

RCB CULV. REP. - TRIPLE BOX
BRFN-078-5(5)--39-58

LOUISA CO.

LETTING DATE
10-19-2021

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 78
G Sheets	Survey Sheets
G.1 - 2	Reference Ties and Bench Marks
G.3	Horizontal Control Tab. & Alignment Coordinantes
J Sheets	Traffic Control and Staging Sheets
* J.1	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.2	Traffic Control Plan
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 3	Cast in Place Culvert Situation Plans
* V.4 - 6	Precast Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 12	Mainline Cross Sections
	* Color Plan Sheets



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
LOUISA COUNTY

RCB CULVERT REPLACEMENT - TRIPLE BOX

IA 78 CULVERT - HONEY CREEK 1.8 MI WEST OF US 61

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



For Project Location Map
Refer to Sheet A.2

DESIGN DATA RURAL			
2021	AADT	2300	V.P.D.
2041	AADT	2900	V.P.D.
2041	DHV	300	V.P.H.
	TRUCKS	12	%
	Total		
	Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	WADE D. HARRIS	Primary Signature Block

D4 PLAN - Date: June 22, 2021

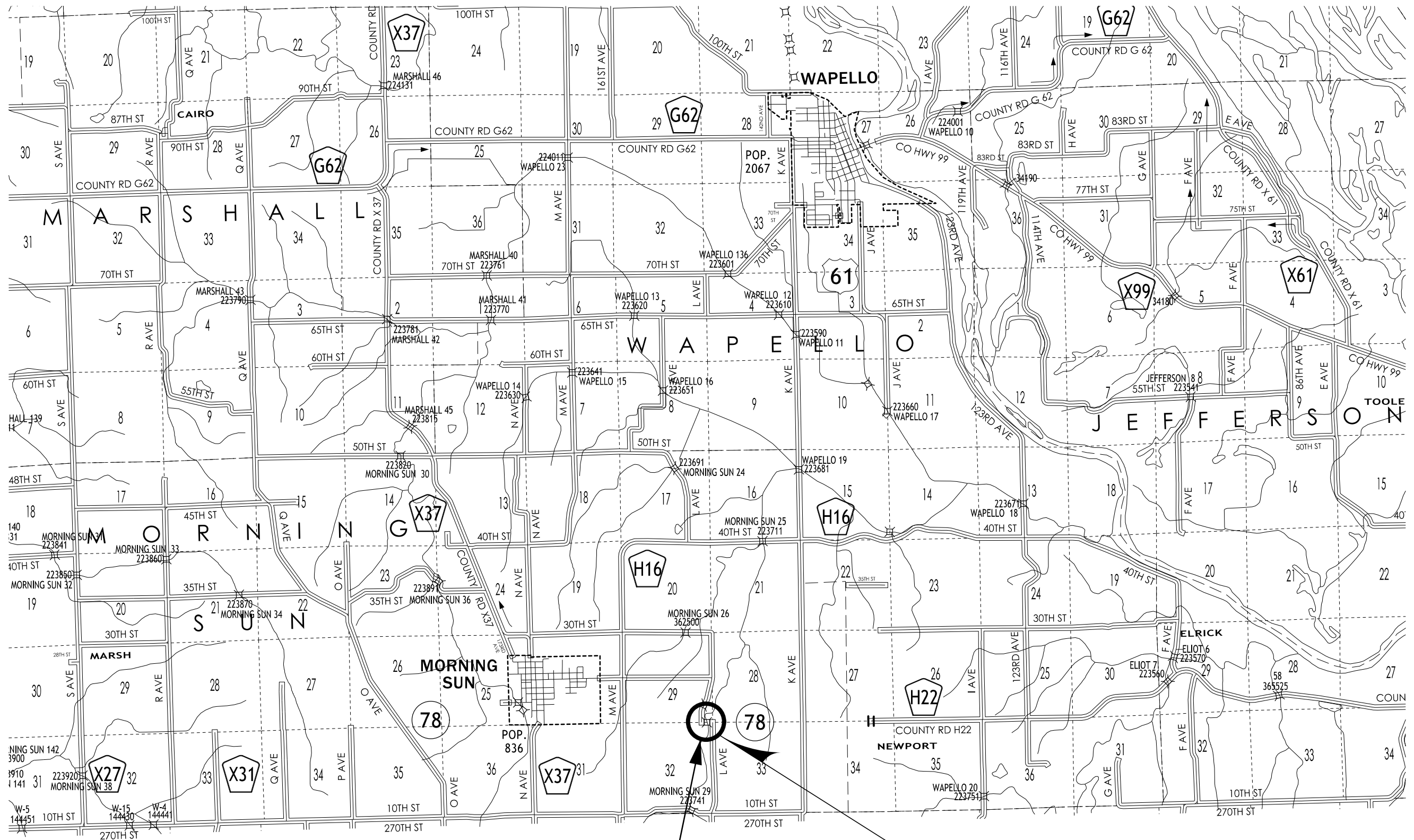
PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: Sept 20, 2019

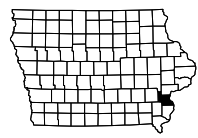
REVISIONS

TOTAL
30
PROJECT IDENTIFICATION NUMBER
17-58-078-010
PROJECT NUMBER
BRFN-078-5(5)--39-58
R.O.W. PROJECT NUMBER
STPN-078-5(6)--2J-58



PROJECT LOCATION

IA 78 BRIDGE REPLACEMENT
 1.8 MILES WEST OF US 61
 EXISTING BRIDGE
 FHWA NO.: 34080
 MAINT. NO.: 5856.9S078
 STA.: 112+86.5

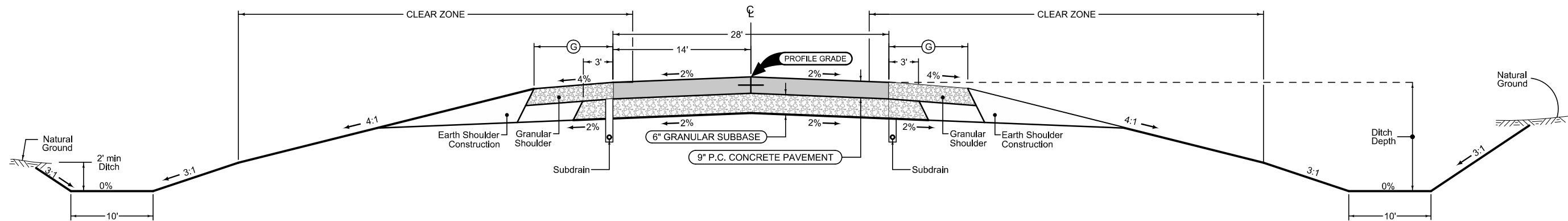


Granular Shoulder

2_G_SR_10-19-10		
STATION TO STATION		Ⓞ Feet
111+28.15	114+43.15	6

Granular Shoulder

2_G_SR_10-19-10		
STATION TO STATION		Ⓞ Feet
111+28.15	114+43.15	6



Mainline Jointing:
 Transverse joints: CD at 20' spacing
 Longitudinal joint: L-2

2P_10-19-10		
STATION TO STATION		
111+28.15	114+43.15	

See Tab 100-24 or 100-25 for pavement quantities.
 See Tab 112-9 for shoulder quantities.

IA 78

SURVEY SYMBOLS

- BBB Bottom of Bridge Beam
- BD Bridge Deck
- BL Topo Breakline
- BRG Bridge
- C Centerline BL of Road (ML or SR)
- CP Control Point
- ← DU Centerline Draw or Stream (Up)
- EG Edge of Gravel Road
- EP Edge of Paved Roads (ML or SR)
- FO1B Fiber Optic Co. 1 - Quality B
- × FW Wire Fence
- GDL Guard Rail Steel
- GR Ground Shot
- MIS Miscellaneous
- PIP Pipe Culvert
- PPA Power Pole Co. 1
- RR Centerline of Railroad Tracks
- SI Sign
- TW Top of Water
- WC Wild Card (Misc. Field Shot)
- RET Retaining Walls
- EL1B Electric line Co. 1 - Quality B

UTILITY LEGEND

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations
 QLA Quality Level A Highest guideline quality level
 QLD Quality Level D Lowest guideline quality level

- T1 - Mutual Tel. Company of Morning Sun - Quality D
- FO2 - Mutual Tel. Company of Morning Sun - Quality D
- FO - Mediacom - Quality D
- E1 - Alliant Energy - Quality A
- PPA Power Pole Alliant Energy
- TP Mutual Tel. Company of Morning Sun - Quality D

T1 - Mutual Telephone

Randy Foor
 Mutual Telephone
 (319) 868-7636 Work
 rfof@mutel.com
 28 W Division St.
 Morning sun, IA 52640

FO - Mediacom

Timothy H. Eagen
 Mediacom Communications
 Construction Supervisor
 (319) 208-1829 Work
 (319) 330-3679 Mobile
 teagan@mediacomcc.com
 3210 Division Street
 Burlington, IA 52301

FO2 - Mutual Telephone (Shown as T1 on plan)

Randy Foor
 Mutual Telephone
 (319) 868-7636 Work
 rfof@mutel.com
 28 W Division St.
 Morning sun, IA 52640

Power Pole - Alliant

Heather Dee
 Alliant Energy
 ROW
 (319) 786-8196 Work
 rerow@alliantenergy.com
 200 1st St. SE
 Cedar Rapids, IA 52401

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	Description
Green	(2)	Green	Existing Topographic Features and Labels
Blue	(1)	Blue	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Magenta	Existing Utilities
SHADING			
Design	Color No.		
Yellow	(4)	Yellow	Highlight for Critical Notes or Features
Red	(3)	Red	Delineates Restricted Areas
Lavender	(9)	Lavender	Temporary Pavement Shading
Gray, Light	(48)	Gray, Light	Proposed Pavement Shading
Gray, Med	(80)	Gray, Med	Proposed Granular Shading
Gray, Dark	(112)	Gray, Dark	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Brown, Light	Grading Shading
Tan	(8)	Tan	Proposed Sidewalk Shading
Blue, Light	(230)	Blue, Light	Proposed Sidewalk Landing Shading
Pink	(11)	Pink	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	Description
Green	(2)	Green	Existing Ground Line Profile
Blue	(1)	Blue	Proposed Profile and Annotation
Magenta	(5)	Magenta	Existing Utilities
Blue, Light	(230)	Blue, Light	Proposed Ditch Grades, Left
Black	(0)	Black	Proposed Ditch Grades, Median
Rust	(14)	Rust	Proposed Ditch Grades, Right

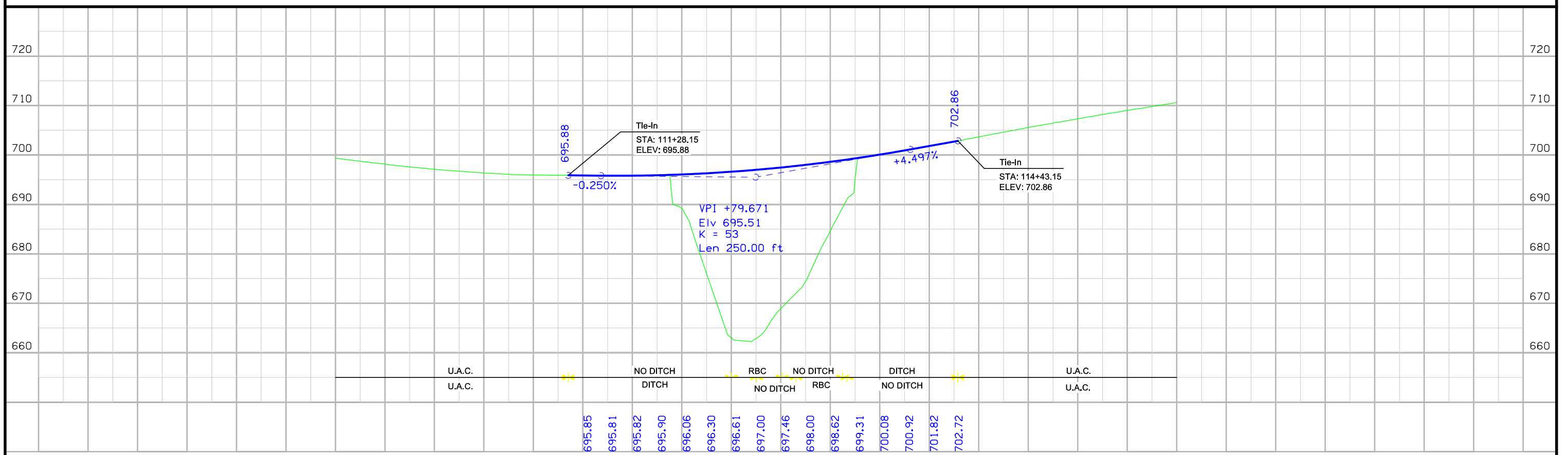
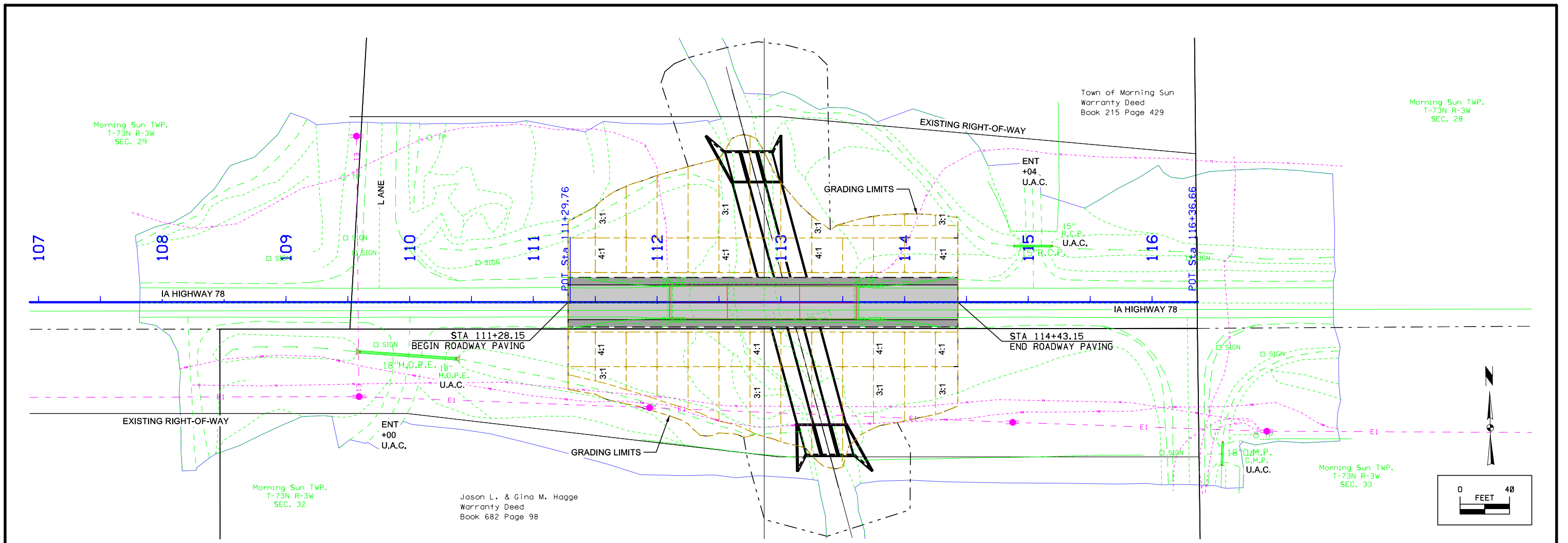
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- Access Control
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)



695.85	695.81	695.82	695.90	696.06	696.30	696.61	697.00	697.46	698.00	698.62	699.31	700.08	700.92	701.82	702.72
U.A.C.	U.A.C.	NO DITCH	DITCH	RBC	NO DITCH	RBC	NO DITCH	DITCH	NO DITCH	U.A.C.	U.A.C.				

Survey Information

County: Louisa
SAP 913.1
PIN: 17-58-078-010
Project Number: BRFN-078-5(5)--39-58
Location: Honey Creek 1.8 mi W of US 61
Type of Work: Bridge-Unspecified
Project Directory: 5807801017

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge replacement on Hwy 78 in Louisa County. Project datum and control information is provided by Design Survey Office. This project is a full DTM survey.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). Benchmarks were placed throughout the project using post processed static observations relative to laRTN Base Network. A minimum of 6hrs of data was simultaneously collected on each of these primary control points.

Des Moines Co GPS Control Pt. 231 was checked for vertical tolerance. The vertical difference is about 0.1 ft.
Van Buren County Control Pt. 161 was checked for vertical tolerance. The vertical difference is about 0.1 ft.

Horizontal Control

The project coordinate system for this survey is laRCS Zone 14 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00.

Des Moines Co GPS Control Pt. 231 was checked for horizontal tolerance. The horizontal difference is about 0.1 ft.
Des Moines Co GPS Control Pt. 244 was checked for horizontal tolerance. The horizontal difference is about 0.1 ft.

Point Name	Northing	Easting	Elevation	Feature Definition
244	6499964.17	24514319.10	747.58	BM Des Moines Co GPS Control Pt. Berntsen Top Security Rod Monument with a 2-1/2" dia. domed survey cap and permanent magnet encased in a 5" dia. PVC pipe with a NGS style aluminum access cover. 30ft S of 270th St, 160ft E of 140th Av. Near the NW corner Sec 3 T72N R3W.

231	6500326.83	24498396.85	764.11	BM Des Moines Co GPS Control Pt. Berntsen Top Security Rod Monument with a 2-1/2" dia. domed survey cap and permanent magnet encased in a 5" dia. PVC pipe with a NGS style aluminum access cover. 50ft N of 270th St, 80ft W of Morning Sun Rd. Near the SE corner of Sec 36 T73N R4W.
-----	------------	-------------	--------	---

301	6505519.39	24507173.36	733.23	Feno1 Monument stamped #1. 59.5ft N. of centerline IA78, 18ft E. of service power pole, and 253ft E. of centerline drive leading N. 4in below the surface.
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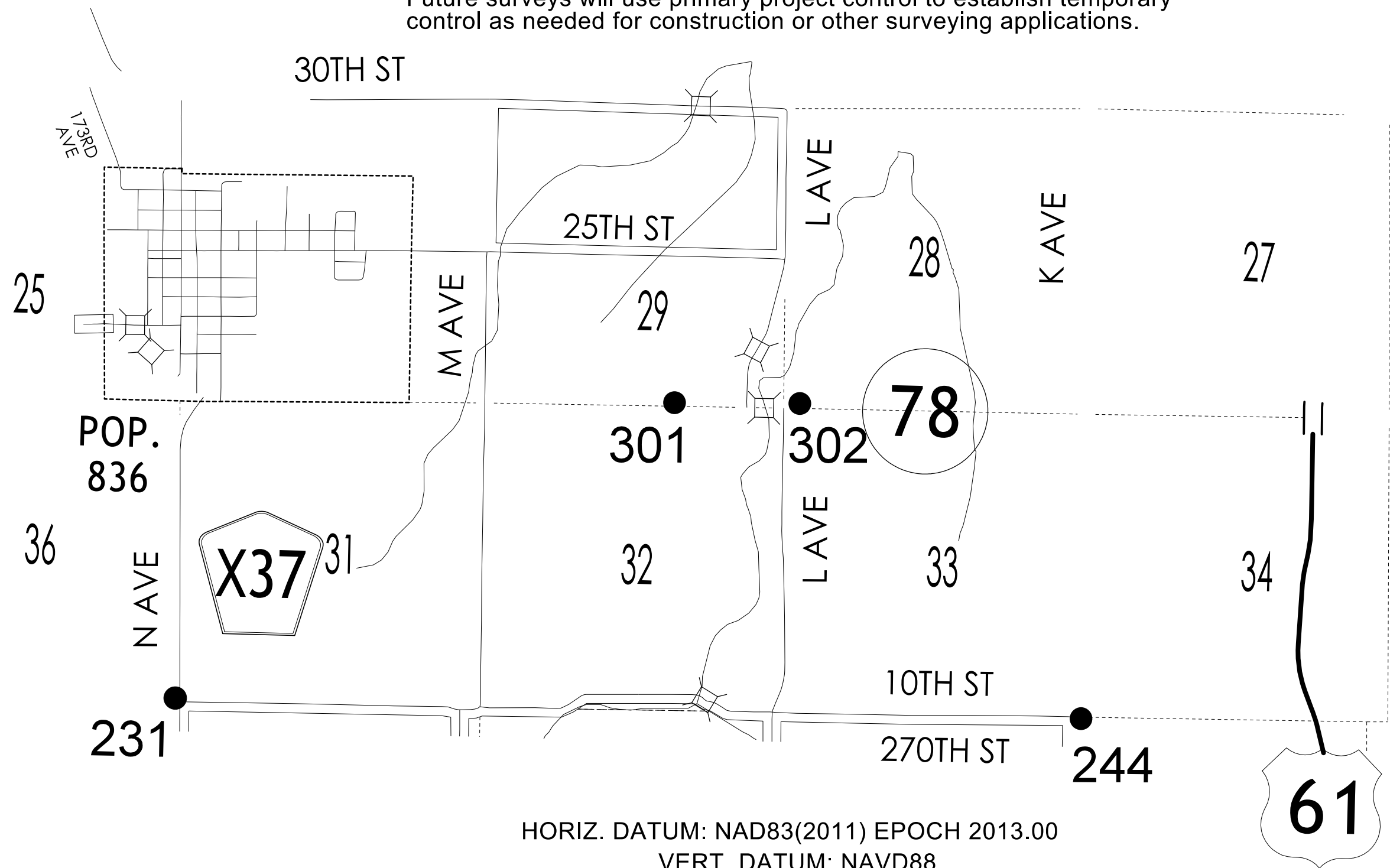
302	6505504.80	24509375.81	730.77	Feno2 Monument stamped #2. 89.5ft N. of centerline IA78 and 213ft W. of centerline of drive #14912 leading N. 4in below the surface.
-----	------------	-------------	--------	--

Alignment Information

The horizontal alignment for this survey was provided by the IDOT district 5 land survey office in Fairfield, Iowa.

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points
 Primary control is for use with RTK base stations and for RTN validation.
 Future surveys will use primary project control to establish temporary
 control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 14

Coordinate listing from next sheet will be used with 1aRTN for monument
 recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 14

Point Name	Northing	Easting	Elevation	Feature Definition
244	6499964.17	24514319.10	747.58	BM Des Moines Co GPS Control Pt. Berntsen Top Security Rod Monument with a 2-1/2" dia. domed survey cap and permanent magnet encased in a 5" dia. PVC pipe with a NGS style aluminum access cover. 30ft S of 270th St, 160ft E of 140th Av. Near the NW corner Sec 3 T72N R3W.
231	6500326.83	24498396.85	764.11	BM Des Moines Co GPS Control Pt. Berntsen Top Security Rod Monument with a 2-1/2" dia. domed survey cap and permanent magnet encased in a 5" dia. PVC pipe with a NGS style aluminum access cover. 50ft N of 270th St, 80ft W of Morning Sun Rd. Near the SE corner of Sec 36 T73N R4W.
301	6505519.39	24507173.36	733.23	Feno1 Monument stamped #1. 59.5ft N. of centerline IA78, 18ft E. of service power pole, and 253ft E. of centerline drive leading N. 4in below the surface.
302	6505504.80	24509375.81	730.77	Feno2 Monument stamped #2. 89.5ft N. of centerline IA78 and 213ft W. of centerline of drive #14912 leading N. 4in below the surface.

ALIGNMENT COORDINATES

This Data Entry Sheet fills Tab 101-16 effective 10-20-09

Name	Location	Point on Tangent		Begin Spiral		Begin Curve		Simple Curve PI or Master PI of SCS		End Curve		End Spiral				
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
ML0781	IA 78							90+07.90	6505474.11	24506467.16						
ML0783	IA 78							111+29.76	6505431.17	24508588.59						
ML0784	IA 78							116+36.66	6505420.92	24509095.38						

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

N

Morning Sun TWP.
T-73N R-3W
SEC. 29

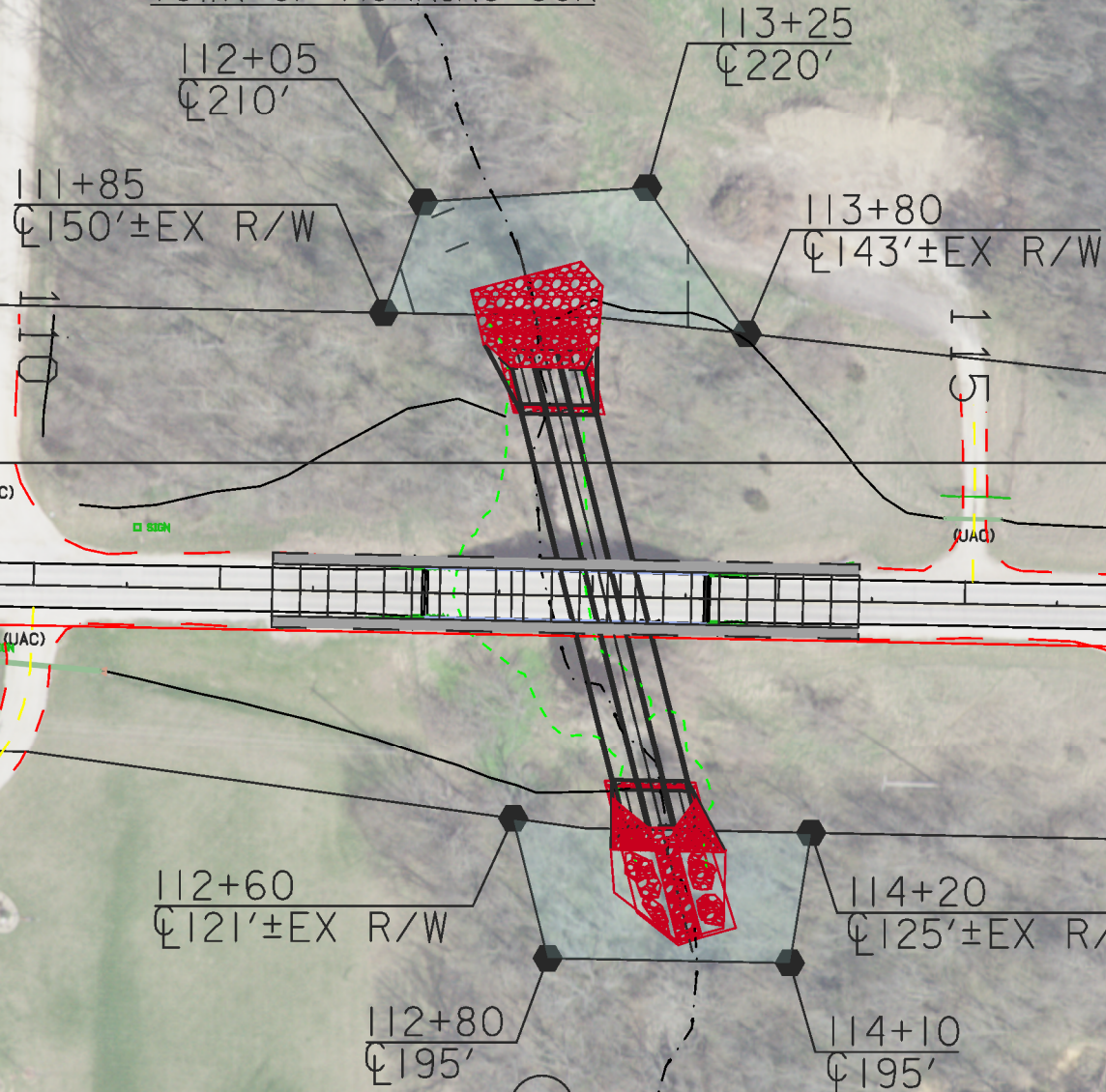
TOWN OF MORNING SUN

Sect. No. 28

Sect. No. 33

JASON L AND GINA M HAGGE

Sect. No. 33



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-078-5(6)--2J-58	
Plan Date: 10/07/19	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

**CROSS SECTION VIEW COLOR LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

**CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

	Pavement Removal		Proposed Granular Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		Permanent Barrier Rail
			Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

**PLAN VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

	Channelizing Device		Crash Cushion (Temp or Perm)
	Drum		Traffic Signal
	Temporary Lane Separator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout		Lane Identification

NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

**TRAFFIC CONTROL
AND
STAGING
LEGEND AND SYMBOL
INFORMATION SHEET**

(COVERS SHEET SERIES J)

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

This Data Entry Sheet fills Tab 111-01 effective 04-17-12

Project	Type of Work

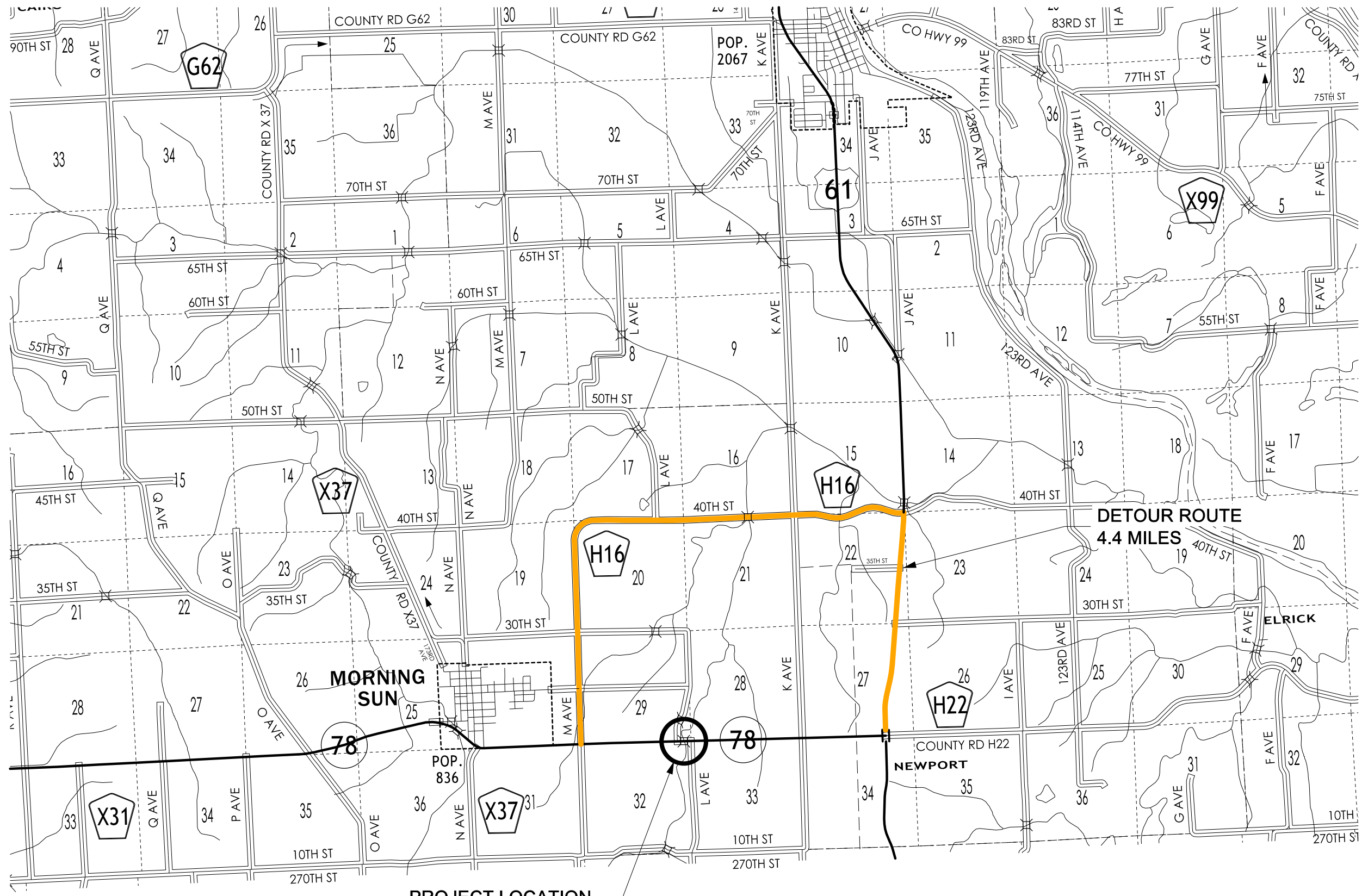
511 TRAVEL RESTRICTIONS

This Data Entry Sheet fills Tab 108-25 effective 10-21-14

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks

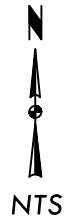
TRAFFIC CONTROL PLAN

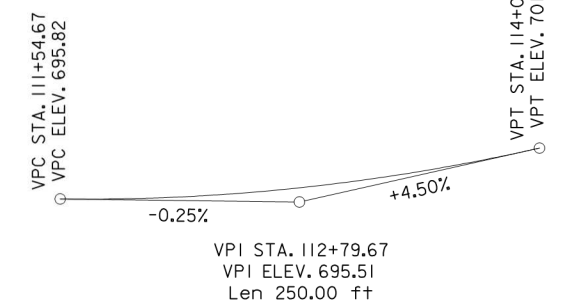
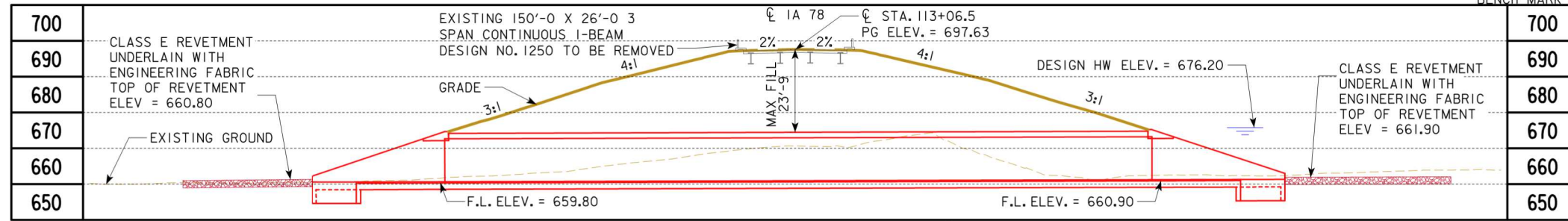
This Data Entry Sheet fills Tab 108-23A effective 08-01-08



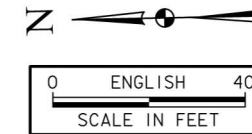
DETOUR ROUTE
4.4 MILES

DETOUR ROUTE





LONGITUDINAL SECTION ALONG CL CULVERT



PROPOSED PROFILE GRADE IA 78

NOTES:

1. EXISTING 150'x26' CONTINUOUS I-BEAM BRIDGE DESIGN NO. 1250.
2. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
3. FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
4. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.

HYDRAULIC DATA

DRAINAGE AREA = 6.46 SQ.MI.
 $Q_{50} = 2,940$ CFS
 HW ELEV. = 676.20
 STREAM SLOPE = 23.3 FT./MI.
 $Q_{100} = 3,500$ cfs HW. EL. = 677.50
 $Q_{500} = 5,000$ cfs HW. EL. = 681.40

UTILITIES LEGEND:

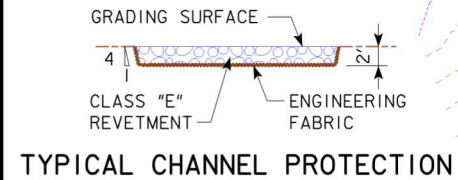
- FO - - - FIBER OPTIC LINE MEDIACOM
- E1 - - - OVERHEAD ELECTRIC ALLIANT ENERGY
- T - - - TELEPHONE LINE MUTUAL TELE CO OF MORNING SUN

LOCATION

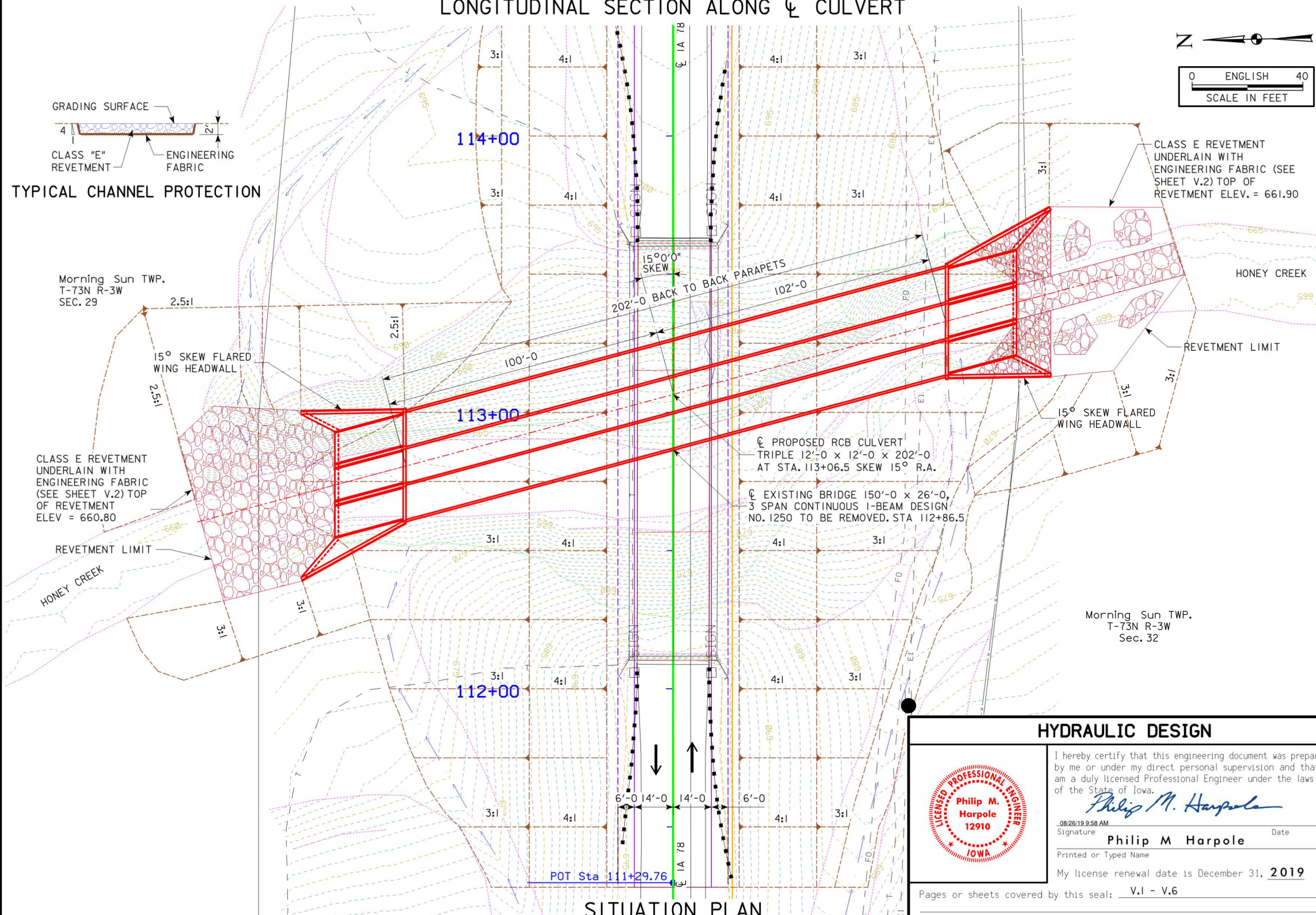
IA78 OVER HONEY CREEK
 T-73N R-3W
 SECTION 29
 MORNING SUN TOWNSHIP
 LOUISA COUNTY
 FHWA NO. 34081
 BRIDGE MAINT. NO. 5856.9S078
 LATITUDE 41.088325°
 LONGITUDE -91.218283°

TRAFFIC ESTIMATE

2021 AADT	2290	V.P.D.
2041 AADT	2880	V.P.D.
2041 DHV		V.P.H.
TRUCKS	12	%
TOTAL DESIGN ESALS		



TYPICAL CHANNEL PROTECTION



SITUATION PLAN

HYDRAULIC DESIGN

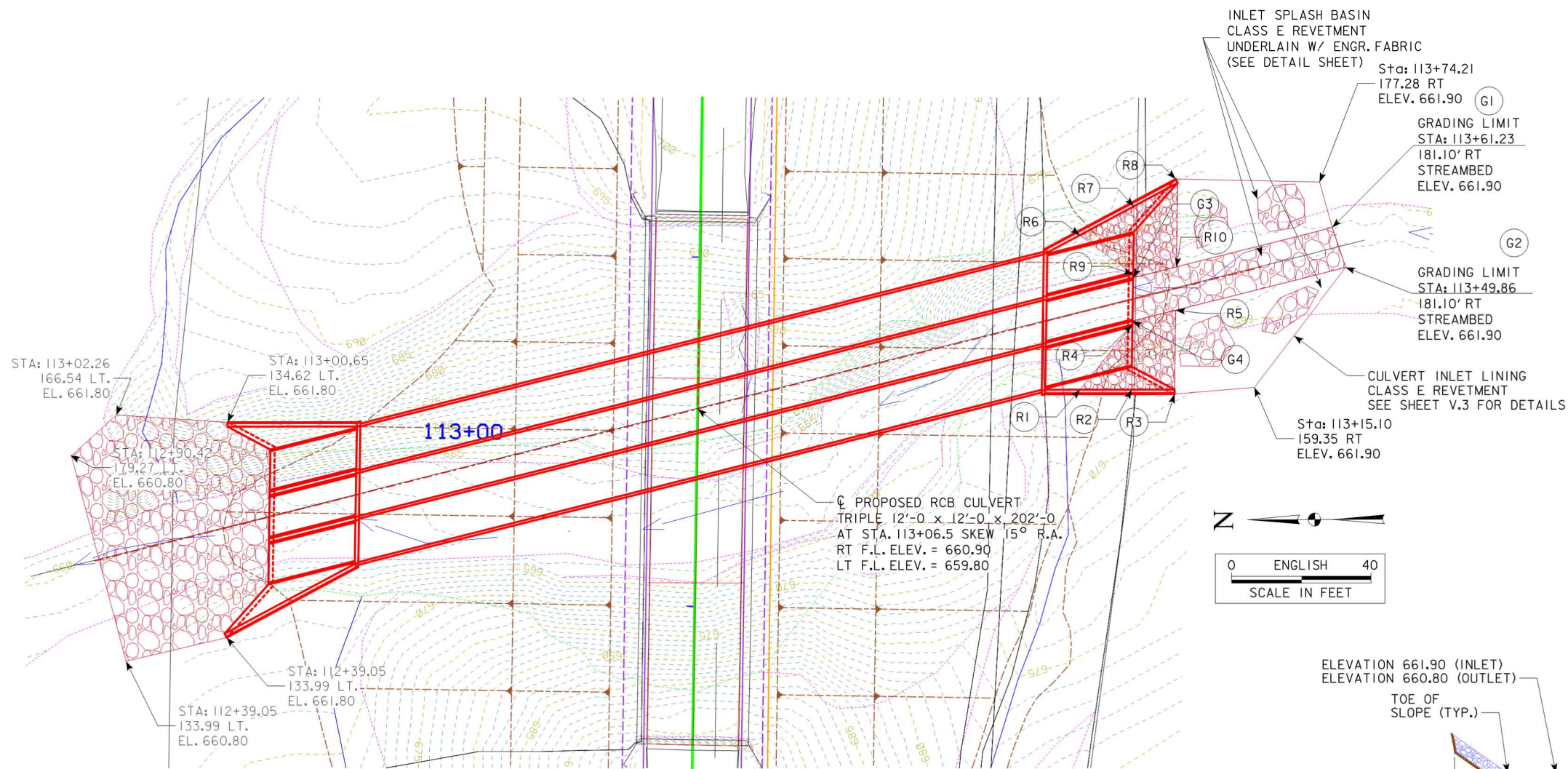
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Philip M. Harpole
 Signature Date
 Philip M Harpole
 Printed or Typed Name
 My license renewal date is December 31, 2019

Pages or sheets covered by this seal: V.1 - V.6



DESIGN FOR 15° SKEW R.A.
**TRIPLE 12'-0 X 12'-0 X 202'-0
 CAST IN PLACE RCB CULVERT**
SITUATION PLAN
 STATION 113+06.5 AUGUST 2019
LOUISA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 6 FILE NO. 31699 DESIGN NO. 121

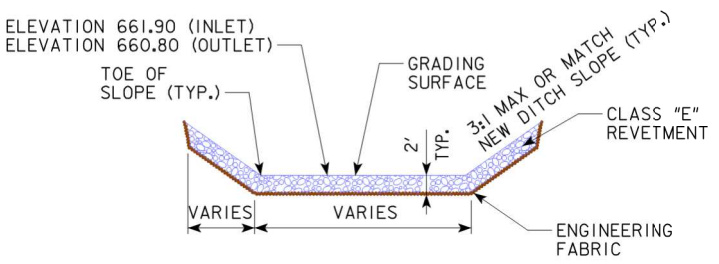
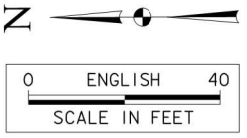


SITE PLAN

- CHANNEL GRADING CONTROL:**
- G1 TOE OF SLOPE OF SPLASH BASIN; BEGIN CHANNEL GRADING.
 - G2 TOE OF SLOPE OF SPLASH BASIN; BEGIN CHANNEL GRADING.
 - G3 STA: 113+45.99, 124.20' RT., TOE OF SLOPE OF SPLASH BASIN; END CHANNEL GRADING, TOP OF REVETMENT EL. 661.90
 - G4 STA: 113+33.56, 124.19' RT., TOE OF SLOPE OF SPLASH BASIN; END CHANNEL GRADING, TOP OF REVETMENT EL. 661.90

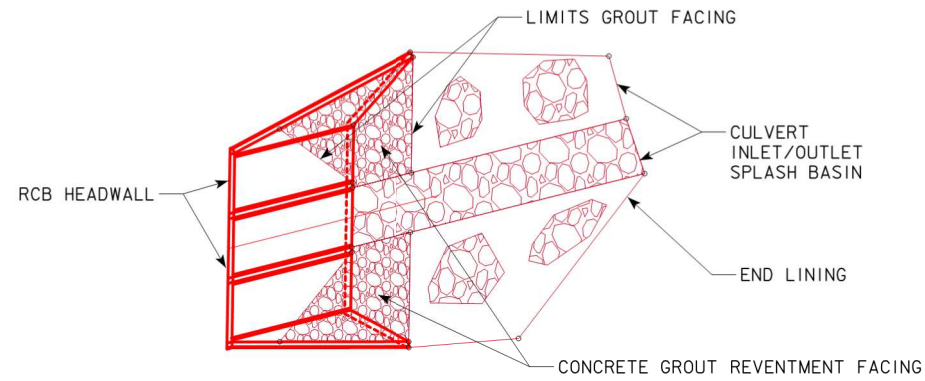
- REVETMENT LAYOUT:**
- R1 END CULVERT INLET LINING AT FACE WALL, RCB HDWL. STA: 113+13.66, 109.46' RT., EL. 661.90
 - R2 CULVERT INLET LINING, STA: 113+13.91, 124.29' RT., EL. 664.90
 - R3 BEGIN CULVERT INLET LINING, STA: 113+12.86, 136.55' RT., EL. 661.90
 - R4 CULVERT INLET LINING, STA: 113+32.53, 124.19' RT., EL. 661.90
 - R5 BEGIN CULVERT INLET LINING, STA: 113+36.86, 136.53' RT., EL. 661.90
 - R6 END CULVERT INLET LINING AT FACE WALL, RCB HDWL. STA: 113+57.95, 108.75' RT., EL. 661.90
 - R7 CULVERT INLET LINING, STA: 113+66.47, 124.09' RT., EL. 664.90
 - R8 BEGIN CULVERT INLET LINING, STA: 113+74.47, 135.93' RT., EL. 661.90
 - R9 CULVERT INLET LINING, STA: 113+47.02, 124.20' RT., EL. 661.90
 - R10 BEGIN CULVERT INLET LINING, STA: 113+49.29, 136.53' RT., EL. 661.90

NOTE: ALL REVETMENT ELEVATIONS ARE TO TOP OF ROCK (GRADING SURFACE).



CLASS E REVETMENT INLET AND OUTLET SPLASH BASIN

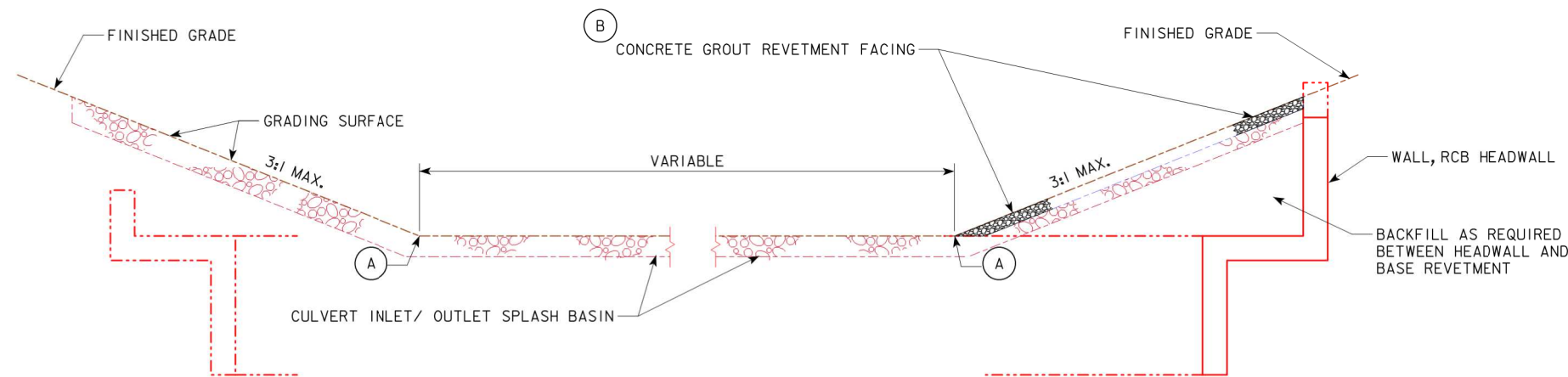
DESIGN FOR 15° SKEW R.A.
TRIPLE 12'-0 X 12'-0 X 202'-0
CAST IN PLACE RCB CULVERT
SITUATION PLAN - SITE
 STATION 113+06.5 AUGUST 2019
LOUISA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 6 FILE NO. 31699 DESIGN NO. 121



LINING PLAN ADJACENT TO HEADWALL

ESTIMATED REVENTMENT QUANTITIES				
LOCATION	REVENTMENT CL. "E" (TON)	CONCRETE GROUT (CY)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	405	18	317	220
OUTLET	363		372	227
TOTALS	768	18	689	447

REVENTMENT ESTIMATED AT 1.6 TON/CY
 CONCRETE GROUT FOR REVENTMENT ESTIMATED AT 0.20 CY/SY



LINING ADJACENT TO HEADWALL

LINING WITHIN HEADWALL LIMITS

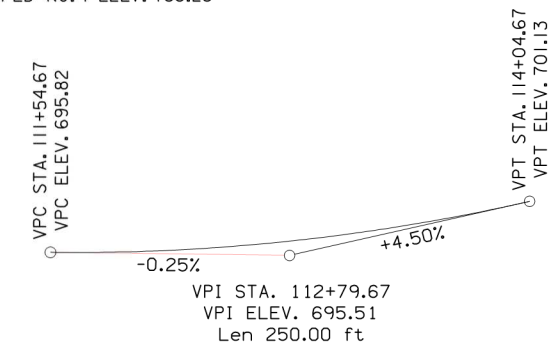
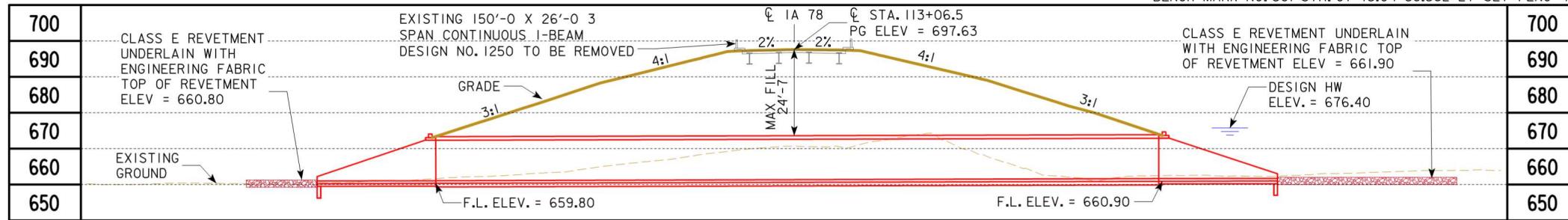
SECTION THRU INLET/OUTLET LINING

- (A) TOE OF SPLASH BASIN
- (B) CONCRETE GROUT FOR REVENTMENT FACING. THE PURPOSE OF THE GROUT IS TO FILL SURFACE VOIDS TO MINIMIZE SUBSTRATE FOR VEGETATIVE GROWTH. APPLY TO REVENTMENT SIDE AND END SLOPES WITHIN LIMITS OF RCB HEADWALL AS SHOWN.

GROUT PENETRATION TO 2/3 OF THE ROCK BLANKET DEPTH IS REQUIRED. FINISH THE GROUT SO THAT FACE STONES ARE LEFT EXPOSED FOR NO MORE THAN 3 IN.

DETAILS

DESIGN FOR 15° SKEW R.A.
TRIPLE 12'-0 X 12'-0 X 202'-0
CAST IN PLACE RCB CULVERT
DETAILS
 STATION 113+06.5 AUGUST 2019
LOUISA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 6 FILE NO. 31699 DESIGN NO. 121



LONGITUDINAL SECTION ALONG CL CULVERT

PROPOSED PROFILE GRADE IA 78

NOTES:

1. EXISTING 150'x26' CONTINUOUS I-BEAM BRIDGE DESIGN NO. 1250.
2. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
3. FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
4. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.

HYDRAULIC DATA

DRAINAGE AREA = 6.46 SQ.MI.
 Q₅₀ = 2,940 CFS
 HW ELEV. = 676.40
 STREAM SLOPE = 23.3 FT./MI.
 Q₁₀₀ = 3,500 cfs HW. EL. = 677.90
 Q₅₀₀ = 5,000 cfs HW. EL. = 682.20

UTILITIES LEGEND:

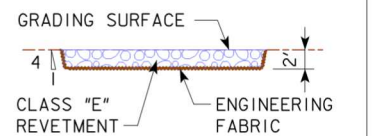
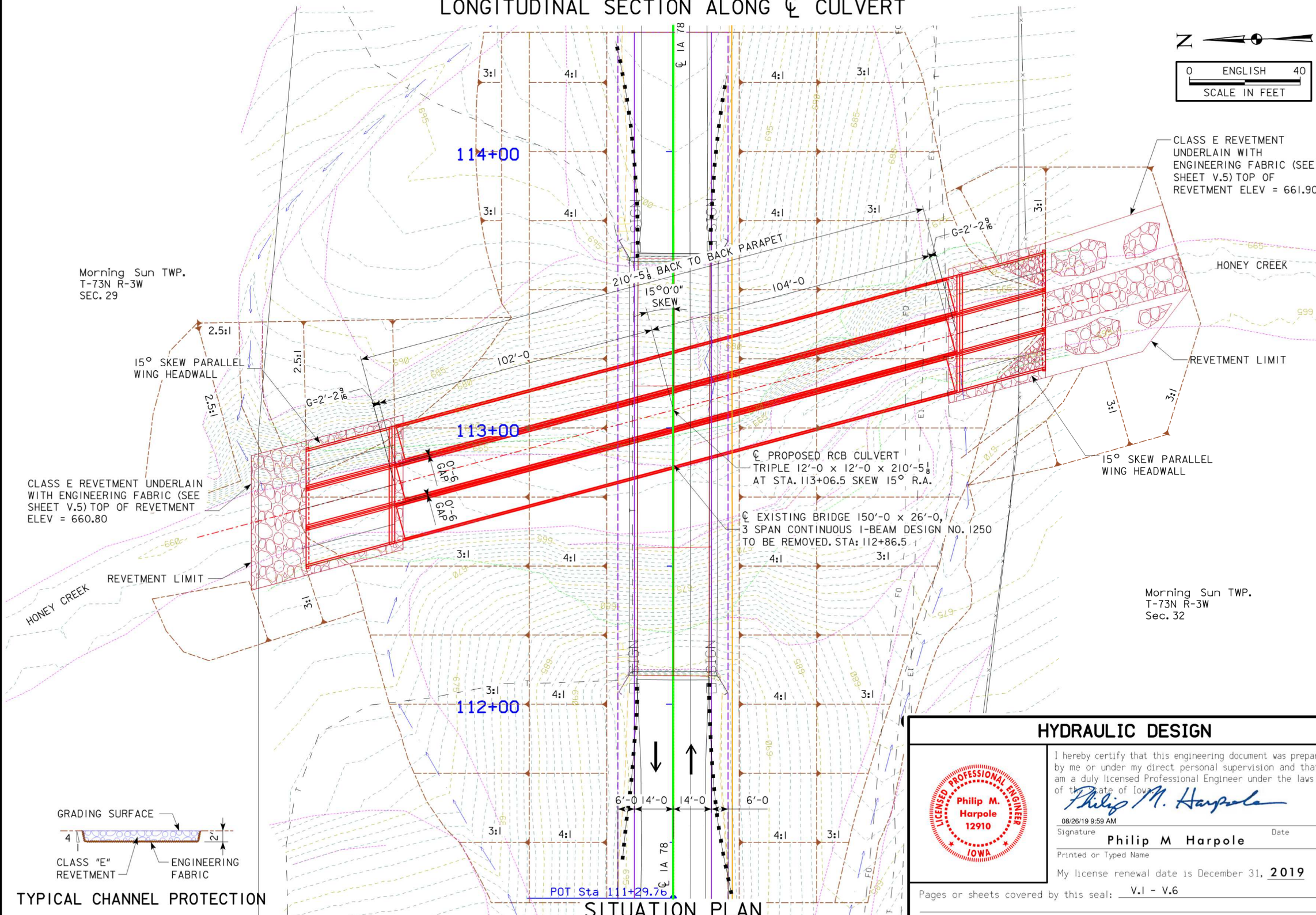
- FO - FIBER OPTIC LINE MEDIACOM
- EI - OVERHEAD ELECTRIC ALLIANT ENERGY
- T - TELEPHONE LINE MUTUAL TELE CO OF MORNING SUN

LOCATION

IA78 OVER HONEY CREEK
 T-73N R-3W
 SECTION 29
 MORNING SUN TOWNSHIP
 LOUISA COUNTY
 FHWA NO. 34081
 BRIDGE MAINT. NO. 5856.9S078
 LATITUDE 41.088325°
 LONGITUDE -91.218283°

TRAFFIC ESTIMATE

2021 AADT	2290	V.P.D.
2041 AADT	2880	V.P.D.
2041 DHV		V.P.H.
TRUCKS	12	%
TOTAL DESIGN ESALS		



TYPICAL CHANNEL PROTECTION

HYDRAULIC DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

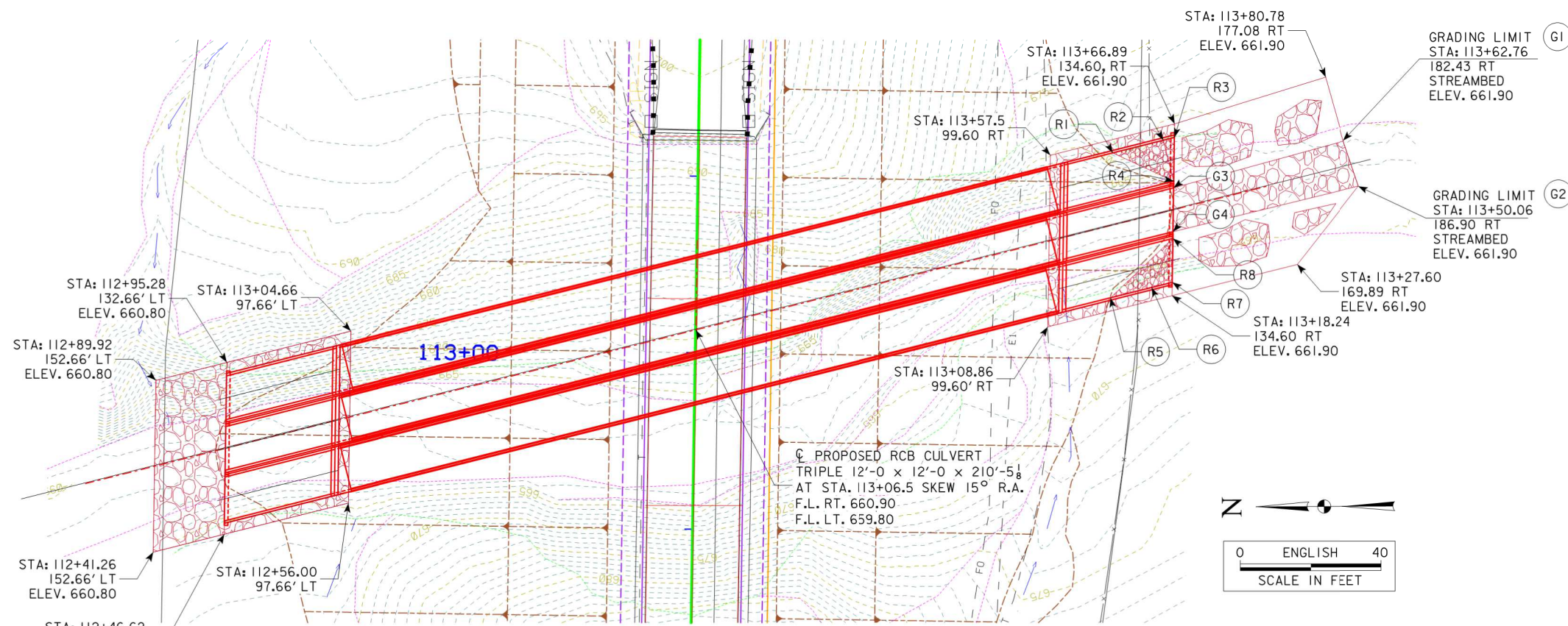
Philip M. Harpole
 08/26/19 9:59 AM
 Signature Philip M Harpole Date
 Printed or Typed Name
 My license renewal date is December 31, 2019

Pages or sheets covered by this seal: V.1 - V.6

DESIGN FOR 15° SKEW R.A.
TRIPLE 12'-0 X 12'-0 X 210'-5 1/8
PRECAST RCB CULVERT

SITUATION PLAN
 STATION 113+06.5 AUGUST 2019
LOUISA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 4 OF 6 FILE NO. 31699 DESIGN NO. 121



SITE PLAN

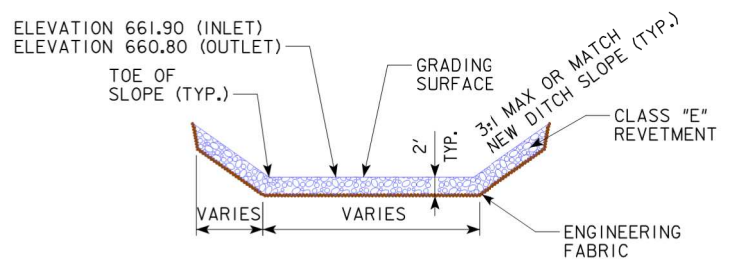
CHANNEL GRADING CONTROL:

- G1 TOE OF SLOPE OF SPLASH BASIN; BEGIN CHANNEL GRADING.
- G2 TOE OF SLOPE OF SPLASH BASIN; BEGIN CHANNEL GRADING.
- G3 STA: 113+48.78, 134.60 RT., TOE OF SLOPE OF SPLASH BASIN; END CHANNEL GRADING, TOP OF REVETMENT EL. 661.90
- G4 STA: 113+36.35, 134.60 RT., TOE OF SLOPE OF SPLASH BASIN; END CHANNEL GRADING, TOP OF REVETMENT EL. 661.90

REVETMENT LAYOUT:

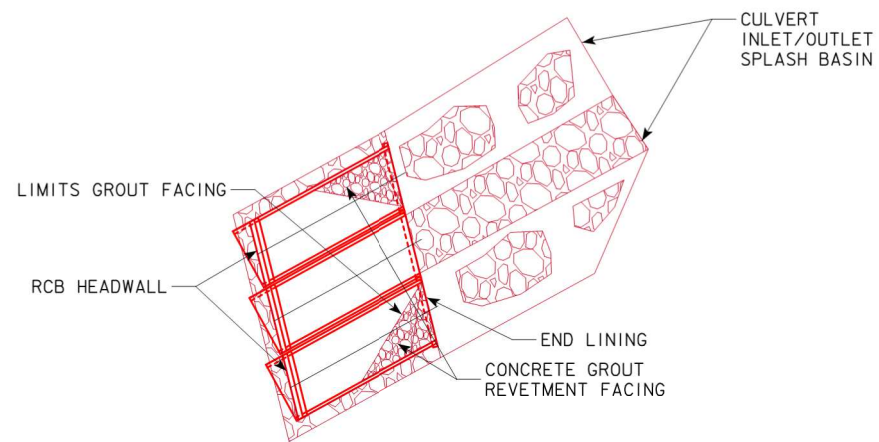
- R1 END CULVERT INLET LINING AT FACE WALL, RCB HDWL. STA: 113+58.44, 117.21 RT., EL. 661.90
- R2 CULVERT INLET LINING, STA: 113+62.26, 131.47 RT., EL. 664.90
- R3 BEGIN CULVERT INLET LINING, STA: 113+63.10, 134.60 RT., EL. 661.90
- R4 CULVERT INLET LINING, STA: 113+50.67, 134.60 RT, EL. 661.90
- R5 BEGIN CULVERT INLET LINING, STA: 113+17.38, 117.21 RT, EL. 661.90
- R6 END CULVERT INLET LINING AT FACE WALL, RCB HDWL. STA: 113+20.49, 128.80 RT, EL. 664.90
- R7 CULVERT INLET LINING, STA: 113+22.03, 134.60 RT, EL. 661.90
- R8 BEGIN CULVERT INLET LINING, STA: 113+34.46, 134.60 RT., EL. 661.90

NOTE: ALL REVETMENT ELEVATIONS ARE TO TOP OF ROCK (GRADING SURFACE).



CLASS E REVETMENT INLET AND OUTLET SPLASH BASIN

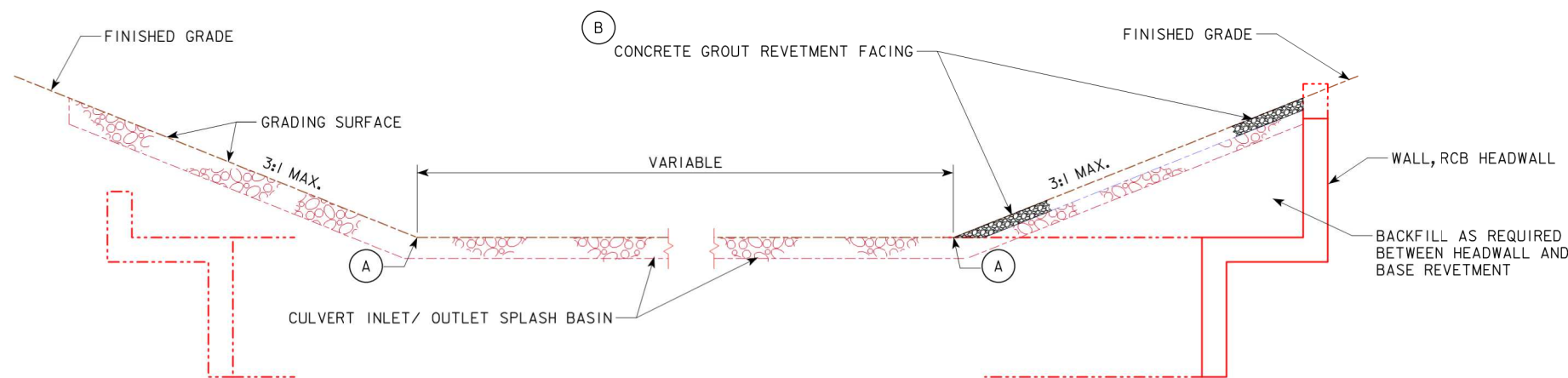
DESIGN FOR 15° SKEW R.A.
TRIPLE 12'-0 X 12'-0 X 210'-5 1/8
PRECAST RCB CULVERT
SITUATION PLAN - SITE
 STATION 113+06.5 AUGUST 2019
LOUISA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 5 OF 6 FILE NO. 31699 DESIGN NO. 121



LINING PLAN ADJACENT TO HEADWALL

ESTIMATED REVELTMENT QUANTITIES				
LOCATION	REVELTMENT CL. "E" (TON)	CONCRETE GROUT (CY)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	347	5	358	200
OUTLET	158		193	98
TOTALS	505	5	551	298

REVELTMENT ESTIMATED AT 1.6 TON/CY
 CONCRETE GROUT FOR REVELTMENT ESTIMATED AT 0.20 CY/SY



LINING ADJACENT TO HEADWALL

LINING WITHIN HEADWALL LIMITS

SECTION THRU INLET/OUTLET LINING

- (A) TOE OF SPLASH BASIN
- (B) CONCRETE GROUT FOR REVELTMENT FACING. THE PURPOSE OF THE GROUT IS TO FILL SURFACE VOIDS TO MINIMIZE SUBSTRATE FOR VEGETATIVE GROWTH. APPLY TO REVELTMENT SIDE AND END SLOPES WITHIN LIMITS OF RCB HEADWALL AS SHOWN.

GROUT PENETRATION TO 2/3 OF THE ROCK BLANKET DEPTH IS REQUIRED. FINISH THE GROUT SO THAT FACE STONES ARE LEFT EXPOSED FOR NO MORE THAN 3 IN.

DETAILS

DESIGN FOR 15° SKEW R.A.
TRIPLE 12'-0 X 12'-0 X 210'-5¹/₈
PRECAST RCB CULVERT
DETAILS
 STATION 113+06.5 AUGUST 2019
LOUISA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 6 OF 6 FILE NO. 31699 DESIGN NO. 121

LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- - - - - - Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- - - - - Additional Topsoil Removal
- Subgrade Treatment
- - - - - Granular Shoulder
- Pavement
- - - - - Existing Pipe\R/CB
- Proposed Pipe\R/CB
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- TS————— Topsoil (Class 10)
- SLOPE DRESSING — Slope Dressing Only
- CL 10————— Class 10 Materials
- SEL L0————— Select Loams And Clay-Loams
- SEL SA————— Select Sand
- UNS A————— Unsuitable Type A Disposal
- UNS B————— Unsuitable Type B Disposal
- UNS C————— Unsuitable Type C Disposal
- SHALE————— Shale
- WASTE————— Waste
- B&W LS————— Broken and Weathered Rock
- ROCK————— Solid Rock
- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

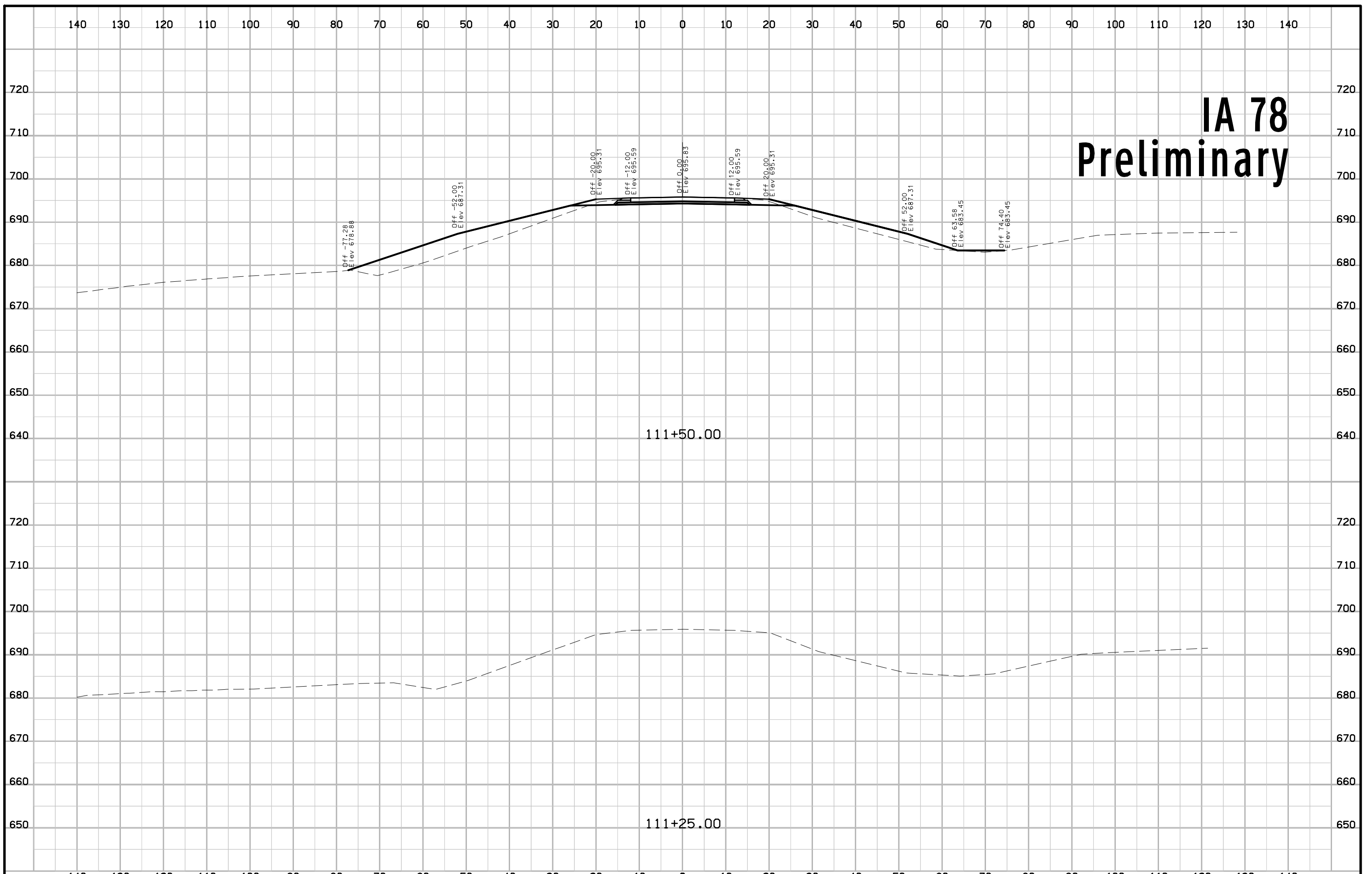
SYMBOL LEGEND OF CROSS SECTION SHEETS

- Existing ROW
|
Existing Right-of-Way Limit
- Proposed ROW
|
Proposed Right-of-Way Limit
- Temporary ROW
|
Temporary Right-of-Way Limit

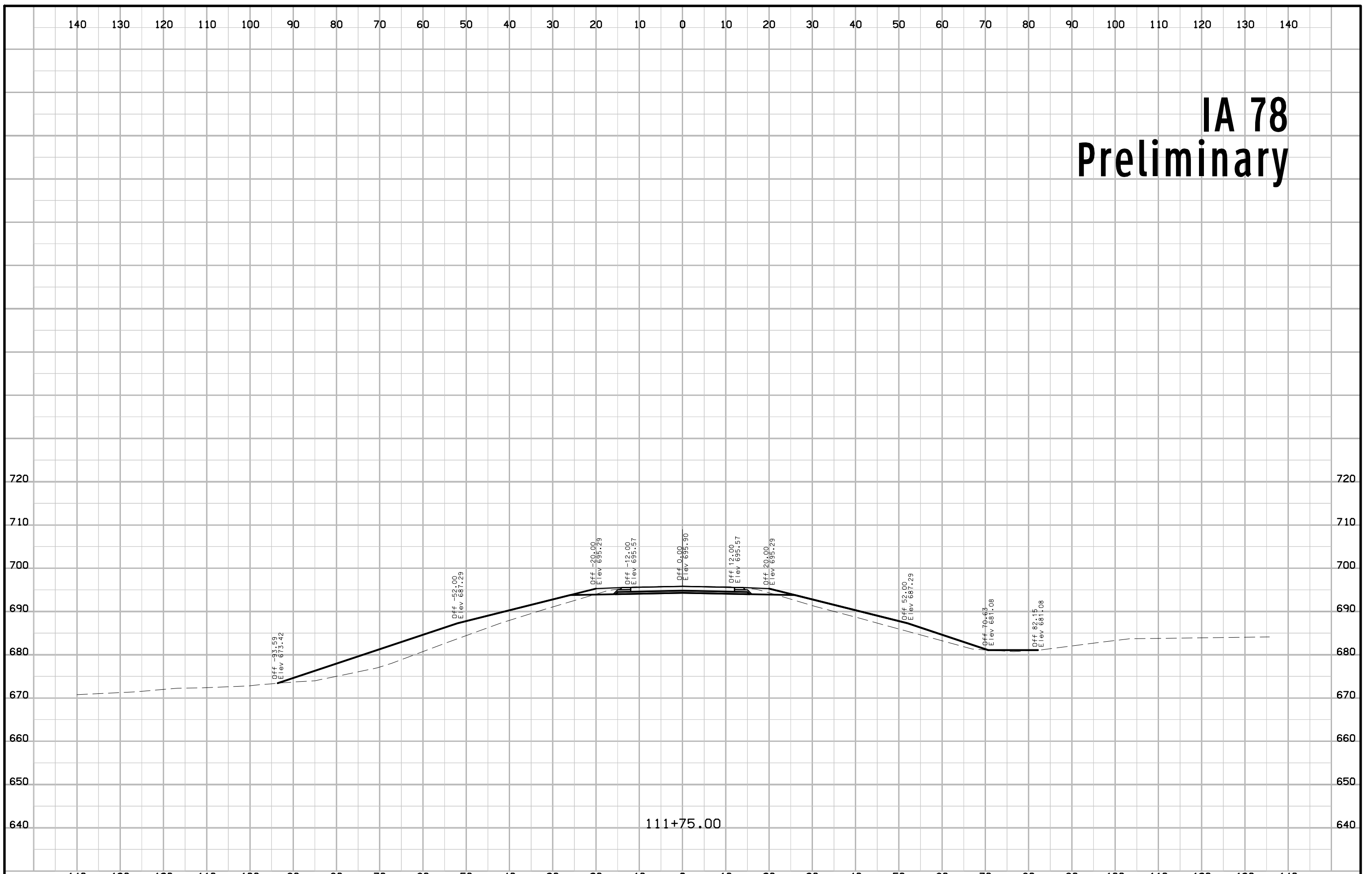
**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

(COVERS SHEET SERIES W, X, Y, & Z)

IA 78 Preliminary

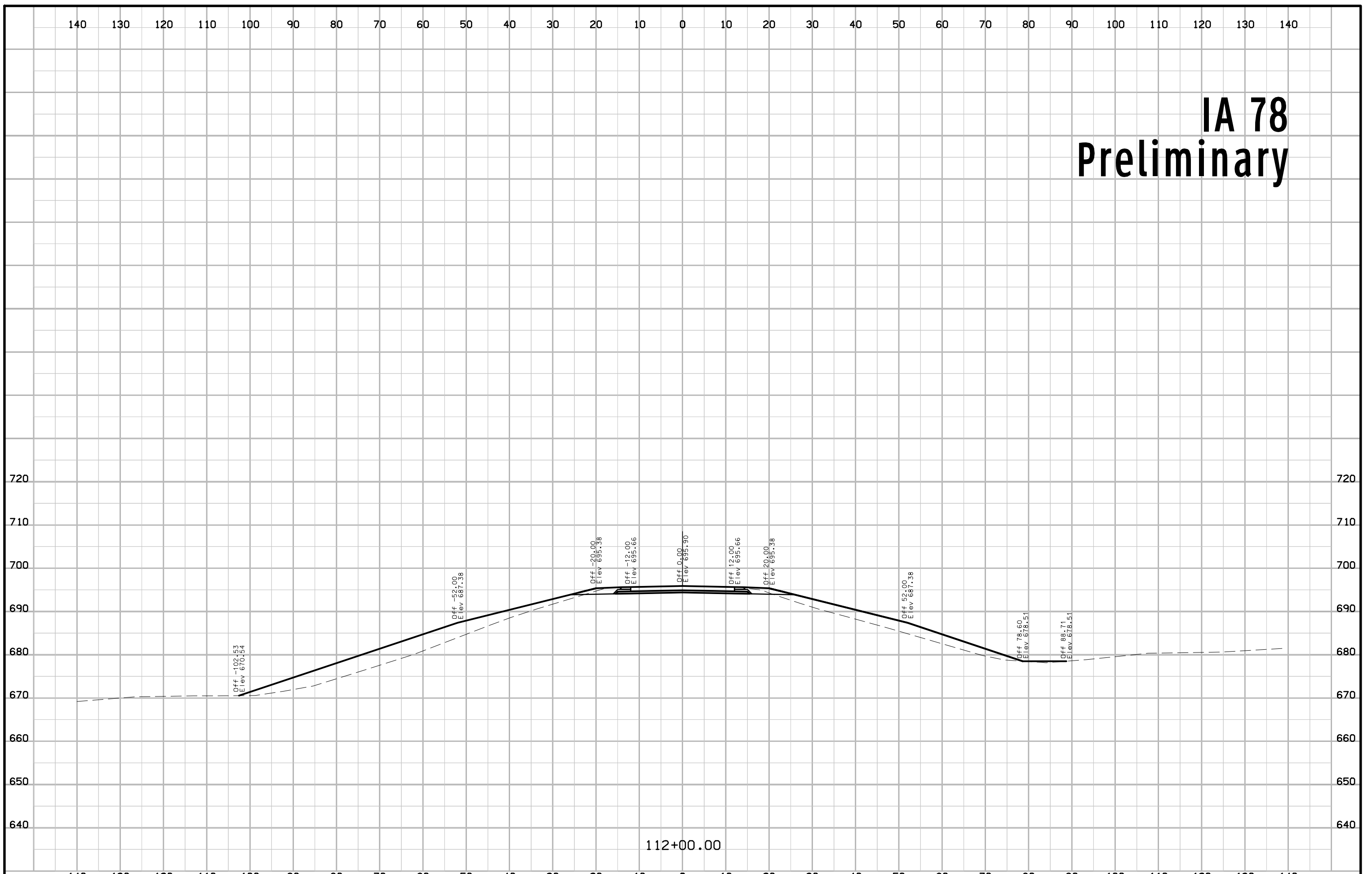


IA 78 Preliminary



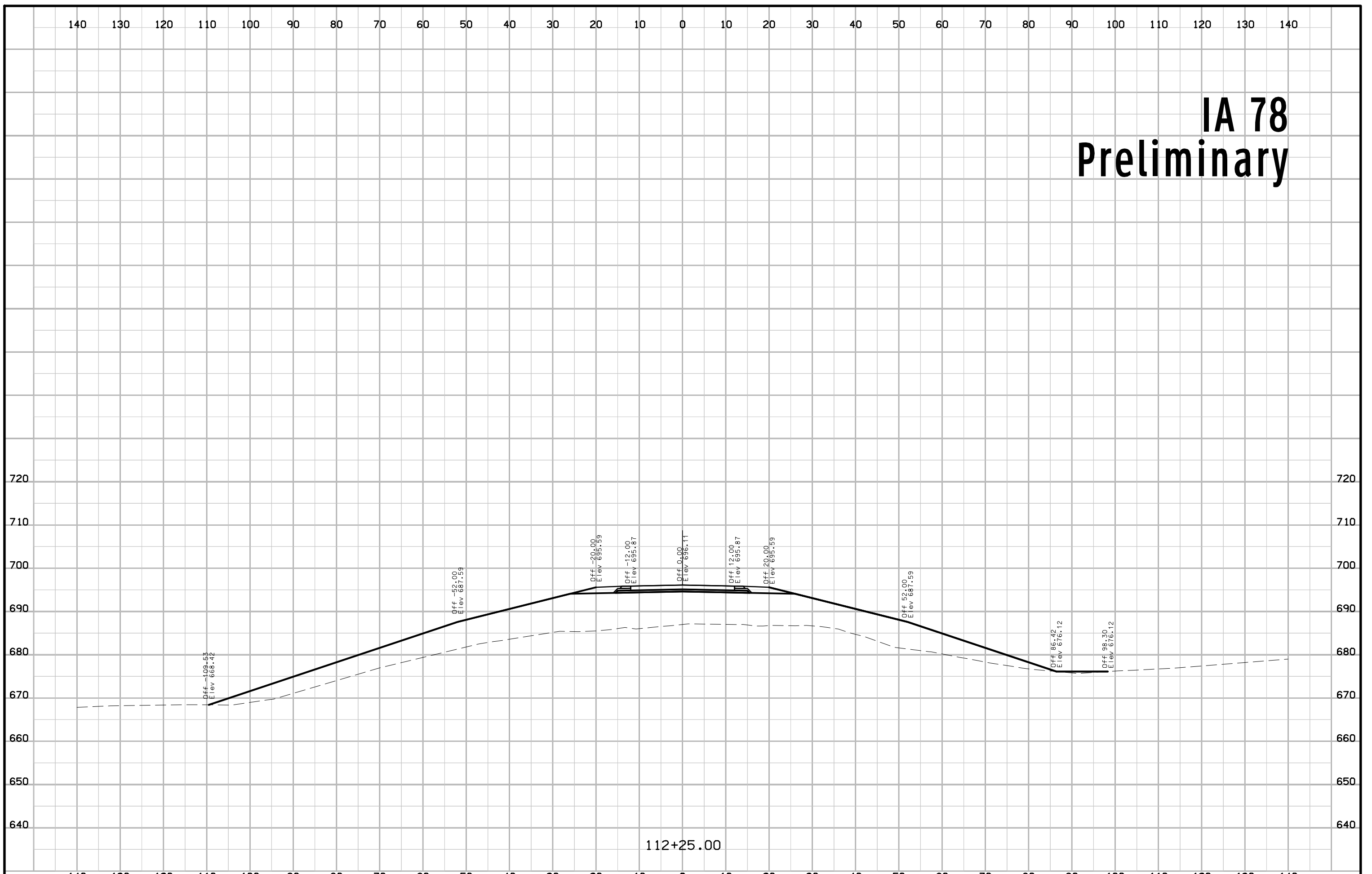
111+75.00

IA 78 Preliminary



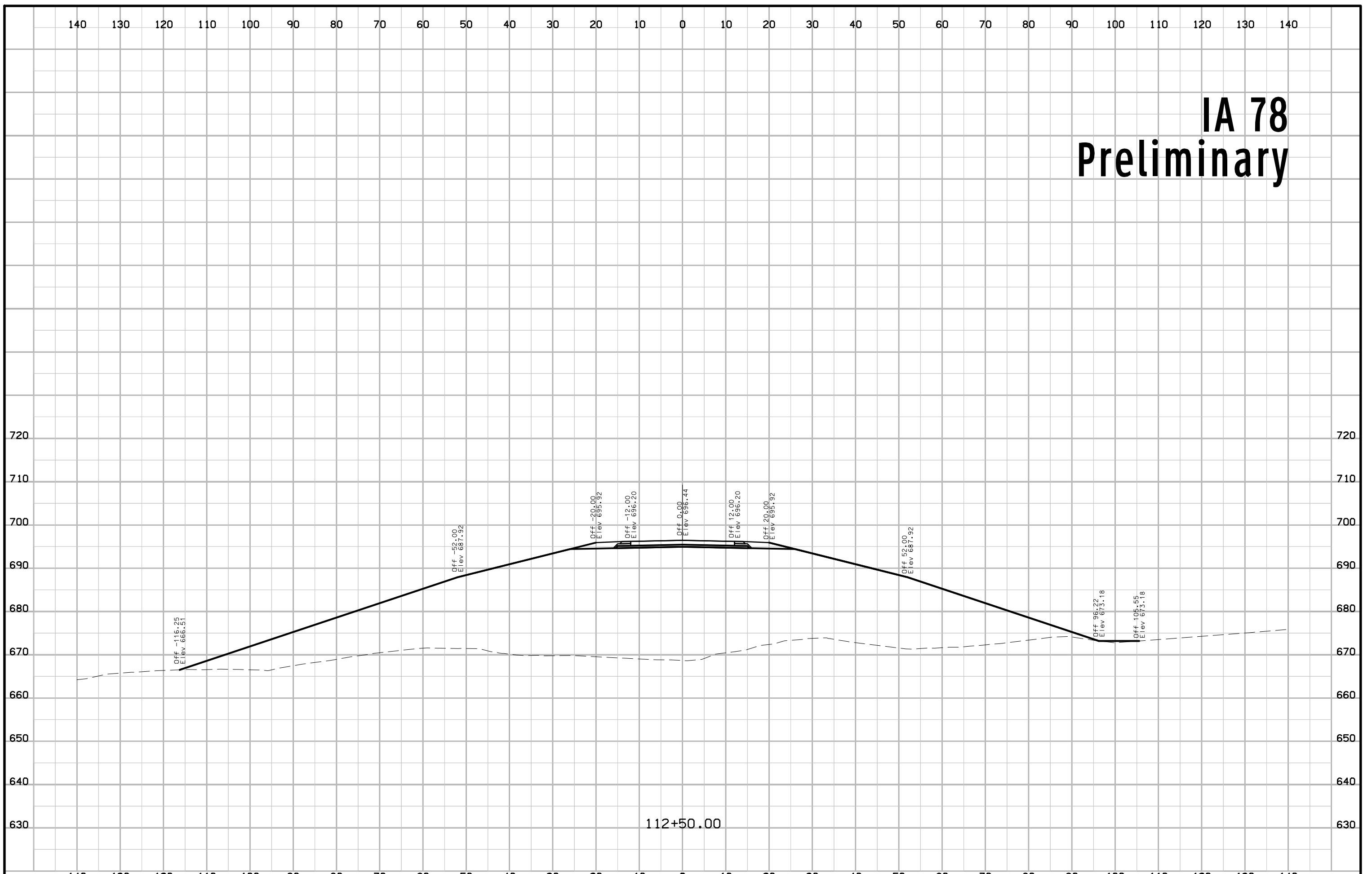
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IA 78 Preliminary



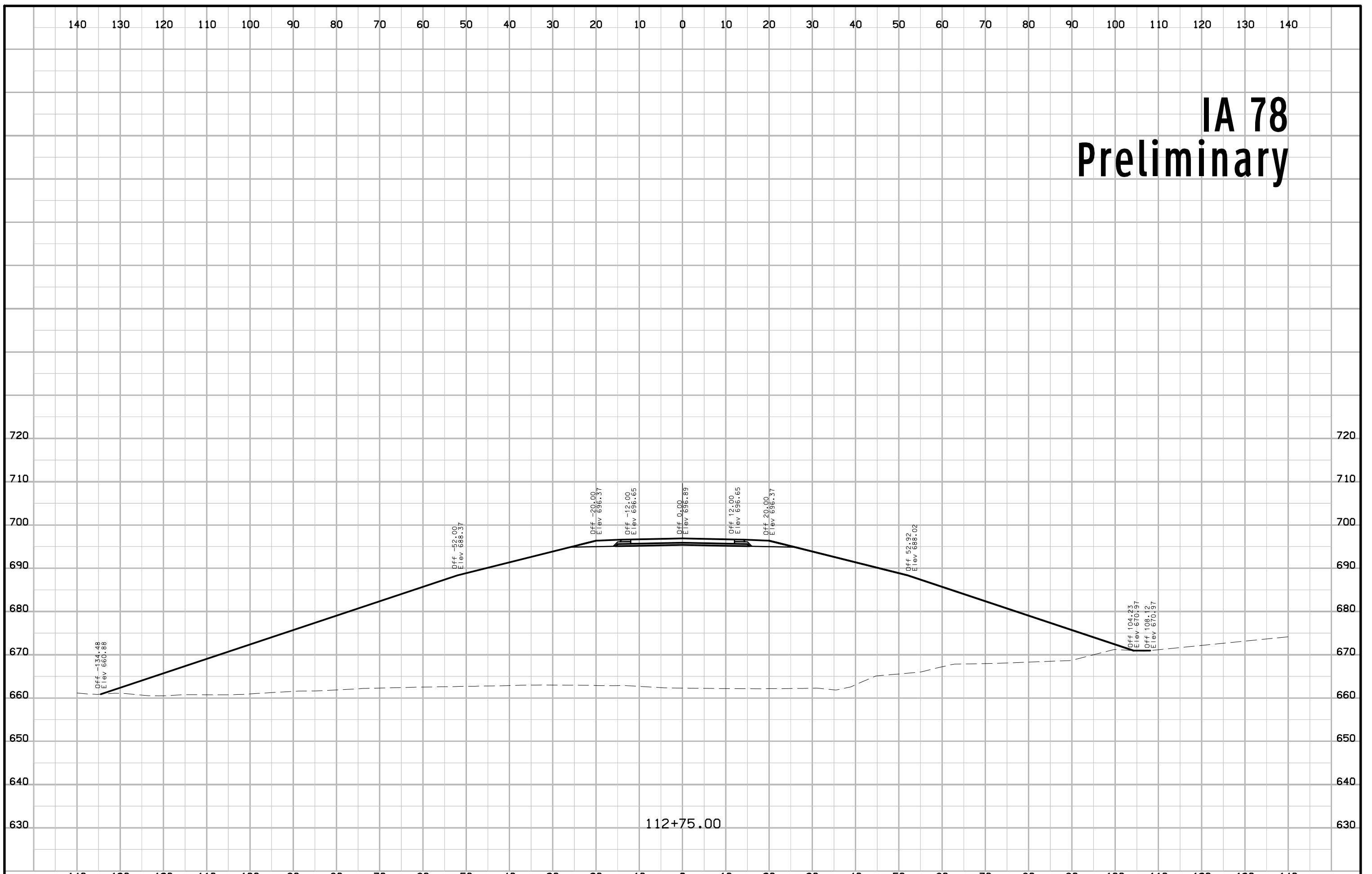
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IA 78 Preliminary



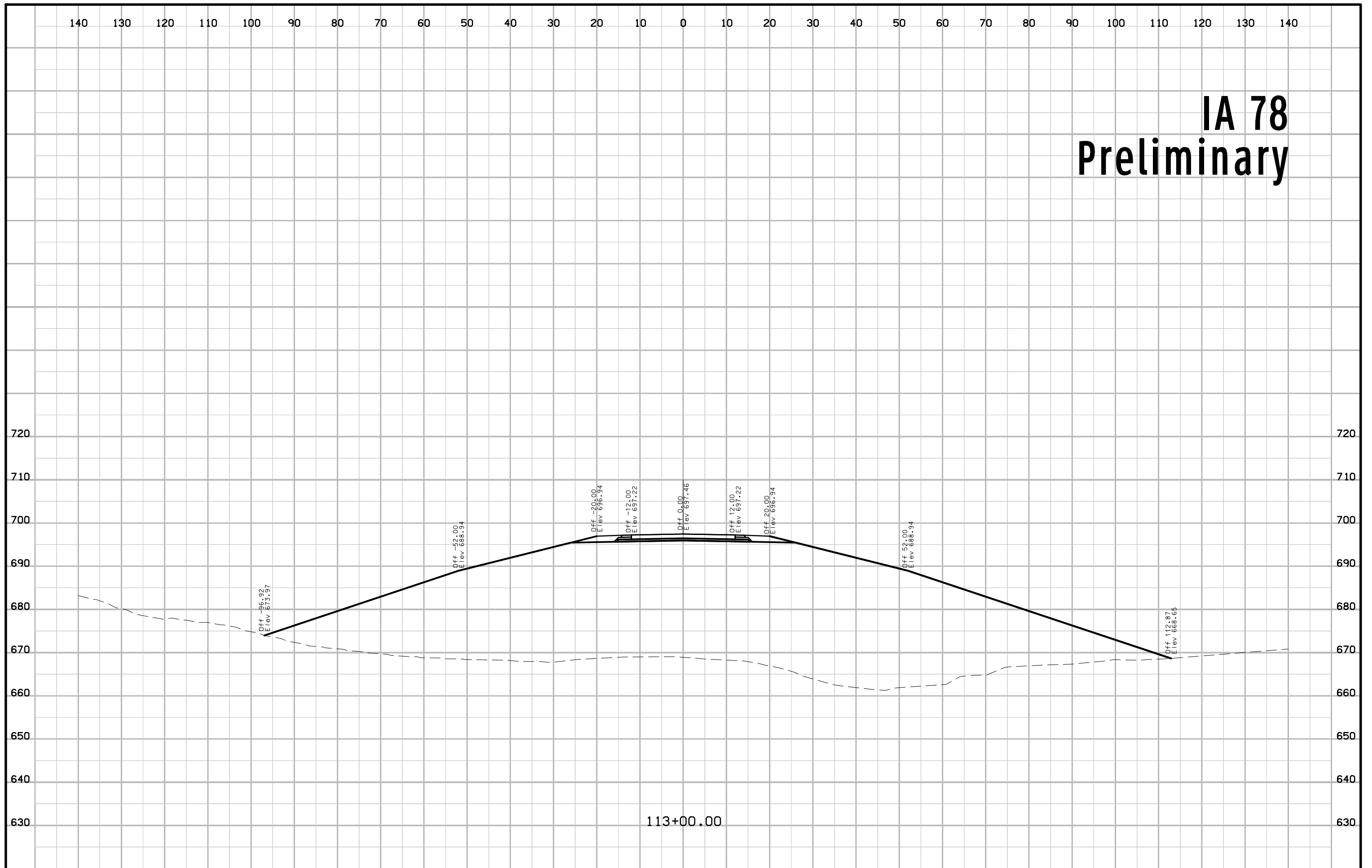
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IA 78 Preliminary



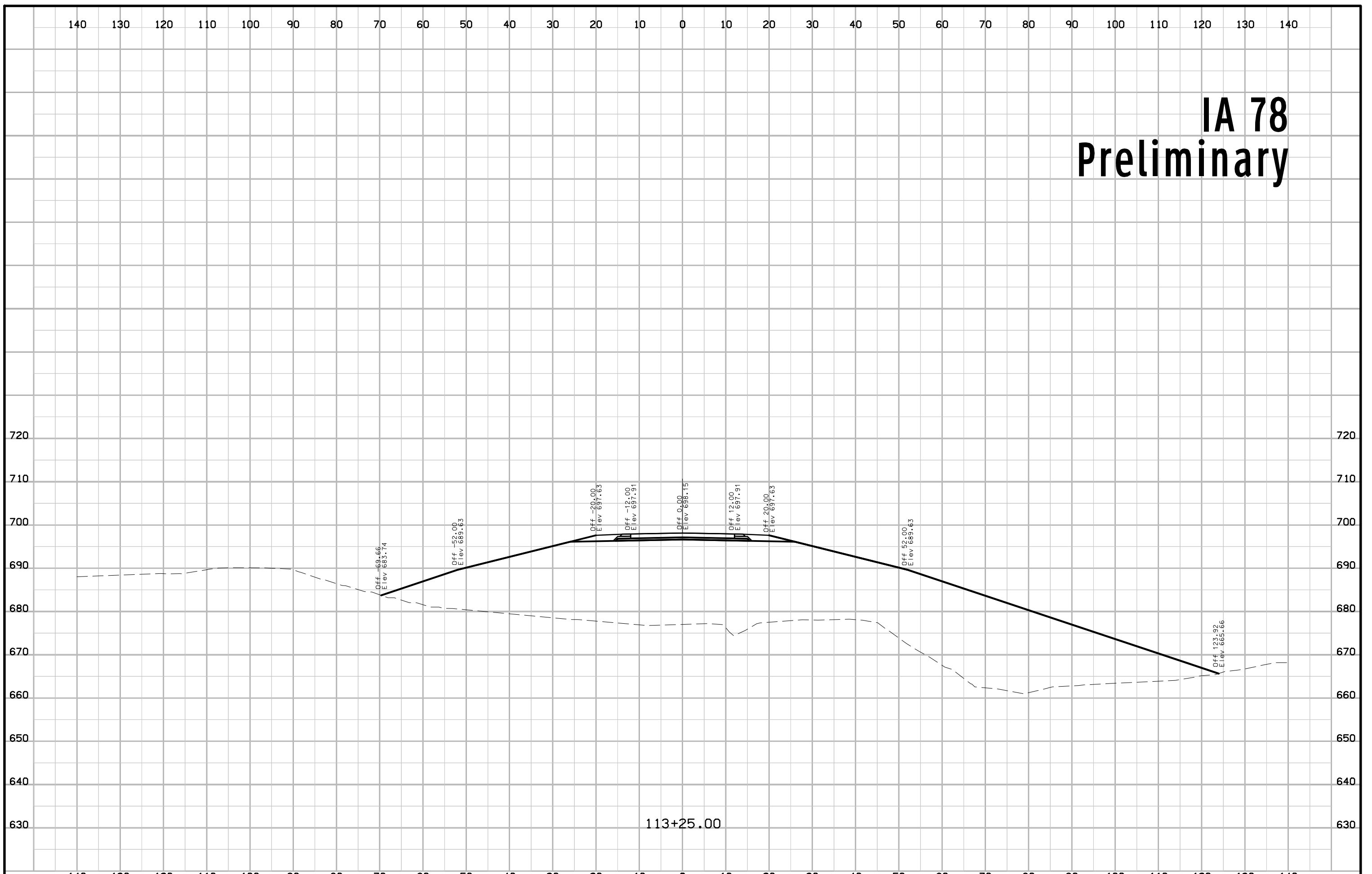
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IA 78 Preliminary



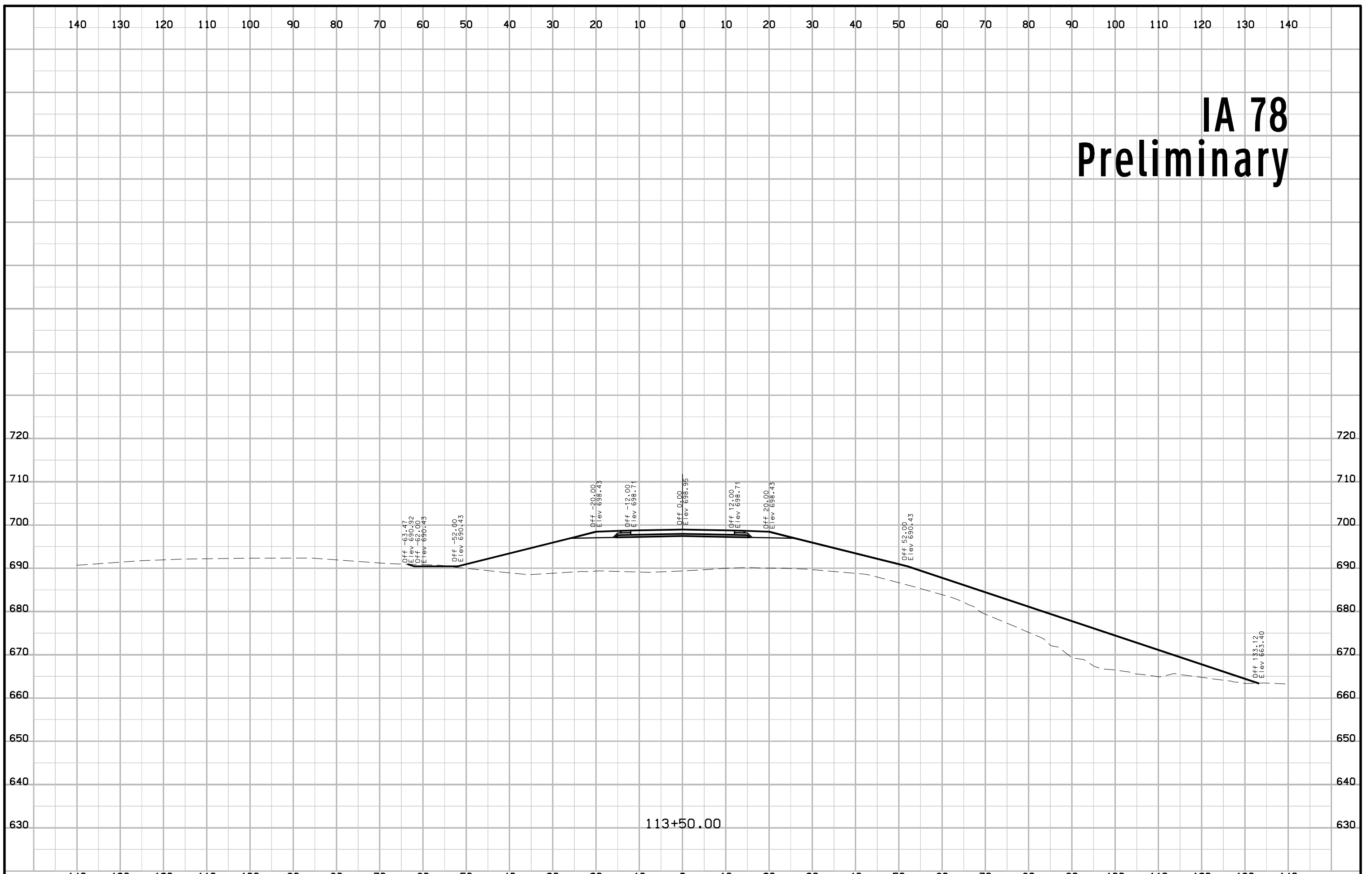
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IA 78 Preliminary



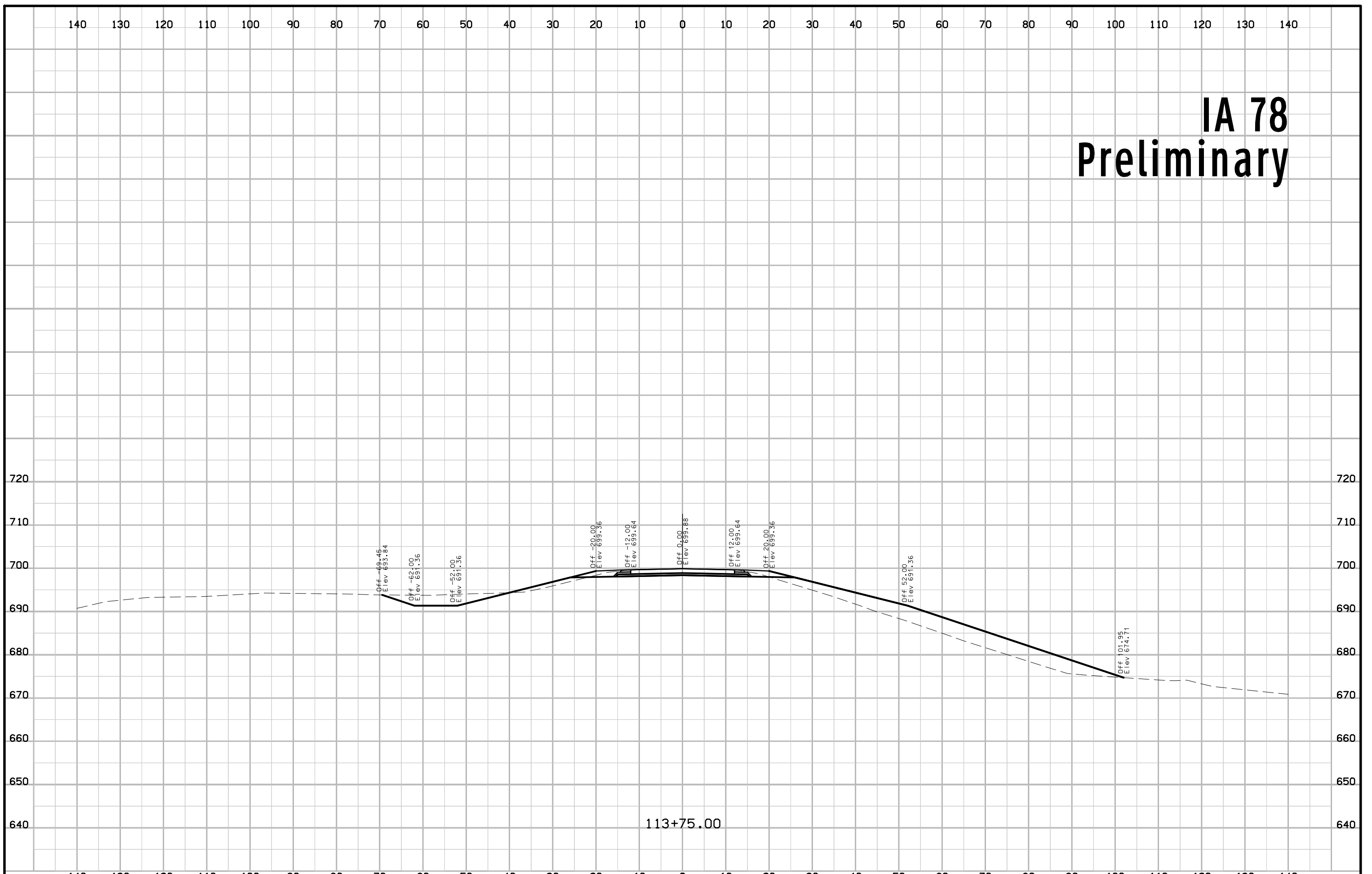
113+25.00

IA 78 Preliminary



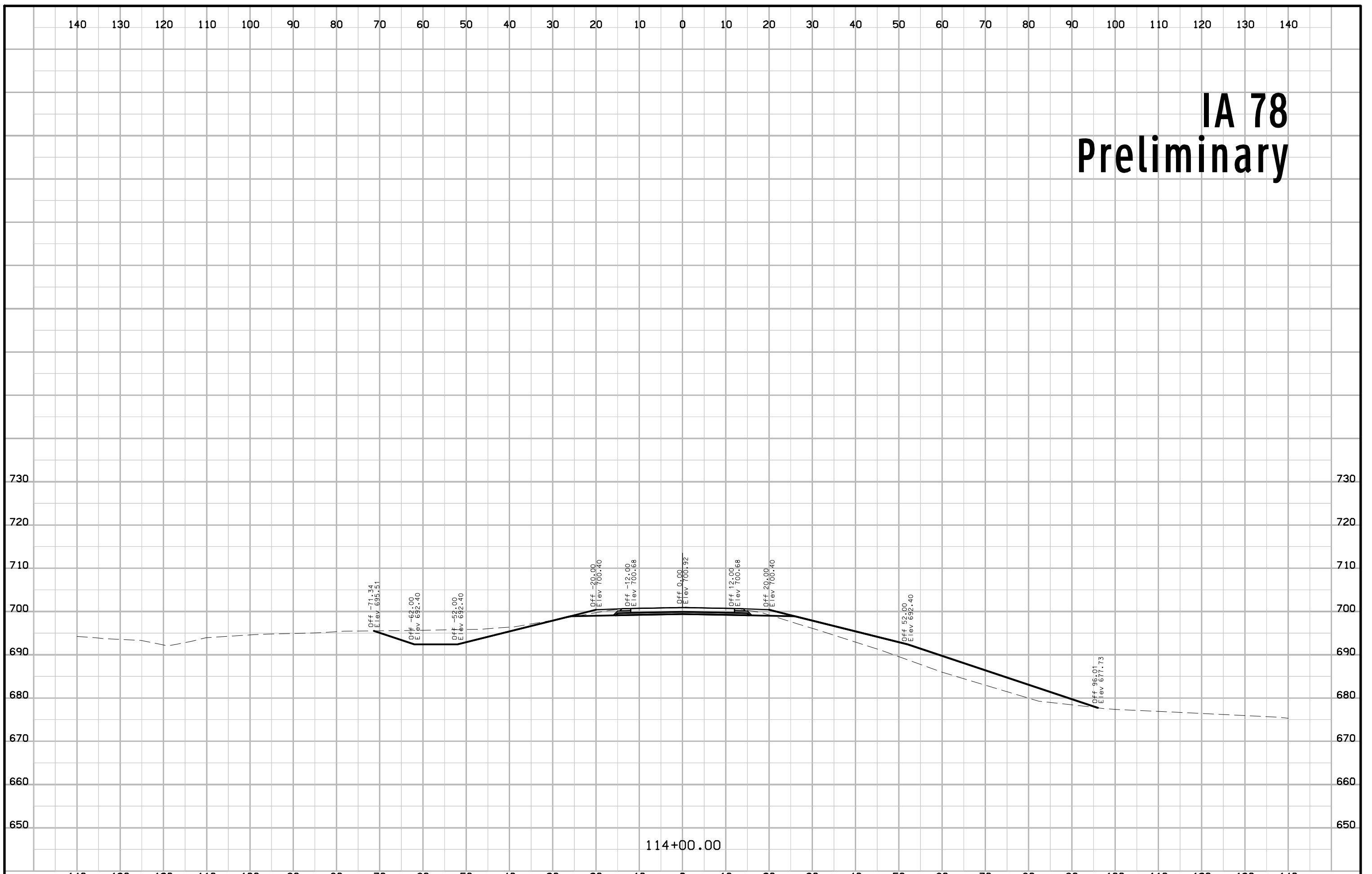
113+50.00

IA 78 Preliminary



113+75.00

IA 78 Preliminary



114+00.00