LETTING DATE
Jan. 18, 2028

Grade and Pave
BRF-010-1(092)--38-84

SIOUX COUNTY

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B Sheets	Typical Cross Section and Details
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IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
SIOUX COUNTY
Grade and Pave

On IA 10 over Dry Creek
0.4 mi W of IA 12

Refer to the Plan Sheets for list of applicable specifications.

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

Revisions

	TOTAL
	38
PROJECT IDENTIFICATION NUMBER	
24-84-010-020	
PROJECT NUMBER	
BRF-010-1(092)--38-84	
R.O.W. PROJECT NUMBER	
-	
PROJECT DIRECTORY NUMBER	
8401002024	

Preliminary
Not For Construction

Revisions to this Design Plan and/or Project Specifications should be submitted by _____

Index of Seals

Sheet No.	Name	Type
A.1	Mark C. Currie	Roadway Design
SPS.1	?????	Geotechnical Design

Roadway Design

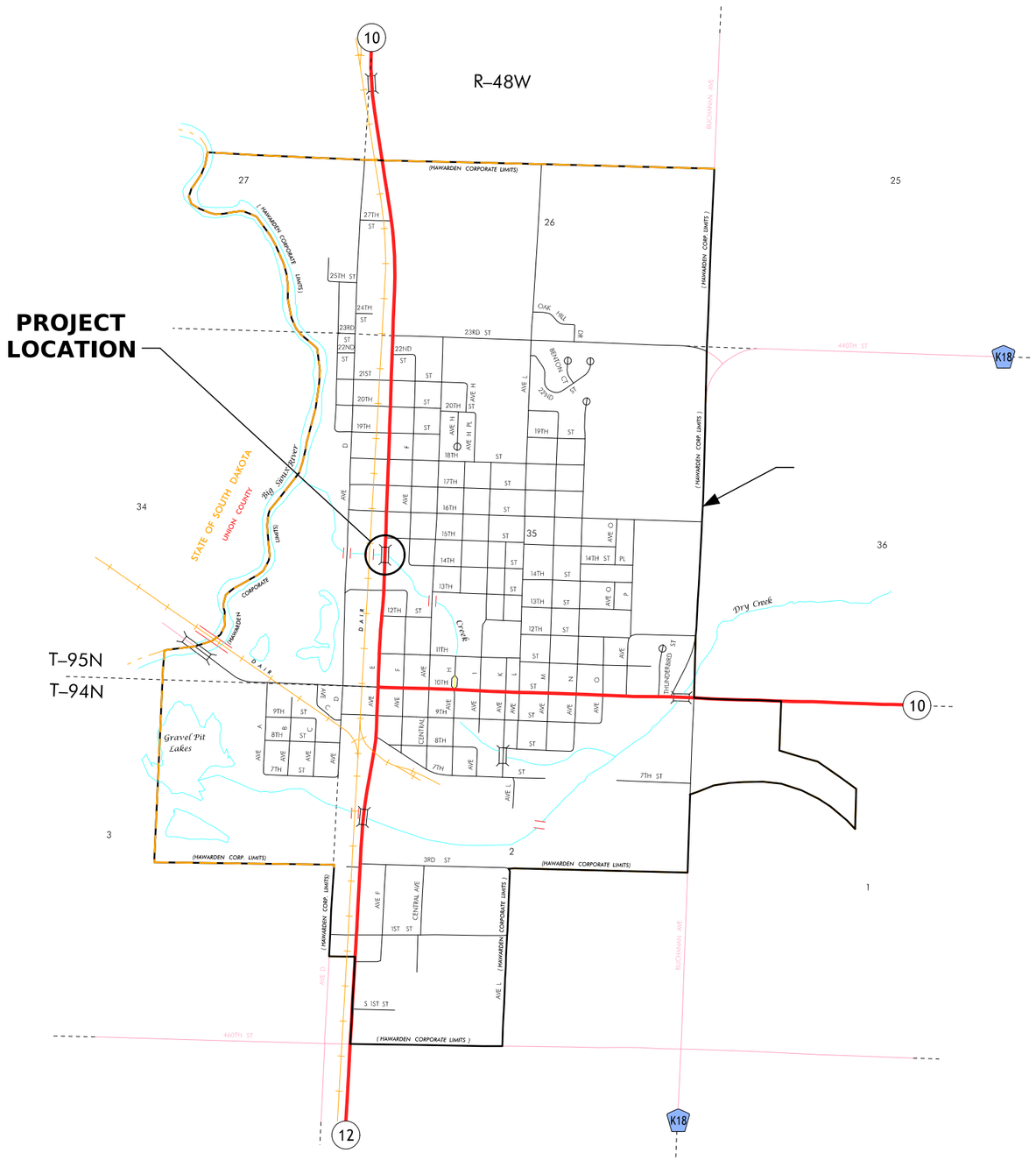
LICENSED PROFESSIONAL ENGINEER
Mark C. Currie
22475
IOWA

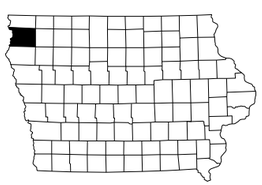
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Preliminary Plans — 09-05-2025
Signature — Date
Mark C. Currie
Printed or Typed Name

My license renewal date is December 31, 2025

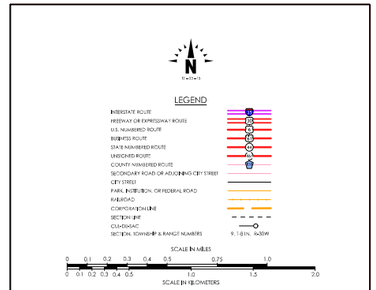
Pages or sheets covered by this seal: All Sheets





City of Hawarden Map

Not To Scale



HIGHWAY AND STREET MAP OF

HAWARDEN
IOWA

PREPARED BY
IOWA DEPARTMENT OF TRANSPORTATION
PLANNING, PROGRAMMING, AND MODAL DIVISION
OFFICE OF SYSTEMS PLANNING
PHONE (515) 239-1664
IN COOPERATION WITH
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

84–3345

FILE NO. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Sioux COUNTY	PROJECT NUMBER BRF-010-1(092)--38-84	SHEET NUMBER A.2

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INDEX OF SHEETS

VEENSTRA & KIMM INC.
6775 Vista Drive
West Des Moines, Iowa 50266

515.225.8000 // 800.241.8000
www.v-k.net

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 3	DATE:	April 4, 2025
ATTENTION:	Jessica Felix	PROJECT:	Sioux County BRF-010-1(092)--38-84 PIN: 24-84-010-020
FROM:	Mark Currie		
OFFICE:	Veenstra & Kimm, Inc.		
SUBJECT:	Project Concept Statement; (Final, D0)		

This project involves the replacement of the IA 10 bridge (Maint. No. 8403.4S010) over Dry Creek, 0.4 mi W of IA 12.

The Draft Concept Statement was sent out for review on February 12, 2025, and a concept review was held on April 2, 2025. Those present included Shane Tymkowicz and Justin Pottorff from District 3; Luka Arroyo, Jimmy Ellis, John Bartholomew, Christian Kennel, Todd Huju, Dylan Pryor, Jason Klemme, Christine Schwienebart, Chelsea Duncan, Janee Becker, and Bethany Waltersdorf from the Iowa DOT; and Mark Currie and Edward Gapatan from Veenstra & Kimm, Inc.

Comments received from the Draft Concept Statement, as well as from the concept review meeting, have been considered and resolved.

It is recommended to remove the bridge, replace the 48" HDPE pipe under the bridge with a 48" RCP with a flap gate, and reconstruct roadway with typical 40' section with traffic maintained via a detour route at an estimated cost of $656,102. Additional right of way/right of entry may be required. Traffic will be maintained via detour using K64 (Buchanan Avenue) and 23rd Street.

This project is recommended for construction in FY 2029. Veenstra & Kimm will coordinate the plan preparation with the assistance of the Project Management Bureau, Bridges and Structures Bureau, and Design Bureau.

Cc:

J. Felix	S. Tymkowicz	M. Sadler
J. Holmes	L. Schlumbohm	M. Thayer
B. Waltersdorf	D. Pryor	A. Yates
C. Purcell	D. Lorenzen	M. Kennerly
K. Nicholson	S. Nielson	D. Harness
D. Ta	S. Majors	M. Swenson
B. Smith	B. Dolan	J. Becker
B. Struecker	M. Solberg	M. Carlson
D. Newell	C. Schwienebart	B. Azeltine
K. Brink	G. Cagle	J. Nelson
M. Nop	D. Evans	L. Grothus
J. Ellis	S. Neubauer	J. Stanisz
R. Meyer	S. Schroder	C. Carter
J. Peterson	B. Worrel	D. Sprengeler
W. Sorenson		

FINAL PROJECT CONCEPT STATEMENT

IA 10 – Bridge over Dry Creek, 0.4 mi W of IA 12
Sioux County
BRF-010-1(092)--38-84
PIN: 24-84-010-020
Maint. No. 8403.4S010
FHWA No. 48470

Mark C. Currie, P.E., S.E.
515-225-8000

April 4, 2025

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 10 bridge (Maint. No. 8403.4S010) over Dry Creek, 0.4 mi W of IA 12.

One alternative was considered:
1. Remove bridge, construct typical 40' roadway section, and replace 48" HDPE pipe with 48" RCP under new roadway embankment and install a flap gap on the outlet end of the pipe.

Alternative 1 is the preferred alternative due to the change in drainage patterns and progression of removals of structures along the former Dry Creek corridor, safety considerations, and maintenance benefits as discussed below.

Traffic will be maintained via detour using K64 (Buchanan Avenue) and 23rd Street.

The preliminary project cost is $656,102.

B. Need for Project

The existing structure is a 127 ft long by 28 ft wide continuous concrete slab bridge built in 1955 and overlaid in 1985 and is near the end of its useful life. The bridge was designed for H20 design load.

Looking South along IA 10

Looking East at Existing Bridge

C. Present Facility

IA 10 is a two-lane urban roadway. The existing structure is a three span, 127 ft long by 28 ft continuous concrete slab bridge constructed in 1955. IA 10 in the project area was originally constructed in 1955 as a 40 ft PCC road that tapers to 28 ft at each end of the bridge. IA 10 was resurfaced with HMA in 1966, then resurfaced again in 1997, and an HMA patching and crack filling project was completed in 2021. IA 10 has 8' paved shoulders with 6" curbs and grass shoulders with foreslopes that are 3:1 or flatter.

D. Traffic Estimates

The 2029 construction year and 2049 design year average daily traffic estimates are 2,700 ADT with 15% trucks and 2,900 ADT with 15% trucks, respectively.

E. Sufficiency Ratings

IA 10 is classified as a Minor Arterial route and is a maintenance service level "C" road. The federal bridge sufficiency rating is 71.6.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from 2020 through 2025, there was one single-car crash with two occupants that had no reported injuries. Cause of the accident was listed as following an animal. Property damage totaling $1,500 was reported.

II. PROJECT CONCEPT

A. Project Description

Alternative #1 – Remove Bridge and Install RCP

The existing 127' x 28' bridge will be removed and replaced with a typical urban two-lane roadway section. In addition, the existing 48" HDPE pipe under the bridge will be replaced with a 48" RCP under the new roadway embankment, and a flap gate will be installed on the outlet end of the RCP. The typical cross section will consist of a 40' roadway with 8' paved effective shoulders, 6" curbs, 4' grass clear zones at 2 percent, and 4:1 foreslopes, as requested by the City of Hawarden.

The bridge used to carry Dry Creek (previously drainage area of 51 square miles per original plan), but Dry Creek was rerouted south of the City due to excessive flooding. The Dry Creek channel was constructed in 1963. The current drainage area is 0.45 square miles. No DNR permit is required. A project in 2002 added fill to Dry Creek to make it a green space. A storm sewer pipe (low flow HDPE pipe) was added with an inlet near Central Avenue that ends downstream of the bridge. While the City of Hawarden participates in NFIP, the project is not located in a detailed FIS Area. The site is in Zone AE of the Big Sioux River. A 48" RCP culvert at Avenue D downstream currently limits flows.

The current bridge was inundated during historic flooding in 2024, but the flood recurrence interval was estimated to be between 4,000 and 10,000 years, which exceeds design storm criteria for bridges and culverts. The City indicated that the existing flap gate on the outlet end of the RCP under Avenue D prevented Big Sioux River flood water from backflowing up the Dry Creek channel until Avenue D overtopped, at which time flood water backflowed through the 48" HDPE pipe under the bridge and contributed to street flooding in the City.

Preliminary hydraulic analysis indicates the existing 48" HDPE pipe, which handles both storm water runoff and surface water runoff from inlets in the park, is inadequate for the 50-year design discharge. However, the 50-year requirement is primarily intended for larger pipes and box culverts. Furthermore, storm sewer systems are usually designed for more frequent storm events. By removing the bridge, the only modification to the drainage area of the existing 4' HDPE pipe is the addition of a small area to the east of the bridge bounded by the bridge and an elevated walk path in the park. This additional area amounts to roughly 1.5 acres, which represents a 0.5% increase from the calculated drainage area of 281.6 acres. The City also noted that the park has not experienced noticeable surface runoff during any storm, and no

ponding under the bridge or directly "upstream" has been observed in the past. In case of larger storm events where the discharge exceeds than the capacity of the 4' pipe, the park will serve as a 'retention basin' holding and slowly releasing water downstream. To capture any surface water that could be trapped in the low area between the road and the sidewalk to the east of the road in the park, a surface inlet will be added in that area that connects to the 48" pipe, similar to the other inlets in the park. If flooding does occur in the park, park structures are not insurable, so there will be no impacts to flood insurance if the bridge is removed and replaced with a pipe.

The roadway will be reconstructed on the existing vertical and horizontal alignment, and fill will be required to build the embankment up to the proposed cross-section. The preferred clear zone (at 2%) behind the back of curb is 10' (per Design Manual Section 8A-2), but the 4' acceptable clear zone is recommended at this location to limit encroachment of the embankment into the park on the east side of IA 10. A 4:1 slope will be preferred to make mowing the embankment easier.

The existing 48" HDPE pipe will be replaced with an RCP from the outlet west of the bridge to where the proposed foreslope will meet the groundline east of the bridge. The flow line of the proposed RCP will match the existing HDPE pipe. A flap gate should be added to the end of the replacement RCP to prevent backflow from the Big Sioux River in the event that Ave D is overtopped.

The removal of the existing bridge and tapered bridge approach pavement will require approximately 400 ft. of new 10 in. PCC pavement over 12 in. of modified subbase, including the installation of subdrains. A manhole in the center of the north bridge approach with access to the sanitary sewer that crosses under IA 10 will require replacement. Erosion control and rural seeding and fertilizing to all disturbed areas.

It appears that right of way will not be required for this project, but temporary easements and/or access will be required to construct the roadway embankments on both sides of the roadway. The City of Hawarden owns all parcels that may be impacted, including the Hawarden City Park to the east of IA 10. The toe of the embankment to the east of IA 10 will fall outside of DOT right of way, so there will be a temporary impact to the park that will need to be approved. Documentation and coordination with the FHWA will be handled by the DOT once ROW needs are confirmed during design.

The road will be closed during construction and a detour route will be provided along IA 10 (10th Street), K64 (Buchanan Avenue), and 23rd Street.

BRIDGE ESTIMATE:				
Item	**Quantity**	**Unit**	**Rate**	**Amount**
Bridge Removal	4820	SF	$23	$110,860
Revetment	12	TON	$100	$1,200
Mobilization	1	LS	10%	$11,206
	Base Cost:			$123,266
	Contingency:		20%	$24,653
	BRIDGE TOTAL:			**$147,919**

ROADWAY ESTIMATE:				
Item	**Quantity**	**Unit**	**Rate**	**Amount**
Removals, As Per Plan	1	LS	$5,000	$5,000
Removal of Pavement	1560	SY	$10	$15,600
48" RCP	150	LF	$200	$30,000
Flap Gate	1	EACH	$23,000	$23,000
Porous Backfill	400	CY	$35	$14,000
Embankment in place, contractor furnished	6500	CY	$10	$65,000
Modified Subbase	650	CY	$50	$32,500
PCC Pavement	1600	SY	$60	$96,000
Curb and Gutter	800	LF	$50	$40,000
Circular Area Intake	1	EACH	$5,000	$5,000
Erosion Control	1	LS	$5,000	$5,000
Right of Way	1	LS	$5,000	$5,000
Traffic Control	1	LS	5%	$16,805
Additional Roadway Items	1	LS	10%	$35,291
Mobilization	1	LS	10%	$35,291
	Base Cost:			$423,486
	Contingency:		20%	$84,697
	ROADWAY TOTAL:			**$508,183**

	PROJECT TOTAL:	**$656,102**

Other Alternatives Considered

An RCB culvert that provides adequate hydraulic capacity for the Q_{50} design discharge was considered, but it was determined that the additional drainage area to be served by the existing 4' pipe (1.5 acres or 0.5% of the delineated drainage area) did not warrant significant increase in hydraulic capacity provided by a RCB culvert. Furthermore, the existing culvert downstream at Ave D is also a 48" RCP which limits the discharge for the whole area. In addition, the proposed RCP pipe will cost less to build and maintain. The City also prefers the pipe, as the future intent is to connect the pipe under IA 10 to the pipe under D Avenue to create a closed drainage system for the City's storm water and surface water from the park. The City has coordinated with the railroad, and the eventual plan is to remove the railroad bridge and connect the pipes between Avenue D and IA 10.

An additional overflow pipe under IA 10 with a flowline at the current groundline or above was discussed to handle possible surface water from a larger storm event. However, it was deemed unnecessary since the area under the bridge does not pond and worst case, the park can serve as a retention basin to temporary hold the surface water.

A bridge removal with flowable mortar was dismissed, because the project is not utilizing a box culvert, the construction time frame is short, the detour is not lengthy, flowable mortar is expensive, and possible settlement and pile drag considerations if the existing bridge remains in place.

B. Detour Analysis

The preference for construction is to close the road and provide a detour route. The identified detour route goes east on IA 10 (10th Street), north on K64 (Buchanan Avenue), and west on 23rd Street. This is a common truck route already used, and the intersections have adequate geometry for turning movements.

The detour route is primarily intended for trucks and thru traffic. Locals should be able to navigate around the bridge construction without significant delay.

C. Recommendations

It is recommended that the present structure be removed as described in Alternative No. 1.

D. Construction Sequence

It is anticipated all work on this project will be awarded to one prime contractor. Veenstra & Kimm, Inc. will coordinate the plan preparation with the assistance of the Project Management Bureau, the Design Bureau, and the Bridges and Structures Bureau.

The bridge removal should not take as long as a bridge replacement, and the project duration is conservatively estimated at 6-8 weeks.

Pipe construction and some backfilling can be completed prior to road closure and demolition of the existing structure.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 10; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The Accelerated Bridge Construction (ABC) Rating Score of 21 is less than the first stage filter threshold of 50, therefore no further evaluation is considered.

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

Standard survey coverage will be required.

A listing of existing utilities present within the project limits are shown in Attachment A.

The District cultural resources manager has not yet completed a cultural resources review on this project.

G. Program Status

Site data has been developed by Veenstra & Kimm, Inc. This project is listed in the 2019-2023 Iowa Transportation Improvement Program with $1,950,000 for replacement in FY 2029. A schedule of events will be developed following approval of the Project Concept.

A map of the City of Hawarden and the proposed Detour Route is attached.

ATTACHMENT A

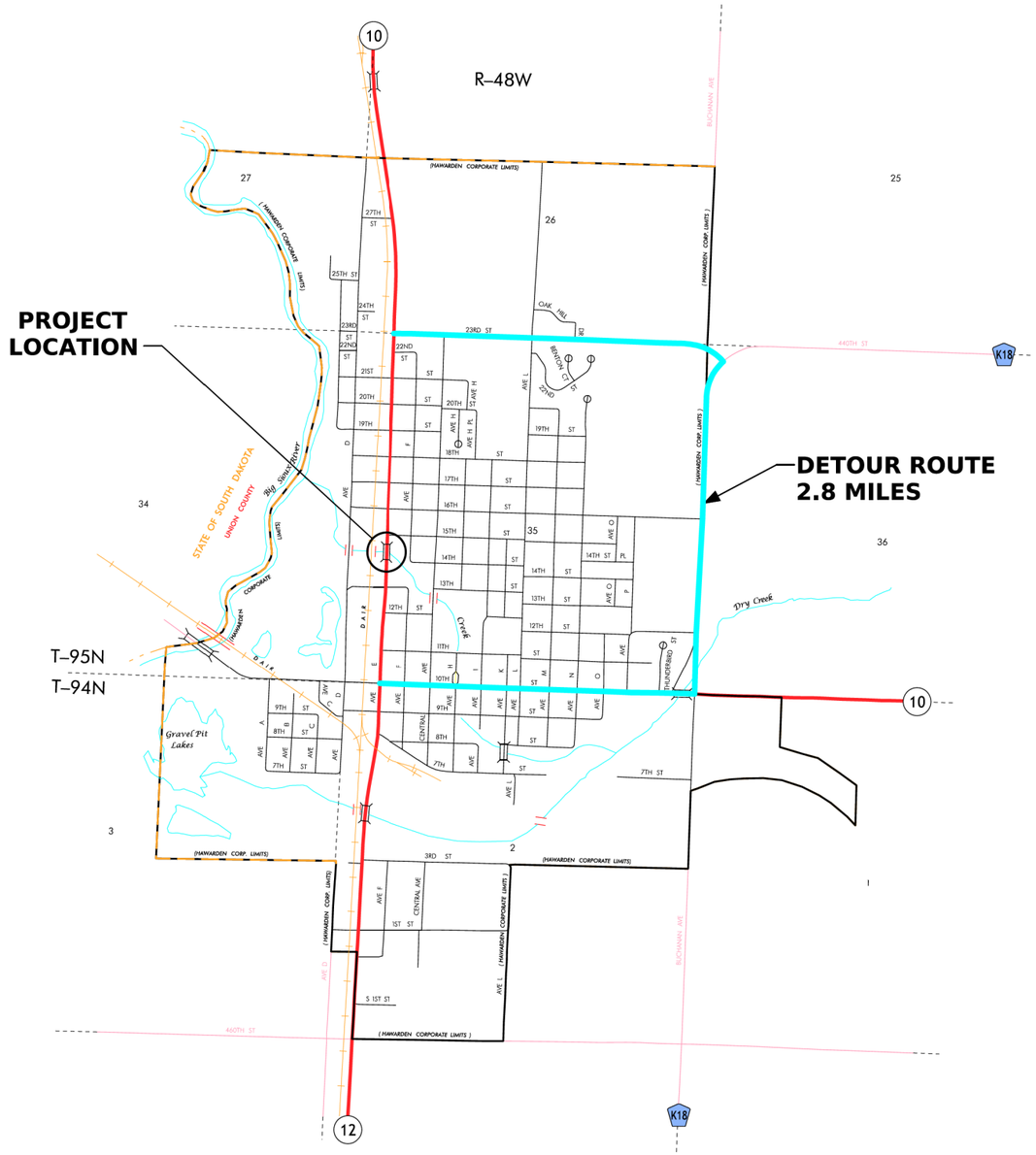
SIOUX COUNTY

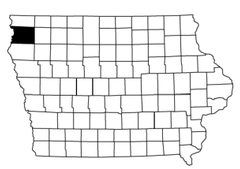
(HAC) HAWARDEN, CITY OF
Company name : HAWARDEN, CITY OF
Design contact: TRAVIS WATERMAN
Phone: 7125512565
Email: travisw@cityofhawarden.com

(HWD) HAWARDEN GAS DEPARTMENT
Company name : HAWARDEN GAS DEPARTMENT
Design contact: TRAVIS WATERMAN
Phone: 7125512565
Email: travisw@cityofhawarden.com

(PR2) PREMIER COMMUNICATIONS
Company name : PREMIER COMMUNICATIONS
Design contact: Jake Van Roekel
Phone: 7127223451
Email: jakevr@mypremieronline.com

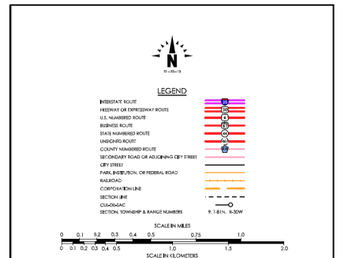
(SCY) SPRINT/COGENT COMMUNICATIONS
Company name : SPRINT/COGENT COMMUNICATIONS
Design contact: Michael Chebul
Phone: 4028808720
Email: mchebul@cogentco.com





City of Hawarden Map

Not To Scale



HIGHWAY AND STREET MAP OF

HAWARDEN
IOWA

PREPARED BY
IOWA DEPARTMENT OF TRANSPORTATION
PLANNING, PROGRAMMING, AND MODAL DIVISION
OFFICE OF SYSTEMS PLANNING
PHONE (515) 239-1664
IN COOPERATION WITH
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84–3345

FILE NO. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Sioux COUNTY	PROJECT NUMBER -	SHEET NUMBER	

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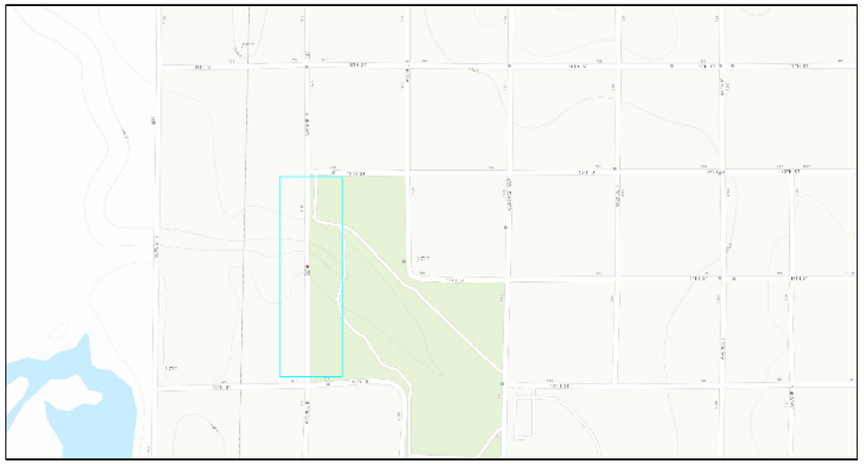
Iowa Crash Analysis Tool
Quick Report
2020-2025

Crash Severity	1
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	0
Property Damage Only	1

Injury Status Summary	1
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	0
Uninjured	0
Unknown	0
Not Reported	1

Property/Vehicles/Occupants	
Property Damage Total (dollars):	1,500.00
Average (per crash dollars):	1,500.00
Total Vehicles:	1.00
Average (per crash):	1.00
Total Occupants:	2.00
Average (per crash):	2.00

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.00
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.00



Iowa Crash Analysis Tool
Quick Report
2020-2025

Major Cause	1		1
Animal	1	Ran traffic signal	0
Ran stop sign	0	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	0	FTYROW: From yield sign	0
FTYROW: Making left turn	0	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	0
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	0
Aggressive driving/road rage	0	Driving too fast for conditions	0
Exceeded authorized speed	0	Improper or erratic lane changing	0
Operating vehicle in an reckless/erratic/care...	0	Followed too close	0
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequa...	0	Passing: Through/around barrier	0
Passing: Other passing	0	Made improper turn	0
Driver Distraction: Manual operation of an e...	0	Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Talking on a hands free ...	0	Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Other electronic device ...	0	Driver Distraction: Passenger	0
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Inattentive/lost in thou...	0	Driver Distraction: Other interior distracti...	0
Driver Distraction: Exterior distraction	0	Ran off road - right	0
Ran off road - straight	0	Ran off road - left	0
Lost control	0	Swerving/Evasive Action	0
Over correcting/over steering	0	Failed to keep in proper lane	0
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	0
Other: Improper operation	0	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	0	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	0
Unknown	0	Not reported	0
Other: No improper action	0		

Time of Day/Day of Week													
Day of Week	12 AM to 2 AM	2 AM to 4 AM	4 AM to 6 AM	6 AM to 8 AM	8 AM to 10 AM	10 AM to Noon	Noon to 2 PM	2 PM to 4 PM	4 PM to 6 PM	6 PM to 8 PM	8 PM to 10 PM	10 PM to 12 AM	Not reported	Total
Sunday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wednesday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thursday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friday	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	1

Manner of Crash Collision	1
Non-collision (single vehicle)	0
Head-on (front to front)	0
Rear-end (front to rear)	0
Angle (oncoming left turn)	0
Broadside (front to side)	0
Sideswipe (same direction)	0
Sideswipe (opposite direction)	0
Rear to rear	0
Rear to side	0
Not reported	1
Other	0
Unknown	0

Surface Conditions	1
Dry	0
Wet	0
Ice/frost	0
Snow	0
Slush	0
Mud/dirt	0
Water (standing or moving)	0
Sand	0
Oil	0
Gravel	0
Not reported	1
Other	0
Unknown	0

Fixed Object Struck			1
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	0	Embankment	0
Ground	0	Culvert/pipe opening	0
Guardrail - face	0	Guardrail - end	0
Concrete traffic barrier (median or right sid...	0	Other traffic barrier	0
Cable barrier	0	Impact attenuator/crash cushion	0
Utility pole/light support	0	Traffic sign support	0
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	0	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	1

Iowa Crash Analysis Tool
Quick Report
2020-2025

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	Total
< 14	0	0	0	0	0
= 14	0	0	0	0	0
= 15	0	0	0	0	0
= 16	0	0	0	0	0
= 17	0	0	0	0	0
= 18	0	0	0	0	0
= 19	0	0	0	0	0
= 20	0	0	0	0	0
>= 21 and <= 24	0	0	0	0	0
>= 25 and <= 29	0	0	0	0	0
>= 30 and <= 34	0	0	0	0	0
>= 35 and <= 39	0	1	0	0	1
>= 40 and <= 44	0	0	0	0	0
>= 45 and <= 49	0	0	0	0	0
>= 50 and <= 54	0	0	0	0	0
>= 55 and <= 59	0	0	0	0	0
>= 60 and <= 64	0	0	0	0	0
>= 65 and <= 69	0	0	0	0	0
>= 70 and <= 74	0	0	0	0	0
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 85 and <= 89	0	0	0	0	0
>= 90 and <= 94	0	0	0	0	0
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	0	0	0
Total	0	1	0	0	1

Drug/Alcohol Related	1
Drug	0
Alcohol (< Statutory)	0
Alcohol (Statutory)	0
Drug and Alcohol (< Statutory)	0
Drug and Alcohol (Statutory)	0
Refused	0
Under Influence of Alcohol/Drugs/Medications	0
None Indicated	1

Alcohol Test Given	1
None	1
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

Drug Test Given	1
None	1
Blood	0
Urine	0
Breath	0
Vitreous	0
Refused	0
Not reported	0

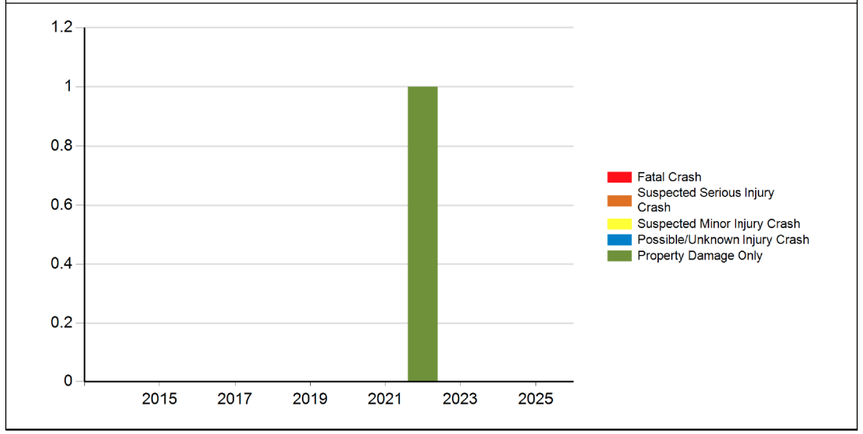
Drug Test Result	1
Negative	0
Cannabis	0
Central Nervous System depressants	0
Central Nervous System stimulants	0
Hallucinogens	0
Inhalants	0
Narcotic Analgesics	0
Dissociative Anesthetic (PCP)	0
Prescription Drug	0
Not reported	1
Other	0

Iowa Crash Analysis Tool
Quick Report
2020-2025

Crash Severity - Annual

Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0
2022	0	0	0	0	1	1
2023	0	0	0	0	0	0
2024	0	0	0	0	0	0
2025	0	0	0	0	0	0
Total	0	0	0	0	1	1

Severity/Year

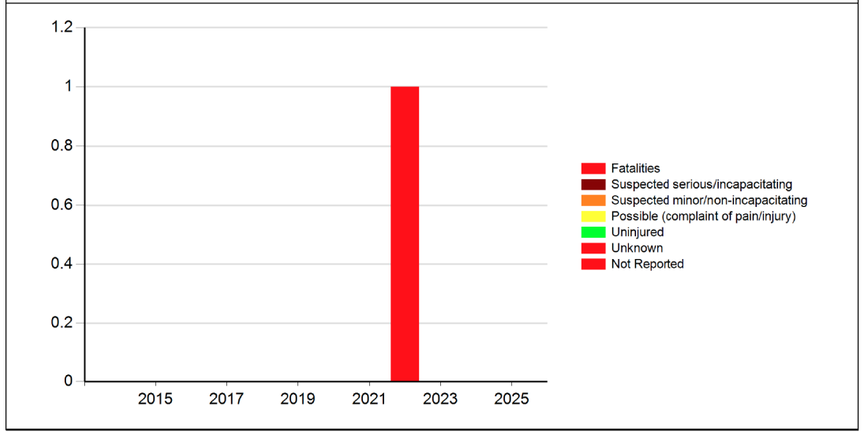


Iowa Crash Analysis Tool
Quick Report
2020-2025

Injury Status - Annual

Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Uninjured	Unknown	Not Reported	Total
2014	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	1	1
2023	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1

Injury Status/Year



Iowa Crash Analysis Tool
Quick Report
2020-2025

Meeting the following criteria
Jurisdiction: Counties (Sioux) Year: 2020, 2021, 2022, 2023, 2024, 2025 Map Selection: Yes Filter: None

Analyst Information
IA 10 over Dry Creek

General input

FHWA or Structure Number	48470
PIN Number	24-84-010-020
Project Number	BRF-010-1(092)--38-84
Design Number	N/A
County Name	Sioux
Route Carried	IA 10
Feature Crossed	Dry Creek
Location Description	0.4 mi W of IA 12

Required SI&A Input for Calculation of ABC Rating Score

SI&A Item No.	SI&A Item	SI&A Item Value	SI&A Units
5B	Route Signing Prefix	3	
19	Bypass, Detour Length	3	miles
29	Average Daily Traffic **(On)**	2,800	
29	Average Daily Traffic **(Under)**	0	
45	Number of Spans in Main Unit	3	
46	Number of Approach Spans	0	
109	Average Daily Truck Traffic	16	%

Note: If the ABC Rating Score is less than 50 and the structure is an interstate bridge or the detour is greater than or equal to 30 miles then the score is set to 50.

Concept Measure Scores

Concept Measure		Score		
Average Annual Daily Traffic	Combined value of 100% on and 25% under = 2,800	1	0	No traffic impacts
			1	Less than 5000
			2	5000 to less than 10,000
			3	10,000 to less than 15,000
			4	15,000 to less than 20,000
			5	20,000 or more
Out of Distance Travel	Value in miles = 3	1	0	No detour
			1	Less than 5
			2	5 to less than 10
			3	10 to less than 15
			4	15 to less than 20
			5	20 or more
User Costs	Value in $ = $4,158.00	1	0	No user costs
			1	Less than $10,000
			2	$10,000 to less than $50,000
			3	$50,000 to less than $75,000
			4	$75,000 to less than $100,000
			5	$100,000 or more
Economy of Scale	Value is total number of spans = 3	1	0	1 span
			1	2 or 3 spans
			2	4 or 5 spans
			3	6 spans or more

ABC Rating Score Factors and Weights

Concept Measure	Score	Weight Factor	Adjusted Score	Maximum Score	Adjusted Score
Average Annual Daily Traffic	1	10	10	5	50
Out of Distance Travel	1	10	10	5	50
User Costs	1	10	10	5	50
Economy of Scale	1	5	5	3	15
		Total Score	35	Max. Score	165
		Calculated ABC Rating Score	21		
		ABC Rating Score	21		

Roadway	IA 10		
PIN Number	24-84-010-020	**Submittal Date**	02/12/25
Project Number	BRF-010-1(092)--38-84		**Approval Date**
District	District 3	**Assistant District Engineer**	Shane Tymkowicz
County	SIOUX	**or**	
Route	IA 10	**Office Director**	
Location	Bridge over Dry Creek, 0.4 mi W of IA 12		
Work Type	Bridge Replacement		
Segment Manager	Luka Arroyo		
Designer	Veenstra & Kimm, Inc.		

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

Urban Two-Lane Roadways (Urban Arterials)

Design Element		Preferred	Acceptable Criteria	Project Values
Design speed (mph)		The anticipated posted speed limit	30	35
Maximum superelevation rate (Refer to Section 2A-2)		4%	6%	N/A
Design lane width (ft)		12	11	12
Full depth paved width (ft)		Design lane width + curb and gutter unit or 14 feet for roadways with shoulders	Match design lane width	41
Right turn lane (ft)		12	10	N/A
Left turn lane (ft)	With raised or painted median	12 ft + median	10 ft + median	N/A
	With depressed median	12	10	N/A
Two-way left turn lane		14	11	N/A
Parking lane width (ft)		10	7	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)	Shoulders	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 and gutter units	Match pavement cross-slope	6% maximum	Match pvmt x-slope
	Parking lanes	1% greater than pavement cross-slope	6% maximum	N/A
Curb type (See Section 3C-2)	Design speed ≤ 45 mph	6-inch standard	any shape	6-inch standard
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	N/A
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	N/A
	Curbed roadways	2%	not steeper than 3:1	2% for 4', then 4:1
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
Traverse Slopes	w/ drainage structures	8:1	6:1	N/A
	w/o drainage structures	10:1	6:1	N/A
Ditches (See Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5 x 10
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths (curbed or uncurbed) or design lane width + 3 ft each side (curbed) which ever is greater	design lane widths + effective shoulder widths or curb-to-curb width in curb and gutter section**	40
	Bridge length > 200 ft	design lane widths + effective shoulder widths (curbed or uncurbed) or design lane width + 3 ft each side (curbed) which ever is greater	design lane widths + 4 ft offset each side for roadways with shoulders or curb-to-curb width in curb and gutter section**	40
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft left and right	28
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		C	D	C

*FHWA notification via email is required if acceptable critera is not met on the NHS system (No formal design exeption is required)
** If travel lanes are less than 12 ft wide contact the Methods Section for assistance.

Design year ADT = 2900

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*	8
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				
On non-NHS routes with design year ADT < 3000	8	0*	Design year ADT < 400 vpd	4	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) = 35

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

Design Criteria for Low Speed Roadways

Design Element			Preferred Criteria, Design Speed, mph					Acceptable Criteria, Design Speed, mph					Project Values
			25	30	35	40	45	25	30	35	40	45	
Stopping sight distance (ft) (Refer to Section 6D-1)			155	200	250	305	360	155	200	250	305	360	250
Minimum horizontal curve radius (ft) and superelevation rate (Refer to Sections 2A-2 and 2A-3)	Method 2 superelevation and side friction distribution	e = 4% max	See Table 10 in Section 2A-3					--					N/A
	Method 5 superelevation and side friction distribution	e_{max} = 6%	144	231	340	485	643	144	231	340	485	643	N/A
		e_{max} = 8%	--	--	--	--	--	134	214	314	444	587	N/A
Minimum vertical curve length (ft) (Refer to Section 2B-1)			75	90	105	120	135	75	90	105	120	135	105
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	29
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	N/A
		roadways with fixed-source lighting	26	37	49	64	79	14	20	27	35	44	N/A
Minimum gradient (%)	(Refer to Section 2B-1)		0.5					0.3% with a curb, 0.0% without a curb					0.5
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	5					--	9	8	8	7	5
		Rural roadways						--	--	--	6	6	N/A
Clear zone			See "Preferred Clear Zone" table in Section 8A-2					See "Acceptable Clear Zone" table in Section 8A-2					4' from back of curb

IOWADOT
Form 532001 (02-23)

RECORD OF COORDINATION
FLOODPLAIN DEVELOPMENT

The purpose of this form is to document Iowa Department of Transportation coordination with the local community for projects which are not within the Iowa Department of Natural Resources' permitting jurisdiction and which are in a community that is participating in the National Flood Insurance Program.

1. Highway Number: IA 10 Stream Dry Creek Phase Number BRF-010-1(092)--38-84

   File No.: _____ Design No. _____ Project Location: NW ¼, SW ¼, T 95N ,S 35 ,R 48W

   Description of Location: On IA 10 over Dry Creek, 0.4 mi. W. of IA 12 in City of Hawarden

   City/County: Sioux County

2. Flood Insurance Rate Map/Floodway Map:

   Panel Number: 19167C0388D , Effective Date of Map: August 2, 2022

3. Type of Development: ☒ Filling ☒ Grading ☐ Excavation ☐ Bridge Construction ☒ Road Construction

   Channel Improvement: N/A. The old Dry Creek has been rerouted and surface flow is carried by existing HDPE pipe under the bridge.

   Description of Development: The existing bridge will be removed and the existing HDPE pipe under the bridge will be replaced with an RCP. The roadway will be widened to typical 40' section to match existing.

4. Is project located in a designated 100-year floodplain?

   ☒ Yes (check the appropriate zone: ☐ A ☐ A1-30 ☒ AE ☐ AO ☐ AH) ☐ No

5. Has a detailed Flood Insurance Study (FIS) been published? ☐ Yes ☒ No

   If yes, what is the Base Flood Elevation (BFE) at project site? _____

   If no, what is the estimated BFE at project site? 1176.8 from the Flood Insurance Study of Big Sioux River, Cross Section D

6. Is project located in designated floodway? ☐ Yes ☒ No

7. Does FIS need to be revised? ☐ Yes ☒ No

   If yes, describe type and extent of revision:

MARK CURRIE (V&K) IDOT Preliminary Bridge Design Engineer	Signature	3-11-25 Date
Jessica Felix IDOT District Engineer	Signature	04/04/2025 Date

Community Official Concurrence:

Travis Waterman Community Official	travis waterman Signature	04/07/2025 Date

NOTE: Bridges and Structures Bureau to submit copy to:
Jason Conn Jason.Conn@dnr.iowa.gov
NFIP State Coordinator
Iowa Department of Natural Resources
Wallace State Office Building
502 East Ninth Street
Des Moines, IA 50319
515-725-8333

Bridge Bureau Attachment for Concept Statement

Date: April 4, 2025
By: Mark Currie (V&K)
Location: IA 10 over Dry Creek

County: Sioux County
Phase No.: BRF-010-1(092)--38-84
Project Code: 24-84-010-020

1. Regulatory/Coordination

   a. Iowa DNR Flood Plain permit = No, drainage area 0.44 sq. mi.
   b. Iowa DNR Sovereign Lands permit = No.
   c. Local Record of Coordination = Yes.
   d. Flood Insurance Study = No.
   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 = <Yes or No>
   j. USGS or Iowa Flood Center (IFC) gage or sensor impacted? No.

2. Hydrologic/Hydraulic Analysis/RIDB Dataset

   a. Design discharges determined = Yes, TR-55.
   b. Hydraulic analysis done = Yes, Iowa Culvert Hydraulics (ICH). The ICH recommends a minimum twin 78” RCP or a single 8’x10’ RCB culvert for the 50-year event design discharge; however, this DOT criteria is meant for bridges and larger culvert structures. The existing 48” HDPE pipe under the bridge is an extension of the City’s storm sewer system, typically designed for more frequent storm events. By removing the bridge and installing a section of 48" RCP under the new embankment to replace the HDPE pipe, the only modification to the drainage area is the addition of the small area to the east of IA 10 bounded by the bridge and elevated walk path in the park (roughly 1.5 acres). This represents a 0.5% increase from the calculated drainage area of 281.6 acres and does not warrant an increase in hydraulic capacity. An inlet will be constructed on the low-lying portion of this additional drainage to area to drain it. The City noted the park has never been flooded from storm events alone (excluding backwater from Big Sioux River), and their preference would be to use a pipe with a flap gate on the outlet side. If, for some reason, flooding did occur in the park upstream of the bridge, park structures are not insurable, so there will be no impacts to flood insurance if the structure is removed and replaced with a pipe.
   c. If DA > 10 sq. mi. Riverine Infrastructure Database (RIDB) dataset is required with B1 submittal = No.
   d. Flowline of RCP will match flowline of existing HDPE pipe.
   e. Flap gate is to be provided at end of new 48” RCP to prevent reverse flow from entering the City’s storm system network.

3. Structure/Roadway Layout Considerations

   a. A grade raise will not be required.
   b. 48” RCP will replace existing buried 48” HDPE along same alignment and elevation below new embankment areas.
   c. Intake will be added in low area between IA 10 and the sidewalk in the park that connects to new RCP.
   d. New roadway section will match typical 40’ roadway with curbs.

4. Special construction issues

   a. None.

5. Special survey = Yes-See below.

6. Aesthetic enhancements = No.

7. Other

   a. The roadway will be closed during construction with traffic placed on an off-site detour.

Special Survey:

The following information is to be provided in addition to the routine survey data.

A. Additional survey of railroad bridge and Avenue D RCP culvert downstream of bridge.

FIELD EXAM NOTES

Attendees:

Name	Org. / Office	E-Mail

Contractor furnished borrow? (Yes) / (No)
Will there be subdrains? (Yes) / (No)
Salvage Guardrail and/or Post? (Yes) / (No)
Pollution Prevention Plan (PPP) required? (Yes) / (No) Approx. Area of Disturbance:_____
Field Office? (Yes) / (No)
Field Lab? (Yes) / (No)
Construction Survey (Yes) / (No)
Survey by Office of Design (Yes) / (No)

Special Events/ Annual Events:

Drainage Issues:

Planned Construction Activities:

Topsoil: Special Considerations:

Special Coordination with:

Desired Pavement / Shoulder Improvements:

FIELD EXAM NOTES

FIELD EXAM NOTES

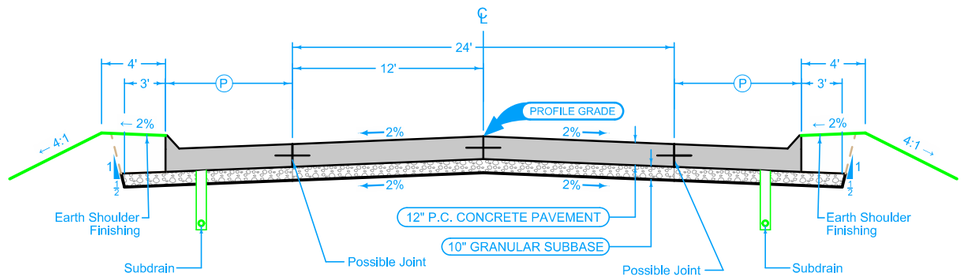
FIELD EXAM NOTES

Curbed Shoulder

Shoulder Jointing:
Longitudinal joint not required when distance from back of curb to nearest joint is less than 15':

Single pour: L-2
Staged : BT-2
Transverse: C at 17' spacing

			2_Curb_ 04-15-25
STATION TO STATION		Ⓟ Feet	Curb Type See PV-102
137+30	141+72	8.5'	6" Standard



Curbed Shoulder

Shoulder Jointing:
Longitudinal joint not required when distance from back of curb to nearest joint is less than 15':

Single pour: L-2
Staged : BT-2
Transverse: C at 17' spacing

			2_Curb_ 04-15-25
STATION TO STATION		Ⓟ Feet	Curb Type See PV-102
137+30	141+72	8.5'	6" Standard

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

	2P_ 04-21-20
STATION TO STATION	

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.

See Tab 100-24 or 100-25 for pavement quantities.

See Tab 112-9 for shoulder quantities.

See U-sheets for shoulder transition details.

US 10

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

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. -	ENGLISH	DESIGN TEAM Veenstra & Kimm, Inc.	Sioux COUNTY	PROJECT NUMBER BRF-010-1(092)--38-84	SHEET NUMBER D.1

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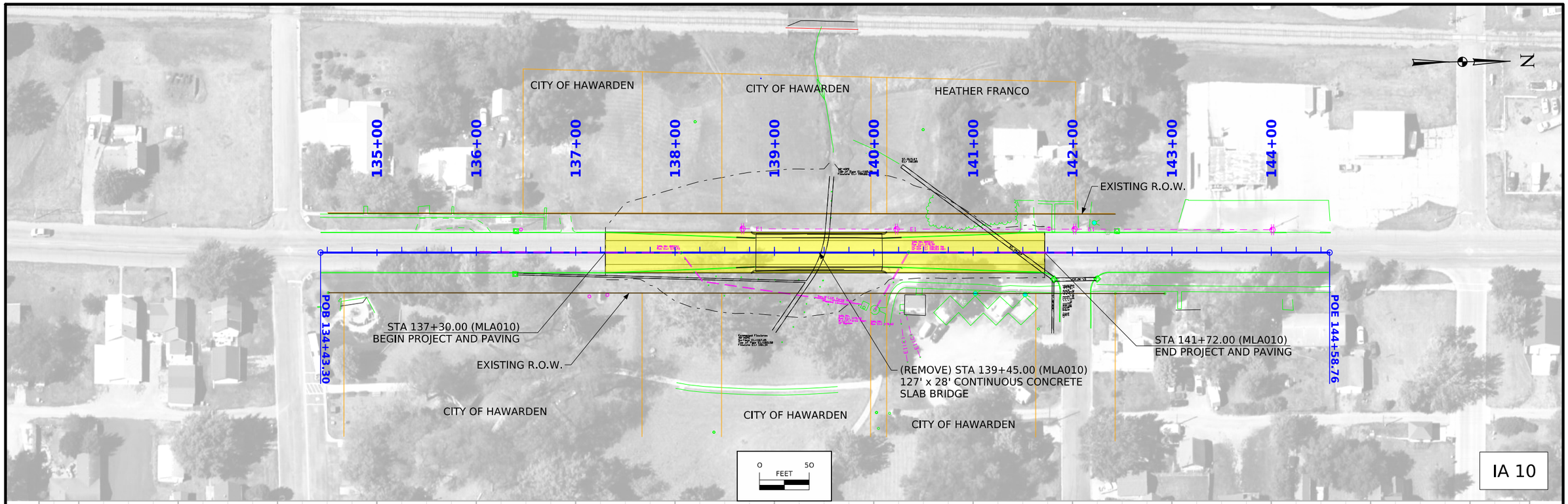

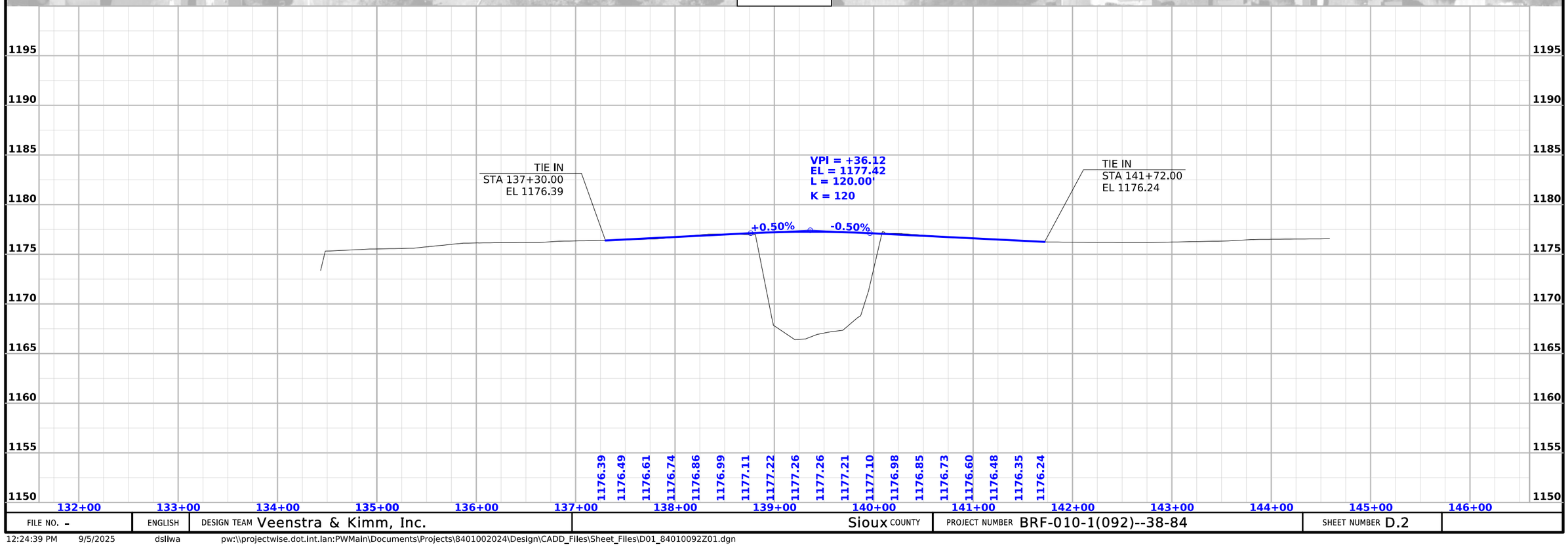

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SURVEY INDEX

County: Sioux
PIN: 24-84-010-020
Project Number: BRF-010-1(092)—38-84
Location: Hawarden City Park Bridge 0.1 miles N of avenue E & 13thSt
Type of Work: Bridge Replacement
Project Directory: 8401002024

Survey Personnel

Jerett Still– Survey Party Chief
TJ Coyle – Assistant Survey Party Chief

Date(s) of Survey

Begin Date 11/08/2024
End Date 01/15/2025

General Information

This survey is for Hawarden City Park Bridge 0.1 miles N of avenue E & 13th St. This survey request was for the Iowa DOT. This project is a Full Field DTM survey. This project is a Partial Field DTM with Photo control.

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

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Three five-minute observations were taken with a minimum two-hour time span between and used in a weighted average to obtain final coordinate values. For additional details of the control survey, contact the Preliminary Survey department.

VERTICAL DATUM: NAVD88
GEOID MODEL: 2018

Vertical Control

Vertical control was established by verifying 4 Sioux County Survey monuments. Vertical datum for this survey is relative to NAVD88. Geoid 2018 was used in processing. The height was computed at CBN 1st order Vertical “D 154 1949” PID: NM0034, G134, G136, and G137. Vertical control was checked with IARTN checks. This survey observed 4 Sioux County Monuments CBN 1st order Vertical “D 154 1949” PID: NM0034, G134, G136, and G137:

CBN 1st order Vertical “D 154 1949” PID: NM0034 – A standard USC and GS bench mark disk set in the top of a concrete post projecting 5 inches above ground. Elevation = 1176.46’
G134 – 3/4 “ diameter x 6’-0” long aluminum rod with survey cap and NGS style access cover. Elevation = 1291.13’
G136 - 3/4 “ diameter x 6’-0” long aluminum rod with survey cap and NGS style access cover. Elevation = 1183.54’
G137- 3/4 “ diameter x 6’-0” long aluminum rod with survey cap and NGS style access cover. Elevation = 1239.48’

Horizontal Control

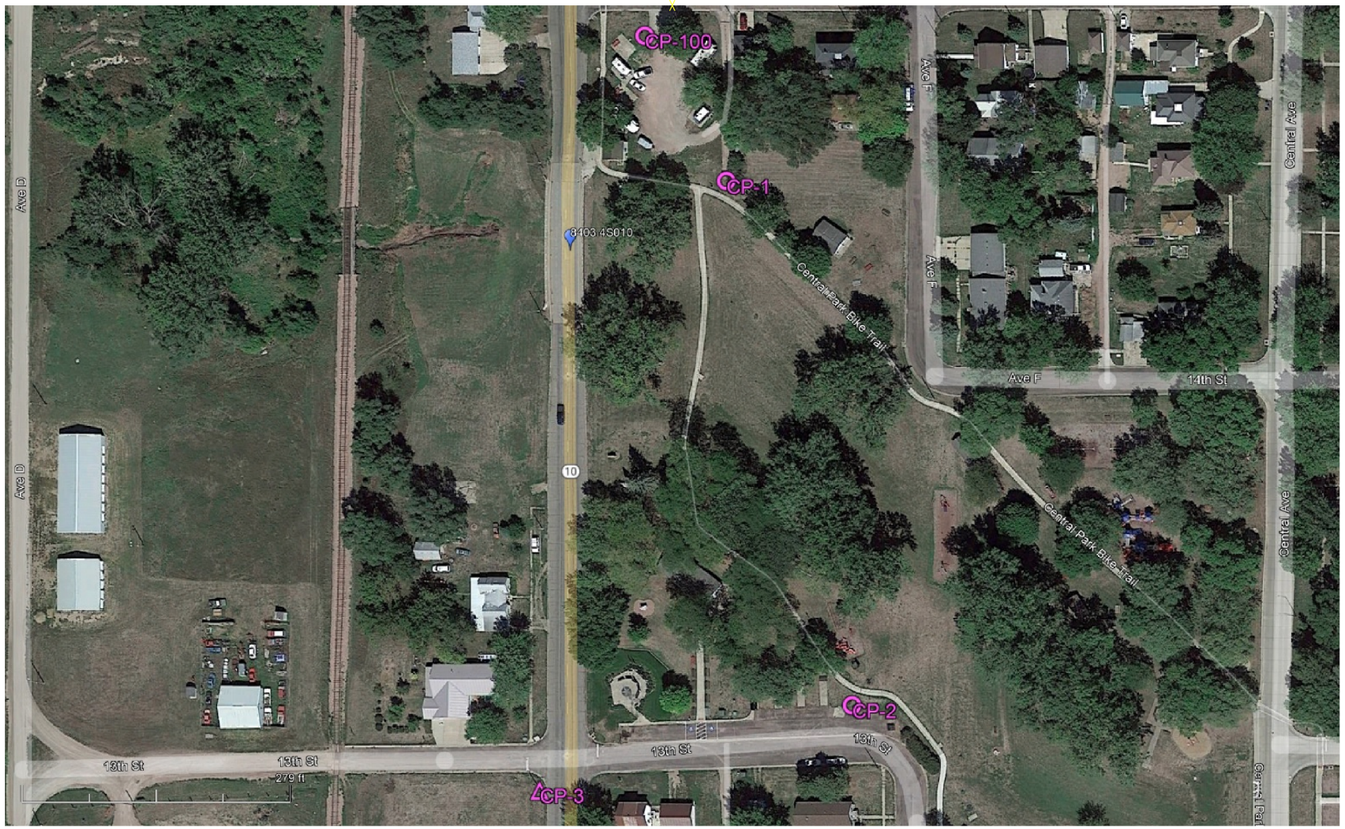
The project coordinate system for this survey is Iowa RCS 1 (U.S. Survey Feet). This survey control is relative to IARTN reference stations IARTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011). Coordinates were determined conducting a 5-minute observation in the morning, afternoon, and evening. Coordinates were then averaged between the three to determine final coordinate.

Alignment Information

The horizontal alignment for Sioux Co. IA 10 is a retrace of As-built Plans No. F-1003(2). Survey stationing was equated to Sta. 139+45.00 and carried back and ahead without equation throughout the survey.

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00 - Iowa RCS Zone 01

VERT. DATUM: NAVD88 - Geoid Model: 2018

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00
Ia. Regional Coordinate System Zone 01
VERT. DATUM: NAVD88
Geoid Model: 2018

Point Name	Northing	Easting	Elevation	Code - Description
CP-100	9530428.884	11168986.16	1176.129	CP cut Xin concrete; 161' East of North end of Bridge
CP-1	9530579.809	11168903.39	1176.0305	CP cut Xin mhss rim; 148' N of north end of bridge; 56' E of Back of Curb
CP-2	9529880.168	11169111.52	1176.6707	CP cut Xin mh rim; 392' S of South End of Bridge; 274.6' E of Back of Curb
CP-3	9529794.874	11168781.81	1177.002	BM cut Xin SW nut of hyd; 483' S of South End of Bridge; 13.8' W of Back of Curb

137+00

138+00

139+00

140+00

141+00

N

0 20
Scale In Feet

ST-01
Apron, DR-201 (48")
Flowline El. = 1160.50
Sta. 139+57.682, -82.604' LT

ST. OUTLET
El.= 1161.85

48" HDPE
Top of Pipe El.=1165.28
Flowline El.=1161.22

P_01 104 LF (48" RCP)

SAN. MH. (BRICK)
Rim El.= 1176.93

SAN. MH. (BRICK)
Rim El.= 1176.94
12" VCP El.= 1161.54 (N)
12" VCP El.= 1161.53 (SE)

P_02 57 LF (18" RCP)

P_03 41 LF (48" RCP)

San. 8" C.I.P. Force Main
(Approx. Location)

SAN. MH.
Rim El.= 1175.94
8" C.I.P. Force Main
12" Bypass

SAN. MH.
Rim El.= 1176.62

ST-03
ST. MH., SW-401 (48")
Rim El.= 1176.233
18" RCP Inlet El. = ? (S.)
18" RCP Outlet El. = ? (N.)

ST-04
Intake, SW-513 (6'x6')
Openings on S.E. and N.E. Faces
Rim El. = 1168.250
Inlet El. = 1167.00
Sta. 139+07.557, 67.870' RT

ST-02
ST. MH., SW-401 (96")
Rim El.= 1176.233
48" RCP Inlet El. = 1161.096 (S.E.)
48" RCP Outlet El. = 1161.058 (W.)
18" RCP Inlet El. = (To be determined) (S.)
Sta. 139+34.025, 29.336' RT

FILE NO. -	ENGLISH	DESIGN TEAM **Veenstra & Kimm, Inc.**	**Sioux** COUNTY	PROJECT NUMBER **BRF-010-1(092)--38-84**	SHEET NUMBER **M.1**

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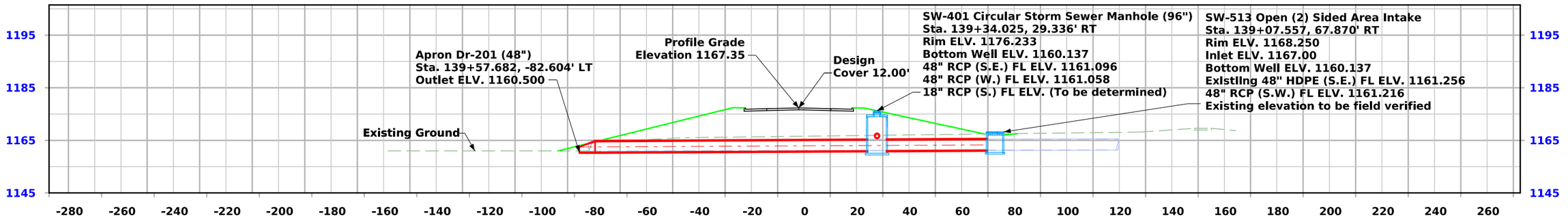

STA. 139+40

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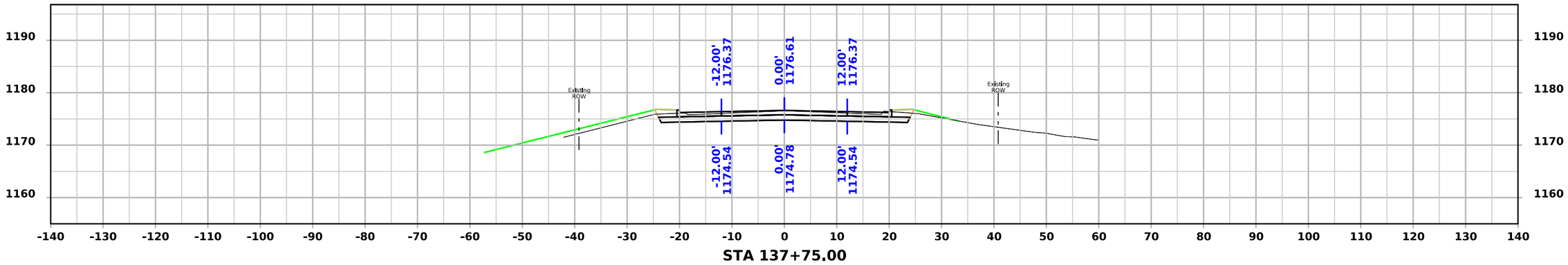
IA 10



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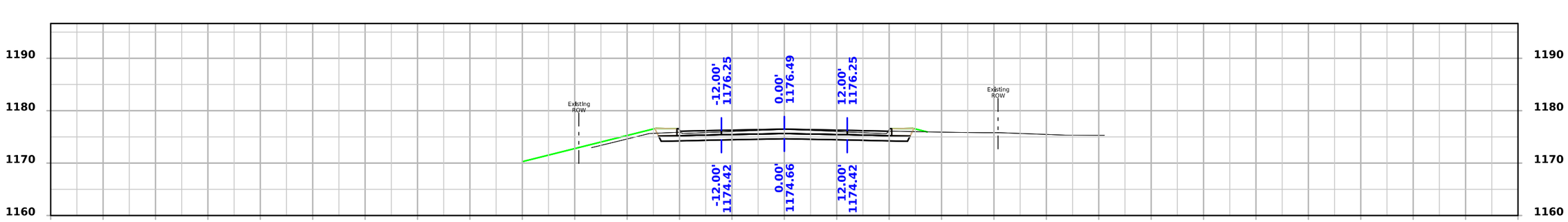

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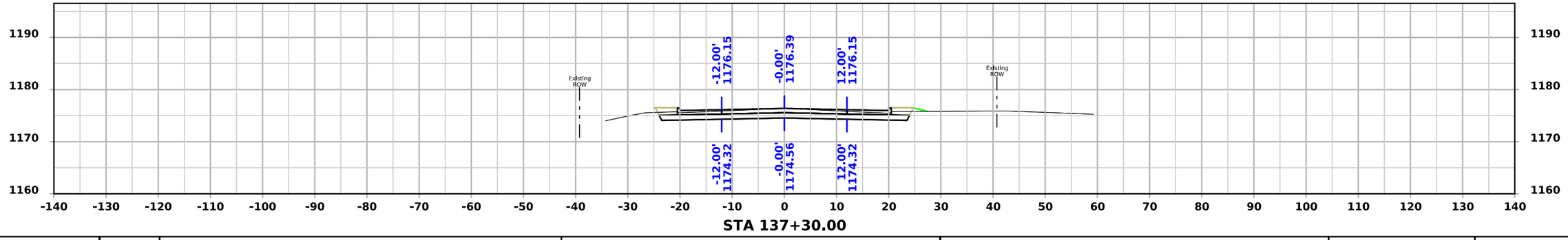

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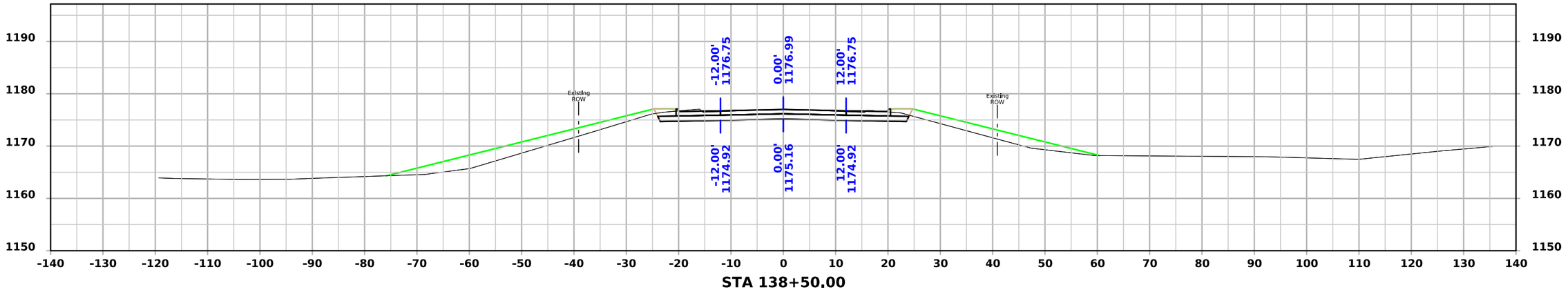
IA 10



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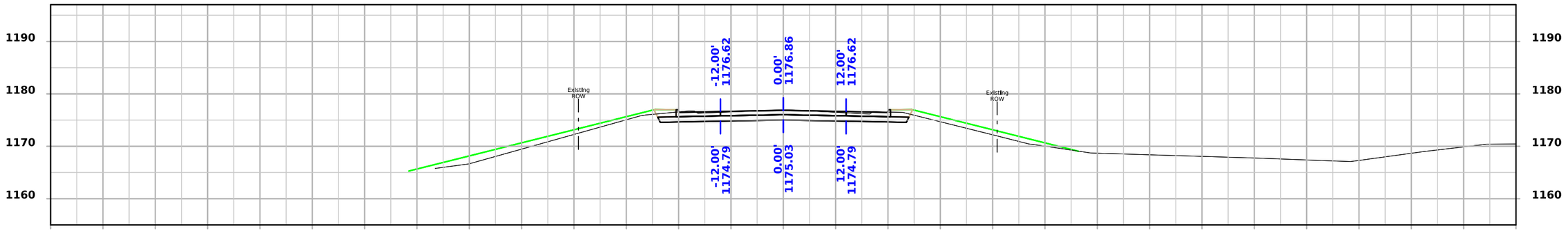

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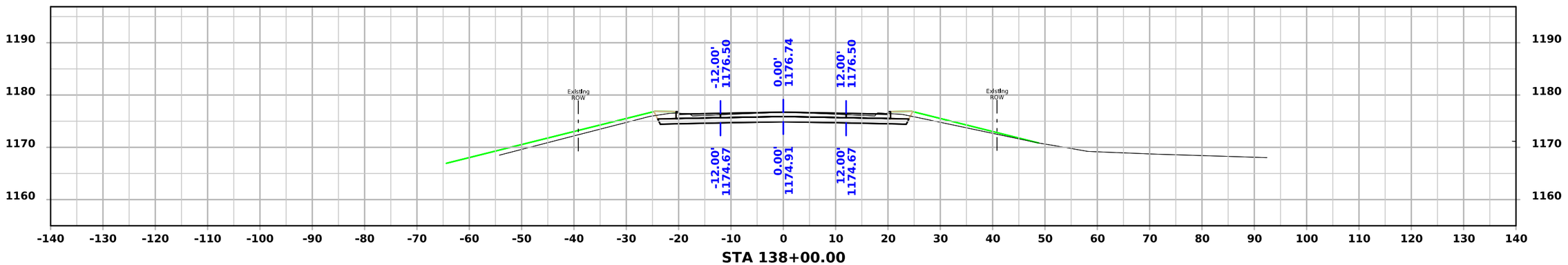

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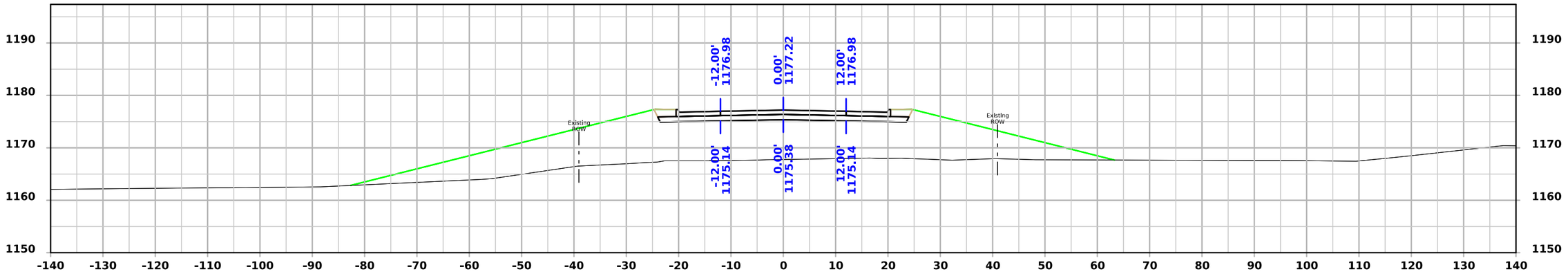

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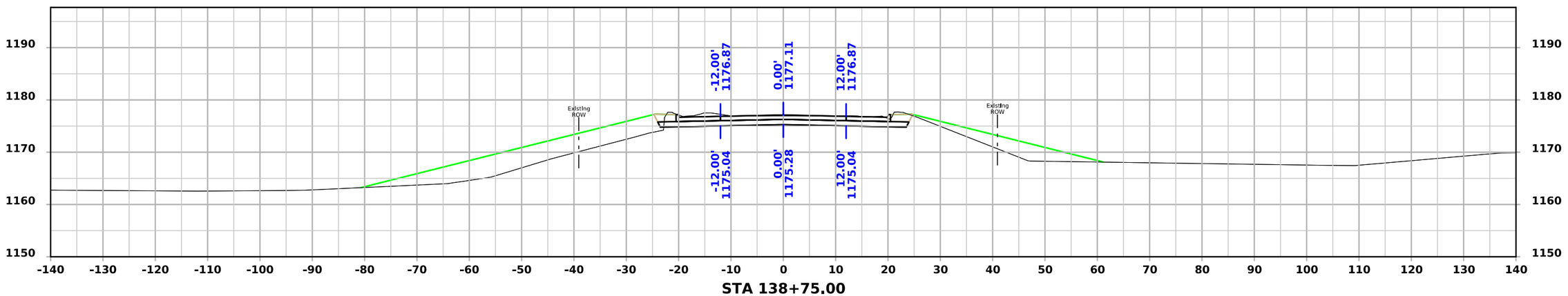

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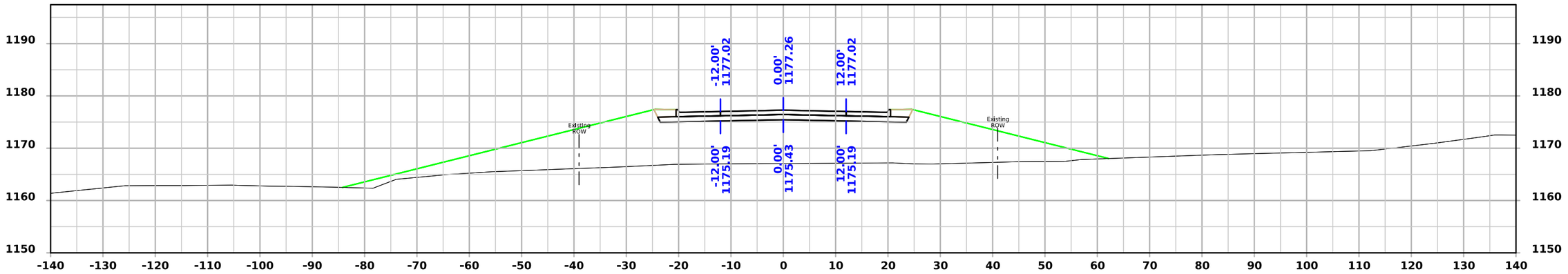

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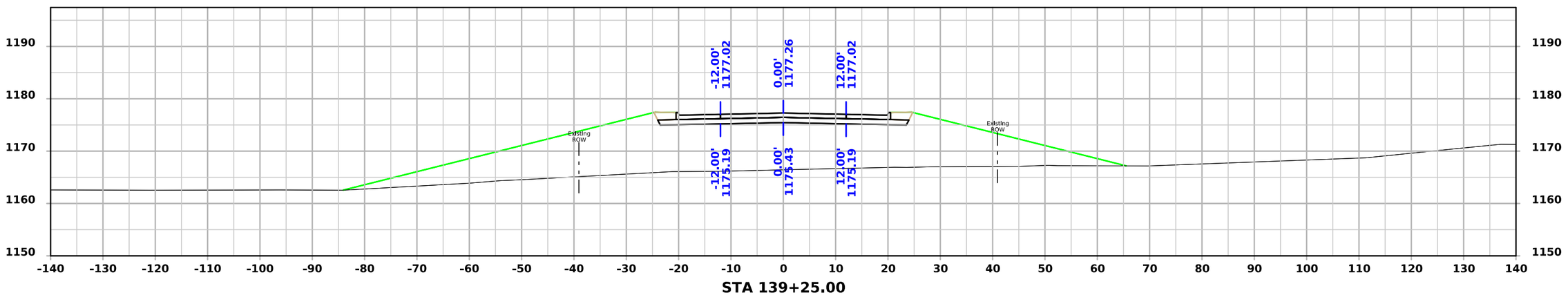

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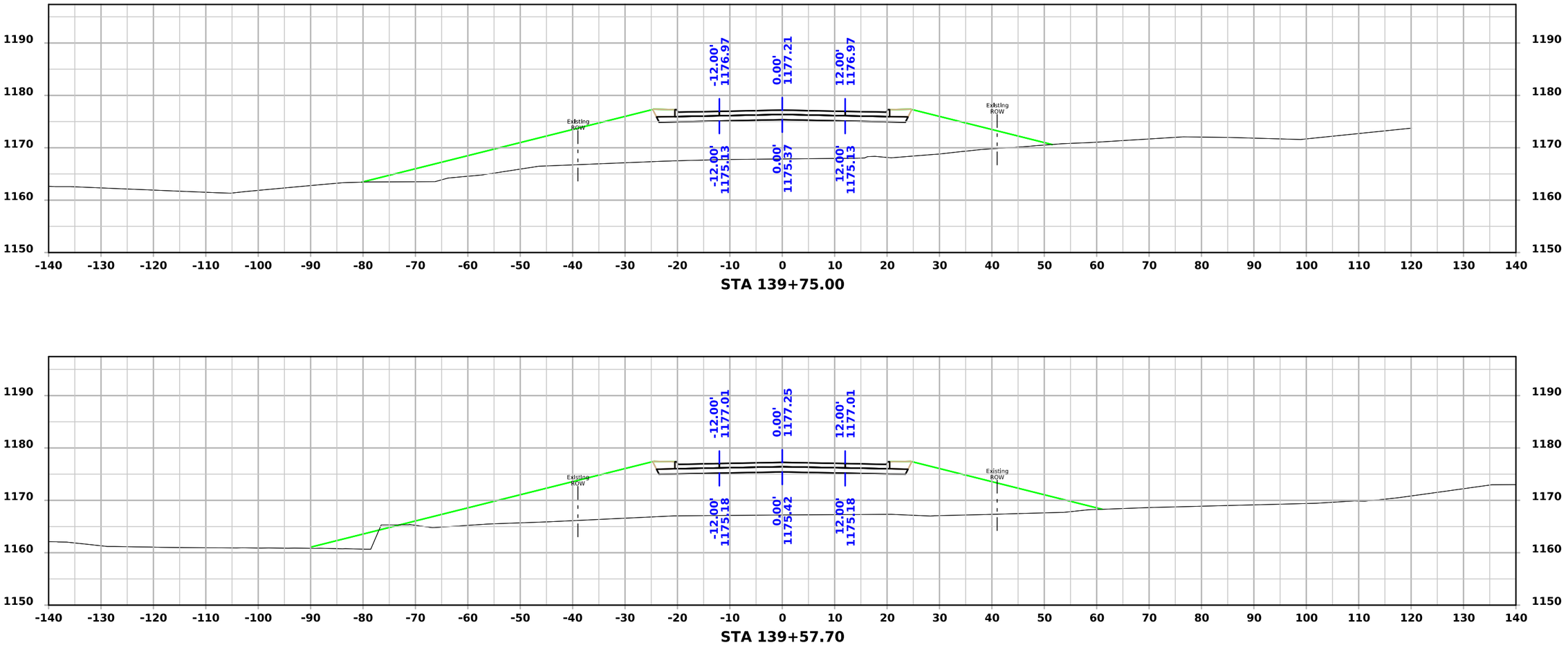

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STA 139+57.70

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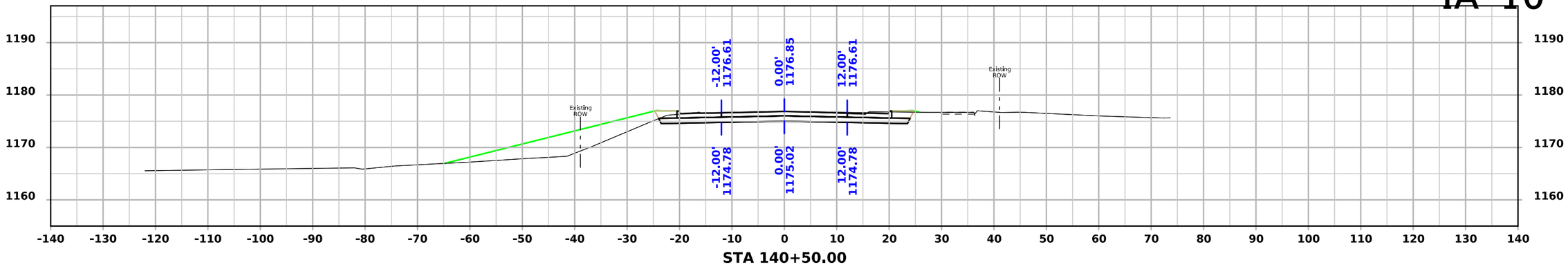

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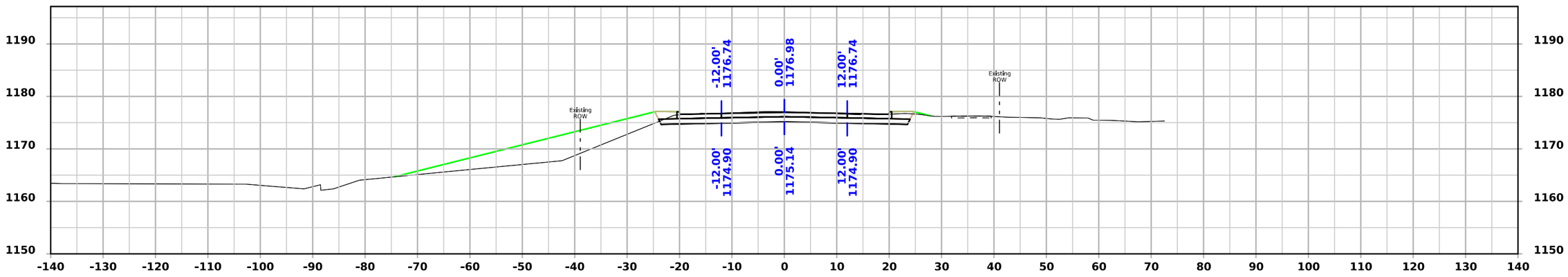

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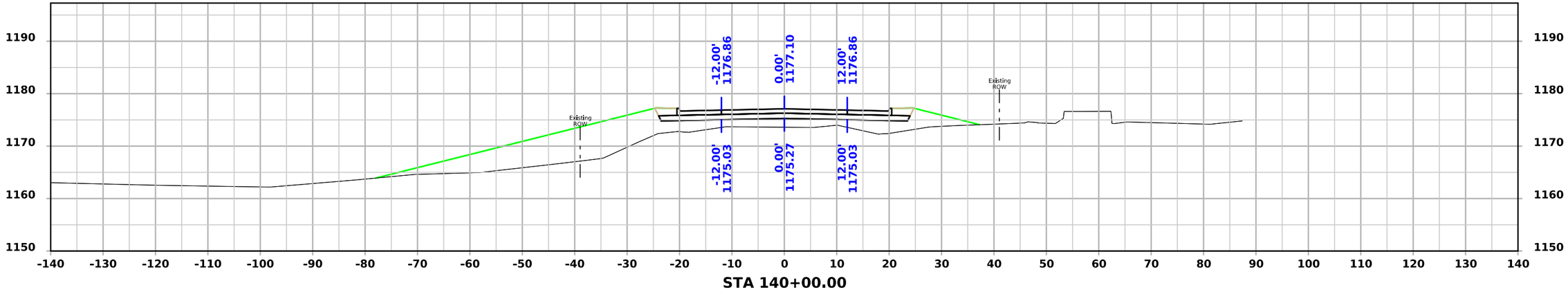

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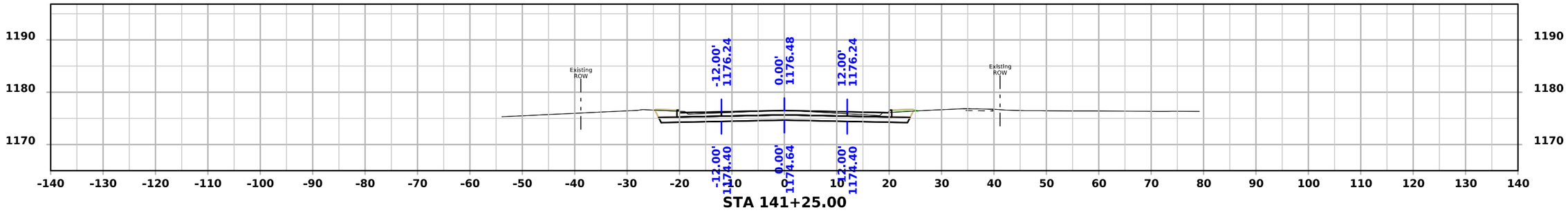

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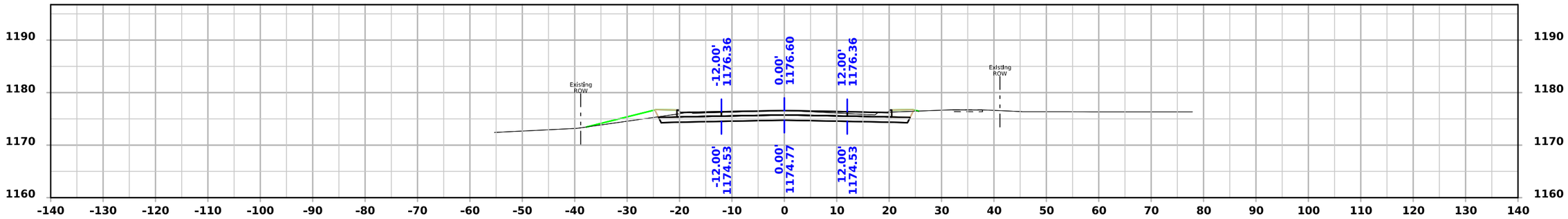

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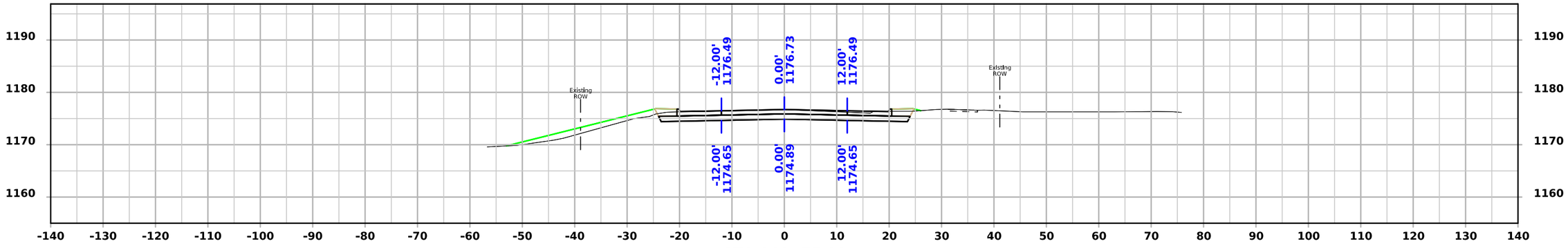

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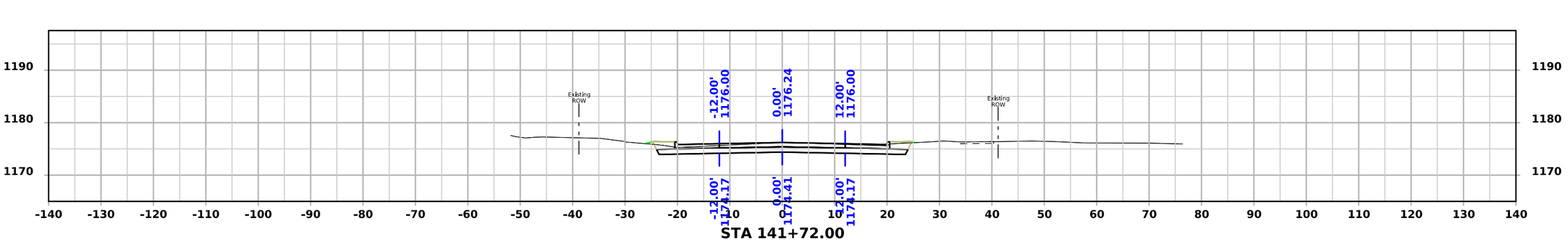

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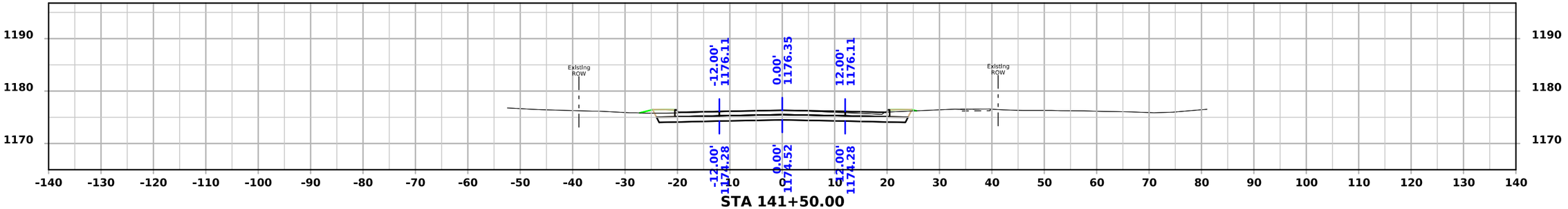

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