

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	
Title Sheets	
* A.1	Title Sheet
A.2	Location Map Sheet
A.3	Field Exam Checklist
A.4 - A.18	Concept Statement
A.19 - A.21	Design Criteria
B Sheets	
Typical Cross Sections and Details	
B.1 - B.3	Typical Cross Sections and Details
D Sheets	
Mainline Plan and Profile Sheets	
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - D.9	NB I-29 Plan and Profile Sheets
G Sheets	
Survey Sheets	
G.1 - G.4	Reference Ties and Bench Marks
G.5 - G.6	Horizontal Control Tabulation
J Sheets	
Traffic Control and Staging Sheets	
J.1	Traffic Control Plan, Staging Notes and Tabulations
* J.2	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.3	Allowable Interstate Lane and Shoulder Closure Map
* J.4 - J.12	Staging and Traffic Control Sheets
* J.13 - J.14	Detour Sheets
V Sheets	
Bridge Situation Plans	
* V.1	Bridge Situation Plan
W Sheets	
Mainline Cross Sections	
* W.1	Cross Sections Legend and Information Sheet
* W.2 - W.22	I-29 NB Cross Sections
	* Color Plan Sheets



PLANS OF PROPOSED IMPROVEMENT ON THE PRIMARY ROAD SYSTEM POTTAWATTAMIE COUNTY

BRIDGE REPLACEMENT - PPCB

I-29 NB BRIDGE OVER SB IA 192
At the IA 192 Interchange in Council Bluffs

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

76

PROJECT IDENTIFICATION NUMBER

22-78-029-020

PROJECT NUMBER

IMX-029-3(270)57--02-78

R.O.W. PROJECT NUMBER

IMN-029-3(275)57--0E-78

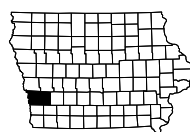
PROJECT EVENT DATES:

S02 - 05-31-2024
D03 - 07-19-2024
B01 - 10-18-2024
D05 - 12-06-2024

Preliminary Earthwork

Cut	6,400	CY
Fill	36,700	CY
	30,300	CY Balance

For Project Location Map
Refer to Sheet No. A.2



I-29 DESIGN DATA URBAN			
2027	AADT	13,000	V.P.D.
2047	AADT	17,400	V.P.D.
2047	DHV	1800	V.P.H.
	TRUCKS	23	%
	Total Design ESALs	--	

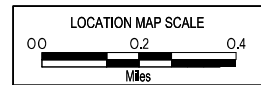
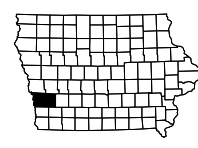
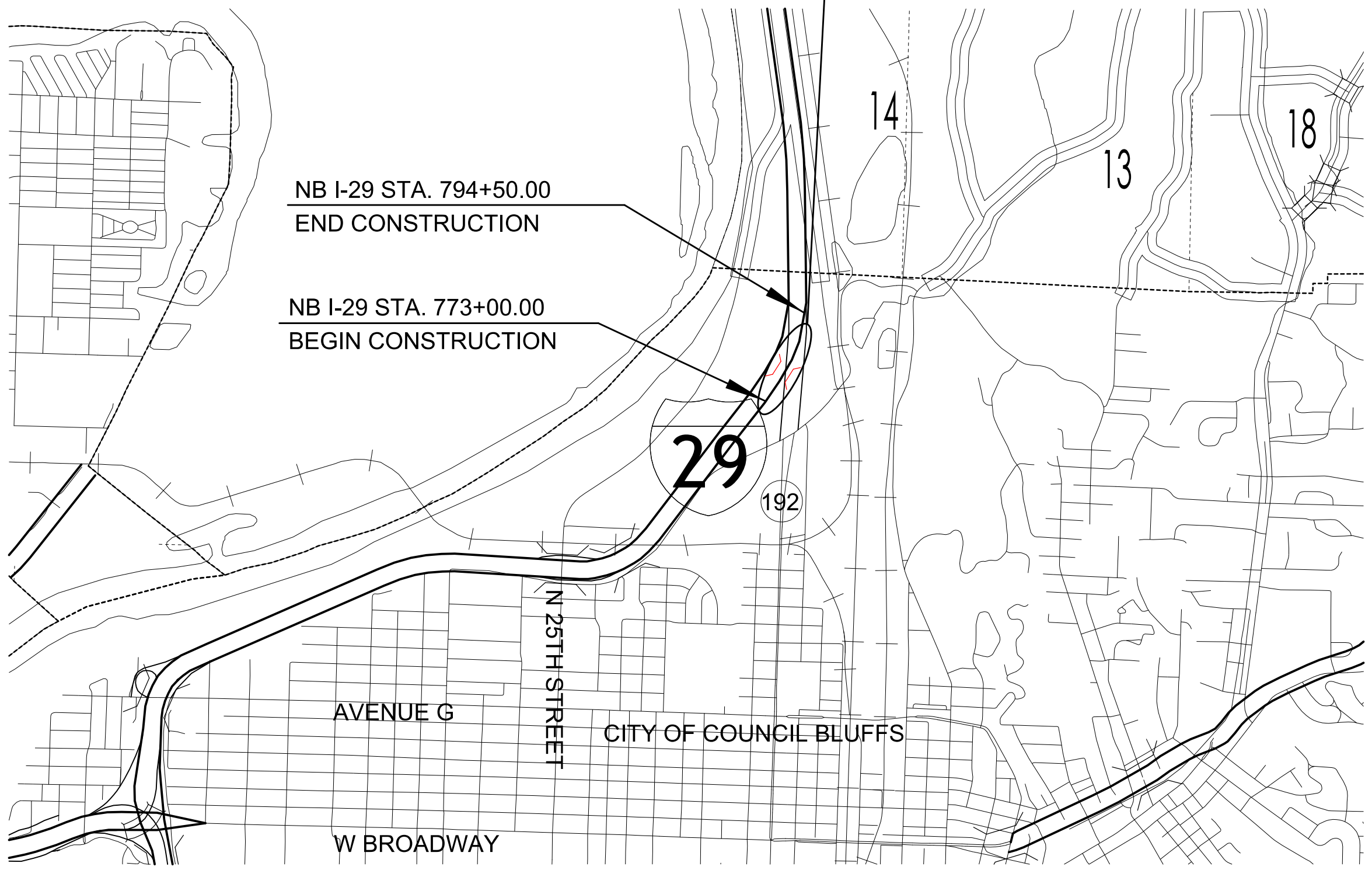
INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Primary Signature Block	X
X	X	X	X

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - Date: 06/14/2024

BRIDGE
I-29 NB
Sta. 785+47.59
FHWA # 44870 (EXIST)
FHWA # XXXXX (NEW)



FIELD EXAM CHECKLIST

1. General
 - a. Schedule
2. Roadway
 - a. Pavement Recommendation
 - b. Vertical Geometry
 - c. Grading
 - d. Existing North Crossover Pavement
 - e. Existing Cable and Steel Beam Guardrail
 - f. Clear Zone for IA 192 SB
3. Bridge
 - a. TSL
 - b. Wing Extensions
 - c. Abutment Slope
 - d. Pier Cap Clearance
 - e. Revetment Type
4. Drainage
 - a. Existing Drainage Patterns
 - b. Bridge End Flumes
 - c. Pipe Extension
5. Geotech
 - a. Boring Program
 - b. Slope Protection
6. Construction Staging
 - a. Median Crossovers
 - b. Portable DMSs
7. Utility Coordination
8. ROW / Wetland Impacts
9. Cost Estimate
10. Other Items

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 4
ATTENTION: Wes Mayberry, PE
FROM: Stephanie Hemberger, PE
 HNTB
OFFICE: Design
SUBJECT: Project Concept Statement; (Final, D0)

DATE: March 22, 2024
REF.: Pottawattamie County
 IMX-029-3(270)57--02-78
 Project Code: 22-78-029-020

This project is recommended for construction in FY 2027.

cc:	B. Hofer	S. J. Gent	M. J. Kennerly
	W. A. Sorenson	E. C. Wright	K. D. Nicholson
	B. Bradley	K. K. Patel	K. Brink
	J. E. Laaser-Webb	C. Poole	N. Pohlen
	N. L. Cuva	M. A. Swenson	C. B. Brakke
	D. E. Sprengeler	J. S. Nelson	M. V. Dyke
	M. Nop	S. P. Anderson	D. Stokes
	B. Smith	M. Dell	R. Harris
	D. Heeren	D. T. Ta	J. E. Bartholomew
	G. Cagle	D. Blue	S. Cook
	J. Hart	S. Majors	J. Ellis
	B. Worrel	R. Meyer	
	S. Schram	W. Mayberry	D. Dorsett
	N. Epperson	D. Redmond	M. Loesch

This project involves the replacement of the northbound I-29 bridge (Maint. No. 7856.7R029) over the southbound IA 192 exit ramp.

A concept review was held on March 7, 2024. Those present included Wes Mayberry, Austin Yates, and Grant Wambold from District 4 Office; Linda Narigon from Project Management Bureau; Bryan Bradley and Claire Asberry from Location and Environment Bureau; Zac Abrams and Jason Hermann from Traffic and Safety Bureau; Nikki Cuva from Right of Way Bureau; Jim Ellis and Matt Erickson from Bridges and Structures Bureau; Kent Nicholson, Kevin Patel, Mark Dell, John Bartholomew, and Dung Ta from Design Bureau; and Stephanie Hemberger, David Green, Ed Sowder, Don Hammond, and Bryce Charipar from HNTB.

The three alternatives considered were:

1. Replace with a prestressed pretensioned concrete beam (PPCB) bridge on alignment utilizing staged construction (**Alternative #1A**). The estimated cost for this replacement is **\$5,601,500**. It is alternatively an option to utilize existing median crossover locations north and south of the project to shift traffic head-to-head to the I-29 southbound lanes in lieu of staged bridge construction (**Alternative #1B**). The southbound IA 192 exit from southbound I-29 would be detoured. The estimated cost for this replacement is **\$5,532,700**.
2. Replace with a PPCB bridge utilizing existing crossovers and closing northbound I-29 during construction. This alternative realigns northbound I-29 slightly to maintain a tangent on the bridge. The estimated cost for this replacement is **\$6,061,900**.
3. Replace with a continuous welded plate girder (CWPG) bridge off alignment. This alternative realigns northbound I-29 to the south to maintain traffic on the existing bridge during construction. The estimated cost for this replacement is **\$7,417,600**.

The preferred alternative is Alternative #1B, constructing the proposed bridge and roadway improvements on the existing northbound I-29 alignment. Instead of utilizing staged bridge construction and maintaining traffic on the northbound lanes during construction, traffic will utilize median crossovers to go head-to-head on the southbound I-29 lanes. The existing south crossover will be used as constructed while the north crossover will be reconstructed. It is desired for the north crossover to be let as a separate tied project in advance. The estimated cost for this replacement is **\$5,532,700**.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved during the Concept Review Meeting on March 7, 2024. Comments received during the review period have been considered and resolved.

FINAL PROJECT CONCEPT STATEMENT
I-29 NB Bridge over SB IA 192 in Council Bluffs

Pottawattamie County
IMX-029-3(270)57--02-78
Project Code: 22-78-029-020
Maint. No. 7856.7R029
FHWA No. 44870

Highway Division
District 4

Wes Mayberry, P.E.
Wes.Mayberry@iowadot.us

March 22, 2024

I. STUDY AREA

A. Project Description

This project involves the replacement of the northbound I-29 bridge (Maint. No. 7856.7R029) over the southbound IA 192 exit ramp.

The three alternatives considered were:

1. Replace with a prestressed pretensioned concrete beam (PPCB) bridge on alignment utilizing staged construction (**Alternative #1A**). The estimated cost for this replacement is **\$5,601,500**. It is alternatively an option to utilize existing median crossover locations north and south of the project to shift traffic head-to-head to the I-29 southbound lanes in lieu of staged bridge construction (**Alternative #1B**). The southbound IA 192 exit from southbound I-29 would be detoured. The estimated cost for this replacement is **\$5,532,700**.
2. Replace with a PPCB bridge utilizing existing crossovers and closing northbound I-29 during construction. This alternative realigns northbound I-29 slightly to maintain a tangent on the bridge. The estimated cost for this replacement is **\$6,061,900**.
3. Replace with a continuous welded plate girder (CWPG) bridge off alignment. This alternative realigns northbound I-29 to the south to maintain traffic on the existing bridge during construction. The estimated cost for this replacement is **\$7,417,600**.

The preferred alternative is Alternative #1B, constructing the proposed bridge and roadway improvements on the existing northbound I-29 alignment. Instead of utilizing

Pottawattamie County
IMX-029-3(270)57--02-78
PIN: 22-78-029-020
Page 2

staged bridge construction and maintaining traffic on the northbound lanes during construction, traffic will utilize median crossovers to go head-to-head on the southbound I-29 lanes. The existing south crossover will be used as constructed while it is desired for the north crossover to be reconstructed. The north crossover will let as a separate tied project in advance. The estimated cost for this replacement is **\$5,532,700**.

During preliminary design, effort will be made to avoid grading within the levee right-of-way at the north project tie-in.

B. Need for Project

The existing structure is a 222'-0" x 39'-0" continuous steel I-beam bridge which was built in 1967 and overlaid in 1996. The bottom of deck has spalls with exposed steel in span 3 and wet leaching areas in span 2. There are 8 confirmed fatigue cracks in the superstructure with drilled holes in 6 locations. Girders #2 and #4 have cracks extending past the holes. Abutments have narrow to wide cracks, areas of delaminations, and spalls with exposed reinforcing. The backwalls have areas of delaminations and pier 2 has a spall with exposed reinforcing. Due to the extent of the deficiencies to the deck, superstructure and substructure, the bridge should be replaced instead of repaired.



Northbound I-29 facing northeast



Northbound I-29 facing southwest



Southbound IA 192 facing south

C. Present Facility

The existing structure is a 222'-0" x 39'-0" continuous steel I-beam bridge at a 54.5° skew and was built in 1967.

I-29 northbound through the project area was constructed in 1967 with 40 ft. wide pavement. It consists of two 12 ft. wide travel lanes in the northbound direction with a 6 ft. inside shoulder and a 10 ft. outside shoulder.

D. Traffic Estimates

The 2027 construction year and 2047 design year average daily traffic estimates are 13,000 ADT with 23% trucks and 17,400 ADT with 23% trucks, respectively.

E. Sufficiency Ratings

I-29 is classified as an Urban – Interstate facility. The federal bridge sufficiency rating is 70.6.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2019, through December 31, 2023, there were 6 property damage only crashes and 1 minor injury crash.

II. PROJECT CONCEPT

A. Design Criteria

The existing northbound I-29 over southbound IA 192 horizontal alignment has a radius of 1,637 feet (6.0% superelevation) just north of the existing bridge, which is good for 64 mph and extends onto the north end of the existing bridge. The existing vertical alignment meets 55 mph. The new bridge and proposed alignment will be designed to meet 65 mph and match posted speed. It was considered during concept to set design speed at 5 mph over posted (70 mph), however it was determined this will create challenges to feasible alternatives due to the grade raise impact noted below. This will be confirmed during preliminary design following survey.

The vertical design criteria requires a grade raise for the proposed northbound I-29 profile over southbound IA 192 due to the following:

- An increase in design speed from existing (55 mph) to proposed (65 mph),
- An increase in the proposed bridge structure depth in order to span the southbound IA 192 clear zone (20') and avoid protection of the piers, and
- An increase in the vertical clearance from existing (15.0') to proposed (16.5').

The proposed typical section will match existing (2-12' travel lanes, with a 6' inside shoulder and a 10' outside shoulder) for a 40'-0" required bridge width. It was discussed during the concept review whether a 54'-0" bridge will be required to accommodate maintaining two lanes during any future staged bridge construction needs. It was confirmed a 54'-0" bridge width will not be required at this location.

All of the following alternatives meet the design criteria.

B. Feasible Alternatives

Alternative #1A - Replace with a PPCB bridge on existing alignment utilizing staged construction

The existing structure is a 222'-0" x 39'-0" continuous steel I-beam bridge and will be replaced with a three span, 289'-0" x 46'-0" PPCB bridge at a 45° skew. While the proposed roadway section will be 40'-0", the bridge will be widened from the minimum 40'-0" width to accommodate the horizontal curve. A chorded PPCB bridge was assessed and would have required non-parallel beam lines due to the horizontal curve on the bridge. Staging would also be complex in this situation due to the non-parallel existing and proposed beam lines.

If the survey linework varies enough from the LIDAR linework, the bridge end spans may change due to clearance and slope requirements resulting in lengthening or shortening of the bridge. This option utilizes the maximum length BTD beam in the main span. If the main span needs to be lengthened, a BTE beam will be required which may make this alternative less desirable due to the additional 9" grade raise.

A curved steel bridge was also assessed and found to have similar square footage to the widened PPCB bridge due to longer end spans to provide span balance.

This bridge will be constructed on the existing horizontal alignment. The bridge will be built to sufficient width to encompass a horizontal curve with superelevation on the bridge while constructing a straight bridge with parallel beam lines. New bridge approaches and guardrail will be constructed. In order to stage the bridge construction, temporary steel sheet pile is proposed along both abutments. Macadam stone will be placed under the bridge for slope protection.

This alternative involves a profile grade raise of over 2 feet to incorporate the criteria above, which creates grading challenges on the southwest end of the bridge where the southbound lanes converge back to the existing 50 foot median. For this option to be feasible, the median grading southwest of the bridge will require steeper slopes with revetment and guardrail protection.

Traffic will be maintained by staged bridge construction requiring one lane of traffic to be maintained for the duration of the project. Temporary shoring is necessary to accommodate the grade raise.

This alternative would impact 0.1 acres of wetlands during construction, which would require a Section 404 Nationwide Permit.

Alternative #1A Cost Breakdown

<u>Bridge Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
PPCB Bridge	14,209	SF	\$155	\$2,202,400
Bridge Removal	9,693	SF	\$10	\$96,900
Staging – 10%	1	LS	\$229,900	\$229,900
Mobilization – 10%	1	LS	\$229,900	\$229,900
M & C – 20%	1	LS	\$551,800	<u>\$551,800</u>
Bridge Costs				\$3,310,900
<u>Roadway Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
Bridge Approach	890	SY	\$240	\$213,600
PCC Pavement (10")	6,700	SY	\$55	\$368,500
Modified Subbase (12")	2,400	CY	\$42	\$100,800
Removal of Pavement	7,100	SY	\$12	\$85,200
Embankment-In-Place, Contractor Furnish	60,000	CY	\$6	\$360,000
Removal of Steel Beam Guardrail	280	LF	\$10	\$2,800
Steel Beam Guardrail	800	LF	\$30	\$24,000
Steel Beam Guardrail Barrier	2	EACH	\$2,600	\$5,200
Transition Section, BA-201				
Steel Beam Guardrail End Anchor, Bolted	2	EACH	\$300	\$600
Steel Beam Guardrail End Terminal, BA-250	2	EACH	\$2,500	\$5,000
Temporary Barrier Rail	4,400	LF	\$14	\$61,600
Temporary Shoring	1,420	LF	\$50	\$71,000
Seeding and Fertilizing	5.8	ACRE	\$3,000	\$17,400
Revetment, Class E	1,800	TON	\$65	\$117,000
Erosion Control	1	LS	\$50,000	\$50,000
Staging – 10%	1	LS	\$148,200	\$148,200
Traffic Control – 5%	1	LS	\$74,100	\$74,100
Mobilization – 5%	1	LS	\$74,100	\$74,100
M & C – 30%	1	LS	\$511,500	<u>\$511,500</u>
Roadway Costs				\$2,290,600
Project Total				\$5,601,500

Alternative #1B - Replace with a PPCB bridge on existing alignment, while closing NB I-29 and utilizing median crossovers

This alternative is similar to Alternative #1A except traffic will be maintained by utilizing existing median crossover locations on the southbound I-29 lanes. This alternative allows the bridge to be constructed in one stage by placing traffic head-to-head on the southbound lanes and detouring the southbound I-29 to southbound IA 192 exit. See Alternative #2 for a description of this staging option.

Alternative #1B Cost Breakdown

<u>Bridge Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
PPCB Bridge	14,209	SF	\$155	\$2,202,400
Bridge Removal	9,693	SF	\$10	\$96,900
Mobilization – 10%	1	LS	\$229,900	\$229,900
M & C – 20%	1	LS	\$505,800	<u>\$505,800</u>
Bridge Costs				\$3,035,000
<u>Roadway Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
Bridge Approach	890	SY	\$240	\$213,600
PCC Pavement (10")	6,700	SY	\$55	\$368,500
Modified Subbase (12")	2,400	CY	\$42	\$100,800
Removal of Pavement	9,800	SY	\$12	\$117,600
Embankment-In-Place, Contractor Furnish	60,000	CY	\$6	\$360,000
Removal of Steel Beam Guardrail	280	LF	\$10	\$2,800
Steel Beam Guardrail	800	LF	\$30	\$24,000
Steel Beam Guardrail Barrier	2	EACH	\$2,600	\$5,200
Transition Section, BA-201				
Steel Beam Guardrail End Anchor, Bolted	2	EACH	\$300	\$600
Steel Beam Guardrail End Terminal, BA-250	2	EACH	\$2,500	\$5,000
Temporary Lane Separator System	7,000	LF	\$10	\$70,000
Detour Pavement	2,700	SY	\$55	\$148,500
Seeding and Fertilizing	5.8	ACRE	\$3,000	\$17,400
Revetment, Class E	1,800	TON	\$65	\$117,000
Erosion Control	1	LS	\$50,000	\$50,000
Staging – 10%	1	LS	\$160,100	\$160,100
Traffic Control – 5%	1	LS	\$80,100	\$80,100
Mobilization – 5%	1	LS	\$80,100	\$80,100
M & C – 30%	1	LS	\$576,400	<u>\$576,400</u>
Roadway Costs				\$2,497,700
Project Total				\$5,532,700

Alternative #2 - Replace with a PPCB bridge on an adjusted alignment, while closing NB I-29 and utilizing median crossovers

This alternative is a hybrid between Alternatives #1 and #3. The alignment will be maintained on existing north of the bridge, but the alignment will be adjusted to keep the horizontal curve off the bridge. The bridge will be a 329'-0" x 40'-0" PPCB at a 45° skew with no radius.

This alternative realigns northbound I-29 to maintain a tangent section through the proposed bridge and shifts the northbound lanes southwest of the bridge to reduce median grading compared to Alternative #1. The proposed bridge will include a grade raise but can be constructed in one stage due to the closure of southbound IA 192 underneath. In order to tie into the existing alignment, the alternative requires a reverse curve southwest of the bridge and additional pavement reconstruction. The alignment ties in before the northbound IA 192 entrance ramp gore on the northeast side to avoid further roadway improvements and impacts to the existing levee at the north project tie-in. New bridge approaches and guardrail will also be constructed.

There is an option to lower southbound IA 192 in this alternative due to the closure of the IA 192 exit ramp. Lowering the profile of southbound IA 192 would help mitigate wetland impacts and reduce proposed embankment, however the benefit is minimal and it may impact a fiber backbone running along the west side of southbound IA 192.

Traffic will be maintained via existing median crossovers approximately 0.5 mile south and 1 mile north of the existing bridge. Northbound I-29 traffic will be head-to-head on the southbound I-29 lanes between the two median crossovers. The north crossover will need to be rehabilitated before being utilized. Due to the head-to-head configuration, the southbound IA 192 ramp will be closed during construction. Passenger vehicles will be detoured to the N 25th Street interchange and Nash Boulevard, while trucks will be detoured to W Broadway to stay on a truck route. This alternative assumes use of channelizers with a tight spacing or a temporary lane separator system (TLSS) to separate head-to-head traffic, however this will be confirmed by District ahead of design. Should temporary barrier rail (TBR) be required, shoulder strengthening may also be required.

This alternative would impact 1.2 acres of wetlands during construction, which would require a Section 404 Individual Permit.

Alternative #2 Cost Breakdown

<u>Bridge Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
PPCB Bridge	14,202	SF	\$162.50	\$2,307,800
Bridge Removal	9,693	SF	\$10	\$96,900
Mobilization – 10%	1	LS	\$240,500	\$240,500
M & C – 20%	1	LS	\$529,000	\$529,000
Bridge Costs				\$3,174,200
<u>Roadway Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
Bridge Approach	800	SY	\$240	\$192,000
PCC Pavement (10")	11,600	SY	\$55	\$638,000
Modified Subbase (12")	4,230	CY	\$42	\$177,700
Removal of Pavement	15,100	SY	\$12	\$181,200
Embankment-In-Place, Contractor Furnish	70,000	CY	\$6	\$420,000
Removal of Steel Beam Guardrail	280	LF	\$10	\$2,800
Steel Beam Guardrail	350	LF	\$30	\$10,500
Steel Bream Guardrail Barrier Transition Section, BA-201	2	EACH	\$2,600	\$5,200
Steel Beam Guardrail End Anchor, Bolted	2	EACH	\$300	\$600
Steel Beam Guardrail End Terminal, BA-250	2	EACH	\$2,500	\$5,000
Temporary Lane Separator System	7,000	LF	\$10	\$70,000
Detour Pavement	2,700	SY	\$55	\$148,500
Seeding and Fertilizing	10.0	ACRE	\$3,000	\$30,000
Erosion Control	1	LS	\$50,000	\$50,000
Traffic Control – 10%	1	LS	\$193,200	\$193,200
Mobilization – 5%	1	LS	\$96,600	\$96,600
M & C – 30%	1	LS	\$666,400	\$666,400
Roadway Costs				\$2,887,700
Project Total				\$6,061,900

Alternative #3 - Replace with a CWPG bridge off alignment to the southeast while maintaining traffic on the existing NB I-29 bridge

This alternative consists of a curved 387'-0" x 40'-0" CWPG bridge at a 45° skew built off alignment in order to maintain traffic on the existing I-29 northbound lanes. To allow for this off-line bridge construction, the northbound I-29 alignment will be realigned to the south using reverse curves on the southwest end to tie back to existing. The proposed bridge will be on a 2,300' horizontal curve and constructed approximately 10 feet away from the existing bridge for constructability. The alignment ties in before the northbound IA 192 entrance ramp gore on the northeast end. New bridge approaches and guardrail will also be constructed.

A widened PPCB bridge was also assessed but found to not be economical due to the amount of curvature in the alignment. The widened bridge would increase the main span length, increasing the cost of the bridge. The amount of curvature in the roadway also eliminated the possibility of using a chorded PPCB bridge.

Due to the existing conditions, a grade raise will still be necessary, although the height of the bridge is reduced by a smaller skewed crossing combined with the steel beams. Despite the lower profile, the south alignment has greater impacts on the wetlands compared to Alternative #1. Impacts could be reduced with additional guardrail and steeper slopes. This alternative may additionally require soil remediations pending geotechnical investigations, given that the site is within the Missouri River Valley.

Traffic will be maintained on the existing northbound I-29 lanes during bridge construction. This alternative will require closure of the outside northbound I-29 lane to construct the proposed tie-in connections to existing.

This alternative would impact 1.1 acres of wetland during construction, which would require a Section 404 Individual Permit.

Alternative #3 Cost Breakdown

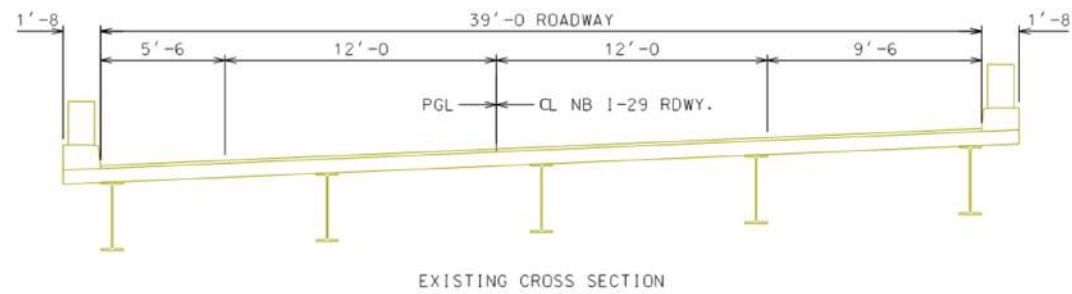
<u>Bridge Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
CWPG Bridge	16,706	SF	\$180	\$3,007,000
Bridge Removal	9,693	SF	\$10	\$96,900
Mobilization – 10%	1	LS	\$310,400	\$310,400
M & C – 20%	1	LS	\$682,900	<u>\$682,900</u>
Bridge Costs				\$4,097,200

<u>Roadway Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Estimated Costs</u>
Bridge Approach	840	SY	\$240	\$201,600
PCC Pavement (10")	9,300	SY	\$55	\$511,500
Modified Subbase (12")	3,350	CY	\$42	\$140,700
Removal of Pavement	9,200	SY	\$12	\$110,400
Embankment-In-Place, Contractor Furnished	85,000	CY	\$6	\$510,000

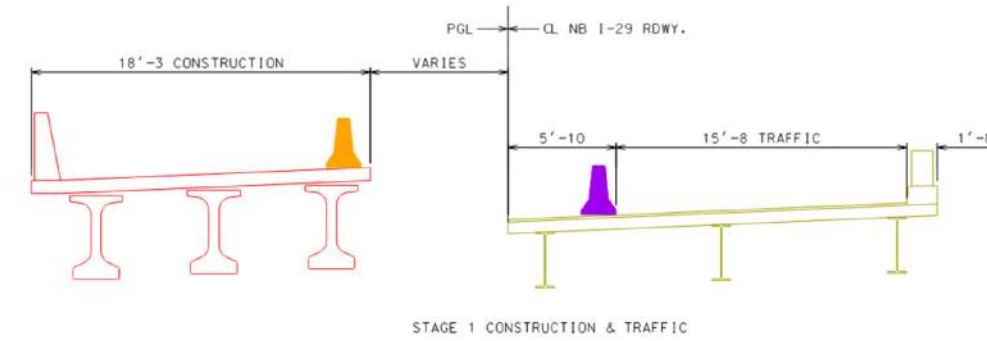
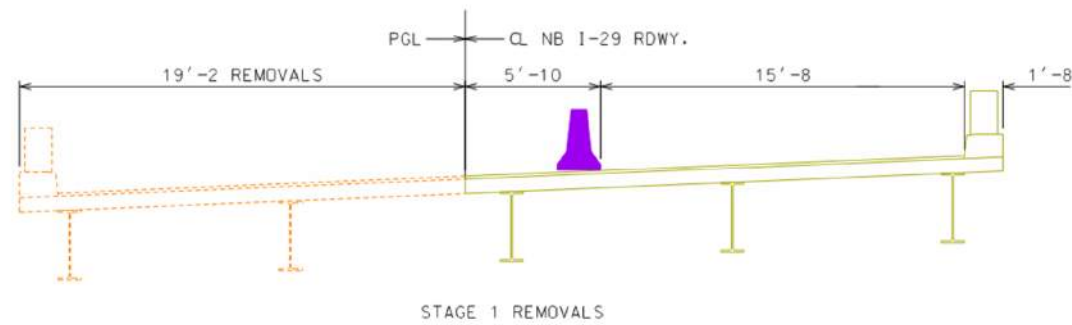
Removal of Steel Beam Guardrail	280	LF	\$10	\$2,800
Steel Beam Guardrail	350	LF	\$30	\$10,500
Steel Beam Guardrail Barrier	2	EACH	\$2,600	\$5,200
Transition Section, BA-201				
Steel Beam Guardrail End Anchor, Bolted	2	EACH	\$300	\$600
Steel Beam Guardrail End Terminal, BA-250	2	EACH	\$2,500	\$5,000
Temporary Barrier Rail	3,600	LF	\$14	\$50,400
Seeding and Fertilizing	8.0	ACRE	\$3,000	\$24,000
Erosion Control	1	LS	\$50,000	\$50,000
Soil Remediation	1	LS	\$1,000,000	\$1,000,000
Traffic Control – 5%	1	LS	\$81,100	\$81,100
Mobilization – 5%	1	LS	\$81,100	\$81,100
M & C – 30%	1	LS	\$535,500	<u>\$535,500</u>
Roadway Costs				\$3,320,400
Project Total				\$7,417,600

C. Staging and Detour Analysis

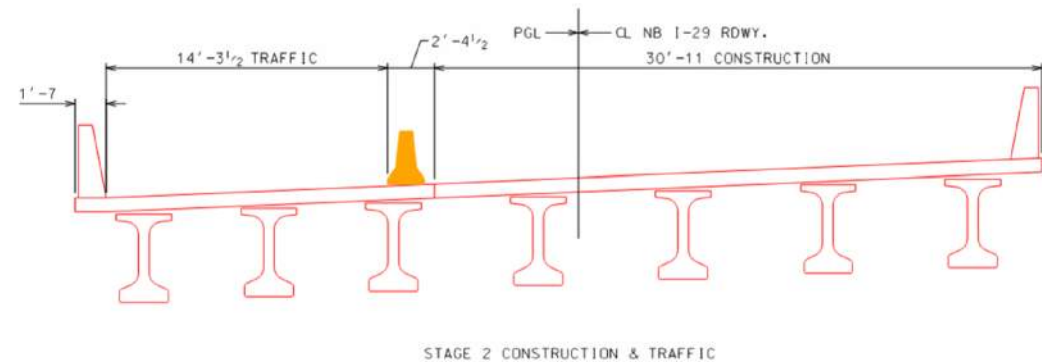
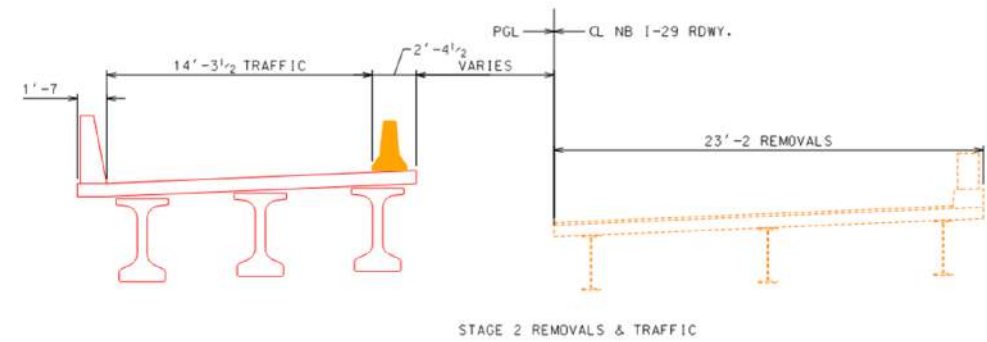
For Alternative #1A, traffic would be maintained by staged construction. One lane would be required during each stage of construction. Sheet pile would be required to accommodate the proposed staging. The overbuilt width of the bridge would allow one lane of traffic to be maintained during the staged construction. The curvature of the bridge on the north end of the existing bridge limits and controls the amount of proposed bridge that can be built in Stage 1. This constraint would require the TBR to be pinned to the proposed bridge deck.

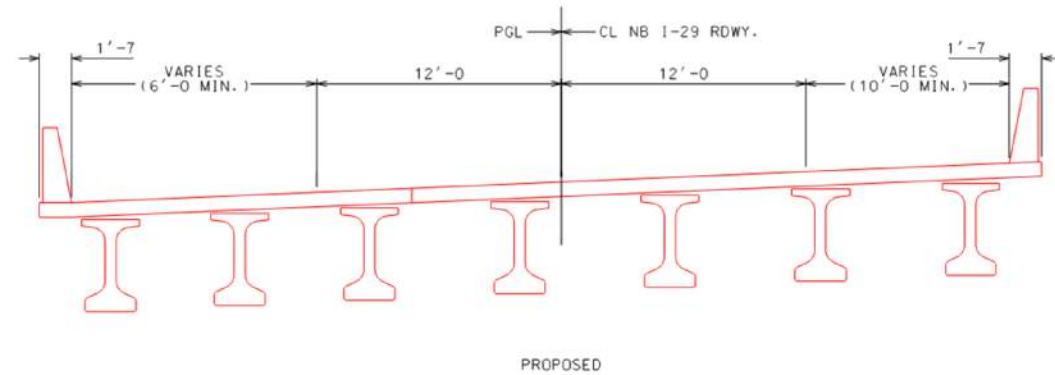


Stage 1: The first stage would require the removal of the western 19'-2". One lane of traffic would be maintained on the remaining east side of the existing bridge as an 18'-3" section of the new bridge is constructed.



Stage 2: The second stage would shift traffic (1 lane) to the west side of the newly constructed bridge section. The remaining 23'-2" of the existing bridge would be removed on the east side. Construction of the 30'-11" of the south side of the new bridge would occur.





For Alternatives #1B and #2, the northbound I-29 bridge will be closed with head-to-head traffic on the southbound lanes for 1.3 miles between median crossover locations. The southbound IA 192 ramp will be closed for the duration of bridge construction.

D. Recommendations

It is recommended the present structure be replaced with Alternative #1B, constructing the proposed bridge and roadway improvements on the existing northbound I-29 alignment. Instead of utilizing staged bridge construction and maintaining traffic on the northbound lanes during construction, traffic will utilize the median crossovers to go head-to-head on the southbound I-29 lanes.

E. Special Considerations

Northbound I-29 is identified on the Iowa DOT's Traffic Critical Projects (TCP) network; therefore, this will be considered a traffic critical project. Additionally, the southbound IA 192 exit ramp is a local diversion route for southbound I-29 as part of the Omaha / Council Bluffs Traffic Incident Management (TIM) Plan.

The location of this project is directly across the Missouri River from Eppley Airfield and may be in the runway protection zone. Due to the proximity of the airfield, there may be a height restriction on construction equipment used for this project and an Federal Aviation Administration (FAA) notification may be required according to IM 4.190. Per preliminary observation, the lowest "z" dimension to the proposed roadway is 26 feet, which may be exceeded by an on-site crane. Coordination with the Contractor will be required prior to construction..

Due to the bridge being located on an interstate route, the Accelerated Bridge Construction (ABC) score is at 50 and is at the threshold for consideration of ABC methods of construction. During design, further consideration to ABC, or other strategies such as precast deck panels or early incentives for completion, can be considered.

Neither pedestrian accommodations nor aesthetic enhancements will be required as part of this project.

There is an existing ground mounted fiber termination cabinet and camera pole at the north end of the existing bridge that will be impacted and need to be relocated. There is also a fiber optic cable backbone that runs along the inside shoulder west of southbound IA 192 to avoid or relocate.

No special survey is anticipated.

Right of Way is not anticipated for this project. The project may include grading within the levee ROW at the north project tie-in, however opportunities to avoid will be explored during preliminary design.

As noted with each alternative and based on preliminary desktop observations, a Section 404 Permit will be required due to wetland impacts, including the Blackbird Marsh. It is expected Alternative #1B will be covered under a Nationwide Permit.

F. Program Status

This project is listed in the 2024 - 2028 Iowa Transportation Improvement Program at \$6,992,000 for replacement in FY 2027. Costs for this project may be eligible for bridge replacement funds. A preliminary schedule of events has been developed with a January 2027 letting.

Utility Contacts

Black Hills Energy Gas Transmission
Chris Dewey
(712) 325-3022
chris.dewey@blackhillscorp.com

Iowa DOT Fiber Transmission
Jason Dale
(515) 239-1995
Jason.Dale@iowadot.us

City of Council Bluffs Water Works
Bryan Cady
(712) 328-1006
custserv@cbwaterworks.com

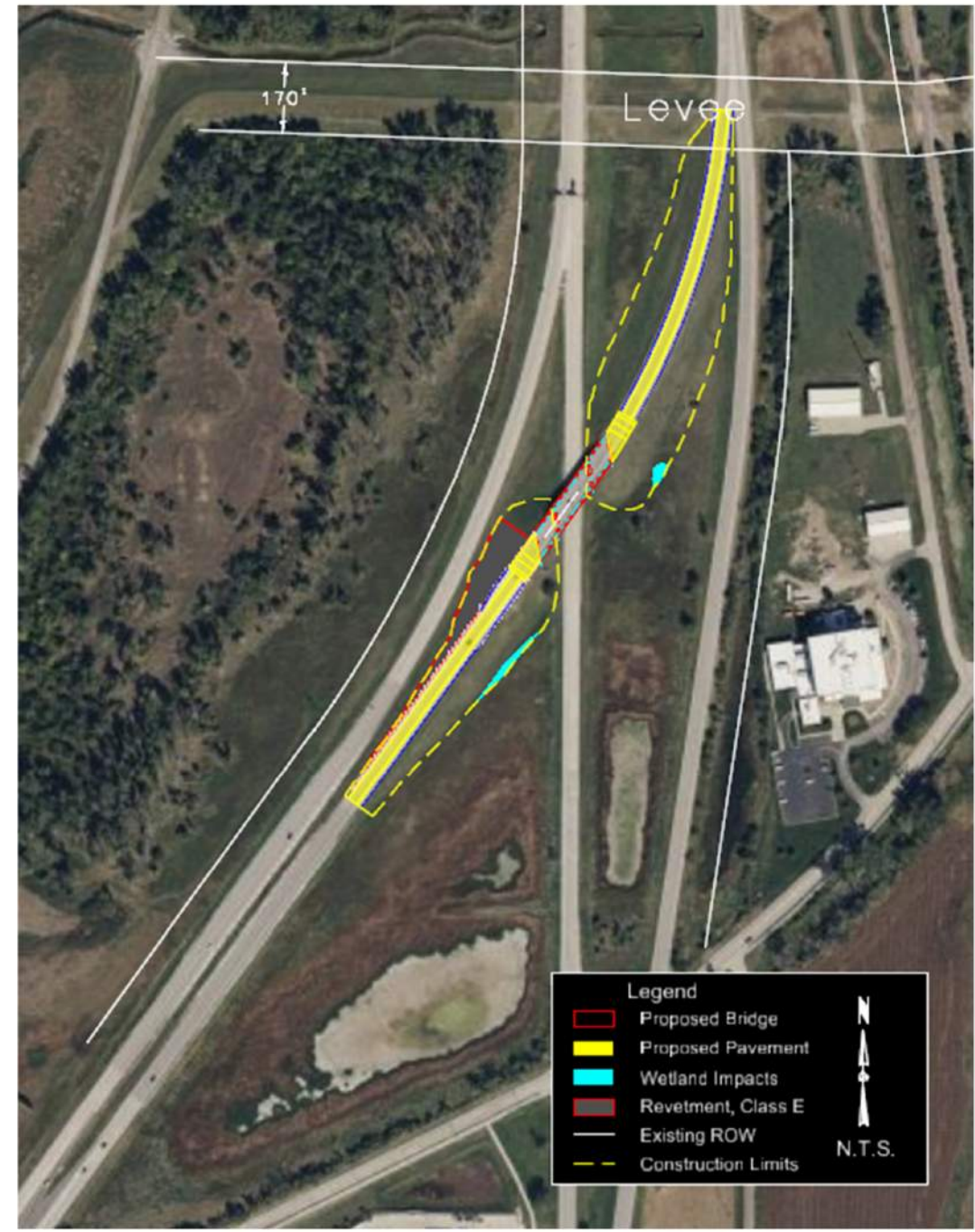
Iowa Communications Network Fiber Distribution
Michael Dalen
(515) 725-4707
mike.dalen@iowa.gov

City of Council Bluffs Sanitary Sewer
Greg Reeder
(712) 328-4636
greeder@councilbluffs.ia.gov

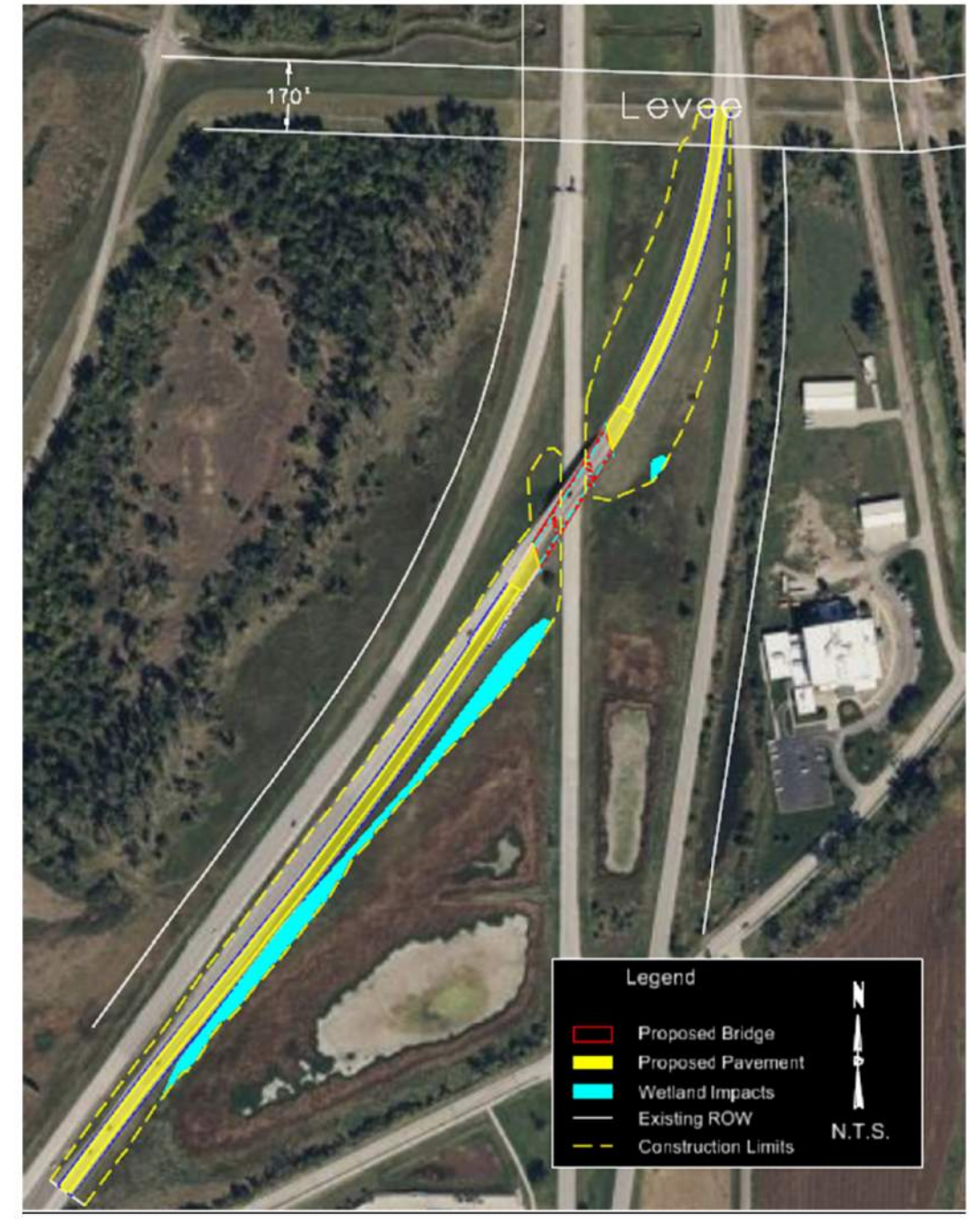
MidAmerican Energy Electric Distribution
Scott Behrens
(712) 366-5636
scott.behrens@midamerican.com



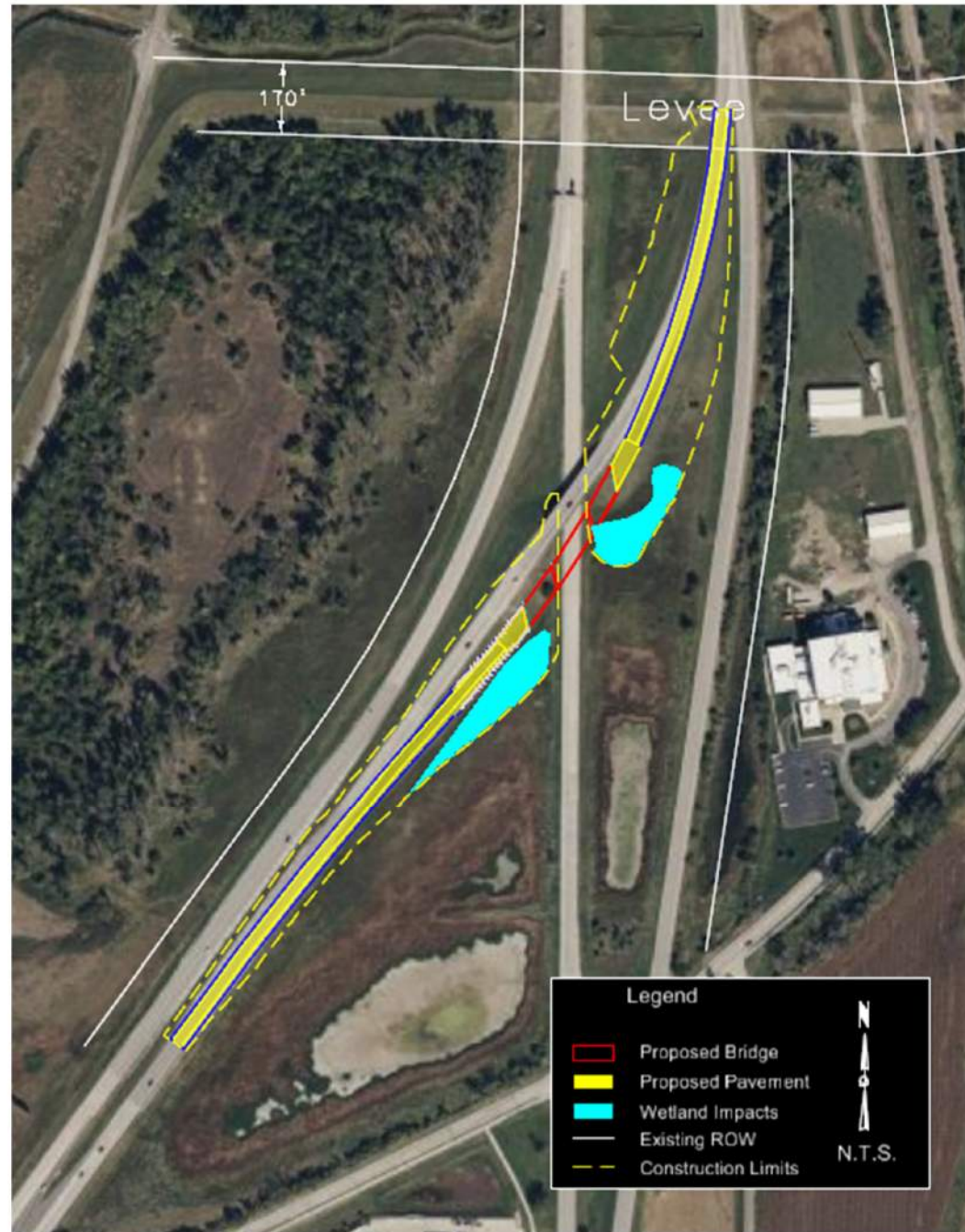
Alternative #1 - Replace with a PPCB bridge on existing alignment
 Alternative #1A: utilizing staged construction
 Alternative #1B: while closing NB I-29 and utilizing median crossovers



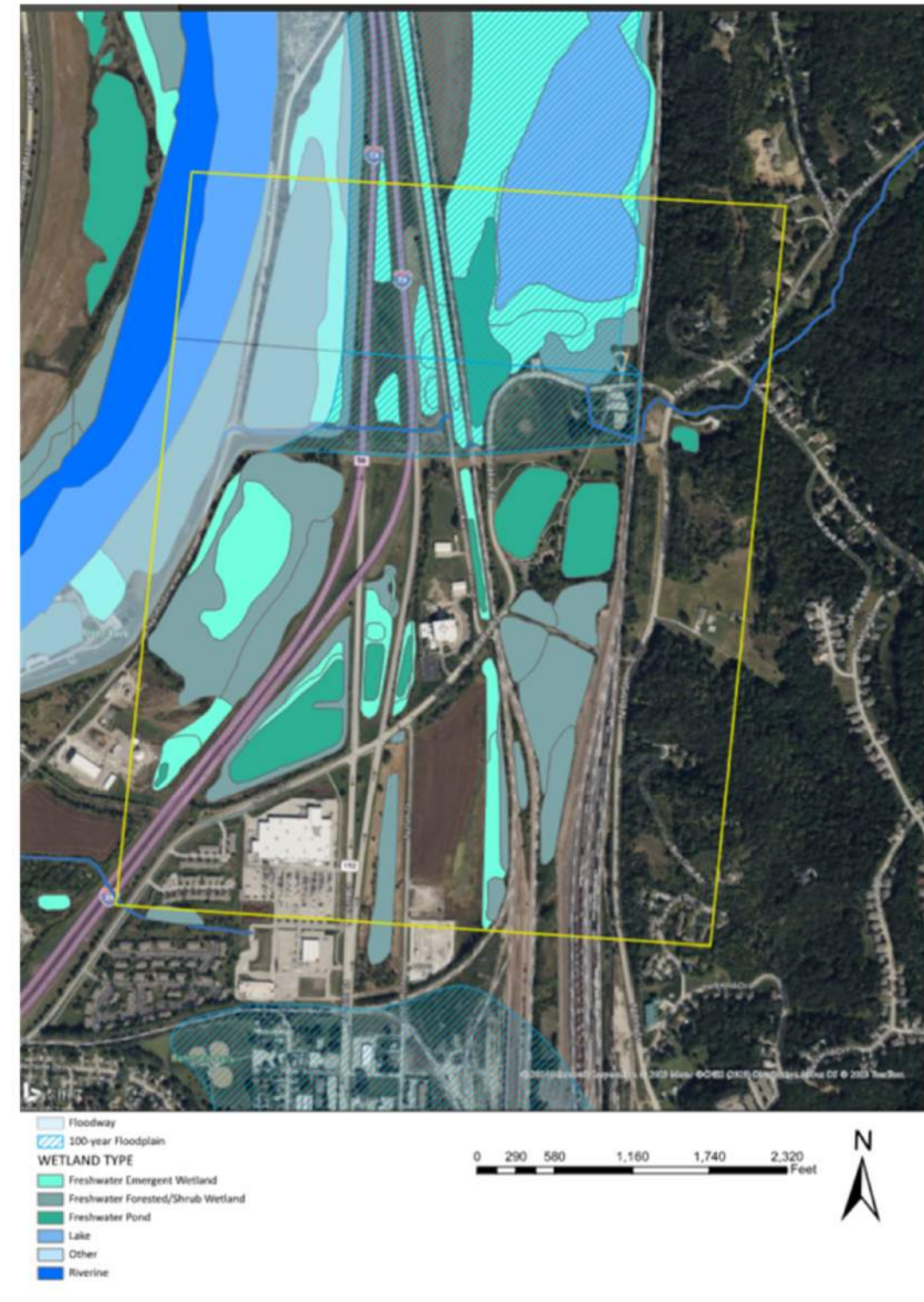
Alternative #2 - Replace with a PPCB bridge on an adjusted alignment, while closing NB I-29 and utilizing median crossovers



Alternative #3 - Replace with a CWPG bridge off alignment to the southeast while maintaining traffic on the existing NB I-29 bridge



Wetlands



I-29 NB over SB IA 192

Concept Alternatives Matrix

		Bridge Type	Geometrics / Grading	Staging / TSMO	Constructability	Additional Long-Term Maintenance Considerations	Environmental / Wetland Impacts	Utility Impacts	Right of Way Impacts	Concept Construction Cost (2024 Dollars)			Concept Review Meeting Notes
										Bridge	Roadway	Total	
Existing	Continuous Steel Beam Bridge	RSB	54.5 Degree Skew	-	-	-	-	-	-	-	-	-	
Alt. #1	PPCB Bridge on Existing Alignment Alt. #1A: with Staged Construction Alt. #1B: with Median Crossovers	289'-0" x 46'-0" PPCB	- 45 Degree Bridge Skew - Overbuild Bridge Width to Accommodate Curve in N. Bridge Span - Requires steeper slopes with revetment and additional guardrail due to grading challenges along SB I-29	Alt. #1A: - Complex Bridge Staging - Maintain Traffic Adjacent to Work Zone with Grade Raise	Alt. #1A: - Half of Bridge Built on a Curve - Temp. Shoring (Bridge + Roadway) - Use of Longest BTD Beams - Minimal Risk of Geotechnical Remediations	N/A	0.1 ac. (Section 404 Nationwide Permit)	ITS Cabinet / Camera Pole	N/A	\$3,310,900	\$2,290,600	\$5,601,500	
				Alt. #1B: - NB / SB I-29 Head-to-Head Traffic - SB IA 192 Detour - No Traffic in Work Zone	Alt. #1B: - Half of Bridge Built on a Curve - Reduced Construction Schedule from Alt. 1A - Use of Longest BTD Beams - Minimal Risk of Geotechnical Remediations					\$3,035,000	\$2,497,700	\$5,532,700	
Alt. #2	PPCB Bridge on Adjusted Alignment with Median Crossovers	329'-0" x 40'-0" PPCB	- 45 Degree Skew - Tangent Bridge - Gradual NB I-29 Reverse Curve	- NB / SB I-29 Head-to-Head Traffic - SB IA 192 Detour - No Traffic in Work Zone	- Reduced Construction Schedule from Alt. 1A - Use of Longest BTD Beams - Minimal Risk of Geotechnical Remediations	N/A	1.2 ac. (Section 404 Individual Permit)	ITS Cabinet / Camera Pole	N/A	\$3,174,200	\$2,887,700	\$6,061,900	
Alt. #3	CWPG Bridge Off Alignment (South) while Maintaining Traffic on Existing	387'-0" x 40'-0" CWPG	- 45 Degree Skew - Full Bridge on Horizontal Curve - NB I-29 Reverse Curve - Exceeds Length for Integral Abutments	- Maintains 2 Lanes of NB I-29 Traffic for Off-Line Construction and 1 Lane at Proposed Connections	- Reduced Construction Schedule from Alt. 1A - Bridge Built on a Curve - Risk of Soil Remediations / IFIs	Steel Girder Inspections / Maintenance	1.1 ac. (Section 404 Individual Permit)	ITS Cabinet / Camera Pole	N/A	\$4,097,200	\$3,320,400	\$7,417,600	
													All Options: - Avoid / minimize impact to I-29 NB entrance ramp from NB IA 192 - Avoid / minimize impact to existing levee

Acronyms

- RSB Rolled Steel Beam
- PPCB Pretensioned Prestressed Concrete Beam
- CWPG Continuous Welded Plate Girder
- IFI Intermediation Foundation Improvements

3/22/2024

Bridges and Structures Bureau Attachment for Concept Statement

Date: March 1st, 2024
 By: HNTB
 Location: I-29 NB Bridge over SB IA 192, at the N junction with IA 192 in Council Bluffs

County: Pottawattamie County
 Phase No.: IMX-029-3(270)57--02-78
 Project Code: 22-78-029-020

1. Regulatory/Coordination
 - a. Iowa DNR Flood Plain permit = Yes
 - b. Iowa DNR Sovereign Lands permit = No
 - c. Local Record of Coordination = No
 - d. Flood Insurance Study = No
 - e. Drainage District = No
 - f. Corps of Engineers Section 408 = No
 - g. State Water Trail or Paddling Route = No
2. Hydrologic/Hydraulic Analysis/RIDB Dataset
 - a. Design discharges determined = N/A
 - b. Hydraulic analysis done = N/A
 - c. Riverine Infrastructure Database (RIDB) = N/A
3. Structure/Roadway Layout Considerations
 - a. No substructures are to be located inside the IA 192 clear zone.
 - b. If 45-degree substructures are used, pier caps also need to be outside the IA 192 clear zone.
 - c. Vertical clearance shall be 16'-6".
 - d. Bridge roadway approach work is near a levee and partially within the floodplain. Coordination with the levee owner may be warranted.
4. Special construction issues
 - a. It is desirable for new structure foundations to avoid existing foundations.
5. Special survey = No
6. Aesthetic enhancements = No
7. Other
 - a. Maintenance of Traffic to use crossovers.

~ 1 ~

ABC Rating Score Calculation
 I-29 NB over SB IA 192 Bridge Replacement

General input	
FHWA or Structure Number	44870
PIN Number	22-78-029-020
Project Number	IMX-029-3(270)57--02-78
Design Number	
County Name	Pottawattamie
Route Carried	I-29 NB
Feature Crossed	SB IA 192
Location Description	At the N Junction with IA 192 in Council Bluffs

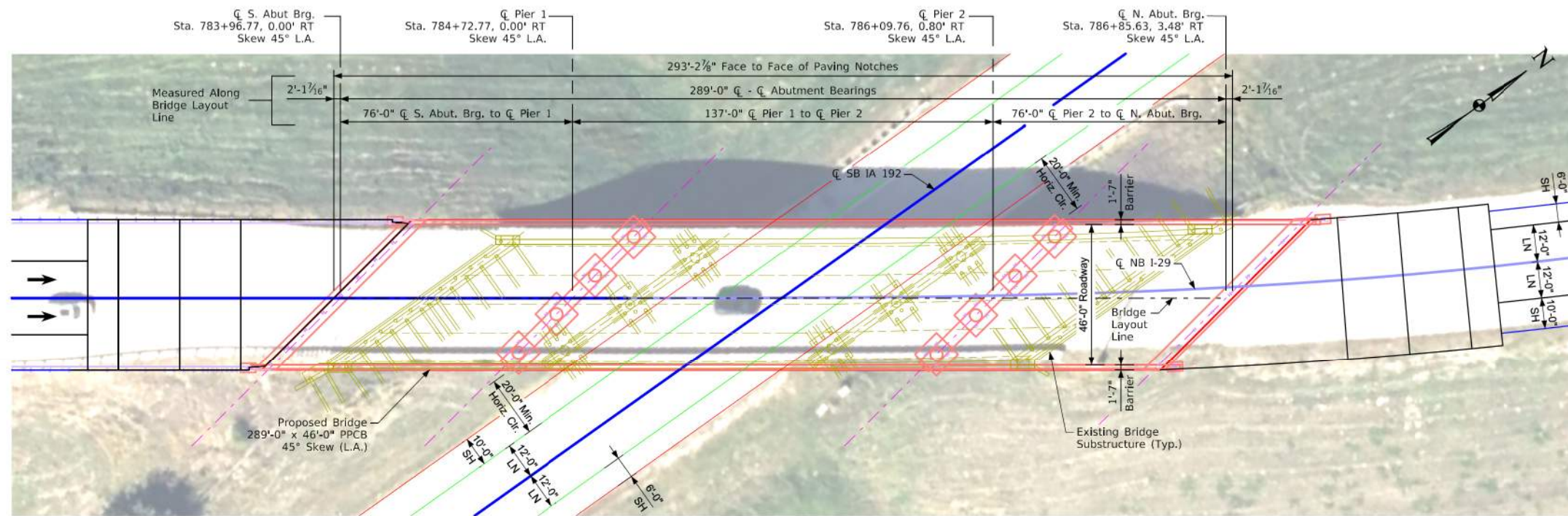
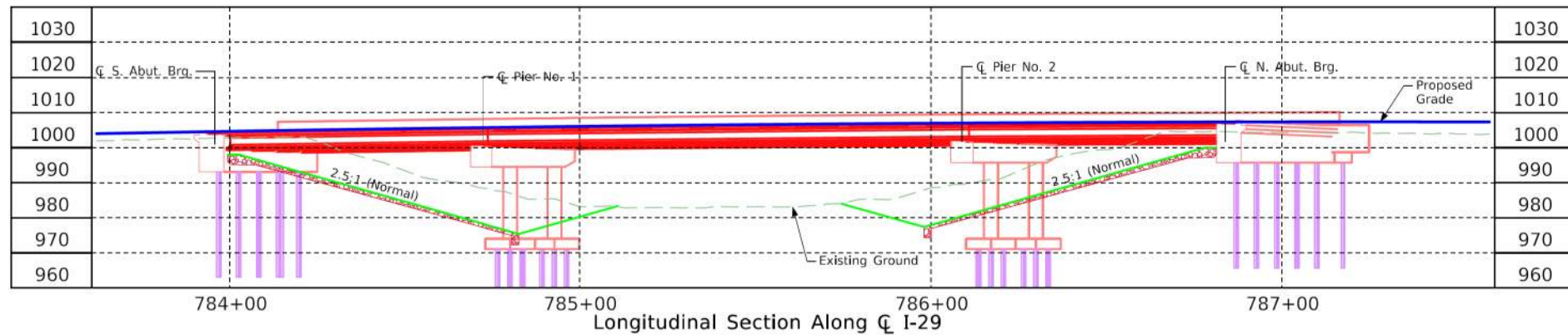
Required SI&A Input for Calculation of ABC Rating Score			
SI&A Item No.	SI&A Item	SI&A Item Value	SI&A Units
5B	Route Signing Prefix	1	
19	Bypass, Detour Length	9	kilometers
29	Average Daily Traffic (On)	13,000	
29	Average Daily Traffic (Under)	2,282	
45	Number of Spans in Main Unit	3	
46	Number of Approach Spans	0	
109	Average Daily Truck Traffic	23	%

Note: If the ABC Rating Score is less than 50 and the structure is an interstate bridge or the detour is greater than or equal to 30 miles then the score is set to 50.

User cost per mile: 0.375 \$/mile Contact PreDesign for updates to user cost per mile

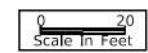
Concept Measure Scores		
Concept Measure	Score	
Average Annual Daily Traffic Combined value of 100% on and 25% under = 13,571	3	0 No traffic impacts 1 Less than 5000 2 5000 to less than 10,000 3 10,000 to less than 15,000 4 15,000 to less than 20,000 5 20,000 or more
Out of Distance Travel Value in miles = 6	2	0 No detour 1 Less than 5 2 5 to less than 10 3 10 to less than 15 4 15 to less than 20 5 20 or more
User Costs Value in \$ = \$42,705.00	2	0 No user costs 1 Less than \$10,000 2 \$10,000 to less than \$50,000 3 \$50,000 to less than \$75,000 4 \$75,000 to less than \$100,000 5 \$100,000 or more
Economy of Scale Value is total number of spans = 3	1	0 1 span 1 2 or 3 spans 2 4 or 5 spans 3 6 spans or more

ABC Rating Score Factors and Weights					
Concept Measure	Score	Weight Factor	Adjusted Score	Maximum Score	Adjusted Score
Average Annual Daily Traffic	3	10	30	5	50
Out of Distance Travel	2	10	20	5	50
User Costs	2	10	20	5	50
Economy of Scale	1	5	5	3	15
Total Score			75	Max. Score	165
Calculated ABC Rating Score			45		
ABC Rating Score			50		



Situation Plan

Design For 45° LA
289'-0" x 46'-0" Prestressed
Pretensioned Conc. Beam Bridge
76'-0" End Spans 137'-0" Interior Span
Situation Plan
STA. 785+41.27 (I-29 NB) Turn-in Date: mmm yyyy
Pottawattamie County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. XXXX Design Sheet No. 1 of 1 FHWA No. FHWANO



FILE NO. XXXXX	ENGLISH	DESIGN TEAM HNTB	Pottawattamie COUNTY	PROJECT NUMBER IMX-029-3(270)57-02-78	SHEET NUMBER V.1
----------------	---------	------------------	----------------------	---------------------------------------	------------------

10:21:54 AM 3/21/2024 mmaresko pw:\projectwise.dot.int.lan:PWMMain\Documents\Projects\7802902022\Bridge\BRPrelim\SHT_78029270_HNTB_DSN_FHWANO_Z06.dgn

© 2024 Microsoft Corporation. © 2024 Maxar. © 2024 CNES. 2024 Distribution Allowed.

Roadway	I-29 Northbound		
PIN Number	22-78-029-020	Submittal Date	05/31/24
Project Number	IMX-029-3(270)57--02-78		Approval Date
District	District 4	Assistant District Engineer	Wes Mayberry
County	Pottawattamie	or	
Route	I-29	Office Director	
Location	I-29 Northbound over IA 192 Southbound		
Work Type	Bridge Replacement - PPCB		
Segment Manager			
Designer	HNTB		

[Design Manual Section 1C-1](#)
Last Updated: 04-29-19

Urban Interstates (Urban Freeways)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		5 miles above the anticipated posted speed limit	50	65
Maximum superelevation rate (%) (Refer to Section 2A-2)		6	8	6
Design lane width (ft)		12	12	12
Full depth paved width (ft)	Outside lane	12	12	12
	Inside lane(s)	12	12	12
Auxiliary-lane width (ft)		12	12	N/A
Pavement cross-slope	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 lanes	3%	3% maximum	N/A
	Crown break at centerline	4%	4% maximum	4%
Shoulder cross-slope	Interstates	4%	6% max, but not less than the cross slope of the adjacent lane	4%
	Freeways	4%	6% max, but not less than the cross slope of the adjacent lane	4%
Curb type (Refer to Section 3C-2)	Interstates	4-inch sloped	4-inch sloped	N/A
	Freeways	4-inch sloped	4-inch sloped	N/A
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	4:1 for Interstates, 3:1 for Freeways*	10:1 for 4' then 6:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1
	Curbed roadways	2%	4:1 for Interstates, 3:1 for Freeways*	N/A
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	N/A
	w/o drainage structures	10:1	6:1	N/A
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	N/A
	Median ditch depth (ft)	4	--	N/A
Median width (ft) (Refer to Section 3E-1)	Interstates	34	10	50
	Freeways	34	10	N/A
Bridge width—new***	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	N/A
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	40
Bridge width—existing***	Bridge length ≤ 200 ft	design lane widths + no less than 10' right and 3.5' left	design lane widths + 10' right shoulder and 3.5' left shoulder	N/A
	Bridge length > 200 ft	design lane widths + no less than 3.5' left and right	design lane widths + 3.5' right and left of the design lane widths	N/A
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks))	Over primary	16.5	16	16.5
	Over non-primary	16.5 at interchange locations, 15 ft at all other locations	14	N/A
	Over railroad	23.3	23.3	N/A
	Sign trusses and pedestrian crossings	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	HL-93
Level of Service	Freeway segments	C	C**	
	Auxiliary Facilities	C	C**	

2:1 where protected with guardrail and revetment

*Design Exception not required for Freeways
 **LOS D may be acceptable in spot locations with FHWA approval
 ***FHWA notification via email is required if acceptable criteria is not met on the Interstate or NHS systems (No formal design exception required)

Directional Design Hourly Volume (DDHV) for Trucks = 168

[Design Manual Section 1C-1](#)
[Last Updated: 04-29-19](#)

Effective Shoulder Width and Type for Interstates (Freeways)

Auxiliary Lanes	Preferred (values shown in feet)		Acceptable (values shown in feet)		Project Values
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
	6	6	6	6	N/A

4-Lane Sections

Design Year Traffic	Outside		Median Side		Outside		Median Side		Project Values
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
Less than or equal to 250 DDHV	10	10	6	6	10	10	4	4	10,6
Greater than 250 DDHV	12	12	6	6	12	12	4	4	N/A

Sections with 6 or more lanes

Design Year Traffic	Outside		Median Side		Outside		Median Side		Project Values
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
Less than or equal to 250 DDHV	10	10	10	10	10	10	10	10	N/A
Greater than 250 DDHV	12	12	12	12	12	12	12	12	N/A

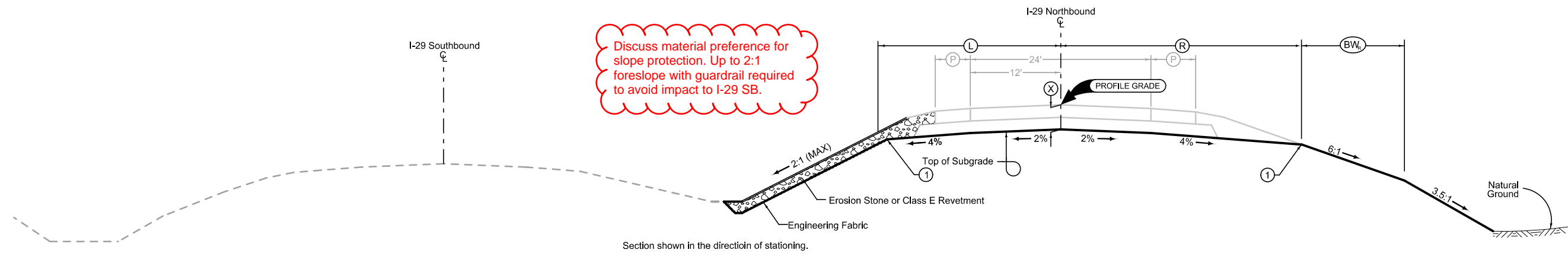
Curbs should be located beyond the outer edge of the paved shoulder

Notes:

Roadway Design Speed (mph) =		65											Project Values		
Design Manual Section 1C-1 Last Updated: 04-29-19		Design Criteria for High Speed Roadways													
Design Element		Preferred Criteria						Acceptable Criteria						Project Values	
		Design Speed, mph						Design Speed, mph							
		50	55	60	65	70	75	50	55	60	65	70	75		
Stopping sight distance (ft) (Refer to Section 6D-1)		425	495	570	645	730	820	425	495	570	645	730	820	645	
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e _{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	1660
			e _{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210
Minimum vertical curve length (ft) (Refer to Section 2B-1)		150	165	180	195	210	225	150	165	180	195	210	225	195	
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	193
	sag vertical curves	roadways without fixed source lighting	96	115	136	157	181	206	96	115	136	157	181	206	157
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	157
Minimum gradient (%) (Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						0.5%	
Maximum gradient (%) (Refer to Section 2B-1)	Urban roadways		4		3				7	6	6	—	—	—	4%
	Rural roadways		4		3				5	5	4	4	4	4	N/A
	Interstates		4		3				5	5	4	4	4	4	4%
Clear zone		See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						34*	

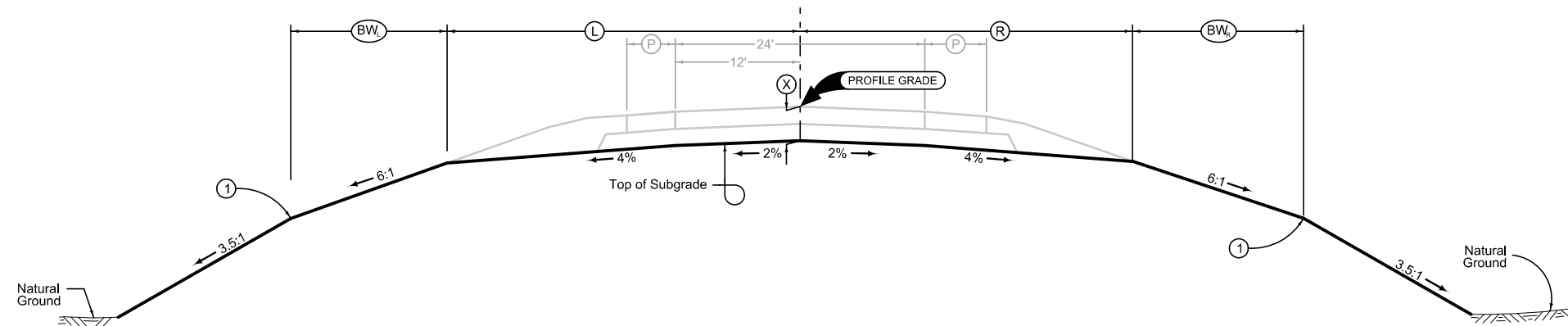
Confirm Iowa DOT concurrence with clear zone on SB IA 192

Notes:
*Clear zone for SB IA 192 is 20ft based on an assumed ramp speed of 50 mph at the bridge (I-29 SB posted = 65 mph, SB IA 192 posted = 45 mph).



Section shown in the direction of stationing.

ROAD IDENTIFICATION	LOCATION		DIMENSIONS				
	STATION TO STATION		Ⓛ	Ⓡ	ⓧ	ⓁⓂ	ⓁⓂ
			Feet	Feet	Inches	Feet	Feet
NB I-29	773+00.00	776+40.39	28	32	22	7.5	
NB I-29	776+40.39	777+28.00	28	38	22	14.5-7.5	
NB I-29	777+28.00	784+00.00	28	38	22	7.5	
NB I-29	786+91.23	789+00.00	28	38	22	10	



Section shown in the direction of stationing.

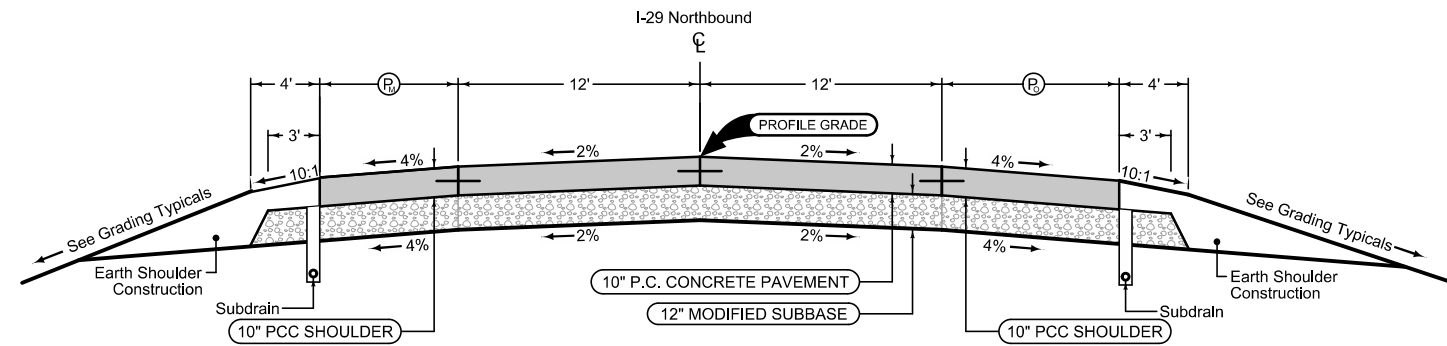
ROAD IDENTIFICATION	LOCATION		DIMENSIONS				
	STATION TO STATION		Ⓛ	Ⓡ	ⓧ	ⓁⓂ	ⓁⓂ
			Feet	Feet	Inches	Feet	Feet
NB I-29	789+00.00	794+50.00	38	36	22	8	10

① Refer to project plan and cross sections for specific location of foreslope change.

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

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

NORTHBOUND I-29 GRADING



Section shown in the direction of stationing.

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

Direction of Travel	BEGIN STATION	END STATION
NB	773+00.00	783+10.22
NB	787+86.68	794+50.00

Pending pavement recommendation. Existing I-29 NB is 10" PCC over 4" granular subbase and 2" special backfill.

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: BT-2, L-2 or KT-2
 Transverse joints: C at 17' spacing

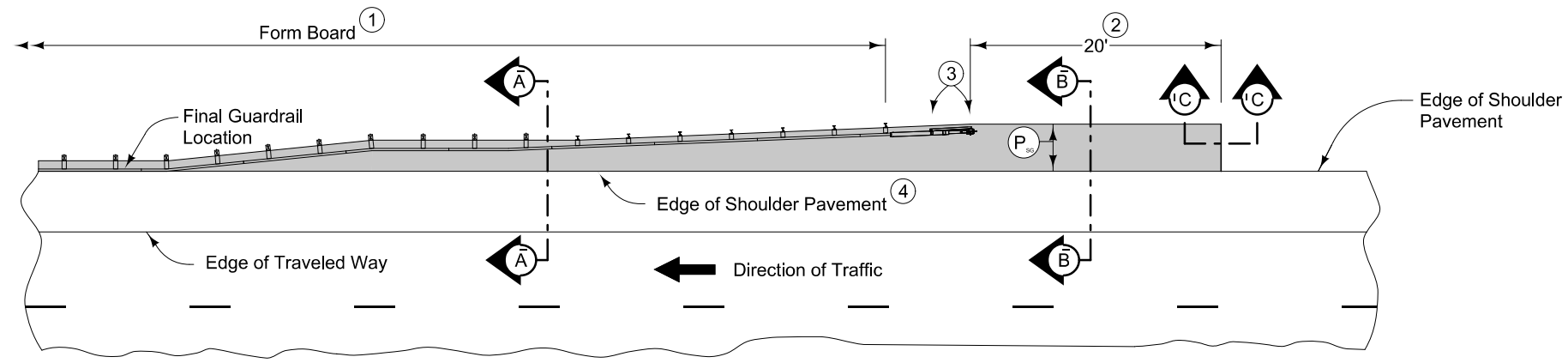
Direction of Travel	STATION TO STATION		Ⓡ Feet
NB	773+00.00	781+48.86	6
NB	781+48.86	781+68.86	12
NB	781+68.86	782+06.26	12-8
NB	782+06.26	782+77.67	8
NB	782+77.67	783+10.22	8-10
NB	787+87.68	794+50.00	6

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: BT-2, L-2 or KT-2
 Transverse joints: C at 17' spacing

Direction of Travel	STATION TO STATION		Ⓡ Feet
NB	773+00.00	781+17.25	10
NB	781+17.25	781+37.25	13
NB	781+37.25	781+79.84	13-11.6
NB	781+79.84	783+10.22	11.6
NB	787+87.68	794+50.00	10

NORTHBOUND I-29 PAVING



PLAN VIEW

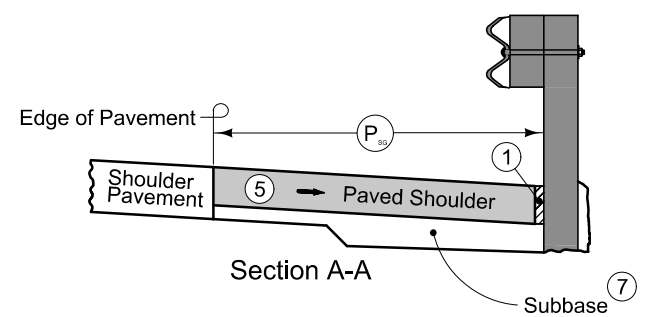
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

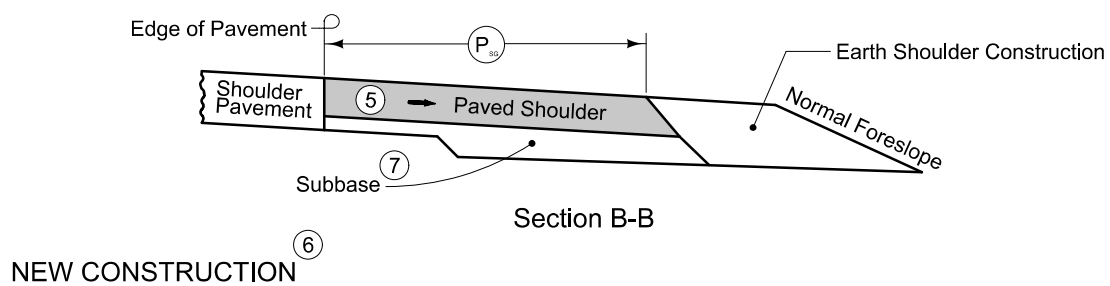
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'KT' (per PV-101) joint for PCC shoulder. 'B' (per PV-101) joint for HMA shoulder.
- ⑤ Match shoulder slope.
- ⑥ The Contractor has the option to pave the paved shoulder at guardrail and the full width paved shoulder as one operation.
- ⑦ Refer to other details in the plan.

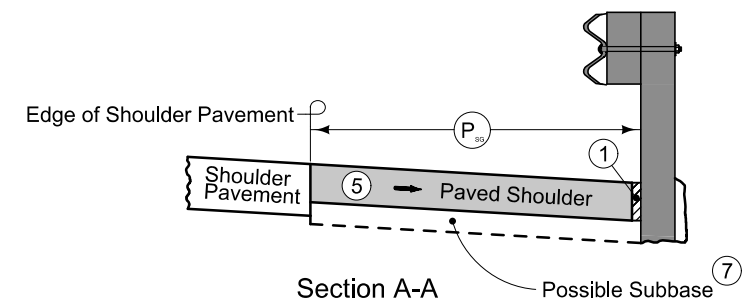


Section A-A

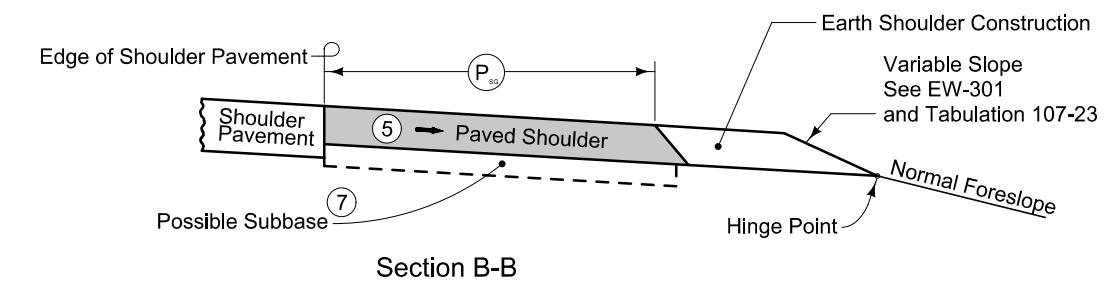


Section B-B

NEW CONSTRUCTION

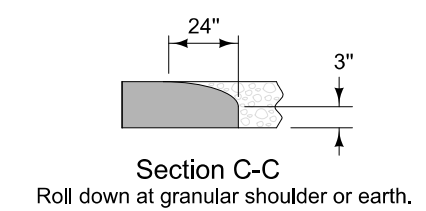


Section A-A



Section B-B

EXISTING SHOULDER



PAVED SHOULDER AT GUARDRAIL (ADJACENT TO FULL WIDTH PAVED SHOULDER)

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
- Traffic Signal Control Box
- Rail Road Signal Control Box
- Telephone Switch Box
- Electric Box

UTILITY LEGEND

- Black Hills Energy Gas Transmission
Chris Dewey
(712) 325-3022
chris.dewey@blackhillscorp.com
- City of Council Bluffs Water Works
Bryan Cady
(712) 328-1006
custserv@cbwaterworks.com
- City of Council Bluffs Sanitary Sewer
Greg Reeder
(712) 328-4636
greeder@councilbluffs.ia.gov
- Iowa DOT Fiber Transmission
Jason Dale
(515) 239-1995
Jason.Dale@iowadot.us
- Iowa Communications Network
Fiber Distribution
Michael Dalen
(515) 725-4707
mike.dalen@iowa.gov
- MidAmerican Energy Electric Distribution
Scott Behrens
(712) 366-5636
scott.behrens@midamerican.com

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.	
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING		Design Color No.	
Lavender	(9)		Temporary Pavement Shading
Yellow	(4)		Proposed Pavement Shading
Orange	(6)		Proposed Granular Shading
Orange	(70)		Proposed Shoulder Granular Shading
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading
Yellow	(132)		Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Orange, Light	(134)		Proposed Granular Entrance Shading
Yellow	(220)		Proposed Paved Entrance Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading
Green, Light	(225)		Existing Pavement Shading
Red	(3)		Proposed Structure Shading
Red	(3)		Delineates Restricted Areas
Gray	(64)		Revetment

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

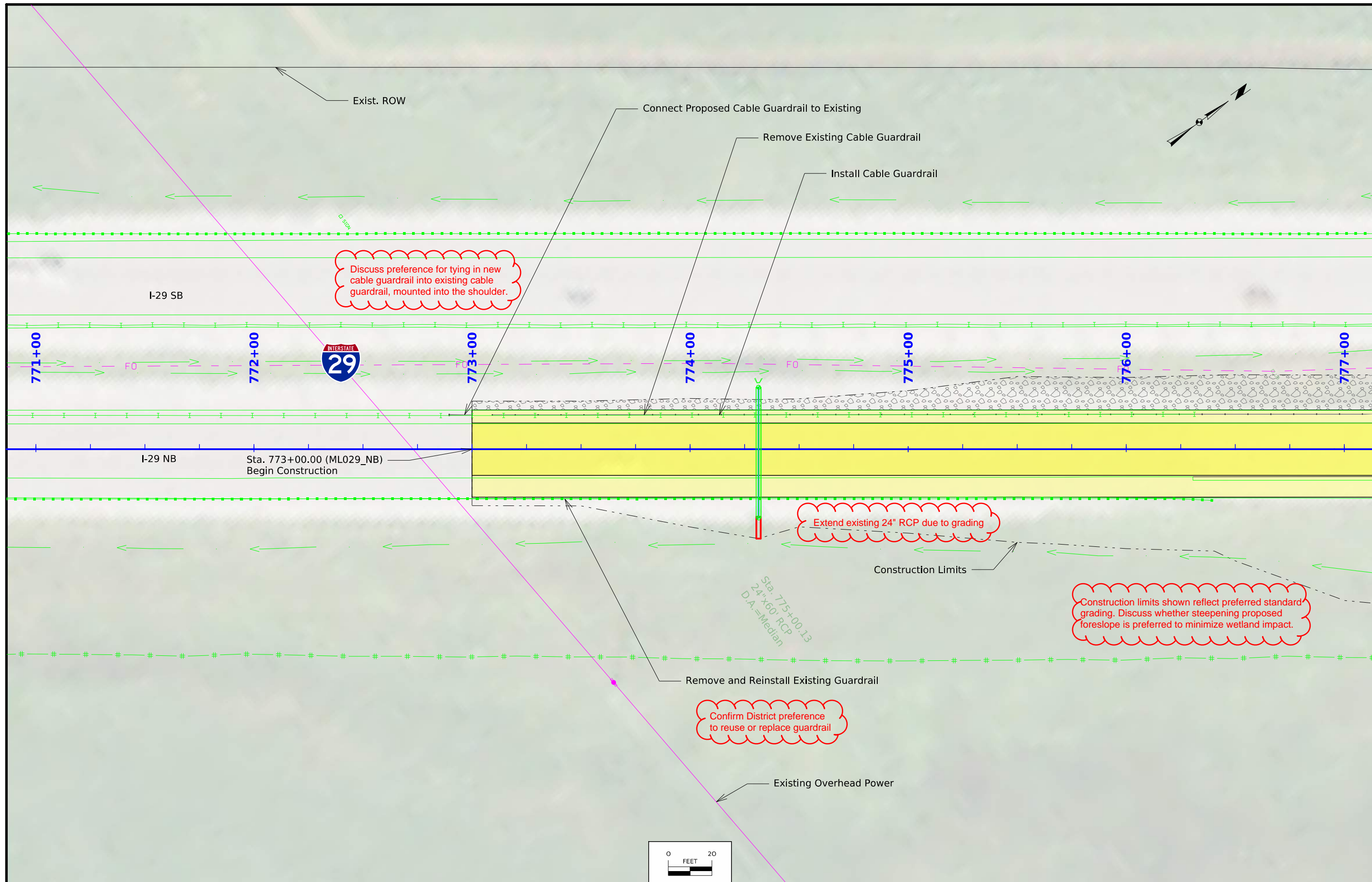
LINEWORK		Design Color No.	
Green	(10)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

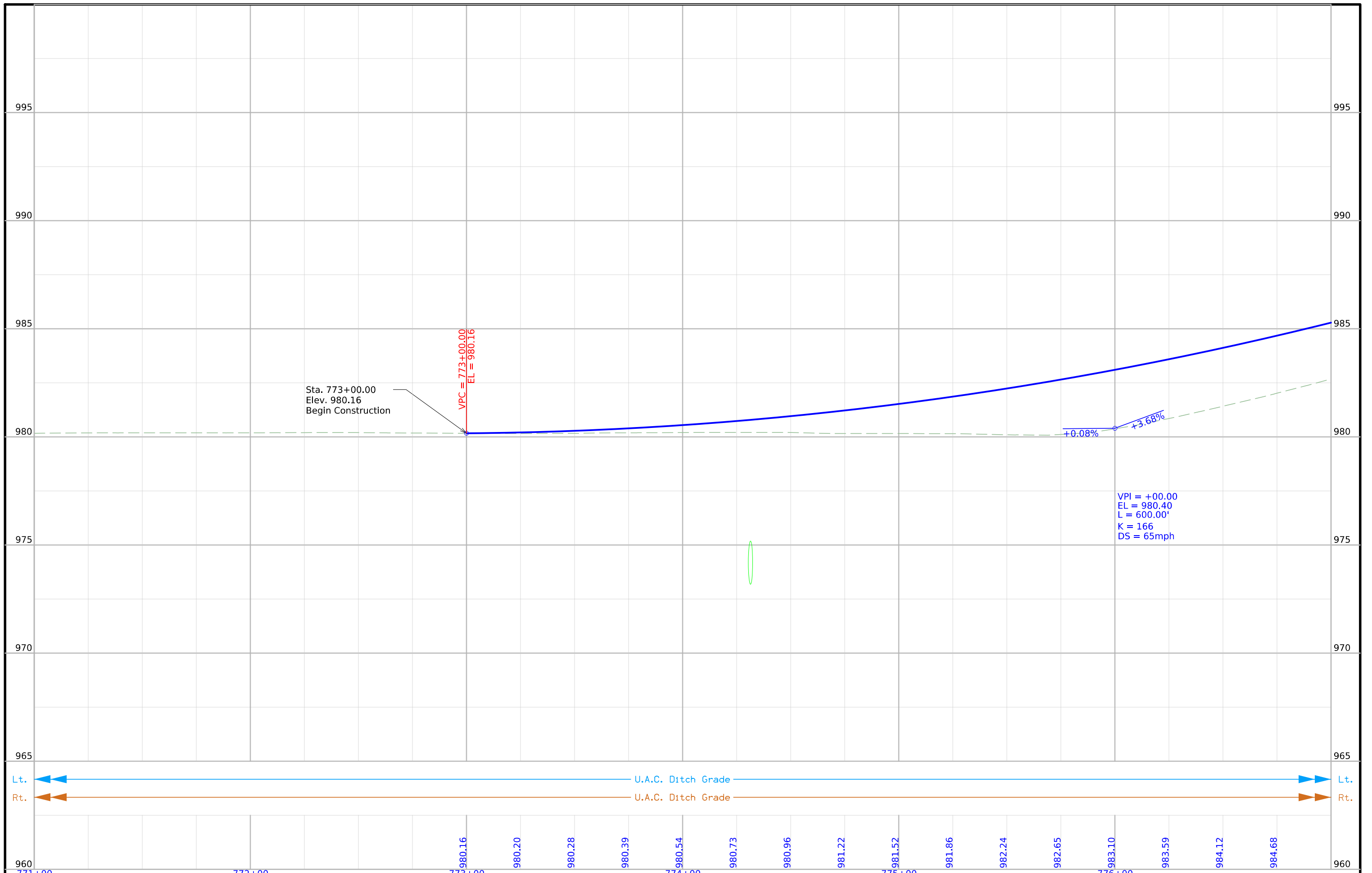
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

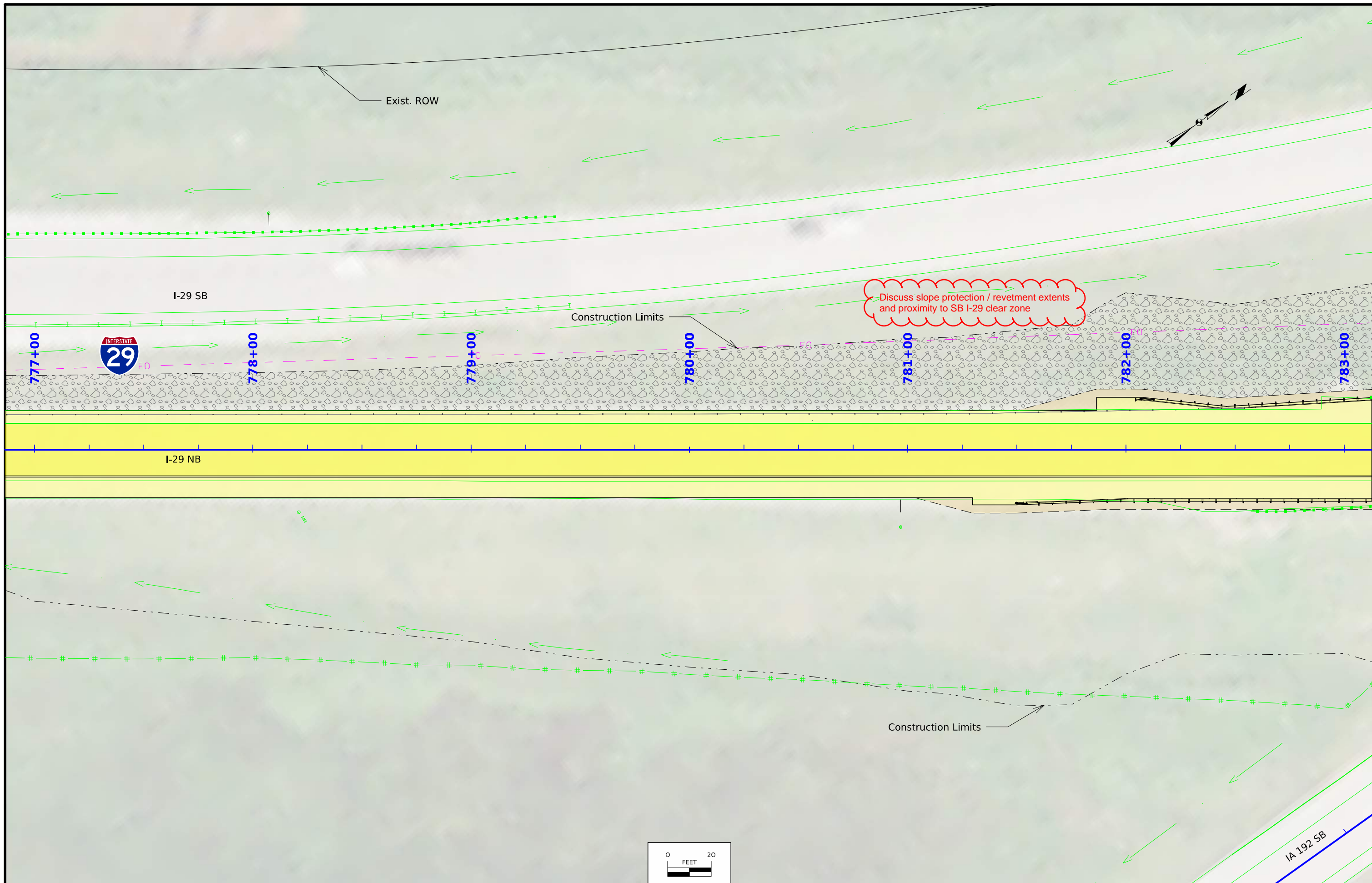
- ### RIGHT-OF-WAY LEGEND
- Proposed Right-of-Way
 - Existing Right of Way
 - Existing and Proposed Right-of-Way
 - Easement and Existing Right-of-Way
 - Easement (Temporary)
 - Easement
 - Access Control
 - Property Line

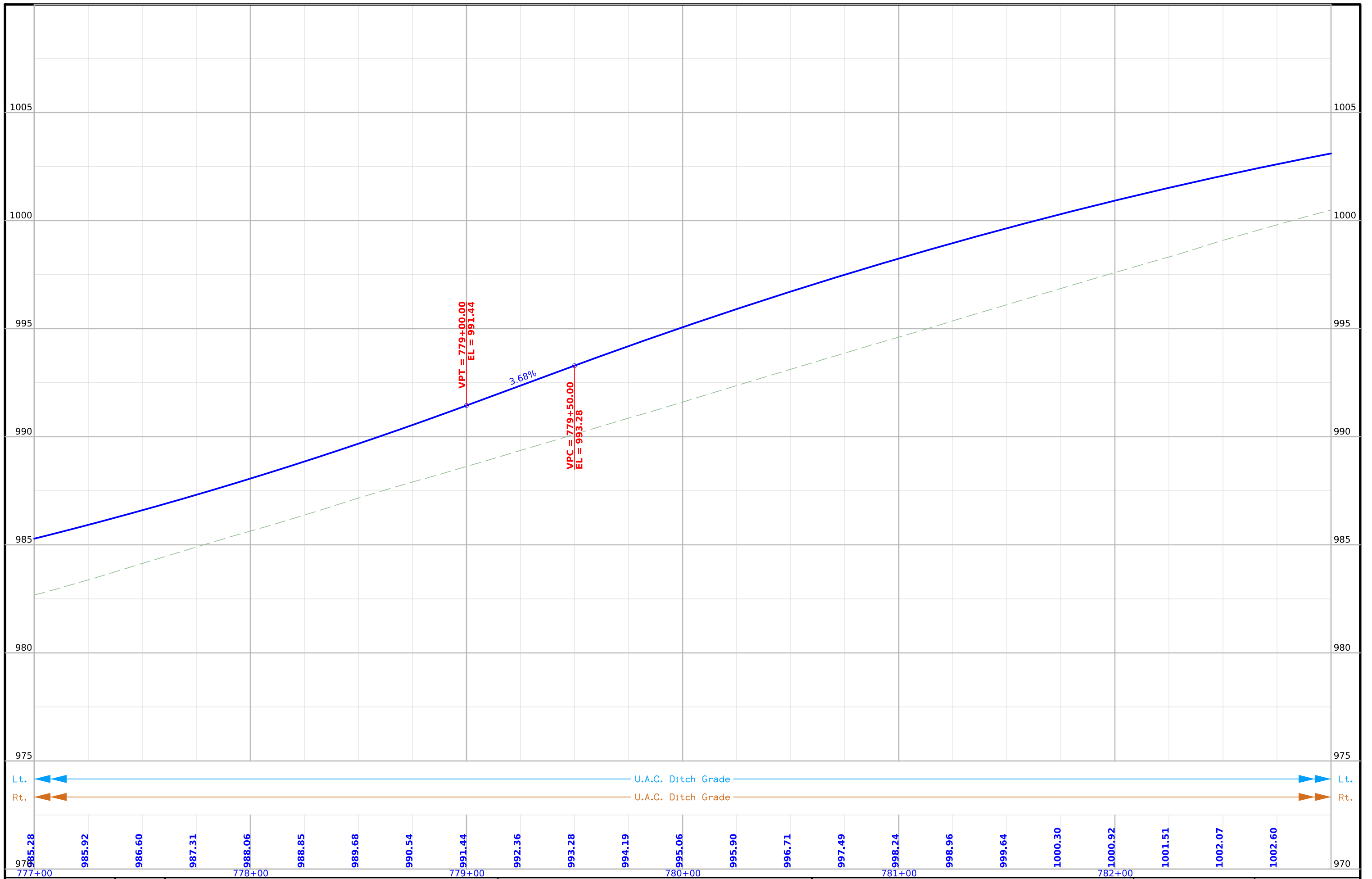
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

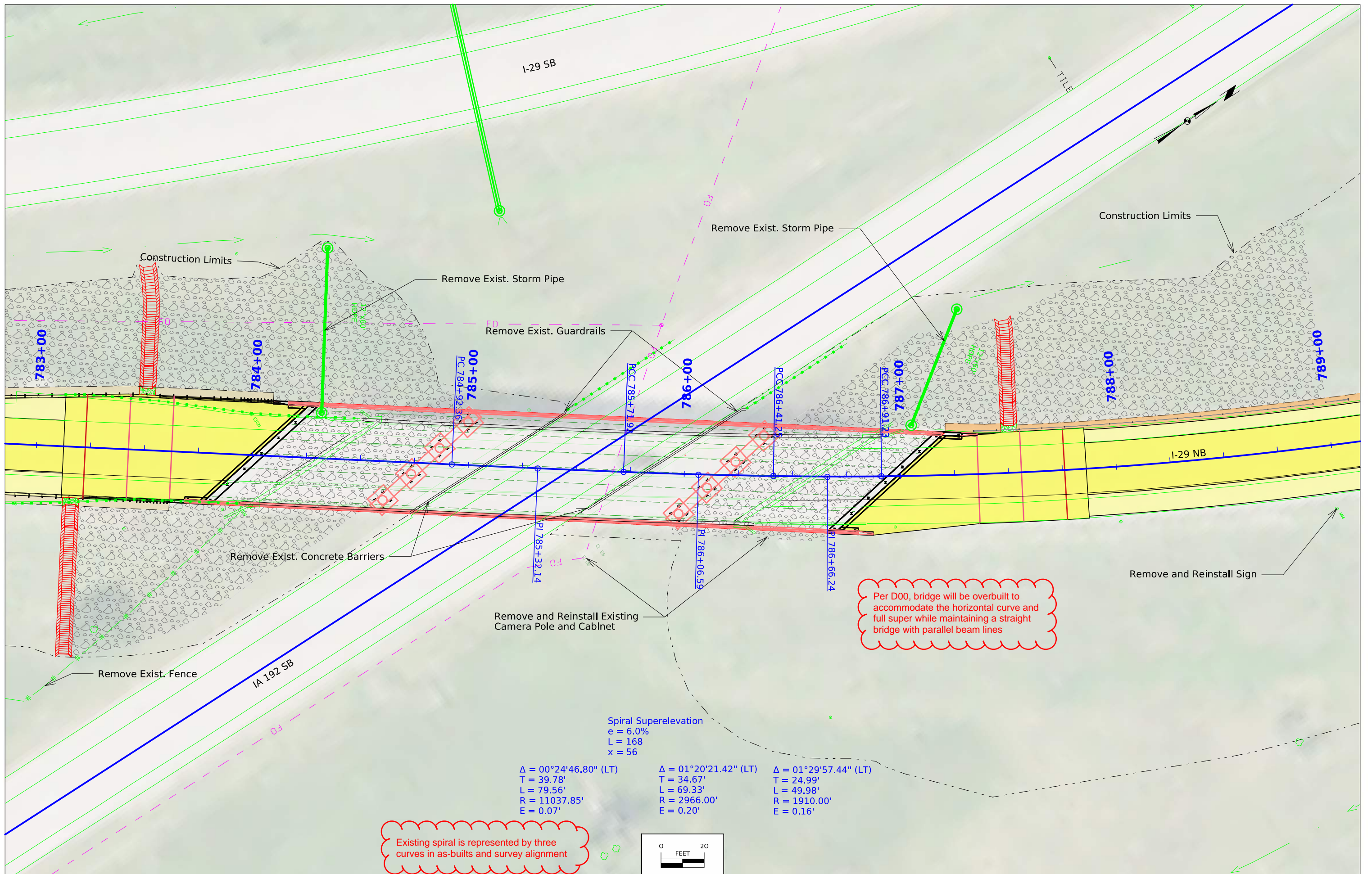
(COVERS SHEET SERIES D)

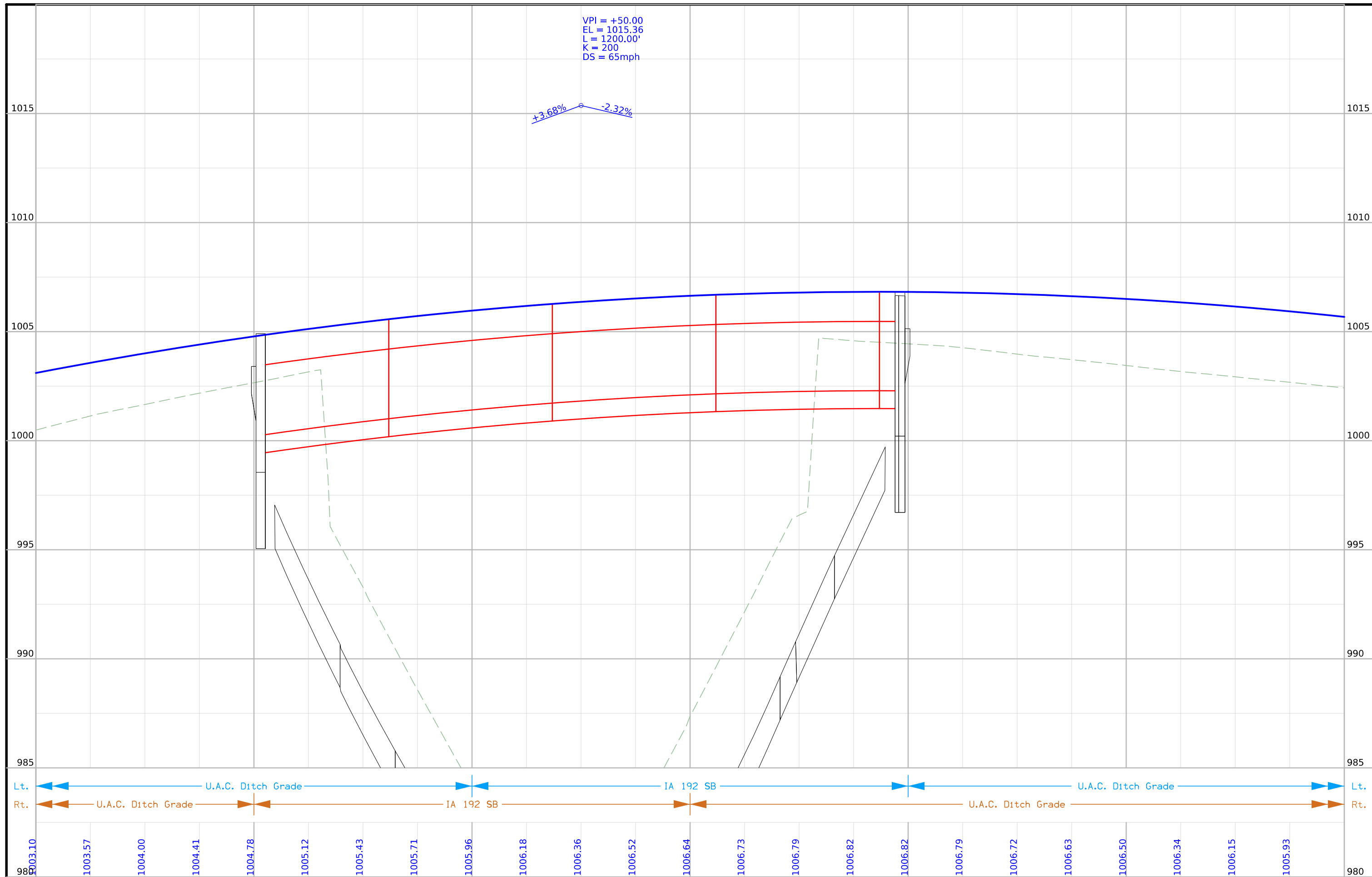




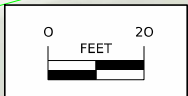
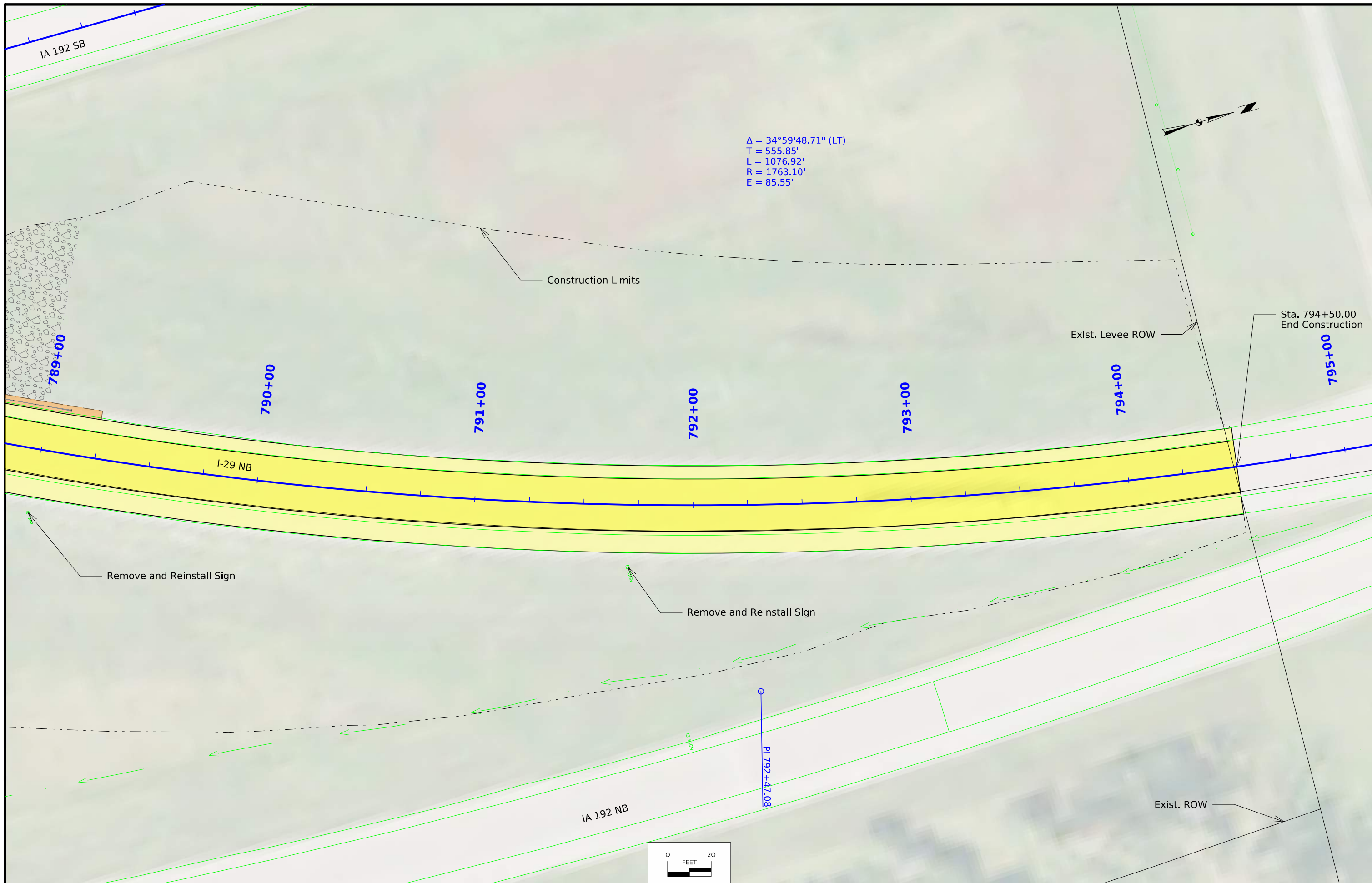


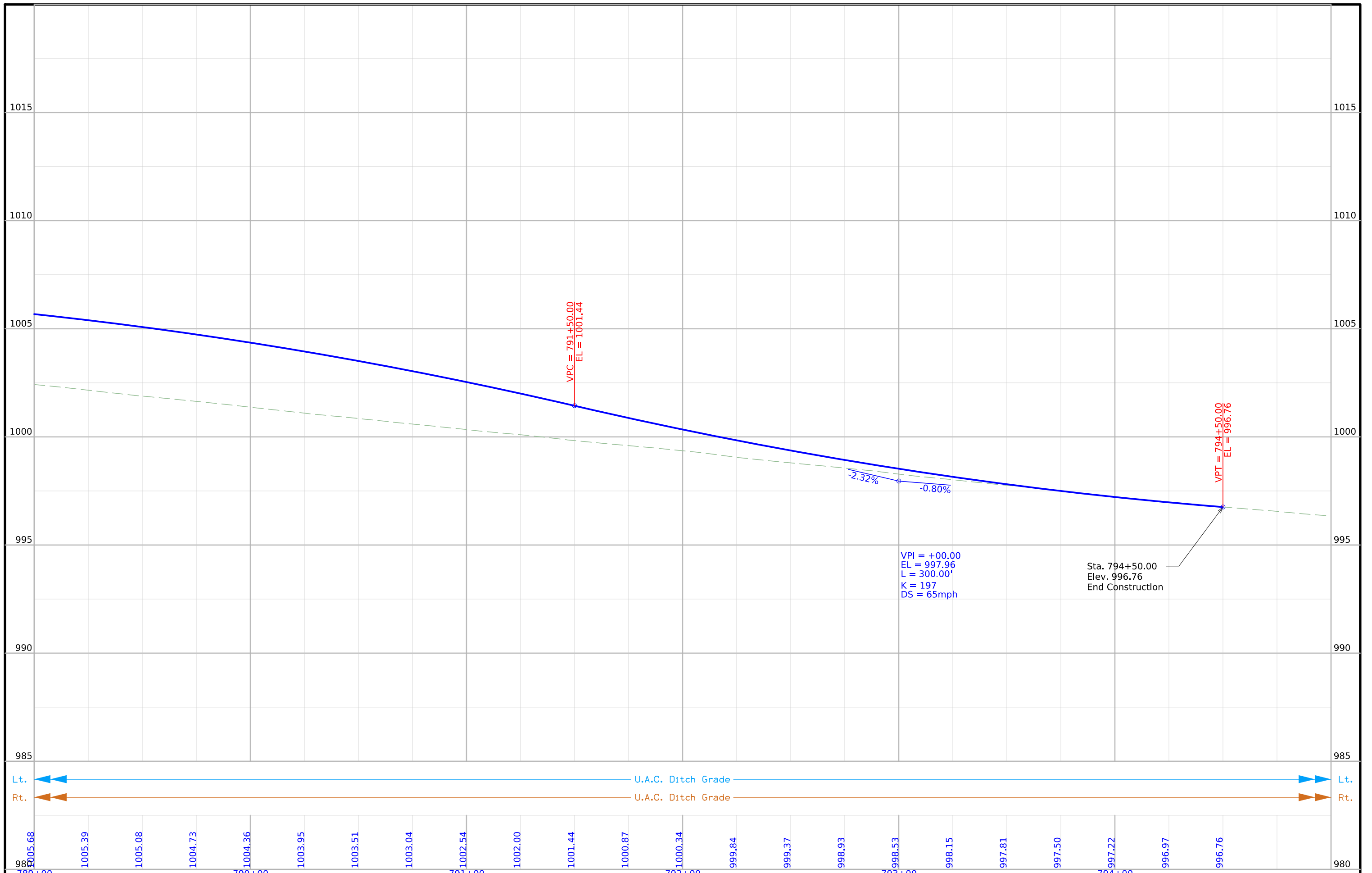






FILE NO.	ENGLISH	DESIGN TEAM HNTB	POTTAWATTAMIE COUNTY	PROJECT NUMBER IMX-029-3(270)57--02-78	SHEET NUMBER D.7
----------	---------	------------------	----------------------	--	------------------





FILE NO.	ENGLISH	DESIGN TEAM HNTB	POTTAWATTAMIE COUNTY	PROJECT NUMBER IMX-029-3(270)57--02-78	SHEET NUMBER D.9
----------	---------	------------------	----------------------	--	------------------

Survey Information

SURVEY INDEX

County: Pottawattamie
PIN: 22-78-029-020
Project Number: IMX-029-3(270)--02-78
Location: At the IA 192 Interchange in Council Bluffs (NB)
Type of Work: 2001-Bridge-Unspecified
Project Directory: 7802902022

Survey Personnel

Wes Shimp – PLS
Matt Svec – Survey Party Chief
Katerina Wyatt – Geospatial Technician
Nate Theis-Barnett – Survey Party Chief
Alexis Avila – Assistant Survey Party Chief
Lee Budde– Geospatial Specialist

Date(s) of Survey

Begin Date 2/07/2024
End Date 6/30/2024

General Information

This survey is for Interstate 29 at the IA 192 Interchange in Council Bluffs. This survey request was for the Interstate 29 corridor only between mile markers 57.8 and 56.2. This project is a Full Field DTM survey.

Utility Information

For logging data and other utility details see Utility Survey and Ownership Report in the Utility folder of the PrelimSurvey project directory.

Project Control

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Three FENO monuments were set using the following method. Three five-minute observations were taken with a minimum two-hour time span between and used in a weighted average to obtain final coordinate values. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 6
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u2

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans I-IG-29-3(9)57—04-78 and I-29-920(5). Survey stationing was equated to the plan POT at Sta. 777+27.66 and carried back and ahead with/without equation throughout the survey.

Mainline A (I29), alignment splits NB/SB lanes, Survey stationing relates to as built plan stationing as follows:

ST Sta. 748+09.13 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey ST Sta. 748+09.13

POT Sta. 777+27.66 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey POT Sta. 777+27.66

POT Sta. 777+64.67 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey POT Sta. 777+64.67

Mainline B (I29), alignment at CL of NB lane, Survey stationing relates to as built plan stationing as follows:

POT Sta. 775+82.00 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey POT Sta. 775+82.00

Station Equation

As-built Plans POT Sta 777+64.19 (Back) = POT Sta 776+95.47 (Ahead)
Survey POT Sta 777+64.19 (Back) = POT Sta 776+95.47 (Ahead)

TS Sta. 784+91.23 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey TS Sta. 784+92.36

ST Sta. 799+68.15 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey ST Sta. 799+67.02
**Stationing equation to As-built Plans Project No. I-29-920(5)

POT Sta. 99+81.47 As-built Plans Project No. I-29-920(5)
Survey POT Sta. 99+81.47

PI Sta. 127+45.9 (East Lane) As-built Plans Project No. I-29-920(5)
Survey POT Sta. 127+47.02

Survey Information

PC Sta. 161+00.69 (East Lane) As-built Plans Project No. I-29-920(5)
Survey POT Sta. 161+00.72

Sideroad (Highway 192) Survey stationing relates to as built plan stationing as follows:

POT Sta. 72+61.00 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey POT Sta. 72+61.00

POT Sta. 97+22.14 As-built Plans Project No. I-IG-29-3(9)57—04-78
Survey POT Sta. 97+22.14

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) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 06 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018u2

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
 HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
 Ia. Regional Coordinate System Zone 06 (U.S. Survey Foot)
 VERT. DATUM: NAVD88
 Geoid Model: 2018u2

POINT NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
500	6982663.14	16462895.50	979.97	SET FENO MONUMENT WEST SIDE OF HIGHWAY APPROX. 600 FT NORTH OF TURN AROUND
501	6978207.53	16463697.36	993.32	SET FENO MONUMENT EAST OF HIGHWAY NEAR NORTHBOUND ON RAMP
502	6975298.21	16461801.21	978.23	SET FENO MONUMENT EAST SIDE OF HIGHWAY NORTH OF MILE MARKER 56.2

ALIGNMENT COORDINATES

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
1	ML029_NB	725+53.66	6973455.25	16458995.85															
C2	ML029_NB						729+40.29	6973447.87	16459382.41	730+40.31	6973445.96	16459482.41	731+40.29	6973449.54	16459582.38				
C3	ML029_NB						731+40.29	6973449.54	16459582.38	738+86.39	6973476.18	16460328.00	745+40.41	6974056.41	16460797.05				
C4	ML029_NB						745+40.41	6974056.41	16460797.05	746+40.43	6974134.19	16460859.93	747+40.41	6974215.16	16460918.65				
5	ML029_NB	776+95.47	6976607.32	16462653.57															
C6	ML029_NB						784+92.36	6977252.42	16463121.43	785+32.14	6977284.62	16463144.78	785+71.92	6977316.99	16463167.91				
C7	ML029_NB						785+71.92	6977316.99	16463167.91	786+06.59	6977345.20	16463188.05	786+41.25	6977373.87	16463207.54				
C8	ML029_NB						786+41.25	6977373.87	16463207.54	786+66.24	6977394.54	16463221.59	786+91.23	6977415.57	16463235.09				
C9	ML029_NB						786+91.23	6977415.57	16463235.09	792+47.08	6977883.33	16463535.38	797+68.15	6978438.73	16463513.10				
C10	ML029_NB						797+68.15	6978438.73	16463513.10	797+93.14	6978463.70	16463512.10	798+18.13	6978488.64	16463510.45				
C11	ML029_NB						798+18.13	6978488.64	16463510.45	798+52.80	6978523.23	16463508.15	798+87.46	6978557.76	16463505.05				
C12	ML029_NB						798+87.46	6978557.76	16463505.05	799+27.24	6978597.38	16463501.49	799+67.02	6978636.97	16463497.64				
C13	ML029_NB						823+42.39	6981001.21	16463267.98	827+32.57	6981389.57	16463230.25	831+22.45	6981774.45	16463166.20				
14	ML029_NB	861+39.67	6984750.74	16462670.89															
1	ML029_SB	876+00.00	6976535.67	16462510.19															
C2	ML029_SB						877+42.66	6976651.16	16462593.95	878+10.17	6976705.80	16462633.58	878+77.66	6976761.80	16462671.28				
C3	ML029_SB						878+77.66	6976761.80	16462671.28	885+02.28	6977279.93	16463020.13	891+07.66	6977896.25	16463121.65				
C4	ML029_SB						891+07.66	6977896.25	16463121.65	892+12.69	6977999.89	16463138.72	893+17.51	6978104.77	16463144.32				
C5	ML029_SB						893+17.51	6978104.77	16463144.32	893+77.81	6978164.98	16463147.54	894+38.08	6978225.27	16463148.01				
6	ML029_SB	899+61.96	6978749.13	16463152.14															
7	ML029_SB	908+98.47	6979685.45	16463171.47															
C8	ML029_SB						919+45.90	6980732.85	16463179.08	924+37.82	6981224.75	16463182.66	929+27.30	6981709.99	16463101.91				
9	ML029_SB	931+00.00	6981880.35	16463073.56															

Existing bridge is on a spiral, as a set of compound curves in as-built and in the recovered alignment. Set proposed to match existing.

SPIRAL OR CIRCULAR CURVE DATA

Horizontal Alignment Data

Name	Location	ASCS	Horizontal Alignment Data												Remarks		
			Spiral Data						Curve Data								
			θS	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	ΔC	T	L	R		E	
C2	ML029_NB											1.570°	100.025	200.000	3649	1.371	
C3	ML029_NB											3.500°	746.102	1400.120	1637	162.001	
C4	ML029_NB											1.500°	100.023	200.000	3820	1.309	
C6	ML029_NB											0.519°	39.782	79.563	11038	0.072	
C7	ML029_NB											1.932°	34.667	69.330	2966	0.203	
C8	ML029_NB											3.000°	24.991	49.980	1910	0.163	
C9	ML029_NB											3.250°	555.850	1076.920	1763	85.546	
C10	ML029_NB											3.000°	24.991	49.980	1910	0.163	
C11	ML029_NB											1.932°	34.667	69.330	2966	0.203	
C12	ML029_NB											0.519°	39.780	79.560	11038	0.072	
C13	ML029_NB											0.500°	390.181	780.060	11460	6.640	
C2	ML029_SB											1.481°	67.507	135.000	3867	0.589	
C3	ML029_SB											2.000°	624.624	1230.000	2865	67.299	
C4	ML029_SB											3.000°	105.031	209.850	1910	2.886	
C5	ML029_SB											2.162°	60.297	120.572	2650	0.686	
C8	ML029_SB											1.005°	491.916	981.400	5700	21.187	

SUPERELEVATION DATA

See PV-300 Series

Road Identification	Circular Curve or Spiral Curve Name	Radius FT	Superelevation Data			Standard Road Plan	Section A-A	Section B-B	Section C-C	Section D-D	Section E-E	Section F-F	Case A	Case B	Case C	Case S	Case T	Case U	Remarks
			e	L	x														
			%	FT	FT														
ML029_NB	C9	1763.1	6.0	168	56	PV-301	784+67.23	785+23.23	785+79.23	786+91.23			786+91.23			See Remarks	See Remarks		Shoulders transition to match lanes across bridge
							See Remarks	See Remarks	See Remarks	See Remarks			See Remarks			See Remarks	See Remarks		Construction ends at full super.

TRAFFIC CONTROL PLAN

108-23A
08-01-08

Median crossovers will be utilized to maintain traffic on I-29 at all times in accordance with the J Sheets. Traffic will be head to head on the southbound lanes to maintain northbound I-29 traffic during construction. Inside lane closures will be permitted to construct the north median crossover Prior to Stage 1.

The southbound I-29 to southbound IA 192 exit (Exit 56) shall be closed when I-29 traffic is head to head on the southbound I-29 lanes. Passenger vehicles shall follow a detour to N 25th Street (Exit 55). Truck traffic shall follow a detour to W Broadway (Exit 54). Refer to Sheets J.13 and J.14 for detour routes.

Northbound IA 192 to northbound I-29 shall remain open during construction.

Refer to Tab. 108-26A for Staging Notes.

For additional information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and the current Standard Specifications.

STAGING NOTES

108-26A
08-01-08

Prior to Stage 1:

Traffic:
Close inside lanes on northbound and southbound I-29 in accordance with Standard Road Plan TC-418.

Construction:
Construct north median crossover on I-29 in accordance with Standard Road Plan PV-500.

Stage 1:

Traffic:
Shift northbound I-29 traffic to southbound I-29 inside lane using the existing south median crossover. Maintain head to head traffic on southbound I-29 lanes in accordance with the J Sheets.
Shift northbound I-29 traffic back to the northbound I-29 lanes using the north median crossover.
Close southbound I-29 exit ramp to IA 192.
See Sheet J.13 for passenger vehicle detour.
See Sheet J.14 for truck detour.

Confirm whether median crossover will be constructed with a separate letting ahead of (270) project

Construction:
Remove existing northbound I-29 bridge and bridge approaches.
Construct new northbound I-29 bridge and bridge approaches.
Construct new northbound I-29 pavement and shoulders.
Remove and replace the existing guardrail on the south side of the northbound bridge.
Construct new northbound I-29 high tension cable guardrail on the inside shoulder.
Construct revetment at both abutments and on the inside foreslope of northbound I-29 south of the bridge.
Complete pavement markings and mill rumble strips.

Final:
Traffic:
Open all lanes to traffic.

COORDINATED OPERATIONS

111-01
04-17-12

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.

Project	Type of Work
None Provided.	

511 TRAVEL RESTRICTIONS

108-25
10-21-14

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

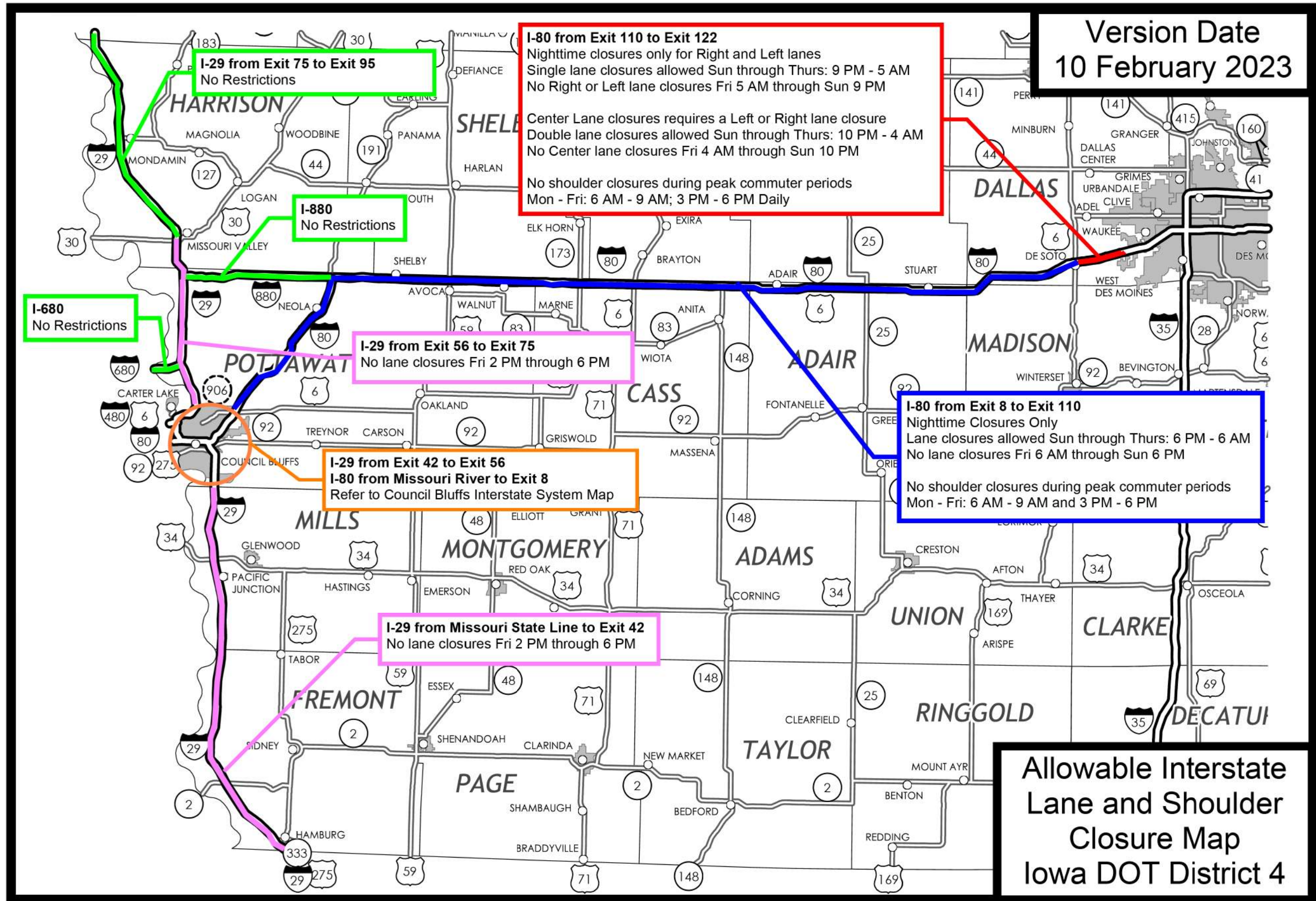
**PLAN VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

	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**

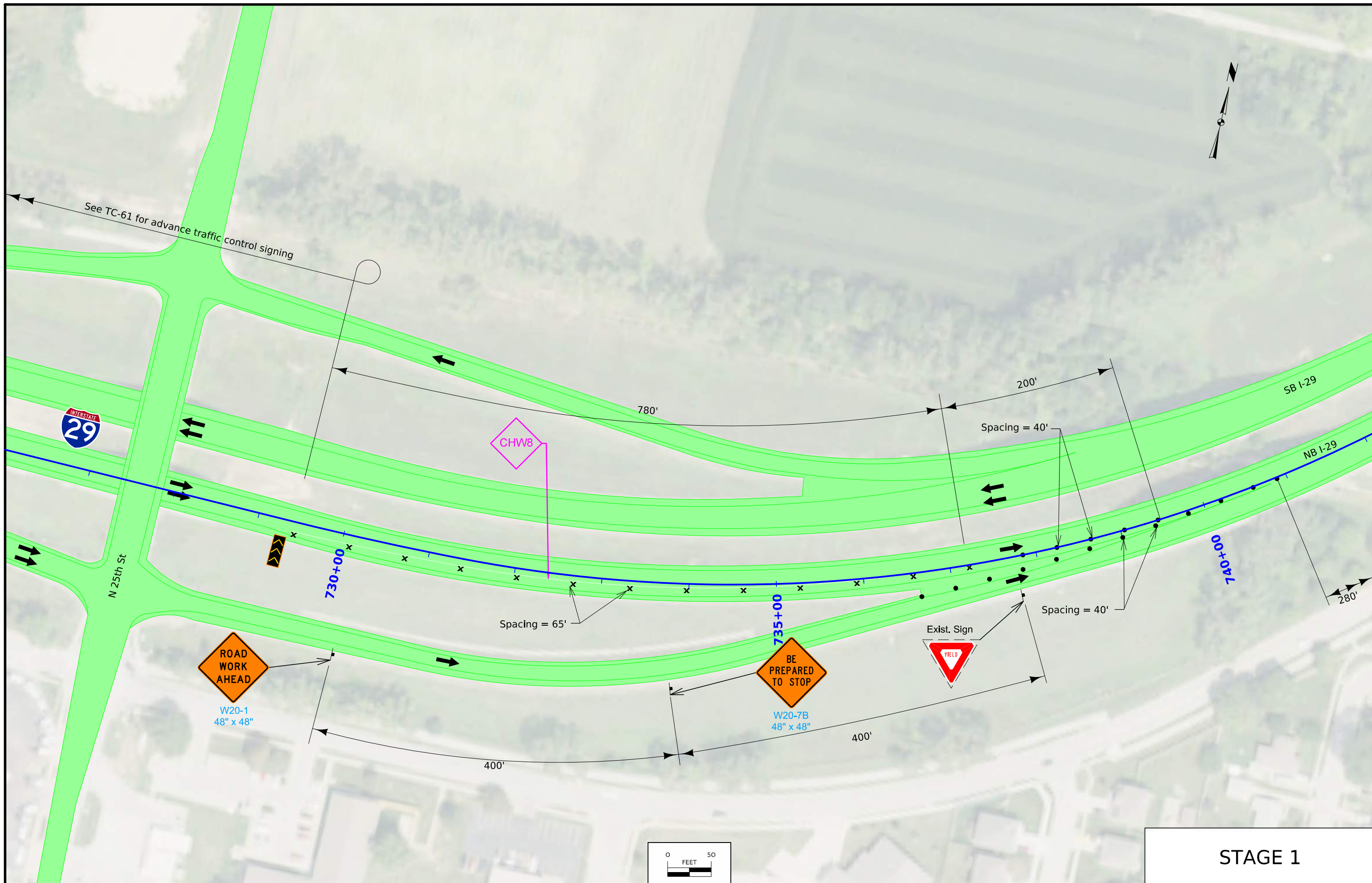
(COVERS SHEET SERIES J)



Version Date
10 February 2023

Allowable Interstate
Lane and Shoulder
Closure Map
Iowa DOT District 4

Council Bluffs Interstate System Map



See TC-61 for advance traffic control signing



N 25th St

730+00

735+00

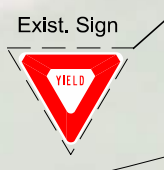
740+00

SB I-29

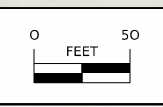
NB I-29

ROAD WORK AHEAD
W20-1
48" x 48"

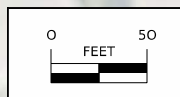
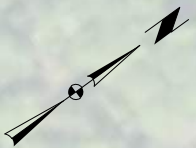
BE PREPARED TO STOP
W20-7B
48" x 48"



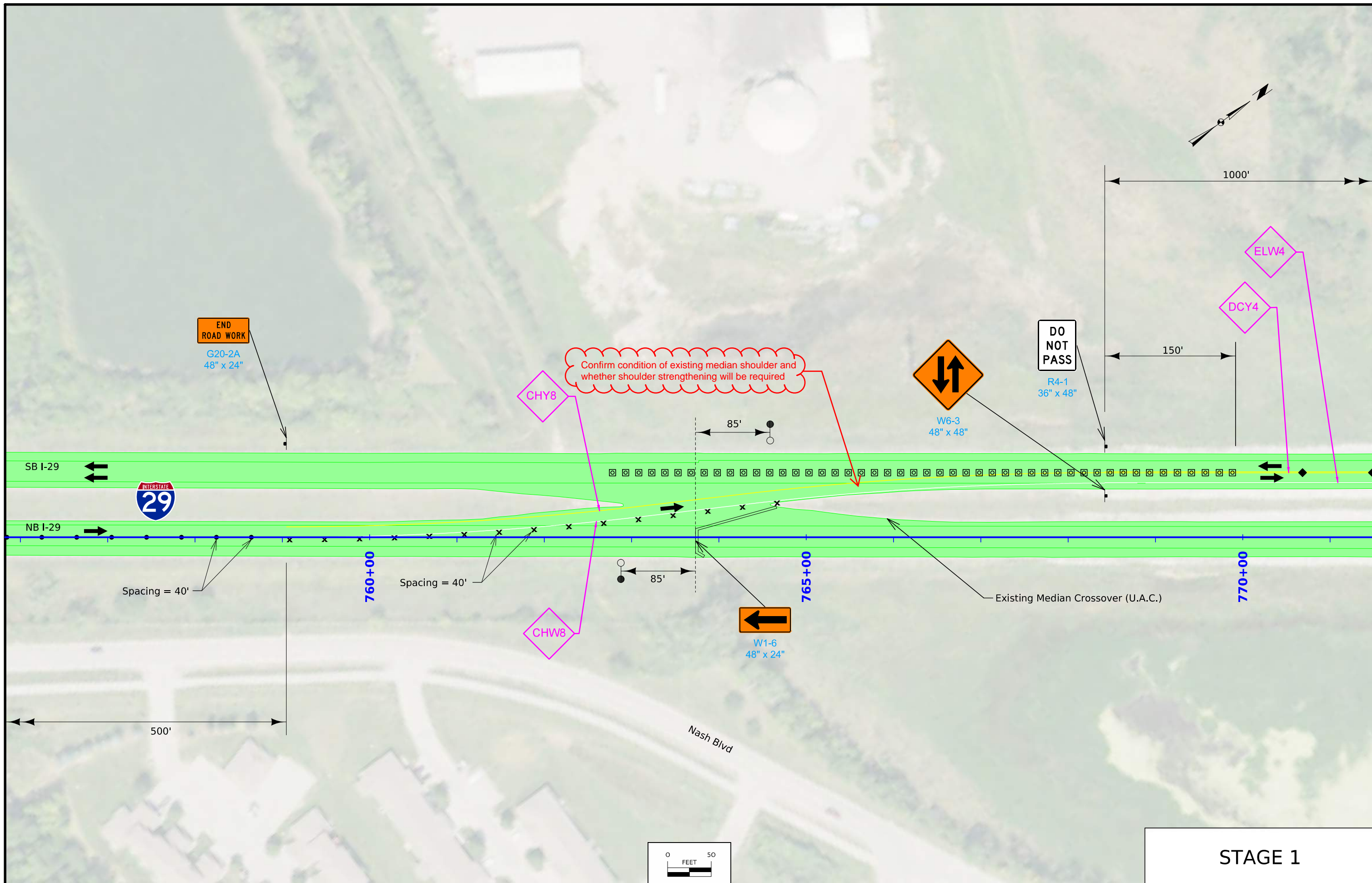
Exist. Sign



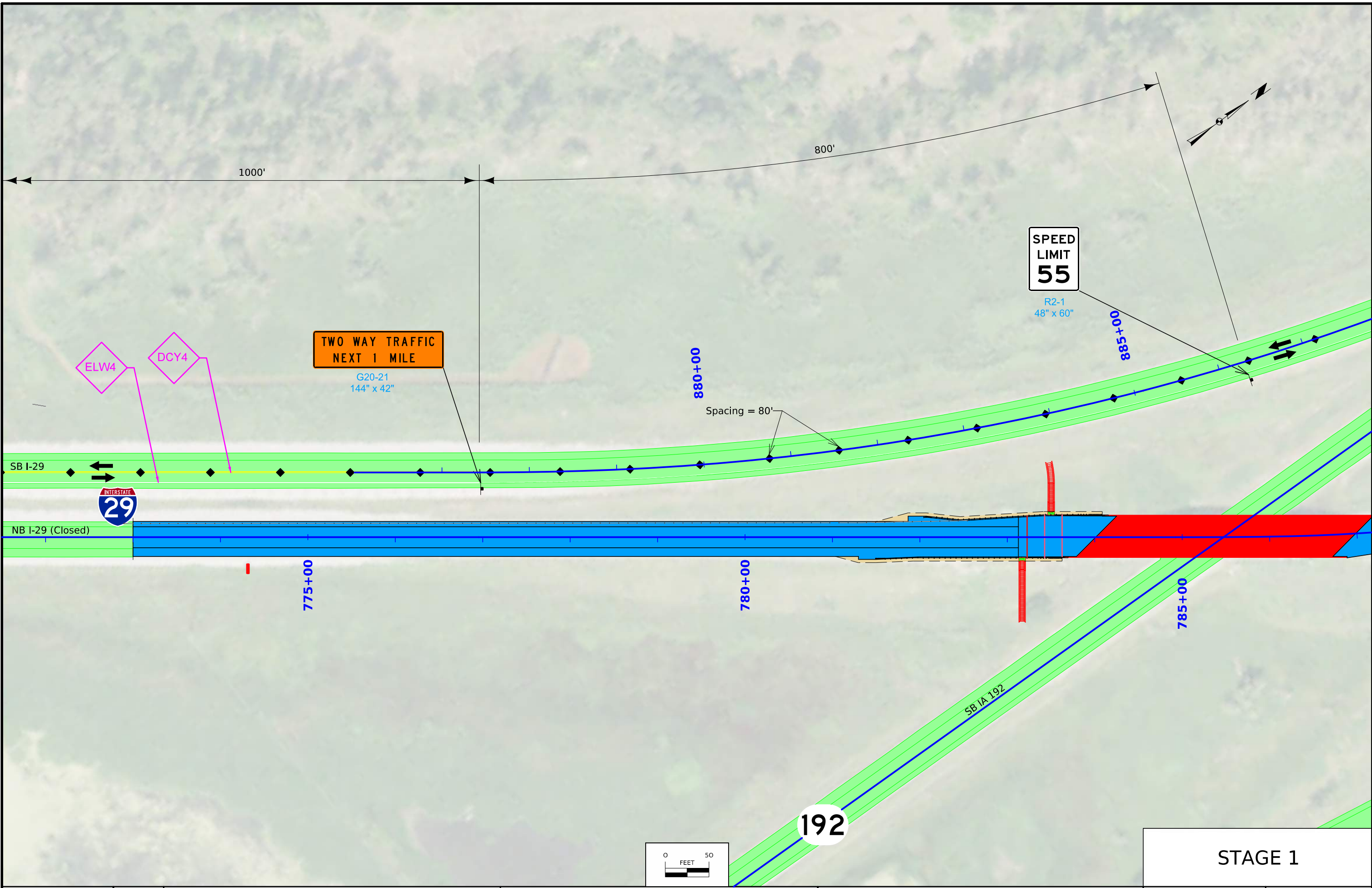
STAGE 1

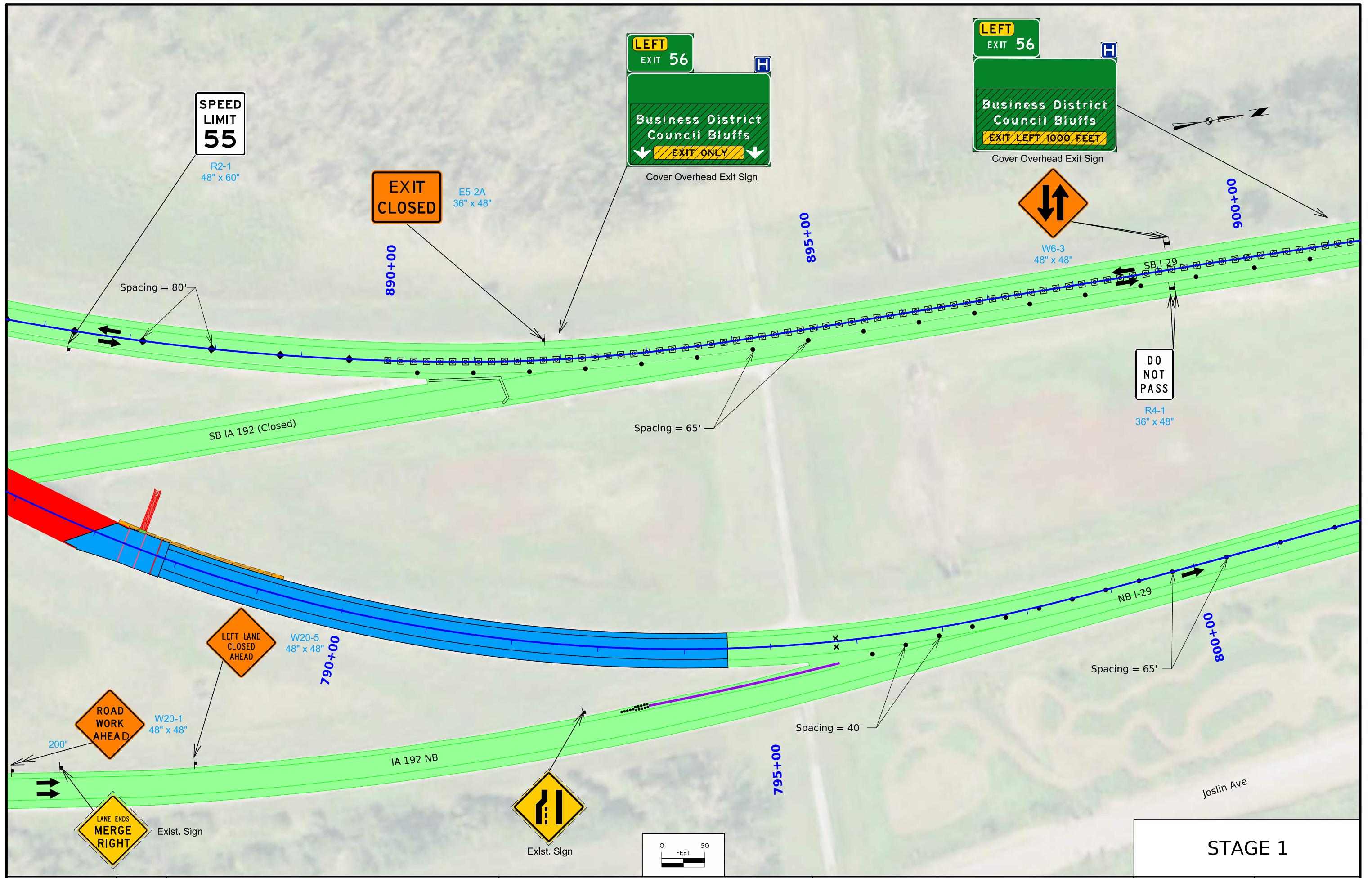


STAGE 1



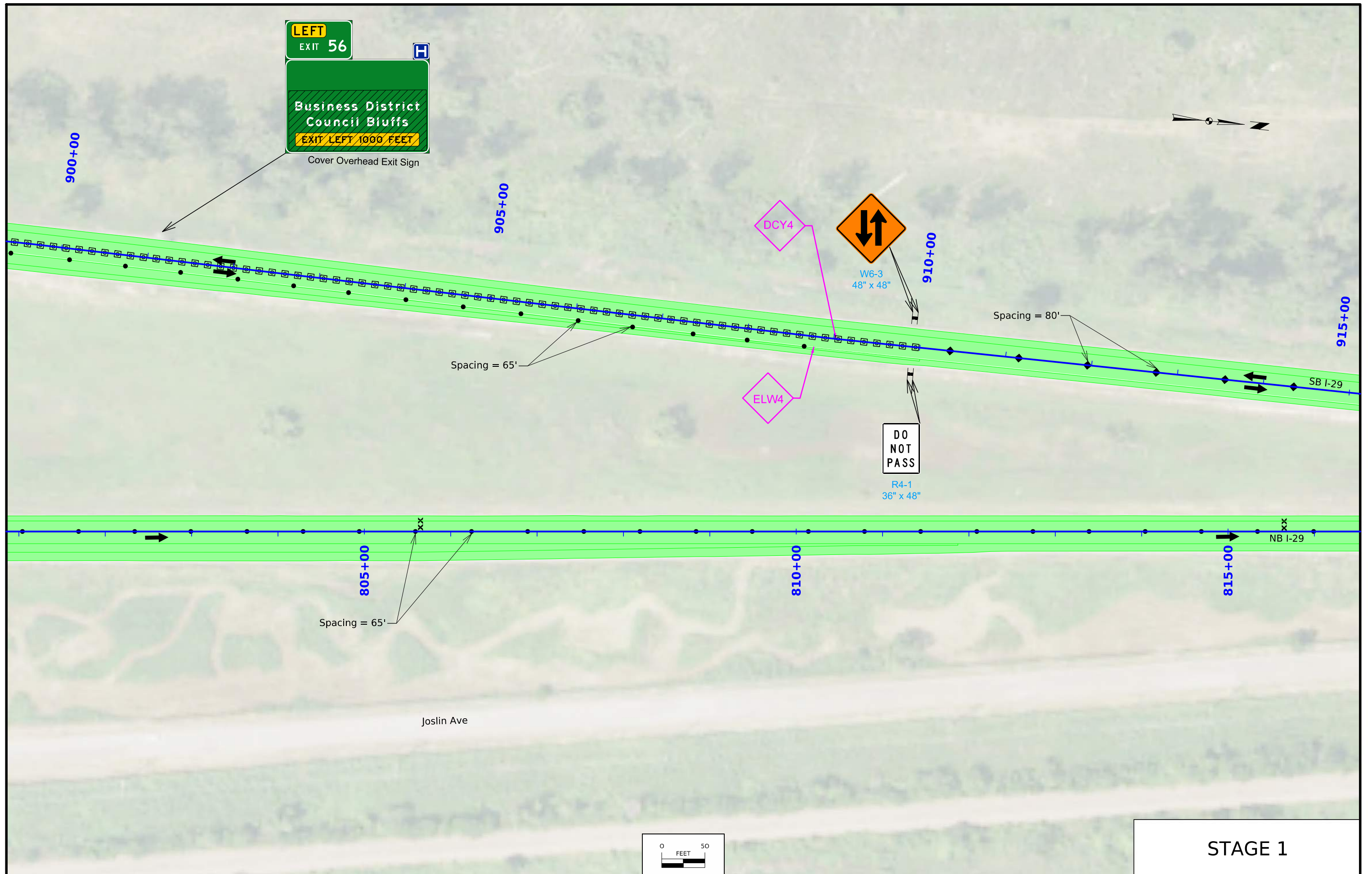
STAGE 1





DO NOT PASS
R4-1
36" x 48"

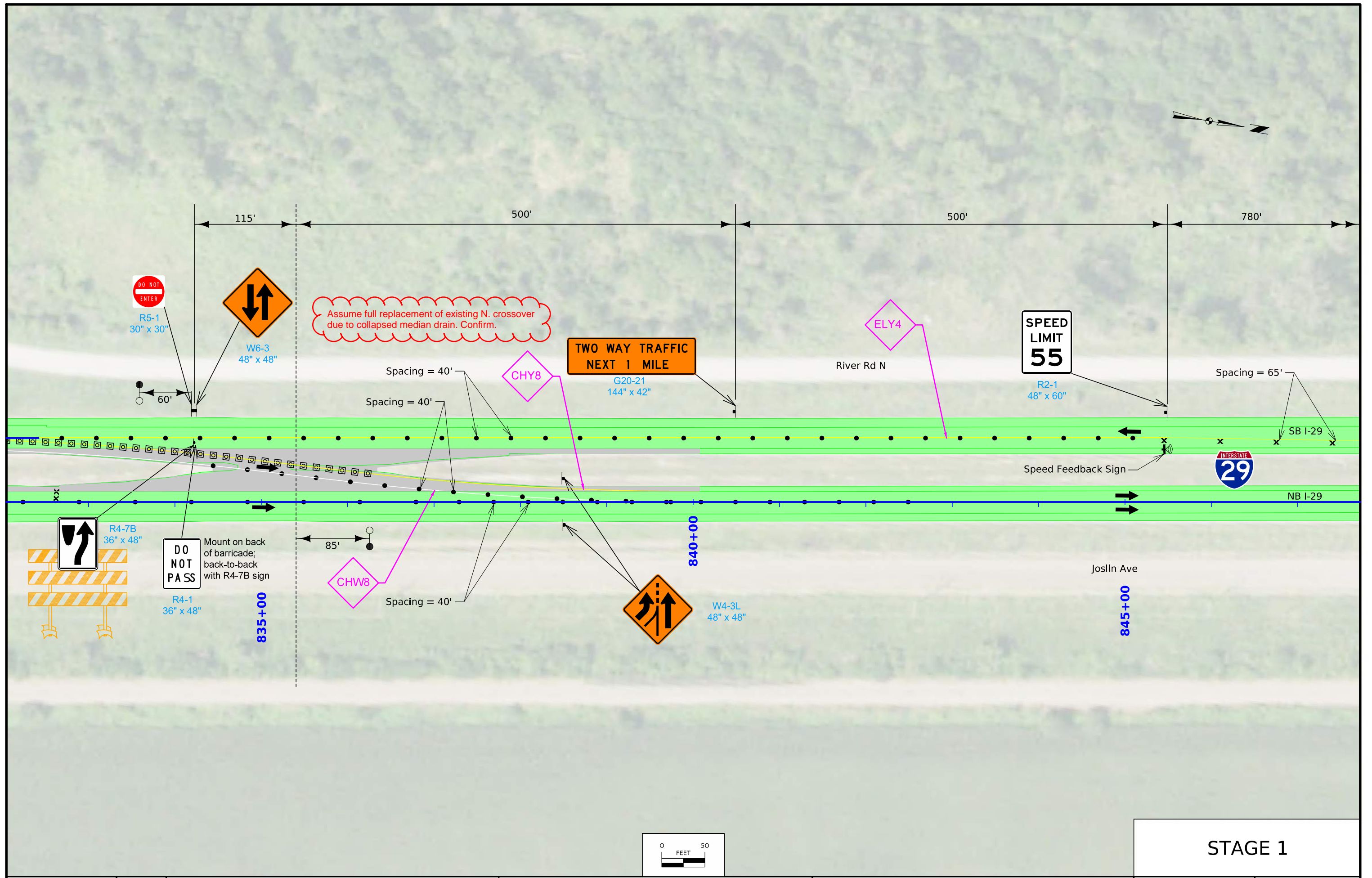
STAGE 1



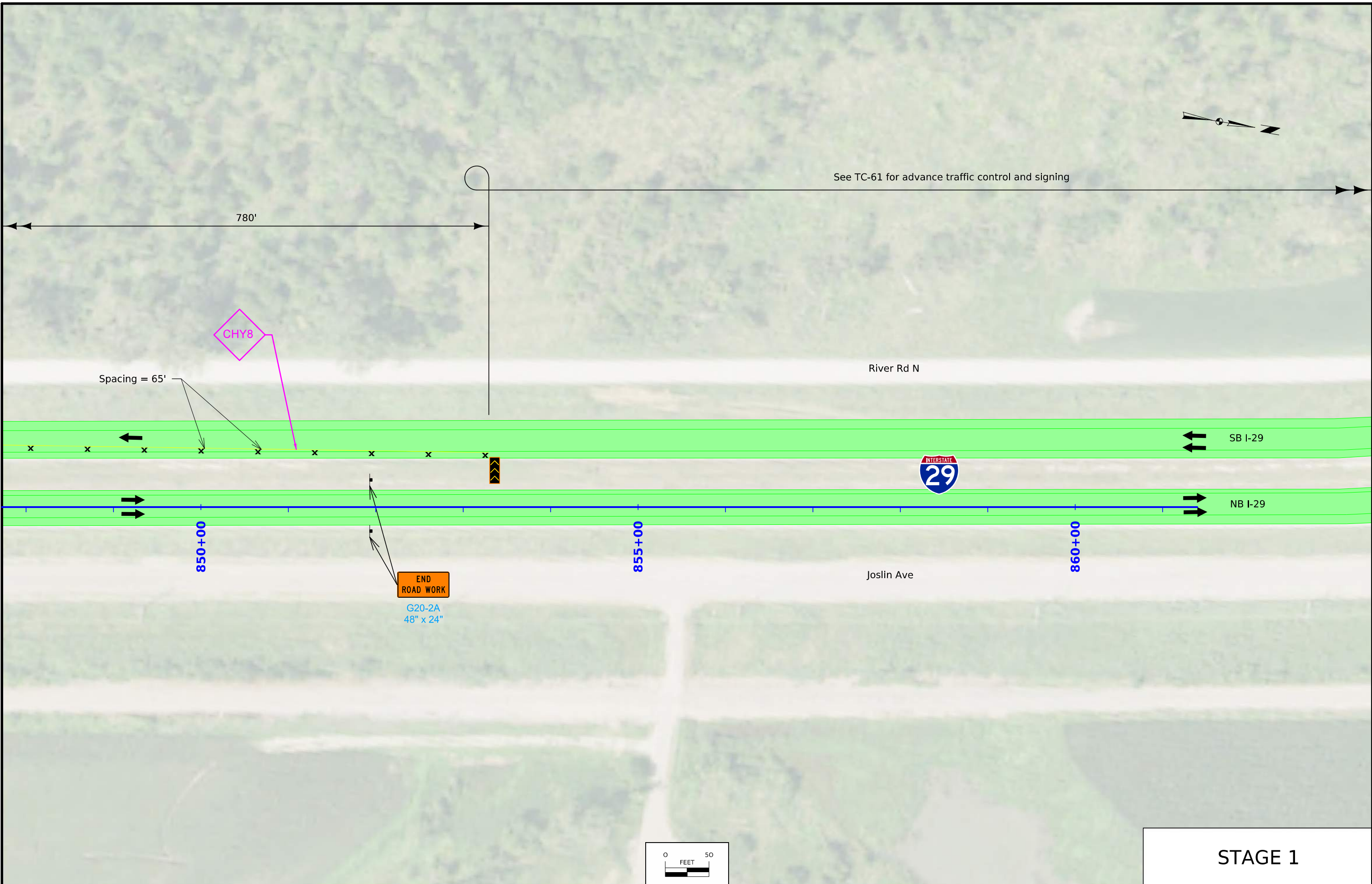
STAGE 1



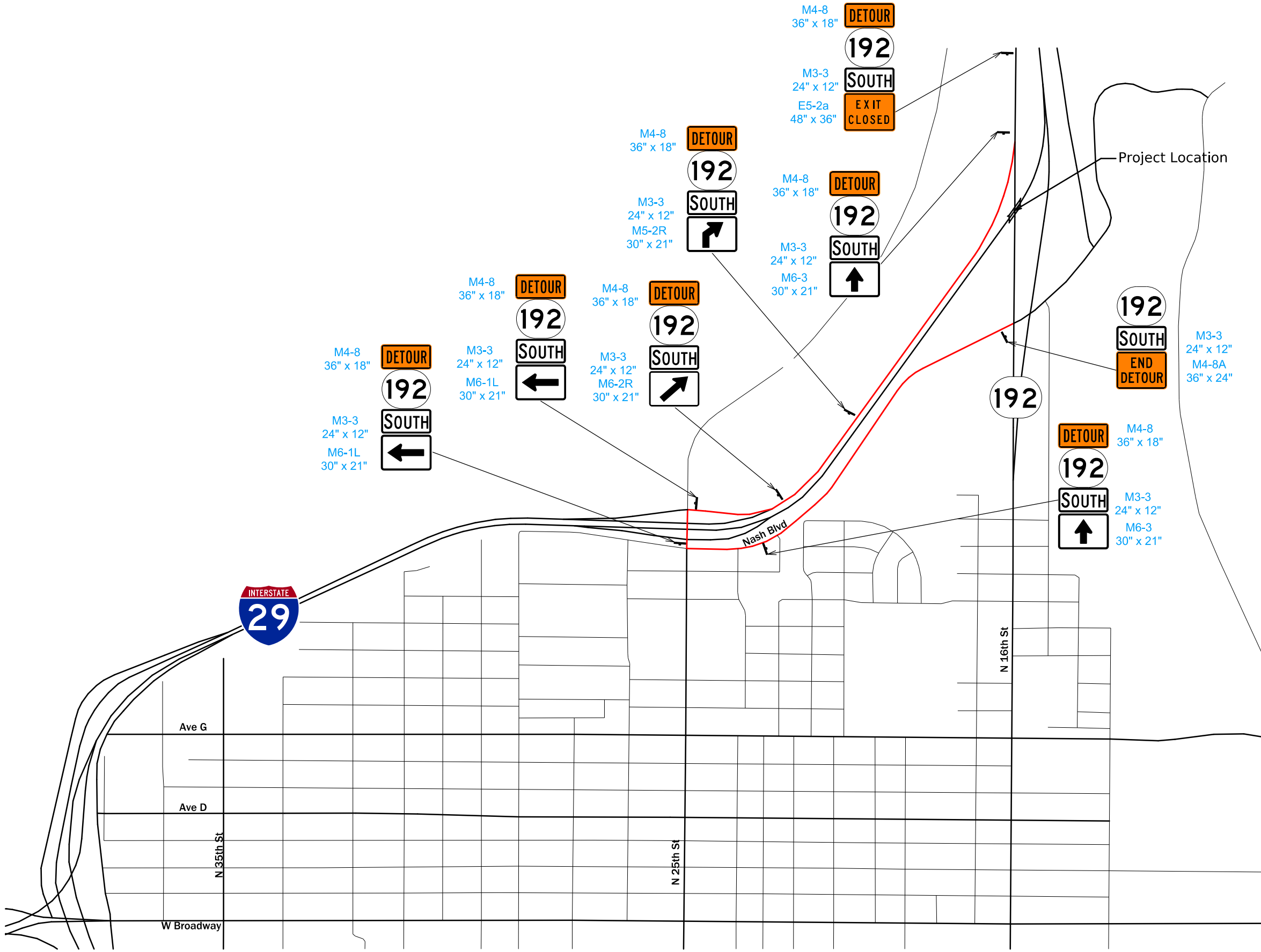
STAGE 1



STAGE 1



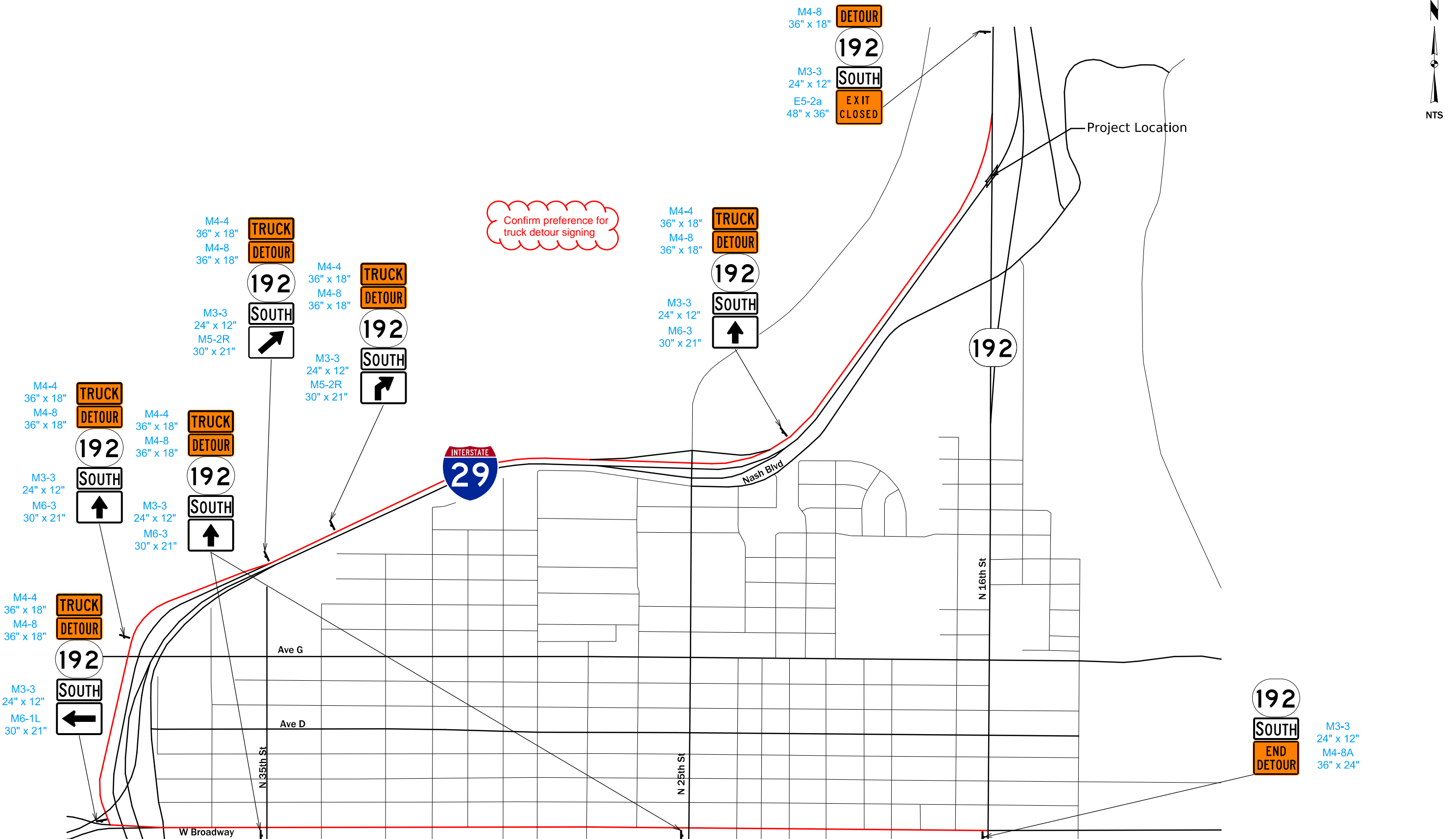
STAGE 1



Passenger Vehicle Detour
SB IA 192 Exit



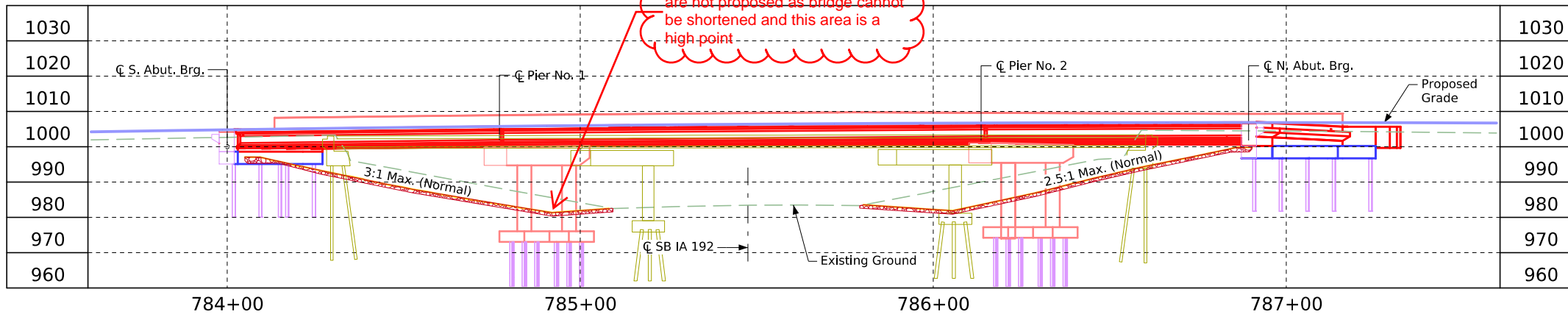
Confirm preference for truck detour signing



Truck Detour
SB IA 192 Exit

Traffic Estimate

I-29	
2027 AADT	13,000 V.P.D.
2047 AADT	17,400 V.P.D.
2047 DHV	1800 V.P.H.
TRUCKS	23 %
Total Design ESALs	--



Longitudinal Section Along I-29 NB

Note:
Top of bridge deck at centerline roadway is 0.03' below the profile grade to account for parabolic crown. Profile grade line (PGL) is at \bar{C} .

- Design Notes
- TSS TL-5 Bridge Railing Proposed
 - Frame Type Pier Proposed assumed 4'-0" column width, pier type may change in final design

Minimum Vertical Clearance

Overhead Station = 785+78.49, 21.74' LT.
Overhead Elevation = 1006.10
Depth of Superstructure = 5.375'
Underpass Station = 86+40.61
Underpass Elevation = 983.87
Minimum Vertical Clearance = 16.85'

Location

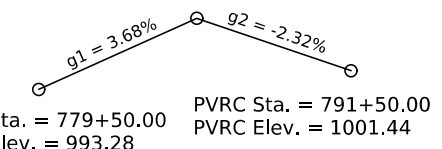
NB I-29 over SB IA192
T-75N R-44W
Section 23
Lake Township
Pottawattamie County
FHWA No. xxxxxx
Latitude 41.285218°
Longitude -95.867662°

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

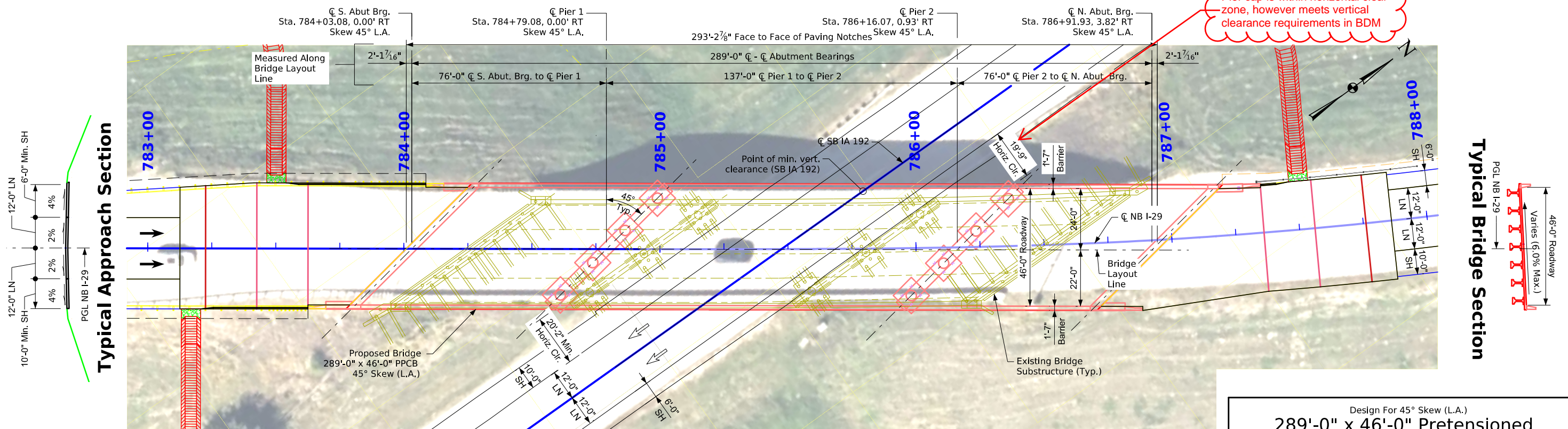
General Utility Symbols:

- E - Electric Line
- G - Gas Line
- SAN. - Sanitary Sewer
- T - Telephone Line
- W - Water Line
- FO - Fiber Optic Line
- GHP - Gas High Pressure
- ST S - Storm Sewer
- TV - TV
- - Power Poles



Proposed Profile Grade I-29 NB

Pier cap is within horizontal clearance zone, however meets vertical clearance requirements in BDM



Situation Plan

Design For 45° Skew (L.A.)
289'-0" x 46'-0" Pretensioned Prestressed Conc. Beam Bridge
 76'-0" End Spans 137'-0" Interior Span
Situation Plan
 STA. 785+47.59, 0.14' Rt. (I-29 NB) Turn-In Date: mmm yyyy
Pottawattamie County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. XXXX Design Sheet No. 1 of 1 FHWA No. FHWANO



CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(112)	Noise Wall
(42)	Engineering Fabric	(112)	Noise Wall Footing
(8)	Flooded Backfill	(112)	Retaining Wall Back
(92)	Macadam Stone	(112)	Retaining Wall Back Excavate
(20)	Modified	(112)	Retaining Wall Face
(12)	Plowing Shaping	(112)	Retaining Wall Front Excavate
(14)	Porous Backfill	(112)	Retaining Wall Front Footing
(8)	Revetment Class A	(112)	Retaining Wall MSE Gutter
(6)	Revetment Class B	(112)	Retaining Wall Reinforced Earth
(62)	Revetment Class C		
(188)	Revetment Class D	Grading	
(28)	Revetment Class E	(8)	Behind Curb Cut
(12)	Shoulder Special Backfill	(6)	Granular
(12)	Special Backfill	(13)	Granular Back Fill
(20)	Subbase	(48)	Rock Undercut
(20)	Subbase Lower	(8)	Shoulder Earth Fill
(20)	Subbase Upper	(2)	Side Slopes
(118)	Subgrade Treatment	(226)	Side Slopes Dressing
Asphalt			
(207)	HMA Base Course	Substrata	
(207)	HMA Interim Course	(128)	Boulder Substrata
(207)	HMA Surface Course	(48)	Broken Weathered Substrata
Concrete			
(0)	Barrier Concrete	(3)	Core Out Substrata
(0)	Barrier Concrete Footing	(203)	Existing Pavement Substrata
(0)	Curb Gutter	(6)	Loam Substrata
(48)	Flowable Mortar	(80)	Rock Substrata
(0)	Median Concrete	(4)	Select Sand Substrata
(0)	PCC Pavement	(3)	Shale Substrata
(0)	Sidewalk	(10)	Topsoil Substrata
Shoulder			
(209)	Shoulder HMA	Unsuitable / Waste	
(0)	Shoulder PCC	(3)	Unsuitable Type A
(6)	Shoulder Granular	(13)	Unsuitable Type B
		(11)	Unsuitable Type C
		(3)	Waste
Existing			
(0)	Existing Pavement		

NOTES:

Text

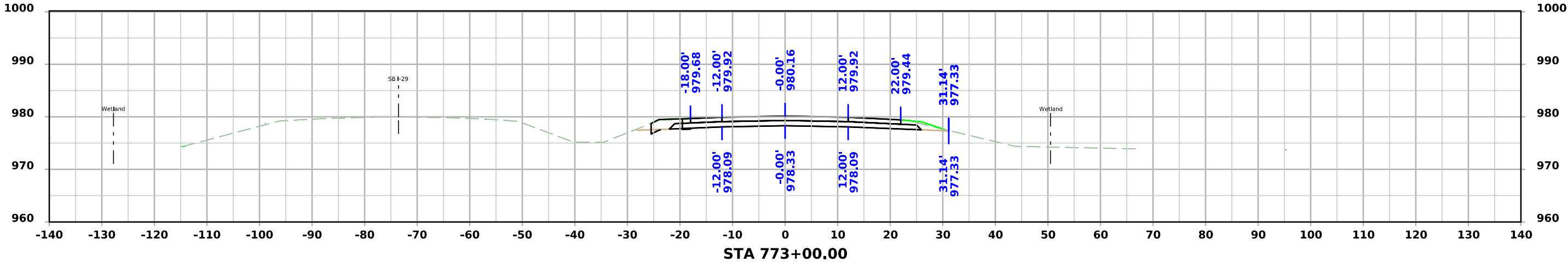
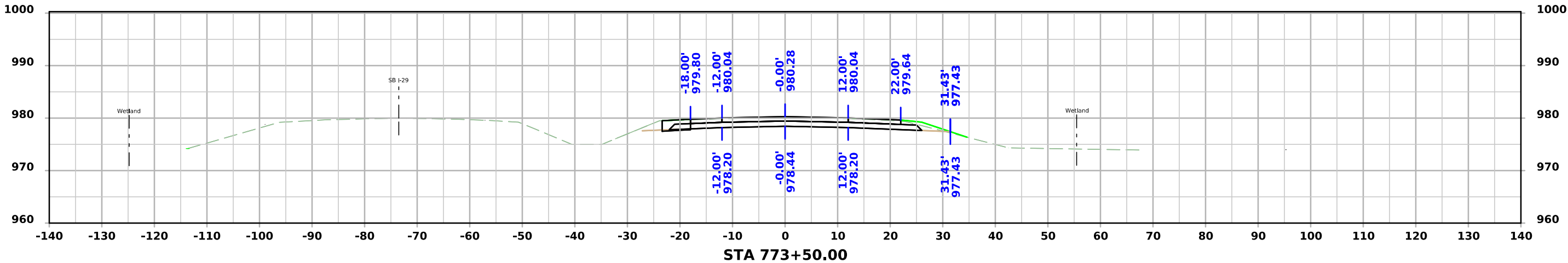
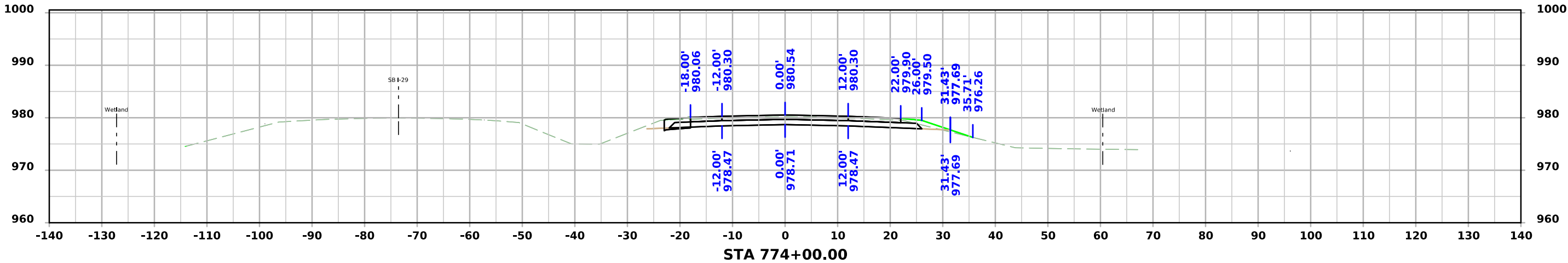
NOTES:

Text

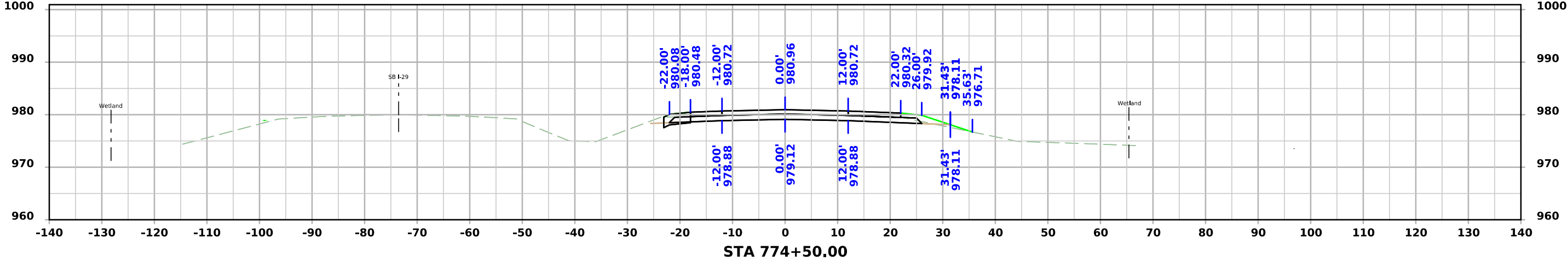
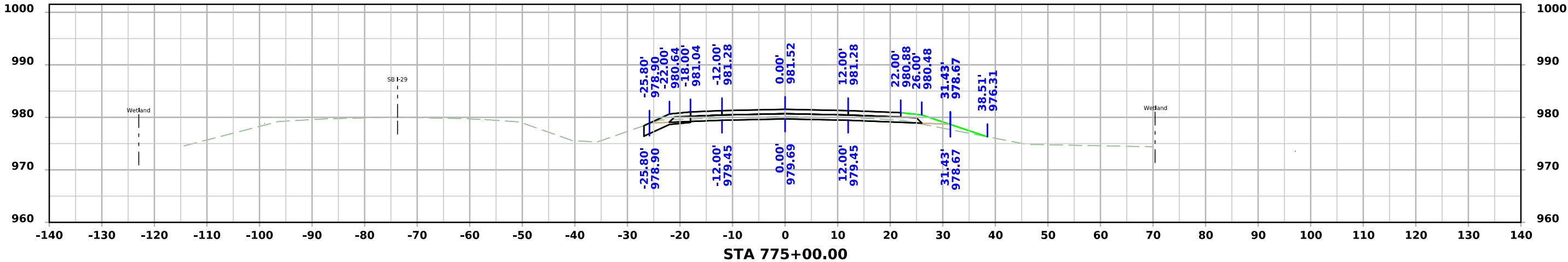
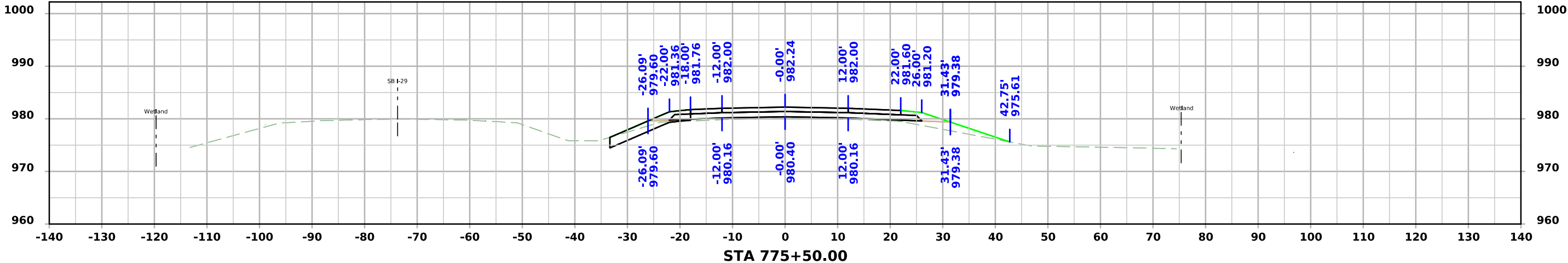
CROSS SECTIONS LEGEND AND INFORMATION SHEET

(COVERS SHEET SERIES W)

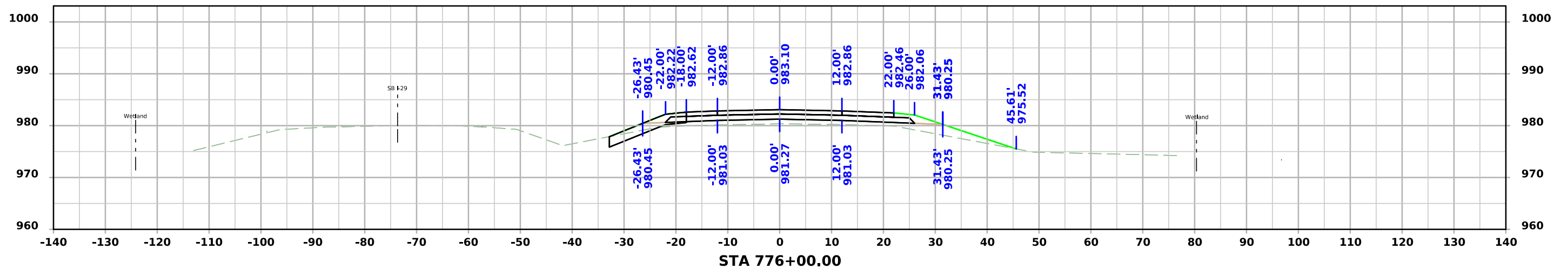
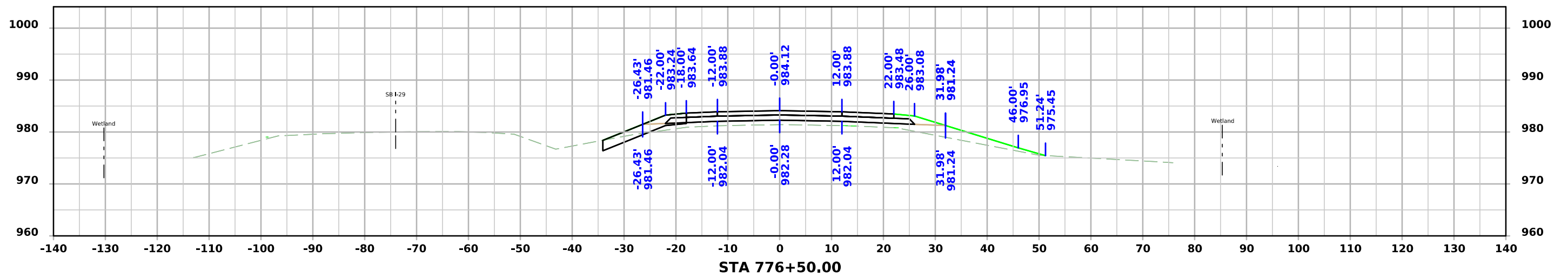
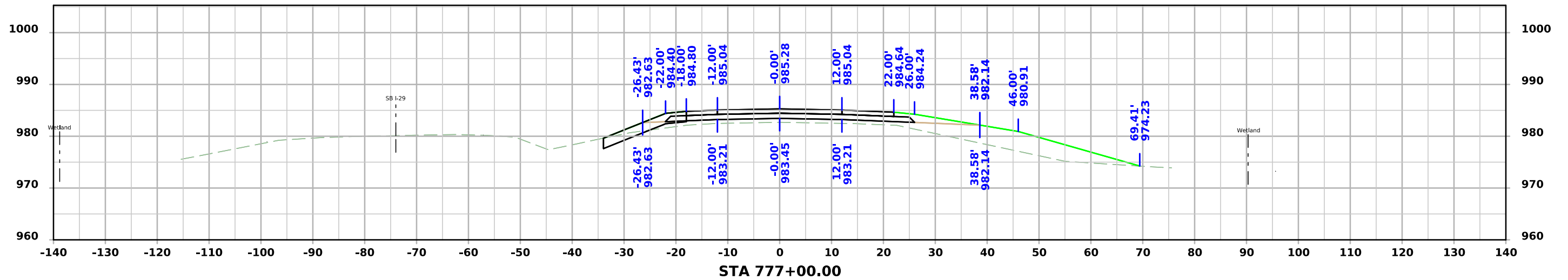
I-29 NB



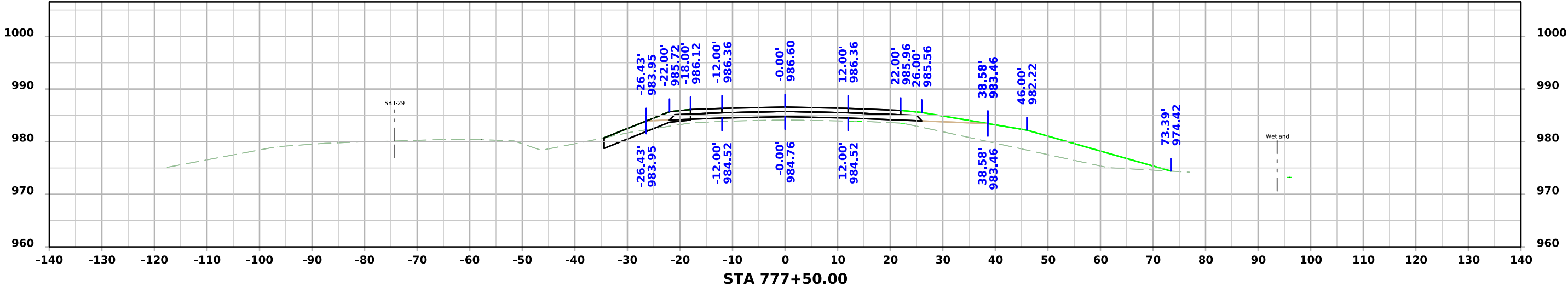
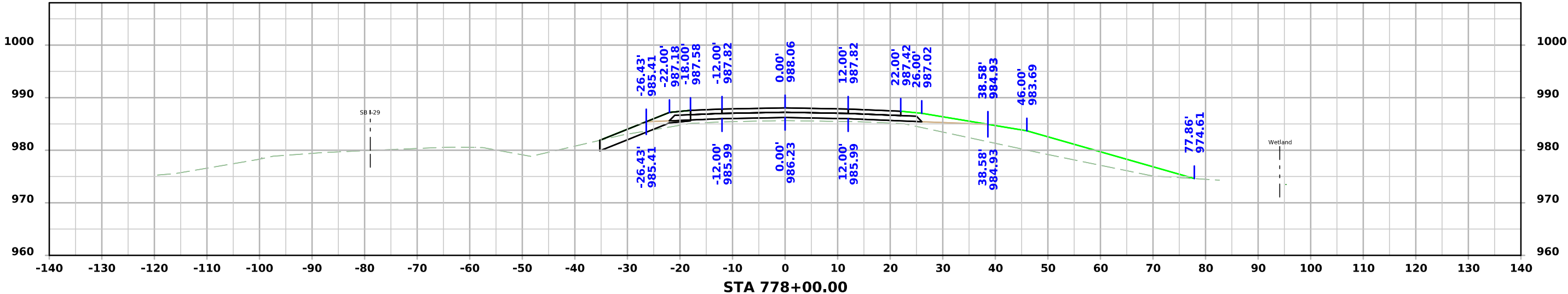
I-29 NB



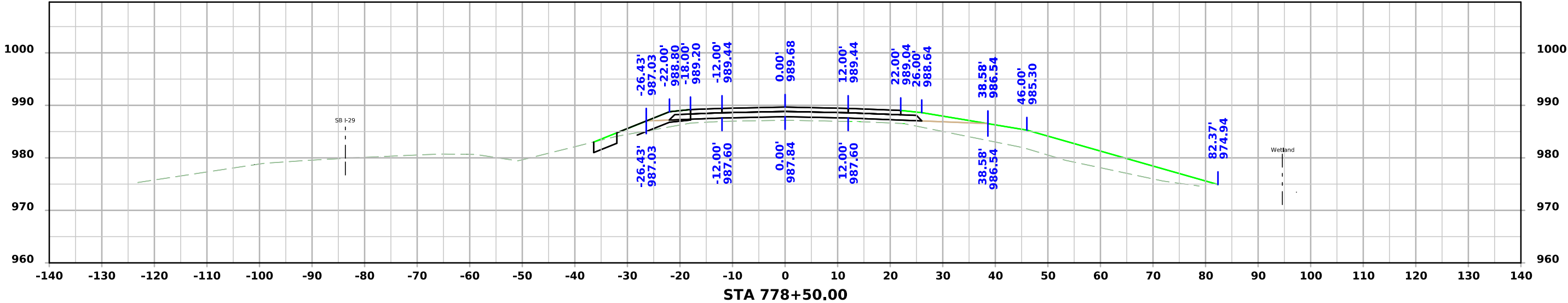
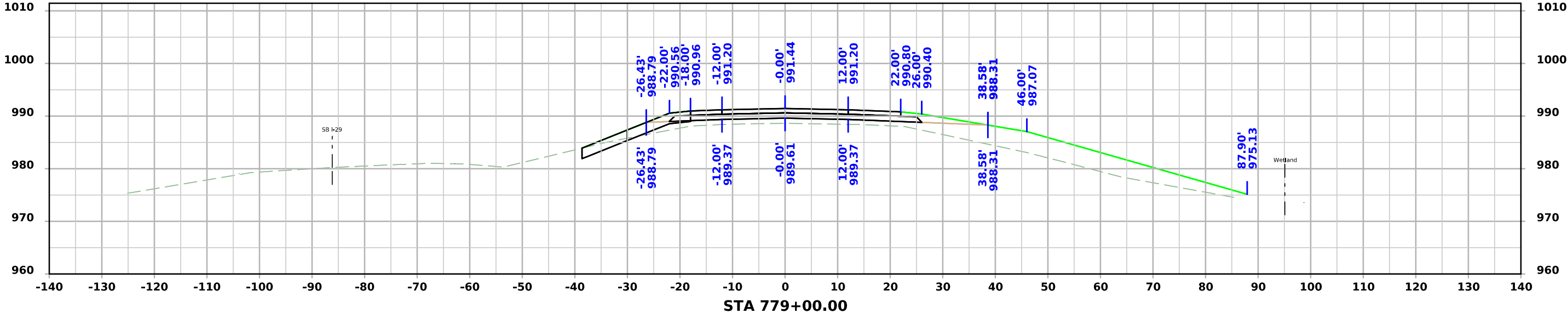
I-29 NB



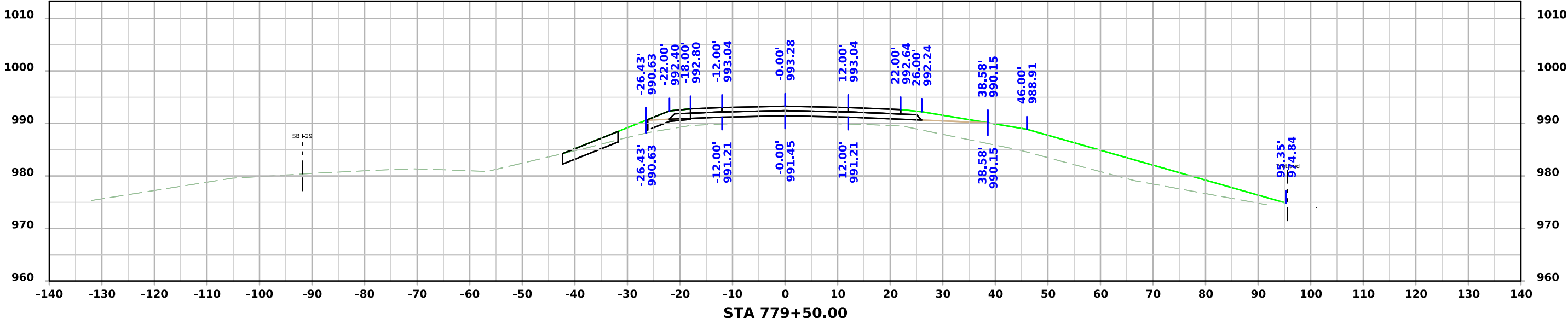
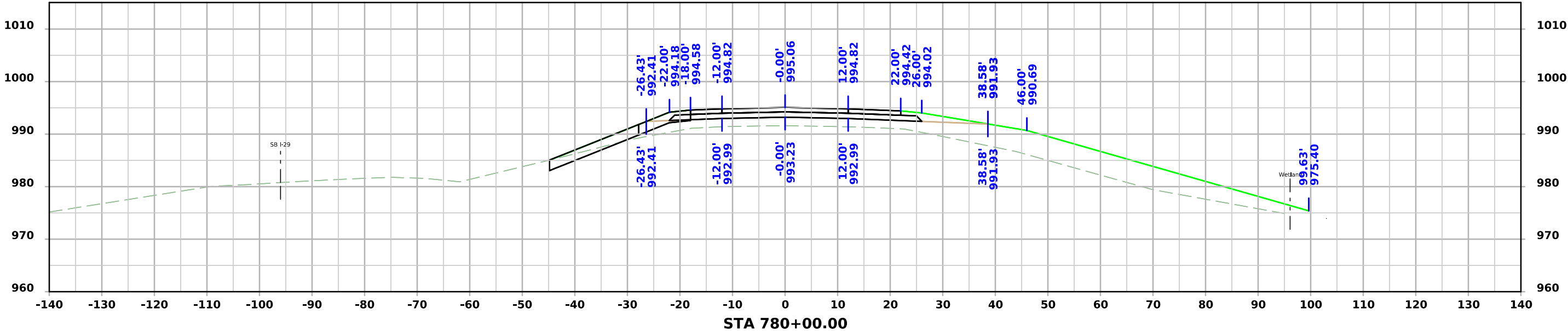
I-29 NB



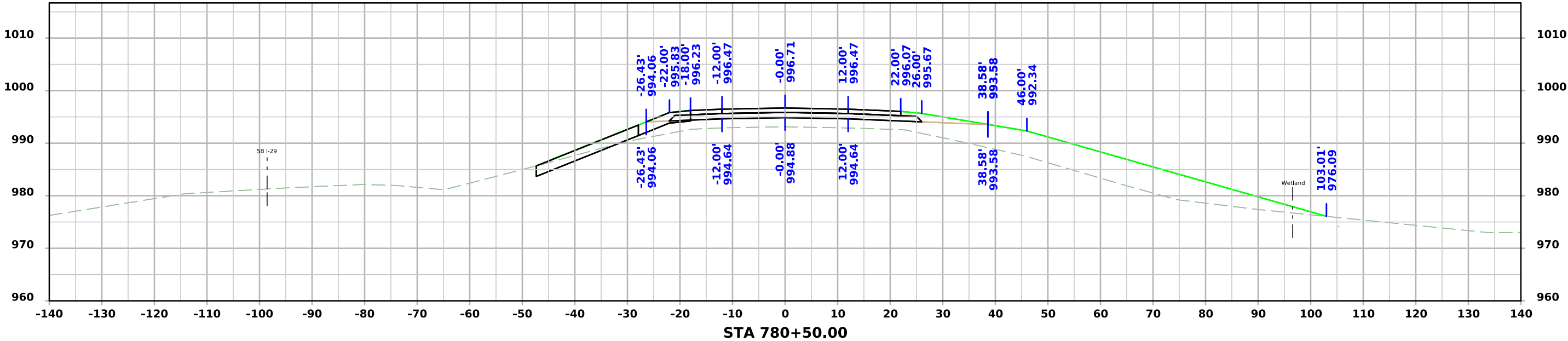
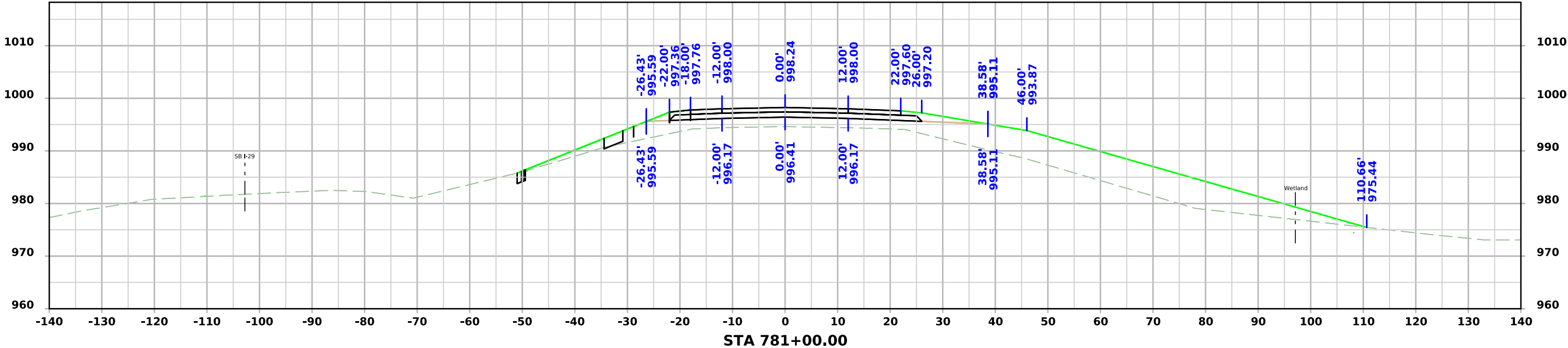
I-29 NB



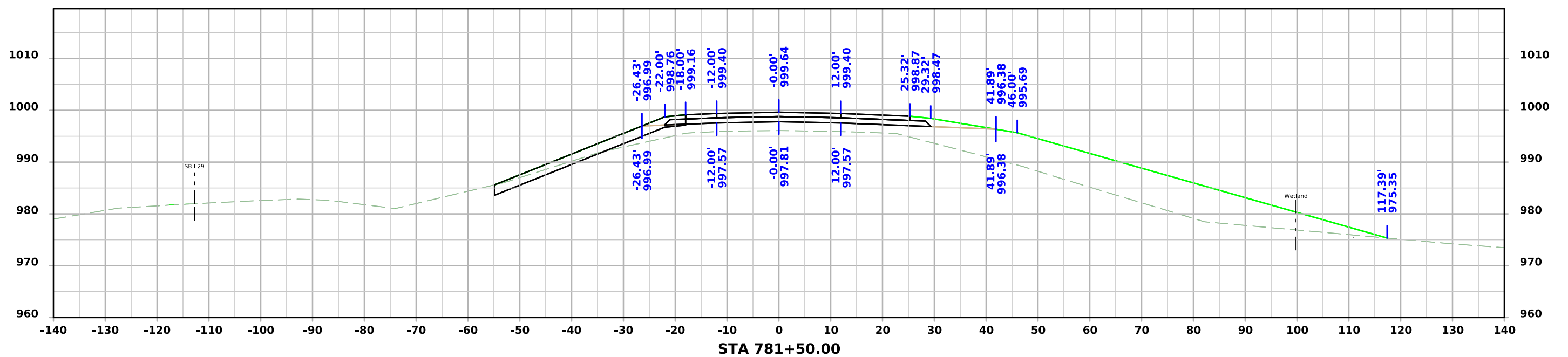
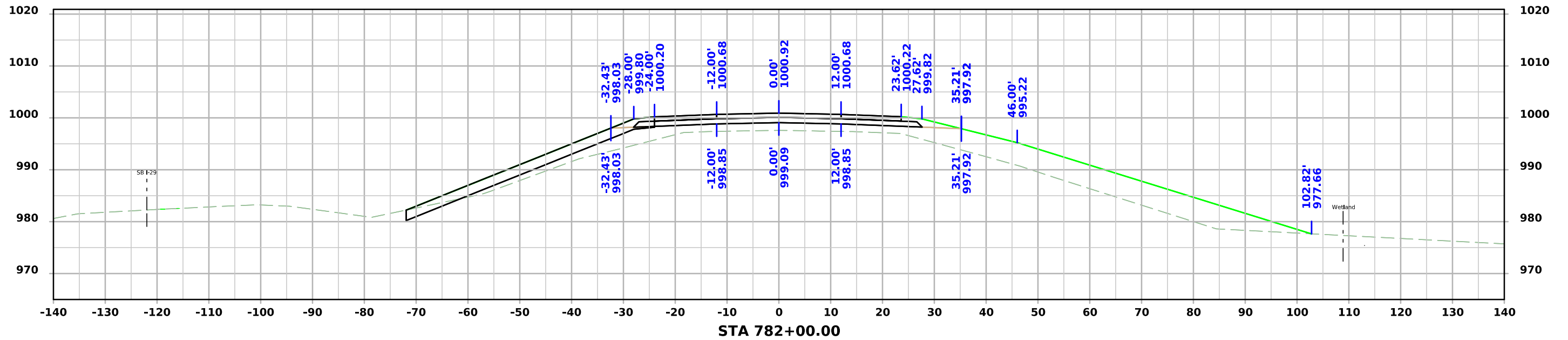
I-29 NB



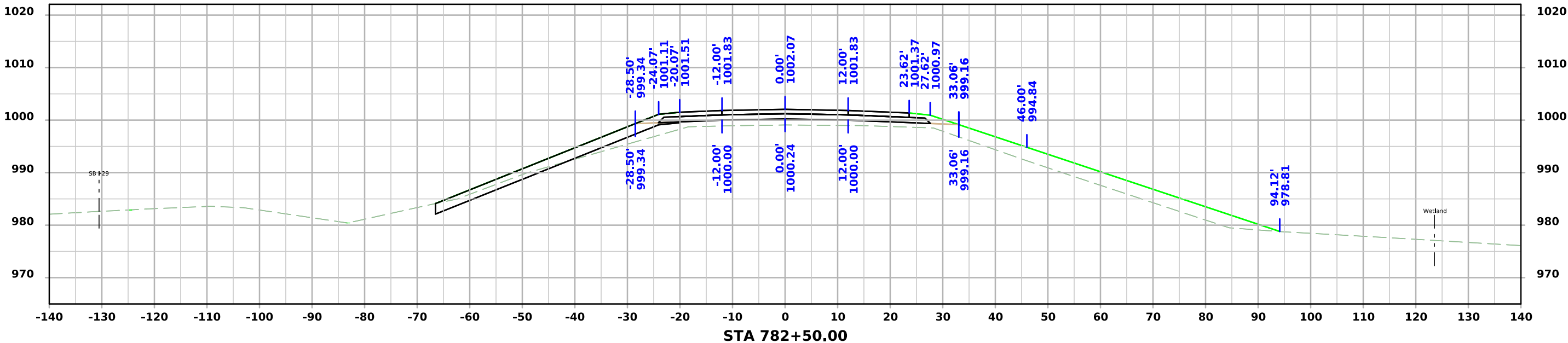
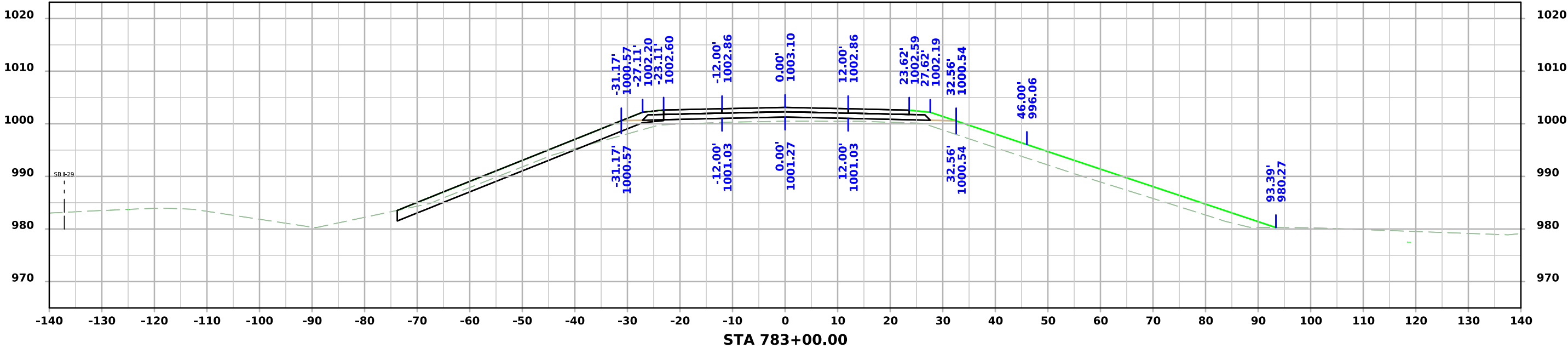
I-29 NB



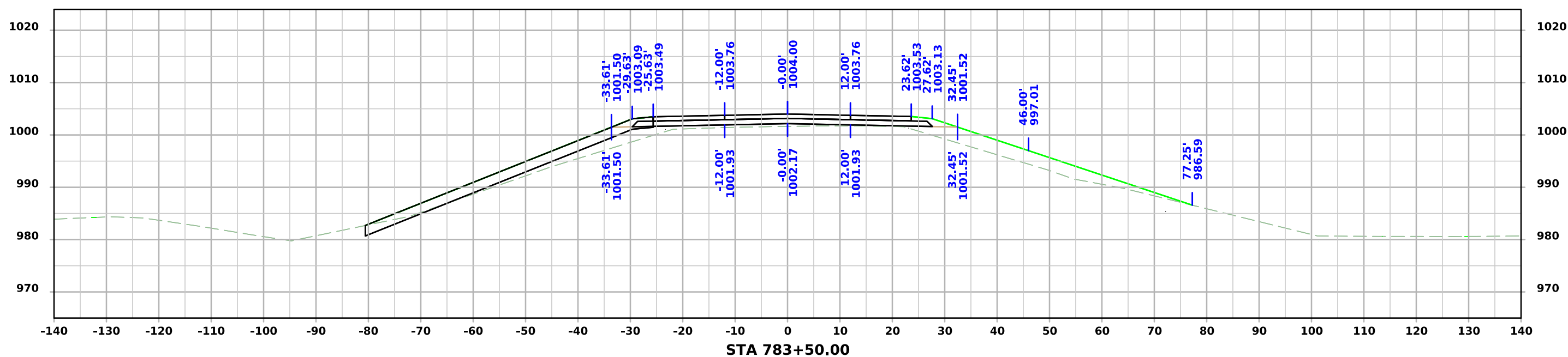
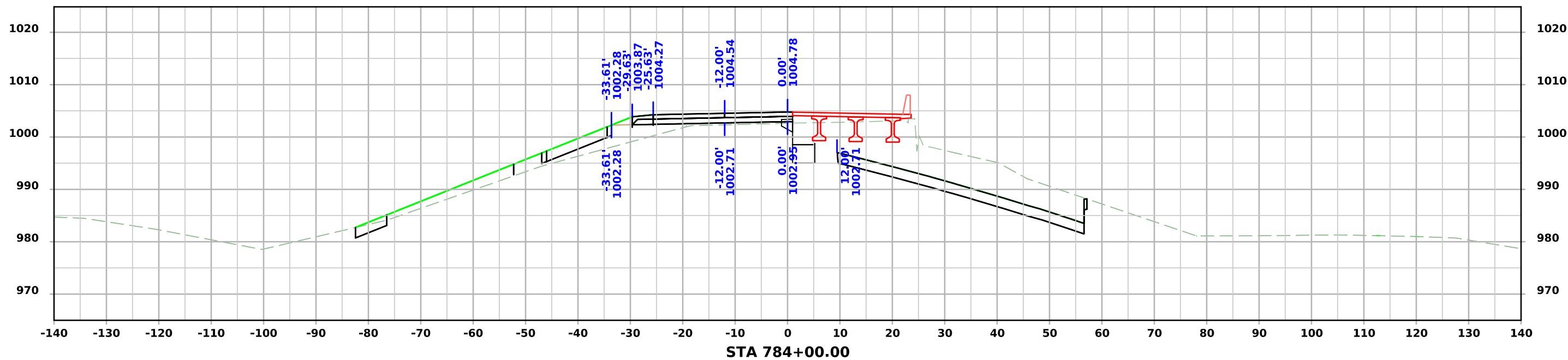
I-29 NB



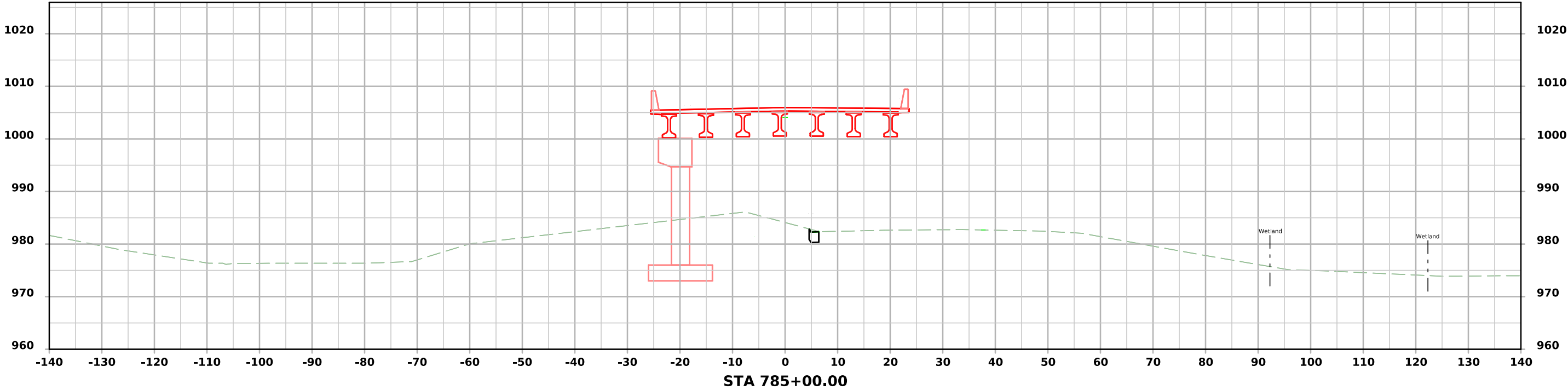
I-29 NB



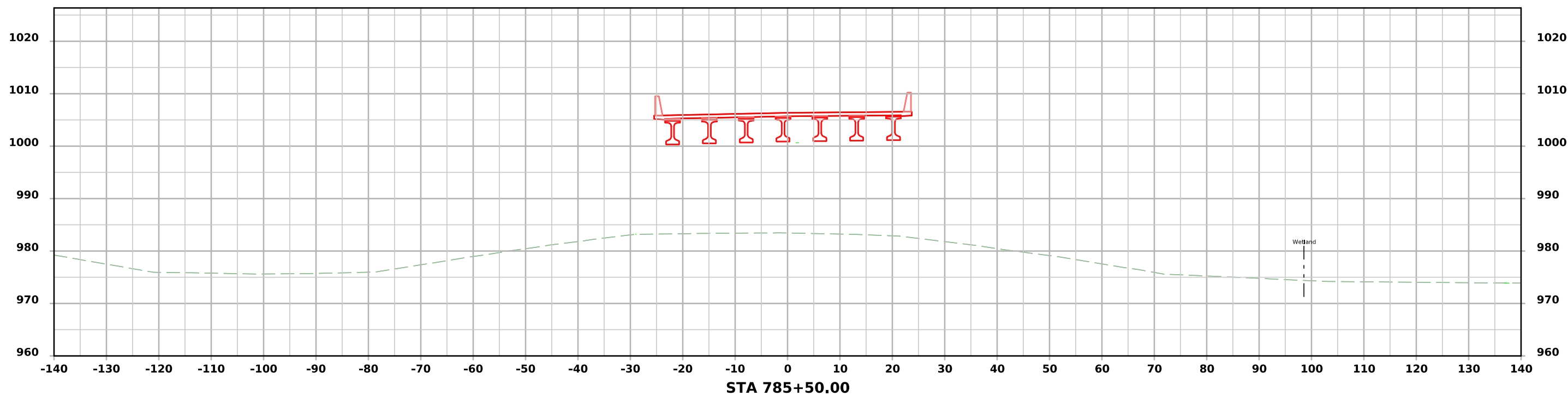
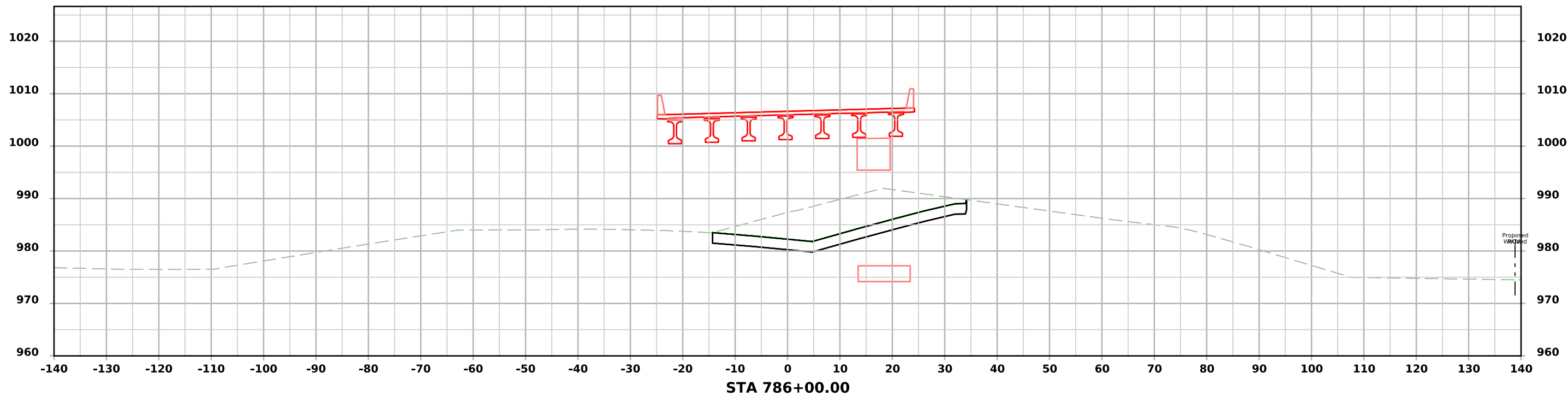
I-29 NB



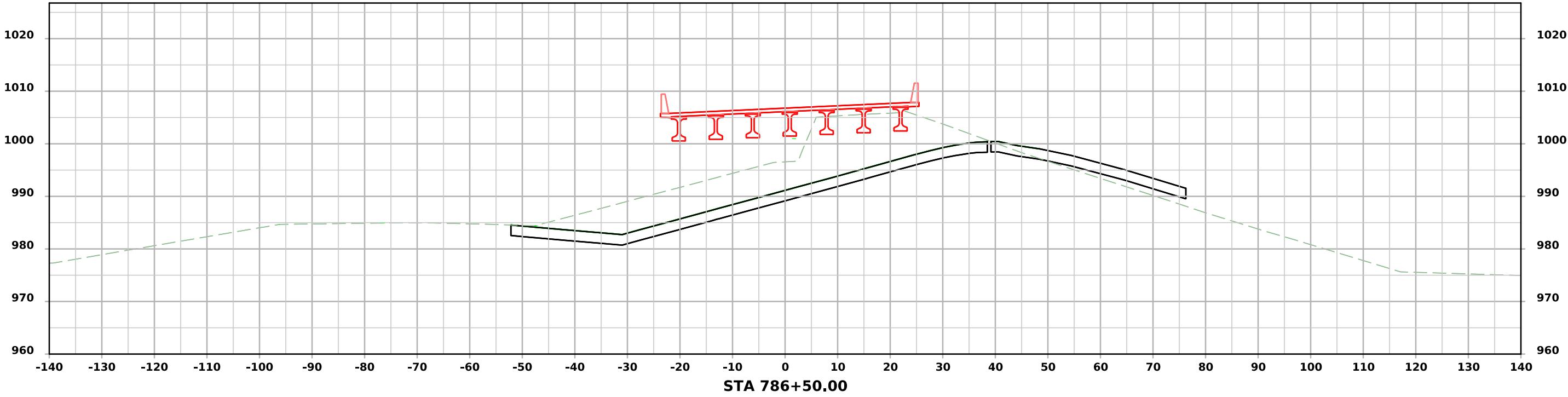
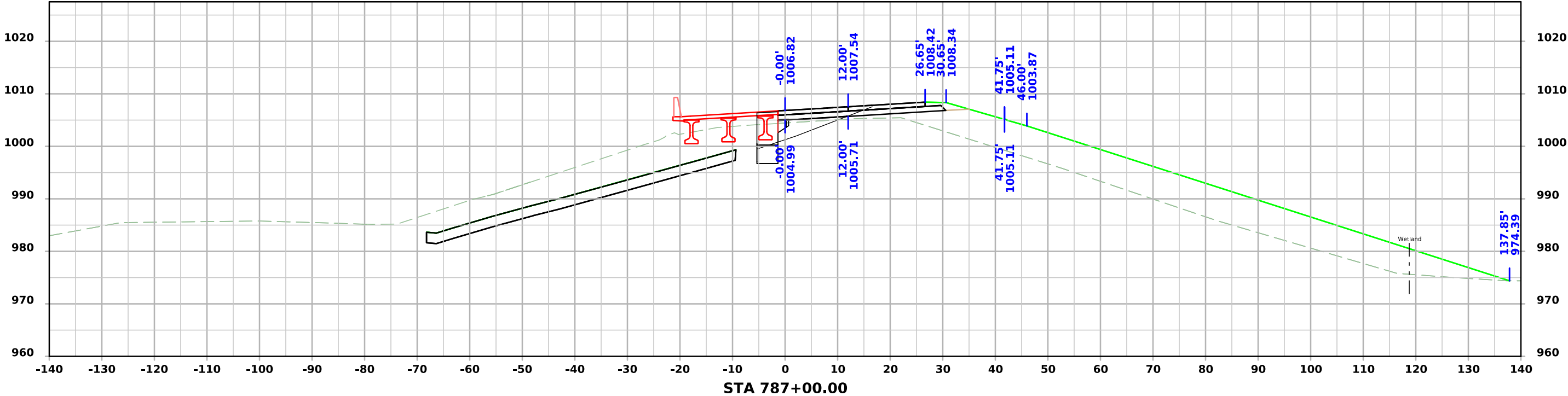
I-29 NB



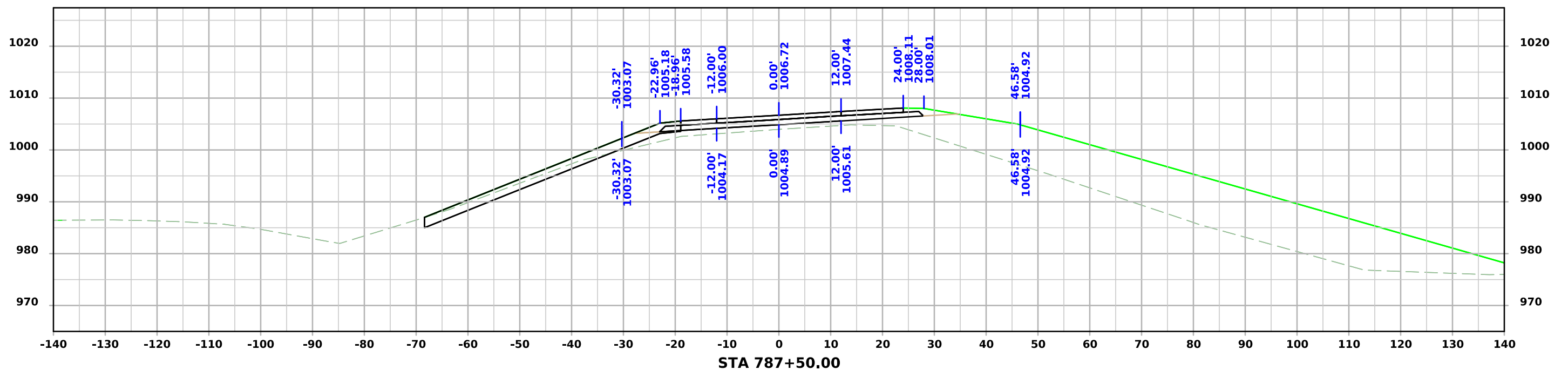
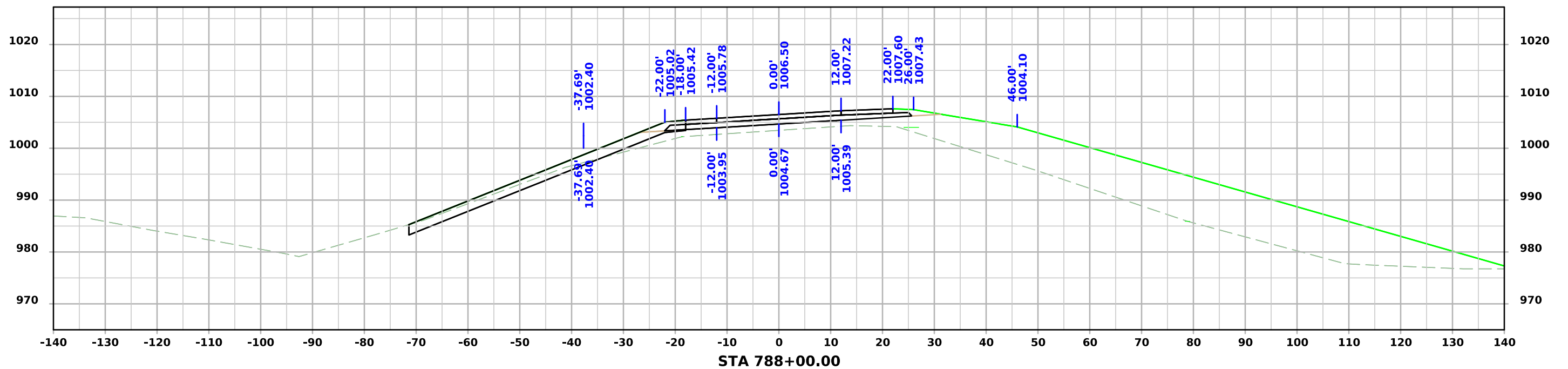
I-29 NB



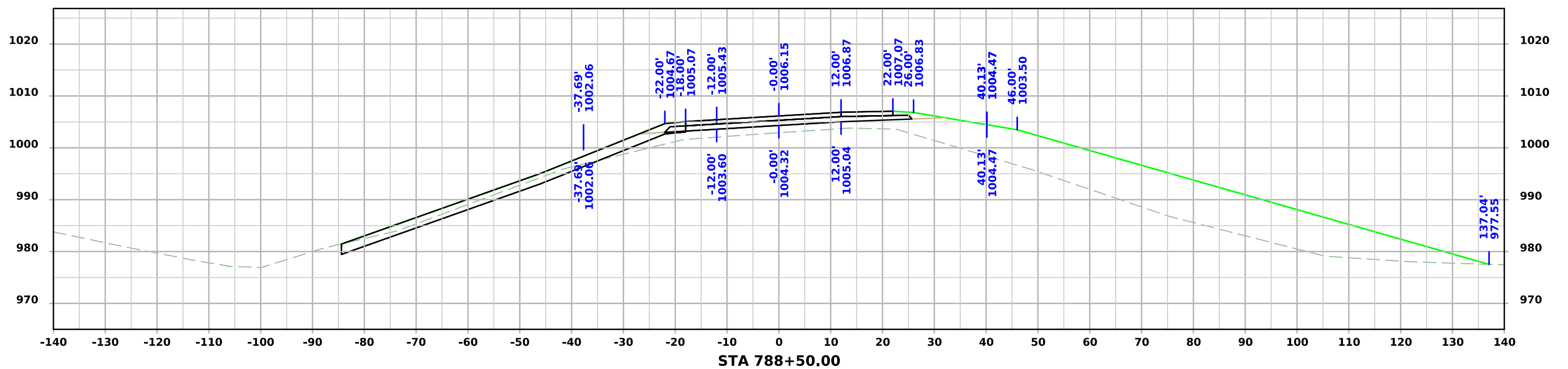
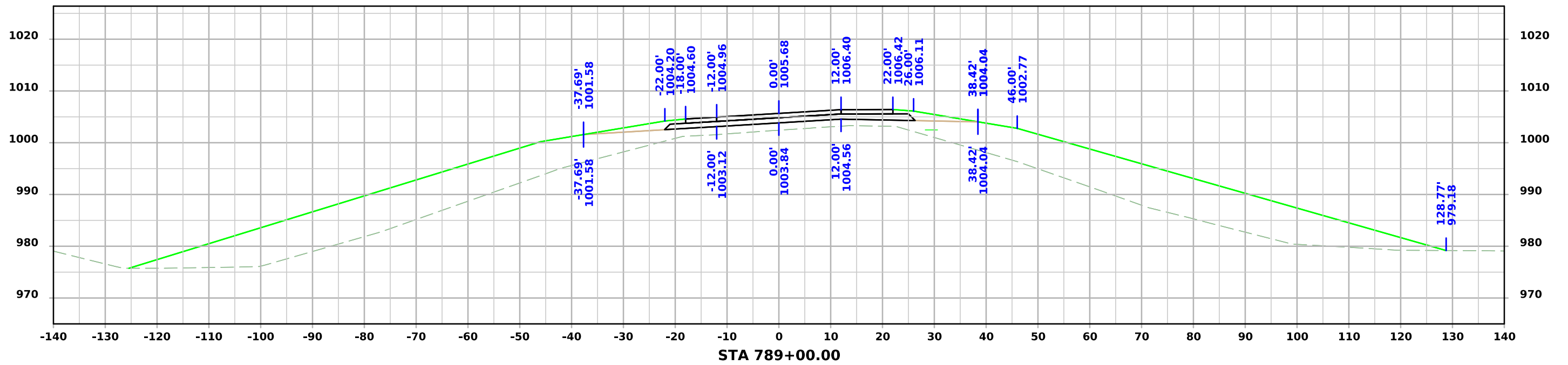
I-29 NB



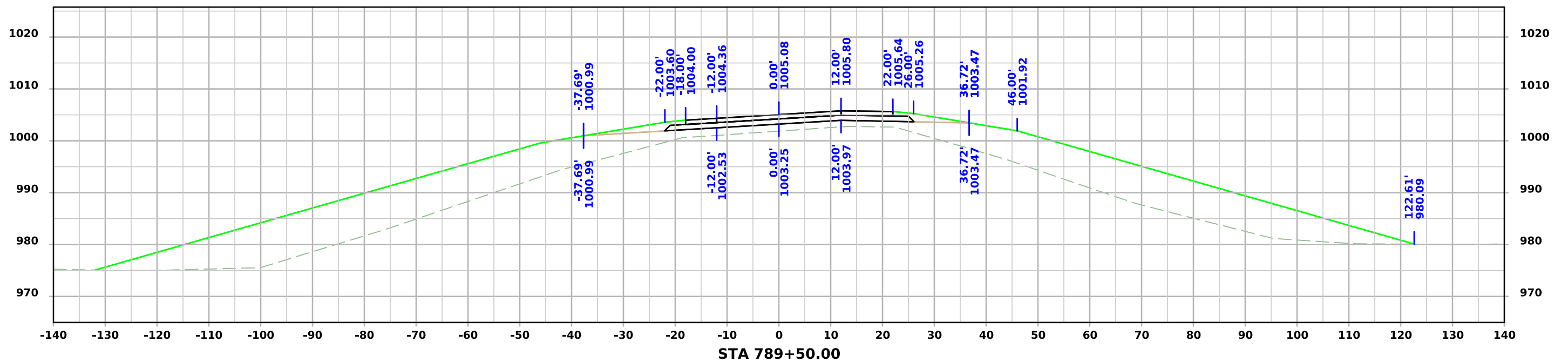
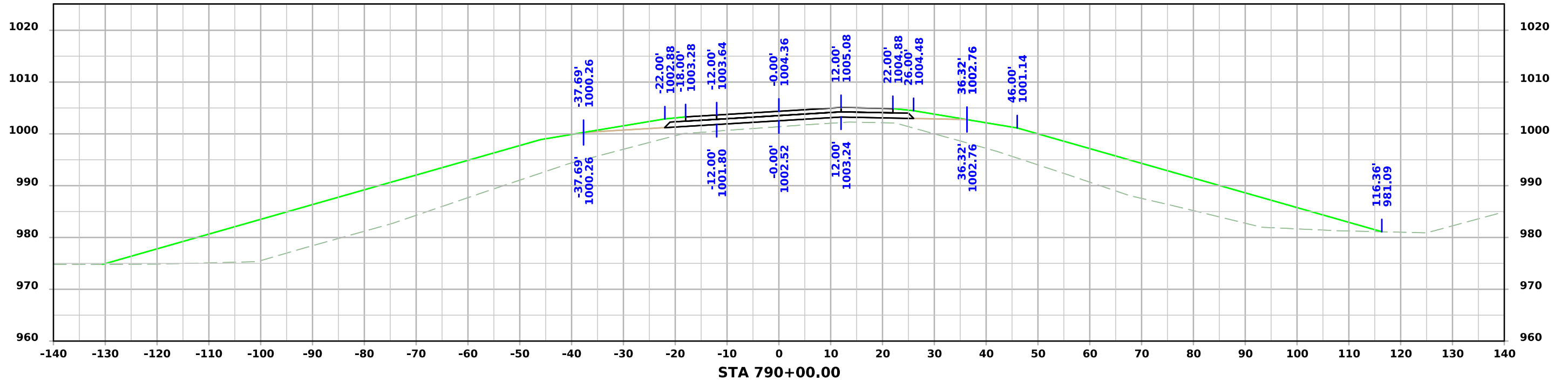
I-29 NB



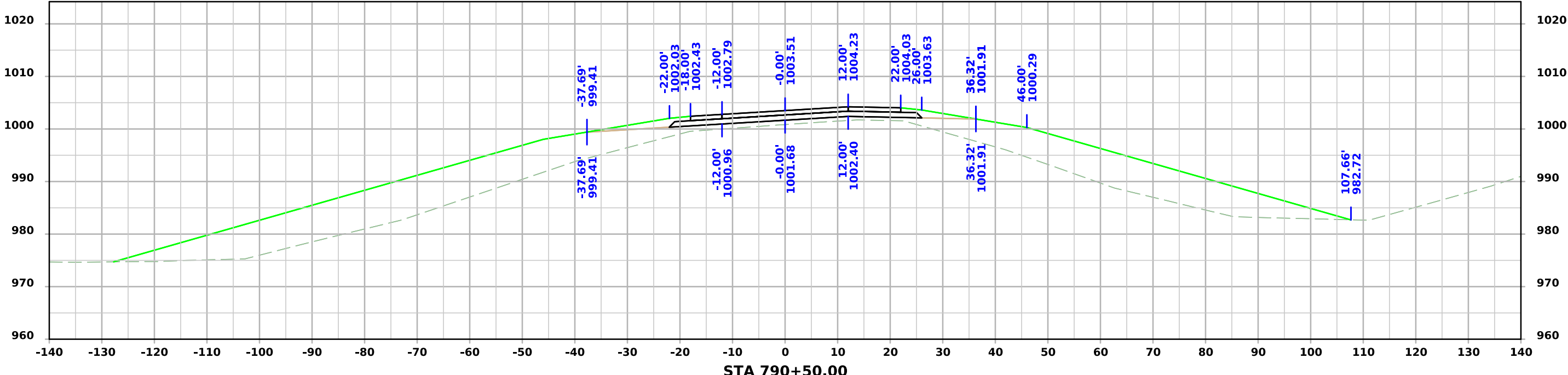
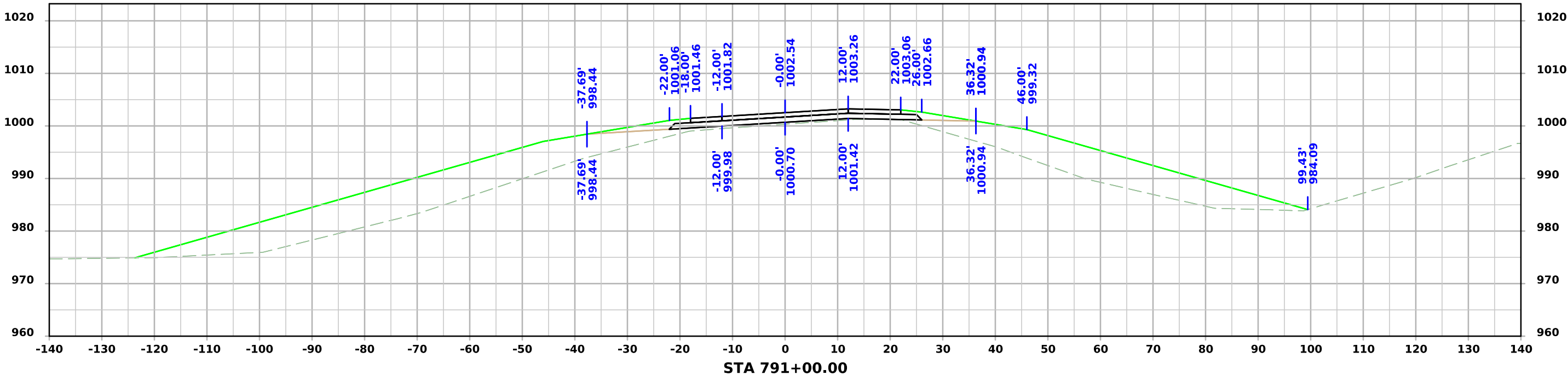
I-29 NB



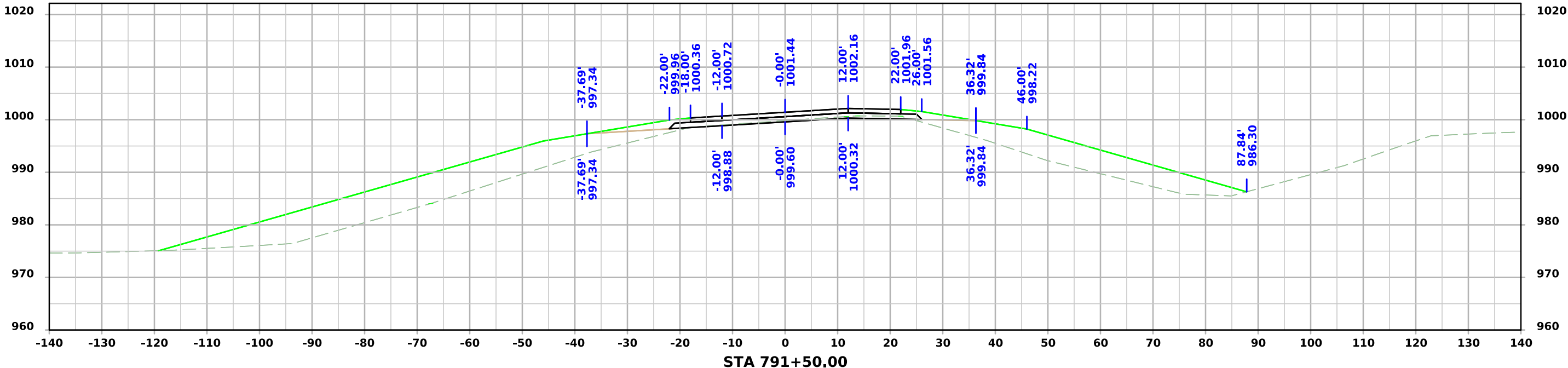
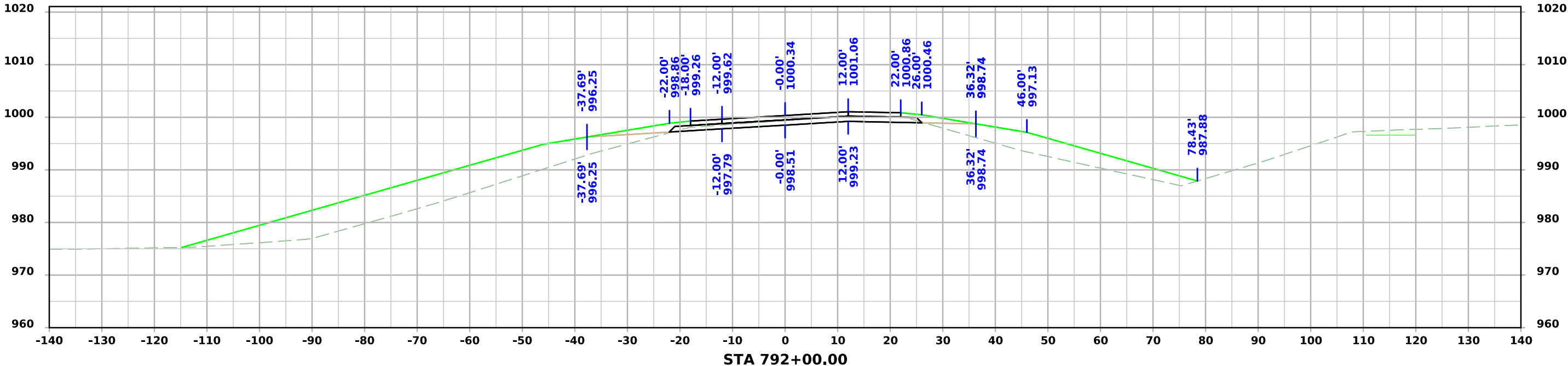
I-29 NB



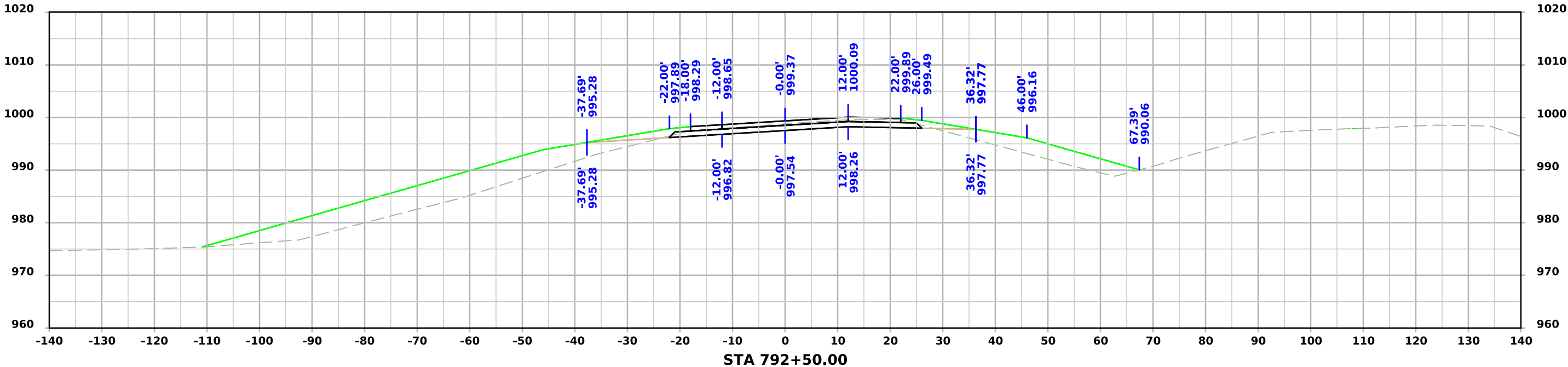
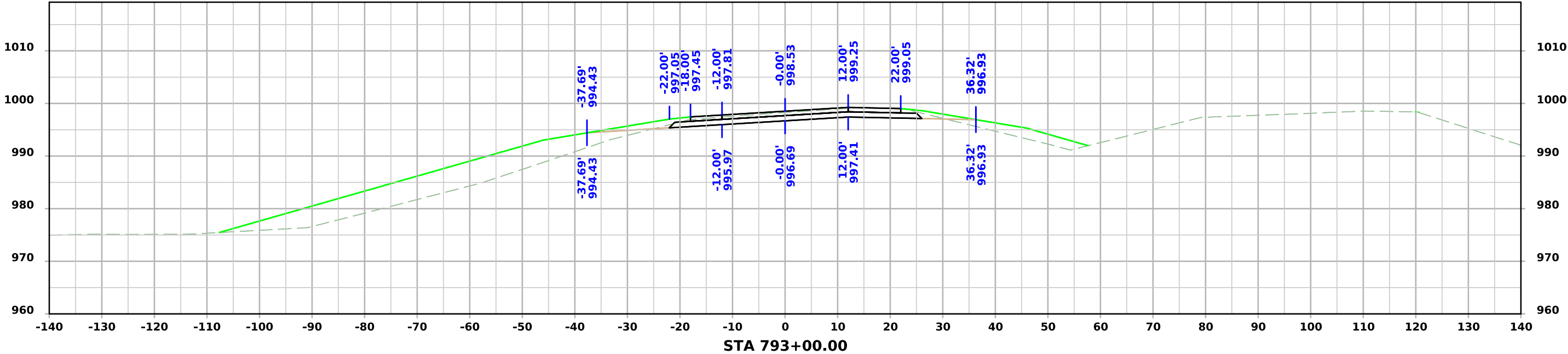
I-29 NB



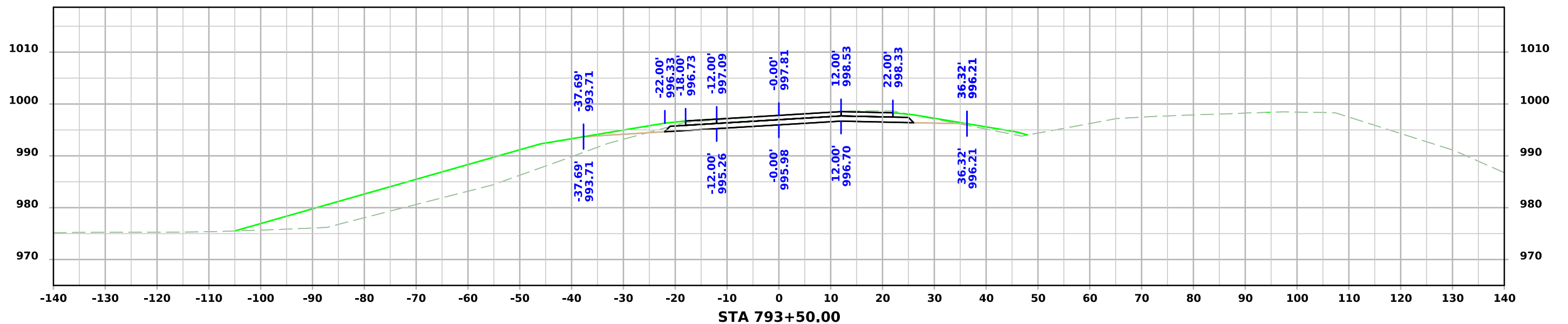
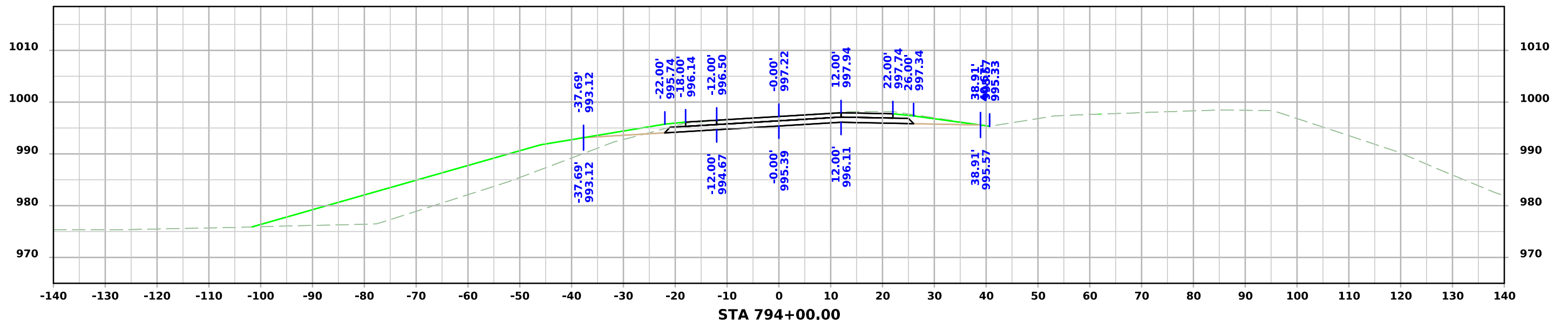
I-29 NB



I-29 NB



I-29 NB



I-29 NB

