

PRELIMINARY ENGINEERING
IMX-080-3(315)128--02-77
POLK COUNTY

LETTING DATE
 XXX XX XXXX

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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
POLK COUNTY
PRELIMINARY ENGINEERING

I-35/80 from IA 141 in Urbandale to E of I-35/80/235
 Northeast Mixmaster System Interchange (NEMM)

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

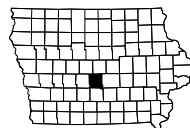


REVISIONS

TOTAL
..
PROJECT IDENTIFICATION NUMBER
22-77-080-040
PROJECT NUMBER
IMX-080-3(315)128--02-77
R.O.W. PROJECT NUMBER

FIELD EXAM ATTENDEES:

- | | |
|---------------------|----------------------------------------|
| Ben Hucker | Iowa DOT - District 1 |
| Tony Gustafson | Iowa DOT - District 1 |
| Allison Smyth | Iowa DOT - District 1 |
| John Narigon | Iowa DOT - District 1 |
| Scott Nixon | Iowa DOT - District 1 |
| Jared Laermans | Iowa DOT - District 1 |
| Sean Passick | Iowa DOT - District 1 |
| Frank Leong | Iowa DOT - District 1 |
| Bob Ellis | Iowa DOT - District 1 |
| Jim Scott | Iowa DOT - District 1 |
| Garret Reeder | Iowa DOT - Project Management Bureau |
| Mark Van Dyke | Iowa DOT - Traffic Operations Bureau |
| Tim Simodynes | Iowa DOT - Traffic Operations Bureau |
| Zac Abrams | Iowa DOT - Traffic & Safety Bureau |
| Jason Hermann | Iowa DOT - Traffic & Safety Bureau |
| Dan Harness | Iowa DOT - Design Bureau |
| Harold Adcock | Iowa DOT - Bridges & Structures Bureau |
| Stephanie Hemberger | HNTB |
| David Green | HNTB |
| Jason Lastovica | HNTB |
| Heidi Lane | HNTB |
| Ashley Cook | HNTB |
| Chuck Miller | HNTB |
| David Urban | HNTB |
| Robert Roth | Econolite |
| Kelly King | Econolite |
| Mark Pohlmann | HDR |



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

100th St. to 86th St.				
DESIGN DATA URBAN				
2020	AADT	91,555--	V.P.D.	
2050	AADT	129,000--	V.P.D.	
20 --	DHV	--	V.P.H.	
TRUCKS		--	%	
Total				
Design	ESALs	--		

86th St. to Merle Hay Rd.				
DESIGN DATA URBAN				
2020	AADT	95,687--	V.P.D.	
2050	AADT	132,400--	V.P.D.	
20 --	DHV	--	V.P.H.	
TRUCKS		--	%	
Total				
Design	ESALs	--		

Merle Hay Rd. to 2nd Ave.				
DESIGN DATA URBAN				
2020	AADT	100,718--	V.P.D.	
2050	AADT	136,900--	V.P.D.	
20 --	DHV	--	V.P.H.	
TRUCKS		--	%	
Total				
Design	ESALs	--		

2nd Ave. to NE 14th St.				
DESIGN DATA URBAN				
2020	AADT	93,118--	V.P.D.	
2050	AADT	128,700--	V.P.D.	
20 --	DHV	--	V.P.H.	
TRUCKS		--	%	
Total				
Design	ESALs	--		

NE 14th St. to NEMM				
DESIGN DATA URBAN				
2020	AADT	87,766--	V.P.D.	
2050	AADT	124,500--	V.P.D.	
20 --	DHV	--	V.P.H.	
TRUCKS		--	%	
Total				
Design	ESALs	--		

NEMM to US 65				
DESIGN DATA URBAN				
2020	AADT	75,700--	V.P.D.	
2050	AADT	130,100--	V.P.D.	
20 --	DHV	10,790--	V.P.H.	
TRUCKS		17--	%	
Total				
Design	ESALs	--		

INDEX OF SEALS		
SHEET NO.	NAME	TYPE

PRELIMINARY PLANS

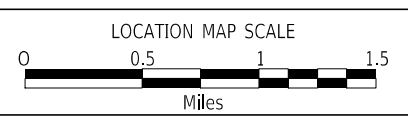
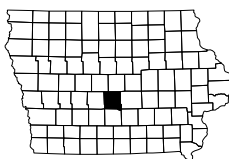
Subject to change by final design.

D2 PLAN – Date: October 31, 2022



STA. 548+75.00
BEGIN PROJECT

STA. 1154+23.00
END PROJECT



FIELD EXAM CHECKLIST

1. General
 - a. Project Limits - IA 141 to E. of 29th St.
 - b. Cost Estimate Assumptions
 - c. Design Criteria and Exceptions
2. Dynamic Shoulder Use (DSU)
 - a. Draft MUTCD Guidance
 - b. Typical Section
 - c. Sign Truss Type and Design - Butterfly, Cantilever, Full Overhead, Full Overhead + Cantilever
 - d. Additional DSU Sign Options
 - e. Pavement Marking
 - f. Coordinated Projects - NEMM
 - g. Existing Sign Truss Removals
3. Roadway
 - a. Median Barrier
 - Replacement Limits - IA 141 Bridges
 - HMA Section - BA-100 Modified
 - US 69 to NEMM - Existing Median Differential
 - b. Pavement Section
 - Intake Top Replacements and HMA Section Patching - HMA or PCC
 - HMA Rumble Strip Patching - Partial Depth Patch or Full Shoulder Mill and Overlay
 - Pavement Depth Assumptions
4. ITS
 - a. Cabinet Placement - Median v. Roadside
 - b. 480V Power Connection Use
5. Bridge
 - a. Pier Integral Barrier (Infill Wall)
 - b. Bridge Barrier Replacement
 - New DOT MASH Single Slope Bridge Rail - TL-5
 - Bridge Deck Removal and Replacement
 - c. EB I-80 over 29th St. Bridge Widening
6. Drainage
 - a. Intake Top Replacements - Height Adjustment and Grate Fastening
 - b. Median Storm Sewer Trunk Lines
 - c. Median Slotted Drain System
 - d. Existing Storm Sewer Condition
7. Construction Staging
 - a. Construction Staging Scroll
 - b. Segment Termini
 - c. Sites
 - d. Long-term Inside Shoulder Closures
 - e. Short-term Lane and Outside shoulder Closures
 - f. Contractor Ingress/Egress
 - g. Detour Routes for Shutdowns
 - h. Detour Pavement for Interim Shoulder Improvements
8. Coordinated Projects
 - a. (260) Bridge Deck Replacement Project over 72nd St. (FY24)
 - b. (258) I-35/80 Fiber Backbone Project
 - c. (317) Merle Hay Rd. and 2nd Ave. Ramp Metering Project
 - d. NEMM - Stage 3, 5, and Full Build

FIELD EXAM NOTES (General)

General:

- To consolidate mobilization and traffic control operations, this project includes planned maintenance for median barrier / intake top replacement and diamond grinding / new pavement marking in the PCC section.

DSU:

- The Proposed Amendments to the 11th Edition of the MUTCD (dated 12/11/2020) were followed in developing preliminary DSU signing.

ITS:

- Place cabinets at roadside locations beyond the clear zone for ease of maintenance.
 - Height limitations for side fire radar v. forward facing radar will be considered in future design.

Drainage:

- See I-35/80 DSU Drainage Review Memo (PDF).

Staging:

- Refer to D2_77080315_J.2 Staging Scroll (PDF).

Coordinated Projects:

- The (258) project is currently under design by HNTB and programmed for a July 2023 letting. All ITS proposed for DSU will be coordinated with (258).
 - The Field Exam for (317) is scheduled for December 20, 2022. Further coordination between (258) and (317) is anticipated.

Please refer to plan sheet markups for specific notes and comments.

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 1
ATTENTION: Tony Gustafson, District 1 Engineer
FROM: Benjamin Hucker, District 1 TSMO Engineer
OFFICE: District 1
SUBJECT: Final Concept Statement for Dynamic Shoulder Use

DATE: June 2, 2022
PROJECT: Polk County
 IMX-080-3(314)128--02-77
 IMX-080-3(315)128--02-77
 IMX-080-3(316)128--02-77
 IMX-080-3(317)128--02-77
 IMX-080-3(318)128--02-77
 IMX-080-3(319)128--02-77
 IMX-080-3(320)128--02-77
 PIN: 22-77-080-040

I. PROJECT DESCRIPTION

A. Project Description

The project includes improvements to support Dynamic Shoulder Use on EB and WB I-35/80 between IA 141 and the Northeast I-35/I-80/I-235 Systems Interchange (NE Mixmaster) in Polk County. The project will also include installation of infrastructure for Ramp Metering and Queue Warning at selected locations along the project corridor. Burial of conduit and fiber communication network to support the Dynamic Shoulder Use, Ramp Metering, and Queue warning will also be included. The dynamic shoulder use project will require reconstruction of some median barrier rail, storm sewer intakes, sign trusses, and PCC diamond grinding. The project will construct overhead sign supports over each inside shoulder, signage, and striping. Due to the amount of local barrier rail reconstruction for this project and the age and condition of the existing rail, it is recommended that all median barrier rail within the project limits be replaced. With full median barrier replacement, the project is estimated to cost \$43,243,935.27.

B. Need for Project

- i. As a result of the Des Moines area Integrated Corridor Management Study, the need to increase throughput capacity during peak periods and traffic incidents was identified for this busy transcontinental freight corridor to support more reliable corridor travel times. Ramp Meters are also needed on at selected locations to manage entering traffic flows and reduce traffic congestion near the interstate merge areas. Queue Warning DMS signs on the western end of the project area supports the Queue Warning infrastructure being added to I-35/80 between IA 141 and the Southwest Mixmaster as part of the Hickman Road Interchange Reconstruction project. Full barrier rail replacement is desired due to its deteriorated condition and its outdated safety design, which has been fully penetrated by both cars and trucks in the recent years. The project seeks to make use of and enhance the existing transportation system through improved operations as an alternative to traditional capacity expansion through the corridor.

II. EXISTING CONDITIONS

A. Present Facility

ROUTE: I-35/80 from the IA 141 interchange to east of the Northeast Mixmaster
 LENGTH: 10.92 miles
 PLANNING CLASSIFICATION: Interstate
 TRAFFIC: see section B below
 YEAR CONSTRUCTED:

- E. of IA 141 (MP 128.21) to W. of IA 28 (MP 130.97): 1994
- W. of IA 28 (MP 130.52) to E. of Beaver Dr. (MP 132.92): 1999-2000
- E. of Beaver Dr. (MP 132.84) to W. of NW 6th Dr. (MP 134.85): 1998
- W. of NW 6th Dr. (MP 134.85) to W. of the NEMM (MP 137.4): 1999
- W. of the NEMM (MP 137.4) to E. of the NEMM (MP 138.5): 1960

YEAR RESURFACED:

- S. of Douglas Ave. to W. of 100th St. (MP 128.3): 2020
- W. of 100th St. (MP 128.3) to W. of IA 28 (MP 130.8): 2014
- East of Milepost 130.8 (~68th St.): No resurfacing
- W. of the NEMM (MP 137.4) to E. of the NEMM (MP 138.5): 1994

PRESENT PAVEMENT SURFACE:

- E. of IA 141 (MP 128.21) to W. of IA 28 (MP 130.8): PCC/HMA Composite
- W. of IA 28 (MP 130.8) to W. of the NEMM (MP 137.4): PCC
- W. of the NEMM (MP 137.4) to E. of the NEMM (MP 138.5): PCC/HMA Composite

PRESENT PAVEMENT WIDTH:

- E. of IA 141 (MP 128.21) to W. of IA 28 (MP 130.97): 36'
- W. of IA 28 (MP 130.52) to E. of Beaver Dr. (MP 132.92): 35.43' (metric conversion)
 - An 11.81' (metric conversion) outside auxiliary lane is included west of IA 28 in the WB direction for approximately 1700'
 - An 11.81' (metric conversion) outside auxiliary lane is included east of IA 28 in both direction for approximately 1800'
- E. of Beaver Dr. (MP 132.84) to W. of NW 6th Dr. (MP 134.85): 36'
- W. of NW 6th Dr. (MP 134.85) to W. of the NEMM (MP 137.4): 35.43' (metric conversion)
 - An 11.81' (metric conversion) auxiliary lane is included between the 2nd Ave. and 14th St. interchange in both directions
- W. of the NEMM (MP 137.4) to E. of the NEMM (MP 138.5): 24'
 - A 12' inside auxiliary lane is included in the EB direction west of the NB I-35 ramp (inside lane west of MP 137.4 aligns with this aux. lane)
 - A 12' outside auxiliary lane is included in the EB direction from the SB to EB loop east approximately 1000'.
 - A 12' outside auxiliary lane is included in the eb direction from the NB to EB ramp to MP 138.5.
 - A 12' inside auxiliary lane is included in the WB direction west of MP 138.5 to the ramp to I-235
 - A 12' outside auxiliary lane is included in the WB direction from the NB to WB loop east approximately 1000'.

- A 12' outside auxiliary lane is included in the eb direction from the SB to WB ramp to MP 137.4 (outside lane west of MP 137.4 aligns with this aux. lane).

PRESENT SHOULDER WIDTH (Inside calculated from CL of median to edge of LT lane):

- E. of IA 141 (MP 128.21) to W. of IA 28 (MP 130.97): 15' inside; 12' outside
- W. of IA 28 (MP 130.52) to E. of Beaver Dr. (MP 132.92): 14.76' inside; 11.81' outside (metric conversion)
- E. of Beaver Dr. (MP 132.84) to W. of NW 6th Dr. (MP 134.85): 15' inside; 12' outside
- W. of NW 6th Dr. (MP 134.85) to W. of the NEMM (MP 137.4): 14.76' inside; 11.81' outside (metric conversion)
- W. of the NEMM (MP 137.4) to E. of the NEMM (MP 138.5): 6' inside; 10' outside

PAVEMENT THICKNESS:

- West of IA 28 (MP 130.8): 12.5" PCC + 4" HMA = 16.5" Composite
- W. of IA 28 (MP 130.8) to E. of Beaver Dr. (MP 132.92): 12.6" (metric conversion)
- E. of Beaver Dr. (MP 132.84) to W. of NW 6th Dr. (MP 134.85): 12.5"
- W. of NW 6th Dr. (MP 134.85): to W. of the NEMM (MP 137.4): 12.6" (metric conversion)
- W. of the NEMM (MP 137.4) to E. of the NEMM (MP 138.5): Varies (Composite)

B. Traffic Estimates

Table 1 below shows traffic data for the area considered for Dynamic Shoulder Use. The data was collected in March of 2020 (pre-COVID), processed, and published by HDR on June 11, 2021, in a Technical Memorandum as part of the ICM study. The Existing AADT represents 2020 data and the Future AADT represents 2050 No-Build volumes.

Table 1: AADT and Peak Hour Volumes by Segment (EB / WB)

SEGMENT	EXISTING AADT	FUTURE AADT	AM PEAK HR	PM PEAK HR
100 th St. to 86 th St. - EB	45,233 / 46,322	63,500 / 65,500	4,065 / 5,130	4,655 / 5,130
86 th St. to Merle Hay Rd.	47,314 / 48,373	65,300 / 67,100	4,075 / 5,430	5,070 / 4,785
Merle Hay Rd. to 2 nd Ave.	50,932 / 49,786	68,600 / 68,300	4,320 / 5,440	5,255 / 4,875
2 nd Ave. to NE 14 th St.	46,232 / 46,886	63,500 / 65,200	3,820 / 4,680	4,665 / 4,350
NE14th St. to NEMM	43,709 / 44,057	61,600 / 62,900	3,335 / 4,959	4,605 / 3,910

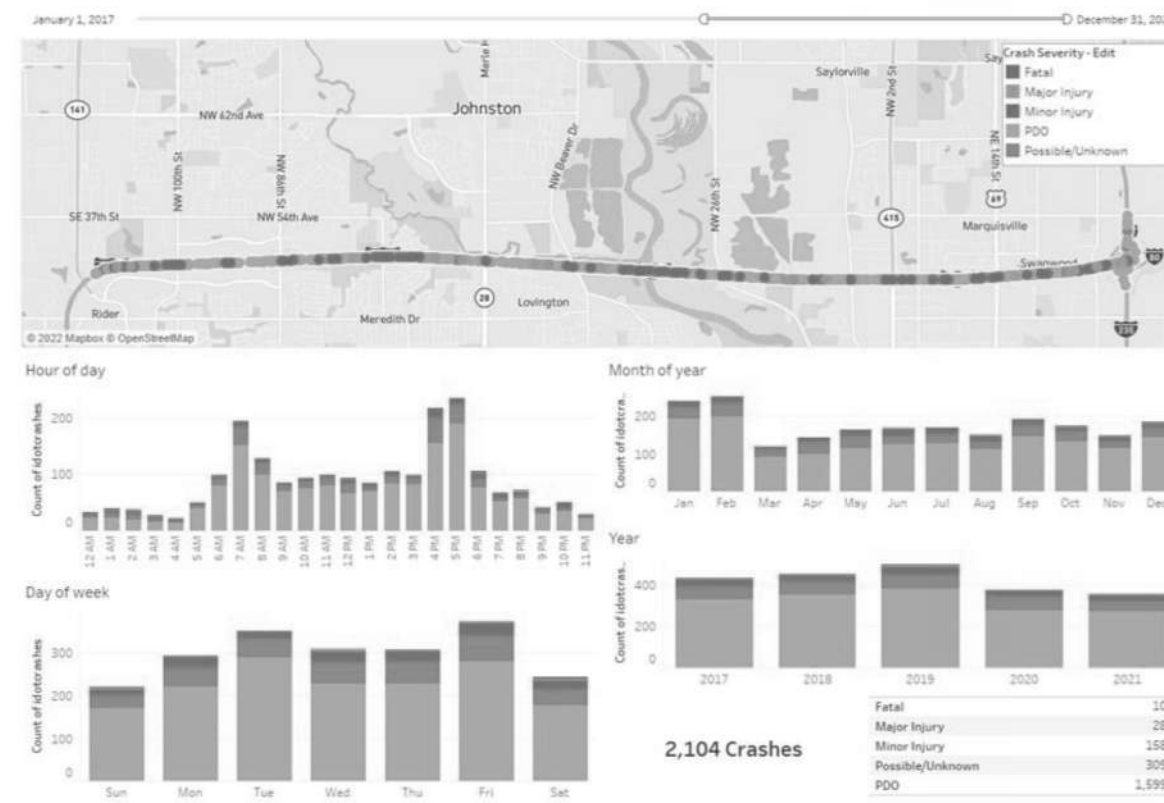
Additional information regarding traffic volumes can be found in the appendix.

C. Access Control

Access control for the existing mainline and sideroads will not change. The inside shoulder will be closed during construction. Additionally, ramps with proposed ramp meters may be closed during construction with offsite detours provided. Adjacent ramps in the same direction will not be closed at the same time during construction.

D. Existing Crash Analysis

As part of the Des Moines Integrated Corridor Management study, HDR gathered crash data along the corridor and has summarized it using Tableau in the tables below.



Manner Of Crash Collision	Count
Rear-end (front to rear)	800
Non-collision (single vehicle)	643
Sideswipe, same direction	489
Other	56
Not Reported	43
Broadside (front to side)	25
Head-on (front to front)	15
Sideswipe, opposite direction	12

Manner of Crash

On Roadway	Minor Injury	124
	Possible/Unknown	250
	PDO	1,251
Shoulder	Possible/Unknown	24
	PDO	134
Median	PDO	82
Roadside	PDO	39
Outside trafficway	PDO	21
Unknown	PDO	47

As can be expected, more crashes occur during the morning and afternoon commutes on weekdays when Dynamic Shoulder Use is anticipated to be operational. Sideswipe, same direction and rear-end (front to rear) crashes lead the multi-vehicle crash types, which is expected on high-speed, high-volume corridors such as this. Implementation of Dynamic Shoulder Use will allow an additional lane, which will assist with throughput at crash scenes, and provide additional space for traffic to use, decreasing traffic density. This additional space should allow motorists to spread out, decreasing the likelihood of drivers sideswiping each other during lane changes and cutting each other off. While the initial movement may cause a following driver to tap their breaks, those brake lights cause drivers behind to slow down abruptly, which forms a shockwave-type queue to form and contributes to rear-end crashes.

III. ALTERNATIVE ANALYSIS

A. Design Criteria

Design criteria for the Dynamic Shoulder Use project has been developed as part of the Des Moines Area Integrated Corridor Management Study. The "Shoulder Use Design" Technical Memo, dated March 17, 2020, is the source for the project design criteria and is available in the appendix in its entirety.

Lane Width

The lane width for travel on the shoulder is typically similar to that of other primary freeway lanes. The AASHTO Policy on Geometric Design of Highways and Streets (Green Book) requires a 12-foot lane for typical freeway lanes as does the AASHTO Policy on Design Standards for Interstate System. The same reference policies require a minimum shoulder width of 10 feet on level interstates with 3 lanes per direction assuming the shoulder is not used for continuous travel. If used as a travel lane, the FHWA Use of Freeway Shoulders for Travel Guide (Feb 2016) recommends a width of 12 feet or more for part-time shoulder use. Due to existing sign truss and bridge piers located in the median, only a 10' shoulder lane can be accommodated around some of those locations. Since the proposed width is less than 12 feet, a design exception through FHWA will be required.

Buffer Width

When the shoulder is utilized for travel, a buffer width should be provided to allow additional space between the vehicle and the edge of pavement. This width reduces the likelihood of vehicles exiting the roadway due to the edge condition and provides space for drainage and snow. While the FHWA Use of Freeway Shoulders for Travel Guide recommends a buffer width of "several feet" beyond the portion identified for shoulder travel, the width will need to account for the specific conditions of the area and roadway. Existing sign truss and bridge piers located in the median will impact the available buffer width at certain locations, creating a variable buffer width throughout the corridor. (See "Proposed Alternative" section for a cross section showing the variable buffer distances.) Roadway features, particularly adjacent to walls or barriers, include drainage inlets and other structures within the existing shoulder width. These features will need to be inspected to ensure they are able to support vehicle loading and are flush with the pavement.

In addition, potential water ponding or runoff flows against barriers will not allow Dynamic Shoulder Use during storm events. Additionally, the shoulder configuration will not be able to provide adequate snow storage during storms until post-storm cleanup is completed. Therefore, Dynamic Shoulder Use will not be permitted during snow events until post-storm cleanup has been completed.

In all cases, a buffer width less than 10 feet will require a design exception through FHWA as the current AASHTO Policy on Geometric Design of Highways and Streets (Green Book) and Policy on Design Standards for Interstate System require a 10-foot shoulder or buffer for typical freeways with 3 or more lanes/direction.

Cross Slope

The AASHTO Policy on Geometric Design of Highways and Streets (Green Book) suggests a 1.5% to 2% cross slope for typical freeway travel lanes. The AASHTO Policy on Design Standards for Interstate System requires a 1.5% minimum slope with an allowance of 2% to 6% for shoulders. While there is no requirement that the shoulder cross slope match the mainline, the maximum cross slope for shoulder use should consider agency standards for mainline travel. Grade breaks between the existing cross slopes may create challenges with transitioning between the mainline lanes and the part-time shoulder. Grade differences of 2% or less may be acceptable if the break occurs between the designated lanes. According to the FHWA *Use of Freeway Shoulders for Travel Guide*, an agency should consider rounding the grade break or prohibit transitions to/from the shoulder if the grade break is greater than 7%. It is proposed that the existing shoulder cross slopes and grade breaks be utilized as constructed, as they are within the allowable limits.

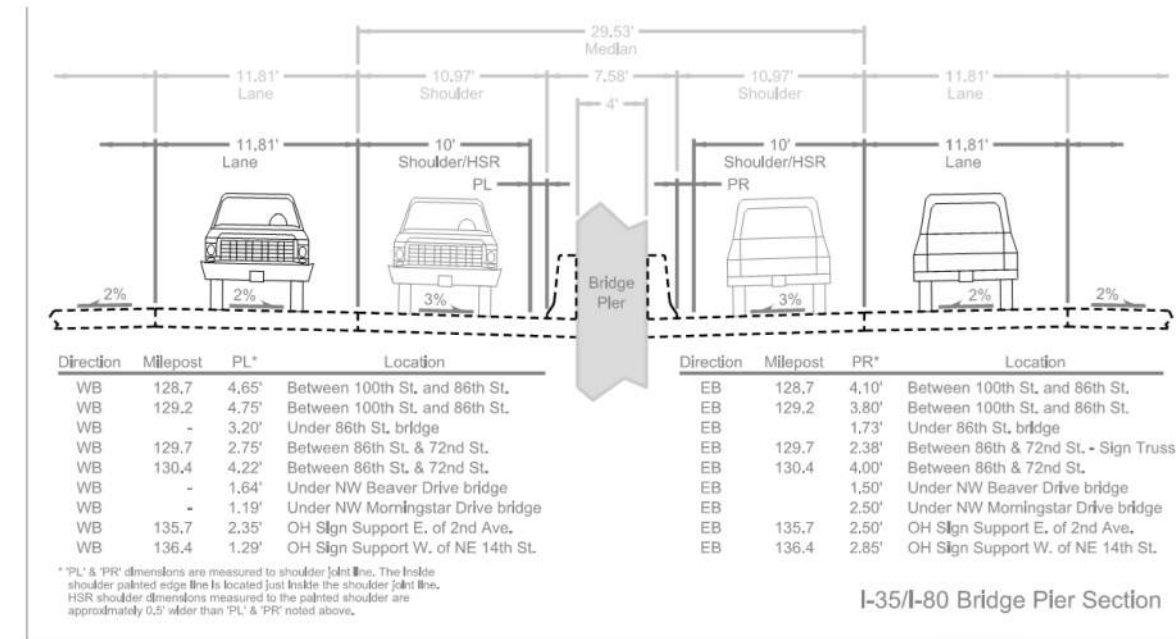
Pavement Markings

The identification of the shoulder for part-time use requires pavement markings that apply during both conditions – as a traditional shoulder and as a traveled shoulder. The FHWA Use of Freeway Shoulders for Travel Guide recommends the following pavement markings:

- The solid edge line typically used between the shoulder and adjacent travel lane remains the same.
- A second solid line is provided on the outside of the shoulder to function as an edge line for traffic using the shoulder.
- The two solid lines should be the same color – white lines for the right shoulder and yellow lines for the left shoulder.

Signage

The operational status of the dynamic shoulder lane will be conveyed to drivers 24 hours a day/365 days a year by using lane use control signs installed over and centered above the shoulder lane. Lane control signs will be installed at the beginning and end of the dynamic shoulder lane, and generally throughout the entire length of the lane. These signs will indicate to drivers the operational status of the dynamic shoulder lane (i.e., open, closed or about to be closed). The ICM study contemplated butterfly-style sign structures for the lane control signage. However, there is no Iowa DOT standard design for this type of structure and the resulting foundation is expected to be too large to fit into the limited median space. Therefore, it has been assumed that all structures will be full over-head sign trusses based on the current Iowa DOT standard. Since the trusses have a 40-year design life, the trusses should be designed to span the ultimate 5-lane section (plus shoulders) design slated for this corridor. This will protect against the need to replace them if the corridor is expanded to the ultimate configuration within the next 40 years.



Through the Northeast Mixmaster area, pavement widening towards the inside will be needed to accommodate Dynamic Shoulder Use through that area. A minimum of a 14' paved shoulder will be needed through this area to accommodate the 10' wide shoulder lane and provide 4' of buffer space beyond it. In the EB direction, this shoulder will be uninterrupted and connect to the existing widened inside shoulder East of the Northeast Mixmaster, as the current NB I-35 left exit ramp will already be relocated to the new right exit ramp and flyover by the time this project occurs. In the WB direction, modifications will be needed beginning at the gore of the left exit to I-235 WB. When Dynamic Shoulder Use is active, the existing exit-only lane to WB I-235 will become an option lane, allowing traffic to exit to I-235 or continue straight onto the newly constructed widened inside shoulder, which will ultimately connect with the widened inside shoulder West of the Northeast Mixmaster. Future phases of the Northeast Mixmaster reconstruction will reconstruct mainline I-80 through the core of the interchange. This would offer an opportunity to look at including this reconstruction in lieu of simply just completing pavement widening for at least the eastbound direction to minimize future throw-away costs. A layout of future Northeast Mixmaster work is included for reference in the Appendix.

The PCC portion of the corridor (east of MP 130.8) is over 20 years old and beginning to show typical distresses of pavements of that age. When constructed, the median shoulders were not considered travel lanes and thus, smoothness requirements were not considered. To prepare the inside shoulder for mainline traffic and address ride quality issues on the mainline lanes, it is proposed to diamond grind the PCC portion of the project, including inside shoulder, through travel lanes, and auxiliary lanes. Outside shoulders will only receive a feather pass to transition from the ground pavement to the un-ground shoulder. An additional benefit of this diamond grinding is the removal of previous pavement marking grooves and scars, allowing new pavement markings to be reinstalled to ensure a uniform inside shoulder width throughout the corridor.

Between 86th Street and MP 130.8 (~68th St.), rumble strips are present on the inside shoulder. HMA partial depth patching will be needed to patch out those rumbles and

IV. PROPOSED ALTERNATIVE

A. Proposed Alternative

To address the current and future operational needs of this corridor, a multifaceted approach of strategies has been assembled:

Dynamic Shoulder Use

From West of 86th St. to West of the Northeast Mixmaster, the existing 15 ft. inside shoulder will be utilized as a part-time traffic lane during peak periods or during emergencies when one or more lanes are compromised. This lane will be striped at 10' wide to allow a variable shy distance/shoulder between the edge line and the median barrier rail. For consistency and driver expectancy, it was decided to maintain a straight edge line and vary the width of the shoulder around median obstructions.

Due to the proximity to median bridge piers, sign footings, and overall reduced width, this lane will be restricted to passenger vehicles only; large trucks will be prohibited from using this lane.

allow for a smooth driving surface. The remaining portion of the HMA west of 86th St. has already had this treatment applied from past construction projects and staged construction. East of MP 130.8 (~68th St.), rumble strips are not present on the PCC inside shoulder.

Existing median drainage features will be impacted by the proposed dynamic shoulder use. West of MP 130.8 (~68th St.), an HMA overlay was placed over the 1994 PCC. Median barrier intakes were not adjusted vertically to meet the new HMA elevation with this project. Rather, the HMA was shaped around the intakes, thus leaving a dip in the pavement surface which will be unacceptable directly adjacent to the Dynamic Shoulder Use Lane. Additionally, the field has observed some deterioration of the intake risers in some locations. Due to this deterioration, it is anticipated that all intake risers will be replaced as part of this project. Riser replacement will also allow those intakes in the HMA section to be raised to the grade of the new HMA. If additional deterioration below the riser is discovered during construction, it will be repaired by Extra Work Order.

Due to the need to ensure positive drainage of the shoulder for traffic operation, all elements of the median drainage system (intakes, wells, slot drains, outlet pipes, aprons, etc.) will need to be inspected and cleaned out to ensure maximum flow capacity. Tech memos covering additional details of the drainage analysis can be found in the appendix.

Ramp Metering

Two ramps along the corridor have been selected for the installation of ramp meters to solve operational issues occurring at the WB entrance ramp from 2nd Ave. and the EB entrance ramp from Merle Hay Road. Installation of these ramp meters will break up the platoons of vehicles entering the freeway which will increase the flow of the mainline lanes and improve the operation of this freeway segment. Since limited numbers of High-Occupancy Vehicles utilize these ramps, no HOV bypasses are being considered for these locations. A layout showing each ramp metering location can be found in the appendix. An Interchange Operations Report (IOR) will be needed due to the interchange modification.

The EB Merle Hay Road entrance ramp is currently a dual-lane ramp with an inside merge configuration at the gore. The inside merge configuration is not ideal from an operations and safety standpoint. As part of the ramp metering work, the dual-lane ramp will be reduced to a single lane ramp after the ramp meter. This single lane will then line up with the existing parallel acceleration lane on the ramp.

Queue Warning

The portion of I-35/80 directly west and south of this project experiences frequent queuing during peak hours, as the volume of traffic passing through the corridor and using the closely spaced service interchanges creates operational friction. Queue Warning has been identified as a mitigation strategy, to warn drivers of queuing ahead, allowing them to be prepared to slow or stop. The bulk of these overhead DMS structures for the queue warning system will be installed south of IA 141 as part of the Hickman Road Interchange and capacity expansion project. However, two of the overhead DMS structures fall within the project limits of this project. They will be

installed over WB I-35/80 between 86th St. and IA 141. Since median barrier work will already be occurring as part of this project, it was decided to include these structures in this project in order to minimize disruption to the traveling public as a result of construction work zones. A layout showing the location of these structures can be found in the appendix.

Median Barrier Rail Replacement

The median barrier that runs throughout the length of this project will be impacted by the proposed construction in a significant number of places. Barrier replacement will need to occur at each location where a sign structure will be added (approximately once every 2,800') or median stormwater drainage intake is raised or repaired (estimated to be at least 64 locations). Additionally, the barrier rail throughout the project limits ranges from 22 to 28 years old, has been repaired/patched multiple times due to deterioration or crashes. The existing barrier rail was built to an older standard with significantly less reinforcing steel than today's standards. As a result, vehicles have penetrated the PCC median barrier rail in multiple locations over the last 5 years. At the far west end of the project, the barrier rail is pre-cast PCC. It sits on short pegs extending up through the pavement to prevent lateral slide, but the precast sections are not attached to each other and can topple over individually when a moderate force is applied to them. As a result, these sections have been hit and knocked over several times in the last few years. Overall, this section of pre-cast barrier rail is a liability, as it has proven penetrable to vehicles as small as a standard sedan multiple times.

Due to the age of the barrier rail, its condition, and the fact that this project will already be impacting the barrier rail in many locations, it is proposed to completely replace the barrier rail throughout the length of the project. Complete replacement now is a more economical solution due to the economies of scale and the fact that the work zones will already need to be set up to complete the other median work. If only the required portions of the median barrier rail are replaced, the remaining chunks (no longer than 1000' to 2500' in length) would need to be replaced in the future. This will result in additional impacts to traffic (including taking the new dynamic shoulder lanes out of service), additional mobilization costs, and increased construction costs due to the number of small segments, each requiring new setups by the contractor. It is for these reasons that full replacement of the median barrier rail throughout the project limits is recommended.

Additionally, the Bridges and Structures Bureau recommends replacement of all median barrier rail across all bridges within the project limits as well. Bridge barrier rails are the same age as the rest of the median barrier rail and as such, is in fair condition with hairline cracking and some efflorescence. Additionally, all new median barrier rail will be of the single-slope type, so replacement of the bridge median barrier rails will minimize the number of transitions needed between rail cross-sections.

B. Cost Estimate

Roadway components of dynamic shoulder use implementation are expected to cost between \$13.25M without full barrier rail replacement and \$20.87M with full barrier rail replacement through the length of the corridor. Optional costs are broken out below.

Table 3: Grade & Pave Cost Estimate Range for Various Option (IMX-080-3(315)128—02-77)

DESCRIPTION	COST ESTIMATE		NOTES
	REQUIRED	RECOMMENDED	
Base Estimate – Dynamic Shoulder Use	\$12,780,295.75		
Option 1 – West Barrier Rail Replacement		\$2,759,749.44	
Option 2 – East Barrier Rail Replacement		\$4,822,989.60	
Grade & Pave at 2 nd Ave. & Merle Hay Rd. for Ramp Metering	\$502,000.00		Minimal work required at Merle Hay Road.
TOTAL	\$13,282,295.75	\$7,582,739.52	

As part of development of the Des Moines area ITS Master Plan, cost estimates were previously developed for dynamic shoulder use, queue warning equipment, fiber communications infrastructure, and labor for fiber integration to the existing system.

Traffic Signs

Let by Traffic & Safety Bureau: This will include the signs, sign structures, and the associated mobilization and traffic control costs associated with the work. An additional \$7,000,000 has been included to cover the cost of installing sign trusses instead of butterfly structures contemplated in the original estimate.

Traffic Signals

Let by Traffic & Safety Bureau: This will include the signal poles, conduit, signal heads, wiring, ground cabinet, signal controller, power service, luminaire, ITS poles installation, traffic signs and the associated mobilization and traffic control costs associated with the work.

ITS Equipment

Procured by Traffic Operations Bureau: This will include the purchase of hardware, DMS, cameras, detectors, poles, footings, cabinets, ethernet switches and other ITS equipment provided by the Iowa DOT to a contractor as an install only item.

ITS Infrastructure

Procured by Traffic Operations Bureau: This work includes the installation of conduit, handholes, fiber, tracer wire systems, poles, footings, cabinets, power services and the associated mobilization, fiber cable acceptance testing and traffic control associated with the work.

ITS Integration

Procured by Traffic Operations Bureau: This work includes minor fiber splicing and terminations work and other ITS related work performed by a specialty contractor such as device installation and system integration work. In some cases, the fiber splicing and terminations work may be administered through the statewide ITS maintenance contract and tied to the associated device installation work.

PROJECT NUMBER	TYPE OF WORK	DESCRIPTION	COST ESTIMATE
IMX-080-3(316)128—02-77	Traffic Signs	Traffic Signs for DSU	\$13,532,600
		Traffic Signs for Queue Warning	\$2,300,300
IMX-080-3(317)128—02-77	Traffic Signals	Ramp Metering Signals	\$395,000
IMX-080-3(318)128—02-77	ITS Infrastructure	DSU Communication Drops & Power	\$1,135,000
		Queue Warn. Comm Drops & Power	\$475,000
		Ramp Metering Comm Drops & Power	\$60,000
IMX-080-3(319)128—02-77	ITS Equipment	LCS and ITS Device Procurement	\$1,590,000
		DMS and ITS Device Procurement	\$1,920,000
		Provide Ramp Metering Components	\$95,000
IMX-080-3(320)128—02-77	ITS Integration	Specialty Work for DSU	\$651,000
		Specialty work for Queue Warning	\$190,000
		Specialty Work for Ramp Metering	\$35,000
		TOTAL	\$22,378,900

The resulting cost estimates when combining grade and pave components with the necessary traffic sign and fiber communication improvements will be between \$35,661,195.75 and \$43,243,935.27. Detailed cost estimates can be found in the appendix.

C. Staging/Construction Sequence

Replacement of the barrier rail, intakes, sign footings, and other roadside improvements will occur under traffic utilizing night-time lane closures for the delivery of equipment and materials. Shoulder closures with TBR will be in place during the daytime to protect the work area and any work occurring during the daytime. Occasional overnight full closures may be needed for the erection of full-width overhead sign trusses. These may be accomplished with short-term closures utilizing TC-451 or grouped together and set on one or two nights will an all-night full closure, whichever has the least overall impact to traffic.

D. Special Considerations

Existing lighting features may also be impacted by pavement widening at ramp meter locations. These impacts may include removing and reinstalling or replacing the light poles.

Median barrier intake grate attachment will be a consideration. While traffic will not drive on top of them, traffic may occasionally stray onto them. Therefore, securement of the grates may be necessary as a safety precaution.

Signage for the Dynamic Shoulder Use will be constructed at approximately one-half mile intervals along the corridor from west of 86th St. to east of the Northeast Mixmaster and will contain a small DMS element will be installed over each shoulder. The management of the shoulder lane will require procurement of a DMS control equipment and software installed at the Statewide Traffic Management Center to allow remote control of the DMS elements.

Ramp metering traffic signals will be constructed at 2 ramps. The ramp meter assemblies will include similar components to other traffic signal projects: traffic signal cabinet with concrete pad, traffic signal pedestal poles or mast arms with one signal indication per lane, non-intrusive detectors such as radar or video detection, and associated signage. The traffic signal management of ramp metering will require procurement of a local controller software and software installed at the Statewide Traffic Management Center to allow remote adjustments of ramp metering rates and periods of operation.

Fiber communication will be buried in conduit to connect devices including the DMS elements, ramp meter signal cabinets, and the backbone Iowa DOT communication network. The project will increase the importance of real-time communication, so a separate fiber communication backbone project is planned along the Interstate 35/80 right of way, scheduled for a July 2023 letting. The fiber connections as part of this dynamic shoulder use project will be designed to connect to this proposed fiber backbone.

A review of State of Iowa Code has been completed by HDR as part of the Des Moines ICM study and is included in the appendix. Additional review by Iowa DOT Legal staff will be needed to determine whether any existing code sections prohibit using the shoulder as a travel lane. If so, working with the Legislature to revise the code to allow the Dynamic Shoulder Use will be required. This process should be started as soon as possible due to the lengthy legislative process.

The Traffic Operations Bureau's Traffic Management Center will need to create new Standard Operating Procedures for the operation of the Dynamic Shoulder Use lanes. Both a visual (via camera) and physical (driven by Highway Helper) inspection will be required before the shoulder can be opened to traffic. Among other things, operators will be looking for stalled vehicles or debris blocking the shoulder which would prevent safe usage by travelers. Additionally increased maintenance and sweeping by the District's Maintenance crews will likely be required to ensure the shoulder is safe to use.

E. Program Status

This project has not yet been programmed but should be considered for the FY 2024 timeframe. External funding sources, such as a USDOT/FHWA grant, could be considered to support a significant amount of this and other I-35/80 work at one or both systems interchanges. While the first Northeast Mixmaster projects are set to let later this year, future phases which address work on I-80 through the core of the interchange may be a good fit to combine with this project. This would show a corridor approach to improving traffic on the east half of the I-80 corridor through the Metro. Alternatively (or additionally), this project could be bundled with improvements at the Southwest Mixmaster which are currently programmed for FY '27. In addition to other capacity improvements already programmed, this would show a commitment to improving the operations on entire I-35/80 corridor, which is a key link to two major freight corridors of national importance. No matter how it is bundled in a grant application, the inclusion of Dynamic Shoulder Use will show a commitment to alternative operational strategies utilizing existing in-place infrastructure, which is currently more favorable than strictly traditional capacity improvement projects.

F. Schedule

The project development schedule, as a printout from PSS, is included on the following page. It is recommended by District 1 that further development of the project be outsourced to a consultant. As noted on the schedule, the D01 event is scheduled for completion in a few months and D02 event in less than six months.

22-77-080-040

IA 141 Interchange in Urbandale to E of the NE I-35/235 Interchange

Corridor : None Project Type : Improvement
District : 1 Project Group : 4R
Project Manager : Tony Gustafson Metric : No
Segment Manager : Allison Smyth Miles : 11.00
5 Year PIN(s) :

Preliminary Engineering: IMX-080-3(314)128--02-77 Allison Smyth

Table with columns: Start Date, Act. Start, Finish Date, Act. Finish, Notes. Includes entries for A01, D00, TE0, U00, W00, D01, D02, H00, NE10, D03, U02, B01, B02, IJR3, IJR5, U03, S03, DM5, U07, D08, L03, C02, TD03, TD07, TD10, L10, C02, TD07, TD09, L09, C02, ITS4, L15, C02, ITS3, L14, C02, ITS5, L16, C02.

Cc:

- C. Purcell, S. J. Megivern, M. Nop, S. Majors, J. W. Laaser-Webb, E. C. Wright, J. Harris, B. D. Hofer, S. Anderson, K. K. Patel, B. Beavers, C. Brakke, V. Brewer, J. Garton, B. Ellis, A. Smyth, S. Nielsen, M. Ortiz-Pagan, D. A. Popp, A. Poole, J. Bennett, A. Lewis, M. J. Kennerly, J. S. Nelson, M. A. Swenson, K. Brink, W. A. Sorenson, M. E. Ross, C. C. Poole, B. E. Azeltine, D. Stokes, S. Godbold, M. Solberg, E. Engle, M. Donovan, A. Loonan, S. Nixon, B. Bradley, D. L. Maifield, G. Kretlow, J. Ellis, W. W. Musgrove, M. Van Dyke, J. Dale, K. D. Nicholson, B. Walls, J. M. Hart, D. L. Newell, D. E. Sprengeler, A. A. Welch, G. Karssen, S. J. Gent, F. Leong, J. Vortherms, N. Cuva, M. Hobbs, J. R. Scott, T. Hildreth, P. Lafleur, FHWA, E. D. Ganson, J. Bartholomew, K. Olson, J. Narigon, H. Bibiano, T. Simodynes

Roadway					
PIN Number	22-77-080-040		Submittal Date		
Project Number	IMX-080-3(315)128--02-77		Approval Date		
District	District 1	Assistant District Engineer	Allison Smyth		
County	POLK	or			
Route	I-80/I-35	Office Director			
Location	Des Moines Metro Area				
Work Type	Dynamic Shoulder Use, Signing, Striping, ITS				
Segment Manager	Neal Fobian				
Designer	HNTB Corporation - Stephanie Hemberger				
Design Manual Section 1C-1 Last Updated: 04-29-19		Urban Interstates (Urban Freeways)			
	Design Element	Preferred	Acceptable	Project Values	Interstates Freeways
	Design speed (mph)	5 miles above the anticipated posted speed limit	50	70 mph (1)	IDG page 3 GB Section 8.2.1
	Maximum superelevation rate (%) (Refer to Section 2A-2)	6	8	6% (Exist.)	GB page 3-31
	Design lane width (ft)	12	12	11.81' or 12' (Exist.)	IDG page 4 GB Section 8.2.4
	Full depth paved width (ft)	Outside lane	12	11.81' or 12' (Exist.)	-- --
		Inside lane(s)	12	11.81' or 12' (Exist.)	-- --
	Auxiliary-lane width (ft)	12	12	10' (2)	IDG page 4 GB page 10-90
	Pavement cross-slope	Through lanes	2%, However, when adjacent lanes slope in the same direction, increase slope by 0.5% per lane up to 3%	1.5% minimum, 3% maximum	2% (Exist.) IDG page 5 GB Section 8.2.4
		Auxiliary lanes	3%	3% maximum	3% (3) GB page 4-6
		Crown break at centerline	4%	4% maximum	4% (Exist.) GB page 4-6
	Shoulder cross-slope	Interstates	4%	6% max, but not less than the cross slope of the adjacent lane	3% (3) IDG page 5 --
		Freeways	4%	6% max, but not less than the cross slope of the adjacent lane	-- GB section 8.2.4
	Curb type (Refer to Section 3C-2)	Interstates	4-inch sloped	4-inch sloped	4-inch sloped IDG page 6 --
		Freeways	4-inch sloped	4-inch sloped	-- GB section 4.7.1
	Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	4:1 for Interstates, 3:1 for Freeways*	10:1 for 4' then 6:1 IDG page 5 RDG section 3.3.2
		Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1 RDG section 3.3.2
		Curbed roadways	2%	4:1 for Interstates, 3:1 for Freeways*	2% IDG page 5 RDG section 3.3.2
	Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1 GB Section 4.8.4
	Transverse Slopes	w/ drainage structures	8:1	6:1	8:1 RDG Section 3.2.3
		w/o drainage structures	10:1	6:1	10:1
	Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5' x 10' --
		Median ditch depth (ft)	4	--	4 --
	Median width (ft) (Refer to Section 3E-1)	Interstates	34	10	29.53' or 30' (Exist.) IDG page 5 --
		Freeways	34	10	-- GB Sections 8.4.2
	Bridge width—new***	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths IDG page 7 GB Section 8.2.8
		Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	design lane width + 4' right and left of the design lane widths IDG page 7
	Bridge width—existing***	Bridge length ≤ 200 ft	design lane widths + no less than 10' right and 3.5' left	design lane widths + 10' right shoulder and 3.5' left shoulder	Varies (Exist.) IDG page 7
		Bridge length > 200 ft	design lane widths + no less than 3.5' left and right	design lane widths + 3.5' right and left of the design lane widths	Varies (Exist.) IDG page 7
	Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks))	Over primary	16.5	16	16.5' IDG page 7 GB Section 8.2.9
		Over non-primary	16.5 at interchange locations, 15 ft at all other locations	14	16.5' GB pages 5-9 and 6-8
		Over railroad	23.3	23.3	23.3' --
		Sign trusses and pedestrian crossings	17.5	17	17.5' IDG page 7 GB Section 8.2.9
	Structural Capacity	Contact Office of Bridges and Structures		Contact Office of Bridges and Structures	
	Level of Service	Freeway segments	C	C**	(4) GB Section 8.2.3
		Auxiliary Facilities	C	C**	(4)
*Design Exception not required for Freeways **LOS D may be acceptable in spot locations with FHWA approval ***FHWA notification via email is required if acceptable criteria is not met on the Interstate or NHS systems (No formal design exception required)					
Notes:					
(1) Dynamic Shoulder Use will be allowed during congested traffic conditions when average running speeds are reduced.					
(2) Dynamic Shoulder Use lane will be striped to a 10' width. General purpose lanes and auxiliary lanes on the outside of the cross section will remain striped at 11.81' or 12'. See Typical Sections in the B sheets.					
(3) Dynamic Shoulder Use lane will be established on the existing median (inside) shoulder. Existing shoulders have 3% cross slopes.					
(4) Dynamic Shoulder Use will only be allowed during congested traffic conditions when average running speeds are reduced (Low Level of Service)					

A design exception is required for inside lane width (11'). The inside lane will be re-striped to 11' west of the NEMM Interchange to provide a min. 3' width between the DSU lane and median barrier.

Directional Design Hourly Volume (DDHV) for Trucks = N/A											
Design Manual Section 1C-1 Last Updated: 04-29-19		Effective Shoulder Width and Type for Interstates (Freeways)									
		Preferred (values shown in feet)				Acceptable (values shown in feet)				Project Values	
Auxiliary Lanes		Effective Shoulder Width		Paved Width		Effective Shoulder Width		Paved Width		Interstates Freeways	
		6		6		6		6		Varies (1) GB page 10-90	
4-Lane Sections											
Design Year Traffic		Outside		Median Side		Outside		Median Side		Project Values	
		Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width		
Less than or equal to 250 DDHV		10	10	6	6	10	10	4	4	N/A	IDG page 4 GB section 8.2.4
Greater than 250 DDHV		12	12	6	6	12	12	4	4	N/A	IDG page 4 GB section 8.2.4
Sections with 6 or more lanes											
Design Year Traffic		Outside		Median Side		Outside		Median Side		Project Values	
		Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width		
Less than or equal to 250 DDHV		10	10	10	10	10	10	10	10	N/A	IDG page 4 GB section 8.2.4
Greater than 250 DDHV		12	12	12	12	12	12	12	12	Varies (Exist.)(2)	IDG page 4 GB section 8.2.4
Curbs should be located beyond the outer edge of the paved shoulder										IDG page 6	GB section 8.2.5
Notes:											
(1) The remaining 3'-5' shoulder width is usable shoulder to the 10' Dynamic Shoulder Use lane. Localized shoulder narrowing will occur at median barrier transitions for vertical structural supports and existing bridge piers. Aux. lane widths on the outside of the cross section will remain unchanged with to existing conditions.											
(2) Inside shoulders will be available to the general use I-35/I-80 lanes when the shoulders are not in use as Dynamic Shoulder Use lanes.											

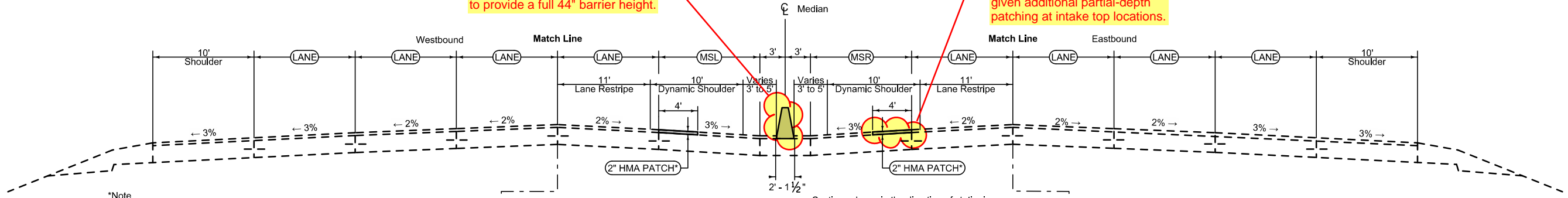
A design exception is required for median side shoulder width while DSU is in operation.

Roadway Design Speed (mph) = 70 mph																							
Design Manual Section 1C-1 Last Updated: 04-29-19																							
Design Criteria for High Speed Roadways																							
Design Element	Preferred Criteria						Acceptable Criteria						Project Values										
	Design Speed, mph						Design Speed, mph																
	50	55	60	65	70	75	50	55	60	65	70	75											
Stopping sight distance (ft) (Refer to Section 6D-1)	425	495	570	645	730	820	425	495	570	645	730	820	730	GB Table 3-1									
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e _{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	2040	GB Table 3-7							
		e _{max} = 8%	--	--	--	--	--	--	--	758	960	1200	1480	1810	2210	1810	GB Table 3-7						
Minimum vertical curve length (ft) (Refer to Section 2B-1)	crest vertical curves						sag vertical curves						Match Existing (1)	GB page 3-167									
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	roadways without fixed-source lighting						roadways with fixed-source lighting						Match Existing (1)	GB Table 3-35									
	roadways with fixed-source lighting						roadways with fixed-source lighting						Match Existing (1)	GB Table 3-37									
Minimum gradient (%) (Refer to Section 2B-1)	0.5						0.3% with a curb, 0.0% without a curb						Match Existing (1)	GB page 3-176									
Maximum gradient (%) (Refer to Section 2B-1)	Urban roadways		4						3						7	6	6	--	--	--	Match Existing (1)	GB page 3-130	
	Rural roadways		4						3						5	5	4	4	4	4	4	Match Existing (1)	GB Table 7-4a
	Interstates		4						3						5	5	4	4	4	4	4	Match Existing (1)	GB Table 7-2
Clear zone	See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						34' (Preferred) 30' (Acceptable)	IDG page 3									

Notes:
(1) Dynamic shoulder will be widened from existing I-80/I-35 lanes.

A Modified BA-100 is anticipated through the HMA overlay section to provide a full 44" barrier height.

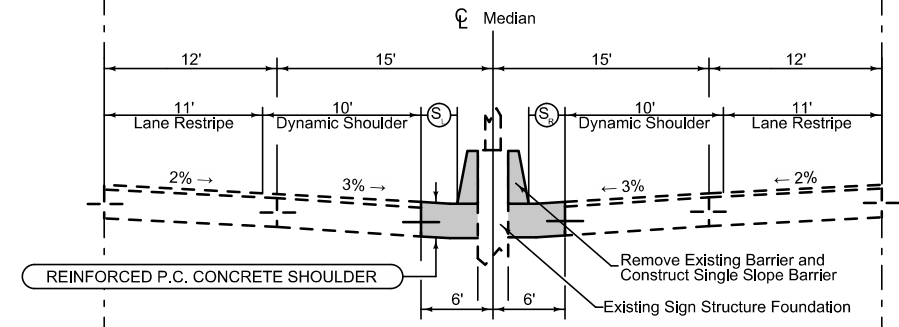
Revise to full-width mill and overlay of the existing shoulder where rumble strips are present given additional partial-depth patching at intake top locations.



*Note
Construct HMA Patch to remove existing rumble strips.
Locations listed below.

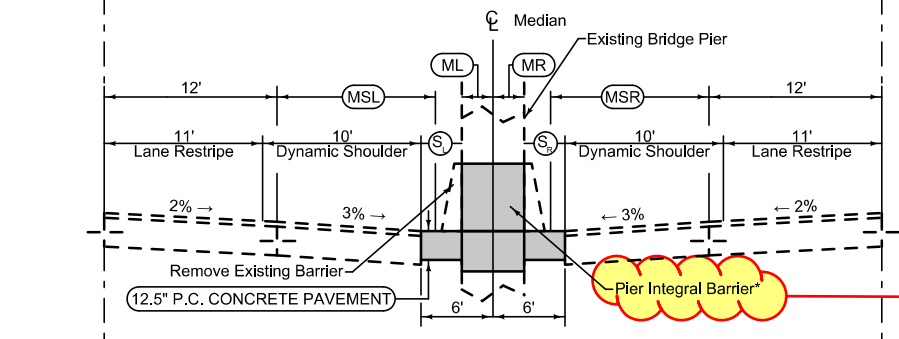
LOCATION			
IDENTIFICATION	DIRECTION	BEGIN STATION	END STATION
ML080	EB	652+00.00	659+96.00
ML080	WB	658+50.00	659+96.00
ML080	EB	661+06.00	702+25.00
ML080	WB	661+06.00	702+25.00
ML080	EB	704+82.00	719+82.00
ML080	WB	704+82.00	719+82.00

LOCATION			DIMENSIONS			Existing Pavement		
IDENTIFICATION	BEGIN STATION	END STATION	LANE Feet	MSL Feet	MSR Feet	PCC Inches	HMA Inches	TOTAL Inches
ML080	548+75.00	719+82.00	12	12	12	12.5	4	16.5
ML080	1057+12.00	1071+80.19	12	12	12	12.5	4	16.5



Full Depth PCC Median at Existing Sign Structures

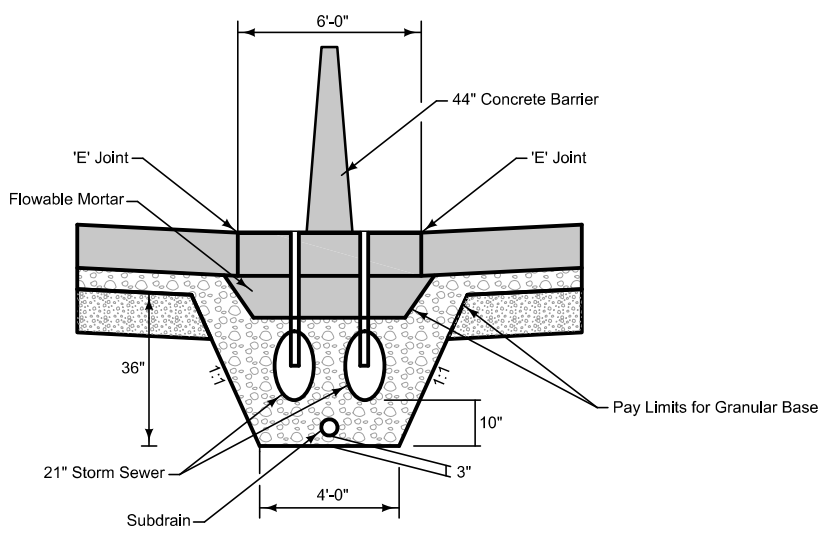
ROAD IDENTIFICATION	BEGIN STATION	END STATION	⊙ Feet	⊙ Feet
ML 080	586+23.00	586+58.00	3.8	4.2
ML 080	598+57.10	598+92.10	2.9	3.0



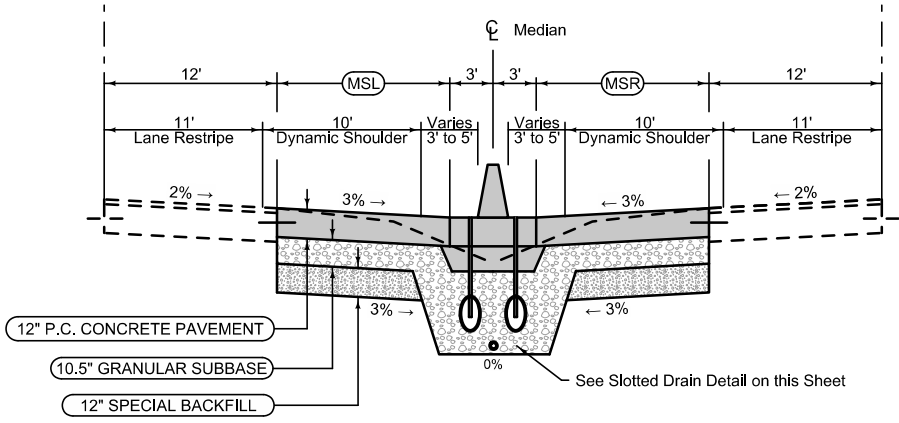
Full Depth PCC Median at Existing Bridge Piers

BRIDGE PIER SIDEROAD LOCATION	BEGIN STATION	END STATION	MSL Feet	ML Feet	⊙ Feet	MSR Feet	MR Feet	⊙ Feet
NW 100th St.	596+66.00	597+97.00	11.5	2	3.2	10.8	1.7	3.1
NW 86th St.	650+24.00	651+04.00	13	1.5	3.1	10.5	1.8	3.3

A pier integral barrier / infill wall is proposed at the four existing overpass locations to accommodate a min. 3' between the inside edge of the DSU lane and median barrier. Piers will be checked for crashworthiness in future design and alternatives explored if necessary.



SLOTTED DRAIN DETAIL



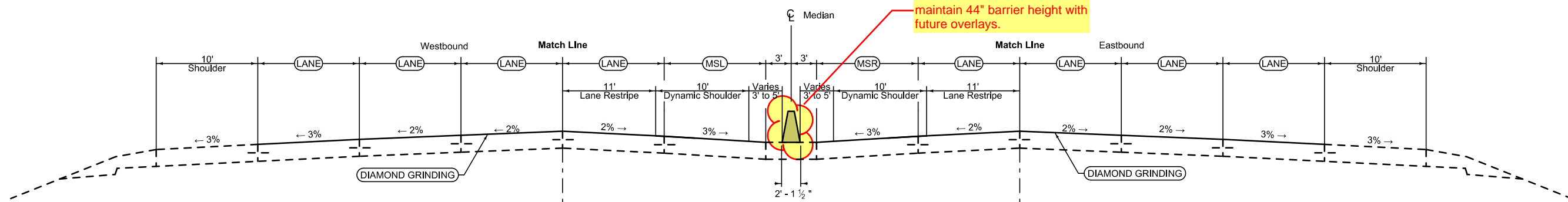
Full Depth PCC Median

Median Jointing:
Transverse joints: CD at 20' spacing
Longitudinal joint: L-2

ROAD IDENTIFICATION	BEGIN STATION	END STATION	MSL Feet	MSR Feet
ML080	1057+12.00	1059+72.00	12 - 16	12 - 14.2
ML080	1059+72.00	1060+90.18	16	14.2 - 16
ML080	1060+90.18	1071+80.19	16	16

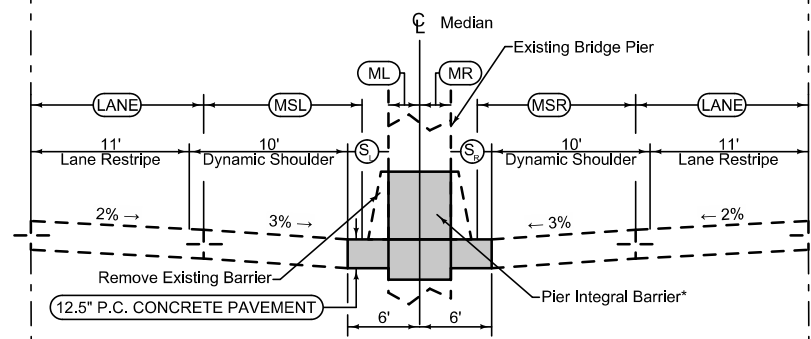
**MAINLINE I-35/80
EXISTING HMA OVERLAY SECTION**

Consider a Modified BA-100 to maintain 44" barrier height with future overlays.



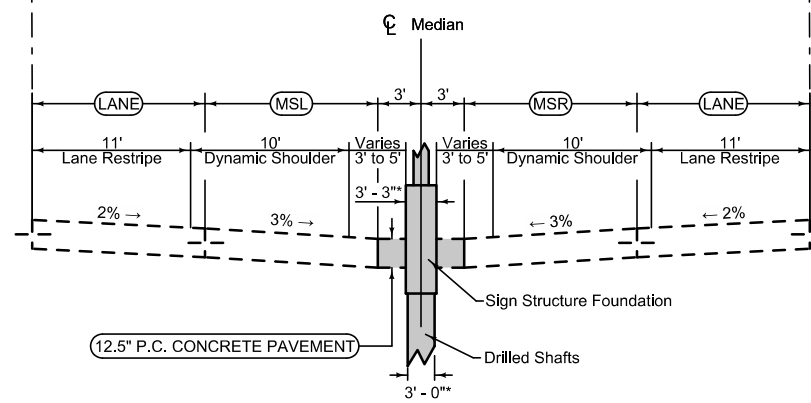
Section shown in the direction of stationing.

LOCATION IDENTIFICATION	BEGIN STATION	END STATION	DIMENSIONS			Existing Pavement		
			LANE Feet	MSL Feet	MSR Feet	PCC Inches	HMA Inches	TOTAL Inches
ML080	719+82.00	833+00.00	11.81	11.81	11.81	12.6	0	12.6
ML080	833+00.00	937+00.00	12	12	12	12.5	0	12.5
ML080	937+00.00	1057+12.00	11.81	11.81	11.81	12.6	0	12.6



Full Depth PCC Median at Existing Bridge Piers

BRIDGE PIER SIDEROAD LOCATION	BEGIN STATION	END STATION	LANE Feet	MSL Feet	ML Feet	S Feet	MSR Feet	MR Feet	S Feet
NW Beaver Dr.	802+62.00	803+08.00	11.81	11	1.8	3.8	10.8	2	3.5
NW Morningstar Dr.	879+67.00	880+19.00	12	10.5	2	3.3	12	2	3.3



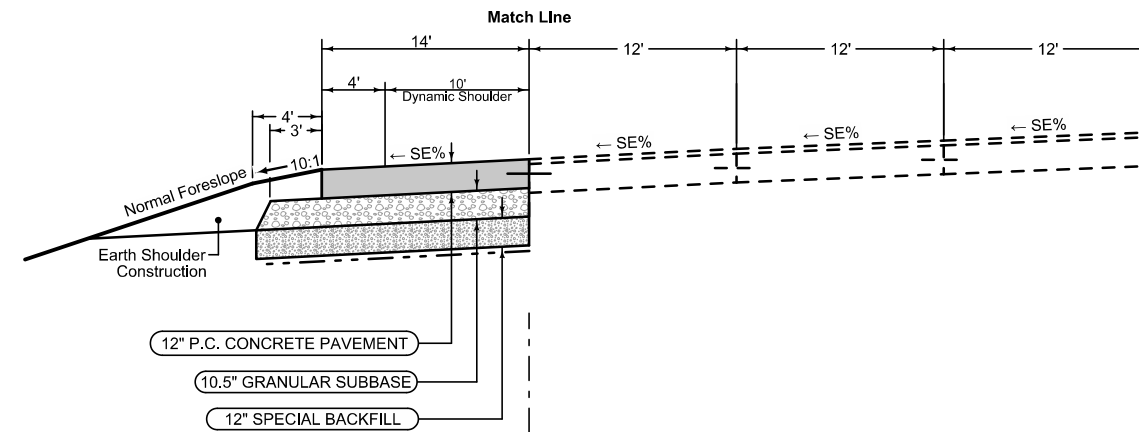
Proposed Sign Structures in Existing Median

**MAINLINE I-35/80
EXISTING PCC SECTION**

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joint: C at 20' spacing
 Section view is in direction of traffic.

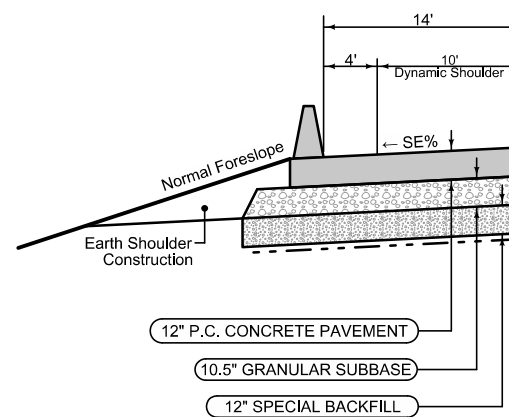
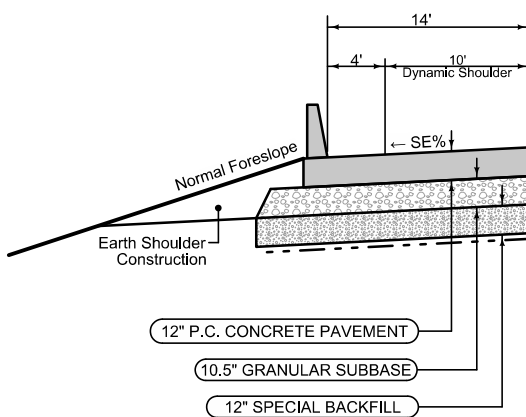
ROAD IDENTIFICATION	BEGIN STATION	END STATION
ML080_EB	3073+64.56	3108+93.04
ML080_WB	2073+83.13	2075+02.44



Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joint: C at 20' spacing
 Section view is in direction of traffic.

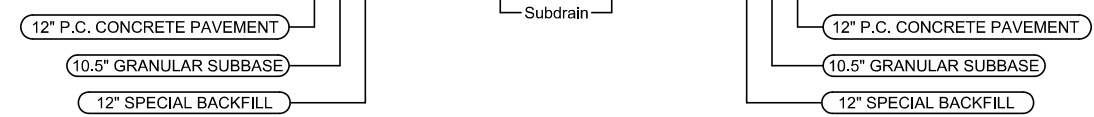
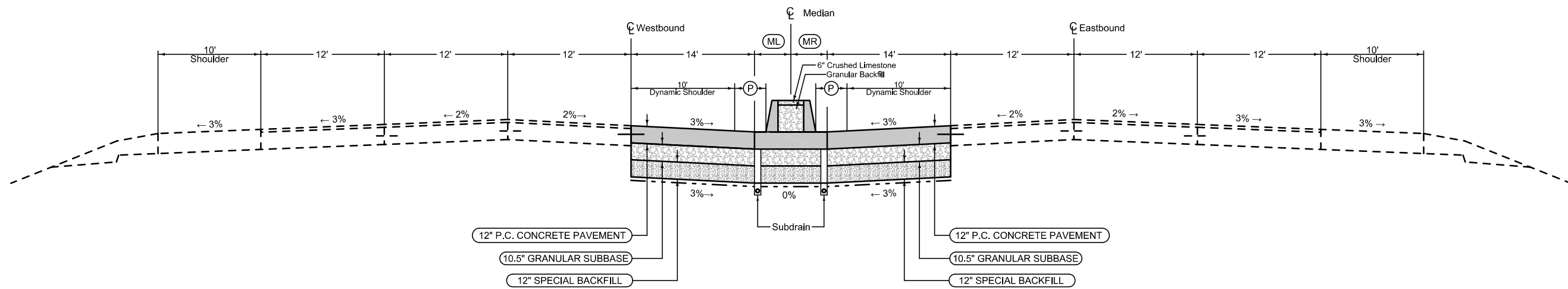
ROAD IDENTIFICATION	BEGIN STATION	END STATION
ML080_WB	2073+65.24	2073+83.13



Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joint: C at 20' spacing
 Section view is in direction of traffic.

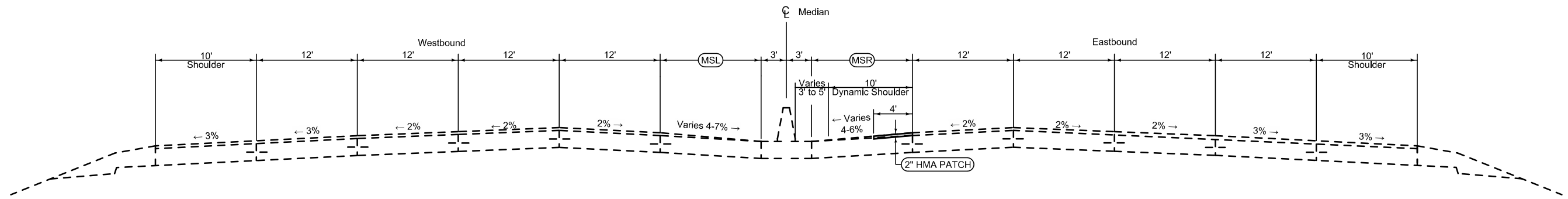
ROAD IDENTIFICATION	BEGIN STATION	END STATION
ML080_EB	3108+93.04	3110+43.27



ROAD IDENTIFICATION	BEGIN STATION	END STATION	(P) Feet	(ML) Feet	(MR) Feet
ML080	1071+80.19	1073+00.77	7.9-4	1.1 - 6	1.1 - 6.2
ML080	1073+00.77	1073+66.00	4	6 - 8.7	6.2 - 8.9

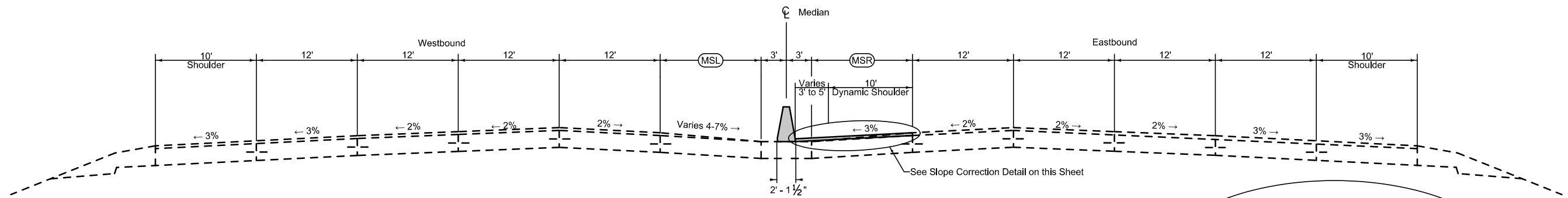
Pavement sections shown are proposed to align with existing pavement and drainage layers. This will be confirmed with a final pavement determination in future design.

MAINLINE I-80 MAINLINE I-80 (EASTBOUND) MAINLINE I-80 (WESTBOUND) NORTHEAST MIXMASTER



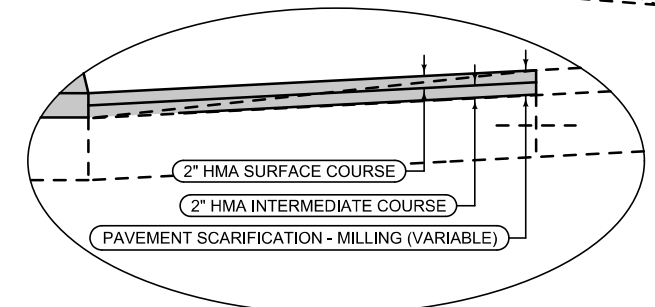
Section shown in the direction of stationing.

LOCATION			DIMENSIONS		Existing Pavement		
ROAD IDENTIFICATION	BEGIN STATION	END STATION	(MSL) Feet	(MSR) Feet	PCC Inches	HMA Inches	TOTAL Inches
ML080	1135+48.00	1139+00.00	14.6-12	14.6-12	12.5	4	16.5
ML080	1139+00.00	1154+00.00	12	12	12.5	4	16.5



Section shown in the direction of stationing.

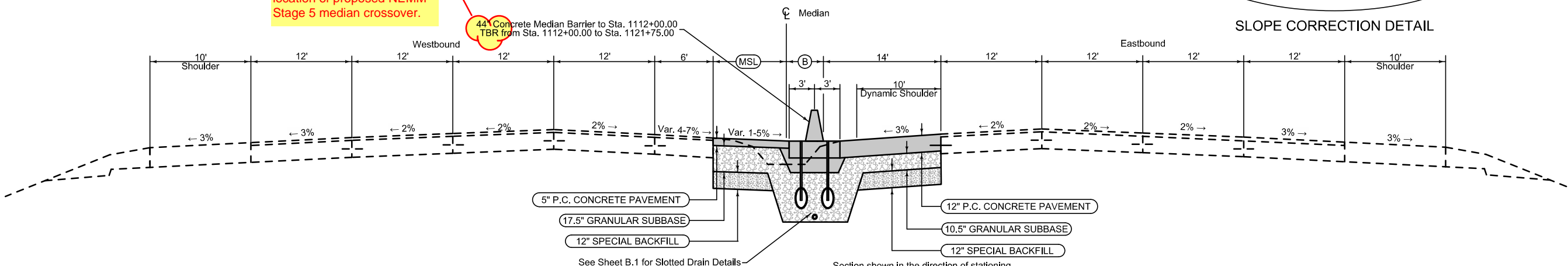
LOCATION			DIMENSIONS		Existing Pavement		
IDENTIFICATION	BEGIN STATION	END STATION	(MSL) Feet	(MSR) Feet	PCC Inches	HMA Inches	TOTAL Inches
ML080	1121+75.00	1131+06.03	15	15.5	12.5	4	16.5
ML080	1133+84.61	1135+00.00	15.5	15.5	12.5	4	16.5
ML080	1135+00.00	1135+48.00	15.5-14.6	15.5-14.6	12.5	4	16.5



SLOPE CORRECTION DETAIL

Coordinate limits of TBR and pavement section with final location of proposed NEMM Stage 5 median crossover.

44' Concrete Median Barrier to Sta. 1112+00.00 TBR from Sta. 1112+00.00 to Sta. 1121+75.00

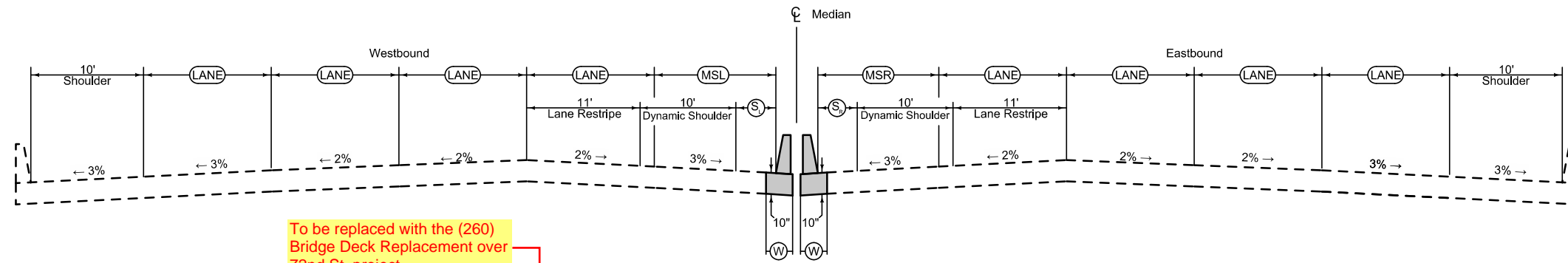


Section shown in the direction of stationing.

LOCATION			DIMENSIONS		Existing Pavement		
IDENTIFICATION	BEGIN STATION	END STATION	(MSL) Feet	(B) Feet	PCC Inches	HMA Inches	TOTAL Inches
ML080	1109+00.00	1110+37.28	14.6-13	8.2-4.5	12.5	4	16.5
ML080	1110+37.28	1113+00.00	13	4.5	12.5	4	16.5
ML080	1113+00.00	1115+75.00	13-12	4.5	12.5	4	16.5
ML080	1115+75.00	1120+75.00	12	4.5	12.5	4	16.5
ML080	1120+75.00	1121+75.00	12-6	4.5-1.1	12.5	4	16.5

Typical Section options are contingent on timing of DSU and NEMM Stage 5. TBR shown through limits of future temporary median crossover and provide flexibility should DSU occur ahead of NEMM Stage 5.

**MAINLINE I-80
EXISTING HMA OVERLAY SECTION**



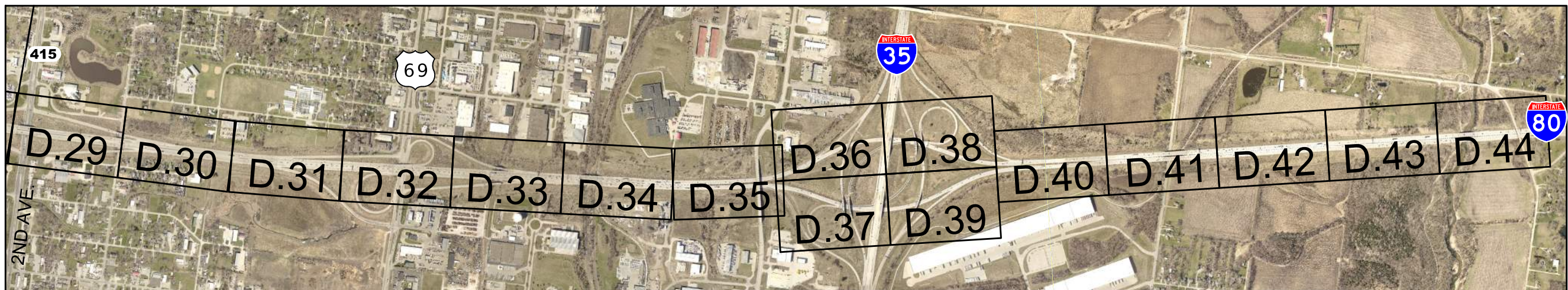
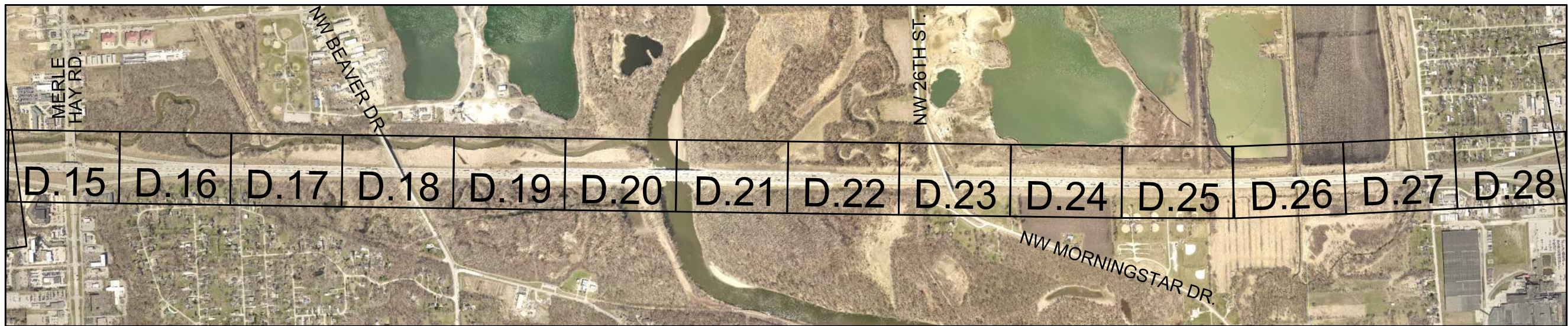
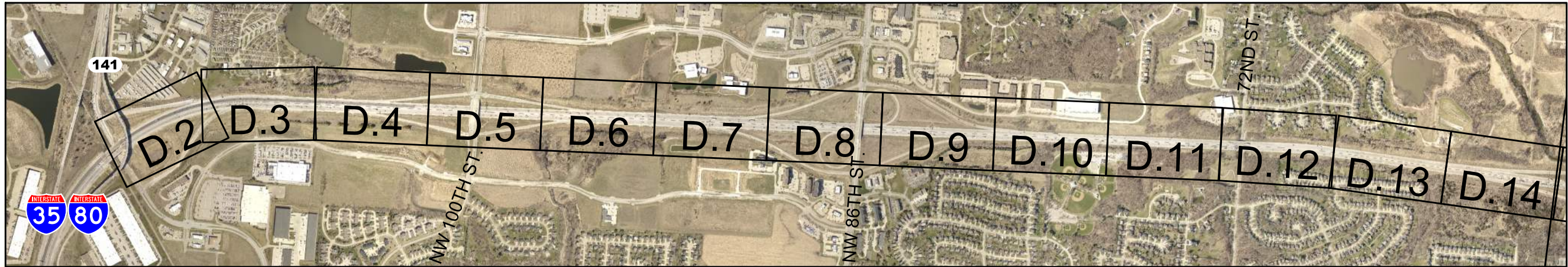
To be replaced with the (260) Bridge Deck Replacement over 72nd St. project.

ROAD IDENTIFICATION	Feature Crossed	EB Maint. No.	WB Maint. No.	BEGIN STATION	END STATION	(LANE) Feet	(W) Feet	(S) Feet	(MSL) Feet	(S ₁) Feet	(MSR) Feet
ML080	NW 72nd St.	7730.5R080	7730.5L080	702+93.55	704+19.48	12.00	2.50	4.15	13.37	3.93	12.52
ML080	IA 28 th Merle Hay Rd.	7731.5R080	7731.5L080	755+38.13	758+03.75	11.81	2.70	3.85	13.61	3.74	12.72
ML080	Des Moines River	7733.1R080	7733.1L080	838+37.82	845+49.98	12.00	2.00	4.45	13.34	3.81	13.15
ML080	Drainage Ditch	7734.7R080	7734.7L080	928+60.15	929+72.44	12.00	2.29	4.00	13.10	3.83	13.35
ML080	Saylor Creek	7735.0R080	7735.0L080	944+25.56	945+96.06	11.81	2.13	4.48	13.65	3.52	12.26
ML080	NW 6th Dr.	7735.1R080	7735.1L080	946+97.36	948+38.26	11.81	2.12	4.49	13.76	3.32	12.65
ML080	IA 415/2nd Ave.	7735.5R080	7735.5L080	968+07.91	970+63.63	11.81	2.70	3.86	11.89	4.15	12.78
ML080	NE 3rd St.	7735.7R080	7735.7L080	981+99.73	983+22.23	11.81	2.36	3.95	12.56	4.14	13.09
ML080	US 69	7736.5R080	7736.5L080	1021+70.19	1024+16.52	11.81	2.70	4.08	13.12	3.97	12.81
ML080	Drainage Ditch	7736.8R080	7736.8L080	1035+52.68	1037+51.39	11.81	2.30	4.05	12.76	3.93	13.16
ML080	Union Pacific Railroad	7737.0R080	7737.0L080	1048+20.54	1051+19.07	11.81	2.30	3.79	12.82	4.08	13.07

Assume use of new MASH single slope bridge rail currently in development.

**MAINLINE I-35/80
BRIDGE**

KEY MAP



NO SCALE

SHEET LAYOUT
OVERVIEW

SURVEY SYMBOLS

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

ABBREVIATIONS

CCTV	Closed Circuit Television
DMS	Dynamic Message Sign
DOT	Department of Transportation
HH	Handhole
ICN	Iowa Communications Network
ITS	Intelligent Transportation Systems
LCS	Lane Closure System
NEC	National Electric Code
NTS	Not to Scale
OH	Overhead
OTDR	Optical Time Domain Reflectometer
RDMS	Roadside Dynamic Message Sign
ROW	Right of Way
SM/D	Single Mode Dielectric
SOST	Steel Overhead Sign Truss
TCP	Traffic Control Plan

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.	
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING		Design Color No.	
Lavender	(9)		Temporary Pavement Shading
Yellow	(4)		Proposed Pavement Shading
Orange	(6)		Proposed Granular Shading
Orange	(70)		Proposed Shoulder Granular Shading
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading
Yellow	(132)		Proposed Shoulder Paved Partial Depth Shading
Blue, Light	(7)		Proposed PCC Patch Shading
Green, Dark	(10)		Proposed Diamond Grinding Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading
Brown, Light	(236)		Grading Shading
Orange, Light	(134)		Proposed Granular Entrance Shading
Yellow	(220)		Proposed Paved Entrance Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading
Green, Light	(225)		Existing Pavement Shading
Red	(3)		Proposed Structure Shading

PLAN LEGEND

	Reference Point		Survey Line
	Station		Section Corner
	Ground Line Intercept		Saw Cut
	Guardrail		Trench Drain
	HighTension Cable Guardrail		Sheet Pile
	Pavement Removal		Pavement Removal (By Others)
	Clearing & Grubbing Area		Mainline Lane
	Dynamic Shoulder Lane		Inlet Top Replacement
	Inlet Replacement		Proposed Truss
	By Others (197)		Existing Storm Sewer
	Plug and Abandon Existing Pipe or Structure		Removal Of Existing Pipe Or Structure
	Direction Of Pipe Flow		

NEMM Stage 3 preliminary signing as of September 2022 is shown as "future existing," with proposed sign trusses shown as gray and proposed signs shown with a dashed outline.

NEMM Full Build preliminary signing as of October 2022 is considered. Additional coordination is warranted.

ITS LEGEND

	Iowa DOT Plowed Conduit
	Iowa DOT Bored Conduit
	Power Conduit Plowed
	Power Conduit Bored
	Existing Iowa DOT Conduit With Fiber
	Iowa DOT Handhole, 30x17x24
	Iowa DOT Handhole, 48x30x36 or 24x36x36
	Power Transformer
	Power Service
	Iowa DOT ITS Device Cabinet, Ground Mount

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

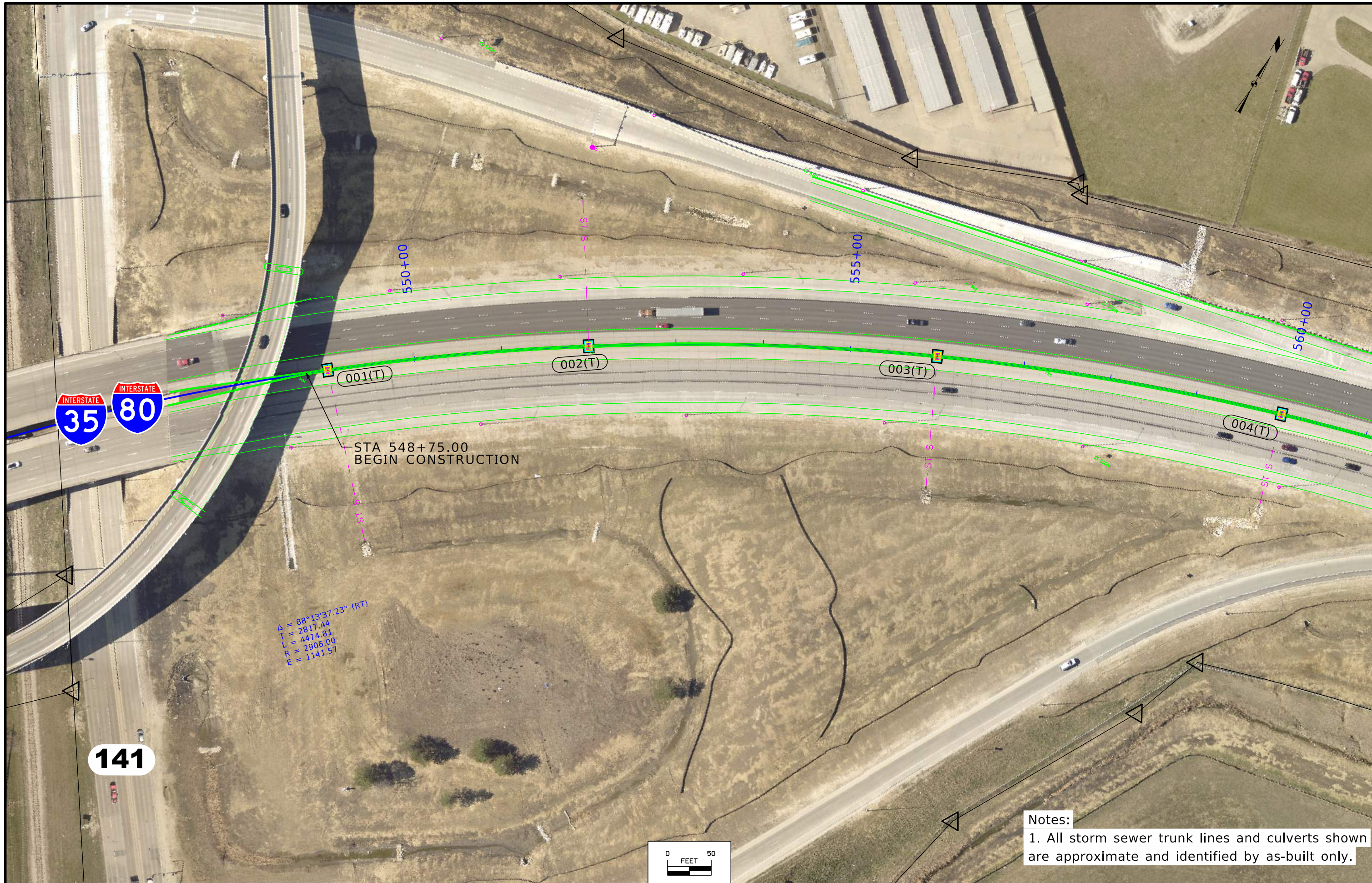
LINEWORK		Design Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

RIGHT-OF-WAY LEGEND

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

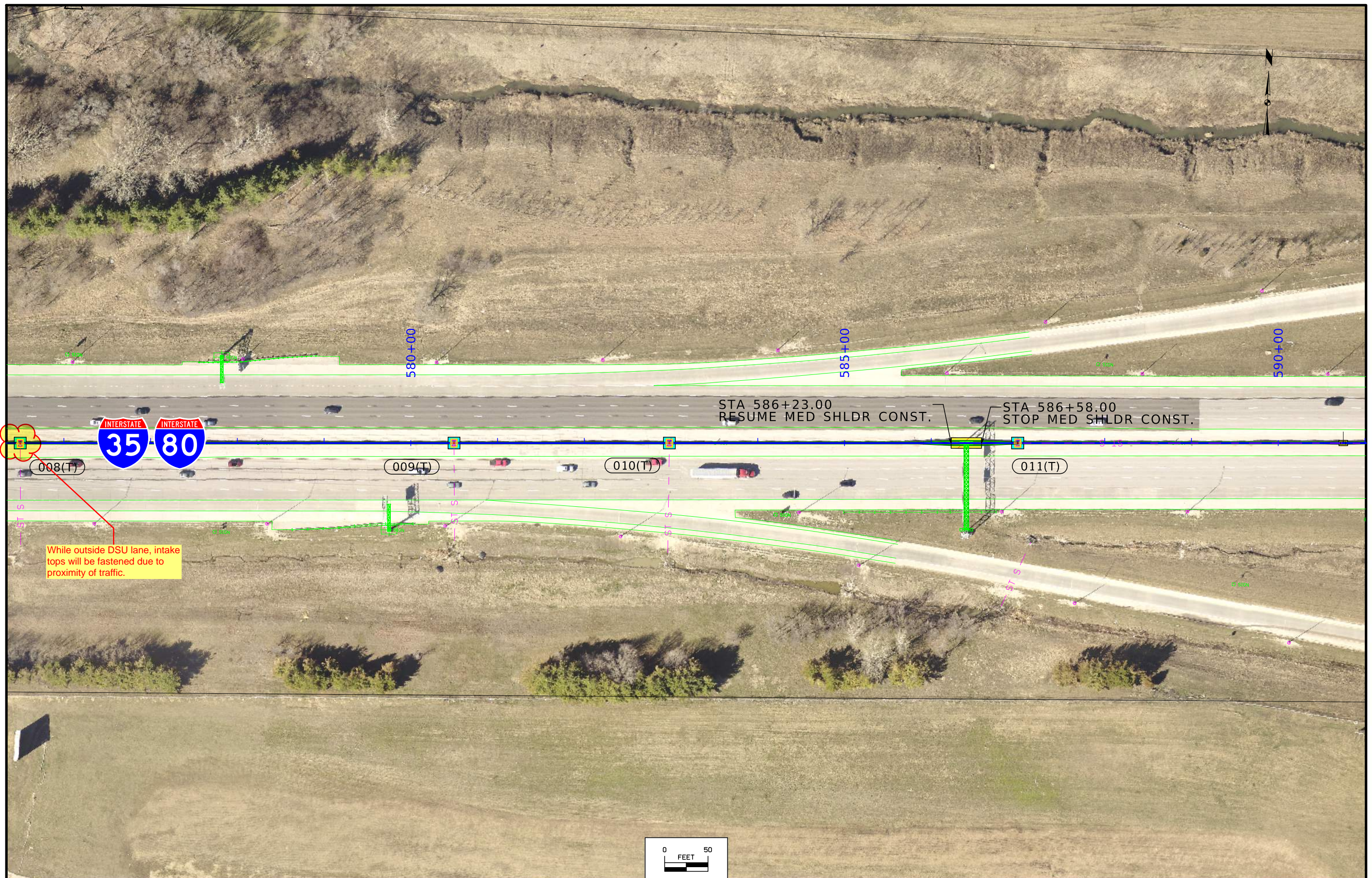
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D & N)



Notes:
 1. All storm sewer trunk lines and culverts shown are approximate and identified by as-built only.

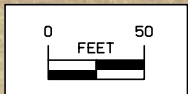


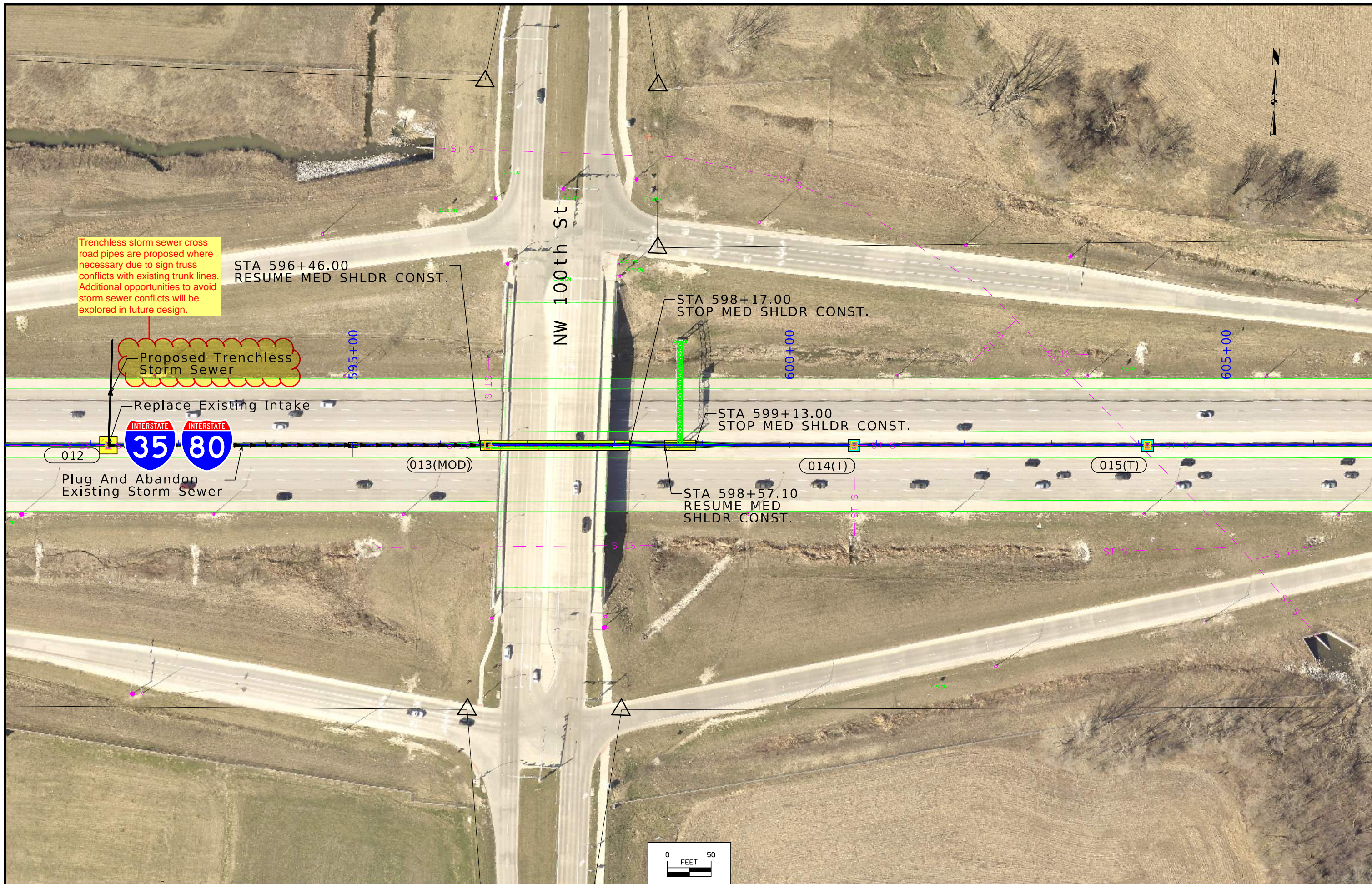


While outside DSU lane, intake tops will be fastened due to proximity of traffic.

STA 586+23.00
RESUME MED SHLDR CONST.

STA 586+58.00
STOP MED SHLDR CONST.





Trenchless storm sewer cross road pipes are proposed where necessary due to sign truss conflicts with existing trunk lines. Additional opportunities to avoid storm sewer conflicts will be explored in future design.

Proposed Trenchless Storm Sewer

Replace Existing Intake



Plug And Abandon Existing Storm Sewer

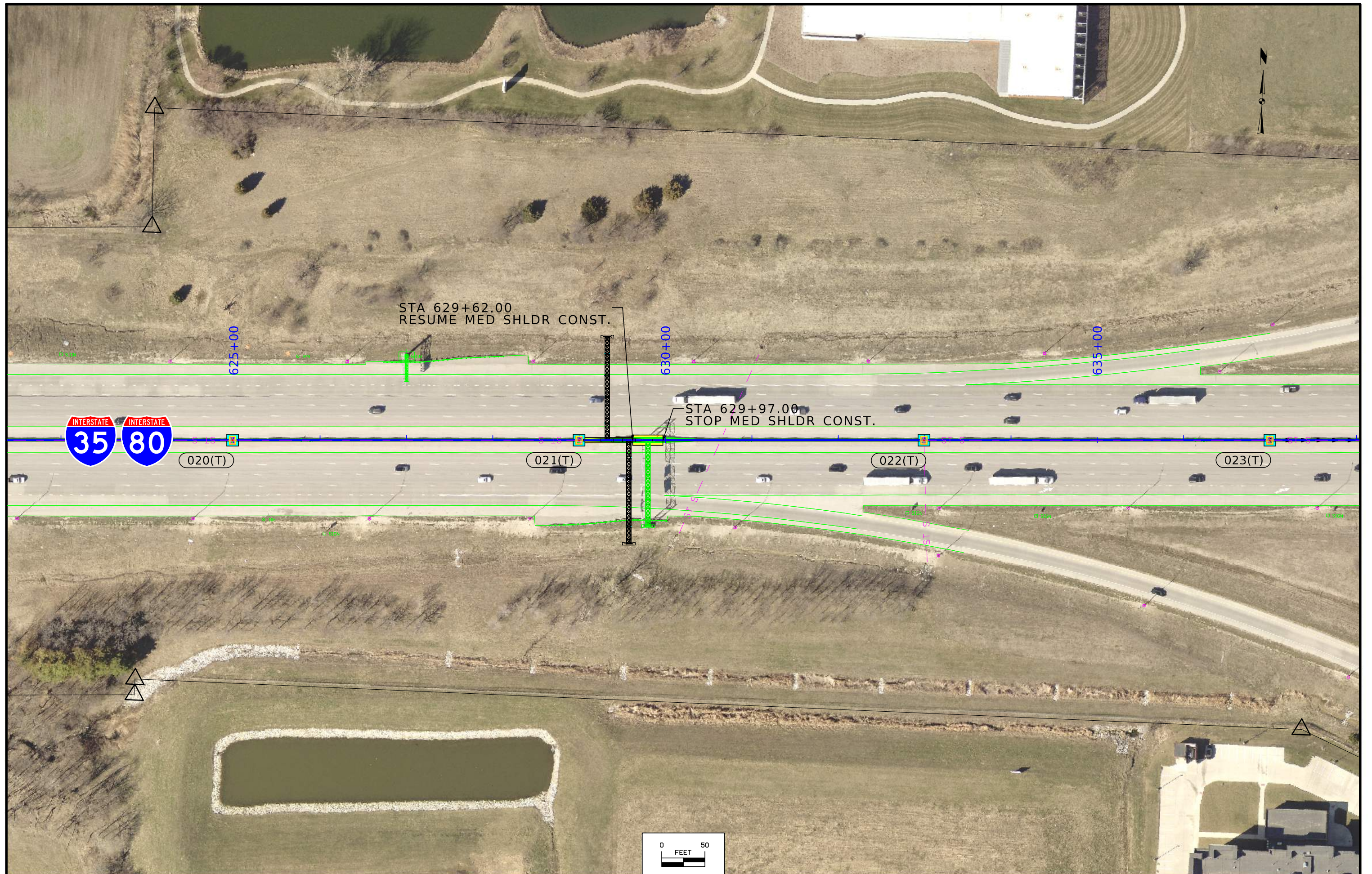
STA 596+46.00
RESUME MED SHLDR CONST.

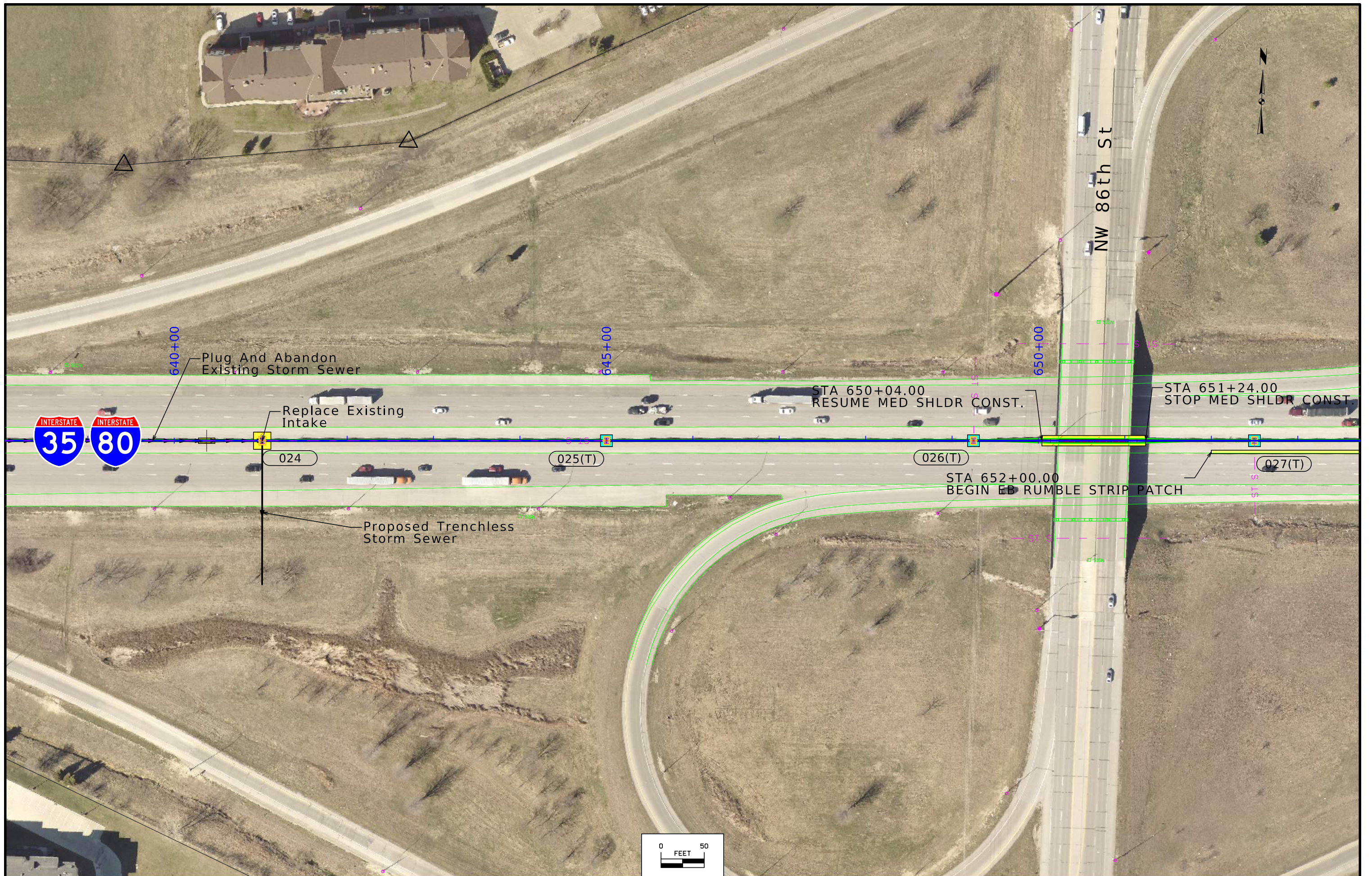
STA 598+17.00
STOP MED SHLDR CONST.

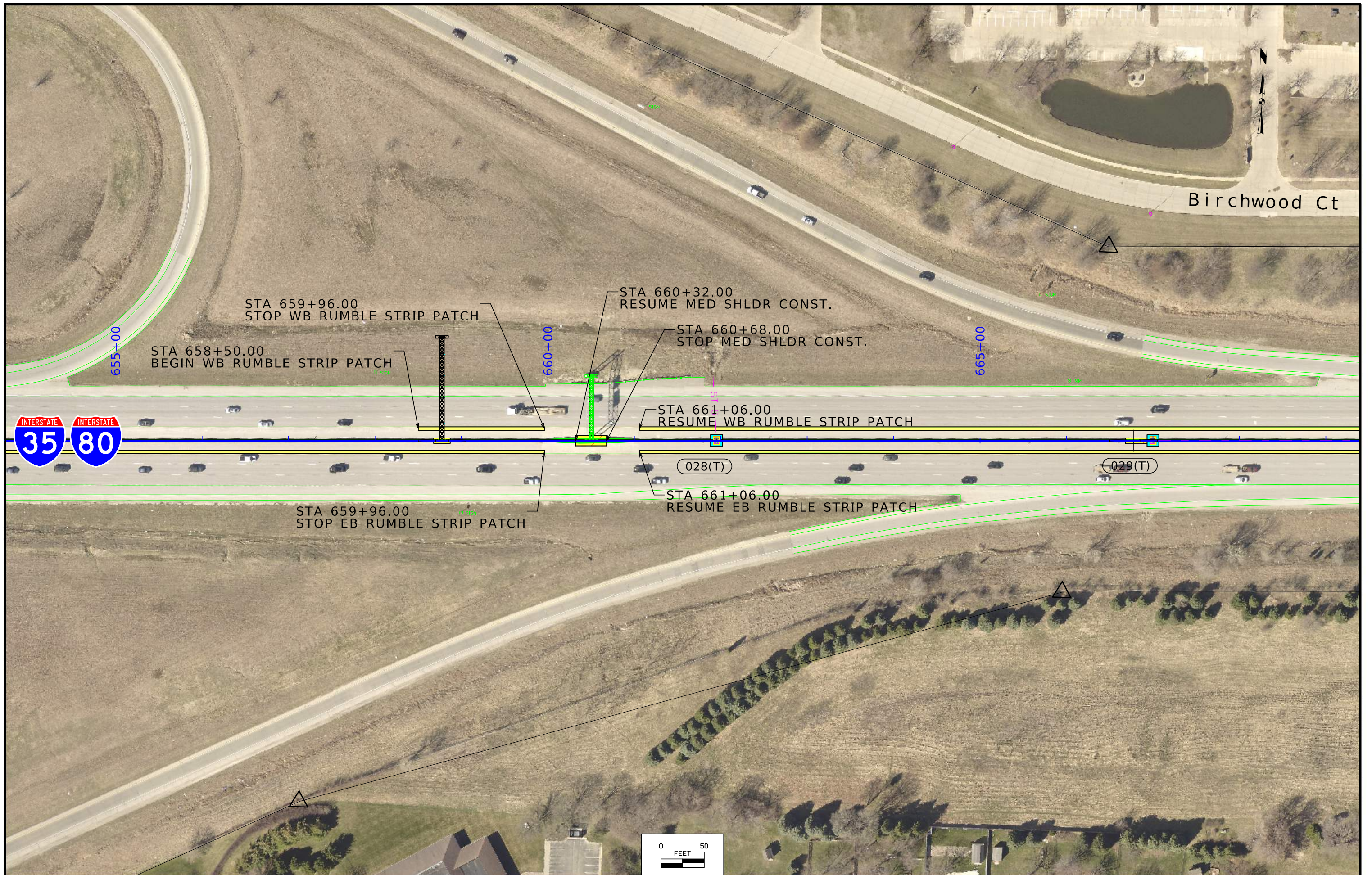
STA 599+13.00
STOP MED SHLDR CONST.

STA 598+57.10
RESUME MED SHLDR CONST.









Birchwood Ct

STA 658+50.00
BEGIN WB RUMBLE STRIP PATCH

STA 659+96.00
STOP WB RUMBLE STRIP PATCH

STA 660+32.00
RESUME MED SHLDR CONST.

STA 660+68.00
STOP MED SHLDR CONST.

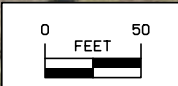
STA 661+06.00
RESUME WB RUMBLE STRIP PATCH

STA 659+96.00
STOP EB RUMBLE STRIP PATCH

STA 661+06.00
RESUME EB RUMBLE STRIP PATCH

028(T)

029(T)



Birchwood Ct

670+00

675+00

680+00

685+00



030(T)

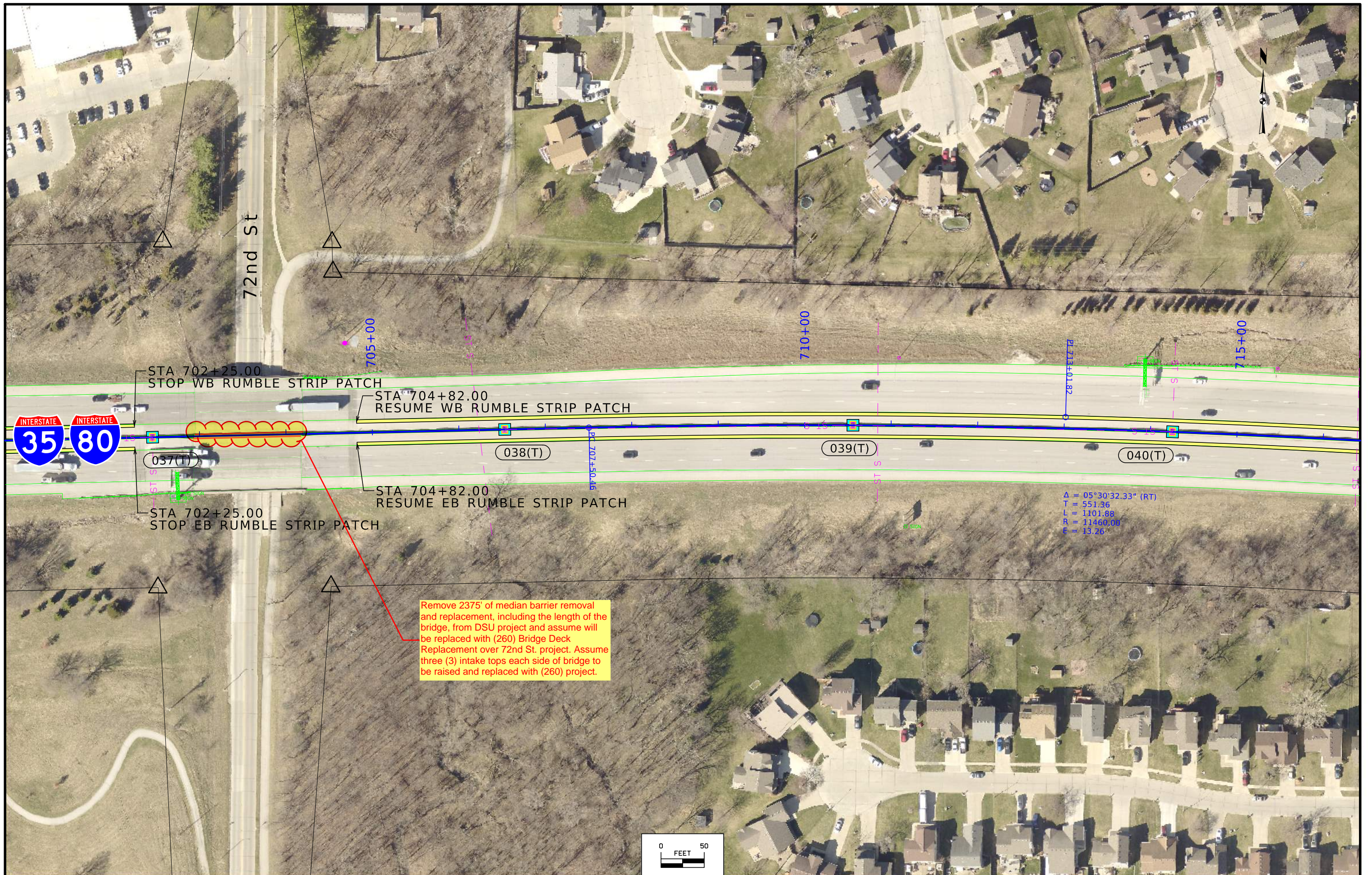
031(T)

032(T)

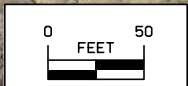
033(T)







Remove 2375' of median barrier removal and replacement, including the length of the bridge, from DSU project and assume will be replaced with (260) Bridge Deck Replacement over 72nd St. project. Assume three (3) intake tops each side of bridge to be raised and replaced with (260) project.





720+00
 STA 719+82.00
 STOP WB RUMBLE STRIP PATCH
 BEGIN WB DIAMOND GRINDING

725+00

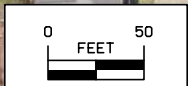
730+00



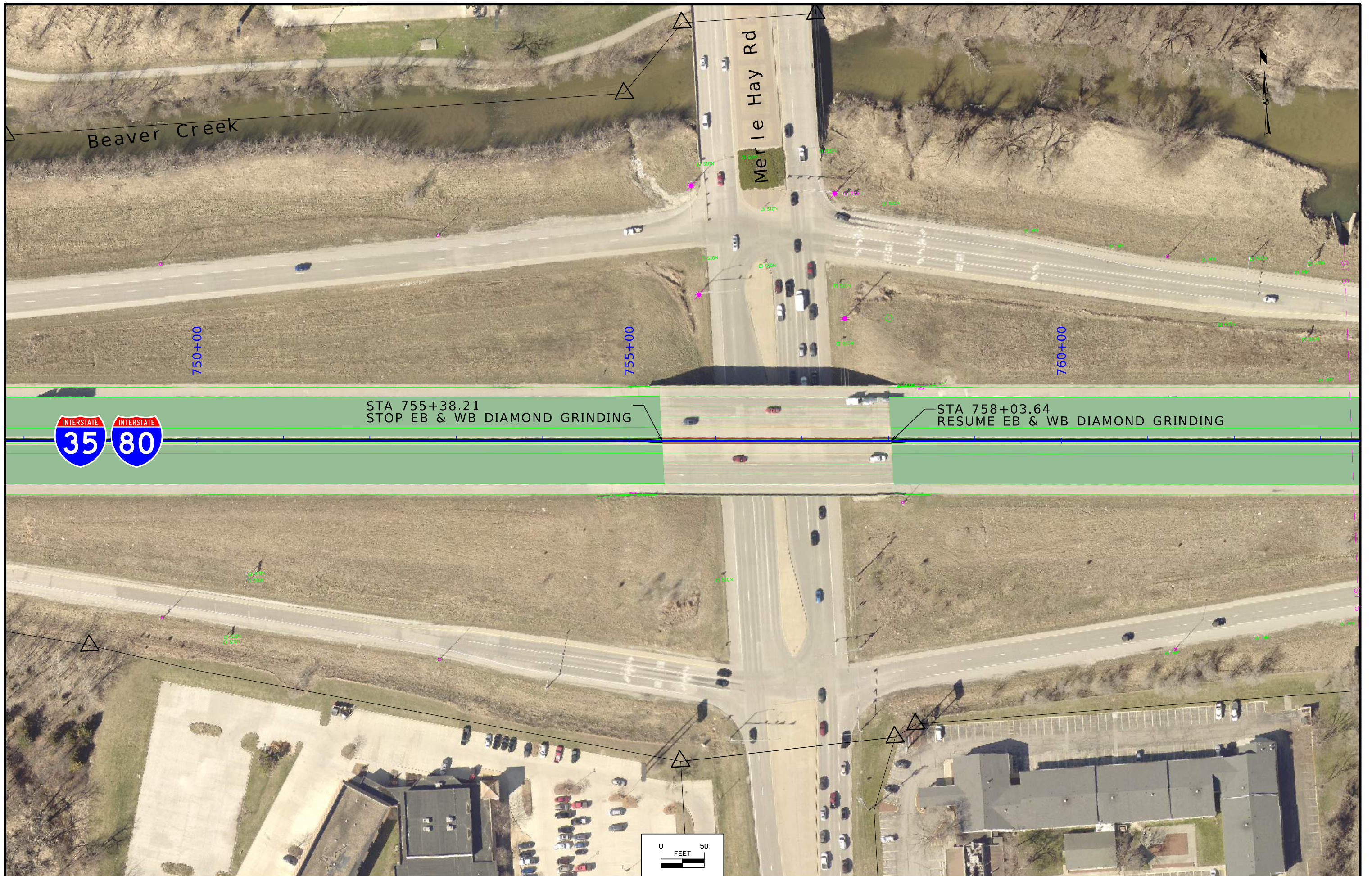
STA 719+82.00
 STOP EB RUMBLE STRIP PATCH
 BEGIN EB DIAMOND GRINDING

041(T)

042(T)







Beaver Creek

Merle Hay Rd

750+00

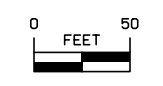
755+00

760+00



STA 755+38.21
STOP EB & WB DIAMOND GRINDING

STA 758+03.64
RESUME EB & WB DIAMOND GRINDING









STA 802+42.50
RESUME MED SHLDR CONST.

052(T)

STA 803+28.00
STOP MED SHLDR CONST.

053(T)

STA 806+77.50
RESUME MED SHLDR CONST.

054

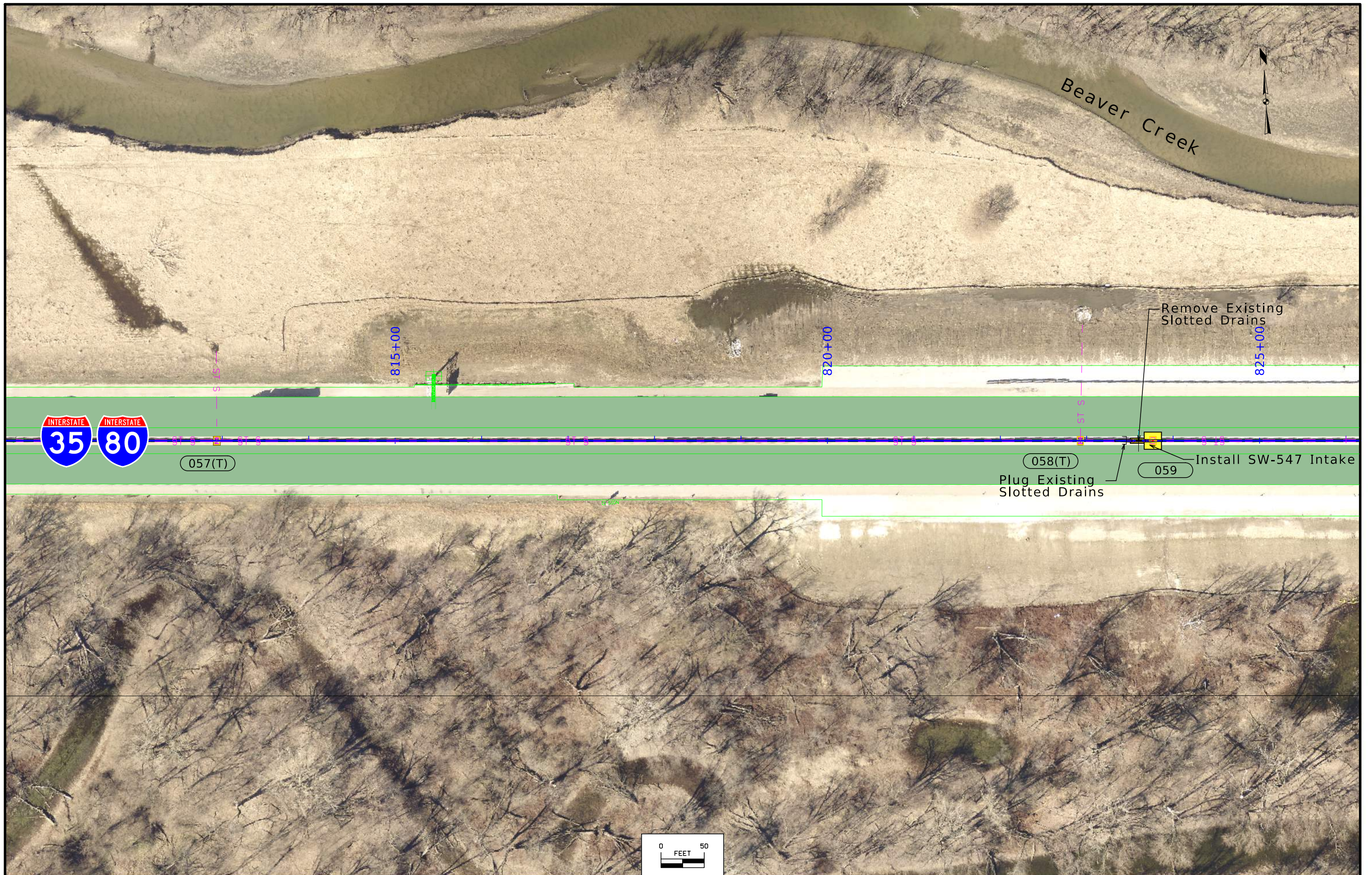
055

056(T)

Remove Existing Slotted Drains
And Install SW-547 Intakes
Either Side Of Sign Truss

STA 807+22.50
STOP MED SHLDR CONST.











067(T)

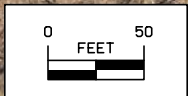
068(T)

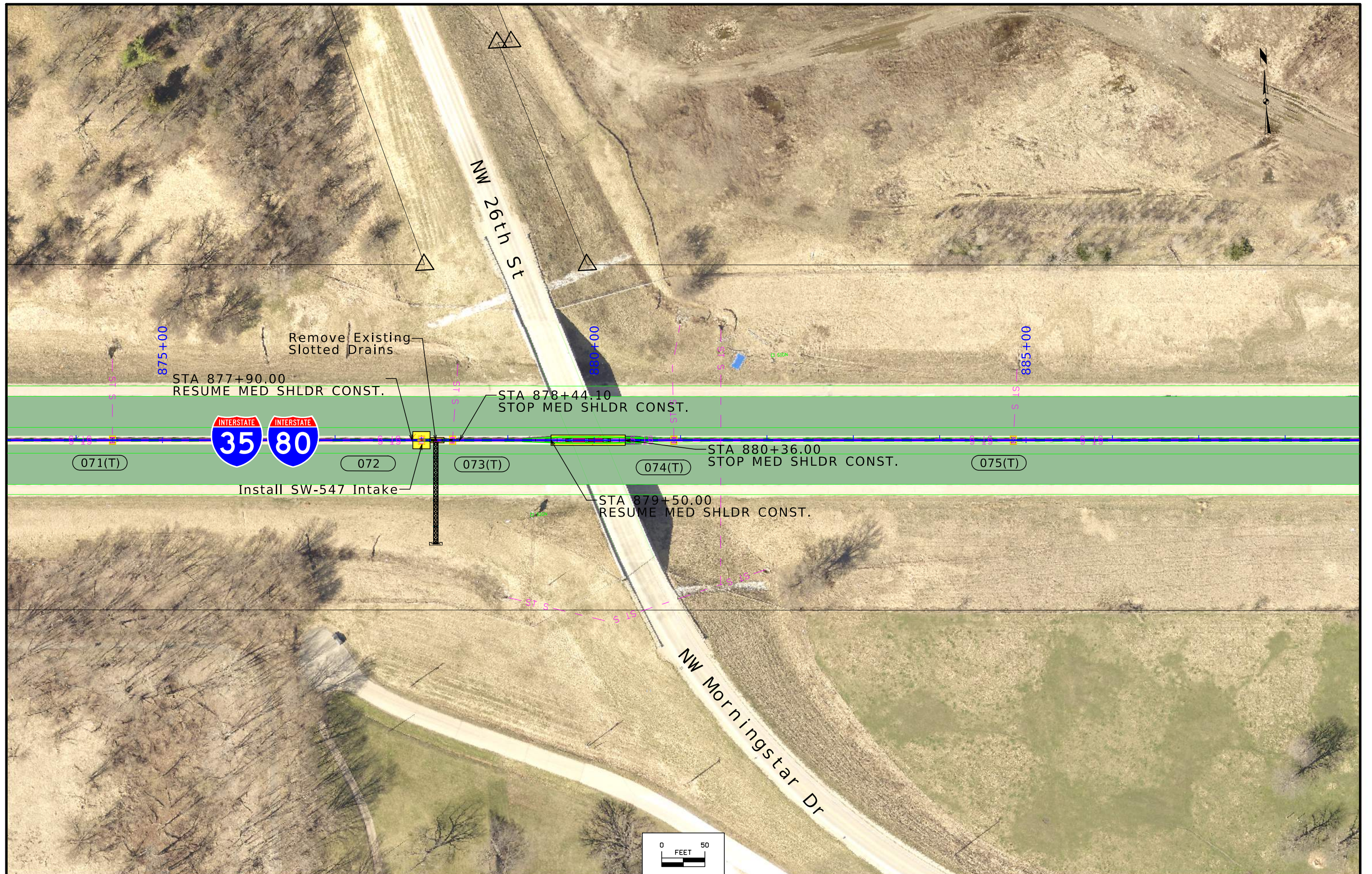
069(T)

070

Remove Existing Slotted Drains

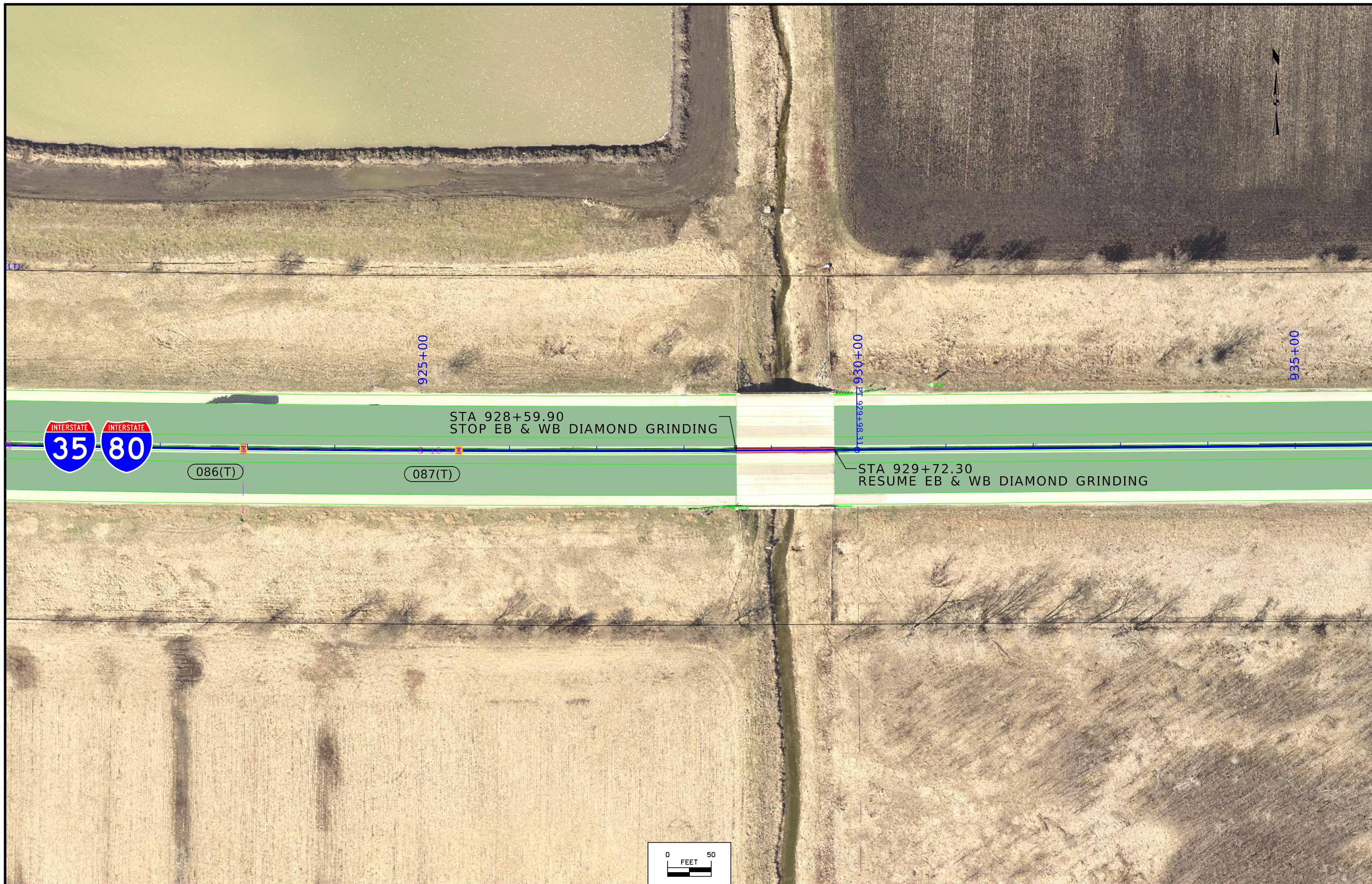
Install SW-547 Intake













940+00

945+00

950+00

STA 944+25.00
STOP EB & WB DIAMOND GRINDING

STA 945+96.00
RESUME EB & WB
DIAMOND GRINDING

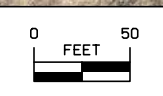
088(T)

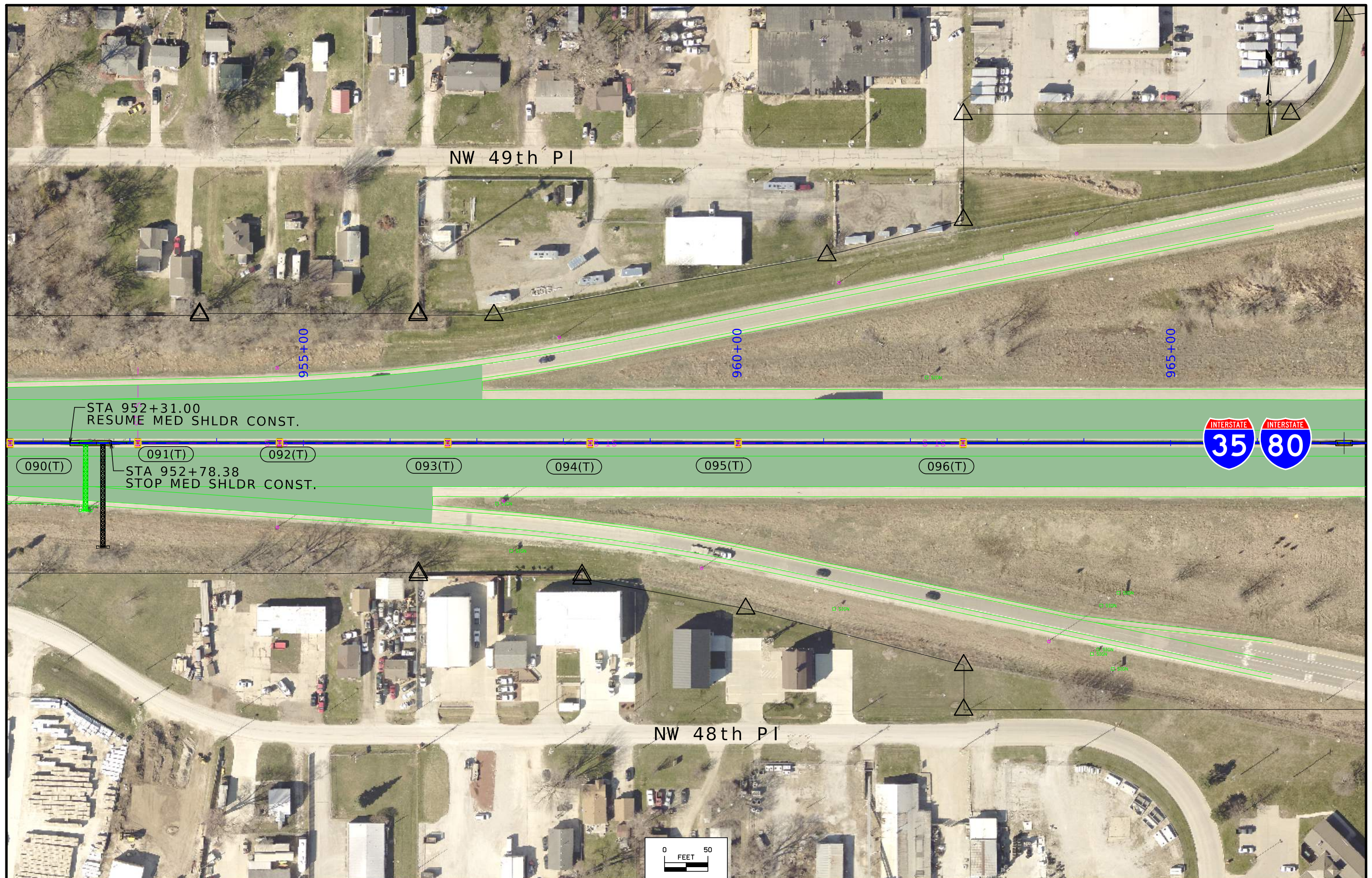
STA 946+96.00
STOP EB & WB DIAMOND GRINDING

089(T)

STA 948+38.20
RESUME EB & WB
DIAMOND GRINDING

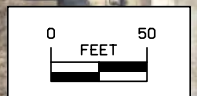
NW 6th St

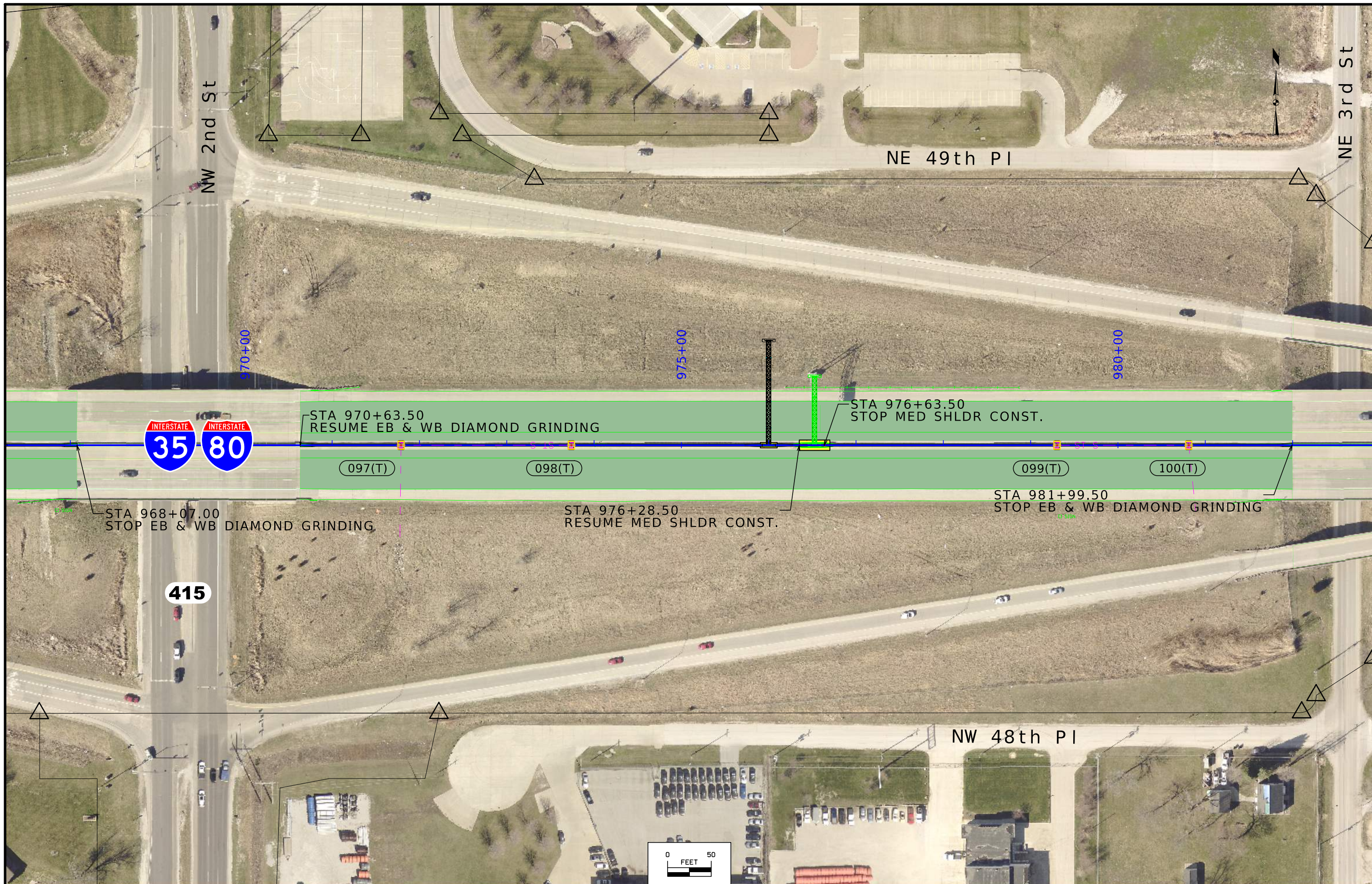




NW 49th PI

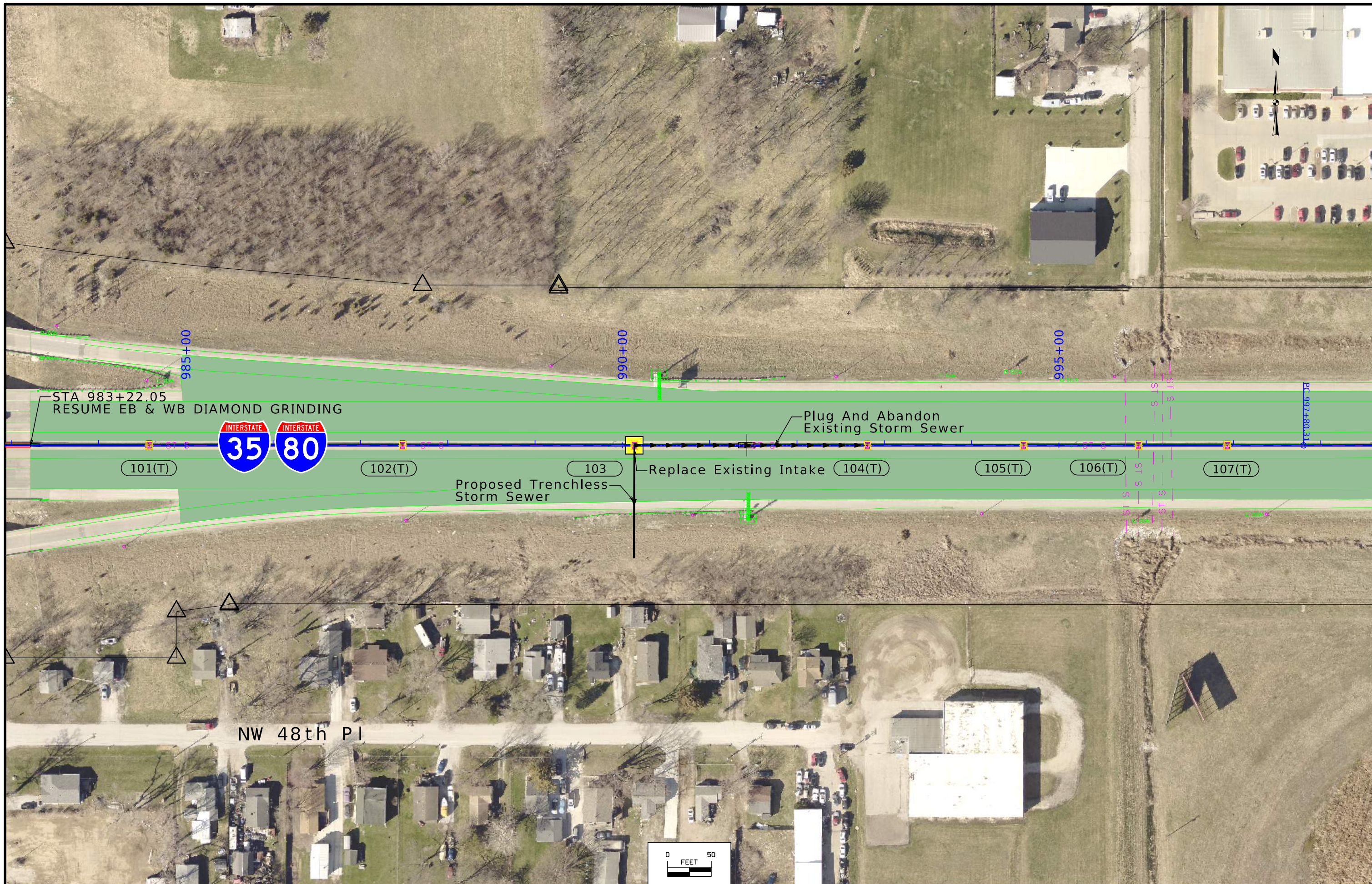
NW 48th PI

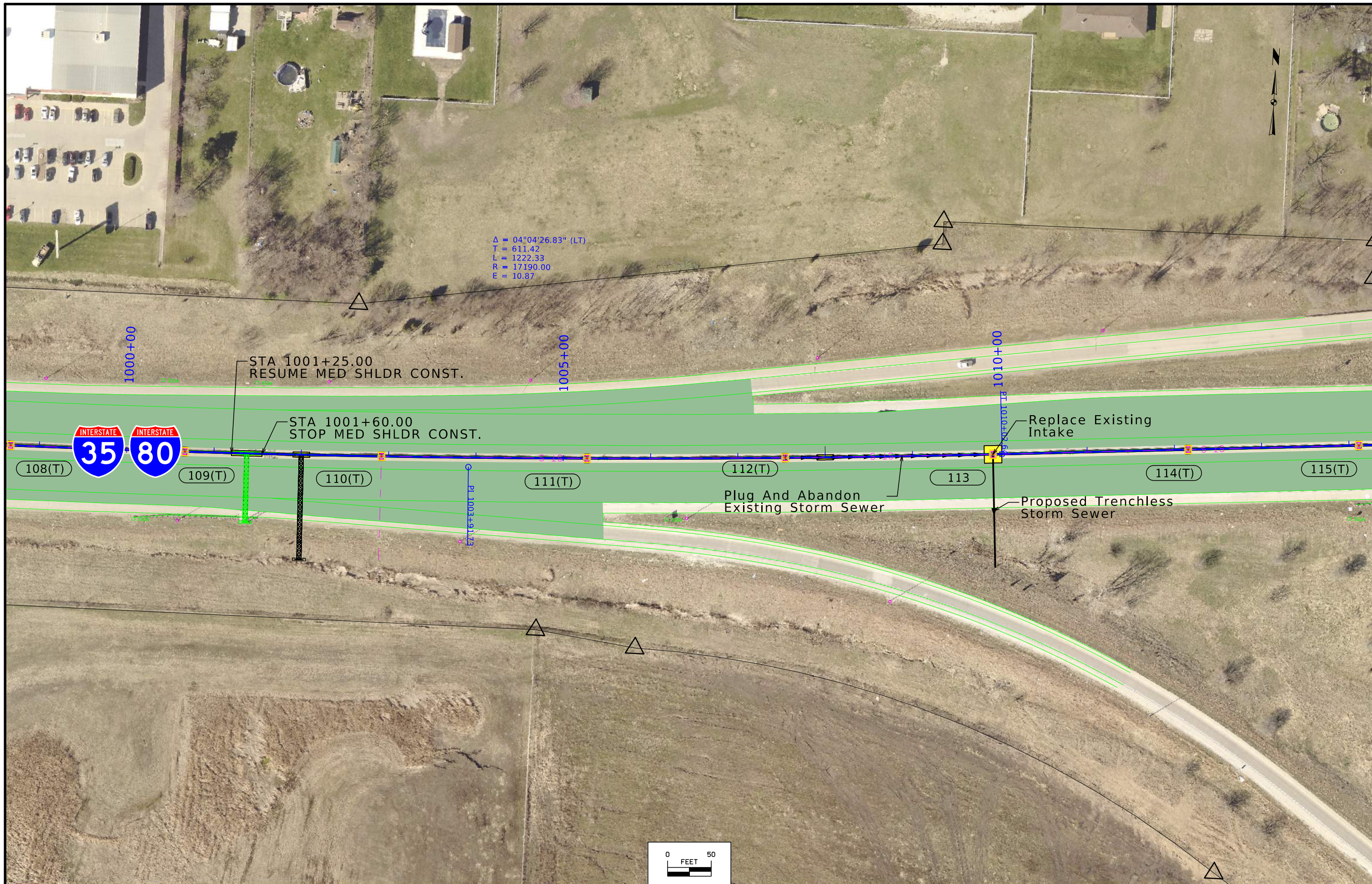


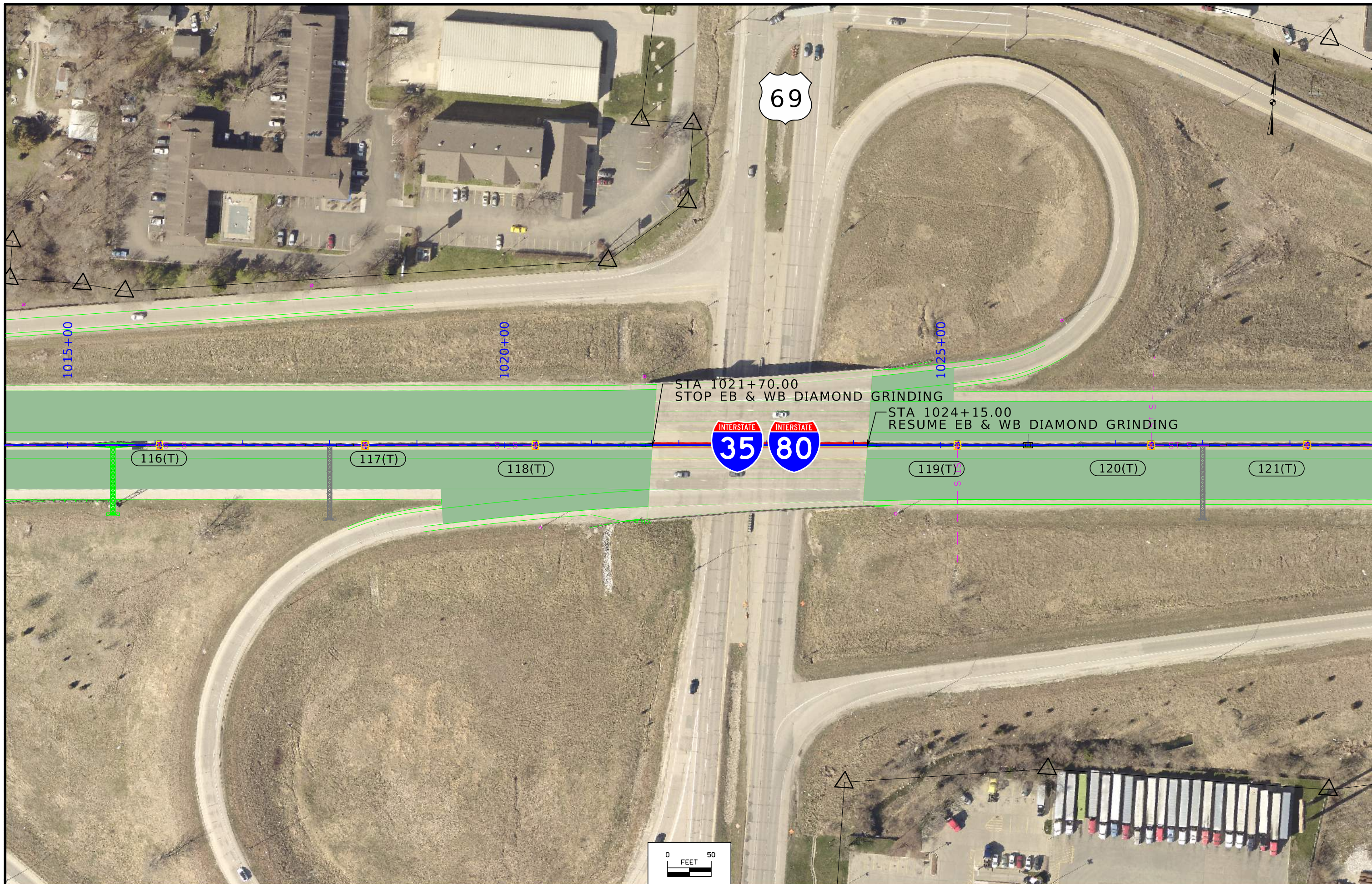


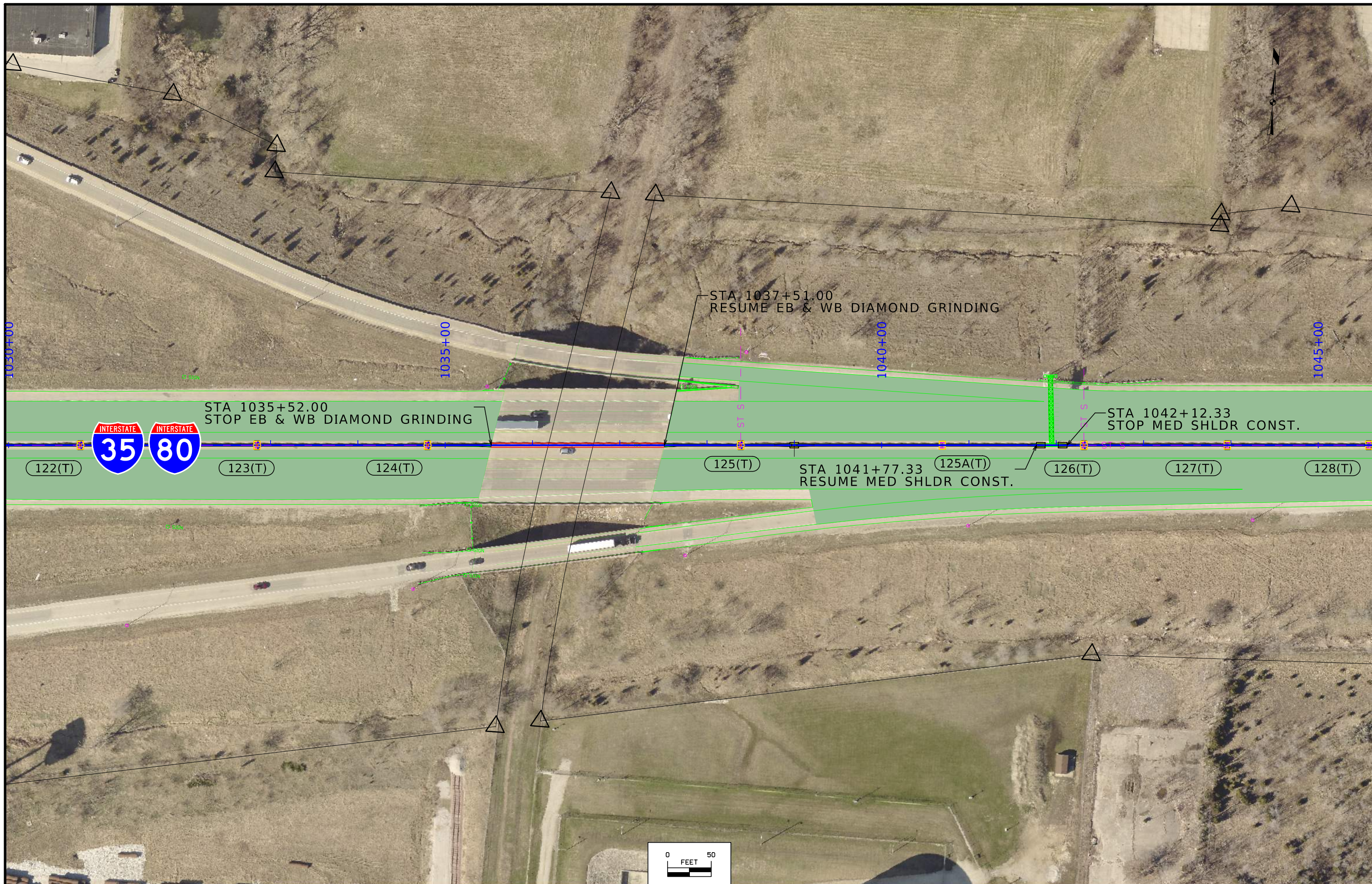
415



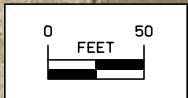


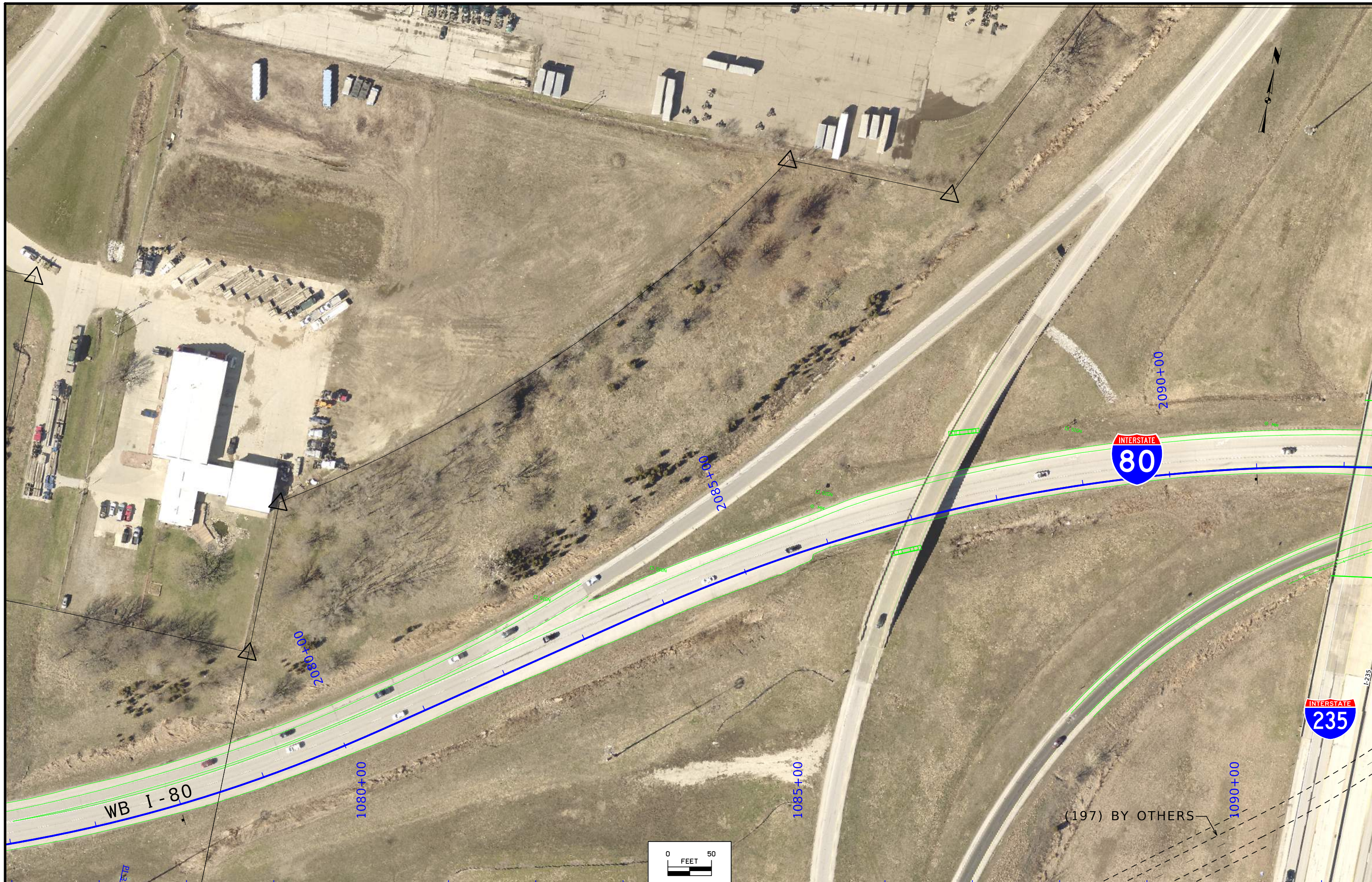






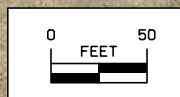








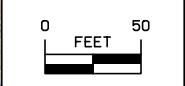
EB shoulder widening assumes the mainline lane cross-slope break created by removal of the left exit is corrected with NEMM Stage 3.





(197) BY OTHERS

WB I-80





(197) BY OTHERS

3110+00
2110+00

1110+00

1115+00

1120+00

150

151

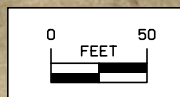
152

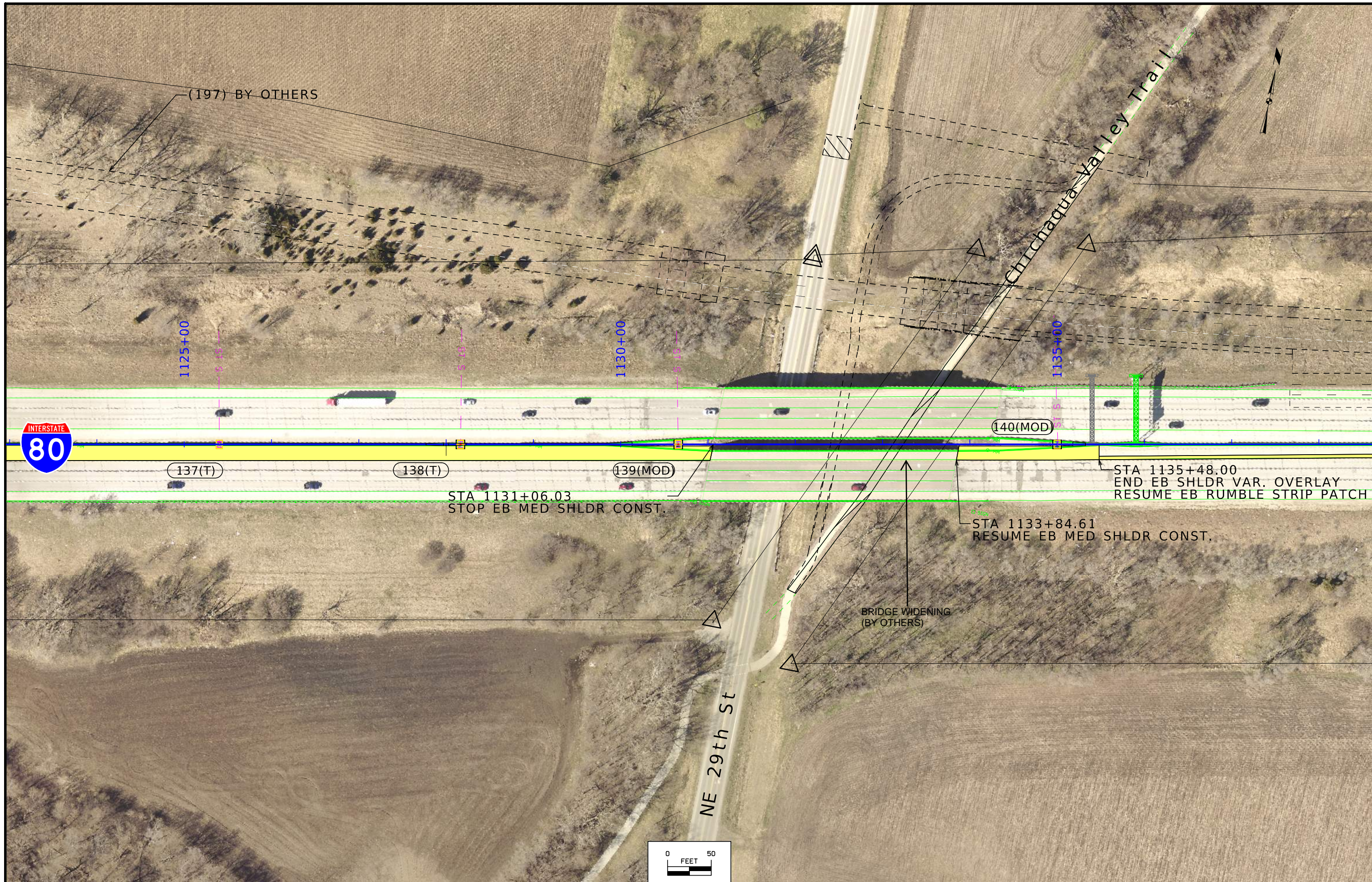


Proposed Trenchless Storm Sewer

Proposed Slotted Drains

STA 1121+75.00 (ML080)
END FULL DEPTH PAVEMENT
BEGIN EB MED. SHLDR VARIABLE OVERLAY





137(T)

138(T)

139(MOD)

140(MOD)

(197) BY OTHERS

1125+00

1130+00

1135+00

STA 1131+06.03
STOP EB MED SHLDR CONST.

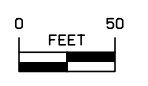
STA 1133+84.61
RESUME EB MED SHLDR CONST.

STA 1135+48.00
END EB SHLDR VAR. OVERLAY
RESUME EB RUMBLE STRIP PATCH

BRIDGE WIDENING
(BY OTHERS)

NE 29th St

Chichaqua Valley Trail





(197) BY OTHERS

1140+00

1145+00

1150+00

STA 1154+23.00
END CONSTRUCTION



140(E)

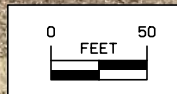
141(E)

142(E)

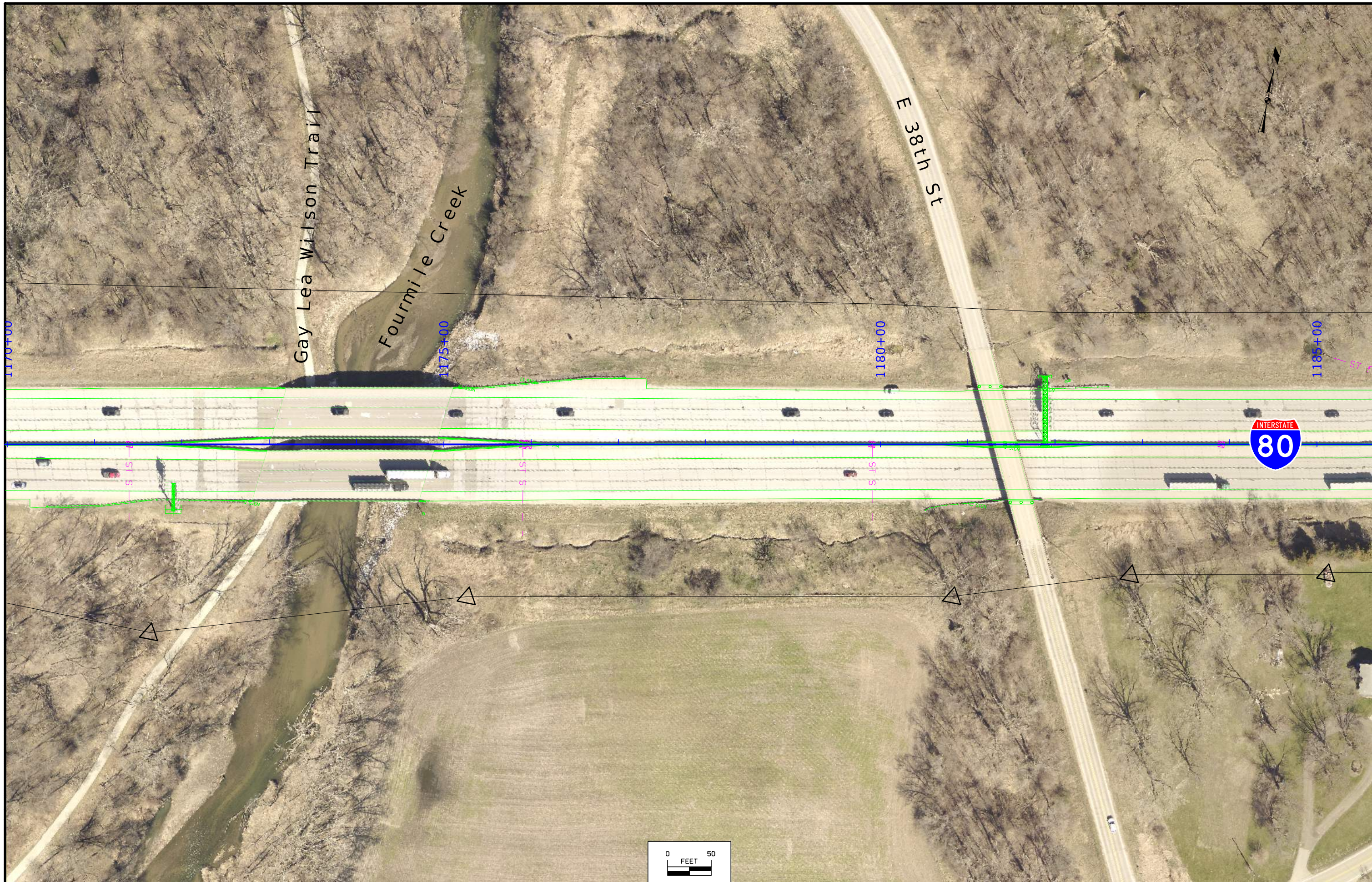
143(E)

STA 1153+77.00
RESUME MED CONST.

STA 1154+00.00
END EB RUMBLE STRIP PATCH







Survey Information

Polk County
Project Number: IMX-080-3(314)128-02-77
I-80 / I-35 Polk County Survey
W of 10th St in Urbandale to E of the NE I35/235 Interchange
PIN 2277080040

Party Personnel

Jody Budde- PLS
Wes Shimp- PLS
Dave Overman-LSIT
Jon Miranda- Geospatial Lead Tech
Ben Sullivan- Geospatial Lead Tech
Lee Budde- Party Chief
Aaron Paulsen- Party Chief
Katerina Wyatt- Assistant Survey Party Chief
Levi Suhr- Assistant Survey Party Chief
Jason Flaherty – Assistant Survey Party Chief
Nathan Theis-Barnett – Geospatial Assistant
Ronaldo Polanco-Rodriguez – Geospatial Assistant

Date(s) of Survey

Begin Date 7/1/2022
End Date 10/31/2022

General Information

Measurement units for this survey are US survey feet. This survey is for the preliminary design for the section of approximately 10.5 miles of Interstate 80 beginning at the I-80/I-35/I-235 interchange and ending west at the I-80 and Hwy 141 interchange. Project datum and control information is provided by Design Survey Office. This project is a partial DTM survey. Project horizontal datum is NAD83 (2011) epoch 2010.00, Iowa RCS Zone 8 (Ames-Des Moines). Foth established nine (9) new 1-meter FENO monuments to supplement existing project control at a 1.0 mile distribution along the project corridor throughout the project lifecycle and for future corridor area work.

Vertical Control

Vertical datum for this survey is relative to NAVD88 (computed using Geoid18) for the new FENO marks. This survey consisted of observing nine new FENO rod monuments and seven existing FENO monuments established by Foth and the Iowa DOT previously for other area projects. Using minimum 2hr initial static observations along with data

from three Iowa RTN CORS sites: Des Moines (IADM), DeSoto (IADS) and Knoxville (IAKN).

The Martensdale station (IAMD) was damaged by lightning from a prior storm, thus no data was available at the time of this survey.

The published Ellipsoidal heights for the three Iowa RTN stations were held for the vertical adjustment portion of this survey using as-published RTN positions by the Iowa DOT dated August 6, 2021.

Additionally, seven existing monuments in the Des Moines area were recovered and observed with published NAVD88 elevations were observed and used that are located within the project corridor region:

Existing FENO 26 Published Elevation: 886.70 usft
Adjusted: 886.73 usft

The final vertical adjustment results show standard deviations were less than 0.04 ft. at 95% confidence level (2 sigma) for the new FENO monuments.

Horizontal Control

The project coordinate system for this survey is NAD83 (2011) Iowa RCS Zone 8 (Ames – Des Moines), US survey feet. This survey control is relative to laRTN reference stations. laRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by observing each mark for 120 minutes minimum. Foth performed independent laRTN 3-min averaged RTK observations as well on each of the newly set FENOs and the existing FENOs observed for additional quality and positional checks for the new control adjustment.

Foth had previously established some FENO monuments for other laDOT projects in recent years for the I-80 / I-35 interchange to the east in 2019, and also on I-235 corridor in early 2022.

For the September 2022 control survey FOTH added FENO monuments FENO 190-193, and FENO marks 195-199. Control point 194 which is an existing survey disk set near the southeast corner of a larger concrete base pad by the local City. Existing FENOs CP2, FENO 100, FENO 101 and FENO 26 were set prior by laDOT. FENO 11 was established by Foth as part of the I-235 project control survey, and FENO 200 was established by Foth as part of a project control survey in 2019. FENO 1000 (aka FENO 100 for the I-235 control survey) was established prior by laDOT and utilized by Foth as part of the I-235 corridor project control survey in Spring 2022.

The as-listed adjusted coordinates in this report were the result of combined field observations and adjustment to the three Iowa RTN stations as listed herein, as well as

Survey Information

constraining to existing FENO control monuments listed above, with exception of existing FENO 26:

Published Coordinates:

Point ID	Northing (sft)	Easting 9sft)	Elv (sft)
CP26	7513259.60	18543281.66	886.70

Adjusted Coordinates:

Point ID	Northing	Easting	Elevation
FENO26	7513259.62	18543281.71	886.73

Three Iowa RTN CORS stations: Des Moines, Knoxville and DeSoto were utilized for the horizontal adjustment portion of this survey as primary constrained control, and the passive existing FENO monuments we systemically added to the adjustment. The published horizontal geodetic positions, and their published ellipsoidal heights for the three Iowa RTN stations were held for the horizontal adjustment portion of this survey using as-published RTN positions by the Iowa DOT dated August 6, 2021.

The published horizontal positions of the existing FENO marks from prior surveys were also confirmed and held fixed, with exception noted above for FENO 26 for the final horizontal constrained adjustment of the nine new FENOs established by Foth.

The horizontal standard deviation of these adjusted observations was less than 0.015 ft. at 95% confidence level (2 sigma).

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. NHS-080-3(199)128—11-77, IM-35-3(78)77—13-77, IM-35-3(71)81—13-77, IM-35-3(116)85—13-77, and IM-35-3(116)85—13-77. As-built plans used are a combination of Iowa RCS, Iowa State Plane South scaled, and Iowa State Plane South metric. Stationing was equated to the plan POT at STA 475+65.42 and run ahead throughout the survey. Station equations were not used to adjust to each plan set due to the differences in coordinate system and the units of measurement.

Mainline Survey stationing relates to as built plan stationing as follows:

POB POT Sta. 475+65.42 As-built Plans Project No. NHS-080-3(199)128—11-77
 *Plans are Iowa RCS Zone 8, US Survey feet
 Survey POT Sta. 475+65.42

PC Sta. 522+84.60 As-built Plans Project No. NHS-080-3(199)128—11-77
 Survey PC Sta. 522+84.60

PT Sta. 567+59.44 As-built Plans Project No. NHS-080-3(199)128—11-77
 Survey PT Sta. 567+59.44

PI Sta. 597+32.96 As-built Plans Project No. NHS-080-3(199)128—11-77
 Survey PI Sta. 597+32.96

PC Sta. 707+55.02 As-built Plans Project No. IM-35-3(78)77—13-77
 *Plans are Iowa State Plane South (scaled), US Survey feet
 Survey PC Sta. 707+50.61

PT Sta. 718+66.21 As-built Plans Project No. IM-35-3(78)77—13-77
 Survey PT Sta. 718+55.47

****Metric As-built Plans Project No. IM-35-3(71)81—13-77 also used to calculate and review survey alignment in this area*

PC Sta. 909+15.68 As-built Plans Project No. IM-35-3(78)77—13-77
 Survey PC Sta. 908+42.83

PT Sta. 929+96.99 As-built Plans Project No. IM-35-3(78)77—13-77
 Also referenced to As-built Plans Project No. IM-35-3(116)85—13-77
 PT Sta. 283+37.980 (Metric)
 Survey PT Sta. 929+58.65

POT Sta. 295+44.803 (Metric) As-built Plans Project No. IM-35-3(116)85—13-77
 Survey POT Sta. 969+34.33

PI Sta. 306+00.568 (Metric) As-built Plans Project No. IM-35-3(116)85—13-77
 Survey PI Sta. 1003+93.88

PI Sta. 324+53.264 (Metric) As-built Plans Project No. IM-35-3(116)85—13-77
 Survey PI Sta. 1064+72.05

***The remainder of the alignment to the east of this location was established using project IM-035-4(158)87—0E-77. We utilized this previous alignment and monumentation while converting it to Iowa RCS Zone 8.*

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 8 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018u3

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

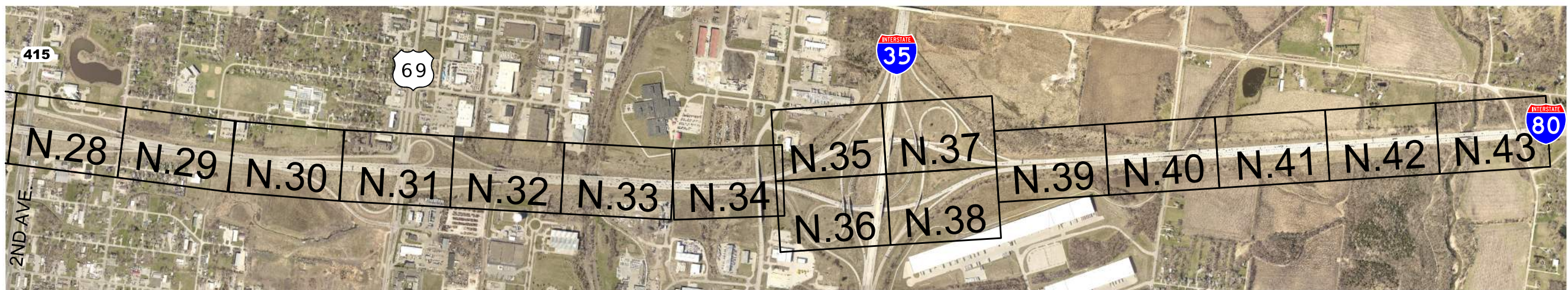
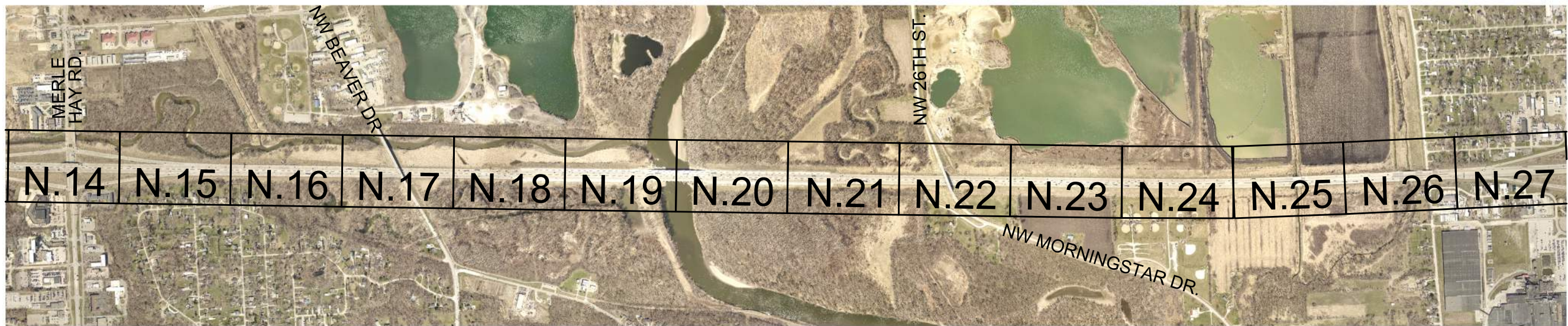
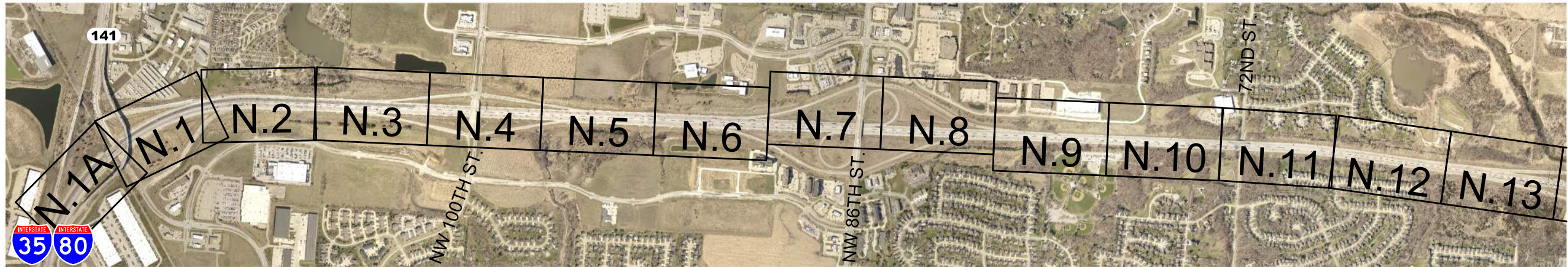
HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
la. Regional Coordinate System Zone 8 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Point ID	Northing	Easting	Elevation	Description
FENO11	7489208.11	18487716.66	996.20	FENO Existing mark found 22.45 feet West of center of 42nd St. 6.62 feet North of fence. 73.38 feet North of Westbound lanes shoulder of I-235
FENO26	7513259.62	18543281.71	886.78	FENO Existing mark found 6.4 feet north of edge of 54th Ave 755.1 feet East of centerline of NE 29th St. 12.4 feet SSW of edge of concrete bike trail
FENO100	7510189.75	18531928.96	904.64	FENO Existing mark found 6.9 feet behind guardrail of on-ramp to I-80 Westbound. 154.0 feet East of centerline of Hwy 69
FENO101	7521244.54	18538037.67	933.01	FENO Existing mark found 10.7 feet N-NE of edge of concrete trail 195.9 feet W-NW of centerline of I-35 368.2 feet E-SE of off-ramp of I-35 southbound
FENO190	7507995.09	18483688.49	1008.87	FENO mark set 5.9 feet North of chain link fence. 164.7 feet East of centerline of I-80. 60.7 feet West of gravel drive to North of Meredith Dr
FENO191	7511056.8	18489177.46	923.15	FENO mark set 8.0 feet West of West edge of concrete sidewalk. 23.4 feet West of edge of 100th street. 119.8 feet North of centerline of on-ramp to I-80 Westbound
FENO192	7510590.19	18493108.27	943.07	FENO mark set 60.6 feet S-SW of edge of concrete off ramp of eastbound I-80. 0.28 miles West of centerline of NW 86th St
FENO193	7510972.11	18499736.33	889.23	FENO mark set 116.9 feet South of centerline of I-80. 161.9 feet West of 72nd St
CP 194	7511499.12	18505110.81	814.75	CP Existing survey disk found set in Southeast corner of concrete pad. 14.8 feet West of back of curb of Merle Hay Rd. 374.9 feet North of on-ramp to Westbound I-80
FENO195	7510426.74	18509909.5	835.27	FENO mark set 165.4 feet South of centerline of I-80. 5.8 feet East of back of curb of NW Beaver Dr
FENO196	7510308.57	18517462.96	833.07	FENO mark set behind the guardrail 25.9 feet E-NE of centerline of NW 26th St. 160.9 feet North of centerline of I-80
FENO197	7509761.27	18520963.99	801.88	FENO mark set 186.5 feet South of centerline of I-80. 10.3 feet North of DOT fence. 72.3 feet South of South base of a large road information sign
FENO198	7509856.43	18526580.38	857.48	FENO mark set near SE corner of Eastbound I-80 bridge over Hwy 415. 154.3 feet East of centerline of Hwy 415. 73.7 feet South of centerline of I-80.
FENO199	7510746.41	18536873.66	947.03	FENO mark set 121.6 feet N-NW of centerline of on-ramp from I-35 S to I-80 Westbound. 112.4 West of centerline of NE 22nd St bridge over I-80
FENO200	7511859.24	18547727.29	851.59	FENO Existing mark found 43.2 feet W-SW of centerline of E 38th St. 258.8 feet S-SE of extended centerline of Sage St.
FENO1000	7491153.22	18532750.72	863.61	FENO Existing mark found 58.5 feet W-SW of centerline of E 15th St. 72.8 feet S-SE of centerline of Walker St. 55.5 feet N-NE of centerline of Johnson Ct
FENO CP2	7519223.93	18485898.44	961.75	FENO Existing mark found at Iowa DOT facility 41.0 feet North of centerline of S 17th St. 56.3 feet West of centerline of entrance to DOT facility

ALIGNMENT COORDINATES

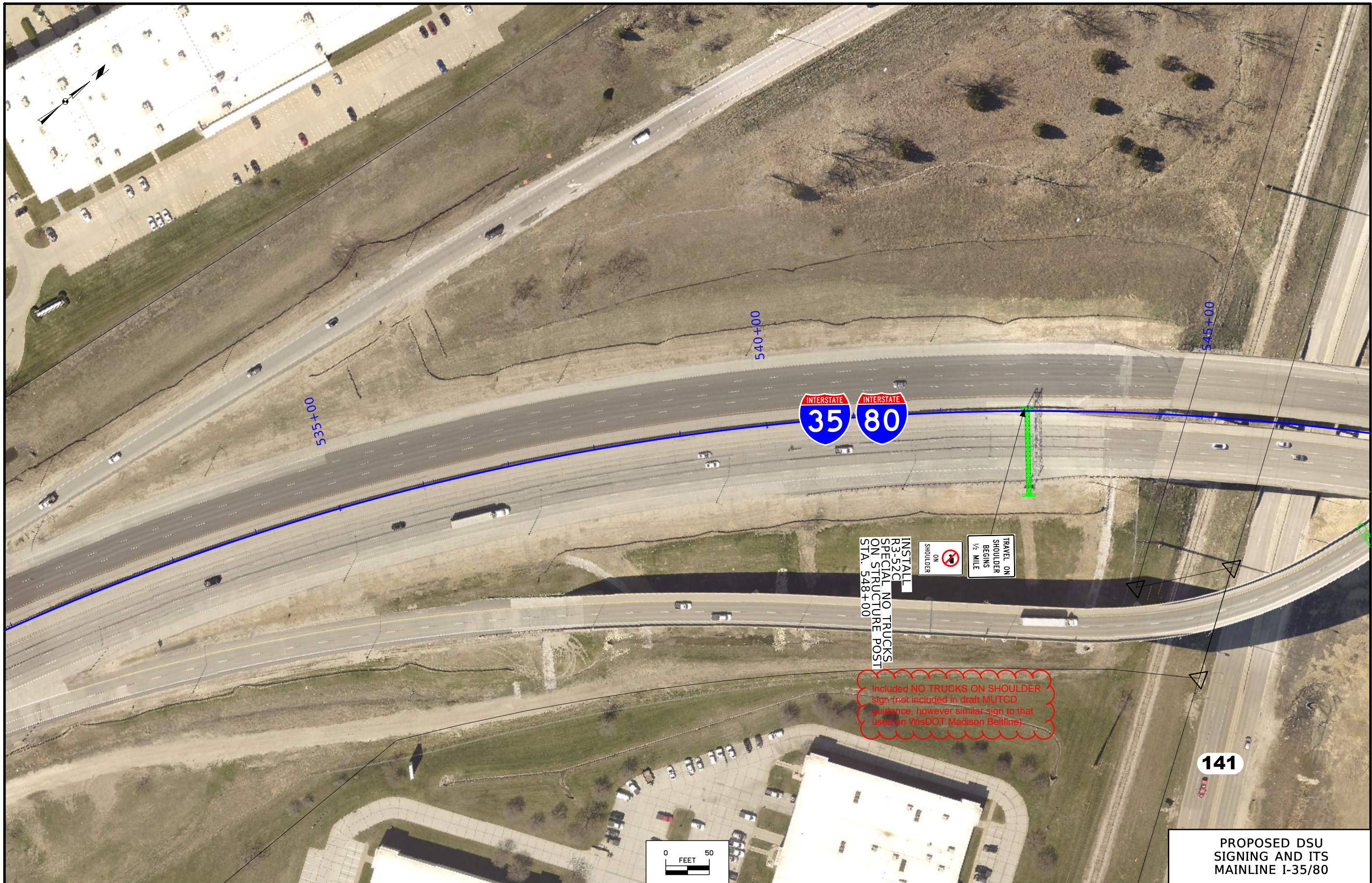
Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
ML080	I-80																		
20000		475+65.44	7502944.28	18483526.17															
20001								522+84.64	7507663.39	18483498.11	551+02.07	7510480.78	18483481.35	567+59.45	7510584.70	18486296.87			
20002		597+32.99	7510694.37	18489268.39															
20003								707+50.46	7511107.07	18500278.13	713+01.83	7511127.73	18500829.11	718+52.34	7511095.39	18501379.52			
20004		746+41.50	7510931.81	18504163.88															
20005		780+80.40	7510729.76	18507596.84															
20006		815+01.11	7510526.04	18511011.48															
20007		830+92.65	7510432.50	18512600.27															
20008								908+87.54	7509976.63	18520381.81	919+43.25	7509914.89	18521435.73	929+98.31	7509917.93	18522491.44			
20009								997+80.31	7509937.46	18529273.41	1003+91.73	7509939.22	18529884.83	1010+02.64	7509984.41	18530494.58			
20010								1058+19.10	7510340.44	18535297.86	1064+72.86	7510388.76	18535949.84	1071+25.01	7510515.78	18536591.14			
20011		1241+68.50	7513827.16	18553309.85															
ML080_NEMM_EB	I-80																		
21000		3071+25.01	7510485.37	18536597.16															
21001								3072+23.48	7510504.50	18536693.76	3073+39.46	7510527.04	18536807.52	3074+55.28	7510539.15	18536922.87			
21002								3074+55.28	7510539.15	18536922.87	3077+09.63	7510565.71	18537175.83	3079+61.00	7510525.15	18537426.92			
21003								3079+61.00	7510525.15	18537426.92	3080+35.04	7510513.34	18537500.01	3081+09.03	7510497.32	18537572.29			
21004								3083+32.46	7510448.95	18537790.42	3084+43.41	7510424.93	18537898.74	3085+54.23	7510410.41	18538008.74			
21005								3085+54.23	7510410.41	18538008.74	3092+07.42	7510324.92	18538656.32	3098+12.98	7510653.91	18539220.61			
21006								3098+12.98	7510653.91	18539220.61	3099+15.86	7510705.73	18539309.49	3100+18.62	7510764.54	18539393.90			
21007								3102+56.64	7510900.59	18539589.20	3103+78.21	7510970.08	18539688.94	3104+99.58	7511029.77	18539794.85			
21008								3104+99.58	7511029.77	18539794.85	3106+94.19	7511125.31	18539964.38	3108+87.46	7511184.70	18540149.71			
21009								3108+87.46	7511184.70	18540149.71	3110+33.71	7511229.33	18540288.98	3111+79.64	7511257.75	18540432.45			
21010		3112+42.37	7511269.93	18540493.98															
ML080_NEMM_WB	I-80																		
22000		2071+25.01	7510534.42	18536587.45															
22001								2072+28.05	7510554.44	18536688.52	2073+51.16	7510578.36	18536809.29	2074+74.09	7510613.80	18536927.19			
22002								2074+74.09	7510613.80	18536927.19	2077+25.27	7510686.11	18537167.75	2079+72.93	7510824.20	18537377.57			
22003								2079+72.93	7510824.21	18537377.59	2080+15.97	7510847.87	18537413.54	2080+59.00	7510872.73	18537448.67			
22004								2083+43.18	7511036.87	18537680.64	2084+13.35	7511077.41	18537737.92	2084+83.48	7511114.73	18537797.35			
22005								2084+83.48	7511114.73	18537797.35	2091+64.27	7511476.81	18538373.86	2097+91.42	7511392.57	18539049.42			
22006								2097+91.42	7511392.57	18539049.42	2099+10.12	7511377.89	18539167.20	2100+28.64	7511352.32	18539283.11			
22007								2102+50.47	7511304.55	18539499.74	2103+30.46	7511287.32	18539577.85	2104+10.39	7511275.02	18539656.88			
22008								2104+10.39	7511275.02	18539656.88	2106+63.10	7511236.17	18539906.59	2109+12.89	7511263.60	18540157.80			
22009								2109+12.89	7511263.60	18540157.80	2110+23.61	7511275.61	18540267.87	2111+34.19	7511297.12	18540376.48			
22010		2112+44.17	7511318.49	18540484.36															

KEY MAP



NO SCALE

SHEET LAYOUT OVERVIEW



INSTALL
R3-52C
SPECIAL NO TRUCKS
ON SHOULDER POST
STA. 548+00

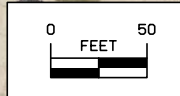


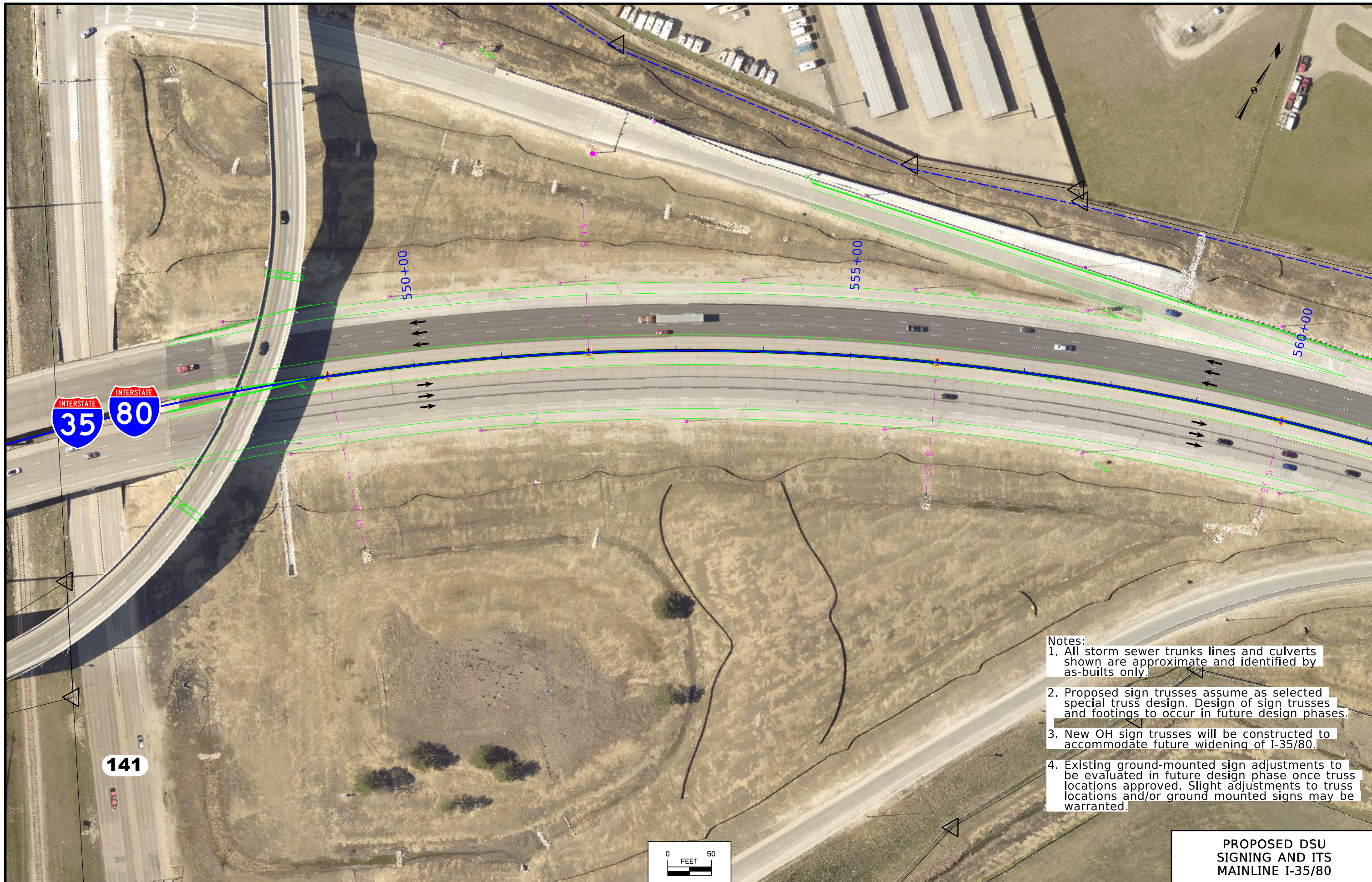
TRAVEL ON
SHOULDER
BEGINS
1/2 MILE

Included NO TRUCKS ON SHOULDER sign (not included in draft MUTCD guidance, however similar sign to that used on WisDOT Madison Beltline).

141

PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80

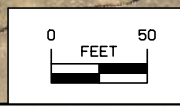


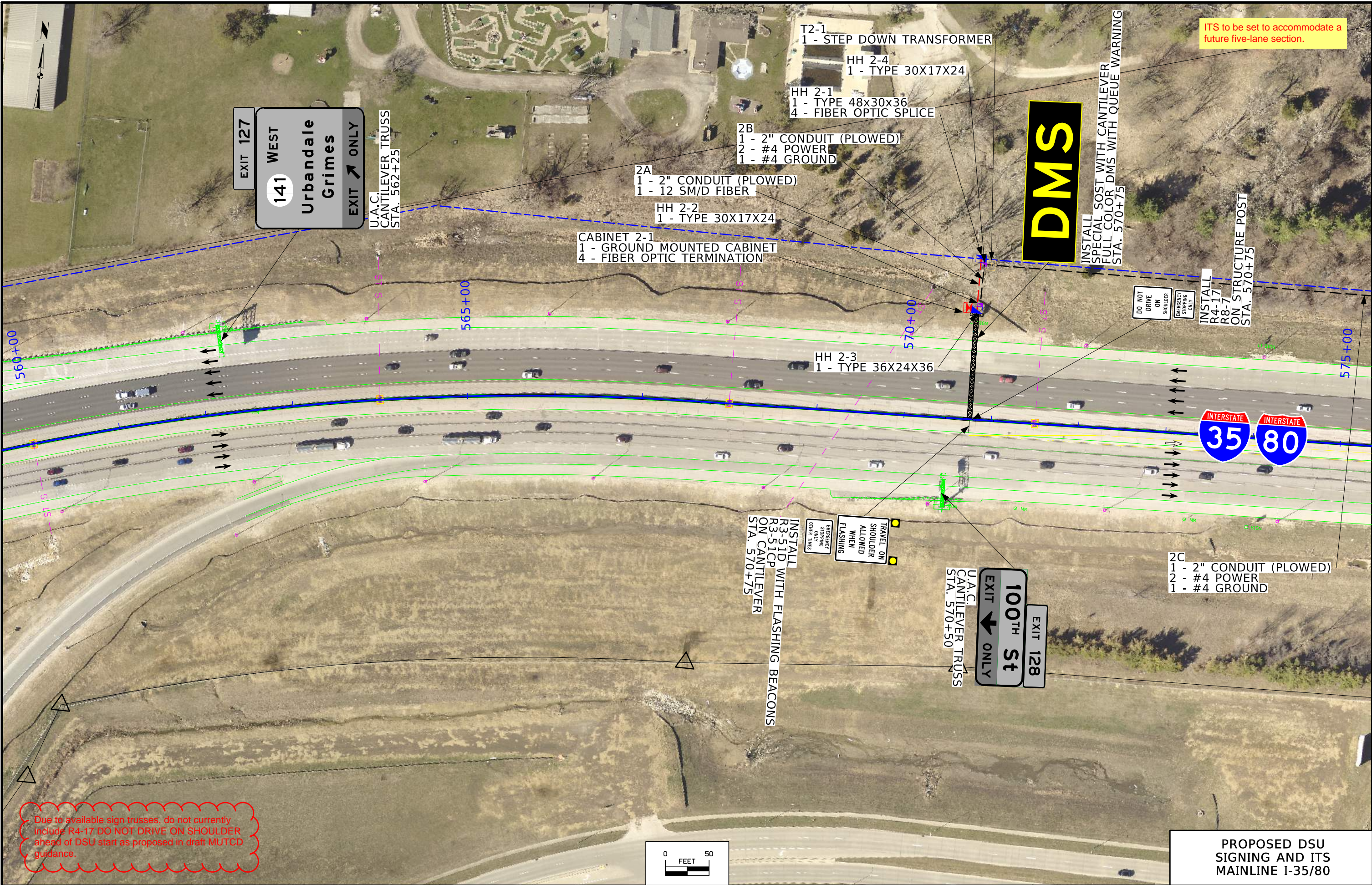


141

- Notes:
1. All storm sewer trunks lines and culverts shown are approximate and identified by as-builts only.
 2. Proposed sign trusses assume as selected special truss design. Design of sign trusses and footings to occur in future design phases.
 3. New OH sign trusses will be constructed to accommodate future widening of I-35/80.
 4. Existing ground-mounted sign adjustments to be evaluated in future design phase once truss locations approved. Slight adjustments to truss locations and/or ground mounted signs may be warranted.

**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**





ITS to be set to accommodate a future five-lane section.

DMS

INSTALL SOST WITH CANTILEVER FULL COLOR DMS WITH QUEUE WARNING STA. 570+75

INSTALL R4-17 R8-7 ON STRUCTURE POST STA. 570+75

DO NOT DRIVE ON SHOULDER EMERGENCY STOPPING ONLY

T2-1
1 - STEP DOWN TRANSFORMER

HH 2-4
1 - TYPE 30X17X24

HH 2-1
1 - TYPE 48X30X36
4 - FIBER OPTIC SPLICE

2B
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

2A
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 2-2
1 - TYPE 30X17X24

CABINET 2-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

HH 2-3
1 - TYPE 36X24X36

2C
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

INSTALL R3-51D R3-51CP ON CANTILEVER STA. 570+75

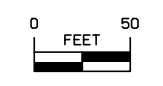
U.A.C. CANTILEVER TRUSS STA. 570+50

EXIT 127
141 WEST
Urbandale Grimes
EXIT ONLY

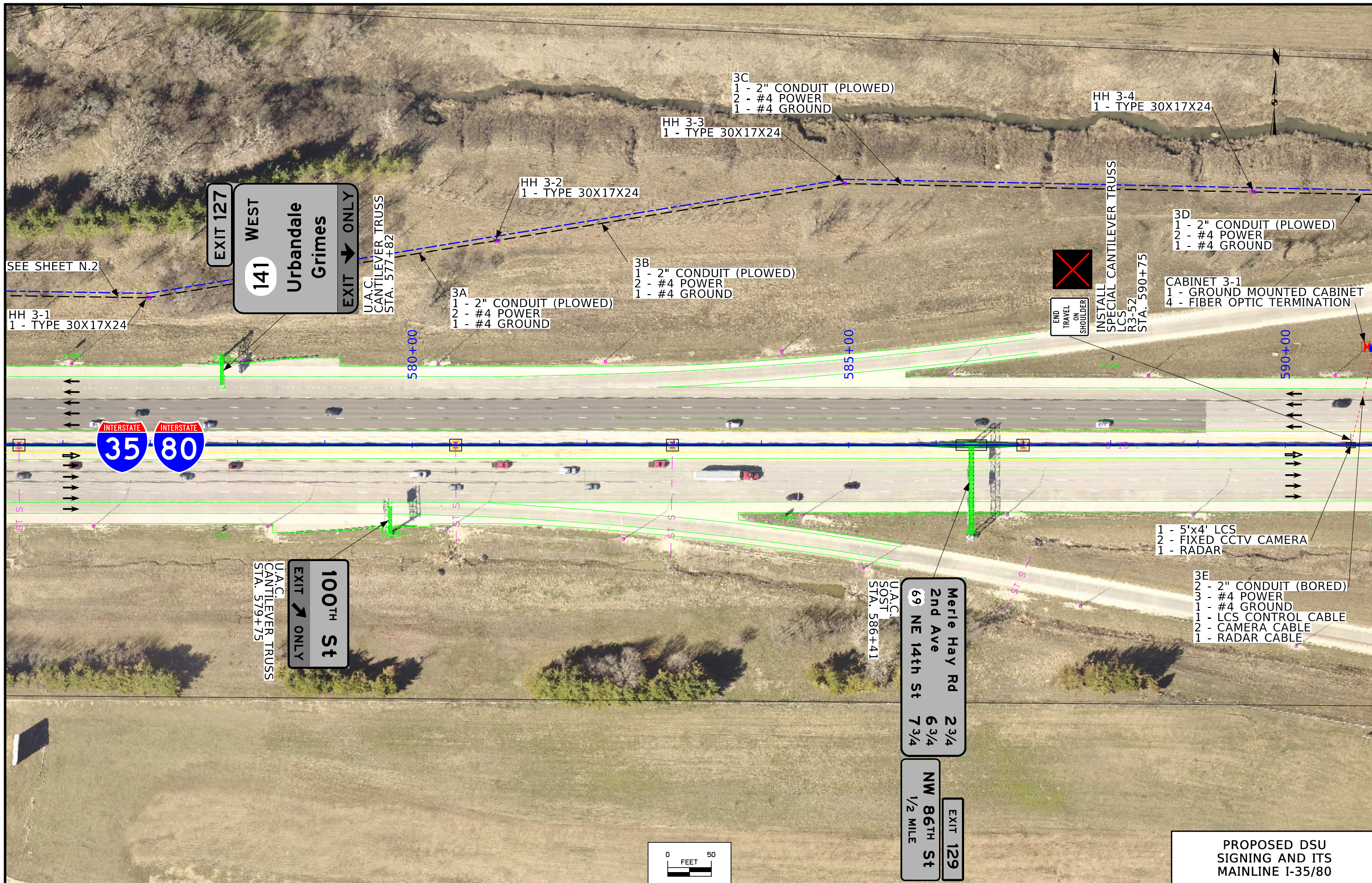
U.A.C. CANTILEVER TRUSS STA. 562+25



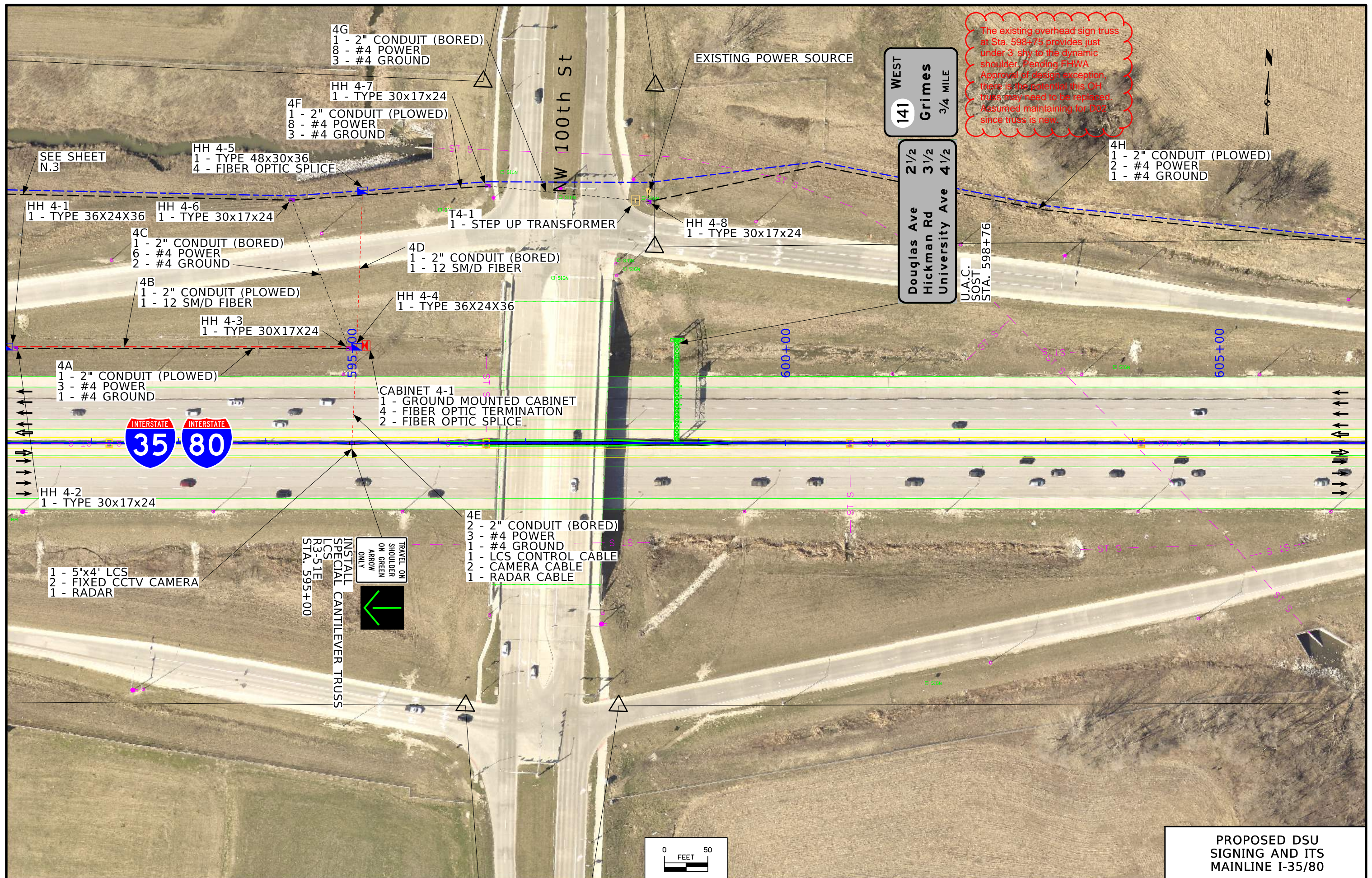
Due to available sign trusses, do not currently include R4-17 DO NOT DRIVE ON SHOULDER ahead of DSU start as proposed in draft MUTCD guidance.



PROPOSED DSU SIGNING AND ITS MAINLINE I-35/80

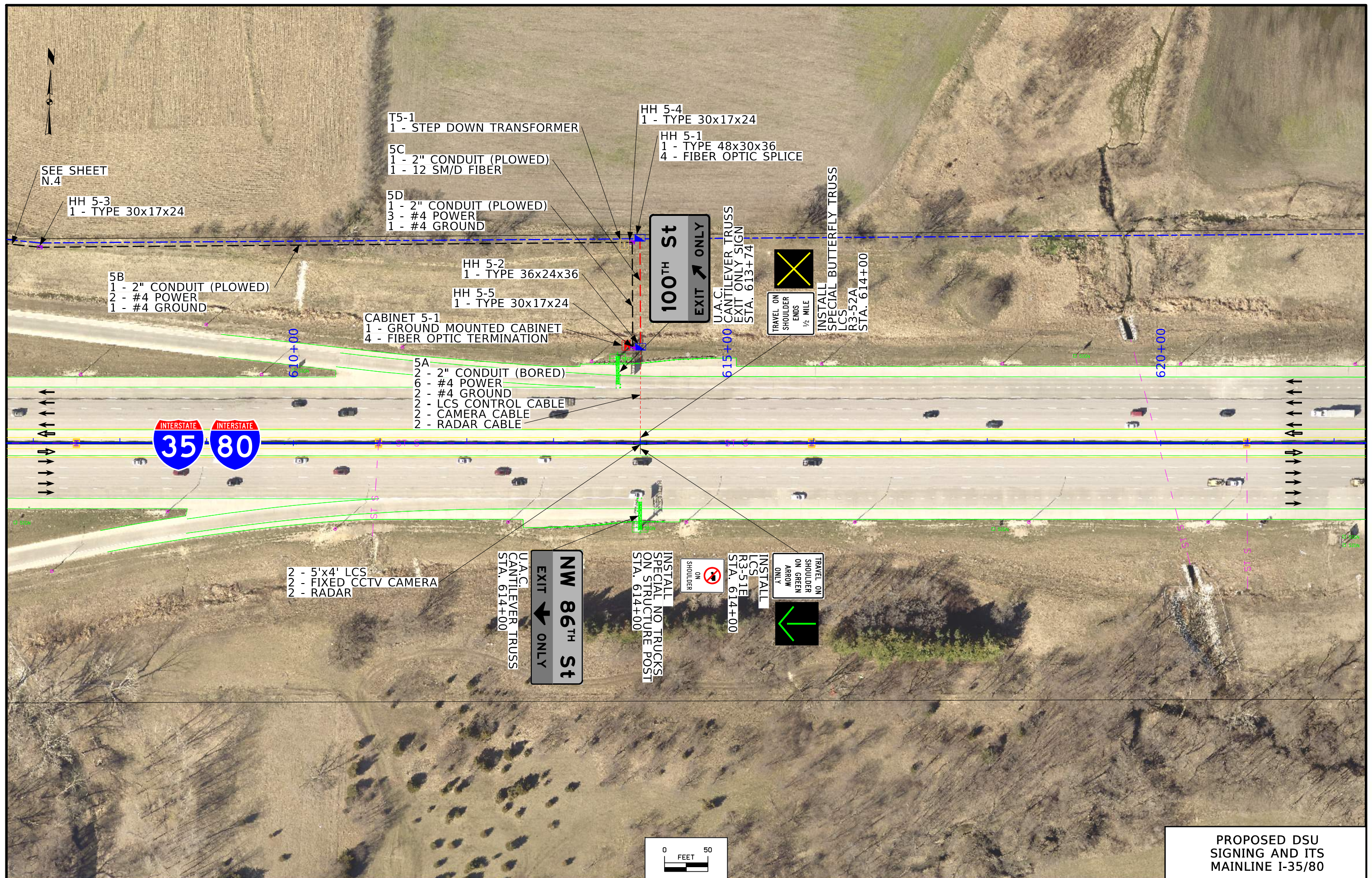


**PROPOSED DSU
 SIGNING AND ITS
 MAINLINE I-35/80**



The existing overhead sign truss at Sta. 598+75 provides just under 3' shy to the dynamic shoulder. Pending FHWA Approval of design exception, there is the potential this OH truss may need to be replaced. Assumed maintaining for D2 since truss is new.

**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**



T5-1
1 - STEP DOWN TRANSFORMER

HH 5-4
1 - TYPE 30x17x24

HH 5-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

5C
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

5D
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

100TH St
EXIT ↗ ONLY

U.A.C.
CANTILEVER TRUSS
EXIT ONLY SIGN
STA. 613+74

TRAVEL ON
SHOULDER
ENDS
1/2 MILE

INSTALL
SPECIAL BUTTERFLY TRUSS
LCS
R3-52A
STA. 614+00

SEE SHEET
N.4

HH 5-3
1 - TYPE 30x17x24

5B
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

HH 5-2
1 - TYPE 36x24x36

HH 5-5
1 - TYPE 30x17x24

CABINET 5-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

5A
2 - 2" CONDUIT (BORED)
6 - #4 POWER
2 - #4 GROUND
2 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR CABLE

2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

NW 86TH St
EXIT ↙ ONLY

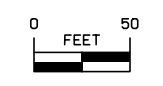
U.A.C.
CANTILEVER TRUSS
STA. 614+00

INSTALL
SPECIAL NO TRUCKS
ON STRUCTURE POST
STA. 614+00

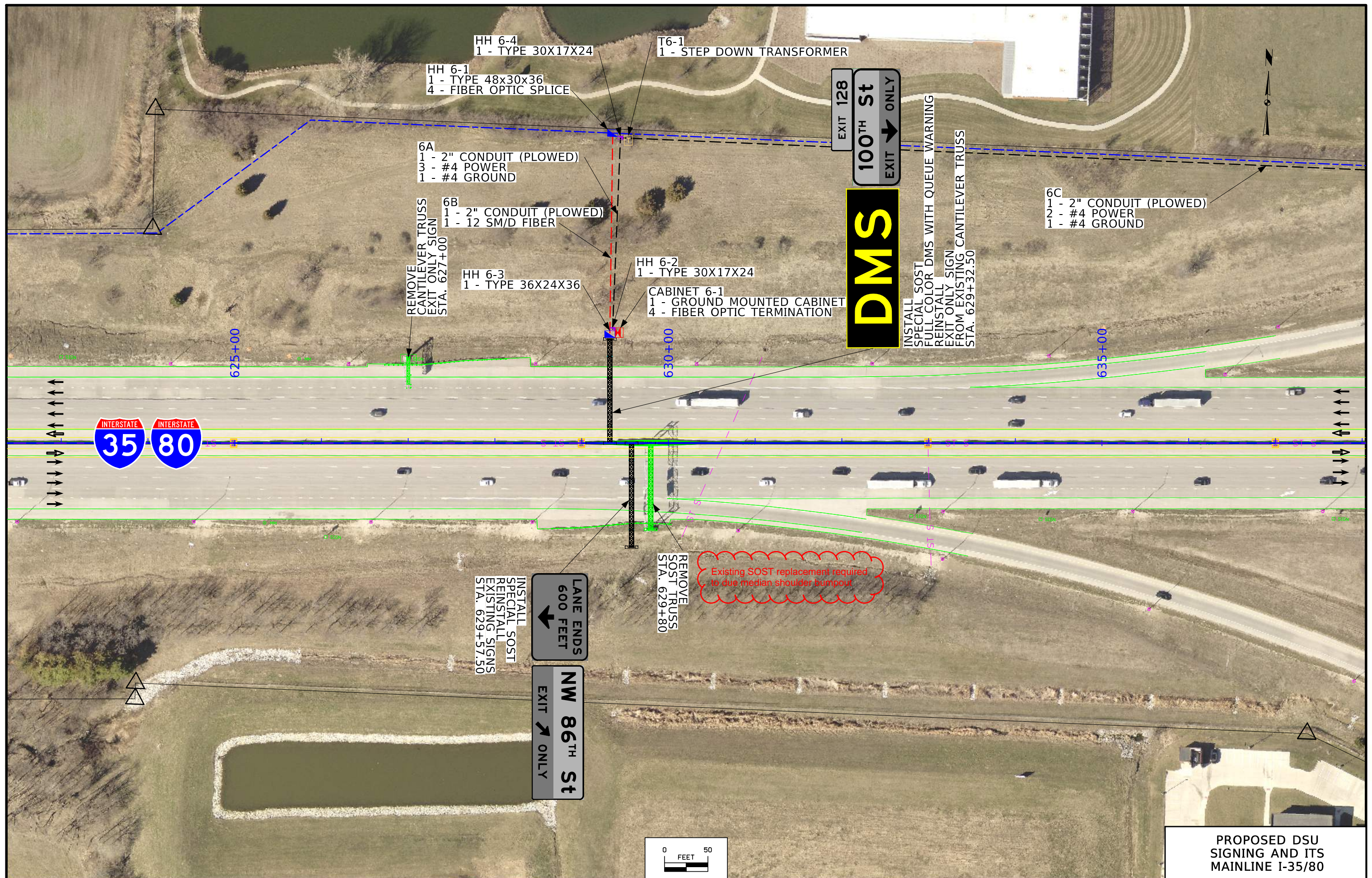
ON
SHOULDER

INSTALL
LCS
R3-51E
STA. 614+00

TRAVEL ON
SHOULDER
ON GREEN
ARROW
ONLY



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



HH 6-4
1 - TYPE 30X17X24

HH 6-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

T6-1
1 - STEP DOWN TRANSFORMER

6A
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

6B
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 6-3
1 - TYPE 36X24X36

HH 6-2
1 - TYPE 30X17X24

CABINET 6-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

6C
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

REMOVE TRUSS
CANTILEVER SIGN
EXIT ONLY SIGN
STA. 627+00

EXIT 128
100TH St
EXIT ONLY

DMS

INSTALL SPECIAL SOST
FULL COLOR DMS WITH QUEUE WARNING
REINSTALL EXIT ONLY SIGN FROM EXISTING CANTILEVER TRUSS
STA. 629+32.50



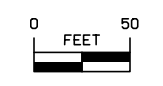
INSTALL SPECIAL SOST
REINSTALL EXISTING SIGNS
STA. 629+57.50

LANE ENDS
600 FEET

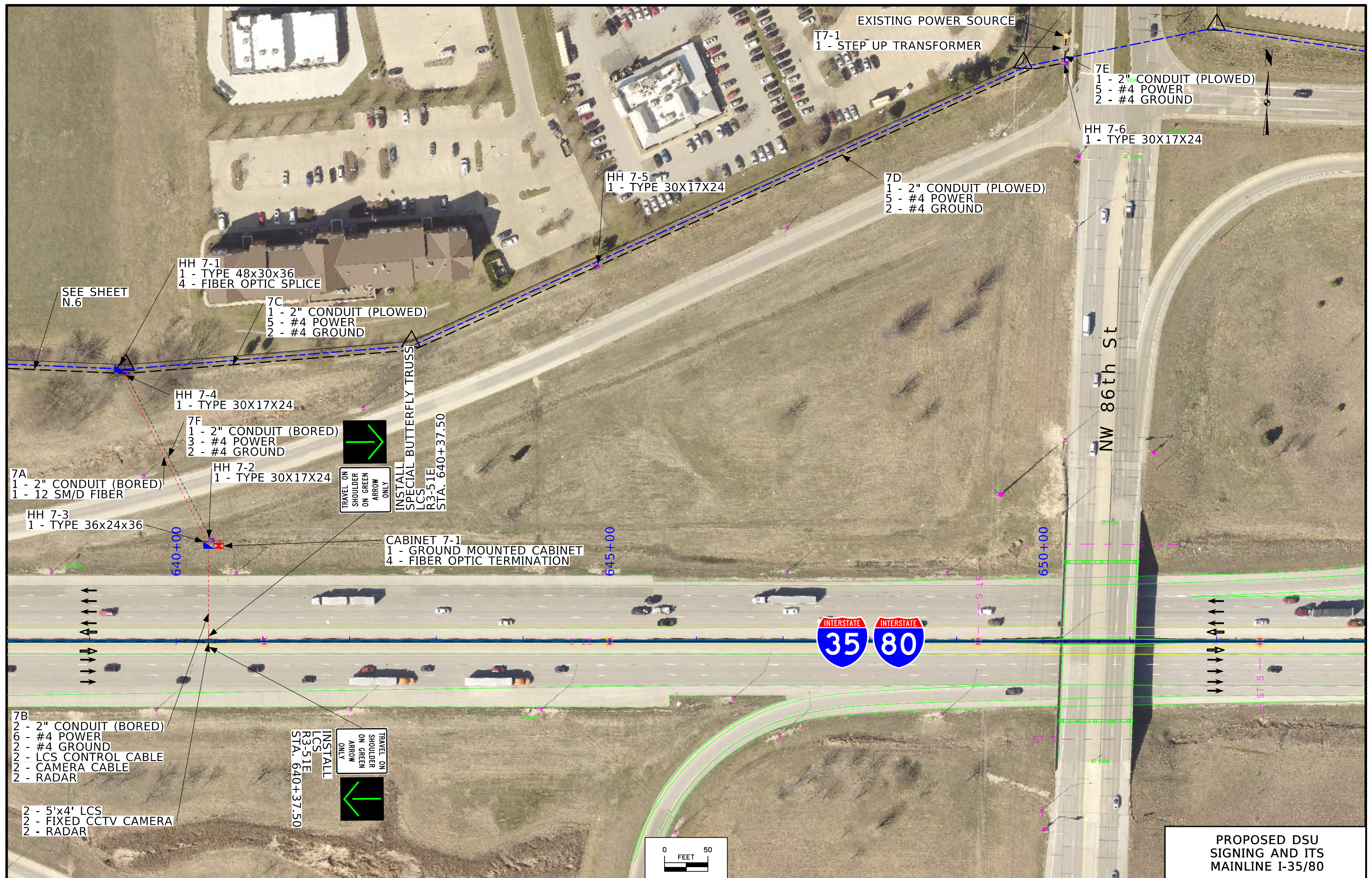
EXIT ONLY
NW 86TH St

REMOVE SOST TRUSS
STA. 629+80

Existing SOST replacement required to due median shoulder bumpout



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



EXISTING POWER SOURCE

T7-1
1 - STEP UP TRANSFORMER

7E
1 - 2" CONDUIT (PLOWED)
5 - #4 POWER
2 - #4 GROUND

HH 7-6
1 - TYPE 30X17X24

7D
1 - 2" CONDUIT (PLOWED)
5 - #4 POWER
2 - #4 GROUND

HH 7-5
1 - TYPE 30X17X24

HH 7-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

7C
1 - 2" CONDUIT (PLOWED)
5 - #4 POWER
2 - #4 GROUND

SEE SHEET
N.6

HH 7-4
1 - TYPE 30X17X24

7F
1 - 2" CONDUIT (BORED)
3 - #4 POWER
2 - #4 GROUND

TRAVEL ON
SHOULDER
ON GREEN
ARROW
ONLY

INSTALL
SPECIAL BUTTERFLY TRUSS
LCS
R3-51E
STA. 640+37.50

HH 7-2
1 - TYPE 30X17X24

7A
1 - 2" CONDUIT (BORED)
1 - 12 SM/D FIBER

HH 7-3
1 - TYPE 36x24x36

CABINET 7-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION



7B
2 - 2" CONDUIT (BORED)
6 - #4 POWER
2 - #4 GROUND
2 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR

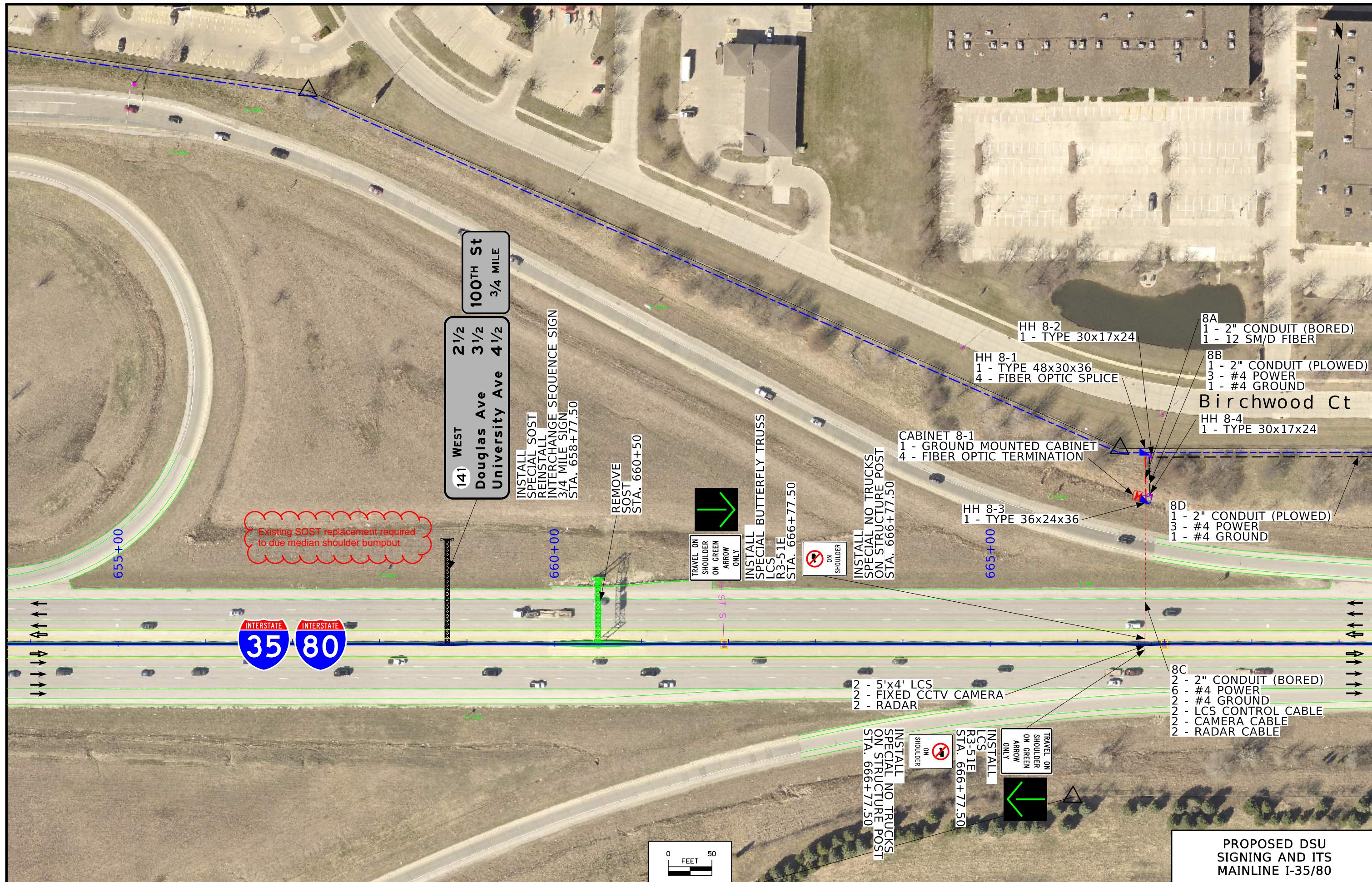
INSTALL
LCS
R3-51E
STA. 640+37.50

TRAVEL ON
SHOULDER
ON GREEN
ARROW
ONLY

2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

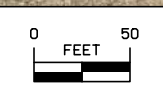


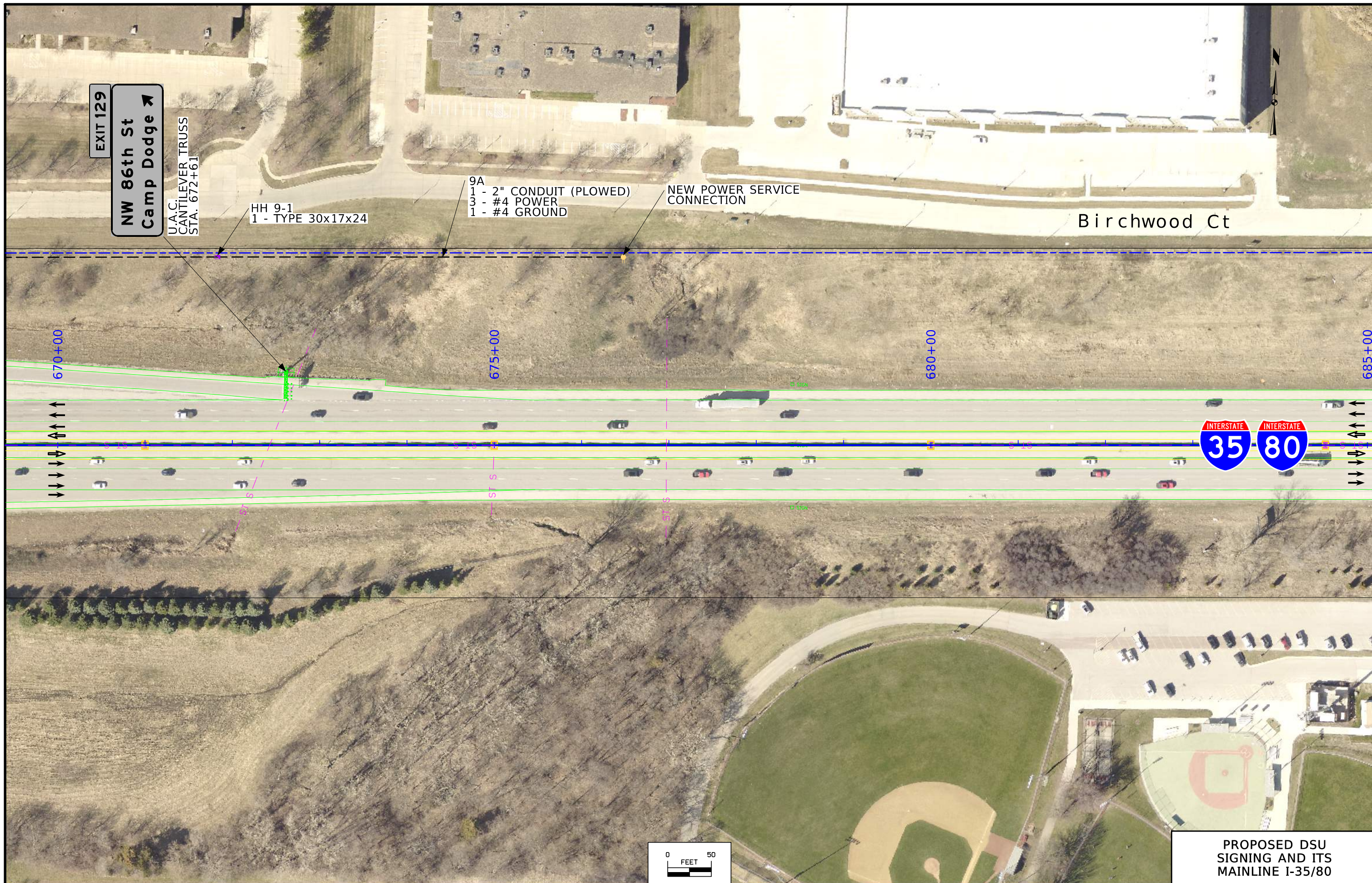
PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



Existing SOST replacement required to due median shoulder bumpout

**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**





EXIT 129
NW 86th St
Camp Dodge

U.A.C.
 CANTILEVER TRUSS
 STA. 672+61

HH 9-1
 1 - TYPE 30x17x24

9A
 1 - 2" CONDUIT (PLOWED)
 3 - #4 POWER
 1 - #4 GROUND

NEW POWER SERVICE
 CONNECTION

Birchwood Ct

670+00

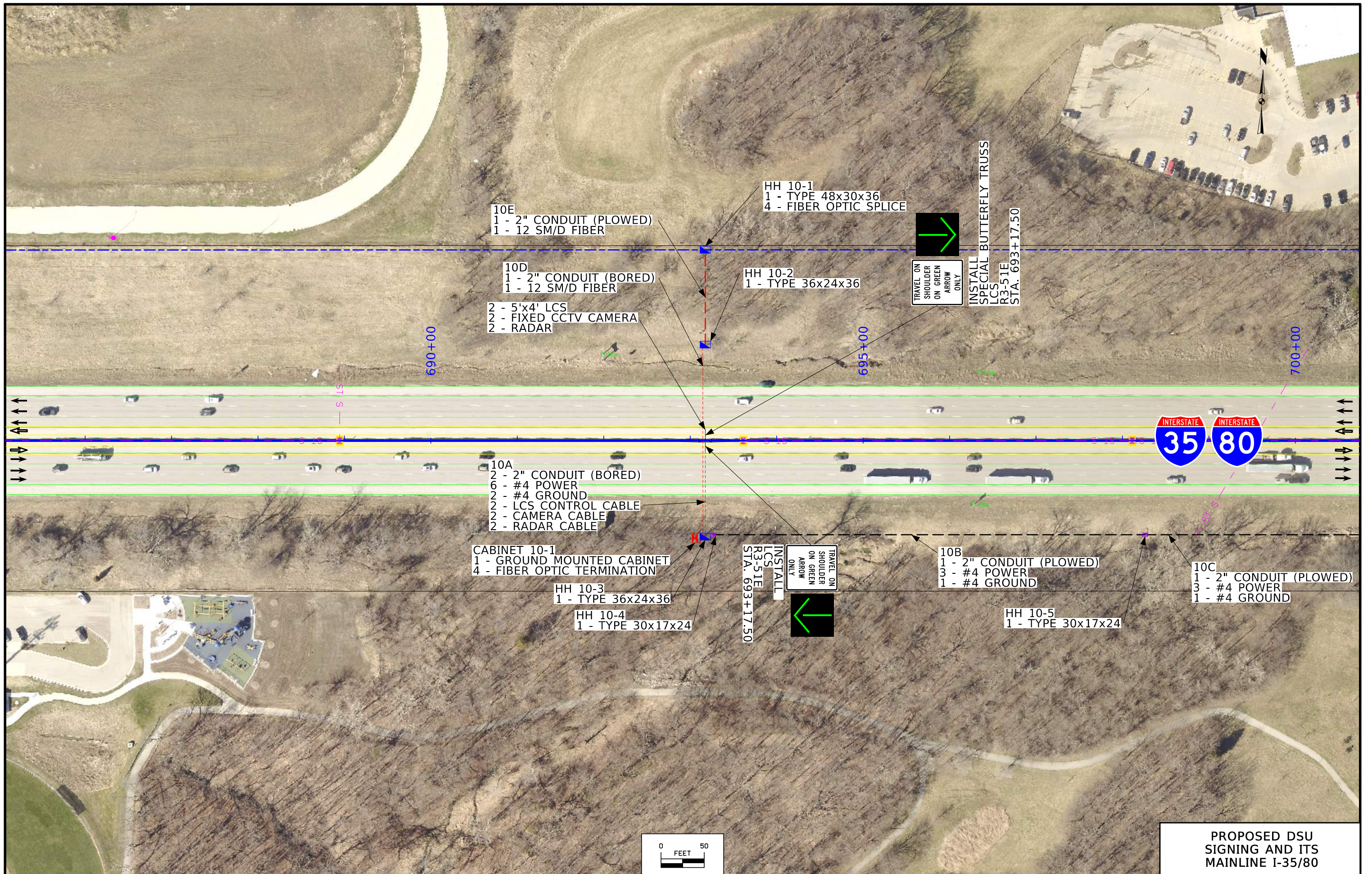
675+00

680+00

685+00



**PROPOSED DSU
 SIGNING AND ITS
 MAINLINE I-35/80**



**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**





NW 86th St
Camp Dodge
3/4 MILE

U.A.C.
CANTILEVER TRUSS
STA. 713+91



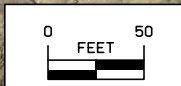
EXIT 131
SOUTH
28
Merle Hay Rd
Saylorville Lake
1/2 MILE

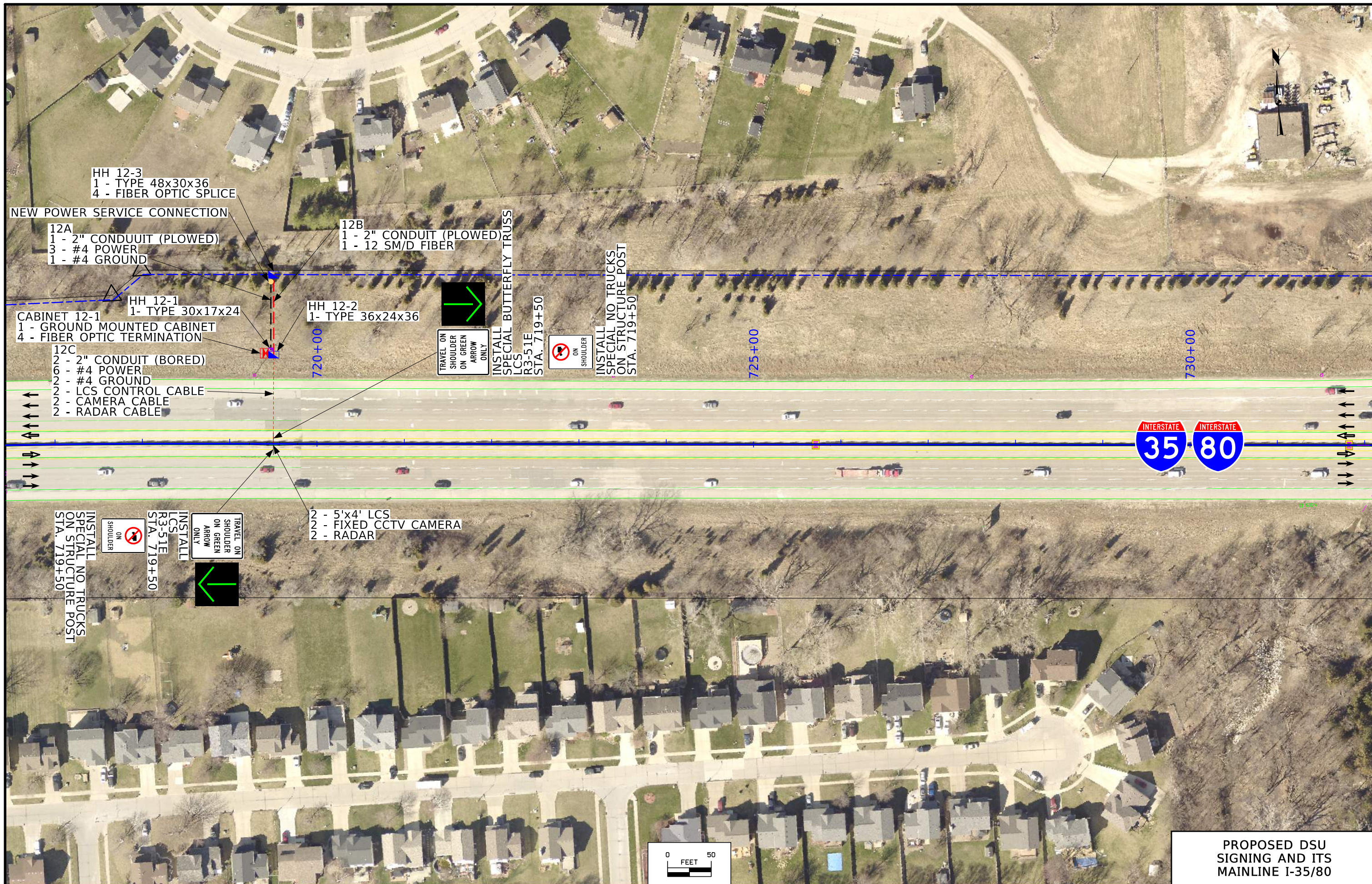
U.A.C.
CANTILEVER TRUSS
STA. 702+74

SEE SHEET N.10

NEW POWER SERVICE CONNECTION

PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80





HH 12-3
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

NEW POWER SERVICE CONNECTION

12A
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

12B
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 12-1
1- TYPE 30x17x24

CABINET 12-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

HH 12-2
1- TYPE 36x24x36

12C
2 - 2" CONDUIT (BORED)
6 - #4 POWER
2 - #4 GROUND
2 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR CABLE

INSTALL ON SHOULDER ON GREEN ARROW ONLY

INSTALL SPECIAL BUTTERFLY TRUSS LCS R3-51E STA. 719+50

INSTALL ON SHOULDER

INSTALL SPECIAL NO TRUCKS ON STRUCTURE POST ON STA. 719+50



2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

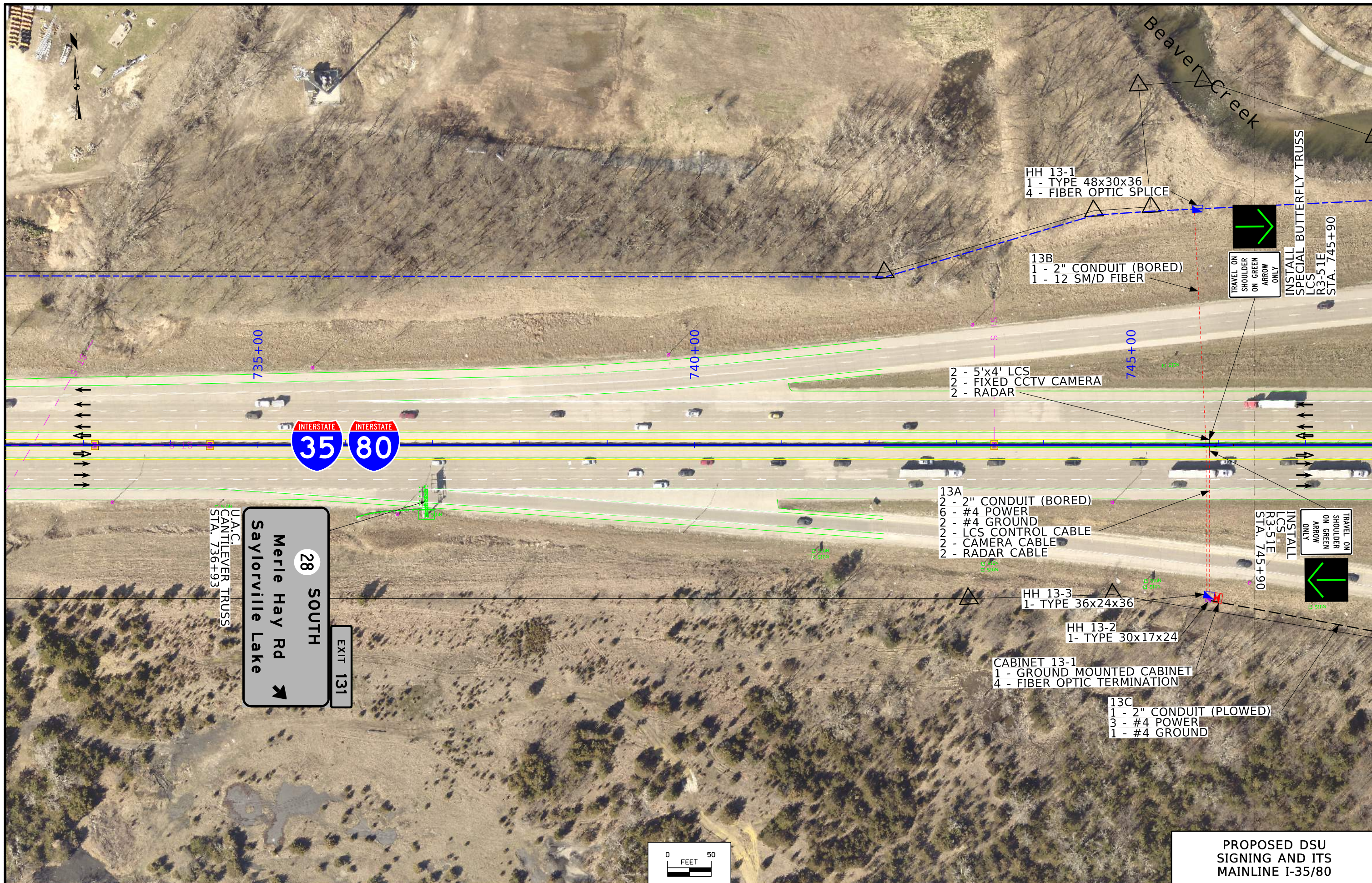
INSTALL ON SHOULDER ON GREEN ARROW ONLY

INSTALL LCS R3-51E STA. 719+50

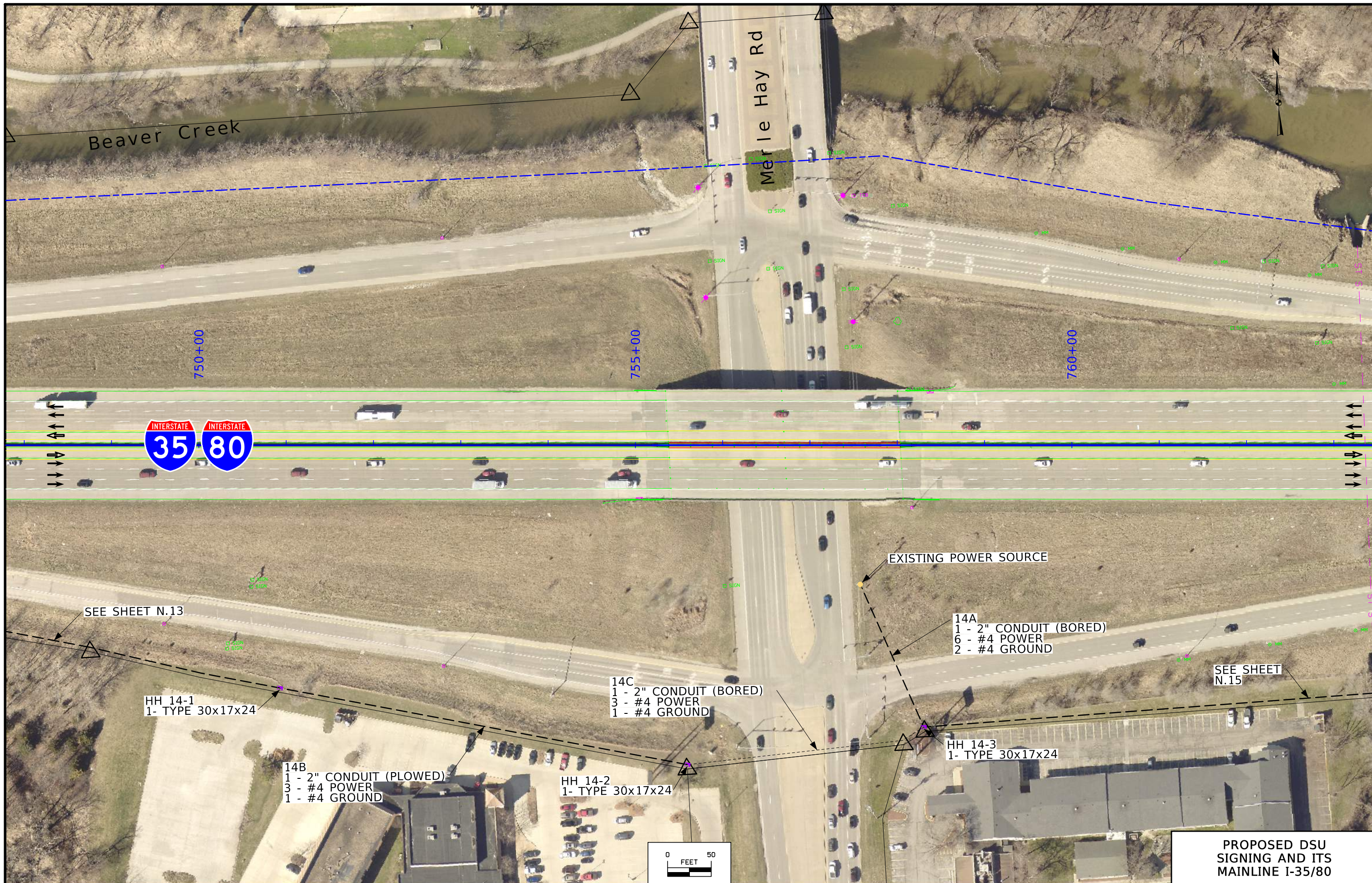
INSTALL SPECIAL NO TRUCKS ON STRUCTURE POST STA. 719+50



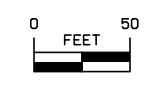
PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**

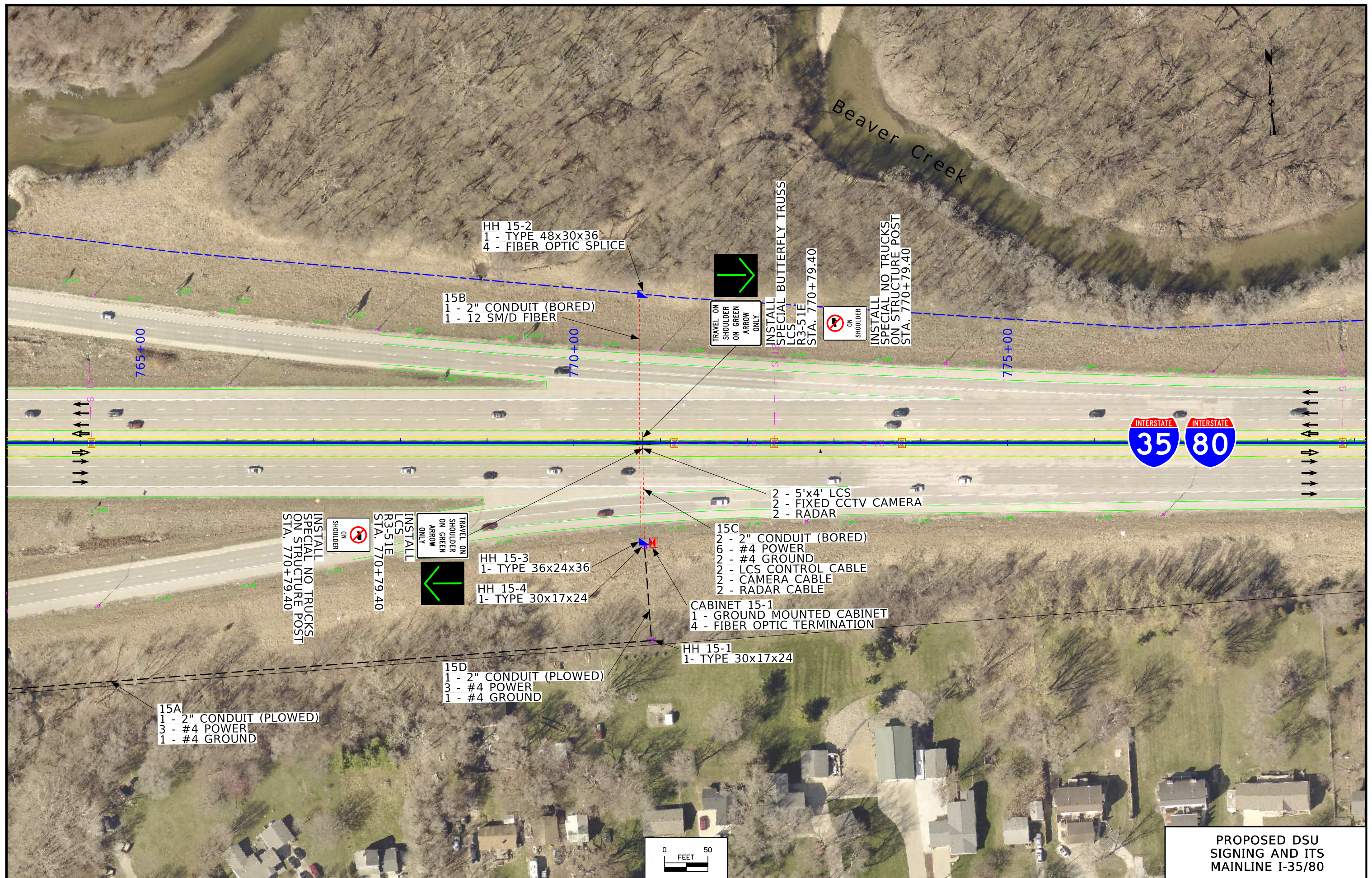


**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**

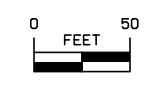


FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT/HNTB	POLK COUNTY	PROJECT NUMBER IMX-080-3(315)128--02-77	SHEET NUMBER N.14
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2:43:53 PM 10/28/2022 mplummer pw:\pw-int.hntb.org:PWCentralDiv\Documents\Kansas City Projects\83603 Iowa DOT I-80 DSU\Production\Roadway\5HT_N_77080314Z08.dgn



**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**





Option to maintain existing truss (not an existing conflict to maintaining 3' shy). Confirm if preference is to replace existing truss for corridor consistency and to accommodate future 5 lane section.

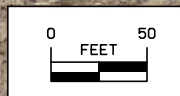
28 SOUTH
Merle Hay Rd
Saylorville Lake
 EXIT ONLY

SOUTH WEST 35
Kansas City
Council Bluffs

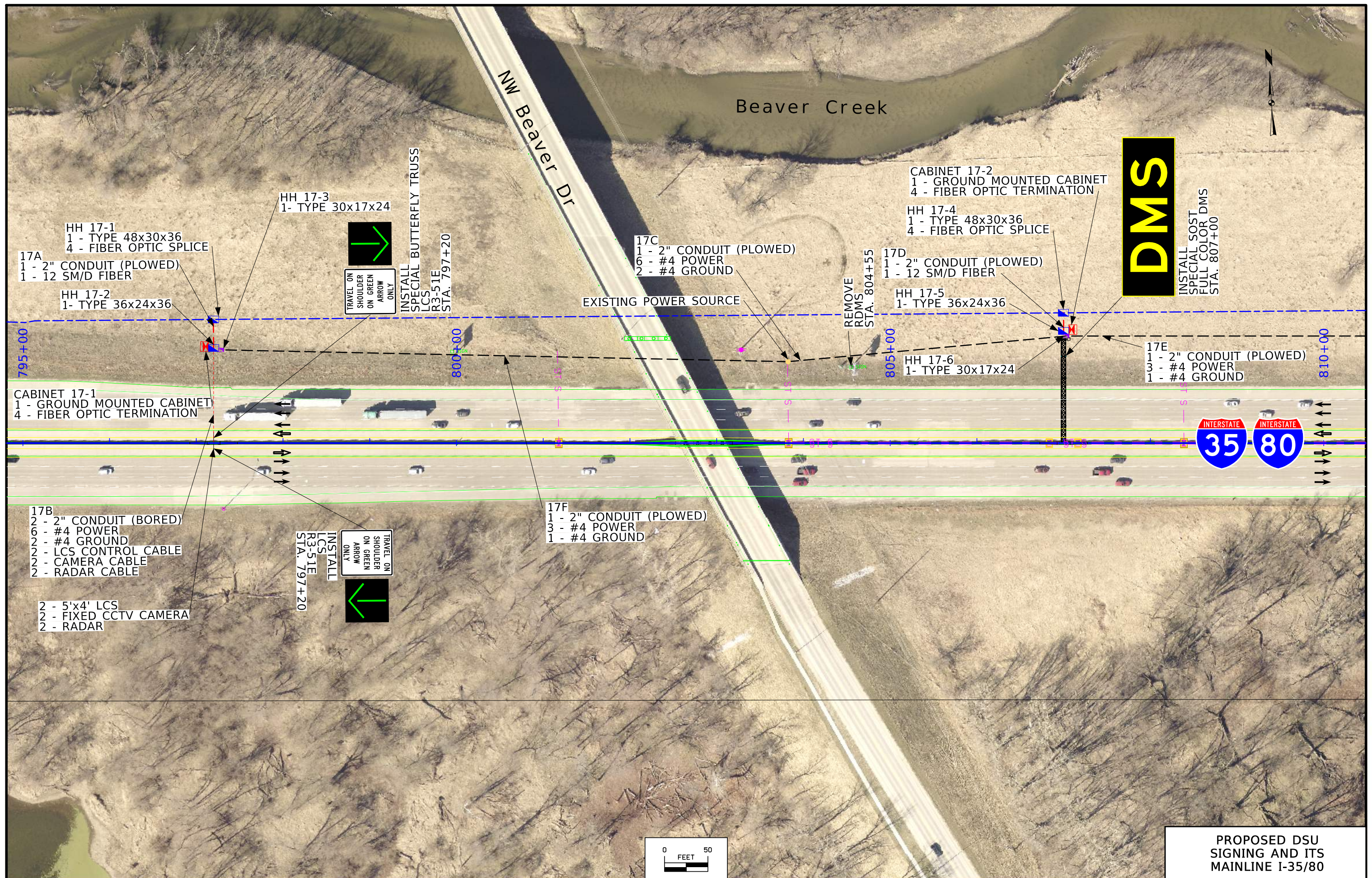
INSTALL SPECIAL SOST
 REINSTALL EXIT ONLY SIGN
 PULL-THRU SIGN
 STA. 780+40

REMOVE SOST EXISTING SIGNS
 STA. 780+85

INTERSTATE 35 INTERSTATE 80



PROPOSED DSU SIGNING AND ITS MAINLINE I-35/80



HH 17-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

17A
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 17-2
1 - TYPE 36x24x36

HH 17-3
1 - TYPE 30x17x24

CABINET 17-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

17B
2 - 2" CONDUIT (BORED)
6 - #4 POWER
2 - #4 GROUND
2 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR CABLE

2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

INSTALL SPECIAL BUTTERFLY TRUSS
LCS
R3-51E
STA. 797+20

TRAVEL ON SHOULDER ON GREEN ARROW ONLY

INSTALL LCS
R3-51E
STA. 797+20

TRAVEL ON SHOULDER ON GREEN ARROW ONLY

17C
1 - 2" CONDUIT (PLOWED)
6 - #4 POWER
2 - #4 GROUND

EXISTING POWER SOURCE

17F
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

REMOVE RDMS
STA. 804+55

17D
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 17-4
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

HH 17-5
1 - TYPE 36x24x36

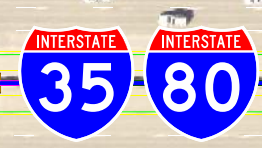
HH 17-6
1 - TYPE 30x17x24

CABINET 17-2
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

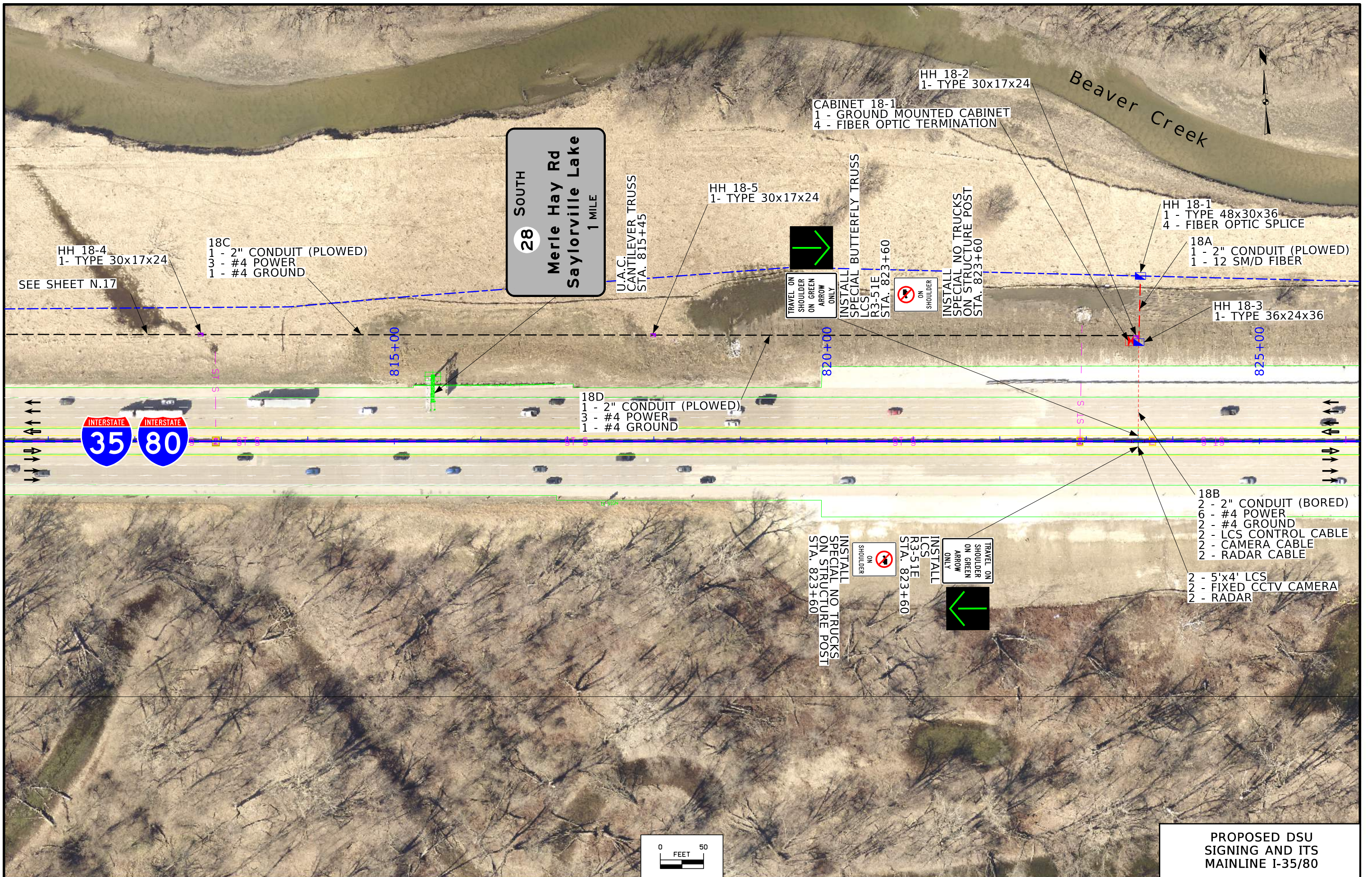
DMS

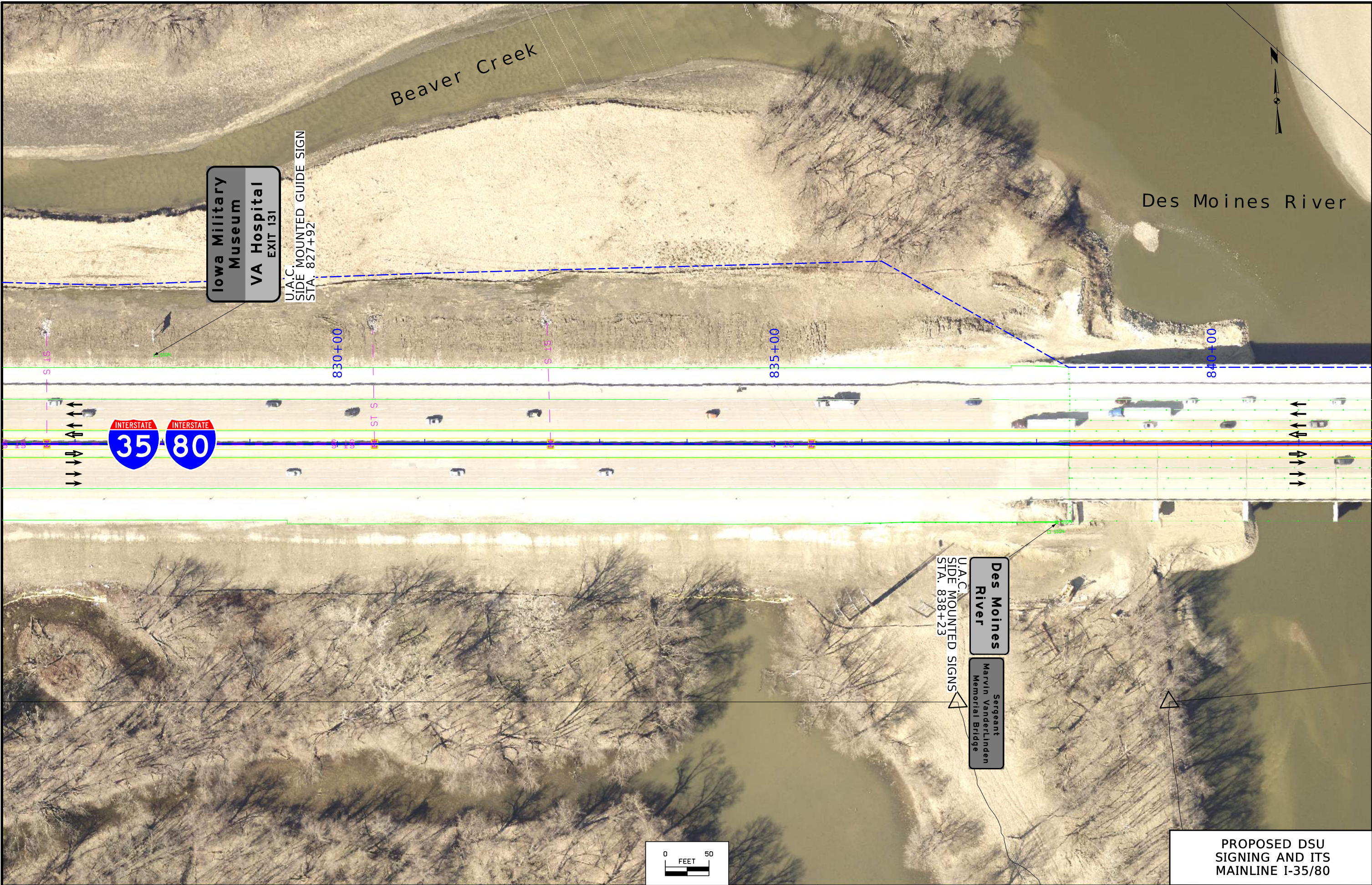
INSTALL SOST
SPECIAL COLOR DMS
FULL COLOR DMS
STA. 807+00

17E
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80





Beaver Creek

Des Moines River

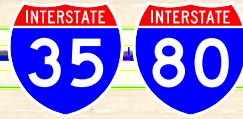
Iowa Military
Museum
VA Hospital
EXIT 131

U.A.C.
SIDE MOUNTED GUIDE SIGN
STA. 827+92

830+00

835+00

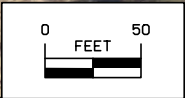
840+00



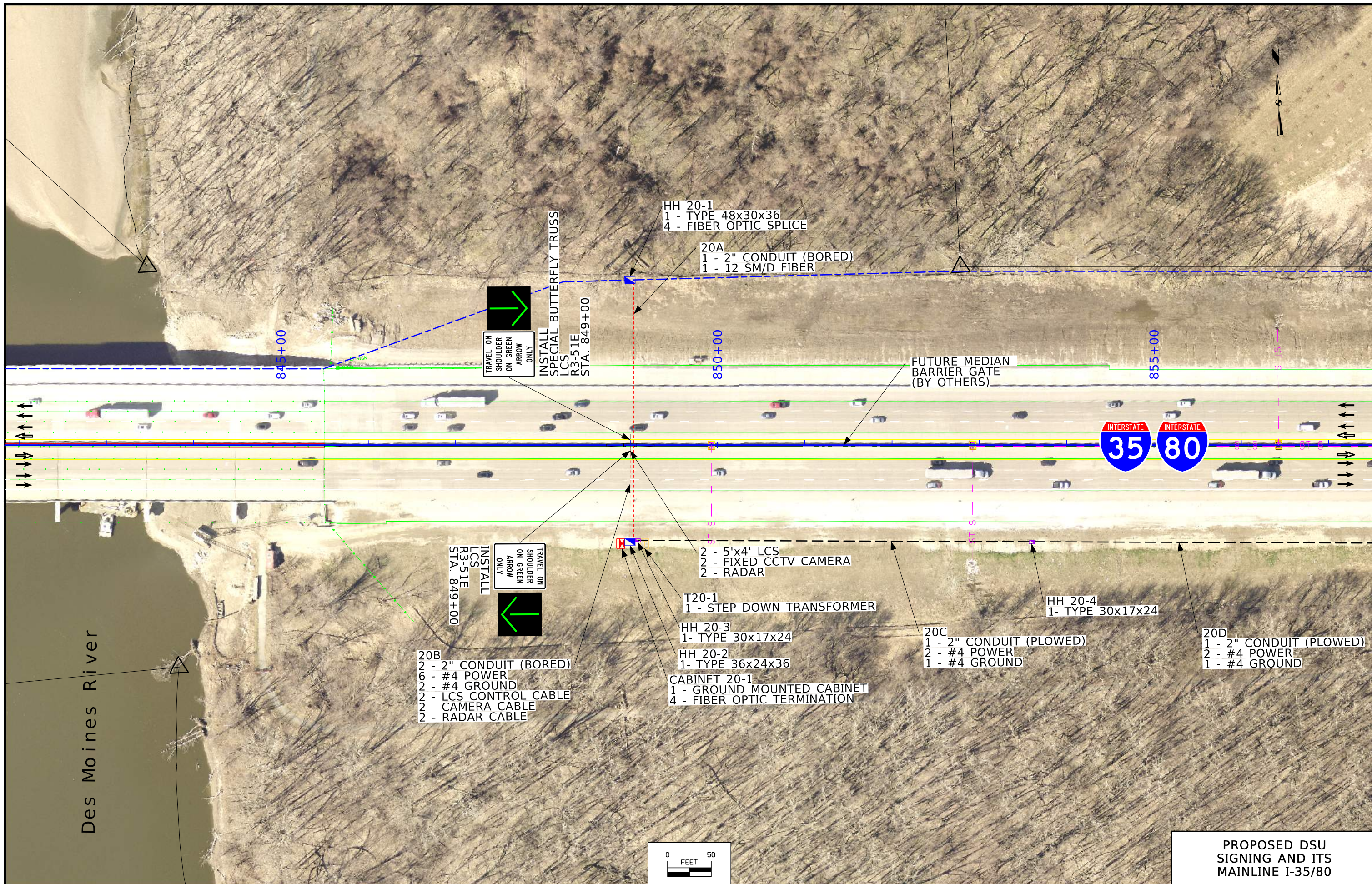
Des Moines
River

U.A.C.
SIDE MOUNTED SIGNS
STA. 838+23

Sergeant
VanderLinden
Memorial Bridge

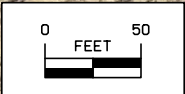


PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



Des Moines River

- HH 20-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE
- 20A
1 - 2" CONDUIT (BORED)
1 - 12 SM/D FIBER
- INSTALL SPECIAL BUTTERFLY TRUSS
LCS
R3-51E
STA. 849+00
- TRAVEL ON SHOULDER ON GREEN ARROW ONLY
- 20B
2 - 2" CONDUIT (BORED)
6 - #4 POWER
2 - #4 GROUND
2 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR CABLE
- INSTALL LCS R3-51E STA. 849+00
- TRAVEL ON SHOULDER ON GREEN ARROW ONLY
- 2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR
- T20-1
1 - STEP DOWN TRANSFORMER
- HH 20-3
1 - TYPE 30x17x24
- HH 20-2
1 - TYPE 36x24x36
- CABINET 20-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION
- 20C
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND
- HH 20-4
1 - TYPE 30x17x24
- 20D
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND
- FUTURE MEDIAN BARRIER GATE (BY OTHERS)



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



SEE SHEET N.20

HH 21-5
1- TYPE 30x17x24

21D
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

HH 21-6
1- TYPE 30x17x24

INSTALL
SPECIAL NO TRUCKS
ON STRUCTURE POST
STA. 870+00

INSTALL
LCS
R3-51E
STA. 870+00

**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**

HH 21-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

21A
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 21-2
1- TYPE 36x24x36

2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

21F
1 - 2" CONDUIT (BORED)
1 - 12 SM/D FIBER

INSTALL
SPECIAL BUTTERFLY TRUSS
LCS
R3-51E
STA. 870+00

INSTALL
SPECIAL NO TRUCKS
ON STRUCTURE POST
STA. 870+00

21E
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

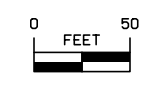
21B
2 - 2" CONDUIT (BORED)
6 - #4 POWER
2 - #4 GROUND
2 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR CABLE

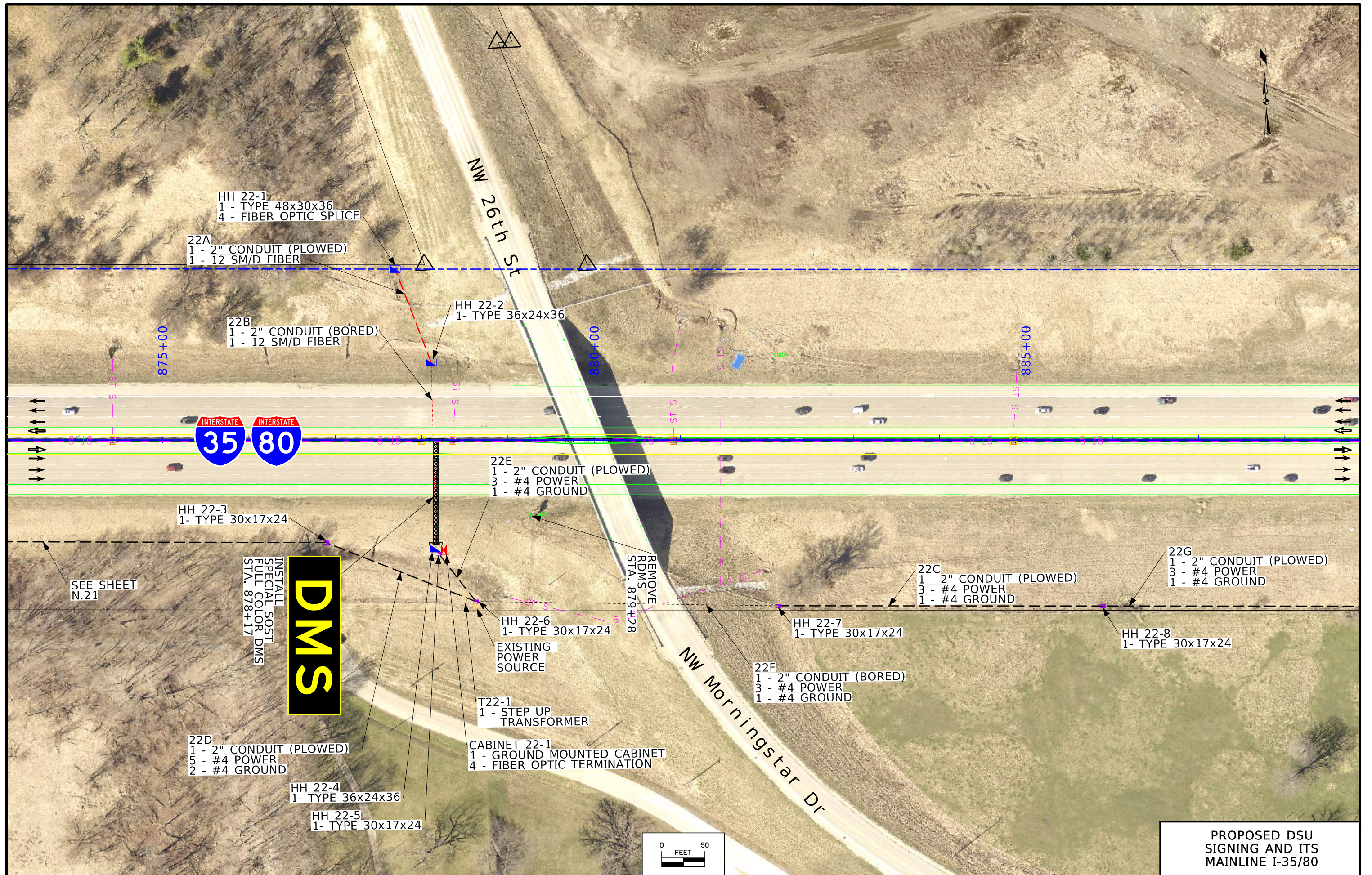
21C
1 - 2" CONDUIT (PLOWED)
5 - #4 POWER
2 - #4 GROUND

HH 21-3
1- TYPE 36x24x36

HH 21-4
1- TYPE 30x17x24

CABINET 21-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION





HH 22-1
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

22A
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

22B
1 - 2" CONDUIT (BORED)
1 - 12 SM/D FIBER

HH 22-2
1 - TYPE 36x24x36

22E
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

HH 22-3
1 - TYPE 30x17x24

22C
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

22G
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

HH 22-6
1 - TYPE 30x17x24

HH 22-7
1 - TYPE 30x17x24

HH 22-8
1 - TYPE 30x17x24

INSTALL
SPECIAL SOST
FULL COLOR DMS
DMS

REMOVE
RDMs
STA. 879+28

22F
1 - 2" CONDUIT (BORED)
3 - #4 POWER
1 - #4 GROUND

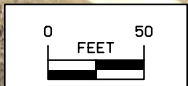
T22-1
1 - STEP UP
TRANSFORMER

CABINET 22-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

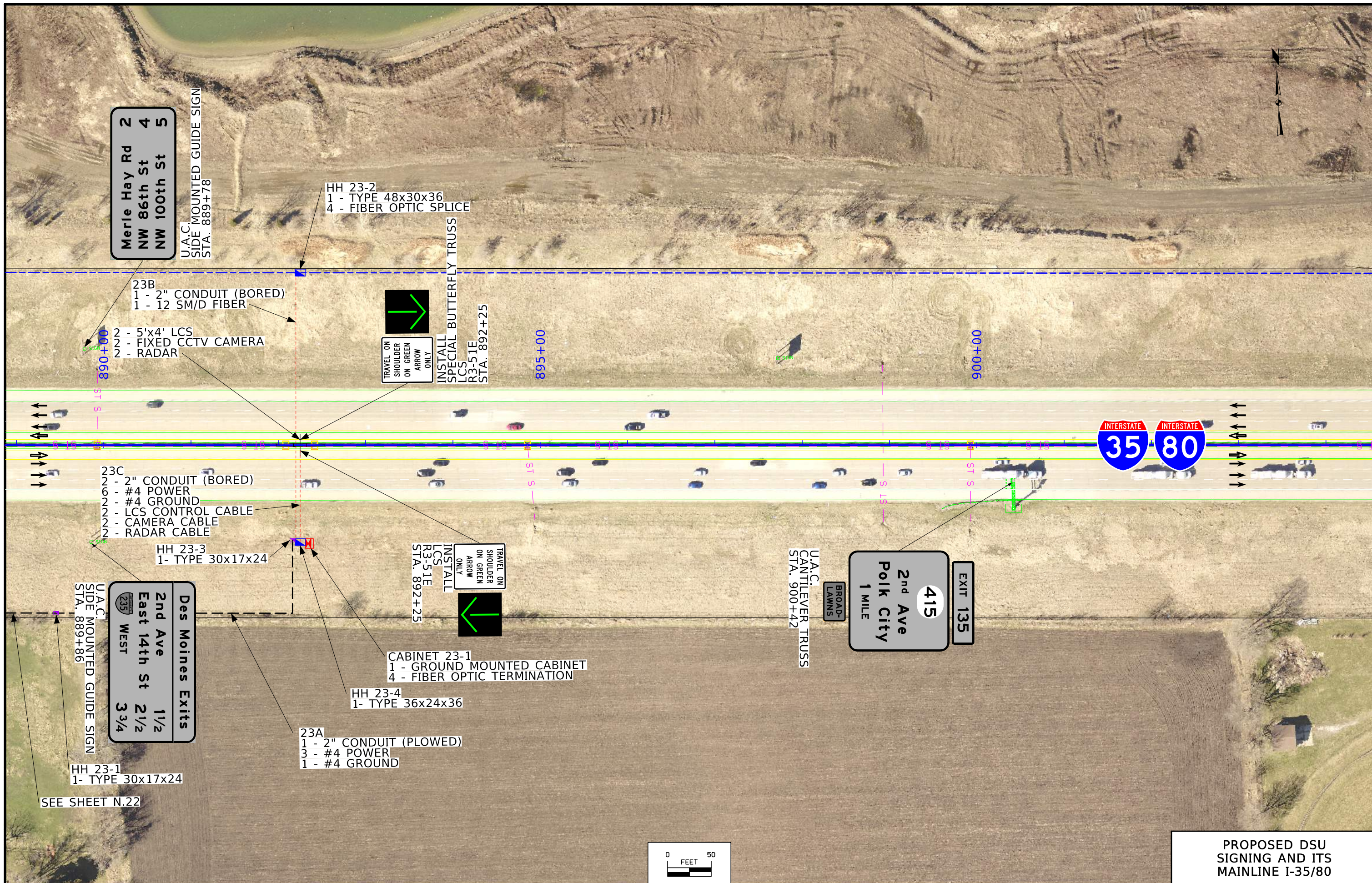
22D
1 - 2" CONDUIT (PLOWED)
5 - #4 POWER
2 - #4 GROUND

HH 22-4
1 - TYPE 36x24x36

HH 22-5
1 - TYPE 30x17x24



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



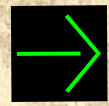
Merle Hay Rd
 2 NW 86th St
 4 NW 100th St
 5

U.A.C.
 SIDE MOUNTED GUIDE SIGN
 STA. 889+78

HH 23-2
 1 - TYPE 48x30x36
 4 - FIBER OPTIC SPLICE

23B
 1 - 2" CONDUIT (BORED)
 1 - 12 SM/D FIBER

2 - 5'x4' LCS
 2 - FIXED CCTV CAMERA
 2 - RADAR



TRAVEL ON
 SHOULDER
 ON GREEN
 ARROW
 ONLY

INSTALL
 SPECIAL BUTTERFLY TRUSS
 LCS
 R3-51E
 STA. 892+25

895+00

00+006



23C
 2 - 2" CONDUIT (BORED)
 2 - #4 POWER
 2 - #4 GROUND
 2 - LCS CONTROL CABLE
 2 - CAMERA CABLE
 2 - RADAR CABLE

HH 23-3
 1- TYPE 30x17x24

INSTALL
 LCS
 R3-51E
 STA. 892+25



TRAVEL ON
 SHOULDER
 ON GREEN
 ARROW
 ONLY

CABINET 23-1
 1 - GROUND MOUNTED CABINET
 4 - FIBER OPTIC TERMINATION

HH 23-4
 1- TYPE 36x24x36

23A
 1 - 2" CONDUIT (PLOWED)
 3 - #4 POWER
 1 - #4 GROUND

U.A.C.
 CANTILEVER TRUSS
 STA. 900+42

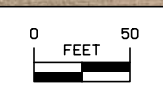
EXIT 135
 415
 2nd Ave
 Polk City
 1 MILE

Des Moines Exits
 2nd Ave 11/2
 East 14th St 21/2
 WEST 33/4

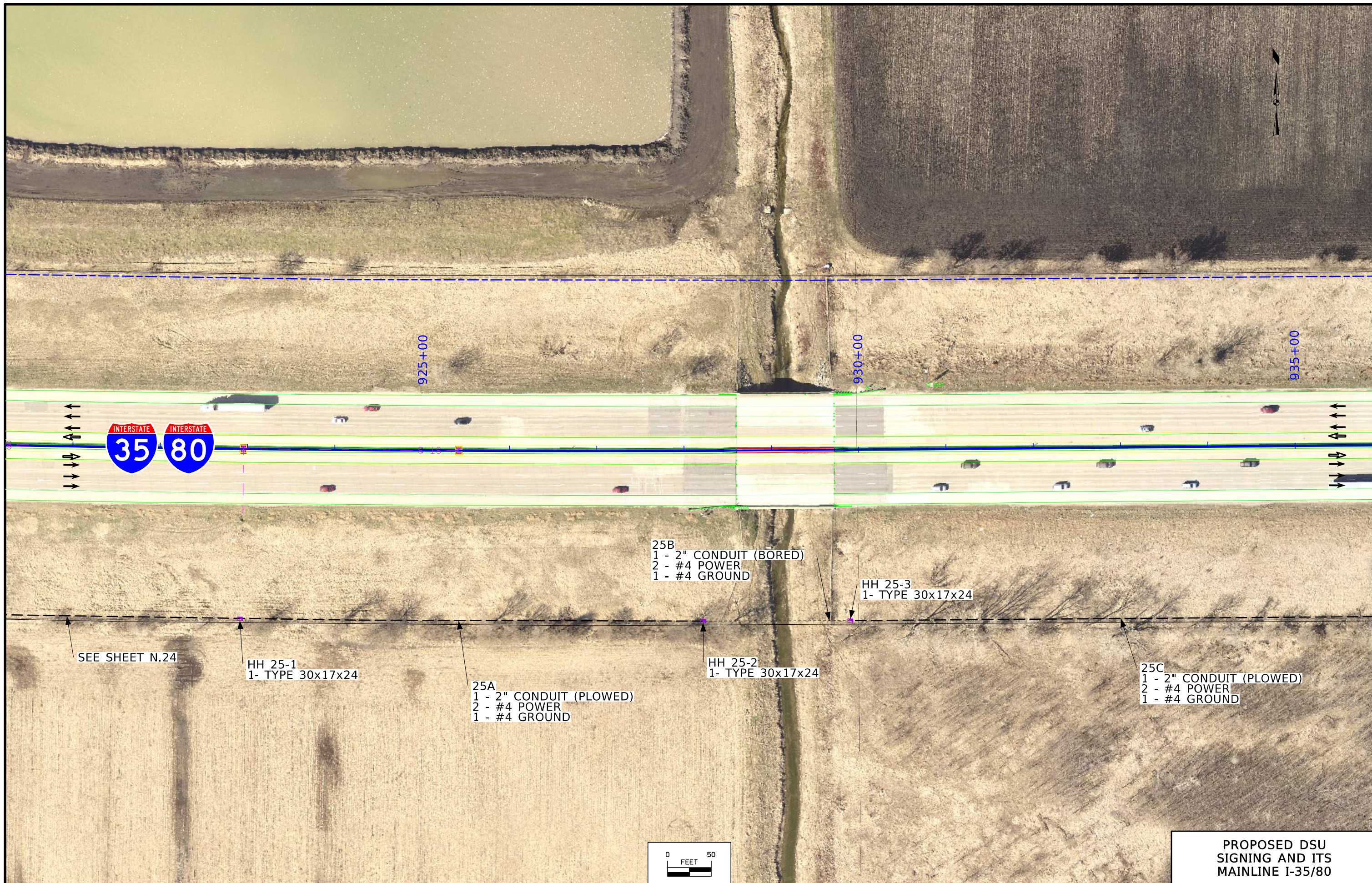
U.A.C.
 SIDE MOUNTED GUIDE SIGN
 STA. 889+86

HH 23-1
 1- TYPE 30x17x24

SEE SHEET N.22



PROPOSED DSU
 SIGNING AND ITS
 MAINLINE I-35/80



925+00

930+00

935+00

25B
 1 - 2" CONDUIT (BORED)
 2 - #4 POWER
 1 - #4 GROUND

HH 25-3
 1- TYPE 30x17x24

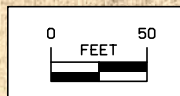
25C
 1 - 2" CONDUIT (PLOWED)
 2 - #4 POWER
 1 - #4 GROUND

SEE SHEET N.24

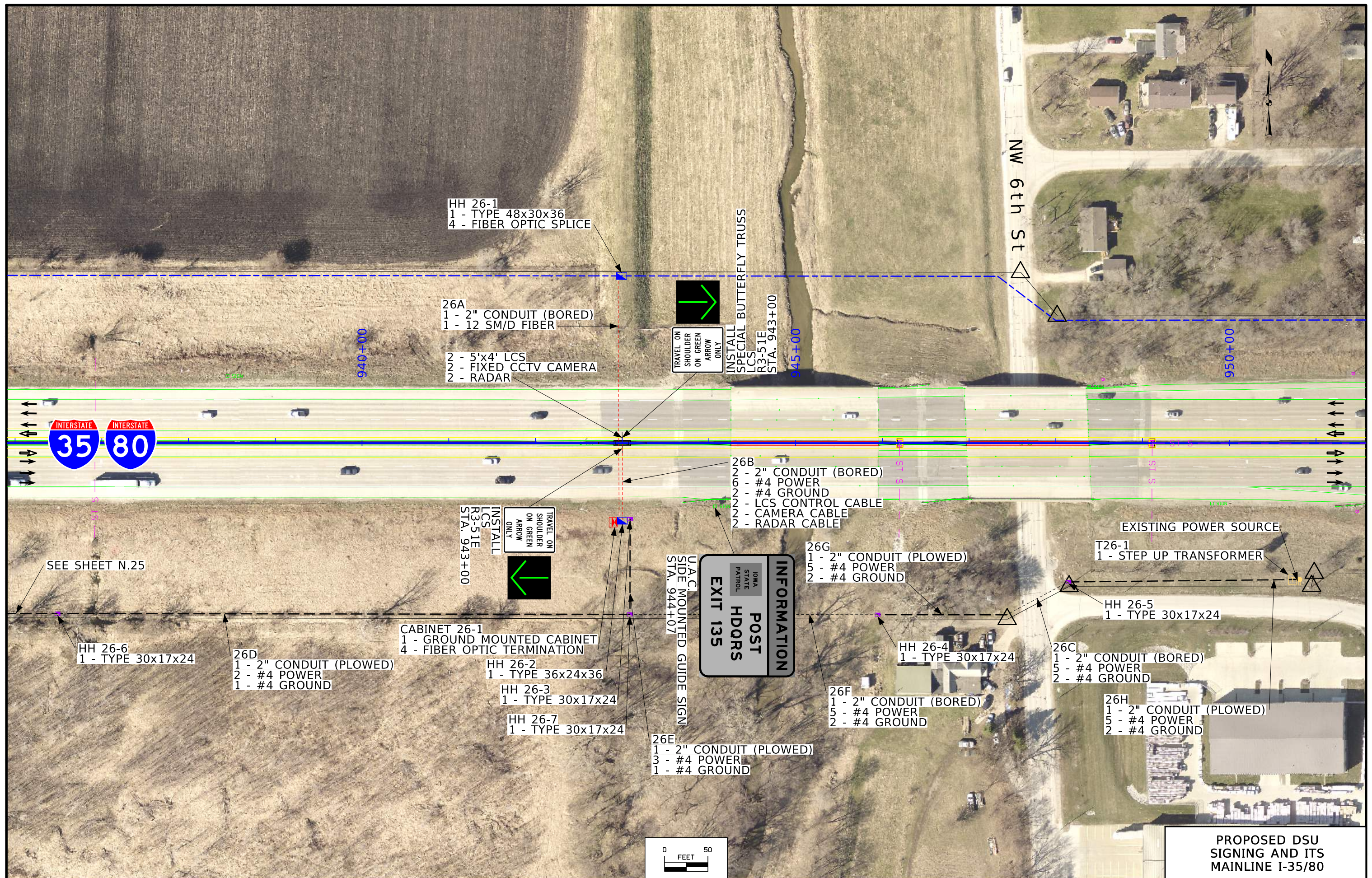
HH 25-1
 1- TYPE 30x17x24

25A
 1 - 2" CONDUIT (PLOWED)
 2 - #4 POWER
 1 - #4 GROUND

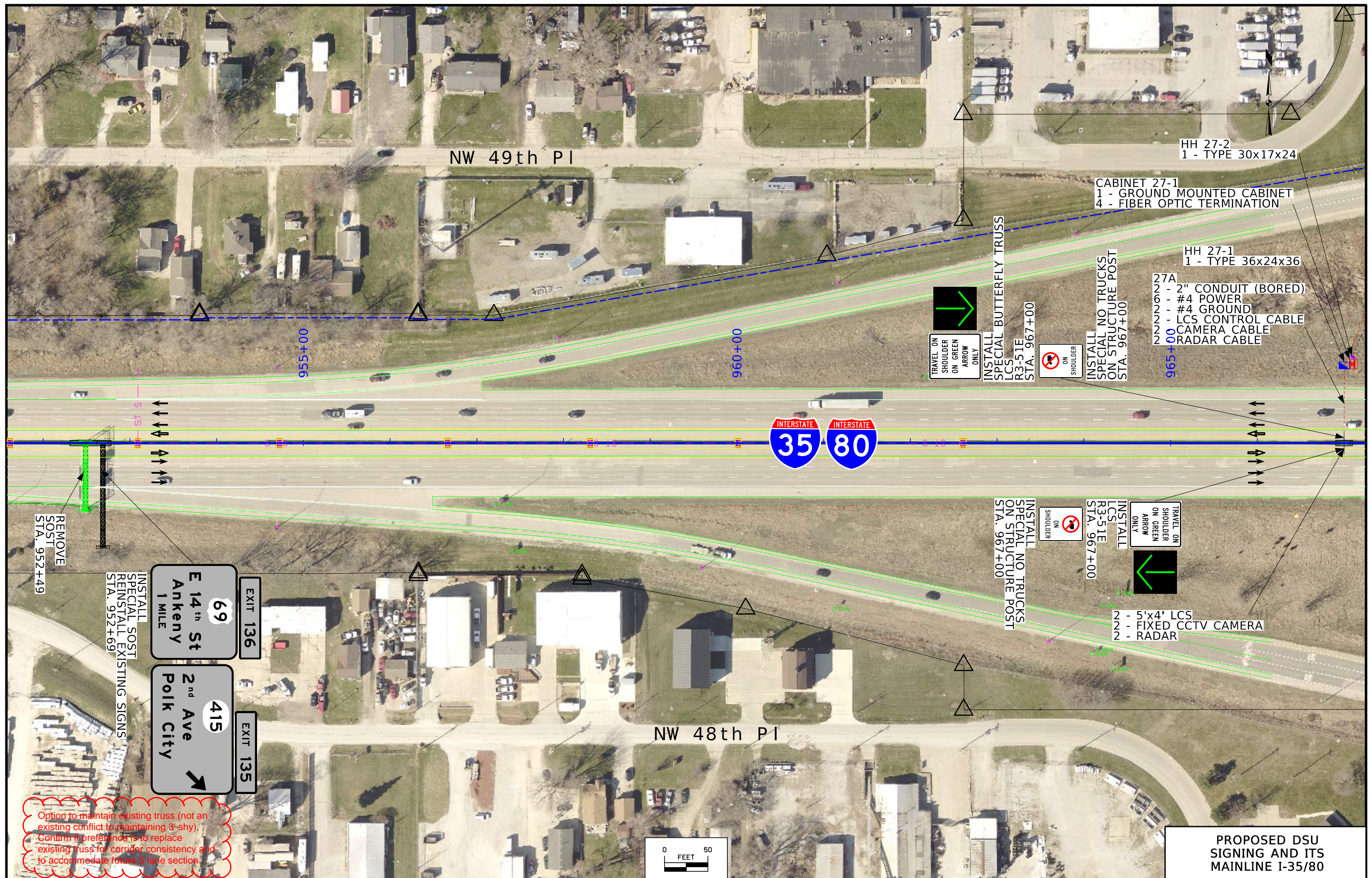
HH 25-2
 1- TYPE 30x17x24



**PROPOSED DSU
 SIGNING AND ITS
 MAINLINE I-35/80**



**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**



HH 27-2
1 - TYPE 30x17x24

CABINET 27-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

HH 27-1
1 - TYPE 36x24x36

27A
- 2" CONDUIT (BORED)
- #4 POWER
- #4 GROUND
- LCS CONTROL CABLE
- CAMERA CABLE
- RADAR CABLE

INSTALL
SPECIAL BUTTERFLY TRUSS
LCS
R3-5.1E
STA. 967+00

INSTALL NO TRUCKS
SPECIAL NO TRUCKS
ON STRUCTURE POST
STA. 967+00

INSTALL
SPECIAL NO TRUCKS
SPECIAL NO TRUCKS
ON STRUCTURE POST
STA. 967+00

INSTALL
LCS
R3-5.1E
STA. 967+00

TRAVEL ON
SHOULDER
ON GREEN
ARROW
ONLY

2 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

REMOVE
SOST
STA. 952+49

INSTALL
SPECIAL SOST
REINSTALL EXISTING SIGNS
STA. 952+69

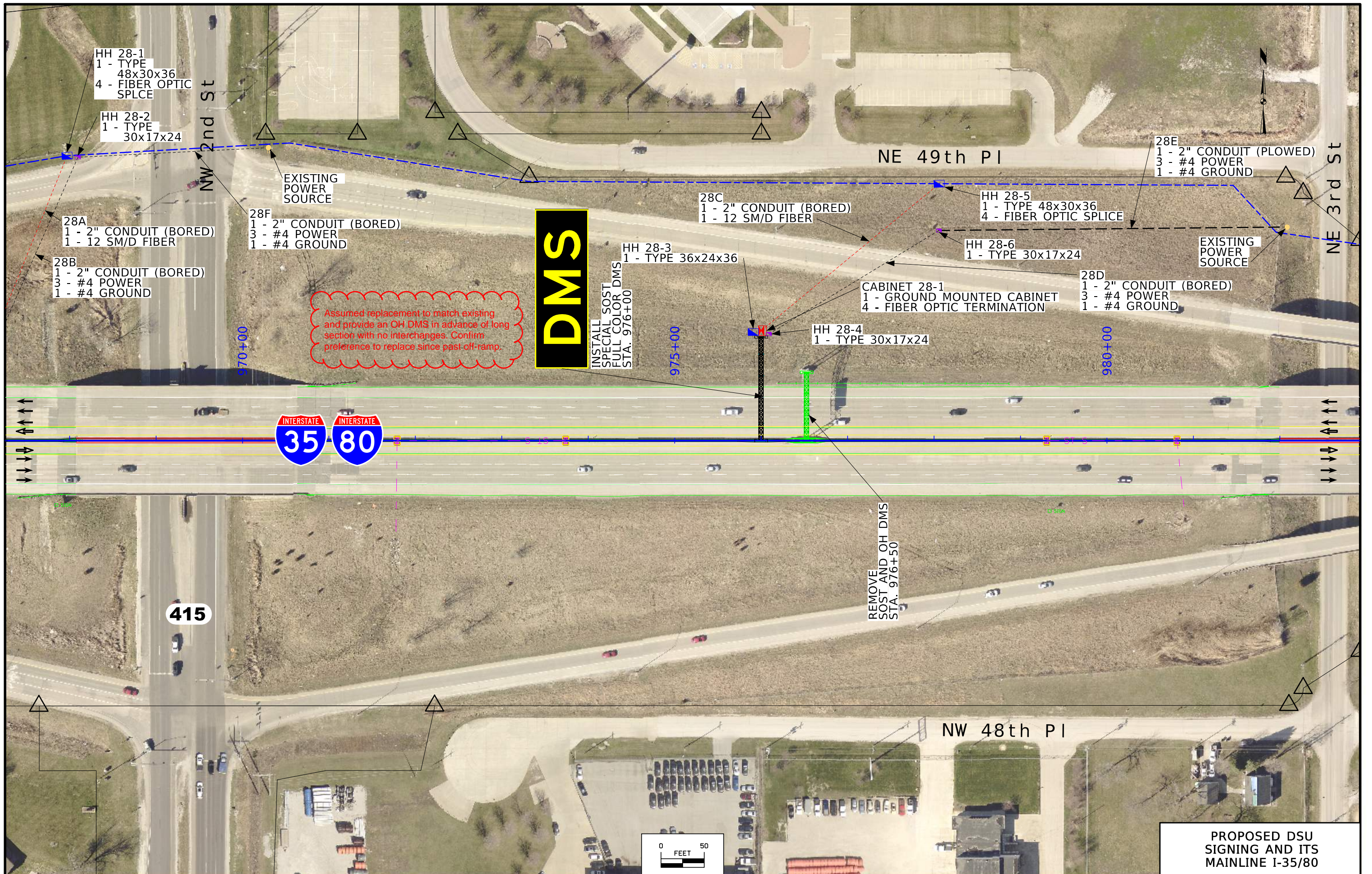
EXIT 136
69
E 14th St
Ankeny
1 Mile

EXIT 135
415
2nd Ave
Polk City

Option to maintain existing truss (not an existing conflict to maintaining 3'-shy). Confirm if preference is to replace existing truss for corridor consistency and to accommodate future 5 lane section.



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



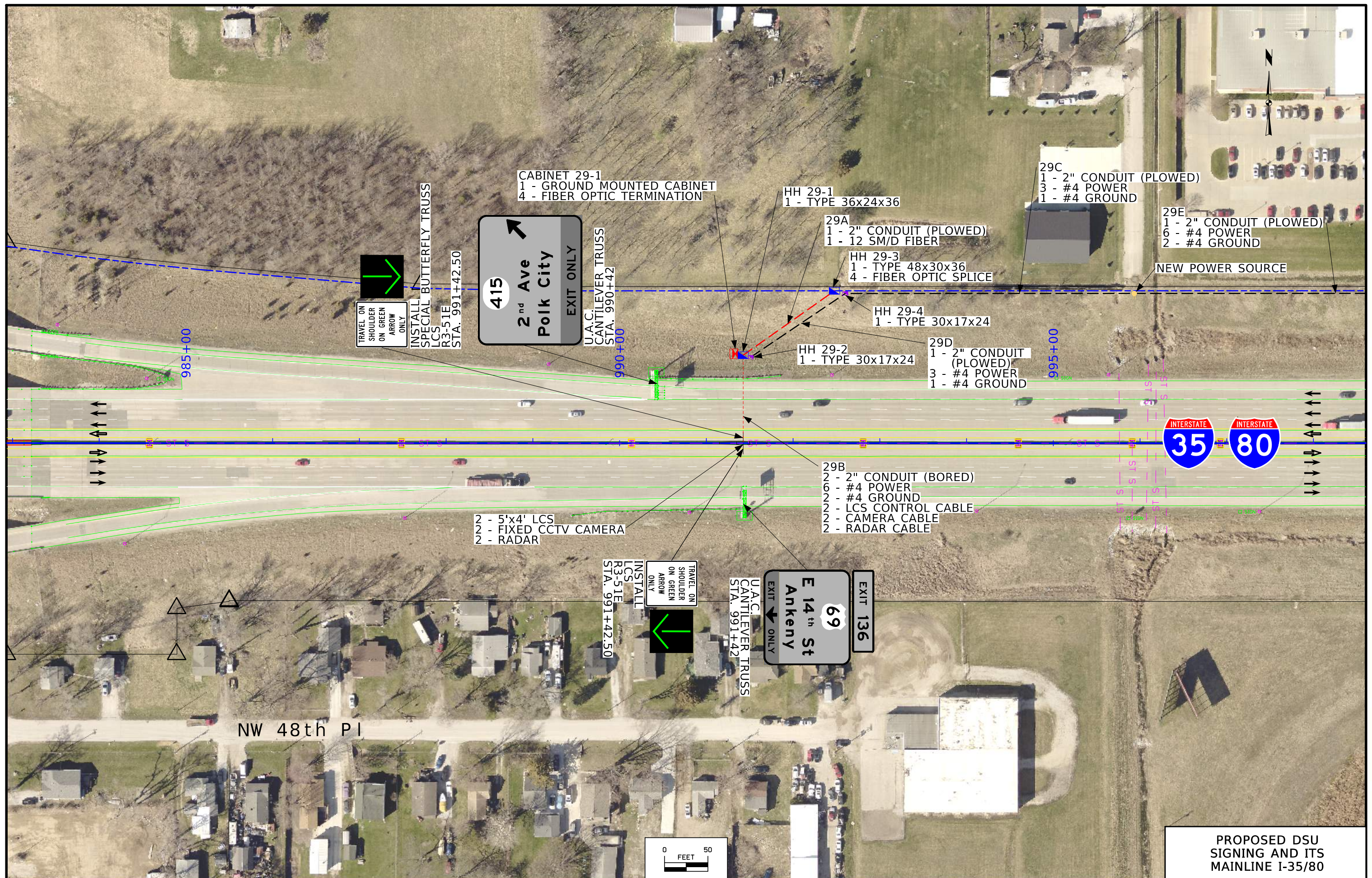
Assumed replacement to match existing and provide an OH DMS in advance of long section with no interchanges. Confirm preference to replace since past off-ramp.

DMS
INSTALL SOST SPECIAL SOST FULL COLOR DMS STA. 976+00

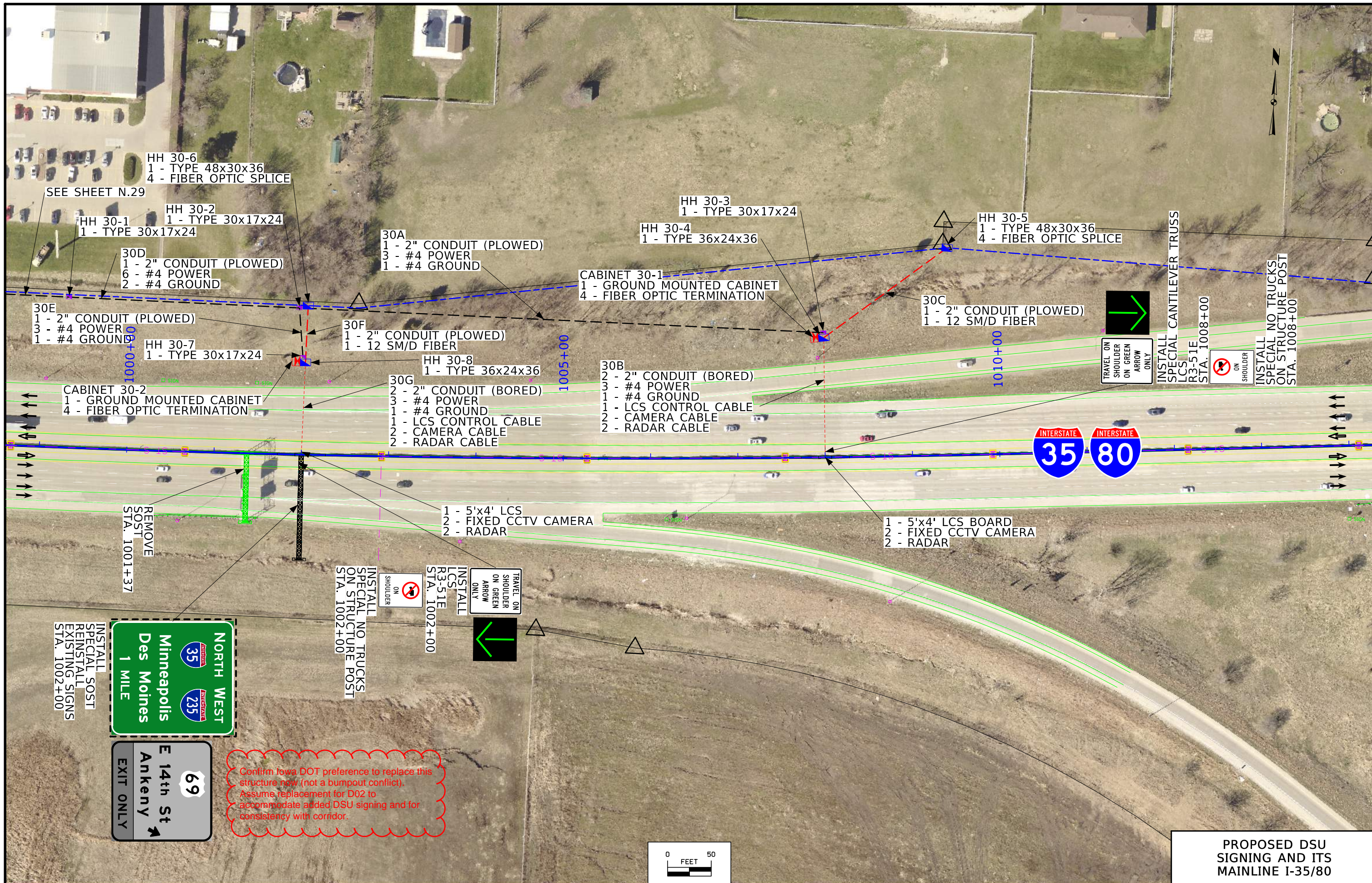
REMOVE SOST AND OH DMS STA. 976+50



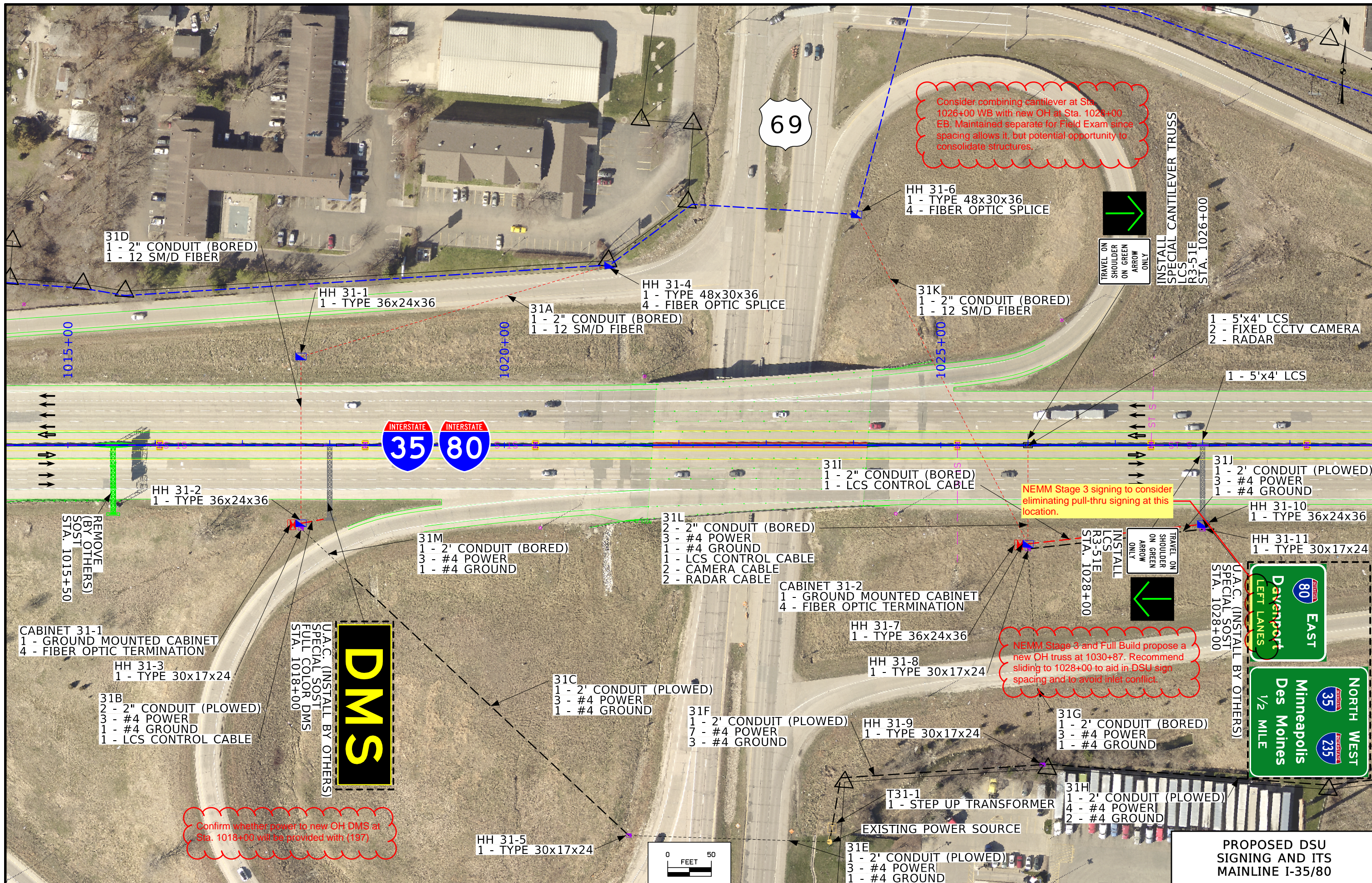
PROPOSED DSU SIGNING AND ITS MAINLINE I-35/80



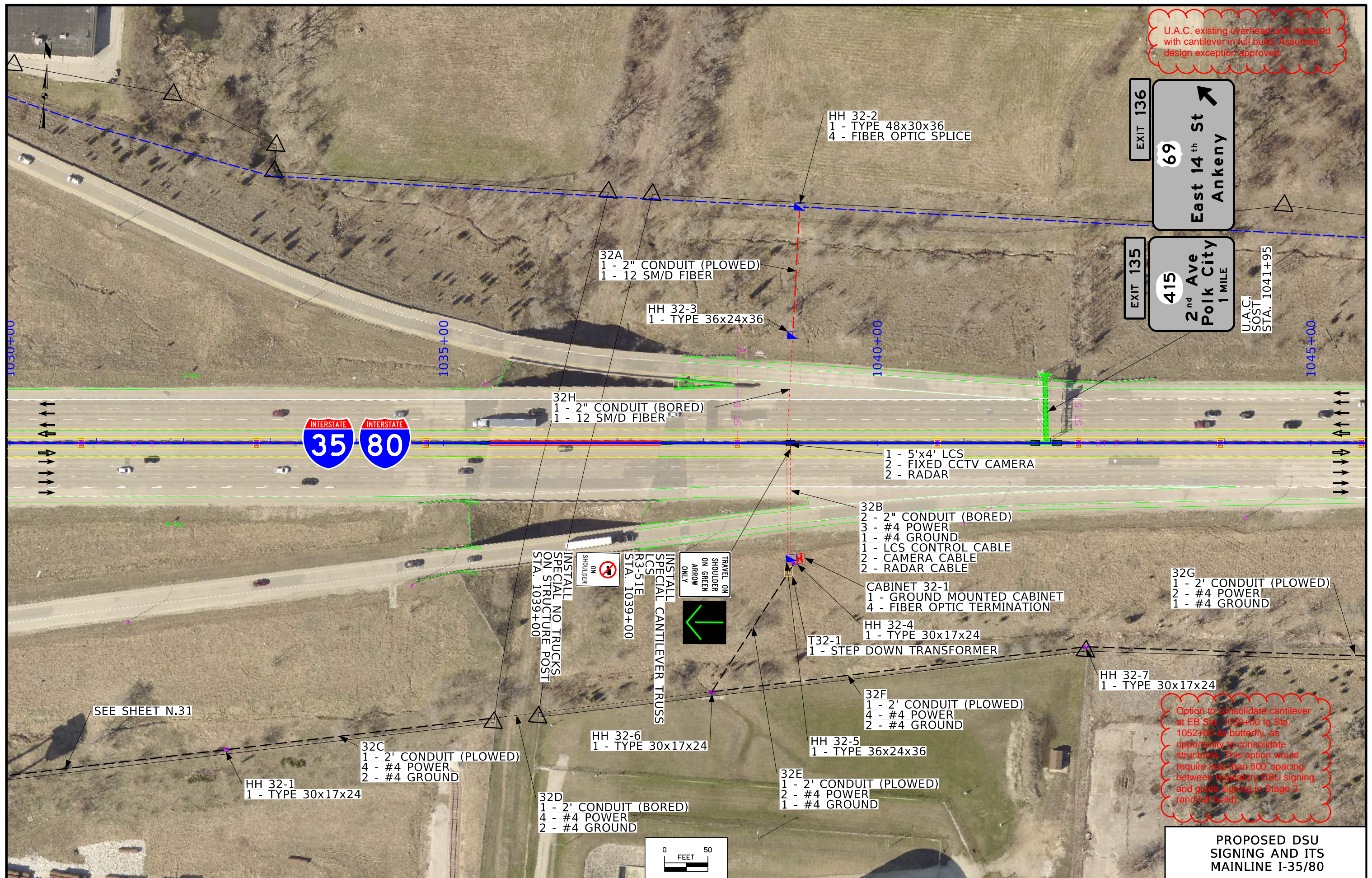
**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**



**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**

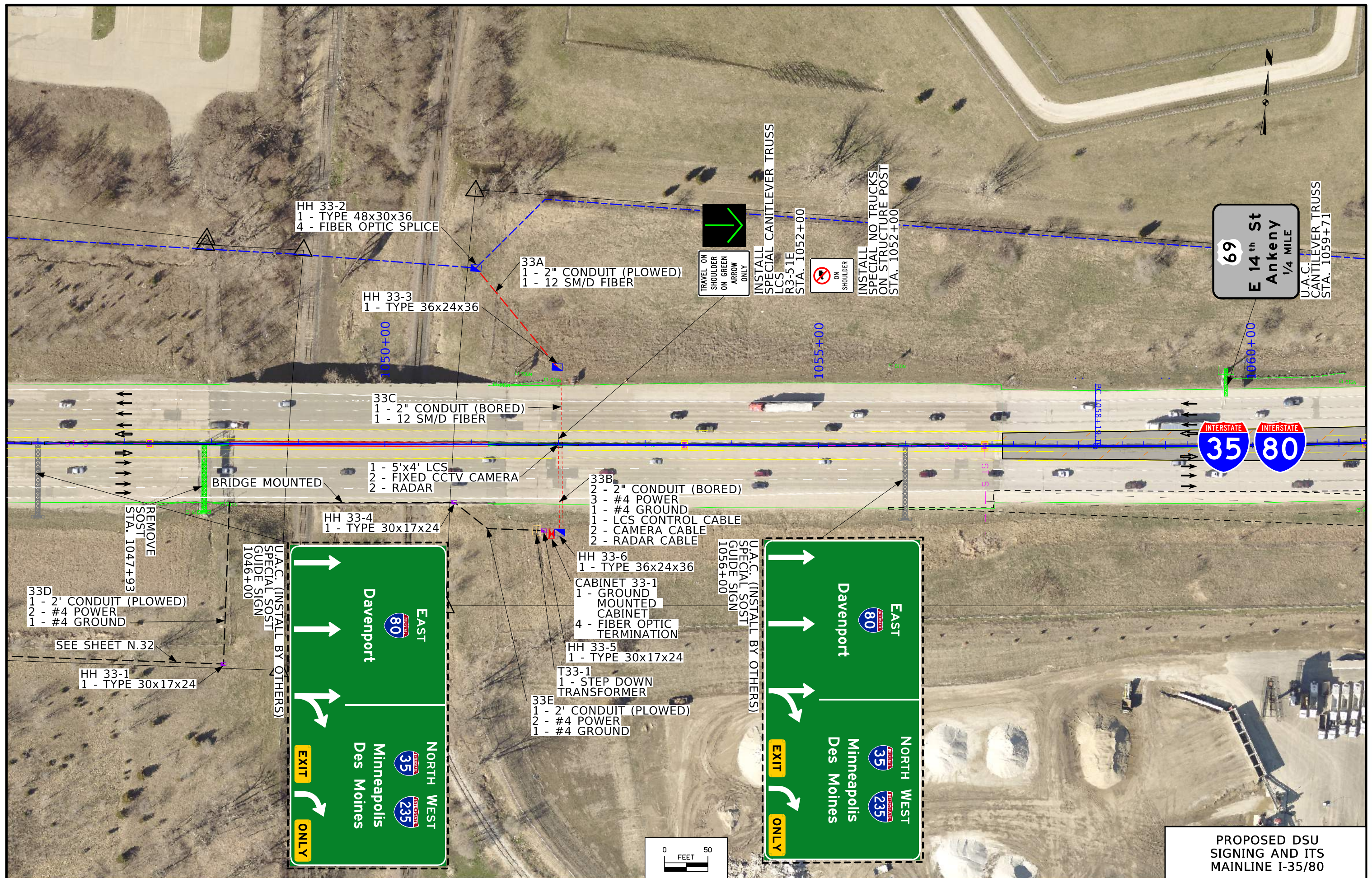


U.A.C. existing overhead until replaced with cantilever in full build. Assumes design exception approved.



Option to consolidate cantilever at EB Sta. 1039+00 to Sta. 1052+00 as butterfly, as opportunity to consolidate structures. This option would require less than 800' spacing between regulatory DSU signing and guide signing in Stage 3 (and full build).

PROPOSED DSU SIGNING AND ITS MAINLINE I-35/80



HH 33-2
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

HH 33-3
1 - TYPE 36x24x36

33A
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

33C
1 - 2" CONDUIT (BORED)
1 - 12 SM/D FIBER

1 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

HH 33-4
1 - TYPE 30x17x24

33B
2 - 2" CONDUIT (BORED)
3 - #4 POWER
1 - #4 GROUND
1 - LCS CONTROL CABLE
2 - CAMERA CABLE
2 - RADAR CABLE

HH 33-6
1 - TYPE 36x24x36

CABINET 33-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

HH 33-5
1 - TYPE 30x17x24

T33-1
1 - STEP DOWN TRANSFORMER

33E
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

33D
1 - 2" CONDUIT (PLOWED)
2 - #4 POWER
1 - #4 GROUND

SEE SHEET N.32

HH 33-1
1 - TYPE 30x17x24

INSTALL SPECIAL CANTILEVER TRUSS
LCS R3-5 IE
STA. 1052+00

INSTALL NO TRUCKS ON STRUCTURE POST
STA. 1052+00

69
E 14th St
Ankeny
1/4 MILE

U.A.C. CANTILEVER TRUSS
STA. 1059+71

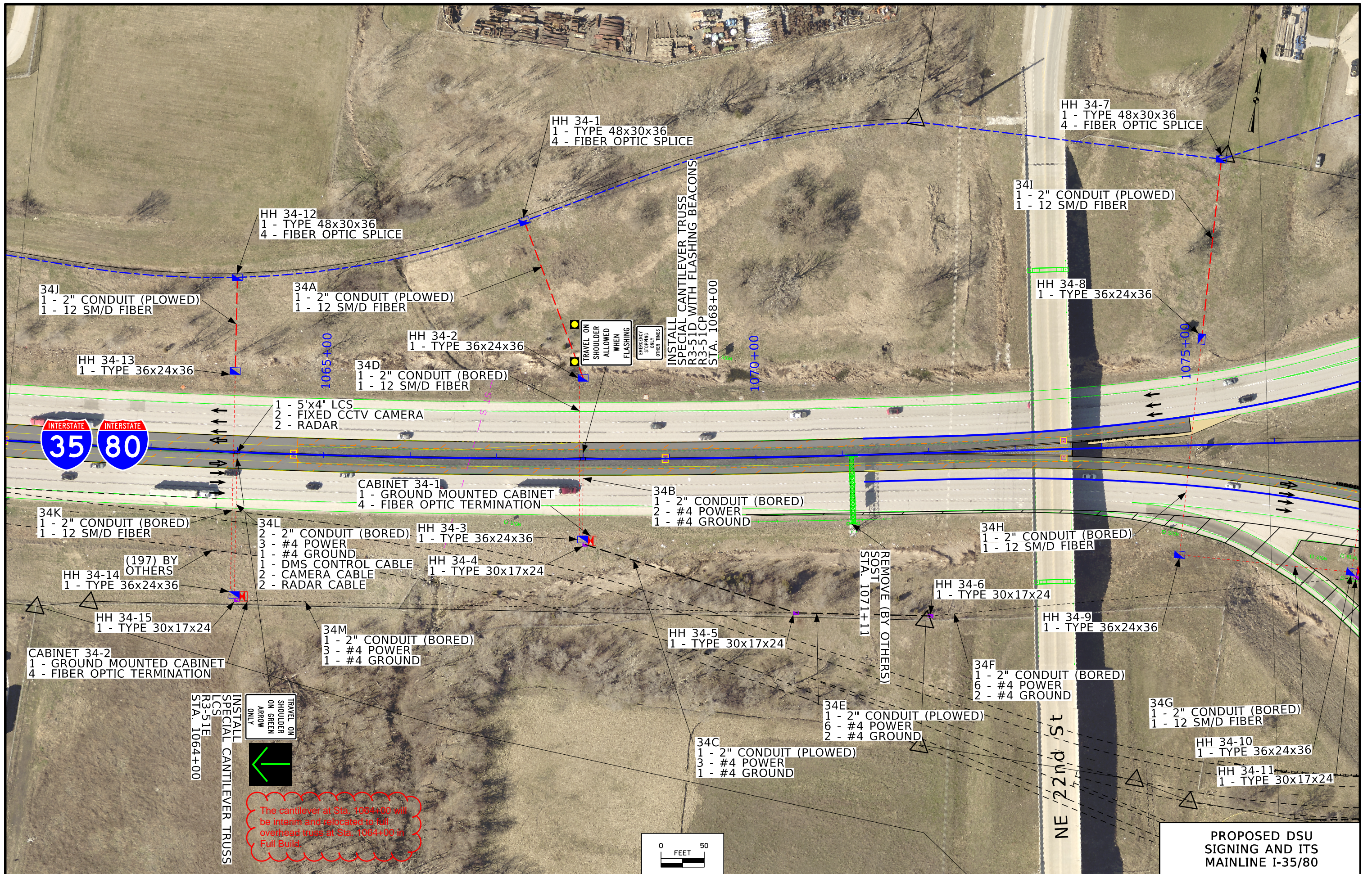
REMOVE SOST
STA. 1047+93

U.A.C. (INSTALL BY OTHERS)
SPECIAL SOST GUIDE SIGN
1046+00

U.A.C. (INSTALL BY OTHERS)
SPECIAL SOST GUIDE SIGN
1056+00



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80





TRAVEL ON SHOULDER BEGINS 1/2 MILE

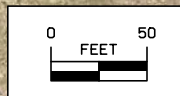
ON SHOULDER

INSTALL R3-52C SPECIAL NO. TRUCKS STA. 2091+00

DO NOT DRIVE ON SHOULDER

INSTALL R4-17 STA. 2078+00

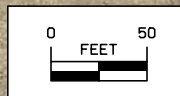
PROPOSED DSU SIGNING AND ITS MAINLINE I-35/80



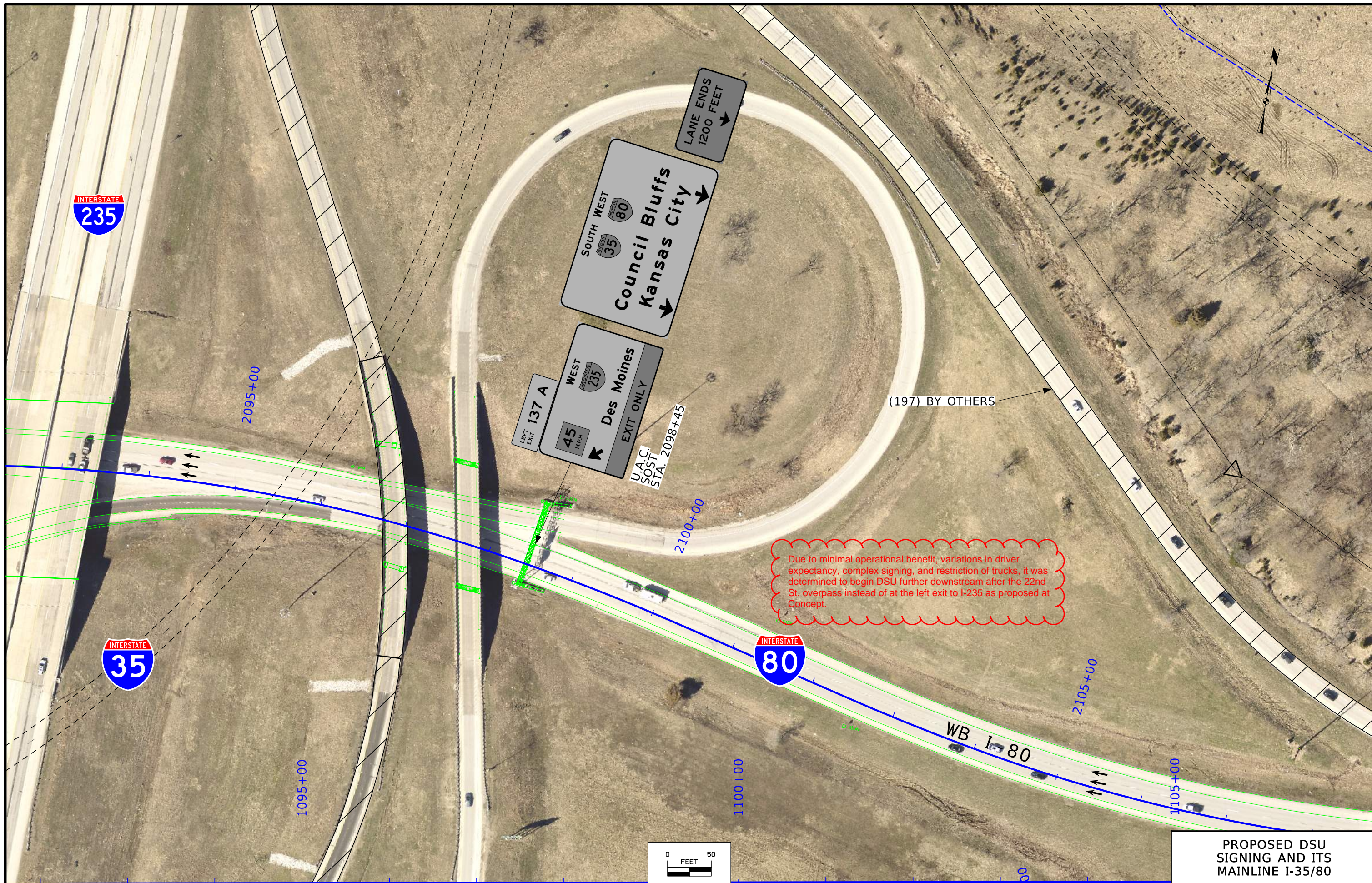
FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT\HNTB	POLK COUNTY	PROJECT NUMBER IMX-080-3(315)128--02-77	SHEET NUMBER N.35
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**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT/HNTB	POLK COUNTY	PROJECT NUMBER IMX-080-3(315)128--02-77	SHEET NUMBER N.36
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Due to minimal operational benefit, variations in driver expectancy, complex signing, and restriction of trucks, it was determined to begin DSU further downstream after the 22nd St. overpass instead of at the left exit to I-235 as proposed at Concept.

**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**

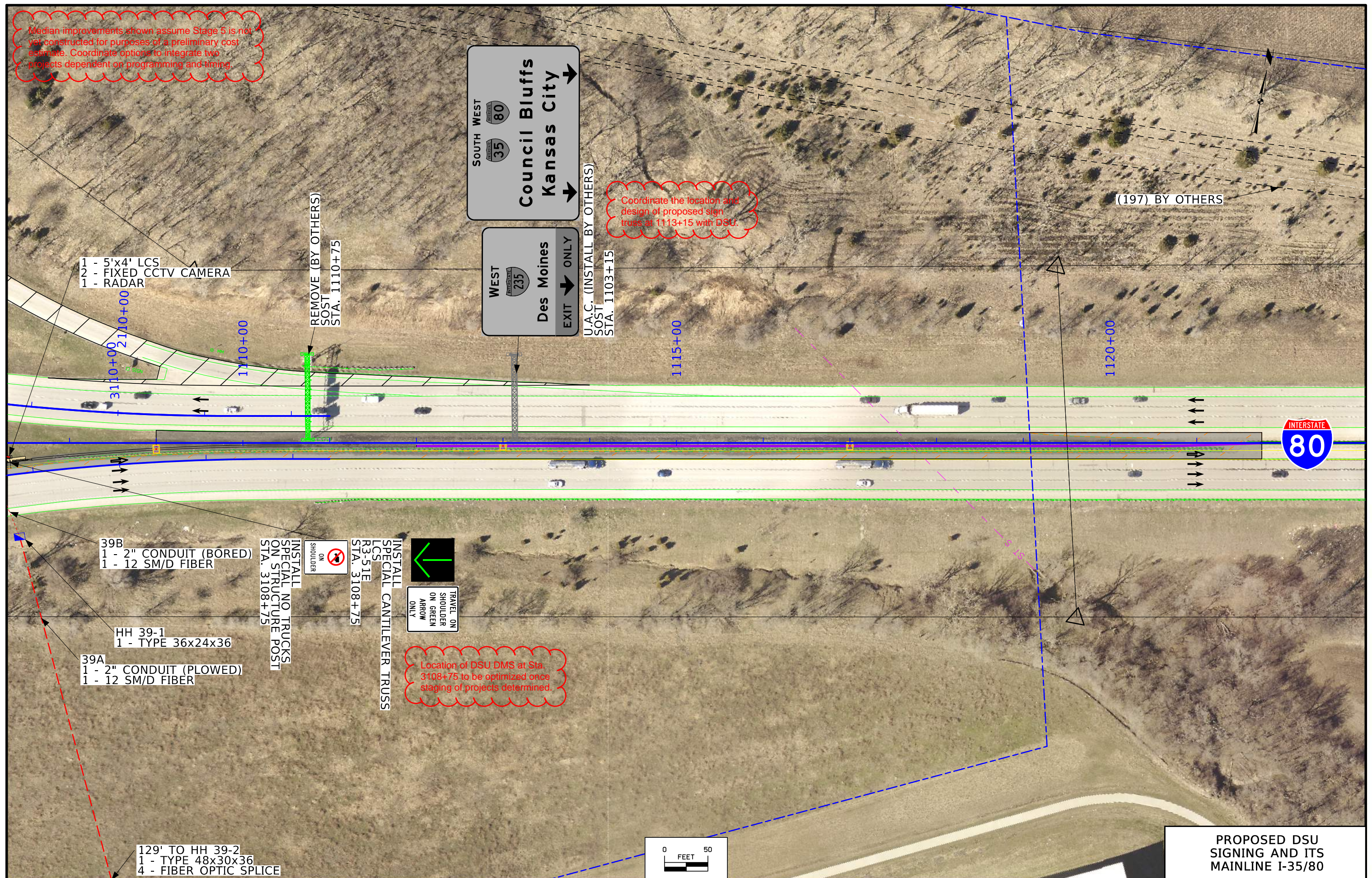


**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**

Median improvements shown assume Stage 5 is not yet constructed for purposes of a preliminary cost estimate. Coordinate options to integrate two projects dependent on programming and timing.

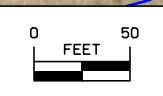
Coordinate the location and design of proposed sign truss at 1113+15 with DSU.

Location of DSU DMS at Sta. 3108+75 to be optimized once staging of projects determined.

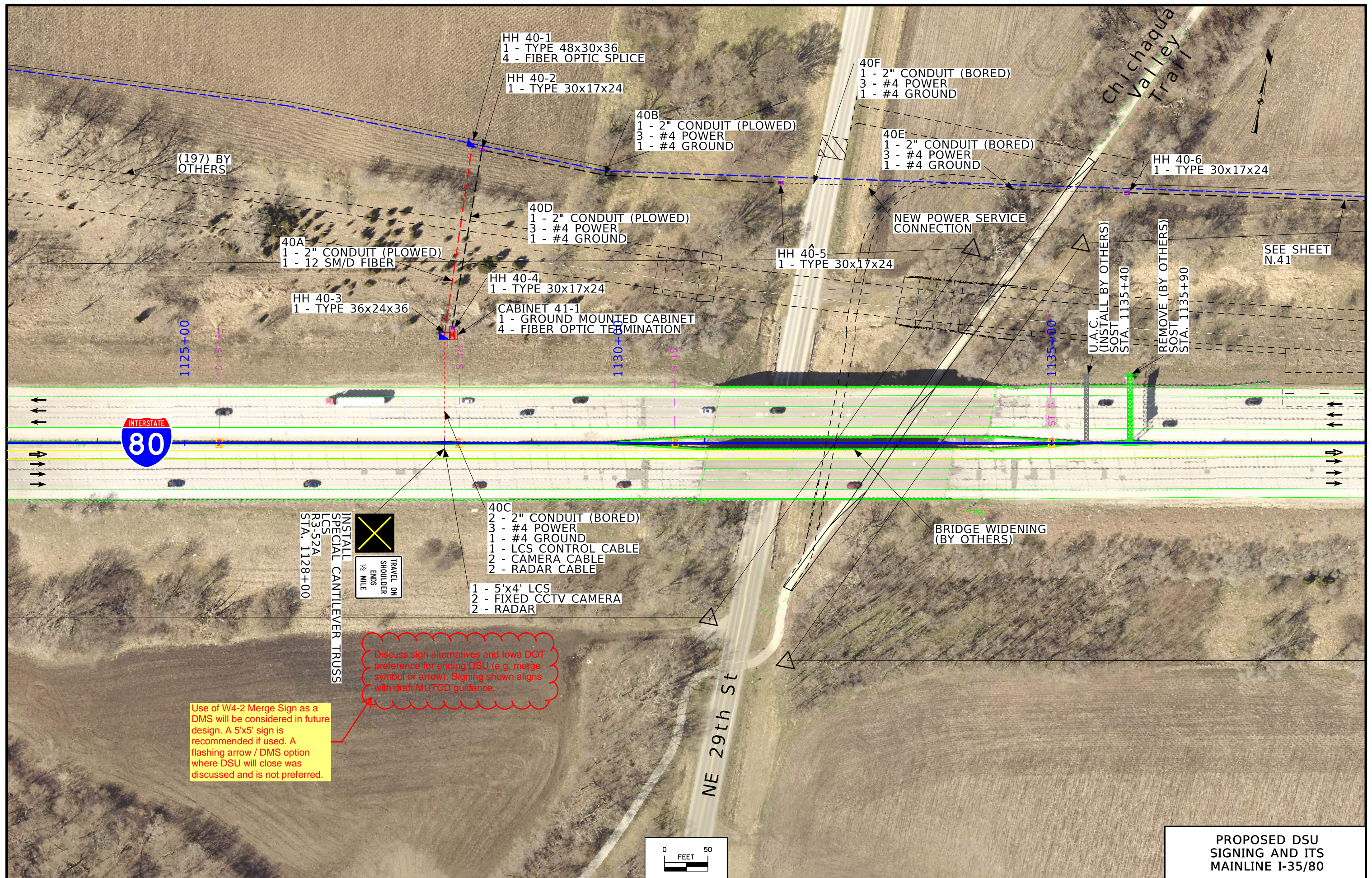


SOUTH WEST
Council Bluffs
Kansas City

WEST
Des Moines
EXIT ONLY



**PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80**



INSTALL
SPECIAL
CANTILEVER TRUSS
LCS
R3-52A
STA. 1128+00

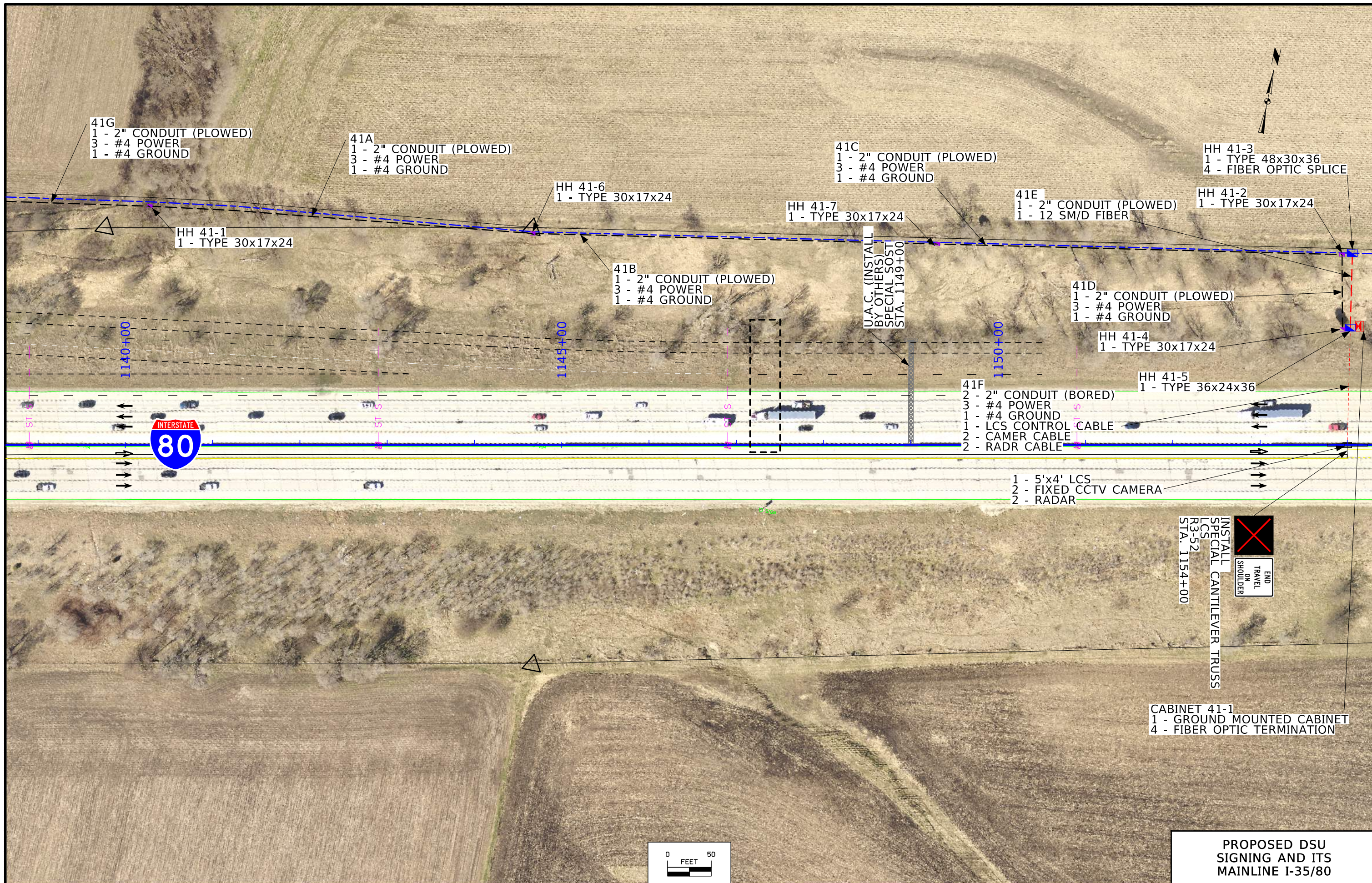
TRAVEL ON
SHOULDER
ENDS
1/2 MILE

Discuss sign alternatives and Iowa DOT preference for ending DSU (e.g. merge symbol or arrow). Signing shown aligns with draft MUTCD guidance.

Use of W4-2 Merge Sign as a DMS will be considered in future design. A 5'x5' sign is recommended if used. A flashing arrow / DMS option where DSU will close was discussed and is not preferred.



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



41G
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

41A
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

HH 41-6
1 - TYPE 30x17x24

41C
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

HH 41-3
1 - TYPE 48x30x36
4 - FIBER OPTIC SPLICE

HH 41-1
1 - TYPE 30x17x24

HH 41-7
1 - TYPE 30x17x24

41E
1 - 2" CONDUIT (PLOWED)
1 - 12 SM/D FIBER

HH 41-2
1 - TYPE 30x17x24

41B
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

U.A.C. (INSTALL BY OTHERS) SPECIAL SOST STA. 1149+00

41D
1 - 2" CONDUIT (PLOWED)
3 - #4 POWER
1 - #4 GROUND

HH 41-4
1 - TYPE 30x17x24

1140+00

1145+00

1150+00

41F
2 - 2" CONDUIT (BORED)
3 - #4 POWER
1 - #4 GROUND
1 - LCS CONTROL CABLE
2 - CAMER CABLE
2 - RADR CABLE

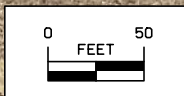
HH 41-5
1 - TYPE 36x24x36

1 - 5'x4' LCS
2 - FIXED CCTV CAMERA
2 - RADAR

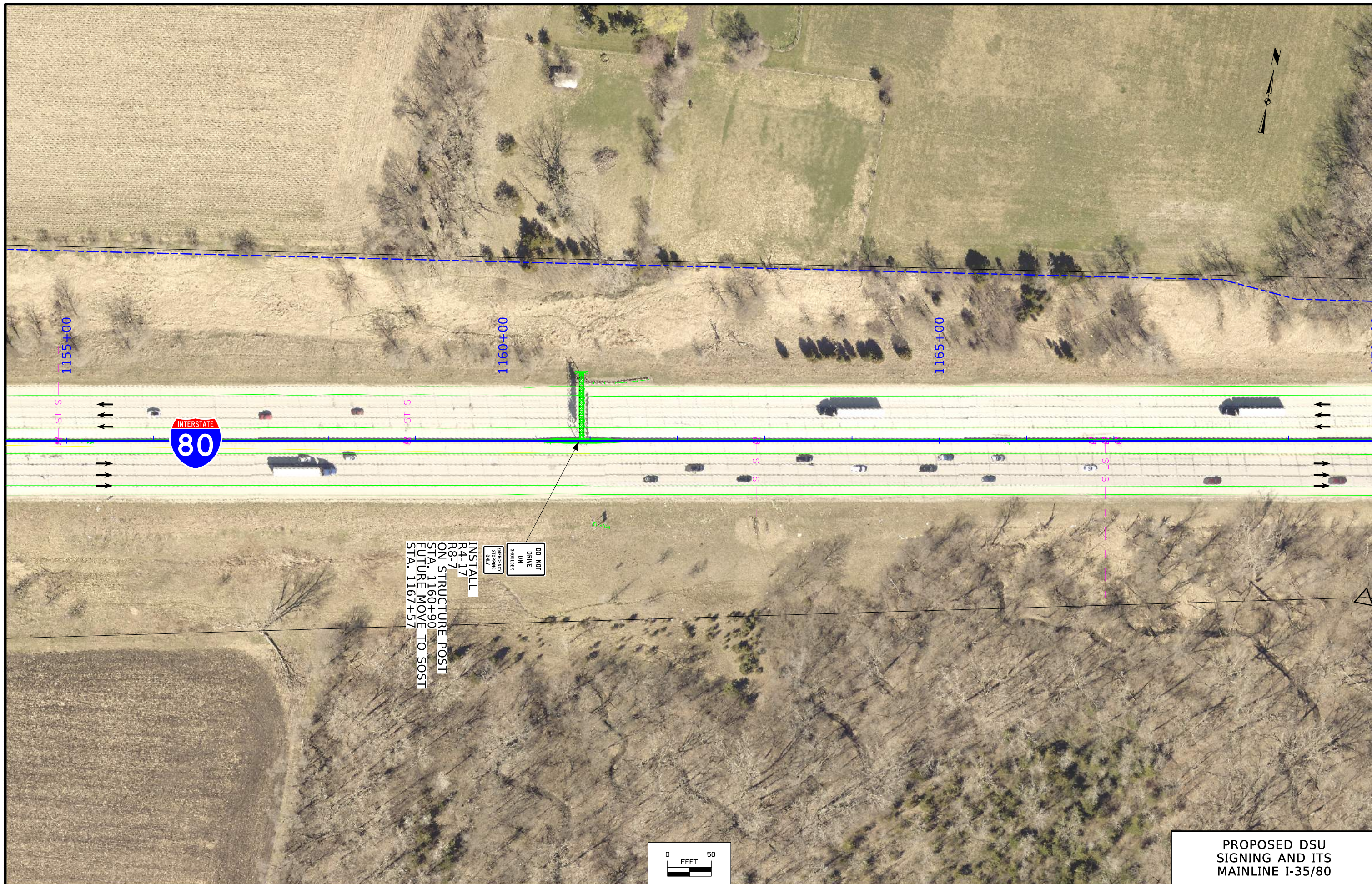
INSTALL SPECIAL CANTILEVER TRUSS R3-52 STA. 1154+00



CABINET 41-1
1 - GROUND MOUNTED CABINET
4 - FIBER OPTIC TERMINATION

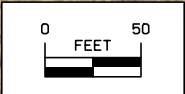


PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80

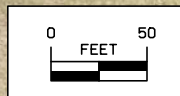
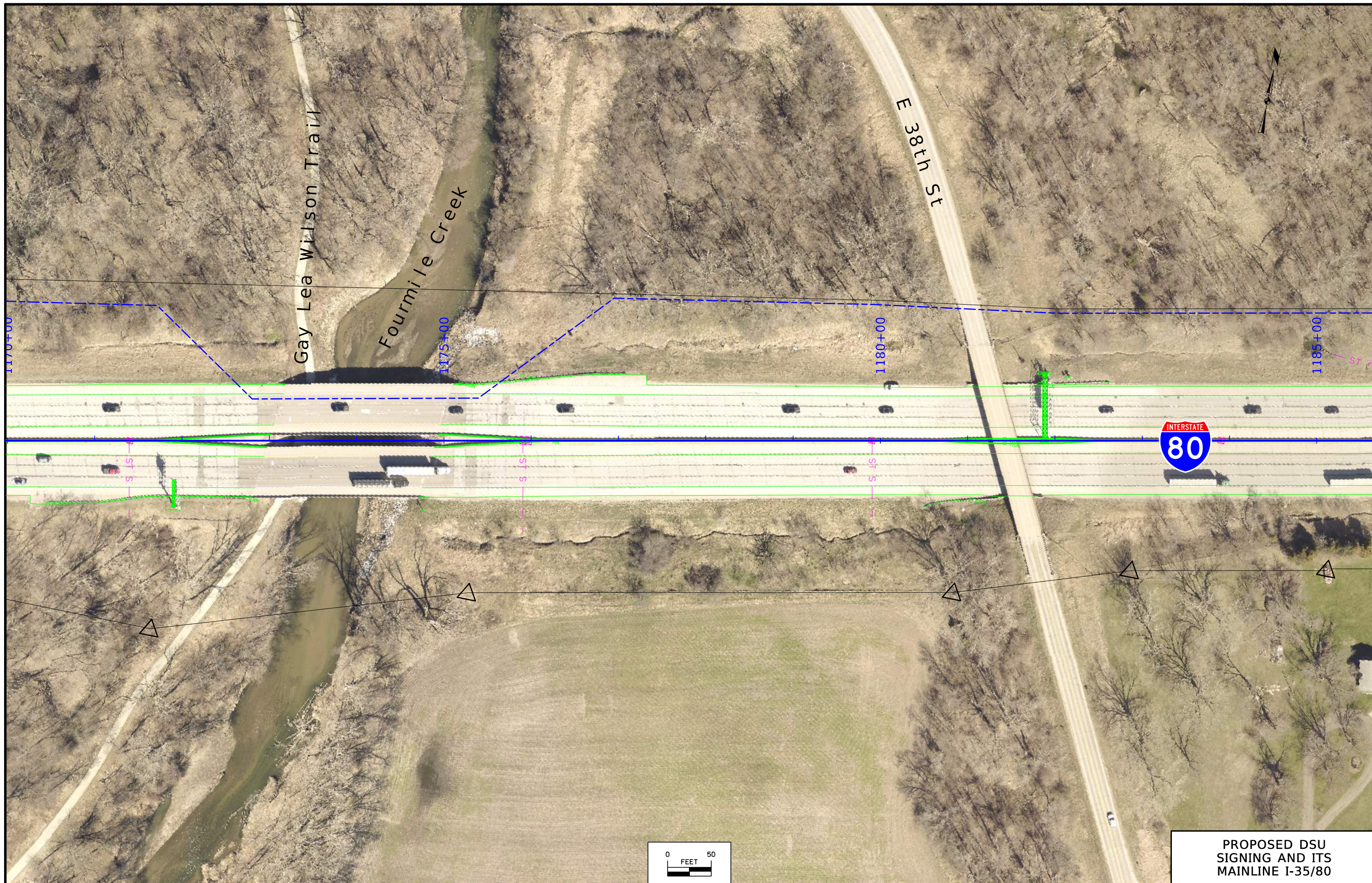


DO NOT
DRIVE
ON
SHOULDER
EMERGENCY
STOPPING
ONLY

INSTALL
R4-17
R8-7
ON STRUCTURE POST
STA. 1160+90
FUTURE MOVE TO SOST
STA. 1167+57



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80



PROPOSED DSU
SIGNING AND ITS
MAINLINE I-35/80

CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(8)	Behind Curb Cut
(42)	Engineering Fabric	(6)	Granular
(8)	Flooded Backfill	(13)	Granular Back Fill
(92)	Macadam Stone	(48)	Rock Undercut
(20)	Modified	(8)	Shoulder Earth Fill
(12)	Plowing Shaping	(2)	Side Slopes
(14)	Porous Backfill	(226)	Side Slopes Dressing
(8)	Revetment Class A	Substrata	
(6)	Revetment Class B	(128)	Boulder Substrata
(62)	Revetment Class C	(209)	Boulder Removed Substrata
(188)	Revetment Class D	(48)	Broken Weathered Substrata
(28)	Revetment Class E	(210)	Broken Weathered Removed Substrata
(12)	Shoulder Special Backfill	(3)	Core Out Substrata
(12)	Special Backfill	(195)	Core Out Remove and Replace Substrata
(20)	Subbase	(115)	Core Out Remove Only Substrata
(20)	Subbase Lower	(203)	Existing Pavement Substrata
(20)	Subbase Upper	(200)	Existing Pavement Remove and Replace Substrata
(118)	Subgrade Treatment	(184)	Existing Pavement Remove Only Substrata
Asphalt			
(207)	HMA Base Course	(6)	Loam Substrata
(207)	HMA Interim Course	(211)	Loam Removed Substrata
(207)	HMA Surface Course	(80)	Rock Substrata
Concrete			
(0)	Barrier Concrete	(212)	Rock Removed Substrata
(0)	Barrier Concrete Footing	(4)	Select Sand Substrata
(0)	Curb Gutter	(214)	Select Sand Removed Substrata
(48)	Flowable Mortar	(3)	Shale Substrata
(0)	Median Concrete	(215)	Shale Removed Substrata
(0)	PCC Pavement	(10)	Topsoil Substrata
(0)	Sidewalk	(4)	Topsoil Remove and Replace Substrata
Shoulder			
(209)	Shoulder HMA	(2)	Topsoil Remove Only Substrata
(0)	Shoulder PCC	Unsuitable / Waste	
(6)	Shoulder Granular	(3)	Unsuitable Type A
Existing			
(0)	Existing Pavement	(216)	Unsuitable Type A Removed
Structural			
(0)	Bridge	(13)	Unsuitable Type B
(21)	Guardrail	(217)	Unsuitable Type B Removed
(112)	Noise Wall	(11)	Unsuitable Type C
(112)	Noise Wall Footing	(218)	Unsuitable Type C Removed
(112)	Retaining Wall Back	(3)	Waste
(112)	Retaining Wall Back Excavate	(219)	Waste Removed
(112)	Retaining Wall Face	Trigger Switches	
(112)	Retaining Wall Front Excavate	(27)	Do Not Construct
(112)	Retaining Wall Front Footing		
(112)	Retaining Wall MSE Gutter		
(112)	Retaining Wall Reinforced Earth		

NOTES:

Text

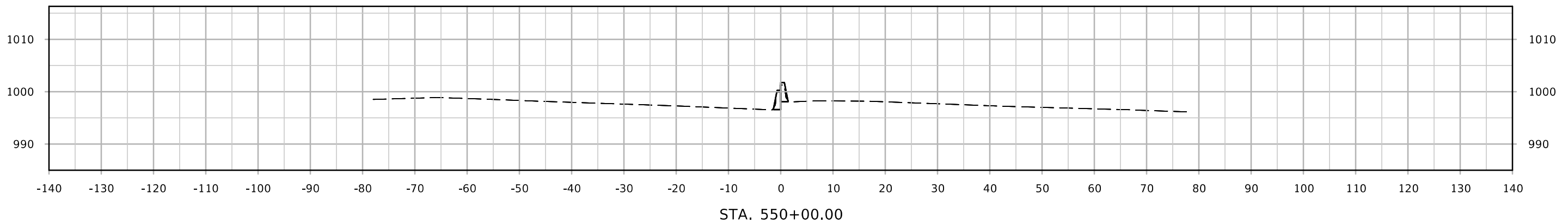
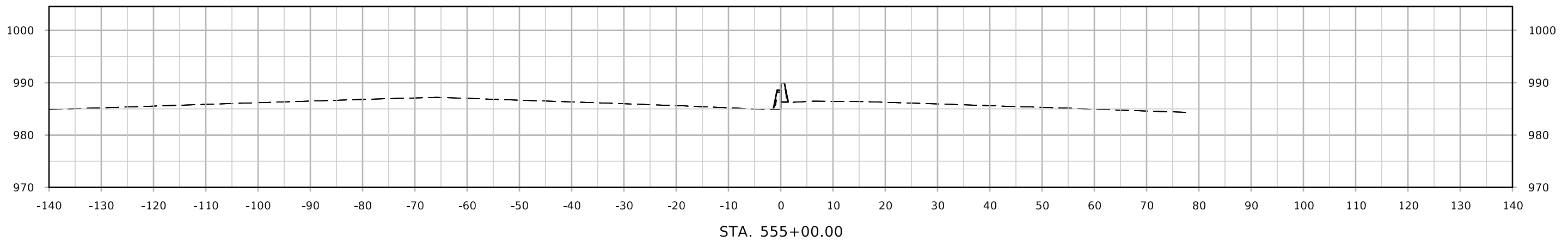
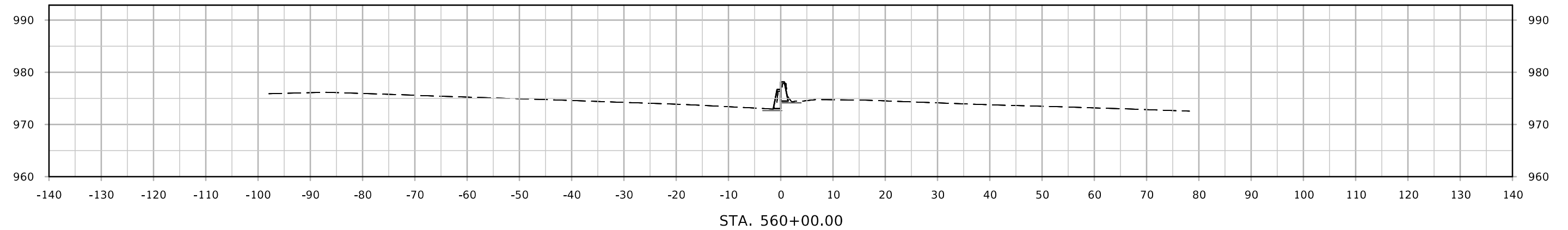
NOTES:

Text

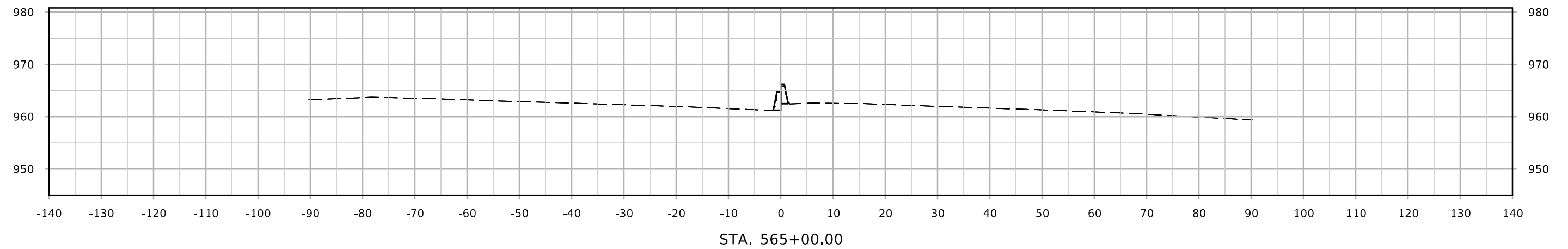
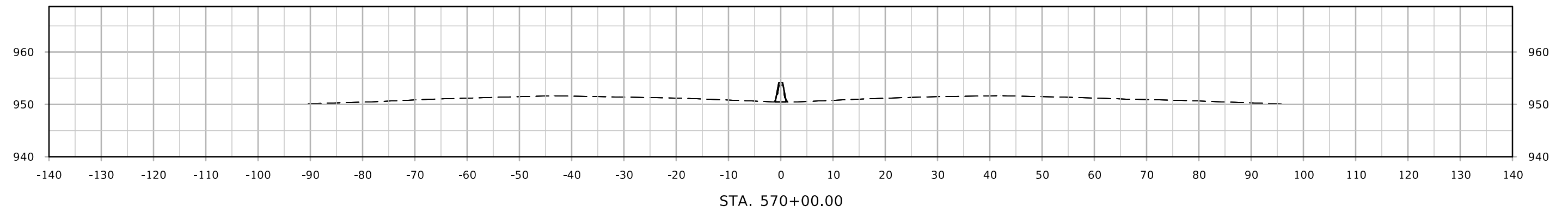
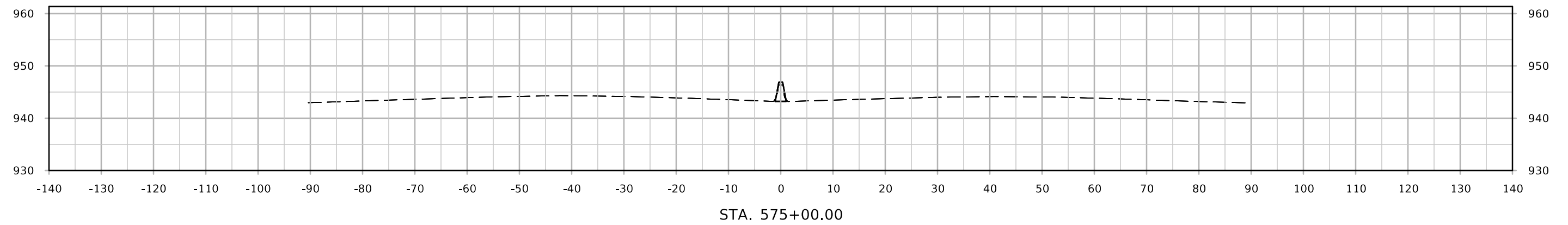
CROSS SECTIONS LEGEND AND INFORMATION SHEET

(COVERS SHEET SERIES W)

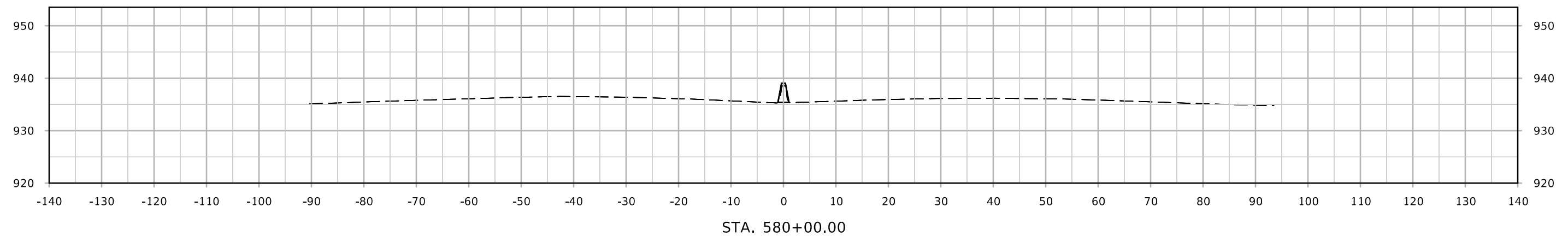
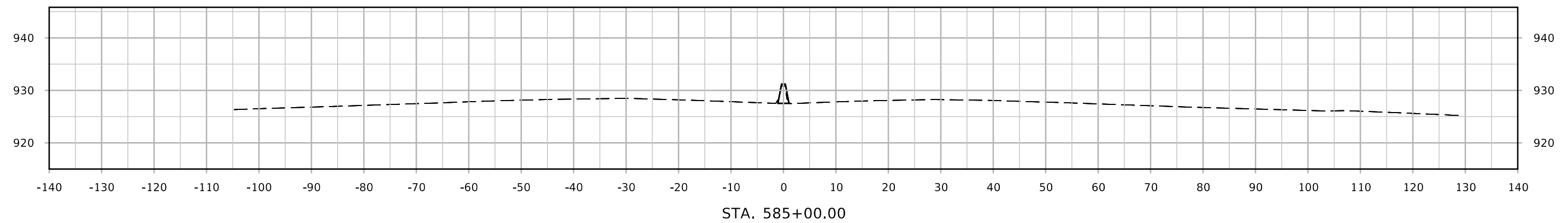
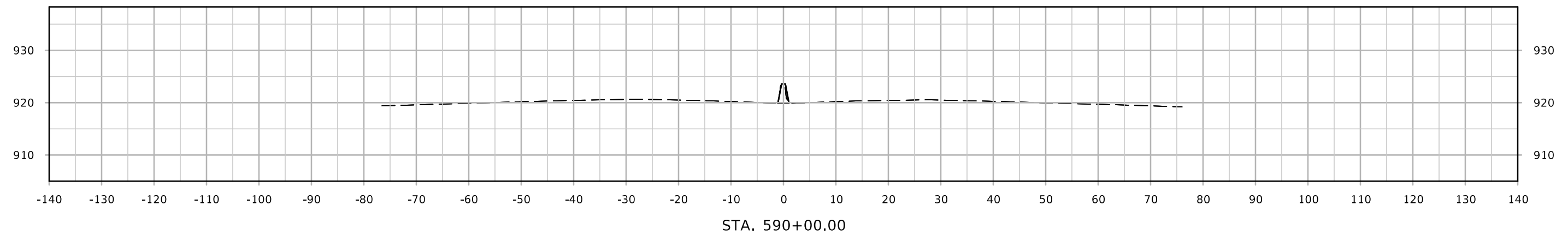
ML - I-35/80



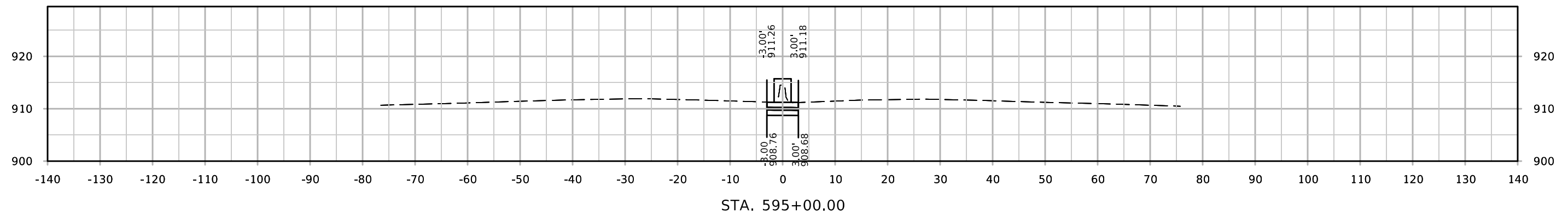
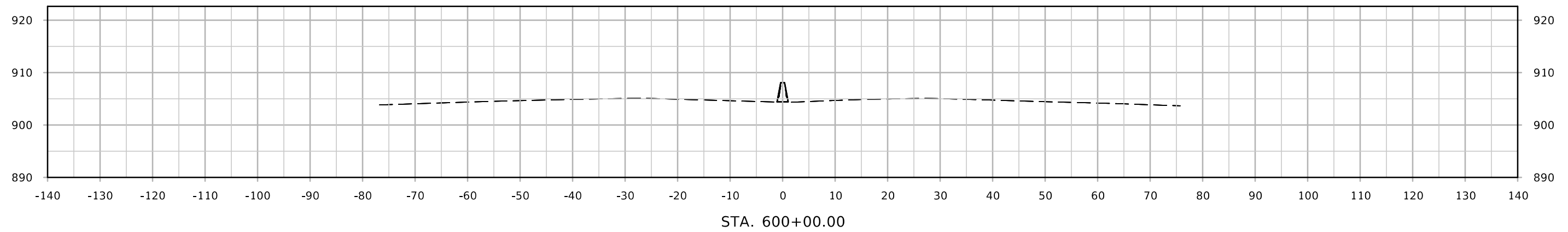
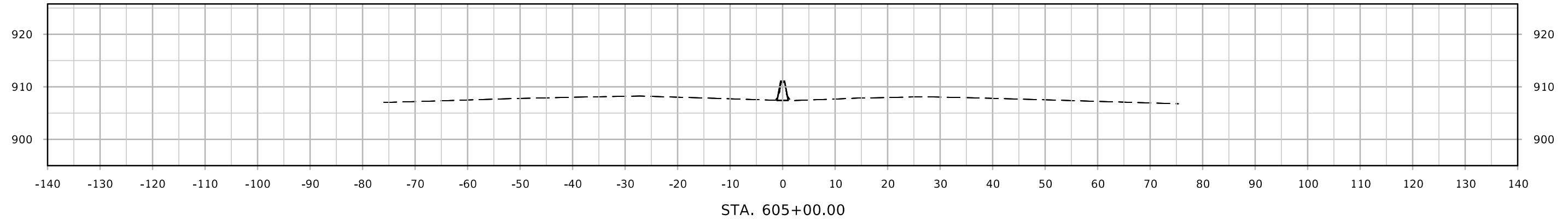
ML - I-35/80



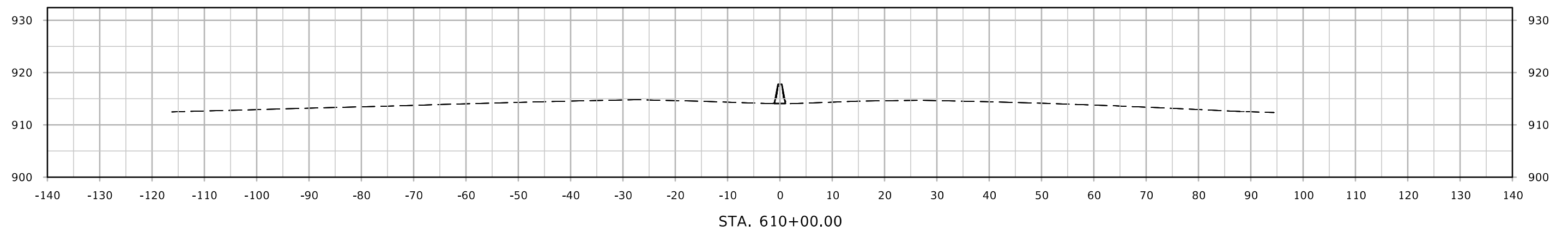
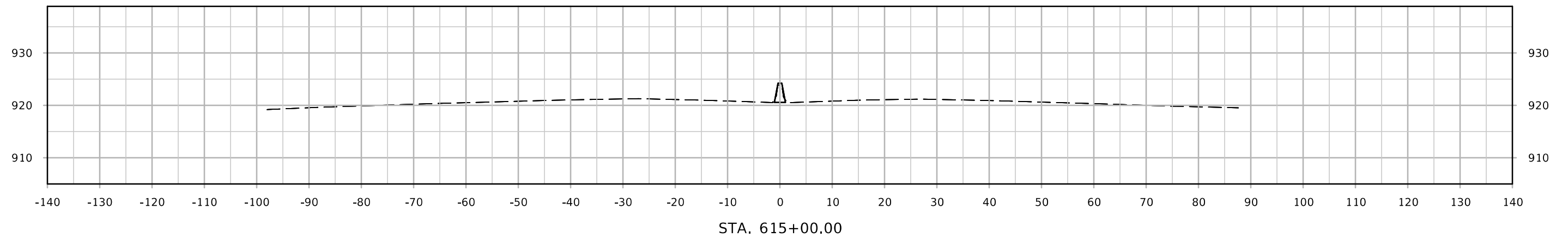
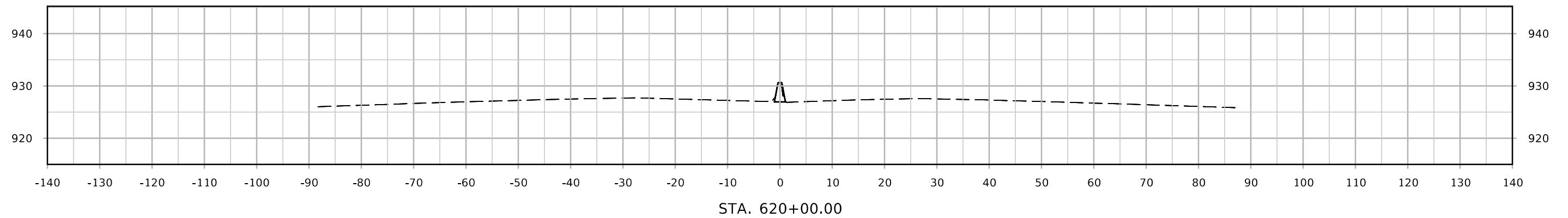
ML - I-35/80



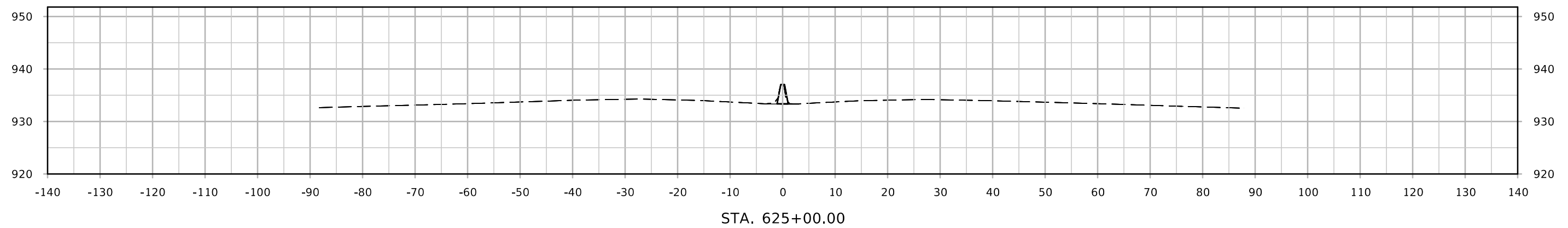
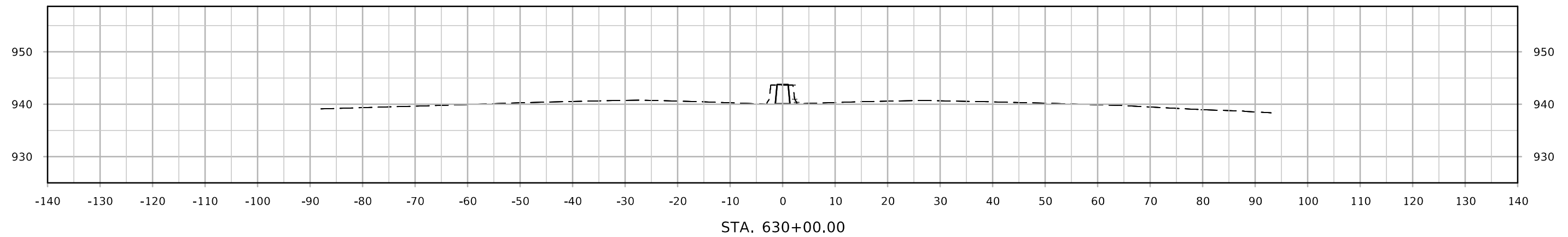
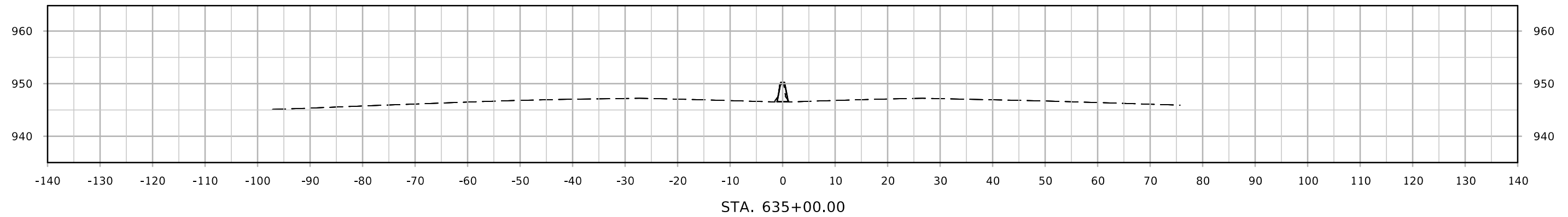
ML - I-35/80



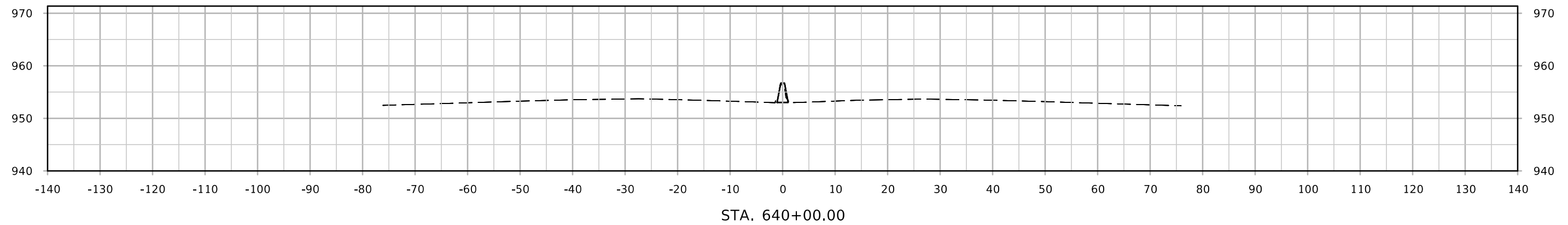
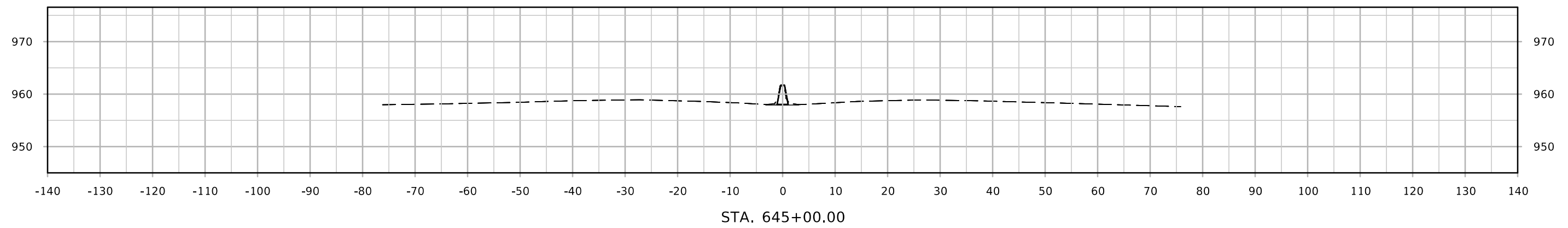
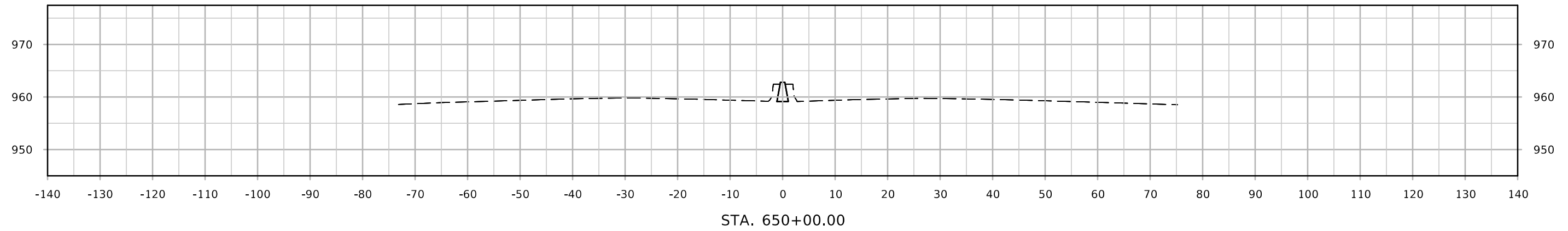
ML - I-35/80



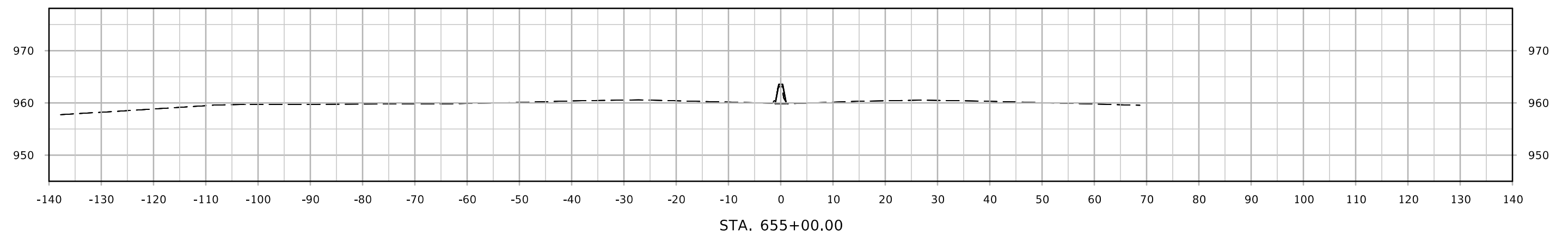
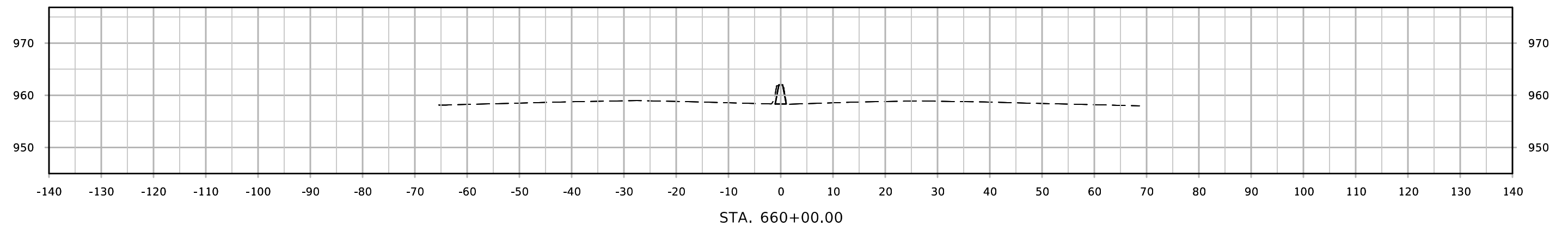
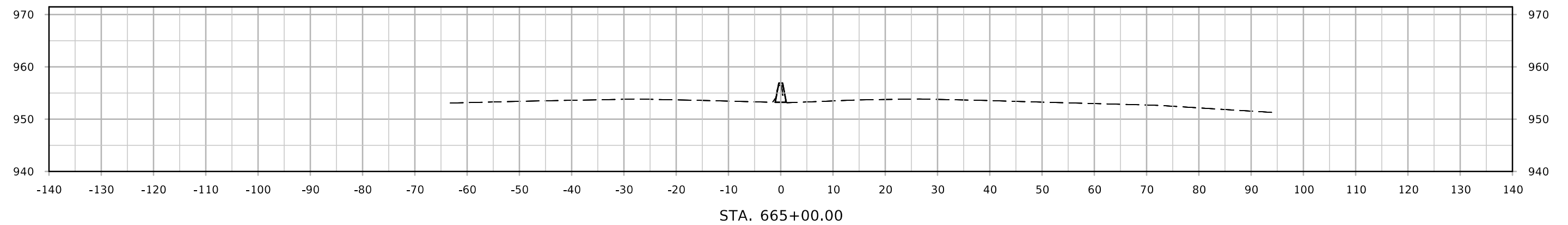
ML - I-35/80



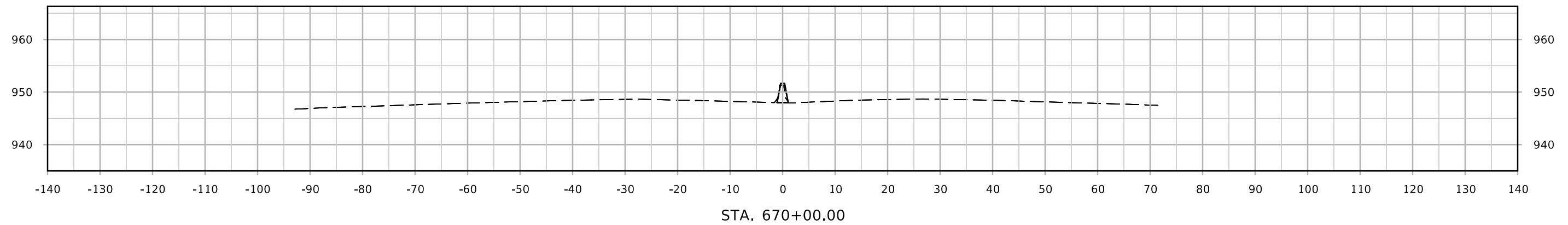
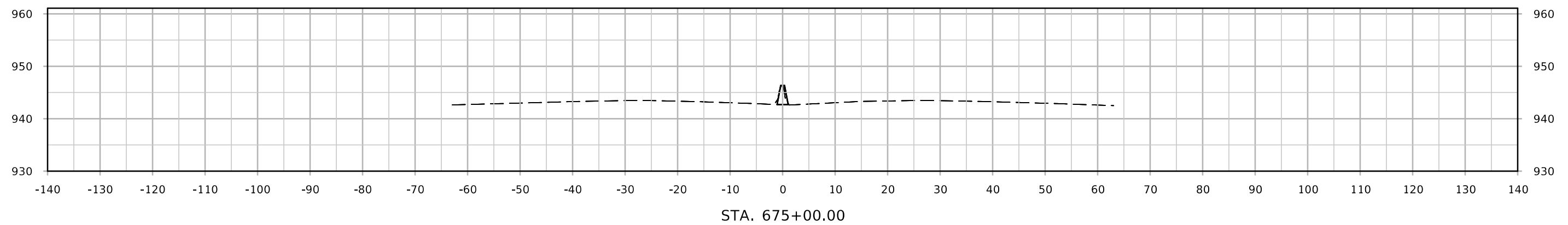
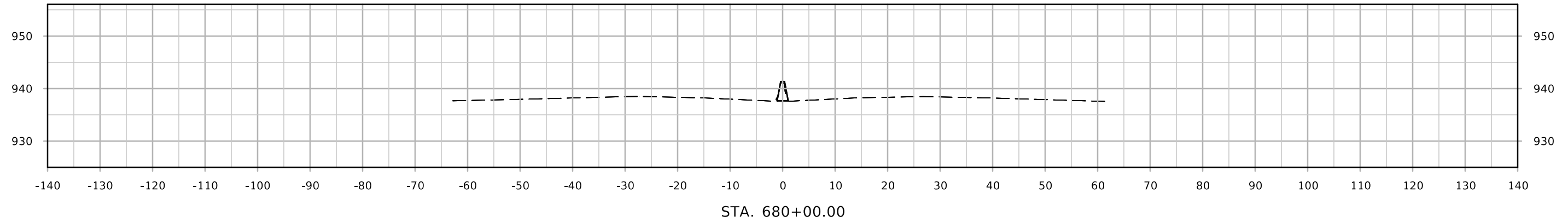
ML - I-35/80



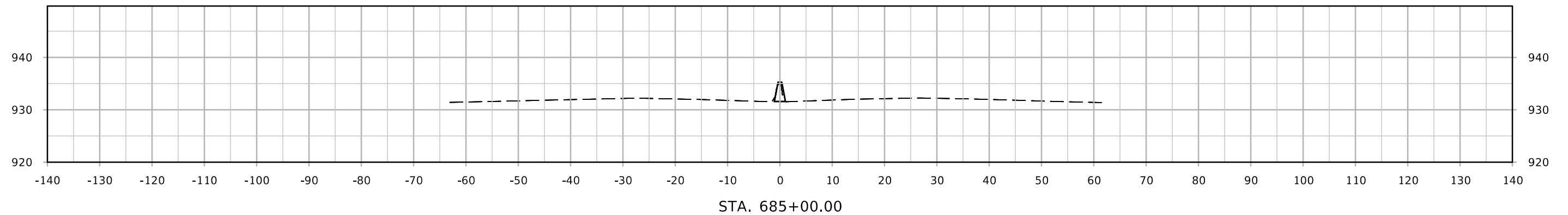
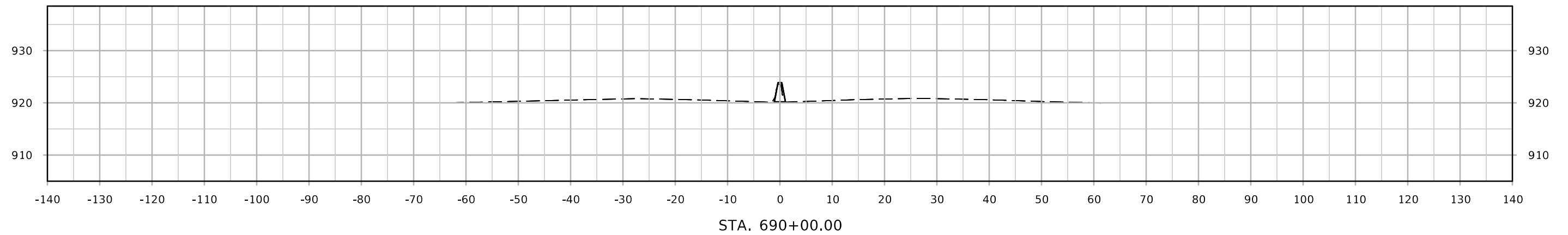
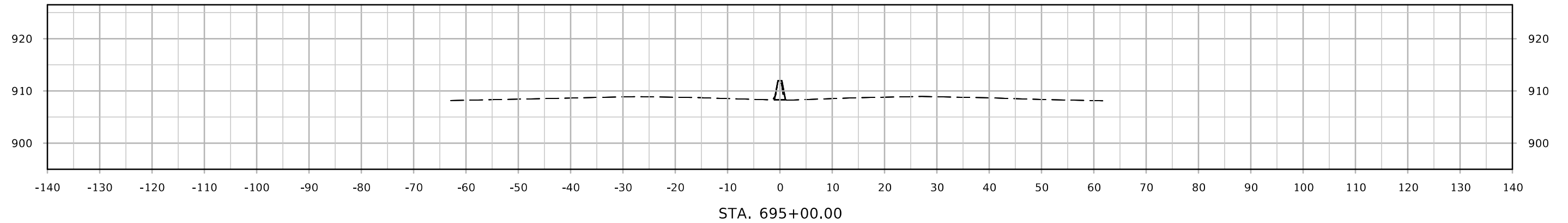
ML - I-35/80



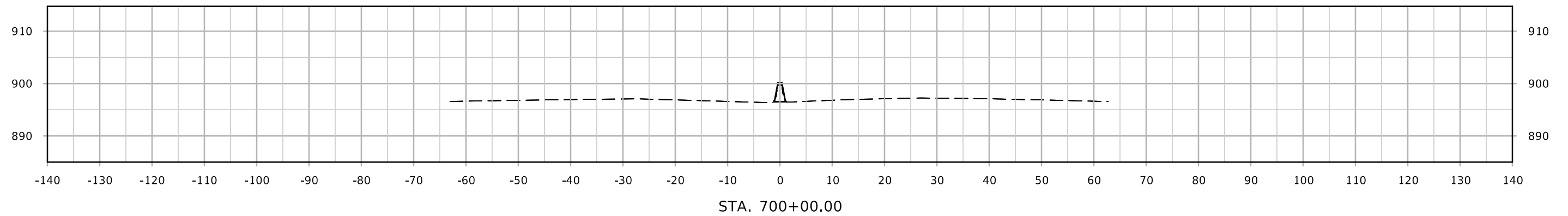
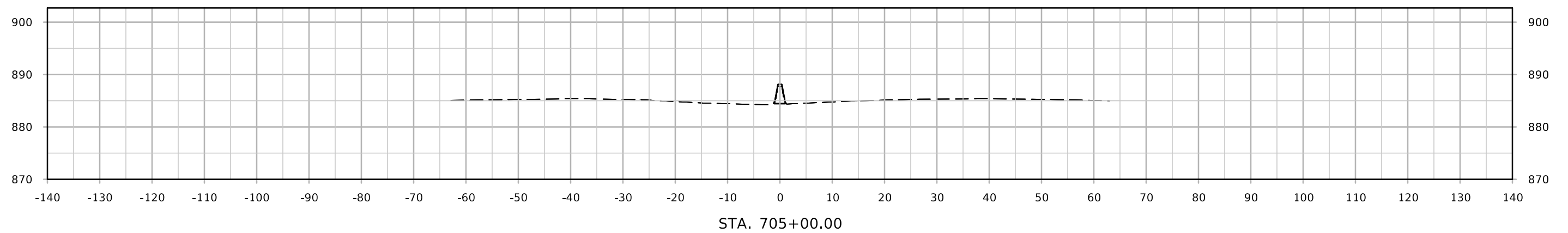
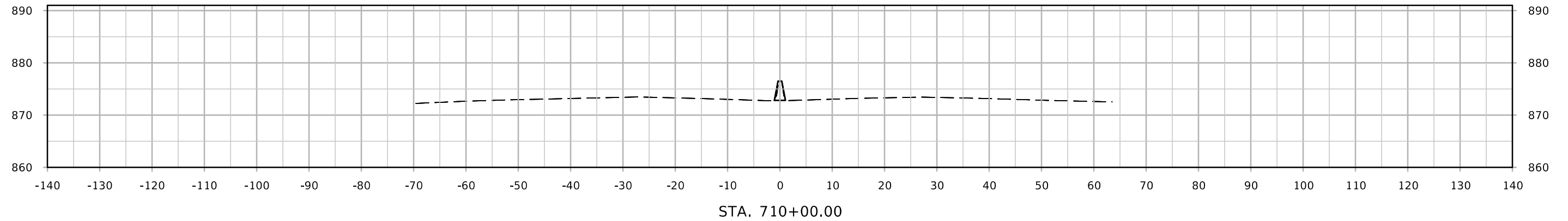
ML - I-35/80



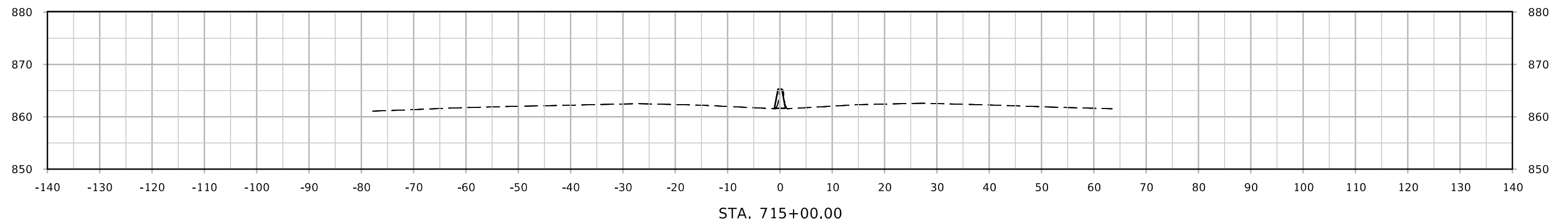
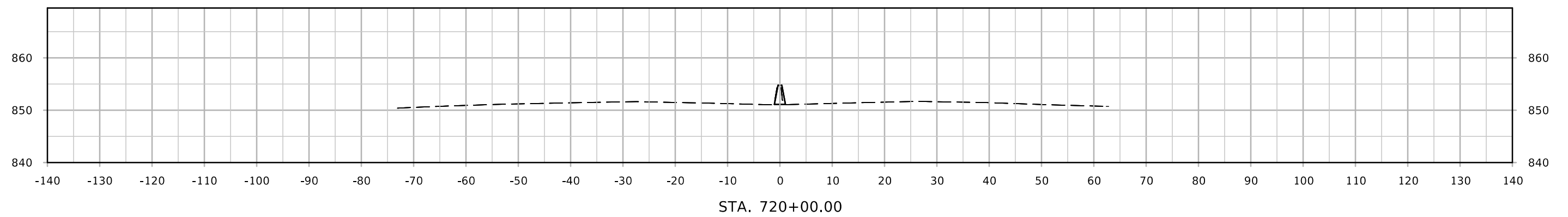
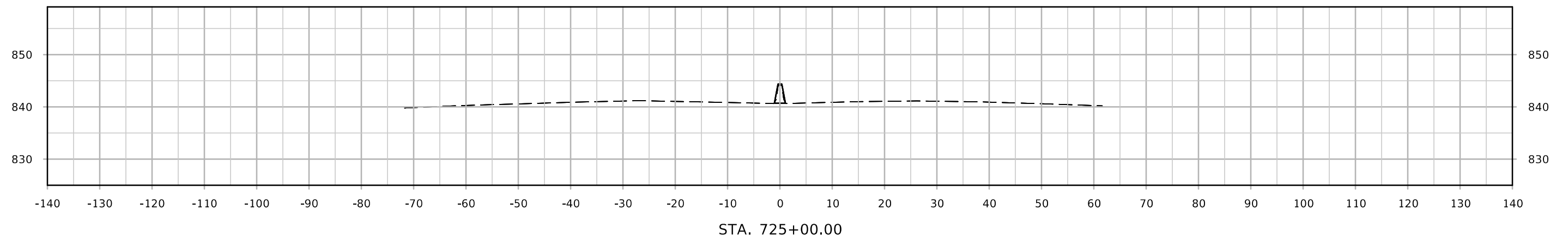
ML - I-35/80



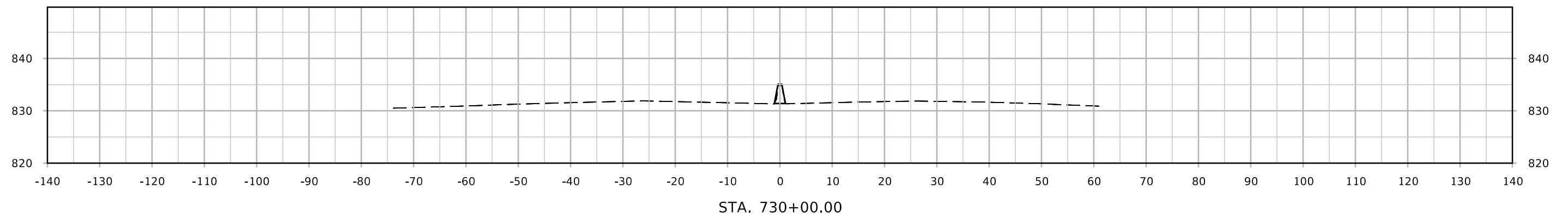
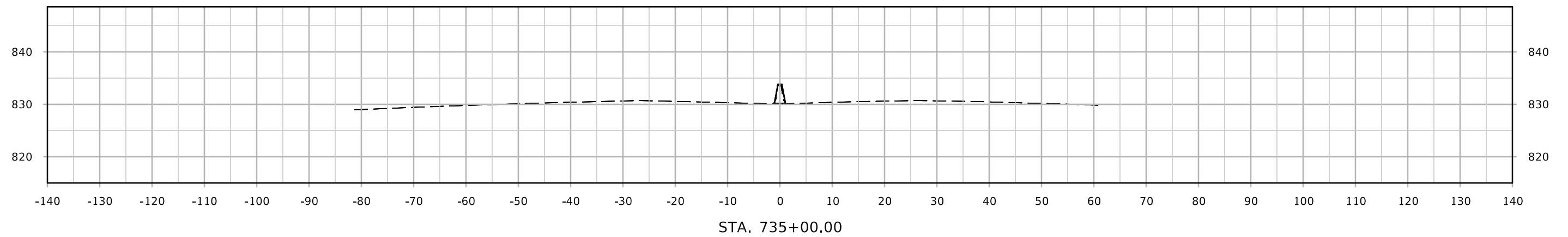
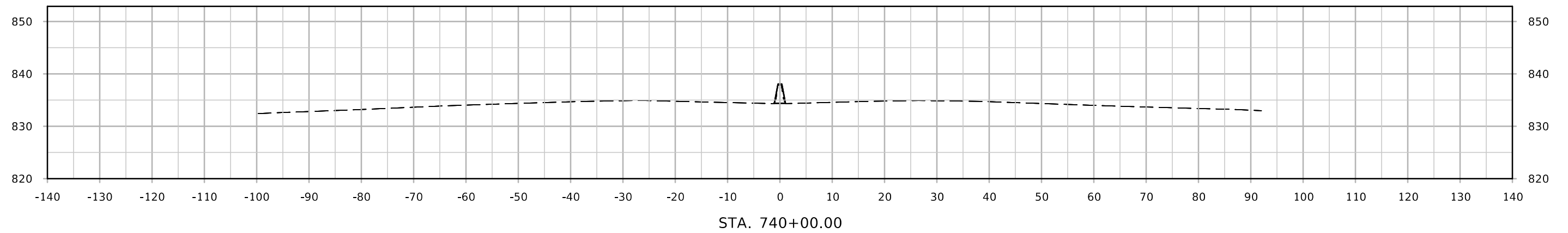
ML - I-35/80



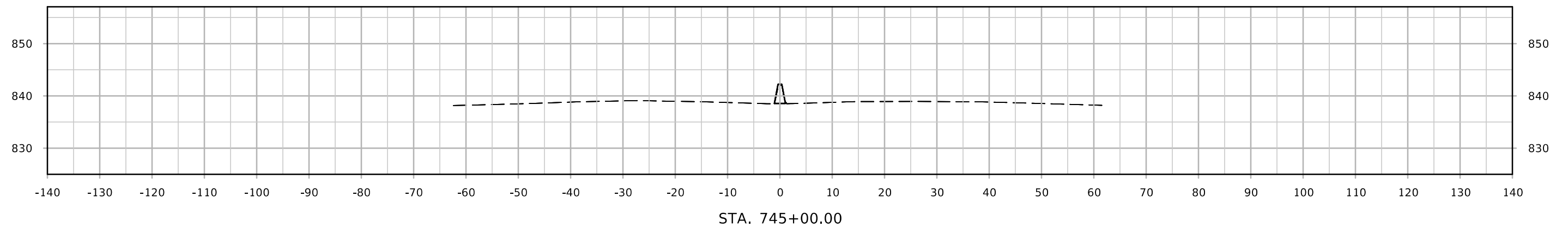
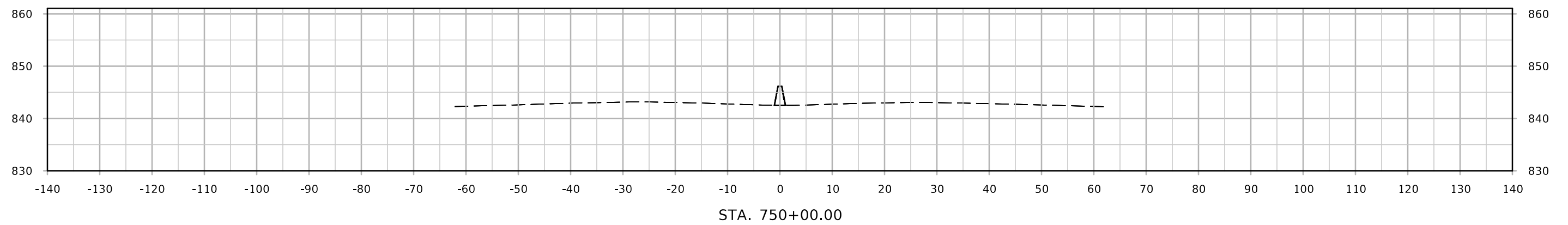
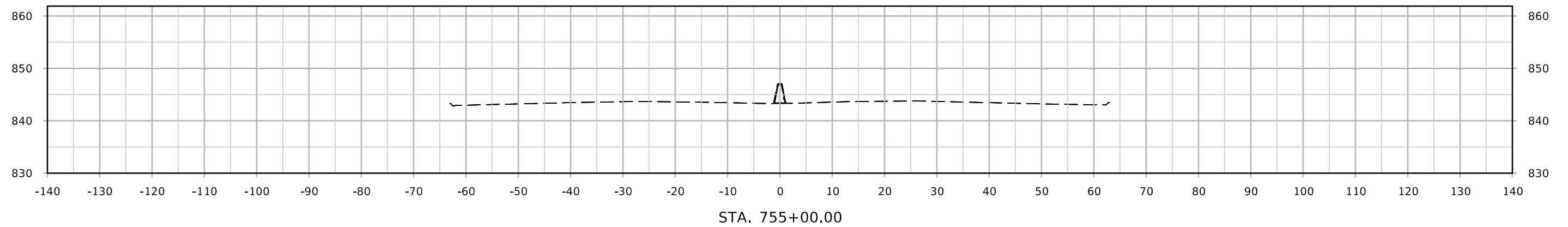
ML - I-35/80



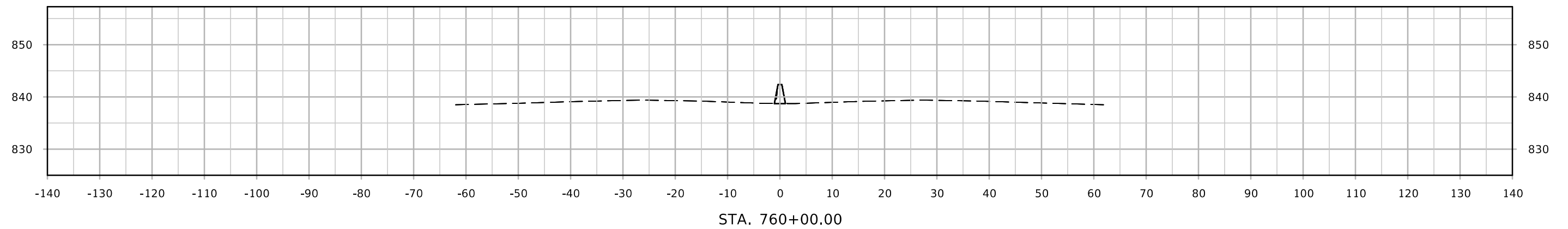
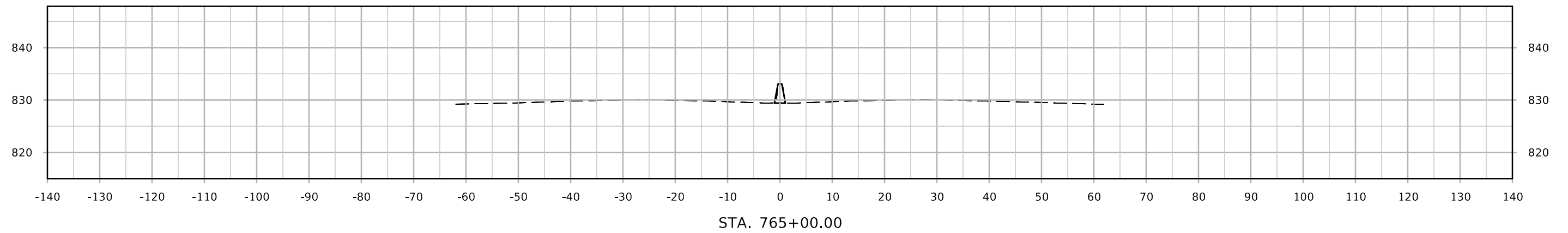
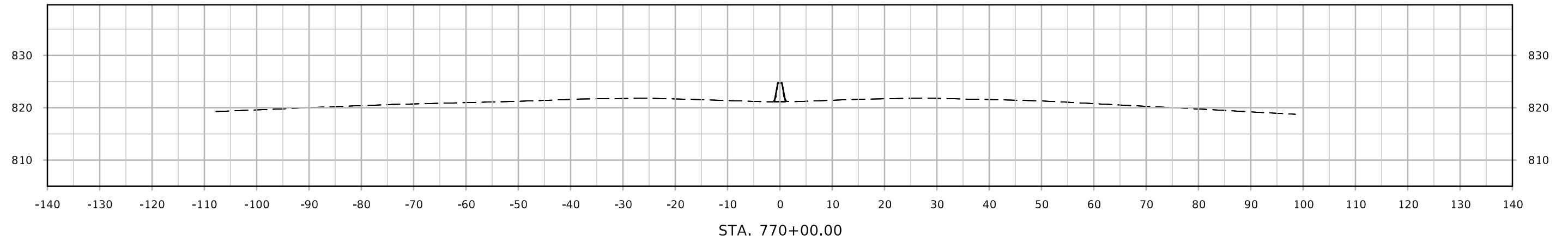
ML - I-35/80



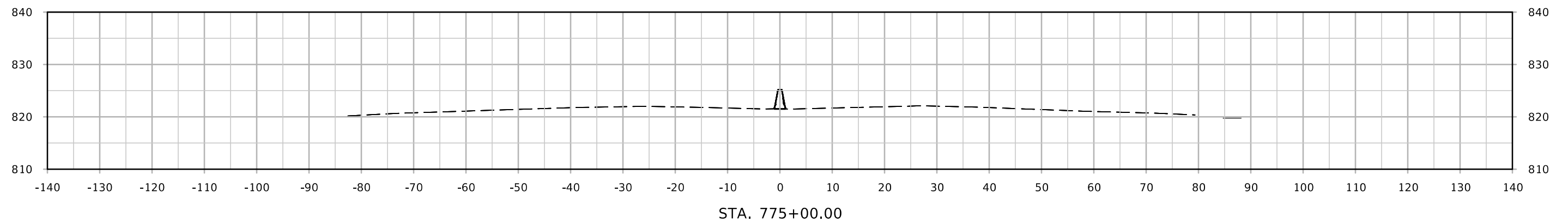
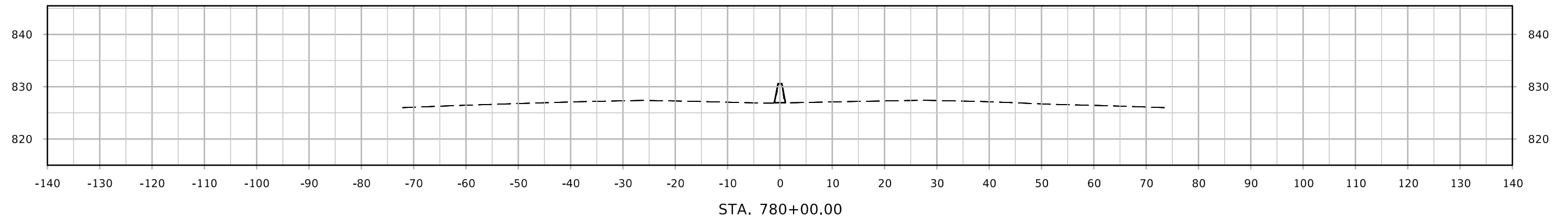
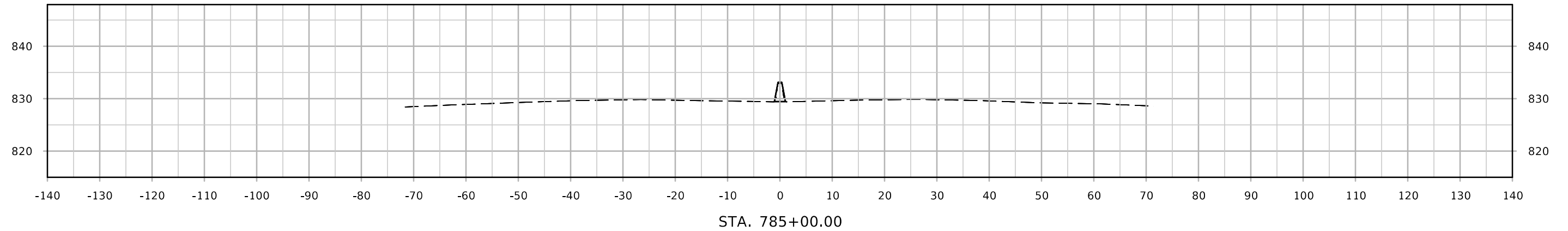
ML - I-35/80



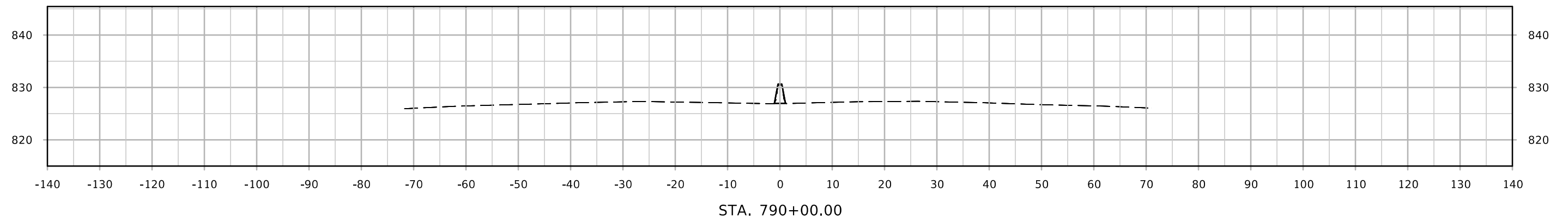
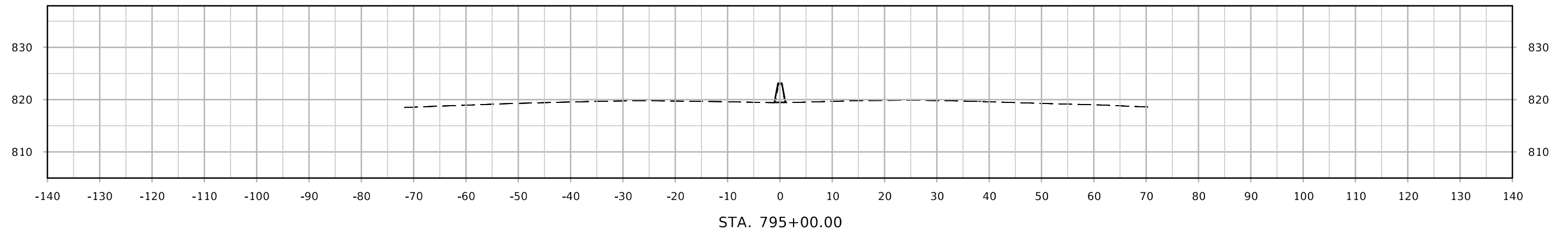
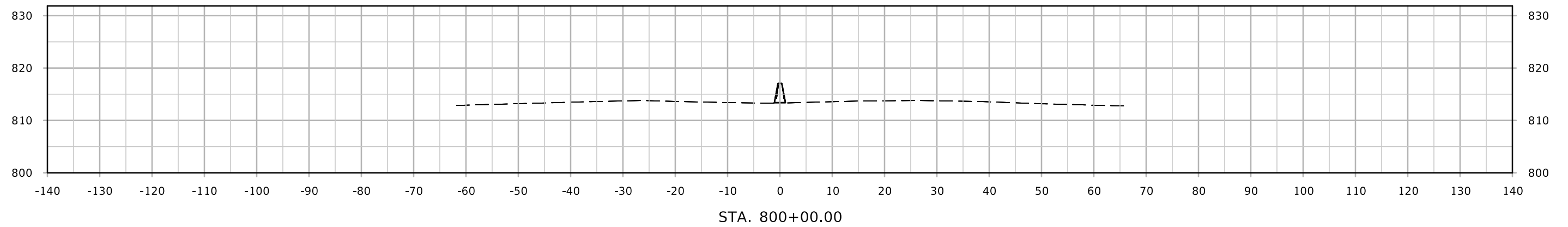
ML - I-35/80



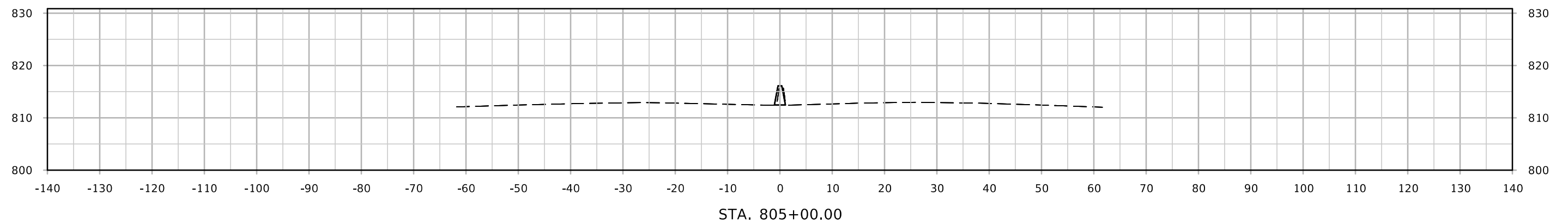
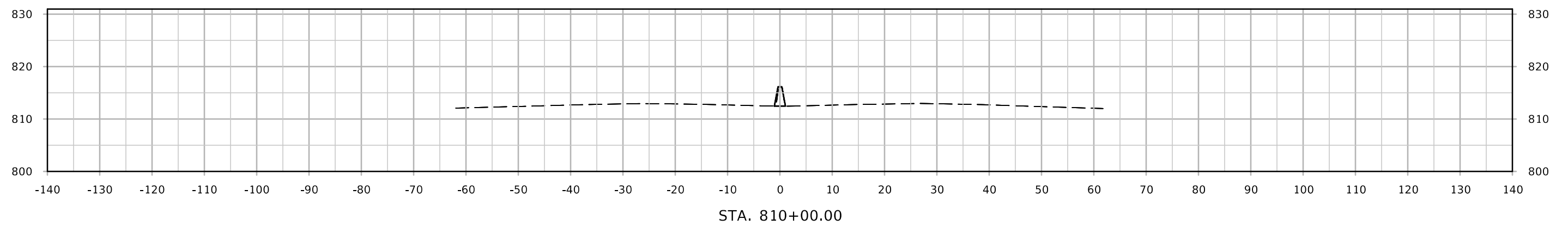
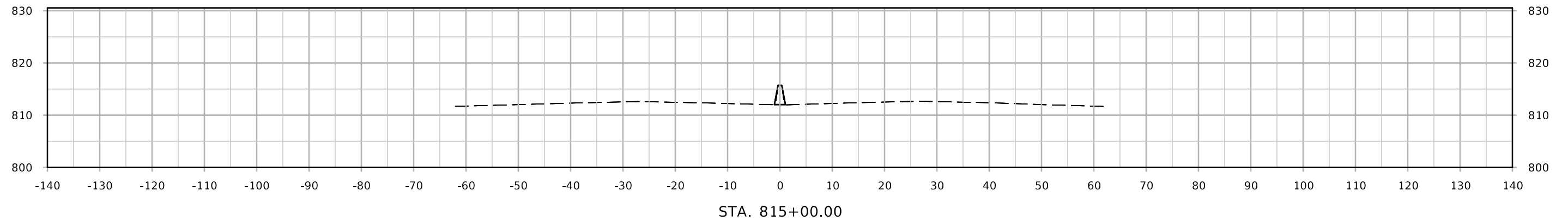
ML - I-35/80



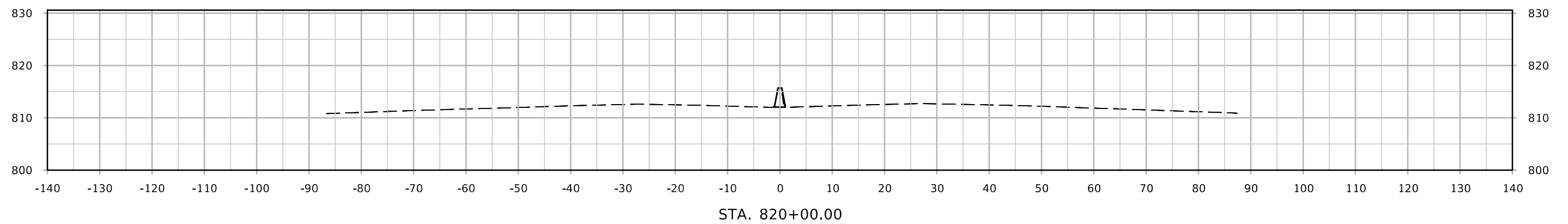
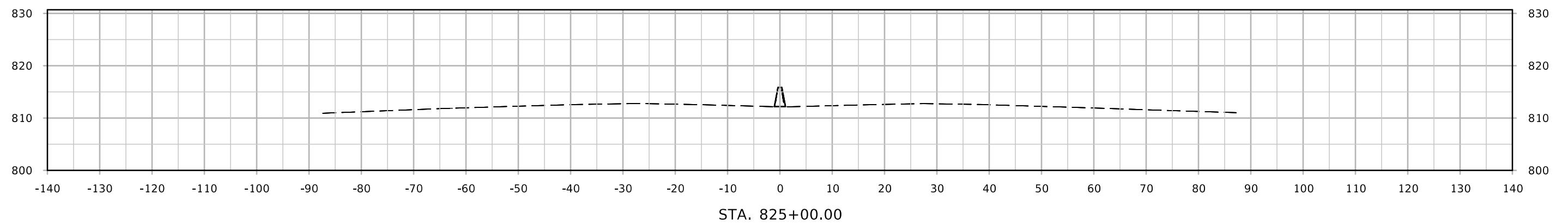
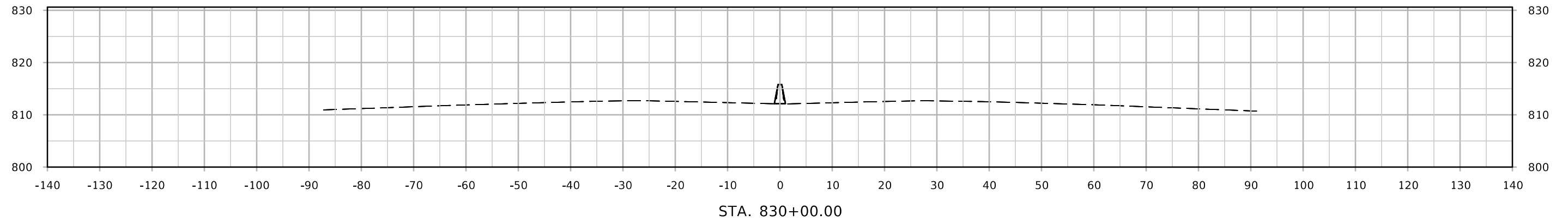
ML - I-35/80



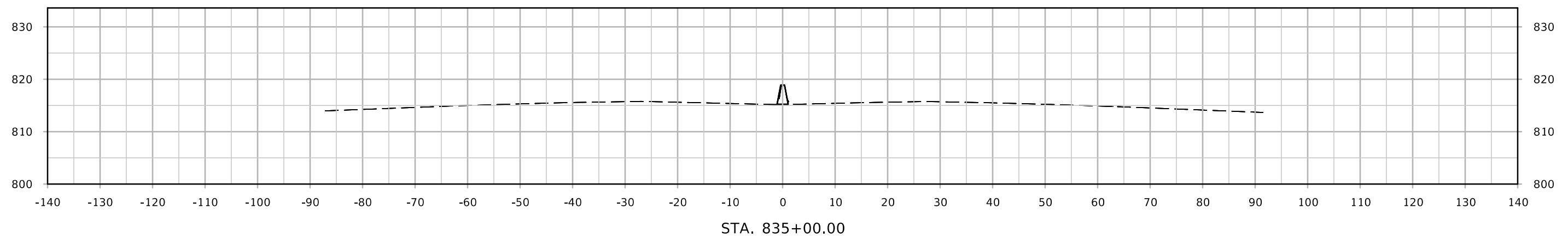
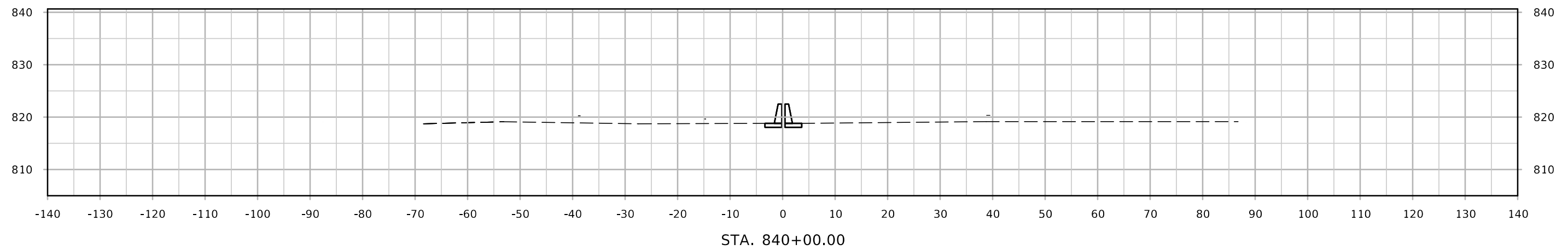
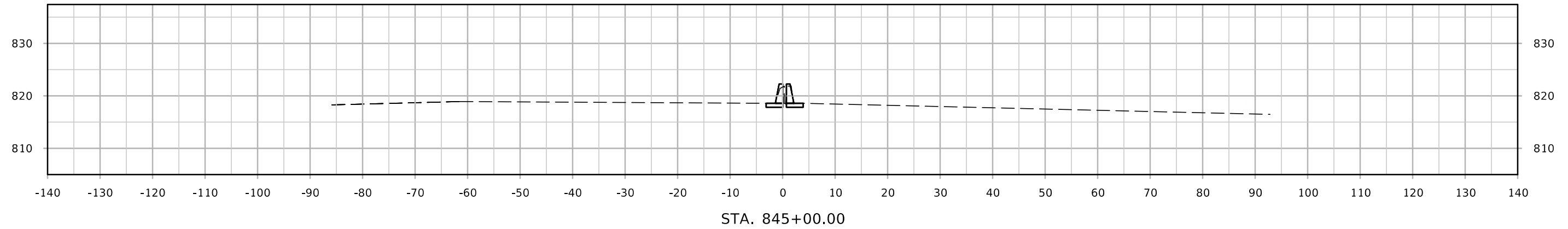
ML - I-35/80



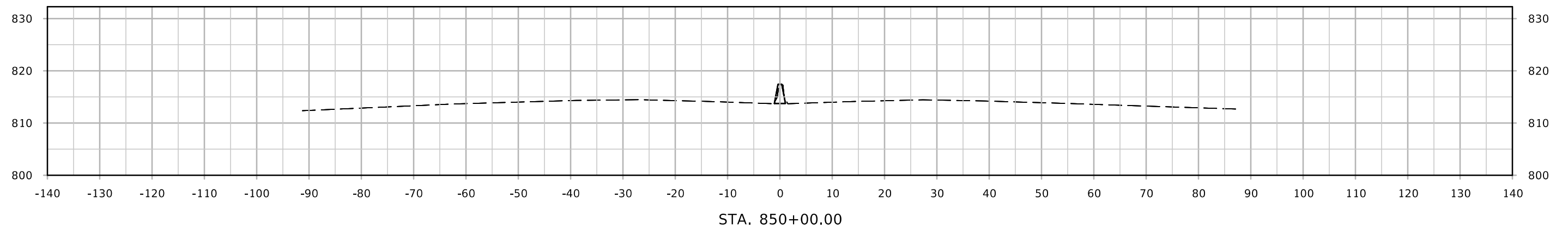
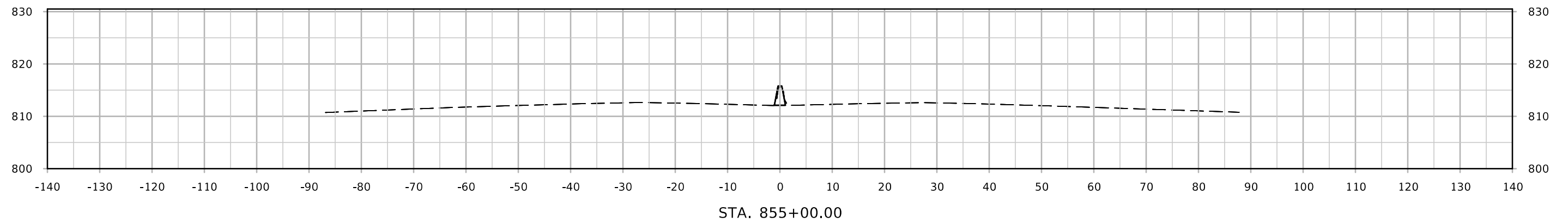
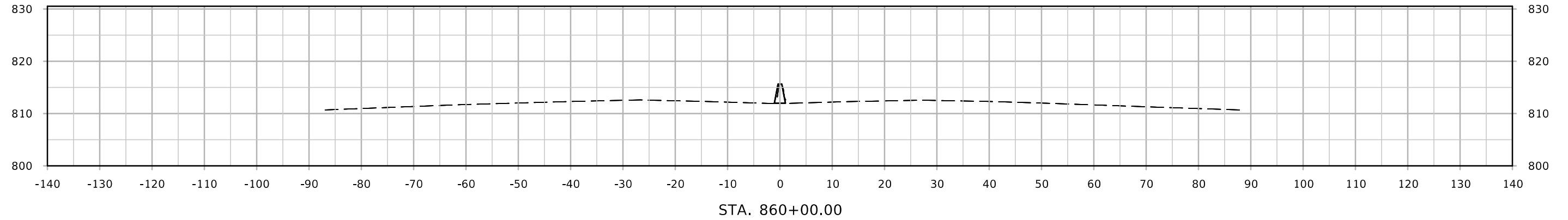
ML - I-35/80



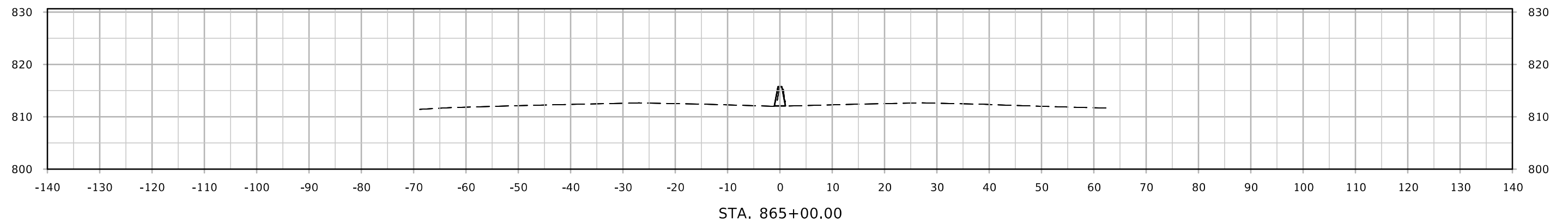
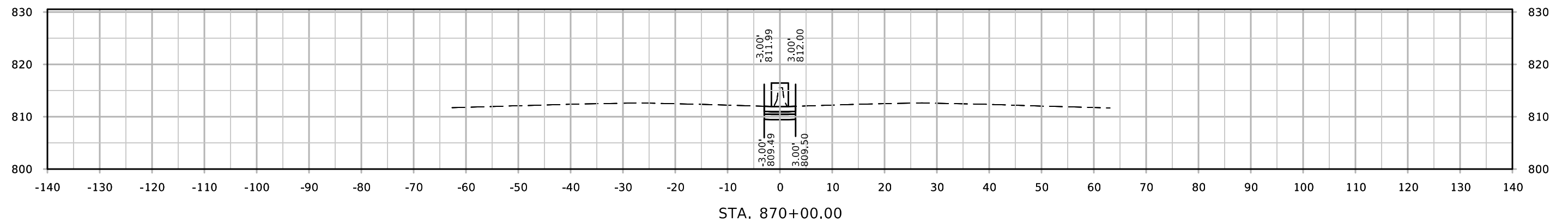
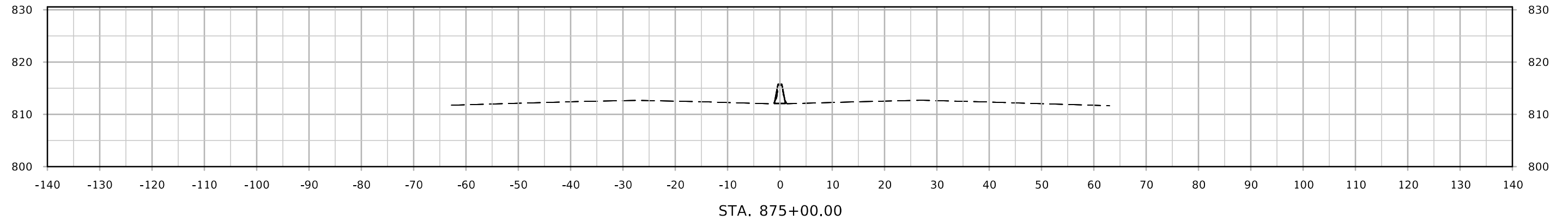
ML - I-35/80



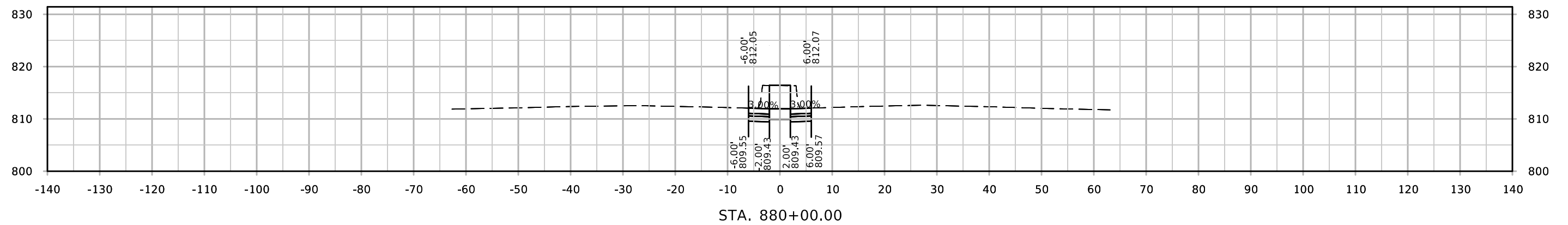
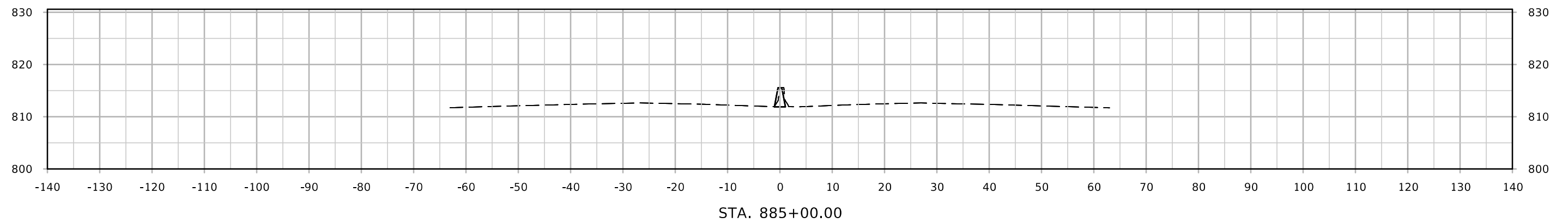
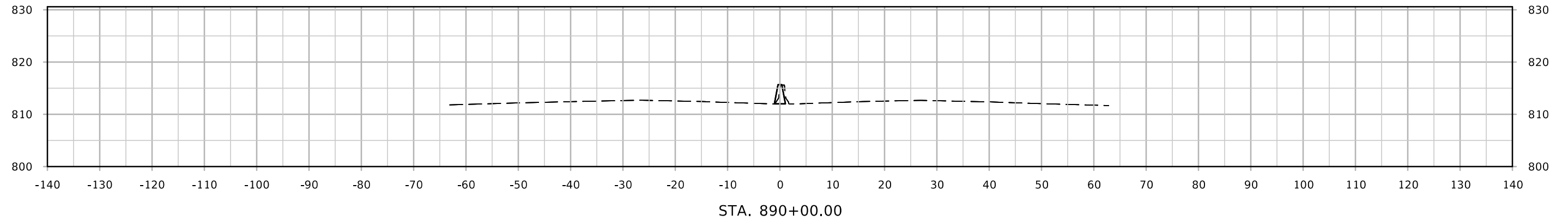
ML - I-35/80



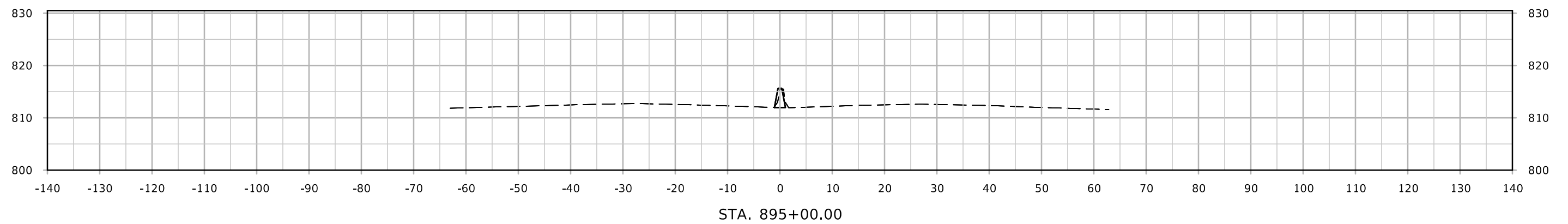
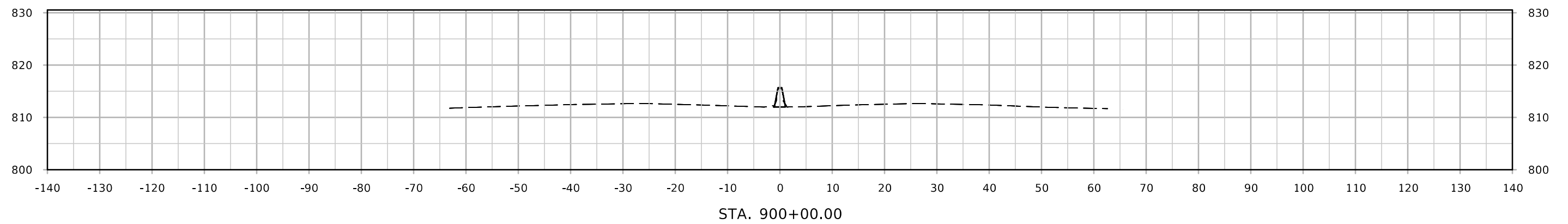
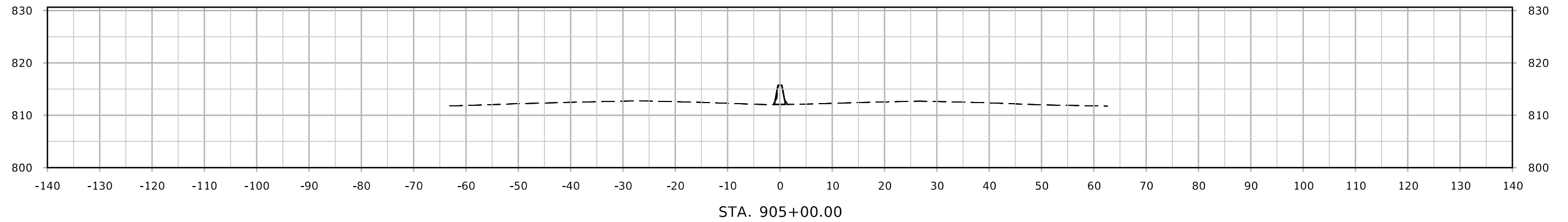
ML - I-35/80



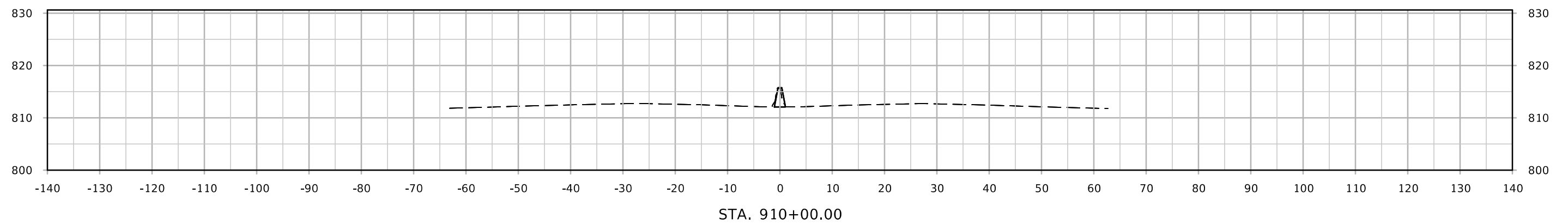
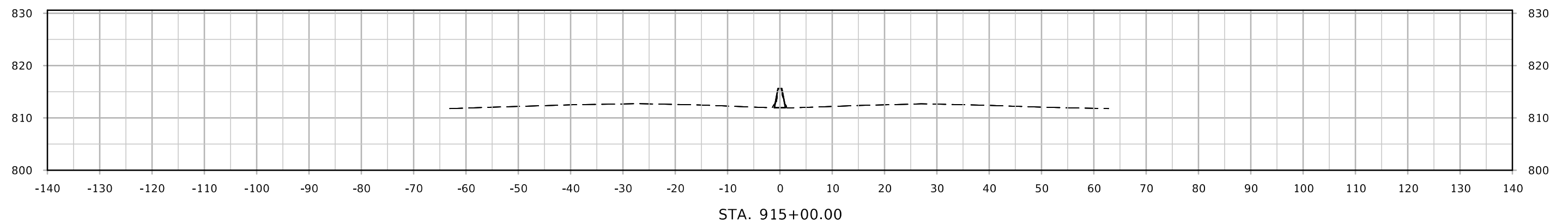
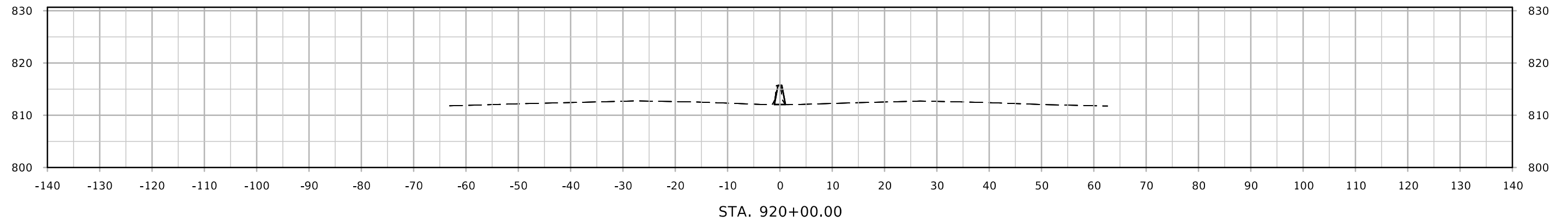
ML - I-35/80



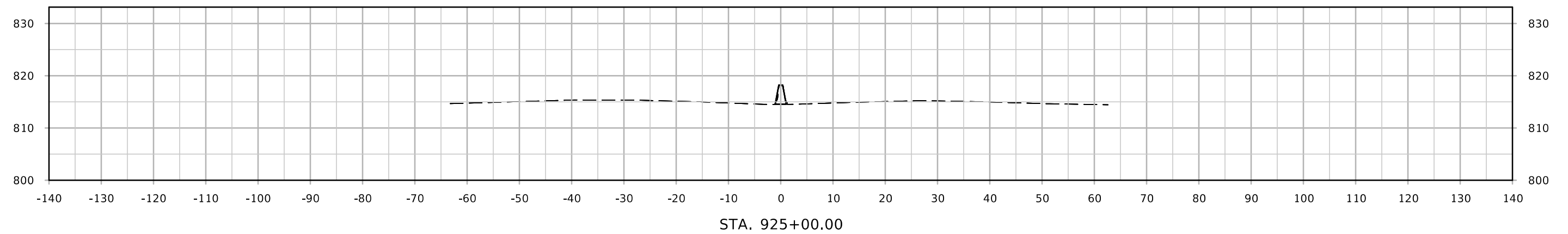
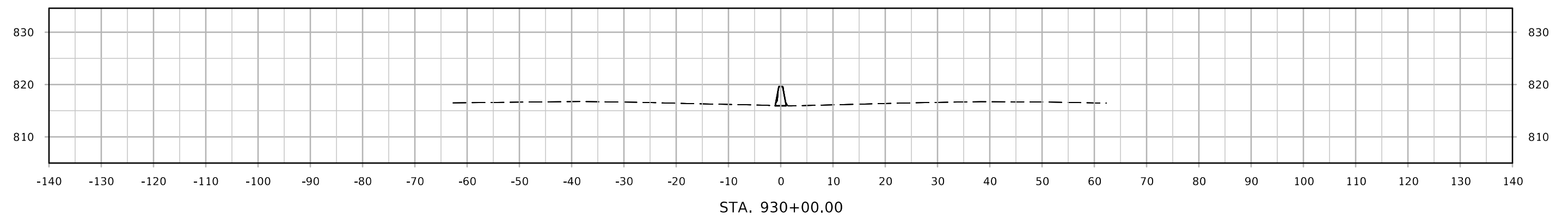
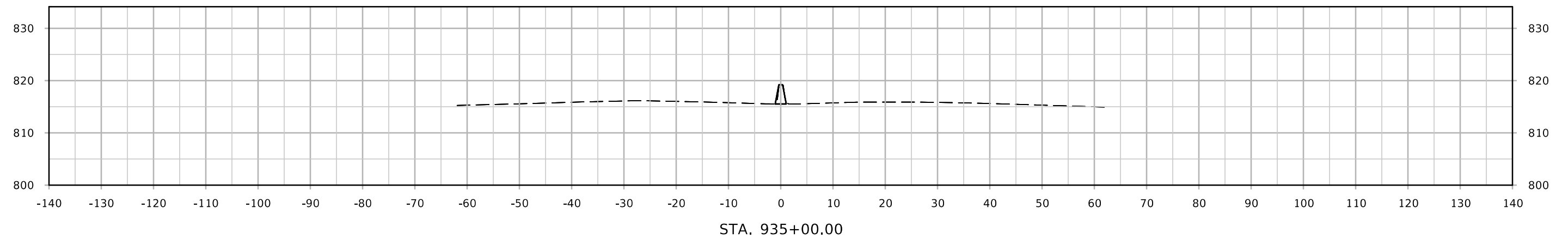
ML - I-35/80



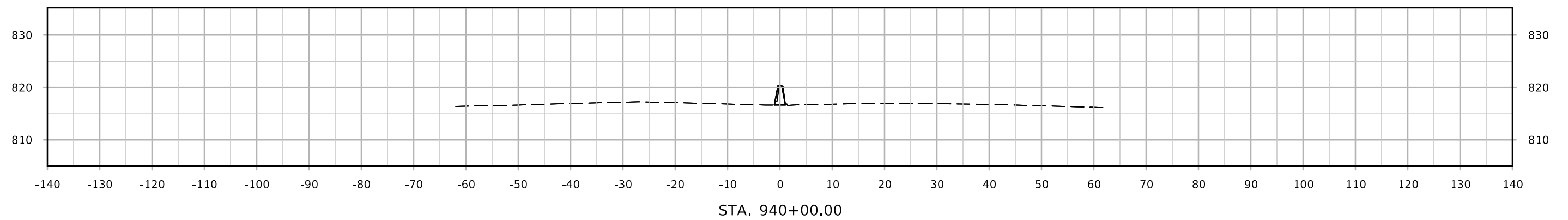
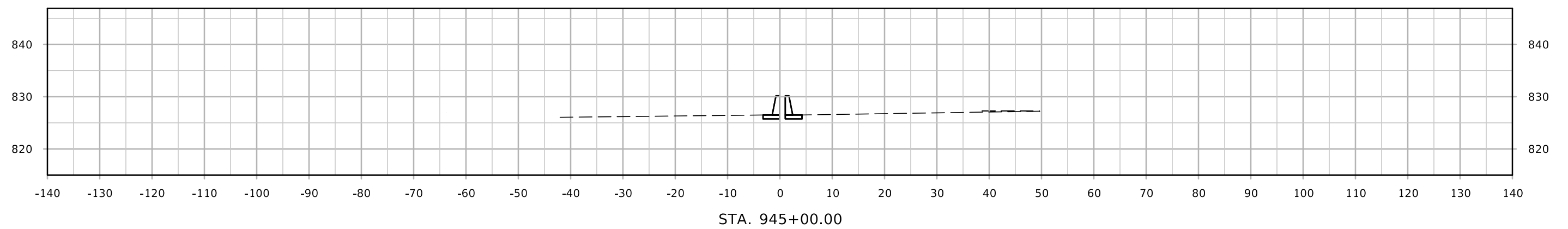
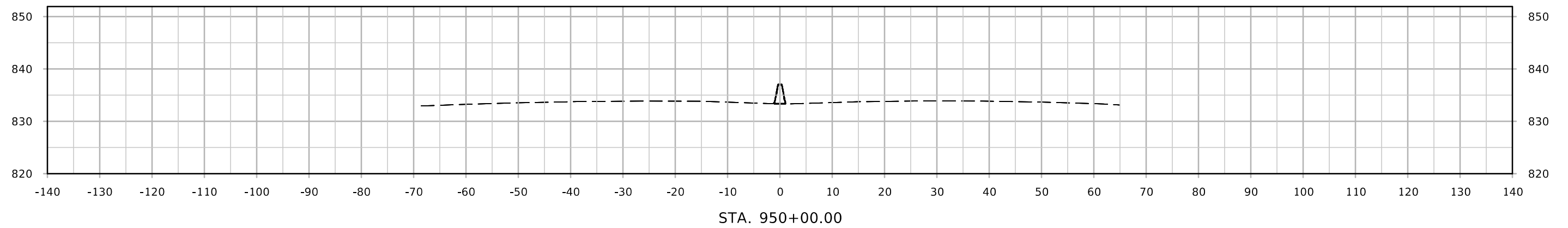
ML - I-35/80



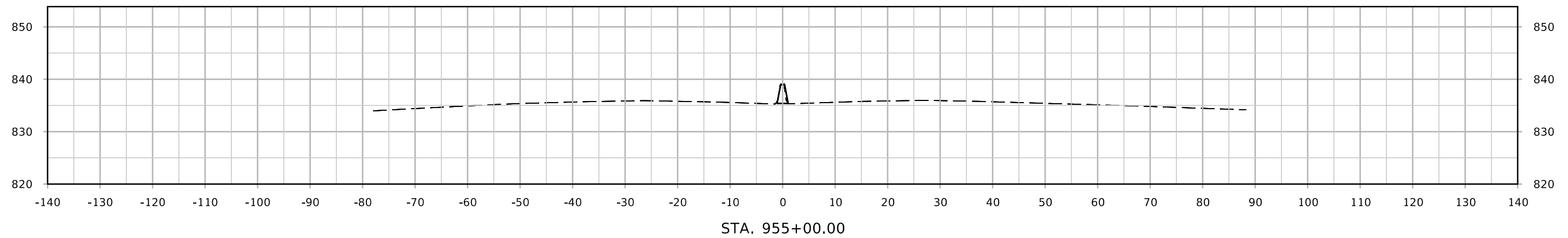
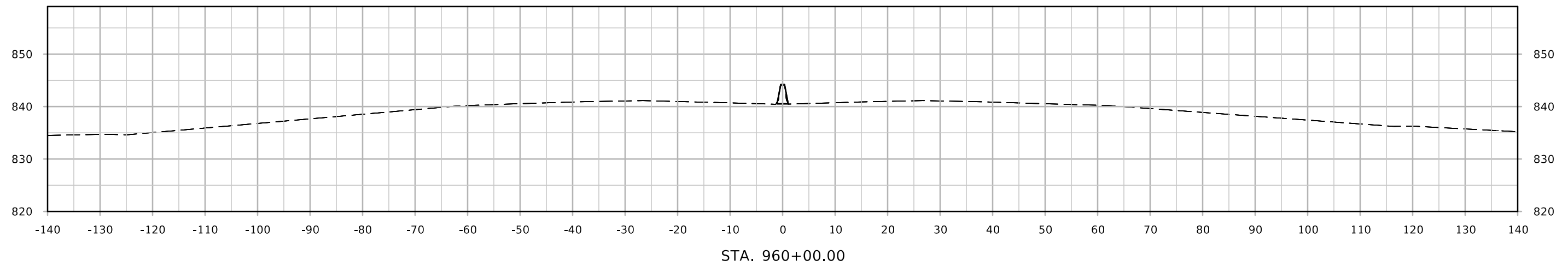
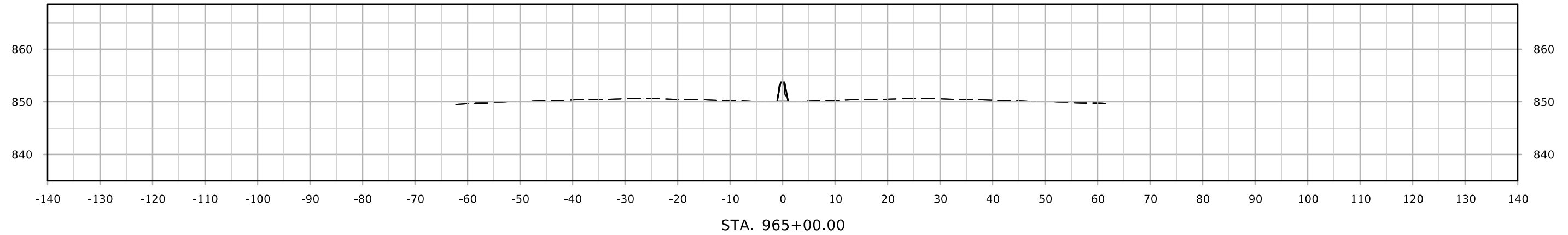
ML - I-35/80



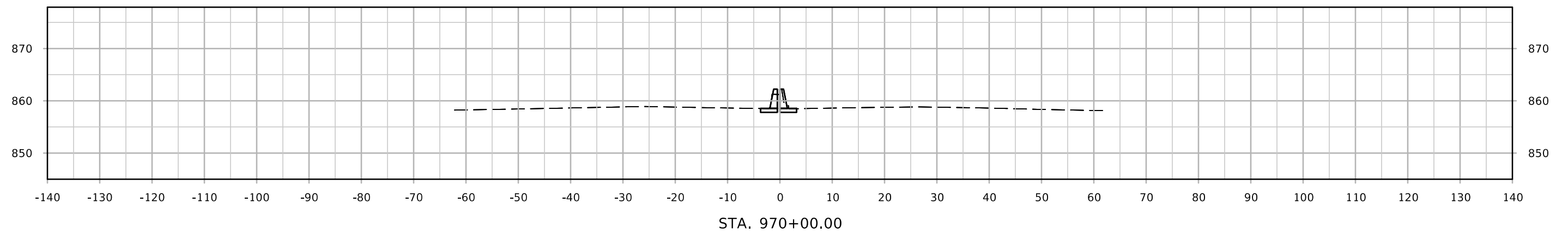
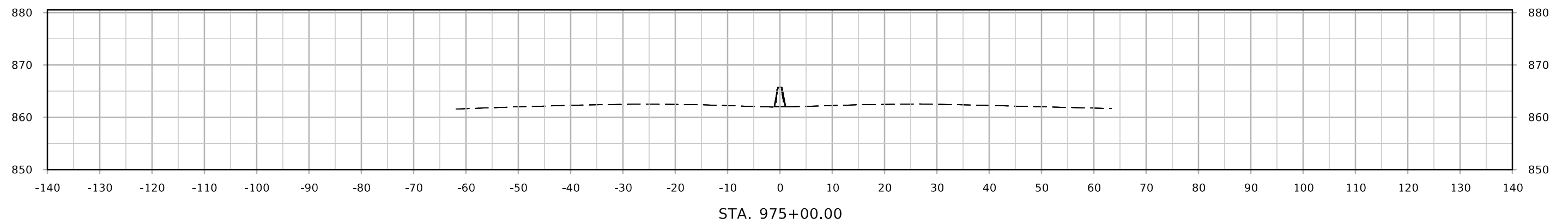
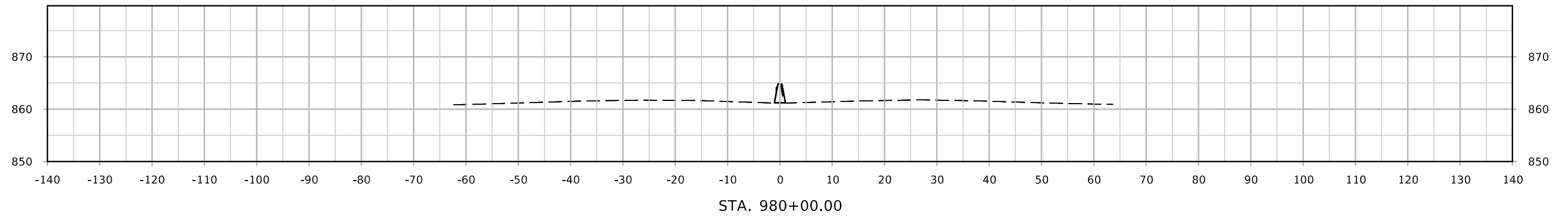
ML - I-35/80



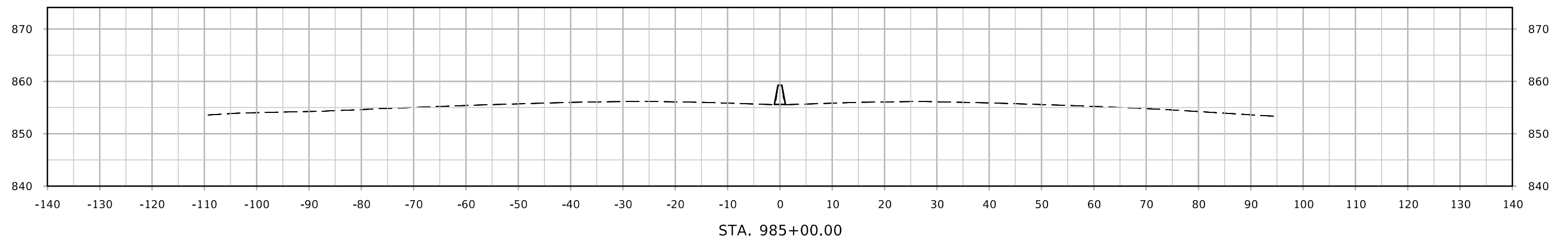
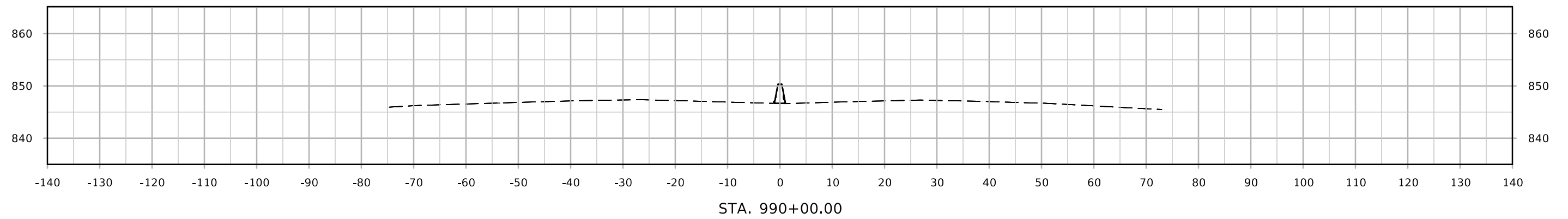
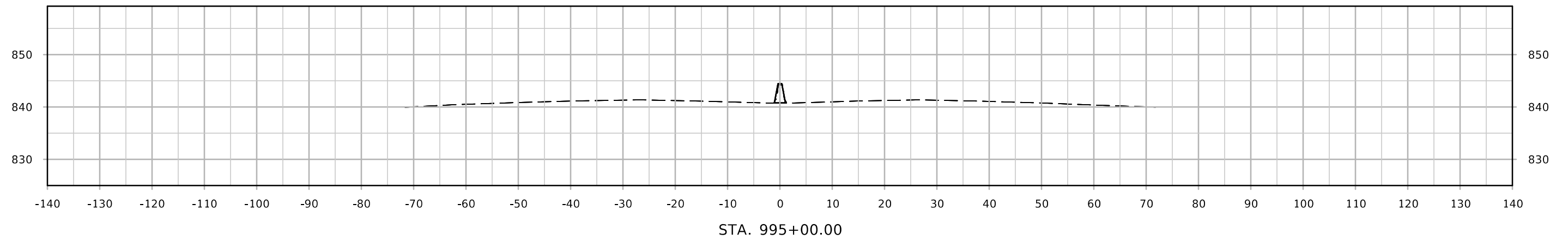
ML - I-35/80



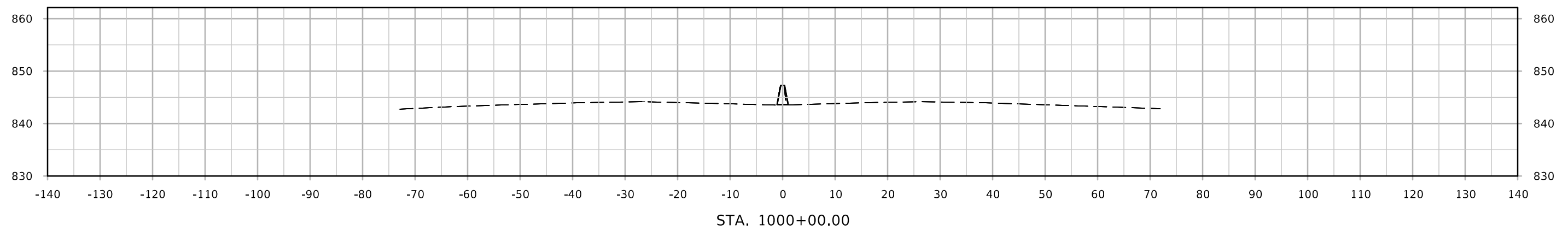
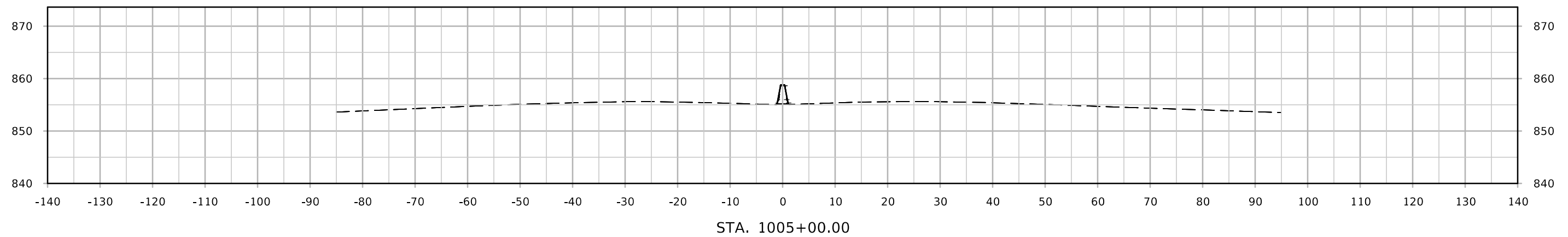
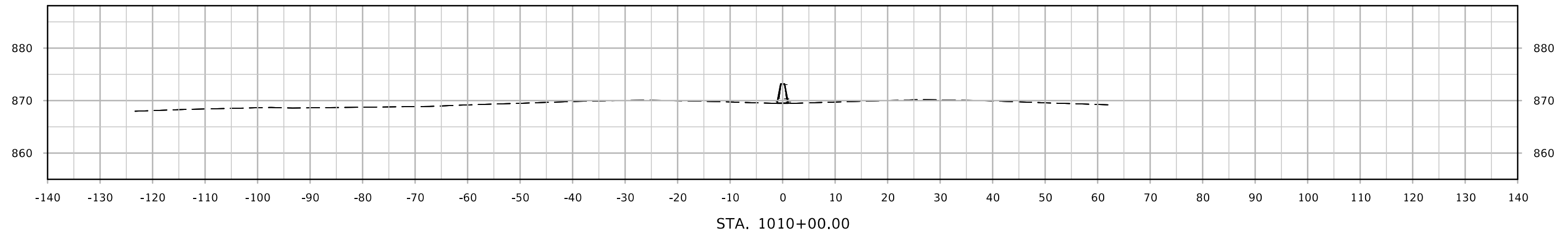
ML - I-35/80



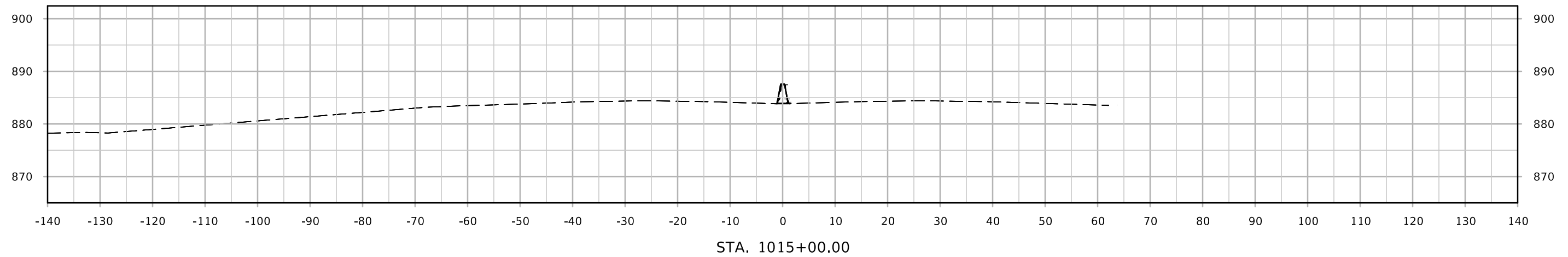
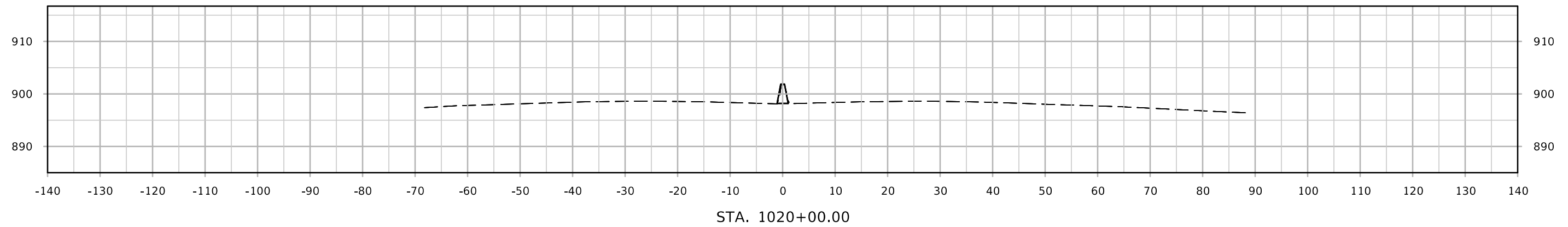
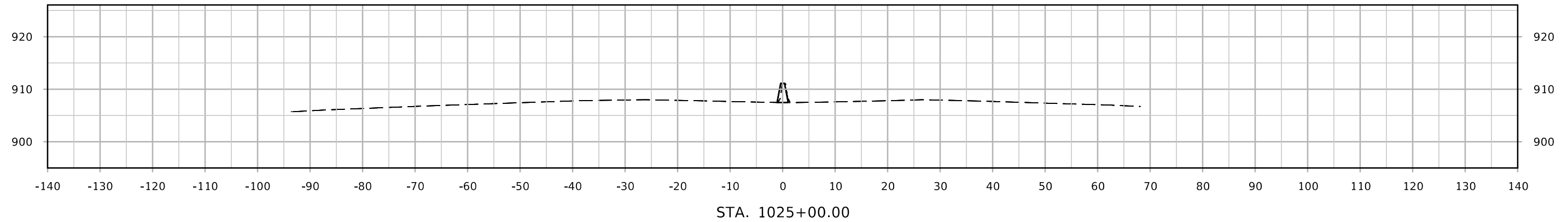
ML - I-35/80



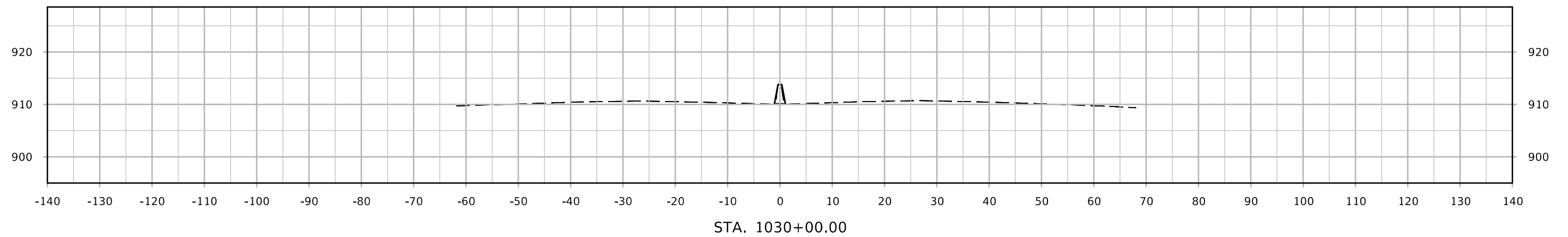
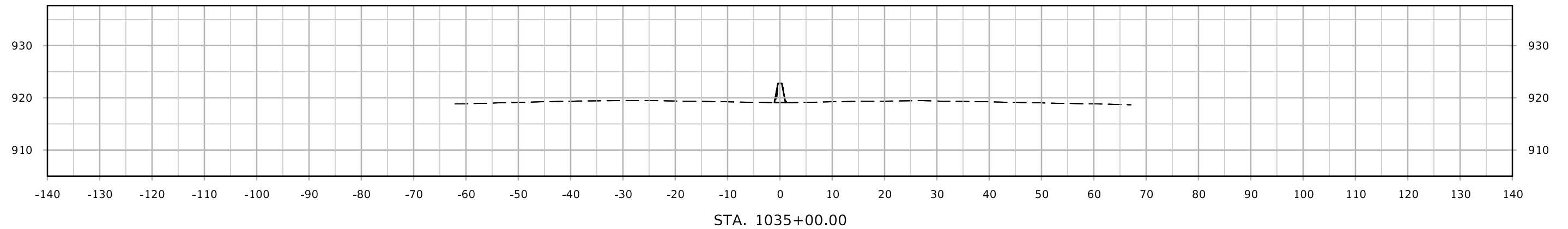
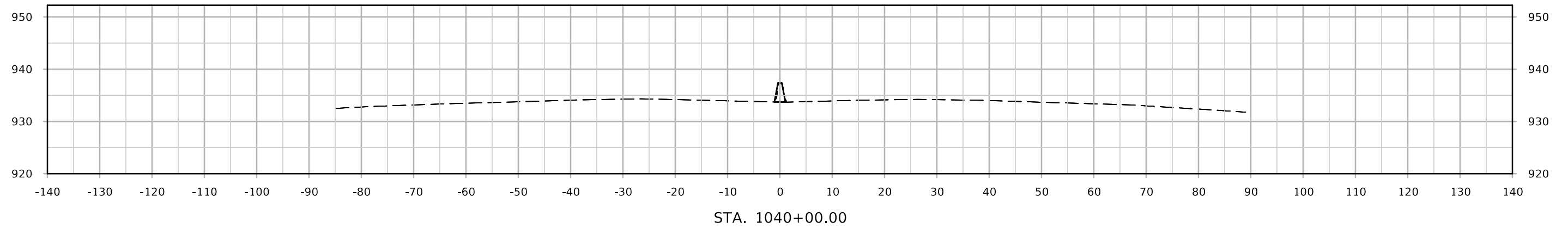
ML - I-35/80



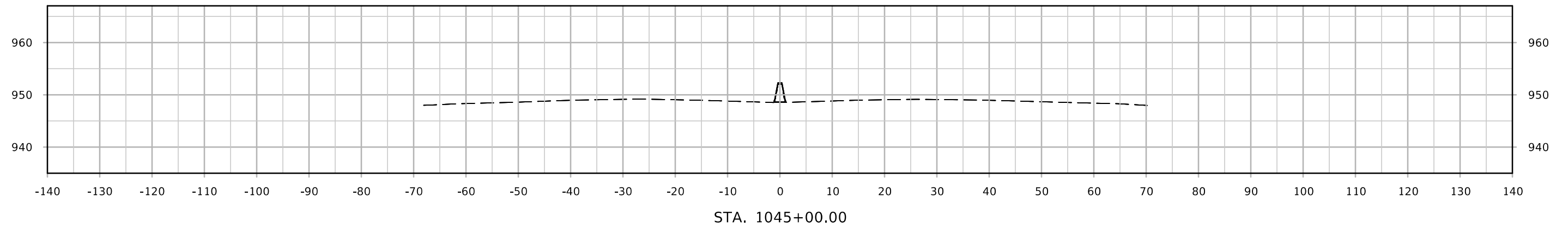
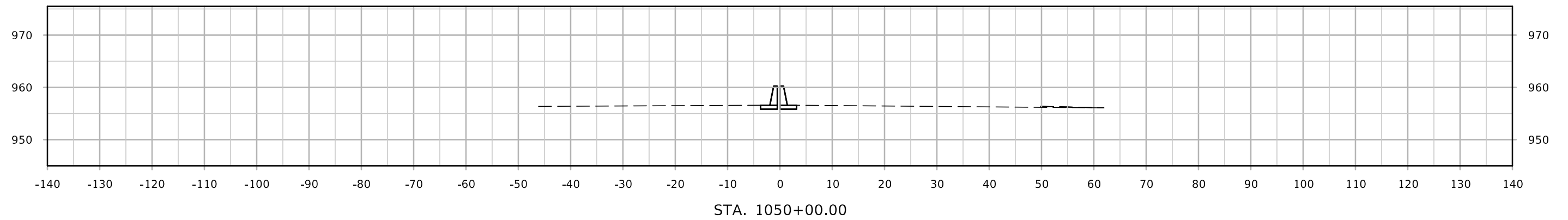
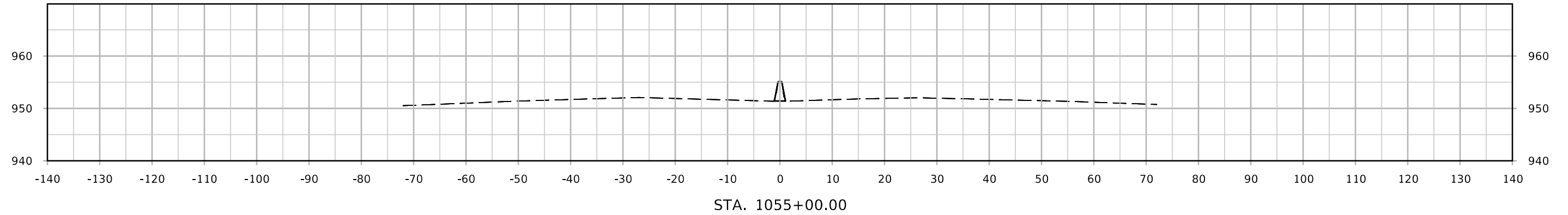
ML - I-35/80



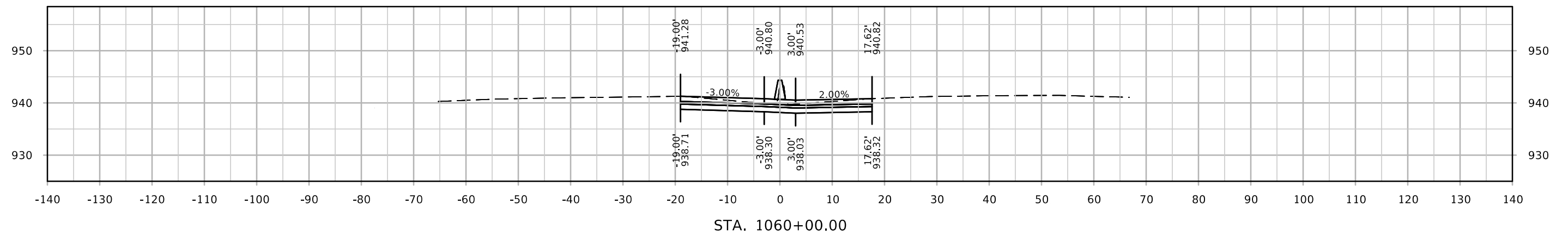
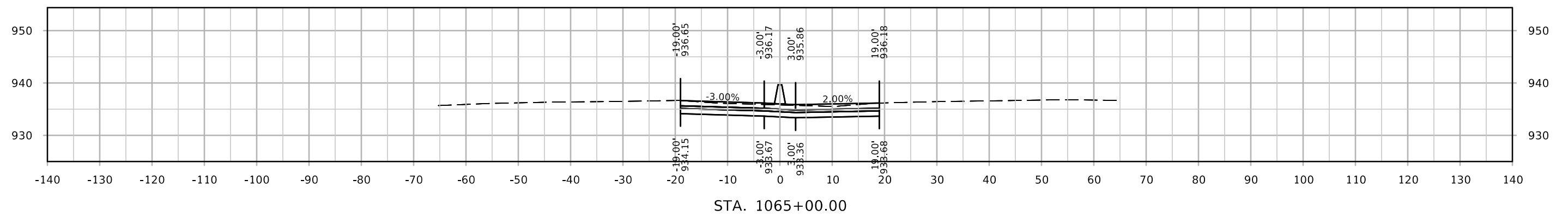
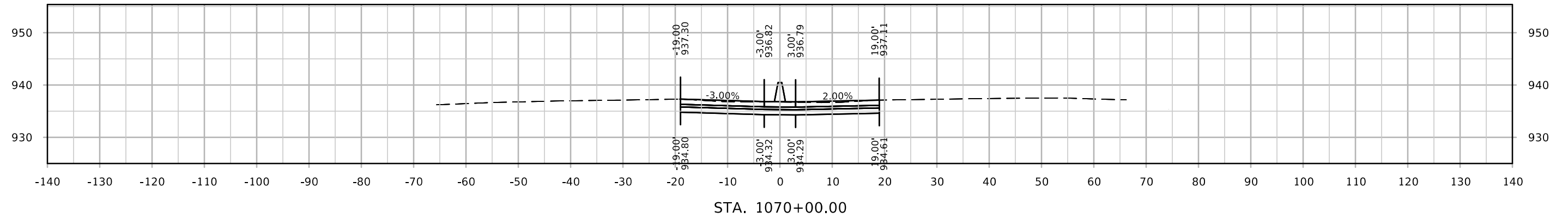
ML - I-35/80



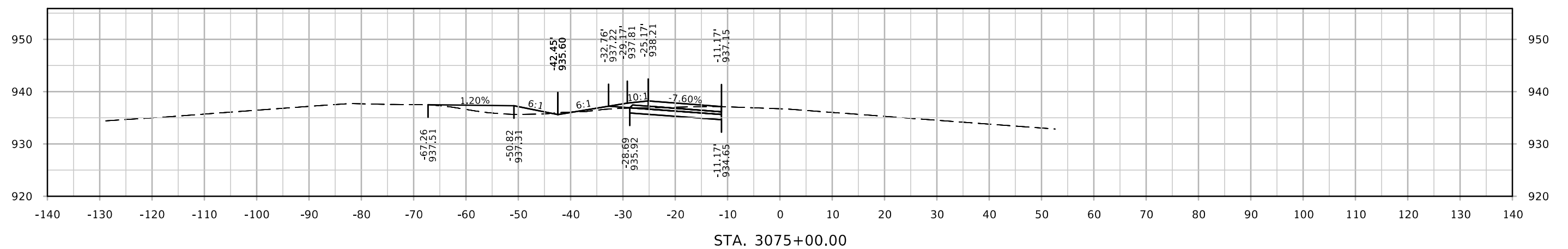
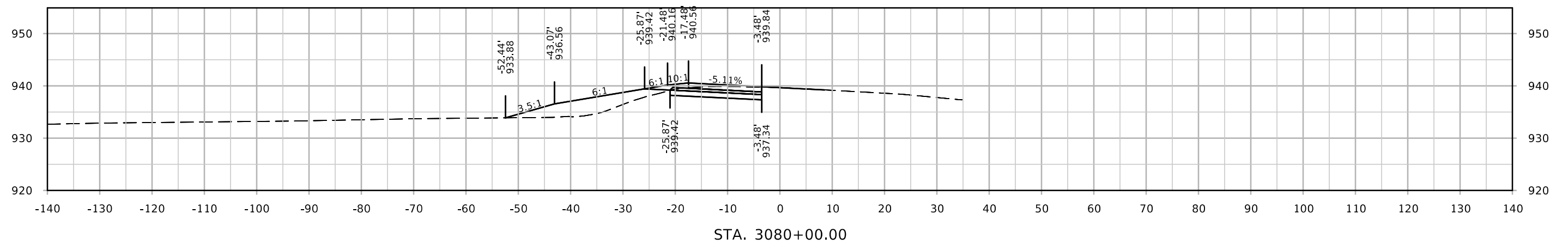
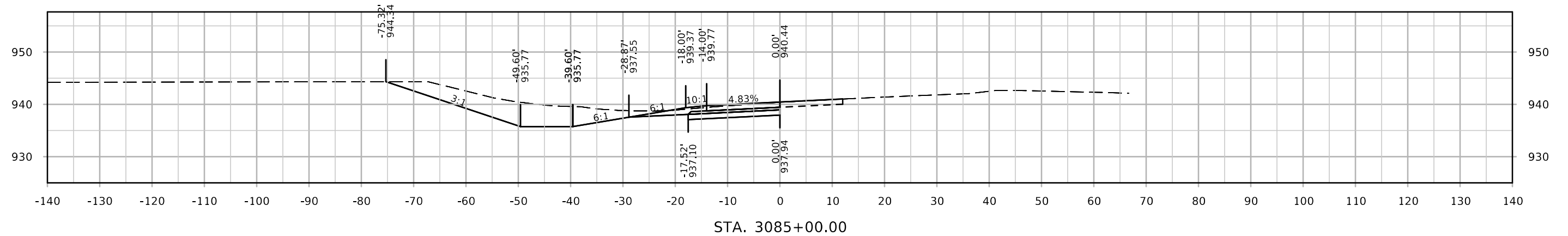
ML - I-35/80



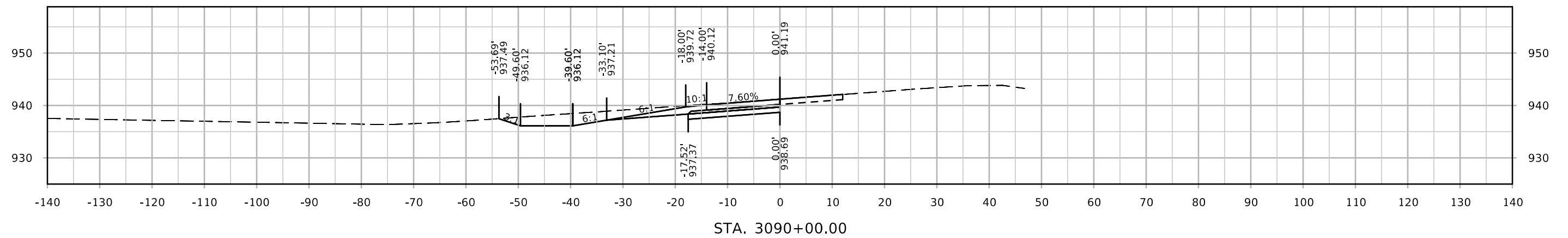
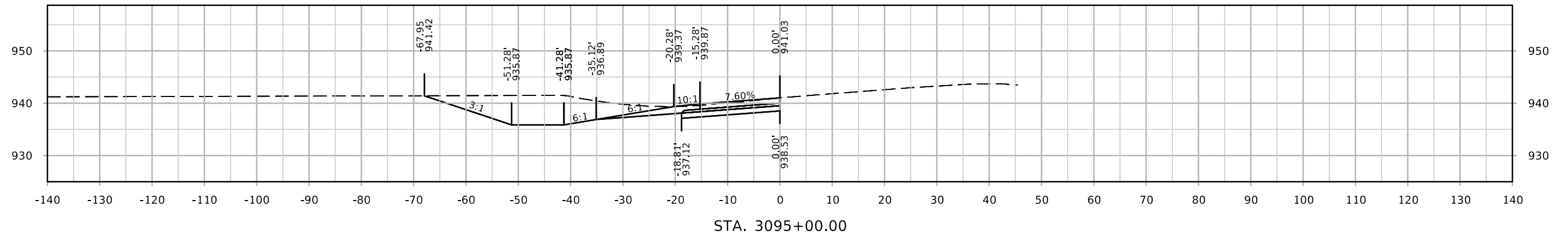
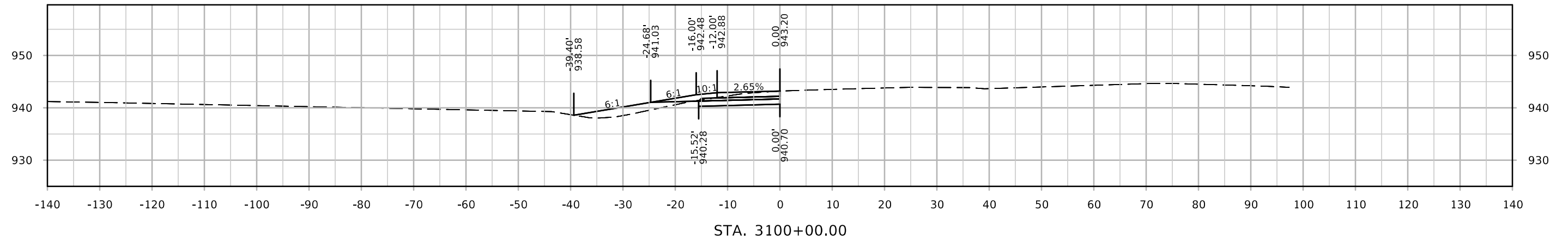
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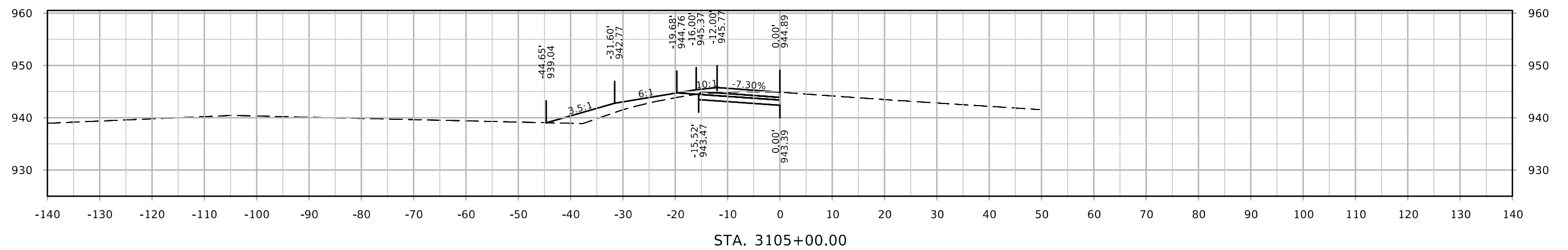
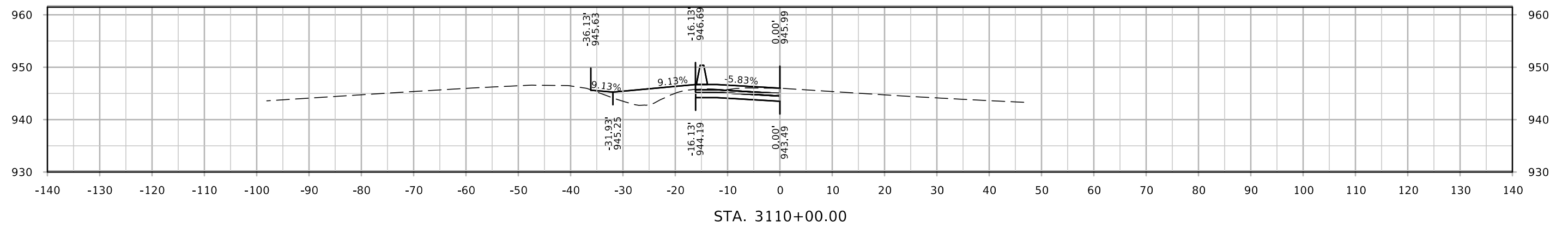
ML - EB I-80



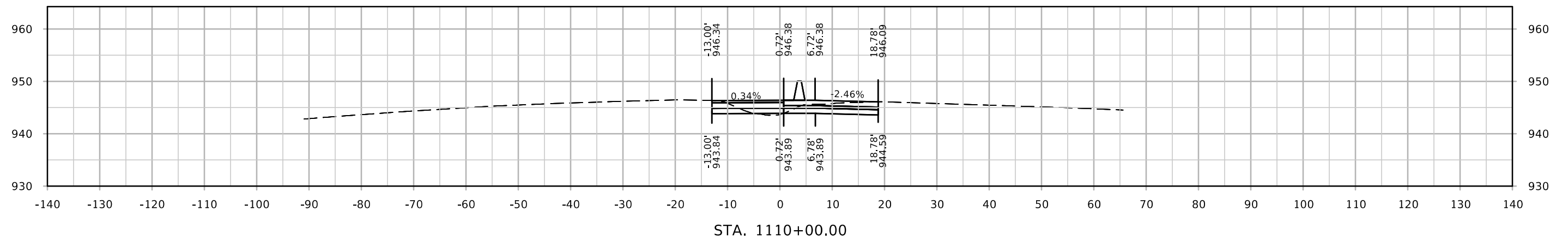
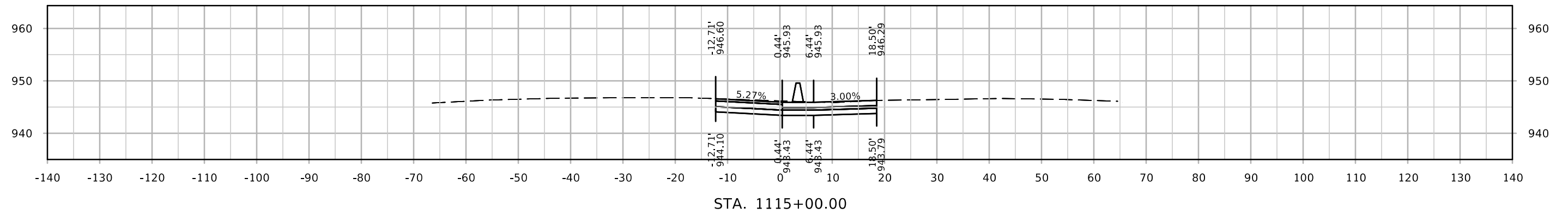
ML - EB I-80



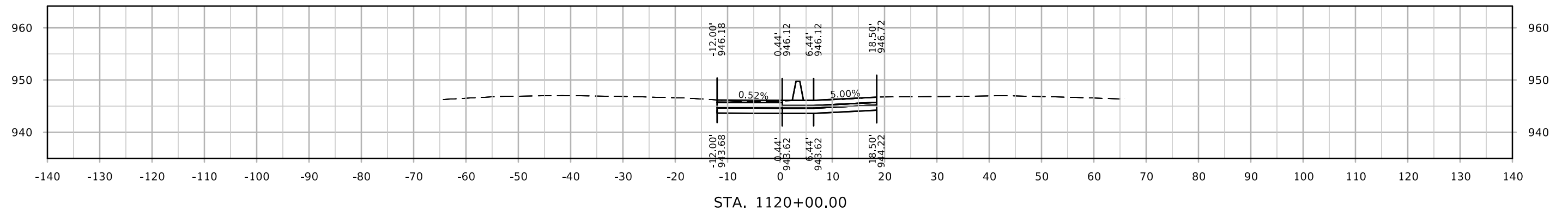
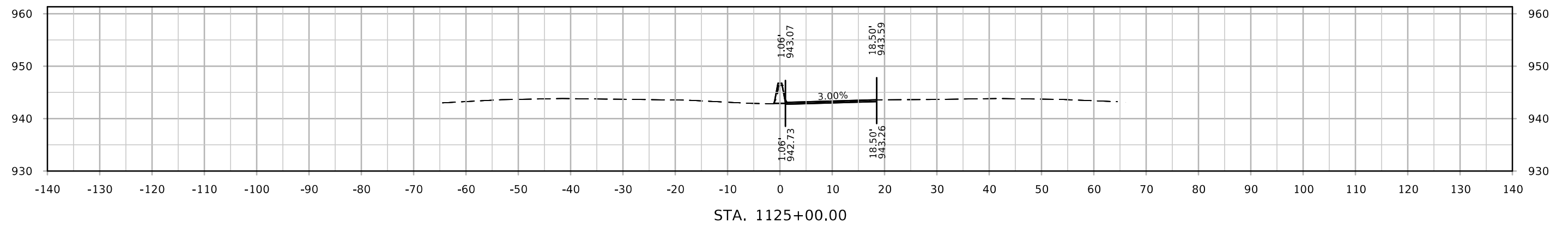
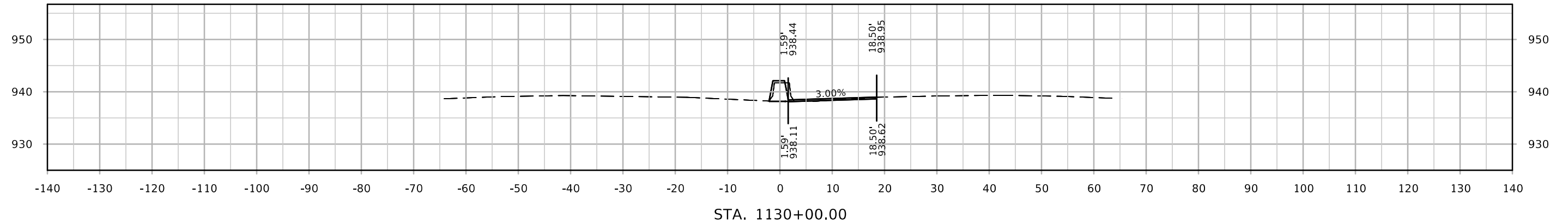
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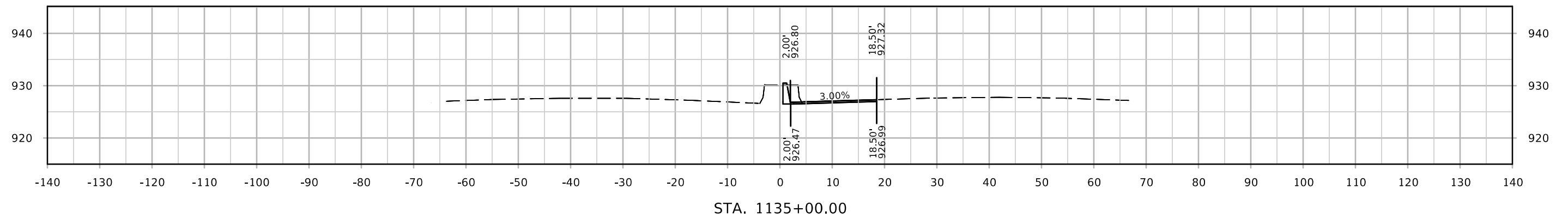
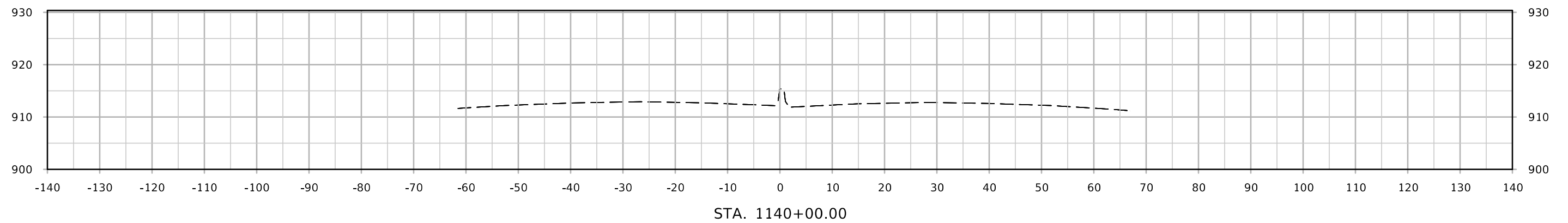
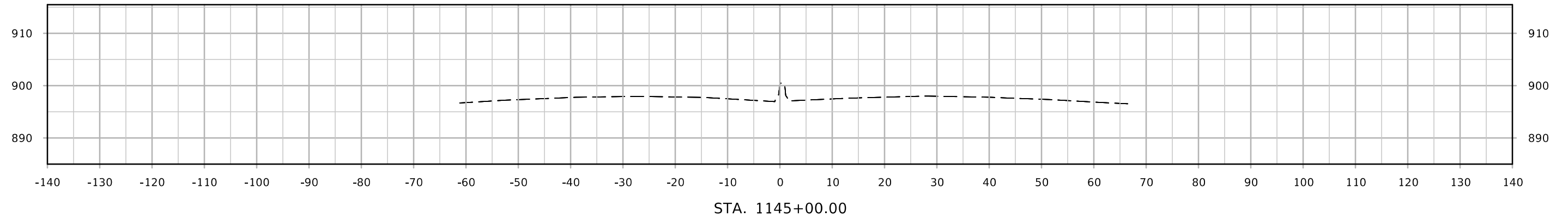
ML - I-80



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