

BRIDGE REPLACEMENT  
 BRF-926-0(19)--38-94

WEBSTER COUNTY

LETTING DATE  
 07-18-2023



PLANS OF PROPOSED IMPROVEMENT ON THE  
**PRIMARY ROAD SYSTEM**  
**WEBSTER COUNTY**  
**BRIDGE REPLACEMENT**

Business U.S. 20 (IA 926) westbound bridge over CN Railroad and 7th st., 1.5 miles north of the south junction of U.S. 169 in Fort Dodge  
 SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.  
 Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

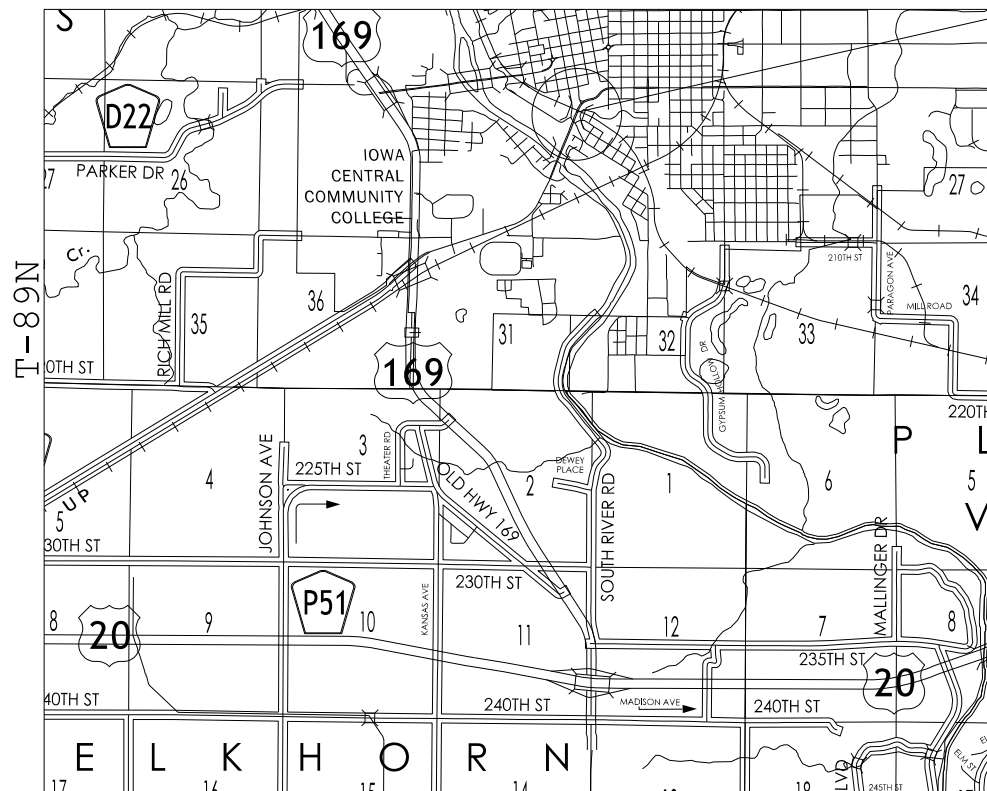
**PROJECT LOCATION**  
 STA. 731+10.00  
 FHWA No. 52101  
 Maint. No. 9401.5L926



REVISIONS

TOTAL	33
PROJECT IDENTIFICATION NUMBER	18-94-926-020
PROJECT NUMBER	BRF-926-0(19)--38-94
R.O.W. PROJECT NUMBER	STPN-926-0(20)--2J-94

INDEX OF SHEETS	
No.	DESCRIPTION
<b>A Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet
A.2 - 8	Concept
A.9	Crash Data
A.10 - 12	Design Criteria
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1	Typical Cross Sections and Details
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 926
<b>G Sheets</b>	<b>Survey Sheets</b>
G.1	Reference Ties and Bench Marks
G.2	Control Point Vicinity Map
G.3	Horizontal Control Tab. & Super for all Alignments
<b>J Sheets</b>	<b>Traffic Control and Staging Sheets</b>
J.1	Traffic Control Plan
* J.2	Detour Plans Legend and Symbol Information Sheet
* J.3 - 9	IA 926 Detour Plans
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
W.1 - 9	IA 926 Cross Sections
	* Color Plan Sheets



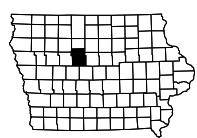
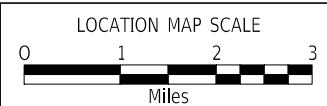
DESIGN DATA URBAN			
2023	AADT	15,500	V.P.D.
2043	AADT	15,800	V.P.D.
20 --	DHV	1634	V.P.H.
	TRUCKS	5	%
	Total		
	Design ESALs	--	

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

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - Date: 12-17-2021





FINAL PROJECT CONCEPT STATEMENT

Business U.S. 20 (IA 926) westbound bridge over CN Railroad and 7<sup>th</sup> St., 1.5 miles north of the south junction of U.S. 169 in Fort Dodge.

Webster County  
BRF-926-0(19)--38-94  
PIN: 18-94-926-020  
Maint. No. 9401.5L926  
FHWA No. 52101

Highway Division  
Design Bureau

John Bartholomew, P.E.  
515-239-1540

April 20, 2020

Webster County  
BRF-926-0(19)--38-94  
PIN: 18-94-926-020  
Page 2

B. Need for Project

The existing structure is a 736 ft. 7.69 in. x 33 ft. steel frame bridge that was built in 1936 and reconstructed in 1977 with PPCB approach spans. It is a Fracture Critical structure. The deck contains numerous cracks and hollows. The steel beams have section loss, and the prestressed beams have deteriorated ends with exposed steel. The substructure has large hollows, spalls with exposed steel, and rusting cracks. Leaking deck joints are accelerating the deterioration of the superstructure and substructure. Due to the overall condition of the bridge and its age, a replacement is recommended.



looking northeast



looking south

I. STUDY AREA

A. Project Description

This project involves the replacement of the Business U.S. 20 (IA 926) bridge (Maint. No. 9401.5L926) over the CN Railroad and 7<sup>th</sup> St., 1.5 miles north of the south junction of U.S. 169 in Fort Dodge.

The two alternatives considered were:

1. Replace with a continuous welded girder bridge utilizing crossovers. The estimated cost for this alternative is **\$7,976,600**.
2. Replace with a continuous welded girder bridge using an offsite detour. The estimated cost for this alternative is **\$7,976,600**.

A bridge replacement with PPCB bridge was also considered, but due to a grade raise requirement of 18 inches this option was dismissed from further consideration.

Alternative 1 is the preferred alternative due to public preference. A public meeting was held February 18<sup>th</sup> to determine which option the public preferred. Comments received from the meeting showed that the public preferred the crossover alternative over the off-site detour alternative.

C. Present Facility

Business U.S. 20 (IA 926) is a four lane roadway. The bridge being replaced is the westbound bridge, the eastbound bridge will remain as is.

The existing westbound structure is a 736 ft. 7.69 in. x 33 ft. pretensioned prestressed concrete beam and steel frame bridge with a 5 ft. sidewalk constructed in 1936 and reconstructed in 1977. The bridge sufficiency rating is 66.3.

Business U.S. 20 (IA 926) (WB) in the project area ranges from 33.5 ft. to 29 ft. in width, due to the raised median between the westbound and eastbound lanes, PCC pavement with curb and gutter constructed in 1976.

D. Traffic Estimates

The 2023 construction year and 2043 design year average daily traffic estimates are 15,500 ADT with 4 % trucks and 15,800 ADT with 5 % trucks, respectively.

E. Access Control

Access rights will not be acquired for this project.

F. Crash History

During the five-year study period from January 1, 2014 through December 31, 2018, there were 13 crashes including, 3 personal injury crashes and 10 personal property crashes.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a continuous welded girder bridge utilizing crossovers

The existing 736 ft. 7.69 in. x 33 ft. pretensioned prestressed concrete beam and steel frame bridge with a 5 ft. sidewalk, that is carrying westbound traffic, will be replaced with a 10 span, 748 ft. x 33 ft. continuous welded girder (CWG) bridge with a 10 ft. shared use path.

The roadway is a 4 lane divided highway with raised median, however we will only be replacing the westbound bridge. The typical cross section adjacent to the bridge will consist of a 24 ft. roadway (33 ft. wide pavement) with curb and gutter.

New bridge approaches will be constructed. The existing grade will need to be raised a minimum of 8 inches which will require approximately 100 ft. of roadway reconstruction on the northeast end of the bridge. The grade raise is required in order to achieve a minimum vertical clearance of 23 ft. 4 in. over the railroad. The reconstruction will include new curb and gutter, and new raised median. Intakes will be removed and replaced. The existing barrier rail and fencing will be removed and replaced. Due to the grade raise a barrier rail will be required along the south side of proposed bridge and along the north side of the existing northeast bound bridge. Tapered end sections will be used to transition from the bridge barrier rail and the medians. Steel sheet piling will be required to retain the earth between the ends of the northbound and southbound bridge abutments. Macadam Stone will be placed under the bridge for slope protection.

Apply erosion control and urban seeding and fertilizing to all disturbed areas.

Existing shared use path not meeting 10 ft. in width will be removed and replaced to transition between the proposed 10 ft. bridge shared use path and the existing 10 ft. shared use path on both ends of the bridge. Due to the grade raise, existing shared use path from the north may need to have a portion removed and replaced to tie in with the new shared use path.

It appears that right of way may be required for this project.

Traffic will be maintained by crossovers. Raised median may need to be removed and replaced for the crossover.

<b>Bridge Items</b>	<u>Estimated Costs</u>
New Bridge	\$ 4,626,600
Aesthetic Treatment	138,800
Bridge Removal	465,900
Barrier Rail NB Bridge	160,000
Steel Sheet Pile for Abutments	18,000
Mobilization - 10%	540,900
Contingency - 20%	<u>1,190,000</u>
<b>Bridge Costs</b>	<b>\$ 7,140,200</b>

<b>Roadway Items</b>	
Bridge Approaches	\$96,400
Removal of Pavement	10,000
PCC Pavement	25,700
Modified Subbase	6,600
Embankment in Place	27,400
Curb and Gutter - Remove and Replace	17,500
Median - Remove and Replace	35,200
Sidewalk - Remove and Replace	22,000
Excavation Class 13 Waste	16,800
Fence - Remove and Replace	1,400
Intakes - Remove and Replace	14,900
Subdrains and Subdrain Outlets	2,200
Concrete Barrier Rail - Tapered	31,100
Seeding and Fertilizing	2,700
Right of Way	10,000
Erosion Control	50,000
Traffic Control - 5%	30,800
Mobilization - 5%	30,800
M & C - 30%	184,900

Railroad Agreement Design Services	15,000
Railroad Insurance	10,000
Railroad Flagging	<u>195,000</u>
<b>Roadway costs</b>	<b>\$ 836,400</b>
<b>Project Total</b>	<b>\$7,976,600</b>

Alternative #2 - Replace with a continuous welded girder bridge using an offsite detour

This alternative is similar to Alternative #1 except the traffic will be maintained by an offsite detour instead of using crossovers.

**B. Detour Analysis**

For Alternative #1, traffic will be maintained by crossovers. Crossovers will be located east of the Business U.S. 20 (IA 926) and Business U.S. 169/S 8<sup>th</sup> St. intersection and at the intersection of Avenue C and Business U.S. 20 (IA 926). Business U.S. 169/S. 8<sup>th</sup> St. will be closed during construction.

For Alternative #2, Business U.S. 20 (IA 926) will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately one calendar year. The detour would follow U.S. 169 north to 2<sup>nd</sup> Ave S east through the roundabout to 1<sup>st</sup> Ave. S continuing east to S. 8<sup>th</sup> St. heading south to Business U.S. 20/ IA 926. This detour route is also considered Business U.S. 169. Out of distance travel is 1.18 miles. The total distance user cost is anticipated to be \$1,351,900. Detour signing costs will be \$10,000.

**C. Recommendations**

It is recommended that the present structure be replaced and traffic maintained with head to head traffic on the eastbound bridge using crossovers, as described in Alternative #1.

**D. Construction Sequence**

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

**E. ADA Accommodations**

There is a shared use path adjacent to Business US 20 (IA 926); therefore, ADA accommodations are planned in conjunction with this project.

Pedestrian traffic seeking to cross the Des Moines River will have to cross using the 2<sup>nd</sup> Ave S/U.S. Business 169 bridges during the construction of the new Business U.S. 20 westbound bridges.

The shared use path under the proposed bridge will be closed during construction.

**F. Special Considerations**

This will not be a traffic critical project.

The ABC Rating Score of 21 is less than the first stage filter threshold of 50, therefore this bridge will not undergo further ABC evaluation.

A shared use path will be required as part of this project. A Section 4F review will be required for the shared use path.

The CN Railroad at this location has 4 day trains, 4 night trains and 10 switching trains. This data was obtained from a 2016 train count. A Right of Way easement may be required with the railroad. Railroad flaggers, rail protective insurance, and a railroad agreement will be required.

Right of Way may be required for this project.

The Location and Environment Bureau has reviewed this project. The replacement of this overpass bridge is not anticipated to require a 404 Permit unless project construction causes an impact to a minor channel that begins just east of the EB IA 926 bridge. This channel may be regulated a regulated resource but further fieldwork will be required to determine for sure. No other regulated natural resources were observed in the project vicinity. No stream or wetland mitigation is anticipated to be necessary for the construction of this project unless significant impacts will occur above-described minor channel.

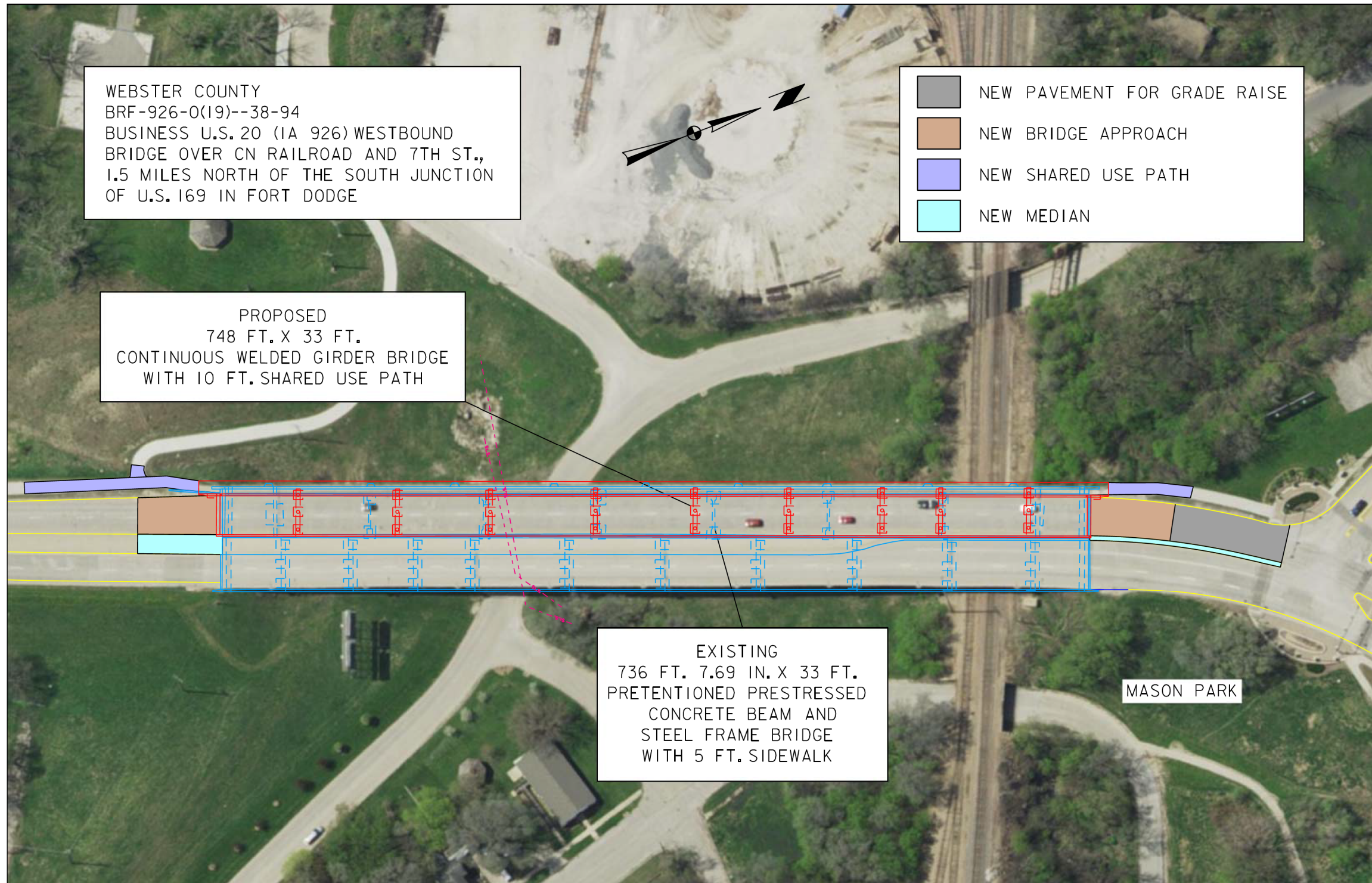
Mason Park is located in the northeast corner of the project. Any right of way impacts to the park will require a Section 4F review and therefore should be avoided if possible.

Webster County  
BRF-926-0(19)--38-94  
PIN: 18-94-926-020  
Page 7

G. Program Status

This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with \$8,000,000 programmed for bridge replacement in FY 2023. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

JEB:hsr



Utilities

Fort Dodge  
Jeff Wood  
Public Works  
819 1<sup>st</sup> Ave.S  
Fort Dodge, IA 50501-4739  
(515) 955-6139  
[jwood@fortdodgeiowa.org](mailto:jwood@fortdodgeiowa.org)

MCI/Verizon Business  
Jim Powers  
Engineer  
2600 Westown PKWY, Suite 100  
West Des Moines, IA 50266  
(515) 380-2208  
[jim.powers1@Verizon.com](mailto:jim.powers1@Verizon.com)

Mediacom Communications Corporation  
Mike Lawler  
Technical Operations Manager  
1225 2<sup>nd</sup> Ave. S  
Fort Dodge, IA 50501  
(515) 955-6100  
[mlawler@mediacomcc.com](mailto:mlawler@mediacomcc.com)

MidAmerican Energy Company  
(Electric)  
Nick Nation  
Supervisor - Electric Distribution Engineering  
637 S 22<sup>nd</sup> St.  
Fort Dodge, IA 50501  
(515) 574-5040  
[njnation@midamerican.com](mailto:njnation@midamerican.com)

MidAmerican Energy Company  
(Gas Distribution)  
Jim Blocker  
Sr Dist Design Tech  
637 S 22<sup>nd</sup> St.  
Fort Dodge, IA 50501  
(515) 574-5013  
[Jhblocker@midamerican.com](mailto:Jhblocker@midamerican.com)

**Bridge Office Attachment for Concept Statement**

**Date:** September 24, 2019  
**By:** Dave Mulholland  
**Location:** IA 926 over the CN railroad and 7<sup>th</sup> ST SW

County: Webster  
Project No.: BRF-926-0(19)-38-94  
Pin No.: 18-94-926-020

1. Regulatory/Coordination
  - a. Iowa DNR Flood Plain permit = No
  - b. Iowa DNR Sovereign Lands permit = No
  - c. Local Record of Coordination = No
  - d. Flood Insurance Study = Yes. Zone X Panel 19187C0305C, December 4, 2012
  - e. Drainage District = No
  - f. Corps of Engineers Section 408 = No
2. Hydrologic/Hydraulic Analysis/RIDB Dataset
  - a. Design discharges determined = No
  - b. Hydraulic analysis done = No
  - c. Riverine Infrastructure Database (RIDB) = No
3. Structure/Roadway Layout Considerations
  - a. Increase separation between SB and NB bridges to 4 inches to meet zone of intrusion criteria.
  - b. Install barrier rail along south side of south bound bridge and along north side of north bound bridge for grade raise. Rail on north bound bridge should be installed prior to construction of south bound bridge. The north bound rail will need to act as a retaining wall at certain locations.
4. Special construction issues
  - a. Shallow bedrock may all pier foundations to be set directly on rock without piles.
  - b. It is desirable for new structure foundations to avoid existing foundations when possible.
5. Special survey = No.
6. Aesthetic enhancements = Yes.
7. Other
  - a. The roadway will be closed during construction with traffic most likely placed on cross overs using head to head on the existing northbound bridge.





Iowa Crash Analysis Tool  
Quick Report  
2014-2018

Crash Severity	13	Injury Status Summary	4
Fatal Crash	0	Fatalities	0
Suspected Serious Injury Crash	0	Suspected serious/incapacitating	0
Suspected Minor Injury Crash	1	Suspected minor/non-incapacitating	1
Possible/Unknown Injury Crash	2	Possible (complaint of pain/injury)	2
Property Damage Only	10	Unknown	1

Property/Vehicles/Occupants		Average Severity	
Property Damage Total (dollars):	43,600.00	Fatalities/Fatal Crash:	0.00
Average (per crash dollars):	3,353.85	Fatalities/Crash:	0.00
Total Vehicles:	18.00	Injuries/Crash:	0.23
Average (per crash):	1.38	Major Injuries/Crash:	0.00
Total Occupants:	24.00	Minor Injuries/Crash:	0.08
Average (per crash):	1.85	Possible/Unknown Injuries/Crash:	0.15



Iowa Crash Analysis Tool  
Quick Report  
2014-2018

Major Cause	13
Animal	2
Ran stop sign	0
FTYROW: At uncontrolled intersection	0
FTYROW: From stop sign	0
FTYROW: Making left turn	0
FTYROW: From parked position	0
FTYROW: Other	0
Disregarded RR Signal	0
Crossed median (divided)	0
Aggressive driving/road rage	0
Exceeded authorized speed	0
Operating vehicle in an reckless, erratic, ca...	0
Passing: On wrong side	0
Passing: With insufficient distance/inadequa...	0
Passing: Other passing	0
Driver Distraction: Manual operation of an e...	0
Driver Distraction: Talking on a hands free ...	0
Driver Distraction: Other electronic device ...	0
Driver Distraction: Unrestrained animal	0
Driver Distraction: Inattentive/lost in thou...	0
Driver Distraction: Exterior distraction	0
Ran off road - straight	0
Lost control	2
Over correcting/over steering	0
Failure to signal intentions	0
Vehicle stopped on railroad tracks	0
Other: Improper operation	0
Other: Disregarded signs/road markings	0
Downhill runaway	0
Towing improperly	0
Equipment failure	0
Other: Getting off/out of vehicle	0
Improper backing	0
Illegally parked/unattended	0
Operator inexperience	0
Unknown	1
Other: No improper action	0
Ran traffic signal	0
Failed to yield to emergency vehicle	0
FTYROW: Making right turn on red signal	0
FTYROW: From yield sign	0
FTYROW: From driveway	0
FTYROW: To pedestrian	0
Drove around RR grade crossing gates	0
Crossed centerline (undivided)	1
Traveling wrong way or on wrong side of road	0
Driving too fast for conditions	4
Improper or erratic lane changing	1
Followed too close	1
Passing: Where prohibited by signs/markings	0
Passing: Through/around barrier	0
Made improper turn	0
Driver Distraction: Talking on a hand-held d...	0
Driver Distraction: Adjusting devices (radio...	0
Driver Distraction: Passenger	0
Driver Distraction: Reaching for object(s)/f...	0
Driver Distraction: Other interior distracti...	0
Ran off road - right	0
Ran off road - left	0
Swerving/Evasive Action	0
Failed to keep in proper lane	0
Traveling on prohibited traffic way	0
Other: Vision obstructed	0
Other: Disregarded warning sign	0
Other: Illegal off-road driving	0
Separation of units	0
Cargo/equipment loss or shift	0
Oversized load/vehicle	0
Failure to dim lights/have lights on	0
Improper starting	0
Driving less than the posted speed limit	0
Other	1
Not reported	0

<b>Roadway</b>			
<b>PIN Number</b>	19-94-926-020	<b>Submittal Date</b>	
<b>Project Number</b>	BRF-926-0(19)--38-94	<b>Approval Date</b>	
<b>District</b>	District 1	<b>Assistant District Engineer</b>	Tony Gustafson
<b>County</b>	WEBSTER	<b>or</b>	
<b>Route</b>	Business U.S. 20 (IA 926)	<b>Office Director</b>	
<b>Location</b>	Business U.S. 20 (IA 926) westbound bridge over CN Railroad and 7th St., 1.5 miles north of the south junction of U.S. 169 in Fort Dodge		
<b>Work Type</b>	Bridge Replacement		
<b>Segment Manager</b>			
<b>Designer</b>	Adam Dewolf / Harrison Cooper		

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

### Urban Multilane Roadways (Urban Arterials)

Design Element	Preferred	Acceptable Criteria	Project Values
Design speed (mph)	The anticipated posted speed limit	30	40
Maximum superelevation rate (Refer to Section 2A-2)	4%	8%	NA
Design lane width (ft)	12	11	12
Full depth paved width (ft)	Outside lane Design lane width + curb and gutter unit or 12 feet for roadways with shoulders	Match design lane width	12+2.5
	Inside lane(s) Design lane width + curb and gutter unit. 12' for roadways without a curb and gutter unit	Match design lane width	12+2.5
Right turn lane or an auxiliary lane (ft)	12	10	NA
Left turn lane (ft)	With raised or painted median	12 ft + median	NA
	With depressed median	12	NA
Two-way left turn lane (ft)	14	11	NA
Parking lane width (ft)	10	7	NA
Pavement cross-slope (on tangent sections)	Through lanes 2%, However, when adjacent lanes slope in the same direction, increase slope by 0.5% per lane up to 3%	1.5% minimum, 3% maximum	2%
	Auxiliary and turn lanes	3% maximum	NA
	Crown break at centerline	4% maximum	4%
Shoulder cross-slope (on tangent sections)	Shoulders	4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders
	Curb and gutter units	Match pavement cross-slope	6% maximum
	Parking lanes	1% greater than pavement cross-slope	6% maximum
Curb type (Refer to Section 3C-2)	Design speed ≤ 45 mph	6-inch standard	any shape
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1
	Curbed roadways	2%	not steeper than 3:1
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)	3:1	2.5:1	NA
Transverse Slopes	w/ drainage structures	8:1	6:1
	w/o drainage structures	10:1	6:1
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--
Median width (ft) (Refer to Section 3E-1)	See Section 3E-1	0	3'-15'
Bridge width—new*	Bridge length ≤ 200 ft design lane widths + effective shoulder widths or design lane width + 3 ft each side in curb and gutter section	design lane widths + effective shoulder widths or curb-to-curb width in curb and gutter section**	NA
	Bridge length > 200 ft design lane widths + effective shoulder widths or design lane width + 3 ft each side in curb and gutter section	design lane widths + 4 ft offset each side for roadways with shoulders or curb-to-curb width in curb and gutter section**	30'
Bridge width—existing*	design lane widths + no less than 2 ft left and right	design lane widths + 2 ft left and right of the design widths	33'
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14
	Over railroad	23.3	23.3
	Sign truss and pedestrian crossings	17.5	17
Structural Capacity	Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service	C	D	

\*FHWA notification via email is required if acceptable criteria is not met on the NHS system (No formal design exception required)

\*\* If travel lanes are less than 12 ft wide contact the Methods Section for assistance.

Design year ADT =

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

### Effective Shoulder Width and Type for Multilane Arterials

Preferred (Values shown in feet)					Acceptable (Values shown in feet)					Project Values		
		Rural Roadways		Urban Roadways				Rural Roadways			Urban Roadways	
Auxiliary lanes or turn lanes with shoulders		6		6		Auxiliary lanes or turn lanes with shoulders		6			0	
Turn lanes with curbs		6		See Section 3C-2		Turn lanes with curbs		6		0		NA
		Outside		Median Side				Outside		Median Side		
Expressways		Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Expressways		Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated		10	10	6	6	Routes where bicycles are to be accommodated		8	4	4	4	2.5'
On roadways approaching urban areas (due to increased bike traffic)		10	10	6	6	On all other Expressways (Multilane Arterials)		8	0*	4	4	
On all curves with a superelevation rate of 7.0% or greater		10	10	6	6							
On roadways with design year ADT > 6500 vpd		10	6	6	6							
On all other Expressways (Multilane Arterials)		10	6	6	6							

\*Requires safety edge-See Section 3C-6

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

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

**Notes:**


Roadway Design Speed (mph) = **40**

**Design Criteria for Low Speed Roadways**

Design Manual Section 1C-1  
Last Updated: 05-26-17

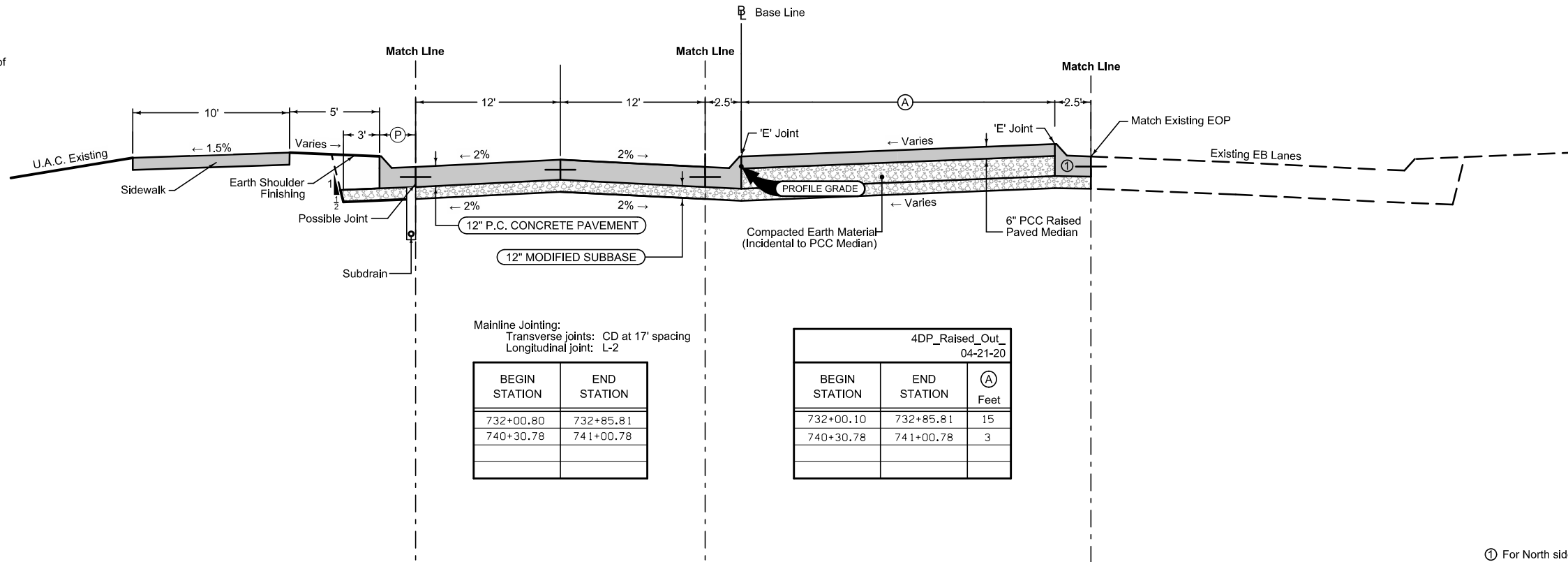
Design Element	Preferred Criteria					Acceptable Criteria					Project Values						
	Design Speed, mph					Design Speed, mph											
	25	30	35	40	45	25	30	35	40	45							
Stopping sight distance (ft) (Refer to Section 6D-1)	155	200	250	305	360	155	200	250	305	360	683						
Minimum horizontal curve radius (ft) and superelevation rate (Refer to Sections 2A-2 and 2A-3)	Method 2 superelevation and side friction distribution	e = 4% max					See Table 10 in Section 2A-3					NA					
	Method 5 superelevation and side friction distribution	e <sub>max</sub> = 6%					144	231	340	485	643	144	231	340	485	643	503
		e <sub>max</sub> = 8%					--	--	--	--	--	134	214	314	444	587	NA
Minimum vertical curve length (ft) (Refer to Section 2B-1)	75	90	105	120	135	75	90	105	120	135	675						
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	216				
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	NA				
		roadways with fixed-source lighting	26	37	49	64	79	14	20	27	35	44	NA				
Minimum gradient (%) (Refer to Section 2B-1)	0.5					0.3% with a curb, 0.0% without a curb					2.66%						
Maximum gradient (%) (Refer to Section 2B-1)	Urban roadways		5					--	9	8	8	7	5.78%				
	Rural roadways							--	--	--	6	6	NA				
Clear zone	See "Preferred Clear Zone" table in Section 8A-2					See "Acceptable Clear Zone" table in Section 8A-2											

### Curbed Shoulder

Shoulder Jointing:  
 Longitudinal joint not required when distance from back of  
 curb to nearest joint is less than 15':

Single pour: L-2  
 Staged : KT-2  
 Transverse: C at 17' spacing

STATION TO STATION		(P) Feet	Curb Type See PV-102
732+00.80	732+39.44	2.5	6" Std
732+39.44	732+69.43	2.5-5.5	6" Std
732+69.43	732+85.81	5.5	6" Std
740+30.77	740+59.84	5.5	6" Std
740+59.84	740+74.32	5.5-4.0	6" Std
740+74.32	741+00.78	4.0	6" Std



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

BEGIN STATION	END STATION
732+00.80	732+85.81
740+30.78	741+00.78

4DP_Raised_Out_04-21-20		
BEGIN STATION	END STATION	(A) Feet
732+00.10	732+85.81	15
740+30.78	741+00.78	3

① For North side of bridge only  
 See Tab 100-24 or 100-25 for pavement quantities.  
 See Tab 112-9 for shoulder quantities.

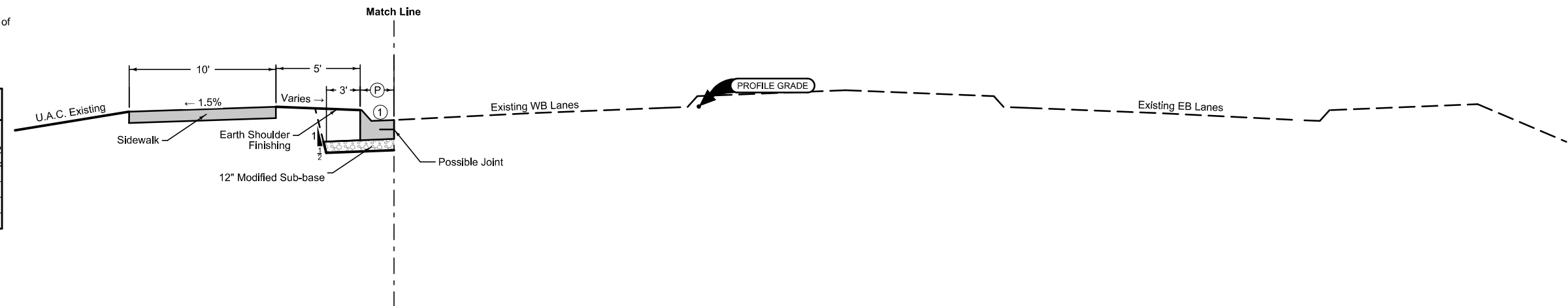
IA 926

### Curbed Shoulder

Shoulder Jointing:  
 Longitudinal joint not required when distance from back of  
 curb to nearest joint is less than 15':

Single pour: L-2  
 Transverse: Match Main Line Joint Spacing

STATION TO STATION		(P) Feet	Curb Type See PV-102
731+10.00	732+00.80	2.5	6" Std
741+00.78	741+72.00	4.0	6" Std



① Match existing cross slope

### SURVEY SYMBOLS

- |  |                                   |  |                              |
|--|-----------------------------------|--|------------------------------|
|  | Interstate Highway Symbol         |  | Septic Tank                  |
|  | U.S. Highway Symbol               |  | Cistern                      |
|  | Iowa Highway Symbol               |  | L.P. Gas Tank (No Footing)   |
|  | County Road Highway Symbol        |  | Underground Storage Tank     |
|  | Evergreen Tree                    |  | Latrine                      |
|  | Deciduous Tree                    |  | Satellite TV Dish            |
|  | Fruit Tree                        |  | Water Hook Up                |
|  | Shrub (Bushes)                    |  | Radio Tower                  |
|  | Timber                            |  | Tower Anchor                 |
|  | Hedge                             |  | Guardrail (Beam or Cable)    |
|  | Stump                             |  | Guard Post (one or two)      |
|  | Swamp                             |  | Guard Post (over two)        |
|  | Rock Outcrop                      |  | Filler Pipe                  |
|  | Broken Concrete                   |  | Gas Valve                    |
|  | Revetment (Rip Rap)               |  | Water Valve                  |
|  | Cemetery                          |  | Speed Limit Sign             |
|  | Grave                             |  | Mile Marker Post             |
|  | Cave                              |  | Sign                         |
|  | Sink Hole                         |  | Traffic Signal Control Box   |
|  | Board Fence                       |  | Rail Road Signal Control Box |
|  | Chain Link or Security Fence      |  | Telephone Switch Box         |
|  | Wire Fence                        |  | Electric Box                 |
|  | Terrace                           |  |                              |
|  | Earth Dam or Dike (Existing)      |  |                              |
|  | Tile Outlet                       |  |                              |
|  | Edge of Water                     |  |                              |
|  | Existing Drainage                 |  |                              |
|  | Right of Way Rail or Lot Corner   |  |                              |
|  | Concrete Monument                 |  |                              |
|  | Well                              |  |                              |
|  | Windmill                          |  |                              |
|  | Beehive Intake                    |  |                              |
|  | Existing Intake                   |  |                              |
|  | Existing Utility Access (Manhole) |  |                              |
|  | Fire Hydrant                      |  |                              |
|  | Water Hydrant (Rural)             |  |                              |

### UTILITY LEGEND

### PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.	
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING		Design Color No.	
Lavender	(9)		Temporary Pavement Shading
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

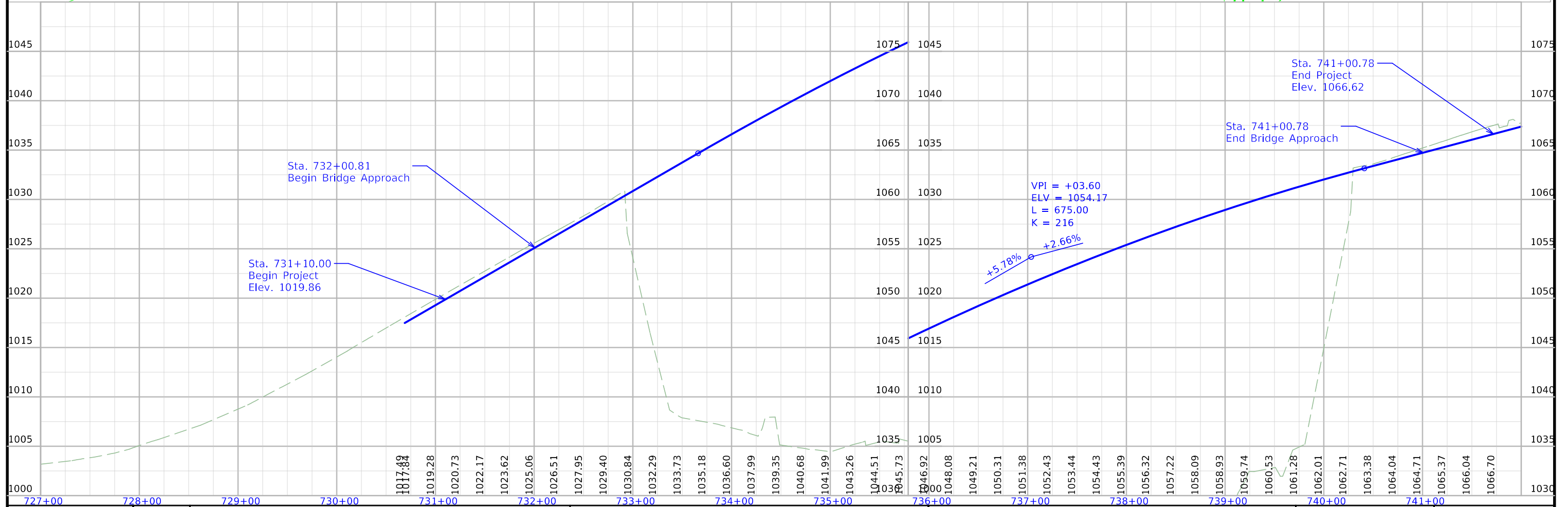
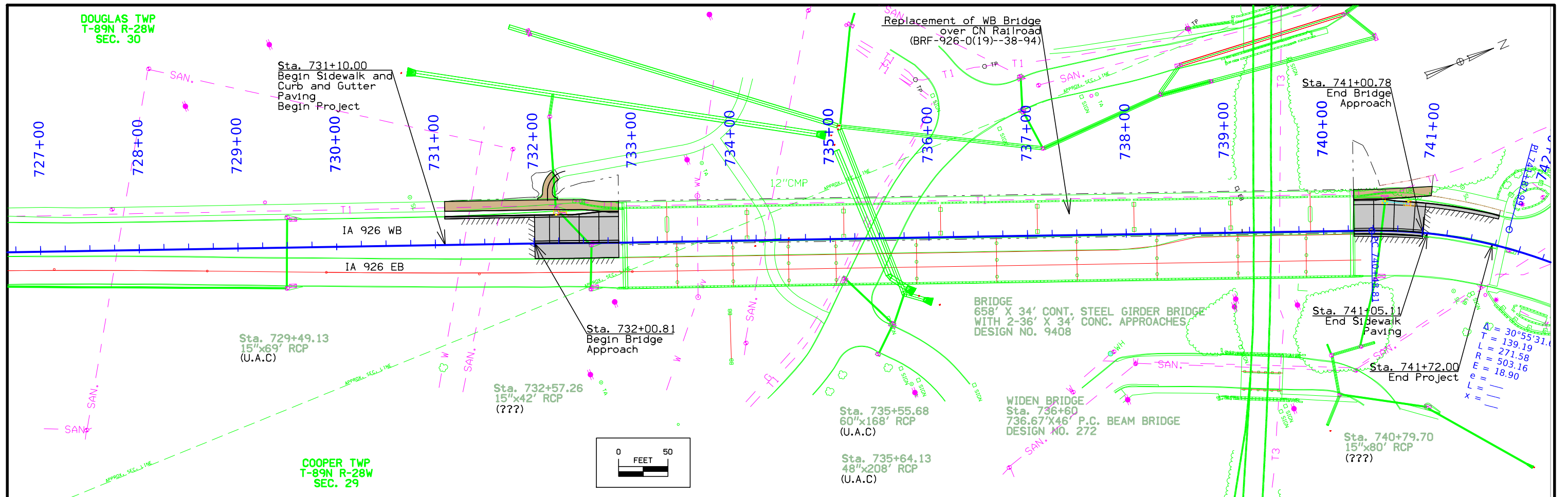
LINEWORK		Design Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

- 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)



## Survey Information

Webster County  
BRF-926-0(17)—38-94  
BRF-926-0(19)—38-94  
US 20 Fort Dodge  
PIN 18-94-926-010  
18-94-926-020  
Sap-09590

### General Information

Measurement units for this survey are US survey feet. This preliminary engineering survey is for improvements to US 20 over Des Moines River and B Ave 1.3 miles north of south junction US 169 in Fort Dodge. This project is a full field survey within the survey limits.

### Vertical Control

Vertical datum for this survey is relative to NAVD88, Geoid 12b.

Vertical positions were established by static observations and post processed using concurrent observations from the IaRTN Fort Dodge and Clarion reference stations.

### Horizontal Control

The project coordinate system is the Iowa Regional Coordinate System, Zone 4. Horizontal datum is NAD83 (2011) for Epoch 2010.00. The projection parameters for Zone 4 of the IaRCS is defined below:

Lambert Conformal Conic Projection North American Datum of 1983  
Origin Lat: 42°32'00"N  
Origin Central Meridian: 094°50'00"W  
Central Meridian Scale: 1.000045  
False Northing: 8,600,000  
False Easting: 14,500,000

Horizontal positions for site control were established by static observations and post processed using concurrent observations from the IaRTN Fort Dodge and Clarion reference stations

### Alignment Information

US 20  
The horizontal alignment for this survey is a retrace of as-built plans U-20-3(11)—40-94. Survey stationing was equated to the plan POC at station 747+50.00 and run back without equation.

Utility Information  
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.

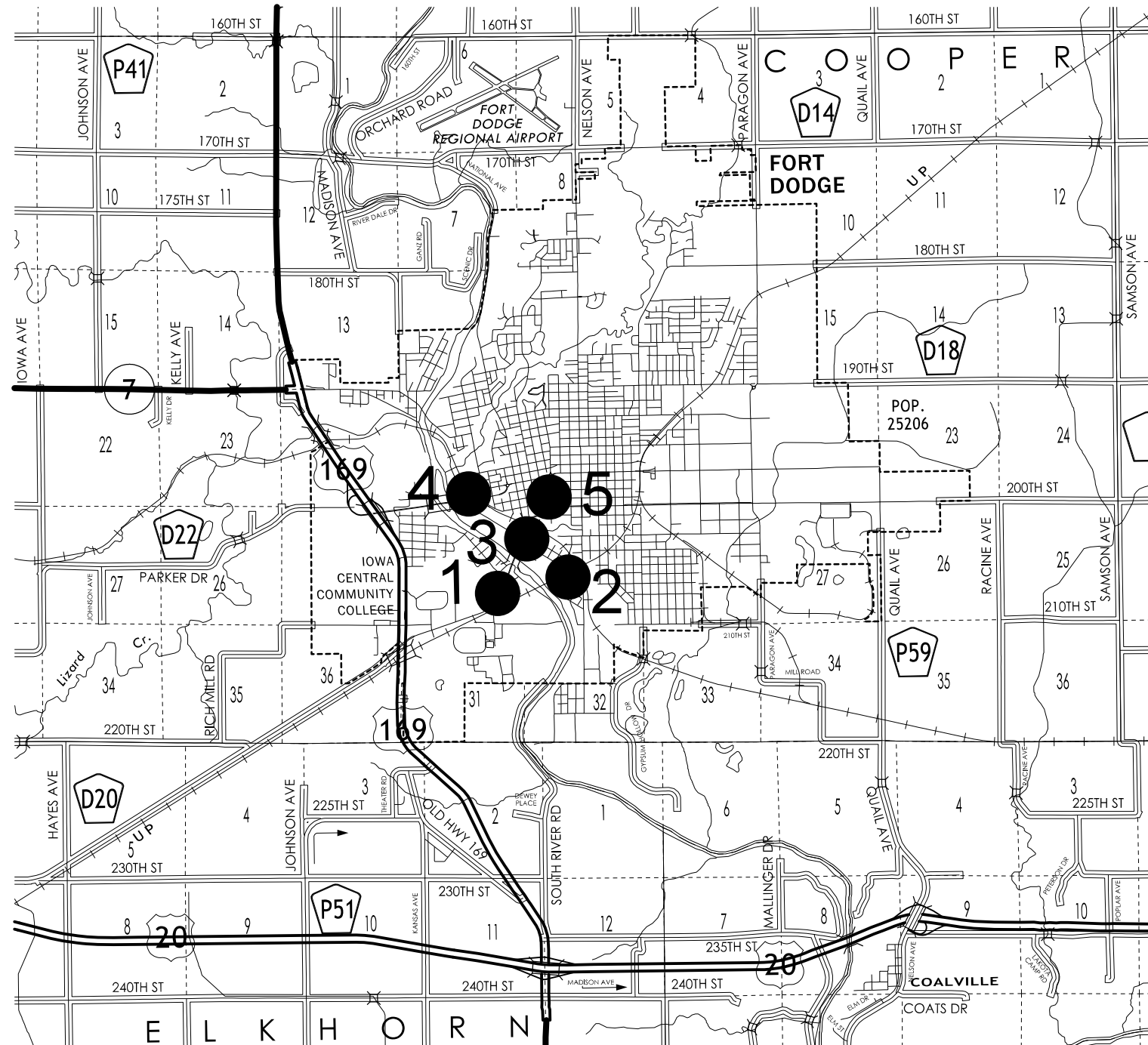
Remark abbreviations  
QLA – Quality Level A Highest guideline quality level  
QLD – Quality Level D Lowest guideline quality level

A One-call utility locate request (Ticket# 552004559) was made July 7, 2020. The following Companies were listed:



## CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

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

# HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Point Name	Northing	Easting	Elevation	Feature Definition	Description
CP1	8585070.70	14673125.15	1079.760	CP	SET FENO MONUMENT//IDOT BRASS CAP NW QUADRANT OF KENYON ROAD AND AVE E//+/-20FT NORTH OF UNITY POINT SIGN//+/-20FT WEST OF SIDEWALK
CP2	8586386.79	14675715.07	1005.635	CP	SET FENO MONUMENT//IDOT BRASS CAP SOUTH SIDE OF 11TH AVE SW INLINE WITH POWERPOLE//+/-7FT SOUTH OF BACK OF CURB//+/-70FT EAST OF 13TH ST SW
CP3	8587469.60	14674403.20	1008.556	CP	SET FENO MONUMENT//IDOT BRASS CAP SOUTH SIDE OF 11TH AVE SW INLINE WITH 1ST PIER FROM SOUTH SIDE OF NORTH BOUND BRIDGE//+/-45FT SOUTHWEST OF BACK OF CURB//ACROSS FROM ROW SIGN
CP4	8588826.74	14671977.48	991.811	CP	SET FENO MONUMENT//IDOT BRASS CAP SOUTH SIDE OF MERIWETHER DRIVE//5FT SOUTH OF BACK OF CURB//ACROSS FROM 2ND LIGHT POLE WEST OF DRIVE TO RIVERFRONT PARKING LOT
CP5	8588447.63	14674882.86	1084.993	CP	SET FENO MONUMENT//IDOT BRASS CAP SOUTH SIDE OF KENYON ROAD//+/-5FT SOUTH OF SIDEWALK//+/-75FT EAST OF 2ND POWER POLE EAST OF S 8TH ST

108-23A 08-01-08
<b>TRAFFIC CONTROL PLAN</b>
IA 926 west bound lanes will be closed during construction. Through traffic will be maintained via crossovers detailed in sheets J.3 through J.9. The contractor shall provide access to all entrances at all times.

111-01 04-17-12								
<b>COORDINATED OPERATIONS</b>								
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.								
<table border="1"> <thead> <tr> <th>Project</th> <th>Type of Work</th> </tr> </thead> <tbody> <tr> <td>BRF-926-0(17)--38-94</td> <td>Bridge Replacement</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Project	Type of Work	BRF-926-0(17)--38-94	Bridge Replacement				
Project	Type of Work							
BRF-926-0(17)--38-94	Bridge Replacement							










108-25 10-21-14	<b>511 TRAVEL RESTRICTIONS</b>
--------------------	--------------------------------

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

**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

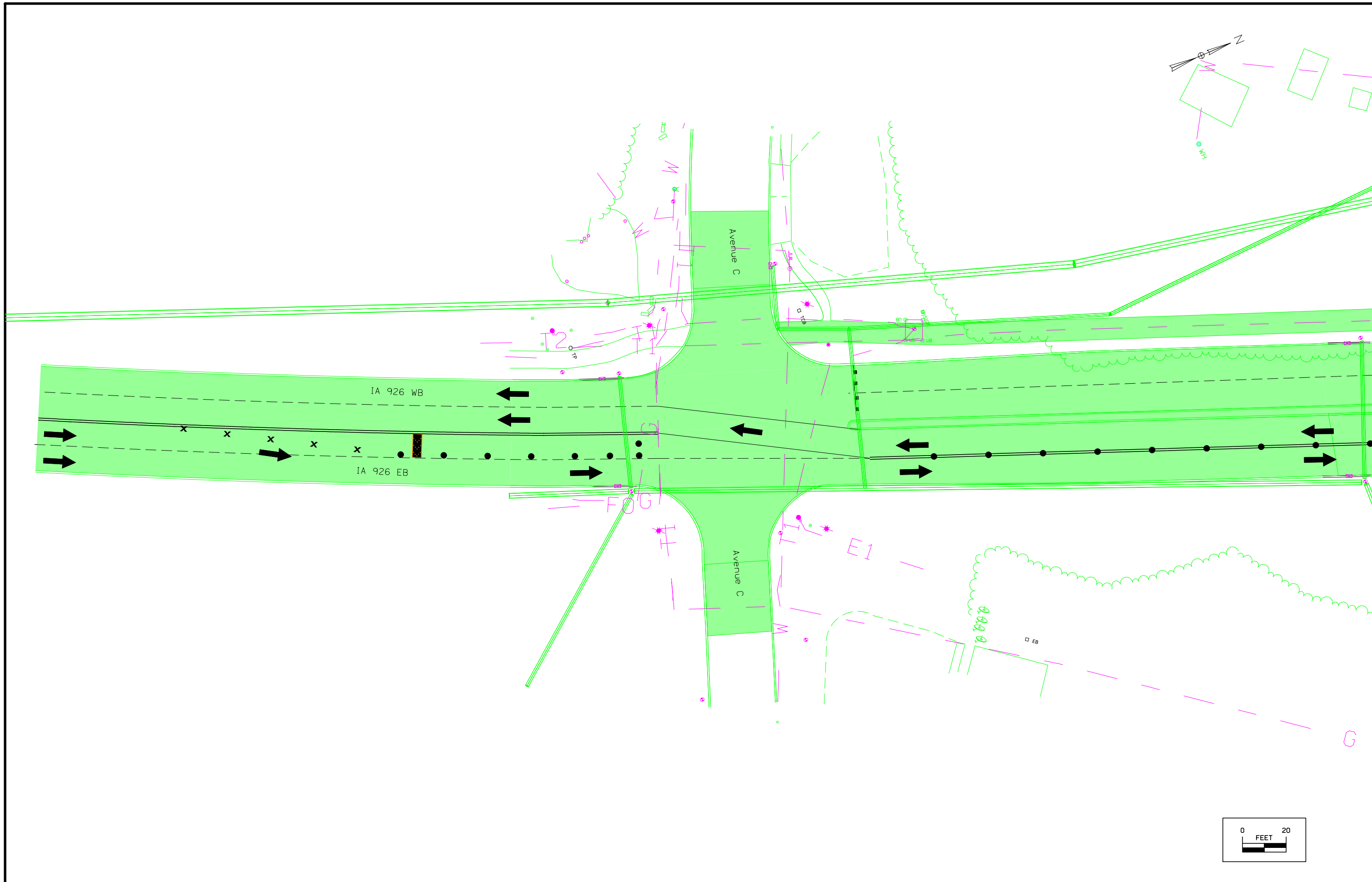
**PLAN VIEW PATTERN AND SYMBOL LEGEND  
OF TRAFFIC CONTROL AND STAGING SHEETS**

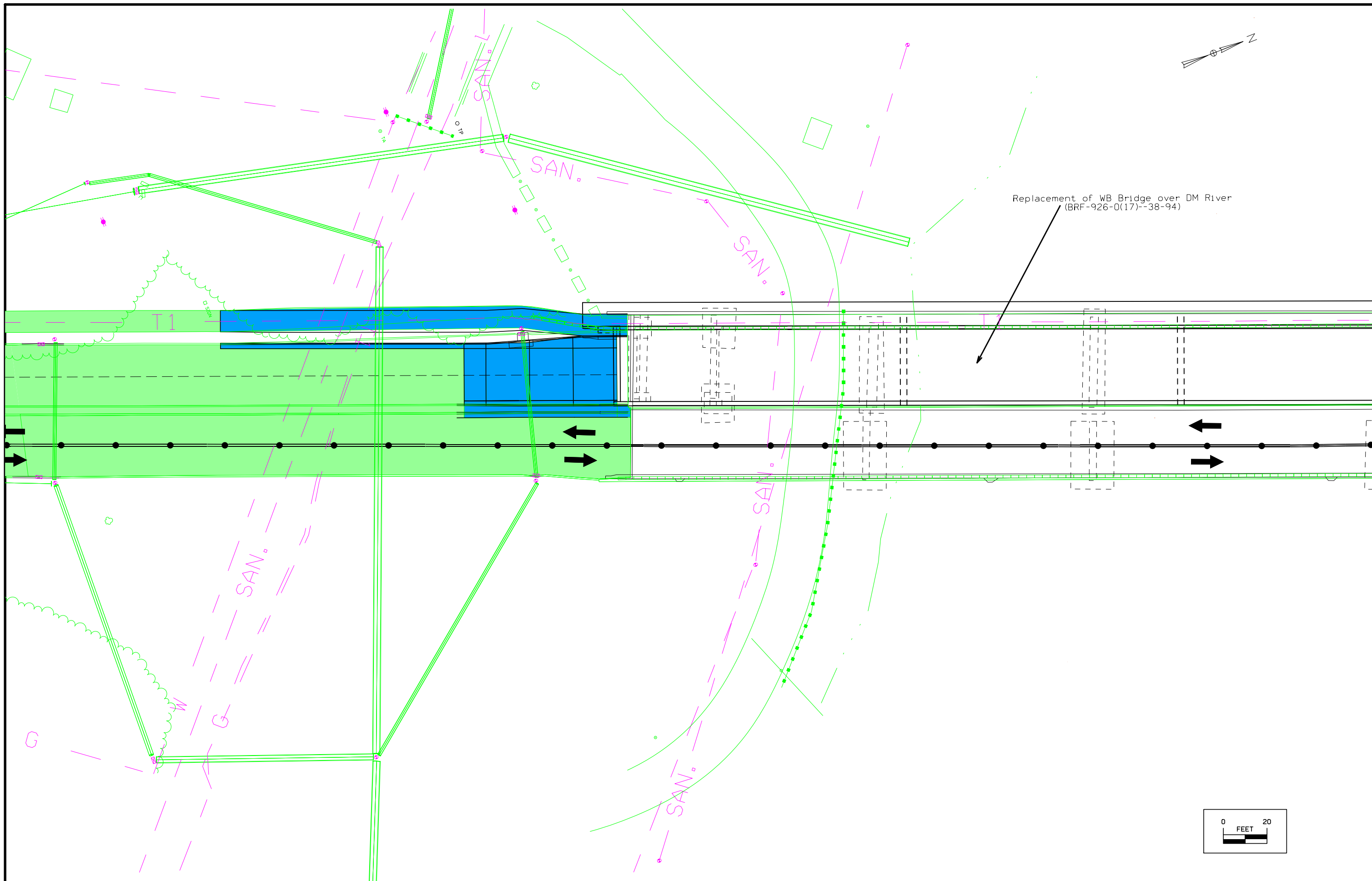
	Channelizing Device		Crash Cushion (Temp or Perm)
	Drum		Traffic Signal
	Temporary Lane Separator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic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

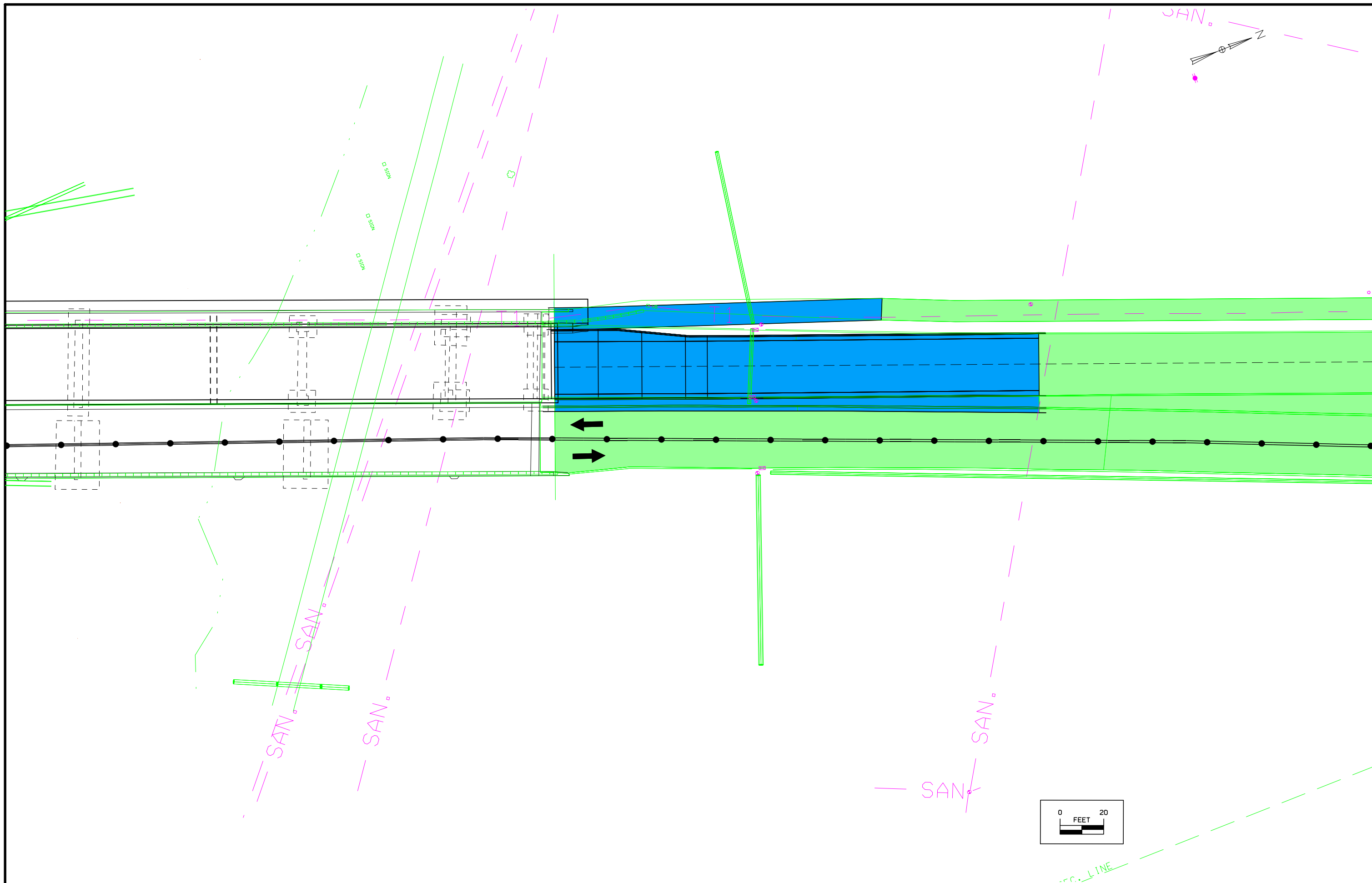
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

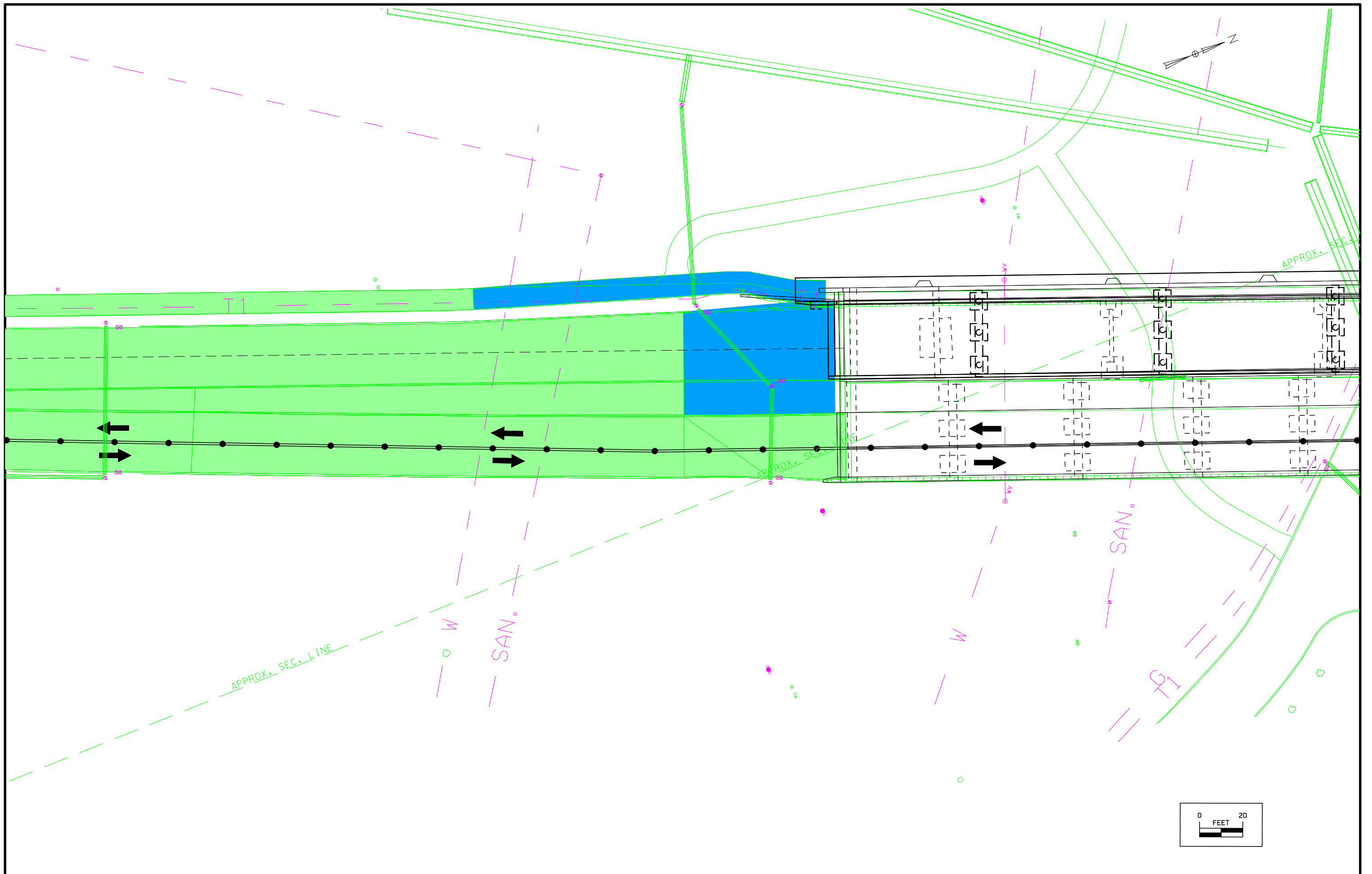
**TRAFFIC CONTROL  
AND  
STAGING  
LEGEND AND SYMBOL  
INFORMATION SHEET**

(COVERS SHEET SERIES J)

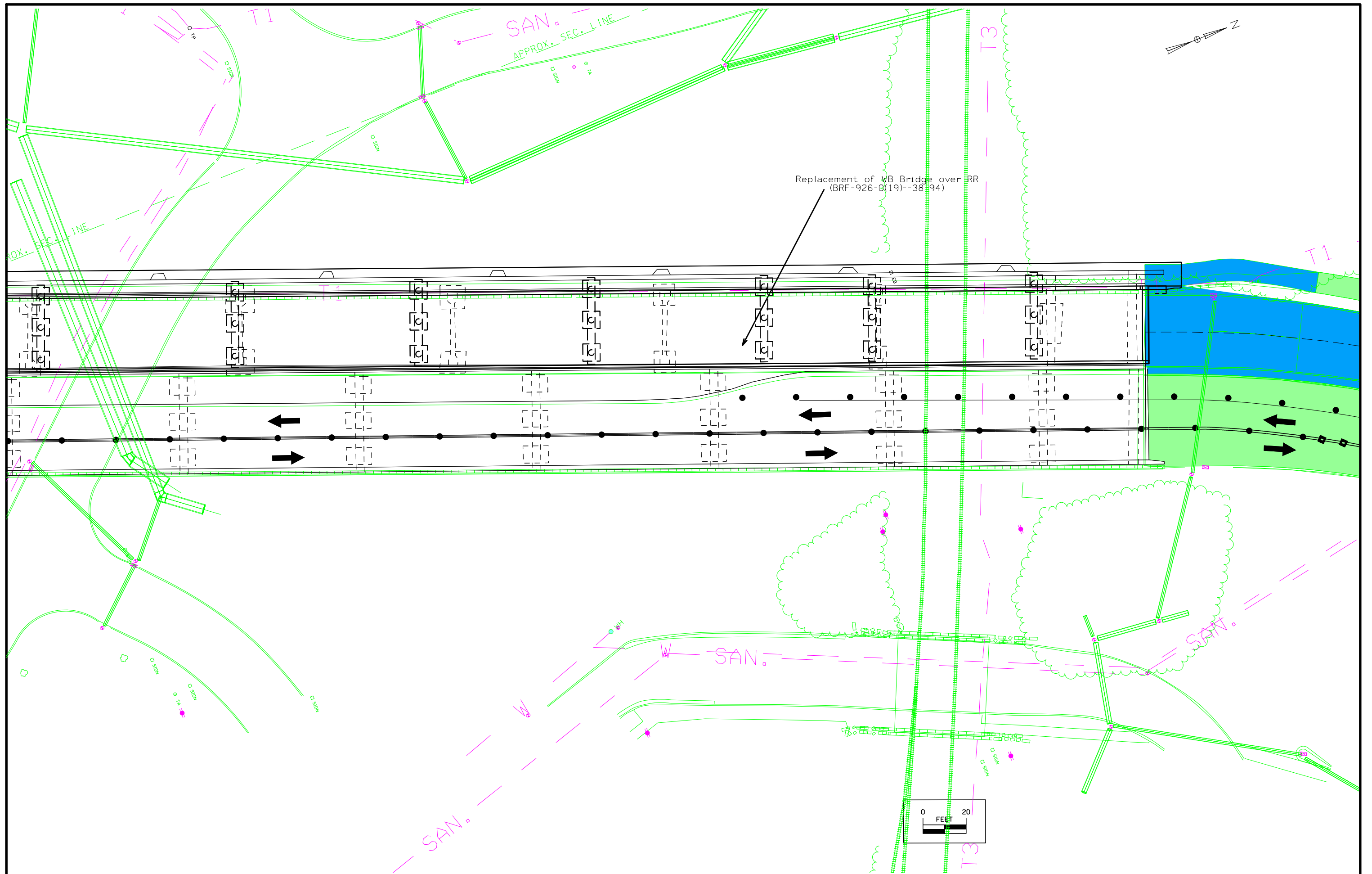


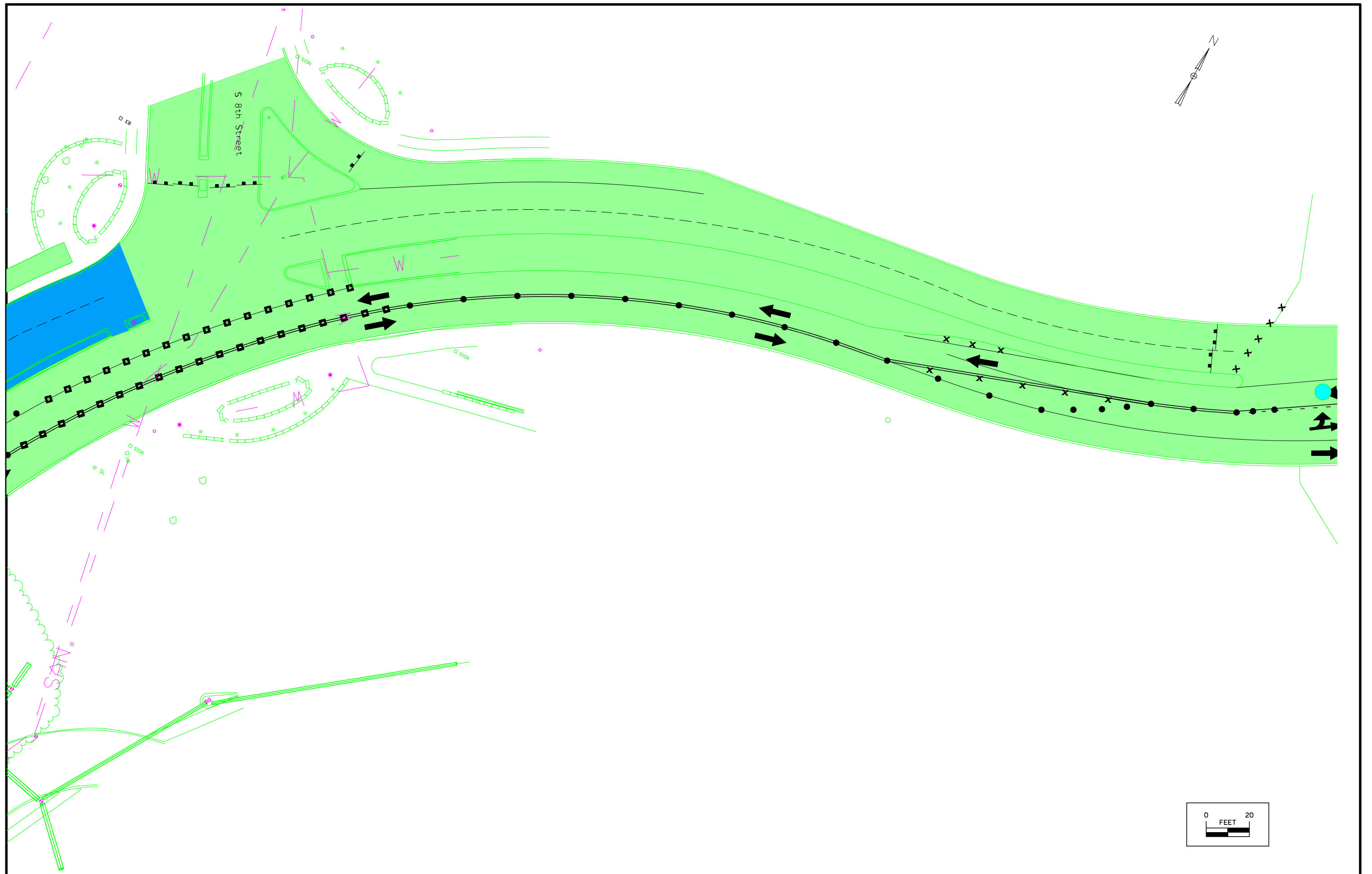


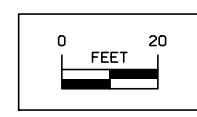
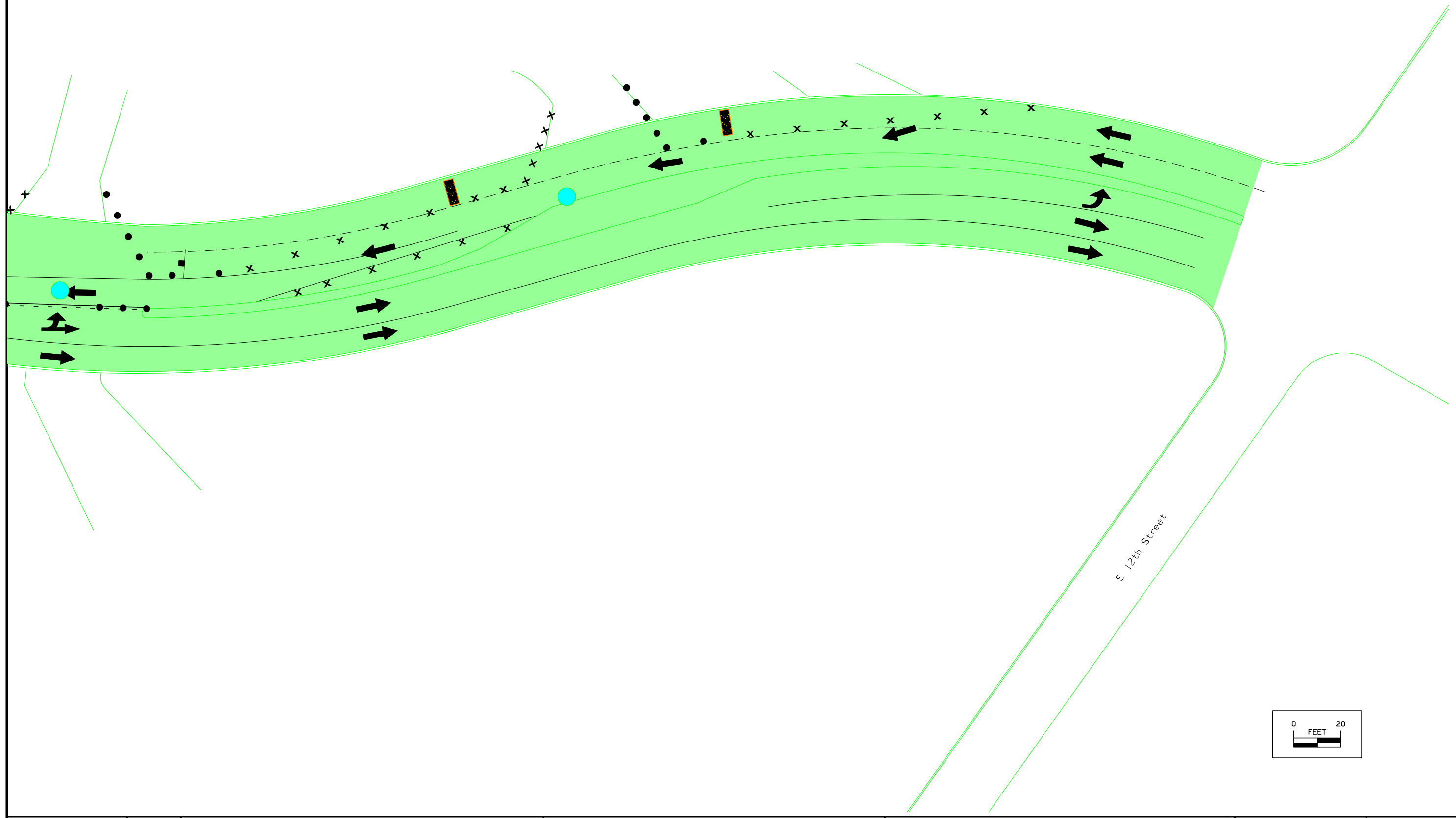
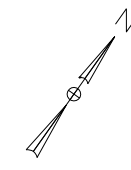




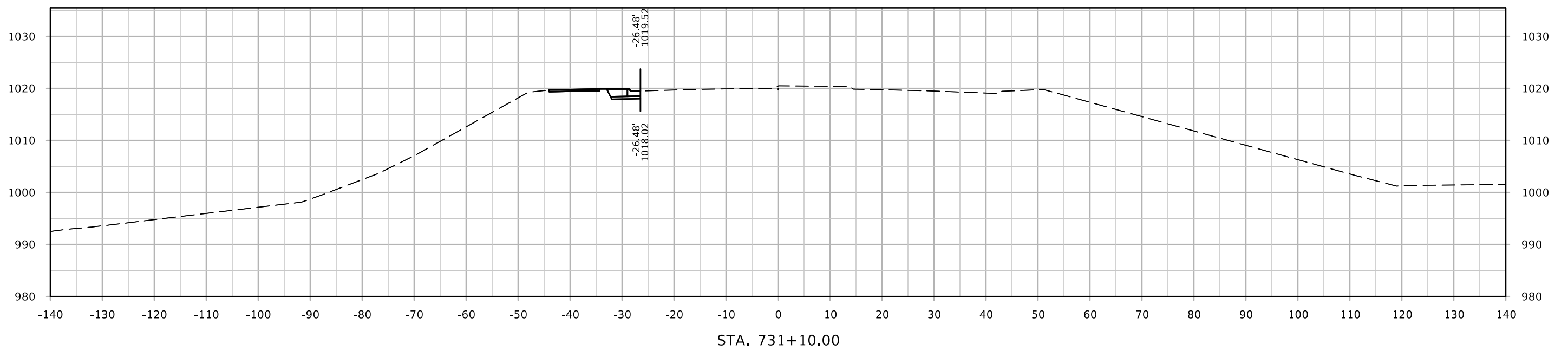
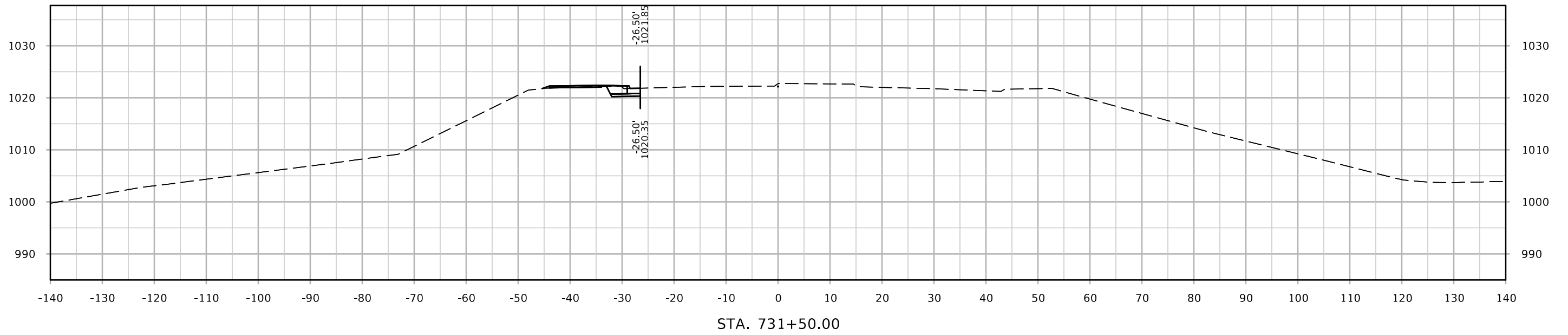




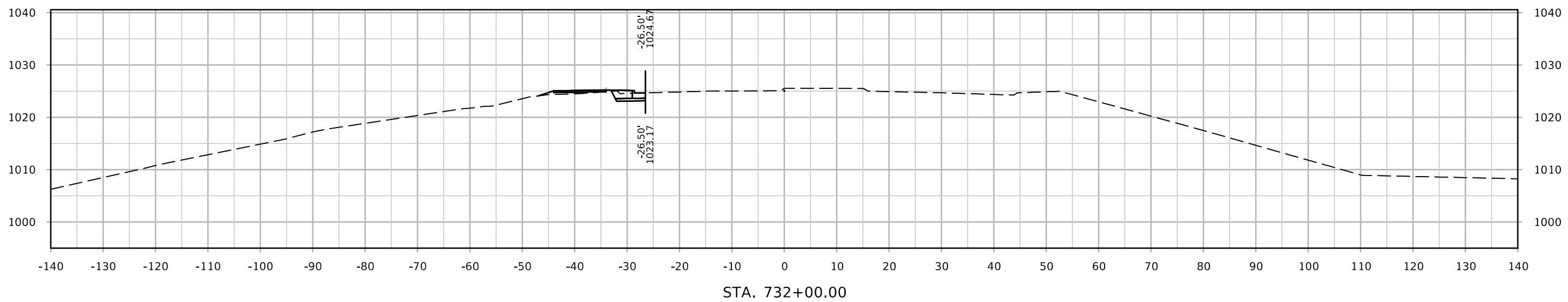
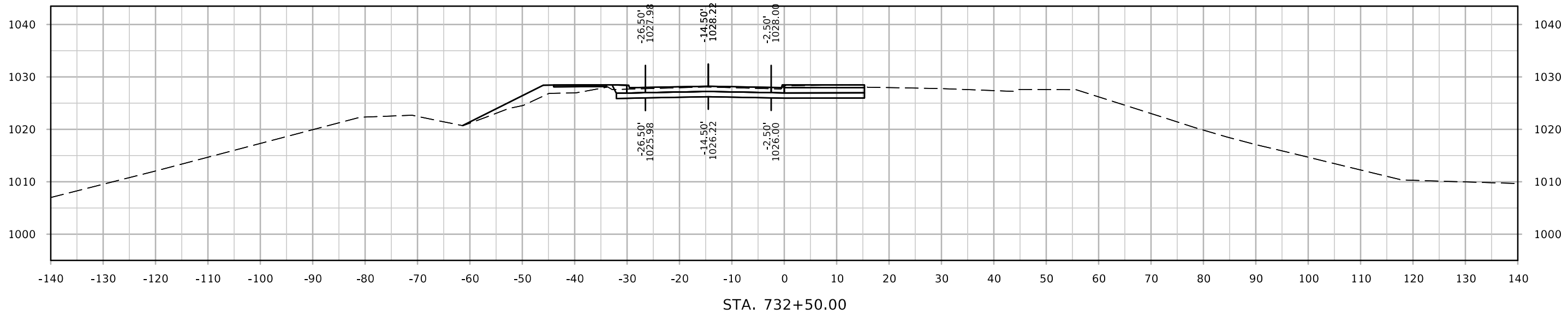




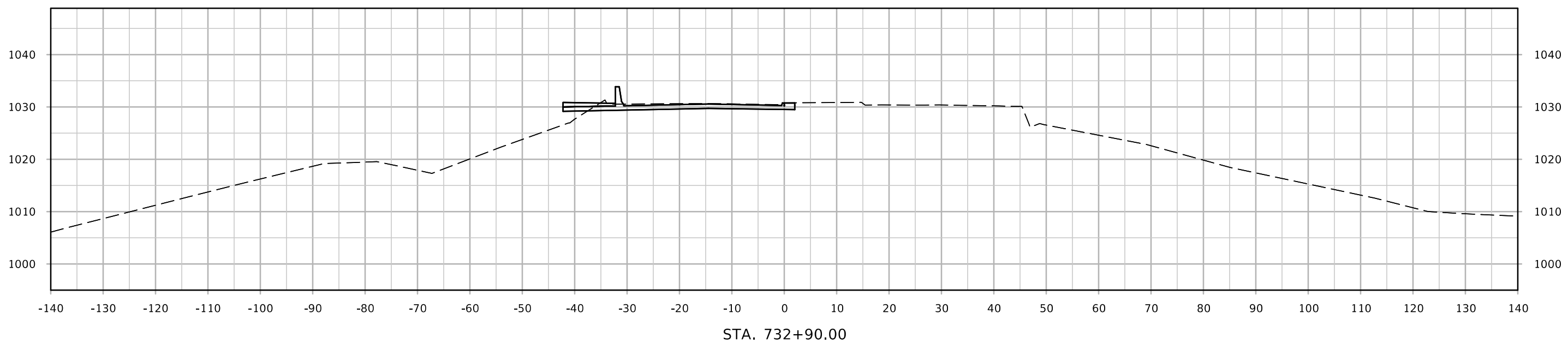
# ML - IA 926



# ML - IA 926

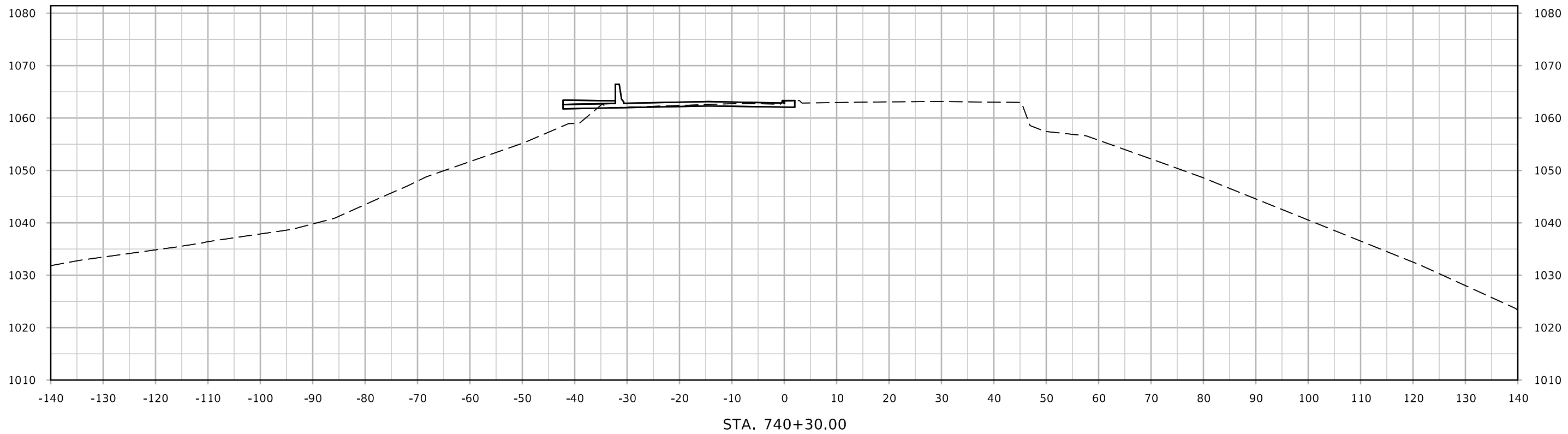
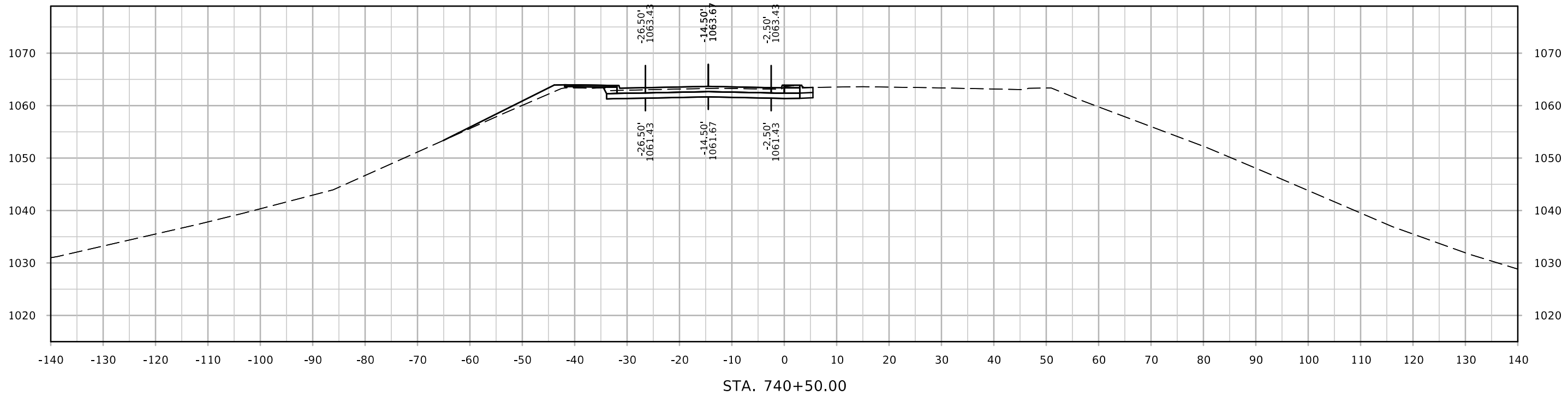


# ML - IA 926

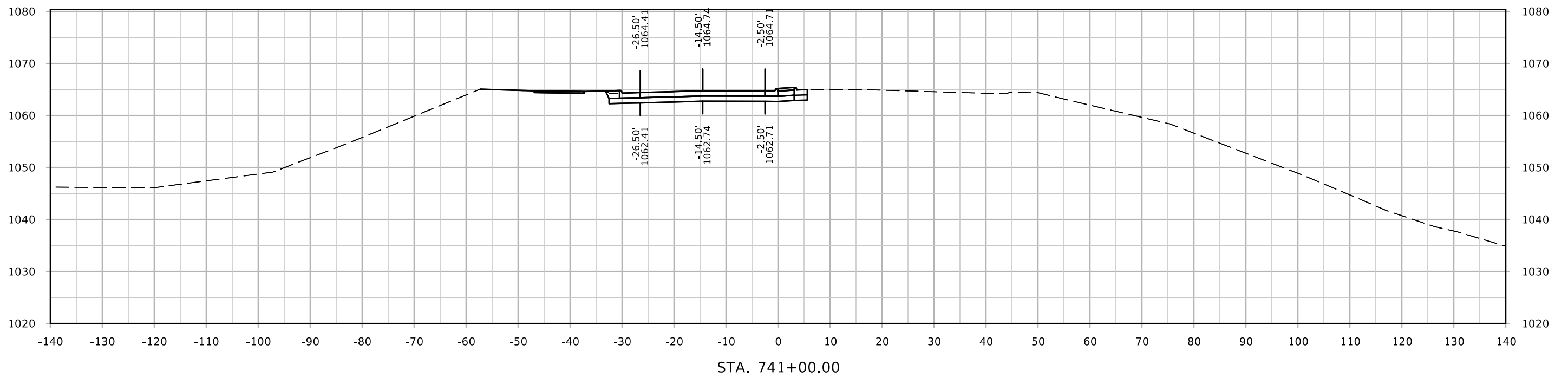
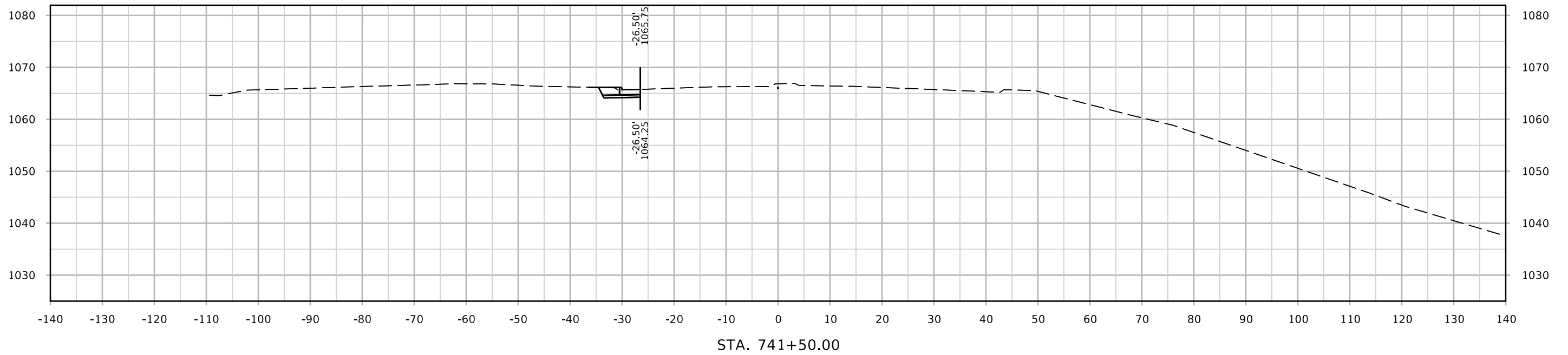


STA. 732+90.00

# ML - IA 926



# ML - IA 926





# ML - IA 926

