

A Sheets	Title Sheets
* A.1	Title Sheet
* A.2	Location Map Sheet
A.3 - 4	Design Criteria (Temporary)
A.4	Concept Statement (Temporary)
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1	Project Description
C.1	Estimated Project Quantities
C.1	Standard Road Plans
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	"Mainline Name"
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.1	Staging Notes Stage
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 2	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 5	Mainline Cross Sections
	* Color Plan Sheets



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

**PRIMARY ROAD SYSTEM
BUTLER COUNTY
RCB CULVERT REPLACEMENT**

IA 57 bridge over Gran Creek 0.5 miles east of County Road T19

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL

24

PROJECT IDENTIFICATION NUMBER

17-12-057-010

PROJECT NUMBER

BRFN-057-1(32)--39-12

R.O.W. PROJECT NUMBER

D3 PLAN - Date: Aug 6, 2019
D4 PLAN - Date: Aug 24, 2021
D5 PLAN - Date: Dec 20, 2019

PRELIMINARY PLANS

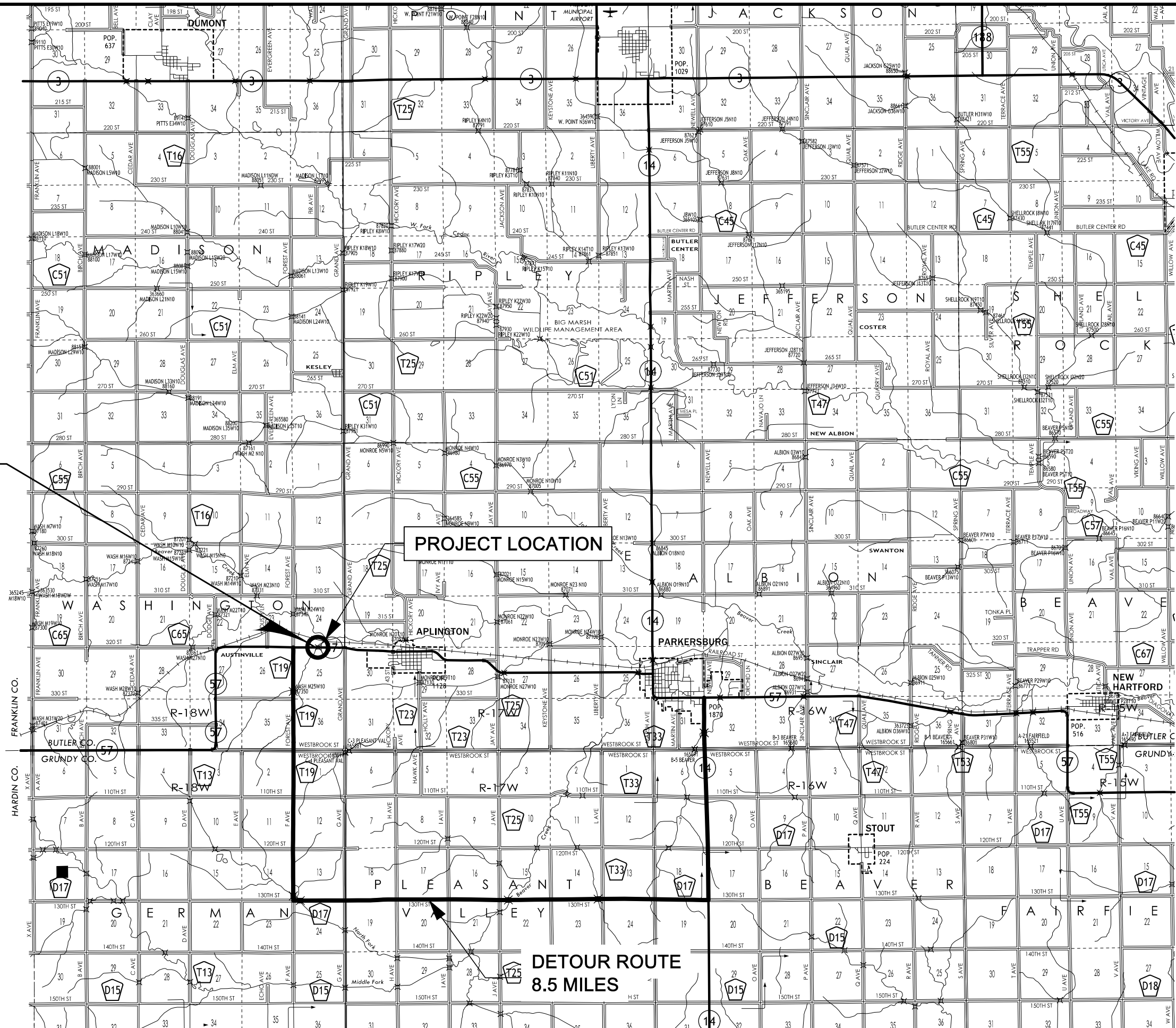
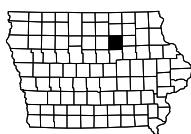
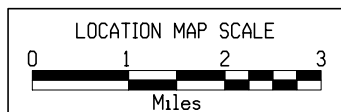
Subject to change by final design.

D2 PLAN - Date: May 20, 2019

DESIGN DATA			
2021	AADT	1,500	V.P.D.
2041	AADT	1,600	V.P.D.
2041	DHV	170	V.P.H.
	TRUCKS	20	%
	Total		
	Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Michael J. Janecek	Primary Signature Block

IA 57 BRIDGE REPLACEMENT
STA.: 211+02
FHWA NO.: 16390
MAINT. NO.: 1216.4S057
GRAN CREEK 0.5 MILES EAST
OF COUNTY ROAD T19



PROJECT LOCATION

DETOUR ROUTE
8.5 MILES

Roadway	IA 57		
PIN Number	17-12-057-010	Submittal Date	12/04/18
Project Number	BRFN-057-1(32)--39-12		Approval Date
District	District 2	Assistant District Engineer	David Little
County	BUTLER	or	
Route	IA 57	Office Director	
Location	Bridge over Honey Creek 1.8 mi W of US 61		
Work Type	Bridge Replacement		
Segment Manager	David Little		
Designer	Jenifer Bates		

Design Manual Section 1C-1

Last Updated: 05-26-17

Rural Two-Lane Highways (Rural Arterials)

Design Element	Preferred	Acceptable	Project Values
Design speed (mph)	60	50	60
Maximum superelevation rate (Refer to Section 2A-2)	6%	8%	6%
Design lane width (ft)	12	12	12
Full depth paved width (ft)	14	12	12
Right turn lane (ft)	12	10	N/A
Climbing Lane (ft)	12	12	N/A
Left turn lane (ft)	12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	1.5% minimum, 2% maximum	2% min/3% max
	Auxiliary and turn lanes	3% maximum	N/A
	Crown break at centerline	4% maximum	N/A
Shoulder cross-slope (on tangent sections)	4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4% min/6% max
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
	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	3 to 1
Transverse Slopes	w/ drainage structures	8:1	6:1
	w/o drainage structures	10:1	6:1
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths
Bridge width—existing*	design lane widths + no less than 2 ft left and right		design lane widths + 2 ft. offset left and right
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14
	Over railroad	23.3	23.3
	Sign trusses and pedestrian bridges	17.5	17
Structural Capacity	Contact Office of Bridges and Structures		Contact Office of Bridges and Structures
Level of Service	B		B

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

Design year ADT = 1600

Design Manual Section 1C-1
Last Updated: 05-26-17 **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	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	6	0	N/A
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	4	0	N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	2*
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	2*
On all other NHS	10	4			
On non-NHS routes with design year ADT > 3000	10	4	Design year ADT < 400 vpd	4	2*
On non-NHS routes with design year ADT < 3000	8	2*			

*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:
 Preferred values used whenever possible, including clear zone calculation.

Roadway Design Speed (mph) = 60

Design Manual Section 1C-1
Last Updated: 05-26-17 **Design Criteria for High Speed Roadways**

Design Element	Preferred Criteria						Acceptable Criteria						Project Values		
	Design Speed, mph						Design Speed, mph								
	50	55	60	65	70	75	50	55	60	65	70	75			
Stopping sight distance (ft) (Refer to Section 6D-1)	425	495	570	645	730	820	425	495	570	645	730	820	570		
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	1330
		e _{max} = 8%	--	--	--	--	--	--	--	758	960	1200	1480	1810	2210
Minimum vertical curve length (ft) (Refer to Section 2B-1)	crest vertical curves		150	165	180	195	210	225	150	165	180	195	210	225	180
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	sag vertical curves	roadways without fixed-source lighting	84	114	151	193	247	312	84	114	151	193	247	312	151
		roadways with fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	136
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	4		3				7	6	6	--	--	--	
		Rural roadways	4		3				5	5	4	4	4	4	3
		Interstates	4		3				5	5	4	4	4	4	
Clear zone	See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						30'		

IOWA DEPARTMENT OF TRANSPORTATION

FINAL PROJECT CONCEPT STATEMENT

TO OFFICE: District 2
ATTENTION: E. Jon Ranney
FROM: Jenifer Bates
OFFICE: Shive-Hattery
SUBJECT: Project Concept Statement; (Final, D0)

DATE: December 5, 2018
PROJECT: Butler County
 BRFN-057-1(32)--39-12
 PIN: 17-12-057-010

IA 57 – Bridge over Gran Creek, 0.5 miles east of Co Rd T19

Butler County
 BRFN-057-1(32)--39-12
 PIN: 17-12-057-010
 Maint No. 1216.4S057
 FHWA No. 16390

Jenifer J. Bates, P.E.
 515-223-8104

December 5, 2018

This project involves the replacement of the IA 57 bridge (Maint. No. 1216.4S057) over Gran Creek, 0.5 miles east of Co Rd T19.

A concept review was held on November 1, 2018. Those present included Nick Humpal from District 2; Steven Schroder, Patricia Schwarz, Steve Seivert and Matthew Erickson from the Iowa DOT and Jenifer Bates, Joe Appel and Mark Harpole from Shive-Hattery.

One alternative was considered:

- 1) Replace the existing bridge with a triple 10' x 12' x 98' RCB with a 25 degree skew and 30 degree headwalls at an estimated cost of \$802,100 (see attached concept for details). Right-of-Way will be required for this project. Traffic will be maintained by an off-site detour.

Alternative 1 is the preferred alternative due to the safety considerations and less maintenance associated with a culvert.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Thursday, November 29, 2018. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2022. The Office of Bridges and Structures will coordinate the plan preparation with the assistance of the Office of Design and Shive-Hattery.

Cc:

C. Purcell	M. J. Kennerly	K. D. Nicholson
S. J. Megivern	J. S. Nelson	B. Walls
G. A. Novey	M. A. Swenson	R. A. Younie
D. R. Tebben	K. Brink	D. L. Newell
J. W. Laaser-Webb	W. A. Sorenson	D. E. Sprengeler
E. C. Wright	M. E. Ross	A. A. Welch
N. M. Miller	C. C. Poole	M. J. Sankey
B. E. Azeltine	B. D. Hofer	T. D. Crouch
S. J. Gent	S. Anderson	P. C. Keen
J. Selmer	K. K. Patel	S. Godbold
D. R. Claman	J. Hauber	A. Abu-Hawash
M. E. Khoda	K. Olson	S. Neubauer
T. Abbett	M. Kelly	B. Dolan
P. Hjelmstad	N. Humpal	D. Little
D. Roeber	K. Rostad	M. K. Solberg
G. Pavelka	R. Loecher	R. Gelhaus
J. Bartholomew		

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 57 bridge (Maint. No. 1216.4S057) over Gran Creek, 0.5 miles east of Co Rd T19.

One alternative was considered:

1. Replace the existing bridge with a triple 10' x 12' x 98' RCB with a 25 degree skew and 30 degree headwalls.

Alternative 1 is the preferred alternative due to the safety considerations and less maintenance associated with a culvert.

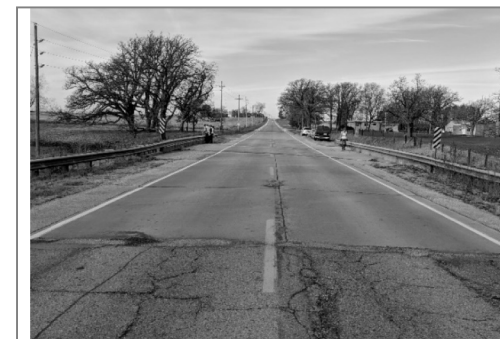
Right-of-Way will be required for this project.

Traffic will be maintained by an off-site detour.

The preliminary project cost is \$802,100.

B. Need for Project

The existing structure is a 35' long by 42.9' wide steel beam bridge on a 30 degree skew built in 1923 and is near the end of its useful life. The bridge was designed for H20 design load.



Looking west along IA 57



Looking north at bridge

SH Project #4172083

SH Project #4172083

Shive-Hattery | 4125 Westown Parkway | Suite 100 | West Des Moines, IA 50266 | 515.223.8104 | shive-hattery.com

Shive-Hattery | 4125 Westown Parkway | Suite 100 | West Des Moines, IA 50266 | 515.223.8104 | shive-hattery.com



C. Present Facility

IA 57 is a two lane roadway. The existing structure is a one span, 35 ft. long x 42.9 ft steel beam bridge on a 30 degree skew constructed in 1923 and then reconstructed for widening in 1962.

IA 57 in the project area was originally constructed in 1930 as an 18 ft. PCC road. IA 57 was then widened to 24' in 1956, then resurfaced with HMA in 1995. IA 57 has 4 ft. wide granular shoulders with 3:1 foreslopes.

D. Traffic Estimates

The 2021 construction year and 2041 design year average daily traffic estimates are 1,500 ADT with 19% trucks and 1,600 ADT with 20% trucks, respectively.

E. Sufficiency Ratings

IA 57 is classified as an Area Development route and is a maintenance service level "C" road. The federal bridge sufficiency rating is 67.2.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from 2013 through 2017, there were no reported crashes near the bridge.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a culvert

Replace the existing bridge with a triple 10' x 12' x 98' RCB with a 25 degree skew and 30 degree headwalls. The typical cross section will consist of a 24 ft. roadway with 8 ft. effective shoulders (2' paved and 6 ft. granular) and 6:1/3:1 foreslopes.

The roadway will be reconstructed on the existing vertical and horizontal alignment. The flow line of the box will be buried 1 ft. below the existing flow line in the channel. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be placed at the ends of the RCB.

The removal of the existing bridge and bridge approach pavement will require approximately 185 ft. of new 9 in. PCC pavement over 12 in. of modified subbase, including the installation of subdrains.

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

Right of way appears to be required for this project.

Traffic will be maintained by an off-site detour.

<u>Culvert Items</u>	<u>Estimated Costs</u>
New Culvert Triple 10'x12'x98'	\$249,600
Headwalls 45 deg	\$156,700
Engineering Fabric	\$900
Revetment	\$16,300
Remove Existing Structure	\$11,200
Mobilization – 10%	\$43,500
Contingency – 20%	\$95,600
Culvert Costs	\$573,800
<u>Roadway Items</u>	
Removal of Pavement	\$9,100
PCC Pavement	\$36,300
Modified Subbase	\$12,150
Granular Shoulder	\$3,750
Embankment in place, contractor furnished	\$26,000
Clearing and Grubbing	\$10,000
Erosion Control	\$50,000
Right of Way	\$10,000
Traffic Control - 5%	\$9,000
Mobilization - 5%	\$9,000
M & C - 30%	\$53,000
Roadway Costs	\$ 228,300
Project Total	\$802,100

Other Alternatives Considered

Other alternatives discussed included a three span, 100' x 40' continuous concrete bridge option, a box culvert using a runaround option, a box culvert using staged construction with temporary traffic signals, and a flowable mortar box culvert option.

A bridge option was discussed at the site visit, but a box culvert option was preferred by both the District and Iowa DOT bridge design office due to the safety considerations and less maintenance associated with a culvert. Therefore, this option was dismissed from further consideration.

This project site is not the most desirable location for a runaround. There is limited sight distance to the east which would require advanced signage to help with the sight distance issue. There is at least one residential yard and driveway on the north side of the road that would be impacted. There is a big grade difference between the roadway and the land adjacent to the bridge and the land slopes away from the road so may require a larger footprint for the runaround. The south side of the road has utility poles in conflict and some big trees. Also, it looks like there may be an issue with soil stability for building a runaround based on the mucky conditions present during the site visit.

The flowable mortar method was dismissed due to minimum clearances not being met for either the twin or triple RCB options. Both precast and CIP options were reviewed.

A twin 12' x 12' RCB was considered for staged construction. This width of RCB has lesser of an impact on staged construction limits but does not function as well hydraulically as the triple RCB proposed. The culvert length could be the same 98' for stage II traffic if a temporary concrete barrier was used on each side to protect the clear zone. If a temporary concrete barrier was not used on the outside during stage II traffic, then an additional 18' length of culvert would be required for clear zone. Staged construction was dismissed due to the greater impacts on the property owners and the culvert size not functioning as well hydraulically.

B. Detour Analysis

IA 57 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 75 days. The detour would follow County Road T19 south to the junction with County Road D17, then east on County Road D17 to junction with IA14, then north on IA14 to junction with IA 57. Out of distance travel is 8.5 miles. The total distance user cost is anticipated to be \$362,309. The cost for county road maintenance will be \$28,777 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.

D. Construction Sequence

It is anticipated all work on this project will be awarded to one prime contractor. The Office of Bridges and Structures will coordinate the plan preparation with the assistance of the Office of Design and Shive-Hattery.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 57; 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 27 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.

Right-of-Way will be required for this project.

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.

The Office of Location and Environment has not reviewed this project at this time to determine if a Section 404 permit will be require.

G. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2018-2022 Iowa Transportation Improvement Program with \$950,000 for replacement in FY 2022. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

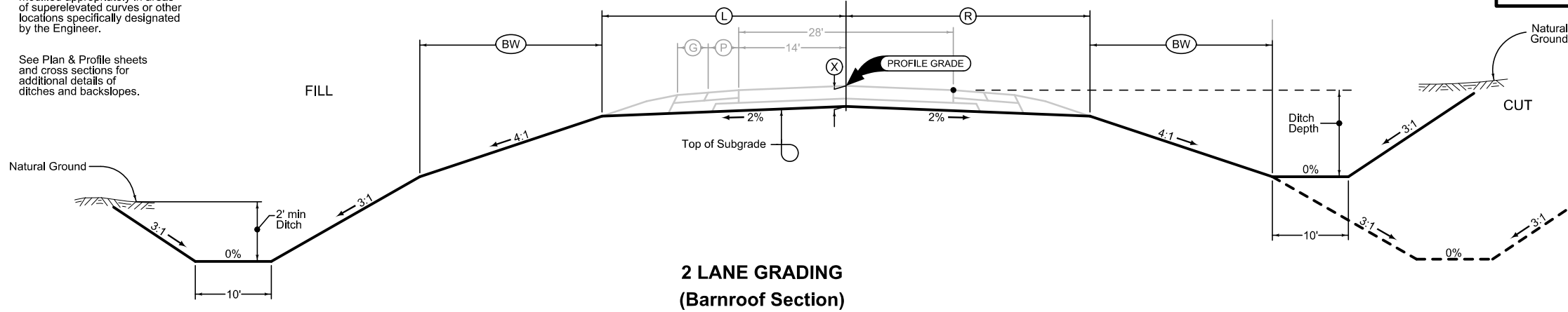
Following page has a map of the county and location of project area.

Attachment A – Utility contacts will be added as an attachment upon receipt from the District

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L)	(R)	(X)	(BW)
			Feet	Feet	Inches	Feet
IA 57	210+11.58	212+10.18	27.09	27.09	15.5	14.91

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

See Plan & Profile sheets and cross sections for additional details of ditches and back-slopes.

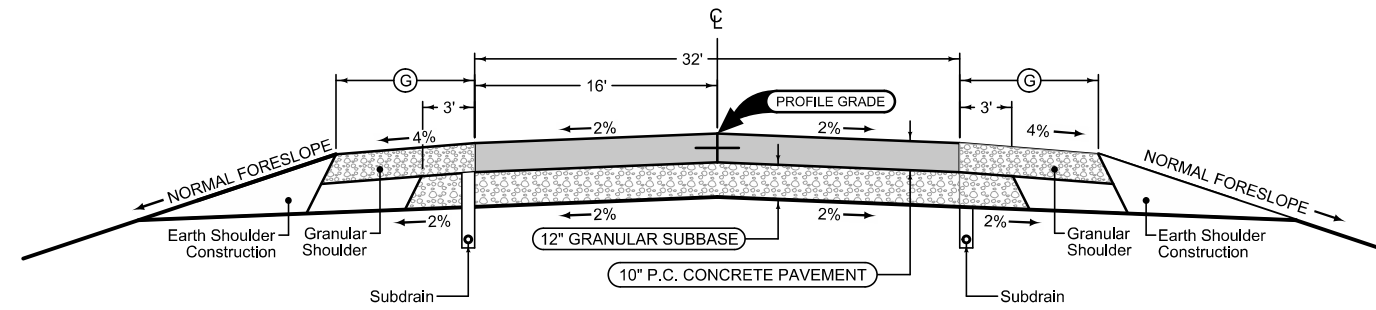


Granular Shoulder

2_G_SR_10-19-10		
STATION TO STATION		Ⓞ Feet
210+11.58	212+10.18	6

Granular Shoulder

2_G_SR_10-19-10		
STATION TO STATION		Ⓞ Feet
210+11.58	212+10.18	6



Mainline Jointing:
 Transverse joints: CD at 20' spacing
 Longitudinal joint: L-2

2P_10-19-10		
STATION TO STATION		
210+11.58	212+10.18	

See Tab 100-24 or 100-25 for pavement quantities.
 See Tab 112-9 for shoulder quantities.

IA 57

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves the replacement of the IA 57 bridge over Gran Creek, 0.5 miles East of County Road T19, with a triple 10' x 12' RCB culvert.

105-4
10-18-11

STANDARD ROAD PLANS

100-0A
10-28-97

**ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)**

The following Standard Road Plans apply to construction work on this project.

Item No.	Item Code	Item	Unit	Total	As Built Qty.

Number	Date	Title
DR-303	10-17-17	Subdrains (Longitudinal)
DR-305	04-17-18	Subdrain Outlets (standard Subdrain, Pressure Release and Special)
EC-201	10-16-18	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	04-18-17	Perimeter and Slope Sediment Control Devices
EC-301	10-18-16	Rock Erosion Control (REC)
EW-101	10-17-17	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
PM-110	10-16-18	Line Types
PM-420	04-19-11	Two-Lane Roadway with no Turn Lanes (One-Way Stop Condition)
PV-101	10-16-18	Joints
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-252	04-19-16	Routes Closed to Traffic

SURVEY SYMBOLS

- CP Control Point
- WC Wild Card (Misc. Field Shot)
- C Centerline BL of Road (ML or SR)
- EP Edge of Paved Roads (ML or SR)
- EG Edge of Gravel Road
- BL Topo Breakline
- GR Ground Shot
- FW Wire Fence
- LUM Luminaire
- MIS Miscellaneous
- EL1C Electric Line Co. 1 - Quality C
- TPD Telephone Pedestal
- SIGN
- GDL Guard Rail Steel
- CU Back of Curb
- BM Bench Mark
- TLNR Tree Line Right
- PPA Power Pole Co. 1
- EL1B Electric Line Co. 1 - Quality B
- TDC Tree Deciduous
- LC Lot Corner
- BCL Bridge Centerline
- TW Top of Water
- OUT Tile Outlet
- TL1C Telephone Line Co. 1 - Quality C
- FO1C Fiber Optic Co. 1 - Quality C
- ROW Right of Way Mark
- TL1B Telephone Line Co. 1 - Quality B
- D Centerline Draw or Stream (Down)
- BRG Bridge
- BBB Bottom of Bridge Beam
- TOP Top of Bridge Pier
- WL1C Water Line Co. 1 - Quality C

UTILITY LEGEND

- LUM Luminaire
- MidAmerican Energy - Quality C
- TPD Telephone Pedestal
- PPA Power Pole MidAmerican Energy
- MidAmerican Energy - Quality B
- Windstream Communications - Quality C
- Windstream Communications - Quality C
- Iowa Reginal Utility Assoc. - Quality C

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.	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

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

RIGHT-OF-WAY LEGEND

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

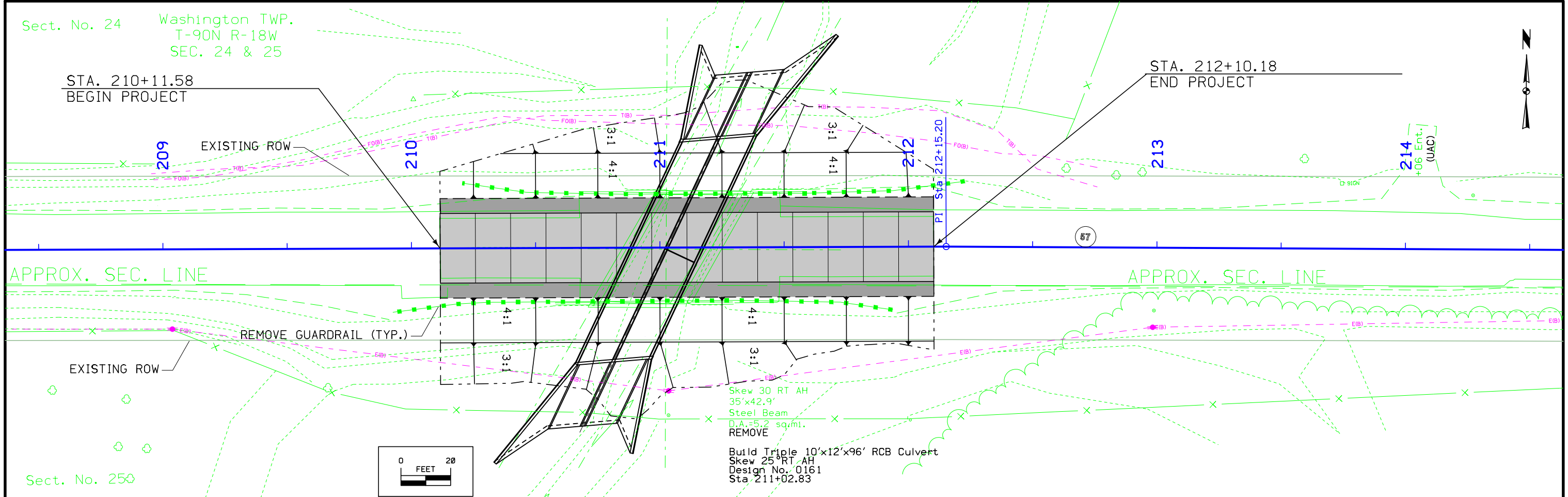
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

Sect. No. 24 Washington TWP.
T-90N R-18W
SEC. 24 & 25

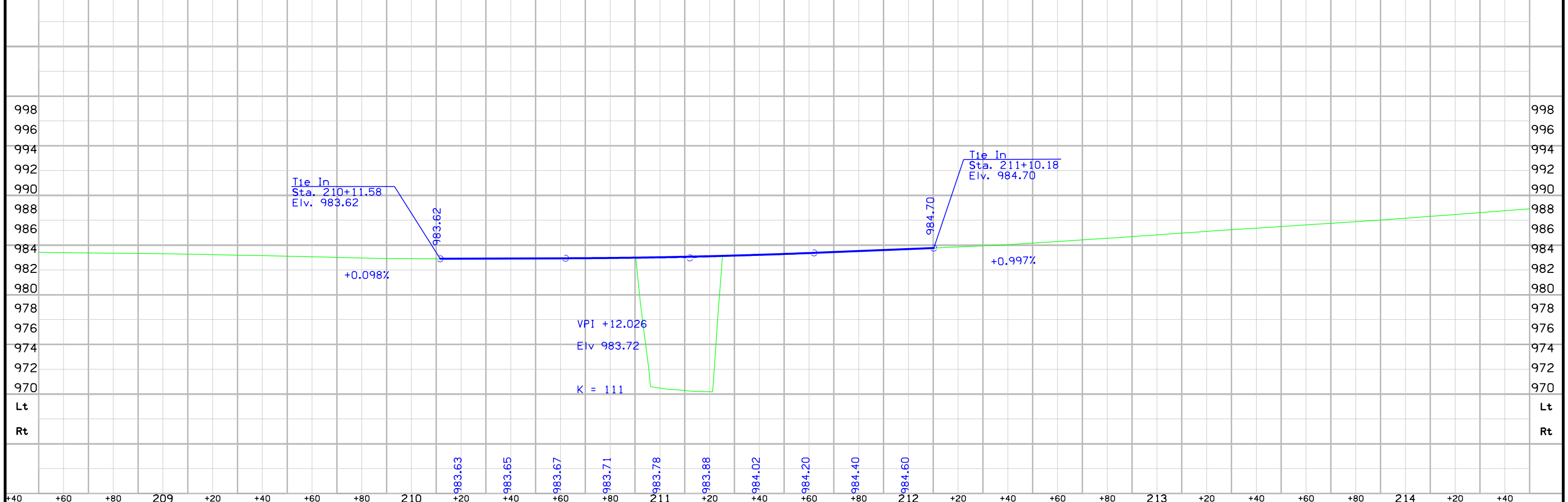
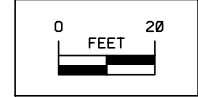
STA. 210+11.58
BEGIN PROJECT

STA. 212+10.18
END PROJECT



Skew 30° RT AH
35'x42.9'
Steel Beam
D.A.=5.2 sq.m.
REMOVE

Build Triple 10'x12'x96' RCB Culvert
Skew 25° RT AH
Design No. 0161
Sta. 211+02.83



FILE NO. ENGLISH DESIGN TEAM IOWA DOT / SHIVE-HATTERY BUTLER COUNTY PROJECT NUMBER BRFN-057-1(32)--39-12 SHEET NUMBER D.2

Survey Information

Butler County
BRFN-057-1(32)-39-12
State Hwy 57 over Gran Creek
0.5mi E of Co Rd T19
PIN 17-12-057-010
Sap-08301

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction and reconstruction of State Highway 57 over Gran Creek. Project datum and control information is provided by Shive-Hattery Inc. This project is a Terrain Model and Survey control. This survey request was for the State Highway 57 corridor and Gran Creek information.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). Additional benchmarks were placed throughout the project using a Total Station setup relative to Pt. 1 and Pt. 2.

This survey observed 4 local area county Control Monuments with published NAVD88 heights to compare to local ground control:

Jones County Control mark GPS 20 has a published Elev. of 1016.05
Survey Elev. = 1016.05

Jones County Control mark GPS 19 has a published Elev. of 1085.87
Survey Elev. = 1085.81

Jones County Control mark GPS 116 has a published Elev. of 1038.76
Survey Elev. = 1038.62

Jones County Control mark GPS 124 has a published Elev. of 1015.25
Survey Elev. = 1015.19

Horizontal Control

(State Plane Coordinates)

The project coordinate system for this survey is Iowa Regional Coordinate System - Zone 5 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by laRTN observations with appropriate occupation times. Additional control points were placed throughout the project using a Total Station setup relative to Pt. 1 and Pt. 2.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. FN-274, Design 161. Survey stationing was equated to the plan centerline of bridge at STA 211+07.1 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

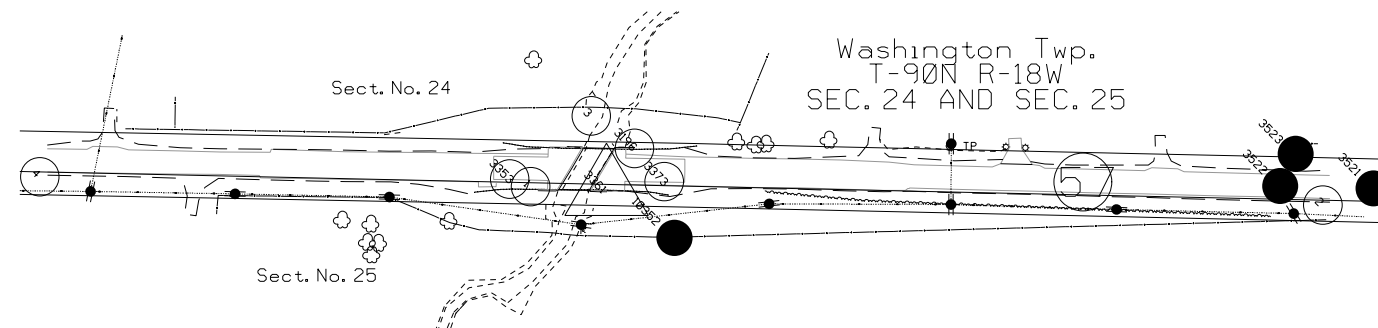
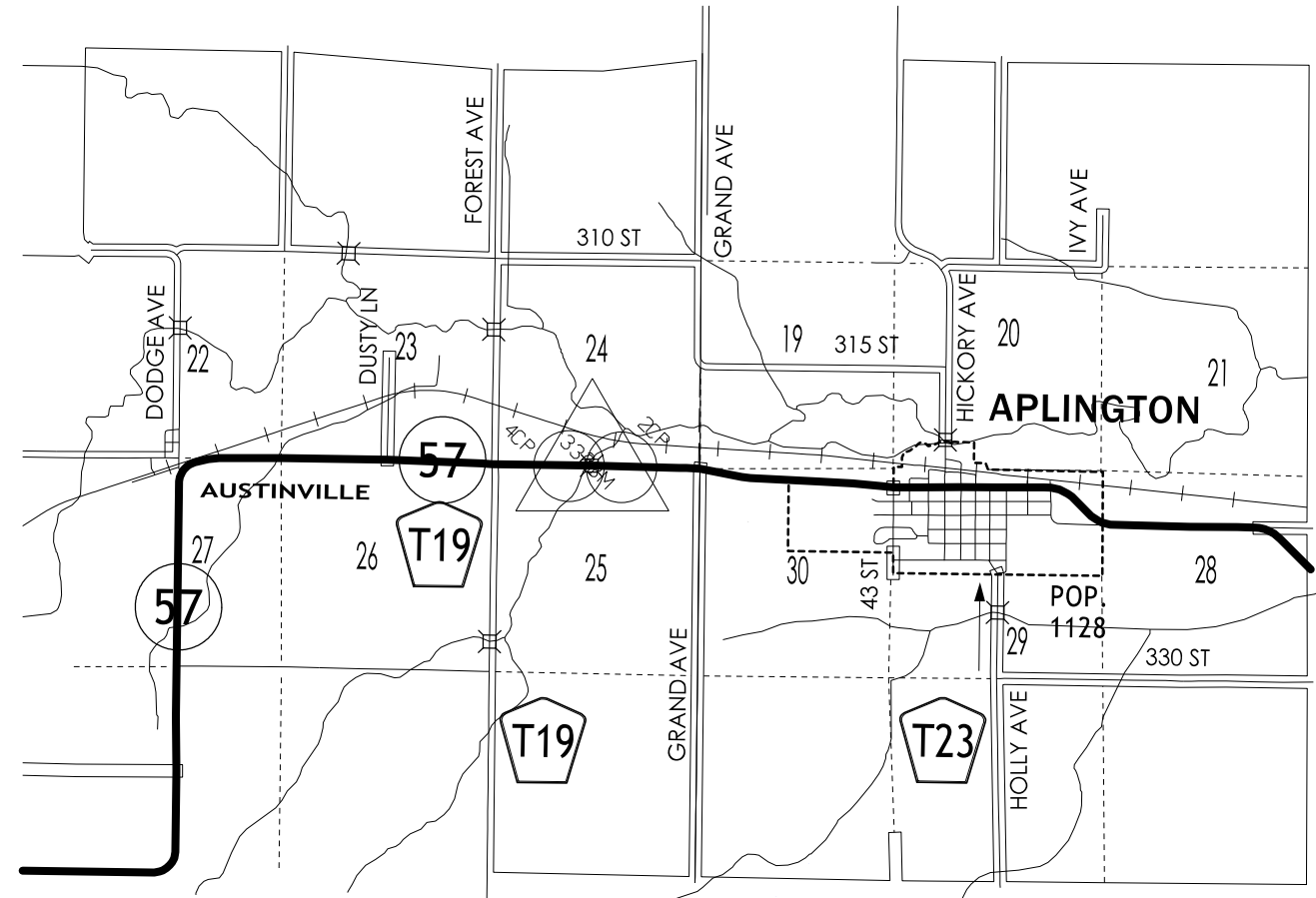
PI Sta. 185+62.75 Project No. FA-274

PI Sta 212+15.2 Project No. FA-274

POT Sta 224+57.5 Project No. FA-274

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 5

Coordinate listing from next sheet will be used with 1aRTN for monument
 recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 5

Point Name	Northing	Easting	Elevation	Feature Definition	Description
1	8877114.489	15320024.53	983.17	CP	TEMP CP
2	8877095.32	15320847.49	999.75	CP	CP
3	8877187.961	15320087.55	975.055	CP	TEMP CP
4	8877124.743	15319514.64	985.02	CP	CP
3196	8877154.214	15320132.41	984.766	CP	CX
3353	8877122.334	15320002.8	983.367	CP	CX
3361	8877109.606	15320103.4	984.644	BM	BM
3373	8877119.609	15320163.3	984.228	CP	CX
3521	8877112.656	15320900.14	1002.524	LC	IR PK
3522	8877115.109	15320803.15	998.918	LC	IR PK
3523	8877148.46	15320819.25	996.736	LC	IR PK
10352	8877061.244	15320173.98	980.066	LC	IR DOT ALUM CAP

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)
ML057 (IA 57)																			
ML0571		205+78.88	8,877,141.14	15,319,553.57															
ML0573		212+15.20	8,877,130.70	15,320,189.81															
ML0574		217+69.82	8,877,116.62	15,320,744.24															

108-26A
08-01-08

STAGING NOTES

Stage 1:
With traffic using detour, remove and replace bridge over Gran Creek with culvert.

Stage 2:
Reopen IA 57 to normal traffic pattern, using flaggers when needed.

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1) While bridge and approaches are being removed and replaced with RCB culvert, traffic shall be maintained via an off-site detour. Detours are furnished, maintained and removed by the Contractor.

2) Contractor will furnish, install, maintain, and remove detour signs. All existing signs that conflict with detour shall be covered. These functions shall be included in the Traffic Control Bid Item.

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
			No Travel Restrictions Expected									

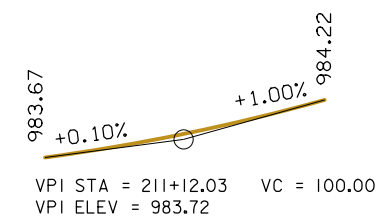
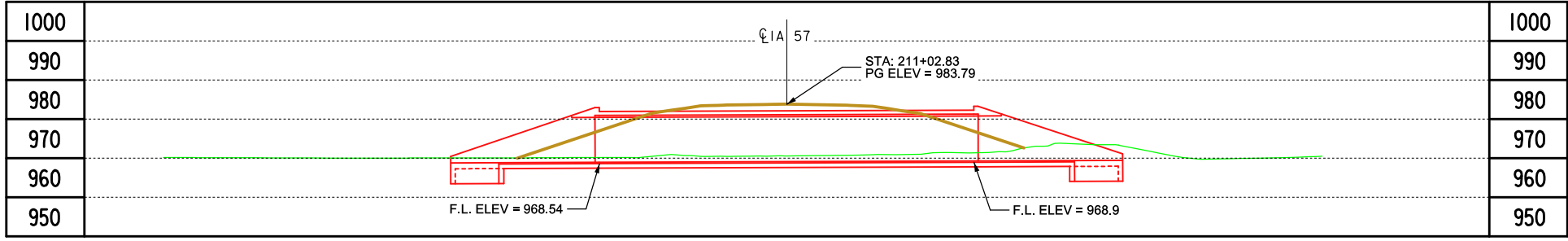
111-01
04-17-12

COORDINATED OPERATIONS

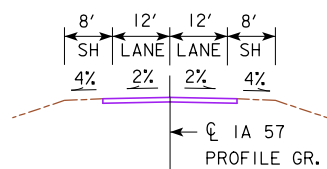
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None Provided	

BENCH MARK NO.

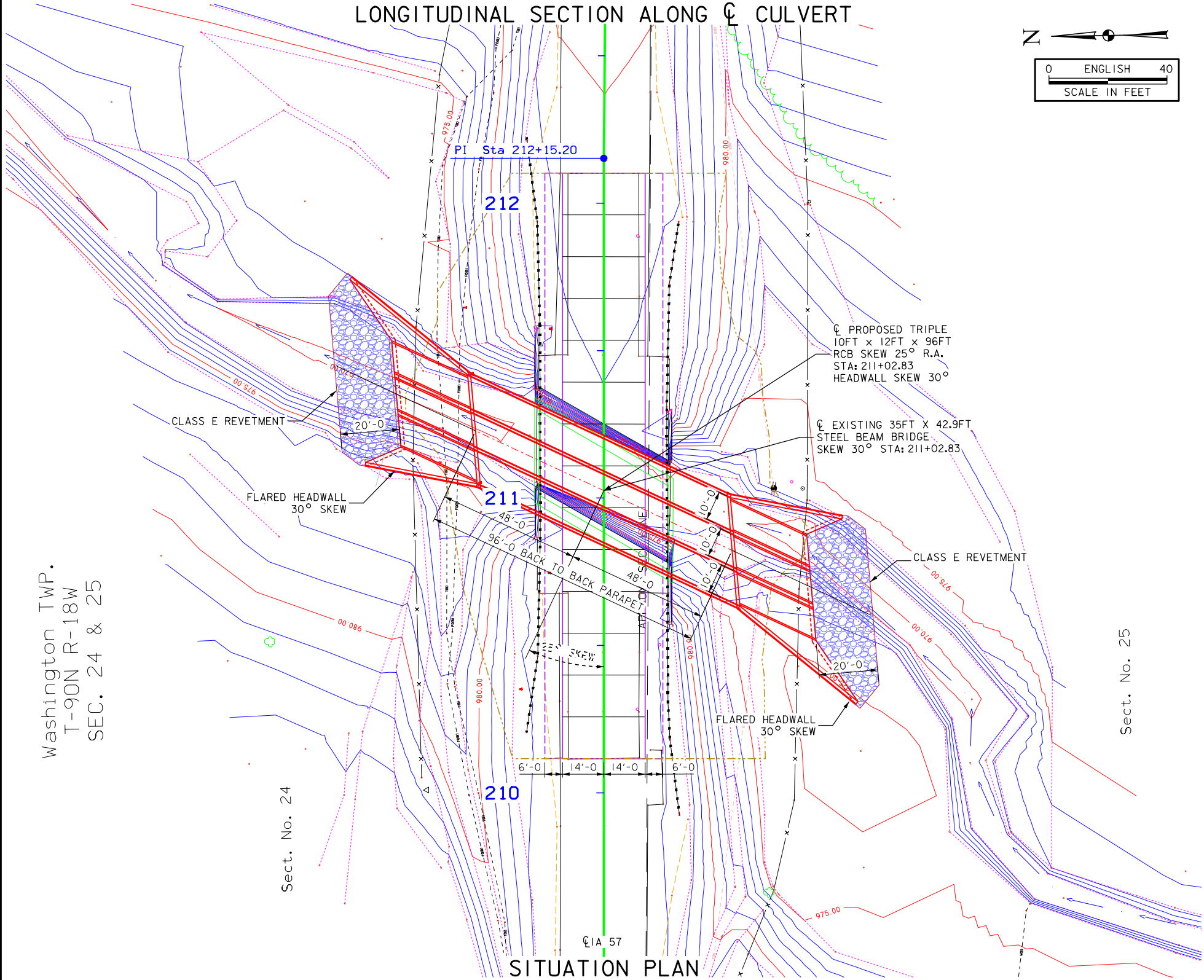
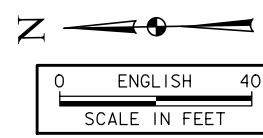


PROPOSED PROFILE GRADE IA 57



TYPICAL APPROACH SECTION

LONGITUDINAL SECTION ALONG CL CULVERT



CL PROPOSED TRIPLE
10FT x 12FT x 96FT
RCB SKEW 25° R.A.
STA: 211+02.83
HEADWALL SKEW 30°

CL EXISTING 35FT X 42.9FT
STEEL BEAM BRIDGE
SKEW 30° STA: 211+02.83

Washington TWP.
T-90N R-18W
SEC. 24 & 25

Sect. No. 24

Sect. No. 25

SITUATION PLAN

HYDRAULIC DATA

DRAINAGE AREA = 5.2 SQ. MI.
Q₅₀ = 2,740 CFS
HW ELEV. = 979.3
STREAM SLOPE = 24.0 FT./MI.
Q₁₀₀ =
Q₅₀₀ =

NOTES:

- EXISTING 35' x 43' STEEL BEAM BRIDGE DESIGN NO. 161.
- DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
- FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
- SEDIMENT REDUCTION WEDGES WILL BE NEEDED AT THE INLET OF THE CULVERT.

UTILITIES LEGEND:

- FO(B) — FIBER OPTIC LINE WINDSTREAM COMM
- E(B) — OVERHEAD ELECTRIC MIDAMERICAN ENERGY
- T(B) — TELEPHONE LINE WINDSTREAM COMM

LOCATION

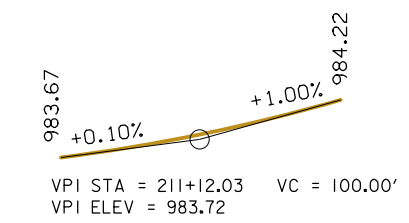
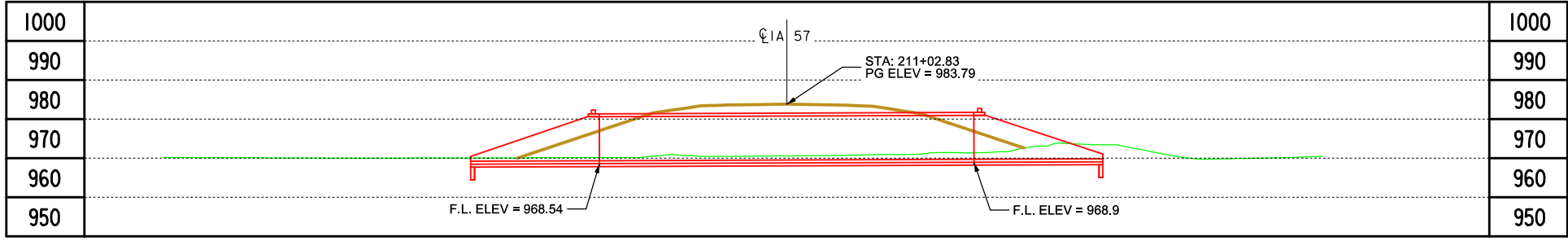
IA 57 BRIDGE OVER GRAN CREEK
T-90N R-18W
SECTION 24 & 25
WASHINGTON TOWNSHIP
BUTLER COUNTY
FHWA NO. 16390
BRIDGE MAINT. NO. 1216.4S057
LATITUDE 42.585312°
LONGITUDE -92.918024°

TRAFFIC ESTIMATE

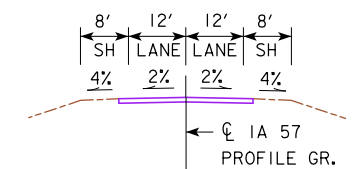
2021 AADT	1500	V.P.D.
2041 AADT	1600	V.P.D.
2041 DHV	170	V.P.H.
TRUCKS	20	%
TOTAL DESIGN ESALS		

PRELIMINARY
DESIGN FOR 25° SKEW
**TRIPLE 10'-0 X 12'-0 X 96'-0
CAST IN PLACE RCB CULVERT**
SITUATION PLAN
STATION 211+02.83 MAY 2019
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ___ OF ? FILE NO. ? DESIGN NO. 0161

BENCH MARK NO.

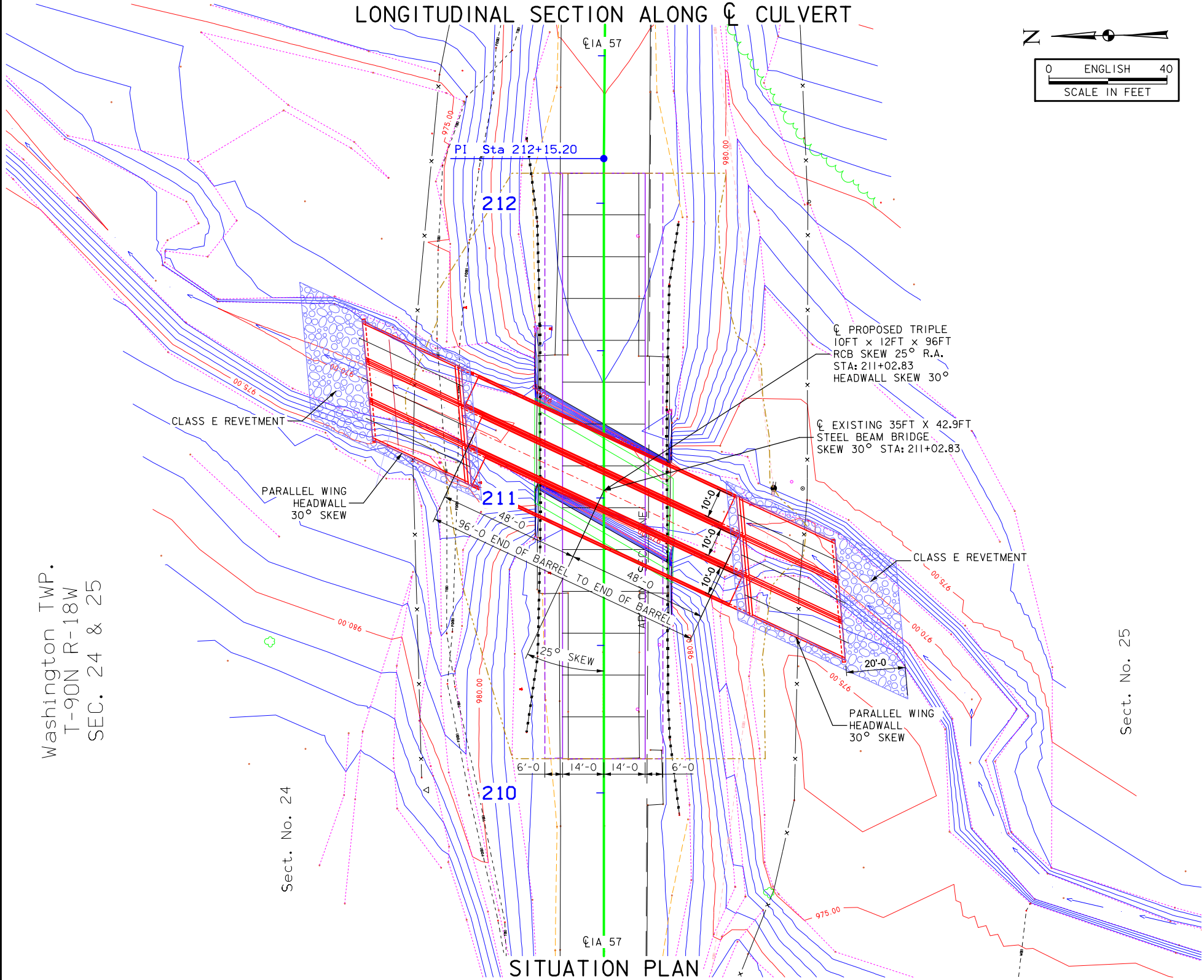
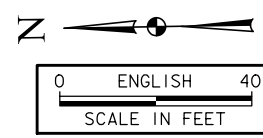


PROPOSED PROFILE GRADE IA 57



TYPICAL APPROACH SECTION

LONGITUDINAL SECTION ALONG CL CULVERT



HYDRAULIC DATA

DRAINAGE AREA = 5.2 SQ. MI.
 Q₅₀ = 2,740 CFS
 HW ELEV. = 979.3
 STREAM SLOPE = 24.0 FT./MI.
 Q₁₀₀ =
 Q₅₀₀ =

NOTES:

- EXISTING 35' x 43' STEEL BEAM BRIDGE DESIGN NO. 161.
- DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
- FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
- SEDIMENT REDUCTION WEDGES WILL BE NEEDED AT THE INLET OF THE CULVERT.

UTILITIES LEGEND:

- FO(B) — FIBER OPTIC LINE WINDSTREAM COMM
- E(B) — OVERHEAD ELECTRIC MIDAMERICAN ENERGY
- T(B) — TELEPHONE LINE WINDSTREAM COMM

LOCATION

IA 57 BRIDGE OVER GRAN CREEK
 T-90N R-18W
 SECTION 24 & 25
 WASHINGTON TOWNSHIP
 BUTLER COUNTY
 FHWA NO. 16390
 BRIDGE MAINT. NO. 1216.4S057
 LATITUDE 42.585312°
 LONGITUDE -92.918024°

TRAFFIC ESTIMATE

2021 AADT	1500	V.P.D.
2041 AADT	1600	V.P.D.
2041 DHV	170	V.P.H.
TRUCKS	20	%
TOTAL DESIGN ESALS		

PRELIMINARY
 DESIGN FOR 25° SKEW
TRIPLE 10'-0 X 12'-0 X 96'-0
PRECAST RCB CULVERT
 SITUATION PLAN
 STATION 211+02.83
BUTLER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. _____ OF ? FILE NO. ? DESIGN NO. 0161

LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- - - - - - Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- - - - - Additional Topsoil Removal
- Subgrade Treatment
- - - - - Granular Shoulder
- Pavement
- - - - - Existing Pipe\RCS
- Proposed Pipe\RCS
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- Topsoil (Class 10)
- Slope Dressing Only
- Class 10 Materials
- Select Loams And Clay-Loams
- Select Sand
- Unsuitable Type A Disposal
- Unsuitable Type B Disposal
- Unsuitable Type C Disposal
- Shale
- Waste
- Broken and Weathered Rock
- Solid Rock
- Boulders

Note: All layer lines and descriptions identify layers above the line.

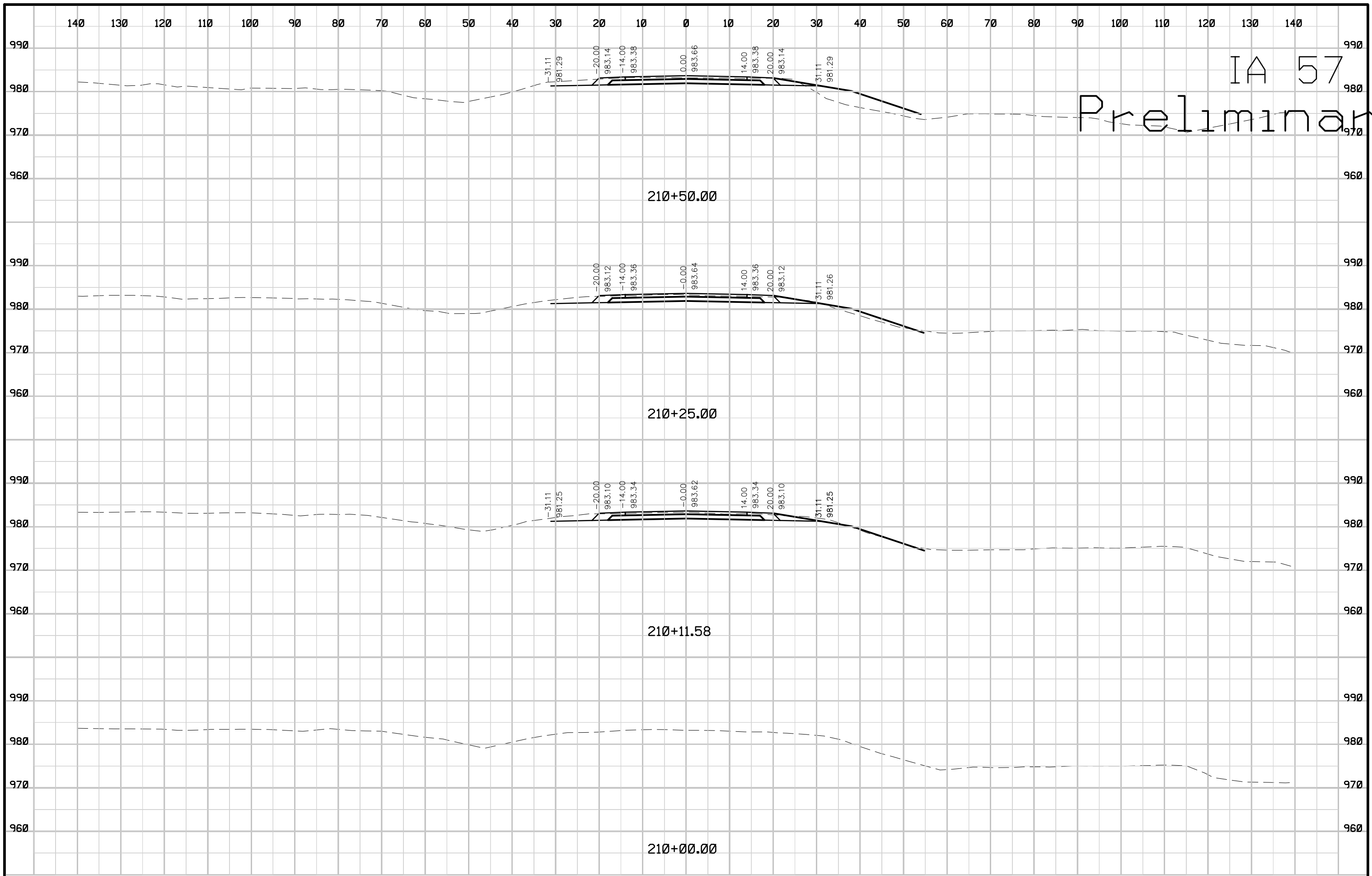
Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

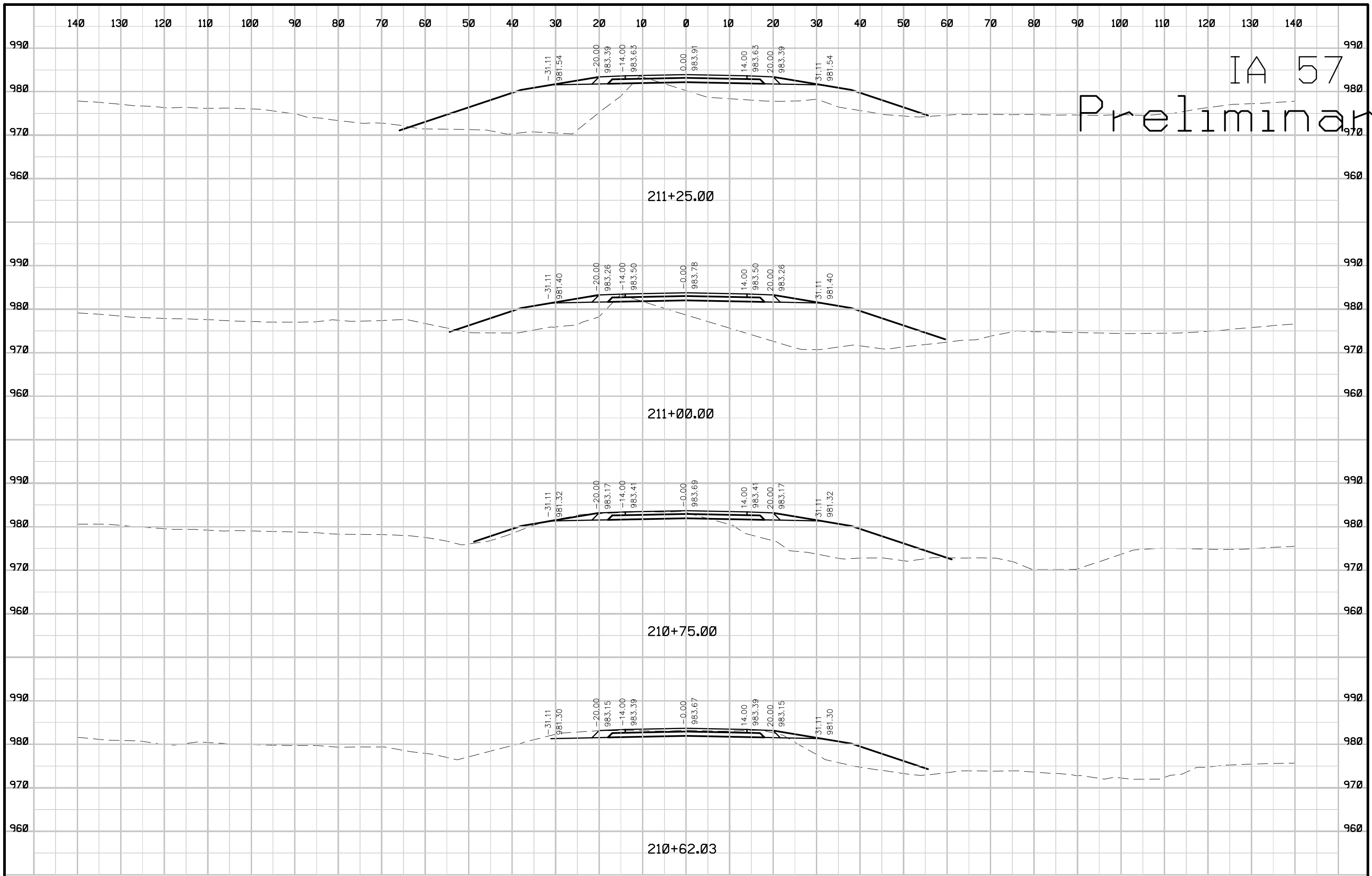
SYMBOL LEGEND OF CROSS SECTION SHEETS

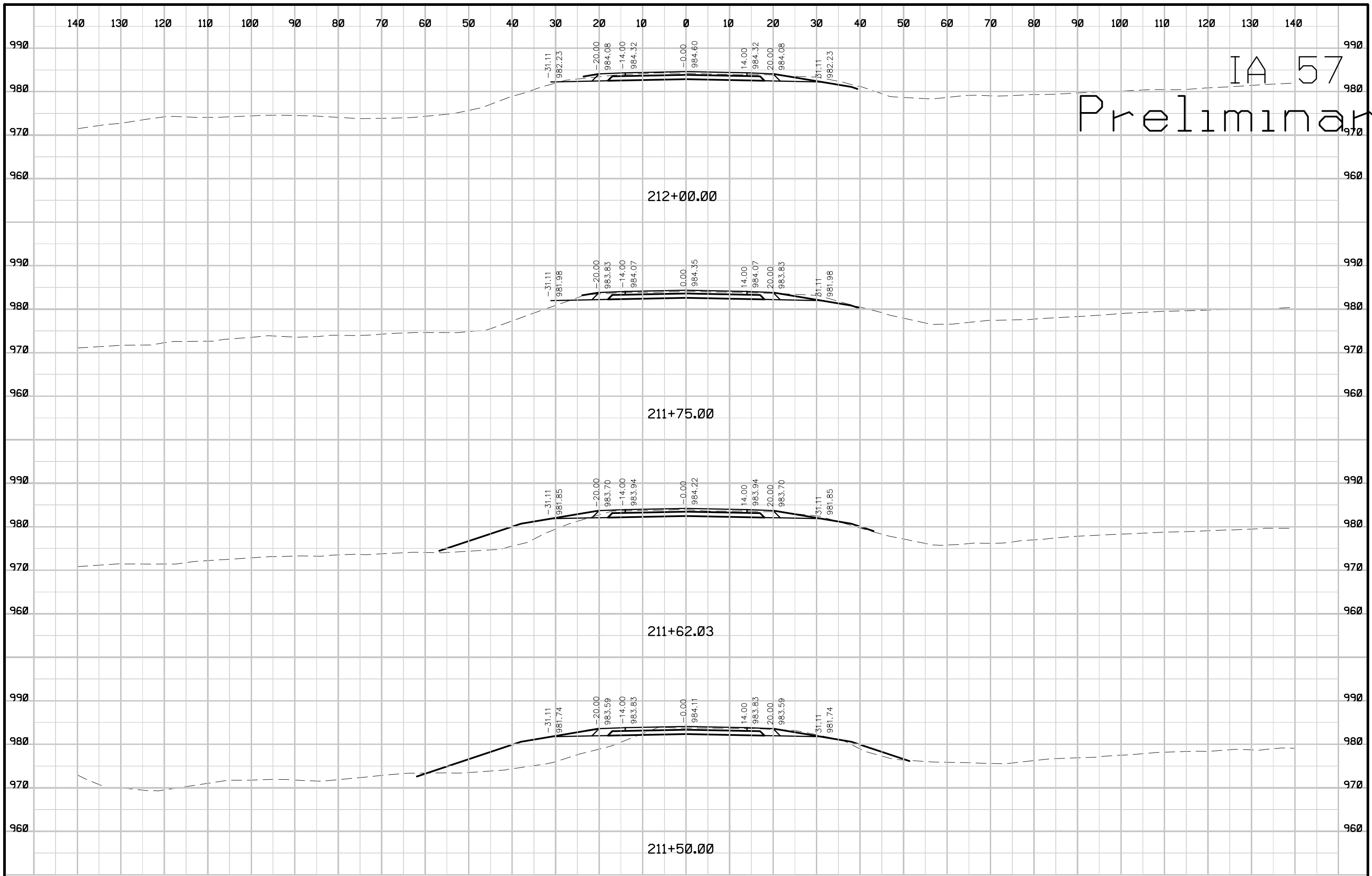
- Existing ROW
- - - - - Existing Right-of-Way Limit
- Proposed ROW
- - - - - Proposed Right-of-Way Limit
- Temporary ROW
- - - - - Temporary Right-of-Way Limit

**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

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







IA 57
Preliminary

IA 57
Preliminary

