

BRIDGE REPLACEMENT-PPCB  
BRF-926-0(17)--38-94

WEBSTER COUNTY

LETTING DATE  
07-18-2023



PLANS OF PROPOSED IMPROVEMENT ON THE  
**PRIMARY ROAD SYSTEM  
WEBSTER COUNTY**  
**BRIDGE REPLACEMENT-PPCB**  
Business U.S. 20 (IA 926) westbound bridge over the  
Des Monies River and B Ave, 1.3 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.



REVISIONS

TOTAL

36

PROJECT IDENTIFICATION NUMBER

18-94-926-010

PROJECT NUMBER

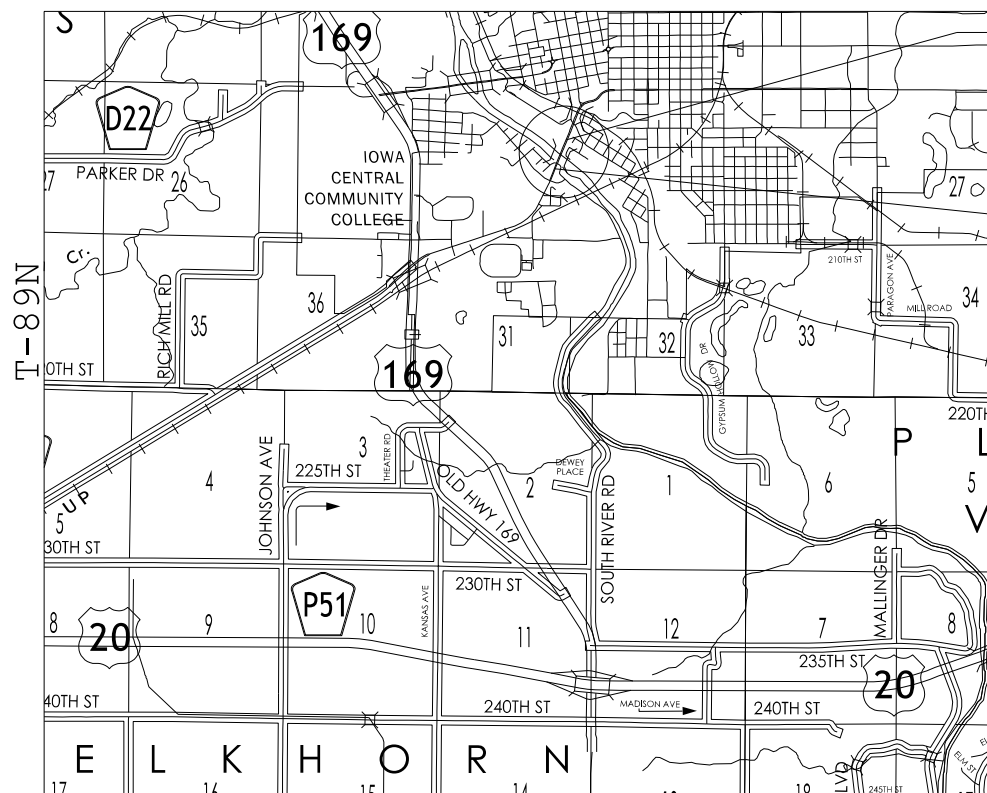
BRF-926-0(17)--38-94

R.O.W. PROJECT NUMBER

STPN-926-0(18)--2J-94

**INDEX OF SHEETS**

No.	DESCRIPTION
<b>A Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet
A.2 - 7	Concept
A.8	Crash Data
A.9 - 11	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 - 10	Mainline Cross Sections * Color Plan Sheets



END PROJECT  
STA. 727+75.00

BEGIN PROJECT  
STA. 718+00.00  
FHWA No. 052081  
Maint. No. 9401.3L926



**DESIGN DATA RURAL**

2023	AADT	15500	V.P.D.
2043	AADT	15800	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: 07-07-2021**

FILE NO.

ENGLISH

DESIGN TEAM Jia \ Cooper \ Homan

WEBSTER COUNTY

PROJECT NUMBER BRF-926-0(17)--38-94

SHEET NUMBER A.1

IOWA DEPARTMENT OF TRANSPORTATION

**TO OFFICE:** District 1  
**ATTENTION:** Tony Gustafson  
**FROM:** John E. Bartholomew  
**BUREAU:** Design  
**SUBJECT:** Project Concept Statement; (Final, D0)

**DATE:** April 27, 2020  
**PROJECT:** Webster County  
 BRF-926-0(17)--38-94  
 PIN: 18-94-926-010

This project involves the replacement of the Business US 20 (IA 926) bridge (Maint. No. 9401.3L926) over the Des Moines River and B Ave., 1.3 miles north of the south junction of U.S. 169 in Fort Dodge.

A concept review was held on November 12, 2019. Those present included Allison Smyth and Mike Roller from District 1; Dave Mulholland from the Bridges and Structures Bureau; Brandon Walls from the Location and Environment Bureau and John Bartholomew and Hollie Richey from the Design Bureau.

The two alternatives considered were:

1. Replace with a pretensioned prestressed concrete beam bridge utilizing crossovers. The estimated cost for this alternative is \$4,912,200.
2. Replace with a pretensioned prestressed concrete beam bridge utilizing an offsite detour. The estimated cost for this alternative is \$4,912,200.

Alternative 1 is the preferred alternative due to public preference. A public meeting was held February 18th 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 (see attached concept for details). Additional right of way may be required. Traffic will be maintained by crossovers.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Thursday, April 23, 2020. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2023. The Bridges and Structures Bureau will coordinate plan preparation with assistance from the Design Bureau.

JEB:hsr  
 Attach.  
 cc:  
 C. Purcell  
 S. J. Megivern  
 M. Nop  
 K. Brink  
 J. W. Laaser-Webb  
 E. C. Wright  
 N. M. Miller  
 B. E. Azeltine  
 S. Anderson  
 K. K. Patel  
 D. R. Claman  
 M. E. Khoda  
 M. Roller  
 V. Brewer  
 J. Garton  
 A. Loonan  
 FHWA

M. J. Kennerly	K. D. Nicholson
J. S. Nelson	B. Walls
M. A. Swenson	R. A. Younie
D. L. Newell	D. Mulholland
W. A. Sorenson	D. E. Sprengeler
M. E. Ross	A. A. Welch
C. C. Poole	B. Hofer
T. D. Crouch	S. J. Gent
P. C. Keen	J. Selmer
S. Godbold	J. Vortherms
J. Hauber	A. Abu-Hawash
K. Olson	S. Neubauer
S. Nixon	S. Ebel
M. Carlson	M. Donovan
T. J. Gustafson	J. Lavine
L. Starbuck	A. Smyth

FINAL PROJECT CONCEPT STATEMENT

Business U.S. 20 (IA 926) westbound bridge over the Des Moines River and B Ave., 1.3 miles north of the south junction of U.S. 169 in Fort Dodge.

Webster County  
BRF-926-0(17)--38-94  
PIN: 18-94-926-010  
Maint. No. 9401.3L926  
FHWA No. 52081

Highway Division  
Design Bureau

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

April 27, 2020

Webster County  
BRF-926-0(17)--38-94  
PIN: 18-94-926-010  
Page 2

substructure is rated 5 and has delamination and cracking. The bridge was designed for live loads below current standards. 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) westbound bridge (Maint. No. 9401.3L926) over the Des Moines River and B Ave., 1.3 miles north of the south junction of U.S. 169 in Fort Dodge.

The two alternatives considered were:

1. Replace with a pretensioned prestressed concrete beam bridge utilizing crossovers. The estimated cost for this alternative is **\$4,912,200**.
2. Replace with a pretensioned prestressed concrete beam bridge utilizing an offsite detour. The estimated cost for this alternative is **\$4,912,200**.

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.

B. Need for Project

The existing structure is a 560 ft. 7 in. x 33 ft. deck truss bridge that was built in 1935 and reconstructed in 1977 with PPCB approach spans. It is a Fracture Critical structure. The steel beams have corrosion, section loss, cracks, and pack rust. The

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 structure is a 560 ft. 7 in. x 33 ft. pretensioned prestressed concrete beam and steel truss bridge with a 5 ft. sidewalk, constructed in 1935 and reconstructed in 1977. The bridge sufficiency rating is 83.

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.

Webster County  
BRF-926-0(17)--38-94  
PIN: 18-94-926-010  
Page 3

Webster County  
BRF-926-0(17)--38-94  
PIN: 18-94-926-010  
Page 4

F. Crash History

During the five-year study period from January 1, 2014 through December 31, 2018, there were 24 crashes including, 2 personal injury crashes and 22 personal property crashes.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a pretensioned prestressed concrete beam bridge utilizing crossovers

The existing 560 ft. 7 in. x 33 ft. pretensioned prestressed concrete beam and steel truss bridge with a 5 ft. sidewalk that is carrying westbound traffic, will be replaced with a 4 span, 571 ft. x 33 ft. pretensioned prestressed concrete beam (PPCB) 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.

This bridge will be constructed on the existing vertical and horizontal alignment. New bridge approaches will be constructed along with raised median and curb and gutter for the approach sections. Intakes will be removed and replaced. Fencing will be removed and replaced. Steel sheet piling will be required to retain the earth between the ends of the northbound and southbound bridge abutments. Erosion stone or equivalent 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.

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	\$ 2,862,800
Aesthetic Treatment	85,900
Bridge Removal	356,900
Cofferdams	75,000
Steel Sheet Pile for Abutments	18,000
Mobilization - 10%	339,900
Contingency - 20%	<u>747,700</u>
<b>Bridge Costs</b>	<b>\$ 4,486,200</b>

<b>Roadway Items</b>	
Bridge Approaches	\$96,500
Removal of Pavement	7,400
Curb and Gutter - Removal and Replacement	10,500
Median - Remove and Replace	22,400
Sidewalk - Remove and Replace	26,900
Excavation Class 13 Waste	13,700
Fence - Remove and Replace	800
Intakes - Remove and Replace	14,900
Seeding and Fertilizing	2,500
Right of Way	10,000
Erosion Control	50,000
Traffic Control - 5%	21,300
Mobilization - 5%	21,300
M & C - 30%	<u>127,800</u>
<b>Roadway costs</b>	<b>\$ 426,000</b>

**Project Total** **\$4,912,200**

Alternative #2 - Replace with a pretensioned prestressed concrete beam bridge utilizing 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 more/less or more 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.

Right of Way may be required for this project.

The Location and Environment Bureau has reviewed this project. The replacement of this bridge will require a 404 Permit but it is expected to be a routine Nationwide Permit 14. As no potential wetlands are observable in the project vicinity and the channel of the Des Moines River is relatively straight and stable at this location, no significant impacts to regulated natural resources are anticipated from construction of this project and no stream or wetland mitigation is anticipated to be necessary. It should be noted that the Des Moines River is a Sovereign River and will require a Sovereign Lands Permit.

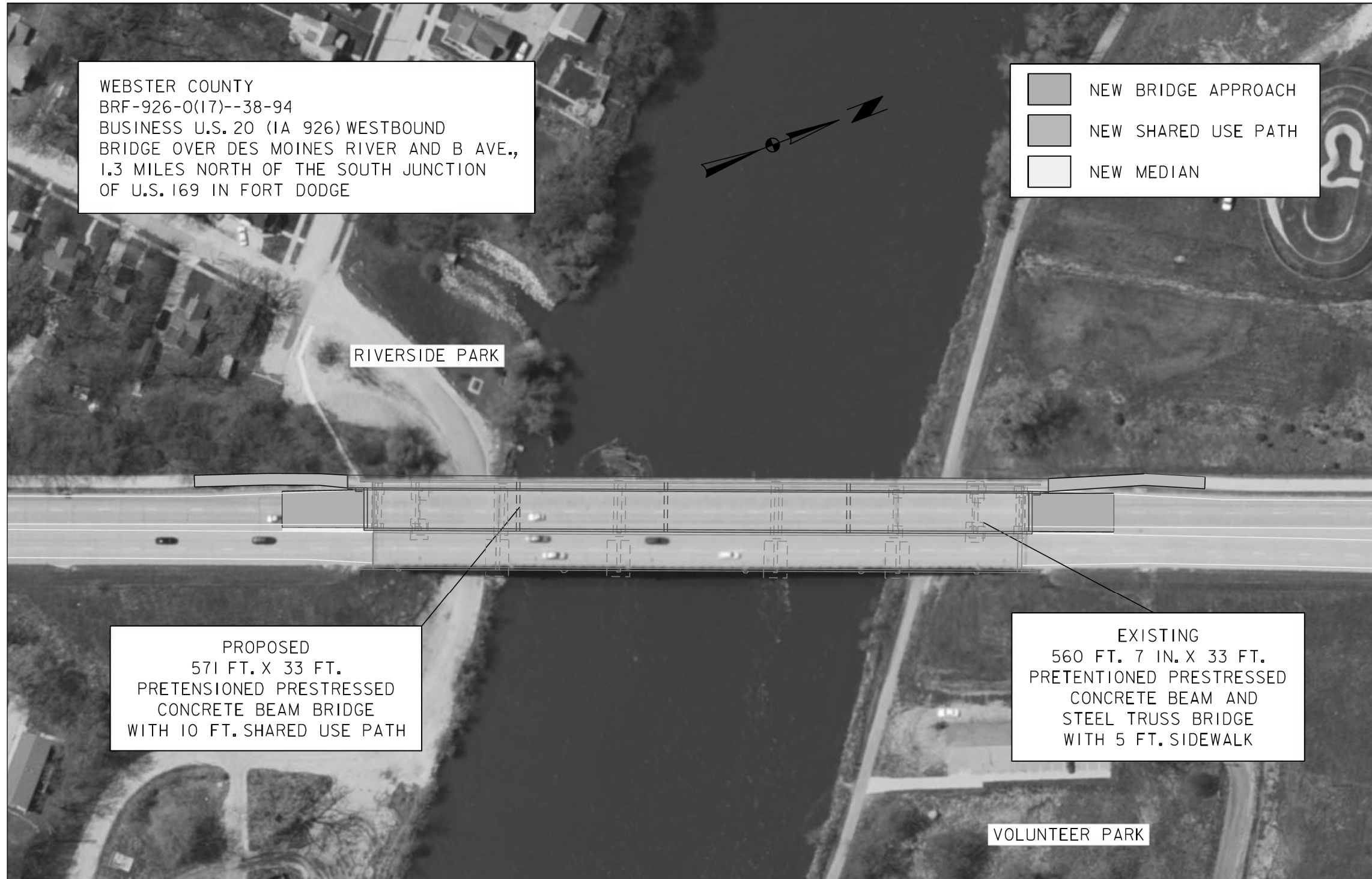
Volunteer Park is located in the northeast corner of the project and Riverside Park is in the southwest corner. Any right of way impacts to the parks will require a Section 4F review and therefore should be avoided if possible.

In compliance with Section 7 of the Endangered Species Act of 1973, a review of the project area shows a state threatened fish species, mudpuppy (*Necturus maculosus*), just downstream of the project. Further review is required when more project details are known and coordination with the Iowa Department of Natural Resources will be required to see if any timing restrictions in the water are required.

G. Program Status

This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with \$6,500,000 programmed for 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



WEBSTER COUNTY  
 BRF-926-0(17)--38-94  
 BUSINESS U.S. 20 (IA 926) WESTBOUND  
 BRIDGE OVER DES MOINES RIVER AND B AVE.,  
 1.3 MILES NORTH OF THE SOUTH JUNCTION  
 OF U.S. 169 IN FORT DODGE

- NEW BRIDGE APPROACH
- NEW SHARED USE PATH
- NEW MEDIAN

RIVERSIDE PARK

PROPOSED  
 571 FT. X 33 FT.  
 PRETENSIONED PRESTRESSED  
 CONCRETE BEAM BRIDGE  
 WITH 10 FT. SHARED USE PATH

EXISTING  
 560 FT. 7 IN. X 33 FT.  
 PRETENSIONED PRESTRESSED  
 CONCRETE BEAM AND  
 STEEL TRUSS BRIDGE  
 WITH 5 FT. SIDEWALK

VOLUNTEER PARK

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 Des Moines River

County: Webster  
Project No.: BRF-926-0(17)- -38-94  
Pin No.: 18-94-926-010

1. Regulatory/Coordination
  - a. Iowa DNR Flood Plain permit = Yes
  - b. Iowa DNR Sovereign Lands permit = Yes
  - c. Local Record of Coordination = Yes
  - d. Flood Insurance Study = Yes. Zone AE 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 = Yes (Webster County FIS)
  - b. Hydraulic analysis done = Yes (HEC-RAS modeled obtained from DNR)
  - c. Riverine Infrastructure Database (RIDB) = Yes, an RIDB dataset will be developed as part of this project.
  - d. Project development hydraulic analysis will comply with the RIDB Guidelines at a minimum.
3. Structure/Roadway Layout Considerations
  - a. Maintain 2 inch separation between SB and NB bridges.
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.



Crash Severity	6
Fatal Crash	0
Suspected Serious Injury Crash	0
Suspected Minor Injury Crash	0
Possible/Unknown Injury Crash	1
Property Damage Only	5

Property/Vehicles/Occupants	
Property Damage Total (dollars):	16,150.00
Average (per crash dollars):	2,691.67
Total Vehicles:	11.00
Average (per crash):	1.83
Total Occupants:	16.00
Average (per crash):	2.67

Injury Status Summary	1
Fatalities	0
Suspected serious/incapacitating	0
Suspected minor/non-incapacitating	0
Possible (complaint of pain/injury)	1
Unknown	0

Average Severity	
Fatalities/Fatal Crash:	0.00
Fatalities/Crash:	0.00
Injuries/Crash:	0.17
Major Injuries/Crash:	0.00
Minor Injuries/Crash:	0.00
Possible/Unknown Injuries/Crash:	0.17



Major Cause	6
Animal	0
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...	1
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	0
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	0
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)	0
Traveling wrong way or on wrong side of road	0
Driving too fast for conditions	1
Improper or erratic lane changing	1
Followed too close	2
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>	18-94-926-010	<b>Submittal Date</b>		
<b>Project Number</b>	BRF-926-0(17)--38-94	<b>Approval Date</b>		
<b>District</b>	District 1	<b>Assistant District Engineer</b>	Allison Smyth	
<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 the Des Moines River and B Ave., 1.3 miles north of the south junction of U.S. 169 in Fort Dodge			
<b>Work Type</b>				
<b>Segment Manager</b>	Yanxiao Jia			
<b>Designer</b>	Adam Dewolf / Harrison Cooper			
Design Manual Section 1C-1 Last Updated: 04-29-19				
<b>Urban Multilane Roadways (Urban Arterials)</b>				
	<b>Design Element</b>	<b>Preferred</b>	<b>Acceptable Criteria</b>	<b>Project Values</b>
	Design speed (mph)	The anticipated posted speed limit	30	45
	Maximum superelevation rate (Refer to Section 2A-2)	4%	8%	N/A
	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	N/A
	Left turn lane (ft)	With raised or painted median	12 ft + median	N/A
		With depressed median	12	10
	Two-way left turn lane (ft)	14	11	N/A
	Parking lane width (ft)	10	7	N/A
	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
		Auxiliary and turn lanes	3%	3% maximum
		Crown break at centerline	4%	4% maximum
	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	N/A
	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'
	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**
		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**
	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 = 15,800**

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		6		0		N/A	
Turn lanes with curbs	6		See Section 3C-2		6		0		N/A	
Expressways	Outside		Median Side		Outside		Median Side		3.5'	
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	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	3.5'	
On roadways approaching urban areas (due to increased bike traffic)	10	10	6	6		On all other Expressways (Multilane Arterials)	8	0*		4
On all curves with a superelevation rate of 7.0% or greater	10	10	6	6			8	0*		4
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:**

Match existing roadway cross section
** Design Manual 6D-1 Table 7 - K Value meets the guidance for sag vertical curves based on driver comfort. Roadway also has fixed lighting.

Roadway Design Speed (mph) = 50 mph

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

Design Criteria for Low Speed Roadways

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	278'						
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					N/A					
	Method 5 superelevation and side friction distribution	e <sub>max</sub> = 6%					144	231	340	485	643	144	231	340	485	643	N/A
		e <sub>max</sub> = 8%					--	--	--	--	--	134	214	314	444	587	N/A
Minimum vertical curve length (ft) (Refer to Section 2B-1)	75	90	105	120	135	75	90	105	120	135	290'						
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	N/A				
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	N/A				
		roadways with fixed-source lighting	26	37	49	64	79	14	20	27	35	44	56				
Minimum gradient (%) (Refer to Section 2B-1)	0.5					0.3% with a curb, 0.0% without a curb					1.6						
Maximum gradient (%) (Refer to Section 2B-1)	Urban roadways		5					--	9	8	8	7	6.5				
	Rural roadways							--	--	--	6	6	N/A				
Clear zone	See "Preferred Clear Zone" table in Section 8A-2					See "Acceptable Clear Zone" table in Section 8A-2											

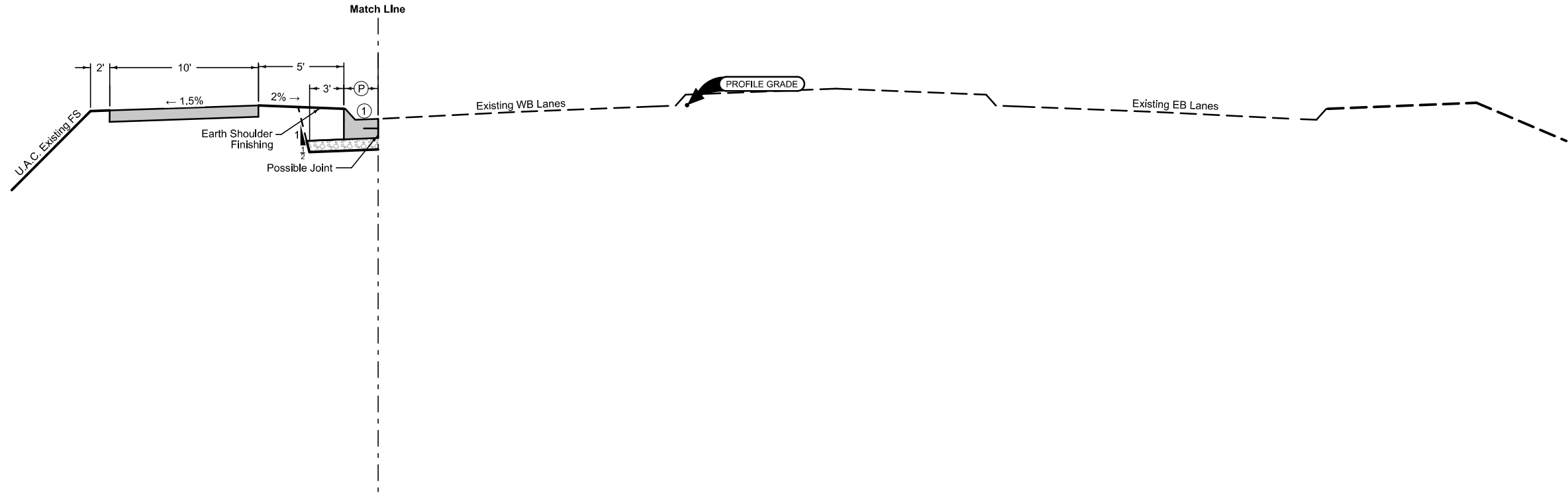
### Curbed Shoulder

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

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

STATION TO STATION		(P) Feet	Curb Type See PV-102
718+00.00	719+11.60	2.5	6" Std

① Match existing cross slope

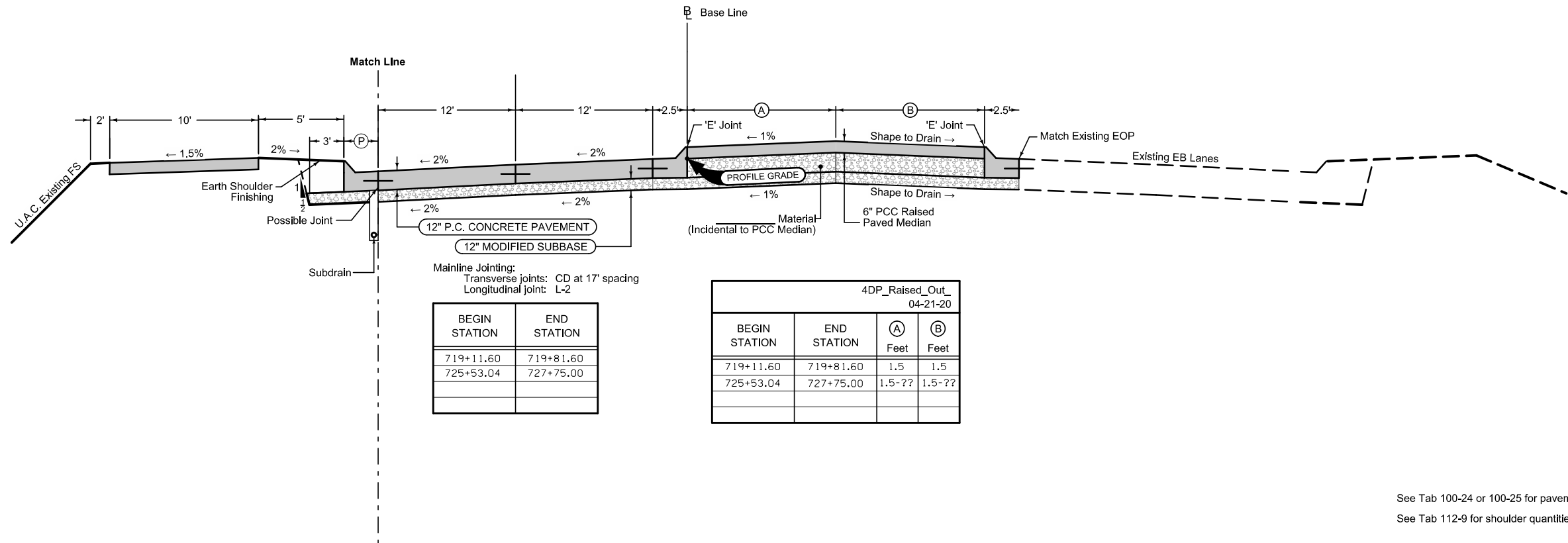


### Curbed Shoulder

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
719+11.60	719+40.23	2.5	6" Std
719+40.23	719+66.02	2.5-5.5	6" Std
719+66.02	719+81.60	5.5	6" Std
725+53.04	725+81.41	5.5	6" Std
725+81.41	726+14.92	5.5-2.5	6" Std
726+14.92	727+75.00	2.5	6" Std



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

BEGIN STATION	END STATION
719+11.60	719+81.60
725+53.04	727+75.00

4DP_Raised_Out_04-21-20			
BEGIN STATION	END STATION	(A) Feet	(B) Feet
719+11.60	719+81.60	1.5	1.5
725+53.04	727+75.00	1.5-??	1.5-??

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

### SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- 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)
- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Satellite TV Dish
- Water Hook Up
- Radio Tower
- Tower Anchor
- Guardrail (Beam or Cable)
- Guard Post (one or two)
- Guard Post (over two)
- Filler Pipe
- Gas Valve
- Water Valve
- Speed Limit Sign
- Mile Marker Post
- SIGN Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

### UTILITY LEGEND

- SA1D Sanitary Sewer City of Fort Dodge - Quality D
- ST1D Storm Sewer City of Fort Dodge - Quality D
- WL1D Water Line City of Fort Dodge - Quality D
- Jeff Wood  
819 1st Avenue S  
Fort Dodge, IA 50501-4739  
jwood@fordodgeiowa.org  
(515) 955-6139
- FO1D Fiber Optic Frontier Communications - Quality D
- TL1D Telephone Line Frontier Communications - Quality D
- Trent Flockhart  
600 1st Avenue North  
Fort Dodge, IA 50501  
Trent.Flockhart@ftr.com  
(515) 573-1268
- GL1D Cable TV Line Mediacom Communications Corporation - Quality D
- Mike Lawler  
1225 2nd Ave. S  
Fort Dodge, IA 50501  
mlawler@mediacomcc.com  
(515) 955-6100
- PPA Power Pole MidAmerican Energy - Quality D
- EL1D Electric Line MidAmerican Energy - Quality D
- GL1D Gas Line MidAmerican Energy - Quality D
- GL2D Gas Line MidAmerican Energy - Quality D
- Brian Sewell  
4000 1st Ave. S  
Fort Dodge, IA 50501  
Brian.Sewell@midamerican.com  
(515) 574-5042
- GL3D Gas Line MidAmerican Energy - Quality D
- Matt Kovacic  
2811 5th Avenue  
Rock Island, IL 61201  
mskovacic@midamerican.com  
(309) 793-3704
- TL2D Telephone Line ICN Iowa Communication Network - 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.	
Lavender	(9)		Temporary Pavement Shading
Gray, Light	(48)		Proposed Pavement Shading
Gray, Med	(80)		Proposed Granular Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading

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

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

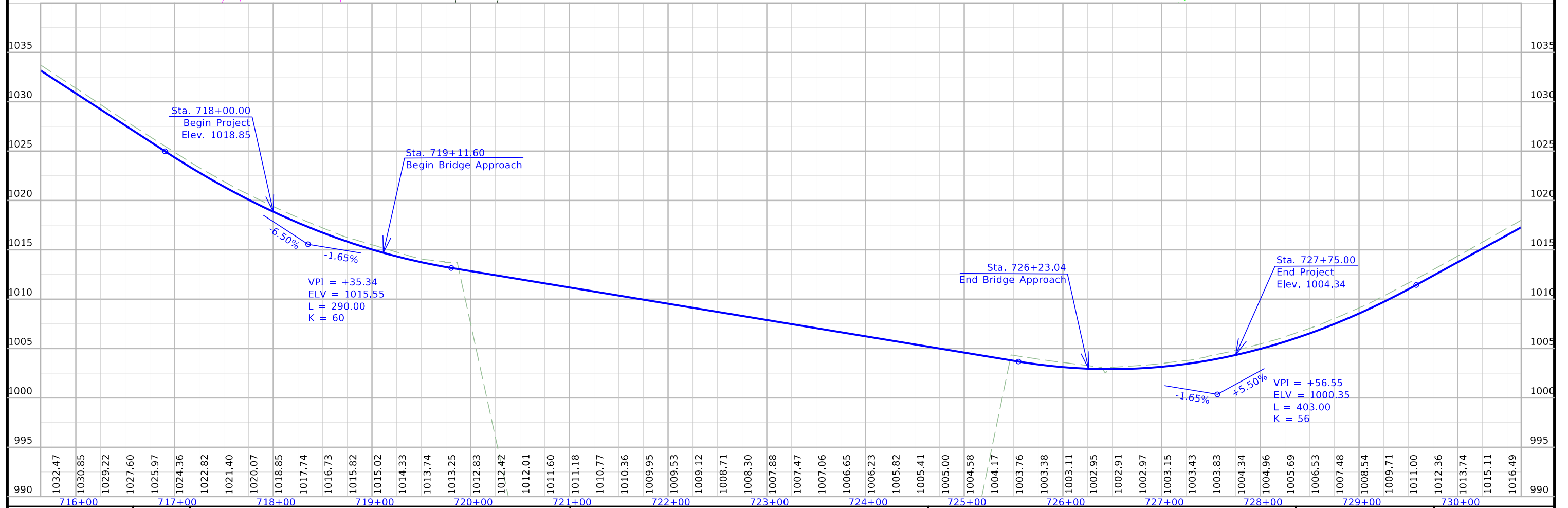
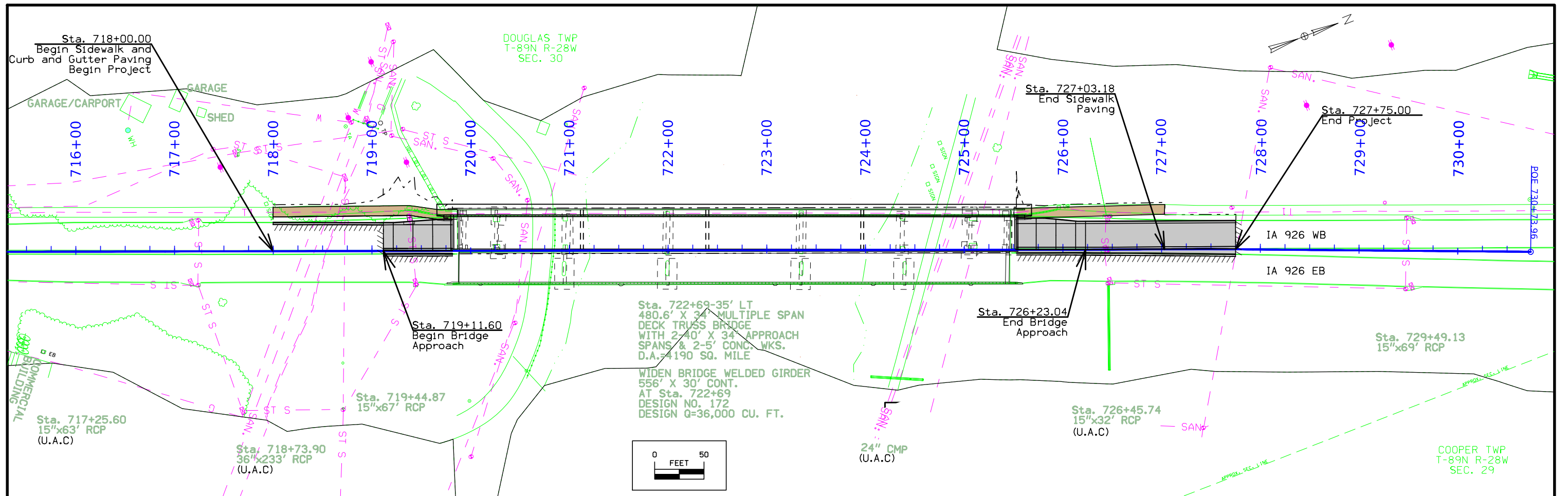
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

### RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- Access Control
- Property Line

## PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



FILE NO. -	ENGLISH	DESIGN TEAM Jia \ Dewolf \ Cooper	Webster COUNTY	PROJECT NUMBER BRF-926-0(17)--38-94	SHEET NUMBER D,2
------------	---------	-----------------------------------	----------------	-------------------------------------	------------------

## 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 laRTN 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 laRCS 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 laRTN 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.

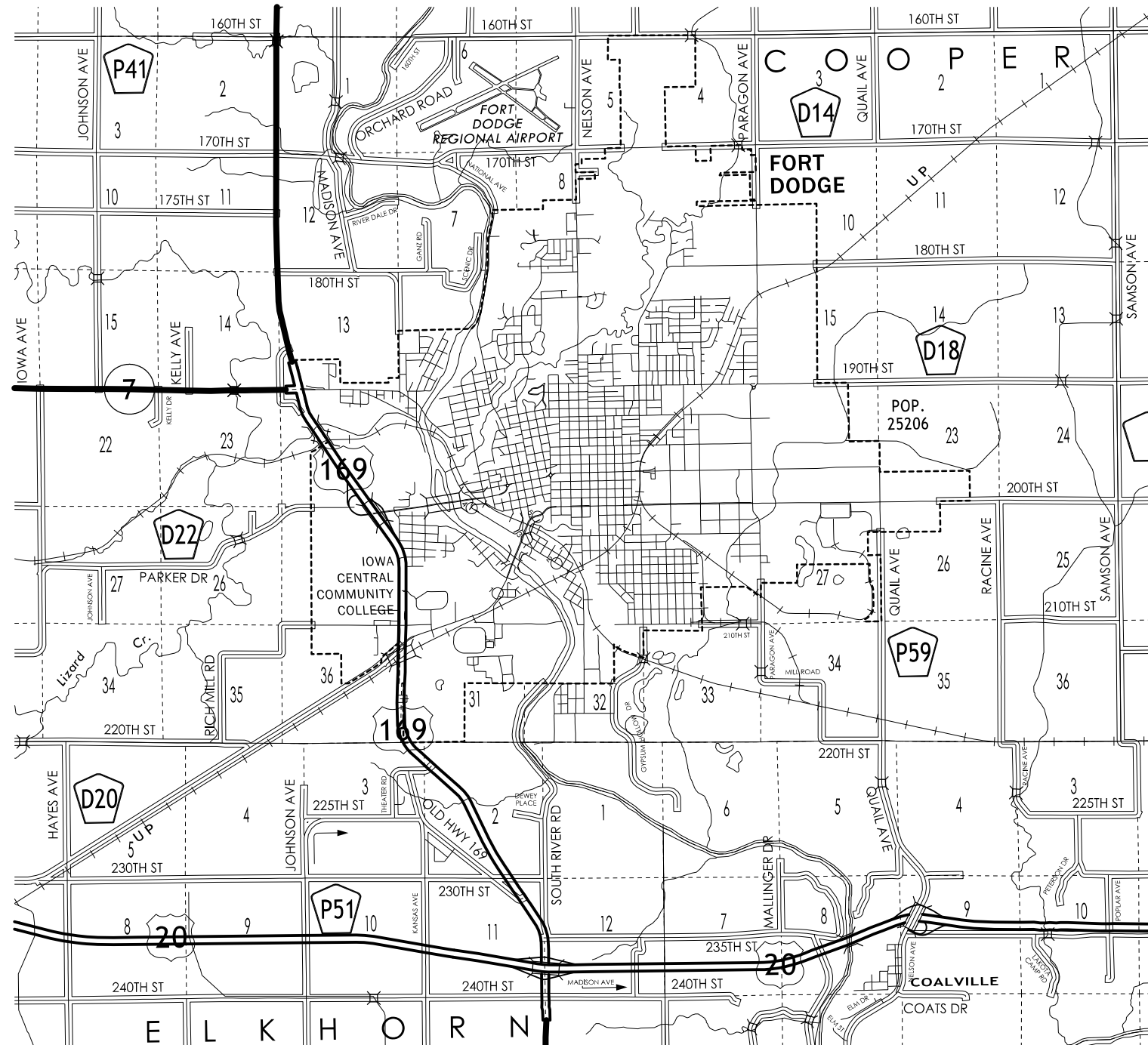
Utility Information  
Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

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" style="width: 100%;"> <tr> <th style="width: 50%;">Project</th> <th style="width: 50%;">Type of Work</th> </tr> <tr> <td>BRF-926-0(19)--38-94</td> <td>Bridge Replacement</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Project	Type of Work	BRF-926-0(19)--38-94	Bridge Replacement				
Project	Type of Work							
BRF-926-0(19)--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**

LINWORK	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

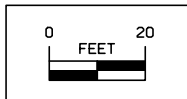
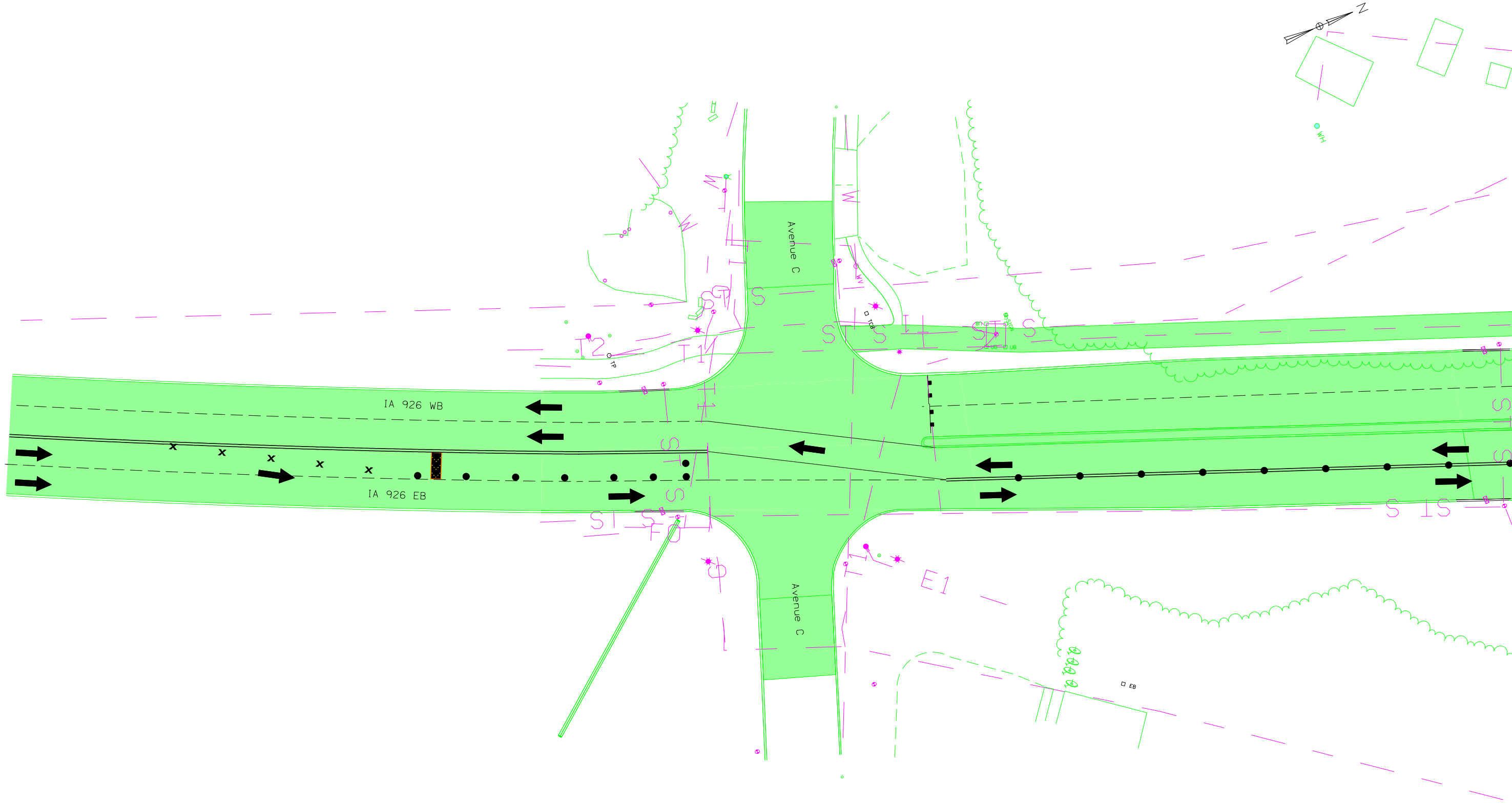
**PLAN VIEW PATTERN AND SYMBOL LEGEND  
OF TRAFFIC CONTROL AND STAGING SHEETS**

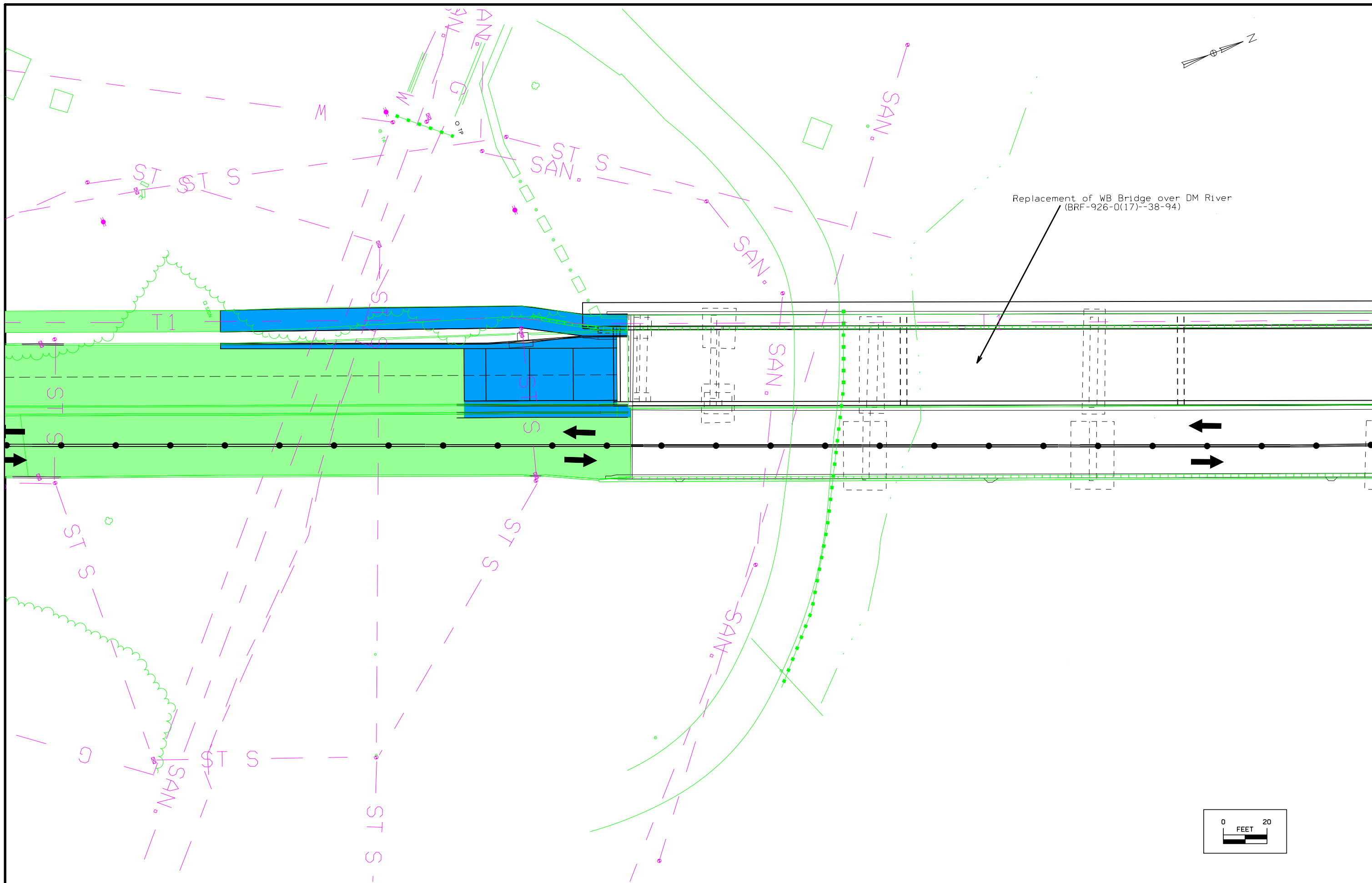
	Channelizing Device		Crash Cushion (Temp or Perm)
	Drum		Traffic Signal
	Temporary Lane Separator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic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

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

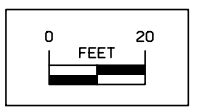
**TRAFFIC CONTROL  
AND  
STAGING  
LEGEND AND SYMBOL  
INFORMATION SHEET**

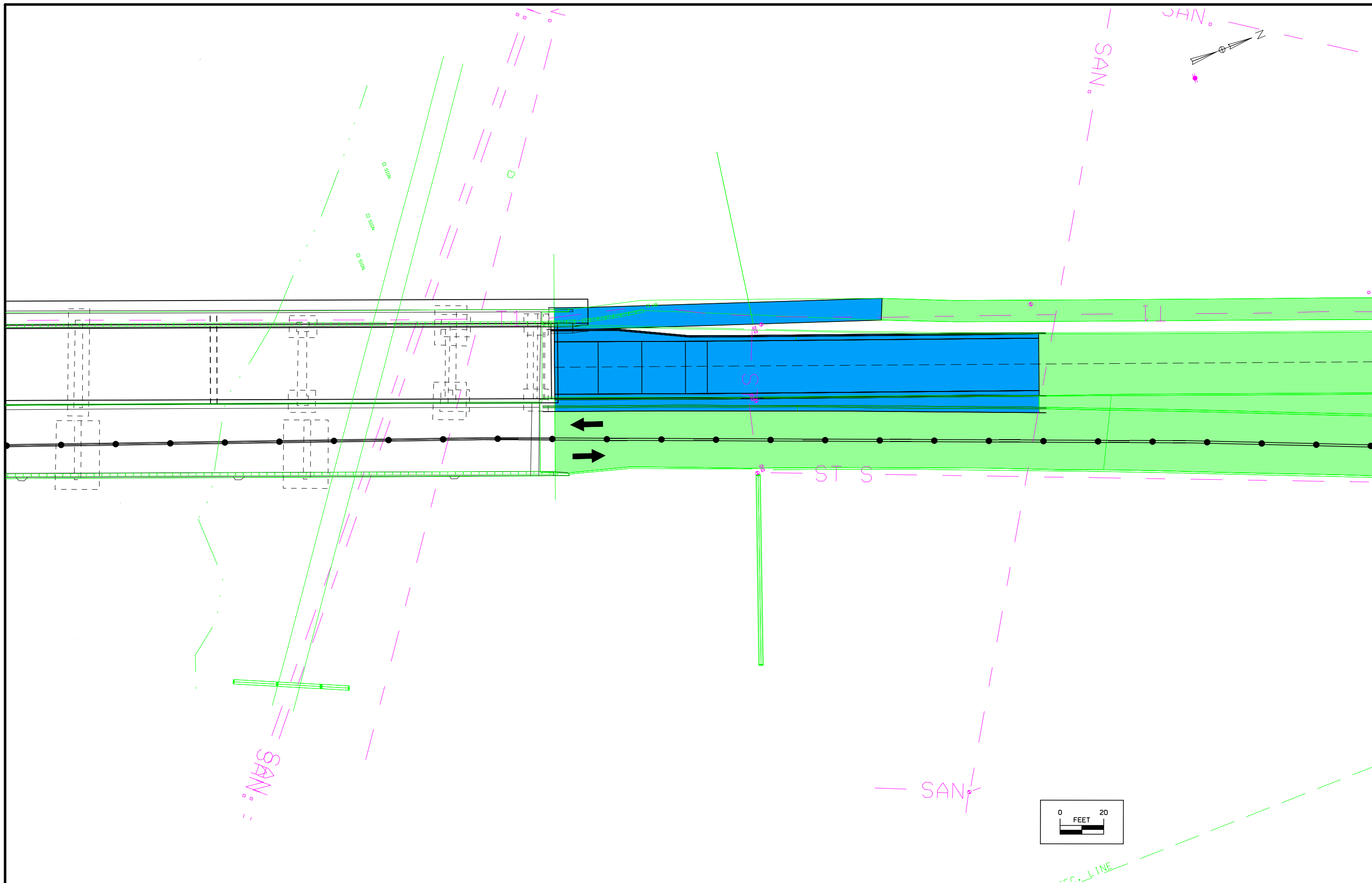
(COVERS SHEET SERIES J)

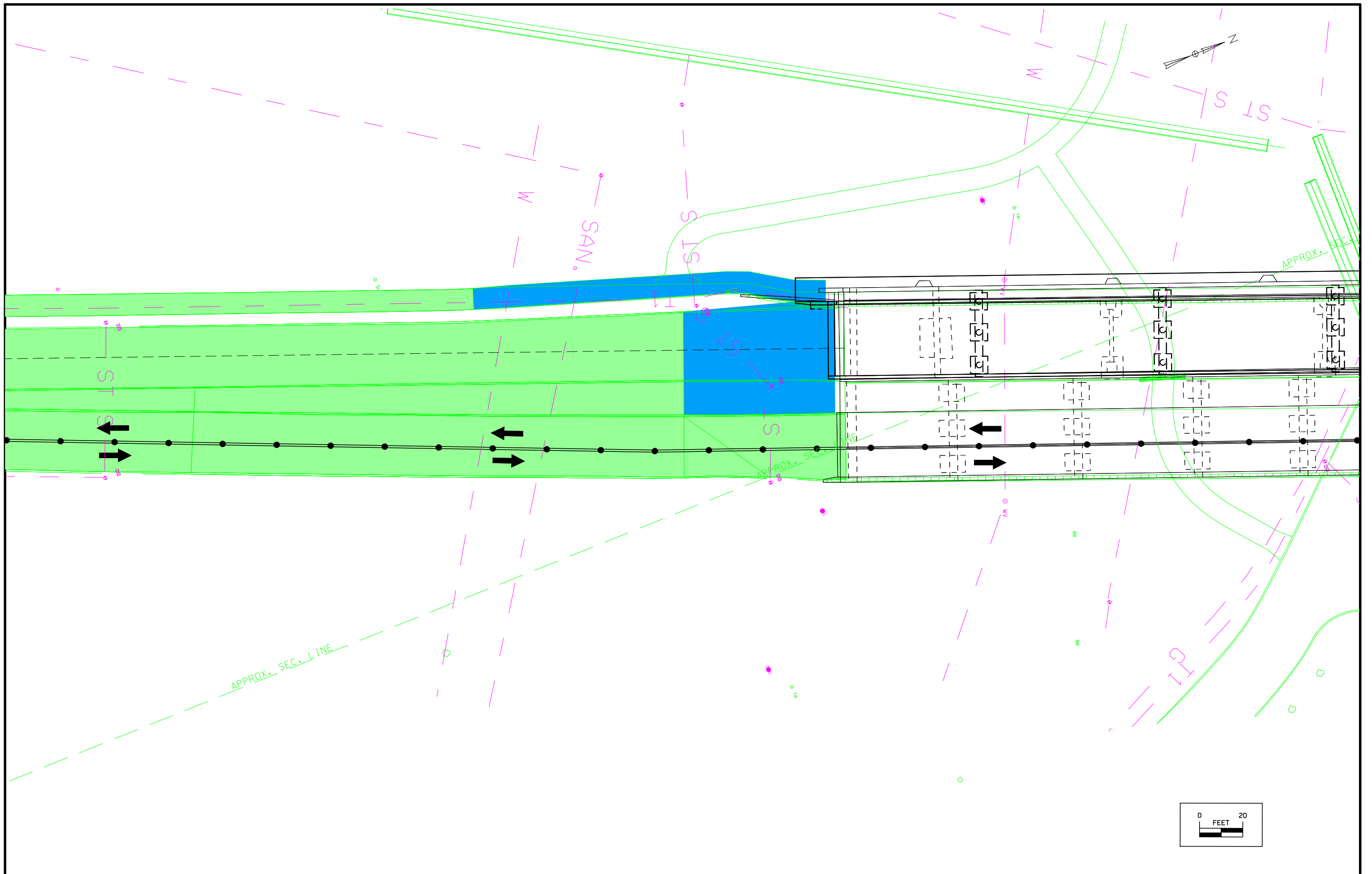


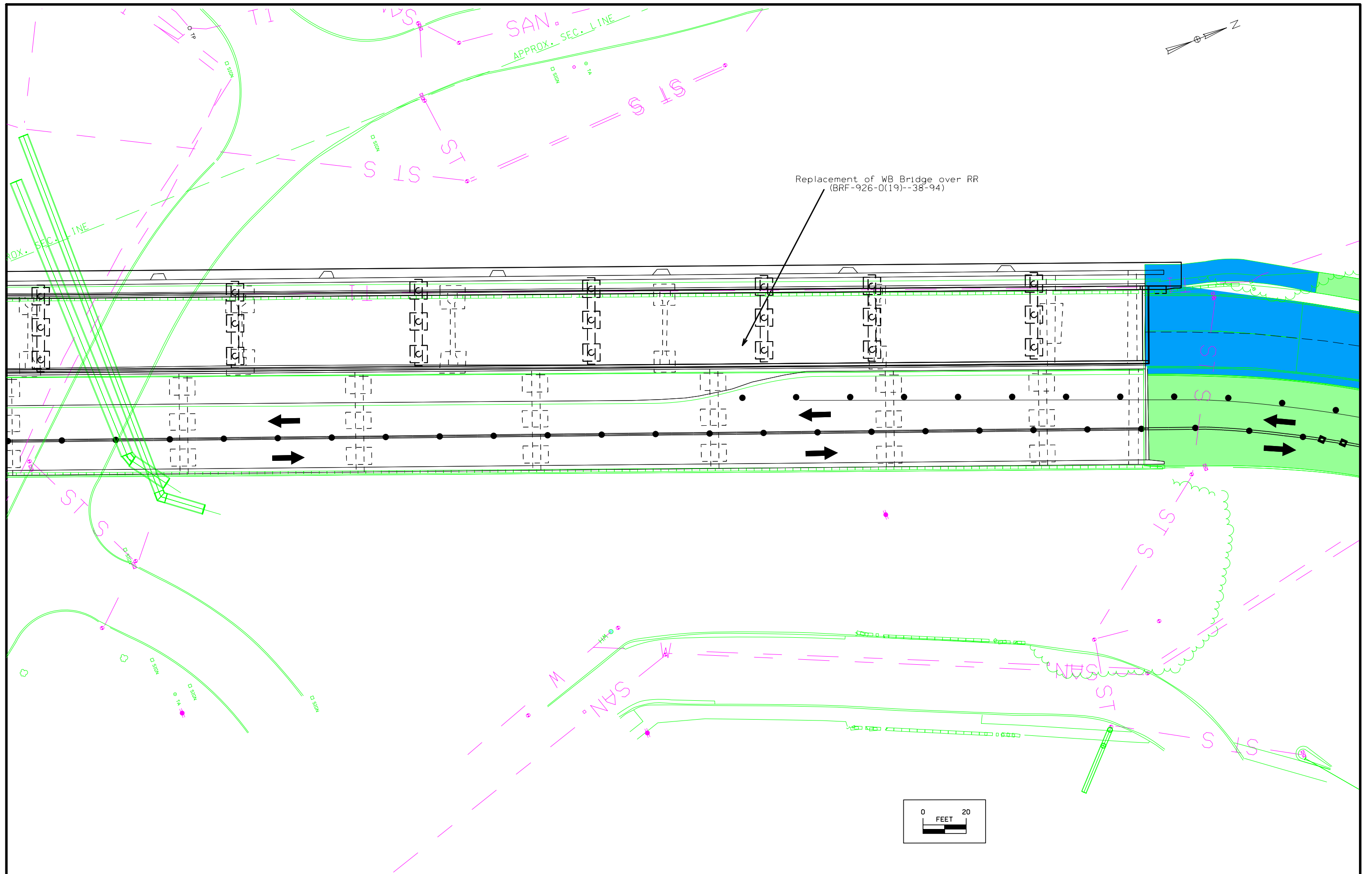


Replacement of WB Bridge over DM River  
(BRF-926-0(17)--38-94)

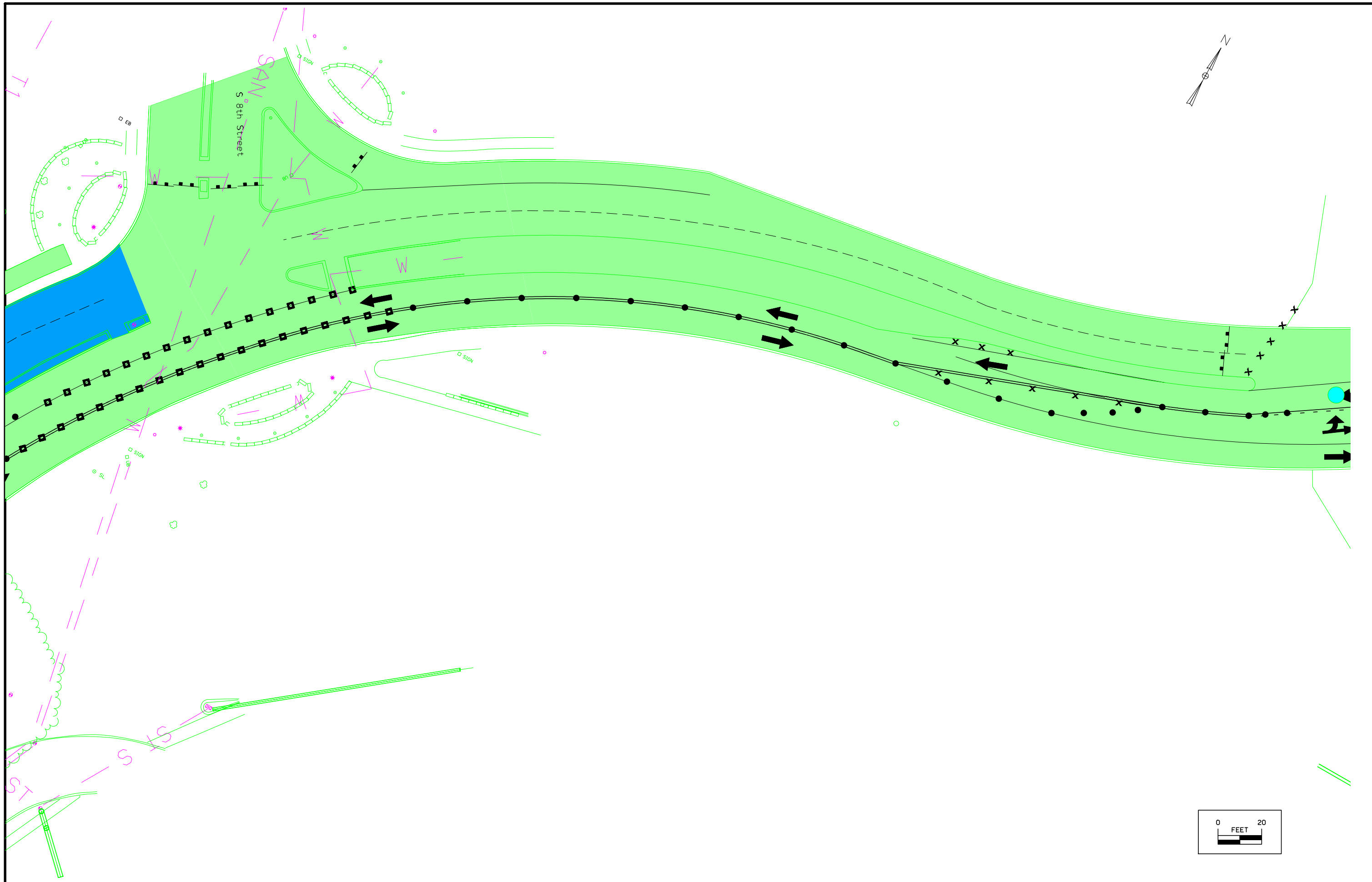


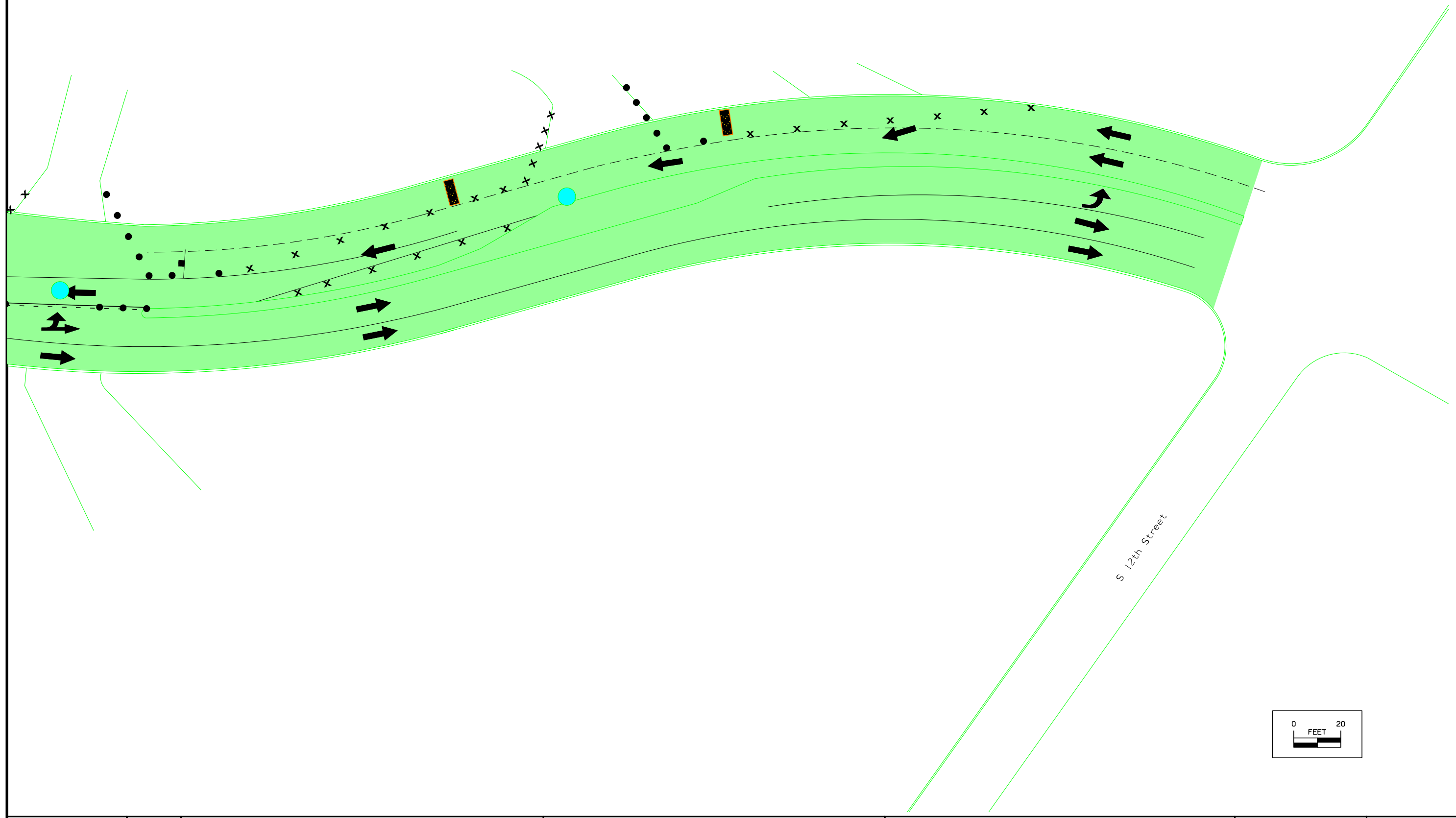
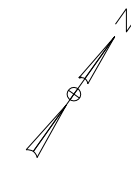




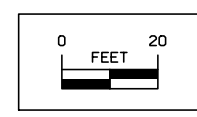


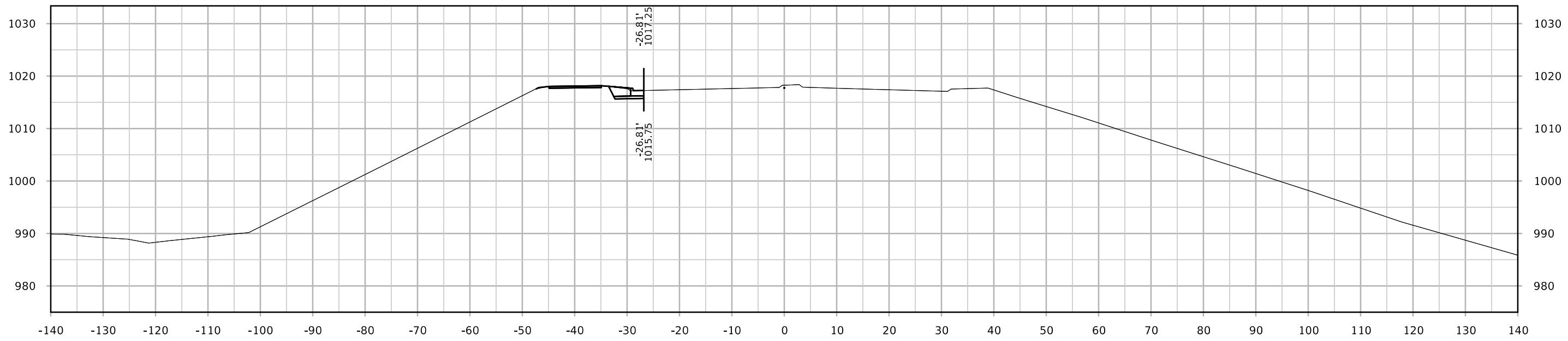




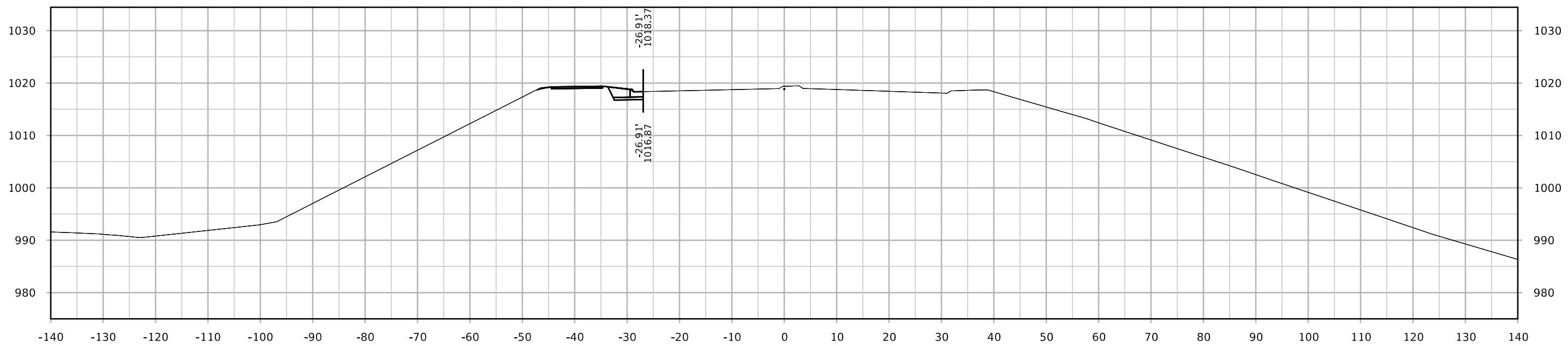


S 12th Street

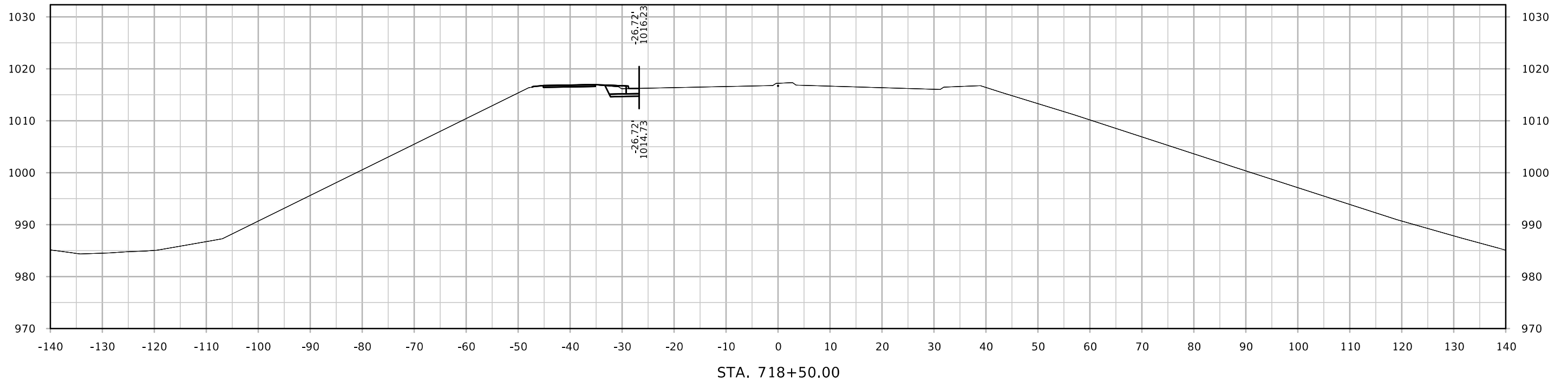
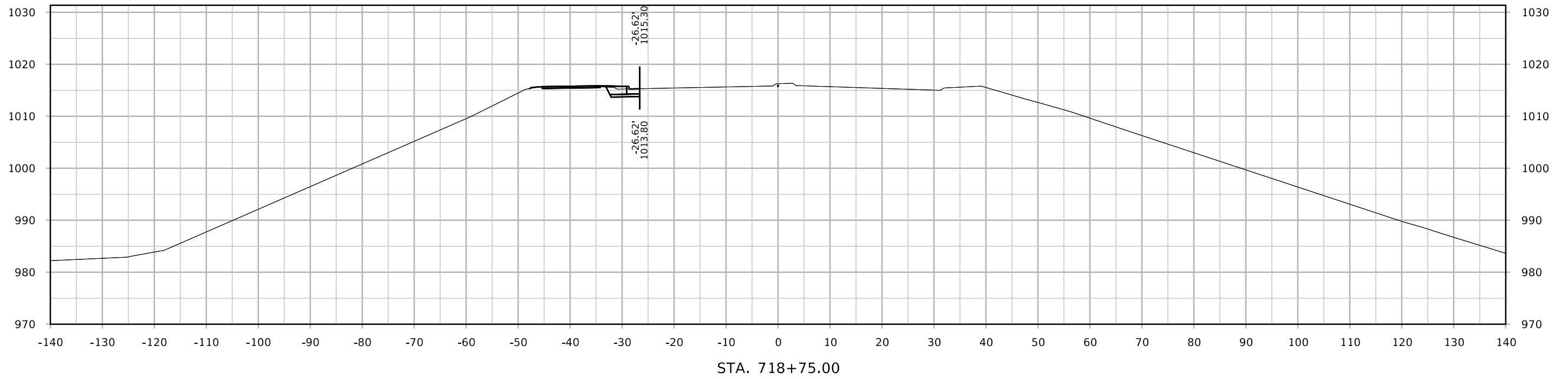


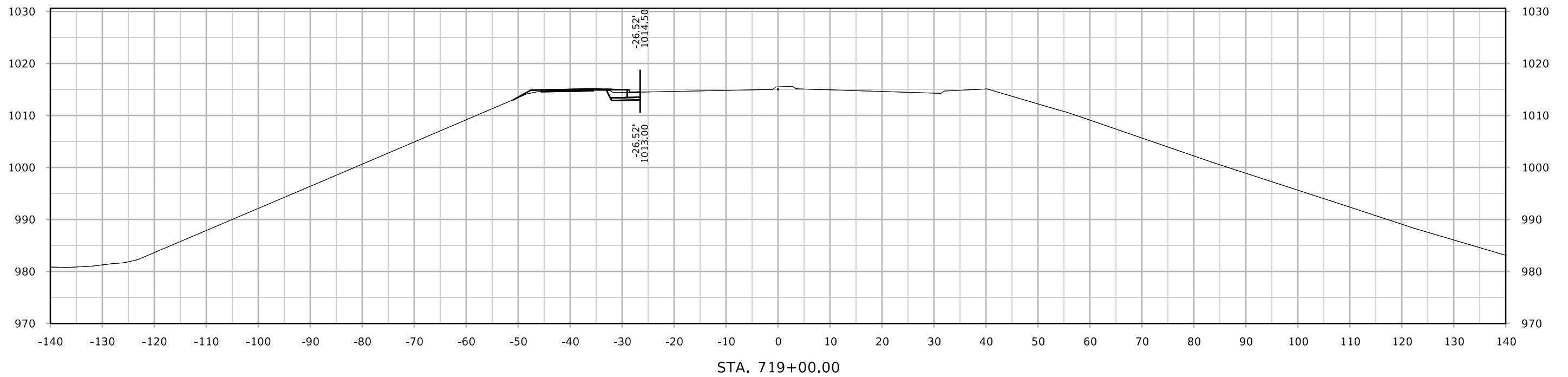
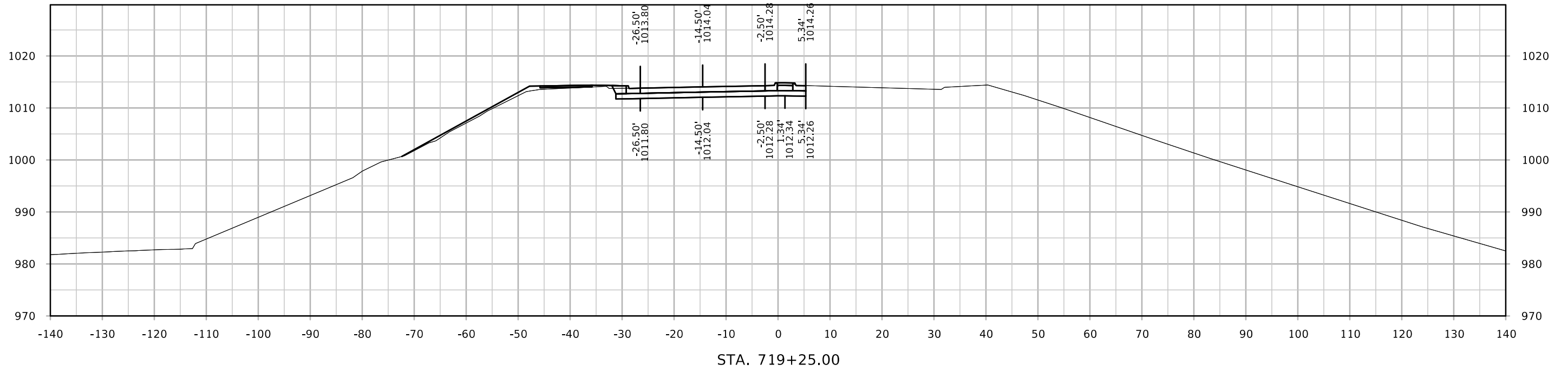


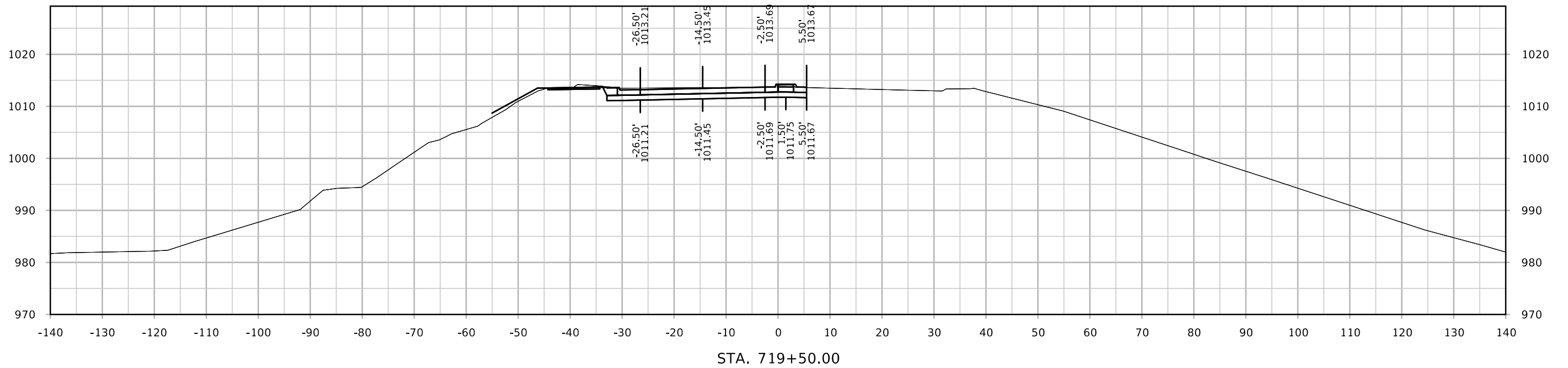
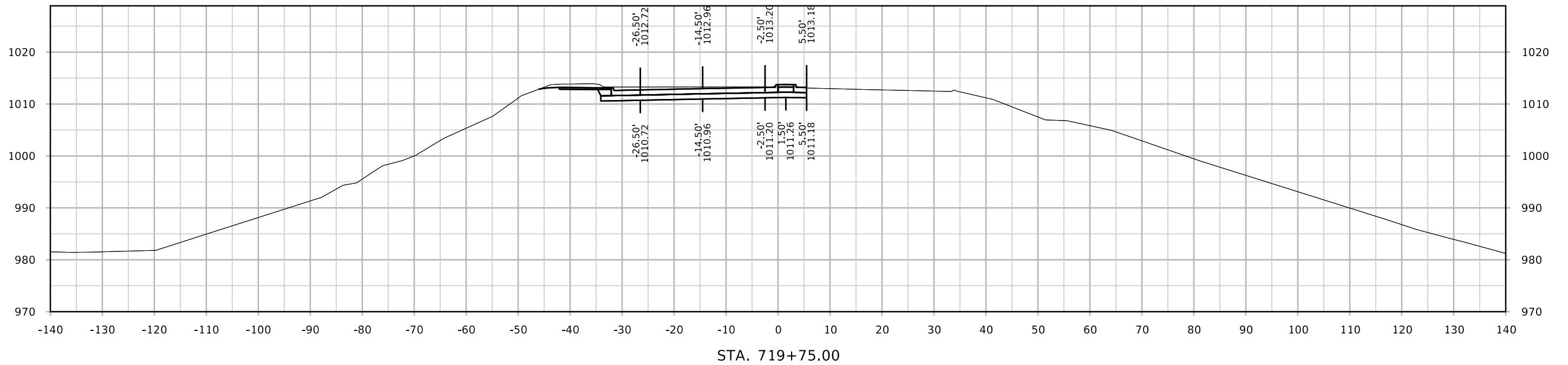
STA. 718+25.00

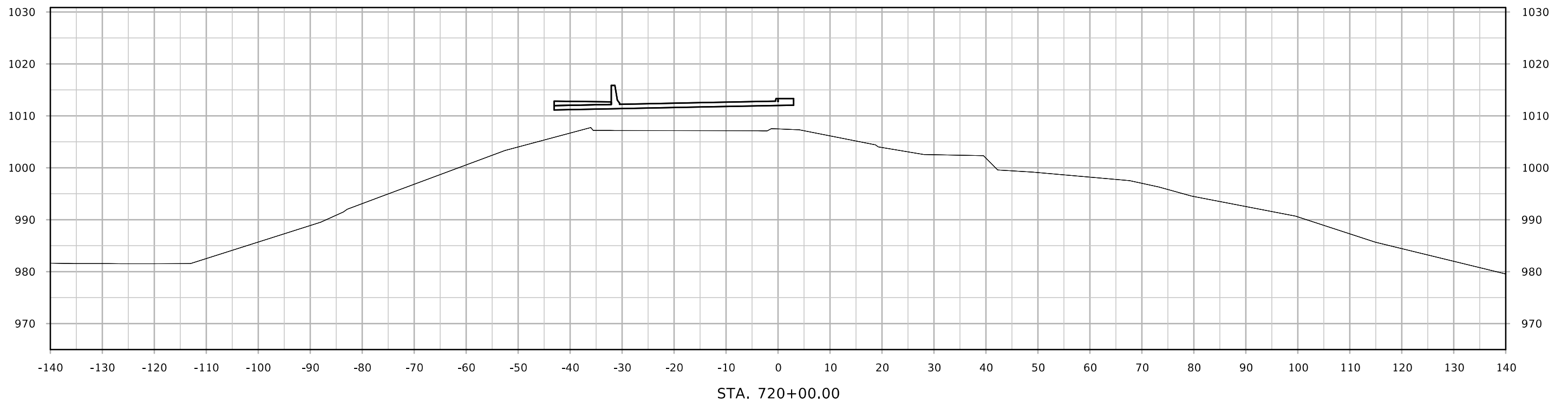


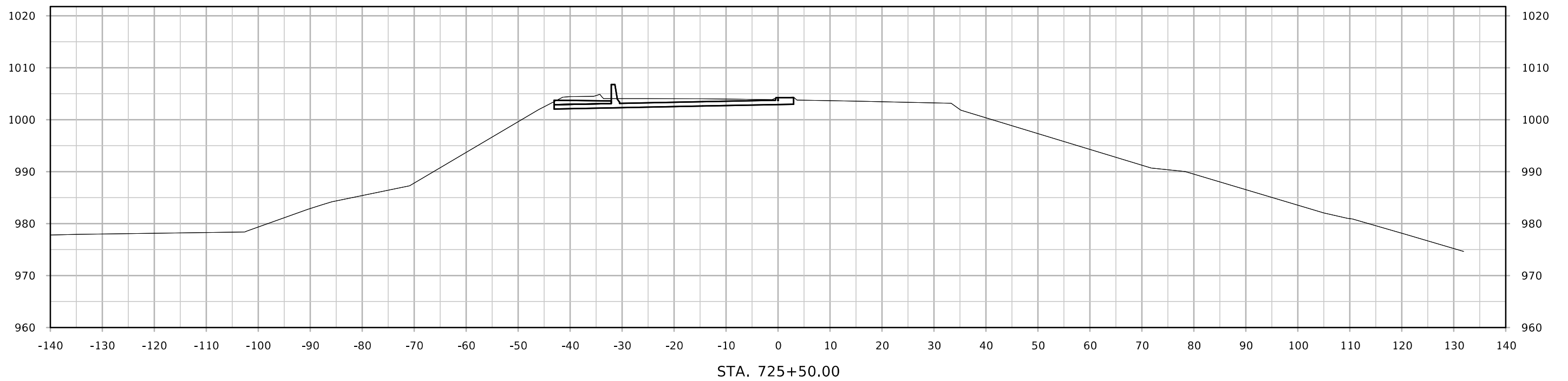
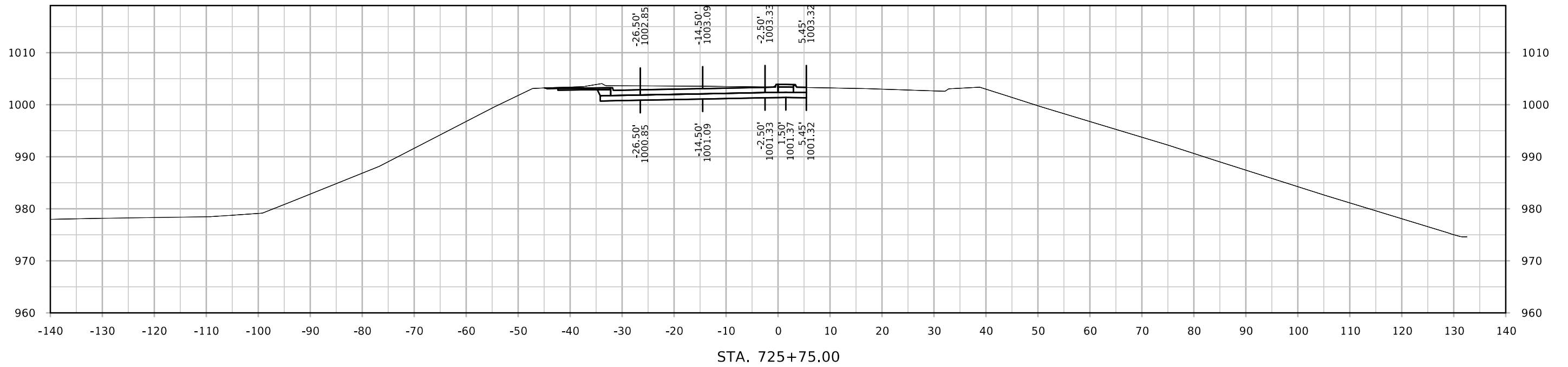
STA. 718+00.00



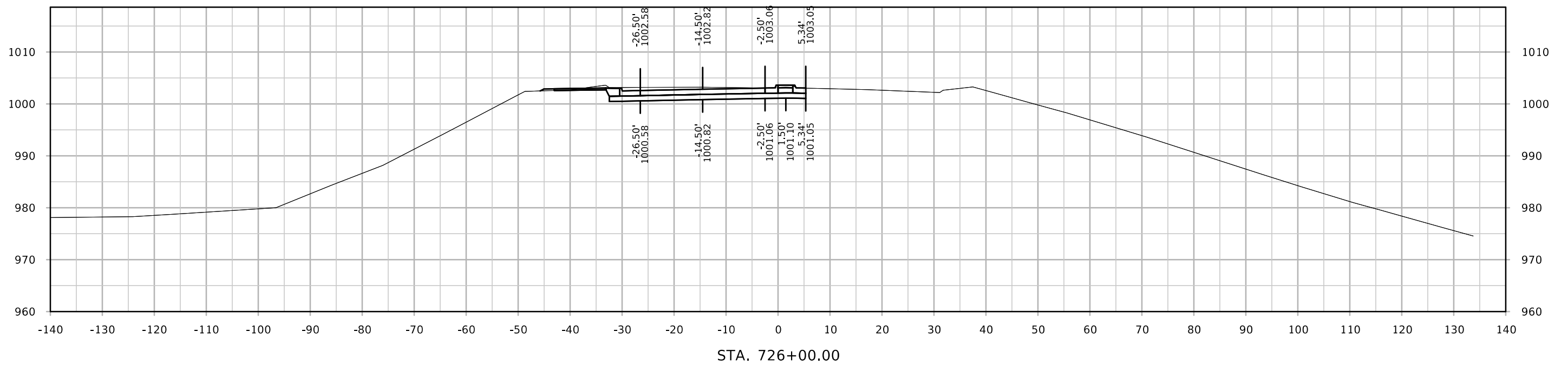
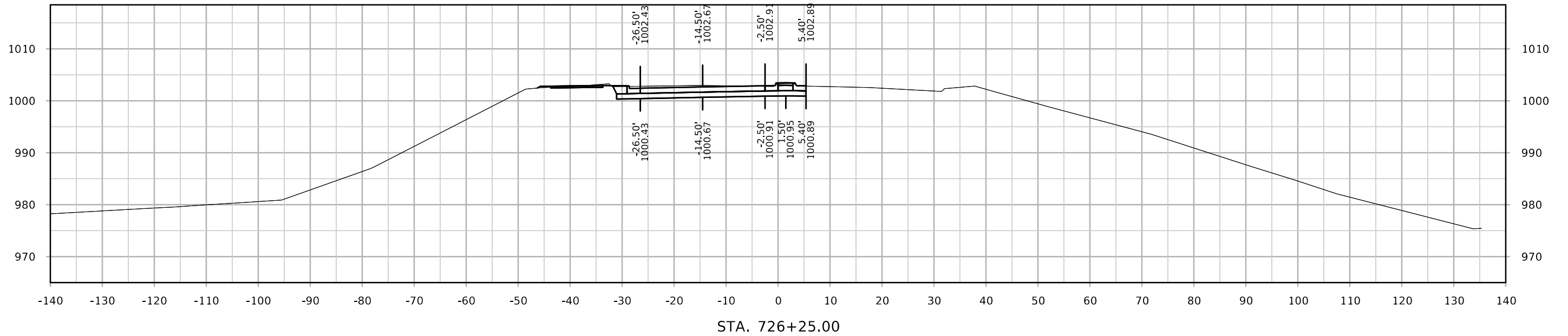


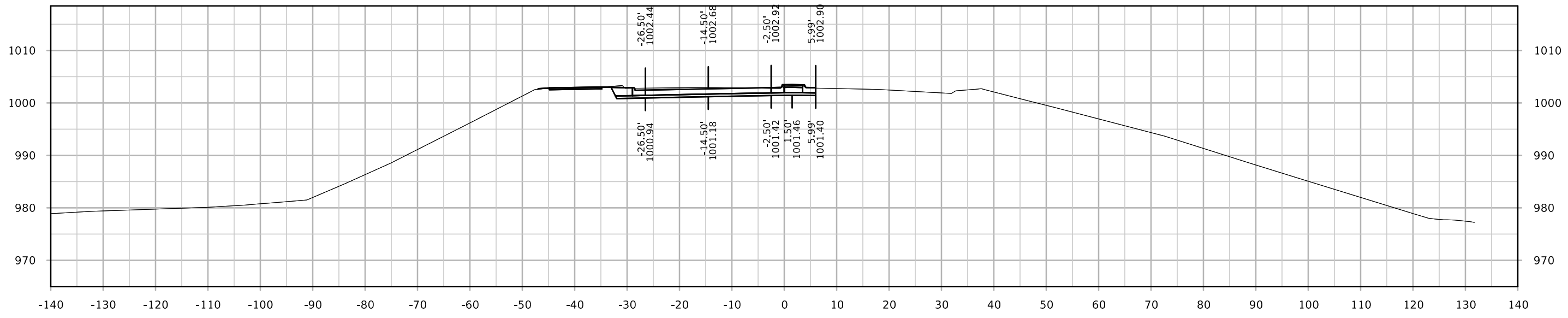




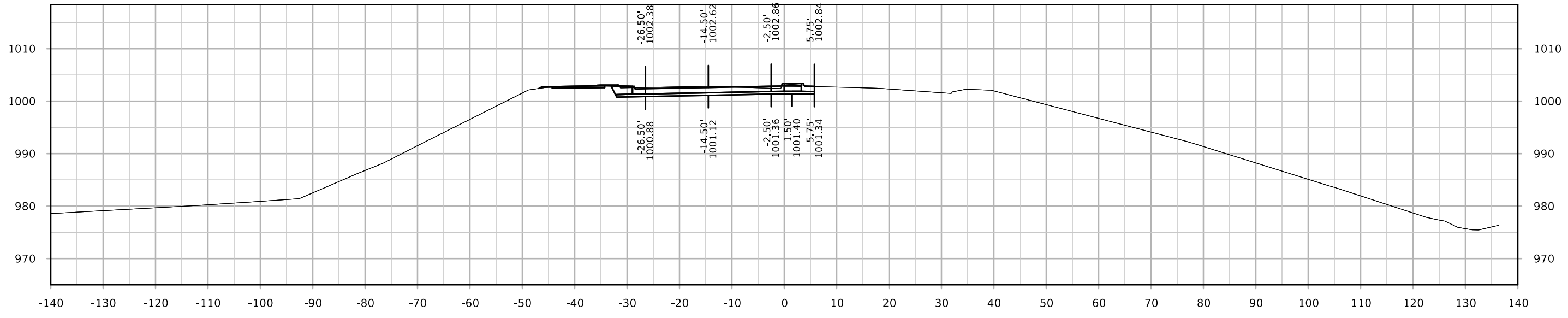








STA. 726+75.00



STA. 726+50.00

