

HMA RESURFACING WITH MILLING  
 IMX-235-2(670)12--02-77  
 LETTING DATE  
 3/15/2022

POLK COUNTY

INDEX OF SHEETS	
No.	DESCRIPTION
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# Highway Division

## PLANS OF PROPOSED IMPROVEMENT ON THE INTERSTATE ROAD SYSTEM POLK COUNTY HMA RESURFACING WITH MILLING Hull Ave in Des Moines to the NE I35/80 Interchange

SCALES: As Noted

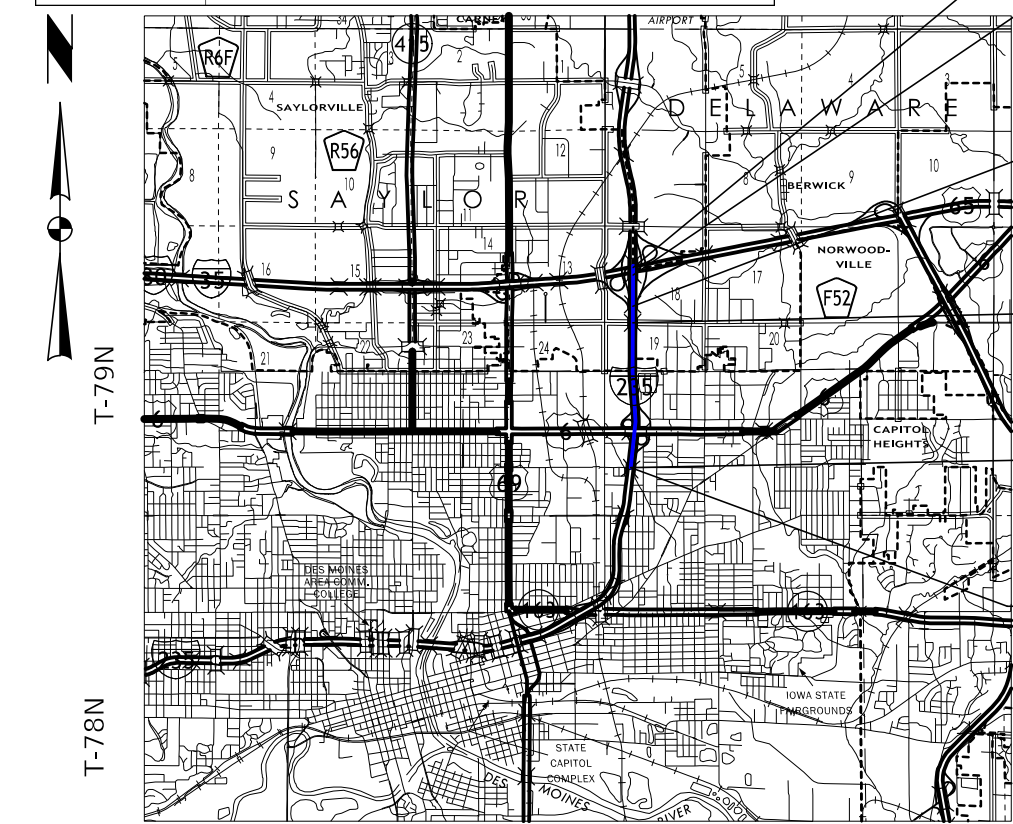
Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS	
TOTAL	147
PROJECT IDENTIFICATION NUMBER	
21-77-235-010	
PROJECT NUMBER	
IMX-235-2(670)12--02-77	
R.O.W. PROJECT NUMBER	

MILEAGE SUMMARY			
			105-1
			09-27-94
Div.	Location	Lin. Ft.	Miles
1	Sta. 1953+07.74 to Sta. 2029+82.00	7,674.26	1.453
	Omit Bridge: Sta. 2029+82.00 to Sta. 2032+58.50	286.50	0.054
	Sta. 2032+58.50 to Sta. 2040+57.00	798.50	0.151
	Omit Bridge: Sta. 2040+57.00 to Sta. 2044+34.00	377.00	0.071
	Sta. 2044+34.00 to Sta. 2053+73.00	939.00	0.178
	Omit Bridge: Sta. 2053+73.00 to Sta. 2057+92.21	419.21	0.079
Sta. 2057+92.21 to Sta. 2062+73.75	481.54	0.091	
Total Length of Project		10,966.01	2.078
Total Length of Bridges on Project		1,082.71	0.205
Total Net Project Length		9,883.30	1.873



END CONSTRUCTION  
STA. 2062+73.75

EB MAINLINE BRIDGE  
FHWA # 609860 MAINT. # 7713.8R235  
WB MAINLINE BRIDGE  
FHWA # 609810 MAINT. # 7713.8L235

EB MAINLINE BRIDGE  
FHWA # 43071 MAINT. # 7713.5R235  
WB MAINLINE BRIDGE  
FHWA # 43081 MAINT. # 7713.5L235

EB MAINLINE BRIDGE  
FHWA # 43051 MAINT. # 7713.3R235  
WB MAINLINE BRIDGE  
FHWA # 43061 MAINT. # 7713.3L235

EB MAINLINE BRIDGE  
FHWA # 43021 MAINT. # 7713.8R235  
WB MAINLINE BRIDGE  
FHWA # 43031 MAINT. # 7713.8L235

BEGIN CONSTRUCTION  
STA. 1953+07.74

DESIGN DATA RURAL			
20 --	AADT	76,400	V.P.D.
20 --	AADT	120,500	V.P.D.
20 --	DHV	--	V.P.H.
	TRUCKS	8	%
	Total		
	Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Brian T. Higginbotham	Primary Signature Block
V.2	Jaremy D. Kotta	Structural Design

PROFESSIONAL ENGINEER

BRIAN T. HIGGINBOTHAM

14503

IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

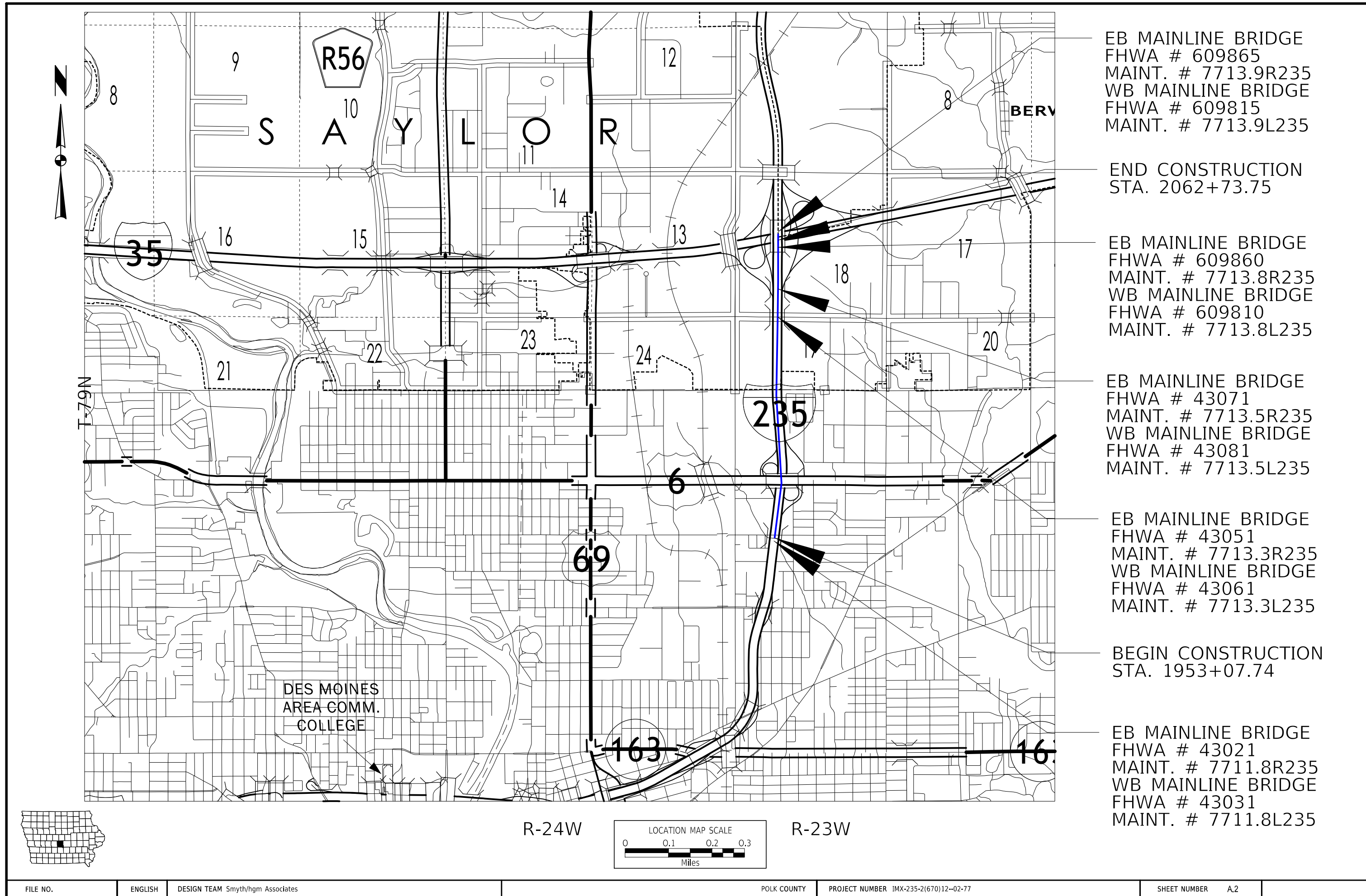
Signature: Brian T. Higginbotham

Printed or Typed Name: Brian T. Higginbotham

Date: XX-XX-XX

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: A.1, A.2, B.1-B.7, C.1-C.14, D.1-D.9, G.1-G.2, J.1-J.72, RC.1, RR.1-RR.9, U.1-U.19



EB MAINLINE BRIDGE  
 FHWA # 609865  
 MAINT. # 7713.9R235  
 WB MAINLINE BRIDGE  
 FHWA # 609815  
 MAINT. # 7713.9L235

END CONSTRUCTION  
 STA. 2062+73.75

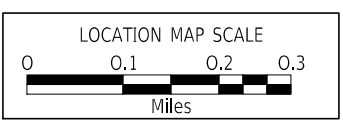
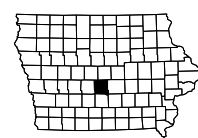
EB MAINLINE BRIDGE  
 FHWA # 609860  
 MAINT. # 7713.8R235  
 WB MAINLINE BRIDGE  
 FHWA # 609810  
 MAINT. # 7713.8L235

EB MAINLINE BRIDGE  
 FHWA # 43071  
 MAINT. # 7713.5R235  
 WB MAINLINE BRIDGE  
 FHWA # 43081  
 MAINT. # 7713.5L235

EB MAINLINE BRIDGE  
 FHWA # 43051  
 MAINT. # 7713.3R235  
 WB MAINLINE BRIDGE  
 FHWA # 43061  
 MAINT. # 7713.3L235

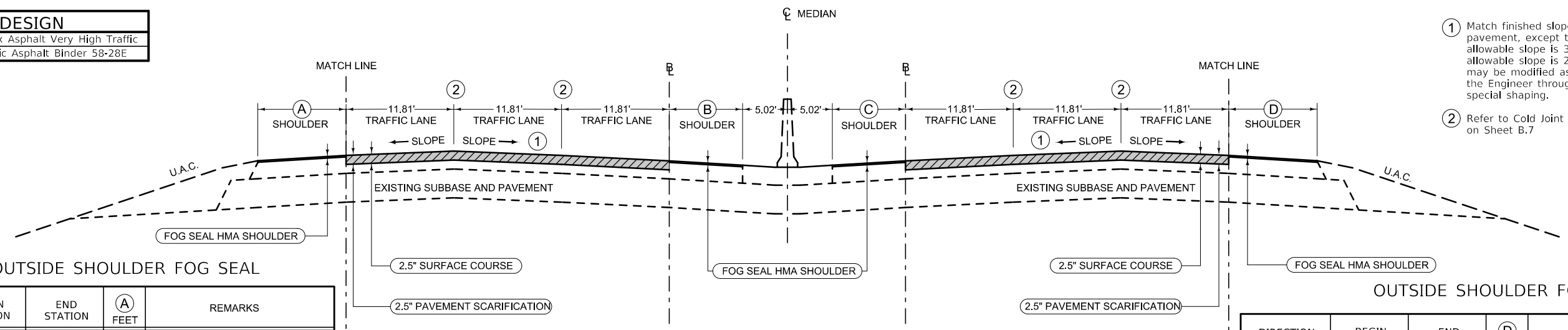
BEGIN CONSTRUCTION  
 STA. 1953+07.74

EB MAINLINE BRIDGE  
 FHWA # 43021  
 MAINT. # 7711.8R235  
 WB MAINLINE BRIDGE  
 FHWA # 43031  
 MAINT. # 7711.8L235



MIX DESIGN	
Surface Course	Hot Mix Asphalt Very High Traffic
Extremely High Traffic Asphalt Binder	58-28E

- ① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0%, minimum allowable slope is 2.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Refer to Cold Joint Density Detail on Sheet B.7



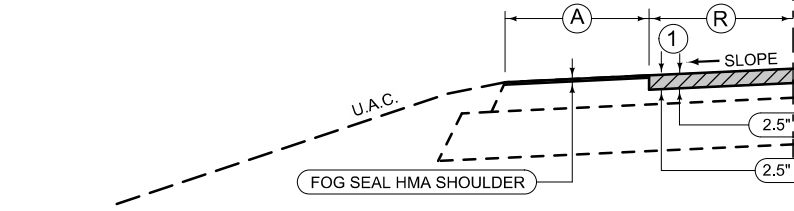
6 LANE MILLING AND RESURFACING

LOCATION	
Sta. 1953+07.74 to Sta. 2029+82.00	

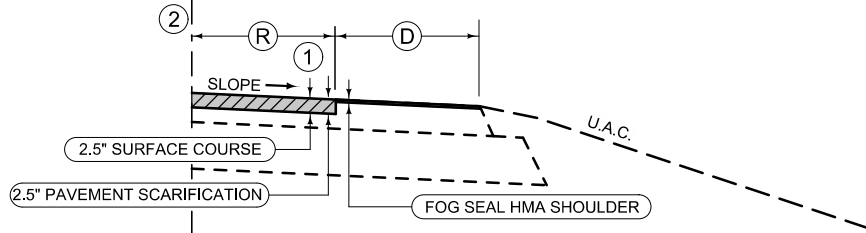
DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	REMARKS
WB	1974+36.68	1975+65.99	7.34	Curb & Gutter along shoulder
WB	1975+65.99	1982+90.03	9.84	
WB	1989+31.49	2030+02.00	9.84	

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(D) FEET	REMARKS
EB	1959+47.55	1967+86.52	9.84	
EB	1982+43.88	1984+67.22	9.84	
EB	1997+14.28	2029+94.47	9.84	

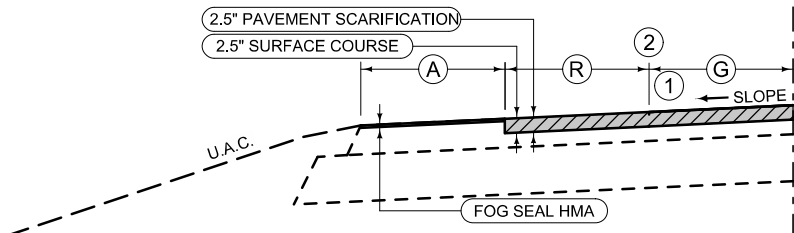
DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(B) FEET	(C) FEET	REMARKS
I-235 EB	1953+07.74	2029+82.00		8.17	
I-235 WB	1953+07.74	1956+68.90	0		
I-235 WB	1956+68.90	2029+82.00	8.17		



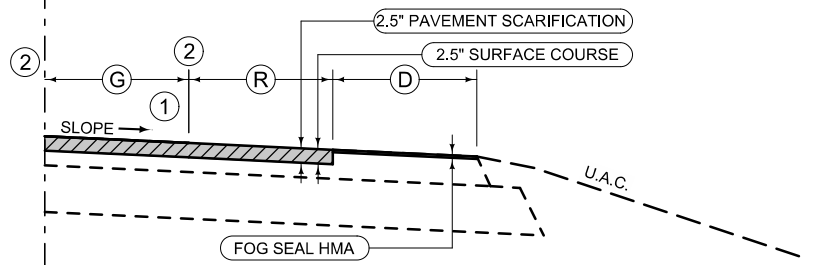
DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	(R) FEET	REMARKS
WB	1953+07.74	1957+39.55	5.91	4.95-15.74	Ramp Taper
WB	1964+31.47	1966+03.79	10.84-5.91	4.44-8.95	Ramp Taper
WB	1966+03.79	1968+51.11	5.91	8.95-15.74	Ramp Taper
WB	1985+99.40	1988+48.43	5.91	15.74-3.91	Ramp Taper
WB	1988+48.43	1989+31.49	5.91-9.84	3.91-0	Ramp Taper



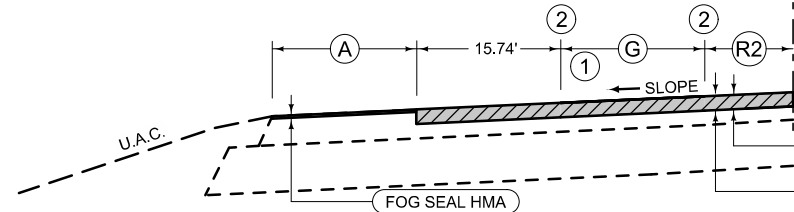
DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(R) FEET	(D) FEET	REMARKS
EB	1953+07.74	1955+68.65	5.03-15.74	5.91	Ramp Taper
EB	1970+81.98	1972+00.14	15.74-11.81	5.91	Aux. Lane/Taper
EB	1972+00.14	1979+65.10	11.81	5.91	Aux. Lane
EB	1979+65.10	1981+51.23	11.81-3.91	5.91	Ramp Taper
EB	1981+51.23	1982+43.88	3.91-0	5.91-9.84	Ramp Taper
EB	1991+32.19	1995+74.59	15.74-3.84	5.91	Ramp Taper
EB	1995+74.59	1997+14.28	3.84-0	5.91-9.84	Ramp Taper



DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	(R) FEET	(G) FEET	REMARKS
WB	1957+39.55	1962+78.27	5.91	15.74	0-14.32	
WB	1968+51.11	1974+36.68	5.91	15.74	0-28.18	
WB	1982+90.03	1985+99.40	5.91	15.74	19.03-0	



DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(G) FEET	(R) FEET	(D) FEET	REMARKS
EB	1955+68.65	1959+47.55	0-20.80	15.74	5.91	
EB	1967+86.52	1970+81.98	24.90-0	15.74	5.91	
EB	1984+67.22	1991+32.19	35.76-0	15.74	5.91	

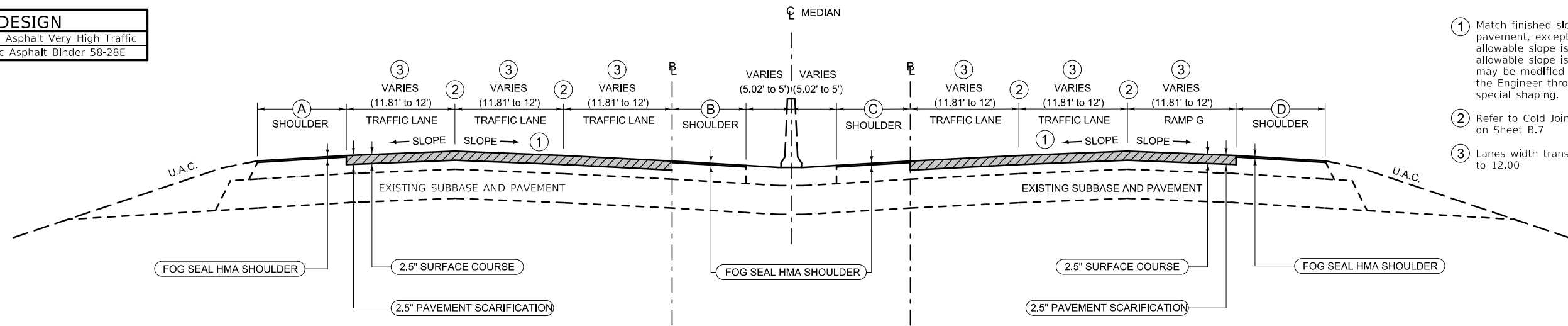


DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	(G) FEET	(R2) FEET	REMARKS
WB	1962+78.27	1964+31.47	5.91	14.32-32.41	0-4.44	

- Notes:
- ▨ PAV'T SCARIFICATION
  - HMA RESURFACING
  - Roadway Cross-Section is looking North.

TYPICAL CROSS SECTIONS I-235 RESURFACING

MIX DESIGN	
Surface Course	Hot Mix Asphalt Very High Traffic
Extremely High Traffic Asphalt Binder	58-28E



- ① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0%, minimum allowable slope is 2.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Refer to Cold Joint Density Detail on Sheet B.7
- ③ Lanes width transitions from 11.81' to 12.00'

6 LANE MILLING AND RESURFACING METRIC TO ENGLISH LANE TRANSITION

LOCATION
Sta. 2032+36.28 to Sta. 2032+86.28

OUTSIDE SHOULDER FOG SEAL

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	REMARKS
WB	2032+36.28	2032+61.48	9.84	
WB	2032+61.48	2032+86.28	12	

ROAD IDENTIFICATION	BEGIN STATION	END STATION	(B) FEET	(C) FEET	REMARKS
I-235 EB	2032+58.50	2032+86.28		8.17-10	
I-235 WB	2032+58.50	2032+86.28	8.17-10		

OUTSIDE SHOULDER FOG SEAL

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(D) FEET	REMARKS
EB	2032+36.28	2032+86.28	9.84-12	

Notes:

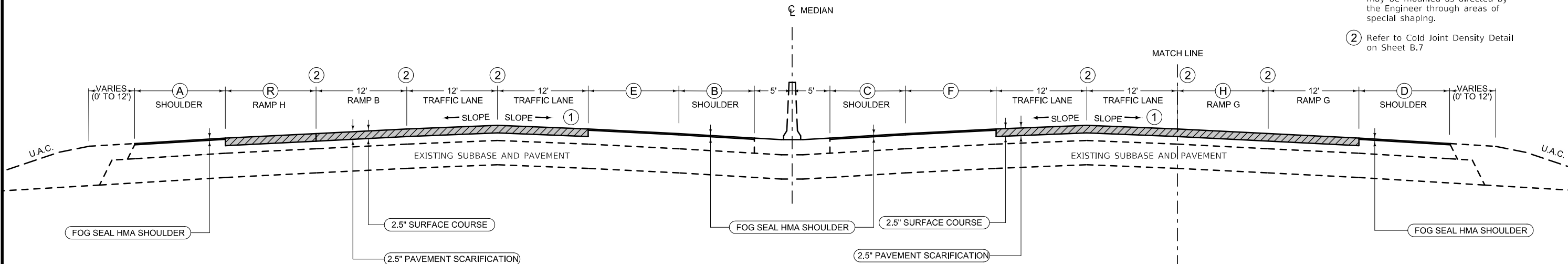
- PAV'T SCARIFICATION
- HMA RESURFACING

▪ Roadway Cross-Section is looking North.

TYPICAL CROSS SECTIONS  
I-235 RESURFACING

MIX DESIGN	
Surface Course	Hot Mix Asphalt Very High Traffic
Extremely High Traffic Asphalt Binder	58-28E

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- ② Refer to Cold Joint Density Detail on Sheet B.7



**OUTSIDE SHOULDER FOG SEAL AND RAMP**

**4 LANE MILLING AND RESURFACING**

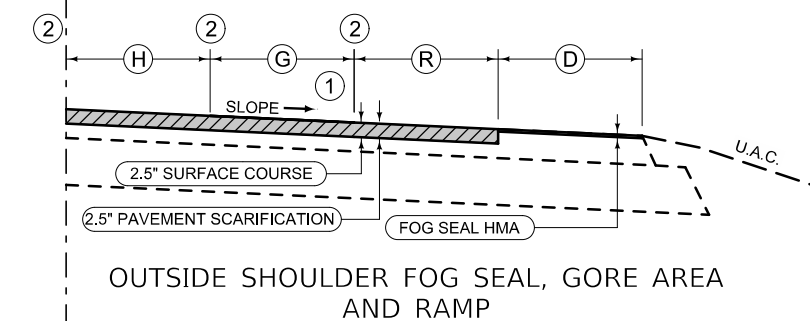
**OUTSIDE SHOULDER FOG SEAL**

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	(R) FEET	REMARKS
WB	2032+86.28	2035+86.28	12	0-12	Ramp Taper
WB	2035+86.28	2040+57.00	12	12	Aux. Lane

LOCATION
Sta. 2032+86.28 to Sta. 2040+57.00

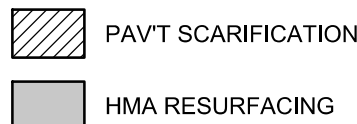
DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(D) FEET	(H) FEET	REMARKS
EB	2032+86.28	2039+14.72	12	0-12	Ramp Taper

ROAD IDENTIFICATION	BEGIN STATION	END STATION	(E) FEET	(B) FEET	(C) FEET	(F) FEET	REMARKS
I-235 EB	2032+86.28	2040+06.28			10	0-12	Lane Shift
I-235 EB	2040+06.28	2040+57.00			10	12	
I-235 WB	2032+86.28	2040+06.28	0-12	10			Lane Shift
I-235 WB	2040+06.28	2040+57.00	12	10			



**OUTSIDE SHOULDER FOG SEAL, GORE AREA AND RAMP**

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(H) FEET	(G) FEET	(R) FEET	(D) FEET	REMARKS
EB	2039+14.72	2040+55.76	24	0-5.02	24	12	



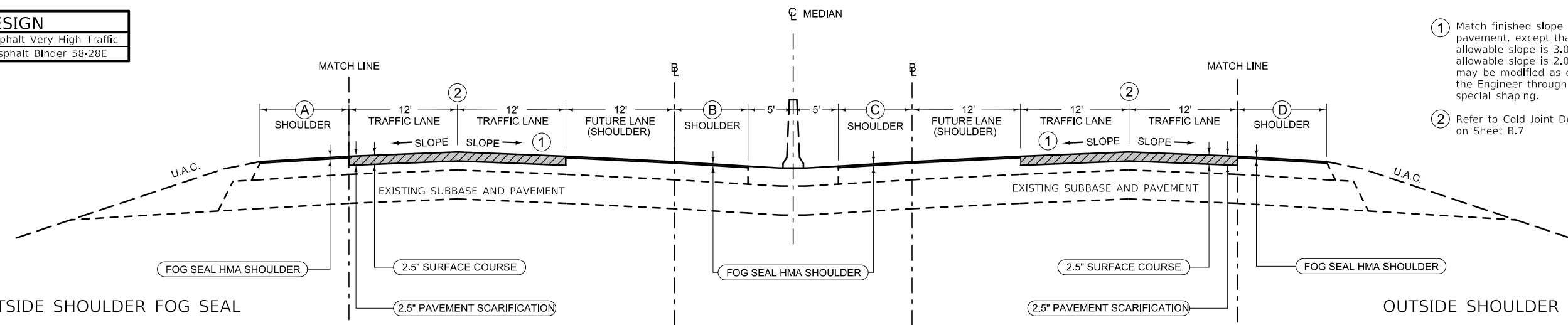
**Notes:**

- Roadway Cross-Section is looking North.

**TYPICAL CROSS SECTIONS I-235 RESURFACING**

MIX DESIGN	
Surface Course	Hot Mix Asphalt Very High Traffic
	Extremely High Traffic Asphalt Binder 58-28E

- ① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0%, minimum allowable slope is 2.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Refer to Cold Joint Density Detail on Sheet B.7



OUTSIDE SHOULDER FOG SEAL

OUTSIDE SHOULDER FOG SEAL

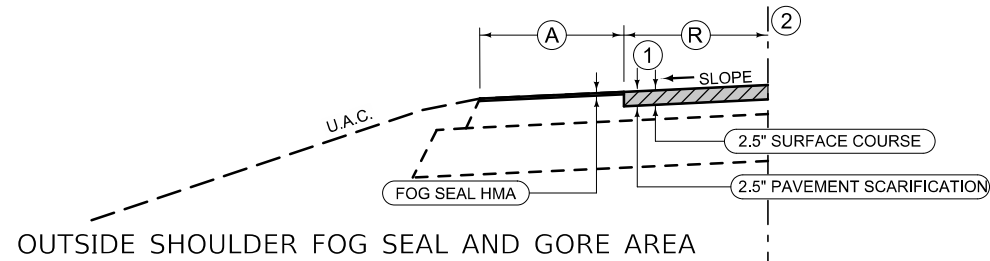
6 LANE MILLING AND RESURFACING

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	REMARKS
WB	2047+94.46	2053+52.72	12	
WB	2057+92.21	2061+93.36	12	

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(D) FEET	REMARKS
EB	2044+34.00	2053+65.94	12	
EB	2058+31.60	2062+66.53	12	

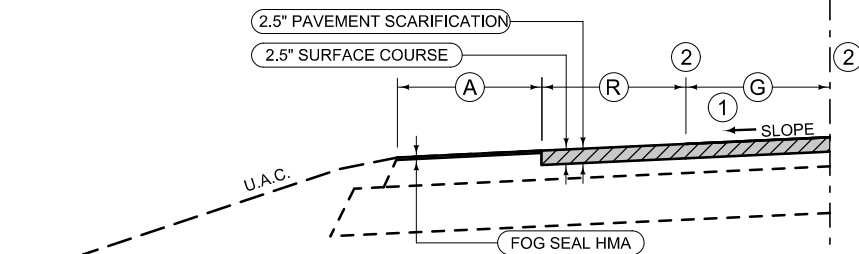
LOCATION	
Sta.	2044+34.00 to Sta. 2053+73.00
Sta.	2057+92.21 to Sta. 2062+73.75

ROAD IDENTIFICATION	BEGIN STATION	END STATION	(B) FEET	(C) FEET	REMARKS
I-235 EB	2044+34.00	2053+73.00		10	
I-235 WB	2044+34.00	2053+73.00	10		
I-235 EB	2057+92.21	2062+73.75		10	
I-235 WB	2057+92.21	2062+73.75	10		



OUTSIDE SHOULDER FOG SEAL AND GORE AREA

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	(R) FEET	REMARKS
WB	2044+34.00	2045+63.42	12	12	Ramp Taper
WB	2045+63.42	2046+52.99	12-7.94	12-16	Ramp Taper



OUTSIDE SHOULDER FOG SEAL, GORE AREA AND RAMP

DIRECTION OF TRAVEL	BEGIN STATION	END STATION	(A) FEET	(R) FEET	(G) FEET	REMARKS
WB	2046+52.99	2046+72.47	7.94-6	16	0-1.87	
WB	2046+72.47	2047+94.46	6	16	1.87-26.36	

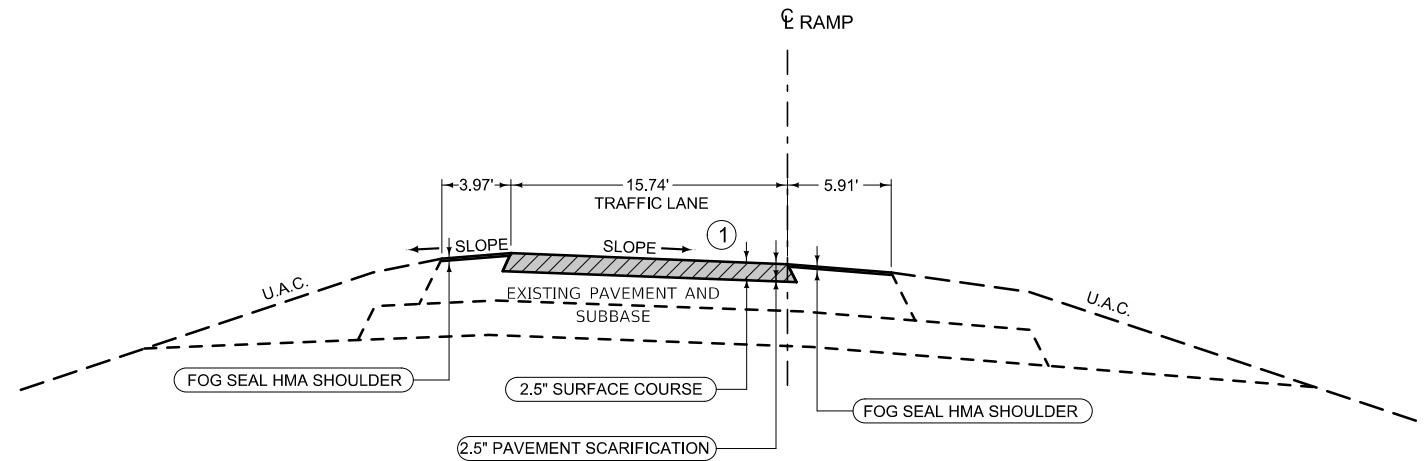
Notes:

- PAV'T SCARIFICATION
- HMA RESURFACING
- Roadway Cross-Section is looking North.

TYPICAL CROSS SECTIONS  
I-235 RESURFACING

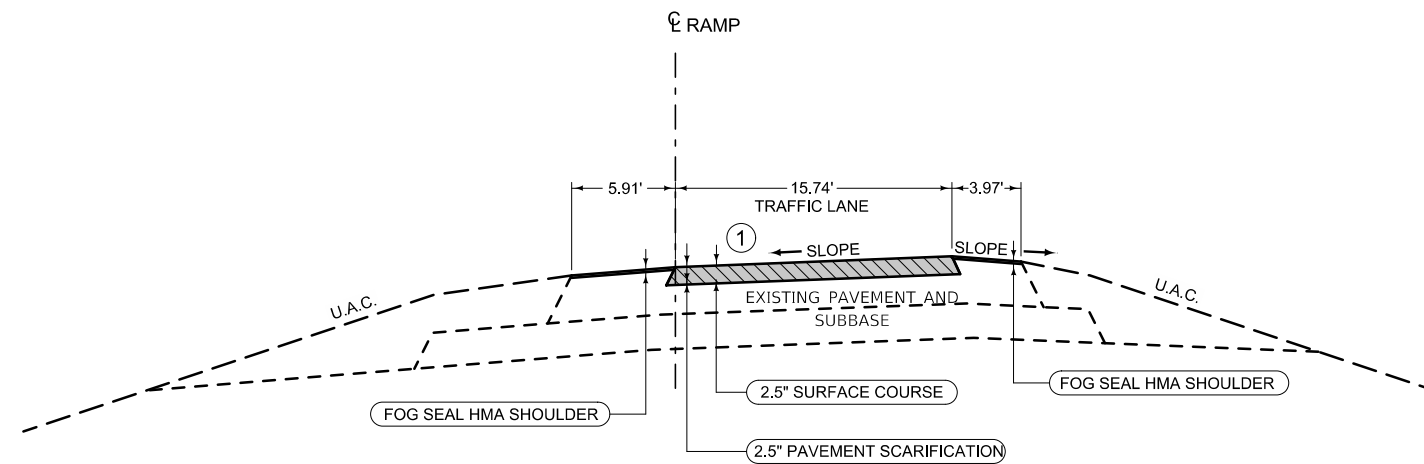
MIX DESIGN	
Surface Course	Hot Mix Asphalt Very High Traffic
	Extremely High Traffic Asphalt Binder 58-28E

- ① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0%, minimum allowable slope is 2.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- ② Refer to Cold Joint Density Detail on Sheet B.7



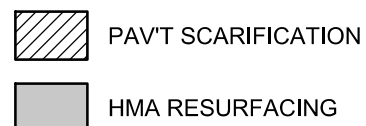
EASTBOUND RAMPS/LOOPS

ROAD IDENTIFICATION	BEGIN STATION	END STATION	REMARKS
ECULID RAMP B	21959+49.14	21961+12.14	
ECULID LOOP F	61966+60.58	61967+70.58	
ECULID RAMP D	41983+64.09	41984+64.09	



WESTBOUND RAMPS/LOOPS

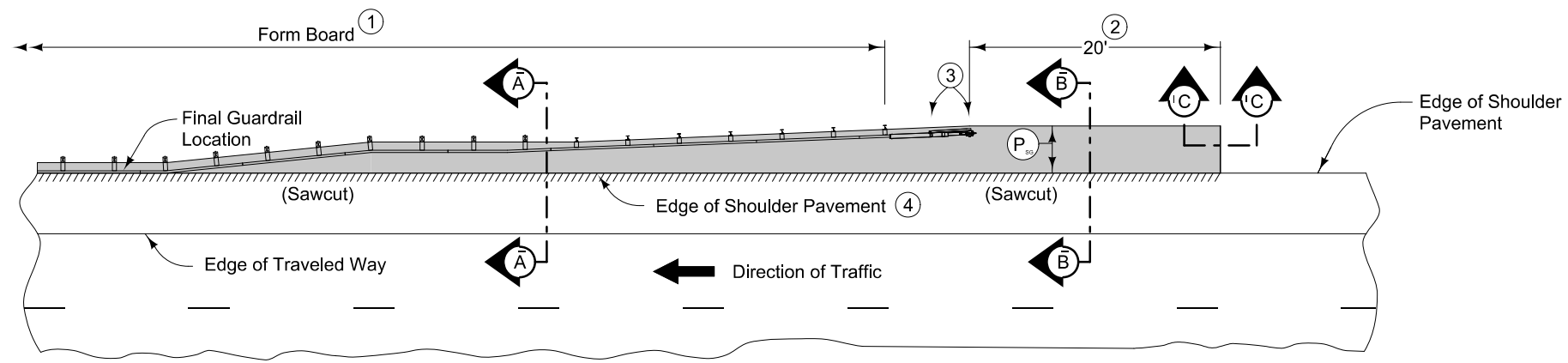
ROAD IDENTIFICATION	BEGIN STATION	END STATION	REMARKS
ECULID RAMP C	31964+34.81	31965+89.81	
ECULID LOOP E	51974+35.50	51974+70.50	
ECULID RAMP A	11981+18.04	11982+88.04	
NE MIXMASTER RAMP B	22047+98.05	22048+02.05	



Notes:

- Roadway Cross-Section is looking North.

TYPICAL CROSS SECTIONS  
RAMPS & LOOPS



PLAN VIEW

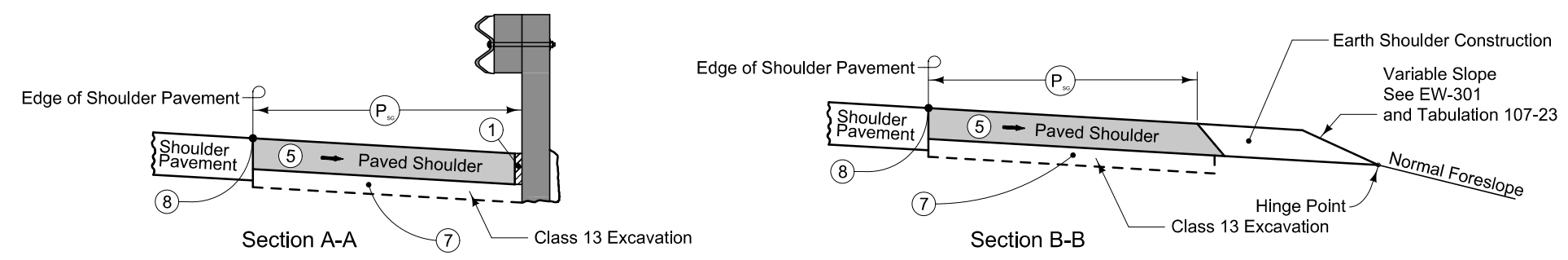
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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.

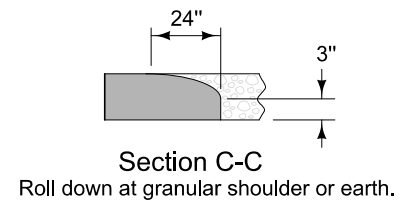
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

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-102) joint for PCC shoulder. 'B' (per PV-102) 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 6" Special Backfill.
- ⑧ Saw cut between existing shoulder pavement and new guardrail pavement.



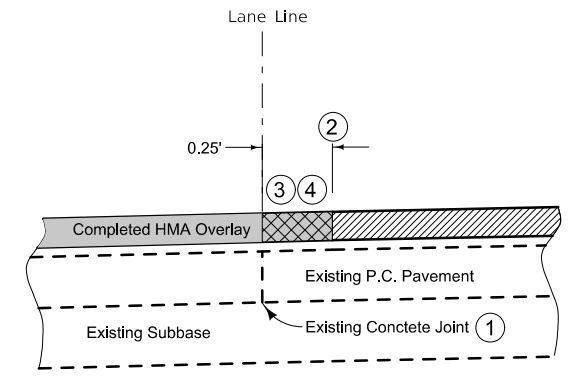
EXISTING SHOULDER



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



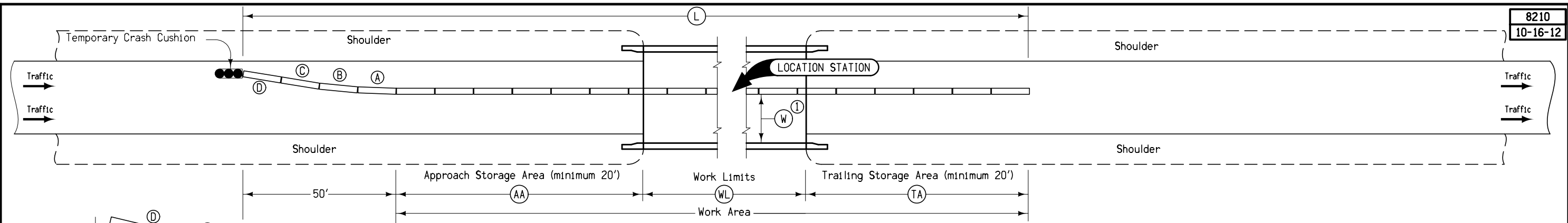
- ① Match assumed existing concrete joint.
- ② Scarify and Overlay 0.25' beyond joint line for Stage 1.
- ③ Scarify and Overlay 0.25' of the completed HMA pavement in the adjacent lane to provide a clean working joint.
- ④ Estimate of Quantities reflect the additional scarification and overlay quantities necessary to the place and remove the 0.25' of the sacrificial pavement.



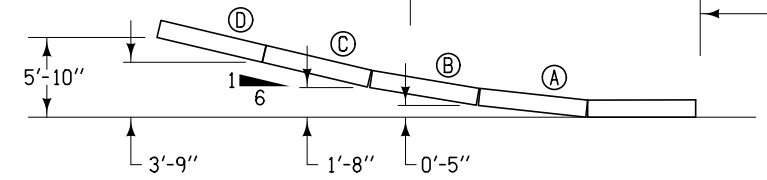
LONGITUDINAL CROSS SECTION



COLD JOINT DENSITY DETAIL



8210  
10-16-12



BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored X	W <sup>①</sup>	Remarks
		Feet	Feet	Feet	Feet		Ft-Inches	
1949+60.44	C	25	237.5	25	287.5		35-5	EB FOR MEDIAN BARRIER REPAIR
1949+24.44	0	25	237.5	25	287.5		35-5	EB FOR OUTSIDE BARRIER REPAIR
2030+34.19	0	25	162.5	25	212.5		35-5	WB FOR OUTSIDE BARRIER REPAIR
2040+84.95	0	25	237.5	25	287.5		VARIES	EB FOR OUTSIDE BARRIER REPAIR

① Where W is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.

TEMPORARY CONCRETE BARRIER LAYOUT  
for One-Way Traffic

**PROJECT DESCRIPTION**

This project proposes to resurface both eastbound and westbound lanes of I-235, from the Hull Ave bridges (approximate Ref. Post 11.86) to the north I-80 bridges (approximate Ref. Post 14.31). The HMA shoulders will be fog sealed. This roadway is a 6 -lane divided highway with inside and outside paved shoulders and a center concrete barrier. Work will also include barrier rail repairs at the WB bridge at NE 46th Ave, EB bridge at of UPPR, and EB bridge over I-80 EB bridge.

**ESTIMATED PROJECT QUANTITIES  
(UP TO A 5 DIVISION PROJECT)**

Division 1: Federal Participation  
Division 2: 100% Iowa DOT

Item No.	Item Code	Item	Unit	Quantities																
				Estimated					As Built											
				Division 1	Division 2	Division 3	Division 4	Division 5	Total	Division 1	Division 2	Division 3	Division 4	Division 5						
1	2102-0425070	SPECIAL BACKFILL	CY	99.8																
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	288.7																
3	2102-2713090	EXCAVATION, CLASS 13, WASTE	CY	186.7																
4	2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY	65.1																
5	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	SY	316.7																
6	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	9.4																
7	2212-0475095	CLEANING AND PREPARATION OF BASE	MILE	5.56																
8	2212-5070310	PATCHES, FULL-DEPTH REPAIR	SY	720																
9	2212-5070330	PATCHES BY COUNT (REPAIR)	EACH	9																
10	2214-5145150	PAVEMENT SCARIFICATION	SY	91409.7																
11	2303-1053502	HOT MIX ASPHALT VERY HIGH TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, FRICTION L-2	TON	12597.401																
12	2303-1258286	ASPHALT BINDER, PG 58-28E, EXTREMELY HIGH TRAFFIC	TON	755.844																
13	2303-6911000	HOT MIX ASPHALT PAVEMENT SAMPLES	LS	1																
14	2303-7000610	PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA MIXTURE LABORATORY VOIDS (FORMULA - BY PAY FACTOR)	EACH	6299																
15	2303-7000620	PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA MIXTURE FIELD VOIDS (FORMULA - BY PAY FACTOR)	EACH	6299																
16	2308-1000000	ASPHALT EMULSION FOR FOG SEAL (SHOULDERS)	GAL	8671.1																
17	2317-7000120	PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA PAVEMENT SMOOTHNESS (BY SCHEDULE)	EACH	21938																
18	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1																
19	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	26																
20	2416-0100024	APRONS, CONCRETE, 24 IN. DIA.	EACH	1																
21	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	8																
22	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	822																
23	2505-4008300	STEEL BEAM GUARDRAIL	LF	412.5																
24	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	5																
25	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	5																
26	2507-3250005	ENGINEERING FABRIC	SY	57.8																
27	2507-6800061	REVTMENT, CLASS E	TON	32.8																
28	2526-8285000	CONSTRUCTION SURVEY	LS	1																
29	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	972.35																
30	2527-9263116	PAINTED PAVEMENT MARKING, MULTI-COMPONENT LIQUID	STA	839.31																
31	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS	STA	143.24																
32	2527-9263137	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED	EACH	16																
33	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	142.61																
34	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EACH	16																
35	2527-9270111	GROOVES CUT FOR PAVEMENT MARKINGS	STA	824.57																
36	2528-2518000	SAFETY CLOSURE	EACH	7																
37	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1075																
38	2528-8445110	TRAFFIC CONTROL	LS	1																
39	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS)	CDAY	28																
40	2533-4980005	MOBILIZATION	LS	1																
41	2551-0000110	TEMP CRASH CUSHION	EACH	4																
42	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS	LS																	
43	2601-2634100	MULCHING	ACRE	0.8																
44	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.4																
45	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	0.4																
46	2602-0000020	SILT FENCE	LF	500																
47	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	500																
48	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	500																
49	2602-0000309	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 9 IN. DIA.	LF	500																
50	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	2130																
51	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	500																
52	2602-0000351	REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE	LF	3130																
53	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1																
54	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1																

Note: See Sheets V.1, V.5, and V.9 for additional bid items and quantities.

**ESTIMATED PROJECT QUANTITIES  
(UP TO A 5 DIVISION PROJECT)**

Division 1: Federal Participation  
Division 2: 100% Iowa DOT

Item No.	Item Code	Item	Unit	Quantities																
				Estimated					As Built											
				Division 1	Division 2	Division 3	Division 4	Division 5	Total	Division 1	Division 2	Division 3	Division 4	Division 5						
		Left Blank Intentionally																		

**100-4A**  
10-29-02

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
1	2102-0425070	<b>SPECIAL BACKFILL</b> Refer to Tab 112-9 and Typical 7156 MOD on Sheet B.6 for locations, quantities and details of construction.
2	2102-2625000	<b>EMBANKMENT-IN-PLACE</b> Refer to Tabs 104-3 and 107-23 for locations and quantities. Item is for fill material for guardrail grading and repairing the scour at station 2008+29.65. Refer to Standard Road Plan EW-301 for details of construction.
3	2102-2713090	<b>EXCAVATION, CLASS 13, WASTE</b> Refer to Tabs 107-23 and 112-9 and Typical 7156 MOD on Sheet B.6 for locations, quantities and details of construction.
4	2105-8425005	<b>TOPSOIL, FURNISH AND SPREAD</b> Refer to Tab 103-10 for locations and quantities. Refer to Typical 7156 MOD on Sheet B.6 for locations and details of construction. Place Topsoil over fill material at guardrail blisters and at the scour repair. Grading shall not block existing subdrain outlets. Subdrain outlet extensions, if necessary, will be paid for by extra work order. Quantity also includes fill material required for Earth Shoulder Construction. Special attention should be given to Article 2107.03.C, of the current Standard Specification Series, on sliver fill. No payment for overhaul allowed for this material.
5	2122-5500090	<b>PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.</b> Refer to Tab 112-9 and Typical 7156 MOD on Sheet B.6 for locations, quantities and details of construction. Quantity is estimated to be 157.1 tons using a design unit weight of 147 pcf.
6	2123-7450000	<b>SHOULDER CONSTRUCTION, EARTH</b> Refer to Tab 112-9, Typical 7156 MOD on Sheet B.6, and Standard Road Plans EW-301 for locations, quantities and details of construction. Fill material for earth shoulder fill is included in bid item for Topsoil, Furnish and Spread. No payment for overhaul allowed for this material.
7	2212-0475095	<b>CLEANING AND PREPARATION OF BASE</b> Item includes all surfaces to receive HMA resurfacing This Bid Item Includes:  Mainline: 1.46 miles of EB three lane roadway (I-235) 0.42 miles of EB two lane roadway (I-235) 1.46 miles of WB three lane roadway (I-235) 0.42 miles of WB two lane roadway (I-235)  Ramps: 0.14 miles of one lane ramps 1.66 miles of ramp tapers and gore areas  5.56 miles total
8	2212-5070310	<b>PATCHES, FULL-DEPTH REPAIR</b> Refer to Tab 102-6C and Standard Road Plan PR-103 for quantities, locations, and details of construction.
9	2212-5070330	<b>PATCHES BY COUNT (REPAIR)</b> Refer to Tab 102-6C and Standard Road Plan PR-103 for quantities, locations, and details of construction.
10	2214-5145150	<b>PAVEMENT SCARIFICATION</b> Refer to Typical Cross Sections on Sheets B.1 through B.5 and Tab 100-25 for locations and details of construction. Additional 1283.4 SY is included for the Cold Joint Density Detail located on Sheet B.7.
11	2303-1053502	<b>HOT MIX ASPHALT VERY HIGH TRAFFIC, SURFACE COURSE, 1/2 IN. MIX, FRICTION L-2</b> Refer to Typical Cross Sections on Sheets B.1 through B.5 and Tab 100-25 for locations and details of construction. Additional 176.863 tons are included for the Cold Joint Density Detail located on Sheet B.7 (design unit weight of 147 pcf).

**100-4A**  
10-29-02

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
12	2303-1258286	<b>ASPHALT BINDER, PG 58-28E, EXTREMELY HIGH TRAFFIC</b> Refer to Typical Cross Sections on Sheets B.1 through B.5 and Tab 100-25 for locations and details of construction. Additional 10.612 Tons is included for the Cold Joint Density Detail located on Sheet B.7 (design unit weight of 8.82 pcf [6%]).
13	2303-6911000	<b>HOT MIX ASPHALT PAVEMENT SAMPLES</b>
14	2303-7000610	<b>PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA MIXTURE LABORATORY VOIDS (FORMULA - BY PAY FACTOR)</b> Quantity based on Tons of HMA x 0.5 (includes sacrificial quantity for Cold Joint Density).
15	2303-7000620	<b>PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA MIXTURE FIELD VOIDS (FORMULA - BY PAY FACTOR)</b> Quantity based on Tons of HMA x 0.5 (includes sacrificial quantity for Cold Joint Density).
16	2308-1000000	<b>ASPHALT EMULSION FOR FOG SEAL (SHOULDERS)</b> Refer to Typical Cross Sections on Sheets B.1 through B.5 and Tab 112-9 for locations, quantities, and details of construction (design application rate is 0.2 gal/SY).
17	2317-7000120	<b>PAYMENT ADJUSTMENT INCENTIVE/DISINCENTIVE FOR HMA PAVEMENT SMOOTHNESS (BY SCHEDULE)</b> Quantity based on the SY of HMA x 0.24 (includes sacrificial quantity for Cold Joint Density).
18	2401-6745650	<b>REMOVAL OF EXISTING STRUCTURES</b> Refer to Tab 110-2 for pipe location.
19	2402-2720100	<b>EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT</b> Refer to Tabs 100-23 and 104-3 for locations and quantities. Refer to Standard Road Plan EC-301 for details of construction.
20	2416-0100024	<b>APRONS, CONCRETE, 24 IN. DIA.</b> Refer to Tab 104-3 for quantities and location. Refer to Standard Road Plans DR-101, DR-121, and DR-201 for details of Construction.
21	2416-1180024	<b>CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.</b> Refer to Tab 104-3 for quantities and location. Refer to Standard Road Plans DR-101, DR-121, DR-122, and DR-201 for details of Construction. (DR-122 Pipe Connection may be necessary for new to existing pipe)
22	2505-4008120	<b>REMOVAL OF STEEL BEAM GUARDRAIL</b> Refer to Tab 110-7A for locations and quantities. Steel Beam Guardrail to be salvaged, refer to Tab 110-13.
23	2505-4008300	<b>STEEL BEAM GUARDRAIL</b> Refer to Tab 108-8A for locations and quantities. Refer to Standard Road Plans BA-200, BA-250, SI-173, and SI-211 for details of Construction.
24	2505-4008410	<b>STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201</b> Refer to Tab 108-8A for locations and quantities. Refer to Standard Road Plans BA-200, BA-201, BA-250, SI-173, and SI-211 for details of Construction.
25	2505-4021720	<b>STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205</b> Refer to Tab 108-8A for locations and quantities. Refer to Standard Road Plans BA-200, BA-205, BA-250, SI-173, and SI-211 for details of Construction.
26	2507-3250005	<b>ENGINEERING FABRIC</b> Refer to Tab 100-23 MOD and Standard Road Plan EC-301 locations, quantities, and details of construction.
27	2507-6800061	<b>REVTMENT, CLASS E</b> Refer to Tab 100-23 MOD and Standard Road Plan EC-301 locations, quantities, and details of construction.
28	2526-8285000	<b>CONSTRUCTION SURVEY</b>
29	2527-9263109	<b>PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED</b> Refer to Tab 108-22 for locations and quantities. Refer to Standard Road Plans PM-110 and PM-310 for details of construction.

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
30	2527-9263116	<b>PAINTED PAVEMENT MARKING, MULTI-COMPONENT LIQUID</b> Refer to Tab 108-22M and U Sheets for locations and quantities. Refer to the Developmental Specification for details. Refer to the Modified Standard Road Plans PM-110 and PM-310 in the U Sheets for details of construction.
31	2527-9263131	<b>WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS</b> Refer to Tab 108-22 for locations and quantities. Refer to Standard Road Plan TC-422 for application. Refer to Sheet J.70 for locations. Bid item includes removal. Note use for Temporary Traffic Control. Refer to Standard Road Plans PM-110 and PM-310 for details of construction. Install pavement marking tape during working hours and remove prior to restoring original traffic pattern.
32	2527-9263137	<b>PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED</b> Refer to Tab 108-29 and Standard Road Plan PM-111 for locations, quantities, and details of construction.
33	2527-9263180	<b>PAVEMENT MARKINGS REMOVED</b> Refer to Tab 108-22 and Standard Road Plan PM-110 for locations, quantities, and details of construction.
34	2527-9263190	<b>SYMBOLS AND LEGENDS REMOVED</b> Refer to Tab 108-29 and Standard Road Plan PM-111 for locations, quantities, and details of construction.
35	2527-9270111	<b>GROOVES CUT FOR PAVEMENT MARKINGS</b> Refer to Tab 108-22M and U Sheets for locations and quantities. Refer to the Developmental Specification for details. Refer to the Modified Standard Road Plans PM-110 and PM-310 in the U Sheets for details of construction.
36	2528-2518000	<b>SAFETY CLOSURE</b> Refer to Tab 108-13A for locations.
37	2528-8400048	<b>TEMPORARY BARRIER RAIL, CONCRETE</b> Refer to Tab 108-33 and Standard Road Plans BA-401 and TC-421 and Detail 8210 on Sheet B.7 for locations, quantities, and details of construction.
38	2528-8445110	<b>TRAFFIC CONTROL</b> Refer to J Sheets for details of Construction.
39	2528-9290050	<b>PORTABLE DYNAMIC MESSAGE SIGN (PDMS)</b> Refer to J Sheets for locations and traffic control details.
40	2533-4980005	<b>MOBILIZATION</b>
41	2551-0000110	<b>TEMP CRASH CUSHION</b> Refer to Tab 108-30 and Standard Road Plans BA-500 and TC-421 and Detail 8210 on Sheet B.7 for locations, quantities, and details of construction.
42	2555-0000010	<b>DELIVER AND STOCKPILE SALVAGED MATERIALS</b> Steel Beam Guardrail to be salvaged, refer to Tab 110-13.
43	2601-2634100	<b>MULCHING</b> One application of Mulch is included for Stabilizing Crop and one for Permanent Seed.
44	2601-2636043	<b>SEEDING AND FERTILIZING (RURAL)</b> All disturbed areas shall be seeded, fertilized and mulched.
45	2601-2642100	<b>STABILIZING CROP - SEEDING AND FERTILIZING</b> All disturbed areas shall be seeded, fertilized and mulched.
46	2602-0000020	<b>SILT FENCE</b> Refer to Tab 100-17 for locations and quantities. Refer to Standard Road Plan EC-201 for details of construction.
47	2602-0000071	<b>REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS</b> Refer to Tab 100-17 for locations and quantities. Refer to Standard Road Plan EC-201 for details of construction.
48	2602-0000101	<b>MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK</b> Refer to Tab 100-17 for locations and quantities. Refer to Standard Road Plan EC-201 for details of construction.
49	2602-0000309	<b>PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 9 IN. DIA.</b> Refer to Tab 100-19 for locations and quantities. Refer to Standard Road Plan EC-204 for details of construction.
50	2602-0000312	<b>PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.</b> Refer to Tab 100-19 for locations and quantities. Refer to Standard Road Plan EC-204 for details of construction.
51	2602-0000320	<b>PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.</b> Refer to Tab 100-19 for locations and quantities. Refer to Standard Road Plan EC-204 for details of construction.

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
52	2602-0000351	<b>REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE</b> Refer to Tab 100-19 for locations and quantities. Refer to Standard Road Plan EC-204 for details of construction.
53	2602-0010010	<b>MOBILIZATIONS, EROSION CONTROL</b>
54	2602-0010020	<b>MOBILIZATIONS, EMERGENCY EROSION CONTROL</b>

262-6  
10-18-05

**UTILITIES**  
**(NOT A POINT 25 PROJECT)**

This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

254-1  
10-02-01

**INCIDENT MANAGEMENT**

An incident management plan, provided by the District Office, will be discussed at the pre-construction conference.



**EXISTING PAVEMENT**

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks		
	County	Route	Dir. of Travel	Begin Ref. Loc. Sign	End Ref. Loc. Sign				Type	Depth	Type	Depth	Type	Depth	Type	Depth	Type	Depth	Source			Type	Durability Class
1	POLK	I-235	EB/NB // WB/SB	11.86	14.31	1968		I-IG-235-2(63)83--04-77	PCC	10				4			West Des Moines		2	Wire Mesh			
2	POLK	I-235	EB/NB // WB/SB	12.05	13.54	2006		IM-NHS235-2(502)-12--03-7	PCC	11.8			MOD	11.8									
3	POLK	I-235	EB/NB // WB/SB	12.05	13.54	2006		IM-35-3(159)87--13-77	HMA	2													
				13.54	14.31	2006			HMA	4	HMA	10	MOD	12									

100-26  
10-15-13

**INCIDENTAL ITEMS**

Special or unique items where method of measurement / basis of payment is not indicated in the specifications or other contract documents.

No.	Incidental Item	Unit	Quantity	Incidental To		Remarks
				Item Code	Item	
1	Saw Cut	LF	953.6	2122-5500090	Paved Shoulder, Hot Mix Asphalt Mixture	

**FULL-DEPTH PATCHES**

Possible Standards: PR-101, PR-102, PR-103, PR-104, PR-105, and PR-140.

Count	Location			Dimension			PCC Patches				HMA Patches	Composite HMA	Subbase Patches	Subbase Patch w/ 'EF' Joint	Patch Subdrain	'CD' Joints	'CT' Joints	'EF' Joints	Anchor Lugs Removal	Remarks		
	Station	Reference Location Sign	Lane	Length	Width	Patch Thickness	With Dowels	Without Dowels	C R C	Ramp with Dowels												
							PR-103 SY	PR-102 SY	PR-104 SY	PR-105 SY												
1	1957+82.90	11.95	LT	6.0	12.0	12.0	72.0														EB	
1	1979+63.60	12.363	RT	6.0	12.0	12.0	72.0														EB	
1	1979+63.60	12.363	RT	6.0	12.0	12.0	72.0														EB	
1	1995+68.70	12.667	RT	6.0	12.0	12.0	72.0														WB	
1	1995+68.70	12.667	CTR	6.0	12.0	12.0	72.0														WB	
1	2060+26.10	13.89	CTR	10.0	12.0	12.0	120.0														EB	
1	2060+26.10	13.89	LT	6.0	12.0	12.0	72.0														EB	
1	2060+26.10	13.95	RT	8.0	12.0	12.0	96.0														EB	
1	2063+42.90	14.31	RT	6.0	12.0	12.0	72.0														EB	
9	Total:						720.0															

108-13A  
08-01-08

**SAFETY CLOSURES**

Refer to Section 2518 of the Standard Specifications

Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
1960+00.00	1		Eculid Exit Ramp B
1970+00.00	1		Eculid Entrance Ramp C
1971+00.00	1		Eculid Entrance Loop F
1971+75.00	1		Eculid Entrance Loop E
1972+00.00	1		Eculid Entrance Ramp D
2044+34.00	1		NE Mixmaster Ramp G
2065+00.00	1		NE Mixmaster Ramp B
Total:	7		

110-13  
04-20-10

**DELIVERY AND STOCKPILING**

Item Description	Quantity	Units	Delivery Location	Contact Name & Number	Remarks
Steel Beam Guardrail	822	LF	1530 NE 53rd Ave #2127 Des Moines, IA 50313		

100-23  
MODIFIED

**ROCK EROSION CONTROL**

Refer to EC-301 and Detail 570-8

Road Identification	Begin Station	End Station	Side	L	W	Rock Erosion Control (REC)					Material Bid Quantities			Remarks		
						Type 1	Type 2	Type 3	Type 4	Type 5	Eng. Fabric	Class E Revetment	Excavation Class 20			
						Rock Ditch Check	Rock Ditch	Rock Flume	Rock Splash Basin	Rock Slope Protection	SY	TON	CY			
I-235	2008+29.65		LT	6	52				X				57.8	32.8	16.0	Rock Flume to ROW
Total:													57.8	32.8	16.0	

**102-16**  
10-21-14

### NOTCHES AND RUNOUTS FOR RESURFACING

Refer to PR-201 and PR-202.  
① Bid item. Applies only to Types 'N1' and 'N3' on PR-202. Refer to 100-25 for remaining values.

Location Station	Type of Notch or Runout	S	I	DI	L	M	Pavement Scarification ①	Remarks
		IN	IN	IN	FT	IN	SY	
Eculid Ramp B 21961+12.14	Type 'N2'	2.5				2.5		
Eculid Loop F 61966+60.58	Type 'N2'	2.5				2.5		
Eculid Ramp D 41986+64.09	Type 'N2'	2.5				2.5		
Eculid Ramp C 31965+89.81	Type 'N2'	2.5				2.5		
Eculid Loop E 51974+70.50	Type 'N2'	2.5				2.5		
Eculid Ramp A 11981+18.04	Type 'N2'	2.5				2.5		
NE Mix Ramp A 2218+02.05	Type 'N2'	2.5				2.5		

**110-7A**  
04-17-12

### REMOVAL OF STEEL BEAM GUARDRAIL

① Lane(s) to which the installation is adjacent.  
② Includes length of End Terminals and End Anchors.

No.	Direction of Traffic	Location			Removal of Guardrail ②
		Station to Station	Side	LF	
1	WB	1953+08.00	1953+66.00	0	58.0
2	EB	2030+02.00	2030+02.00	0	206.0
3	EB	2053+66.00	2040+55.00	0	186.0
4	WB	2057+92.00	2045+24.00	0	186.0
5	EB	2062+67.00	2053+66.00	0	186.0
Total:					822.0

**103-10**  
04-18-17

### TOPSOIL STRIPPING AND PLACEMENT

Road Identification	Location			Topsoil Stripping Thickness	Topsoil Placement Thickness	Remarks
	Dir. of Traffic	Begin Station	End Station	IN	IN	
I-235	EB	2027+38.55	2029+94.47		4.0	15.8 CY of Topsoil
I-235	EB	2051+51.04	2053+65.94		4.0	9.9 CY of Topsoil
I-235	EB	2060+35.61	2062+66.53		4.0	9.9 CY of Topsoil
I-235	WB	1953+07.74	1954+88.48		4.0	10.7 CY of Topsoil
I-235	WB	2008+15.00	2008+50.00		4.0	10.4 CY of Topsoil
I-235	WB	2057+92.21	2062+30.36		4.0	8.4 CY of Topsoil
Total:						65.1 CY

**110-2**  
04-16-13

### REMOVAL OF EXISTING STRUCTURES

Location	Description	Remarks
2008+29.65	8' of RCP and Concrete Apron	Remove damaged RCP and Apron

**104-3**  
10-17-17

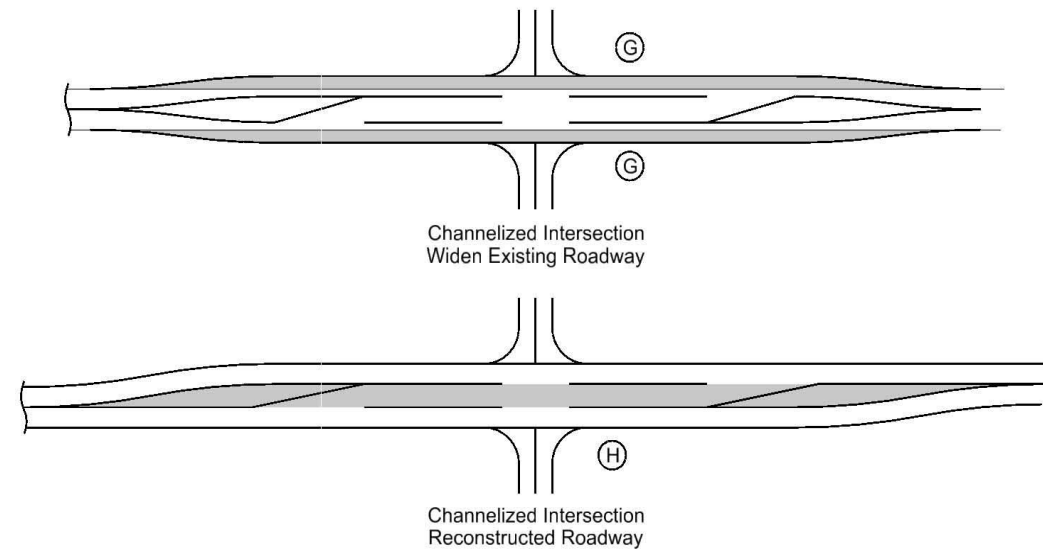
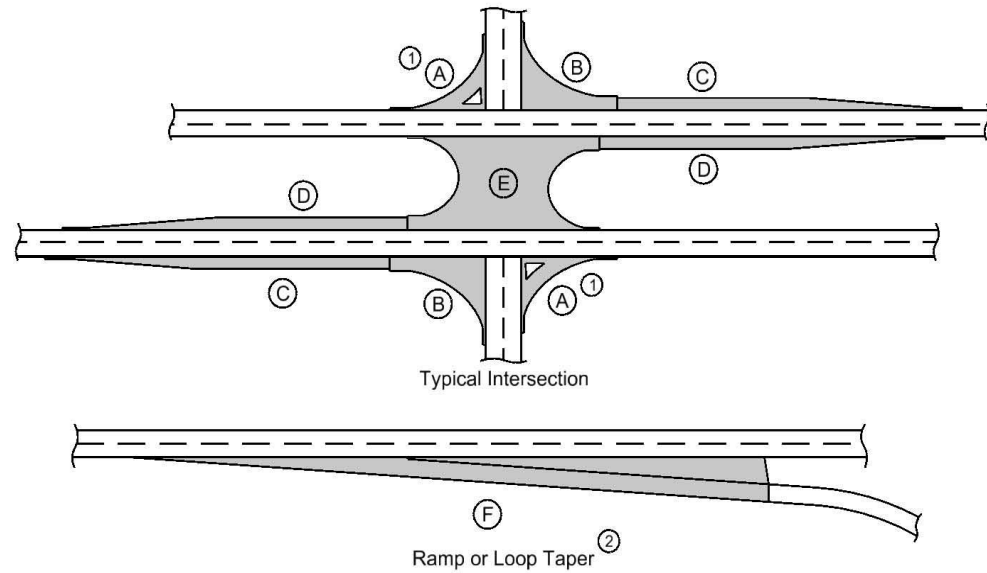
### DRAINAGE STRUCTURE BY ROAD CONTRACTOR

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.  
\* Not a bid item  
① Diameter or equivalent diameter  
② UNCL = Unclassified Pipe    CMP = Corrugated Metal Pipe    RCP = Reinforced Concrete Pipe    LCP = Arch or Elliptical Low Clearance Pipe    SARC = Steel Arch Pipe  
③ Backfill according to DR-101

Drainage Area	Location	Type	Size ①	Kind of Pipe ②	Length New Const. LF	Bedding Class	Design Cover (H)		Apron No.	Apron Guard* (DR-213) No.	Elbow* (DR-141) No.	Diaphragm* (DR-501) No.	Tee Section* (DR-142) No.	"D" Section* (DR-141) No.	Reducer* No.	Type 'C' Connections* (DR-122)		Connected Pipe Joint* (DR-121) Type	4" Perforated Subdrain* FT	Flow Line Elevations				Dimensions Lin. Ft.				Skew Ahead Degrees		Dike			Class 20	Flowable Mortar	Floodable* Backfill (A) CY	Porous* Backfill (B) CY	Flooded Backfill ③ (A+B) CY	Remarks								
							FT	FT								IN	OUT			Type	No.	Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.							Rt.	Lt.	Rt.	Lt.	Rt.	Location Station	Top Elevation	Type
							Total	Extensions																																						
ACRE	2008+29.65		24	RCP	8		FT	FT	IN	OUT								Type 3	FT	Lt.	Rt.	Other	Other	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	Lt.	Rt.	10.0	CY				*							
					Total:	8				1																																				

\* Remove damaged concrete pipe and end section. Fill Scour and grade foreslope with 167.8 CY of Embankment-in-Place

HMA PAVEMENT



- ① Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
- ② Refer to PV-410, PV-411, PV-412, and PV-414.
- ③ Quantity includes Pavement Header.

Calculations assume a surface course unit weight (lbs/cf) of 147, an intermediate course unit weight (lbs/cf) of 0, a Cold Joint Density unit weight (lbs/cf) of 0, and a special backfill unit weight (lbs/cf) of 140.

Road Identification	Direction of Travel	Location Station to Station		Mainline			Area ③								Hot Mix Asphalt Pavement						Bid Items					Remarks		
				Width FT	Length FT	Area SY	A ① SY	B SY	C SY	D SY	E SY	F ② SY	G SY	H SY	Surface		Intermediate		Cold Joint		Surface TONS	Intermediate TONS	Base TONS	Special Backfill TONS	Modified Subbase CY		Granular Subbase SY	Pavement Scarification SY
															TONS	SY	TONS	SY	TONS	SY								
															TONS	SY	TONS	SY	TONS	SY								
I-235	EB	1953+07.74	2004+90.00	35.4	5182.3	20400.8								2811.489	20400.8					168.689						20400.8		
I-235	EB	2004+90.00	2029+82.00	35.4	2492.0	9810.2								1351.965	9810.2					81.118						9810.2		
I-235	EB	1953+07.74	1959+47.55	0.0	639.8	0.0				1336.1				184.131	1336.1					11.048						1336.1		
I-235	EB	1967+86.52	1982+43.88	0.0	1457.4	0.0				2141.4				295.112	2141.4					17.707						2141.4		
I-235	EB	1984+67.22	1997+14.27	0.0	1247.0	0.0				2528.3				348.431	2528.3					20.906						2528.3		
I-235	EB	2032+58.50	2032+86.28	23.6	27.8	72.8								10.039	72.8					0.602						72.8		
I-235	EB	2032+86.28	2040+57.00	24.0	770.7	2055.3								283.240	2055.3					16.994						2055.3		
I-235	EB	2032+86.28	2040+55.76	0.0	769.5	0.0				1678.5				231.318	1678.5					13.879						1678.5		
I-235	EB	2044+34.00	2053+73.00	24.0	939.0	2504.0								345.083	2504.0					20.705						2504.0		
I-235	EB	2057+92.21	2062+73.75	24.0	481.5	1284.1								176.966	1284.1					10.618						1284.1		
I-235	WB	1953+07.74	2004+90.00	35.4	5182.3	20400.8								2811.489	20400.8					168.689						20400.8		
I-235	WB	2004+90.00	2029+82.00	35.4	2492.0	9810.2								1351.965	9810.2					81.118						9810.2		
I-235	WB	1953+07.74	1964+31.47	0.0	1123.7	0.0				2513.4				346.378	2513.4					20.783						2513.4		
I-235	WB	1962+78.27	1974+36.68	0.0	1158.4	0.0				2093.9				288.566	2093.9					17.314						2093.9		
I-235	WB	1982+90.03	1989+31.49	0.0	641.5	0.0				1071.1				147.611	1071.1					8.857						1071.1		
I-235	WB	2032+58.50	2032+86.28	35.4	27.8	109.4								15.071	109.4					0.904						109.4		
I-235	WB	2032+86.28	2040+57.00	36.0	770.7	3082.9								424.859	3082.9					25.492						3082.9		
I-235	WB	2032+86.28	2040+57.00	0.0	770.7	0.0				827.8										0.0						0.0		
I-235	WB	2032+86.28	2040+55.76	0.0	769.5	0.0				1375.7				189.589	1375.7					11.375						1375.7		
I-235	WB	2044+34.00	2045+63.42	36.0	129.4	517.7								71.343	517.7					4.281						517.7		
I-235	WB	2045+63.42	2047+94.46	0.0	231.0	0.0				607.9				83.776	607.9					5.027						607.9		
I-235	WB	2045+63.42	2053+73.00	24.0	809.6	2158.9								297.521	2158.9					17.851						2158.9		
I-235	WB	2057+92.21	2062+73.75	24.0	481.5	1284.1								176.966	1284.1					10.618						1284.1		
Euclid Ramp B	EB	21959+49.14	21961+12.14	15.7	163.0	285.1								39.286	285.1					2.357						285.1		
Euclid Loop F	EB	61966+60.58	61967+70.58	15.7	110.0	192.4								26.512	192.4					1.591						192.4		
Euclid Ramp D	EB	41983+64.09	41984+64.09	15.7	100.0	174.9								24.102	174.9					1.446						174.9		
Euclid Ramp C	WB	31964+34.81	31965+89.81	15.7	155.0	271.1								37.358	271.1					2.241						271.1		
Euclid Loop E	WB	51974+35.50	51974+70.50	15.7	35.0	61.2								8.436	61.2					0.506						61.2		
Euclid Ramp A	WB	11981+18.04	11982+88.04	15.7	170.0	297.3								40.973	297.3					2.458						297.3		
NE Mix Ramp B	WB	22047+98.05	22048+02.05	15.7	4.0	7.0								0.964	7.0					0.058						7.0		
Cold Joint Density Sacrificial Pavement				0.3	46201.1	1283.4								176.863	1283.4					10.612						1283.4		
Total:														12597.401	91409.7					755.844						91409.7		







### PAVEMENT MARKING LINE TYPES

See PM-110

\*\*\*MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

\*BCY4 - Place on the same side of the roadway to match existing markings near the project.

\*\*NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

BCY4: Broken Centerline (Yellow) @ 0.25

DCY4: Double Centerline (Yellow) @ 2.00

NPY4: No Passing Zone Line (Yellow) @ 1.25

BLW4: Broken Lane Line (White) @ 0.25

ELW4: Edge Line Right (White) @ 1.00

ELY4: Edge Line Left (Yellow) @ 1.00

Road ID	Station to Station		Dir. of Travel	Location Marking Type	Side			Length by Line Type (Unfactored)												Remarks		
								BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4									
														STA	STA	STA	STA	STA	STA		STA	STA
<b>Temporary Pavement Markings</b>																						
I-235	1953+07.74	1955+68.65	EB	Waterborne/Solvent Paint	X	X	X	2.61		5.22				2.61								
I-235	1955+68.65	1959+47.55	EB	Waterborne/Solvent Paint	X	X	X	3.79		7.58		3.79										
Ramp B	1955+68.65	1959+47.55	EB	Waterborne/Solvent Paint	X		X					3.79										
I-235	1959+47.55	1967+86.52	EB	Waterborne/Solvent Paint	X	X	X	8.39	8.39	16.78												
I-235	1967+86.52	1973+31.98	EB	Waterborne/Solvent Paint	X	X	X	5.45		10.91		5.45										
Loop F	1967+86.52	1973+31.98	EB	Waterborne/Solvent Paint	X		X					5.45										
I-235	1973+31.98	1978+03.28	EB	Waterborne/Solvent Paint	X	X	X	4.71		9.43			4.71									
I-235	1978+03.28	1982+43.88	EB	Waterborne/Solvent Paint	X	X	X	4.41		8.81												
I-235	1982+43.88	1984+67.22	EB	Waterborne/Solvent Paint	X	X	X	2.23	2.23	4.47												
I-235	1984+67.22	1991+32.19	EB	Waterborne/Solvent Paint	X	X	X	6.65		13.30		6.65										
Ramp D	1984+67.22	1991+32.19	EB	Waterborne/Solvent Paint	X		X					6.65										
I-235	1991+32.19	1997+14.28	EB	Waterborne/Solvent Paint	X	X	X	5.82		11.64												
I-235	1997+14.28	2004+70.64	EB	Waterborne/Solvent Paint	X	X	X	7.56		15.13												
I-235	2004+70.64	2030+92.07	EB	Waterborne/Solvent Paint	X	X	X	26.21	26.21	26.21				26.21								
I-235	2030+92.07	2032+36.28	EB	Waterborne/Solvent Paint	X	X	X	1.44	1.44	1.44		1.44										
I-235	2032+36.28	2036+14.72	EB	Waterborne/Solvent Paint	X	X	X	3.78		3.78												
I-235	2039+14.72	2044+34.00	EB	Waterborne/Solvent Paint	X	X	X	5.19		5.19		5.19										
Ramp G	2039+14.72	2044+34.00	EB	Waterborne/Solvent Paint	X	X	X					10.39										
I-235	2044+34.00	2062+73.75	EB	Waterborne/Solvent Paint	X	X	X	18.40	18.40	18.40												
Ramp B	21959+49.14	21961+12.14	EB	Waterborne/Solvent Paint	X		X															1.63
Loop F	61966+60.58	61967+70.58	EB	Waterborne/Solvent Paint	X		X															1.10
Ramp D	41983+64.09	41984+64.09	EB	Waterborne/Solvent Paint	X		X															1.00
I-235	1953+07.74	1957+39.55	WB	Waterborne/Solvent Paint	X	X	X	4.32		8.64												4.32
I-235	1957+39.55	1964+31.47	WB	Waterborne/Solvent Paint	X	X	X	6.92		13.84		6.92										
Ramp C	1957+39.55	1964+31.47	WB	Waterborne/Solvent Paint	X		X					6.92										6.92
I-235	1964+31.47	1968+51.11	WB	Waterborne/Solvent Paint	X	X	X	4.20		8.39												4.20
I-235	1968+51.11	1974+36.68	WB	Waterborne/Solvent Paint	X	X	X	5.86		11.71		5.86										
Loop E	1968+51.11	1974+36.68	WB	Waterborne/Solvent Paint	X		X					5.86										5.86
I-235	1974+36.68	1980+90.03	WB	Waterborne/Solvent Paint	X	X	X	6.53	6.53	13.07												
I-235	1980+90.03	1985+99.40	WB	Waterborne/Solvent Paint	X	X	X	5.09		10.19		5.09										
Ramp A	1980+90.03	1985+99.40	WB	Waterborne/Solvent Paint	X		X					5.09										5.09
I-235	1985+99.40	1989+31.49	WB	Waterborne/Solvent Paint	X	X	X	3.32		6.64			3.32									3.32
I-235	1989+31.49	2032+36.28	WB	Waterborne/Solvent Paint	X	X	X	43.05	43.05	86.10												
I-235	2032+36.28	2037+44.39	WB	Waterborne/Solvent Paint	X	X	X	5.08		10.16												5.08
I-235	2037+44.39	2040+02.55	WB	Waterborne/Solvent Paint	X	X	X	2.58		5.16			2.58									2.58
I-235	2040+02.55	2042+52.55	WB	Waterborne/Solvent Paint	X	X	X	2.50		5.00		2.50										2.50
I-235	2042+52.55	2044+12.45	WB	Waterborne/Solvent Paint	X	X	X	1.60		3.20		1.60										1.60
Ramp H	2042+52.55	2044+12.45	WB	Waterborne/Solvent Paint	X		X					1.60										1.60
I-235	2044+12.45	2045+63.42	WB	Waterborne/Solvent Paint	X	X	X	1.51	1.51	3.02												
I-235	2045+63.42	2046+52.99	WB	Waterborne/Solvent Paint	X	X	X	0.90		1.79												0.90
I-235	2046+52.99	2047+94.46	WB	Waterborne/Solvent Paint	X	X	X	1.41		1.41		1.41										1.41
Ramp B	2046+52.99	2047+94.46	WB	Waterborne/Solvent Paint	X		X					1.41										1.41
I-235	2047+94.46	2062+73.75	WB	Waterborne/Solvent Paint	X	X	X	14.79	14.79	14.79												
Ramp C	31964+34.81	31965+89.81	WB	Waterborne/Solvent Paint	X		X															1.55
Loop E	51974+35.50	51974+70.50	WB	Waterborne/Solvent Paint	X		X															0.35
Ramp A	11981+18.04	11982+88.04	WB	Waterborne/Solvent Paint	X		X															1.70
Ramp B	22047+98.05	22048+02.05	WB	Waterborne/Solvent Paint	X		X															0.04
<b>Pavement Markings for Traffic Control</b>																						
I-235	2038+00.00	2040+50.00	WB	Wet Retroreflective Removable Tape			X					2.50										
I-235	2038+00.00	2040+50.00	WB	Removal of Removable Tape			X					2.50										
I-235	1928+05.44	1950+10.44	EB	Removal of Paint	X			22.05														
I-235	1928+05.44	1950+10.44	EB	Wet Retroreflective Removable Tape	X			22.05														
I-235	1928+05.44	1950+10.44	EB	Removal of Removable Tape	X			22.05														
I-235	1928+05.44	1950+10.44	EB	Waterborne/Solvent Paint	X			22.05														
I-235	1927+69.44	1949+74.44	EB	Removal of Paint			X	22.05														
I-235	1927+69.44	1949+74.44	EB	Wet Retroreflective Removable Tape			X	22.05														
I-235	1927+69.44	1949+74.44	EB	Removal of Removable Tape			X	22.05														
I-235	1927+69.44	1949+74.44	EB	Waterborne/Solvent Paint			X	22.05														
I-235	2031+96.69	2056+41.69	WB	Removal of Paint			X	24.45														
I-235	2031+96.69	2056+41.69	WB	Wet Retroreflective Removable Tape			X	24.45														
I-235	2031+96.69	2056+41.69	WB	Removal of Removable Tape			X	24.45														
I-235	2031+96.69	2056+41.69	WB	Waterborne/Solvent Paint			X	24.45														
I-235	2019+29.95	2041+34.95	EB	Removal of Paint			X	22.05														
I-235	2019+29.95	2041+34.95	EB	Wet Retroreflective Removable Tape			X	22.05														
I-235	2019+29.95	2041+34.95	EB	Removal of Removable Tape			X	22.05														



### PAVEMENT MARKING LINE TYPES

See PM-110

\*\*\*MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

\*BCY4 - Place on the same side of the roadway to match existing markings near the project.

\*\*NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

ELY6: Edge Line Left (Yellow) @ 1.00

ELW6: Edge Line Right (White) @ 1.00

BLW6: Broken Line Contrast (White/Black) @ 0.50

CHW12: Channelizing Line (White) @ 2.00

DLW6: Dotted Line (White) @ 0.33

LDW12: Lane Drop (White) @ 0.50

RLW6: Ramp Edge Line Right (White) @ 1.00

RLY6: Ramp Edge Line Left (Yellow) @ 1.00

Road ID	Station to Station		Dir. of Travel	Location	Marking Type	Side			Length by Line Type (Unfactored)												Remarks		
						L	C	R	ELY6	ELW6	BLC6	CHW12	DLW6	LDW12	RLW6	RLY6	STA	STA	STA	STA		STA	STA
						STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA		STA	STA
<b>Groove Cuts for Pavement Markings</b>																							
I 235	1953+07.74	1955+68.65	EB		Grooves Cut for Pavement Markings	X	X	X	2.61		5.22			2.61		2.61							
I 235	1955+68.65	1959+47.55	EB		Grooves Cut for Pavement Markings	X	X	X	3.79		7.58		3.79										
Ramp B	1955+68.65	1959+47.55	EB		Grooves Cut for Pavement Markings	X		X					3.79			3.79							
I 235	1959+47.55	1967+86.52	EB		Grooves Cut for Pavement Markings	X	X	X	8.39	8.39	16.78												
I 235	1967+86.52	1973+31.98	EB		Grooves Cut for Pavement Markings	X	X	X	5.45		10.91		5.45										
Loop F	1967+86.52	1973+31.98	EB		Grooves Cut for Pavement Markings	X		X					5.45										
I 235	1973+31.98	1978+03.28	EB		Grooves Cut for Pavement Markings	X	X	X	4.71		9.43			4.71									
I 235	1978+03.28	1982+43.88	EB		Grooves Cut for Pavement Markings	X	X	X	4.41		8.81												
I 235	1982+43.88	1984+67.22	EB		Grooves Cut for Pavement Markings	X	X	X	2.23	2.23	4.47												
I 235	1984+67.22	1991+32.19	EB		Grooves Cut for Pavement Markings	X	X	X	6.65		13.30		6.65										
Ramp D	1984+67.22	1991+32.19	EB		Grooves Cut for Pavement Markings	X		X					6.65										
I 235	1991+32.19	1997+14.28	EB		Grooves Cut for Pavement Markings	X	X	X	5.82		11.64												
I 235	1997+14.28	2004+70.64	EB		Grooves Cut for Pavement Markings	X	X	X	7.56		15.13												
I 235	2004+70.64	2030+92.07	EB		Grooves Cut for Pavement Markings	X	X	X	26.21	26.21	26.21			26.21									
I 235	2030+92.07	2032+36.28	EB		Grooves Cut for Pavement Markings	X	X	X	1.44	1.44	1.44		1.44										
I 235	2032+36.28	2036+14.72	EB		Grooves Cut for Pavement Markings	X	X	X	3.78		3.78												
I 235	2039+14.72	2044+34.00	EB		Grooves Cut for Pavement Markings	X	X	X	5.19		5.19												
Ramp G	2039+14.72	2044+34.00	EB		Grooves Cut for Pavement Markings	X	X	X					10.39										
I 235	2044+34.00	2062+73.75	EB		Grooves Cut for Pavement Markings	X	X	X	18.40	18.40	18.40												
I 235	1953+07.74	1957+39.55	WB		Grooves Cut for Pavement Markings	X	X	X	4.32		8.64												
I 235	1957+39.55	1964+31.47	WB		Grooves Cut for Pavement Markings	X	X	X	6.92		13.84		6.92										
Ramp C	1957+39.55	1964+31.47	WB		Grooves Cut for Pavement Markings	X		X					6.92										
I 235	1964+31.47	1968+51.11	WB		Grooves Cut for Pavement Markings	X	X	X	4.20		8.39												
I 235	1968+51.11	1974+36.68	WB		Grooves Cut for Pavement Markings	X	X	X	5.86		11.71		5.86										
Loop E	1968+51.11	1974+36.68	WB		Grooves Cut for Pavement Markings	X		X					5.86										
I 235	1974+36.68	1980+90.03	WB		Grooves Cut for Pavement Markings	X	X	X	6.53	6.53	13.07												
I 235	1980+90.03	1985+99.40	WB		Grooves Cut for Pavement Markings	X	X	X	5.09		10.19		5.09										
Ramp A	1980+90.03	1985+99.40	WB		Grooves Cut for Pavement Markings	X		X					5.09										
I 235	1985+99.40	1989+31.49	WB		Grooves Cut for Pavement Markings	X	X	X	3.32		6.64			3.32									
I 235	1989+31.49	2032+36.28	WB		Grooves Cut for Pavement Markings	X	X	X	43.05	43.05	86.10												
I 235	2032+36.28	2037+44.39	WB		Grooves Cut for Pavement Markings	X	X	X	5.08		10.16												
I 235	2037+44.39	2040+02.55	WB		Grooves Cut for Pavement Markings	X	X	X	2.58		5.16			2.58									
I 235	2040+02.55	2042+52.55	WB		Grooves Cut for Pavement Markings	X	X	X	2.50		5.00		2.50										
I 235	2042+52.55	2044+12.45	WB		Grooves Cut for Pavement Markings	X	X	X	1.60		3.20		1.60										
Ramp H	2042+52.55	2044+12.45	WB		Grooves Cut for Pavement Markings	X		X					1.60										
I 235	2044+12.45	2045+63.42	WB		Grooves Cut for Pavement Markings	X	X	X	1.51	1.51	3.02												
I 235	2045+63.42	2046+52.99	WB		Grooves Cut for Pavement Markings	X	X	X	0.90		1.79												
I 235	2046+52.99	2047+94.46	WB		Grooves Cut for Pavement Markings	X	X	X	1.41		1.41		1.41										
Ramp B	2046+52.99	2047+94.46	WB		Grooves Cut for Pavement Markings	X		X					1.41										
I 235	2047+94.46	2062+73.75	WB		Grooves Cut for Pavement Markings	X	X	X	14.79	14.79	14.79												
<b>Permanent Pavement Markings</b>																							
I 235	1953+07.74	1955+68.65	EB		Multi-Component Liquid Pavement Marking	X	X	X	2.61		5.22			2.61		2.61							
I 235	1955+68.65	1959+47.55	EB		Multi-Component Liquid Pavement Marking	X	X	X	3.79		7.58		3.79										
Ramp B	1955+68.65	1959+47.55	EB		Multi-Component Liquid Pavement Marking	X		X					3.79										
I 235	1959+47.55	1967+86.52	EB		Multi-Component Liquid Pavement Marking	X	X	X	8.39	8.39	16.78												
I 235	1967+86.52	1973+31.98	EB		Multi-Component Liquid Pavement Marking	X	X	X	5.45		10.91		5.45										
Loop F	1967+86.52	1973+31.98	EB		Multi-Component Liquid Pavement Marking	X		X					5.45										
I 235	1973+31.98	1978+03.28	EB		Multi-Component Liquid Pavement Marking	X	X	X	4.71		9.43			4.71									
I 235	1978+03.28	1982+43.88	EB		Multi-Component Liquid Pavement Marking	X	X	X	4.41		8.81												
I 235	1982+43.88	1984+67.22	EB		Multi-Component Liquid Pavement Marking	X	X	X	2.23	2.23	4.47												
I 235	1984+67.22	1991+32.19	EB		Multi-Component Liquid Pavement Marking	X	X	X	6.65		13.30		6.65										
Ramp D	1984+67.22	1991+32.19	EB		Multi-Component Liquid Pavement Marking	X		X					6.65										
I 235	1991+32.19	1997+14.28	EB		Multi-Component Liquid Pavement Marking	X	X	X	5.82		11.64												
I 235	1997+14.28	2004+70.64	EB		Multi-Component Liquid Pavement Marking	X	X	X	7.56		15.13												
I 235	2004+70.64	2030+92.07	EB		Multi-Component Liquid Pavement Marking	X	X	X	26.21	26.21	26.21			26.21									
I 235	2030+92.07	2032+36.28	EB		Multi-Component Liquid Pavement Marking	X	X	X	1.44	1.44	1.44		1.44										
I 235	2032+36.28	2036+14.72	EB		Multi-Component Liquid Pavement Marking	X	X	X	3.78		3.78												
I 235	2039+14.72	2044+34.00	EB		Multi-Component Liquid Pavement Marking	X	X	X	5.19		5.19												
Ramp G	2039+14.72	2044+34.00	EB		Multi-Component Liquid Pavement Marking	X	X	X					10.39										
I 235	2044+34.00	2062+73.75	EB		Multi-Component Liquid Pavement Marking	X	X	X	18.40	18.40	18.40												
Ramp B	21959+49.14	21961+12.14	EB		Multi-Component Liquid Pavement Marking	X		X															
Loop F	61966+60.58	61967+70.58	EB		Multi-Component Liquid Pavement Marking	X		X															
Ramp D	41983+64.09	41984+64.09	EB		Multi-Component Liquid Pavement Marking	X		X															
I 235	1953+07.74	1957+39.55	WB		Multi-Component Liquid Pavement Marking	X	X	X	4.32		8.64												
I 235	1957+39.55	1964+31.47	WB		Multi-Component Liquid Pavement Marking	X	X	X	6.92		13.84		6.92										
Ramp C	1957+39.55	1964+31.47	WB		Multi-Component Liquid Pavement Marking	X		X					6.92										
I 235	1964+31.47	1968+51.11	WB		Multi-Component Liquid Pavement Marking	X	X	X	4.20		8.39												



**TEMPORARY BARRIER RAIL**

Possible Standard: BA-401 Possible Detail: 560-7

\* Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.

No.	Station to Station		Length LF	(Select One)		Anchored* (Y/N)	Modular Glare Screen System (Y/N)	Remarks
				Concrete BA-401	Steel 560-7			
1	1949+60.44	1952+47.94	287.5	X		No	No	EB for Median Barrier Repiar
2	1949+24.44	1952+11.94	287.5	X		No	No	EB for Outside Barrier Repiar
3	2030+34.19	2032+46.69	212.5	X		No	No	WB for Outside Barrier Repiar
4	2040+84.95	2043+72.45	287.5	X		No	No	EB for Outside Barrier Repiar
Total:			1075.0					

**UTILITY LEGEND**

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

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING		
	Design Color No.	
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed 2 1/2in Mill & Fill
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
Turquoise	(7)	Proposed Shoulder Fog Seal

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

**RIGHT-OF-WAY LEGEND**

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

**PLAN AND PROFILE  
LEGEND AND SYMBOL  
INFORMATION SHEET**

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



LEE TWP.  
T-79N R-23W  
SEC. 30

Sta. 1960+89  
42" x 255' CMP  
(U.A.C.)

STA 1953+07.74  
Steel Beam Guardrail  
Remove and Replace

STA 1953+07.74  
BEGIN HMA MILL & OVERLAY  
BEGIN SHOULDER FOG SEAL

STA 1950+10.44  
BEGIN PROJECT

Hull Ave



Hull Ave

STA 1951+43.51  
BRIDGE RAIL REPAIR  
(SEE V SHEETS)

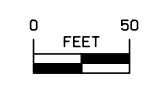
Sta. 1953+28  
24" CMP  
(U.A.C.)

STA 1955+87.00  
Attenuator  
(U.A.C.)

Ramp, B

LEE TWP.  
T-79N R-23W  
SEC. 30

Note:  
① Station based off adjacent ramp alignment



I-235



LEE TWP.  
T-79N R-23W  
SEC. 19

Sta. 1987+70  
24" CMP  
(U.A.C.)

STA 1986+75.00  
Attenuator  
(U.A.C.)

Sta. 1993+27  
24" CMP  
(U.A.C.)

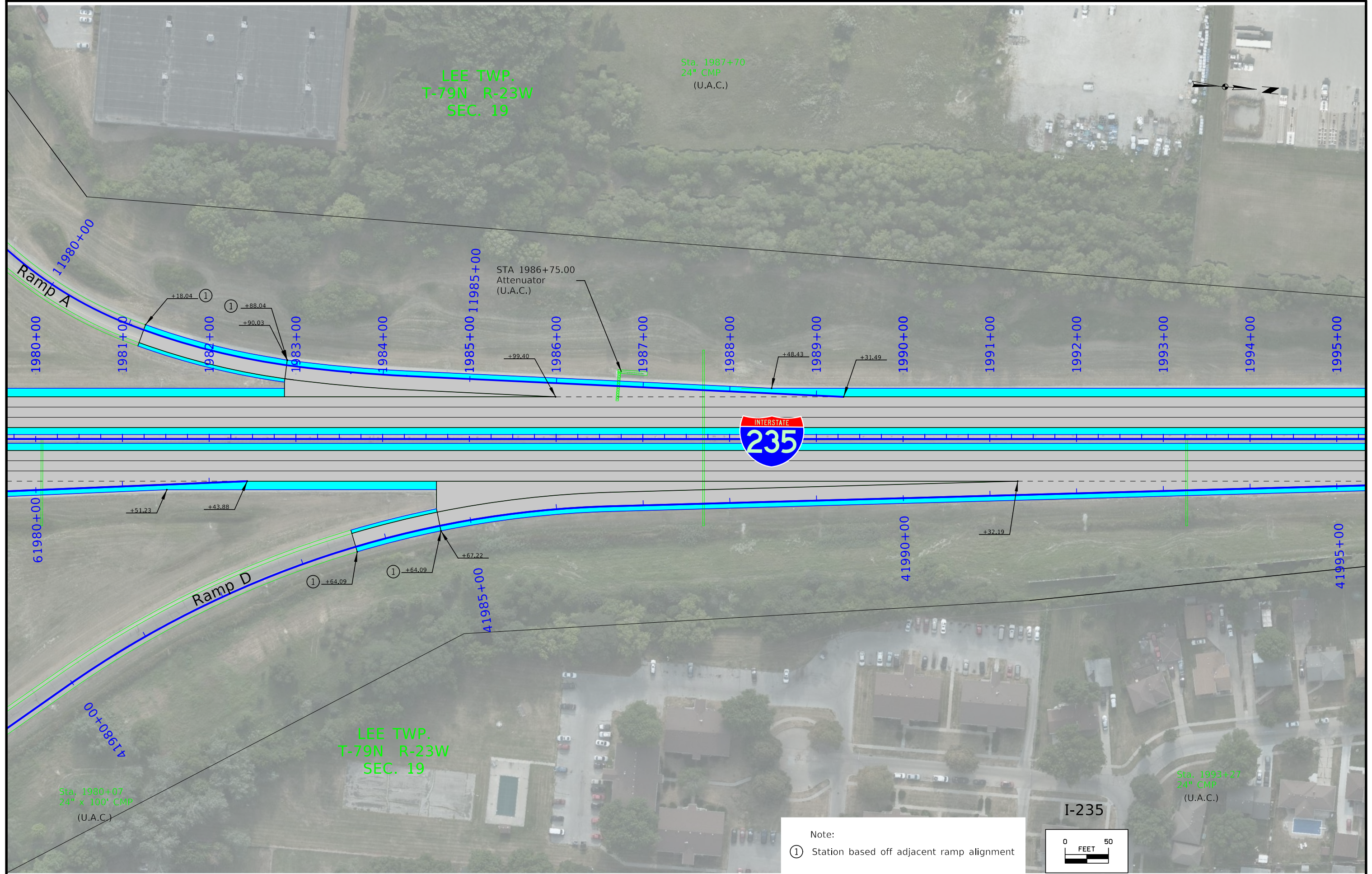
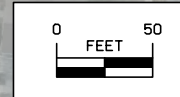
Sta. 1980+07  
24" x 100' CMP  
(U.A.C.)

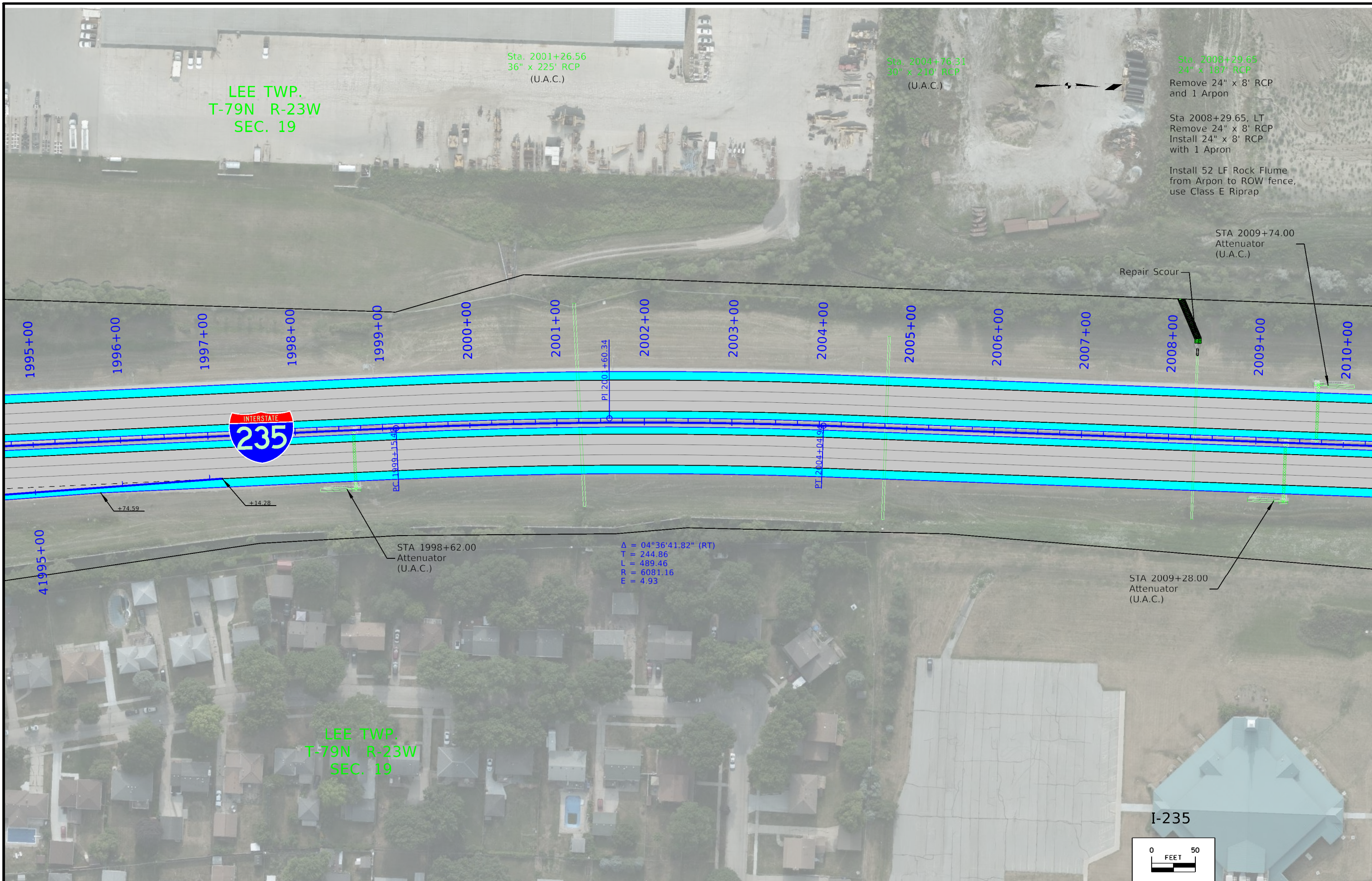
LEE TWP.  
T-79N R-23W  
SEC. 19



I-235

Note:  
① Station based off adjacent ramp alignment





LEE TWP.  
T-79N R-23W  
SEC. 19

Sta. 2001+26.56  
36" x 225' RCP  
(U.A.C.)

Sta. 2004+76.31  
30" x 210' RCP  
(U.A.C.)

Sta. 2008+29.65  
24" x 187' RCP  
Remove 24" x 8' RCP  
and 1 Arpon

Sta 2008+29.65, LT  
Remove 24" x 8' RCP  
Install 24" x 8' RCP  
with 1 Apron

Install 52 LF Rock Flume  
from Arpon to ROW fence,  
use Class E Riprap

STA 2009+74.00  
Attenuator  
(U.A.C.)

Repair Scour

1995+00 1996+00 1997+00 1998+00 1999+00 2000+00 2001+00 2002+00 2003+00 2004+00 2005+00 2006+00 2007+00 2008+00 2009+00 2010+00



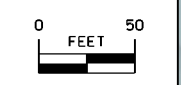
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L = 489.46  
R = 6081.16  
E = 4.93

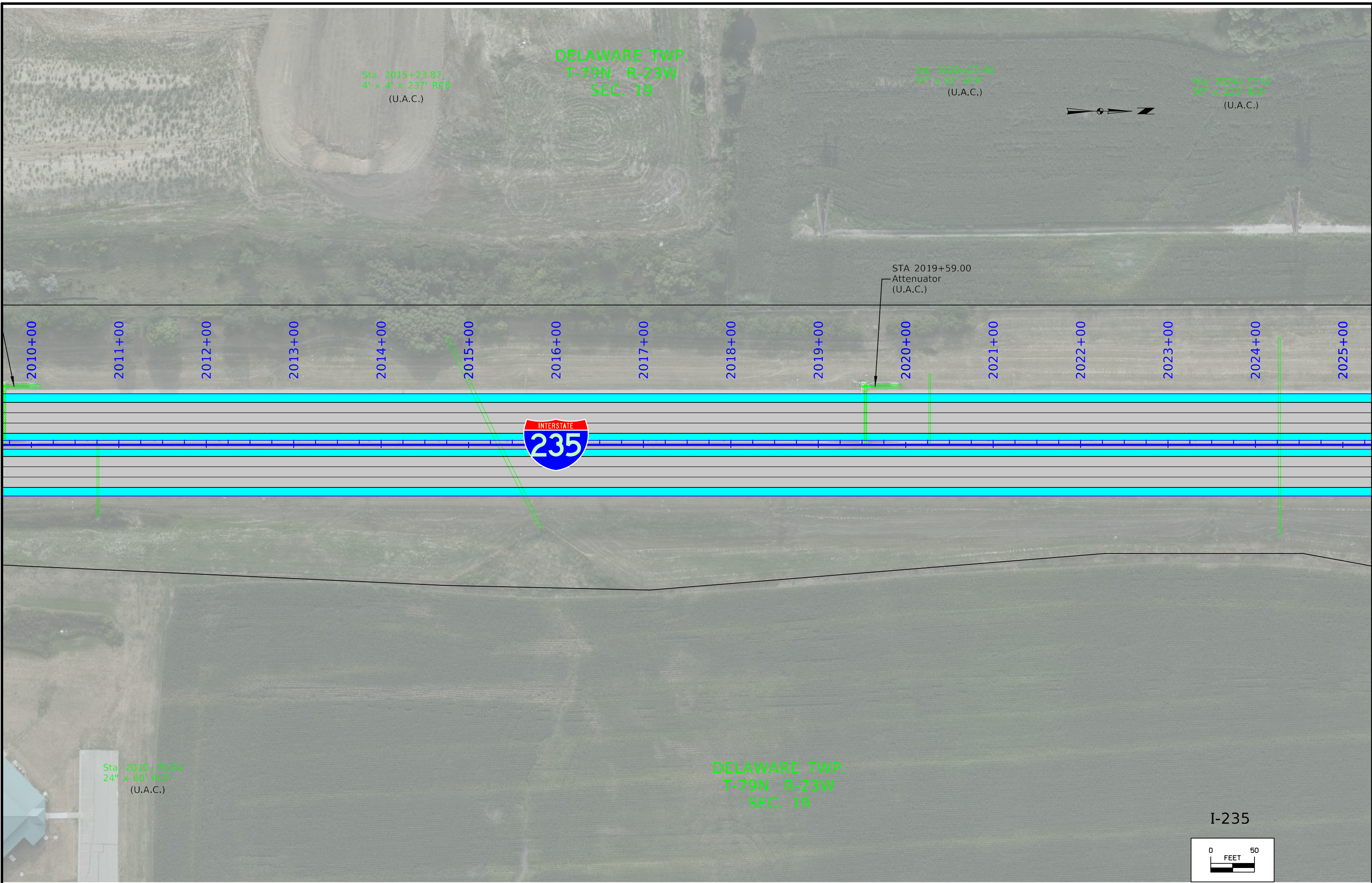
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Attenuator  
(U.A.C.)

STA 2009+28.00  
Attenuator  
(U.A.C.)

LEE TWP.  
T-79N R-23W  
SEC. 19

I-235





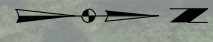
FILE NO.	ENGLISH	DESIGN TEAM Smyth/hgm Associates	POLK COUNTY	PROJECT NUMBER IMX-235-2(670)12--02-77	SHEET NUMBER D.6
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DELAWARE TWP.  
T-79N R-23W  
SEC. 19

DELAWARE TWP.  
T-79N R-23W  
SEC. 18

NE 46th Ave

NE 46th Ave



STA 2032+58.50  
RESUME CONSTRUCTION  
STA 2031+20.84  
BRIDGE RAIL REPAIR  
(SEE V SHEETS)

Sta. 2035+55.35  
2' x 3.5' x 256.3' RCB  
(U.A.C.)

High Tension Guardrail  
(U.A.C.)

2025+00 2026+00 2027+00 2028+00 2029+00 2030+00 2031+00 2032+00 2033+00 2034+00 2035+00 2036+00 2037+00 2038+00 2039+00 2040+00

STA 2029+82.00  
STOP CONSTRUCTION

STA 2029+94.00  
Steel Beam Guardrail  
Remove and Replace

STA 2032+86.28  
END METRIC TO ENGLISH LN. TRANS.

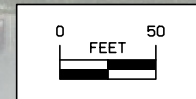
STA 2032+36.28  
BEGIN METRIC TO ENGLISH LN. TRANS.

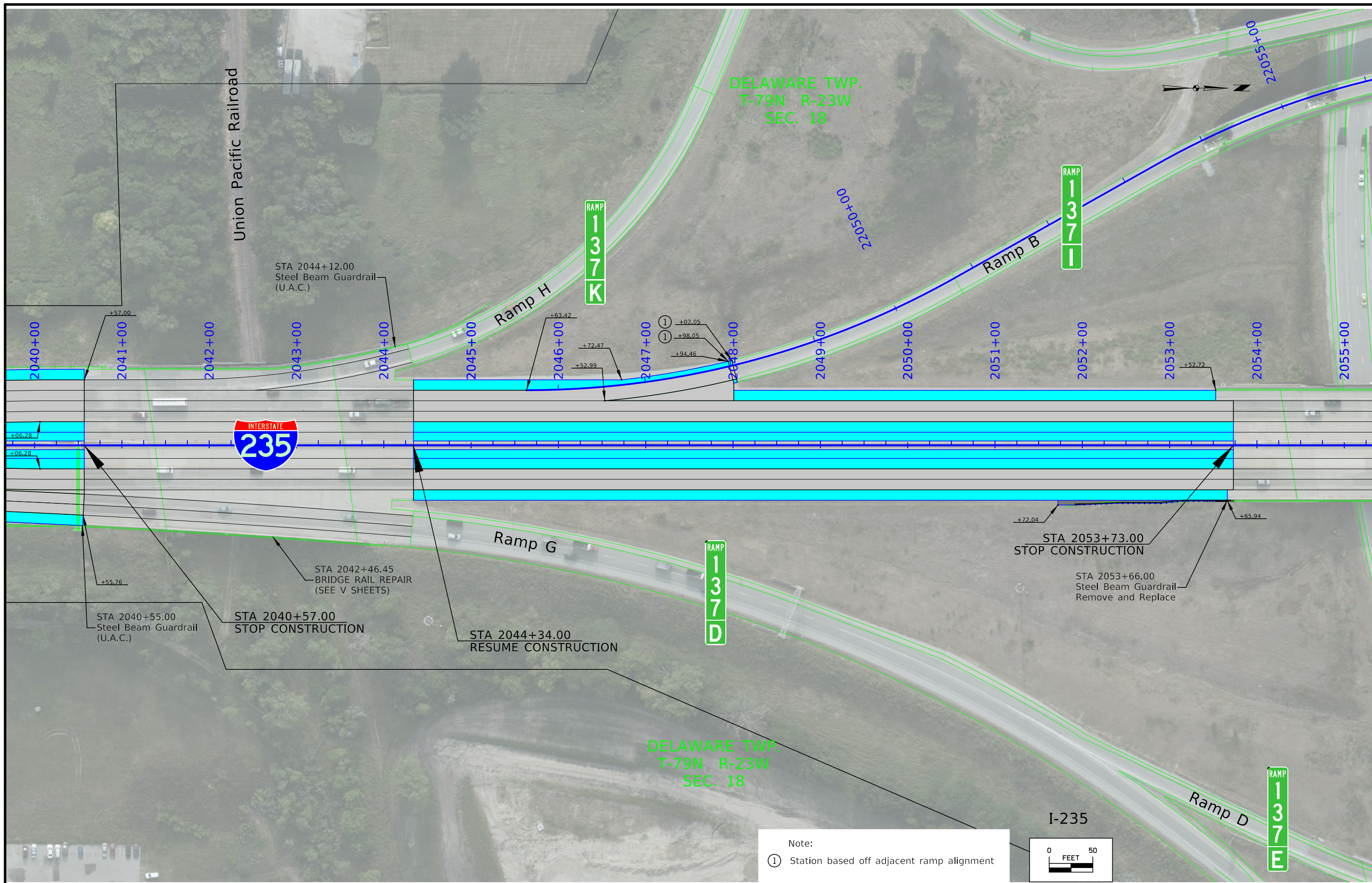
High Tension Guardrail  
(U.A.C.)

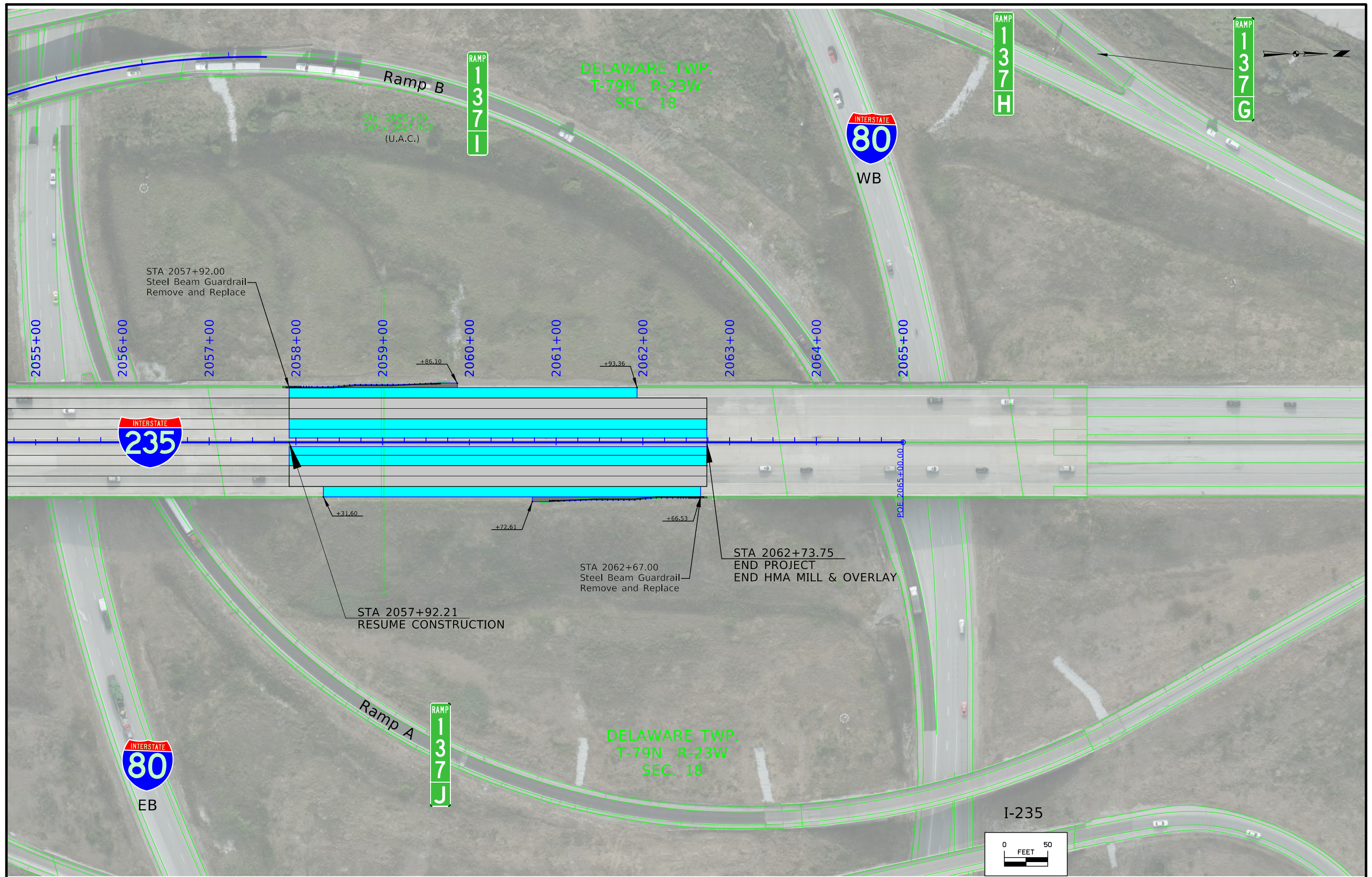
DELAWARE TWP.  
T-79N R-23W  
SEC. 19

DELAWARE TWP.  
T-79N R-23W  
SEC. 18

I-235









### HORIZONTAL DATUM

The Horizontal alignment and stationing for the survey was taken from the as built plans IM-035-3(159)87--13-77.

101-16  
10-20-09

### 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)
20000	ML235	1932+03.84	589148.17	1619409.13															
20002	ML235						1973+46.40	593261.43	1619895.33	1976+33.23	593546.89	1619923.44	1979+18.55	593832.81	1619900.64				
20005	ML235						1999+15.88	595823.82	1619741.84	2001+60.74	596067.91	1619722.37	2004+05.34	596312.77	1619722.59				
20007	ML235	2065+00.41	602407.81	1619742.52															
31000	RPAEUCLID	11969+71.52	593066.59	1619261.78															
31002	RPAEUCLID						11972+51.96	593347.03	1619262.43	11973+92.17	593487.24	1619262.75	11975+15.37	593579.75	1619368.12				
31005	RPAEUCLID						11978+41.88	593795.43	1619613.24	11979+75.66	593883.81	1619713.68	11981+02.32	594012.17	1619751.36				
31007	RPAEUCLID						11981+02.32	594012.17	1619751.36	11982+00.61	594106.47	1619779.05	11982+97.96	594204.66	1619783.63				
31008	RPAEUCLID						11982+97.96	594204.66	1619783.63	11983+62.41	594269.04	1619786.63	11984+26.79	594333.45	1619784.57				
31009	RPAEUCLID	11989+30.99	594837.39	1619768.41															
32000	RPBEUCLID	21953+07.72	591230.43	1619706.17															
32002	RPBEUCLID						21958+20.46	591736.72	1619787.22	21958+82.69	591798.17	1619797.06	21959+44.87	591858.70	1619811.54				
32004	RPBEUCLID						21959+44.87	591858.70	1619811.54	21962+59.06	592164.28	1619884.61	21965+44.87	592342.48	1620143.38				
32007	RPBEUCLID						21967+69.87	592470.09	1620328.69	21969+34.62	592563.54	1620464.38	21970+72.95	592728.29	1620463.47				
32009	RPBEUCLID	21974+07.06	593062.40	1620461.63															
33000	RPCEUCLID	31952+59.88	591195.35	1619595.27															
33002	RPCEUCLID						31962+35.25	592166.54	1619685.52	31963+45.57	592276.39	1619695.72	31964+55.07	592385.93	1619682.70				
33004	RPCEUCLID						31964+55.07	592385.93	1619682.70	31967+42.93	592671.78	1619648.71	31970+19.12	592907.64	1619483.68				
33006	RPCEUCLID						31970+19.12	592907.64	1619483.68	31971+80.07	593039.51	1619391.41	31973+16.22	593040.51	1619230.47				
34000	RPDEUCLID	41969+63.02	593062.13	1620529.57															
34002	RPDEUCLID						41973+25.50	593424.61	1620530.79	41974+38.08	593537.19	1620531.18	41975+41.56	593623.99	1620459.48				
34005	RPDEUCLID						41979+94.01	593972.83	1620171.33	41983+38.08	594238.10	1619952.21	41986+62.53	594580.20	1619915.44				
34007	RPDEUCLID	41997+14.28	595625.93	1619803.06															
35000	RPFEUCLID	51962+78.27	592206.27	1619718.54															
35002	RPFEUCLID						51973+40.01	593263.77	1619814.14	51974+77.55	593400.76	1619826.53	51975+99.05	593502.17	1619733.62				
35004	RPFEUCLID						51975+99.05	593502.17	1619733.62	51975+99.03	593346.10	1619563.26	51985+00.31	593115.62	1619547.09				
36001	RPFEUCLID						61956+08.34	593015.19	1620093.97	61958+62.28	592997.42	1620347.29	61960+34.40	592745.72	1620380.86				
36004	RPFEUCLID						61960+34.40	592745.74	1620380.60	61970+14.08	591774.66	1620510.12	61966+53.24	592585.53	1619960.34				
34006	RPFEUCLID						61966+53.24	592585.53	1619960.34	61967+63.42	592676.73	1619898.51	61968+65.04	592786.52	1619907.79				
34008	RPFEUCLID	61971+88.64	593108.97	1619935.05															
34010	RPFEUCLID						61973+35.09	593254.40	1619952.24	61976+27.27	593545.17	1619980.87	61979+17.91	593836.43	1619957.64				
34012	RPFEUCLID	61979+64.85	593883.22	1619953.91															
34013	RPFEUCLID	61982+43.88	594160.18	1619919.97															
36001	RPBNEMIX						22045+63.42	600470.15	1619669.76	22048+25.48	600732.21	1619670.64	22050+76.01	600961.02	1619542.88				
36004	RPBNEMIX						22053+42.73	601193.89	1619412.86	22055+98.99	601417.64	1619287.93	22058+43.33	601673.85	1619292.47				

**SPIRAL OR CIRCULAR CURVE DATA**

Name	Location	ΔSCS	Horizontal Alignment Data												Remarks		
			Spiral Data						Curve Data								
			θS	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	ΔC	T	L	R		E	
20002	ML235												10.185°	286.831	572.151	3218.494	12.756
20005	ML235												4.612°	244.863	489.461	6081.175	4.928
31002	RPAEUCLID												48.586°	140.210	263.411	310.631	30.178
31005	RPAEUCLID												32.292°	133.778	260.435	462.084	18.975
31007	RPAEUCLID												13.693°	98.289	195.641	818.623	5.879
31008	RPAEUCLID												4.507°	64.449	128.832	1637.755	1.268
32002	RPBEUCLID												4.354°	62.235	124.410	1637.140	1.182
32004	RPBEUCLID												41.997°	314.195	600.000	818.570	58.228
32007	RPBEUCLID												55.763°	164.755	303.080	311.410	40.897
33002	RPCEUCLID												12.089°	110.320	219.820	1041.820	5.825
33004	RPCEUCLID												28.200°	287.860	564.050	1146.000	35.600
33006	RPCEUCLID												54.663°	160.947	297.100	311.410	39.133
34002	RPDEUCLID												39.751°	112.581	216.057	311.415	19.725
34005	RPDEUCLID												33.423°	344.070	668.514	1146.002	50.537
35002	RPDEUCLID												47.659°	137.540	259.033	311	29.021
35004	RPDEUCLID												223.495°	0.000	901.260	231	0
36001	RPFEUCLID												78.391°	253.937	426.062	311.406	90.412
36004	RPFEUCLID												153.459°	979.673	618.836	231	775.501
34006	RPFEUCLID												38.970°	110.184	211.806	311	18.918
34010	RPFEUCLID												10.184°	292.178	582.816	3278.918	12.992
36001	RPBNEMIX												29.369°	262.060	512.593	1000	33.767
36004	RPBNEMIX												30.192°	256.256	500.597	950	33.955

**SUPERELEVATION DATA**

See PV-300 Series

Road Identification	Circular Curve or Spiral Curve Name	Radius	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	FT	FT														
I-235	20002	3218.5	4.8	268	140	PV-305	1970+18.40	1970+46.40	1971+58.40	1972+70.40	1972+98.40	1974+26.40	1973+46.00				1973+81.73	1973+81.73		
							1982+45.75	1982+17.75	1981+05.75	1979+93.75	1979+65.75	1978+37.75	1979+18.15				1978+82.42	1978+82.42		
I-235	20005	6081.2	3.0	168	140	PV-305	1996+57.88	1996+85.88	1997+97.88	1999+09.88	1999+37.88	1999+65.88		1999+15.48						
							2006+62.54	2006+34.54	2005+22.54	2004+10.54	2003+82.54	2003+54.54		2004+04.94						

**TRAFFIC CONTROL PLAN**

I-235 will be resurfaced using nightly lane closures maintaining minimum one lane in each direction so the adjacent lane(s) can be resurfaced. Follow Standard Road Plans TC-418 and TC-422 for I-235 lane closures. The middle lane shall be closed with the inside lane allowing the ramps to remain open. Follow Standard Road Plans TC-417 and TC-420 for ramp closures staging through Exit and Entrance Ramps.

1. Traffic will be maintained on the project at all times.  
Restricted Work Hours - Night Work Required

2. Lane Closures on I-235 from Hull Ave (REF. Post 11.86) to NE I-35/I-80 Interchange (REF. Post 14.31) will not be permitted from 5 AM to 8 PM on Sunday through Saturday refer to the Allowable Interstate Closure Map on Sheet J.4.

No outside shoulder closures are allowed Monday through Friday from 6 AM to 9 AM and 3 PM to 6 PM daily, except for those shoulder closures necessary for bridge repairs.

On each work day, traffic control devices will be required to be placed and removed during the project's scheduled work hours.

The Contractor shall place Portable Dynamic Message Sign (PDMS) on Eastbound/Northbound I-235 southwest of the project limits. The PDMS and the existing Dynamic Overhead Static Message board on I-35 Southbound (Mile Marker 80.5 ) north of the project limits. The message boards are to be used to inform the traveling public of lane and ramp closures.

The Iowa Department of Transportation reserves the right to modify these hours as necessary to accommodate unexpected traffic volume.

3. Work will be prohibited and traffic shall be returned to normal on the nights of special events:

- A. Aug. 11-21, 2022 for the Iowa State Fair at the State Fair Grounds in Des Moines, IA.
- B. All events at Well Fargo Arena, including concerts scheduled for April 24 & June 12

Note: The contractor shall be responsible for contacting officials of all events to confirm all event dates and plan not to work those dates. Contract time will be suspended during required work shutdowns, as noted in bullet item 3.

4. Bridge Barrier repair work to be performed at night using lane closures. The closed lane may remain closed during daylight hours. Refer to Standard Road Plan TC-421. This work shall be completed exclusive from the mill and overlay work.

2 lanes of EB and WB traffic shall be maintained.

5. The Contractor shall provide the Engineer at least a 3-day notice (excluding weekends/holidays) prior to any roadway/ramp closure.

6. No traffic will be allowed on milled sections of the roadway at any time.

7. No drop-offs will be allowed during non-working hours.

**COORDINATED OPERATIONS**

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
IMX-035-4(296)88--02-77	HMA Resurfacing with Milling
IMN-235-2(661)0--0E-77	Landscaping
MPIN-235-1(708)0--0N-77	PCC Patching
IMN-235-2(671)0--0E-77	Barrier Rail
MPIN-080-1(717)121--0N-77	PCC Patching
IM-035-3(194)87--13-77	Grading
IM-035-3(195)87--13-77	Bridge New-Steel Girder
IM-035-3(196)87--13-77	Bridge New-PPCB
IM-035-3(203)87--13-77	Bridge New-PPCB
ITS-035-4(298)95--25-77	ITS Infrastructure

**STAGING NOTES**

This project is broken up into 4 Sites.

- Site 1- I-235 EB from Sta. 1953+07.74 to Sta. 2004+90
- Site 2- I-235 WB from Sta. 1953+07.74 to Sta. 2004+90
- Site 3- I-235 EB from Sta. 2004+90 to 2062+73.75
- Site 4- I-235 WB from Sta. 2004+90 to 2062+73.75

- Stage 1- Inside Lane Mill and Fill and Inside Shoulder Fog Seal
- Stage 2 - Middle Lane Mill and Fill
- Stage 3 - Outside Lane Mill and Fill and Outside Shoulder Fog Seal

Site 1 - I-235 EB Sta. 1953+07.74 to Sta. 2004+90

- Stage 1 (Close Inside Lane)
  - Close inside lane of I-235 EB Sta. 1953+07.74 to Sta. 2004+90 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418. Modification to the Standard Road Plan extends the work zone buffer to 1875' (600' min) to establish the full inside-lane closure prior to the Guthrie Avenue / I-235 EB Entrance Ramp merge.
  - Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both sides of the roadway in advance of the lane closure.
  - Cover existing speed limit signs and place temporary signs to reduce speeds to 55 MPH.
  - Through traffic will use the middle, and the outside lanes and Exit and Entrance Ramps will remain open.
  - US 6 (Euclid Ave)/ I-235 EB Entrance Ramp will be signed per Standard Road Plan TC-420.

Stage 2 (Close Inside and Middle Lanes)

- Close inside and middle lane of I-235 EB Sta. 1953+07.74 to Sta. 2004+90 for HMA Mill & Overlay of middle lane. Lane closure utilizes Standard Road Plan TC-422. Modifications to the Standard Road Plan extends the work zone buffer 1875' (600' min) to establish the full-two-lane closure prior to the Guthrie Avenue / I-235 EB Entrance Ramp merge.
- Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Through traffic will use the outside lane, and the adjacent Exit and Entrance Ramps will remain open.
- Guthrie Avenue / I-235 EB Entrance Ramp will be signed per Standard Road Plan TC-420.
- US 6(East Euclid Avenue) / I-235 EB Entrance Ramps will be signed per Standard Road Plan TC-420.

Stage 3 (Close Outside Lane)

- Close outside lane of I-235 EB Sta. 1953+07.74 to Sta. 2004+90 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-422. Modifications to the Standard Road Plan include extending the work zone buffer 1875' (600' min) to establish the full-lane closure prior to the Guthrie Avenue / I-235 EB Entrance Ramp.
- Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Traffic will use inside and middle lanes and the US 6 (East Euclid Avenue) / I235 EB Entrance and Exit Ramps and Entrance Loop will be closed. Refer to Detour Route.
- The Guthrie Avenue / I-235 EB Entrance Ramp will be signed per Standard Road Plan TC-420.

Site 2 - I-235 WB Sta. 1953+07.74 to Sta. 2004+90

- Stage 1 (Close Inside Lane)
  - Close inside lane of I-235 WB Sta. 1953+07.74 to Sta. 2004+90 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418.
  - Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
  - Cover existing speed limit signs and reduce speeds to 55 MPH.
  - Traffic will use middle and outside lane and Exit and Entrance Ramps will remain open.
  - US 6 (East Euclid Avenue) / I-235 EB Entrance Ramps will be signed per Standard Road Plan TC-420.

Stage 2 (Close Middle and Inside Lane)

- Close middle and inside lanes I-235 WB Sta. 1953+07.74 to Sta. 2004+90 for HMA Mill & Overlay of middle lane. lane closure utilizes Standard Road Plan TC-422. Modifications to the Standard Road Plan extends the work zone buffer to 1850' (910' required) to establish the lane closure prior to the I-80 & I-235 WB Entrance Ramp merge.
- Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Through traffic to use outside lane and adjacent Exit and Entrance Ramps will remain open.
- I-80 EB to I-235 WB Entrance Ramp will be signed per Standard Road Plan TC-420.
- US 6 (East Euclid Avenue) to I-235 EB Entrance Ramps will be signed per Standard Road Plan TC-420.

Stage 3 (Close Outside Lane)

- Close the outside lane of I-235 WB Sta. 1953+07.74 to Sta. 2004+90 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418.
- Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Traffic will use the inside and middle lanes and adjacent Exit and Entrance Ramps and the Entrances Loop at US 6 (East Euclid Avenue) / I-235 EB will be closed. Refer to detour route.

Site 3 - I-235 EB Sta. 2004+90 to Sta. 2062+73.75

- Stage 1 (Close Inside Lane)
  - Close inside lane I-235 EB Sta. 2004+90 to Sta. 2062+73.75 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418. Modifications to the Standard Road Plan extends the work zone buffer to 3650' (600' min) to establish the lane closure prior to the US 6(East Euclid Avenue) / I-235 EB Entrance Ramp merge.
  - Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
  - Cover existing speed limit signs and reduce speeds to 55 MPH.
  - Through traffic will use middle and outside lanes and adjacent Exit and Entrance Ramps will remain open.
  - US 6 (East Euclid Avenue) / I-235 EB Entrance Ramps will be signed per Standard Road Plan TC-420.
  - The Northeast Mixmaster ramps will remain open.

Stage 2 (Close Middle and Outside Lanes)

- Close middle and outside lanes of I-235 EB Sta. 2004+90 to Sta. 2062+73.75 for HMA Mill & Overlay of the middle lane. Lane closure utilizes Standard Road Plan TC-422. Modifications to the Standard Road Plan extends the work zone buffer to 3650' (600' min) to establish full-two-lane closure prior to the US 6 (East Euclid Avenue) / I-235 EB Entrance Ramp merge.
- The first lane closure is extended 1750' (770' required) to establish the full-outside lane closure prior to the Guthrie Avenue Entrance Ramp merge.
- Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.

**STAGING NOTES**

- Through traffic will use the inside lane and adjacent Exit and Entrance Ramps will be closed.
- Guthrie Avenue / I-235 EB Entrance Ramp will be signed per Standard Road Plan TC-420.
- US 6 (East Euclid Avenue) / I-235 EB Entrance Ramp will be signed per Standard Road Plan TC-420.
- I-235 EB to I-80/I-35 WB and I-235 WB to I-80 EB Ramps will be closed. Refer to detour routes.

Stage 3 (Close Outside Lane)

- Close outside lane of I-235 EB Sta. 2004+90 to Sta. 2062+73.75 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418. Modifications to the Standard Road Plan extend the work zone buffer 3650' (600' min) to establish the full lane closure prior to the US 6 (East Euclid Avenue) / I-235 EB Entrance Ramp merge.
- Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Through traffic will use middle and inside lanes.
- US 6 (East Euclid Avenue) to I-235 EB Entrance Ramp will be signed per Standard Road Plan TC-420.
- The Northeast Mixmaster ramps will remain open per Standard Road Plan TC-420.

Site 4 - I-235 WB Sta. 2004+90 to Sta. 2062+73.75

Stage 1 (Close Inside Lane)

- Close the inside lane of I-235 WB Sta. 2004+90 to Sta. 2062+73.75 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418.
- Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Through traffic will use middle and outside lanes and adjacent Exit and Entrance Ramps will remain open.
- US 6(East Euclid Avenue) to I-235 EB Entrance Ramps will be signed per Standard Road Plan TC-420.
- The Northeast Mixmaster ramps will remain open.

Stage 2 (Close Middle Lane)

- Close the inside and middle lane I-235 EB Sta. 2004+90 to Sta. 2040+50 for HMA Mill & Overlay of the middle lane. Lane closure utilizes Standard Road Plan TC-422.
- Close the left lane, merging traffic from Sta. 2045+50 to Sta. 2060+75. Shift traffic from the right lane to the added outside lane at Ramp B (I-80 WB to I-235 WB) from Sta. 2040+50 to Sta. 2045+50.
- Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Through traffic to use outside lane.
- Northeast Mixmaster I-80 EB to I-235 WB ramp will remain open following Standard Road Plan TC-420.
- Northeast Mixmaster I-80 WB to I-235 WB ramp will be closed. Refer to detour route.

Stage 3 (Close Outside Lane)

- Close the outside lane of I-235 EB Sta. 2004+90 to Sta. 2062+73.75 for HMA Mill & Overlay. Lane closure utilizes Standard Road Plan TC-418.
- Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES on both side of the roadway in advance of the lane closure.
- Cover existing speed limit signs and reduce speeds to 55 MPH.
- Through traffic to use middle and inside lanes.
- Northeast Mixmaster I-80 EB to I-235 WB will remain open and turn into the outside lane.
- Northeast Mixmaster I-80 WB to I-235 WB ramp will be closed. Refer to detour route.

**CROSS SECTION VIEW COLOR LEGEND  
OF TRAFFIC CONTROL AND STAGING SHEETS**

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

**CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND  
OF TRAFFIC CONTROL AND STAGING SHEETS**

	Pavement Removal		Proposed Granular Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		Permanent Barrier Rail
			Channelizing Device

**PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS**

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

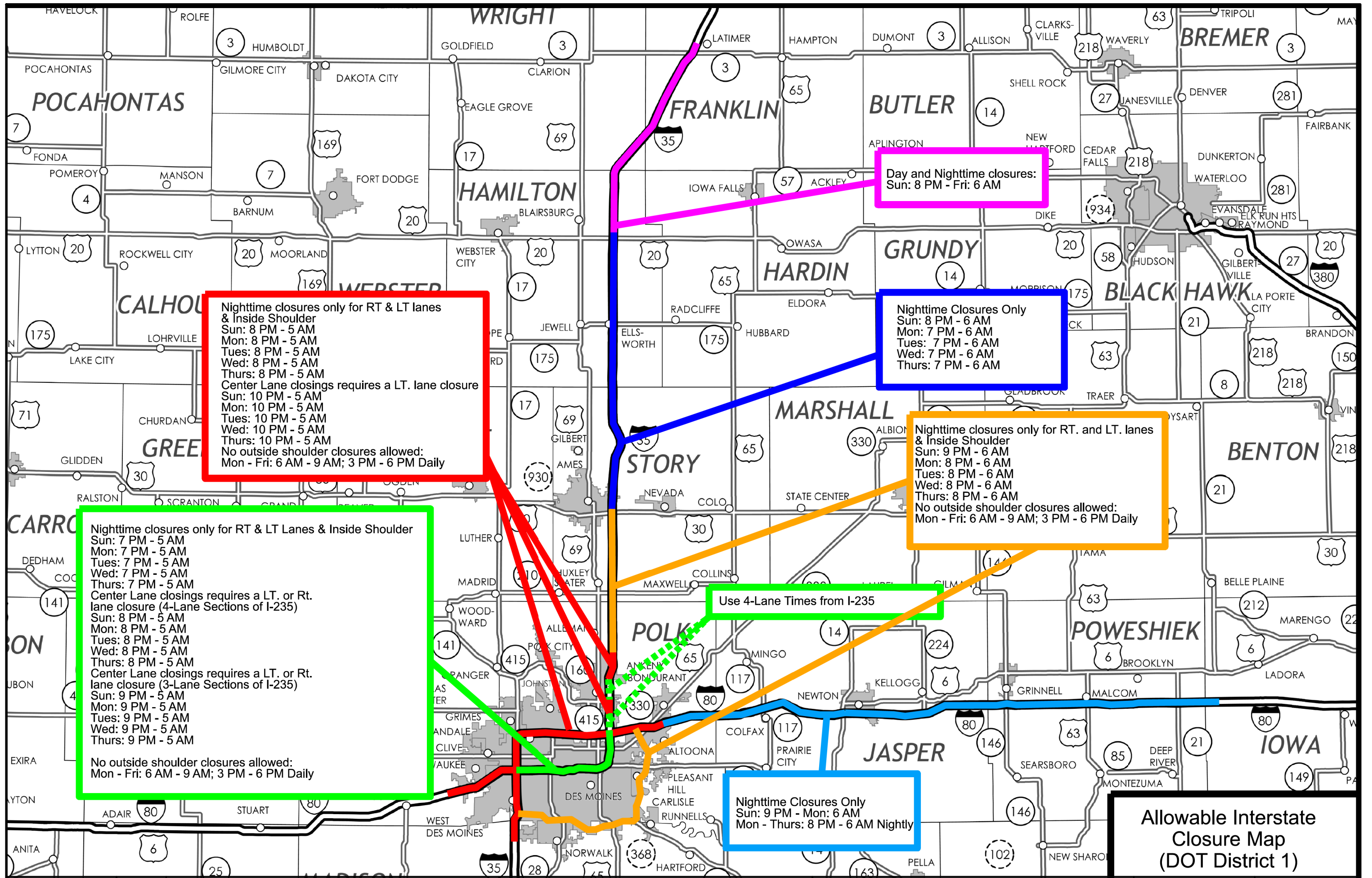
**PLAN VIEW PATTERN AND SYMBOL LEGEND  
OF TRAFFIC CONTROL AND STAGING SHEETS**

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

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

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

(COVERS SHEET SERIES J)



**Nighttime closures only for RT & LT lanes & Inside Shoulder**  
 Sun: 8 PM - 5 AM  
 Mon: 8 PM - 5 AM  
 Tues: 8 PM - 5 AM  
 Wed: 8 PM - 5 AM  
 Thurs: 8 PM - 5 AM  
 Center Lane closings requires a LT. lane closure  
 Sun: 10 PM - 5 AM  
 Mon: 10 PM - 5 AM  
 Tues: 10 PM - 5 AM  
 Wed: 10 PM - 5 AM  
 Thurs: 10 PM - 5 AM  
 No outside shoulder closures allowed:  
 Mon - Fri: 6 AM - 9 AM; 3 PM - 6 PM Daily

**Day and Nighttime closures:**  
 Sun: 8 PM - Fri: 6 AM

**Nighttime Closures Only**  
 Sun: 8 PM - 6 AM  
 Mon: 7 PM - 6 AM  
 Tues: 7 PM - 6 AM  
 Wed: 7 PM - 6 AM  
 Thurs: 7 PM - 6 AM

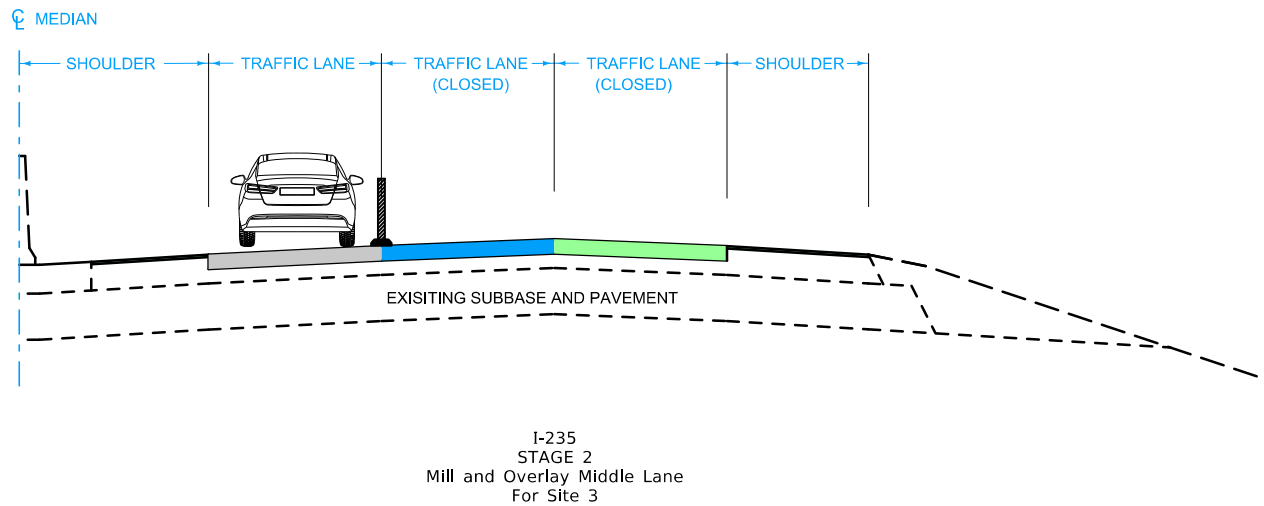
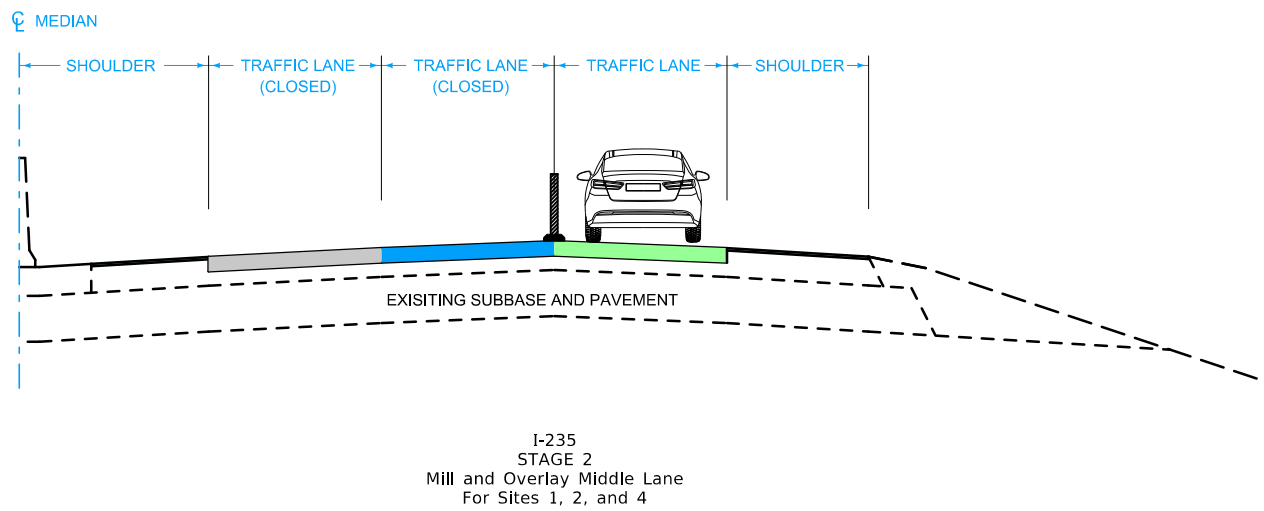
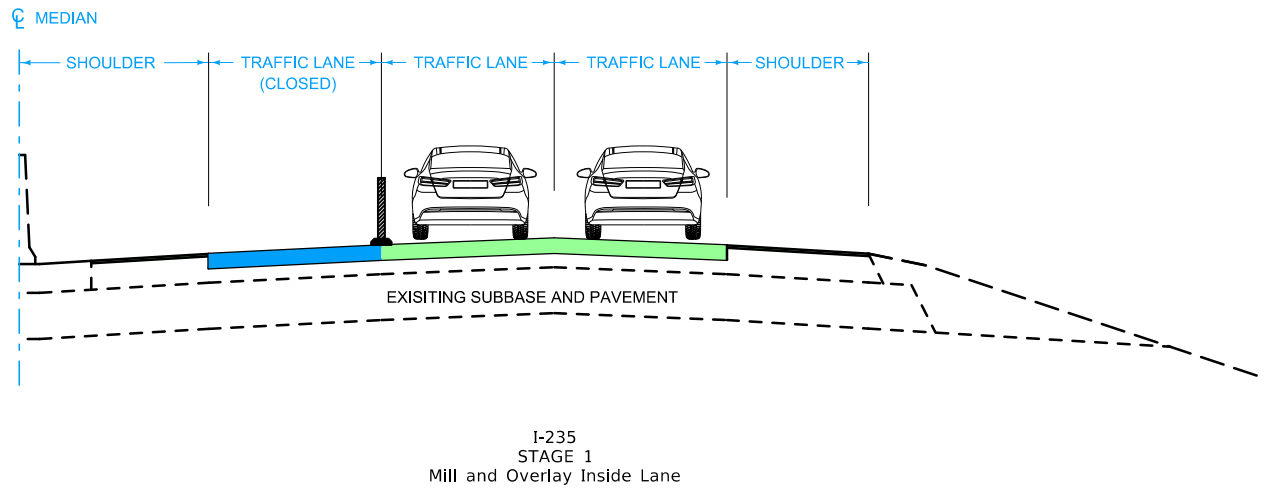
**Nighttime closures only for RT. and LT. lanes & Inside Shoulder**  
 Sun: 9 PM - 6 AM  
 Mon: 8 PM - 6 AM  
 Tues: 8 PM - 6 AM  
 Wed: 8 PM - 6 AM  
 Thurs: 8 PM - 6 AM  
 No outside shoulder closures allowed:  
 Mon - Fri: 6 AM - 9 AM; 3 PM - 6 PM Daily

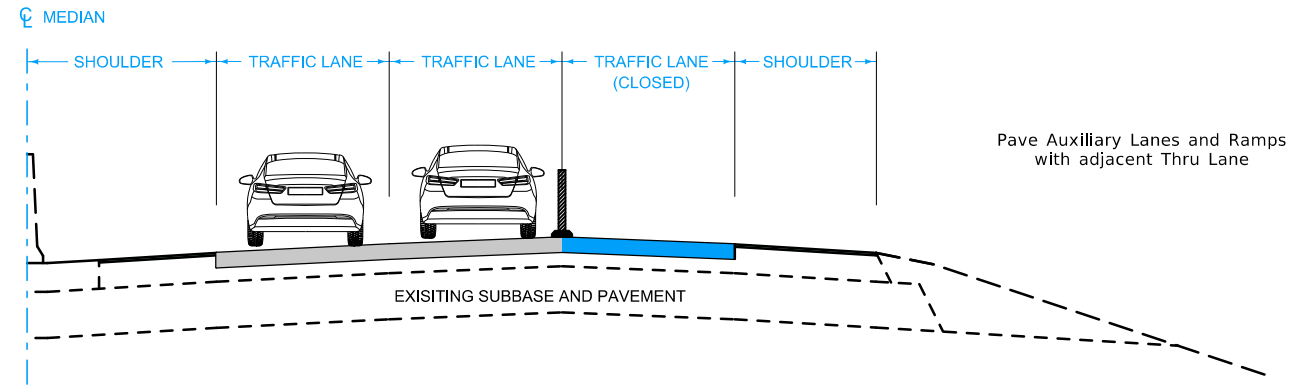
**Nighttime closures only for RT & LT Lanes & Inside Shoulder**  
 Sun: 7 PM - 5 AM  
 Mon: 7 PM - 5 AM  
 Tues: 7 PM - 5 AM  
 Wed: 7 PM - 5 AM  
 Thurs: 7 PM - 5 AM  
 Center Lane closings requires a LT. or Rt. lane closure (4-Lane Sections of I-235)  
 Sun: 8 PM - 5 AM  
 Mon: 8 PM - 5 AM  
 Tues: 8 PM - 5 AM  
 Wed: 8 PM - 5 AM  
 Thurs: 8 PM - 5 AM  
 Center Lane closings requires a LT. or Rt. lane closure (3-Lane Sections of I-235)  
 Sun: 9 PM - 5 AM  
 Mon: 9 PM - 5 AM  
 Tues: 9 PM - 5 AM  
 Wed: 9 PM - 5 AM  
 Thurs: 9 PM - 5 AM  
 No outside shoulder closures allowed:  
 Mon - Fri: 6 AM - 9 AM; 3 PM - 6 PM Daily

Use 4-Lane Times from I-235

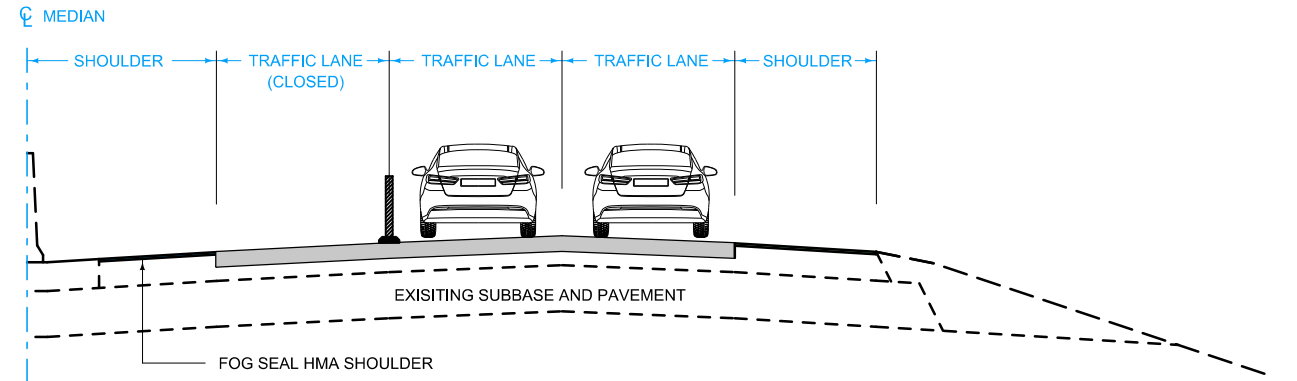
**Nighttime Closures Only**  
 Sun: 9 PM - Mon: 6 AM  
 Mon - Thurs: 8 PM - 6 AM Nightly

**Allowable Interstate Closure Map (DOT District 1)**

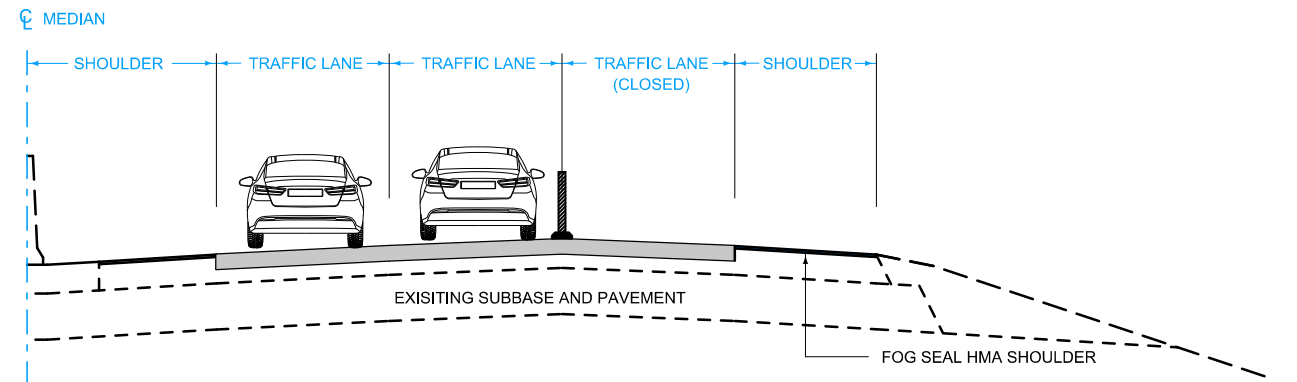




I-235  
STAGE 3  
Mill and Overlay Outside Lane

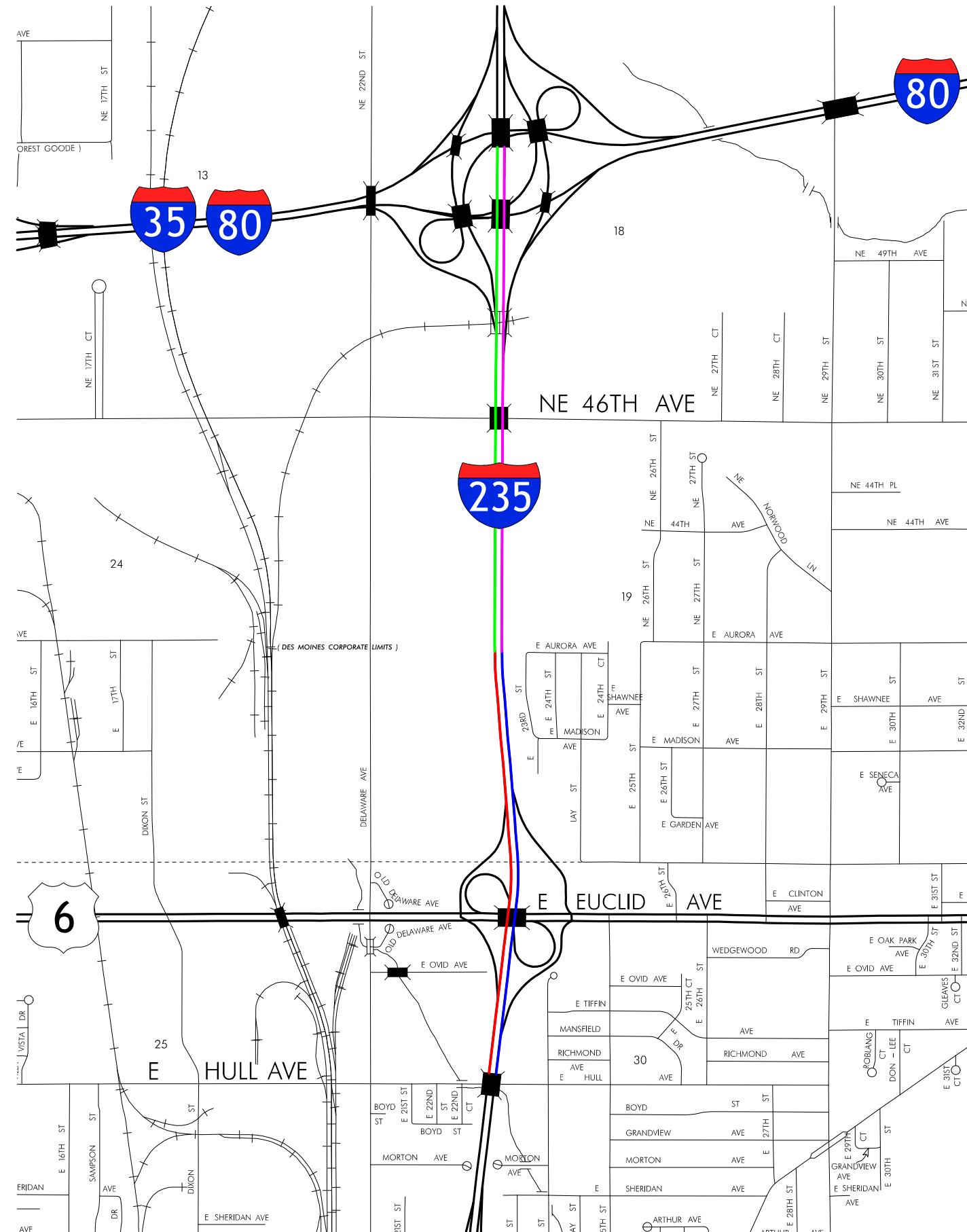


I-235  
STAGE 4  
Fog Seal Inside Shoulder



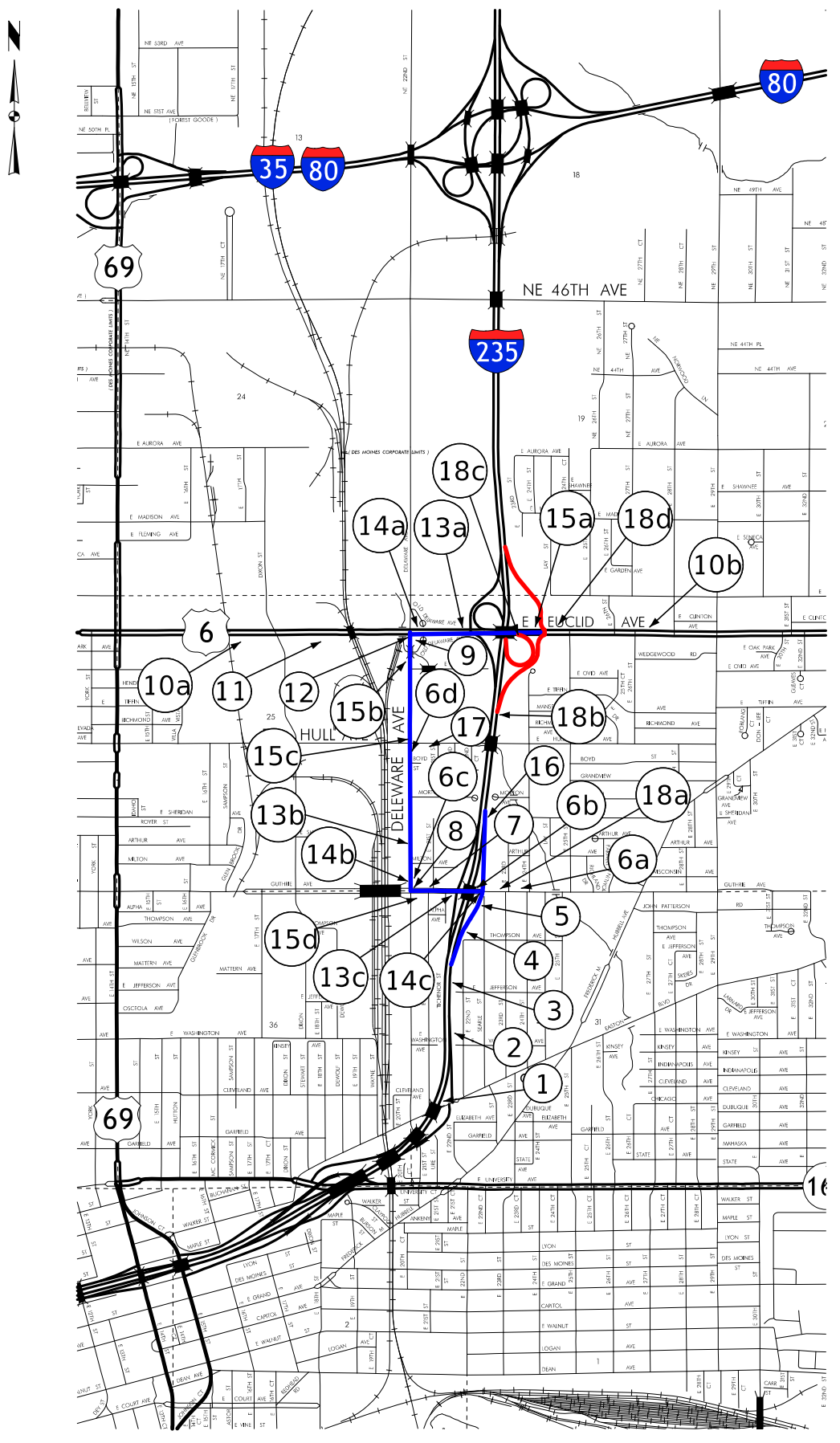
I-235  
STAGE 5  
Fog Seal Outside Shoulder





- Site 1 - Refer to Sheets J.14 - J.28
- Site 2 - Refer to Sheets J.29 - J.43
- Site 3 - Refer to Sheets J.44 - J.60
- Site 4 - Refer to Sheets J.61 - J.72

Staging Site  
Overview Map



 M3-2 36x18 M3-4 36x18 M1-4 36x36 Special Sign	 M4-8 30x15 M3-2 36x18 M3-4 36x18 M1-4 36x36 Special Sign	 M4-8 30x15 M3-2 36x18 M3-4 36x18 M1-4 36x36 Special Sign	 M4-8 30x15 M3-2 36x18 M3-4 36x18 M1-4 36x36 Special Sign	 M4-8 24x12 M3-2 24x12 M3-4 24x12 M1-4 24x24 Special Sign	 M4-8 24x12 M3-2 24x12 M3-4 24x12 M1-4 24x24 Special Sign	 M4-8 24x12 M3-2 24x12 M3-4 24x12 M1-4 24x24 Special Sign	 M4-8 24x12 M3-2 24x12 M3-4 24x12 M1-4 24x24 Special Sign	 M4-8 24x12 M3-2 24x12 M3-4 24x12 M1-4 24x24 Special Sign
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1 2 3 4 5 6a 6b 7 8 6c 6d

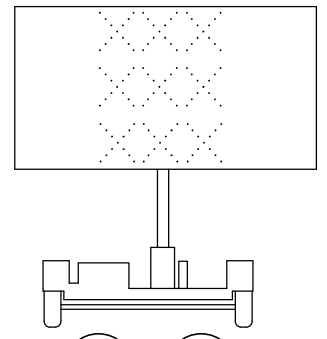
 M4-8a 24x18 M1-4 24x24 Special Sign	 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8 24x12 M3-2 24x12 M1-1 30x24	 M4-8a 24x18 M1-1 30x24
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9 10a 10b 11 12 13a 13b 13c 14a 14b 14c 15a 15b 15c 15d 16

Special Sign  
 Place Sign on E Hull Ave EB

17

PORTABLE DYNAMIC MESSAGE SIGN (PDMS)



18a 18b 18c 18d

— Detour Route  
— Ramp Closure

PDMS Messages

Contractor to place PDMS at Exit Ramp from I-235 EB to Euclid Ave and Entrance Ramps Euclid Ave to I-235 EB at least 3 days prior to closing the ramp to display advance warning message.

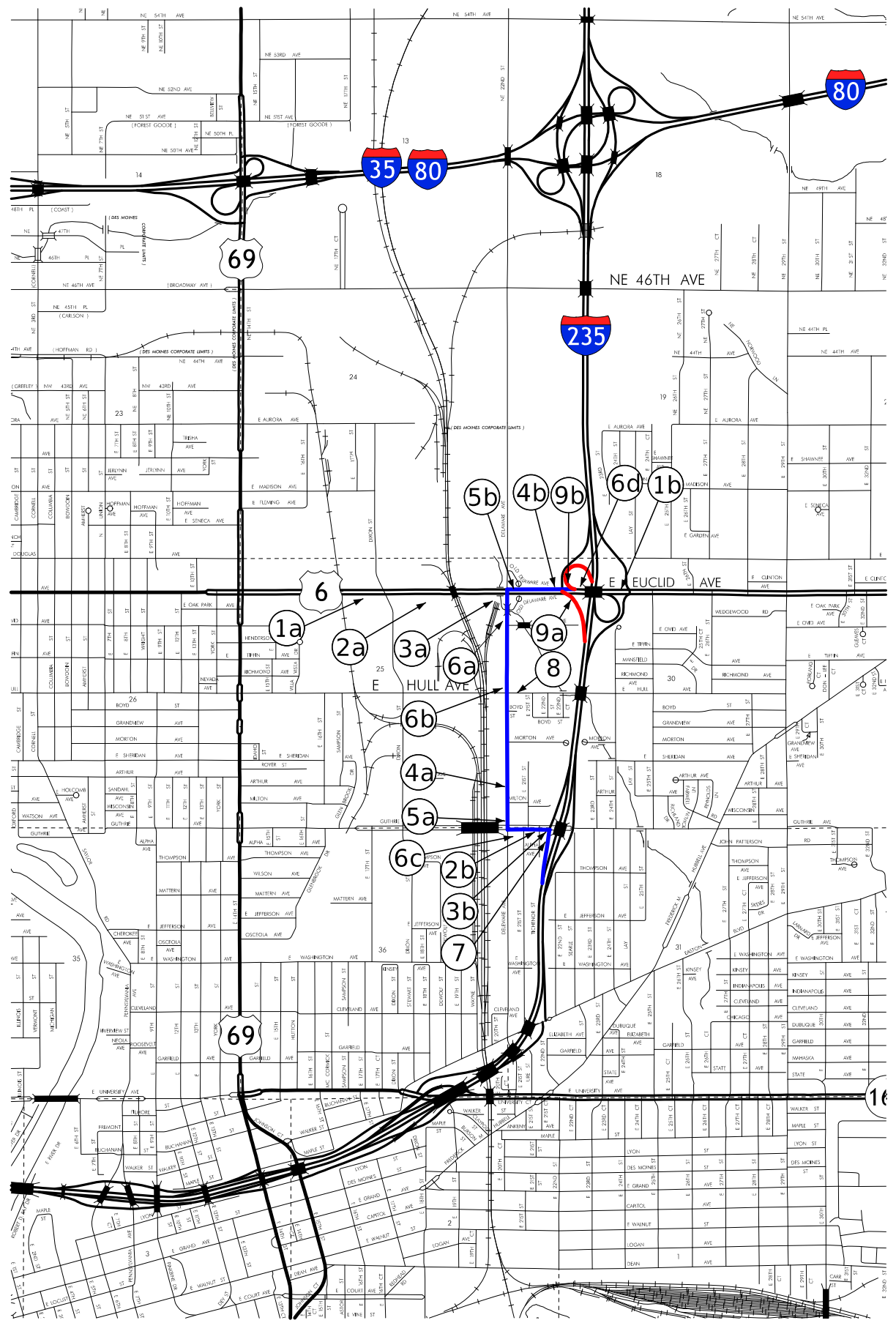
The following message should be displayed starting 3 days prior to closing the ramp until the day of the ramp closure:

Phase 1: RAMP / CLOSES / \*  
 \* Day of the week (i.e MONDAY)  
 Phase 2: \*\*  
 \*\*Time (i.e. 8 PM to 5 AM)

Notes:

- 1) All signs locations are approximate and may be adjusted to fit final conditions.
- 2) Contractor to cover all conflicting signs and messages.

Site 1 Stages 2 & 3  
 I-235 EB to US Highway 6  
 and Highway 6 to I-235 EB  
 Ramp Closures



	M3-4 24x12		M4-8 24x12		M4-8 24x12		M4-8 24x12
	M1-1 30x24		M3-4 24x12		M3-4 24x12		M3-4 24x12
	W20-2 36x36		M1-1 30x24		M1-1 30x24		M1-1 30x24
			M5-1 21x15		M6-1 21x15		M6-1 21x15

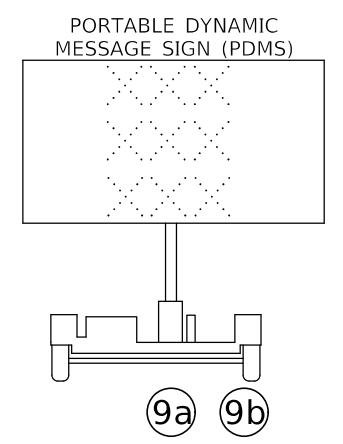
(1a) (1b)                      (2a) (2b)                      (3a) (3b)                      (4a) (4b)                      (5a) (5b)

	M4-8 24x12		M4-8a 24x18
	M1-1 30x24		M1-1 30x24
	M6-3 21x15		

**NO ACCESS TO I-235 FOLLOW DETOUR**

Place Sign on E Hull Ave EB

(6a) (6b)                      (7)                      (8)  
(6c) (6d)



Special Sign

**PDMS Messages**

Contractor to place PDMS at Entrance Ramps from Euclid Ave to I-235 WB at least 3 days prior to closing the ramp to display advance warning message.

The following message should be displayed starting 3 days prior to closing the ramp until the day of the ramp closure:

- Phase 1: RAMP / CLOSES / \*
- \* Day of the week (i.e MONDAY)
- Phase 2: \*\*
- \*\*Time (i.e. 8 PM to 5 AM)

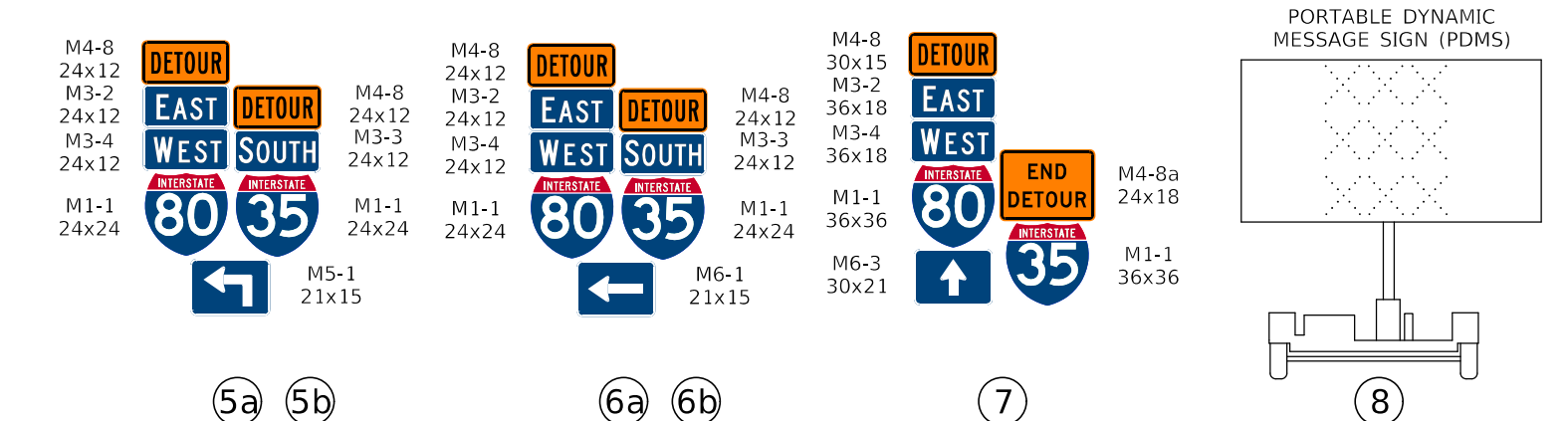
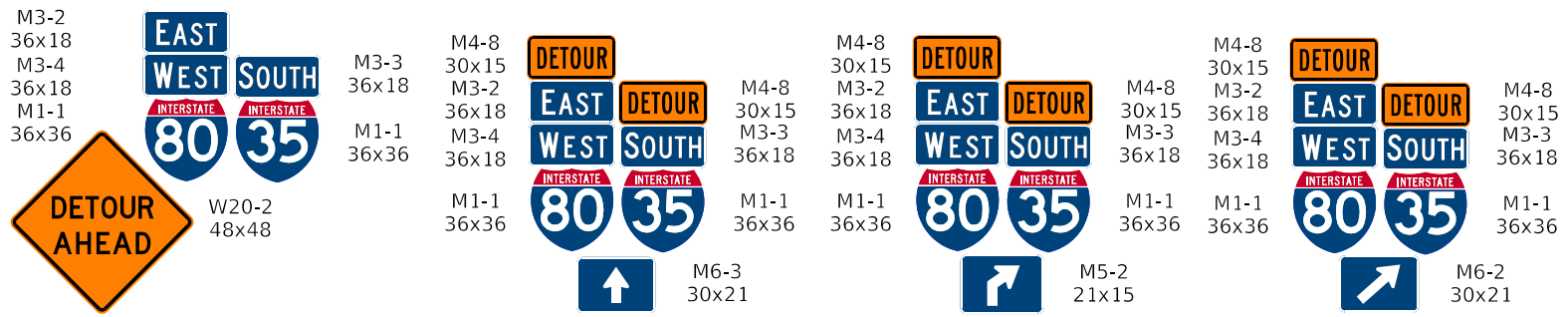
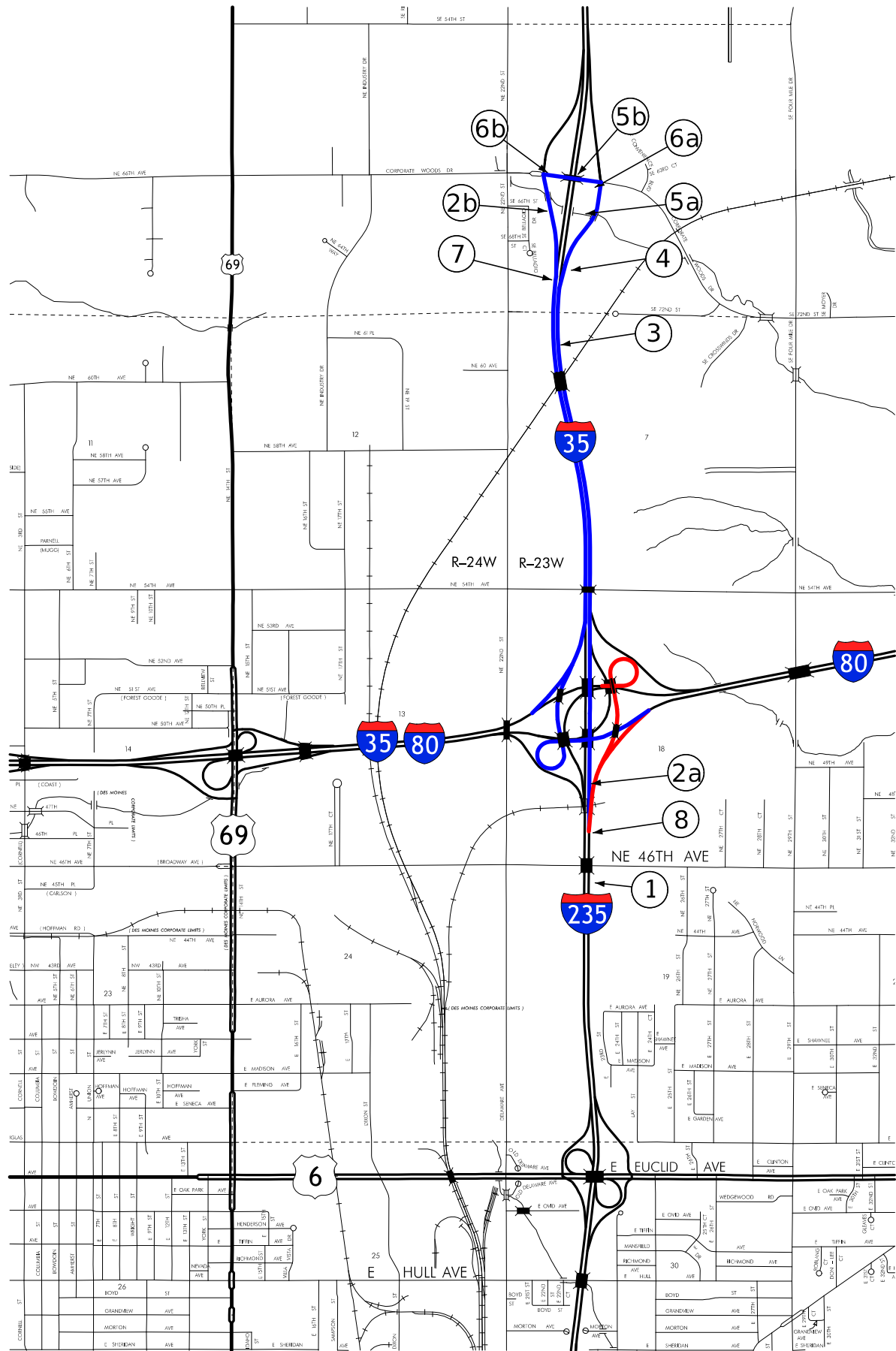
**Notes:**

- 1) All signs locations are approximate and may be adjusted to fit final conditions.
- 2) Contractor to cover all conflicting signs and messages.

**Site 2 Stage 3  
US Highway 6 EB to I-235 WB  
and I-235 WB to US Highway 6  
Ramp Closures**

Detour Route  
 Ramp Closure





**PDMS Messages**

Contractor to place PDMS at Exit/Entrance Ramps from I-235 WB to I-80 & I-35 at least 3 days prior to closing the ramp to display advance warning message.

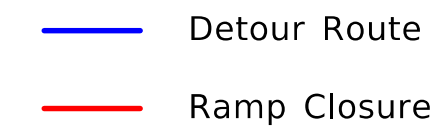
The following message should be displayed starting 3 days prior to closing the ramp until the day of the ramp closure:

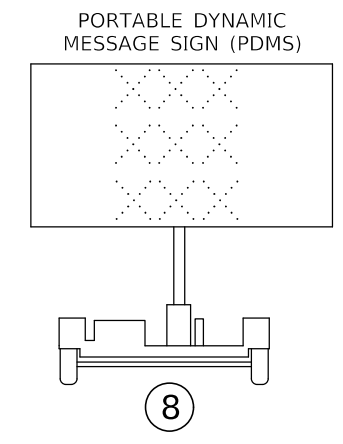
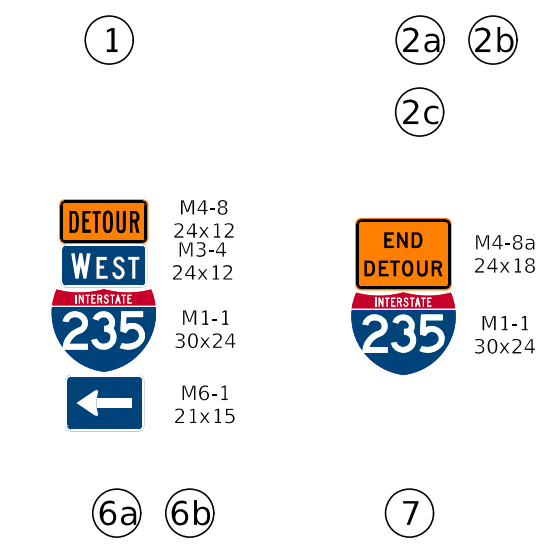
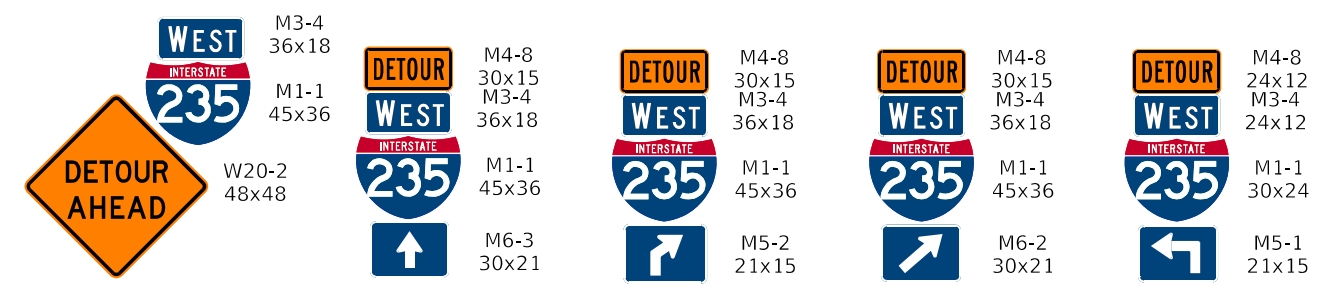
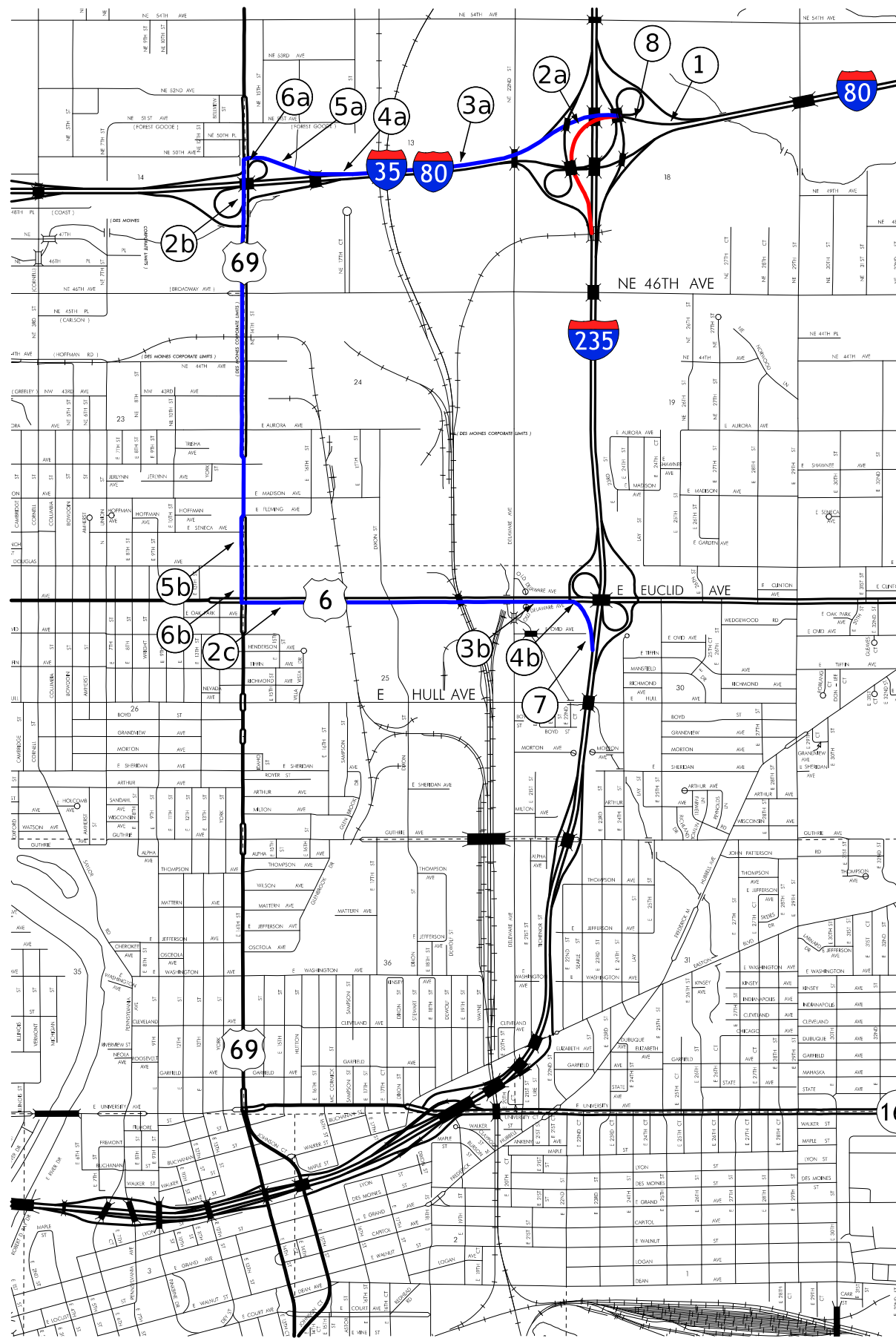
- Phase 1: RAMP / CLOSING / \*
- \* Day of the week (i.e MONDAY)
- Phase 2: \*\*
- \*\*Time (i.e. 8 PM to 5 AM)

**Notes:**

- 1) All signs locations are approximate and may be adjusted to fit final conditions.
- 2) Contractor to cover all conflicting signs and messages.

**Site 3 Stage 2  
I-235 EB to I-80 EB  
and I-80 WB/I-35 SB  
Ramp Closures**





For Information Only  
Alternative Routing Through  
Corporate Woods Interchange

### PDMS Messages

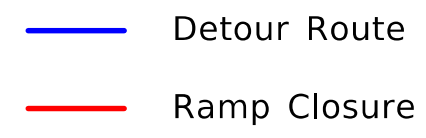
Contractor to place PDMS at Exit Ramp from I-80 WB to I-235 WB at least 3 days prior to closing the ramp to display advance warning message.

The following message should be displayed starting 3 days prior to closing the ramp until the day of the ramp closure:

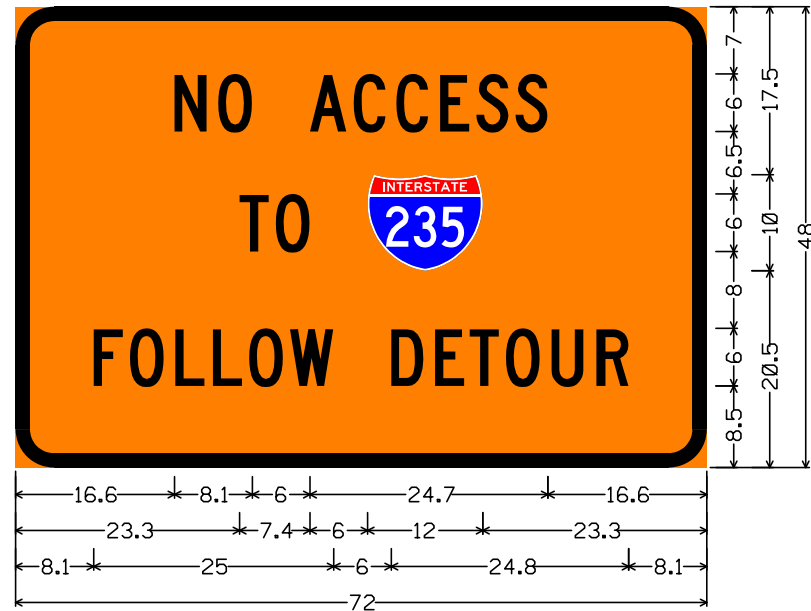
Phase 1: RAMP / CLOSING / \*  
\* Day of the week (i.e MONDAY)  
Phase 2: \*\*  
\*\*Time (i.e. 8 PM to 5 AM)

### Notes:

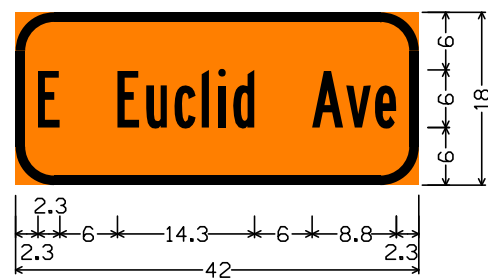
- 1) All signs locations are approximate and may be adjusted to fit final conditions.
- 2) Contractor to cover all conflicting signs and messages.



### Site 4 Stages 2 & 3 I-80 WB to I-235 WB and Ramp Closure



4.0" Radius, 1.5" Border, Black on Orange;  
 "NO ACCESS", C 2K; "TO", C 2K; Interstate 235 4.3" C 2K;  
 "FOLLOW DETOUR", C 2K;



4.0" Radius, 1.0" Border, Black on Orange;  
 "E Euclid Ave", B 2K;

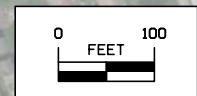


Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

- ① For roadways with a posted speed limit of 60 mph or greater before road work:  
 Place SPEED LIMIT 55 signs prior to the lane closure as shown.  
 When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.  
 Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.  
 For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

- ② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Traffic Control Layout  
 Site 1 EB I-235  
 Stage 1  
 Inside Lane Closed







Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

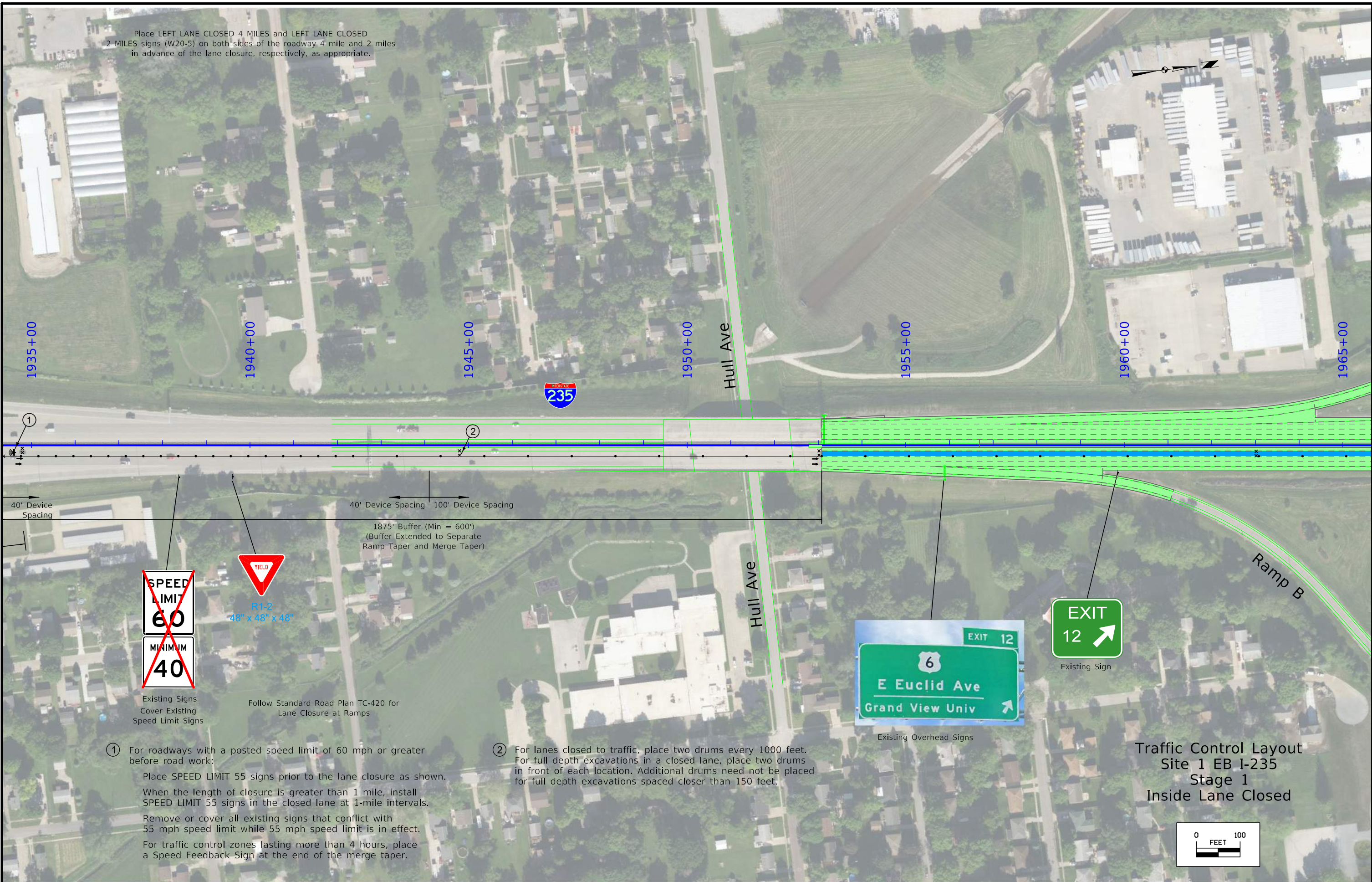
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Traffic Control Layout  
Site 1 EB I-235  
Stage 1  
Inside Lane Closed



Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



Existing Signs  
Cover Existing  
Speed Limit Signs



R1-2  
48" x 48" x 48"

Follow Standard Road Plan TC-420 for  
Lane Closure at Ramps

- ① For roadways with a posted speed limit of 60 mph or greater before road work:  
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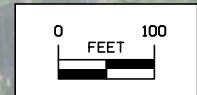


Existing Overhead Signs



Existing Sign

Traffic Control Layout  
Site 1 EB I-235  
Stage 1  
Inside Lane Closed

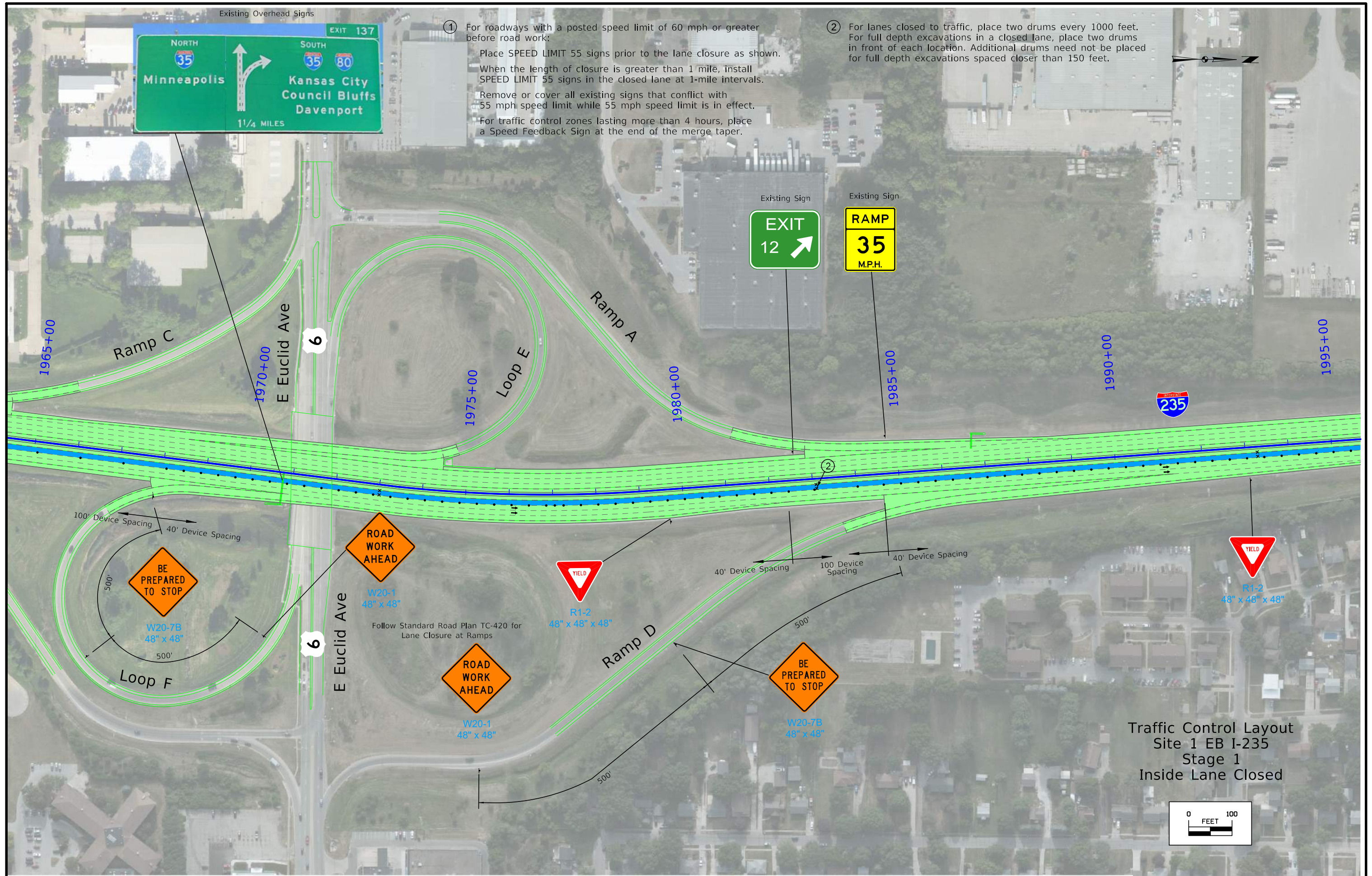


Existing Overhead Signs

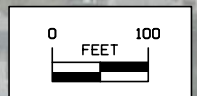


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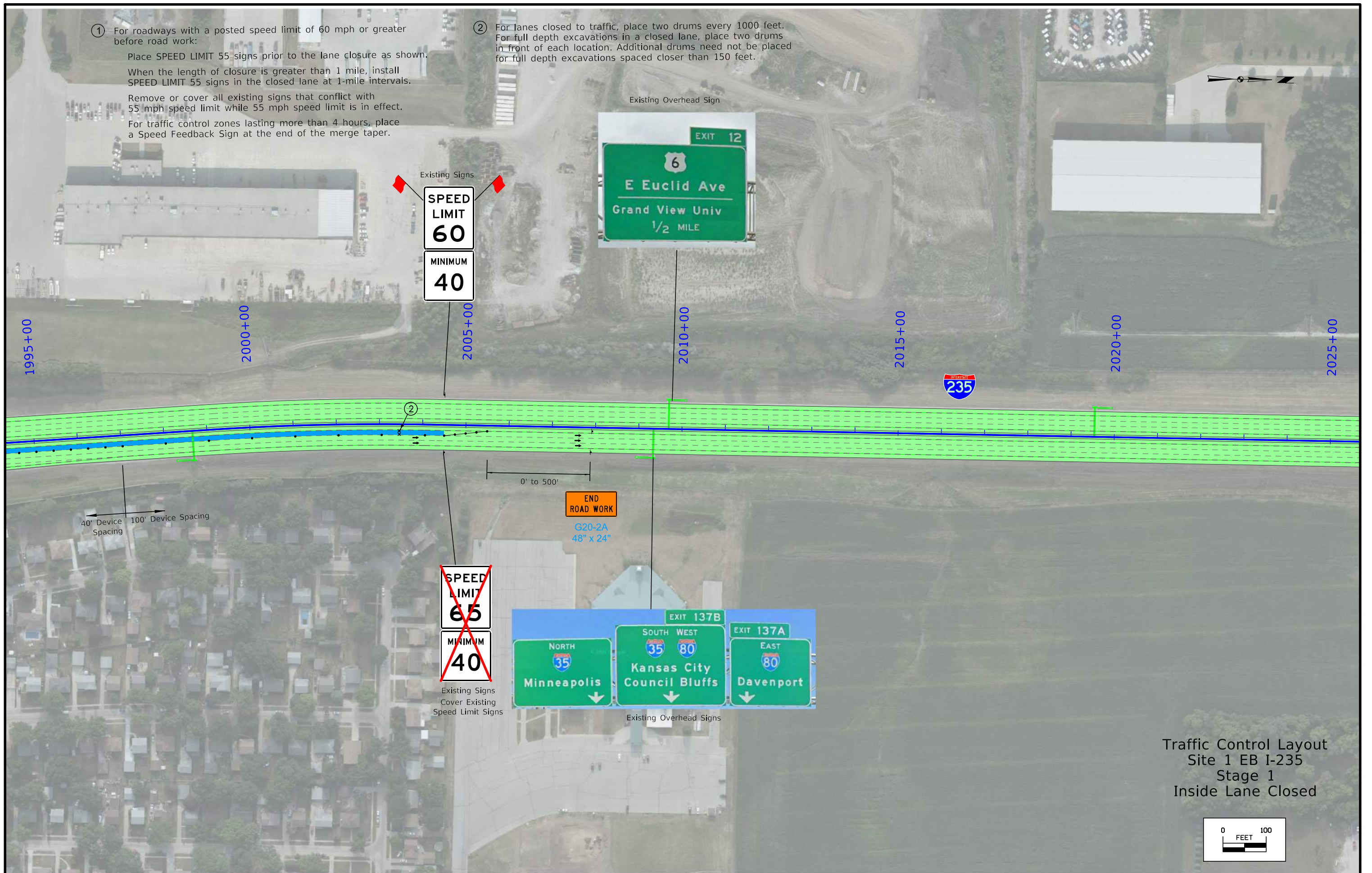


Traffic Control Layout  
Site 1 EB I-235  
Stage 1  
Inside Lane Closed

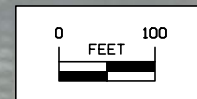


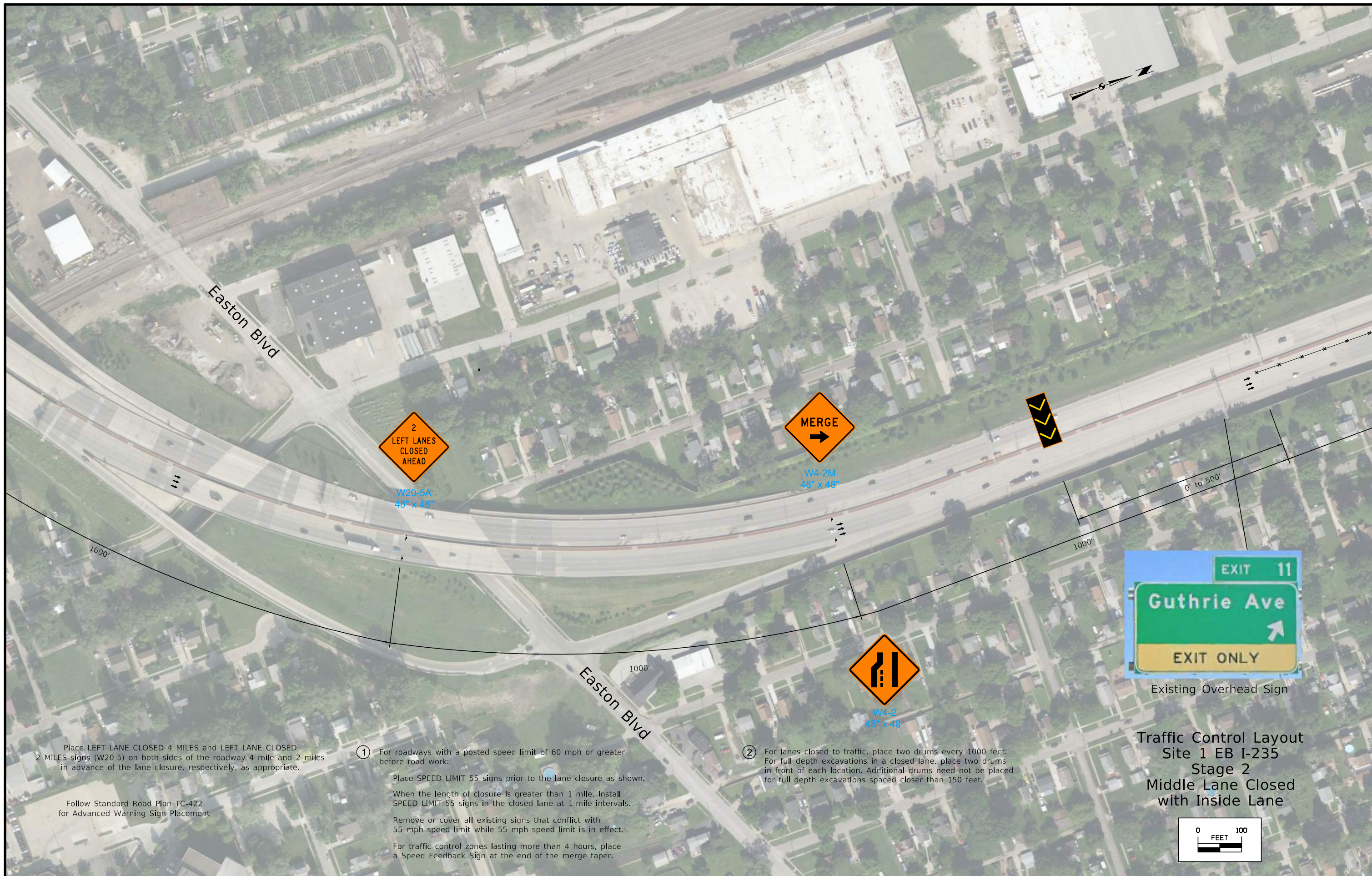
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Traffic Control Layout  
 Site 1 EB I-235  
 Stage 1  
 Inside Lane Closed





Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

Follow Standard Road Plan TC-422 for Advanced Warning Sign Placement

- ① For roadways with a posted speed limit of 60 mph or greater before road work:
  - Place SPEED LIMIT 55 signs prior to the lane closure as shown.
  - When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.
  - Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.
  - For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

- ② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.



Existing Overhead Sign

Traffic Control Layout  
 Site 1 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane





Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

Follow Standard Road Plan TC-422 for Advanced Warning Sign Placement

- ① For roadways with a posted speed limit of 60 mph or greater before road work:  
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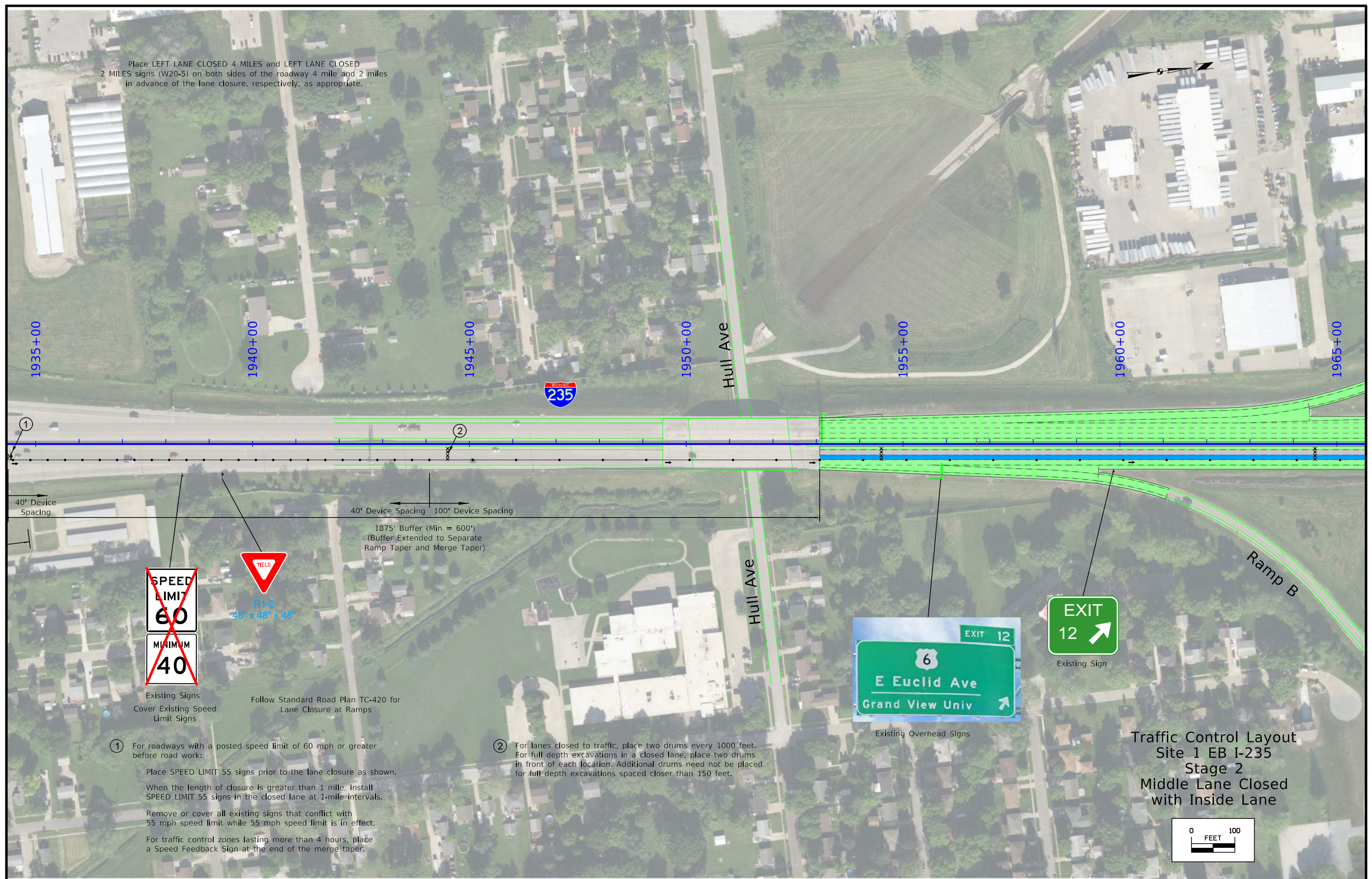
- ② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Follow Standard Road Plan TC-420 for Lane Closure at Ramps

Traffic Control Layout  
Site 1 EB I-235  
Stage 2  
Middle Lane Closed  
with Inside Lane



Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



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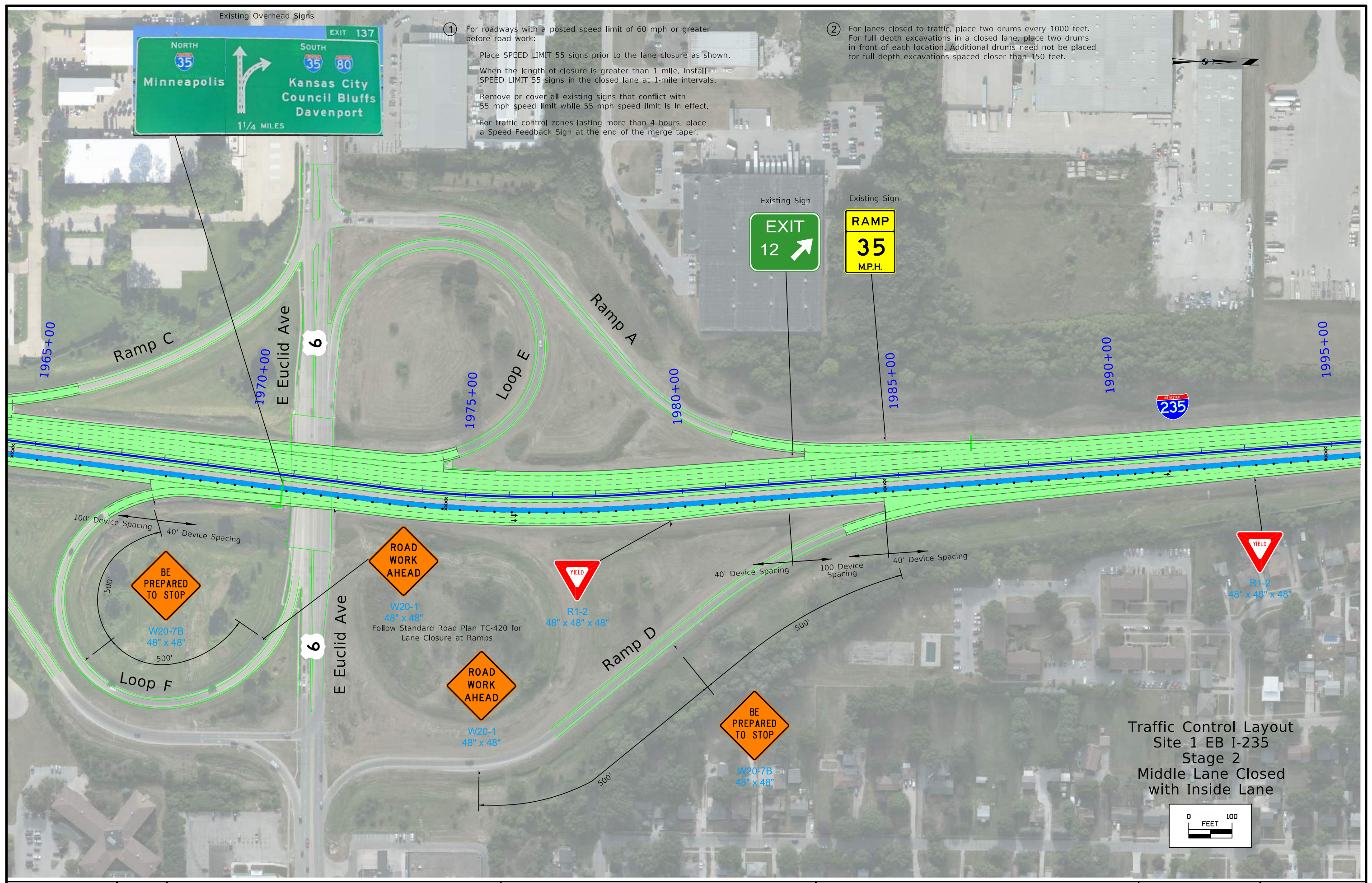
Traffic Control Layout  
 Site 1 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane

Existing Overhead Signs

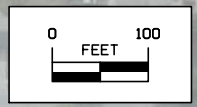


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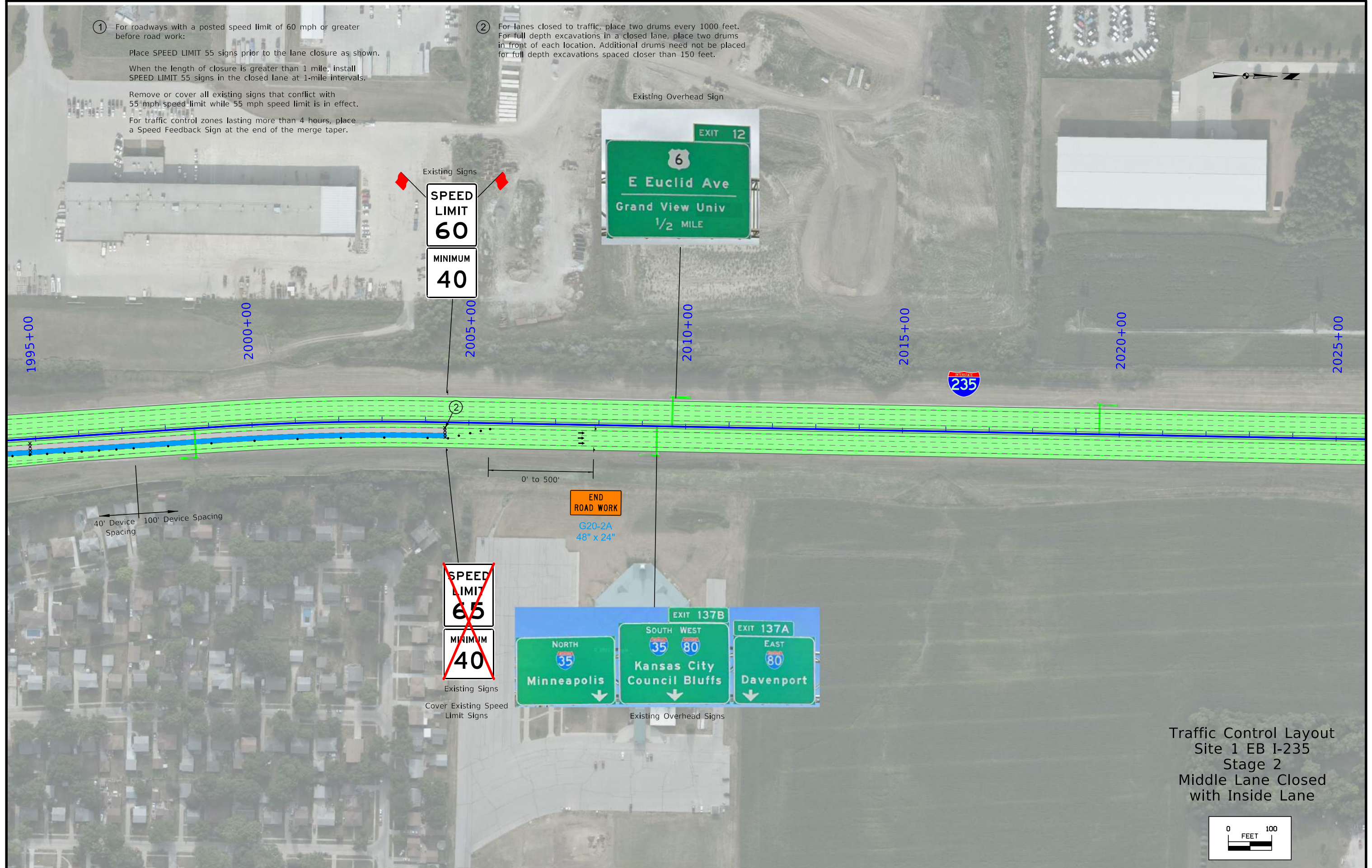
Traffic Control Layout  
 Site 1 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane



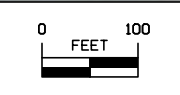


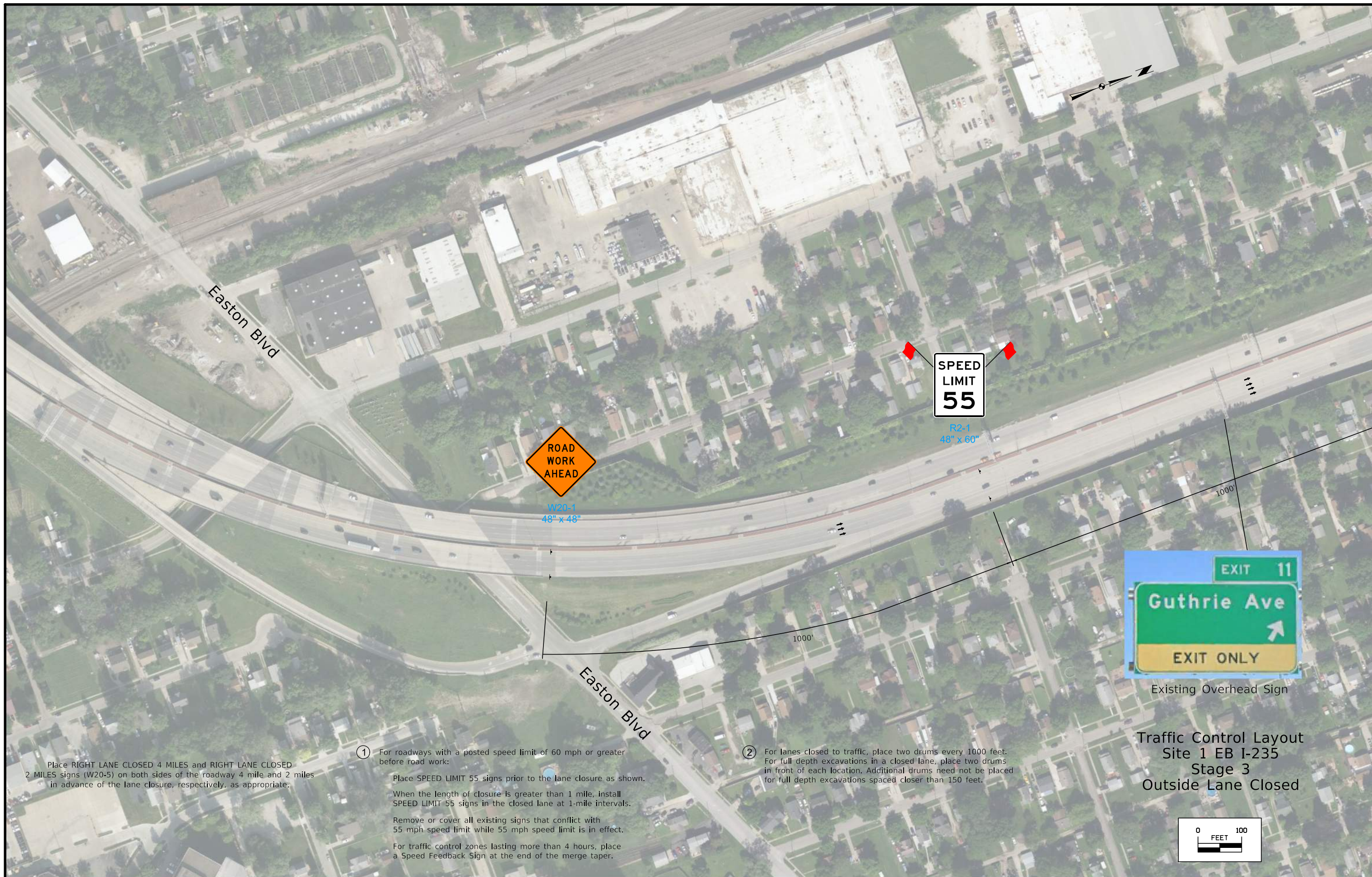
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Traffic Control Layout  
 Site 1 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane





Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

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② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.



Existing Overhead Sign

Traffic Control Layout  
Site 1 EB I-235  
Stage 3  
Outside Lane Closed





Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

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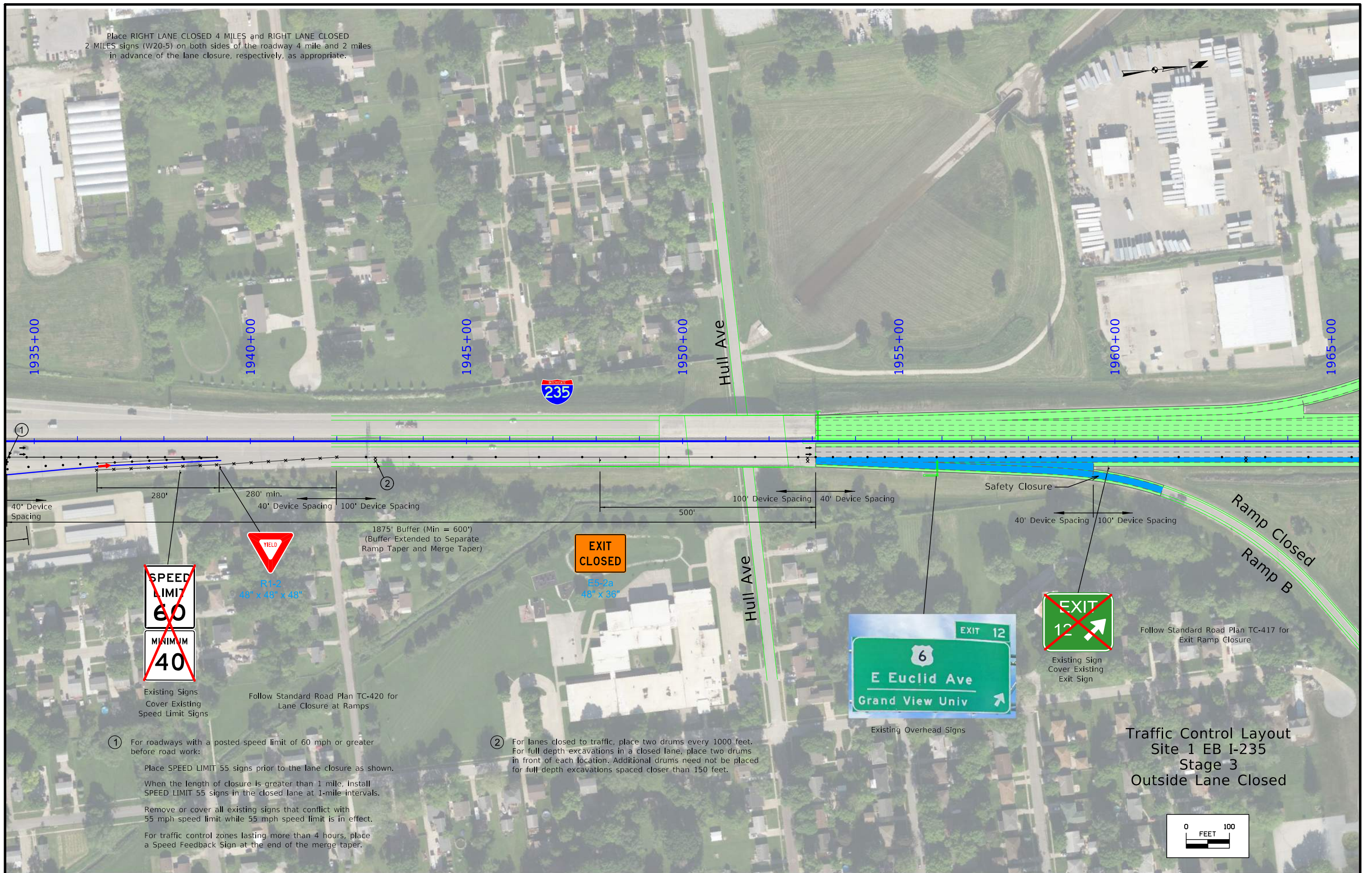
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② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

**Traffic Control Layout  
Site 1 EB I-235  
Stage 3  
Outside Lane Closed**



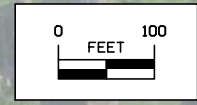
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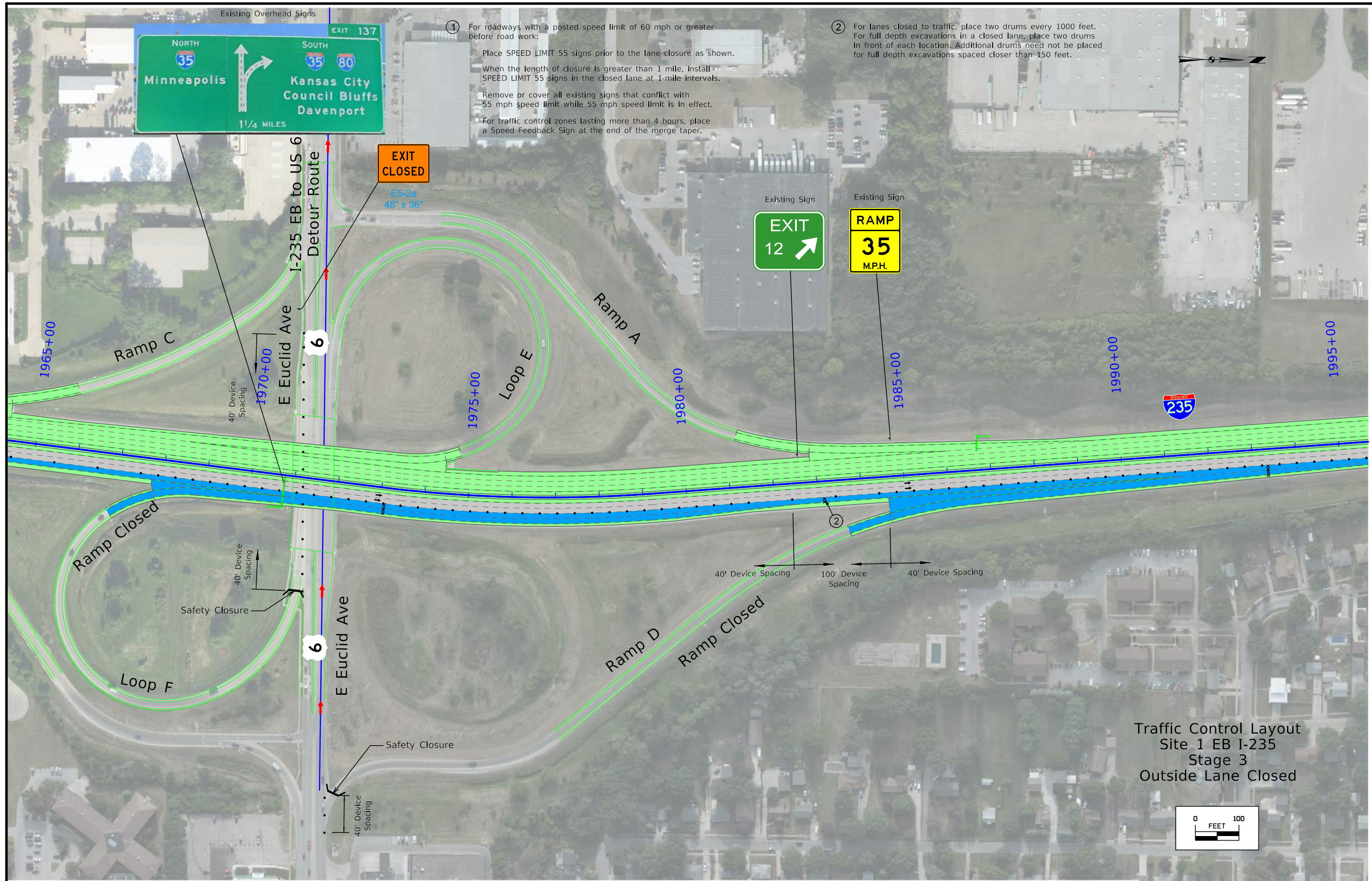


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Traffic Control Layout  
 Site 1 EB I-235  
 Stage 3  
 Outside Lane Closed

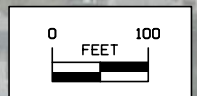




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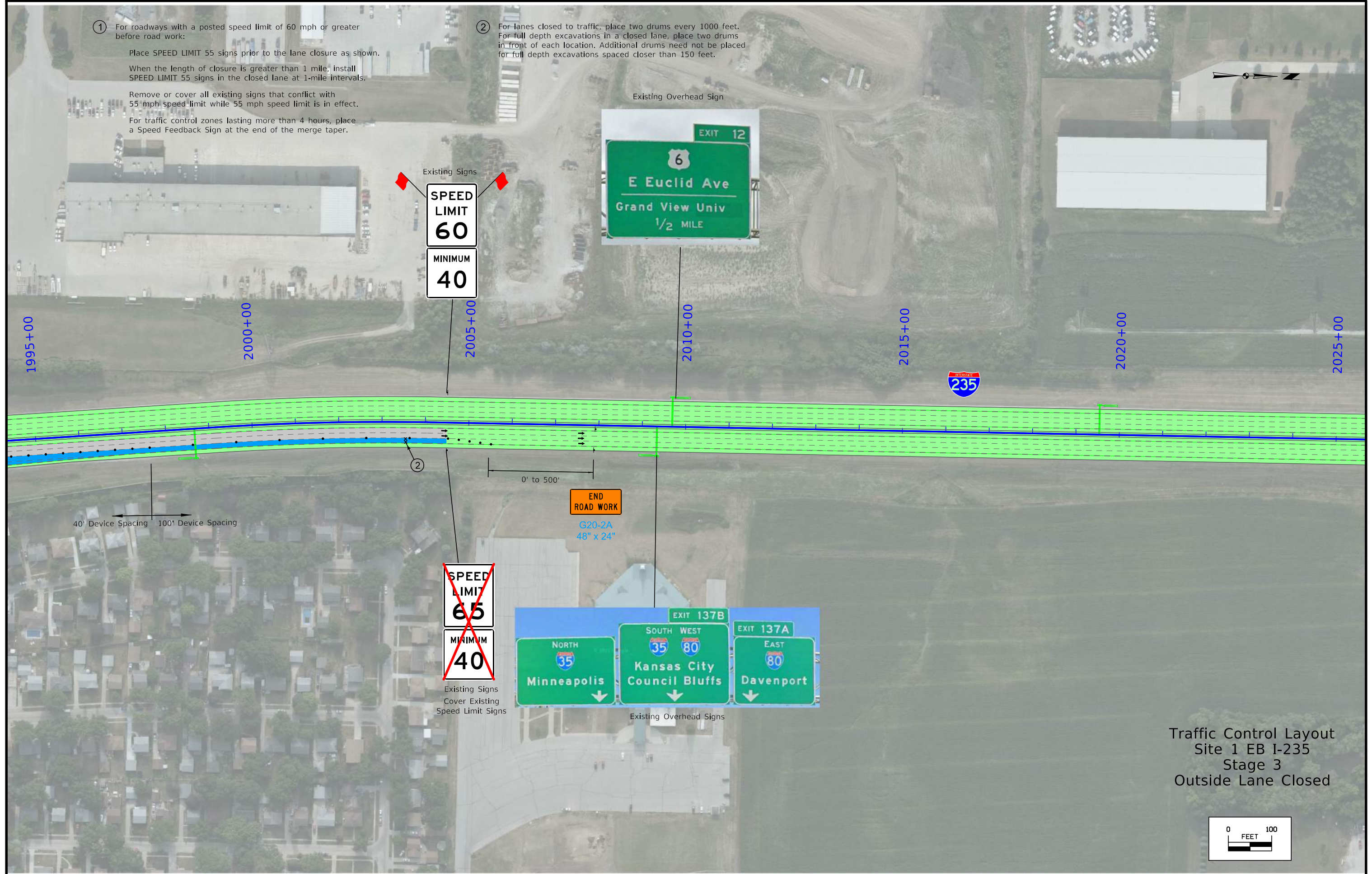
② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Traffic Control Layout  
 Site 1 EB I-235  
 Stage 3  
 Outside Lane Closed

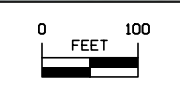


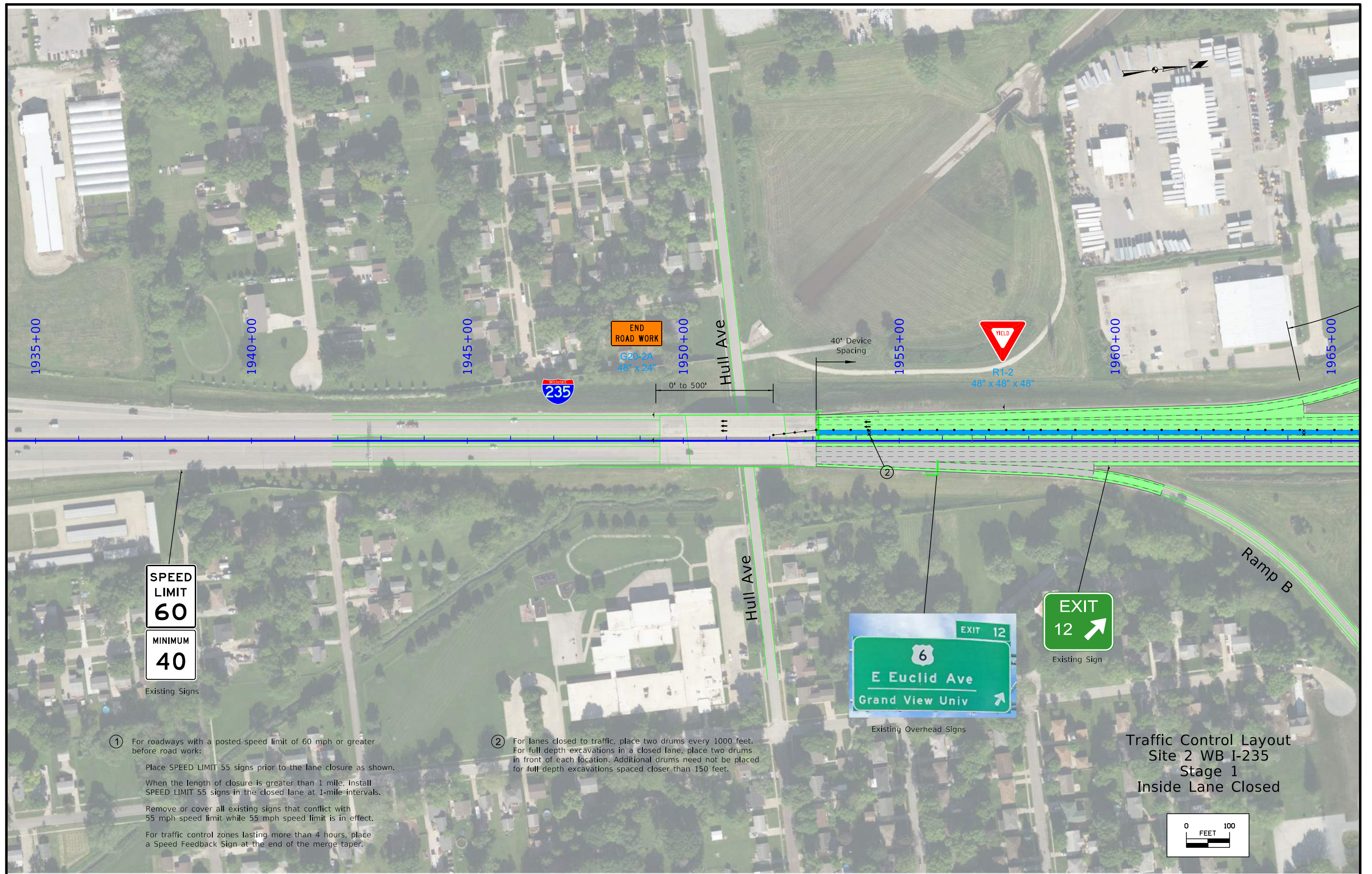
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Traffic Control Layout  
 Site 1 EB I-235  
 Stage 3  
 Outside Lane Closed





**SPEED LIMIT 60**  
**MINIMUM 40**

Existing Signs

**EXIT 12**  
**6**  
**E Euclid Ave**  
**Grand View Univ**

Existing Overhead Signs

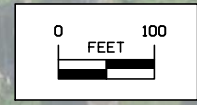
**EXIT 12**

Existing Sign

- ① For roadways with a posted speed limit of 60 mph or greater before road work:
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Traffic Control Layout  
 Site 2 WB I-235  
 Stage 1  
 Inside Lane Closed



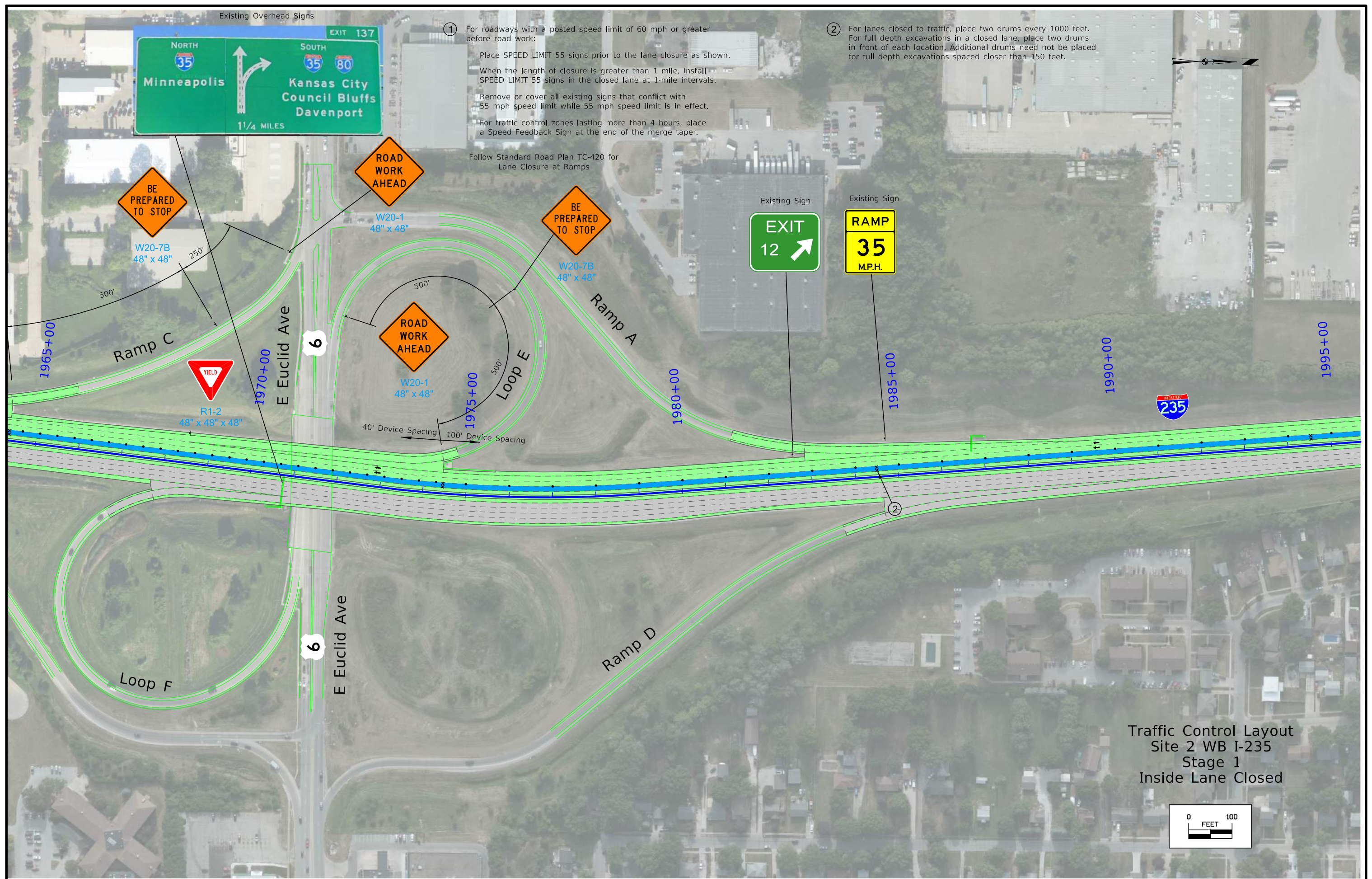
Existing Overhead Signs



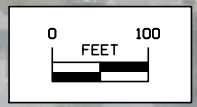
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Follow Standard Road Plan TC-420 for Lane Closure at Ramps



Traffic Control Layout  
 Site 2 WB I-235  
 Stage 1  
 Inside Lane Closed





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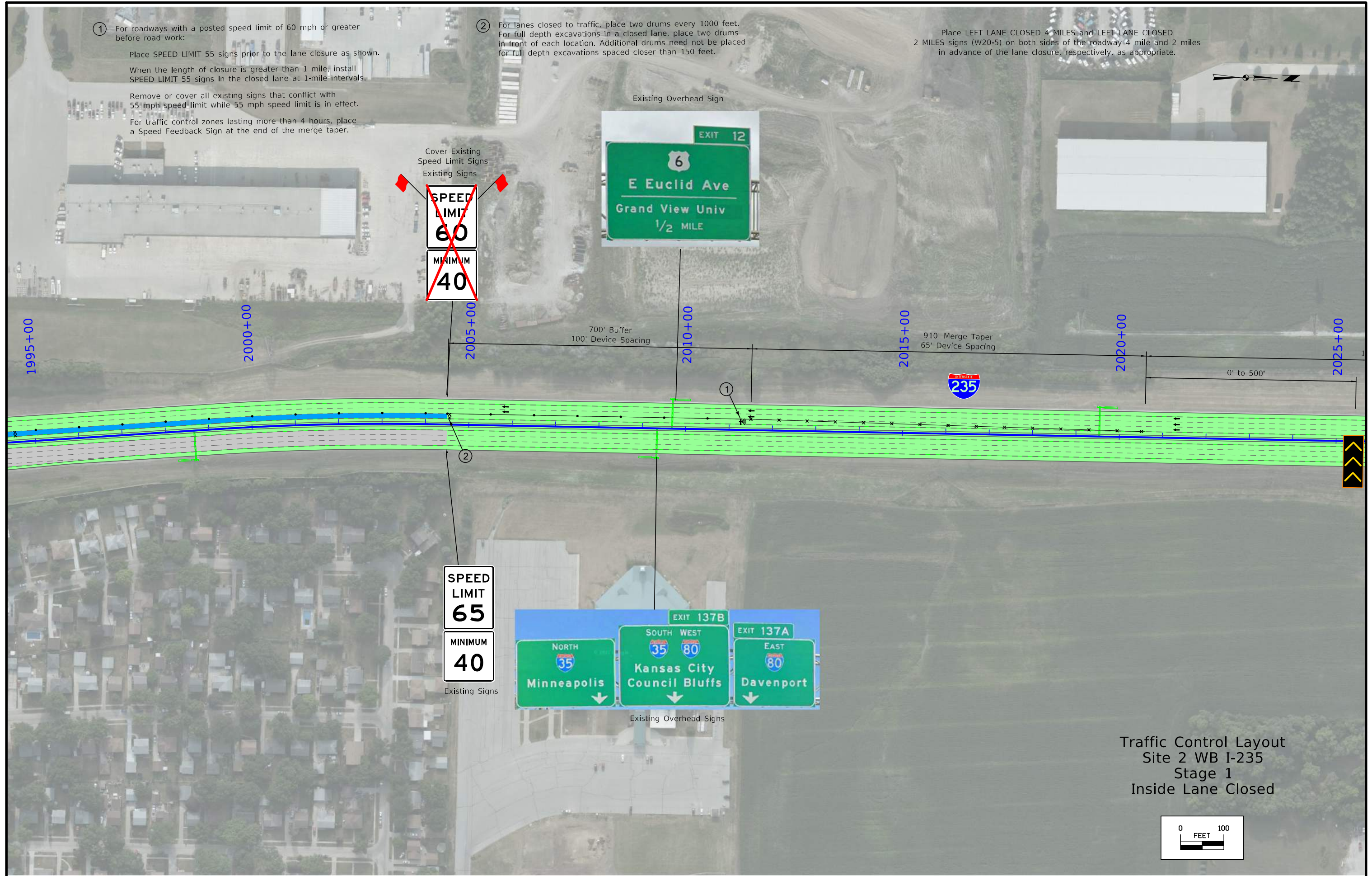
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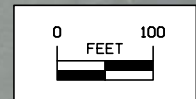
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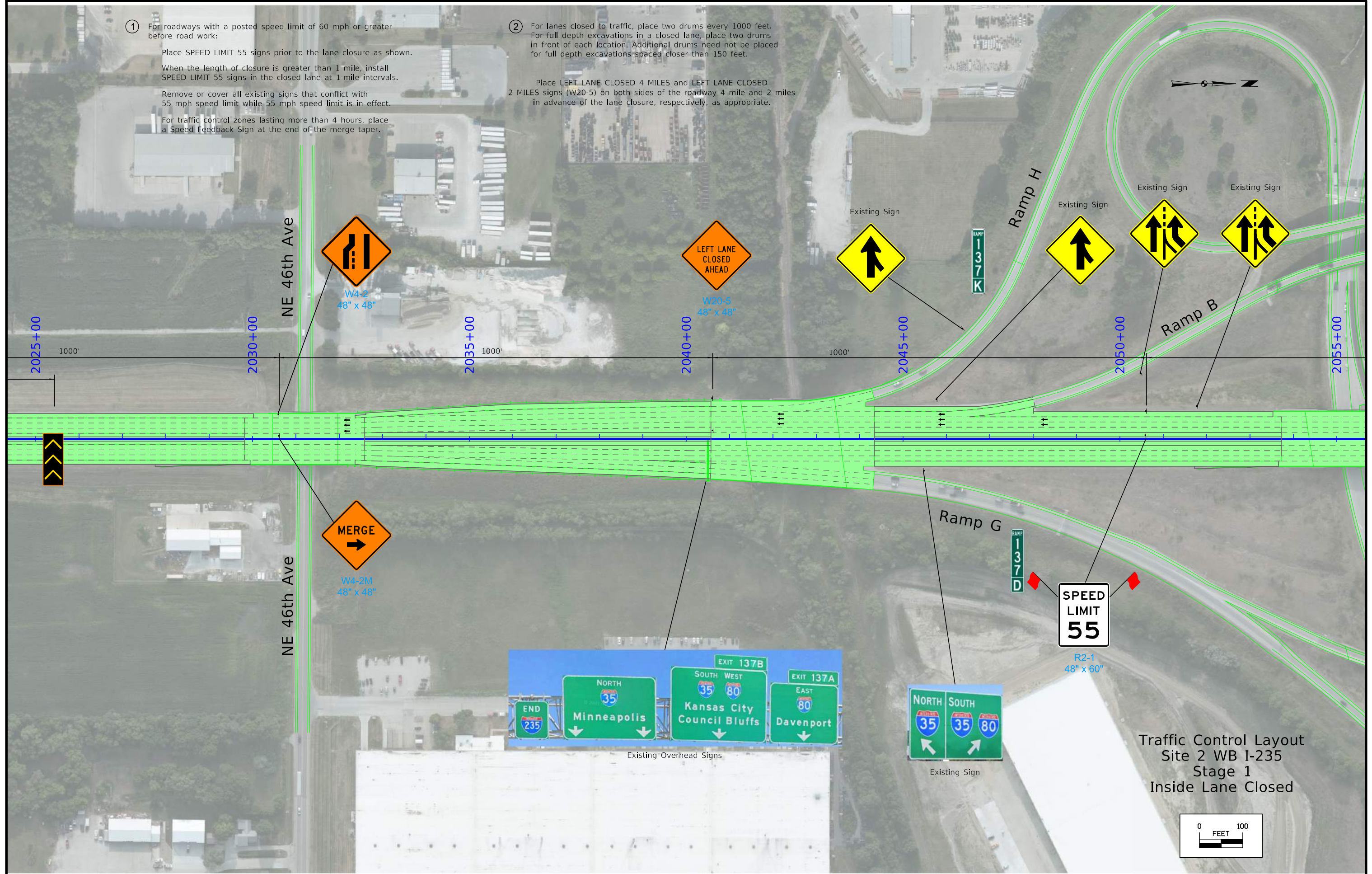


Traffic Control Layout  
 Site 2 WB I-235  
 Stage 1  
 Inside Lane Closed



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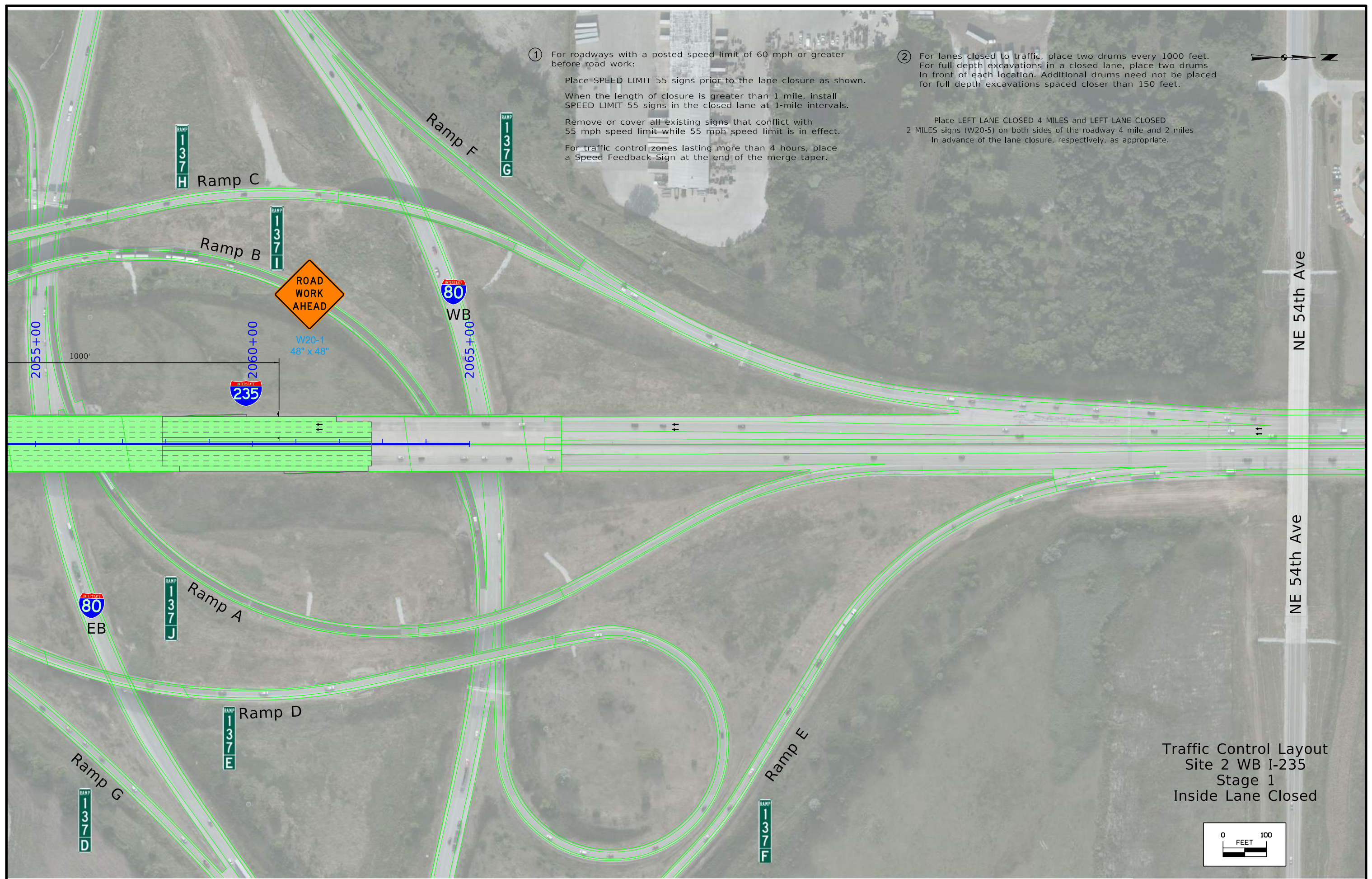
② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.  
 Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



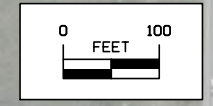
Traffic Control Layout  
 Site 2 WB I-235  
 Stage 1  
 Inside Lane Closed

① For roadways with a posted speed limit of 60 mph or greater before road work:  
 Place SPEED LIMIT 55 signs prior to the lane closure as shown.  
 When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.  
 Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.  
 For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

② For lanes closed to traffic, place two drums every 1000 feet.  
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Traffic Control Layout  
 Site 2 WB I-235  
 Stage 1  
 Inside Lane Closed





**SPEED LIMIT 60**  
**MINIMUM 40**

Existing Signs

**EXIT 12**  
**6**  
**E Euclid Ave**  
**Grand View Univ**

Existing Overhead Signs

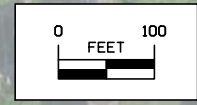
**EXIT 12**

Existing Sign

① For roadways with a posted speed limit of 60 mph or greater before road work:  
Place SPEED LIMIT 55 signs prior to the lane closure as shown.  
When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.  
Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.  
For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

**Traffic Control Layout**  
**Site 2 WB I-235**  
**Stage 2**  
**Middle Lane Closed**  
**with Inside Lane**

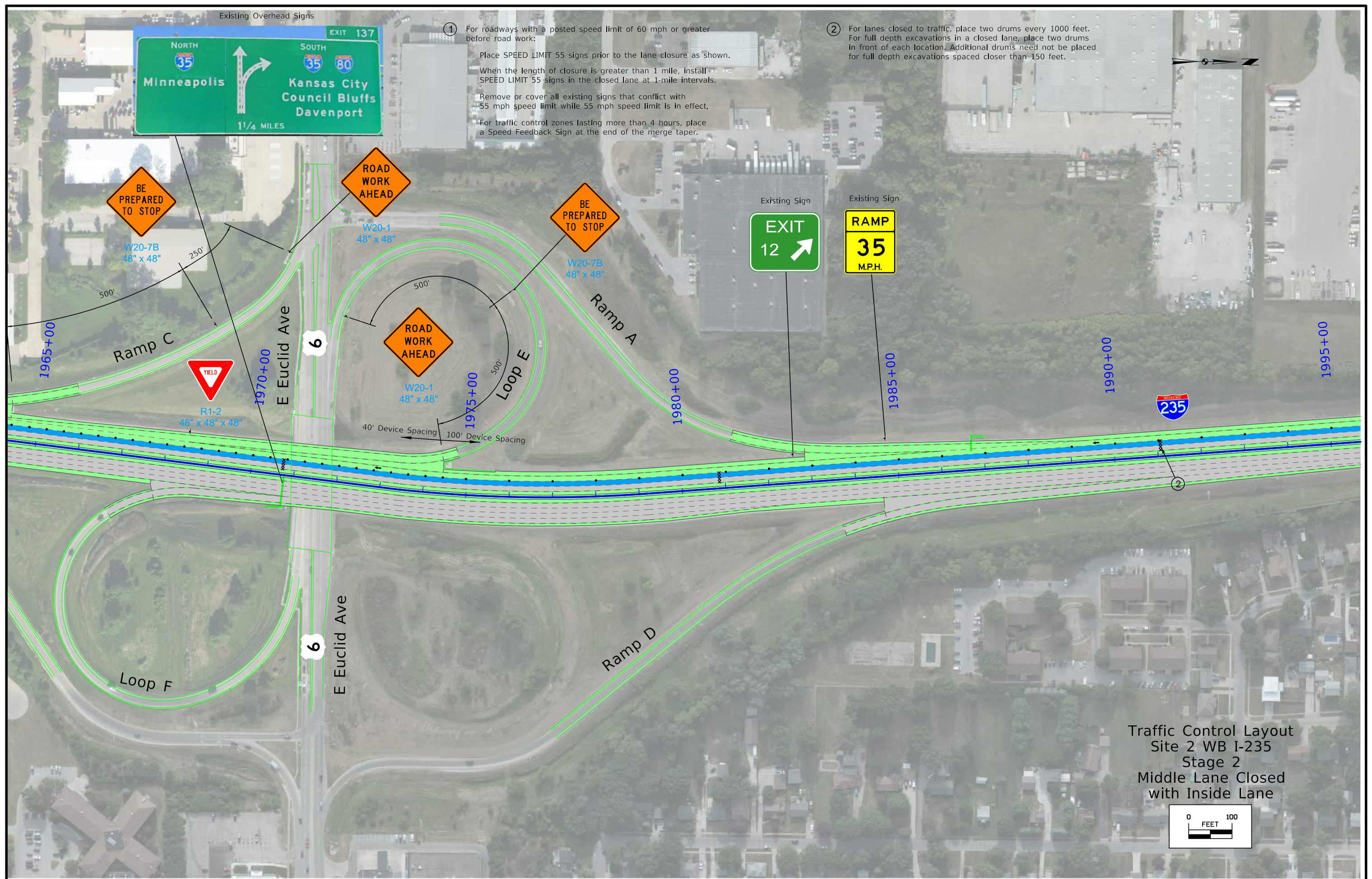
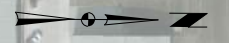


Existing Overhead Signs

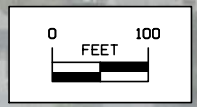


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- ② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.



Traffic Control Layout  
 Site 2 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane

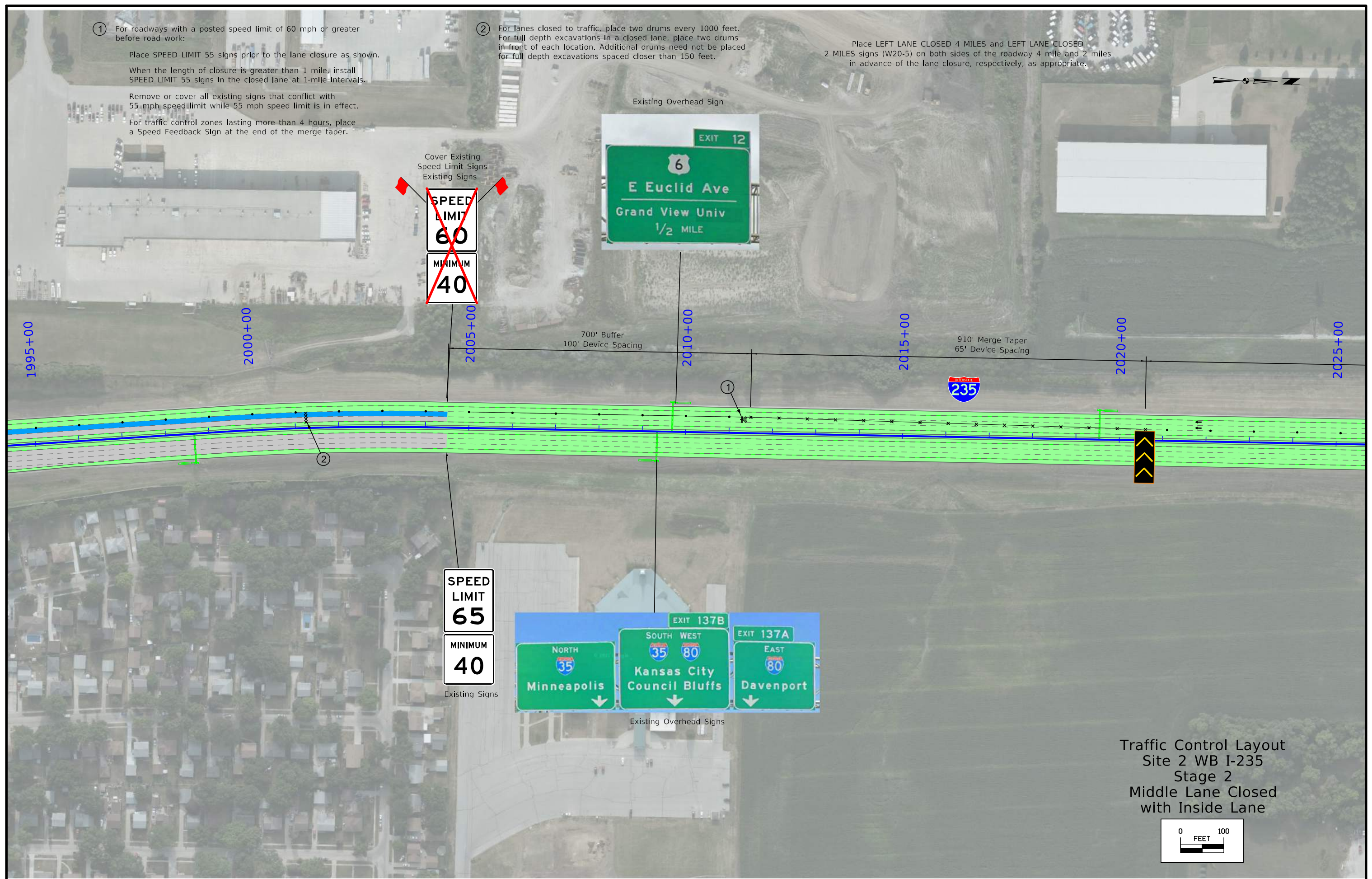


① For roadways with a posted speed limit of 60 mph or greater before road work:

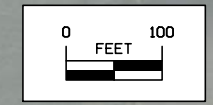
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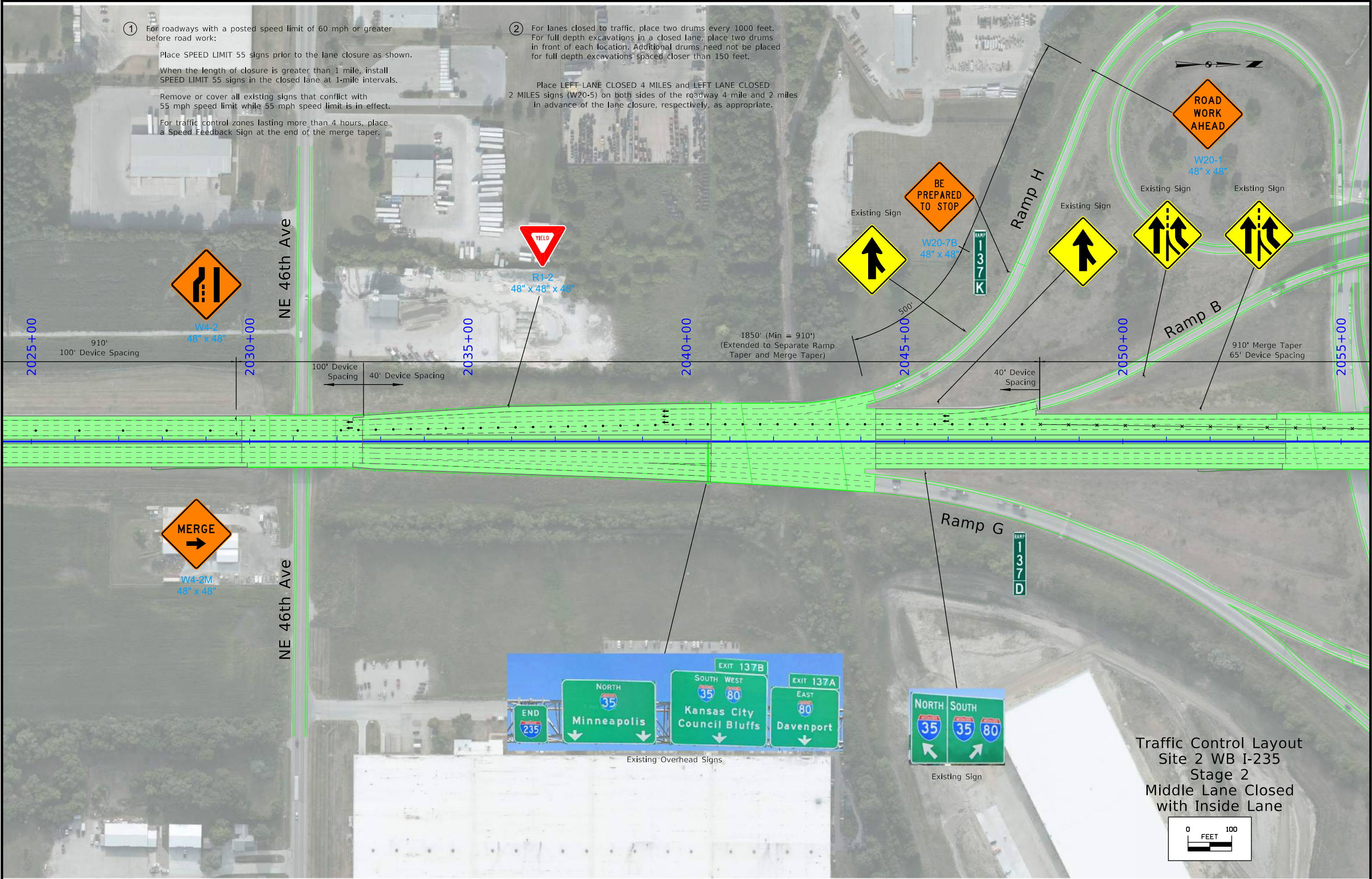


Traffic Control Layout  
 Site 2 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane

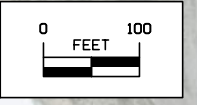


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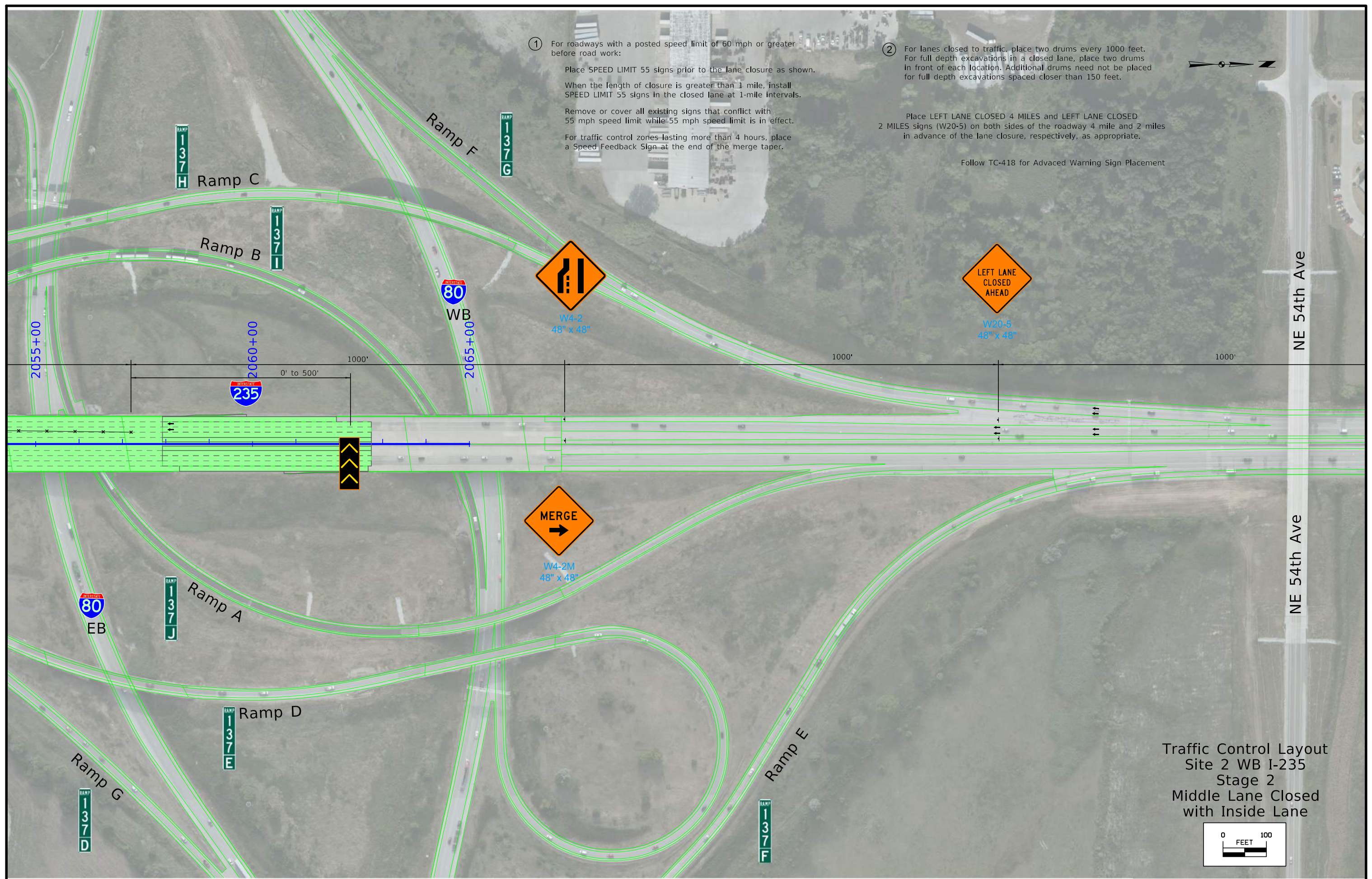
Traffic Control Layout  
 Site 2 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane



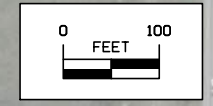
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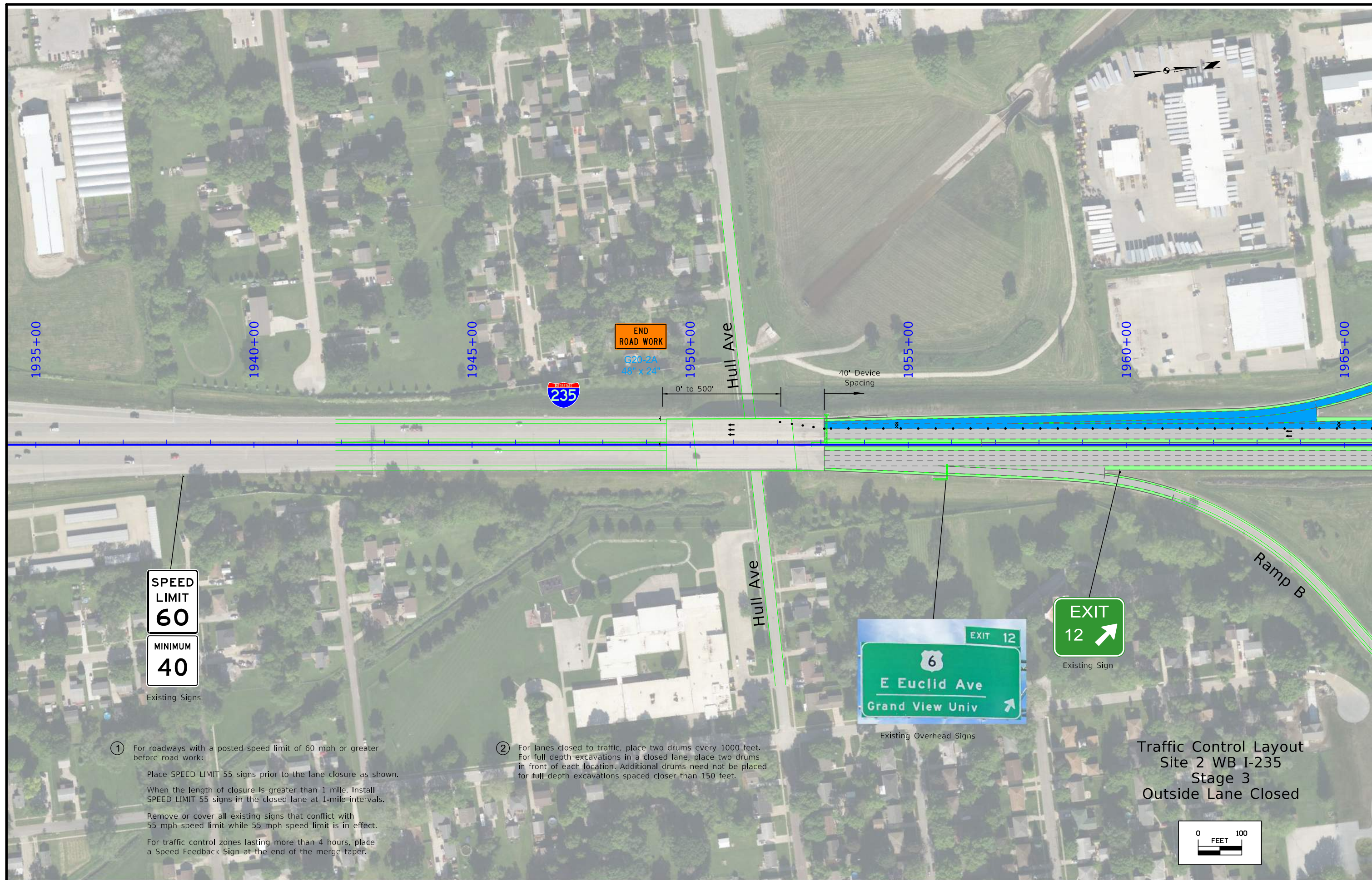
Follow TC-418 for Advanced Warning Sign Placement



Traffic Control Layout  
 Site 2 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane







SPEED LIMIT 60  
MINIMUM 40

Existing Signs

EXIT 12  
6  
E Euclid Ave  
Grand View Univ

Existing Overhead Signs

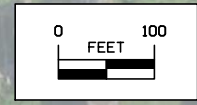
EXIT 12

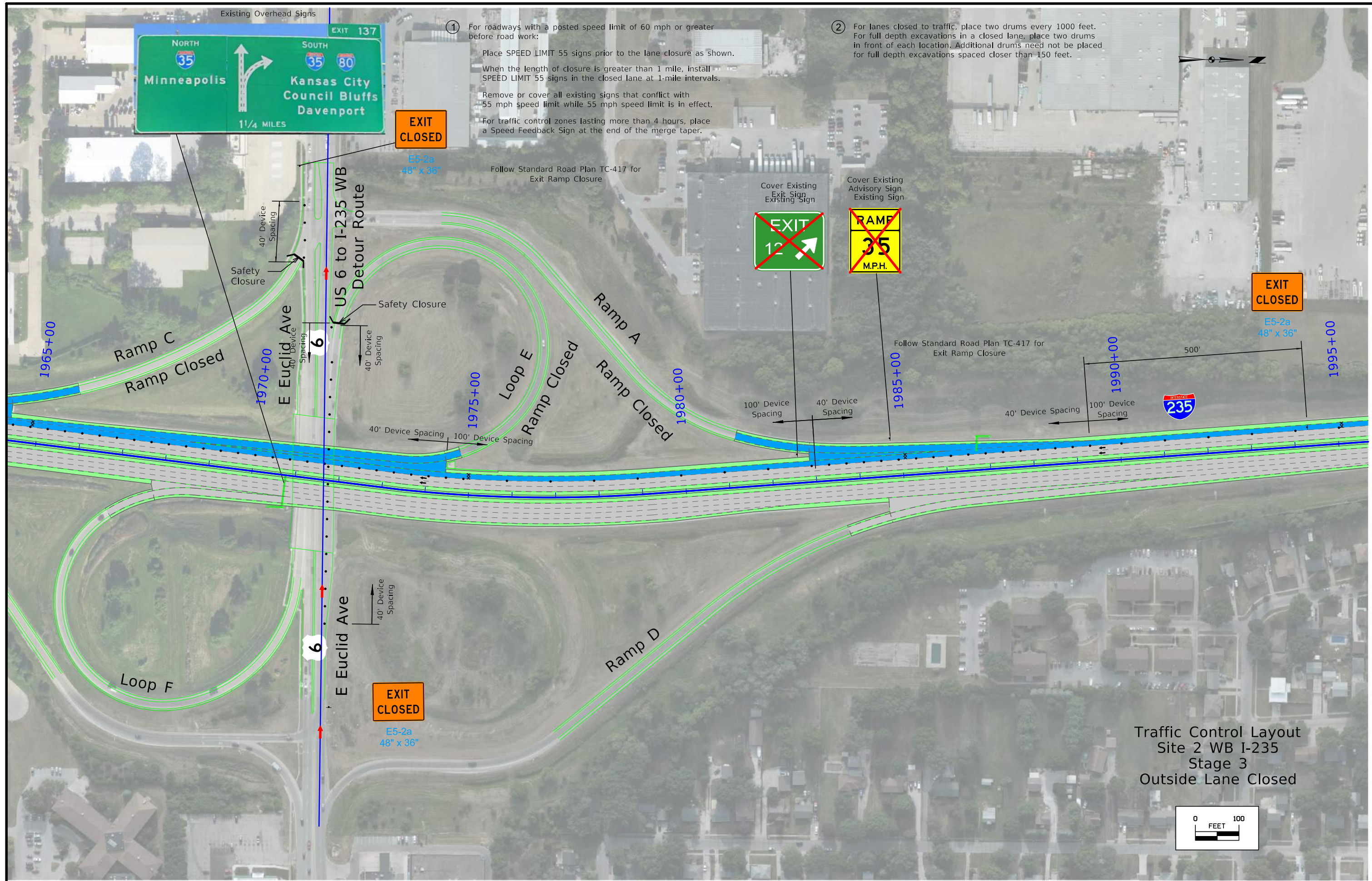
Existing Sign

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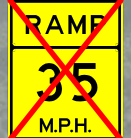
Traffic Control Layout  
Site 2 WB I-235  
Stage 3  
Outside Lane Closed



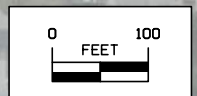


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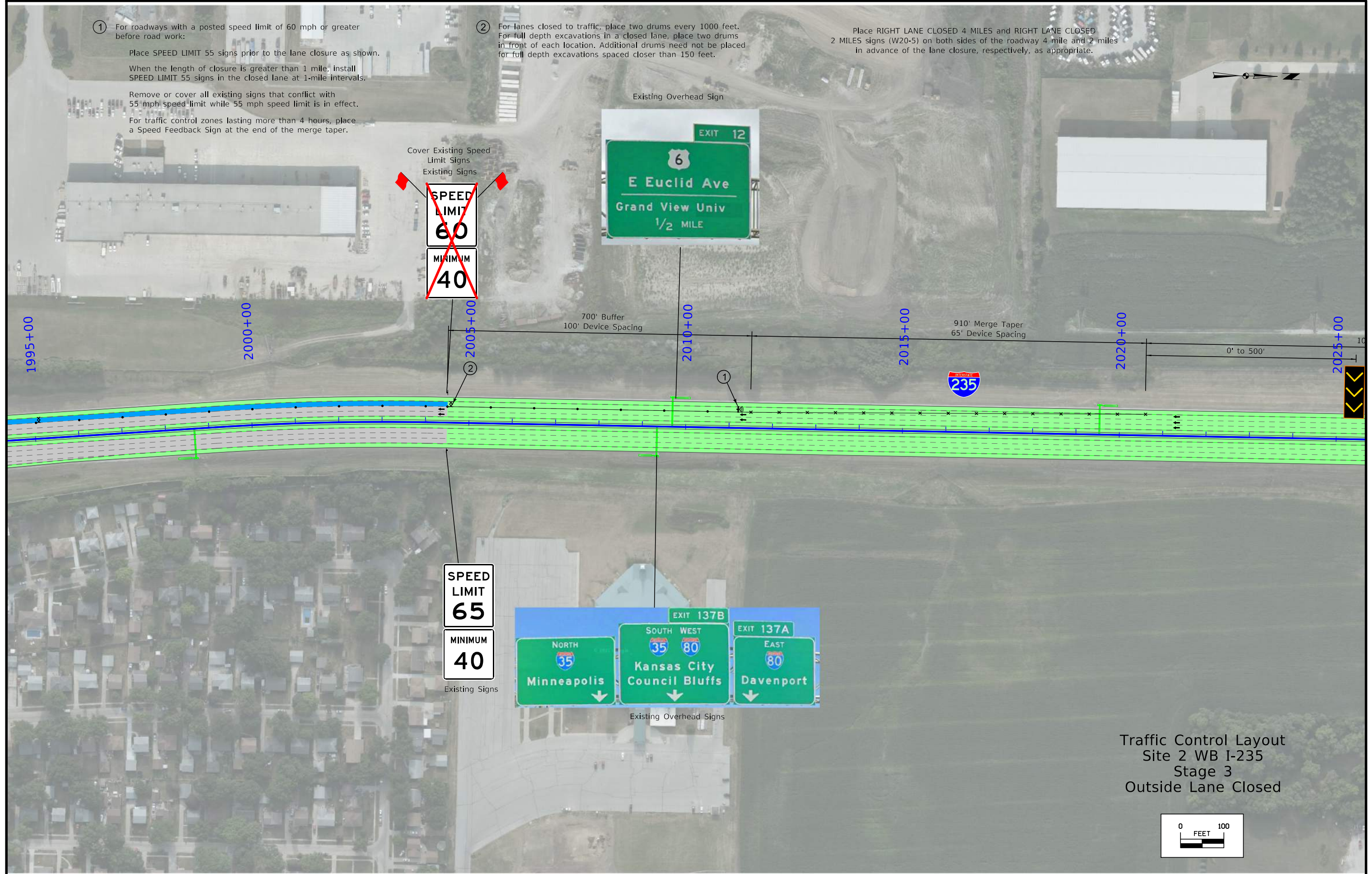
Traffic Control Layout  
 Site 2 WB I-235  
 Stage 3  
 Outside Lane Closed



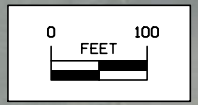
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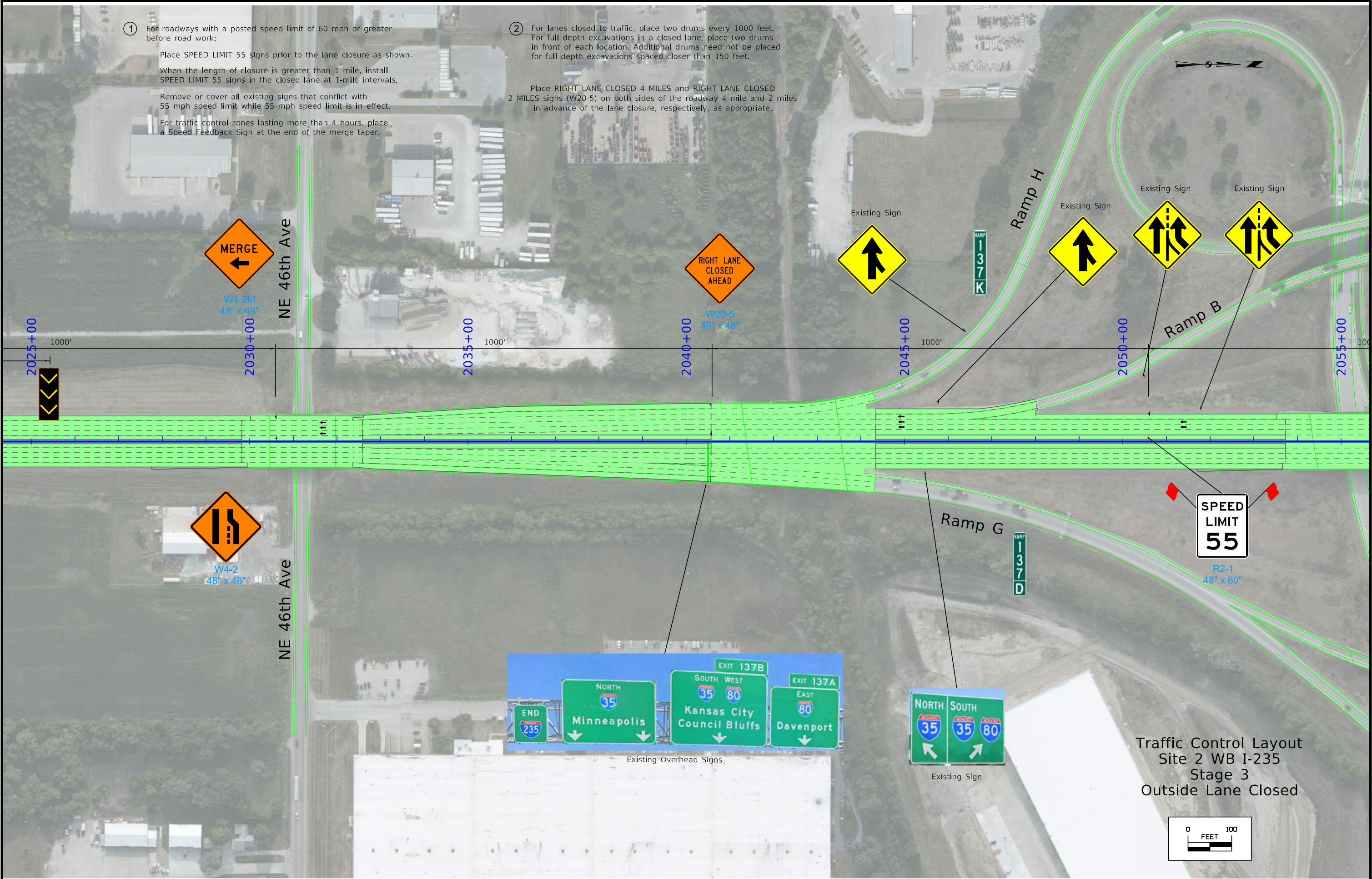


Traffic Control Layout  
 Site 2 WB I-235  
 Stage 3  
 Outside Lane Closed



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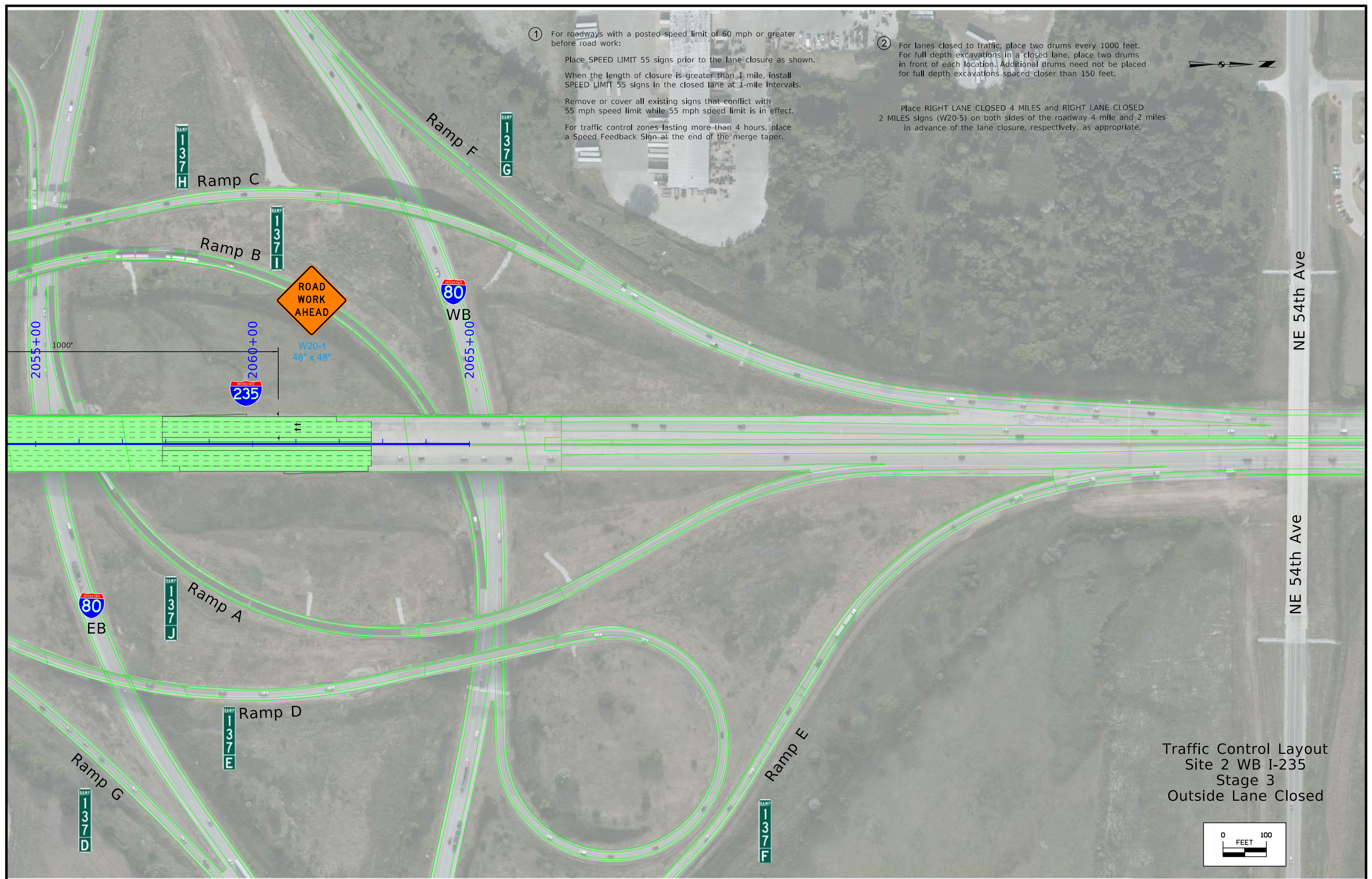
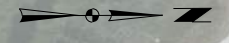
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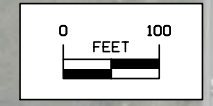
Traffic Control Layout  
 Site 2 WB I-235  
 Stage 3  
 Outside Lane Closed

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Traffic Control Layout  
 Site 2 WB I-235  
 Stage 3  
 Outside Lane Closed



Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



Existing Sign



W20-1  
48" x 48"

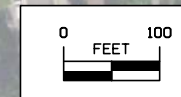


R2-1  
48" x 60"

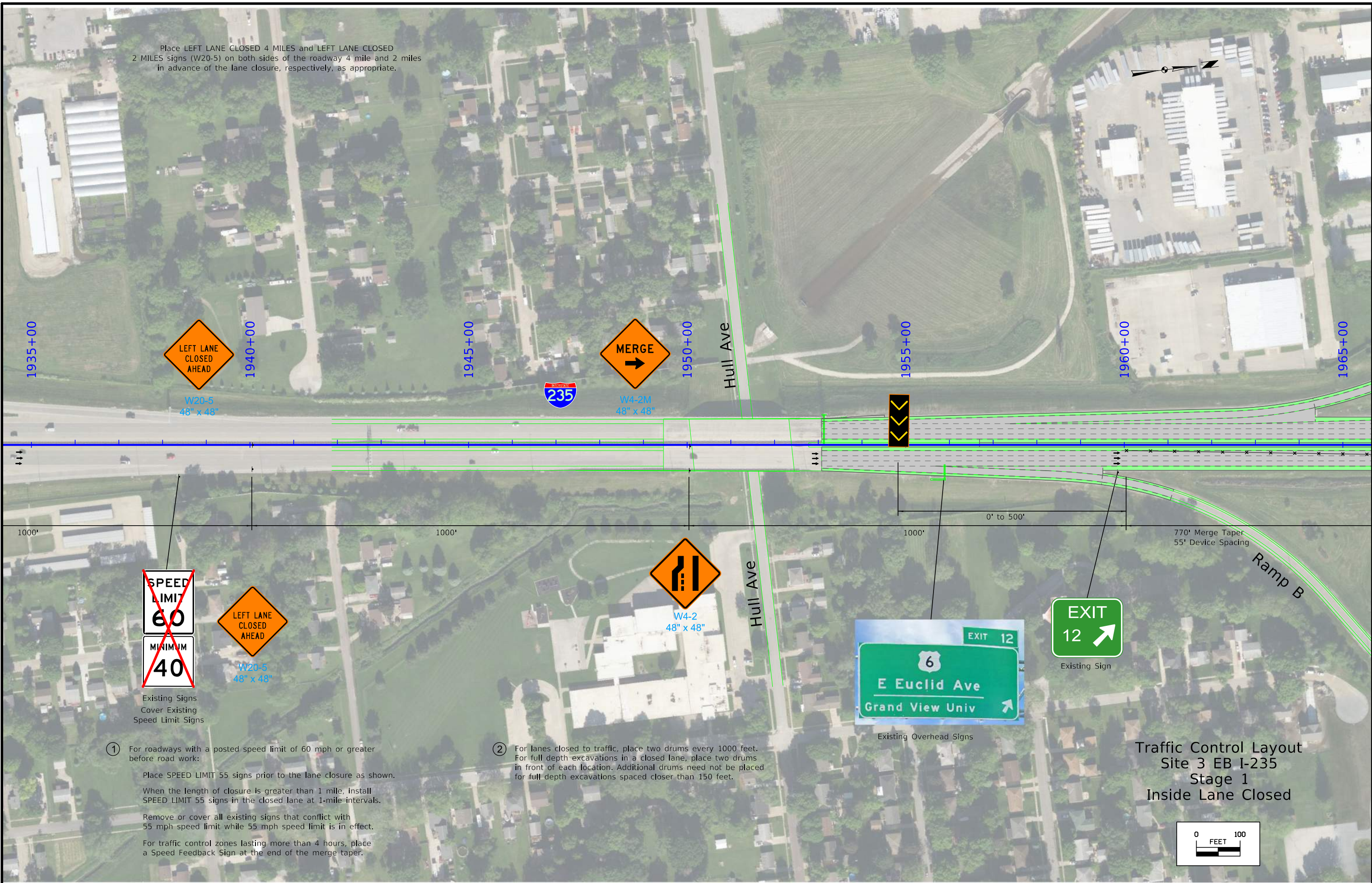
- ① For roadways with a posted speed limit of 60 mph or greater before road work:
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Traffic Control Layout  
Site 3 EB I-235  
Stage 1  
Inside Lane Closed



Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



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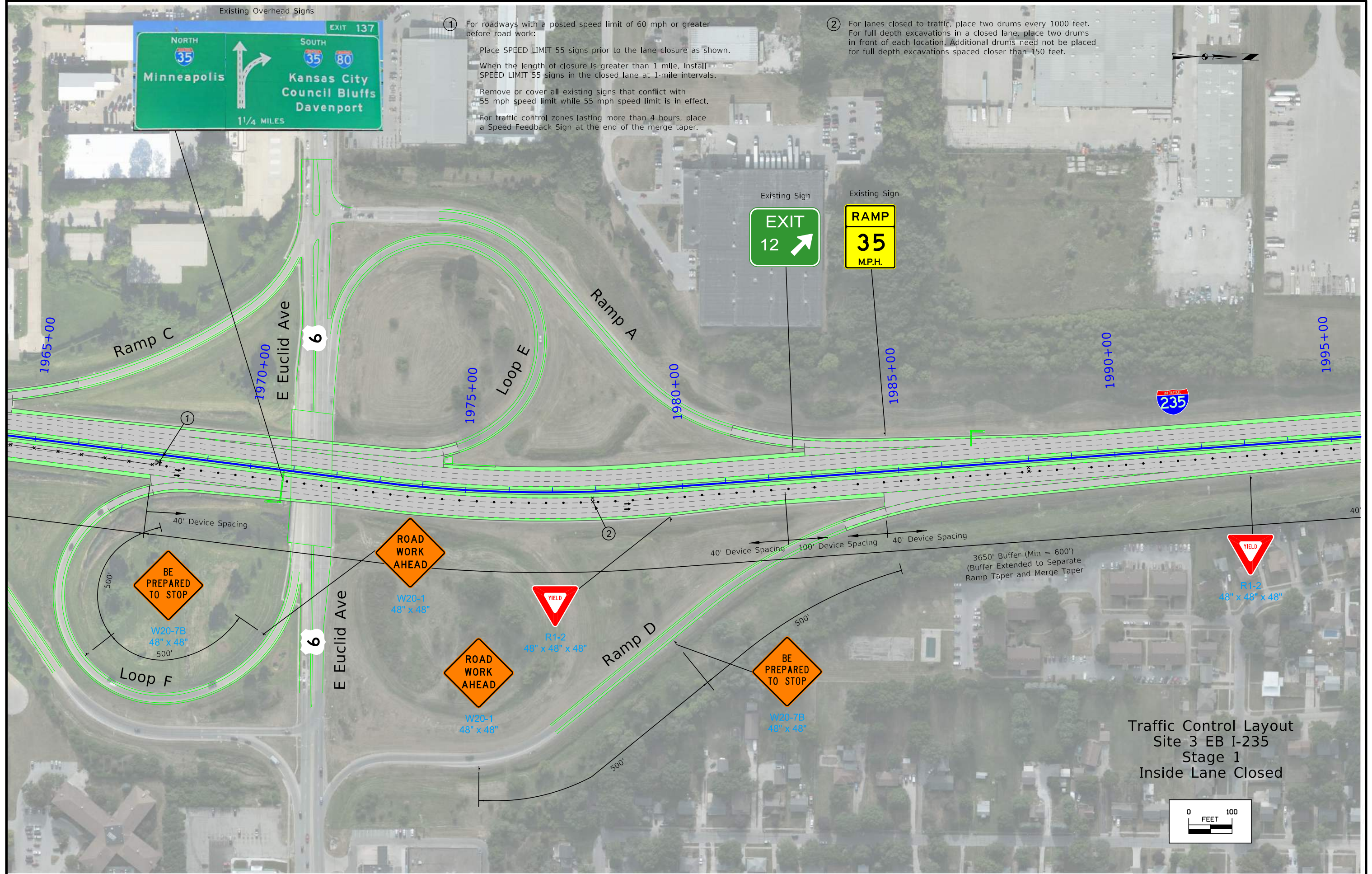
Traffic Control Layout  
 Site 3 EB I-235  
 Stage 1  
 Inside Lane Closed

Existing Overhead Signs

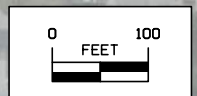


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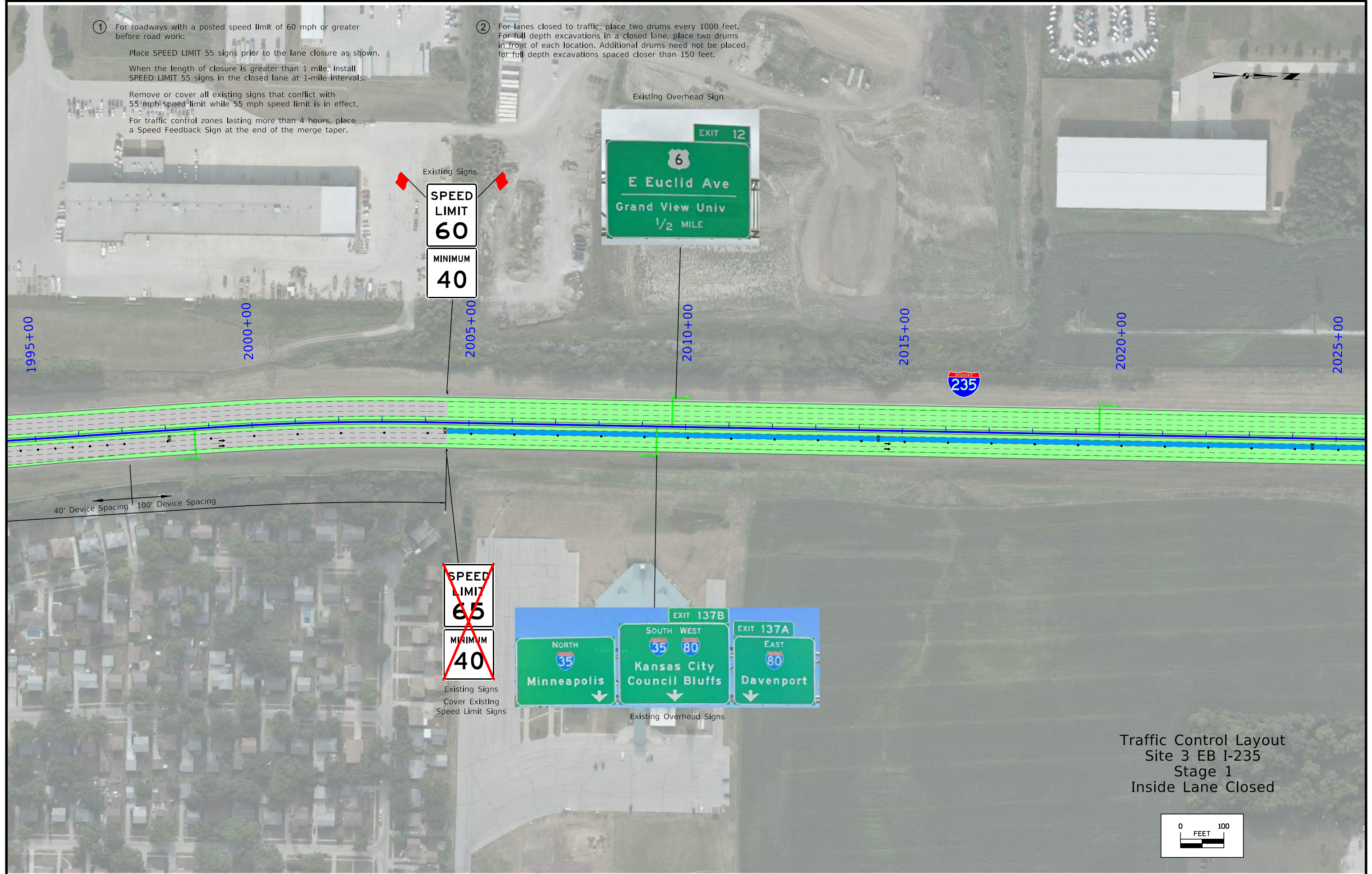
Traffic Control Layout  
 Site 3 EB I-235  
 Stage 1  
 Inside Lane Closed



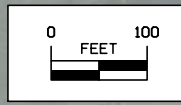


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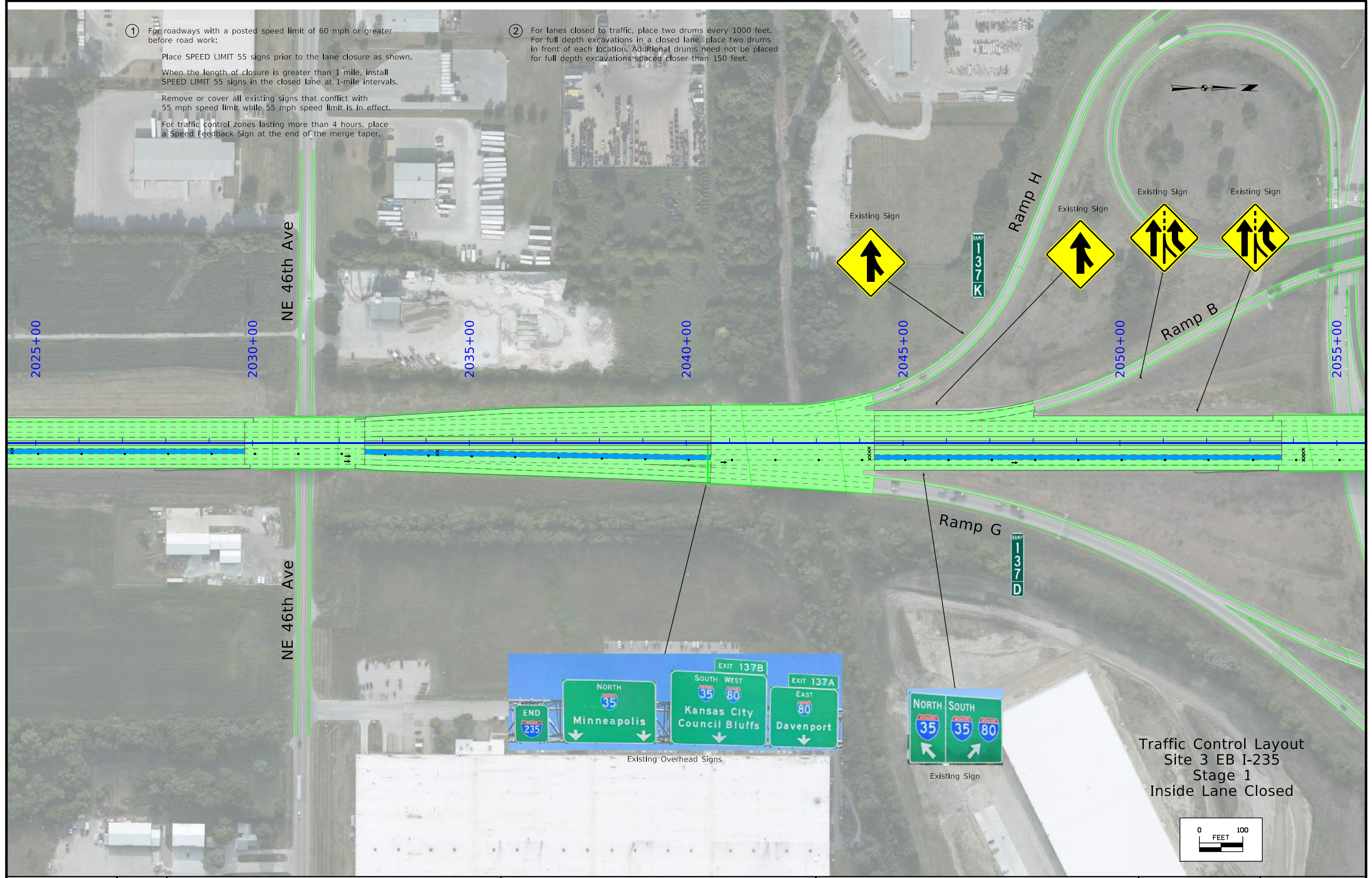


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 1  
 Inside Lane Closed

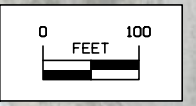


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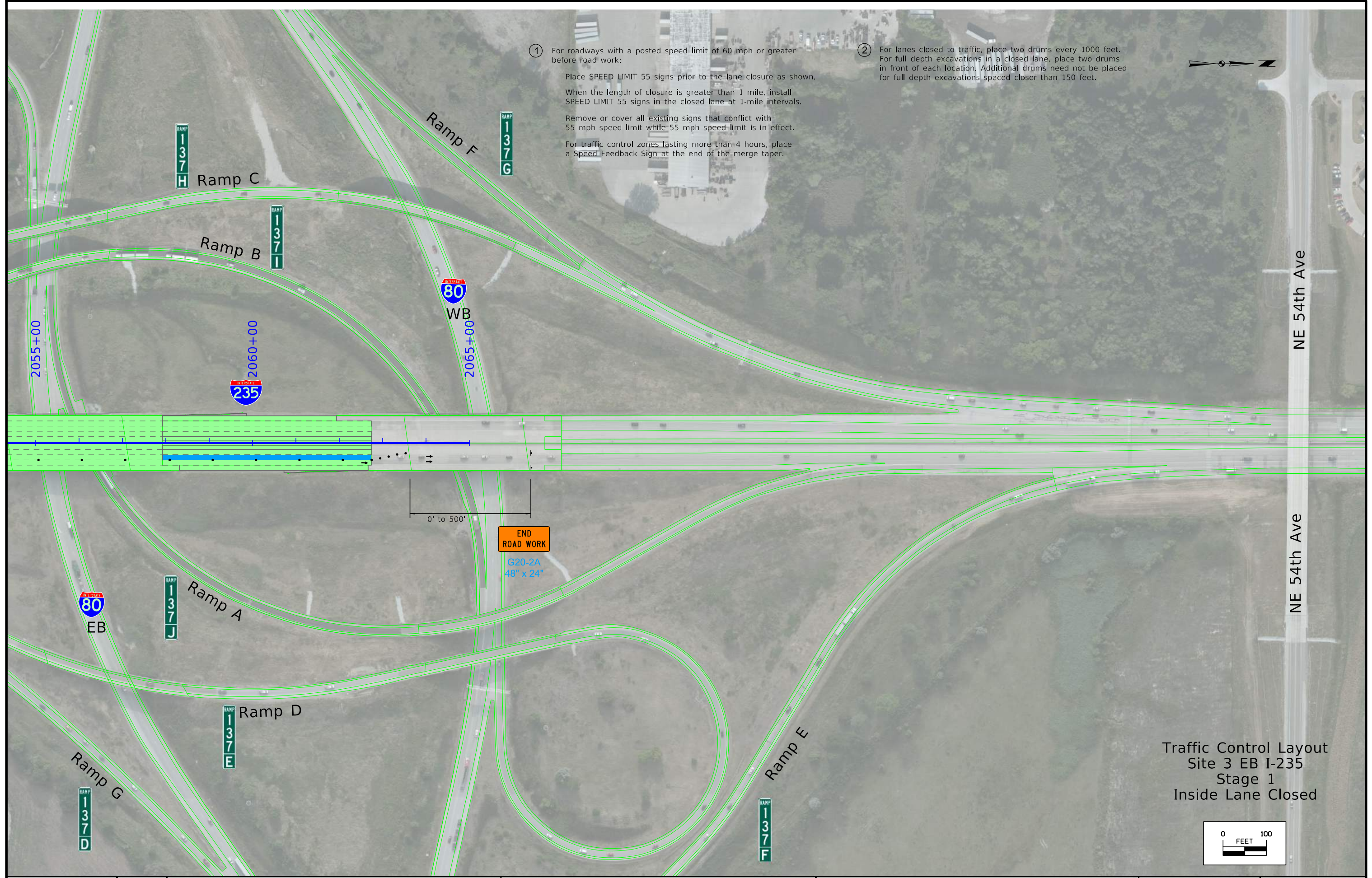
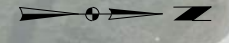


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 1  
 Inside Lane Closed

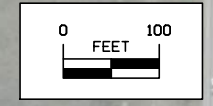


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Traffic Control Layout  
 Site 3 EB I-235  
 Stage 1  
 Inside Lane Closed





Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

Follow Standard Road Plan TC-422 for Advance Warning Signs placement

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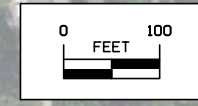
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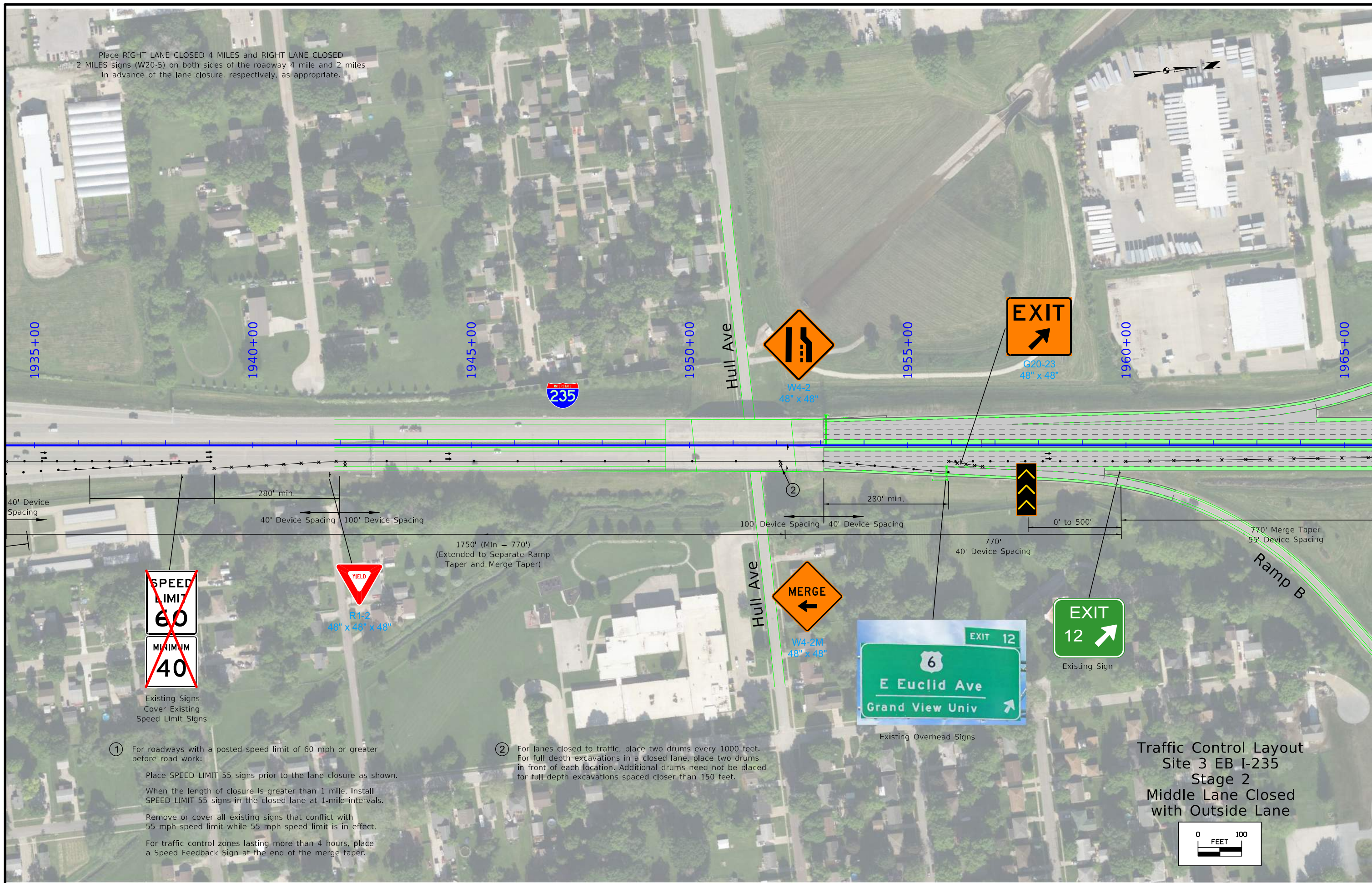
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Traffic Control Layout  
 Site 3 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Outside Lane



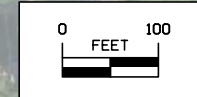
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Traffic Control Layout  
 Site 3 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Outside Lane

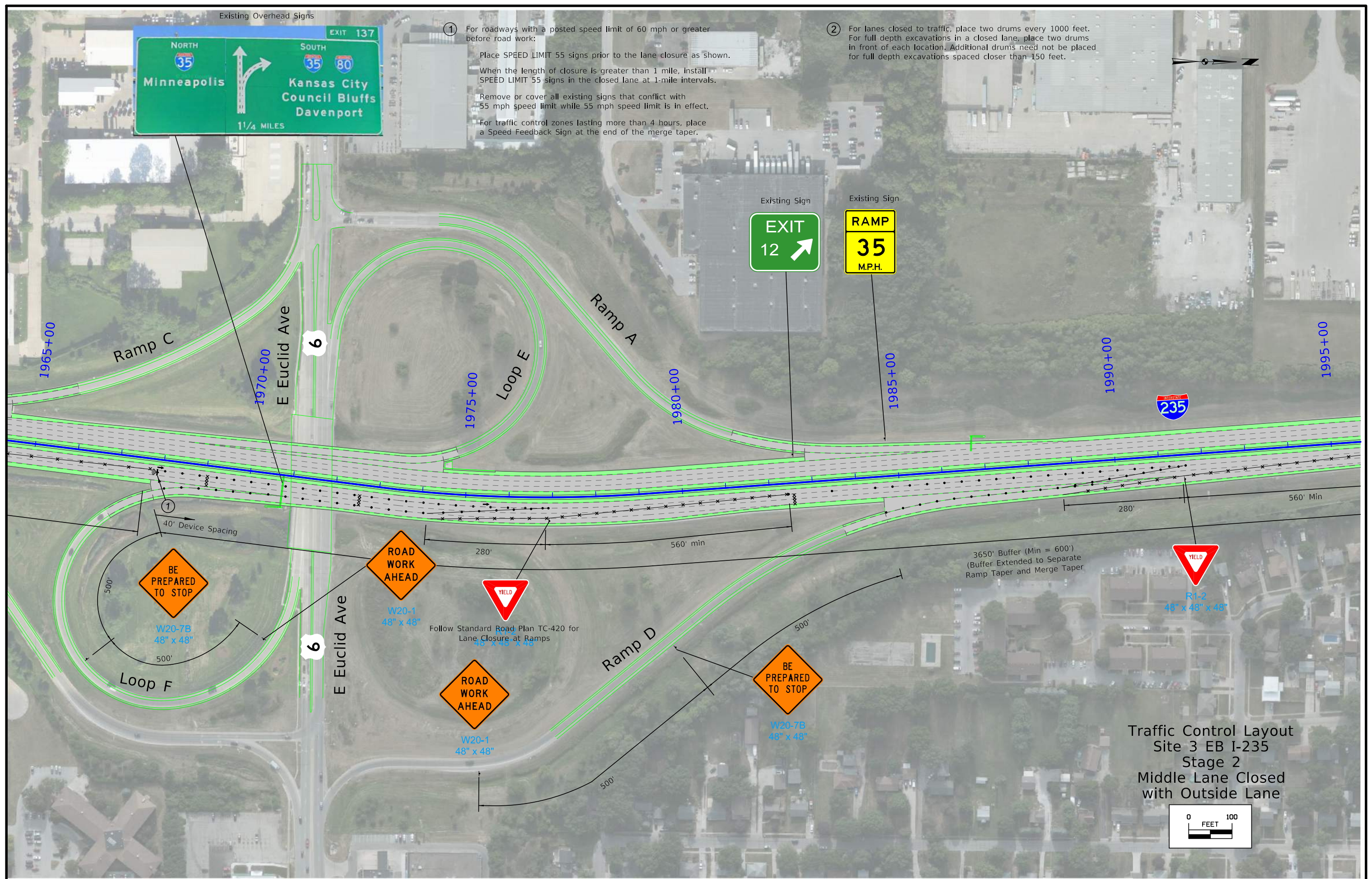


Existing Overhead Signs

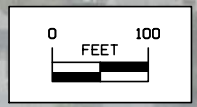


- ① For roadways with a posted speed limit of 60 mph or greater before road work:  
Place SPEED LIMIT 55 signs prior to the lane closure as shown.  
When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.  
Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.  
For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

- ② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

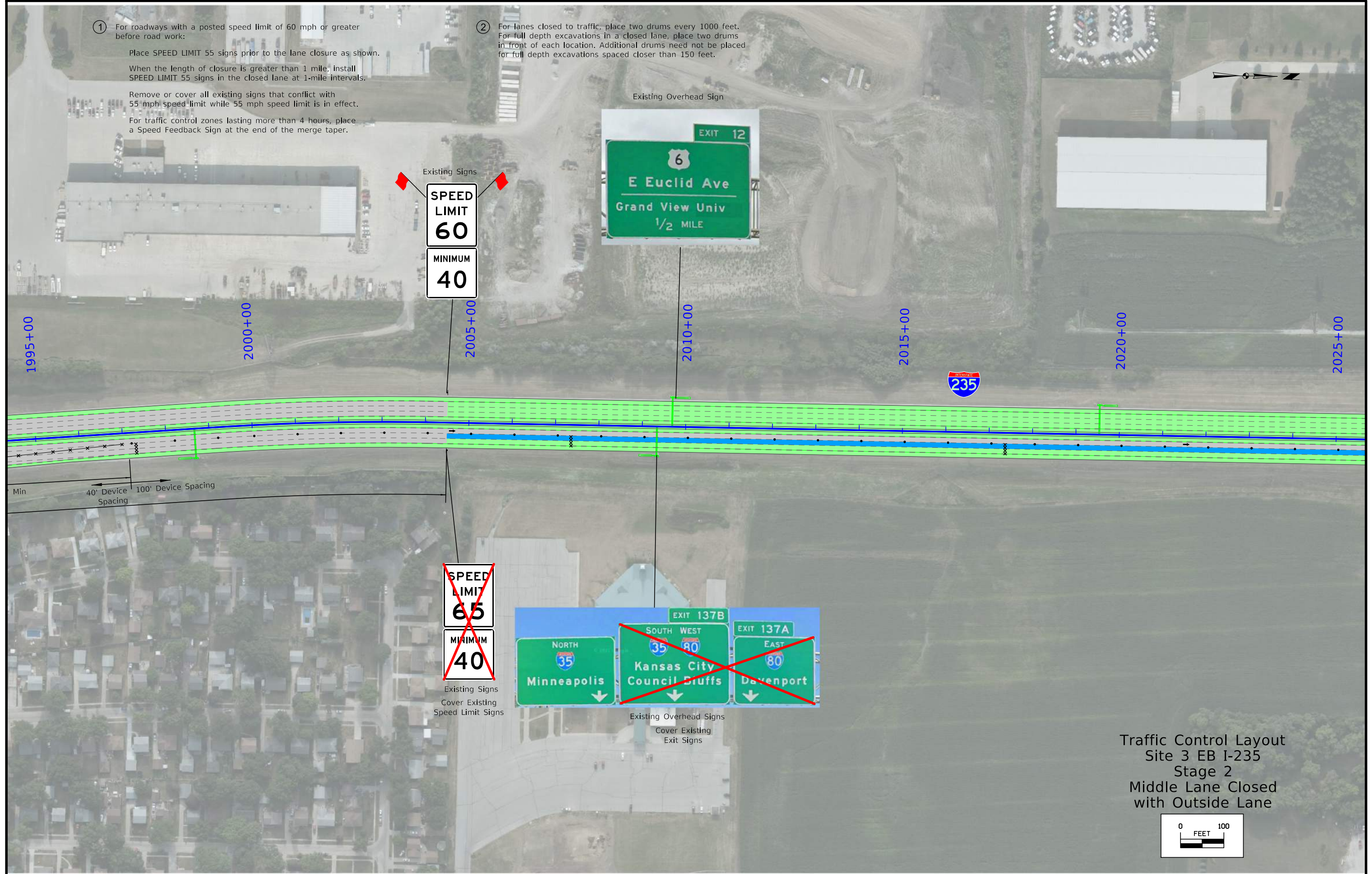


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Outside Lane

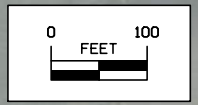


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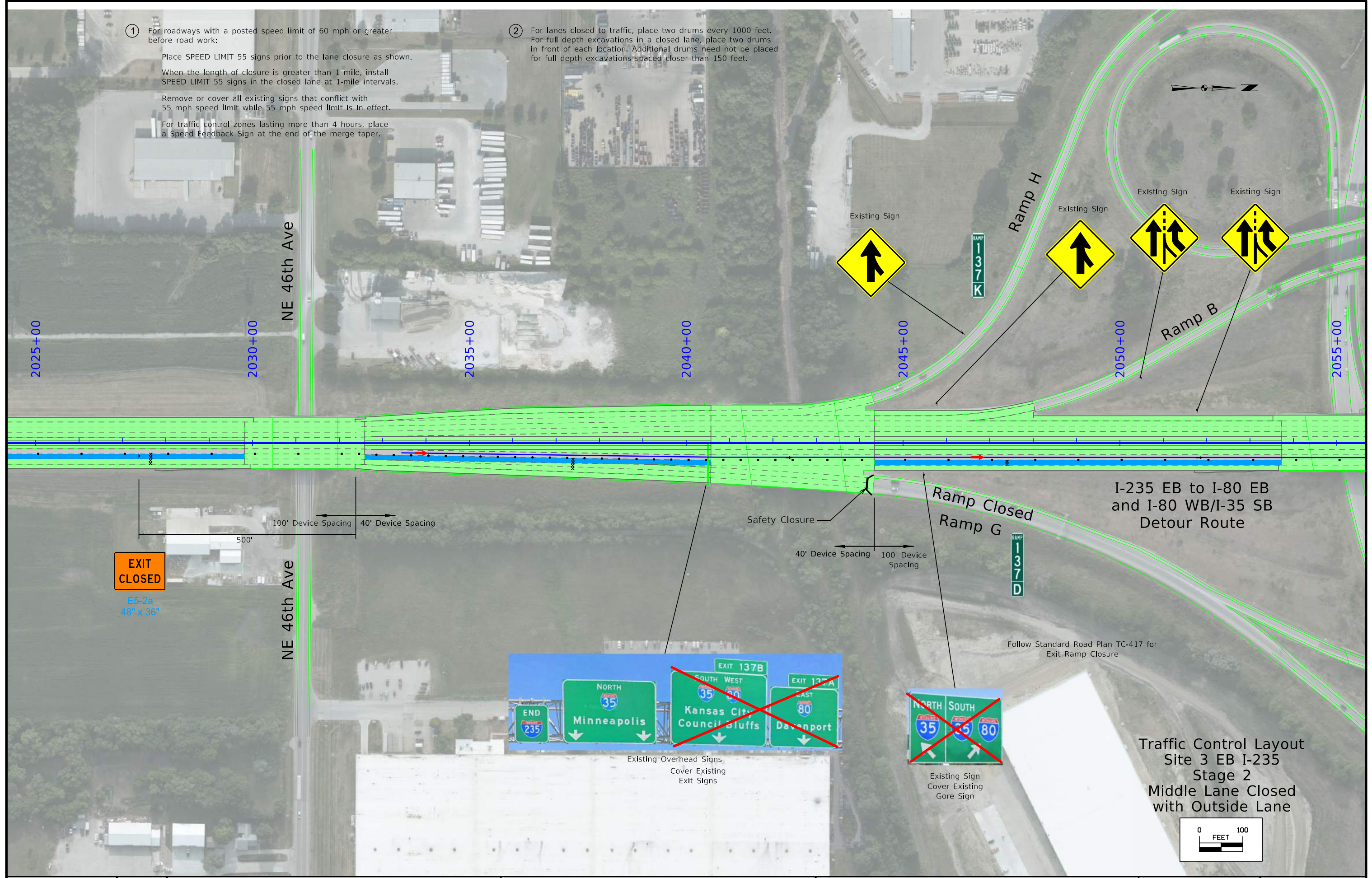


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Outside Lane



① For roadways with a posted speed limit of 60 mph or greater before road work:  
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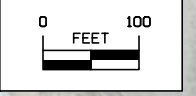


I-235 EB to I-80 EB and I-80 WB/I-35 SB Detour Route

**EXIT CLOSED**  
 E5-2a  
 48" x 36"

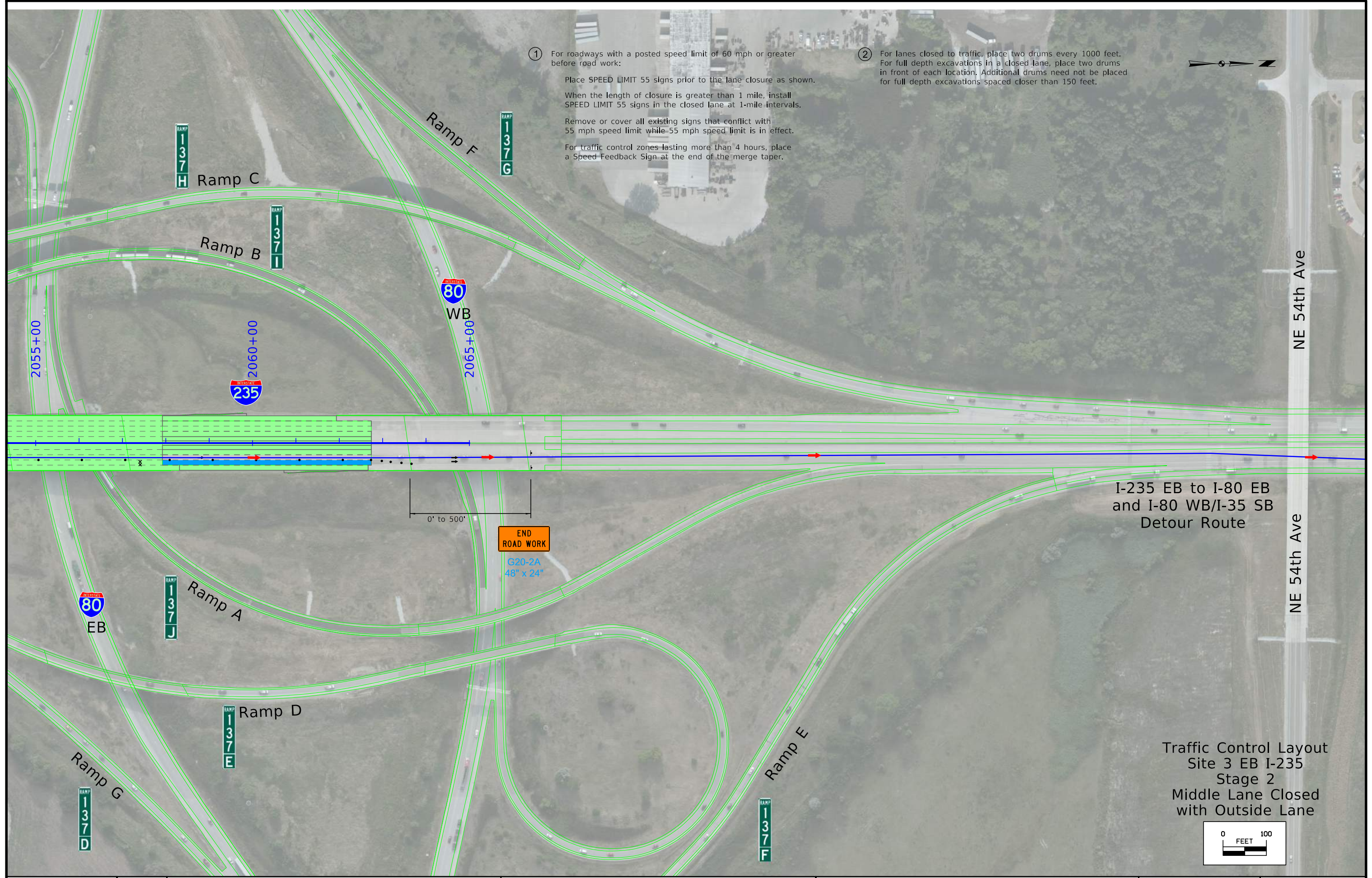
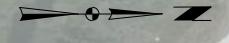


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 2  
 Middle Lane Closed  
 with Outside Lane



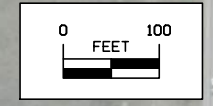


- ① For roadways with a posted speed limit of 60 mph or greater before road work:  
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For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.
- ② For lanes closed to traffic, place two drums every 1000 feet.  
For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.



I-235 EB to I-80 EB  
and I-80 WB/I-35 SB  
Detour Route

Traffic Control Layout  
Site 3 EB I-235  
Stage 2  
Middle Lane Closed  
with Outside Lane

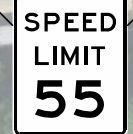




Existing Sign



W20-1  
48" x 48"



R2-1  
48" x 60"

Guthrie Ave

Guthrie Ave

1935+00

1000'

1000'



Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

Follow Standard Road Plan TC-418 for Advance Warning Signs placement

① For roadways with a posted speed limit of 60 mph or greater before road work:

Place SPEED LIMIT 55 signs prior to the lane closure as shown.

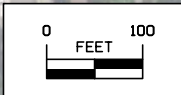
When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.

Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.

For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

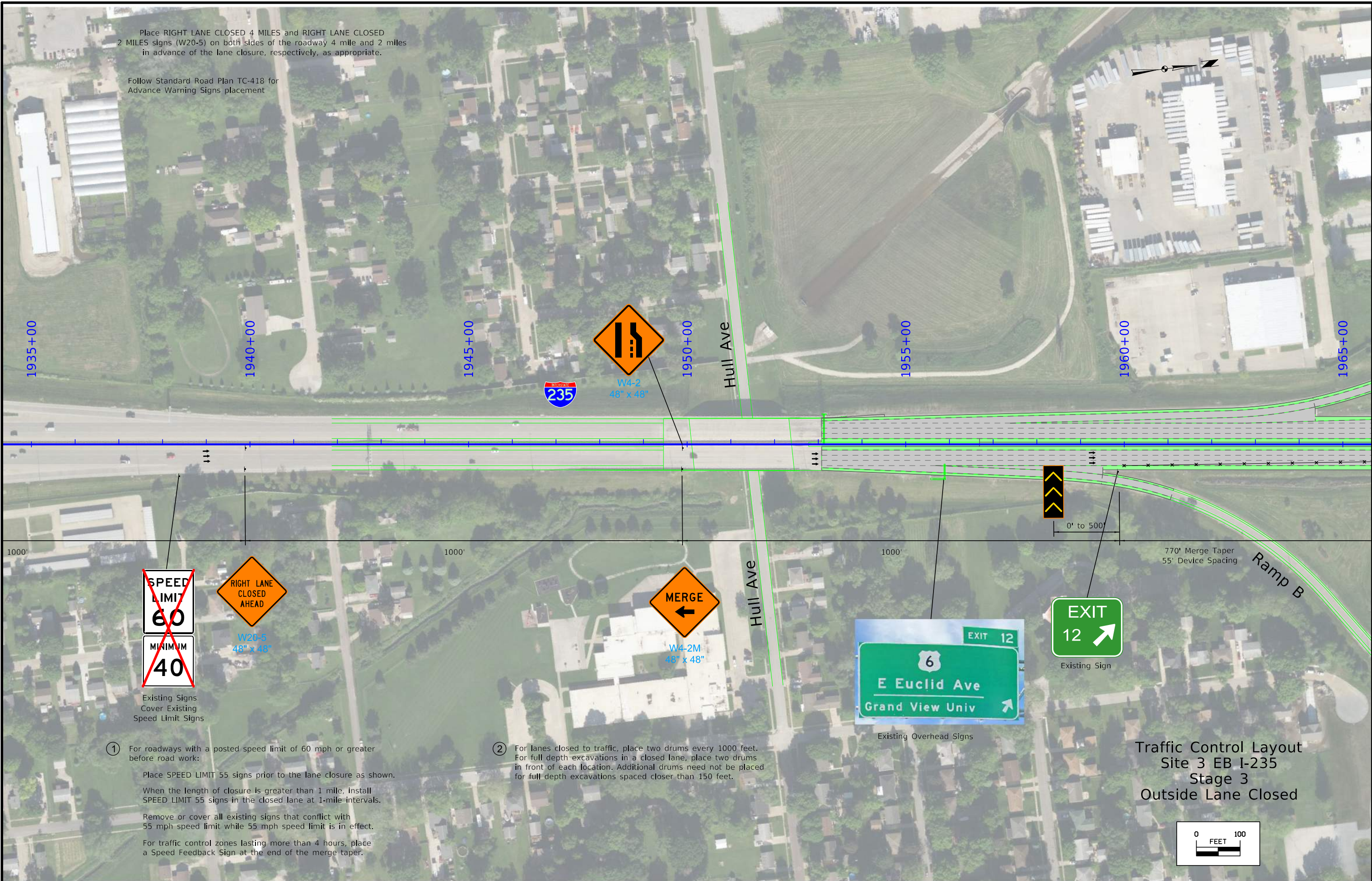
② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Traffic Control Layout  
Site 3 EB I-235  
Stage 3  
Outside Lane Closed



Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

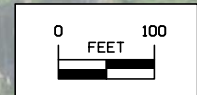
Follow Standard Road Plan TC-418 for Advance Warning Signs placement



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For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

- For lanes closed to traffic, place two drums every 1000 feet.  
For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Traffic Control Layout  
Site 3 EB I-235  
Stage 3  
Outside Lane Closed

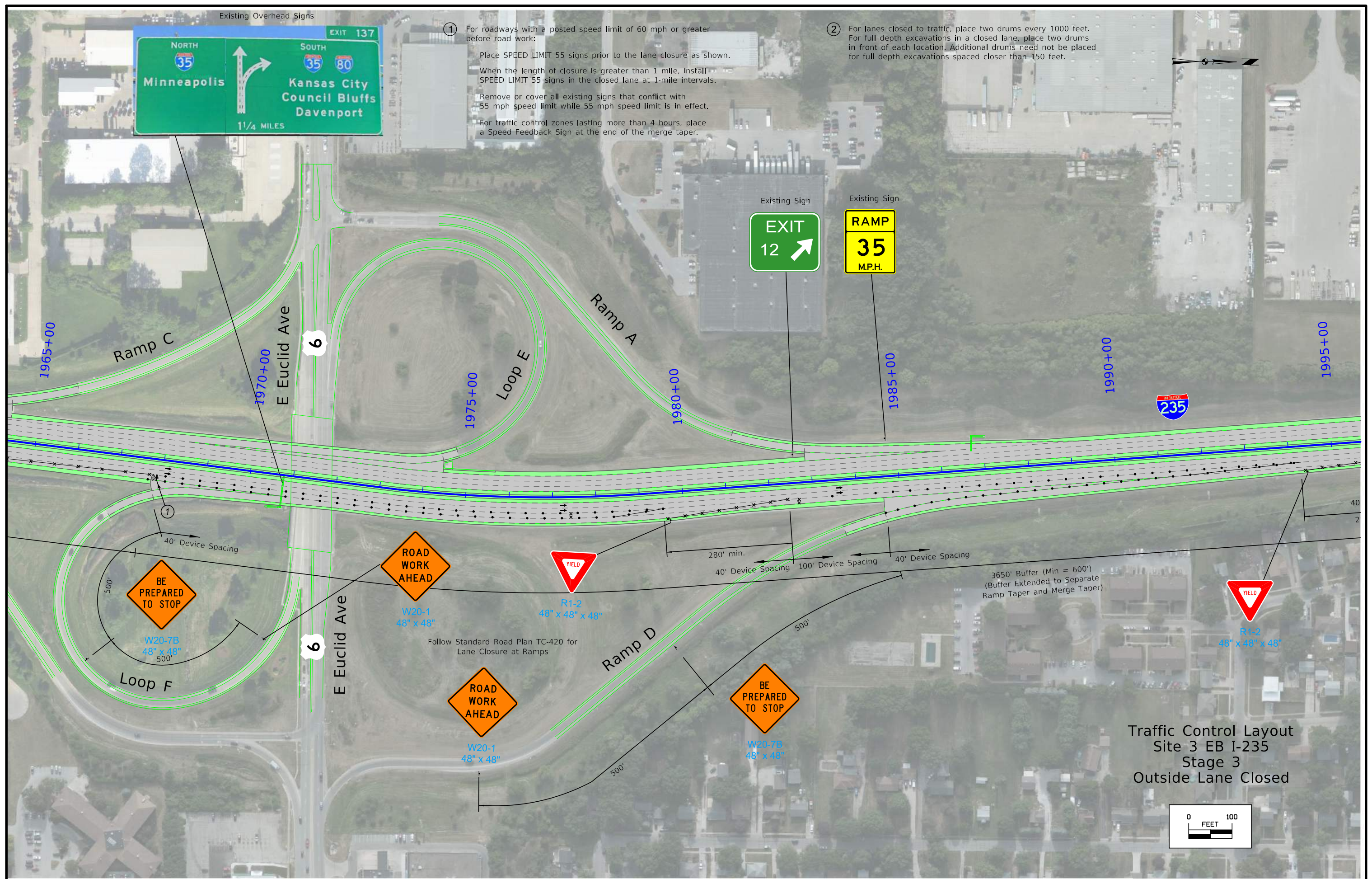


Existing Overhead Signs

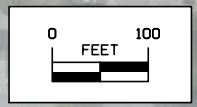


- ① For roadways with a posted speed limit of 60 mph or greater before road work:  
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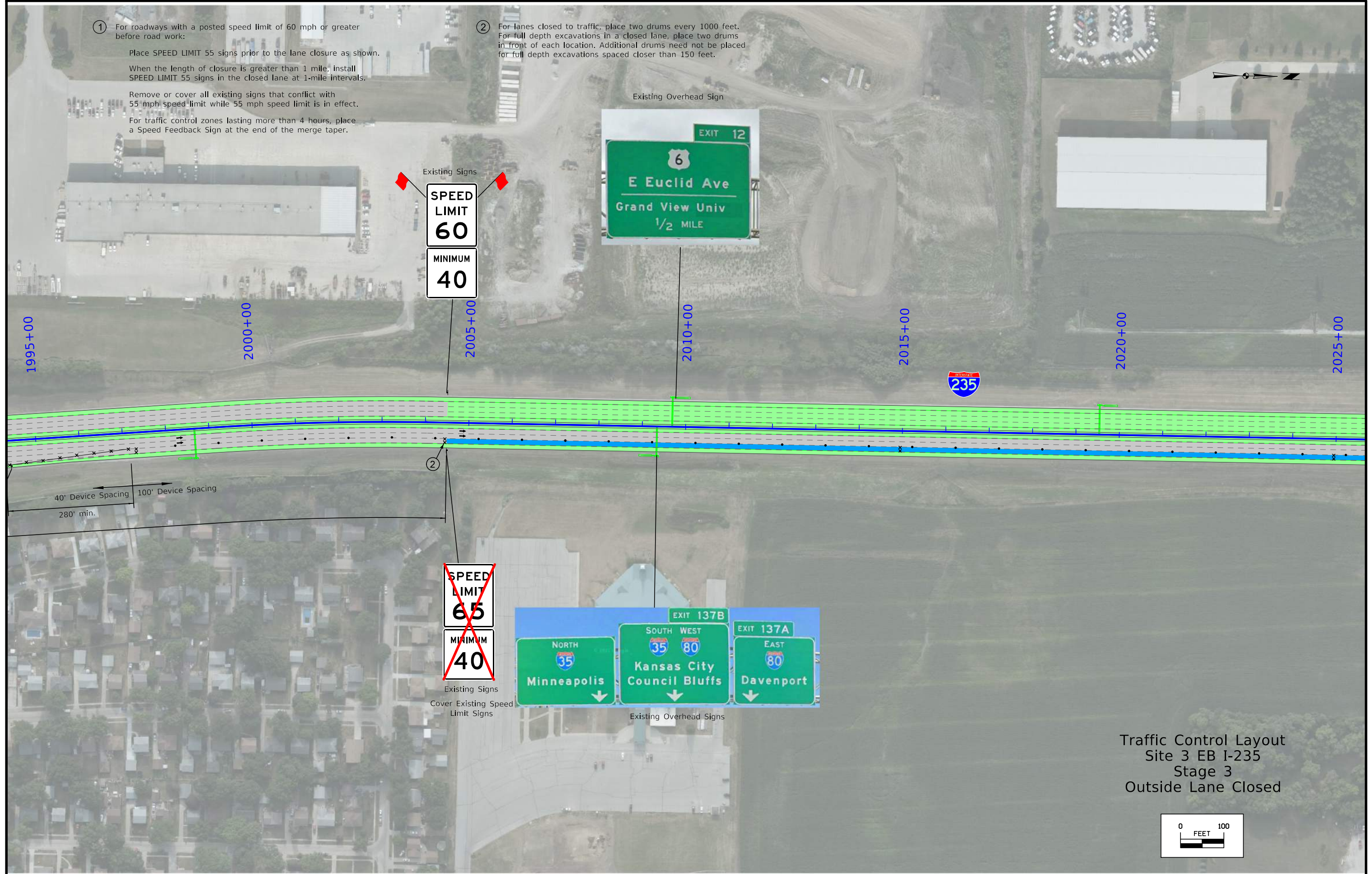


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 3  
 Outside Lane Closed

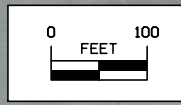


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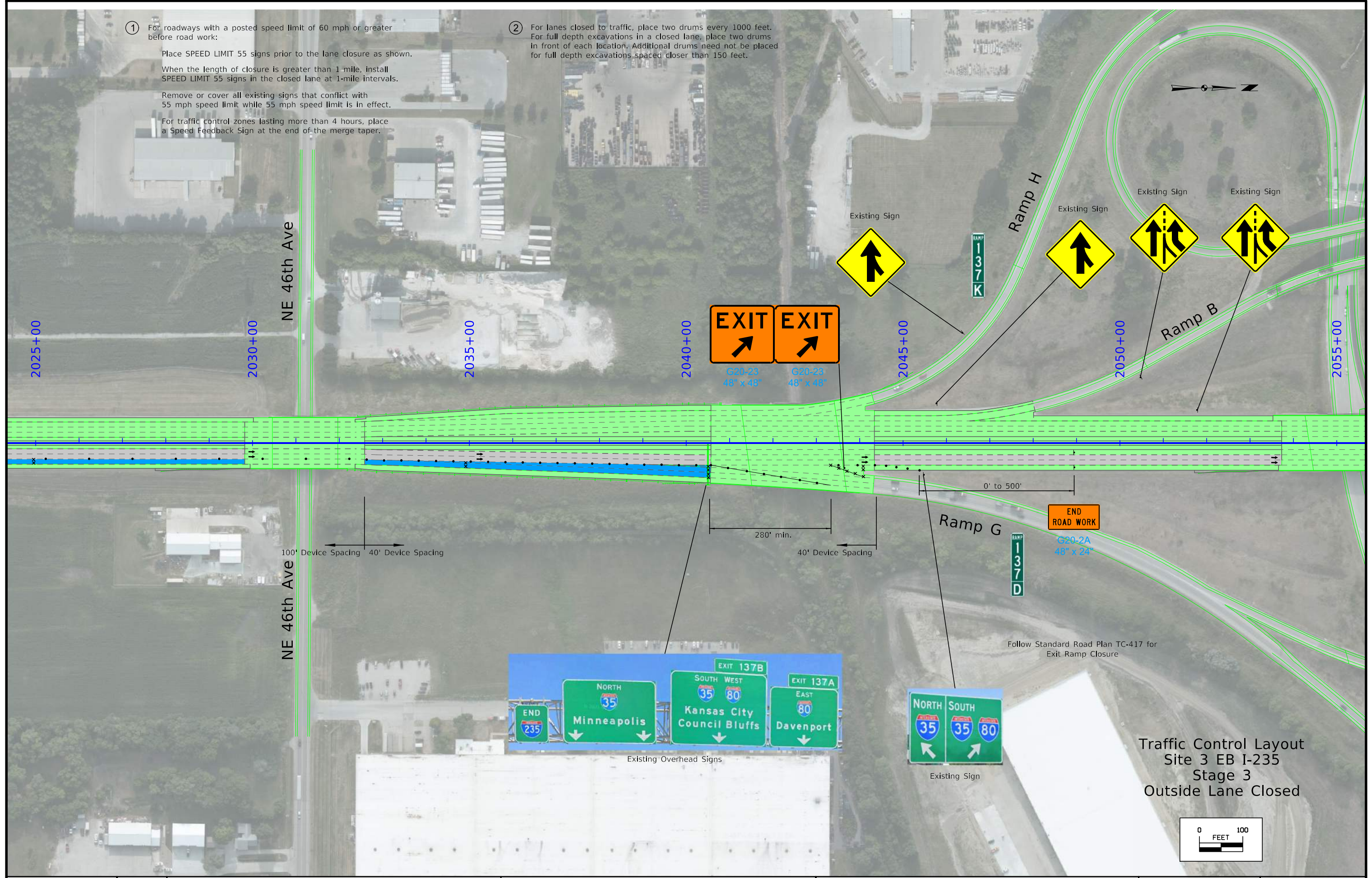


Traffic Control Layout  
 Site 3 EB I-235  
 Stage 3  
 Outside Lane Closed



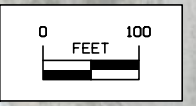
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Follow Standard Road Plan TC-417 for Exit Ramp Closure

Traffic Control Layout  
 Site 3 EB I-235  
 Stage 3  
 Outside Lane Closed



① For roadways with a posted speed limit of 60 mph or greater before road work:

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Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.

For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Cover Existing Speed Limit Signs  
Existing Signs



Existing Overhead Sign



1995+00

END ROAD WORK

G20-2A  
48" x 24"

2000+00

0' to 500'

2005+00

40' Device Spacing

2010+00

2015+00

2020+00

2025+00

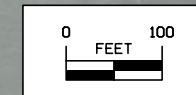


Existing Signs

Existing Overhead Signs

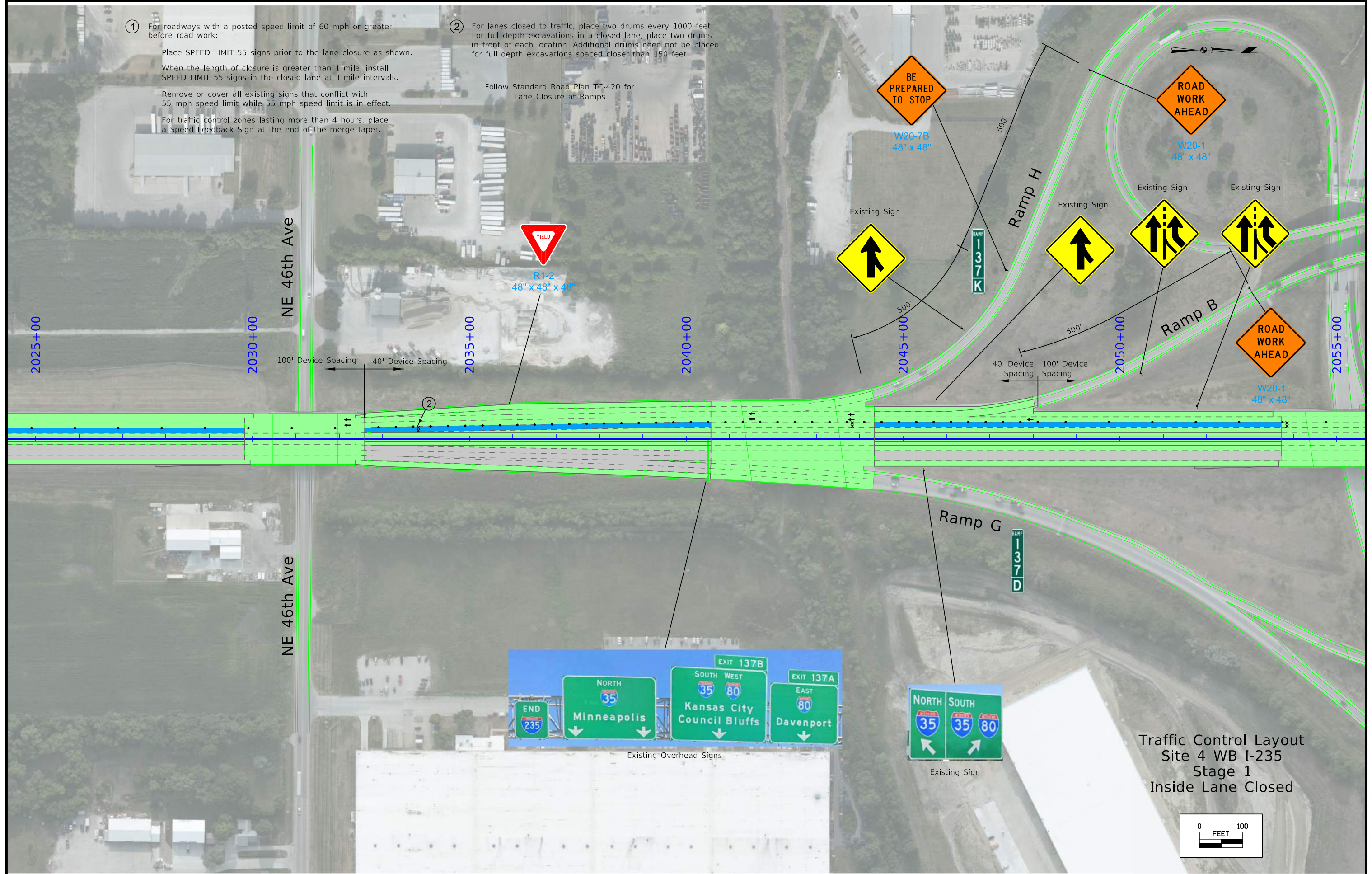


Traffic Control Layout  
Site 4 WB I-235  
Stage 1  
Inside Lane Closed

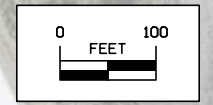


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 Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.  
 For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.  
 Follow Standard Road Plan TC-420 for Lane Closure at Ramps



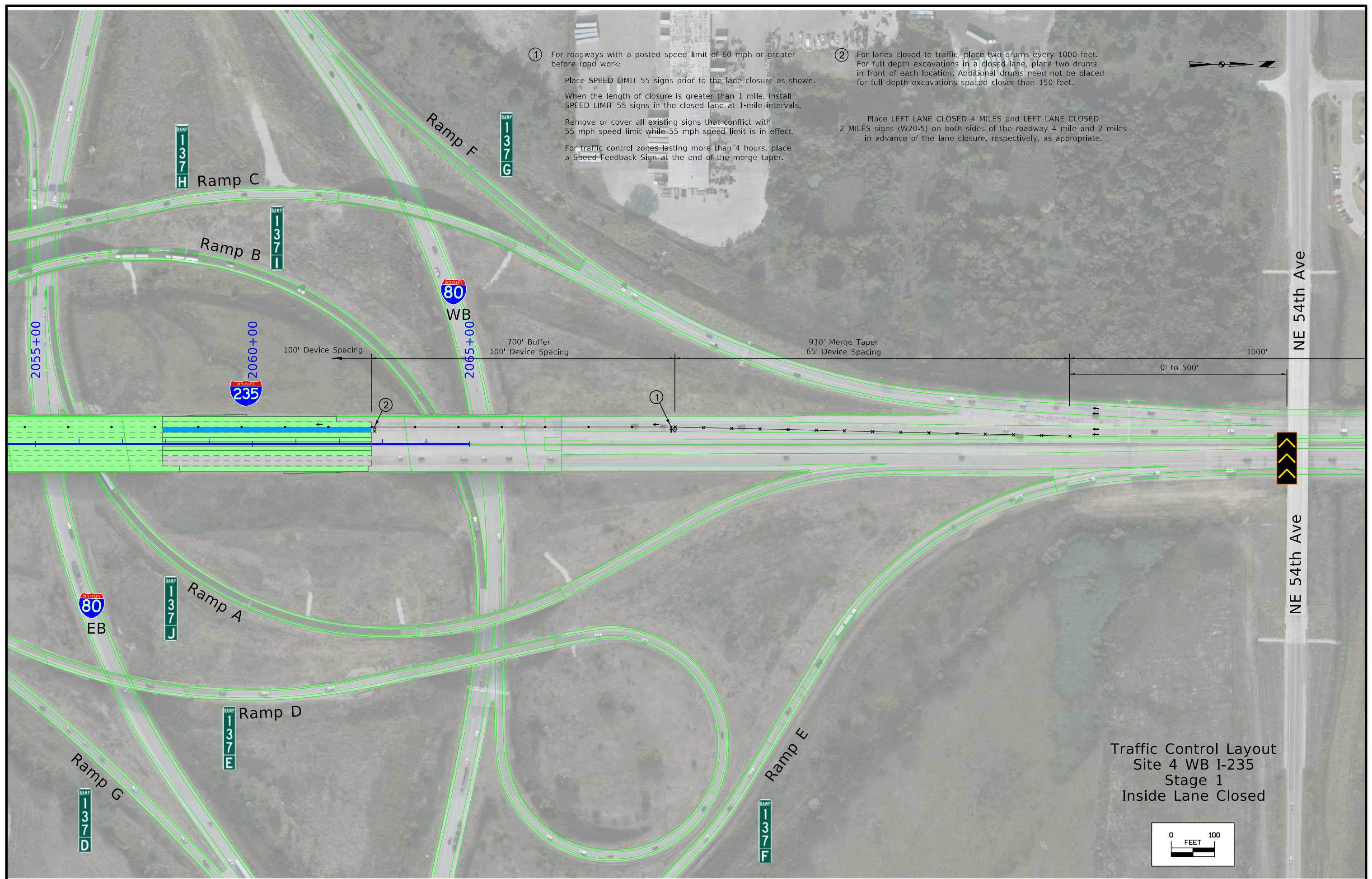
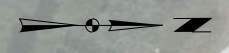
Traffic Control Layout  
 Site 4 WB I-235  
 Stage 1  
 Inside Lane Closed



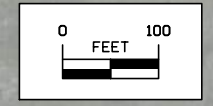


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 For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.  
 Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



Traffic Control Layout  
 Site 4 WB I-235  
 Stage 1  
 Inside Lane Closed



Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

Follow Standard Road Plan TC-418 for Advance Warning Signs placement



W4-2  
48" x 48"



W4-2M  
48" x 48"



W20-5  
48" x 48"

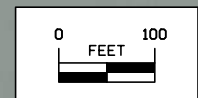


R2-1  
48" x 60"

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Traffic Control Layout  
Site 4 WB I-235  
Stage 1  
Inside Lane Closed



① For roadways with a posted speed limit of 60 mph or greater before road work:

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Existing Overhead Sign



Cover Existing Speed Limit Signs Existing Signs



2005+00

2010+00

2015+00

2020+00

2025+00

END ROAD WORK

G20-2A  
48" x 24"

2000+00

0' to 500'

40' Device Spacing

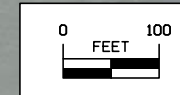


Existing Signs

Existing Overhead Signs

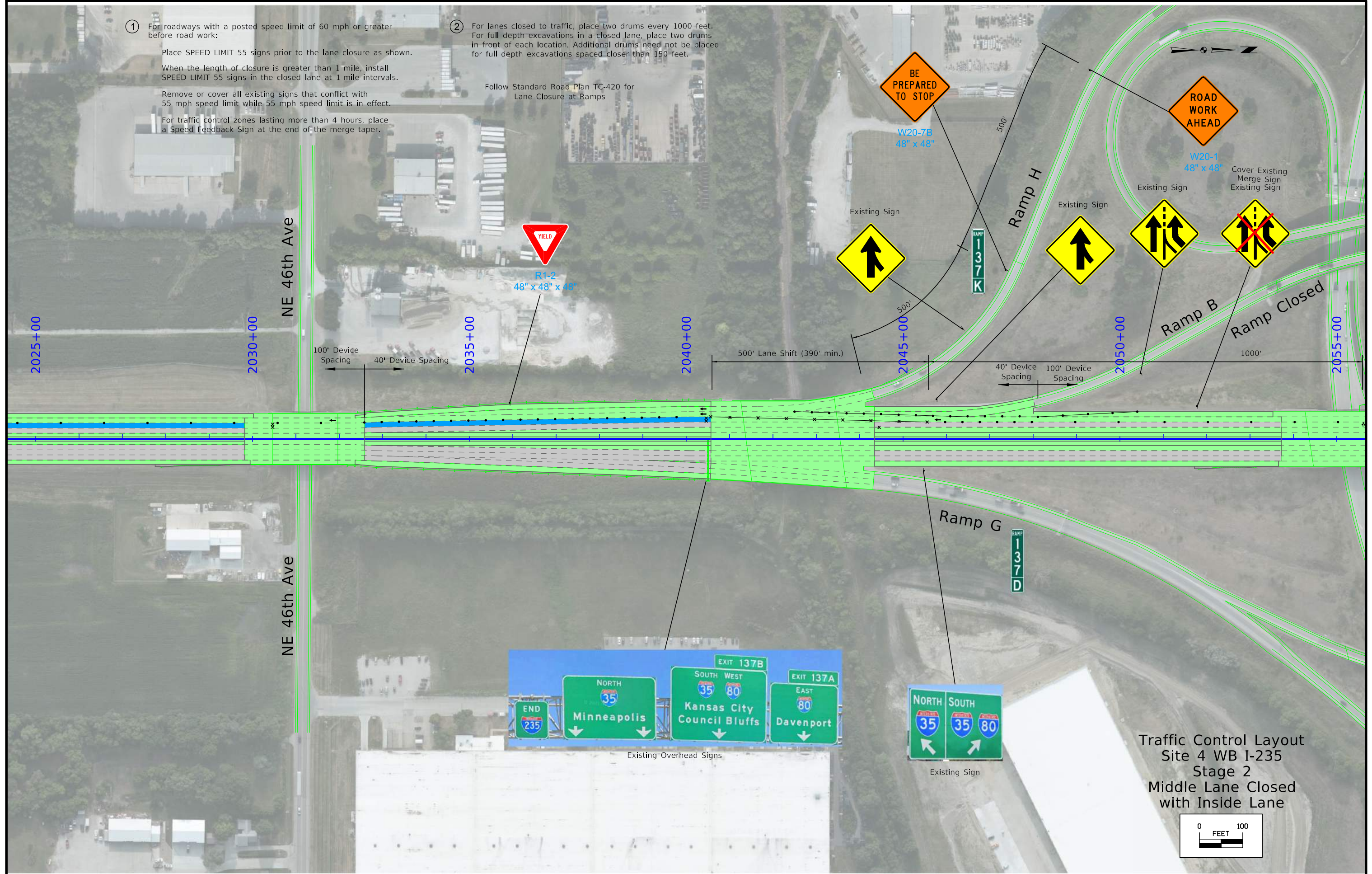


Traffic Control Layout  
Site 4 WB I-235  
Stage 2  
Middle Lane Closed  
with Inside Lane

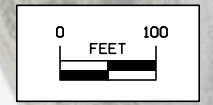


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 Follow Standard Road Plan TC-420 for Lane Closure at Ramps

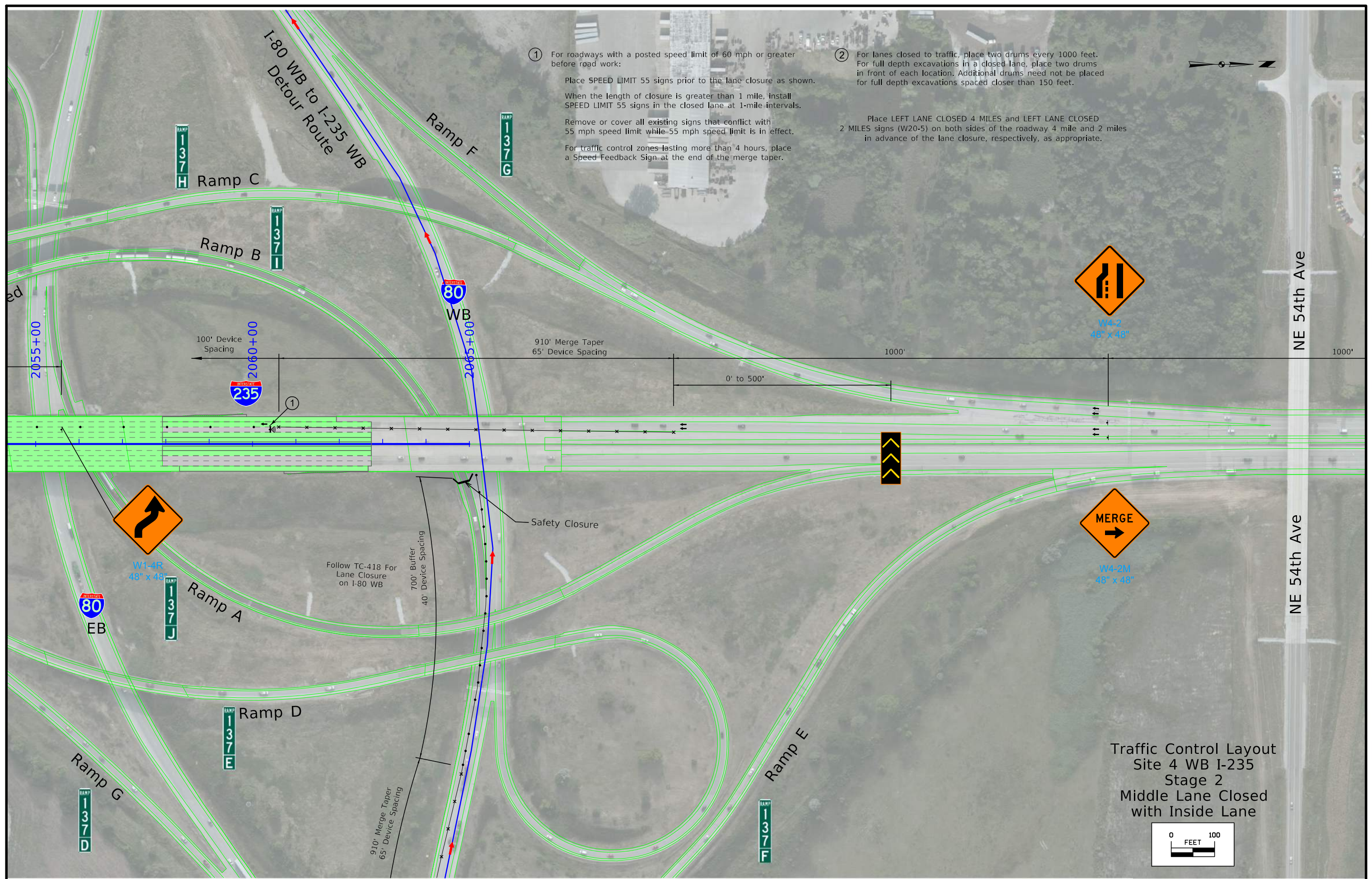
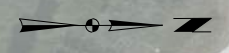


Traffic Control Layout  
 Site 4 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane

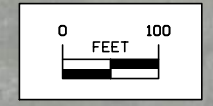


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 For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.  
 Place LEFT LANE CLOSED 4 MILES and LEFT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.



Traffic Control Layout  
 Site 4 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane



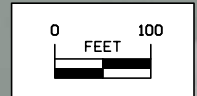
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Traffic Control Layout  
 Site 4 WB I-235  
 Stage 2  
 Middle Lane Closed  
 with Inside Lane



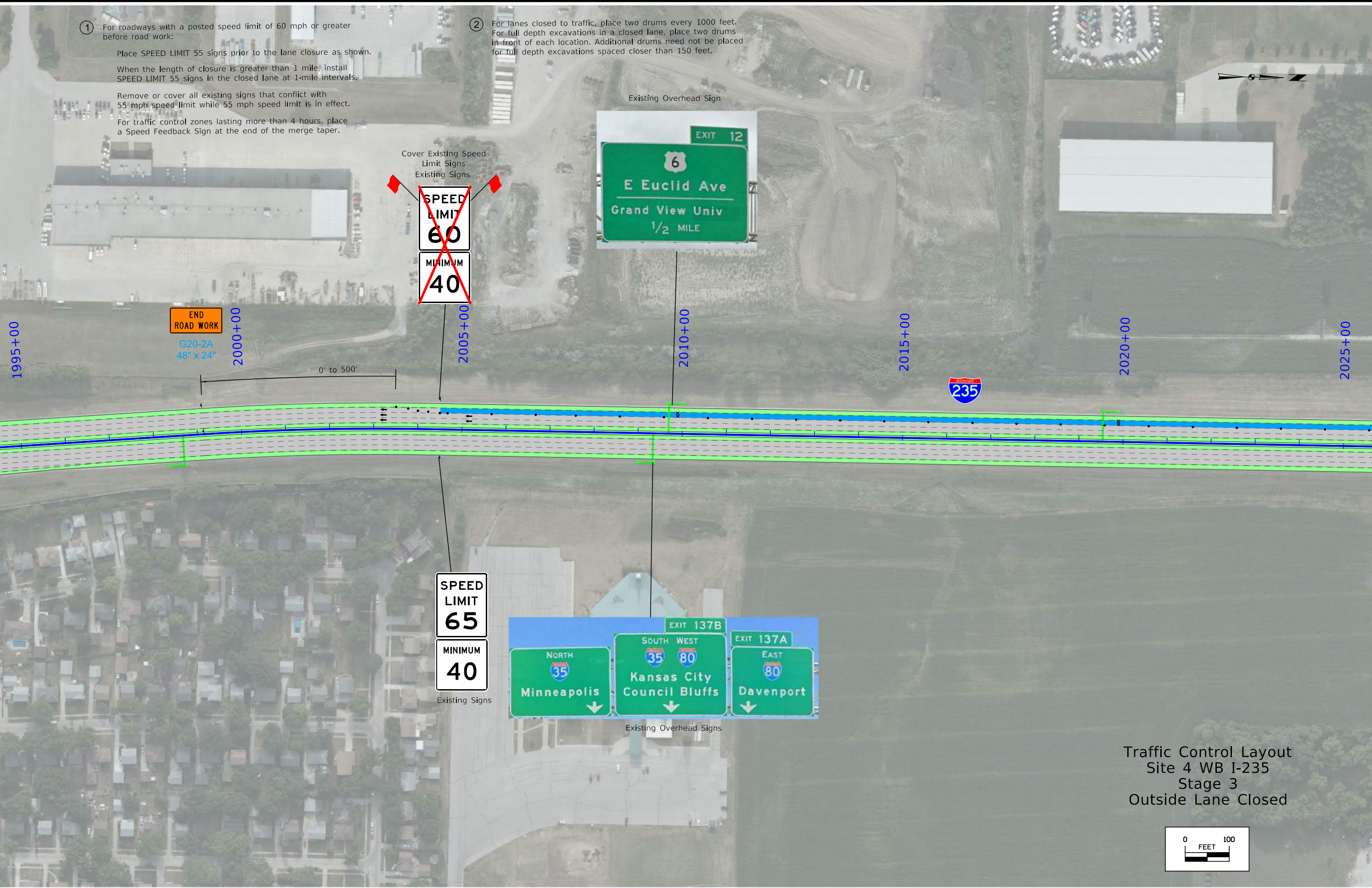
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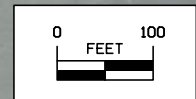
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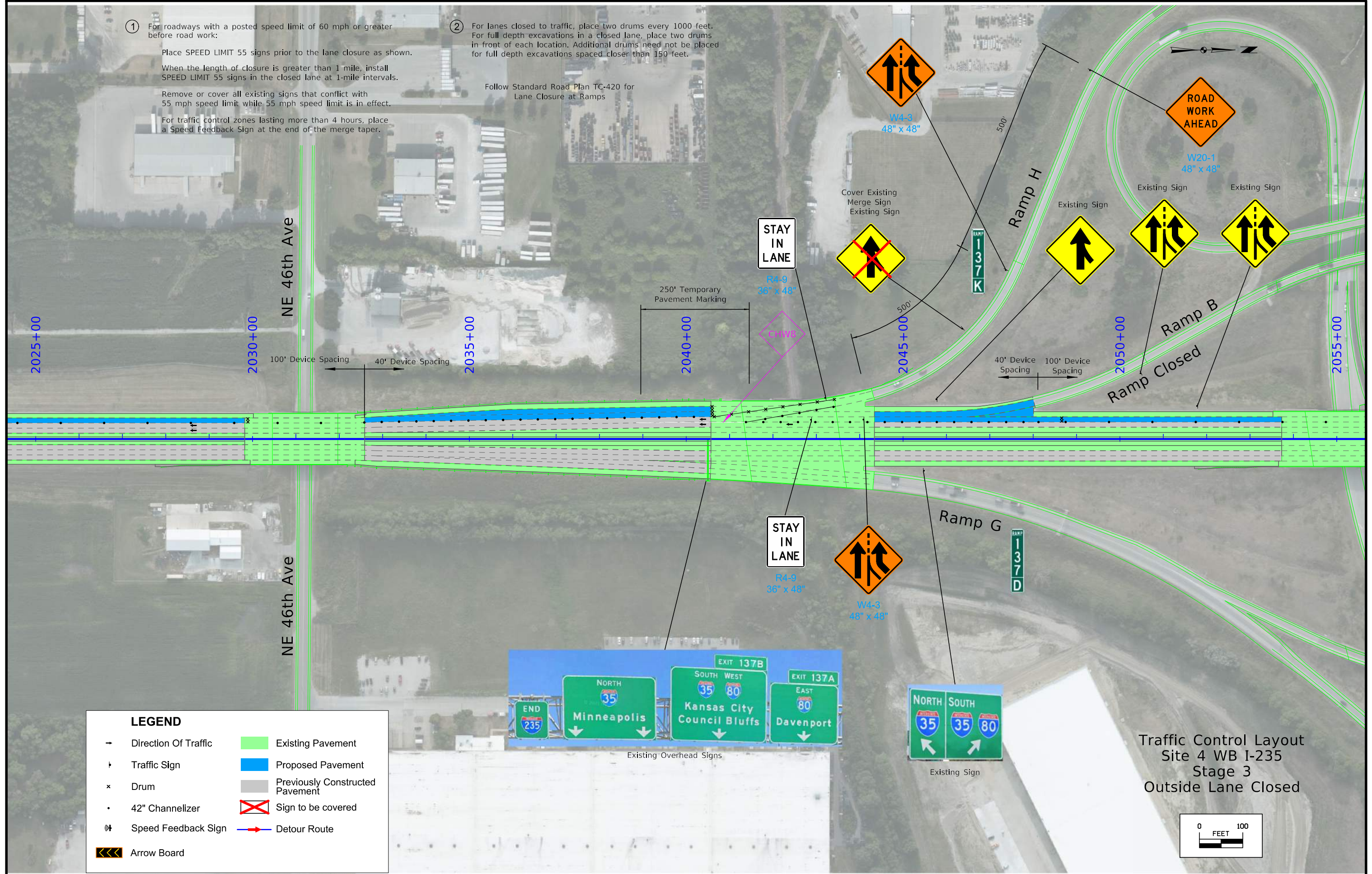


Traffic Control Layout  
Site 4 WB I-235  
Stage 3  
Outside Lane Closed

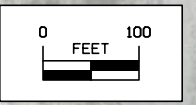


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 Follow Standard Road Plan TC-420 for Lane Closure at Ramps



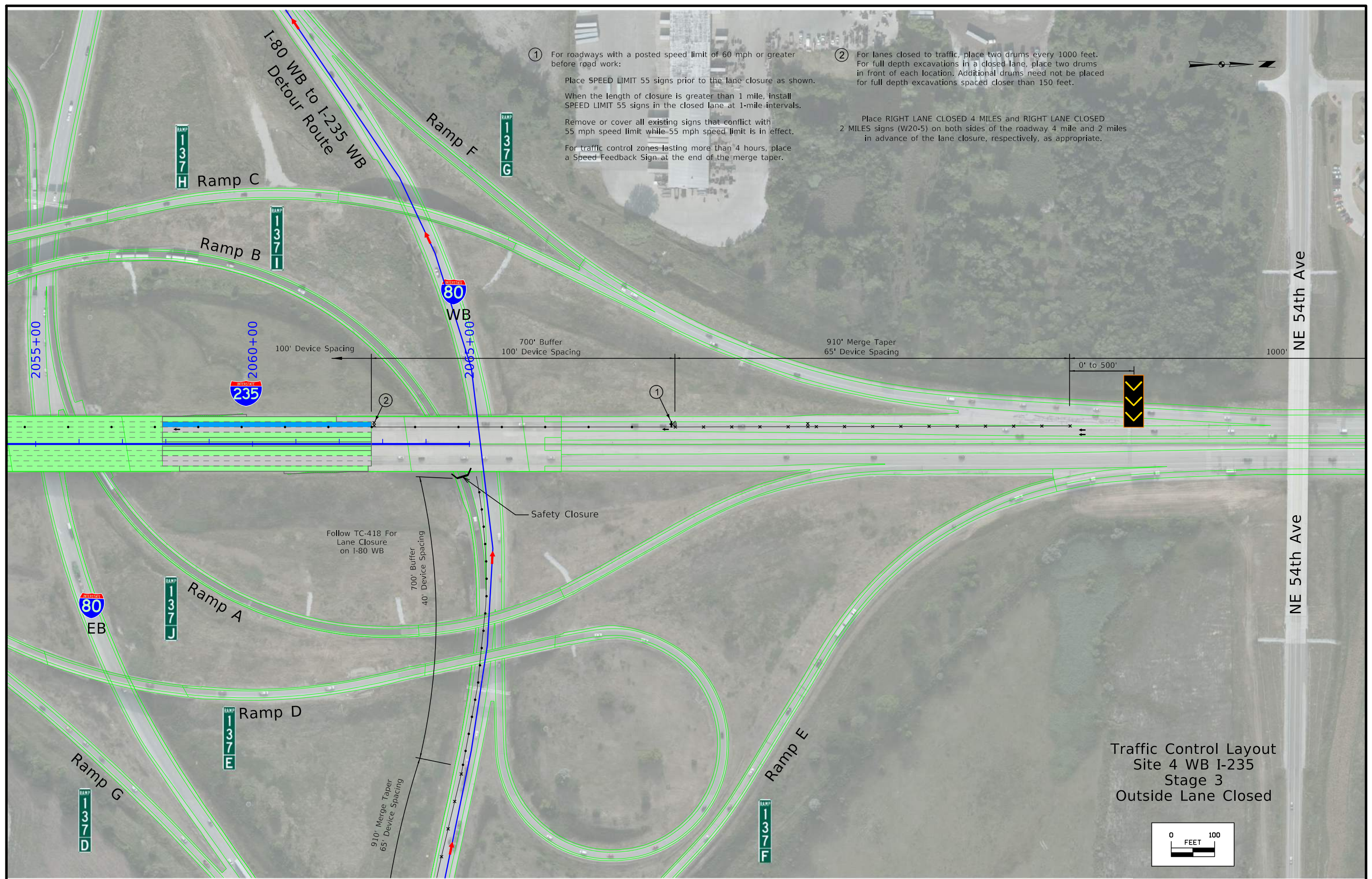
Traffic Control Layout  
 Site 4 WB I-235  
 Stage 3  
 Outside Lane Closed



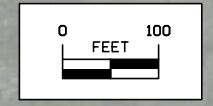


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Traffic Control Layout  
 Site 4 WB I-235  
 Stage 3  
 Outside Lane Closed



Place RIGHT LANE CLOSED 4 MILES and RIGHT LANE CLOSED 2 MILES signs (W20-5) on both sides of the roadway 4 mile and 2 miles in advance of the lane closure, respectively, as appropriate.

Follow TC-418 for Advanced Warning Sign Placement



W4-2M  
48" x 48"



W20-5  
48" x 48"



R2-1  
48" x 60"



W4-2  
48" x 48"

- ① For roadways with a posted speed limit of 60 mph or greater before road work:

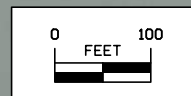
Place SPEED LIMIT 55 signs prior to the lane closure as shown. When the length of closure is greater than 1 mile, install SPEED LIMIT 55 signs in the closed lane at 1-mile intervals.

Remove or cover all existing signs that conflict with 55 mph speed limit while 55 mph speed limit is in effect.

For traffic control zones lasting more than 4 hours, place a Speed Feedback Sign at the end of the merge taper.

- ② For lanes closed to traffic, place two drums every 1000 feet. For full depth excavations in a closed lane, place two drums in front of each location. Additional drums need not be placed for full depth excavations spaced closer than 150 feet.

Traffic Control Layout  
Site 4 WB I-235  
Stage 3  
Outside Lane Closed



281-3  
10-17-17

**STORM WATER  
BEST MANAGEMENT PRACTICES**

When the following best management practices are used, they are intended to account for disturbed areas where storage volume cannot be provided:

100-17  
04-20-10

**TABULATION OF SILT FENCES**  
Refer to EC-201







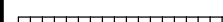
Location			Length	Remarks
Begin Station	End Station	Side	LF	
1953+07.74	2062+73.75	B	500.0	Undistubited
Total:			500.0	

100-19  
04-19-16






**PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE**  
Possible Standards: EC-204

Location			Length of Installation			Remarks
Begin Station	End Station	Side	9 inch Dia	12 inch Dia	20 inch Dia	
			LF	LF	LF	
2027+75.55	2029+94.47	RT		330.0		Guardrail Grading and Paving
2051+72.04	2053+65.94	RT		300.0		Guardrail Grading and Paving
2060+72.61	2062+66.53	RT		300.0		Guardrail Grading and Paving
1953+07.74	1954+51.48	LT		250.0		Guardrail Grading and Paving
2057+92.21	2059+86.10	LT		300.0		Guardrail Grading and Paving
2008+29.65		LT		150.0		Scour Repair
1953+07.74	2062+73.75	B	500.0	500.0	500.0	Undistubited
Total:			500.0	2130.0	500.0	



### LINE STYLE LEGEND OF EROSION CONTROL SHEETS

-  Silt Fence
-  Perimeter and Slope Sediment Control Device (9")
-  Perimeter and Slope Sediment Control Device (12")
-  Perimeter and Slope Sediment Control Device (20")
-  Open-Throat Curb Intake Sediment Filter
-  Concentrated Flow
-  Sheet Flow








### PLAN VIEW COLOR LEGEND OF EROSION CONTROL 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
Black	(0)		Permanent Erosion Control Features
Blaze Orange	(222)		Temporary Erosion Control Features

















  

SHADING		Design Color No.		Transparency
Citron	(234)		Mulching, All Types	50%
Light Brown	(238)		Special Ditch Control, Wood Excelsior Mat	0%

### CELL LEGEND OF EROSION CONTROL SHEETS

-  Temporary Sediment Control basin
-  Erosion Control for Circular Intake or Manhole Well
-  Erosion Control for Rectangular Intake or Manhole Well
-  Grate Intake Sediment Filter Bag
-  Silt Basin
-  Silt Fence Tail
-  Stormwater Drainage Basin Discharge Point

### PATTERN LEGEND OF EROSION CONTROL SHEETS

-  Seeding and Fertilizing
-  Seeding and Fertilizing (Rural)
-  Seeding and Fertilizing (Urban)
-  Native Grass Seeding
-  Salt Tolerant Seeding
-  Wetland Grass Seeding
-  Wildflower Seeding
-  Sodding
-  Turf Reinforcement Mat Type 1
-  Turf Reinforcement Mat Type 2
-  Turf Reinforcement Mat Type 3
-  Turf Reinforcement Mat Type 4
-  Slope Protection, Wood Excelsior Mat
-  Transition Mat
-  Rock Features, Permanent
-  Rock Features, Temporary

## EROSION CONTROL LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES R)

LEE TWP.  
T-79N R-23W  
SEC. 30

Sta. 1960+89  
42" x 255' CMP  
(U.A.C.)

STA 1953+07.74  
Steel Beam Guardrail  
Remove and Replace

STA 1950+10.44  
BEGIN PROJECT

STA 1953+07.74  
BEGIN HMA MILL & OVERLAY  
BEGIN SHOULDER FOG SEAL



Hull Ave

Hull Ave

STA 1951+43.51  
BRIDGE RAIL REPAIR  
(SEE V SHEETS)

STA 1955+87.00  
Attenuator  
(U.A.C.)

Ramp B

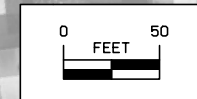
Sta. 1953+28  
24" CMP  
(U.A.C.)

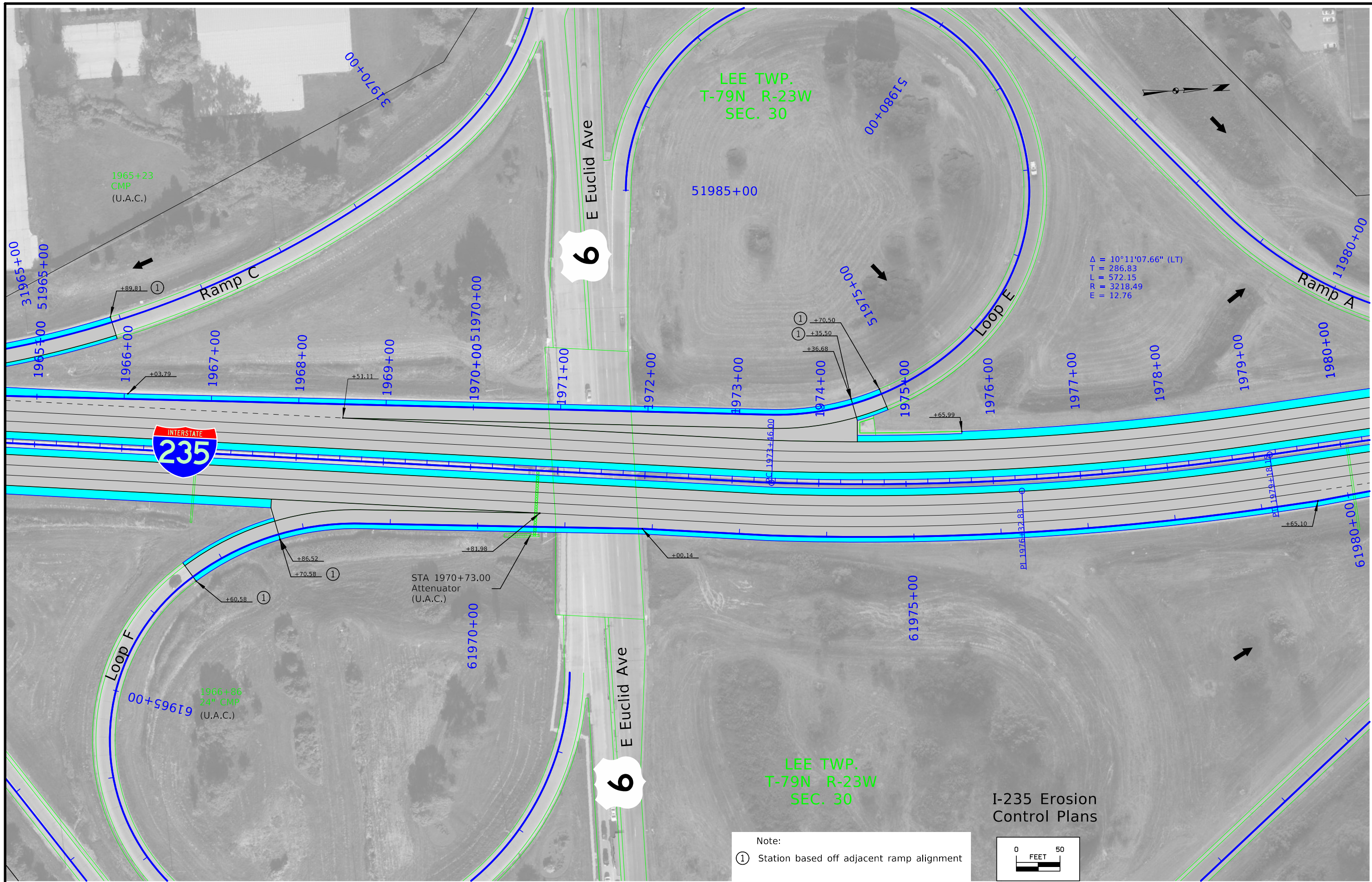
LEE TWP.  
T-79N R-23W  
SEC. 30

I-235 Erosion  
Control Plans

Note:

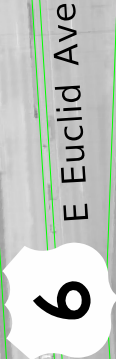
① Station based off adjacent ramp alignment





LEE TWP.  
T-79N R-23W  
SEC. 30

1965+23  
CMP  
(U.A.C.)



Δ = 10°11'07.66" (LT)  
T = 286.83  
L = 572.15  
R = 3218.49  
E = 12.76

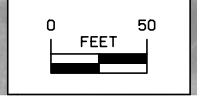
STA 1970+73.00  
Attenuator  
(U.A.C.)

1966+86  
24" CMP  
(U.A.C.)

LEE TWP.  
T-79N R-23W  
SEC. 30

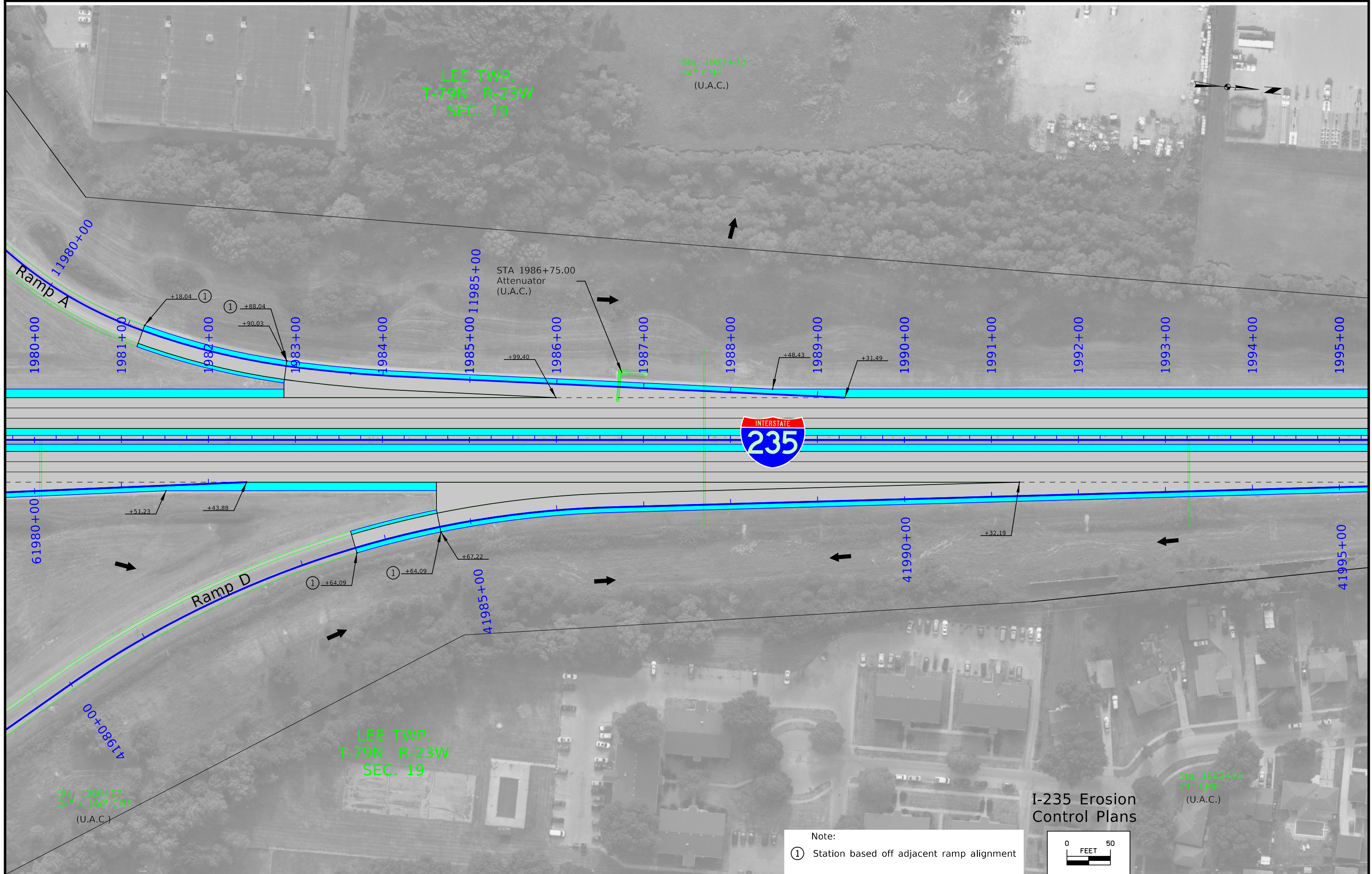
I-235 Erosion  
Control Plans

Note:  
① Station based off adjacent ramp alignment



LEE TWP.  
T-79N R-23W  
SEC. 19

Sta. 1987+70  
24" CMP  
(U.A.C.)



STA 1986+75.00  
Attenuator  
(U.A.C.)



Ramp D

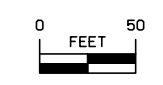
Sta. 1980+07  
24" x 100' CMP  
(U.A.C.)

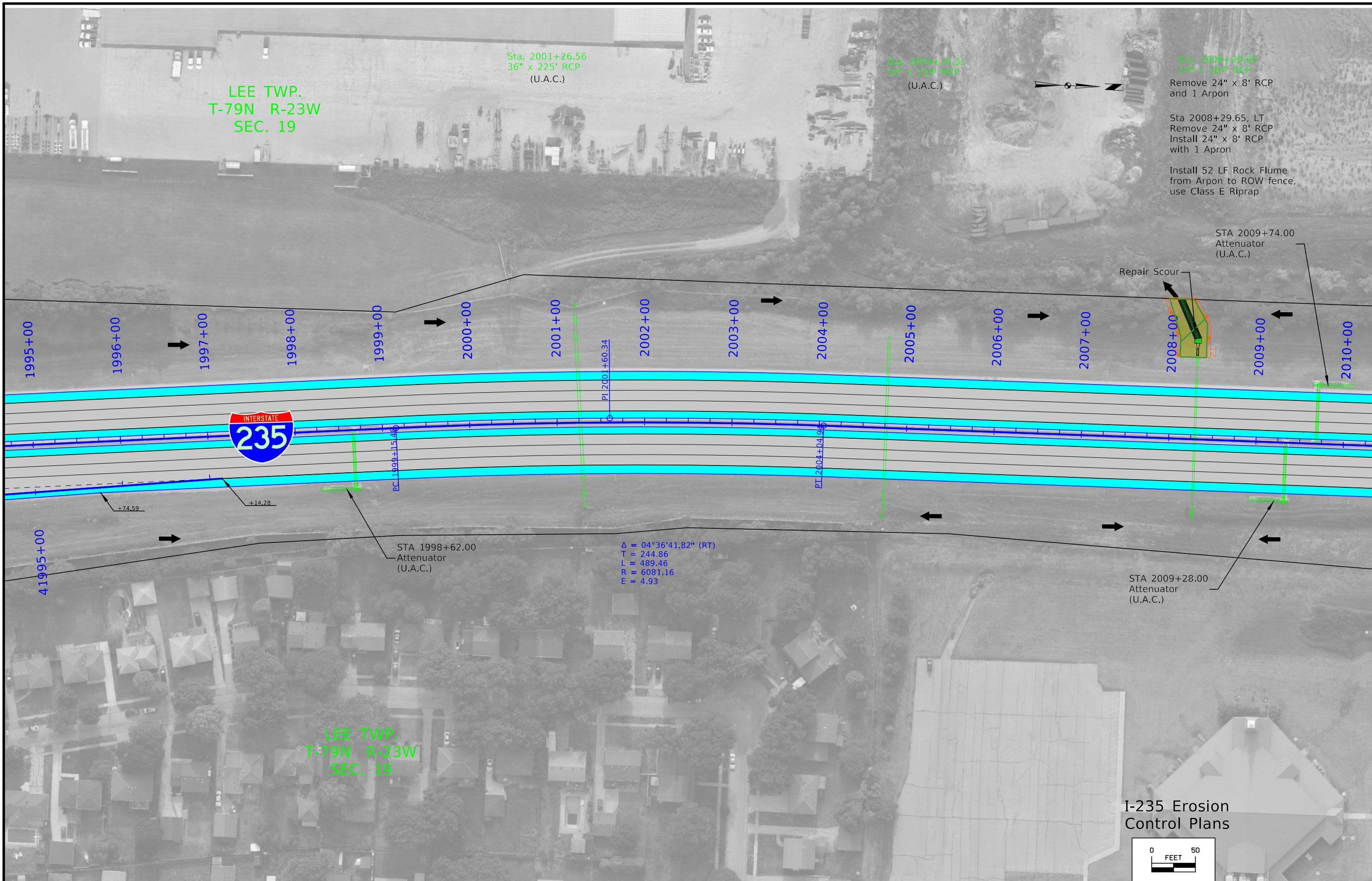
LEE TWP.  
T-79N R-23W  
SEC. 19

Sta. 1993+27  
24" CMP  
(U.A.C.)

I-235 Erosion  
Control Plans

Note:  
① Station based off adjacent ramp alignment





LEE TWP.  
T-79N R-23W  
SEC. 19

Sta. 2001+26.56  
36" x 225' RCP  
(U.A.C.)

Sta. 2004+76.31  
30" x 210' RCP  
(U.A.C.)

Sta. 2008+29.65  
24" x 187' RCP  
Remove 24" x 8' RCP  
and 1 Arpon

Sta 2008+29.65, LT  
Remove 24" x 8' RCP  
Install 24" x 8' RCP  
with 1 Apron

Install 52 LF Rock Flume  
from Arpon to ROW fence,  
use Class E Riprap

STA 2009+74.00  
Attenuator  
(U.A.C.)

Repair Scour



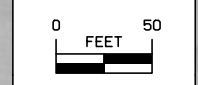
$\Delta = 04^{\circ}36'41.82''$  (RT)  
T = 244.86  
L = 489.46  
R = 6081.16  
E = 4.93

STA 1998+62.00  
Attenuator  
(U.A.C.)

STA 2009+28.00  
Attenuator  
(U.A.C.)

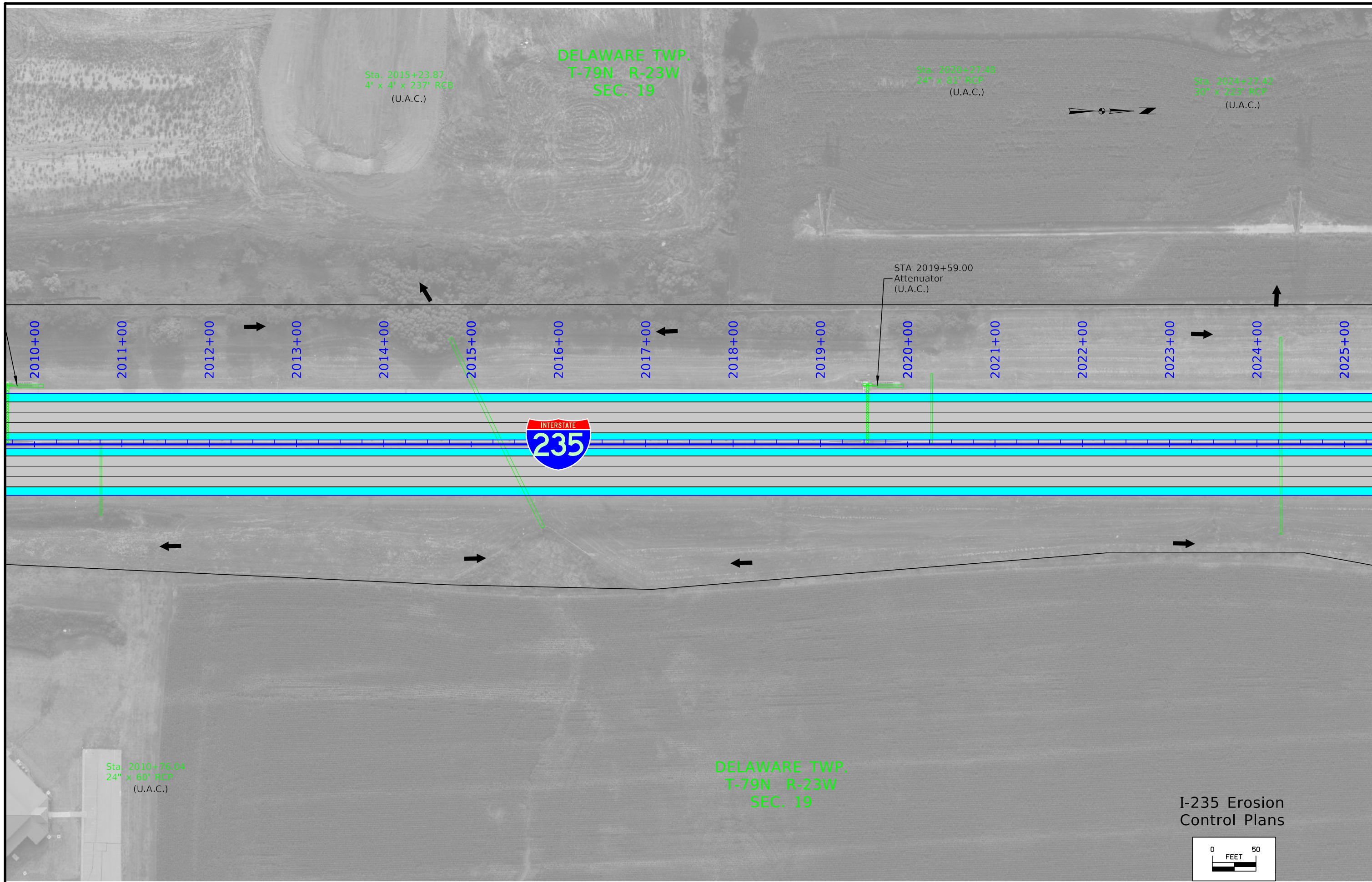
LEE TWP.  
T-79N R-23W  
SEC. 19

I-235 Erosion  
Control Plans



FILE NO.	ENGLISH	DESIGN TEAM Smyth/hgm Associates	POLK COUNTY	PROJECT NUMBER IMX-235-2(670)12--02-77	SHEET NUMBER RR.5
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FILE NO.	ENGLISH	DESIGN TEAM Smyth/hgm Associates	POLK COUNTY	PROJECT NUMBER IMX-235-2(670)12--02-77	SHEET NUMBER RR.6
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11:52:26 AM 11/29/2021 kjm c:\pw\_work\pworkmain\kenneth.mueller\d1294450\ORD\_77235670\_RR02.dgn

DELAWARE TWP.  
T-79N R-23W  
SEC. 19

DELAWARE TWP.  
T-79N R-23W  
SEC. 18

Sta. 2035+55.35  
2' x 3.5' x 256.3' RCB  
(U.A.C.)

NE 46th Ave

NE 46th Ave

STA 2032+58.50  
RESUME CONSTRUCTION  
STA 2031+20.84  
BRIDGE RAIL REPAIR  
(SEE V SHEETS)

STA 2032+36.00  
Attenuator  
(U.A.C.)

High Tension Guardrail  
(U.A.C.)

2025+00 2026+00 2027+00 2028+00 2029+00 2030+00 2031+00 2032+00 2033+00 2034+00 2035+00 2036+00 2037+00 2038+00 2039+00 2040+00



STA 2029+82.00  
STOP CONSTRUCTION

STA 2029+94.00  
Steel Beam Guardrail  
Remove and Replace

STA 2032+86.28  
END METRIC TO ENGLISH LN. TRANS.

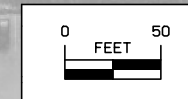
STA 2032+36.28  
BEGIN METRIC TO ENGLISH LN. TRANS.

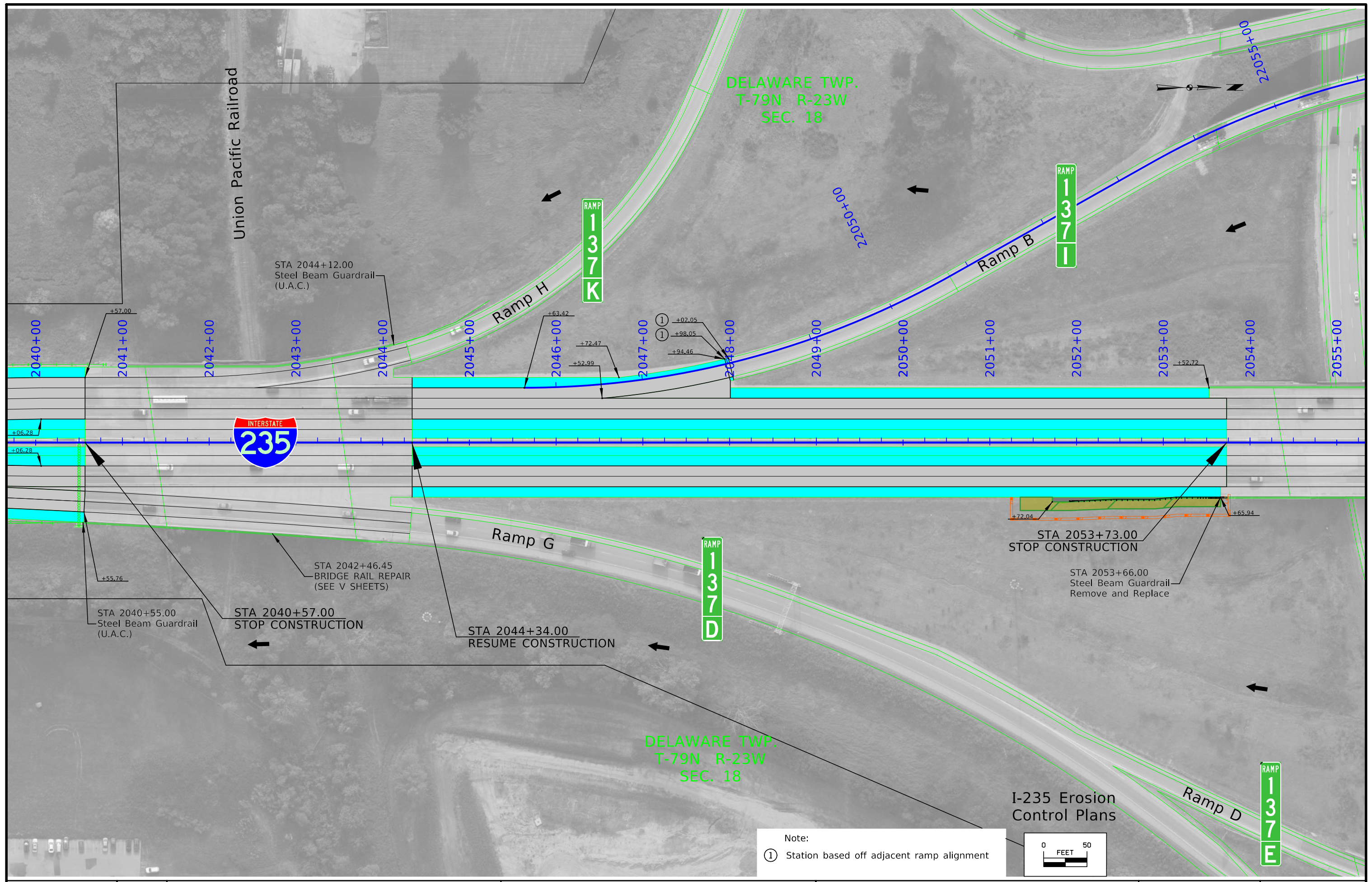
High Tension Guardrail  
(U.A.C.)

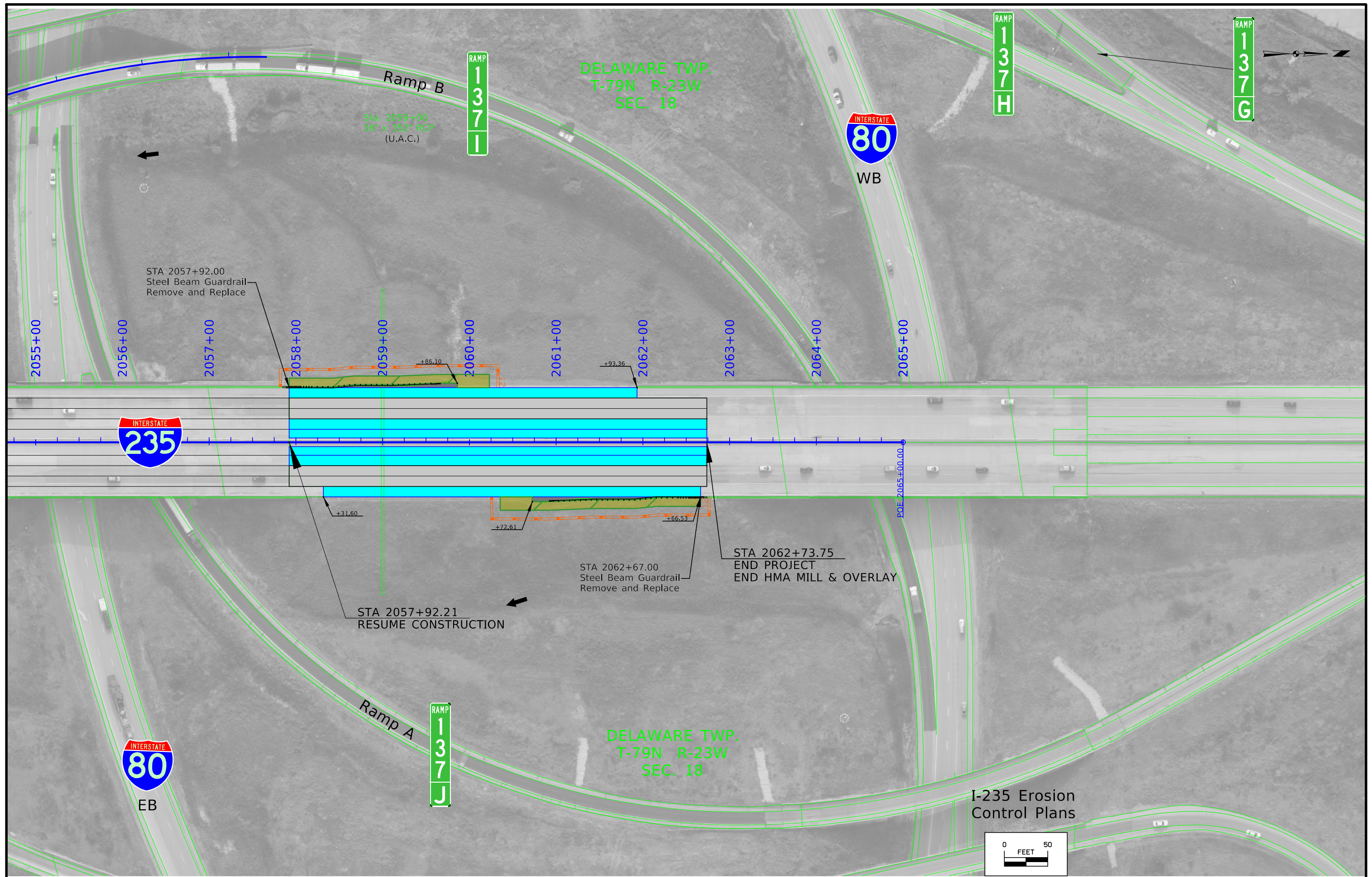
DELAWARE TWP.  
T-79N R-23W  
SEC. 19

DELAWARE TWP.  
T-79N R-23W  
SEC. 18

### I-235 Erosion Control Plans





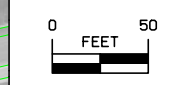


DELAWARE TWP.  
T-79N R-23W  
SEC. 18

DELAWARE TWP.  
T-79N R-23W  
SEC. 18



I-235 Erosion  
Control Plans





STA 1950+10.44  
BEGIN PROJECT

STA 1953+07.74  
BEGIN HMA MILL & OVERLAY  
BEGIN SHOULDER FOG SEAL



Hull Ave

Hull Ave

Ramp, B

1950+00

1955+00 31955+00

1960+00 31960+00

31965+00

1965+00 51965+00

ELY6

DLW6

21955+00

BLC6

CHW12

RLW6

RLY6

21960+00

ELW6

RLY6

+51.48

+68.90

+39.55

+78.27

+68.65

+47.55

+49.14

+12.14

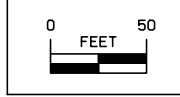
① +34.81

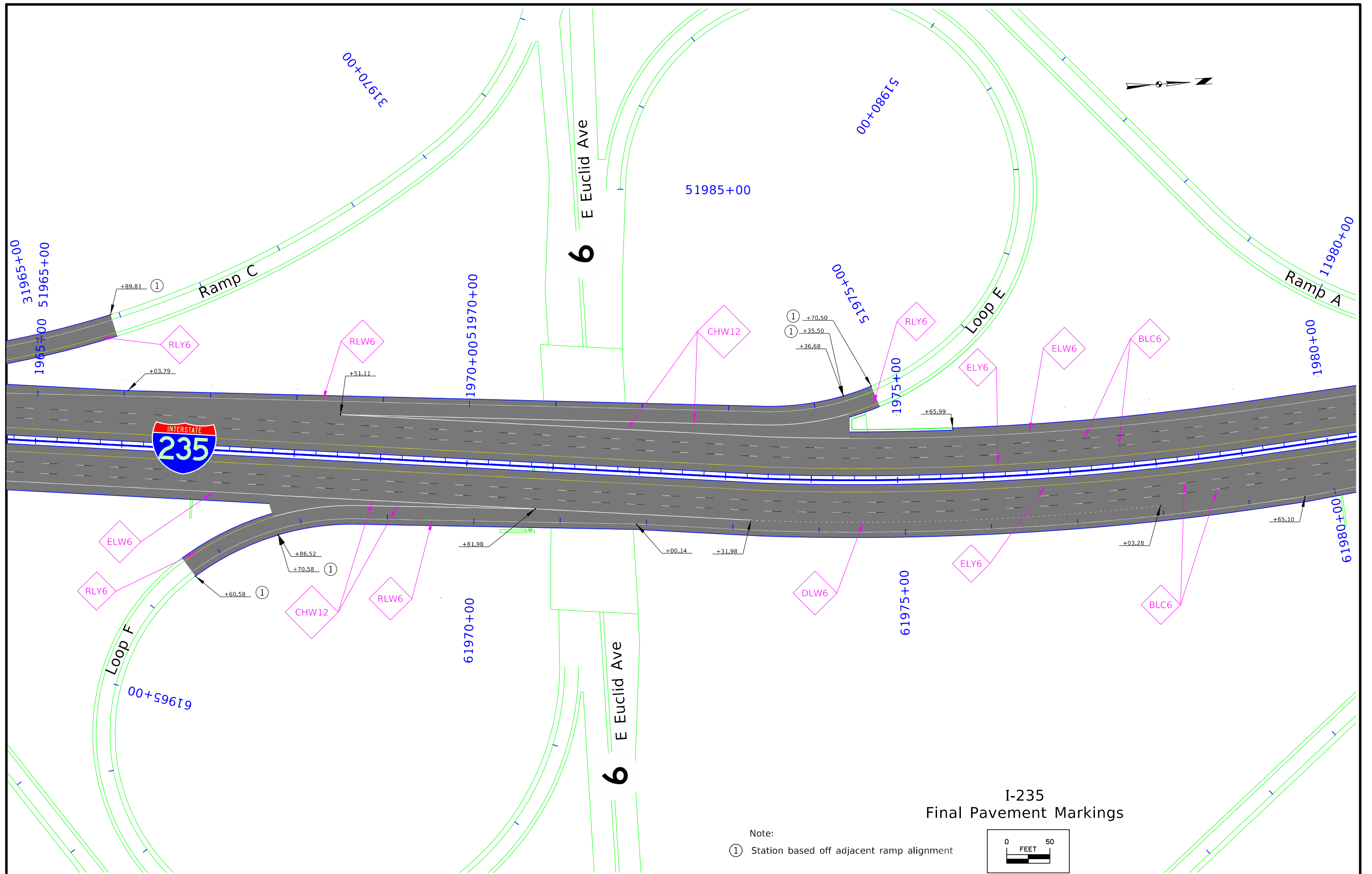
+31.47

### I-235 Final Pavement Markings

Note:

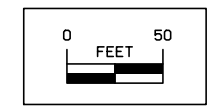
- ① Station based off adjacent ramp alignment

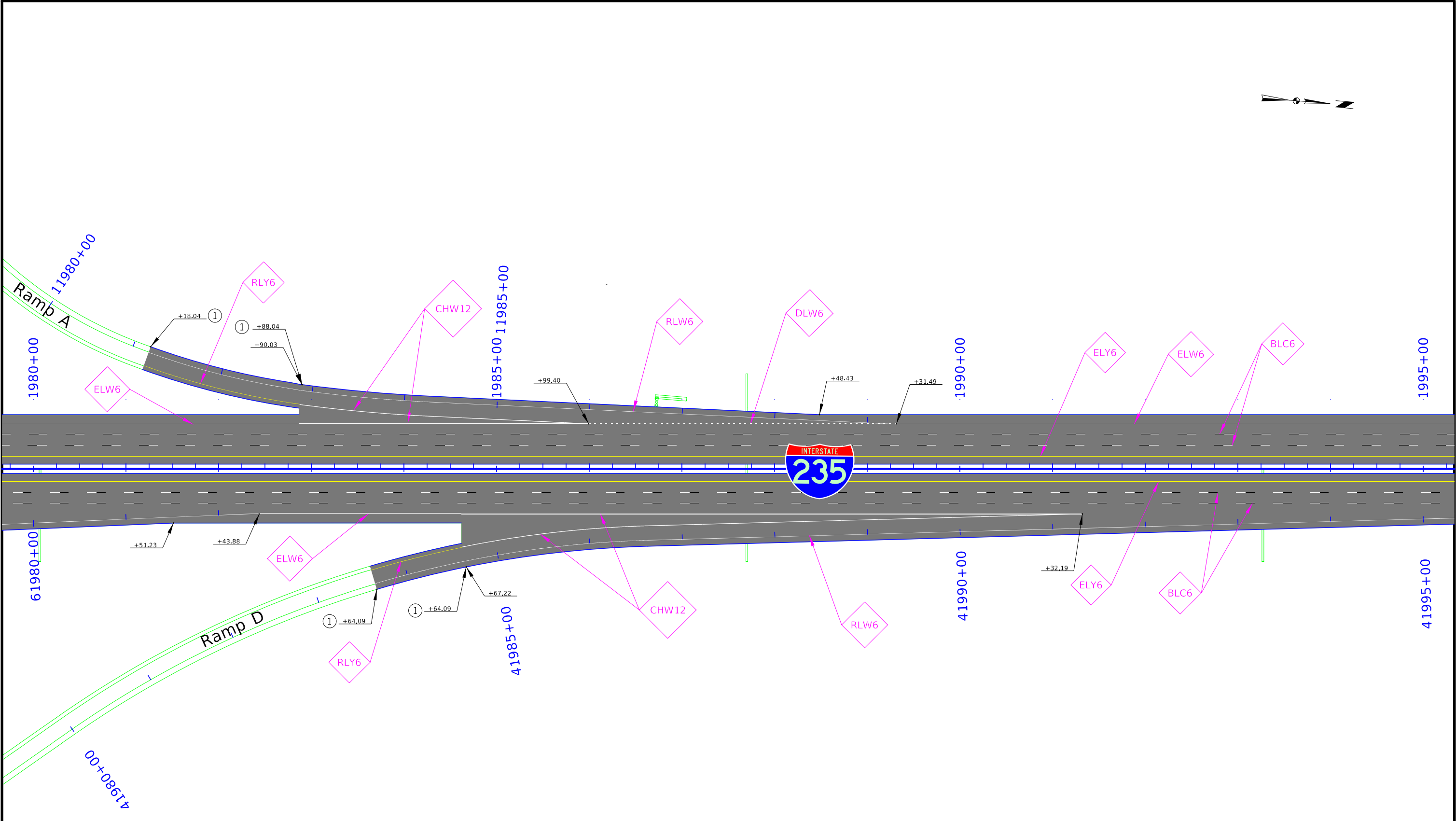




I-235  
Final Pavement Markings

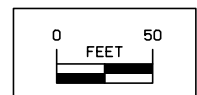
Note:  
① Station based off adjacent ramp alignment

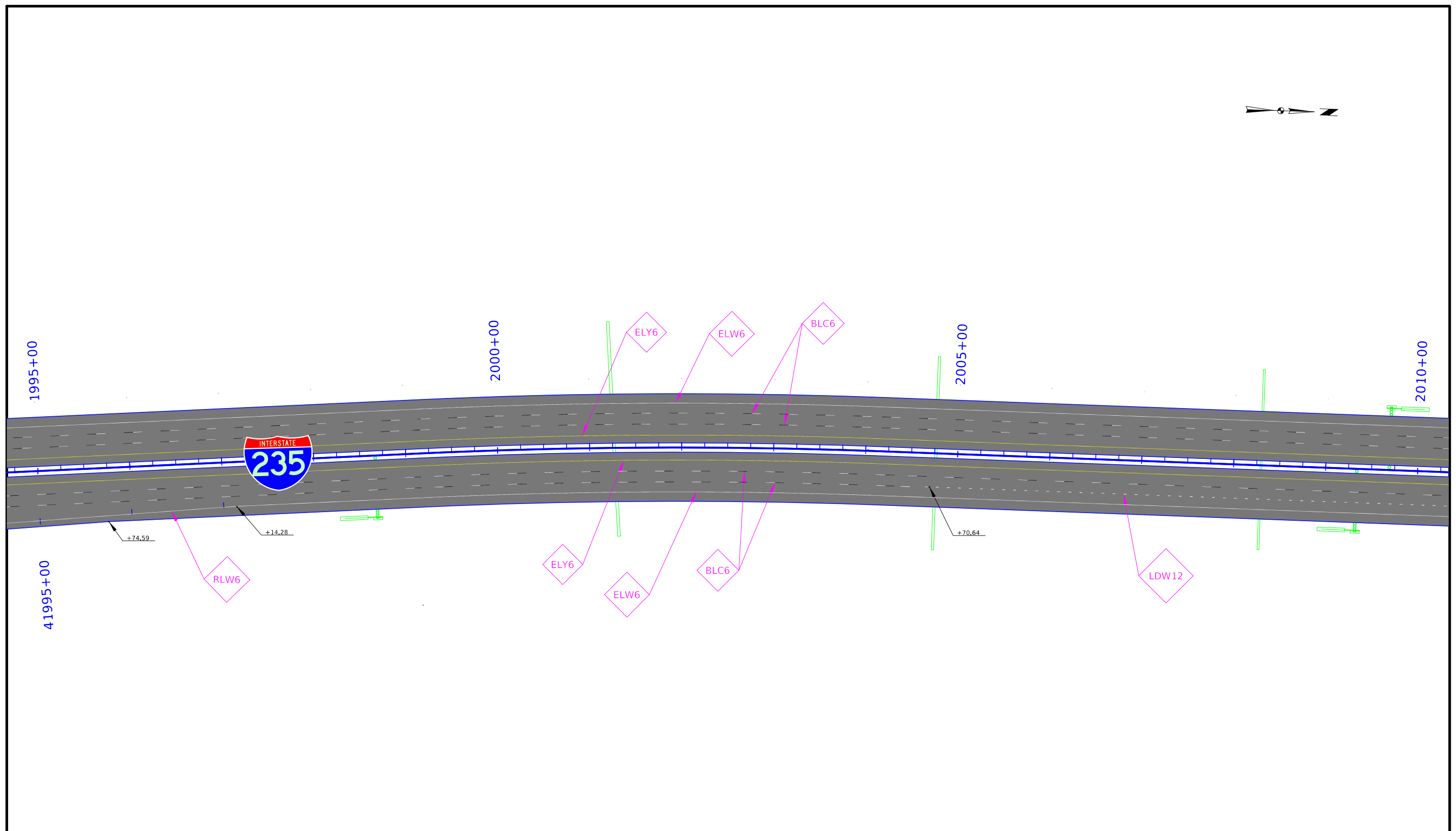




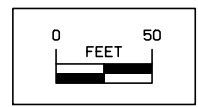
I-235  
Final Pavement Markings

Note:  
① Station based off adjacent ramp alignment



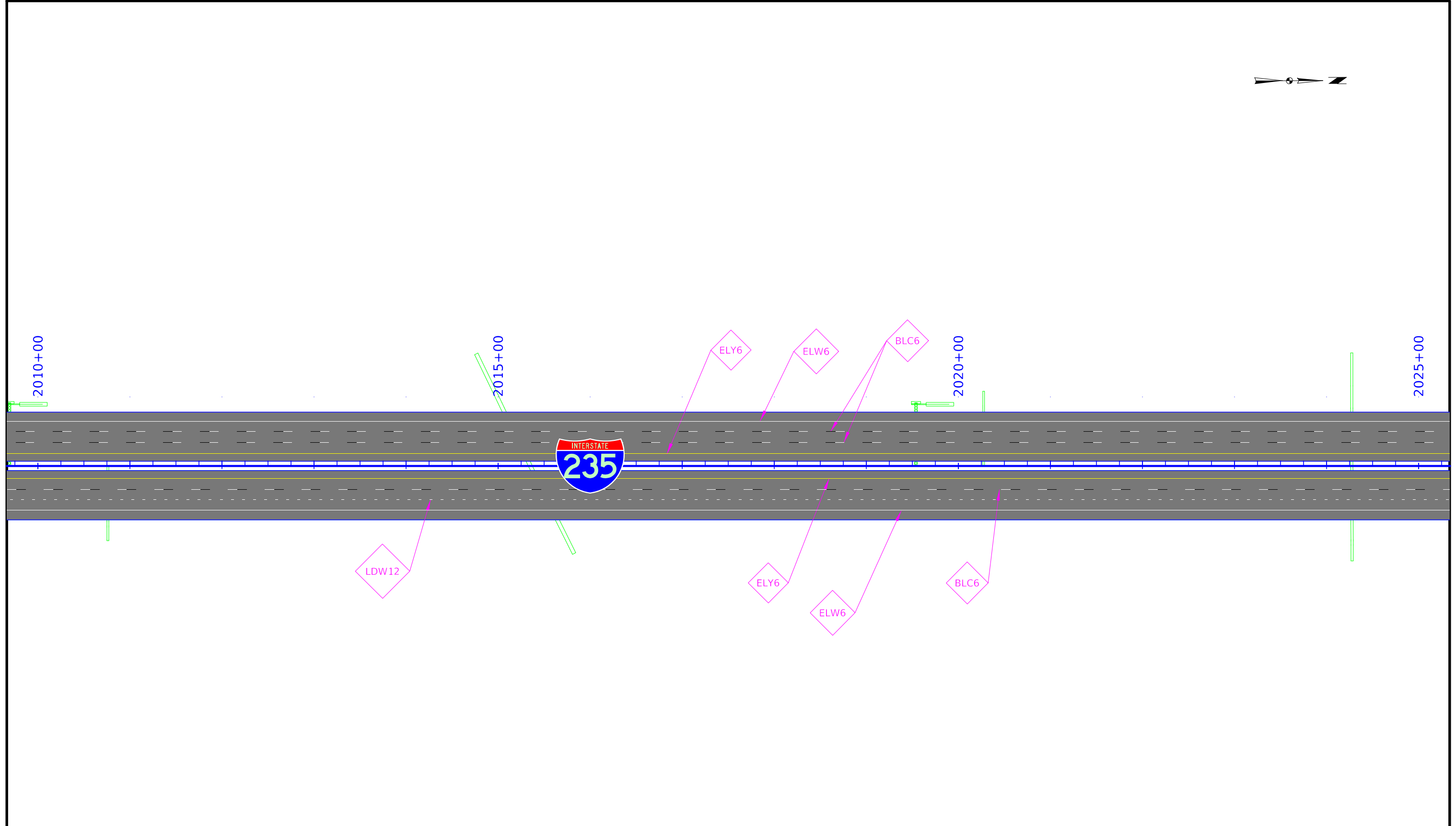
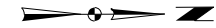


I-235  
Final Pavement Markings

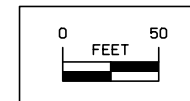


FILE NO.	ENGLISH	DESIGN TEAM Smyth/hgm Associates	POLK COUNTY	PROJECT NUMBER IMX-235-2(670)12--02-77	SHEET NUMBER U,4
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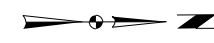




I-235  
Final Pavement Markings

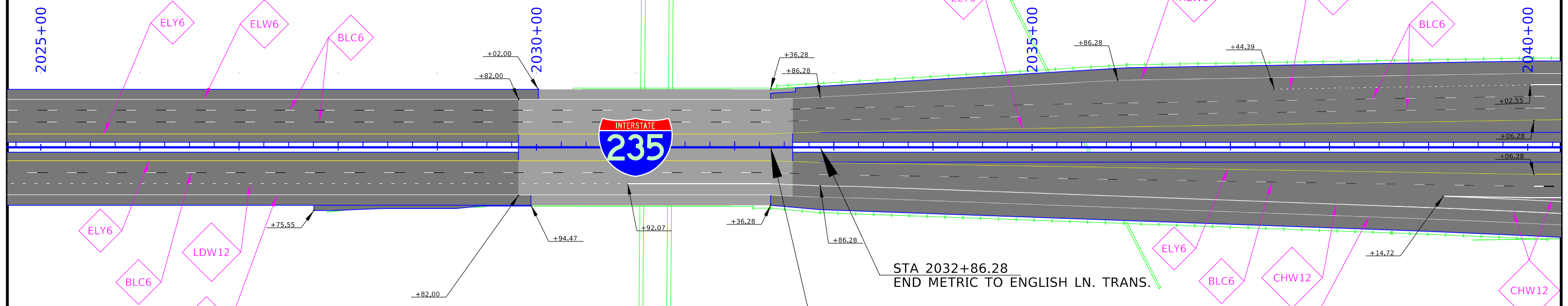


FILE NO.	ENGLISH	DESIGN TEAM Smyth/hgm Associates	POLK COUNTY	PROJECT NUMBER IMX-235-2(670)12--02-77	SHEET NUMBER U,5
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NE 46th Ave

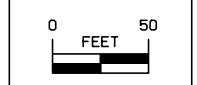
NE 46th Ave

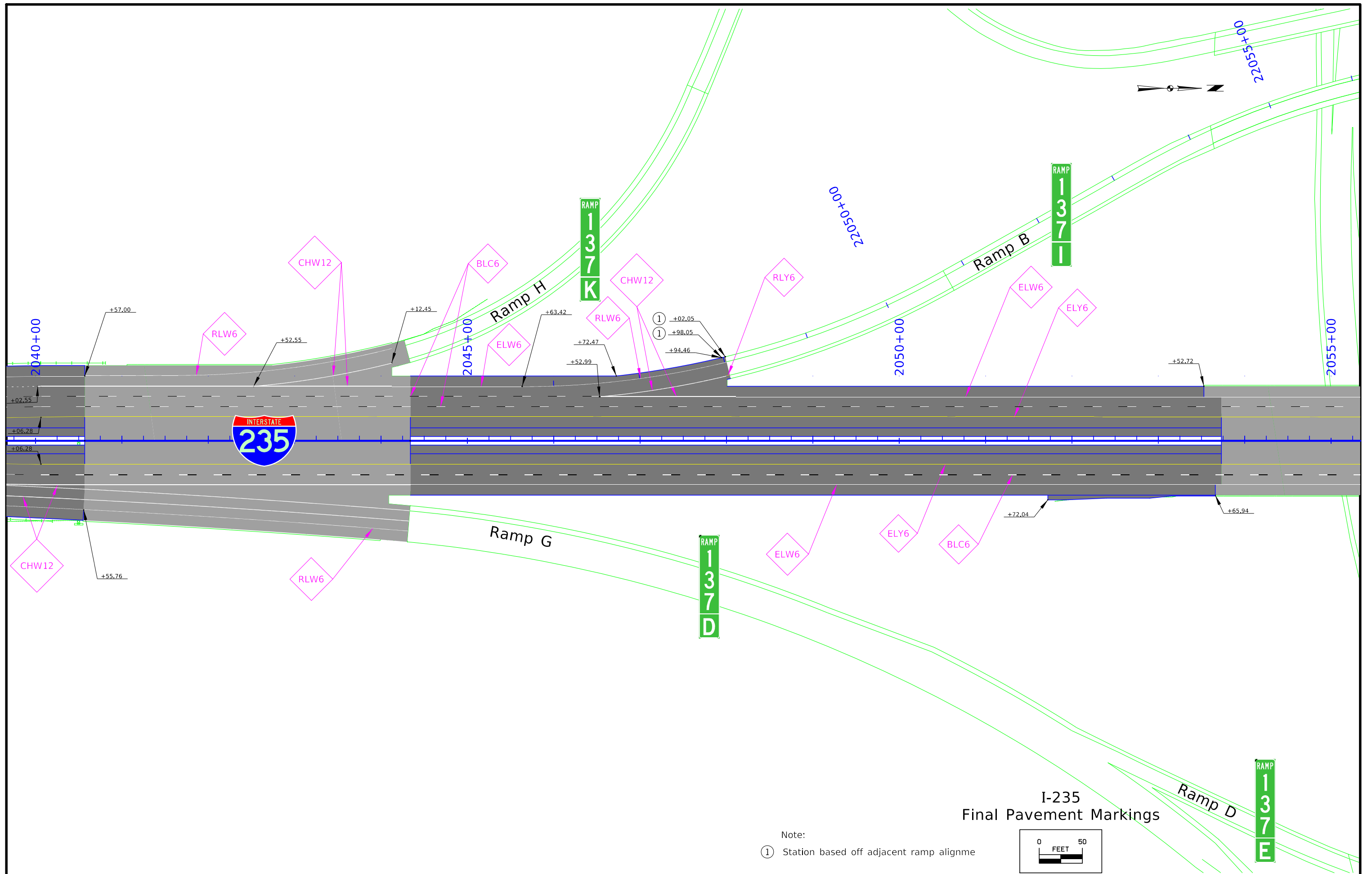


STA 2032+86.28  
END METRIC TO ENGLISH LN. TRANS.

STA 2032+36.28  
BEGIN METRIC TO ENGLISH LN. TRANS.

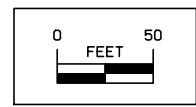
### I-235 Final Pavement Markings

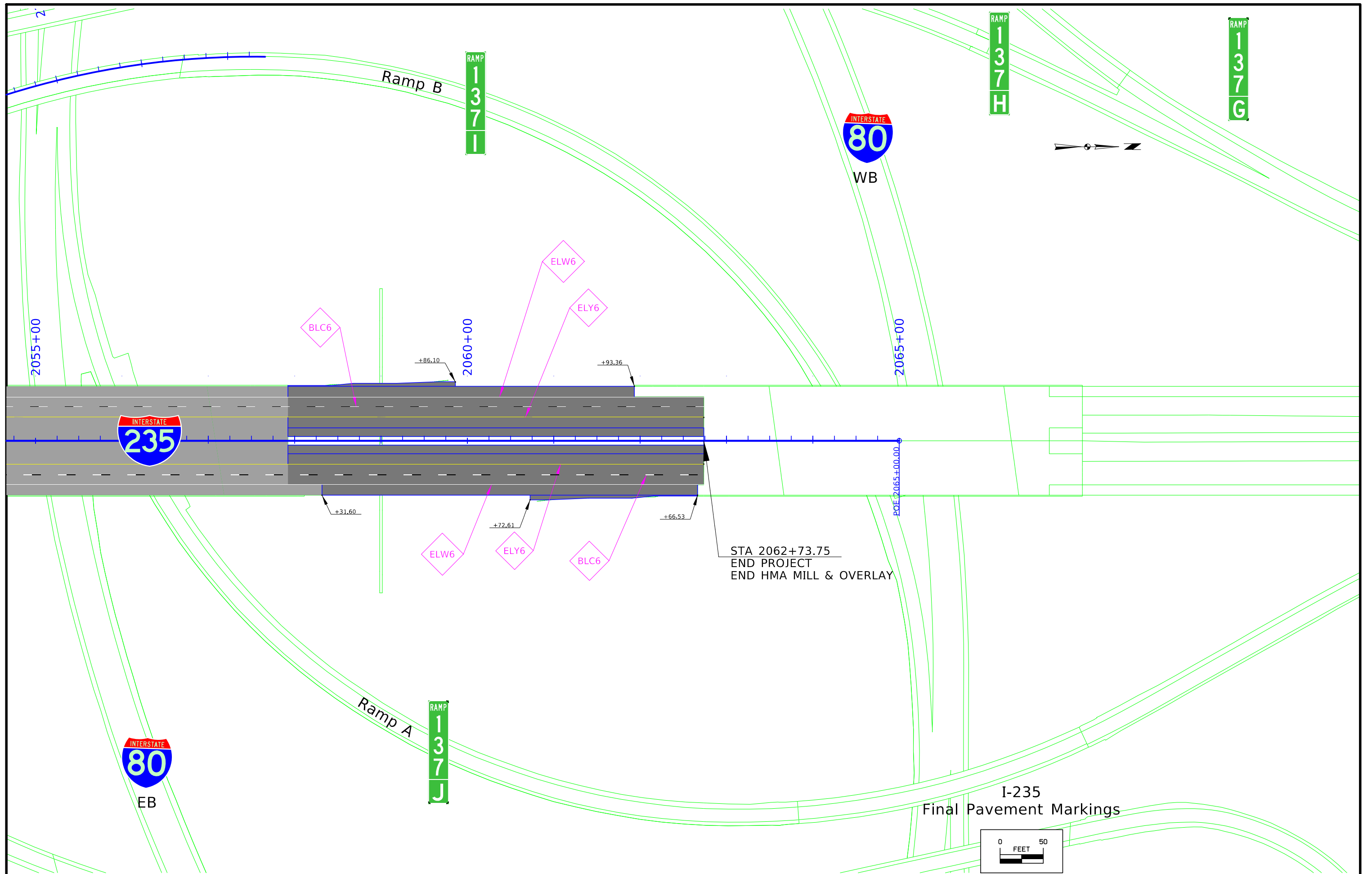




I-235  
Final Pavement Markings

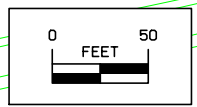
Note:  
① Station based off adjacent ramp alignme



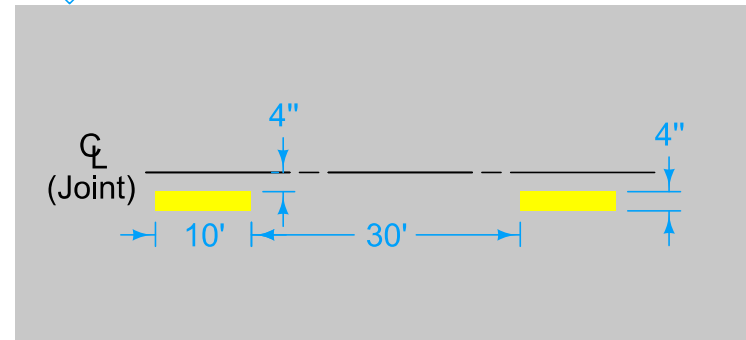


STA 2062+73.75  
 END PROJECT  
 END HMA MILL & OVERLAY

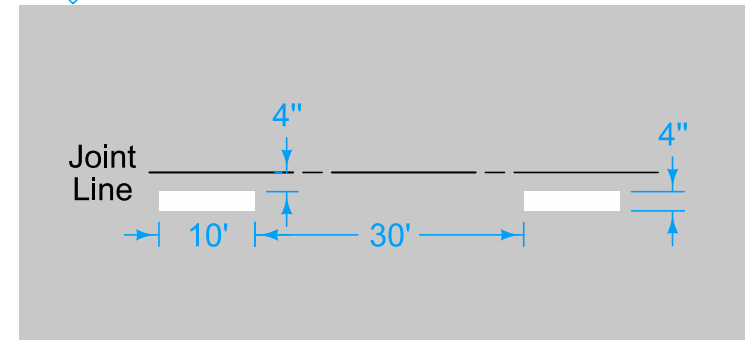
I-235  
 Final Pavement Markings



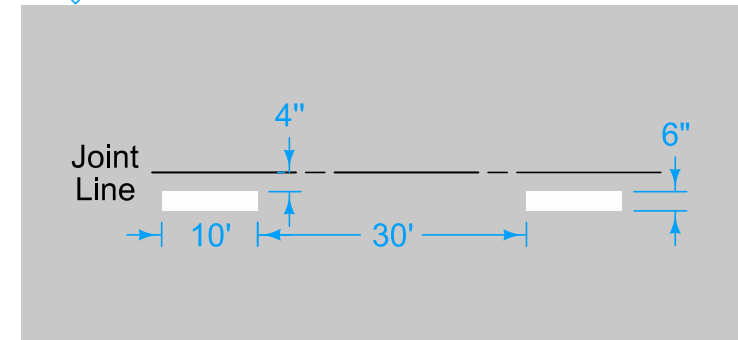
**BCY4** BROKEN CENTERLINE (Yellow)



**BLW4** BROKEN LANE LINE (White)



**BLW6** BROKEN LANE LINE (White)

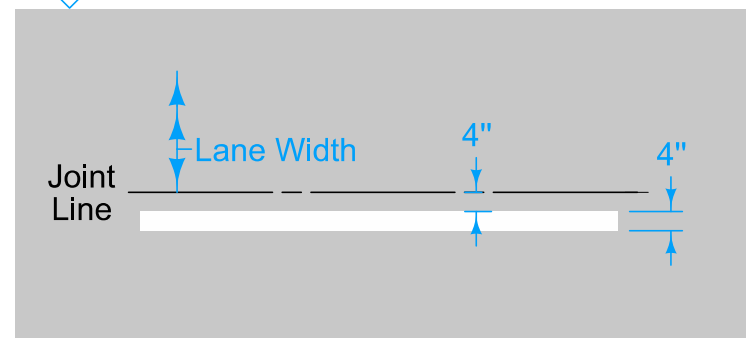


Lane layouts shown are typical.

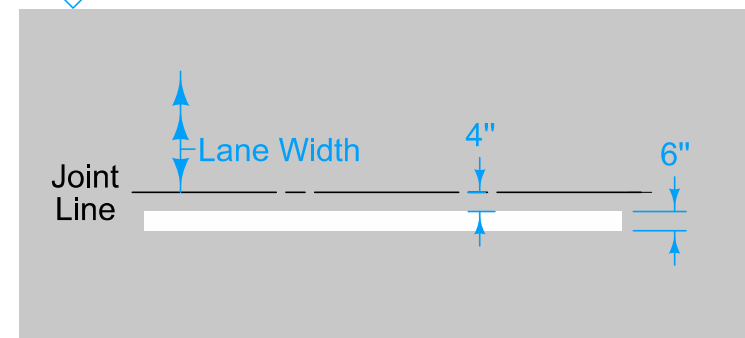
Centerlines and lane lines may be painted either side of centerline.

Drawings on sheets 1 to 3 are oriented to represent direction of traffic moving from left to right.

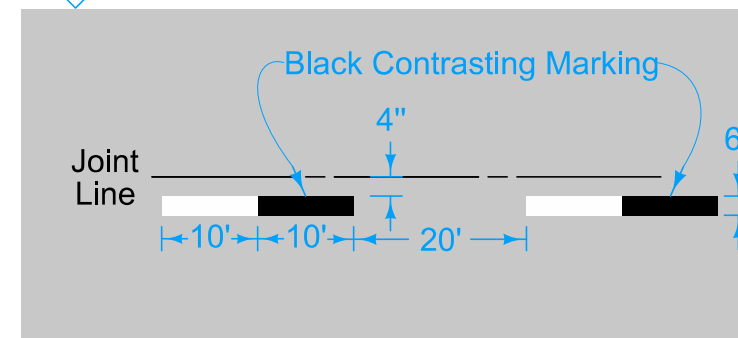
**SLW4** SOLID LANE LINE (White)



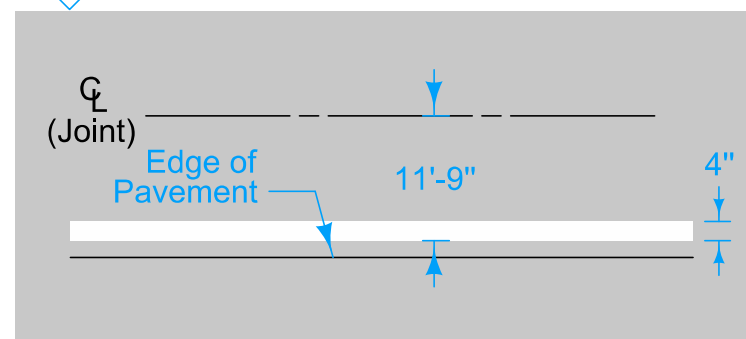
**SLW6** SOLID LANE LINE (White)



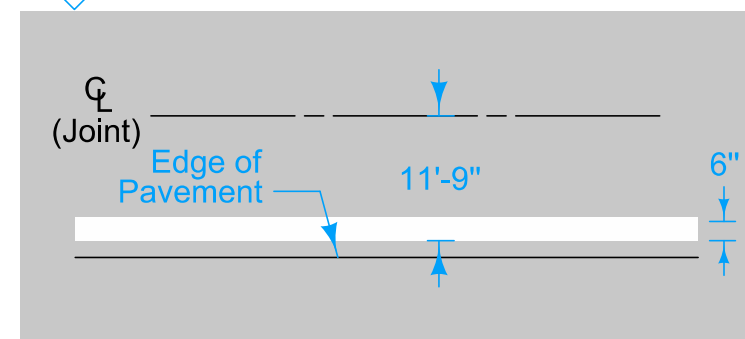
**BLC6** BROKEN LINE CONTRAST (White/Black)



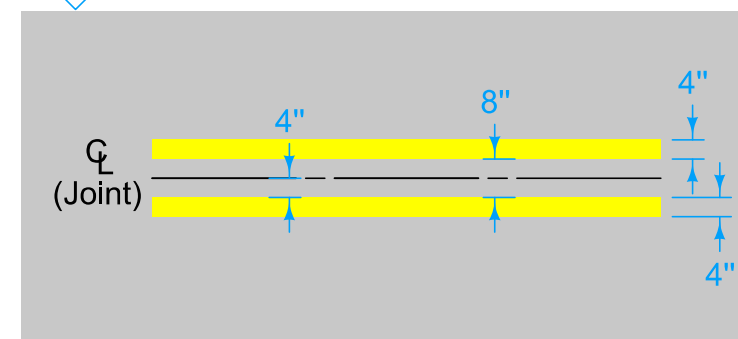
**ELW4** EDGE LINE RIGHT (White)



**ELW6** EDGE LINE RIGHT (White)



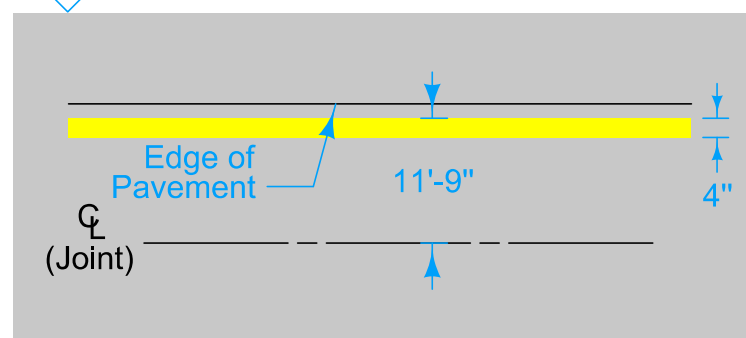
**DCY4** DOUBLE CENTERLINE (Yellow)



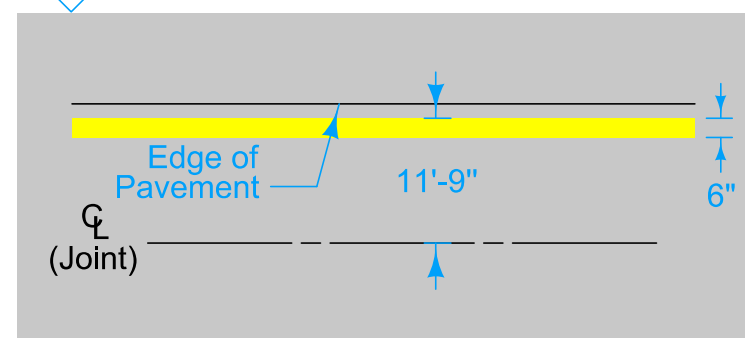
Possible Contract Item:  
 Pavement Marking Line Items  
 Painted Pavement Markings,  
 Multi-Component Liquid  
 Grooves Cut for Pavement Markings

Possible Tabulation:  
 108-22  
 108-22M

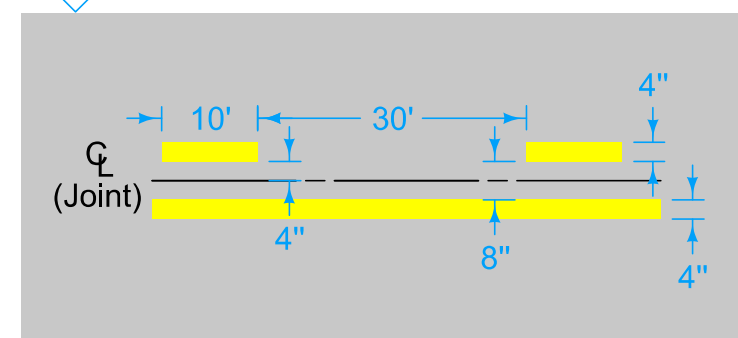
**ELY4** EDGE LINE LEFT (Yellow)



**ELY6** EDGE LINE LEFT (Yellow)



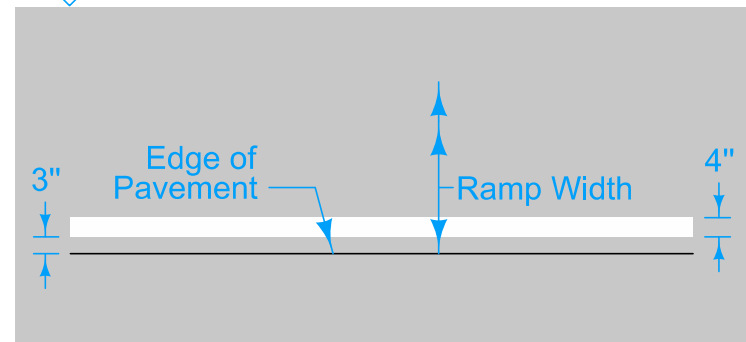
**NPY4** NO PASSING ZONE LINE (Yellow)



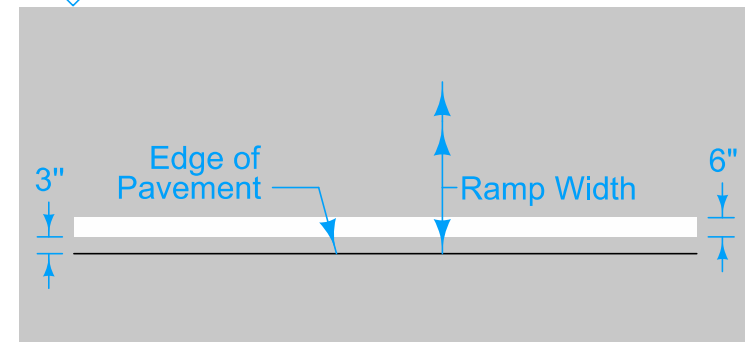
<b>MODIFIED</b>	REVISION	
	3	04-21-20
	<b>PM-110</b>	
<b>STANDARD ROAD PLAN</b>	SHEET 1 of 4	
MODIFICATIONS: Added BLW6, BLC6, SLW6, ELY6, RLY6, DLW6, CHW12, and LDW12. Added new possible contract items and tabulation.		

<b>LINE TYPES</b>	
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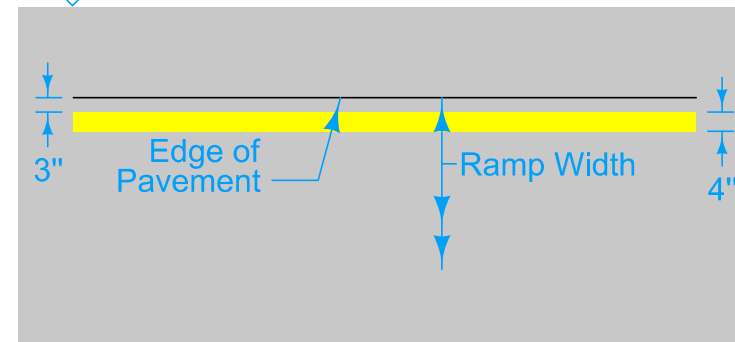
RLW4 RAMP EDGE LINE RIGHT (White)



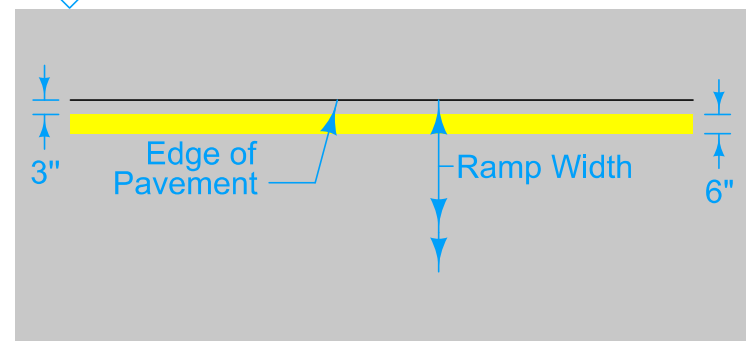
RLW6 RAMP EDGE LINE RIGHT (White)



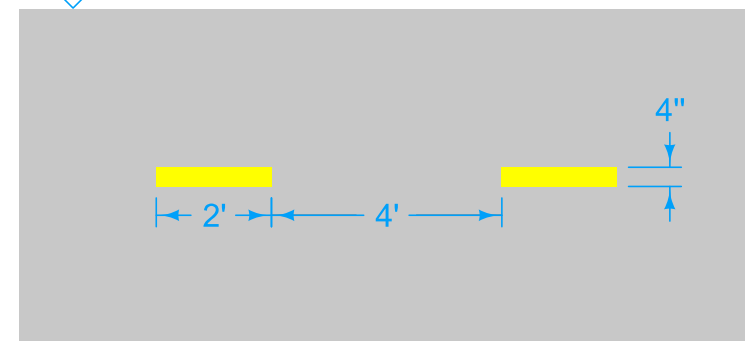
RLY4 RAMP EDGE LINE LEFT (Yellow)



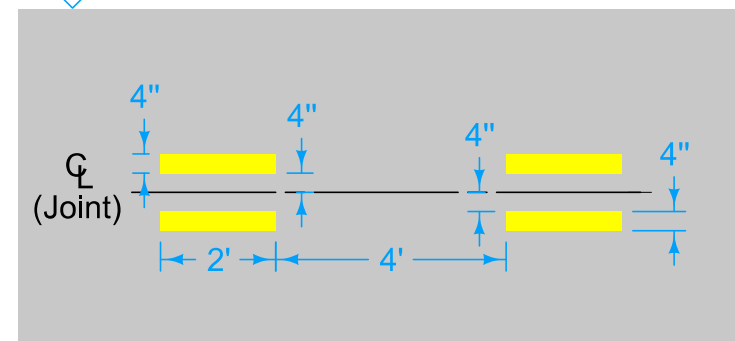
RLY6 RAMP EDGE LINE LEFT (Yellow)



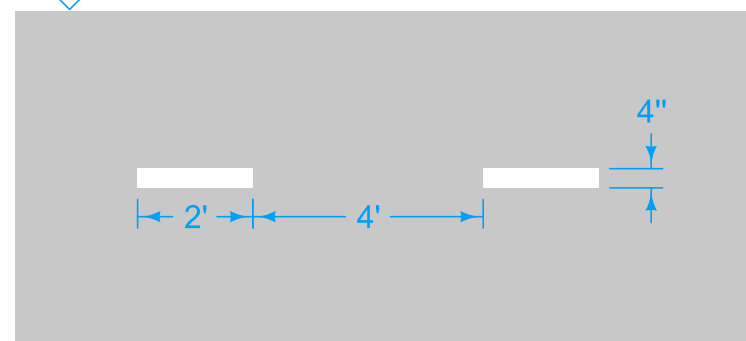
DLY4 DOTTED LINE (Yellow)



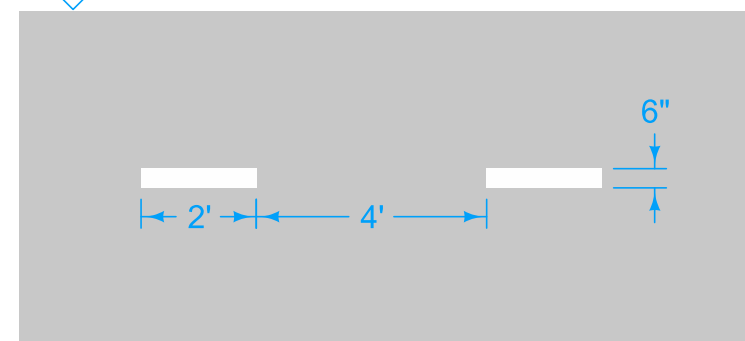
DDY4 DOUBLE DOTTED LINE (Yellow)



DLW4 DOTTED LINE (White)



DLW6 DOTTED LINE (White)



CHY8 CHANNELIZING LINE (Yellow)



CHW8 CHANNELIZING LINE (White)

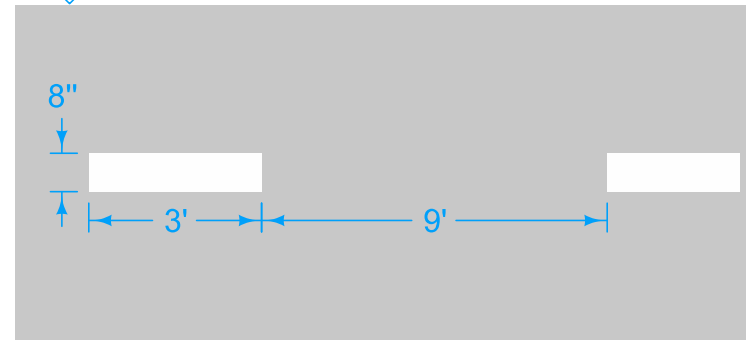


CHW12 CHANNELIZING LINE (White)

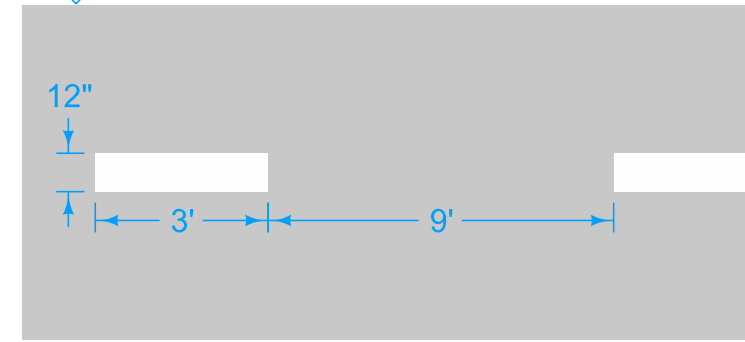


<b>MODIFIED</b>	REVISION	
	3	04-21-20
<b>STANDARD ROAD PLAN</b>		<b>PM-110</b>
		SHEET 2 of 4
MODIFICATIONS: Added BLW6, BLC6, SLW6, ELY6, RLY6, DLW6, CHW12, and LDW12. Added new possible contract items and tabulaton.		
<b>LINE TYPES</b>		

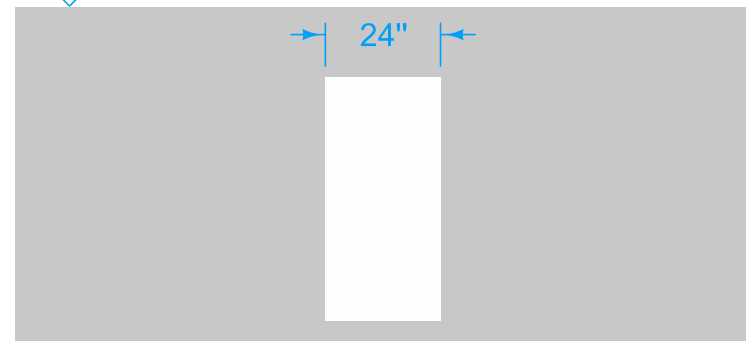
LDW8 LANE DROP (White)



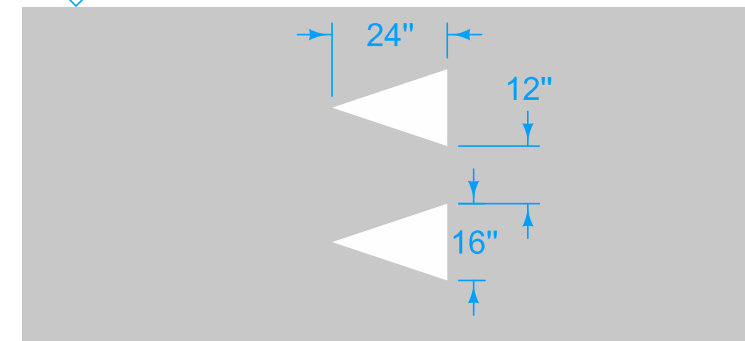
LDW12 LANE DROP (White)



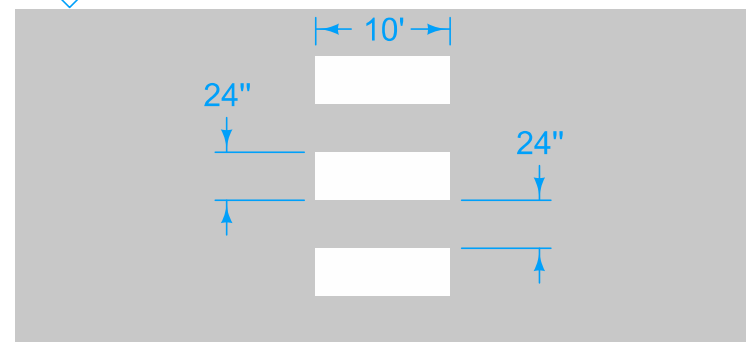
SLW2 STOP LINE (White)



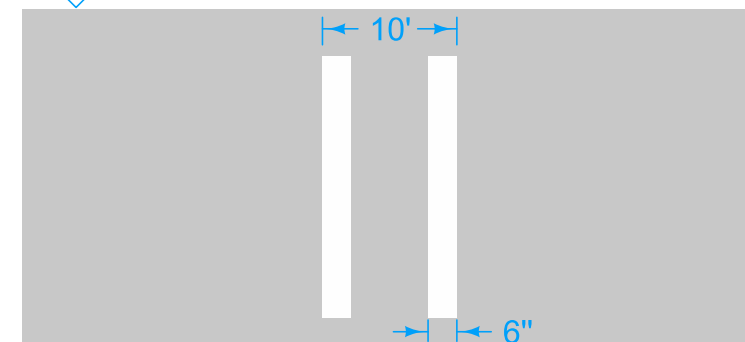
YLW2 YIELD LINE (White)



CBW6 CROSSWALK BAR (White)



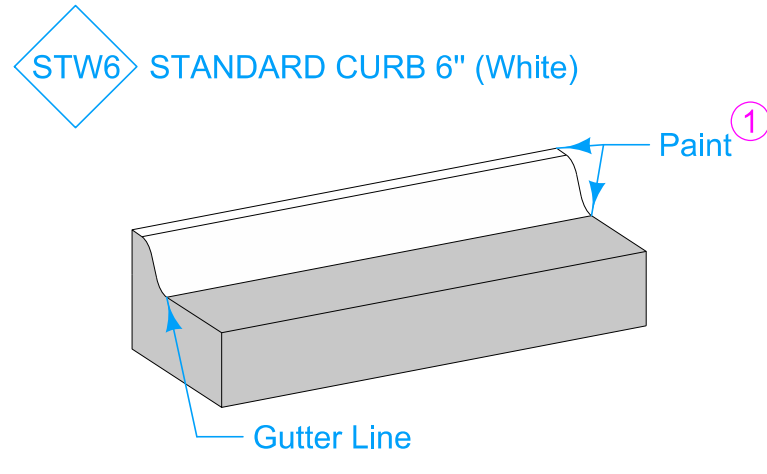
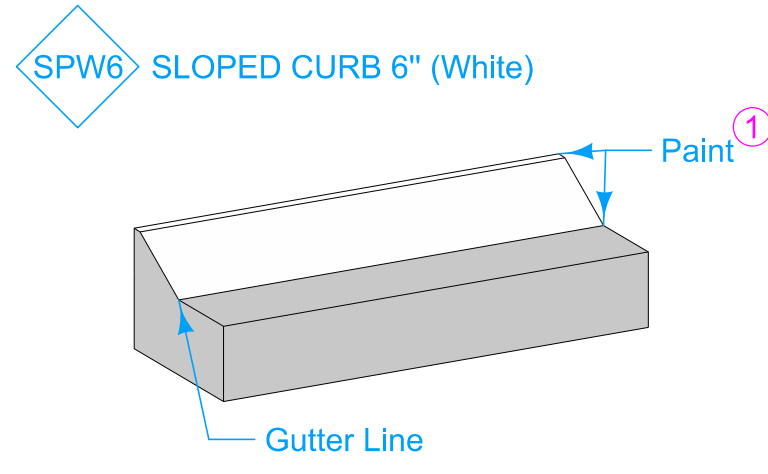
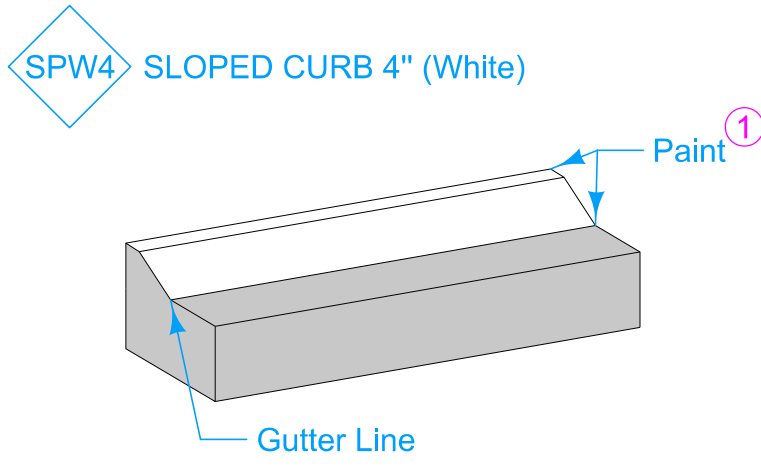
CLW6 CROSSWALK LINE (White)



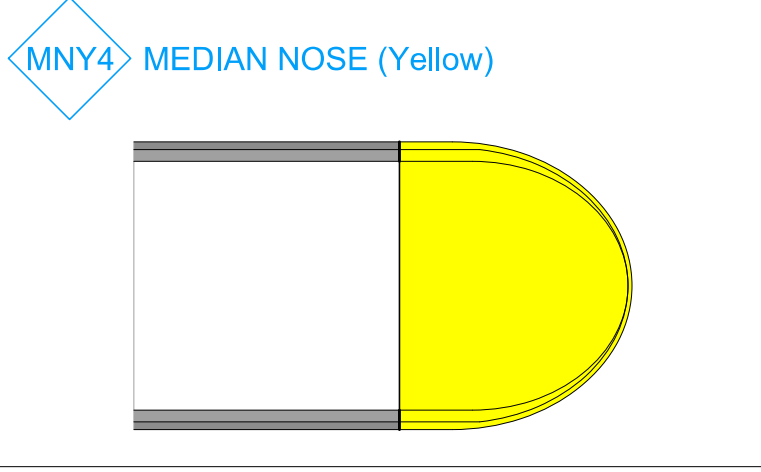
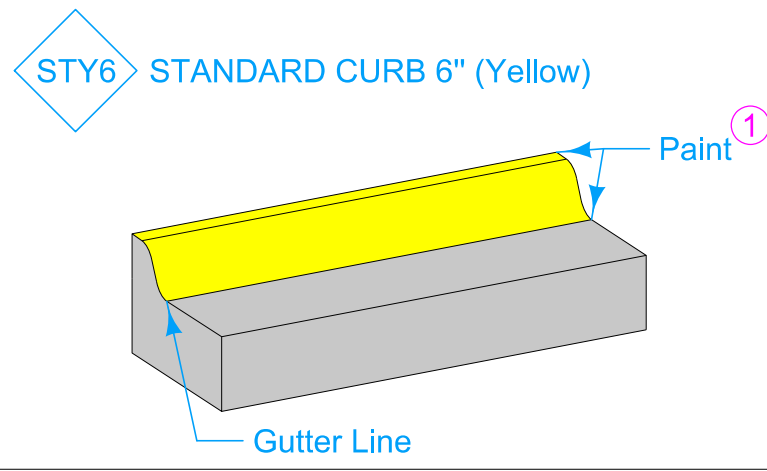
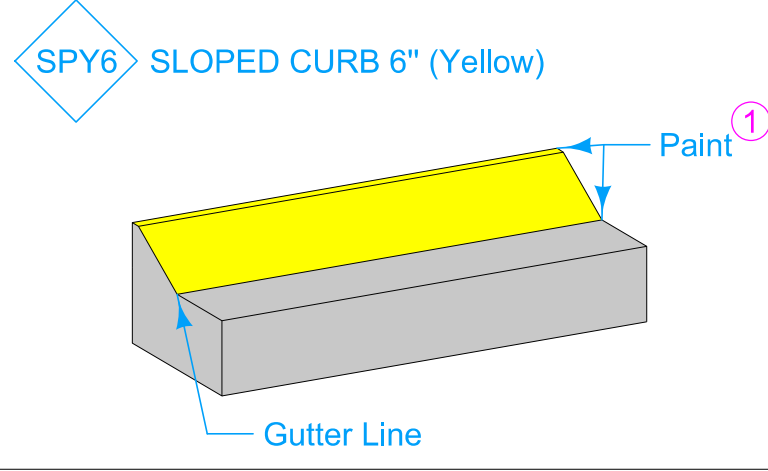
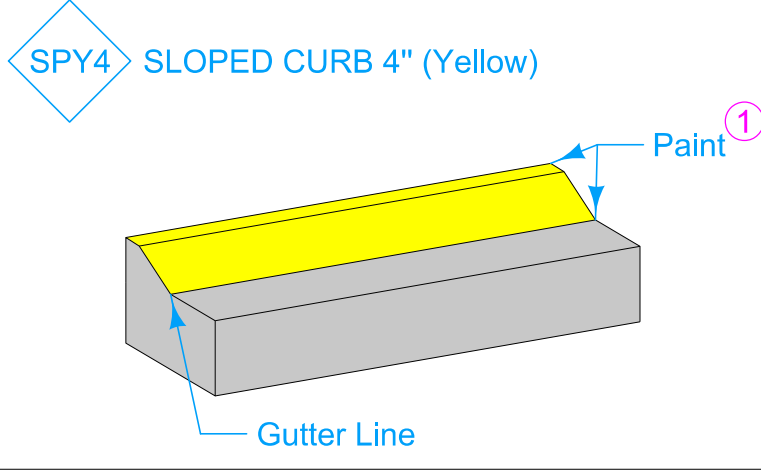
<b>MODIFIED</b>	REVISION	
	3	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-110</b>	
SHEET 3 of 4		

MODIFICATIONS: Added BLW6, BLC6, SLW6, ELY6, RLY6, DLW6, CHW12, and LDW12. Added new possible contract items and tabulaton.

**LINE TYPES**

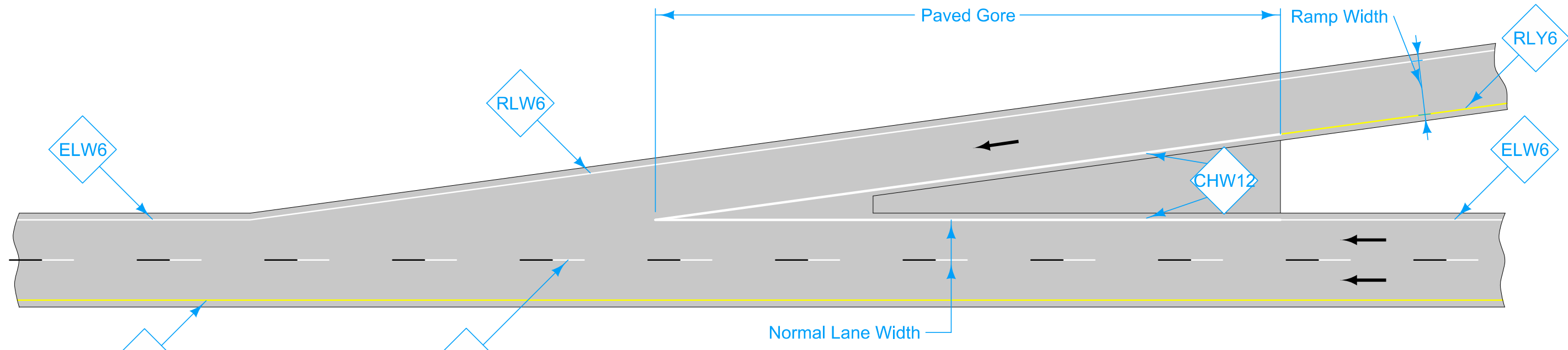


① Apply paint from back of curb to gutter line.

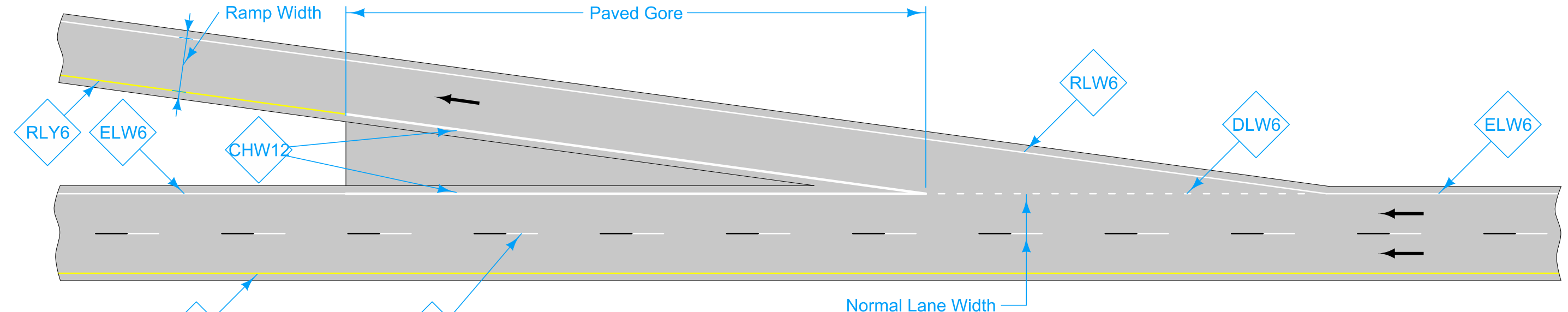


<b>MODIFIED</b>	REVISION	
	3	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-110</b>	
SHEET 4 of 4		
MODIFICATIONS: Added BLW6, BLC6, SLW6, ELY6, RLY6, DLW6, CHW12, and LDW12. Added new possible contract items and tabulation.		
<b>LINE TYPES</b>		





**TAPERED ENTRANCE RAMP**



**TAPERED EXIT RAMP**

For line information, see PM-110.

Possible Contract Item:  
 Pavement Marking Line Items  
 Painted Pavement Markings,  
 Multi-Component Liquid  
 Grooves Cut for Pavement  
 Markings

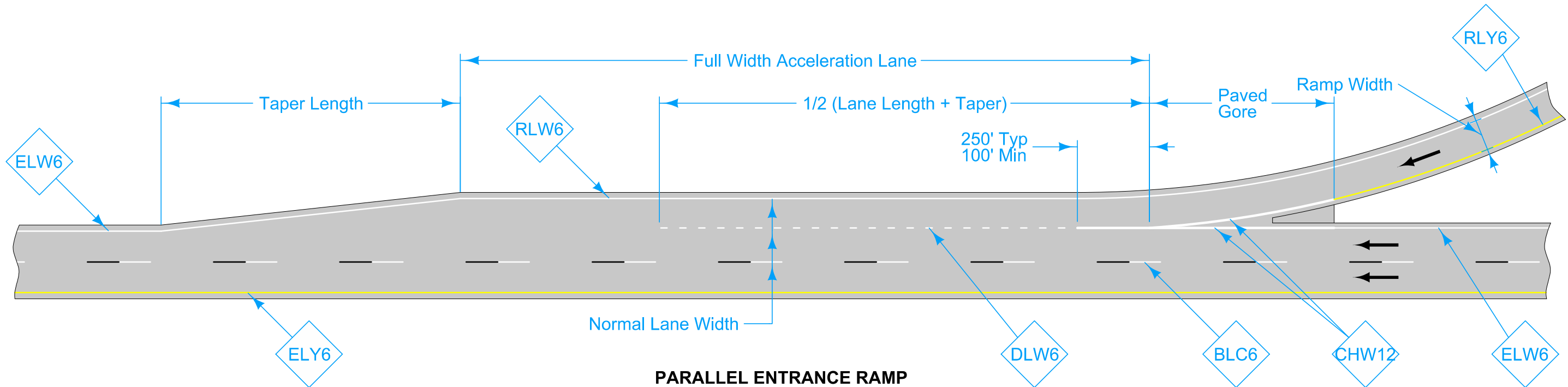
Possible Tabulation:  
 108-22  
 108-22M

LEGEND					
ELW6	Edge Line Right (White)	ELY6	Edge Line Left (Yellow)	RLW6	Ramp Edge Line Right (White)
DLW6	Dotted Line (White)	CHW12	Channelizing Line (White)	RLY6	Ramp Edge Line Left (Yellow)
LDW12	Lane Drop (White)	BLC6	Broken Line Contrast (White/Black)		
←	Direction of Traffic				

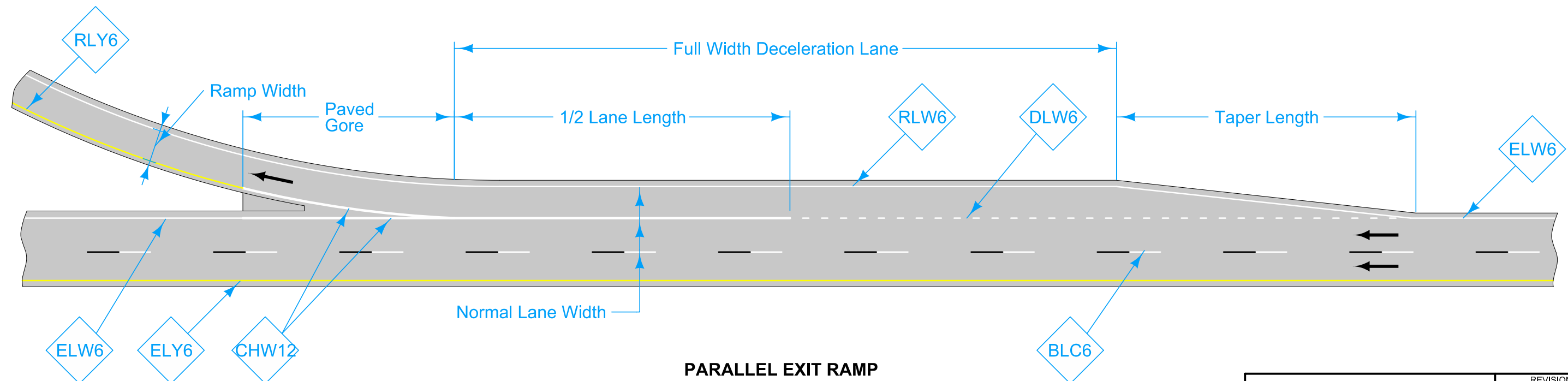
<b>MODIFIED</b>	REVISION	
	4	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-310</b>	
SHEET 1 of 7		

MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.

**ENTRANCE AND EXIT RAMPS**



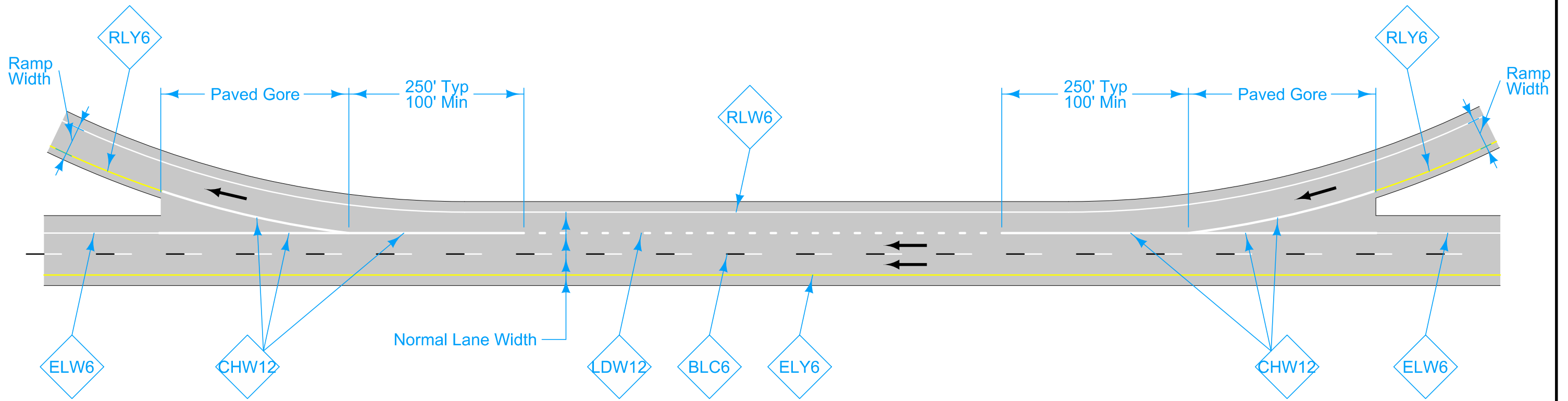
**PARALLEL ENTRANCE RAMP**



**PARALLEL EXIT RAMP**

LEGEND			
ELW6	Edge Line Right (White)	RLW6	Ramp Edge Line Right (White)
DLW6	Dotted Line (White)	RLY6	Ramp Edge Line Left (Yellow)
LDW12	Lane Drop (White)	CHW12	Channelizing Line (White)
←	Direction of Traffic	BLC6	Broken Line Contrast (White/Black)
ELY6	Edge Line Left (Yellow)		

<b>MODIFIED</b>	REVISION	
	4	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-310</b>	
SHEET 2 of 7		
<small>MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.</small>		
<b>ENTRANCE AND EXIT RAMPS</b>		



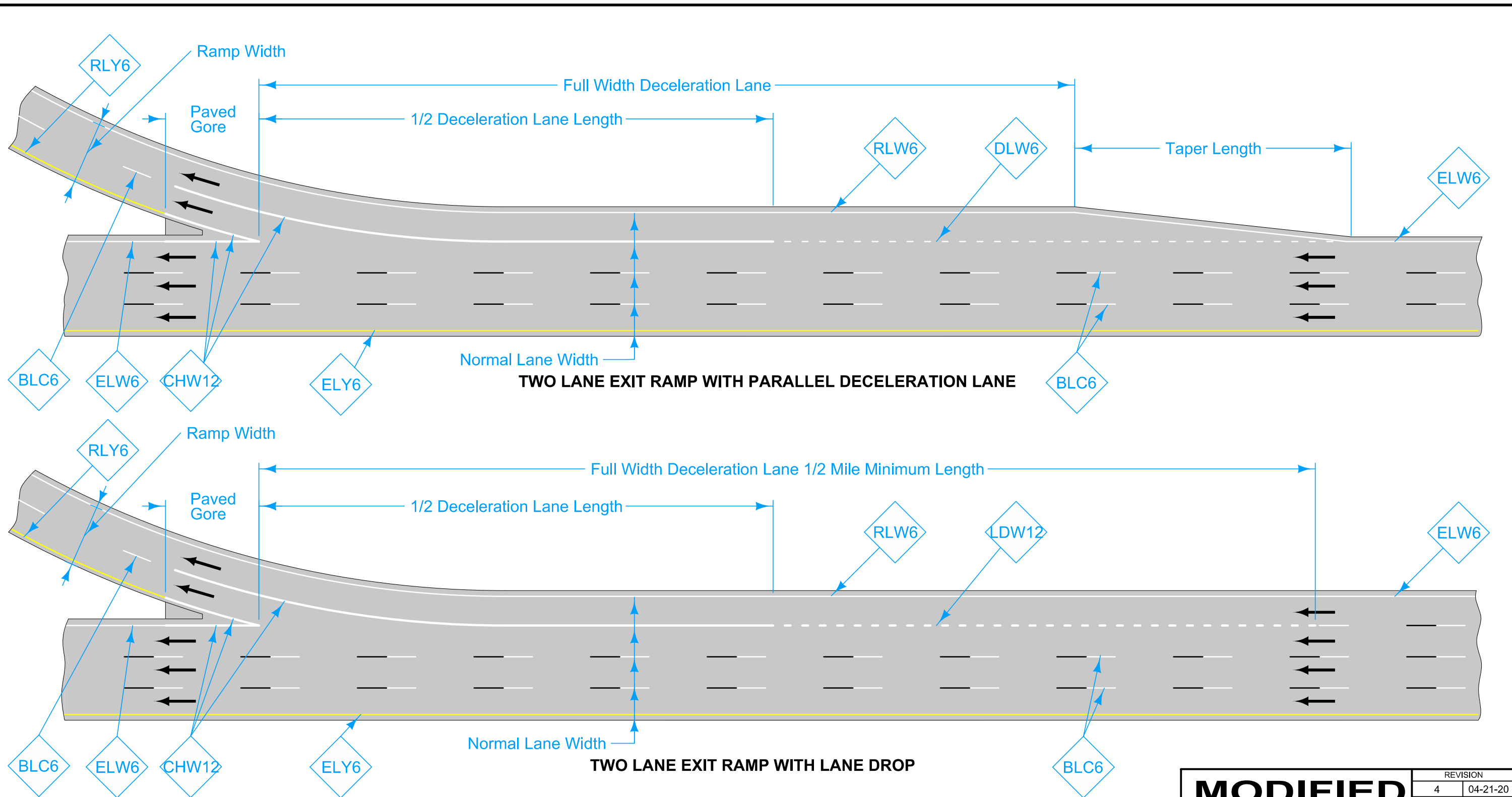
**AUXILLARY LANE BETWEEN RAMPS**

LEGEND			
ELW6	Edge Line Right (White)	RLW6	Ramp Edge Line Right (White)
DLW6	Dotted Line (White)	RLY6	Ramp Edge Line Left (Yellow)
LDW12	Lane Drop (White)	ELY6	Edge Line Left (Yellow)
←	Direction of Traffic	BLC6	Broken Line Contrast (White/Black)
		CHW12	Channelizing Line (White)

<b>MODIFIED</b>	REVISION	
	4	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-310</b>	
SHEET 3 of 7		

MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.

**ENTRANCE AND EXIT RAMPS**



**TWO LANE EXIT RAMP WITH PARALLEL DECELERATION LANE**

**TWO LANE EXIT RAMP WITH LANE DROP**

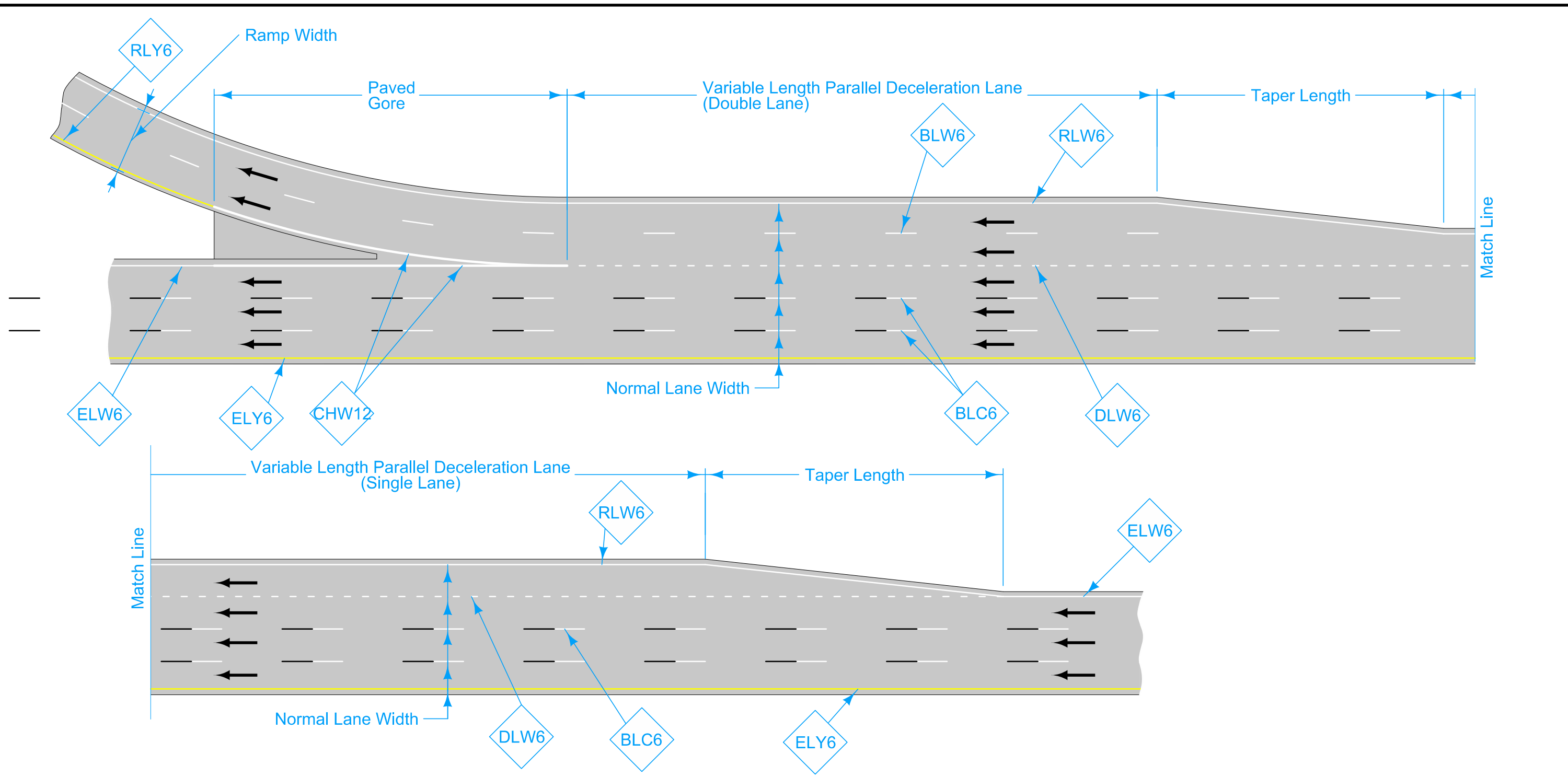
**LEGEND**

- ELW6 Edge Line Right (White)
- DLW6 Dotted Line (White)
- LDW12 Lane Drop (White)
- ← Direction of Traffic
- ELY6 Edge Line Left (Yellow)
- CHW12 Channelizing Line (White)
- BLC6 Broken Line Contrast (White/Black)
- RLW6 Ramp Edge Line Right (White)
- RLY6 Ramp Edge Line Left (Yellow)

<b>MODIFIED STANDARD ROAD PLAN</b>	REVISION	
	4	04-21-20
<b>PM-310</b>		
SHEET 4 of 7		

MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.

**ENTRANCE AND EXIT RAMPS**



**TWO LANE EXIT RAMP WITH DOUBLE PARALLEL DECELERATION LANE**

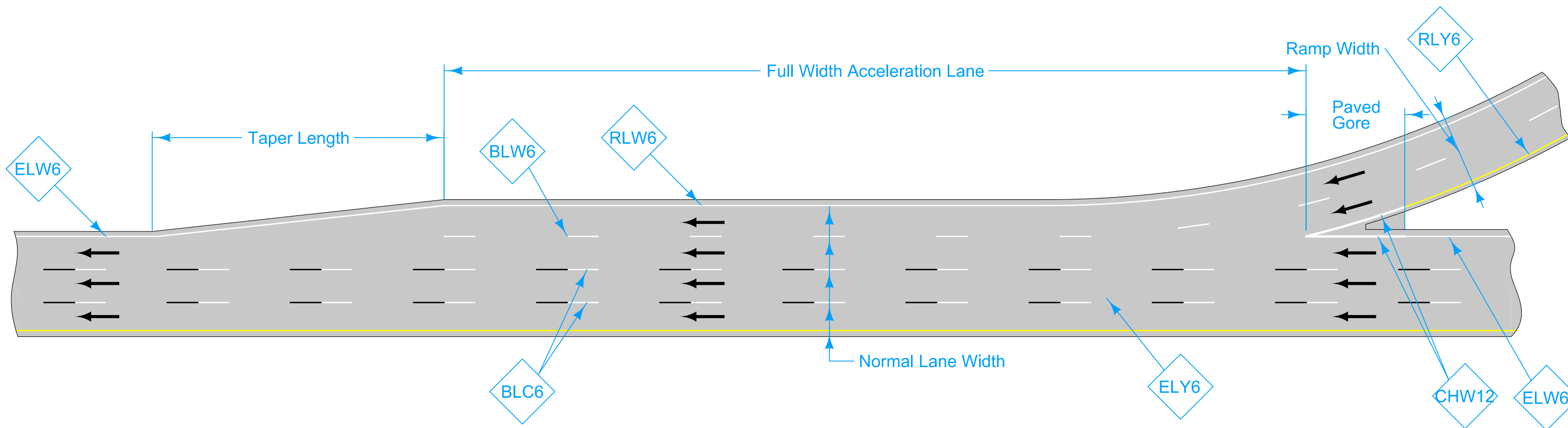
**LEGEND**

- |                                     |  |  |
|-------------------------------------|--|--|
| <b>ELW6</b> Edge Line Right (White) | <b>ELY6</b> Edge Line Left (Yellow)            | <b>RLW6</b> Ramp Edge Line Right (White) |
| <b>DLW6</b> Dotted Line (White)     | <b>CHW12</b> Channelizing Line (White)         | <b>RLY6</b> Ramp Edge Line Left (Yellow) |
| <b>LDW12</b> Lane Drop (White)      | <b>BLC6</b> Broken Line Contrast (White/Black) |  |
| <b>←</b> Direction of Traffic       |  |  |

<b>MODIFIED</b>	REVISION	
	4	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-310</b>	
SHEET 5 of 7		

MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.

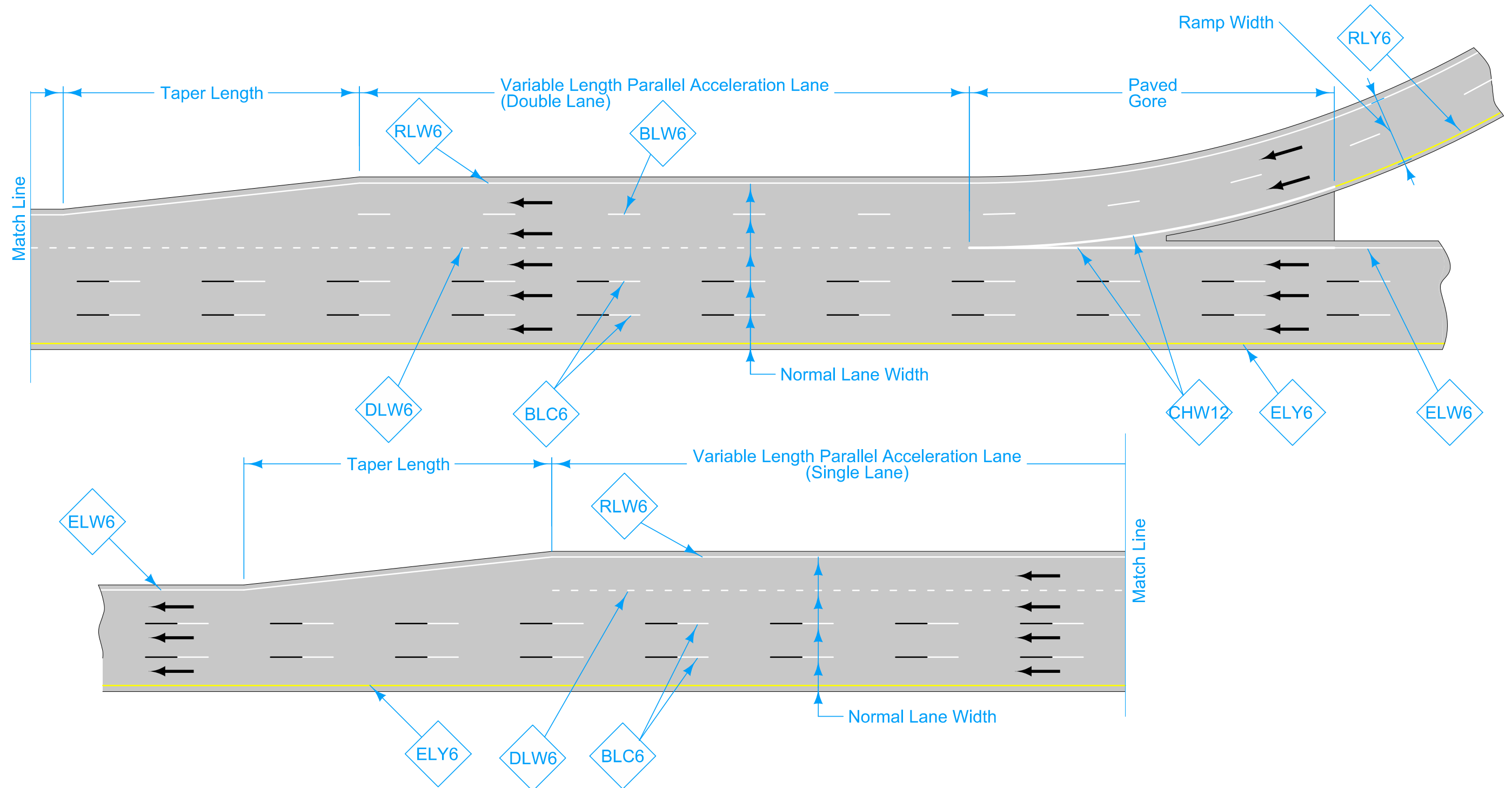
**ENTRANCE AND EXIT RAMPS**



**TWO LANE ENTRANCE RAMP WITH SINGLE PARALLEL ACCELERATION LANE**

LEGEND					
ELW6	Edge Line Right (White)	ELY6	Edge Line Left (Yellow)	RLW6	Ramp Edge Line Right (White)
DLW6	Dotted Line (White)	CHW12	Channelizing Line (White)	RLY6	Ramp Edge Line Left (Yellow)
LDW12	Lane Drop (White)	BLC6	Broken Line Contrast (White/Black)		
←	Direction of Traffic				

<b>MODIFIED</b>	REVISION	
	4	04-21-20
<b>STANDARD ROAD PLAN</b>	<b>PM-310</b>	
SHEET 6 of 7		
<small>MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.</small>		
<b>ENTRANCE AND EXIT RAMPS</b>		



**TWO LANE ENTRANCE RAMP WITH DOUBLE PARALLEL ACCELERATION LANE**

**LEGEND**

- |                                     |  |  |
|-------------------------------------|--|--|
| <b>ELW6</b> Edge Line Right (White) | <b>ELY6</b> Edge Line Left (Yellow)            | <b>RLW6</b> Ramp Edge Line Right (White) |
| <b>DLW6</b> Dotted Line (White)     | <b>CHW12</b> Channelizing Line (White)         | <b>RLY6</b> Ramp Edge Line Left (Yellow) |
| <b>LDW12</b> Lane Drop (White)      | <b>BLC6</b> Broken Line Contrast (White/Black) |  |
| <b>←</b> Direction of Traffic       |  |  |

<b>MODIFIED STANDARD ROAD PLAN</b>	REVISION	
	4	04-21-20
<b>PM-310</b>		
SHEET 7 of 7		
MODIFICATIONS: Changed ELW4 to ELW6, ELY4 to ELY6, BLW4 to BLW6, DLW4 to DLW6, RLW4 to RLW6, RLY4 to RLY6, CHW8 to CHW12, and LDW8 to LDW12. Added BLC6. Added new possible contract items and tabulation.		
ENTRANCE AND EXIT RAMPS		

# ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Design No. 0822-Polk : Design No. 0822-Polk

Item no.	Item Code	Item	Unit	Quantities		Estimate Reference Notes
				Estimated		
				Design No. 0822-Polk		
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1		Includes all work for removal and off-site disposal of portions of the barrier rail. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the state.
2	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	0.5		Includes cleaning existing concrete rail, furnishing and placing concrete sealer. See design sheet 3 for additional details.
3	2426-6772016	CONCRETE REPAIR	SF	16		
4	2533-4980005	MOBILIZATION	LS	1		--

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.



**GENERAL NOTES:**

THIS DESIGN IS FOR REPAIRS TO THE EXISTING 228'-3<sup>3</sup>/<sub>4</sub> x 58'-10<sup>1</sup>/<sub>4</sub> PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE ON I-235 E.B. OVER HULL AVENUE IN POLK COUNTY.

ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS AND REPAIR PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NOS. 3505, 805, & 306).

FAINT LINES ON PLANS INDICATE EXISTING PORTIONS OF THE BRIDGE.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

THE CITY AND UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE TRAFFIC LANE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

THE TOP AND INTERIOR FACES OF THE EXISTING CONCRETE RAILING ARE TO BE CLEANED AND SEALED IN ACCORDANCE WITH ARTICLE 2403.03, P, OF THE STANDARD SPECIFICATIONS. IF NEW SECTIONS OF RAIL ARE CONSTRUCTED, THE NEW SECTIONS SHALL NOT BE SEALED. ALL COSTS ASSOCIATED WITH CLEANING AND SEALING OF THE CONCRETE RAILS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM "STRUCTURAL CONCRETE (MISCELLANEOUS)".

AREA OF BARRIER RAIL INDICATED ON THE CONCRETE REPAIR DETAILS OR DESIGNATED BY THE ENGINEER ARE TO BE REPAIRED USING CONCRETE REPAIR NOTES AND DETAILS IN THESE PLANS.

THE LUMP SUM BID FOR "REMOVALS, AS PER PLAN" SHALL INCLUDE ALL COSTS ASSOCIATED WITH REMOVING PORTIONS OF THE WEST (MEDIAN) RAIL AS SHOWN. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE SPECIFICATIONS. ANY DAMAGE TO ANY STEEL OR CONCRETE NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

**SPECIFICATIONS:**

DESIGN: AASHTO SERIES 2002.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

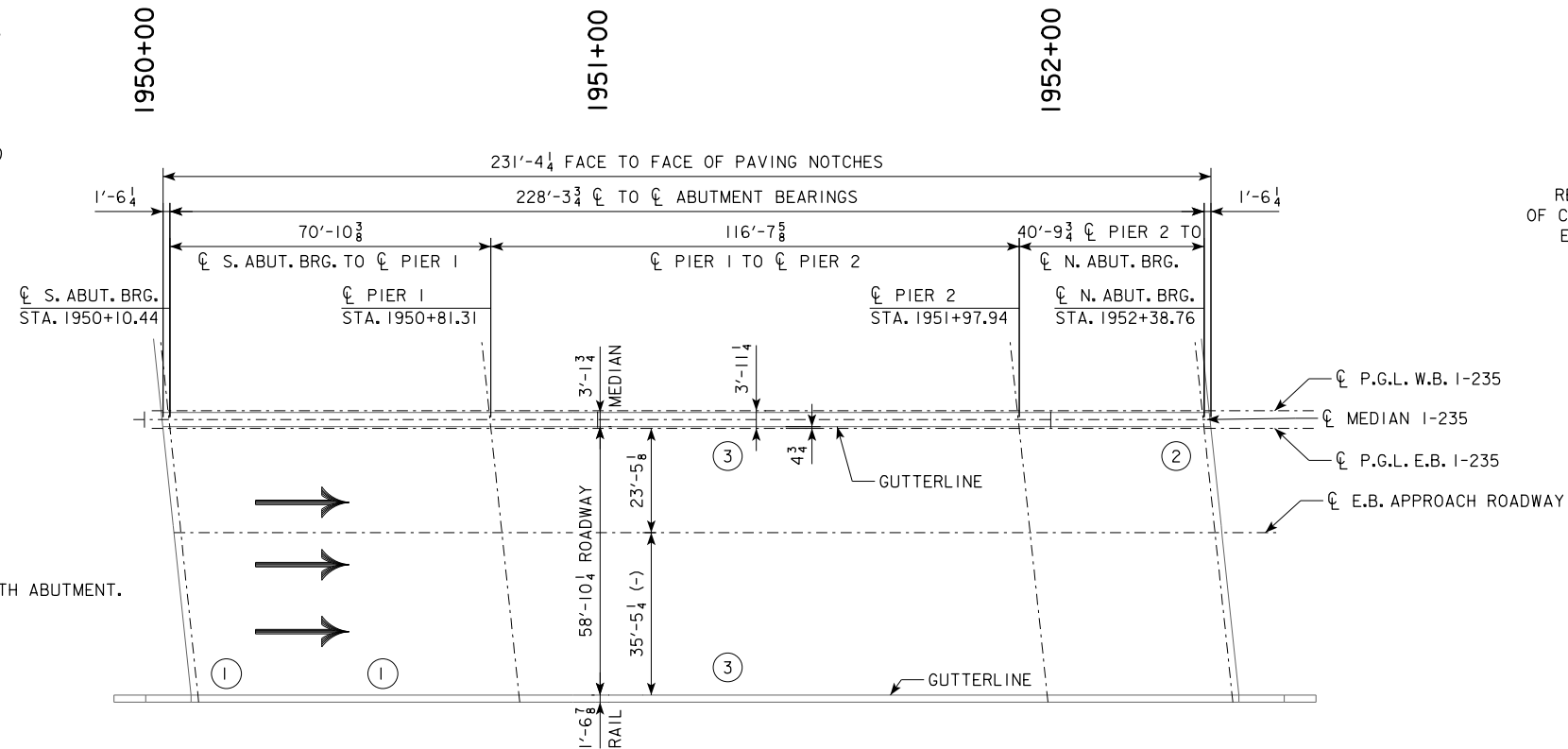
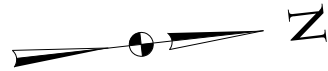
**DESIGN STRESSES:**

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES 2002.

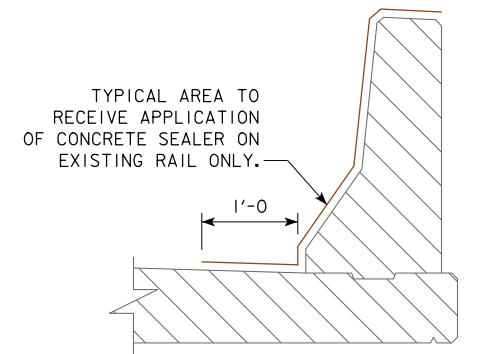
CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 4.0 KSI.

**REPAIRS SHALL CONSIST OF:**

- ① CONCRETE REPAIR ON BARRIER RAILS.
- ② REMOVE AND RECONSTRUCT A PORTION OF THE WEST BARRIER RAIL AT THE NORTH ABUTMENT.
- ③ CLEAN AND SEAL CONCRETE BARRIER RAILS.



SITUATION PLAN



DETAIL OF CONCRETE SEALER AREA

**TRAFFIC ESTIMATE**

2020 AADT 33,200 V.P.D.  
TRUCKS 1 %

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
3505	ORIGINAL DESIGN (STAGE 1)
805	ORIGINAL DESIGN (STAGE 2)
306	ORIGINAL DESIGN (STAGE 3)
822	BRIDGE REPAIRS



**LOCATION:**

I-235 E.B. OVER HULL AVENUE  
T-79N R-23W  
SECTION 30  
LEE TOWNSHIP  
POLK COUNTY  
MAINT. NO. 7711.8R235  
FHWA NO. 43021  
LATITUDE 41.621967  
LONGITUDE -93.575977

TRAFFIC CONTROL PLAN:  
THE ROADWAY WILL BE OPEN TO THRU TRAFFIC.  
REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

**STRUCTURAL DESIGN**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

**JEREMY D. KOTTA** 18994  
IOWA

Printed or Typed Name: Jeremy D. Kotta Date: \_\_\_\_\_  
My license renewal date is December 31, 2021  
Pages or sheets covered by this seal: \_\_\_\_\_ V.1 THRU V.12

**PRELIMINARY NOT FOR CONSTRUCTION**

DESIGN FOR REPAIRS TO A 6° SKEW (R.A.)  
**228'-3<sup>3</sup>/<sub>4</sub> x 58'-10<sup>1</sup>/<sub>4</sub> PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
70'-10<sup>3</sup>/<sub>8</sub> & 40'-9<sup>3</sup>/<sub>8</sub> END SPANS 116'-7<sup>5</sup>/<sub>8</sub> INTERIOR SPAN  
**NOTES & SITUATION PLAN**  
STA. 1951+43.51 (CL I-235) JANUARY, 2022  
**POLK COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 2 OF 4 FILE NO. 32055 DESIGN NO. 822

**WEST (MEDIAN) RAIL REPAIR NOTES:**

ALL THE COSTS OF EQUIPMENT AND MATERIALS REQUIRED FOR REMOVAL AND OFF-SITE DISPOSAL OF THE DETERIORATED AREAS ON THE BARRIER RAIL SHALL BE INCLUDED IN THE PRICE BID FOR "REMOVALS, AS PER PLANS". REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

ALL THE COSTS OF EQUIPMENT AND MATERIAL REQUIRED TO REPLACE THE DETERIORATED AREAS ON THE BARRIER RAIL SHALL BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (MISCELLANEOUS)". MEASUREMENT SHALL BE CUBIC YARDS AS MEASURED IN THE FIELD. PAYMENT WILL BE THE CONTRACT UNIT PRICE PER CUBIC YARD AND CONSIDERED FULL COMPENSATION FOR ALL WORK INVOLVED.

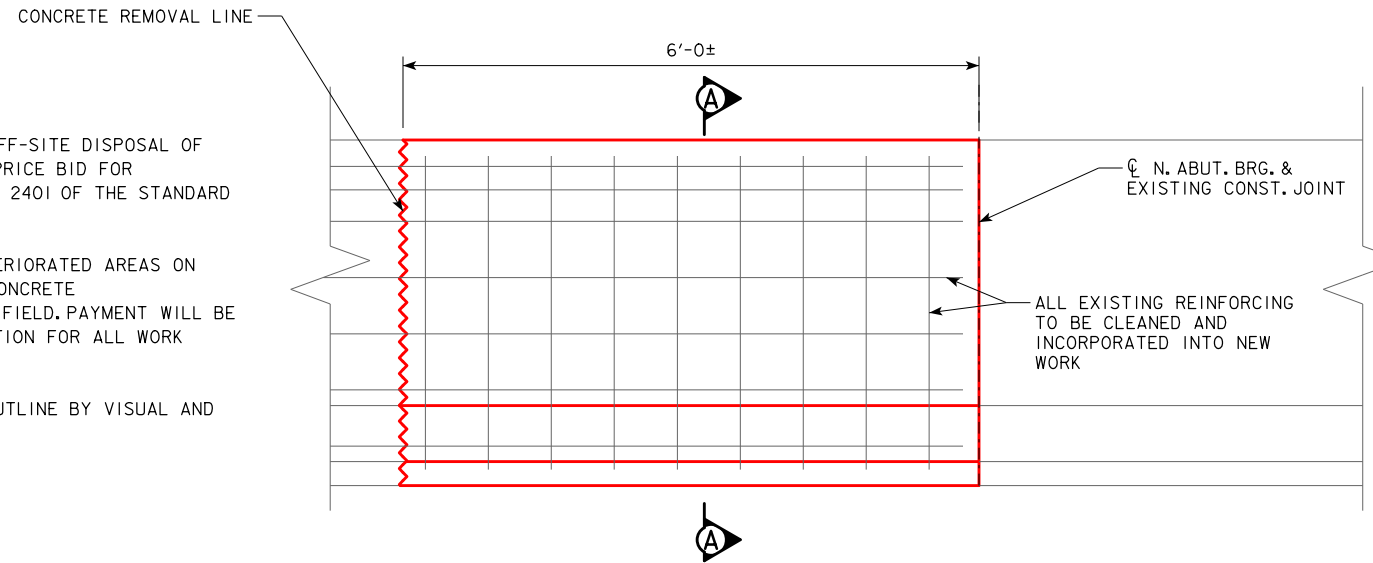
THE LIMITS SHOWN ARE APPROXIMATE. THE ENGINEER SHALL DETERMINE AND OUTLINE BY VISUAL AND AUDIBLE INSPECTION THE ACTUAL AREAS OF THE REPAIRS.

REMOVALS SHALL BE INITIATED WITH A 3/4" SAWCUT.

NEW CONCRETE SECTION SHALL MATCH EXISTING.

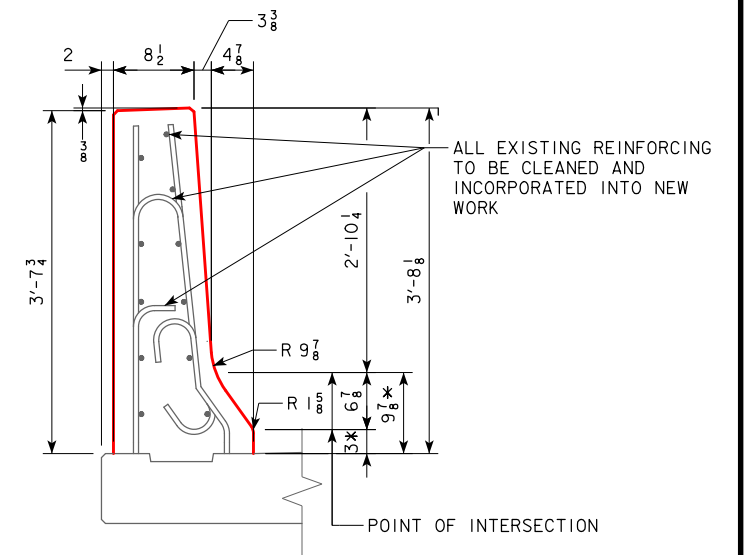
CONTRACTOR SHALL EXERCISE CARE WHEN REMOVING CONCRETE AROUND THE EPOXY COATED REINFORCING AND USE HAND TOOLS THAT WILL NOT DAMAGE THE EPOXY COATING ACCORDING TO ARTICLE 2413.03, C OF THE STANDARD SPECIFICATIONS.

EXISTING EPOXY COATED REINFORCING SHALL BE CAREFULLY CLEANED AND INCORPORATED INTO NEW WORK. ANY DAMAGE TO THE EPOXY COATING SHALL BE REPAIRED WITH A TWO PART LIQUID EPOXY COATING PER IM 451.03B, APPENDIX B.



**ELEVATION VIEW OF WEST (MEDIAN) RAIL**

(LOOKING WEST)

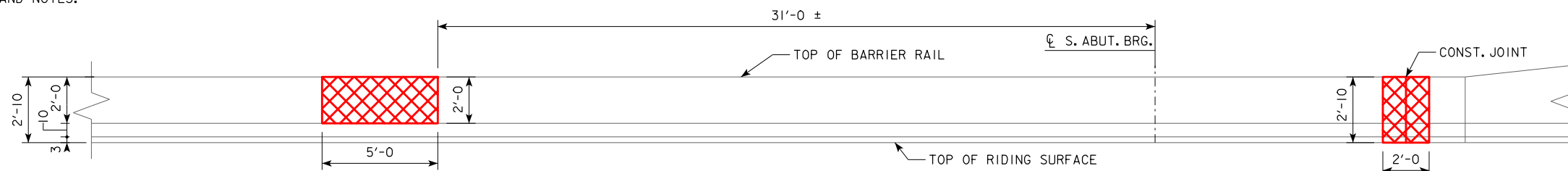


**SECTION A-A**

\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

CONCRETE PLACEMENT SUMMARY	
LOCATION	TOTAL
WEST (MEDIAN) RAIL	0.5
TOTAL (CU. YDS.)	0.5

NOTE:  
SEE DESIGN SHEET 4 FOR EAST BARRIER RAIL REPAIR DETAILS AND NOTES.



**EAST BARRIER RAIL**

(LOOKING EAST)

**EAST BARRIER RAIL REPAIR**

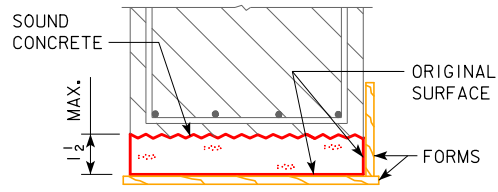
NOTE:  
ACTUAL CONCRETE REPAIR AREAS ARE TO BE DETERMINED BY THE ENGINEER AT THE TIME OF CONSTRUCTION.

LEGEND	
	INDICATES REGULAR REPAIR
	INDICATES SHALLOW REPAIR

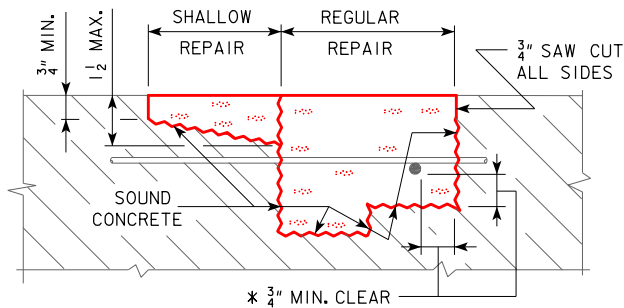
DESIGN FOR REPAIRS TO A 6° SKEW (R.A.)  
**228'-3 3/4 x 58'-10 1/4 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
 70'-10 3/8 & 40'-9 3/4 END SPANS 116'-7 5/8 INTERIOR SPAN  
**RAIL REPAIR DETAILS**  
 STA. 1951+43.51 (CL 1-235) JANUARY, 2022  
**POLK COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 DESIGN SHEET NO. 3 OF 4 FILE NO. 32055 DESIGN NO. 822



REVISED 10-14 - DELETED ALL REFERENCES TO GROUT - SECTION 2426 COVERS THIS REQUIREMENT AND DOESN'T NEED TO STATED ON THE PLANS. ENGLISHREPAIRRETRFITBRIDGES.DGN 1045 - THIS SHEET REDRAWN 9-27-90.

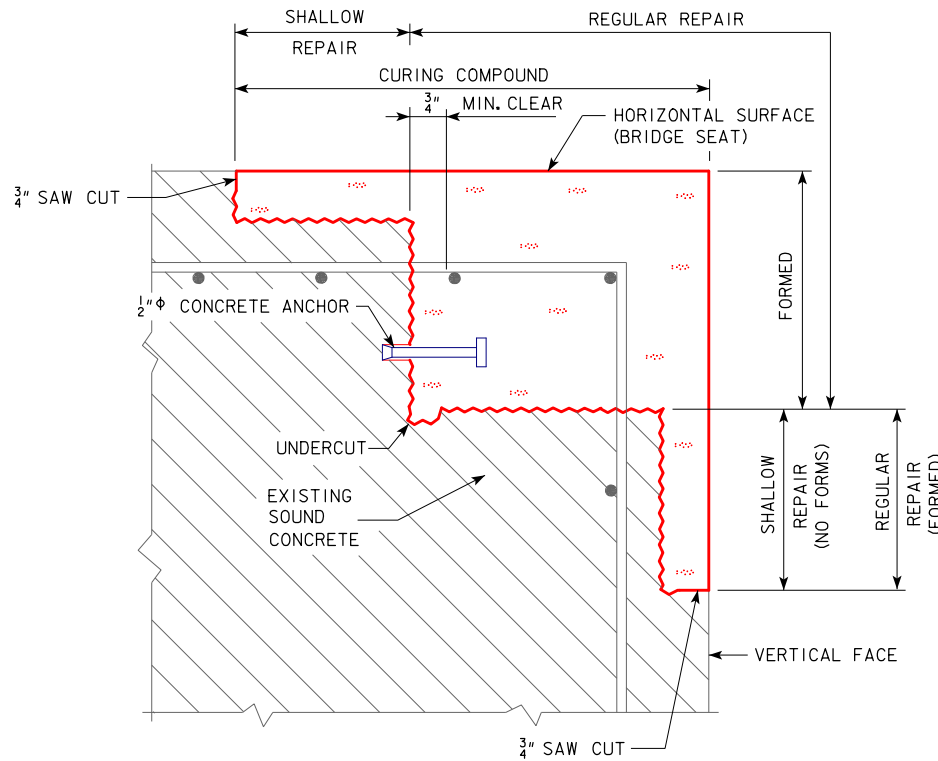


**SHALLOW REPAIR  
BOTTOM SURFACE**

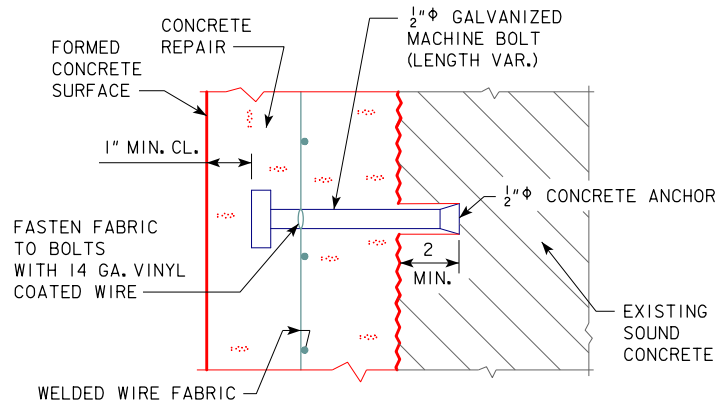


**REPAIR DEFINITION**

\* INDICATES CLEARANCE FOR AN UN-BONDED REBAR.

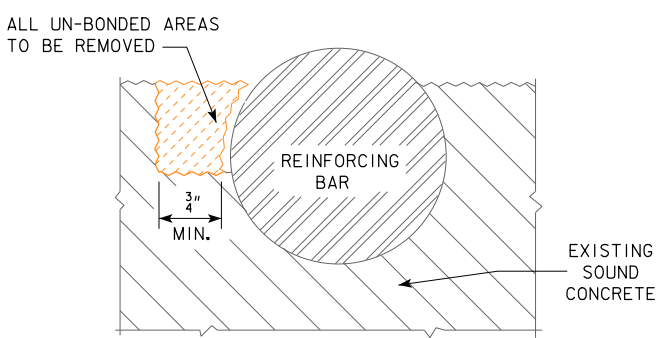


**CORNER REPAIR**

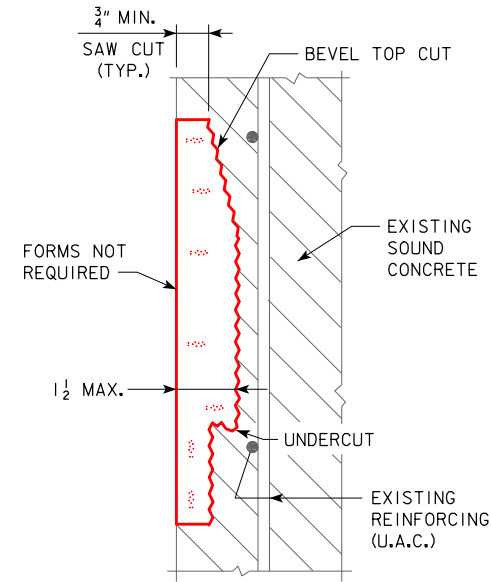


**ANCHOR DETAIL**

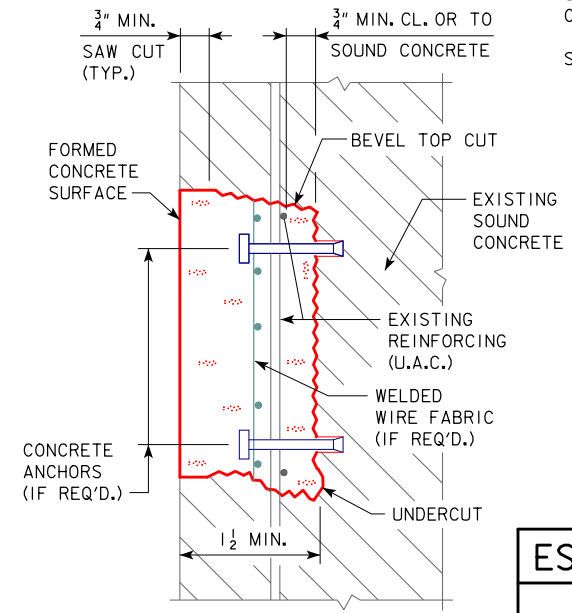
FOR SPACING AND USE OF CONCRETE ANCHORS AND WWF SEE THE REPAIR NOTES.



**CONCRETE REMOVAL  
ADJACENT TO REINFORCING**



**SHALLOW REPAIR  
VERTICAL FACE**



**REGULAR REPAIR  
VERTICAL FACE**

**REPAIR NOTES:**

THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE AS NOTED AND SHOWN IN THESE PLANS SHALL BE REPAIRED AS FOLLOWS:  
 ALL THE COSTS OF EQUIPMENT AND MATERIALS REQUIRED TO REPAIR THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".  
 THE PRICE BID FOR "CONCRETE REPAIR" SHALL INCLUDE THE COST OF ALL CONCRETE ANCHORS AND WELDED WIRE FABRIC REQUIRED BY THE PLANS.  
 THE ENGINEER SHALL DETERMINE AND OUTLINE BY VISUAL AND AUDIBLE INSPECTION THE ACTUAL AREAS OF THE CONCRETE REPAIRS. THE CONTRACTOR SHALL BE PAID FOR THE ACTUAL AMOUNT OF REPAIRS MADE ON A SQUARE FOOT BASIS BASED ON THE PRICE BID PER SQUARE FOOT.  
 ALL EXISTING REINFORCING BARS THAT ARE EXPOSED BY CONCRETE REMOVAL SHALL BE CLEANED AND CAREFULLY INCORPORATED INTO THE NEW WORK, EXCEPT BADLY DETERIORATED EXISTING REINFORCING WHICH SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.  
 THE CONCRETE ANCHORS REQUIRED SHALL HAVE A MINIMUM PULL OUT OF 5000 LBS. BASED ON 4000 PSI CONCRETE. AN ANCHOR MEETING THE REQUIREMENTS OF IOWA D.O.T. MATERIALS I.M. 453.09 AND THE PULL OUT LOAD ABOVE IS REQUIRED. THE ANCHORS SHALL BE GALVANIZED AND SHALL BE INSTALLED ACCORDING TO RECOMMENDATIONS OF THE MANUFACTURER. THE COST OF FURNISHING AND INSTALLING THE CONCRETE ANCHORS SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".  
 THE WELDED WIRE FABRIC SHALL BE ASTM A185 AND GALVANIZED AS PER ASTM A-641. THE WWF WIRES SHALL BE SPACED 3 x 3 OR 4 x 4 AND THE WIRES SHALL HAVE A NOMINAL AREA OF 0.014 TO 0.029 SQUARE INCHES INCLUSIVE, EXAMPLE "WWF 3 x 3 - W1.4 x W2.9".  
 WHERE REINFORCEMENT HAS BEEN EXPOSED AND CLEARANCE AROUND THE PERIPHERY OF THE EXISTING BAR IS PROVIDED NO SUPPLEMENTAL REINFORCING IS REQUIRED, EXCEPT WHERE EXISTING REINFORCEMENT DENSITY AND PATTERN ARE SUCH THAT INDIVIDUAL OPEN SPACES BETWEEN BARS ARE OF 1.5 SQUARE FOOT OR LARGER. FOR THIS CONDITION 1/2" CONCRETE ANCHORS AND WELDED WIRE FABRIC SHALL BE INSTALLED AT THE RATE OF ONE CONCRETE ANCHOR WITH WWF PER EACH 1.5 SQUARE FEET OF AREA WITHIN EACH OPEN SPACE.  
 REPAIRING THE STRUCTURAL CONCRETE SHALL BE IN ACCORDANCE WITH SECTION 2426, OF THE STANDARD SPECIFICATIONS.

CONCRETE PLACEMENT QUANTITIES			
MARK	TYPE	UNITS	QUANTITY
①	SHALLOW REPAIR	SQ. FT.	0
②	REGULAR REPAIR	SQ. FT.	16
TOTAL (SQ. FT.)			16

ESTIMATED CONCRETE REPAIR QUANTITIES		
DESCRIPTION	UNITS	AMOUNT
CONCRETE REPAIR	SQ. FT.	16

DESIGN FOR REPAIRS TO A 6° SKEW (R.A.)  
**228'-3 3/4" x 58'-10 1/4" PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 70'-10 3/8" & 40'-9 3/8" END SPANS      116'-7 5/8" INTERIOR SPAN  
**CONCRETE REPAIRS**  
 STA. 1951+43.51 (C 1-235)      JANUARY, 2022  
**POLK COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 DESIGN SHEET NO. 4 OF 4      FILE NO. 32055      DESIGN NO. 822

# ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Design No. 0922-Polk : Design No. 0922-Polk

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Design No. 0922-Polk	
1	2426-6772016	CONCRETE REPAIR	SF	42	INCLUDES CLEANING EXISTING CONCRETE RAIL, FURNISHING AND PLACING CONCRETE SEALER.
2	2533-4980005	MOBILIZATION	LS	1	--

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

**GENERAL NOTES:**

THIS DESIGN IS FOR REPAIRS TO THE EXISTING 150'-10 x 56'-10 1/4 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE ON I-235 W.B. OVER NE 46TH AVE. IN POLK COUNTY.

ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS AND REPAIR PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. 565, REPAIR DESIGN NOS. 905 & 506).

FAINT LINES ON PLANS INDICATE EXISTING PORTIONS OF THE BRIDGE.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

THE CITY AND UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE TRAFFIC LANE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

THE TOP AND INTERIOR FACES OF THE EXISTING CONCRETE RAILING ARE TO BE CLEANED AND SEALED IN ACCORDANCE WITH ARTICLE 2403.03, P, OF THE STANDARD SPECIFICATIONS. IF NEW SECTIONS OF RAIL ARE CONSTRUCTED, THE NEW SECTIONS SHALL NOT BE SEALED. ALL COSTS ASSOCIATED WITH CLEANING AND SEALING OF THE CONCRETE RAILS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM "CONCRETE REPAIR".

AREA OF BARRIER RAIL INDICATED ON THE CONCRETE REPAIR DETAILS OR DESIGNATED BY THE ENGINEER ARE TO BE REPAIRED USING CONCRETE REPAIR NOTES AND DETAILS IN THESE PLANS.

**SPECIFICATIONS:**

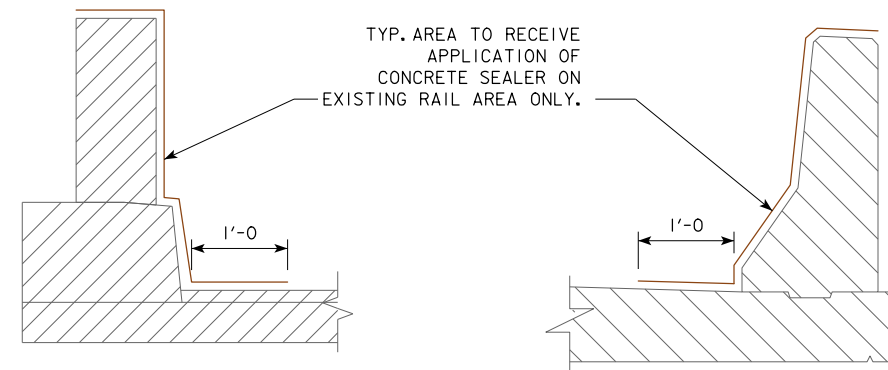
DESIGN: AASHTO SERIES 2002.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

**DESIGN STRESSES:**

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES 2002.

CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 4.0 KSI.



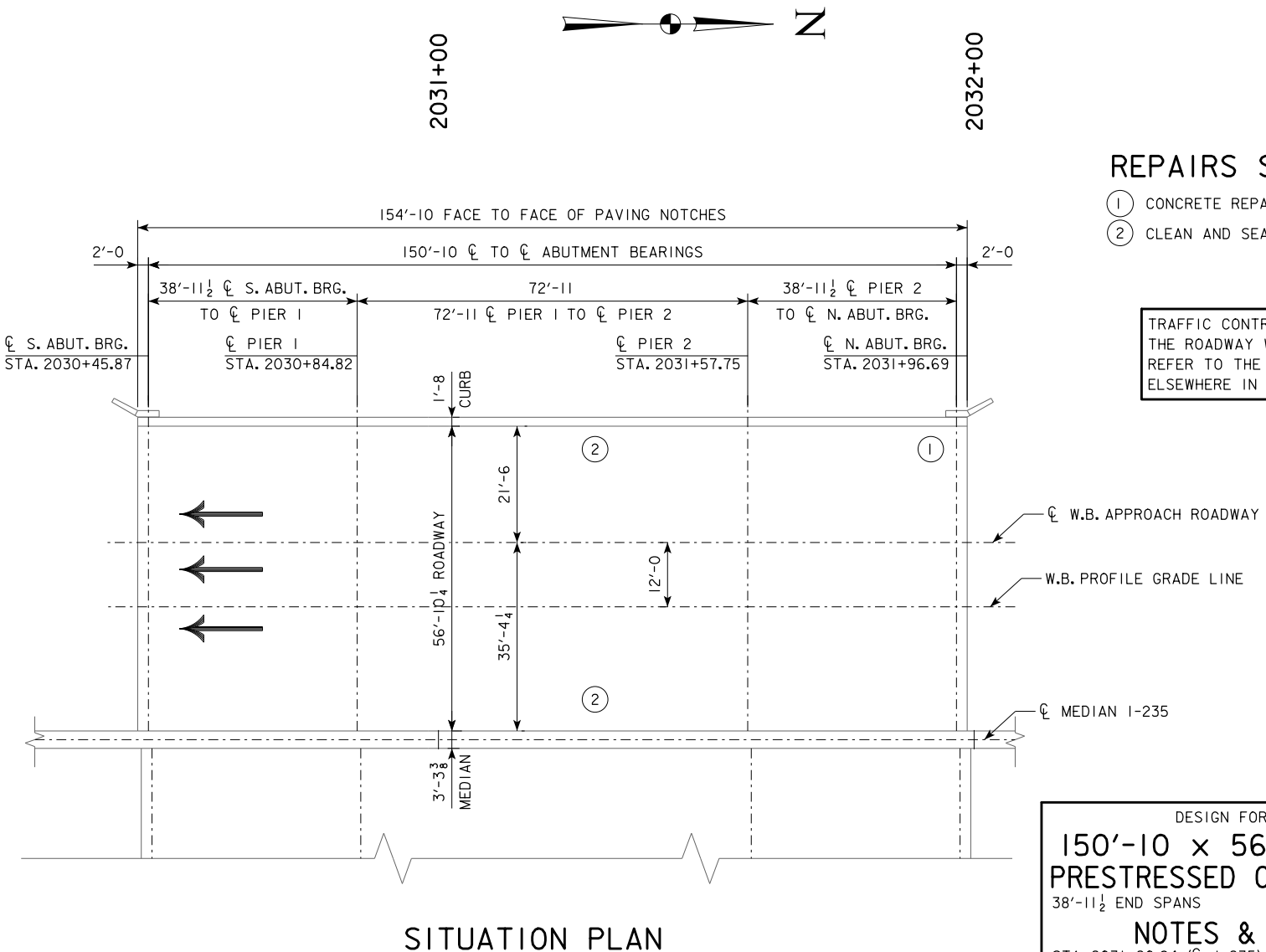
DETAIL OF CONCRETE SEALER AREA ON WEST RAIL

DETAIL OF CONCRETE SEALER AREA ON EAST RAIL

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
565	ORIGINAL DESIGN
905	RECONSTRUCTION - BRIDGE WIDENING
506	BRIDGE OVERLAY
922	BRIDGE REPAIRS

**LOCATION:**

I-235 W.B. OVER NE 46TH AVE.  
T-79N R-23W  
SECTION 18 & 19  
DELAWARE TOWNSHIP  
POLK COUNTY  
MAINT. NO. 7713.3L235  
FHWA NO. 43061  
LATITUDE 41.644259  
LONGITUDE -93.575818



**REPAIRS SHALL CONSIST OF:**

- ① CONCRETE REPAIR ON BARRIER RAILS.
- ② CLEAN AND SEAL CONCRETE BARRIER RAILS.

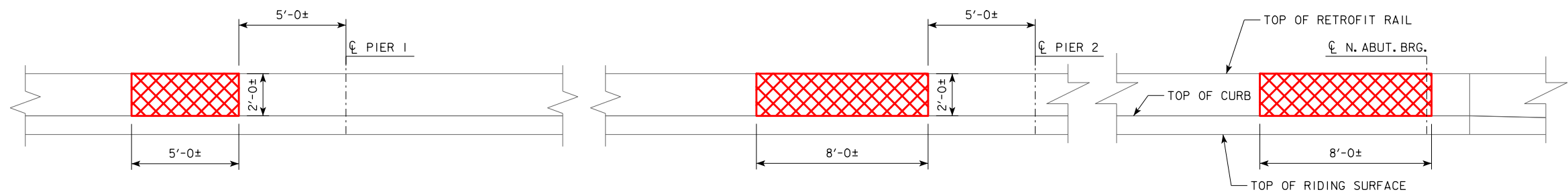
**TRAFFIC CONTROL PLAN:**  
THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

**TRAFFIC ESTIMATE**

2020 AADT	32,550	V.P.D.
TRUCKS	9	%

DESIGN FOR REPAIRS TO A 0° SKEW  
**150'-10 x 56'-10 1/4 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
38'-11 1/2 END SPANS 72'-11 INTERIOR SPAN  
**NOTES & SITUATION PLAN**  
STA. 2031+20.84 (CL I-235) JANUARY, 2022  
**POLK COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 2 OF 4 FILE NO. 32055 DESIGN NO. 922







WEST RAIL  
(LOOKING WEST)

ELEVATION VIEW OF WEST RETROFIT RAIL

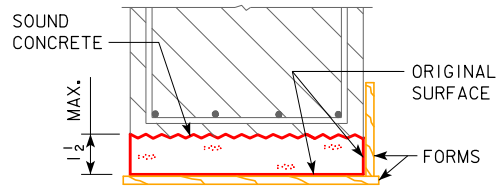
NOTE:  
ACTUAL CONCRETE REPAIR  
AREAS ARE TO BE  
DETERMINED BY THE  
ENGINEER AT THE TIME OF  
CONSTRUCTION.

LEGEND	
	INDICATES REGULAR REPAIR
	INDICATES SHALLOW REPAIR

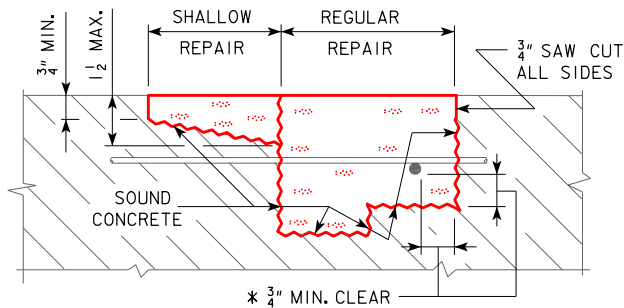
DESIGN FOR REPAIRS TO A 0° SKEW  
**150'-10 x 56'-10<sup>1</sup>/<sub>4</sub> PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 38'-11<sup>1</sup>/<sub>2</sub> END SPANS 72'-11 INTERIOR SPAN  
**CONCRETE REPAIRS**  
 STA. 2031+20.84 (CL 1-235) JANUARY, 2022  
**POLK COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 DESIGN SHEET NO. 3 OF 4 FILE NO. 32055 DESIGN NO. 922



REVISED 10-14 - DELETED ALL REFERENCES TO GROUT - SECTION 2426 COVERS THIS REQUIREMENT AND DOESN'T NEED TO STATED ON THE PLANS. ENGLISHREPAIR.TROFIBRIDGES.DGN 1045 - THIS SHEET REDRAWN 9-27-90.

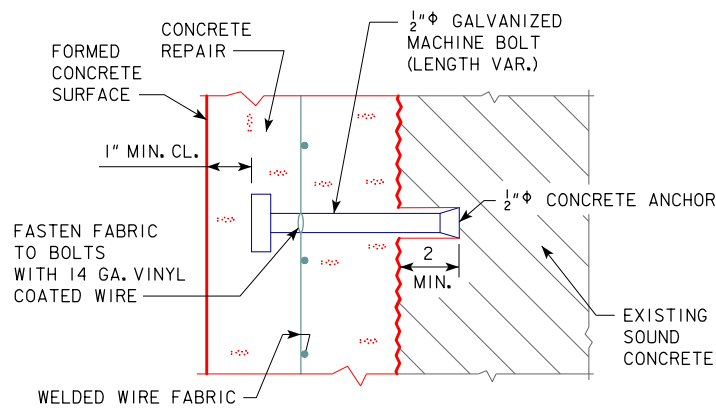


**SHALLOW REPAIR  
BOTTOM SURFACE**



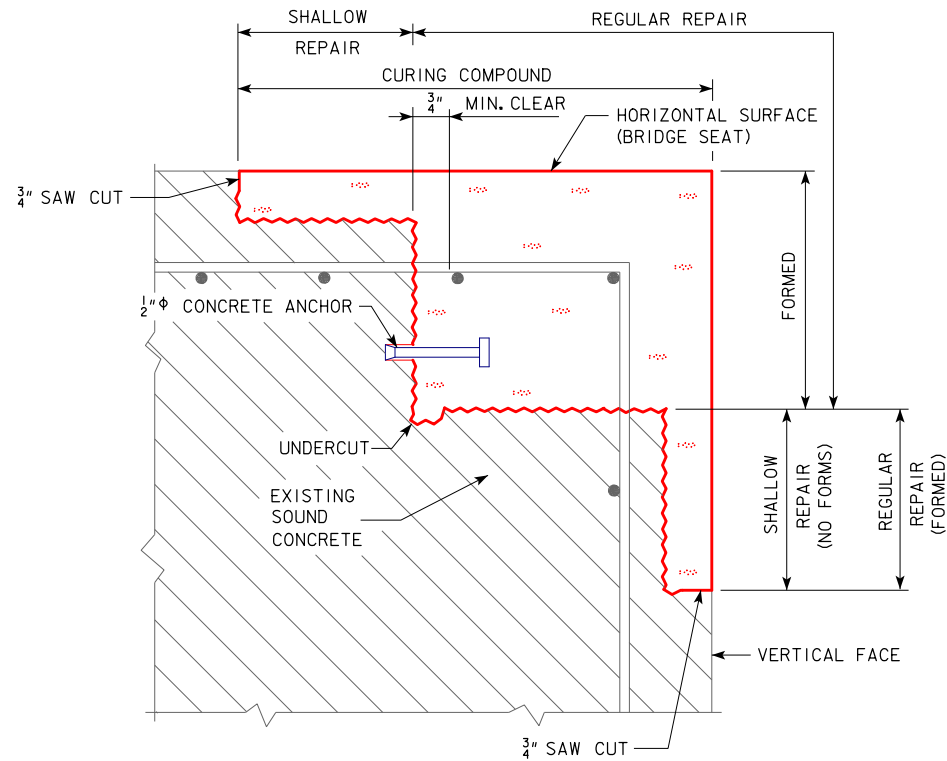
**REPAIR DEFINITION**

\* INDICATES CLEARANCE FOR AN UN-BONDED REBAR.

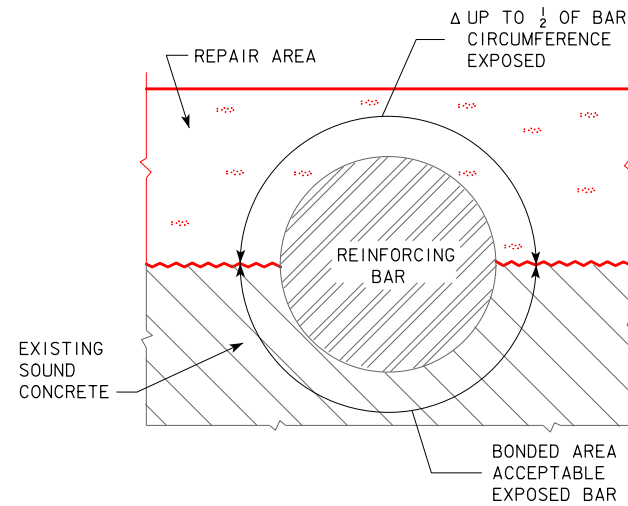


**ANCHOR DETAIL**

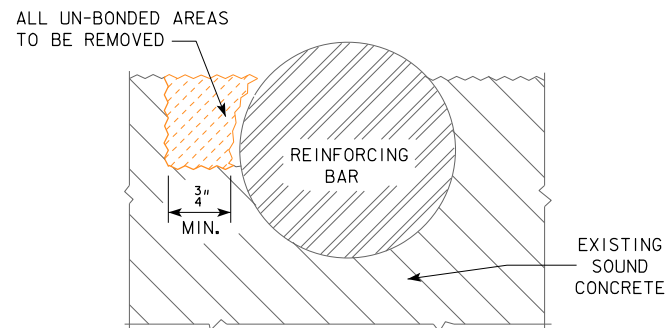
FOR SPACING AND USE OF CONCRETE ANCHORS AND WWF SEE THE REPAIR NOTES.



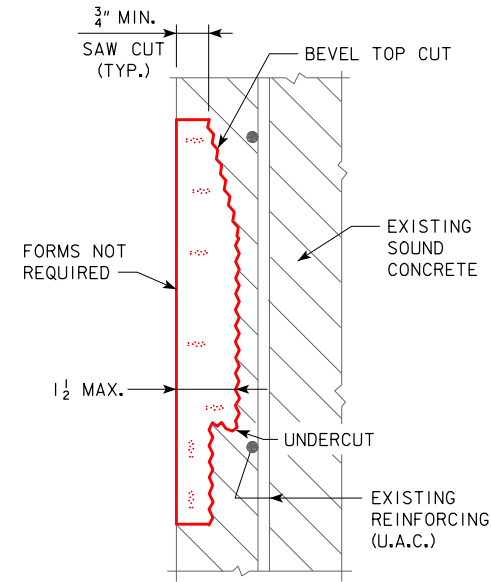
**CORNER REPAIR**



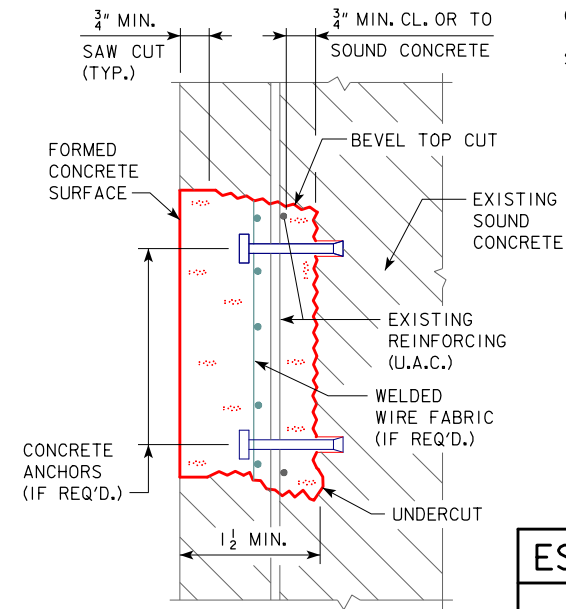
Δ IF MORE THAN 1/2 OF THE REBAR IS EXPOSED IT SHALL BE TREATED AS AN UN-BONDED REBAR.



**CONCRETE REMOVAL  
ADJACENT TO REINFORCING**



**SHALLOW REPAIR  
VERTICAL FACE**



**REGULAR REPAIR  
VERTICAL FACE**

**REPAIR NOTES:**

THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE AS NOTED AND SHOWN IN THESE PLANS SHALL BE REPAIRED AS FOLLOWS:  
 ALL THE COSTS OF EQUIPMENT AND MATERIALS REQUIRED TO REPAIR THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".  
 THE PRICE BID FOR "CONCRETE REPAIR" SHALL INCLUDE THE COST OF ALL CONCRETE ANCHORS AND WELDED WIRE FABRIC REQUIRED BY THE PLANS.  
 THE ENGINEER SHALL DETERMINE AND OUTLINE BY VISUAL AND AUDIBLE INSPECTION THE ACTUAL AREAS OF THE CONCRETE REPAIRS. THE CONTRACTOR SHALL BE PAID FOR THE ACTUAL AMOUNT OF REPAIRS MADE ON A SQUARE FOOT BASIS BASED ON THE PRICE BID PER SQUARE FOOT.  
 ALL EXISTING REINFORCING BARS THAT ARE EXPOSED BY CONCRETE REMOVAL SHALL BE CLEANED AND CAREFULLY INCORPORATED INTO THE NEW WORK, EXCEPT BADLY DETERIORATED EXISTING REINFORCING WHICH SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.  
 THE CONCRETE ANCHORS REQUIRED SHALL HAVE A MINIMUM PULL OUT OF 5000 LBS. BASED ON 4000 PSI CONCRETE. AN ANCHOR MEETING THE REQUIREMENTS OF IOWA D.O.T. MATERIALS I.M. 453.09 AND THE PULL OUT LOAD ABOVE IS REQUIRED. THE ANCHORS SHALL BE GALVANIZED AND SHALL BE INSTALLED ACCORDING TO RECOMMENDATIONS OF THE MANUFACTURER. THE COST OF FURNISHING AND INSTALLING THE CONCRETE ANCHORS SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".  
 THE WELDED WIRE FABRIC SHALL BE ASTM A185 AND GALVANIZED AS PER ASTM A-641. THE WWF WIRES SHALL BE SPACED 3 x 3 OR 4 x 4 AND THE WIRES SHALL HAVE A NOMINAL AREA OF 0.014 TO 0.029 SQUARE INCHES INCLUSIVE, EXAMPLE "WWF 3 x 3 - W1.4 x W2.9".  
 WHERE REINFORCEMENT HAS BEEN EXPOSED AND CLEARANCE AROUND THE PERIPHERY OF THE EXISTING BAR IS PROVIDED NO SUPPLEMENTAL REINFORCING IS REQUIRED, EXCEPT WHERE EXISTING REINFORCEMENT DENSITY AND PATTERN ARE SUCH THAT INDIVIDUAL OPEN SPACES BETWEEN BARS ARE OF 1.5 SQUARE FOOT OR LARGER. FOR THIS CONDITION 1/2" CONCRETE ANCHORS AND WELDED WIRE FABRIC SHALL BE INSTALLED AT THE RATE OF ONE CONCRETE ANCHOR WITH WWF PER EACH 1.5 SQUARE FEET OF AREA WITHIN EACH OPEN SPACE.  
 REPAIRING THE STRUCTURAL CONCRETE SHALL BE IN ACCORDANCE WITH SECTION 2426, OF THE STANDARD SPECIFICATIONS.

CONCRETE PLACEMENT QUANTITIES			
MARK	TYPE	UNITS	QUANTITY
①	SHALLOW REPAIR	SQ. FT.	0
②	REGULAR REPAIR	SQ. FT.	42
TOTAL (SQ. FT.)			42

ESTIMATED CONCRETE REPAIR QUANTITIES		
DESCRIPTION	UNITS	AMOUNT
CONCRETE REPAIR	SQ. FT.	42

DESIGN FOR REPAIRS TO A 0° SKEW  
**150'-10 x 56'-10 1/4 PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 38'-11 1/2 END SPANS 72'-11 INTERIOR SPAN  
**CONCRETE REPAIRS**  
 STA. 2031+20.84 (C 1-235) JANUARY, 2022  
**POLK COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 DESIGN SHEET NO. 4 OF 4 FILE NO. 32055 DESIGN NO. 922



# ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Design No. 1022-Polk : Design No. 1022-Polk

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Design No. 1022-Polk	
1	2426-6772016	CONCRETE REPAIR	SF	3	INCLUDES CLEANING EXISTING CONCRETE RAILS, FURNISHING AND PLACING CONCRETE SEALER.
2	2533-4980005	MOBILIZATION	LS	1	--

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.



**GENERAL NOTES:**

THIS DESIGN IS FOR REPAIRS TO THE EXISTING 223'-0 x VARIES PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE ON I-235 E.B. OVER THE UPRR IN POLK COUNTY.

ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS AND REPAIR PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. 4706).

FAINT LINES ON PLANS INDICATE EXISTING PORTIONS OF THE BRIDGE.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

THE CITY AND UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE TRAFFIC LANE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

THE TOP AND INTERIOR FACES OF THE EXISTING CONCRETE RAILING ARE TO BE CLEANED AND SEALED IN ACCORDANCE WITH ARTICLE 2403.03, P, OF THE STANDARD SPECIFICATIONS. IF NEW SECTIONS OF RAIL ARE CONSTRUCTED, THE NEW SECTIONS SHALL NOT BE SEALED. ALL COSTS ASSOCIATED WITH CLEANING AND SEALING OF THE CONCRETE RAILS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM "CONCRETE BARRIER RAIL REPAIR".

THE BRIDGE CONTRACTOR SHALL WORK IN SUCH A MANNER THAT EQUIPMENT AND MATERIALS SHALL NOT BE ALLOWED TO INTERFERE WITH TRAIN TRAFFIC OR BE ALLOWED TO FALL ON THE RAILROAD TRACKS. INTERFERENCE ABOVE THE RAILROAD TRACK AREA SHALL BE COORDINATED WITH THE RAILROAD.

**SPECIFICATIONS:**

DESIGN: AASHTO SERIES 2002.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

SPECIAL PROVISIONS FOR WORK ON RAILROAD RIGHT-OF-WAY (UNION PACIFIC RAILROAD)

DISTRICT VERIFY IF THIS SHOULD BE INCLUDED IN V SHEETS

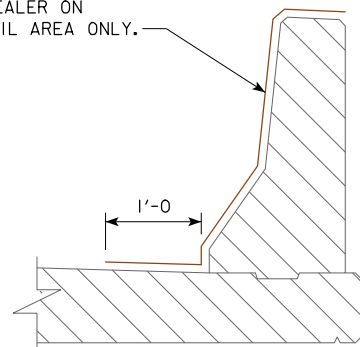
**DESIGN STRESSES:**

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES 2002.

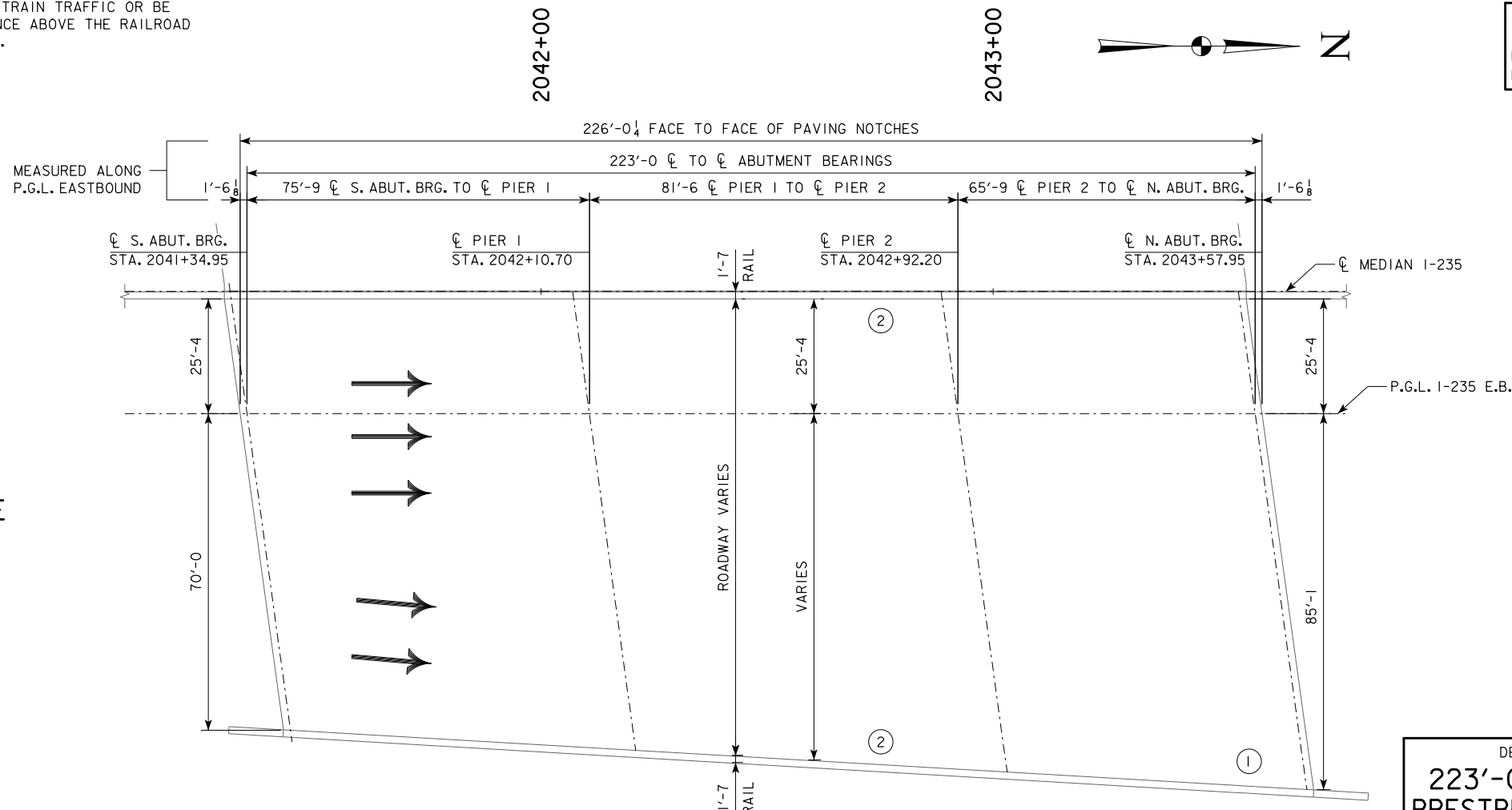
CONCRETE IN ACCORDANCE WITH SECTION 8,  $f'c = 4.0$  KSI.

**TRAFFIC CONTROL PLAN:**  
THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

TYP. AREA TO RECEIVE APPLICATION OF CONCRETE SEALER ON EXISTING RAIL AREA ONLY.



**DETAIL OF CONCRETE SEALER AREA**



**LOCATION:**

I-235 E.B. OVER UPRR  
T-79N R-23W  
SECTION 18  
DELAWARE TOWNSHIP  
POLK COUNTY  
FRA CROSSING NO. 1926SST  
IOWA CROSSING NO. 2318  
MAINT. NO. 7713.5R235  
FHWA NO. 43071  
LATITUDE 41.646973  
LONGITUDE -93.575536

**TRAFFIC ESTIMATE**

2020 AADT 22,300 V.P.D.  
TRUCKS 8 %

**DESIGN HISTORY AT THIS SITE**  
(INCLUDES THIS DESIGN)

DES. NO.	TYPE OF WORK
4706	ORIGINAL DESIGN
1022	BRIDGE REPAIRS

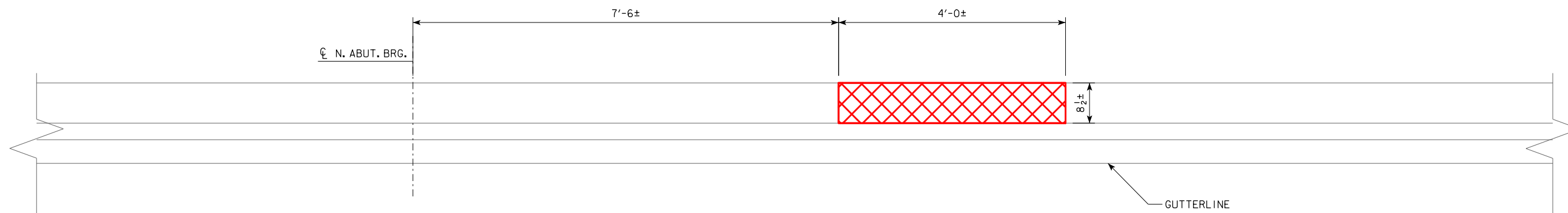
**REPAIRS SHALL CONSIST OF:**

- ① CONCRETE REPAIR ON BARRIER RAILS.
- ② CLEAN AND SEAL CONCRETE BARRIER RAILS.


**SITUATION PLAN**

DESIGN FOR REPAIRS TO A 7°50' SKEW (R.A.)  
**223'-0 x VARIES PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
75'-9 & 65'-9 END SPANS 81'-6 INTERIOR SPAN  
**NOTES & SITUATION PLAN**  
STA. 2042+46.45 (CL I-235) JANUARY, 2022  
**POLK COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION  
DESIGN SHEET NO. 2 OF 4 FILE NO. 32055 DESIGN NO. 1022





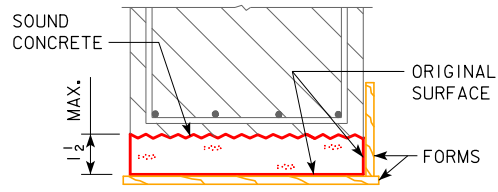
PLAN VIEW OF EAST BARRIER RAIL

LEGEND	
	INDICATES REGULAR REPAIR
	INDICATES SHALLOW REPAIR

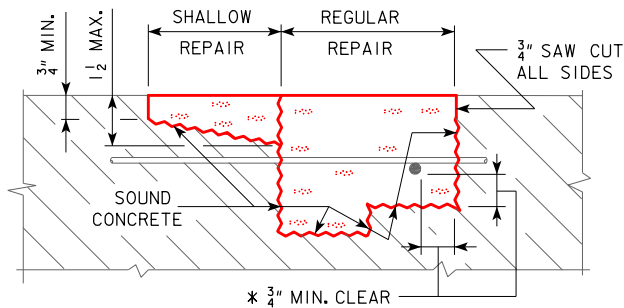
DESIGN FOR REPAIRS TO A 7°50' SKEW (R.A.)  
**223'-0 x VARIES PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 75'-9 & 65'-9 END SPANS 81'-6 INTERIOR SPAN  
**RAIL REPAIR DETAILS**  
 STA. 2042+46.45 (C 1-235) JANUARY, 2022  
**POLK COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 DESIGN SHEET NO. 3 OF 4 FILE NO. 32055 DESIGN NO. 1022



REVISED 10-14 - DELETED ALL REFERENCES TO GROUT - SECTION 2426 COVERS THIS REQUIREMENT AND DOESN'T NEED TO STATED ON THE PLANS. ENGLISHREPAIR.TROFIBRIDGES.DGN 1045 - THIS SHEET REDRAWN 9-27-90.

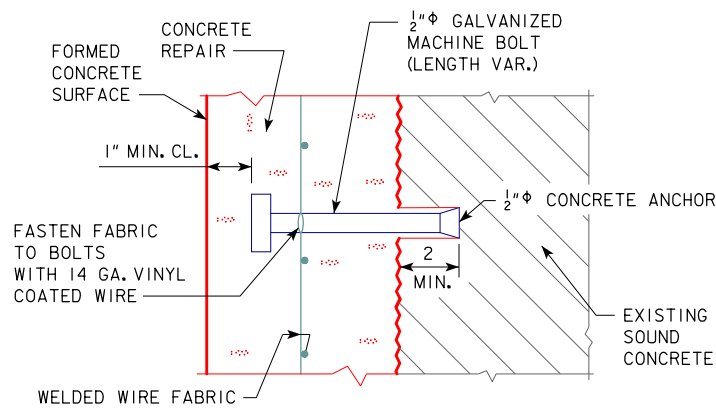


**SHALLOW REPAIR  
BOTTOM SURFACE**



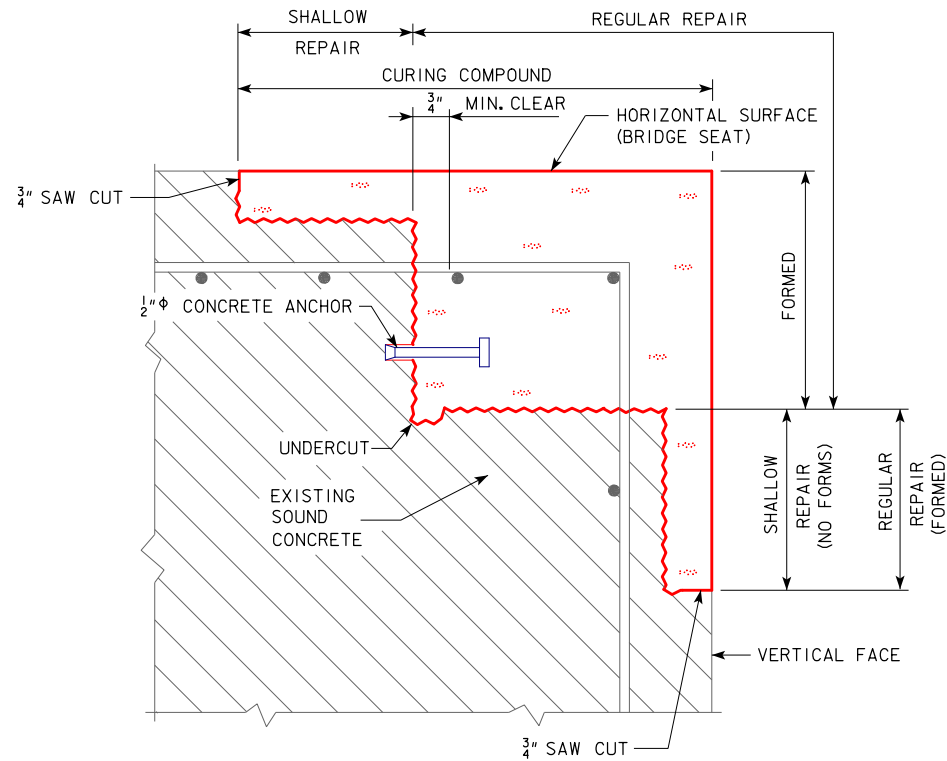
**REPAIR DEFINITION**

\* INDICATES CLEARANCE FOR AN UN-BONDED REBAR.

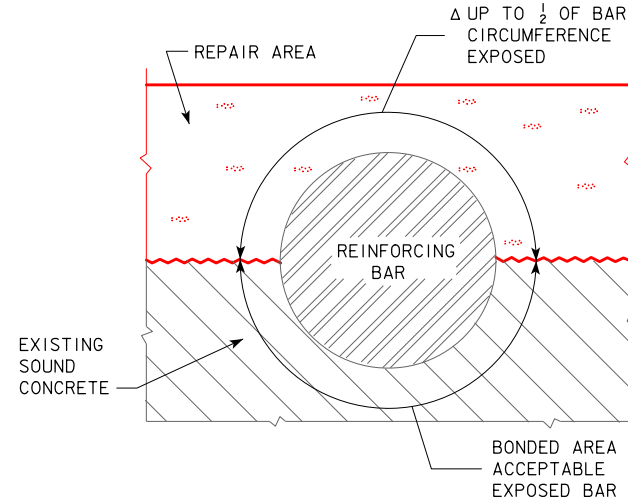


**ANCHOR DETAIL**

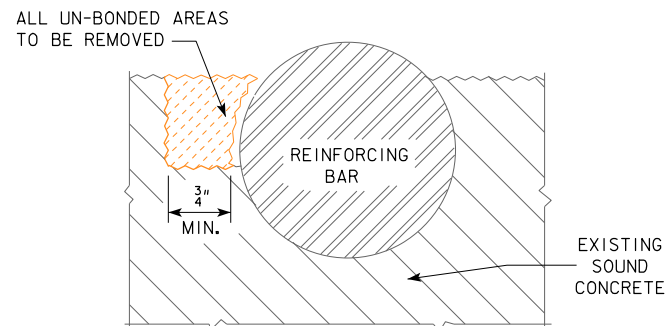
FOR SPACING AND USE OF CONCRETE ANCHORS AND WWF SEE THE REPAIR NOTES.



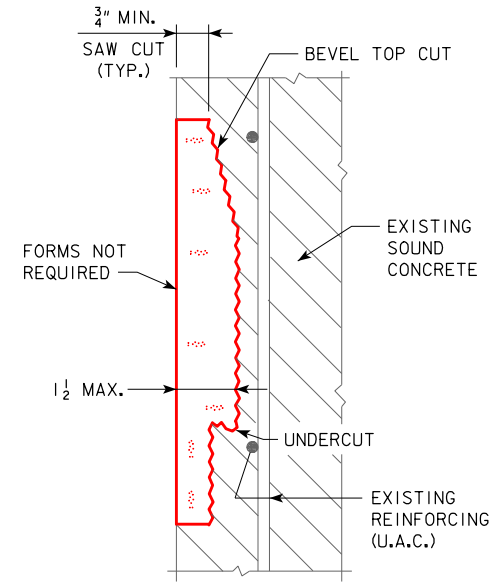
**CORNER REPAIR**



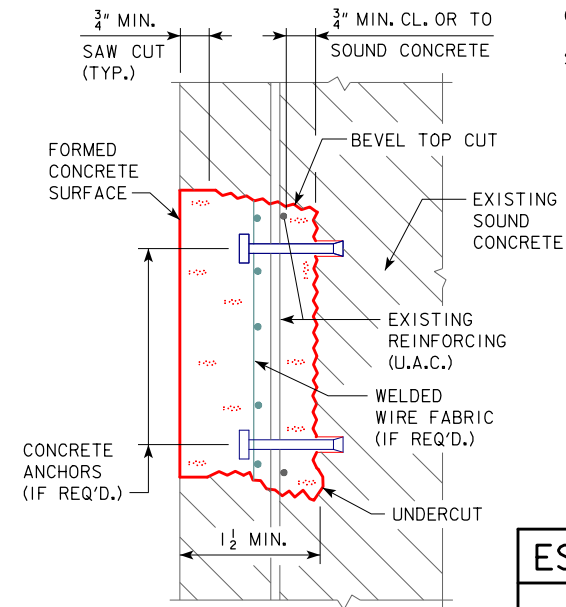
Δ IF MORE THAN 1/2 OF THE REBAR IS EXPOSED IT SHALL BE TREATED AS AN UN-BONDED REBAR.



**CONCRETE REMOVAL  
ADJACENT TO REINFORCING**



**SHALLOW REPAIR  
VERTICAL FACE**



**REGULAR REPAIR  
VERTICAL FACE**

**REPAIR NOTES:**

THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE AS NOTED AND SHOWN IN THESE PLANS SHALL BE REPAIRED AS FOLLOWS:  
 ALL THE COSTS OF EQUIPMENT AND MATERIALS REQUIRED TO REPAIR THE SPALLED AND HOLLOW AREAS OF THIS BRIDGE SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".  
 THE PRICE BID FOR "CONCRETE REPAIR" SHALL INCLUDE THE COST OF ALL CONCRETE ANCHORS AND WELDED WIRE FABRIC REQUIRED BY THE PLANS.  
 THE ENGINEER SHALL DETERMINE AND OUTLINE BY VISUAL AND AUDIBLE INSPECTION THE ACTUAL AREAS OF THE CONCRETE REPAIRS. THE CONTRACTOR SHALL BE PAID FOR THE ACTUAL AMOUNT OF REPAIRS MADE ON A SQUARE FOOT BASIS BASED ON THE PRICE BID PER SQUARE FOOT.  
 ALL EXISTING REINFORCING BARS THAT ARE EXPOSED BY CONCRETE REMOVAL SHALL BE CLEANED AND CAREFULLY INCORPORATED INTO THE NEW WORK, EXCEPT BADLY DETERIORATED EXISTING REINFORCING WHICH SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.  
 THE CONCRETE ANCHORS REQUIRED SHALL HAVE A MINIMUM PULL OUT OF 5000 LBS. BASED ON 4000 PSI CONCRETE. AN ANCHOR MEETING THE REQUIREMENTS OF IOWA D.O.T. MATERIALS I.M. 453.09 AND THE PULL OUT LOAD ABOVE IS REQUIRED. THE ANCHORS SHALL BE GALVANIZED AND SHALL BE INSTALLED ACCORDING TO RECOMMENDATIONS OF THE MANUFACTURER. THE COST OF FURNISHING AND INSTALLING THE CONCRETE ANCHORS SHALL BE INCLUDED IN THE PRICE BID FOR "CONCRETE REPAIR".  
 THE WELDED WIRE FABRIC SHALL BE ASTM A185 AND GALVANIZED AS PER ASTM A-641. THE WWF WIRES SHALL BE SPACED 3 x 3 OR 4 x 4 AND THE WIRES SHALL HAVE A NOMINAL AREA OF 0.014 TO 0.029 SQUARE INCHES INCLUSIVE, EXAMPLE "WWF 3 x 3 - W1.4 x W2.9".  
 WHERE REINFORCEMENT HAS BEEN EXPOSED AND CLEARANCE AROUND THE PERIPHERY OF THE EXISTING BAR IS PROVIDED NO SUPPLEMENTAL REINFORCING IS REQUIRED, EXCEPT WHERE EXISTING REINFORCEMENT DENSITY AND PATTERN ARE SUCH THAT INDIVIDUAL OPEN SPACES BETWEEN BARS ARE OF 1.5 SQUARE FOOT OR LARGER. FOR THIS CONDITION 1/2" CONCRETE ANCHORS AND WELDED WIRE FABRIC SHALL BE INSTALLED AT THE RATE OF ONE CONCRETE ANCHOR WITH WWF PER EACH 1.5 SQUARE FEET OF AREA WITHIN EACH OPEN SPACE.  
 REPAIRING THE STRUCTURAL CONCRETE SHALL BE IN ACCORDANCE WITH SECTION 2426, OF THE STANDARD SPECIFICATIONS.

CONCRETE PLACEMENT QUANTITIES			
MARK	TYPE	UNITS	QUANTITY
①	SHALLOW REPAIR	SQ. FT.	0
②	REGULAR REPAIR	SQ. FT.	3
TOTAL (SQ. FT.)			3

ESTIMATED CONCRETE REPAIR QUANTITIES		
DESCRIPTION	UNITS	AMOUNT
CONCRETE REPAIR	SQ. FT.	3

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**POLK COUNTY**  
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 DESIGN SHEET NO. 4 OF 4 FILE NO. 32055 DESIGN NO. 1022

