LETTING DATE **Nov 20 2029**

Bridge-Unspecified

BRF-039-1(033)--38-24

CRAWFORD COUNTY

| INDEX OF SHEETS | |
|---|---|
| No. | DESCRIPTION |
| **A Sheets** | **Title Sheets** |
| A.1 | Title Sheet |
| A.2 | Location Map Sheet |
| A.3 - 14 | Design Concept |
| A.15 - 17 | Design Criteria |
| **B Sheets** | **Typical Cross Sections and Details** |
| B.1 - 3 | Typical Cross Sections and Details |
| **D Sheets** | **Mainline Plan and Profile Sheets** |
| D.1 | Plan & Profile Legend & Symbol Information Sheet |
| D.2 | IA 39 |
| **G Sheets** | **Survey Sheets** |
| G.1 - 3 | Reference Ties and Bench Marks |
| G.4 | Horizontal Control Tab. & Super for all Alignments |
| **J Sheets** | **Traffic Control and Staging Sheets** |
| J.1 | Traffic Control Plan |
| J.2 | Detour Map |
| **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 | IA 39 Cross Sections |

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

# PRIMARY ROAD SYSTEM

# CRAWFORD COUNTY

## Bridge-Unspecified

Otter Creek 5.6 mi N of US 59

SCALES: As Noted

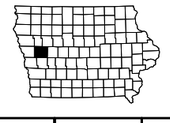
Refer to the Proposal Form for list of applicable specifications.

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

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

REVISIONS

| | TOTAL |
|---|---|
| | 45 |
| PROJECT IDENTIFICATION NUMBER | |
| 25-24-039-010 | |
| PROJECT NUMBER | |
| BRF-039-1(033)--38-24 | |
| R.O.W. PROJECT NUMBER | |
| STPN-039-1(034)--2J-24 | |



| DESIGN DATA RURAL | | | |
|---|---|---|---|
| 20 30 | AADT | 2,900 | V.P.D. |
| 20 50 | AADT | 3,100 | V.P.D. |
| 20 – | DHV | -- | V.P.H. |
| TRUCKS | | 24 | % |
| Total Design ESALs | | -- | |

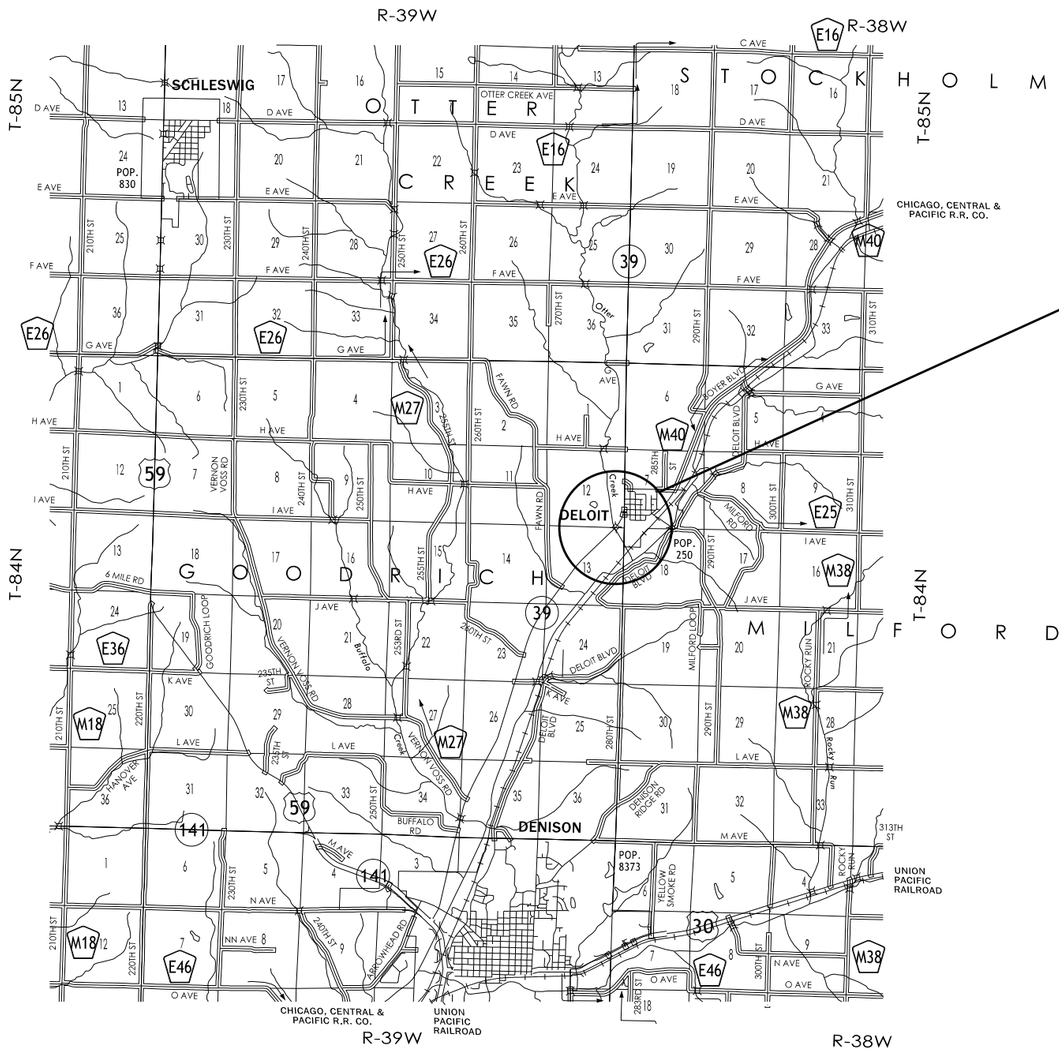
| INDEX OF SEALS | | | |
|---|---|---|---|
| SHEET NO. | NAME | TYPE | BID QUANTITY SHEETS |
| A.1 | Kelly C. Bell | Primary Signature Block | X |
| | | | |
| X | X | X | X |
| | | | |
| | | | |
| | | | |
| | | | |

D3 PLAN - Date: 9/25/2026
D5 PLAN - Date: 2/12/2027
D4 PLAN - Date: 7/10/2029

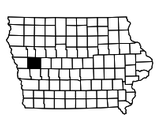
**PRELIMINARY PLANS**

Subject to change by final design.

D2 PLAN - Date: 8/25/2026





LOCATION MAP SCALE
0 1 2 3
Miles

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER A.2 | |
|---|---|---|---|---|---|---|

11:41:36 AM 7/20/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Sheet_Files\SHT_A01_24039033Z03.dgn

**IOWA DEPARTMENT OF TRANSPORTATION**

**TO OFFICE:** District 3 **DATE:** December 17, 2025

**ATTENTION:** Jessica Felix **PROJECT:** Crawford County
BRF-039-1(033)--38-24

**FROM:** John E. Bartholomew PIN: 25-24-039-010

**BUREAU:** Design

**SUBJECT:** Project Concept Statement; (FINAL, D0)

JEB:hsr
Attach.
cc:

C. Purcell
M. Dell
M. A. Swenson
S. Majors
D. L. Newell
W. A. Sorenson
A. A. Welch
B. Hofer
T. Quam
J. Holst
T. Lovan
D. Dudley
A. Knight
L. Narigon
M. E. Khoda
J. Ellis
J. Klemme
D. Pryor
J. Becker
S. Tracy
B. Waltersdorf
C. Duncan
K. D. Nicholson
J. S. Nelson
S. Ingersol
A. Poole
D. Breitbach
E. C. Wright
J. Harris
G. Karssen
S. Anderson
R. Harris
M. Solberg
L. Armstrong
P. Flattery
J. Hauber
M. Gordy
J. Galliart
S. Tymkowicz
J. Abbott
T. Huju
B. Strueker
C. Schwienebart
W. Musgrove
Y. Jia
M. Nop
C. C. Poole
K. Brink
J. W. Laaser-Webb
M. E. Ross
M. Van Dyke
D. Johnson
D. Stokes
B. Dolan
T. Gustafson
B. Smith
A. Yates
S. Sersland
M. Todsen
T. Sheets
D. Clark
K. Bell
M. Thayer
J. Pottorff
S. Goetz
FHWA

This project involves the replacement of the IA 39 bridge (Maint No. 2405.4S039) over IA 39 Bridge over Otter Creek 5.6 mi N of US 59.

A concept review was held on October 29, 2025. Those present included Todd Huju, Dennis Clark, Justin Pottorff, Dylan Pryor, Jason Klemme and Jared Abbott from the District 3 Office; Linda Narigon, Jim Ellis and Tom Lovan from the Bridges and Structures Bureau; Christine Schwienebart, Chelsea Duncan, Jim Galliart, Marc Solberg and Shawn Goetz from the Location and Environment Bureau; Scott Ingersol and Tim Sheets from FOTH; Tami Quam from the Project Management Bureau and John Bartholomew, Kelly Bell, Yan Jia, Paul Flattery, Jason Holst and Hollie Richey from the Design Bureau.

The two alternatives considered were:

1. Replace the existing IA 39 bridge with a pretensioned prestressed concrete beam (PPCB) bridge utilizing an offsite detour. The estimated cost for this alternative is **$2,783,100**.
2. Replace the existing IA 39 bridge with a pretensioned prestressed concrete beam (PPCB) bridge utilizing staged construction.

Alternative 1 is the preferred alternative. Additional right of way may be required it is programmed for $5,000. Traffic will be maintained by offsite detour. Estimated cost for Alternative 1 is **$2,783,100**.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Tuesday, December 16, 2025. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2030. The Bridges and Structures Bureau will coordinate plan preparation with assistance from the Design Bureau.

FINAL PROJECT CONCEPT STATEMENT

IA 39 Bridge over Otter Creek 5.6 mi N of US 59.

Crawford County
BRF-039-1(033)--38-24
PIN: 25-24-039-010
Maint. No. 2405.4S039
FHWA No. 21530

Highway Division
Design Bureau

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

December 17, 2025

## I. STUDY AREA

### A. Project Description

This project involves the replacement of the IA 39 bridge (Maint. No. 2405.4S039) over Otter Creek.

The two alternatives considered were:

1. Replace the existing IA 39 bridge with a pretensioned prestressed concrete beam (PPCB) bridge utilizing an offsite detour. The estimated cost of this alternative is **$2,783,100**.
2. Replace the existing IA 39 bridge with a pretensioned prestressed concrete beam (PPCB) bridge utilizing staged construction.

Alternative 1 is the preferred alternative due to limited lane width for staged construction. Estimated cost for this project is **$2,783,100**.

### B. Need for Project

This is a 155 ft. x 26 ft. steel beam bridge that was built in 1951 and reconstructed in 1967. The top of the deck has many delaminated areas, transverse and longitudinal cracking, and PC patching at both deck joints. The bottom of the deck has several transverse leaching cracks, hollow areas, and spall areas. Steel beams have areas of severe rust and section loss. The substructure also has several vertical leaching cracks and hollow areas. The bridge was designed for live loads below the current standards. Due to the overall condition of the bridge, the bridge should be replaced.



Photos from SIIMS



2014
Profile Left



2014
With Route

### C. Present Facility

The existing structure is a 155 ft. x 26 ft., steel beam bridge constructed in 1951 and reconstructed in 1967.

IA 39 in the project area is 22 ft. wide PC8 pavement (10 in. - 8 in. - 10 in. PCC concrete slab) with 10 ft. wide earth shoulders and 3:1 foreslopes, constructed in 1952. AAC resurfacing of 1.5 in. over 1.5 in. BAC was accomplished in 1994. HMA resurfacing of 1.5 in. and milling of 1.5 in. occurred in 2021.

### D. Traffic Estimates

The 2030 construction year and 2050 design year average daily traffic estimates are 2,900 ADT with 24% trucks and 3,100 ADT with 24% trucks, respectively.

### E. Sufficiency Ratings

IA 39 is classified as an "Area Development" route and is a maintenance service level "C" roadway. The Bridge Condition Index is 48.7 and the Bridge Condition Rating is "Fair".

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2020 through December 31, 2024, there were 4 personal property. The PCR Level is 'Negligible' with a PCR Value All Crashes of -0.122722.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 – Replace the existing IA 39 bridge with a 189 ft. x 44 ft. pretensioned prestressed concrete beam (PPCB) bridge utilizing an offsite detour.

The existing 150 ft. x 26 ft., steel beam bridge will be replaced with a 3 span, 189 ft. x 44 ft., PPCB bridge.

The typical cross section adjacent to the bridge approach will consist of a 42 ft. roadway (32 ft. wide pavement) with 10 ft. combination shoulders (5 ft. paved, 5 ft. granular) 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 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes 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 will may be required for this project. It is programmed for $5,000.

Traffic will be maintained by an off-site detour.



| **Bridge Items** | Estimated Costs |
|---|---|
| New Bridge | $ 1,450,000 |
| Bridge Removal | 99,000 |
| Revetment | 78,000 |
| Mobilization - 10% | 163,000 |
| M & C - 20% | 358,000 |
| **Bridge Costs** | **$ 2,148,000** |
| | |
| **Right of Way** | **$ 5,000** |
| | |
| **Roadway Items** | |
| Bridge Approaches | $ 160,400 |
| Removal of Pavement | 10,800 |
| Excavation Class 13 Waste | 110,800 |
| Guardrail (Includes Removal) | 20,300 |
| Paved Shoulders for Guardrail | 61,000 |
| Class 10 for Guardrail Blisters | 20,400 |
| Bridge End Drains | 6,300 |
| Seeding and Fertilizing | 1,100 |
| Erosion Control | 50,000 |
| Traffic Control - 5% | 31,500 |
| Mobilization - 5% | 31,500 |
| M & C - 30% | 126,000 |
| **Roadway costs** | **$ 630,100** |
| | |
| **Project Total** | **$ 2,783,100** |

Alternative #2 – Replace the existing IA 39 bridge with a 189 ft. x 46 ft. pretensioned prestressed concrete beam (PPCB) bridge utilizing staged construction.

This alternative was dismissed due to the limited lane width (10 ft.) available for staging. Gaining additional lane width for staging would require substantially more overall bridge width, increasing the overall cost further.

A layout of the proposed staged construction is available in the concept attachments.

B. Detour Analysis

IA 39 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 U.S. 59 northwest to County Road E-16, then east on County Road E-16 to the junction of IA 39. Out of distance travel is 6.92 miles. The total distance user cost is anticipated to be $1,002,400. The cost for county road maintenance will be $29,900 as calculated by the Gas Tax Method. Detour signing costs will be $10,000.

C. Recommendations

It is recommended that the present structure be replaced, as described in Alternative No. 1. Estimated cost for this project is **$2,783,100**.

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 39; 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 33 is less than the first stage filter threshold of 50, therefore this bridge will be constructed using traditional 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.

Right of Way appears to be required for this project. It is programmed for $5,000.



The Location and Environment Bureau has attended the concept review meeting for this project and no special concerns were noted. It is anticipated that a Nationwide Permit will be needed.

There is a utility attached to the current bridge that will be impacted. During the utility investigation, the owner will be identified and will be required to relocate.

An Environmental Research Study Area (ERSA) has been developed for this project and can be viewed in the concept attachments.

G. Program Status

Site data has been developed by the Design Bureau. This project is listed in the 2026-2030 Iowa Transportation Improvement Program, with $5,00 programmed for right of way in FY 2030, and $3,256,000 for replacement in FY 2030. 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:hsr




| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER A.7 | |
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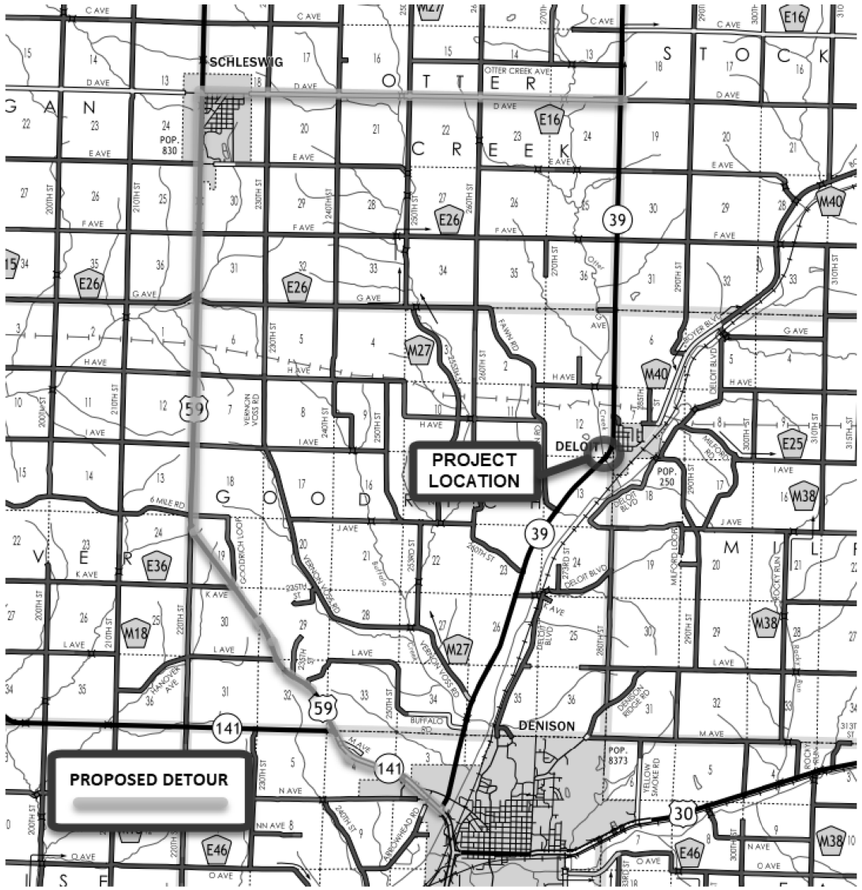
11:42:01 AM 7/20/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Sheet_Files\SHT_A01_24039033Z03.dgn

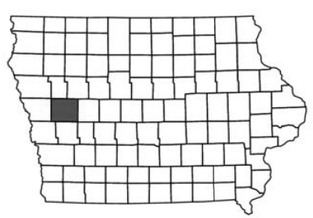



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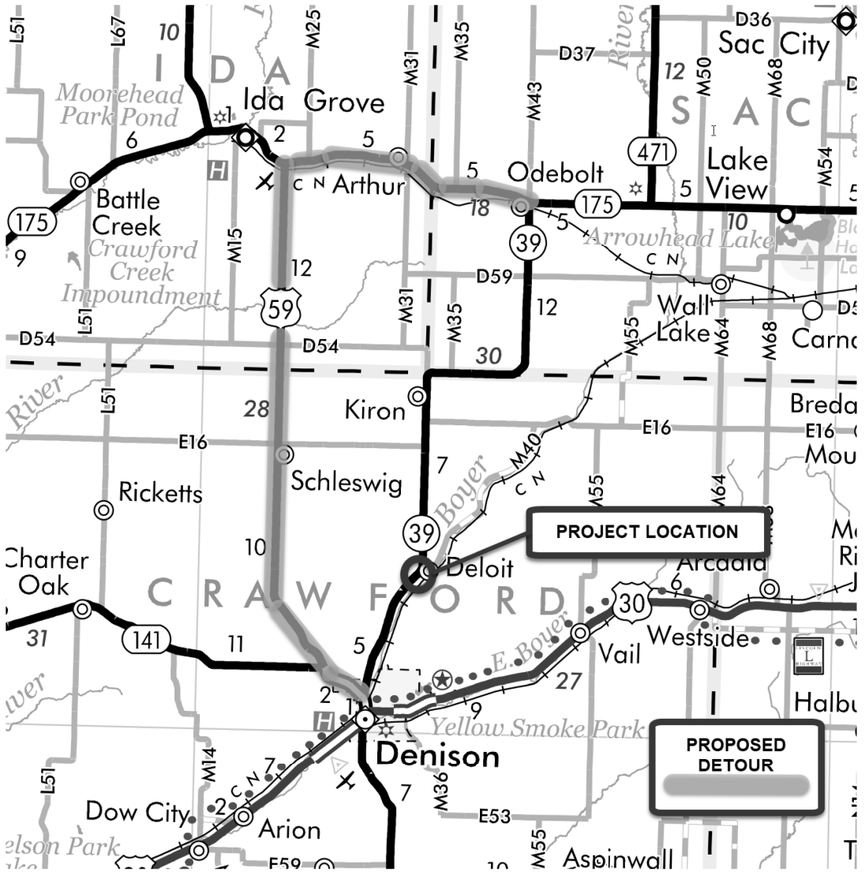
## PROPOSED DETOUR



**Crawford County**
PIN Number: 25-24-039-010
Project Number: BRF-039-1(033)--38-24
Location: Otter Creek 5.6 mi N of US 59
Type of Work: Bridge replacement
Project Directory: 2403901025
Maint. No.: 2405.4S039
FHWA No.: 21530

## PRIMARY ROUTE DETOUR






**Crawford County**
PIN Number: 25-24-039-010
Project Number: BRF-039-1(033)--38-24
Location: Otter Creek 5.6 mi N of US 59
Type of Work: Bridge replacement
Project Directory: 2403901025
Maint. No.: 2405.4S039
FHWA No.: 21530

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER A.9 |
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# ERSA LIMITS






**Crawford County**
PIN Number: 25-24-039-010
Project Number: BRF-039-1(033)--38-24
Location: Otter Creek 5.6 mi N of US 59
Type of Work: Bridge replacement
Project Directory: 2403901025
Maint. No.: 2405.4S039
FHWA No.: 21530
ERSA Phase ID: 68415

## Utilities

Breda Telephone Corporation
Mike Ludwig
Ph: 7126732311
mludwig@westianet.com

Frontier Communications
Uranan Thao
Ph: 5155731268
frontierlocatemapsia@ftr.com

Mediacom Cable
Tim Adreon
Ph: 5154518404
tadreon@mediacomcc.com

MIDAMER-ELEC
Gerald Rickabaugh
Ph: 7122777476
gerald.rickabaugh@midamerican.com

Windstream Enterprise
CLEC LOCATE DESK
Ph: 8009413430
wci.clec.locate@windstream.com

Control Point:

## Hydraulic Data

RIDB: OtterC_Crawford
Drainage Area = 44.8 Sq. Mi.
Stream Slope (HGL) = 13.5 ft./Mi.
Avg. Low Water Stage = 1170.15

Channel and Operational
Low Beam = 1195.40

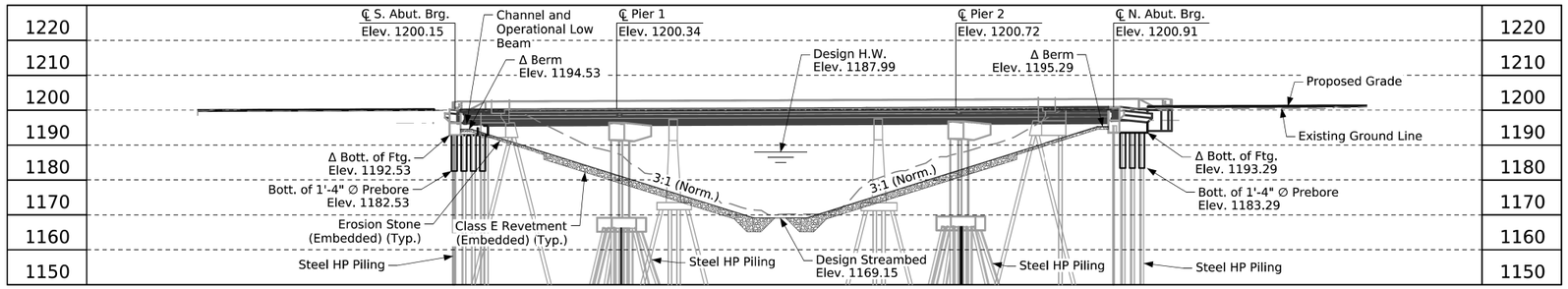
$Q_{50}$ = 7740 cfs
Stage = 1187.99
Operational Freeboard = 7.41 ft.
Avg. Bridge Velocity = 5.96 fps

$Q_{100}$ = 9070 cfs
Stage = 1189.60
Operational Freeboard = 5.80 ft.
Backwater = 0.73 ft.
Avg. Bridge Velocity = 5.90 fps

$Q_{200}$ = 11,600 cfs
Stage = 1190.45
Calculated Design Scour = N/A

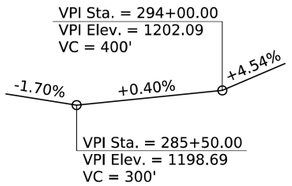
$Q_{500}$ = 12,600 cfs
Stage = 1190.75
Channel Freeboard = 4.65 ft.
Avg. Bridge Velocity = 7.28 fps
Calculated Check Scour = N/A

Extreme HW Stage = Unknown
Date = Unknown




## BRG TSL Longitudinal Section Along ℄ Approach Roadway

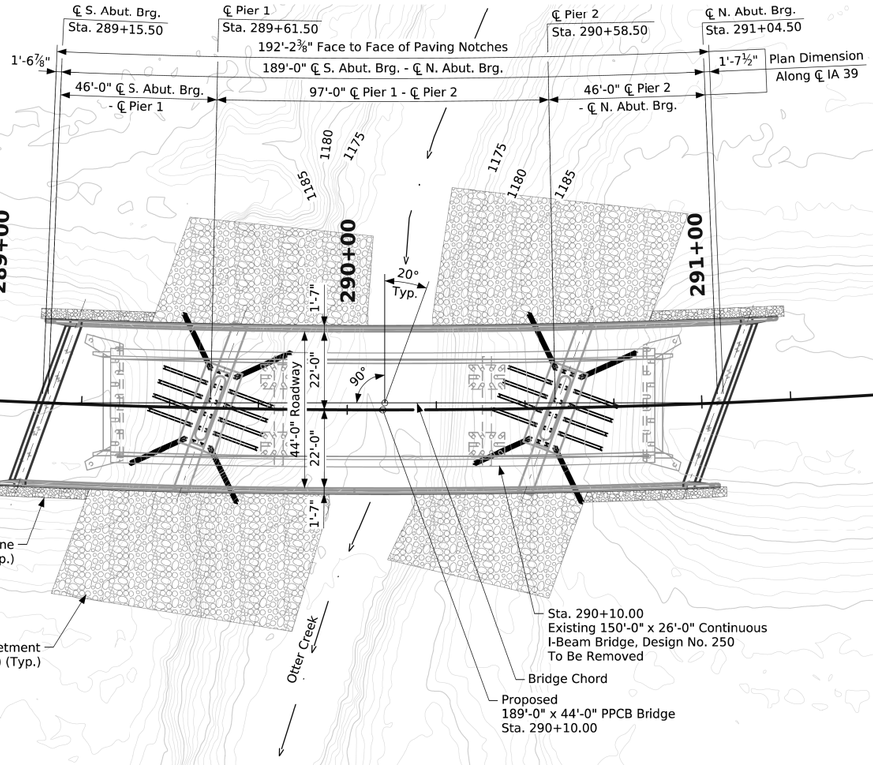
Δ Bottom of abutment and berm are sloped to match deck cross slope.
Maintain 2'-0" minimum fill adjacent to abutment face.




**Proposed Profile Grade IA 39**

General Notes:
1) This design is for the replacement of the existing 150' x 26' Continuous I-Beam bridge, Crawford Design No. 250, FHWA No. 021530, Maint. No. 2405.4S039.

Plan Notes:
1) Class E revetment is embedded.




## Situation Plan




## Curve Data

PI Sta. 297+96.30
Δ = 45°40'01" Lt.
D = 02°29'59"
T = 965.04'
L = 1826.81'
E = 194.88'
R = 2292'
e = 4.0%
PC Sta. 288+31.26
PT Sta. 306+58.07

Design Notes:
1) TL-4 single slope bridge railing proposed.
2) Pier type - T-Piers on HP Piling.
3) There is a potential for conflicts with existing foundations, including the battered piling for the existing abutments and piers.
4) All structures are skewed 20° from a line perpendicular to the bridge chord.
5) Bridge Chord (M) = 1'-11$\frac{5}{16}$
   Center Span Chord (S) = 6$\frac{3}{16}$"
   Per BDM table 3.6.3-1, with M > 1' and S < 9", deck shall be curved and beams set parallel to span chords.
6) Final design shall consider the need for conduit within the bridge rail for utilities. Existing bridge has attached conduit on West fascia

## Traffic Estimate

| | |
|---|---|
| 2024 AADT | 2790 V.P.D. |
| 2050 AADT | 3100 V.P.D. |
| 20?? DHV | ??? V.P.H. |
| TRUCKS | 24 % |
| Total Design ESALs | ??? |

## Location

IA 39 over Otter Creek
T-84N R-39W
Sections 12 & 13
Goodrich Township
Crawford County
FHWA No. 021531
Bridge Maint. No. 2405.4S039
Latitude 42.094389°
Longitude -95.325639°

Design For 20 Degree Skew LA

# 189'-0" x 44'-0" Pretensioned Prestressed Concrete Beam Bridge

46'-0" End Spans | Radius = 2292' | 97'-0" Interior Span

## Situation Plan

STA. 290+10.00 (℄ IA 39) | Turn-in Date: Oct 2025

**Crawford County**
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 | Design Sheet No. 1 of 1 | FHWA No. 021531

| FILE NO. 32775 | ENGLISH | DESIGN TEAM Foth | Crawford COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER V.1 |
|---|---|---|---|---|---|

10:31:27 AM 11/3/2025 JAE pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\2403901025\Bridge\(033)_Bridge-Unspecified\SHT_24039033_FOTH_130_021531_Z06.dgn

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER A.11 |
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## Bridge Bureau Attachment for Concept Statement

**Date:** November 3, 2025
**By:** Foth IE
**Location:** On IA 39 over Otter Creek 5.6 mi N of Jct. US 59

County: Crawford County
Phase No.: BRF-039-1(033)--38-24
Project Code: 25-24-039-010

1. Regulatory/Coordination

   a. Iowa DNR Flood Plain permit = No
   b. Iowa DNR Sovereign Lands permit = No
   c. Local Record of Coordination = Yes
   d. Flood Insurance Study = Yes. Zone A. Panel 19047C0227D 12/02/2021
   e. Drainage District = No
   f. Corps of Engineers Section 408 = No
   g. State Water Trail or Paddling Route = No
   h. Historic Structure = No
   i. Federally owned land in vicinity = No
   j. USGS or Iowa Flood Center (IFC) gage or sensor impacted? No
   k. Obstruction Evaluation/Airport Airspace Analysis per FAA website = No

2. Hydrologic/Hydraulic Analysis/RIDB Dataset

   a. Design discharge methodology = StreamStats SIR-2013-5086
   b. Hydraulic analysis done = Yes - HEC-RAS with pre-survey data.
   c. If DA > 10 sq. mi. Riverine Infrastructure Database (RIDB) dataset is required with B1 submittal = Yes - OtterC_13.9
   d. Project development hydraulic analysis will comply with the RIDB Guidelines at a minimum.

3. Structure/Roadway Layout Considerations

   a. Bridge location is on a horizontal curve. Due to radius of curve, bridge deck shall be curved, and concrete beams shall be set parallel to the span chords, according to BDM 3.6.3. Bridge length is set along the centerline of roadway.
   b. Bridge cross slope is at a constant superelevation.
   c. Based on LiDAR elevations and the existing plans, the proposed beams clear the existing piers by about 6”. BDM 3.6.9 indicates that the clearance should be a minimum of 1’-0”. This should be reviewed, if the bridge is staged-constructed, after the survey is complete to either verify that a 1’ minimum can be met or that a slight grade raise is requested.

4. Special construction issues

   a. It is desirable for new structure foundations to avoid existing foundations when possible.
   b. The existing bridge beams are set parallel to the bridge chord with a curved deck. The proposed bridge beams are set parallel to the span chords with a curved deck. This means that, if stage-constructed, the Stage 1 and Stage 2 overhangs will be variable.





5. Special survey = No
6. Aesthetic enhancements = No
7. Other

   a. Maintenance of Traffic - Off-site detour is preferred due to limited lane width for the stage-constructed option.

**Special Survey:**

None

Control Point:

## Hydraulic Data

RIDB: OtterC_Crawford
Drainage Area = 44.8 Sq. Mi.
Stream Slope (HGL) = 13.5 ft./Mi.
Avg. Low Water Stage = 1170.15

Operational Low Beam = 1195.40

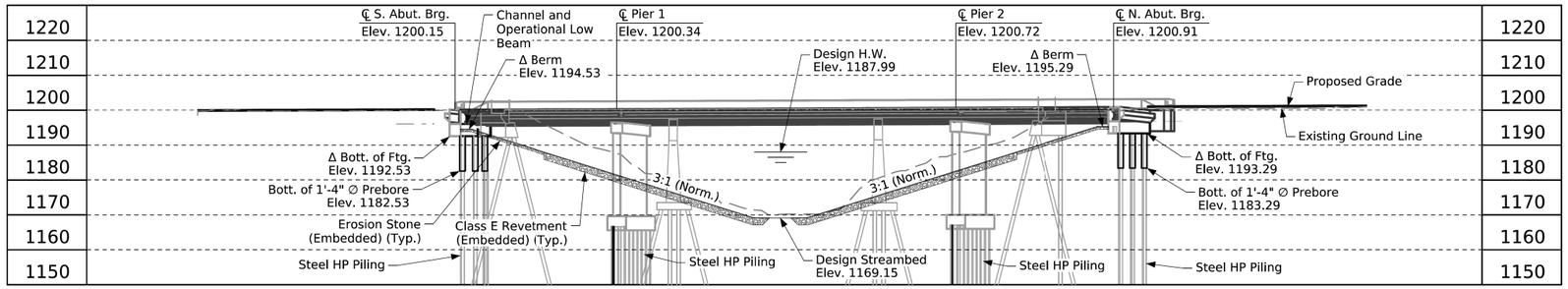
$Q_{50}$ = 7740 cfs
Stage = 1187.99
Operational Freeboard = 7.41 ft.
Avg. Bridge Velocity = 5.96 fps

$Q_{100}$ = 9070 cfs
Stage = 1189.60
Operational Freeboard = 5.80 ft.
Backwater = 0.73 ft.
Avg. Bridge Velocity = 5.90 fps

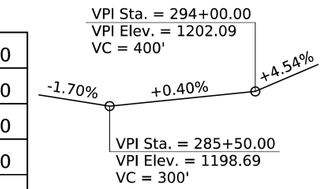
$Q_{200}$ = 11,600 cfs
Stage = 1190.45
Calculated Design Scour = N/A

$Q_{500}$ = 12,600 cfs
Stage = 1190.75
Channel Freeboard = 4.65 ft.
Avg. Bridge Velocity = 7.28 fps
Calculated Check Scour = N/A

Extreme HW Stage = Unknown
Date = Unknown




## BRG TSL Longitudinal Section Along ℄ Approach Roadway

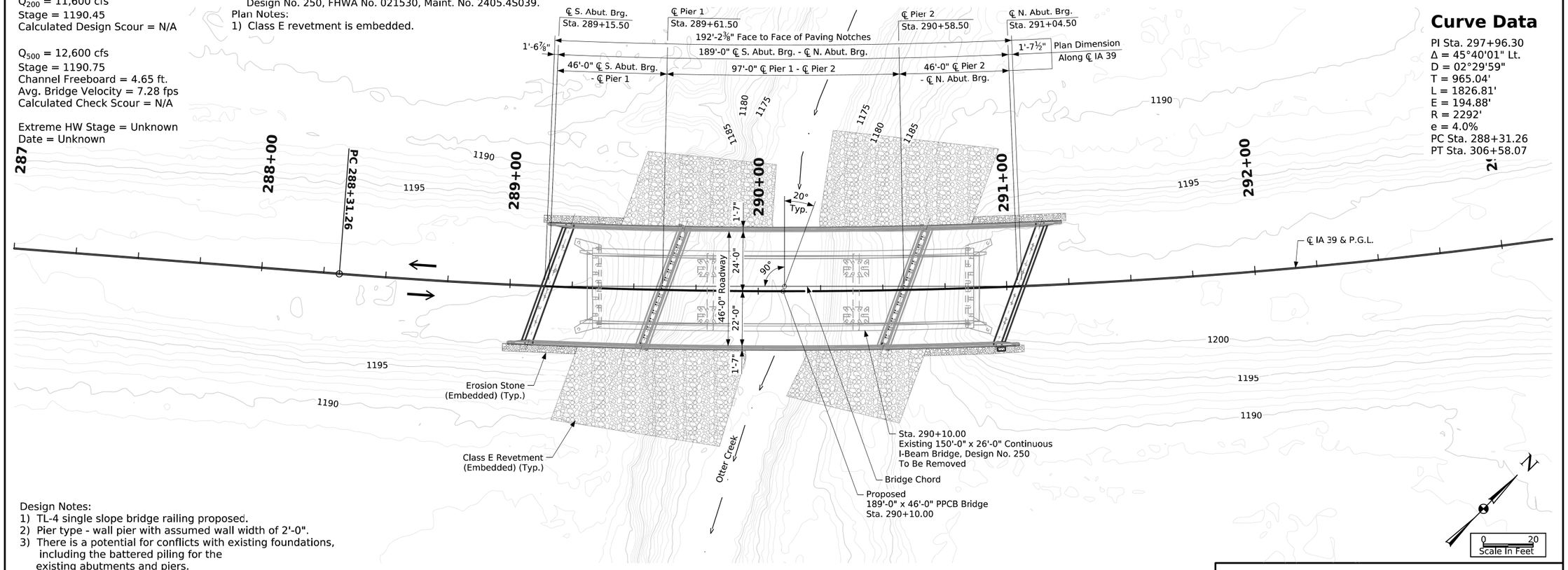



## Proposed Profile Grade IA 39

General Notes:
1) This design is for the replacement of the existing 150' x 26' Continuous I-Beam bridge, Crawford Design No. 250, FHWA No. 021530, Maint. No. 2405.4S039.

Plan Notes:
1) Class E revetment is embedded.

Δ Bottom of abutment and berm are sloped to match deck cross slope. Maintain 2'-0" minimum fill adjacent to abutment face.




## Situation Plan

## Curve Data

PI Sta. 297+96.30
Δ = 45°40'01" Lt.
D = 02°29'59"
T = 965.04'
L = 1826.81'
E = 194.88'
R = 2292'
e = 4.0%
PC Sta. 288+31.26
PT Sta. 306+58.07

Design Notes:
1) TL-4 single slope bridge railing proposed.
2) Pier type - wall pier with assumed wall width of 2'-0".
3) There is a potential for conflicts with existing foundations, including the battered piling for the existing abutments and piers.
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) All structures are skewed 20° from a line perpendicular to the bridge chord.
6) Bridge Chord (M) = 1'-11 5/16"
   Center Span Chord (S) = 6 3/16"
   Per BDM table 3.6.3-1, with M > 1' and S < 9", deck shall be curved and beams set parallel to span chords.

## Traffic Estimate

| | | |
|---|---|---|
| 2024 AADT | 2790 | V.P.D. |
| 2050 AADT | 3100 | V.P.D. |
| 20?? DHV | ??? | V.P.H. |
| TRUCKS | 24 | % |
| Total Design ESALs | ??? | |

## Location

IA 39 over Otter Creek
T-84N R-39W
Sections 12 & 13
Goodrich Township
Crawford County
FHWA No. 021531
Bridge Maint. No. 2405.4S039
Latitude 42.094389°
Longitude -95.325639°

Design For 20 Degree Skew LA

# 189'-0" x 46'-0" Pretensioned Prestressed Concrete Beam Bridge

46'-0" End Spans | Radius = 2292' | 97'-0" Interior Span

## Situation Plan

STA. 290+10.00 (℄ IA 39) | Turn-in Date: Sept 2025

## Crawford County

IOWA DEPARTMENT OF TRANSPORTATION

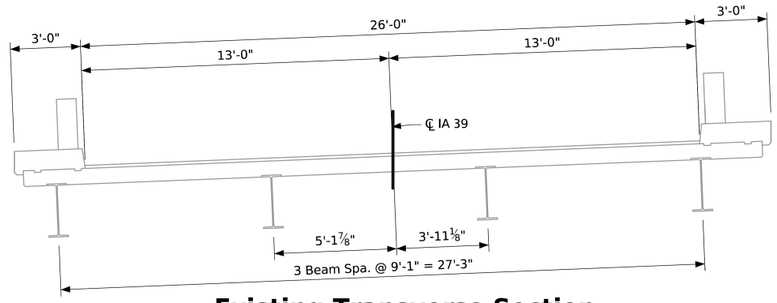
Design No. 130 | Design Sheet No. 1 of 2 | FHWA No. 021531

| FILE NO. 32775 | ENGLISH | DESIGN TEAM Foth | Crawford COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER V.1 |
|---|---|---|---|---|---|

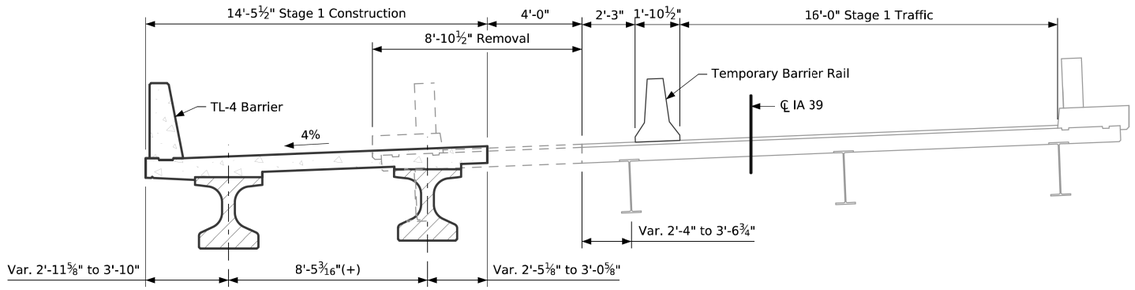
1:45:16 PM 9/26/2025 JAE pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\2403901025\Bridge\(033)_Bridge-Unspecified\SHT_24039033_FOTH_130_021531_Z06.dgn

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER A.13 |
|---|---|---|---|---|---|

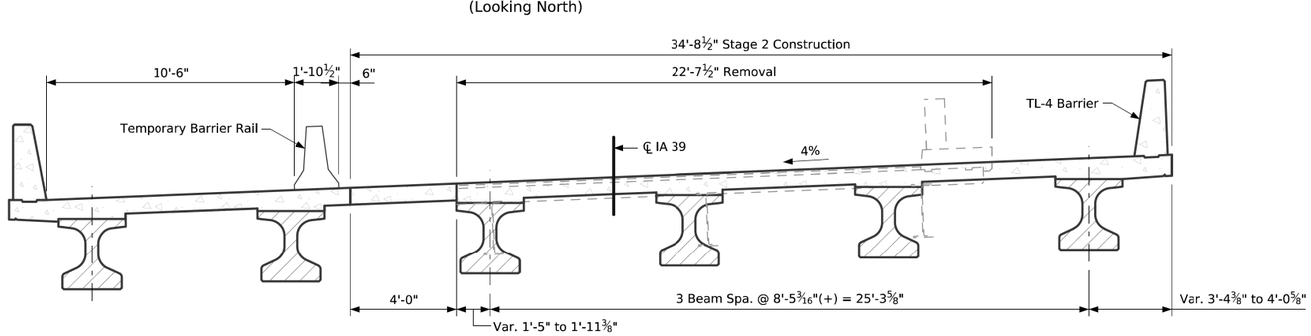
11:42:44 AM 7/20/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Sheet_Files\SHT_A01_24039033Z03.dgn



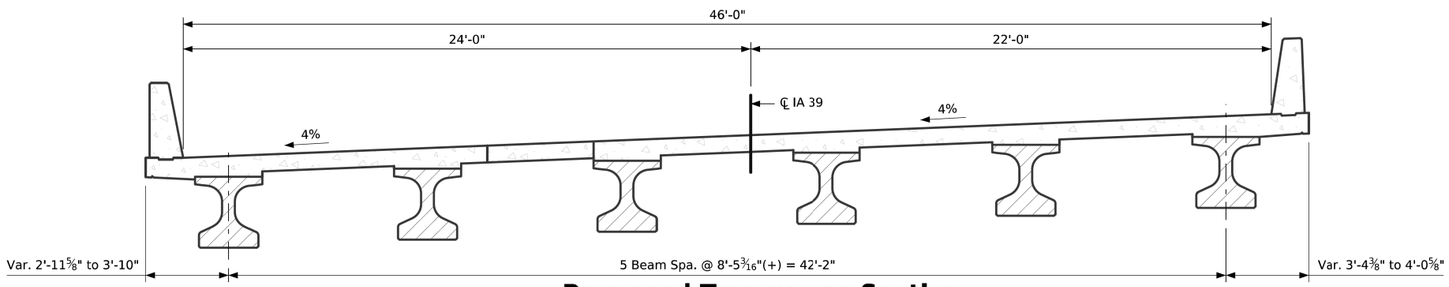

## Existing Transverse Section
(Looking North)




## Transverse Section - Stage 1
(Looking North)




## Transverse Section - Stage 2
(Looking North)




## Proposed Transverse Section
(Looking North)

Notes:
1) Transverse sections shown are cut perpendicular to the bridge chord at Station 290+10.00. Overhang dimensions will be variable (as noted) along the bridge length for the existing and proposed beam lines.
2) Removal line and stage construction line shall be parallel to ℄ IA 39 along the curve. Temporary barrier rail shall be placed parallel to ℄ IA 39.

Design For 20 Degree Skew LA

# 189'-0" x 46'-0" Pretensioned Prestressed Concrete Beam Bridge

46'-0" End Spans | Radius = 2292' | 97'-0" Interior Span

## Construction Staging & Notes

STA. 290+10.00 (℄ IA 39) | Turn-in Date: Sept 2025

## Crawford County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 | Design Sheet No. 2 of 2 | FHWA No. 021531

| FILE NO. 32775 | ENGLISH | DESIGN TEAM Foth | Crawford COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER V.2 | |
|---|---|---|---|---|---|---|

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| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER A.14 | |
|---|---|---|---|---|---|---|

11:43:01 AM 7/20/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Sheet_Files\SHT_A01_24039033Z03.dgn

| | | | | | |
|---|---|---|---|---|---|
| **Roadway** | IA 39 | | | | |
| **PIN Number** | 25-24-039-010 | | **Submittal Date** | | |
| **Project Number** | BRF-039-1(033)--38-24 | | | **Approval Date** | |
| **District** | District 3 | **Assistant District Engineer** | S. Tymkowicz | | |
| **County** | CRAWFORD | | **or** | | |
| **Route** | IA 39 | **Office Director** | | | |
| **Location** | Otter Creek 5.6 miles N of US 59 | | | | |
| **Work Type** | Bridge Replacement | | | | |
| **Segment Manager** | | | | | |
| **Designer** | | | | | |

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 | 60 | GB Section 7.2.2 |
| Maximum superelevation rate (Refer to Section 2A-2) | | 6% | 8% | 4 | GB page 7-6 |
| Design lane width (ft) | | 12 | 12 | UAC | GB table 7-3 |
| Full depth paved width (ft) | | 12 | 12 | UAC | -- |
| Right turn lane (ft) | | 12 | 10 | | GB section 9.7.1 |
| Climbing Lane (ft) | | 12 | 12 | | GB page 3-141 |
| Left turn lane (ft) | | 12 | 10 | | GB section 9.7.1 |
| Pavement cross-slope (on tangent sections) | Through lanes | 2% | 1.5% minimum, 2% maximum | | GB page 7-6 |
| | Auxiliary and turn lanes | 3% | 3% maximum | | GB page 7-15 |
| | Crown break at centerline | 4% | 4% maximum | 4% | GB page 4-6 |
| 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 | | GB Section 4.4.3 |
| Curb type (Refer to Section 3C-2) | Design speed = 50 or 55 mph | 6-inch sloped | 6-inch standard | | |
| | Design speed ≥ 60 mph | 4-inch sloped | 6-inch sloped | | |
| 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 | RDG section 3.3.2 |
| | Beyond standard ditch depth and design clear zone | 3.5:1 | 3:1 | | |
| | Curbed roadways | 2% | not steeper than 3:1 | | |
| Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.) | | 3:1 | 2.5:1 | | GB Section 4.8.4 |
| Transverse Slopes | w/ drainage structures | 8:1 | 6:1 | | RDG Section 3.2.3 |
| | w/o drainage structures | 10:1 | 6:1 | | |
| Ditches (Refer to Section 3G-1) | Outside ditch (depth x width) (ft) | 5 x 10 | -- | UAC | -- |
| Bridge width—new* | Bridge length ≤ 200 ft | design lane widths + effective shoulder widths | design lane widths + effective shoulder widths | | GB Section 7.2.5 |
| | Bridge length > 200 ft | design lane widths + effective shoulder widths | design lane width + 4' right and left of the design lane widths | 44 ft | |
| Bridge width—existing* | | design lane widths + no less than 2 ft left and right | design lane widths + 2 ft. offset left and right | 26 ft | |
| Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks) | Over primary | 16.5 | 16 | | GB Section 7.2.5 |
| | Over non-primary | 16.5 at interchange locations, 15 at all other locations | 14 | | GB pages 5-9 and 6-8 |
| | Over railroad | 23.3 | 23.3 | | -- |
| | Sign trusses and pedestrian bridges | 17.5 | 17 | | GB section 7.2.5 |
| Structural Capacity | | Contact Office of Bridges and Structures | Contact Office of Bridges and Structures | | -- |
| Level of Service | | B | B | | GB section 7.2.2 |

*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 = | 3,100 | | | | | | |
|---|---|---|---|---|---|---|---|

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 | | GB section 9.7.1 |
| Turn lanes with curbs | 6 | See Section 3C-2 | Turn lanes with curbs | 6 | 0 | | GB section 9.7.1 and 4.7.3 |
| | Effective Shoulder Width | Paved Width | | Effective Shoulder Width | Paved Width | | |
| Climbing Lanes | 6 | 4 | Climbing Lanes | 4 | 0 | | GB page 3-141 |
| 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 ft. | GB table 7-3 |
| 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

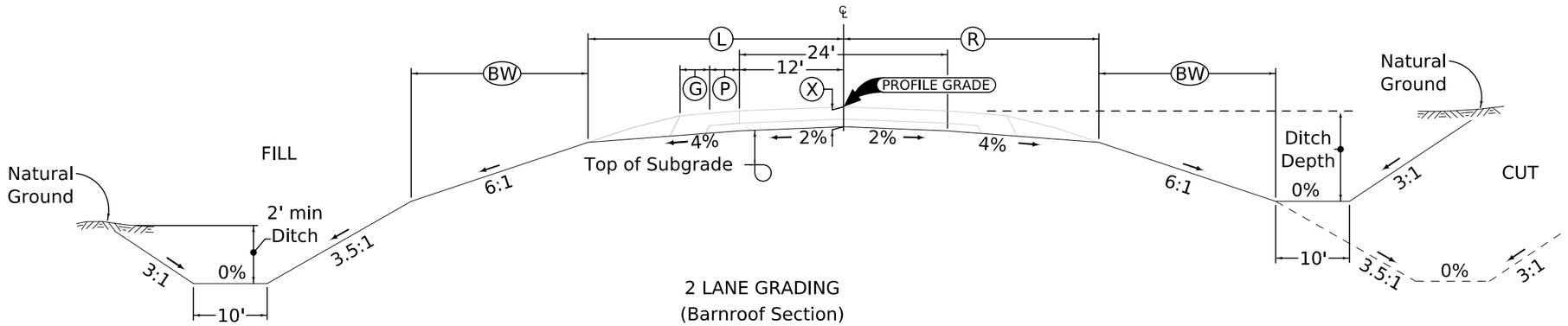
Refer to Section 3C-2 for curb offsets in urban areas

Notes:

** 10 ft. combination shoulders (5 ft. pavement, 5 ft. granular)

| Roadway Design Speed (mph) = | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Design Manual Section 1C-1<br>Last Updated: 04-29-19 | | | **Design Criteria for High Speed Roadways** | | | | | | | | | | | | |
| Design Element | | | Preferred Criteria<br>Design Speed, mph | | | | | | Acceptable Criteria<br>Design Speed, mph | | | | | | Project Values | |
| | | | 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 | 570 | GB Table 3-1 |
| 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 | 2292 | GB Table 3-7 |
| | | $e_{max}$ = 8% | -- | -- | -- | -- | -- | -- | 758 | 960 | 1200 | 1480 | 1810 | 2210 | | GB Table 3-7 |
| Minimum vertical curve length (ft) (Refer to Section 2B-1) | | | 150 | 165 | 180 | 195 | 210 | 225 | 150 | 165 | 180 | 195 | 210 | 225 | 300 | GB page 3-167 |
| Minimum rate of vertical curvature (K) | crest vertical curves | | 84 | 114 | 151 | 193 | 247 | 312 | 84 | 114 | 151 | 193 | 247 | 312 | | GB Table 3-35 |
| | sag vertical curves | roadways without fixed-source lighting | 96 | 115 | 136 | 157 | 181 | 206 | 96 | 115 | 136 | 157 | 181 | 206 | 96 | GB Table 3-37 |
| (Refer to Section 2B-1) | | roadways with fixed-source lighting | 96 | 115 | 136 | 157 | 181 | 206 | 54 | 66 | 78 | 91 | 106 | 121 | | GB page 3-176 |
| Minimum gradient (%) | (Refer to Section 2B-1) | | 0.5 | | | | | | 0.3% with a curb, 0.0% without a curb | | | | | | 0.4% | GB page 3-130 |
| Maximum gradient (%) | (Refer to Section 2B-1) | Urban roadways | 4 | | 3 | | | | 7 | 6 | 6 | -- | -- | -- | | GB Table 7-4a |
| | | Rural roadways | | | | | | | 5 | 5 | 4 | 4 | 4 | 4 | 4.54 | GB Table 7-2 |
| | | Interstates | | | | | | | 5 | 5 | 4 | 4 | 4 | 4 | | IDG page 3 |
| Clear zone | | | See "Preferred Clear Zone" table in Section 8A-2 | | | | | | See "Acceptable Clear Zone" table in Section 8A-2 | | | | | | 30 | |

G_2_Grade_BR
04-21-20




2 LANE GRADING
(Barnroof Section)

| LOCATION | | | DIMENSIONS | | | |
|---|---|---|---|---|---|---|
| ROAD IDENTIFICATION | STATION TO STATION | | (L) Feet | (R) Feet | (X) Inch | (BW) Feet |
| IA 39 | 287+25.00 | 289+12.00 | 32 | 32 | 24 | 30 |
| | Bridge & Abutment | | | | | |
| | 291+02.00 | 294+25.00 | 32 | 32 | 24 | 30 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

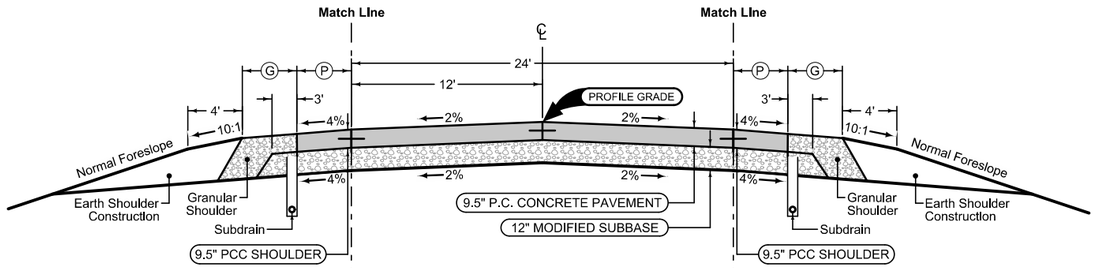
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.

## 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 |
| 287+25.00 | 287+72.35 | 5 | 5 |
| 287+72.35 | 289+12.00 | 10 | |
| Bridge & Abutment | | | |
| 291+02.00 | 293+49.96 | 10 | |
| 293+49.96 | 294+25.00 | 5 | 5 |




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

| 2P_ 04-21-20 | |
|---|---|
| STATION TO STATION | |
| 287+25.00 | 289+12.00 |
| Bridge & Abutment | |
| 291+02.00 | 294+25.00 |
| | |


## Full Depth PCC Combination Shoulder

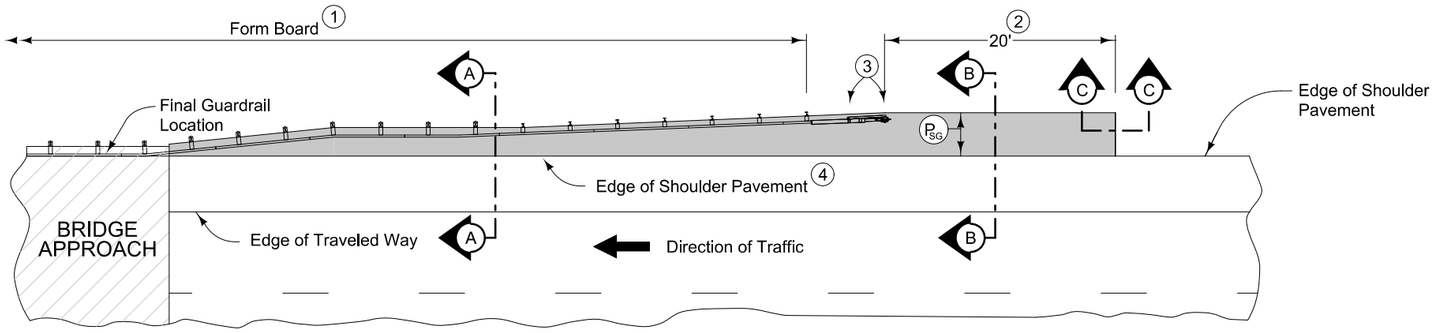
Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing


| 2_C_FullPCC_ 04-15-25 | | | |
|---|---|---|---|
| STATION TO STATION | | (P) Feet | (G) Feet |
| 287+25.00 | 287+72.35 | 5 | 5 |
| 287+72.35 | 289+12.00 | 10 | |
| Bridge & Abutment | | | |
| 291+02.00 | 293+49.96 | 5 | 5 |
| 293+49.96 | 294+25.00 | 10 | |

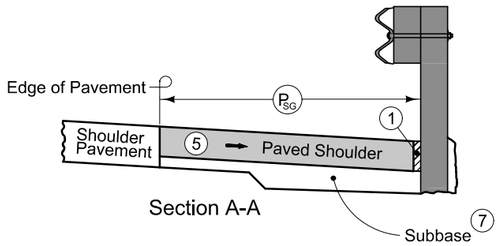
See Tab. 100-24 for pavement quantities.
See Tab. 112-9 for shoulder quantities.

**IA Highway 39**

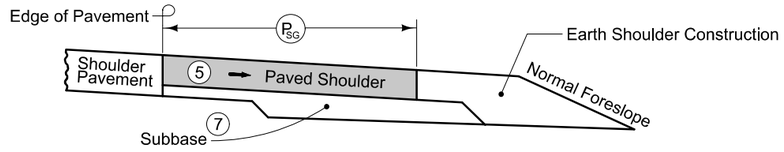
7158B
MODIFIED




PLAN VIEW

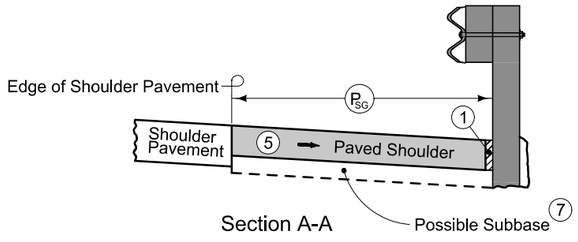



Section A-A

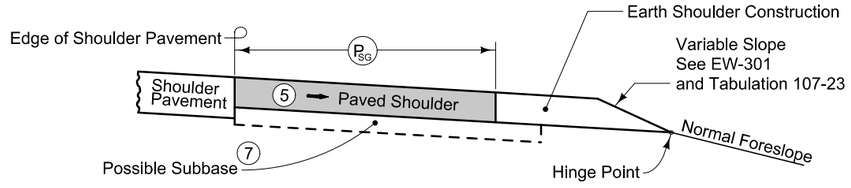



Section B-B

NEW CONSTRUCTION 6




Section A-A




Section B-B

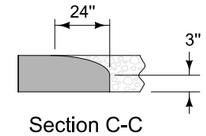
EXISTING SHOULDER

6" PCC Paved Shoulder at guardrail 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.

Refer to Tabulation 112-9 for shoulder quantities.

1. 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' joint (per PV-101) for PCC shoulder.
5. Match shoulder slope.
6. The Contractor has the option to pave the paved shoulder at guardrail and the partial width paved shoulder as one operation.
7. Refer to other details in the plan.




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

PAVED SHOULDER AT GUARDRAIL
(ADJACENT TO 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

### SURVEYED UTILITY OWNER SYMBOLS

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

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

- T1 — ***TL1D, Frontier - Quality D***
- FO — ***FO1D, Frontier - Quality D***
- FO2 — ***FO2D, Western Iowa Network - Quality D***
- FO3 — ***FO3D, Windstream - Quality D***
- FO4 — ***FO4D, Mediacom - 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 — Survey Line
- Station
- 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. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER D.1 |
|---|---|---|---|---|---|

1:41:45 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Sheet_Files\SHT_LGD_24039033Z03.dgn

Remove
Sta. 290+06.90
150'x26' I-Beam Bridge
D.A.=28920 A-WH
Proposed
199'-0⅛" x 44'-0" PPCB Bridge
Sta. 290+08.00

STA 287+25.00 (ML039)
BEGIN CONSTRUCTION

STA 294+25.00 (ML039)
END CONSTRUCTION

Goodrich TWP.
T-84N R-39W
SEC. 12

Δ = 45°36'53.67" (LT)
T = 964.11'
L = 1825.29'
R = 2292.70'
E = 194.46'
e = ___
L = ___
x = ___

285+00
290+00
295+00

PC 288+26.32

UAC
24'x71.1'
Conc. Pipe

Otter Creek
Otter Creek

39

Sect. No. 13

0 50
FEET

+38.00 Prop.
Type "C" End.
24" x X" RCP Pipe

Pl 294+67.43

TIE TO E.S.
STA 287+25.00
EL 1199.12

TIE TO E.S.
STA 294+25.00
EL 1204.83

+0.50%
+3.10%

VPI = +40.00
EL = 1202.19
L = 170.00'
K = 65

1215 1210 1205 1200 1195 1190 1185 1180 1175 1170

1199.12 1199.24 1199.37 1199.49 1199.62 1199.74 1199.87 1199.99 1200.12 1200.24 1200.37 1200.49 1200.62 1200.74 1200.87 1200.99 1201.12 1201.24 1201.37 1201.49 1201.62 1201.74 1201.90 1202.15 1202.49 1202.93 1203.47 1204.10 1204.83

283+00 284+00 285+00 286+00 287+00 288+00 289+00 290+00 291+00 292+00 293+00 294+00 295+00 296+00 297+00

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER D.2 |
|---|---|---|---|---|---|

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## SURVEY INDEX

**County: Crawford**
**PIN: 25-24-039-010**
**Project Number: BRF-039-1(033)--38-24**
**Location: Otter Creek 5.6 mi N of US 59**
**Type of Work: Bridge Unspecified**
**Project Directory: 2403901025**

## Survey Personnel

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

## Date(s) of Survey

| | |
|---|---|
| Begin Date | 08/25/2025 |
| End Date | 09/23/2025 |

## General Information

This survey is for IA Hwy 39 Bridge over Otter Creek for possible Repair or Replacement at location 5.6 mi N of US Hwy 59 Interchange. This survey request was for the IA Hwy 39 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: 2018u2**

## Alignment Information

The horizontal alignment for IA Hwy 39 this survey is a retrace of PCC Paving Plans No. F-412(5) 1952. Survey stationing was equated to the plan PT at Sta. 263+00.5 and carried ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PT Sta. 263+00.5 PCC Paving Plans No. F-412(5) 1952
Survey PT Sta. 263+00.5

PC Sta. 288+28.1 PCC Paving Plans No. F-412(5) 1952
Survey PC Sta. 288+26.32

PT Sta. 306+53.4 PCC Paving Plans No. F-412(5) 1952
Survey PT Sta. 306+51.6

SCR Sta. 343+73.1, 1.82 Rt. PCC Paving Plans No. F-412(5) 1952
Survey SCR Sta. 343+70.74, 1.82 Rt.

## 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: 2018u2

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: 2018u2

| Point Name | Northing | Easting | Elevation | Feature Definition-Description |
|---|---|---|---|---|
| 23 RB | 7277670.90 | 16632309.80 | 1361.63 | CP NGS MONUMENT AS DECRIBED IN GOOD CONDITION |
| 24039005 | 7269661.69 | 16608059.28 | 1199.05 | CP SET FENO MONUMENT IN CL FIELD ENT ON WEST SIDE IA 39 |
| 240390055 | 7271793.49 | 16610226.02 | 1202.09 | CP SET REBAR IN SOUTH EDGE FIELD ENT ON EAST SIDE IA 39 |
| 240390061 | 7274876.22 | 16611128.10 | 1285.91 | CP FD CONC MONUMENT IN WEST ROW OF IA 39 ON NORTH EDGE OF DELOIT |

# ALIGNMENT COORDINATES

| Name | Location | Point on Tangent | | | Begin Spiral | | | Begin Curve | | | Simple Curve PI or Master PI of SCS | | | End Curve | | | End Spiral | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Station | Coordinates | | Station | Coordinates | | Station | Coordinates | | Station | Coordinates | | Station | Coordinates | | Station | Coordinates | |
| | | | Y (Northing) | X (Easting) | | Y (Northing) | X (Easting) | | Y (Northing) | X (Easting) | | Y (Northing) | X (Easting) | | Y (Northing) | X (Easting) | | Y (Northing) | X (Easting) |
| 1 | ML039 | 26300.500 R1 | 7270391.55 | 16608757.83 | | | | | | | | | | | | | | | |
| 2 | ML039 | | | | | | | 28826.316 R1 | 7272180.49 | 16610540.93 | 29790.429 R1 | 7272863.33 | 16611221.55 | 30651.604 R1 | 7273827.37 | 16611209.63 | | | |
| 3 | ML039 | 34370.737 R1 | 7277546.22 | 16611163.63 | | | | | | | | | | | | | | | |
| 1 | ENTR293 | +00.00 | 7272580.03 | 16610858.89 | | | | | | | | | | | | | | | |
| 1 | ENTR293 | 2+00.00 | 7272473.70 | 16611028.28 | | | | | | | | | | | | | | | |



# SPIRAL OR CIRCULAR CURVE DATA

| Name | Chain | ΔSCS | Horizontal Alignment Data | | | | | | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Spiral Data | | | | | | | | Curve Data | | | | | |
| | | | θS | Ls | Ts | Es | Xc | Yc | L.T. | S.T. | ΔC | T | L | R | E | |
| C1 | ML039 | | | | | | | | | | 45.615 | 964.113 | 1825.288 | 2293 | 194.465 | |

108-23A
08-01-08

## TRAFFIC CONTROL PLAN

Traffic on IA39 shall be maintained via offsite detour. See J.2 for detour route.

Contractor shall furnish, install, maintain and remove detour signs.

111-01
04-17-12

## COORDINATED OPERATIONS

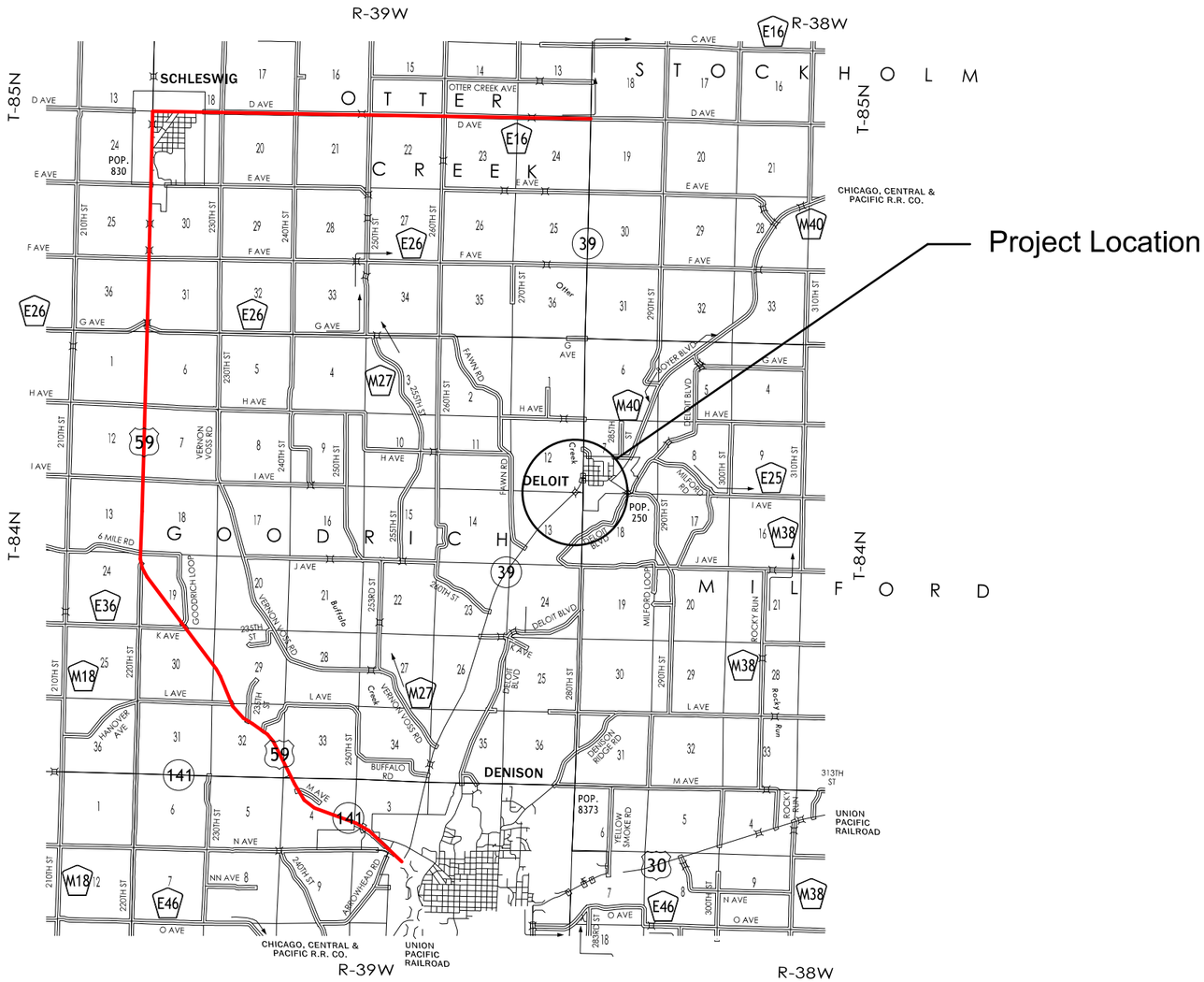
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

| Project | Type of Work |
|---|---|
| None provided. | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | None provided. | | | | | | | | | |




**Note:**

**Contractor shall furnish, install, and remove detour signs.**

**LEGEND**

Detour Route

| FILE NO. | ENGLISH | DESIGN TEAM **Flattery\Bell** | **CRAWFORD** COUNTY | PROJECT NUMBER **BRF-039-1(033)--38-24** | SHEET NUMBER **J.2** |
|---|---|---|---|---|---|

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Control Point 240390055: 7271793.494 N, 16610226.020 E, CP Set rebar in south edge field ent on east side IA 39, Elev. = 1202.094

## Hydraulic Data

RIDB: OtterC_Crawford
Drainage Area = 44.8 Sq. Mi.
Stream Slope (HGL) = 13.5 ft./Mi.
Avg. Low Water Stage = 1169.42

Channel and Operational Low Beam = 1195.38

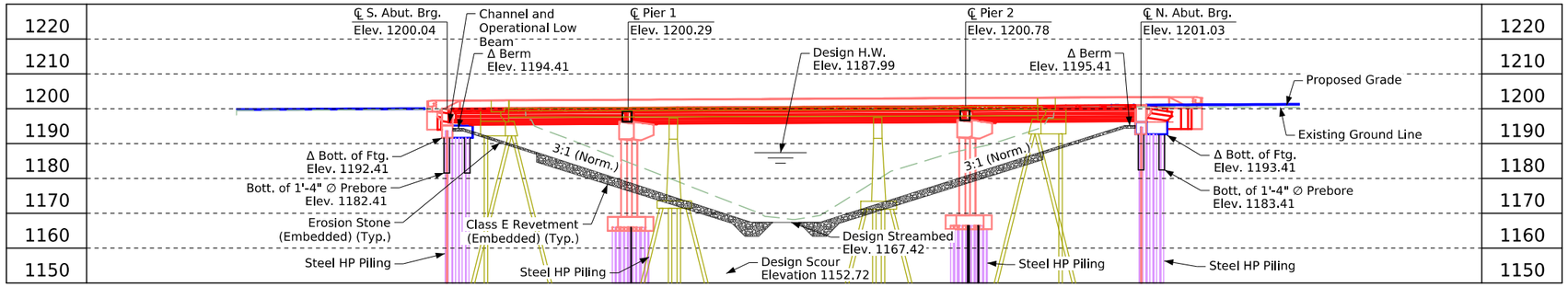
$Q_{50}$ = 7740 cfs
Stage = 1187.39
Operational Freeboard = 7.99 ft.
Avg. Bridge Velocity = 6.35 fps

$Q_{100}$ = 9070 cfs
Stage = 1188.50
Operational Freeboard = 6.88 ft.
Backwater = 0.50 ft.
Avg. Bridge Velocity = 6.73 fps

$Q_{200}$ = 11,600 cfs
Stage = 1189.46
Calculated Design Scour = 1152.72

$Q_{500}$ = 12,600 cfs
Stage = 1189.76
Channel Freeboard = 5.62 ft.
Avg. Bridge Velocity = 8.27 fps
Calculated Check Scour = 1152.72

Extreme HW Stage = Unknown
Date = Unknown




VPI Sta. = 293+40.00
VPI Elev. = 1202.19
VC = 170'
+0.500%
+3.104%
VPI Sta. = 287+25.00
VPI Elev. = 1199.12

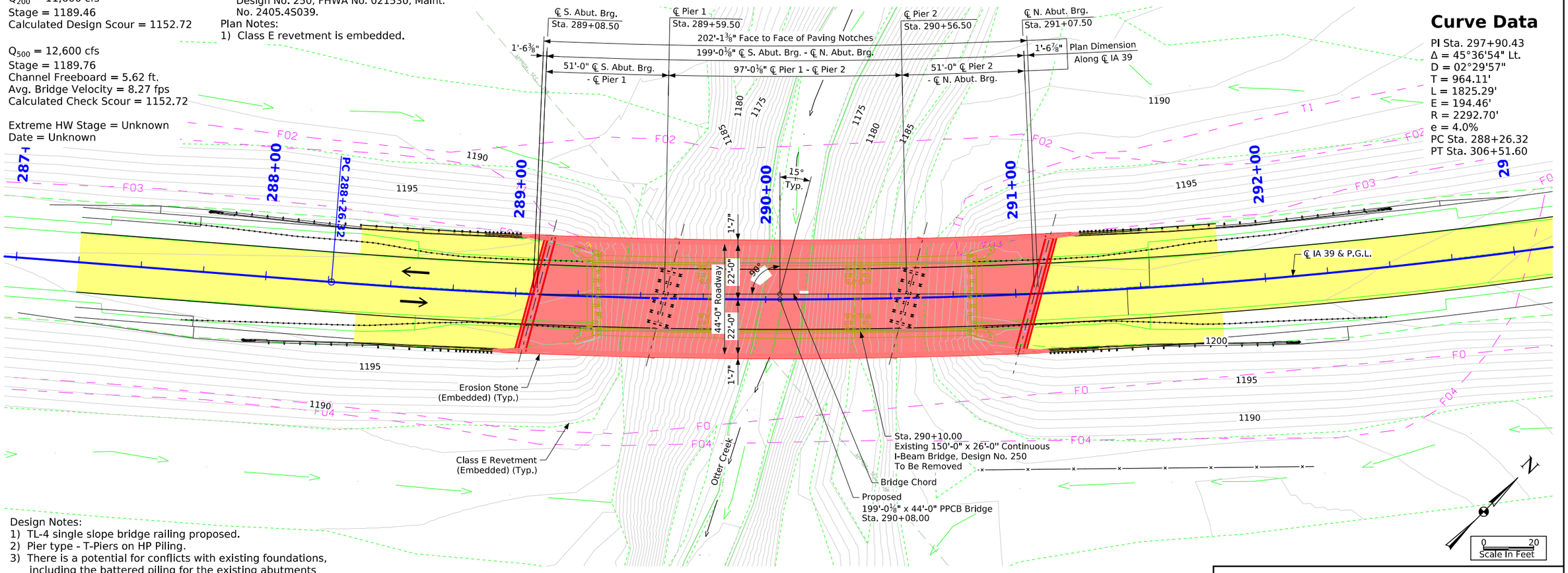
**Proposed Profile Grade IA 39**

General Notes:
1) This design is for the replacement of the existing 150' x 26' Continuous I-Beam bridge, Crawford Design No. 250, FHWA No. 021530, Maint. No. 2405.4S039.

Plan Notes:
1) Class E revetment is embedded.

Δ Bottom of abutment and berm are sloped to match deck cross slope. Maintain 2'-0" minimum fill adjacent to abutment face.

## BRG TSL Longitudinal Section Along ℄ Approach Roadway




## Curve Data

PI Sta. 297+90.43
Δ = 45°36'54" Lt.
D = 02°29'57"
T = 964.11'
L = 1825.29'
E = 194.46'
R = 2292.70'
e = 4.0%
PC Sta. 288+26.32
PT Sta. 306+51.60

Design Notes:
1) TL-4 single slope bridge railing proposed.
2) Pier type - T-Piers on HP Piling.
3) There is a potential for conflicts with existing foundations, including the battered piling for the existing abutments and piers.
4) All structures are skewed 15° from a line perpendicular to the bridge chord.
5) Bridge Chord (M) = 2'-1 15/16"
   Center Span Chord (S) = 6 3/16"
   Per BDM table 3.6.3-1, with M > 1' and S < 9", deck shall be curved and beams set parallel to span chords.
6) Final design shall consider the need for conduit within the bridge rail for utilities. Existing bridge has attached conduit on West fascia.
7) Non-standard abutment wingwall (3'-0" longer).

## Situation Plan

## Traffic Estimate

| | | |
|---|---|---|
| 2024 AADT | 2790 | V.P.D. |
| 2050 AADT | 3100 | V.P.D. |
| 20?? DHV | ??? | V.P.H. |
| TRUCKS | 24 | % |
| Total Design ESALs | ??? | |

## Location

IA 39 over Otter Creek
T-84N R-39W
Sections 12 & 13
Goodrich Township
Crawford County
FHWA No. 021531
Bridge Maint. No. 2405.4S039
Latitude 42.094389°
Longitude -95.325639°

Design For 15 Degree Skew LA

# 199'-0 1/8" x 44'-0" Pretensioned Prestressed Concrete Beam Bridge

51'-0" End Spans | Radius = 2292' | 97'-0 1/8" Interior Span

## Situation Plan

STA. 290+08.00 (℄ IA 39)
Turn-in Date: Oct 2026

## Crawford County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 130 | Design Sheet No. 1 of 1 | FHWA No. 021531

| FILE NO. 32775 | ENGLISH | DESIGN TEAM Foth | Crawford COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER V.1 |
|---|---|---|---|---|---|

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# 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

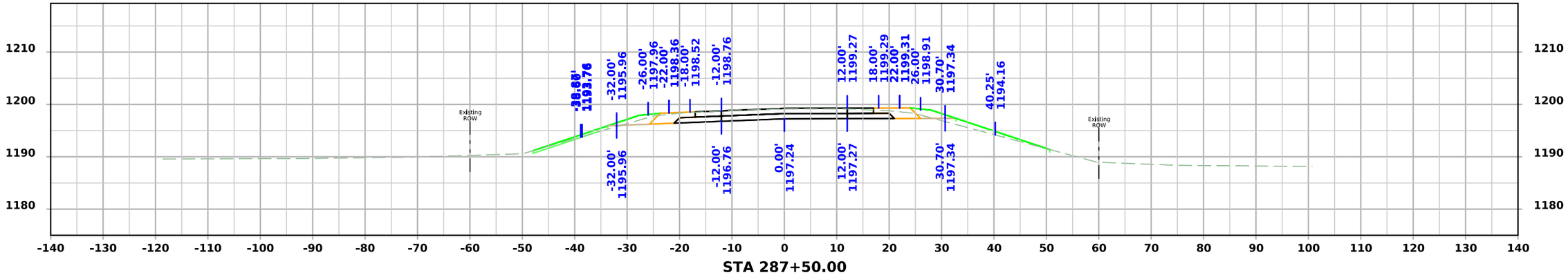
# CROSS SECTIONS
# LEGEND AND INFORMATION SHEET

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

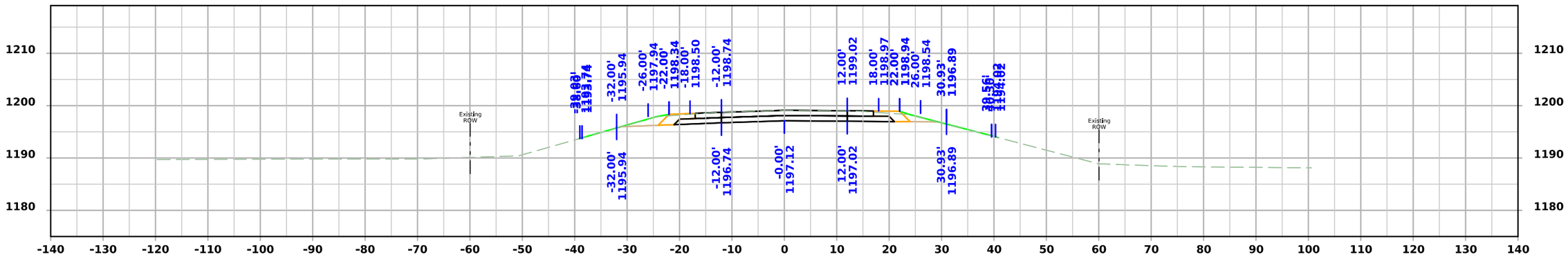
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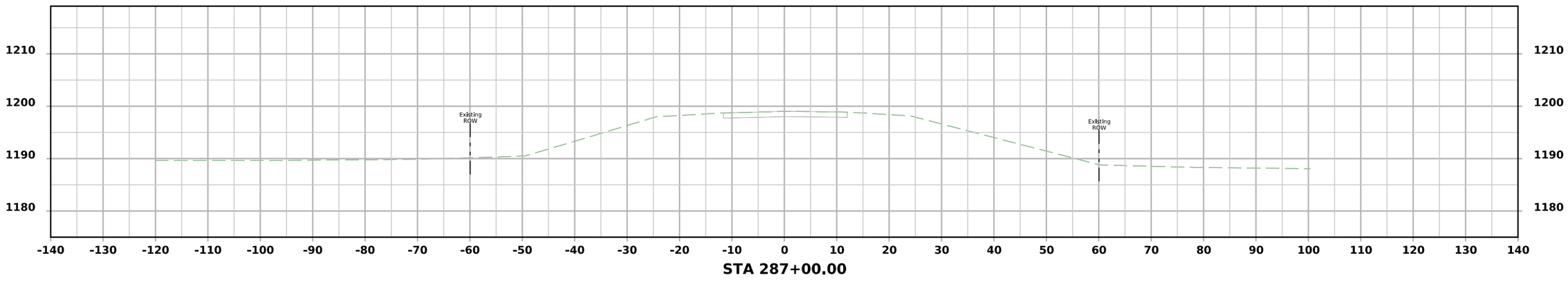
# IA 39




STA 287+50.00




STA 287+25.00

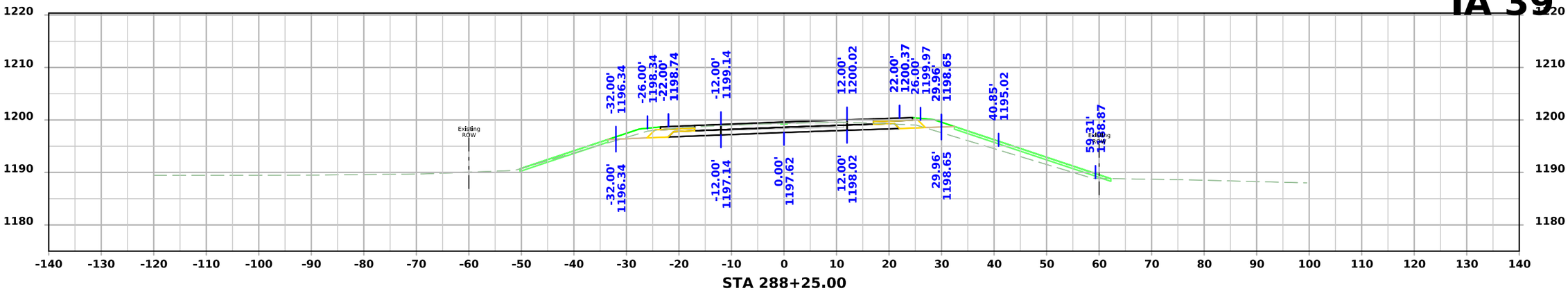



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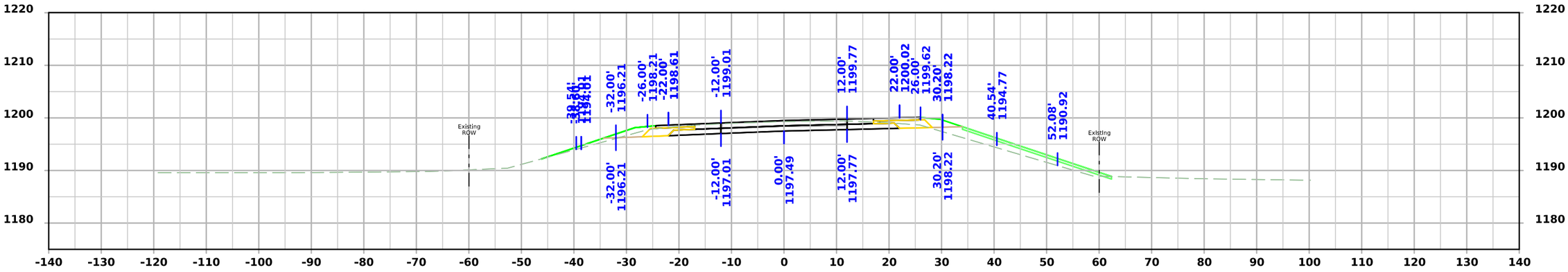
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|---|---|---|---|---|---|

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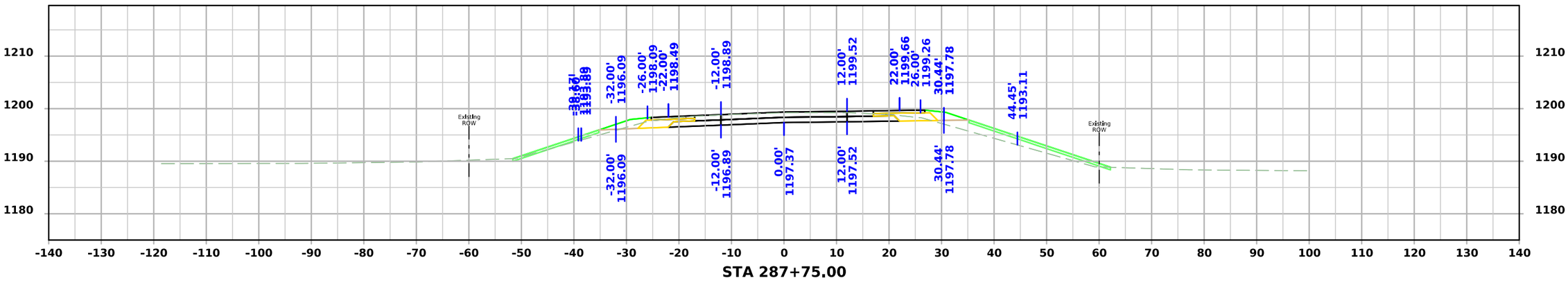
# IA 39




STA 288+25.00




STA 288+00.00

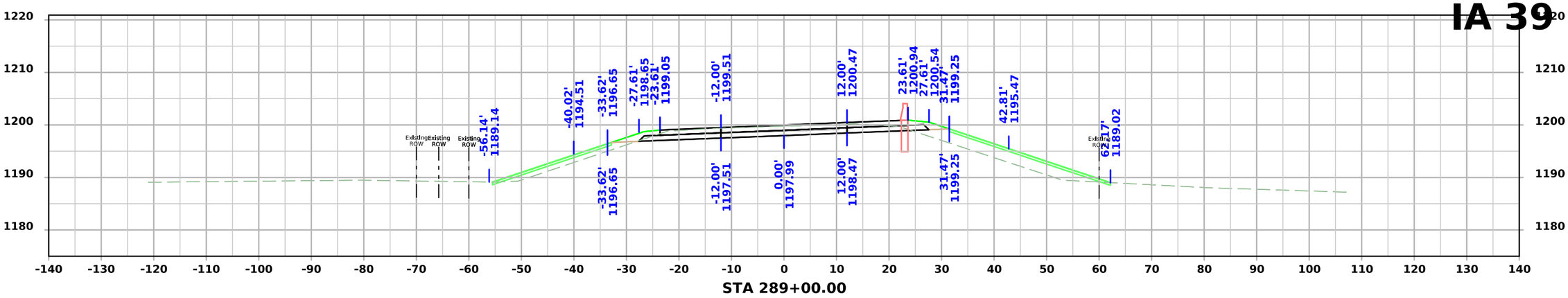



STA 287+75.00

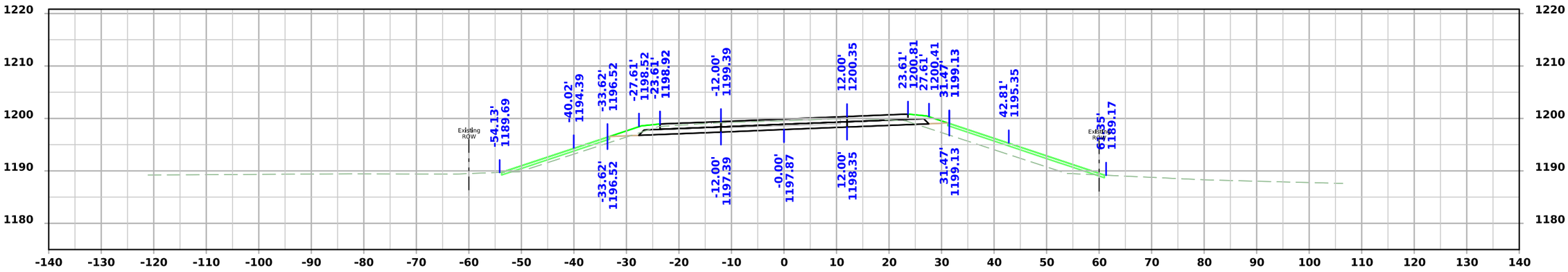
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|---|---|---|---|---|---|

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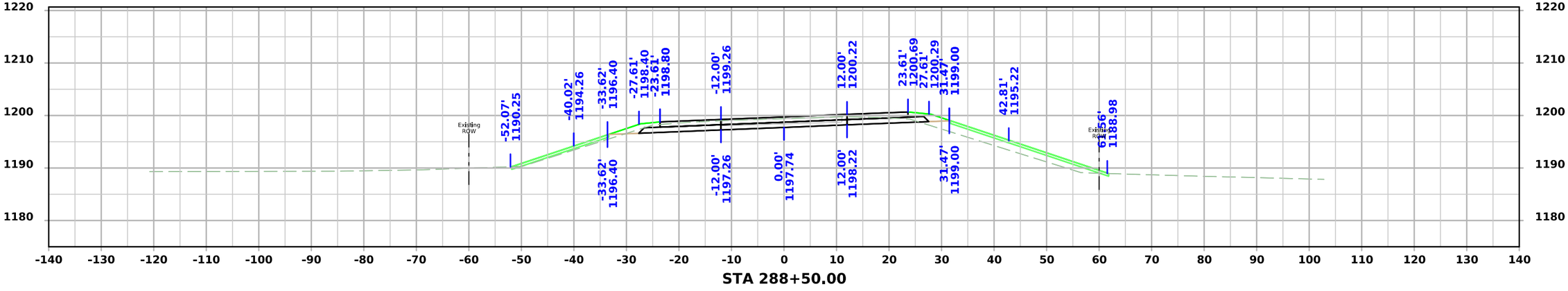
# IA 39




STA 289+00.00




STA 288+75.00

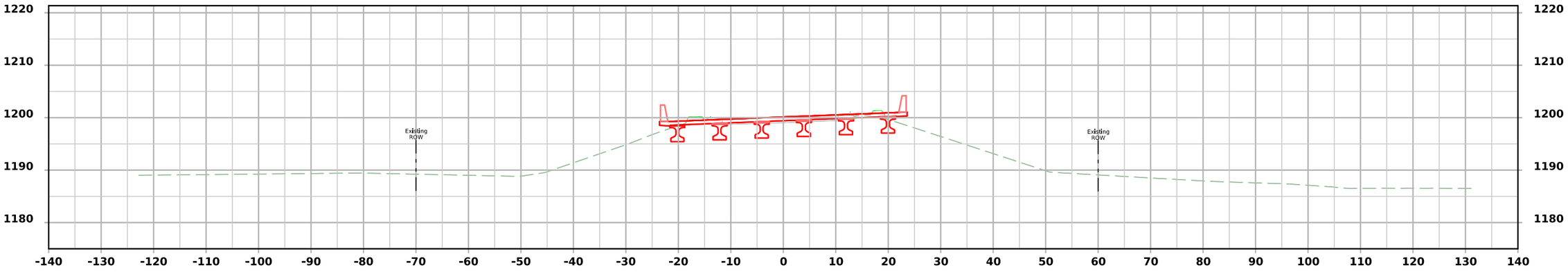



STA 288+50.00

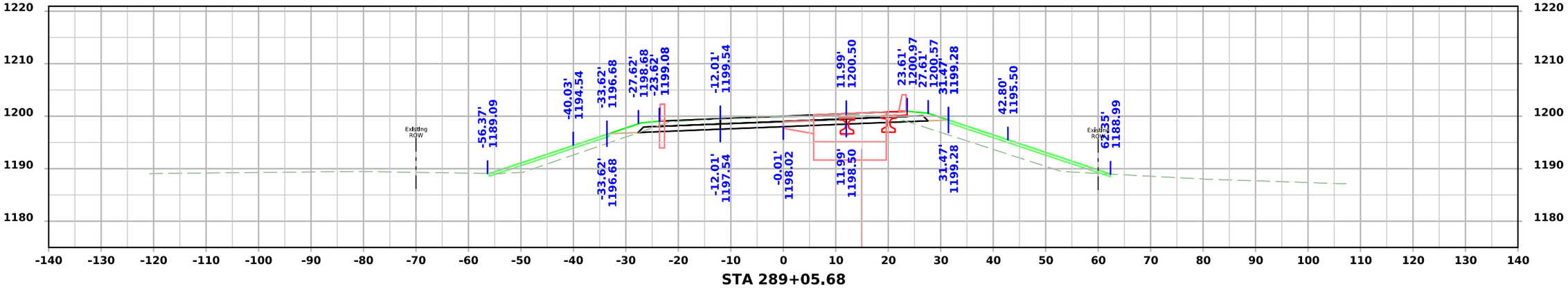
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.4 |
|---|---|---|---|---|---|

1:24:32 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 289+25.00

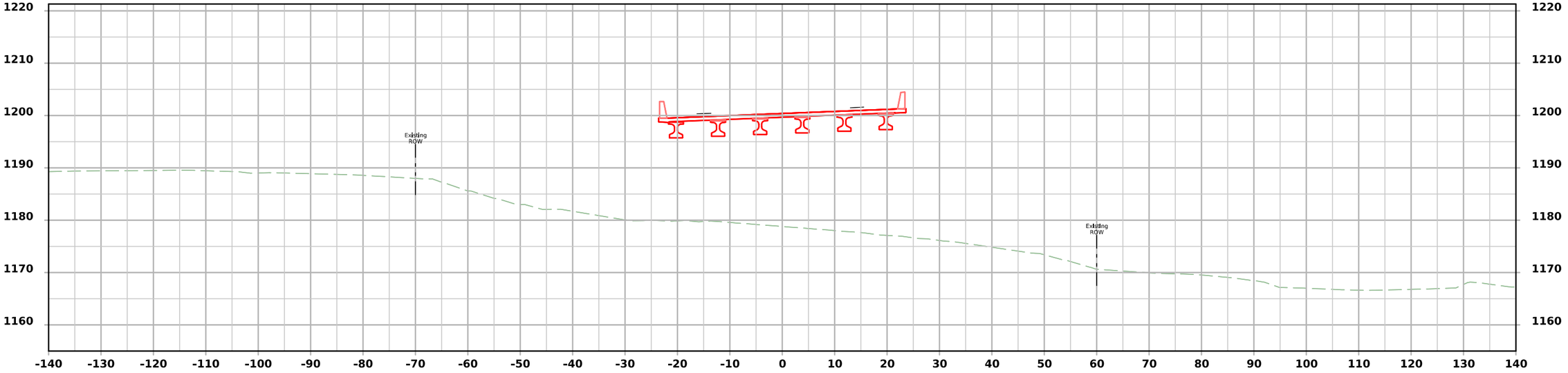



STA 289+05.68

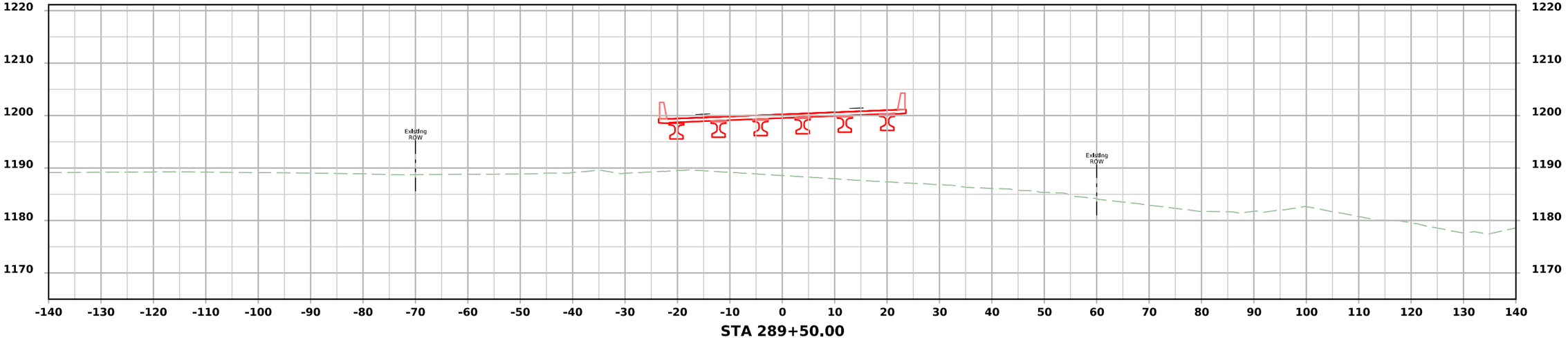
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.5 |
|---|---|---|---|---|---|

1:24:34 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 289+75.00

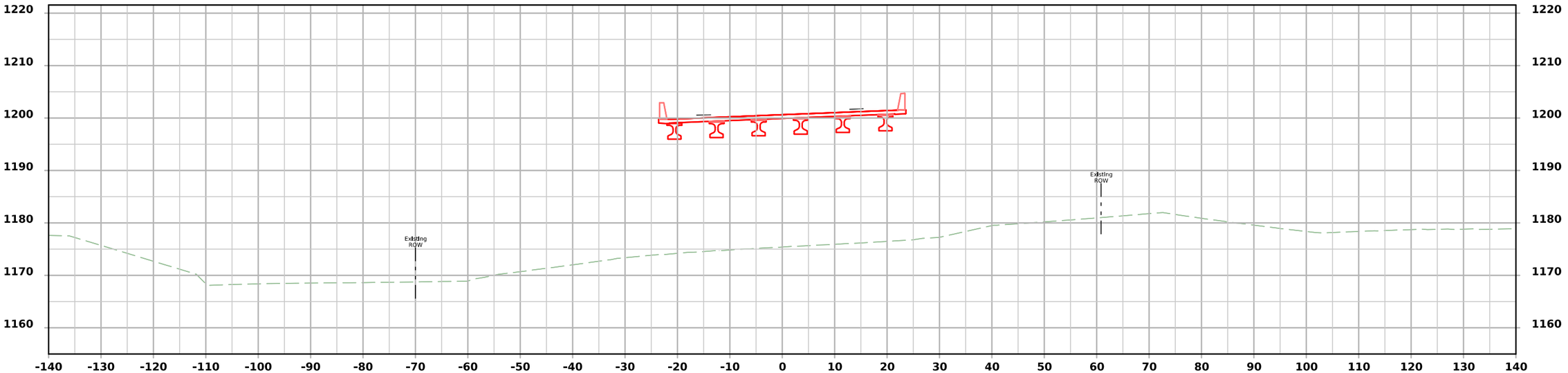



STA 289+50.00

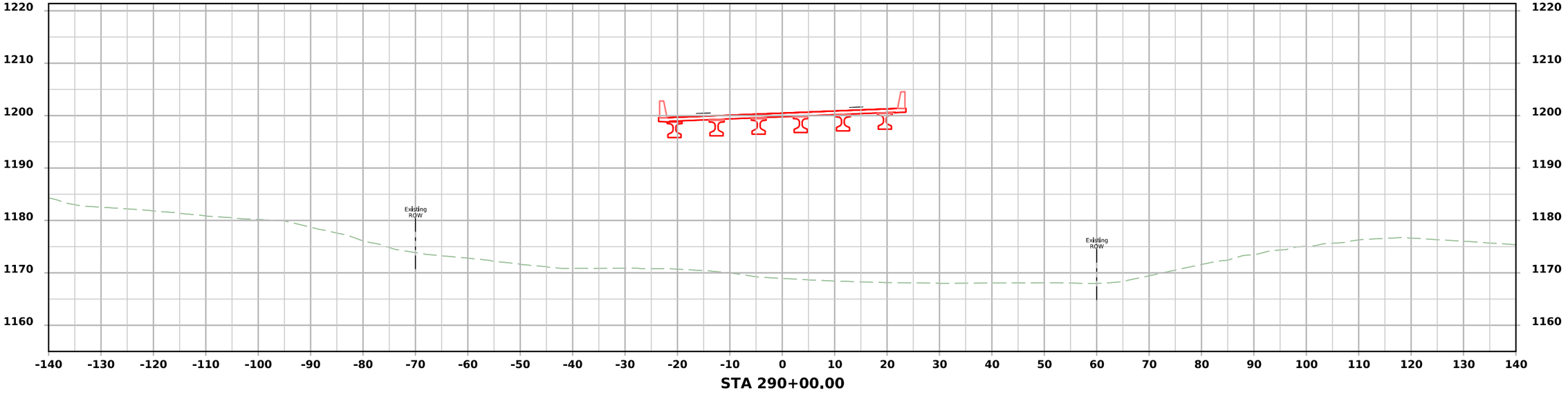
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.6 |
|---|---|---|---|---|---|

1:24:35 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 290+25.00

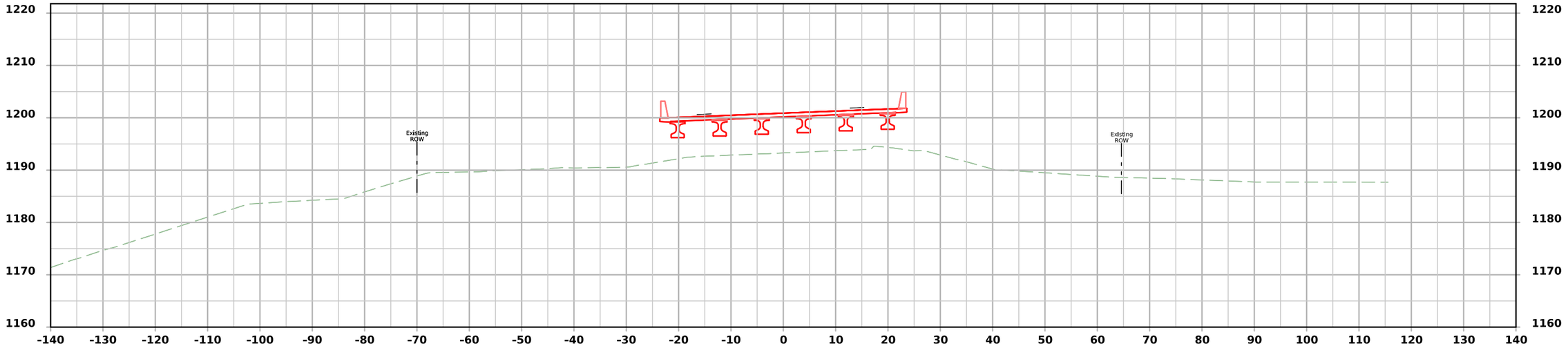



STA 290+00.00

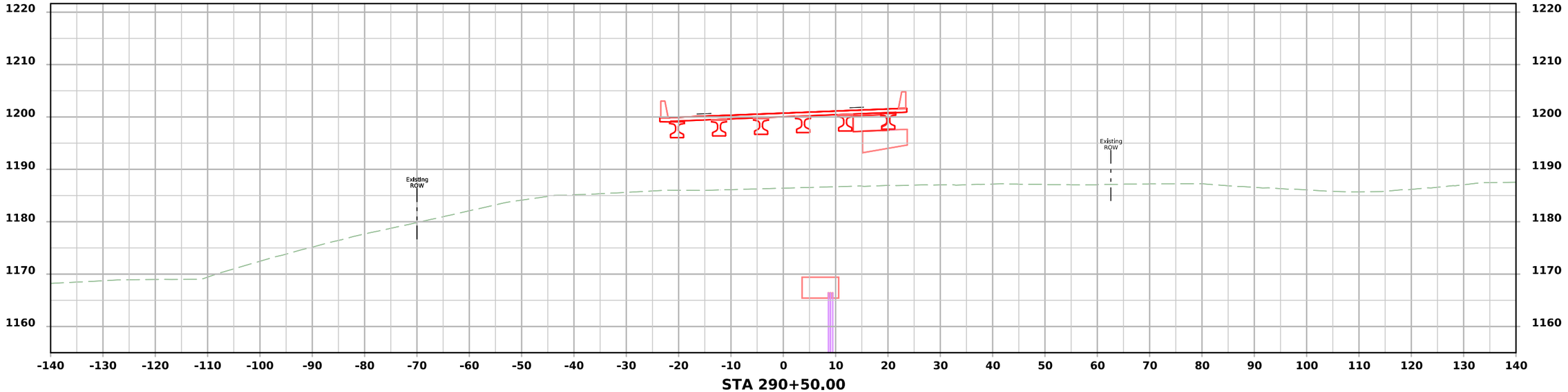
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.7 |
|---|---|---|---|---|---|

1:24:36 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 290+75.00

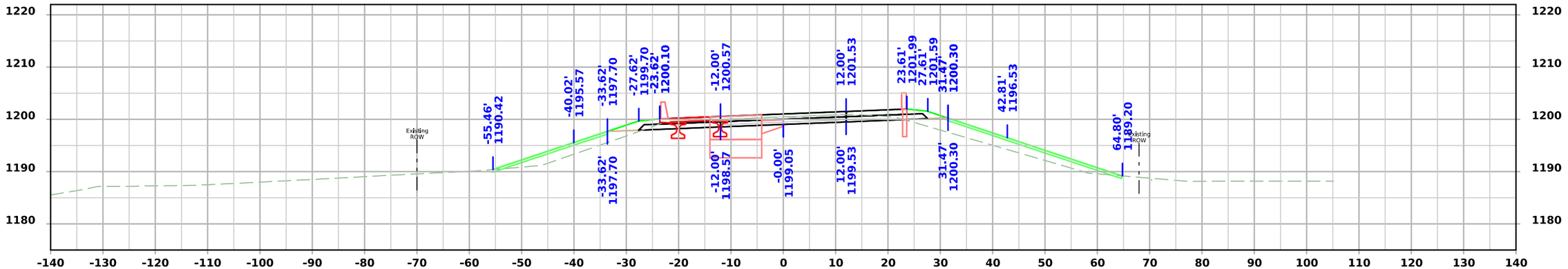



STA 290+50.00

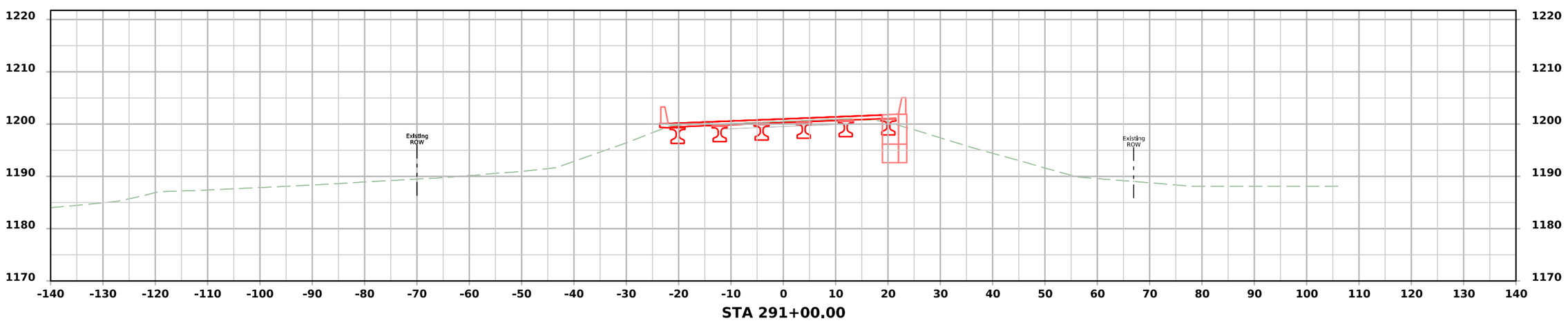
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.8 | |
|---|---|---|---|---|---|---|

1:24:37 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




**STA 291+10.39**

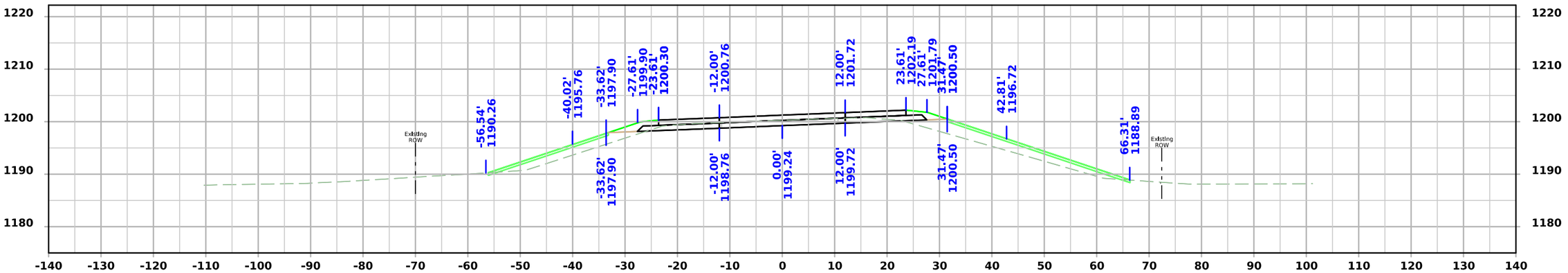


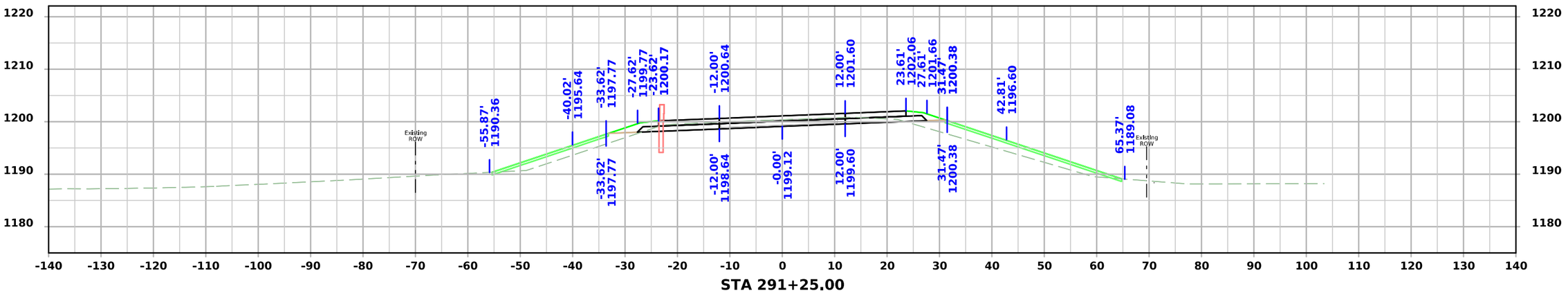

**STA 291+00.00**

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.9 |
|---|---|---|---|---|---|

1:24:38 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39

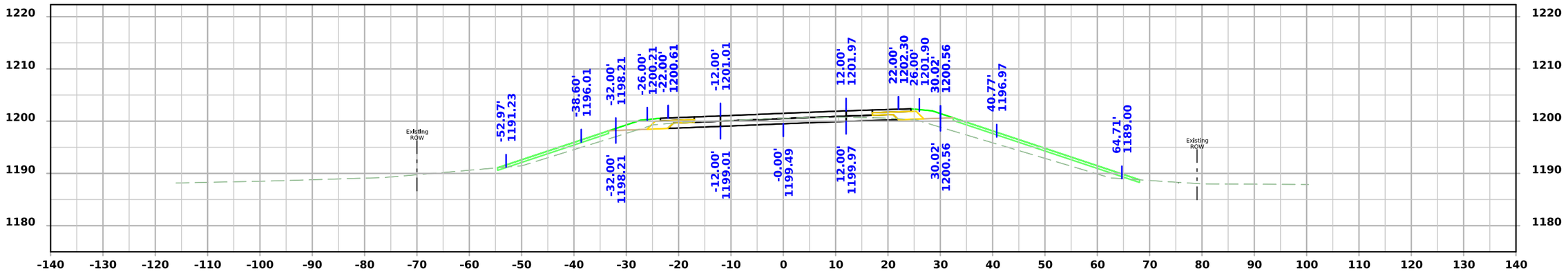


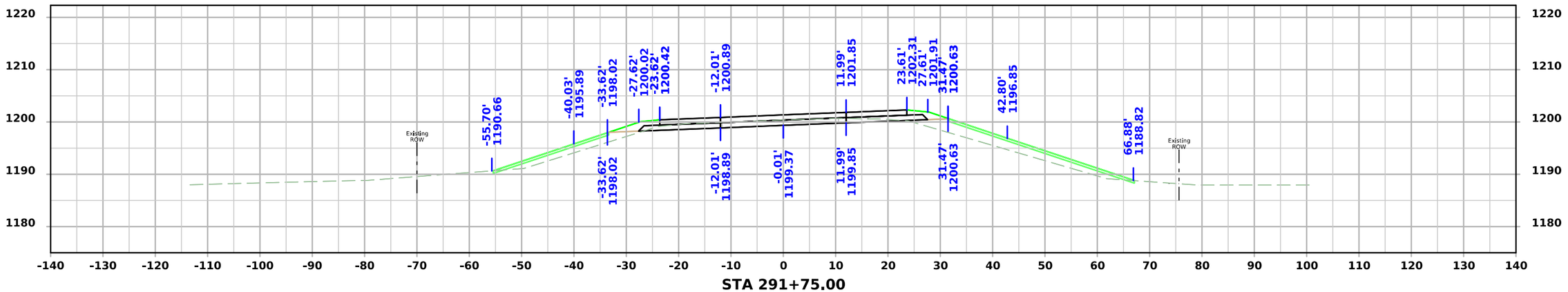

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.10 |
|---|---|---|---|---|---|

1:24:39 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 292+00.00

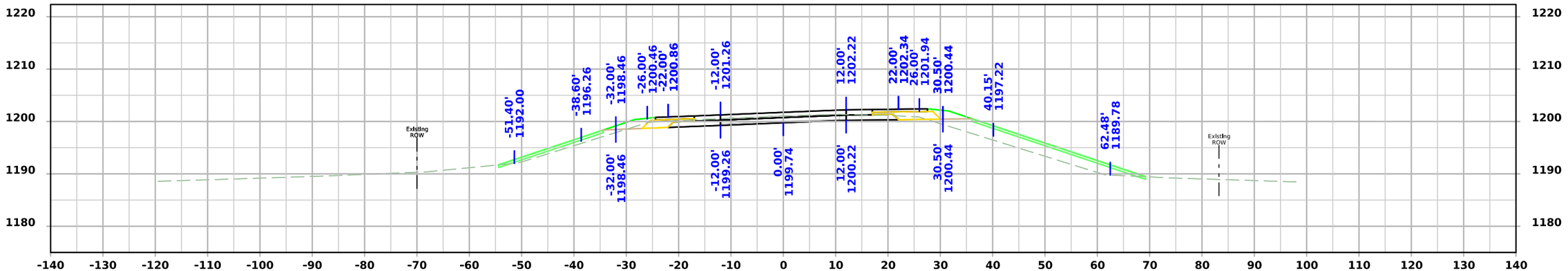



STA 291+75.00

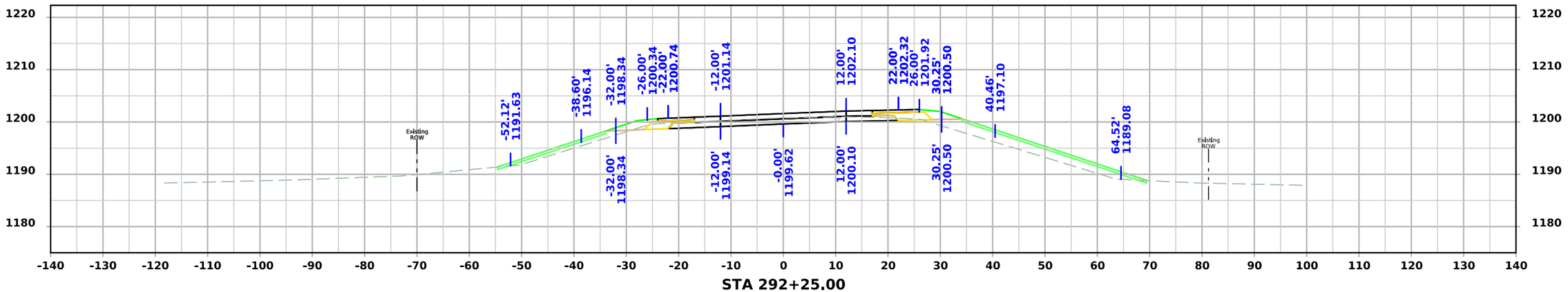
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.11 |
|---|---|---|---|---|---|

1:24:40 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 292+50.00

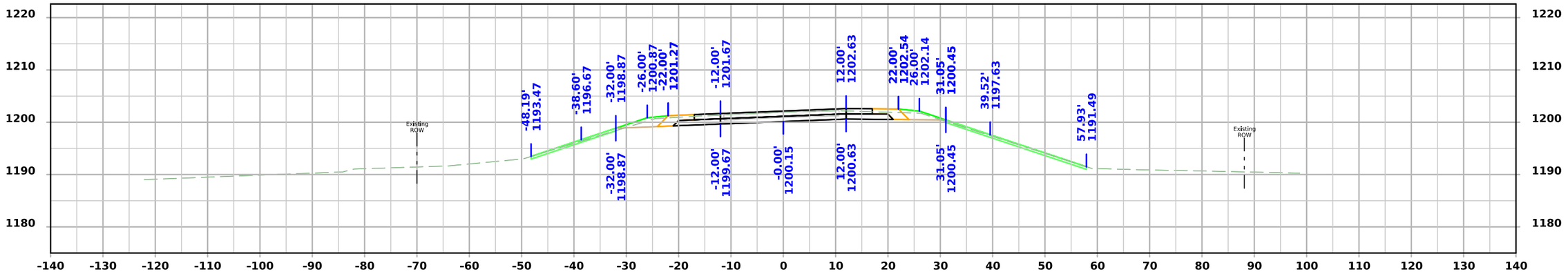



STA 292+25.00

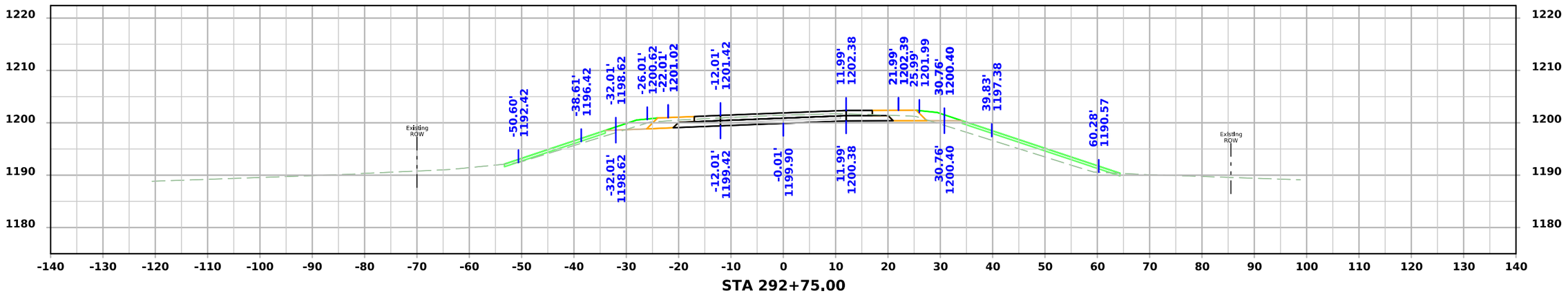
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.12 |
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1:24:40 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




STA 293+00.00

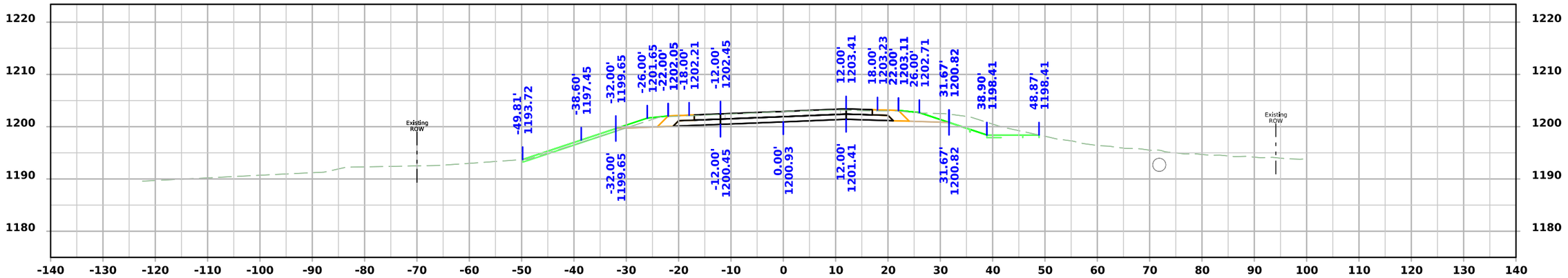



STA 292+75.00

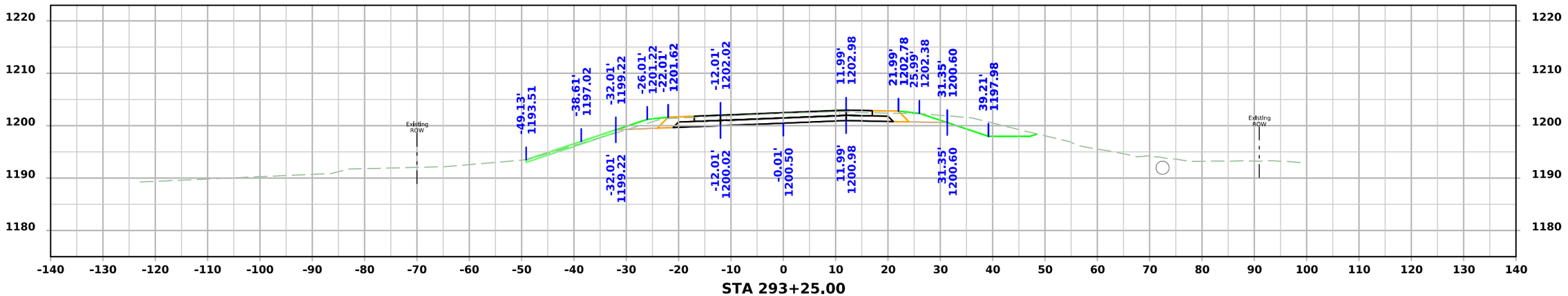
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.13 |
|---|---|---|---|---|---|

1:24:41 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

# IA 39




**STA 293+50.00**

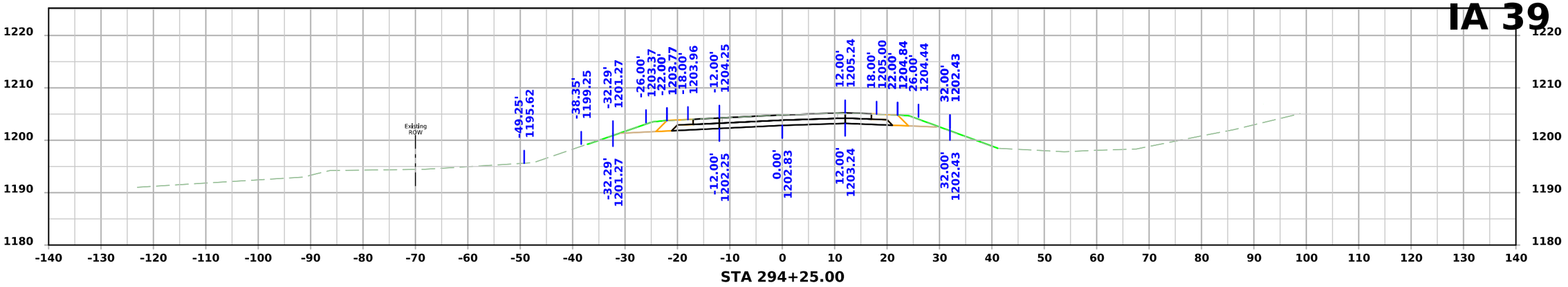



**STA 293+25.00**

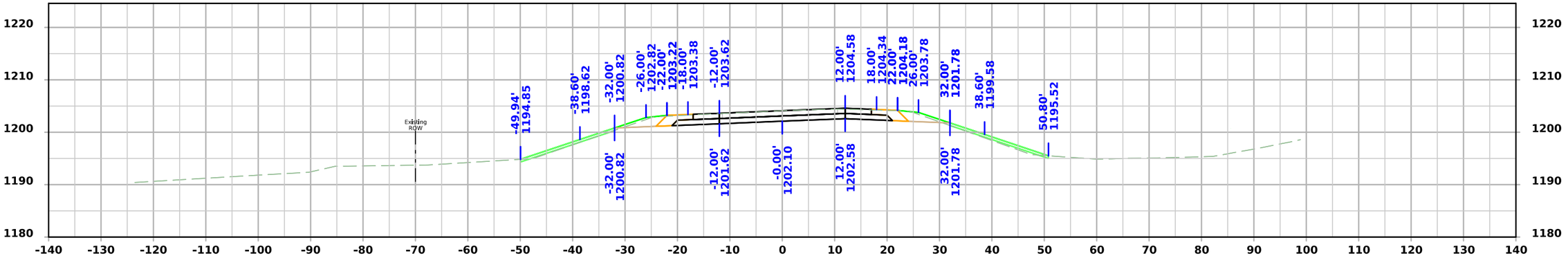
| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.14 |
|---|---|---|---|---|---|

1:24:41 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

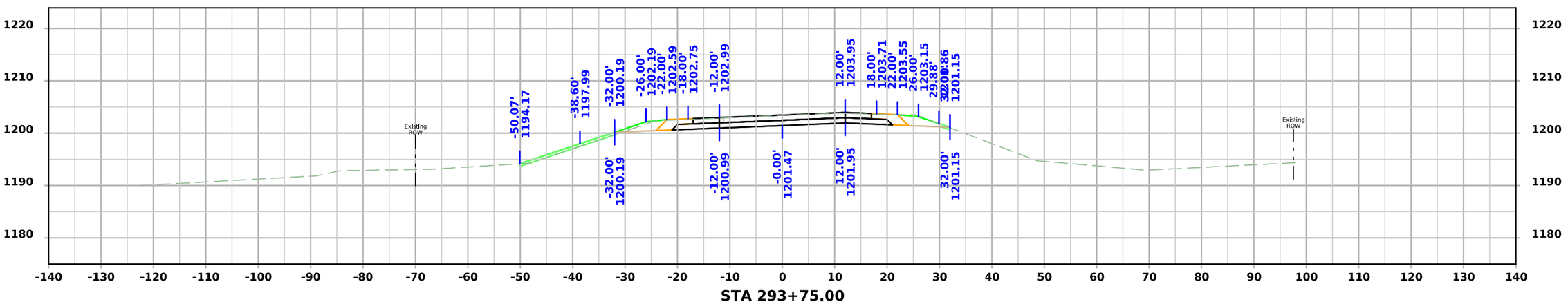
# IA 39




**STA 294+25.00**




**STA 294+00.00**

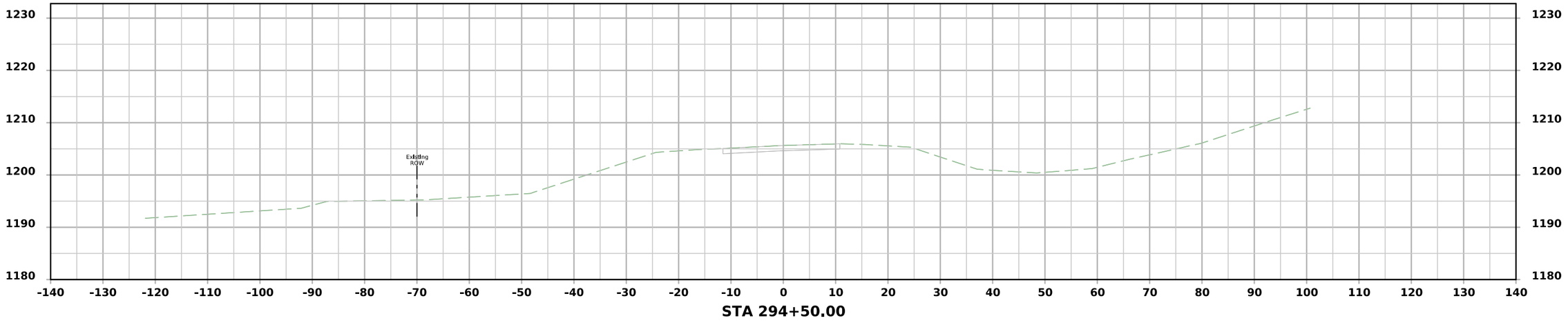



**STA 293+75.00**

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.15 |
|---|---|---|---|---|---|

1:24:42 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn

**IA 39**




**STA 294+50.00**

| FILE NO. | ENGLISH | DESIGN TEAM Flattery\Bell | CRAWFORD COUNTY | PROJECT NUMBER BRF-039-1(033)--38-24 | SHEET NUMBER W.16 |
|---|---|---|---|---|---|

1:24:43 PM 7/24/2026 npalmer pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\2403901025\Design\BRF-039-1(033)--38-24_Bridge-Unspecified\CADD_Files\Cross_Sections\SHT_W02_24039033Z06.dgn