BRIDGE REPLACEMENT - PPCB
BRF-014-6(42)--38-38

LETTING DATE
10-15-2024

GRUNDY COUNTY

IOWA DOT

REVISIONS

TOTAL
31
PROJECT IDENTIFICATION NUMBER
18-38-014-020
PROJECT NUMBER
BRF-014-6(42)--38-38
R.O.W. PROJECT NUMBER
NHSN-014-6(43)--2R-38

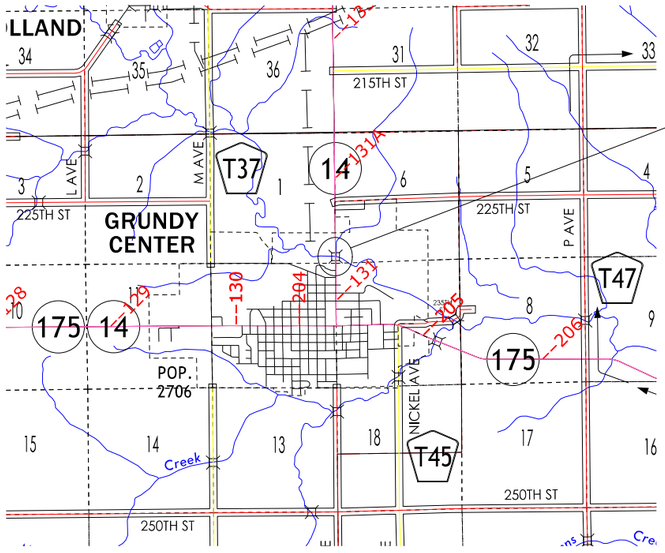
PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
GRUNDY COUNTY
BRIDGE REPLACEMENT - PPCB
Black Hawk Creek 1.5 mi S of S Jct Co Rd D35 in Grundy Center

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



PROJECT LOCATION
FHWA No. 25841
MAINT. No. 3831.3S014
REF. LOC. 131.34

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	**Title Sheets**
A.1	Title Sheet
A.1	Location Map Sheet
B Sheets	**Typical Cross Sections and Details**
B.1 - 3	Typical Cross Sections and Details
D Sheets	**Mainline Plan and Profile Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 14
G Sheets	**Survey Sheets**
G.1	Horizontal Control Tab. & Super for all Alignments
G.2 - 4	Reference Ties and Bench Marks
J Sheets	**Traffic Control and Staging Sheets**
J.1	Traffic Control Plan
* J.2	Detour
W Sheets	**Mainline Cross Sections**
W.1 - 19	Mainline Cross Sections
	* Color Plan Sheets

INDEX OF SEALS

PRELIMINARY PLANS

Subject to change by final design.

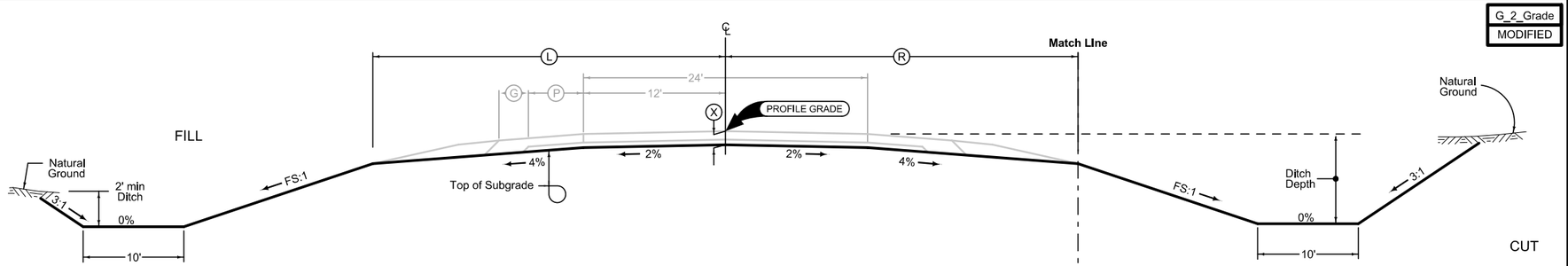
D5 PLAN – Date: 9–15–2023

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER A.1

6:48:00 AM 9/13/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\38014042_A01.dgn

G_2_Grade
MODIFIED

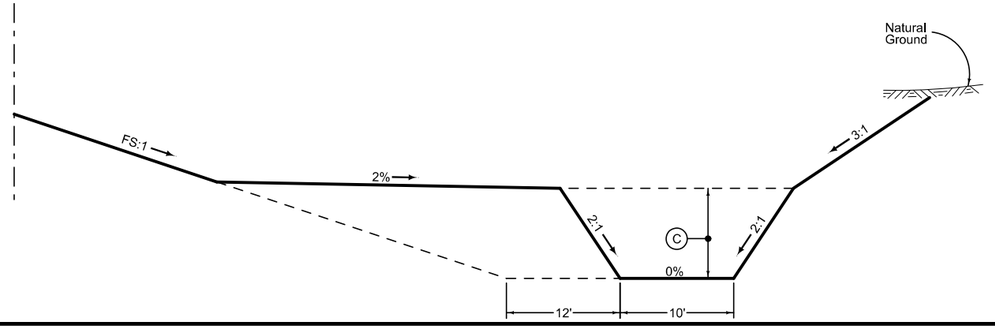
LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	FS
	110+25.00	112+41.43	36	36		3.5
	112+41.43	113+83.11	VAR.	VAR.		3.5
	116+82.00	118+10.73	VAR.	VAR.		3.5
	118+10.73	122+50.00	36	36		3.5



Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

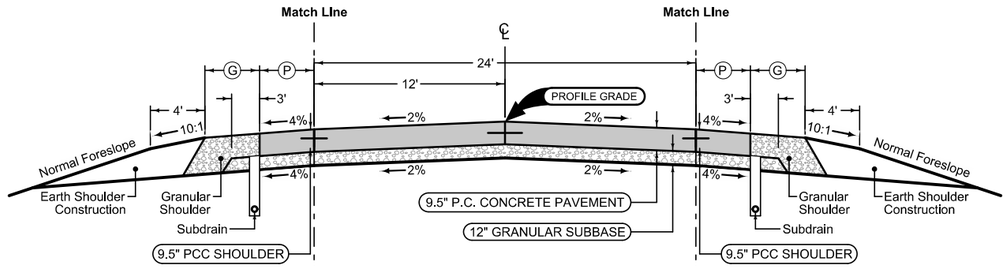
See plan & profile sheets and cross sections for additional details of ditches and backslopes.

2 LANE GRADING



Stream Grading

		MODIFIED
STATION TO STATION		(C) Feet
115+17.00	120+90.00	5



Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

2_C_FullPCC_
04-21-20

STATION TO STATION		(P) Feet	(G) Feet
110+25.00	112+54.38	4	6
118+23.23	122+50.00	4	6	

Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

2P_
04-21-20

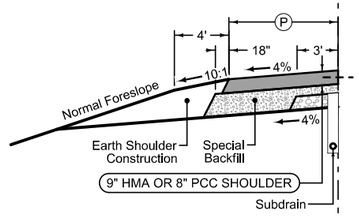
STATION TO STATION	
110+25.00	113+86.00
116+80.35	122+50.00

Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

2_C_FullPCC_
04-21-20

STATION TO STATION		(P) Feet	(G) Feet
110+25.00	112+41.43	4	6
118+10.73	122+50.00	4	6

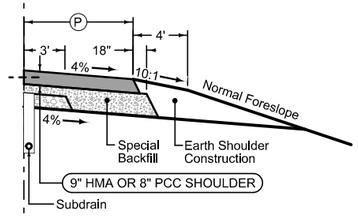


Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_
04-21-20

STATION TO STATION		(P) Feet
112+54.38	113+86.00	VAR.
116+80.35	118+23.23	VAR.



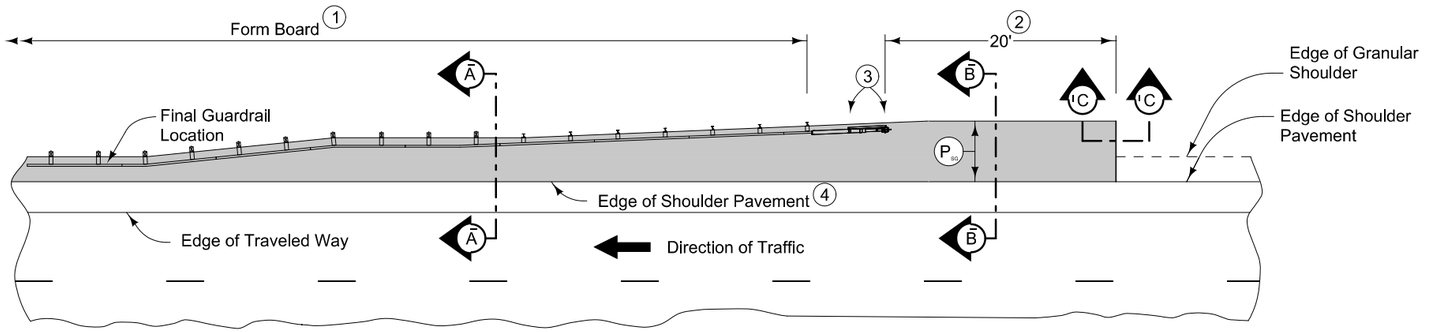
Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

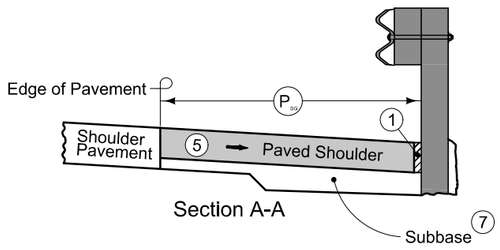
2_P_Guard_
04-21-20

STATION TO STATION		(P) Feet
112+42.00	113+86.00	VAR.
116+80.35	118+10.73	VAR.

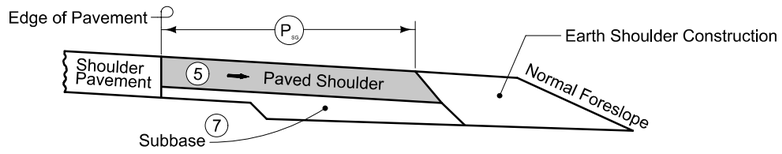
DESIGNER INFO | 7157 | 10-20-20



PLAN VIEW

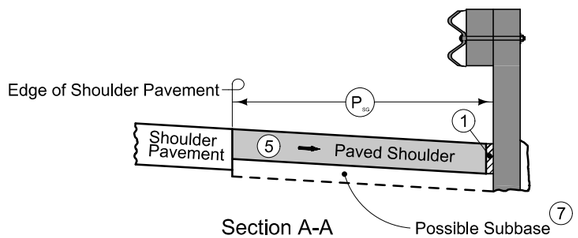


Section A-A

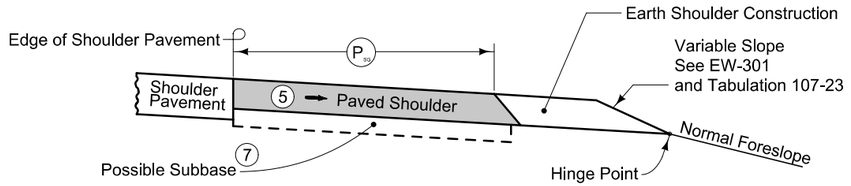


Section B-B

NEW CONSTRUCTION 6



Section A-A



Section B-B

EXISTING SHOULDER

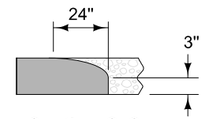
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

1. PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
2. Continue paved shoulder 20 feet beyond the center of the first post.
3. Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
4. 'KT-1 joint for PCC shoulder.
   'B' joint for HMA shoulder.
5. Match shoulder slope.
6. The Contractor has the option to pave the paved shoulder at guardrail and the partial width paved shoulder as one operation.
7. Refer to other details in the plan.



Section C-C
Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL
(ADJACENT TO PARTIAL WIDTH PAVED SHOULDER)

SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Existing Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)
- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Satellite TV Dish
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

UTILITY LEGEND

- Consumers Energy
- -E1- Grundy Center Municipal Utilities
- -FO- Aureon Network Services
- -FO2- Windstream Communications
- -G- Black Hills Energy
- -St.S.- City of Grundy Center
- -T1- Windstream Communications
- -T2- Windstream Communications

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
Lavender	(9)	Temporary Pavement Shading
Yellow	(4)	Proposed Pavement Shading
Orange	(6)	Proposed Granular Shading
Orange	(70)	Proposed Shoulder Granular Shading
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Orange, Light	(134)	Proposed Granular Entrance Shading
Yellow	(220)	Proposed Paved Entrance Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading
Green, Light	(225)	Existing Pavement Shading
Red	(3)	Proposed Structure Shading
Red	(3)	Delineates Restricted Areas

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(10)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	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
- C/A Access Control
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER D.1

9:19:33 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\38014042_D01.dgn

Sta. 114+96.8
176'6"x30'
Multiple Span I-Beam Bridge
D.A.=30,000 A-R (from plan)

Palermo TWP.
T-87N R-17W
SEC. 1

Sect. No. 12

5th Street

109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00

Install Guardrail

Install Guardrail

Station: 122+50.00
End Construction

ROWMLA014

14

14

Install Guardrail

Install Guardrail

Station: 110+25.00
Begin Const.

Sect. No. 7

0 FEET 50

Washington TWP.
T-87N R-16W
SEC. 6

VPI = +00.00
ELV = 979.83
L = 150.00
K = 100

+0.80% -0.70%

-1.13% +0.80%
VPI = +72.50
ELV = 977.21
L = 250.00
K = 129

-0.70% +0.41%
VPI = +87.50
ELV = 975.01
L = 125.00
K = 112

-1.75% LT Ditch Grade

-2.40% LT Ditch Grade

LT +25
975.40

LT +00
972.34

LT +83
967.94

+0.40% RT Ditch Grade

RT +97
961.42

RT +90
963.38

985 980 975 970 965 960 955 950 945 940

LT
RT

Ditch Grade | Bridge | No Ditch

978.82 978.59 978.34 978.13 977.98 977.87 977.81 977.80 977.83 977.92 978.05 978.23 978.43 978.63 978.84 979.03 979.23 979.40 979.51 979.54 979.53 979.49 979.31 979.14 978.96 978.78 978.61 978.43 978.26 978.08 977.91 977.73 977.54 977.38 977.20 977.03 976.85 976.68 976.50 976.33 976.15 975.98 975.85 975.63 975.45 975.30 975.21 975.17 975.19 975.27

Ditch Grade | No Ditch

110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER D.2

7:52:08 AM 9/13/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\38014042_D02.dgn

ALIGNMENT COORDINATES

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		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
IA 14		100+00.00	8796686.45	15359927.33															
IA 14		151+77.13	8801863.55	15359946.90															

Grundy County
BRF-014-6(42)--38-38
Black Hawk Creek 1.5 mi S of
S Jct. Co Rd D35 in Grundy Center
PIN 18-38-014-020
Sap-0272.1

Party Personnel

Jason Page - Survey Party Chief
John Hahn – Assistant Survey Party Chief

Date(s) of Survey

Begin Date	10/16/2018
End Date	05/26/2021

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction over Black Hawk Creek on Iowa Highway 14. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12B). GRS80 Ellipsoidal Height was computed at project Pts. CP1, CP2 and L 30 by conducting two concurrent 6-hour static observations. The project control is relative to nearby Iowa RTN Base Stations.

This survey observed 1 NGS Control Monument with published NAVD88 heights to compare to local ground control:

NGS 2nd order class 0 mark designated L 30 has a published Elev. Of 967.87
Survey Elev. = 968.241

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 5 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting two six-hour static observations. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to point CP1.

Alignment Information

Alignment information was provided by the District 1 Land Survey Department.

Utility Information

For utility details see Utility Survey and Ownership Report in the Utility folder of the PrelimSurvey project directory.

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 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 5

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 5

Point Name	Northing	Easting	Elevation	Code	Description
CP1	8797933.476	15359961.394	975.408	BM	SET FENO MONUMENT 230 FT SOUTH OF S BLACK HAWK CREEK 40 FT EAST OF CTR IA HWY 14 AND 20 FT NORTH OF CTR ENT TO EAST
CP2	8800514.504	15359891.178	1010.393	BM	DRILLED HOLE IN BALL OF ROW RAIL 2O FT SOUTH AND 40 FT WEST OF INTSEC IA HWY 14 AND E COTTONWOOD NEAR WOOD POST
L30	8792061.862	15375892.807	968.241	BM	FD NGS 2ND ORDER CLASS 0 BENCH MARK DESIGNATED L 30 AS DESCRIBED

511 TRAVEL RESTRICTIONS

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
			None Anticipated									

TRAFFIC CONTROL PLAN

IA 14 will be closed at Black Hawk Creek. IA 14 traffic will be detoured using IA 175, T37 and D35. Refer to detour map on J.2 for details.

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.

Project	Type of Work
To be determined	

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

FILE NO.	ENGLISH	DESIGN TEAM	IOWA DOT * OFFICE OF ROW	COUNTY	PROJECT NUMBER	SHEET NUMBER	

Grundy	ROW: NHSN-014-6(43)--2R-38				PIN	18-38-014-020															
	Black Hawk Creek 1.5 mi S of S Jct Co Rd D35 in Grundy Center																				
		STATE			COUNTY			CITY				TEMP EASE		BORROW							
PARCEL NO.	OWNER NAME	FEE	EASE		FEE	EASE		FEE	EASE		EXCESS			FEE	T.E.	MITIGATION	OTHER	HOUSE	BUILDING(S)	A/C ONLY	TOTAL ACQ.
1	Manatts, Inc. - Fee	1502 SF																			
2	McDowell & Sons Lime Co. - Fee	4663 SF																			
3	Patrick M Brown - Fee			13400 SF																	
4	Michael J. Freese Rev. Trust Dated August 3 2022 - Fee Cynthia J. Freese Rev. Trust Dated August 3 2022 - Fee			25587 SF																	
5	Larry G Phelps - Fee			38823 SF																	
6	Scott R Bienfang - Fee			5102 SF																	
6 Parcels	"TOTALS	0 AC	0 AC		0 AC	0 AC		0 AC	0 AC		0 AC	0 AC		0 AC	0 AC	0 AC					
		6165 SF		82912 SF	0 SF		0 SF	0 SF		0 SF	0 SF		0 SF								

Sta. 114+96.8
176'6"x30'
Multiple Span I-Beam Bridge
D.A.=30,000 A-R (From plan)

Palermo TWP.
T-87N R-17W
SEC. 1

5th ST.

EAST 895.44 Ft of SOUTH 60 Ft of SE 1/4 Sec. 1
Warranty Deed 1977

WILSON AVE.

MILL ST.

5th Street

NE¼ NE¼ SEC. 12-T87N-R17W

KERR'S HUBBARD ADD. OUTLOT 3 (BK 45 PG 103-104)

KERR'S HUBBARD ADD. OUTLOT 4 (BK 45 PG 103-104)

PARCEL NO. 3753-A (BK 73-D PG 381)

SE¼ SE¼ SEC. 1-T87N-R17W

SE 1/2 OF SE 1/2 LYING NORTH OF CREEK EXCEPT 15 x 125' PARCEL (BK 2019 PG 1270)

KARR PROPERTIES
CT:ERIC M. LARSON
Sect. No. 12

1
MANATTS, INC.

THE CITY OF GUNDY CENTER IOWA

3
PATRICK M & KATHLEEN J BROWN

5
LARRY G PHELPS

108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00

110+77 ℄ 64'
112+62±P ℄ 80'
112+01±P ℄ 68'
110+46 ℄ 55'±EX.R/W
114+09 ℄ 174'
113+90 ℄ 103'
114+87±P ℄ 153'
117+57 ℄ 156'
117+64 ℄ 75'
123+00 ℄ 49'±EX.R/W
122+37 ℄ 58'

14

Station: 110+25.00
Begin Const.

113+58 ℄ 85'±EX.R/W
113+74 ℄ 100'
114+38 ℄ 98'
115+30±P ℄ 143'
120+00±P ℄ 114'
120+91 ℄ 112'
121+20 ℄ 62'±EX.R/W

Station: 122+50.00
End Construction

NW¼ NW¼ SEC. 7-T87N-R16W

CRAIG R.
MacLOUGHLIN
Sect. No. 7

2
McDOWELL & SONS LIME CO.

6
SCOTT R. BIENFANG

4
MICHAEL J FREESE REV TRUST DATED AUGUST 3 2022,
CYNTHIA J FREESE REV TRUST DATED AUGUST 3 2022

PATENT NO. 4571 (BK 152 PG 468)

SW¼ SW¼ SEC. 6-T87N-R16W

PARCEL NO. 527-A (BK 73-E PG 207)

NO PARCEL NUMBER PLAT OF SURVEY (BK 73C PG 179)

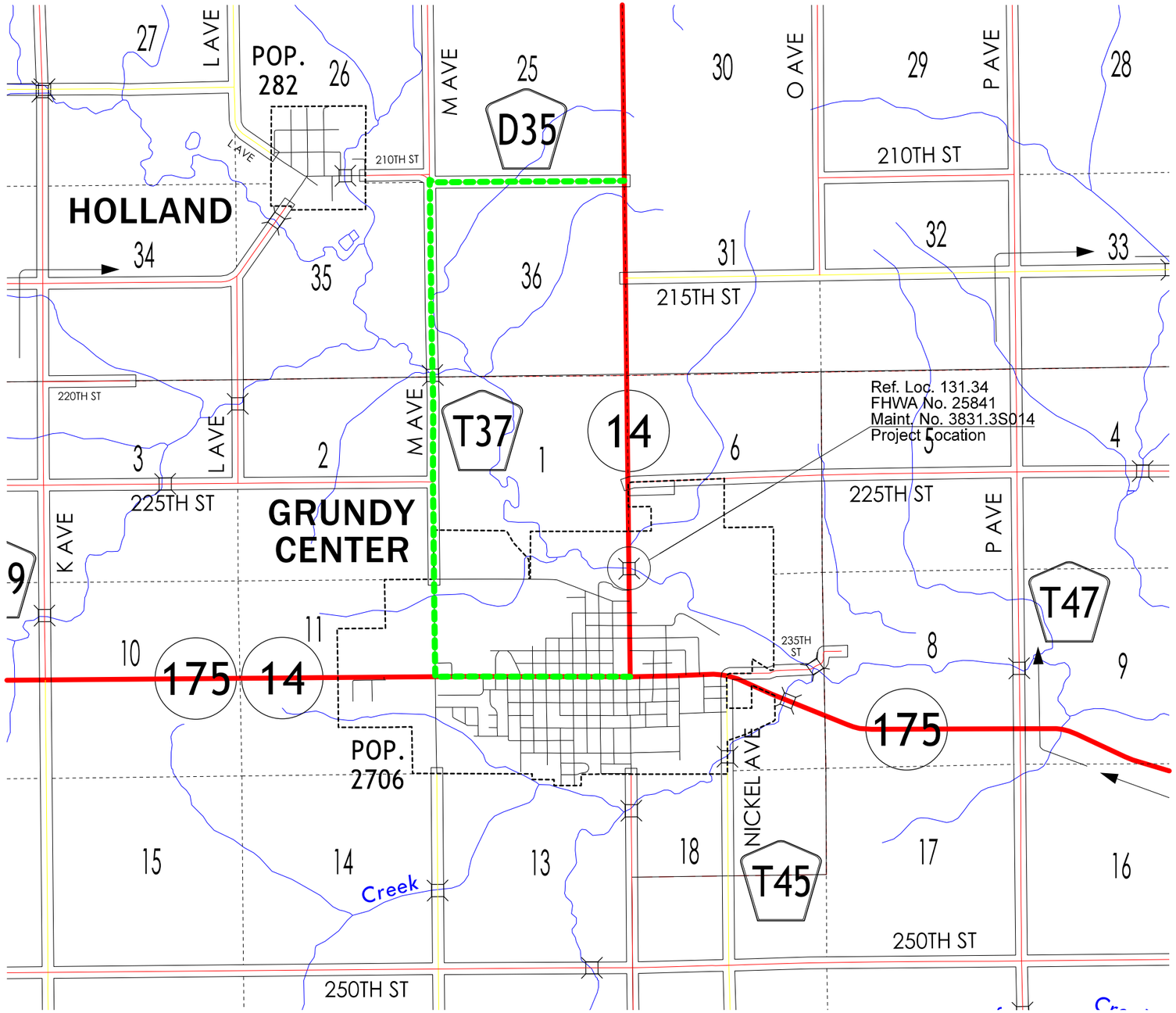
Washington TWP.
T-87N R-16W
SEC. 6

Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY
ROW Team: Larson / Hughes
ROW #:NHSN-014-6(43)--2R-38
Plan Date: 10-23-2023
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition

0 50 FEET

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey \ Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER H.1	

11:20:18 AM 10/23/2023 CHUGHES pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\ROW\ROW_38014043.dgn



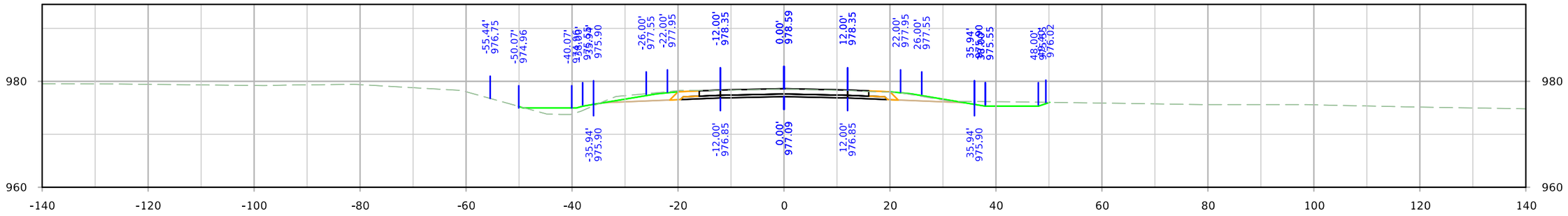
Detour Route

Detour Map

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER J.2

10:12:10 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\38014042_J02.dgn

Preliminary - IA 14



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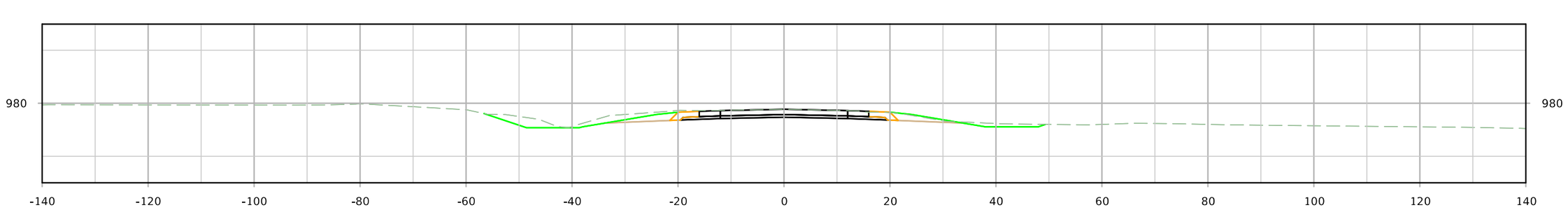
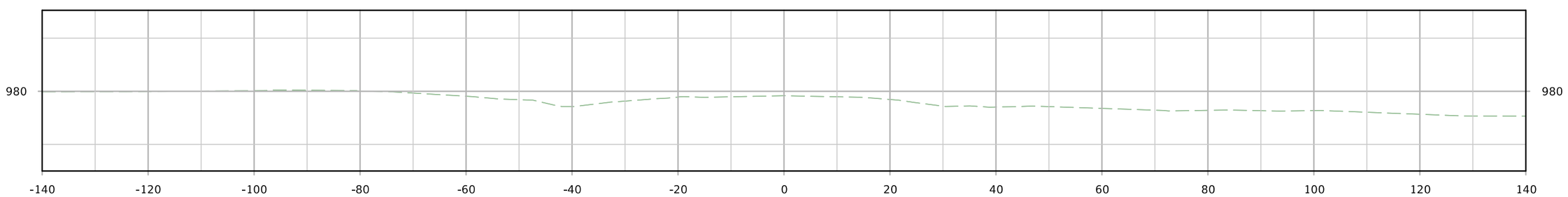


STA. 110+25.00

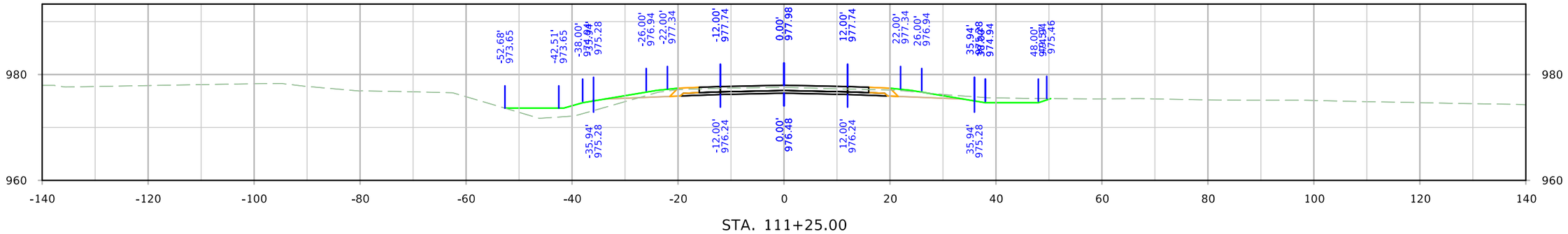


STA. 110+00.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.1

7:14:39 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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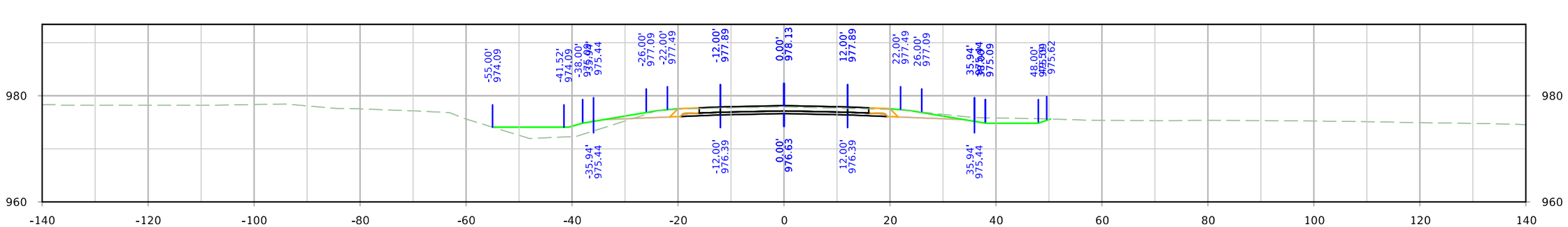

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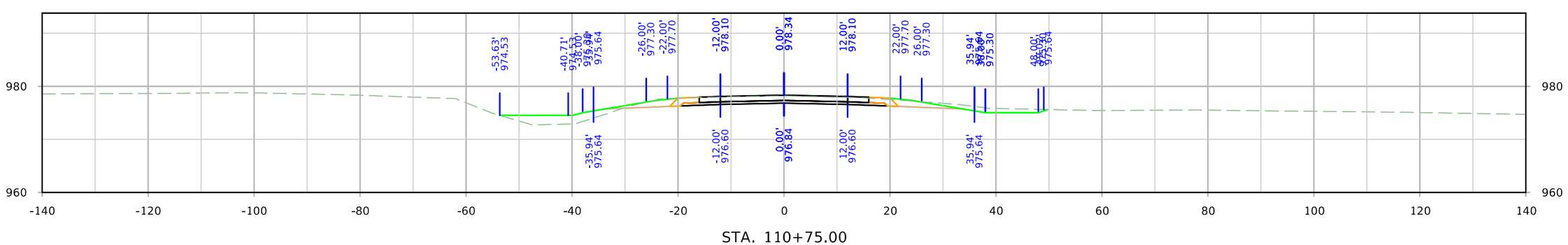

STA. 110+75.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.2

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Grundy IA
w/o project overlay

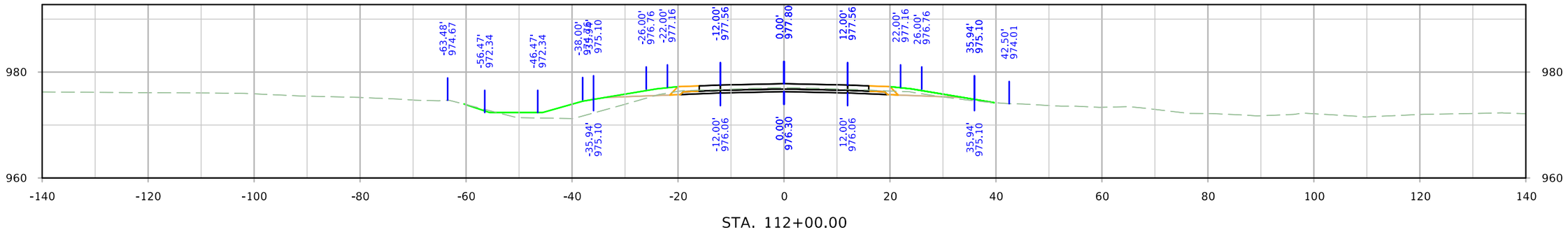
4' (50'11" from CL)
6' (47'7" from CL)
9' (42'6" from CL)
13' (977'-13'=964') (43' from CL)
16' (970'-16'=954') (45'8" from CL)
17' (964'-17'=947') (47'5" from CL)
17' (960'-17'=943') (53' from CL)
21' (975'-21'=954') (52'5" from CL)
20' (975'-20'=955') (53'1" from CL)
13' (975'-13'=962') (53'10" from CL)
11' (975'-11'=964') (51'9" from CL)
7' (52'8" from CL)
5' (53'6" from CL)
6' (51'7" from CL)

Google Earth

N

300 ft

Preliminary - IA 14



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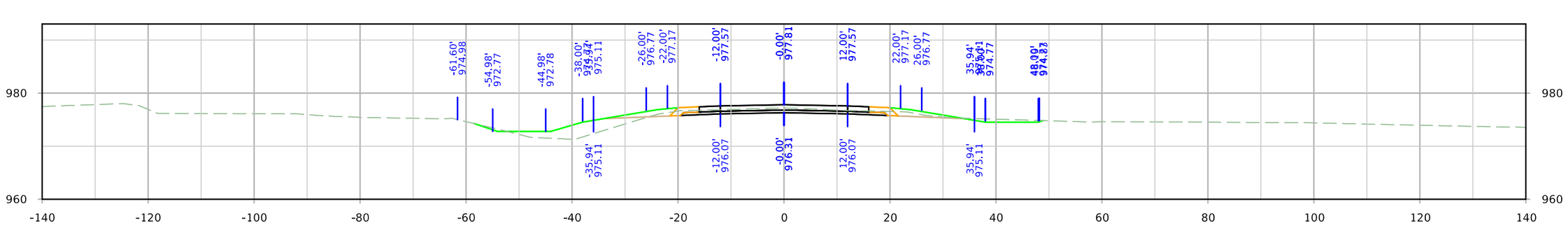

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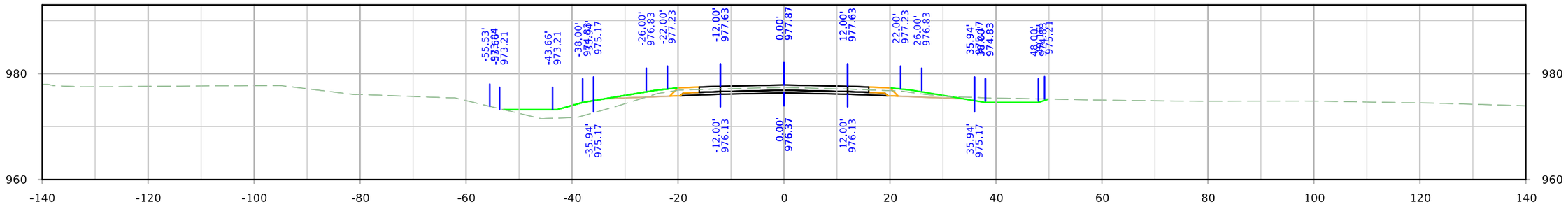
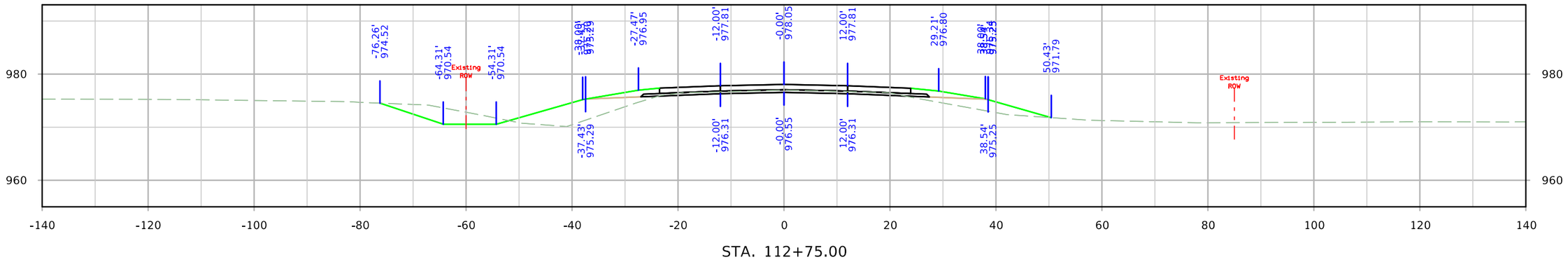


STA. 111+50.00

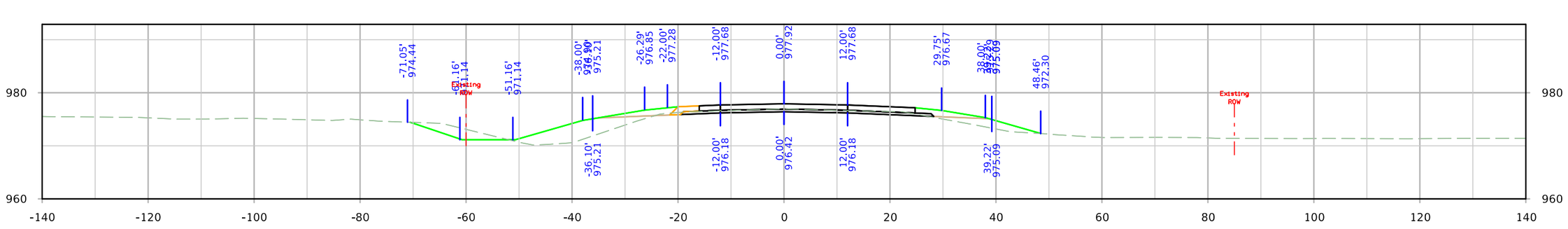
FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.3

7:14:41 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

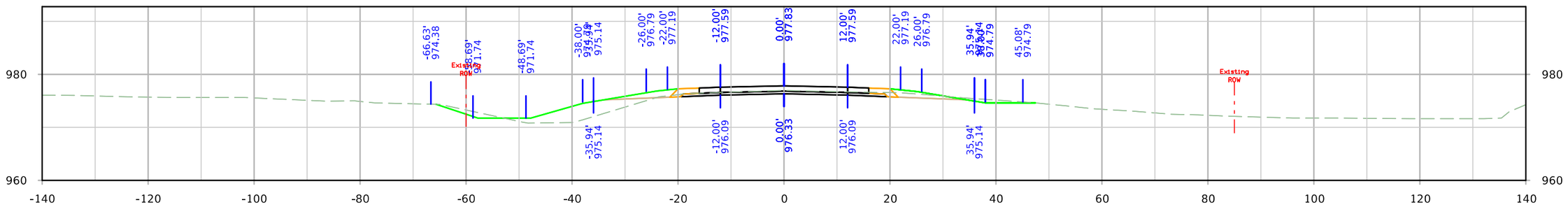
Preliminary - IA 14



STA. 112+75.00



STA. 112+50.00

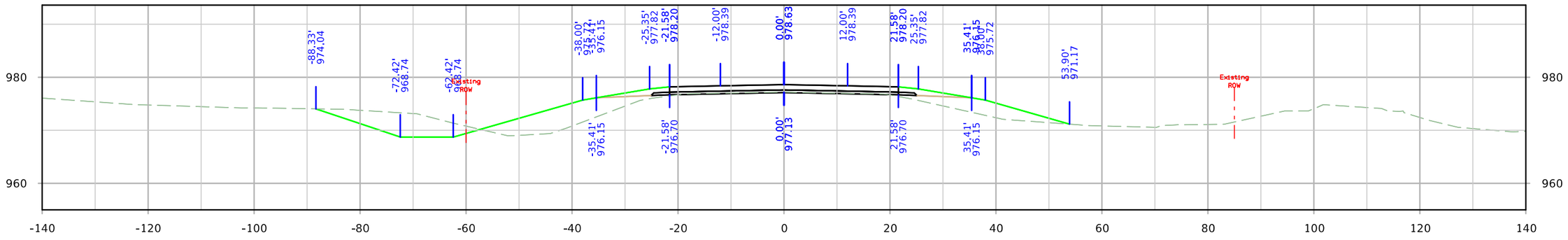


STA. 112+25.00

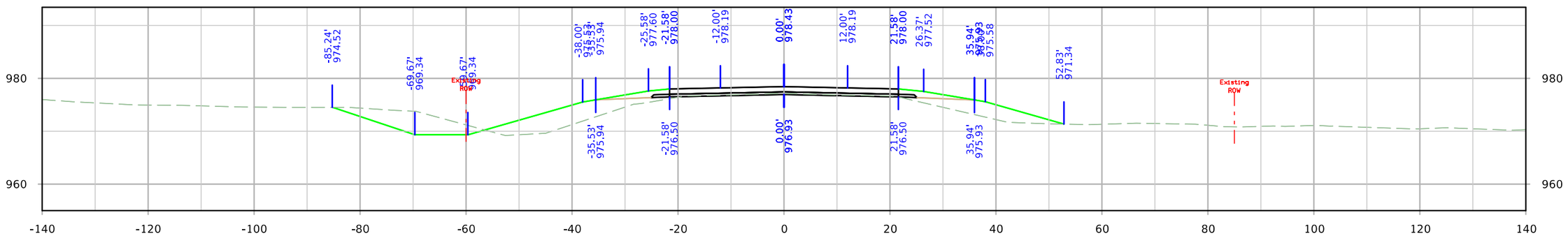
FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.4

7:14:41 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

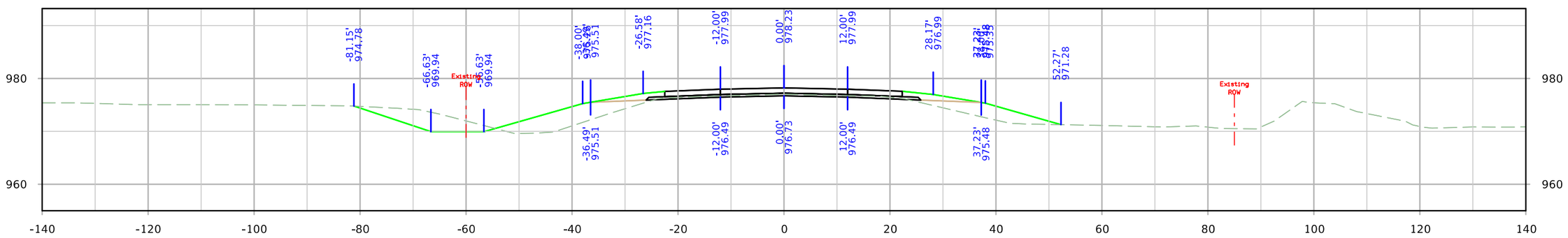
Preliminary - IA 14



STA. 113+50.00



STA. 113+25.00

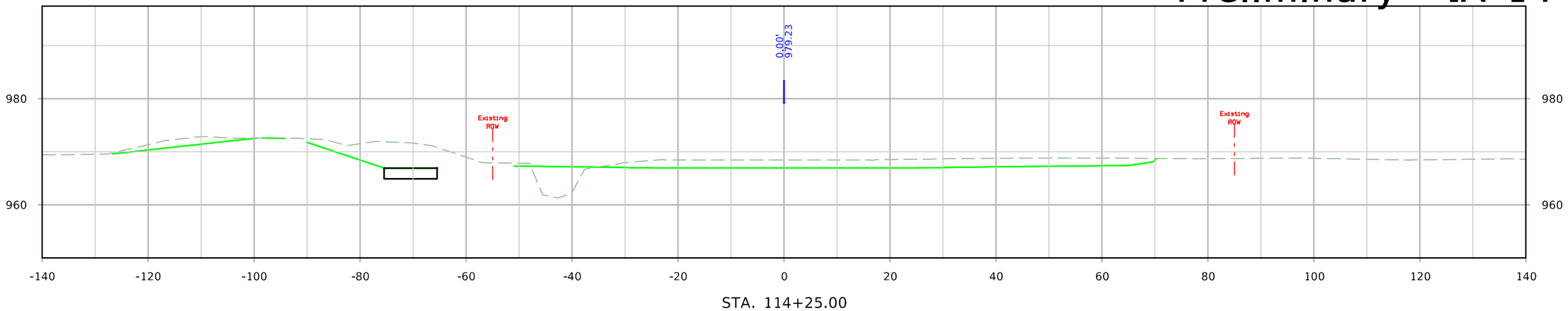


STA. 113+00.00

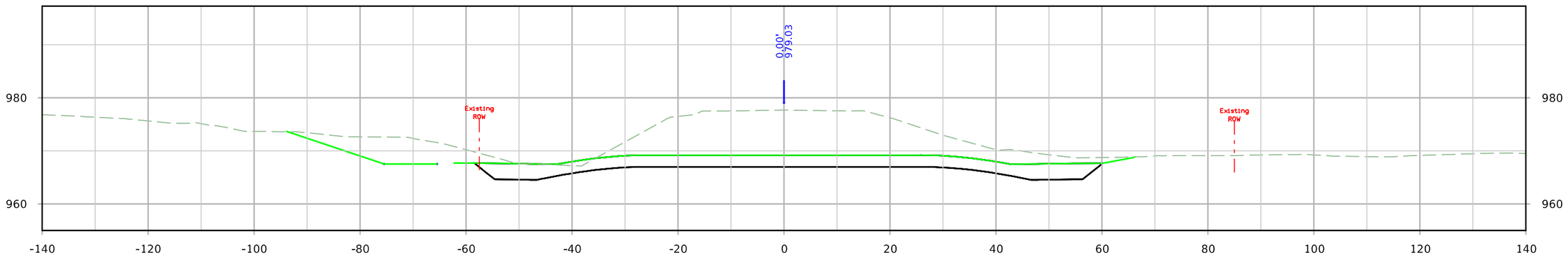
FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.5

7:14:42 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



STA. 114+25.00



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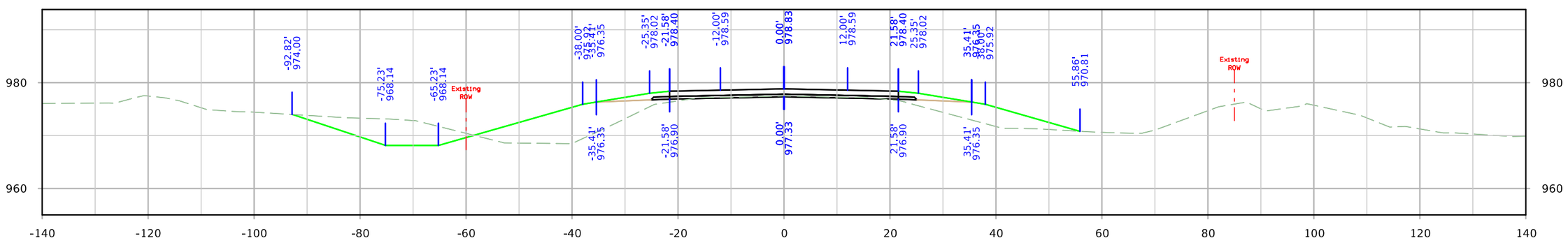
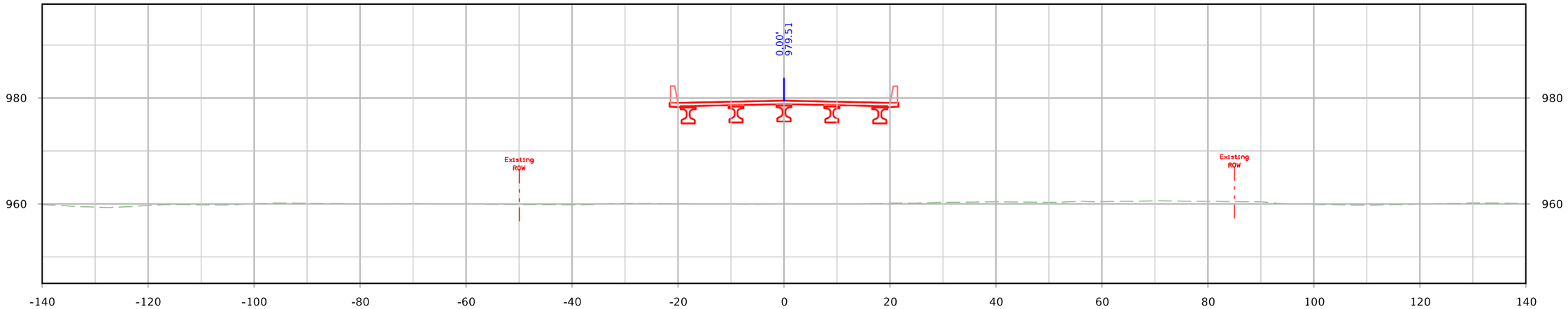


STA. 113+75.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.6

7:14:43 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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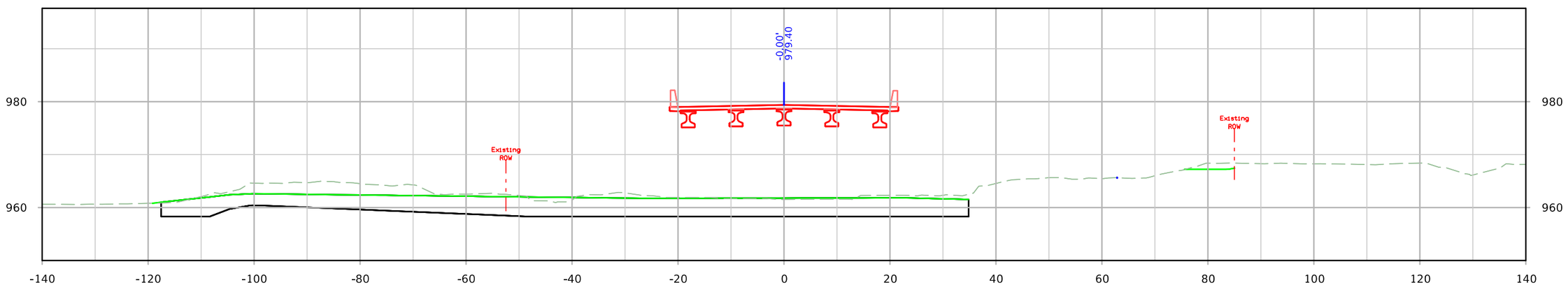
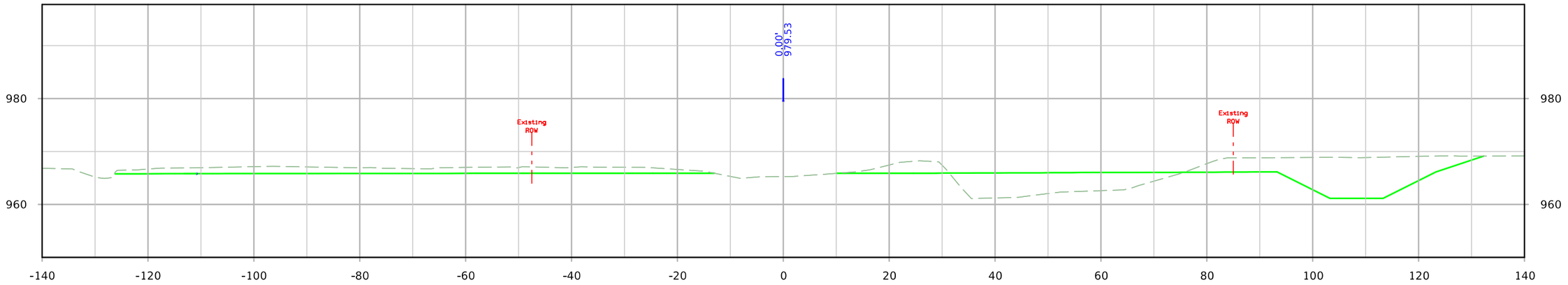


STA. 114+50.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.7

7:14:44 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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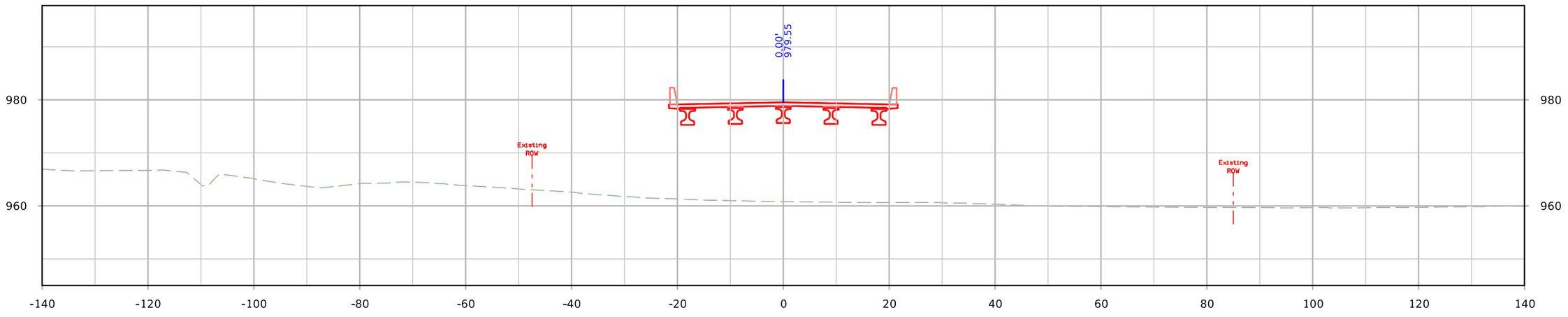
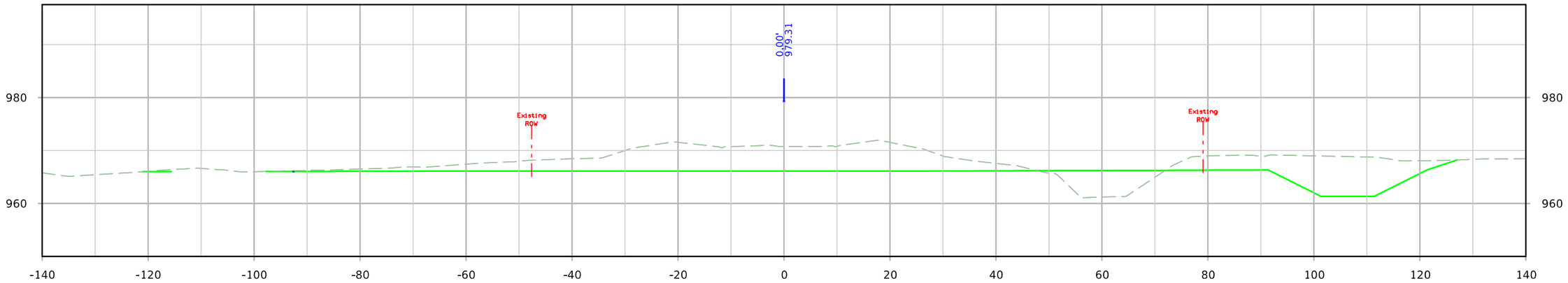


STA. 115+00.00

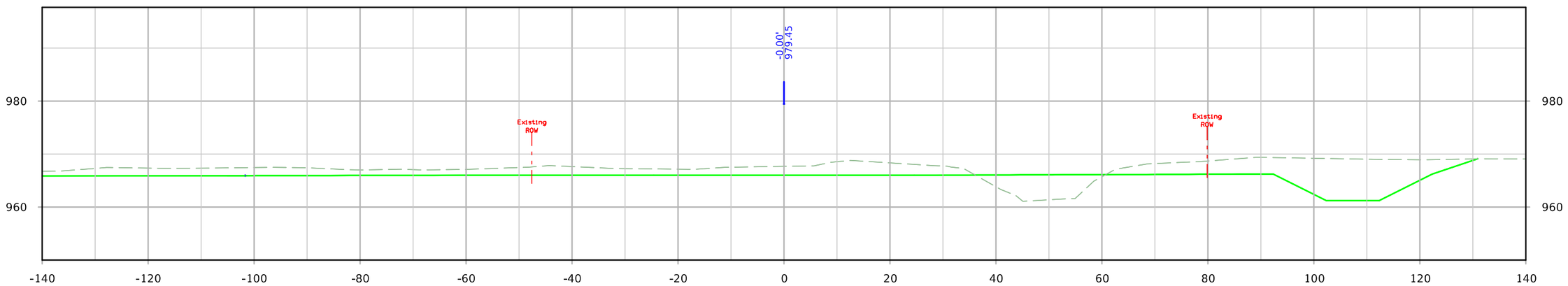
FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.8

7:14:44 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



STA. 115+75.00



STA. 115+50.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.9

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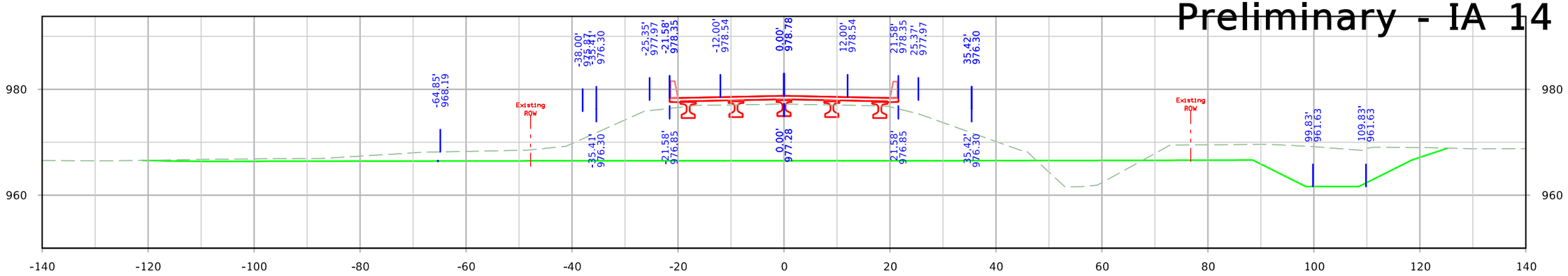

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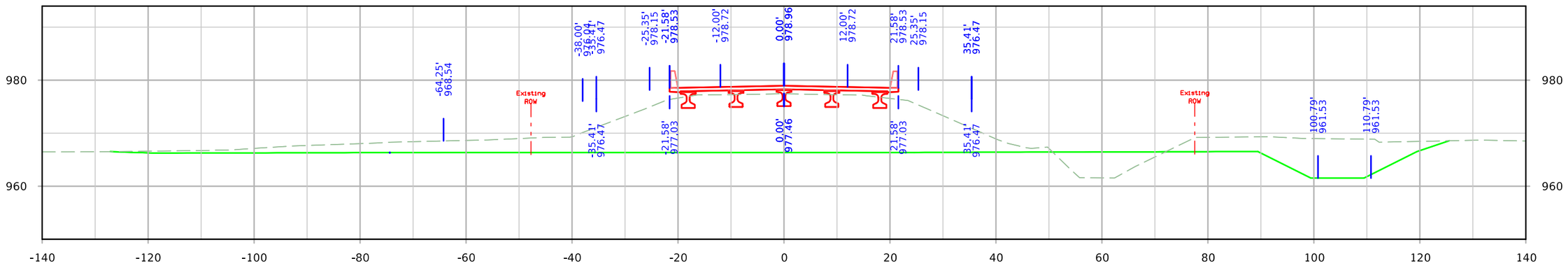
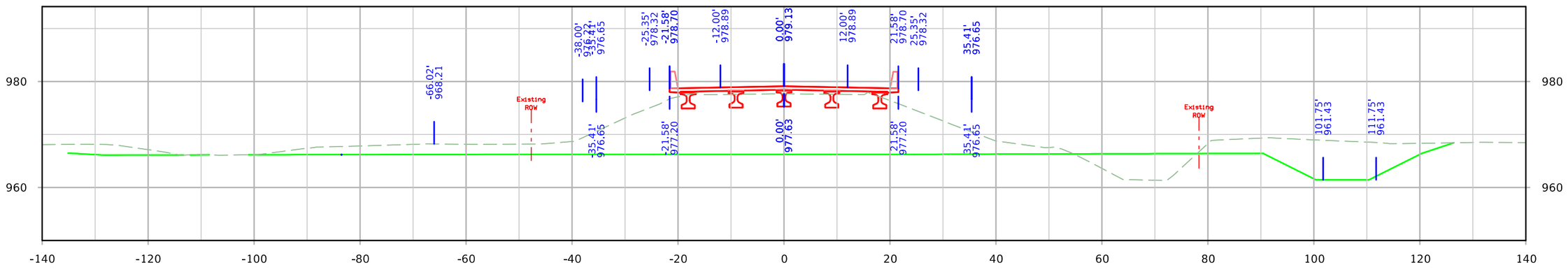


STA. 116+25.00



STA. 116+00.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.10

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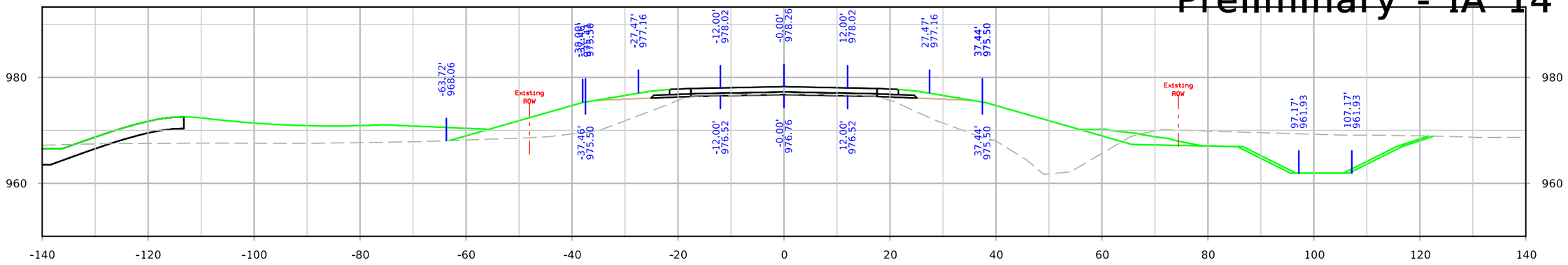
Preliminary - IA 14



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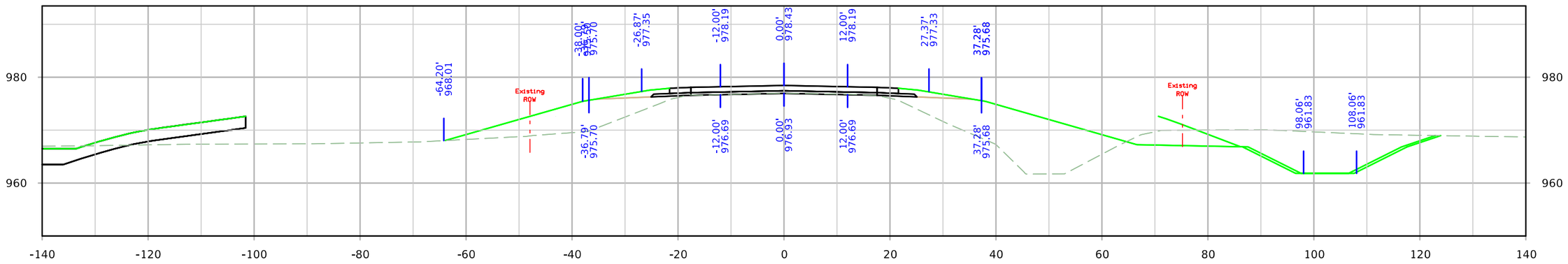

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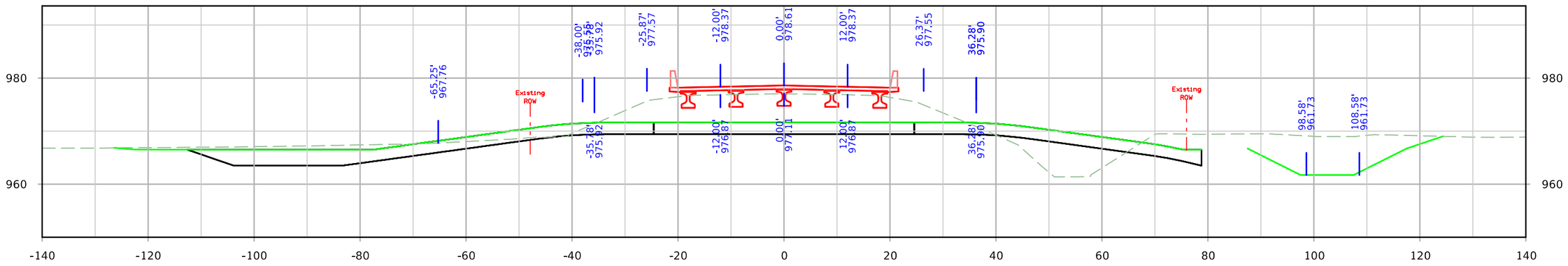
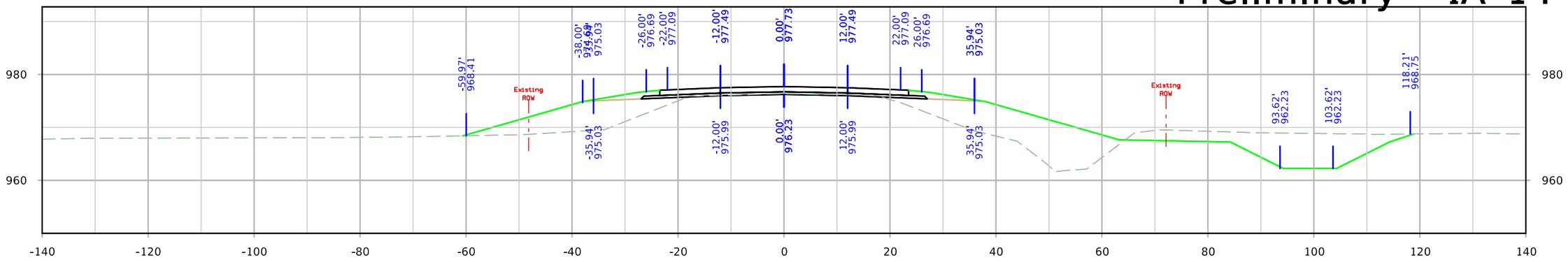


STA. 116+75.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.11

7:14:47 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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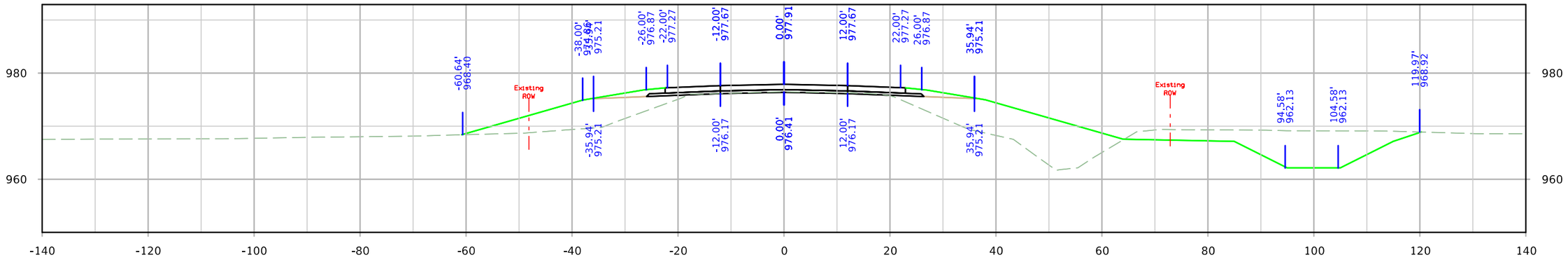

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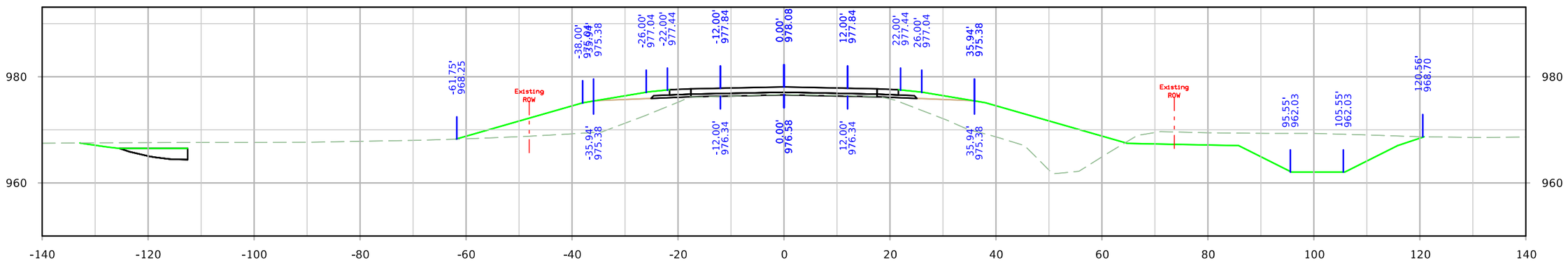
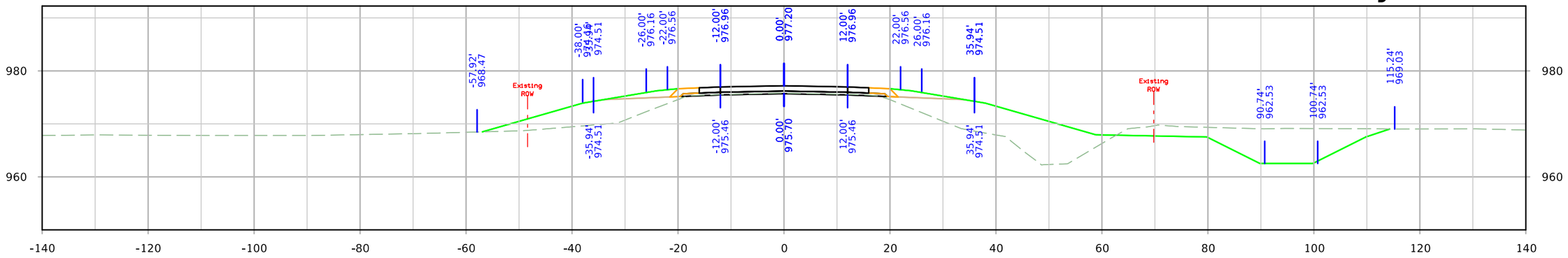


STA. 117+50.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.12

7:14:48 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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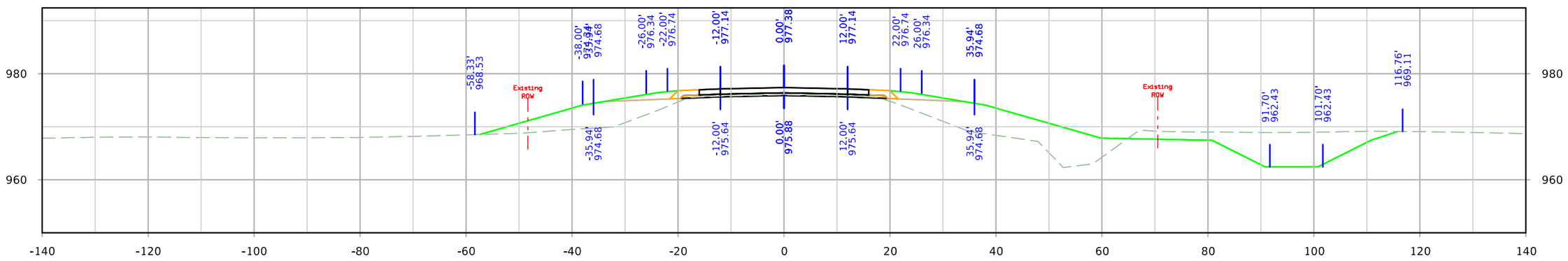

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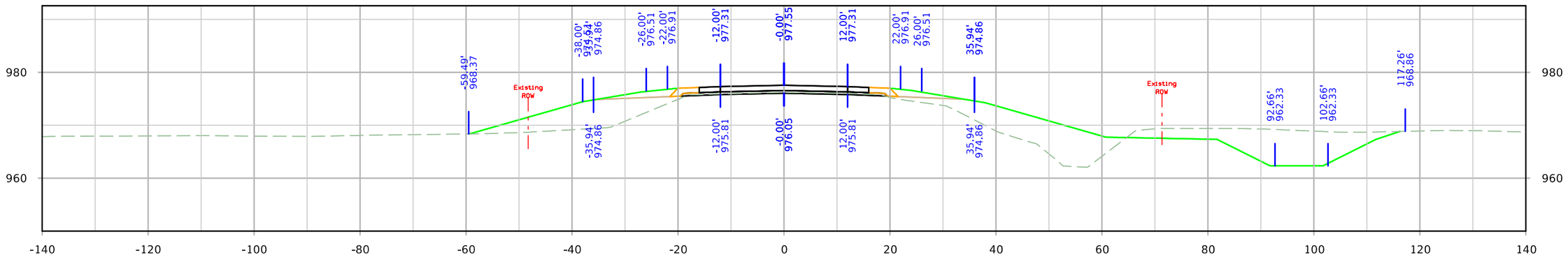
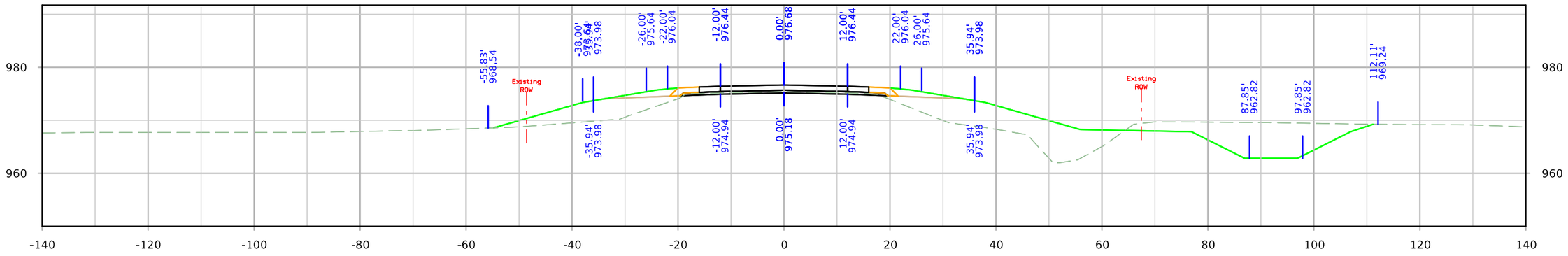


STA. 118+25.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.13

7:14:49 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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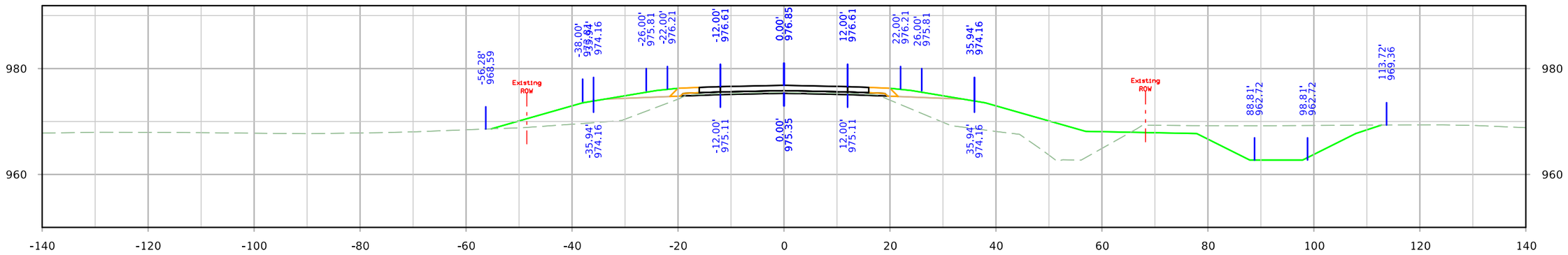

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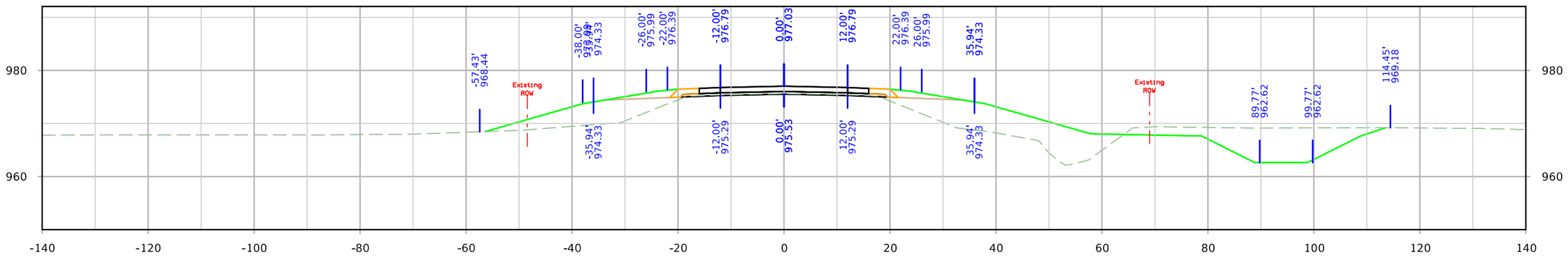
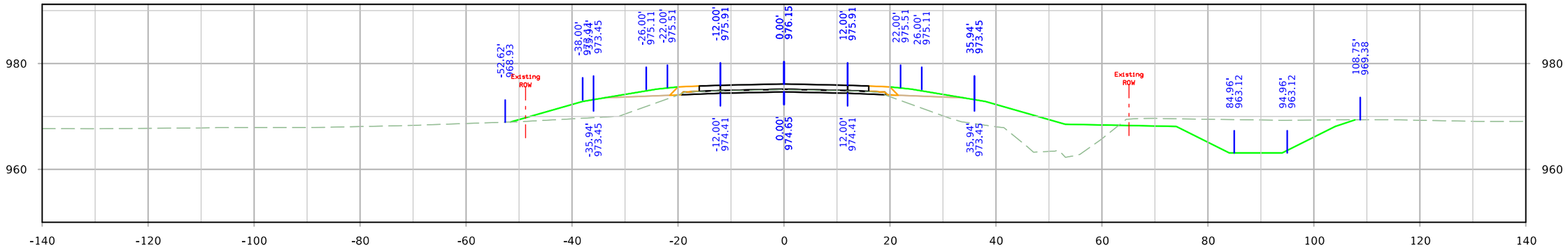


STA. 119+00.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.14

7:14:49 AM 9/6/2023 mvais pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\DistrictDesign\CADD Files\XS_ML014_38014042_Z05.dgn

Preliminary - IA 14



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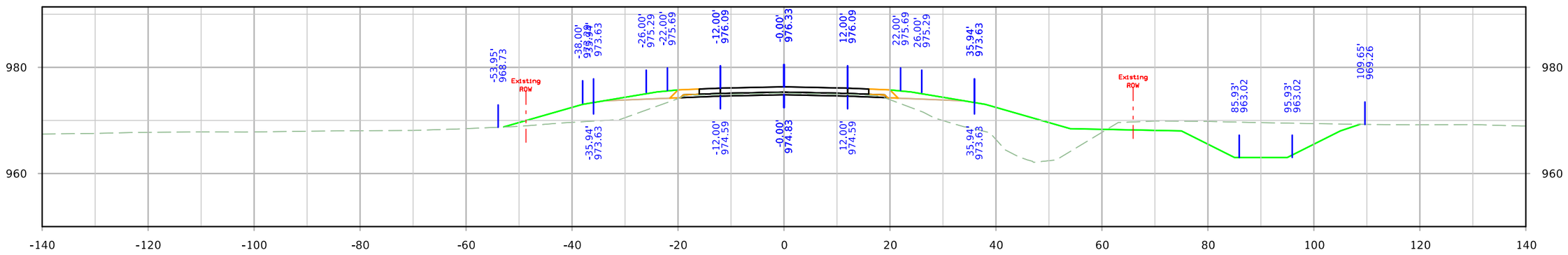

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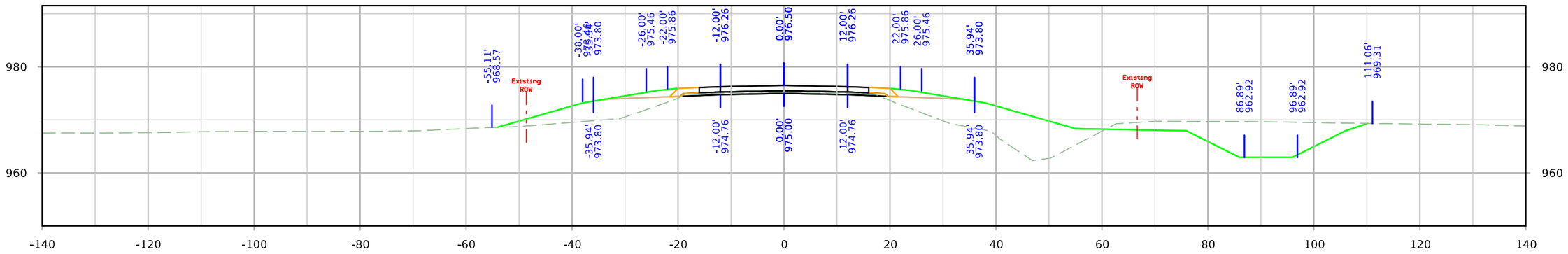

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FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.15

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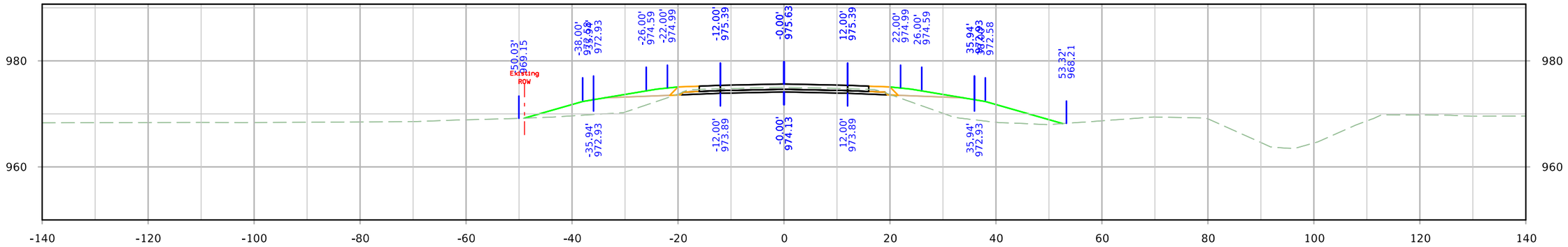
Preliminary - IA 14



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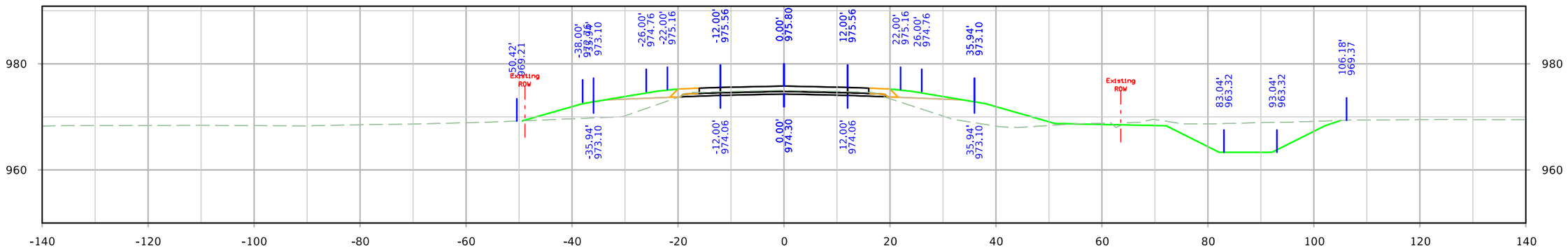

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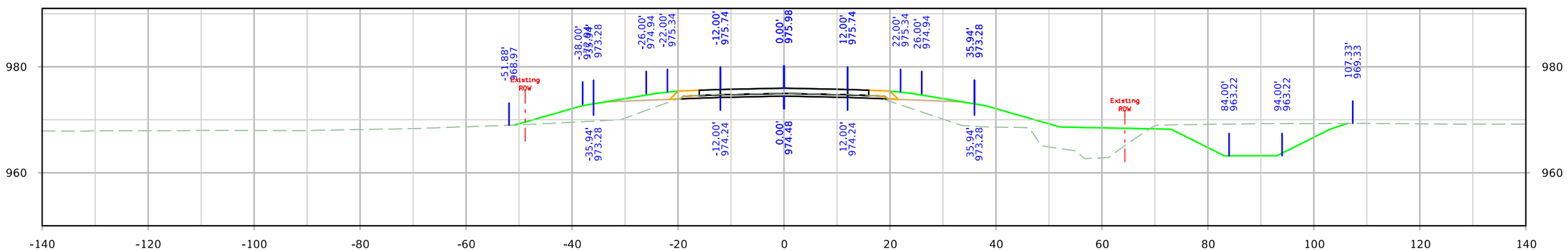

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FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.16

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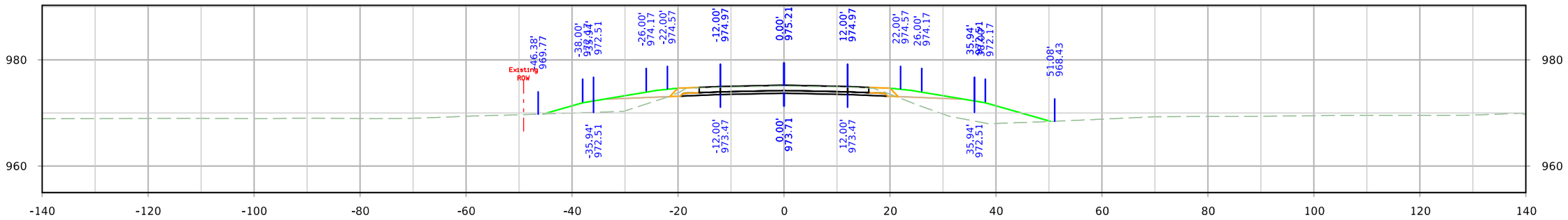
Preliminary - IA 14



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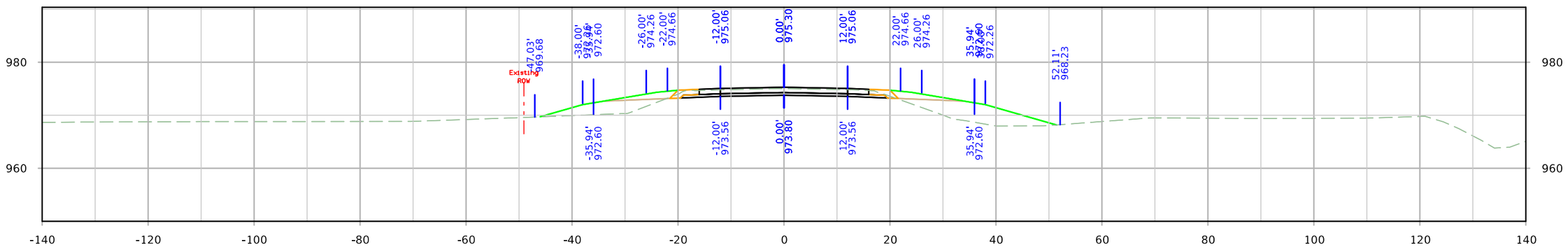

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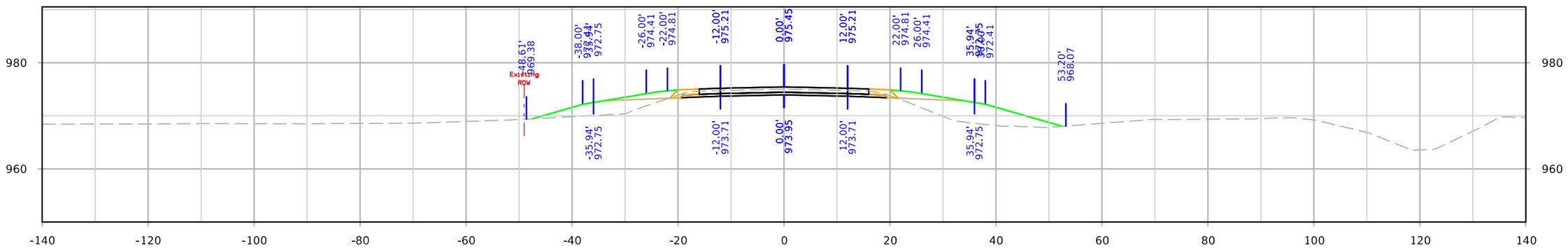

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FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.17

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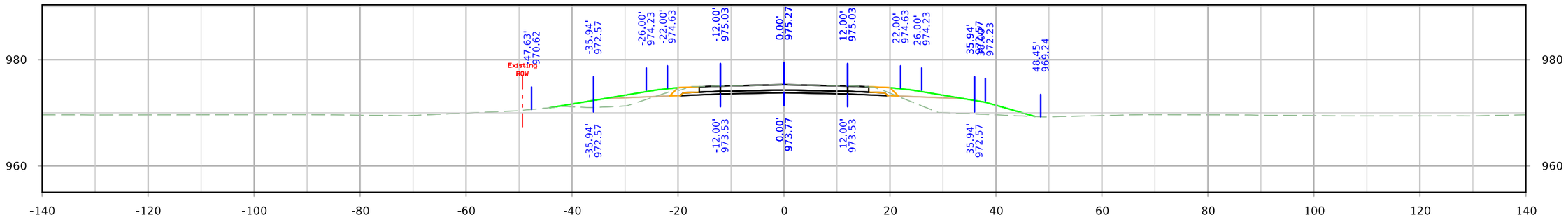
Preliminary - IA 14



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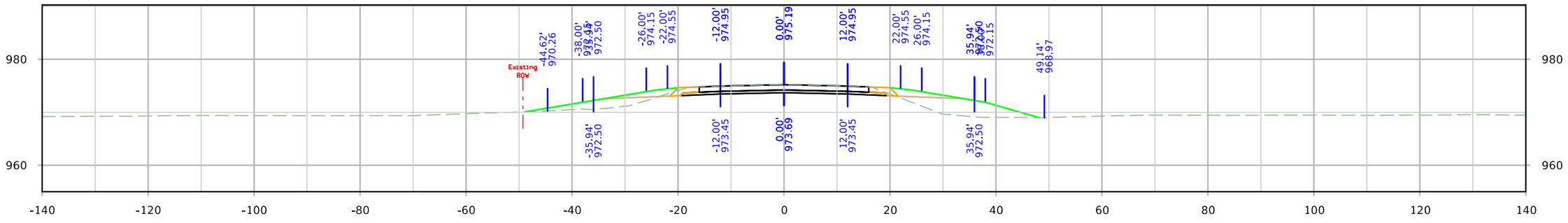

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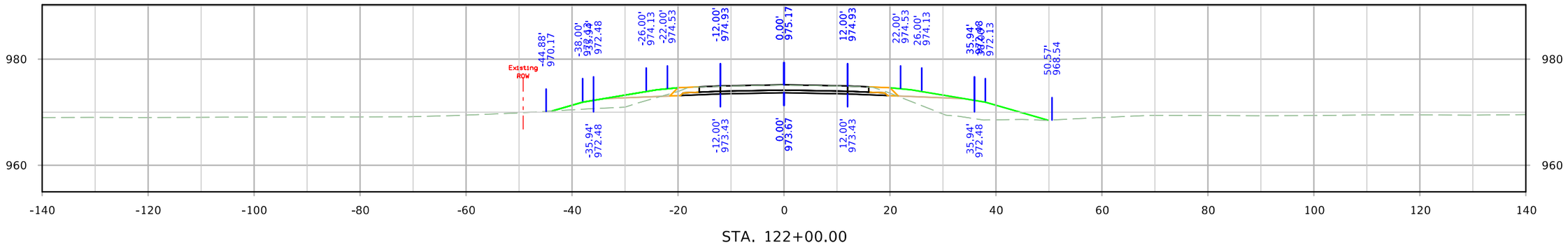

STA. 122+00.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth \ Adey	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.18

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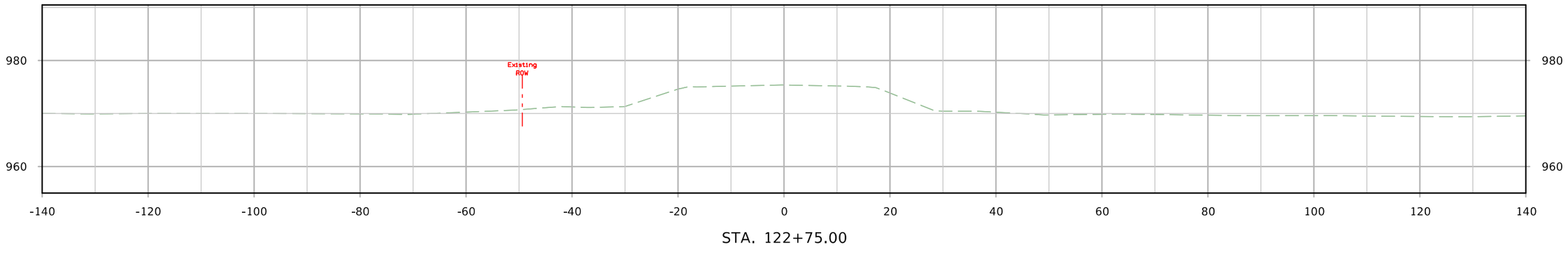
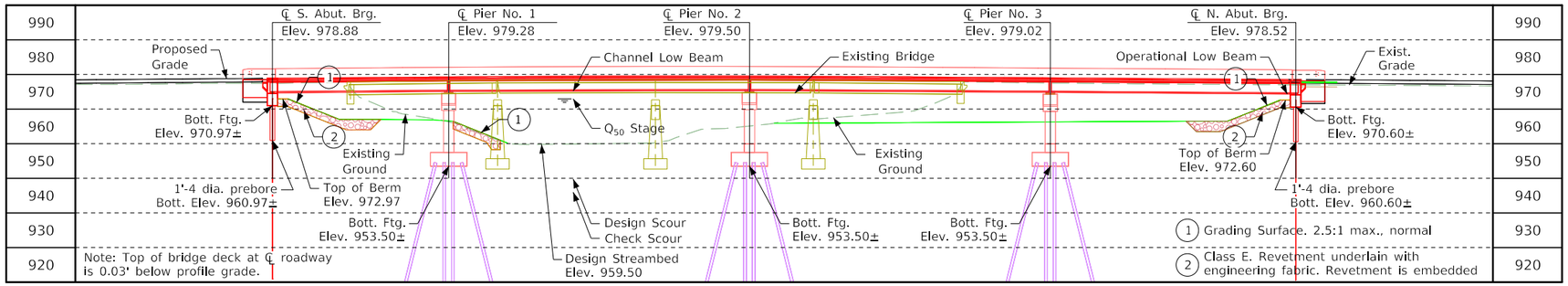


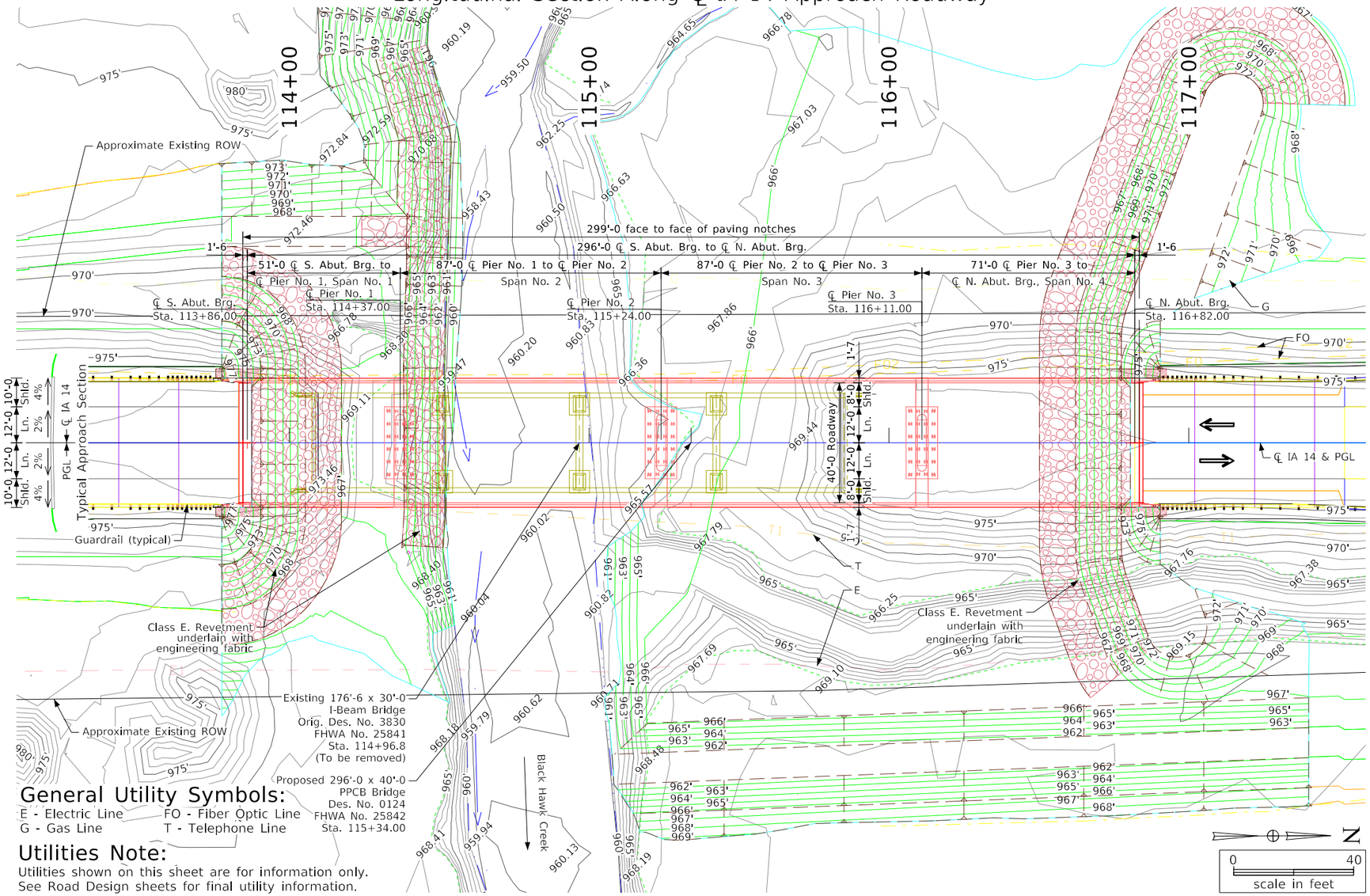
STA. 122+75.00

FILE NO.	ENGLISH	DESIGN TEAM Smyth\Adey\Vais	GRUNDY COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER W.19

Control Point CP2: N 8800514.504, E 15359891.178, El. 1010.393, DRILLED HOLE IN BALL OF ROW RAIL 20 FEET SOUTH AND 40 FEET WEST OF INTSEC IA HWY 14 and E COTTONWOOD NEAR WOOD POST



Longitudinal Section Along ℄ IA 14 Approach Roadway



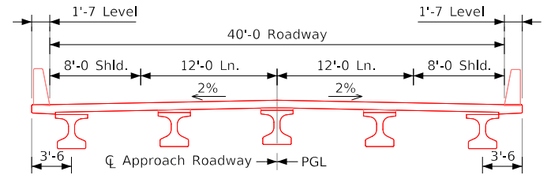
General Utility Symbols:

E - Electric Line
FO - Fiber Optic Line
G - Gas Line
T - Telephone Line

Utilities Note:

Utilities shown on this sheet are for information only.
See Road Design sheets for final utility information.

Situation Plan



Typical Bridge Section

General Notes
This design is for the replacement of the existing 176'-6 x 30' I-Beam Bridge, Design No. 0282, FHWA No. 25481, Maint. No. 3831.3S014

Design Notes
TL-4 Bridge Railing Proposed
Pier Type - T-Pier 3'-0 column width assumed

This bridge will be designed to withstand the applicable effects of ice and the horizontal stream loads and uplift forces associated with the Q100.

An Iowa DNR Flood Plain Permit is required. Preliminary Design will submit the application and place the permit in the PW Regulatory_Permits subdirectory folder upon receipt.

Hydraulic Data

RIDB: BlackHawkC_Black_39.42
Drainage Area = 56.1 Sq. Mi.
Stream Slope (HGL) = 4.2 Ft./Mi.
Avg. Low Water Stage = 961.0

Q_{50} = 9,500 cfs (design)
Stage = 972.91
Channel Low Beam = 975.20
Avg. Bridge Velocity = 4.69 fps

Q_{100} = 11,150 cfs
Stage = 973.53
Operational Low Beam = 974.35
Backwater = 1.35 Ft.
Avg. Bridge Velocity = 5.12 fps

Q_{200} = 14,350 cfs
Stage = 974.59
Calculated Design Scour = 947.4
Q Overtop = 14,925 cfs
Avg. Bridge Velocity = 5.31 fps
Calculated Check Scour = 946.0

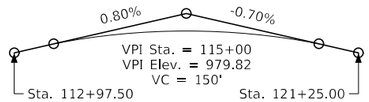
Q_{500} = 15,640 cfs
Roadway Overtop 975.0
Sta. 122+00.0

Location

IA 14 Over Black Hawk Creek
T-87N, R-16W and R-17W
Sections 1 and 6
Palermo and Washington Township
Grundy County
City of Grundy Center
FHWA No. 25842
Maint. No. 3831.3S014
Latitude 42.369560°
Longitude -92.768284°

IA 14 Traffic Est.

2022	AADT	4,800	V.P.D.
2042	AADT	5,600	V.P.D.
2042	DHV	580	V.P.H.
Trucks		14	%
Total Design ESALs		---	



Proposed Profile IA 14

Hydraulic Design

LICENSED PROFESSIONAL ENGINEER Matthew J. Erickson 26479 IOWA

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.

Matt Erickson — 05-31-2023
Signature — Date
Matthew J. Erickson
Printed or Typed Name
My license renewal date is December 31, 2024
Pages or sheets covered by this seal: V.1 and V.2

Preliminary

Design For 0° Skew

296'-0 x 40' Pretensioned Prestressed Concrete Beam Bridge

51'-0 and 71'-0 End Spans — BTB Beams — 87'-0 Interior Spans

Situation Plan

STA. 115+34.00 (℄ IA 14)
Turn-in Date: May 2023

Grundy County

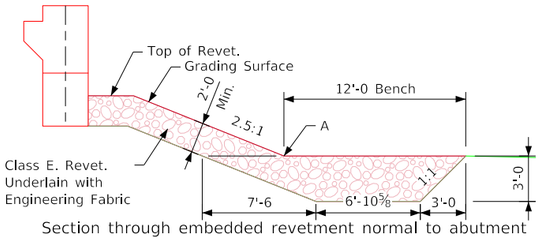
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0124 — Design Sheet No. 001 of 2 — FHWA No. 025842

FILE NO. 32046	ENGLISH	DESIGN TEAM ME	Grundy COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER V.1

7:15:45 PM 8/30/2023 mericks pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\3801402018\Bridge\(042)_Bridge Replacement-PPCB\SHT_38014042_DOT_0124_025842_Z05.dgn

Control Point CP2: N 8800514.504, E 15359891.178, El. 1010.393, DRILLED HOLE IN BALL OF ROW RAIL 20 FEET SOUTH AND 40 FEET WEST OF INTSEC IA HWY 14 and E COTTONWOOD NEAR WOOD POST



Section through embedded revetment normal to abutment

Grading Control Points:
G1: Sta. 113+77.50, 55.46' Lt., Elev. 968.00
G2: Sta. 113+77.50, 70.47' Lt., Elev. 968.08
G3: Sta. 114+39.00, 70.47' Lt., Elev. 966.50
G4: Sta. 114+45.74, 132.55' Lt., Elev. 961.00
G5: Sta. 113+77.50, 55.46' Rt., Elev. 968.00
G6: Sta. 114+51.34, 34.93' Rt., Elev. 961.00
G7: Sta. 115+08.00, 108.92' Rt. Elev. 961.06
G8: Sta. 117+40.00, 100.00' Rt., Elev. 961.99
G9: Sta. 117+40.11, 112.82' Lt., Elev. 966.50
G10: Sta. 116+76.50, 77.49' Rt., Elev. 966.50

See Standard Road Plan EW-210 for wing dike details.

Situation Plan - Site

General Utility Symbols:

E - Electric Line
G - Gas Line
FO - Fiber Optic Line
T - Telephone Line

Utilities Note:

Utilities shown on this sheet are for information only.
See Road Design sheets for final utility information.

Estimated Berm Armoring Quantities

Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	Excavation (CY)
Berm - South Abut.	371.0	4.0	345.0	232.0
Berm - North Abut.	851.0	4.0	794.0	532.0
Streambank	372.0	---	420.0	233.0
Totals	1594.0	8.0	1559.0	997.0

Excavation quantity calculated from grading surface.

Berm Slope Location Table

Points	South Abutment			Points	North Abutment		
	Station	Offset	Elev.		Station	Offset	Elev.
A1	114+05.42	24.58' Lt.	967.00	A3	116+62.24	24.58' Lt.	966.50
A2	114+05.42	24.58' Rt.	967.00	A4	116+62.24	24.58' Rt.	966.50
B1	113+90.50	24.58' Lt.	972.97	B3	116+77.50	24.58' Lt.	972.60
B2	113+90.50	24.58' Rt.	972.97	B4	116+77.50	24.58' Rt.	972.60
W1	113+77.50	24.58' Lt.	978.29	W3	116+90.50	24.58' Lt.	977.94
W2	113+77.50	24.58' Rt.	978.29	W4	116+90.50	24.58' Rt.	977.74

Berm slope elevations reflect the grading surface.

Section Through Key-In Trench

Preliminary

Design For 0° Skew

296'-0 x 40' Pretensioned Prestressed Concrete Beam Bridge

51'-0 and 71'-0 End Spans BTB Beams 87'-0 Interior Spans

Situation Plan - Site

STA. 115+34.00 (℄ IA 14)

Turn-in Date: May 2023

Grundy County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0124 Design Sheet No. 002 of 2 FHWA No. 025842

FILE NO. 32046	ENGLISH	DESIGN TEAM ME	Grundy COUNTY	PROJECT NUMBER BRF-014-6(42)--38-38	SHEET NUMBER V.2

SYSTEMTIME SYSTEMDATE USERNAME DGNSPEC