LETTING DATE TBD

Bridge Replacement

BRF-218-7(242)--38-07

BLACK HAWK COUNTY

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	**Title Sheets**
A.1	Title Sheet
A.2	Location Map Sheet
* A.3	Design Criteria (Temp Sheet)
* A.4	Design Criteria (Temp Sheet)
B Sheets	**Typical Cross Sections and Details**
B.1 - 2	Typical Cross Sections and Details
C Sheets	**Quantities and General Information**
C.1	Estimated Project Quantities and Reference Notes
C.1	Standard Road Plans
C.1	Tabulations (beg. with tab. of incidentals if needed)
D Sheets	**Mainline Plan and Profile Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	US 218
G Sheets	**Survey Sheets**
G.1	Reference Ties and Bench Marks
* G.2	Reference Ties and Bench Marks
G.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
U Sheets	**500 Series, Mod.Stds. and Detail Sheets**
* U.1	Modified BA-108
* U.2	Modified TC-217
V Sheets	**Bridge and Culvert Situation Plans**
* V.1	Bridge and Culvert Situation Plans
W Sheets	**Mainline Cross Sections**
* W.1	Cross Sections Legend & Symbol Information Sheet
* W.2 - 8	Mainline Cross Sections
	* Color Plan Sheets

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

BLACK HAWK COUNTY

Bridge Replacement

U.S. 218 bridge over Big Creek Overflow
0.3 mile north of County Road D48
in the city of La Porte

SCALES: As Noted

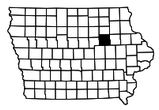
Refer to the Proposal Form for list of applicable specifications.

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

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

REVISIONS

TOTAL 26
PROJECT IDENTIFICATION NUMBER
21-07-218-050
PROJECT NUMBER
BRF-218-7(242)--38-07
R.O.W. PROJECT NUMBER



DESIGN DATA URBAN		
20 21	AADT	3,530 V.P.D.
20 –	AADT	-- V.P.D.
20 –	DHV	-- V.P.H.
TRUCKS		7 %
Total Design ESALs		--

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

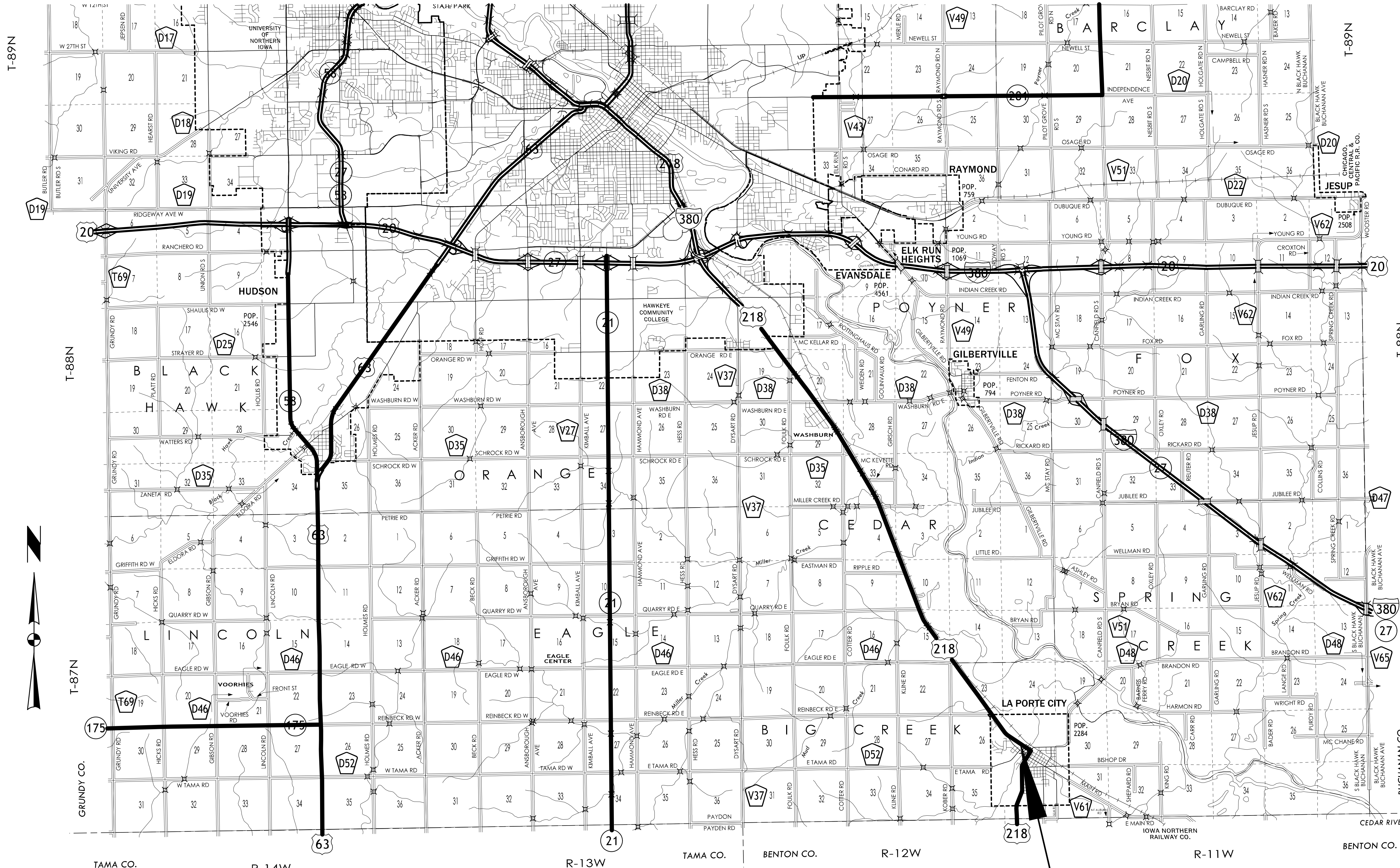
PRELIMINARY PLANS

Subject to change by final design.

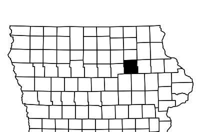
D2 PLAN - Date: Jun 15, 2023

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER A.1

6:40:04 PM 6/13/2023 9589 pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0721805021\Design\CADD_Files\Sheet_Files\SHT_07218242_A01.dgn



US 218 BRIDGE REPLACEMENT
FHWA NO. 14790
MAINT. 0767.3S218
STA. 85+50.00



LOCATION MAP SCALE
0 1 2 3
Miles

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER A.2

3:31:40 PM 6/10/2023 9589 pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0721805021\Design\CADD_Files\Sheet_Files\SHT_07218242_A01.dgn

Roadway	US 218			
PIN Number	21-07-218-050		**Submittal Date**	06/15/23
Project Number	BRF-218-7(242)--38-07			**Approval Date**
District	District 2	**Assistant District Engineer**		
County	BLACK HAWK	**or**		
Route	US 218	**Office Director**		
Location	Over Wolf Creek Tributary, 0.3 Miles North of Jct. SR D48			
Work Type	Bridge Replacement			
Segment Manager				
Designer	Stanley Consultants, 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	40
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	12
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	N/A
	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	4-inch
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	10:1 for 6'
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	4:1 - 2:1
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Traverse Slopes	w/ drainage structures	8:1	6:1	8:1
	w/o drainage structures	10:1	6:1	10:1
Ditches (See Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	N/A
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths (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**	44
	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**	N/A
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft left and right	N/A
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	

*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 =	3,530 (2021 ADT)

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

Effective Shoulder Width and Type for Two-Lane Highways

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

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

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

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

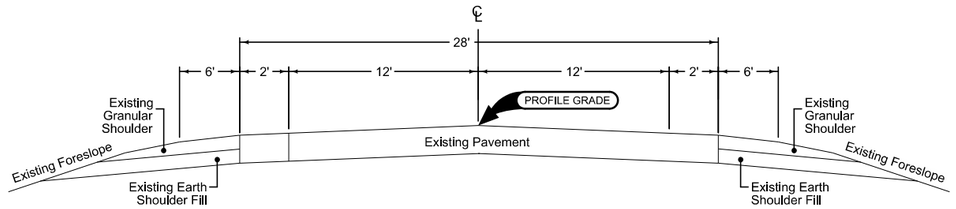
Notes:

Roadway Design Speed (mph) =	40

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	305
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	120
Minimum rate of vertical curvature (K)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	44
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	64
(Refer to Section 2B-1)		roadways with fixed-source lighting	26	37	49	64	79	14	20	27	35	44	64
Minimum gradient (%)	(Refer to Section 2B-1)		0.5					0.3% with a curb, 0.0% without a curb					0.36
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	5					–	9	8	8	7	1.89
		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					16



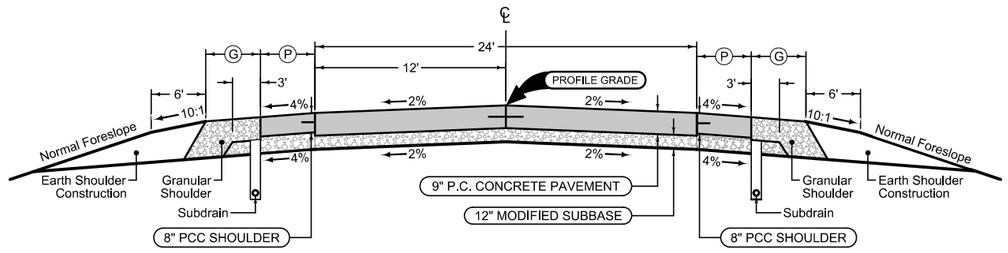
US 218

EXISTING US 218

Full Depth PCC Combination Shoulder

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

2_C_FullPCC_ 04-20-21			
STATION TO STATION		(P) Feet	(G) Feet
82+91.09	84+22.56	8	2
86+77.44	87+58.00	8	2



Refer to Standard Road Plan BR-205
for Reinforced Approach Pavement

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

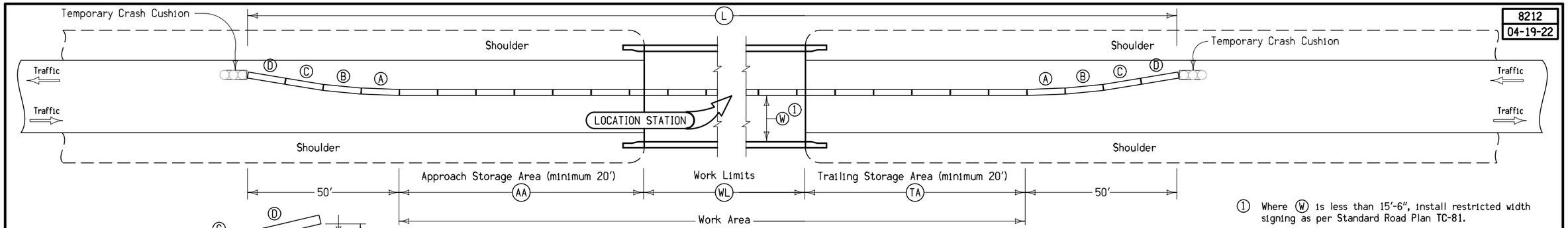
2P_ 04-21-20	
STATION TO STATION	
82+91.09	84+22.56
86+77.44	87+58.00

Full Depth PCC Combination Shoulder

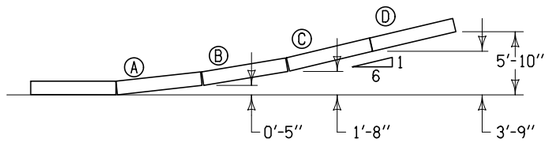
Shoulder Jointing:
Longitudinal joint: BT-2, L-2 or KT-2
Transverse joints: C at 17' spacing

2_C_FullPCC_ 04-20-21			
STATION TO STATION		(P) Feet	(G) Feet
82+91.09	84+22.56	6	4
86+77.44	87+58.00	6	4

US 218



1 Where W is less than 15'-6", install restricted width signing as per Standard Road Plan TC-81.



BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W 1	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
85+50.00	RT	22.4	466.9	22.4	611.7	X	12 - 6	Stage 1B
85+50.00	LT	22.4	466.9	22.4	611.7	X	14 - 2	Stage 2

TEMPORARY CONCRETE BARRIER LAYOUT for Two-Way Traffic

100-0A
10-28-97

ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)

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

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description

105-4
10-18-11

STANDARD ROAD PLANS

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

Number	Date	Title
BA-401	04-20-21	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-21	Temporary Crash Cushions Sand Barrel
BR-205	10-19-21	Double Reinforced 12" Approach (Slab Bridge)
DR-306	10-16-18	Precast Concrete Headwall for Subdrain Outlets
DR-401	04-19-22	Scour Protection for Bridge End Drain
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
PM-110	04-21-20	Line Types
PV-101	04-19-22	Joints
PV-102	04-21-20	PCC Curb Details
SI-881	04-16-19	Special Signs for Workzones
SI-882	10-18-16	Special Signs for Restricted Width Traffic Control Zones
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-81	04-18-23	Restricted Width Signing (Less Than 14.5 Feet)
TC-202	04-18-23	Work Within 15 ft of Traveled Way
TC-213	04-18-23	Lane Closure with Flaggers
TC-233	10-17-17	Pavement Marking Operations Two-Lane

102-5
04-18-17

EXISTING PAVEMENT

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks
	County	Route	Dir. of Travel	Begin Ref. Loc. Sign	End Ref. Loc. Sign				Type	Depth IN	Type	Depth IN	Type	Depth IN	Type	Depth IN	Source	Type	Durability Class	Type	
1	Black Hawk	US-218	1	168.03	176.5	2001		STP-218-7(177)--2C-07	AAC	1.5	BAC	2					WATERLOO SOU	C.LST			
						1973		FN-218-7(30)--21-07	AAC	1	AAC	3.5					WATERLOO SOU	C.LST			VL 95AC MP
						1953		F-200(5)(10)	PCC	9.5							NEWTON QRY.	C.LST	1		

SURVEY SYMBOLS

AST, Above Ground Storage Tank
BB, Billboard
BBB, Bottom of Bridge Beam
BCL, Bridge Centerline
BD, Bridge Deck
BIN, Grain Bin
BL, Topo Breakline
BLD, Building or Foundation
BLS, Bridge Low Steel
BM, Bench Mark
BNK, Stream Bank
BRG, Bridge
C, Centerline BL of Road -ML or SR
CAV, Cave
CEL, Cell Phone Tower
CIS, Cistern
CON, Concrete or A/C Slab
CP, Control Point
CRP, Corporation Line
CS, Curve Point
CU, Back of Curb
CUL, Culvert
D, Centerline Draw or Stream -Down
DAB, Drainage Area Boundary
DIK, Centerline of Dike or Dam
DTM, Photogrammetry Elv Control Check
DU, Centerline Draw or Stream -Up
EB, Electrical Box
EG, Edge of Gravel Road
ENP, Edge Paved Entrance and Park Lot
ENT, Centerline BL of Entrance
ENU, Edge Unpaved Entrance and Parking
EP, Edge of Paved Roads -ML or SR
EW, Edge of Water
FCL, Chain Link and Security Fence
FENO, FENO Monument
FHD, Fire Hydrants
FLG, Flag Poles
FP, Filler Pipe
FW, Wire Fence
FWD, Wood Fence
GDC, Guard Rail Cable
GDL, Guard Rail Steel
GP, Guard Post -Less Than 4 Posts
GPR, Guard Post -4 or More Posts
GR, Ground Shot
GRV, Grave
GU, Gutter In Front of Curb
GV, Gas Valve
HDG, Hedge Row
HS, Hydric Soil -Wetlands
HT, Electrical Highline Tower
IN, Storm Sewer Intake
INB, Storm Sewer Beehive Intake
LC, Lot Corner
LIN, Miscellaneous Line
LP, L.P. Tank
LUM, Luminaire
MH, Utility Access -Manhole
MIS, Miscellaneous
MM, Mile Marker Post
OUT, Tile Outlet
PC, Curve Point
PCP, Photo Control Point
PCT, Photo Control Target
PI, Tangent Point
PIP, Pipe Culvert
PL, Location of Photo -Wetlands
PLG, Location of General Photo
POC, Curve Point
POST, Spiral Point

PR, Electic Riser Pole
PRO, Profile Shot
PT, Curve Point
REF, Reference Tie Point
RET, Retaining Walls
RIP, Rip-Rap
ROC, Rock Outcropping
ROW, Right of Way Mark
RR, Centerline of Railroad Tracks
RRB, Railroad Signal Box
RRF, Railroad Frog
RRR, Railroad Rail
RRS, Railroad Signal
RRW, Railroad Switch
RT, Radio Tower
S, Soil Sampling Site -Wetlands
SBR, Size of Bridge
SC, Spiral Point
SCR, Section Corner
SEP, Septic Tank
SF, Silt Fence -Wetlands
SG, Staff Gauge -Wetlands
SH, Paved Shoulder
SHR, Shrub
SI, Sign
SL, Speed Limit Sign
SLN, Section Line
SLO, Silo
SNK, Sink Hole
SNP, Unpaved Shoulder
SP, Stream Profile
STP, Stump
SWK, Sidewalk
SWP, Swamp or Marsh
TA, Tower Anchor
TBO, Telephone Booth
TCB, Traffic Signal Box
TDC, Tree Deciduous
TDL, Trafic Detection Loop
TER, Terrace
TEV, Evergeen Tree
TFR, Tree Fruit
TGP, Telegraph Pole
TIL, Tile Line
TLNL, Tree Line Left
TLNR, Tree Line Right
TOP, Top of Bridge Pier
TPA, Telephone Pole Co. 1
TPB, Telephone Pole Co. 2
TPC, Telephone Pole Co. 3
TR, Telephone Riser Pole
TRL, Trail
TS, Spiral Point
TSB, Telephone Switch Box
TSG, Traffic Signal
TSL, Traffic Signal and Luminare
TV, Satelite TV Dish
TVP, TV Pedestal
TW, Top of Water
UB, Utility Box
UE, Utility Elevation
UPH, Utility Pot Hole - Quality A
UST, Underground Tank
UV, Underground Utility Vault
VS, Channel Cross Section
WC, Wild Card -Misc. Field Shot
WEL, Well
WHD, Water Hydrant
WHU, RV Water Hook Up
WM, Wind Mill
WND, Wind Turbine
WV, Water Valve

SURVEYED UTILITY OWNER SYMBOLS

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

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

FO — FOID, MEDIACOM - Quality D
E1 — EL1D, LA PORTE CITY UTILITIES - Quality D
T1 — TL1D, LA PORTE CITY TELEPHONE - Quality D
G — GL1D, BLACK HILLS ENERGY - Quality D
FO — FOID, PEOPLESERVICE LA PORTE CITY - Quality D

Request utility contact info.

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
Lavender	(9)	Temporary Pavement Shading
Yellow	(4)	Proposed Pavement Shading
Orange	(6)	Proposed Granular Shading
Orange	(70)	Proposed Shoulder Granular Shading
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Orange, Light	(134)	Proposed Granular Entrance Shading
Yellow	(220)	Proposed Paved Entrance Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading
Green, Light	(225)	Existing Pavement Shading
Red	(3)	Proposed Structure Shading
Red	(3)	Delineates Restricted Areas

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(10)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

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

RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

Will add Sec/Twn/ Rng info and existing ROW info after T1 is finished.

Note 1:
BR-205 double reinforced section shall be extended to bridge joints at all four corners due to Modified BA-108 extending to bridge joints.

Need survey here to determine the limits of the clearing and grubbing

Sta. 84+94.58
End Bridge Approach
Begin Bridge Construction

Sta. 86+05.42
End Bridge Construction
Begin Bridge Approach

81+00 | 82+00 | 83+00 | 84+00 | 85+00 | 86+00 | 87+00

US 218
(ML218)

Sta. 81+25.00
Begin Shoulder Strengthening Construction

Sta. 82+91.09
Begin Roadway Pavement Construction

Modified BA-108
See Sheet U.1
Typical All Four Corners

4"X??" C.M.P.
BAD CONDITION

Big Creek Overflow

6"X??' C.P.P.
BAD CONDITION

Review corridor model during Field Exam. Left side foreslopes will be very steep to avoid tree line.

Sta. 84+22.56
End Roadway Pavement Construction
Begin Bridge Approach

DR-401
Typical All Four Corners

Sta. 86+77.44
End Bridge Approach
Begin Roadway Pavement Construction

0 FEET 20

835 | 830 | 825 | 820 | 815 | 810 | 805 | 800

VPC = 82+91.00
ELV = 822.70

VPT = 84+61.00
ELV = 823.67

VPI = +50.00
ELV = 825.35
L = 170.00
K = 45

VPC = 86+38.00
ELV = 823.69

+1.89%
-1.89%

US 218
(ML218)

-0.76%
+1.89%

VPI = +76.00
ELV = 822.06
L = 170.00
K = 64

Begin Construction

VPC = 84+65.00
ELV = 823.74

VPT = 86+35.00
ELV = 823.74

-1.89%

VPI = +98.00
ELV = 822.55
L = 120.00
K = 78

822.70 | 822.64 | 822.54 | 822.53 | 822.62 | 822.80 | 823.09 | 823.47 | 823.92 | 824.27 | 824.48 | 824.55 | 824.48 | 824.27 | 823.92 | 823.47 | 823.07 | 822.76

82+00 | 83+00 | 84+00 | 85+00 | 86+00 | 87+00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER D.2

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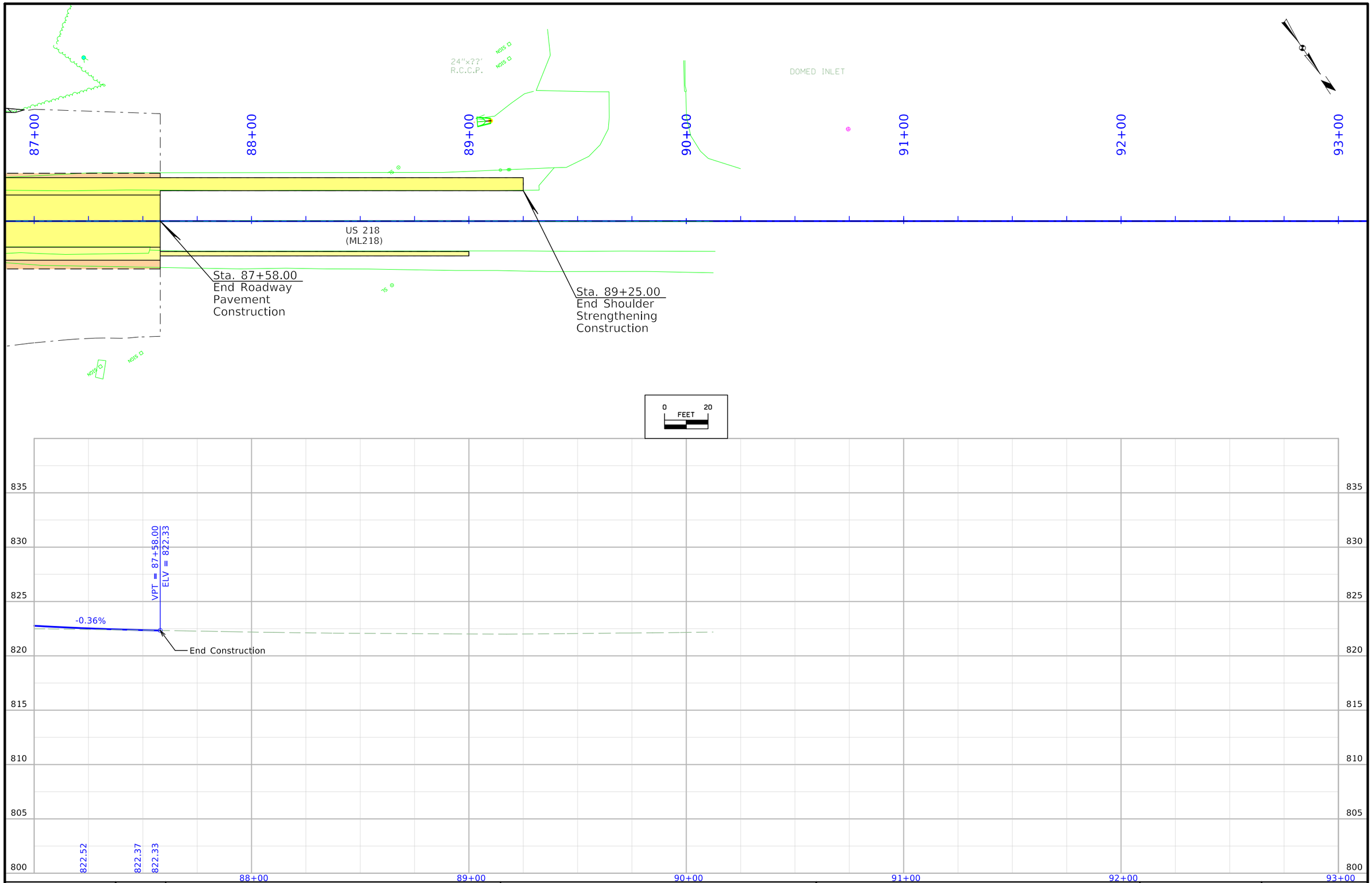

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER D.3

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SURVEY INDEX

County: Blackhawk
PIN: 21-07-218-050
Project Number: BRF-218-7(242)—38-07
Location: Big Creek overflow 0.3 mi. north of Co. Rd. in La Porte City.
Type of Work: Bridge Replacement

Survey Personnel

Matthew Fouts – PLS
Daniel Marti – PLS
Drake Marti – Survey Technician
Joshua Randolph – Survey CADD Technician

Date(s) of Survey

Begin Date	01/16/2023
End Date	01/26/2023

General Information

This survey is for preliminary design for the section of approximately 0.2 miles of roadway, there is one bridge along the route. Project datum is provided by Design Survey Office. This project is a full DTM Survey.

Utility Information

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

Project Control

(RTN)
Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. For additional details of the control survey, contact the Preliminary Survey department.

(Static)
Static observations were not used for this survey.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 5 (Waterloo).
(U.S. SURVEY FOOT)

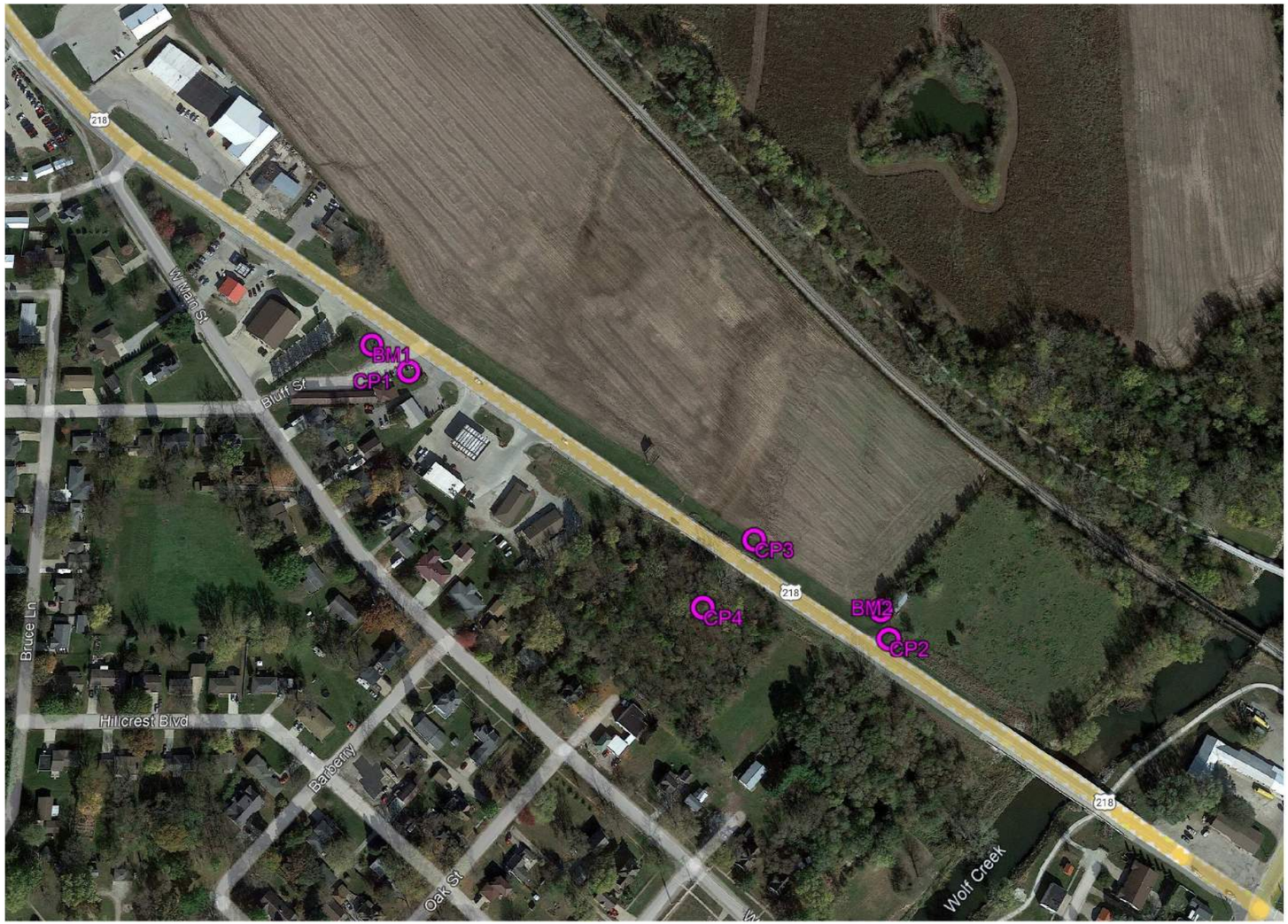
VERTICAL DATUM: NAVD88
GEOID MODEL: GEOID12B

Alignment Information

NO alignment

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 05 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 12B

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 05 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 12B

POINT NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	8779299.37	15514573.04	820.70	SET 5/8" REBAR SOUTH OF LA PORTE ROAD AND NORTH OF JOE'S GYM
CP2	8778910.15	15515271.65	822.39	SET 5/8" REBAR IN FIELD ENTRANCE EAST OF BRIDGE ON NORTH SIDE OF ROAD
CP3	8779146.27	15514963.76	813.89	SET 5/8" REBAR NORTH OF THE MIDDLE OF THE BRIDGE
CP4	8779062.63	15514924.96	814.31	SET 5/8" REBAR SOUTH OF THE BRIDGE
BM1	8779318.57	15514500.40	821.75	SET NORTHEAST BOLT ON THE CASEY'S SIGN
BM2	8778942.75	15515274.99	816.84	SET RAILROAD SPIKE IN SOUTH SIDE OF FENCE

ALIGNMENT COORDINATES

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
1	US218(ML218)	75+07.45	8778523.37	15515779.05															
2	US218(ML218)	95+93.20	8779704.80	15514060.17															

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. At least one lane of traffic shall be maintained on US 218 at all times.

2. Refer to Standard Road Plans shown on Tab 105-4 in C Sheets for other information.

3. Refer to Staging Notes (Tabulation 108-26A) and other J sheets for details of specific closures.

111-01
04-17-12

COORDINATED OPERATIONS

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

Project	Type of Work
None provided	

108-25
10-21-14

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 218	NB	Black Hawk	0.3 mile north of County Road D48 in the city of La Porte	Big Creek Overflow	Barrier	Maint. No.0767.3S218	Horizontal	N/A	12'-6"	11'-6"	N/A	Stage 1B
US 218	SB	Black Hawk	0.3 mile north of County Road D48 in the city of La Porte	Big Creek Overflow	Barrier	Maint. No.0767.3S218	Horizontal	N/A	14'-2"	13'-2"	N/A	Stage 2
US 218	NB	Black Hawk	0.3 mile north of County Road D48 in the city of La Porte	Big Creek Overflow	Temporary Signal	Maint. No.0767.3S218	Vertical	N/A	15'-0"	N/A	N/A	Stage 1B
US 218	SB	Black Hawk	0.3 mile north of County Road D48 in the city of La Porte	Big Creek Overflow	Temporary Signal	Maint. No.0767.3S218	Vertical	N/A	15'-0"	N/A	N/A	Stage 2

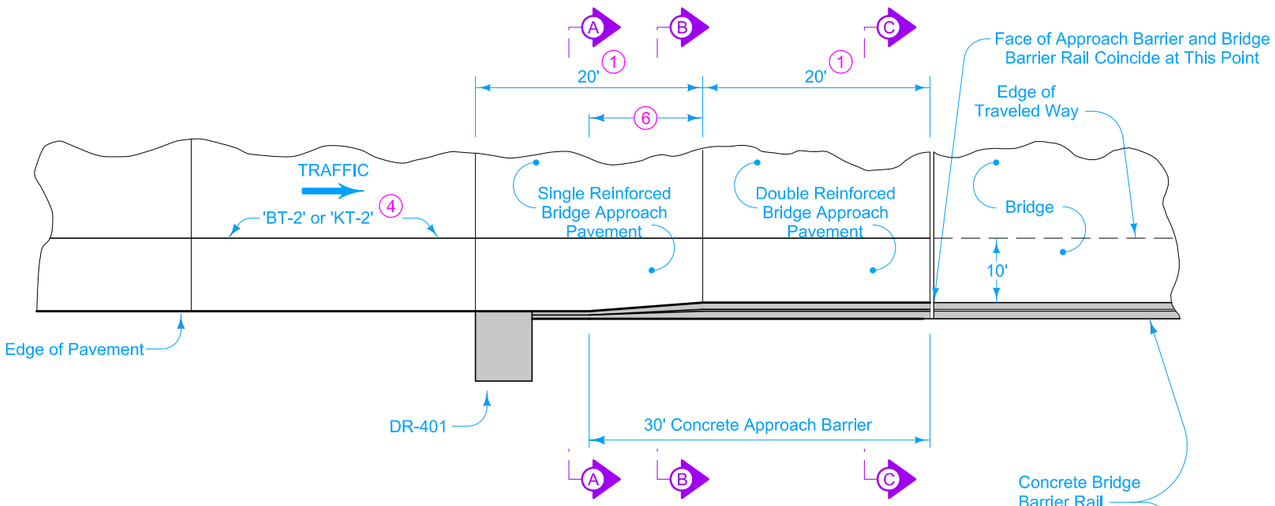
108-26A
08-01-08

STAGING NOTES

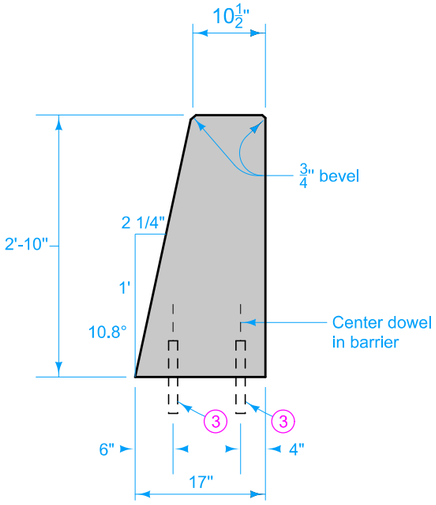
Stage 1A
Traffic Control: Close US 218 NB lane. Maintain traffic using single lane closure with flaggers (SRP TC-213).
Construction: Construct US 218 NB lane shoulder strengthening.

Stage 1B
Traffic Control: Close US 218 SB lane using temporary traffic signals and temporary barrier rail (TBR) per Sheet U.2.
Construction: Construct west half of US 218 bridge, approaches, shoulders and shoulder strengthening.

Stage 2
Traffic Control: Close US 218 NB lane using temporary traffic signals and temporary barrier rail (TBR) per Sheet U.2.
Construction: Construct east half of US 218 bridge, approaches, and shoulders.



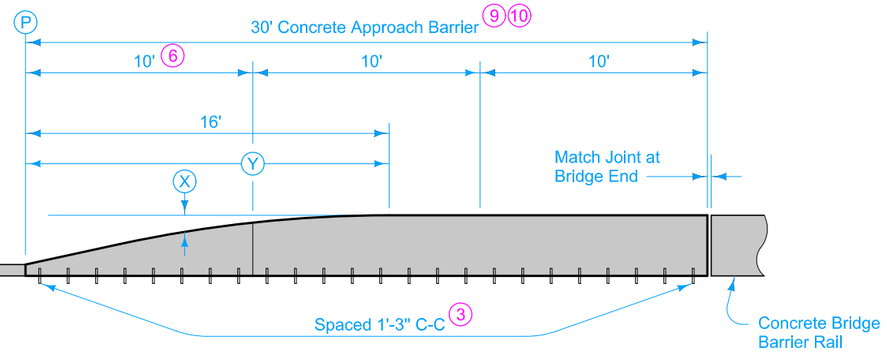
PLAN



FULL BARRIER RAIL SECTION

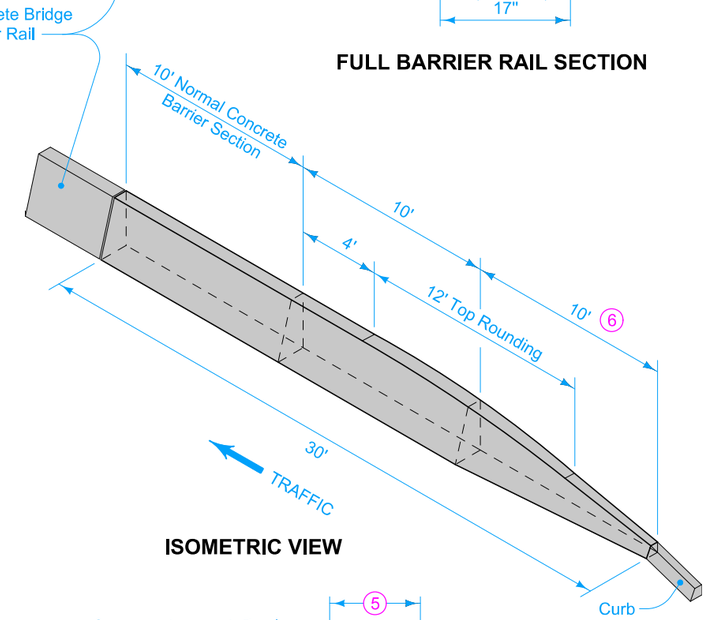
Install a 'C' joint in concrete approach barrier to match the location of each joint in both roadway and bridge approach pavement.

1. Typical joint spacing and location. Follow specific project requirements as directed by the Engineer.
3. #8 x 8 inch deformed bars or 1 inch diameter smooth.
4. For joint detail, see PV-101.
5. Bottom width of barrier is maintained at 17 inches.
6. Bottom width of barrier transitions from 8 to 17 inches.
8. Additional concrete quantity required for extended roadway pavement will be included in bridge approach pavement quantity.
9. Place no delineator or object marker in front of, or on, the barrier.
10. Approximately 3 cubic yards of concrete are required to construct barrier as shown. Amount may vary depending on individual site requirements.

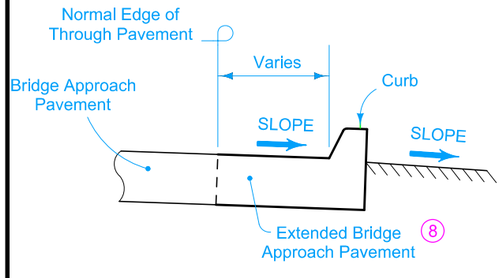


ELEVATION

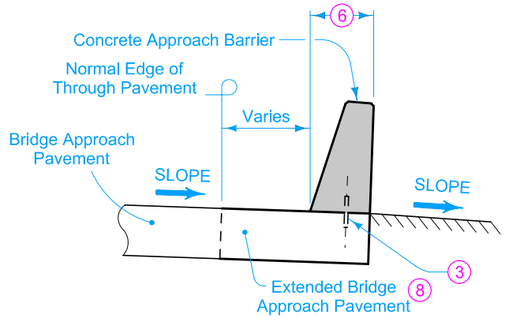
OFFSETS FOR ROUNDED BARRIER TOP																	
Y = Distance from (P)	ft.	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
X = Offset to Rounded Top	ft.	2.13	1.91	1.70	1.48	1.26	1.06	0.87	0.70	0.54	0.42	0.30	0.20	0.12	0.06	0.02	0.00



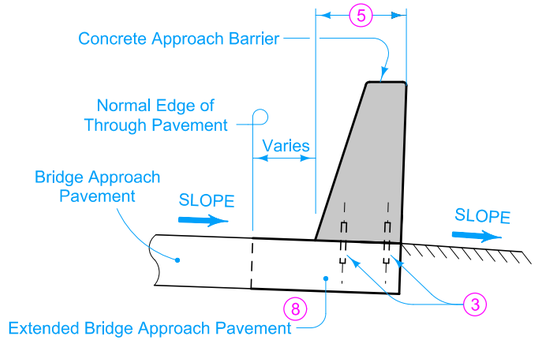
ISOMETRIC VIEW



SECTION A-A



SECTION B-B



SECTION C-C

Contract Item:
Concrete Barrier, Tapered End, BA-108

Tabulation:
108-18B

MODIFIED

STANDARD ROAD PLAN

REVISION	
3	10-18-22

BA-108

SHEET 1 of 1

MODIFICATIONS: Removed sidewalks. Changed extended roadway pavement to be exteded bridge approach pavement.

CONCRETE BARRIER TAPERED END SECTION

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER U.1

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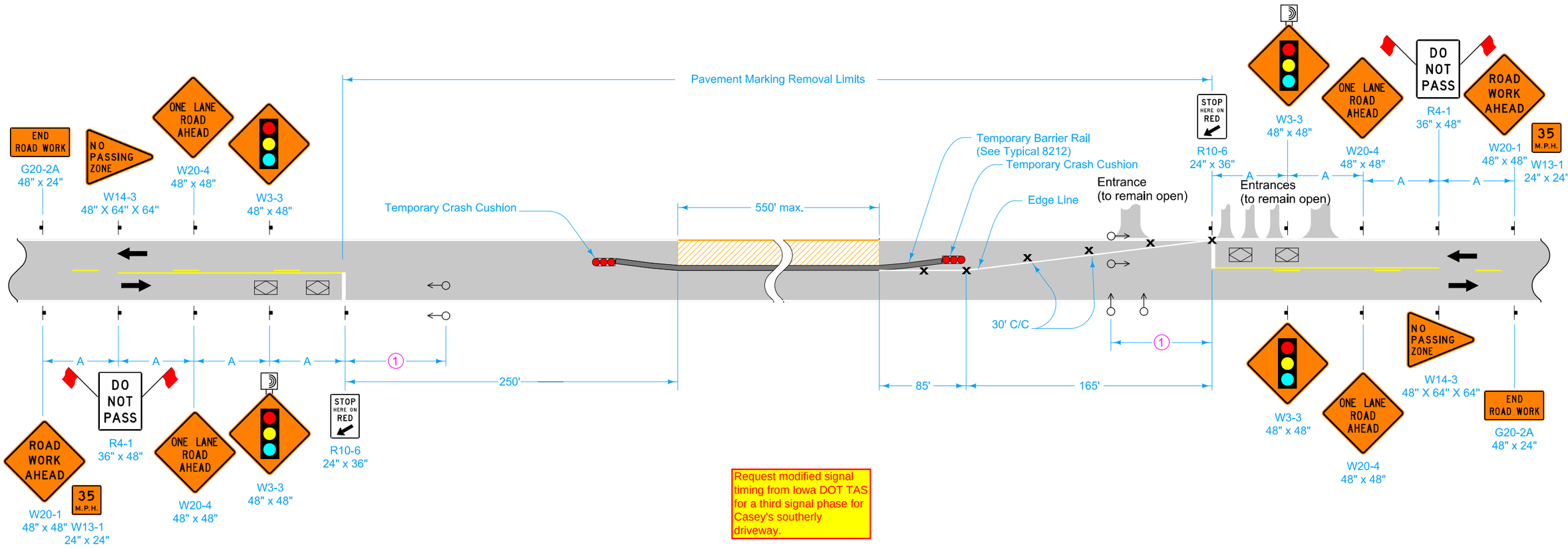

Request modified signal timing from Iowa DOT TAS for a third signal phase for Casey's southerly driveway.

Contract Items:
- Pavement Marking Items
- Pavement Markings Removed
- Temporary Barrier Rail
- Temporary Crash Cushions
- Temporary Traffic Signals
- Traffic Control

Tabulations:
- 108-22
- 108-28
- 108-30
- 108-33

LEGEND

- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
- Type 'B' High-Intensity Flashing Warning Light
- Work Area
- Temporary Traffic Signal

TIMING FOR ACTUATED SIGNALS Recommended Settings, secs.	Distance Between Stop Lines	All Red (secs.)*
Initial = 12.0	1050'	20.4-35.7
Extension = 2.5	950'	18.5-32.3
Maximum Green = 45.0	850'	17-30
Yellow = 5.0	750'	15-27
All Red = (see table)	650'	14-23
	550'	12-20

* Range of values are based on operating speeds between 20 and 35 mph

SPEED LIMIT (mph)*	A
35 or less	250'
40 - 45	350'
50 or greater	500'

* Speed Limit refers to regulatory speed limit before road work.

Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

(1) Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

MODIFIED

STANDARD ROAD PLAN

REVISION 9 4-18-23

TC-217

SHEET 1 of 1

MODIFICATIONS: Added 5 entrances and traffic signals.

LANE CLOSURE WITH SIGNALS AND TBR

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER U.2

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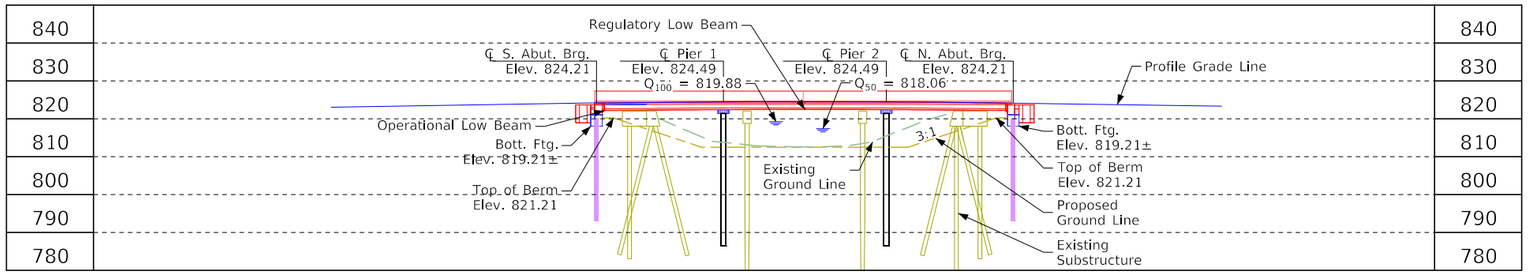
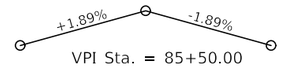
PROGRESS PLANS, NOT FOR CONSTRUCTION



Longitudinal Section along ℄ US 218

BENCH MARK NO. CP3, N:8779146.27, E:15514963.76, ELEV 813.89;
SET ⅝" REBAR NORTH OF THE MIDDLE OF THE BRIDGE

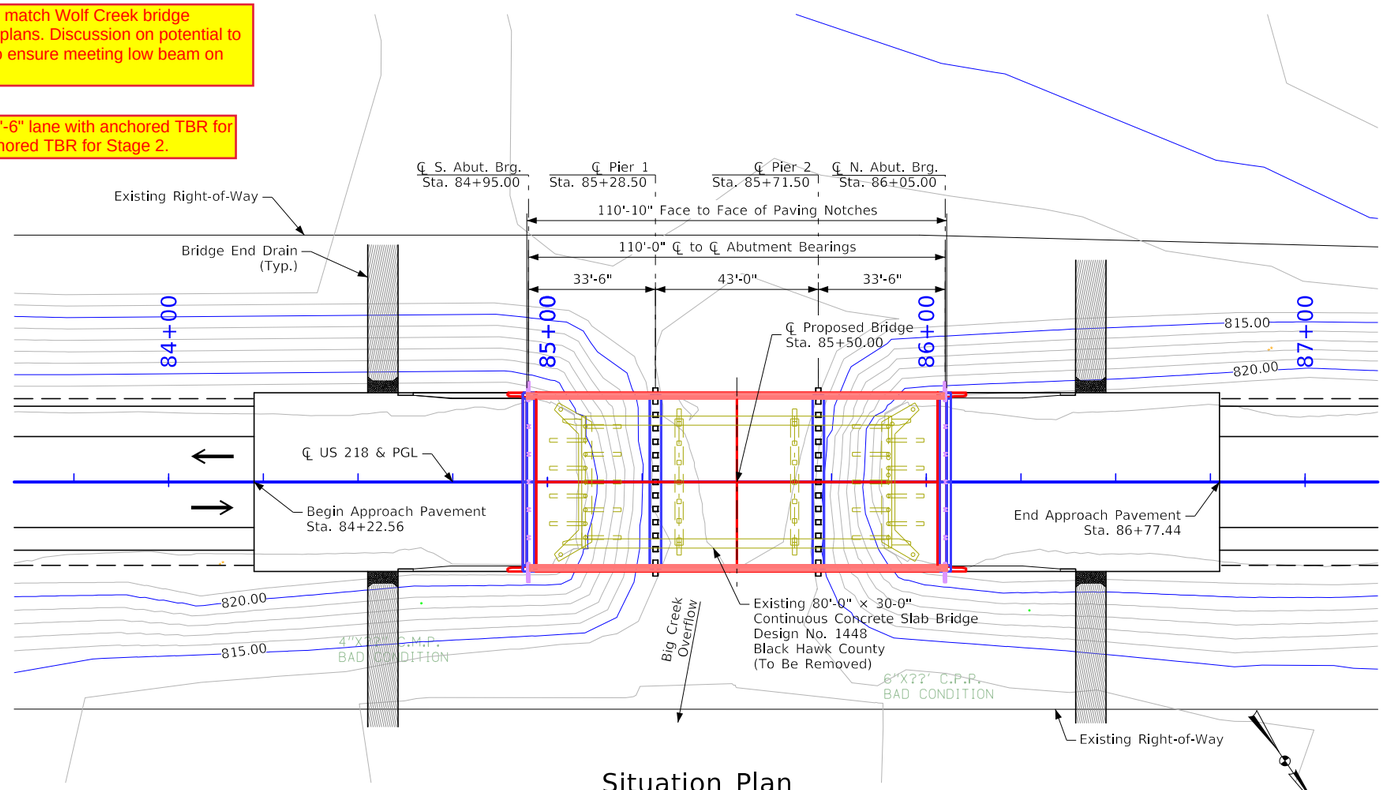


VPC Sta. 84+65.00 | VPI Sta. = 85+50.00 | VPT Sta. 86+35.00
VPC Elev. = 823.74 | VPI Elev. = 825.35 | VC = 170' | VPT Elev. = 823.74

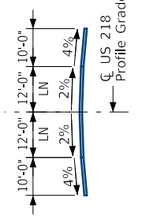
Proposed Profile Grade US 218

Profile set such that low beam should match Wolf Creek bridge nearby. Elevations based on existing plans. Discussion on potential to survey a shot on Wolf Creek bridge to ensure meeting low beam on proposed bridge.

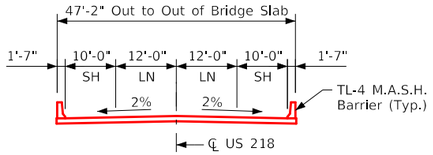
Construction will be phased with 12'-6" lane with anchored TBR for Stage 1 and 14'-2" lane with unanchored TBR for Stage 2.



Situation Plan



Typical Approach Section



Typical Bridge Section

(Looking Northwest)

Location

US 218 over Big Creek Overflow
In City of La Porte City
T-87N R-12W
Section 25
Big Creek Township
Black Hawk County
FHWA No. 14790
Bridge Maint. No. 0767.3S218
Latitude 42.318244°
Longitude -92.194698°

Utilities Legend

No Known Utilities

0 ENGLISH 40
SCALE IN FEET

Traffic Estimate

2021 AADT 3,530 V.P.D.

Trucks 7 %

Hydraulic Data

RIDB: WolfC_x.x
Drainage Area = 326 sq. mi.
Stream Slope (HGL) = 3.19 ft./mi.
Avg. Low Water Stage = N/A

Q_{50} = 16,000 cfs
Stage = 818.06
Regulatory Low Beam = 822.56
Avg. Bridge Velocity = 1.09 fps

Q_{100} = 18,465 cfs
Stage = 819.88
Operational Low Beam = 822.23
Backwater = 0.04 ft.
Avg. Bridge Velocity = 1.21 fps

Q_{200} = 20,135 cfs
Stage = 820.40
Calculated Design Scour = 809.5

Q_{500} = 23,070 cfs
Stage = 821.38
Avg. Bridge Velocity = 1.12 fps
Calculated Check Scour = 809.3

50-, 100-, 500-year stages and discharges from FEMA HEC-RAS Model
F.I.S datum = NAVD88

Notes

Top of bridge slab at ℄ US 218 is 0.03' below the profile grade to account for parabolic crown.
All units are in feet unless otherwise noted.
TL-4 Bridge Railing proposed.
Pier Type - Fully Encased Pile Bents
Foundation type to be confirmed during final design.
Berm slope to be determined during final design.

HYDRAULIC DESIGN

LICENSED PROFESSIONAL ENGINEER
MARK D. WERNER
15418
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.

Signature Date

MARK D. WERNER
Printed or Typed Name

My license renewal date is December 31, 2023

Pages or sheets covered by this seal: V.01

PRELIMINARY

Design For 0° Skew

110'-0" × 44'-0" Continuous Concrete Slab Bridge

33'-6" End Spans 43'-0" Interior Span

Situation Plan

STA. 85+50.00 (℄ US 218)

Black Hawk County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. TBD Design Sheet No. 1 of 1 FHWA No. 14790

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER V.01

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CROSS SECTION VIEW COLOR LEGEND

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

NOTES:

Text

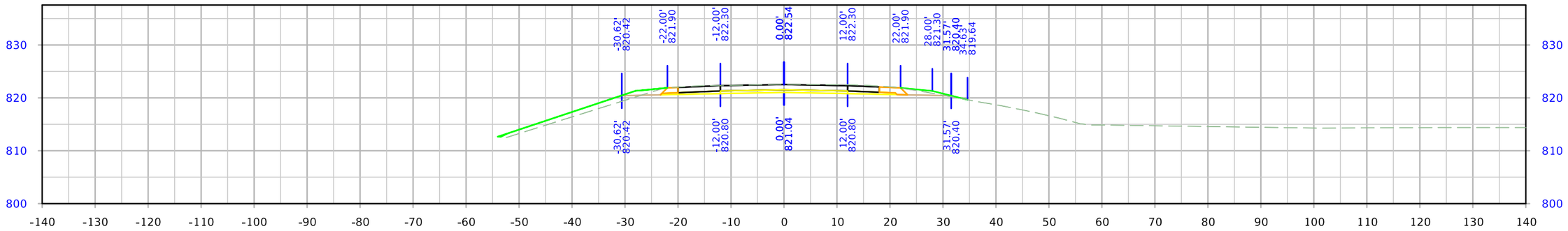
NOTES:

Text

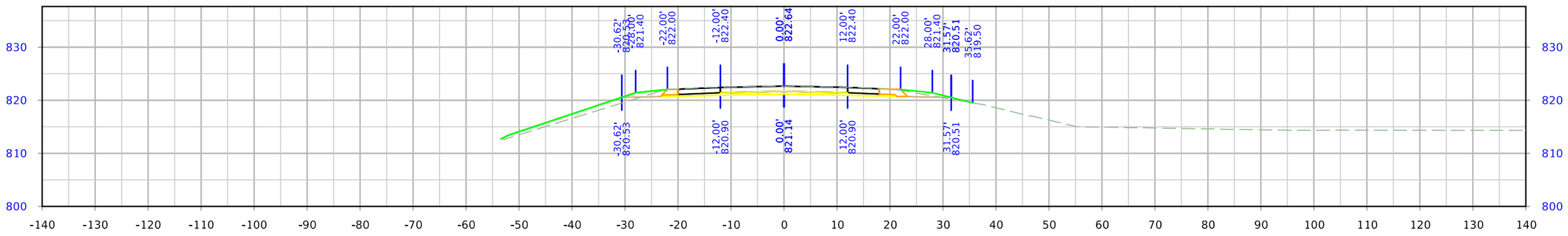
CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

US 218



STA. 83+25.00



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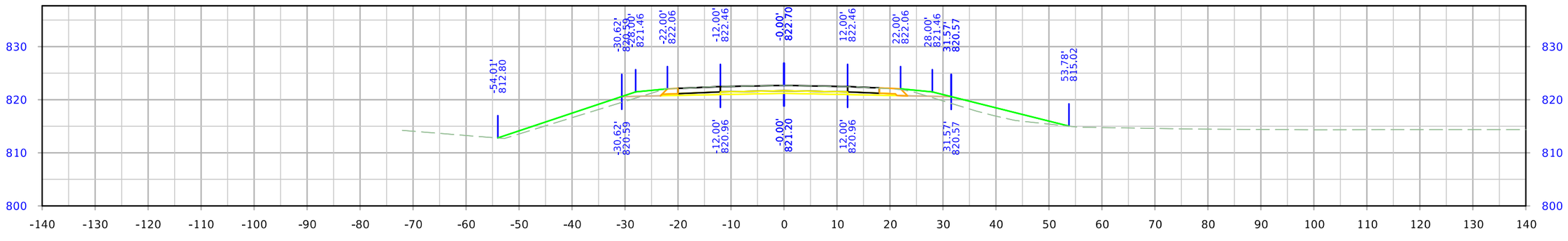

STA. 82+91.09

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.2

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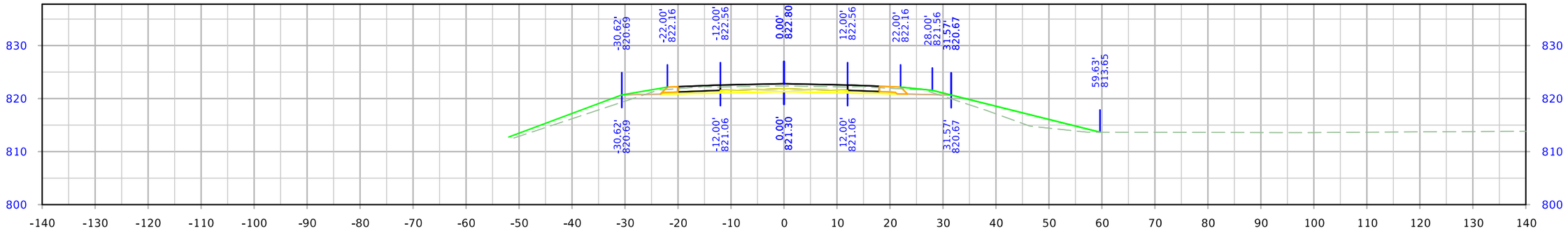
US 218



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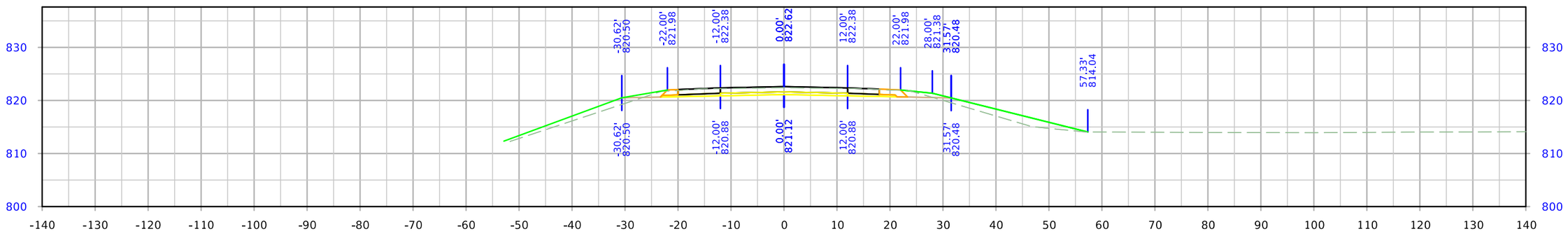
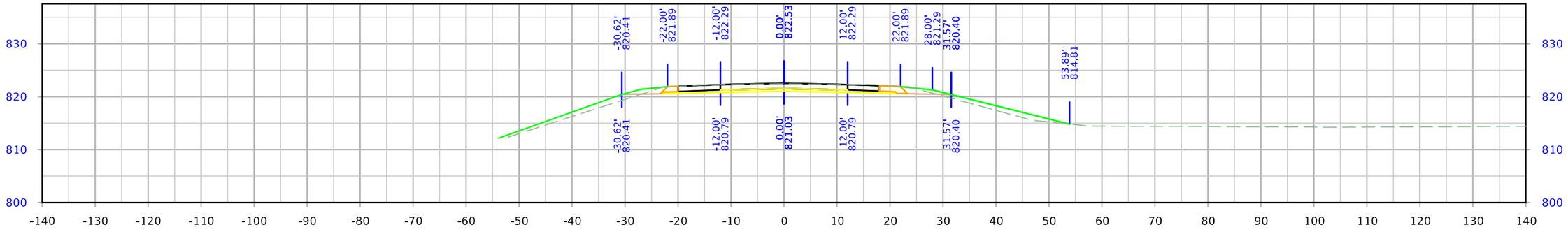


STA. 83+75.00



STA. 83+50.00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.3

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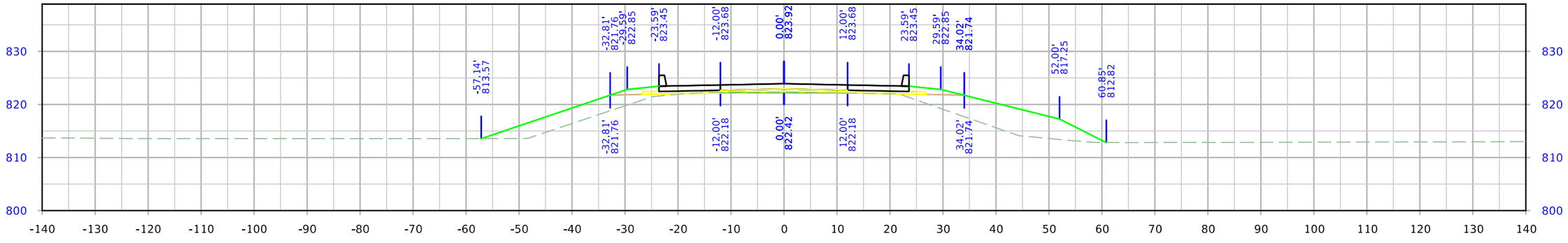
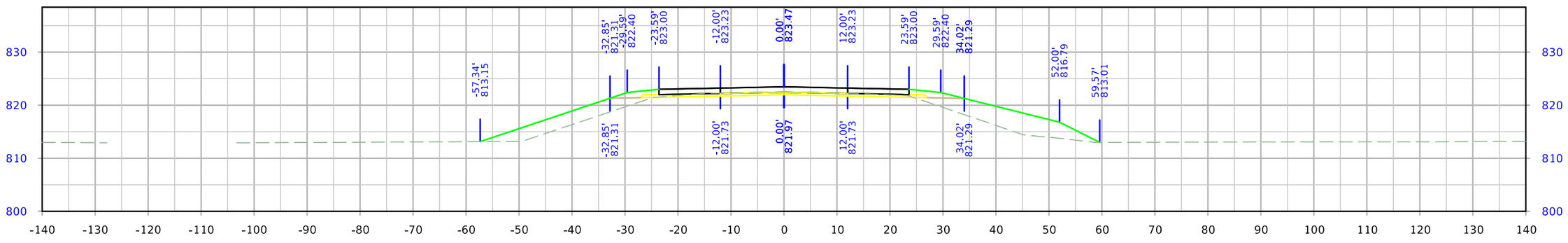
US 218



STA. 84+75.00



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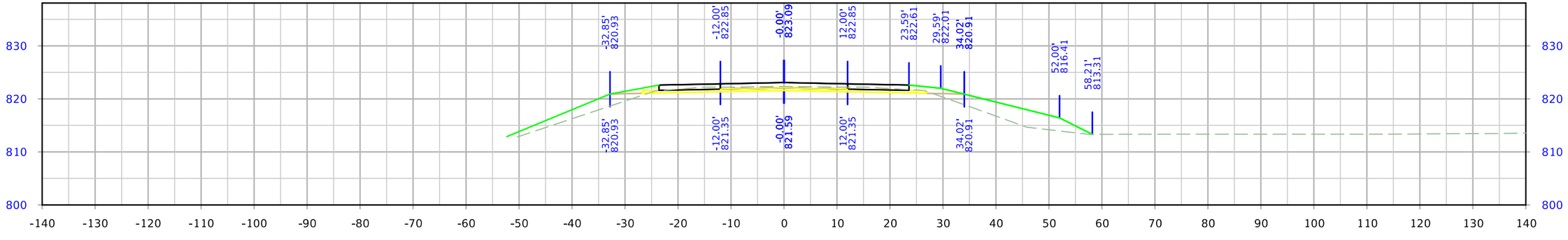

STA. 84+25.00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.4	

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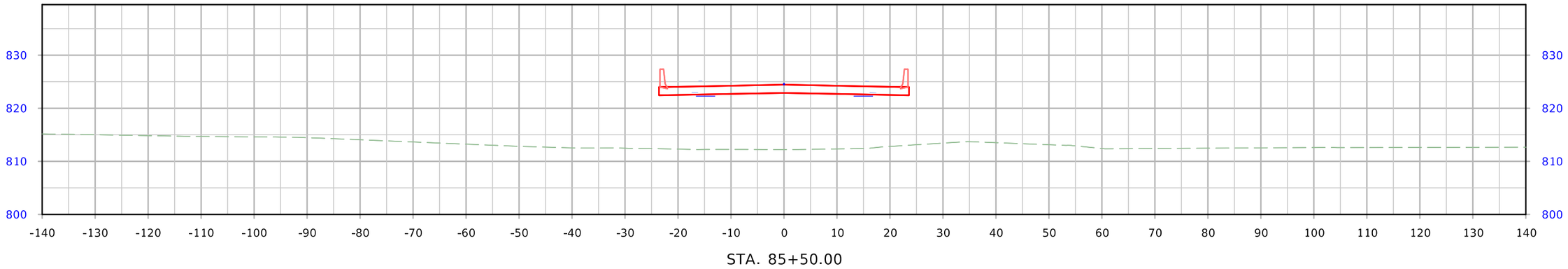
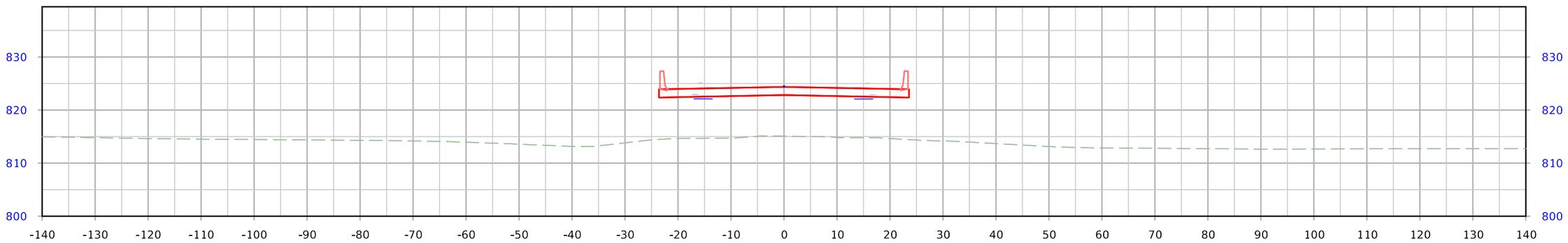
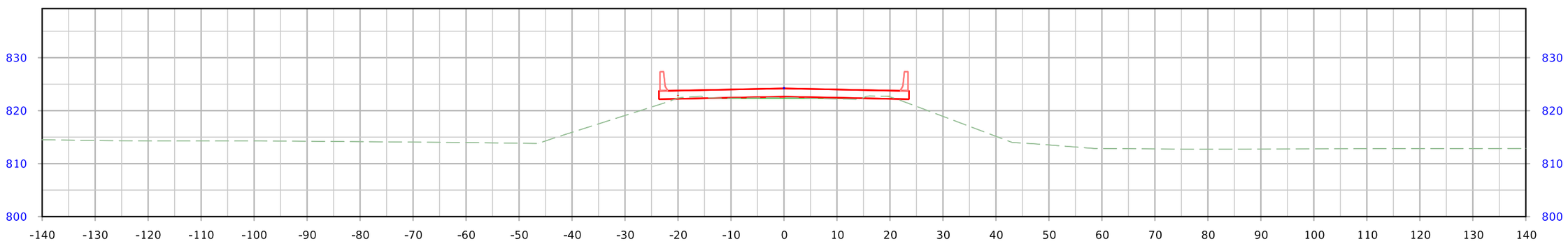
US 218



STA. 85+50.00



STA. 85+25.00



STA. 85+00.00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.5	

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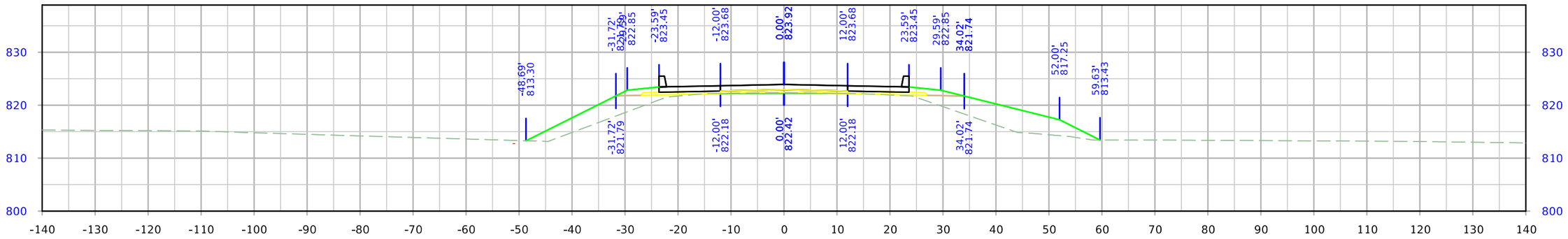
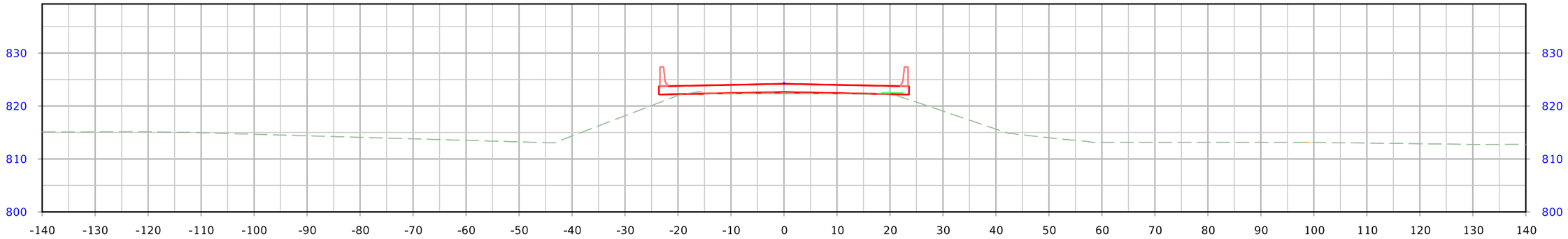
US 218



STA. 86+25.00



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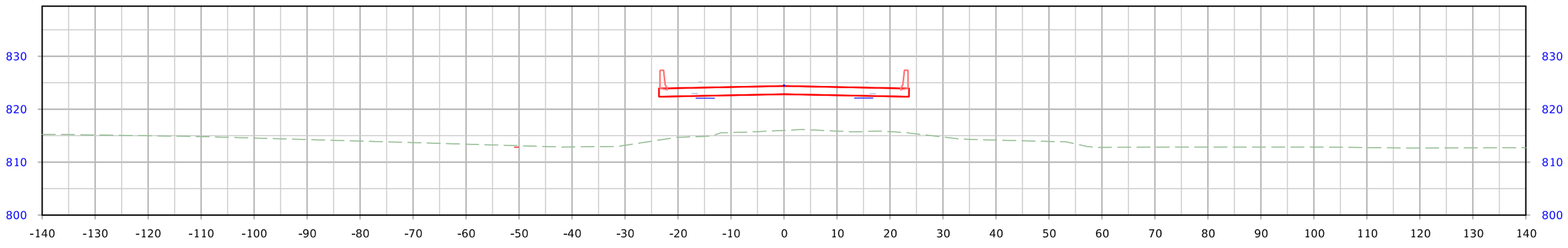

STA. 85+75.00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.6	

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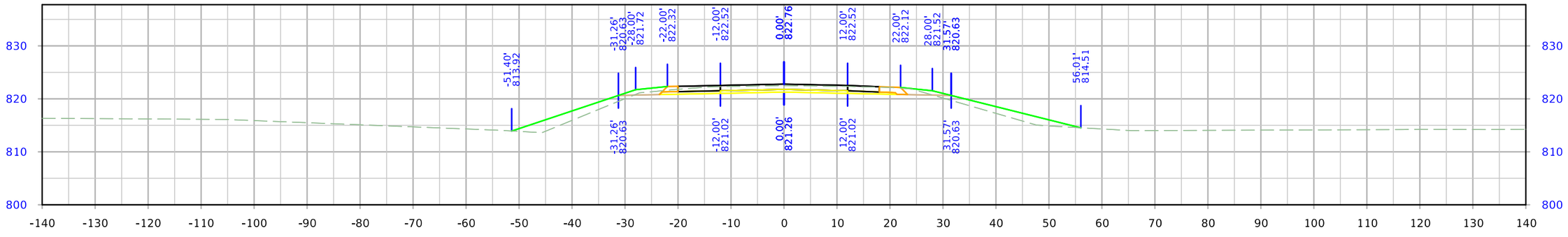
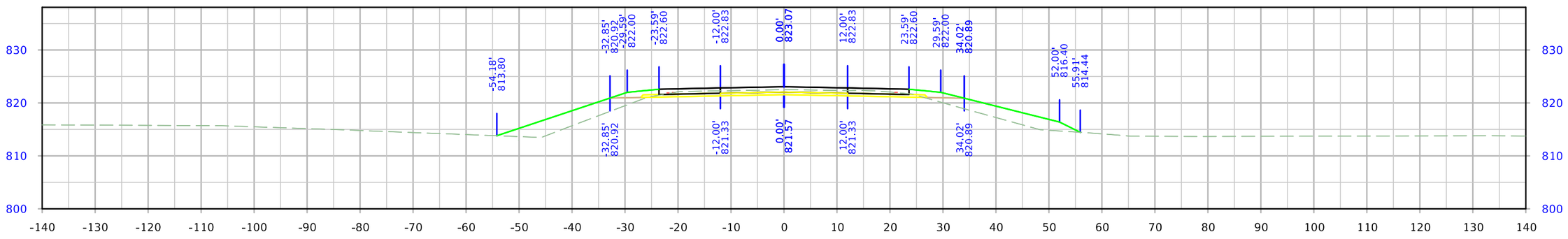
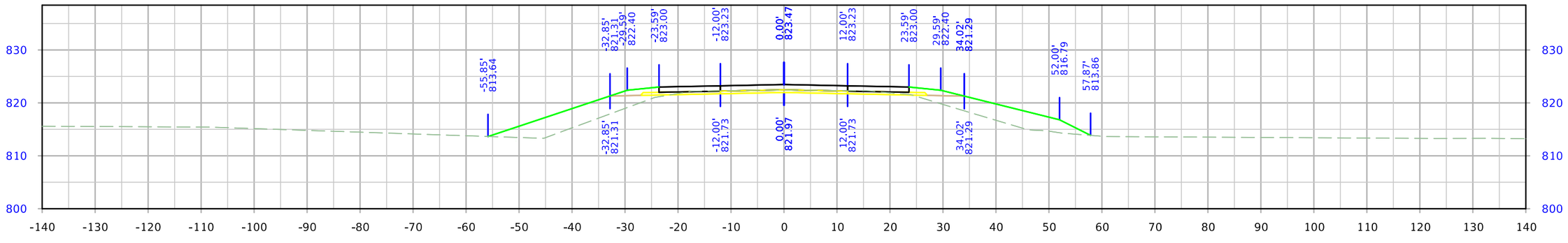
US 218



STA. 87+00.00



STA. 86+75.00



STA. 86+50.00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.7

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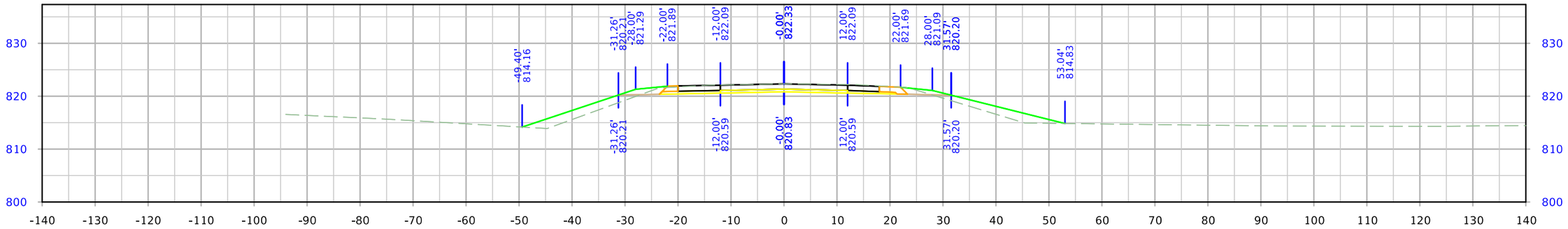
US 218



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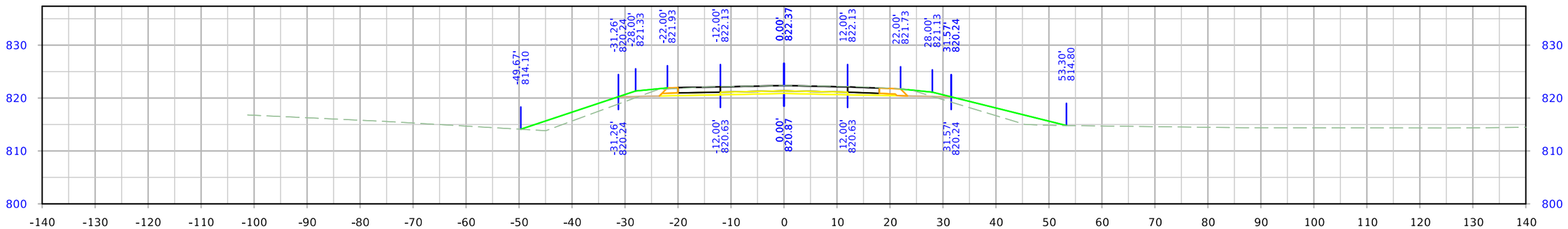
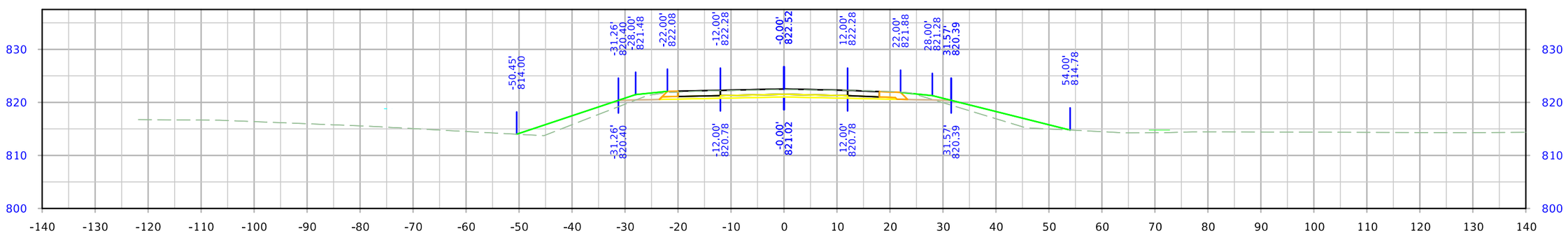


STA. 87+50.00



STA. 87+25.00

FILE NO. TBD	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	BLACK HAWK COUNTY	PROJECT NUMBER BRF-218-7(242)--38-07	SHEET NUMBER W.8	

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