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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
Adair COUNTY
Bridge Replacement- PPCB
W Fork Nodaway River
1.6 mi E of Co Rd N51

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL
33
PROJECT IDENTIFICATION NUMBER
19-01-092-010
PROJECT NUMBER
BRF-092-3(40)--38-01
R.O.W. PROJECT NUMBER
STPN-092-3(41)--2J-01

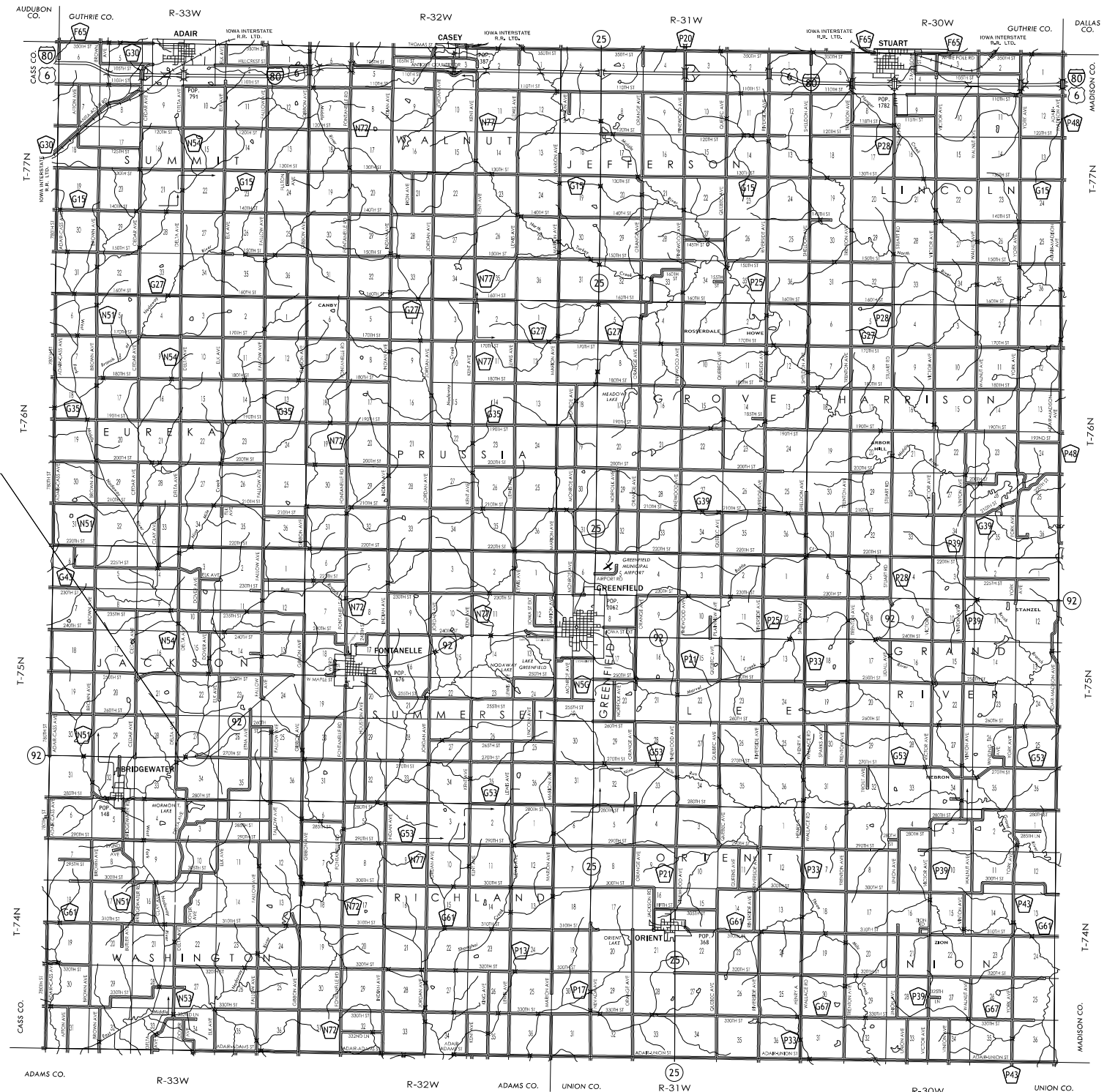
DESIGN DATA RURAL	
2024 AADT	1100 V.P.D.
2044 AADT	1100 V.P.D.
20 -- DHV	-- V.P.H.
TRUCKS	17 %
Total	
Design ESALS	--

PRELIMINARY PLANS

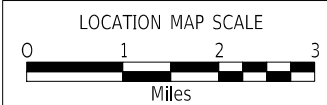
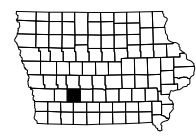
Subject to change by final design.

D5 PLAN - Date: 12-22-23

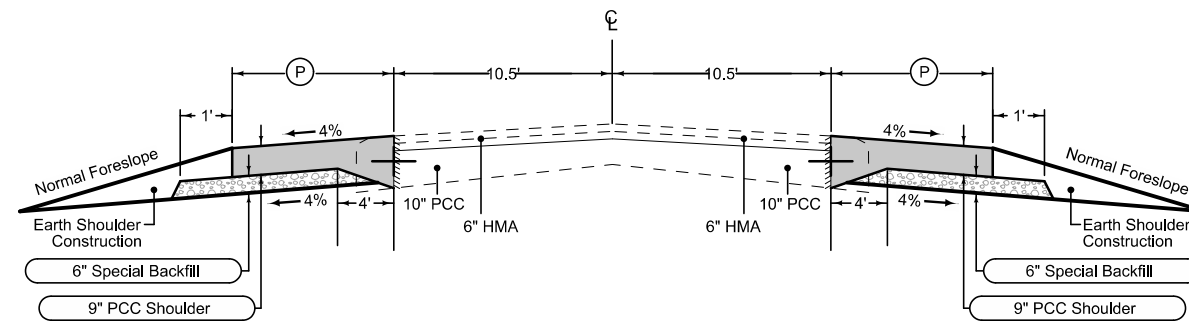
ADAIR COUNTY



PROJECT LOCATION
FHWA 13010
REF LOC = 70.60



1



PCC Paved Shoulder

PCC Pavement Jointing:
 Longitudinal joint: BT-3
 Transverse joint: C Match mainline spacing

Custom		
STATION TO STATION		(P) Feet
166+10.00	168+15.21	11.5'
168+15.21	168+61.40	Varies*
172+04.60	172+79.49	Varies*
172+79.49	174+60.00	11.5'

① Refer to Tab 112-9

* Includes paved shoulder in front of guardrail.

PCC Paved Shoulder

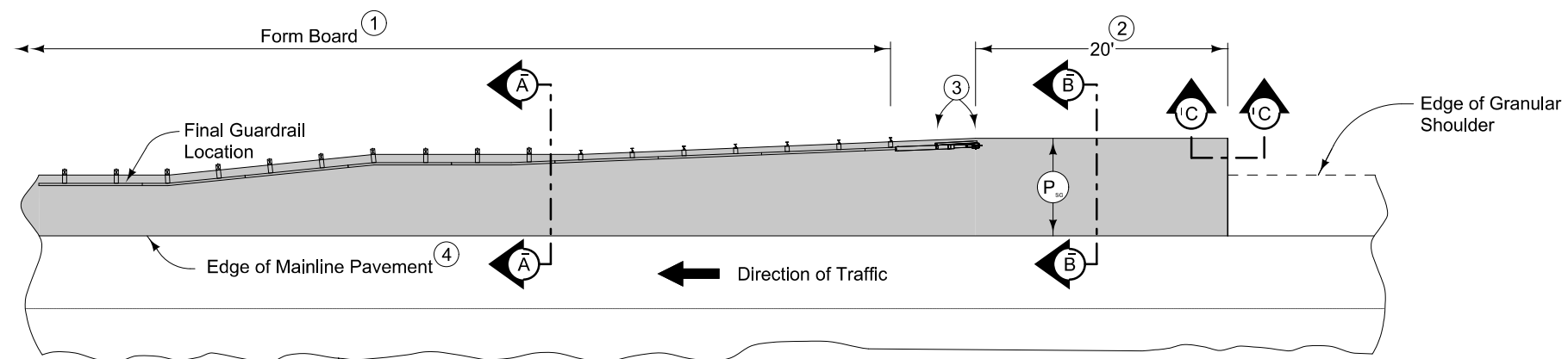
PCC Pavement Jointing:
 Longitudinal joint: BT-3
 Transverse joint: C Match mainline spacing

Custom		
STATION TO STATION		(P) Feet
167+86.63	168+61.40	Varies*
172+04.60	172+50.81	Varies*

① Refer to Tab 112-9

* Paved shoulder in front of guardrail.

IA 92



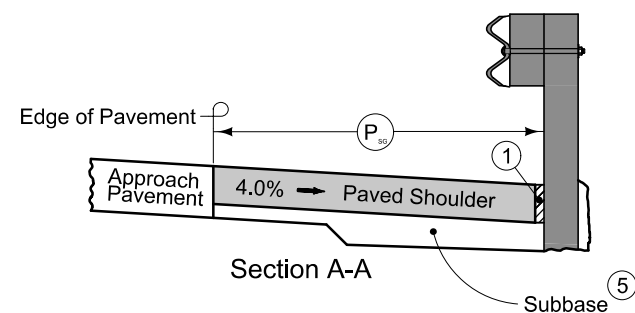
PLAN VIEW

9" PCC Paved Shoulder at guardrail.

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.

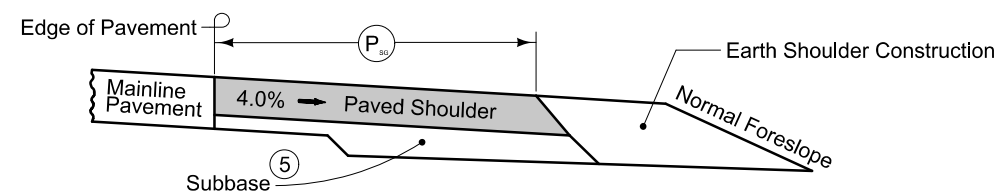
Refer to Tabulation 112-9 for shoulder quantities.

- 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' joint (per PV-101) for PCC shoulder. 'B' joint (per PV-101) for HMA shoulder.
- ⑤ Refer to other details in the plan.



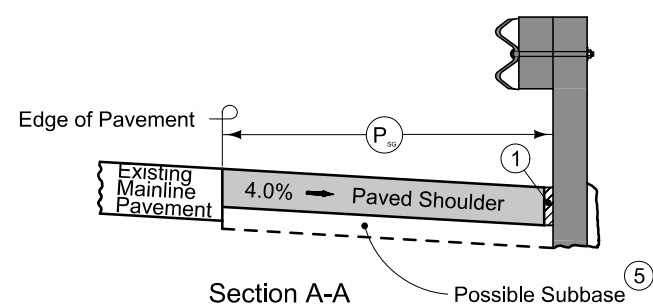
Section A-A

Subbase ⑤



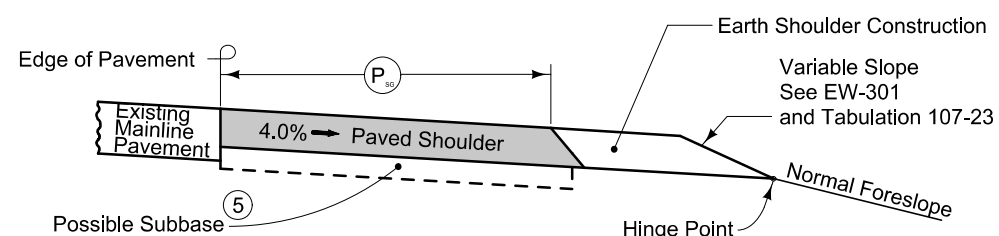
Section B-B

NEW CONSTRUCTION



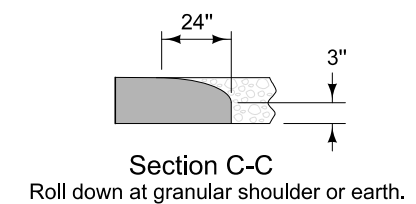
Section A-A

Possible Subbase ⑤



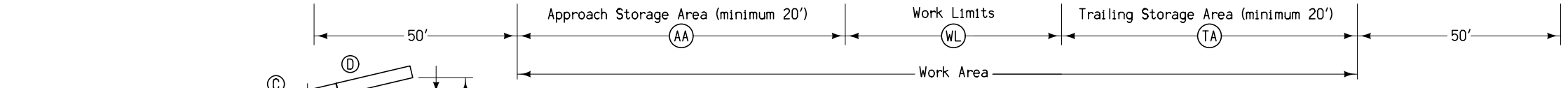
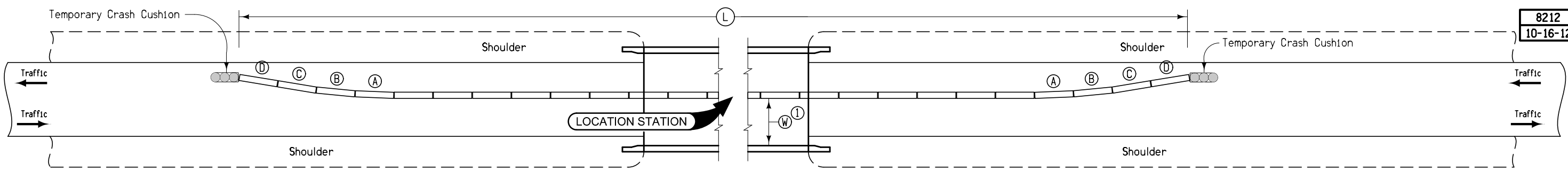
Section B-B

NEW SHOULDER NEXT TO EXISTING PAVEMENT



PAVED SHOULDER AT GUARDRAIL
(GRANULAR SHOULDER ADJACENT TO MAINLINE)

8212
10-16-12

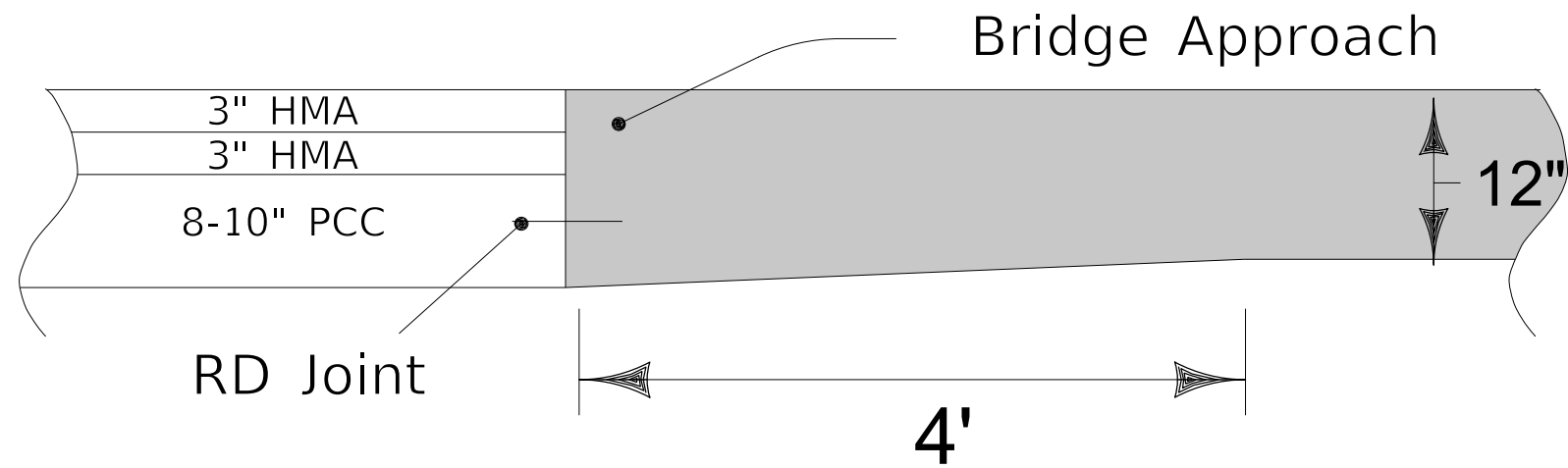


BARRIER OFFSETS FOR FLARE SECTIONS

① Where (W) is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.

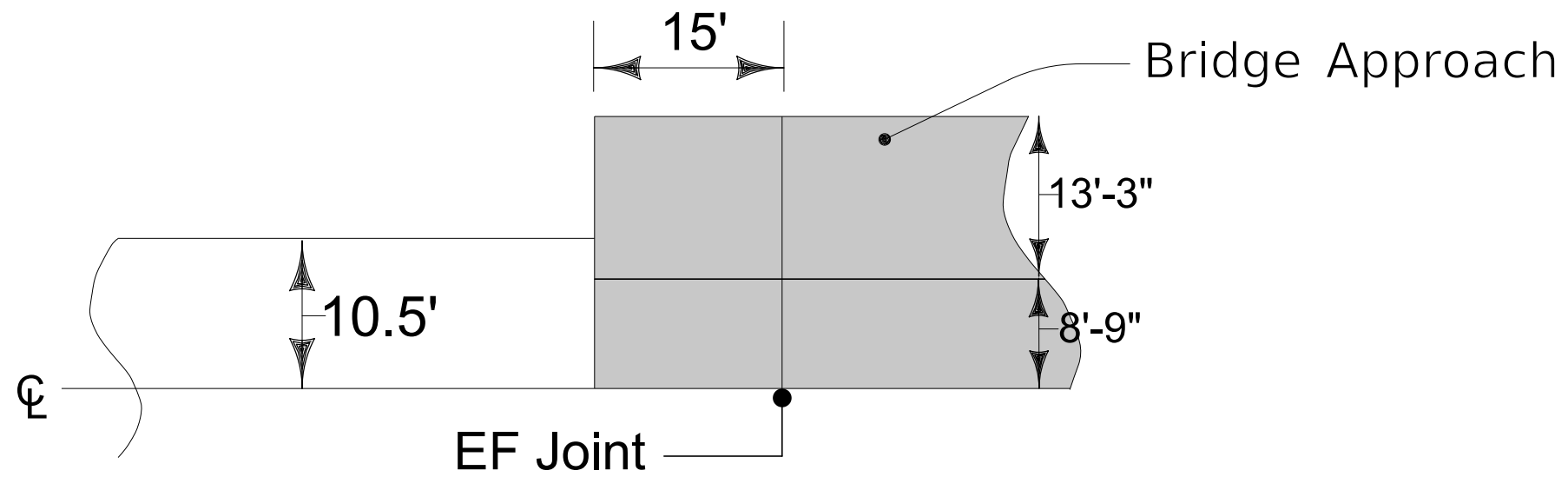
**TEMPORARY CONCRETE BARRIER LAYOUT
for Two-Way Traffic**

Station	Side	(AA)	(WL)	(TA)	(L)	Anchored X	(W) ①	Remarks
		Feet	Feet	Feet	Feet		Ft-Inches	
170+33	Left	125	362.5	125	712.5	X	15'-3"	Stage 2
170+33	Right	125	362.5	125	712.5	X	11'	Stage 3



Profile View

Transition at End of Bridge Approach



Plan View

EF Joint Location at Bridge Approach

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
- Water Hydrant (Rural)
- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Satellite TV Dish
- Water Hook Up
- Radio Tower
- Tower Anchor
- Guardrail (Beam or Cable)
- Guard Post (one or two)
- Guard Post (over two)
- Filler Pipe
- Gas Valve
- Water Valve
- Speed Limit Sign
- Mile Marker Post
- Sign
- Traffic Signal Control Box
- Rail Road Signal Control Box
- Telephone Switch Box
- Electric Box

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

- FO1D Windstream Communications - Quality D
- FO2D Centurylink - Quality D
- TL1D Cumberland Telephone Company - Quality D
- PPA Farmers Electric Cooperative

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

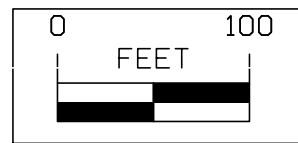
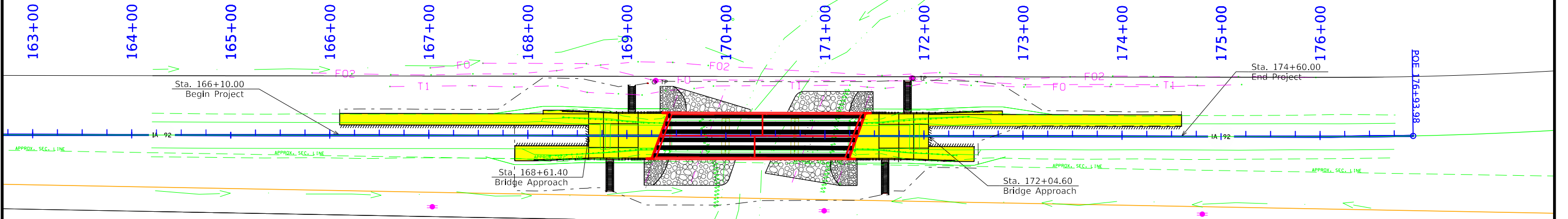
RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

Jackson TWP.
T-75N R-33W
SEC. 27

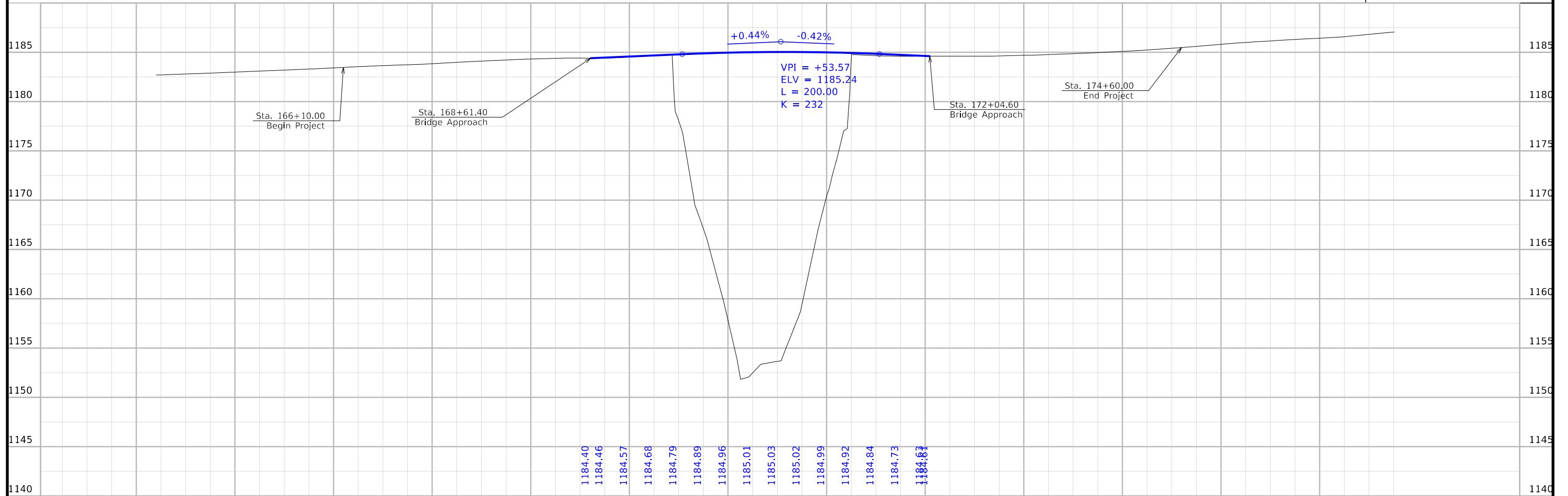


(Remove)
Sta. 170+51.30
180' x 26' Continuous
I-Beam Bridge
D.A.= 105 Sq Miles H (Per As-Built Plans)

Sta. 170+33.00
Build
194'-0" x 44'-0" PPCB Bridge
Skew 20° L.A.
Design No. 524

West Fork Nodaway River
Sect. No. 34

IA 92



Survey Information

Adair County
BRF-092-3(40)--38-01
Location: W Fork Nodaway River 1.6 mi E of Co Rd N51
Type of Work: Bridge-Unspecified
Project Directory: 0109201019
PIN: 19-01-092-010
Sap-0250.1

Party Personnel

Clayton Henningsen- Survey Party Chief
Jason Arn- Survey Party Chief
Paul Harry- Survey Party Chief

Date(s) of Survey

Begin Date 10/01/2020
End Date 10/15/2020

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction on IA 92 1.6 mi east of County Road N51. This is a full field survey.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project Pts. 01092005, 01092006, X 103, PJH 20 1968 and by doing concurrent 5 hour static observations. The project control is relative to nearby Iowa RTN Base Stations.

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

NGS mark designated X 103 (PID MJ1036) has a published Elev. 1366.34
Survey Elev. = 1366.252

This survey observed 1 USGS 3rd Order benchmark with published NGVD 29 converted to NAVD88 heights to compare to local ground control:

USGS 3rd Order mark designated PJH 20 1968 has a published NGVD29 =1260.558
NAVD88 conversion= 1260.89
Survey Elev. = 1260.861

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 7 (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. Coordinates were determined by conducting concurrent 5 hour static observations on Project Pts. 01092005, 01092006, X 103, PJH 20 1968.

Alignment Information

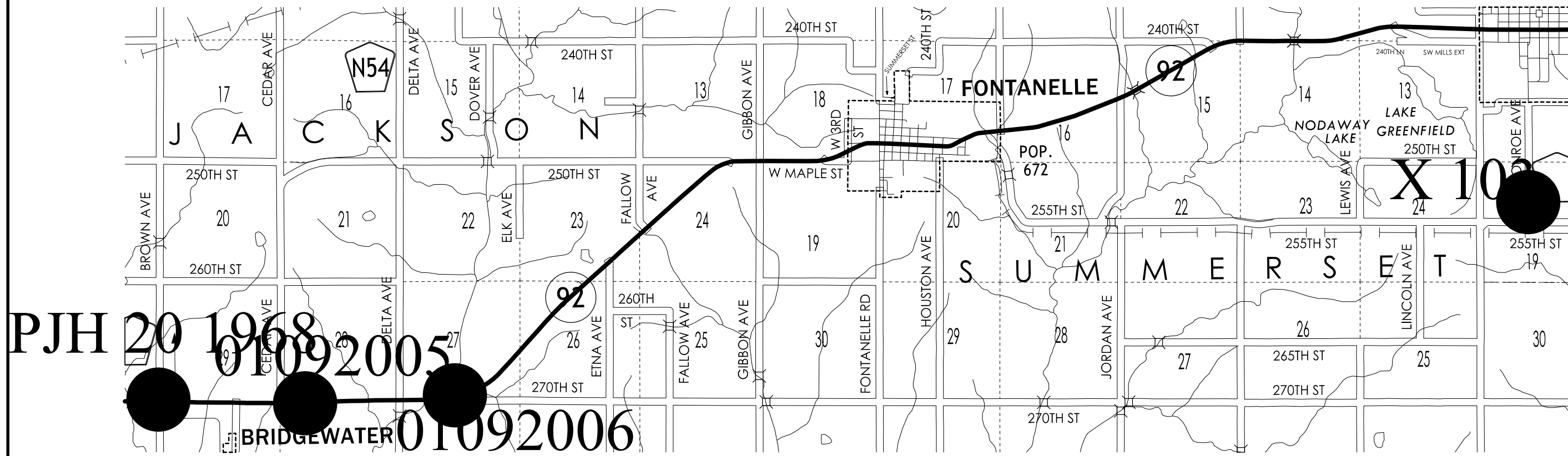
The horizontal alignment for this survey is a retrace of A.C.C. Widening & Resurfacing No. F-92-3(16)—20-01. Survey stationing was equated to the plan PC at Sta. 176+26.9 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PC Sta. 176+26.9 A.C.C. Widening & Resurfacing No. F-92-3(16)—20-01
Survey PC Sta. 176+26.9

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

1a. Regional Coordinate System Zone 7

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 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 7

Project Control Marks are Bench Marks

Point Name	North Coordinate	East Coordinate	Elevation	Feature Code- Monument Description
01092005	7167420.18	17493326.35	1276.182	CP 01092005 FROM INTERSECTION OF IA 92 AND CO RD N51 NEAR BRIDGWATER GO EAST 0.57 MILES ALONG HWY 92 TO A FIELD ENTRANCE ON SOUTH SIDE OF HWY 92 SET FENO TYPE MONUMENT 0.3 DEEP 33 FEET SOUTH OF IA 92 CENTERLINE 35 FEET NORTHWEST OF P POLE 38 FEET NORTHWEST OF EAST GATE POST 22 FEET EAST OF FIELD ENTRANCE CENTERLINE
01092006	7167772.07	17499885.01	1191.597	CP 01092006 FROM INTERSECTION OF IA 92 AND CO RD N51 NEAR BRIDGWATER GO EAST 1.8 MILES ALONG HWY 92 TO 270 TH ST ON NORTH SIDE OF HWY A SET FENO TYPE MONUMENT 0.3 DEEP 98 FEET NORTH OF IA 92 CENTERLINE 67 FEET NORTHWEST OF TEL PEDESTAL 62 FEET NORTHWEST OF WOOD POST WITH ATTACHED UTILITY BOX
X103	7176234.373	17546866.83	1366.252	CP X103 AT INTERSECTION OF SW 2ND ST AND IA 92 IN GREENFIELD GO SOUTH 1.4 MILES ALONG SW 2ND ST FOUND A STANDARD DISK STAMPED X 103 1935 AND SET IN THE TOP OF A CONCRETE POST 2 FEET NORTH OF A HARN SIGN 5 FEET WEST OF A WITNESS POST 36 FEET WEST OF MONROE AVE CENTERLINE 103 FEET SOUTH OF TEL PEDESTAL
PJH 20 1968	7167586.317	17486903.58	1260.861	CP PJH 20 1968 FROM INTERSECTION OF IA 92 AND CO RD N51 NEAR BRIDGWATER GO WEST 0.65 MILES ALONG HWY 92 TO BROWN AVE IN NORTHWEST CORNER OF INTERSECTION A FOUND DISK ENCASED IN A CLAY TILE STAMPED 20 PJH 1968 2.5 FEET NORTHEAST OF A WITNESS POST 87 FEET NORTH OF IA 92 CENTERLINE 65 FEET WEST OF BROWN AVE CENTERLINE 41 FEET NORTHWEST OF TEL PEDESTAL

108-23A
08-01-08

TRAFFIC CONTROL PLAN

One lane of alternating traffic on IA 92 shall be maintained at all times via temporary traffic signals.

108-26A
08-01-08

STAGING NOTES

Stage 1

Traffic:
Maintain one lane of alternating traffic on EB lane of IA 92 via temporary traffic signals.
Close WB lane.
Construction:
Construct paved shoulder (including paved shoulder in front of guardrail) from Sta. 166+10.00 to Sta. 168+61.40 and Sta. 172+04.60 to Sta. 174+60.00.

Stage 2

Traffic:
Maintain one lane of alternating traffic on EB lane of IA 92 via temporary traffic signals and TBR.
Construction:
Construct north side of the bridge and bridge approaches.

Stage 3

Traffic:
Maintain one lane of alternating traffic on WB lane of IA 92 via temporary traffic signals and TBR.
Construction:
Construct south side of the bridge, bridge approaches, and paved shoulder in front of guardrail.

108-25
10-21-14










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
IA 92	Both	Adair	REF LOC: 70.5-70.65		Barrier	N/A	Horizontal	N/A	11'	10'	N/A	

**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

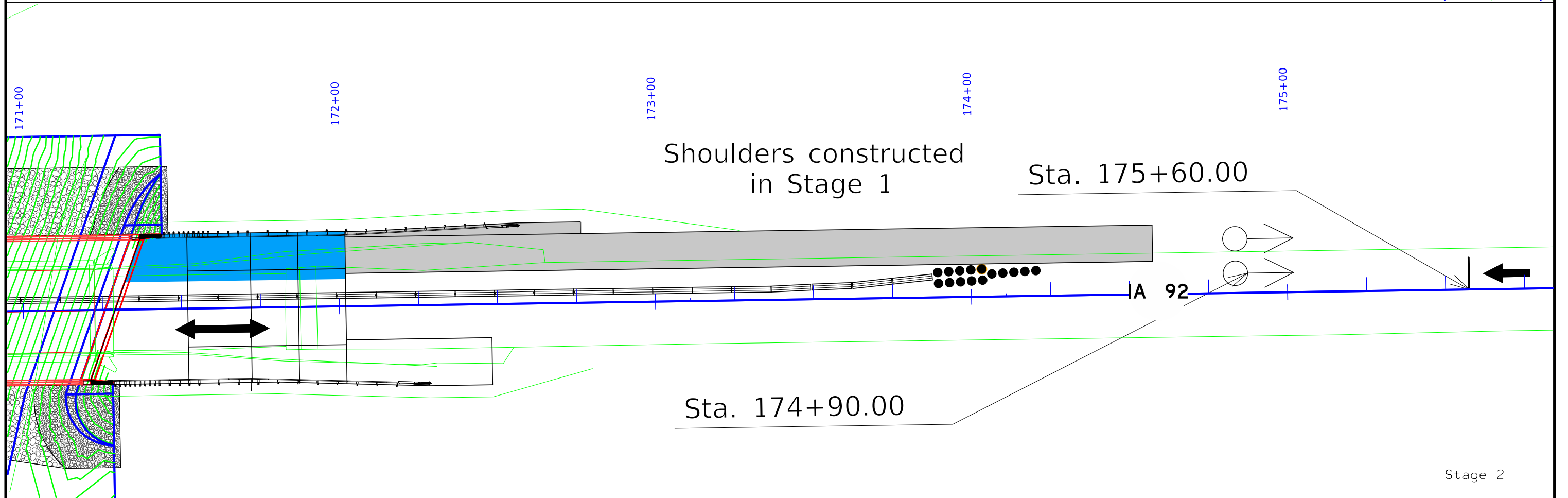
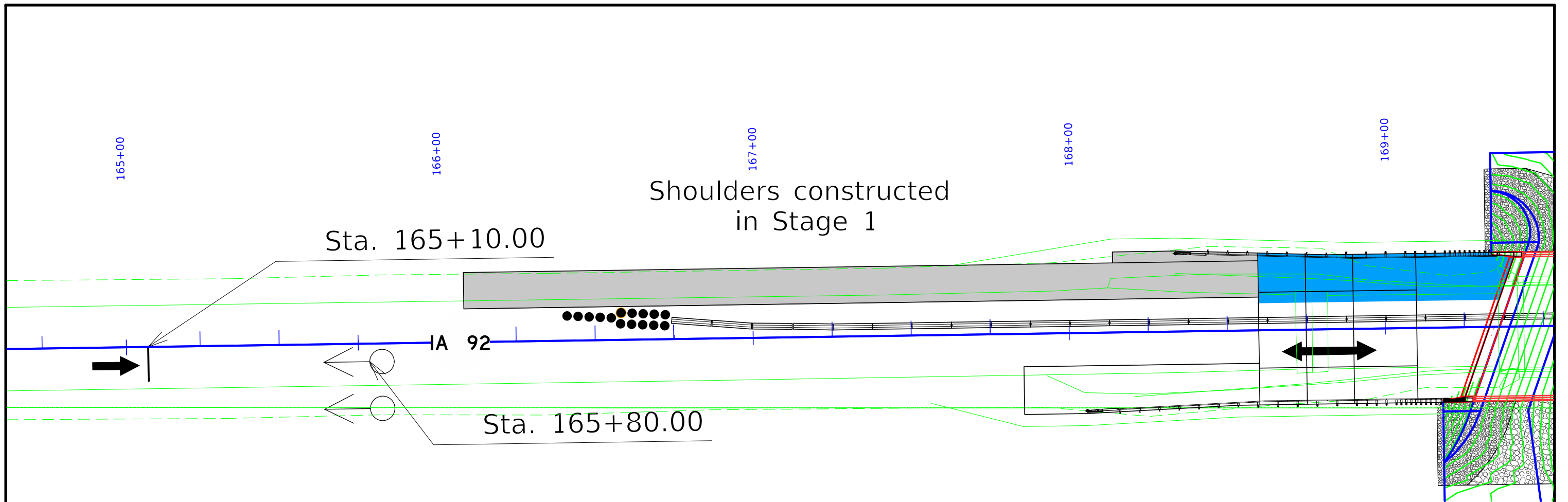
**PLAN VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

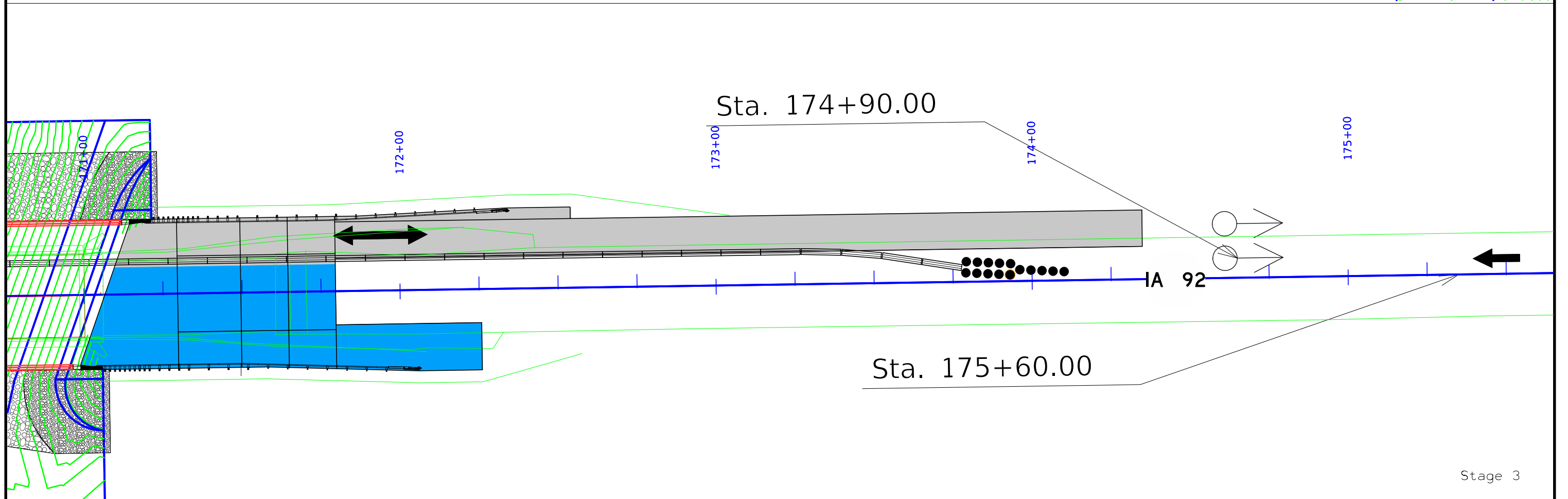
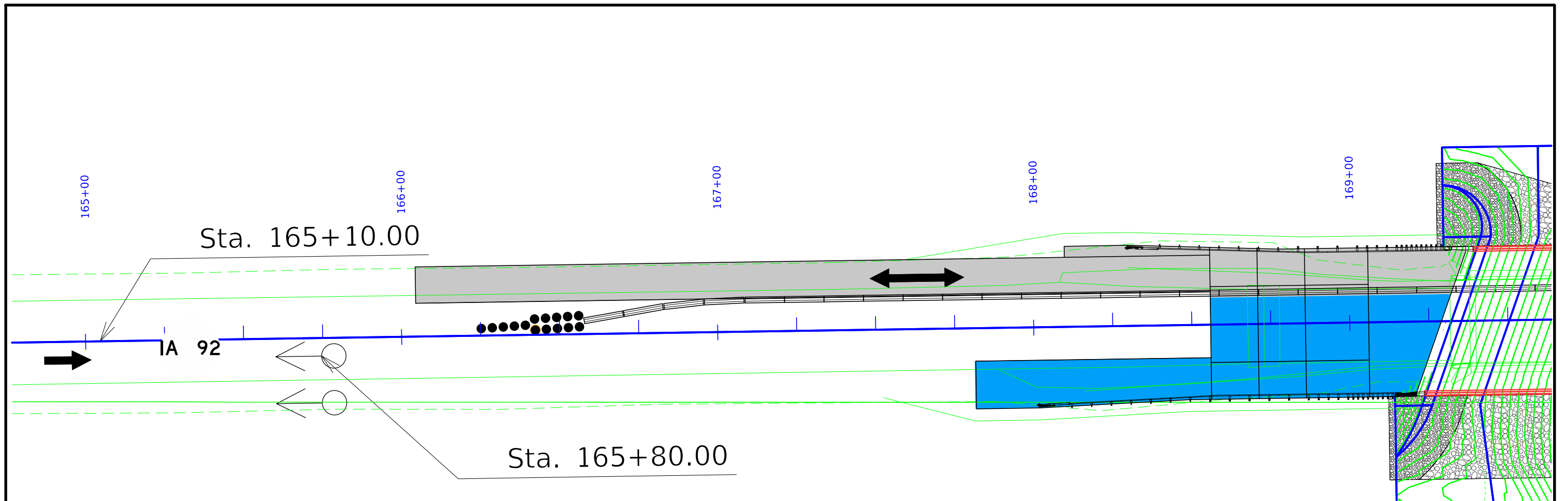
	Channelizing Device		Crash Cushion (Temp or Perm)
	Drum		Traffic Signal
	Temporary Lane Separator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic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





Stage 3

Control Point 01092006: 7167772.07N, 17499885.01E, CP 01092006 from the intersection of IA 92 and Co. Rd N51 near Bridgwater, go East 1.8 miles along Hwy 92 to 270th St. on North side of Hwy. A, set FENO type monument 0.3' deep, 98' North of IA 92 centerline, 67' Northwest of Tel. pedestal 62' Northwest of wood post with attached utility box, Elev. 1191.597.

Hydraulic Data

RIDB: NodawayR_Mid_WF_7.31
 Drainage Area = 104 Sq. Mi.
 Stream Slope (HGL) = 4.59 Ft./Mi.
 Avg. Low Water Stage = 1153.8

Q₅₀ = 17,200 cfs
 Stage = 1174.86
 Channel Low Beam = 1180.44
 Avg. Bridge Velocity = 9.18 fps

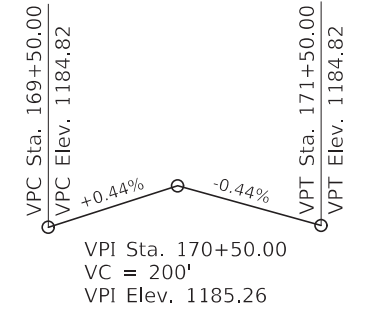
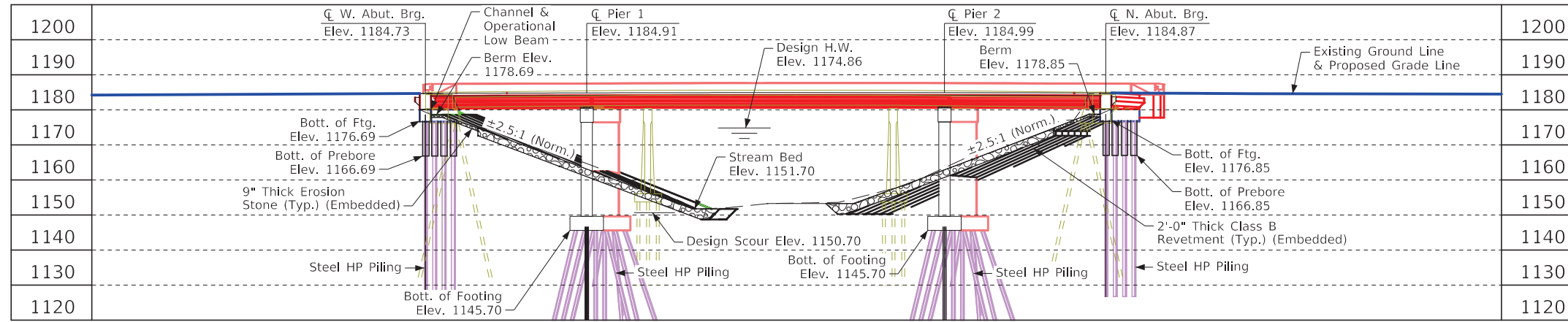
Q₁₀₀ = 20,600 cfs
 Stage = 1175.65
 Backwater = 0.64 Ft.
 Avg. Bridge Velocity = 10.36 fps

Q₂₀₀ = 24,100 cfs
 Stage = 1176.34
 Calculated Design Scour = 1150.70

Q₅₀₀ = 28,400 cfs
 Stage = 1177.10
 Avg. Bridge Velocity = 12.85 fps
 Calculated Check Scour = 1150.39

Roadway Overtop 1182.68
 Sta. 164+20

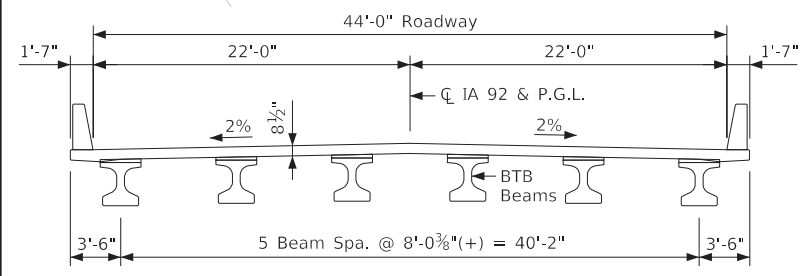
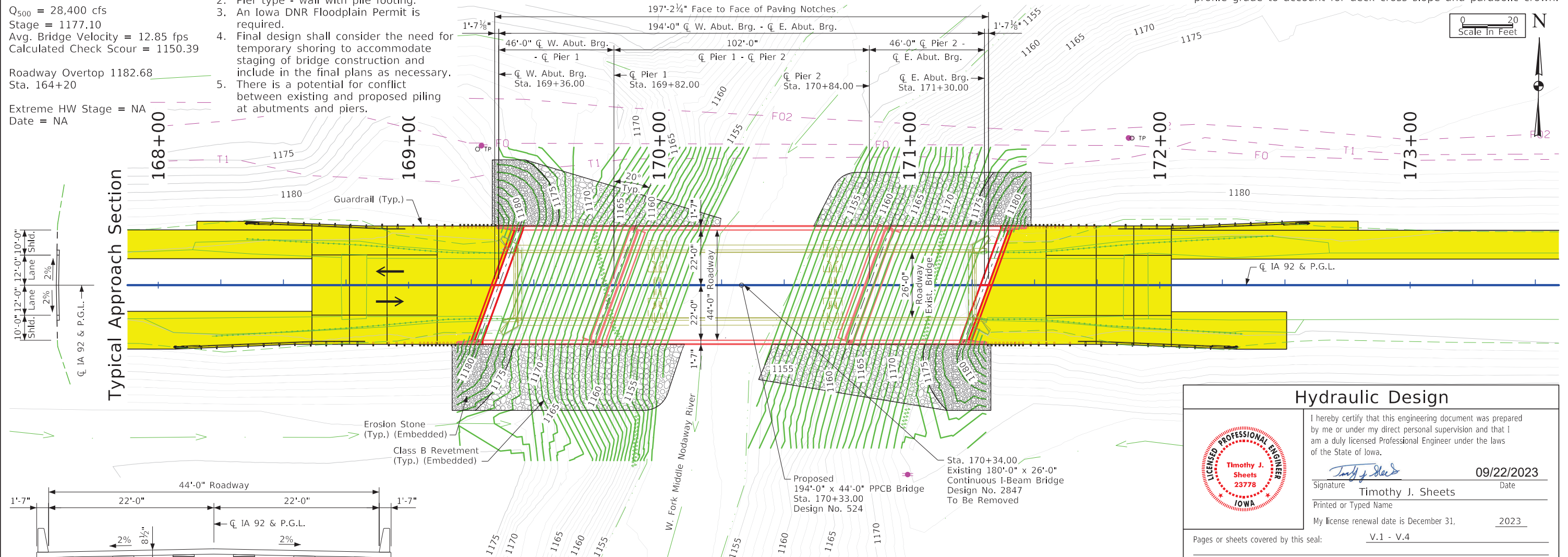
Extreme HW Stage = NA
 Date = NA



- Design Notes:**
1. TSS TL-4 bridge railing proposed.
 2. Pier type - wall with pile footing.
 3. An Iowa DNR Floodplain Permit is required.
 4. Final design shall consider the need for temporary shoring to accommodate staging of bridge construction and include in the final plans as necessary.
 5. There is a potential for conflict between existing and proposed piling at abutments and piers.

BRG TSL Longitudinal Section Along CL IA 92

Note:
 Top of bridge deck at centerline roadway is 0.03' below the profile grade to account for deck cross slope and parabolic crown.



Traffic Estimate

2024 AADT	1100 V.P.D.
2044 AADT	1100 V.P.D.
20?? DHV	?? V.P.H.
2024 TRUCKS	16 %
2044 TRUCKS	17 %
Total	???
Design ESALS	???

Situation Plan

Note:
 This design is for the replacement of the existing 180' x 26' continuous I-Beam bridge, Adair Design No. 2847, FHWA No. 13010, Maint. No. 0170.6S092.

Location

IA 92 over West Fork Middle Nodaway River
 T-75N R-33W
 Section 27/34
 Jackson Township
 Adair County
 FHWA No. 13011
 Bridge Maint. No. 0170.6S092
 Latitude 41.258831°
 Longitude -94.638793°

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.

Signature: *Timothy J. Sheets* Date: 09/22/2023
 Printed or Typed Name: Timothy J. Sheets
 My license renewal date is December 31, 2023

Pages or sheets covered by this seal: V.1 - V.4

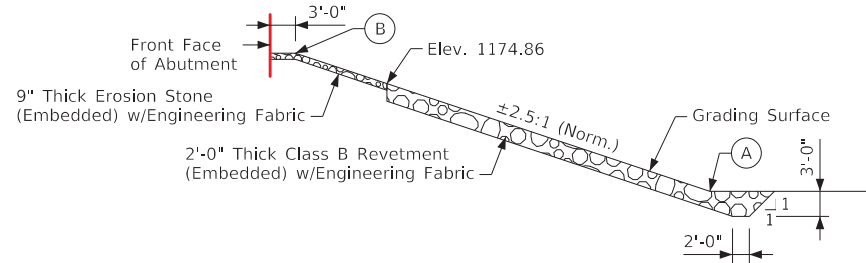
Design For 20 Degree LA
194'-0" x 44'-0" Prestressed Concrete Beam Bridge
 46'-0" End Spans 102'-0" Interior Span

Situation Plan

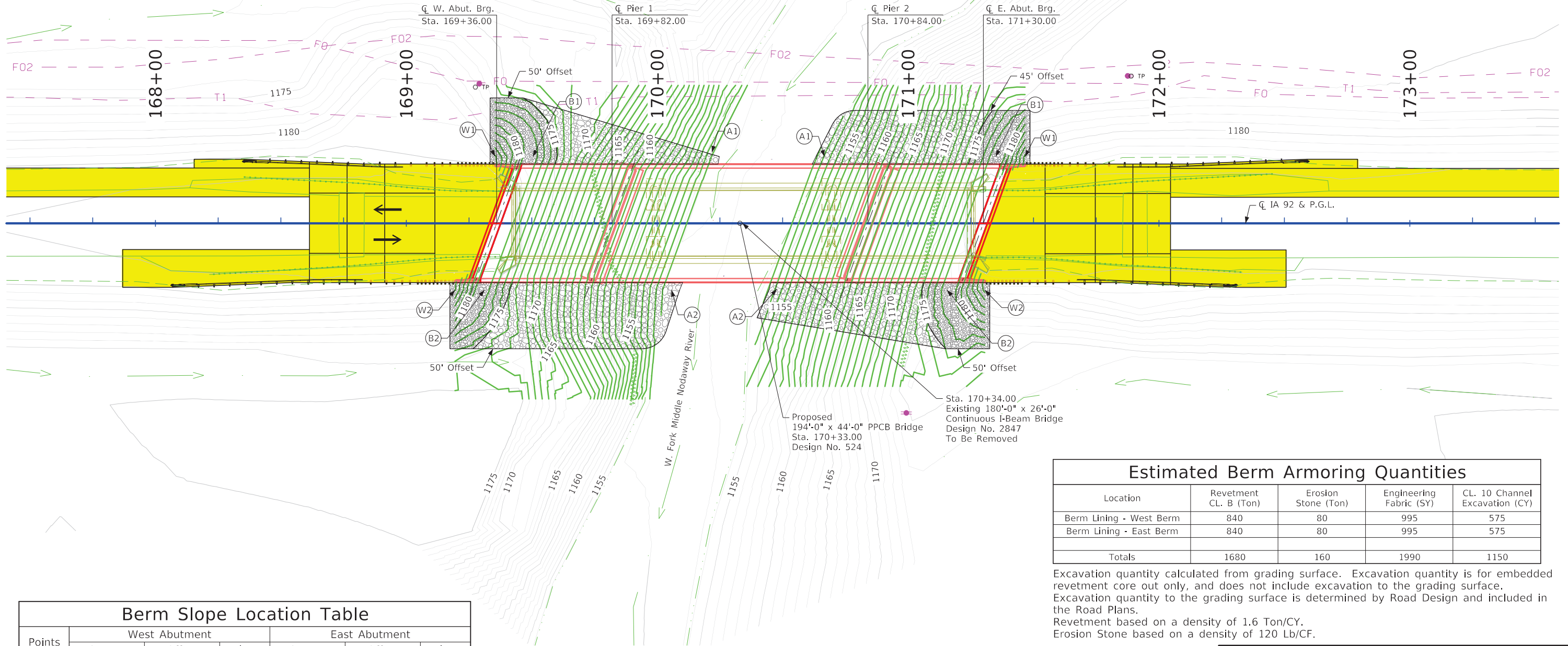
STA. 170+33.00 (CL IA 92) Turn-In Date: Oct 2023
Adair County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 524 Design Sheet No. 1 of 4 FHWA No. 13011

Control Point 01092006: 7167772.07N, 17499885.01E, CP 01092006 from the intersection of IA 92 and Co. Rd N51 near Bridgwater, go East 1.8 miles along Hwy 92 to 270th St. on North side of Hwy. A, set FENO type monument 0.3' deep, 98' North of IA 92 centerline, 67' Northwest of Tel. pedestal 62' Northwest of wood post with attached utility box, Elev. 1191.597.

0 20
Scale in Feet



Section Thru Embedded Revetment Berm



Site Plan

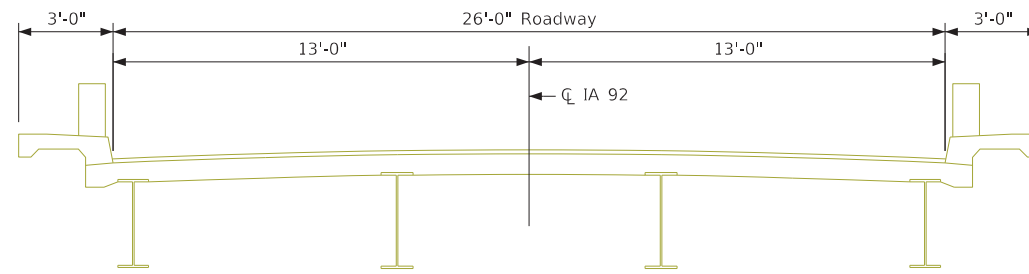
Location	Revetment CL. B (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - West Berm	840	80	995	575
Berm Lining - East Berm	840	80	995	575
Totals	1680	160	1990	1150

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Revetment based on a density of 1.6 Ton/CY. Erosion Stone based on a density of 120 Lb/CF.

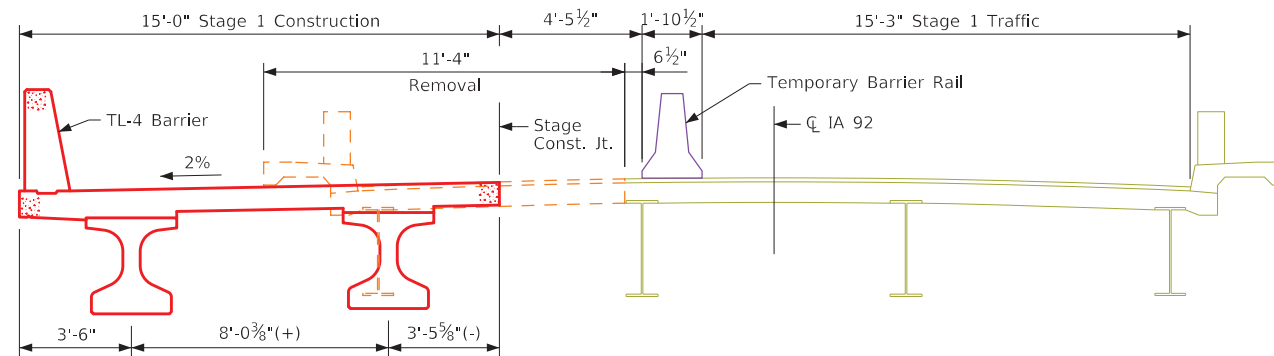
Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	170+17.66	26.58' Lt.	1151.70	170+71.89	26.58' Lt.	1151.70
A2	170+01.54	26.58' Rt.	1151.70	170+51.79	26.58' Rt.	1151.70
B1	169+50.46	26.58' Lt.	1178.69	171+34.88	26.58' Lt.	1178.85
B2	169+31.11	26.58' Rt.	1178.69	171+15.53	26.58' Rt.	1178.85
W1	169+35.41	26.58' Lt.	1184.17	171+46.60	26.58' Lt.	1184.25
W2	169+19.39	26.58' Rt.	1184.10	171+30.59	26.58' Rt.	1184.31

Berm slope elevations reflect the grading surface. All points are 3'-0" from the end of the abutment footing. Offsets are from CL IA 92.

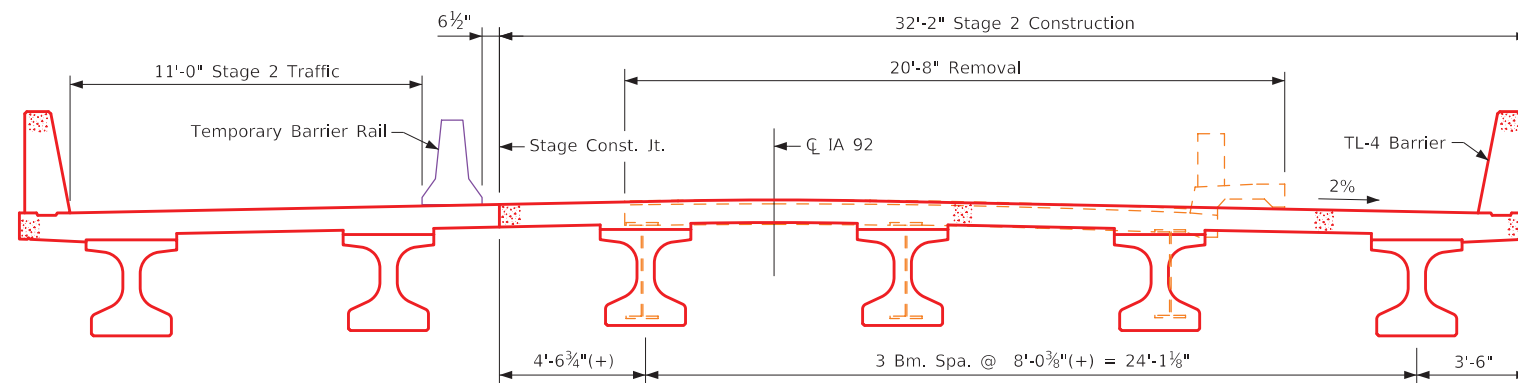
Design For 20 Degree LA
194'-0" x 44'-0" Prestressed Concrete Beam Bridge
 46'-0" End Spans 102'-0" Interior Span
Site Plan
 STA. 170+33.00 (CL IA 92) Turn-In Date: Oct 2023
Adair County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 524 Design Sheet No. 2 of 4 FHWA No. 13011



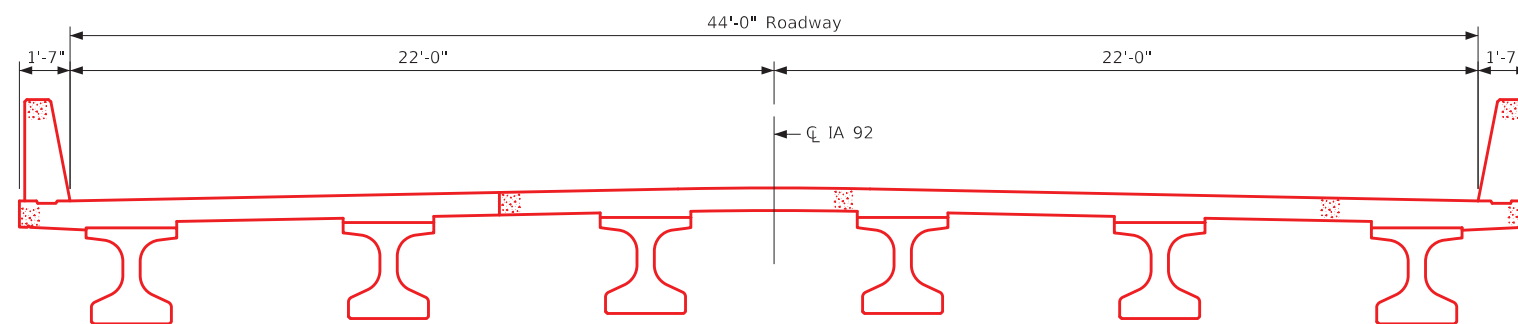
Existing Transverse Section
(Looking East)



Transverse Section - Stage 1
(Looking East)



Transverse Section - Stage 2
(Looking East)



Proposed Transverse Section
(Looking East)

Design For 20 Degree LA
194'-0" x 44'-0" Prestressed Concrete Beam Bridge
 46'-0" End Spans 102'-0" Interior Span
Construction Staging
 STA. 170+33.00 (CL IA 92) Turn-In Date: Oct 2023
Adair County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 524 Design Sheet No. 3 of 4 FHWA No. 13011

IA 92 over West Fork Middle Nodaway River

Project No. BRF-092-3(040)--38-01

PIN: 19-01-092-010

File No. 32043

Adair County - Design No. 524

194'-0" x 44'-0" Pretensioned Prestressed Concrete Beam (PPCB) Bridge

Location: 1.6 mi. E of County Road N51

Station 170+33.00 (CL IA 92)

Maintenance No. 0170.6S092

FHWA No. 13011

Work Description: Bridge Replacement - PPCB

Prepared for: Iowa DOT

Prepared by: Foth IE

TSL DEVELOPMENT DETAILS

- 1. BDM 3.2.2.4 - Freeboard
 - a. Q_{50} design elevation is 1174.86 on the downstream edge of the proposed bridge.
 - b. Channel low beam at Sta. 169+45 and is 1180.44.
Freeboard for the proposed bridge is 5.58', which is greater than the DNR requirement of 3'. Calculation is below:
 Low Step Elevation at W. Abut. = 1180.19
 Bearing Device Height = 0.25'
 Low Beam Elevation = 1180.44
 Freeboard = 1180.44 - 1174.86 = 5.58'
- 2. BDM 3.2.2.7 - Scour
 - a. Design scour does not extend below the proposed bottom of pier footing.
- 3. BDM 3.6.1.6 - Superstructures - PPCB
 - a. A 194' x 44' PPCB Bridge with an 8.5" deck thickness is proposed.
 - b. Estimated 2" haunches at both abutments.
 - c. BTB beams are proposed.
- 4. BDM 3.6.2.1 - Width - Highway
 - a. The width of the bridge was set by adding together the proposed lane widths and effective shoulder widths.
- 5. BDM 3.6.2.2 - Sidewalk, Shared Use Path, and Bicycle Lane
 - a. No pedestrian or bicycle facilities are included in the proposed bridge.
- 6. BDM 3.6.6 - Deck Drainage
 - a. The proposed bridge is located on a crest vertical curve. Deck drain locations to be determined during Final Design.
- 7. BDM 3.6.8 - Barrier Rails
 - a. TL-4 barrier rails conform with the BDM requirements for a mainline non-interstate bridge.
 - b. Barrier rails for this project will be the TSS TL-4 rails.
- 8. BDM 3.6.9 - Staging
 - a. Staged construction is proposed. Refer to Construction Staging sheet.
- 9. BDM 3.7.1 - Substructures - Skew
 - a. The bridge abutments and piers will be placed at a 20 degree skew to match the channel flow direction.
- 10. BDM 3.7.2 - Abutments
 - a. Integral abutments will be used with 10'-0" prebored HP piling.
- 11. BDM 3.7.3.5 - Slope Protection
 - a. Embedded Class B revetment is proposed to an elevation equal to the Design Q_{50} water surface elevation.
 - b. Embedded erosion stone is proposed above the Class B revetment to the face of the abutment.
- 12. BDM 3.7.4 - Piers and Pier Footings
 - a. Wall piers with a pile footing and HP10x57 piling are proposed for both piers for better constructability during Phase 1 construction.
 - b. Assumed pier wall width for hydraulic model is 3'-0".
- 13. BDM 3.7.6 - Foundation Conflicts
 - a. The bridge abutments and piers will be placed behind the existing abutments and piers.
 - b. There is a potential for conflict between existing and proposed abutment and pier piling. Adjust proposed pile spacing in final design to avoid existing piling.

Design For 20 Degree LA

**194'-0" x 44'-0" Pretensioned
Prestressed Concrete Beam Bridge**

46'-0" End Spans 102'-0" Interior Span

TSL Development Report

STA. 170+33.00 (CL IA 92) Turn-In Date: Oct 2023

Adair County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 524 Design Sheet No. 4 of 4 FHWA No. 13011

FILE NO. 32043	ENGLISH	DESIGN TEAM FOTH	Adair COUNTY	PROJECT NUMBER BRF-092-3(040)--38-01	SHEET NUMBER V.4
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CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(112)	Noise Wall
(42)	Engineering Fabric	(112)	Noise Wall Footing
(8)	Flooded Backfill	(112)	Retaining Wall Back
(92)	Macadam Stone	(112)	Retaining Wall Back Excavate
(20)	Modified	(112)	Retaining Wall Face
(12)	Plowing Shaping	(112)	Retaining Wall Front Excavate
(14)	Porous Backfill	(112)	Retaining Wall Front Footing
(8)	Revetment Class A	(112)	Retaining Wall MSE Gutter
(6)	Revetment Class B	(112)	Retaining Wall Reinforced Earth
(62)	Revetment Class C	Grading	
(188)	Revetment Class D	(8)	Behind Curb Cut
(28)	Revetment Class E	(6)	Granular
(12)	Shoulder Special Backfill	(13)	Granular Back Fill
(12)	Special Backfill	(48)	Rock Undercut
(20)	Subbase	(8)	Shoulder Earth Fill
(20)	Subbase Lower	(2)	Side Slopes
(20)	Subbase Upper	(226)	Side Slopes Dressing
(118)	Subgrade Treatment	Substrata	
Asphalt			
(207)	HMA Base Course	(128)	Boulder Substrata
(207)	HMA Interim Course	(48)	Broken Weathered Substrata
(207)	HMA Surface Course	(3)	Core Out Substrata
Concrete			
(0)	Barrier Concrete	(203)	Existing Pavement Substrata
(0)	Barrier Concrete Footing	(6)	Loam Substrata
(0)	Curb Gutter	(80)	Rock Substrata
(48)	Flowable Mortar	(4)	Select Sand Substrata
(0)	Median Concrete	(3)	Shale Substrata
(0)	PCC Pavement	(10)	Topsoil Substrata
(0)	Sidewalk	Unsuitable / Waste	
Shoulder			
(209)	Shoulder HMA	(3)	Unsuitable Type A
(0)	Shoulder PCC	(13)	Unsuitable Type B
(6)	Shoulder Granular	(11)	Unsuitable Type C
(0)	Shoulder	(3)	Waste
Existing			
(0)	Existing Pavement		

NOTES:

Text

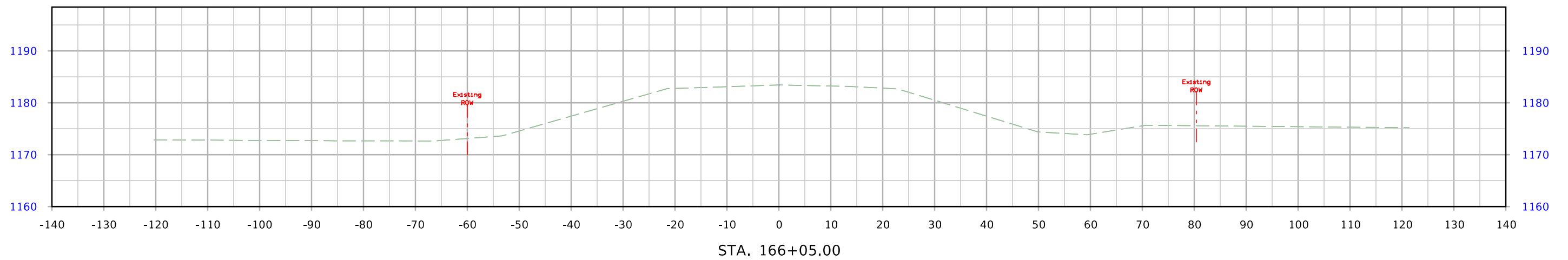
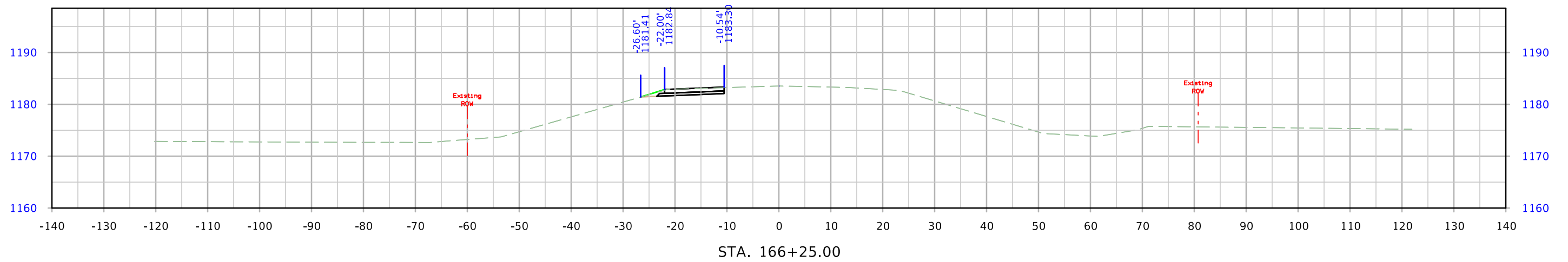
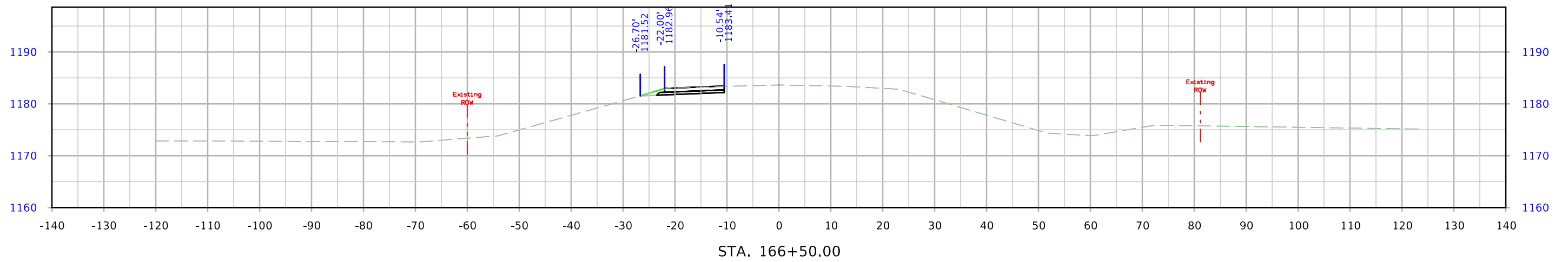
NOTES:

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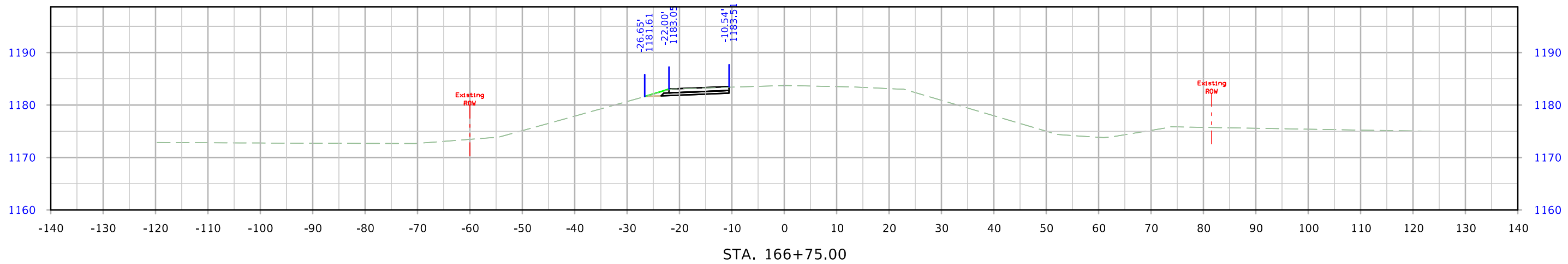
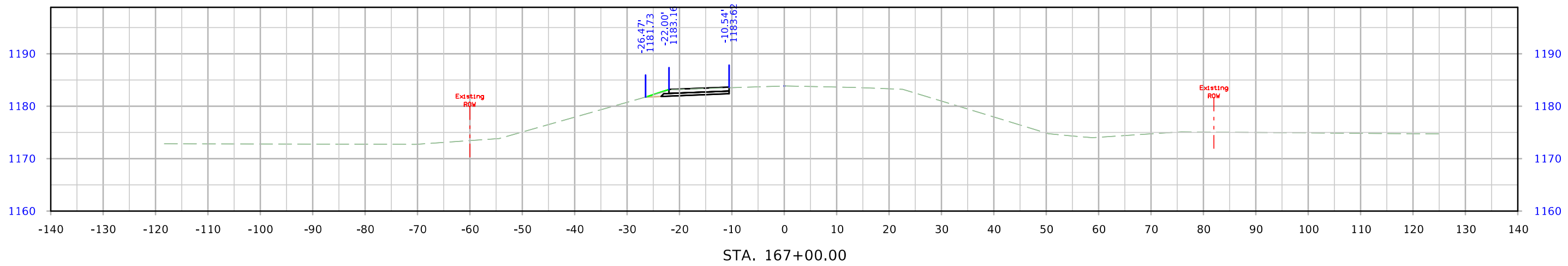
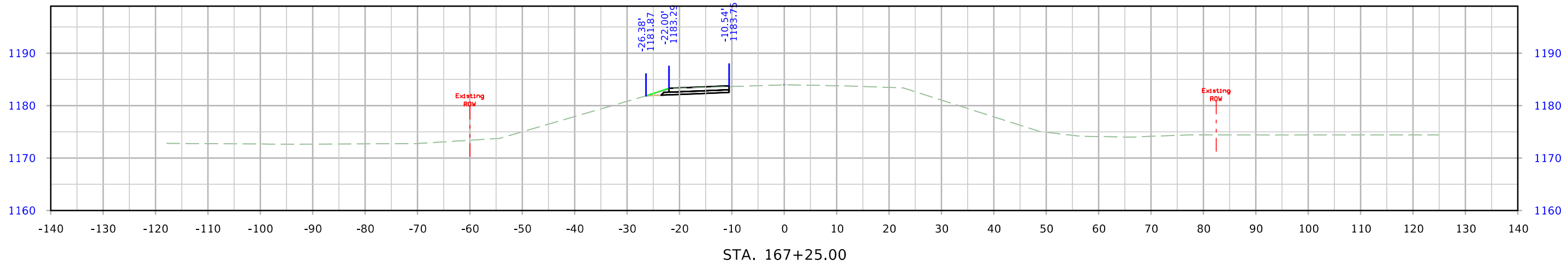
CROSS SECTIONS LEGEND AND INFORMATION SHEET

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

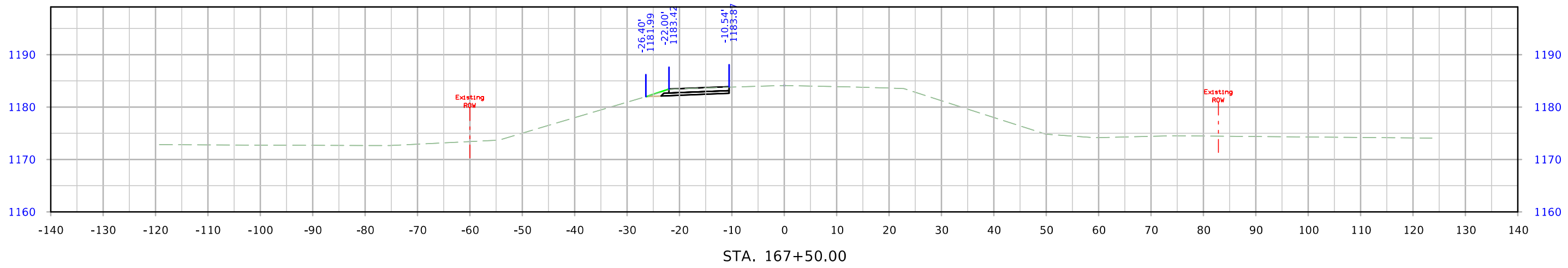
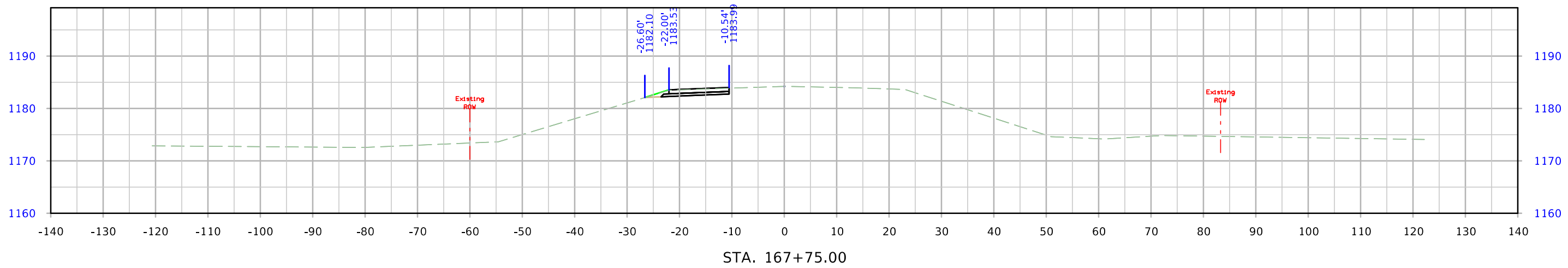
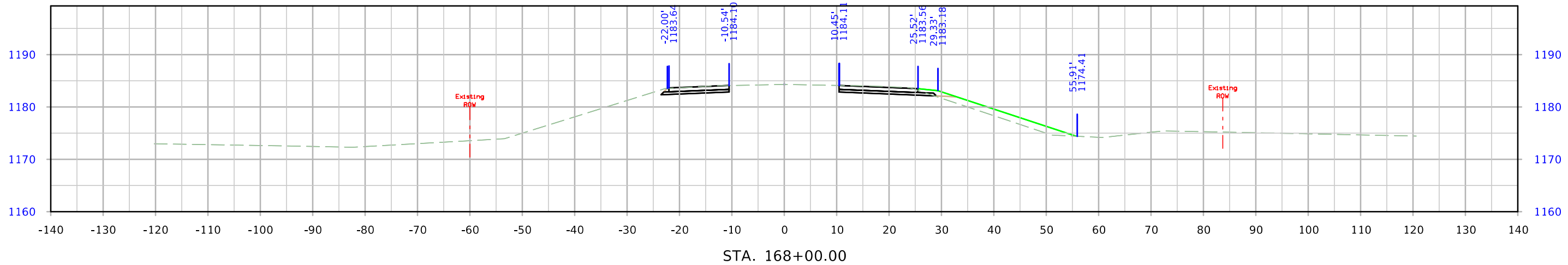
ML - IA 92



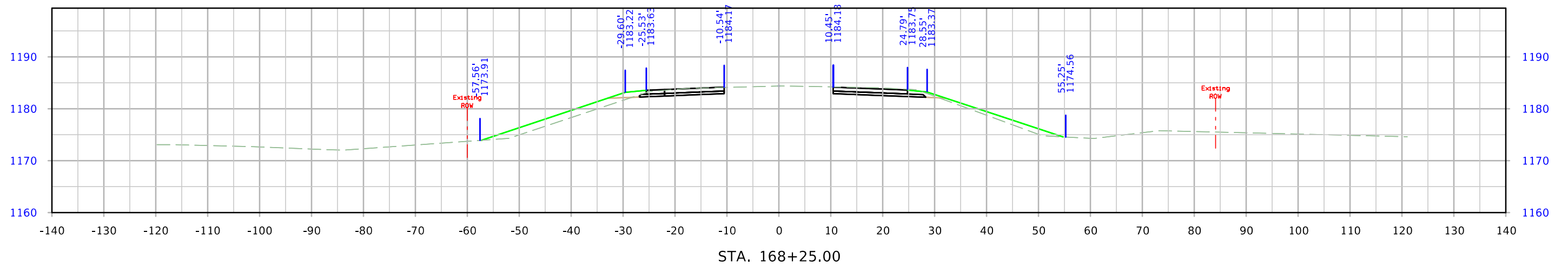
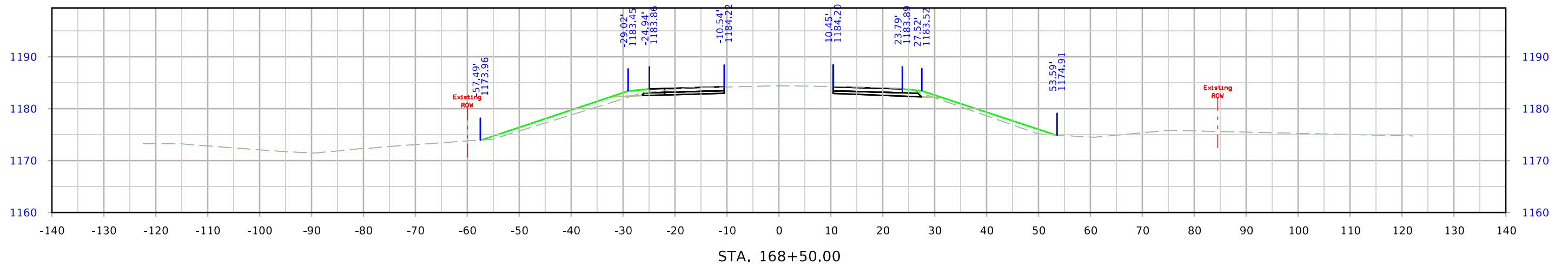
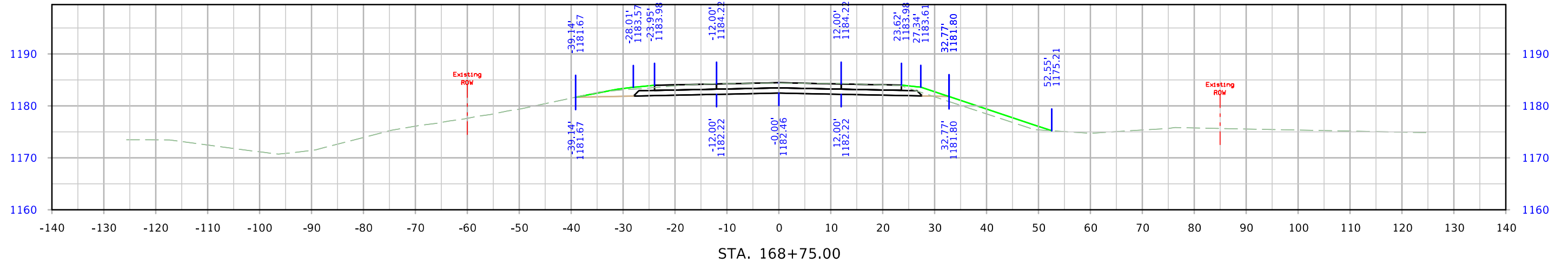
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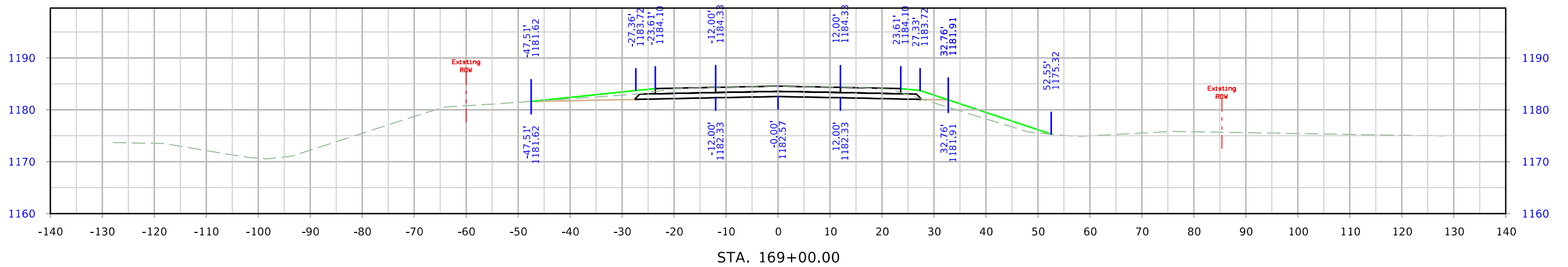
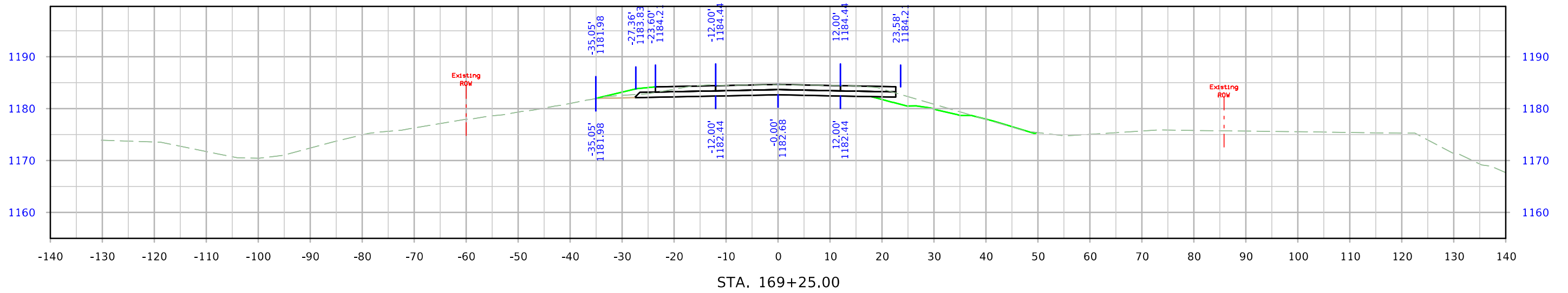
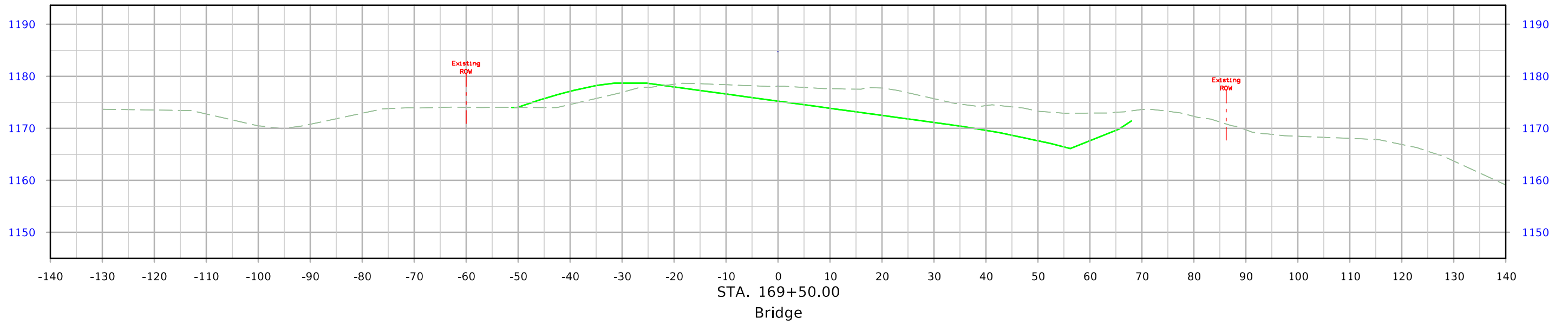
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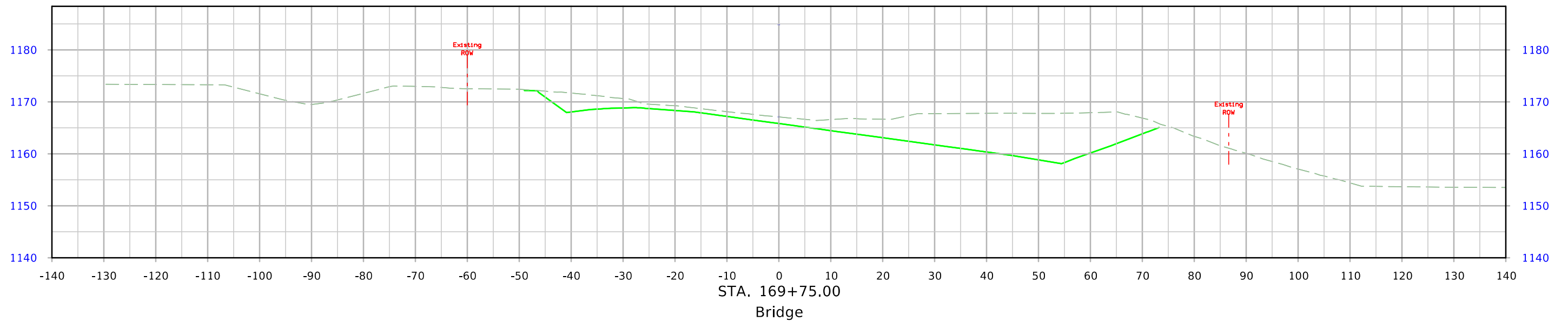
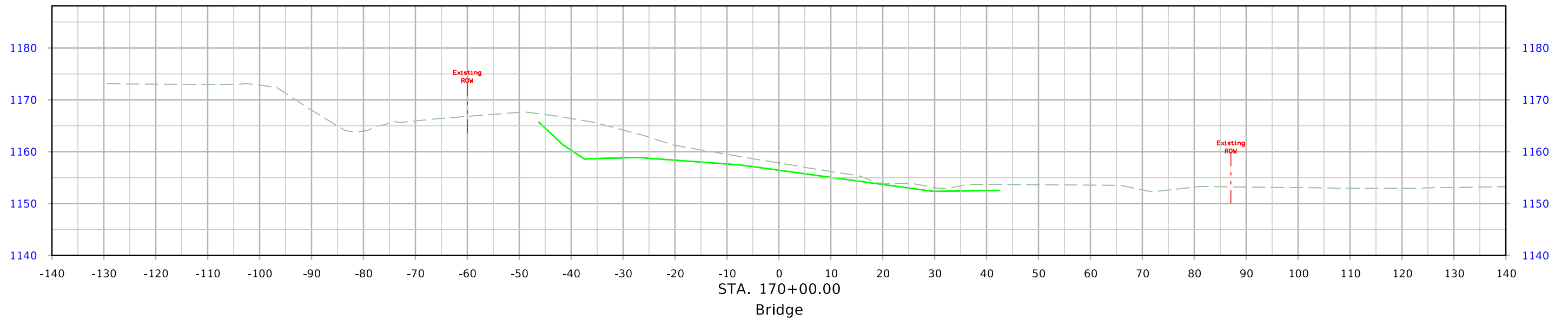


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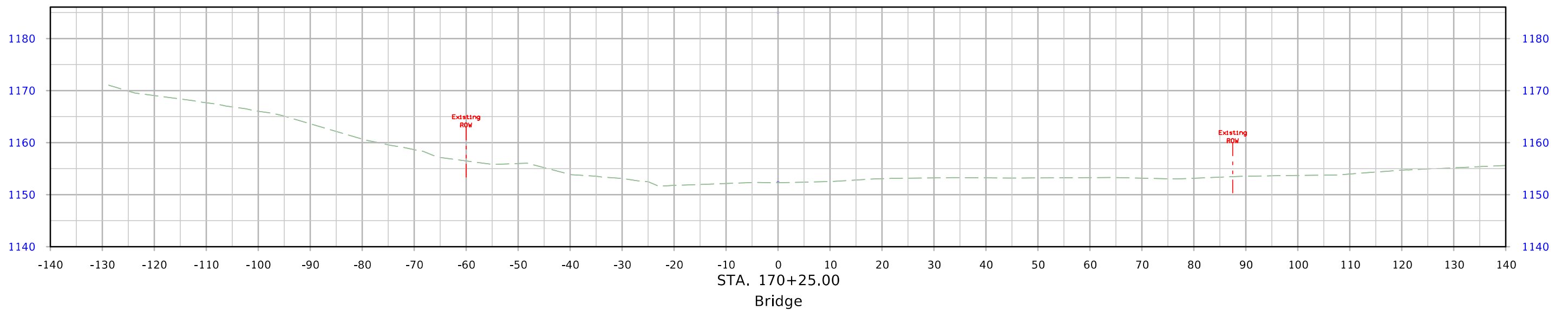
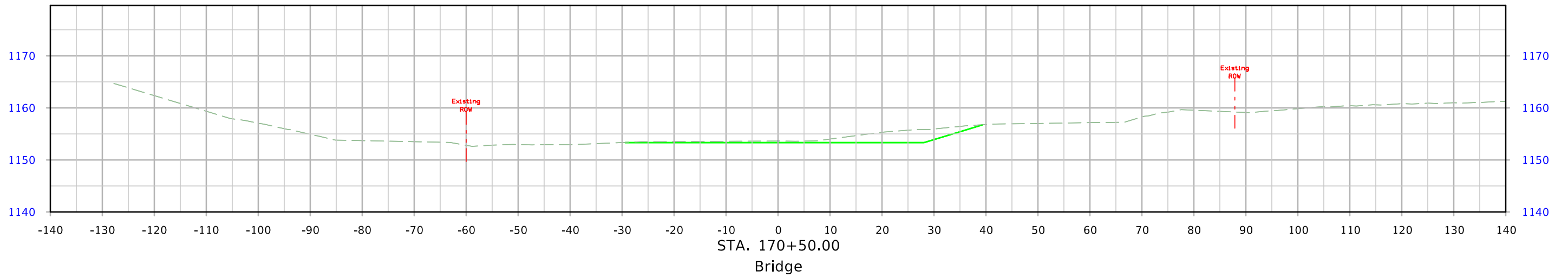
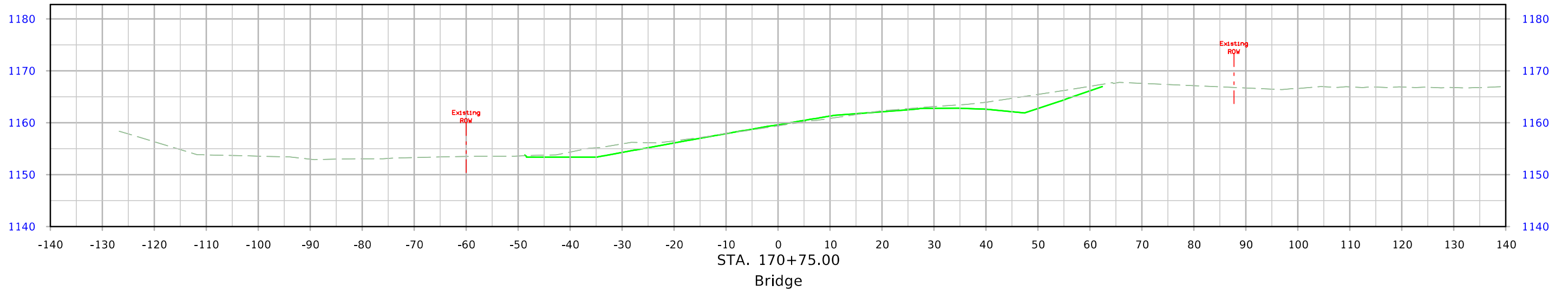


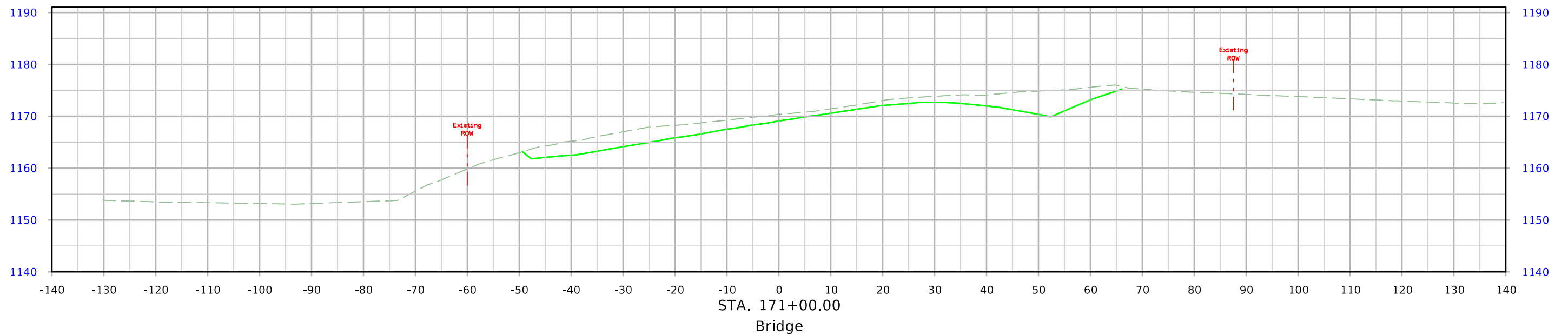
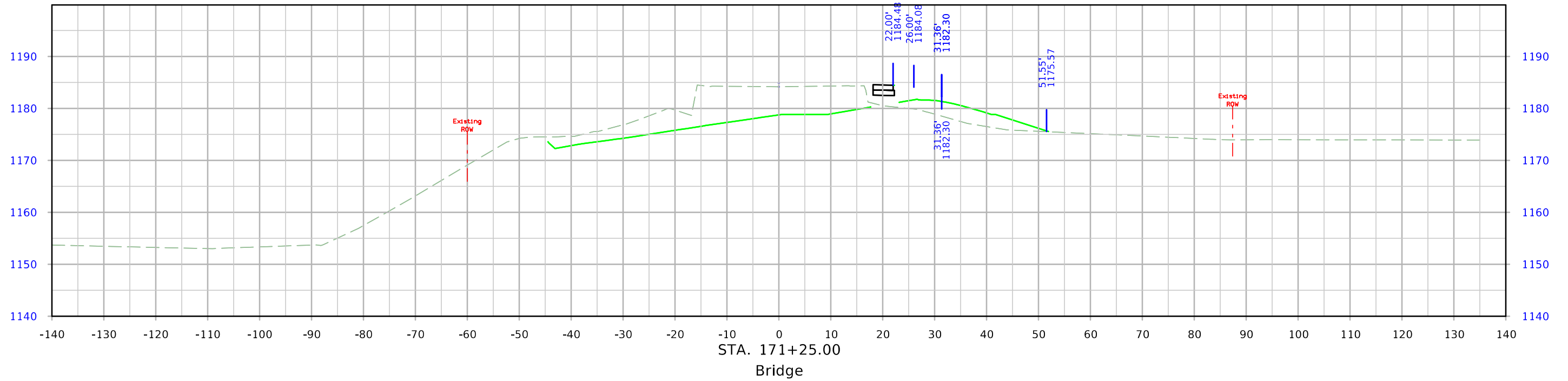
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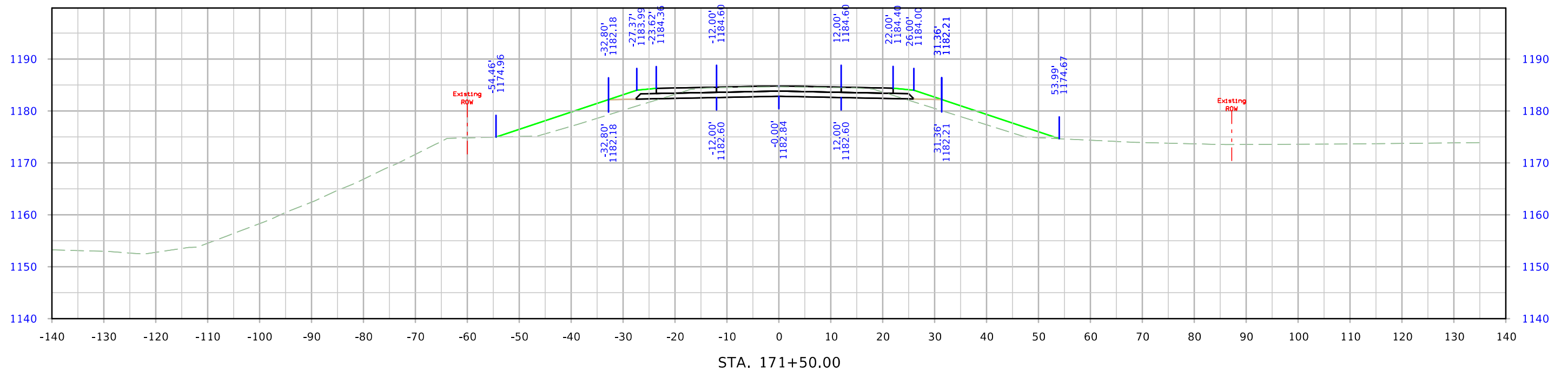
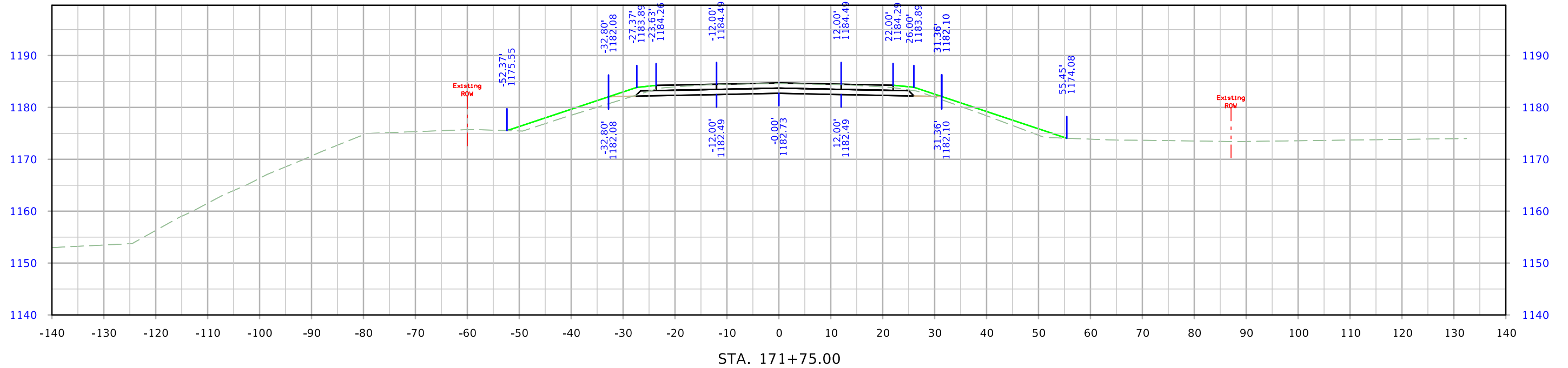


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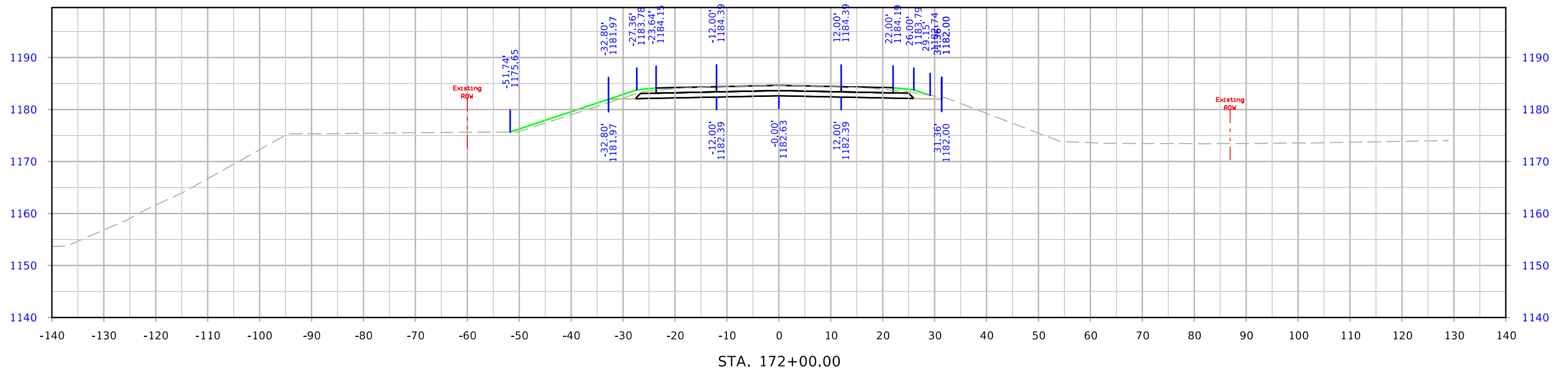
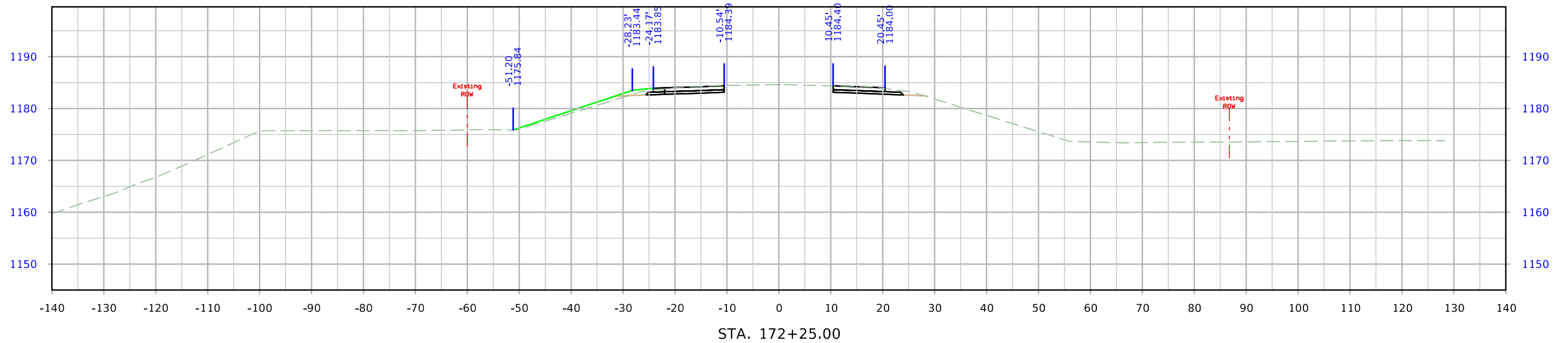




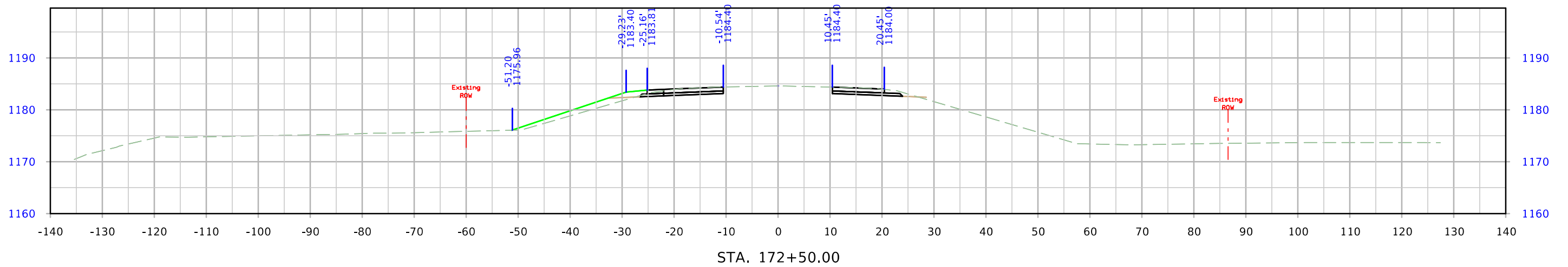
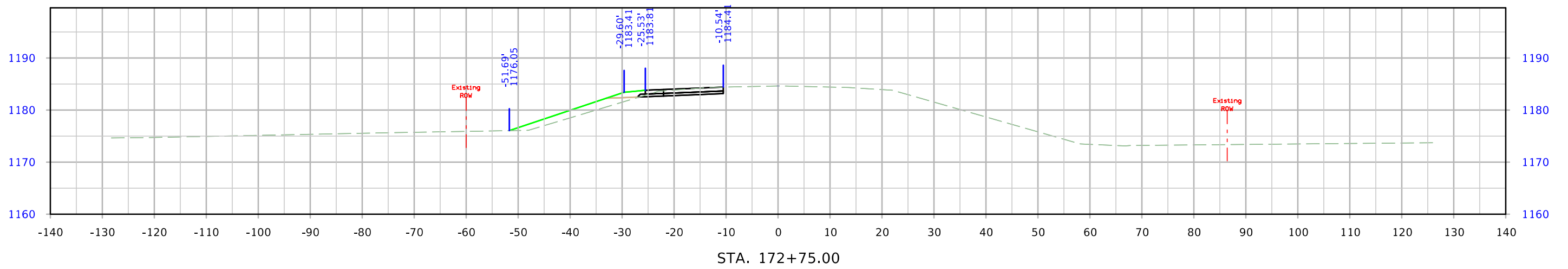
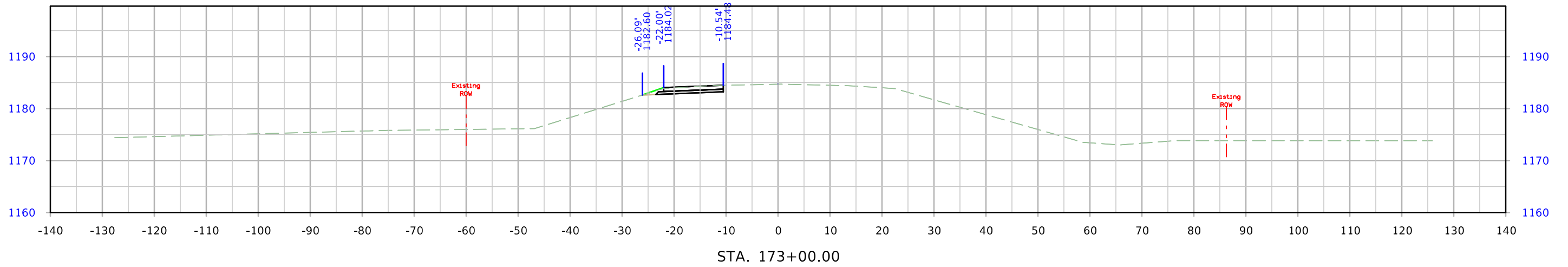
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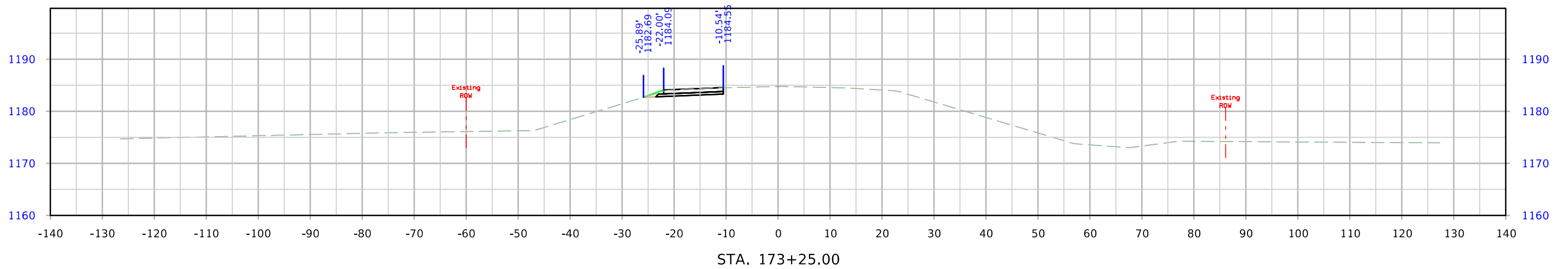
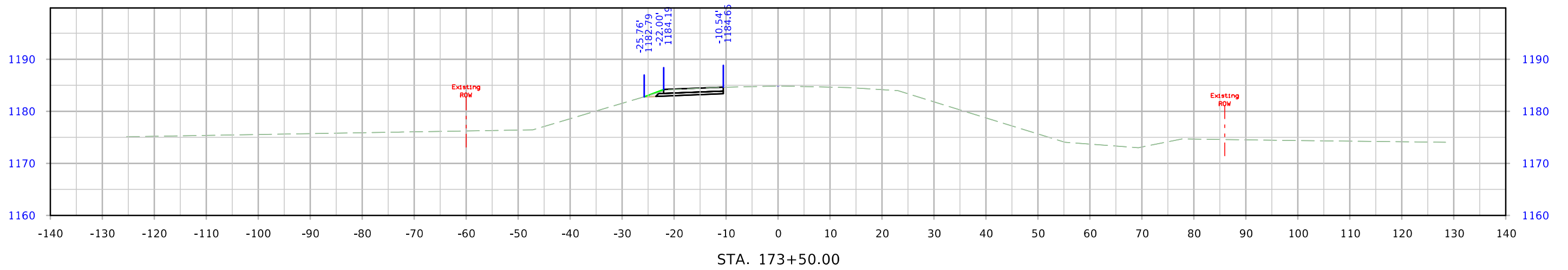
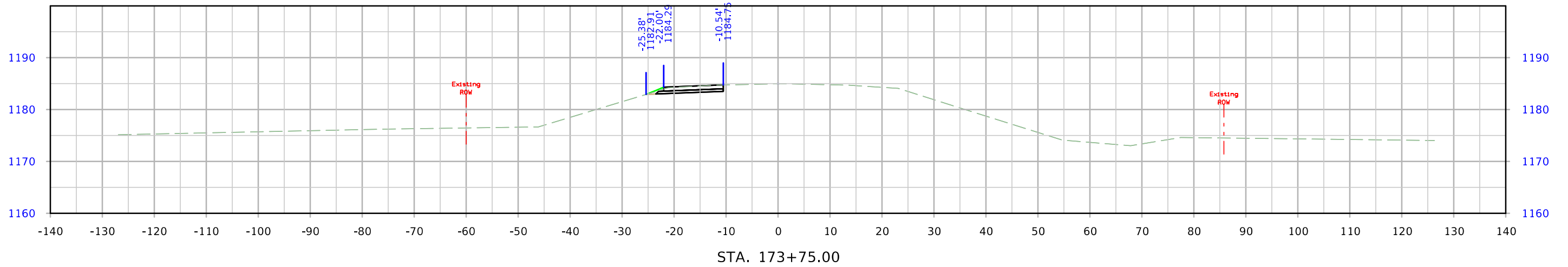
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