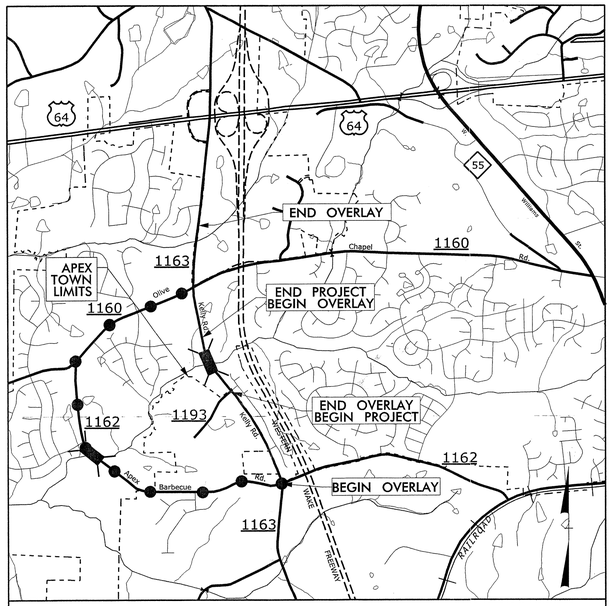
TIP PROJECT: B-4991

CONTRACT: C202573



DETOUR ROUTE

VICINITY MAP

Not To Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: BRIDGE NO. 359 OVER BEAVER CREEK ON SR 1163 (KELLY ROAD)

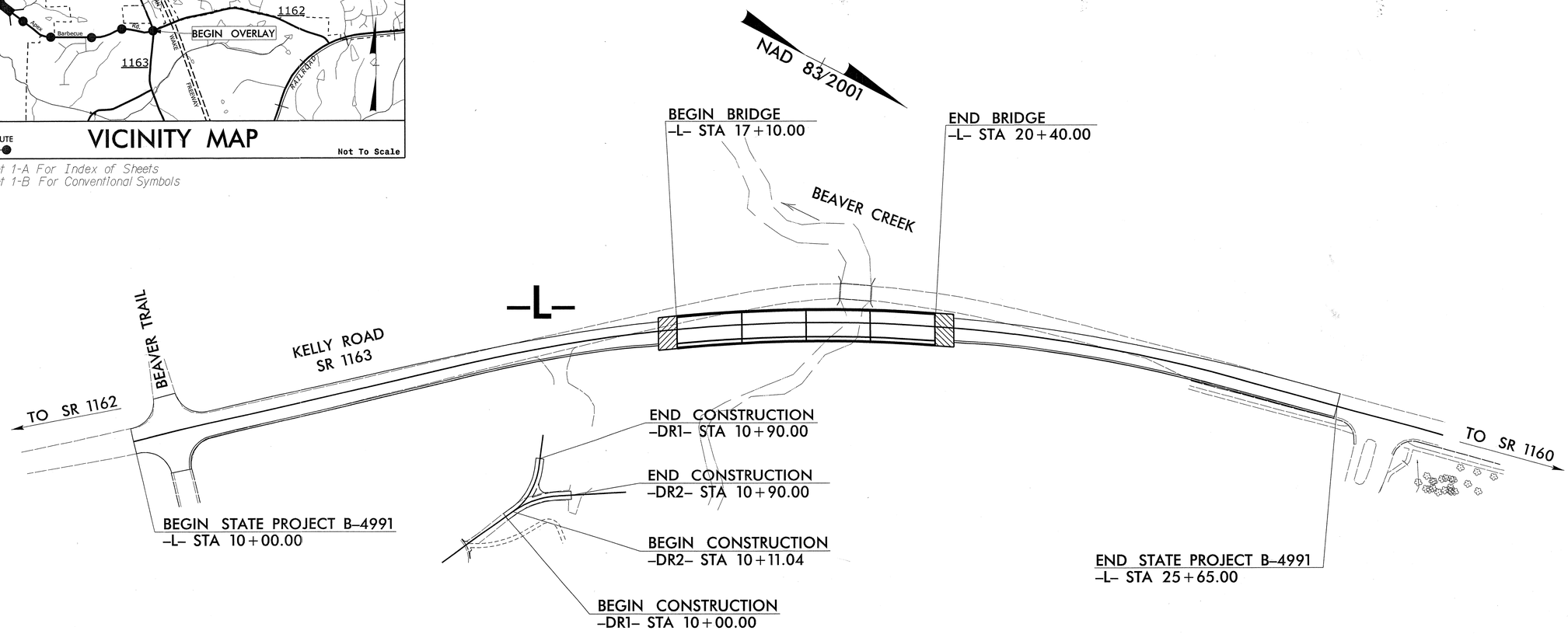
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, AND RESURFACING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4991	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40890.1.1	FA# BRZ-1163(7)	PE
40890.2.1	FA# BRZ-1163(7)	R/W
40890.3.FD1	FA# BRZ-1163(7)	Constr.

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com
PROJECT #:B11001

NAD 83/2001



GRAPHIC SCALES

60 30 0 60 120
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 11,500
ADT 2030 = 20,000
DHV = 3%
D = %
T = 6% *
* (TTST % + DUAL %)
V = 50 MPH
CLASS = LOCAL

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4991	=	0.233 mi.
LENGTH STRUCTURE TIP PROJECT B-4991	=	0.063 mi.
TOTAL LENGTH TIP PROJECT B-4991	=	0.296 mi.

Prepared in the Office of:
STEWART
For
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 5, 2012

LETTING DATE:
FEBRUARY 18, 2014

DAVID RUGGLES, PE
PROJECT ENGINEER

BEN CRAWFORD, PE
PROJECT DESIGN ENGINEER

ROY GIROLAMI, PE
NCDOT CONTACT

ROADWAY DESIGN AND HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN R. CRAWFORD
10/18/2013

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

10/8/2013
Proj: B4991_rdy_psh_01_tsh.dgn
USER: mburns

9/09/9

8/17/99

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS

PROJECT REFERENCE NO.	SHEET NO.
B-4991	1-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER NEIL J. DEAN
2/3/2014

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T 919.380.8750
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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 SHEET
1-D	CENTERLINE COORDINATE LIST
2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2-A	RETAINING WALL ENVELOPES
2-B	GRADING PLAN
2-C	B-77 STANDARD DETAIL
2-D	CONCRETE TRAIL DETAILS
3	SUMMARY OF QUANTITIES
3-A	EARTHWORK, DRAINAGE, GUARDRAIL, RIGHT OF WAY AREA DATA, AND ASPHALT PAVEMENT REMOVAL SUMMARIES
4 THRU 5	PLAN & PROFILE SHEETS
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UC-1 THRU UC-5	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS SECTION SUMMARY AND INDEX
X-2 THRU X-12	CROSS-SECTIONS
S-1 THRU S-48	STRUCTURE PLANS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	Anchorage for Frames
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.05	Curb Ramp - Proposed Curb & Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
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 III.

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:

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

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

Town of Apex - Water

Town of Apex - Sanitary Sewer

AT&T - Telephone

Duke Energy Progress - Electrical

Town of Apex - Electrical

PSNC - Gas

Time Warner Cable - Cable TV

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 CONTRACT.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS IN ACCORDANCE WITH STD. 848.05 AND/OR 848.06.

2/3/2014
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USER:pgnolas

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4991	1-B

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

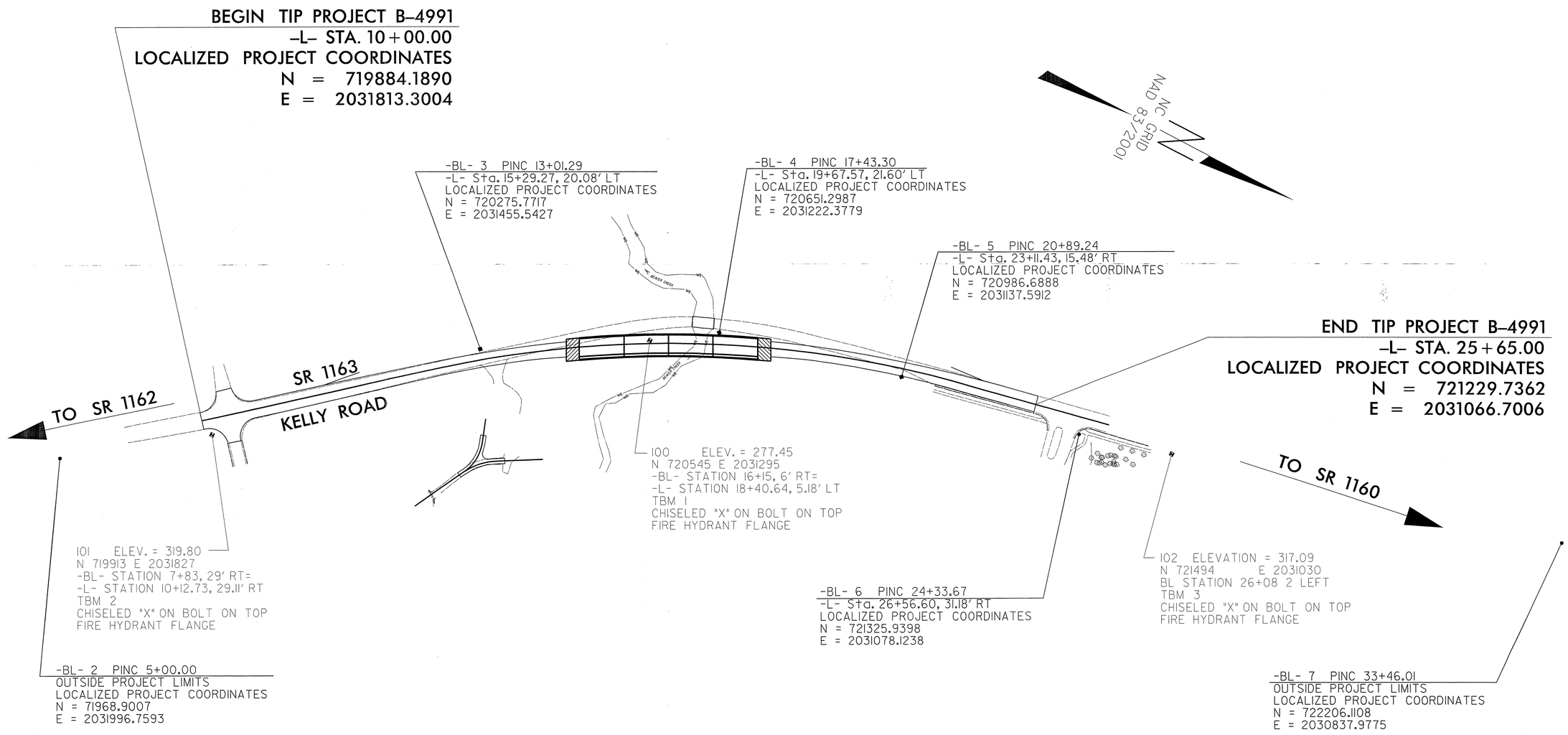
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-4991	1-C

SURVEY CONTROL SHEET B-4991



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "GPS 7"
WITH NAD 1983(2001) STATE PLANE GRID COORDINATES OF
NORTHING: 722,206.11(ft) EASTING: 2,030,837.98(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989110
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS 7" TO -L- STATION 10+00.00 IS 2,518.45 FEET @ S22°47'05.24"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

REVISIONS

8/17/99

10/8/2013
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PROJECT REFERENCE NO.	SHEET NO.
B-4991	1-D

SURVEY CONTROL SHEET B-4991

FINAL

(DESIGN ALIGNMENTS)

-L-

TYPE	STATION	NORTH	EAST
POT	10+00.00	2031813.3004	719884.1890
PC	14+44.25	2031525.1020	720222.2778
PT	24+26.76	2031095.4154	721094.6436
POT	27+05.43	2031037.4773	721367.2210

-DR1-

TYPE	STATION	NORTH	EAST
POT	9+00.00	2031768.9894	720304.9401
PC	10+11.04	2031670.3141	720355.8715
PT	10+76.55	2031606.7627	720360.1391
POT	11+20.00	2031565.8383	720345.5527

-DR2-

TYPE	STATION	NORTH	EAST
POT	9+00.00	2031768.9894	720304.9401
PC	10+11.04	2031670.3141	720355.8715
PT	10+75.17	2031624.8392	720399.7864
POT	11+60.00	2031581.9938	720473.0058

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
OTHERS FOR MONUMENT "GPS 7"
WITH NAD 1983(2001) STATE PLANE GRID COORDINATES OF
NORTHING: 722,206.11(ft) EASTING: 2,030,837.98(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.99989110
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LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS 7" TO -L- STATION 10+00.00 IS
2,518.45 FEET @ S22°47'05.24"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

REVISIONS

8/17/99

10/8/2013
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jjsf8mburns

PROJECT REFERENCE NO.	SHEET NO.
B-4991	2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN R. CRAWFORD

2/3/14

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22883 ENGINEER CLARK S. MORRISON

2/4/14

STEWART

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Raleigh, NC 27601
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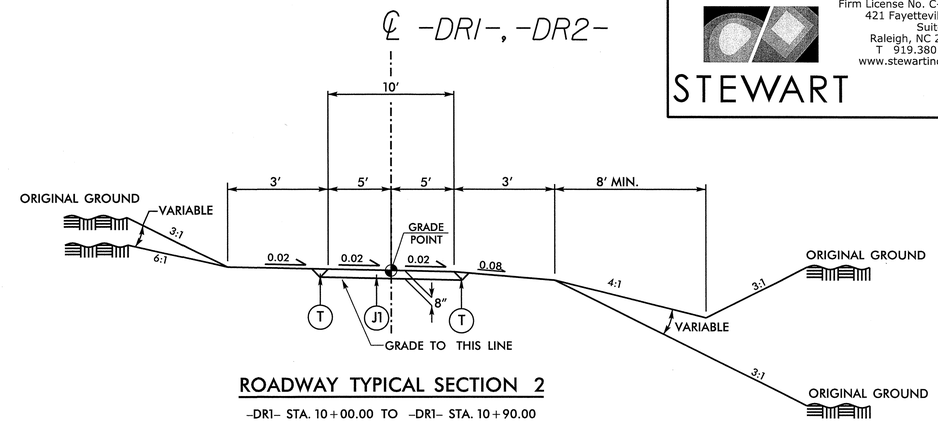
www.stewartinc.com

PAVEMENT SCHEDULE

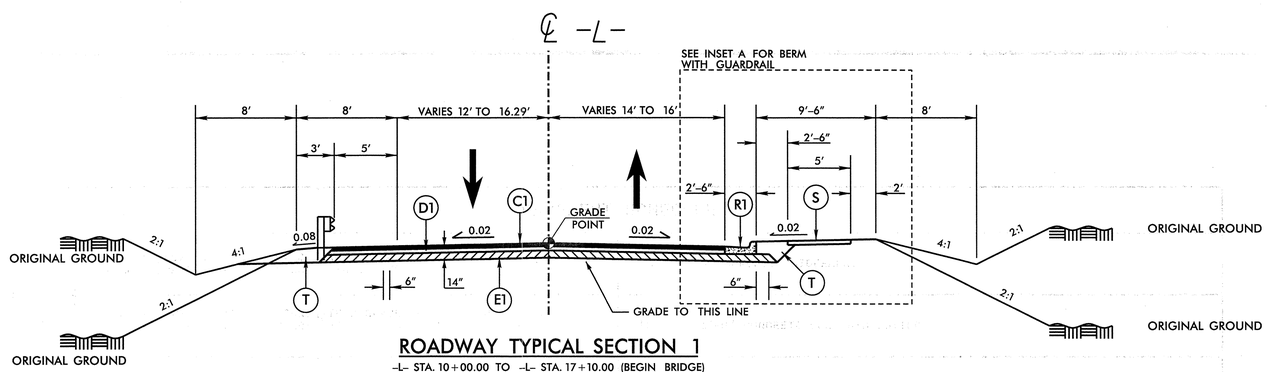
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'-6" CONCRETE CURB AND GUTTER.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
E1	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	U	EXISTING PAVEMENT
J1	PROP. 8" AGGREGATE BASE COURSE.	V	GEOTEXTILE FOR SOIL STABILIZATION

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



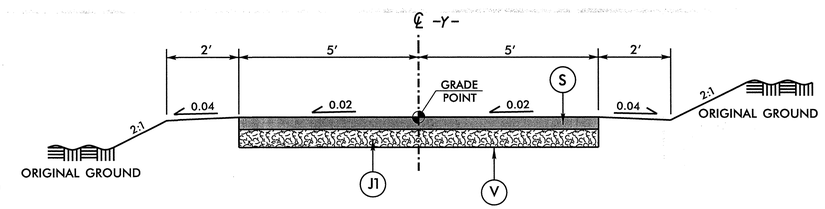
ROADWAY TYPICAL SECTION 2

-DR1- STA. 10+00.00 TO -DR1- STA. 10+90.00
-DR2- STA. 10+11.07 TO -DR2- STA. 10+90.00



ROADWAY TYPICAL SECTION 1

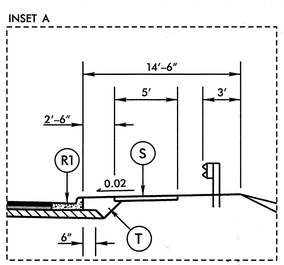
-L- STA. 10+00.00 TO -L- STA. 17+10.00 (BEGIN BRIDGE)
-L- STA. 20+40.00 (END BRIDGE) TO -L- STA. 25+65.00

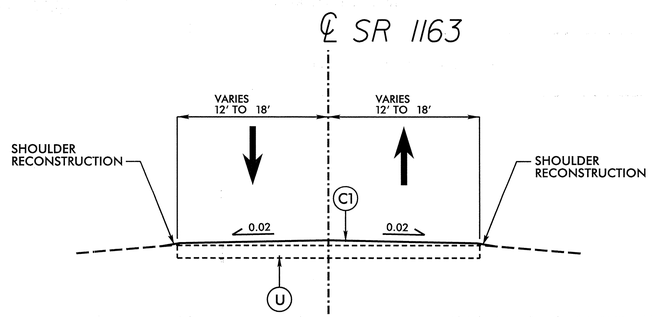


CONCRETE PATH TYPICAL SECTION 3

-Y- STA. 11+70.45 TO -Y- STA. 13+39.81

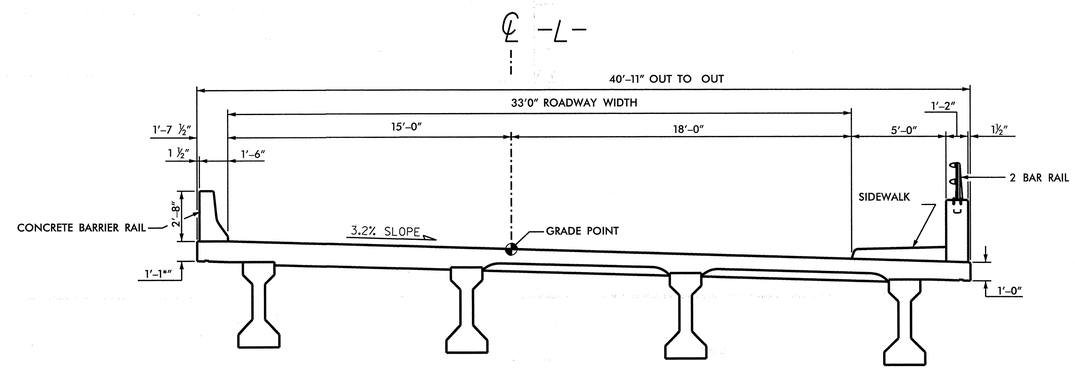
NOTE: UNDERCUT OF TRAIL FOOTPRINT MAY BE REQUIRED AS DIRECTED BY THE ENGINEER. UNDERCUT WIDTH SHALL BE 14 FEET MAXIMUM. PLACE GEOTEXTILE FOR SOIL STABILIZATION AT BASE OF UNDERCUT.





ROADWAY TYPICAL SECTION NO. 2

OVERLAY EXISTING SR 1163 (KELLY ROAD) FROM JUST NORTH OF BEAVER CREEK COMMONS RD. TO -L- STA. 10+00 AND FROM -L- STA. 25+65 TO APEX BARBECUE RD.



BRIDGE TYPICAL SECTION 1

-L- STA. 17+10.00 TO -L- STA. 20+40.00

REVISIONS

8/17/99

2/3/2014
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jlisfrad\wpolas

PROJECT REFERENCE NO.	SHEET NO.
B-4991	2A
R/W SHEET NO.	
ROADWAY DESIGN AND HYDRAULICS ENGINEER	

NORTH CAROLINA PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN S. CRAWFORD
10/8/2013

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Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com
STEWART

20' 0' 20' 40'
10'
(HORIZONTAL)

2' 0' 2' 4'
1'
(VERTICAL)

REVISIONS

8/17/99

-DR1- PC Sta.10+97.54

-DR1- PT Sta.10+76.55

END CONSTRUCTION
-DR1- STA. 10+90.00

BEGIN WALL B
WALL B POT 10+00.00

REMOVE PART OF WALL B
AND ADD COPING

END WALL B
TIE TO EX. WALL
WALL B POT 10+05.00

TIE TO EX. WALL
WALL A POT 10+36.32
S 70° 28' 50.0" W

WALL A PI 10+25.12
N 79° 09' 37.7" W

BEGIN WALL A
WALL A POT 10+00.00

POT Sta. 11+06.10 -DR2-

END CONSTRUCTION
-DR2- STA. 10+90.00

PT Sta. 10+75.17 -DR2-

BEGIN CONSTRUCTION
-DR1- PC 10+11.04 =
-DR2- PC 10+11.04

BEGIN CONSTRUCTION
-DR1- STA. 10+00.00

-DR1- POT Sta.10+00.00

HEDGEROW
EXIST R/W
EIP
S 52°00'00" W
148.32'
12"RCP
15"RCP
TPED
WV
TB
WE
CONC.

290
280

TOP OF WALL
EL = 288.00'
TIE TO EX.WALL

BEGIN WALL A
PI = 10+00.00
EL = 286.03'

PI = 10+08.99
EL = 285.43'

EXISTING WALL

END WALL A
PI = 10+36.32
EL = 283.42'
TIE TO EX.WALL

PI = 10+17.86
EL = 284.73'

PI = 10+26.97
EL = 284.04'

5'

THIS PORTION OF
EXISTING WALL
TO BE REMOVED

TIE TO EX.WALL
END WALL B
PI = 10+05.00
EL = 286.04'

EXIST.WALL

BEGIN WALL B
PI = 10+00.00
EL = 283.54'

RETAINING WALL
ENVELOPES

10

10/8/2013
...\proj\b4991_rdy_psh_02A.dgn
USER:mburns

GRADING PLAN

PROJECT REFERENCE NO.	SHEET NO.
B-4991	2B
R/W SHEET NO.	

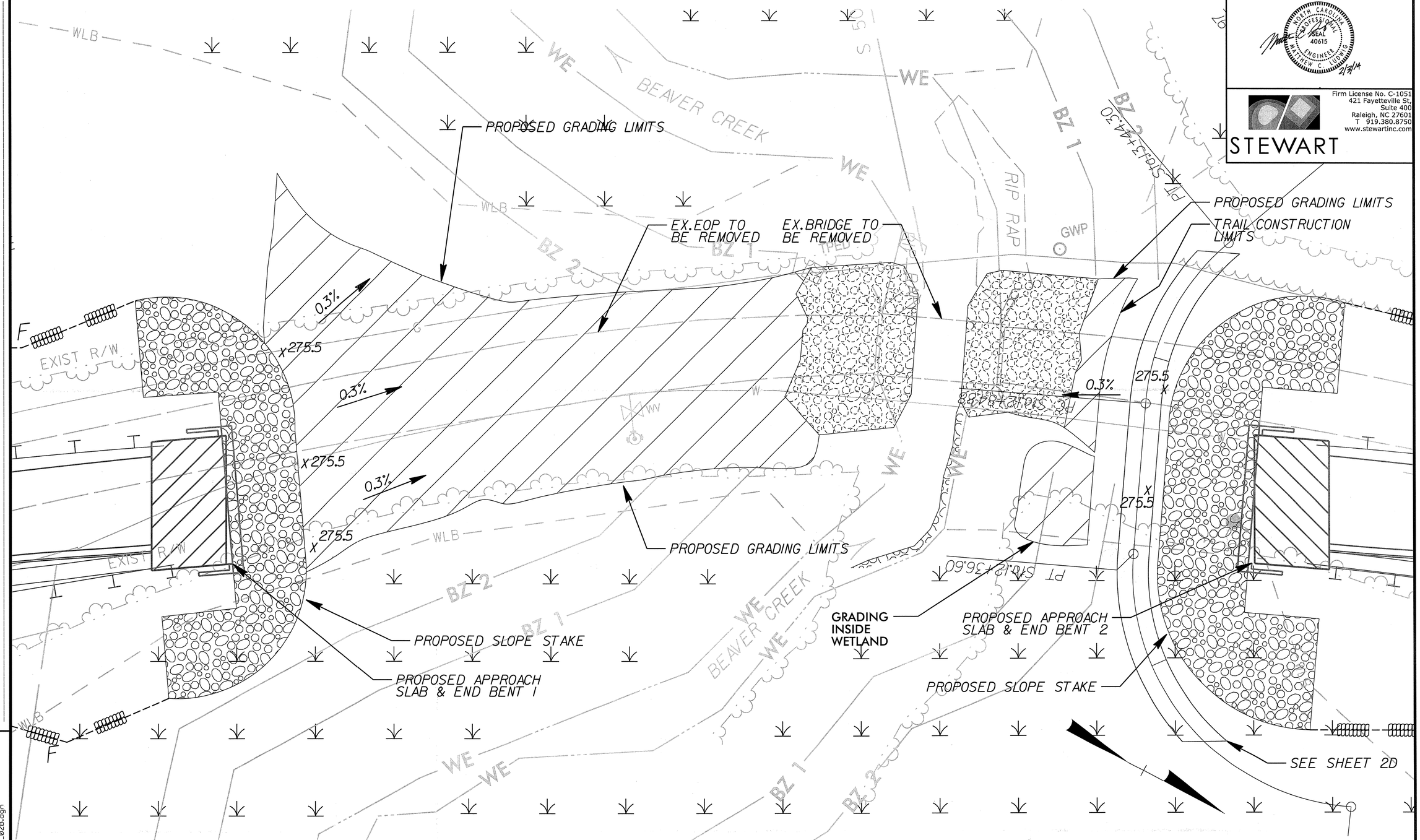
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 40615 ENGINEER MATTHEW C. LUENIG

2/3/14

Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

STEWART



NOTE:

- CONTRACTOR TO GRADE AT 0.3% GRADE TO ELEVATION 275.

REVISIONS

8/17/99

2/3/2014
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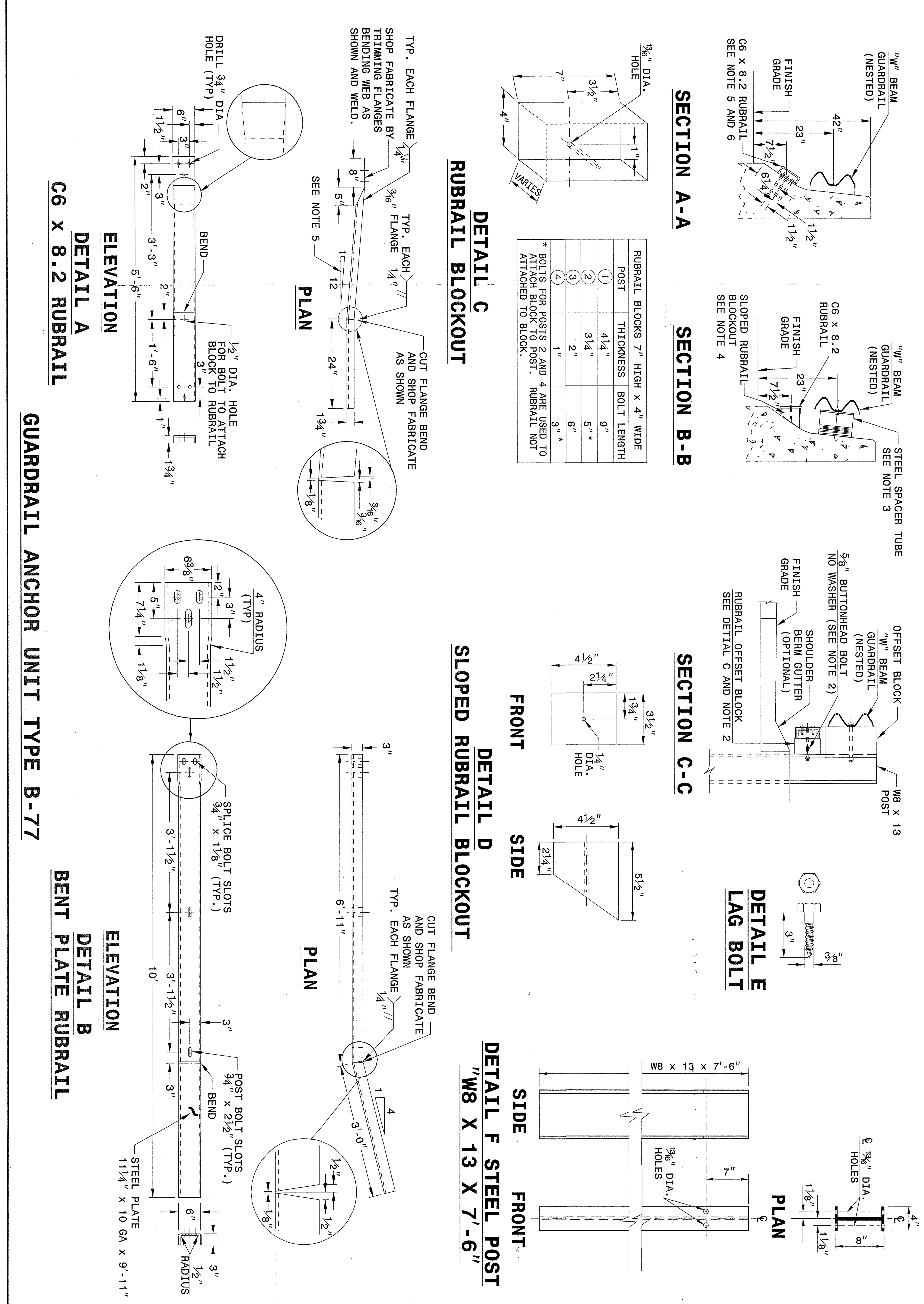
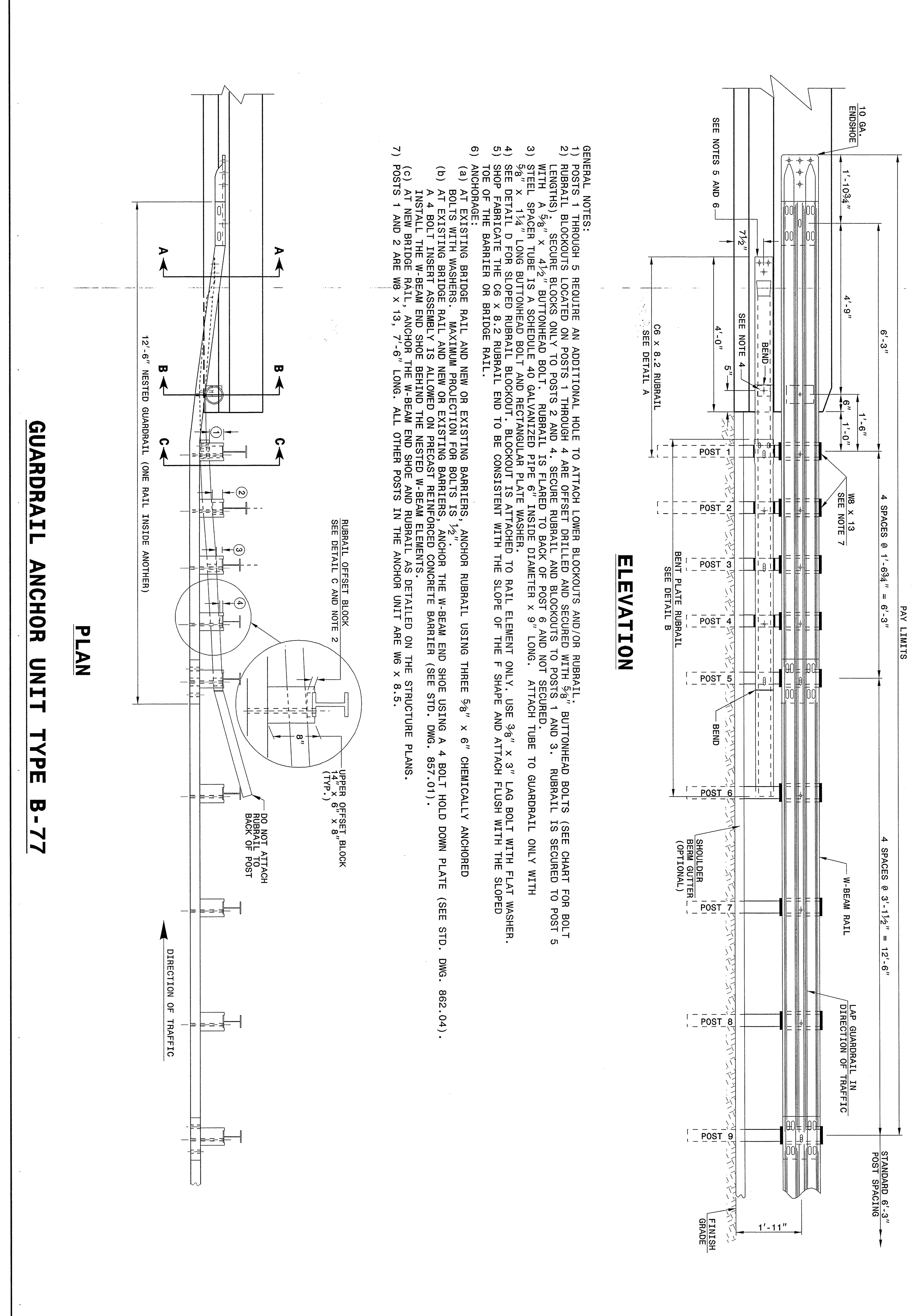
PROJECT REFERENCE NO.	SHEET NO.
B-4991	2-C



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

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

SHEET 5 OF 7
862D03



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

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

SHEET 4 OF 7
862D03

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.:

PROJECT REFERENCE NO.	SHEET NO.
B-4991	2D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 40615 ENGINEER MATTHEW C. LUDWIG 2/3/14

Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com
STEWART

20' 0' 20' 40'
10'
(HORIZONTAL)

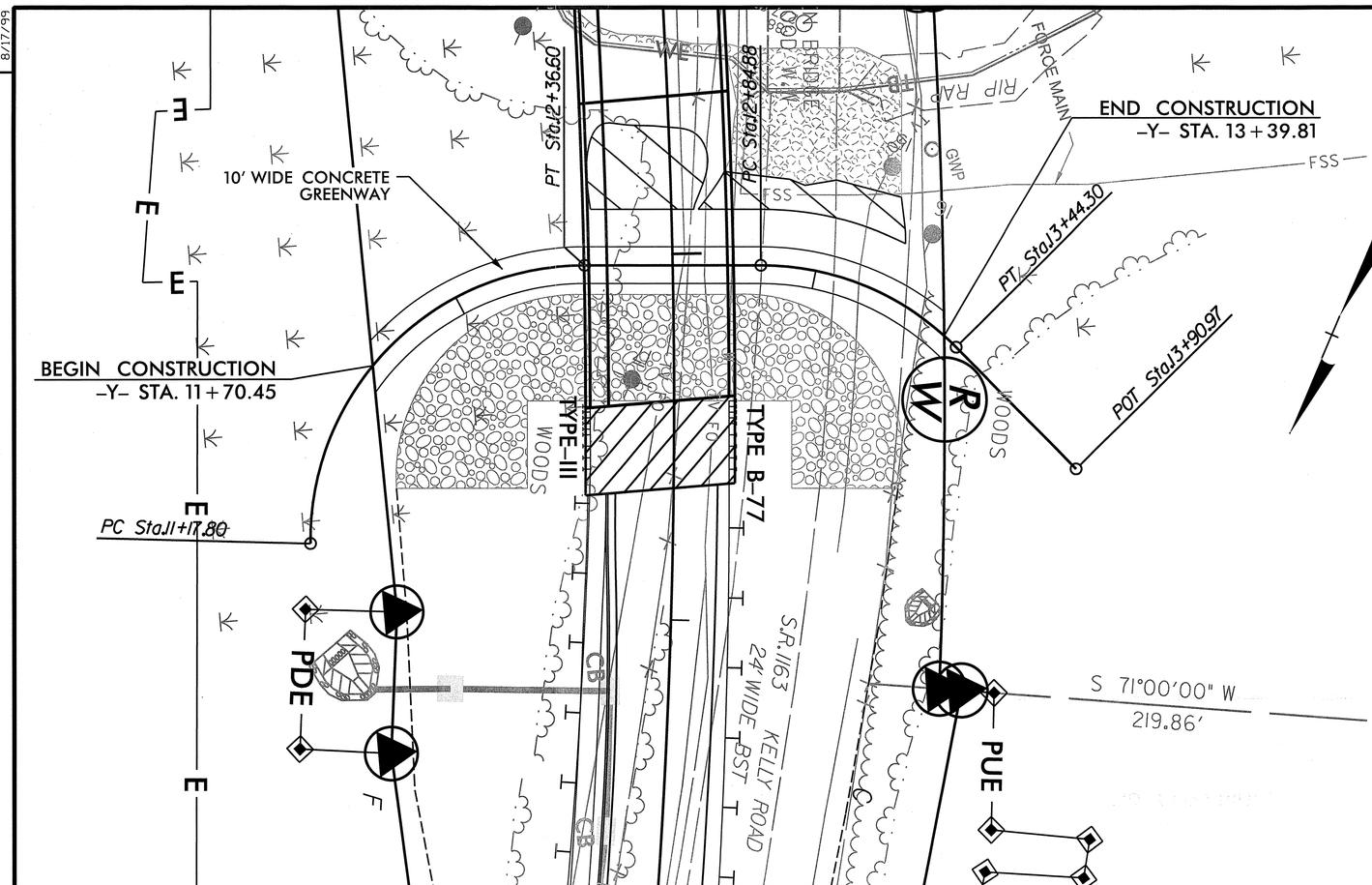
4' 0' 4' 8'
2'
(VERTICAL)

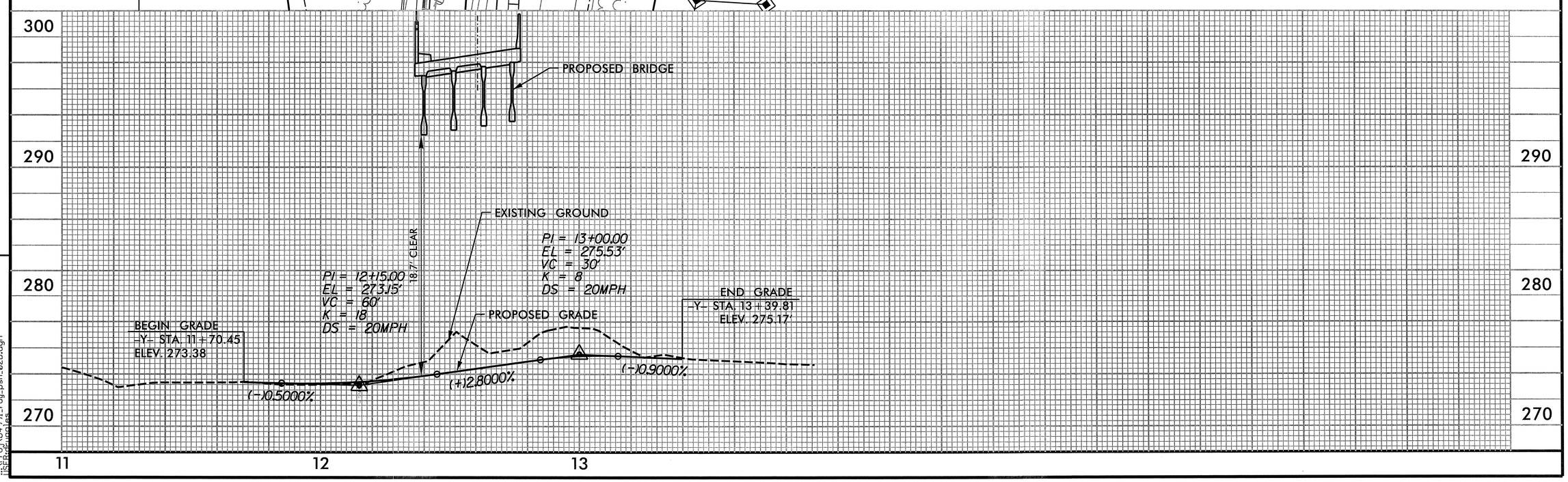
REVISIONS

8/17/99

-Y- CURVE DATA

PI STA.11+93.80	PI STA.13+16.25
Δ = 90° 45' 23.8" (RT)	Δ = 45° 23' 34.1" (RT)
D = 76° 23' 39.7"	D = 76° 23' 39.7"
L = 118.80'	L = 59.42'
T = 76.00'	T = 31.37'
R = 75.00'	R = 75.00'





2/3/2014
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jlsFRidgeyoples

COMPUTED BY: JCH DATE: 2/25/2013
CHECKED BY: BRC DATE: 2/25/2013

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4991	3A

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- Sta. 10+00	-L- Sta. 17+10	910	17,666	16,756	
-DR1- Sta. 10+00	-DR1- Sta. 10+90	86			86
-DR2- Sta. 10+25	-DR2- Sta. 10+90	54			54
SUBTOTAL:		1,050	17,666	16,756	140
-L- Sta. 20+40	-L- Sta. 25+65	284	13,804	13,520	
SUBTOTAL:		284	13,804	13,520	
-L- Sta. 17+25	-L- Sta. 19+10	747			747
-L- Sta. 19+65	-L- Sta. 20+10	110			110
SUBTOTAL:		857			857
TOTAL:		2,191	31,470	30,276	997
MATERIAL FOR SHOULDER CONSTRUCTION			312	312	
LOSS DUE TO CLEARING AND GRUBBING		-70		70	
WASTE IN LIEU OF BORROW				-997	-997
TOTAL:		2,121	31,782	29,661	0
EST 5% TO REPLACE TOP SOIL ON BORROW PIT				1,483	
GRAND TOTAL:		2,121	31,782	31,144	0
SAY:		2,150		31,200	

UNDERDRAINS (CONTINGENCY) = 100 LF

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

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	10+00.00	19+17.00	CL	2,877
-L-	19+57.00	25+65.00	CL	1,655
			TOTAL:	4,532
			SAY:	4,540

RIGHT-OF-WAY DATA

Parcel No.	Property Owner	Deed Book and Page	Total Acreage*	Previous Takings	Prop. R/W (SF)	PDE (SF)	PUE (SF)	TCE (SF)
1Y	Michael R. Stancill and wife, Cindy A. Stancill	DB 07237 PG 0446	7.39	PUE - 3167.47 SF (DB013698 PG 0648-00650) TCE - 3993.22 SF (DB013480 PG 01810-01812)	33787.72		14567.27	3260.18
2Z	Alice Y. Carrier and husband, Scott R. Carrier	DB 10518 PG 1197	0.25	PDE - 958.74 SF (DB013781 PG 01284-01286)	1322.78			
3Z	Billy J. Bishnow and wife, Mary Jan Bishnow	DB 12962 PG 0916	0.25	PDE - 1098.41 SF (DB013532 PG 01260-01262)	1324.01			
4Z	Jason T. Bledsoe and wife, Summer D. Bledsoe	DB 13314 PG 2338	0.26	PDE - 1088.54 SF (DB013744 PG 01582-01584)	1452.77			
5Z	Bryan T. Stines	DB 12887 PG 2688	0.44	PDE - 2229.05 SF (DB013480 PG 01807-01809)	4088.25			516.98
6	Town of Apex	DB 06143 PG 0226	0.44		4900.65			4117.55
6A	Town of Apex	DB 11880 PG 1794	6.4		2136.31			2126.54
6B	Town of Apex	DB 07056 PG 0571	23		49040.55	1384.67		26849.99
6C	Town of Apex	DB 07575 PG 0395	2.24		2779.26			1781.47
6D	Town of Apex	DB 06802 PG 0289	2.16					7538.9
7	A. Clifford Altobellis, Jr. and wife, Nancy O. Altobellis	DB 10631 PG 2697	0.27		1487.31			
8	Horace Johnson and wife, Irma J. johnson	DB 02950 PG 0365 DB 02950 PG 0361	15.8		7483.42		7604.05	

* From Wake County Imaps

Note: The Proposed R/W, PDE, PUE, and TCE are total areas and include the previous takings.

SUB-REGIONAL & REGIONAL LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

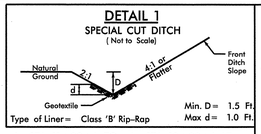
| STATION | LOCATION (LT,RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | C.S. PIPE 12" | 15" | 18" | 24" | 36" | 42" | 48" | R.C. PIPE (CLASS III) 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE (CLASS IV) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | *** R.C. PIPE (CLASS V) | *** R.C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE | *** R.C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) R.C.P. | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') PER EACH (0' THRU 5.0') | LIN. *FT. A 5.0' THRU 10.0' | LIN. *FT. B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION CATCH BASIN | DROP INLET | CONC. BRIDGE APPROACH D.I. STD. 840.13 | D.I. FRAME & GRATE STD. 840.16 | J.B. STD. 840.31 OR 840.32 | M.H. FRAME & COVER STD. 840.54 | PIPE REMOVAL LIN.FT. | CS PIPE ELBOWS | REMARKS |
|---|---|---|---|---|---|---|---|---

8/17/99

REVISIONS

-L- CURVE DATA	-DR1- CURVE DATA	-DR2- CURVE DATA
PI Sta 19+45.85	PI STA.10+45.76	PI Sta 10+44.04
Δ = 28° 26' 43.4" (RT)	Δ = 46° 55' 03.9" (LT)	Δ = 33° 23' 56.9" (RT)
D = 2° 53' 42.7"	D = 71° 37' 11.0"	D = 52° 05' 13.5"
L = 982.51'	L = 65.51'	L = 64.12'
T = 501.60'	T = 34.72'	T = 33.00'
R = 1,979.00'	R = 80.00'	R = 110.00'
SE = .032	= N 62° 41' 57.9" W	= N 62° 41' 57.9" W
RUNOFF = 115.20'	= S 70° 22' 58.2" W	= N 30° 20' 04.8" W

DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)

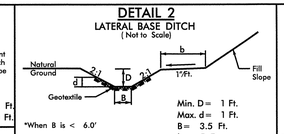


Min. D = 1.5 Ft.
Max. d = 1.0 Ft.

Type of Liner= Class 'B' Rip-Rap

-L- STA. 11+00+/- TO -L- STA. 13+00+/- LT

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)



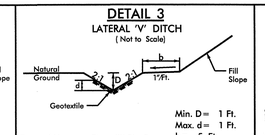
Min. D= 1 Ft.
Max. d= 1 Ft.
B= 3.5 Ft.
b= 5 Ft.

*When B is < 6.0'

Type of Liner= Class 'II' Rip-Rap

-L- STA. 13+00+/- TO -L- STA. 15+25+/- LT

DETAIL 3
LATERAL 'V' DITCH
(Not to Scale)

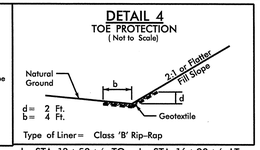


Min. D= 1 Ft.
Max. d= 1 Ft.
Max. b= 1 Ft.
b= 5 Ft.

Type of Liner= Class 'II' Rip-Rap

-L- STA. 21+00+/- TO -L- STA. 24+00+/- LT

DETAIL 4
TOE PROTECTION
(Not to Scale)

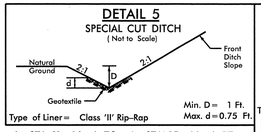


d= 2 Ft.
b= 4 Ft.

Type of Liner= Class 'B' Rip-Rap

-L- STA. 13+50+/- TO -L- STA. 16+90+/- LT
-L- STA. 20+80+/- TO -L- STA. 23+50+/- LT
-L- STA. 15+00+/- TO -L- STA. 16+85+/- RT
-L- STA. 20+70+/- TO -L- STA. 23+00+/- RT

DETAIL 5
SPECIAL CUT DITCH
(Not to Scale)

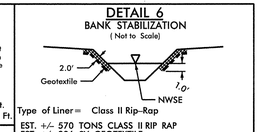


Min. D= 1 Ft.
Max. d= 0.75 Ft.

Type of Liner= Class 'II' Rip-Rap

-L- STA. 11+00+/- TO -L- STA. 15+00+/- RT

DETAIL 6
BANK STABILIZATION
(Not to Scale)



Type of Liner= Class II Rip-Rap
EST. +/- 570 TONS CLASS II RIP RAP
EST. +/- 396 SY GEOTEXTILE

Note: Remove All Portions of Timber Abutment.

DETAIL 7
RIP-RAPPED ENERGY DISSIPATOR BASIN

DIM. (ft)	RIP RAP BASIN 1	2	3
A	1.0'	1.0'	1.0'
B	1.0'	1.0'	1.0'
C	1.5	1.5'	1.5'
D	1.5'	1.0'	1.0'
E	6.5'	2.0'	2.0'
F	16.0'	8.0'	8.0'
G	13.5'	6.0'	6.0'

ALL DIMENSIONS APPROXIMATE
CLASS II RIP RAP ONLY

PLAN

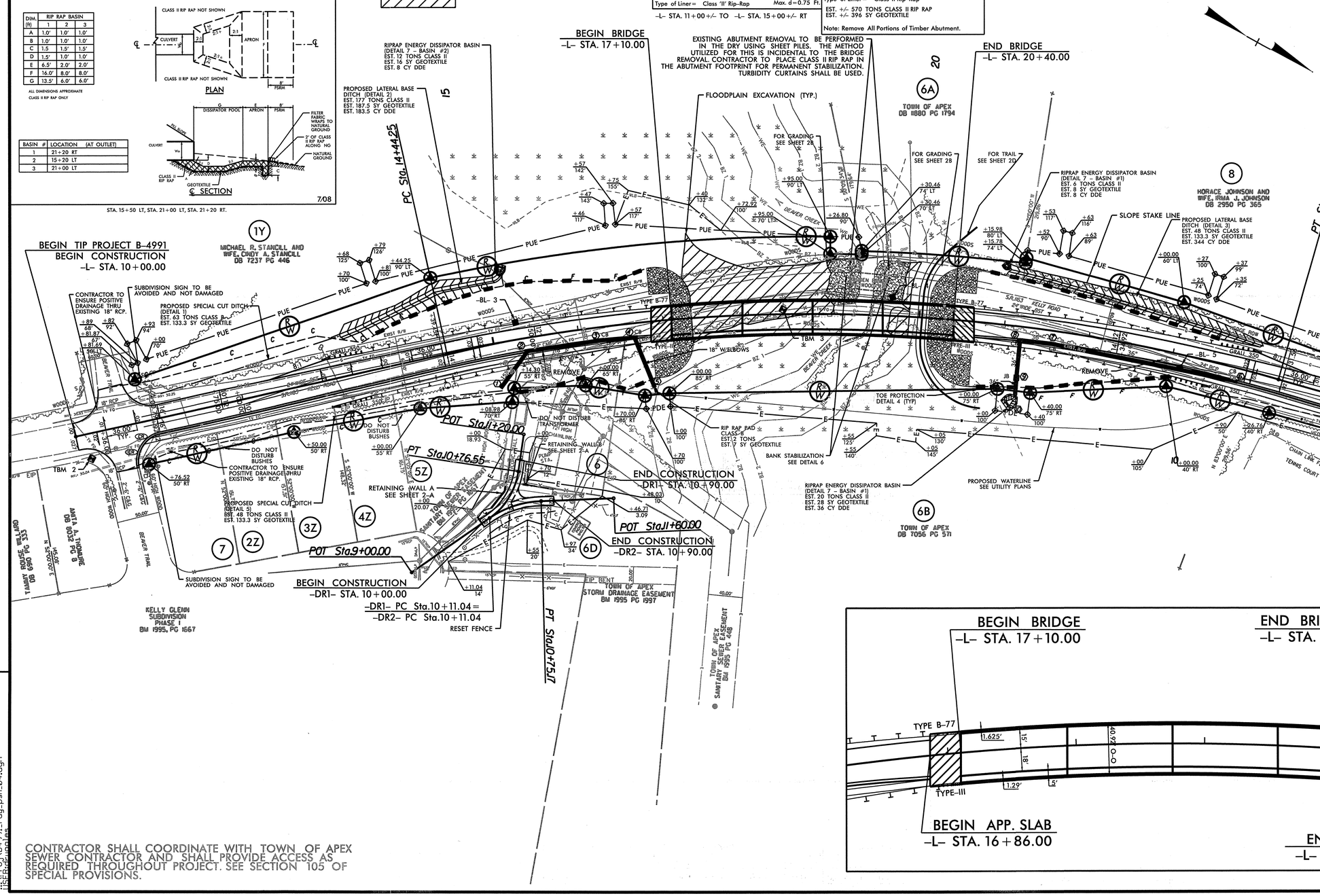
℄ SECTION

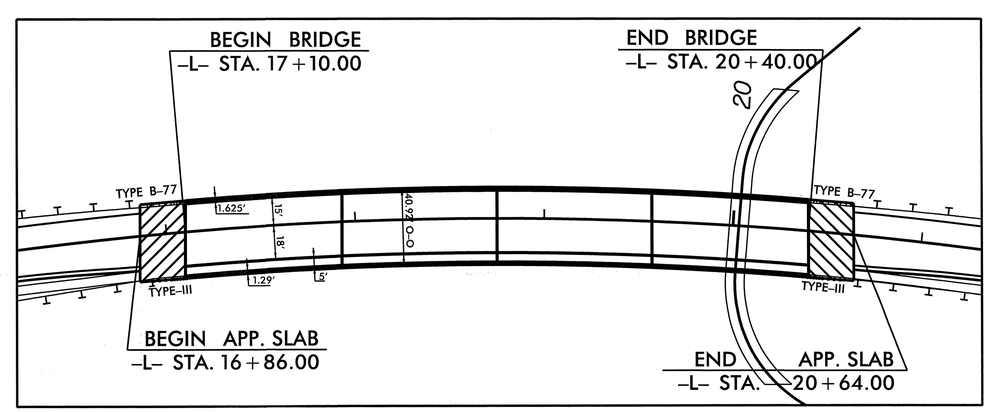
BASIN #	LOCATION (AT OUTLET)
1	21+20 RT
2	15+20 LT
3	21+00 LT

7/08

STA. 15+50 LT, STA. 21+00 LT, STA. 21+20 RT.

FLOODPLAIN EXCAVATION





CONTRACTOR SHALL COORDINATE WITH TOWN OF APEX SEWER CONTRACTOR AND SHALL PROVIDE ACCESS AS REQUIRED THROUGHOUT PROJECT. SEE SECTION 105 OF SPECIAL PROVISIONS.

2/3/2014
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jiserpa, jnoales

PROJECT REFERENCE NO.	SHEET NO.
B-4991	4
R/W SHEET NO.	

ROADWAY DESIGN AND HYDRAULICS ENGINEER

SEAL 32606
ENGINEER BENJAMIN CRAWFORD
2/3/14

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Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com
STEWART

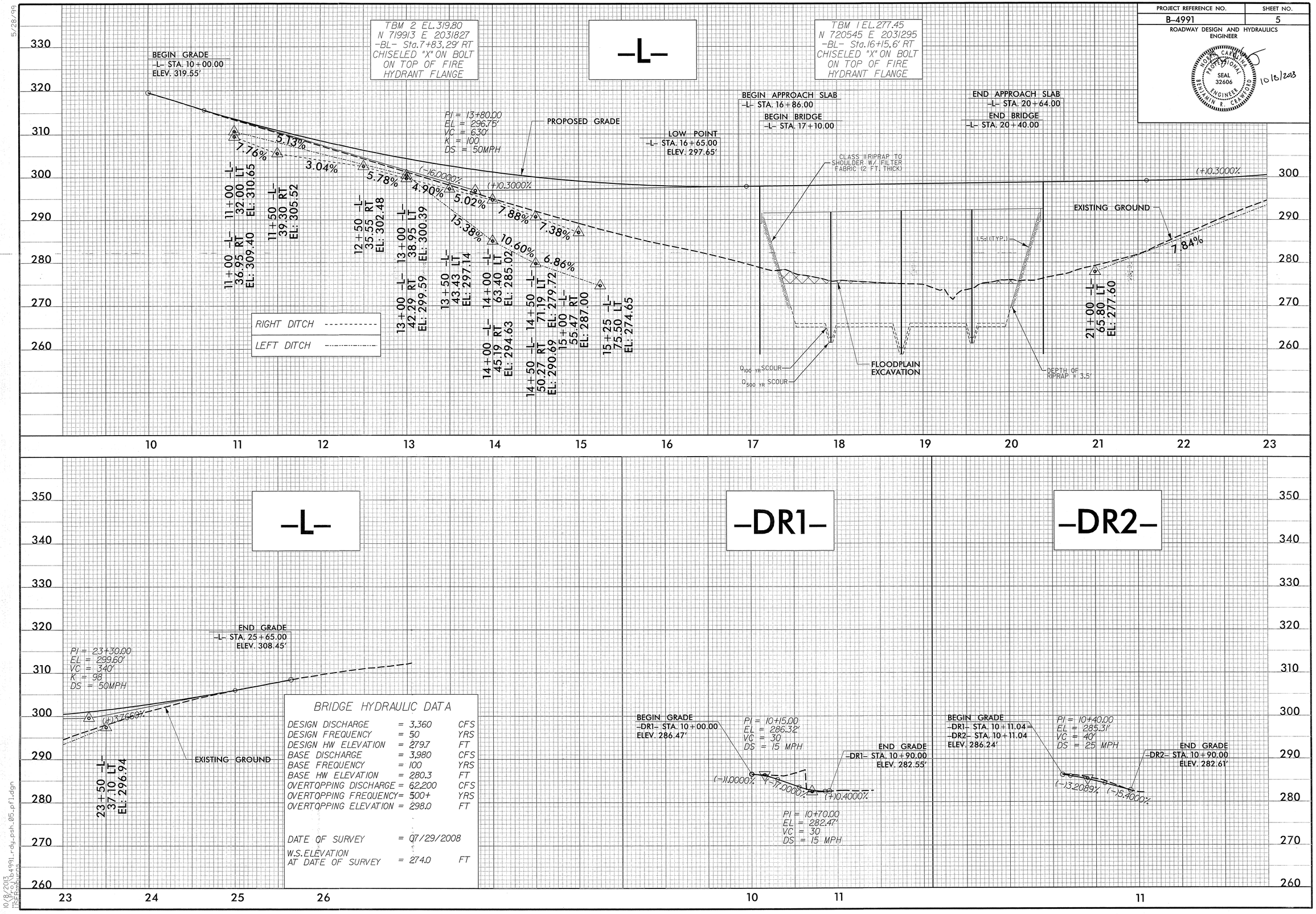
SEE SHEET 5 FOR PROFILES
SEE 'S' SERIES PLANS FOR STRUCTURE PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-4991	5

ROADWAY DESIGN AND HYDRAULICS ENGINEER

ROBERT CARTWRIGHT PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN R. CRAWFORD

10/16/2013



5/28/99

10/8/2013
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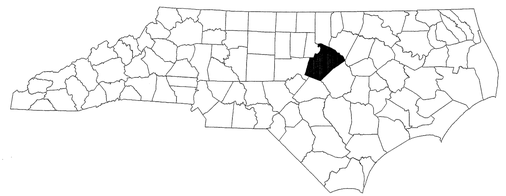
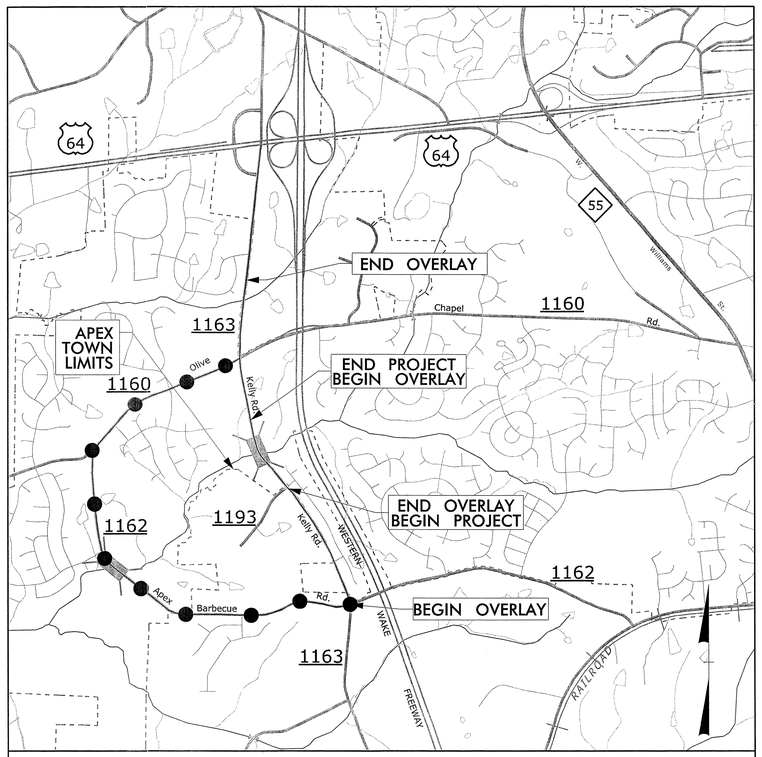
jstephenson

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY





VICINITY MAP

Not To Scale

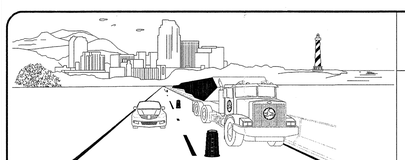
INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (GENERAL NOTES, MANAGEMENT STRATEGIES, AND PHASING)
TMP-2	OFF-SITE DETOUR
TMP-3	SPECIAL SIGN DESIGN

SHEET NO.
TMP-1

B-4991

TIP PROJECT:



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

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
JOSEPH ISHAK, P.E. — TRAFFIC CONTROL PROJECT ENGINEER
MIKE STEELMAN — TRAFFIC CONTROL PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

APPROVED: David Ruggles
DATE: 10-09-13

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

10/9/2013
B-4991_TC_TCP_01_tsh.dgn
USER:mburns

PROJ. REFERENCE NO.	SHEET NO.
B-4991	TMP-1A

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 JANAUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1180.01	SKINNY - DRUM

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL
- USER DEFINED (IF NEEDED)
- USER DEFINED (IF NEEDED)

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM — SKINNY DRUM — TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY (TEMP)

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

APPROVED: David Rugglis DATE: 10-09-13

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

10/9/2013
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USER:mburns

PROJ. REFERENCE NO.	SHEET NO.
B-4991	TMP-1B

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.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS	
KELLY ROAD	MONDAY - FRIDAY	7:00AM TO 9:00AM
KELLY ROAD	MONDAY - FRIDAY	4:00PM TO 6:00PM

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) 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.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

E) 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.

F) 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

G) 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.

H) 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) 500 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

I) NOTIFY THE ENGINEER SIXTY (60) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

J) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRANSPORTATION MANAGEMENT PLANS.

K) PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRANSPORTATION MANAGEMENT PLANS.

L) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

M) COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

N) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

P) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

MANAGEMENT STRATEGIES

- COORDINATE WITH THE ENGINEER TO CONTACT OLIVE CHAPEL ELEMENTARY SCHOOL AND KEEP THEM INFORMED OF CONSTRUCTION SCHEDULE. AVOID OVERLAY ACTIVITIES DURING SCHOOL EVENTS.
- COORDINATE WITH THE ENGINEER TO CONTACT LOCAL MEDIA, NEWS MEDIA, LOCAL GOVERNEMENT, AND EMERGENCY SERVICE PROVIDERS TO INFORM THEM OF CONSTRUCTION SCHEDULE.
- MAINTAIN ACCESS TO EXISTING DRIVEWAYS DURING CONSTRUCTION UNLESS ANOTHER OUTLET IS PROVIDED AS PROVIDED IN THESE PLANS OR AS DIRECTED BY THE ENGINEER.

PHASING

PHASE I

STEP 1 INSTALL CHANGEABLE MESSAGE SIGNS FOURTEEN (14) DAYS IN ADVANCE OF SR 1163 (KELLY RD.) CLOSURE AS SHOWN ON SHEET TMP-2.

STEP 2 INSTALL DETOUR AND ROAD CLOSURE SIGNING AND DEVICES AS SHOWN ON SHEET TMP-2 AND IN ACCORDANCE WITH ROADWAY STANDARD DRAWING 1101.03 SHEET 1 OF 9. CLOSE SR 1163 (KELLY RD.) AND DETOUR TRAFFIC TO THE OFFSITE DETOUR. MAINTAIN ACCESS TO TOWN OF APEX PUMP STATION. REMOVE CMSs UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEP 3 -RESET FENCE ADJACENT TO DR1 AND DR2. AWAY FROM TRAFFIC, CONSTRUCT RETAINING WALLS AND -DR1- AND -DR2- TO PROVIDE NEW ACCESS FOR THE TOWN OF APEX TO THE PUMP STATION. THIS WORK SHALL NOT INTERFERE WITH THE TOWN OF APEX PUMPHOUSE OPERATIONS.
-INSTALL WATERLINE FROM KELLY GLEN DRIVE TO THE PUMP STATION. THIS WORK MUST BE COMPLETED BEFORE BEGINNING WATERLINE RELOCATION ALONG SR 1163 (KELLY RD.).
-PERFORM THE FOLLOWING WORK WITHIN THE ROAD CLOSURE:

-INSTALL WATER AND SEWER UTILITY RELOCATIONS AND ENCASEMENT PIPE.
-CONSTRUCT APPROACH FILLS AND PROPOSED STRUCTURE.
-REMOVE THE EXISTING STRUCTURE.
-CONSTRUCT THE PROPOSED ROADWAY SECTION -L- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE FROM STATION 10+00 TO STATION 25+65.

STEP 4 WORKING WITHIN THE ROAD CLOSURE, PLACE THE FINAL LAYER OF SURFACE COURSE FROM -L- STA. 10+00 TO -L- STA. 25+65. USING LANE CLOSURES, AS NEEDED, PLACE THE ASPHALT OVERLAY FROM APEX BARBECUE RD. TO -L- STA. 10+00 AND FROM -L- STA. 26+65 TO US 64. USING LANE CLOSURES, AS NEEDED, PLACE FINAL PAVEMENT MARKINGS AND MARKERS ON SR 1163 (KELLY RD.) FROM APEX BARBECUE RD. TO US 64.

STEP 5 REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES AND OPEN SR 1163 (KELLY RD.) TO THROUGH TRAFFIC.

APPROVED: David Ruggles DATE: 10-09-13

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

10/9/2013
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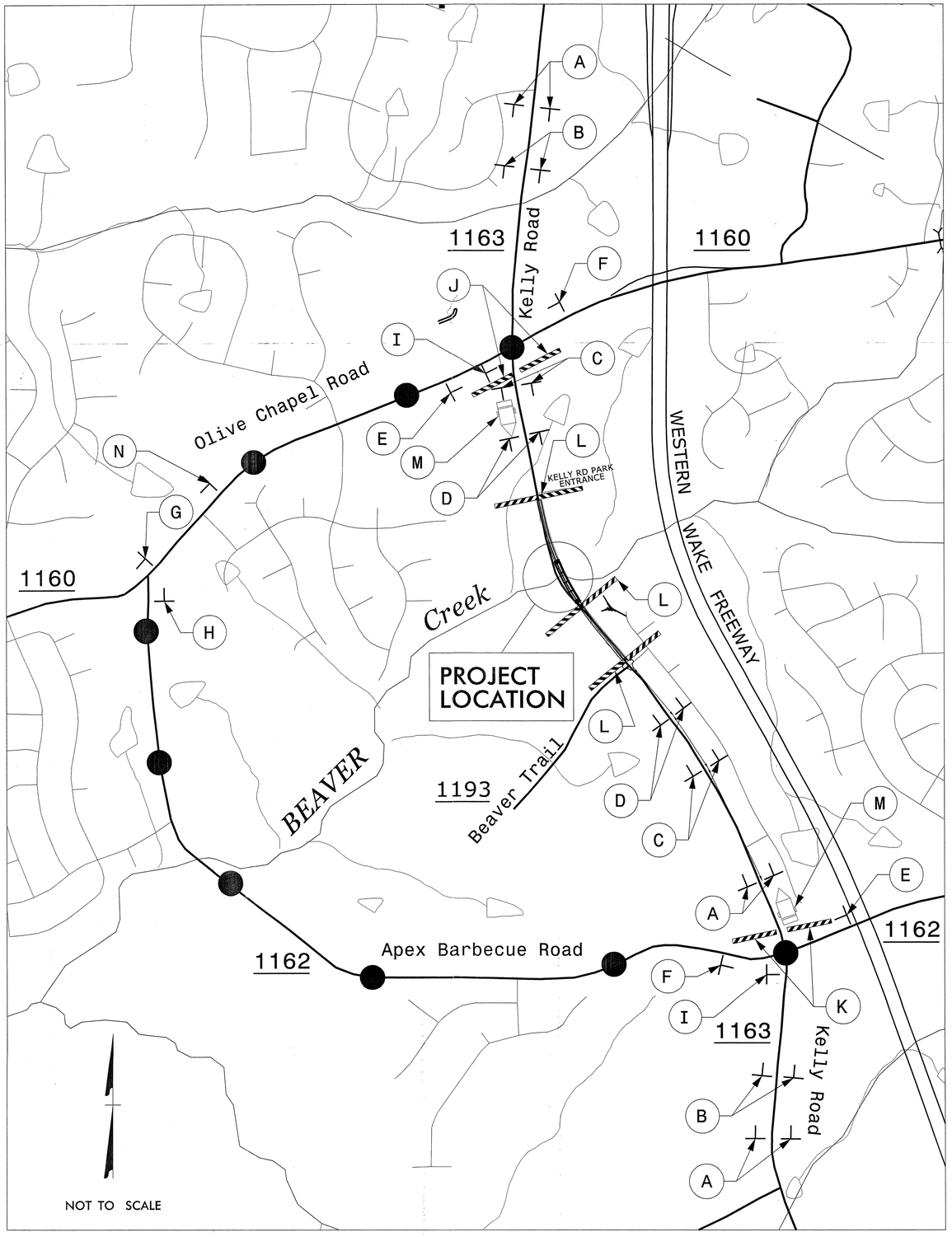
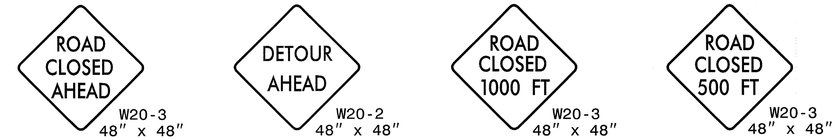
USER:mburns

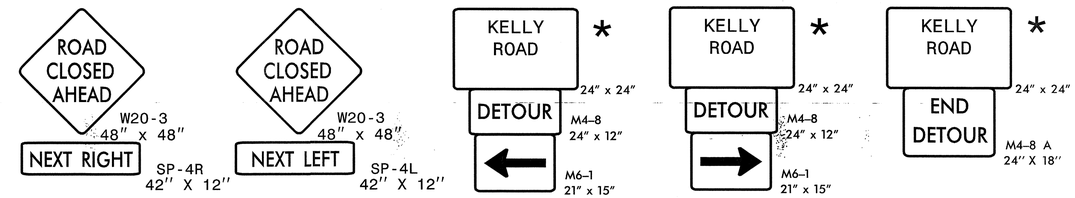
PROJ. REFERENCE NO.	SHEET NO.
B-4991	TMP-2



DETOUR ROUTE

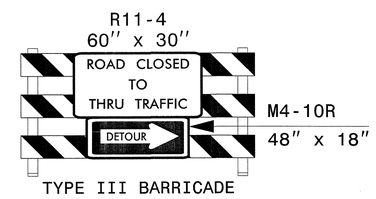


A B C D



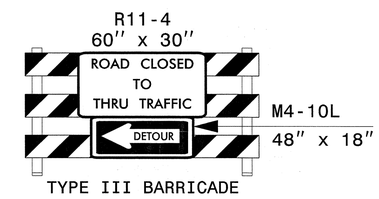
E F G H I

* SEE SHEET TMP-3 FOR SIGN DESIGN



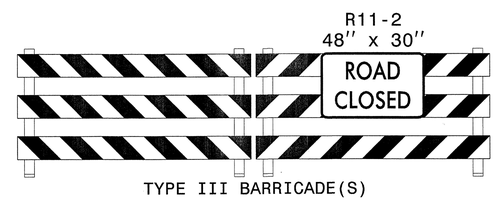
TYPE III BARRICADE

J



TYPE III BARRICADE

K



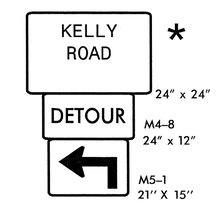
TYPE III BARRICADE(S)

L

MESSAGE NO. 1	MESSAGE NO. 2
KELLY RD WILL BE CLOSED	STARTING XX-XX-XX

CHANGEABLE MESSAGE SIGN

M

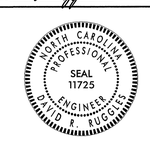


N

NOTE:
SEE ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR SIGN SPACING

APPROVED: David Ruggles DATE: 10-09-13

SEAL



OFFSITE DETOUR FOR SR 1163 (KELLY RD.)

10/9/2013
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USER:mbourns

PROJ. REFERENCE NO.	SHEET NO.
B-4991	TMP-3

SIGN NUMBER: ___
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 2'-0"
HEIGHT: 2'-0"
TOTAL AREA: 4.0 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.5"
WIDTH: 0.5"
RADII: 3"

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

DESIGN BY: J HEFNER
PROJECT ID: B-4991

CHECKED BY:
DIV: 5

DATE: Sep 04, 2012

USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluoresent orange retroreflective sheeting.

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

						Series/Size Text Length
	K	E	L	L	Y	C 2000
	3.8	7.5	10.9	14.1	17	16.4
	R	O	A	D		C 2000
	5.1	8.7	12.2	16.1		13.8

FILENAME: B-4991_SIGN_SD_01

NORTH CAROLINA D.O.T. SIGN DETAIL

APPROVED: David Ruggles DATE: 10-09-13

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

SPECIAL SIGN DESIGN
KELLY ROAD

10/9/2013
B-4991_TC_TCP_03_SIGN.dgn
USERmburns

T.I.P.: B-4991

CONTRACT: C202573

TIP NO.	SHEET NO.
B-4991	PMP-1

APPROVED: Neil J. Dean

DATE: 23 DEC 2013

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026453 ENGINEER NEIL J. DEAN

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
WAKE COUNTY

LOCATION: BRIDGE NO. 359 OVER BEAVER CREEK ON SR 1163 (KELLY ROAD)

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR 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:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS - TEMPORARY AND PERMANENT
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	COLD APPLIED PLASTIC (4")
CA	WHITE EDGELINE
CI	YELLOW DOUBLE CENTER
	THERMOPLASTIC (24", 120 MILS)
T2	WHITE STOPBAR
	THERMOPLASTIC (4", 90 MILS)
TA	WHITE EDGELINE
	THERMOPLASTIC (4", 120 MILS)
TI	YELLOW DOUBLE CENTER
TD	3 FT-9 FT/SP. WHITE MINISKIP
	THERMOPLASTIC (6", 120 MILS)
TL	WHITE SOLID LANELINE
	THERMOPLASTIC (8", 90 MILS)
TT	YELLOW DIAGONAL

THE FOLLOWING ADDITIONAL PAVEMENT MARKINGS ARE USED IN THE RESURFACING PORTION OF THE PROJECT, BUT ARE NOT DEPICTED IN THE PLANS

	THERMOPLASTIC SYMBOL (90 MILS)
UA	LEFT TURN ARROW
UB	RIGHT TURN ARROW
UC	STRAIGHT ARROW
UE	COMBO RIGHT/STRAIGHT ARROW
UI	ALPHANUMERIC CHARACTER

GENERAL NOTES

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.

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

ROAD NAME	MARKING	MARKER
ALL	THERMOPLASTIC	RAISED
BRIDGE	COLD APPLIED PLASTIC	RAISED

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) STOP BAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

F) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON CONCRETE BRIDGE DECKS PRIOR TO PLACING (COLD APPLIED PLASTIC) PAVEMENT MARKING MATERIAL.

G) TYPE III COLD APPLIED PLASTIC MAY BE USED IN LIEU OF TYPE II COLD APPLIED PLASTIC. IF TYPE III COLD APPLIED PLASTIC IS USED, IT SHALL BE PAID FOR USING THE TYPE II COLD APPLIED PLASTIC PAY ITEM.

PLAN PREPARED BY: STEWART

BENJAMIN CRAWFORD, PE — PROJECT ENGINEER

MICHAEL BURNS, EI — PROJECT DESIGN ENGINEER

STEWART — Firm License No. C-1051, 421 Fayetteville St., Suite 400, Raleigh, NC 27601, T 919.380.8750, www.stewartinc.com

PLAN REVIEWED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

SUSAN B. KUNZ — SIGNING & DELINEATION REGIONAL ENGINEER

SAMUEL COLEMAN — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL UNIT

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND MARKING SCHEDULE SHEET
PMP-2	PAVEMENT MARKING DETAIL

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TIP NO.	SHEET NO.
B-4991	PMP-2

APPROVED:

DATE:

SEAL:

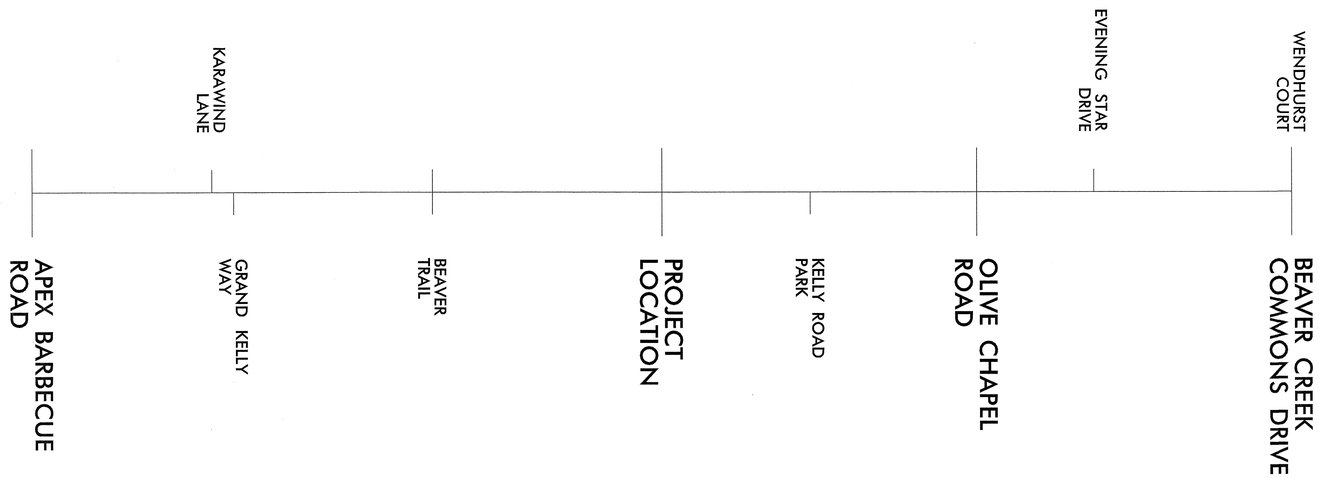
NORTH CAROLINA PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN R. CRAWFORD

10/7/13

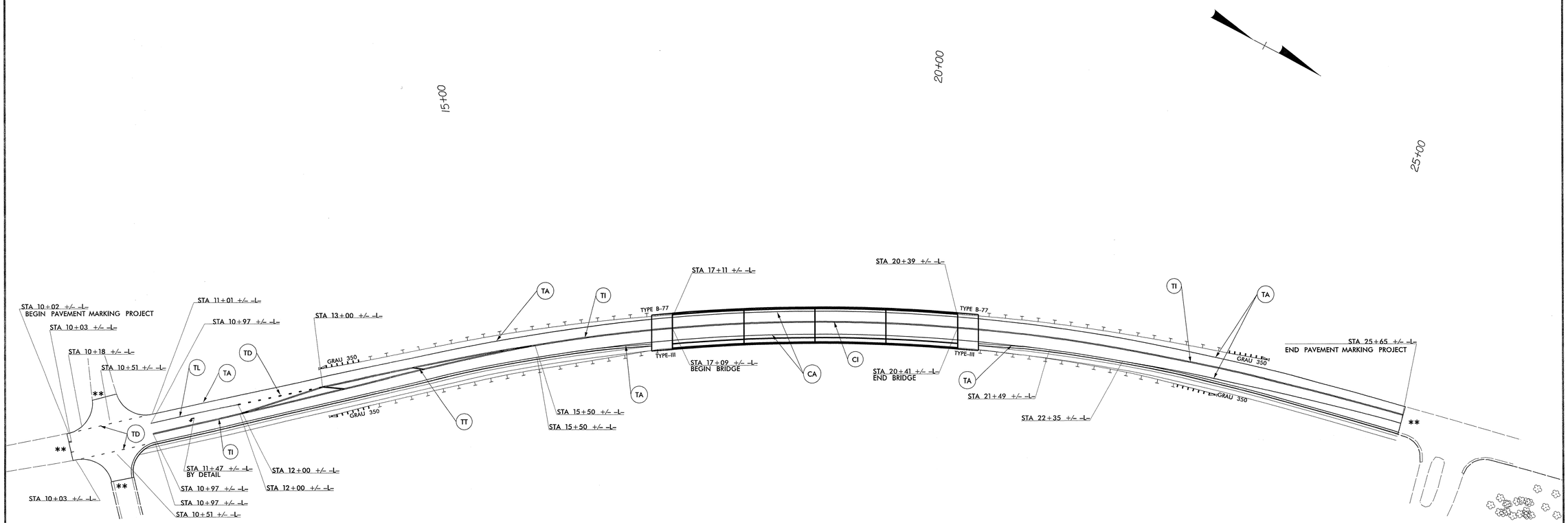
PROJECT NOTES

** TIE TO EXISTING MARKINGS. REPLACE EXISTING MARKINGS FROM BEAVER CREEK COMMONS TO STA. 10+00.00 AND FROM STA. 25+65.00 TO APEX BARBEQUE ROAD.

KELLY RD – FROM BEAVER CREEK COMMONS DR. TO STA 10+00 AND FROM STA 25+65 TO APEX BARBECUE RD. REVIEW AND RECORD THE EXISTING PAVEMENT MARKINGS AND MARKERS PRIOR TO MILLING AND RESURFACING. USE THE RECORD OF EXISTING PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH THE ROADWAY STANDARD DRAWINGS TO RE-ESTABLISH THE PROPOSED PAVEMENT MARKINGS AND MARKERS. THE CONTRACTOR SHALL SUBMIT A PAVEMENT MARKING PLAN TO THE ENGINEER FOR APPROVAL 7 CALENDAR DAYS BEFORE THE OBLITERATION OF ANY PAVEMENT MARKINGS



SKETCH SHOWING OVERLAY LIMITS



PAVEMENT MARKING DETAIL
KELLY RD (SR 1163)

10/9/2013
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USER:mburns

TIP PROJECT: B-4991

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4991	EC-1	5

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

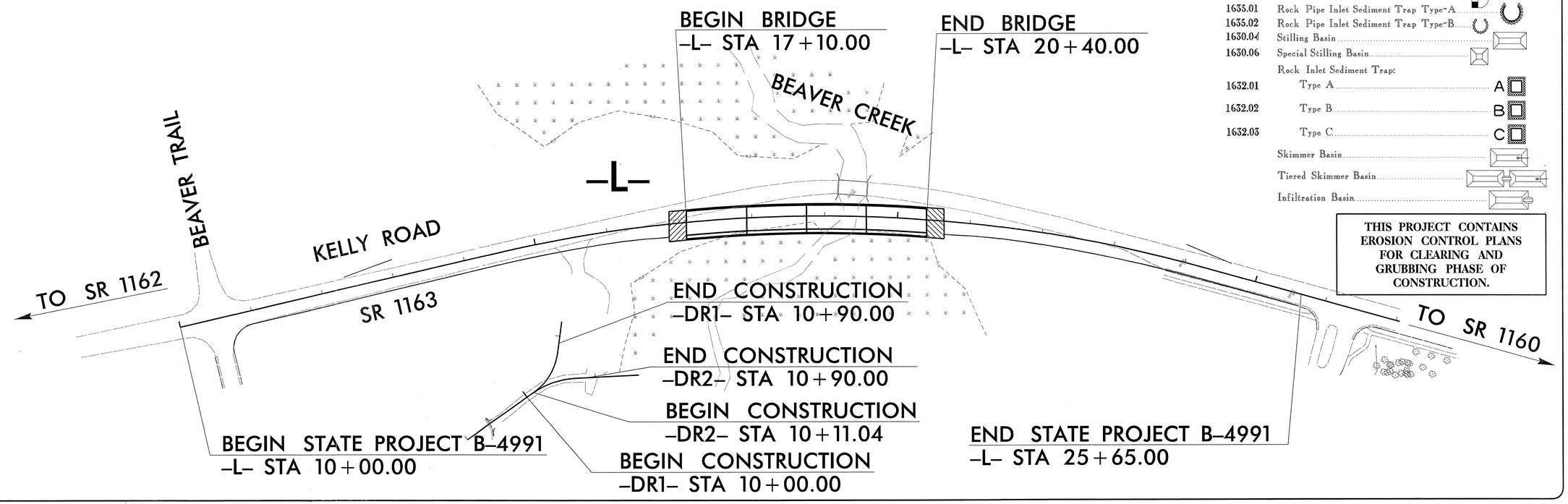
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WAKE COUNTY

LOCATION: BRIDGE NO. 359 OVER BEAVER CREEK ON SR 1163 (KELLY ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, AND RESURFACING



THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle/ Coir Fiber Wattle	
	Wattle/ Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

GRAPHIC SCALE

30 0 60
PLANS

30 0 60
PROFILE (HORIZONTAL)

2.5 0 5
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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.

Prepared In the Office of:

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com
PROJECT #:B11001

2012 STANDARD SPECIFICATIONS

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1605.01 Temporary Silt Fence
1606.01 Special Sediment Control Fence
1631.01 Matting Installation
1632.03 Rock Inlet Sediment Trap Type C
1635.01 Rock Pipe Inlet Sediment Trap Type A

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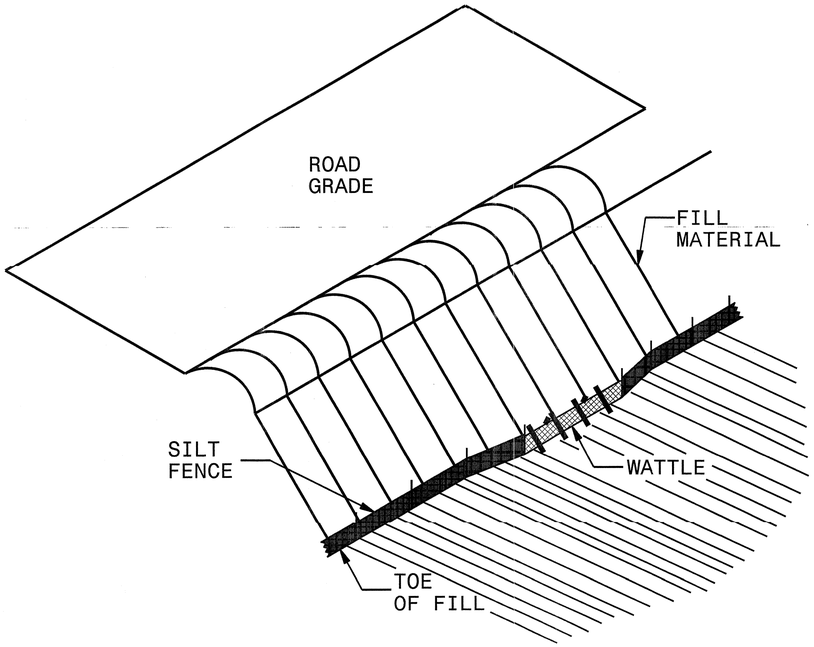
USER:ricardo

PROJECT REFERENCE NO.	SHEET NO.
B-4991	EC-2
R/W SHEET NO.	

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

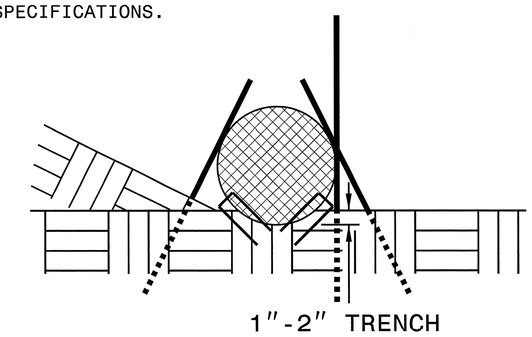
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

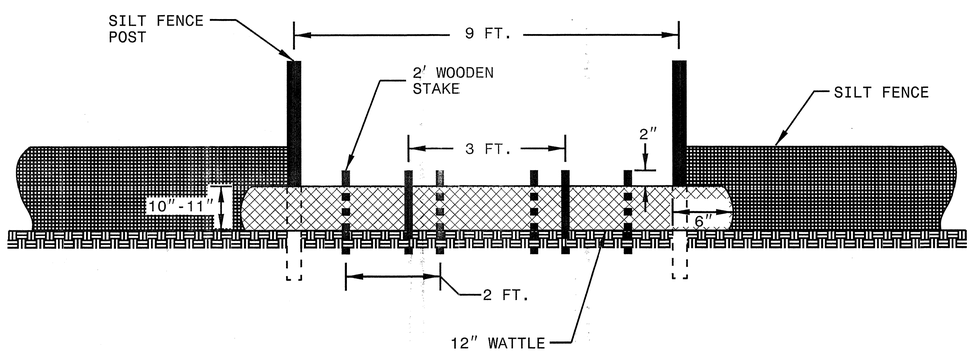
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

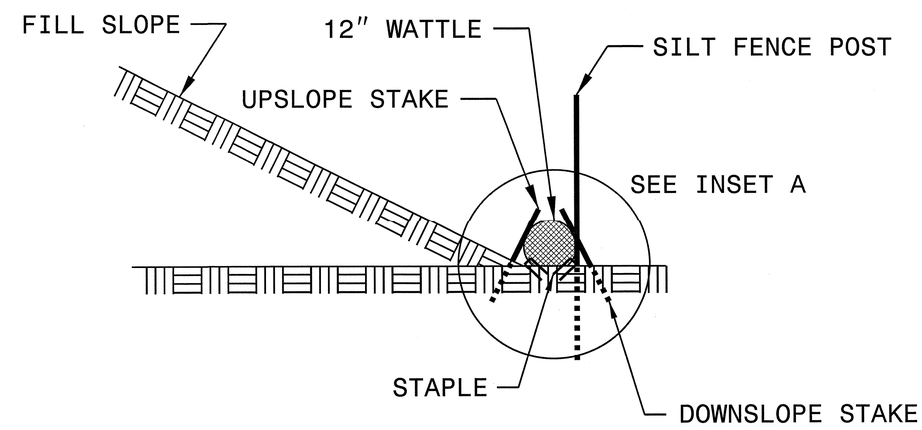
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE

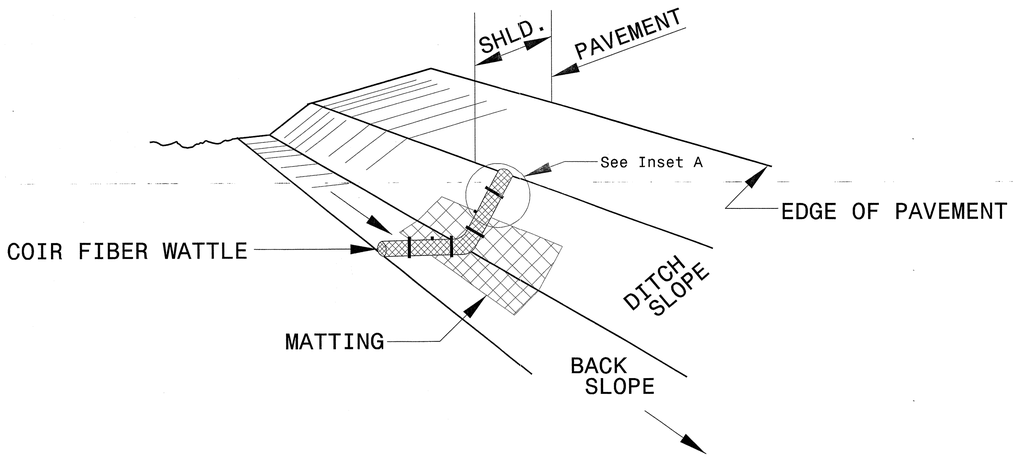


SIDE VIEW

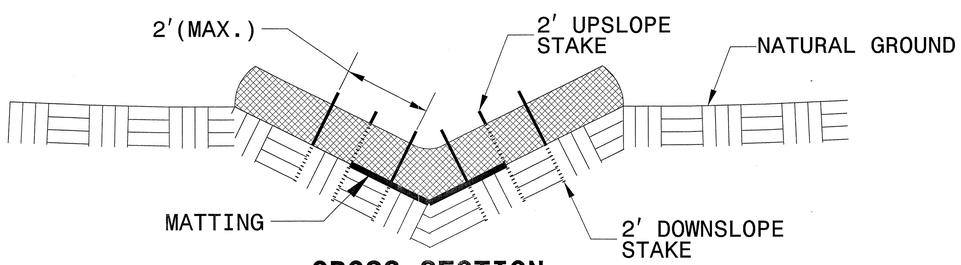
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
B-4991	EC-2A
R/W SHEET NO.	

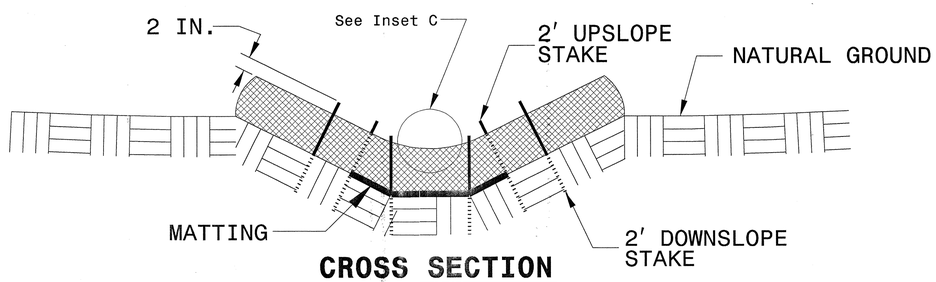
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

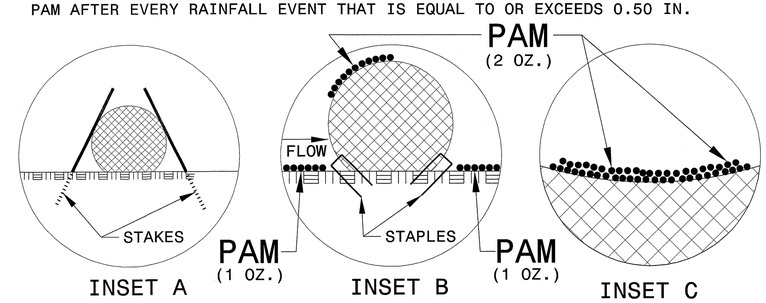
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

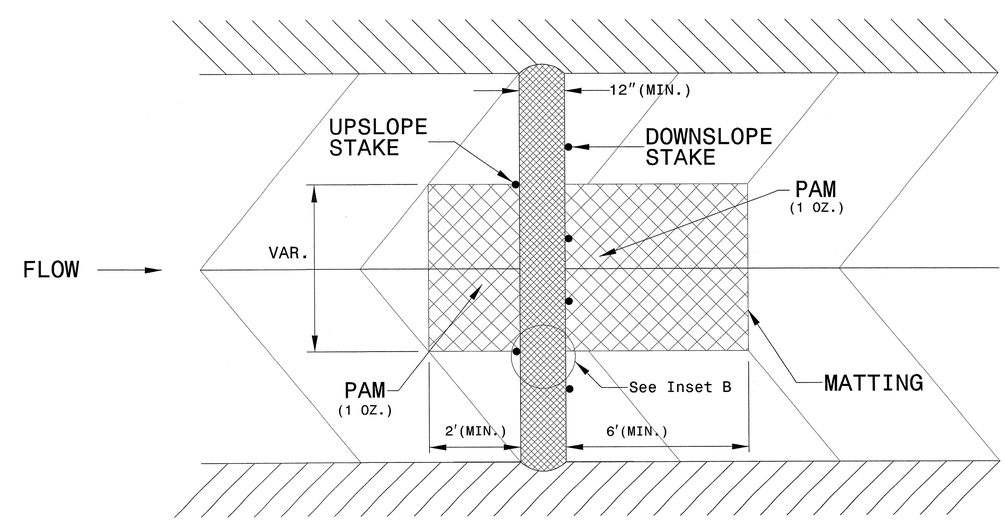
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
B-4991	EC-3
R/W SHEET NO.	

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	13+50	17+10	LT	1,360
4	-L-	14+00	17+10	RT	1,206
4	-L-	20+40	23+00	LT	881
4	-L-	20+40	22+50	RT	863
				SUBTOTAL	4,310
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					397
				TOTAL	4,707
				SAY	4,750

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	11+00	15+00	RT	360
4	-L-	11+00	13+45	LT	220
4	-L-	13+45	17+10	LT	323
4	-L-	20+60	23+60	LT	149
				SUBTOTAL	1,052
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					0
				TOTAL	1,052
				SAY	1,100

PROJECT REFERENCE NO.	SHEET NO.
B-4991	EC-3A
R/W SHEET NO.	

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

PROJECT REFERENCE NO.	SHEET NO.
B-4991	EC-4/CONST. 4
R/W SHEET NO.	

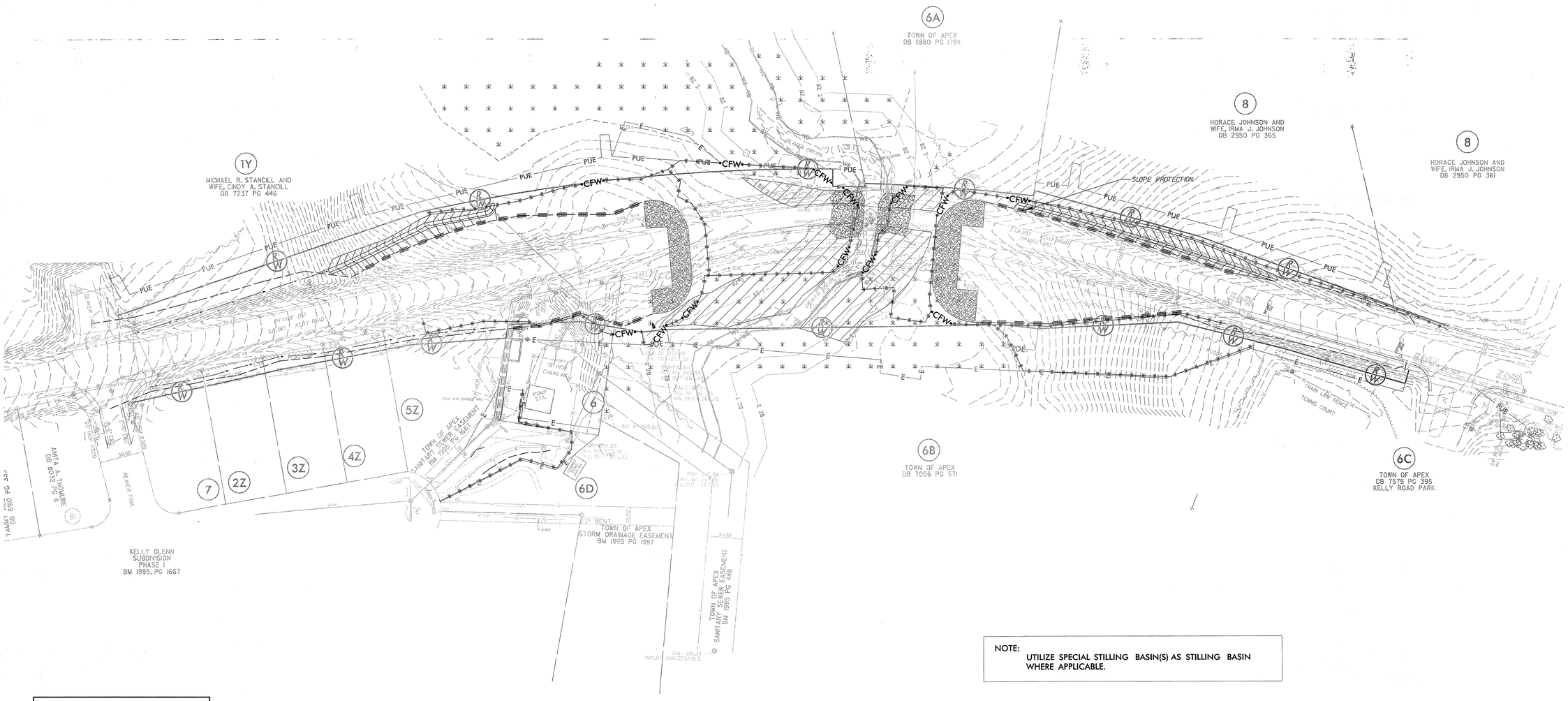
Firm License No. C-1051
421 Fayetteville St,
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com
STEWART

EROSION CONTROL PLAN

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

CLEARING & GRUBBING EROSION CONTROL



NOTE:
UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

REVISIONS

8/17/99

10/9/2013
R:\Projects\B4991_ec_psh_04_cg.dgn
USF Bmburns

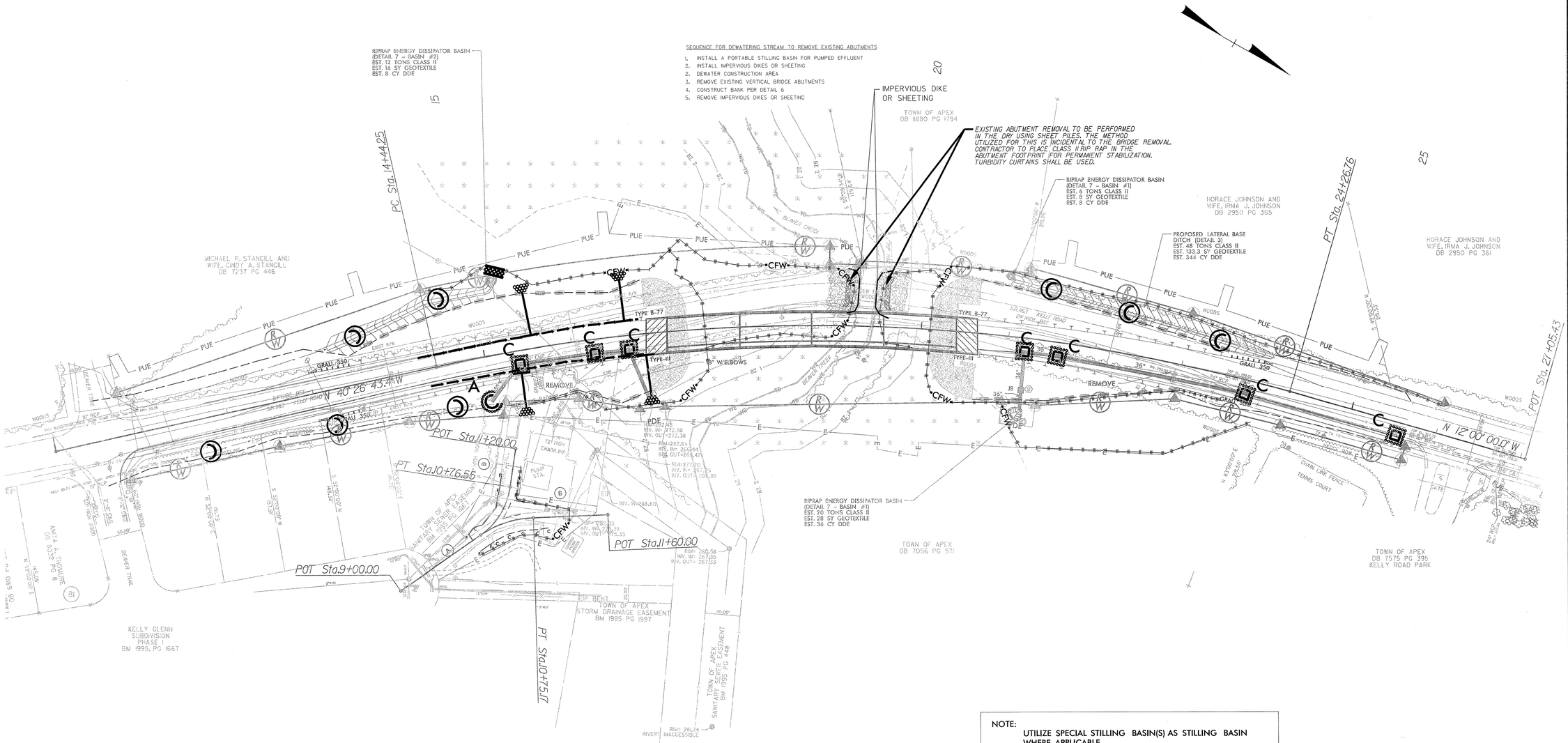
FINAL EROSION CONTROL

Place Matting for Erosion Control on Slope as Work Allows.

PROJECT REFERENCE NO.	SHEET NO.
B-4991	EC-5/CONST. 4
R/W SHEET NO.	

Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com
STEWART

EROSION CONTROL PLAN



NOTE:
UTILIZE SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

REVISIONS

8/17/99

10/9/2013
Proj\b4991_ec_psh_05_final.dgn
USFFimburns

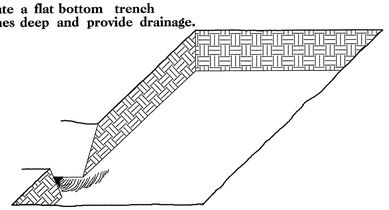
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4991	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40890.1.1	BRZ-1163(7)	PE	

PLANTING DETAILS

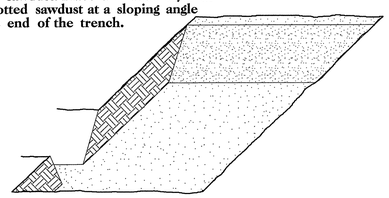
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

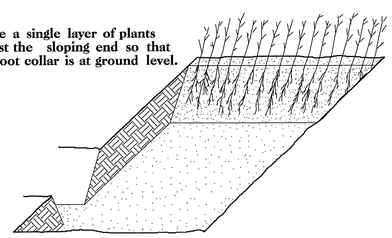
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



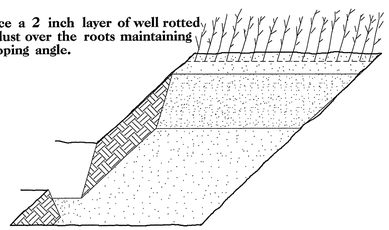
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

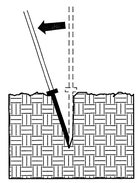


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

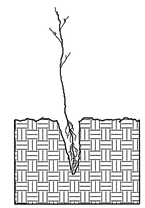


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

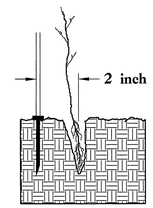
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



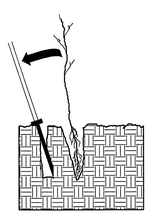
1. Insert planting bar as shown and pull handle toward planter.



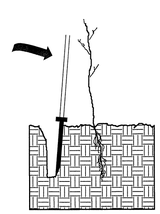
2. Remove planting bar and place seedling at correct depth.



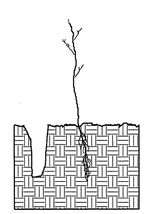
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25%	PINUS TAEDA	LOBLOLLY PINE	12 in - 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

T.I.P. NO.	SHEET NO.
B-4991	UC-1

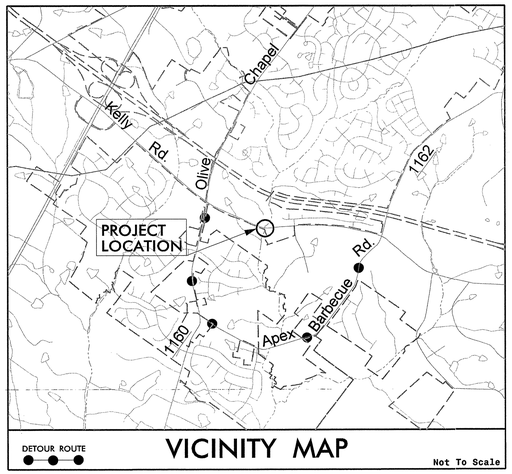
TIP PROJECT: B-4991

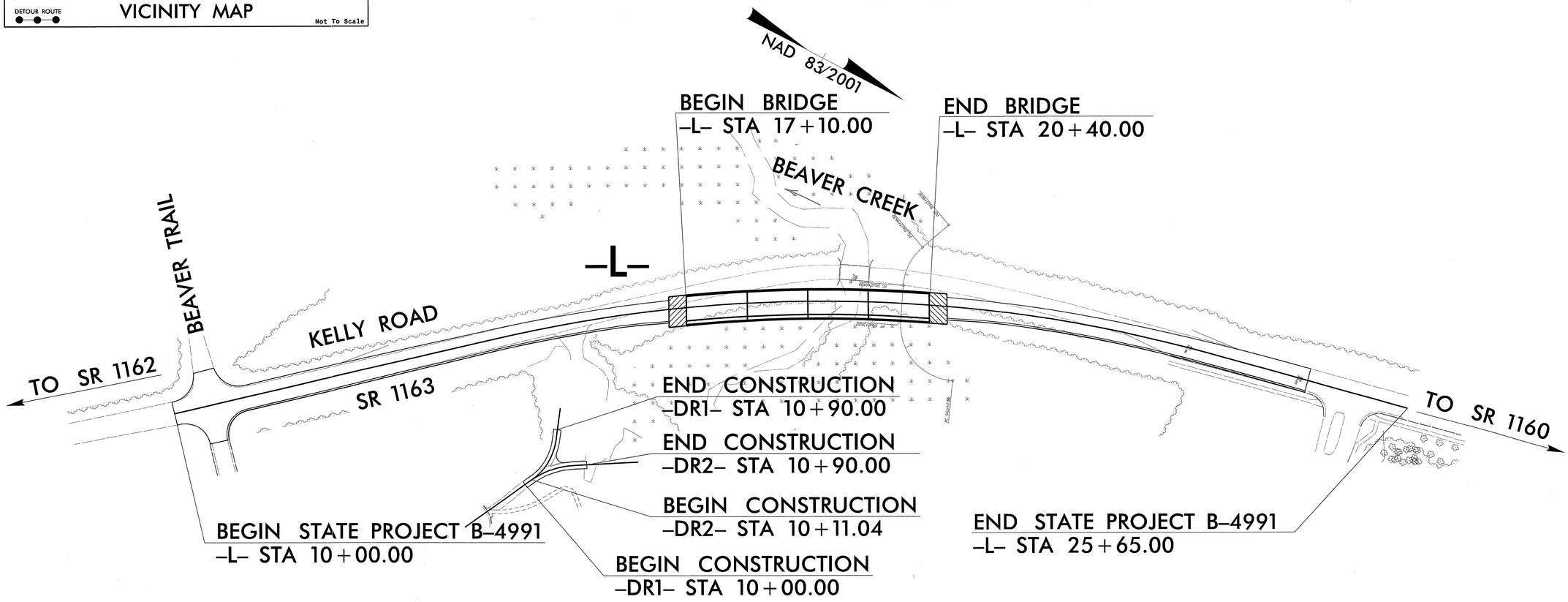
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
WAKE COUNTY

LOCATION: BRIDGE NO. 359 OVER BEAVER CREEK ON SR 1163 (KELLY ROAD)

TYPE OF WORK: UTILITY CONSTRUCTION





GRAPHIC SCALES

60 30 0 60 120
PLANS

60 330 0 60 120
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	WATERLINE CONSTRUCTION PLAN SHEET
UC-3	SEWERLINE CONSTRUCTION PLAN SHEET
UC-4 THRU UC-5	DETAILS

WATER AND SEWER OWNERS ON PROJECT

(1) TOWN OF APEX - WATER
(2) TOWN OF APEX - SANITARY SEWER

SEAL

STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

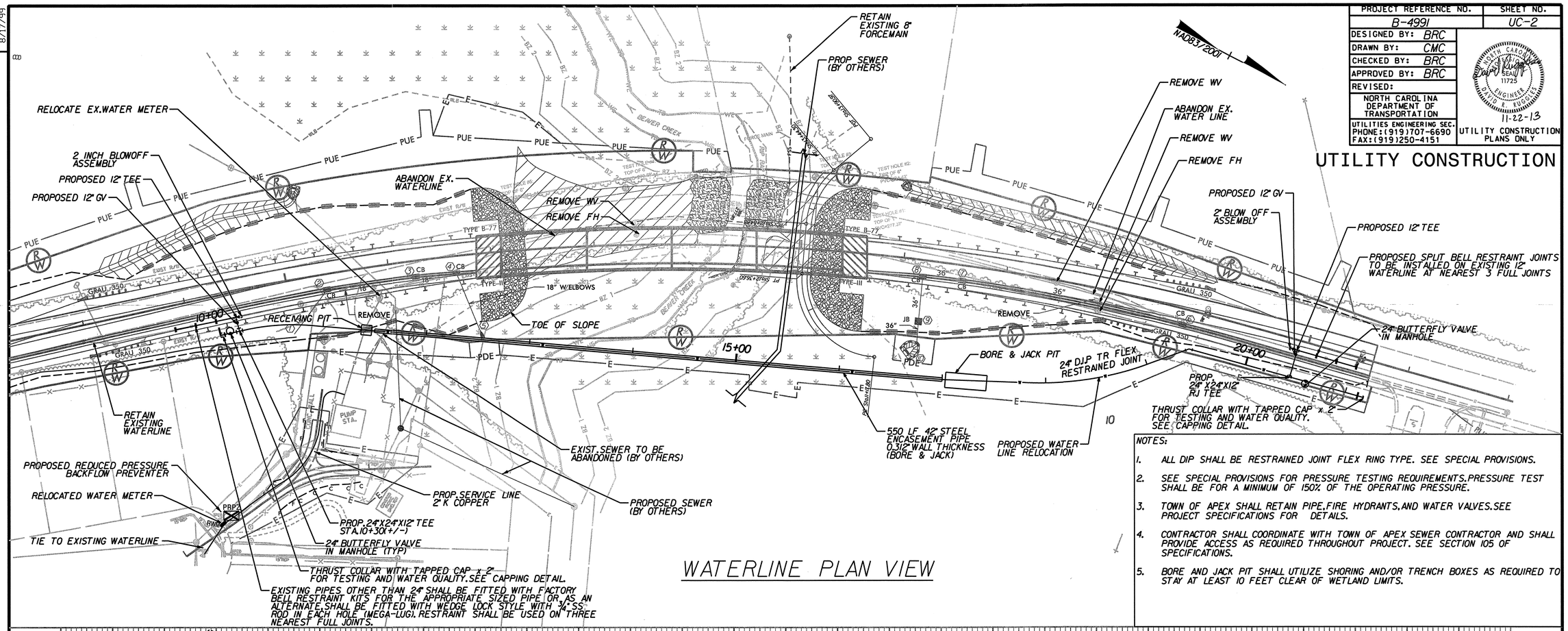
David Ruggles, P.E.	UTILITIES PROJECT MANAGER
Ben Crawford, P.E.	UTILITIES PROJECT ENGINEER
Michael Burns, E.I.	UTILITIES PROJECT DESIGNER

09/08/99
12/5/2013
B4991_util_psh_uc1_tsh.dgn
USER:mburns

PROJECT REFERENCE NO.	SHEET NO.
B-4991	UC-2
DESIGNED BY: BRC	
DRAWN BY: CMC	
CHECKED BY: BRC	
APPROVED BY: BRC	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID B. RUDOLPH 11-22-13

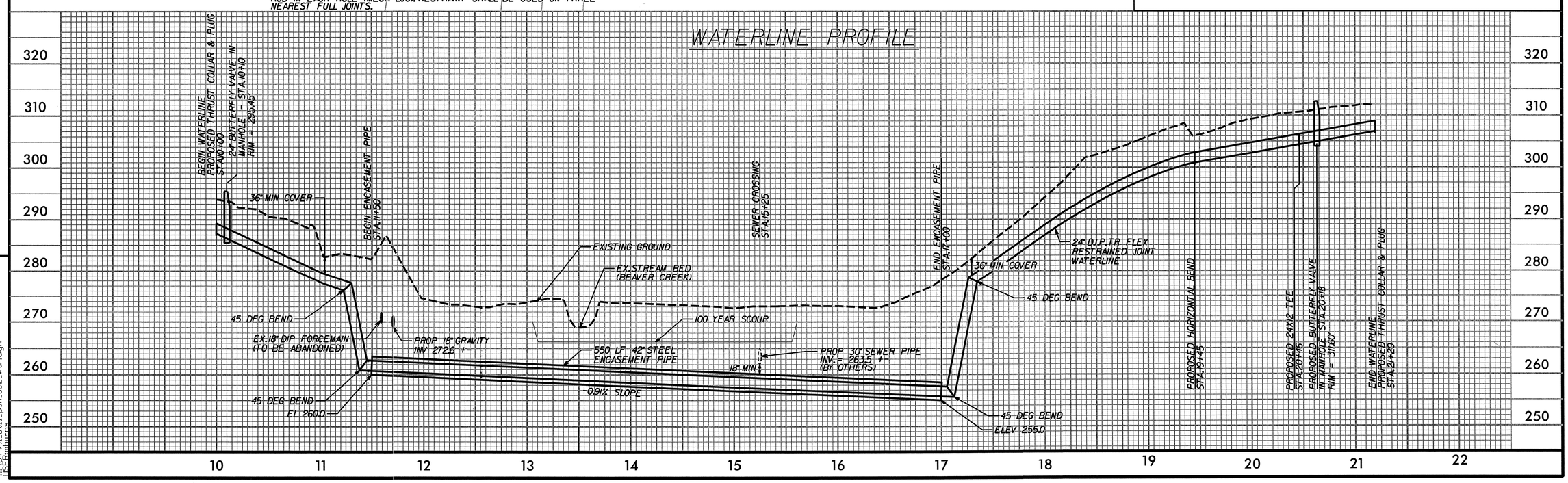
UTILITY CONSTRUCTION



WATERLINE PLAN VIEW

NOTES:

1. ALL DIP SHALL BE RESTRAINED JOINT FLEX RING TYPE. SEE SPECIAL PROVISIONS.
2. SEE SPECIAL PROVISIONS FOR PRESSURE TESTING REQUIREMENTS. PRESSURE TEST SHALL BE FOR A MINIMUM OF 150% OF THE OPERATING PRESSURE.
3. TOWN OF APEX SHALL RETAIN PIPE, FIRE HYDRANTS, AND WATER VALVES. SEE PROJECT SPECIFICATIONS FOR DETAILS.
4. CONTRACTOR SHALL COORDINATE WITH TOWN OF APEX SEWER CONTRACTOR AND SHALL PROVIDE ACCESS AS REQUIRED THROUGHOUT PROJECT. SEE SECTION 105 OF SPECIFICATIONS.
5. BORE AND JACK PIT SHALL UTILIZE SHORING AND/OR TRENCH BOXES AS REQUIRED TO STAY AT LEAST 10 FEET CLEAR OF WETLAND LIMITS.



REVISIONS

8/17/99

12/5/2013
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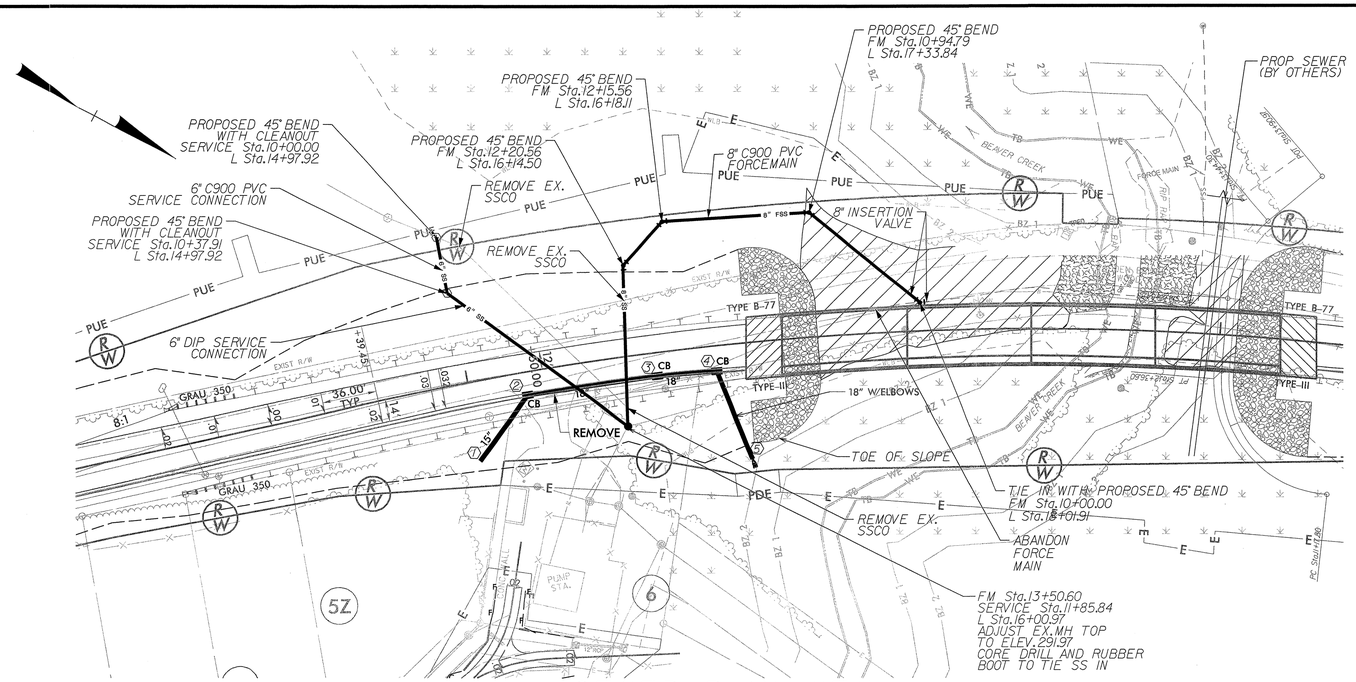
jISERnbuuos

PROJECT REFERENCE NO.	SHEET NO.
B-4991	UC-3
DESIGNED BY: BRC	
DRAWN BY: CMC	
CHECKED BY: BRC	
APPROVED BY: BRC	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

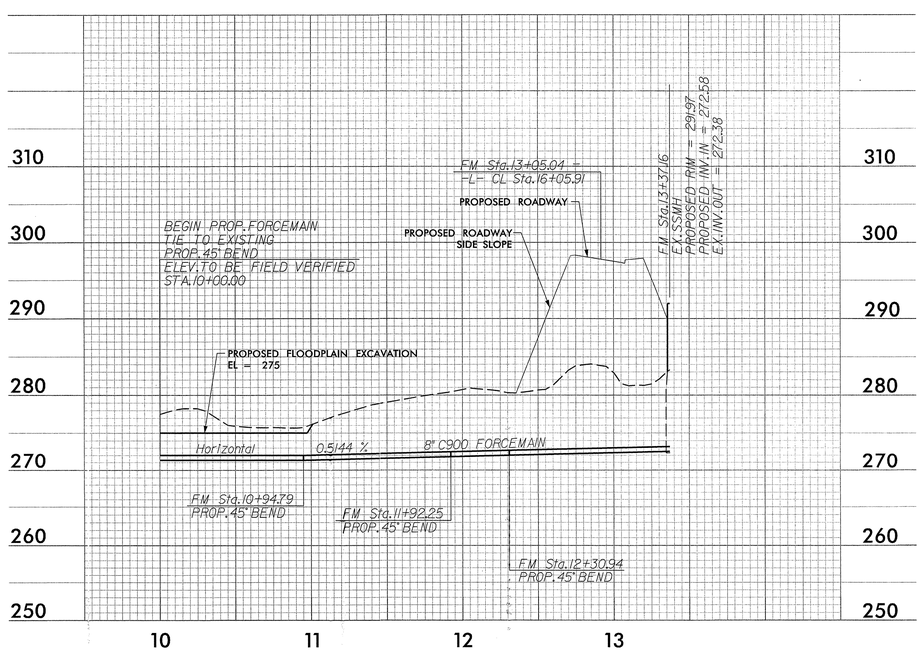
NORTH CAROLINA PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN R. CRAWFORD 11/7/13

UTILITY CONSTRUCTION

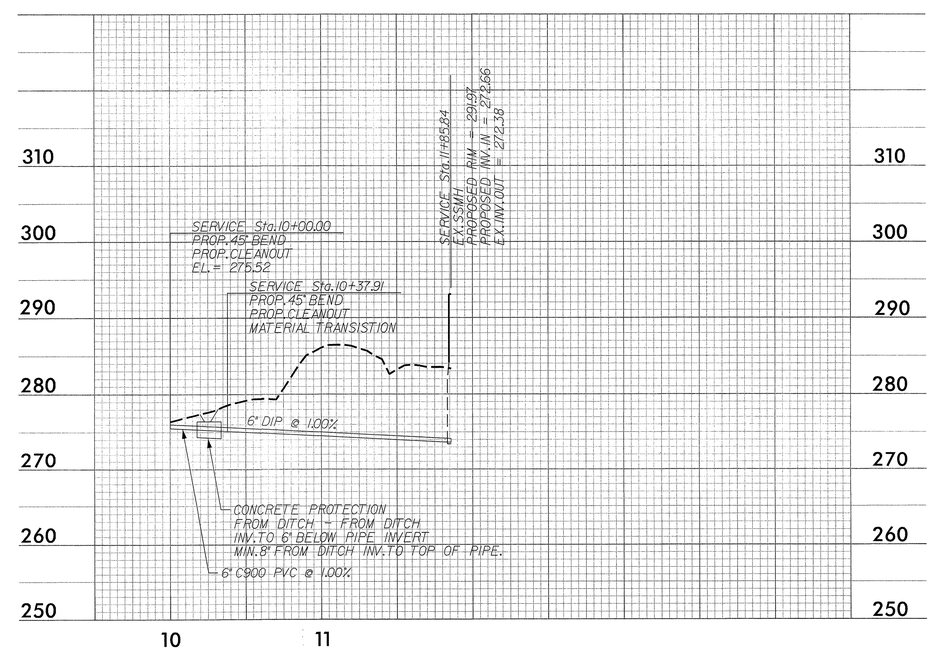


SEWER PLAN VIEW

CONTRACTOR SHALL COORDINATE WITH TOWN OF APEX SEWER CONTRACTOR AND SHALL PROVIDE ACCESS AS REQUIRED THROUGHOUT PROJECT. SEE SECTION 105 OF SPECIFICATIONS.



SEWER PROFILE



SERVICE PROFILE

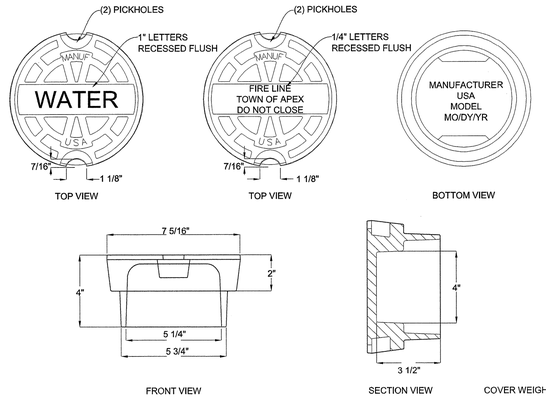
REVISIONS

8/17/99

12/5/2013
B4991_util_psh_uc3_swr.dgn
USER:Rmburns

PROJECT REFERENCE NO.	SHEET NO.
B-4991	UC-4
DESIGNED BY: BRC	
DRAWN BY: CMC	
CHECKED BY: BRC	
APPROVED BY: BRC	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

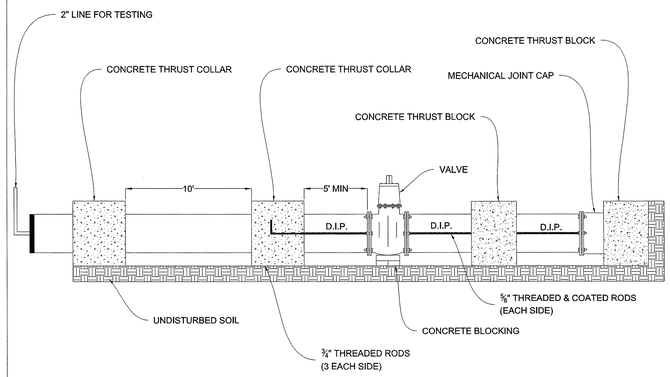
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32606 BENJAMIN F. CRAVEDI 11/7/13



TOWN OF APEX STANDARDS — EFFECTIVE: NOVEMBER 20, 2007

VALVE COVER

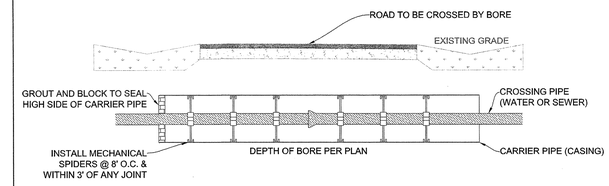
STD. NO. 600.09 — SHEET 1 OF 1



TOWN OF APEX STANDARDS — EFFECTIVE: DECEMBER 3, 2002

CAPPING DETAIL

STD. NO. 600.10 — SHEET 1 OF 1



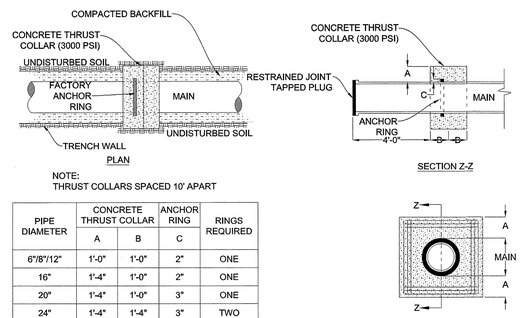
PIPE DIAMETER	CASING DIAMETER	WALL THICKNESS
4" - 12"	24"	0.188"
16" - 24"	36"	0.250"
30"	42"	0.312"

NOTES:
1. CASING SHALL BE UNCOATED SPIRAL WELDED STEEL MEETING ASTM A-139, GRADE B WITH A YIELD STRENGTH OF 35,000 PSI.
2. CROSSINGS ON NCDOT MAINTAINED ROADS TO BE IN ACCORDANCE WITH CURRENT NCDOT STANDARDS AND APPROVED ENCROACHMENT AGREEMENT.
3. RESTRAINED JOINT PIPE ONLY.
4. MINIMUM 3 SPIDERS PER JOINT.

TOWN OF APEX STANDARDS — EFFECTIVE: DECEMBER 21, 2010

BORE & JACK DETAIL

STD. NO. 600.18 — SHEET 1 OF 1



NOTE:
THRUST COLLARS SPACED 10' APART

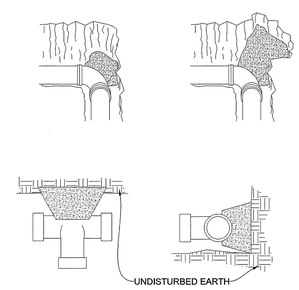
PIPE DIAMETER	CONCRETE THRUST COLLAR A	CONCRETE THRUST COLLAR B	ANCHOR RING C	RINGS REQUIRED
6"/8"/12"	1'-0"	1'-0"	2"	ONE
16"	1'-4"	1'-0"	2"	ONE
20"	1'-4"	1'-0"	3"	ONE
24"	1'-4"	1'-4"	3"	TWO
30"	1'-4"	1'-2"	4"	TWO
36"	1'-4"	1'-4"	4"	TWO

NOTE:
6" TO 16" MAINS--12-NO. 7 BARS
20"TO 36" MAINS--12-NO. 8 BARS
* BARS PLACED AS SHOWN

TOWN OF APEX STANDARDS — EFFECTIVE: DECEMBER 3, 2002

THRUST COLLAR INSTALLATION

STD. NO. 600.11 — SHEET 1 OF 1



MINIMUM CONCRETE BLOCKING (C.Y.)*					
NOM. PIPE DIA. (INCHES)	TEES & DEAD ENDS	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4	0.1	0.1	0.1	0.1	0.1
6	0.2	0.2	0.1	0.1	0.1
8	0.2	0.3	0.2	0.1	0.1
10	0.3	0.5	0.3	0.2	0.2
12	0.4	0.6	0.5	0.3	0.3
14	0.7	0.9	0.6	0.5	0.5
16	0.7	0.9	0.6	0.5	0.5
18	0.9	1.2	0.7	0.6	0.6
20	1.1	1.6	1.1	0.7	0.7
24	1.7	2.3	1.6	0.9	0.9

* CONCRETE SHALL BE 3000 PSI

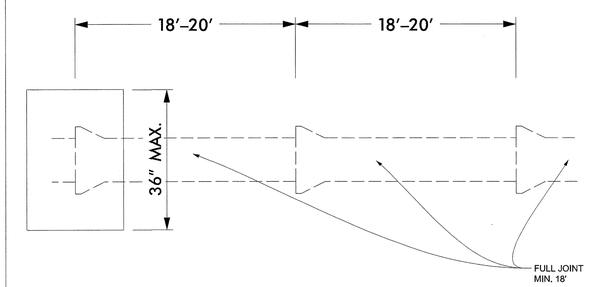
NOTE: WRAP FITTINGS IN 6 MIL PLASTIC BEFORE POURING CONCRETE

TOWN OF APEX STANDARDS — EFFECTIVE: DECEMBER 3, 2002

REACTION BLOCKING

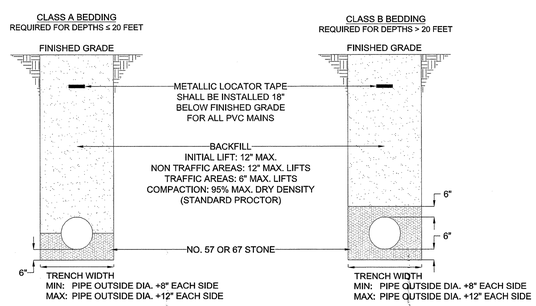
STD. NO. 600.13 — SHEET 1 OF 1

ACCEPTABLE RESTRAINTS:
1. FACTORY BELL RESTRAINTS
2. MEGALUG W/ 3/4 S.S. ALL THREAD IN EACH BOLT HOLE
3. REINFORCED THRUST BLOCK AS PER APEX STD. NO. 600.11



NOTES:
1. ANYJOINT LESS THAN 18' WILL NOT SUFFICE AS A JOINT, HOWEVER RESTRAINT ON PARTIAL JOINT WILL BE REQUIRED.
2. EXCAVATED SOIL SHALL BE TAMPED IN 6"-8" LIFTS.
3. MAX DISTANCE OVER THE BELL AND SPIGOT IS 36" (PERPENDICULAR TO PIPE) TO INSTALL BELL RESTRAINT. THE BELL RESTRAINTS MUST HAVE ¾" RODS FOR ALL IDENTIFIED HOLES ON THE RESTRAINT. THE RESTRAINT STYLE SHALL BE WEDGE LOCK WITH SPLIT FACE.

SPLIT BELL RESTRAINTS

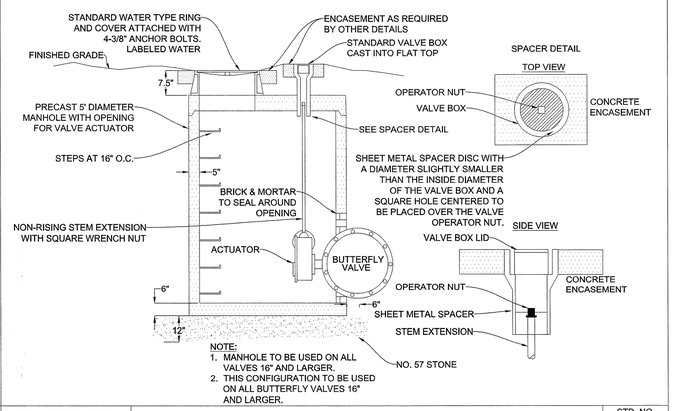


NOTES:
1. FOR TRENCHES REQUIRING SHORING & BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING & BRACING.
2. INSTALLATIONS THAT EXCEED 13 FEET DEPTH SHALL BE DIP.

TOWN OF APEX STANDARDS — EFFECTIVE: NOVEMBER 20, 2007

SANITARY SEWER PIPE BEDDING & BACKFILLING

STD. NO. 700.01 — SHEET 1 OF 1



NOTE:
1. MANHOLE TO BE USED ON ALL VALVES 16" AND LARGER.
2. THIS CONFIGURATION TO BE USED ON ALL BUTTERFLY VALVES 16" AND LARGER.

TOWN OF APEX STANDARDS — EFFECTIVE: NOVEMBER 20, 2007

BUTTERFLY VALVE WITH 5' MANHOLE ENCASEMENT

STD. NO. 600.17 — SHEET 1 OF 1

REVISIONS

8/17/99

12/5/2013
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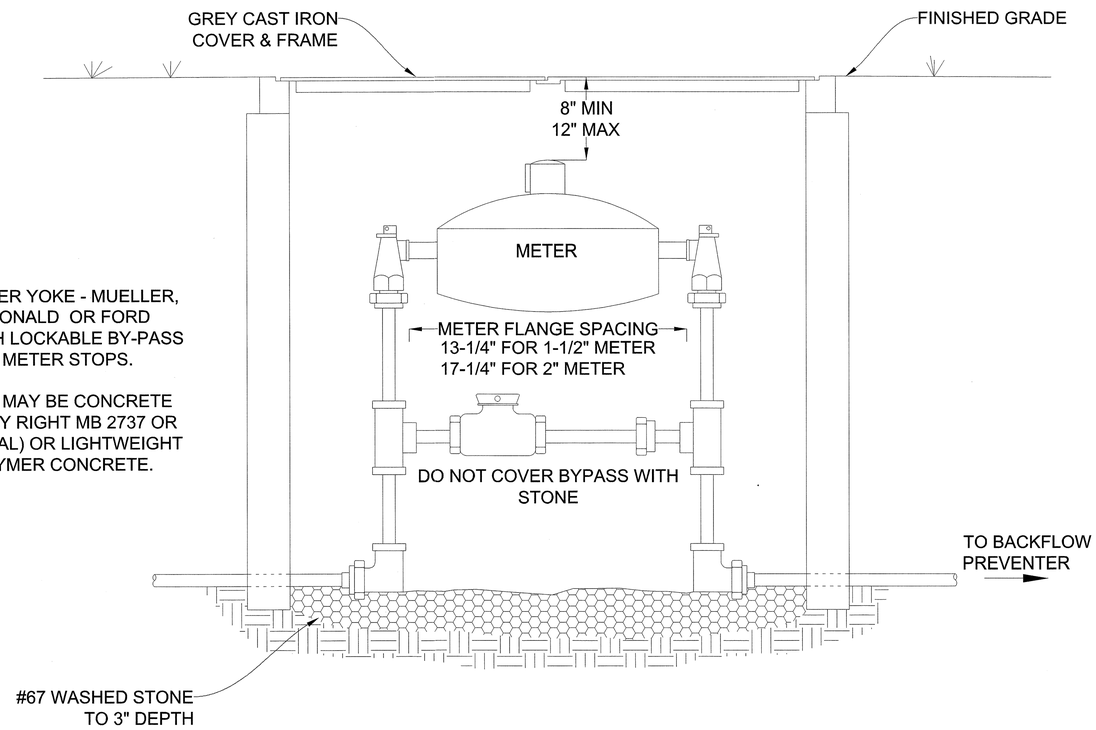
USERBRBURNS

PROJECT REFERENCE NO.	SHEET NO.
B-4991	UC-5
DESIGNED BY: BRC	
DRAWN BY: CMC	
CHECKED BY: BRC	
APPROVED BY: BRC	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 32606 ENGINEER BENJAMIN R. CRAMPTON
10/9/13



NOTES:

1. METER YOKE - MUELLER, MCDONALD OR FORD WITH LOCKABLE BY-PASS AND METER STOPS.
2. BOX MAY BE CONCRETE (STAY RIGHT MB 2737 OR EQUAL) OR LIGHTWEIGHT POLYMER CONCRETE.

TOWN OF APEX STANDARDS	1-1/2" & 2" METER INSTALLATION & VAULT	STD. NO.
EFFECTIVE: DECEMBER 21, 2010		600.02
		SHEET 1 OF 1

8/17/99

12/5/2013
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USERbhrgrns

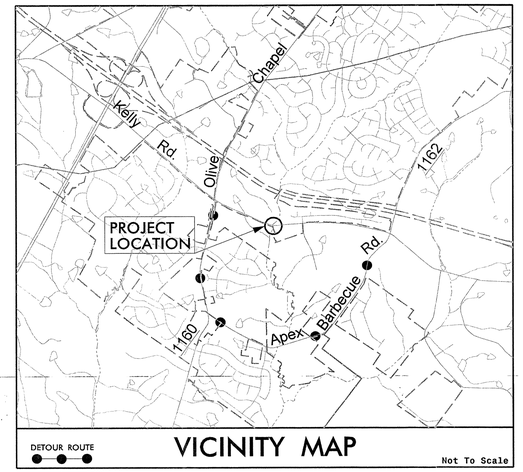
T.I.P. NO.	SHEET NO.
B-4991	UO-1

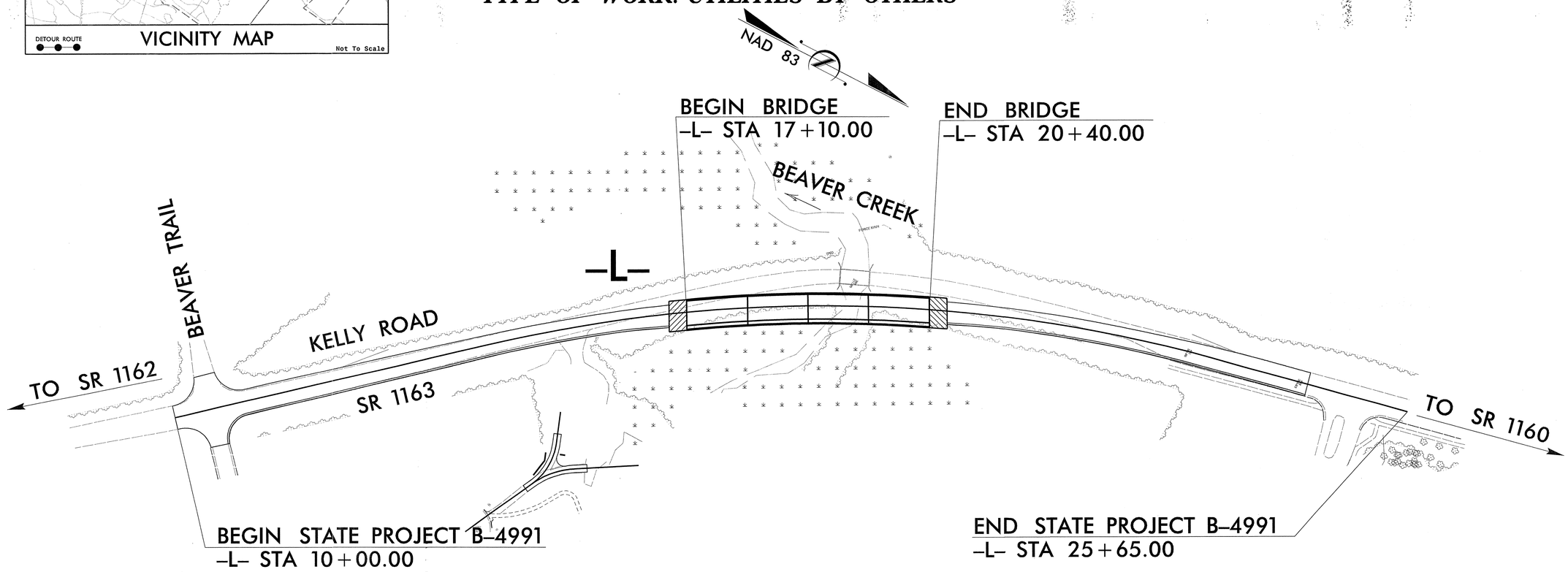
TIP PROJECT: B-4991

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
WAKE COUNTY

LOCATION: BRIDGE NO. 359 OVER BEAVER CREEK ON SR 1163 (KELLY ROAD)
TYPE OF WORK: UTILITIES BY OTHERS





GRAPHIC SCALES

60 30 0 60 120
PLANS

60 30 0 60 120
PROFILE (HORIZONTAL)

5 22.5 0 5 10
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITY BY OTHERS PLAN SHEET

UTILITY OWNERS ON PROJECT

(1) AT&T - TELEPHONE
(2) TOWN OF APEX - ELECTRICAL
(3) DUKE ENERGY PROGRESS - ELECTRICAL
(4) PSNC - GAS
(5) TWC - CABLE TV

PREPARED IN THE OFFICE OF:

STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

David Ruggles, P.E. — UTILITIES PROJECT MANAGER
Ben Crawford, P.E. — UTILITIES PROJECT ENGINEER
Michael Burns, E.I. — UTILITIES DESIGN ENGINEER

09/08/99
10/9/2013
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USER:mburns

PROJECT REFERENCE NO.	SHEET NO.
B-4991	UO-2

UTILITIES BY OTHERS

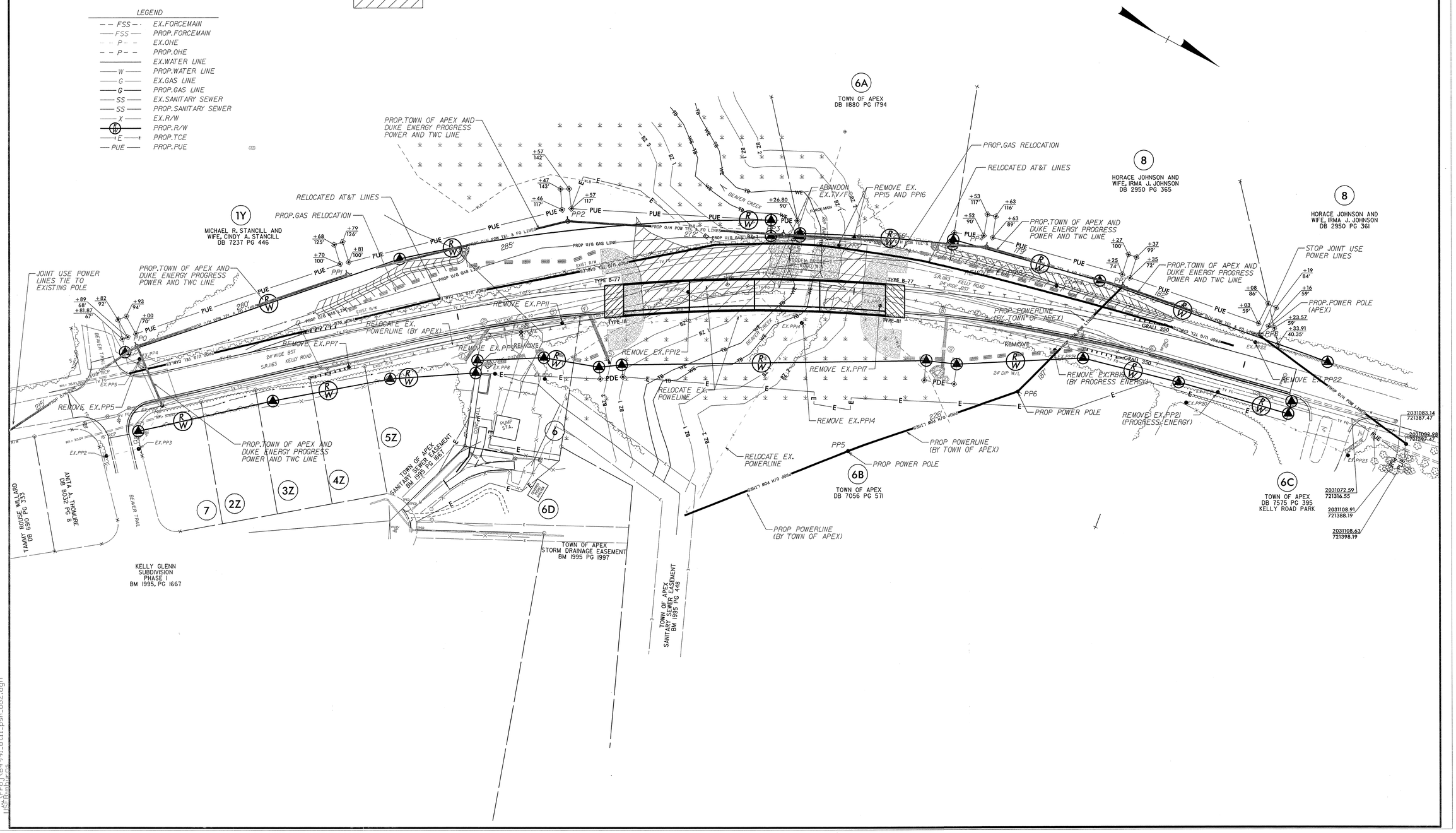
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

NOTES:
1. RELOCATED TIME WARNER CABLE LINES GO AERIAL JOINT USE ON APEX POWER POLES.
2. DUKE ENERGY PROGRESS POWER LINES TO BE RELOCATED TO TOWN OF APEX POWER POLES IN JOINT USE AGREEMENT.
3. AT&T TELECOMMUNICATION HAS BEEN RELOCATED AS SHOWN ON THIS PLAN.

FLOODPLAIN EXCAVATION

LEGEND

FSS	EX.FORCEMAIN
FSS	PROP.FORCEMAIN
P	EX.OHE
P	PROP.OHE
	EX.WATER LINE
W	PROP.WATER LINE
G	EX.GAS LINE
G	PROP.GAS LINE
SS	EX.SANITARY SEWER
SS	PROP.SANITARY SEWER
X	EX.R/W
	PROP.R/W
E	PROP.TCE
PUE	PROP.PUE



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PROJECT REFERENCE NO.	SHEET NO.
B-4991	X-1

CROSS SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATION L	UNCL. EXC. (CU. YD.)	EMBT. (CU. YD.)
10+00.00	–	–
10+50.00	–	–
11+00.00	92	10
11+50.00	182	50
11+75.00	85	40
12+00.00	82	38
12+50.00	164	104
13+00.00	170	214
13+50.00	93	407
14+00.00	9	730
14+50.00	13	1140
15+00.00	14	1566
15+50.00	6	2010
16+00.00	0	2217
16+50.00	0	2470
16+86.00	0	2166
17+10.00	0	1560

STATION DR1	UNCL. EXC. (CU. YD.)	EMBT. (CU. YD.)
10+00.00	–	–
10+10.00	4	0
10+20.00	5	0
10+30.00	7	0
10+40.00	10	0
10+50.00	16	0
10+60.00	24	0
10+70.00	15	0
10+80.00	2	0
10+90.00	3	0

STATION DR2	UNCL. EXC. (CU. YD.)	EMBT. (CU. YD.)
10+25.00	–	–
10+50.00	17	0
10+75.00	27	0
10+90.00	10	0

STATION L	UNCL. EXC. (CU. YD.)	EMBT. (CU. YD.)
20+40.00	–	–
20+64.00	0	1732
21+00.00	0	2374
21+50.00	0	2777
22+00.00	0	2011
22+34.92	0	951
22+50.00	0	319
23+00.00	0	726
23+50.00	3	369
24+00.00	4	180
24+50.00	32	57
25+00.00	93	7
25+54.62	131	0
25+65.00	21	0

CROSS SECTION INDEX

SHEET	BEGIN STATION	END STATION
X-2	-L- 10+00.00	-L- 12+50.00
X-3	-L- 13+00.00	-L- 14+50.00
X-4	-L- 15+00.00	-L- 16+00.00
X-5	-L- 16+50.00	-L- 17+50.00
X-6	-L- 18+00.00	-L- 19+50.00
X-7	-L- 20+00.00	-L- 21+00.00
X-8	-L- 21+50.00	-L- 23+00.00
X-9	-L- 23+50.00	-L- 25+65.00
X-10	-DR1- 10+00.00	-DR1- 10+50.00
X-11	-DR1- 10+60.00	-DR1- 10+90.00
X-12	-DR2- 10+25.00	-DR2- 10+90.00

Note:

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

REVISIONS

8/17/99

10/8/2013
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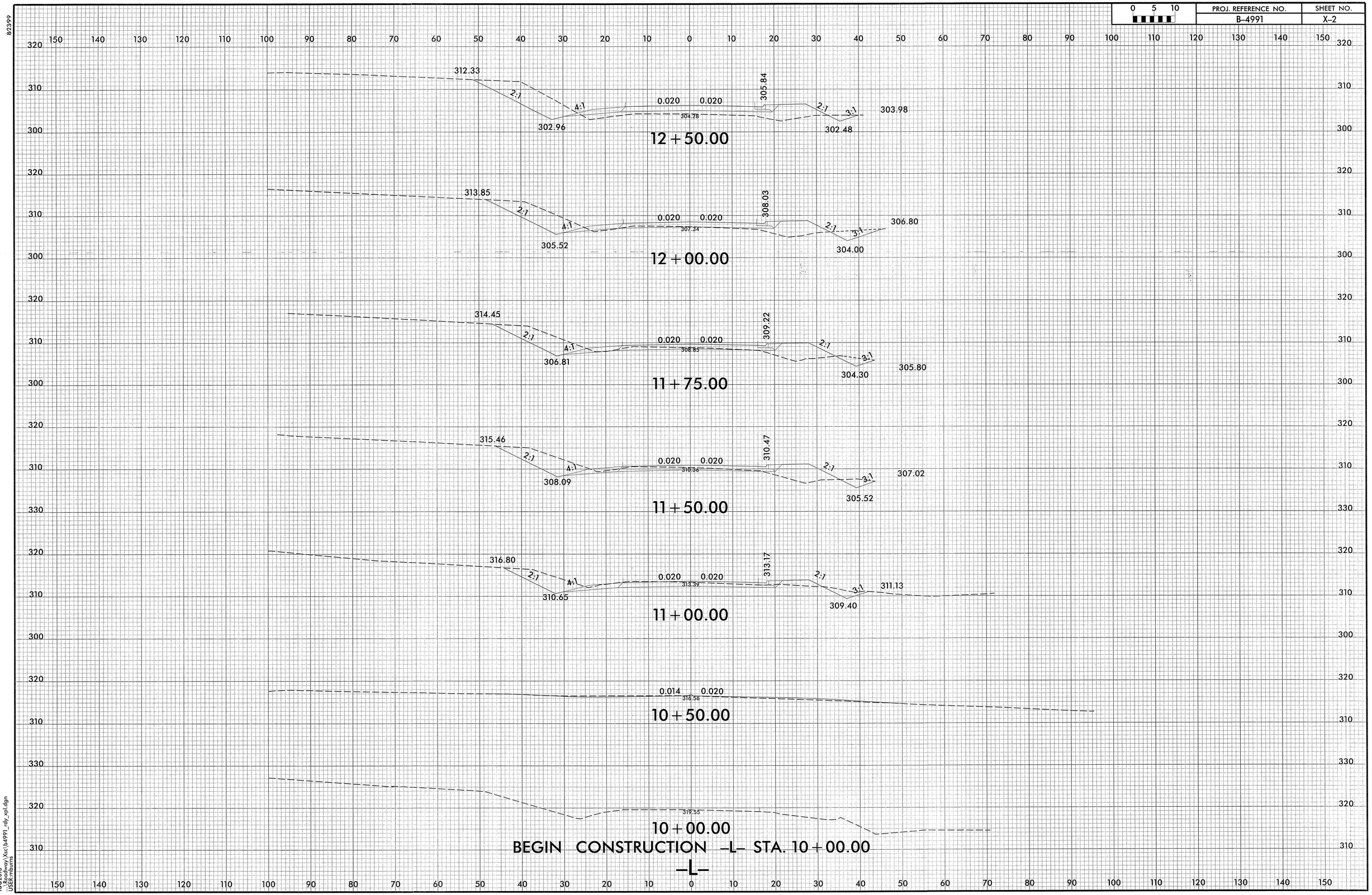
PROJ. REFERENCE NO.	SHEET NO.
B-4991	X-2



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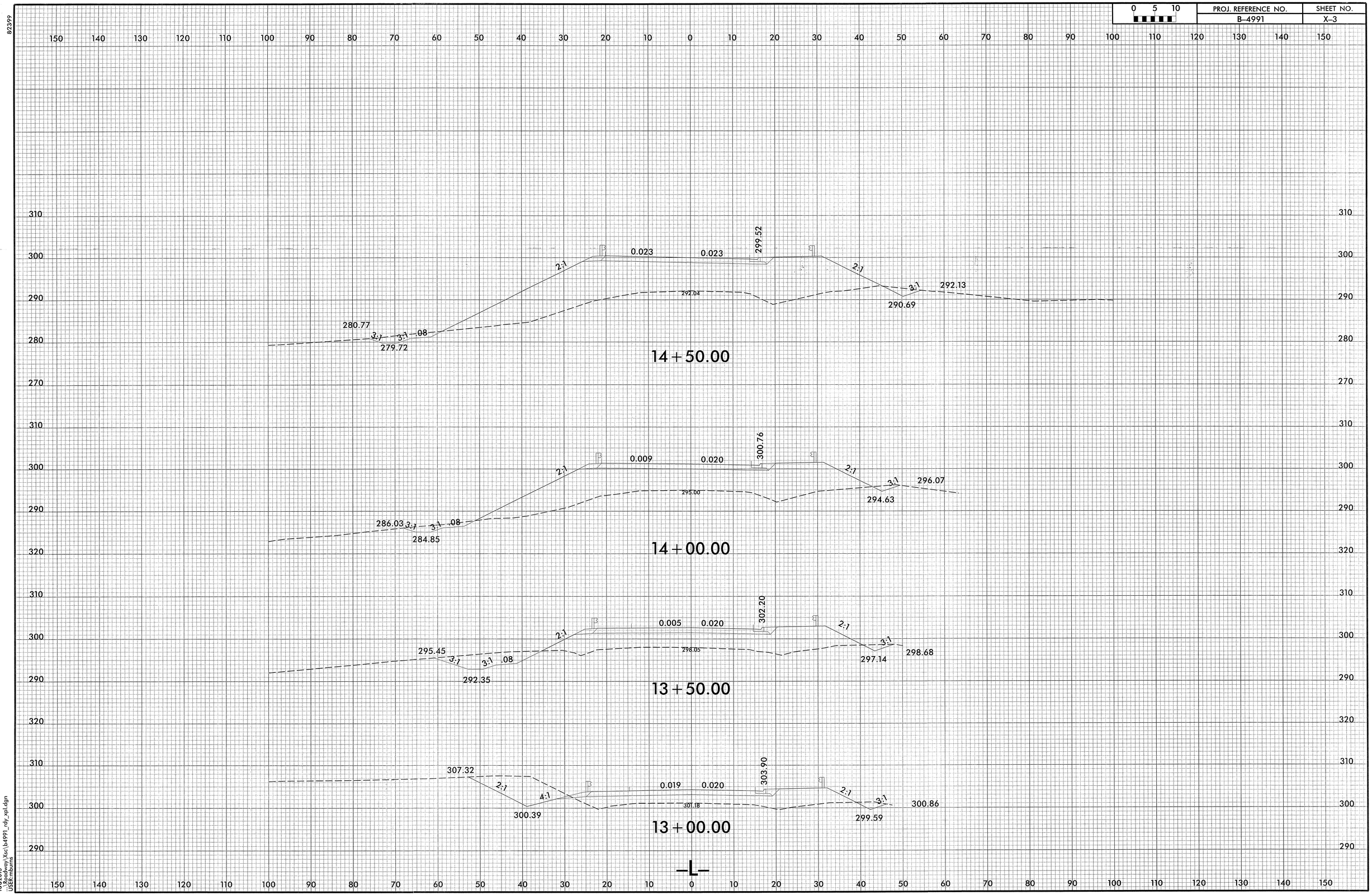

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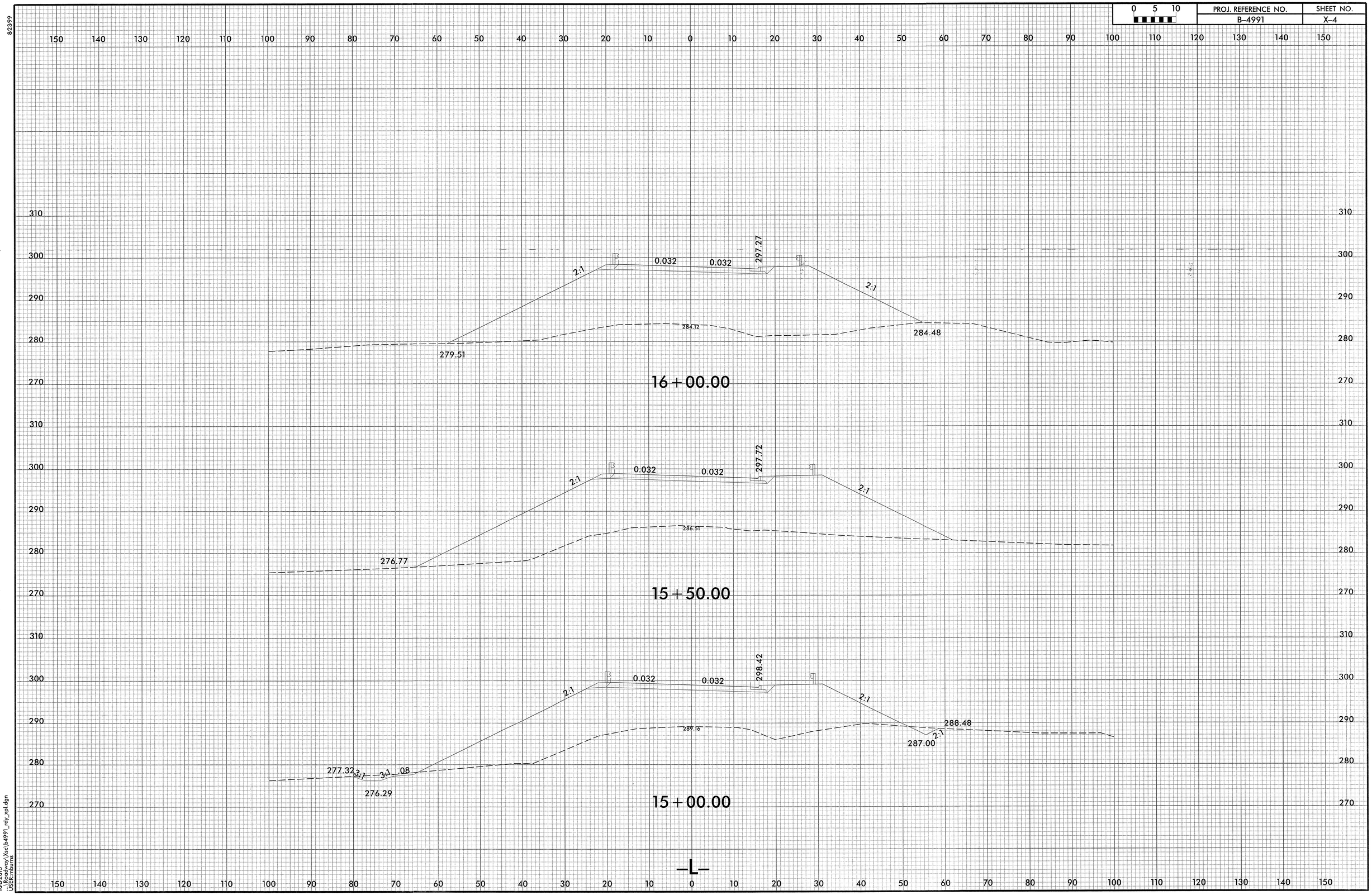

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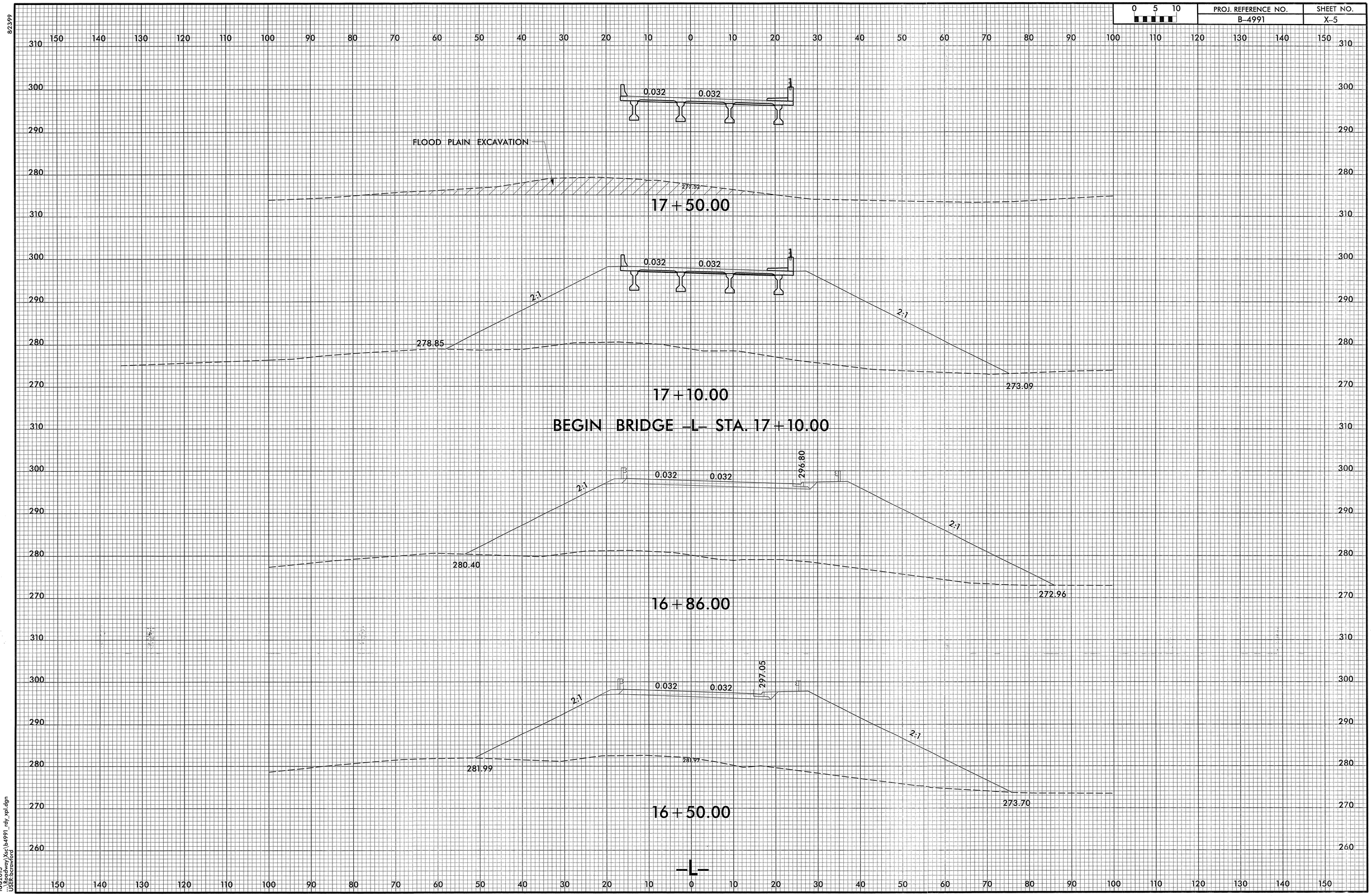

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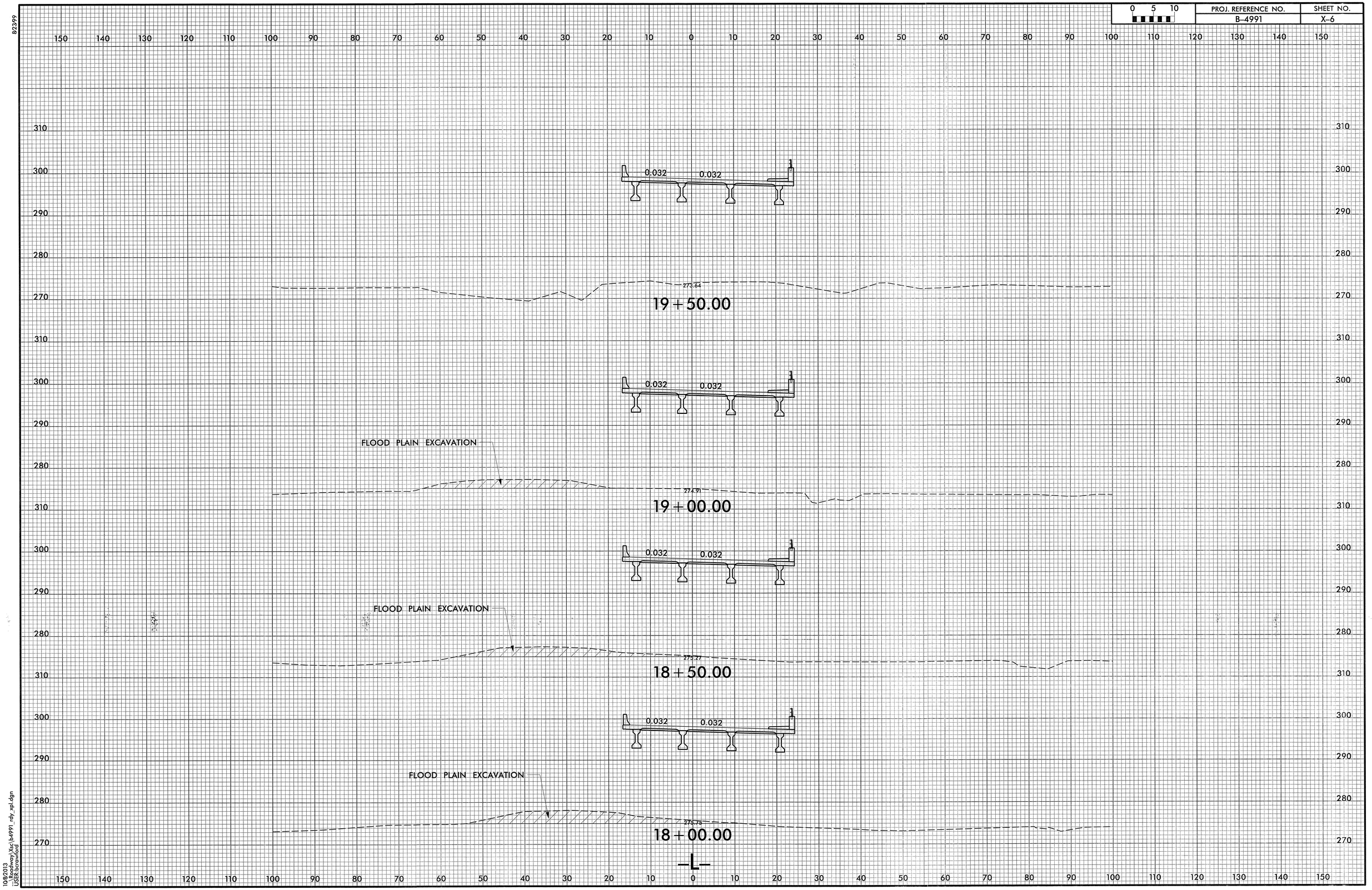

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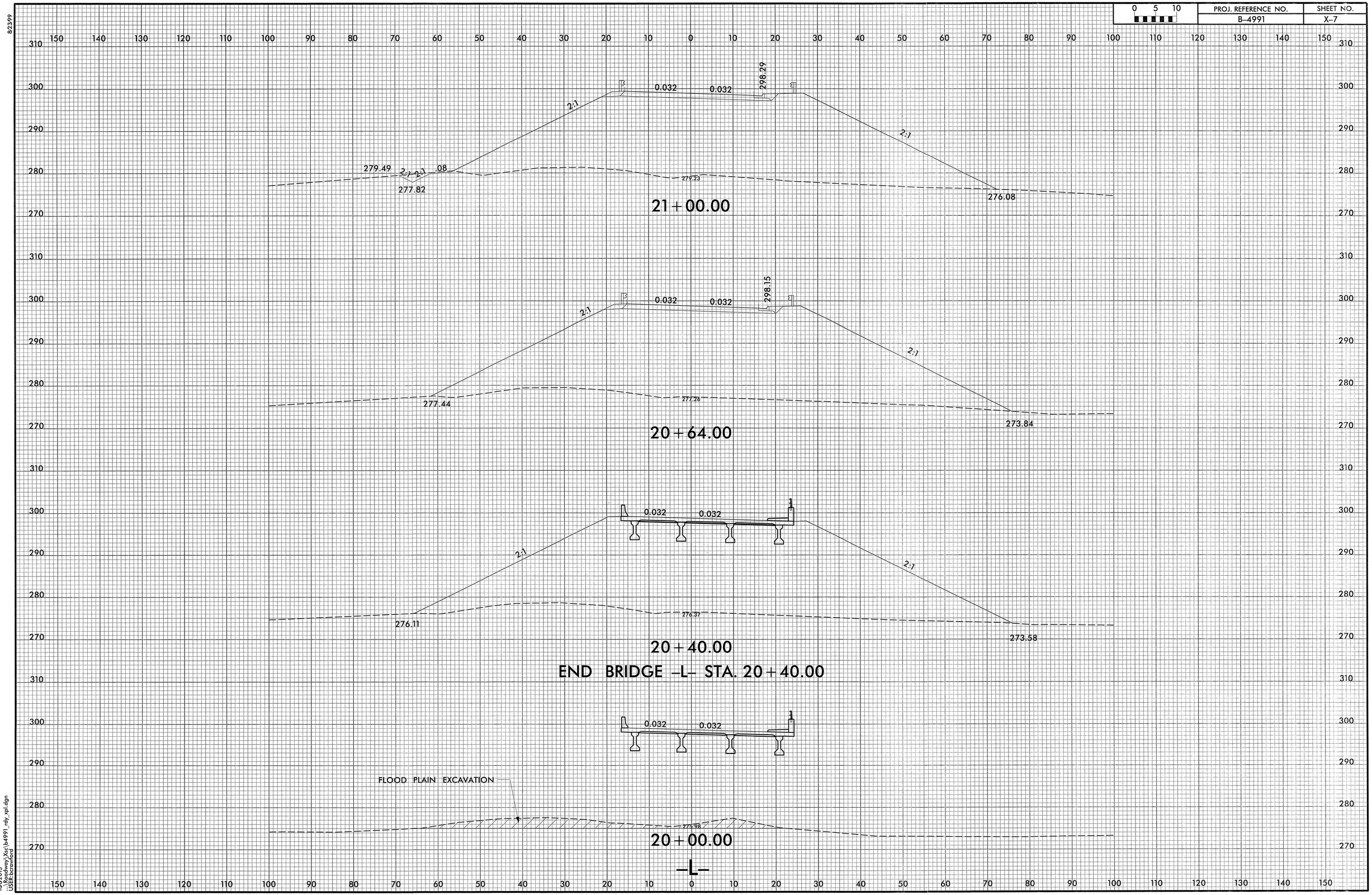

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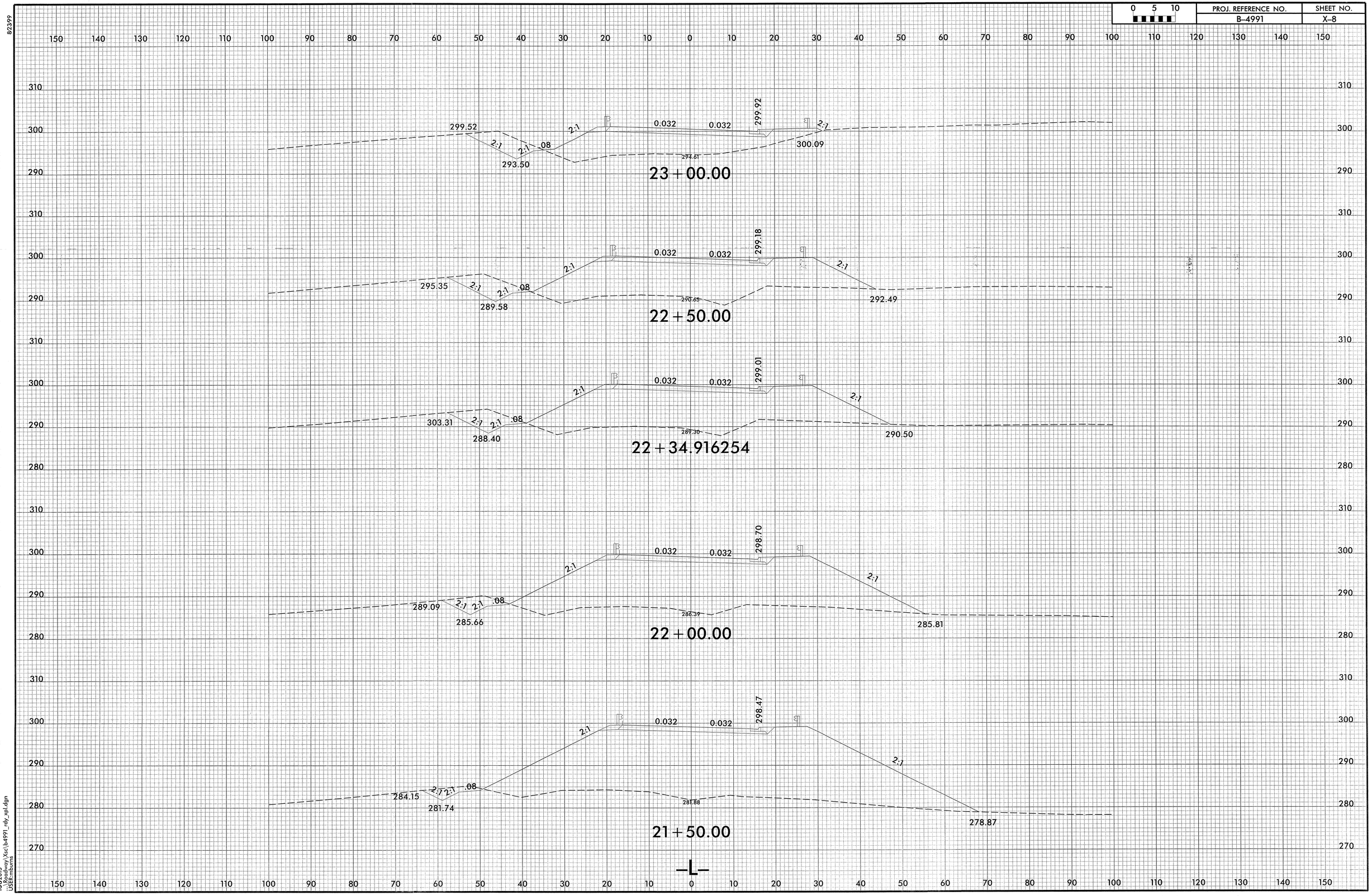

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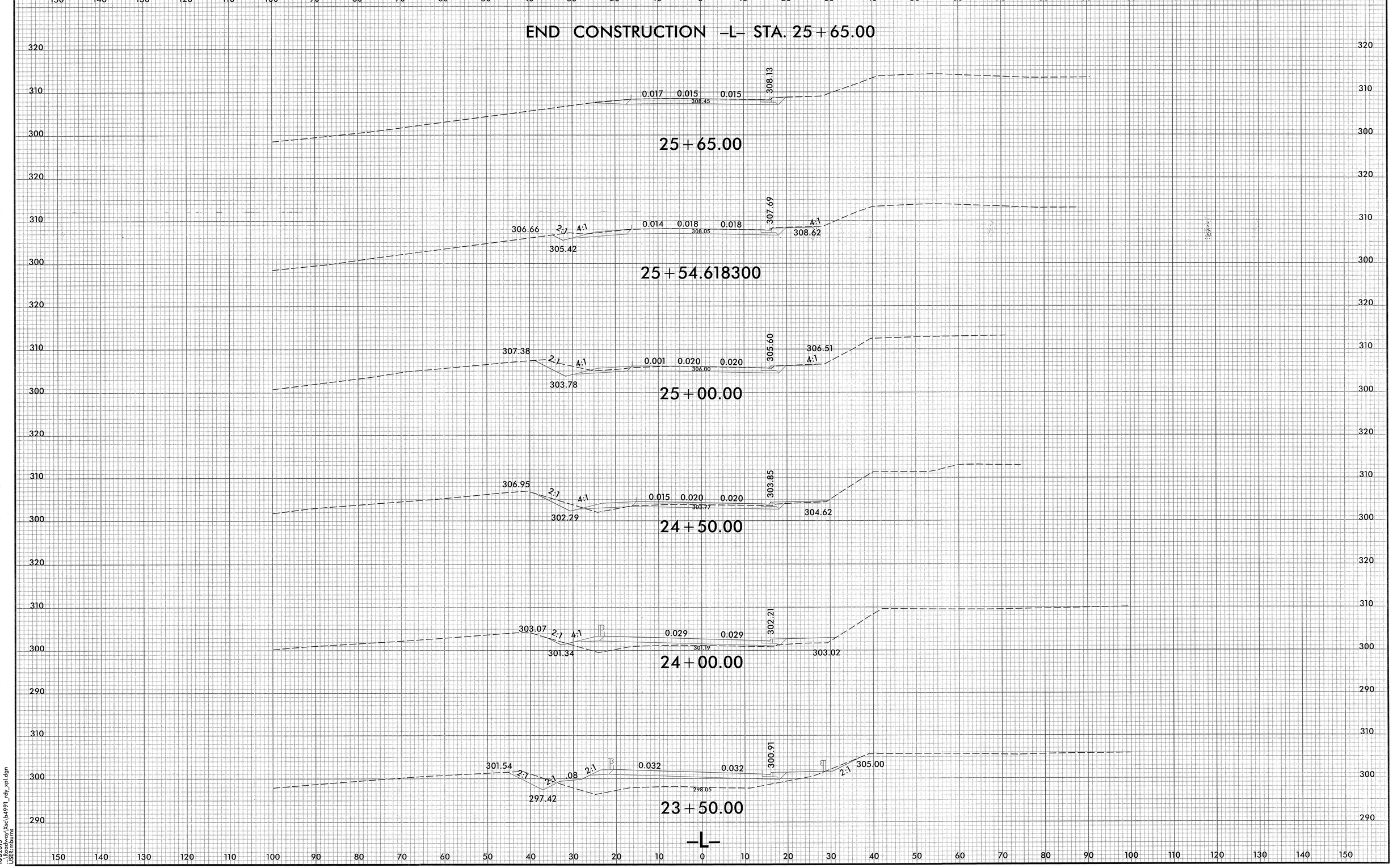
PROJ. REFERENCE NO.	SHEET NO.
B-4991	X-9

0 5 10

END CONSTRUCTION -L- STA. 25+65.00



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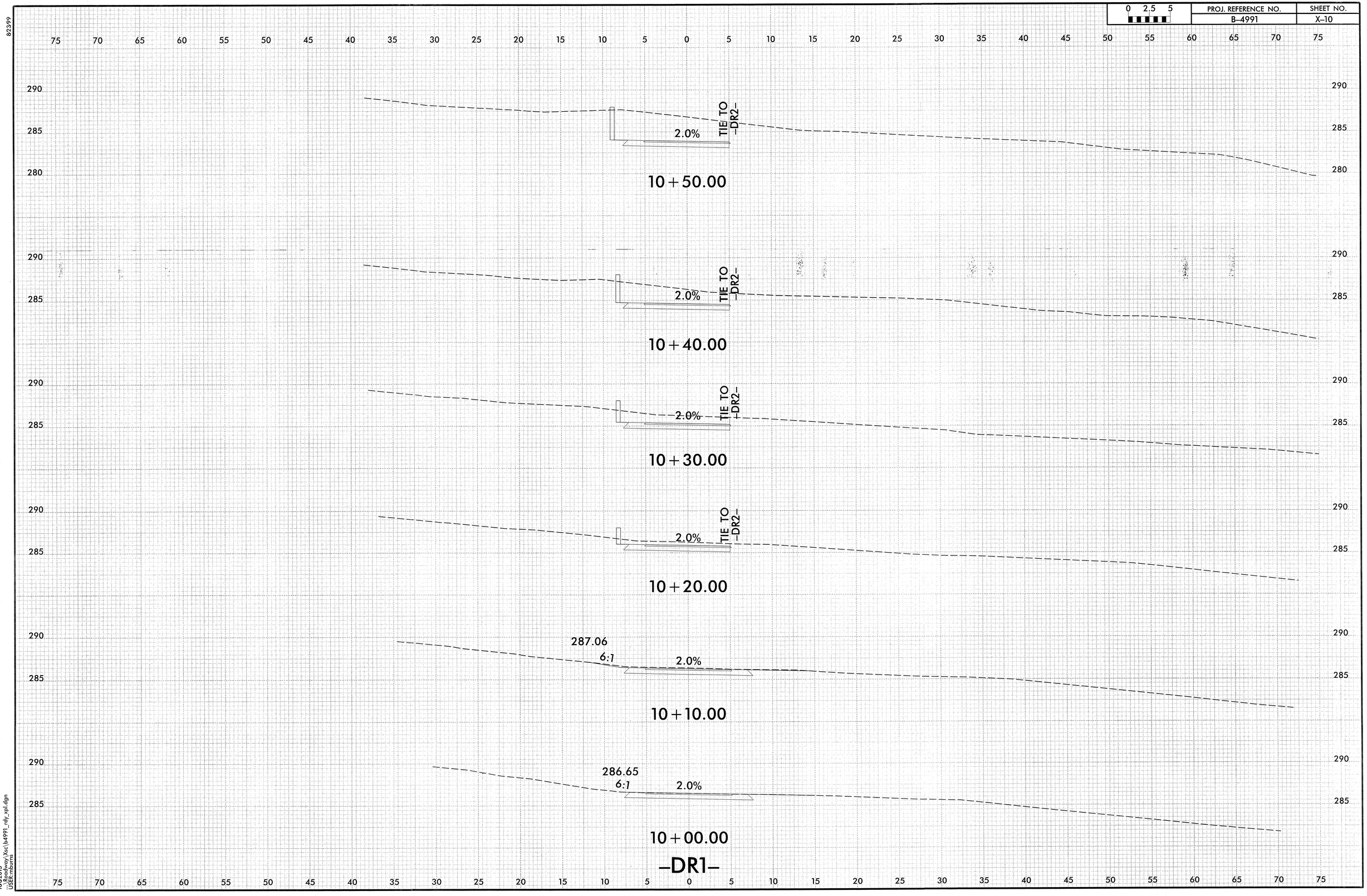

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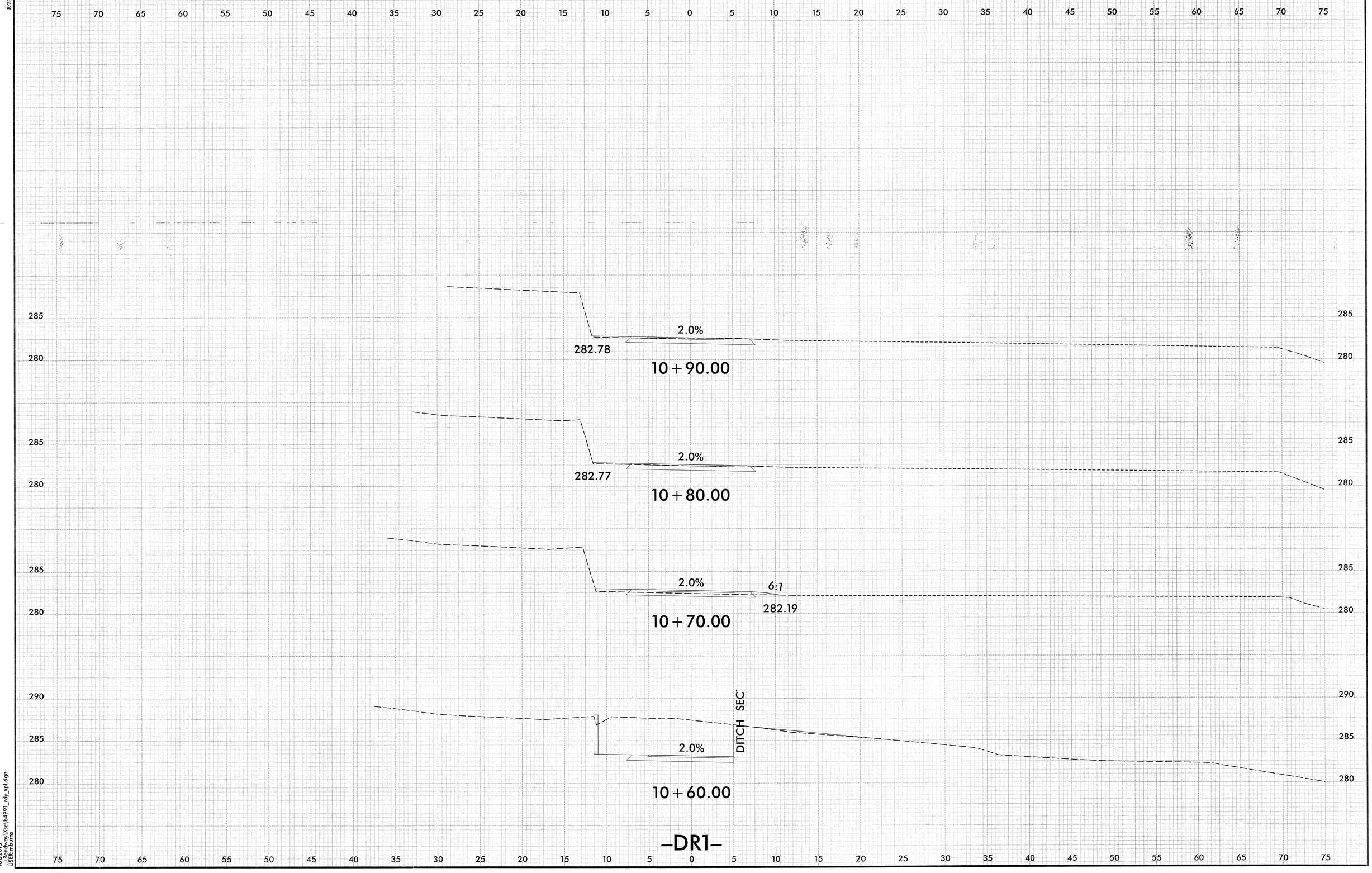

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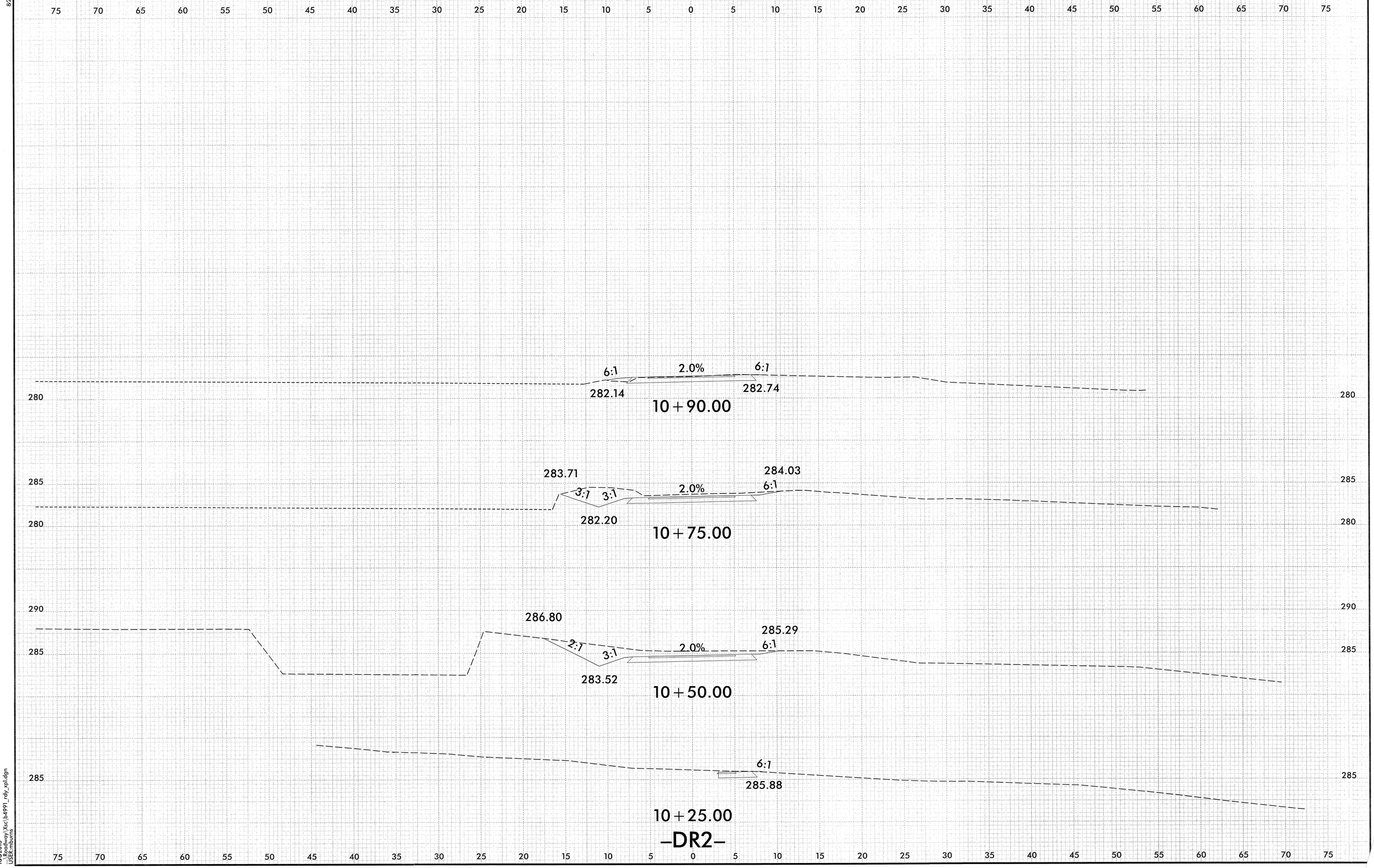

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