

BRIDGE REPLACEMENT-CCS
NHSN-030-6(236)--2R-86

TAMA CO.

LETTING DATE
12-18-2018



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

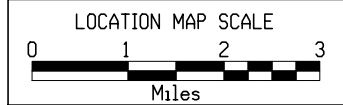
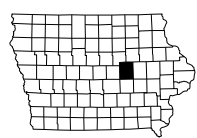
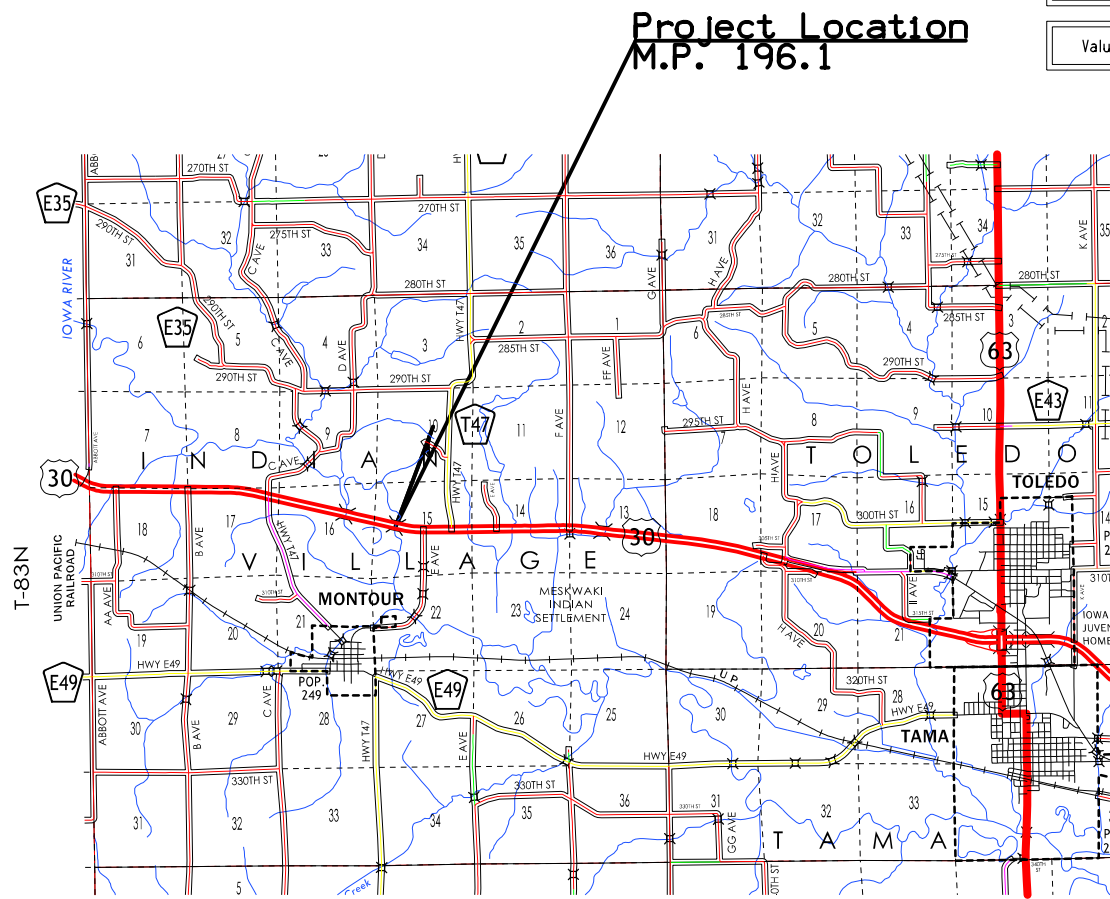
**PRIMARY ROAD SYSTEM
TAMA COUNTY
BRIDGE REPLACEMENT-CCS**

Iowa River Overflow 0.6 mi W of E Jct Co Rd T47

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



DESIGN DATA RURAL			
2014	AADT	9,300	V.P.D.
20--	AADT	--	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	11	%
	Total		
	Design	ESALs	--

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

D4 PLAN - Date: 8-21-2018
LETTING - Date: 12-18-2018

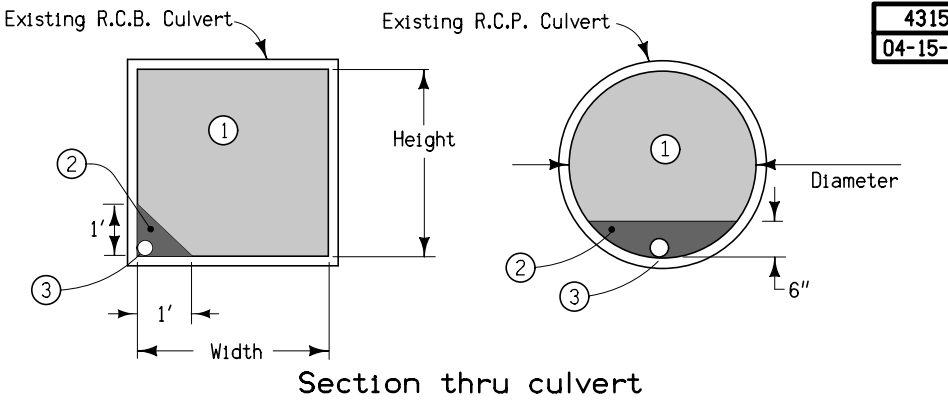
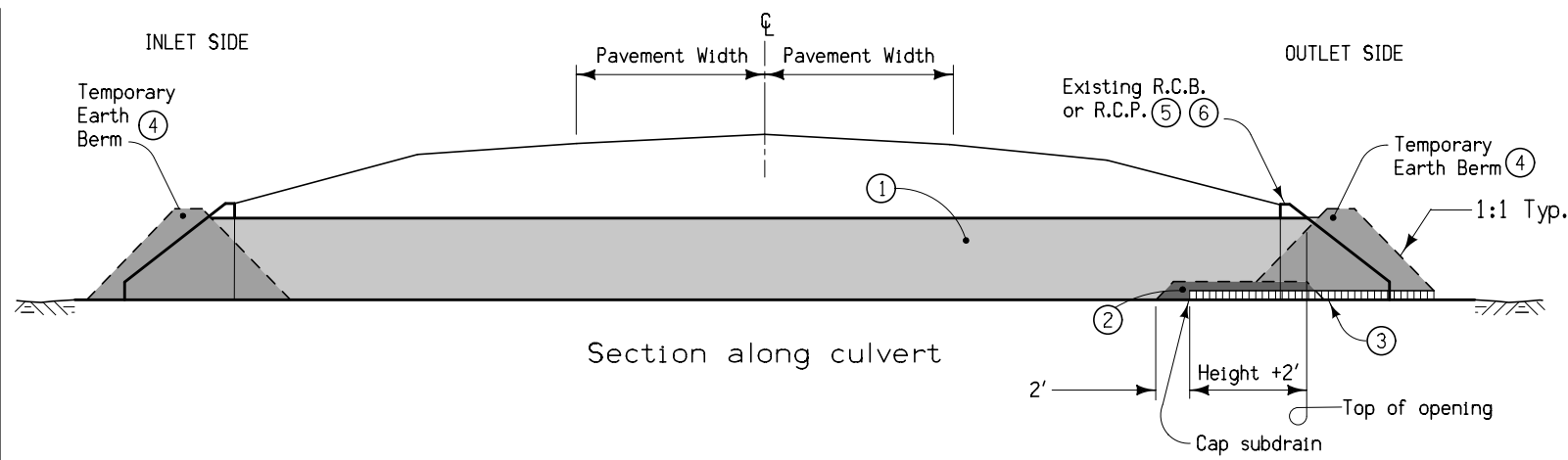
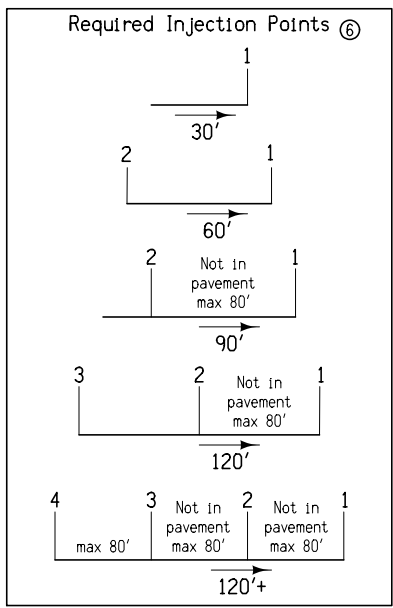
PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 7-13-2017

REVISIONS		TOTAL
		30
PROJECT IDENTIFICATION NUMBER		
16-86-030-020		
PROJECT NUMBER		
NHSN-030-6(236)--2R-86		
R.O.W. PROJECT NUMBER		
NHSN-030-6(237)--2R-86		

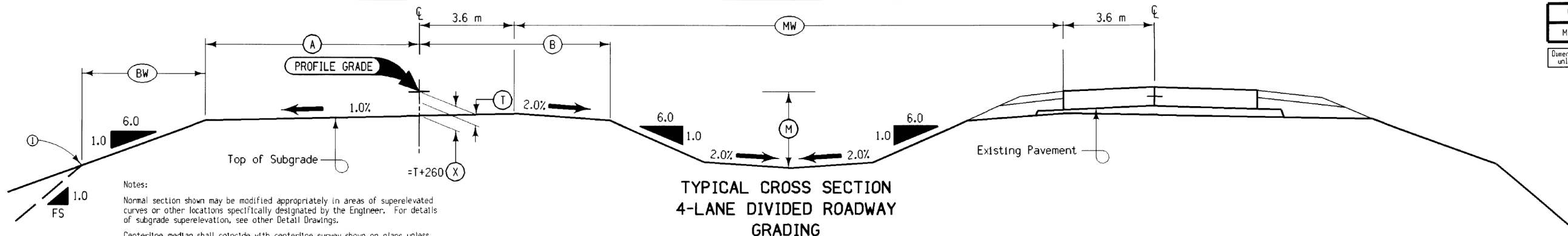
INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
* A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	US 30
G Sheets	Survey Sheets
* G.1	Reference Ties and Bench Marks
* G.2 - 3	Horizontal Control Tab. & Super for all Alignments
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.1	Staging Notes Stage
* J.2	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.3 - 11	Staging and Traffic Control Sheets
U Sheets	500 Series, Mod.Stds. and Detail Sheets
U.1 - 3	500 Series, Modified Standards and Detail Sheets
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 5	Bridge and Culvert Situation Plans & Flood Information
W Sheets	Mainline Cross Sections
W.1	Mainline Cross Sections
X Sheets	Levee Cross Sections
X.1	Levee Cross Sections * Color Plan Sheets



- ① Flowable Mortar.
- ② Granular Backfill.
- ③ 4" subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2' plus the height of the culvert. Granular Backfill covers subdrain and extends an additional 2'. Subdrain and granular backfill are incidental to flowable mortar.
- ④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
- ⑤ Removal of headwalls may be required.
- ⑥ Outlet shall be filled first. See injection point detail for additional information.

DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures less than 8' in either height or width.
Circular structures less than 10' Dia.)

5103
MODIFIED
Dimensions in mm unless noted.



Notes:

Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer. For details of subgrade super-elevation, see other Detail Drawings.

Centerline median shall coincide with centerline survey shown on plans unless specified otherwise.

For typical cross sections of ditches and backslopes for roadway in cut, refer to other detail drawings within the plans.

① Refer to Detail Project Plan and Cross Sections for specific locations of foreslope change.

(M) Design depth of median ditch.

TYPICAL CROSS SECTION
4-LANE DIVIDED ROADWAY
GRADING

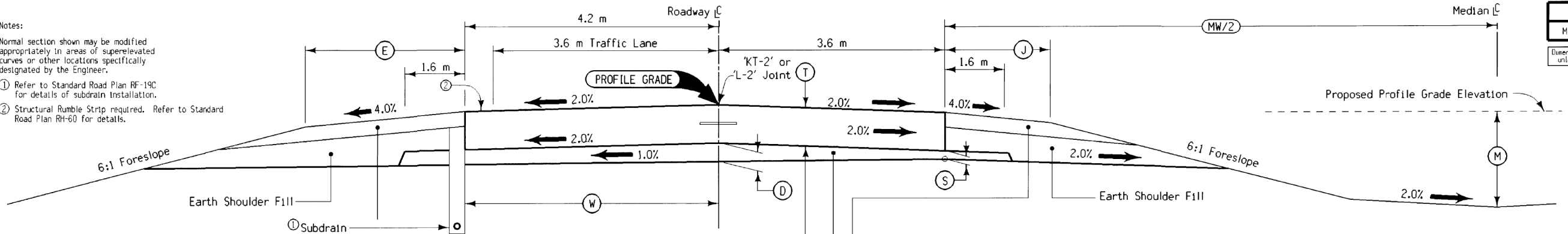
LOCATION		A	B	MW	T	X	M	BW	SLOPE	
ROAD IDENTIFICATION	STATION TO STATION	m	m	m	mm	mm	m	m	FS	
U.S. 30 WBL	88+74.910	111+00.000	9.7	8.5	Var1	260	520	1.2	4.94	3

Notes:

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

① Refer to Standard Road Plan RF-19C for details of subdrain installation.

② Structural Rumble Strip required. Refer to Standard Road Plan RH-60 for details.



TYPICAL CROSS SECTION
4-LANE DIVIDED ROADWAY
PCC PAVING
WITH GRANULAR SHOULDERS

LOCATION		T	S	D	E	J	MW	M	W	
ROAD IDENTIFICATION	STATION TO STATION	mm	mm	mm	m	m	m	m	m	
U.S. 30 WBL	88+74.910	159+74.170	260	152	260	2.4	1.8	20.8	1.2	4.2

3217
MODIFIED
Dimensions in mm unless noted.

Notes:

Subgrade adjustment is required on tangent section of the roadbed. Curved sections that require super-elevation will not require subgrade adjustment once a 2% cross slope is attained across the entire subgrade.

TYPICAL PAVING CROSS SECTION
SUBGRADE ADJUSTMENT TO 1% SLOPE
4-LANE DIVIDED ROADWAY

LOCATION		A	B	MW	X	
ROAD IDENTIFICATION	STATION TO STATION	m	m	m	mm	
U.S. 30 WBL	111+00	159+74.170	9.7	8.5	20.8	260

(X) is the distance between the Profile Grade and the bottom of the 1% grade line at the inside of pavement.

This Sheet
For Information Only

3221
MODIFIED
Dimensions in mm unless noted.

DESIGN TEAM Abrams/Flattery/Bartlett/Happe

METRIC

IOWA DOT * OFFICE OF DESIGN

TAMA COUNTY

PROJECT NUMBER NHSX-030-6(104)--3H-86

SHEET NUMBER B.01

29-AUG-2003 14:06 pflatte v:\Projects\86030021092\Design\86030104.b01

SURVEY SYMBOLS

- CP Control Point
- ▲ PCP Photo Control Point
- WC Wild Card (Misc. Field Shot)
- EP Edge of Paved Roads (ML or SR)
- SH Paved Shoulder
- SNP Unpaved Shoulder
- BL Topo Breakline
- ENU Edge Unpaved Entrance & Parking
- D Centerline Draw or Stream (Down)
- C Centerline BL of Road (ML or SR)
- GR Ground Shot
- ENT Centerline BL of Entrance
- ⊠ IN Storm Sewer Intake
- UE Utility Elevation
- PIP Pipe Culvert
- SOP Size of Pipe or Culvert
- Tile TIL Tile Line
- OUT Tile Outlet
- ← DU Centerline Draw or Stream (Up)
- x FW Wire Fence
- ▲ RIP Rip-Rap
- PPA Power Pole Co. 1
- TW Top of Water
- CUL Culvert
- PRO Profile Shot
- REF Reference Tie Point
- F0 - FO1D Fiber Optic Co. 1 - Quality D
- F02 - FO2D Fiber Optic Co. 2 - Quality D
- F03 - FO3D Fiber Optic Co. 3 - Quality D
- ▲ BM Bench Mark

UTILITY LEGEND

- F0 - FO1D Fiber Optic Century Link - Quality D
- F02 - FO2D Fiber Optic Windstream - Quality D
- F03 - FO3D Fiber Optic Mediacom - 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

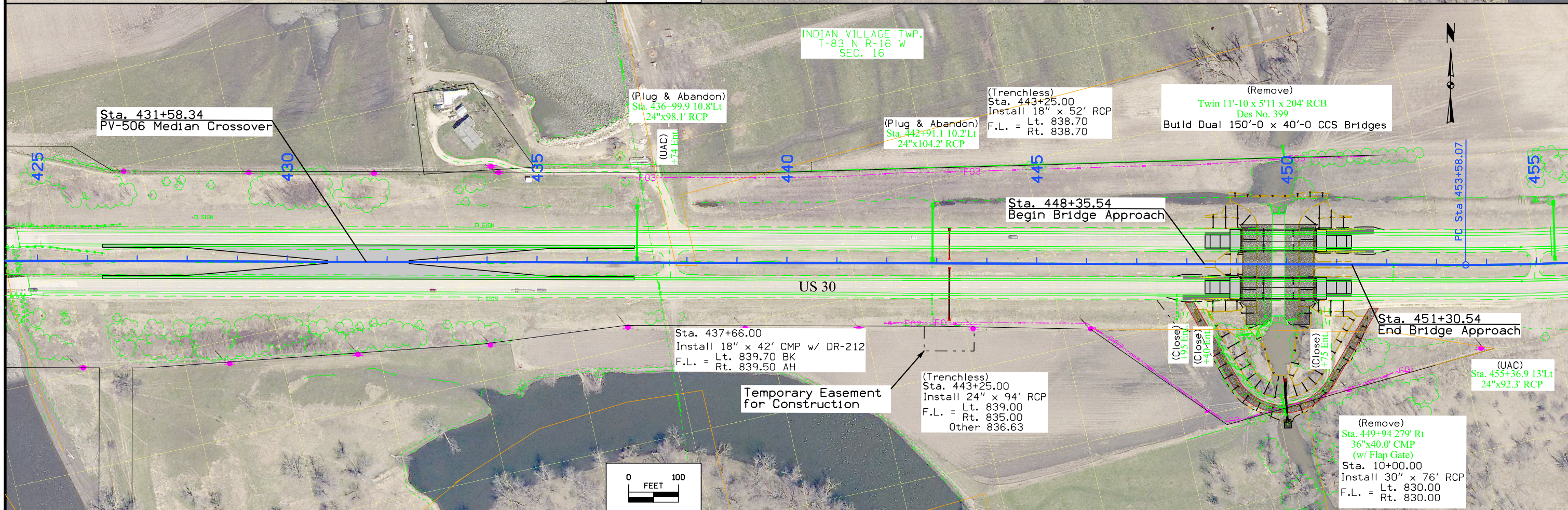
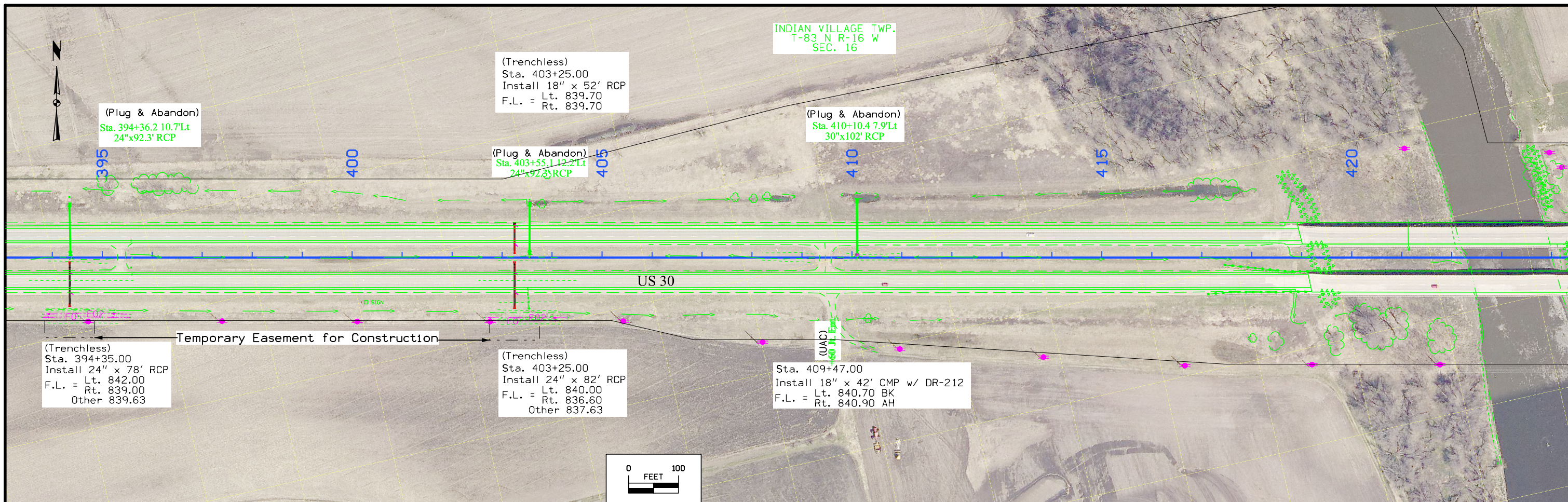
LINEWORK		Design Color No.	
Green	(2)	█	Existing Ground Line Profile
Blue	(1)	█	Proposed Profile and Annotation
Magenta	(5)	█	Existing Utilities
Blue, Light	(230)	█	Proposed Ditch Grades, Left
Black	(0)	█	Proposed Ditch Grades, Median
Rust	(14)	█	Proposed Ditch Grades, Right

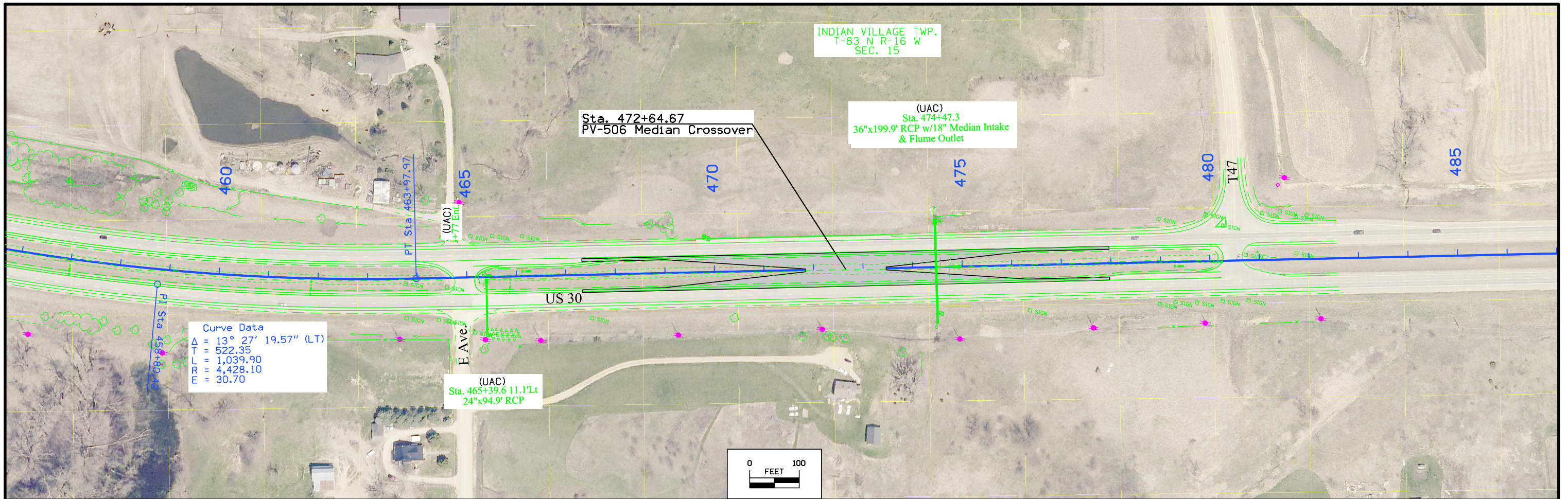
- Reference Point
- Station
- ▲ Section Corner
- Ground Line Intercept
- ▨ Saw Cut
- Guardrail
- ▨ Trench Drain
- HighTension Cable Guardrail
- ~ Sheet Pile
- ▨ Pavement Removal
- ▨ Clearing & Grubbing Area

- 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)





Survey Information

Tama County
NHSN-030-6(236)--2R-86
Iowa River 0.6 mi W of
E Jct Co Rd T47
PIN 16-86-030-020
Sap-0910

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge construction on US Hwy 30. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). GRS80 Ellipsoidal Height was computed at project Pts. GSVS 144, GSVS 145, GSVS 146 by doing concurrent 4 hour static observations. The project control is relative to nearby Iowa RTN Base Stations.

This survey observed 3 NGS Control Monument with published NAVD88 heights to compare to local ground control:

NGS 2nd. order class 1 mark designated GSVS 144 has a published Elev. Of 843.91
Survey Elev. = 844.013

NGS 2nd. order class 1 mark designated GSVS 145 has a published Elev. Of 842.96
Survey Elev. = 843.103

NGS 2nd. order class 1 mark designated GSVS 146 has a published Elev. Of 884.50
Survey Elev. = 884.696

This survey observed 4 As-Built plan bench marks to compare to local ground control:

BM 1907 Project NHSX -30-6 (105)—3H-86 Elev. 850.953
Survey Elev. = 851.07

BM 1908 Project NHSX -30-6 (105)—3H-86 Elev. 850.969
Survey Elev. = 851.07

BM 1909 Project NHSX -30-6 (105)—3H-86 Elev. 837.209
Survey Elev. = 837.23

BM 1910 Project NHSX -30-6 (105)—3H-86 Elev. 861.737
Survey Elev. = 861.79

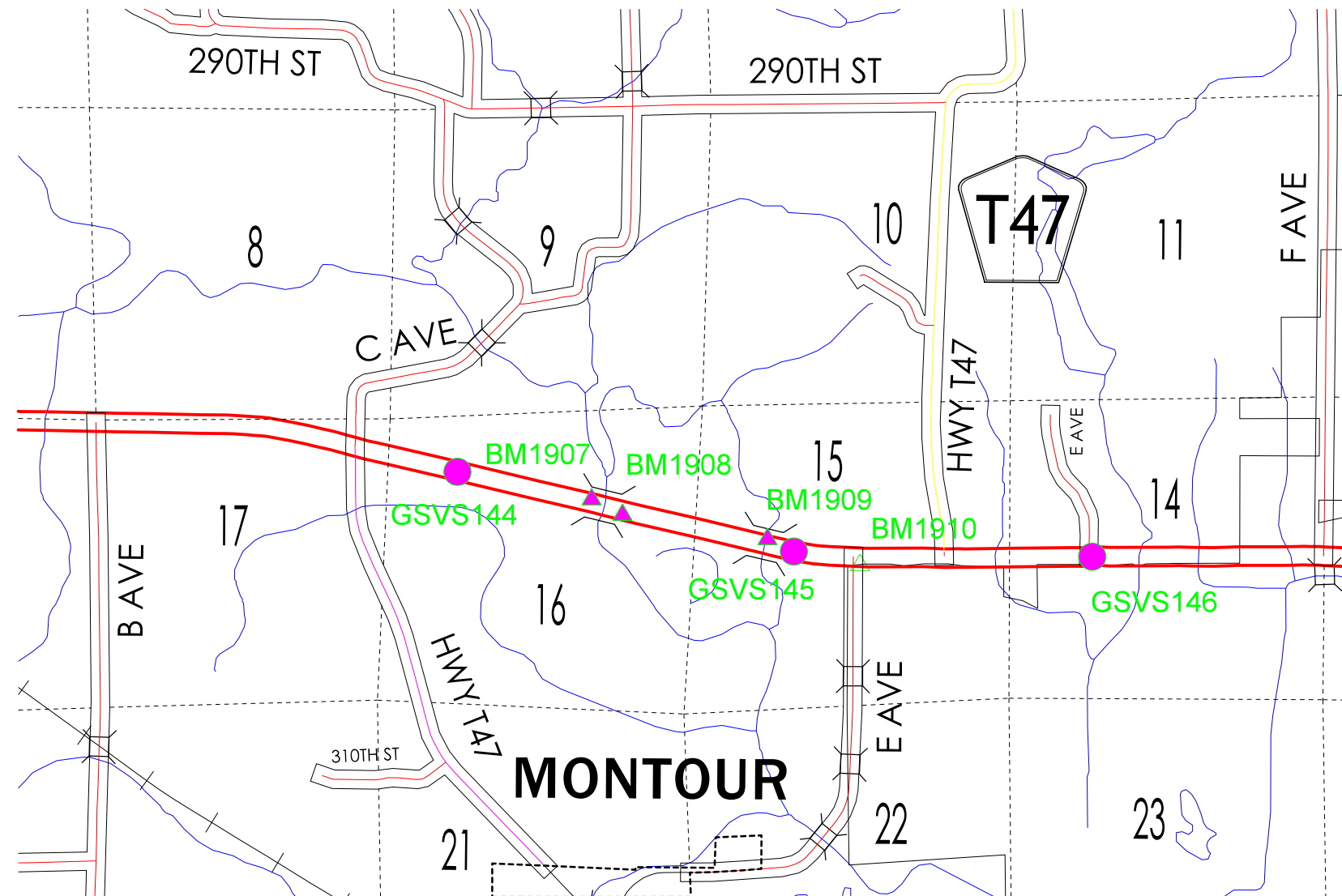
Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 9 (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 determined by conducting 3 concurrent 4 hour static observations at project Pts. GSVS 144, GSVS 145, GSVS.

Alignment Information

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 9

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

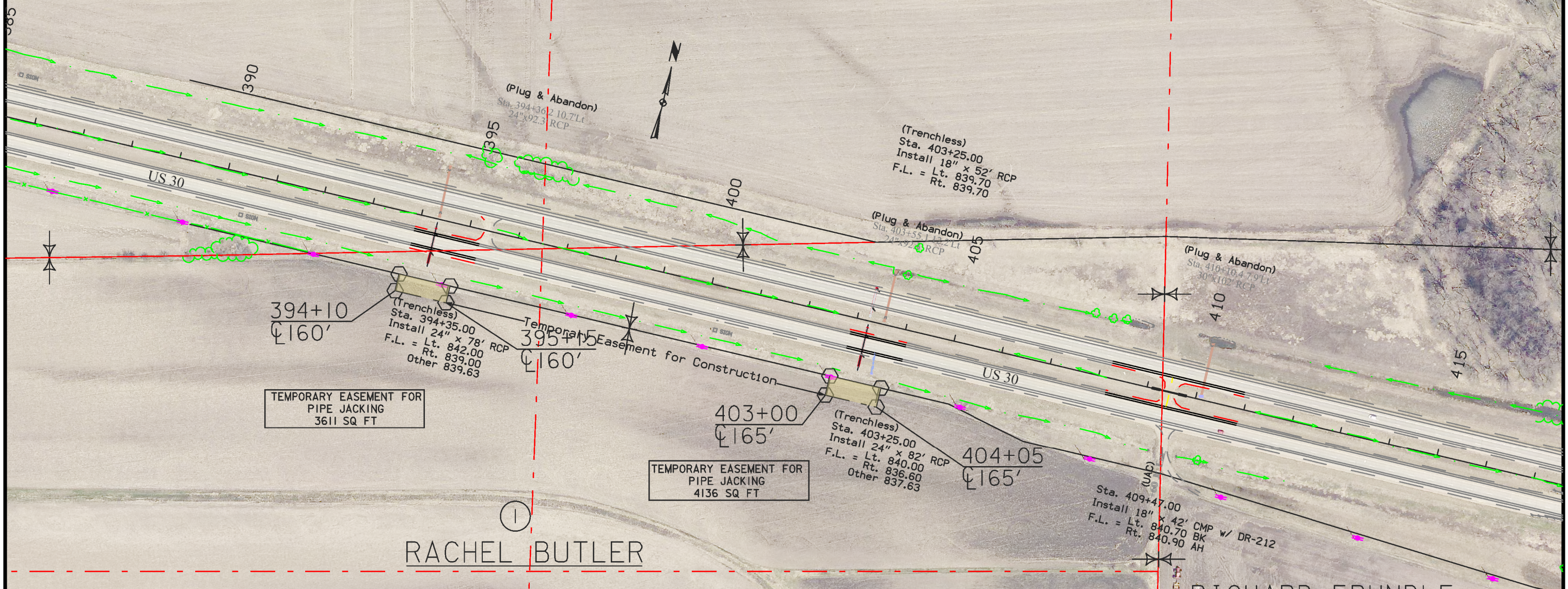
HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 9

Point Name	Northing	Easting	Elevation	Feature Definition
GSVS 144	7839074.164	19525355.740	844.01	CP Survey Disk in top of Conc. Mon. 20' from Delineator Post, 33' from X in Edge of EB Lane, 34' from X in Edge of WB Lane
GSVS 145	7837711.978	19531104.800	843.10	CP Survey Disk in top of Conc. Mon. 31' from X in Edge of EB Lane, 37' from X in Edge of WB Lane, 71' from Pin in 24in RCP
GSVS 146	7837623.811	19536204.340	884.70	CP Survey Disk in top of Conc. Mon. 26' from X in Edge WB Turn Lane, 28' from X in Edge of WB Lane, 38' from X in E Edge of Crossover
BM1907	7839074.164	19525355.740	851.07	BM BRASS PLUG NW CONC BR RAIL
BM1908	7838336.345	19528176.990	851.01	BM BRASS PLUG SE BR CONC RAIL
BM1909	7837924.510	19530656.510	837.23	BM BRASS PLUG IN TWIN RCB
BM1910	7837478.700	19532235.470	861.79	BM GPS PT REBAR W/PLASTIC CAP

INDIAN VILLAGE TWP.
T-83 N R-16 W
SEC. 16



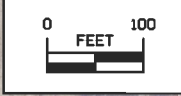
TEMPORARY EASEMENT FOR
PIPE JACKING
3611 SQ FT

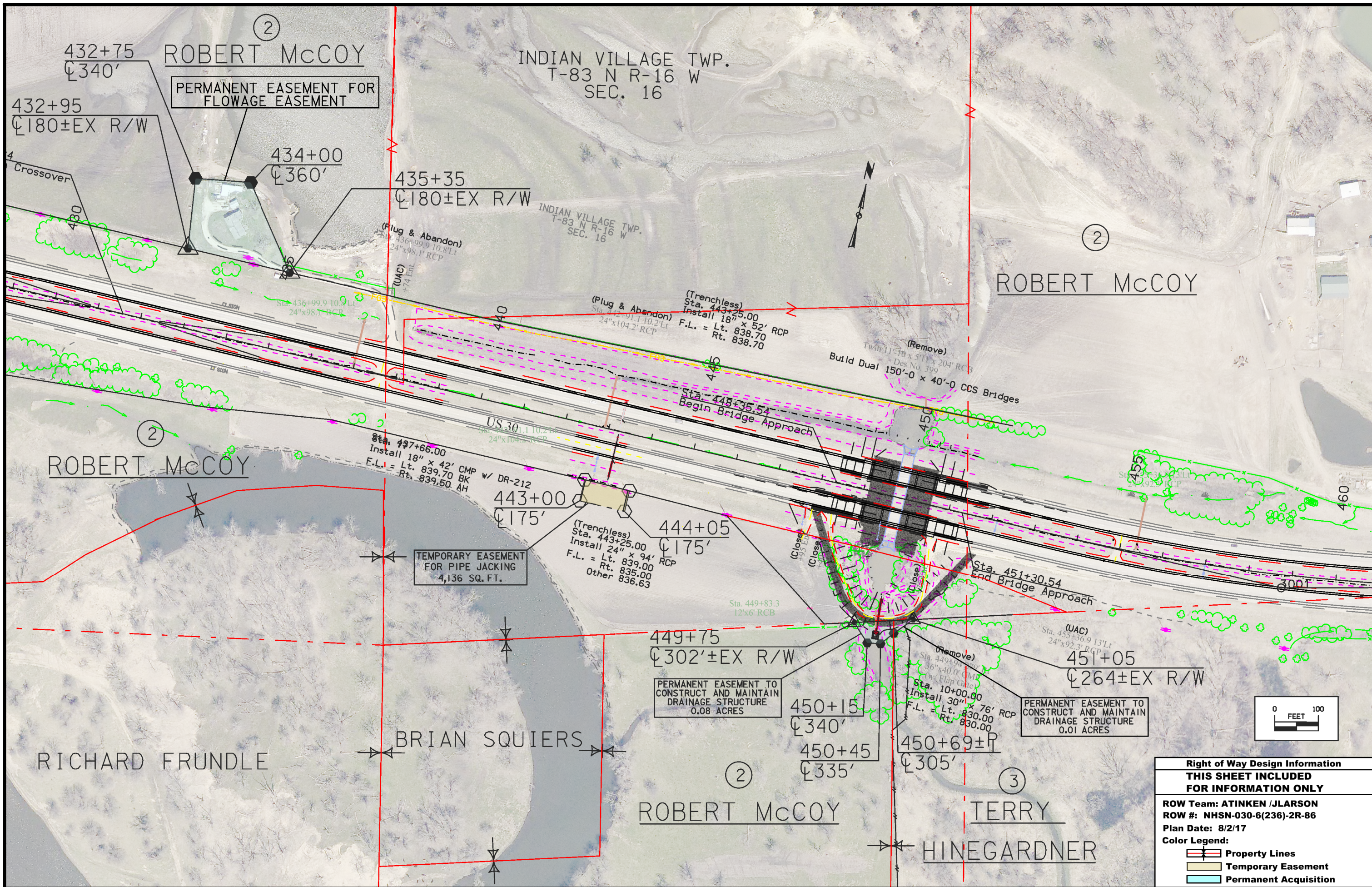
TEMPORARY EASEMENT FOR
PIPE JACKING
4136 SQ FT

RACHEL BUTLER

RICHARD FRUNDLE

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: NHSN-030-6(237)--2R-86	
Plan Date: 8/2/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition














Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: NHSN-030-6(236)-2R-86	
Plan Date: 8/2/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

**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

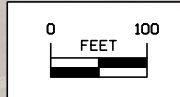
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

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

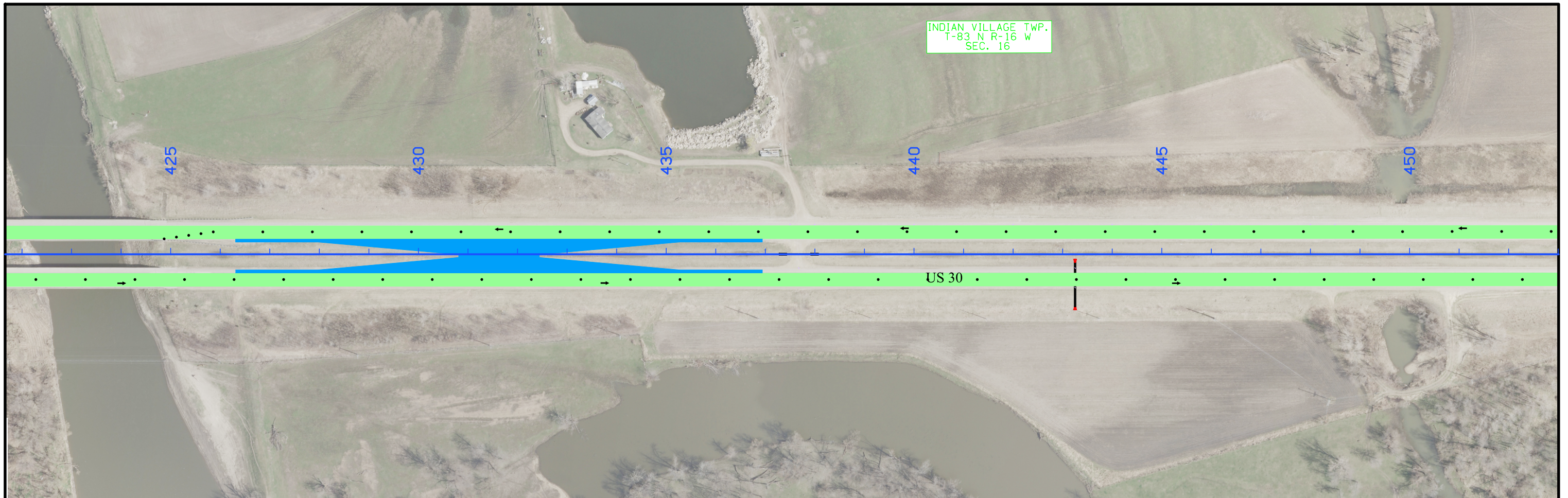
(COVERS SHEET SERIES J)



INDIAN VILLAGE TWP.
T-83 N R-16 W
SEC. 16

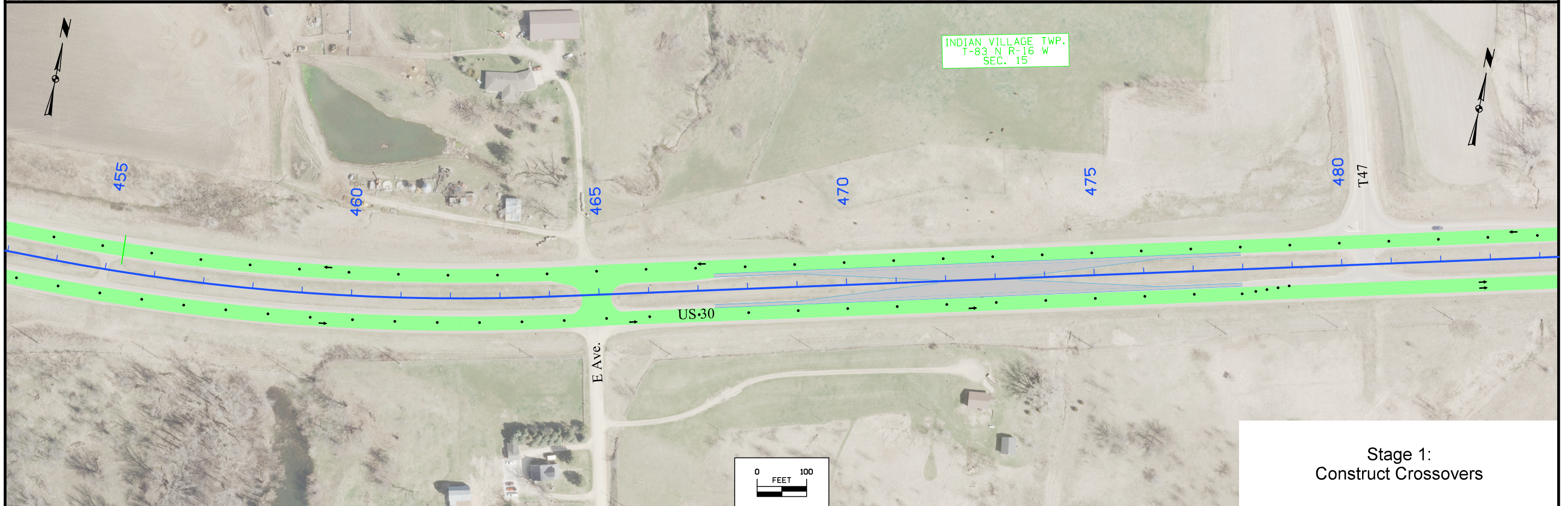


Stage 1:
Construct Crossovers



INDIAN VILLAGE TWP.
T-83 N R-16 W
SEC. 16

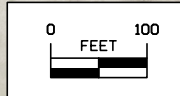
US 30



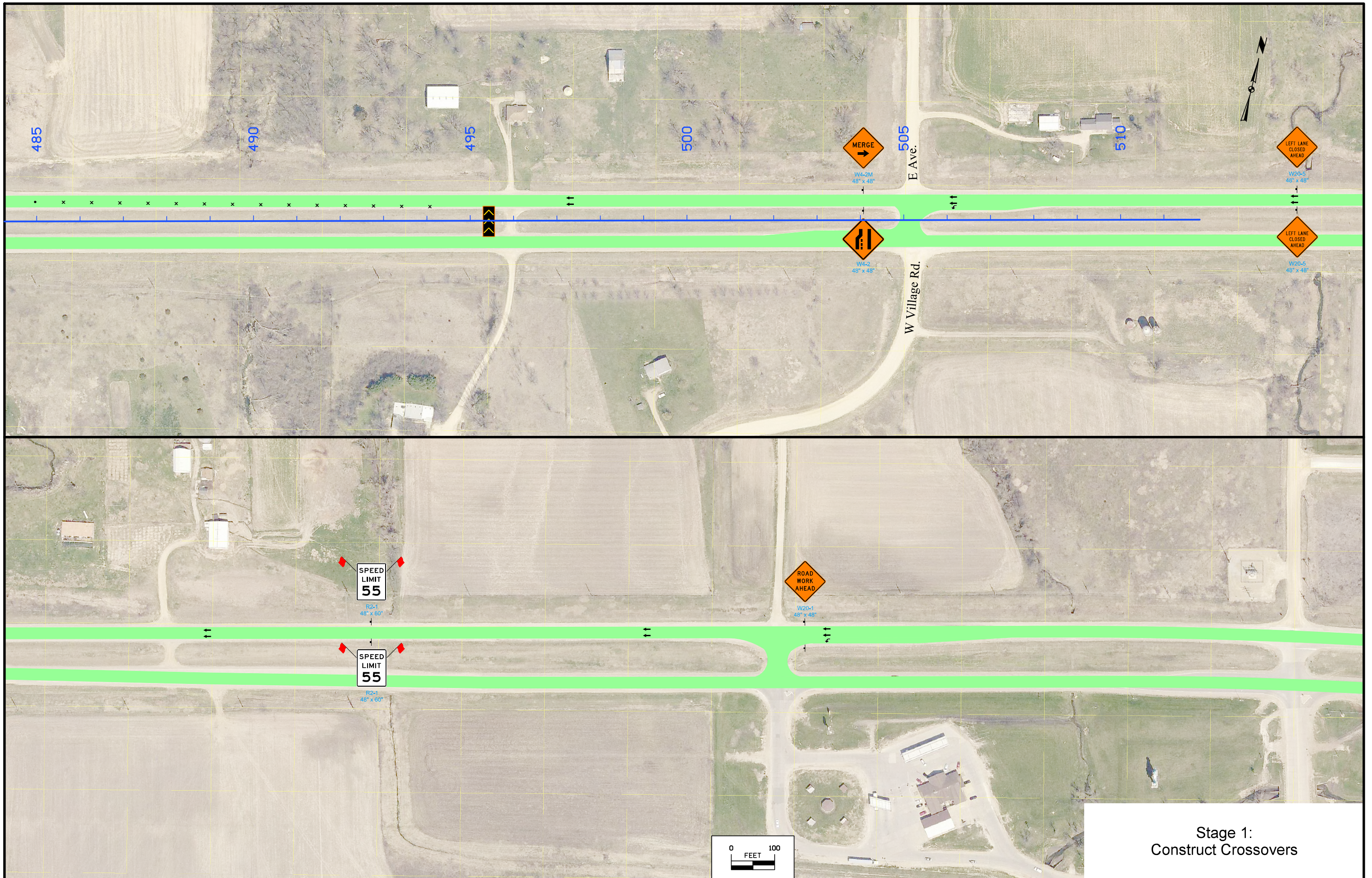
INDIAN VILLAGE TWP.
T-83 N R-16 W
SEC. 15

US-30

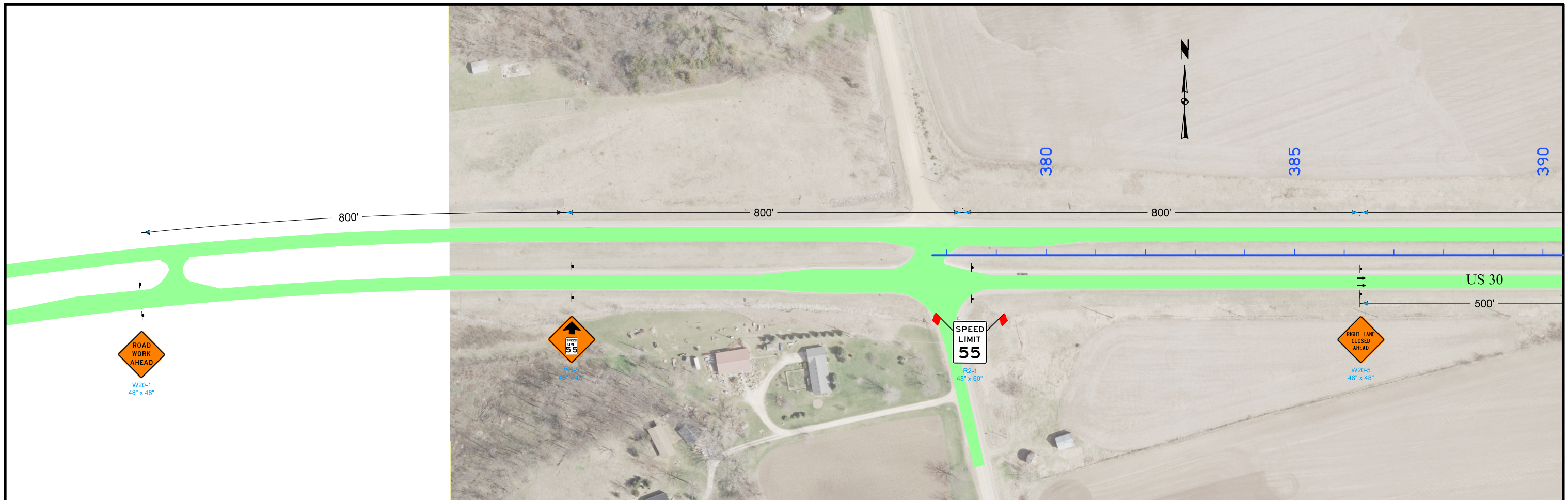
E Ave.



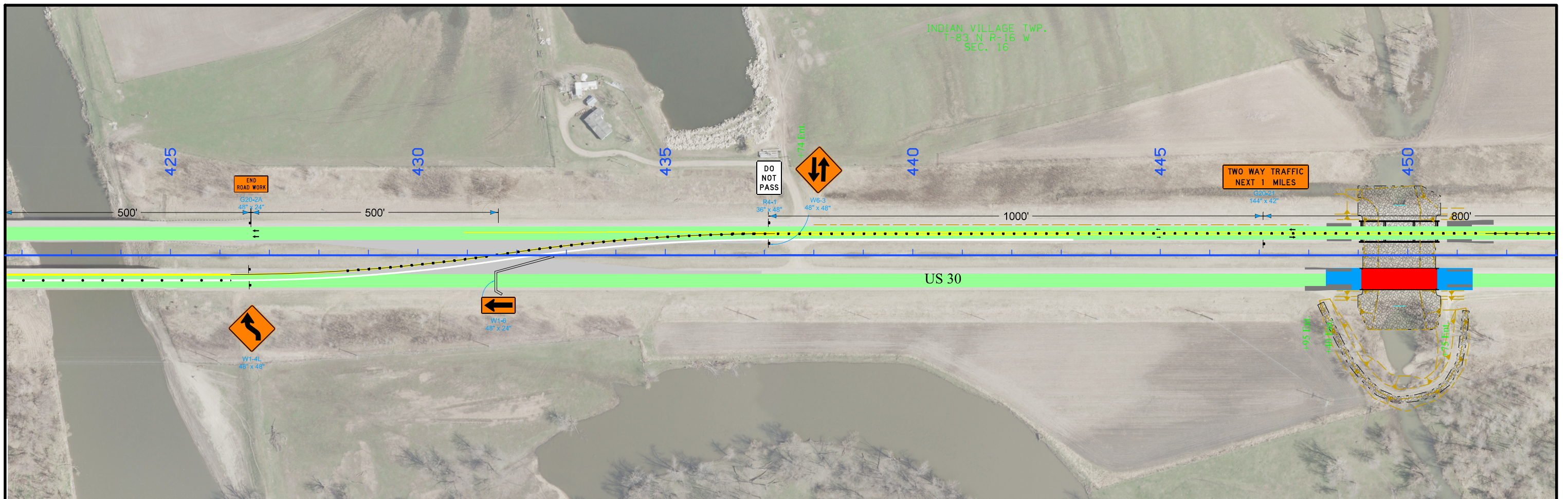
Stage 1:
Construct Crossovers



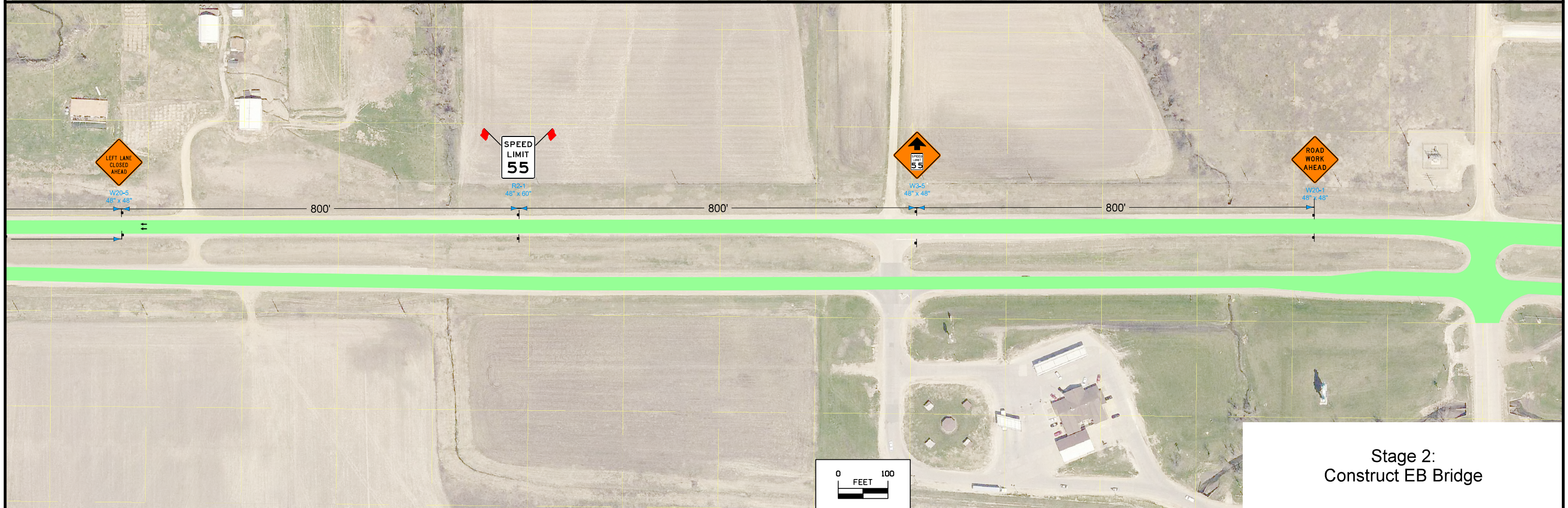
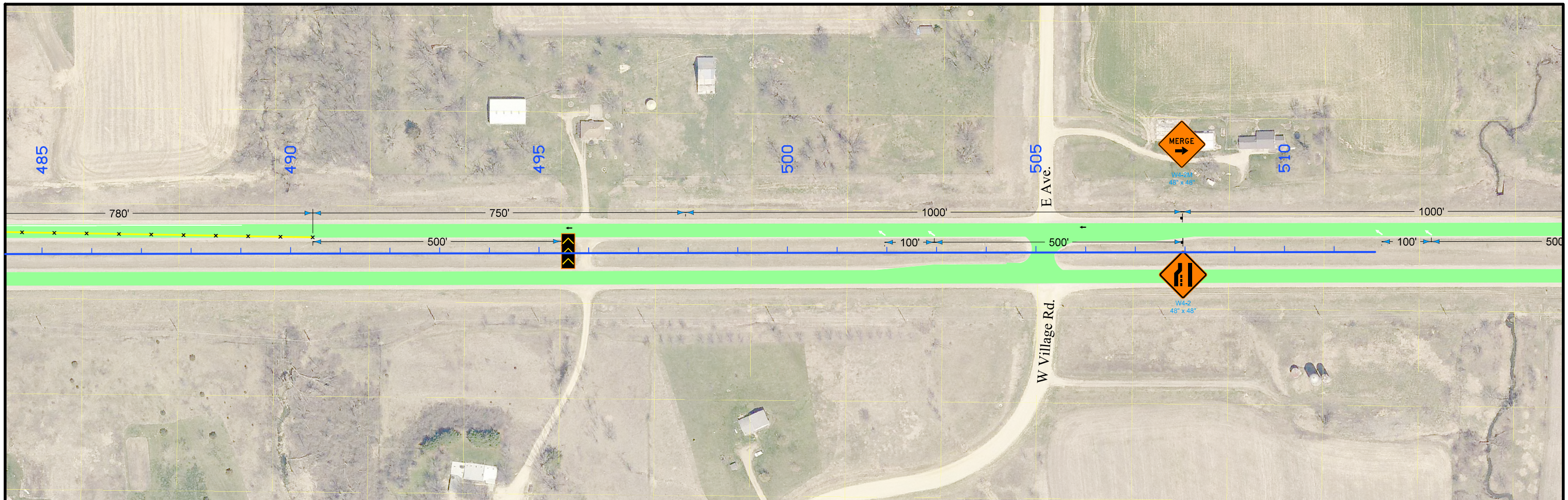
Stage 1:
Construct Crossovers



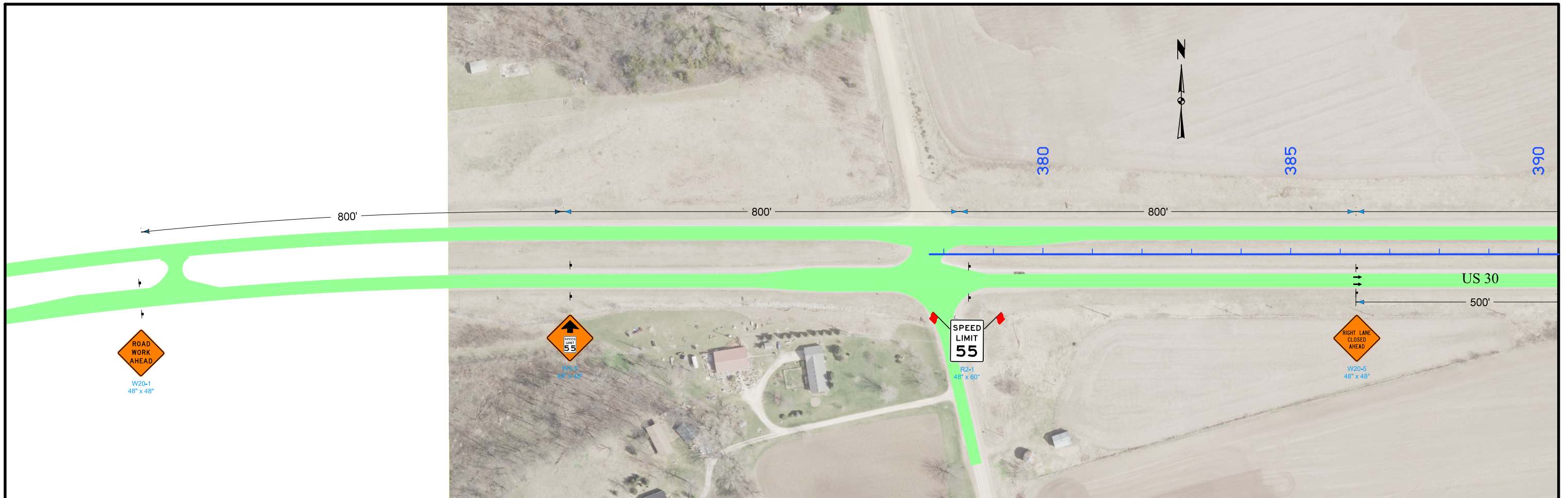
Stage 2:
Construct EB Bridge



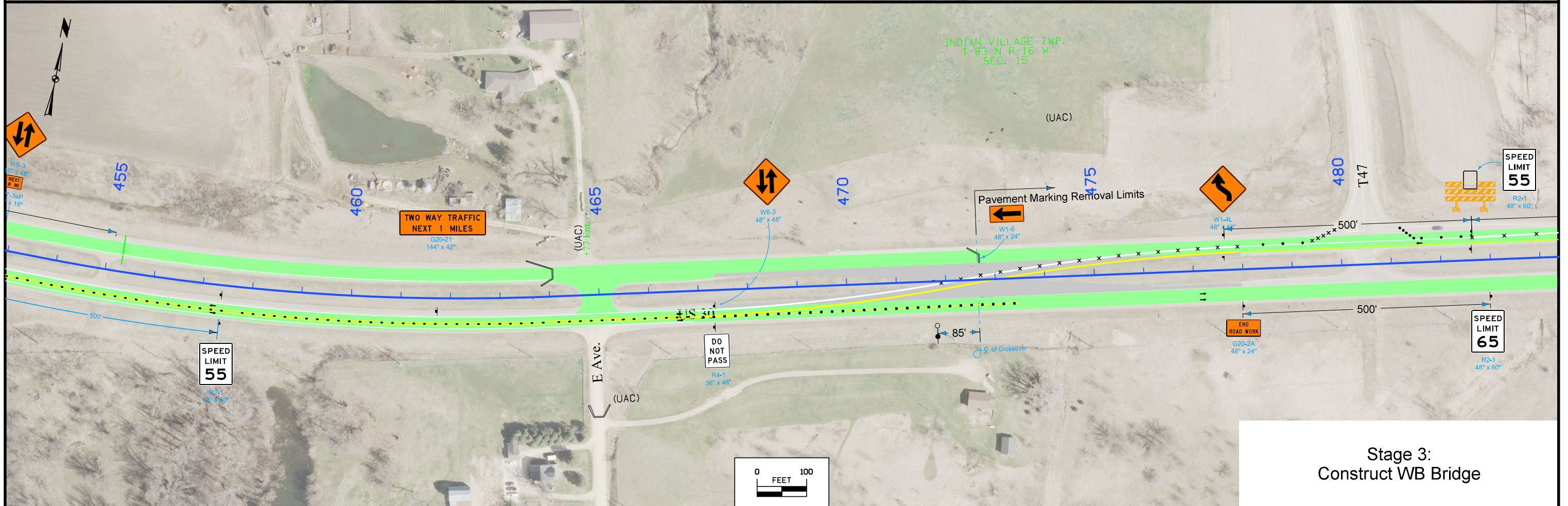
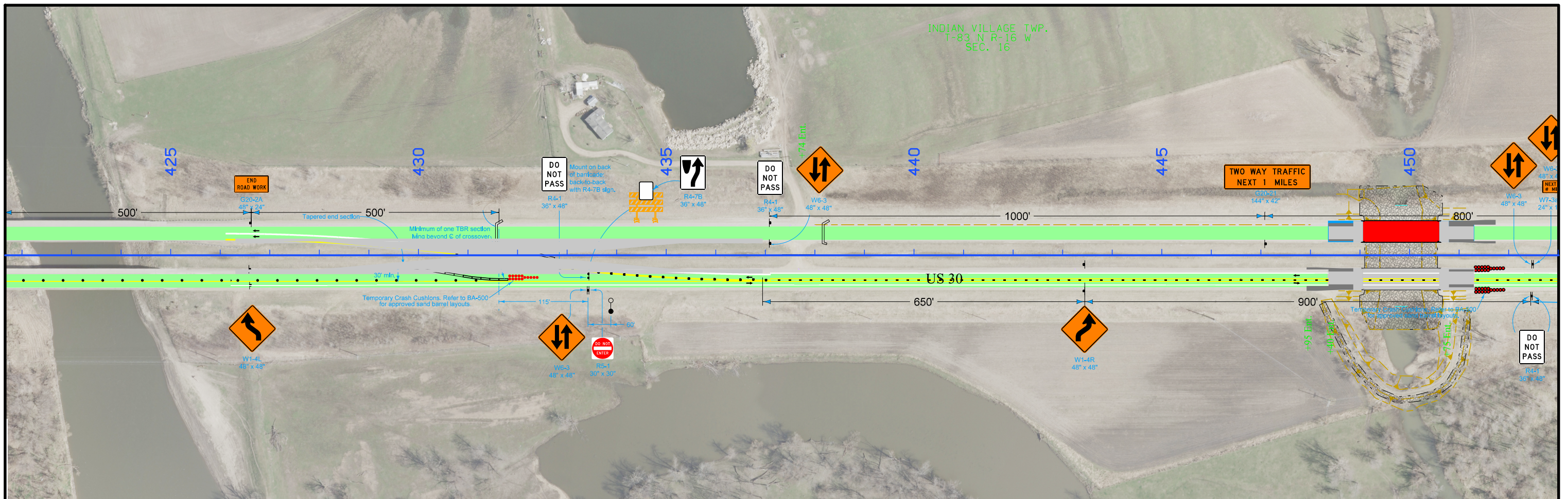
Stage 2:
Construct EB Bridge



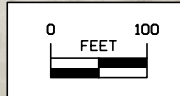
Stage 2:
Construct EB Bridge

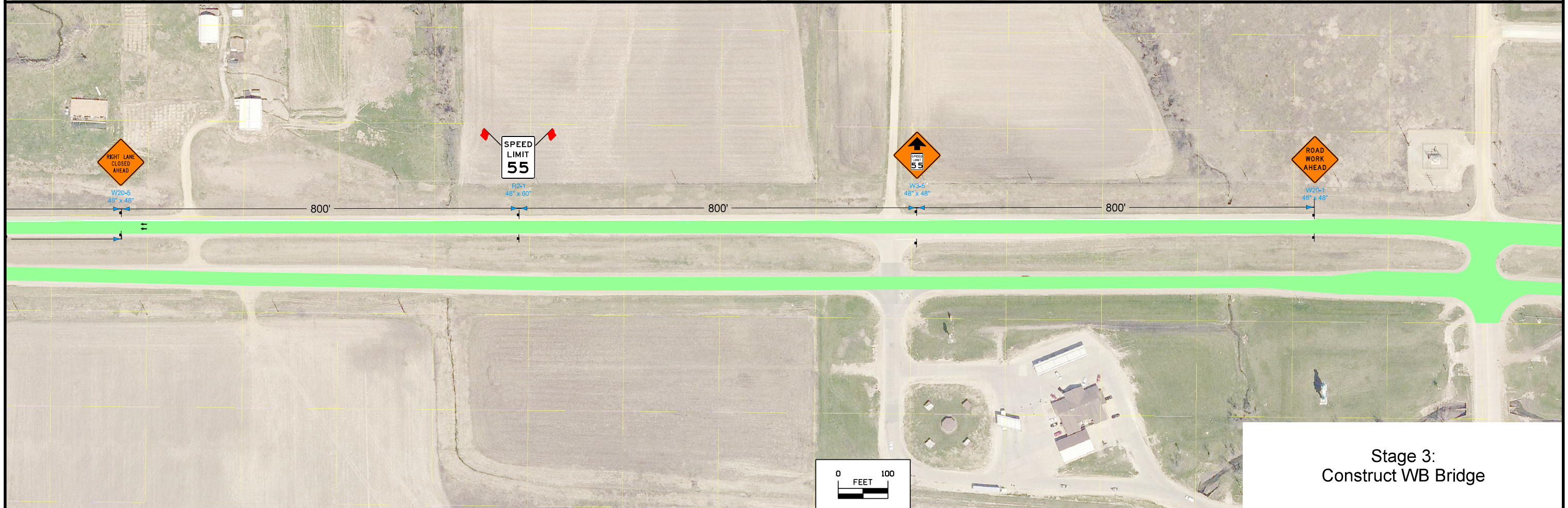


Stage 3:
Construct WB Bridge



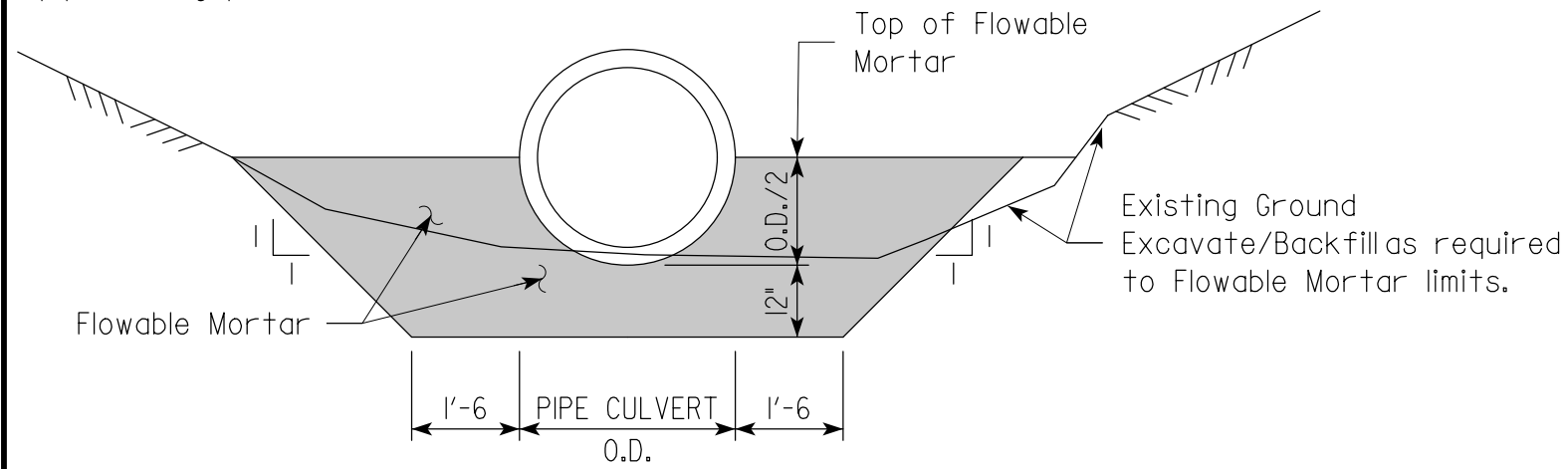
Stage 3:
Construct WB Bridge





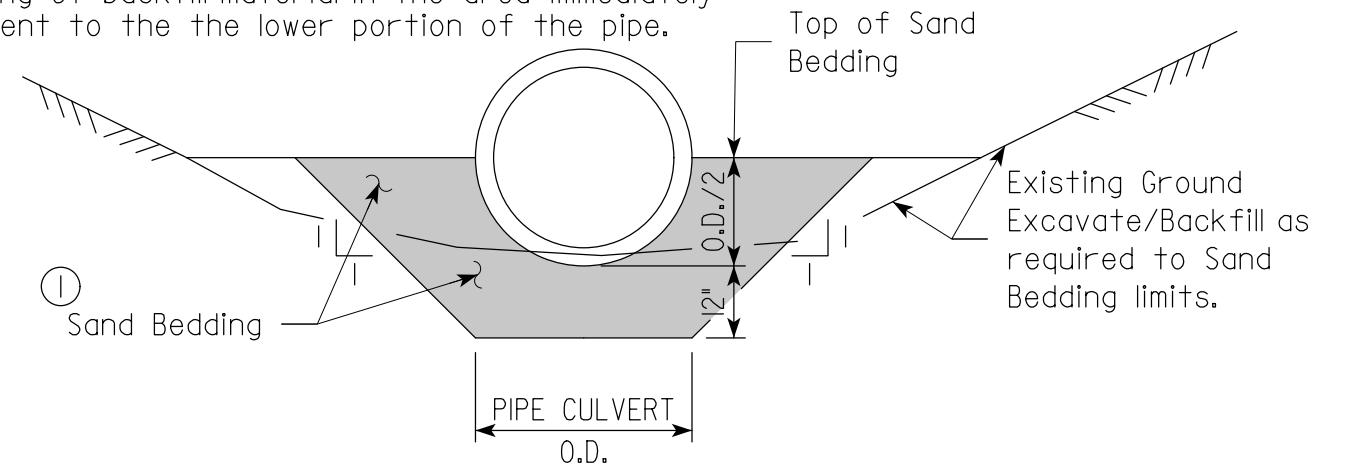
Stage 3:
Construct WB Bridge

Note:
Contractor shall provide bracing or restraint of the pipe culvert as required to prevent buoyant forces from displacing pipe during placement of the Flowable Mortar.



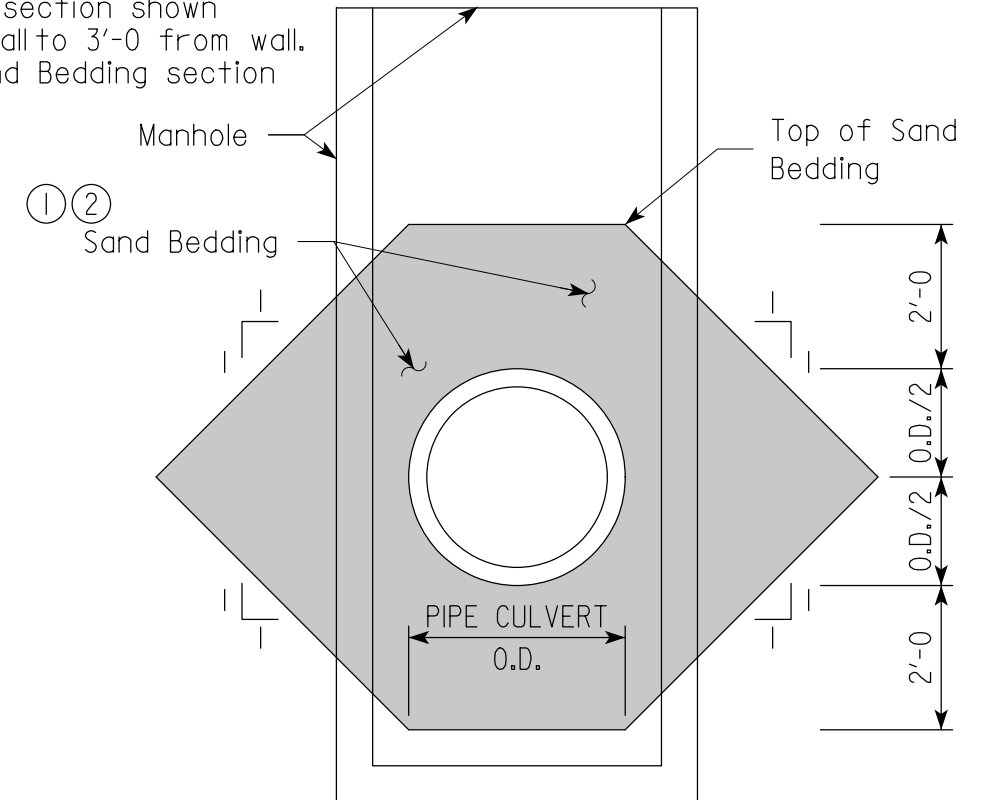
TYPICAL SECTION
FLOWABLE MORTAR BEDDING
(MODIFICATION OF DR-101, CI. B BEDDING)

① Take extra care to ensure complete and satisfactory tamping of backfill material in the area immediately adjacent to the the lower portion of the pipe.

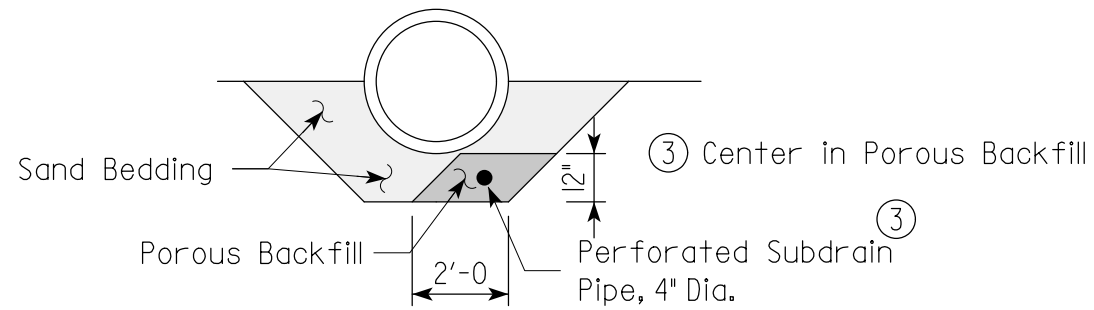


TYPICAL SECTION
SAND BEDDING
(MODIFICATION OF DR-101, CI. B BEDDING)

② Construct Sand Bedding section shown from face of manhole wall to 3'-0" from wall. Transition to typical Sand Bedding section using 1:1 taper.

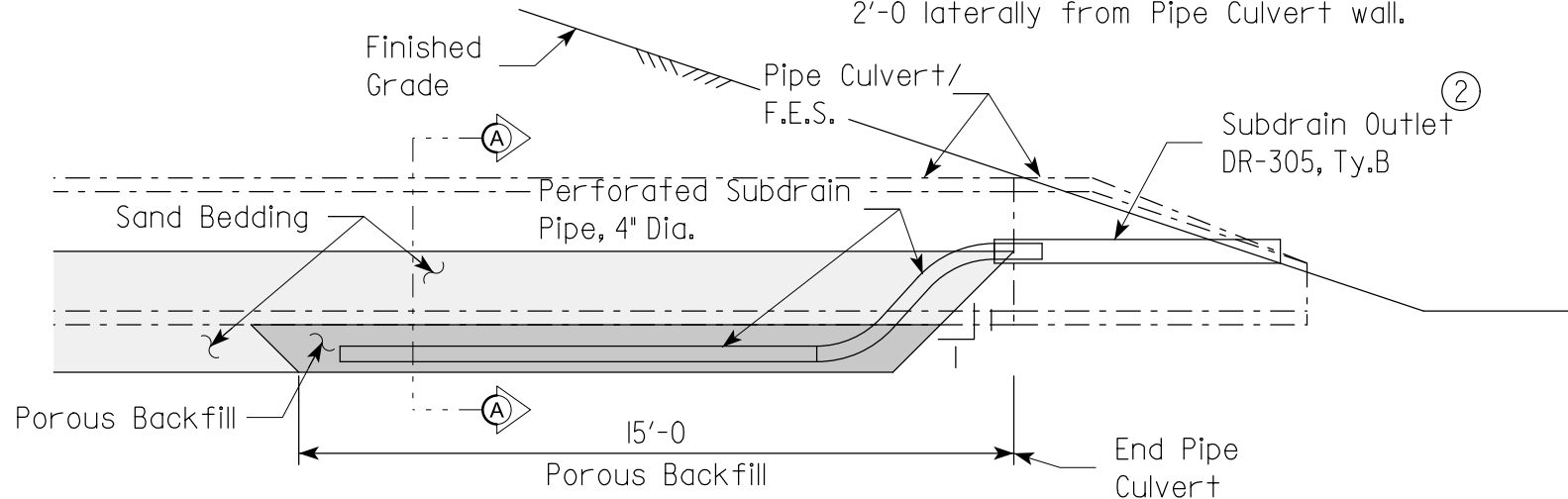


SECTION
SAND BEDDING ADAJACENT TO MANHOLE



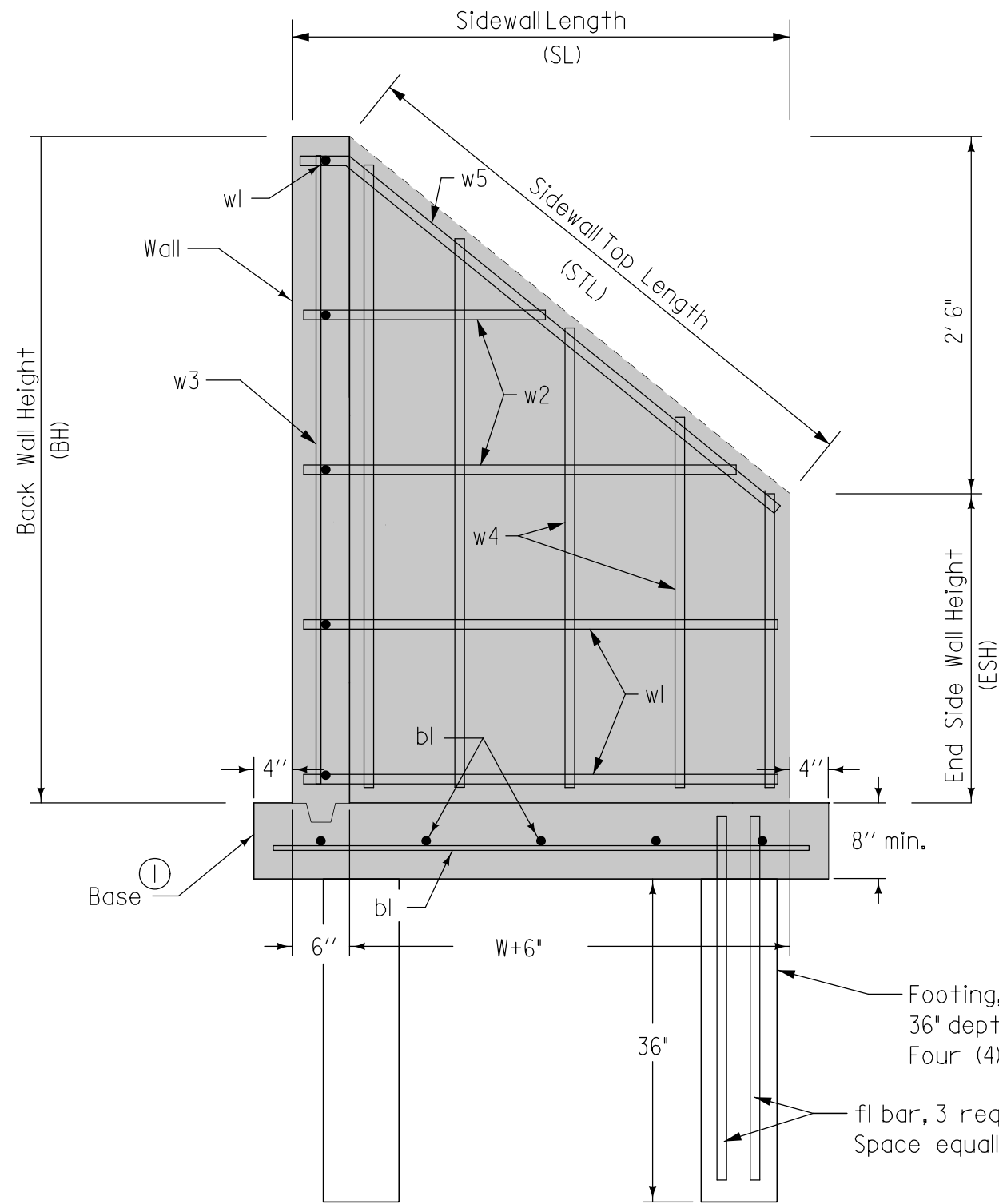
SEC. A-A
SECTION POROUS BACKFILL

② Place outlet 12" above Pipe Culvert flowline, 2'-0" laterally from Pipe Culvert wall.

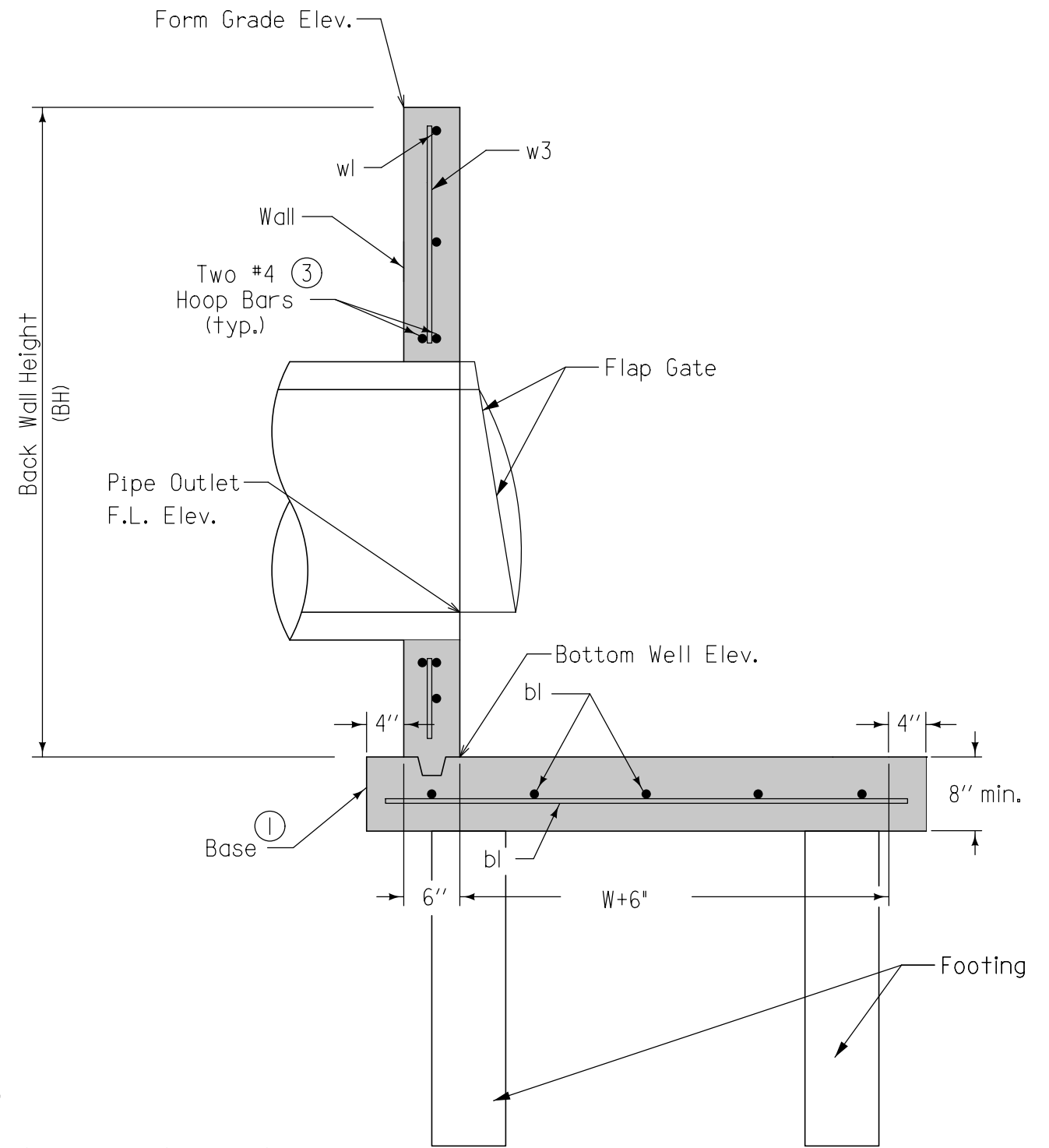


LONGITUDINAL SECTION
SUBDRAIN OUTLET
(MODIFICATION OF DR-305, TYPE B)

DR-101, DR-305 MODIFIED
CULVERT BEDDING, SUBDRAIN OUTLET
1/1



SEC. A-A
TYPICAL SECTION

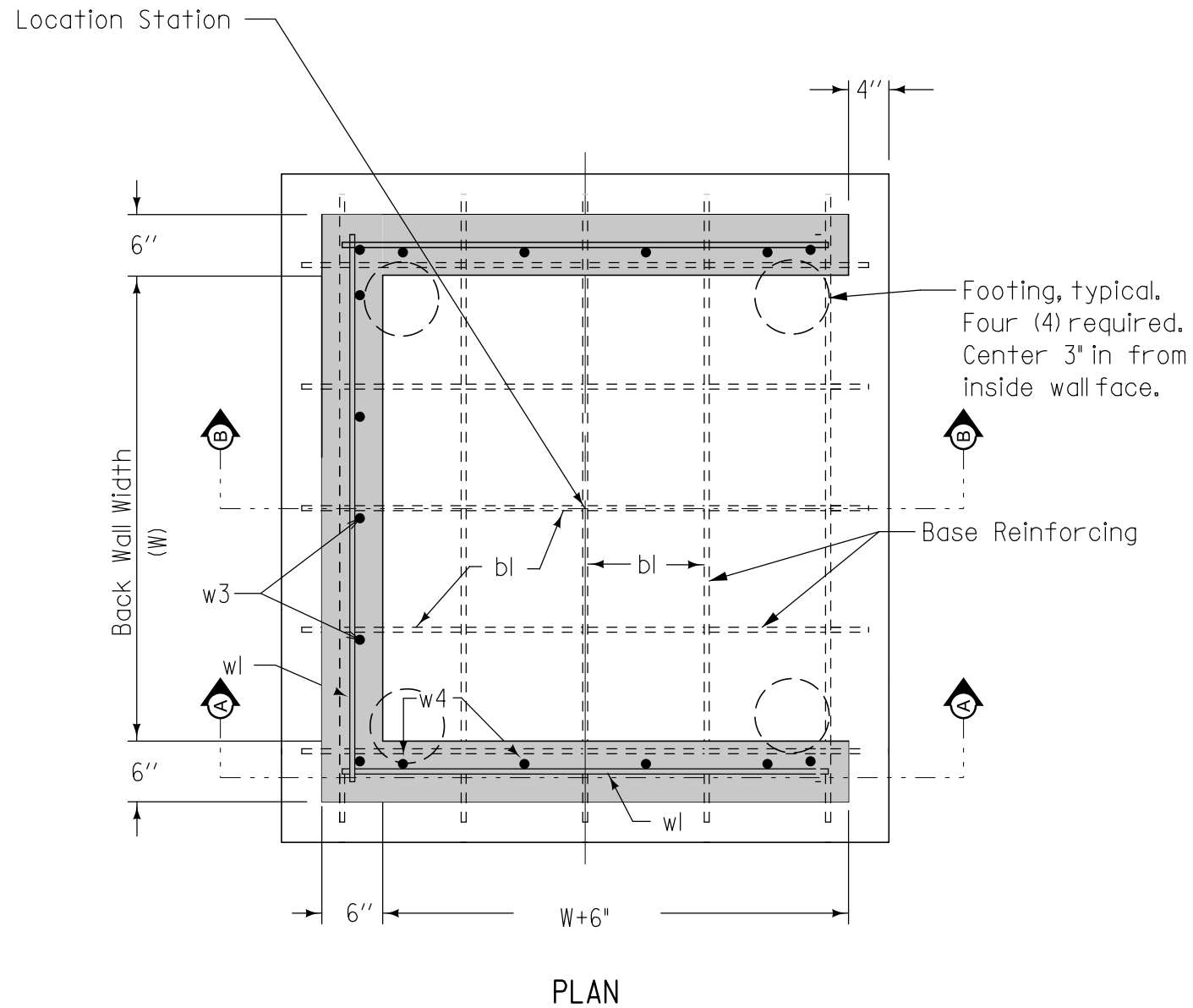


SEC B-B
TYPICAL SECTION

Refer to M sheets for further design details.

- ① Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
- ② For precast base, provide 6" dia. blockout in base at footing locations. Extend footing bars into base and fill blockout with concrete.
- ③ Provide two #4 hoop bars at all pipe openings.

**SW-402 MODIFIED
STORM SEWER MANHOLE
1/2**



REINFORCING BAR LIST					
Mark	Size	Location	Shape	Length	Spacing
bl	5	Base	—	W plus 14"	12"
w1	5	Walls Hor.	—	W plus 8"	12"
w2	5	Walls Hor.	—	Var. 6" to SL minus 4"	12"
w3	5	Walls Vert.	—	BH minus 4"	12"
w4	5	Walls Vert.	—	Var. ESH to BH minus 4"	12"
w5	5	Wall Top	—	STL plus 2"	NA
fl	4	Footing	—	40"	NA

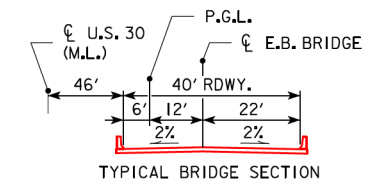
**SW-402 MODIFIED
STORM SEWER MANHOLE
2/2**

860	CL W. ABUT.	CL PIER 1	DESIGN H.W.	CL PIER 2	CL E. ABUT.	860
850	CR EL. 844.13	CR EL. 844.23	EL. 842.7	CR EL. 844.36	CR EL. 844.47	850
840		LOW SLAB EL. 841.7	LOW SLAB EL. 841.9	LOW WATER EL. 831.4		840
830	BERM EL. 840.05 BTM. FTG. EL. 838.05		PILE BENT TYP.		BERM EL. 840.39 BTM. FTG. EL. 838.39	830
820			EXISTING RCB			820
810	TOP OF BRIDGE DECK CROWN (CR) 0.03 FT. BELOW PROFILE GRADE					810

BENCH MARK:
 BM NO. 1908, BRASS PLUG, S.E. COR. E.B. BRIDGE
 X=19,528,177.0 Y=7,838,336.3
 IARCS ZONE 9, SURVEY FEET
 ELEV. = 851.01 NAVD88/IARTN (GEOID12A)

+0.2250%
 PVI STA 447+00.00 PVI STA 453+00.00
 PVI EL. 843.45 PVI EL. 844.80

U.A.C. GRADE ON E.B. U.S. 30



HYDRAULIC DATA

DRAINAGE AREA = 1,830 SQ. MI.
 STREAM SLOPE = 2.10 FT./MI.
 AVERAGE LOW WATER STAGE
 MAIN CHANNEL EL. 825.7
 EAST OVERFLOW EL. 831.4

Q₅₀ = 6,220 CFS (29,400 CFS)
 STAGE = EL. 842.7
 REGULATORY LOW SLAB = EL. 841.9
 BACKWATER = (-) 0.76 FT./ (+) 2.15 FT.
 AVG. BRIDGE VELOCITY = 4.2 FPS

Q₁₀₀ = 7,200 CFS (33,100 CFS)
 STAGE = EL. 843.0
 OPERATIONAL LOW SLAB = EL. 841.7
 BACKWATER = (-) 0.70 FT./ (+) 2.26 FT.
 AVG. BRIDGE VELOCITY = 4.8 FPS

Q₂₀₀ = 8,580 CFS (39,200 CFS)
 STAGE = EL. 843.3
 BACKWATER = (-) 0.60 FT./ (+) 2.35 FT.
 AVG. BRIDGE VELOCITY = 5.7 FPS
 CALCULATED DESIGN SCOUR = EL. 814.0

Q₅₀₀ = 9,030 CFS (42,200 CFS)
 STAGE = EL. 843.5
 AVG. BRIDGE VELOCITY = 6.0 FPS
 CALCULATED CHECK SCOUR = EL. 812.0

ROADWAY OVERTOP = 30,400 CFS
 ROADWAY OVERTOP EL. 843.3
 STA. 442+90

DISCHARGE IN PARANS. REPRESENTS
 TOTAL STREAMFLOW.
 BACKWATER REFERENCES CHANGE FROM
 EXISTING/PRE-DEVELOPMENT CONDITION
 NEAR FIRST HIGH-DAMAGE POTENTIAL
 DEVELOPMENT UPSTREAM OF U.S. 30
 (RESIDENCE N.E. OF MAIN CHANNEL BRIDGES).

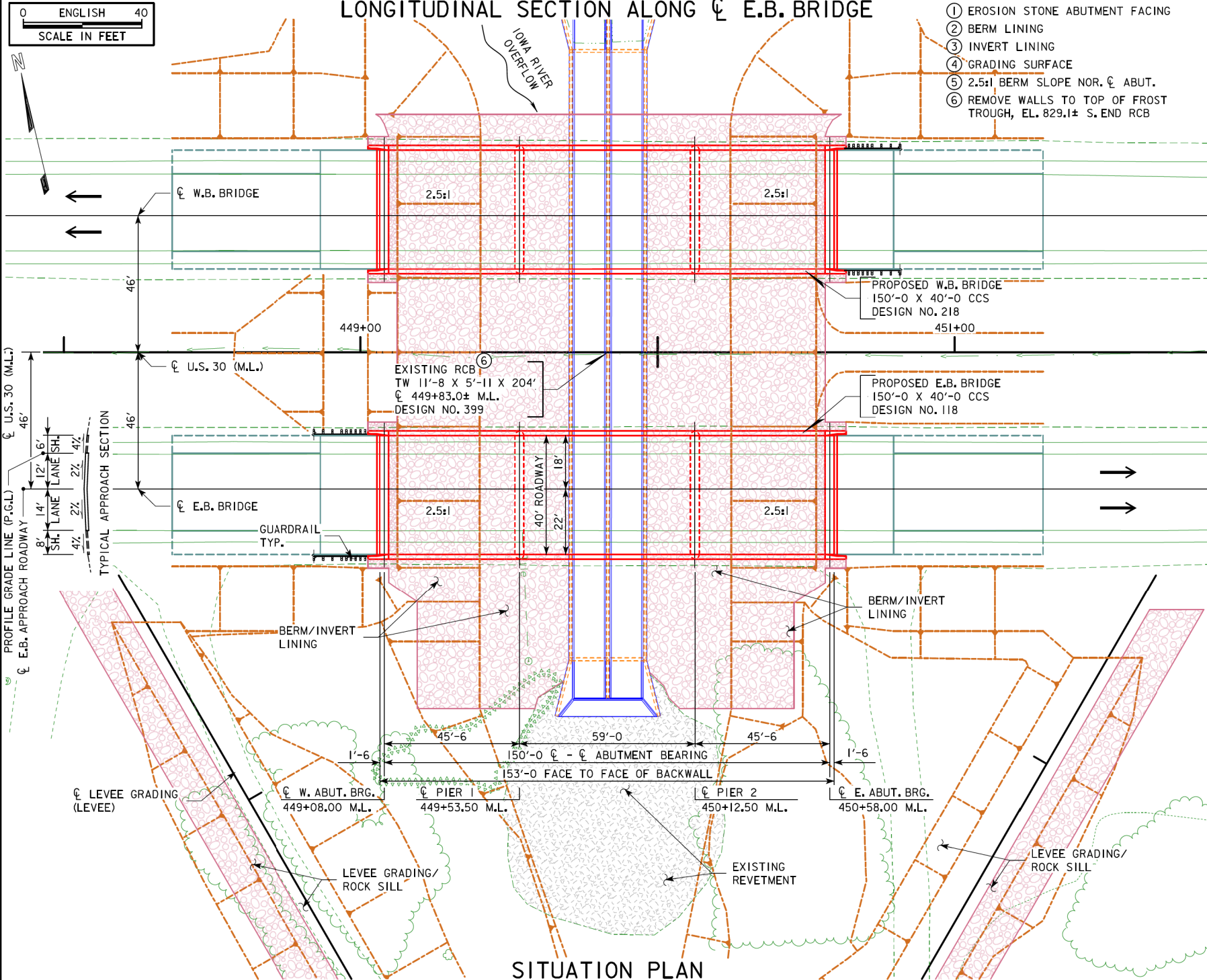
TRAFFIC ESTIMATE

2014 AADT 9,300 V.P.D.
 20-- AADT -- V.P.D.
 20-- DHV -- V.P.H.
 TRUCKS 11%
 TOTAL DESIGN ESALS --

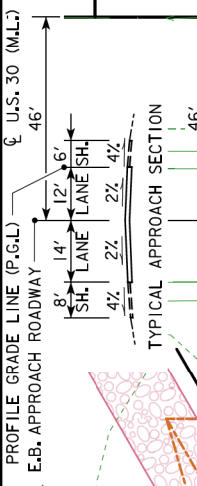
UTILITIES LEGEND

F0 - F0D BURIED FIBER OPTIC CENTURY LINK
 F02 - F02D BURIED FIBER OPTIC WINDSTREAM
 F03 - F03D BURIED FIBER OPTIC MEDIACOM

LONGITUDINAL SECTION ALONG CL E.B. BRIDGE



- ① EROSION STONE ABUTMENT FACING
- ② BERM LINING
- ③ INVERT LINING
- ④ GRADING SURFACE
- ⑤ 2.5:1 BERM SLOPE NOR. CL ABUT.
- ⑥ REMOVE WALLS TO TOP OF FROST TROUGH, EL. 829.1± S. END RCB



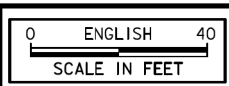
CL LEVEE GRADING (LEVEE)
 CL W. ABUT. BRG. 449+08.00 M.L.
 CL PIER 1 449+53.50 M.L.
 CL PIER 2 450+12.50 M.L.
 CL E. ABUT. BRG. 450+58.00 M.L.

SITUATION PLAN

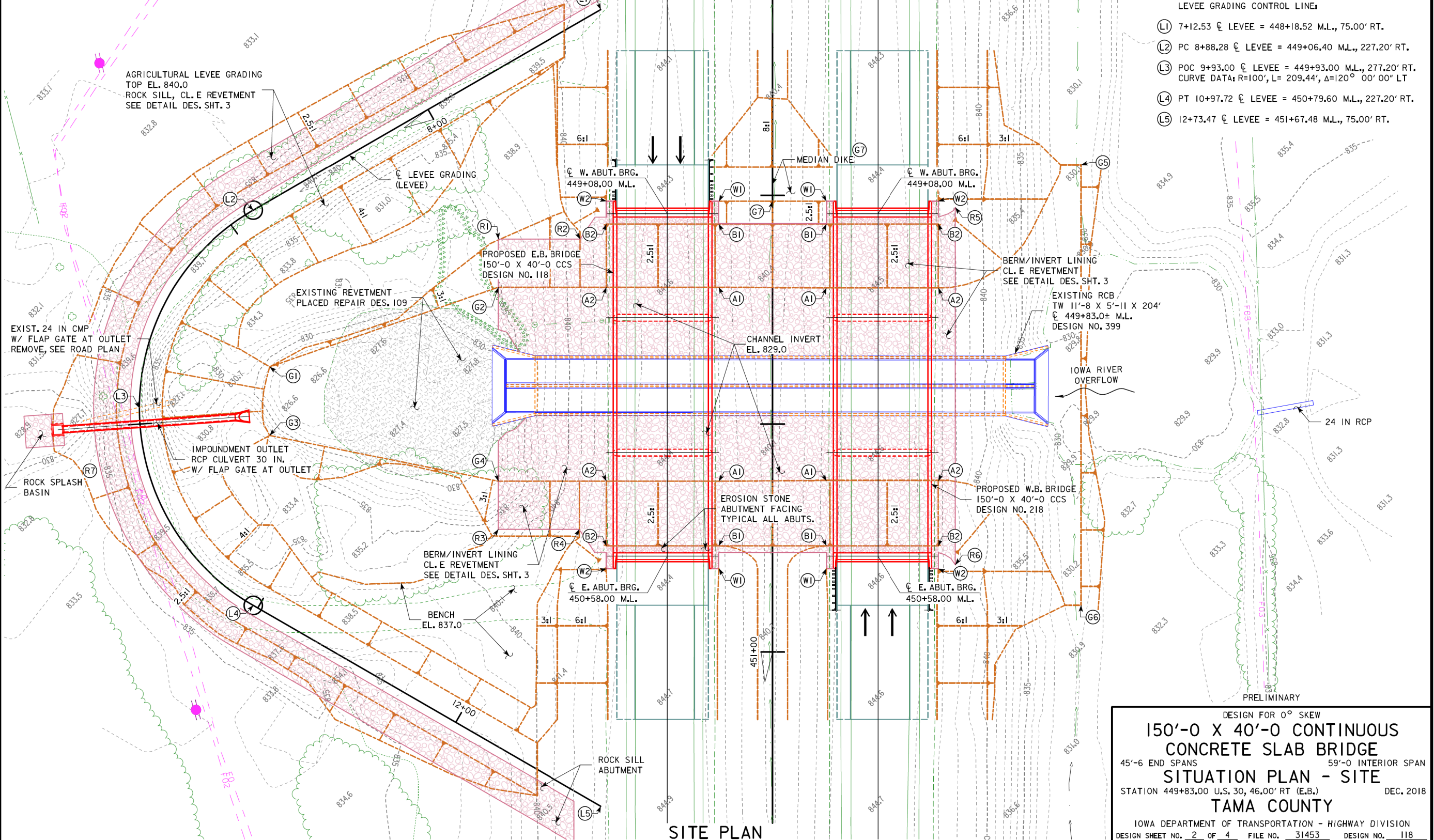
LOCATION

U.S. 30 E.B. OVER IOWA RIVER
 (EAST OVERFLOW)
 T 83 N R 16 W
 SECTION 15
 INDIAN VILLAGE TOWNSHIP
 TAMA COUNTY
 FHWA NO. 700945
 MAINT. NO. 8696.3R030
 STA. 449+83.00 CL M.L., 46.00' RT.
 LATITUDE 42.000324°
 LONGITUDE -92.704012°

PRELIMINARY
 DESIGN FOR 0° SKEW
**150'-0 X 40'-0 CONTINUOUS
 CONCRETE SLAB BRIDGE**
 45'-6 END SPANS 59'-0 INTERIOR SPAN
SITUATION PLAN
 STATION 449+83.00 U.S. 30, 46.00' RT (E.B.) DEC. 2018
TAMA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 4 FILE NO. 31453 DESIGN NO. 118



0 ENGLISH 40
SCALE IN FEET



NOTES:
REFER TO DES. SHT. 3 FOR BERM SLOPE LOCATION
TABLE, GRADING CONTROL AND REVETMENT LAYOUT
CONTROL POINTS.

- LEVEE GRADING CONTROL LINE:
- (L1) 7+12.53 CL LEVEE = 448+18.52 M.L., 75.00' RT.
 - (L2) PC 8+88.28 CL LEVEE = 449+06.40 M.L., 227.20' RT.
 - (L3) POC 9+93.00 CL LEVEE = 449+93.00 M.L., 277.20' RT.
CURVE DATA: R=100', L= 209.44', Δ=120° 00' 00" LT
 - (L4) PT 10+97.72 CL LEVEE = 450+79.60 M.L., 227.20' RT.
 - (L5) 12+73.47 CL LEVEE = 451+67.48 M.L., 75.00' RT.

PRELIMINARY

DESIGN FOR 0° SKEW

**150'-0 X 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE**

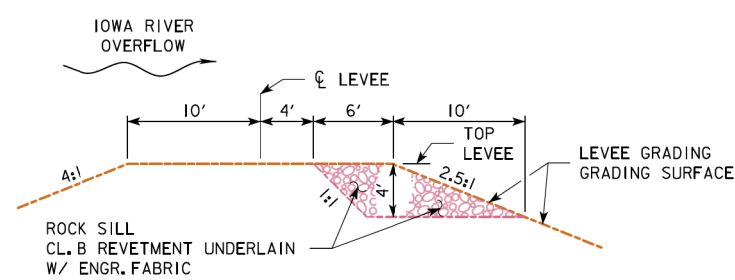
45'-6 END SPANS 59'-0 INTERIOR SPAN

SITUATION PLAN - SITE

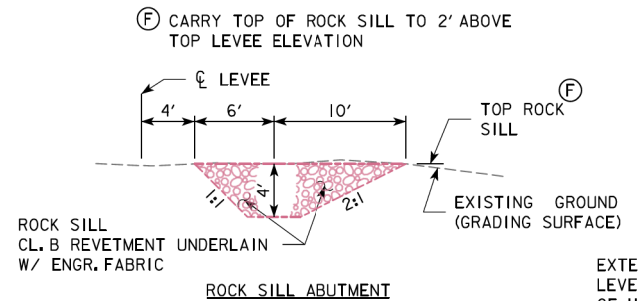
STATION 449+83.00 U.S. 30, 46.00' RT (E.B.) DEC. 2018

TAMA COUNTY

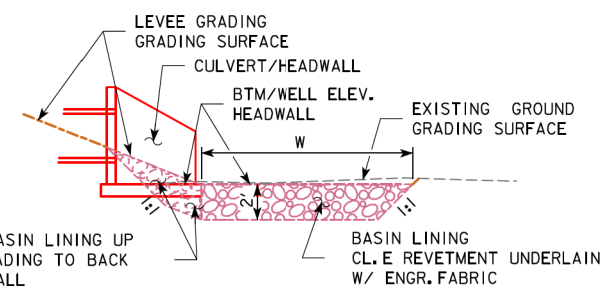
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 4 FILE NO. 31453 DESIGN NO. 118



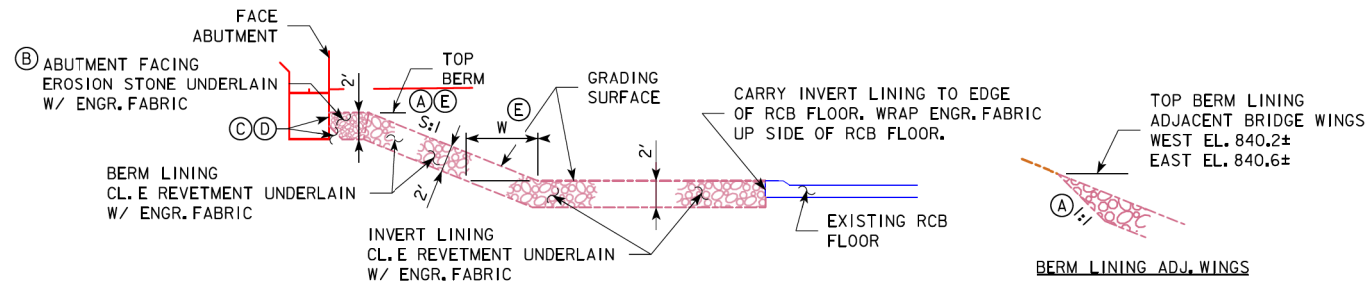
SECTION THROUGH ROCK SILL



ROCK SILL ABUTMENT



SECTION THROUGH ROCK SPASH BASIN (TYPE 4 MODIFIED)



SECTION THROUGH BERM AND INVERT LINING

- (A) Slope nor. ϕ abut. / grading control line (pt. A1-A2).
- (B) Extend facing out to limits of wing armoring.
- (C) 1' x 1' soil wedge at face abutment.
- (D) Carry engr. fabric up soil wedge and face abutment.
- (E) Berm/dike slope $S:1$ $S=2.5:1$ $W=5.4'$
 $S=3:1$ $W=6.3'$
 $S=3.5:1$ $W=7.2'$

ESTIMATED CULVERT ARMORING QUANTITIES

(CULVERT ARMORING QUANTITIES INCLUDED WITH ROAD PLANS)

REVTMENT TYPE - LOCATION	REVTMENT CL. E (TON)	REVTMENT CL. B (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
IMPOUNDMENT OUTLET 30" RCP - INLET	-	-	-	-	-
SPLASH BASIN - OUTLET	25.3	-	-	23.7	15.8
TOTALS	25.3	-	-	23.7	15.8

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS. REVTMENT AND EROSION STONE ESTIMATED AT 1.6 TON/CY

ESTIMATED BERM/LEVEE ARMORING QUANTITIES

REVTMENT TYPE - LOCATION	REVTMENT CL. E (TON)	REVTMENT CL. B (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM/INVERT LINING - W.B. BRIDGE DES. 218	1,114.6	-	32.0	1,169.7	716.7
BERM/INVERT LINING - E.B. BRIDGE DES. 118	1,570.2	-	32.0	1,639.5	1001.4
LEVEE - ROCK SILL	-	1,254.4	-	1,152.4	784.0
TOTALS	2,684.8	1,254.4	64.0	3,961.6	2,502.1

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITY SPLIT E.B. TO W.B. (DES. 118 TO 218) ASSUMED AT ϕ US 30 (M.L.) REVTMENT AND EROSION STONE ESTIMATED AT 1.6 TON/CY

	W. ABUTMENT			E. ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	449+40.45	23.42' LT	829.00	450+24.67	23.42' LT	829.00
A2	449+40.45	72.58' LT	829.00	450+24.67	72.58' LT	829.00
B1	449+12.50	23.42' LT	840.18	450+53.50	23.42' LT	840.53
B2	449+12.50	72.58' LT	840.18	450+53.50	72.58' LT	840.53
W1	449+02.50	23.42' LT	843.76	450+63.50	23.42' LT	844.15
W2	449+02.50	72.58' LT	843.68	450+63.50	72.58' LT	844.07

	W. ABUTMENT			E. ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	449+40.13	23.42' RT	829.00	450+25.02	23.42' RT	829.00
A2	449+40.13	72.58' RT	829.00	450+25.02	72.58' RT	829.00
B1	449+12.50	23.42' RT	840.05	450+53.50	23.42' RT	840.39
B2	449+12.50	72.58' RT	840.05	450+53.50	72.58' RT	840.39
W1	449+02.50	23.42' RT	843.64	450+63.50	23.42' RT	844.00
W2	449+02.50	72.58' RT	843.56	450+63.50	72.58' RT	843.92

BERM SLOPE ELEVATIONS REFLECT GRADING SURFACE

GRADING CONTROL:

- (G1) 449+75.0 M.L., 220.0' RT., BTM./EDGE BERM GRADING, EL. 829.0
- (G2) 449+40.1 M.L., 120.0' RT., PI BTM./EDGE BERM GRADING, EL. 829.0
- (G3) 450+05.0 M.L., 220.0' RT., BTM./EDGE BERM GRADING, EL. 829.0
- (G4) 450+25.0 M.L., 120.0' RT., PI BTM./EDGE BERM GRADING, EL. 829.0
- (G5) 448+86.5 M.L., 135.0' LT., END BTM./EDGE CHANNEL INVERT GRADING, EL. 829.0
- (G6) 450+79.5 M.L., 135.0' LT., END BTM./EDGE CHANNEL INVERT GRADING, EL. 829.0
- (G7) 448+95.0 M.L., ϕ , MEDIAN DIKE, 15' W. TOP WIDTH, TOP EL. 844.1. FILL TO BACK/TOP OF CURB OF BRIDGE APPROACH SECTION.

REVTMENT LAYOUT:

- (R1) 449+19± M.L., 120.0' RT., END BERM/INVERT LINING. TOP LINING EL. 836.0.
- (R2) 449+19± M.L., 85.0' RT., PI TOP BERM LINING. TOP LINING EL. 836.0.
- (R3) 450+46± M.L., 120.0' RT., END BERM/INVERT LINING. TOP LINING EL. 836.0.
- (R4) 450+46± M.L., 85.0' RT., PI TOP BERM LINING. TOP LINING EL. 836.0.
- (R5) 449+05± M.L., 80.0' LT., END BERM/INVERT LINING. TOP LINING EL. 840.5.
- (R6) 450+62± M.L., 80.0' LT., END BERM/INVERT LINING. TOP LINING EL. 841.0.
- (R7) ROCK SLASH BASIN, TYPE 4 MOD., 14' L X 12' W, CL. E REVETMENT, SEE DETAIL DES. SH. 4

PRELIMINARY

DESIGN FOR 0° SKEW
150'-0 X 40'-0 CONTINUOUS CONCRETE SLAB BRIDGE
 45'-6 END SPANS 59'-0 INTERIOR SPAN
SITUATION PLAN - MISCELLANEOUS
 STATION 449+83.00 U.S. 30, 46.00' RT (E.B.) DEC. 2018
TAMA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 4 FILE NO. 31453 DESIGN NO. 118

EAST TEMPORARY FLOOD DIKE:
 100 YR. LEVEL OF SERVICE
 TOP EL. 844.1 (100 YR. + 0.5')
 DIKE HEIGHT RELATIVE TO ETW

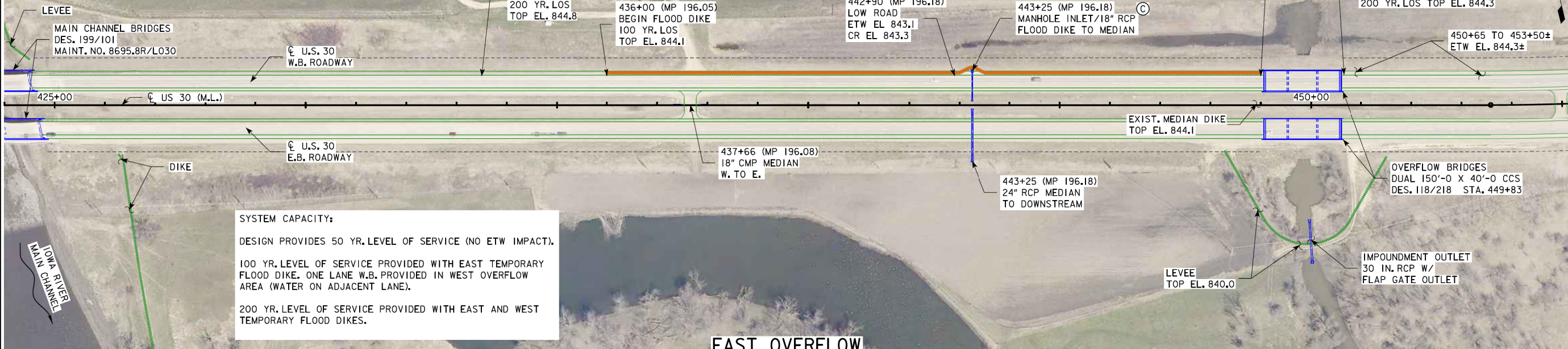
436+00 0.0' 444+00 1.0'
 438+00 0.6' 446+00 0.7'
 440+00 0.9' 448+00 0.3'
 442+00 1.0' 449+00 0.1'

BENCHMARKS:

BM 1908, 424+75 M.L., 69' RT., IHC BUTTON,
 TOP BAR. RAIL, S.E. COR. E.B. BRIDGE, EL. 851.01

BM 1907, 418+99 M.L., 69' LT., IHC BUTTON,
 TOP BAR. RAIL, N.W. COR. W.B. BRIDGE, EL. 851.07

FOR 200 YR. LOS, TOP EL. 844.8
 (200 YR. + 0.5')



SYSTEM CAPACITY:

DESIGN PROVIDES 50 YR. LEVEL OF SERVICE (NO ETW IMPACT).

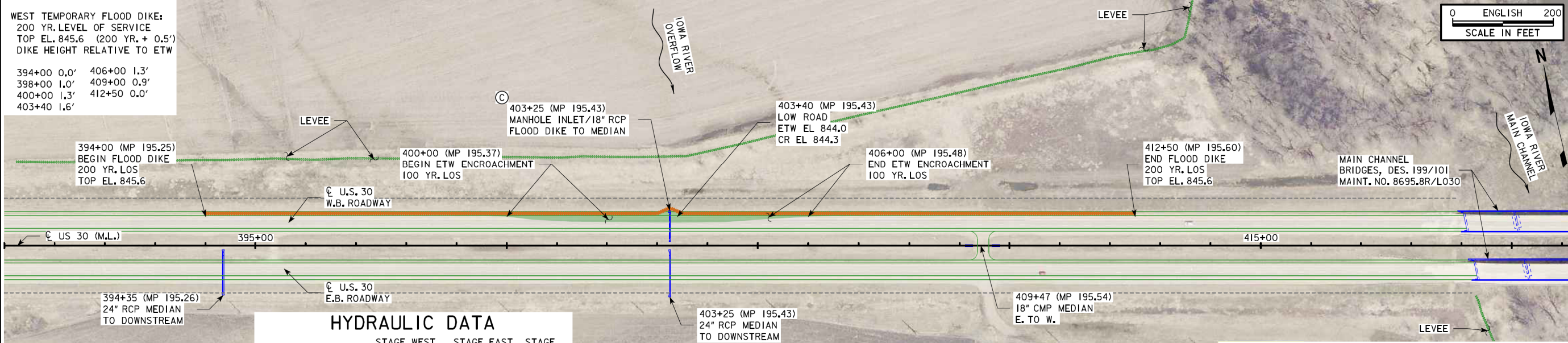
100 YR. LEVEL OF SERVICE PROVIDED WITH EAST TEMPORARY FLOOD DIKE. ONE LANE W.B. PROVIDED IN WEST OVERFLOW AREA (WATER ON ADJACENT LANE).

200 YR. LEVEL OF SERVICE PROVIDED WITH EAST AND WEST TEMPORARY FLOOD DIKES.

EAST OVERFLOW

WEST TEMPORARY FLOOD DIKE:
 200 YR. LEVEL OF SERVICE
 TOP EL. 845.6 (200 YR. + 0.5')
 DIKE HEIGHT RELATIVE TO ETW

394+00 0.0' 406+00 1.3'
 398+00 1.0' 409+00 0.9'
 400+00 1.3' 412+50 0.0'
 403+40 1.6'



HYDRAULIC DATA

DISCHARGE	STAGE WEST OVERFLOW		STAGE EAST OVERFLOW		STAGE OVERFLOW BRIDGE
	U/S	D/S	U/S	D/S	
50 YR. 29,400 CFS	843.8	839.9	843.2	841.6	842.9
100 YR. 33,100 CFS	844.3	840.3	843.6	841.8	843.2
200 YR. 39,200 CFS	845.1	841.0	844.3	842.2	843.7
500 YR. 42,200 CFS	845.5	841.3	844.6	842.4	844.0

IOWA RIVER, RIDB RM 197.1, DRAINAGE AREA 1,830 SQ.MI.

OVERFLOW STAGE IN VICINITY OF ROAD LOW POINT. BRIDGE STAGE IN MEDIAN AREA BETWEEN BRIDGES. STAGES REFLECT U.S. 30 ROAD OVERTOP BLOCKED.

LOCATION

US 30 OVER IOWA RIVER
 T 83 N R 16 W
 SECTIONS 15-16
 INDIAN VILLAGE TOWNSHIP
 TAMA COUNTY
 M.P. 195.2-196.4

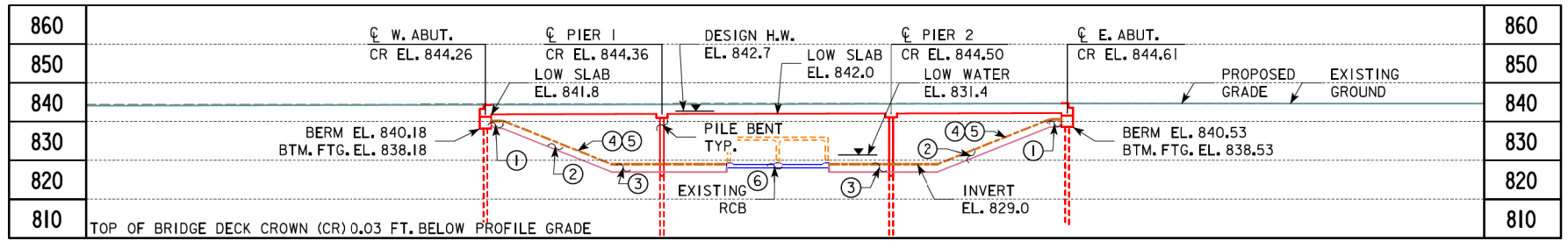
- NOTES:**
- ETW - EDGE TRAVEL WAY
 - LOS - LEVEL OF SERVICE
 - (A) TIE DIKE INTO BRIDGE BARRIER RAIL
 - (B) BLOCK SHLDR. BETWEEN ETW AND BRIDGE BARRIER, 200 YR. LOS
 - (C) REMOVE LID, WRAP DIKE AROUND MANHOLE OPENING. DRIVE FENCE POSTS AT CORNERS, PLACE SAFETY FENCE AROUND MANHOLE.

DESIGN FOR 0° SKEW

**U.S. 30 OVER IOWA RIVER
 FLOOD MITIGATION
 FLOOD OPERATIONS PLAN**

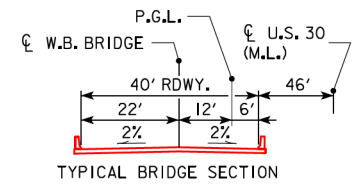
STATION 421+90.00 U.S. 30
 TAMA COUNTY
 DEC. 2018

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 4 OF 4 FILE NO. 31453 DESIGN NO. 118



BENCH MARK:
 BM NO. 1908, BRASS PLUG, S.E. COR. E.B. BRIDGE
 X=19,528,177.0 Y=7,838,336.3
 IARCS ZONE 9, SURVEY FEET
 ELEV. = 851.01 NAVD88/IARTN (GEOID12A)

+0.2383%
 PVI STA 447+00.00 PVI STA 453+00.00
 PVI EL. 843.55 PVI EL. 844.98

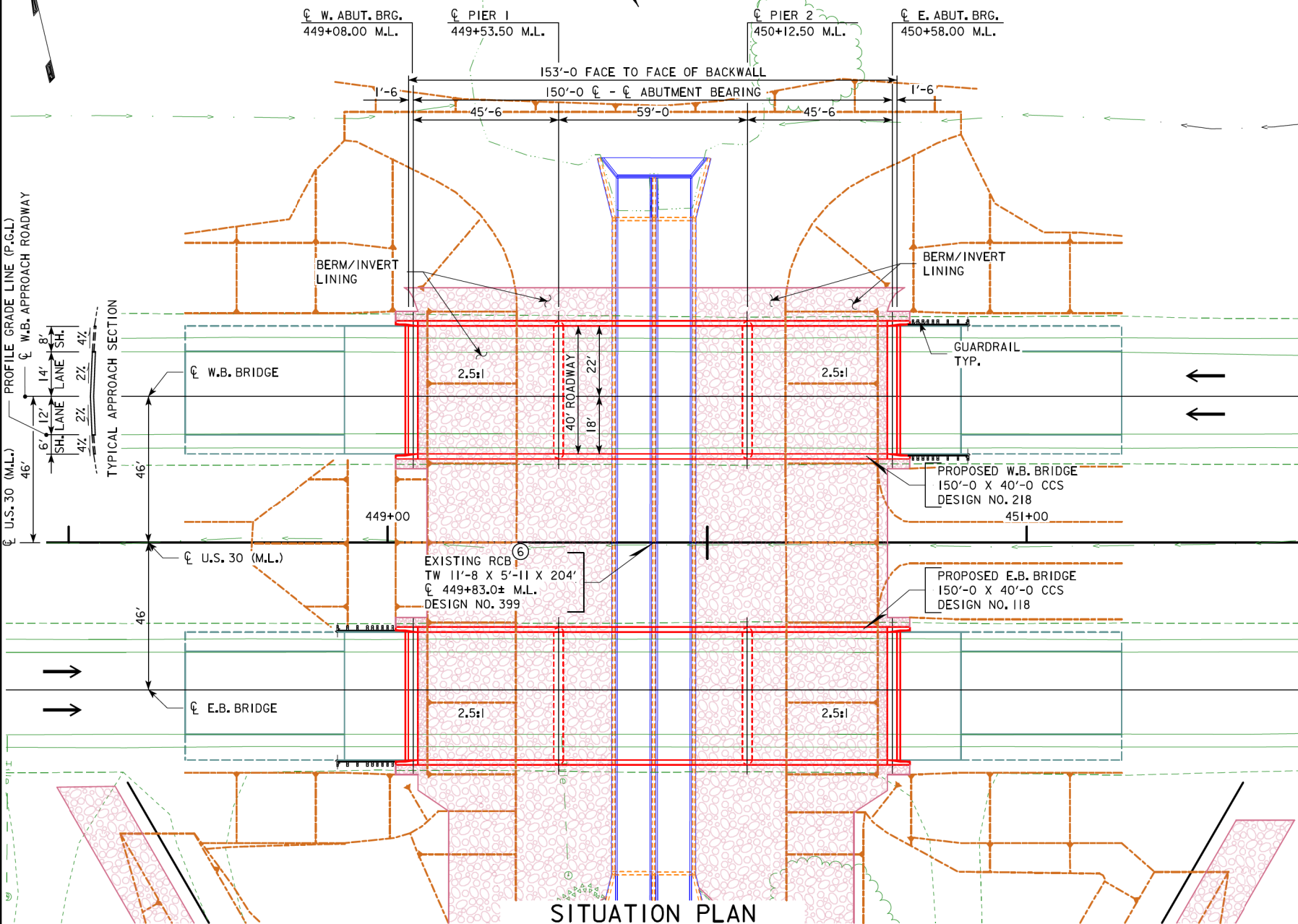
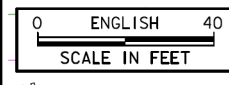


U.A.C. GRADE ON W.B. U.S. 30

NOTES:
 REFER TO TAMA DESIGN NO. 118 FOR HYDRAULIC DATA, SITE PLAN, GRADING CONTROL, REVETMENT DETAILS AND QUANTITIES.

LONGITUDINAL SECTION ALONG CL W.B. BRIDGE

- ① EROSION STONE ABUTMENT FACING
- ② BERM LINING
- ③ INVERT LINING
- ④ GRADING SURFACE
- ⑤ 2.5:1 BERM SLOPE NOR. CL ABUT.
- ⑥ REMOVE WALLS TO TOP OF FROST TROUGH, EL. 829.3± N. END RCB



TRAFFIC ESTIMATE

2014 AADT 9,300 V.P.D.
 20-- AADT -- V.P.D.
 20-- DHV -- V.P.H.
 TRUCKS 11%
 TOTAL DESIGN ESALS --

UTILITIES LEGEND

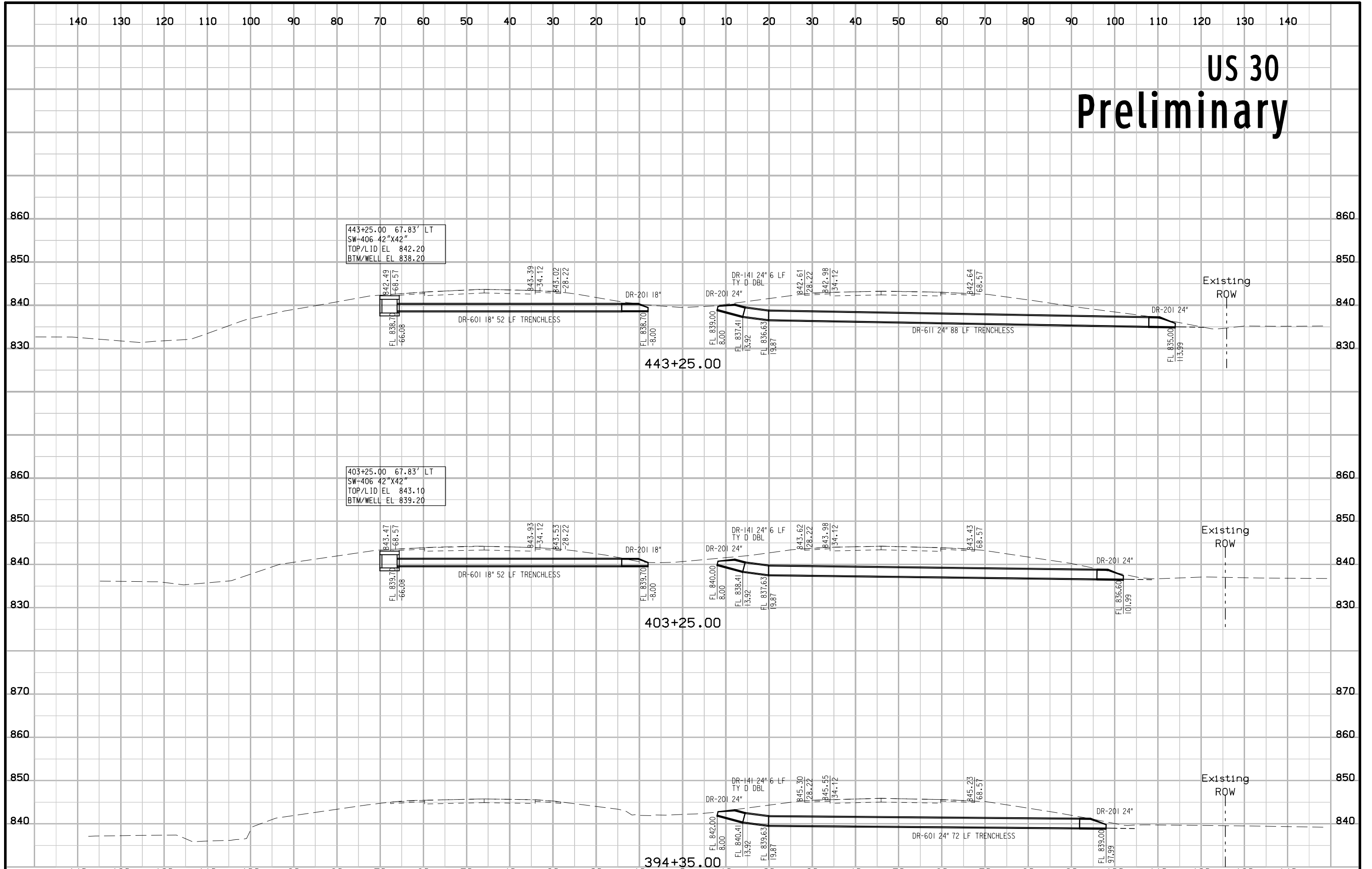
F0 - F01D BURIED FIBER OPTIC CENTURY LINK
 F02 - F02D BURIED FIBER OPTIC WINDSTREAM
 F03 - F03D BURIED FIBER OPTIC MEDIACOM

LOCATION

U.S. 30 W.B. OVER IOWA RIVER (EAST OVERFLOW)
 T 83 N R 16 W SECTION 15
 INDIAN VILLAGE TOWNSHIP TAMA COUNTY
 FHWA NO. 700950
 MAINT. NO. 8696.3L030
 STA. 449+83.00 CL M.L., 46.00' LT.
 LATITUDE 42.000569°
 LONGITUDE -92.703934°

PRELIMINARY
 DESIGN FOR 0° SKEW
150'-0" X 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE
 45'-6" END SPANS 59'-0" INTERIOR SPAN
SITUATION PLAN
 STATION 449+83.00 U.S. 30, 46.00' LT. (W.B.) DEC. 2018
TAMA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 1 FILE NO. 31453 DESIGN NO. 218

US 30 Preliminary



Levee Preliminary

