

STRUCTURES MISCELLANEOUS
BRFN-038-2(39)--39-16

CEDAR CO.

LETTING DATE
10/15/2019



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

CEDAR COUNTY
STRUCTURES MISCELLANEOUS

Ditch 1.0 mi N of US 30

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL

PROJECT IDENTIFICATION NUMBER

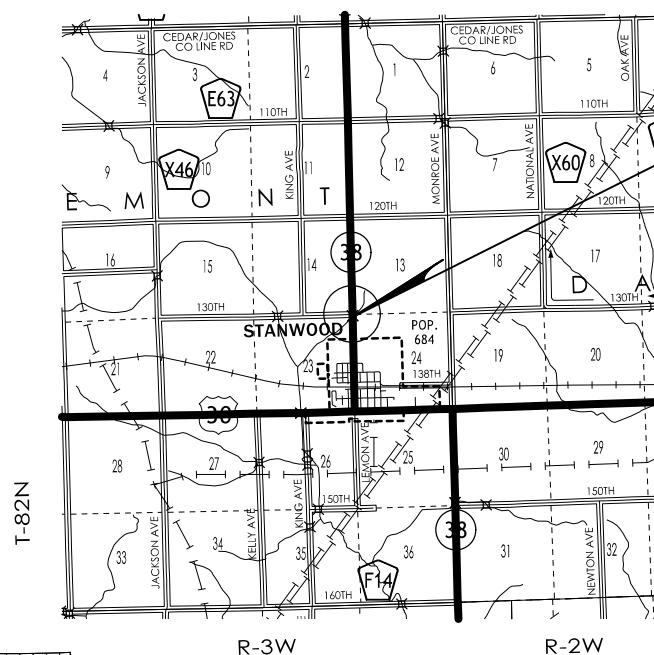
15-16-038-030

PROJECT NUMBER

BRFN-038-2(39)--39-16

R.O.W. PROJECT NUMBER

STPN-038-2(40)--2J-16



STA 52+53.00
PROJECT LOCATION
R.L. 36.10
FHWA No. 18370

DESIGN DATA RURAL

2020 AADT	1,500	V.P.D.
2040 AADT	1,800	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	16	%
Total Design ESALs	--	

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 9-15-2017

FILE NO.

ENGLISH

DESIGN TEAM **Holst \ Strum \ Janus**

CEDAR COUNTY

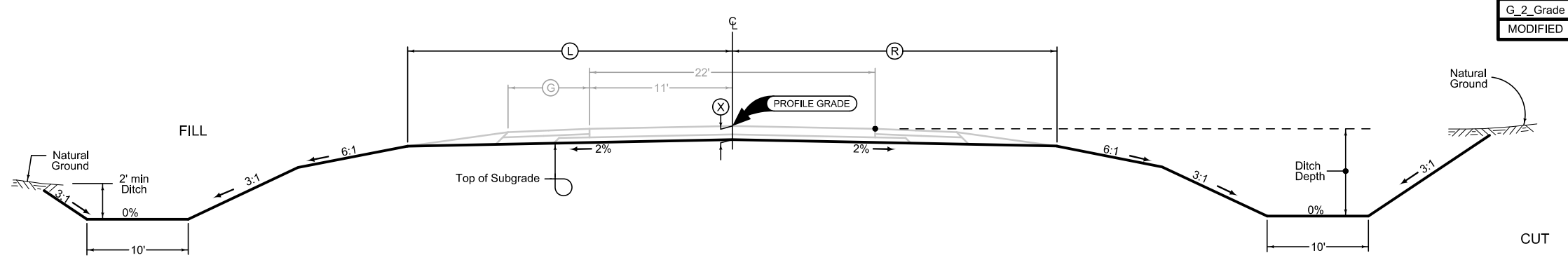
PROJECT NUMBER

BRFN-038-2(39)--39-16

SHEET NUMBER

A.1

LOCATION		DIMENSIONS		
ROAD IDENTIFICATION	STATION TO STATION	Ⓐ Feet	Ⓑ Feet	Ⓧ Inches
IA38	51+00.00 54+00.00	33.0	33.0	22



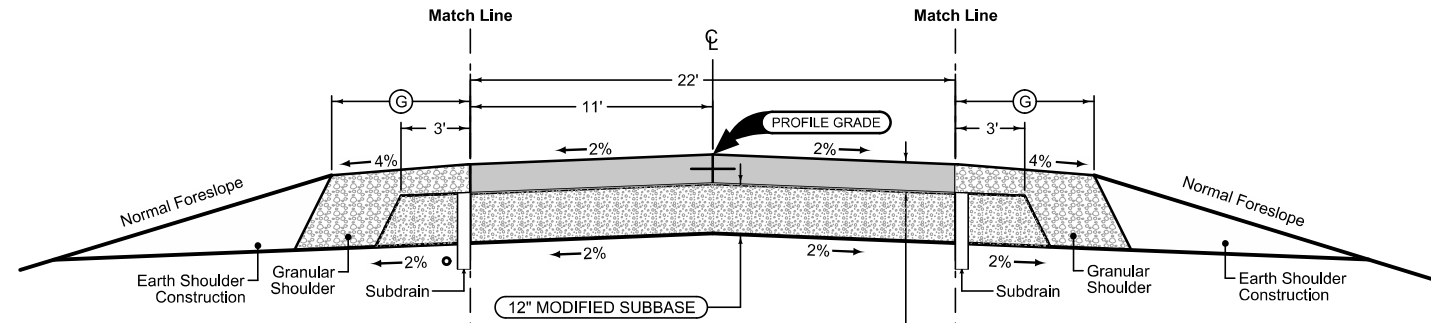
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

2 LANE GRADING

See plan & profile sheets and cross sections for additional details of ditches and backslopes.

Granular Shoulder

2_G_		Ⓞ
10-21-14		
STATION TO STATION		Feet
52+00.00	53+00.00	11



Granular Shoulder

2_G_		Ⓞ
10-21-14		
STATION TO STATION		Feet
52+00.00	53+00.00	11

12" MODIFIED SUBBASE

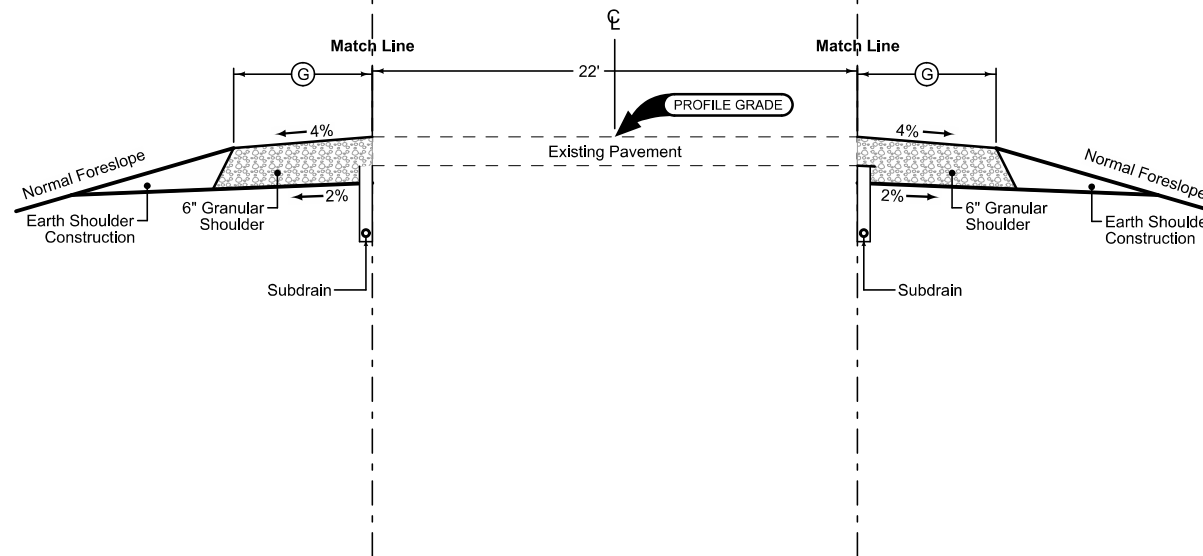
10" P.C. CONCRETE PAVEMENT

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

2P_	
10-19-10	
STATION TO STATION	
52+00.00	53+00.00

Granular Shoulder

2_G_		Ⓞ
10-19-10		
STATION TO STATION		Feet
51+70.00	52+00.00	11
53+00.00	54+00.00	11

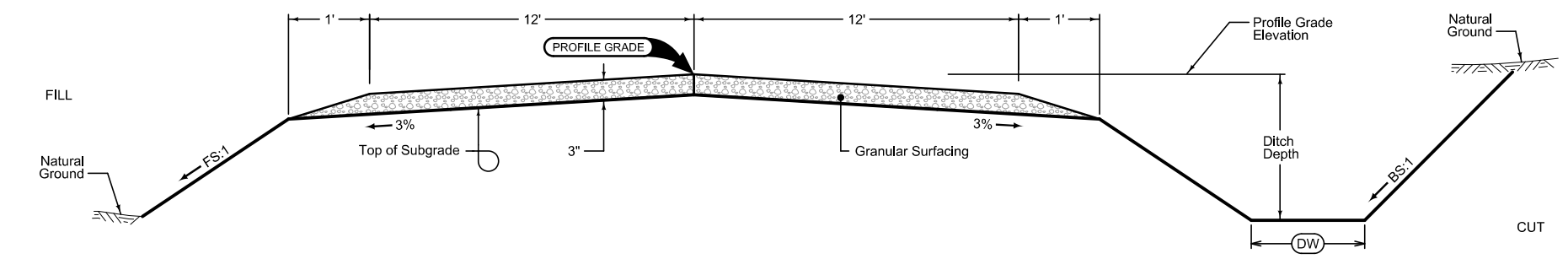


Granular Shoulder

2_G_		Ⓞ
10-19-10		
STATION TO STATION		Feet
51+70.00	52+00.00	11
53+00.00	53+37.00	11

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

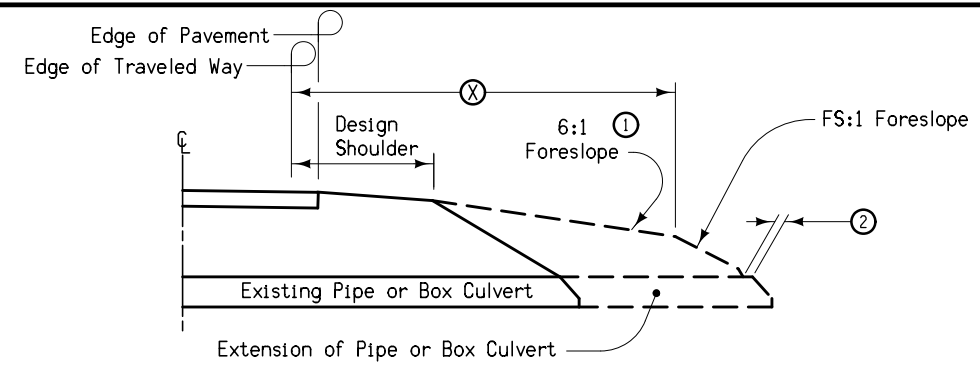
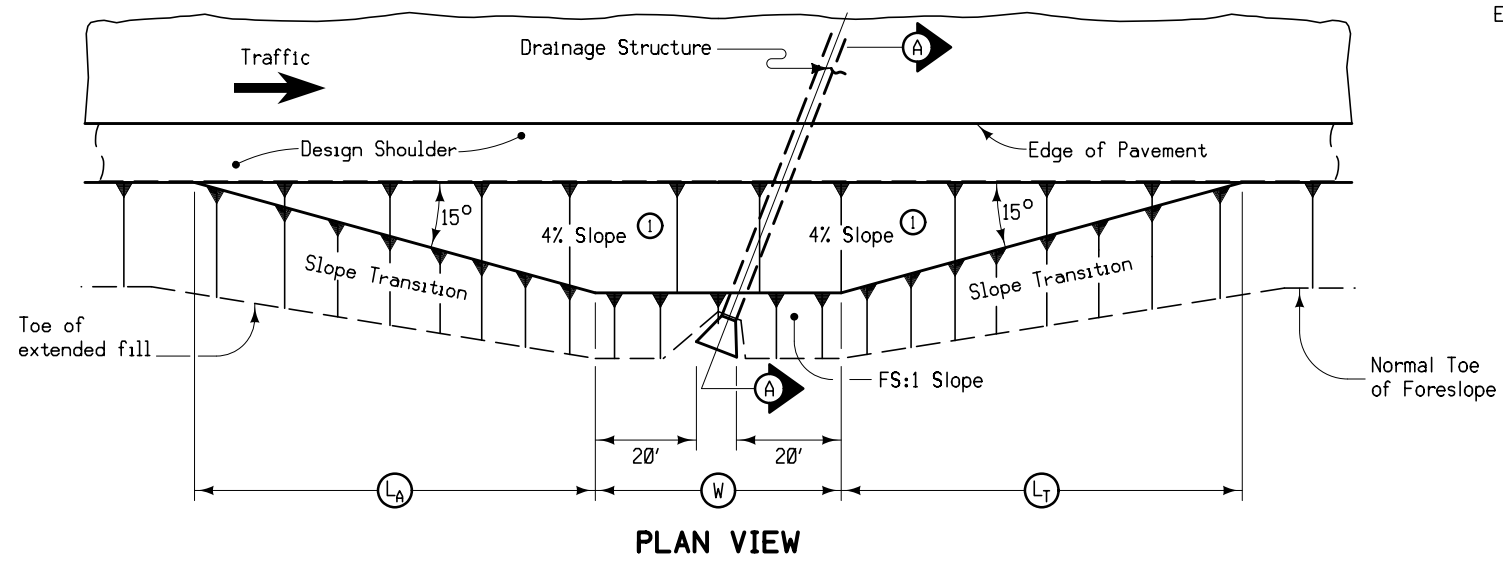
LOCATION		DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION	FS	BS	(DW) Feet	
130th St	3052+00.00	3052+25.00	3	3	0-10
130th St	3052+25.00	3052+97.00	3	3	10



GRADING AND GRANULAR SURFACING

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

See plan & profile sheets and cross sections for additional details of ditches and backslopes.

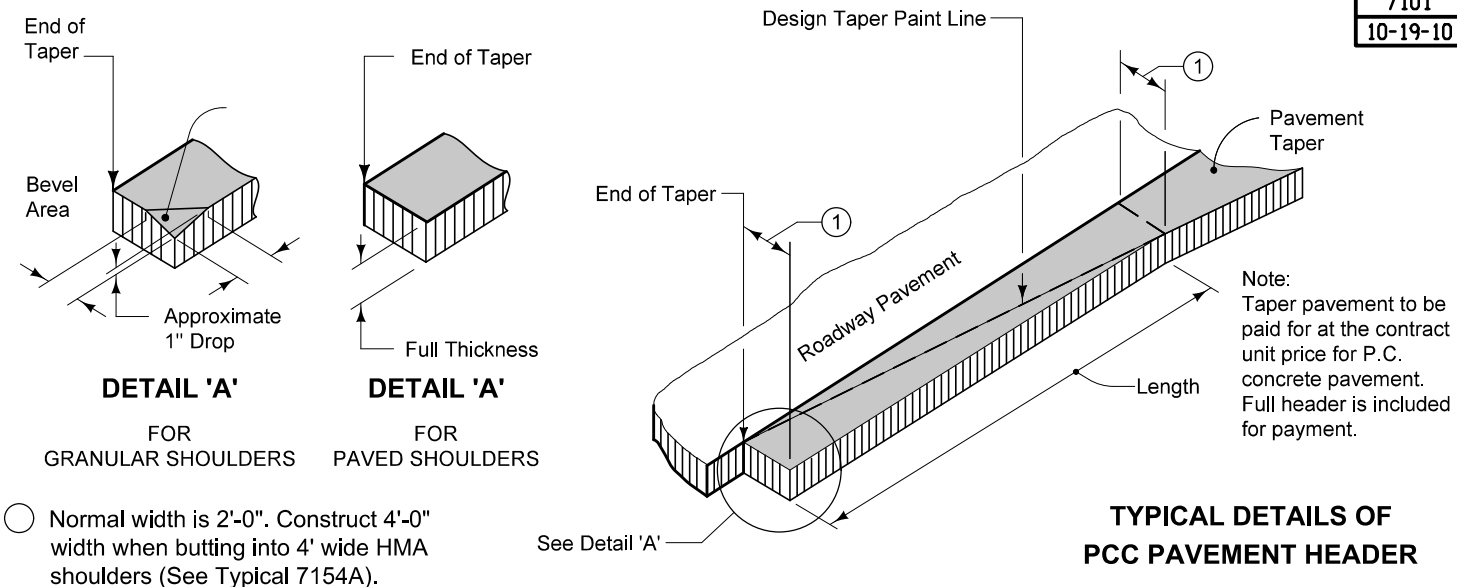


- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.
- ① Slope may be flatter than 6:1.
 - ② 6 inch minimum for pipe installations or to top of headwall on RCB.
 - ③ At ϕ of road.
 - Ⓜ = Pipe or RCB opening width plus 20 feet each side.

STRUCTURE LOCATION		Ⓜ	Ⓛ _A	Ⓛ _T	Ⓧ	ⓕ _S
STATION ③	SIDE	Feet	Feet	Feet	Feet	
52+40.00	RT	91.0	74.6	74.6	31	3
52+40.00	LT	91.0	-	74.6	31	3

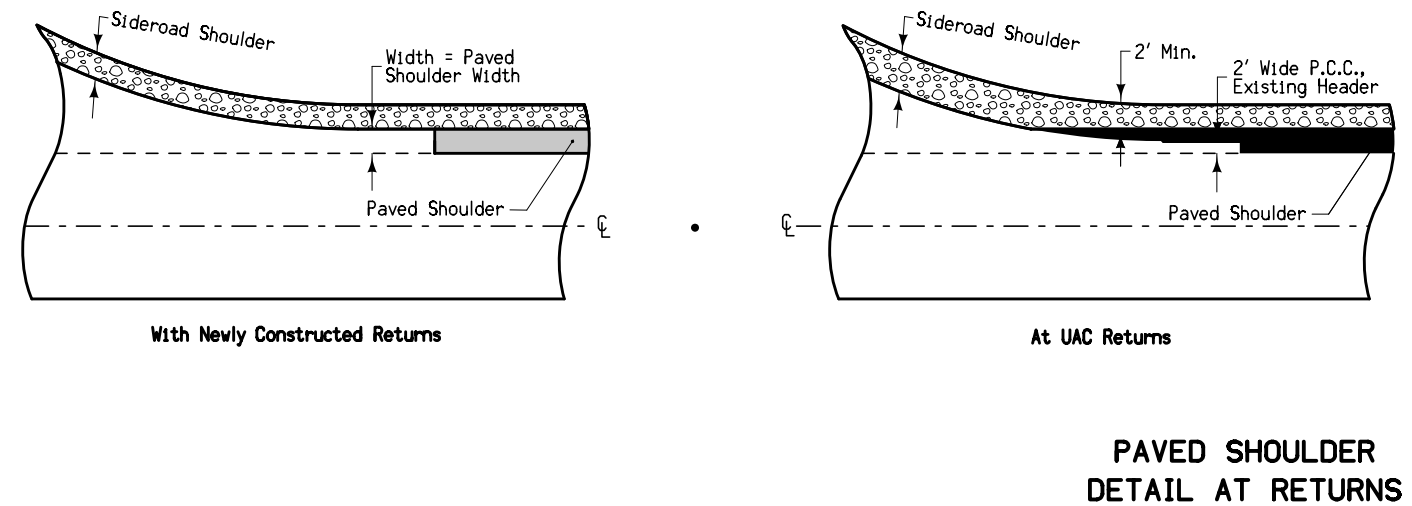
BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE

7101
10-19-10

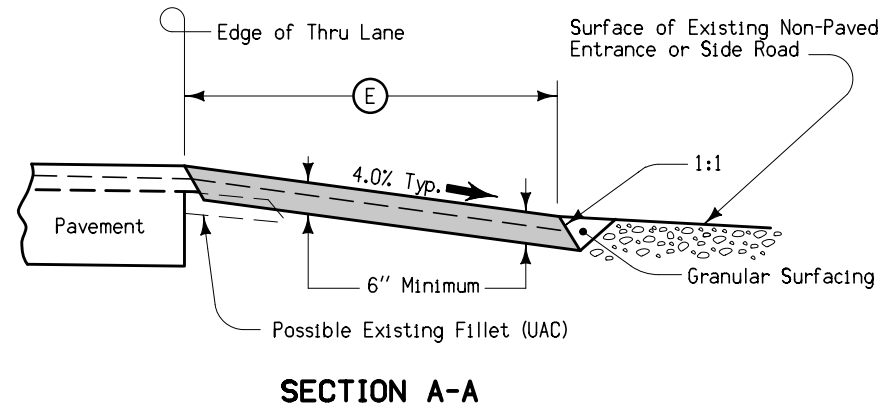
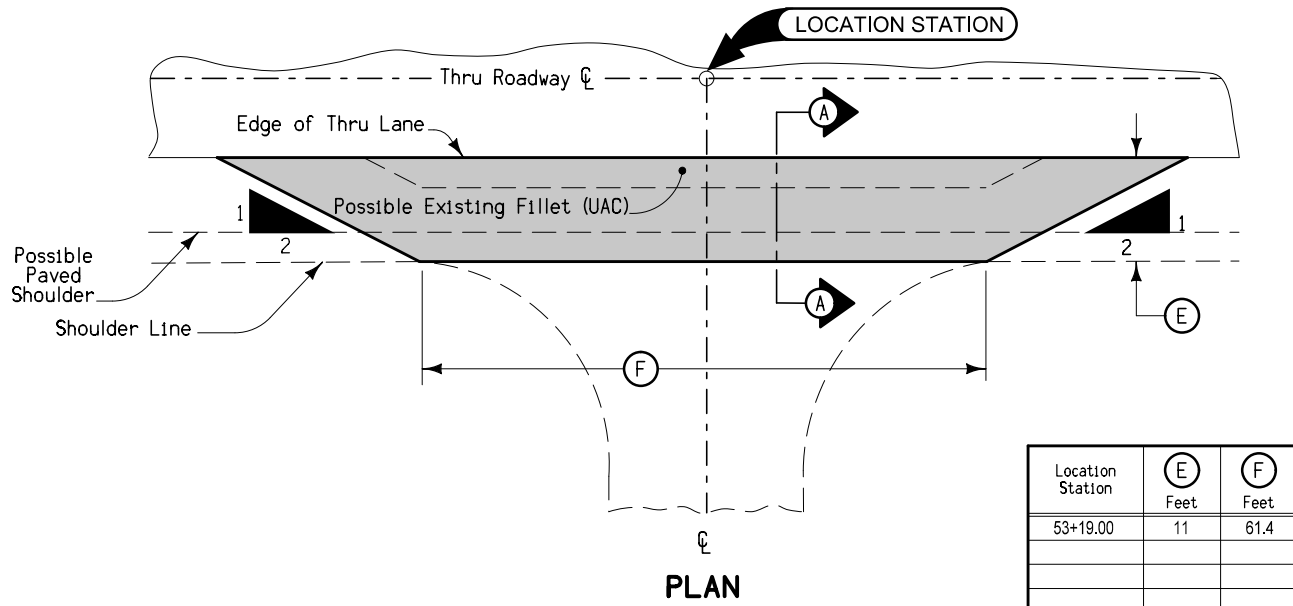


○ Normal width is 2'-0". Construct 4'-0" width when butting into 4' wide HMA shoulders (See Typical 7154A).

7154B
10-20-09



7148
10-21-14



Special shaping of existing surface prior to placement of fillet may be required by the Engineer and is incidental to other work on the project.
Quantities included with mainline quantities.

FILLET FOR NON-PAVED ENTRANCES OR SIDE ROADS

SURVEY SYMBOLS

- EP Edge of Paved Roads (ML or SR)
- SNP Unpaved Shoulder
- EG Edge of Gravel Road
- GDL Guard Rail Steel
- SIGN SI Sign
- > D Centerline Draw or Stream (Down)
- TP TPD Telephone Pedestal
- ⊕ TR Telephone Riser Pole
- ⊕ PPA Power Pole Co. 1
- x — FW Wire Fence
- MM MM Mile Marker Post
- ~~~~~ RIP Rip-Rap
- T1le — TIL Tile Line
- T1 — TL1D Telephone Line Co. 1 - Quality D
- CON Concrete or A/C Slab
- ⊕ MH Utility Access (Manhole)
- SIGN SL Speed Limit Sign
- F02 — FO2D Fiber Optic Co. 2 - Quality D
- F0 — FO1D Fiber Optic Co. 1 - Quality D

UTILITY LEGEND

- ⊕ Eastern Iowa Light and Power Cooperative
- T1 — TL1D Telephone Line WINDSTREAM - Quality D
- F0 — FO1D Fiber Optic MEDIACOM - Quality D
- F02 — FO2D Fiber Optic Cedar Communications - Quality D

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

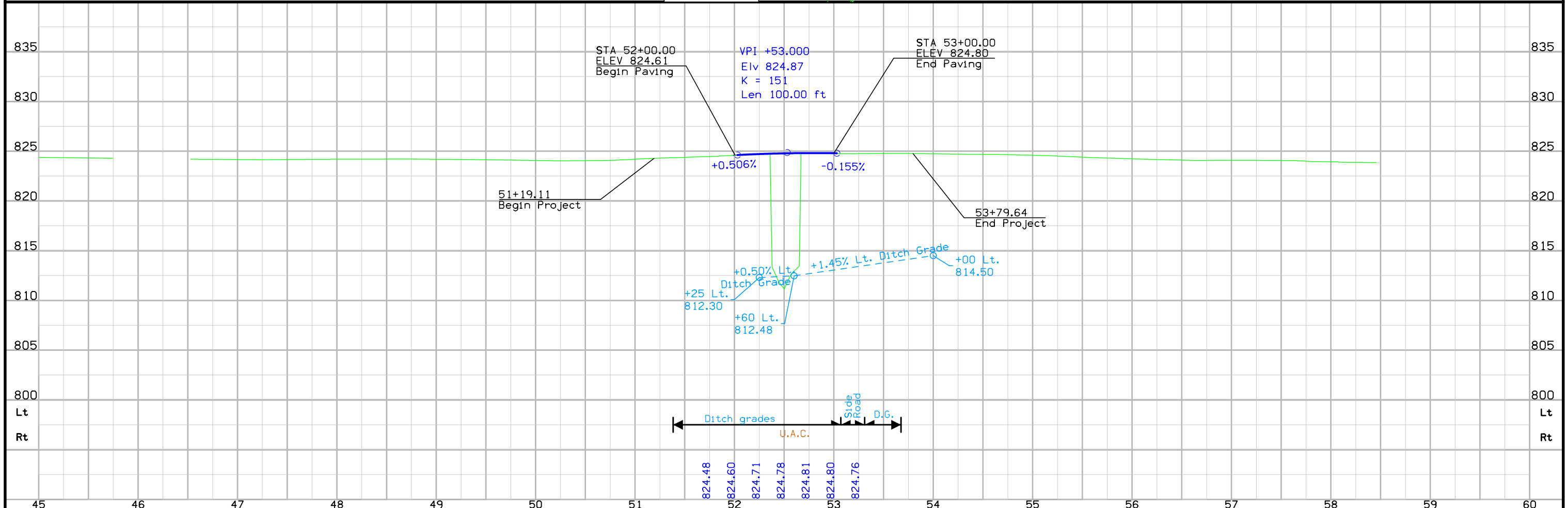
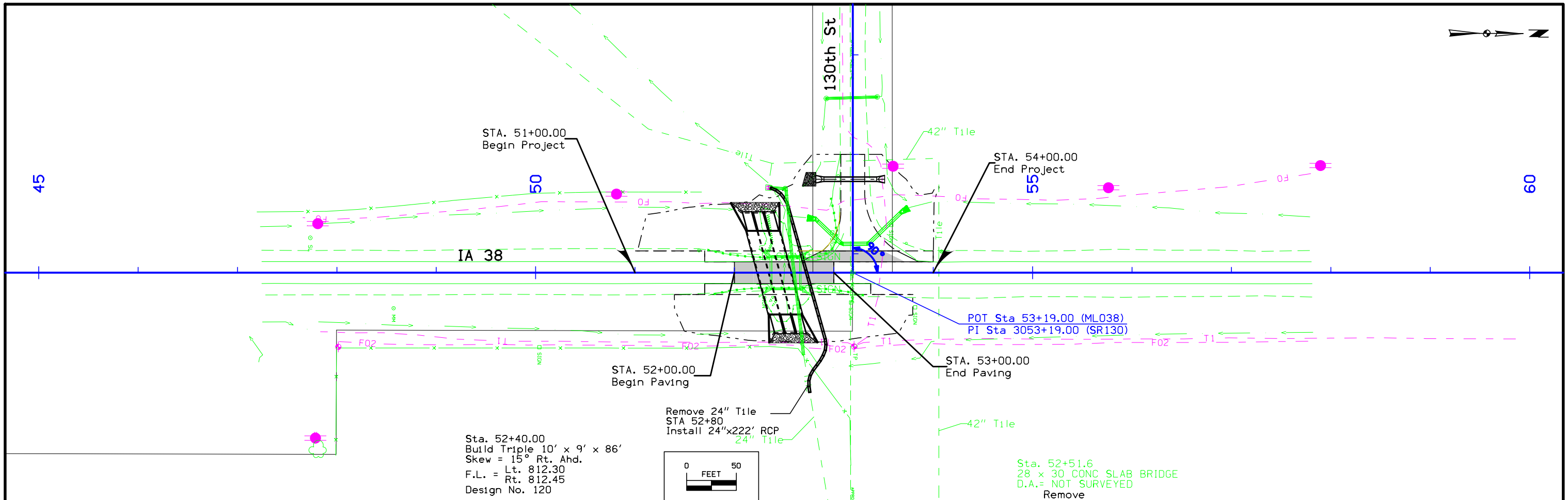
LINEWORK		Design Color No.	
Green	(2)	Existing Ground Line Profile	
Blue	(1)	Proposed Profile and Annotation	
Magenta	(5)	Existing Utilities	
Blue, Light	(230)	Proposed Ditch Grades, Left	
Black	(0)	Proposed Ditch Grades, Median	
Rust	(14)	Proposed Ditch Grades, Right	

- 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)

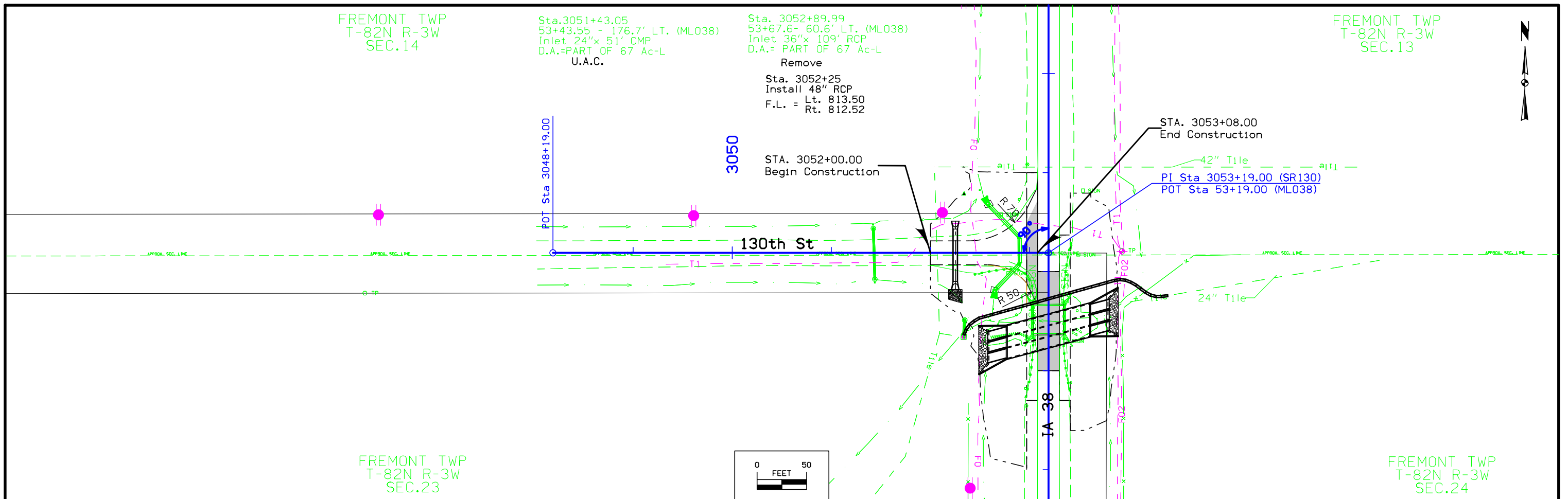


FREMONT TWP
T-82N R-3W
SEC.14

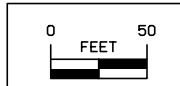
Sta.3051+43.05
53+43.55 - 176.7' LT. (ML038)
Inlet 24"x 51' CMP
D.A.=PART OF 67' Ac-L
U.A.C.

Sta. 3052+89.99
53+67.6- 60.6' LT. (ML038)
Inlet 36"x 109' RCP
D.A.= PART OF 67' Ac-L

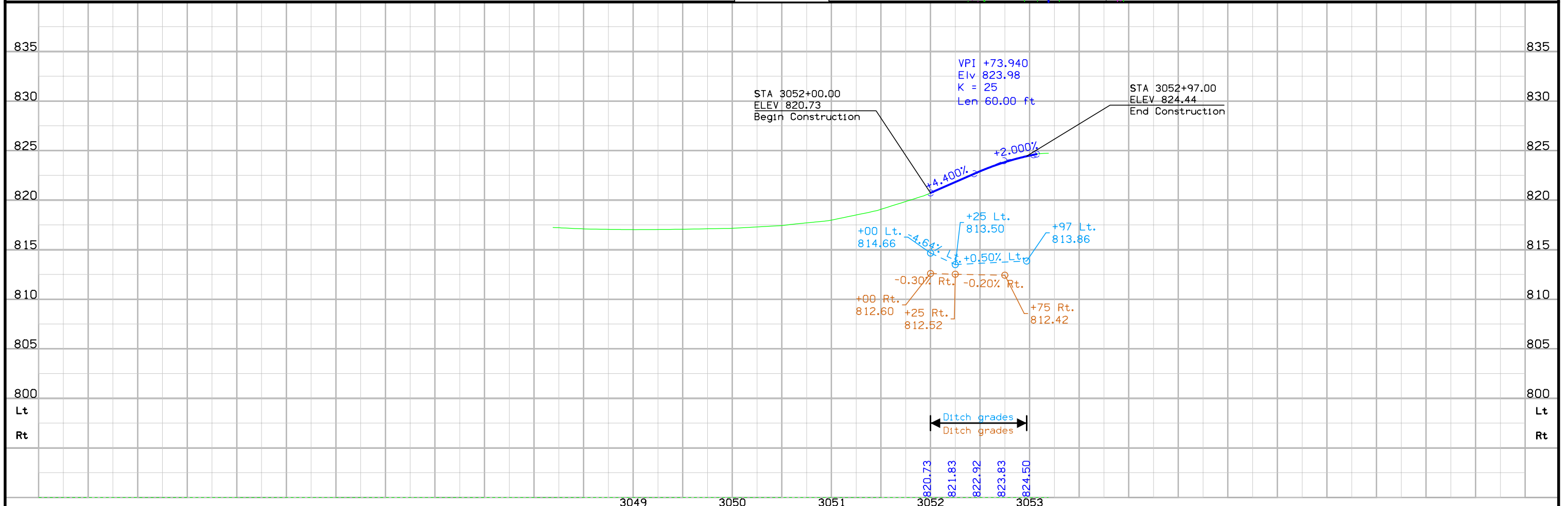
FREMONT TWP
T-82N R-3W
SEC.13



FREMONT TWP
T-82N R-3W
SEC.23



FREMONT TWP
T-82N R-3W
SEC.24



Survey Information

County: Cedar
 PIN: 15-16-038-030
 Project Number: BRFN-038-2(39)--39-16
 Location: Ditch 1.0 mi N of US 30
 Type of Work: Bridge-Unspecified
 Project Directory: 1603803015
 Sap-862

County: Cedar
 PIN: 15-16-038-030
 Project Number: BRFN-038-2(39)--39-16
 Location: Ditch 1.0 mi N of US 30
 Type of Work: Bridge-Unspecified
 Project Directory: 1603803015
 Sap-862

Field Personnel
 John Bennett- Asst. Party Chief

Office Personnel
 Norman Miller- Survey Manager
 Eric Diedrich-Design Technician Specialist

Date(s) of Survey
 Begin Date 08/10/2016
 End Field Work Date 09/15/2016
 End Mapping Date 03/01/2017

General Information
 Measurement units for this survey are US survey feet. This survey is for proposed Bridge replacement. This project is a Partial DTM with Photo control. Bentley OpenRoads was used to map this survey.

Vertical Control
 Vertical datum for this survey is NAVD88 (Computed using Geoid12A). Ellipsoidal heights were transferred to project points 1 and 2 from nearby Iowa RTN reference stations using static survey and post processing.

Survey elevations were obtained on the bridge features and are compared to the 1951 FN 234 situation plan sheet at Station 52+53.0 as follows:

Plan north and south abutment elevation = 841.65
 Survey north and south abutment elevation = 822.81
 Plan elevation= survey elevation + 18.84

Plan south end floor grade elevation = 843.44
 Survey south end floor grade elevation = 824.76
 Plan elevation= survey elevation + 18.68

Plan north end floor grade elevation = 843.44
 Survey north end floor grade elevation = 824.82
 Plan elevation= survey elevation + 18.62

There were no benchmarks remaining inside the survey limits from FN-234 plans. The best estimate that can be made between plan and survey datum is Plan datum = Survey datum + 18.71' with a standard deviation of 0.11'.

Horizontal Control
 The project coordinate system for this survey is Iowa Regional Coordinate System Zone 10 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were transferred to project points 1 and 2 from nearby Iowa RTN reference stations using static survey and post processing.

Point	Northing	Easting	Elevation	Feature	Description
1	8021771.8	20640791.72	844.74	CP	FD. 5/8" X 40" REROD - SET FOR PREVIOUS PHOTO CONTROL PROJECT FOR US 30 PROJECT.
2	8025888.69	20640095.69	823.92	CP	SET 5/8IN X 40IN REBAR
3	8024526.46	20640069.45	821.42	CP	1/2" REROD EMBEDDED IN 4" SQUARE CONC REF MONUMENT NW OF PI PT 20.
4	8028570.73	20640176.61	826.19	CP	1/2" REROD EMBEDDED IN 4" SQUARE CONC REF MONUMENT NE OF QUARTER SECTION CORNER PT 40.
20	8024494	20640129.61	825.63	PI	39+78 FD PK 1/4" BELOW SURFACE
30	8025834.74	20640125.48	824.66	SCR	NW COR 24-82-3 FD PK 0.1 BELOW SURFACE
32	8025823.8	20637412.46	829.08	SCR	S 1/4 14-82-3 FD 1/2" X30IN REBAR BENT DUG
40	8028512.21	20640112.58	829.66	SCR	TILL VERT SPIN PULL STRIGHTEN REPLACE 4" DEEP
500	8025783.63	20640141.19	825.17	BM	E 1/4 14-82-3 FD PK ON SURFACE IHC PLUG ON NE WING WALL BRG

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans FN-234. Survey stationing was equated to the plan PI at STA 39+78.00 and run ahead without station equation to POT Sta 79+95.70.

Alignment Name: SUR038

Station	Northing	Easting	
PI 39+78.00	8024493.995	20640129.607	
POT 79+95.70	8028511.677	20640117.162	
Tangential Direction:	N 0°10'39" W		
Tangential Length:	4017.70		

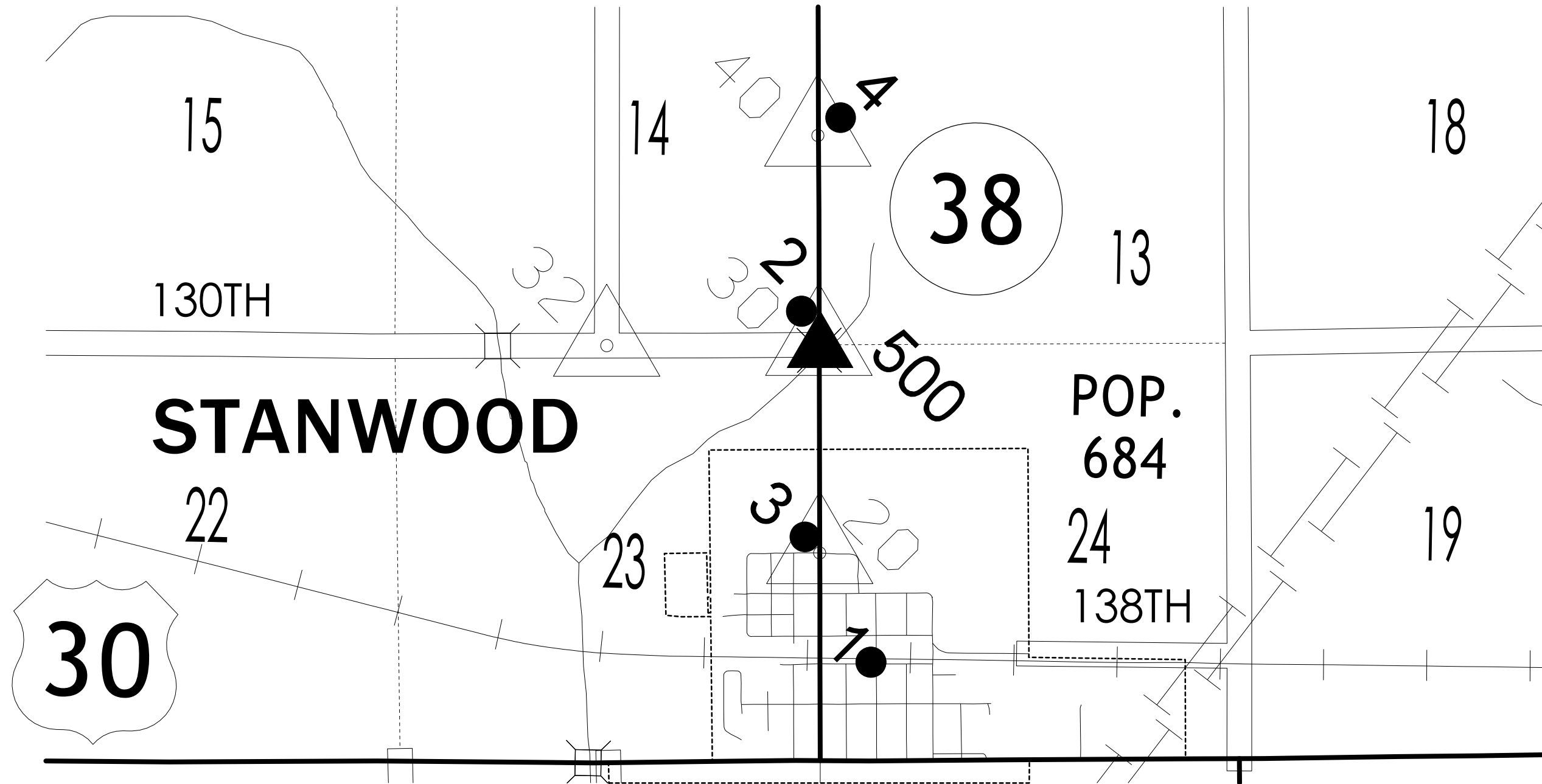
Survey stationing relates to as built plan stationing as follows:

PI Sta. 39+78..0 Plans =
 Survey PI Sta. 39+78..0

POT Sta 79+96.3 Plans =
 Survey POT STA 79+95.70

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 2013.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 10

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

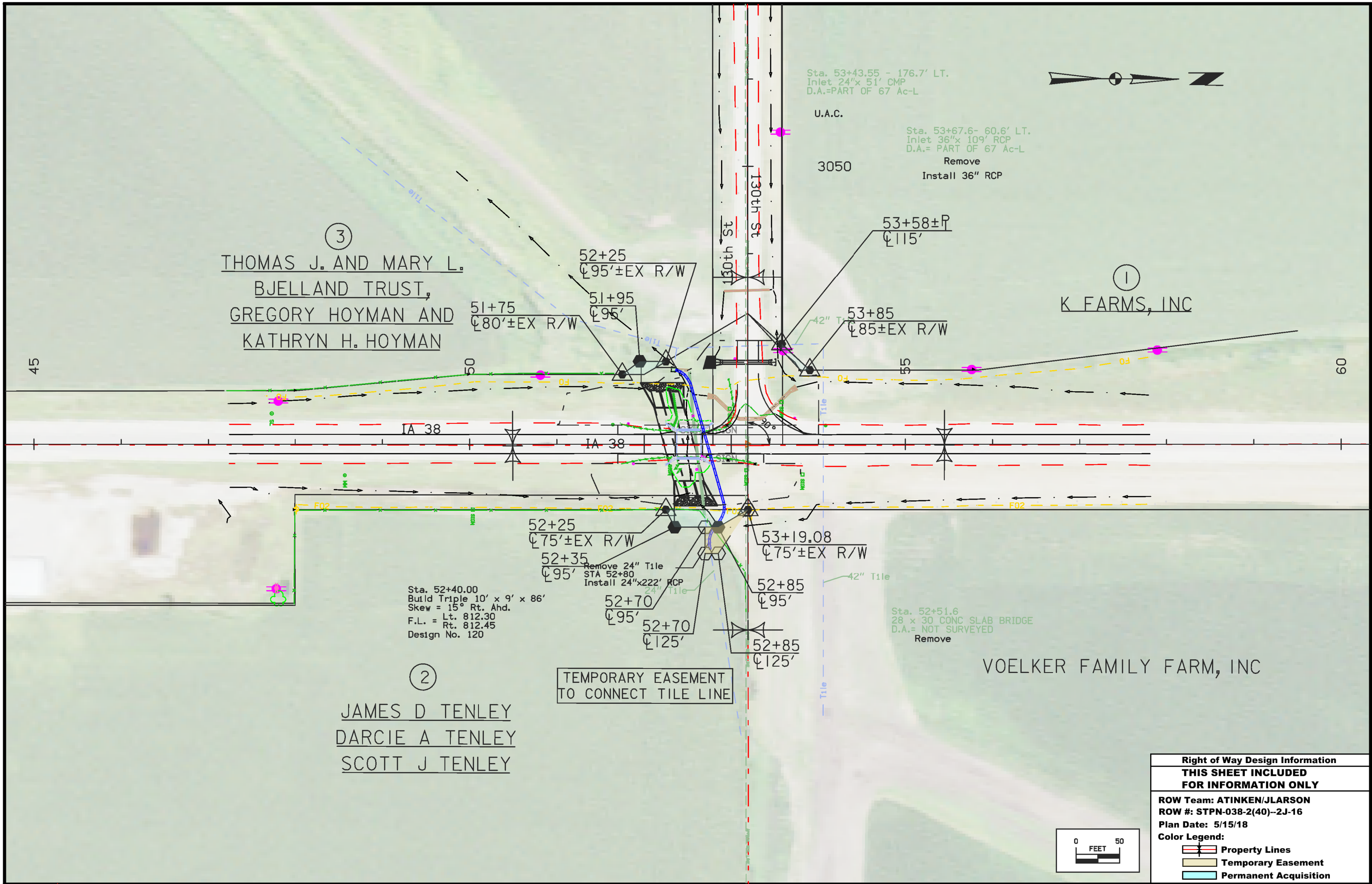
Ia. Regional Coordinate System Zone 10

Point	Northing	Easting	Elevation	Feature	Description
1	8021771.8	20640791.72	844.74	CP	FD. 5/8" X 40" REROD - SET FOR PREVIOUS PHOTO CONTROL PROJECT FOR US 30 PROJECT.
2	8025888.69	20640095.69	823.92	CP	SET 5/8IN X 40IN REBAR
3	8024526.46	20640069.45	821.42	CP	1/2" REROD EMBEDDED IN 4" SQUARE CONC REF MONUMENT NW OF PI PT 20.
4	8028570.73	20640176.61	826.19	CP	1/2" REROD EMBEDDED IN 4" SQUARE CONC REF MONUMENT NE OF QUARTER SECTION CORNER PT 40.
20	8024494	20640129.61	825.63	PI	39+78 FD PK 1/4IN BELOW SURFACE
30	8025834.74	20640125.48	824.66	SCR	NW COR 24-82-3 FD PK 0.1 BELOW SURFACE
32	8025823.8	20637412.46	829.08	SCR	S 1/4 14-82-3 FD 1/2X30IN REBAR BENT DUG TILL VERT SPIN PULL STRIGHTEN REPLACE 4IN DEEP
40	8028512.21	20640112.58	829.66	SCR	E 1/4 14-82-3 FD PK ON SURFACE
500	8025783.63	20640141.19	825.17	BM	IHC ON NE WING WALL BRG

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	ML038	39+78.0000 R1	8024494.00	20640129.61															
1	ML038	79+95.7015 R1	8028511.68	20640117.16															
1	SR130	48+19.0000 R1	8025833.44	20639625.46															
1	SR130	53+19.0000 R1	8025834.99	20640125.45															

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



③
 THOMAS J. AND MARY L.
 BJELLAND TRUST,
 GREGORY HOYMAN AND
 KATHRYN H. HOYMAN

①
 K FARMS, INC

②
 JAMES D TENLEY
 DARCI E A TENLEY
 SCOTT J TENLEY

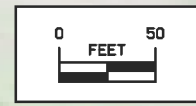
TEMPORARY EASEMENT
 TO CONNECT TILE LINE

Sta. 52+40.00
 Build Triple 10' x 9' x 86'
 Skew = 15° Rt. Ahd.
 F.L. = Lt. 812.30
 Rt. 812.45
 Design No. 120

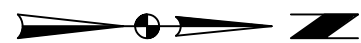
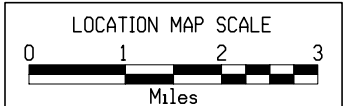
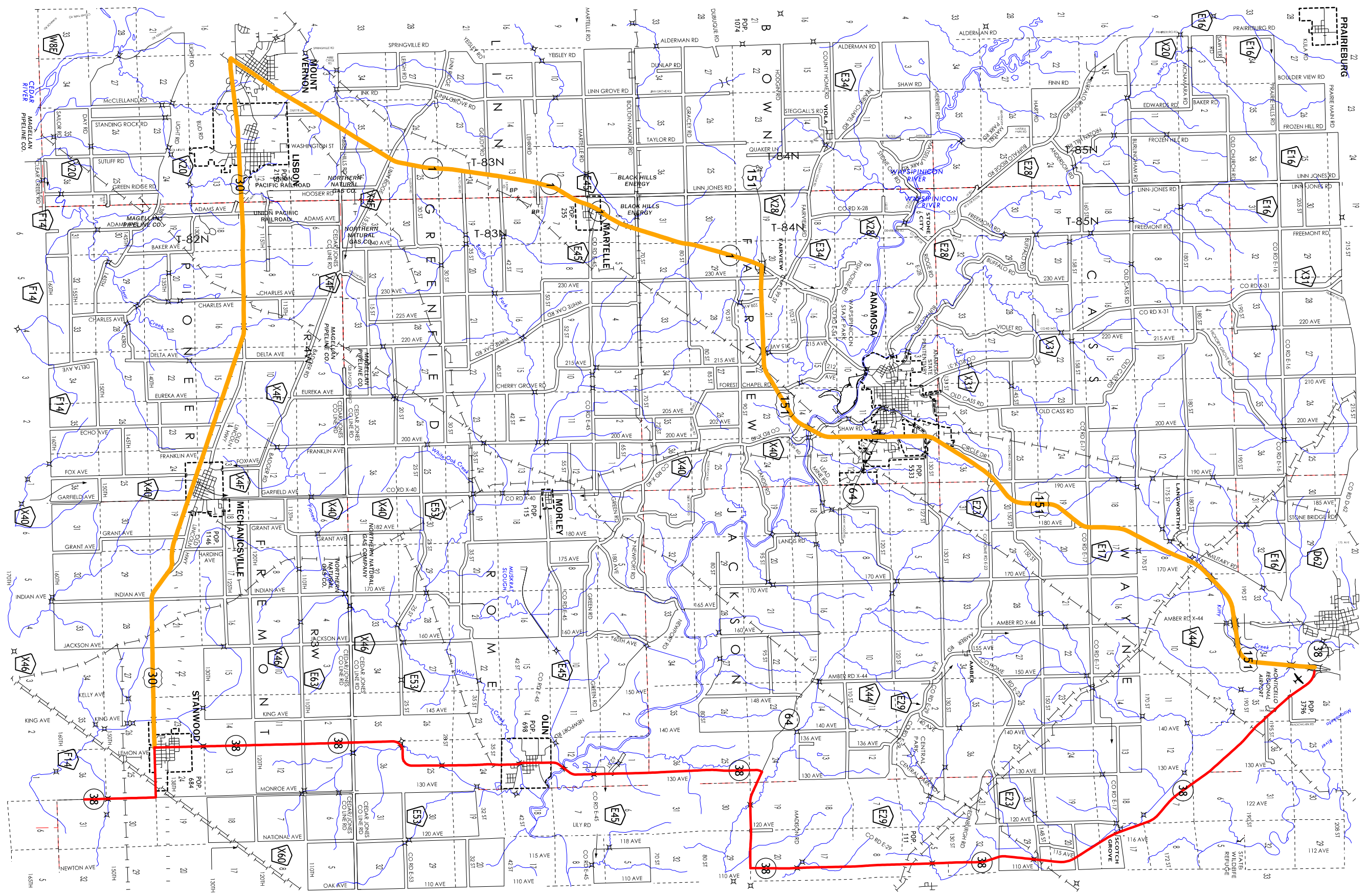
Sta. 52+51.6
 28 x 30 CONC SLAB BRIDGE
 D.A.= NOT SURVEYED
 Remove

Sta. 53+43.55 - 176.7' LT.
 Inlet 24"x 51' CMP
 D.A.=PART OF 67 Ac-L

Sta. 53+67.6- 60.6' LT.
 Inlet 36"x 109' RCP
 D.A.= PART OF 67 Ac-L
 Remove
 Install 36" RCP



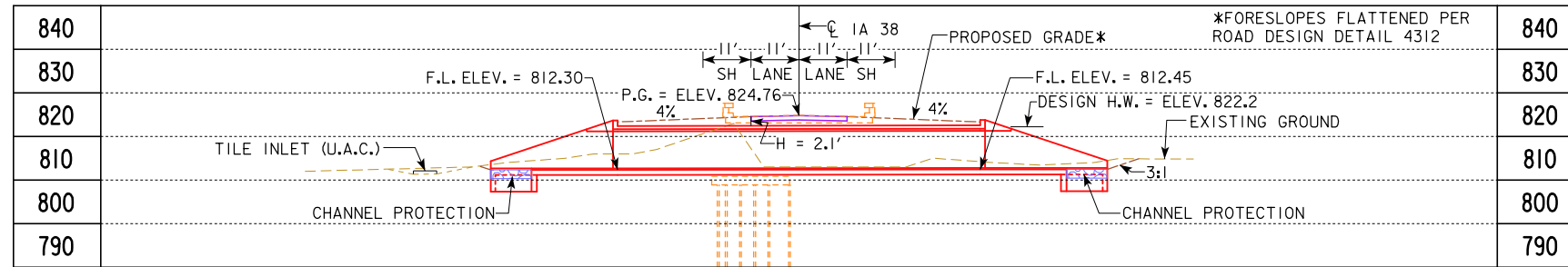
Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN/JLARSON	
ROW #: STPN-038-2(40)--2J-16	
Plan Date: 5/15/18	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



DETOUR

511 TRAVEL RESTRICTIONS

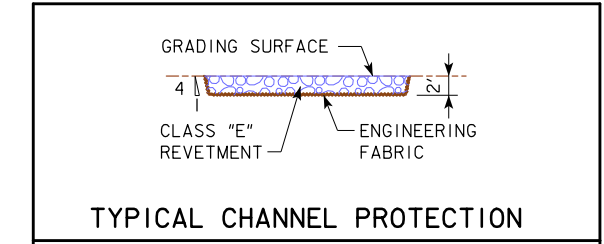
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
No travel Restriction expected												



G1 = +0.506% G2 = -0.155%

VPI STA = 52+53.00 VC = 100.00'
VPI ELEV = 824.87

**PROPOSED PROFILE
GRADE IA 38**



ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	44.2	64.8	27.7
OUTLET	44.2	64.8	27.7
TOTALS	88.4	129.6	55.4

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

UTILITIES LEGEND:

- ◆ - PPA - EASTERN IOWA LIGHT AND POWER COOP.
- TI - TELEPHONE LINE - WINDSTREAM
- FO - FIBER OPTIC - MEDIACOM
- FO2 - FIBER OPTIC - CEDAR COMMUNICATIONS

TRAFFIC ESTIMATE

2020 AADT	1500	V.P.D.
2040 AADT	1800	V.P.D.
20... DHV		V.P.H.
TRUCKS	16	%
TOTAL DESIGN ESALS		

HYDRAULIC DATA

DRAINAGE AREA = 3.3 SQ. MI.
STREAM SLOPE = 5.3 FT./MI.
(REF. CO. PLAN FOR LAT. A DITCH DATED 11/24/14)

Q₅₀ = 2310 CFS, HW = 822.2
Q₁₀₀ = 2760 CFS, HW = 823.4

ROADWAY OVERTOP ELEV. 824.0
STA. 50+25 & 57+73
F.I.S. DATED AUG. 19, 2013, ZONE A.

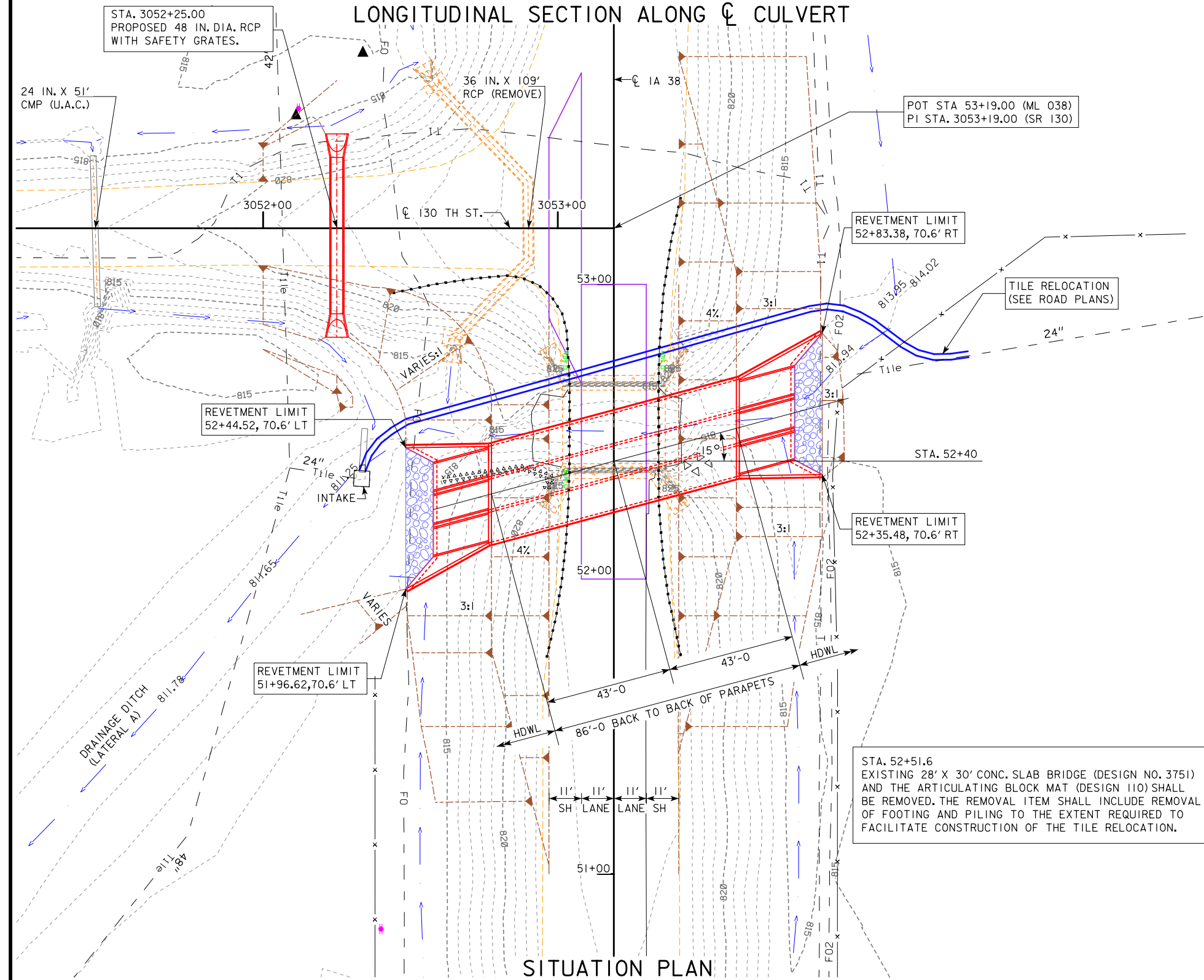
LOCATION

IA 38 OVER DRAINAGE DITCH
T-82N R-3W
SECTION 23/24
FREMONT TOWNSHIP
CEDAR COUNTY
FHWA NO. 18371
BRIDGE MAINT. NO. 1636.1S038
LATITUDE 41.902860°
LONGITUDE -91.151946°

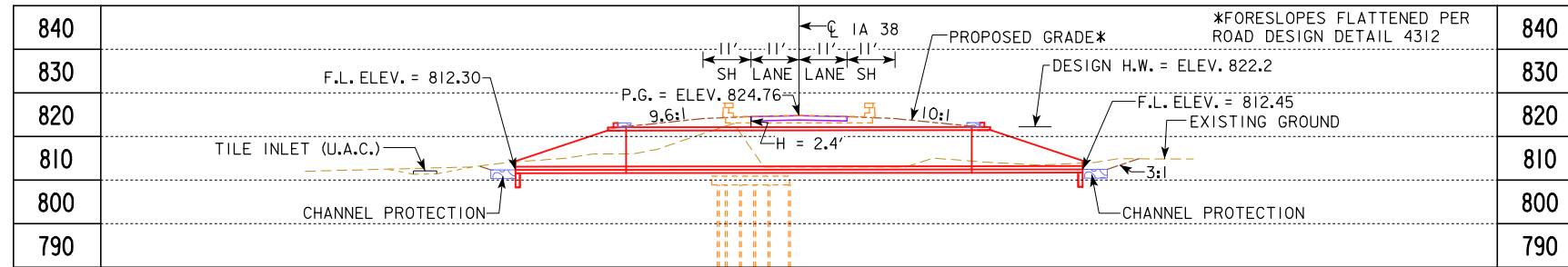
PRELIMINARY

DESIGN FOR 15° SKEW (R.A.)
**TRIPLE 10'-0 X 9'-0 X 86'-0 REINF.
CONCRETE BOX CULVERT**

SITUATION PLAN
STATION 52+40.00 (IA 38) SEPT. 2017
CEDAR COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 1 FILE NO. 31468 DESIGN NO. 120



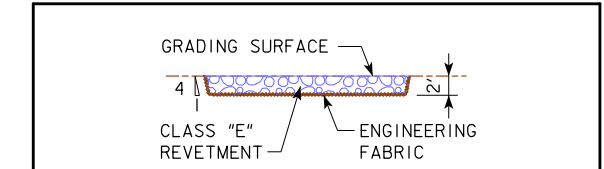
STA. 52+51.6
EXISTING 28' X 30' CONC. SLAB BRIDGE (DESIGN NO. 3751) AND THE ARTICULATING BLOCK MAT (DESIGN 110) SHALL BE REMOVED. THE REMOVAL ITEM SHALL INCLUDE REMOVAL OF FOOTING AND PILING TO THE EXTENT REQUIRED TO FACILITATE CONSTRUCTION OF THE TILE RELOCATION.



G1 = +0.506% G2 = -0.155%

VPI STA = 52+53.00 VC = 100.00'
VPI ELEV = 824.87

**PROPOSED PROFILE
GRADE IA 38**



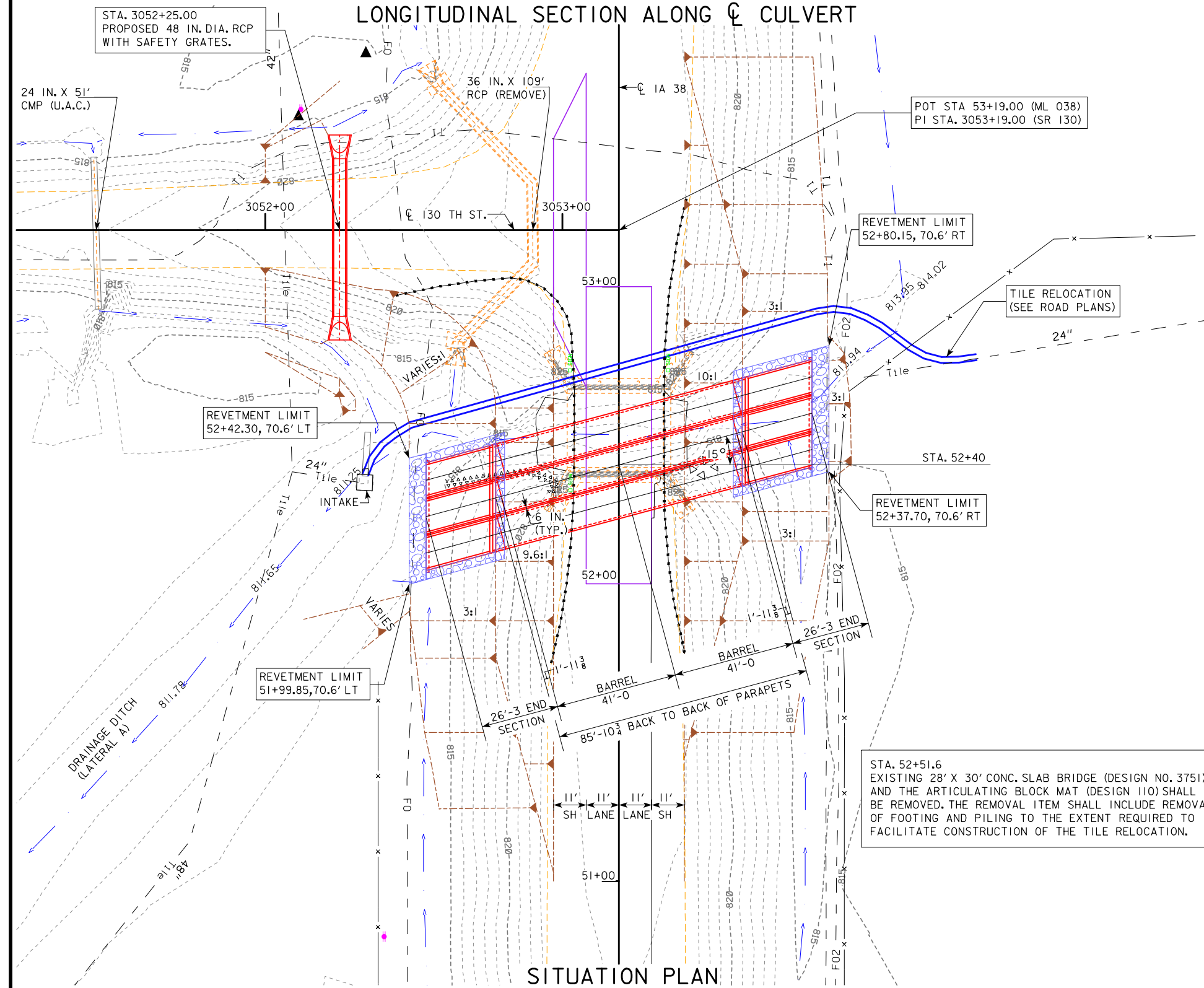
TYPICAL CHANNEL PROTECTION

ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	54.3	115.2	33.9
OUTLET	54.3	115.2	33.9
TOTALS	108.6	230.4	67.8

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

LONGITUDINAL SECTION ALONG CL CULVERT



UTILITIES LEGEND:

- - PPA - EASTERN IOWA LIGHT AND POWER COOP.
- T1 - TELEPHONE LINE - WINDSTREAM
- FO - FIBER OPTIC - MEDIATECOM
- F02 - FIBER OPTIC - CEDAR COMMUNICATIONS

TRAFFIC ESTIMATE

2020 AADT	1500	V.P.D.
2040 AADT	1800	V.P.D.
20... DHV	-	V.P.H.
TRUCKS	16	%
TOTAL DESIGN ESALs	-	-

HYDRAULIC DATA

DRAINAGE AREA = 3.3 SQ. MI.
STREAM SLOPE = 5.3 FT./MI.
(REF. CO. PLAN FOR LAT. A DITCH DATED 11/24/14)

Q₅₀ = 2310 CFS, HW = 822.2
Q₁₀₀ = 2760 CFS, HW = 823.4

ROADWAY OVERTOP ELEV. 824.0
STA. 50+25 & 57+73
F.I.S. DATED AUG. 19, 2013, ZONE A.

LOCATION

IA 38 OVER DRAINAGE DITCH
T-82N R-3W
SECTION 23/24
FREMONT TOWNSHIP
CEDAR COUNTY
FHWA NO. 18371
BRIDGE MAINT. NO. I636.I5038
LATITUDE 41.902860°
LONGITUDE -91.151946°

PRELIMINARY

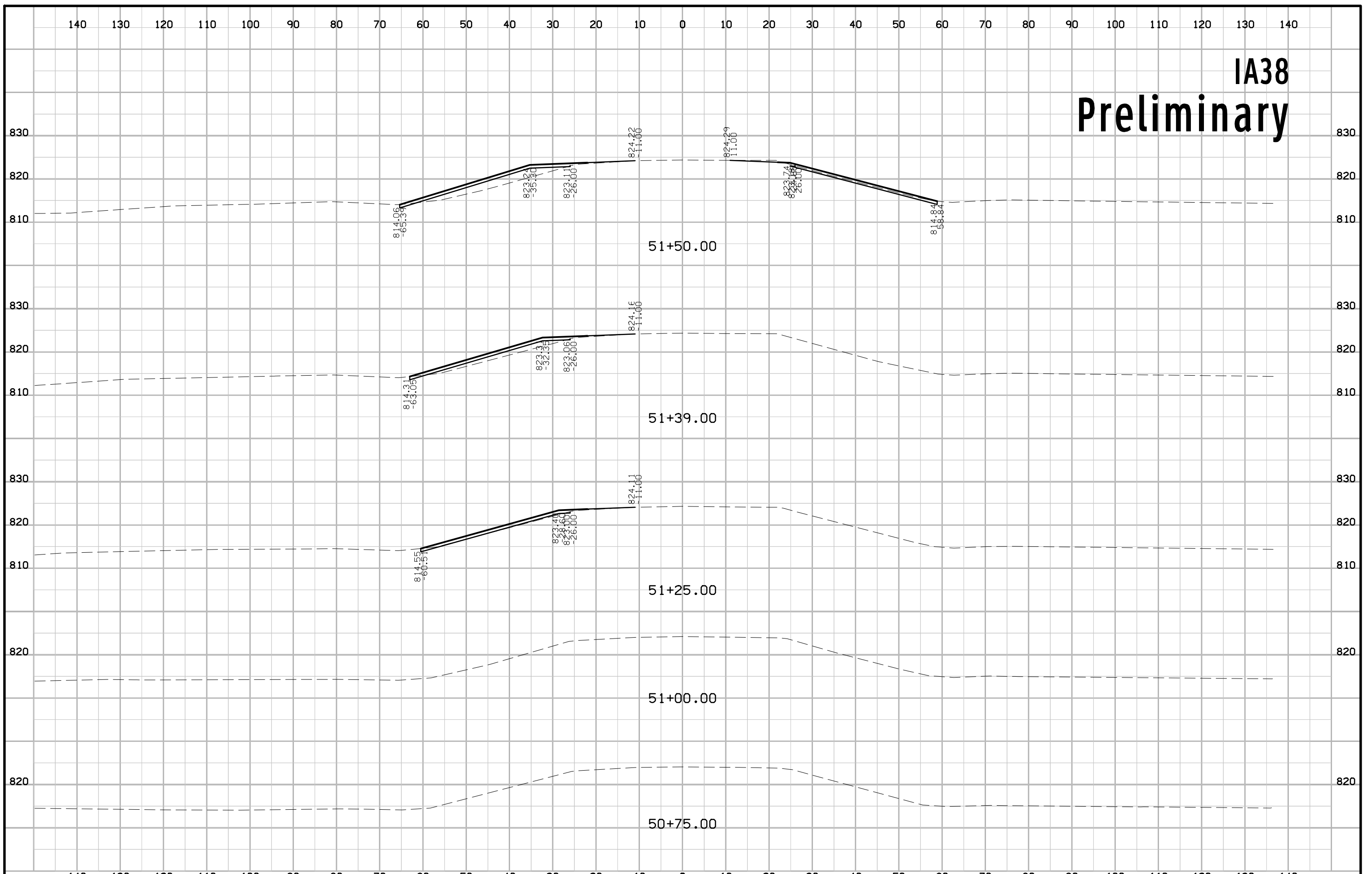
**DESIGN FOR 15° SKEW (R.A.)
TRIPLE 10'-0 X 9'-0 X 85'-10³/₄ PRECAST
CONCRETE BOX CULVERT**

SITUATION PLAN

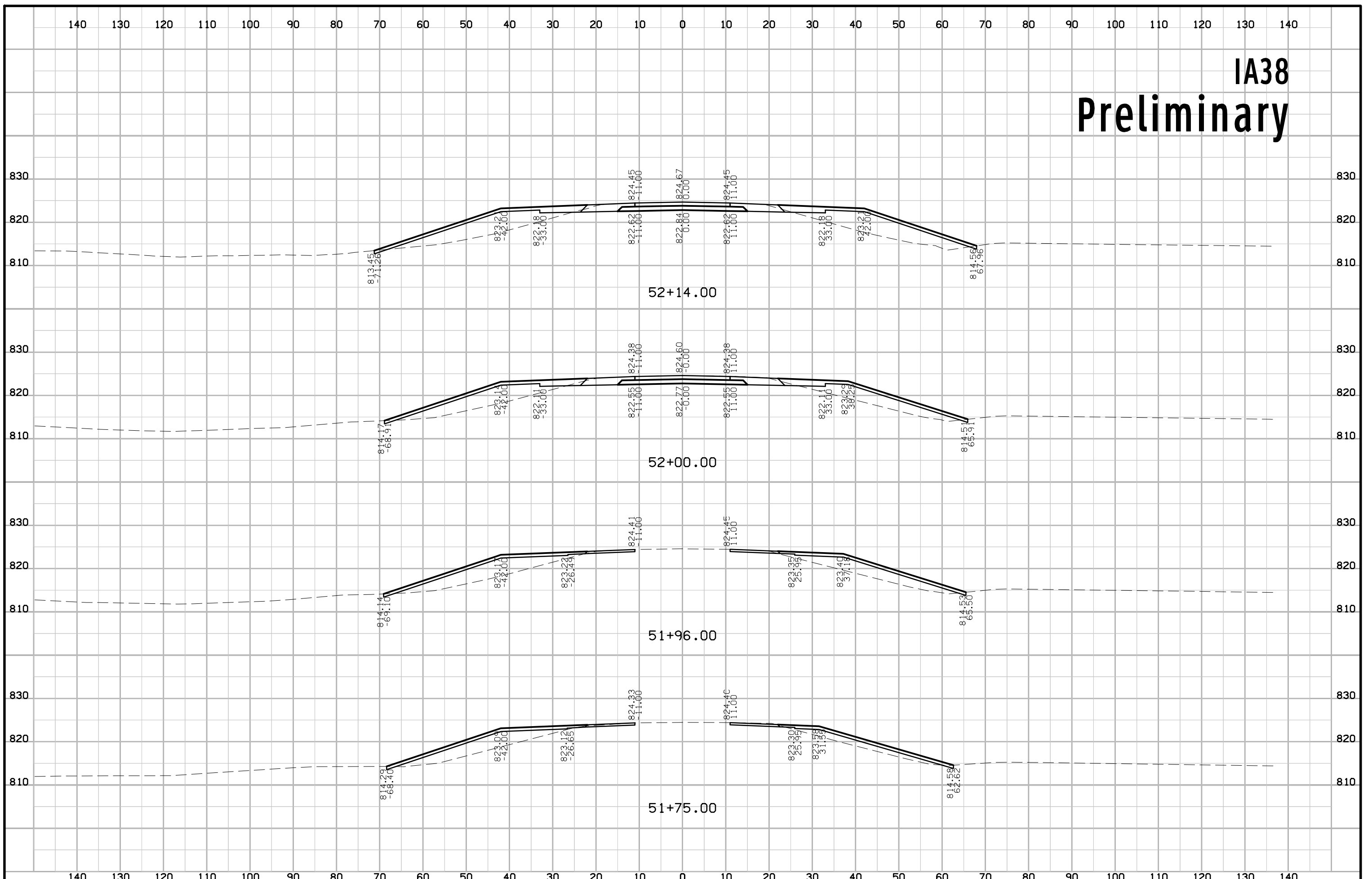
STATION 52+42.00 (IA 38) SEPT. 2017
CEDAR COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 1 FILE NO. 31468 DESIGN NO. 120



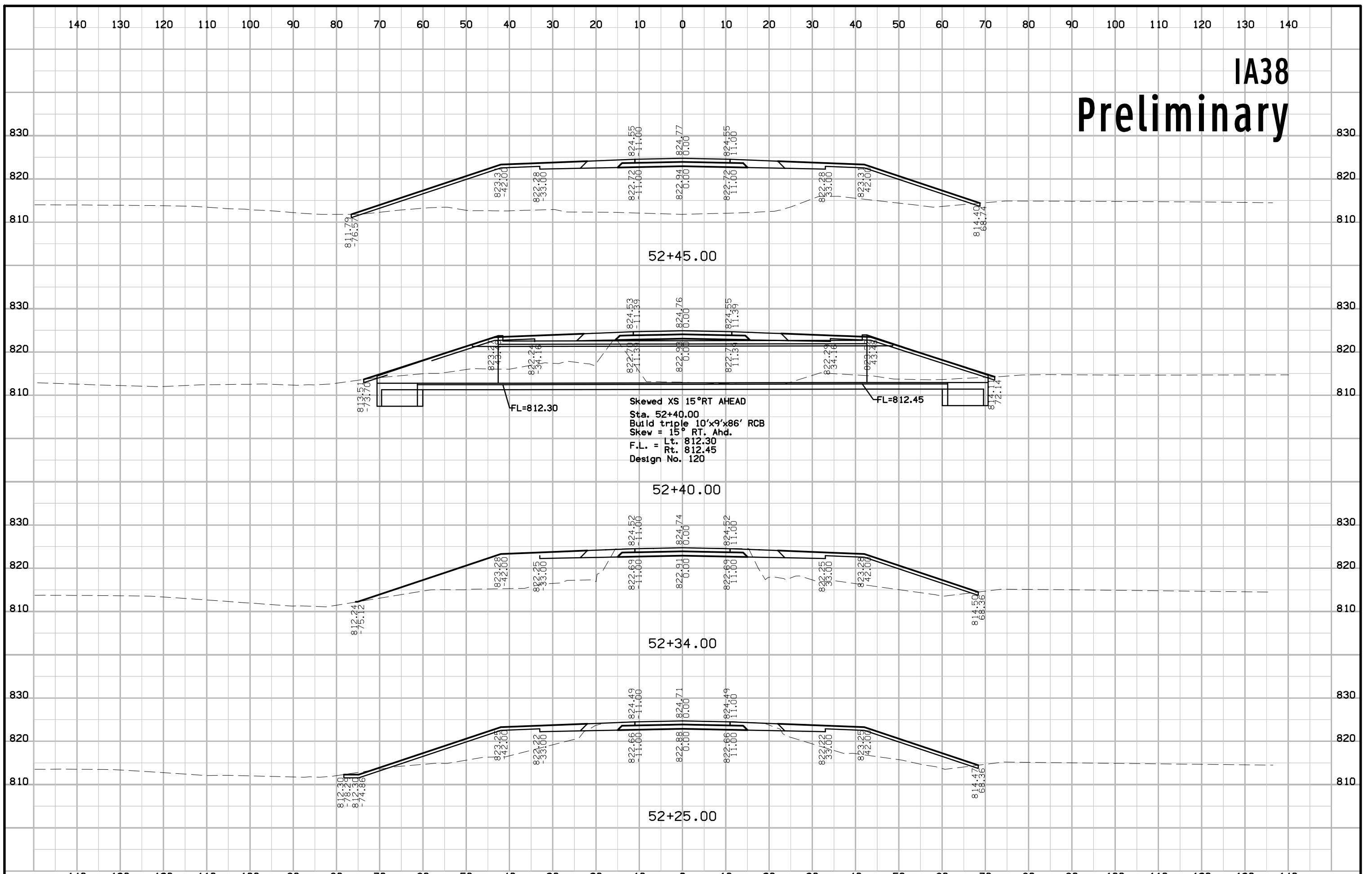
IA38 Preliminary



IA38 Preliminary

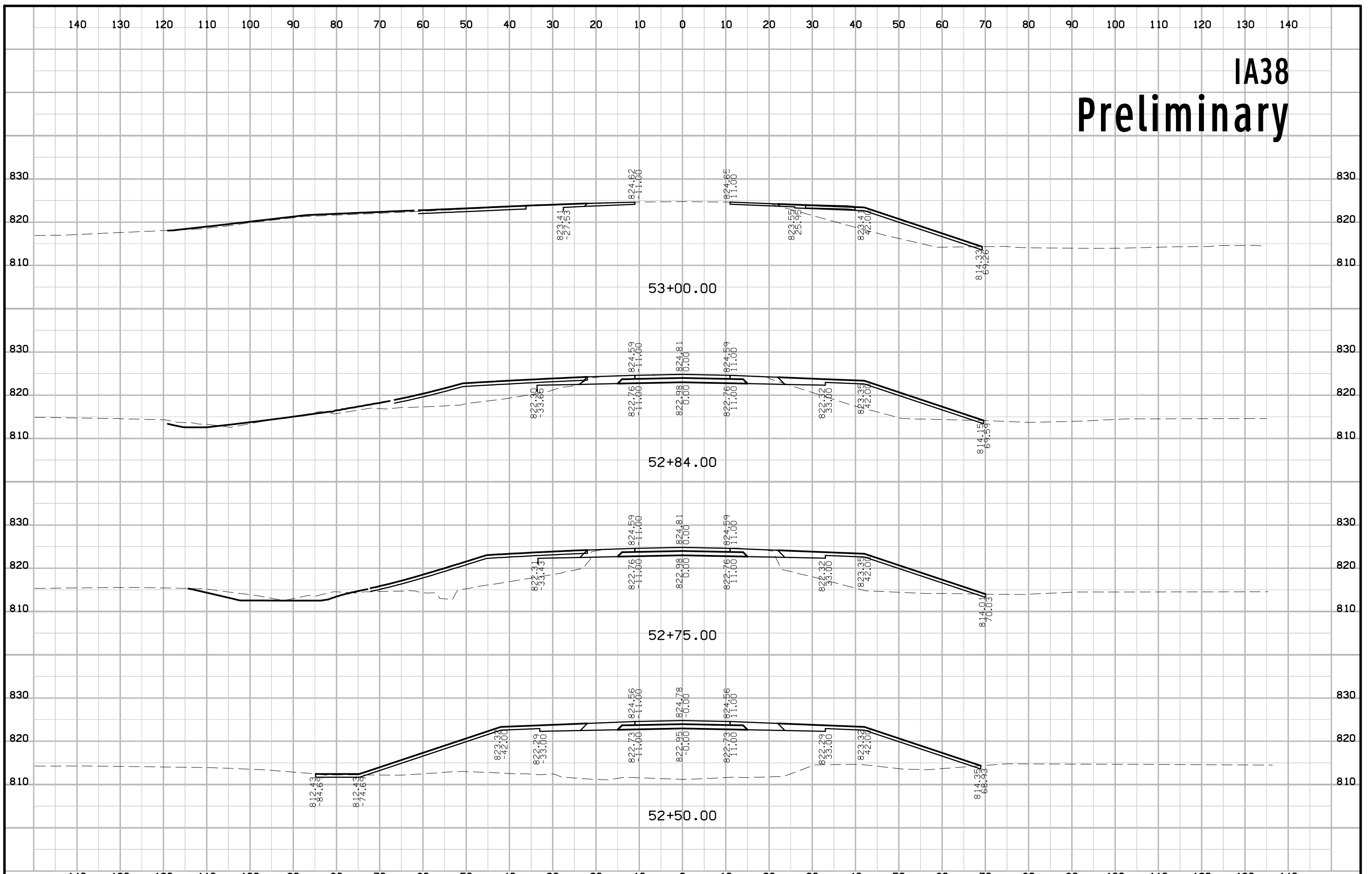


IA38 Preliminary

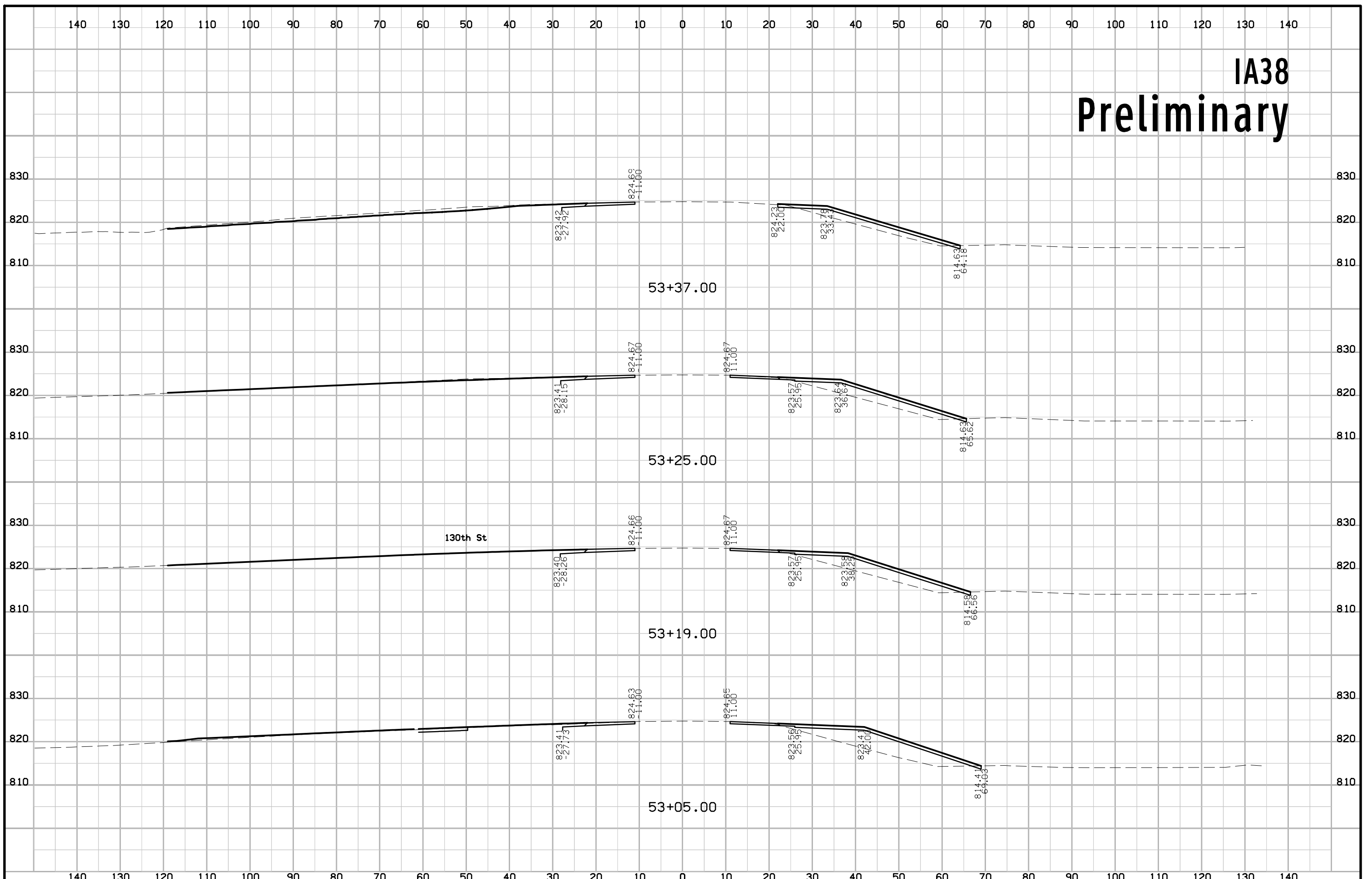


Skewed XS 15°RT AHEAD
 Sta. 52+40.00
 Build triple 10'x9'x86' RCB
 Skew = 15° RT. Ahd.
 F.L. = Lt. 812.30
 Rt. 812.45
 Design No. 120

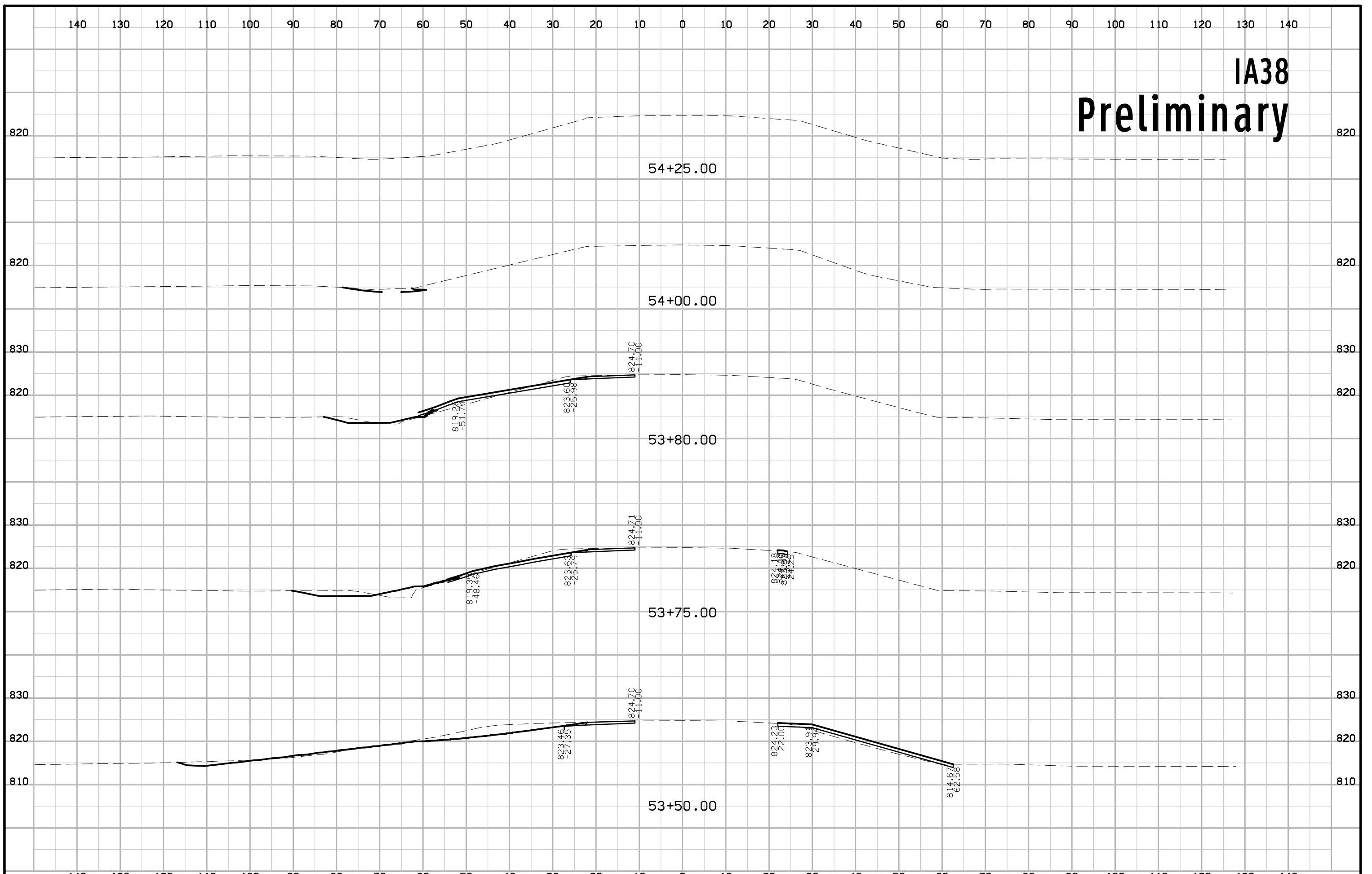
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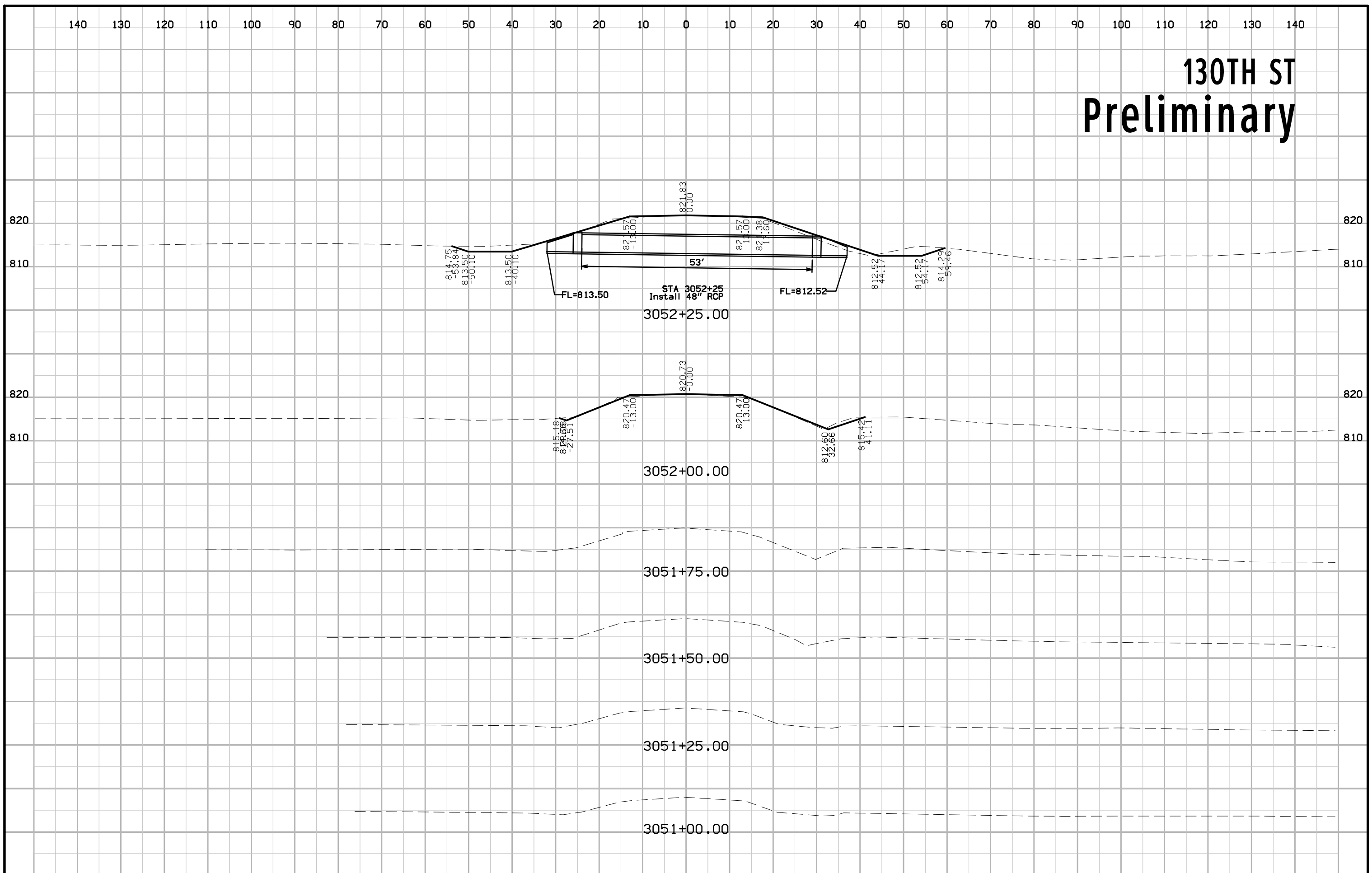
IA38 Preliminary



IA38 Preliminary



130TH ST Preliminary



130TH ST Preliminary

