATION	LENGTH	WIDTH	SQUARE YARDS
-Y9-	19+60.00	22+56.00	LT	296	5	164.44
-Y9-	19+34.00	22+30.00	RT	296	5	164.44
					TOTAL:	328.89
					SAY:	330

2'-6" CURB & GUTTER

LINE	STATION	STATION	SIDE	GROSS LENGTH	DEDUCTIONS DRIVES	DEDUCTIONS OTHERS	NET LENGTH
-Y7LPA-	12+08.00	19+81.80	LT	733.10			733.10
-Y7LPC-	12+90.83	19+86.11	LT	659.23			659.23
-Y9-	19+35.00	22+30.00	RT	320.17			320.17
-Y9-	19+60.00	22+56.00	LT	320.21			320.21
						TOTAL:	2,032.71
						SAY:	2,035.00

SHOULDER BERM GUTTER

LOCATION	SIDE	BEG. STA.	END STA.	LENGTH
-L-	LT	209+70.00	216+32.00	668.27
-L-	RT	211+11.00	216+75.00	560.74
-L-	LT	217+87.00	224+47.00	664.92
-L-	RT	218+32.00	223+82.00	544.86
-Y7-	LT	24+49.00	25+97.00	148.22
-Y7-	RT	24+23.00	25+83.00	159.68
-Y7-	LT	28+20.00	29+48.00	128.32
-Y7-	RT	28+06.00	29+63.00	157.29
-Y7LPC-	LT	10+00.00	11+50.00	150
-Y9RPB	LT	14+86.00	19+90.00	506.56
-Y9RPD-	LT	16+97.00	22+00.00	500.3
-SR1-	LT	25+77.00	27+94.00	216.21
			TOTAL:	4405.4
			SAY:	4410

RAL-WS090

COMPUTED BY: SMM **DATE:** 6/26/19

CHECKED BY: JCH **DATE:** 6/27/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5600	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 / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 21+23	0	CL	0501		261.1	256.3														
L 21+09	90	RT	0502				255.3													
			0504	0505		260.5	259.8													
SR2 20+90	31	RT	0505		262.8															
			0505	0506		259.8	256.5	0.5												
SR2 24+70	36	RT	0506		260.5															
			0506	0507		256.5	256.1	0.7												
SR2 24+70	19	LT	0507		264.4															
			0507	0508		256.1	255.7	0.8												
L 32+21	0	CL	0508		260.3															
			0508	0509		255.8	254.9	1.7												
L 36+24	0	CL	0601		257.3															
L 36+23	70	LT	0602																	
			0602	0603		254.0	253.5													
SR2 30+14		CL																		
SR2 30+99		CL																		
L 40+50		CL	0604		249.0															
			0604	0605		246.0	245.3													
SR1 22+23		CL	0606			241.8	241.4													
SR2 34+12	25	LT	0607		249.8															
			0607	0608		246.8	246.7													
SR2 34+12	19	LT	0608		249.7															
			0608	0609		246.7	245.6	0.5												
SR2 34+12	28	RT	0609		248.4															
			0609	0613		245.6	236.6	0.7	272											
SR2 35+60	19	LT	0610		248.2															
			0610	0612		245.2	244.8													
L 44+19	59	RT	0611		247.8															
			0611	0612		244.8	244.8													
SR2 36+84	18	LT	0612		247.8															
			0612	0613		244.8	236.6	1.5												
SR2 36+84	41	RT	0613		243.4															
			0613	0614		236.6	236.5													
SR2 39+00	18	LT	0615		249.1															
			0615	0612		246.1	244.8	0.5												
L 46+33	60	RT	0616		249.1															
			0616	0615		246.1	246.1													
L 44+19	0	CL	0617		245.3															
			0617	0618		242.3	242.1													
L 44+19	60	LT	0618		247.0															
			0618	0619		242.1	241.7	0.4												
L 44+70	60	LT	0619		246.3															
			0619	0620		241.7	240.2	0.6												
SR1 25+84	19	LT	0620		245.1															
			0620	0621		236.5	236.1	0.7												
L 48+21	0	CL	0701		249.8															
L 48+02	60	LT	0702		250.2															
SR1 28+96	25	LT	0703		245.0															
			0703	0704		243.5	243.4	0.4	16											
SR1 31+12	34	LT																		
SHEET TOTALS									288											

LINE & STATION	FROM	TO	C. S. PIPE 15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 15	18	24	30
L 21+23	0501																										
L 21+09	0502																										
	0504	0505									68																
SR2 20+90	0505																										
	0505	0506									376																
SR2 24+70	0506																										
	0506	0507									52																
SR2 24+70	0507																										
	0507	0508																									
L 32+21	0508																										
	0508	0509																									
L 36+24	0601																										
L 36+23	0602																										
	0602	0603								16																	
SR2 30+14																											
SR2 30+99																											
L 40+50	0604																										
	0604	0605																									
SR1 22+23	0606													88													
SR2 34+12	0607																										
	0607	0608																						4			
SR2 34+12	0608																										
	0608	0609																						48			
SR2 34+12	0609																										
	0609	0613																									
SR2 35+60	0610																										
	0610	0612															120										
L 44+19	0611																										
	0611	0612															8										
SR2 36+84	0612																										
	0612	0613																						60			
SR2 36+84	0613																										
	0613	0614					20																				
SR2 39+00	0615																										
	0615	0612															212										
L 46+33	0616																										
	0616	0615															4										
L 44+19	0617																										
	0617	0618																									
L 44+19	0618																										
	0618	0619																48									
L 44+70	0619																										
	0619	0620																							44		
SR1 25+84	0620																										
	0620	0621			32																						
L 48+21	0701																										
L 48+02	0702																										
SR1 28+96	0703																										
	0703	0704																									
SR1 31+12																											
SHEET TOTALS					32		20			16	496			88			344	48						112	44		

LINE & STATION	FROM	TO	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05
L 21+23	0501																				
L 21+09	0502																				
	0504	0505																			
SR2 20+90	0505												1								
	0505	0506																			
SR2 24+70	0506												1								
	0506	0507																			
SR2 24+70	0507												1	3.2							
	0507	0508						68													
L 32+21	0508												1								
	0508	0509						84													
L 36+24	0601																				
L 36+23	0602																				
	0602	0603																			
SR2 30+14																					
SR2 30+99																					
L 40+50	0604												1								
	0604	0605						96													
SR1 22+23	0606																				
SR2 34+12	0607												1								
	0607	0608																			
SR2 34+12	0608												1								
	0608	0609																			
SR2 34+12	0609												1								
	0609	0613																			
SR2 35+60	0610												1								
	0610	0612																			
L 44+19	0611												1								
	0611	0612																			
SR2 36+84	0612												1								
	0612	0613																			
SR2 36+84	0613												1	1.8							
	0613	0614																			
SR2 39+00	0615												1								
	0615	0612																			
L 46+33	0616												1								
	0616	0615																			
L 44+19	0617												1								
	0617	0618						60													
L 44+19	0618												1								
	0618	0619																			
L 44+70	0619												1								
	0619	0620																			
SR1 25+84	0620												1	3.6							
	0620	0621																			
L 48+21	0701																				
L 48+02	0702												1	1.3							
SR1 28+96	0703																				
	0703	0704																			
SR1 31+12																					
SHEET TOTALS								308					19	9.9							

LINE & STATION	FROM	TO	OPEN THROAT C.B., SEE SPECIAL DETAIL SHEET 20	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 21+23	0501														1										
L 21+09	0502																								
	0504	0505																							
SR2 20+90	0505						1				1														
	0505	0506																						112	
SR2 24+70	0506						1			1															
	0506	0507																							
SR2 24+70	0507						1				1														
	0507	0508																				6			
L 32+21	0508						1			1															
	0508	0509																				5			
L 36+24	0601														1										
L 36+23	0602																						0.3990		
	0602	0603																							
SR2 30+14																								24	
SR2 30+99																								25	
L 40+50	0604						1			1															
	0604	0605																				3		43	
SR1 22+23	0606																								
SR2 34+12	0607						1		1																
	0607	0608																							
SR2 34+12	0608						1		1																
	0608	0609																							
SR2 34+12	0609						1			1															
	0609	0613																							
SR2 35+60	0610						1		1																
	0610	0612																							
L 44+19	0611						1		1																
	0611	0612																							
SR2 36+84	0612						1		1																
	0612	0613																							
SR2 36+84	0613											1	1												
	0613	0614																							
SR2 39+00	0615						1		1																
	0615	0612																							
L 46+33	0616						1		1																
	0616	0615																							
L 44+19	0617						1			1															
	0617	0618																				4			
L 44+19	0618						1		1																
	0618	0619																							
L 44+70	0619						1		1																
	0619	0620																						62	
SR1 25+84	0620						1		1																
	0620	0621																							
L 48+21	0701														1										
L 48+02	0702						1		1																
SR1 28+96	0703																						0.3990		
	0703	0704																							
SR1 31+12																								26	
SHEET TOTALS							18		11	5	2	1	1		3							18	0.7980	292	

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

RAL-WS090

COMPUTED BY:	SMM	DATE:	6/26/19
CHECKED BY:	JCH	DATE:	6/27/19

PROJECT NO.	SHEET NO.
W-5600	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

Line & Station	Offset	Structure Number From	Structure Number To	Top Elevation FT.	Invert Elevation FT.	Invert Elevation FT.	Minimum Required Slope %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 53+50	68 RT	0705		259.7															
		0705	0707		256.7	253.0													
SR02 44+57	28 RT	0706		257.1															
		0706	0707		254.1	252.7													
SR02 44+45	27 LT	0707		259.0															
L 51+62	0 CL	0708		257.5															
L 55+50	77 LT	0709		257.9															
		0709	0710		254.9	251.2	0.3												
SR01 32+80	19 RT	0710		258.6															
		0710	0711		250.7	249.5	0.5												
SR2 51+98	34 RT	0712						36											
SR2 55+15	27 RT	0801	0801A		251.0	250.9				12									
SR2 55+02	23 LT	0802		255.1															
L 62+34	0 CL	0803		258.5															
SR1 43+54	29 RT	0804		258.1															
SR1 43+53	25 LT	0805	0805A		257.7	257.7				12									
SR1 48+35	12 LT																		
L 67+48	0 CL																		
SR2 59+58	42 RT																		
SR1 49+46	14 RT																		
SR2 61+16	5 LT																		
SR2 60+59	48 RT	0806	0807		250.7	246.9													
SR2 60+54	28 RT	0807		251.2															
		0807	0814		246.4	238.4	0.3			484									
L 68+00	74 RT	0808		251.9															
		0808	0807		248.4	246.9	0.9												
L 68+00	0 CL	0809		252.7															
		0809	0808		249.7	248.7	0.9												
L 68+00	70 LT	0810		252.9															
		0810	0809		249.9	249.7													
SR1 29+07	29 LT	0815						20											
L 73+00	0 CL	0812		246.9															
		0812	0813		243.9	243.7													
L 73+00	58 RT	0813		247.7															
		0813	0814		243.7	240.1	0.5												
SR2 65+45	32 RT	0814		243.1															
		0814	0901		238.4	237.8	0.7			48									
SR1 66+55	0 CL	0902			235.2	235.0	0.4												
SR01 59+00	0 CL	0905			236.6	235.7													
L 78+05	60 RT	0906		244.0															
		0906	0910		241.0	236.9													
SR2 70+58	0 CL	0907																	
		0907	0908		234.4	234.2	0.4												
L 77+86	88 LT	0909																	
SR2 70+43	28 RT	0910		240.5															
		0910	0911		234.4	234.3		20											
L 78+04	0 CL	0912		243.2															
L 83+90	89 LT	0914																	
L 83+48	0 CL	0915		242.6															
SR2 75+28	2 RT	0916		238.7															
SHEET TOTALS								76		556									

Line & Station	From	To	C. S. Pipe 15 (.064)	C. S. 18 (.064)	C. S. 24 (.064)	C. S. 30 (.079)	C. S. 36 (.079)	C. S. 42 (.109)	C. S. 48 (.109)	R. C. Pipe Class III 15	III 18	III 24	III 30	III 36	III 42	III 48	R. C. Pipe Class IV 15	IV 18	IV 24	IV 30	IV 36	IV 42	IV 48	R. C. Pipe Class V 15	V 18	V 24	V 30
L 53+50	0705																										
	0705	0707								172																	
SR02 44+57	0706																										
	0706	0707																							56		
SR02 44+45	0707																										
L 51+62	0708																										
L 55+50	0709																										
	0709	0710									376																
SR01 32+80	0710																										
	0710	0711																								60	
SR2 51+98	0712																										
SR2 55+15	0801	0801A																									
SR2 55+02	0802																										
L 62+34	0803																										
SR1 43+54	0804																										
SR1 43+53	0805	0805A																									
SR1 48+35																											
L 67+48																											
SR2 59+58																											
SR1 49+46																											
SR2 61+16																											
SR2 60+59	0806	0807									40																
SR2 60+54	0807																										
	0807	0814																									
L 68+00	0808																										
	0808	0807																							56		
L 68+00	0809																										
	0809	0808																									
L 68+00	0810																										
	0810	0809																									
SR1 29+07	0815																										
L 73+00	0812																										
	0812	0813																									
L 73+00	0813																										
	0813	0814																							56		
SR2 65+45	0814																										
	0814	0901																									
SR1 66+55	0902																			76							
SR01 59+00	0905														92												
L 78+05	0906																										
	0906	0910																						52			
SR2 70+58	0907																										
	0907	0908												52													
L 77+86	0909																										
SR2 70+43	0910																										
	0910	0911																									
L 78+04	0912																										
L 83+90	0914																										
L 83+48	0915																										
SR2 75+28	0916																										
SHEET TOTALS										172	416			52	92						76			52	168	60	

Line & Station	From	To	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	QUANTITIES FOR DRAINAGE STRUCTURES 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
L 53+50	0705												1						
	0705	0707																	
SR02 44+57	0706												1						
	0706	0707																	
SR02 44+45	0707												1	1.3					
L 51+62	0708																		
L 55+50	0709												1						
	0709	0710																	
SR01 32+80	0710												1	2.9					
	0710	0711																	
SR2 51+98	0712																		
SR2 55+15	0801	0801A																	
SR2 55+02	0802																		
L 62+34	0803																		
SR1 43+54	0804																		
SR1 43+53	0805	0805A																	
SR1 48+35																			
L 67+48																			
SR2 59+58																			
SR1 49+46																			
SR2 61+16																			
SR2 60+59	0806	0807																	
SR2 60+54	0807												1						
	0807	0814																	
L 68+00	0808												1						
	0808	0807																	
L 68+00	0809												1						
	0809	0808						72											
L 68+00	0810												1						
	0810	0809						68											
SR1 29+07	0815																		
L 73+00	0812												1						
	0812	0813						60											
L 73+00	0813												1						
	0813	0814																	
SR2 65+45	0814												1						
	0814	0901																	
SR1 66+55	0902										3.400								
SR01 59+00	0905										4.500								
L 78+05	0906												1						
	0906	0910																	
SR2 70+58	0907																		
	0907	0908																	
L 77+86	0909																		
SR2 70+43	0910												1	1.2					
	0910	0911																	
L 78+04	0912																		
L 83+90	0914																		
L 83+48	0915																		
SR2 75+28	0916												1	0.3					
SHEET TOTALS								200			7.900		15	5.7					

Line & Station	From	To	CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B., SEE SPECIAL DETAIL SHEET 20	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 53+50	0705								1			1															
	0705	0707																									
SR02 44+57	0706								1			1															
	0706	0707																									
SR02 44+45	0707								1		1																
L 51+62	0708																1										
L 55+50	0709								1			1															
	0709	0710																									
SR01 32+80	0710													1	1												
	0710	0711																									
SR2 51+98	0712																										
SR2 55+15	0801	0801A																							0.5526		
SR2 55+02	0802																1										
L 62+34	0803																1										
SR1 43+54	0804																1										
SR1 43+53	0805	0805A																							0.5526		
SR1 48+35																										71	
L 67+48																								4			
SR2 59+58																										58	
SR1 49+46																										102	
SR2 61+16																										94	
SR2 60+59	0806	0807																									
SR2 60+54	0807							1				1															
	0807	0814																									
L 68+00	0808								1			1															
	0808	0807																									
L 68+00	0809								1			1															
	0809	0808																									
L 68+00	0810								1			1															
	0810	0809																									
SR1 29+07	0815																										
L 73+00	0812								1			1															
	0812	0813																									
L 73+00	0813								1		1																
	0813	0814																									
SR2 65+45	0814							1				1															
	0814	0901																									
SR1 66+55	0902																							8			
SR01 59+00	0905																										
L 78+05	0906								1		1																
	0906	0910																									
SR2 70+58	0907																								0.7640		
	0907	0908																									
L 77+86	0909																										
SR2 70+43	0910													1	1												
	0910	0911																									
L 78+04	0912																1										
L 83+90	0914																										
L 83+48	0915																1										
SR2 75+28	0916													1													Use Slab Lid
SHEET TOTALS								2	10		3	9		3	2		6							12	1.8692	325	

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

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

RAL-WS090

COMPUTED BY: SMM DATE: 6/26/19

CHECKED BY: JCH DATE: 6/27/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5600	3D-3

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

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 15	18	24	30	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B., SEE SPECIAL DETAIL SHEET 2	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
			0916	0917		233.5	233.3																										40																																																						
Y4 12+52	35	RT	0918						32																																																																																						
L 87+45	59	RT	1001		242.2																																																			1													1		1																
			1001	1003		239.2	238.2																												100																																																				
L 88+47	0	CL	1002		241.2																																																			1													1			1															
			1002	1003		238.2	238.1																																												60																																	3		36	
L 88+47	59	RT	1003		242.0																																																			1													1		1																
			1003	1004		238.1	237.9																																					56																																											
L 93+04	0	CL																																																																																		3		20	
L 95+50	0	CL	1005		240.4																																																			1													1			1															
			1005	1006		237.6	237.3																																											60																																					
L 95+50	60	RT	1006		241.2																																																			1													1		1																
			1006	1007		237.3	237.0	0.6																																		56																																													
L 97+74	0	CL																																																																																		3		20	
DR1 10+40	0	CL	1008			234.9	234.6																																					24																																											
DR1 11+23	14	RT	1009			237.3	236.3		72																																																																													22	
L 99+36	0	CL	1101		239.3																																																			1													1			1															
			1101	1102		236.5	236.2																																											60																																					
L 99+36	60	RT	1102		240.4																																																			1													1		1																
			1102	1104		236.2	234.5	0.4																				76																																																											
L 99+00	60	RT	1103		240.5																																																			1													1		1																
			1103	1102		237.5	236.2																												36																																																				
SR2 92+49	0	CL	1105	1106		234.2	234.0																															80																																																	
L 102+38	0	CL	1108		238.4																																																			1													1			1												3		16	
			1108	1109		235.6	235.1		148																																																																														
L 103+90	0	CL	1109		238.1																																																			1													1			1															
			1109	1110		235.1	233.9	0.3																																											88																																				
L 109+73	0	CL	1112		237.4																																																																								1										
L 109+75	85	RT	1113																																																																																		0.3990		
			1113	1114		231.9	231.2		12																																																																														
SR2 96+87	0	CL	1115			234.0	233.7																													64																																																			
SR3 10+40	0	CL	1116			234.6	233.5																													68																																																			
Y5 13+19	0	CL																																																																																				85	
Y5 15+49	0	CL																																																																																				90	
Y5 17+66	45	RT																																																																																				68	
L 114+25	0	CL	1201																																																																										1										
L 118+41	0	CL	1202																																																																										1										
L 124+43	0	CL	1204																																																																										1										
SR3 19+50	0	CL	1206		230.0	230.0																										76																																																							
SR3 23+50	0	CL	1207		229.0	229.0																																	76																																												
SR3 27+50	0	CL	1208		228.0	228.0																										80																																																							
L 129+43	0	CL	1301																																																																										1										
SR3 37+30	0	CL	1305			222.7	222.2																										80																					4.375																																35	SEE SHT. 2C-4 FOR DETAIL
L 134+36	0	CL	1307		228.7																																																			1													1			1															
			1307	1309		225.7	224.3																																												88																																	4			
SR3 40+75	28	RT	1310						24																																																																																						
L 139+52	0	CL	1401		223.3		220.7																																																																						1										
Y7RPC 12+54	9	RT	1402			220.4																						36																																																									0.3990		
L 144+58	83	RT	1403																																																			3.400																																	
			1403	1404		208.4	208.3																									8																																																							0.7640		
SHEET TOTALS									288																			112				164	120		136	132		80	76			56		80						120	236			7.775		11													11		5	6					6							16	1.5620	392	

RAL-WS090

COMPUTED BY: SMM DATE: 6/26/19

CHECKED BY: JCH DATE: 6/27/19

PROJECT NO.	SHEET NO.
W-5600	3D-4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain 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				42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	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., SEE SPECIAL DETAIL SHEET 2C	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE			FROM	TO					15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	15	18	24	30	36	42	48	15	18	24	30	36	42	48	15	18	24	30	36	42	48	15	18	24	30											0' THRU 5'	A: 5' THRU 10'	B: 10' AND ABOVE		GRATE TYPE E	F	G	D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																						
THICKNESS OR GAUGE					FT.	FT.	FT.	%													.064	.064	.064	.079	.079	.109	.109																											CY	CY	EACH	LIN. FT.	LIN. FT.																											CY	CY	LIN. FT.	
L 144+55	0	CL	1405																																																																																			1										
SR3 48+78	0	CL	1406	1407		214.5	208.3																											100																						4.500																																	
SR3 48+78	60	LT	1407		212.3																																																			1									1																						SEE SHT. 2C-8 FOR DETAIL
			1407	1408		208.3	202.2							60																																																																									
Y7RPC 17+92	42	RT	1408		208.5																																																			1	1.3											1				1															
			1408	1409		202.2	201.8																											88																																																								23	
Y7PRC 18+38	34	LT	1409		210.5																																																			1	3.8											1				1															
			1409	1410		201.8	195.2							264																																																																									
L 148+00	77	RT	1410		201.5																																																			1	1.3											1				1															
			1410	1501		195.2	185.3	0.4						500																																																																									
L 147+62	0	CL	1411		204.4																																																																										1							2			
L 150+93	0	CL	1412		196.1																																																																										1							3			
SR03 52+25	28	RT	1413						24																																																																															
L 153+00	76	RT	1501		191.6																																																			1	1.8											1				1															
			1501	1509		184.8	182.8																										124																																																									
Y7RPC 26+84	48	RT	1502		204.3																																																			1													1			1															
			1502	1503		201.3	198.2	0.7																			96																																																											
Y7RPC 27+25	40	LT	1503		201.2																																																			1													1			1															
			1503	1504		198.2	197.1	0.8																																		48																																															
Y7LPC 17+00	14	LT	1504		202.0																																																			1			1		1																										
			1504	1505		197.1	193.2	1.1		180																																																																												
Y7LPC 15+00	14	LT	1505		196.8																																																			1			1		1																										
			1505	1506		193.2	188.5				172																																																																											
Y7LPC 13+10	14	LT	1506		192.2																																																			1			1		1																										
			1506	1507		188.5	183.0	0.4			60																																																																											
Y7LPC 12+46	42	LT	1507		188.3																																																			1	0.3											1				1															
			1507	1509		183.0	182.8					84																																																																										
Y7LPC 11+46	21	LT	1508		192.6																																																			1													1		1																	
			1508	1509		187.6	185.3																					24																																																											
Y7LPC 11+46	45	LT	1509		191.5																																																			1	3.8																	1	1											
			1509	1510		182.8	182.5								80																																																																							
L 153+67	5	LT	1511																																																																																		1							4		13	
L 154+81	5	LT	1512		192.8																																																			1													1			1															
Y7 24+54	27	LT	1515		216.4																																																			1													1		1																	
			1515	1516		213.4	213.1																																			60																																											30	
Y7 24+27	27	RT	1516		216.1																																																			1													1		1																	
			1516	1517		213.1	194.3		76																																																																					2								
Y7 29+12	27	LT	1519		217.0																																																			1													1		1																	
			1519	1520		214.0	213.6																												32																																																			
Y7 29+45	27	LT	1520		217.1																																																			1													1		1																	
			1520	1521		213.6	213.1																																			64																																												
Y7 29+59	36	RT	1521		216.1																																																			1													1		1																	
			1521	1522		213.1	196.4	0.4	64																																																																					2								
Y7 30+92	6	LT	1523		215.7																																																			1							1			1	1																				
			1523	1524		212.5	192.2														96																																																										2						95	
Y7 33+42	6	RT	1525		212.7																																																			1							1			1	1																				
			1525	1526		209.5	206.9																																			44																																												
SR3 63+00	0	CL	1527	1528		206.3	204.6																									88																							3.400																																	
Y7 34+00	0	CL	1529	1530		204.1	203.7																									120																							3.400																																	
SR5 10+90	0	CL	1531	1532		198.0	193.3																										136																						4.375																																	SEE SHT. 2C-4 FOR DETAIL
SHEET TOTALS									164	180	232	84		824	80						96							120				208	324	124	32							168	48											15.675		21	12.3		3		3		2		1	2	2	5	9		6	8		1	1		4	4		2				9		161	

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

RAL: WS090

COMPUTED BY: SMM DATE: 6/26/19

CHECKED BY: JCH DATE: 6/27/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5600	3D-5

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
									THICKNESS OR GAUGE											
L 159+00	0	CL	1534		193.8															
			1534	1535		188.9	188.3													
L 159+10	81	RT	1536	1537		184.0	183.5		12											
L 158+58	92	LT	1538		190.9															
			1538	1539		187.9	187.5			76										
Y7LPA 11+49	42	LT	1539		190.5															
			1539	1540		187.5	187.1	0.7		96										
Y7LPA 12+58	14	LT	1540		192.9															
			1540	1544		187.1	186.5													
Y7LPA 13+25	14	LT	1541		193.3															
			1541	1540		188.6	187.1													
Y7LPA 15+00	14	LT	1542		197.5															
			1542	1541		192.0	189.1					156								
Y7LPA 13+20	36	RT	1543		192.6															
			1543	1541		189.6	189.1													
SR4 16+53	22	RT	1546		197.7															
			1546	1548		192.7	192.0	0.3			132									
SR4 16+53	20	LT	1547		198.5															
			1547	1546		193.7	192.7													
SR4 12+98	20	LT	1549		209.4															
			1549	1550		206.7	201.6		240											
SR4 15+39	20	LT	1550		204.4															
			1550	1547		201.4	194.2	1.0			112									
Y7LPA 16+50	28	RT	1552		202.4															
			1552	1556		199.4	198.6													
Y7RPA 25+63	9	LT	1553		207.6															
			1553	1557		201.6	201.4	0.5												
			1554	1553		201.9	201.6	0.5												
Y7LPA 15+00	41	RT	1555		195.3															
			1555	1542		193.2	192.0													
Y7LPA 16+50	14	LT	1556		201.6															
			1556	1542		197.9	192.0					136								
Y7LPA 17+90	14	LT	1557		206.0															
			1557	1556		201.4	198.4	0.6			128									
Y7 14+64	24	RT	1558						28											
Y7 14+85	32	LT	1559						28											
Y7 15+84	33	RT	1560						28											
Y7 16+41	33	RT	1561						28											
Y7 16+78	31	RT	1562						28											
Y7 17+95	29	LT	1563						28											
Y7 17+92	31	RT	1564						28											
Y7 18+90	31	RT	1565						20											
Y7 19+85	35	RT	1566						26											
SR4 11+96	19	LT	1567						20											
Y7 19+95	35	LT																		
Y7 20+96	3	LT																		
Y7 21+85	44	LT																		
Y7 22+17	11	LT																		
Y7 23+23	51	LT																		
Y7 23+77	53	LT																		
SHEET TOTALS									514	412	268	156								

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

RAL-WS090

COMPUTED BY: SMM DATE: 6/26/19

CHECKED BY: JCH DATE: 6/27/19

PROJECT NO.	SHEET NO.
W-5600	3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 15	18	24	30	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B., SEE SPECIAL DETAIL SHEET 2C	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
DR2 10+88	0	CL	1568			201.2	195.5																						104																																																										
Y7 30+47	11	LT																																																																																					72	
Y7 32+46	17	LT																																																																																					23	
Y7 35+25	43	LT	1569							24																																																																												26	
Y7 37+80	33	LT	1570							20																																																																												26	
SR4 17+90	0	CL	1571			192.0																									64																																																							25	
L 163+19	0	CL	1601																																																																										1										
L 163+15	86	RT	1601A				183.6																					8																																																									0.3990		
Y7RPA 17+50	42	RT	1605		192.9																																																			1	2.0											1				1															
			1605	1607		185.9	183.5	0.4																							124																																																							12	
Y7RPA 15+80	42	RT	1606		191.7																																																			1												1				1															
			1606	1605		186.9	186.4				164																																																																												
			1610	1611		193.7	188.2			16																																																																								11					
Y7RPA 14+75	42	RT	1611		192.2																																																			1												1				1															
			1611	1606		187.5	186.9				104																																																																												
L 167+19	0	CL	1613																																																																										1										
Y7RPA 11+50	75	RT	1616	1617		202.2	190.6	0.8																32																																																											31				
Y7RPA 11+50	42	RT	1617		195.6																																																			1														1		1															
			1617	1622		190.6	187.1																																														96																															19			
L 171+52	0	CL	1622		198.2																																																			1	5.0	1.1											1			1															
			1622	1619		187.1	182.6																																														124																																		
Y7RPA 18+64	0	CL	1620			185.0	189.0																										128																					4.375																																	SEE SHT. 2C-4 FOR DETAIL
L 174+94	0	CL	1621																																																																										1										
L 173+00	133	RT																																																																																					64	
L 168+80	153	RT	1623			179.3	178.0																																180															5.600																																	SEE SHT. 2C-3 FOR DETAIL
L 175+12	0	CL	1701			191.9	189.5																																														216	2.289																																	SEE SHT. 2C-4 FOR DETAIL
L 179+67	68	LT	1703	1702		197.0	196.7		12																																																																												0.3990		
L 179+69	0	CL	1704		200.8																																																																								1										
L 189+41	0	CL	1801		201.1																																																																								1										
L 189+41	68	LT	1802	1803		197.4	197.3		12																																																																												0.3990		
L 191+26	0	CL	1804		200.7																																																			1													1			1															
			1804	1805		197.7	195.5																																													92																																			
L 193+26	0	CL	1806			188.2	186.3																																										228					4.500																																	
L 193+58	0	CL	1807		201.6																																																																								1										
WBL 13+28	0	CL																																																																																		83		38	
L 203+35	0	CL	1901		200.5																																																			1													1			1															
			1901	1902		197.0	192.0	0.7																					108																																																										
Y9RPC 11+98	44	RT	1903		197.6																																																			1												1				1															
			1903	1903A		192.8	192.0	0.7			52																																																																												
Y9RPC 17+41	42	RT	1904		205.3																																																			1													1			1															
			1904	1904A		202.3	196.3	1.1		288																																																																													
Y9RPC 17+41	19	LT	1905		210.1																																																			1													1			1															
			1905	1904		207.1	202.3	0.8																																			60																																												
L 209+70	0	CL	1906		212.1																																																			1													1			1															
			1906	1905		208.5	207.1	0.6																																			68																																												
L 209+70	56	LT	1907		214.4																																																			1													1		1																
			1907	1906		210.4	208.8																																			56																																													
L 211+15	11	LT	1908		217.9																																																			1													1		1																
SHEET TOTALS									24	348	320													32				8	212		188		128						180			56	128						228			92	436	16.764		13	7.0	1.1										4	8	1	2	11					6					11	31	102	1.1970	286	

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

RAL-WS090

COMPUTED BY:	SMM	DATE:	6/26/19
CHECKED BY:	JCH	DATE:	6/27/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5600	3D-7

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)

(Row labels: SIZE; THICKNESS OR GAUGE)

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
			1908	1909		213.3	211.8	
L 211+15	0	CL	1909		216.0			
			1909	1906		211.8	208.8	0.4
L 212+00	54	RT	1910		218.3			
			1910	1911		214.8	212.1	
L 211+15	55	RT	1911		216.0			
			1911	1909		212.1	211.8	
Y9RPB 16+55	22	RT	1912		210.2			
			1912	1914		207.2	207.0	
Y9RPB 14+93	23	LT	1913		208.5			
			1913	1915		205.5	197.6	
Y9RPB 16+55	23	LT	1914		212.3			
			1914	1913		207.0	205.5	
Y9RPB 19+85	23	LT	1917		211.4			
			1917	1918		208.6	200.1	
Y9RPB 12+02	72	LT	1919		196.3			
			1919	1920		192.3	188.9	3.5
Y9RPC 25+05	0	CL	2001			195.9	195.5	
Y9RPC 22+81	42	RT	2003		202.2			
			2003	2008		199.5	198.0	
Y9 22+33	28	LT	2004		200.8			
			2004	2017		197.8	192.6	
Y9 22+20	28	RT	2005		200.8			
			2005	2005A		197.8	195.3	
Y9RPB 23+70	37	RT	2006		199.2			
			2006	2007		196.2	195.7	0.6
Y9RPB 23+70	43	LT	2007		199.7			
			2007	2009		195.5	195.1	
Y9RPC 22+81	38	LT	2008		200.7			
			2008	2006		198.0	196.5	0.6
Y9RPD 23+30	39	RT	2017		195.4			
			2017	2017A		192.6	192.3	
Y9RPD 22+00	28	RT	2018		197.9			
			2018	2022		193.3	192.1	
Y9RPA 24+29	40	LT	2020		197.4			
			2020	2021		195.3	194.9	
Y9RPD 22+00	23	LT	2022		199.1			
			2022	2019		192.1	192.0	
Y9 16+90	60	RT	2023		201.3			
			2023	2024		198.3	195.0	0.7
Y9 26+00	0	CL	2025			194.4	194.0	
SR6 12+65	0	CL	2026			189.7	187.5	
Y9RPA 21+36	34	RT	2101A					
			2101	2101A		191.8		
			2101A	2102				
Y9RPA 20+69	34	RT	2102		208.2			
			2102	2103		191.0		
			2103	2104				
			2104	2105		189.1	188.9	0.3
Y9RPD 20+09	39	RT	2105		205.5			
SHEET TOTALS								

Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC)

FROM	TO	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
1908	1909												
1909													
1909	1906		144										
1910													
1910	1911												
1911													
1911	1909												
1912													
1912	1914												
1913													
1913	1915	48											
1914													
1914	1913												
1917													
1917	1918	40											
1919													
1919	1920		100										
2001													
2003													
2003	2008												
2004													
2004	2017	132											
2005													
2005	2005A												
2006													
2006	2007												
2007													
2007	2009			88									
2008													
2008	2006												
2017													
2017	2017A												
2018													
2018	2022												
2020													
2020	2021												
2022													
2022	2019		48										
2023													
2023	2024		128										
2025													
2026													
2101A													
2101	2101A							24					
2101A	2102							68					
2102													
2102	2103												
2103	2104												
2104	2105												
2105													
SHEET TOTALS		220	420	88				92					

FROM	TO	C. S. PIPE 15	18	24	30	36	42	48	R. C. PIPE CLASS III 15	18	24	30	36	42	48
THICKNESS OR GAUGE		.064	.064	.064	.079	.079	.109	.109							
1908	1909														
1909															
1909	1906														
1910															
1910	1911														
1911															
1911	1909														
1912															
1912	1914								44						
1913															
1913	1915														
1914															
1914	1913														
1917															
1917	1918														
1919															
1919	1920														
2001										92					
2003															
2003	2008								80						
2004															
2004	2017														
2005															
2005	2005A														
2006															
2006	2007														
2007															
2007	2009														
2008															
2008	2006								216						
2017															
2017	2017A								92						
2018															
2018	2022								52						
2020															
2020	2021									100					
2022															
2022	2019														
2023															
2023	2024														
2025															
2026															
2101A															
2101	2101A														
2101A	2102														
2102															
2102	2103														44
2103	2104														
2104	2105														28
2105															
SHEET TOTALS									484	192					72

FROM	TO	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 15	18	24	30
1908	1909	12										
1909												
1909	1906											
1910												
1910	1911	84										
1911												
1911	1909		56									
1912												
1912	1914											
1913												
1913	1915											
1914												
1914	1913	160										
1917												
1917	1918											
1919												
1919	1920											
2001												
2003												
2003	2008											
2004												
2004	2017											
2005												
2005	2005A	88										
2006												
2006	2007		80									
2007												
2007	2009											
2008												
2008	2006											
2017												
2017	2017A											
2018												
2018	2022											
2020												
2020	2021											
2022												
2022	2019											
2023												
2023	2024											
2025						92						
2026						100						
2101A												
2101	2101A											
2101A	2102											
2102												
2102	2103											
2103	2104											
2104	2105											
2105												
SHEET TOTALS		344	136			192						

FROM	TO	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY
1908	1909										
1909											
1909	1906										
1910											
1910	1911										
1911											
1911	1909										
1912											
1912	1914										
1913											
1913	1915										
1914											
1914	1913										
1917											
1917	1918										
1919											
1919	1920										
2001											
2003											
2003	2008										
2004											
2004	2017										
2005											
2005	2005A										
2006											
2006	2007										
2007											
2007	2009										
2008											
2008	2006										
2017											
2017	2017A										
2018											
2018	2022										
2020											
2020	2021										
2022											
2022	2019										
2023											
2023	2024										
2025											
2026										3.533	
2101A											
2101	2101A									5.580	
2101A	2102										
2102											
2102	2103										
2103	2104			168							
2104	2105										
2105											
SHEET TOTALS				168						9.113	

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

FROM	TO	0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B., SEE SPECIAL DETAIL SHEET 2C
1908	1909										
1909		1									
1909	1906										
1910		1									
1910	1911										
1911		1									
1911	1909										
1912		1									
1912	1914										
1913		1									
1913	1915										
1914		1	0.4								
1914	1913										
1917		1									
1917	1918										
1919		1									
1919	1920										
2001											
2003		1									
2003	2008										
2004		1			1			1			
2004	2017										
2005		1			1		1				
2005	2005A										
2006		1									
2006	2007										
2007		1									
2007	2009										
2008		1									
2008	2006										
2017		1									
2017	2017A										
2018		1									
2018	2022										
2020		1									
2020	2021										
2022		1	2.0								
2022	2019										
2023		1									1
2023	2024										
2025											
2026											
2101A		1	5.0	7.3							
2101	2101A										
2101A	2102										
2102		1	5.0	7.3							
2102	2103										
2103	2104										
2104	2105										
2105		1	5.0	6.6							
SHEET TOTALS		22	17.4	21.2	2		1	1			1

FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.
1908	1909												
1909					1			1					
1909	1906												
1910					1		1						
1910	1911												
1911					1		1						
1911	1909												
1912					1			1					
1912	1914												
1913					1		1						
1913	1915												
1914					1		1						
1914	1913												
1917					1		1						
1917	1918												
1919					1			1					
1919	1920												
2001													
2003					1			1					
2003	2008												
2004													
2004	2017												
2005													
2005	2005A												
2006					1		1						
2006	2007												
2007					1		1						
2007	2009												
2008					1		1						
2008	2006												
2017					1			1					
2017	2017A												
2018					1			1					
2018	2022												
2020						1		1					
2020	2021												
2022					1		1						
2022	2019												
2023													
2023	2024												
2025													
2026													
2101A										1	1		
2101	2101A												
2101A	2102												
2102										1	1		
2102	2103												
2103	2104												
2104	2105												
2105										1	1		
SHEET TOTALS					15	1	9	7		3	3		

FROM	TO	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
1908	1909										
1909											
1909	1906										
1910											
1910	1911										
1911											
1911	1909										
1912											
1912	1914										
1913											
1913	1915	2									
1914											
1914	1913									70	
1917											
1917	1918	2								68	
1919								4		16	
1919	1920		2								
2001											
2003											
2003	2008										
2004											
2004	2017										
2005											
2005	2005A									21	
2006											
2006	2007									76	
2007											
2007	2009										
2008											
2008	2006										
2017											
2017	2017A										
2018											
2018	2022										
2020											
2020	2021										
2022											
2022	2019										
2023											
2023	2024									110	
2025								3			
2026											SEE SHT. 2C-5 FOR DETAIL
2101A											
2101	2101A										SEE SHT. 2C-4 FOR DETAIL
2101A	2102										
2102											
2102	2103								1.0126		
2103	2104							45			
2104	2105								1.0126		
2105											
SHEET TOTALS		4	2					52	2.0252	361	

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

RAL-WS090

COMPUTED BY: SMM DATE: 6/26/19

CHECKED BY: JCH DATE: 6/27/19

PROJECT NO.	SHEET NO.
W-5600	3D-8

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109
			2105	2106		188.9	187.9	0.3																			
Y9RPA 21+50	45	LT	2107		200.5																						
			2107	2020		197.5	195.5		272																		
L 224+42	50	LT	2109		215.9																						
			2109	2110		212.9	210.7																				
L 224+42	2	LT	2110		214.8																						
			2110	2111		210.7	210.6	0.4																			
L 224+42	2	RT	2111		214.7																						
			2111	2113		207.9	204.9	0.7																			
L 223+77	50	RT	2112		215.3																						
			2112	2113		210.3	204.9																				
Y9RPD 18+50	26	RT	2113		211.6																						
			2113	2113A		204.6	198.0	0.6																			
Y9RPD 18+55	42	LT	2113A		201.9																						
			2113A	2114		194.9	189.0															40					
Y9RPA 16+02	21	LT	2116		206.6																						
			2116	2117		203.6	201.9																				
L 230+00	2	LT	2118		199.0																						
			2118	2119		196.0	195.9	0.4																			
L 230+00	3	RT	2119		199.0																						
			2119	2120		195.9	192.1	0.6																			
L 230+00	84	RT	2120		194.8																						
			2120	2126		192.1	187.3	1.0	396																		
Y9RPA 11+00	42	RT	2121		192.0																						
			2121	2123		189.9	188.8			184																	
			2122	2123		190.8	188.8																				
L 233+83	67	LT	2123		192.8																						
			2123	2124		188.8	188.0																				
L 233+84	2	LT	2124		194.9																						
			2124	2125		188.0	187.9	0.3																			
L 233+84	3	RT	2125		194.9																						
			2125	2126		187.9	187.3	0.3																			
L 234+00	74	RT	2126		192.2																						
			2126	2201		187.3	186.4	0.6																			
Y9RPD 17+00	23	LT	2128		206.2																						
			2128	2129		203.2	196.1		36																		
SR7 16+50	0	CL	2131			192.0	191.7																				
SR6 25+32	67	RT	2201		189.6																						
			2201	2202		186.4	186.1	0.6																			
L 240+00	2	LT	2203		187.8																						
			2203	2204		184.8	184.7																				
L 240+00	3	RT	2204		187.8																						
			2204	2205		184.7	181.4																				
L 240+00	70	RT	2205		184.4																						
			2205	2209		181.4	174.4	0.5		492																	
L 244+93	3	LT	2206		182.3																						
L 244+93	3	RT	2207		182.3																						
SR7 36+79	33	LT	2208																								
L 244+95	68	RT	2209		178.7																						
								SHEET TOTALS	704	676												40					

FROM	TO	R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 15	18	24	30	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY
2105	2106							112																					
2107																													
2107	2020																												
2109																													
2109	2110															48													
2110																													
2110	2111															4													
2111																													
2111	2113															56													
2112																													
2112	2113	64																											
2113																													
2113	2113A																68												
2113A																													
2113A	2114																												
2116																													
2116	2117								96																				
2118																													
2118	2119															4													
2119																													
2119	2120															80													
2120																													
2120	2126																												
2121																													
2121	2123																												
2122	2123																		60										
2123																													
2123	2124																										64		
2124																													
2124	2125				4																								
2125																													
2125	2126																										72		
2126																													
2126	2201				128																								
2128																													
2128	2129																												
2131			84																										
2201																													
2201	2202				64																								
2203																													
2203	2204															4													
2204																													
2204	2205																								68				
2205																													
2205	2209																												
2206																													
2207																													
2208																48													
2209																													
SHEET TOTALS		64	84		196			112	96							244	68		60						68		136		

FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B., SEE SPECIAL DETAIL SHEET 20	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	J.B. STD. 840.31 OR STD. 840.32	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING D.I. TO J.B.	ADJUST D.I.	15" SIDE DRAIN PIPE ELBOW	18" SIDE DRAIN PIPE ELBOW	15" C.S. ELBOW	18" C.S. ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
2105	2106																																
2107		1													1			1															
2107	2020																													3			
2109		1													1		1																
2109	2110																																
2110		1													1		1																
2110	2111																																
2111		1	1.9												1		1																
2111	2113																															63	
2112		1													1		1																
2112	2113																																
2113		1	2.0																	1	1												
2113	2113A																																
2113A		1	2.0																	1	1												
2113A	2114																										2						
2116		1													1			1															
2116	2117																																
2118		1													1		1																
2118	2119																																
2119		1													1		1																
2119	2120																																
2120		1													1			1															
2120	2126																																
2121		1														1		1															
2121	2123																																
2122	2123																															60	
2123		1													1			1															
2123	2124																													4			
2124		1	1.9												1		1																
2124	2125																																
2125		1	2.0												1		1																
2125	2126																													5			
2126		1													1		1																
2126	2201																															100	
2128		1													1		1																
2128	2129																							2									
2131																																	
2201		1														1		1															
2201	2202																															64	
2203		1													1		1																
2203	2204																																
2204		1													1		1																
2204	2205																													4			
2205		1													1			1															
2205	2209																																
2206		1													1		1																
2207		1													1		1																
2208																																41	
2209		1													1			1														8	
SHEET TOTALS		24	9.8												20	2	14	8		2	2			2			2			16		336	

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

RAL: WS090

COMPUTED BY: SMM DATE: 6/26/19

CHECKED BY: JCH DATE: 6/27/19

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
W-5600	3D-9

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
									THICKNESS OR GAUGE											
			2209	2316		173.9	170.0				380									
SR7 37+52	20	RT	2210		176.1															
			2210	2212		170.6	170.4													
SR7 38+20	30	LT	2211		172.9															
			2211	2212		170.8	170.4				68									
SR7 37+52	24	LT	2212		175.8															
			2212	2213		170.4	170.3													
SR7 38+00	30	RT	2214		174.3															
			2214	2210		171.3	170.6	1.1			48									
SR7 39+04	36	LT	2217																	
SR7 39+41	35	LT	2218																	
SR7 39+73	34	RT	2219																	
SR6 32+12	31	RT	2220						84											
SR6 33+90	33	RT	2221						24											
SR6 35+29	32	RT	2222						28											
SR6 35+96	32	RT	2223						40											
SR6 37+51	33	RT	2224						36											
L 250+34	3	LT	2301		177.0															
			2301	2302		173.5	173.3													
L 250+34	3	RT	2302		177.0															
SR7 47+29	0	CL	2303			170.9	168.0													
L 250+35	64	RT	2304		174.3															
			2304	2305		168.5	168.0						172							
L 252+68	0	CL	2306			167.8	167.0													
SR6 47+30	0	CL	2307			163.3	162.3													
L 257+23	2	LT	2309		166.5															
			2309	2310		162.1	162.1													
L 257+23	3	RT	2310		166.5															
L 257+22	71	RT	2311																	
			2311	2312		161.7	161.6		8											
SR7 54_79	0	CL	2313																	
SR6 39+23	33	RT	2315		176.2															
			2315	2316		172.7	170.5	0.4												
SR6 39+23	45	LT	2316		174.8															
			2316	2304		169.5	168.5					160								
L 260+17	7	RT	2401		163.8															
L 261+26	2	LT	2402		163.3															
			2402	2403		160.3	160.2													
L 261+26	3	RT	2403		163.3															
			2403	2401		160.2	153.1	0.3												
L 264+86	2	LT	2404		164.4															
			2404	2405		161.4	161.3													
L 264+86	3	RT	2405		164.4															
L 264+88	67	RT	2406																	
			2406	2407		158.8	158.5		8											
SR7 56+07	0	CL	2408	2409		157.1	156.1													
SR7 58+58	28	LT	2410						36											
L 260+48	77	RT	2411																	
L 261+58	81	RT																		
SHEET TOTALS									264	116	380	160	172							

C. S. PIPE 15	18	24	30	36	42	48	R. C. PIPE CLASS III 15	18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 15	18	24	30	42" x 29" C.S. PIPE ARCH CULVERTS, 0.079" THICK	36" WELDED STEEL PIPE 0.312" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B	42" WELDED STEEL PIPE 0.375" THICK, GRADE B	15" WELDED STEEL PIPE 0.25" THICK, GRADE B	18" WELDED STEEL PIPE 0.25" THICK, GRADE B	24" WELDED STEEL PIPE 0.25" THICK, GRADE B	30" WELDED STEEL PIPE 0.312" THICK, GRADE B	ENDWALLS STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY
.064	.064	.064	.079	.079	.109	.109																										