

WASHINGTON CO.
RCB CULVERT REPLACEMENT - TWIN BOX
BRFN-022-2(74)--39-92
 LETTING DATE 12/15/2020



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
WASHINGTON COUNTY
 RCB CULVERT REPLACEMENT - TWIN BOX

IA 22 OVER BULGERS RUN 4.8 MI. E OF IA 1

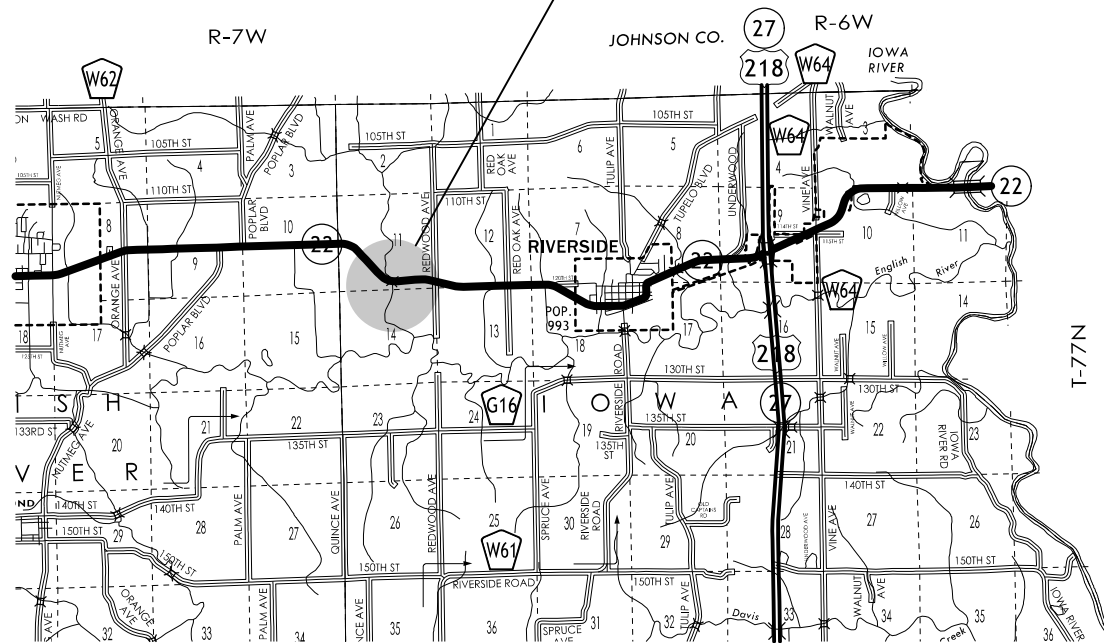
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



STA. 350+26.50
 FHWA 51740
 MAINT. 9240.OS022
 DESIGN 3534



NO PROJECT LENGTH SUMMARY

DESIGN DATA RURAL			
2021	AADT	5300	V.P.D.
2041	AADT	7300	V.P.D.
2041	DHV	760	V.P.H.
	TRUCKS	10	%
Total			
Design	ESALs	1,935,000	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Mark D. Rooney	Primary Signature Block
V.1	Brian Sandberg	Hydraulic Design
V.2	Brian Sandberg	Hydraulic Design
Q.1	Bhooshan Karnik	Geotechnical Design

PRELIMINARY PLANS

Subject to change by final design.

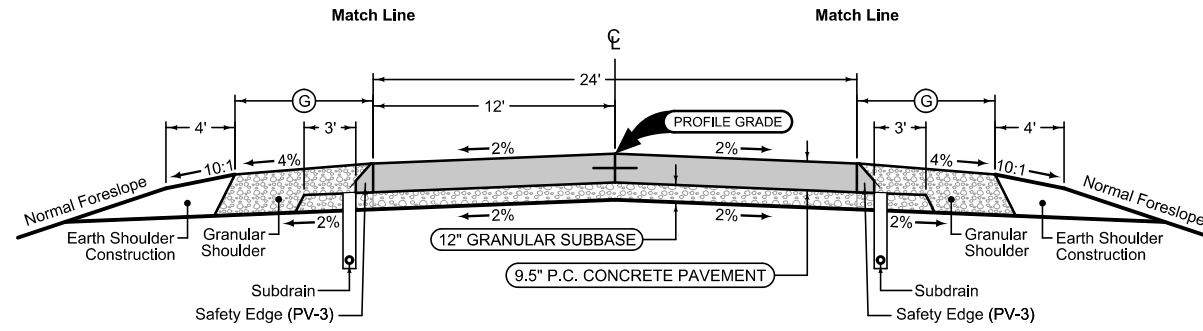
D5 PLAN-Date: 11/9/2018

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
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	Highway 22 Plan
* D.3	Highway 22 Profile
E Sheets	Channel Plan and Profile Sheets
* E.1	Bulgers Run Plan
* E.2	Bulgers Run Profile
G Sheets	Survey Sheets
G.1	Reference Ties and Bench Marks
G.2	Control Point Vicinity Map
G.3	Horizontal and Vertical Control
J Sheets	Traffic Control and Staging Sheets
* J.1	Detour Option 1
* J.2	Detour Option 2
J.3	Traffic Control Plan
Q Sheets	Soils Sheets
Q.1	Soils Sheets Highway 22
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 2	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 3	Highway 22 Cross Sections
X Sheets	Channel Cross Sections
X.1 - 7	Bulgers Run Cross Sections
	* Color Plan Sheets

REVISIONS		TOTAL
		27
PROJECT IDENTIFICATION NUMBER		
16-92-022-010		
PROJECT NUMBER		
BRFN-022-2(74)--39-92		
R.O.W. PROJECT NUMBER		
STPN-022-2(75)--2J-92		

Granular Shoulder with Safety Edge

		2_G_
		10-21-14
STATION TO STATION		(G) Feet
349+68.52	350+82.85	13'



Granular Shoulder with Safety Edge

		2_G_
		10-21-14
STATION TO STATION		(G) Feet
349+68.52	350+82.85	13'

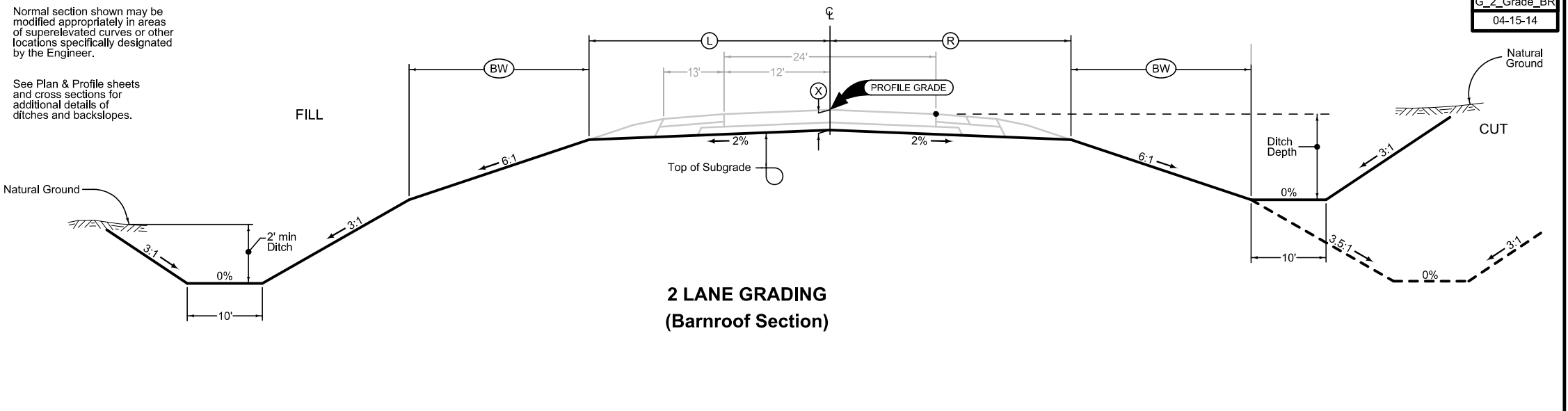
Mainline Jointing:
 Transverse joints: CD at 20' spacing
 Longitudinal joint: L-2

		2P_
		10-19-10
STATION TO STATION		
349+68.52	350+82.85	

LOCATION		DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	(BW) Feet	
IA 22	349+68.52 350+82.85	25	25	21.5	22	

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

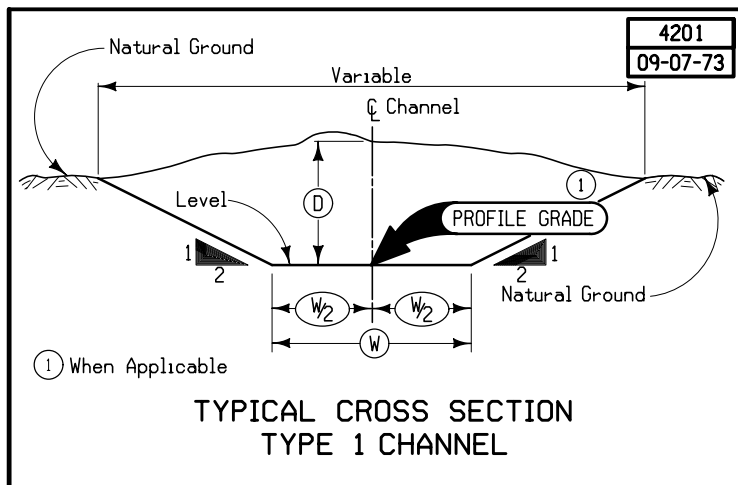
See Plan & Profile sheets and cross sections for additional details of ditches and backstops.



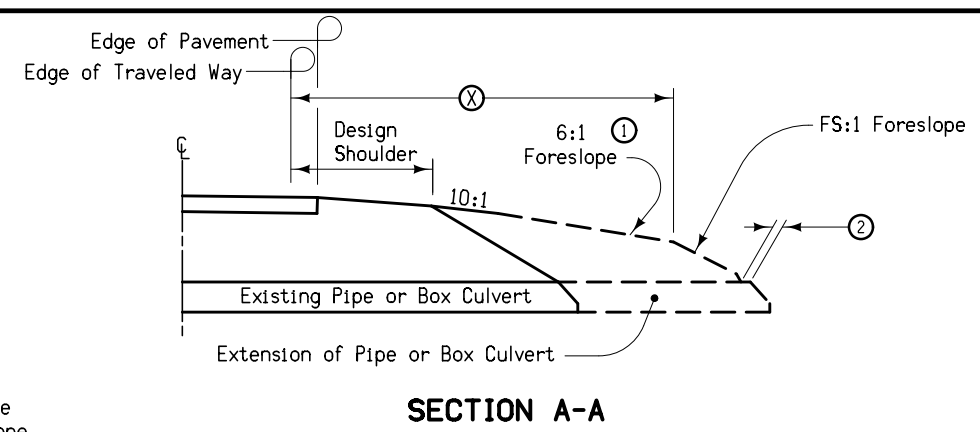
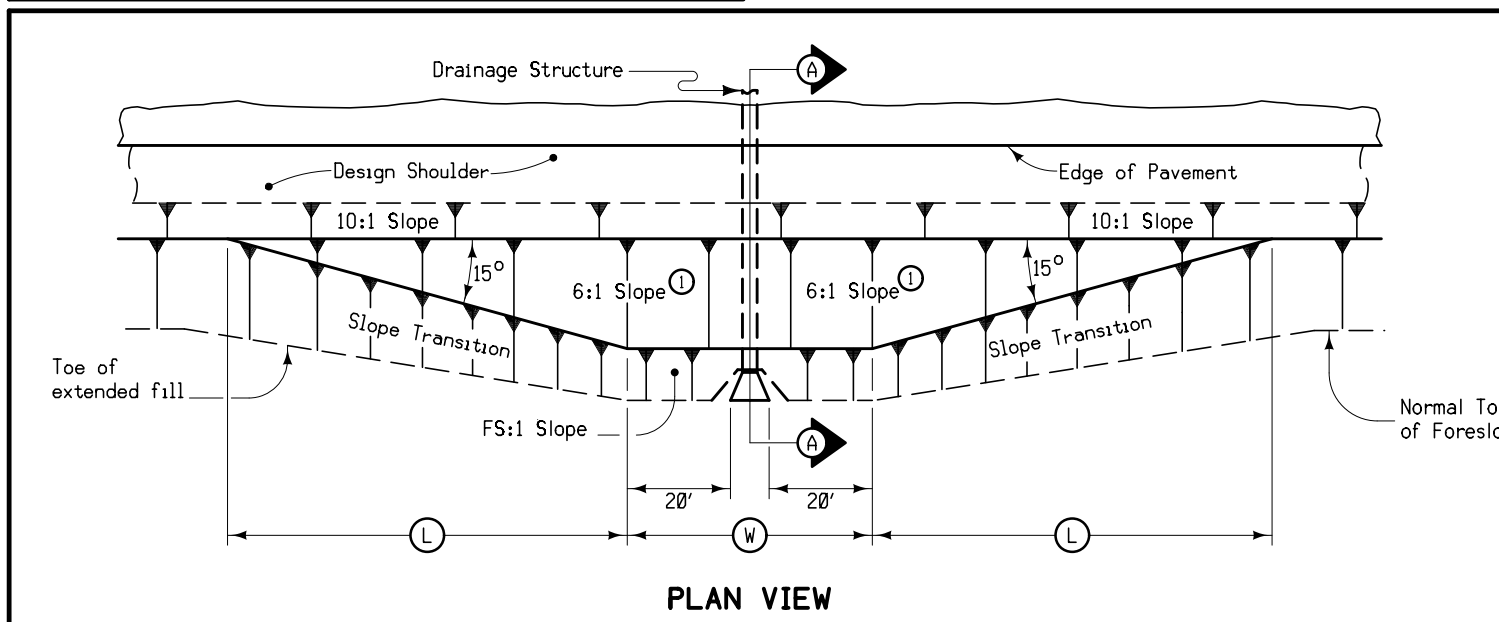
G_2_Grade_BR
04-15-14

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

IA 22 TYPICAL SECTION



LOCATION		WIDTH	DEPTH (Average)
STATION	SIDE	(W)	(D)
1000+10.58	N/A	10.5	10
1003+67.06	N/A	7	10



STRUCTURE LOCATION		(W)	(L)	(X)	(FS)
STATION	SIDE	Feet	Feet	Feet	
350+34.46	BOTH	87	50	32	3:1

4311
04-18-17

- Notes:
- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6".
 - ① Slope may be flatter than 6:1.
 - ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
 - W = Pipe or R.C.B. opening width plus 20 feet each side.

**BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE**

SURVEY SYMBOLS

- ▲ BM Bench Mark
- FENO FENO Monument
- ▲ PCP Photo Control Point
- WC Wild Card (Misc. Field Shot)
- EP Edge of Paved Roads (ML or SR)
- SNP Unpaved Shoulder
- C Centerline BL of Road (ML or SR)
- ENP Edge Paved Entrance & Park Lot
- ENT Centerline BL of Entrance
- PIP Pipe Culvert
- SOP Size of Pipe or Culvert
- REF Reference Tie Point
- FO — F01D Fiber Optic Co. 1 - Quality D
- T1 — T11D Telephone Line Co. 1 - Quality D
- TV — T11D TV Cable Co. 1 - Quality D
- D Centerline Draw or Stream (Down)
- BL Topo Breakline
- PPA Power Pole Co. 1
- x— FW Wire Fence
- ROW Right of Way Mark
- BD Bridge Deck
- BRG Bridge
- CON Concrete or A/C Slab
- BCL Bridge Centerline
- TW Top of Water
- DTM Photogrammetry Elv Control Check
- EW Edge of Water
- GR Ground Shot
- BLS Bridge Low Steel
- PRO Profile Shot
- PI Tangent Point

UTILITY LEGEND

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 — Windstream Communications
 Kelly Eggers
 Engineer
 101 West Madison
 Mt. Pleasant, IA 52641
 (319) 385-5004 Work
 (319) 931-1372 Mobile
 kelly.a.egggers@windstream.com

— TV — Mediacom Communications Corporation
 Darwin Driscoll
 Construction Specialist III
 546 Southgate Ave
 Iowa City, IA 52240
 (845) 204-5742 Mobile
 ddriscoll@mediacomcc.com

● Eastern Iowa Electric
 Tom Quiram
 PO Box 3003
 Wilton, IA 52778
 (563) 732-2211 Work
 (563) 529-3709 Mobile
 tquiram@easterniowa.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
- ▲ Section Corner
- Ground Line Intercept
- /// Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- ~ Sheet Pile
- ▨ Pavement Removal
- ▩ Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

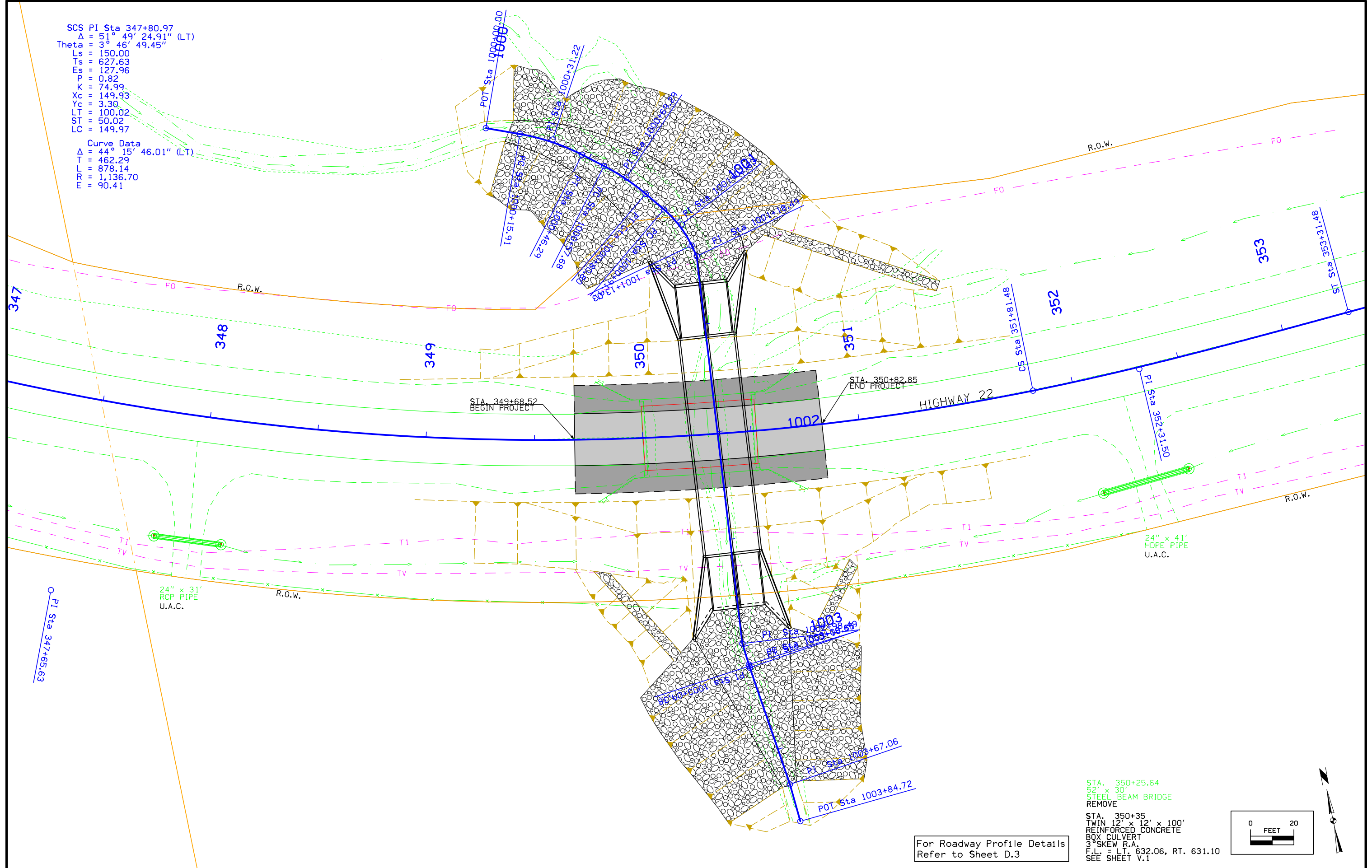
- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

PLAN AND PROFILE

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

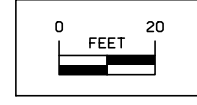
SCS PI Sta 347+80.97
 $\Delta = 51^\circ 49' 24.91''$ (LT)
 Theta = $3^\circ 46' 49.45''$
 Ls = 150.00
 Ts = 627.63
 Es = 127.96
 P = 0.82
 K = 74.99
 Xc = 149.93
 Yc = 3.30
 LT = 100.02
 ST = 50.02
 LC = 149.97

Curve Data
 $\Delta = 44^\circ 15' 46.01''$ (LT)
 T = 462.29
 L = 878.14
 R = 1,136.70
 E = 90.41

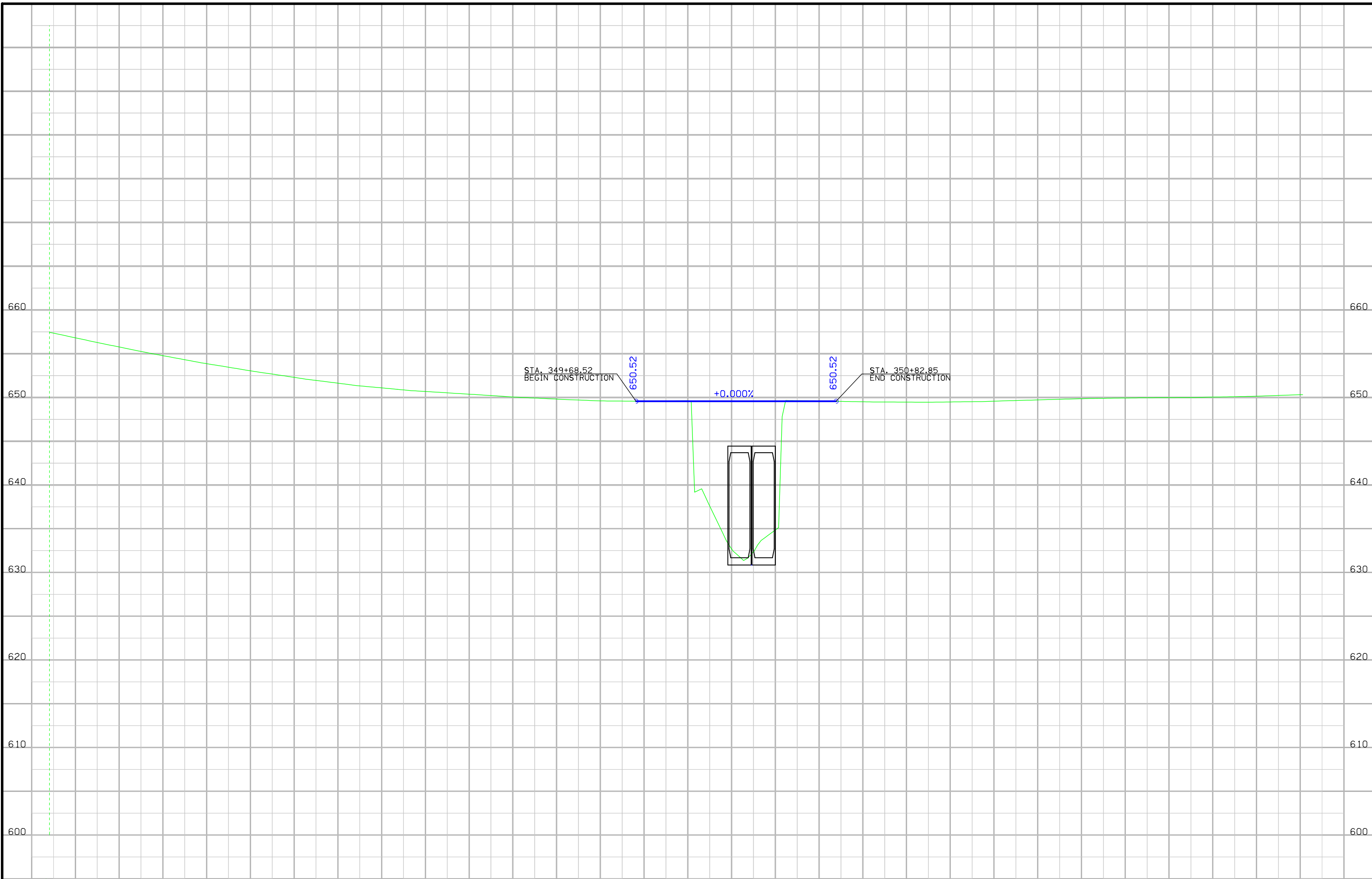


STA. 350+25.64
 52' x 30'
 STEEL BEAM BRIDGE
 REMOVE

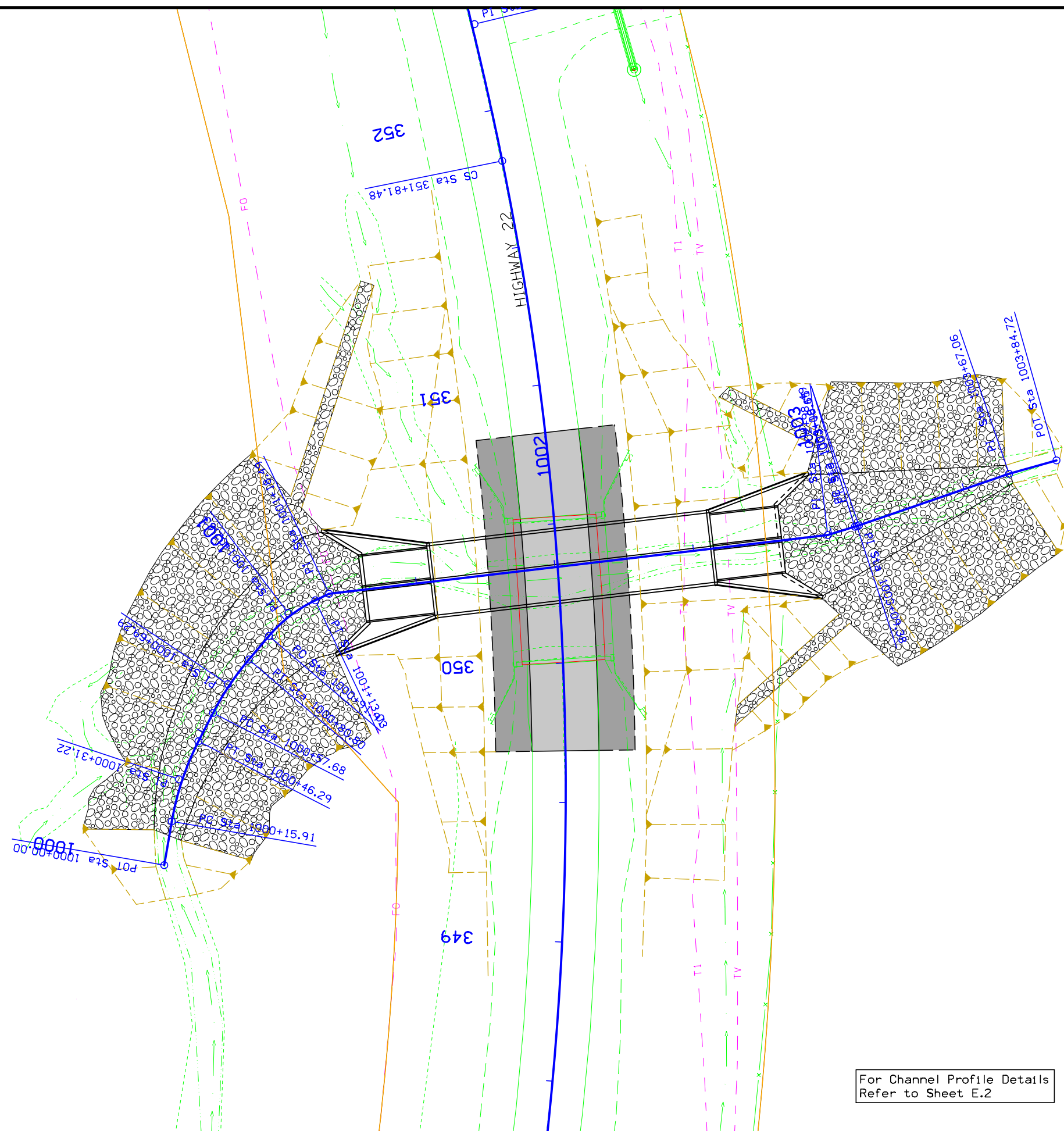
STA. 350+35
 TWIN 12' x 12' x 100'
 REINFORCED CONCRETE
 BOX CULVERT
 3° SKEW R.A.
 F.L. = LT. 632.06, RT. 631.10
 SEE SHEET V.1



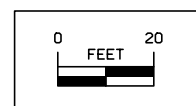
For Roadway Profile Details
 Refer to Sheet D.3

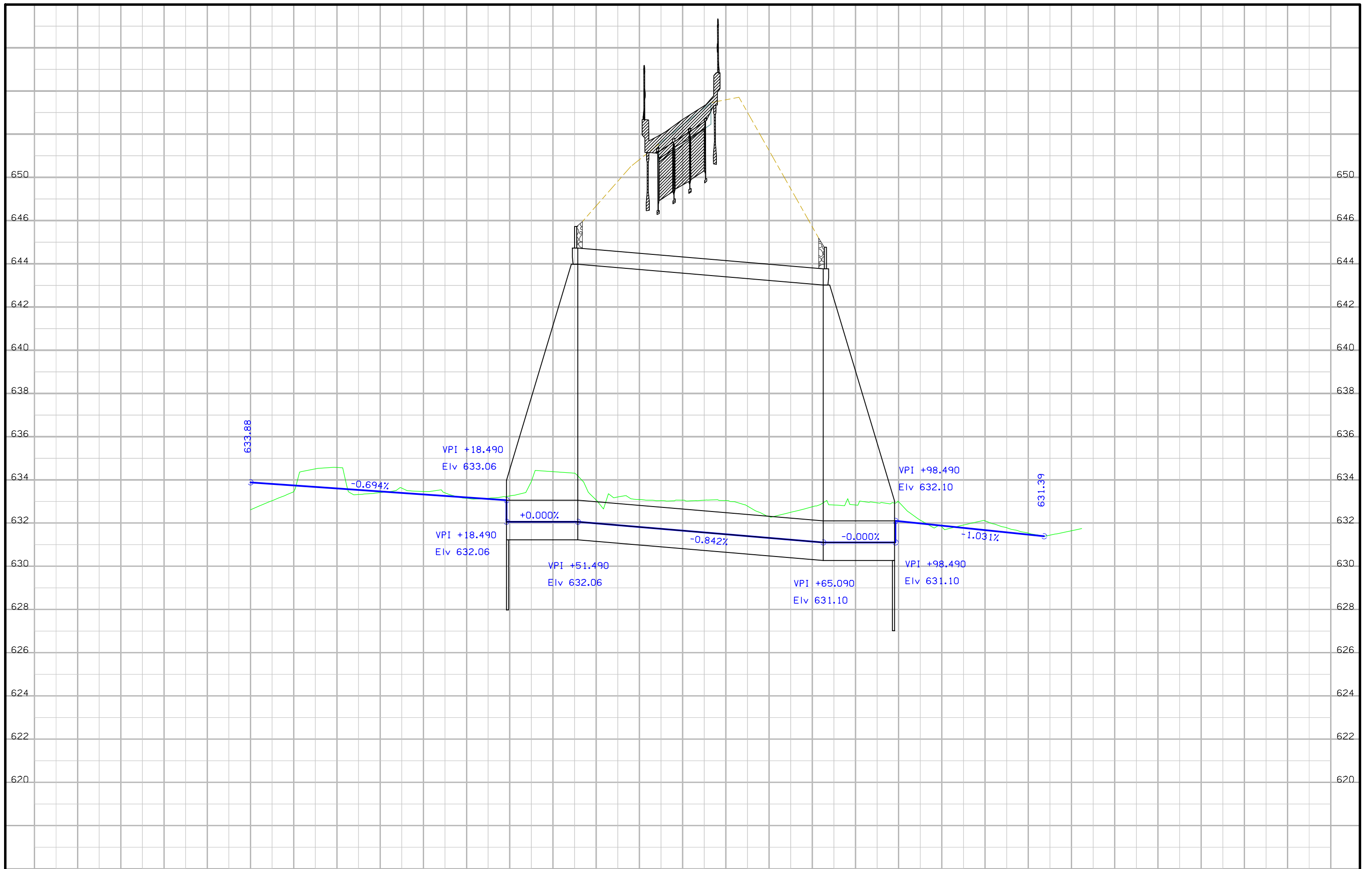


FILE NO.	ENGLISH	DESIGN TEAM IOWA DOT/McCLURE	348 +25 +50 +75	349 +25 +50 +75	WASHINGTON COUNTY	PROJECT NUMBER	BRFN-022-2(74)--39-92	SHEET NUMBER	D.3
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For Channel Profile Details
Refer to Sheet E.2





Survey Information

County: Washington
 SAP 926
 PIN: 16-92-022-010
 Project Number: BRFN-022-2(74)--39-92
 Location: Bulgers Run 4.8 mi E of IA 1
 Type of Work: RCB Culvert Replacement - Twin Box
 Project Directory: 9202201016

General Information

Measurement units for this survey are US survey feet. This survey is for proposed replacement of the IA 22 bridge (Maint. No.9240.0S022) over Bulgers Run, 4.8 miles east of the junction of IA 1. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control. This survey request was for the IA 22 corridor only.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). Benchmarks were placed throughout the project using post processed static observations relative to laRTN Base Network. A minimum of 6hrs of data was simultaneously collected on each of these primary control points.

Washington County Control Pt. 032 is checked for vertical tolerance. The vertical difference is about 0.1 ft.
 Washington County Control Pt. 107 is checked for vertical tolerance. The vertical difference is about 0.1 ft.

Horizontal Control

The project coordinate system for this survey is laRCS Zone 13 (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.

Washington County Control Pt. 032 is checked for horizontal tolerance. The horizontal difference is about 0.2 ft.
 Washington County Control Pt. 107 is checked and horizontal tolerance. The horizontal difference is about 0.1 ft.

Point Name	Northing	Easting	Elevation	Feature Definition
039	6850854.50	23555389.54	665.93	FENO39 USGS DISC PROJ NO STPN-1-4(37)--2J-92.
107	6851766.44	23576327.58	729.02	BM WASHINGTON CO. #107 MONUMENT. 30' E OF FIELD ENT TO THE S AND 50' SOUTH OF HWY 22.
302	6849709.56	23580926.32	672.28	FENO2 MONUMENT STAMPED #302. 59' S OF EP HWY 22, +/- STA 365+24.5, AND 1500' E OF C/L OF BRIDGE.
032	6850838.48	23593341.11	685.76	BM WASHINGTON CO. #032 MONUMENT. 30' E OF TUPELO BLVD, 50' N OF DRIVE TO HOUSE #1153 ON N SIDE OF RIVERSIDE.
301	6850167.10	23578581.07	687.69	FENO1 MONUMENT STAMPED #301. 43' SW OF EP HWY 22, 10' SE OF C/L FIELD ENT., AND 960' W OF C/L OF BRIDGE.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans F PROJ. NO. 484(2). Survey stationing was equated to the plan TS at STA 341+53.34 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

TS STA 341+53.34 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey TS STA 341+53.34

SC STA 343+03.34 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey SC STA 343+03.34

CS STA 351+81.48 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey CS STA 351+81.48

PI STA 347+80.9 As-built Plans Project No. F-PROJ. NO. 484(2)

CS STA 351+81.48 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey CS STA 351+81.48

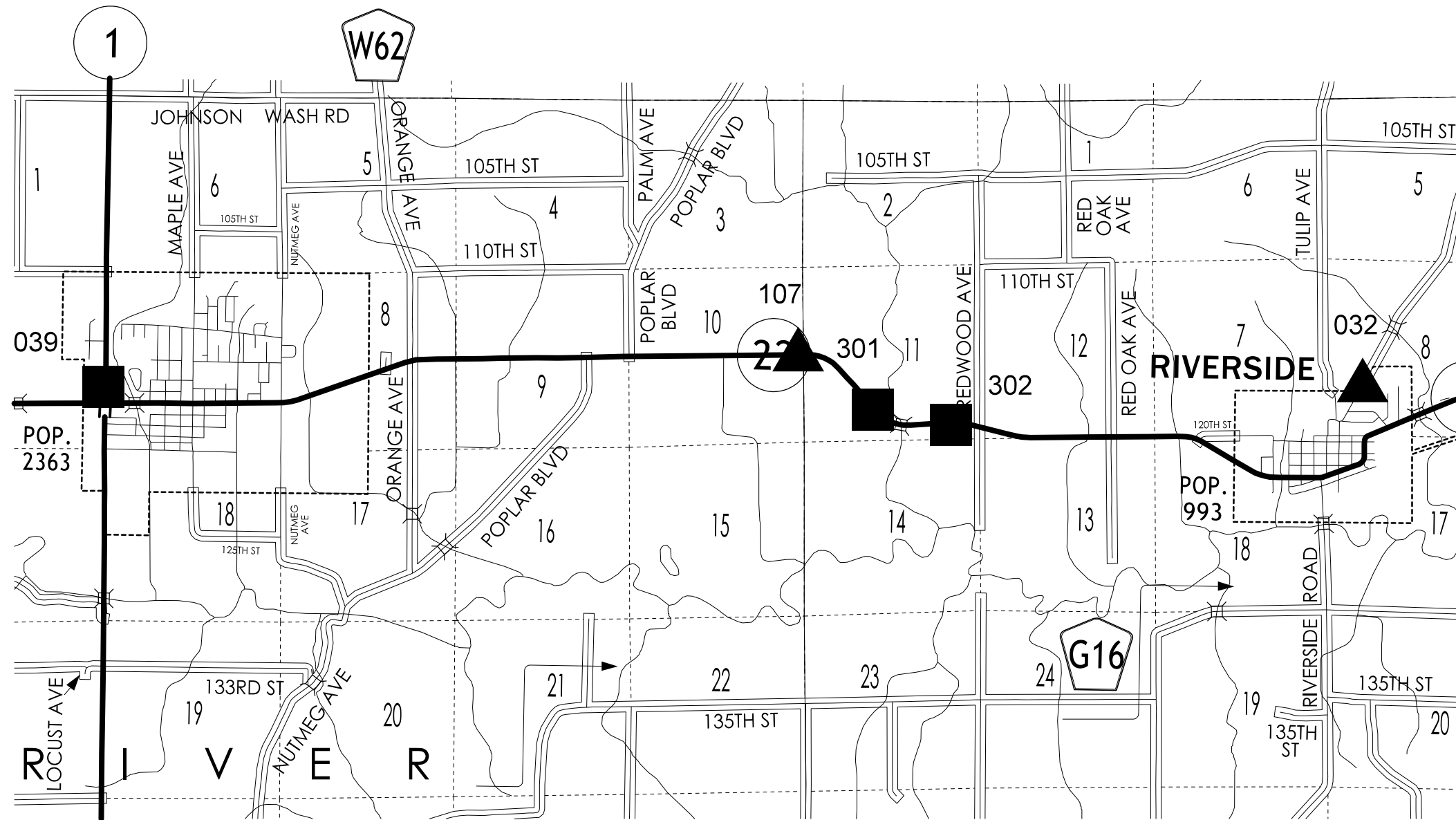
ST STA 353+31.48 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey ST STA 353+31.48

PI STA 367+90.17 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey PI STA 367+89.32

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.

R-7W



HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 13

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 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 13

Point Name	Northing	Easting	Elevation	Feature Definition
039 6850854.50	23555389.54	665.93	FENO39 USGS DISC PROJ NO STPN-1-4(37)—2J-92.	
107 6851766.44	23576327.58	729.02	BM WASHINGTON CO. #107 MONUMENT. 30' E OF FIELD ENT TO THE S AND 50' SOUTH OF HWY 22.	
302 6849709.56	23580926.32	672.28	FENO2 MONUMENT STAMPED #302. 59' S OF EP HWY 22, +/- STA 365+24.5, AND 1500' E OF C/L OF BRIDGE.	
032 6850838.48	23593341.11	685.76	BM WASHINGTON CO. #032 MONUMENT. 30' E OF TUPELO BLVD, 50' N OF DRIVE TO HOUSE #1153 ON N SIDE OF RIVERSIDE.	
301 6850167.10	23578581.07	687.69	FENO1 MONUMENT STAMPED #301. 43' SW OF EP HWY 22, 10' SE OF C/L FIELD ENT., AND 960' W OF C/L OF BRIDGE.	

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



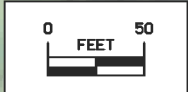
1

PAUL J. SHEBEK &
PATRICIA KAY SHEBEK

2

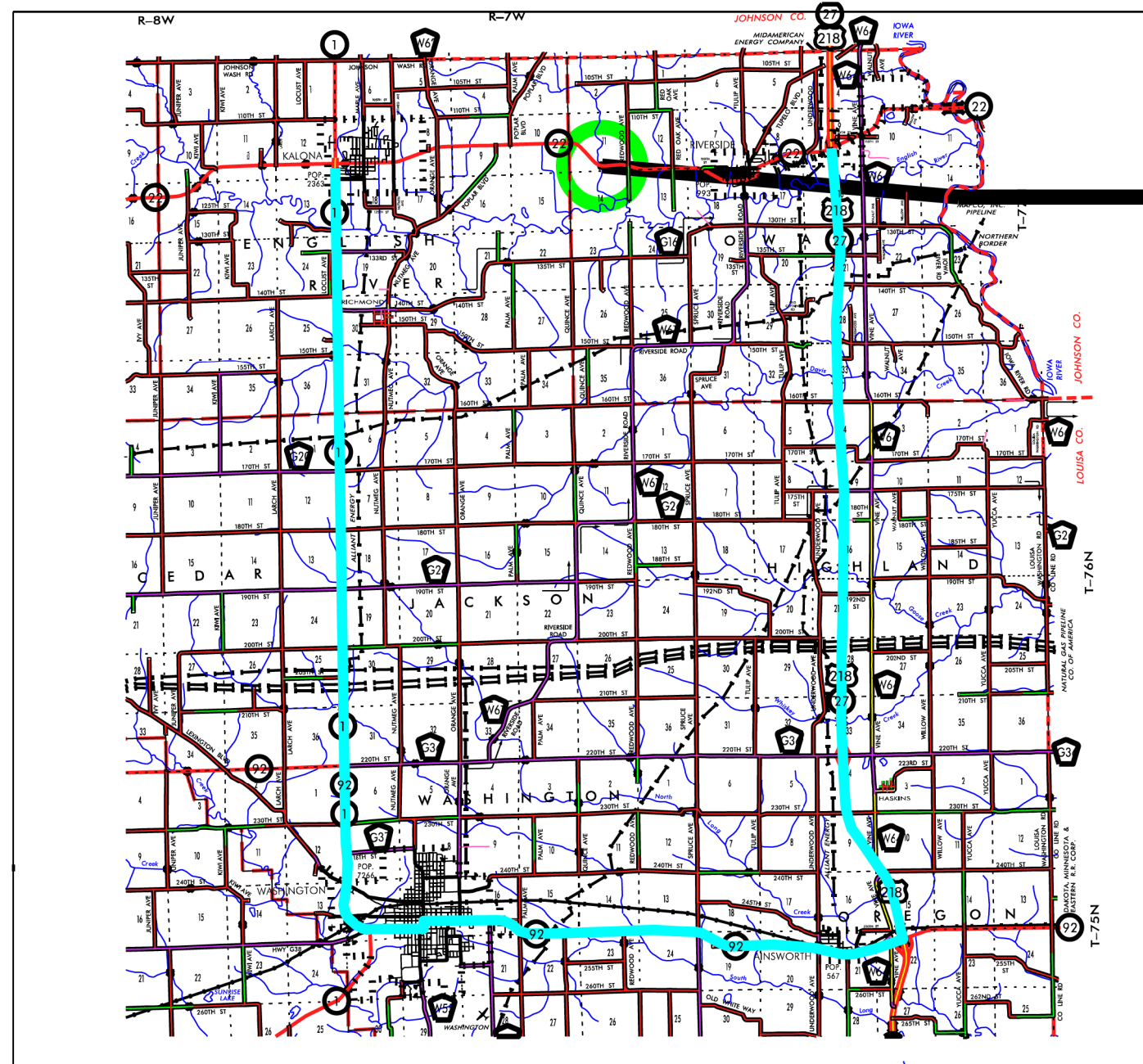
LLOYD W. WEBER &
FRANCES J. WEBER

Right of Way Design Information	
THIS SHEET INCLUDED	
FOR INFORMATION ONLY	
ROW Team: CUVA/CARMAN	
ROW #: STPN-022-2(75)--2J-92	
Plan Date: 02/01/2019	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



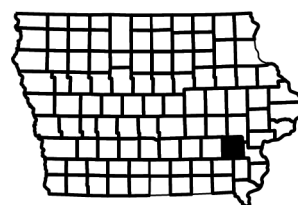
DETOUR OPTION 1

WASHINGTON COUNTY



STA 350+26.50
FHWA 51740
MAINT. 9240.0S022
DESIGN 3534

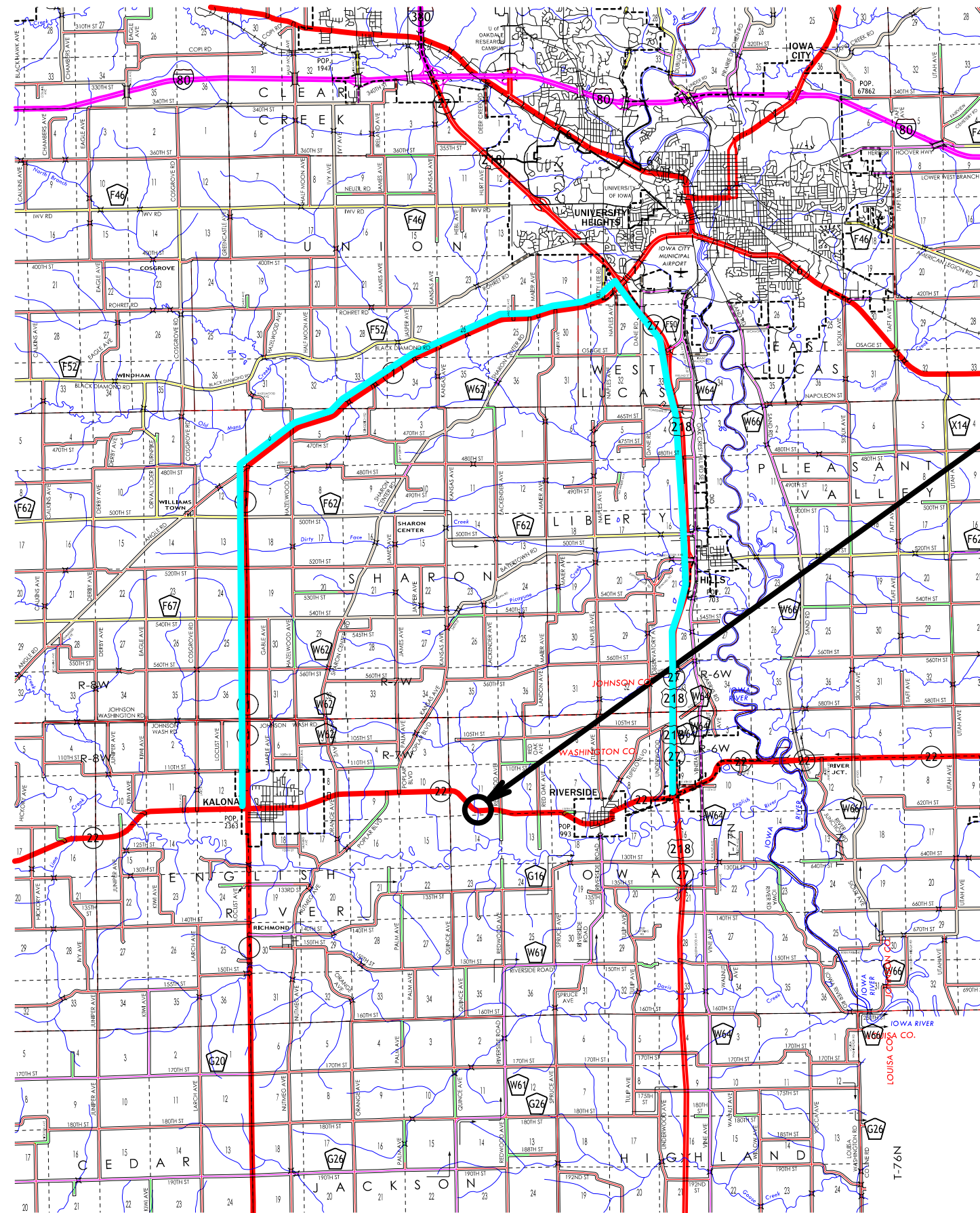
 Detour



ON IA 22, 4.8 MILES EAST OF JCT. IA. 1,
BULGERS RUN
BRFN-022-2(74)-39-92
PIN: 16-92-022-010



DETOUR OPTION 2



PROJECT LOCATION

DETOUR

108-23A
08-01-08

TRAFFIC CONTROL PLAN

IA 22 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 14 days.
Detour route will be chosen from the following two options:

DETOUR OPTION 1

The detour follows from the IA 22/IA 1 junction south on IA 1 to the south junction of IA 1/IA 92, then go east on IA 92 to the IA 92/IA 27/US 218 junction, then north on US 218 to the IA 27/US 218/IA 22 junction.

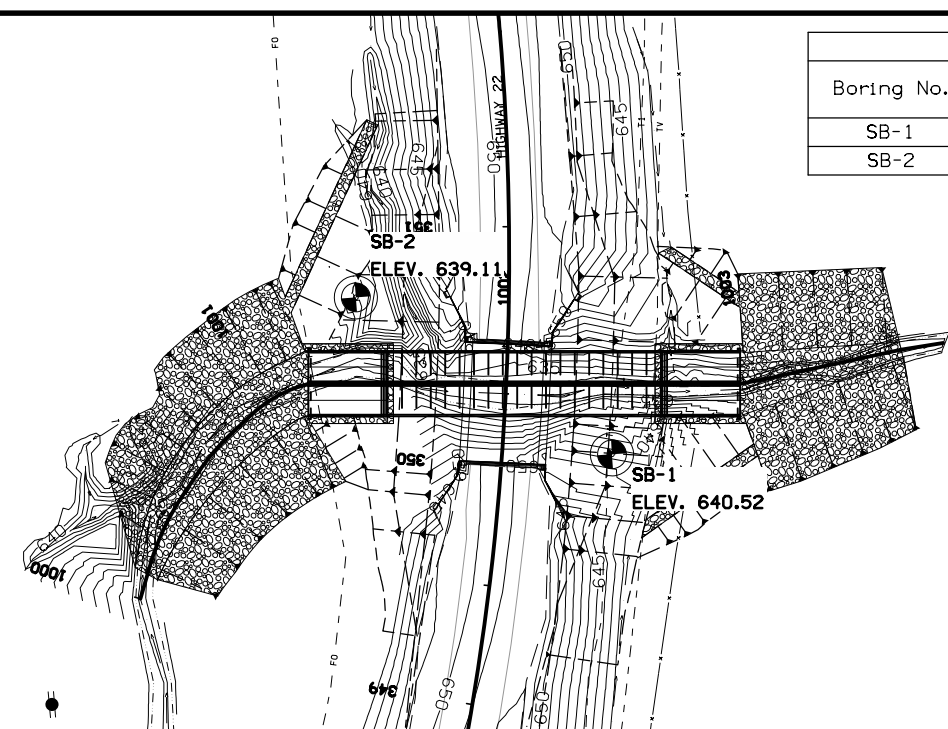
DETOUR OPTION 2

The detour follows from the IA22/IA 1 junction north on IA 1 to the junction of IA 1/IA 27, then go south on IA 27/US 218 to the IA 27/US 218/IA 22 junction.

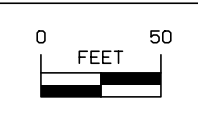
108-25
10-21-14

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



WATER LEVEL OBSERVATIONS (FT)				
Boring No.	Date Drilled	While Drilling	End of Drilling	After 24 Hours
SB-1	07/12/2018	15'	-	-
SB-2	07/12/2018	10'	-	-



GEOTECHNICAL DESIGN

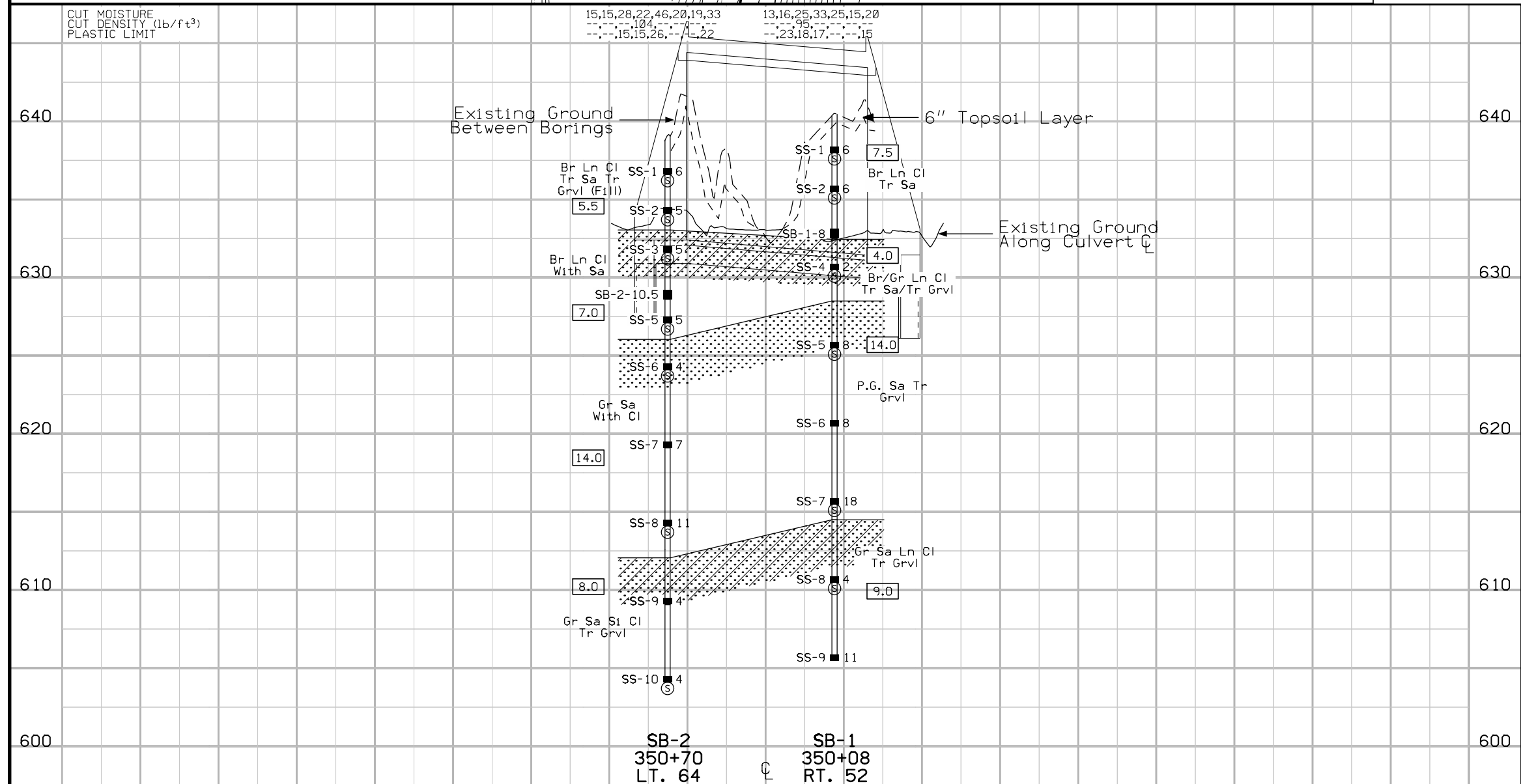


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature _____ Date _____
 Bhooshan A. Karnik
 Printed or Typed Name
 My license renewal date is December 31, 2019.

Pages or sheets covered by this seal: **Q.1**

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.



LOCATION

IA 22 OVER BULGERS RUN
 T-77N R-7W
 SECTION 11
 IOWA TOWNSHIP
 WASHINGTON COUNTY
 FHWA NO. 51741
 BRIDGE MAINT. NO. 9240.0S022
 LATITUDE 41.483925°
 LONGITUDE -91.626814°

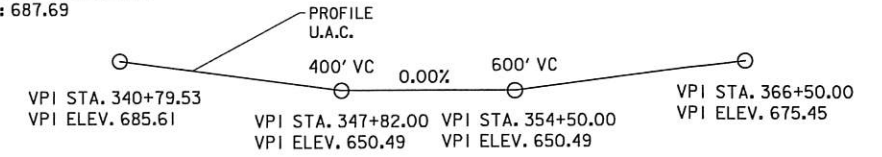
SHELBY TUBE CORE DATA

CORE NO.	ST-3-8	ST-4-10.5
DEPTH IN FEET	6.0 - 8.0	8.5 - 10.5
CLASSIFICATION (AASHTO)	A-6 (20)	A-6 (14)
COEFF. CONSOL. (ft ² /DAY)	-	-
TRIAxIAL COMPRESSION	UU	UU
COHESION - PSF	900	1,060
FRICTION ANGLE - DEGREES	-	-
MOISTURE CONTENT %	25	22
DRY DENSITY - PCF	95	104
CU-CONSOLIDATED UNDRAINED		
UU-UNCONSOLIDATED UNDRAINED		
UC-UNCONFINED COMPRESSION (c=1/2 Qu)		

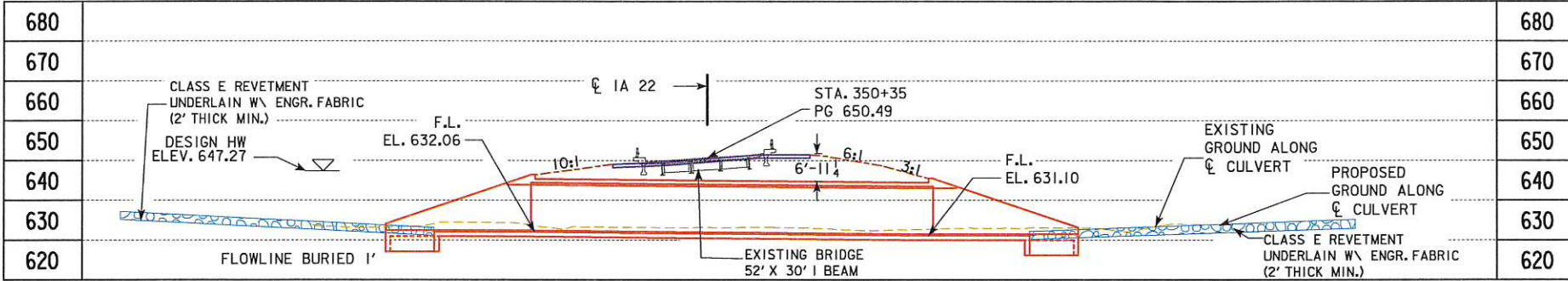
SOIL LAYER THICKNESS		ROCK CORE		BLOW COUNT		LEGEND	
THICKNESS	SYMBOL	SAMPLE NO.	REC./REQ.	SAMPLE NO.	NO. BLOWS	SYMBOL	DESCRIPTION
13.0	[Symbol]	R1	100/85	SS2	5	[Symbol]	SOIL REMEDIATION AREA
-H ₂ O-	[Symbol]					[Symbol]	LIMESTONE (L.S.)
-DRY-	[Symbol]					[Symbol]	BROKEN & WEATHERED L.S.
-d-	[Symbol]					[Symbol]	SANDSTONE
M	[Symbol]					[Symbol]	CLAY
						[Symbol]	SANDY SOIL

DESIGN FOR 3° SKEW
TWIN 12' X 12' X 114' PRECAST REINFORCED CONCRETE BOX CULVERT
SOIL PROFILE SHEET
 STATION 350+35 OCTOBER 2020
WASHINGTON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. OF FILE NO. 31634 DESIGN NO. 0120

BENCH MARK: 301
 DESCRIPTION: FENO MONUMENT 43 FT. SW OF EP OF HWY 22, 10 FT. SE OF ϕ FIELD ENT., AND 960 FT. W OF ϕ OF BRIDGE.
 NORTHING: 6850167.10
 EASTING: 23578581.07
 ELEV: 687.69



PROPOSED PROFILE GRADE ON IA-22
 (NOT TO SCALE)



LONGITUDINAL SECTION ALONG ϕ CULVERT

NOTES:
 ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.
 CLASS E REVETMENT STONE IS EMBEDDED.
 DRAINAGE THROUGH EXISTING CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.

USGS GAGE AT SOUTHEAST CORNER OF EXISTING BRIDGE; CONTRACTOR TO CONTACT USGS AT LEAST 2 WEEKS PRIOR TO REMOVAL OF EXISTING BRIDGE; CONTACT JASON MCVAY, PHONE 319-358-3636, USGS, 400 SOUTH CLINTON STREET, IOWA CITY, IA 52240

ESTIMATED REVETMENT QUANTITIES

LOCATION	REVETMENT CL. 'E' (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	1175	1088	726
OUTLET	880	815	544
TOTALS	2055	1903	1270

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.

PROPOSED CHANNEL DATA

LOCATION	STATION	OFFSET	ELEVATION
N1	349+38.21	147.41' LT	633.98
N2	349+33.95	137.63' LT	634.02
N3	350+18.57	69.70' LT	633.06
N4	350+44.48	70.89' RT	633.06
S1	350+56.28	162.79' RT	631.94
S2	350+50.54	165.00' RT	632.27
S3	350+27.06	81.40' RT	632.10
S4	350+49.76	80.36' RT	632.10

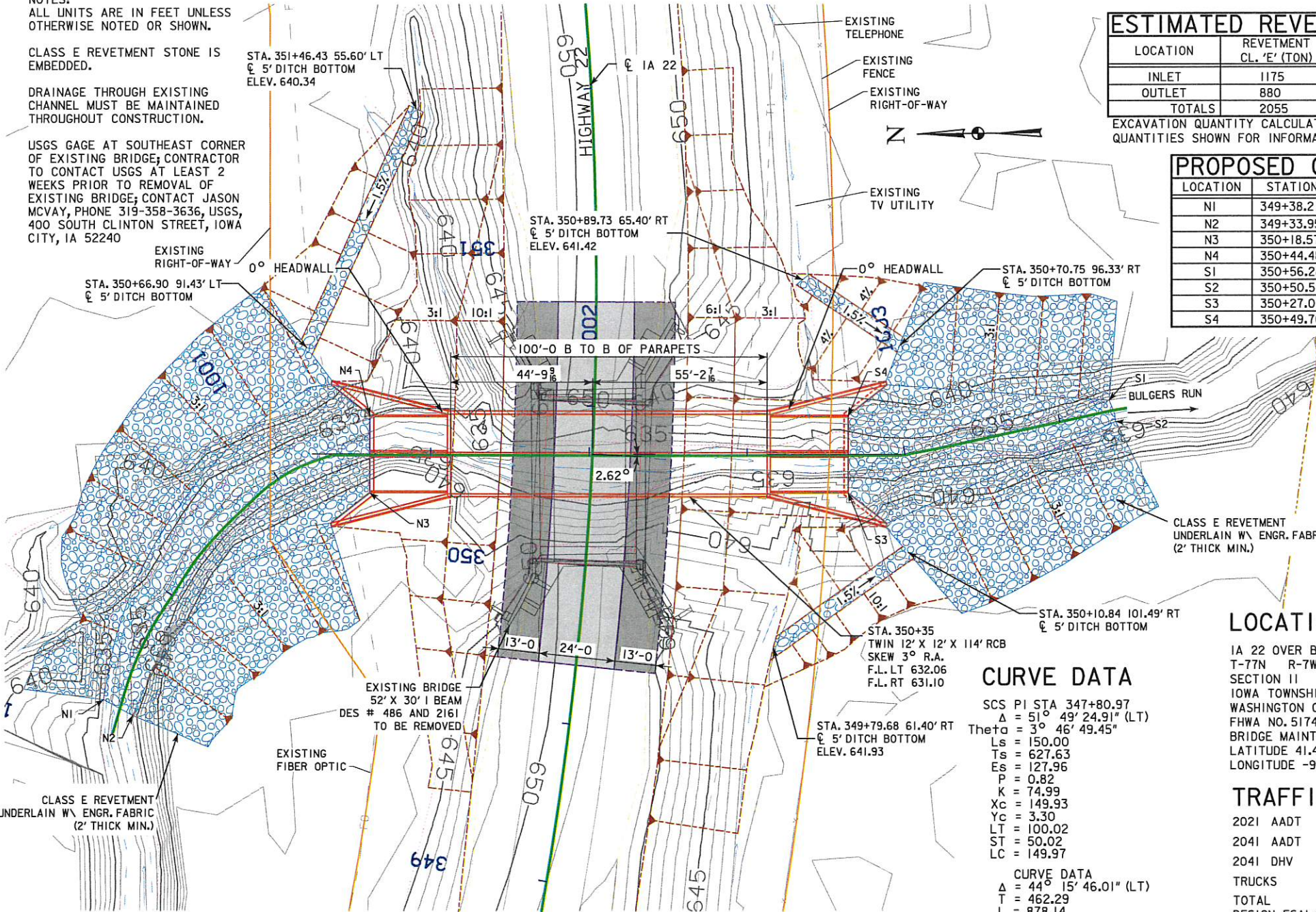
UTILITIES

- T1 - WINDSTREAM COMMUNICATIONS
- TV - MEDIACOM
- FO - WINDSTREAM COMMUNICATIONS

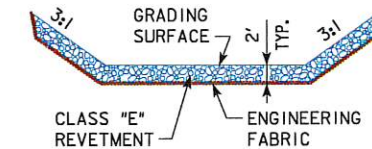
HYDRAULIC DATA

DRAINAGE AREA = 6.3 SQ. MI.
 STREAM SLOPE = 5.3 FT./MI.

Q_{50} = 2,860 CFS
 HW ELEV. = 647.27
 Q_{100} = 3,400 CFS
 HW ELEV. = 649.52
 Q_{OT} = 3,602 CFS
 HW ELEV. = 650.49



SITUATION PLAN



TYP. CHANNEL SECTION AT OUTLET/INLET



CURVE DATA

SCS PI STA 347+80.97
 $\Delta = 51^\circ 49' 24.91''$ (LT)
 Theta = $3^\circ 46' 49.45''$
 Ls = 150.00
 Ts = 627.63
 Es = 127.96
 P = 0.82
 K = 74.99
 Xc = 149.93
 Yc = 3.30
 LT = 100.02
 ST = 50.02
 LC = 149.97

CURVE DATA
 $\Delta = 44^\circ 15' 46.01''$ (LT)
 T = 462.29
 L = 878.14
 R = 1,136.70
 E = 90.41

LOCATION

IA 22 OVER BULGERS RUN
 T-77N R-7W
 SECTION 11
 IOWA TOWNSHIP
 WASHINGTON COUNTY
 FHW No. 51741
 BRIDGE MAINT. NO. 9240.OS022
 LATITUDE 41.483925°
 LONGITUDE -91.626814°

TRAFFIC ESTIMATE

2021 AADT 5,300 V.P.D.
 2041 AADT 7,300 V.P.D.
 2041 DHV 760 V.P.H.
 TRUCKS 10 %
 TOTAL
 DESIGN ESALS 1,935,000

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.
 Signature: Brian Sandberg Date: 10/10/18
 Printed or Typed Name
 My license renewal date is December 31, 2019

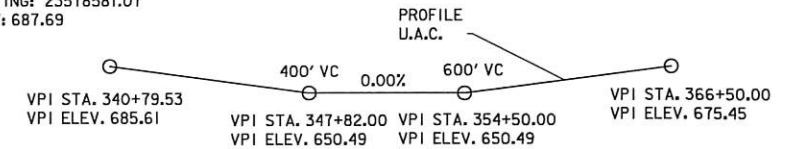
Pages or sheets covered by this seal: V.1

DESIGN FOR 3° SKEW R.A.
TWIN 12' X 12' X 100' REINFORCED CONCRETE BOX CULVERT

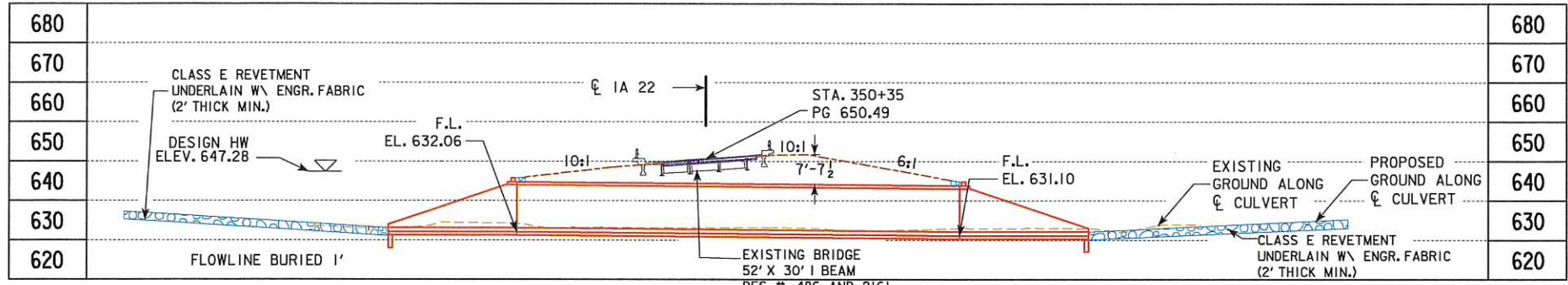
SITUATION PLAN

STATION 350+35 SEPTEMBER 2018
WASHINGTON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 1 FILE NO. 31634 DESIGN NO. 0120

BENCH MARK: 301
 DESCRIPTION: FENO MONUMENT 43 FT. SW OF EP OF HWY 22, 10 FT. SE OF ϕ FIELD ENT., AND 960 FT. W OF ϕ OF BRIDGE.
 NORTHING: 6850167.10
 EASTING: 23578581.07
 ELEV: 687.69



PROPOSED PROFILE GRADE ON IA-22 (NOT TO SCALE)



LONGITUDINAL SECTION ALONG ϕ CULVERT

ESTIMATED REVETMENT QUANTITIES

LOCATION	REVETMENT CL. 'E' (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	1014	939	626
OUTLET	736	682	455
TOTALS	1750	1621	1081

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.

PROPOSED CHANNEL DATA

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N4	350+44.35	82.97' LT	633.06
S1	350+56.28	162.79' RT	631.94
S2	350+50.54	165.00' RT	632.27
S3	350+26.79	98.02' RT	632.10
S4	350+50.56	96.92' RT	632.10

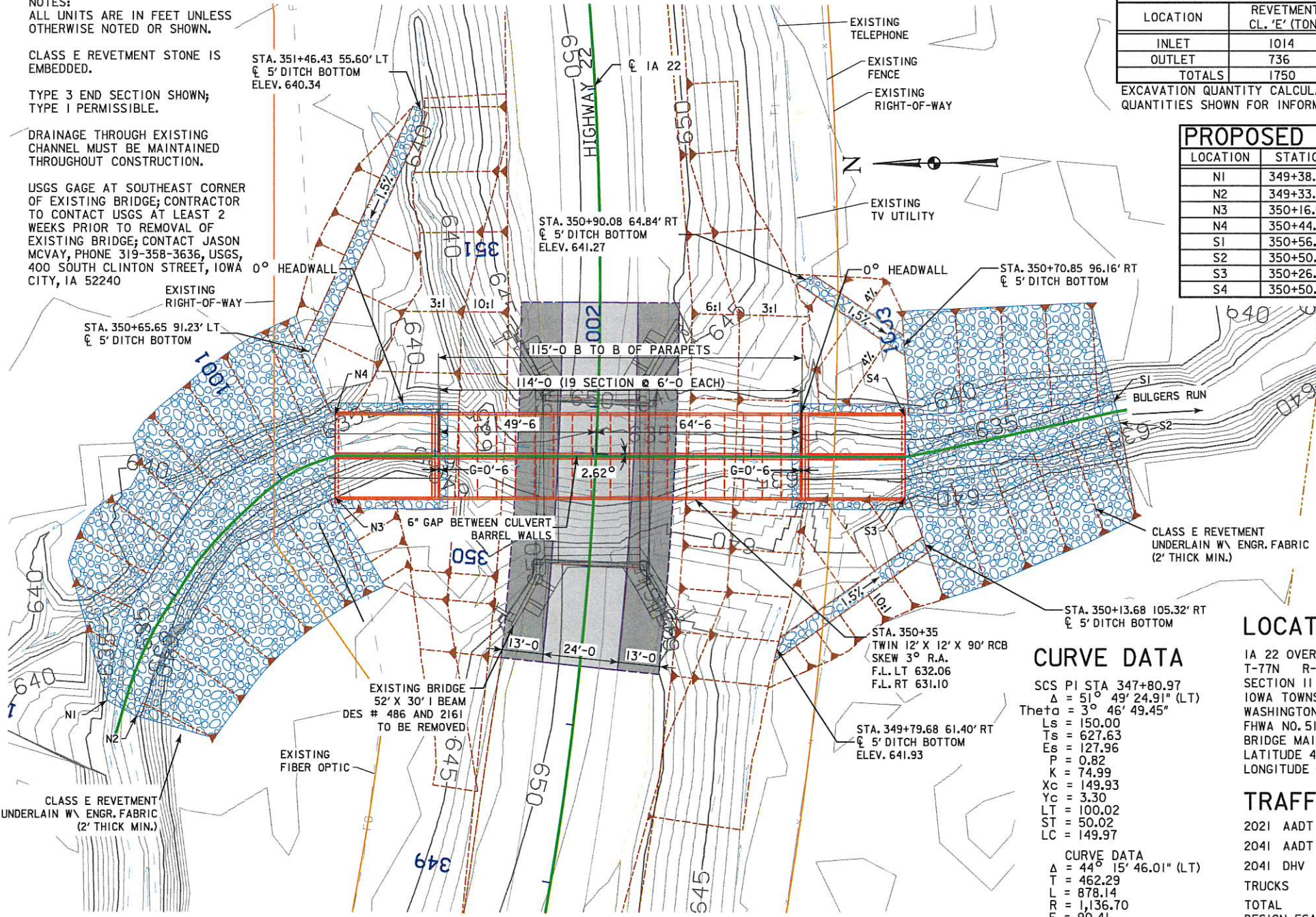
UTILITIES

- T1 - WINDSTREAM COMMUNICATIONS
- TV - MEDIACOM
- FO - WINDSTREAM COMMUNICATIONS

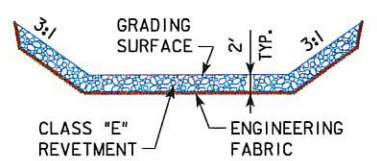
HYDRAULIC DATA

DRAINAGE AREA = 6.3 SQ. MI.
 STREAM SLOPE = 5.3 FT./MI.
 $Q_{50} = 2,860$ CFS
 HW ELEV. = 647.28
 $Q_{100} = 3,400$ CFS
 HW ELEV. = 649.62
 $Q_{07} = 3,579$ CFS
 HW ELEV. = 650.49

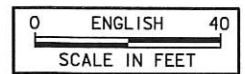
NOTES:
 ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.
 CLASS E REVETMENT STONE IS EMBEDDED.
 TYPE 3 END SECTION SHOWN; TYPE 1 PERMISSIBLE.
 DRAINAGE THROUGH EXISTING CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
 USGS GAGE AT SOUTHEAST CORNER OF EXISTING BRIDGE; CONTRACTOR TO CONTACT USGS AT LEAST 2 WEEKS PRIOR TO REMOVAL OF EXISTING BRIDGE; CONTACT JASON MCVAY, PHONE 319-358-3636, USGS, 400 SOUTH CLINTON STREET, IOWA CITY, IA 52240



SITUATION PLAN



TYP. CHANNEL SECTION AT OUTLET/INLET



CURVE DATA

SCS PI STA 347+80.97
 $\Delta = 51^\circ 49' 24.91''$ (LT)
 $\theta = 3^\circ 46' 49.45''$
 $L_s = 150.00$
 $T_s = 627.63$
 $E_s = 127.96$
 $P = 0.82$
 $K = 74.99$
 $X_c = 149.93$
 $Y_c = 3.30$
 $LT = 100.02$
 $ST = 50.02$
 $LC = 149.97$
 CURVE DATA
 $\Delta = 44^\circ 15' 46.01''$ (LT)
 $T = 462.29$
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LOCATION


IA 22 OVER BULGERS RUN
 T-77N R-7W
 SECTION 11
 IOWA TOWNSHIP
 WASHINGTON COUNTY
 FHWA NO. 51741
 BRIDGE MAINT. NO. 9240.0S022
 LATITUDE 41.483925°
 LONGITUDE -91.626814°

TRAFFIC ESTIMATE

2021 AADT	5,300	V.P.D.
2041 AADT	7,300	V.P.D.
2041 DHV	760	V.P.H.
TRUCKS	10	%
TOTAL DESIGN ESALs	1,935,000	

HYDRAULIC DESIGN

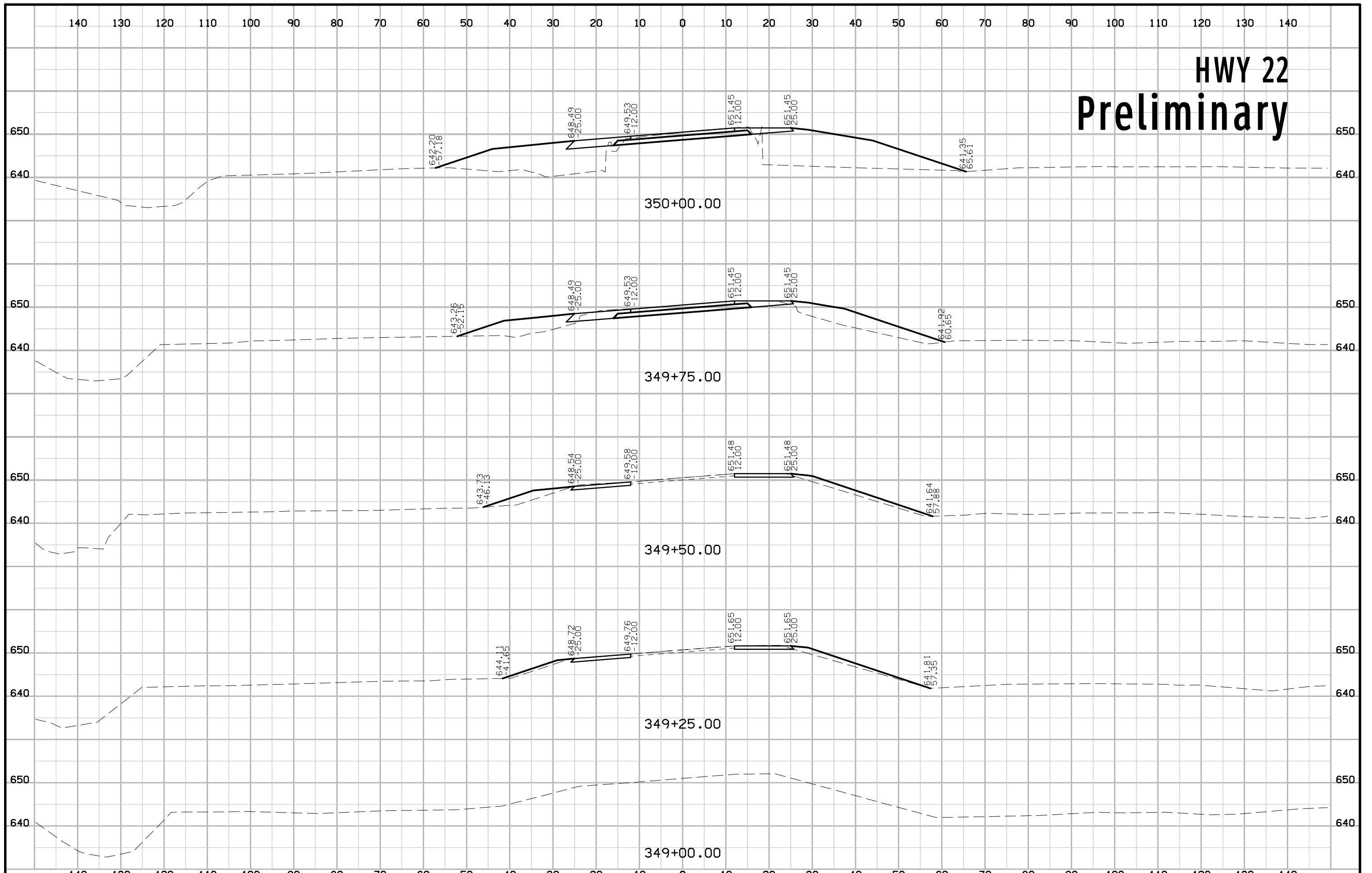
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

 Signature: Brian Sandberg Date: 10/10/18
 Printed or Typed Name: Brian Sandberg
 My license renewal date is December 31, 2019

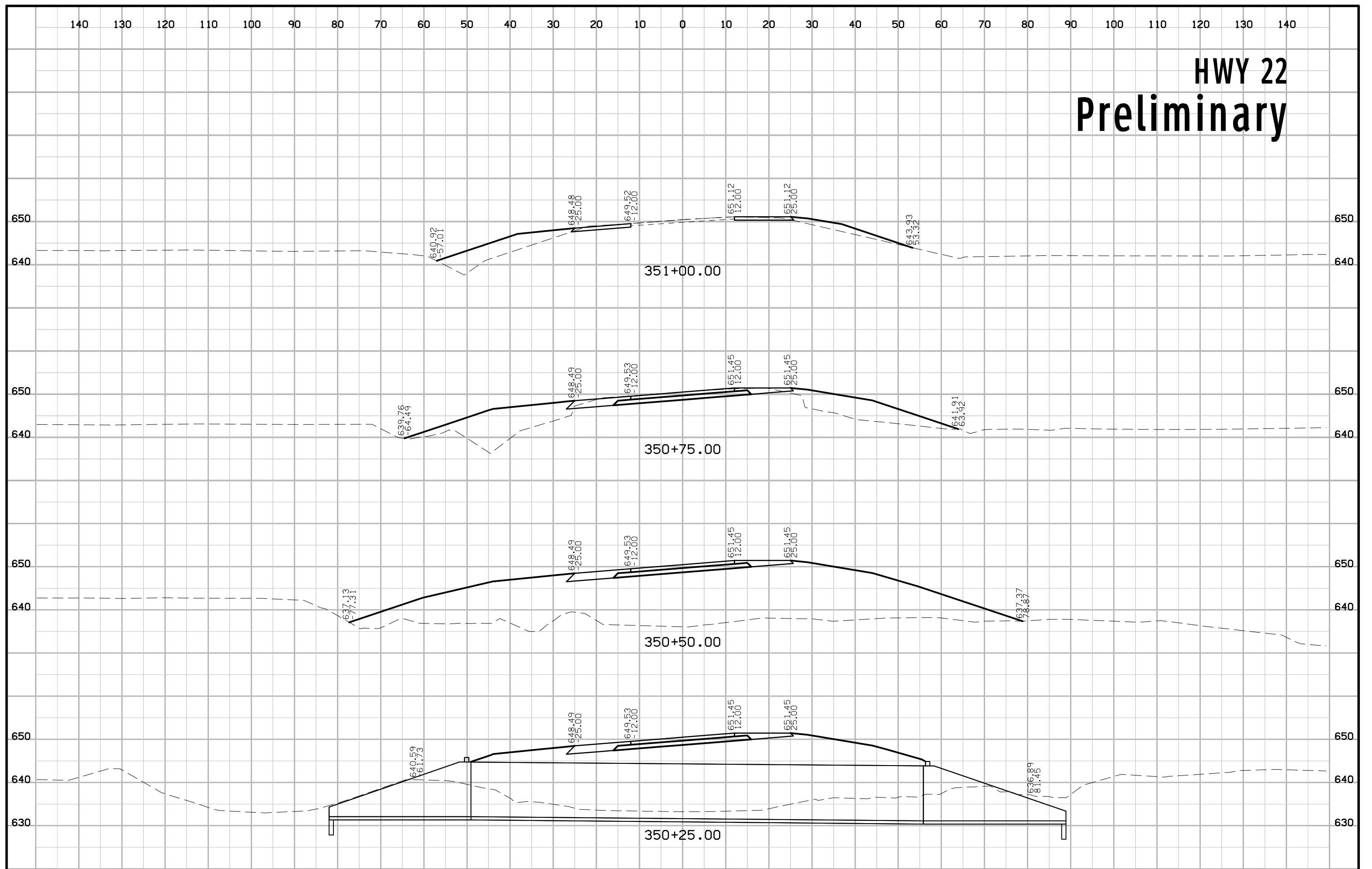
Pages or sheets covered by this seal: V.2

DESIGN FOR 3° SKEW R.A.
TWIN 12' X 12' X 114' PRECAST REINFORCED CONCRETE BOX CULVERT
 SITUATION PLAN
 STATION 350+35 SEPTEMBER 2018
WASHINGTON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 1 FILE NO. 31634 DESIGN NO. 0120

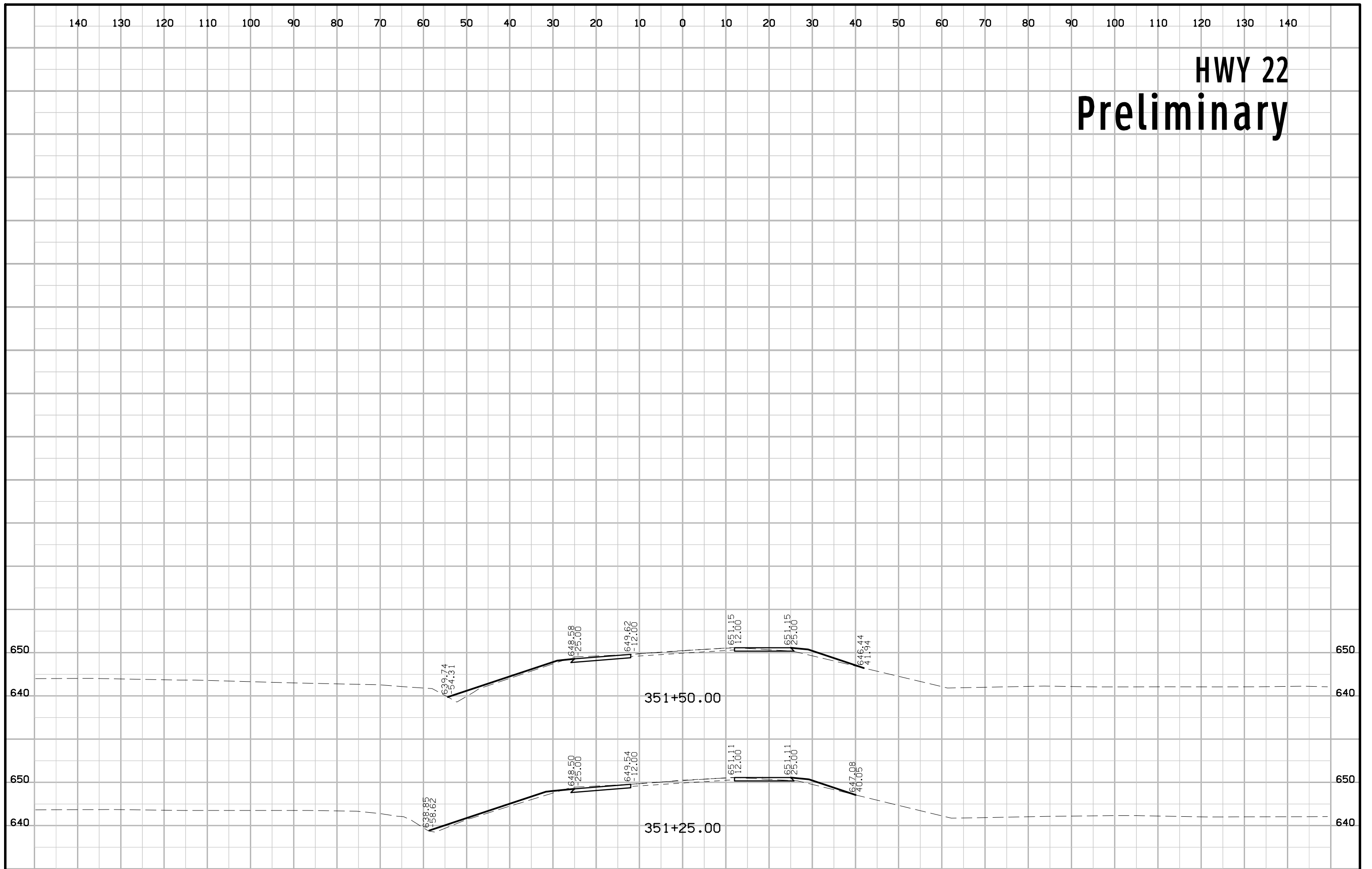
HWY 22 Preliminary



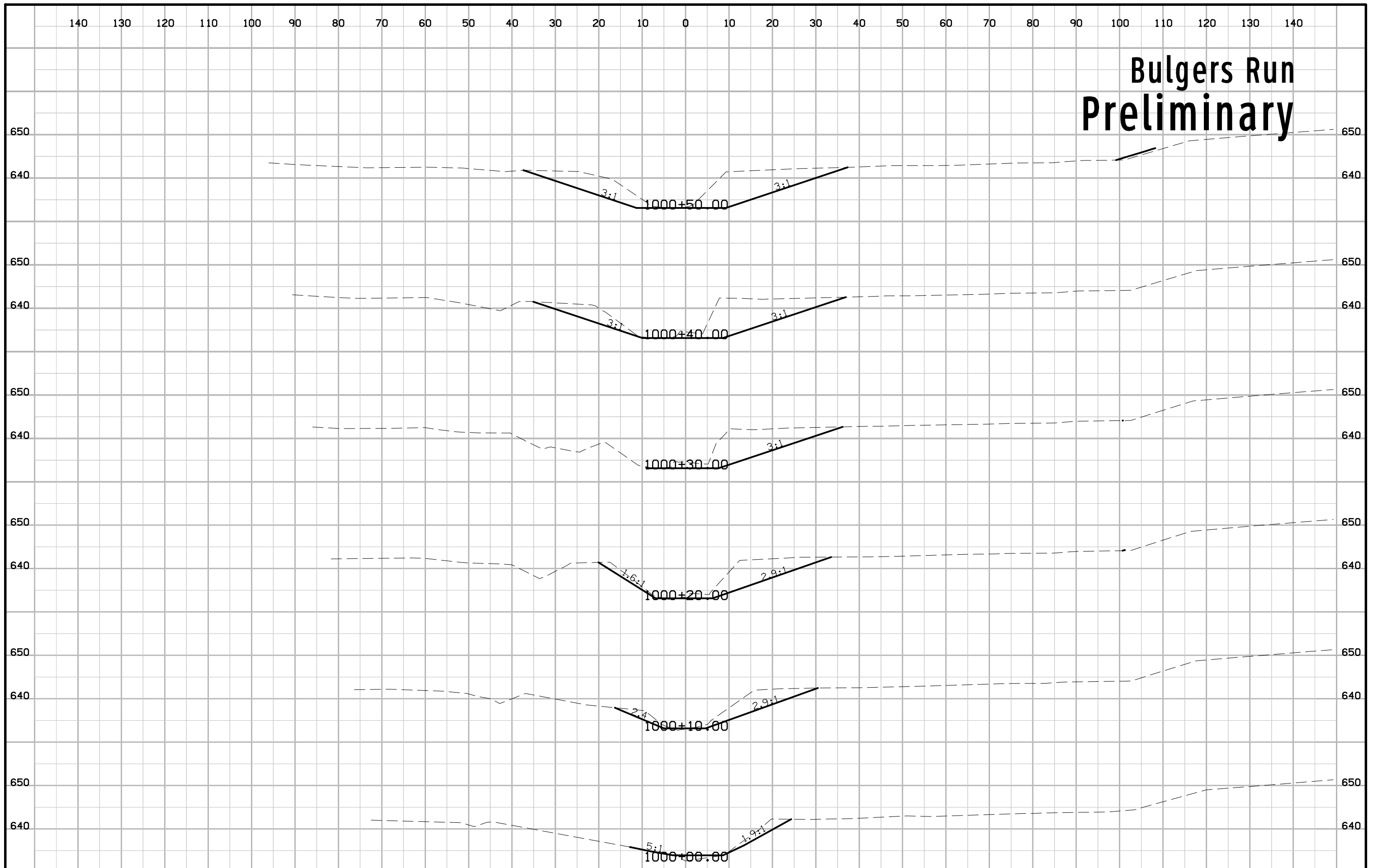
HWY 22 Preliminary



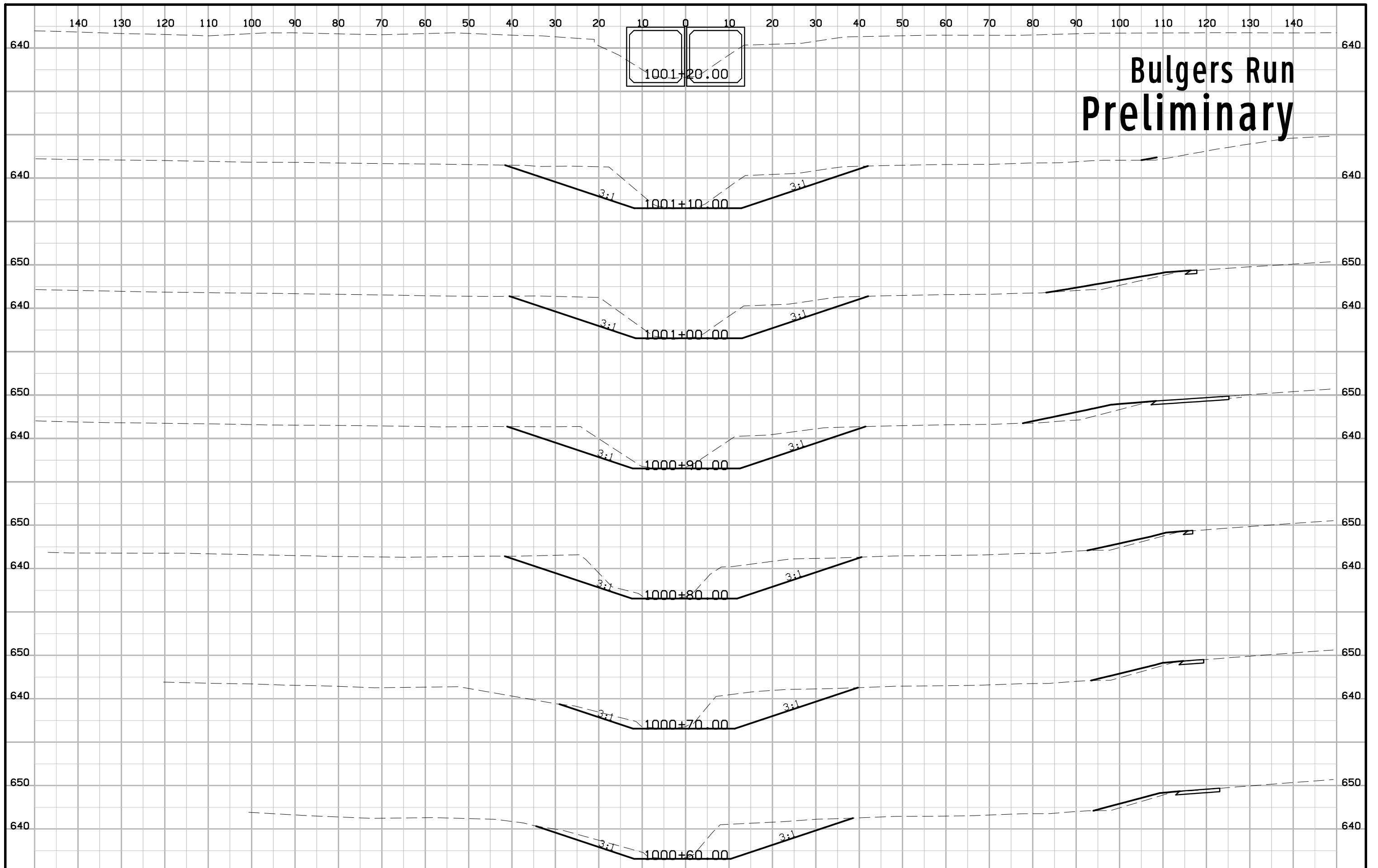
HWY 22 Preliminary



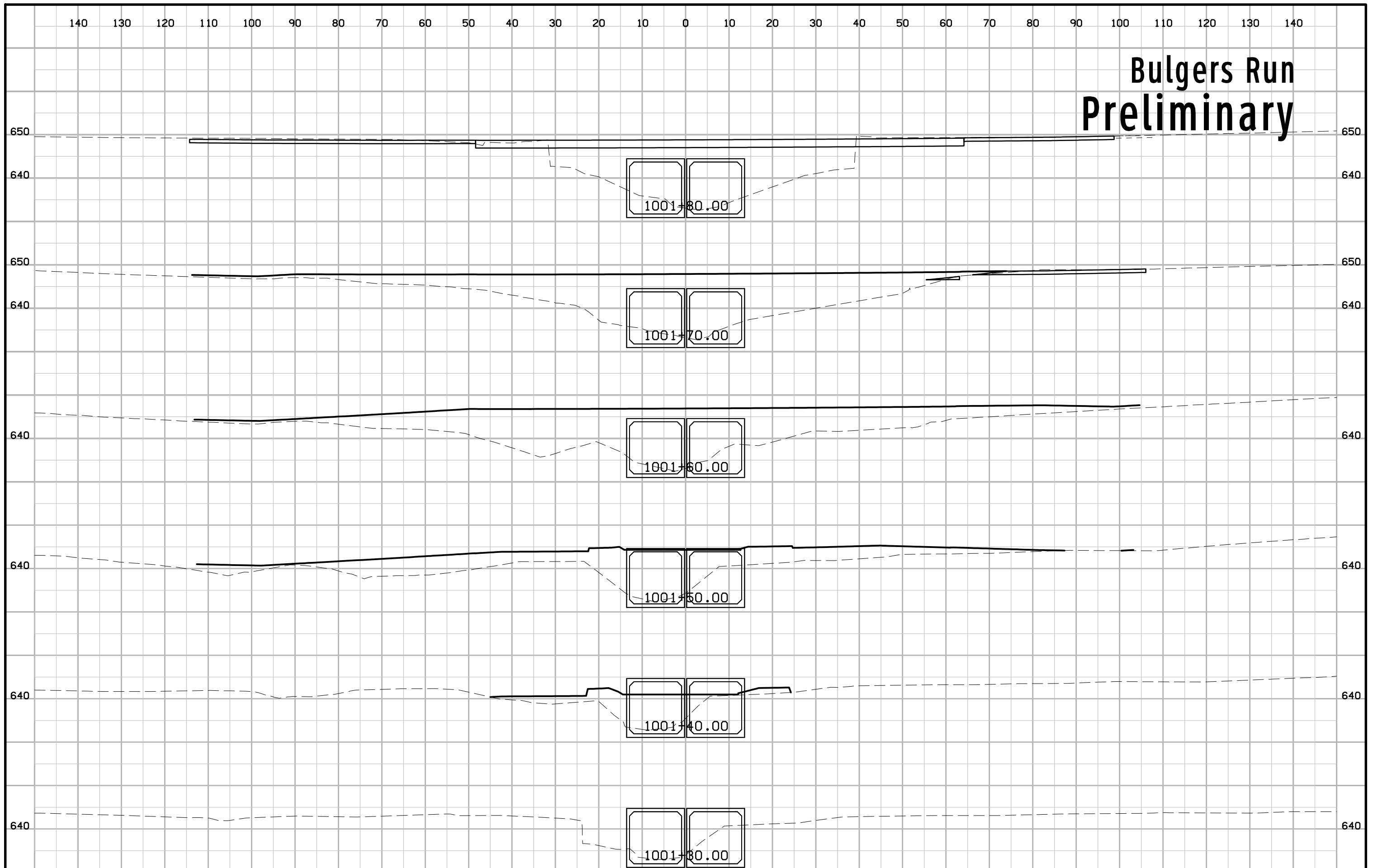
Bulgers Run Preliminary

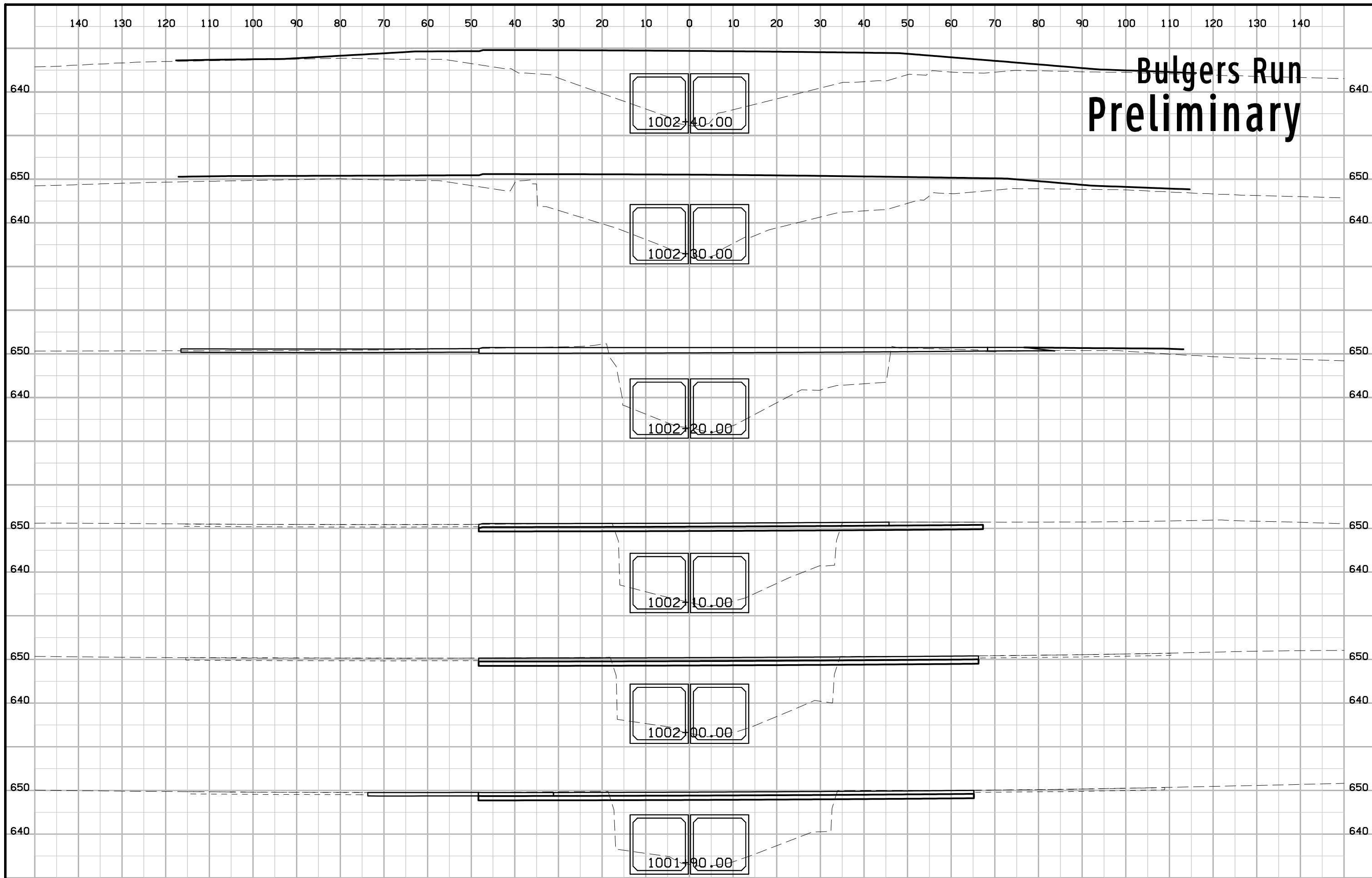


Bulgers Run Preliminary



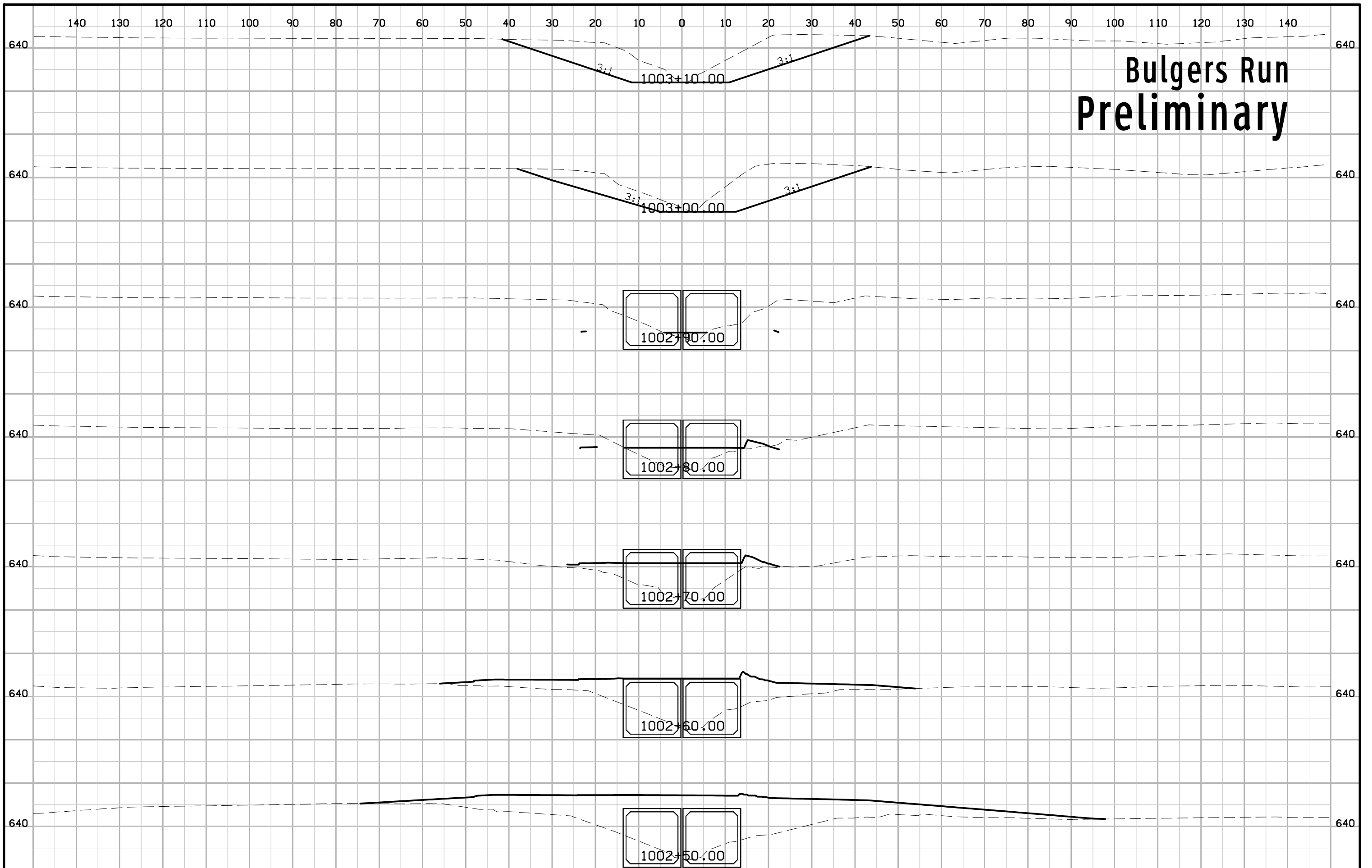
Bulgers Run Preliminary



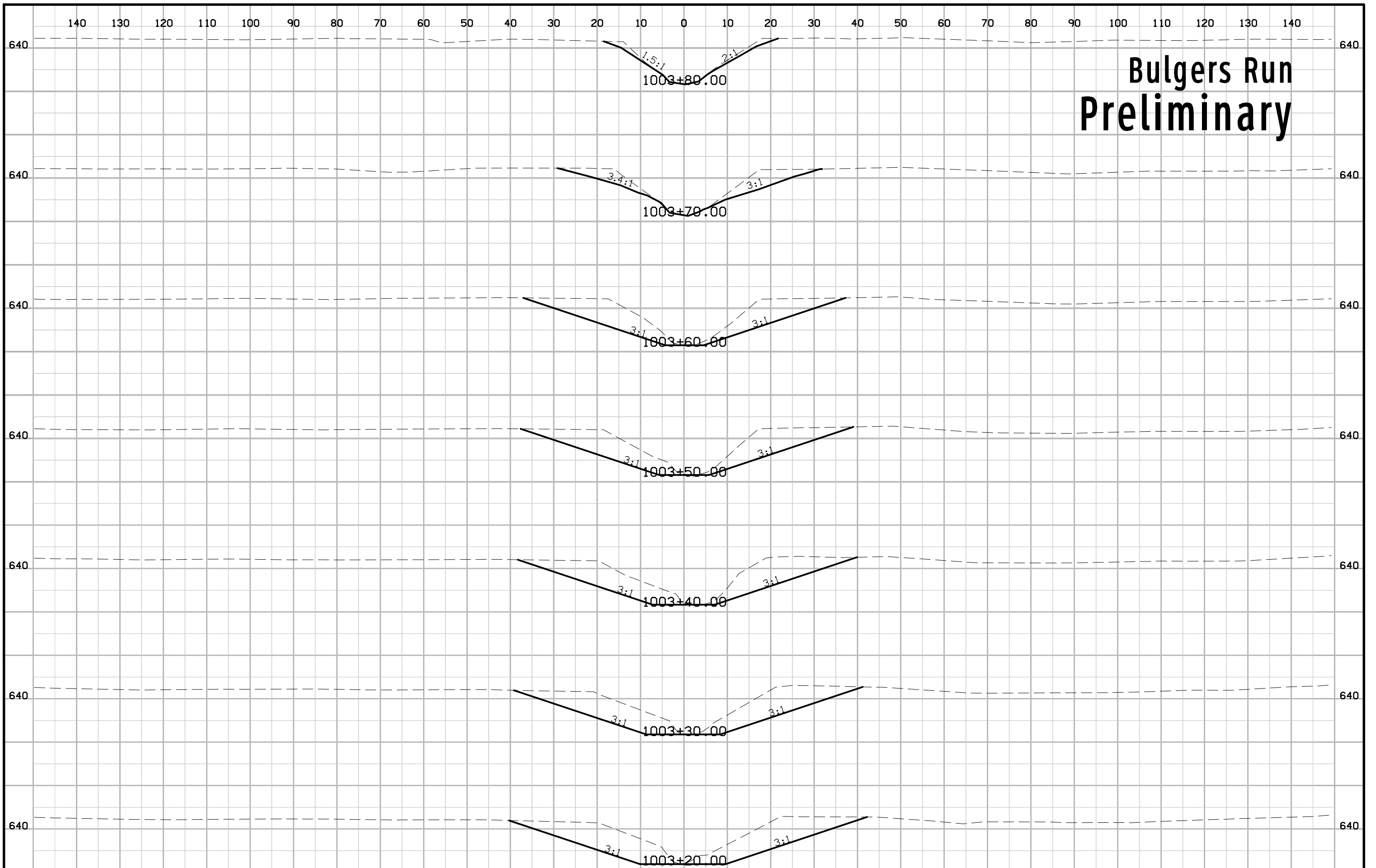


Bulgers Run Preliminary

Bulgers Run Preliminary



Bulgers Run Preliminary



Bulgers Run Preliminary

