LETTING DATE
Oct 19, 2027

Bridge Replacement - PPCB
BRF-141-2(067)--38-67

MONONA COUNTY

REVISIONS

	TOTAL
	..
PROJECT IDENTIFICATION NUMBER	
23-67-141-010	
PROJECT NUMBER	
BRF-141-2(067)--38-67	
R.O.W. PROJECT NUMBER	
-	
-	
-	

IOWA | DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
MONONA COUNTY
Bridge Replacement - PPCB

Maple River 0.1 mi E of W Jct IA 175 in Mapleton

-

-

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

IOWA ONE CALL
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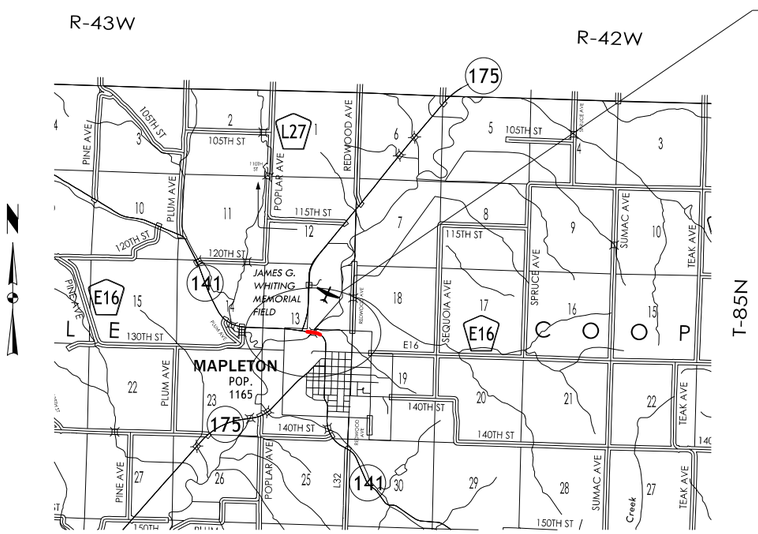
www.iowaonecall.com
811 Know what's below. Call before you dig.

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	**Title Sheets**
A.1	Title Sheet
* A.2 - 9	Concept
* A.10 - 12	Design Criteria
A.13	Design Notes/Questions
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 141
G Sheets	**Survey Sheets**
G.1 - 2	Reference Ties and Bench Marks
G.3	Horizontal Control Tab. & Super for all Alignments
J Sheets	**Traffic Control and Staging Sheets**
J.1	Traffic Control Plan
* J.2	Detour Plan
L Sheets	**Geometric, Staking and Jointing Sheets**
* L.1	Superelevation Detail
V Sheets	**Bridge and Culvert Situation Plans**
* V.1	Bridge and Culvert Situation Plans
W Sheets	**Mainline Cross Sections**
* W.1	Cross Sections Legend & Symbol Information Sheet
* W.2 - 16	Mainline 141 Cross Sections
	* Color Plan Sheets



PROJECT LOCATION
FHWA # 36750
REF LOC 24.5

D3 PLAN - Date: 3/28/25
D5 PLAN - Date: 8/08/25
P9 PLAN - Date: 1/07/26
D4 PLAN - Date: 6/22/27

PRELIMINARY PLANS

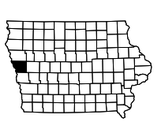
Subject to change by final design.

D2 PLAN - Date: 3/03/25

DESIGN DATA RURAL			
2028	AADT	3300	V.P.D.
2048	AADT	3500	V.P.D.
20 –	DHV	–	V.P.H.
TRUCKS		11	%
Total Design ESALs		–	

INDEX OF SEALS

SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Primary Signature Block	X
X	X	X	X



IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 3	**DATE:**	July 15, 2024
ATTENTION:	Jessica Felix	**PROJECT:**	Monona County BRF-141-2(067)--38-67
FROM:	John E. Bartholomew		PIN: 23-67-141-010
BUREAU:	Design		
SUBJECT:	Project Concept Statement; (Final, D0)		

This project involves the replacement of the IA 141 bridge (Maint. No 6724.7S141) over the Maple River 0.1 mi E of W Jct IA 175 in Mapleton.

A concept review was held on Tuesday, June 4, 2024. Those present included Michael Thayer, Shane Tymkowicz, and Darwin Bishop from the District 3 Office; Christian Kennel, Mohamad Dokmak, Jimmy Ellis, Patricia Schwarz, and Abraham Kuol from the Bridges and Structures Bureau; Michael Carlson from the Location and Environment Bureau; and John Bartholomew and Yuejia Gu, John Bartholomew, and Kevin Patel from the Design Bureau.

The two alternatives considered were:

1. Replace with a 339' x 44' PPCB BTE bridge utilizing offsite detour (**Estimated cost $4,054,400)**
2. Replace with a 339' x 47' PPCB BTE bridge utilizing staged construction **(Estimated cost $4,805,100)**

Alternative 1 is the preferred alternative. Additional right of way may be required. Traffic will be maintained by offsite detour.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Monday, July 15, 2024. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2028. The Design Bureau will coordinate plan preparation with assistance from the Bridges and Structures Bureau.

JEB: YG
Attach.
cc:

C. Purcell	M. J. Kennerly	K. D. Nicholson
M. Dell	J. S. Nelson	M. Nop
M. A. Swenson	D. E. Sprengeler	C. C. Poole
S. Majors	A. Poole	K. Brink
D. L. Newell	B. Bradley	J. W. Laaser-Webb
W. A. Sorenson	E. C. Wright	M. E. Ross
A. A. Welch	J. Harris	M. Van Dyke
B. Hofer	G. Karssen	B. E. Azeltine
S. Anderson	D. Stokes	J. Ellis
T. Jerman	K. K. Patel	R. Harris
M. Todsen	B. Dolan	T. Lovan
Z. Abrams	A. Yates	C. Schwienebart
R. Meyer	J. Hauber	S. Sersland
M. E. Khoda	K. Olson	S. Neubauer
D. Bishop	S. Tymkowicz	M. Carlson
J. Becker	T. Huju	M. Thayer
B. Strueker	L. Sievers	B. Waltersdorf

FINAL PROJECT CONCEPT STATEMENT

IA 141 Bridge over Maple River 0.1 mi E of W Jct IA 175 in Mapleton

Monona County
BRF-141-2(067)--38-67
Project Code: 23-67-141-010
Maint. No. 6724.7S141
FHWA No. 36750

Highway Division
Design Bureau

John Bartholomew, P.E.
515-239-1540

July 15, 2024

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 141 bridge (Maint. No 6724.7S141) over the Maple River, 0.1 mi E of W Jct IA 175 in Mapleton.

The two alternatives considered were:

1. Replace with a 339' x 44' PPCB BTE bridge utilizing offsite detour **(Estimated cost $4,054,400)**
2. Replace with a 339' x 47' PPCB BTE bridge utilizing staged construction **(Estimated cost $4,805,100)**

Alternative 1 is the preferred alternative due to the preference for detouring the bridge replacement.

B. Need for Project

This is a 305' x 30' steel girder bridge that was built in 1967 and overlaid in 2010. The top of the deck has a few delamination, and the bottom of the deck has several hollow areas, cracks with leaching, and spalls with exposed steel. The steel girders have section loss and severe rust. The substructure has large hollows, scour, and spalled areas with exposed steel and horizontal cracks. Due to the condition, the bridge should be replaced.

Figure 1: With route, 2022

Figure 2: Against route, 2022

Figure 3: Right profile n-f, 2022

Figure 4: Left profile n-f, 2022

C. Present Facility

The existing structure is a 305' x 30', continuous welded girder bridge constructed in 1967.

IA 141 in the project area is 24' wide PCC pavement with 4' wide paved and 6' granular shoulders and 3:1 foreslopes, constructed in 1967. Planing and grooving with diamond grinding resurfacing was accomplished in 2019. PCC patching was done in 2021.

D. Traffic Estimates

The 2028 construction year and 2048 design year average daily traffic estimates are 3300 ADT with 11% trucks and 3500 ADT with 11% trucks, respectively.

E. Sufficiency Ratings

IA 141 is classified as an "Area Development" route and is a maintenance service level "C" roadway. The Bridge Condition Index is 52.1 and the Bridge Condition Rating is "Poor".

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2019 through December 31, 2023, there was 1 personal property crash.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a PPCB BTE bridge with offsite detour

The existing 305’ x 30’ steel girder bridge will be replaced with a three span, 339’ x 44’, PPCB BTE bridge.

The typical cross section adjacent to the bridge approaches will consist of a 24’ roadway with 4’ paved and 6’ granular shoulders and 3:1 foreslopes.

This bridge will be constructed on the existing vertical and horizontal alignment. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20’ beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes to 6:1 and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on both ends of the bridge.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

It appears that right of way may be required for this project.

Traffic will be maintained by an off-site detour.

Bridge Items	Estimated Costs
New Bridge - 16,131 sf @ $135/sf	$2,178,000
Remove Exist. Bridge 11,016 sf @ $10.00/sf	110,000
Cofferdam – 2 EA @ $50,000/EA	100,000
Revetment	125,000
Aesthetics	44,000
Mobilization (10%)	256,000
Contingency and Misc. (20%)	563,000
Bridge Total	$3,376,000

Roadway Items	Estimated Costs
Bridge Approaches	$152,500
Removal of Pavement	16,200
PCC Pavement	63,700
Modified Subbase	42,400
Excavation Class 13 Waste	28,500
Guardrail Removal	4,900
New Guardrail	27,900
Paved Shoulders for Guardrail	55,600
Class 10 for Guardrail Blisters	51,900
Bridge End Drains	200
Clearing and Grubbing	8,800
Seeding and Fertilizing	1,800
Erosion Control	10,600
Right of Way	10,000
Traffic Control - 5%	33,900
Mobilization - 5%	33,900
M & C - 20%	135,600
Roadway costs	**$678,400**
Project Total	**$4,054,400**

Alternative #2 - Replace with a PPCB BTE bridge with staged construction

The existing 305’ x 30’ steel girder bridge will be replaced with a three span, 339’ x 47’, PPCB BTE bridge.

The typical cross section adjacent to the bridge approaches will consist of a 24’ roadway with 10’ paved shoulders and 3:1 foreslopes.

The existing grade will need to be raised a minimum of 1’-3” to obtain clearance

between existing pier caps and proposed low beams. This will require approximately 150' of roadway reconstruction on both sides. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 300' beyond the ends of the bridge approaches. Class 10 will be necessary to flatten the existing foreslopes to 6:1 and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on both ends of the bridge.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

It appears that right of way may be required for this project.

Traffic will be maintained by staged construction. Staging diagrams are attached to this concept.

Bridge Items	Estimated Costs
New Bridge - 17,157 sf @ $135/sf	$2,316,000
Remove Exist. Bridge 11016 sf @ $10.00/sf	110,000
Cofferdam – 2 EA @ $50,000/EA	100,000
Revetment	125,000
Aesthetics	46,000
Staging (10%)	270,000
Mobilization (10%)	297,000
Contingency and Misc. (20%)	653,000
Bridge Total	$3,917,000

Roadway Items	Estimated Costs
Bridge Approaches	$152,500
Removal of Pavement	26,800
PCC Pavement	113,400
Modified Subbase	52,400
Embankment in place, contractor furnished	27,800
Excavation Class 13 Waste	33,800
Guardrail Removal	4,900
New Guardrail	27,900
Paved Shoulders for Guardrail	95,800
Class 10 for Guardrail Blisters	51,900
Bridge End Drains	200
Clearing and Grubbing	8,800
Seeding and Fertilizing	1,800
Erosion Control	13,800
Right of Way	10,000
Traffic Control - 5%	44,400
Mobilization - 5%	44,400

M & C - 20%	177,500
Roadway costs	**$888,100**
Project Total	**$4,805,100**

B. Detour Analysis

IA 141/IA 175 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 180 days. The detour would follow IA 175 north at the junction with IA 141 to Danbury, then south on County Road D54 following Story Ave/Teak Ave until 130th St., then west to the junction of Sioux St. and N 4th St. before traveling back onto IA 175 southwest. Out of distance travel is 14.9 miles. The total out of distance travel cost is anticipated to be $2,024,575. The cost for county road maintenance will be $76,406.52 as calculated by the Gas Tax Method. Detour signing costs will be $10,000.

The out of distance travel for IA 175 is 9.07 miles.

C. Recommendations

It is recommended that the present structure be replaced and an offsite detour be utilized, as described in Alternative No. 1.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 141; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 45 is less than the first stage filter threshold of 50, therefore

this bridge will be built using traditional construction methods.

No bike path or sidewalk will be required as part of this project.

Waterway is not on a state water trail or paddling route.

Additional survey requests are not anticipated at this time.

Right of Way appears to be required for this project.

The Location and Environment Bureau has not reviewed this project at this time. Once their review is completed, comments will be incorporated into the final concept statement.

G. Program Status

Site data has been developed by the Design Bureau. This project is listed in the 2024-2028 Iowa Transportation Improvement Program, with $10,000 programmed for right of way in FY 2028, and $4,370,000 for replacement in FY 2028. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

JEB: YG

Bridge Bureau Attachment for Concept Statement

Date: May 20, 2024
By: P. Schwarz
Location: Maple River 0.1 mi E of W Jct IA 175 in Mapleton

County: Monona County
Phase No.: BRF-141-2(067)--38-67
Project Code: 23-67-141-010

1. Regulatory/Coordination
   a. Iowa DNR Flood Plain permit = Yes-Required (DA 644 sq mi)
   b. Iowa DNR Sovereign Lands permit = No
   c. Local Record of Coordination = No
   d. Flood Insurance Study = Yes. Zone A, Map 19133C0116D date 6/15/2022
   e. Drainage District = No
   f. Corps of Engineers Section 408 = No
   g. State Water Trail or Paddling Route = No
   h. Historic Structure = 5 (not eligible)
   i. Federally owned land in vicinity = No
   j. USGS or Iowa Flood Center (IFC) gage or sensor impacted? No

2. Hydrologic/Hydraulic Analysis/RIDB Dataset
   a. Design discharges determined = Yes, Use USGS Mapleton Gage, Alternate Regression Weighted, WIE Estimate
   b. Hydraulic analysis done = Partial (pre-survey concept GeoHECRAS model is available)
   c. Riverine Infrastructure Database (RIDB) dataset with B1 submittal = Required. RIDB Site ID MapleR_17.70. Check for potential roadway overtop sites.
   d. Project development hydraulic analysis will comply with the RIDB Guidelines at a minimum.

3. Structure/Roadway Layout Considerations
   a. The site is within a Loess Hills county. The 3:1 berm slopes assumed for the concept should be verified by Soils Design, potentially during preliminary design (post survey)
   b. Selected method of Maintenance of Traffic will affect the project profile grade:
      i. Off-site detour – a roadway profile grade raise is not anticipated to be needed.
      ii. Staged construction – a roadway profile grade raise of 1.3’ is needed to obtain clearance between existing pier cap and proposed low beams.
      iii. Potentially, final bridge design could become involved at the concept or preliminary design stage to determine whether an option could be found that would reduce or eliminate the need for a profile grade raise or a wider bridge.

c. The preliminary bridge designer shall review any potential affects that the horizontal curve east of the bridge may have on the bridge design. (e.g. superelevation transitions, wing kinks, etc.)

4. Special construction issues

a. There are possible utilities hanging from the existing bridge. Do any utilities need to be accommodated on the proposed bridge or during construction? Concept Team input required.

5. Special survey = No

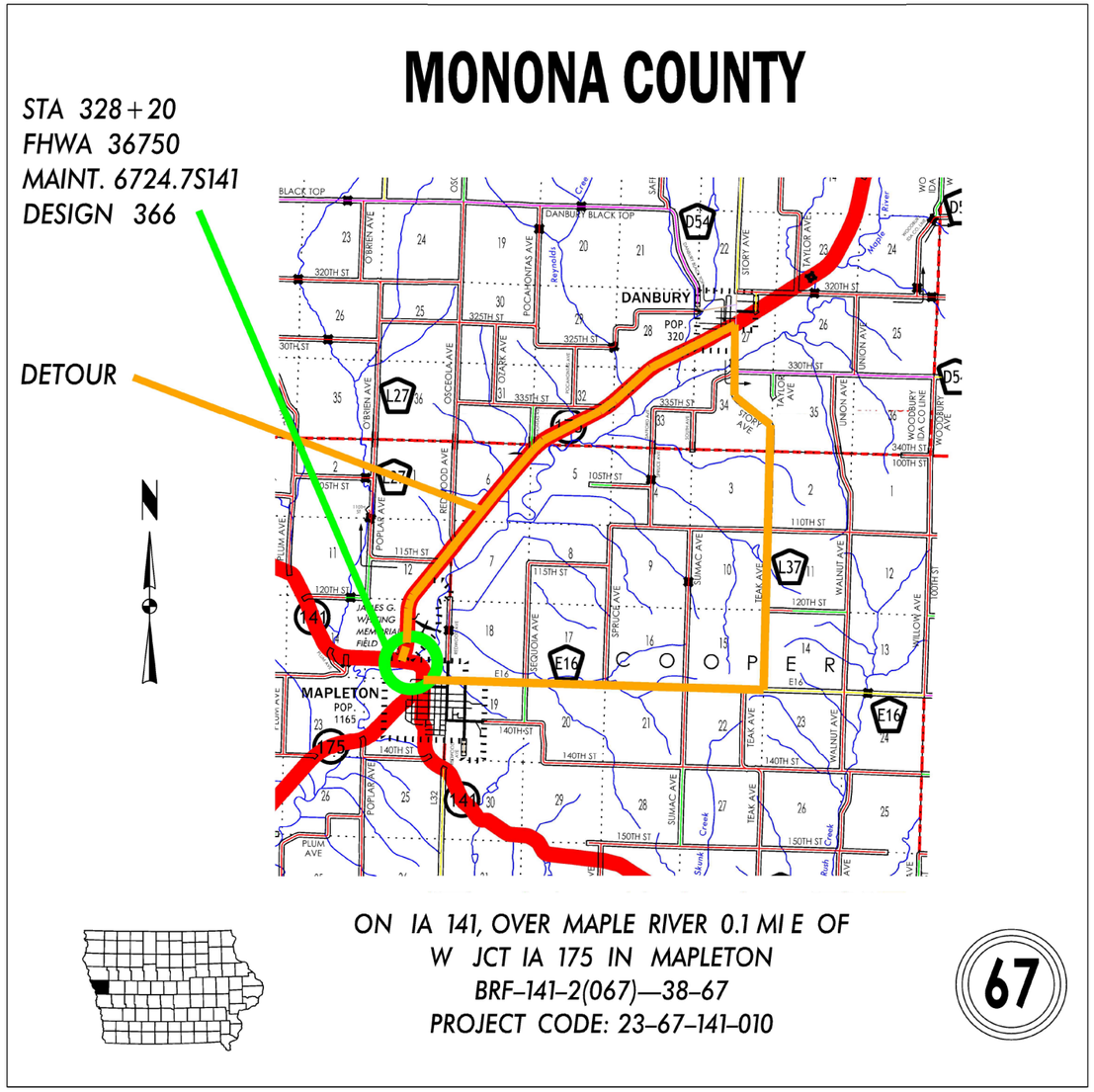
6. Aesthetic enhancements = Possible.

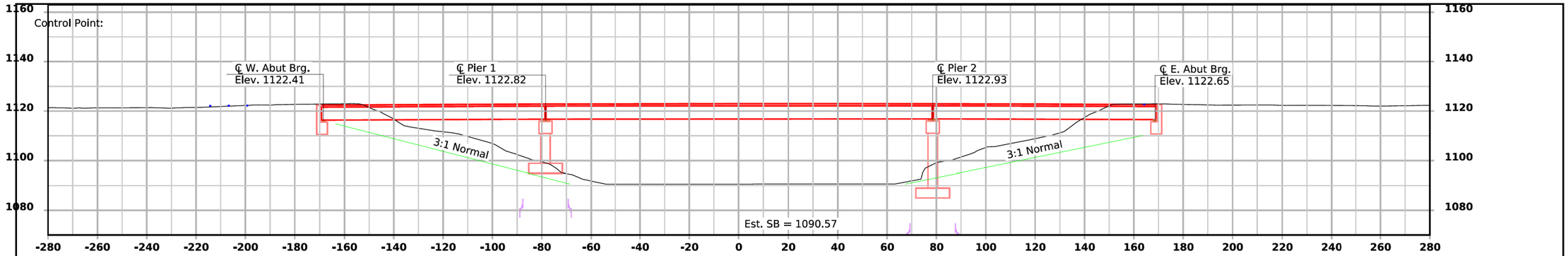
7. Other

a. Maintenance of Traffic - To be determined by Concept Team

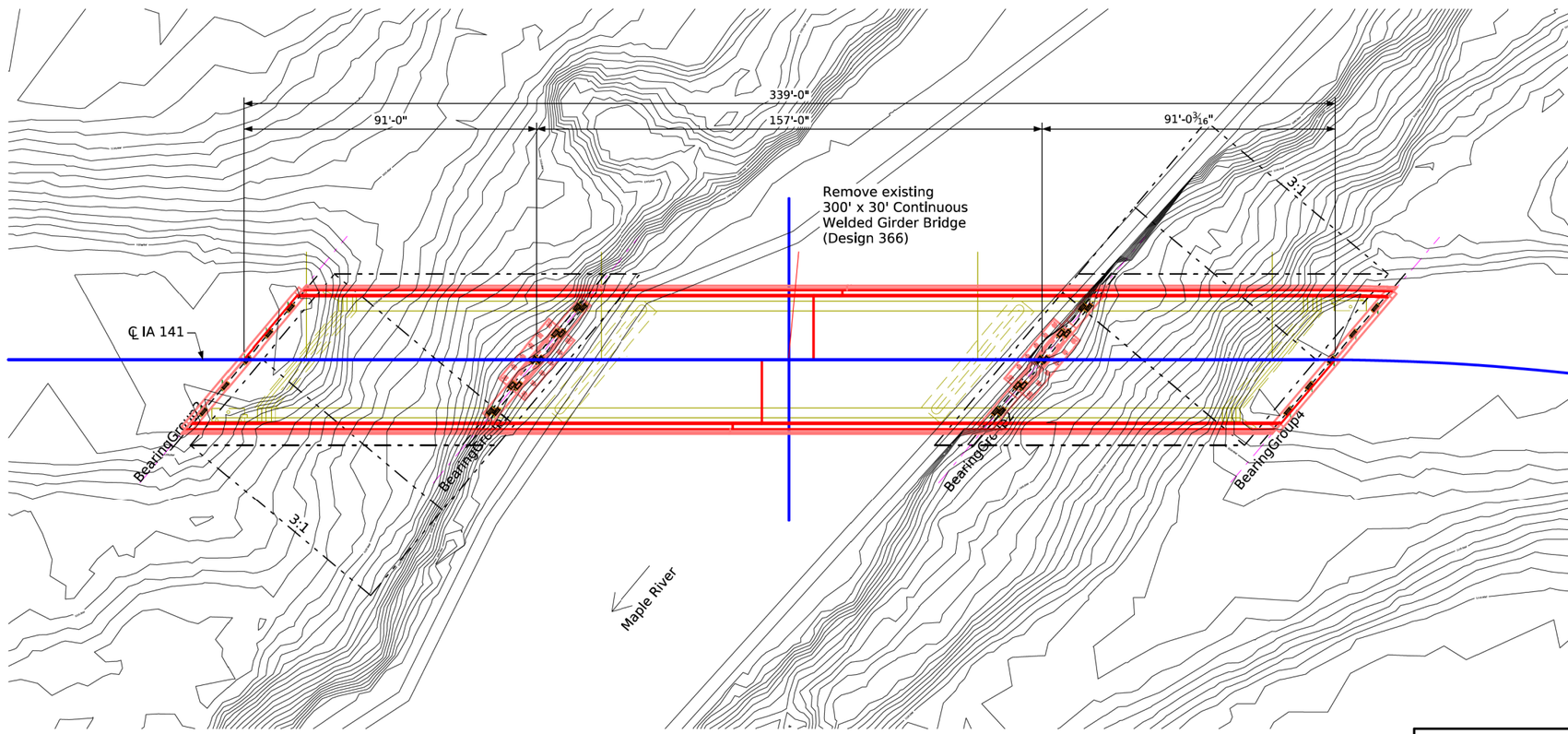
Special Survey:

Not anticipated at this time.





BRG TSL Longitudinal Section Along ℄ Approach Roadway



+0.800% -0.737%

VPI Sta. = 328+33.016 VC = 500'
VPI Elev. = 1123.969

Proposed Profile Grade IA 141 (Match Existing)

Concept Level Hydraulic Data

RIDB: MapleR_17.70
Drainage Area = 644 Sq. Mi.

Operational Low Beam = 1115.9
Channel Low Beam = 1116.4
Q_{50} = 22,800 cfs (Design Event)
Stage = 1110.9
Operational Freeboard = 5 ft.
Avg. Bridge Velocity = 7.1 fps

Q_{100} = 26,000 cfs
Stage = 1112.0
Operational Freeboard = 3.9 ft.
Backwater = 0.1 ft.
Avg. Bridge Velocity = 7.5 fps

Roadway Overtop ???.?
Sta. ???+??

Location

IA 141 over Maple River
In City of Mapleton
T-85N R-43W
Section 13
Maple Township
Monona County
FHWA No. ??
Bridge Maint. No. 6724.7S141
Latitude ??.123456°
Longitude -??.123456°

Preliminary - Concept Level

TSL Designer Notes:
1. The concept bridge layout is proposed to be straight, even though the east end of the bridge is slightly into the horizontal curve.
2. BTE Beams are proposed. BSB approval for skew greater than 30 degrees has been received.
3. Integral abutments and T-Piers are proposed.
4. There appear to be utilities hanging from the existing bridge, and there may potentially be need for accommodation on the proposed bridge (staging?).
5. Twin RCPs (est. 3'or 3.5' dia) with flap gates and flume is located north of the bridge (west of river).
6. A CMP (est. 24" or 36") with flap gate is located south of bridge (east of river).

Situation Plan

0 40
Scale In Feet

N

Design For 40 Degree LA
339'-0" x 44'-0" Pretensioned, Prestressed Concrete Beam Bridge
91'-0" End Spans 157'-0" Interior Span

Situation Plan

STA. 328+20.00 (IA 141) Turn-In Date: May 2024

Monona County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. ???? Design Sheet No. 1 of 1 FHWA No. 0375?

FILE NO. 98765	ENGLISH	DESIGN TEAM AAA\BBB\CCC	Monona COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER V.1

9:55:09 AM 6/4/2024 pschwa1 pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\6714101023\Bridge\(067)_Bridge Replacement-PPCB\SHT_67141067_DOT_DDDD_FFFFFF_Z06.dgn

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER A.8

4:31:44 PM 10/9/2024 jryan3 pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\6714101023\Design\CADD_Files\Sheet_Files\SHT_67141067_A01.dgn

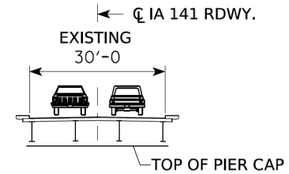
CONCEPT STAGING SKETCH
IA 141 over Maple River

General Notes:
1. The staging concept, if selected, should work with either side constructed first.
2. An estimated 1'-3 profile grade raise is anticipated be needed. Proposed beams should clear the existing pier caps with the desired 1' minimum vertical clearance from top of pier cap to low beam for constructability.

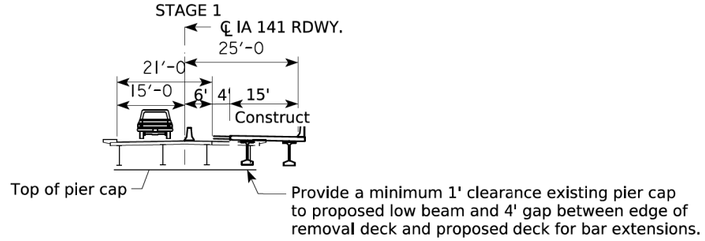
Stage 1 Notes:
1. Stage 1 traffic lane is 15'-0. A wider stage 1 traffic width may be possible with TBR tie downs.
2. The estimated existing bridge superstructure removal line is 6' right.
3. Do not stage remove piers due to stability.
4. Provide a 4' gap to the existing bridge cutline to accommodate proposed deck rebar extensions.
5. Construct proposed bridge Stage 1 with 15' roadway width.

Stage 2 Notes:
1. Stage 2 traffic 1 lane at 12' width. TBR Tie downs required.
2. Remove remaining existing bridge.
3. Stage 2 Construct 32' Rdwy to complete the proposed bridge.
4. The concept Final staged bridge 47' roadway width shown is 3' wider than the required 44' width.

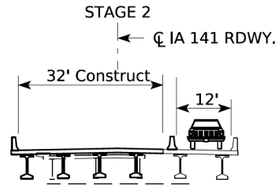
EXISTING CONDITIONS



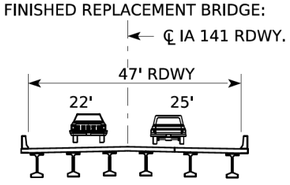
STAGE 1



STAGE 2



FINISHED REPLACEMENT BRIDGE:



Roadway				
PIN Number	23-67-141-010		**Submittal Date**	
Project Number	BRF-141-2(067)--38-67			**Approval Date**
District	District 3	**Assistant District Engineer**	Shane Tymkowicz	
County	MONONA		**or**	
Route	IA 141	**Office Director**		
Location	Maple River 0.1 mi E of W Jct IA 175 in Mapleton			
Work Type	2001-Bridge-Unspecified			
Segment Manager	Yanxiao Jia			
Designer	Adam Dewolf, Jonathan Ryan			

Design Manual Section 1C-1
Last Updated: 04-29-19

Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	50
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	7.5%
Design lane width (ft)		12	12	12
Full depth paved width (ft)		12	12	12
Right turn lane (ft)		12	10	N/A
Climbing Lane (ft)		12	12	N/A
Left turn lane (ft)		12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	N/A
	Crown break at centerline	4%	4% maximum	4%
Shoulder cross-slope (on tangent sections)		4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
Curb type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	N/A
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	N/A
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	3:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3:1
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	N/A
	w/o drainage structures	10:1	6:1	N/A
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	N/A
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	N/A
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	44'
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	30'
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	N/A
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A
	Over railroad	23.3	23.3	N/A
	Sign trusses and pedestrian bridges	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		B	B	

*FHWA notification via email is required if acceptable critera is not met on the NHS system (No formal design exeption is required)

Design year ADT = 3500

Design Manual Section 1C-1
Last Updated: 04-29-19

Effective Shoulder Width and Type for Two-Lane Highways

Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	N/A
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	Climbing Lanes	4	0	N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	0*	10'
On roadways approaching urban areas (due to increased bike traffic)	10	10				
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	0*	
On all other NHS	10	6				
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4	0*	
On non-NHS routes with design year ADT < 3000	8	0*				

*Requires safety edge-Refer to Section 3C-6

Curbs should be located beyond the outer edge of the effective shoulder width in rural areas

Refer to Section 3C-2 for curb offsets in urban areas

Notes:

Roadway Design Speed (mph) = 50

Design Manual Section 1C-1
Last Updated: 04-29-19

Design Criteria for High Speed Roadways

Design Element			Preferred Criteria						Acceptable Criteria						Project Values
			Design Speed, mph						Design Speed, mph						
			50	55	60	65	70	75	50	55	60	65	70	75	
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	425
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e_{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	--
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	716.3
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	300
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	136
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	N/A
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	N/A
Minimum gradient (%)	(Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						0.9
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	4		3				7	6	6	--	--	--	N/A
		Rural roadways							5	5	4	4	4	4	1.3
		Interstates							5	5	4	4	4	4	N/A
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						26'

Superelevation Radius is below Minimum

FIELD EXAM NOTES/QUESTIONS

FAA Obstruction Evaluation form 7460 due to close proximity to the Airport KMEY runway. Crane height may be an Issue.

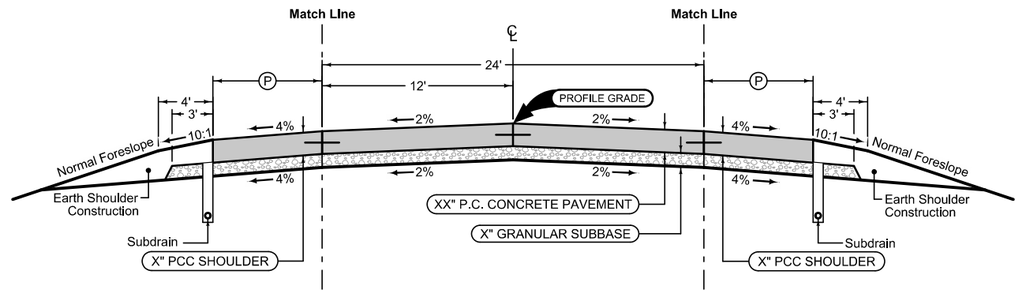
Existing Pavement PCC. Reconstruct Roadway out to edge of constructed shoulders
or keep existing roadway next to new shoulders?

FIELD EXAM NOTES/QUESTIONS

Full Depth PCC Shoulder

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

2_P_FullPCC_ MODIFIED		
STATION TO STATION		(P) Feet
325+42.00	325+67.00	Varies
330+73.00	331+30.11	Varies



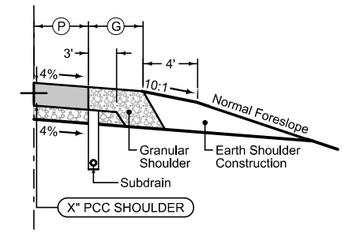
Full Depth PCC Shoulder

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

2_P_FullPCC_ MODIFIED		
STATION TO STATION		(P) Feet
325+05.05	325+67.00	Varies
330+73.00	331+00.42	Varies

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

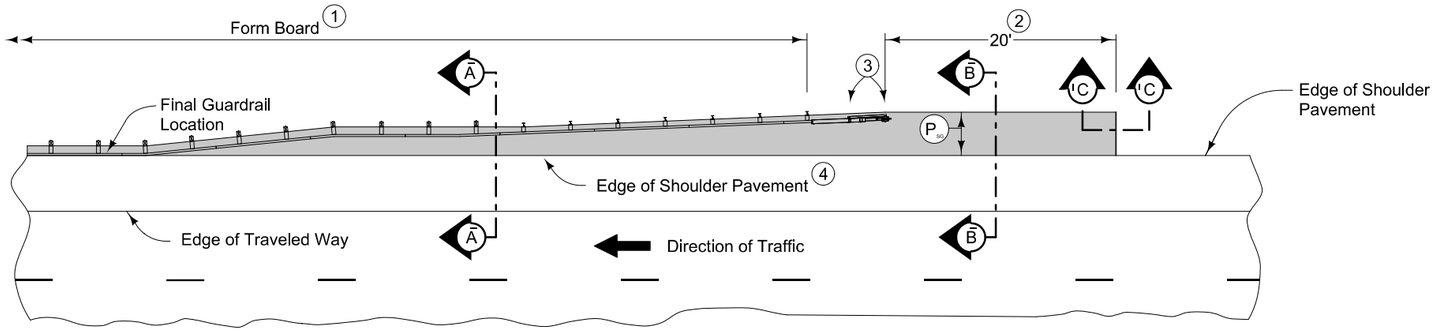
2P_ 04-21-20	
STATION TO STATION	
330+73.00	331+30.11



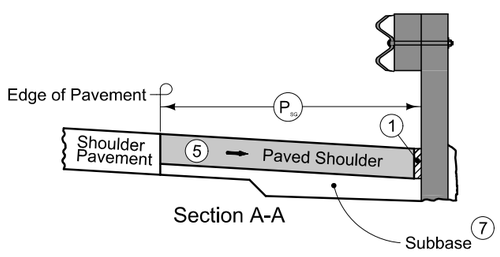
Full Depth PCC Combination Shoulder

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

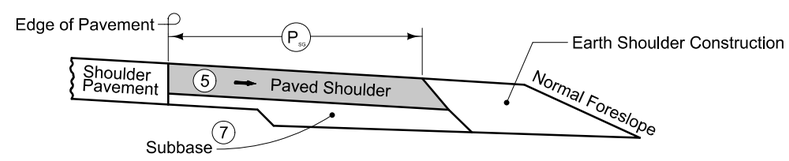
2_C_FullPCC_ 04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
331+00.42	331+30.11	4	6



PLAN VIEW

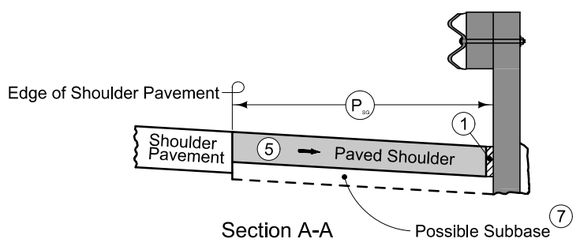


Section A-A

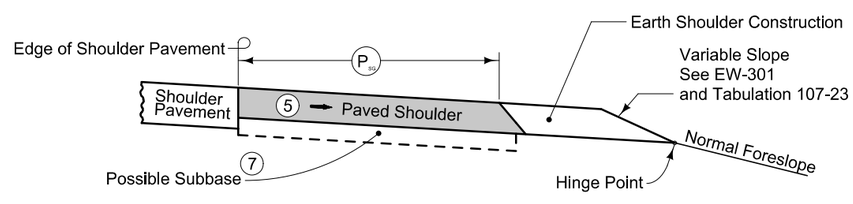


Section B-B

NEW CONSTRUCTION 6



Section A-A



Section B-B

EXISTING SHOULDER

DESIGNER INFO | 7158 MODIFIED

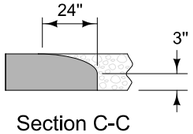
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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. 'BT' (per PV-101) joint for PCC shoulder.
   'B' (per PV-101) joint for HMA shoulder.
5. Match shoulder slope.
6. The Contractor has the option to pave the paved shoulder at guardrail and the full 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 FULL 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)
- ST Septic Tank
- C Cistern
- LP L.P. Gas Tank (No Footing)
- UST 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

- F0 — ***FO1D, Mapleton, City of - Quality D***
- F02 — ***FO2D, Midamerican Fiber - Quality D***
- F03 — ***FO3D, Centurylink - Quality D***
- F04 — ***FO4D, Unkown - Quality D***
- F05 — ***FO5D, ICN - Quality D***
- E1 — ***EL1D, Mapleton Municipal Electric - Quality D***

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.**		**Transparency**
Pink, Dark	(13)	Temporary Pavement Shading	50%
Yellow	(4)	Proposed Pavement Shading	50%
Orange	(6)	Proposed Granular Shading	50%
Orange	(70)	Proposed Shoulder Granular Shading	50%
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading	50%
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading	50%
Brown, Light	(236)	Grading Shading	50%
Orange, Light	(134)	Proposed Granular Entrance Shading	50%
Yellow	(220)	Proposed Paved Entrance Shading	50%
Tan	(8)	Proposed Sidewalk Shading	50%
Blue, Light	(230)	Proposed Sidewalk Landing Shading	50%
Pink	(11)	Proposed Sidewalk Ramp Shading	50%
Red	(3)	Proposed Structure Shading	50%
Red	(3)	Delineates Restricted Areas	0%

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

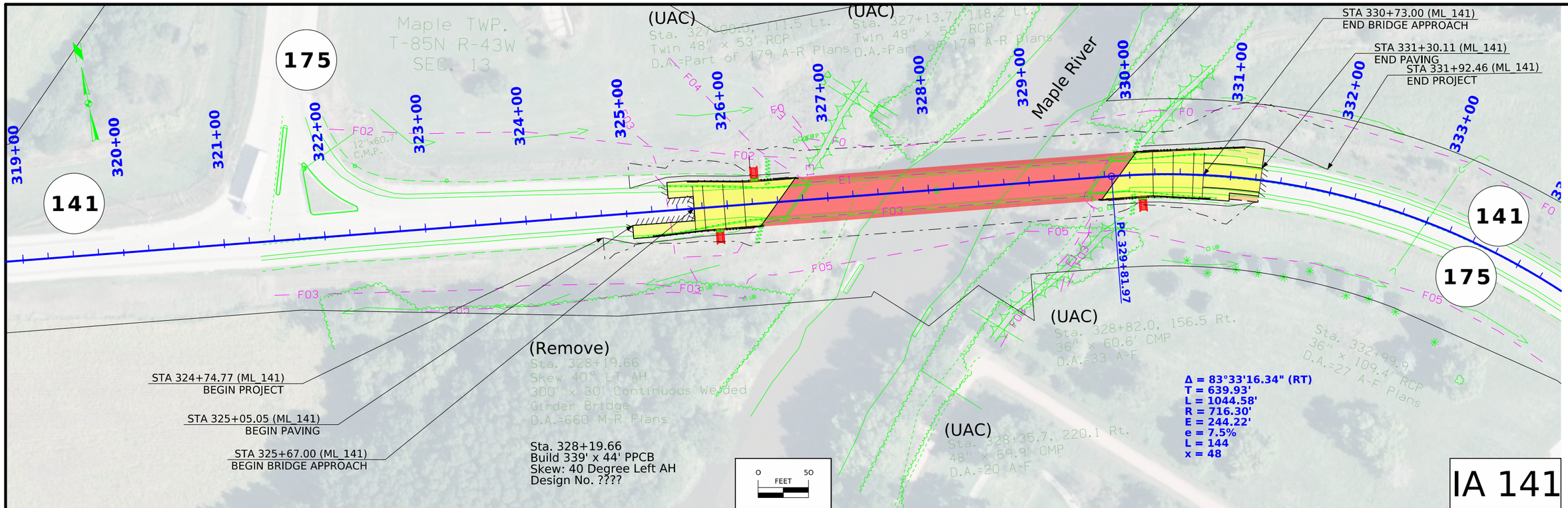
- Reference Point — Station — Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

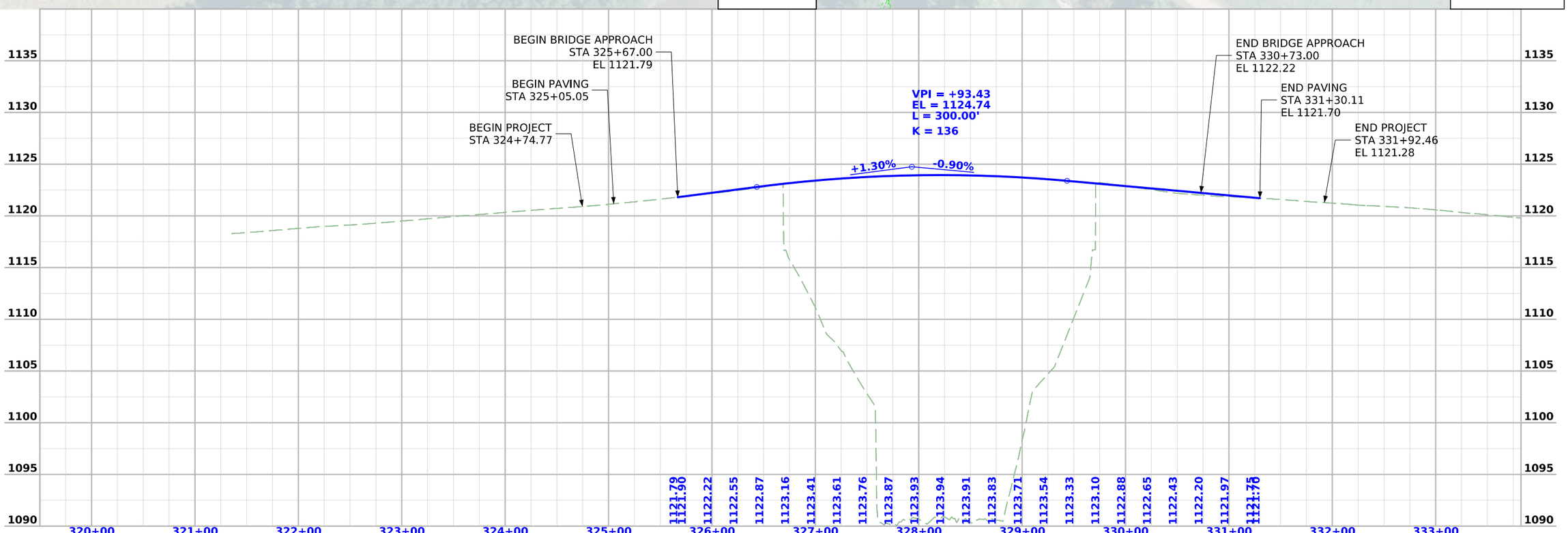
RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way Symbol
- Proposed Right-of-Way Line
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary) Symbol
- Easement (Temporary) Line
- Easement
- C/A Access Control
- Property Line Symbol
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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





FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER D.2

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SURVEY INDEX

County: Monona
PIN: 23-67-141-010
Project Number: BRF-141-2(067)--38-67
Location: Maple River 0.1 mi E of W Jct IA 175 in Mapleton
Type of Work: Bridge-Unspecified
Project Directory: 6714101023

Survey Personnel

Clayton Henningsen – Survey Party Chief
Jason Arn – Survey Party Chief

Date(s) of Survey

Begin Date	07/23/2024
End Date	09/03/2024

General Information

This survey is for IA Hwy 141 bridge over Maple River at location 0.1 mi E of W junction IA Hwy 175 Interchange. This survey request was for the IA Hwy 141 corridor only. This project is a Full Field DTM survey.

Utility Information

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

Project Control

Coordinates were determined for primary project control points by conducting concurrent six-hour static observations. Post processing is constrained to nearby Iowa Real Time Network reference stations. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 06 (U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The horizontal alignment for IA Hwy 141 this survey is a retrace of PCC Paving Plans No. F-175-1(1)—20-67. Survey stationing was equated to the plan PI at Sta. 313+00.0 and carried back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 313+00.0 PCC Paving Plans No. F-175-1(1)—20-67
Survey PI Sta. 313+00.0

PI Sta. 336+22.9 PCC Paving Plans No. F-175-1(1)—20-67
Survey PI Sta. 336+21.9

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) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 06 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018u3

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

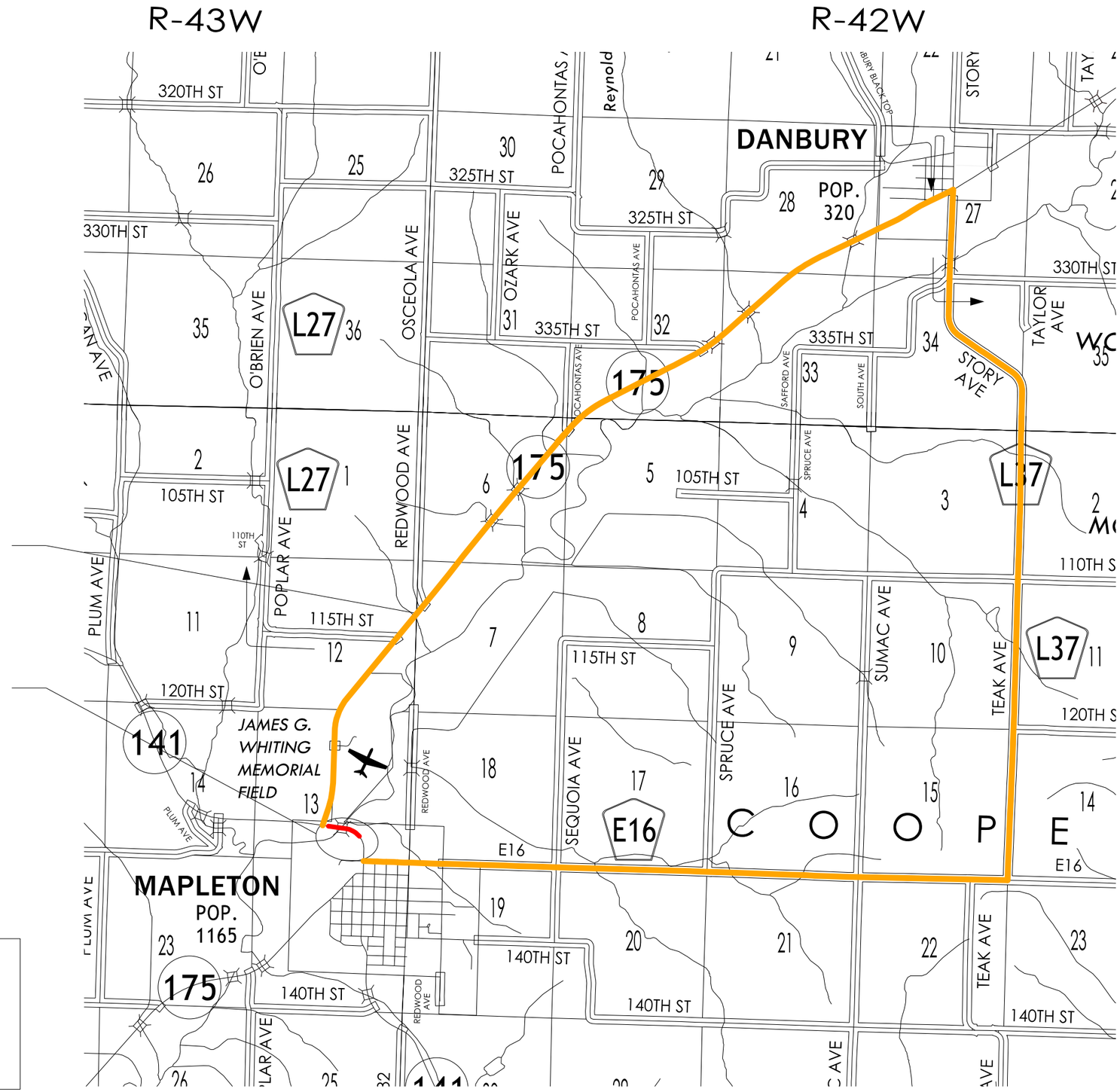
HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 06 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Point Name	Northing	Easting	Elevation	Feature Definition-Description
671410247	7299311.74	16483720.49	1113.47	CP FD X IN THE CONC COLLAR OF A MANHOLE LID 40 FT WEST OF CL IA HWY 141/175 AND APPROX. 50 FT EAST OF SE CORNER PARKING LOT
671750295	7300921.48	16482647.37	1115.19	CP SET FENO MONUMENT IN EAST EDGE OLD IA HWY 175 GRADE APPROX 135 FT FROM CL CURRENT IA HWY 175 ALONG CL OF A GRAVEL ENT
MAPPORT	7303152.06	16483815.74	1114.50	CP FOUND NGS DISK AS DESCRIBED IN GOOD CONDITION
T91 RESET	7296699.41	16481743.99	1106.46	CP FOUND NGS DISK AS DESCRIBED IN GOOD CONDITION

108_23A
8/15/22

TRAFFIC CONTROL PLAN

Traffic will be maintained by an offsite detour.



FILE NO. -	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER J.2

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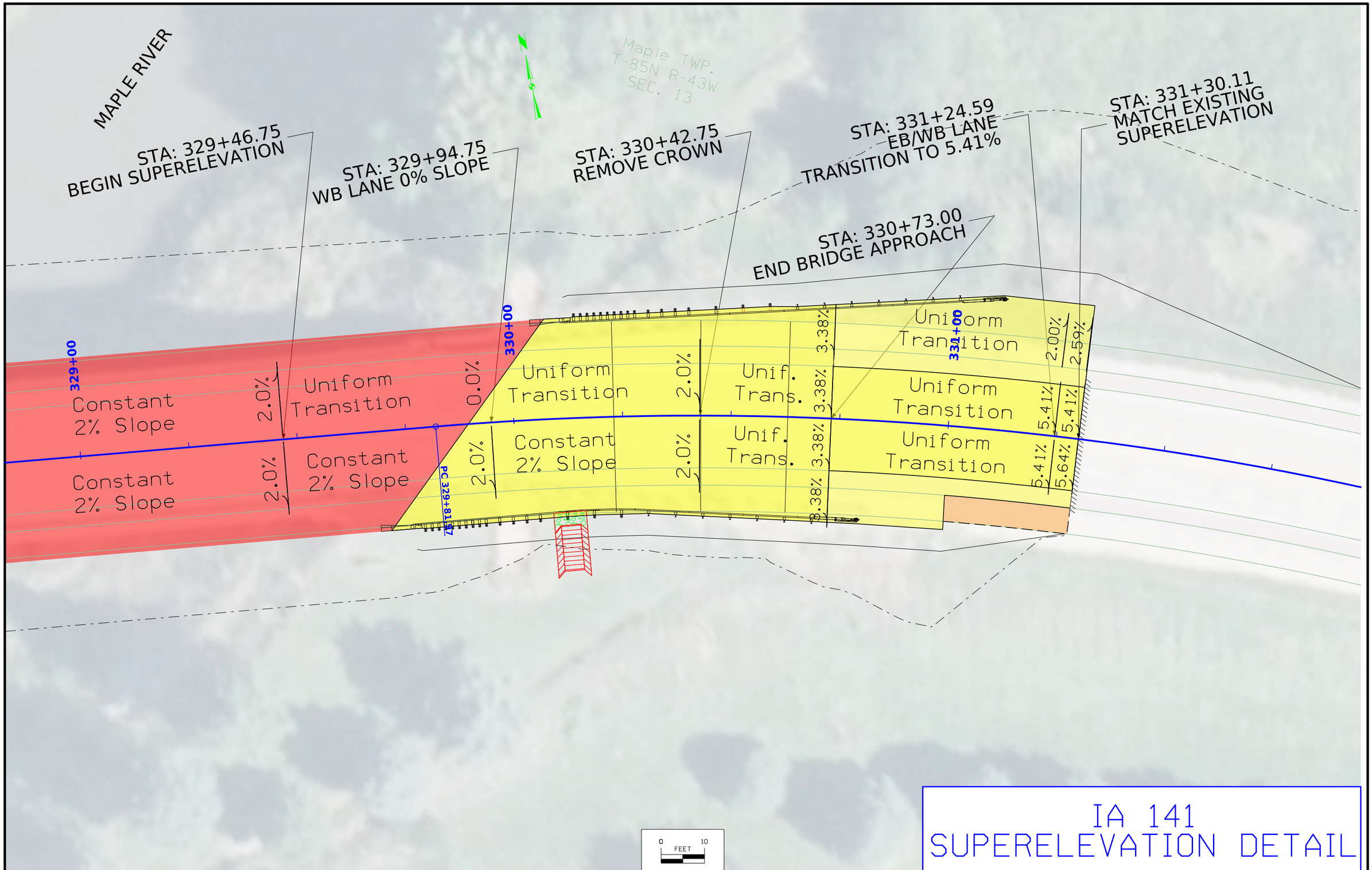

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER L.1

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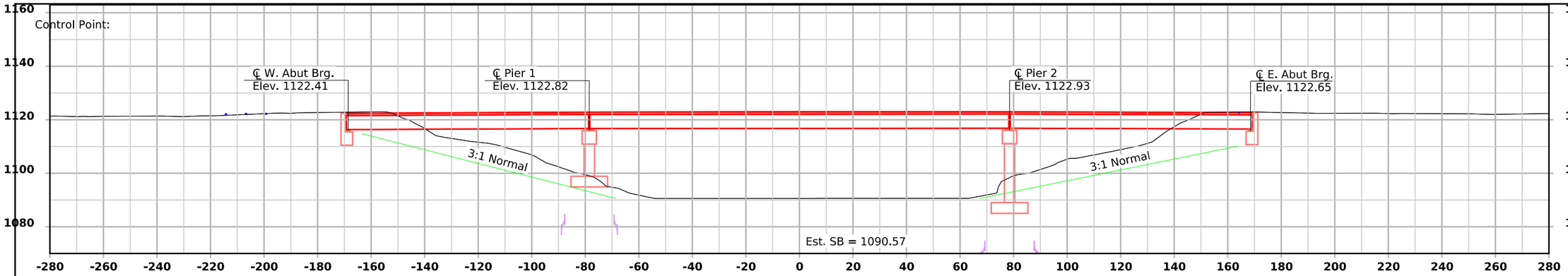
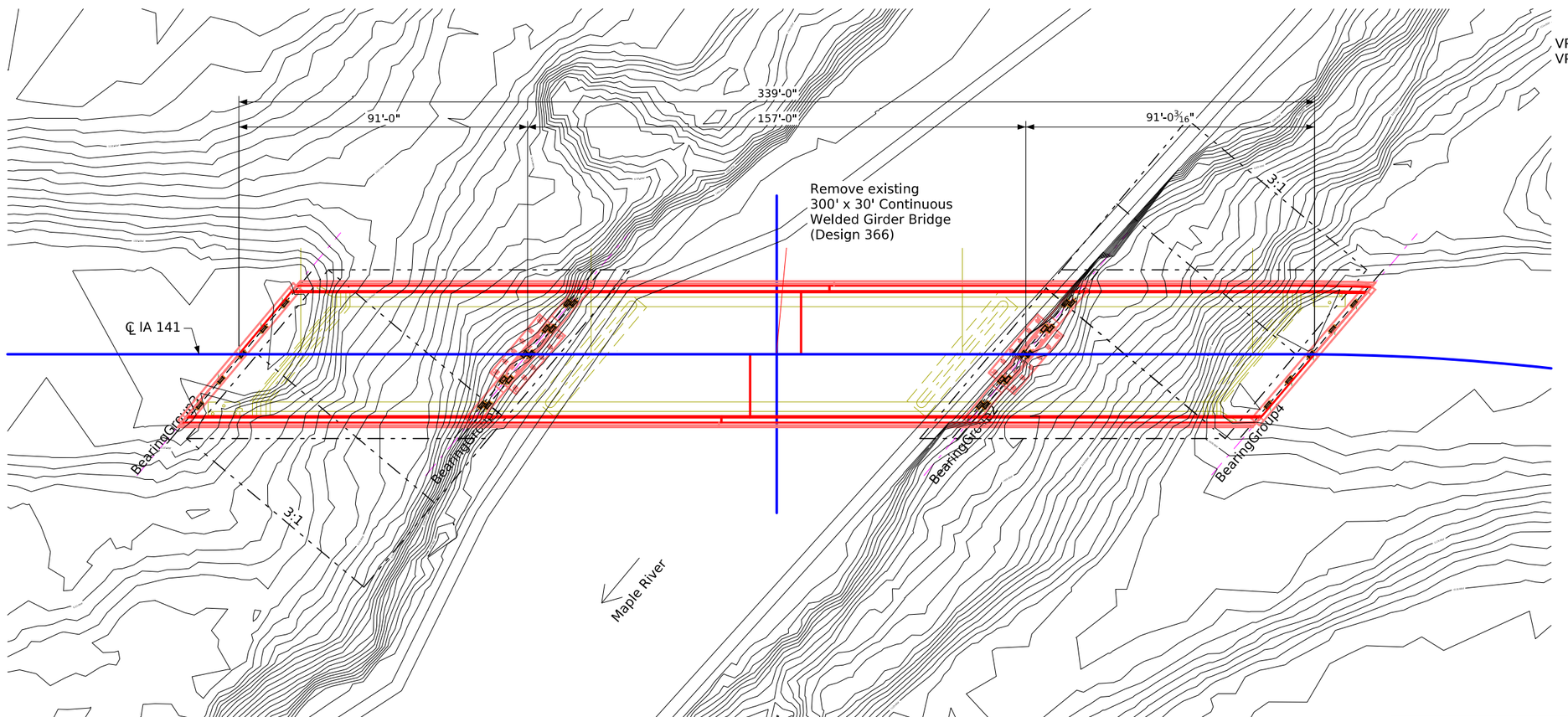


STA 0+50.00

BRG TSL Longitudinal Section Along ℄ Approach Roadway



+0.800% -0.737%

VPI Sta. = 328+33.016 VC = 500'
VPI Elev. = 1123.969

Proposed Profile Grade IA 141 (Match Existing)

Concept Level Hydraulic Data

RIDB: MapleR_17.70
Drainage Area = 644 Sq. Mi.

Operational Low Beam = 1115.9
Channel Low Beam = 1116.4
Q_{50} = 22,800 cfs (Design Event)
Stage = 1110.9
Operational Freeboard = 5 ft.
Avg. Bridge Velocity = 7.1 fps

Q_{100} = 26,000 cfs
Stage = 1112.0
Operational Freeboard = 3.9 ft.
Backwater = 0.1 ft.
Avg. Bridge Velocity = 7.5 fps

Roadway Overtop ???.?
Sta. ???+??

Location

IA 141 over Maple River
In City of Mapleton
T-85N R-43W
Section 13
Maple Township
Monona County
FHWA No. ??
Bridge Maint. No. 6724.7S141
Latitude ??.123456°
Longitude -??.123456°

Preliminary - Concept Level

TSL Designer Notes:
1. The concept bridge layout is proposed to be straight, even though the east end of the bridge is slightly into the horizontal curve.
2. BTE Beams are proposed. BSB approval for skew greater than 30 degrees has been received.
3. Integral abutments and T-Piers are proposed.
4. There appear to be utilities hanging from the existing bridge, and there may potentially be need for accommodation on the proposed bridge (staging?).
5. Twin RCPs (est. 3'or 3.5' dia) with flap gates and flume is located north of the bridge (west of river).
6. A CMP (est. 24" or 36") with flap gate is located south of bridge (east of river).
7. The site is near to an airplane runway, and there may be restrictions or requirements. Refer to correspondence dated October 2024 from Tim McClung, Aviation Director, Modal Transportation Bureau, stored in the project directory BRPrelim Correspondence subfolder for more information.

Situation Plan

0 40
Scale In Feet

N

Design For 40 Degree LA
339'-0" x 44'-0" Pretensioned, Prestressed Concrete Beam Bridge
91'-0" End Spans 157'-0" Interior Span

Situation Plan

STA. 328+20.00 (IA 141) Turn-in Date: May 2024

Monona County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. ???? Design Sheet No. 1 of 1 FHWA No. 0375?

FILE NO. 98765	ENGLISH	DESIGN TEAM AAA\BBB\CCC	Monona COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER V.1

9:03:32 AM 10/16/2024 pschwa1 pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\6714101023\Bridge\(067)_Bridge Replacement-PPCB\SHT_67141067_DOT_DDDD_FFFFFF_Z06.dgn

CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature
Aggregate	
(64)	Choke Stone
(42)	Engineering Fabric
(8)	Flooded Backfill
(92)	Macadam Stone
(20)	Modified
(12)	Plowing Shaping
(14)	Porous Backfill
(8)	Revetment Class A
(6)	Revetment Class B
(62)	Revetment Class C
(188)	Revetment Class D
(28)	Revetment Class E
(12)	Shoulder Special Backfill
(12)	Special Backfill
(20)	Subbase
(20)	Subbase Lower
(20)	Subbase Upper
(118)	Subgrade Treatment
Asphalt	
(207)	HMA Base Course
(207)	HMA Interim Course
(207)	HMA Surface Course
Bridge	
(0)	Bridge
Concrete	
(0)	Barrier Concrete
(0)	Barrier Concrete Footing
(0)	Curb Gutter
(48)	Flowable Mortar
(0)	Median Concrete
(0)	PCC Pavement
(0)	Sidewalk
Existing	
(0)	Existing Pavement
Shoulder	
(209)	Shoulder HMA
(0)	Shoulder PCC
(6)	Shoulder Granular
Structural	
(112)	Noise Wall
(112)	Noise Wall Footing
(112)	Retaining Wall Back
(112)	Retaining Wall Back Excavate
(112)	Retaining Wall Face
(112)	Retaining Wall Front Excavate
(112)	Retaining Wall Front Footing
(112)	Retaining Wall MSE Gutter
(112)	Retaining Wall Reinforced Earth

Design Color No.	Feature
Grading	
(8)	Behind Curb Cut
(6)	Granular
(13)	Granular Back Fill
(48)	Rock Undercut
(8)	Shoulder Earth Fill
(2)	Side Slopes
(226)	Side Slopes Dressing
Substrata	
(128)	Boulder
(209)	Boulder Removed
(48)	Broken Weathered
(210)	Broken Weathered Removed
(3)	Core Out
(115)	Core Out Remove Only
(195)	Core Out Remove and Replace
(203)	Existing Pavement
(184)	Existing Pavement Remove Only
(200)	Existing Pavement Remove and Replace
(6)	Loam
(211)	Loam Removed
(80)	Rock
(212)	Rock Removed
(4)	Select Sand
(214)	Select Sand Removed
(3)	Shale
(215)	Shale Removed
(10)	Topsoil
(2)	Topsoil Remove Only
(4)	Topsoil Remove and Replace
Unsuitable / Waste	
(3)	Unsuitable Type A
(216)	Unsuitable Type A Removed
(13)	Unsuitable Type B
(217)	Unsuitable Type B Removed
(11)	Unsuitable Type C
(218)	Unsuitable Type C Removed
(3)	Waste
(219)	Waste Removed

NOTES:

Text

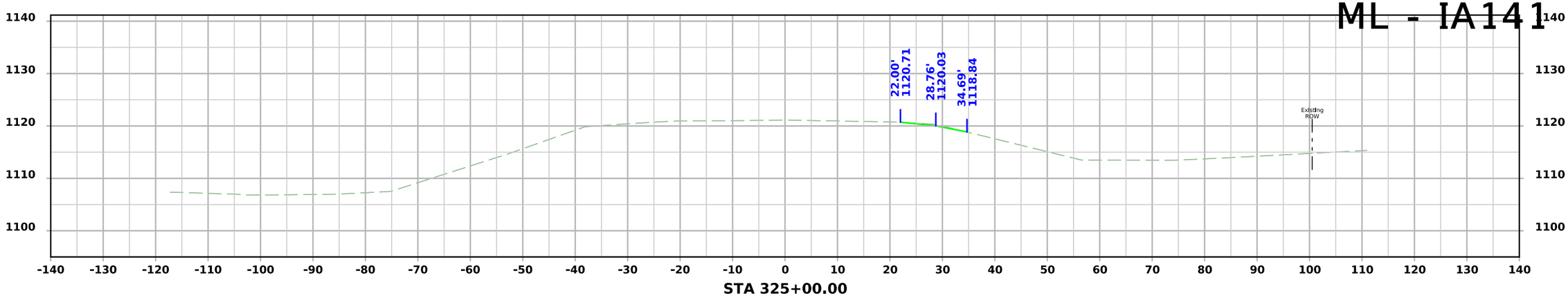
NOTES:

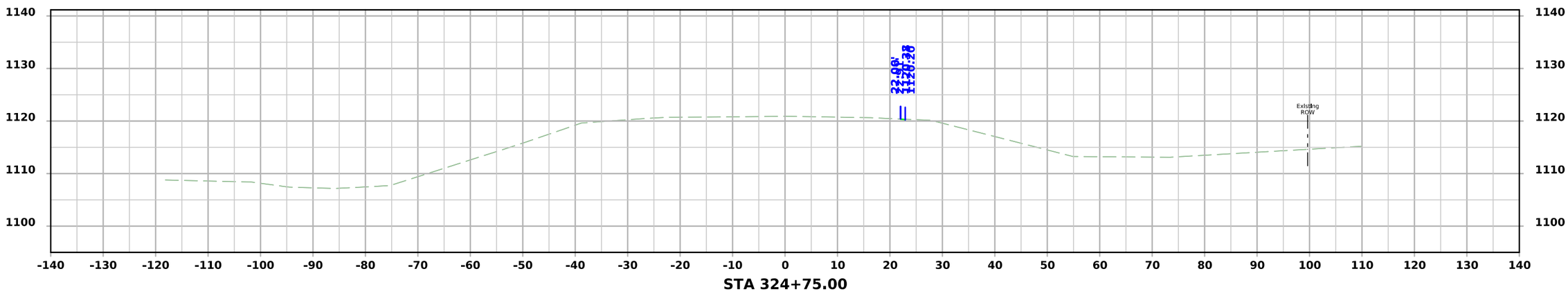
Text

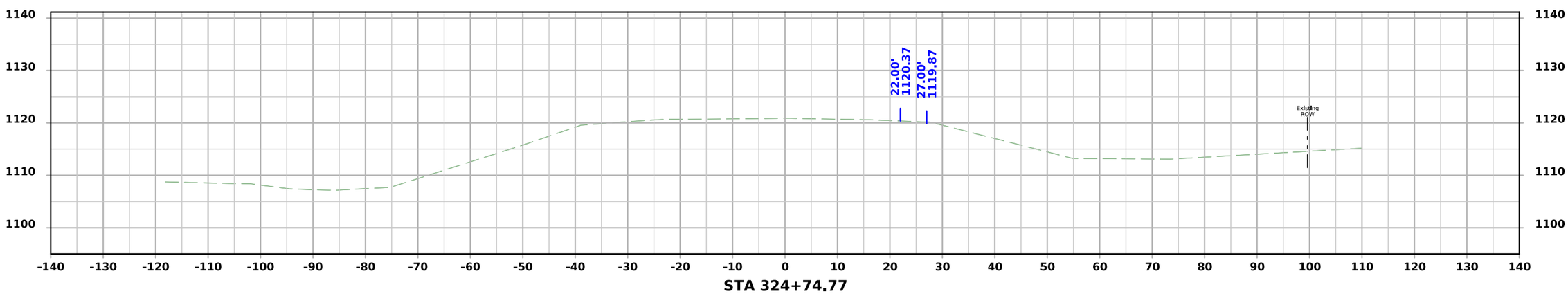
CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

ML - IA141

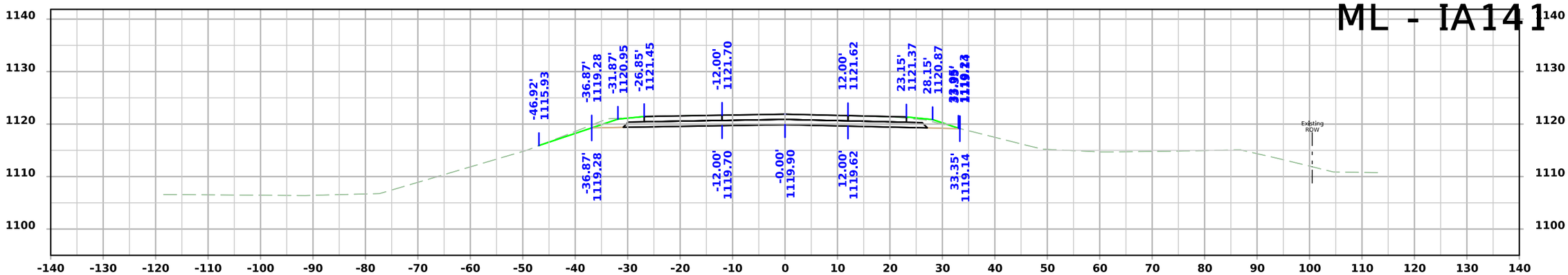




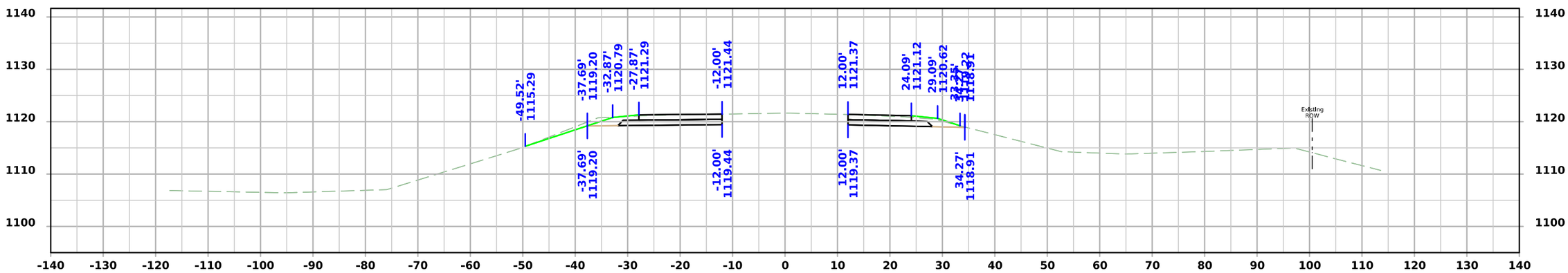


FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.2

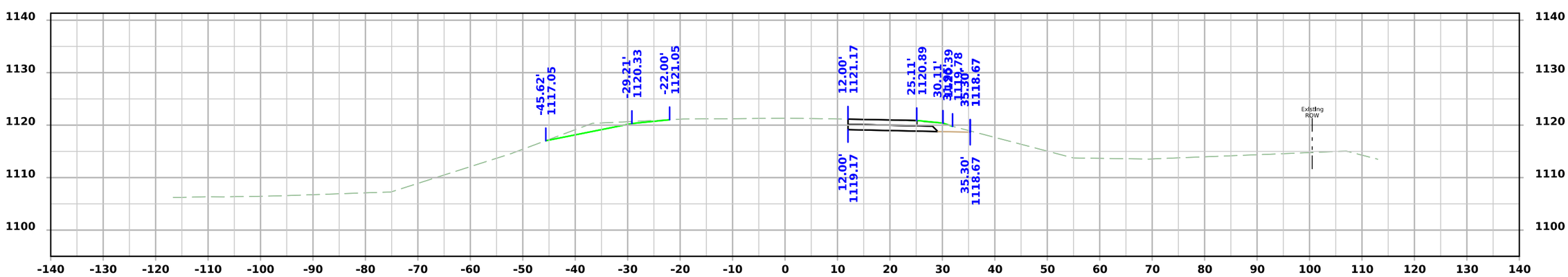
ML - IA141



STA 325+75.00



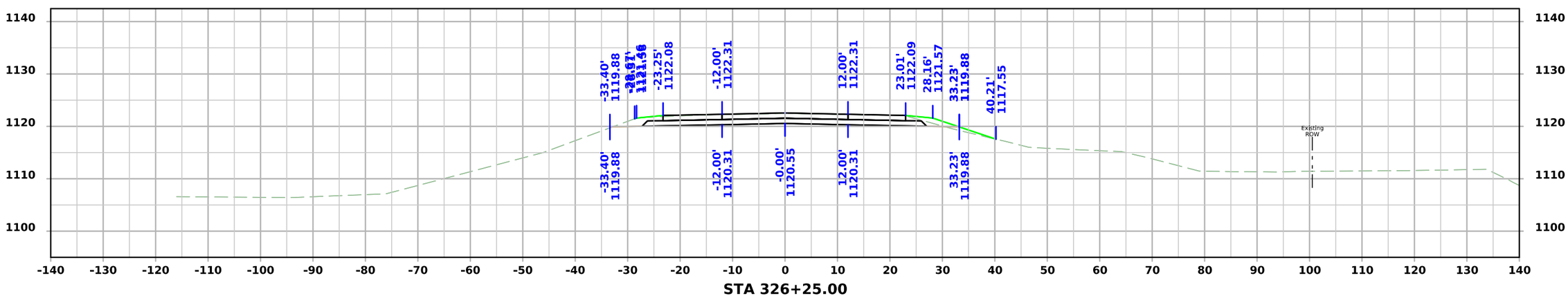
STA 325+50.00



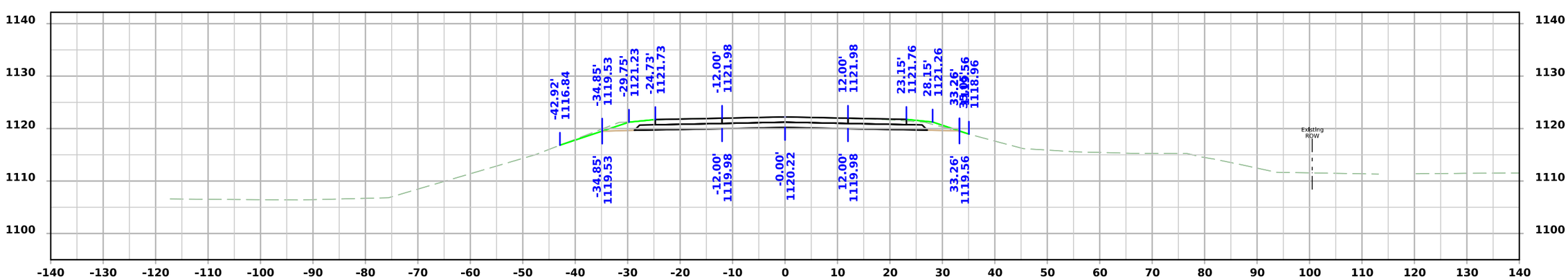
STA 325+25.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.3

ML - IA141



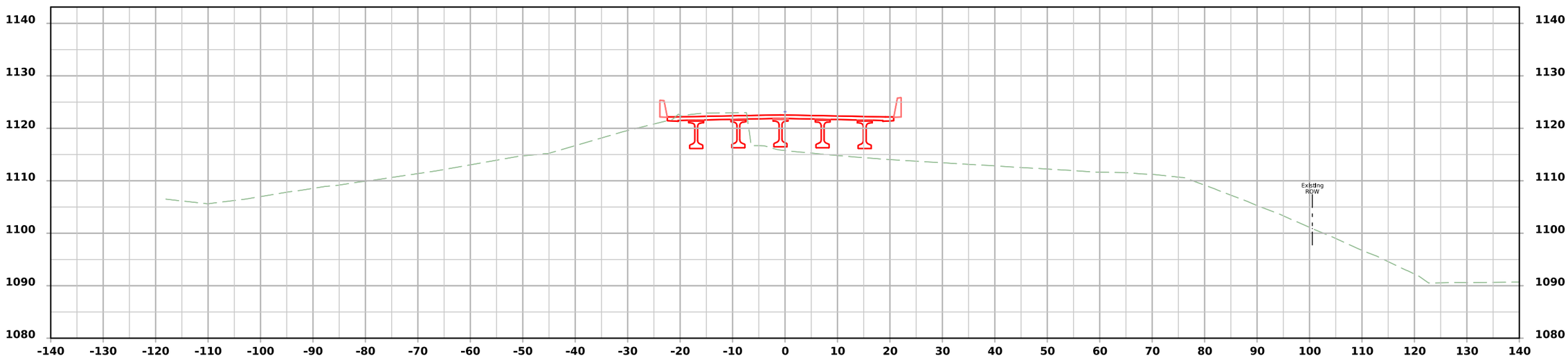
STA 326+25.00



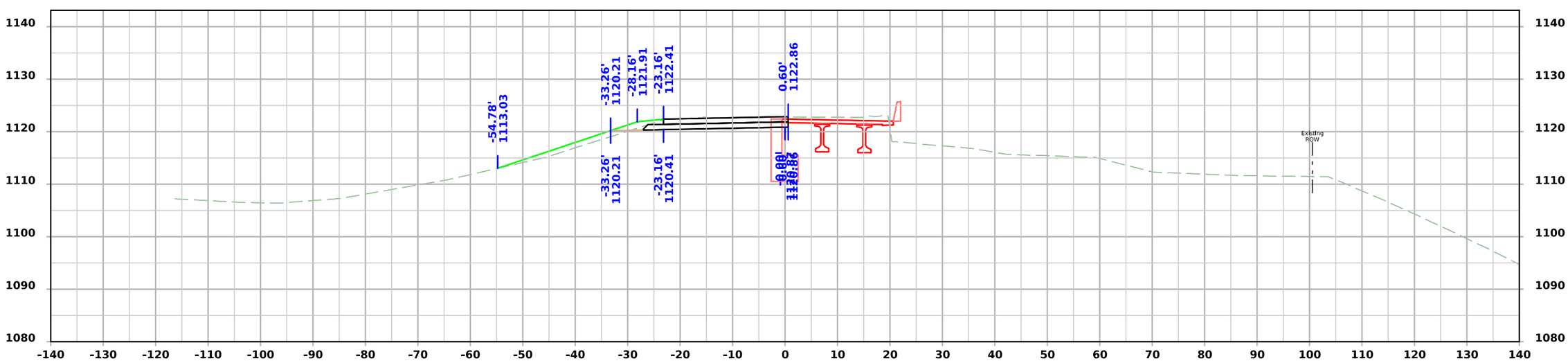
STA 326+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.4

ML - IA141



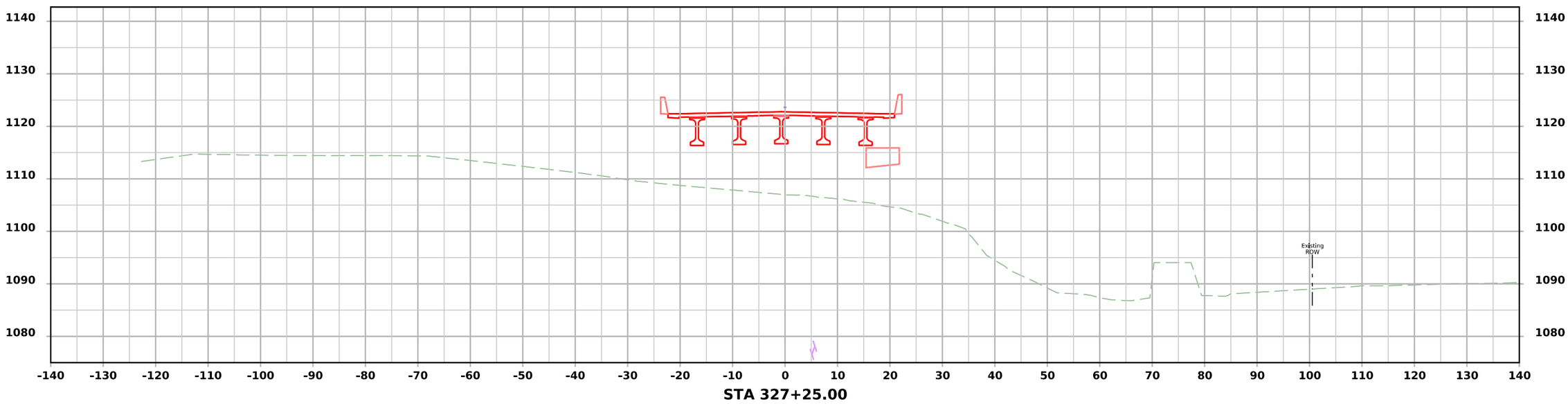
STA 326+75.00



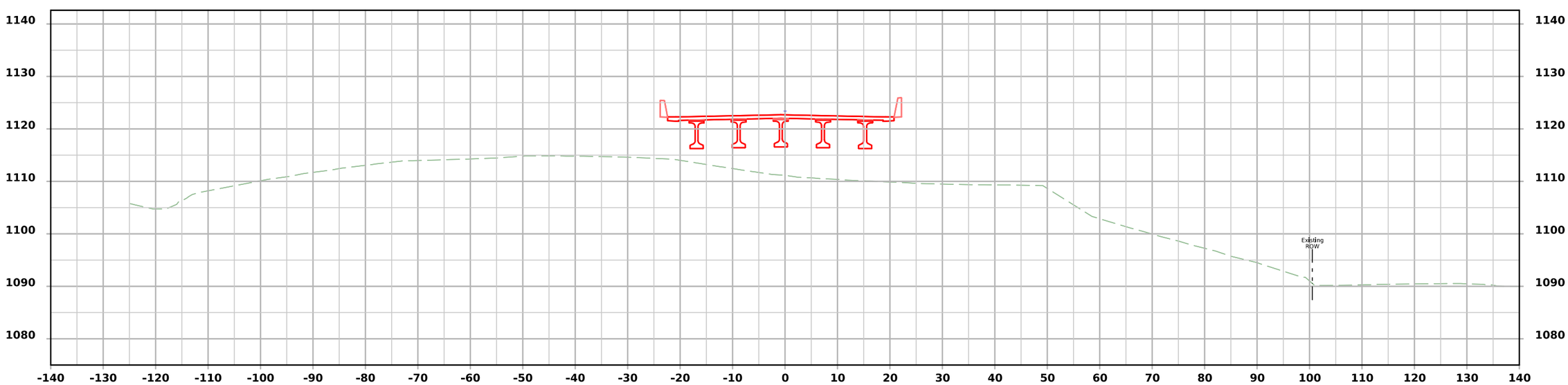
STA 326+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.5

ML - IA141



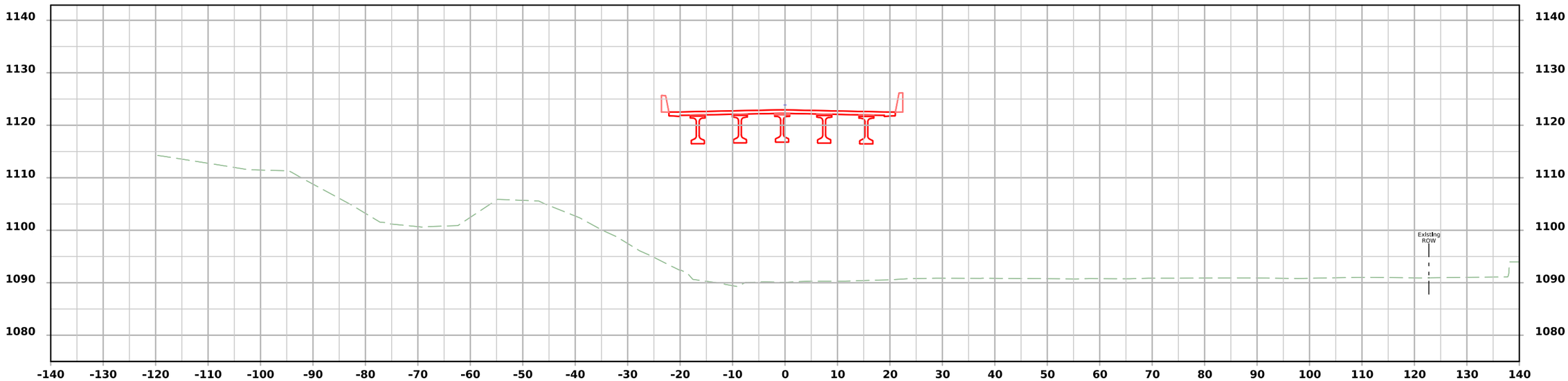
STA 327+25.00



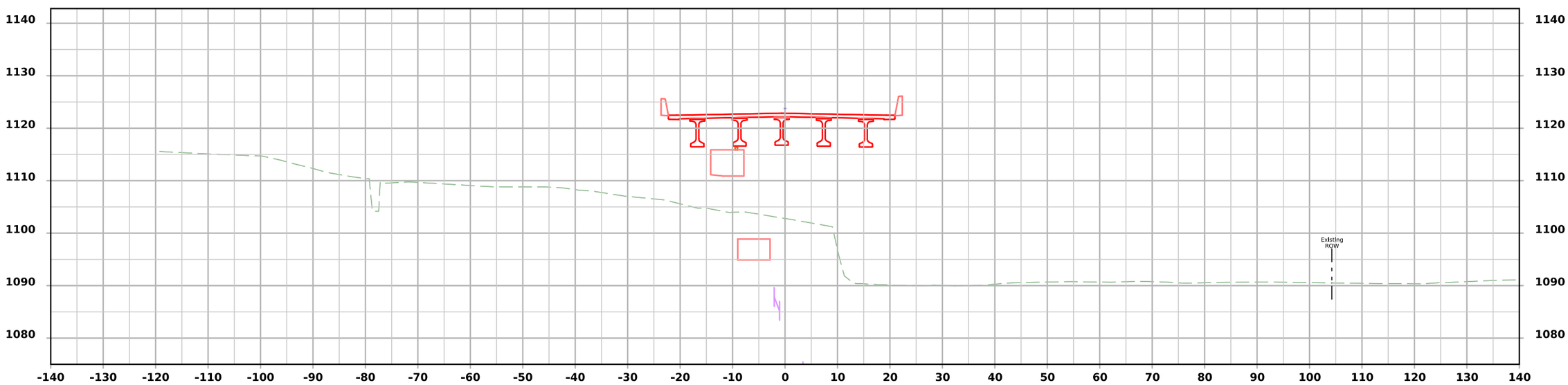
STA 327+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.6

ML - IA141



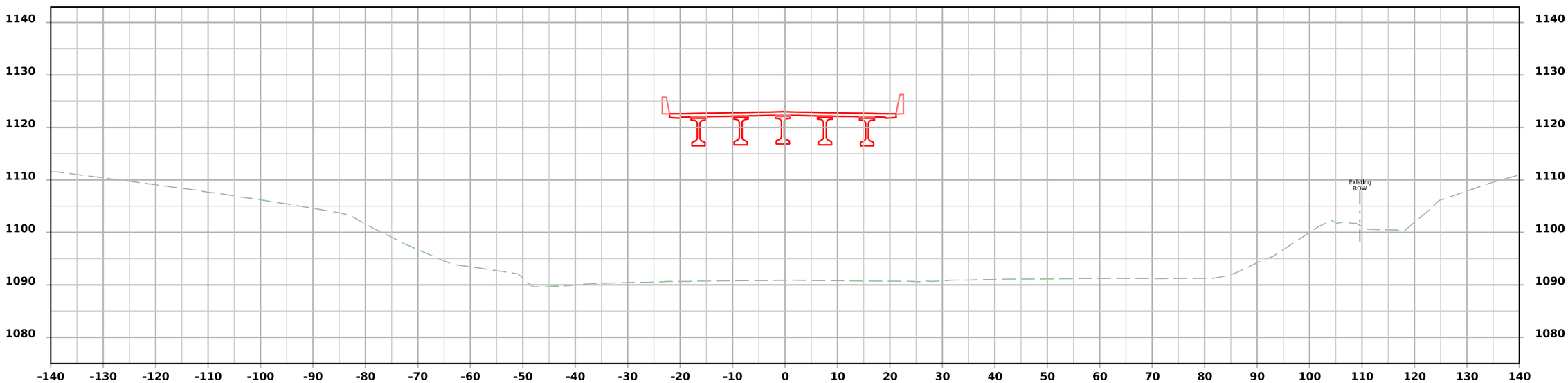
STA 327+75.00



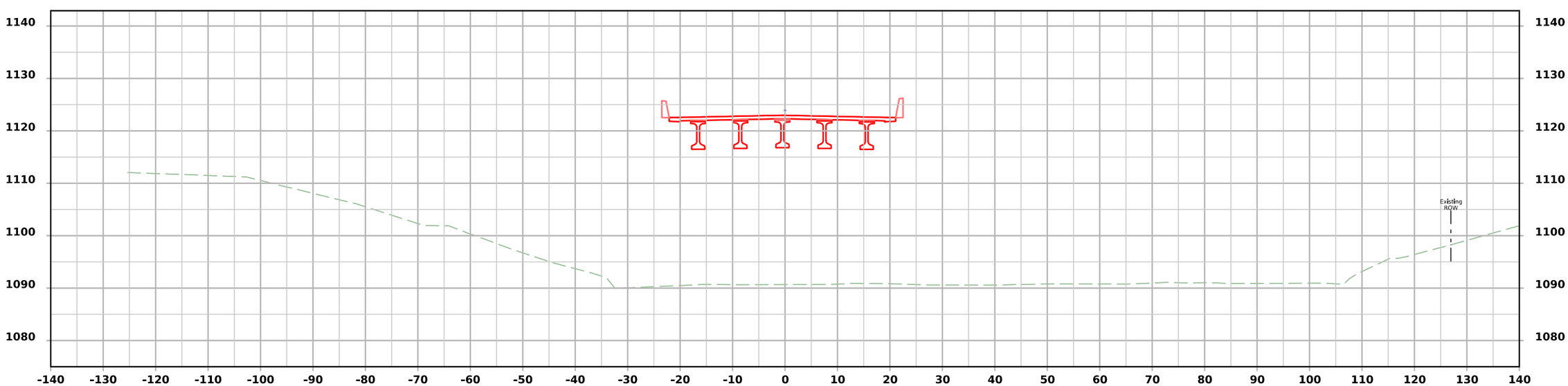
STA 327+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.7

ML - IA141



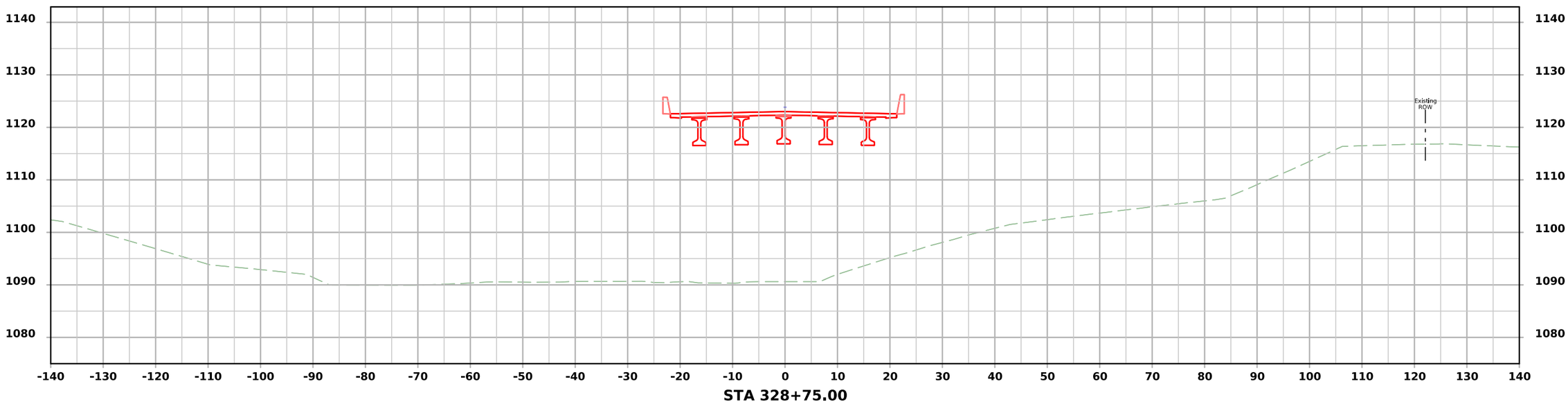
STA 328+25.00



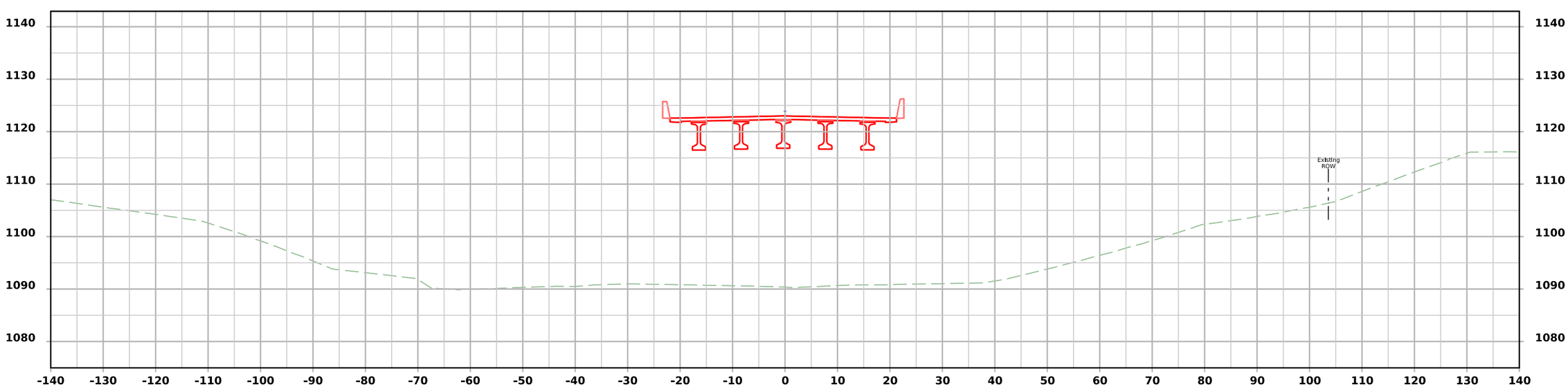
STA 328+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.8

ML - IA141



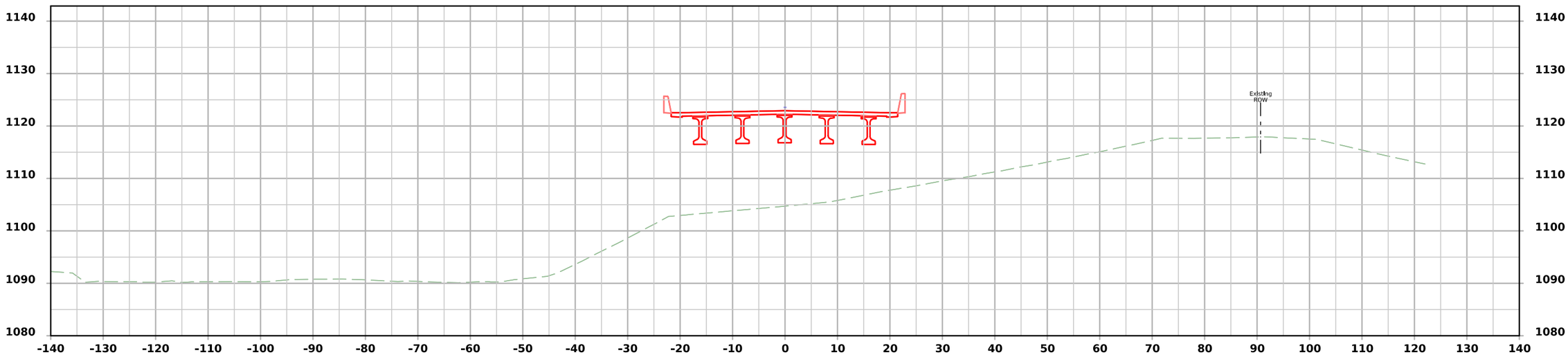
STA 328+75.00



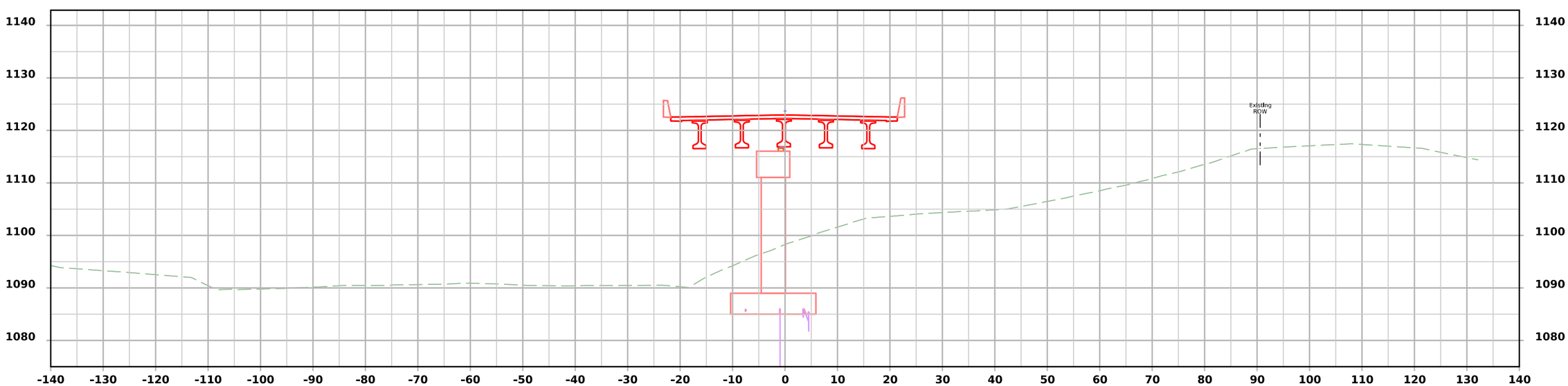
STA 328+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.9

ML - IA141



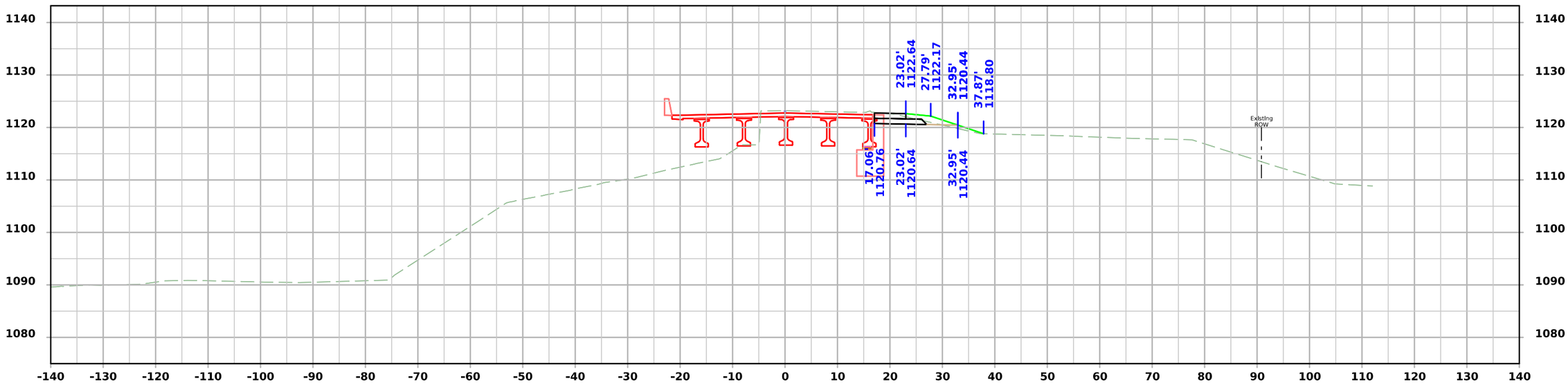
STA 329+25.00



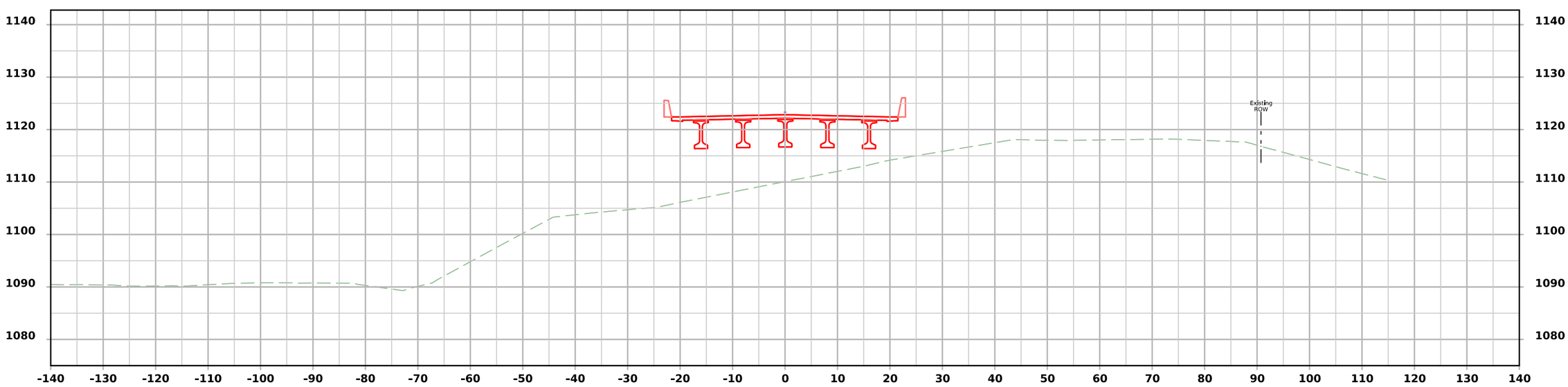
STA 329+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.10

ML - IA141



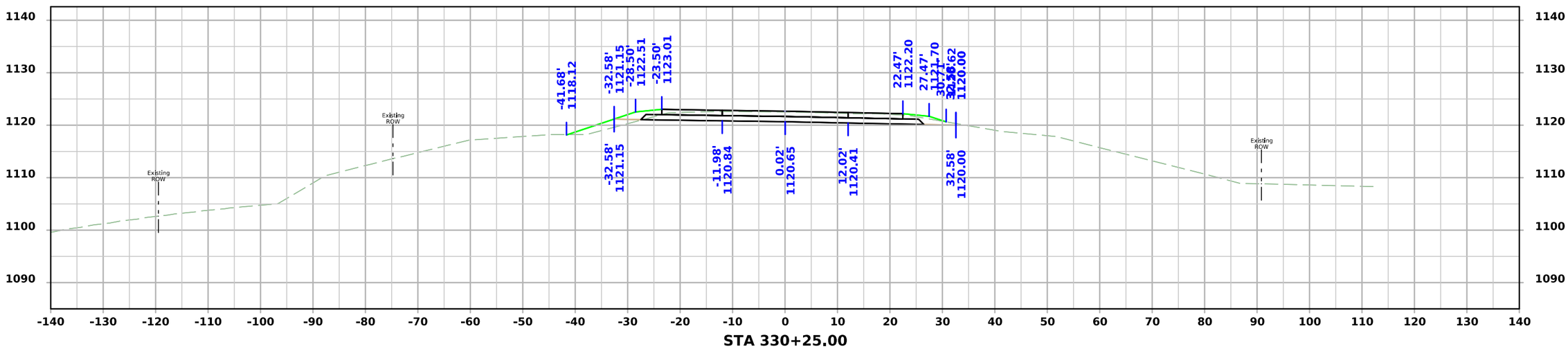
STA 329+75.00

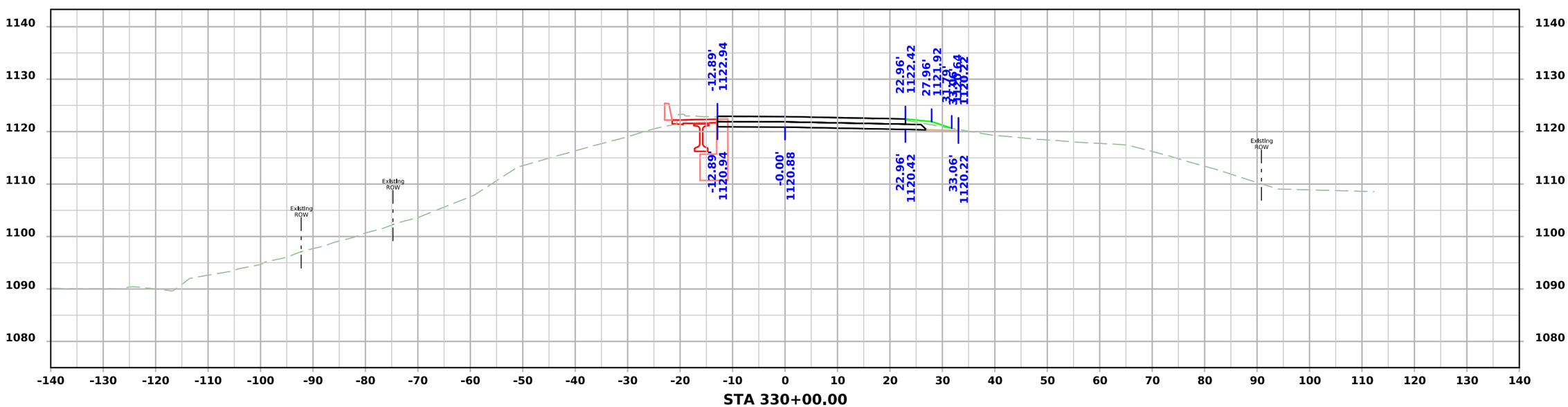


STA 329+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.11

ML - IA141

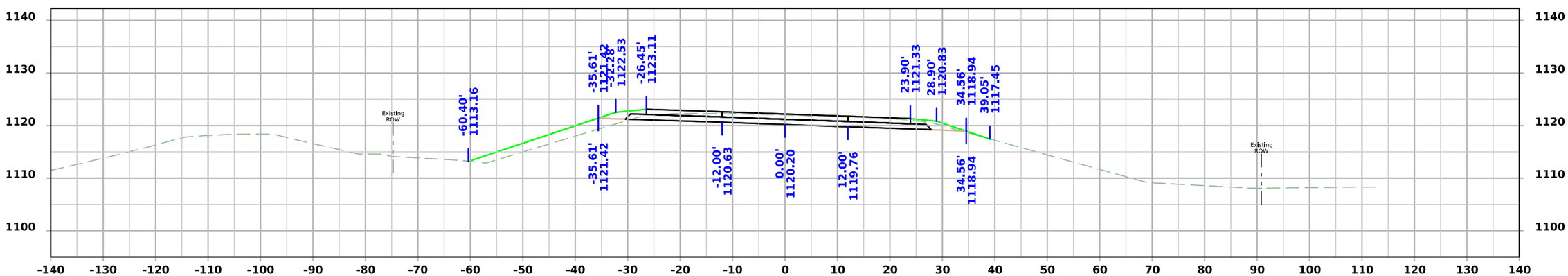




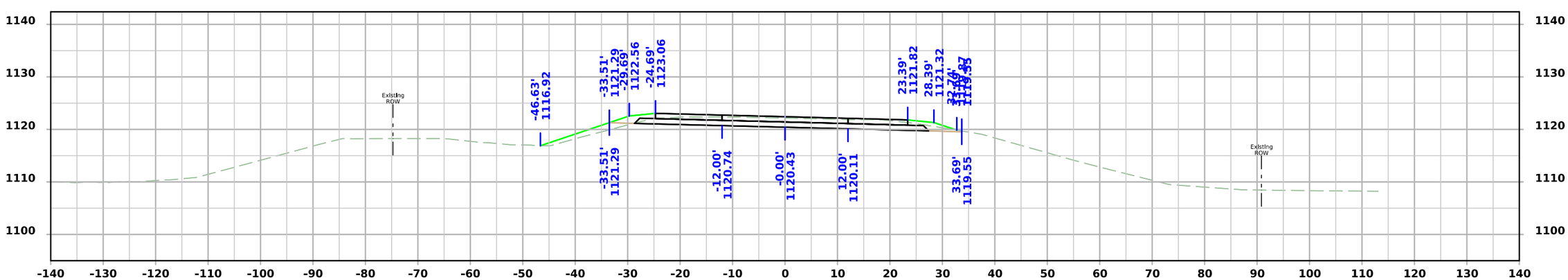
FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.12

5:08:34 PM 2/12/2025 jryan3 pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\6714101023\Design\CADD_Files\Sheet_Files\SHT_67141067_W02.dgn

ML - IA141



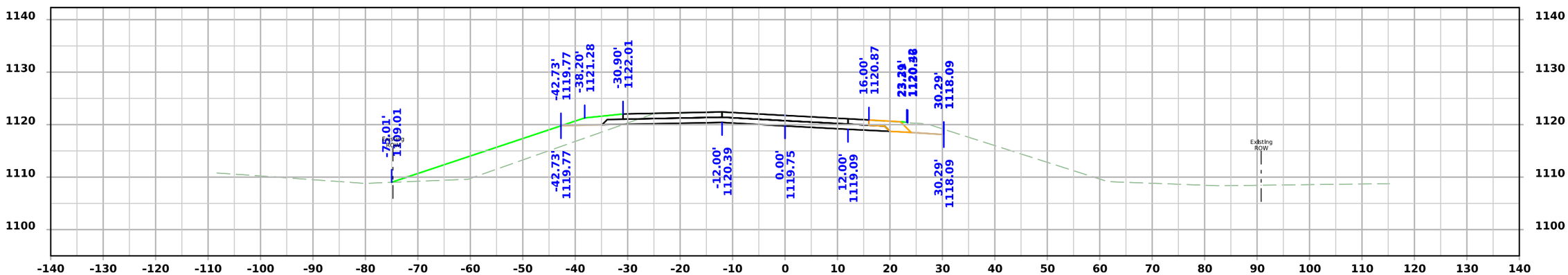
STA 330+75.00



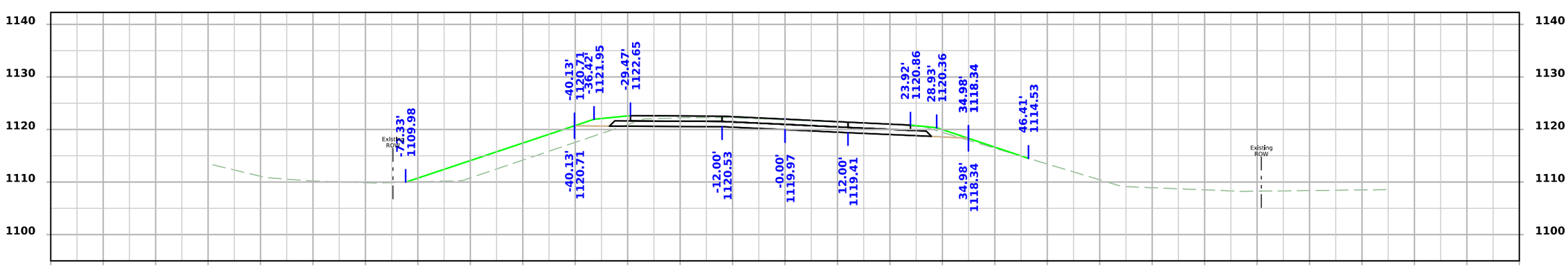
STA 330+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.13

ML - IA141



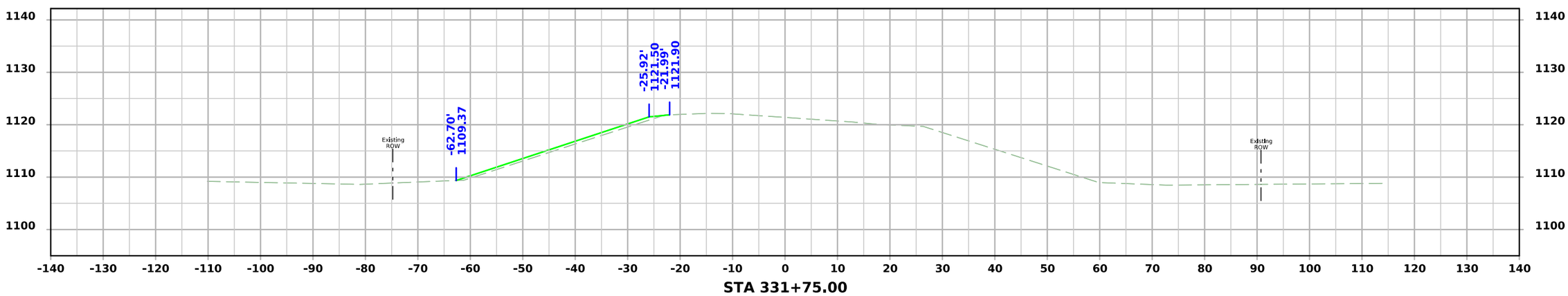
STA 331+25.00

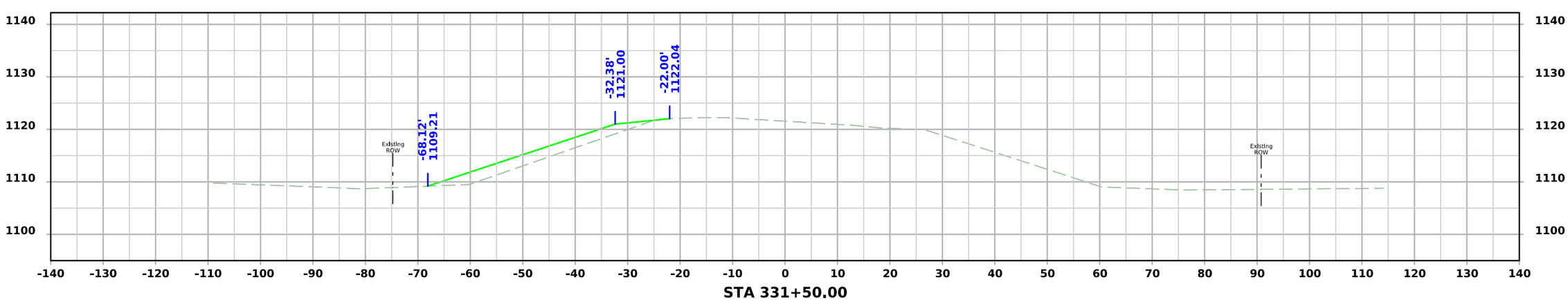


STA 331+00.00

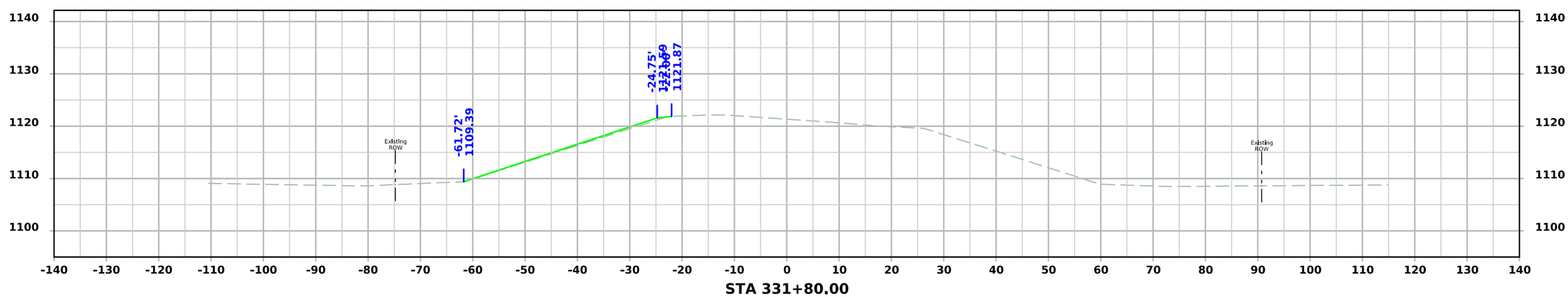
FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.14

ML - IA141


1140
1130
1120
1110
1100
Existing ROW
-62.70'
1109.37
-25.92'
1121.50
-21.99'
1121.90
Existing ROW
-140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
STA 331+75.00


1140
1130
1120
1110
1100
Existing ROW
-68.12'
1109.21
-32.38'
1121.00
-22.00'
1122.04
Existing ROW
-140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
STA 331+50.00

ML - IA141



FILE NO. 98765	ENGLISH	DESIGN TEAM JIA / DEWOLF / RYAN	MONONA COUNTY	PROJECT NUMBER BRF-141-2(067)--38-67	SHEET NUMBER W.16