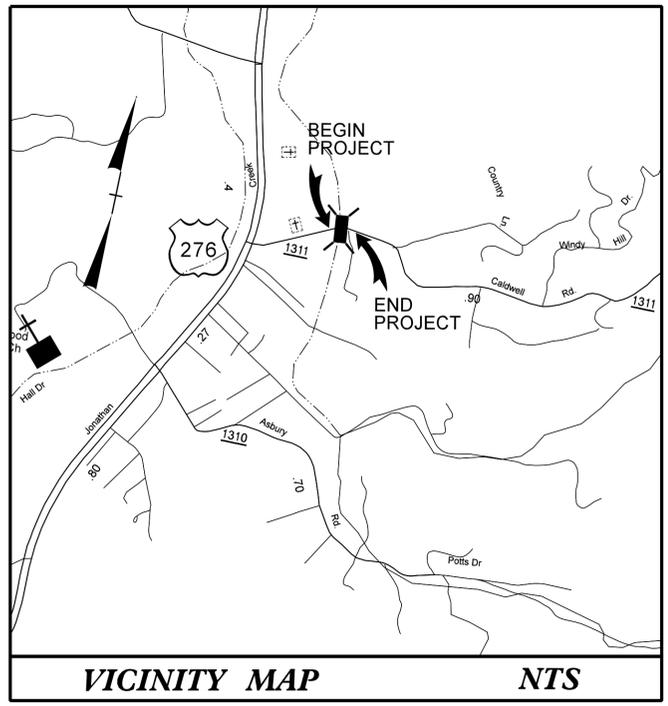


See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP NTS

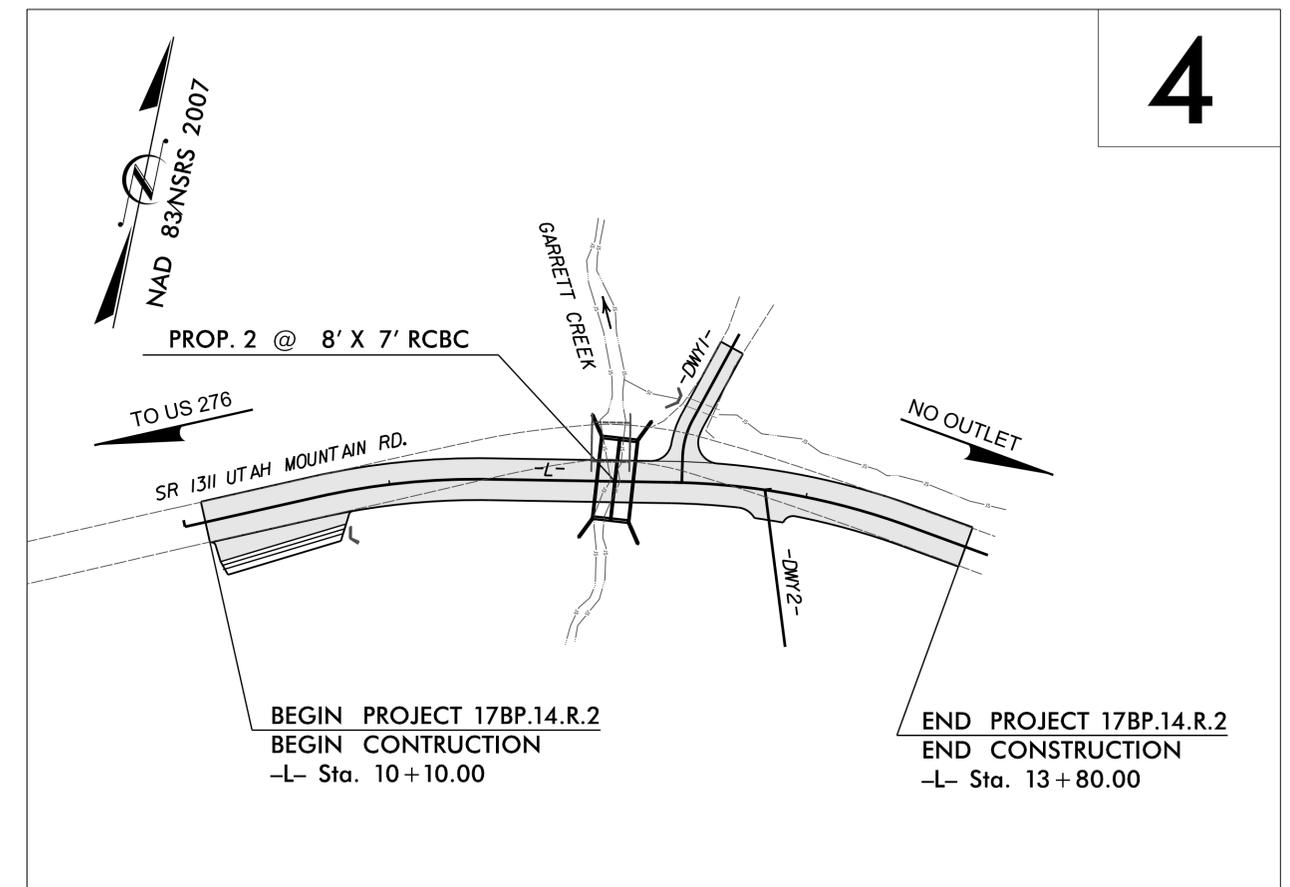
FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
HAYWOOD COUNTY

LOCATION: BRIDGE NO. 328 ON SR 1311 OVER GARRETT CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.2	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.14.R.2			

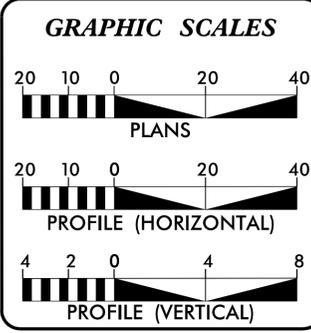


PROJECT: 17BP.14.R.2

CONTRACT: DN00136

NCDOT CONTACT:
JOSH DEYTON, PE
HIGHWAY DIVISION 14
BRIDGE MANAGER
828-488-0902

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2000	=	1000
ADT	=	
DHV	=	%
D	=	%
T	=	% *
V	=	35 MPH
* TTST	=	DUAL
FUNC CLASS	=	
LOCAL SUBREGIONAL TIER	=	

PROJECT LENGTH

LENGTH ROADWAY PROJECT	=	0.070 MILES
LENGTH STRUCTURES PROJECT	=	0.000 MILES
TOTAL LENGTH PROJECT	=	0.070 MILES

Prepared in the Office of:
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605
License No.: F-0840

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 30, 2012

LETTING DATE: JULY 23, 2013

DEAN D. HATFIELD, PE
PROJECT ENGINEER

WILLIAM E. TILLITT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

SEAL 27876
RINA STANSELL
P.E.

SEAL 16003
DEAN D. HATFIELD
P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
3	SUMMARY OF QUANTITIES
3A	SUMMARIES OF EARTHWORK, GUARDRAIL, PAVEMENT REMOVAL & SUMMARY OF DRAINAGE QUANTITIES
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-3	EROSION CONTROL PLANS
UO-1 THRU UO-5	UTILITIES BY OTHERS PLANS
X-1 THRU X-12	CROSS-SECTIONS
C-1 THRU C-8	CULVERT PLANS

GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 11/01/11

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 II.

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

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

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

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE
FRONTIER COMMUNICATIONS & HAYWOOD EMC
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

ROADWAY ENGLISH STANDARD DRAWINGS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
862.01	Guardrail Placement
862.02	Guardrail Installation
866.04	Barbed Wire Fence with Wood Posts (2 - 7 Strands)
876.01	Rip Rap in Channels

Note: Not to Scale

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Known Soil Contamination: Area or Site	☠
Potential Soil Contamination: Area or Site	☠?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○ W
Small Mine	⊗
Foundation	□
Area Outline	□
Cemetery	⊕
Building	□
School	□
Church	⊕
Dam	▬

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
Proposed Permanent Utility Easement	----- PUE
Proposed Temporary Utility Easement	----- TUE
Proposed Aerial Utility Easement	----- AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----

Orchard	-----
Vineyard	-----

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	-----
H-Frame Pole	-----
Recorded U/G Power Line	----- P
Designated U/G Power Line (S.U.E.*)	----- P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	----- G
Designated U/G Gas Line (S.U.E.*)	----- G
Above Ground Gas Line	----- A/G Gas

SANITARY SEWER:

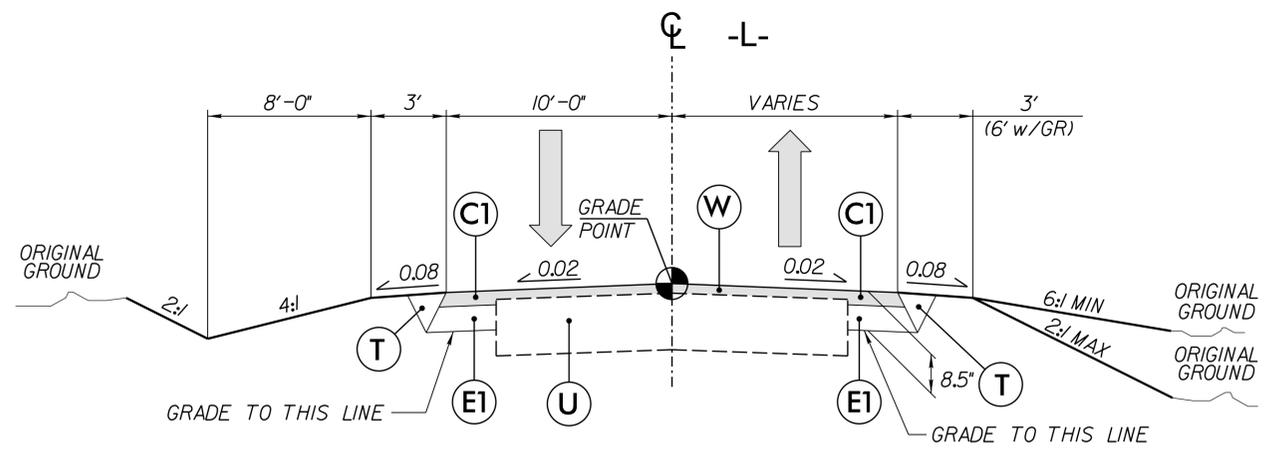
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
Recorded SS Forced Main Line	----- FSS
Designated SS Forced Main Line (S.U.E.*)	----- FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	----- 7UTL
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

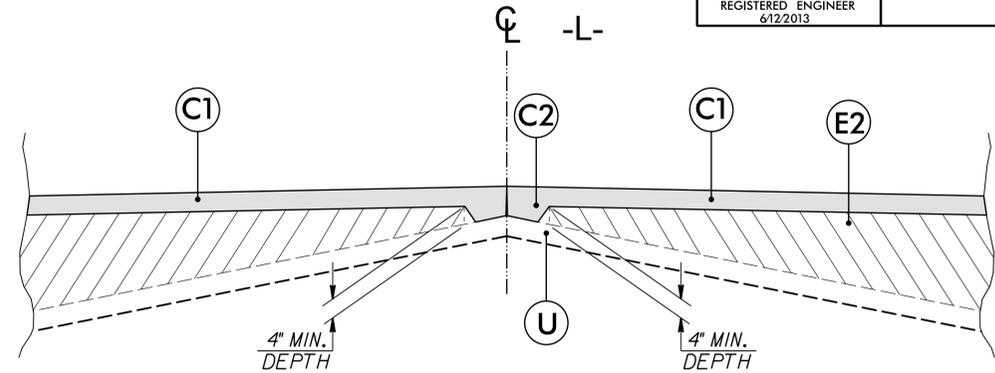
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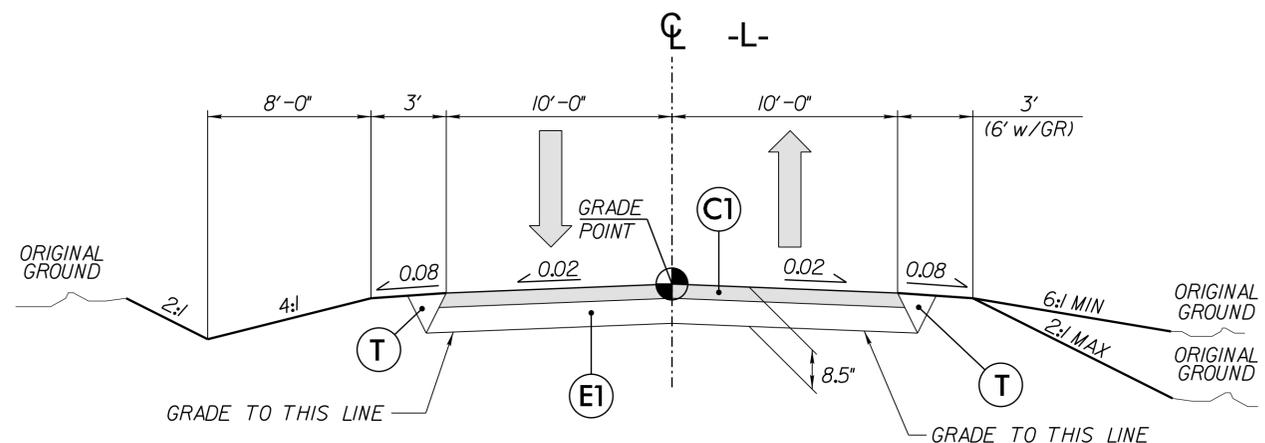


TYPICAL SECTION No. 1

-L- STA 10+10.00 TO -L- STA 11+00.00
-L- STA 13+00.00 TO -L- STA 13+80.00

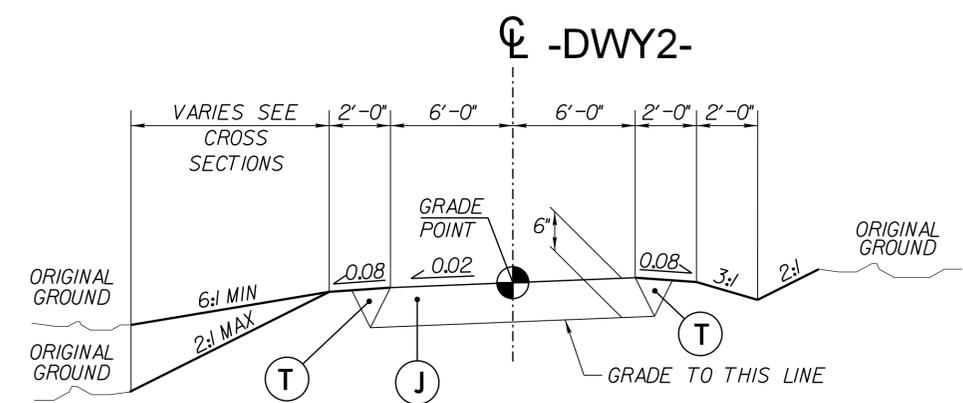


DETAIL SHOWING METHOD OF WEDGING



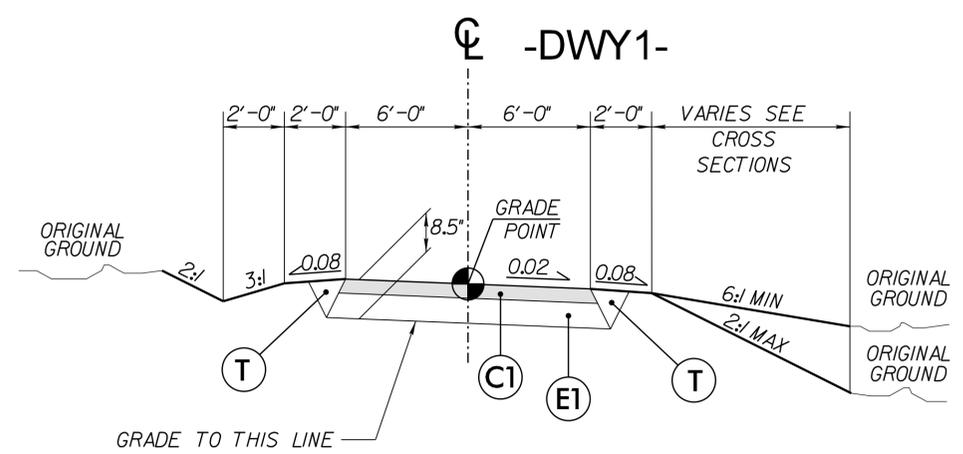
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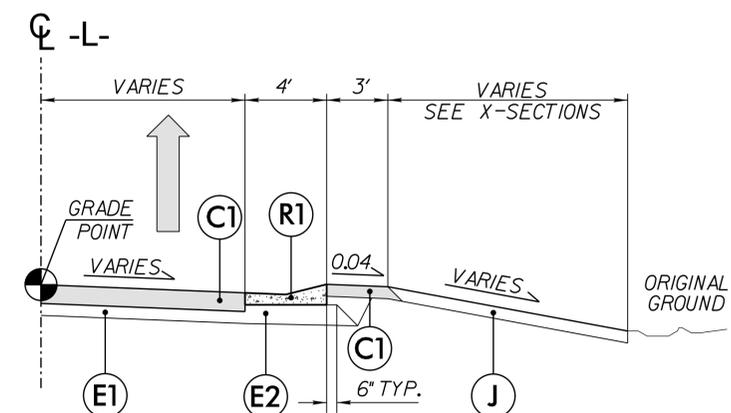
TYPICAL SECTION No. 4

-DWY2- STA 10+14.00 TO -DWY2- STA 10+50.00



TYPICAL SECTION No. 3

-DWY1- STA 10+10.00 TO -DWY1- STA 10+70.00



TYPICAL SECTION EXPRESSWAY GUTTER

-L- STA 10+20.00 TO -L- STA 10+70.00 RT

PAVEMENT SCHEDULE	
ITEM	DESCRIPTION
C1	Prop. Approx 3.0" Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 168 lbs. Per sq. yard in each of two layers.
C2	Prop. Var. Depth Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 112 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 1.5" or greater than 2" in depth.
E1	Prop. Approx 5.5" Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 627 lbs. Per sq. yard.
E2	Prop. Var. Depth Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 114 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 4" or greater than 5.5" in depth.
R1	Concrete Expressway Gutter
J	6" ABC
T	Earth Material
U	Existing Pavement
W	Var. Depth Asphalt Pavement

Note: Pavement edge slopes are 1:1 unless shown otherwise.

REVISIONS

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

Line Item	Des	See No.	Description	Quantity	Unit
1	0000100000-N	800	MOBILIZATION	1	LS
2	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS
3	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB-BING	1	ACR
4	0036000000-E	225	UNDERCUT EXCAVATION	50	CY
12	0134000000-E	240	DRAINAGE DITCH EXCAVATION	60	CY
13	0195000000-E	265	SELECT GRANULAR MATERIAL	50	CY
14	0199000000-E	SP	TEMPORARY SHORING	120	SF
15	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL MINOR STRUCTURES	10	TON
16	0320000000-E	300	FOUNDATION CONDITIONING FABRIC	20	SY
17	0335800000-E	305	48" DRAINAGE PIPE	32	LF
18	0343000000-E	310	15" SIDE DRAINAGE PIPE	16	LF
19	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	8	LF
20	1121000000-E	520	AGGREGATE BASE COURSE	19	TON
21	1220000000-E	545	INCIDENTAL STONE BASE	100	TON
22	1489000000-E	610	ASPHALT CONG BASE COURSE, TYPE B25.0B	330	TON
23	1519000000-E	610	ASPHALT CONG SURFACE COURSE, TYPE S9.5B	160	TON
24	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	25	TON
25	2220000000-E	838	REINFORCED ENDWALLS	12	CY
26	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	1	EA
27	2352000000-N	840	RFRAME WITH GRATE, STD 570.16	1	EA
28	3030000000-E	862	STEEL BM GUARDRAIL	125	LF
29	3045000000-E	862	STEEL BM GUARDRAIL, SHOP CURVED	12.5	LF
30	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	4	EA
31	3165000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350 TL-2	3	EA
32	3195000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE AT-1	1	EA
33	3559000000-E	866	4 STRAND BARBED WIRE FENCE WITH POSTS	320	LF
34	3628000000-E	876	RIP RAP, CLASS 1	15	TON
35	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	325	SY
36	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	156	SF
37	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	20	SF
38	4430000000-N	1130	DRUMS	35	EA
39	4445000000-E	1145	BARRICADES (TYPE III)	32	LF
40	4450000000-N	1150	FLAGGER	4	HR
41	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	4	EA
42	4485000000-E	1170	PORTABLE CONCRETE BARRIER	55	LF
43	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	3,000	LF
44	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	22	LF
44	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	100	LF
45	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	22	LF
46	6000000000-E	1605	TEMPORARY SILT FENCE	1,025	LF
47	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	110	TON
48	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	60	TON
49	6012000000-E	1610	SEDIMENT CONTROL STONE	90	TON
50	6015000000-E	1615	TEMPORARY MULCHING	0.5	ACR
51	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	50	LB
52	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	0.25	TON
53	6024000000-E	1622	TEMPORARY SLOPE DRAINS	200	LF
54	6029000000-E	SP	SAFETY FENCE	300	LF
55	6030000000-E	1630	SILT EXCAVATION	120	CY
56	6036000000-E	1631	MATTING FOR EROSION CONTROL	5,000	SY
57	6042000000-E	1632	1/4" HARDWARE CLOTH	25	LF
58	6070000000-N	1639	SPECIAL STILLING BASINS	3	EA
59	6071010000-E	SP	WATTLE	300	LF
60	6071020000-E	SP	POLYACRYLAMIDE (PAM)	15	LB
61	6084000000-E	1660	SEEDING & MULCHING	0.5	ACR
62	6087000000-E	1660	MOWING	1.0	ACR
63	6090000000-E	1661	SEED FOR REPAIR SEEDING	50	LB
64	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.25	TON
65	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	50	LB
66	6108000000-E	1665	FERTILIZER TOPDRESSING	0.25	TON
67	6111000000-E	SP	IMPERVIOUS DIKE	60	LF
68	6114500000-N	1667	SPECIALIZED HAND MOWING	10	MHR
69	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	13	EA
70	6123000000-E	1670	REFORESTATION	0.10	ACR
STRUCTURES					
71	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION -L- 12+07.80	1	LS
72	8126000000-N	414	CULVERT EXCAVATION, STATION -L- 12+07.80	1	LS
73	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	63	TON
74	8196000000-E	420	CLASS A CONCRETE (CULVERT)	99.5	CY
75	8245000000-E	425	REINFORCING STEEL (CULVERT)	21,689	LB
76	8594000000-E	876	RIP RAP, CLASS B	31	TON

REVISIONS

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PROJECT REFERENCE NO. 17BPJ4.R.2	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
REGISTERED ENGINEER 6/12/2013	REGISTERED ENGINEER 6/12/2013

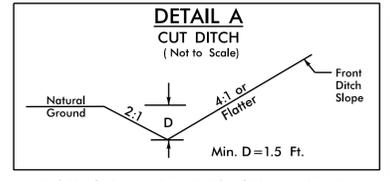
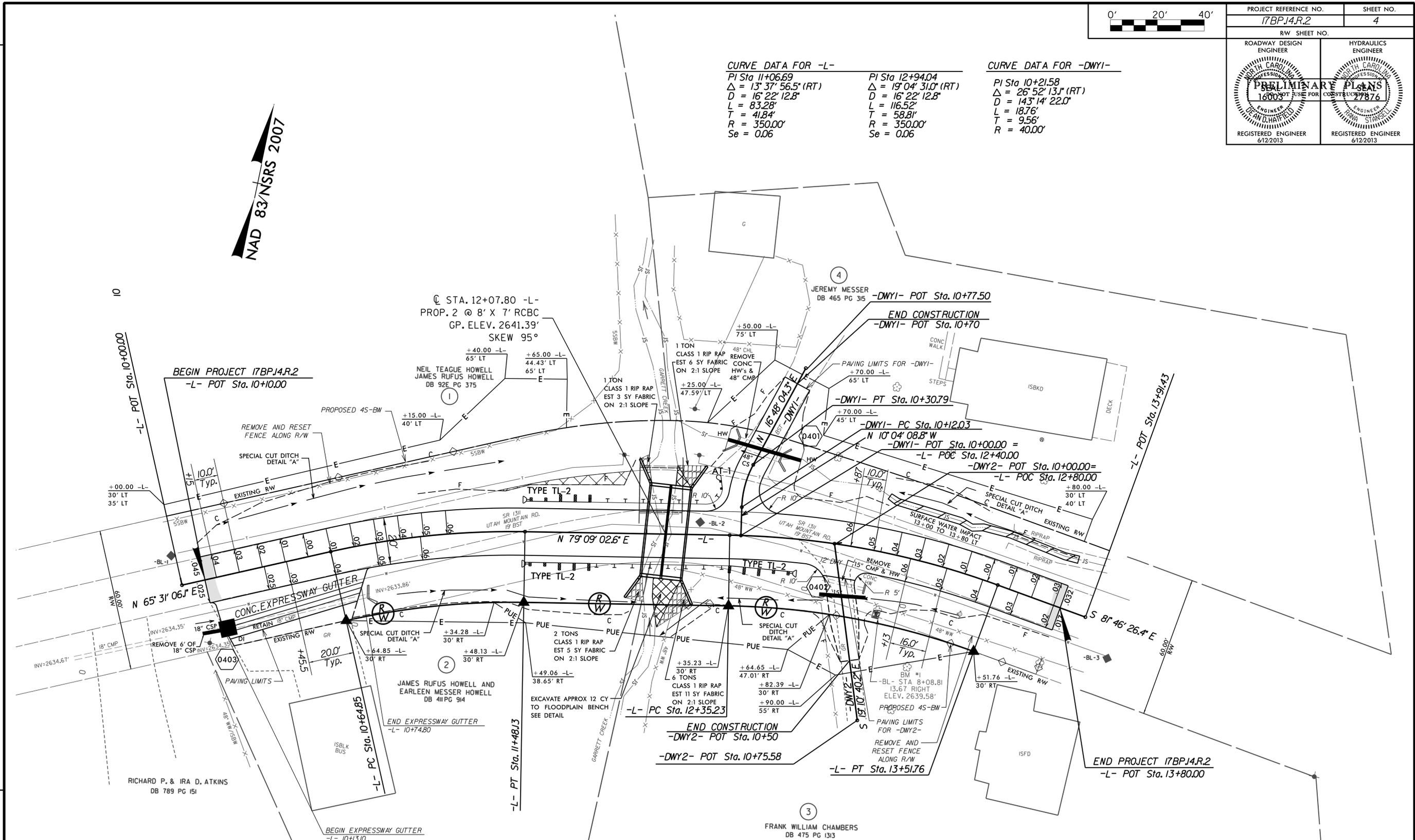
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$L = 83.28'$	$L = 116.52'$
$T = 41.84'$	$T = 58.81'$
$R = 350.00'$	$R = 350.00'$
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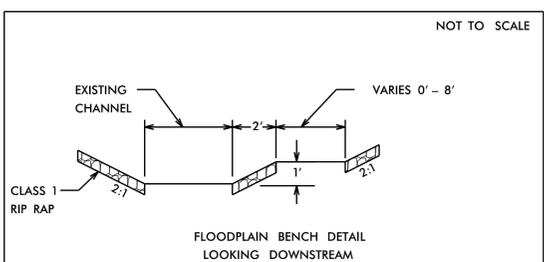
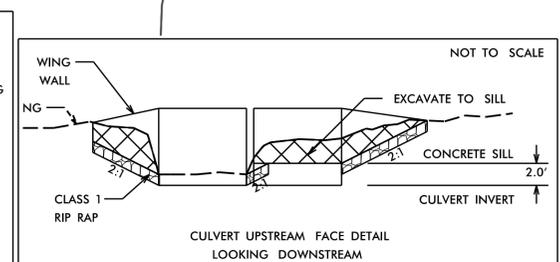
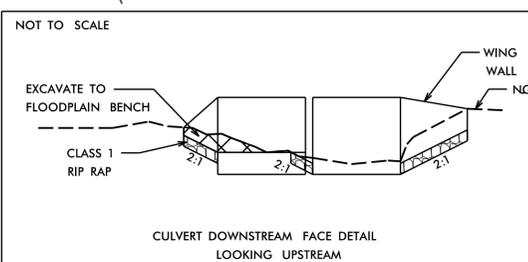
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$D = 143' 14' 22.0''$
$L = 18.76'$
$T = 9.56'$
$R = 40.00'$

NAD 83/NSRS 2007



FROM STA. 10+20 LT TO STA. 11+40 LT
 FROM STA. 13+00 LT TO STA. 13+60 LT
 FROM STA. 10+80 RT TO STA. 12+00 RT
 FROM STA. 12+10 RT TO STA. 13+40 RT (MATTING)



DENOTES PAVEMENT REMOVAL

SEE SHEET 5 FOR PROFILE
 SEE SHEETS C-1 THRU C-8 FOR STRUCTURE PLANS

REVISIONS

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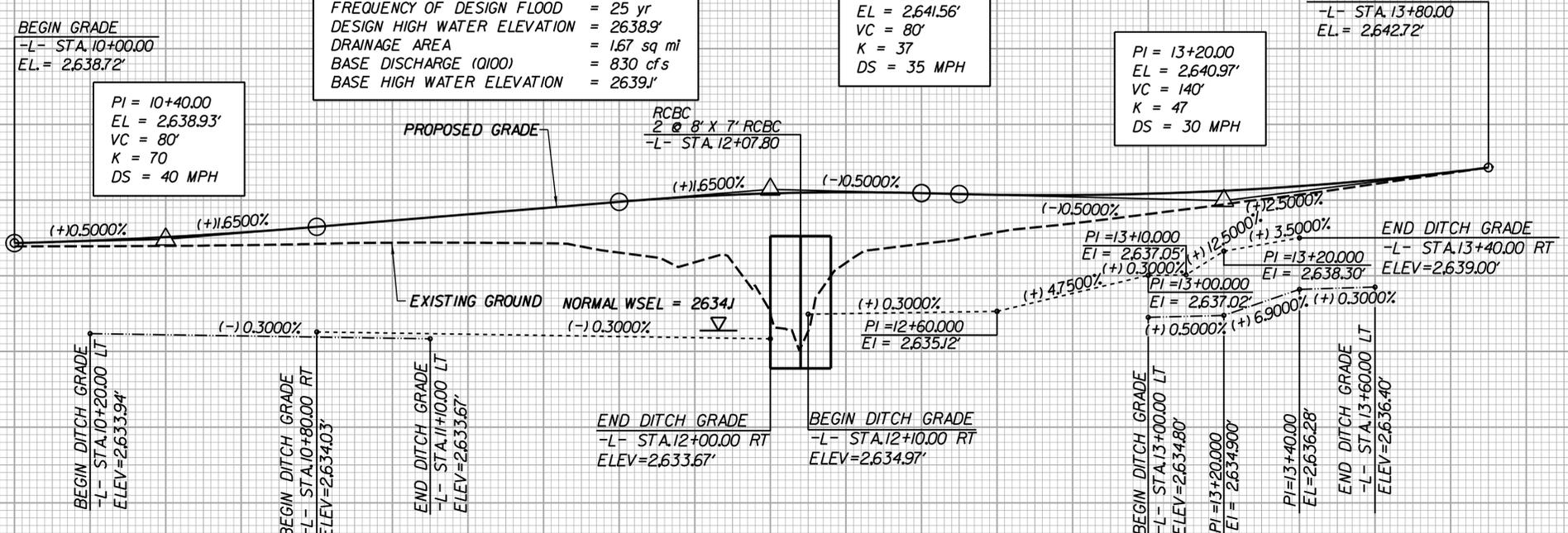
THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, North Carolina 27605

HORIZONTAL: 0 20 40
 VERTICAL: 0 4 8

PROJECT REFERENCE NO. 17BP14.R.2	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER

HYDRAULIC DATA
 DESIGN DISCHARGE = 580 cfs
 FREQUENCY OF DESIGN FLOOD = 25 yr
 DESIGN HIGH WATER ELEVATION = 2638.9'
 DRAINAGE AREA = 1.67 sq mi
 BASE DISCHARGE (1000) = 830 cfs
 BASE HIGH WATER ELEVATION = 2639.1'

BM-1 Elev. 2639.58
 6" NAIL IN ROOT OF 20' WALNUT TREE
 -BL- Sta. 8+09.00 14' Rt.

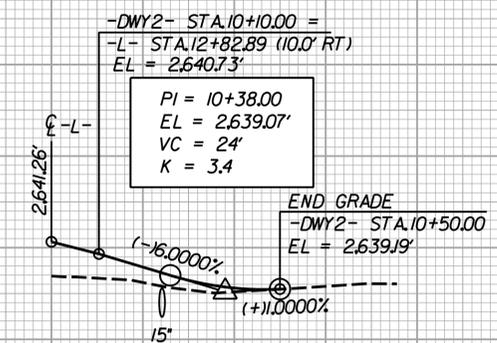
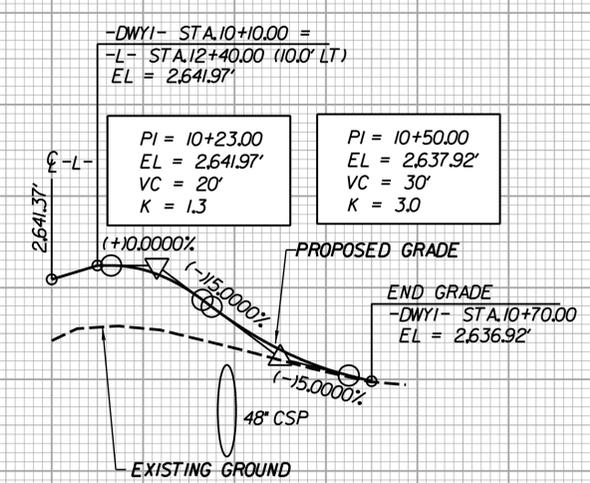


SEE SHEET 4 FOR PLAN

10 11 12 13

-DWY1-

-DWY2-



2,641 2,641
2,637 2,637
2,633 2,633
2,629 2,629

2,641
2,637
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2,629

SEE SHEET 4 FOR PLAN

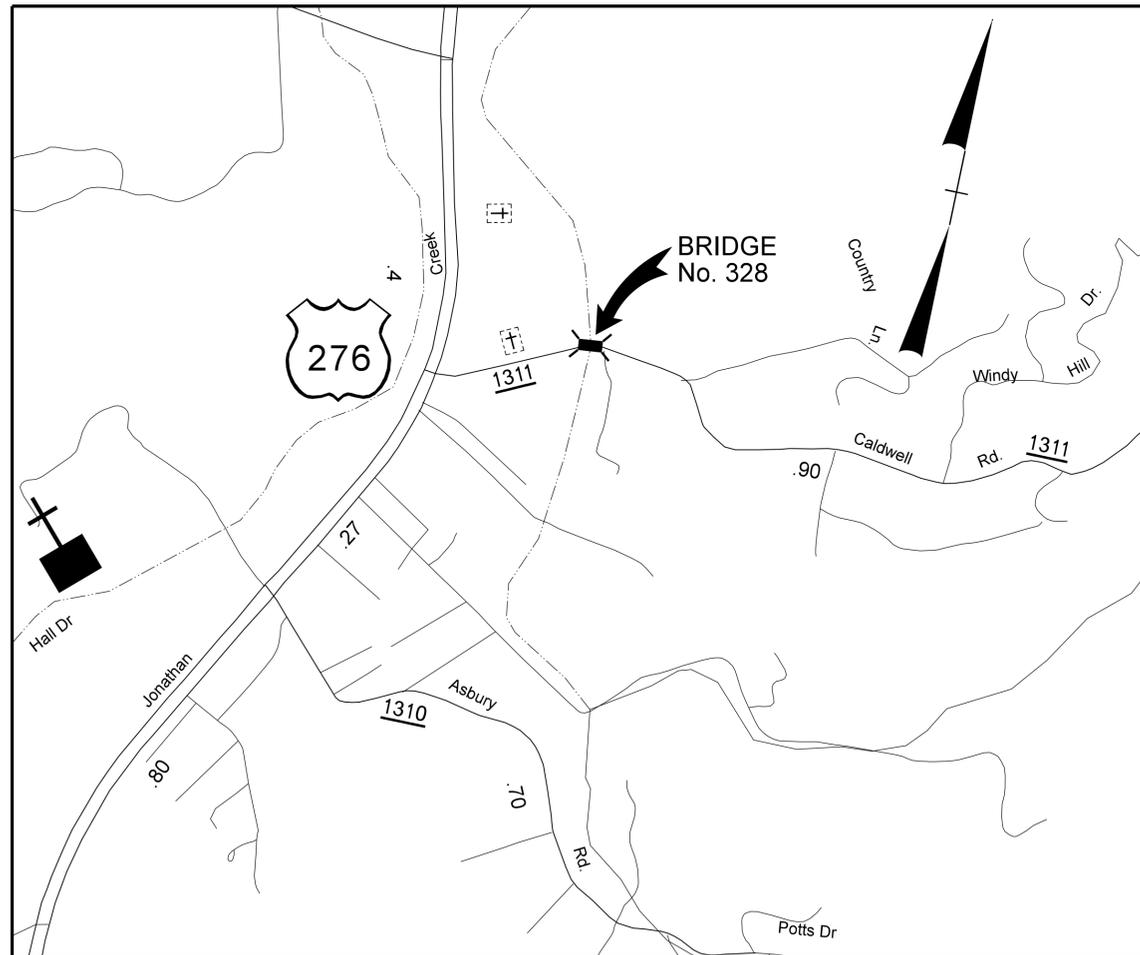
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

HAYWOOD COUNTY



VICINITY MAP NTS
LOCATION: BRIDGE NO. 328 ON SR 1311 OVER GARRETT CREEK

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP-1C	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS DETAIL
TMP-2	TEMPORARY TRAFFIC CONTROL PHASING
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL

SHEET NO.
TMP-1

 **THE LOUIS BERGER GROUP, Inc.**
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605



N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. S. BOURNE, P.E. STATE TRAFFIC MANAGEMENT ENGINEER
D. HATFIELD, P.E. TRAFFIC CONTROL PROJECT ENGINEER
C. WHITE, P.E. TRAFFIC CONTROL PROJECT DESIGN ENGINEER
TRAFFIC CONTROL DESIGN ENGINEER



APPROVED: _____
DATE: _____

SEAL



PROJECT: 17BP.14.R.2

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ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

<u>STD. NO.</u>	<u>TITLE</u>
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUMS
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1170.01	PORTABLE CONCRETE BARRIER
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS

LEGEND

GENERAL

 DIRECTION OF TRAFFIC FLOW

 NORTH ARROW

 REMOVAL

TRAFFIC CONTROL DEVICES

 BARRICADE (TYPE III)

 DRUM

 TEMPORARY CRASH CUSHION

TEMPORARY SIGNING

 STATIONARY SIGN

SIGNALS

 TEMPORARY

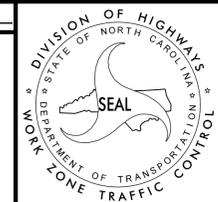
TEMPORARY PAVEMENT MARKING

PAINT 4"

PA WHITE EDGELINE

STOPBAR

P4 24" WHITE STOPBAR

APPROVED: _____ DATE: _____		
ROADWAY STANDARD DRAWINGS & LEGEND		

MANAGEMENT STRATEGIES

- PER NCDOT, DURING CONSTRUCTION, SR 1311 (UTAH MOUNTAIN RD) TRAFFIC WILL BE PLACED IN A ONE-LANE, TWO-WAY PATTERN.
- TEMPORARY SIGNALS AT THE BEGINNING AND END OF AN ONSITE DETOUR WILL MANAGE SR 1311 TRAFFIC.
- THE CONSTRUCTION OF THE TIE INS, TRAFFIC SHIFTS, PLACEMENT OF FINAL SURFACE COURSE AND PAVEMENT MARKINGS WILL BE PERFORMED USING FLAGGER OPERATIONS ON A ONE-LANE, TWO-WAY TRAFFIC PATTERN.

GENERAL NOTES / LOCAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- C) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- D) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:
 - BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.
 - BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.
 - BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.
- E) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 ft IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- F) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- G) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- H) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC BARRIER

- I) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRAFFIC CONTROL PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRAFFIC CONTROL PLANS OR AS DIRECTED BY THE ENGINEER.
 - DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.
 - ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE/RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRAFFIC CONTROL PLANS. TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.
 - INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.
 - INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

- J) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED IMPACT ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS:

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

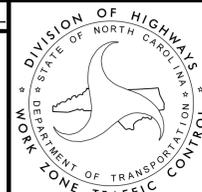
TRAFFIC CONTROL DEVICES

- K) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- L) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.
- M) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
-L- (UTAH MOUNTAIN RD)	PAINT	NONE
- N) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- O) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- P) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

- Q) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 200 ft AND 400 ft RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

APPROVED: _____	DATE: _____			<h1>TRANSPORTATION OPERATIONS PLAN</h1>
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PROJECT PHASING

MAINTAIN ACCESS TO ALL RESIDENCES WITHIN THE PROJECT LIMITS.

PHASE I

STEP 1:
INSTALL ADVANCE WORK ZONE WARNING SIGNS USING RDWY STD 1101.01, SHEET 3 OF 3.

STEP 2:
USING RDWY STD 1101.02, SHEET 1 OF 15, COMPLETE THE FOLLOWING ON SR 1311 IN ONE WORK PERIOD:

- CONSTRUCT/INSTALL TEMPORARY TRAFFIC SIGNAL AND PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) FOR LANE SHIFT TAPER AT THE BEGINNING AND END OF PROJECT.
- UTILIZE EXISTING PAVEMENT MARKINGS FOR A TEMPORARY ONE LANE, TWO WAY TRAFFIC PATTERN. REMOVE OR COVER EXISTING DOUBLE YELLOW CENTER LINE IN LANE SHIFT AT THE BEGINNING AND END OF PROJECT. (SEE SHEET TMP-3).
- INSTALL ADDITIONAL SIGNS FOR TEMPORARY TRAFFIC SIGNAL AND TRAFFIC CONTROL DEVICES, ACTIVATE THE SIGNAL AND SHIFT TRAFFIC TO THE TEMPORARY ONE-LANE, TWO-WAY PATTERN AS SHOWN ON SHEET TMP-3.

STEP 3:
USING RDWY STD 1101.02, SHEET 1 OF 15, PERFORM THE FOLLOWING WORK ON SR 1311:

- INSTALL PORTABLE CONCRETE BARRIER AND CRASH CUSHIONS FROM -L- STA 12+17 +/- TO -L- STA 12+40 +/- . (SEE SHEET TMP-3)
- CONSTRUCT TEMPORARY SHORING BEHIND PORTABLE CONCRETE BARRIER FROM -L- STA 12+17 +/- TO -L- STA 12+65 +/- . (SEE SHEET TMP-3)
- CONSTRUCT PHASE 1 OF PROPOSED CULVERT. (SEE STRUCTURES PLANS)
- CONSTRUCT PHASE 1 OF PROPOSED ROADWAY UP TO, BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -L- STA 11+30 +/- TO -L- STA 12+80 +/-, AND -DWY2- (SEE SHEET TMP-3)

STEP 4:
IN ONE WORK PERIOD, PERFORM THE FOLLOWING WORK ON SR 1311:

- USING FLAGGERS, RDWY STD 1101.02, SHEET 1 OF 15, CONSTRUCT TIE INS FROM -L- STA 10+10 +/- TO -L- STA 11+30 +/- AND FROM -L- STA 12+80 +/- TO -L- STA 13+80 +/- .
- INSTALL PORTABLE CONCRETE BARRIER AND CRASH CUSHIONS FROM -L- STA 11+50 +/- TO -L- STA 12+05 +/- . (SEE SHEET TMP-4)
- PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) ON -L- FOR A TEMPORARY ONE-LANE, TWO-WAY TRAFFIC PATTERN. (SEE SHEET TMP-4)
- RETAIN ADVANCE WORK ZONE SIGNS AND TEMPORARY TRAFFIC SIGNAL FROM PHASE 1 AND SWITCH TRAFFIC ONTO THE NEWLY CONSTRUCTED SECTION OF SR 1311 AT THE END OF THE WORK PERIOD.

PHASE II

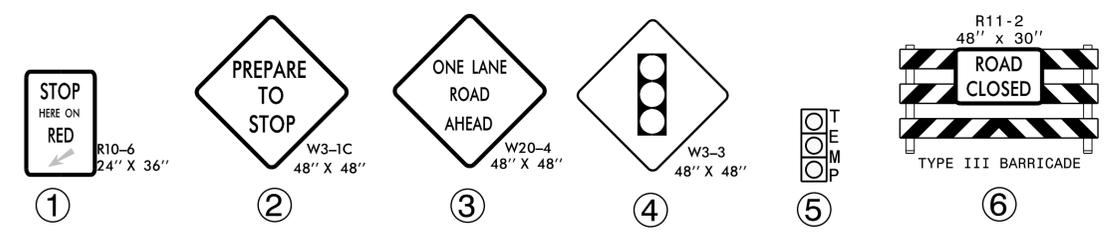
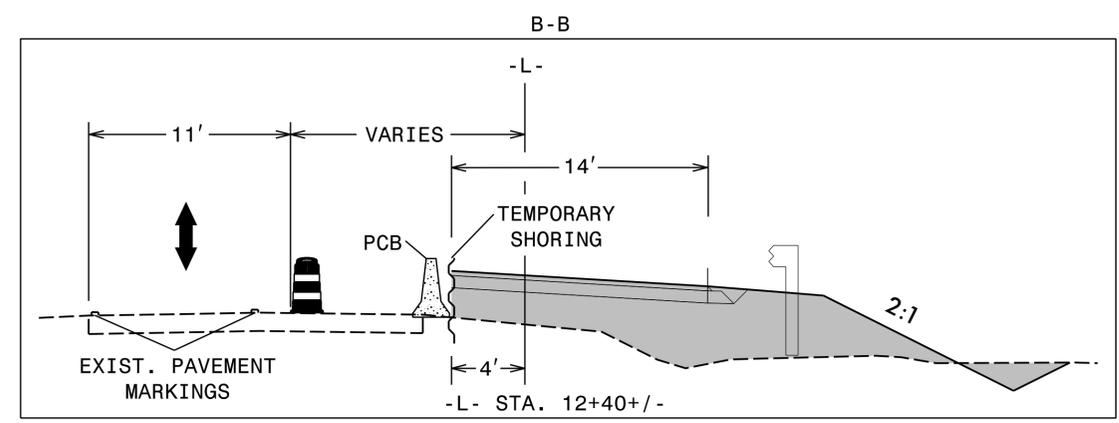
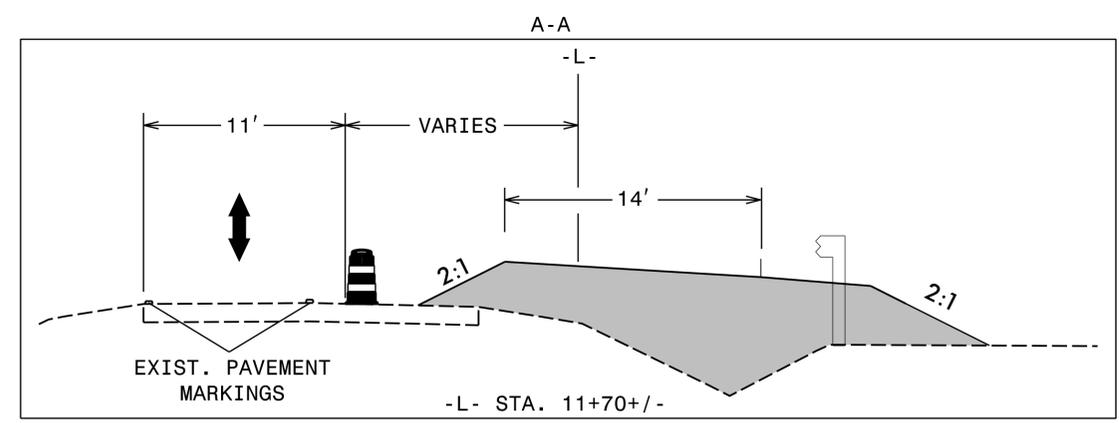
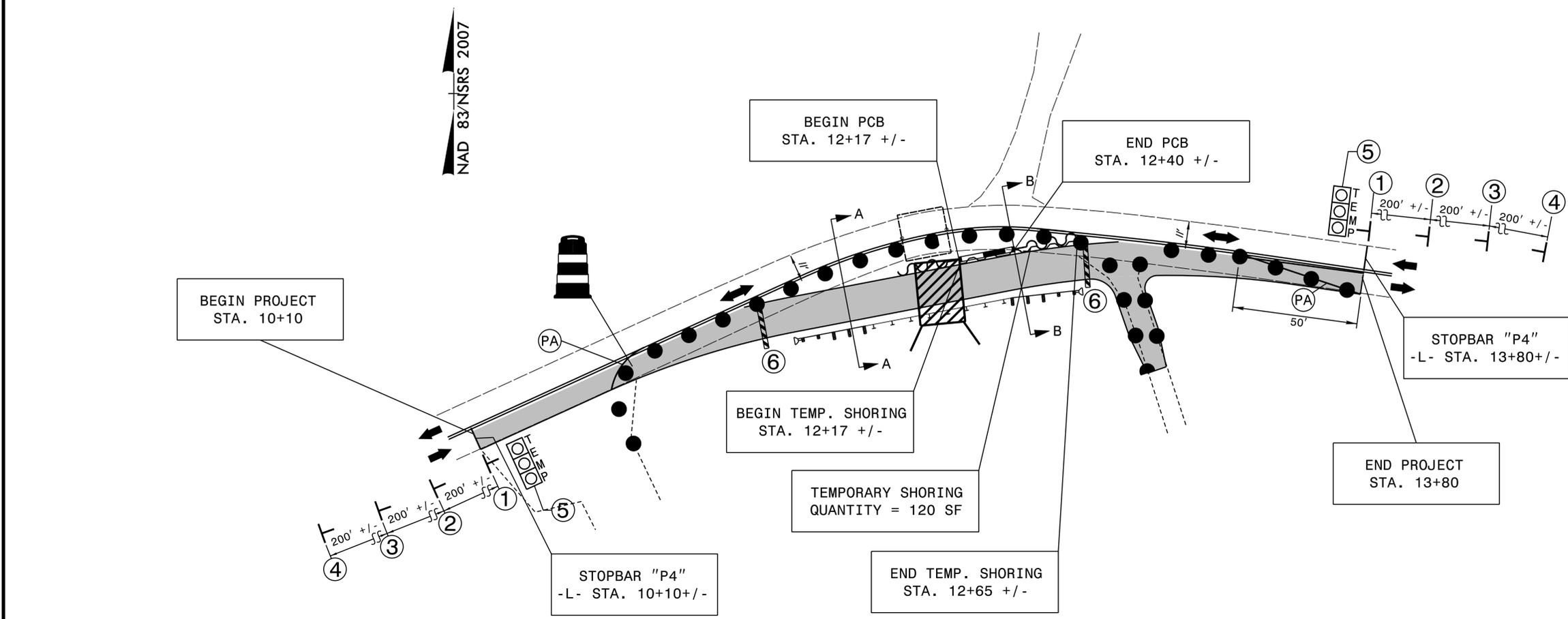
STEP 1:
USING RDWY STD 1101.02, SHEET 1 OF 15, PERFORM THE FOLLOWING WORK ON SR 1311:

- REMOVE THE EXISTING BRIDGE IN ACCORDANCE WITH ROADWAY AND STRUCTURE PLANS.
- CONSTRUCT PHASE II OF PROPOSED CULVERT. (SEE STRUCTURE PLANS)
- REMOVE PORTABLE CONCRETE BARRIER AND SHORING UTILIZED IN PHASE 1 AND CONSTRUCT PHASE II OF PROPOSED ROADWAY FROM -L- STA 10+10 +/- TO -L- STA 13+80 +/-, UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE. (SEE SHEET TMP-4)

STEP 2:
USING FLAGGERS, RDWY STD 1101.02, SHEET 1 OF 15, IN ONE WORK PERIOD, REMOVE PORTABLE CONCRETE BARRIER AND CRASH CUSHIONS AND PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS ON PROPOSED -L- FROM STA 10+10 +/- TO STA 13+80 +/- . SHIFT TRAFFIC ONTO NEWLY CONSTRUCTED ROADWAY AND CULVERT IN A TWO LANE, TWO WAY PATTERN AT THE END OF THAT WORK PERIOD.

STEP 3:
USING FLAGGERS AS NECESSARY, COMPLETE REMOVAL OF ANY REMAINING ROADWAY AND STRUCTURE. REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AND OPEN -L- TO THE FINAL TRAFFIC PATTERN.

APPROVED: _____ DATE: _____			<h3 style="margin: 0;">TEMPORARY TRAFFIC CONTROL PHASING</h3>
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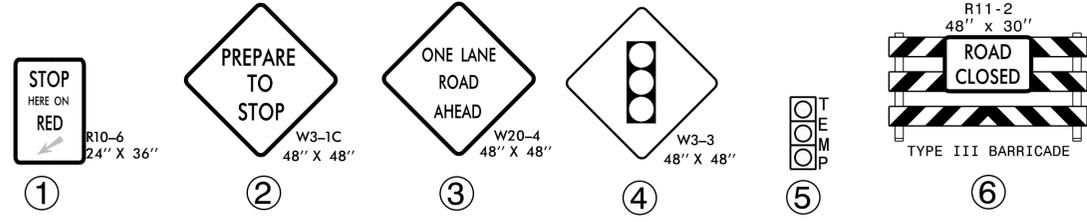
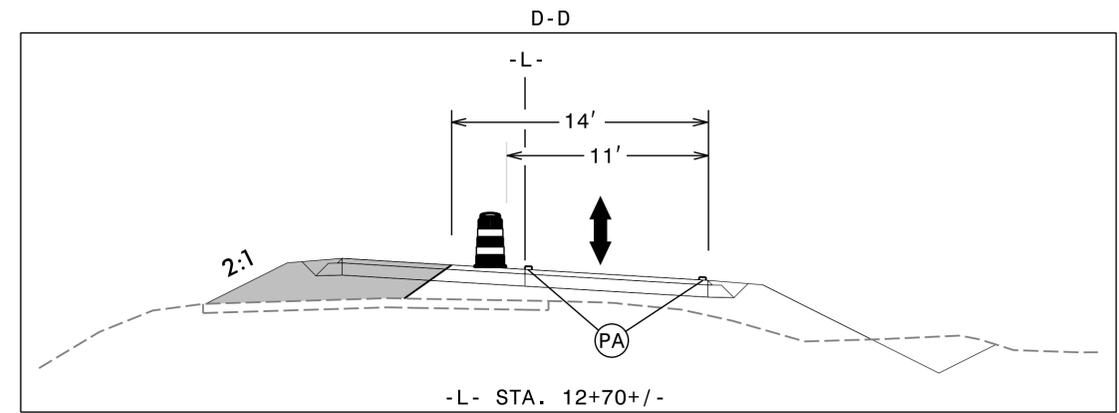
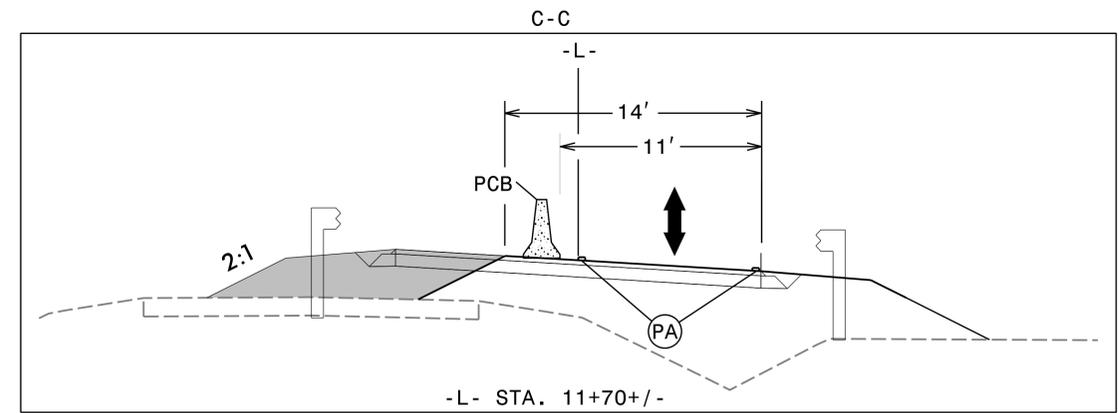
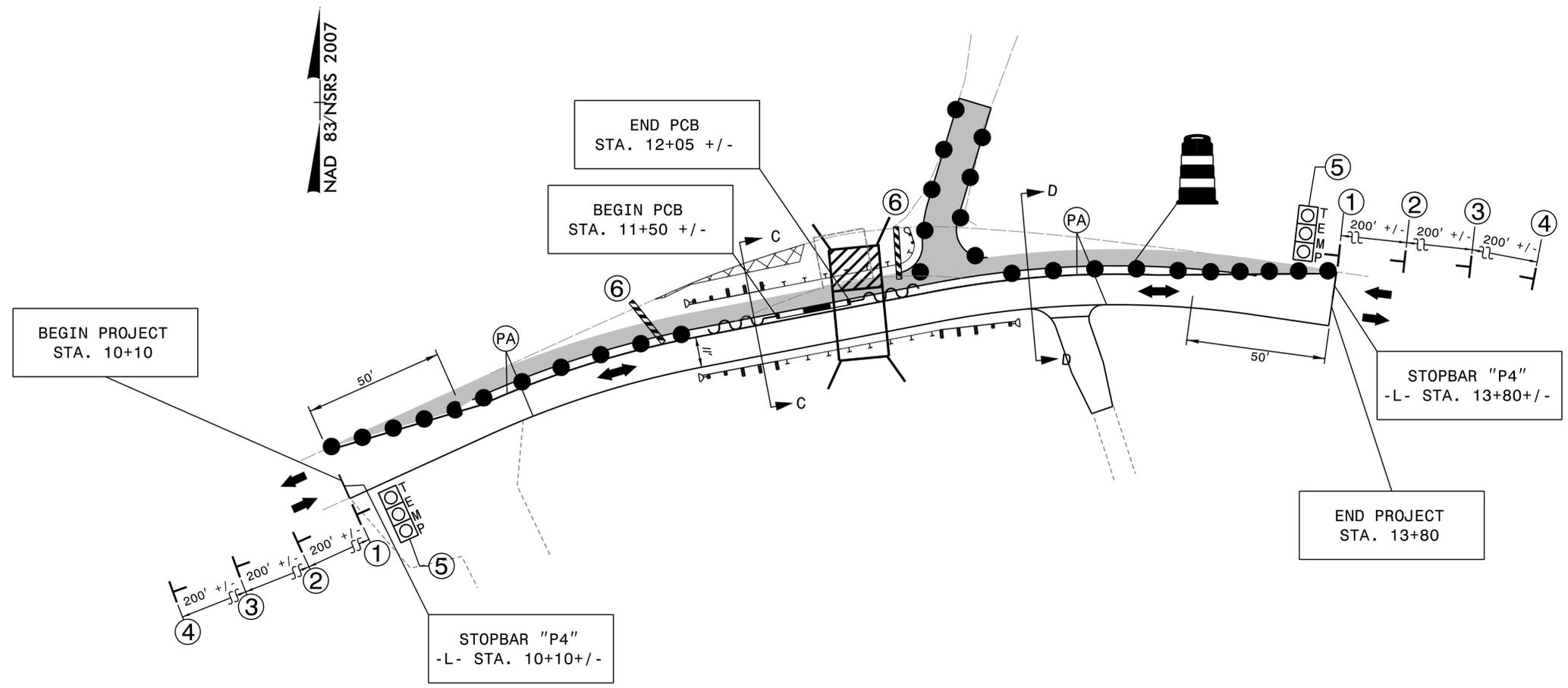


- NOTES:
1. FOR CONSTRUCTION PHASING NOTES, SEE SHEET TMP-2
 2. ALL SIGN LOCATIONS ARE APPROXIMATE.
 3. SEE ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3 FOR ADDITIONAL WORK ZONE SIGNS AND APPLICABLE NOTES.

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THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, North Carolina 27605

APPROVED: _____ DATE: _____			TEMPORARY TRAFFIC CONTROL PHASE I
SEAL			



- NOTES:
- FOR CONSTRUCTION PHASING NOTES, SEE SHEET TMP-2
 - ALL SIGN LOCATIONS ARE APPROXIMATE.
 - SEE ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3 FOR ADDITIONAL WORK ZONE SIGNS AND APPLICABLE NOTES.

THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, North Carolina 27605

APPROVED: _____ DATE: _____			TEMPORARY TRAFFIC CONTROL PHASE II
SEAL			

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**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

STATE	PROJECT NO.	SHEET NO.	TOTAL SHTS.
N.C.	17BP.14.R.2	PMP-1	2

APPROVED: _____
DATE: _____

SEAL



PAVEMENT MARKING PLANS

LOCATION: BRIDGE NO. 328 ON SR 1311 OVER GARRETT CREEK

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - ROADWAY DESIGN UNIT-N.C. DEPARTMENT OF TRANSPORTATION-RALEIGH, N.C., DATED JULY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS

PAVEMENT MARKING SCHEDULE

ASPHALT PAVEMENT DESIGN
(AS SHOWN)

PAVEMENT MARKING LINES

PA - PAINT - WHITE EDGELINE (4")
PI - PAINT - YELLOW DOUBLE CENTER LINE (4")

GENERAL NOTES

THE FOLLOWING NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ASPHALT PAVEMENT DESIGN:

ROAD NAME	MARKING	MARKER
ALL	PAINT	NONE

- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
C) REMOVE/ REPLACE ANY CONFLICTING/ DAMAGED PAVEMENT MARKINGS AND MARKERS.
D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN COVER SHEET
PMP-2	PAVEMENT MARKING DETAIL



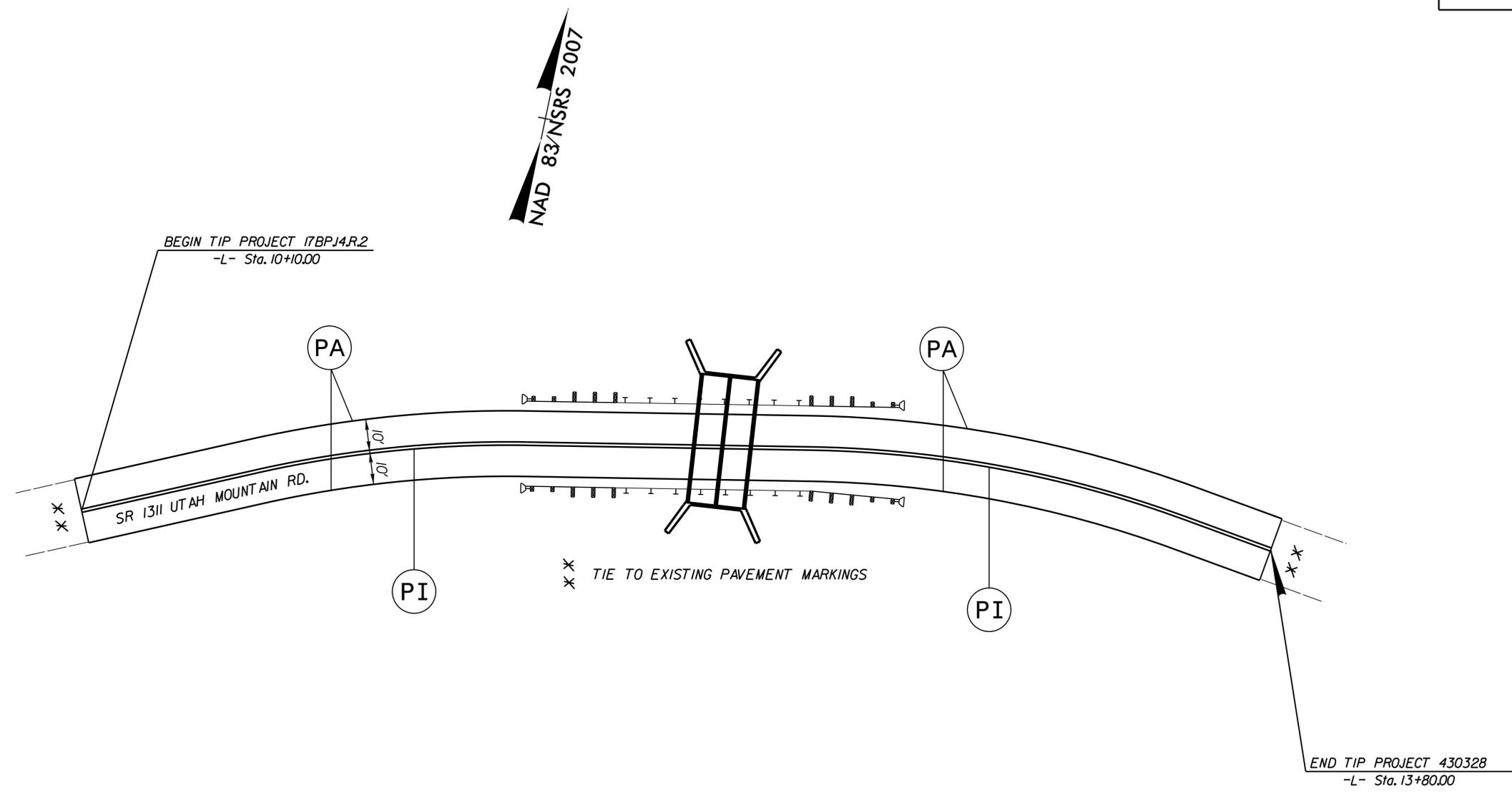
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY
PLANS

STATE	PROJECT NO.	SHEET NO.	TOTAL SHTS.
N.C.	17BP.14.R.2	PMP-2	2

APPROVED: _____
DATE: _____

SEAL

LEGEND

-  - PAINT - WHITE EDGELINE (4")
-  - PAINT - YELLOW DOUBLE CENTER LINE (4")

PAVEMENT MARKING DETAIL
UTAH MOUNTAIN RD.

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Environmentally Sensitive Areas:

This project is located in an "Environmentally Sensitive Area." This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the area identified on the plans. This also requires special procedures to be used for seeding and mulching and staged seeding within the project.

Clearing and Grubbing:

In areas identified on the erosion control plans as "Environmentally Sensitive Areas", the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Section 200, Article 200-1, in the Standard Specifications. The "Environmentally Sensitive Area" shall be defined as a 50 foot buffer zone on both sides of the stream (or depression), measured from top of streambank (or center of depression). Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

Grading:

Once grading operations begin in identified "Environmentally Sensitive Areas", work will progress in a continuous manner until complete. All construction within these areas must progress in a continuous manner such that each phase is complete and areas permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in "Environmentally Sensitive Areas" as specified will be just cause for the Engineer to direct the suspension of work in accordance with Section 108-7 of the Standard Specifications.

Temporary Stream Crossings:

Any crossing of streams within the limits of this project must be accomplished in accordance with Section 107-13(b) of the Standard Specifications.

Seeding and Mulching:

Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the "Environmentally Sensitive Areas" as indicated on the erosion control plans.

Stage Seeding:

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes which are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS



PROJECT REFERENCE NO.	SHEET NO.
17BP14.R.2	EC-01/CONST.04
R/W SHEET NO.	

**ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.**

2012 STANDARD SPECIFICATIONS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

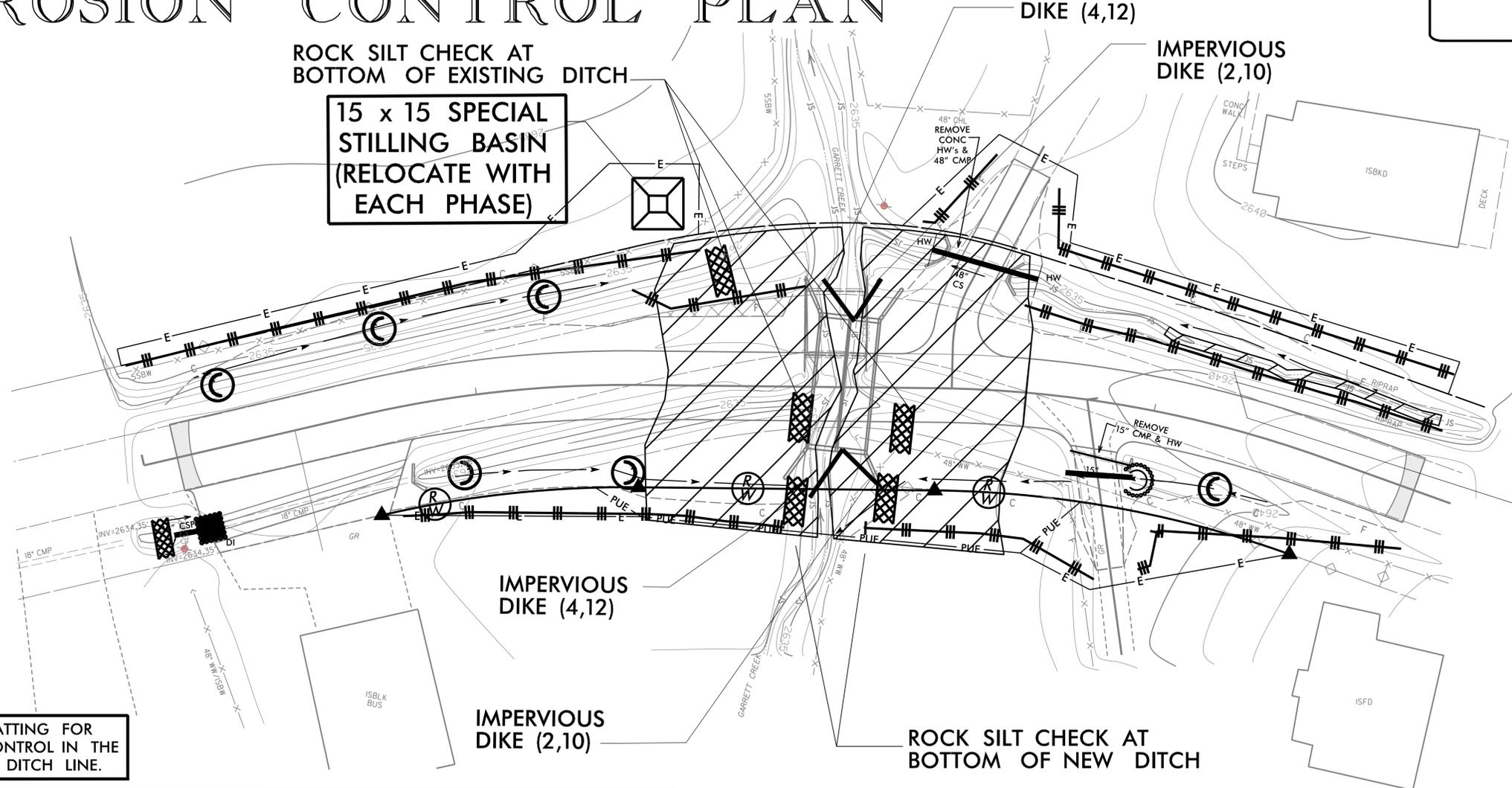
EROSION CONTROL PLAN

ROCK SILT CHECK AT
BOTTOM OF EXISTING DITCH

15 x 15 SPECIAL
STILLING BASIN
(RELOCATE WITH
EACH PHASE)

IMPERVIOUS
DIKE (4,12)

IMPERVIOUS
DIKE (2,10)



- (1) PLACE SILT FENCE AT EXISTING TOP OF BANK
- (2) CONSTRUCT NEW DITCH ADJACENT TO EXISTING DITCH
- (3) CONSTRUCT ROADWAY EMBANKMENT

INSTALL MATTING FOR
EROSION CONTROL IN THE
PROPOSED DITCH LINE.

2012 STANDARD DRAWINGS

1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	— — —
1632.03	Rock Inlet Sediment Trap Type C	□□□□
1633.01	Temporary Rock Silt Check Type-A	▨▨▨▨
1633.02	Wattle with Polyacrylamide (PAM)	○
1635.02	Rock Pipe Inlet Sediment Trap Type-B	⊖

Crystal Moore
LEVEL III NAME

3124
LEVEL III CERTIFICATION NO.

6/12/2013 10:05:57 AM G:\OR Projects\NRI100 - NCDOT Group\W430328\Roadway\Proj\430328_RDY_08_EC_01.dgn G:\CADD\Plot\NRI100\1100_rdy_EC.tst

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
<i>PERIMETER DIKES, SWALES, DITCHES AND SLOPES</i>	<i>7 DAYS</i>	<i>NONE</i>
<i>HIGH QUALITY WATER (HOW) ZONES</i>	<i>7 DAYS</i>	<i>NONE</i>
<i>SLOPES STEEPER THAN 3:1</i>	<i>7 DAYS</i>	<i>IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.</i>
<i>SLOPES 3:1 OR FLATTER</i>	<i>14 DAYS</i>	<i>7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.</i>
<i>ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1</i>	<i>14 DAYS</i>	<i>NONE, EXCEPT FOR PERIMETERS AND HOW ZONES.</i>

REVISIONS

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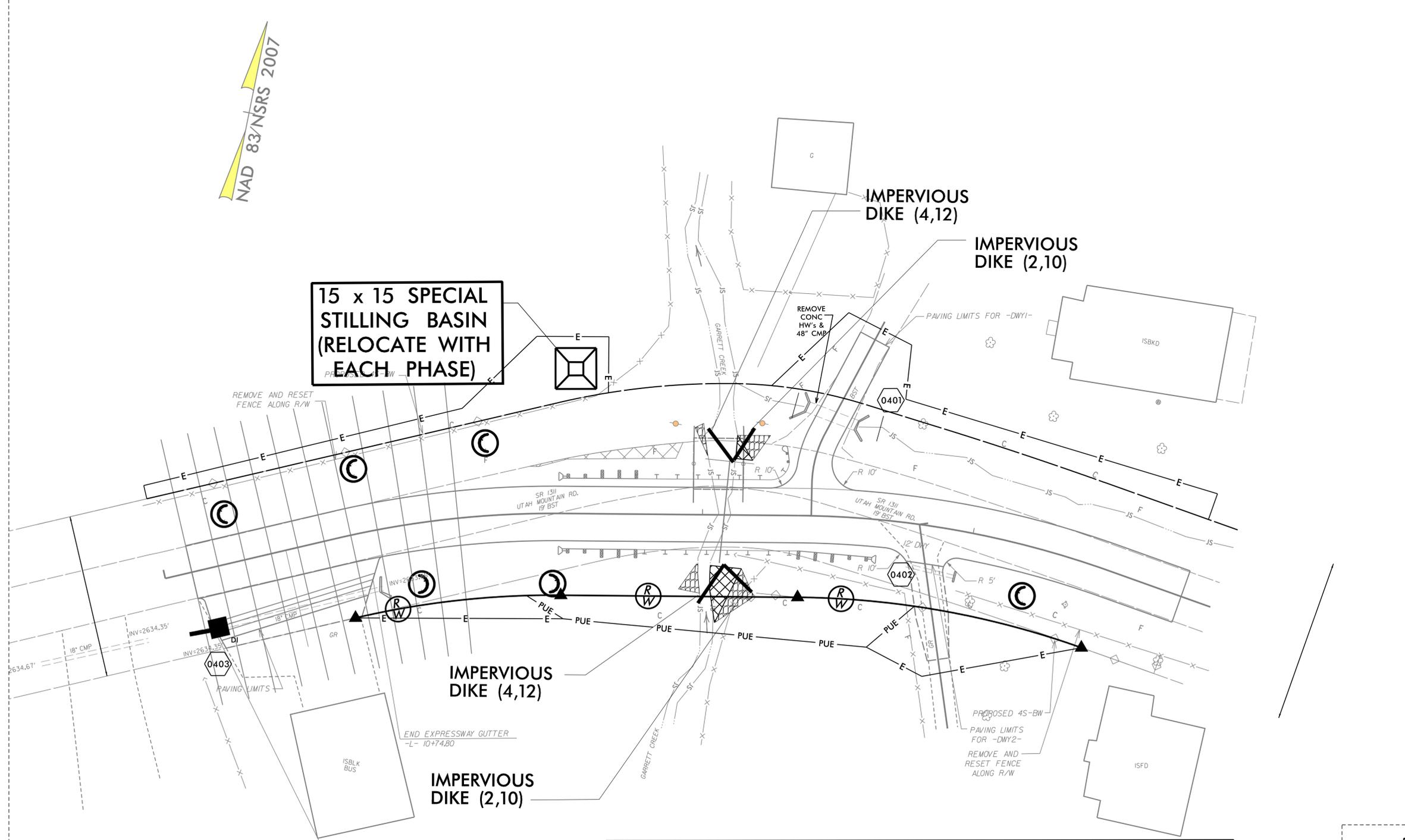


PROJECT REFERENCE NO.	SHEET NO.
17BP14.R.2	EC-03/CONST.04
R/W SHEET NO.	

CULVERT CONSTRUCTION SEQUENCE -L- STA. 12 + 08

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. INSTALL SPECIAL STILLING BASIN 2. INSTALL IMPERVIOUS DIKE AND DIVERT FLOW TO LEFT. 3. CONSTRUCT RIGHT UPSTREAM BARREL. 4. RELOCATE IMPERVIOUS DIKES AND DIVERT FLOW TO RIGHT BARREL. 5. CONSTRUCT LEFT UPSTREAM BARREL. 6. CONSTRUCT INLET CHANNEL AND PLACE CLASS 1 RIP RAP ON BANKS 7. CONSTRUCT ROADWAY. | <ol style="list-style-type: none"> 8. SHIFT TRAFFIC TO NEW ROADWAY. 9. REMOVE BRIDGE. 10. INSTALL IMPERVIOUS DIKE AND DIVERT FLOW TO LEFT BARREL. 11. CONSTRUCT RIGHT DOWNSTREAM BARREL. 12. INSTALL IMPERVIOUS DIKE AND DIVERT FLOW TO RIGHT BARREL. 13. CONSTRUCT LEFT DOWNSTREAM BARREL. 14. PLACE CLASS 1 RIP RAP ON DOWSTREAM BANKS. 15. REMOVE STILLING BASIN. |
|--|--|

NAD 83/NSRS 2007



15 x 15 SPECIAL STILLING BASIN (RELOCATE WITH EACH PHASE)

IMPERVIOUS DIKE (4,12)

IMPERVIOUS DIKE (2,10)

IMPERVIOUS DIKE (4,12)

IMPERVIOUS DIKE (2,10)

REVISIONS

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Seq #	Description	Symbol
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PROJECT: 17BP.14.R.2

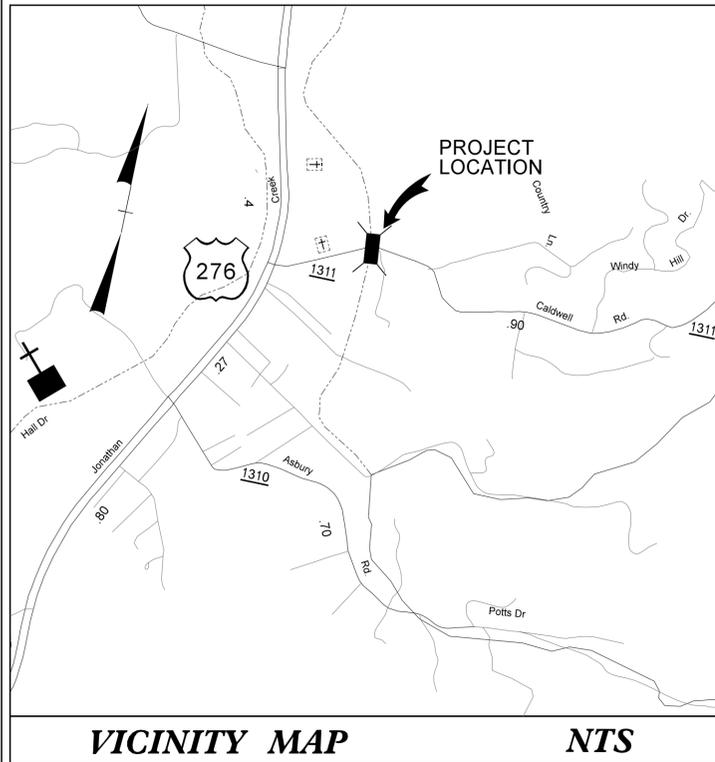
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
17BP.14.R.2	UO-1

**UTILITIES BY OTHERS
HAYWOOD COUNTY**

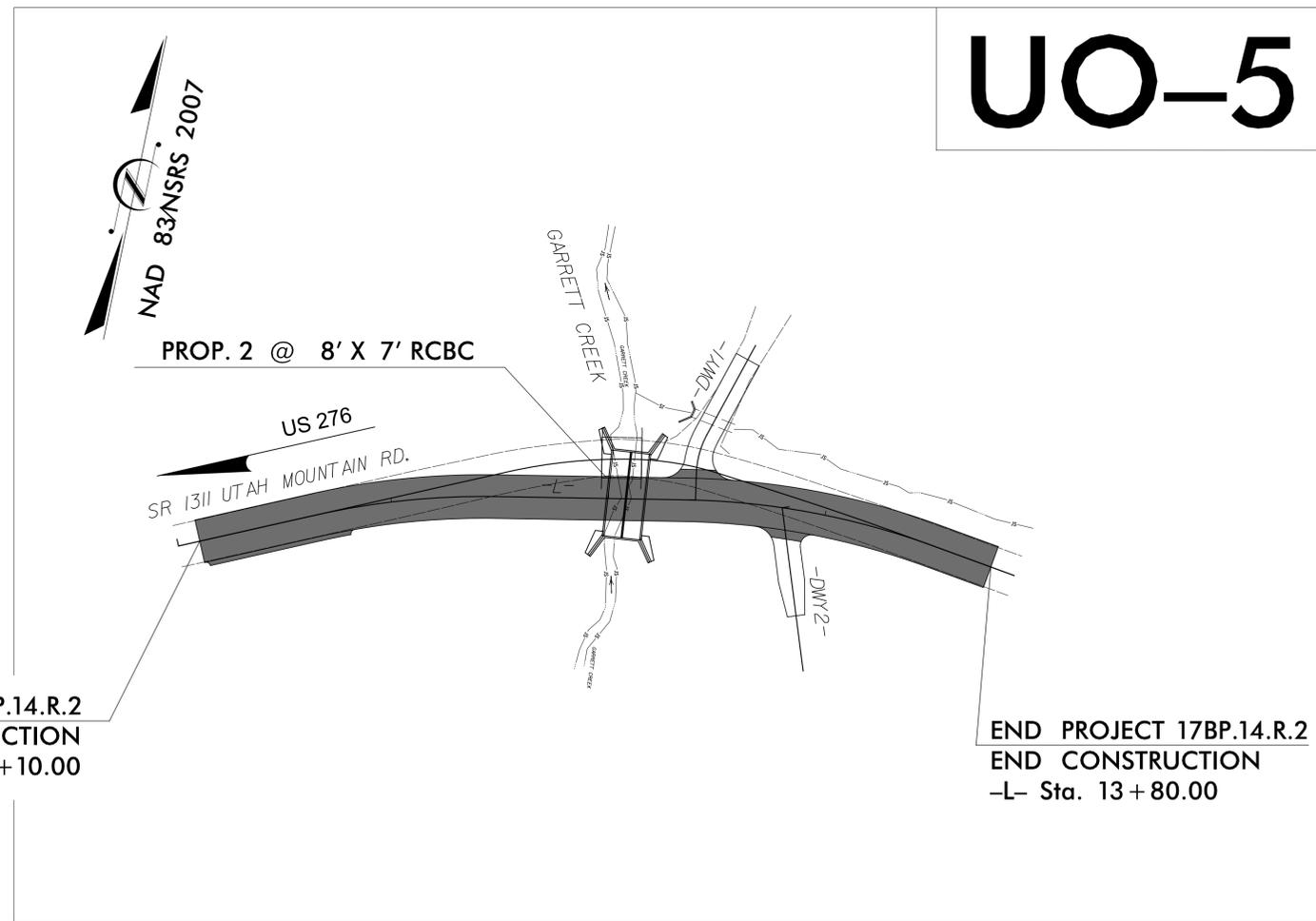
LOCATION: BRIDGE NO. 328 ON SR 1311 OVER GARRETT CREEK

TYPE OF WORK: UTILITIES - AERIAL, UNDERGROUND RELOCATION AND UTILITY CONSTRUCTION



VICINITY MAP

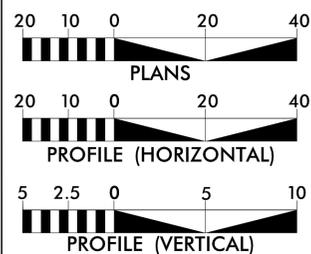
NTS



BEGIN PROJECT 17BP.14.R.2
BEGIN CONSTRUCTION
-L- Sta. 10+10.00

END PROJECT 17BP.14.R.2
END CONSTRUCTION
-L- Sta. 13+80.00

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	SYMBOLY SHEET
UO-3	WATER LINE DETAILS
UO-4	WATER LINE PLAN AND PROFILE
UO-5	UTILITIES BY OTHERS PLAN SHEET

UTILITY OWNERS ON PROJECT

- (1) POWER: HAYWOOD EMC - Wayne Nichols (828) 506-0170
- (2) TELEPHONE: AT&T - Scott Addington (828) 258-7138
- (3) CABLE: CAROLINA MOUNTAIN CABLEVISION - Terry Sersland (828) 507-6472
- (4) WATER: MAGGIE VALLEY SANITARY DISTRICT - Neil Carpenter (828) 926-0145

PLANS PREPARED BY:



3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

UTILITIES PROJECT ENGINEER

Eric Tweed, P.E.



PREPARED FOR THE OFFICE OF:

DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING

1555 MAIL SERVICE CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Roger Worthington, P.E. UTILITIES SECTION ENGINEER

\$ DATE \$
\$ FILE \$
\$ PENTBL \$

5/14/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P0189

PROJECT REFERENCE NO. 17BP.14.R.2	SHEET NO. UO-2
BRIDGE NO. 430328	

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	—————
11¼ Degree Bend	+ +
22½ Degree Bend	+ X
45 Degree Bend	+ X
90 Degree Bend	+ †
Plug	
Tee	+ †
Cross	+ †
Reducer	▶
Gate Valve	GV
Butterfly Valve	BV
Tapping Valve	TGV
Line Stop	LS
Line Stop with Bypass	LS/BP
Blow Off	BO
Fire Hydrant	PFH
Relocate Fire Hydrant	RFH
Remove Fire Hydrant	REM FH
Water Meter	PMM
Relocate Water Meter	RWM
Remove Water Meter	REM WM
Water Pump Station	PS(W)
RPZ Backflow Preventer	PRPZ
DCV Backflow Preventer	PBFP
Relocate RPZ Backflow Preventer	RRPZ
Relocate DCV Backflow Preventer	RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	—————
Force Main Sewer Line (Sized as Shown)	—————
Manhole (Sized per Note)	•
Sewer Pump Station	PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	o
Telephone Pole	-o-
Joint Use Pole	-o-
Telephone Pedestal	TEL PED
Utility Line by Others (Type as Shown)	—————
Trenchless Installation	—————
Encasement by Open Cut	—————
Encasement	—————

Thrust Block	
Air Release Valve	AR
Utility Vault	UV
Concrete Pier	CP
Steel Pier	SP
Plan Note	NOTE
Pay Item Note	PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole	•	
Telephone Pole	•	
Joint Use Pole	•	
Utility Pole	•	
Utility Pole with Base	□	
H-Frame Pole	•—•	
Power Transmission Line Tower	⊠	
Water Manhole	⊙	
Power Manhole	⊙	
Telephone Manhole	⊙	
Sanitary Sewer Manhole	⊙	
Hand Hole for Cable	⊠	
Power Transformer	⊠	
Telephone Pedestal	⊠	
CATV Pedestal	⊠	
Gas Valve	◇	
Gas Meter	◇	
Located Miscellaneous Utility Object	o	
Abandoned According to Utility Records	AATUR	
End of Information	E.O.I.	

*Underground Power Line	—————
*Underground Telephone Cable	—————
*Underground Telephone Conduit	—————
*Underground Fiber Optics Telephone Cable	—————
*Underground TV Cable	—————
*Underground Fiber Optics TV Cable	—————
*Underground Gas Pipeline	—————
Aboveground Gas Pipeline	A/G Gas
*Underground Water Line	—————
Aboveground Water Line	A/G Water
*Underground Gravity Sanitary Sewer Line	—————
Aboveground Gravity Sanitary Sewer Line	A/G Sanitary Sewer
*Underground SS Forced Main Line	—————
Underground Unknown Utility Line	—————
SUE Test Hole	•
Water Meter	o
Water Valve	⊙
Fire Hydrant	◇
Sanitary Sewer Cleanout	⊙

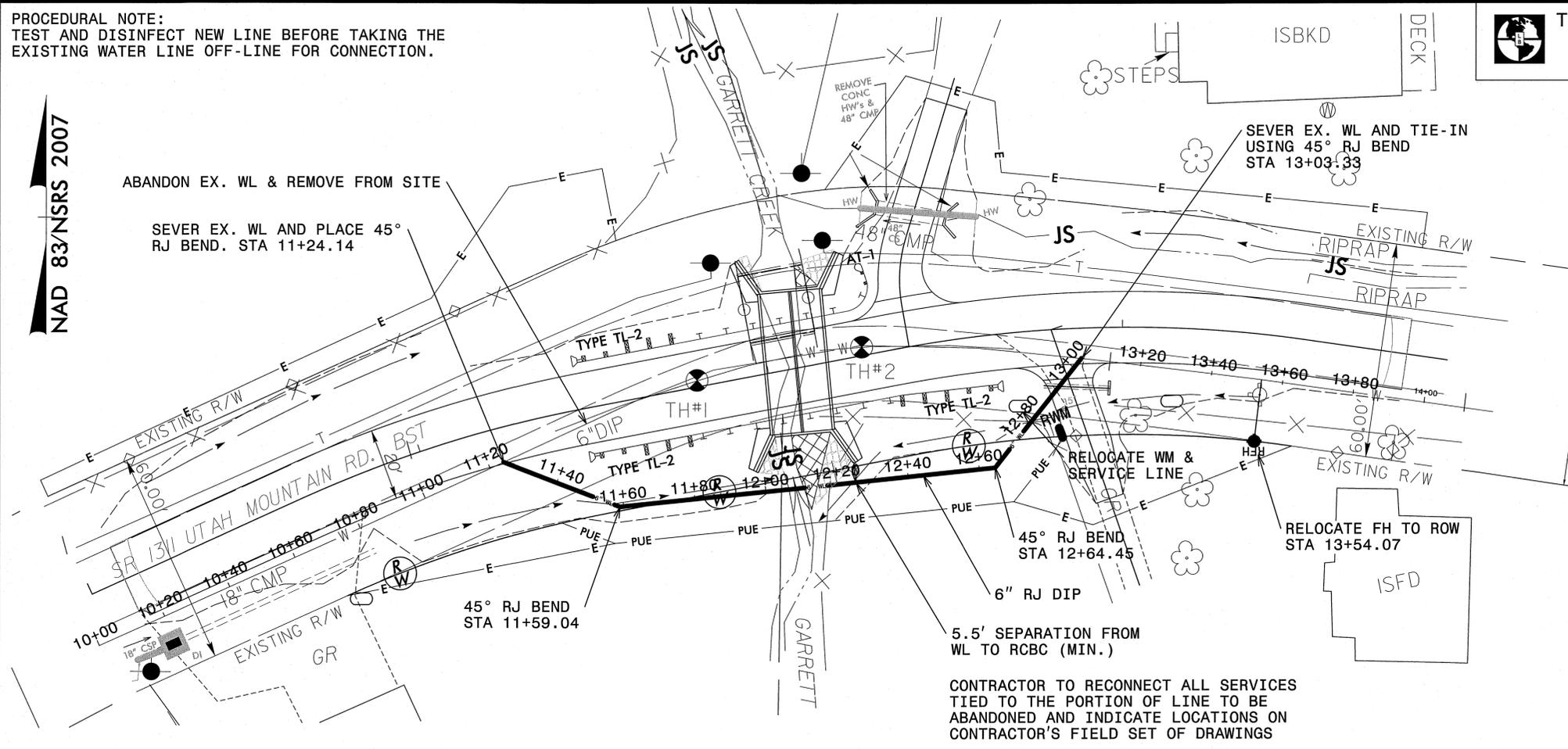
*For Existing Utilities
Utility Line Drawn from Record

Designated Utility Line

5/28/99

PROCEDURAL NOTE:
TEST AND DISINFECT NEW LINE BEFORE TAKING THE
EXISTING WATER LINE OFF-LINE FOR CONNECTION.

NAD 83/NSRS 2007



THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

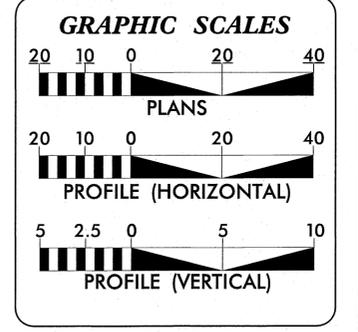
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

PROJECT REFERENCE NO. 430328	SHEET NO. UO-4
ROADWAY DESIGN ENGINEER	UTILITY ENGINEER
	5-7-13

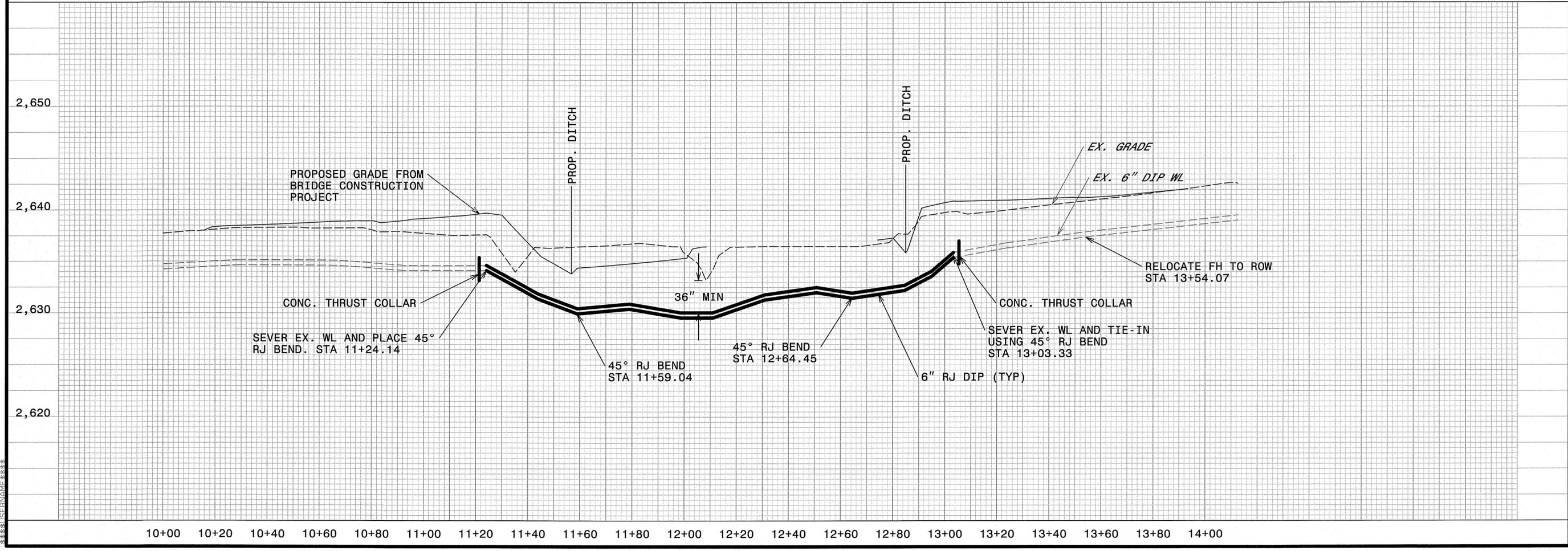
- NOTES:**
- COORDINATE WITH UTILITY OWNER FOR MAKING TIES TO EXISTING LINE.
 - THRUST COLLARS SHALL BE ON THE SAME JOINT OF PIPE AS THE NEW RJ BEND OR THE BEND SHALL BE RODDED TO THE CONCRETE COLLAR.
 - ALL STREAM CROSSINGS 401-404 PERMITS ARE COVERED UNDER BRIDGE RELOCATION.
 - CONTRACTOR SHALL REPAIR DRIVEWAY IN KIND RESULTING FROM WATER LINE CONSTRUCTION.

TEST HOLE #1
Utility Owner: Maggie Valley San. District
Utility Type: Water
Size and Material: 6" DIP
Ground Elevation (ft.): 2,638.49'
Utility Depth to Top (ft.): 2.50'
Utility Top Elevation (ft.): 2,635.99'
Northing (ft.): 679,568.54'
Easting (ft.): 805,172.40'

TEST HOLE #2
Utility Owner: Maggie Valley San. District
Utility Type: Water
Size and Material: 6" DIP
Ground Elevation (ft.): 2,638.42'
Utility Depth to Top (ft.): 1.84'
Utility Top Elevation (ft.): 2,636.58'
Northing (ft.): 679,577.89'
Easting (ft.): 805,218.43'



CONTRACTOR TO RECONNECT ALL SERVICES TIED TO THE PORTION OF LINE TO BE ABANDONED AND INDICATE LOCATIONS ON CONTRACTOR'S FIELD SET OF DRAWINGS



CONTACT INFORMATION FOR UTILITIES

POWER: HAYWOOD EMC; WAYNE NICHOLS 828-506-0170 WAYNE.NICHOLS@HAYWOODEMC.COM
 PHONE: AT&T; SCOTT ADDINGTON 1-828-258-7138 JA2089@ATT.COM
 CABLE: CAROLINA MOUNTAIN CABLEVISION; TERRY SERSLAND 1-828-507-6472 TERRY@CBVNOL.COM
 WATER: MAGGIE VALLEY SANITARY DISTRICT; NEIL CARPENTER 828-926-0145 NEILC@MVSDH2O.COM

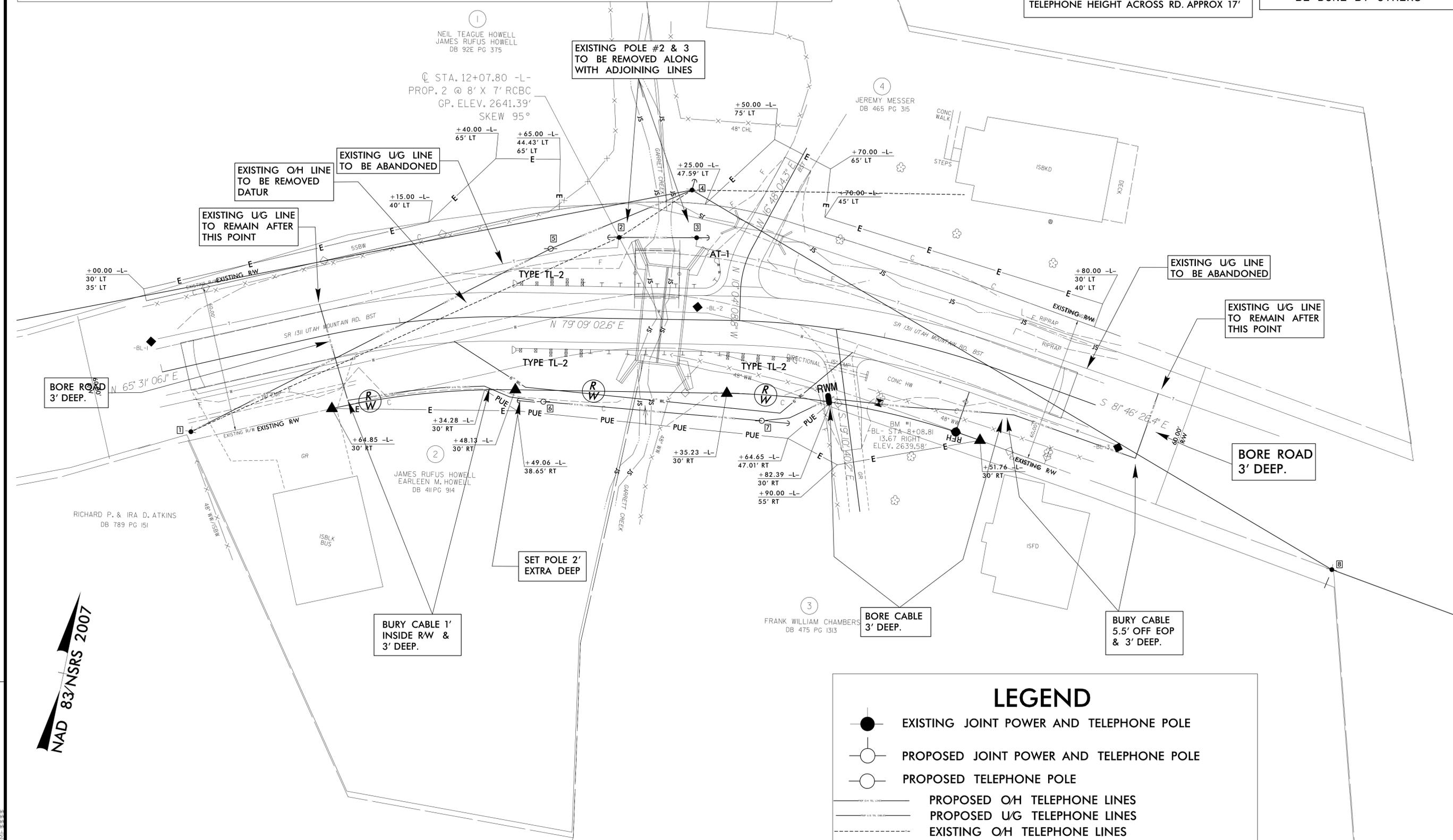
CH ENGINEERING
 3220 GLEN ROYAL RD. RALEIGH, NC 27617
 TELE 919.788.0224 FAX 919.788.0232
 NC LICENSE #P-0189

PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.2	UO-5
BRIDGE NO. 430328	

UTILITIES BY OTHERS

NOTE:
 ALL PROPOSED UTILITY WORK
 SHOWN ON THIS SHEET WILL
 BE DONE BY OTHERS

NOTE:
 POWER LINE HEIGHT ACROSS RD. APPROX 27'
 TELEPHONE HEIGHT ACROSS RD. APPROX 17'



NAD 83/NSRS 2007



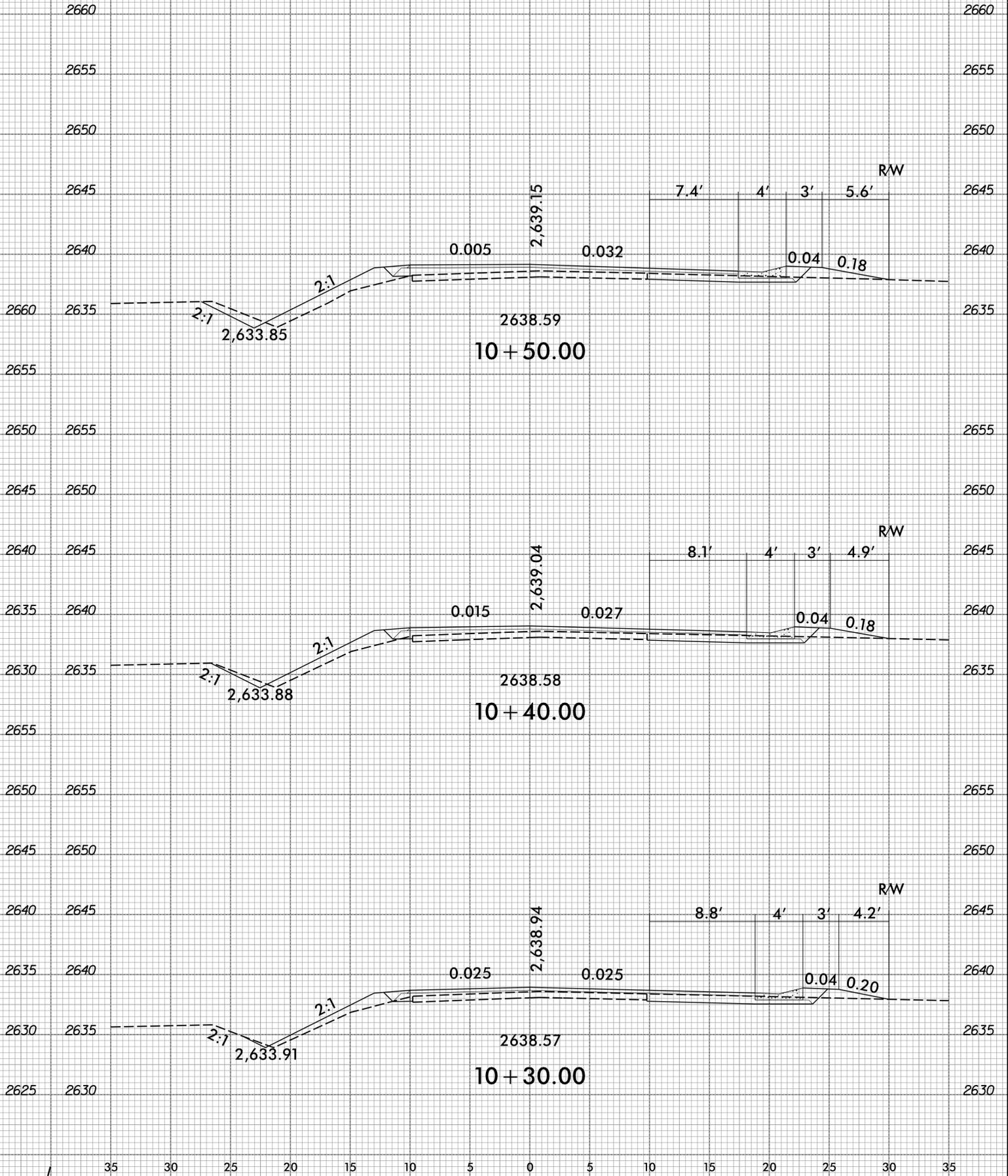
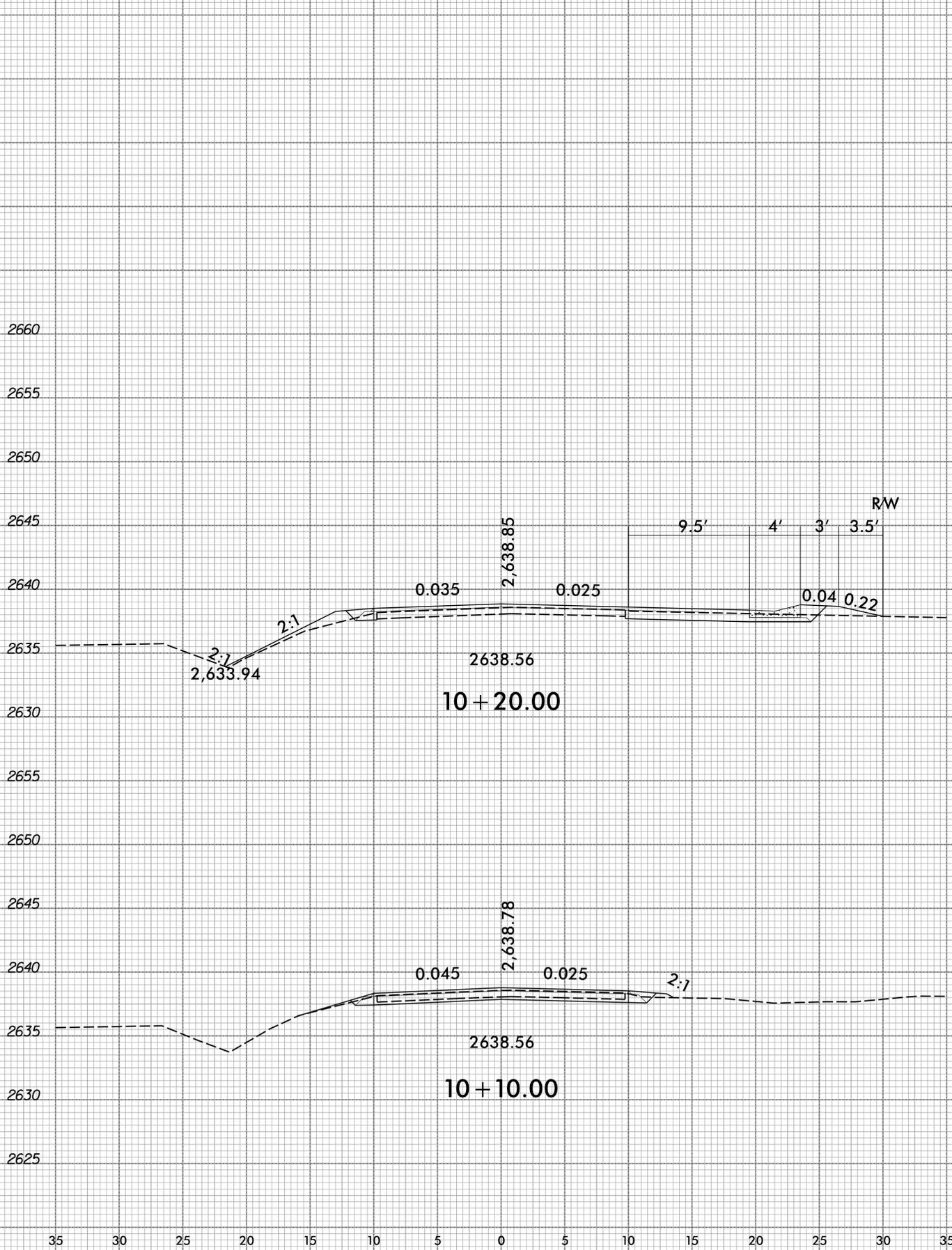
LEGEND

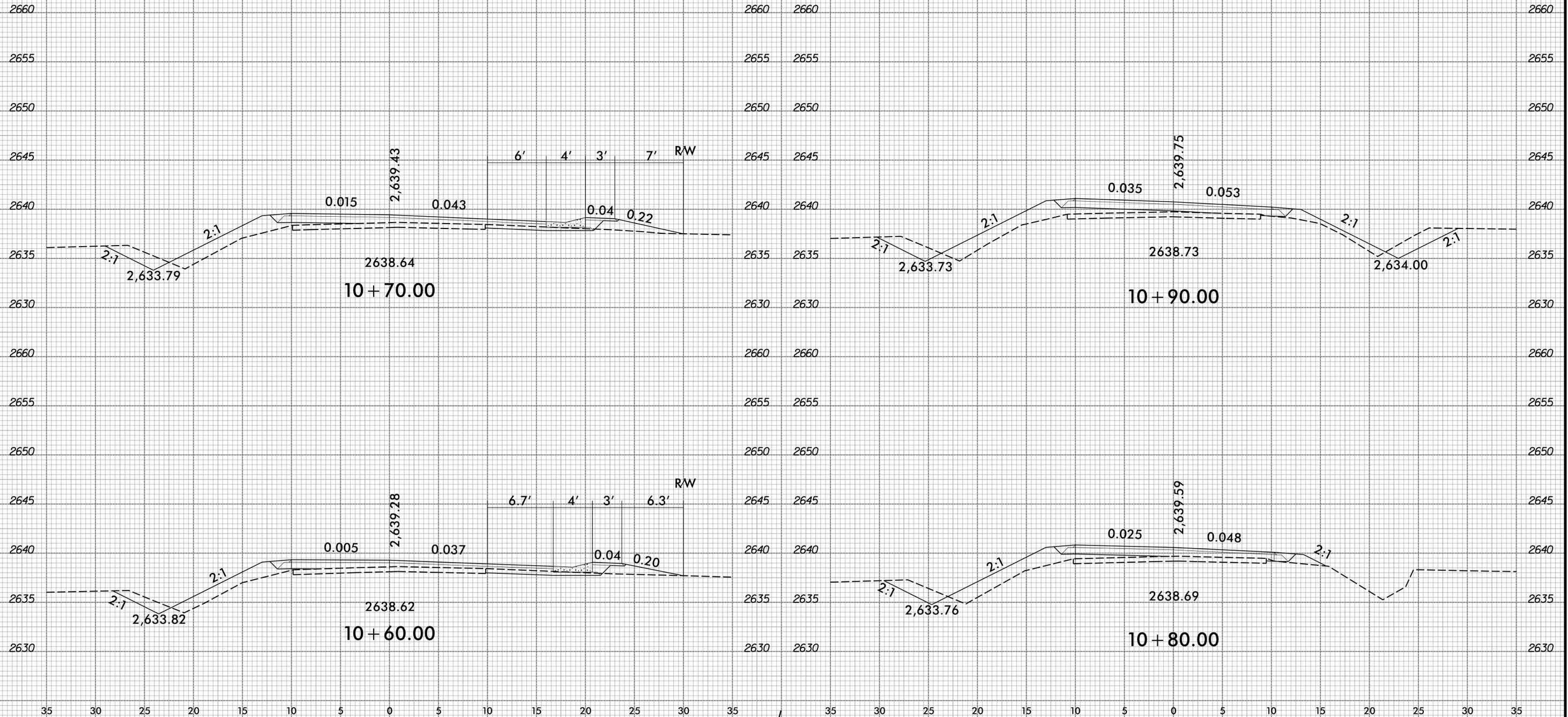
- EXISTING JOINT POWER AND TELEPHONE POLE
- PROPOSED JOINT POWER AND TELEPHONE POLE
- PROPOSED TELEPHONE POLE
- PROPOSED O/H TELEPHONE LINES
- PROPOSED U/G TELEPHONE LINES
- EXISTING O/H TELEPHONE LINES
- EXISTING O/H POWER, TELEPHONE, AND CABLE LINES
- EXISTING U/G TELEPHONE LINES

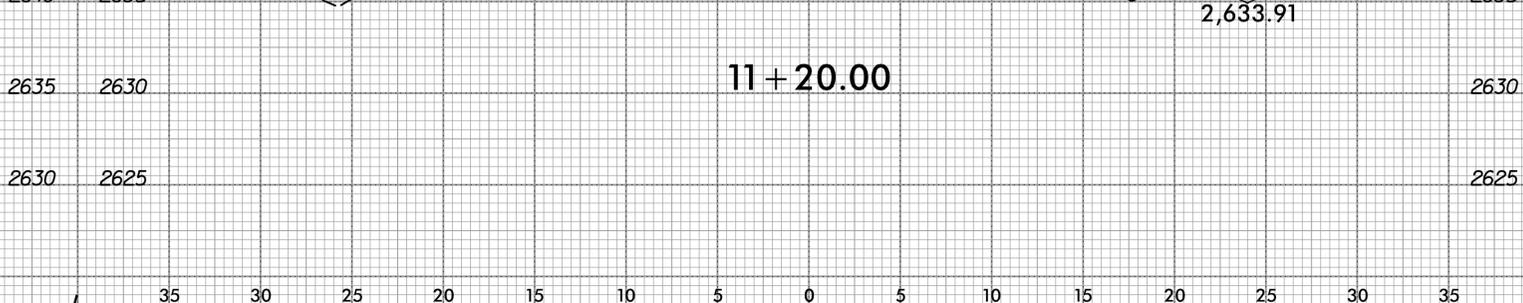
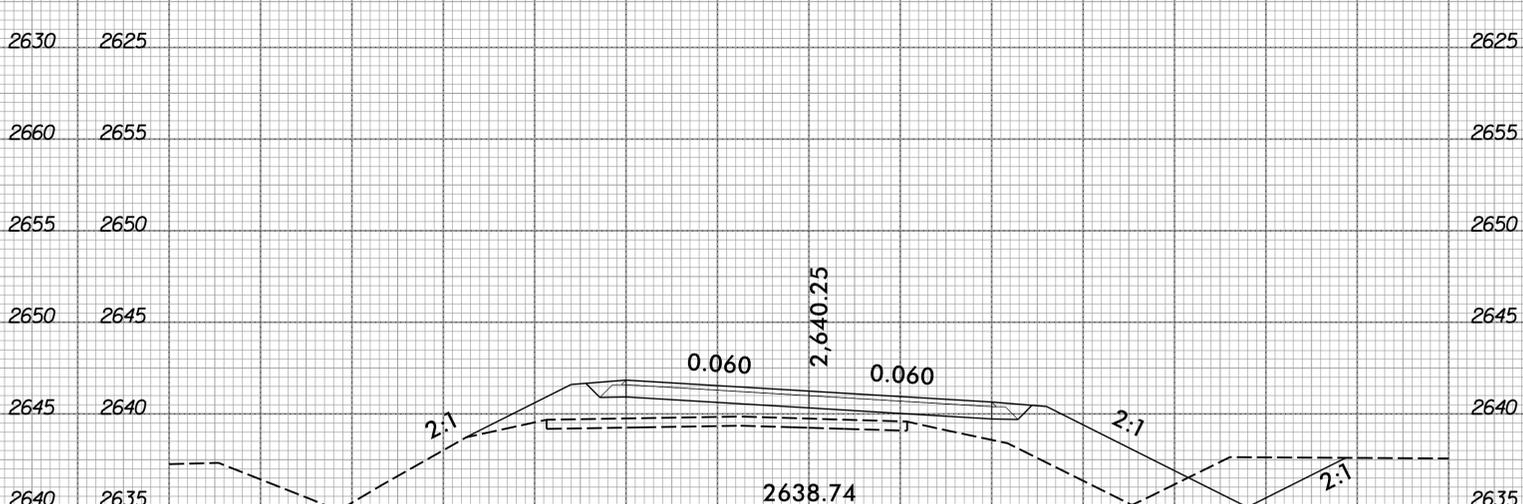
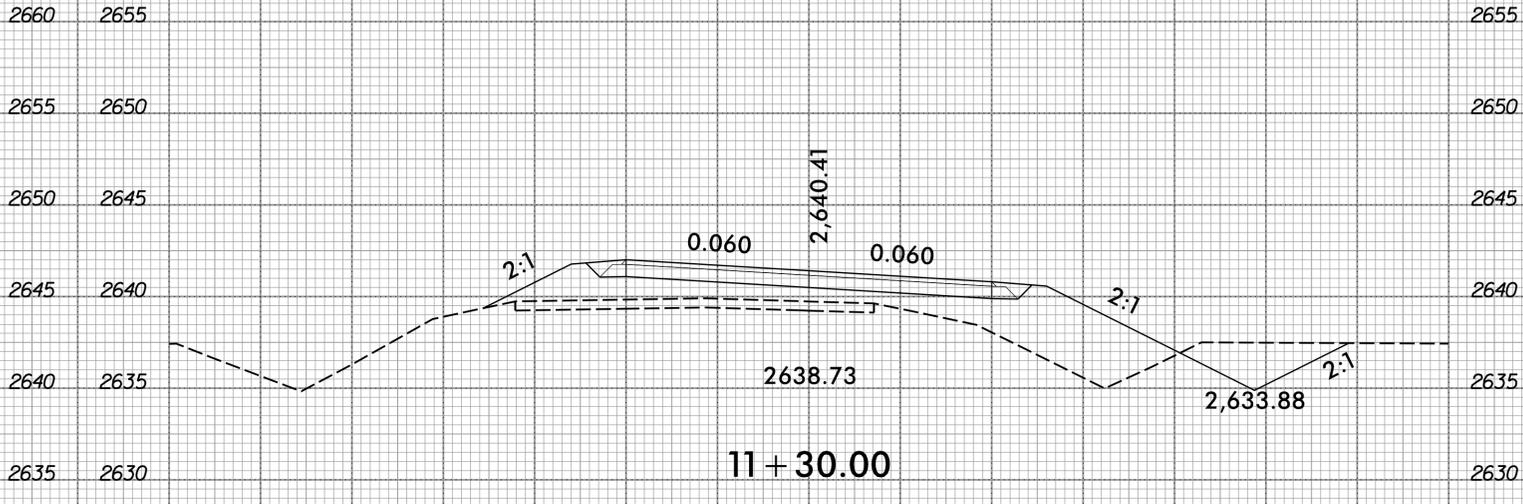
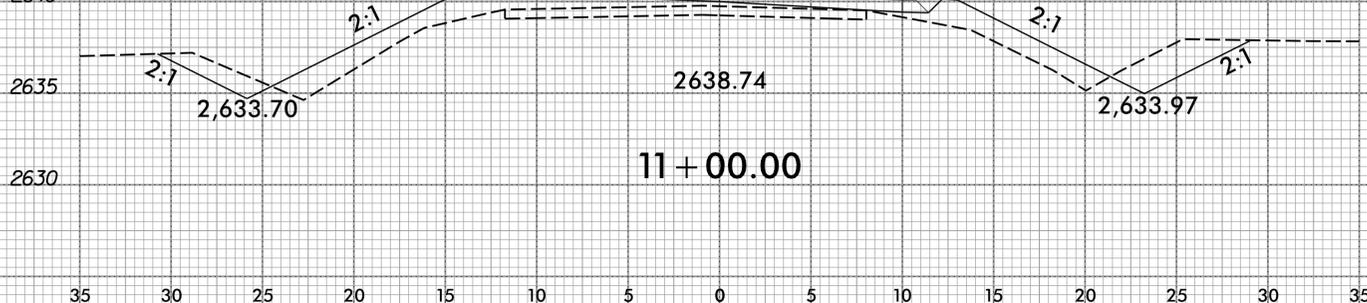
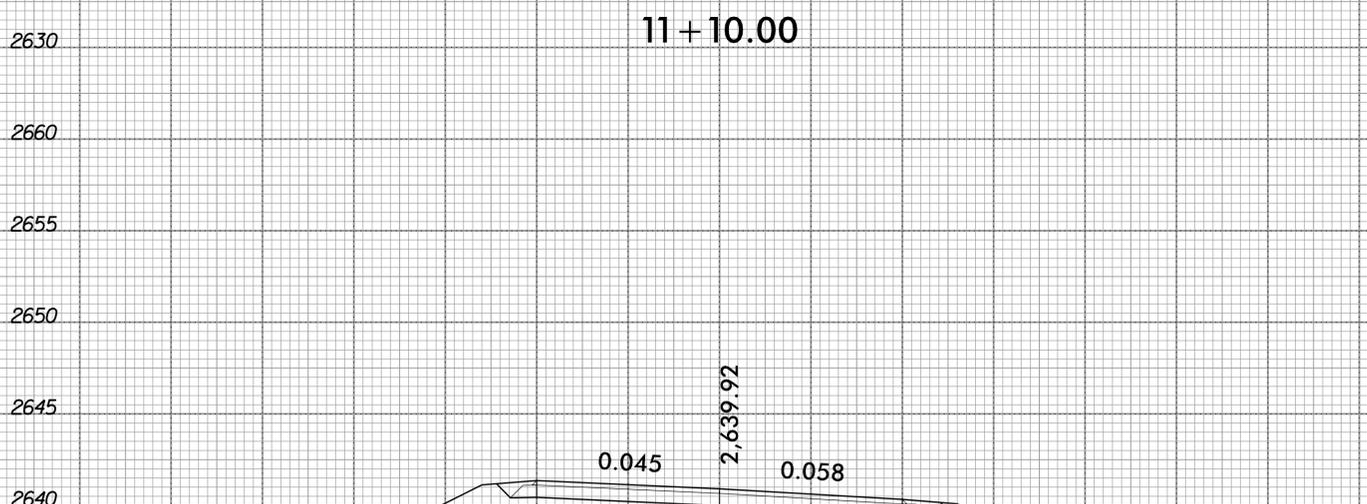
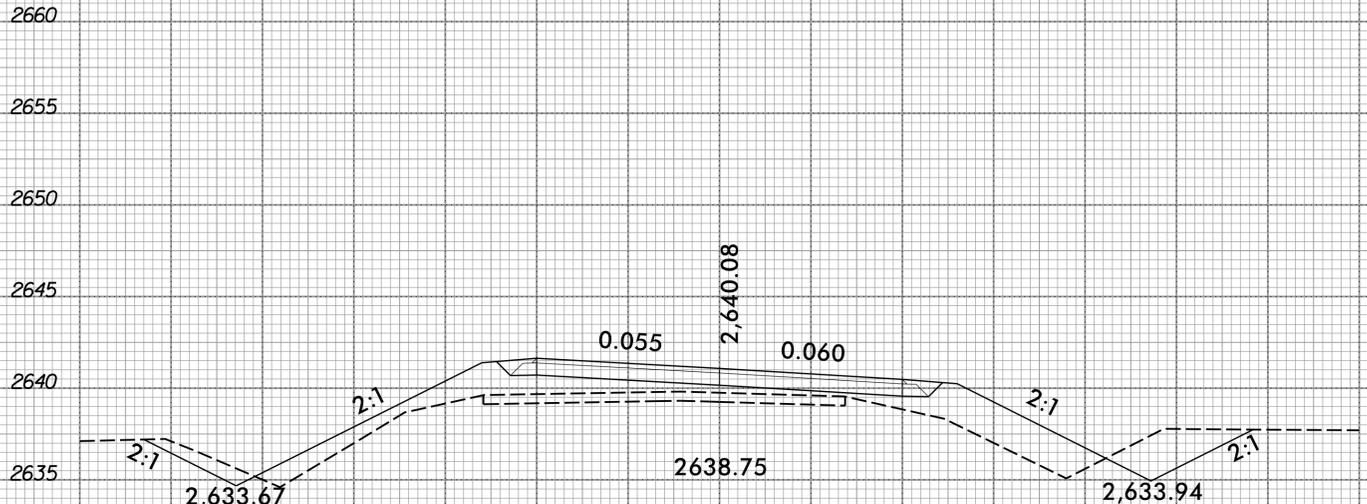
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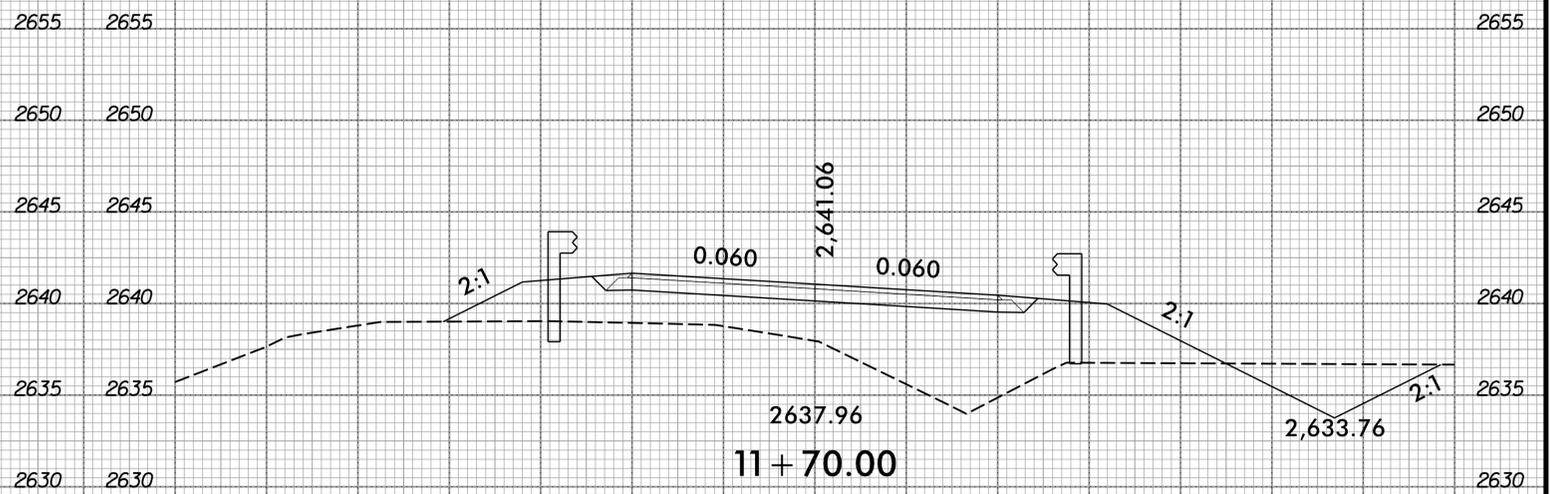
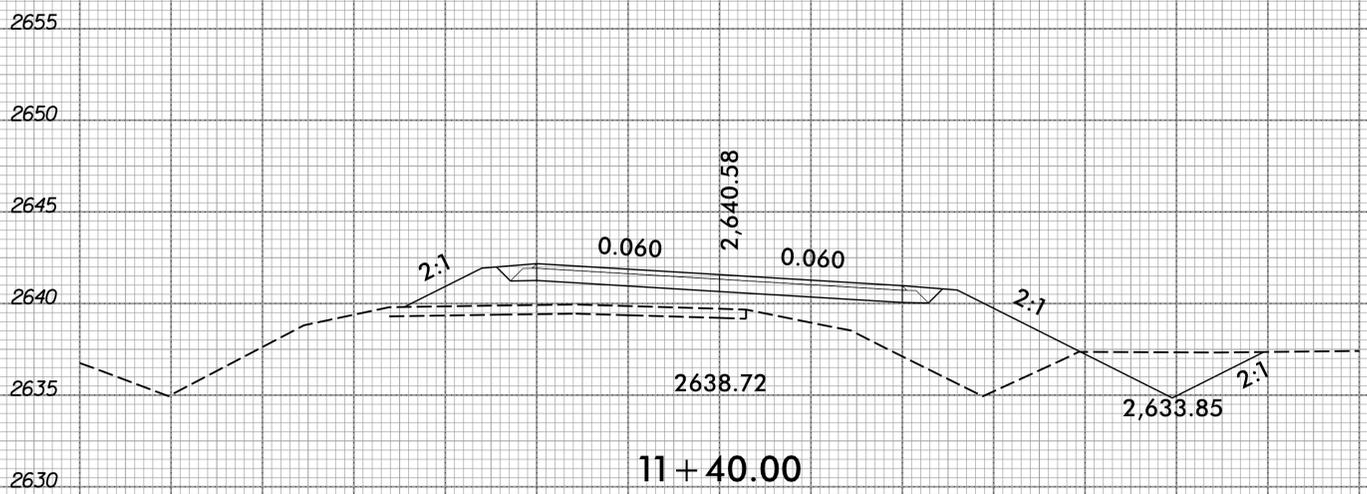
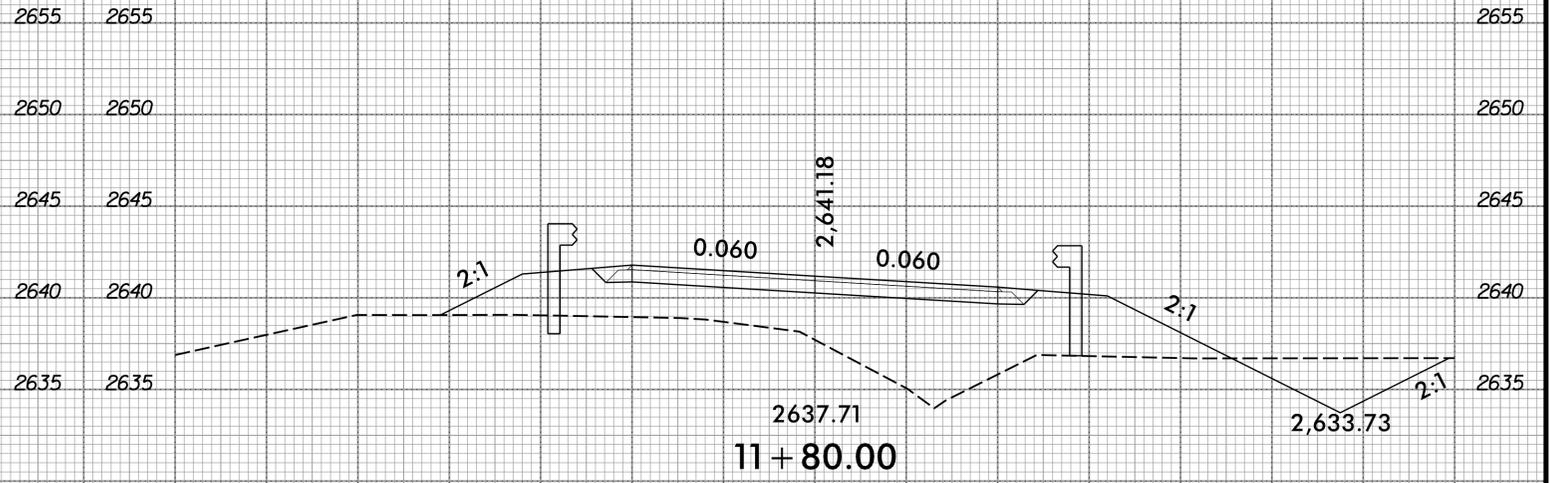
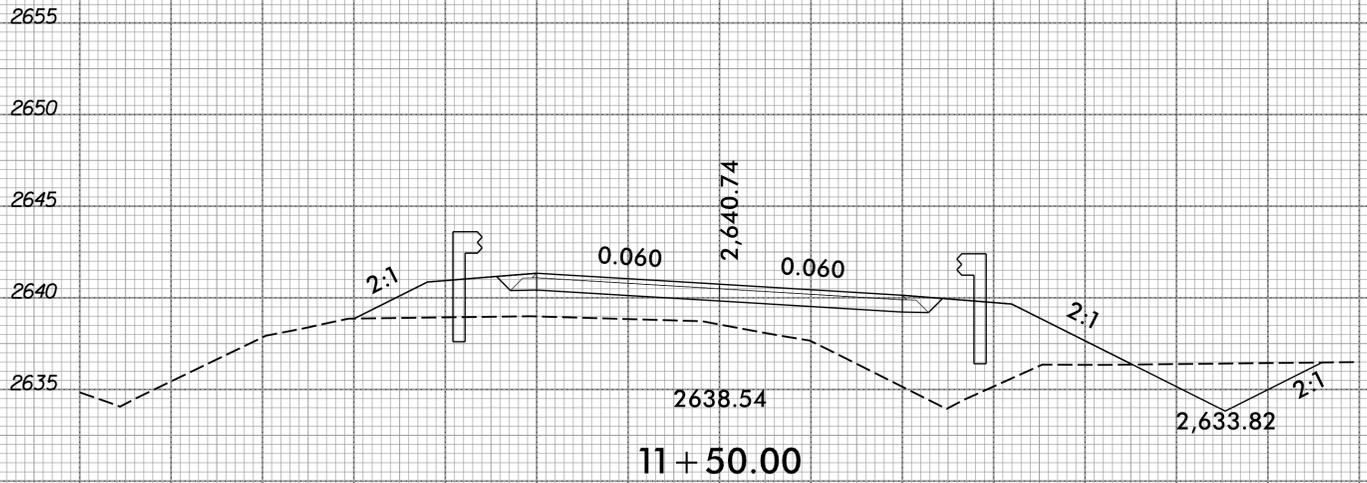
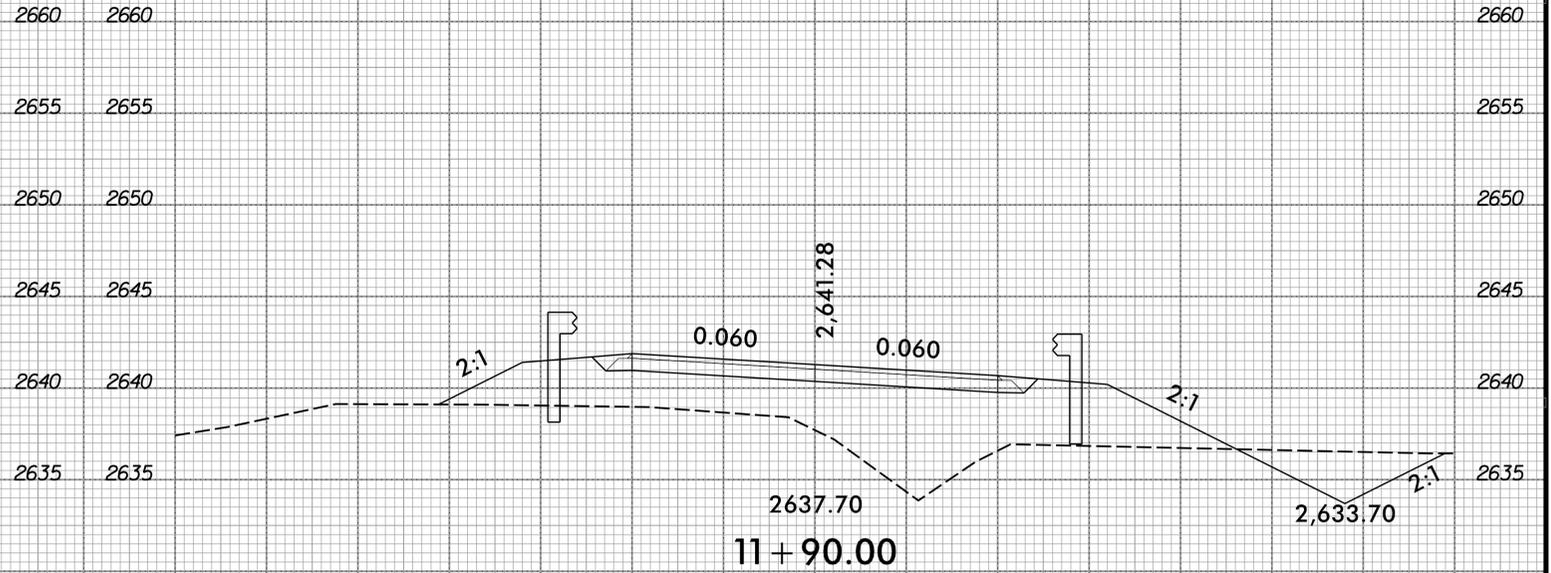
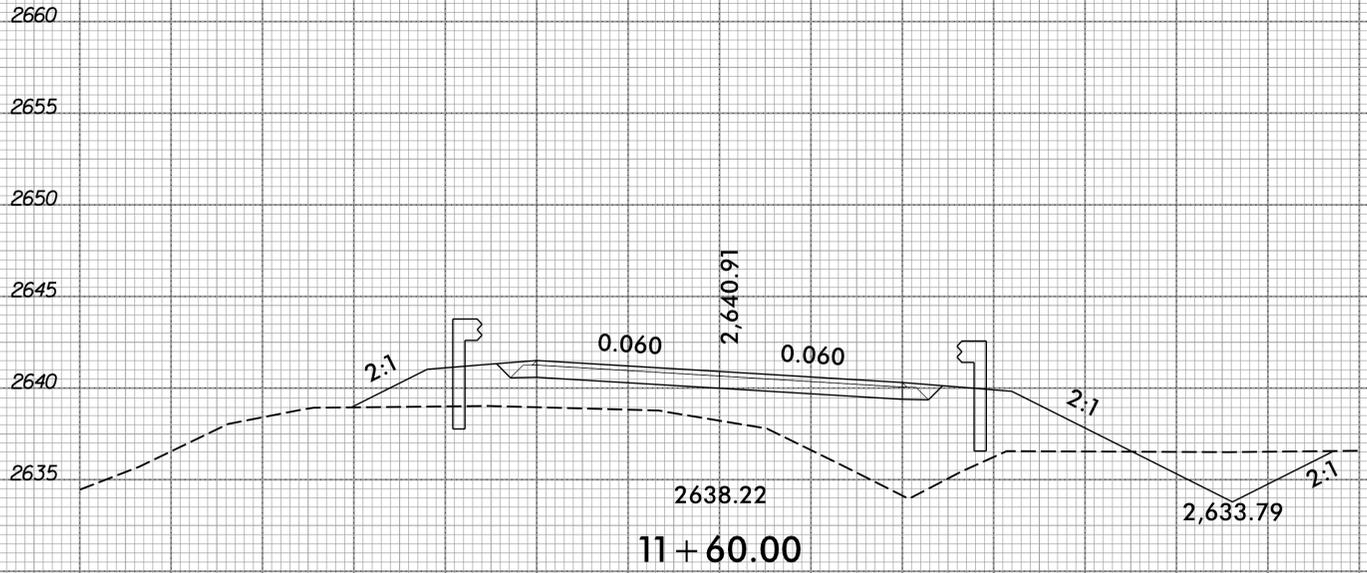
INDEX OF SHEETS

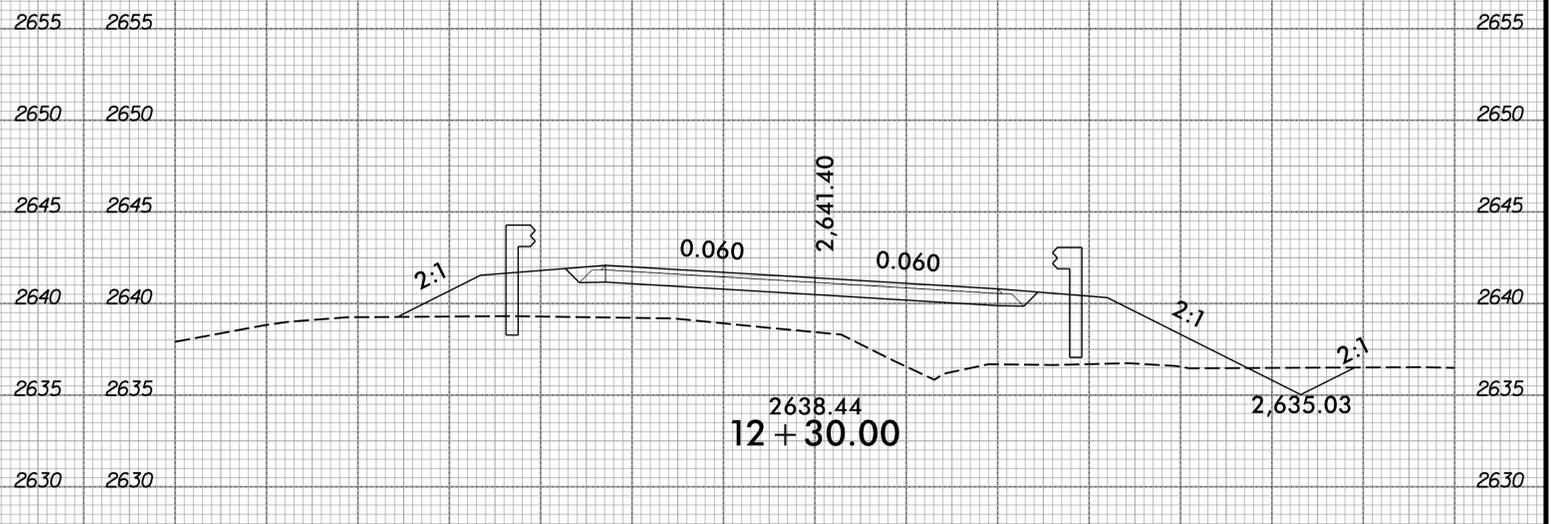
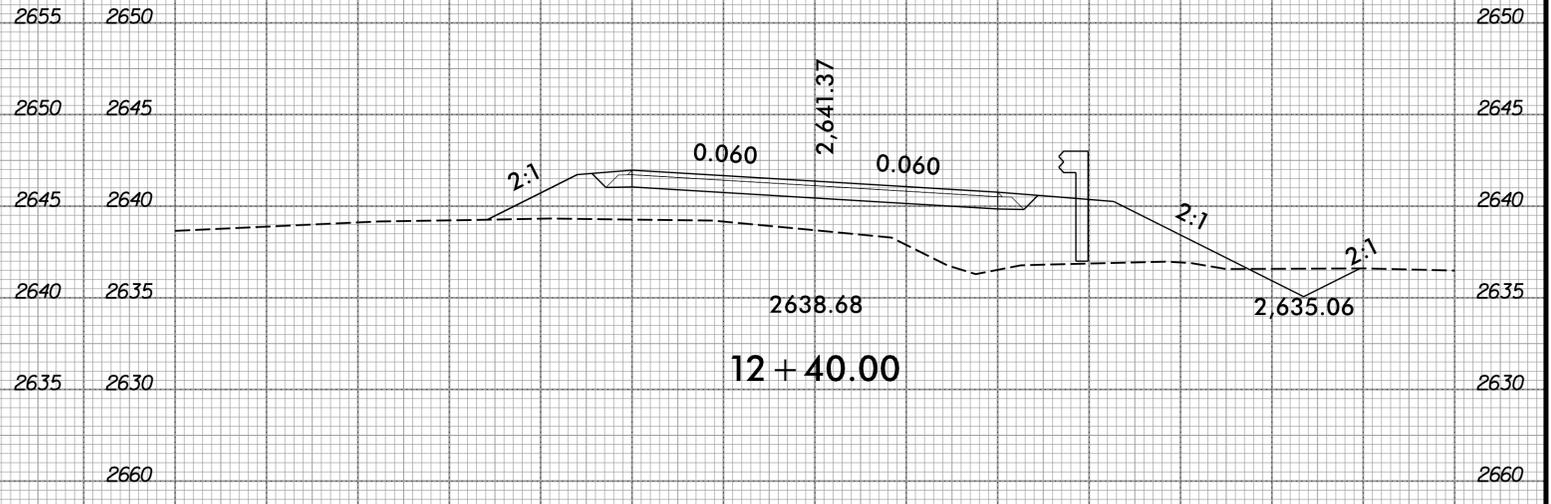
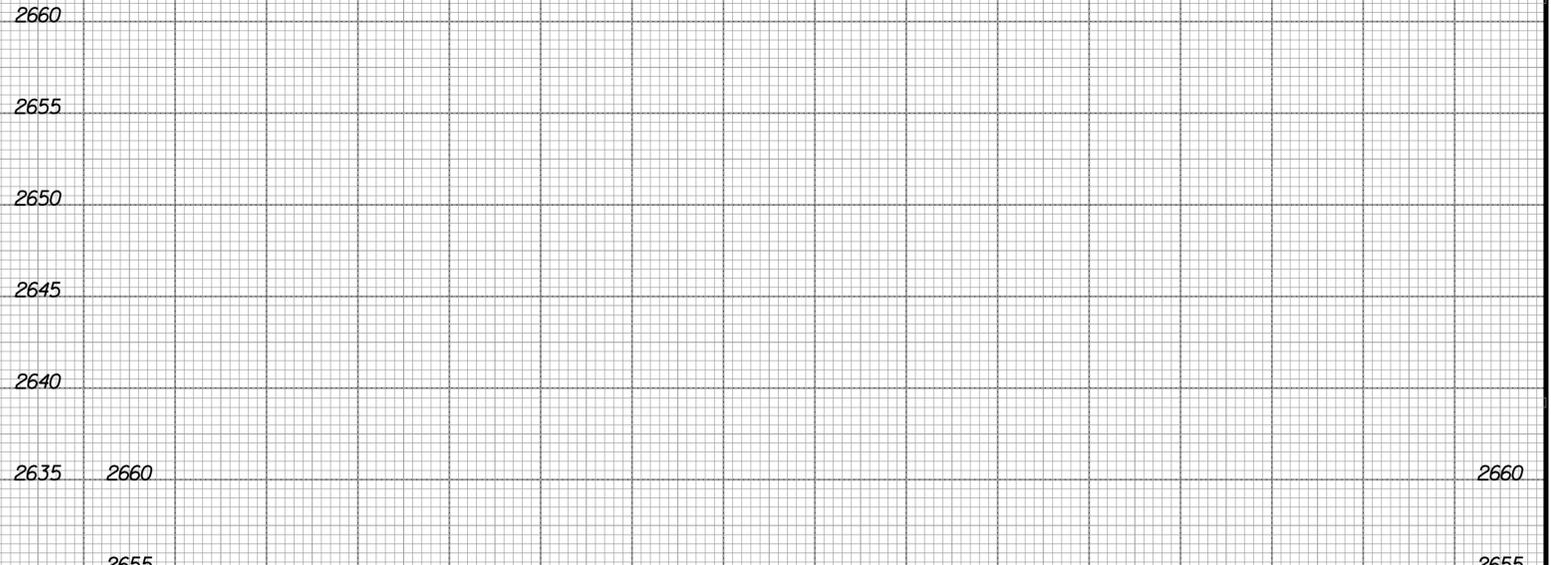
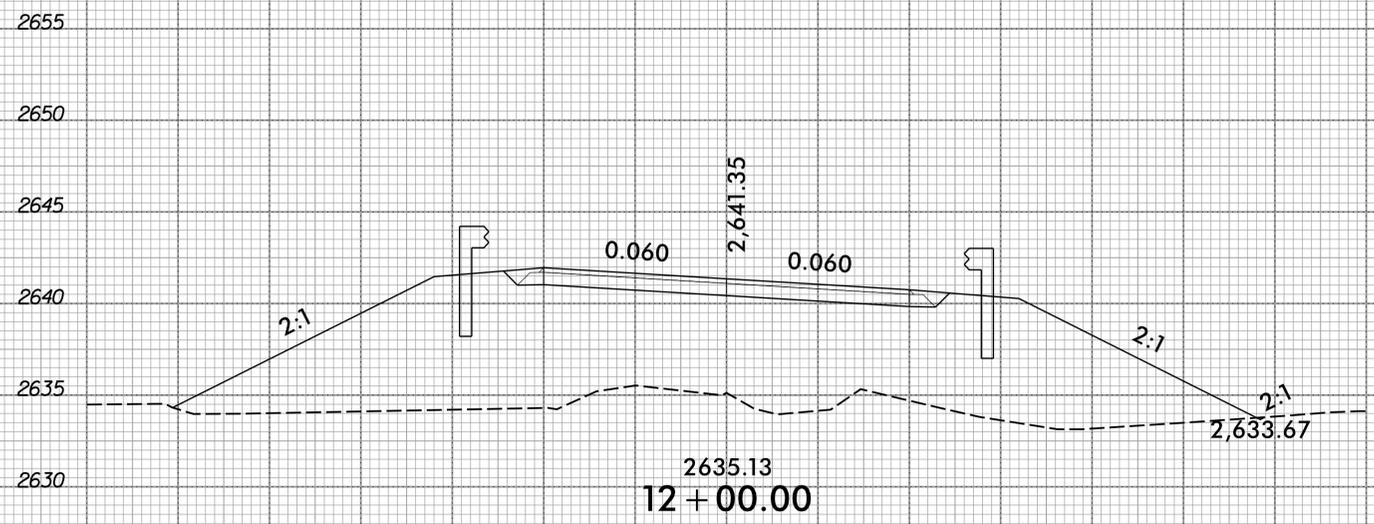
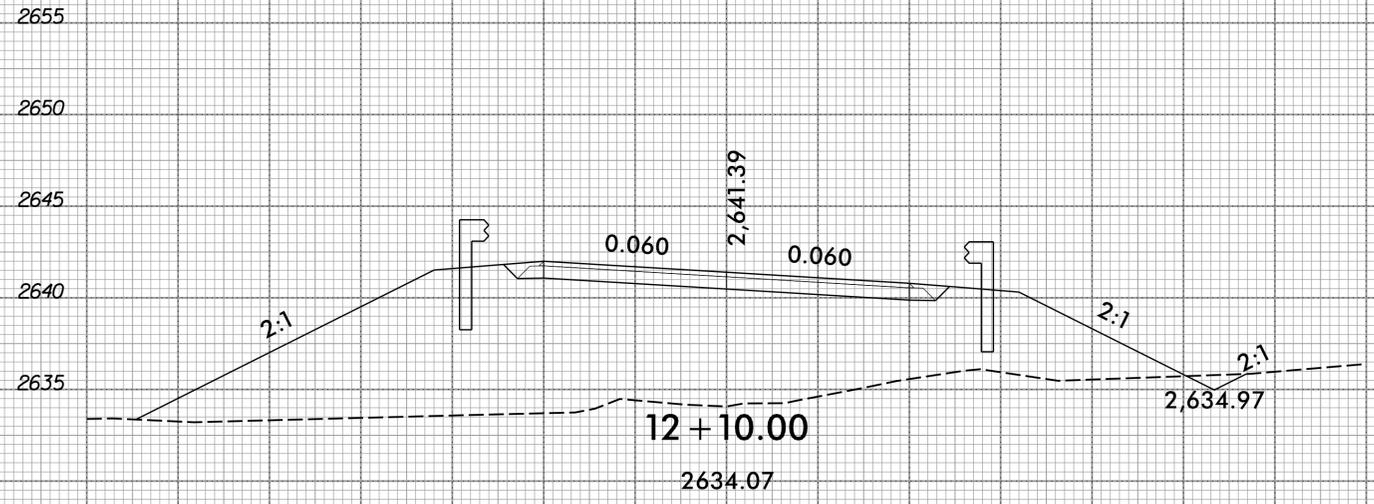
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CROSS-SECTION INDEX.....		X-1
CROSS-SECTION SUMMARY.....		X-1A
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-DWY2- CROSS-SECTIONS	10+10 - 10+50.....	X-12

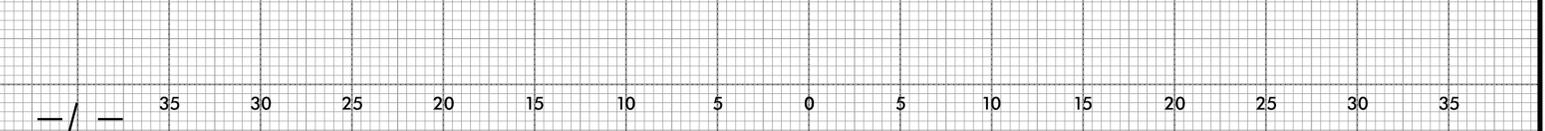
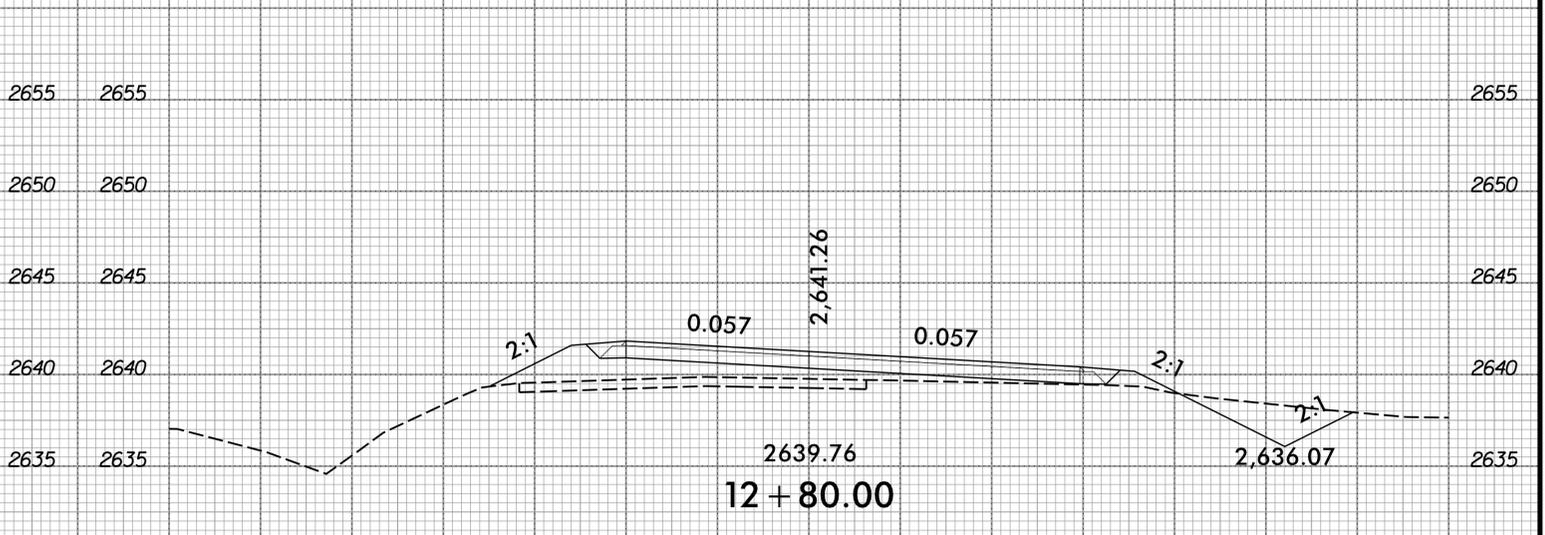
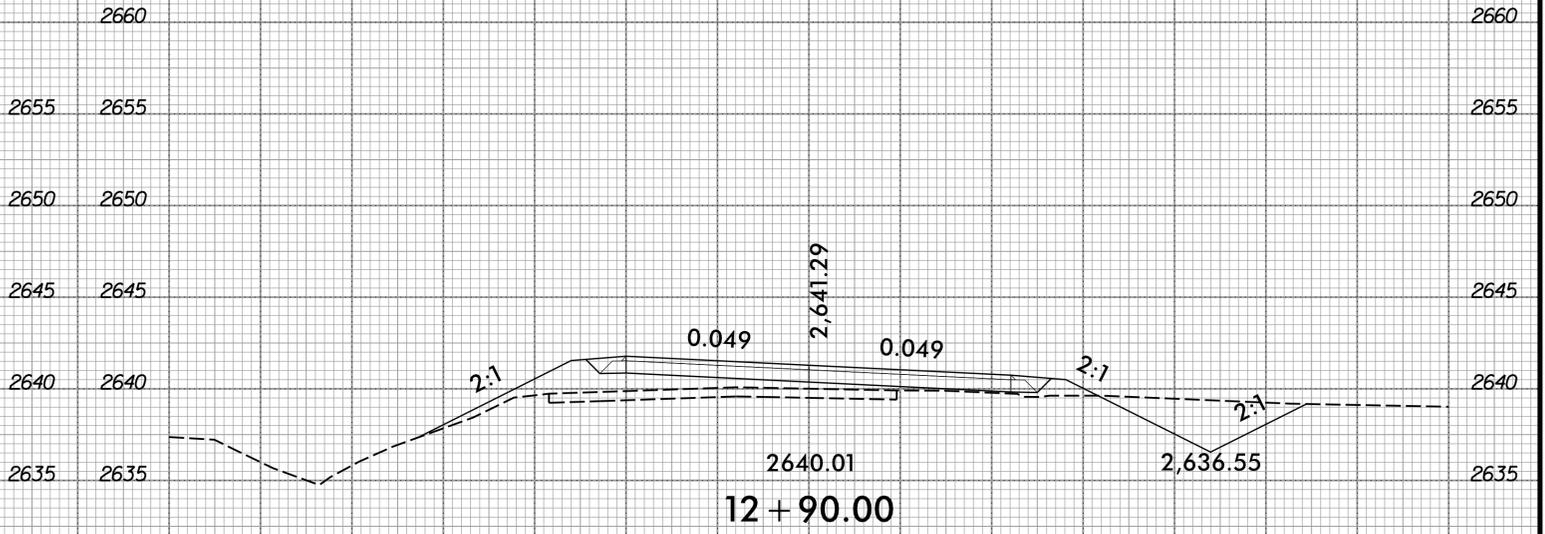
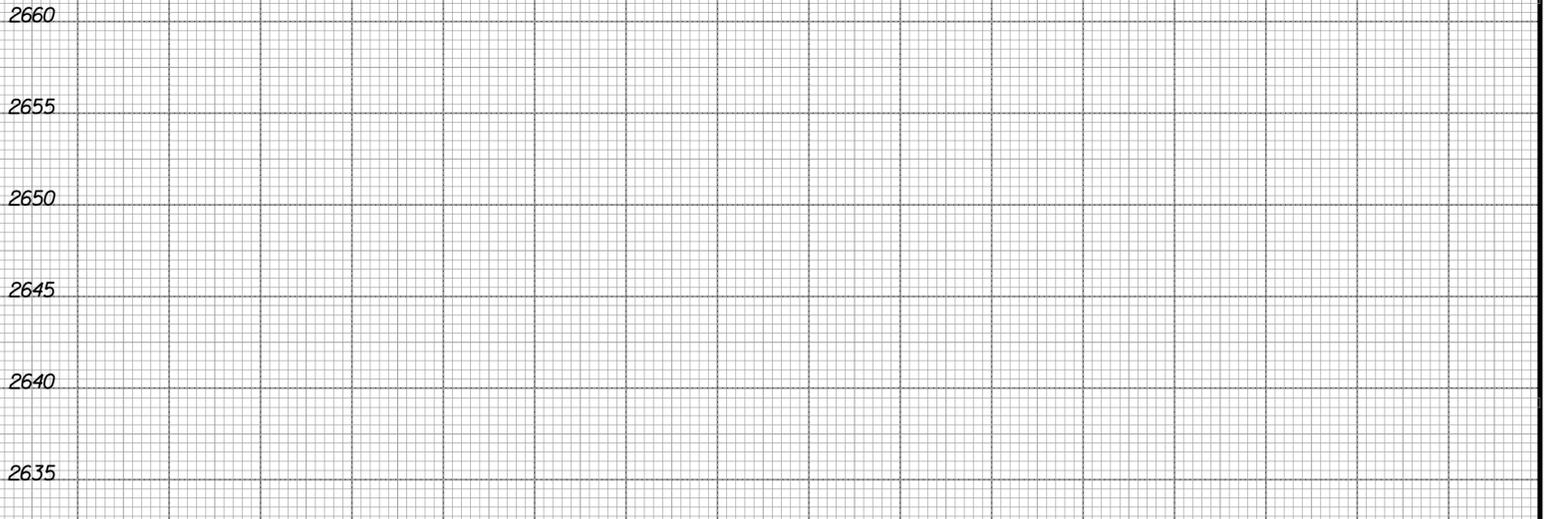
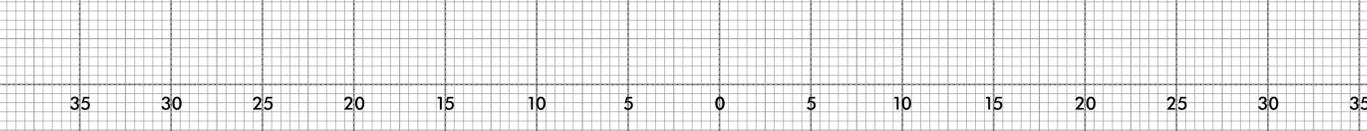
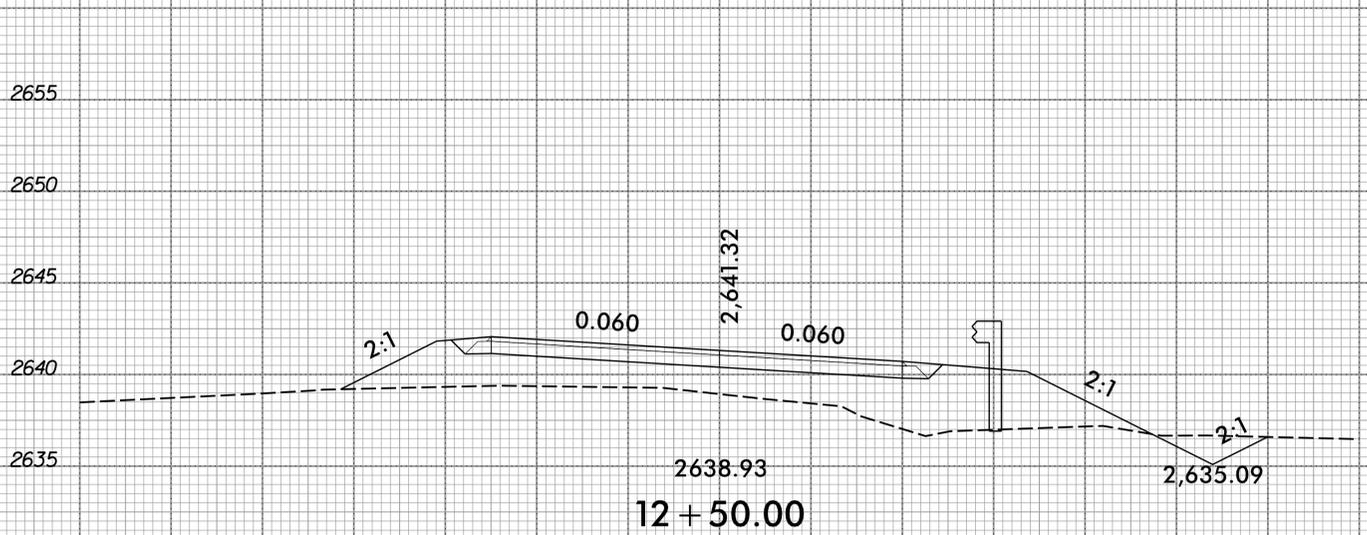
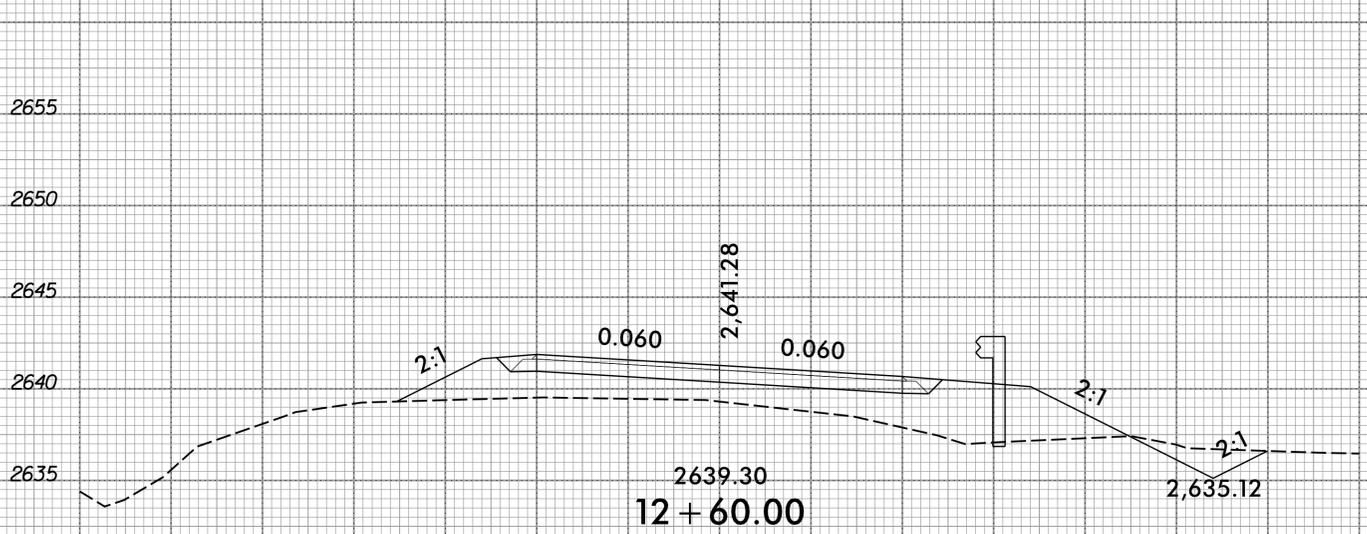
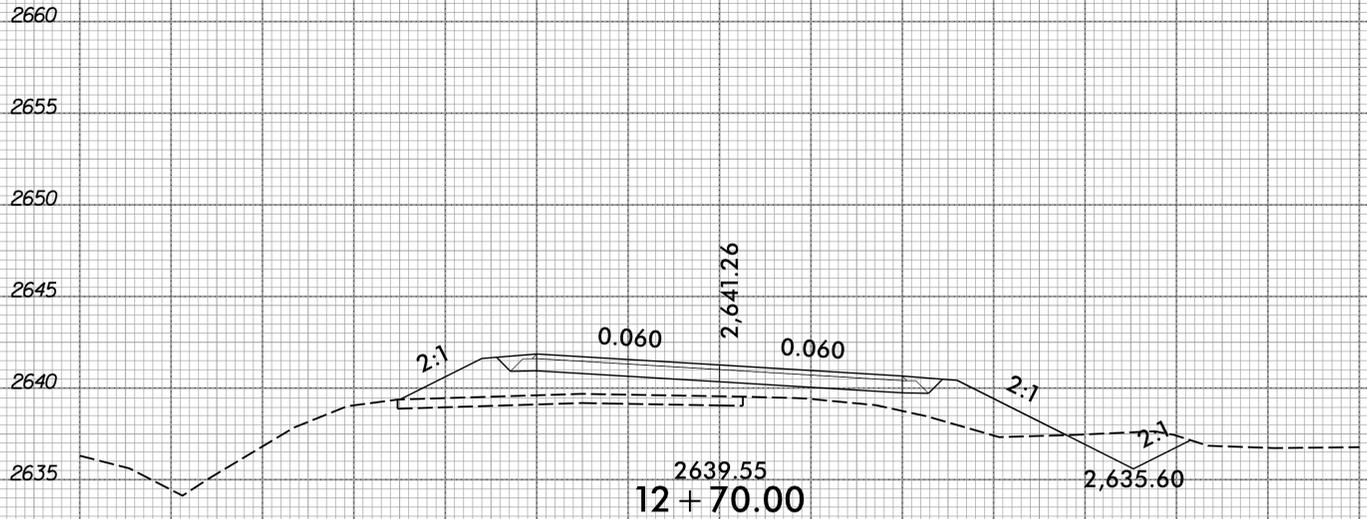


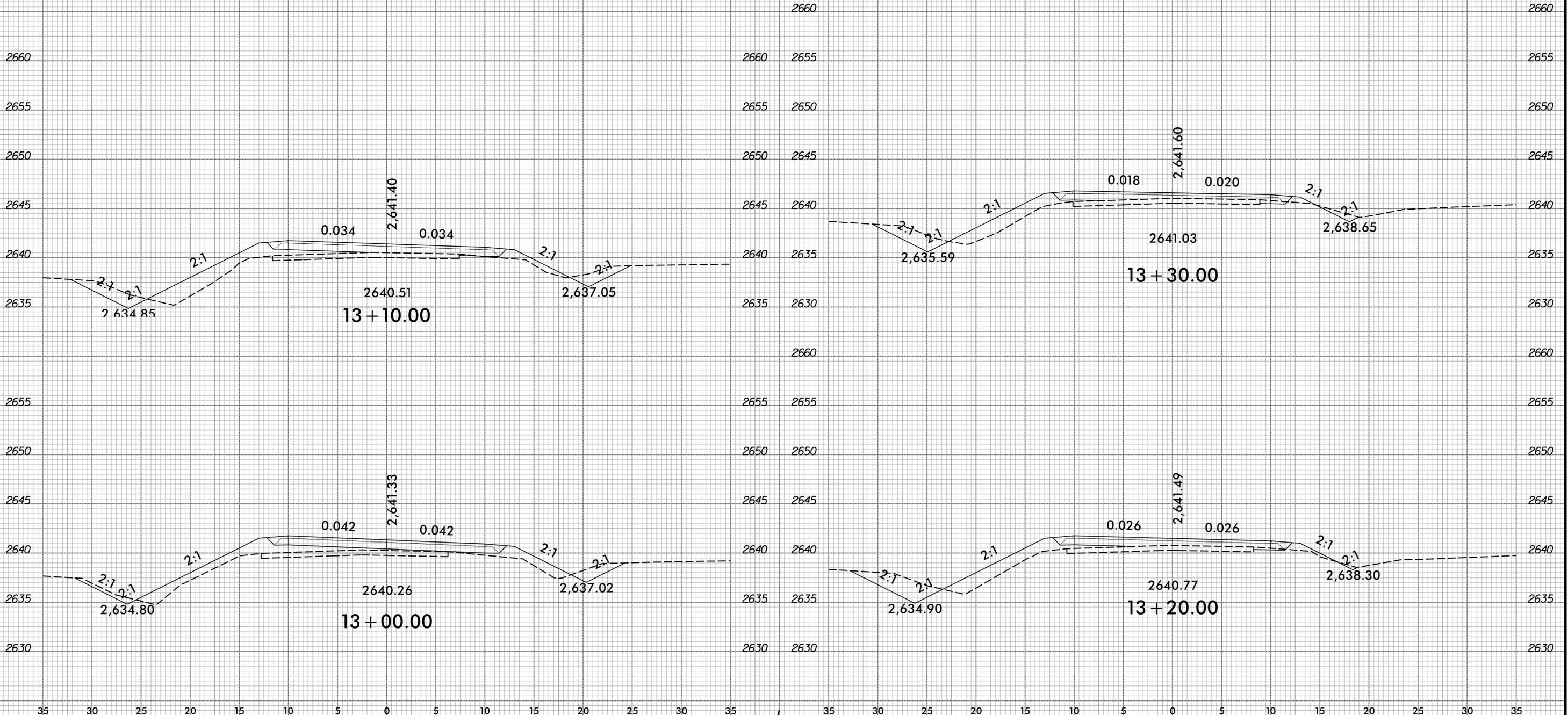


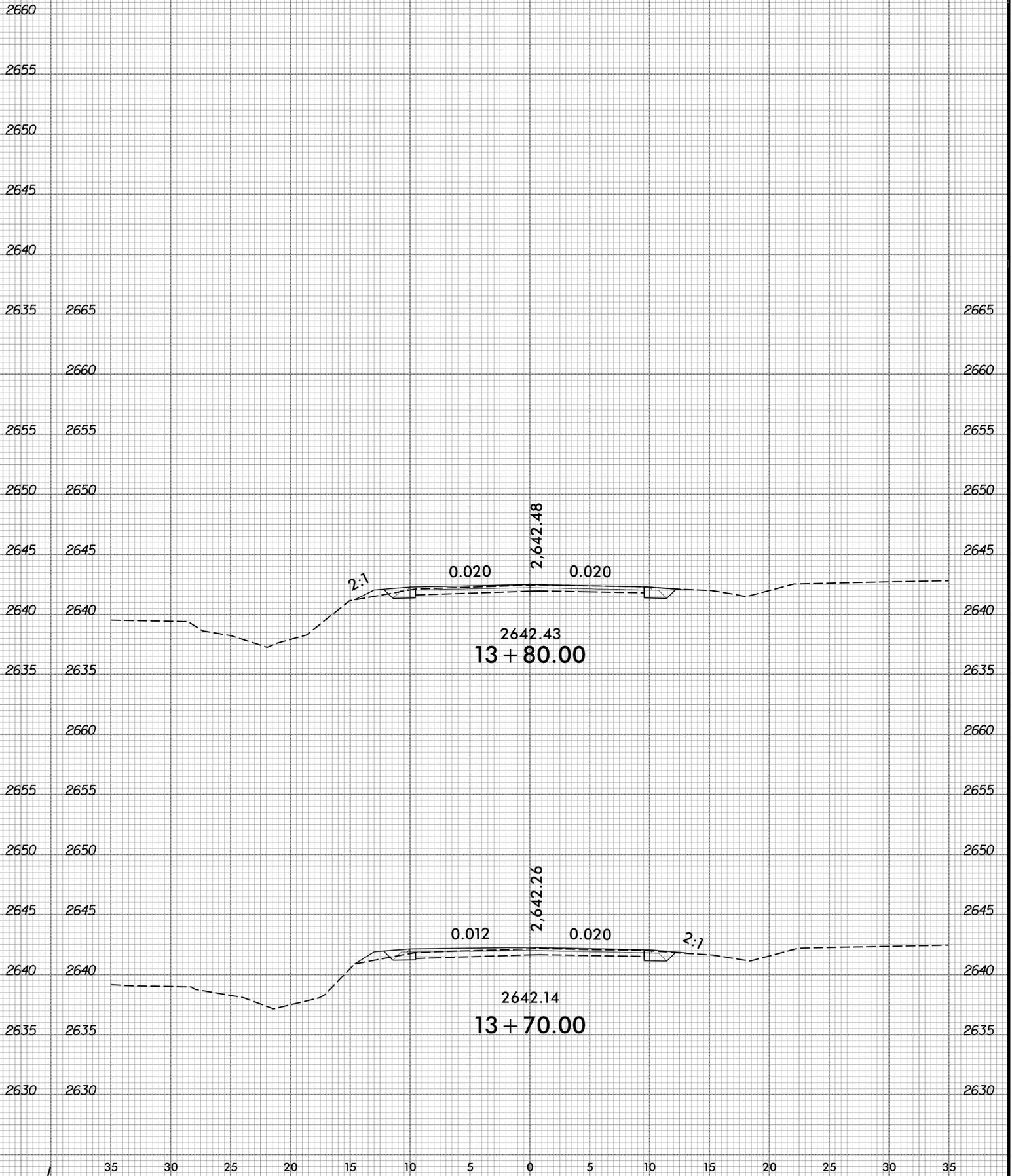
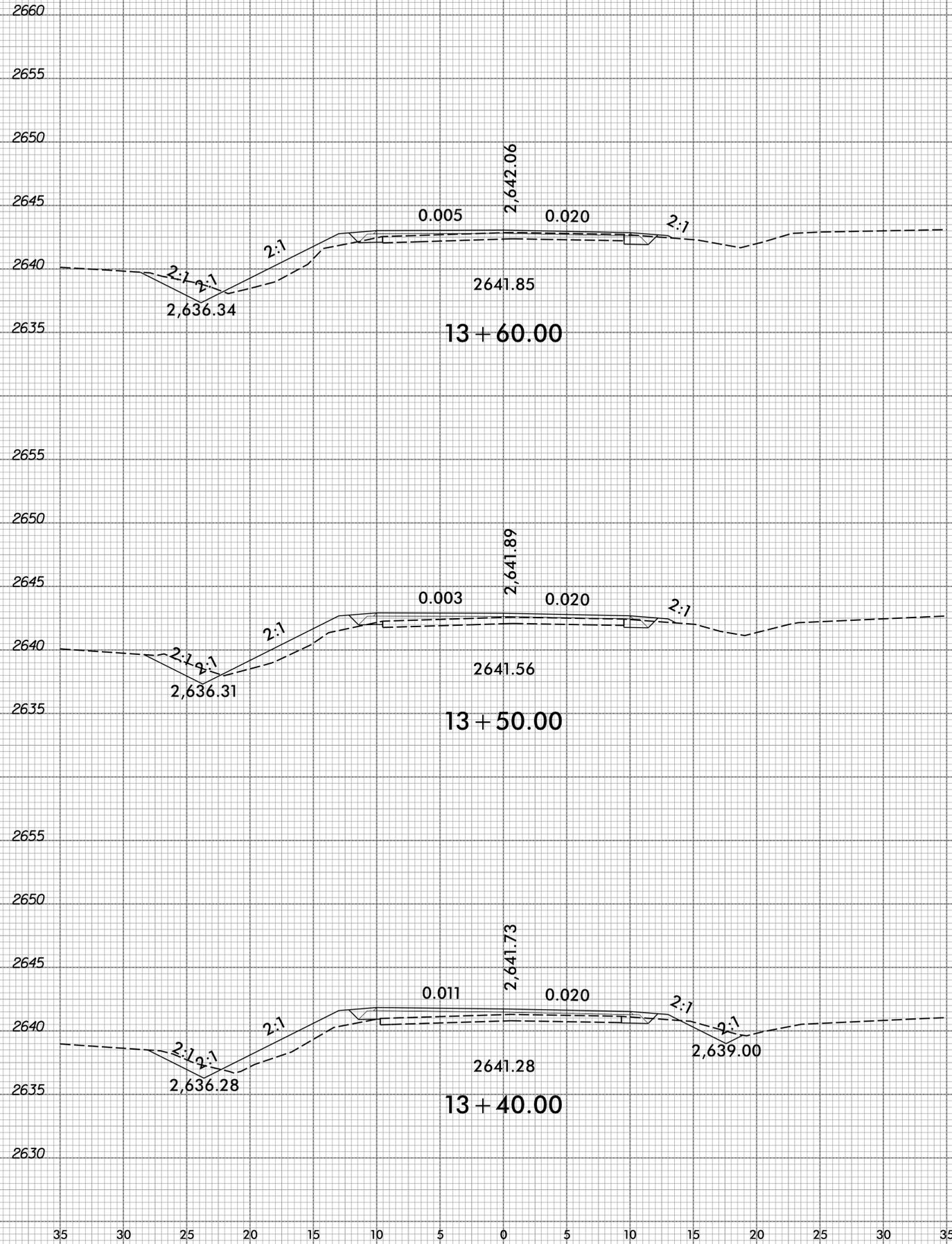










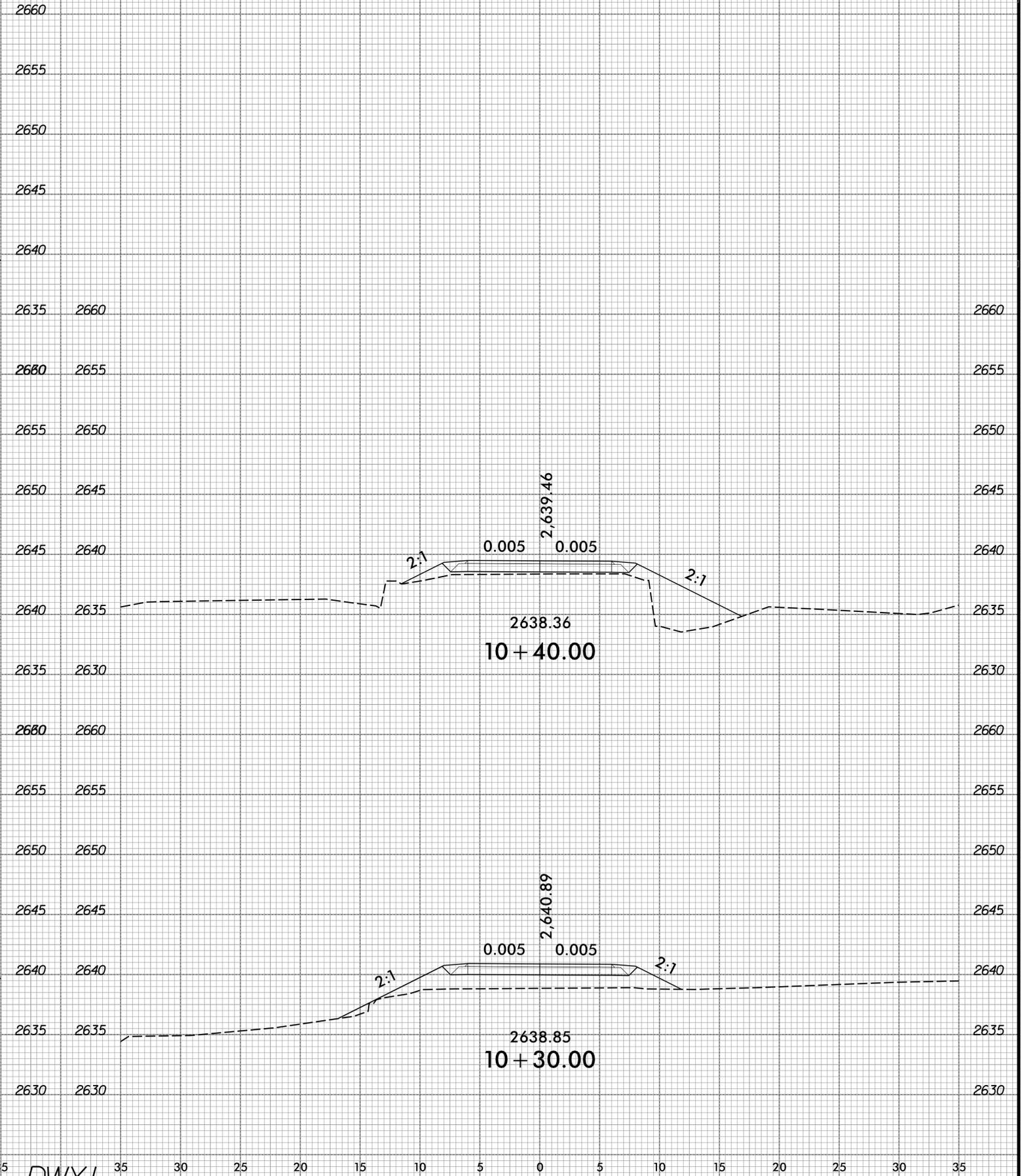
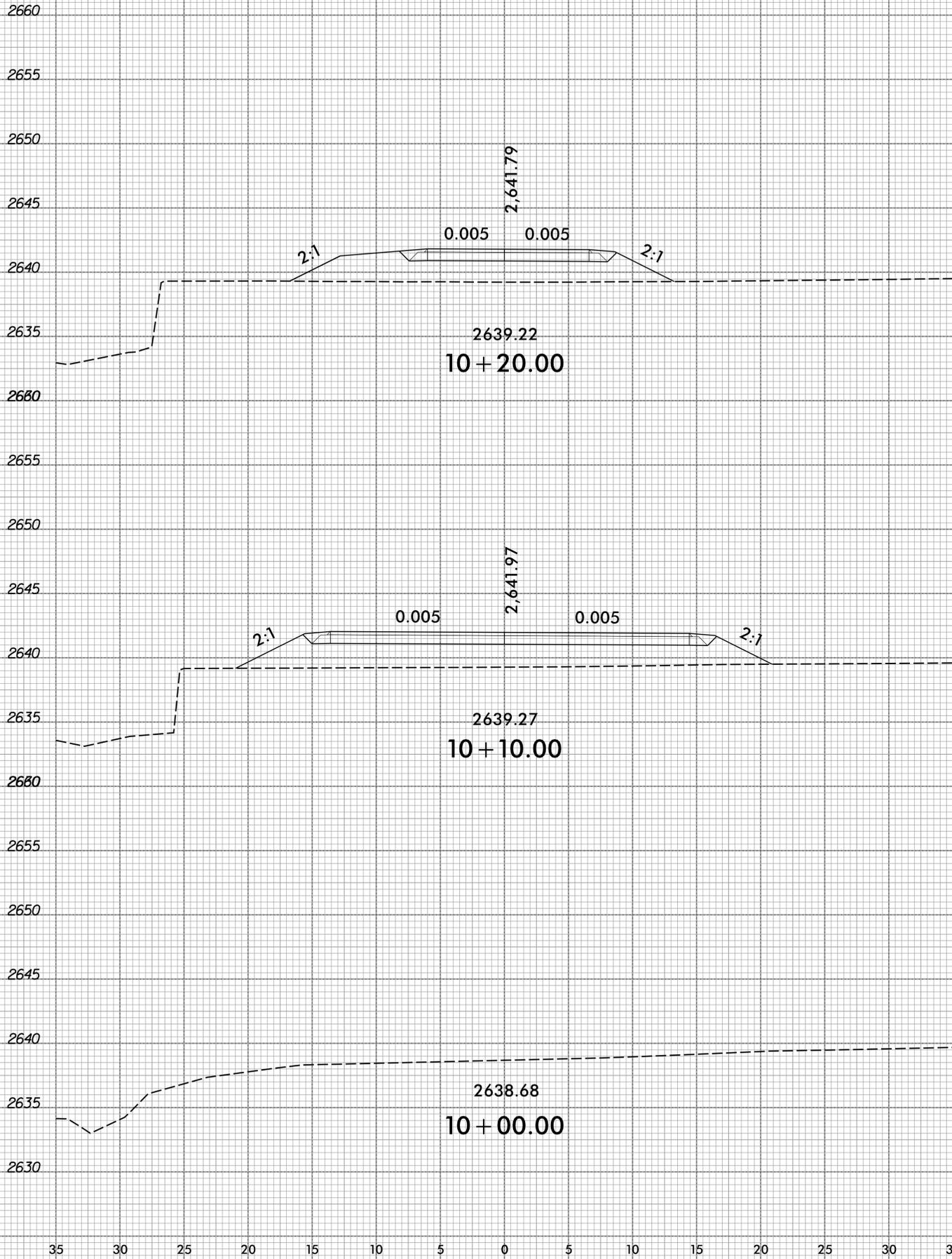


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PROJ. REFERENCE NO.
17BP.14.R.2

SHEET NO.
X-10



-DWYI-

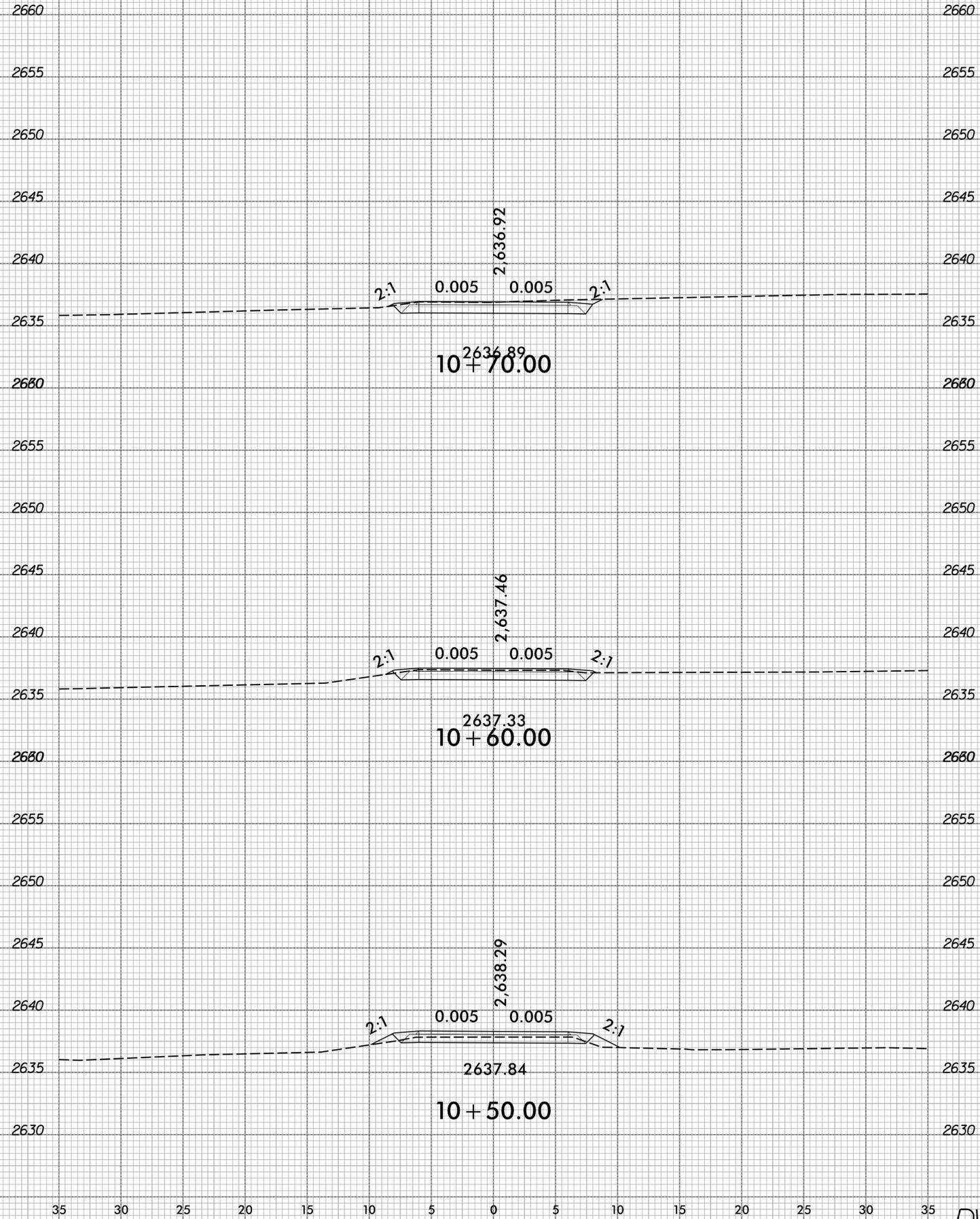
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8/23/99



PROJ. REFERENCE NO.
17BP.14.R.2

SHEET NO.
X-11



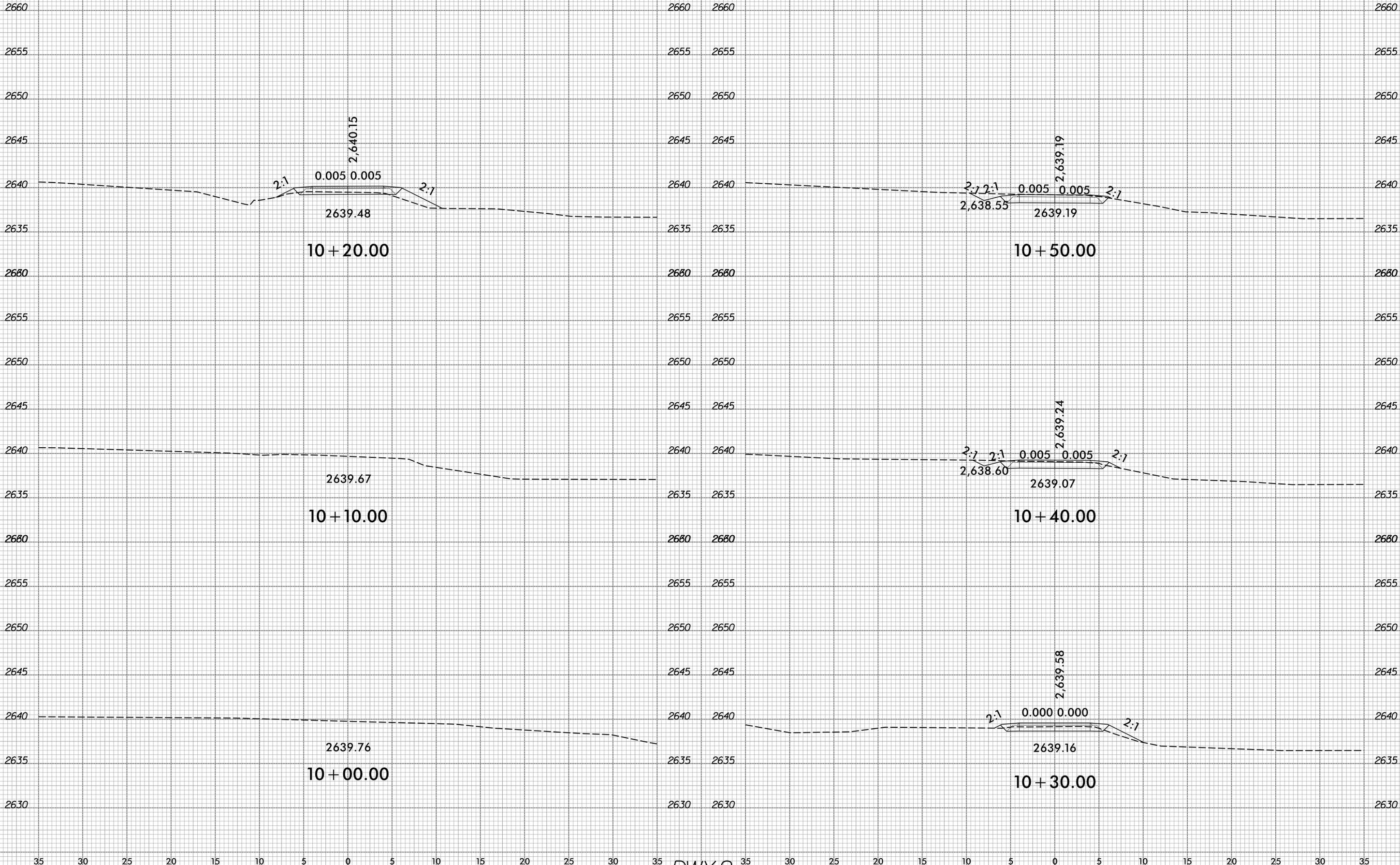
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
17BP.14.R.2	X-12

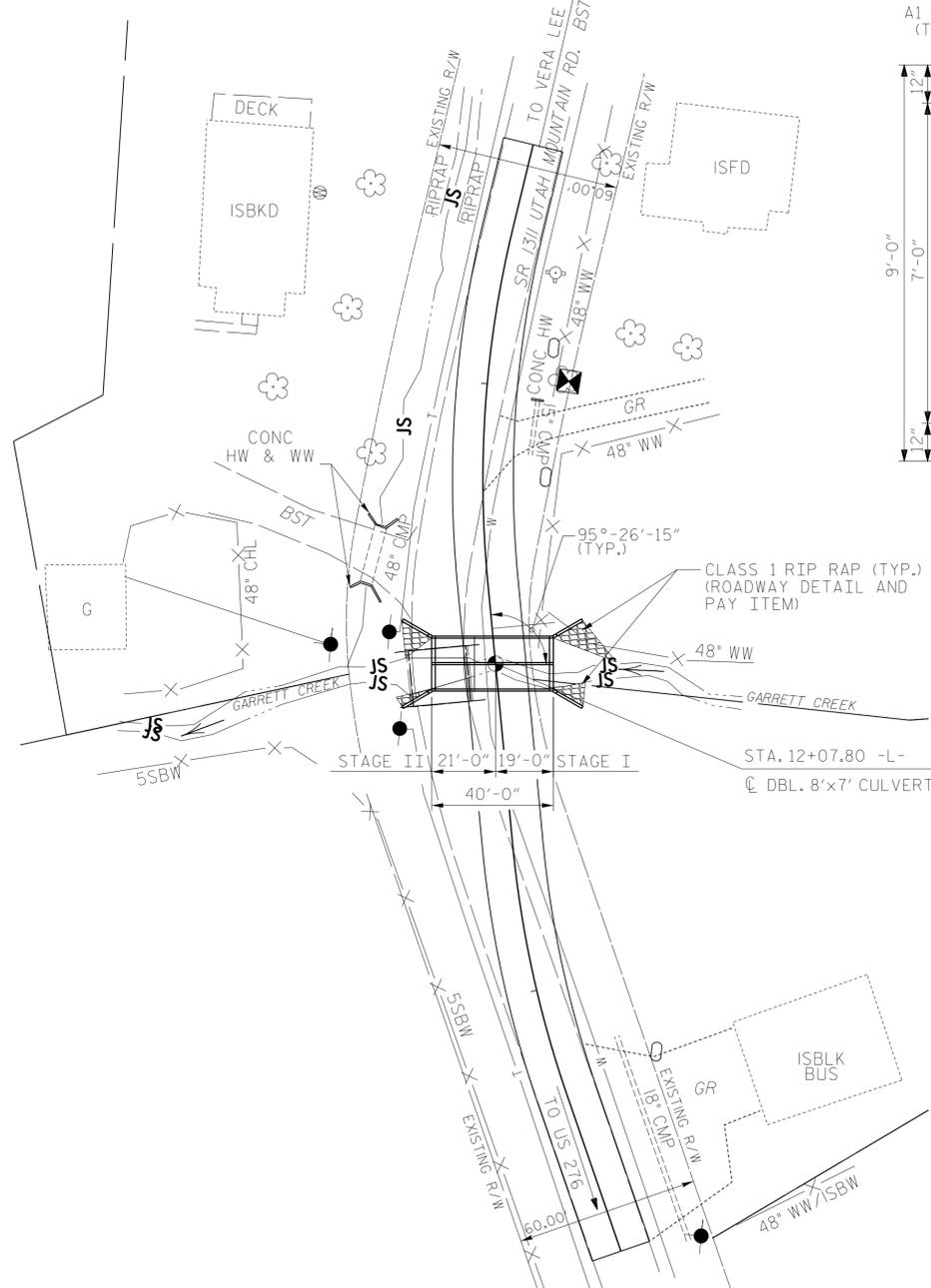


-DWY2-

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BM#1 : 6" NAIL SET IN ROOT OF 20" WALNUT TREE, -B- STA. 8+09, 14' RT., EL. 2639.58'

NAD 83/NSRS 2007



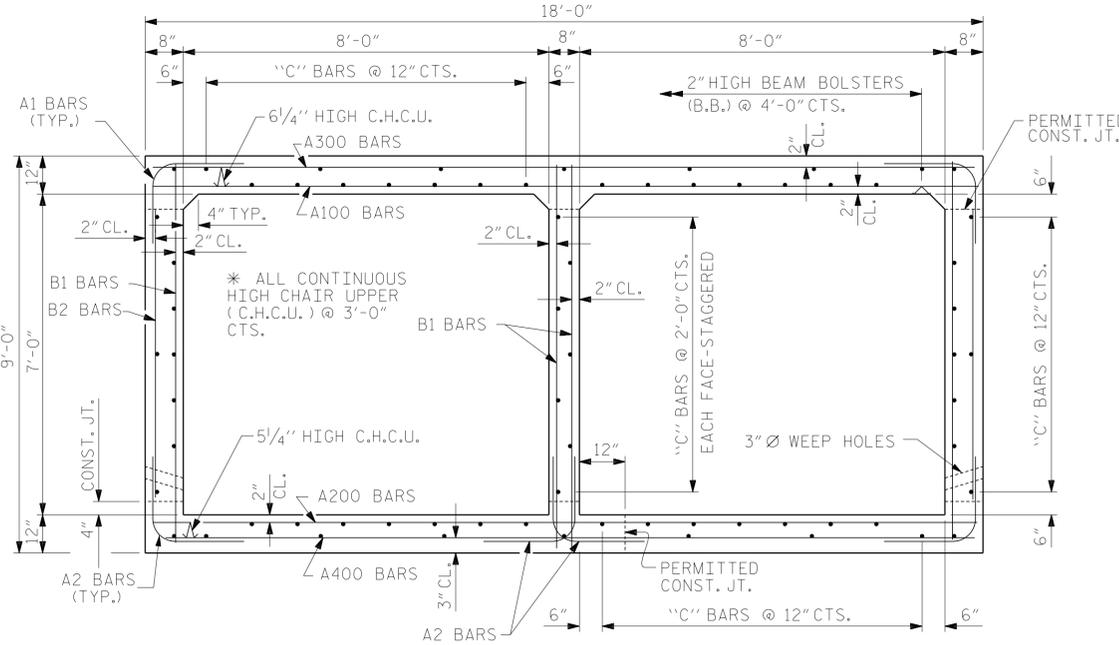
LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE = 580 C.F.S.
 FREQUENCY OF DESIGN FLOOD = 25 YEARS
 DESIGN HIGH WATER ELEVATION = 2638.9'
 DRAINAGE AREA = 1.67 SQ. MI.
 BASIC DISCHARGE @100' = 830 C.F.S.
 BASIC HIGH WATER ELEVATION = 2639.1'

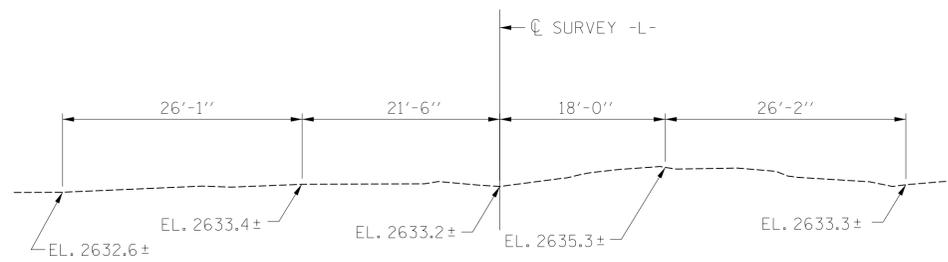
OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 530 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD = 10 YEARS
 OVERTOPPING FLOOD ELEVATION = 2638.8'



RIGHT ANGLE SECTION OF BARREL

THERE ARE 69 #4 BARS IN SECTION OF BARREL.



PROFILE ALONG CULVERT

TOTAL STRUCTURE QUANTITIES			
CLASS A CONCRETE		REINFORCING STEEL	
STAGE I	59.0 C.Y.	STAGE I	13,416 LBS.
STAGE II	40.5 C.Y.	STAGE II	8,273 LBS.
TOTAL	99.5 C.Y.	TOTAL	21,689 LBS.
FOUNDATION COND. MAT'L		RIP RAP CLASS B	
STAGE I	39 TONS	STAGE I	20 TONS
STAGE II	24 TONS	STAGE II	11 TONS
TOTAL	63 TONS	TOTAL	31 TONS
CULVERT EXCAVATION -- LUMP SUM			
REMOVAL OF EXIST. STRUCTURE -- LUMP SUM			

NOTES

ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
 DESIGN FILL-----2.0'.
 FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.
 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
 THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
 DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
 STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY CONTRACTOR.
 AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
 AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.
 A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
 FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
 AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 18'-6", TIMBER FLOOR ON TIMBER JOIST WITH A CLEAR ROADWAY WIDTH OF 19'-1" ON 11 LINES 6 X 12 TIMBER JOISTS AT 1'-9 1/2" CENTER ON TIMBER END BENT CAPS, TIMBER POST AND SILLS AT VARIOUS CENTERS AND LOCATED 10'-0" DOWN STREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 FOR UTILITY INFORMATION, SEE UTILITY PLANS.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOUNDATION NOTES

SEE SECTION 414 OF THE STANDARD SPECIFICATIONS FOR CULVERT EXCAVATION AND BACKFILLING.
 EXCAVATE 1 FOOT BELOW CULVERTS AND FOOTINGS AND REPLACE WITH COMPACTED FOUNDATION CONDITIONING MATERIAL.
 FOUNDATION CONDITIONING MATERIAL SHALL BE CLASS VI SELECT MATERIAL DESCRIBED IN SECTION 1016 OF THE STANDARD SPECIFICATIONS.
 BACKFILL WING WALLS WITH CLASS II OR BETTER SELECT MATERIAL, MEETING REQUIREMENTS OF IN SECTION 1016 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.14.R.2
HAYWOOD COUNTY
 STATION: 12+07.80 -L-

SHEET 1 OF 8 REPLACES BRIDGE #430328



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**BARREL STANDARD
 DOUBLE 8 FT. x 7 FT.
 CONCRETE BOX CULVERT
 95° SKEW**

NOVEMBER 1990

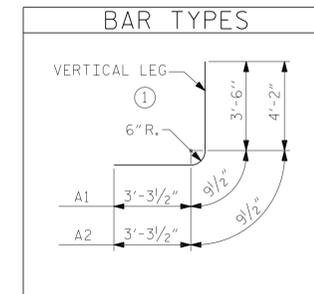
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2						4					TOTAL SHEETS 8

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 1001 Wade Avenue, Suite 400
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 ADDED NOV. 1, 1990

ASSEMBLED BY : R. KNIGHT	DATE : MAR 2012	SPECIAL
CHECKED BY : S. COOK	DATE : MAR 2012	
DRAWN BY : R.W. WRIGHT	DATE : JULY 1990	STANDARD
CHECKED BY : D.A. GLADDEN	DATE : JULY 1990	

BILL OF MATERIAL (STAGE 1)						BILL OF MATERIAL (STAGE 2)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	102	6	1	7'-7"	1161	A1	60	6	1	7'-7"	683
A2	204	6	1	8'-3"	2528	A2	120	6	1	8'-3"	1487
A100	51	6	STR.	17'-7"	1347	A100	30	6	STR.	17'-7"	792
A200	51	6	STR.	17'-7"	1347	A200	30	6	STR.	17'-7"	792
A300	51	6	STR.	17'-7"	1347	A300	30	6	STR.	17'-7"	792
A400	51	6	STR.	17'-7"	1347	A400	30	6	STR.	17'-7"	792
B1	152	5	STR.	8'-7"	1361	B1	92	5	STR.	8'-7"	823
B2	100	5	STR.	7'-6"	782	B2	60	5	STR.	7'-6"	469
C2	69	4	STR.	26'-9"	1233	C1	69	4	STR.	14'-9"	680
G1	4	5	STR.	17'-8"	74	G1	4	5	STR.	17'-8"	74
S1	6	8	STR.	17'-8"	283	S1	6	8	STR.	17'-8"	283



SPLICE CHART	
#4C1	1'-11"
#5B1	2'-2"

TOTAL STRUCTURE QUANTITIES (STAGE 1)	
CLASS A CONCRETE	
BARREL @ 1.86	CY/FT 46.5 C.Y.
WING ETC.	11.9 C.Y.
SILLS	0.9 C.Y.
TOTAL	59.3 C.Y.
REINFORCING STEEL	
BARREL	12810 LBS.
WINGS ETC.	576 LBS.
SILLS	30 LBS.
TOTAL	13416 LBS.
FOUNDATION COND. MAT./L	39 TONS
RIP RAP, CLASS B	20 TONS
CULVERT EXCAVATION	LUMP SUM

TOTAL STRUCTURE QUANTITIES (STAGE 2)	
CLASS A CONCRETE	
BARREL @ 1.86	CY/FT 28.0 C.Y.
WING ETC.	11.9 C.Y.
SILLS	0.9 C.Y.
TOTAL	39.8 C.Y.
REINFORCING STEEL	
BARREL	7667 LBS.
WINGS ETC.	576 LBS.
SILLS	30 LBS.
TOTAL	8273 LBS.
FOUNDATION COND. MAT./L	24 TONS
RIP RAP, CLASS B	11 TONS
CULVERT EXCAVATION	LUMP SUM
REMOVAL OF EXIST. STRUCTURE	LUMP SUM

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DRAWN BY : J. MYA DATE : 7-2012
CHECKED BY : S. COOK DATE : 7-2012

PROJECT NO. 17BP.14.R.2
HAYWOOD COUNTY
STATION: 12+07.80 -L-
SHEET 2 OF 8 REPLACES BRIDGE #430328

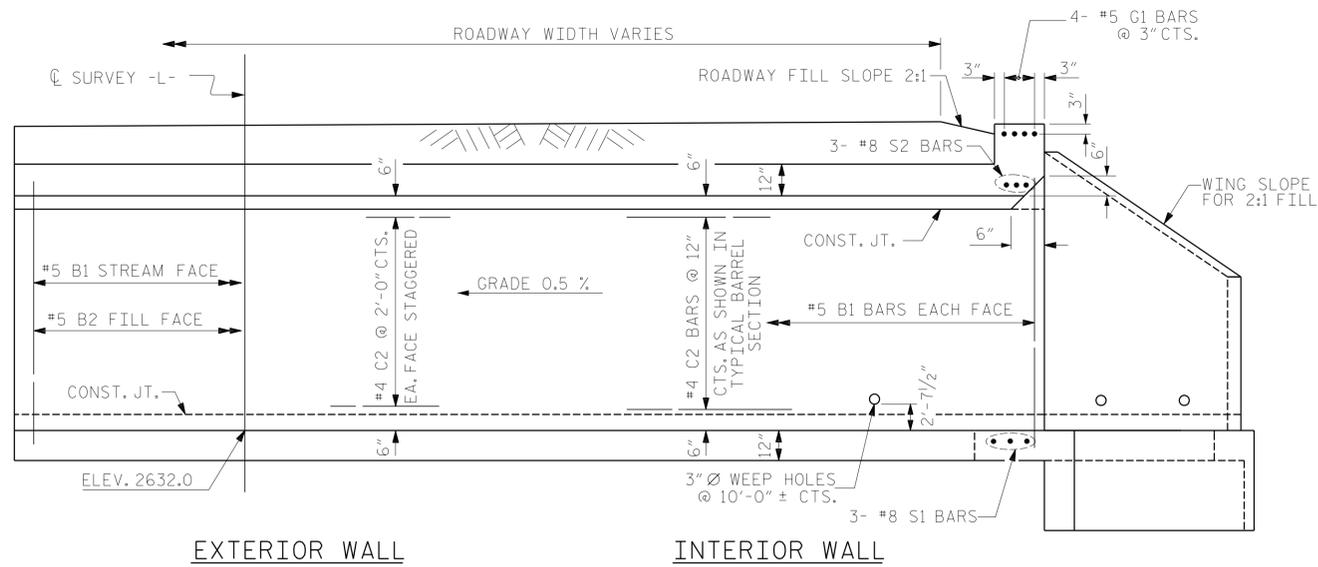


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BILL OF MATERIAL
DOUBLE 8 FT. X 7 FT.
CONCRETE BOX CULVERT

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

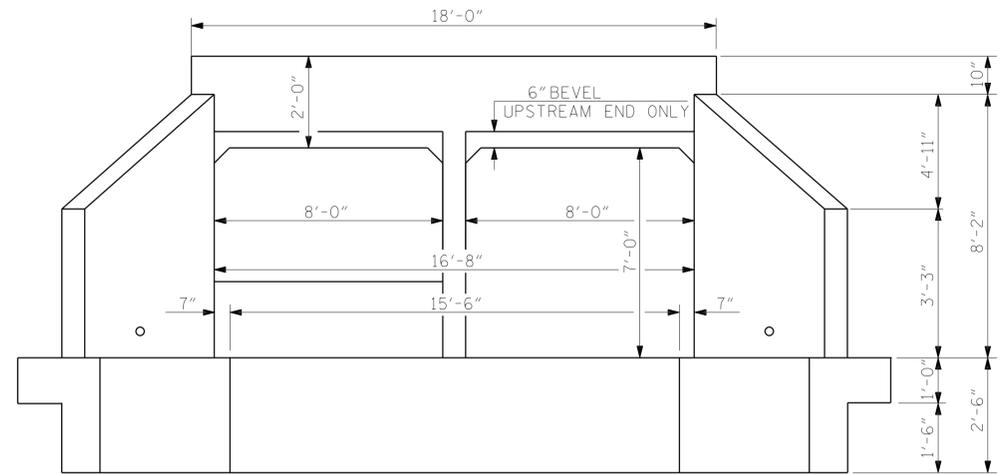
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TOTAL SHEETS 8



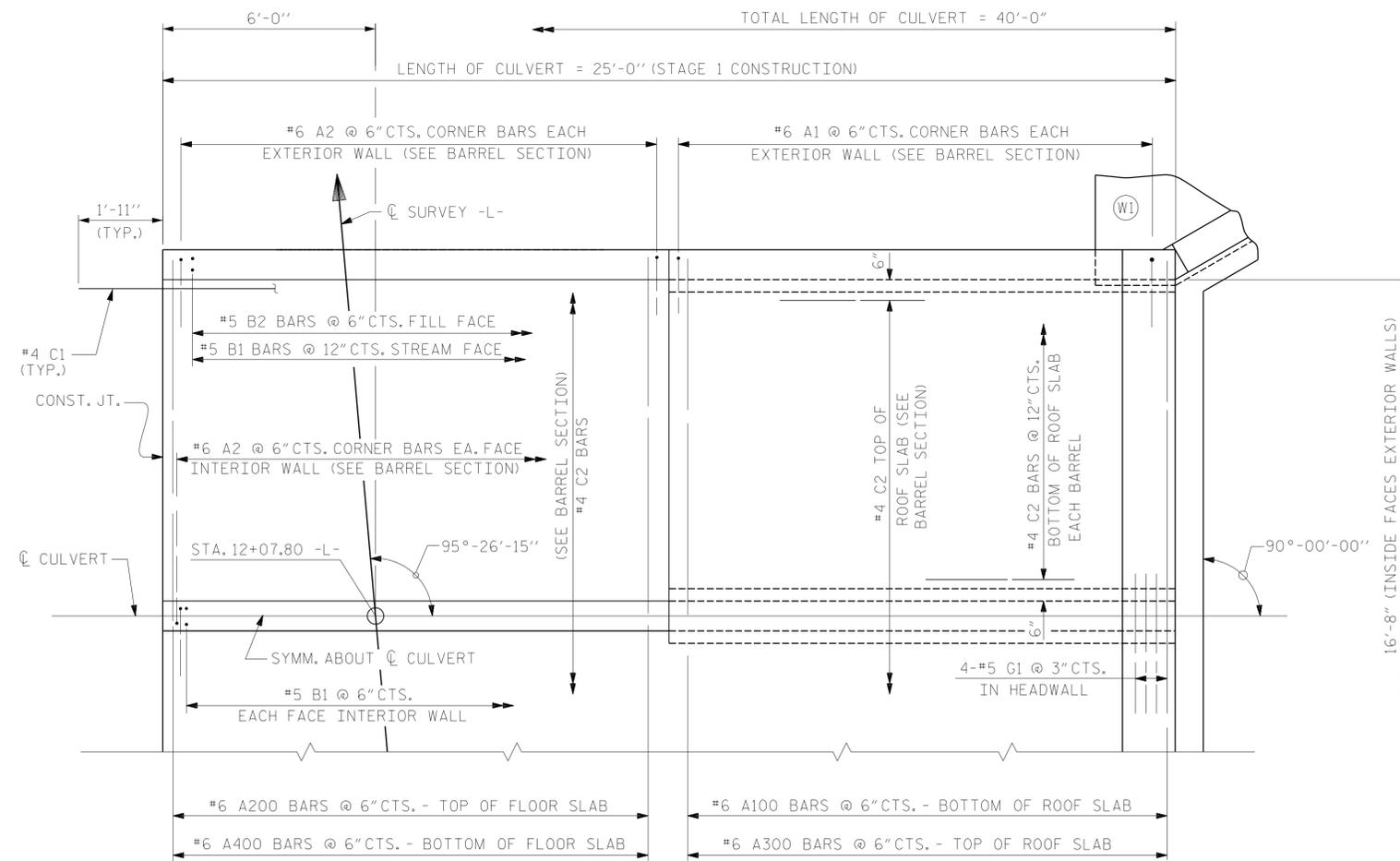
CULVERT SECTION NORMAL TO ROADWAY

(STAGE 2)



END ELEVATION

FOR SILL DETAILS, SEE SHEET 5 OF 8.



PART PLAN-FLOOR SLAB

(STAGE 1)

PART PLAN-ROOF SLAB

(STAGE 1)

PROJECT NO. 17BP.14.R.2
 HAYWOOD COUNTY
 STATION: 12+07.80 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BARREL STANDARD
 DOUBLE 8 FT. X 7 FT.
 CONCRETE BOX CULVERT
 90° SKEW

1971



THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, NC 27605-3322

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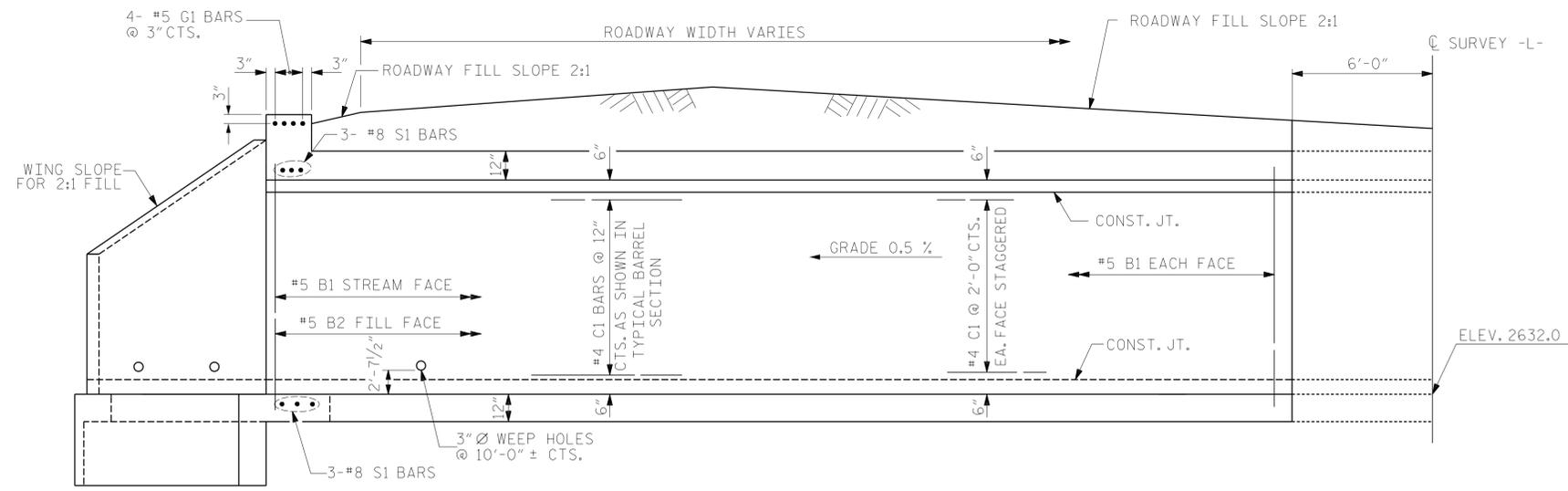
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ASSEMBLED BY : R. KNIGHT	DATE : MAR 2012	SPECIAL
CHECKED BY : S. COOK	DATE : APR 2012	
DRAWN BY : RALPH D. UNDERWOOD	DATE : MAY 1971	STANDARD
CHECKED BY : JOEL A. JOHNSON	DATE : JULY 1971	

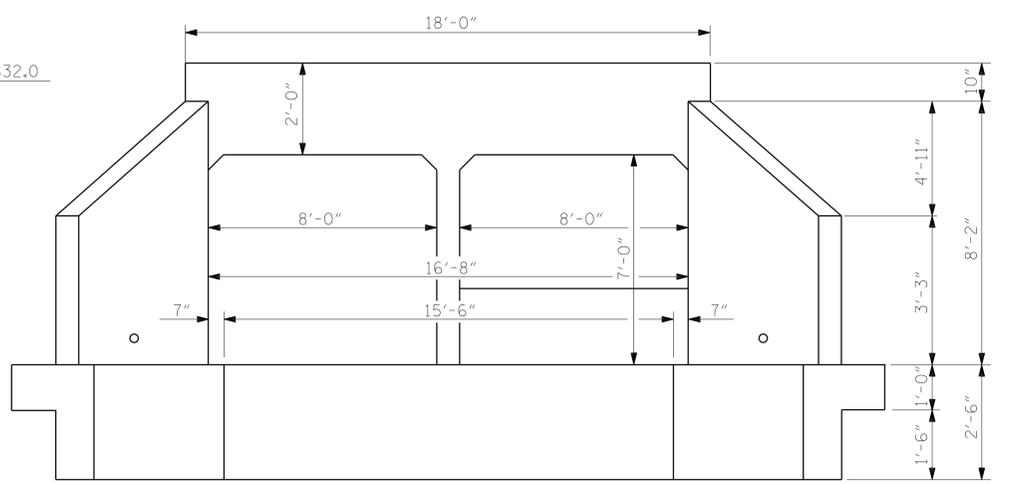
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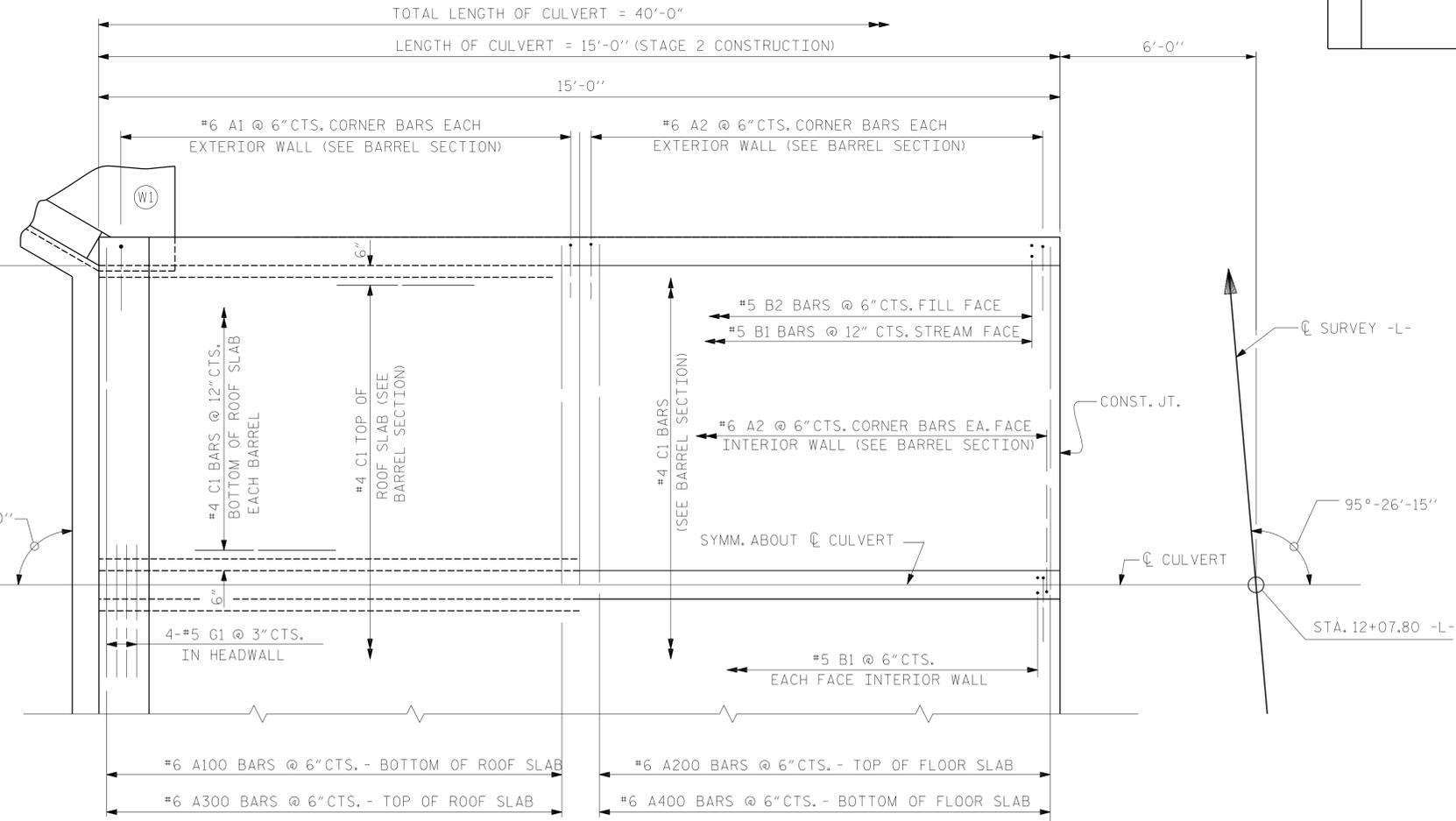
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 REDRAWN NOV. 1990 BY TSS CHECKED BY ARB



EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY
 (STAGE 1)



END ELEVATION
 FOR SILL DETAILS, SEE SHEET 5 OF 8.



PART PLAN-ROOF SLAB
 (STAGE 2)

PART PLAN-FLOOR SLAB
 (STAGE 2)

PROJECT NO. 17BP.14.R.2
HAYWOOD COUNTY
 STATION: 12+07.80 -L-
 SHEET 4 OF 8

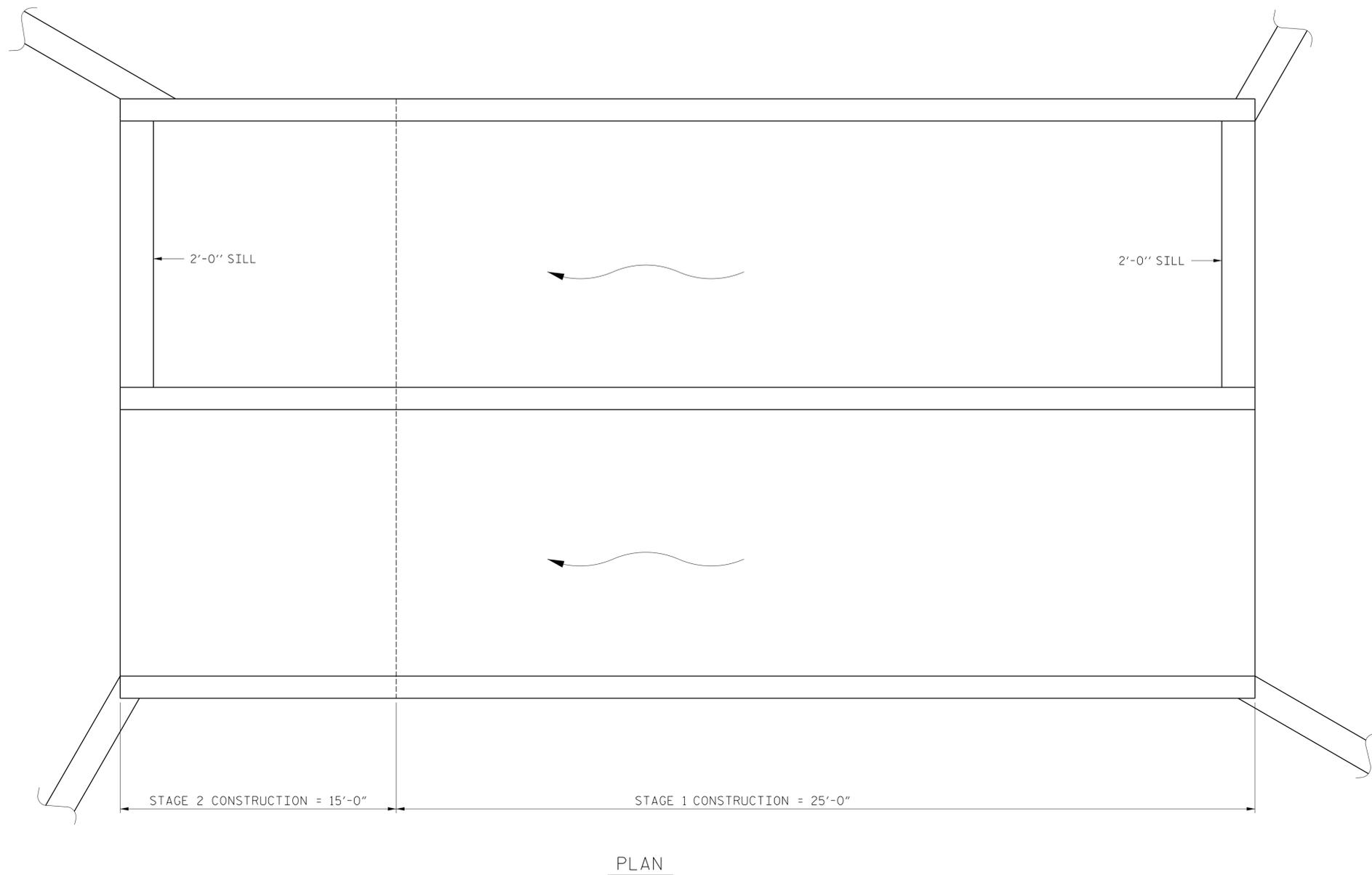


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BARREL STANDARD
DOUBLE 8 FT. X 7 FT.
CONCRETE BOX CULVERT
90° SKEW
 1971

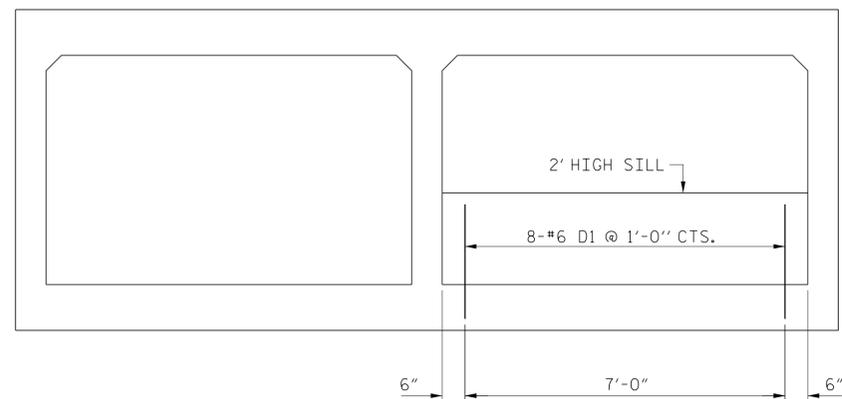
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CHECKED BY : S. COOK	DATE : JULY 2012	
DRAWN BY : RALPH D. UNDERWOOD	DATE : MAY 1971	STANDARD
CHECKED BY : JOEL A. JOHNSON	DATE : JULY 1971	

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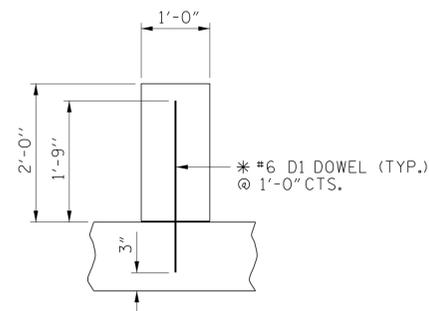
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PLAN



ELEVATION VIEW - INLET



* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED

SECTION THRU 2'-0" SILL

NOTES:
 PLACE SILLS AT INLET AND OUTLET OF CULVERT ONLY.
 SILLS SHALL BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED WITH DOWELS.
 TOP OF THE LOW SILL SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM.
 CLASS "B" RIP RAP MAY BE USED TO SUPPLEMENT NATURAL BED MATERIAL.
 DO NOT SET ELEVATION OF HIGH SILL ABOVE BANK FULL.
 SET ASIDE EXCAVATED NATURAL BED MATERIAL AND USE IT TO BACK FILL INSIDE BOTTOM OF R.C.B.C. CELLS.

SILL QUANTITIES					
STAGE 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
D1	8	#6	STR	2'-6"	30
REINFORCING STEEL					30 LBS
CLASS A CONCRETE					0.6 CY
RIP RAP, CLASS B					20 TONS

SILL QUANTITIES					
STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
D1	8	#6	STR	2'-6"	30
REINFORCING STEEL					30 LBS
CLASS A CONCRETE					0.6 CY
RIP RAP, CLASS B					11 TONS

REINFORCING STEEL TOTAL	60 LBS
CLASS A CONCRETE TOTAL	1.2 CY
RIP RAP, CLASS B TOTAL	31 TONS

PROJECT NO. 17BP.14.R.2
 HAYWOOD COUNTY
 STATION: 12+07.80 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

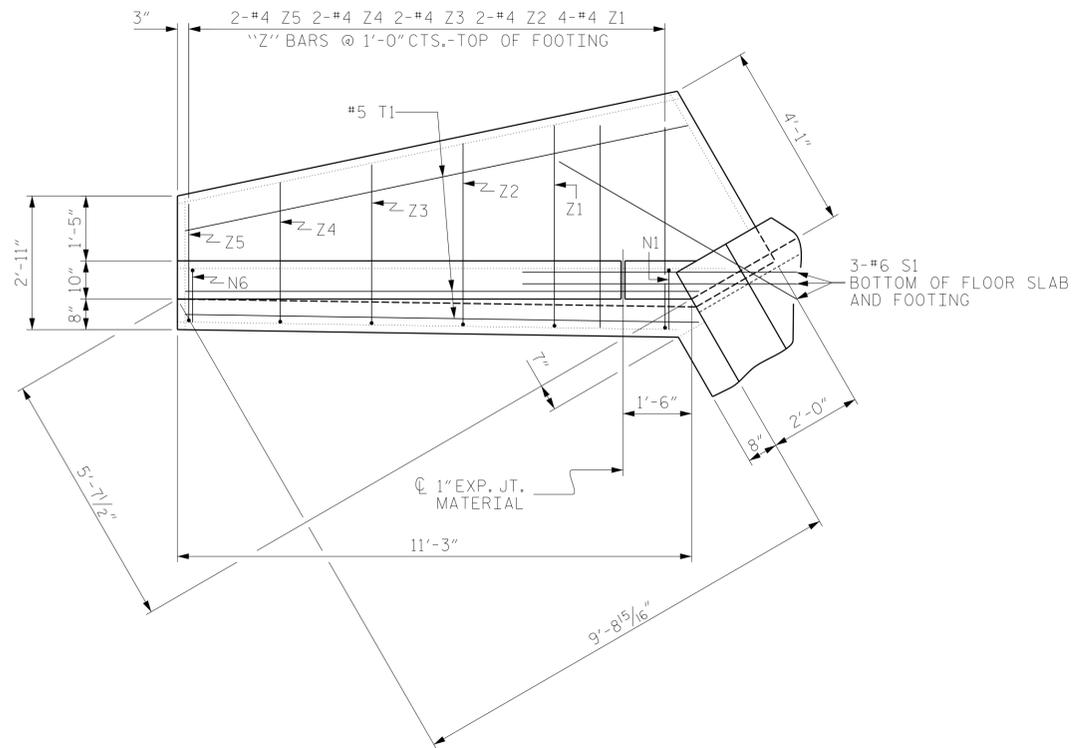
CONCRETE SILL
 DETAILS



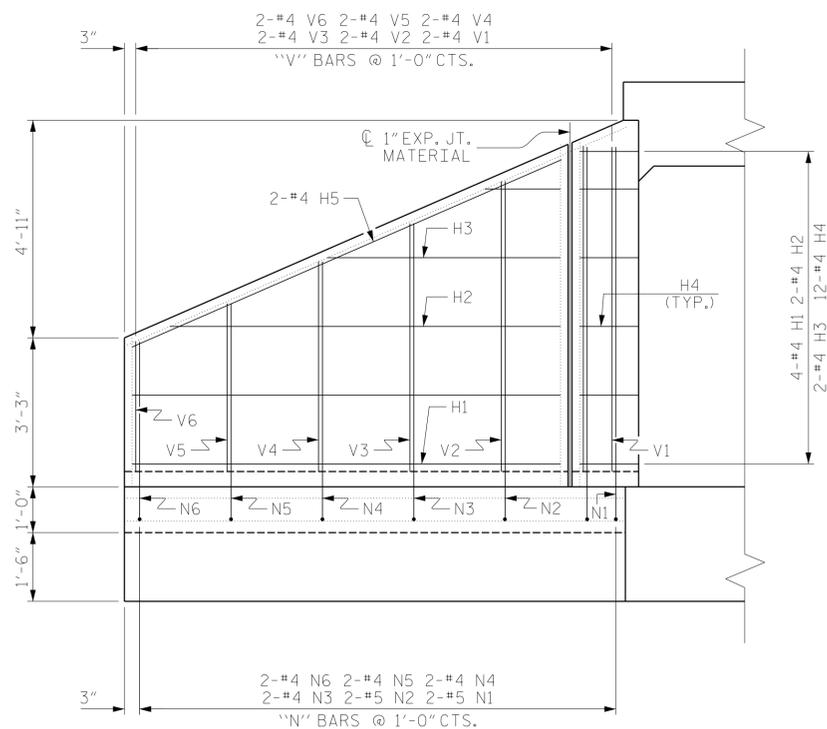
DRAWN BY : R. KNIGHT DATE : JUNE 2012
 CHECKED BY : S. COOK DATE : JUNE 2012

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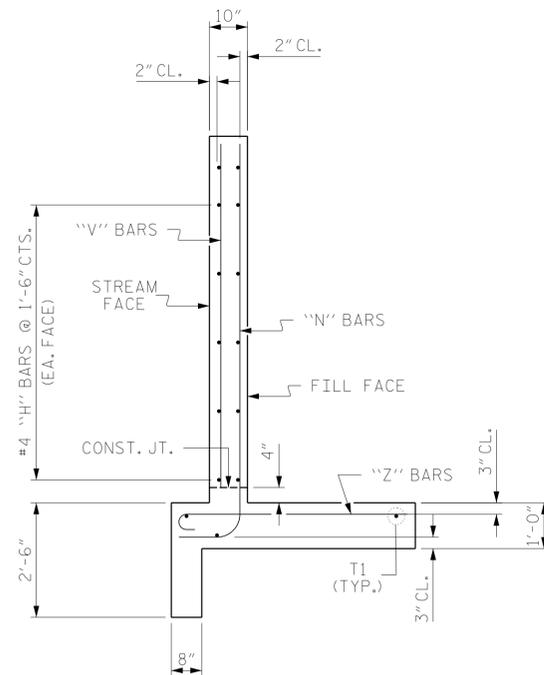
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PLAN



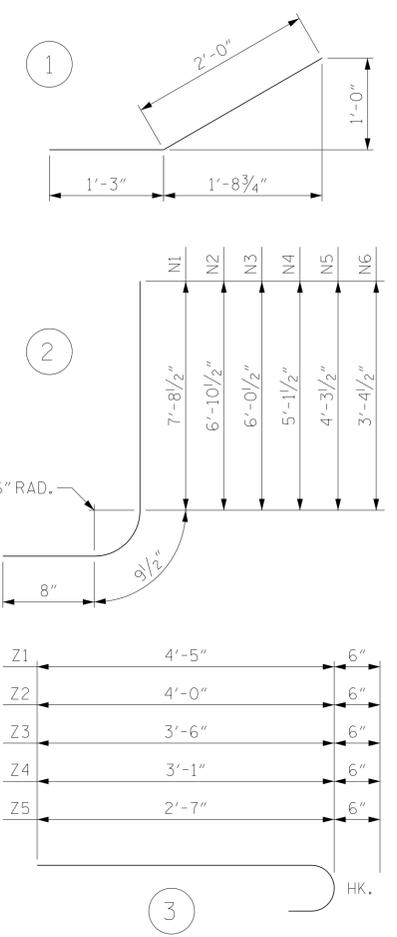
ELEVATION



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	9'-4"	100
H2	4	#4	STR	8'-6"	45
H3	4	#4	STR	5'-1"	27
H4	24	#4	1	3'-3"	104
H5	4	#4	STR	10'-3"	55
N1	4	#5	2	9'-2"	76
N2	4	#5	2	8'-4"	70
N3	4	#4	2	7'-6"	40
N4	4	#4	2	6'-7"	35
N5	4	#4	2	5'-9"	31
N6	4	#4	2	4'-10"	26
S1	6	#6	STR	6'-0"	108
T1	6	#5	STR	11'-3"	141
V1	4	#4	STR	7'-1"	38
V2	4	#4	STR	6'-4"	34
V3	4	#4	STR	5'-5"	29
V4	4	#4	STR	4'-7"	24
V5	4	#4	STR	3'-8"	20
V6	4	#4	STR	2'-10"	15
Z1	8	#4	3	4'-11"	53
Z2	4	#4	3	4'-6"	24
Z3	4	#4	3	4'-0"	21
Z4	4	#4	3	3'-7"	19
Z5	4	#4	3	3'-1"	16

TOTAL REINFORCING STEEL FOR 2 WINGS 576 LBS

CLASS A CONCRETE
 2 WINGS 8.6 CY
 1 HEADWALLS 0.8 CY
 1 END CURTAIN WALLS 2.5 CY
 TOTAL 11.9 CY

STAGE 1 SHOWN,
 STAGE 2 SIMILAR

PROJECT NO. 17BP.14.R.2
 HAYWOOD COUNTY
 STATION: 12+07.80 -L-

SHEET 6 OF 8



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD WINGS
 FOR
 CONCRETE BOX CULVERT
 H = 7'-0" SLOPE = 2:1
 90° SKEW

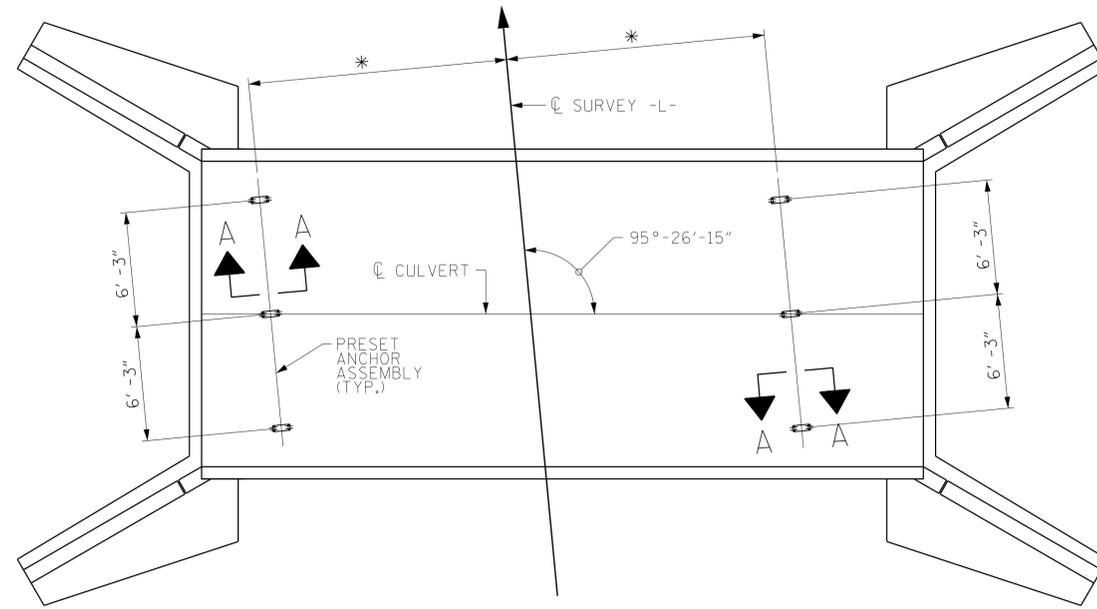
ASSEMBLED BY : R. KNIGHT DATE : MAR 2012
 CHECKED BY : S. COOK DATE : APR 2012
 DRAWN BY : CCJ 10/99
 CHECKED BY : RWW 03/00

REVISIONS						SHEET NO.
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STD. NO. CW9007

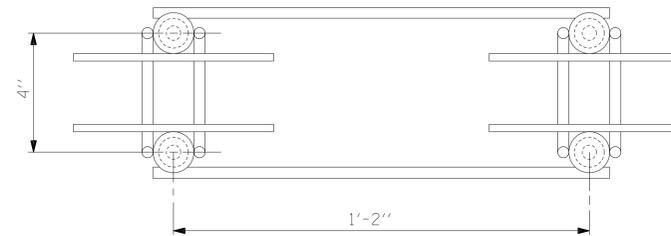
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 1001 Wade Avenue, Suite 400
 Raleigh, NC 27605-3322

* DIMENSION TO BE FURNISHED BY ENGINEER.

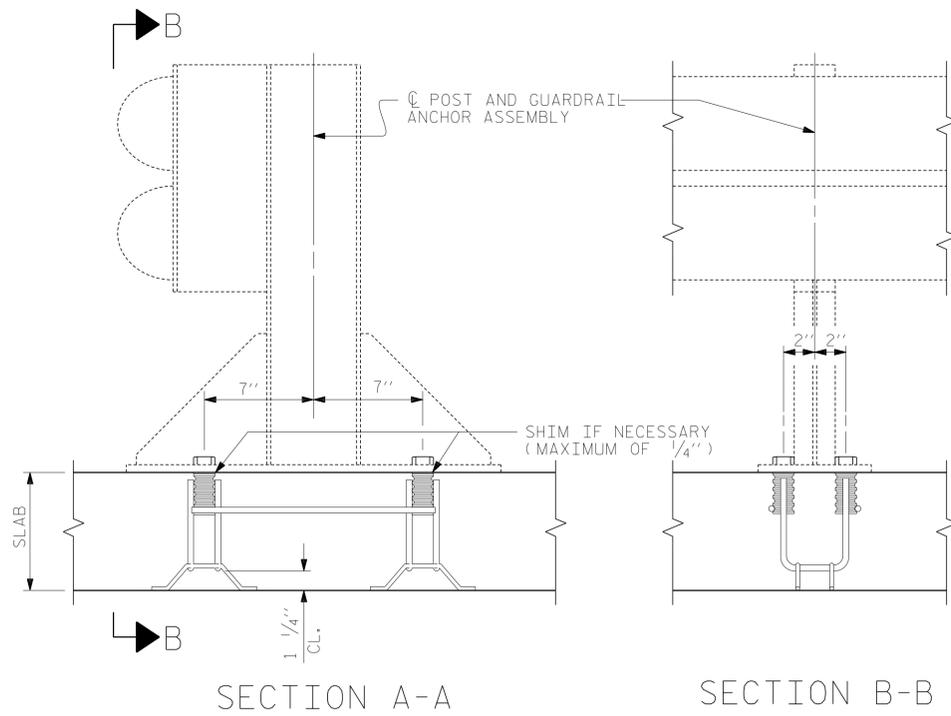


PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

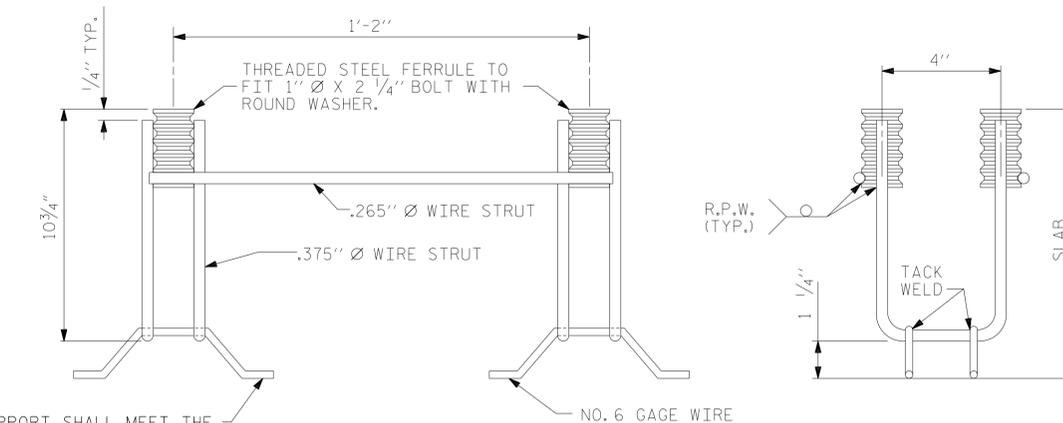


PLAN



SECTION A-A

SECTION B-B



ELEVATION

THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

- THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
 - B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

PROJECT NO. 17BP.14.R.2
 HAYWOOD COUNTY
 STATION: 12+07.80 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 ANCHORAGE DETAILS FOR
 GUARDRAIL ANCHOR ASSEMBLY
 FOR CULVERTS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			8

THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, NC 27605-3322

ASSEMBLED BY : R. KNIGHT	DATE : MAR. 2012
CHECKED BY : S. COOK	DATE : APR. 2012
DRAWN BY : FCJ 6/88	REV. 7/10/01 LES/RDR
CHECKED BY : ARB 6/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R KMM/GM

LOAD AND RESISTANCE FACTOR RATING (LRFR)
SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{L1})	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (FT)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.04	--	1.75	2.10	2	TOP SLAB	18.00	1.04	2	TOP SLAB	18.00		
	HL-93 (OPERATING)	N/A		1.34	--	1.35	2.72	2	TOP SLAB	18.00	1.34	2	TOP SLAB	18.00		
	HS-20 (INVENTORY)	36.000	②	1.34	48.24	1.75	2.84	2	TOP SLAB	18.00	1.34	2	TOP SLAB	18.00		
	HS-20 (OPERATING)	36.000		1.71	61.56	1.35	2.68	2	TOP SLAB	18.00	1.71	2	TOP SLAB	18.00		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.28	30.78	1.40	3.55	2	TOP SLAB	18.00	2.28	2	TOP SLAB	18.00	
		SNGARBS2	20.000		2.14	42.80	1.40	3.33	2	TOP SLAB	18.00	2.14	2	TOP SLAB	18.00	
		SNAGRIS2	22.000		2.28	50.16	1.40	3.55	2	TOP SLAB	18.00	2.28	2	TOP SLAB	18.00	
		SNCOTTS3	27.250	③	1.37	37.33	1.40	2.10	2	TOP SLAB	18.00	1.37	2	TOP SLAB	18.00	
		SNAGGRS4	34.925		1.67	58.32	1.40	2.05	2	TOP SLAB	18.00	1.67	2	TOP SLAB	18.00	
		SNS5A	35.550		1.53	54.39	1.40	1.97	2	TOP SLAB	18.00	1.53	2	TOP SLAB	18.00	
		SNS6A	39.950		1.50	59.93	1.40	1.94	2	TOP SLAB	18.00	1.50	2	TOP SLAB	18.00	
		SNS7B	42.000		1.50	63.00	1.40	1.94	2	TOP SLAB	18.00	1.50	2	TOP SLAB	18.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.12	69.96	1.40	2.25	2	TOP SLAB	18.00	2.12	2	TOP SLAB	18.00	
		TNT4A	33.075		1.60	52.92	1.40	2.23	2	TOP SLAB	18.00	1.60	2	TOP SLAB	18.00	
		TNT6A	41.600		1.57	65.31	1.40	2.16	2	TOP SLAB	18.00	1.57	2	TOP SLAB	18.00	
		TNT7A	42.000		1.57	65.94	1.40	2.24	2	TOP SLAB	18.00	1.57	2	TOP SLAB	18.00	
		TNT7B	42.000		1.51	63.42	1.40	1.95	2	TOP SLAB	18.00	1.51	2	TOP SLAB	18.00	
		TNAGRIT4	43.000		1.57	67.51	1.40	2.00	2	TOP SLAB	18.00	1.57	2	TOP SLAB	18.00	
TNAGT5A	45.000		1.54	69.30	1.40	2.00	2	TOP SLAB	18.00	1.54	2	TOP SLAB	18.00			
TNAGT5B				1.55	69.75	1.40	2.02	2	TOP SLAB	18.00	1.55	2	TOP SLAB	18.00		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

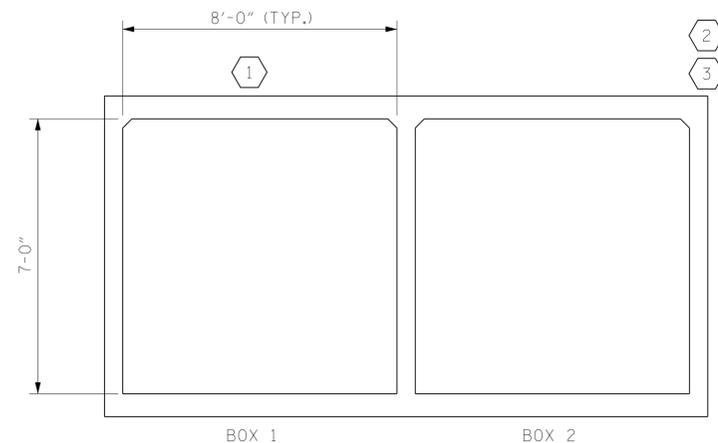
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

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-
-
-

⑥	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.14.R.2
HAYWOOD COUNTY
STATION: 12+07.80 -L-

SHEET 8 OF 8



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS

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

SHEET NO.
C-8
TOTAL SHEETS
8

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

STD. NO. LRFR5

ASSEMBLED BY : R. KNIGHT	DATE : MAR. 2012
CHECKED BY : S. COOK	DATE : APR. 2012
DRAWN BY : WMC 7/11	REV. 10/1/11 MAA/GM
CHECKED BY : GM 7/11	