

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet & Location Map
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	US 18
G Sheets	Survey Sheets
G.1 - 3	Reference Ties and Bench Marks
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
* J.2	Legend and Symbol Information Sheet
* J.3 - 4	Staging Plans
U Sheets	500 Series, Mod.Stds. and Detail Sheets
U.1	Superelevation Details
V Sheets	Bridge and Culvert Situation Plans
* V.1	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 5	Mainline Cross Sections
	* Color Plan Sheets



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM PALO ALTO COUNTY BRIDGE REPLACEMENT-CCS

US 18 over Cylinder Creek at W Jct Co Rd N60

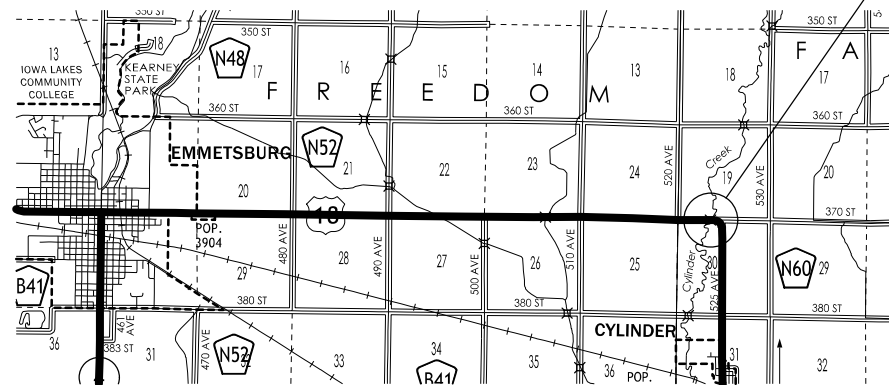
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

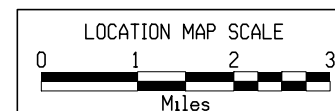
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



STA. 309+03.70 - 312+62.69
PROJECT LOCATION



DESIGN DATA RURAL			
2022	AADT	3500	V.P.D.
2042	AADT	3800	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	16	%
Total			
Design	ESALs	--	

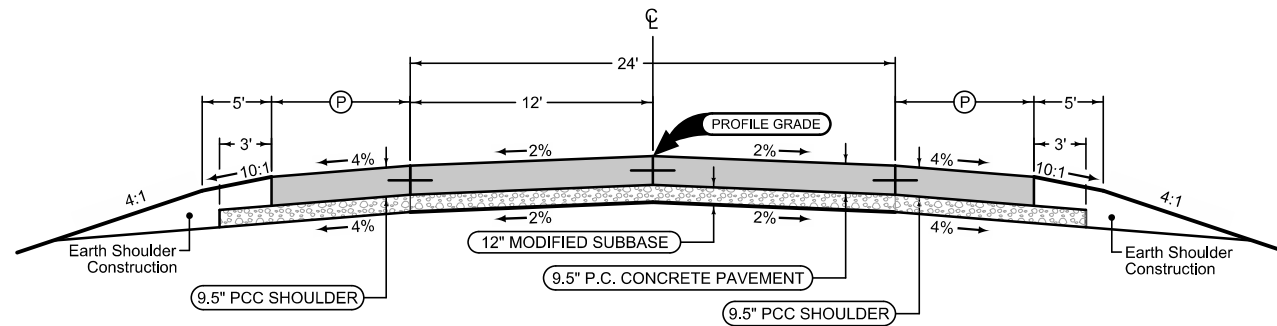


PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 04-13-20

REVISIONS	TOTAL
	19
PROJECT IDENTIFICATION NUMBER	
17-74-018-020	
PROJECT NUMBER	
BRFN-018-3(103)--39-74	
R.O.W. PROJECT NUMBER	
NHSN-018-3(104)--2R-74	



Notes:

Section shown in the direction of travel

① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0 %, minimum allowable slope is 2.0 %. Section may be modified as directed by the Engineer through areas of special shaping.

Refer to tabulation listing of superelevated curves and Standard Road Plans for additional requirements through superelevated curves.

Full Depth PCC Shoulder

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

2_P_FullPCC_04-21-20		(P)
STATION TO STATION		Feet
309+03.70	309+80.00	10
312+40.00	313+56.72	10

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

2P_04-21-20	
STATION TO STATION	
309+03.70	309+80.00
312+40.00	312+62.69

Full Depth PCC Shoulder

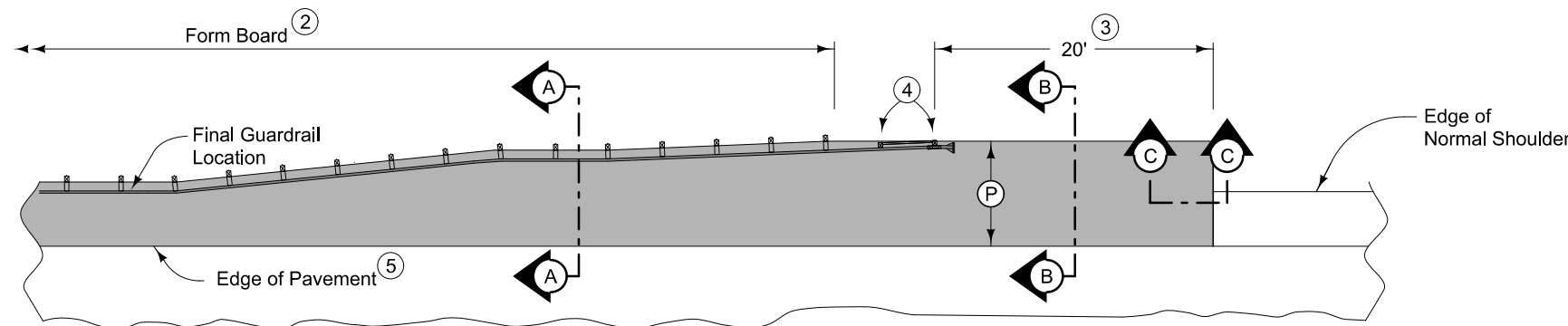
Shoulder Jointing:
Longitudinal joint: L-2 or KT-2
Transverse joints: C at 17' spacing

2_P_FullPCC_04-21-20		(P)
STATION TO STATION		Feet
308+72.98	309+80.00	10
312+40.00	313+32.39	10

**TYPICAL CROSS SECTION
PCC PAVING**

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

US 18

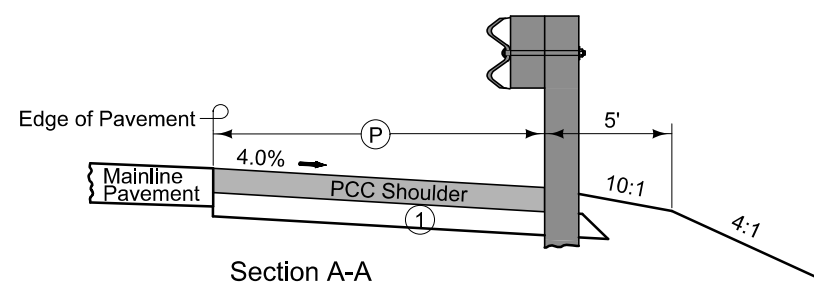


PLAN VIEW

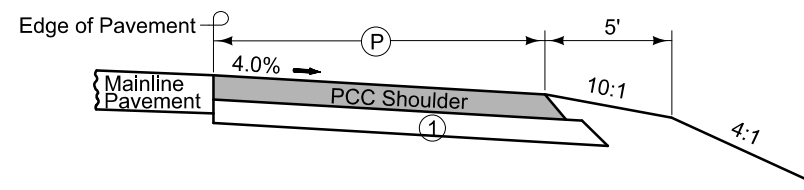
9.5" PCC Shoulder at guardrail.

Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

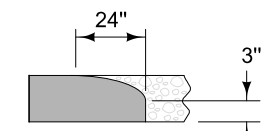
- ① For subgrade treatment, refer to other details in the plan.
- ② When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown. Refer to note 4 for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20 feet beyond the center of the first post.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ⑤ 'KT-1' joint for PCC shoulder.



Section A-A



Section B-B

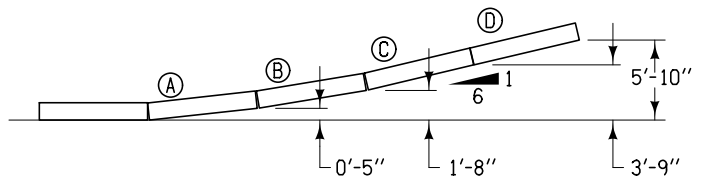
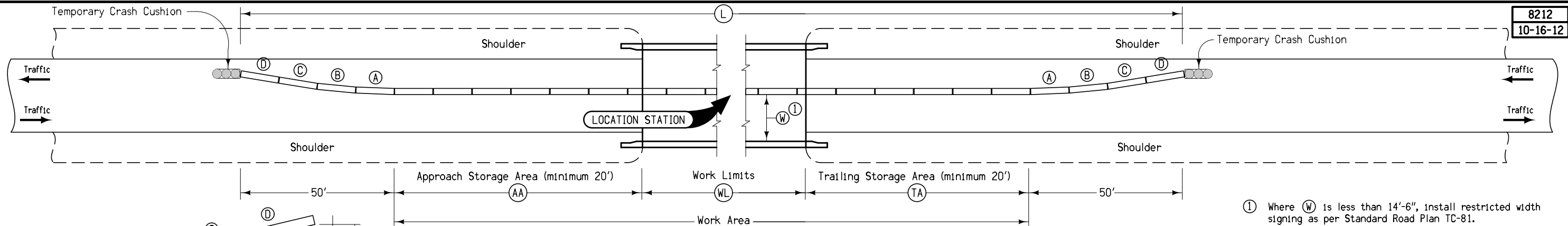


Section C-C
Roll down at granular shoulder or earth.

PCC PAVED SHOULDER AT GUARDRAIL

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

US 18










BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W ^①	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
311+10	RT	175	100	187.5	562.5	X	10-8	STAGE 1
311+10	LT	175	100	187.5	562.5	X	15-0	STAGE 2




① Where W is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.

**TEMPORARY CONCRETE BARRIER LAYOUT
for Two-Way Traffic**














SURVEY SYMBOLS

-  Telephone Pedestal
-  Fiber Optics Telephone Line
-  Stream Bank
-  Centerline Draw or Stream (Down)
-  Edge of Paved Roads
-  Bridge
-  Edge of Gravel Shoulder or Entrance
-  Power Pole
-  Guard Rail Steel







UTILITY LEGEND





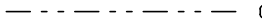




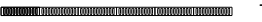


-  Iowa Lakes Electric Cooperative
Electric Transmission
Brian Scott
702 South 1st Street
Estherville, IA 51334
(712)362-6746
brians@ilec.coop
-  Windstream Communications (CLEC)
Fiber Transmission
Joy Matthews
11101 Anderson Drive, Suite 100
Little Rock, AR 72212
(501)748-7654
WCI.OSP.Permits@Windstream.com
-  Windstream Communications (ILEC)
Telephone, Fiber Distribution, &
Fiber Transmission
Albert Prah
4001 N. Rodney Parham, 3rd Floor
Little Rock, AR 72212
(501)784-4760
WCI.OSP.Permits@Windstream.com

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

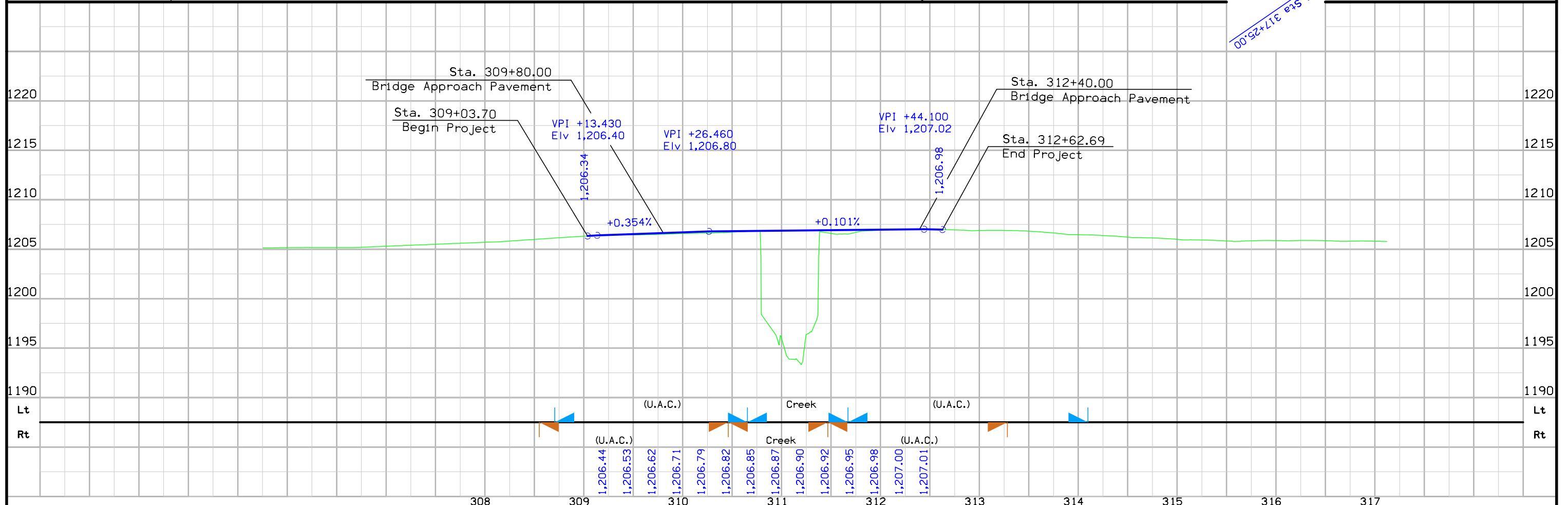
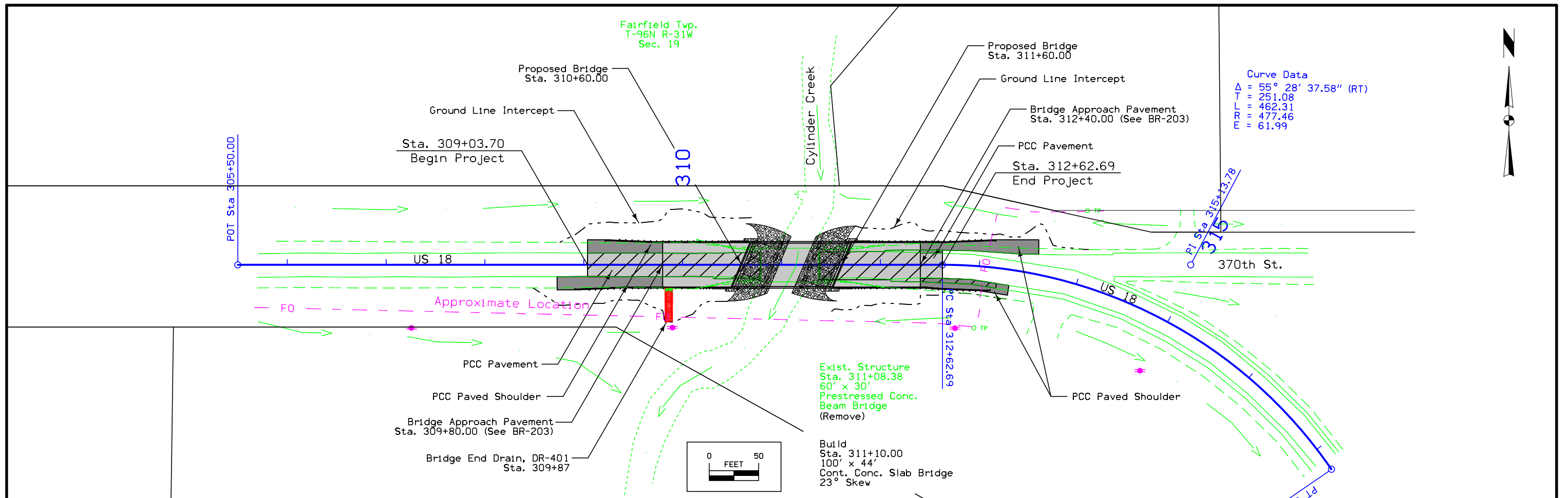
-  Reference Point
-  Station
-  Survey Line
-  Section Corner
-  Ground Line Intercept
-  Saw Cut
-  Guardrail
-  Trench Drain
-  HighTension Cable Guardrail
-  Sheet Pile
-  Pavement Removal
-  Clearing & Grubbing Area

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)



FILE NO.	ENGLISH	DESIGN TEAM	J1a \ Koch	PALO ALTO COUNTY	PROJECT NUMBER	BRFN-018-3(103)--39-74	SHEET NUMBER	D.2
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Survey Information

Palo Alto County
BRFN-018-3(103)--39-74
Cylinder Creek at W Jct Co Rd N60
PIN 17-74-018-020
Sap-611.1

Party Personnel

Jeffrey Duncan- Party Chief

Date(s) of Survey

Begin Date 04/23/2019
End Date 06/19/2019

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge work on Cylinder Creek along US Highway 18. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control.

Vertical Control

The vertical datum is NAVD88. Vertical Control was established on 3 monuments designated as points A19, 446, and X18. These monuments are expected to hold vertical reasonably well. Datum was transferred from Iowa RTN reference stations to the projects monuments by using concurrent 6-hour static measurements and post processing connecting vectors. Geoid 12 B was used in processing.

This survey observed 2 NGS Control Monument with published NAVD88 heights to compare to local ground control:

NGS 2nd. order class 0 mark designated A19 has a published Elev. of 1223.13
Survey Elev. = 1223.079

NGS 2nd. order class 0 mark designated X18 has a published Elev. of 1193.73
Survey Elev. = 1193.653

This survey observed 1 Palo Alto County Control Monument with published NAVD88 heights to compare to local ground control:

Palo Alto County mark designated 446 has a published Elev. Of 1210.58
Survey Elev. = 1210.527

Horizontal Control

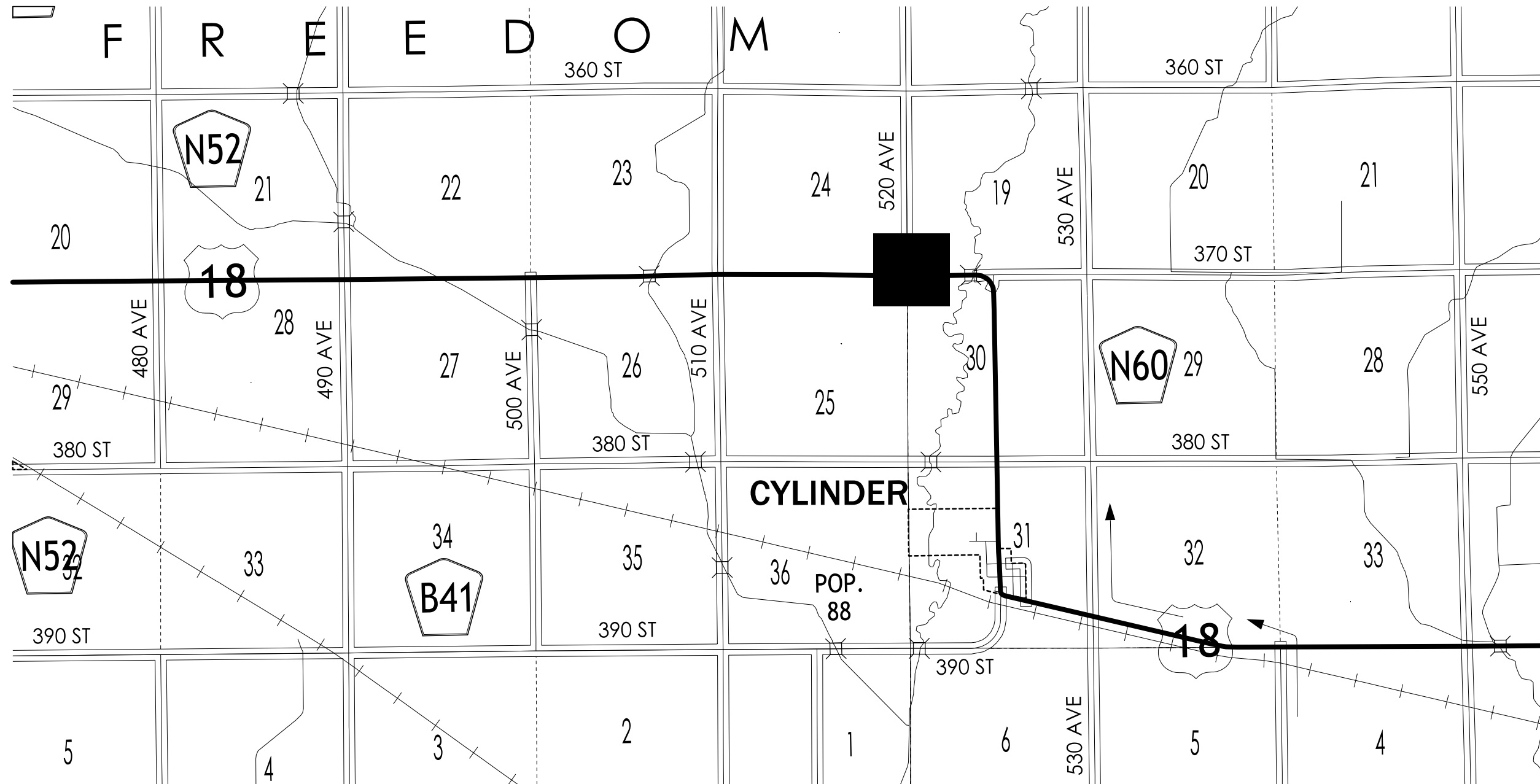
The project coordinate system for this survey is Iowa RCS Zone 1 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinate are relative to the National Reference Station network datum NAD83 (2011) for Epoch 2010.00. Coordinates were determined by using concurrent 6-hour static measurements and post processing connecting vectors. Additional control points were placed throughout the project using a GNSS Base-Rover setups.

Alignment Information

The horizontal alignment for this survey is provided by District 3 ROW.

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 1

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 1

Point	North	East	Elevation	Feature Code-Description
Name	Coordinate	Coordinate		
446	9573872.713	11685415.9	1210.53	CP COUNTY GPS MON 34.0FT S CL 360TH ST 21.1FT W OF POWER POLE 16.0FT W DNR ENT
A19	9565105.067	11663037.77	1223.08	CP NGS MON 46.4FT S OF THE S RAIL 46.2FT W OF CL OF 480TH AVE 0.7FT W METAL POLE PAINTED PINK
X18	9557638.298	11695002.05	1193.65	CP NGS MON 360.0FT E OF CO RD N60 37.5FT S OF THE S RAIL 9.6FT N OF S ROW
FENO1	9568753.269	11685308.41	1202.6	FENO 22.5ft NE TOP OF INLET CMP 28.0FT W OF FIELD ENT 75.5FT N OF CL HWY 18

108-23A 08-01-08
TRAFFIC CONTROL PLAN
Traffic will be maintained in stages by utilizing a 10'-8" wide traffic lane during Stage 1 and a 15 ft. wide traffic lane for Stage 2. One lane of traffic will be maintained during each stage. Temporary traffic signals will be required. To ensure proper sight distance, the West/Northbound traffic will be re-routed to County Road N60 (370th St.). East/Southbound traffic will continue to use US 18.

108-26A 08-01-08
STAGING NOTES
<p>Stage 1:</p> <p>Traffic Control: Utilize temporary traffic control standard TC-213 to install temporary PCC Pavement along East/Southbound lane. Remove temporary traffic control for temporary PCC Pavement and install temporary traffic control devices for bridge staging utilizing traffic control standard TC-217 and details within the plans. Close West/Northbound lane of US 18 through curve. Install temporary concrete barrier rail across bridge. Maintain alternating one lane of traffic.</p> <p>Construction: Construct temporary PCC Pavement along East/Southbound lane. Construct North side of bridge, approaches, mainline pavement, shoulders, and guardrail.</p> <p>Stage 2:</p> <p>Traffic Control: Relocate temporary concrete barrier rail and shift alternating traffic to North side of bridge. When construction is complete, remove temporary traffic control devices and open all lanes to traffic.</p> <p>Construction: Remove temporary PCC Pavement. Construct South side of bridge, approaches, mainline pavement, shoulders, and guardrail.</p>










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.								
<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Project</th> <th style="width: 50%;">Type of Work</th> </tr> </thead> <tbody> <tr> <td>None provided.</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Project	Type of Work	None provided.					
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
			No Restrictions Anticipated									

**CROSS SECTION VIEW COLOR LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

**CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**













	Pavement Removal		Proposed Granular Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		Permanent Barrier Rail
			Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

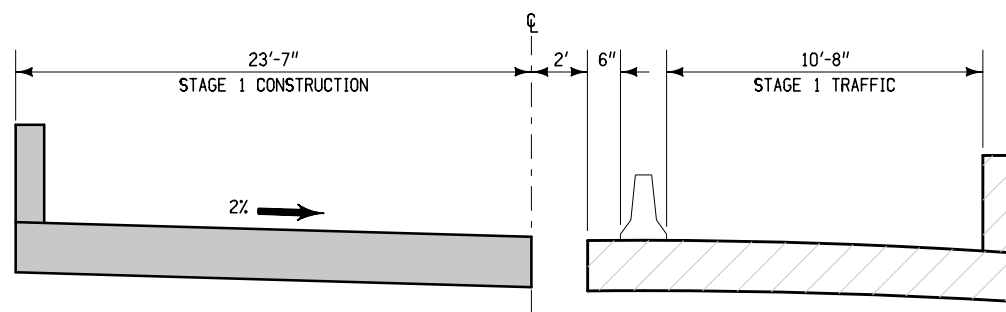
**PLAN VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

●	Channelizing Device		Crash Cushion (Temp or Perm)
✕	Drum		Traffic Signal
■	Temporary Lane Separator		Flagger
◆	Tubular Marker		Temporary Floodlighting
♦	Channelizer Marker		Traffic Sign
△	Concrete Barrier Marker		Type III Barricade
◁	Delineator		Type A Warning Light
—	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout		Lane Identification

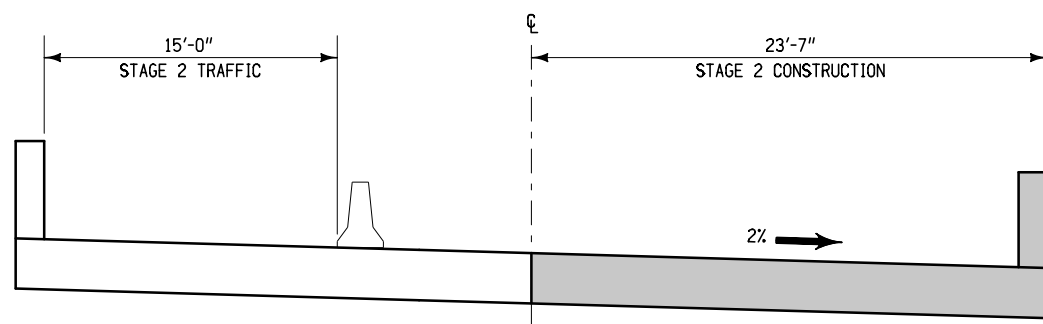
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

**TRAFFIC CONTROL
AND
STAGING
LEGEND AND SYMBOL
INFORMATION SHEET**

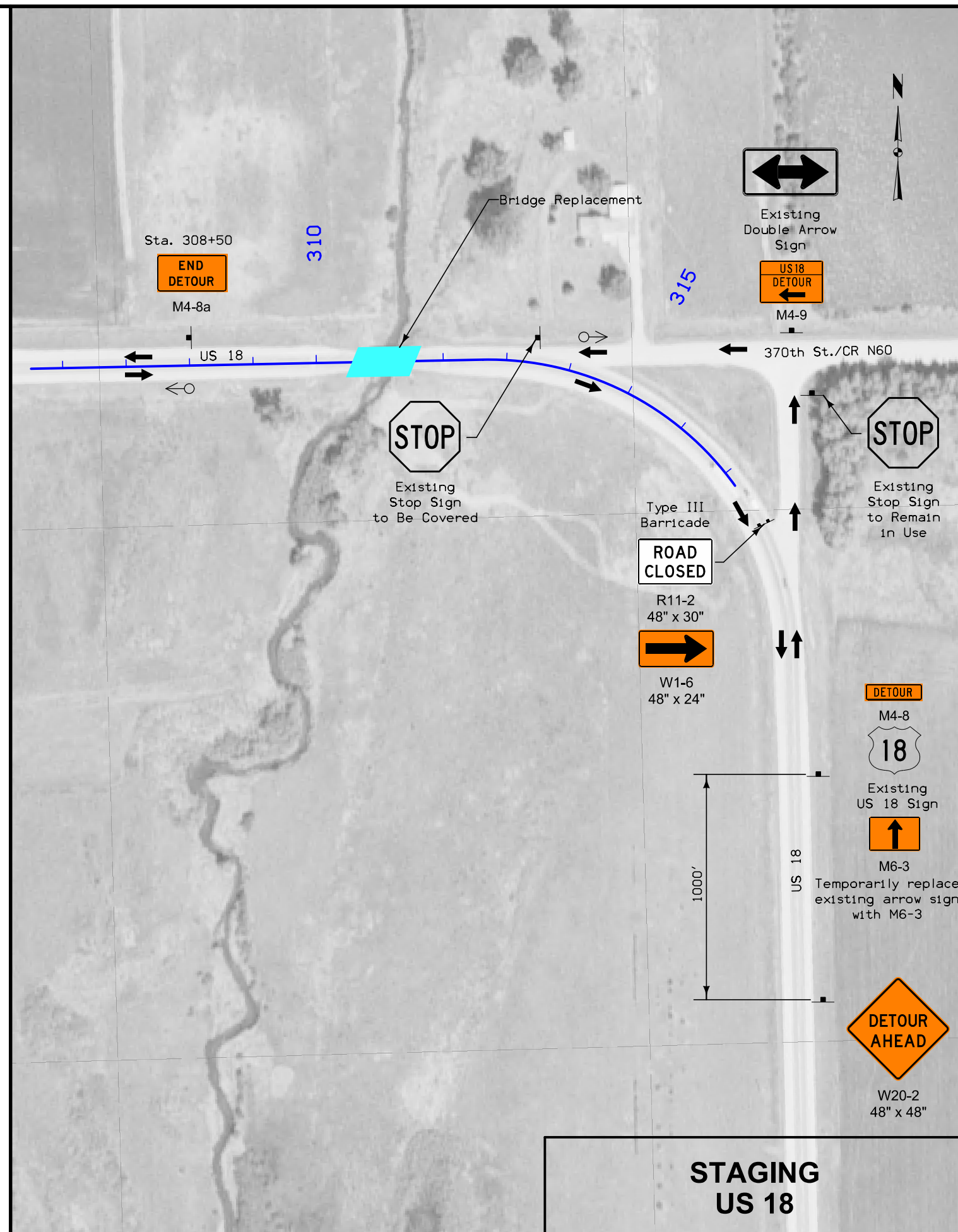
(COVERS SHEET SERIES J)



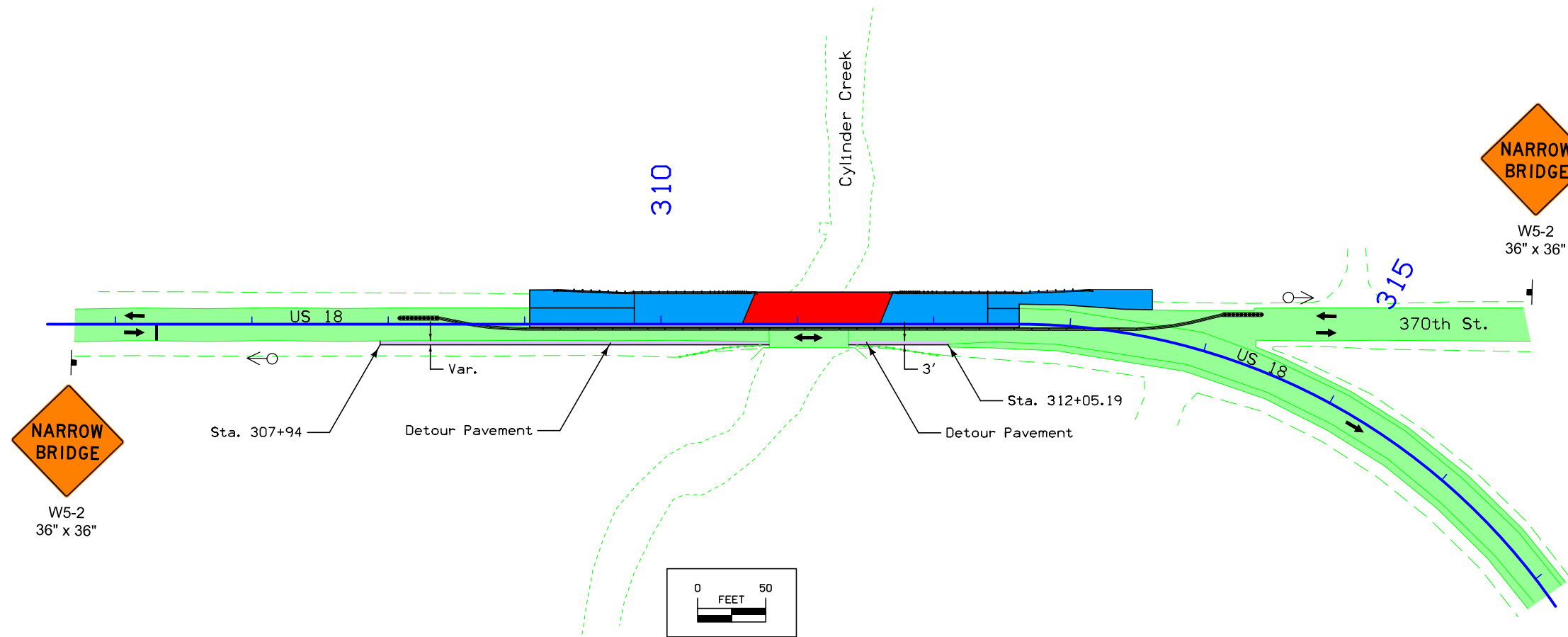
TYPICAL BRIDGE CROSS SECTION
STAGE 1



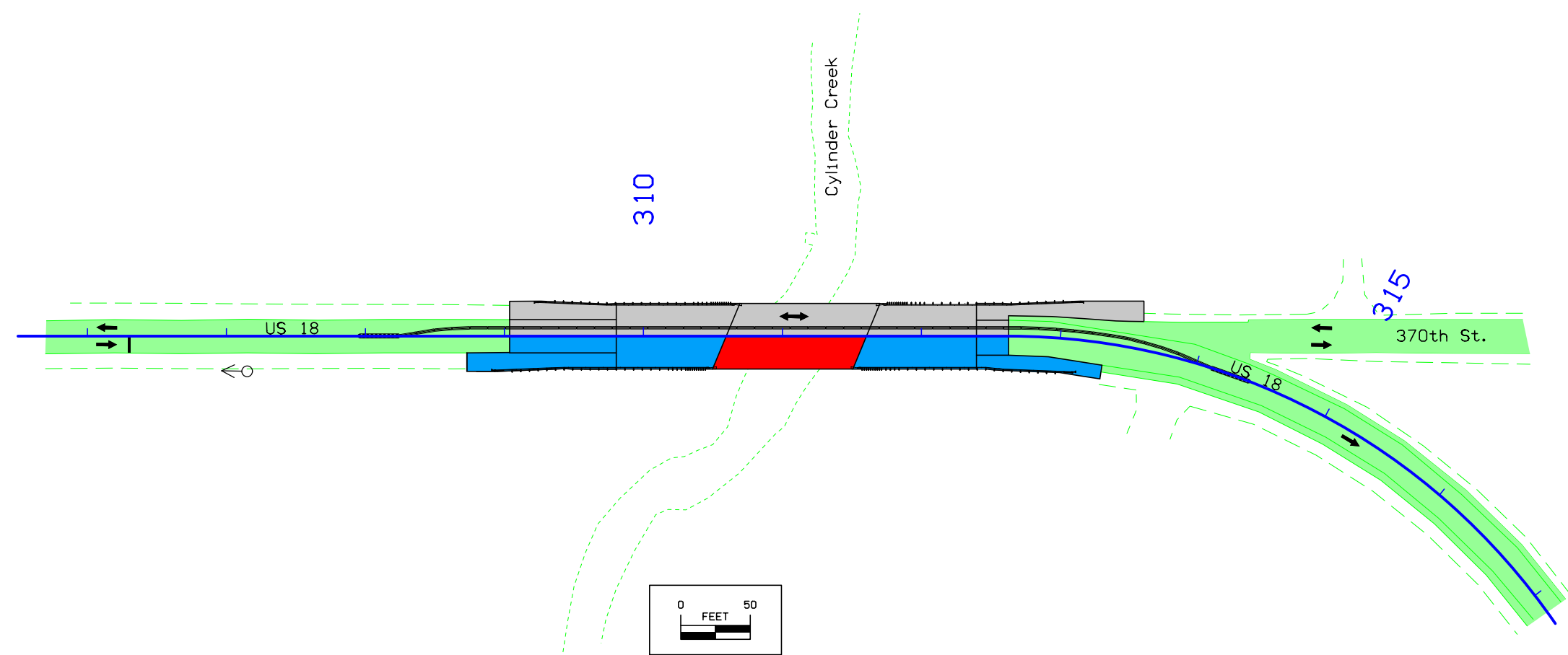
TYPICAL BRIDGE CROSS SECTION
STAGE 2



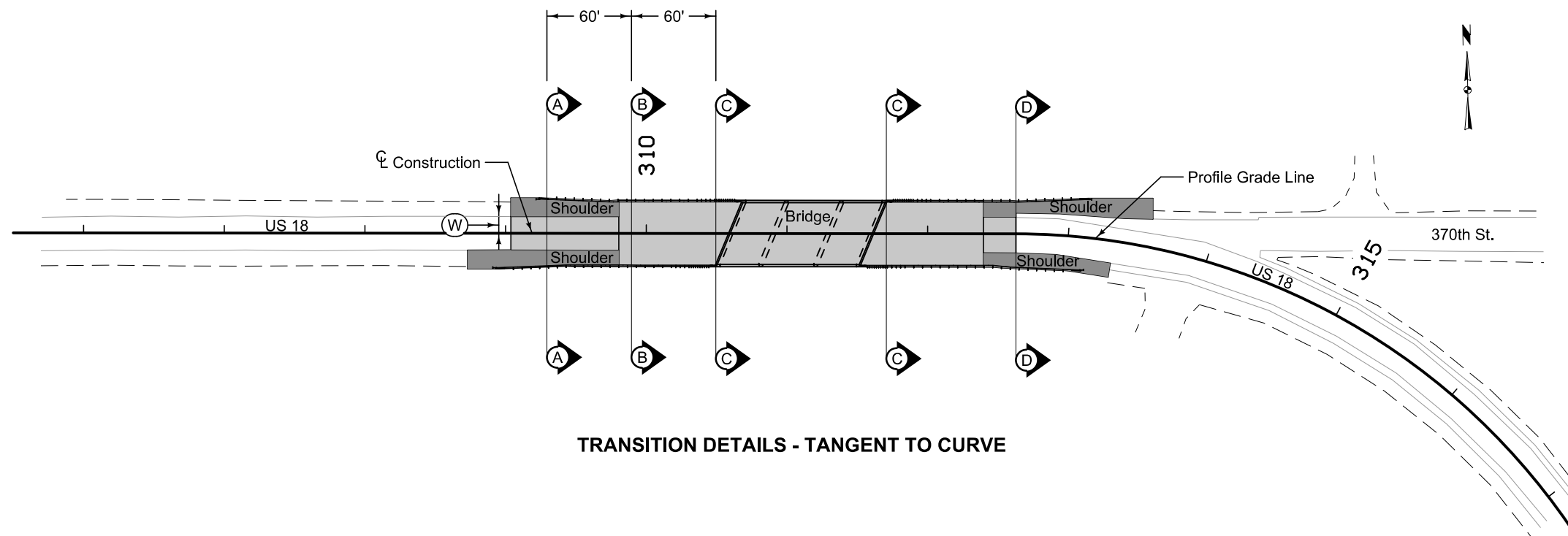
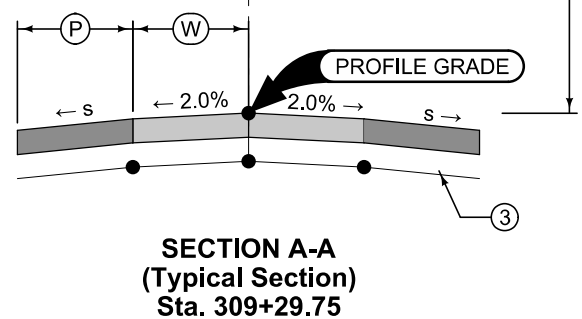
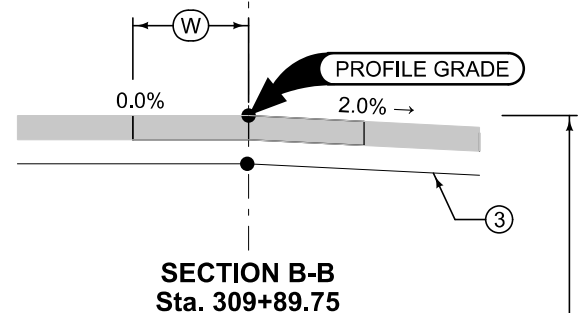
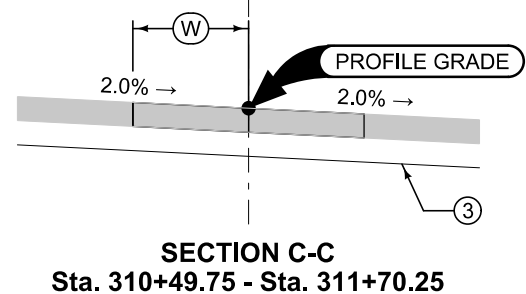
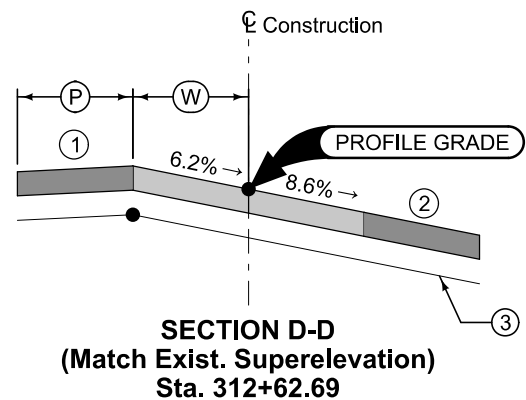
**STAGING
US 18**



STAGE 1



STAGE 2



Unless otherwise specified, all lengths are measured along the centerline of construction.

Axis of rotation coincides with profile grade location.

Ⓜ = 12' Regardless of Pavement Width

Ⓟ = Typical 10' and Var. HMA Shoulder Width

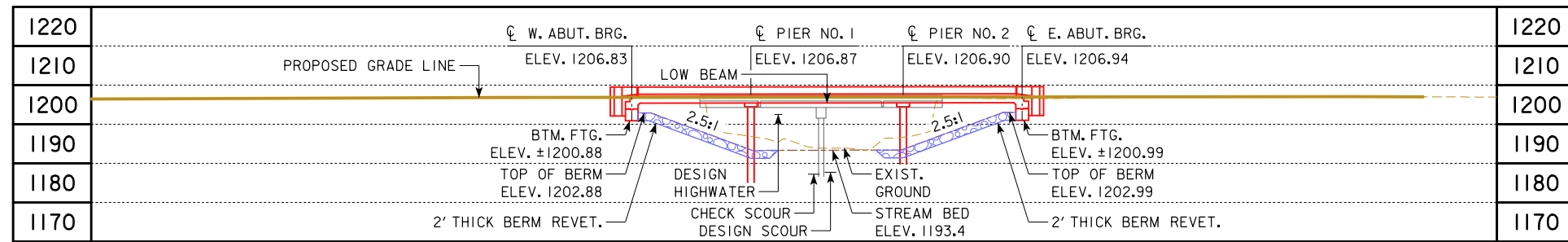
s = Normal Shoulder Slope

- ① High Side Shoulder: Maintain normal shoulder cross slope (s), until the cross slope break with the adjacent pavement reaches 8.0%. Maintain 8% breakover until superelevation rate reaches 7%. If superelevation rate exceeds 7.0%, maintain a 1% shoulder cross slope away from the adjacent pavement.
- ② Low Side Shoulder: Maintain shoulder slope at the same cross slope as the adjacent pavement.
- ③ Subgrade Surface: Subgrade surface cross slope parallel to pavement surface cross slope.

Possible Tabulation:
101-18

SUPERELEVATION DETAILS
US 18

CONTROL POINT FENO1: N 9568753.27, E 11685308.41, FENO 22.5 FEET NE TOP OF INLET CMP 28.0 FEET WEST OF FIELD ENTRANCE 75.5 FEET NORTH OF CL HIGHWAY 18. ELEV. 1202.6

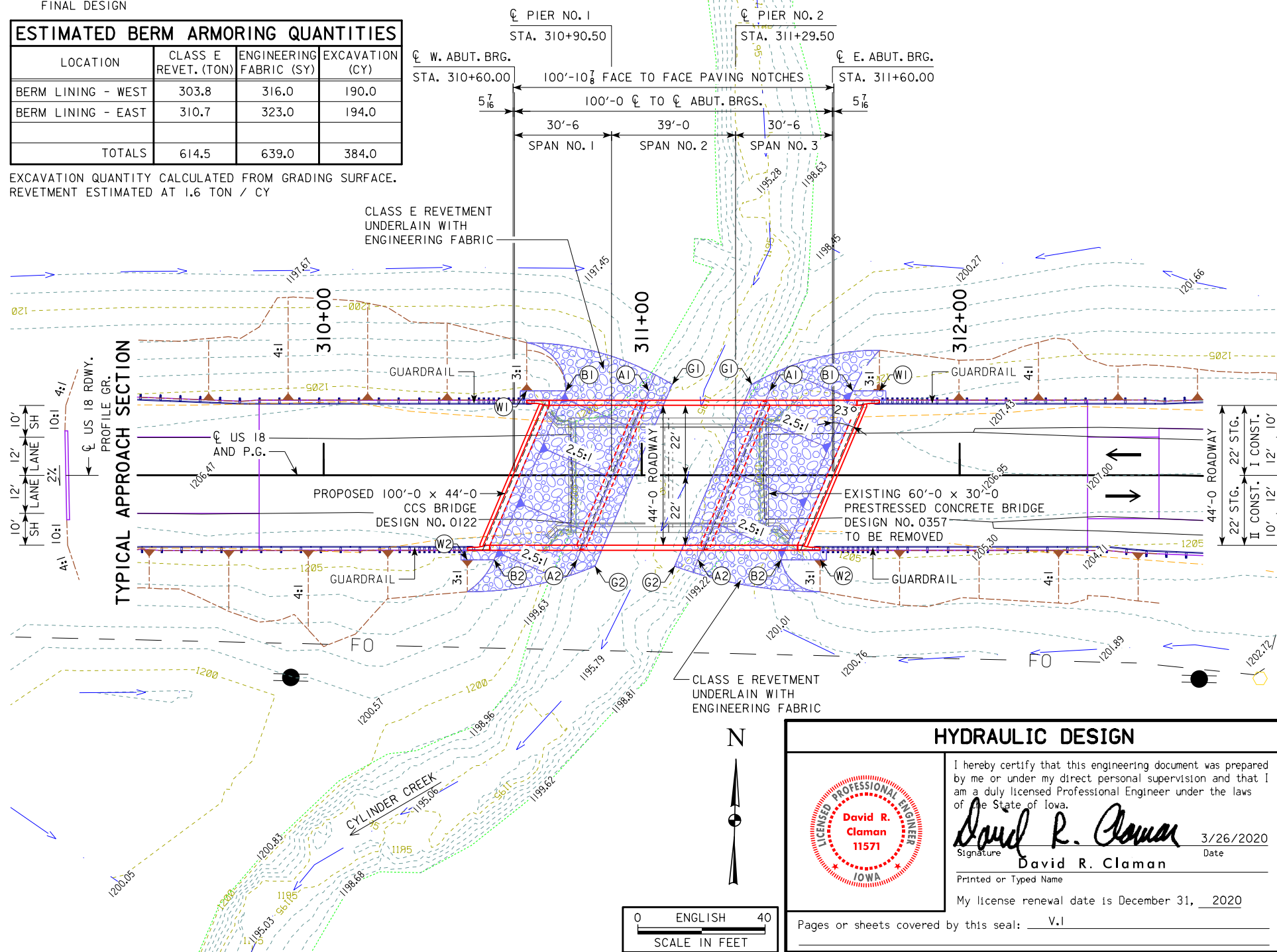


LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY

NOTES:
 TL-4 BRIDGE RAILING PROPOSED
 TOP OF BRIDGE DECK AT PROFILE GRADE
 PIER TYPE - FULLY ENCASED PILE BENT
 BERM SLOPES TO BE CONFIRMED DURING FINAL DESIGN

LOCATION	CLASS E REVET. (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM LINING - WEST	303.8	316.0	190.0
BERM LINING - EAST	310.7	323.0	194.0
TOTALS	614.5	639.0	384.0

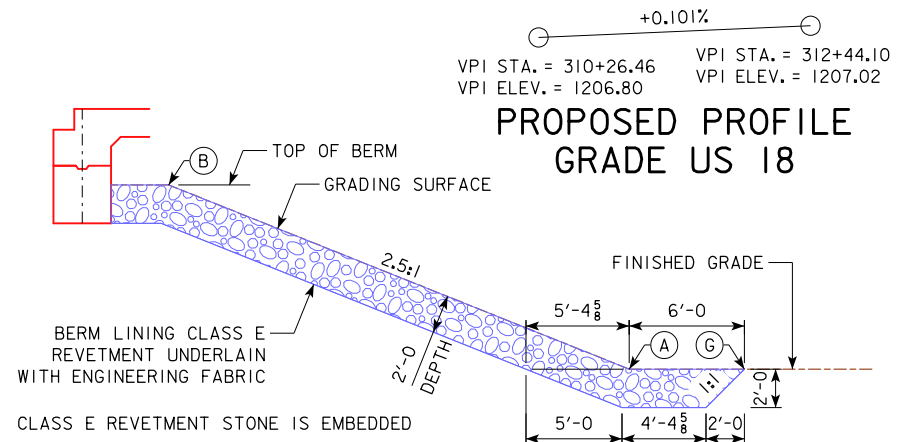
EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.
 REVETMENT ESTIMATED AT 1.6 TON / CY



SITUATION PLAN

POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	311+02.25	26.58' LT.	1193.28	311+40.32	26.58' LT.	1193.39
A2	310+79.68	26.58' RT.	1193.28	311+18.40	26.58' RT.	1193.39
B1	310+76.17	26.58' LT.	1202.88	311+66.40	26.58' LT.	1202.99
B2	310+53.61	26.58' RT.	1202.88	311+43.83	26.58' RT.	1202.99
G1	311+09.61	28.58' LT.	1193.28	311+34.65	28.58' LT.	1193.39
G2	310+85.35	28.58' RT.	1193.28	311+10.39	28.58' RT.	1193.39
W1	310+63.86	26.58' LT.	1207.13	311+74.81	26.58' LT.	1207.24
W2	310+45.19	26.58' RT.	1206.23	311+56.14	26.58' RT.	1206.34

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE



SECTION THRU EMBEDDED REVETMENT BERM

HYDRAULIC DATA

DRAINAGE AREA = 38.2 SQ. MI.
 STREAM SLOPE = 8.5 FT./MI.
 Q₅₀ = 1,650 CFS
 STAGE = 1202.2
 REGULATORY LOW BEAM = 1204.97
 AVG. BRIDGE VELOCITY = 6.3 FPS
 Q₁₀₀ = 1,950 CFS
 STAGE = 1202.5
 OPERATIONAL LOW BEAM = 1204.97
 BACKWATER = 1.76 FT.
 AVG. BRIDGE VELOCITY = 7.0 FPS
 Q₂₀₀ = 2,200 CFS
 DESIGN SCOUR = 1187.7
 Q₅₀₀ = 2,600 CFS
 CHECK SCOUR = 1187.2

TRAFFIC ESTIMATE

2022 AADT 3,500 V.P.D.
 2042 AADT 3,800 V.P.D.
 2021 DHV - V.P.H.
 TRUCKS 16 %
 TOTAL DESIGN ESALS -

LOCATION

US 18 OVER CYLINDER CREEK
 T-96N R-31W
 SECTIONS 19 AND 30
 FAIRFIELD TOWNSHIP
 PALO ALTO COUNTY
 FHWA NO. 039171 (REPLACEMENT)
 FHWA NO. 039170 (EXISTING)
 BRIDGE MAINT. NO. 7412.3S018
 LATITUDE 43.111985°
 LONGITUDE -94.553659°

UTILITIES LEGEND:

FO - FIBER OPTIC - WINDSTREAM
 ● - POWER POLE - IOWA LAKES ELECTRIC
 UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

HYDRAULIC DESIGN

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.

David R. Claman 3/26/2020
 Signature Date
 David R. Claman
 Printed or Typed Name
 My license renewal date is December 31, 2020

Pages or sheets covered by this seal: V.I

PRELIMINARY

DESIGN FOR 23° SKEW L.A.

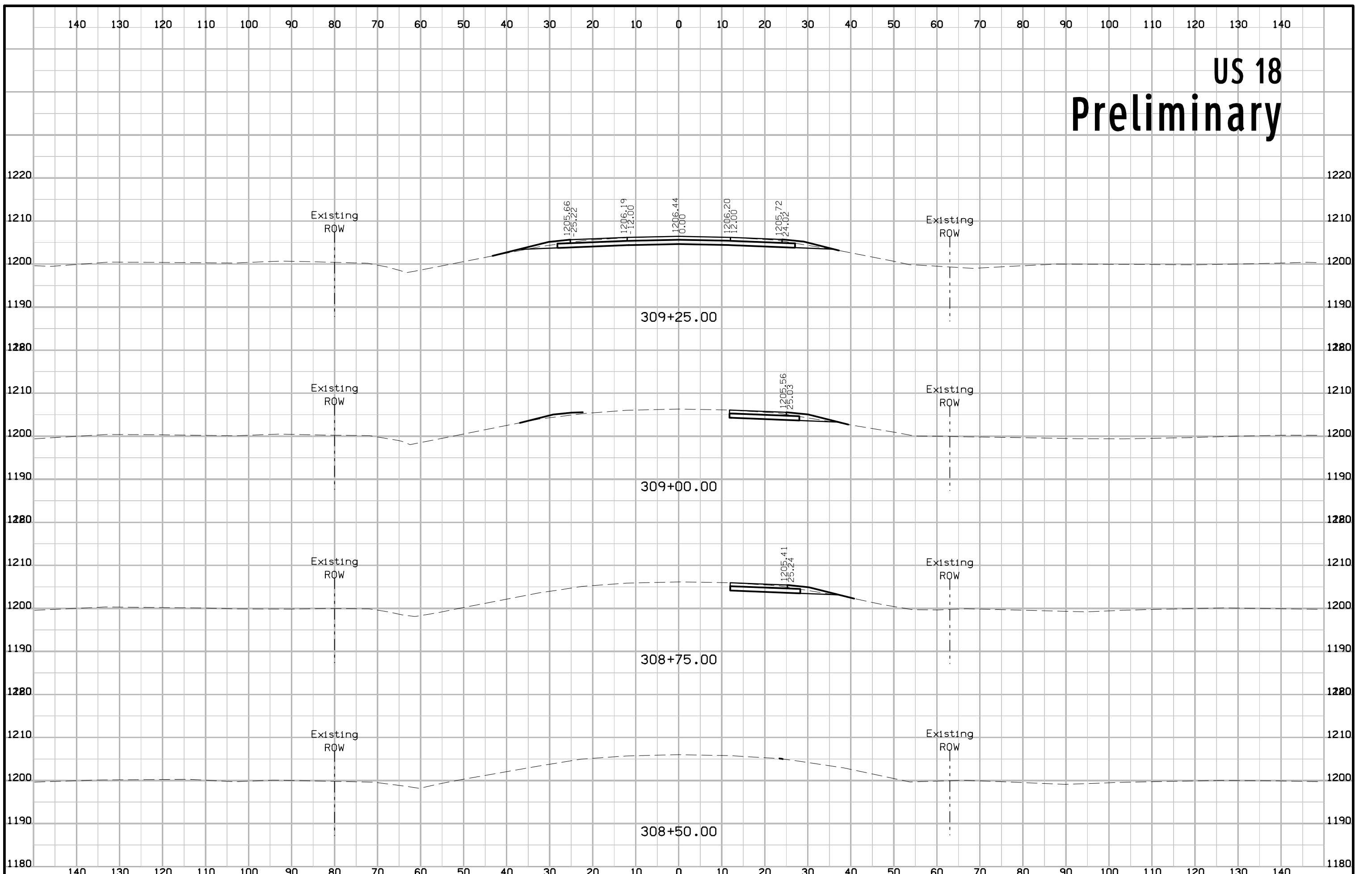
100'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE

30'-6 END SPANS 39'-0 CENTER SPAN

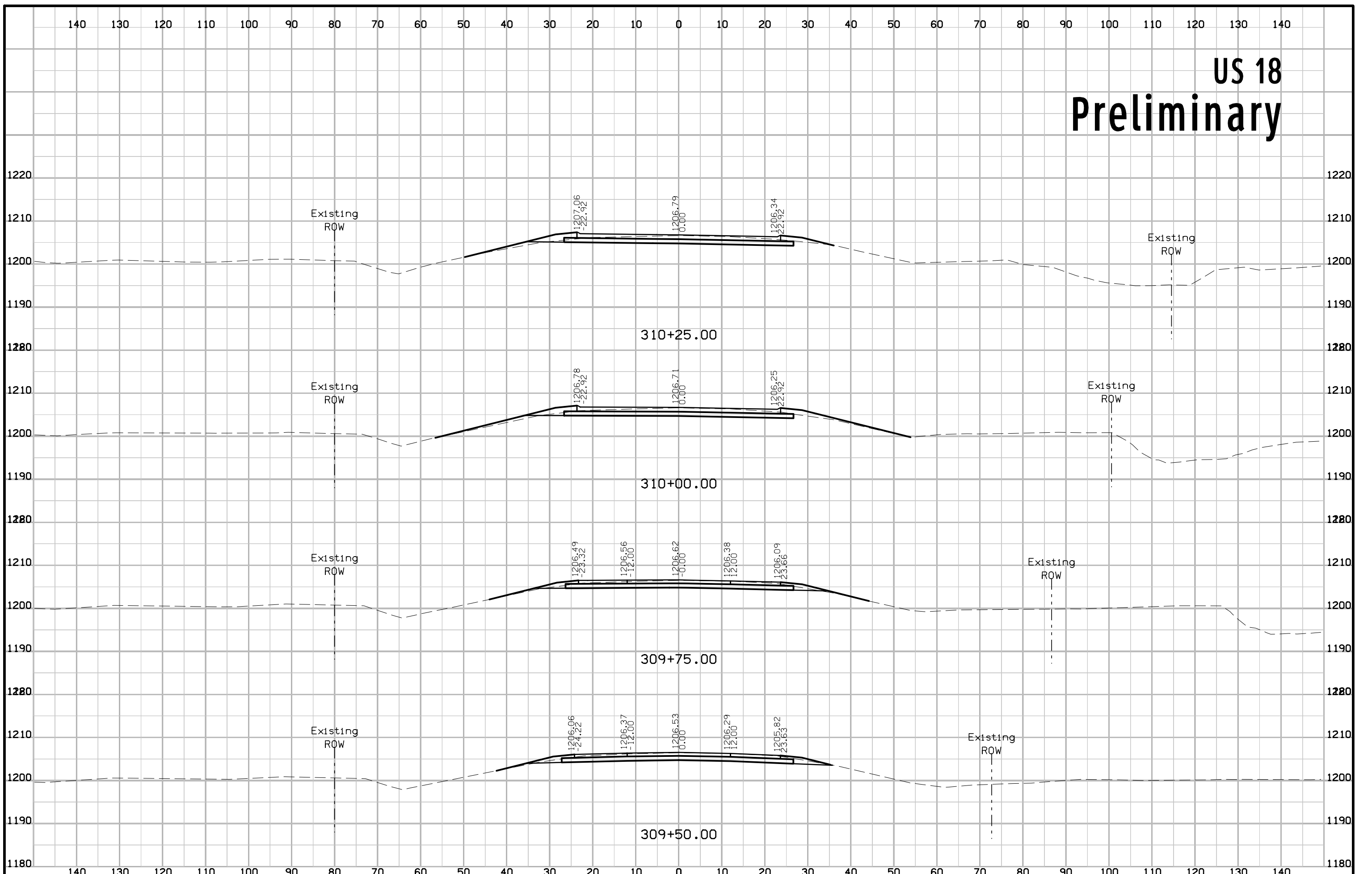
SITUATION PLAN

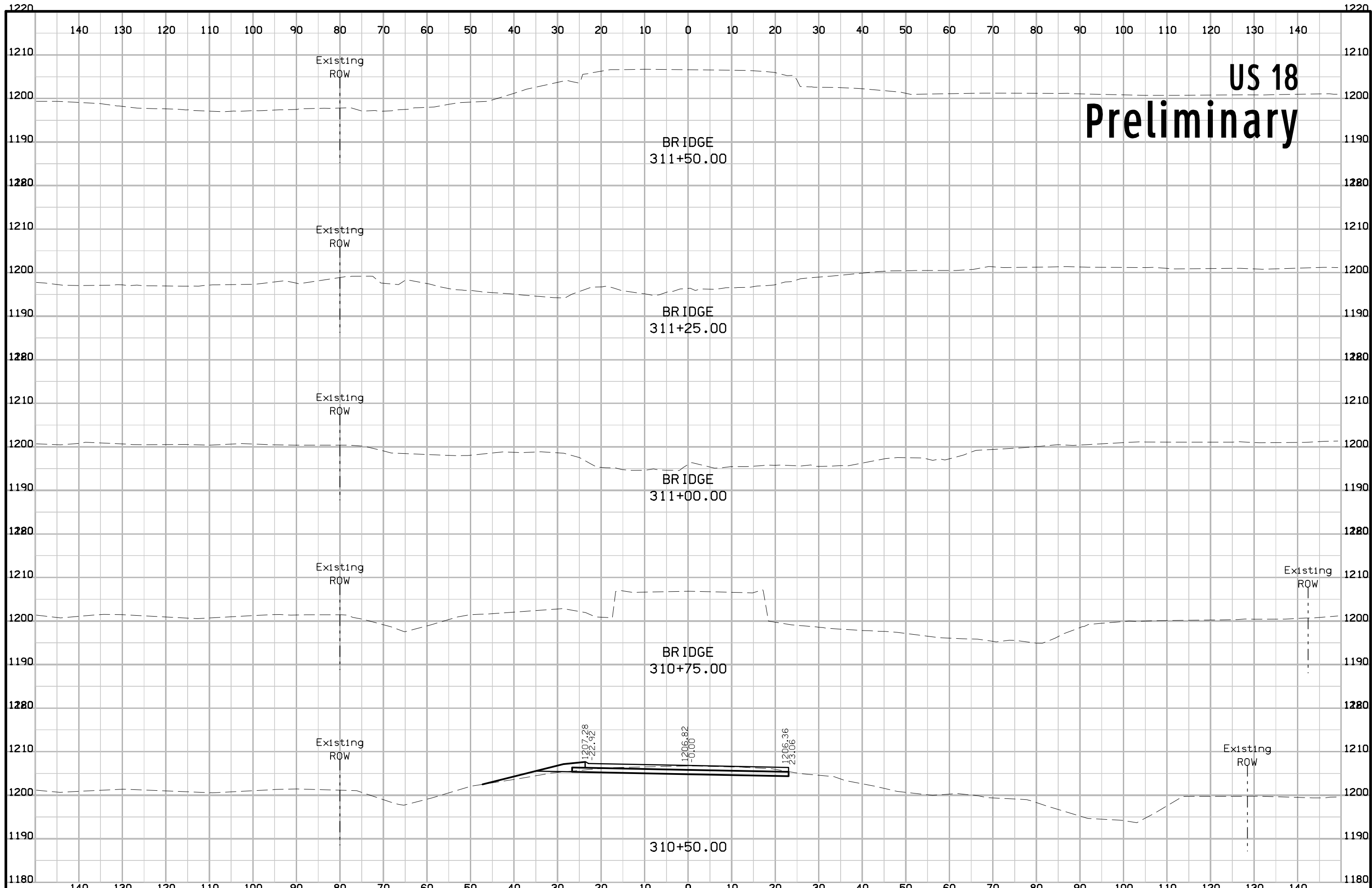
STATION 311+10.00 (US 18) MARCH, 2020
PALO ALTO COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 1 FILE NO. 31692 DESIGN NO. 0122

US 18 Preliminary

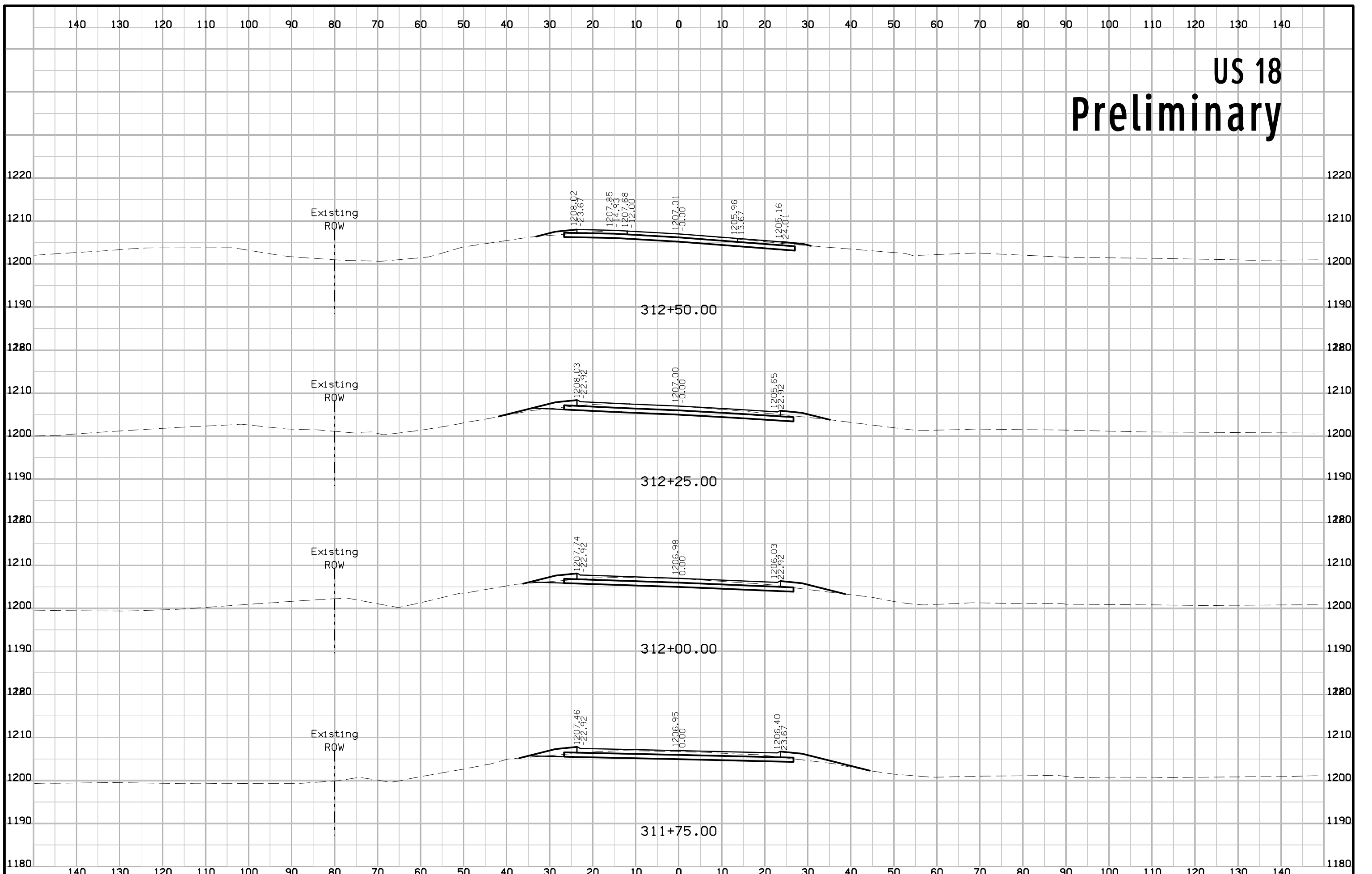


US 18 Preliminary





US 18 Preliminary



US 18 Preliminary

