

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 6 **DATE:** October 5, 2015

ATTENTION: Jim Schnoebelen **PROJECT:** Cedar County
BRFIMX-080-7(108)270--14-16

FROM: Kevin K. Patel PIN: 14-16-080-020

OFFICE: Design

SUBJECT: Project Concept Statement; (Final Approval, D0)

This project involves the replacement of the I-80 eastbound and westbound bridges (Maint No.1669.5R080 and 1669.5L080) over Sugar Creek, 1.5 miles west of the east junction of IA 38.

A concept review was held on April 7, 2015. Those present included Doug McDonald, Newman Abuissa, Roger Walton, Steve Flockhart, William Kreinbring, Mark Brandl, Cedric Wilkinson and Trent Sorgenfrey from the District 6 Office; Dave Mulholland from the Office of Bridges and Structures; Mark Sloppy from the Office of Location and Environment and Kevin Patel and Jean Borton from the Office of Design.

The three alternatives considered were:

1. Replace both bridges on the existing vertical and horizontal Alignment.
Both bridges will be stage constructed and will require the bridges to be 2 ft. wider than necessary (62' vs 60'). A design exception would be required for insufficient sag "K" Values. The total estimated cost is \$9,087,700.
2. Replace both bridges on the existing horizontal alignment. The new bridges will be raised and placed on a revised vertical alignment that meets the required K value; therefore, no design exception will be required. These bridges will be constructed using stage construction and will require the bridges to be built 2 ft. wider than necessary. The total estimated cost is \$11,481,800.
3. The eastbound bridge will be constructed on a new vertical and horizontal alignment. This new eastbound alignment will parallel the westbound alignment and will provide an 82 ft. wide median. The westbound bridge will remain on the existing horizontal alignment; however, the vertical alignment will be revised to meet the preferred "K" values. The ramps to the eastbound rest area will be extended to meet the new eastbound alignment. No design exception would be required. Many of the trees in the existing median area will be removed. The total estimated cost is \$15,222,100.

Alternative 2 is the preferred alternative as it eliminates the need for a design exception and the bridges can be utilized with the future I-80, 6-lane project with little disruption to the landscape. Additional right of way/right of entry will not be required. Traffic will be maintained by stage construction.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Tuesday, September 22, 2015. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2019. The Office of Bridges and Structures will coordinate plan preparation with assistance from the Office of Design.

KKP: jmb

Attach.

cc:

J. F. Adam

K. D. Nicholson

M. D. Masteller

N. M. Miller

G. A. Novey

A. Abu-Hawash

P. C. Keen

S. P. Anderson

B. D. Hofer

D. L. Newell

S. J. Gent

W.A. Sorenson

K. A. Yanna

D. L. Rick

N. M. Abuissa

S. W. Flockhart

V. A. Brewer

J. R. Selmer

D. L. Maifield

B. R. Smith

C. C. Poole

D. R. Claman

J. S. McClain

M. J. Sankey

Z. T. Bitting

J. N. Garton

B. E. Azeltine

T. D. Crouch

D. E. Sprengeler

D. McDonald

J. J. Tjaden

T. M. Storey

M. Sloppy

FHWA

M. J. Kennerly

S. J. Megivern

A. A. Welch

N. L. McDonald

P. Lu

M. A. Swenson

R. A. Younie

D. R. Tebben

A. Poole

M. E. Khoda

J.W. Laaser-Webb

E. C. Wright

C. L. Cutler

A. F. Gourley

R. R. Walton

M. J. Donovan

M. E. Ross

FINAL PROJECT CONCEPT STATEMENT

I-80 Eastbound and Westbound Bridges over Sugar Creek,
1.5 miles west of the east junction of IA 38

Cedar County
BRFIMX-080-7(108)270--14-16
PIN: 14-16-080-020
Maint. No.1669.5R080, FHWA No. 18650
Maint. No.1669.5L080, FHWA No. 18660

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

October 5, 2015

I. STUDY AREA

A. Project Description

This project involves the replacement of the I-80 eastbound and westbound bridges (Maint No.1669.5R080 and 1669.5L080) over Sugar Creek, 1.5 miles west of the east junction of IA 38

The three alternatives considered were:

1. Replace both bridges on the existing vertical and horizontal Alignment. Both bridges will be stage constructed and will require the bridges to be 2 ft. wider than necessary (62' vs 60'). A design exception would be required for insufficient sag "K" Values. The total estimated cost is \$9,087,700.
2. Replace both bridges on the existing horizontal alignment. The new bridges will be raised and placed on a revised vertical alignment that meets the required K value; therefore, no design exception will be required. These bridges will be constructed using stage construction and will require the bridges to be built 2 ft. wider than necessary. The total estimated cost is \$11,481,800.
3. The eastbound bridge will be constructed on a new vertical and horizontal alignment. This new eastbound alignment will parallel the westbound alignment and will provide an 82 ft. wide median. The westbound bridge will remain on the existing horizontal alignment; however, the vertical alignment will be revised to meet the preferred "K" values. The ramps to the eastbound rest area will be extended to meet the new eastbound alignment. No design exception would be required. Many of the trees in the existing median area will be removed. The total estimated cost is \$15,222,100.

Alternative 2 is the preferred alternative as it eliminates the need for a design exception and the bridges can be utilized with the future I-80, 6-lane project with little disruption to the landscape. Additional right of way/right of entry will not be required. Traffic will be maintained by stage construction.

B. Need for Project

Eastbound Bridge:

The deck, deck overlay, superstructure and substructure are all at the end of their service life and deteriorations are found in all the components. The deck has cracking, hollow and spall areas. Rust areas are found at the steel girders and diaphragms and cracks are found at the piers and abutments. The structure was designed for H20 load and needs to be strengthened. Also the bridge needs to be widened to satisfy highway traffic requirement. The bridge widening in conjunction with bridge strengthening and bridge repair would not be cost effective. Also this option would cause difficulties in traffic control. Therefore, this bridge should be replaced.



Westbound Bridge:

The top of the deck is in a state of advanced deterioration. Cracking and rusting staining are found on the bridge deck, abutments and pier caps. There are damages and section losses at multiple beams and diaphragms. In addition, the bridge needs to be widened to satisfy current traffic requirement. Due to the location of the bridge, cost for deck replacement and the bridge widening would be a large fraction of the cost of bridge replacement. Provided with the age of the bridge, bridge replacement would be more cost effective.



C. Present Facility

Both of the existing structures are 229' x 30' steel bridges constructed in 1960 and overlaid in 1982.

I-80 in the project area is 26 ft. wide PCC pavement with 6 ft. wide paved inside shoulders and 10 ft. effective outside shoulders (2 ft. outside pavement, 8 ft. additional paved) and 6:1/3:1 foreslopes, reconstructed in 1991. The median width in this area is variable with widths approaching 300 ft.

D. Traffic Estimates

The 2019 and 2039 average daily traffic estimates are 35,700 ADT with 36% trucks and 44,400 ADT with 37% trucks, respectively.

E. Sufficiency Ratings

I-80 is classified as an "Interstate" route and is a maintenance service level "A" road. The federal bridge sufficiency rating is 73.3 for the eastbound bridge and 78.7 for the westbound bridge.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2010 through December 31, 2014, there were 4 crashes including, 1 minor injury crashes, and 3 personal property damage only crashes. All 4 crashes were in the westbound lanes.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a new bridges on alignment

The existing 240' x 30' eastbound and 225' x 30' westbound, continuous welded girder bridges over Sugar Creek will be replaced with two 264' x 62' pretensioned prestressed concrete beam bridges. The new bridges will be constructed to accommodate the future 6-lane facility on I-80.

The typical cross section adjacent to the bridges will consist of 3-12 ft. wide lanes and 12 ft. inside and outside paved shoulders with a 10:1 ledge for 4 ft. then 6:1/3.5:1 foreslopes. The existing vertical and horizontal alignment will be used as constructed.

New bridge approaches will be constructed. The existing guardrail will be updated and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 2 bridge end drains on the trailing ends of each bridge.

The new bridges will be built 2 ft. wider than will ultimately be required (62 ft. vs. 60 ft.) in order to stage construct the bridges. During construction, two lanes of traffic will be maintained at all times. The additional widening of I-80 will be performed on the median side, thus reducing right of way impacts. There will be a 21 ft. shift to the inside from existing centerline to the new future relocated centerline. This shift is due to the existing 3 ft. wide shoulder on the bridge rather than the required 12 ft. wide shoulder, plus the additional 12 ft. wide lane. Additional pavement will be required in order to stage construct this project; however, no additional pavement beyond what is necessary for staging will be constructed. The pavement widening will consist of 12" PCC with 6" granular subbase at the inside pavement edge and 12" of special backfill with 100% sub-drain coverage. The pavement widening will eventually need to be removed when the future 6-lane project takes place.

In the first stage of construction the removal of the inside shoulder may require night work.

Culverts that are approximately 500 ft. east of the bridges will need to be replaced. The existing culverts will be plugged and abandoned and new roadway pipe culverts will be jacked under the existing roadway and extended beyond the new widened roadway.

Clearing and grubbing will be required. Apply erosion control, six inches of topsoil and rural seeding and fertilizing to all disturbed areas.

It appears that no right of way will be required for this project.

This alternative will require a design exception due to the insufficient K values for the sag vertical curve for both bridges. The sag curves provide K values of 138 for the eastbound lanes and 167 for the westbound lanes. The preferred K value for a 75 mph design speed is 206. One potential mitigation strategy to eliminate the need for a design exception is to install continuous lighting.

Eastbound Bridge Items

New Bridge
Stage Construction

Estimated Costs

\$1,827,900
182,800

Bridge Removal	88,900
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	24,000
Mobilization - 10%	222,100
M & C - 15%	<u>366,500</u>
Bridge Costs	\$ 2,809,400

Westbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800
Bridge Removal	83,200
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	24,000
Mobilization - 10%	221,500
M & C - 15%	<u>365,500</u>
Bridge Costs	\$ 2,802,100

Total Bridge Costs **\$5,611,500**

Eastbound Roadway Items	
Bridge Approaches	\$154,200
Removal of Pavement	15,100
PCC Pavement	250,400
Special Backfill	64,400
Granular Subbase	31,800
Excavation Class 10 Waste	44,200
Excavation Class 13 Waste	26,500
Shoulder Earth Construction	3,400
Roadway Pipe Culvert	105,200
Class E Revetment	1,000
Longitudinal Subdrains and Outlets	19,000
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	41,500
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	500
Bridge End Drains	5,900
Clearing and Grubbing	3,500
Topsoil	10,800
Seeding and Fertilizing	1,500

Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	20,000
Signing	7,500
Traffic Control - 5%	45,600
Mobilization - 5%	45,600
Staged Construction - 30%	273,800
M & C - 30%	<u>383,400</u>
Eastbound Roadway costs	\$ 1,661,300

Westbound Roadway Items

Bridge Approaches	\$154,200
Removal of Pavement	13,500
PCC Pavement	254,800
Special Backfill	68,000
Granular Subbase	33,600
Class 10 Waste	32,800
Excavation Class 13 Waste	30,000
Shoulder Earth Construction	3,900
Longitudinal Subdrains and Outlets	19,100
Roadway Pipe Culvert	204,200
Class E Revetment	500
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	41,600
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,000
Milled Rumble Strips	600
Bridge End Drains	5,900
Clearing and Grubbing	1,200
Topsoil	10,800
Seeding and Fertilizing	1,500
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	7,000
Signing	7,500
Traffic Control - 5%	49,900
Mobilization - 5%	49,900
Staged Construction - 30%	299,200
M & C - 30%	<u>418,800</u>
Westbound Roadway costs	\$1,814,900

Total Roadway Costs **\$3,476,200**

Project Total for Alt 1 **\$9,087,700**

Alternative #2 - Replace with a new bridges, raising both profile grades

This alternative is similar to Alternative 1 with the exception of raising the profile grade by lengthening the vertical sag curves to meet the preferred K values. Therefore no design exception will be required. This will require approximately 900 ft. of roadway reconstruction for both the eastbound and west bound lanes. This will allow the new pavement and bridge to be used as constructed and therefore can be gapped when the future I-80 6-lane project occurs. The pavement widening for stage construction will however need to be removed when the future 6-lane project takes place.

The new pavement will consist of 12" PCC on 6" of granular subbase, 12" of special backfill and polymer grid subgrade stabilization material.

Eastbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800
Bridge Removal	88,900
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	28,000
Mobilization - 10%	222,500
M & C - 15%	<u>367,100</u>
Bridge Costs	\$ 2,814,400

Westbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800
Bridge Removal	83,200
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	28,000
Mobilization - 10%	221,900
M & C - 15%	<u>366,200</u>
Bridge Costs	\$ 2,807,200

Total Bridge Costs **\$5,621,600**

Eastbound Roadway Items	
Bridge Approaches	\$154,200
Removal of Pavement	46,600
PCC Pavement	618,600
Special Backfill	157,400
Granular Subbase	77,800

Polymer Grid Subgrade Stabilizer	24,700
Class 10 Excavation (Waste)	214,800
Excavation Class 13 Waste	57,800
Longitudinal Subdrains and Outlets	33,700
Roadway Pipe Culvert	88,900
Class E Revetment	800
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	64,700
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	1,300
Bridge End Drains	5,900
Clearing and Grubbing	4,700
Seeding and Fertilizing	1,500
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	26,000
Signing	12,500
Traffic Control - 5%	84,900
Mobilization - 5%	84,900
Staged Construction - 30%	509,500
M & C - 30%	713,300
Eastbound Roadway costs	\$ 3,091,000

Westbound Roadway Items

Bridge Approaches	\$154,200
Removal of Pavement	30,400
Shoulder Strengthening	19,600
PCC Pavement	608,600
Special Backfill	153,700
Granular Subbase	75,900
Polymer Grid Subgrade Stabilizer	24,300
Class 10 Excavation (Waste)	35,300
Excavation Class 13 Waste	55,300
Longitudinal Subdrains and Outlets	26,000
Roadway Pipe Culvert	137,800
Class E Revetment	500
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	41,500
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	1,300
Bridge End Drains	5,900

Clearing and Grubbing	4,700
Seeding and Fertilizing	1,500
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	26,000
Signing	12,500
Traffic Control - 5%	76,100
Mobilization - 5%	76,100
Staged Construction - 30%	456,500
M & C - 30%	<u>639,000</u>
Westbound Roadway costs	\$ 2,769,200
Total Roadway Costs	\$5,860,200
Project Total for Alt. 2	\$11,481,800

Alternative #3 - Replace with new bridges and relocate EB Lanes

The existing 240' x 30' eastbound and 225' x 30' westbound, continuous welded girder bridges over Sugar Creek will be replaced with two 264' x 62' pretensioned prestressed concrete beam bridges. The new bridges will be constructed to accommodate the future 6-lane facility on I-80.

The existing horizontal alignment for the westbound lanes will be used as constructed. The vertical alignment will however be revised to correct the K value for the sag vertical curve. This will require approximately 1,650 ft. of pavement reconstruction. The eastbound lanes will be built on a relocated alignment, paralleling the westbound lanes to provide an 82 ft. wide median. The length of reconstruction for the eastbound lanes is approximately 9,000 ft.

The typical cross section adjacent to the bridges will consist of 3-12 ft. wide lanes and a 12 ft. inside and outside paved shoulders with a 10:1 ledge for 4 ft. then 6:1/3.5:1 foreslopes. The new pavement will consist of 12" PCC on 6" of granular subbase, 12" of special backfill and polymer grid subgrade stabilization material. Only four lanes 12 ft. wide will be paved with this project.

New bridge approaches will be constructed. The existing guardrail will be updated and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 2 bridge end drains on the trailing ends of each bridge.

Culverts that are approximately 500 ft. east of the bridges will need to be replaced. The existing culvert under the westbound lanes will be plugged and abandoned and new roadway pipe culverts will be jacked under the existing roadway and extended beyond the new widened roadway. The culvert under the existing eastbound lanes will be removed with the removal of the existing eastbound roadway.

The eastbound bridge will be constructed first along with the majority of the adjacent eastbound roadway. The crossovers will then be constructed to move traffic from the existing westbound to the new eastbound lanes.

When westbound traffic is placed on the newly constructed eastbound lanes the new westbound bridge and roadway can be reconstructed. The eastbound connections from the existing roadway to the new relocated roadway will then be constructed.

New entrance and exit ramps for the eastbound rest area will be constructed. A portion of the existing eastbound roadway may be utilized for the new entrance ramp.

A large amount of clearing and grubbing will be required for the removal of trees in the median area. This location may meet criteria for the Indiana bat and Northern long ear bat habitat. Apply erosion control, six inches of topsoil and rural seeding and fertilizing to all disturbed areas.

It appears that no right of way will be required for this project.

Traffic will be maintained with two lanes of traffic at all times via stage construction.

Eastbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,771,800
Erosion Stone	7,200
Revetment	90,000
Mobilization - 10%	186,900
M & C - 15%	<u>308,400</u>
Bridge Costs	\$ 2,364,300
Westbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,771,800
Bridge Removal	83,200
Erosion Stone	7,200
Revetment	90,000
Mobilization - 10%	195,200
M & C - 15%	<u>322,100</u>
Bridge Costs	\$ 2,469,500
Total Bridge Costs	\$4,833,800

Eastbound Roadway Items

Bridge Approaches	\$154,200
PCC Pavement	1,925,200
Special Backfill	486,100
Granular Subbase	240,200
Polymer Grid Subgrade Stabilizer	77,000
Class 10 Excavation (Waste)	809,600
Longitudinal Subdrains and Outlets	99,400
Roadway Pipe Culvert	23,500
Class E Revetment	900
Guardrail	17,600
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Milled Rumble Strips	3,600
Bridge End Drains	5,900
Clearing and Grubbing	74,400
Seeding and Fertilizing	18,900
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	417,000
Signing	30,000
Traffic Control - 5%	223,000
Mobilization - 5%	223,000
M & C - 30%	<u>1,471,400</u>
Eastbound Roadway costs	\$6,376,000

Westbound Roadway Items

Bridge Approaches	\$154,200
Removal of Pavement	289,300
PCC Pavement	785,200
Special Backfill	110,100
Granular Subbase	54,400
Modified Subbase on Ramps	161,300
Polymer Grid Subgrade Stabilizer	17,400
Class 10 Excavation Roadway and Borrow	44,900
Excavation Class 13 Waste	171,000
Longitudinal Subdrains and Outlets	54,200
Roadway Pipe Culvert	137,900
Class E Revetment	500
Guardrail (Includes Removal)	24,100
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Paved Shoulders on Ramps	184,400
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	800
Bridge End Drains	5,900

Clearing and Grubbing	2,300
Place Topsoil	150,100
Seeding and Fertilizing	9,100
Erosion Control	5,000
Woodland Mitigation	50,000
Wetland Mitigation	13,000
Median Cross-overs	342,600
Signing	7,500
Traffic Control - 5%	140,300
Mobilization - 5%	140,300
M & C - 30%	<u>925,900</u>
Westbound Roadway costs	\$ 4,012,300
Total Roadway Costs	\$10,388,300
Project Total	\$15,222,100

B. Detour Analysis

There will be no off-site detour. Two lanes of traffic will be maintained at all times via stage construction.

C. Recommendations

It is recommended that the present structures be reconstructed as described in Alternative No. 2.

D. Construction Sequence

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

E. Special Considerations

This project is considered a "Traffic Critical Project".

Right of Way will not be required for this project.

The Office of Location and Environment has been onsite and has determined that a Section 404 Permit will be required. The Iowa Department of Natural Resources has designated Sugar Creek as a protected stream, so impacts to the stream should be minimized. There appears to be a small stream in the southeast quadrant of the

eastbound bridge. Any realignment to the stream should be avoided. All trees would need to be cut before March 31 or after October 1 and consultation may be required pending field review when project specifics are known. The project area may meet criteria for Indiana bat or Northern long ear bat habitat.

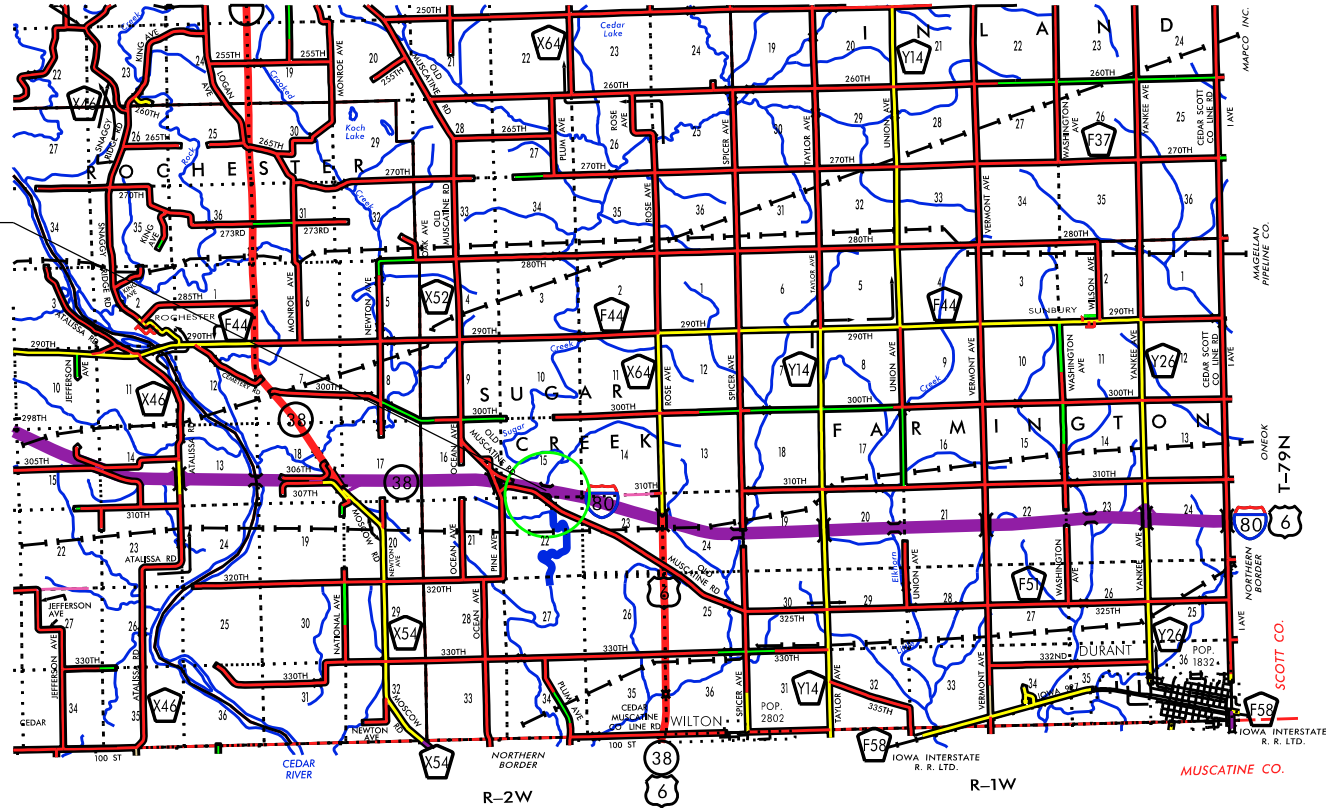
F. Program Status

The eastbound bridge project is listed in the 2016-2020 Iowa Transportation Improvement Program with \$5,963,000 scheduled in FY 2019. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

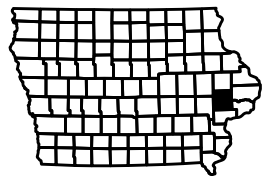
KKP: jmb

CEDAR COUNTY

STA 5924+90
 FHWA 18650
 MAINT. NO. 1669.5R080
 DESIGN 8759



ON EB I-80, 1.4 MILES WEST OF EAST JCT.
 IA. 38, SUGAR CREEK
 BRFIMX-080-7(108)270-14-16
 PIN: 14-16-080-020



BRIDGE REPLACEMENT - PPCB
BRFIMX-080-7(108)270--14-16
CEDAR CO.

UPCOMING EVENT DATES

D3 - Plans for Preliminary Bridge	October 21, 2016
B1 - Bridges and Structures Layout	December 16, 2016
B2 - Drainage Design and Misc. Layout To Office of Design	December 16, 2016
D5 - Preliminary Plans to Right-of-Way	January 20, 2017
TMP - Transportation Management Plan	January 20, 2017
D4 - Final Plans to Bridge	June 21, 2017

FIELD EXAM ATTENDEE'S



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE
INTERSTATE ROAD SYSTEM
CEDAR COUNTY
BRIDGE REPLACEMENT - PPCB

Interstate 80 over Sugar Creek
 1.5 mi. W. of E. Jct IA 38

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

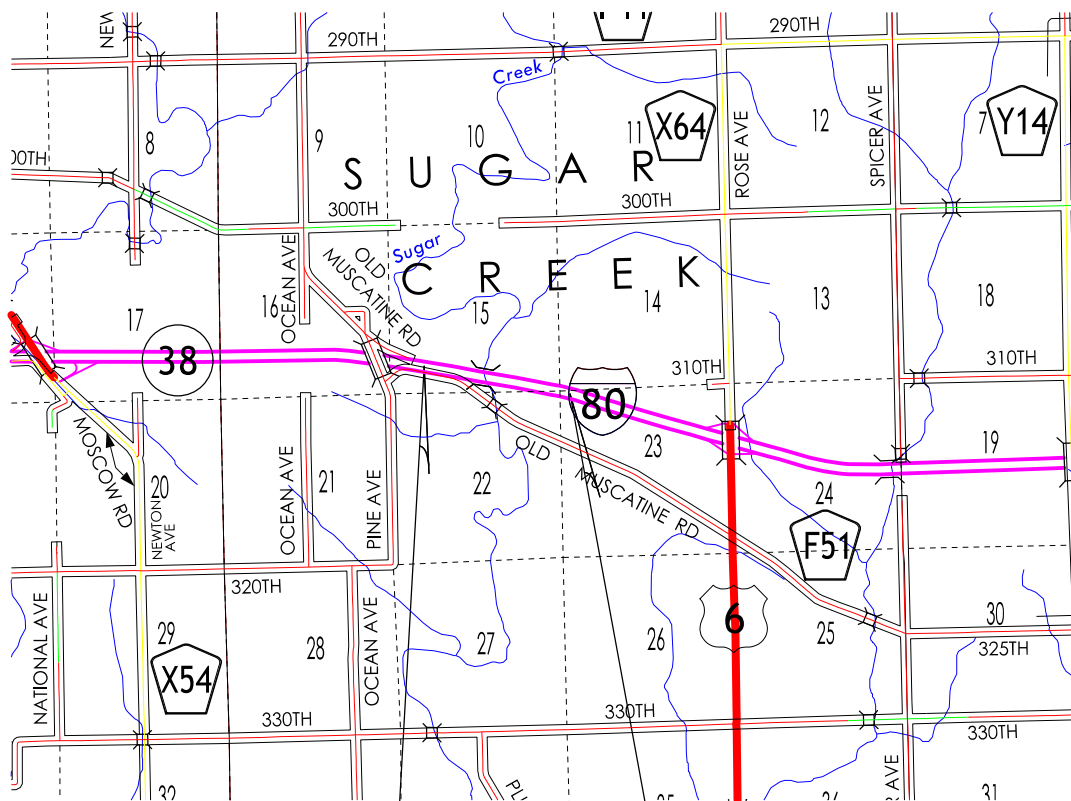


REVISIONS

TOTAL
PROJECT IDENTIFICATION NUMBER
14-16-080-020
PROJECT NUMBER
BRFIMX-080-7(108)270--14-16
R.O.W. PROJECT NUMBER

INDEX OF SHEETS

No.	DESCRIPTION
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A.4 - 12	Project Concept (FIELD EXAM ONLY)
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B.1 - 5	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 9	Interstate 80 - Westbound
* D.10 - 17	Interstate 80 - Eastbound
G Sheets	Survey Sheets
G.1 - 2	Reference Ties and Bench Marks
G.3	Horizontal Control Tab. & Super for all Alignments
J Sheets	Traffic Control and Staging Sheets
* J.1	Traffic Control Plan & Staging Notes
* J.2	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.3 - 15	Staging and Traffic Control Sheets Stage ??
T Sheets	Earthwork Quantity Sheets
T.1 - 4	Earthwork Quantity Sheets
V Sheets	Bridge and Culvert Situation Plans
V.1	I-80 Bridge Situation Plan - Westbound
V.2	I-80 Bridge Situation Plan - Eastbound
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 54	Mainline Cross Sections
* Color Plan Sheets	



STA 922+89.12
 BEGIN PROJECT
 M.P. ??

STA 968+91.19
 END PROJECT
 M.P. ??

MAP NOT TO SCALE

MILEAGE SUMMARY

Div.	Location	Lin. Ft.	Miles
1	RURAL: Westbound I-80 Sta. 4925+69.00 to 4966+96.49 Deduct Bridge at Sta. ???	4127.49 264.00	
	Total Length of Westbound Roadway	3863.49	
	Total Length of Westbound Bridge	264.00	
	Total Length of Westbound	4127.49	0.782
	Eastbound I-80 Sta. 5925+94.90 to 5965+18.77 Deduct Bridge at Sta. ???	3923.87 264.00	
	Total Length of Eastbound Roadway	3659.87	
	Total Length of Eastbound Bridge	264.00	
	Total Length of Eastbound	3923.87	0.743
	Total Net Length of Roadway	7523.36	1.425
	Total Net Length of Bridge	528.00	0.100
	Total Net Length of Project	8051.36	1.525

Preliminary Earthwork: Excavation, Class 10, Roadway and Borrow

Stage 1	24619
Stage 2	5980
Total	30599
Excavation, Class 10, Waste	
Stage 1	62524
Stage 2	0
Total	62524
Embankment in Place, Contractor Furnished	
Stage 1	0
Stage 2	1186
Total	1186
Compaction with Moisture Control	
Total	25080

DESIGN DATA RURAL

2019 AADT	35,700	V.P.D.
2039 AADT	44,400	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	37 %	
Total Design ESALs	--	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.1	X	Primary Signature Block
	X	
	X	

PRELIMINARY PLANS

Subject to change by final design.

D2 Field Exam - Date: Sept 21, 2016

FIELD EXAM DESIGN QUESTIONS

1. Has "Draft" Design Criteria been approved? Submitted on 8/9/2016
2. Any special construction times required? Travel restrictions?
3. Reduced speeds during construction?
4. Condition of existing culverts not being abandoned?
5. Existing subdrain? Locations?
6. Clearing and Grubbing - Units or Acres? Quantity provided by_____?
7. Disposition of existing guardrail? Deliver to nearest maintenance garage?
8. Construction Survey by _____? Contractor or IDOT?
9. Field office or field laboratory needed?
10. What is minimum depth of cover required to bore/jack pipe under the Interstate?
 - a. Add drop inlet to increase depth of cover?
 - b. Require flume at outlet or handle with rip rap?
11. Preliminary Bridge guidelines recommend jacking from the downstream side; however, we have more room on the upstream side. Also helps with staging. Is it Ok to jack from the median?

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 6
ATTENTION: Jim Schnoebelen
FROM: Kevin K. Patel
OFFICE: Design
SUBJECT: Project Concept Statement; (Final Approval, D0)

DATE: October 5, 2015
PROJECT: Cedar County
 BRFIMX-080-7(108)270--14-16
 PIN: 14-16-080-020

This project involves the replacement of the I-80 eastbound and westbound bridges (Maint No.1669.5R080 and 1669.5L080) over Sugar Creek, 1.5 miles west of the east junction of IA 38.

A concept review was held on April 7, 2015. Those present included Doug McDonald, Newman Abuissa, Roger Walton, Steve Flockhart, William Kreinbring, Mark Brandl, Cedric Wilkinson and Trent Sorgenfrey from the District 6 Office; Dave Mulholland from the Office of Bridges and Structures; Mark Sloppy from the Office of Location and Environment and Kevin Patel and Jean Borton from the Office of Design.

The three alternatives considered were:

1. Replace both bridges on the existing vertical and horizontal Alignment.
Both bridges will be stage constructed and will require the bridges to be 2 ft. wider than necessary (62' vs 60'). A design exception would be required for insufficient sag "K" Values. The total estimated cost is \$9,087,700.
2. Replace both bridges on the existing horizontal alignment. The new bridges will be raised and placed on a revised vertical alignment that meets the required K value; therefore, no design exception will be required. These bridges will be constructed using stage construction and will require the bridges to be built 2 ft. wider than necessary. The total estimated cost is \$11,481,800.
3. The eastbound bridge will be constructed on a new vertical and horizontal alignment. This new eastbound alignment will parallel the westbound alignment and will provide an 82 ft. wide median. The westbound bridge will remain on the existing horizontal alignment; however, the vertical alignment will be revised to meet the preferred "K" values. The ramps to the eastbound rest area will be extended to meet the new eastbound alignment. No design exception would be required. Many of the trees in the existing median area will be removed. The total estimated cost is \$15,222,100.

Alternative 2 is the preferred alternative as it eliminates the need for a design exception and the bridges can be utilized with the future I-80, 6-lane project with little disruption to the landscape. Additional right of way/right of entry will not be required. Traffic will be maintained by stage construction.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Tuesday, September 22, 2015. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2019. The Office of Bridges and Structures will coordinate plan preparation with assistance from the Office of Design.

KKP: jmb
 Attach.

cc:

J. F. Adam	J. R. Selmer	M. J. Kennerly
K. D. Nicholson	D. L. Maifield	S. J. Megivern
M. D. Masteller	B. R. Smith	A. A. Welch
N. M. Miller	C. C. Poole	N. L. McDonald
G. A. Novey	D. R. Claman	P. Lu
A. Abu-Hawash	J. S. McClain	M. A. Swenson
P. C. Keen	M. J. Sankey	R. A. Younie
S. P. Anderson	Z. T. Bitting	D. R. Tebben
B. D. Hofer	J. N. Garton	A. Poole
D. L. Newell	B. E. Azeltine	M. E. Khoda
S. J. Gent	T. D. Crouch	J.W. Laaser-Webb
W.A. Sorenson	D. E. Sprengeler	E. C. Wright
K. A. Yanna	D. McDonald	C. L. Cutler
D. L. Rick	J. J. Tjaden	A. F. Gourley
N. M. Abuissa	T. M. Storey	R. R. Walton
S. W. Flockhart	M. Sloppy	M. J. Donovan
V. A. Brewer	FHWA	M. E. Ross

FINAL PROJECT CONCEPT STATEMENT

I-80 Eastbound and Westbound Bridges over Sugar Creek,
1.5 miles west of the east junction of IA 38

Cedar County
BRFIMX-080-7(108)270--14-16
PIN: 14-16-080-020
Maint. No.1669.5R080, FHWA No. 18650
Maint. No.1669.5L080, FHWA No. 18660

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

October 5, 2015

Cedar County
BRFIMX-080-7(108)270--14-16
PIN: 14-16-080-020
Page 2

Alternative 2 is the preferred alternative as it eliminates the need for a design exception and the bridges can be utilized with the future I-80, 6-lane project with little disruption to the landscape. Additional right of way/right of entry will not be required. Traffic will be maintained by stage construction.

B. Need for Project

Eastbound Bridge:

The deck, deck overlay, superstructure and substructure are all at the end of their service life and deteriorations are found in all the components. The deck has cracking, hollow and spall areas. Rust areas are found at the steel girders and diaphragms and cracks are found at the piers and abutments. The structure was designed for H20 load and needs to be strengthened. Also the bridge needs to be widened to satisfy highway traffic requirement. The bridge widening in conjunction with bridge strengthening and bridge repair would not be cost effective. Also this option would cause difficulties in traffic control. Therefore, this bridge should be replaced.



Westbound Bridge:

The top of the deck is in a state of advanced deterioration. Cracking and rusting staining are found on the bridge deck, abutments and pier caps. There are damages and section losses at multiple beams and diaphragms. In addition, the bridge needs to be widened to satisfy current traffic requirement. Due to the location of the bridge, cost for deck replacement and the bridge widening would be a large fraction of the cost of bridge replacement. Provided with the age of the bridge, bridge replacement would be more cost effective.



I. STUDY AREA

A. Project Description

This project involves the replacement of the I-80 eastbound and westbound bridges (Maint No.1669.5R080 and 1669.5L080) over Sugar Creek, 1.5 miles west of the east junction of IA 38

The three alternatives considered were:

1. Replace both bridges on the existing vertical and horizontal Alignment. Both bridges will be stage constructed and will require the bridges to be 2 ft. wider than necessary (62' vs 60'). A design exception would be required for insufficient sag "K" Values. The total estimated cost is \$9,087,700.
2. Replace both bridges on the existing horizontal alignment. The new bridges will be raised and placed on a revised vertical alignment that meets the required K value; therefore, no design exception will be required. These bridges will be constructed using stage construction and will require the bridges to be built 2 ft. wider than necessary. The total estimated cost is \$11,481,800.
3. The eastbound bridge will be constructed on a new vertical and horizontal alignment. This new eastbound alignment will parallel the westbound alignment and will provide an 82 ft. wide median. The westbound bridge will remain on the existing horizontal alignment; however, the vertical alignment will be revised to meet the preferred "K" values. The ramps to the eastbound rest area will be extended to meet the new eastbound alignment. No design exception would be required. Many of the trees in the existing median area will be removed. The total estimated cost is \$15,222,100.

C. Present Facility

Both of the existing structures are 229' x 30' steel bridges constructed in 1960 and overlaid in 1982.

I-80 in the project area is 26 ft. wide PCC pavement with 6 ft. wide paved inside shoulders and 10 ft. effective outside shoulders (2 ft. outside pavement, 8 ft. additional paved) and 6:1/3:1 foreslopes, reconstructed in 1991. The median width in this area is variable with widths approaching 300 ft.

D. Traffic Estimates

The 2019 and 2039 average daily traffic estimates are 35,700 ADT with 36% trucks and 44,400 ADT with 37% trucks, respectively.

E. Sufficiency Ratings

I-80 is classified as an "Interstate" route and is a maintenance service level "A" road. The federal bridge sufficiency rating is 73.3 for the eastbound bridge and 78.7 for the westbound bridge.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2010 through December 31, 2014, there were 4 crashes including, 1 minor injury crashes, and 3 personal property damage only crashes. All 4 crashes were in the westbound lanes.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a new bridges on alignment

The existing 240' x 30' eastbound and 225' x 30' westbound, continuous welded girder bridges over Sugar Creek will be replaced with two 264' x 62' pretensioned prestressed concrete beam bridges. The new bridges will be constructed to accommodate the future 6-lane facility on I-80.

The typical cross section adjacent to the bridges will consist of 3-12 ft. wide lanes and 12 ft. inside and outside paved shoulders with a 10:1 ledge for 4 ft. then 6:1/3.5:1 foreslopes. The existing vertical and horizontal alignment will be used as constructed.

New bridge approaches will be constructed. The existing guardrail will be updated and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 2 bridge end drains on the trailing ends of each bridge.

The new bridges will be built 2 ft. wider than will ultimately be required (62 ft. vs. 60 ft.) in order to stage construct the bridges. During construction, two lanes of traffic will be maintained at all times. The additional widening of I-80 will be performed on the median side, thus reducing right of way impacts. There will be a 21 ft. shift to the inside from existing centerline to the new future relocated centerline. This shift is due to the existing 3 ft. wide shoulder on the bridge rather than the required 12 ft. wide shoulder, plus the additional 12 ft. wide lane. Additional pavement will be required in order to stage construct this project; however, no additional pavement beyond what is necessary for staging will be constructed. The pavement widening will consist of 12" PCC with 6" granular subbase at the inside pavement edge and 12" of special backfill with 100% sub-drain coverage. The pavement widening will eventually need to be removed when the future 6-lane project takes place.

In the first stage of construction the removal of the inside shoulder may require night work.

Culverts that are approximately 500 ft. east of the bridges will need to be replaced. The existing culverts will be plugged and abandoned and new roadway pipe culverts will be jacked under the existing roadway and extended beyond the new widened roadway.

Clearing and grubbing will be required. Apply erosion control, six inches of topsoil and rural seeding and fertilizing to all disturbed areas.

It appears that no right of way will be required for this project.

This alternative will require a design exception due to the insufficient K values for the sag vertical curve for both bridges. The sag curves provide K values of 138 for the eastbound lanes and 167 for the westbound lanes. The preferred K value for a 75 mph design speed is 206. One potential mitigation strategy to eliminate the need for a design exception is to install continuous lighting.

<u>Eastbound Bridge Items</u>	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800

Bridge Removal	88,900
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	24,000
Mobilization - 10%	222,100
M & C - 15%	<u>366,500</u>
Bridge Costs	\$ 2,809,400

Westbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800
Bridge Removal	83,200
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	24,000
Mobilization - 10%	221,500
M & C - 15%	<u>365,500</u>
Bridge Costs	\$ 2,802,100
Total Bridge Costs	\$5,611,500

Eastbound Roadway Items	
Bridge Approaches	\$154,200
Removal of Pavement	15,100
PCC Pavement	250,400
Special Backfill	64,400
Granular Subbase	31,800
Excavation Class 10 Waste	44,200
Excavation Class 13 Waste	26,500
Shoulder Earth Construction	3,400
Roadway Pipe Culvert	105,200
Class E Revetment	1,000
Longitudinal Subdrains and Outlets	19,000
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	41,500
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	500
Bridge End Drains	5,900
Clearing and Grubbing	3,500
Topsoil	10,800
Seeding and Fertilizing	1,500

Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	20,000
Signing	7,500
Traffic Control - 5%	45,600
Mobilization - 5%	45,600
Staged Construction - 30%	273,800
M & C - 30%	<u>383,400</u>
Eastbound Roadway costs	\$ 1,661,300

Westbound Roadway Items	
Bridge Approaches	\$154,200
Removal of Pavement	13,500
PCC Pavement	254,800
Special Backfill	68,000
Granular Subbase	33,600
Class 10 Waste	32,800
Excavation Class 13 Waste	30,000
Shoulder Earth Construction	3,900
Longitudinal Subdrains and Outlets	19,100
Roadway Pipe Culvert	204,200
Class E Revetment	500
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	41,600
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,000
Milled Rumble Strips	600
Bridge End Drains	5,900
Clearing and Grubbing	1,200
Topsoil	10,800
Seeding and Fertilizing	1,500
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	7,000
Signing	7,500
Traffic Control - 5%	49,900
Mobilization - 5%	49,900
Staged Construction - 30%	299,200
M & C - 30%	<u>418,800</u>
Westbound Roadway costs	\$1,814,900

Total Roadway Costs \$3,476,200

Project Total for Alt 1 \$9,087,700

Alternative #2 - Replace with a new bridges, raising both profile grades

This alternative is similar to Alternative 1 with the exception of raising the profile grade by lengthening the vertical sag curves to meet the preferred K values. Therefore no design exception will be required. This will require approximately 900 ft. of roadway reconstruction for both the eastbound and west bound lanes. This will allow the new pavement and bridge to be used as constructed and therefore can be gapped when the future I-80 6-lane project occurs. The pavement widening for stage construction will however need to be removed when the future 6-lane project takes place.

The new pavement will consist of 12" PCC on 6" of granular subbase, 12" of special backfill and polymer grid subgrade stabilization material.

Eastbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800
Bridge Removal	88,900
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	28,000
Mobilization - 10%	222,500
M & C - 15%	<u>367,100</u>
Bridge Costs	\$ 2,814,400

Westbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,827,900
Stage Construction	182,800
Bridge Removal	83,200
Erosion Stone	7,200
Revetment	90,000
Steel Sheet Pile	28,000
Mobilization - 10%	221,900
M & C - 15%	<u>366,200</u>
Bridge Costs	\$ 2,807,200

Total Bridge Costs **\$5,621,600**

Eastbound Roadway Items	
Bridge Approaches	\$154,200
Removal of Pavement	46,600
PCC Pavement	618,600
Special Backfill	157,400
Granular Subbase	77,800

Polymer Grid Subgrade Stabilizer	24,700
Class 10 Excavation (Waste)	214,800
Excavation Class 13 Waste	57,800
Longitudinal Subdrains and Outlets	33,700
Roadway Pipe Culvert	88,900
Class E Revetment	800
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	64,700
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	1,300
Bridge End Drains	5,900
Clearing and Grubbing	4,700
Seeding and Fertilizing	1,500
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	26,000
Signing	12,500
Traffic Control - 5%	84,900
Mobilization - 5%	84,900
Staged Construction - 30%	509,500
M & C - 30%	<u>713,300</u>
Eastbound Roadway costs	\$ 3,091,000

Westbound Roadway Items	
Bridge Approaches	\$154,200
Removal of Pavement	30,400
Shoulder Strengthening	19,600
PCC Pavement	608,600
Special Backfill	153,700
Granular Subbase	75,900
Polymer Grid Subgrade Stabilizer	24,300
Class 10 Excavation (Waste)	35,300
Excavation Class 13 Waste	55,300
Longitudinal Subdrains and Outlets	26,000
Roadway Pipe Culvert	137,800
Class E Revetment	500
Guardrail (Includes Removal)	20,900
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Temporary Concrete Barrier Rail	41,500
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	1,300
Bridge End Drains	5,900

Clearing and Grubbing	4,700
Seeding and Fertilizing	1,500
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	26,000
Signing	12,500
Traffic Control - 5%	76,100
Mobilization - 5%	76,100
Staged Construction - 30%	456,500
M & C - 30%	<u>639,000</u>
Westbound Roadway costs	\$ 2,769,200
Total Roadway Costs	\$5,860,200
Project Total for Alt. 2	\$11,481,800

Alternative #3 - Replace with new bridges and relocate EB Lanes

The existing 240' x 30' eastbound and 225' x 30' westbound, continuous welded girder bridges over Sugar Creek will be replaced with two 264' x 62' pretensioned prestressed concrete beam bridges. The new bridges will be constructed to accommodate the future 6-lane facility on I-80.

The existing horizontal alignment for the westbound lanes will be used as constructed. The vertical alignment will however be revised to correct the K value for the sag vertical curve. This will require approximately 1,650 ft. of pavement reconstruction. The eastbound lanes will be built on a relocated alignment, paralleling the westbound lanes to provide an 82 ft. wide median. The length of reconstruction for the eastbound lanes is approximately 9,000 ft.

The typical cross section adjacent to the bridges will consist of 3-12 ft. wide lanes and a 12 ft. inside and outside paved shoulders with a 10:1 ledge for 4 ft. then 6:1/3.5:1 foreslopes. The new pavement will consist of 12" PCC on 6" of granular subbase, 12" of special backfill and polymer grid subgrade stabilization material. Only four lanes 12 ft. wide will be paved with this project.

New bridge approaches will be constructed. The existing guardrail will be updated and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 2 bridge end drains on the trailing ends of each bridge.

Culverts that are approximately 500 ft. east of the bridges will need to be replaced. The existing culvert under the westbound lanes will be plugged and abandoned and new roadway pipe culverts will be jacked under the existing roadway and extended beyond the new widened roadway. The culvert under the existing eastbound lanes will be removed with the removal of the existing eastbound roadway.

The eastbound bridge will be constructed first along with the majority of the adjacent eastbound roadway. The crossovers will then be constructed to move traffic from the existing westbound to the new eastbound lanes.

When westbound traffic is placed on the newly constructed eastbound lanes the new westbound bridge and roadway can be reconstructed. The eastbound connections from the existing roadway to the new relocated roadway will then be constructed.

New entrance and exit ramps for the eastbound rest area will be constructed. A portion of the existing eastbound roadway may be utilized for the new entrance ramp.

A large amount of clearing and grubbing will be required for the removal of trees in the median area. This location may meet criteria for the Indiana bat and Northern long ear bat habitat. Apply erosion control, six inches of topsoil and rural seeding and fertilizing to all disturbed areas.

It appears that no right of way will be required for this project.

Traffic will be maintained with two lanes of traffic at all times via stage construction.

Eastbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,771,800
Erosion Stone	7,200
Revetment	90,000
Mobilization - 10%	186,900
M & C - 15%	<u>308,400</u>
Bridge Costs	\$ 2,364,300

Westbound Bridge Items	<u>Estimated Costs</u>
New Bridge	\$1,771,800
Bridge Removal	83,200
Erosion Stone	7,200
Revetment	90,000
Mobilization - 10%	195,200
M & C - 15%	<u>322,100</u>
Bridge Costs	\$ 2,469,500

Total Bridge Costs **\$4,833,800**

Eastbound Roadway Items

Bridge Approaches	\$154,200
PCC Pavement	1,925,200
Special Backfill	486,100
Granular Subbase	240,200
Polymer Grid Subgrade Stabilizer	77,000
Class 10 Excavation (Waste)	809,600
Longitudinal Subdrains and Outlets	99,400
Roadway Pipe Culvert	23,500
Class E Revetment	900
Guardrail	17,600
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Milled Rumble Strips	3,600
Bridge End Drains	5,900
Clearing and Grubbing	74,400
Seeding and Fertilizing	18,900
Erosion Control	5,000
Wetland Mitigation	50,000
Woodland Mitigation	417,000
Signing	30,000
Traffic Control - 5%	223,000
Mobilization - 5%	223,000
M & C - 30%	1,471,400

Eastbound Roadway costs \$6,376,000

Westbound Roadway Items

Bridge Approaches	\$154,200
Removal of Pavement	289,300
PCC Pavement	785,200
Special Backfill	110,100
Granular Subbase	54,400
Modified Subbase on Ramps	161,300
Polymer Grid Subgrade Stabilizer	17,400
Class 10 Excavation Roadway and Borrow	44,900
Excavation Class 13 Waste	171,000
Longitudinal Subdrains and Outlets	54,200
Roadway Pipe Culvert	137,900
Class E Revetment	500
Guardrail (Includes Removal)	24,100
Paved Shoulders for Guardrail	9,200
Class 10 for Guardrail Blisters	10,900
Paved Shoulders on Ramps	184,400
Temporary Crash Cushion	2,400
Temporary Floodlighting	8,100
Milled Rumble Strips	800
Bridge End Drains	5,900

Clearing and Grubbing	2,300
Place Topsoil	150,100
Seeding and Fertilizing	9,100
Erosion Control	5,000
Woodland Mitigation	50,000
Wetland Mitigation	13,000
Median Cross-overs	342,600
Signing	7,500
Traffic Control - 5%	140,300
Mobilization - 5%	140,300
M & C - 30%	925,900
Westbound Roadway costs	\$ 4,012,300

Total Roadway Costs \$10,388,300

Project Total \$15,222,100

B. Detour Analysis

There will be no off-site detour. Two lanes of traffic will be maintained at all times via stage construction.

C. Recommendations

It is recommended that the present structures be reconstructed as described in Alternative No. 2.

D. Construction Sequence

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

E. Special Considerations

This project is considered a "Traffic Critical Project".

Right of Way will not be required for this project.

The Office of Location and Environment has been onsite and has determined that a Section 404 Permit will be required. The Iowa Department of Natural Resources has designated Sugar Creek as a protected stream, so impacts to the stream should be minimized. There appears to be a small stream in the southeast quadrant of the

eastbound bridge. Any realignment to the stream should be avoided. All trees would need to be cut before March 31 or after October 1 and consultation may be required pending field review when project specifics are known. The project area may meet criteria for Indiana bat or Northern long ear bat habitat.

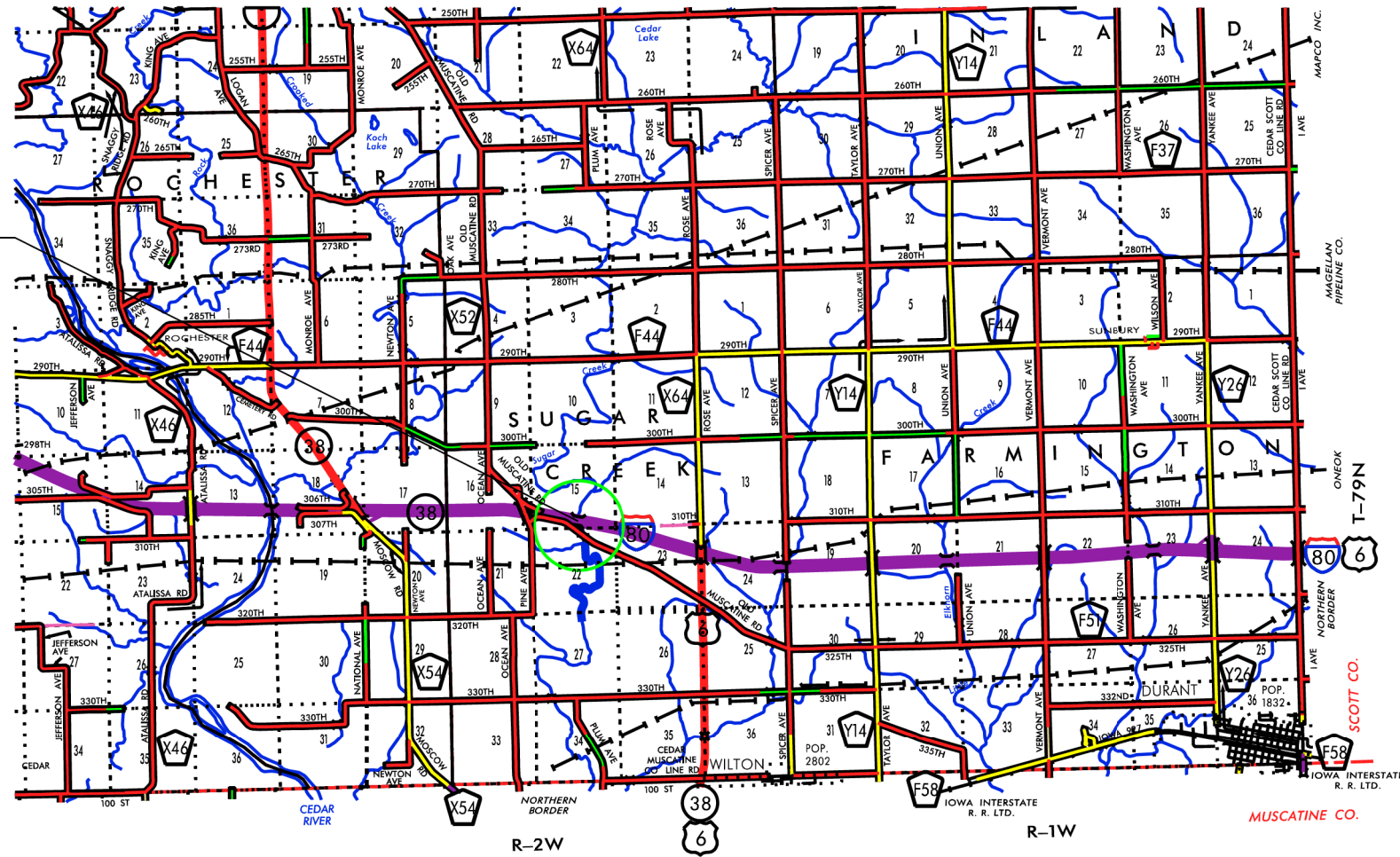
F. Program Status

The eastbound bridge project is listed in the 2016-2020 Iowa Transportation Improvement Program with \$5,963,000 scheduled in FY 2019. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

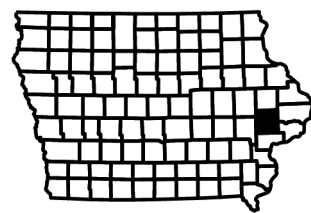
KKP: jmb

CEDAR COUNTY

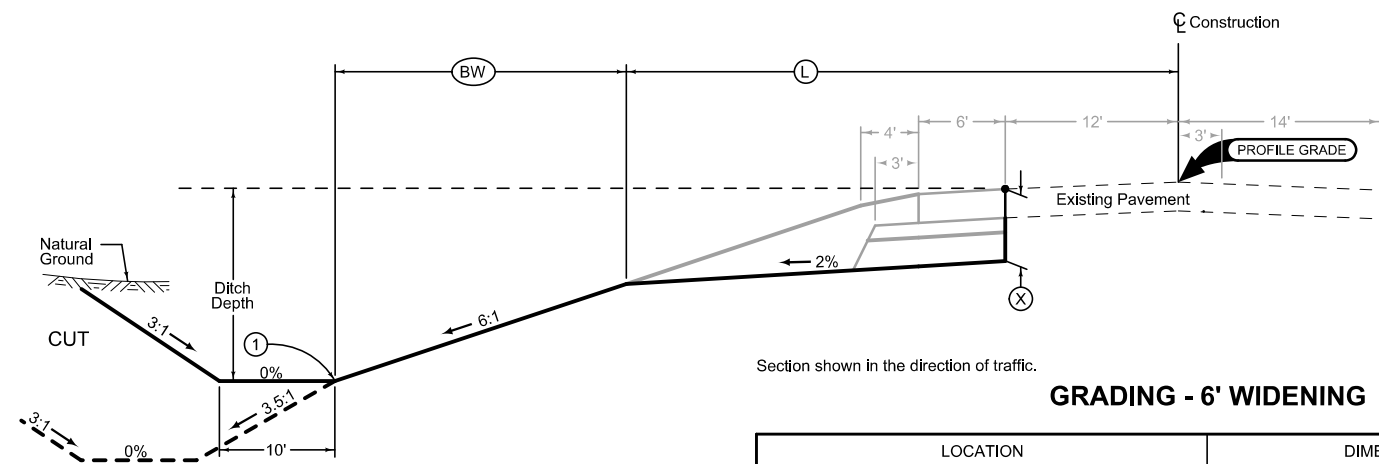
STA 5924+90
 FHWA 18650
 MAINT. NO. 1669.5R080
 DESIGN 8759



ON EB I-80, 1.4 MILES WEST OF EAST JCT.
 IA. 38, SUGAR CREEK
 BRFIMX-080-7(108)270-14-16
 PIN: 14-16-080-020



16



Section shown in the direction of traffic.

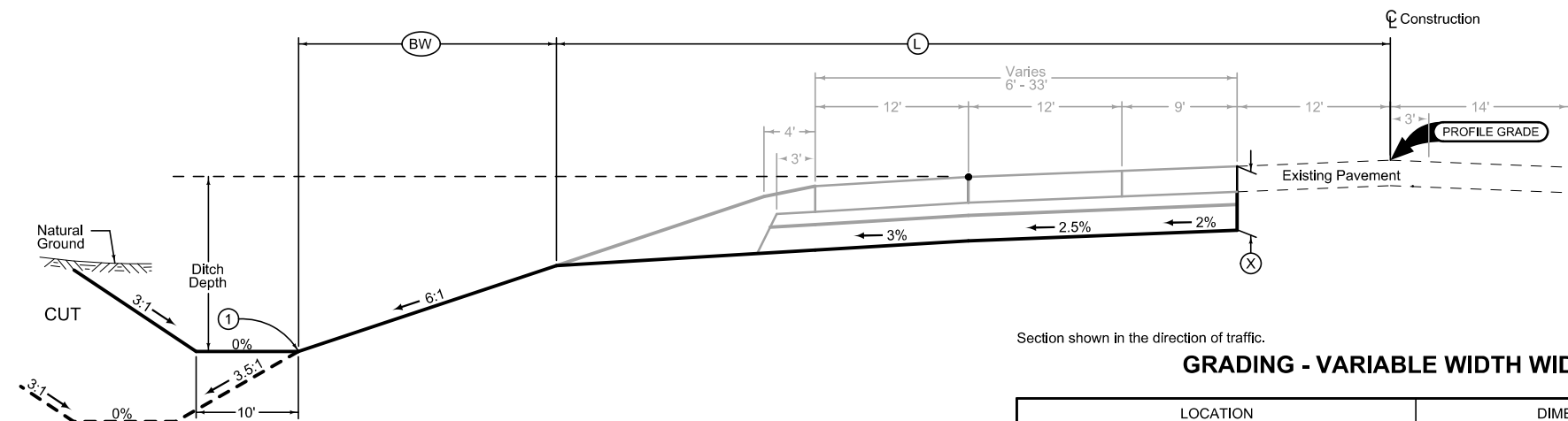
GRADING - 6' WIDENING

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

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

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

ROAD IDENTIFICATION	LOCATION		DIMENSIONS					
	STATION TO STATION		Ⓛ	Ⓡ	ⓧ	ⓁⓂ	ⓂⓂ	Ⓜ
			Feet	Feet	Inches	Feet	Feet	Feet
I-80	4925+69.90	4929+63.30	37	n/a	30	9	Varies	n/a
I-80	4961+14.64	4966+96.49	37	n/a	30	9	Varies	n/a
I-80	5925+94.90	5929+88.30	37	n/a	30	9	Varies	n/a
I-80	5962+04.17	5965+18.77	37	n/a	30	9	Varies	n/a



Section shown in the direction of traffic.

GRADING - VARIABLE WIDTH WIDENING

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

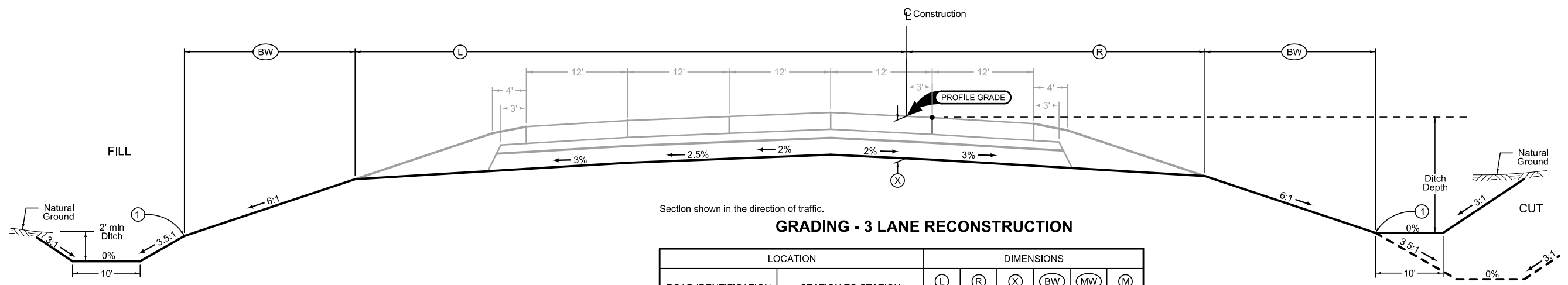
See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.

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

ROAD IDENTIFICATION	LOCATION		DIMENSIONS					
	STATION TO STATION		Ⓛ	Ⓡ	ⓧ	ⓁⓂ	ⓂⓂ	Ⓜ
			Feet	Feet	Inches	Feet	Feet	Feet
I-80	4929+63.30	4938+75.00	37-65	n/a	30	2-9	Varies	n/a
I-80	4951+75.00	4961+14.64	37-65	n/a	30	2-9	Varies	n/a
I-80	5929+88.30	5939+00.00	37-65	n/a	30	2-9	Varies	n/a
I-80	5953+00.00	5962+04.17	37-65	n/a	30	2-9	Varies	n/a

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

I-80



Section shown in the direction of traffic.

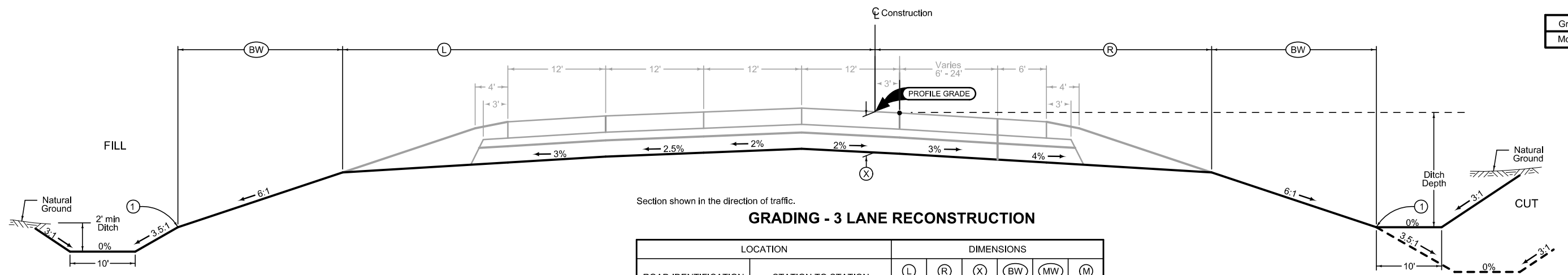
GRADING - 3 LANE RECONSTRUCTION

LOCATION		DIMENSIONS						
ROAD IDENTIFICATION	STATION TO STATION	L Feet	R Feet	X Inches	BW Feet	MW Feet	M Feet	
I-80	4938+75.00 4947+19.84	65	35	30	2.5	Varies	n/a	
I-80	5939+00.00 5953+00.00	65	35	30	2.5	Varies	n/a	

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

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

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



Section shown in the direction of traffic.

GRADING - 3 LANE RECONSTRUCTION

LOCATION		DIMENSIONS						
ROAD IDENTIFICATION	STATION TO STATION	L Feet	R Feet	X Inches	BW Feet	MW Feet	M Feet	
I-80	4947+19.84 4951+75.00	65	35-55	30	6	Varies	n/a	

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

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

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

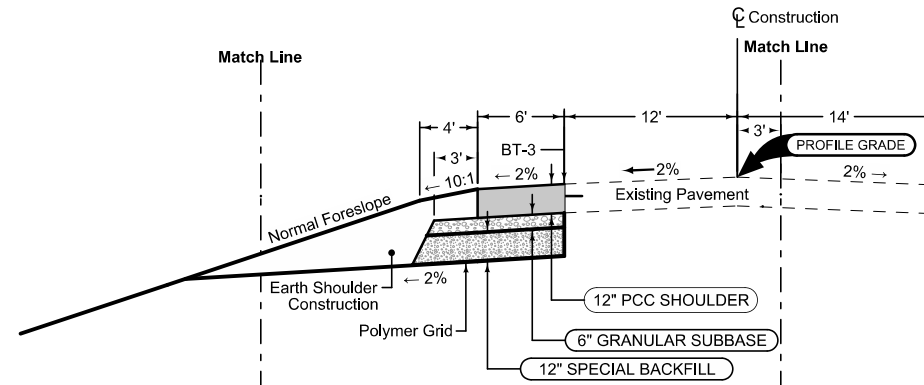
See Tab 100-24 or 100-25 for pavement quantities.
See Tab 112-9 for shoulder quantities.

I-80

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joints: C at 20' spacing

6D_Closed_P_FullPCC_04-19-11	
BEGIN STATION	END STATION
4925+69.90	4929+63.30
4961+14.64	4966+96.49
5925+94.90	5929+88.30
5962+04.14	5965+18.77



Polymer Grid placed under the Special Backfill.

Section shown in the direction of traffic.

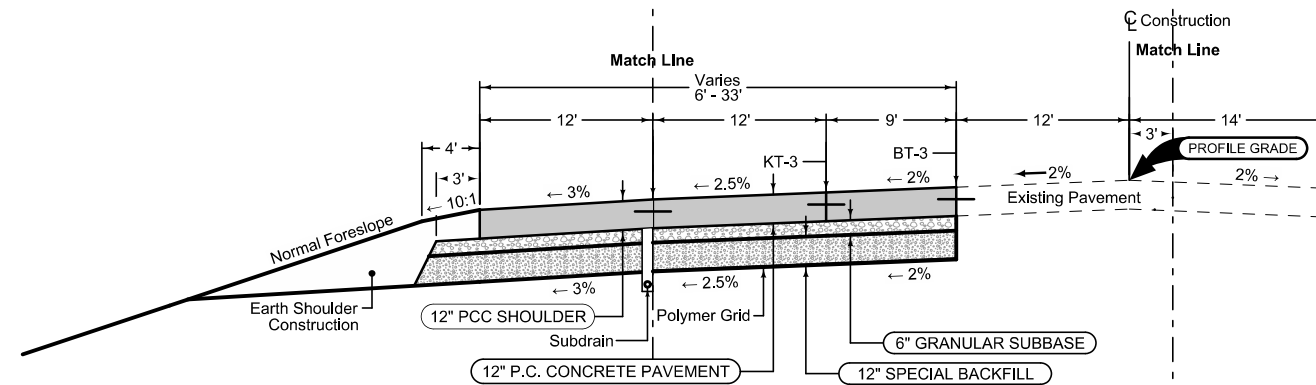
Mainline Jointing:
 Transverse joints: CD at 20' spacing

3-LANE Modified	
BEGIN STATION	END STATION
4925+69.90	4929+63.30
4961+14.64	4966+96.49
5925+94.90	5929+88.30
5962+04.17	5965+18.77

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joints: C at 20' spacing

6D_Closed_P_FullPCC_04-19-11	
BEGIN STATION	END STATION
4929+63.30	4938+75.00
4951+75.00	4961+14.64
5929+88.30	5939+00.00
5953+00.00	5962+04.17



Polymer Grid placed between the existing pavement and Subdrain trench under the Special Backfill.

Section shown in the direction of traffic.

Mainline Jointing:
 Transverse joints: CD at 20' spacing

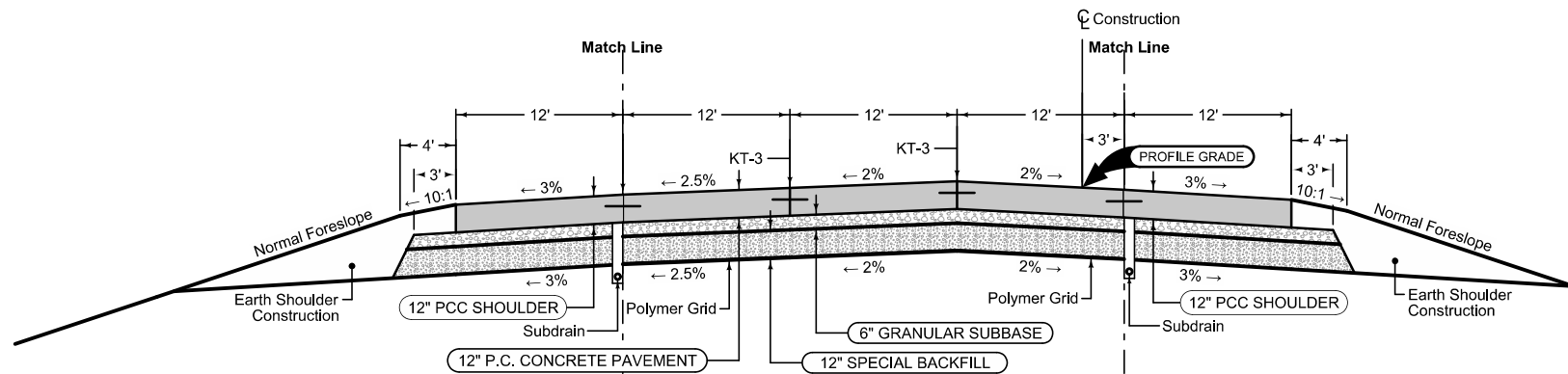
3-LANE Modified	
BEGIN STATION	END STATION
4929+63.30	4938+75.00
4951+75.00	4961+14.64
5929+88.30	5939+00.00
5953+00.00	5962+04.17

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

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joints: C at 20' spacing

6D_Closed_P_FullPCC_04-19-11	
BEGIN STATION	END STATION
4938+75.00	4951+75.00
5939+00.00	5953+00.00



Polymer Grid placed between the Subrain trenches and under the Special Backfill.

Section shown in the direction of traffic.

Mainline Jointing:
 Transverse joints: CD at 20' spacing

3-LANE Modified	
BEGIN STATION	END STATION
4938+75.00	4951+75.00
5939+00.00	5953+00.00

Full Depth PCC Shoulder

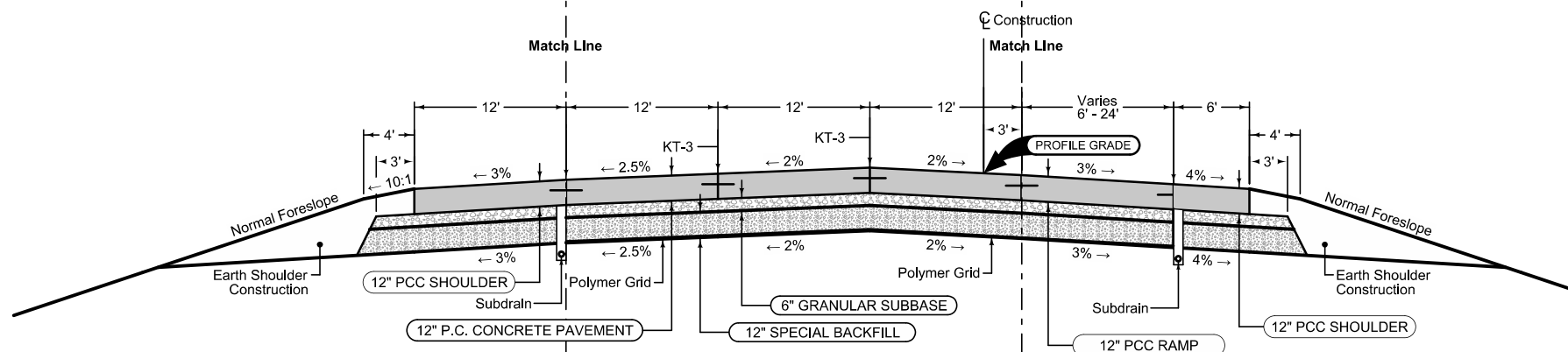
Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joints: C at 20' spacing

6D_Closed_P_FullPCC_04-19-11	
BEGIN STATION	END STATION

Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joints: C at 20' spacing

6D_Closed_P_FullPCC_04-19-11	
BEGIN STATION	END STATION
4947+19.84	4951+75.00



Polymer Grid placed between the Subrain trenches and under the Special Backfill.

Section shown in the direction of traffic.

Mainline Jointing:
 Transverse joints: CD at 20' spacing

3-LANE Modified	
BEGIN STATION	END STATION
4947+19.84	4951+75.00

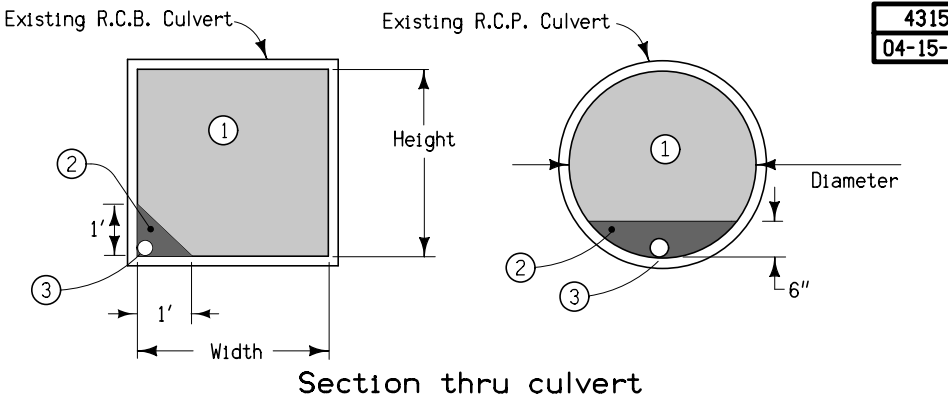
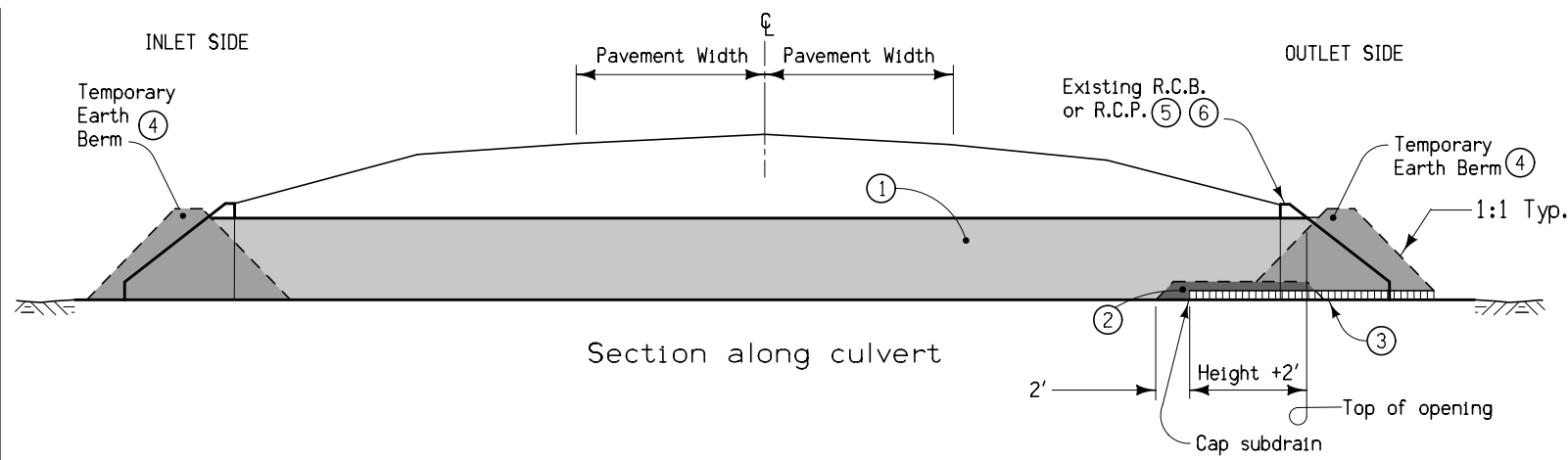
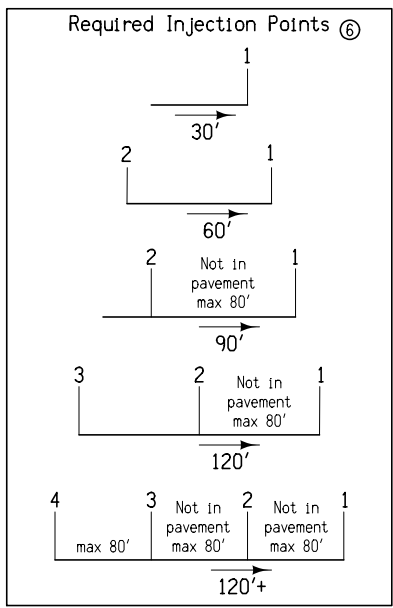
Full Depth PCC Shoulder

Shoulder Jointing:
 Longitudinal joint: L-2 or KT-2
 Transverse joints: C at 20' spacing

6D_Closed_P_FullPCC_04-19-11	
BEGIN STATION	END STATION

See Tab 100-24 or 100-25 for pavement quantities.

See Tab 112-9 for shoulder quantities.



- ① Flowable Mortar.
- ② Granular Backfill.
- ③ 4" subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2' plus the height of the culvert. Granular Backfill covers subdrain and extends an additional 2'. Subdrain and granular backfill are incidental to flowable mortar.
- ④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
- ⑤ Removal of headwalls may be required.
- ⑥ Outlet shall be filled first. See injection point detail for additional information.

DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures less than 8' in either height or width.
Circular structures less than 10' Dia.)

SURVEY SYMBOLS

- FW Wire Fence
- TPD Telephone Pedestal
- BB Billboard
- SI Sign
- MM Mile Marker Post
- PPA Power Pole Co. 1
- TLNL Tree Line Left
- TLNR Tree Line Right
- SL Speed Limit Sign
- LUM Luminaire
- TDC Tree Deciduous
- GDL Guard Rail Steel
- STP Stump
- MH Utility Access (Manhole)
- TEV Evergreen Tree
- EB Electrical Box
- PPB Power Pole Co. 2
- PPC Power Pole Co. 3
- PIP Pipe Culvert
- BRG Bridge
- OUT Tile Outlet
- CUL Culvert
- PLG Location of General Photo
- DU Centerline Draw or Stream (Up)
- D Centerline Draw or Stream (Down)
- BNK Stream Bank
- EG Edge of Gravel Road
- RIP Rip-Rap
- CON Concrete or A/C Slab
- SP Stream Profile
- F0(C) FO1C Fiber Optic Co. 1 - Quality C
- E(C) EL1C Electric Line Co. 1 - Quality C
- F0 FO1D Fiber Optic Co. 1 - Quality D
- PRO Profile Shot
- BLS Bridge Low Steel
- TW Top of Water
- SOP Size of Pipe or Culvert
- SBR Size of Bridge
- BL Topo Breakline
- F02 FO2D Fiber Optic Co. 2 - Quality D
- INB Storm Sewer Beehive Intake
- TOP Top of Bridge Pier
- ST Spiral Point
- LC Lot Corner
- E2(C) EL2C Electric Line Co. 2 - Quality C

UTILITY LEGEND

- E(C) - Eastern Iowa Light and Power - Quality C
- E1 - Eastern Iowa Light and Power - Quality D
- E2(C) - Iowa DOT - Quality C
- E2 - Iowa DOT - Abandoned - Quality D
- F0(C) - (ICN) Iowa Communications Network - Quality C
- F0 - (ICN) Iowa Communications Network - Quality D
- T(C) - WTC Communications - Quality C
- T1 - WTC Communications - Quality D
- PPA Power Pole Co. 1
- PPB Power Pole Co. 2
- PPC Power Pole Co. 3
- EB Electrical Box
- TPD Telephone Pedestal
- LUM Luminaire
- MH Utility Access (Manhole)

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.	
Yellow	(4)		Highlight for Critical Notes or Features
Red	(3)		Delineates Restricted Areas
Lavender	(9)		Temporary Pavement Shading
Gray, Light	(48)		Proposed Pavement Shading
Gray, Med	(80)		Proposed Granular Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

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

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

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

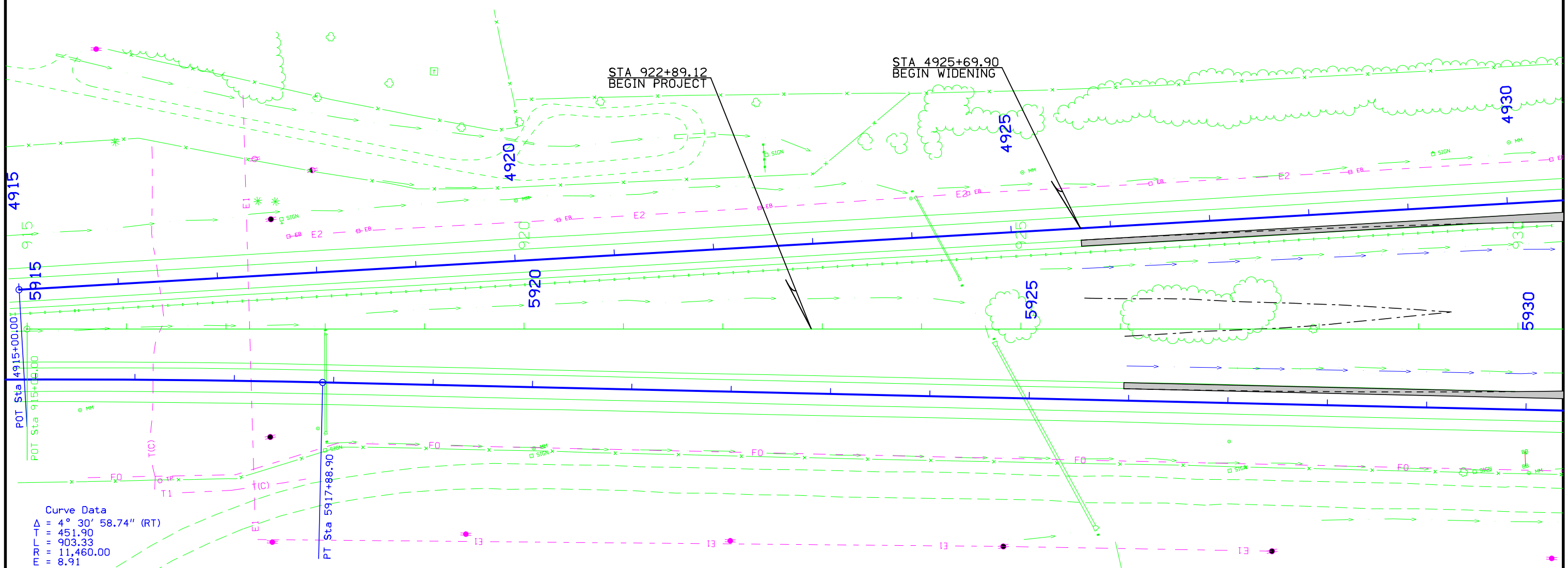
SUGAR CREEK TWP.
T-79N R-2W
SEC. 15



Sta. 4924+21.00
Skew 25°
30" X 87.2' Conc Pipe
D.A. = 14 Ac -
U.A.C.

STA 922+89.12
BEGIN PROJECT

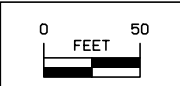
STA 4925+69.90
BEGIN WIDENING



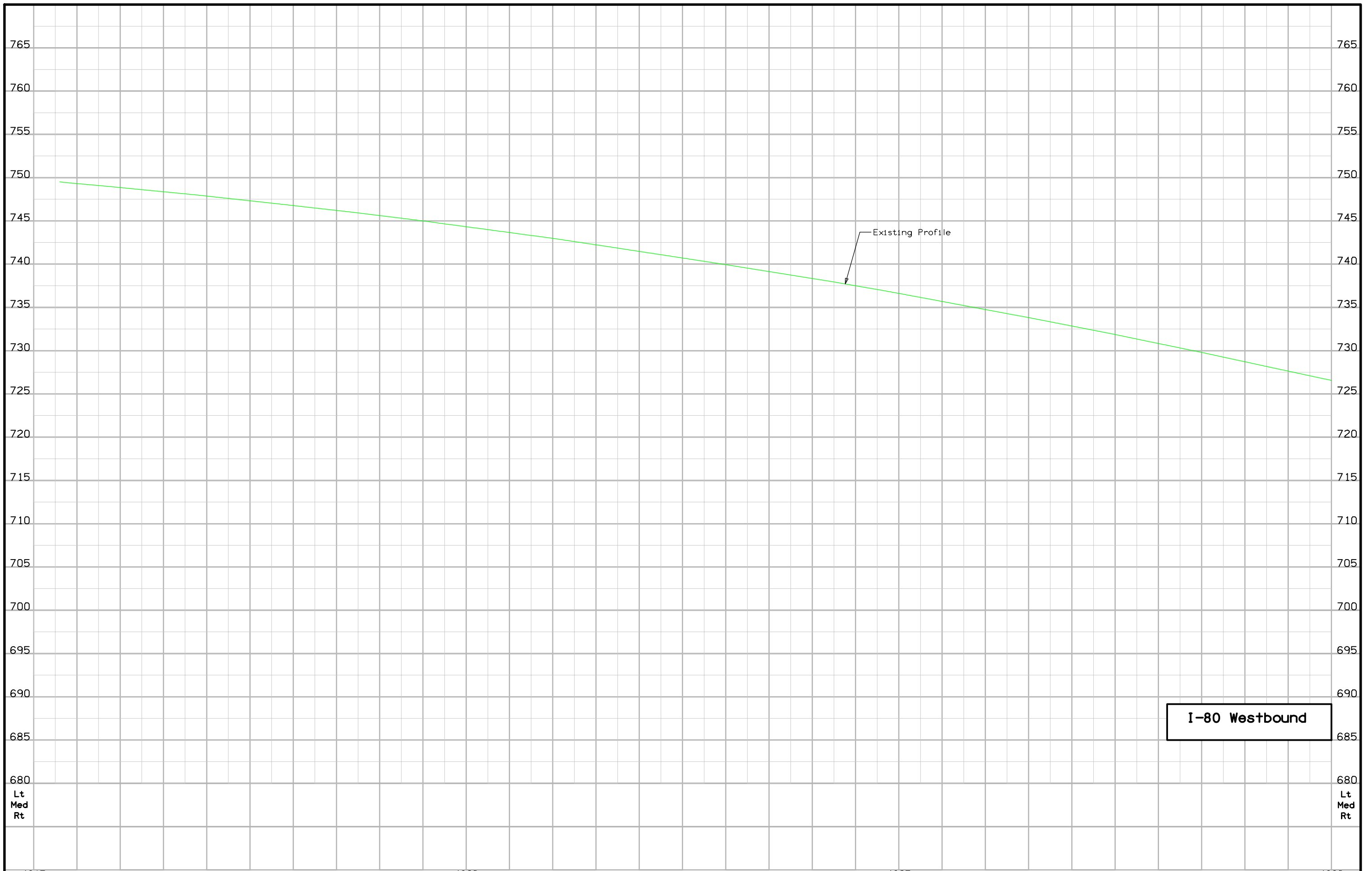
Curve Data
Δ = 4° 30' 58.74" (RT)
T = 451.90
L = 903.33
R = 11,460.00
E = 8.91

Sta. 5917+87.00
24" X 97.5' Conc Pipe
D.A. = MEDIAN Ac -
U.A.C.

Sta. 5924+92.00
30" X 206.3' Conc Pipe
D.A. = 14 Ac -
U.A.C.



I-80 Westbound



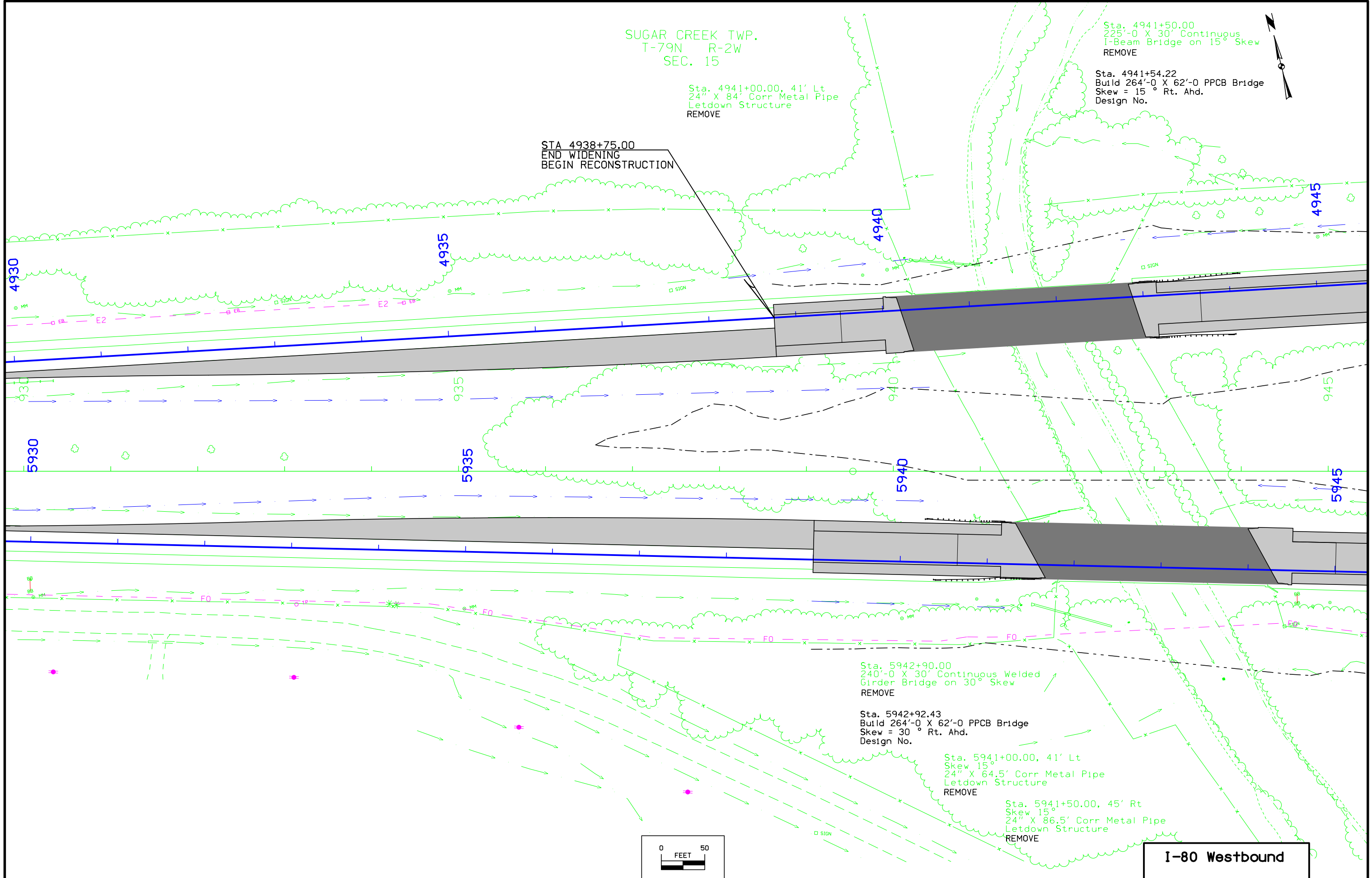
SUGAR CREEK TWP.
T-79N R-2W
SEC. 15

Sta. 4941+50.00
225'-0" X 30' Continuous
I-Beam Bridge on 15° Skew
REMOVE

Sta. 4941+54.22
Build 264'-0" X 62'-0" PPCB Bridge
Skew = 15° Rt. Ahd.
Design No.

Sta. 4941+00.00, 41' Lt
24" X 84' Corr Metal Pipe
Letdown Structure
REMOVE

STA 4938+75.00
END WIDENING
BEGIN RECONSTRUCTION

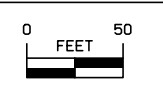


Sta. 5942+90.00
240'-0" X 30' Continuous Welded
Girder Bridge on 30° Skew
REMOVE

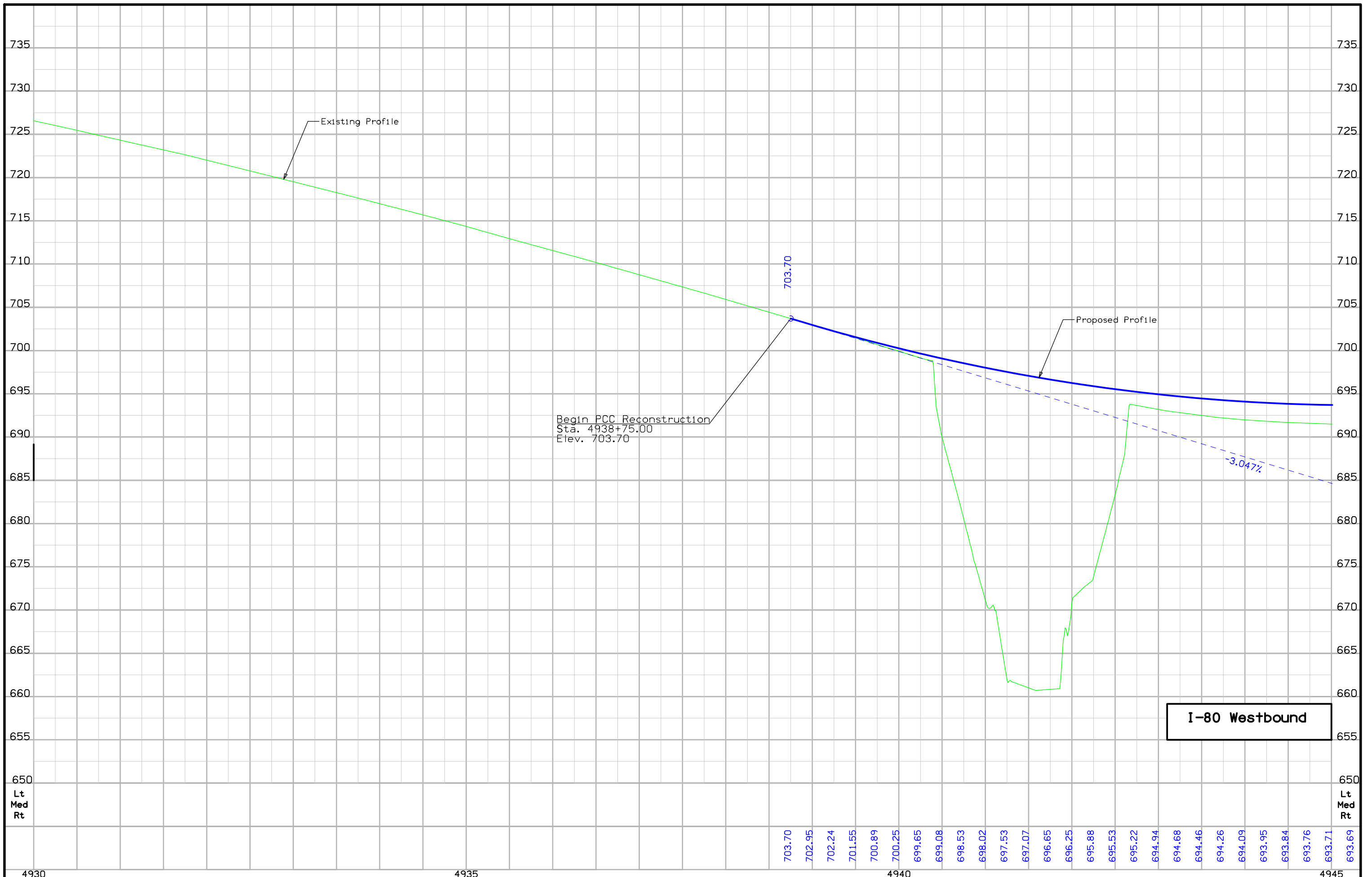
Sta. 5942+92.43
Build 264'-0" X 62'-0" PPCB Bridge
Skew = 30° Rt. Ahd.
Design No.

Sta. 5941+00.00, 41' Lt
Skew 15°
24" X 64.5' Corr Metal Pipe
Letdown Structure
REMOVE

Sta. 5941+50.00, 45' Rt
Skew 15°
24" X 86.5' Corr Metal Pipe
Letdown Structure
REMOVE



I-80 Westbound



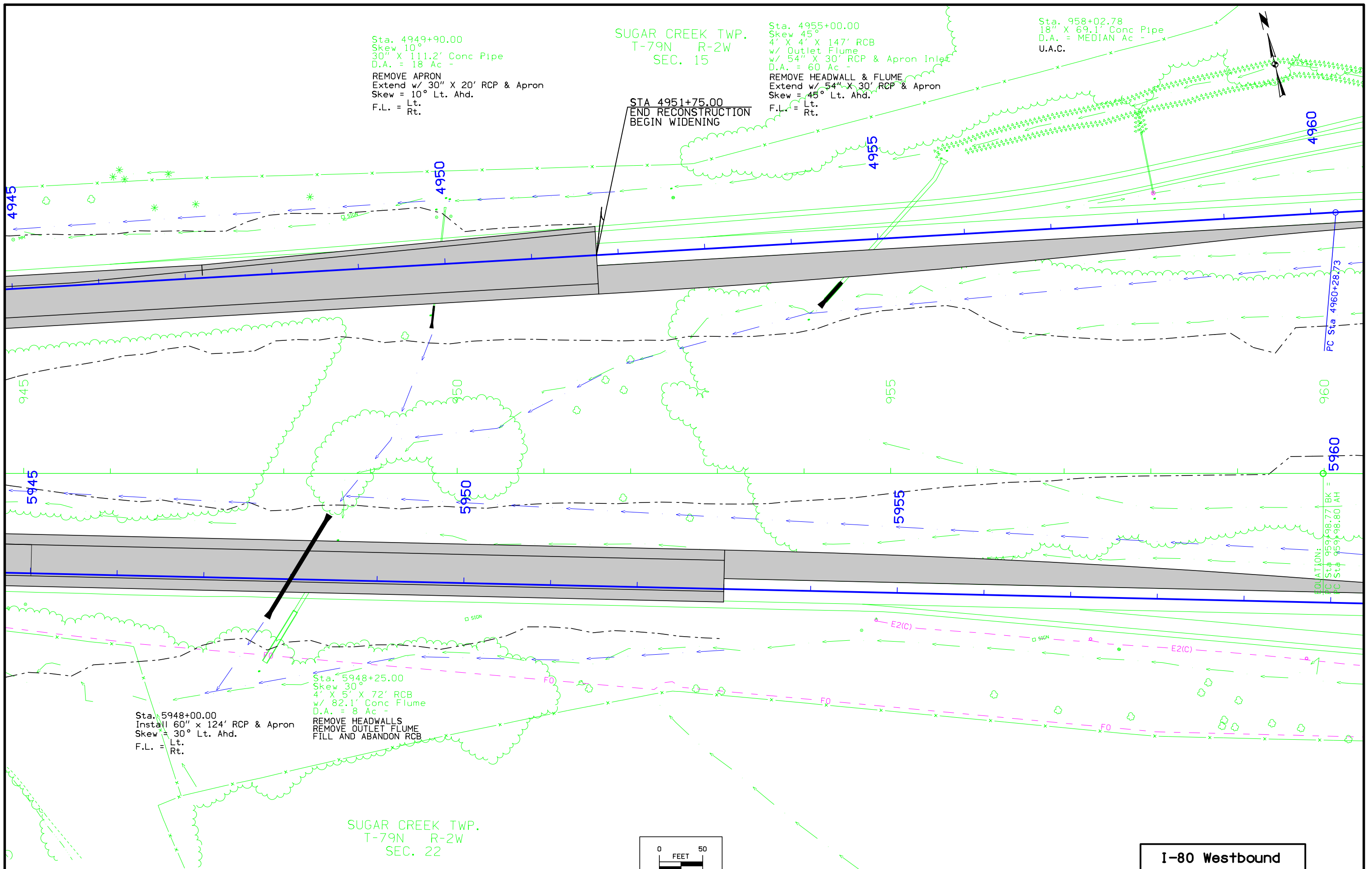
Sta. 4949+90.00
 Skew 10°
 30" X 111.2' Conc Pipe
 D.A. = 18 Ac -
 REMOVE APRON
 Extend w/ 30" X 20' RCP & Apron
 Skew = 10° Lt. Ahd.
 F.L. = Lt.
 F.L. = Rt.

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 15

Sta. 4955+00.00
 Skew 45°
 4' X 4' X 147' RCB
 w/ Outlet Flume
 w/ 54" X 30' RCP & Apron Inlet
 D.A. = 60 Ac -
 REMOVE HEADWALL & FLUME
 Extend w/ 54" X 30' RCP & Apron
 Skew = 45° Lt. Ahd.
 F.L. = Lt.
 F.L. = Rt.

Sta. 958+02.78
 18" X 69.1' Conc Pipe
 D.A. = MEDIAN Ac -
 U.A.C.

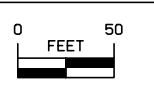
STA 4951+75.00
 END RECONSTRUCTION
 BEGIN WIDENING



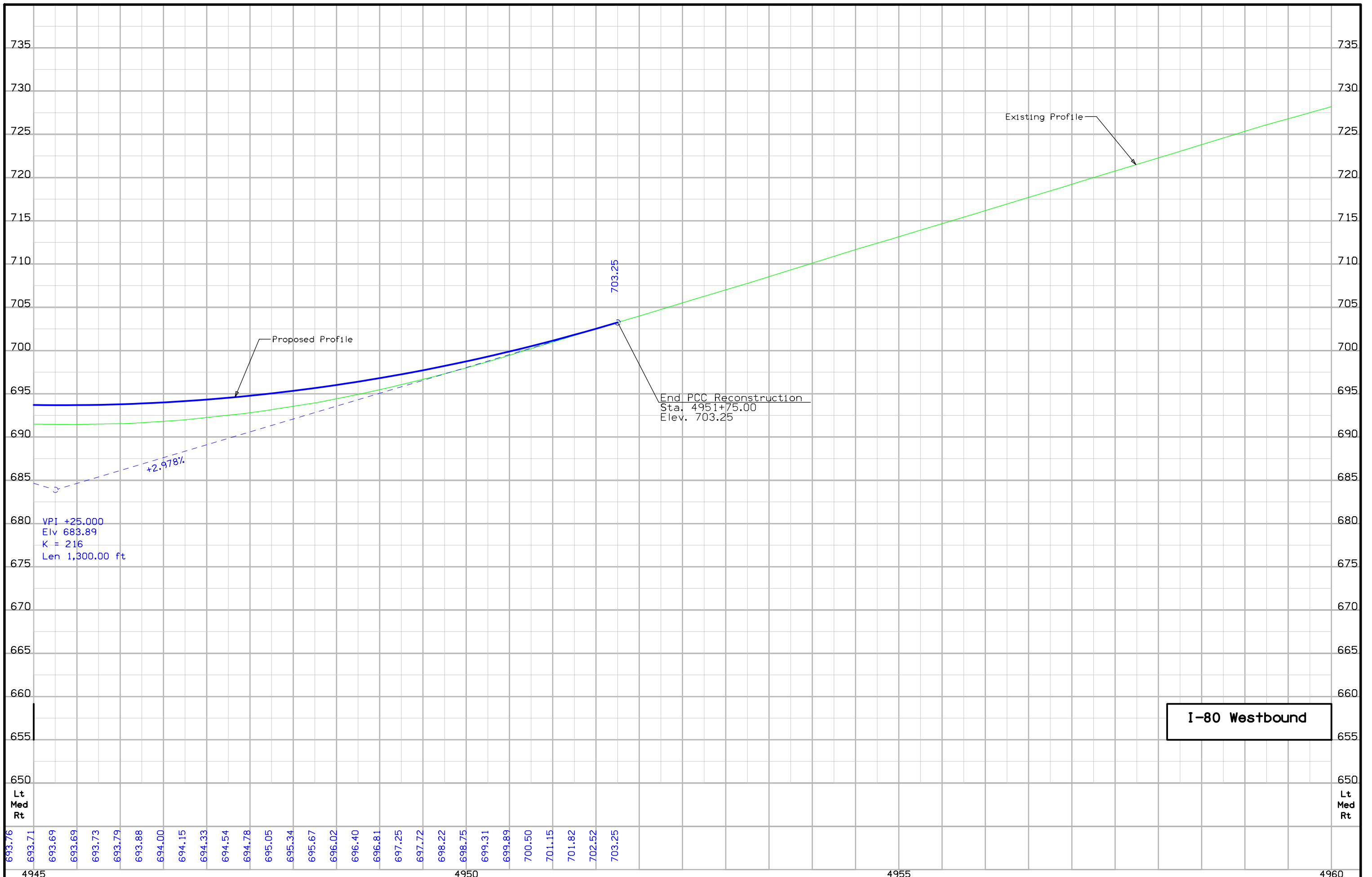
Sta. 5948+00.00
 Install 60" x 124' RCP & Apron
 Skew = 30° Lt. Ahd.
 F.L. = Lt.
 F.L. = Rt.

Sta. 5948+25.00
 Skew 30°
 4' X 5' X 72' RCB
 w/ 82.1' Conc Flume
 D.A. = 8 Ac -
 REMOVE HEADWALLS
 REMOVE OUTLET FLUME
 FILL AND ABANDON RCB

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 22



I-80 Westbound



Sta. 4961+04.00
 24" X 65.1' Conc Pipe
 D.A. = MEDIAN Ac -
 REMOVE APRON
 Extend w/ 24" X 14' RCP & Apron
 Skew = 10° Lt. Ahd.
 F.L. = Lt.
 Rt.

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 15

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 14

Curve Data
 $\Delta = 13^\circ 33' 56.52''$ (RT)
 T = 681.52
 L = 1,356.67
 R = 5,730.00
 E = 40.39

4960

4965

4970

4975

PC Sta 4960+28.73

PI Sta 4967+10.25

STA 4966+96.49
 END WIDENING

STA 968+91.19
 END PROJECT

PT Sta 4973+85.40

960

PI Sta 964+80.75

Curve Data
 $\Delta = 4^\circ 48' 58.66''$ (RT)
 T = 481.95
 L = 963.32
 R = 11,459.93
 E = 10.13

5960

5965

5970

5975

ELEVATION:
 PC Sta 959+98.77 BK =
 PC Sta 959+98.80 AH

PI Sta 5966+44.28

PT Sta 969+62.12

PC Sta 5963+17.59

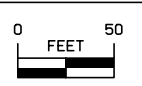
PT Sta 5969+70.92

Curve Data
 $\Delta = 1^\circ 37' 59.54''$ (RT)
 T = 326.69
 L = 653.33
 R = 22,920.00
 E = 2.33

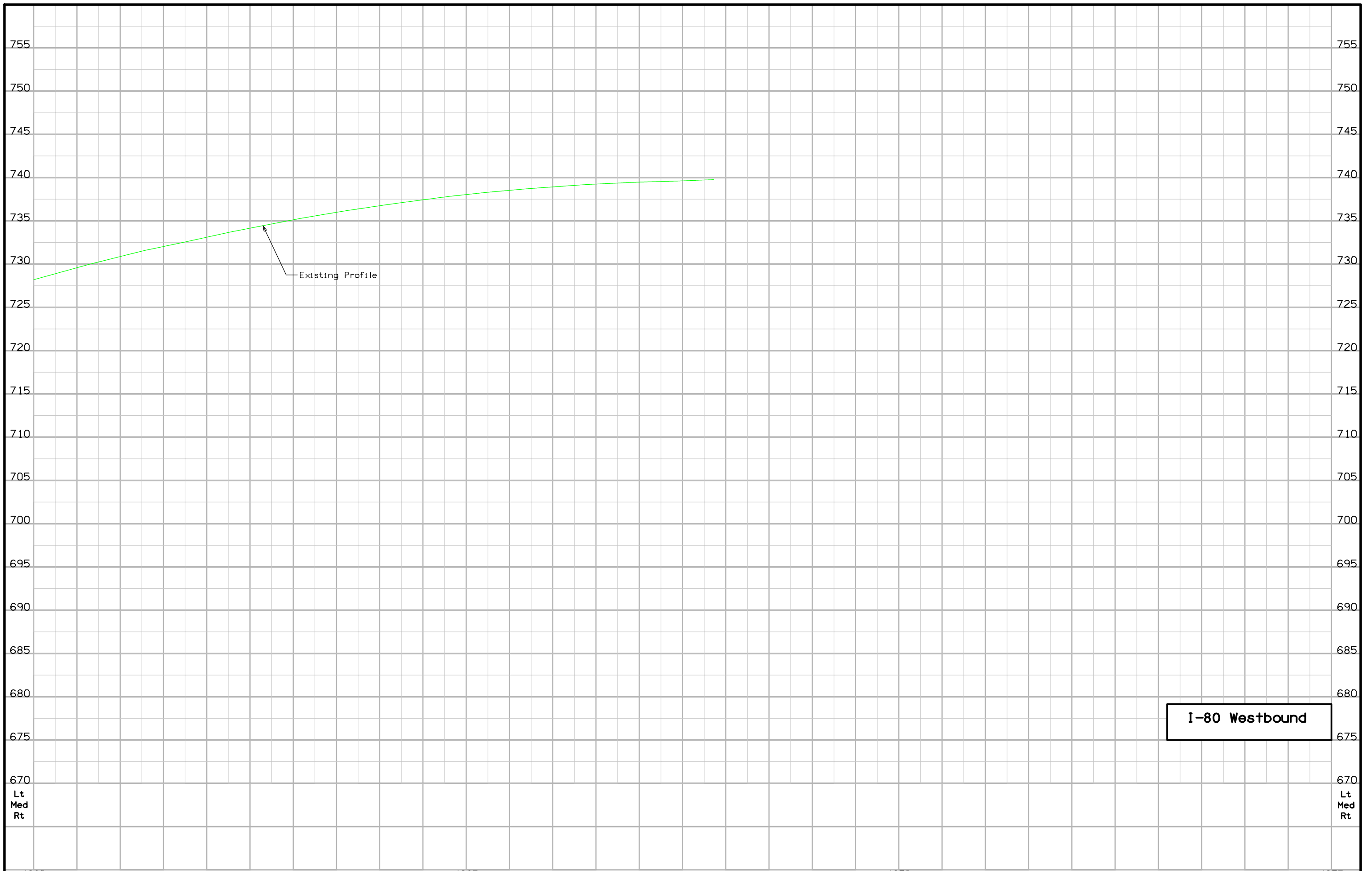
Sta. 960+93.55
 24" X 50.7' Conc Pipe
 D.A. = MEDIAN Ac -
 U.A.C.

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 22

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 23



I-80 Westbound



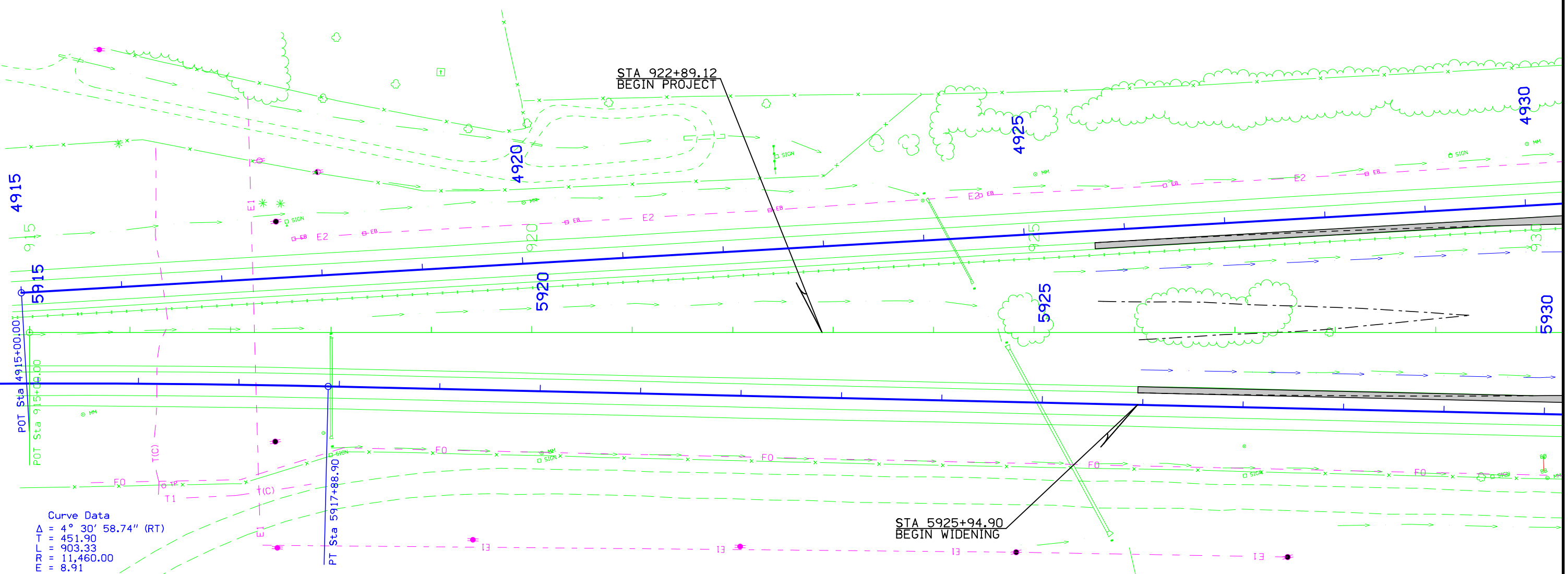
I-80 Westbound

SUGAR CREEK TWP.
T-79N R-2W
SEC. 15



Sta. 4924+21.00
Skew 25°
30" X 87.2' Conc Pipe
D.A. = 14 Ac -
U.A.C.

STA 922+89.12
BEGIN PROJECT

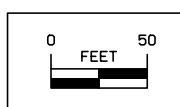


Curve Data
Δ = 4° 30' 58.74" (RT)
T = 451.90
L = 903.33
R = 11,460.00
E = 8.91

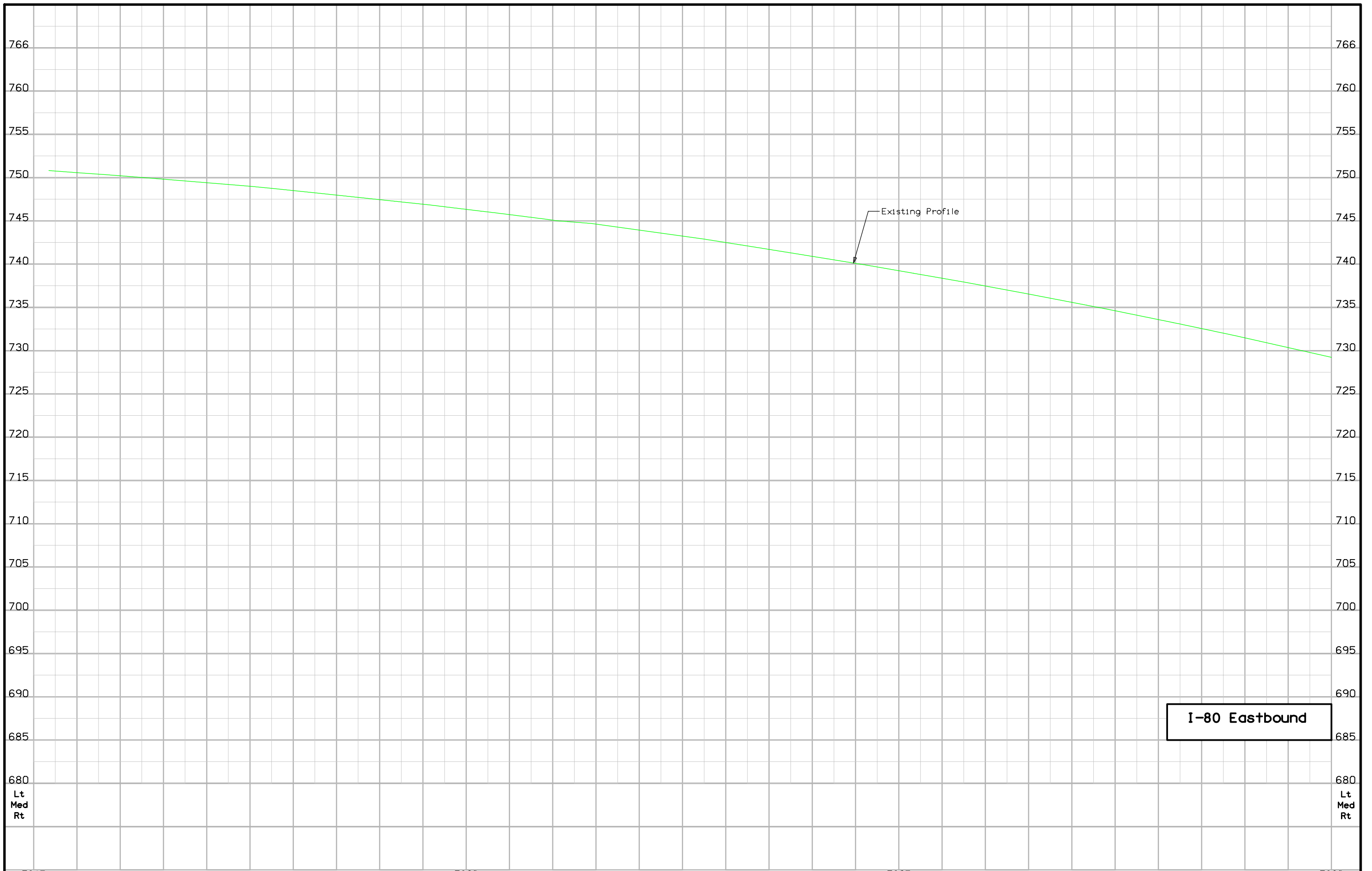
Sta. 5917+87.00
24" X 97.5' Conc Pipe
D.A. = MEDIAN Ac -
U.A.C.

STA 5925+94.90
BEGIN WIDENING

Sta. 5924+92.00
30" X 206.3' Conc Pipe
D.A. = 14 Ac -
U.A.C.



I-80 Eastbound



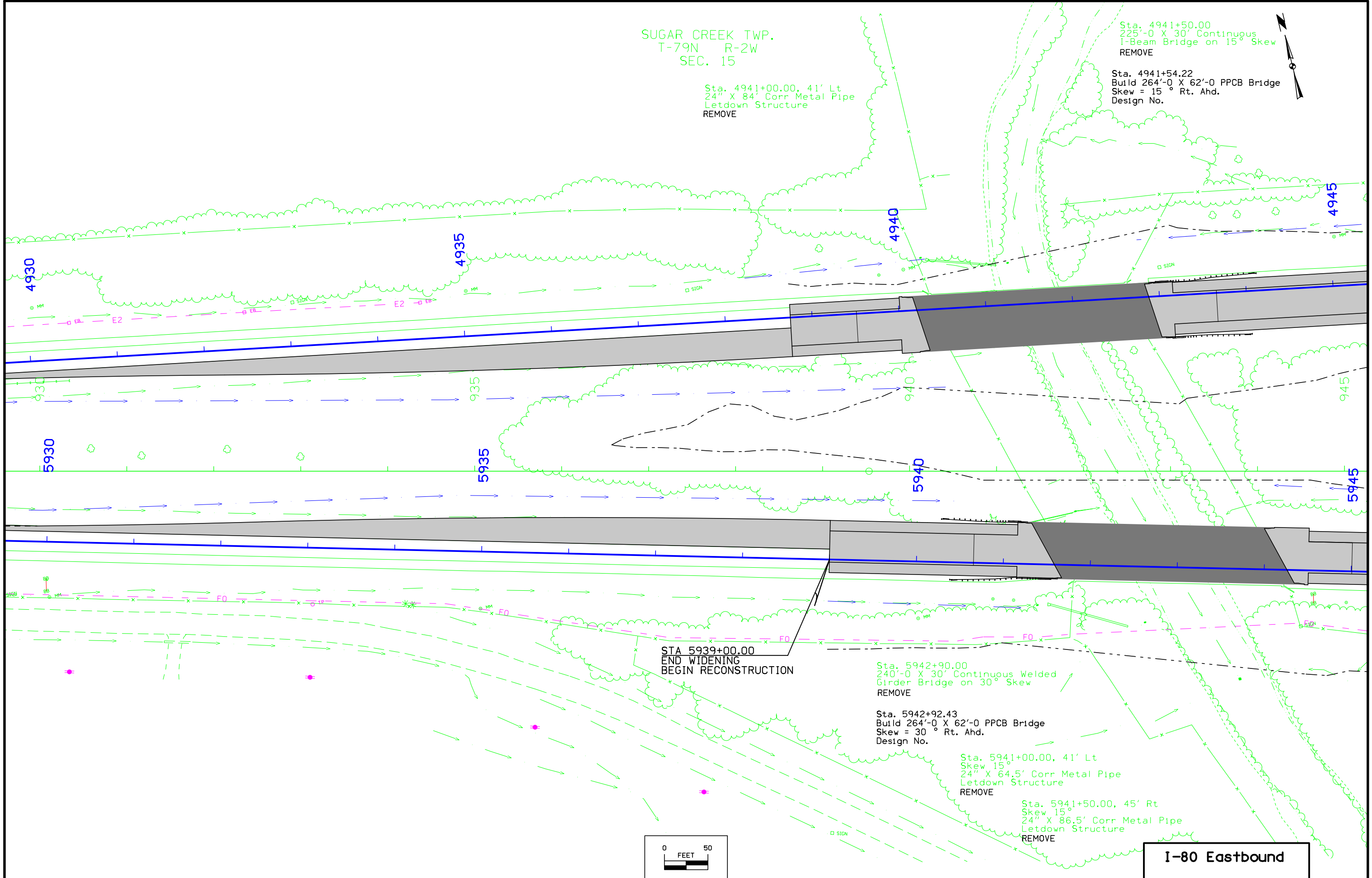
I-80 Eastbound

SUGAR CREEK TWP.
T-79N R-2W
SEC. 15

Sta. 4941+50.00
225'-0" X 30' Continuous
I-Beam Bridge on 15° Skew
REMOVE

Sta. 4941+00.00, 41' Lt
24" X 84' Corr Metal Pipe
Letdown Structure
REMOVE

Sta. 4941+54.22
Build 264'-0" X 62'-0" PPCB Bridge
Skew = 15° Rt. Ahd.
Design No.



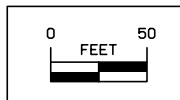
STA 5939+00.00
END WIDENING
BEGIN RECONSTRUCTION

Sta. 5942+90.00
240'-0" X 30' Continuous Welded
Girder Bridge on 30° Skew
REMOVE

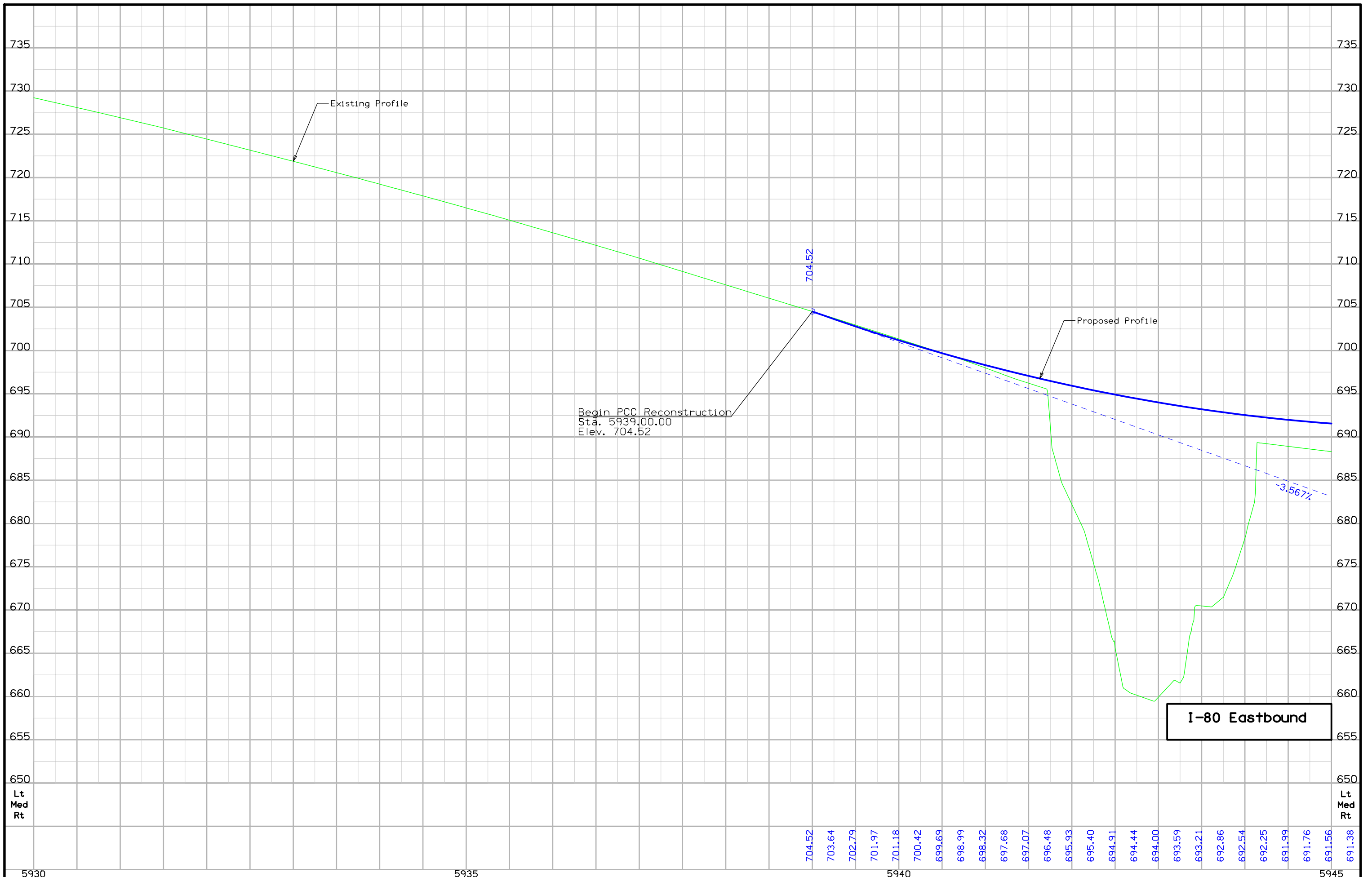
Sta. 5942+92.43
Build 264'-0" X 62'-0" PPCB Bridge
Skew = 30° Rt. Ahd.
Design No.

Sta. 5941+00.00, 41' Lt
Skew 15°
24" X 64.5' Corr Metal Pipe
Letdown Structure
REMOVE

Sta. 5941+50.00, 45' Rt
Skew 15°
24" X 86.5' Corr Metal Pipe
Letdown Structure
REMOVE



I-80 Eastbound



Sta. 4949+90.00
 Skew 10°
 30" X 111.2' Conc Pipe
 D.A. = 18' Ac -
 REMOVE APRON
 Extend w/ 30" X 20' RCP & Apron
 Skew = 10° Lt. Ahd.
 F.L. = Lt.
 F.L. = Rt.

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 15

Sta. 4955+00.00
 Skew 45°
 4' X 4' X 147' RCB
 w/ Outlet Flume
 w/ 54" X 30' RCP & Apron Inlet
 D.A. = 60' Ac -
 REMOVE HEADWALL & FLUME
 Extend w/ 54" X 30' RCP & Apron
 Skew = 45° Lt. Ahd.
 F.L. = Lt.
 F.L. = Rt.

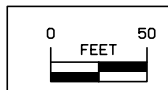
Sta. 958+02.78
 18" X 69.1' Conc Pipe
 D.A. = MEDIAN Ac -
 U.A.C.

Sta. 5948+00.00
 Install 60" x 124' RCP & Apron
 Skew = 30° Lt. Ahd.
 F.L. = Lt.
 F.L. = Rt.

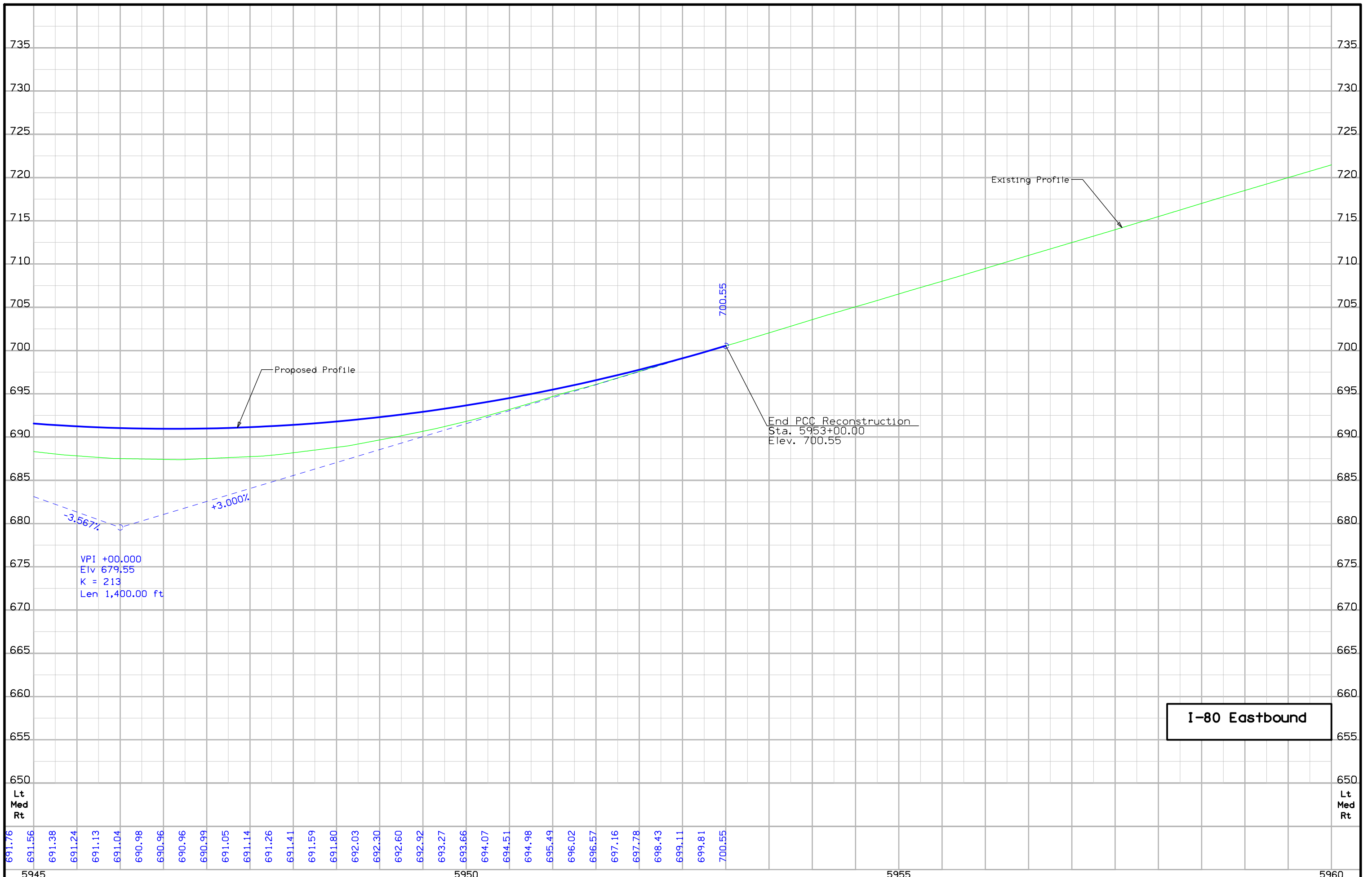
Sta. 5948+25.00
 Skew 30°
 4' X 5' X 72' RCB
 w/ 82.1' Conc Flume
 D.A. = 8' Ac -
 REMOVE HEADWALLS
 REMOVE OUTLET FLUME
 FILL AND ABANDON RCB

STA 5953+00.00
 END RECONSTRUCTION
 BEGIN WIDENING

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 22



I-80 Eastbound



Sta. 4961+04.00
 24" X 65.1' Conc Pipe
 D.A. = MEDIAN Ac -
 REMOVE APRON
 Extend w/ 24" X 14' RCP & Apron
 Skew = 10° Lt. Ahd.
 F.L. = Lt.
 Rt.

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 15

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 14

Curve Data
 $\Delta = 13^\circ 33' 56.52''$ (RT)
 T = 681.52
 L = 1,356.67
 R = 5,730.00
 E = 40.39

Curve Data
 $\Delta = 4^\circ 48' 58.66''$ (RT)
 T = 481.95
 L = 963.32
 R = 11,459.93
 E = 10.13

Curve Data
 $\Delta = 1^\circ 37' 59.54''$ (RT)
 T = 326.69
 L = 653.33
 R = 22,920.00
 E = 2.33

4960

4965

4970

4975

960

965

5970

5975

5960

5965

5969+70.92

STA 5965+18.77
 END WIDENING

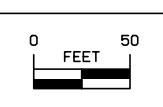
STA 968+91.19
 END PROJECT

ELEVATION:
 PC Sta 959+98.77 BK =
 PC Sta 959+98.80 AH

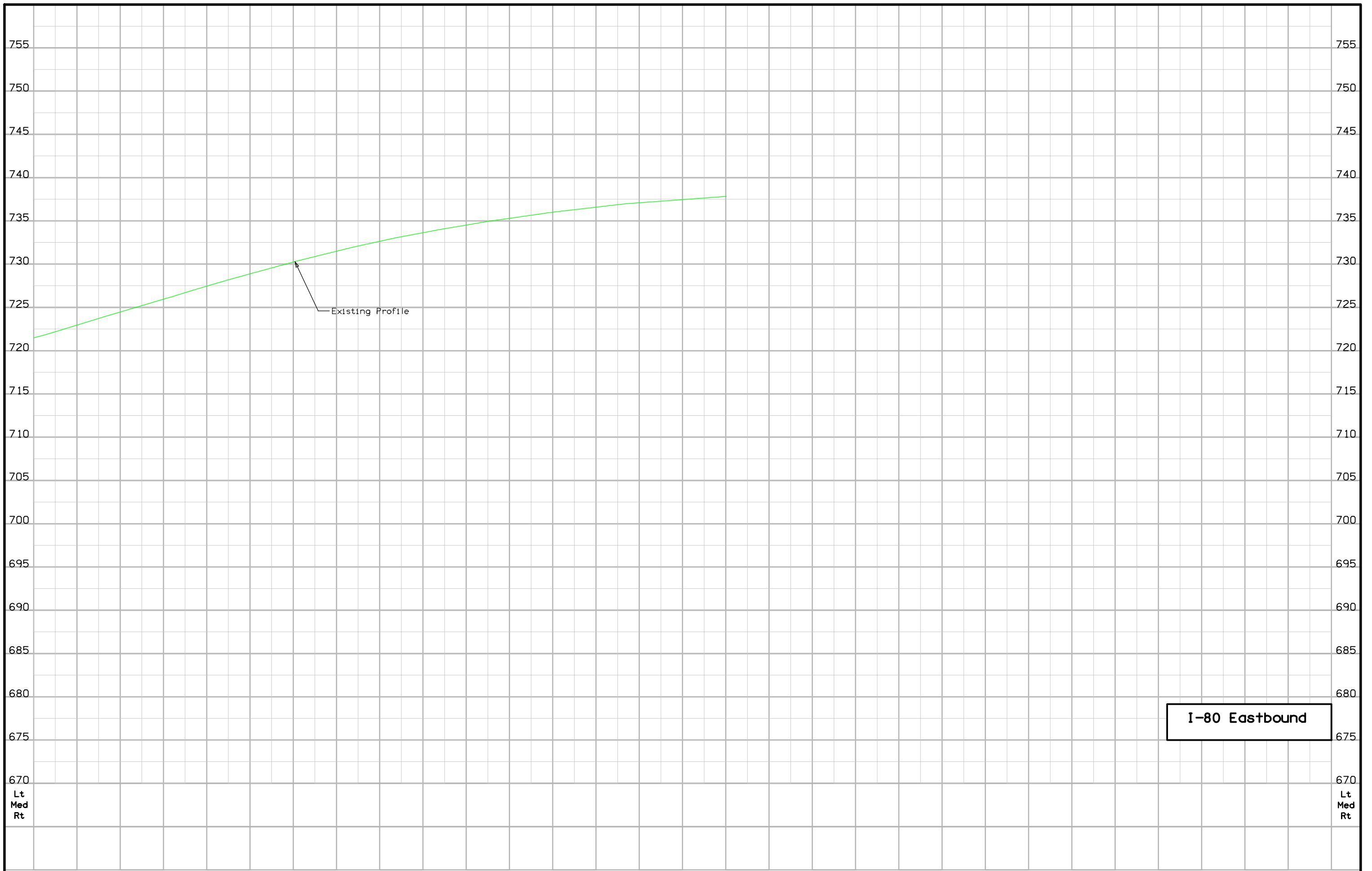
Sta. 960+93.55
 24" X 50.7' Conc Pipe
 D.A. = MEDIAN Ac -
 U.A.C.

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 22

SUGAR CREEK TWP.
 T-79N R-2W
 SEC. 23



I-80 Eastbound



I-80 Eastbound

General Information

Survey Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge EB and WB replacement on I-80 over Sugar Creek in Cedar County. Project datum and control information matches survey performed previously for project IMX-080-8(269)269—02-16. This project is a Partial DTM field survey.

Vertical Control

Vertical datum for this survey is relative to NAVD88.

Survey vertical datum matches survey performed previously for project IMX-080-8(269)269—02-16, SAP #0710. Control for original survey was established relative to NAVD88 and utilized benchmark #G004 for benchmark origin.

Additional benchmarks were established by running a digital level loop from IDOT monument designated G004 through the project benchmarks and returned to G004. The loop error was allowable and the error was distributed proportionately among the project marks.

Horizontal Control

Measurement units for this survey are US survey feet.

The project coordinate system is the Iowa Regional Coordinate System, Zone 10 Cedar Rapids. Horizontal datum is NAD83 (2011) for Epoch 2010.00. The projection parameters for Zone 10 of the IaRCS is defined below:

The IaRTN base stations are the primary control for this project. Additional control points were placed throughout the project using the IaRTN with multiple observations. Observations were averaged to determine control coordinates.

*Originally the survey was performed using the below described coordinate system, but was reprojected after the field survey was completed. The survey raw files have not been modified to reflect Zone 10 coordinates.

Survey horizontal datum will match survey performed previously for project IMX-080-8(269)269—02-16, SAP #0710. Control for the original survey control is relative to NAD83 (1996) Iowa State Plane South Zone at Control Point G004. Grid to ground distortion was reduced by scaling all project points about Pt. G004 by the inverse of the combined scale factor for that point (1.00005324).

Iowa State Plane South coordinates were transformed to project ground coordinates by applying a 1/combined scale factor (computed by OPUS) from held point G004 at the approximate center of the project.

Alignment Information

The horizontal alignment for this survey is a retrace of the mainline As-built Plans No.IR-80-7(57)265- -12-16. Survey stationing was equated to the plan at Sta. 959+98.8 and run ahead and back without equation throughout the survey.

Equations are as follows:

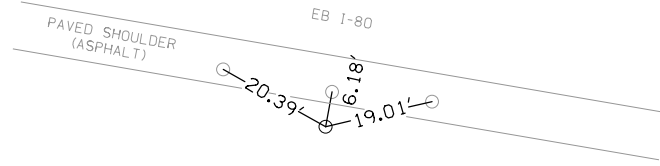
PC STA 959+98.80 this survey
= PC STA 959+98.80 As-built Plans Project No. IR-80-7(57)265- -12-16

PT STA 969+62.13 this survey
= PT STA 969+62.13 As-built Plans Project No. IR-80-7(57)265- -12-16

VERTICAL CONTROL

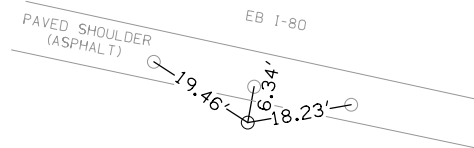
Point	North	East	Elevation	Station	Offset	Feature	Description
5000	7931014.482	20663618.875	725.770	930+08.03	125.111	BM	CUT "X" ON TOP OF FOOTING AT SIGN, EXIT 271, WILTON/MUSCATINE 1 1/2 MILES
5001	7930462.576	20666032.366	705.520	954+83.47	167.569	BM	CUT "X" ON LIGHT POLE, 1ST L.P. EAST OF SUGAR CREEK BRIDGE AT GORE AREA REST RAMP
5002	7931392.341	20661967.613	747.890	913+14.33	95.811	BM	CUT "X" ON TOP OF FOOTING AT SIGN, LODGING EXIT 271, SOUTH SIDE I-80, EAST BOUND LANE
5003	7931499.216	20662441.740	741.050	917+56.24	-106.520	BM	CUT "X" ON TOP OF FOOTING AT SIGN, REST AREA NEXT RIGHT/PARKING ONLY
5004	7931330.147	20663589.682	725.890	929+14.38	-177.756	BM	CUT "X" ON TOP OF FOOTING AT SIGN, WORK ZONE, NORTH SIDE OF I-80, WEST BOUND LANE

C.P. STA. 913+13.99, RT. 80.99 I-80
C.P. G012, SET 1/2" REBAR
N=608062.090, E=2303390.549



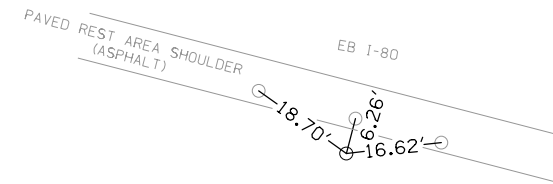
SET 1/2" REBAR, 5' SOUTH OF EAST BOUND SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

C.P. STA. 930+07.98, RT. 108.53 I-80
C.P. G013, SET 1/2" REBAR
N=607720.645, E=2305049.997



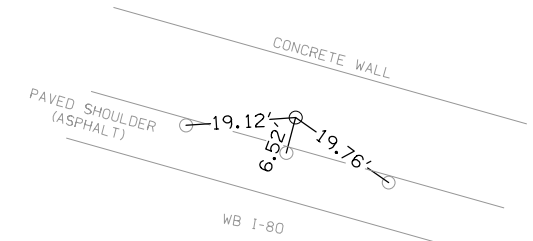
SET 1/2" REBAR, 5' SOUTH OF EAST BOUND SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

C.P. STA. 961+67.48, LT. 223.83 I-80
C.P. G014, SET 1/2" REBAR
N=607020.401, E=2308129.745



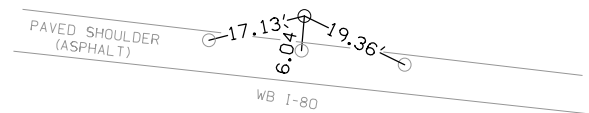
SET 1/2" REBAR, 5' SOUTH OF REST AREA SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

C.P. STA. 968+20.21, LT. 345.758 I-80
C.P. G015, SET 1/2" REBAR
N=607425.284, E=2308898.327



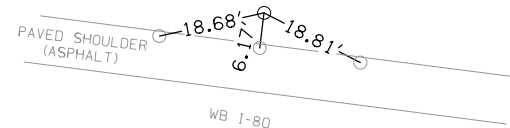
SET 1/2" REBAR, 5' NORTH OF WEST BOUND SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

C.P. STA. 949+19.90, LT. 271.94 I-80
C.P. G016, SET 1/2" REBAR
N=607739.670, E=2306999.314



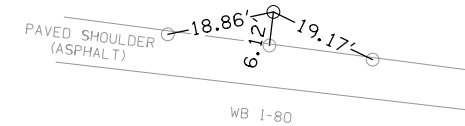
SET 1/2" REBAR, 5' NORTH OF WEST BOUND SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

C.P. STA. 929+51.45, LT. 150.54 I-80
C.P. G017, SET 1/2" REBAR
N=607985.702, E=2305042.525



SET 1/2" REBAR, 5' NORTH OF WEST BOUND SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

C.P. STA. 913+10.01, LT. 55.61 I-80
C.P. G018, SET 1/2" REBAR
N=608197.055, E=2303411.987



SET 1/2" REBAR, 5' NORTH OF WEST BOUND SHOULDER
ALL TIES ARE SET MAG NAILS IN ASPHALT

ALIGNMENT COORDINATES

101-16
10-20-09

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)

SPIRAL OR CIRCULAR CURVE DATA

101-17
04-19-11

Name	Location	Δ_{scs}	Horizontal Alignment Data											Remarks			
			Spiral Data					Curve Data									
			θ_s	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	Δ_c	T	L	R	E		

TRAFFIC CONTROL PLAN

1. Contractor shall maintain two lanes of traffic on I-80, both Eastbound and Westbound, at all times.
2. Both Eastbound and Westbound rest area shall remain open at all times.
3. Traffic control on this project shall be in accordance with Standard Road Plans TC-1, TC-402, TC-418, and TC-420.

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None Provided	

STAGING NOTES

Stage 1

Traffic:

- Shift traffic to the outside edge of existing pavement. Refer to Traffic Control Plan for details.

Construction:

- Remove the existing inside bridge barrier of both bridges and install TBR as shown on the typical sections.
- Remove the existing shoulder adjacent to the inside lanes.
- Grade for pavement widening on the inside lanes and the proposed Sugar Creek bridge berms.
- Extend existing culverts to the inside of existing lanes.
- Jack new culvert under the EB lanes at Sta. ???+??.
- Abandon the existing culvert at Sta. 948+51.52 per Typical 4515 in the C Sheets.
- Construct the inside 29' of both bridges.
- Construct pavement widening to the inside for both the EB and WB directions.
- Construct the bridge approach slabs for both bridges.
- Install temporary erosion control items.

Stage 2

Traffic:

- Shift traffic to the newly construction inside lanes and the inside 29' of the proposed bridge. Refer to Traffic Control Plan for details.

Construction:

- Remove the existing bridge.
- Remove the existing pavement required for full-width reconstruction.
- Grade for new EB and WB pavement reconstruction and the proposed Sugar Creek bridge berms.
- Extend existing culverts to the outside of proposed lanes.
- Construct the remaining sections of both bridges.
- Construct pavement reconstruction in both EB and WB directions.
- Construct the bridge approach slabs for both bridges.
- Install temporary erosion control items.

Stage 3

Traffic:

- Shift traffic to final layout with permanent pavement markings.

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

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

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

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

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

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

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

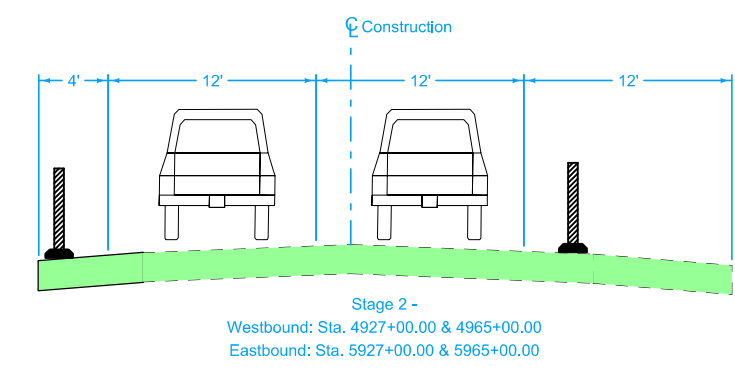
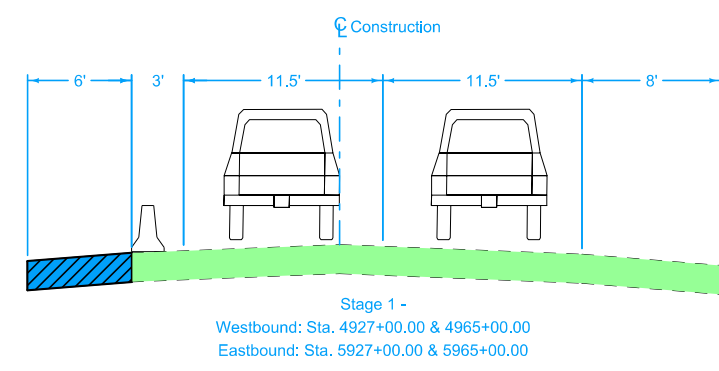
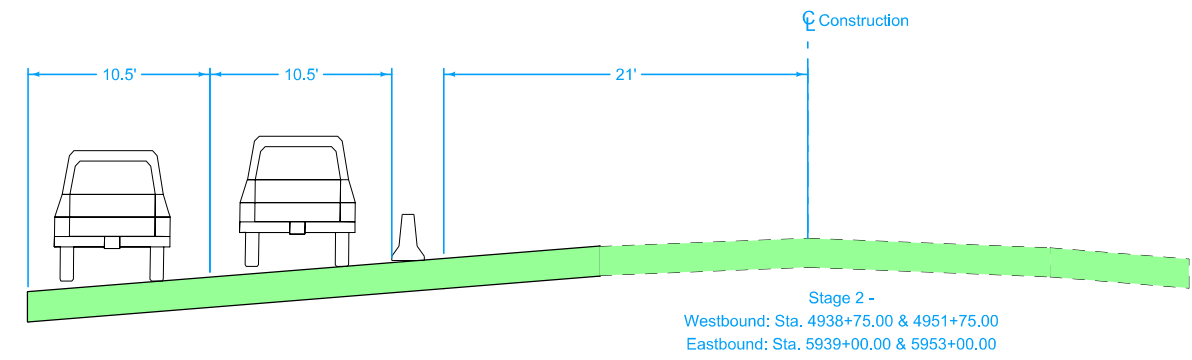
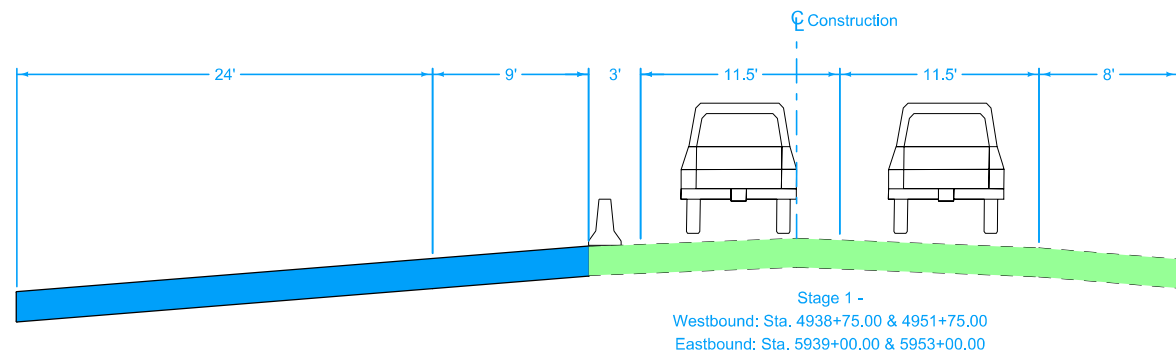
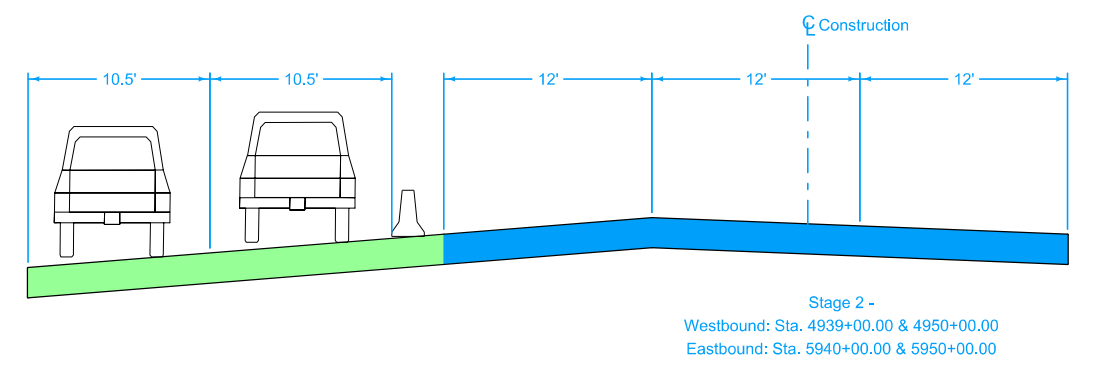
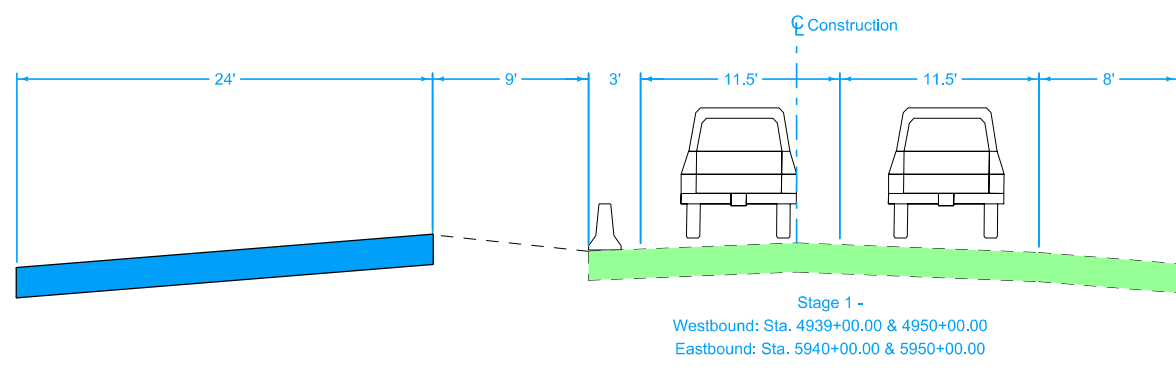
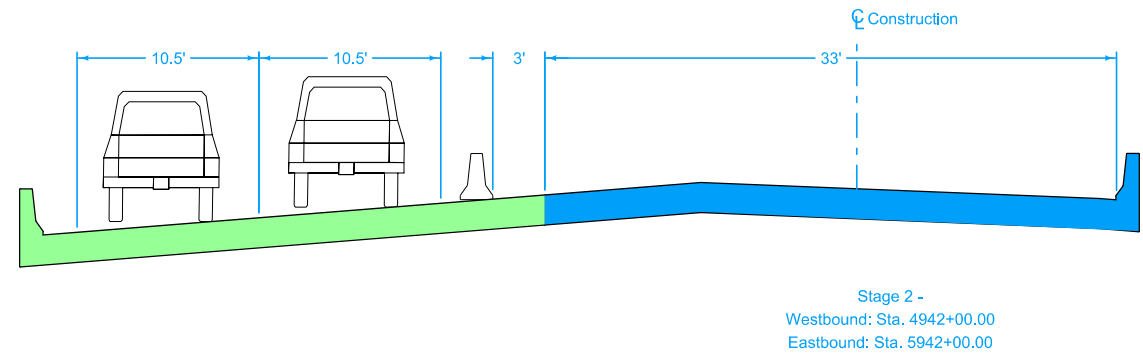
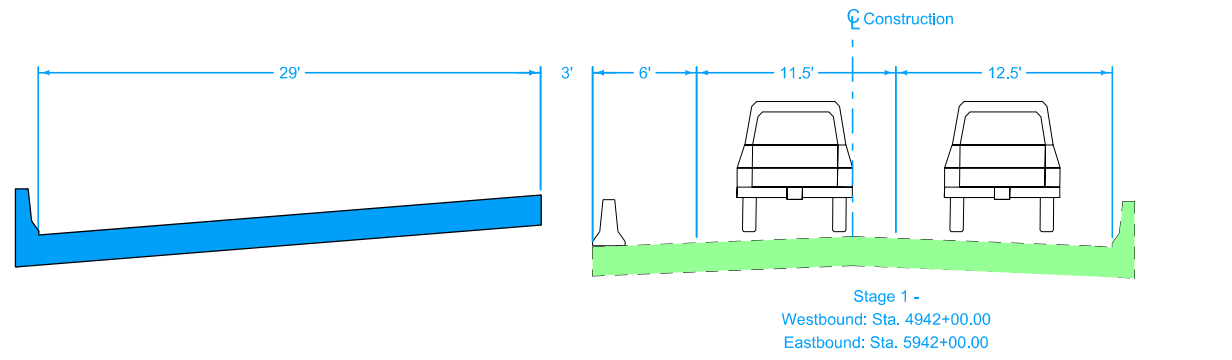
**PLAN VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS**

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

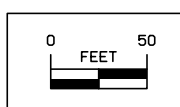
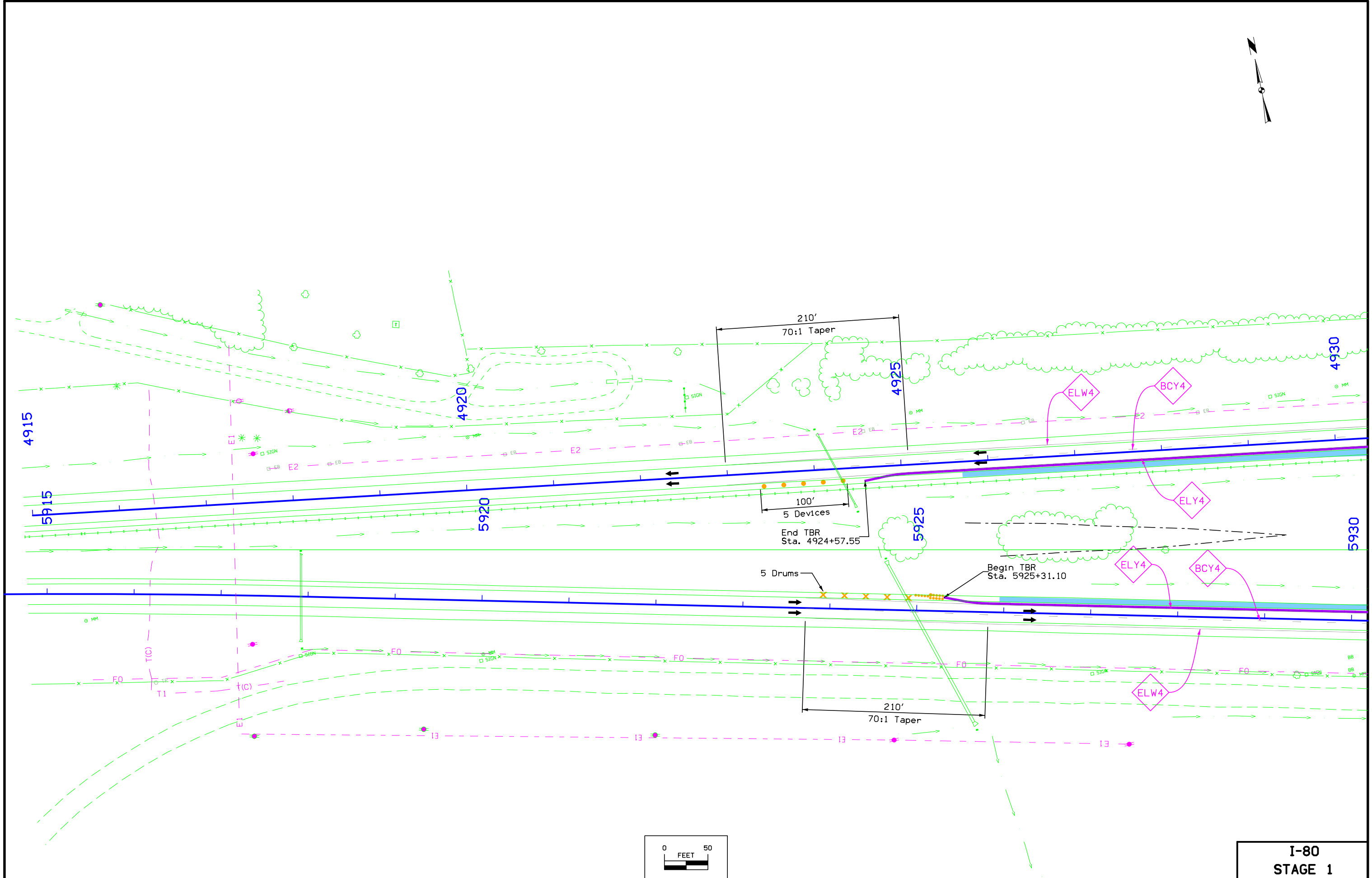
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

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

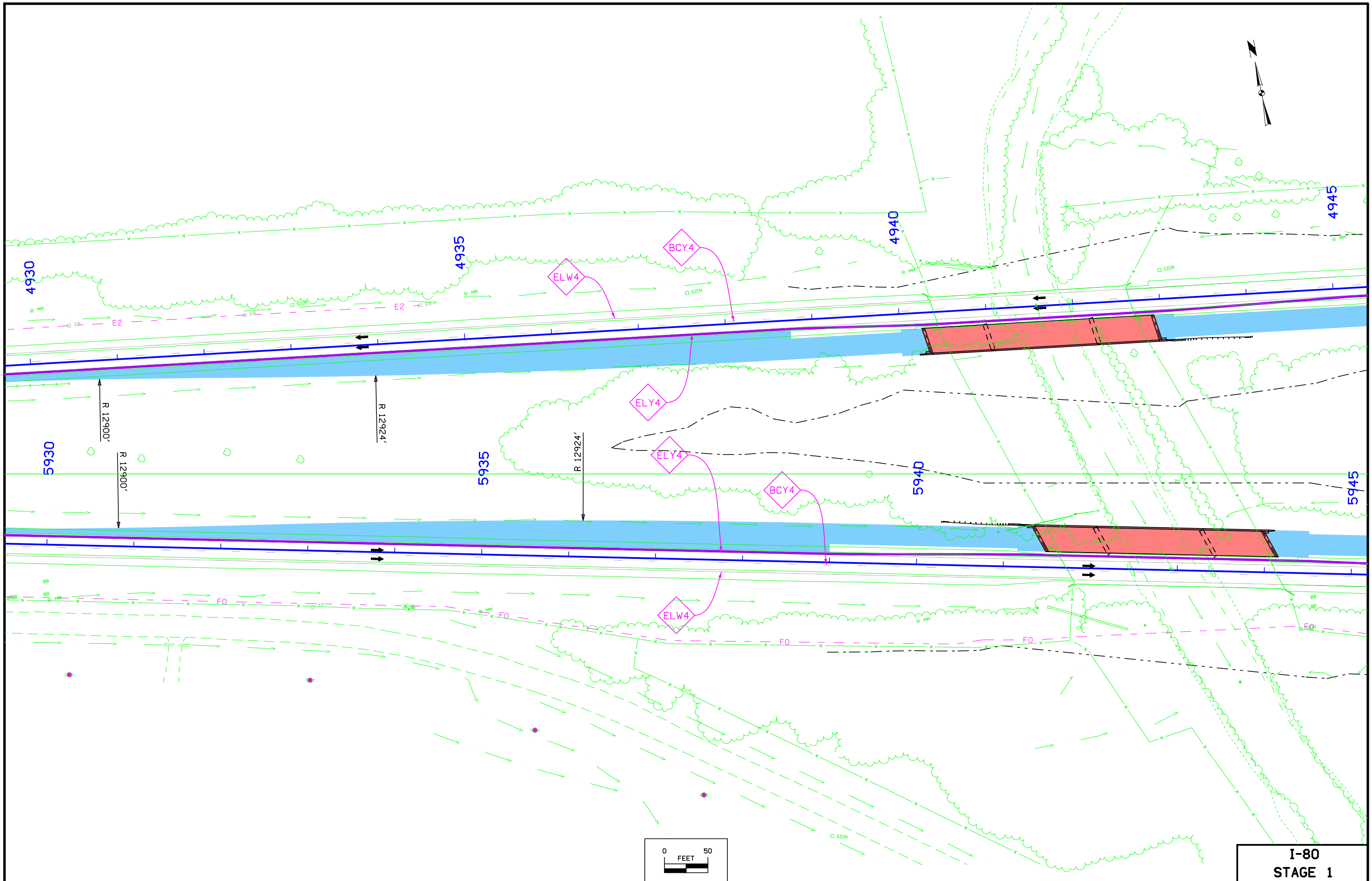
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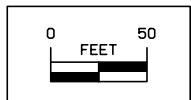
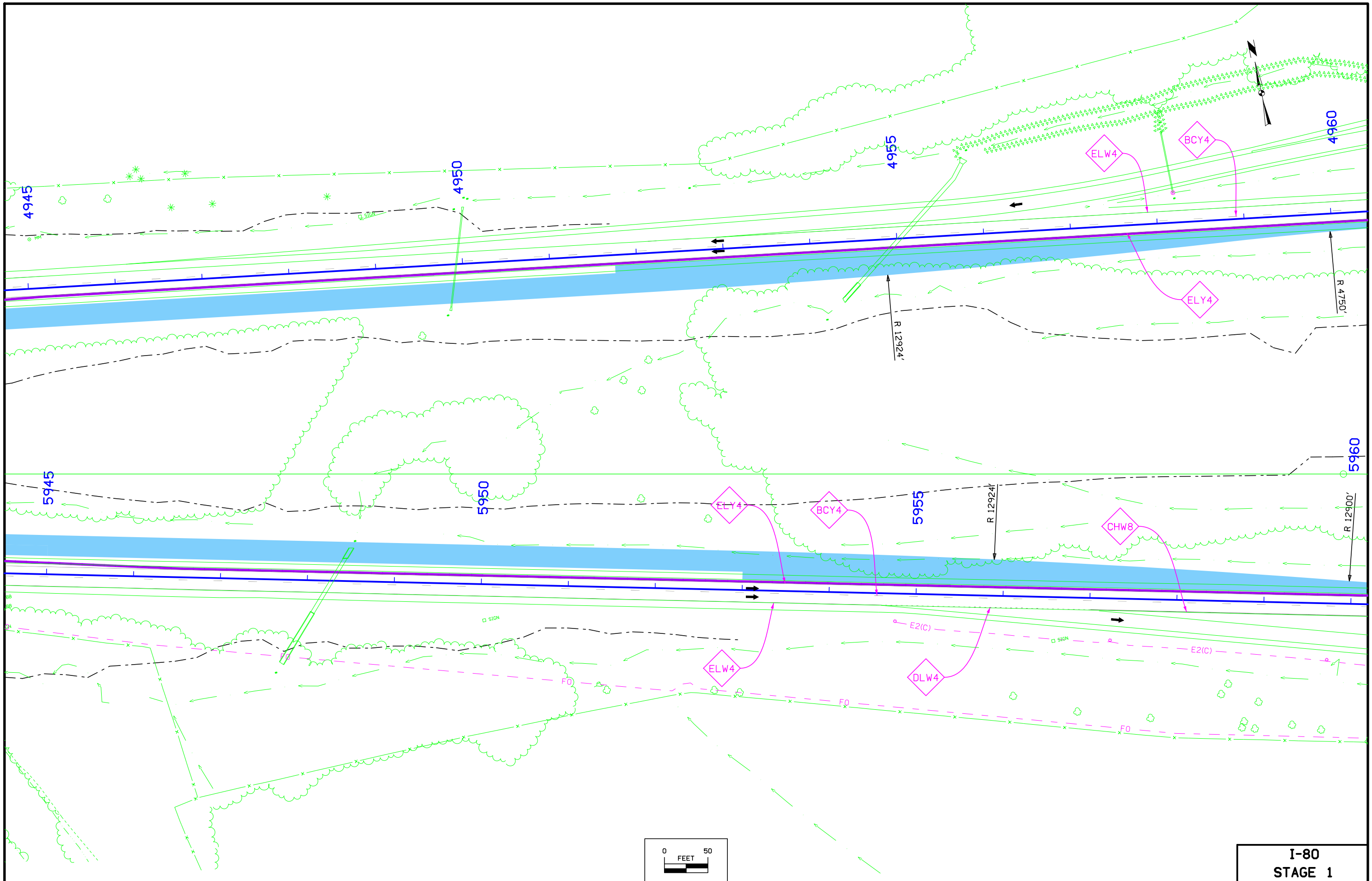


I-80, Staging Typical Sections

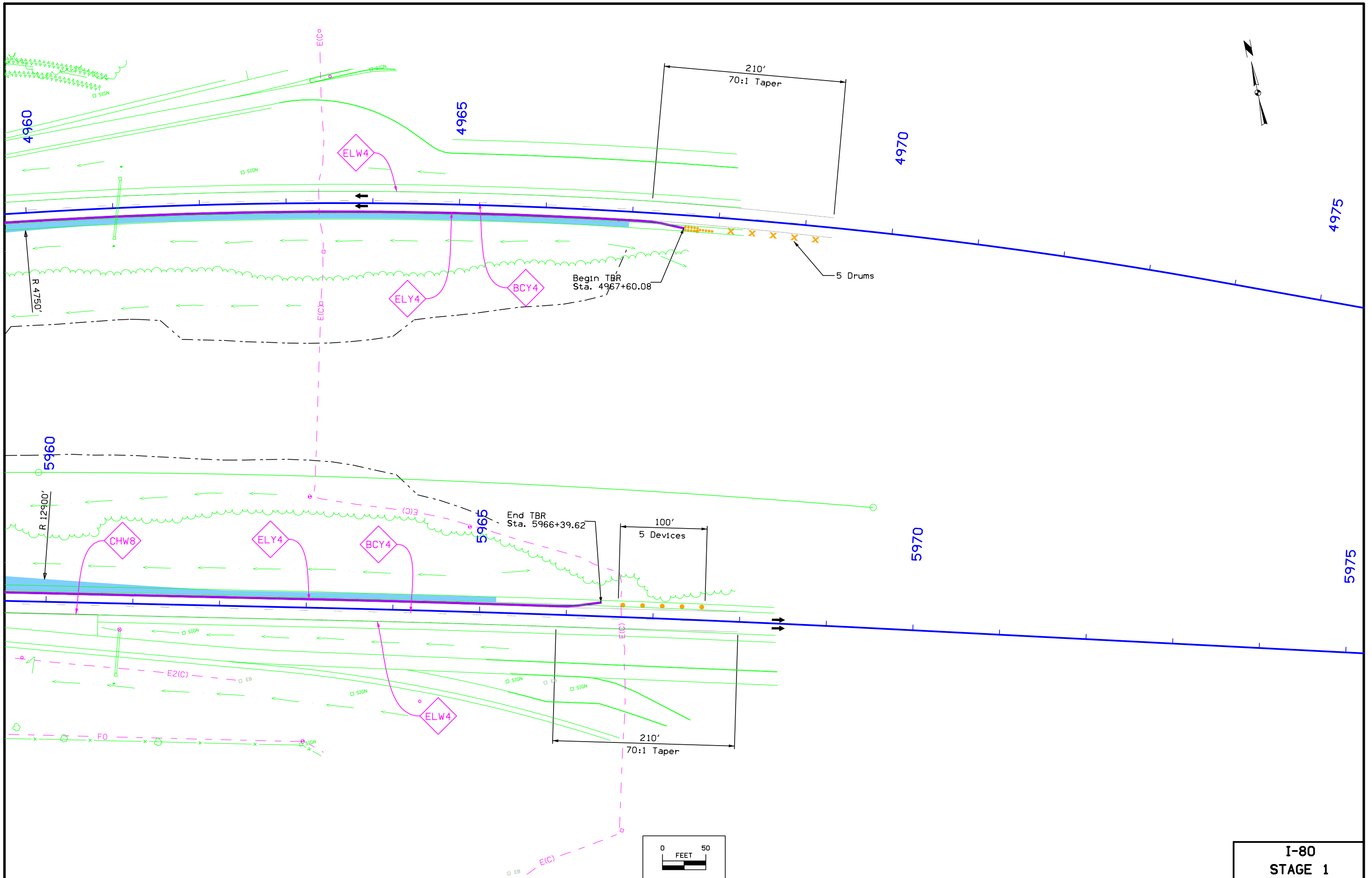


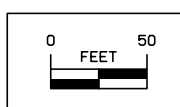
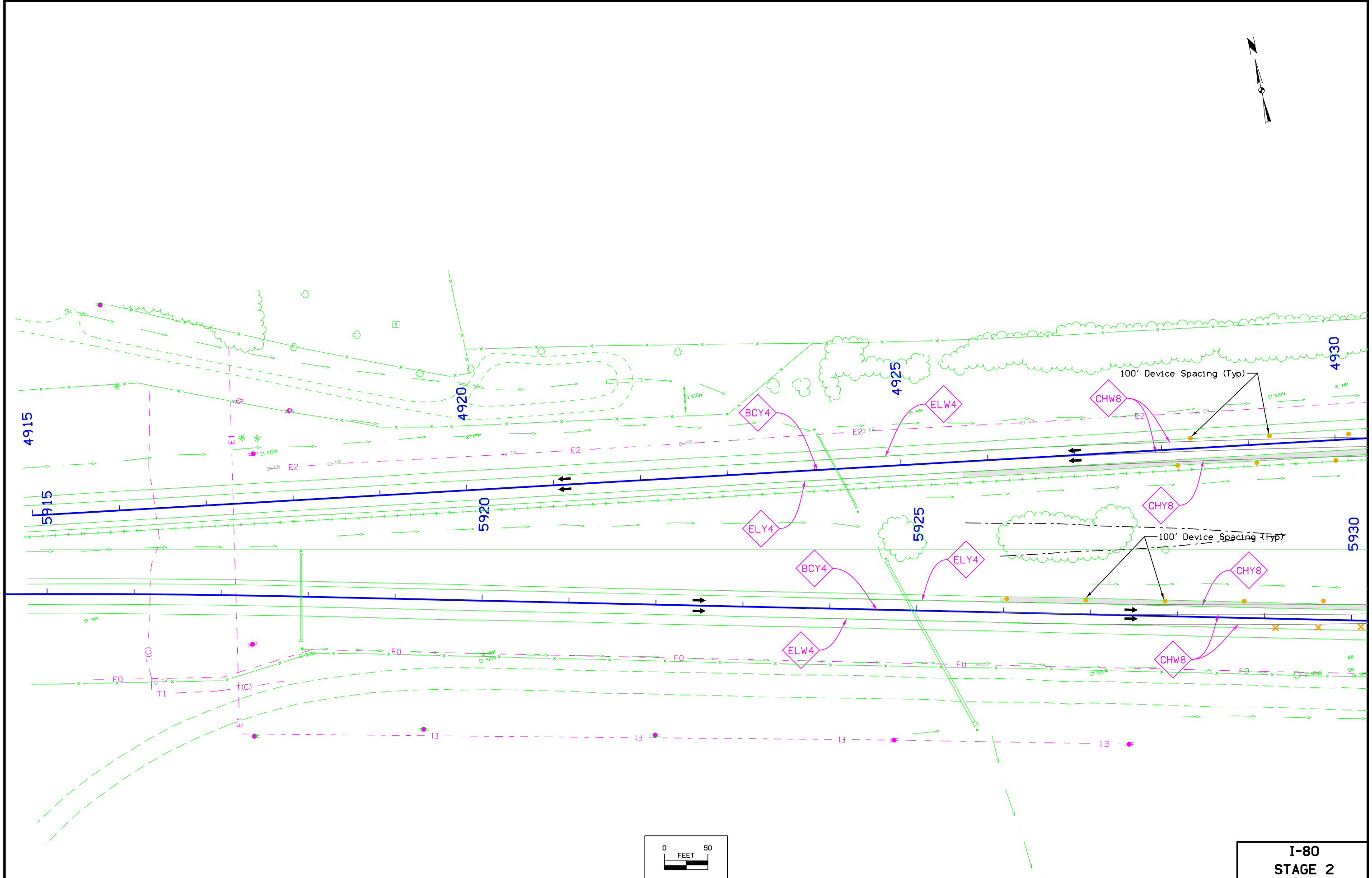
I-80
STAGE 1



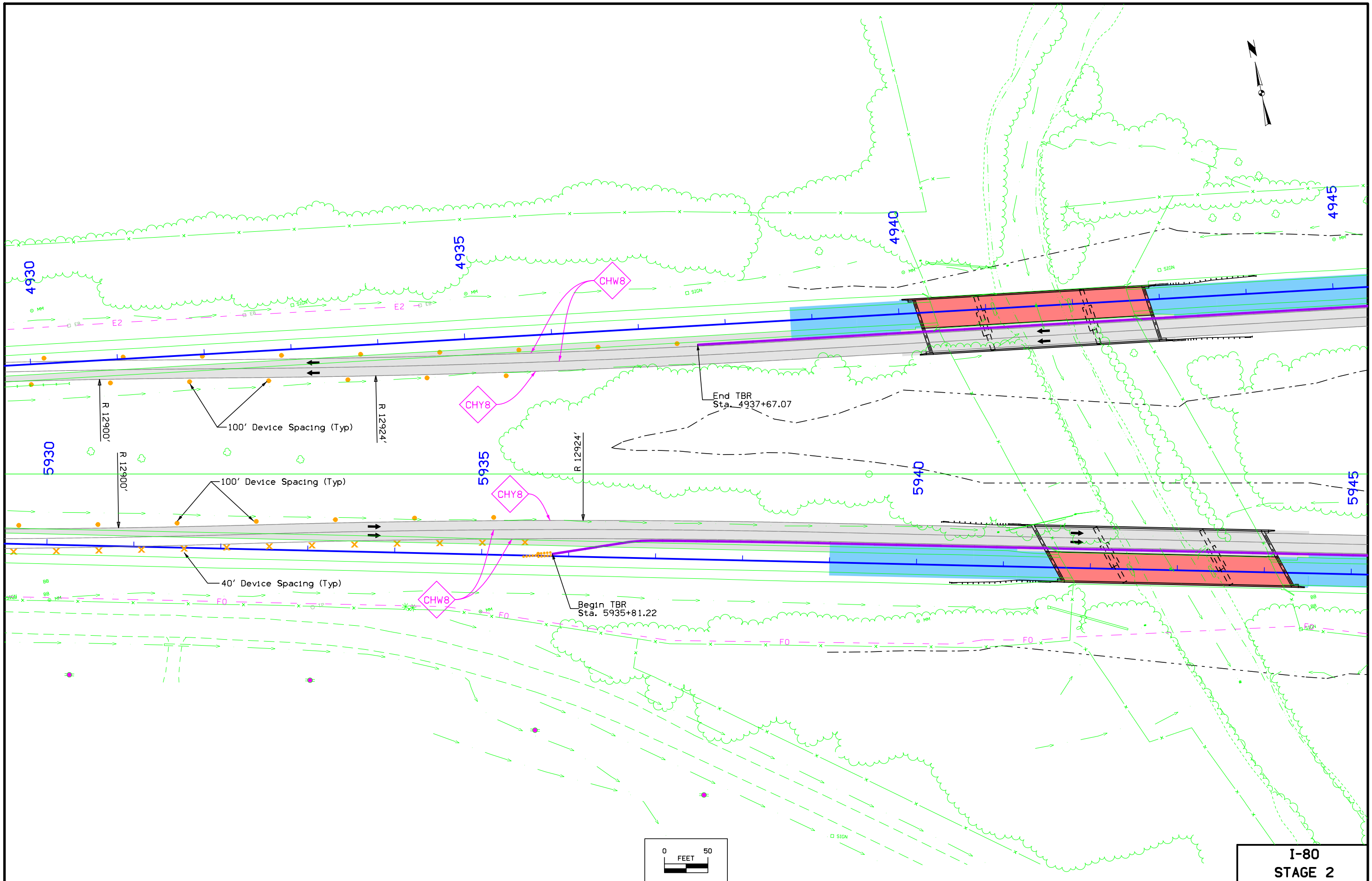


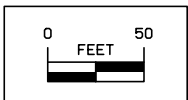
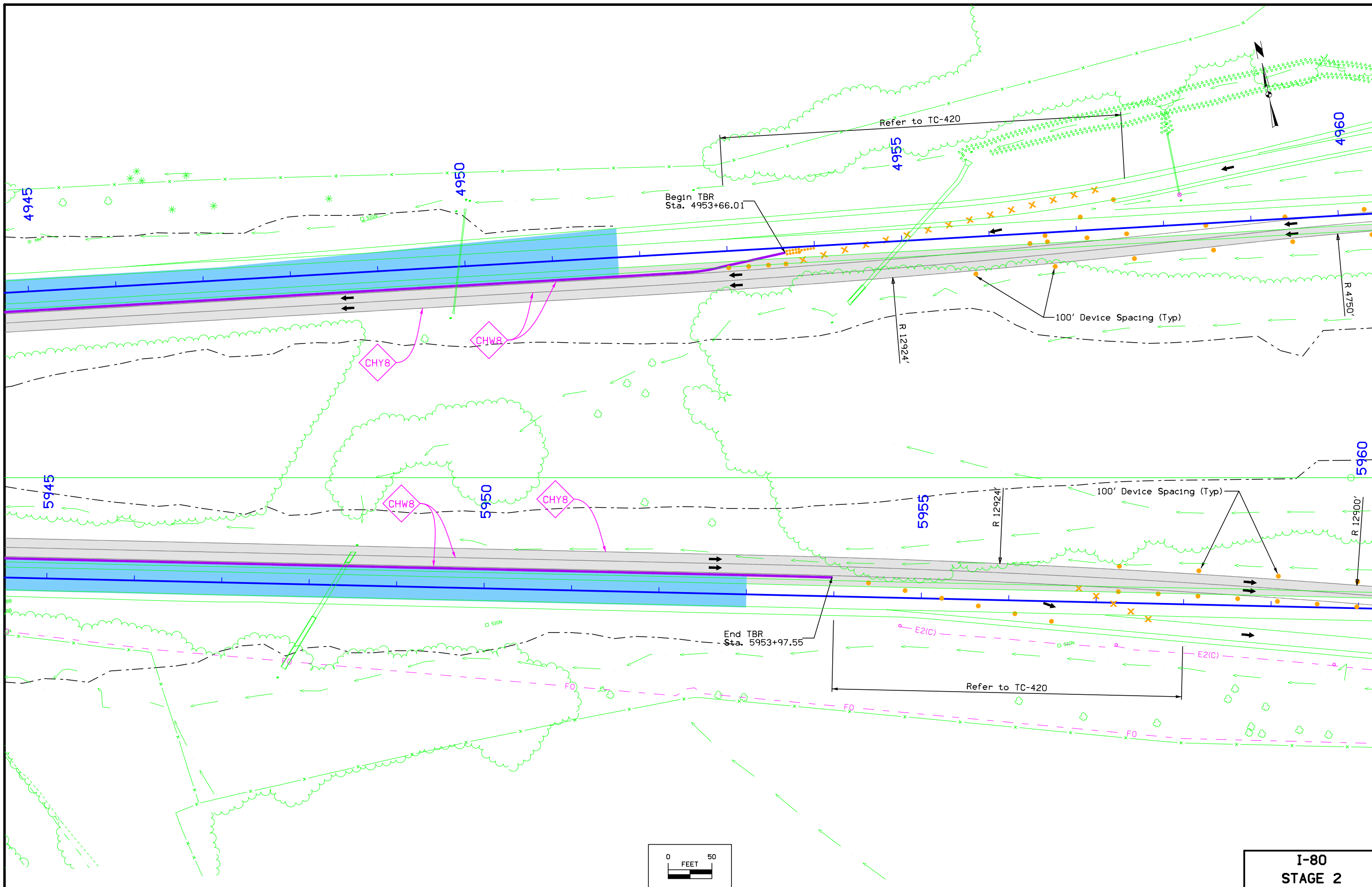
**I-80
STAGE 1**





I-80
STAGE 2

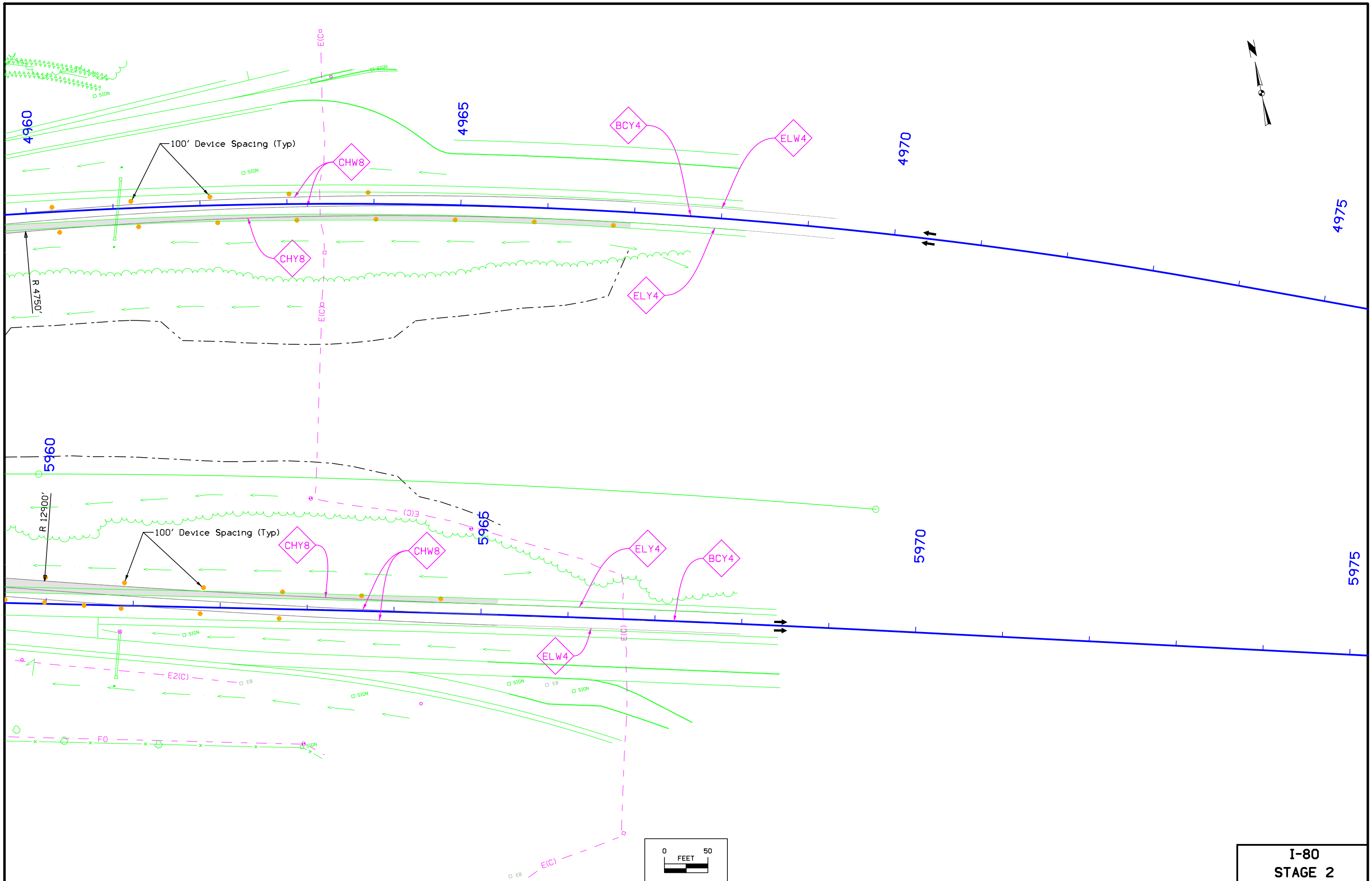


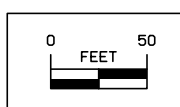
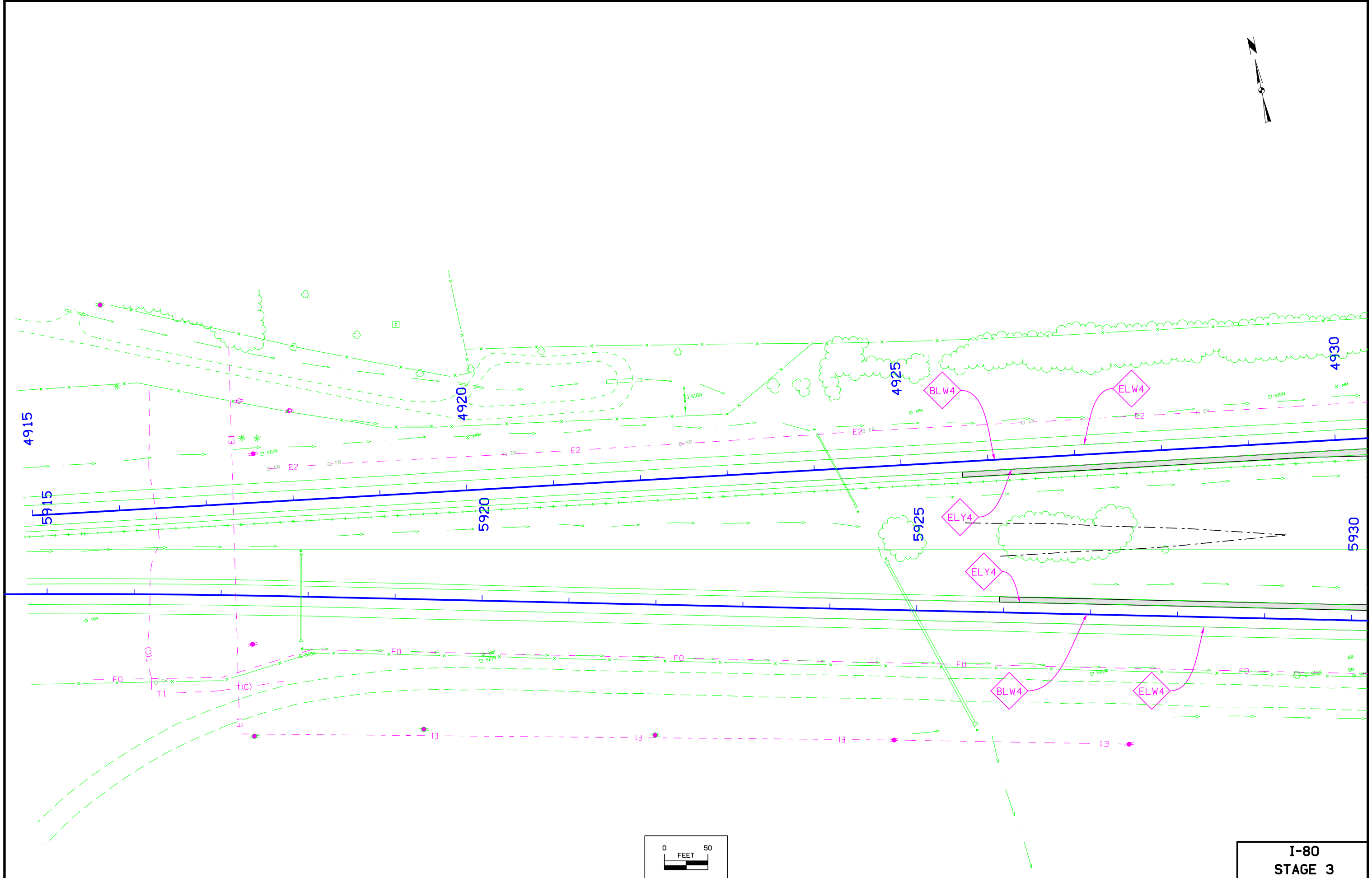


**I-80
STAGE 2**

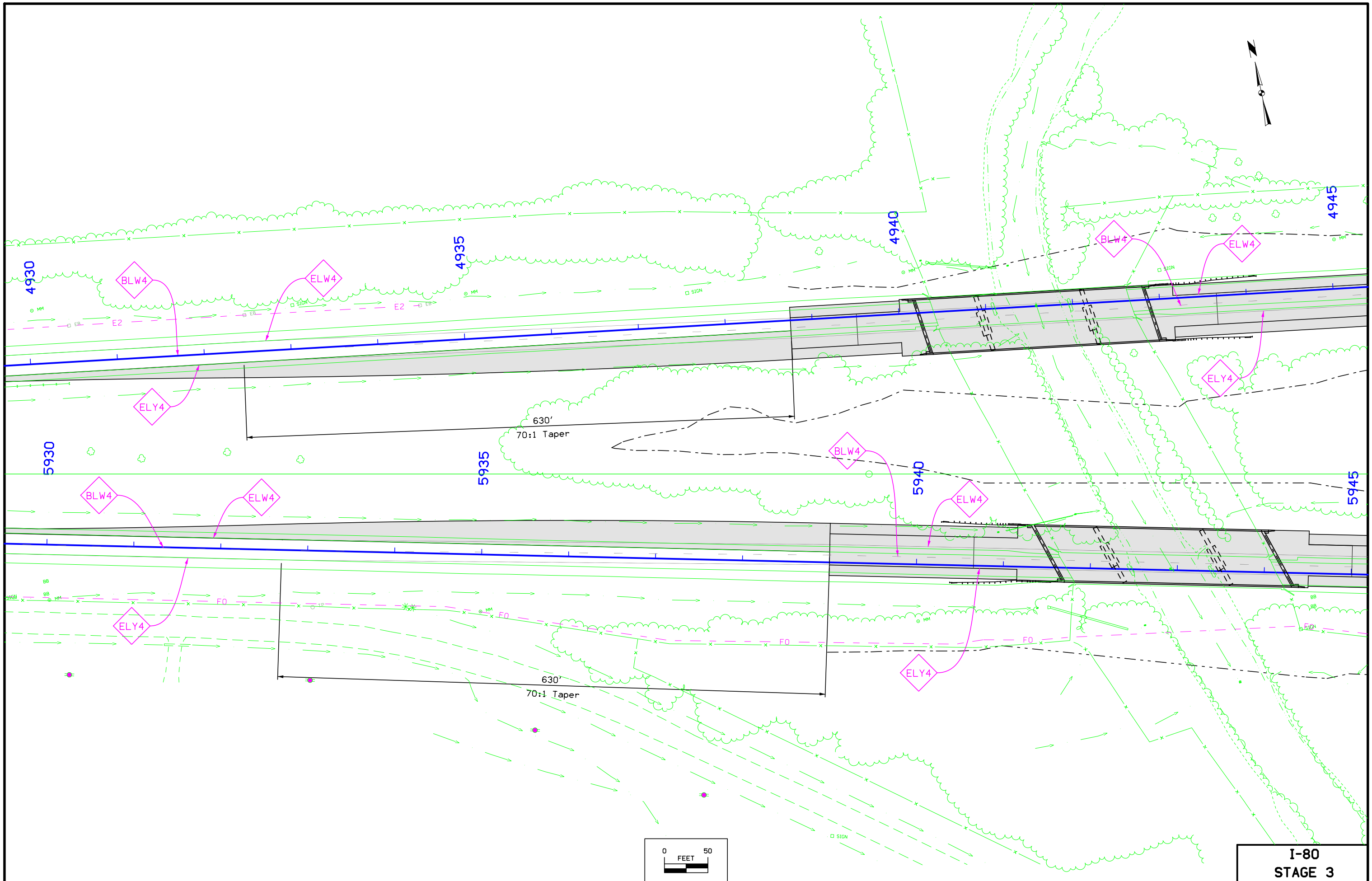
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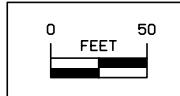


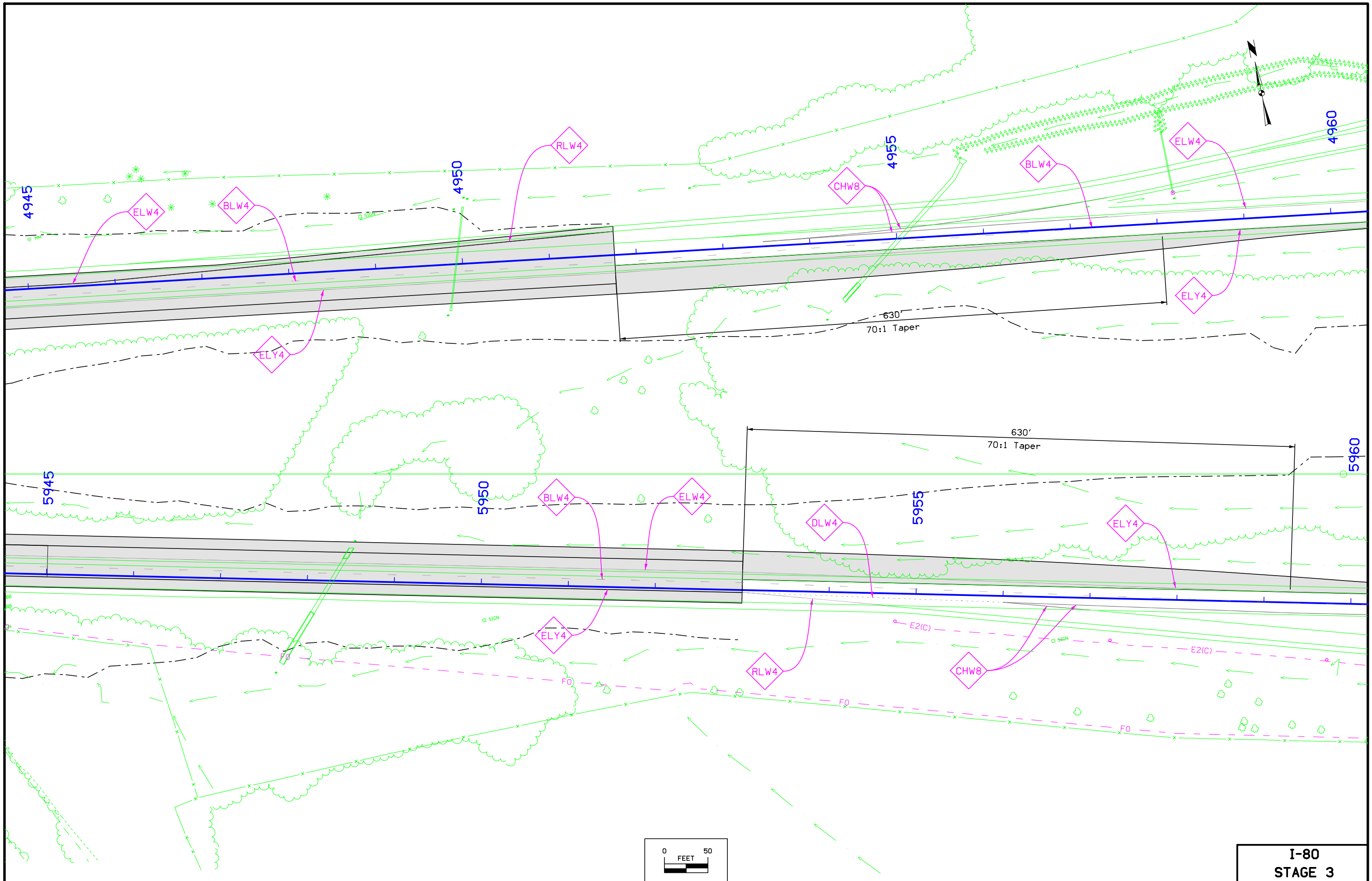


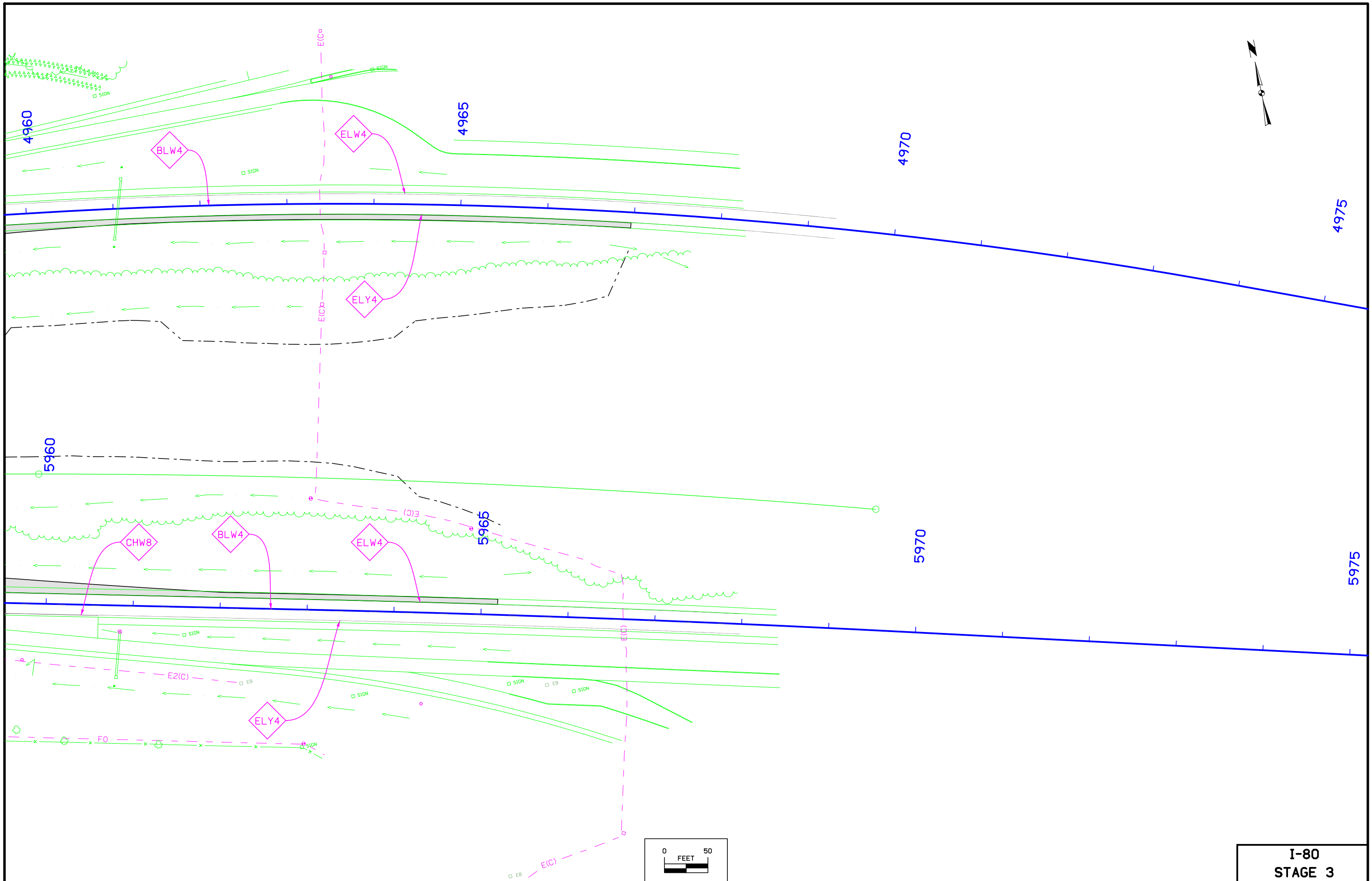
I-80
STAGE 3



**I-80
STAGE 3**







TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill			Checks (EW-102)		Topsoil				[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[9]+[10]+[11]+[12]									
	Template Cut Volume	Template Class 10 Volume	Total Cut Adjusted	Total Cut Adjusted w/ Weighted Average 1.3 Shrink Factor	Template Fill Volume	Total Fill Adjusted	Total Cut Adjusted w/ 1.3 Shrink Factor Minus Fill	Approx. Fill Volume Below 5' And Above 20' Cu. Yds.	Approx. Fill Volume Below 3' Cu. Yds.	Total Topsoil Cut Volume	Template Topsoil Replacement Volume	Topsoil Cut With 1.4 Shrink Factor	Topsoil Cut With Shrink Minus Topsoil Replacement									
ML 1-80 WB STG1																						
4925+69.90	163	163	163	125	0	0	125	0	0	0	27	0	-27									
4926+00.00	288	288	288	222	0	0	222	0	0	0	44	0	-44									
4926+50.00	315	315	315	242	0	0	242	0	0	0	44	0	-44									
4927+00.00	386	386	386	297	0	0	297	0	0	0	44	0	-44									
4927+50.00	471	471	471	362	0	0	362	0	0	0	44	0	-44									
4928+00.00	536	536	536	412	0	0	412	0	0	0	44	0	-44									
4929+00.00	621	621	621	478	0	0	478	0	0	0	44	0	-44									
4929+50.00	728	728	728	560	0	0	560	0	0	0	44	0	-44									
4929+63.30	209	209	209	161	0	0	161	0	0	0	12	0	-12									
4930+00.00	609	609	609	468	0	0	468	0	0	0	32	0	-32									
4930+50.00	897	897	897	690	0	0	690	0	0	0	44	0	-44									
4931+00.00	987	987	987	759	0	0	759	0	0	0	44	0	-44									
4931+50.00	1,126	1,126	1,126	866	0	0	866	0	0	0	44	0	-44									
4932+00.00	1,289	1,289	1,289	992	0	0	992	0	0	0	44	0	-44									
4932+21.84	617	617	617	475	0	0	475	0	0	0	19	0	-19									
4932+50.00	836	836	836	643	0	0	643	0	0	0	25	0	-25									
4933+00.00	1,568	1,568	1,568	1,206	0	0	1,206	0	0	0	44	0	-44									
4933+50.00	1,701	1,701	1,701	1,308	0	0	1,308	0	0	0	44	0	-44									
4934+00.00	1,806	1,806	1,806	1,389	0	0	1,389	0	0	0	44	0	-44									
4934+50.00	1,899	1,899	1,899	1,461	0	0	1,461	0	0	0	44	0	-44									
4935+00.00	2,068	2,068	2,068	1,591	1	1	1,590	0	0	0	44	0	-44									
4935+50.00	2,200	2,200	2,200	1,692	1	1	1,691	0	1	0	44	0	-44									
4936+00.00	2,145	2,145	2,145	1,650	2	2	1,648	0	1	0	44	0	-44									
4936+50.00	1,758	1,758	1,758	1,352	4	4	1,348	0	3	0	44	0	-44									
4937+00.00	1,164	1,164	1,164	895	7	7	888	0	7	0	44	0	-44									
4937+50.00	666	666	666	512	12	12	500	0	12	0	44	0	-44									
4938+00.00	297	297	297	228	28	28	200	0	28	0	44	0	-44									
4938+50.00	156	156	156	120	72	72	48	0	72	0	44	0	-44									
4939+00.00	222	222	222	171	99	99	72	0	98	0	44	0	-44									
4939+50.00	204	204	204	157	108	108	49	0	107	0	44	0	-44									
4940+00.00	82	82	82	63	173	173	-110	0	172	0	44	0	-44									
4940+01.23	0	0	0	0	3	3	-3	0	111	0	1	0	-1									
4940+20.67	2	2	2	2	0	0	2	0	0	0	0	0	0									
4943+15.79	3	3	3	2	328	328	-326	0	227	0	12	0	-12									
4943+50.00	3	3	3	2	711	711	-709	0	6,137	0	30	0	-30									
4944+00.00	0	0	0	0	888	888	-886	0	608	0	44	0	-44									
4944+50.00	0	0	0	0	836	836	-836	0	837	0	44	0	-44									
4945+00.00	0	0	0	0	705	705	-705	0	704	0	44	0	-44									
4945+50.00	0	0	0	0	541	541	-541	0	540	0	44	0	-44									
4946+00.00	0	0	0	0	424	424	-424	0	424	0	44	0	-44									
4946+50.00	0	0	0	0	309	309	-309	0	309	0	44	0	-44									
4947+00.00	5	5	5	4	213	213	-213	0	212	0	44	0	-44									
4947+50.00	6	6	6	5	163	163	-159	0	162	0	44	0	-44									
4948+00.00	3	3	3	2	149	149	-144	0	149	0	44	0	-44									
4948+50.00	5	5	5	4	134	134	-132	0	133	0	44	0	-44									
4949+00.00	7	7	7	5	113	113	-109	0	112	0	44	0	-44									
4949+50.00	10	10	10	8	170	170	-165	0	170	0	44	0	-44									
4950+00.00	14	14	14	11	299	299	-291	0	300	0	44	0	-44									
4950+50.00	18	18	18	14	344	344	-333	0	344	0	44	0	-44									
4951+00.00	19	19	19	15	303	303	-289	0	303	0	44	0	-44									
4951+50.00	37	37	37	28	349	349	-334	0	349	0	44	0	-44									
4952+00.00	54	54	54	42	473	473	-445	0	473	0	44	0	-44									
4952+50.00	52	52	52	40	615	615	-573	0	615	0	44	0	-44									
4953+00.00	50	50	50	38	670	670	-630	0	670	0	44	0	-44									
4953+50.00	48	48	48	37	717	717	-679	0	716	0	44	0	-44									
4954+00.00	48	48	48	37	832	832	-795	0	832	0	44	0	-44									
4954+50.00	48	48	48	37	840	840	-803	0	839	0	44	0	-44									
4955+00.00	48	48	48	37	699	699	-662	0	699	0	44	0	-44									
4955+50.00	50	50	50	38	555	555	-517	0	554	0	44	0	-44									
4956+00.00	54	54	54	42	444	444	-402	0	443	0	44	0	-44									
4956+50.00	180	180	180	138	257	257	-119	0	257	0	44	0	-44									
4957+00.00	515	515	515	396	98	98	298	0	97	0	44	0	-44									
4957+50.00	818	818	818	629	50	50	579	0	49	0	44	0	-44									
4958+00.00	857	857	857	659	46	46	613	0	46	0	44	0	-44									
4958+50.00	797	797	797	613	49	49	564	0	49	0	44	0	-44									
4958+81.59	488	488	488	375	28	28	347	0	43	0	28	0	-28									
4959+00.00	279	279	279	215	13	13	202	0	21	0	16	0	-16									
4959+50.00	833	833	833	641	26	26	615	0	9	0	44	0	-44									
4960+00.00	868	868	868	668	24	24	644	0	24	0	44	0	-44									

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

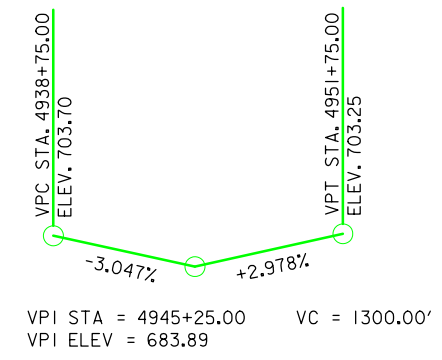
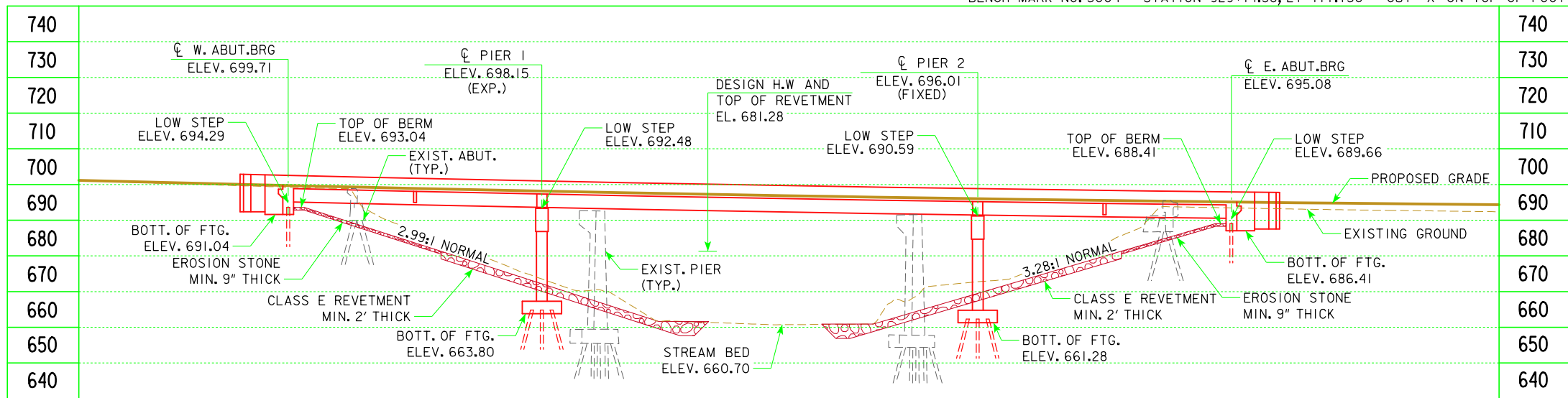
Station	Cut				Fill			Checks (EW-102)		Topsoil				[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]									
	Template Cut Volume	Template Class 10 Volume	Total Cut Adjusted	Total Cut Adjusted w/ Weighted Average 1.3 Shrink Factor	Template Fill Volume	Total Fill Adjusted	Total Cut Adjusted w/ 1.3 Shrink Factor Minus Fill	Approx. Fill Volume Below 5' And Above 20' Cu. Yds.	Approx. Fill Volume Below 3' Cu. Yds.	Total Topsoil Cut Volume	Template Topsoil Replacement Volume	Topsoil Cut With 1.4 Shrink Factor	[9]+[10]+[11]+[12]									
4960+00.00	794	794	794	611	24	24	587	0	25	0	44	0	-44									
4960+50.00	710	710	710	546	20	20	526	0	19	0	44	0	-44									
4961+00.00	197	197	197	152	4	4	148	0	13	0	13	0	-13									
4961+14.64	518	518	518	398	8	8	390	0	3	0	31	0	-31									
4961+50.00	890	890	890	685	8	8	677	0	5	0	44	0	-44									
4962+00.00	1,032	1,032	1,032	794	3	3	791	0	2	0	44	0	-44									
4962+50.00	1,121	1,121	1,121	862	0	0	862	0	0	0	44	0	-44									
4963+00.00	1,176	1,176	1,176	905	0	0	905	0	0	0	44	0	-44									
4963+50.00	1,079	1,079	1,079	830	0	0	830	0	0	0	44	0	-44									
4964+00.00	970	970	970	746	0	0	746	0	0	0	44	0	-44									
4964+50.00	893	893	893	687	0	0	687	0	0	0	44	0	-44									
4965+00.00	773	773	773	595	0	0	595	0	0	0	44	0	-44									
4965+50.00	852	852	852	655	0	0	655	0	0	0	44	0	-44									
4966+00.00	901	901	901	693	0	0	693	0	0	0	44	0	-44									
4966+50.00	541	541	541	416	0	0	416	0	0	0	41	0	-41									
4966+96.49	0	0	0	0	0	0	0	0	0	0	0	0	0									
Subtotals:	46,635	46,635	46,635	35,871	13,992	13,992	21,879	0	19,135	0	3,367	0	-3,367									
ML I-80 WB STG2																						
4938+75.00	113	113	113	87	0	0	87	0	0	0	22	0	-22									
4939+00.00	226	226	226	174	0	0	174	0	0	0	44	0	-44									
4939+50.00	215	215	215	165	0	0	165	0	0	0	43	0	-43									
4940+00.00	3	3	3	2	0	0	2	0	0	0	1	0	-1									
4940+01.23	15	15	15	12	0	0	12	0	0	0	0	0	0									
4940+20.67	25	25	25	19	71	71	-52	0	49	0	12	0	-12									
4943+15.79	36	36	36	28	147	147	-119	0	1,267	0	30	0	-30									
4943+50.00	39	39	39	30	159	159	-129	0	108	0	44	0	-44									
4944+00.00	25	25	25	19	146	146	-127	0	145	0	44	0	-44									
4944+50.00	19	19	19	15	129	129	-114	0	128	0	44	0	-44									
4945+00.00	17	17	17	13	105	105	-92	0	105	0	44	0	-44									
4945+50.00	16	16	16	12	98	98	-86	0	98	0	44	0	-44									
4946+00.00	17	17	17	13	91	91	-78	0	89	0	44	0	-44									
4946+50.00	24	24	24	18	64	64	-46	0	63	0	44	0	-44									
4947+00.00	36	36	36	28	26	26	2	0	25	0	44	0	-44									
4947+50.00	58	58	58	45	9	9	36	0	9	0	44	0	-44									
4948+00.00	91	91	91	70	4	4	66	0	4	0	44	0	-44									
4948+50.00	120	120	120	92	1	1	91	0	0	0	44	0	-44									
4949+00.00	152	152	152	117	0	0	117	0	0	0	44	0	-44									
4949+50.00	189	189	189	145	0	0	145	0	0	0	44	0	-44									
4950+00.00	218	218	218	168	0	0	168	0	0	0	44	0	-44									
4950+50.00	247	247	247	190	0	0	190	0	0	0	44	0	-44									
4951+00.00	275	275	275	212	0	0	212	0	0	0	43	0	-43									
4951+50.00	147	147	147	113	0	0	113	0	0	0	22	0	-22									
4951+75.00	0	0	0	0	0	0	0	0	0	0	0	0	0									
Subtotals:	2,323	2,323	2,323	1,787	1,050	1,050	737	0	2,090	0	877	0	-877									
ML I-80 EB STG1																						
5925+95.00	16	16	16	12	0	0	12	0	0	0	4	0	-4									
5926+00.00	190	190	190	146	0	0	146	0	0	0	44	0	-44									
5926+50.00	254	254	254	195	0	0	195	0	0	0	44	0	-44									
5927+00.00	306	306	306	235	0	0	235	0	0	0	44	0	-44									
5927+50.00	363	363	363	279	0	0	279	0	0	0	44	0	-44									
5928+00.00	435	435	435	335	0	0	335	0	0	0	44	0	-44									
5928+50.00	523	523	523	402	0	0	402	0	0	0	44	0	-44									
5929+00.00	619	619	619	476	0	0	476	0	0	0	44	0	-44									
5929+50.00	536	536	536	412	0	0	412	0	0	0	34	0	-34									
5929+88.00	174	174	174	134	0	0	134	0	0	0	10	0	-10									
5930+00.00	778	778	778	598	0	0	598	0	0	0	44	0	-44									
5930+50.00	854	854	854	657	0	0	657	0	0	0	44	0	-44									
5931+00.00	935	935	935	719	0	0	719	0	0	0	44	0	-44									
5931+50.00	984	984	984	757	0	0	757	0	0	0	44	0	-44									
5932+00.00	1,022	1,022	1,022	786	0	0	786	0	0	0	41	0	-41									
5932+47.00	75	75	75	58	0	0	58	0	0	0	3	0	-3									
5932+50.00	1,245	1,245	1,245	958	0	0	958	0	0	0	44	0	-44									
5933+00.00	1,344	1,344	1,344	1,034	0	0	1,034	0	0	0	44	0	-44									
5933+50.00	1,437	1,437	1,437	1,105	0	0	1,105	0	0	0	44	0	-44									
5934+00.00																						

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill			Checks (EW-102)		Topsoil				[14]-[22]									
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	
	Template Cut Volume	Template Class 10 Volume	Total Cut Adjusted	Total Cut Adjusted w/ Weighted Average 1.3 Shrink Factor	Template Fill Volume	Total Fill Adjusted	Total Cut Adjusted w/ 1.3 Shrink Factor Minus Fill	Approx. Fill Volume Below 5' And Above 20' Cu. Yds.	Approx. Fill Volume Below 3' Cu. Yds.	Total Topsoil Cut Volume	Template Topsoil Replacement Volume	Topsoil Cut With 1.4 Shrink Factor	Topsoil Cut With Shrink Minus Topsoil Replacement	[9]+[10]+[11]+ [12]									
														[8]-[13]									
5934+00.00	1,530	1,530	1,530	1,177	0	0	1,177	0	0	0	44	0	-44										
5934+50.00	1,657	1,657	1,657	1,275	0	0	1,275	0	0	0	44	0	-44										
5935+00.00	1,773	1,773	1,773	1,364	0	0	1,364	0	0	0	44	0	-44										
5935+50.00	1,722	1,722	1,722	1,325	0	0	1,325	0	0	0	44	0	-44										
5936+00.00	1,540	1,540	1,540	1,185	0	0	1,185	0	0	0	44	0	-44										
5936+50.00	1,426	1,426	1,426	1,097	0	0	1,097	0	0	0	44	0	-44										
5937+00.00	1,371	1,371	1,371	1,055	0	0	1,055	0	0	0	44	0	-44										
5937+50.00	1,323	1,323	1,323	1,018	0	0	1,018	0	0	0	44	0	-44										
5938+00.00	1,303	1,303	1,303	1,002	1	1	1,001	0	0	0	44	0	-44										
5938+50.00	1,195	1,195	1,195	919	3	3	916	0	3	0	44	0	-44										
5939+00.00	1,015	1,015	1,015	781	5	5	776	0	5	0	44	0	-44										
5939+50.00	824	824	824	634	3	3	631	0	3	0	44	0	-44										
5940+00.00	569	569	569	438	3	3	435	0	3	0	44	0	-44										
5940+50.00	263	263	263	202	19	19	183	0	19	0	44	0	-44										
5941+00.00	18	18	18	14	5	5	9	0	16	0	7	0	-7										
5941+16.00	3	3	3	2	0	0	2	0	0	0	0	0	0										
5941+60.00	1	1	1	1	268	268	-267	0	396	0	13	0	-13										
5944+51.00	0	0	0	0	781	781	-781	0	4,612	0	44	0	-44										
5945+00.00	0	0	0	0	606	606	-606	0	594	0	44	0	-44										
5945+50.00	0	0	0	0	484	484	-484	0	484	0	44	0	-44										
5946+00.00	0	0	0	0	404	404	-404	0	404	0	44	0	-44										
5946+50.00	0	0	0	0	324	324	-324	0	324	0	44	0	-44										
5947+00.00	1	1	1	1	251	251	-250	0	250	0	44	0	-44										
5947+50.00	1	1	1	1	225	225	-224	0	225	0	44	0	-44										
5948+00.00	0	0	0	0	379	379	-379	0	378	0	44	0	-44										
5948+50.00	0	0	0	0	427	427	-427	0	427	0	44	0	-44										
5949+00.00	0	0	0	0	310	310	-310	0	310	0	44	0	-44										
5949+50.00	1	1	1	1	243	243	-242	0	243	0	44	0	-44										
5950+00.00	25	25	25	19	130	130	-111	0	130	0	44	0	-44										
5950+50.00	79	79	79	61	45	45	16	0	45	0	44	0	-44										
5951+00.00	133	133	133	102	18	18	84	0	18	0	44	0	-44										
5951+50.00	166	166	166	128	7	7	121	0	7	0	44	0	-44										
5952+00.00	191	191	191	147	2	2	145	0	2	0	44	0	-44										
5952+50.00	225	225	225	173	1	1	172	0	0	0	44	0	-44										
5953+00.00	271	271	271	208	0	0	208	0	0	0	44	0	-44										
5953+50.00	360	360	360	277	0	0	277	0	0	0	44	0	-44										
5954+00.00	487	487	487	375	0	0	375	0	0	0	44	0	-44										
5954+50.00	649	649	649	499	0	0	499	0	0	0	44	0	-44										
5955+00.00	850	850	850	654	0	0	654	0	0	0	44	0	-44										
5955+50.00	1,022	1,022	1,022	786	0	0	786	0	0	0	44	0	-44										
5956+00.00	1,155	1,155	1,155	888	0	0	888	0	0	0	44	0	-44										
5956+50.00	1,258	1,258	1,258	968	0	0	968	0	0	0	44	0	-44										
5957+00.00	1,301	1,301	1,301	1,001	0	0	1,001	0	0	0	44	0	-44										
5957+50.00	1,319	1,319	1,319	1,015	1	1	1,014	0	0	0	44	0	-44										
5958+00.00	1,385	1,385	1,385	1,065	0	0	1,065	0	0	0	44	0	-44										
5958+50.00	1,461	1,461	1,461	1,124	0	0	1,124	0	0	0	44	0	-44										
5959+00.00	1,506	1,506	1,506	1,158	1	1	1,157	0	0	0	44	0	-44										
5959+50.00	509	509	509	392	0	0	392	0	1	0	15	0	-15										
5959+67.00	1,042	1,042	1,042	802	0	0	802	0	0	0	30	0	-30										
5960+00.00	1,621	1,621	1,621	1,247	0	0	1,247	0	0	0	44	0	-44										
5960+50.00	1,662	1,662	1,662	1,278	0	0	1,278	0	0	0	44	0	-44										
5961+00.00	1,634	1,634	1,634	1,257	0	0	1,257	0	0	0	44	0	-44										
5961+50.00	1,512	1,512	1,512	1,163	0	0	1,163	0	0	0	44	0	-44										
5962+00.00	120	120	120	92	0	0	92	0	0	0	4	0	-4										
5962+04.00	1,337	1,337	1,337	1,028	0	0	1,028	0	0	0	40	0	-40										
5962+50.00	1,478	1,478	1,478	1,137	0	0	1,137	0	0	0	44	0	-44										
5963+00.00	1,435	1,435	1,435	1,104	0	0	1,104	0	0	0	44	0	-44										
5963+50.00	1,285	1,285	1,285	988	0	0	988	0	0	0	44	0	-44										
5964+00.00	1,085	1,085	1,085	835	0	0	835	0	0	0	44	0	-44										
5964+50.00	848	848	848	652	0	0	652	0	0	0	44	0	-44										
5965+00.00	232	232	232	178	0	0	178	0	0	0	17	0	-17										
5965+19.00	0	0	0	0	0	0	0	0	0	0	0	0	0										
Subtotals:	59,269	59,269	59,269	45,591	4,946	4,946	40,645	0	8,899	0	3,166	0	-3,166										
ML I-80 EB STG2																							
5939+00.00	306	306	306	235	0	0	235	0	0	0	22	0	-22										
5939+25.00	308	308	308	237	0	0	237	0	0	0	22	0	-22										
5939+50.00	303	303	303	233	0	0	233	0	0	0	22	0	-22										
5939+75.00																							

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill			Checks (EW-102)		Topsoil													
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	
	Template Cut Volume	Template Class 10 Volume	Total Cut Adjusted	Total Cut Adjusted w/ Weighted Average 1.3 Shrink Factor	Template Fill Volume	Total Fill Adjusted	Total Cut Adjusted w/ 1.3 Shrink Factor Minus Fill	Approx. Fill Volume Below 5' And Above 20' Cu. Yds.	Approx. Fill Volume Below 3' Cu. Yds.	Total Topsoil Cut Volume	Template Topsoil Replacement Volume	Topsoil Cut With 1.4 Shrink Factor	[9]+[10]+[11]+[12]	[8]-[13]						[17]/1.4	[19]-[18]		
5939+75.00	297	297	297	228	0	0	228	0	0	0	22	0	-22										
5940+00.00	298	298	298	229	0	0	229	0	0	0	22	0	-22										
5940+25.00	302	302	302	232	0	0	232	0	0	0	22	0	-22										
5940+50.00	297	297	297	228	0	0	228	0	0	0	22	0	-22										
5940+75.00	257	257	257	198	0	0	198	0	0	0	22	0	-22										
5941+00.00	74	74	74	57	0	0	57	0	0	0	7	0	-7										
5941+15.65	4	4	4	3	0	0	3	0	0	0	0	0	0										
5941+25.00	6	6	6	5	1	1	4	0	0	0	0	0	0										
5941+50.00	1	1	1	1	1	1	0	0	1	0	0	0	0										
5941+60.10	0	0	0	0	0	0	0	0	0	0	0	0	0										
5941+75.00	0	0	0	0	0	0	0	0	0	0	0	0	0										
5944+50.74	0	0	0	0	334	334	-334	0	167	0	13	0	-13										
5944+75.00	0	0	0	0	526	526	-526	0	5,979	0	21	0	-21										
5945+00.00	0	0	0	0	480	480	-480	0	465	0	22	0	-22										
5945+25.00	0	0	0	0	441	441	-441	0	440	0	22	0	-22										
5945+50.00	0	0	0	0	428	428	-428	0	428	0	22	0	-22										
5945+75.00	0	0	0	0	390	390	-390	0	389	0	22	0	-22										
5946+00.00	0	0	0	0	348	348	-348	0	347	0	22	0	-22										
5946+25.00	0	0	0	0	297	297	-297	0	297	0	22	0	-22										
5946+50.00	0	0	0	0	255	255	-255	0	254	0	22	0	-22										
5946+75.00	0	0	0	0	230	230	-230	0	229	0	22	0	-22										
5947+00.00	0	0	0	0	194	194	-194	0	194	0	22	0	-22										
5947+25.00	0	0	0	0	156	156	-156	0	156	0	22	0	-22										
5947+50.00	0	0	0	0	134	134	-134	0	133	0	22	0	-22										
5947+75.00	0	0	0	0	127	127	-127	0	127	0	22	0	-22										
5948+00.00	0	0	0	0	118	118	-118	0	118	0	22	0	-22										
5948+25.00	0	0	0	0	104	104	-104	0	103	0	22	0	-22										
5948+50.00	0	0	0	0	95	95	-95	0	94	0	22	0	-22										
5948+75.00	0	0	0	0	86	86	-86	0	85	0	22	0	-22										
5949+00.00	0	0	0	0	73	73	-73	0	72	0	22	0	-22										
5949+25.00	1	1	1	1	59	59	-58	0	59	0	22	0	-22										
5949+50.00	5	5	5	4	54	54	-50	0	53	0	22	0	-22										
5949+75.00	11	11	11	8	52	52	-44	0	51	0	22	0	-22										
5950+00.00	20	20	20	15	43	43	-28	0	43	0	22	0	-22										
5950+25.00	31	31	31	24	32	32	-8	0	31	0	22	0	-22										
5950+50.00	44	44	44	34	23	23	11	0	23	0	22	0	-22										
5950+75.00	58	58	58	45	10	10	35	0	10	0	22	0	-22										
5951+00.00	73	73	73	56	1	1	55	0	0	0	22	0	-22										
5951+25.00	88	88	88	68	0	0	68	0	0	0	22	0	-22										
5951+50.00	100	100	100	77	0	0	77	0	0	0	22	0	-22										
5951+75.00	109	109	109	84	0	0	84	0	0	0	22	0	-22										
5952+00.00	116	116	116	89	0	0	89	0	0	0	22	0	-22										
5952+25.00	126	126	126	97	0	0	97	0	0	0	22	0	-22										
5952+50.00	136	136	136	105	0	0	105	0	0	0	22	0	-22										
5952+75.00	142	142	142	109	0	0	109	0	0	0	22	0	-22										
5953+00.00	144	144	144	111	0	0	111	0	0	0	22	0	-22										
Subtotals:	3,657	3,657	3,657	2,813	5,092	5,092	-2,279	0	10,348	0	943	0	-943										
Project Totals:	109,561	109,561	109,561	84,275	24,030	24,030	60,245	0	38,382	0	7,476	0	-7,476										



LONGITUDINAL SECTION ALONG WB I-80

NOTES:
 STANDARD INTEGRAL ABUTMENT
 TL-5 BRIDGE RAILING PROPOSED
 PIER TYPE - T
 BEAM TYPE - STD BTC - 3'-9".
 CLASS E REVELTMENT STONE IS EMBEDDED
 SEE SHEET V.5 FOR STAGING NOTES AND DETAILS

HYDRAULIC DATA

DRAINAGE AREA = 92.3 SQ. MI.
 STREAM SLOPE = 2.0 FT./MI.

 $Q_2 = 2,350$ CFS
 STAGE = 671.11
 CHANNEL VELOCITY = 2.2 FPS

 $Q_{50} = 11,600$ CFS
 STAGE = 681.28
 BACKWATER = 0.12 FT.
 AVG. BRIDGE VELOCITY = 4.2 FPS

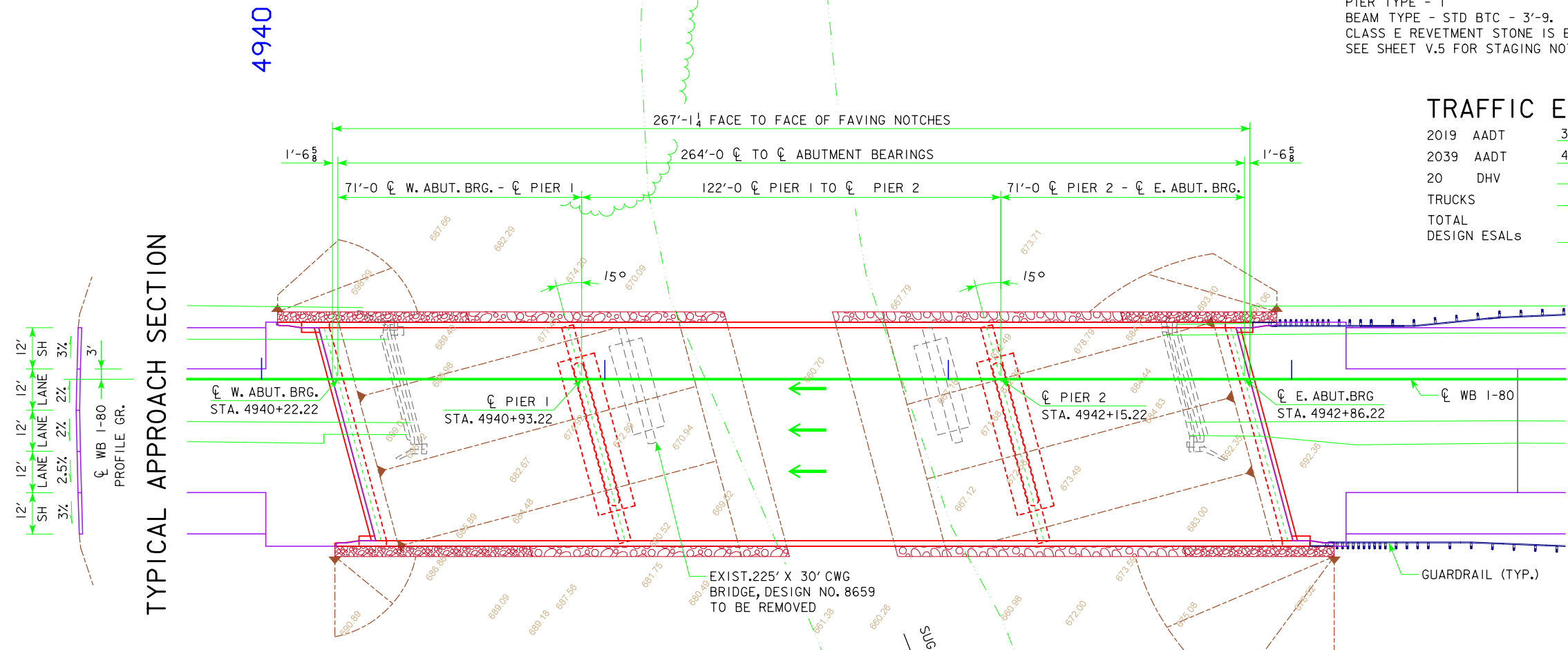
 $Q_{100} = 13,500$ CFS
 STAGE = 682.44
 BACKWATER = 0.17 FT.
 AVG. BRIDGE VELOCITY = 4.6 FPS

 $Q_{200} = 17,300$ CFS
 STAGE = 684.48
 CALCULATED DESIGN SCOUR = ????.?

 $Q_{500} = 18,700$ CFS
 STAGE = 685.15
 AVG. BRIDGE VELOCITY = 5.3 FPS
 CALCULATED CHECK SCOUR = ????.?

TRAFFIC ESTIMATE

2019 AADT	35,700	V.P.D.
2039 AADT	44,400	V.P.D.
20 DHV		V.P.H.
TRUCKS	37%	%
TOTAL DESIGN ESALs		



LOCATION
 WESTBOUND I-80 OVER SUGAR CREEK
 T-79N R-2W
 SECTION 15
 SUGAR CREEK TOWNSHIP
 CEDAR COUNTY
 FHWA NO. 18660
 BRIDGE MAINT. NO. 8659
 LATITUDE 41.64219696°
 LONGITUDE -91.06360124°

UTILITIES LEGEND:
 E(C) = EASTERN IOWA LIGHT AND POWER - QUALITY C
 E1 = EASTERN IOWA LIGHT AND POWER - QUALITY D
 E2(C) = IOWA DOT - QUALITY C
 E2 = IOWA DOT - ABANDONED - QUALITY D
 FO(C) = (ICN) IOWA COMMUNICATIONS NETWORK - QUALITY C
 FO = (ICN) IOWA COMMUNICATIONS NETWORK - QUALITY D
 T(C) = WTC COMMUNICATIONS - QUALITY C
 T1 = WTC COMMUNICATIONS - QUALITY D

SITUATION PLAN

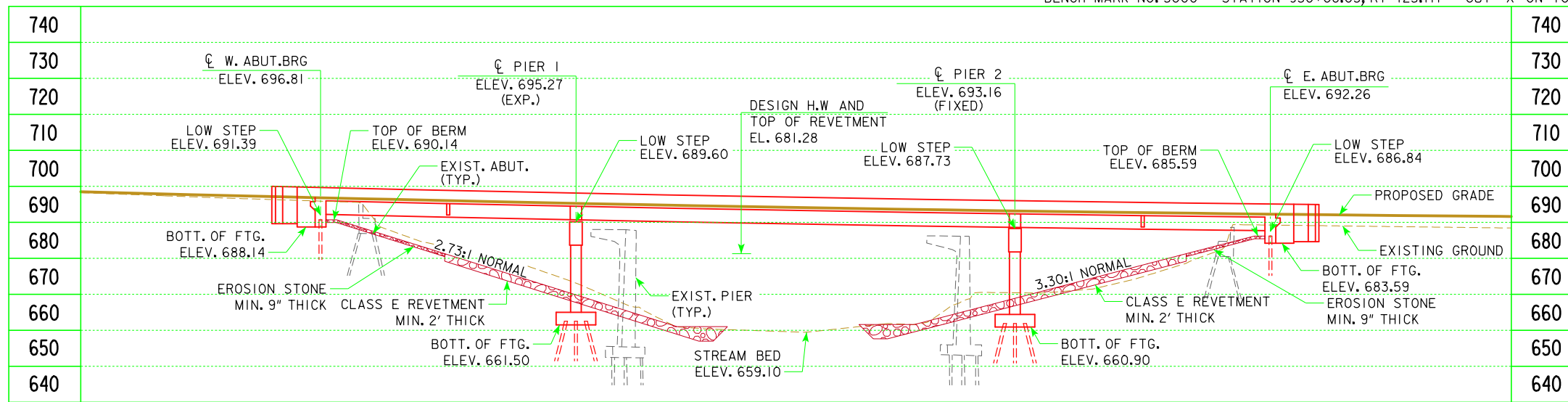
HYDRAULIC DESIGN

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

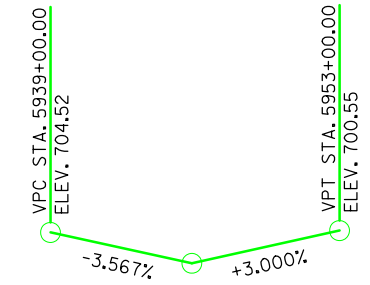
Signature: Michael J. Ryan Date: 21-10-2016
 Printed or Typed Name: Michael J. Ryan
 My license renewal date is December 31, 2017

Pages or sheets covered by this seal: SHEETS 1 THRU 3 OF 5

PRELIMINARY
 DESIGN FOR 15° SKEW (R.A.)
**264'-0" X 62'-0" PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 71'-0" END SPANS (BTC BEAM TYPE) 122'-0" INTERIOR SPAN
SITUATION PLAN
 STATION 4941+54.22 WB I-80 OVER SUGAR CREEK AUGUST 2016
CEDAR COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 5 FILE NO. ? DESIGN NO. ?



LONGITUDINAL SECTION ALONG EB I-80



PROPOSED PROFILE GRADE EB I-80

HYDRAULIC DATA

DRAINAGE AREA = 92.3 SQ. MI.
STREAM SLOPE = 2.0 FT./MI.

Q₂ = 2,350 CFS
STAGE = 671.11
CHANNEL VELOCITY = 2.2 FPS

Q₅₀ = 11,600 CFS
STAGE = 681.28
BACKWATER = 0.12 FT.
AVG. BRIDGE VELOCITY = 4.2 FPS

Q₁₀₀ = 13,500 CFS
STAGE = 682.44
BACKWATER = 0.17 FT.
AVG. BRIDGE VELOCITY = 4.6 FPS

Q₂₀₀ = 17,300 CFS
STAGE = 684.48
CALCULATED DESIGN SCOUR = ????

Q₅₀₀ = 18,700 CFS
STAGE = 685.15
AVG. BRIDGE VELOCITY = 5.3 FPS
CALCULATED CHECK SCOUR = ????

UTILITIES LEGEND:

- E(C) = EASTERN IOWA LIGHT AND POWER - QUALITY C
- EI = EASTERN IOWA LIGHT AND POWER - QUALITY D
- E2(C) = IOWA DOT - QUALITY C
- E2 = IOWA DOT - ABANDONED - QUALITY D
- FO(C) = (ICN) IOWA COMMUNICATIONS NETWORK - QUALITY C
- FO = (ICN) IOWA COMMUNICATIONS NETWORK - QUALITY D
- T(C) = WTC COMMUNICATIONS - QUALITY C
- TI = WTC COMMUNICATIONS - QUALITY D

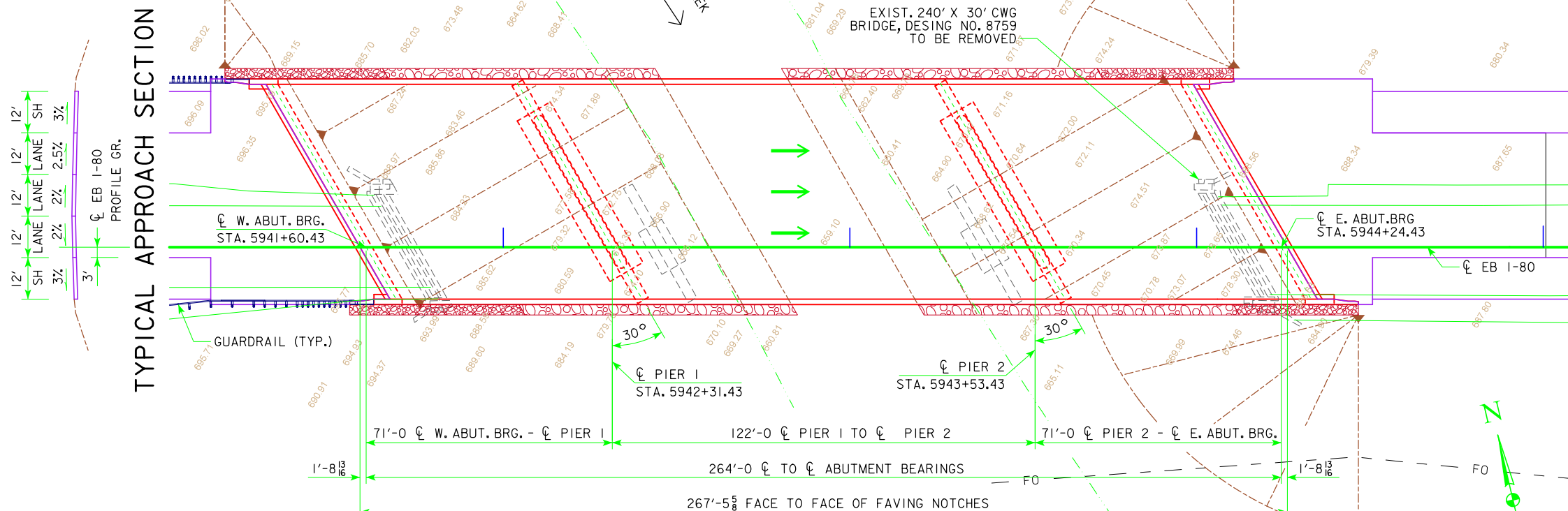
TRAFFIC ESTIMATE

2019 AADT	35,700	V.P.D.
2039 AADT	44,400	V.P.D.
20 DHV		V.P.H.
TRUCKS	37%	%
TOTAL DESIGN ESALs		

LOCATION

EASTBOUND I-80 OVER SUGAR CREEK
T-79N R-2W
SECTION 15
SUGAR CREEK TOWNSHIP
CEDAR COUNTY
FHWA NO. 18650
BRIDGE MAINT. NO. 8759
LATITUDE 41.64219766°
LONGITUDE -91.06360601°

5945



HYDRAULIC DESIGN



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

Signature: Michael J. Ryan Date: 21-10-2016

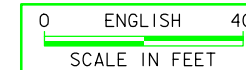
Printed or Typed Name: Michael J. Ryan

My license renewal date is December 31, 2017

Pages or sheets covered by this seal: SHEETS 1 THRU 3 OF 5

- NOTES:
- STANDARD INTEGRAL ABUTMENT
 - TL-5 BRIDGE RAILING PROPOSED
 - PIER TYPE - T
 - BEAM TYPE - STD BTC - 3'-9"
 - CLASS E REVETMENT STONE IS EMBEDDED
 - SEE SHEET V.5 FOR STAGING NOTES AND DETAILS

SITUATION PLAN



PRELIMINARY

DESIGN FOR 30° SKEW (R.A.)

264'-0" X 62'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

71'-0" END SPANS (BTC BEAM TYPE) 122'-0" INTERIOR SPAN

SITUATION PLAN

STATION 5942+92.43 EB I-80 OVER SUGAR CREEK AUGUST 2016

CEDAR COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 5 FILE NO. ? DESIGN NO. ?

LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- - - - - - Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- - - - - Additional Topsoil Removal
- Subgrade Treatment
- - - - - Granular Shoulder
- Pavement
- - - - - Existing Pipe\R/CB
- Proposed Pipe\R/CB
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- TS————— Topsoil (Class 10)
- SLOPE DRESSING — Slope Dressing Only
- CL 10————— Class 10 Materials
- SEL L0————— Select Loams And Clay-Loams
- SEL SA————— Select Sand
- UNS A————— Unsuitable Type A Disposal
- UNS B————— Unsuitable Type B Disposal
- UNS C————— Unsuitable Type C Disposal
- SHALE————— Shale
- WASTE————— Waste
- B&W LS————— Broken and Weathered Rock
- ROCK————— Solid Rock
- BLDRS————— Boulders

Note: All layer lines and descriptions identify layers above the line.

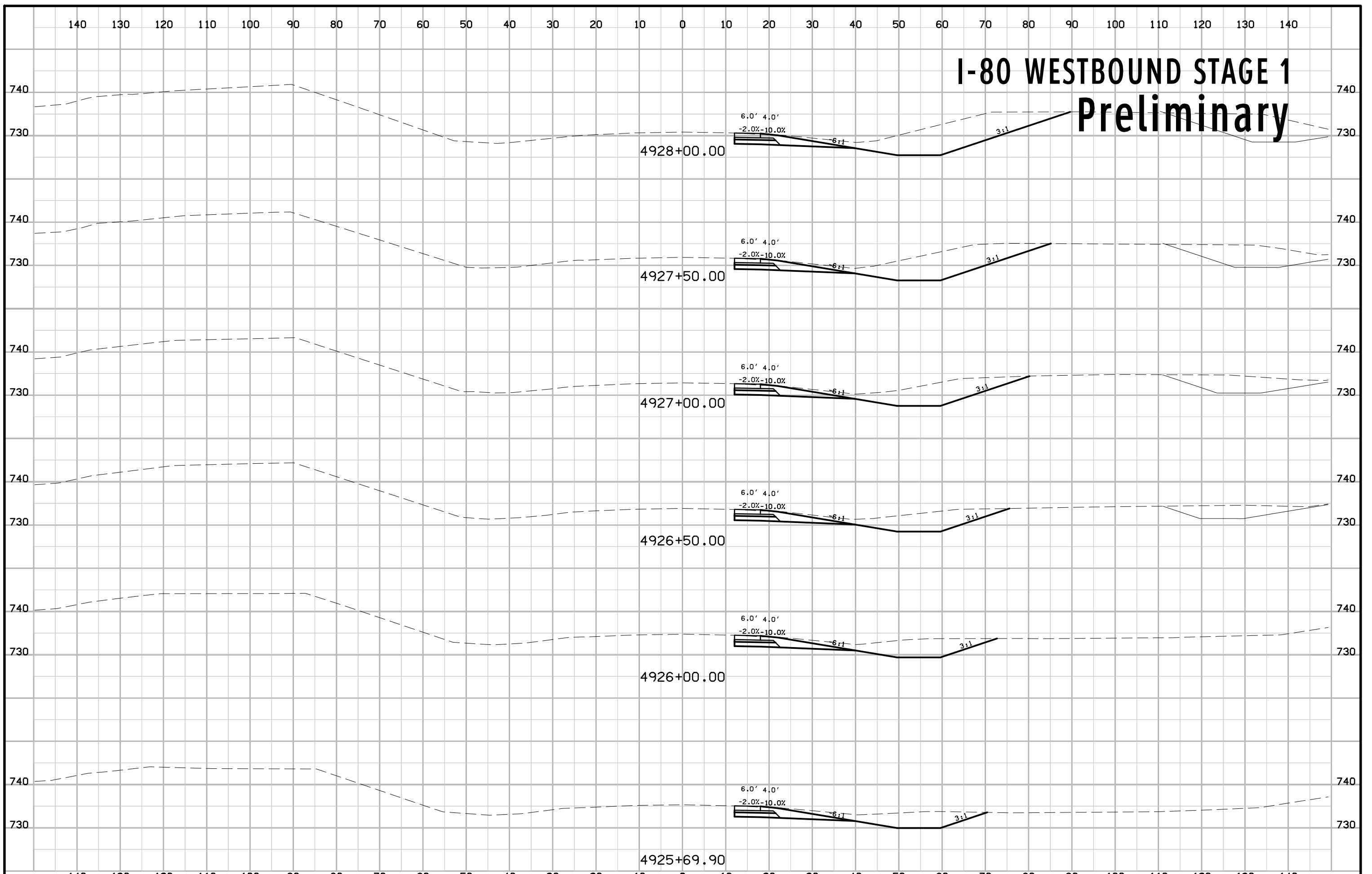
Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

SYMBOL LEGEND OF CROSS SECTION SHEETS

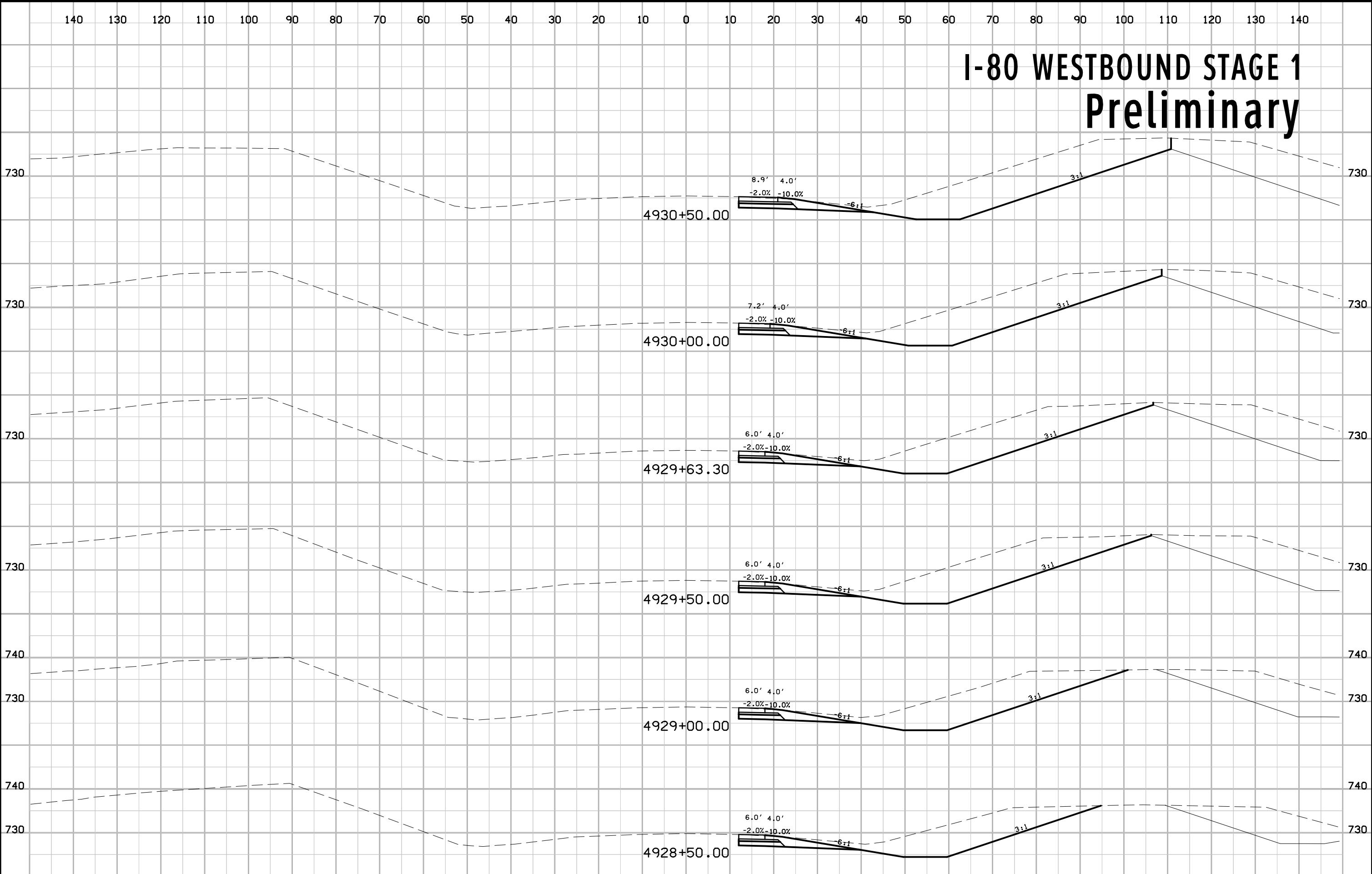
- Existing ROW
|
Existing Right-of-Way Limit
- Proposed ROW
|
Proposed Right-of-Way Limit
- Temporary ROW
|
Temporary Right-of-Way Limit

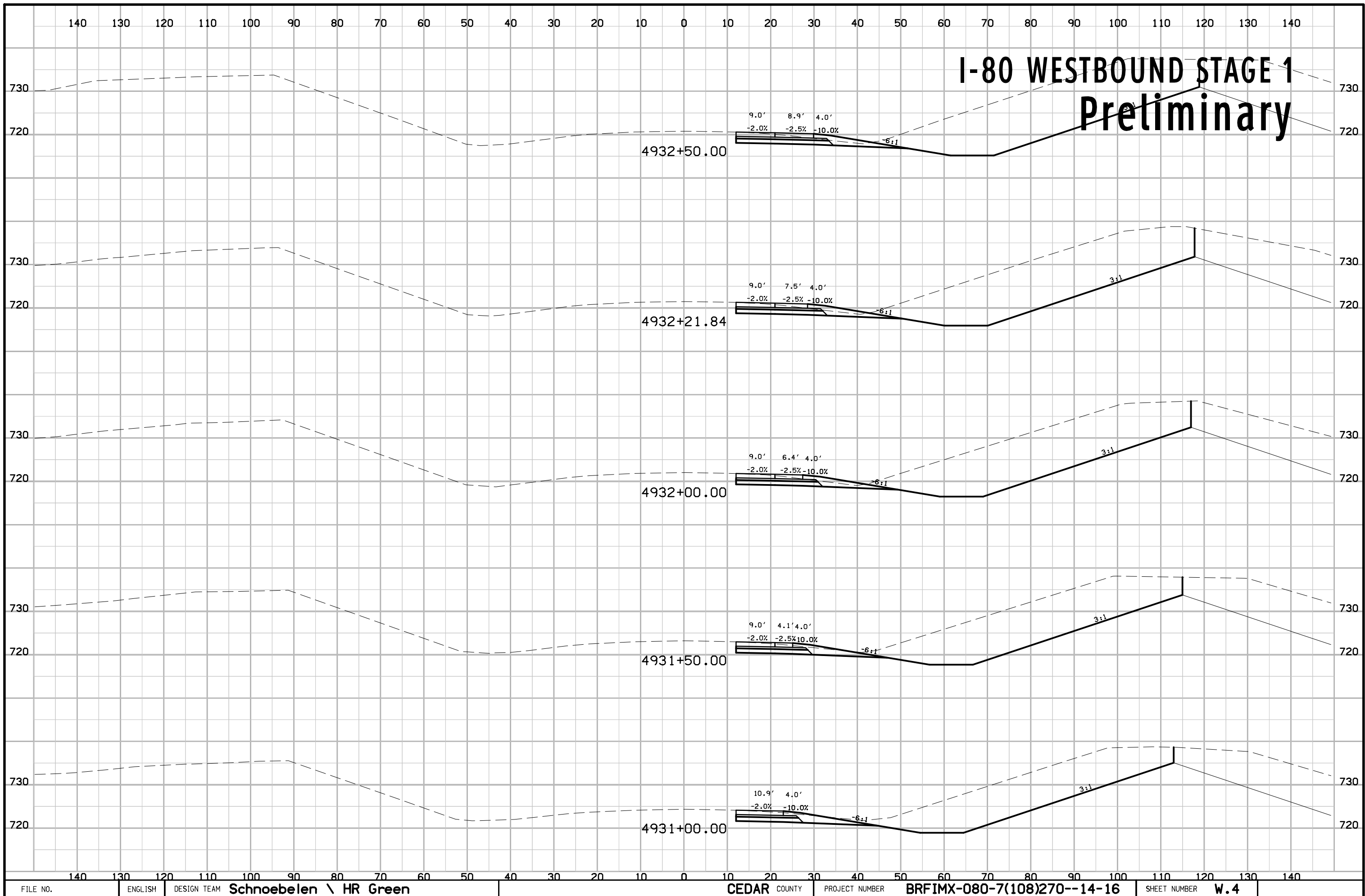
**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET
(COVERS SHEET SERIES W, X, Y, & Z)**

I-80 WESTBOUND STAGE 1 Preliminary

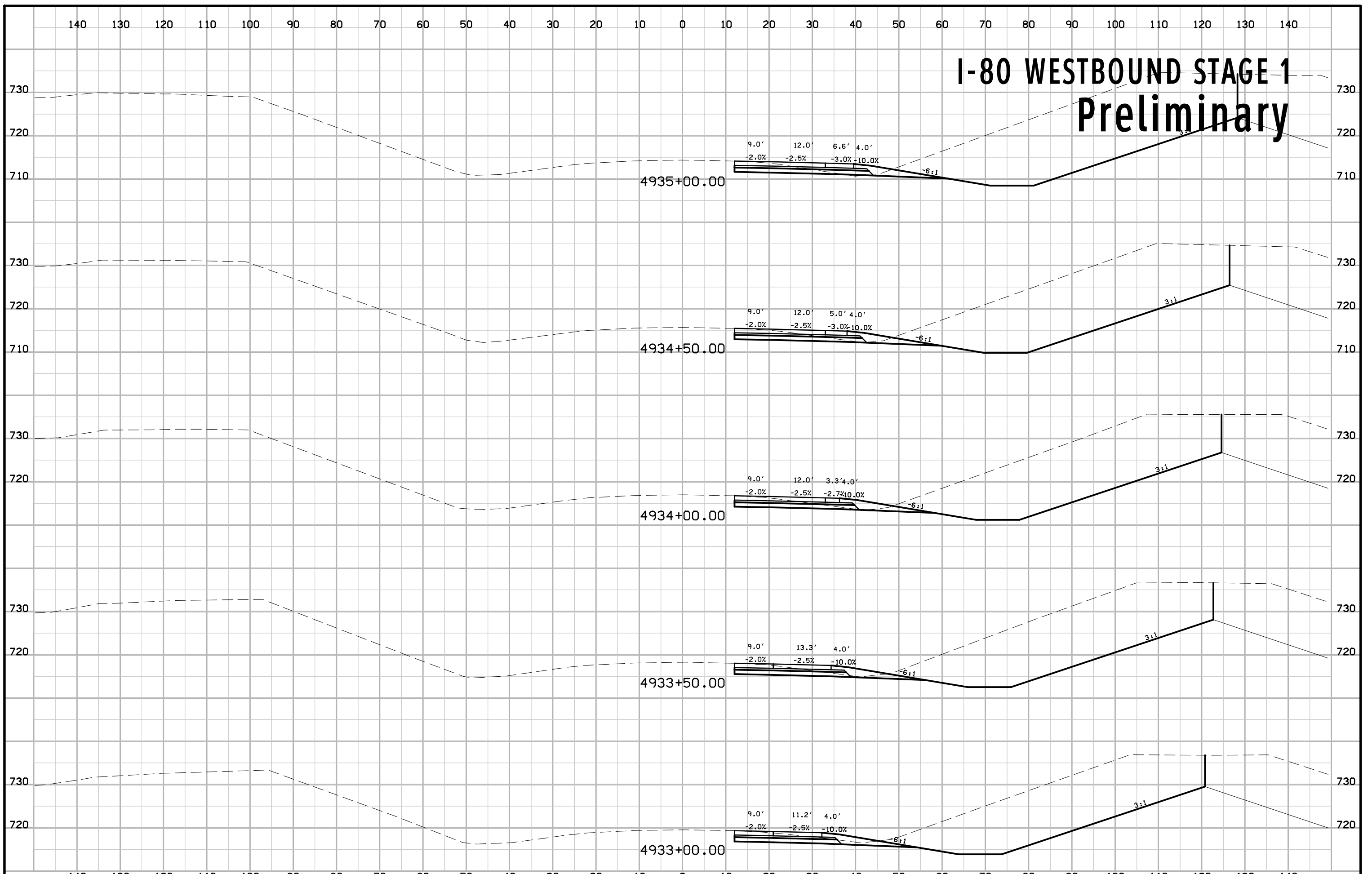


I-80 WESTBOUND STAGE 1 Preliminary

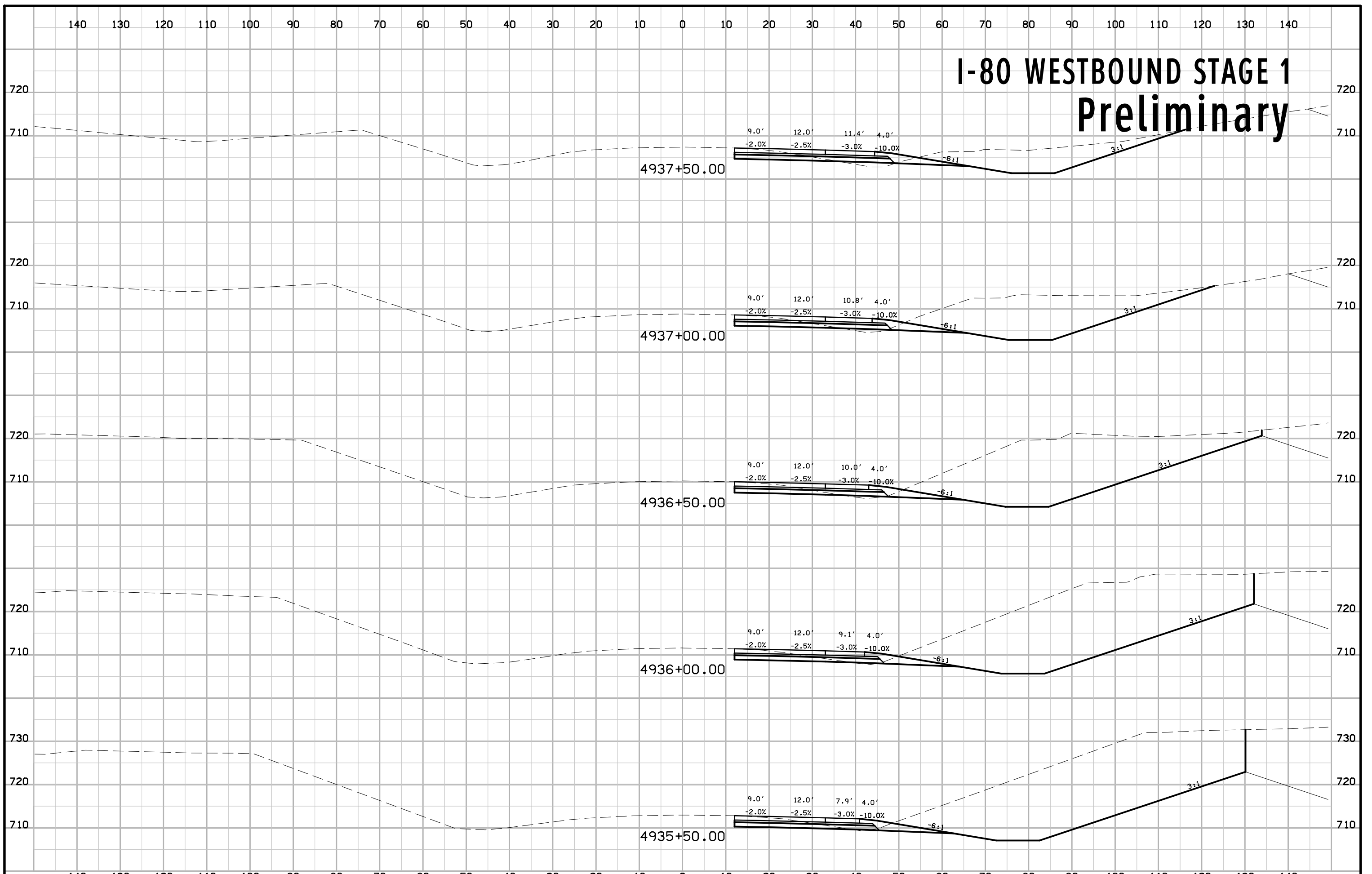




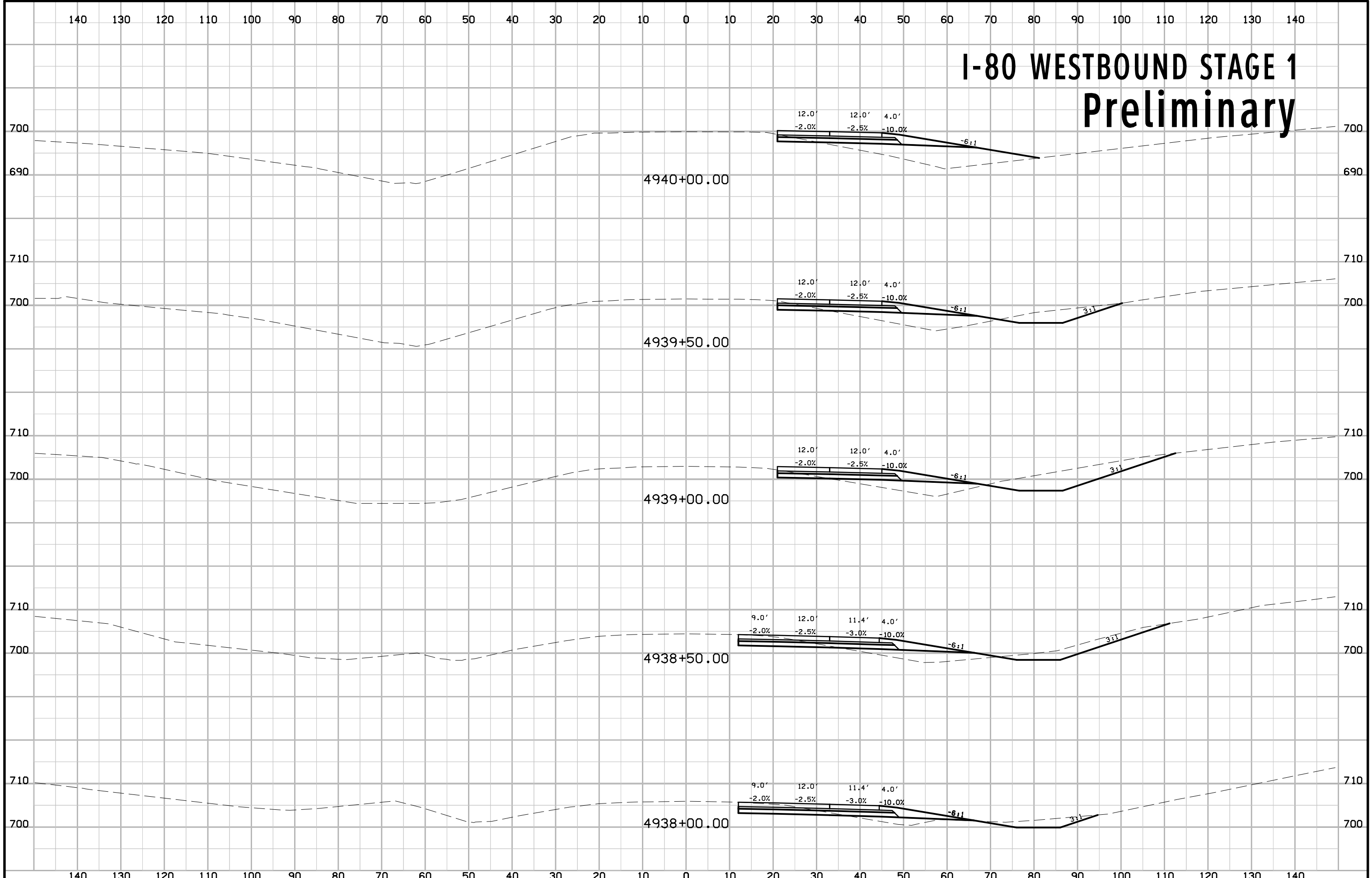
I-80 WESTBOUND STAGE 1 Preliminary

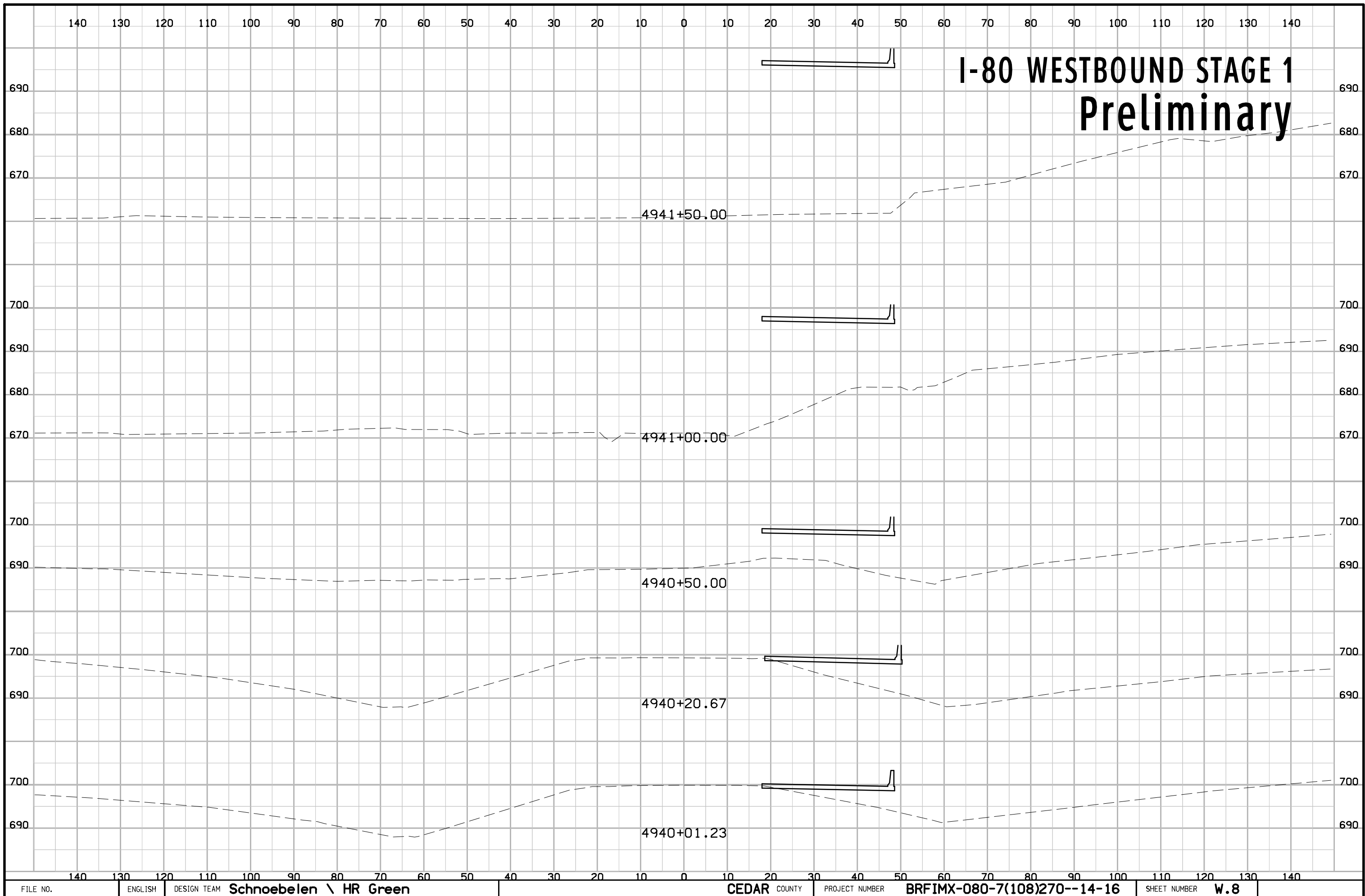


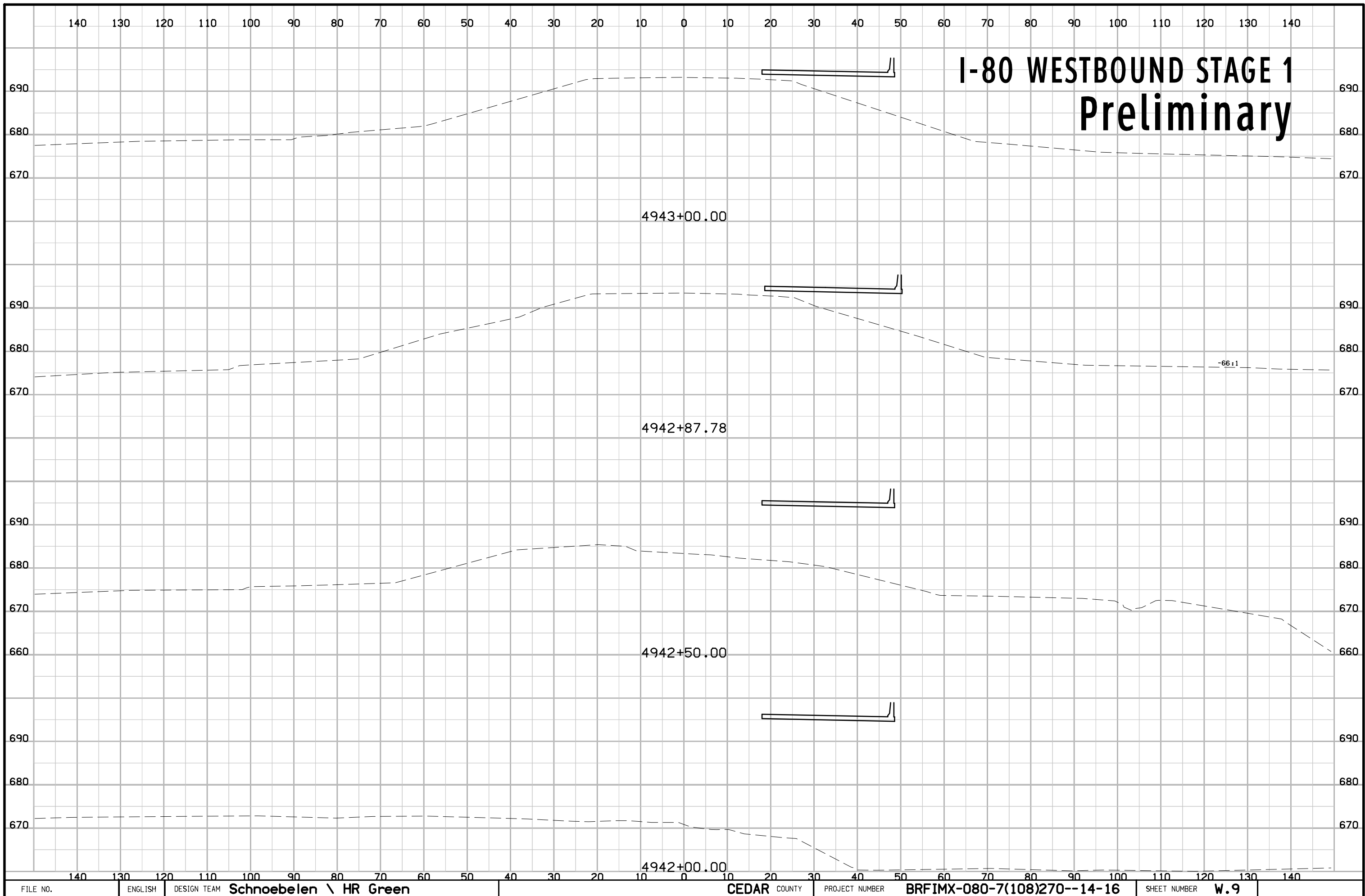
I-80 WESTBOUND STAGE 1 Preliminary

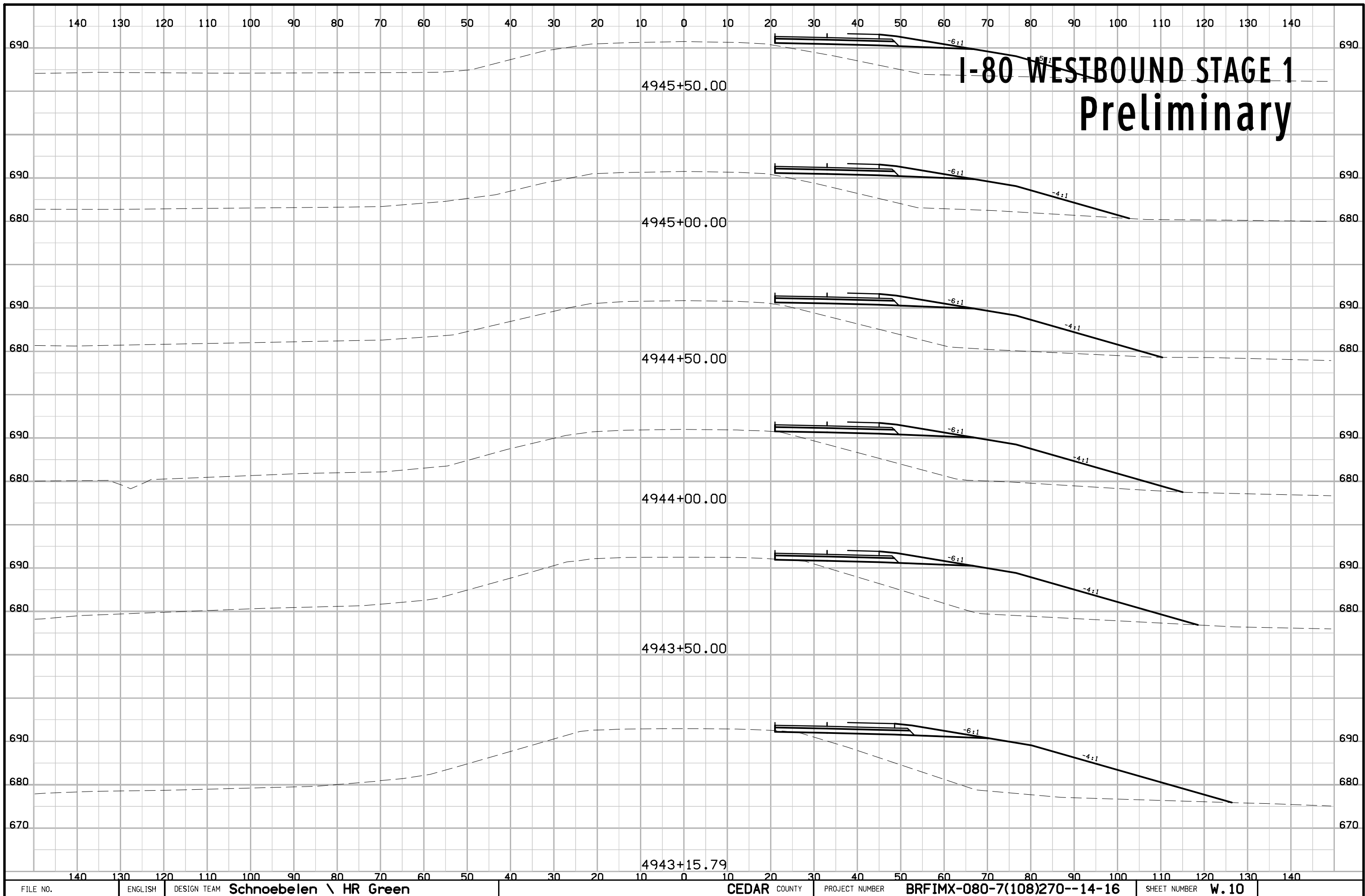


I-80 WESTBOUND STAGE 1 Preliminary









I-80 WESTBOUND STAGE 1 Preliminary

4945+50.00

4945+00.00

4944+50.00

4944+00.00

4943+50.00

4943+15.79

-6:1

-4:1

-6:1

-4:1

-6:1

-4:1

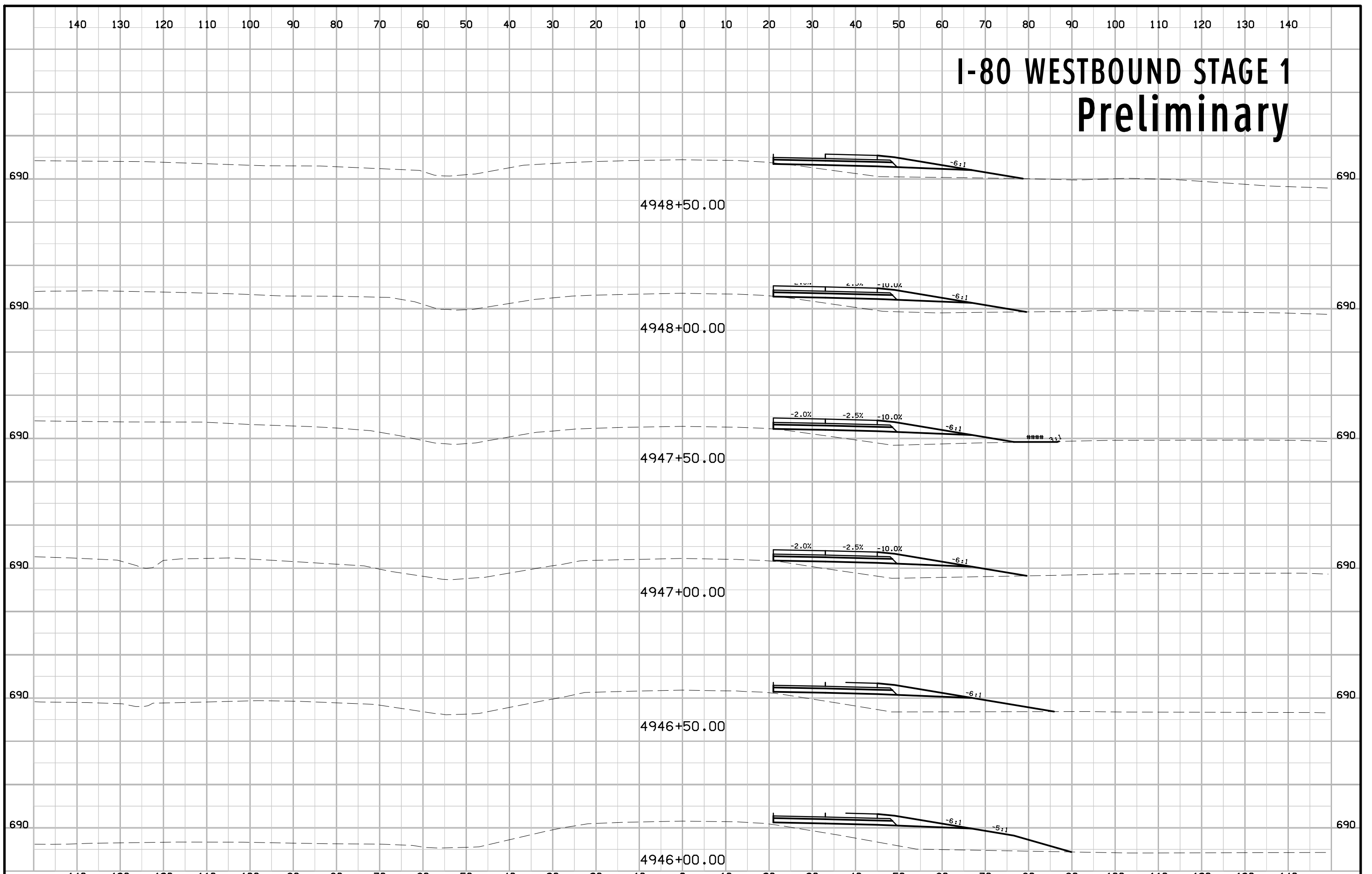
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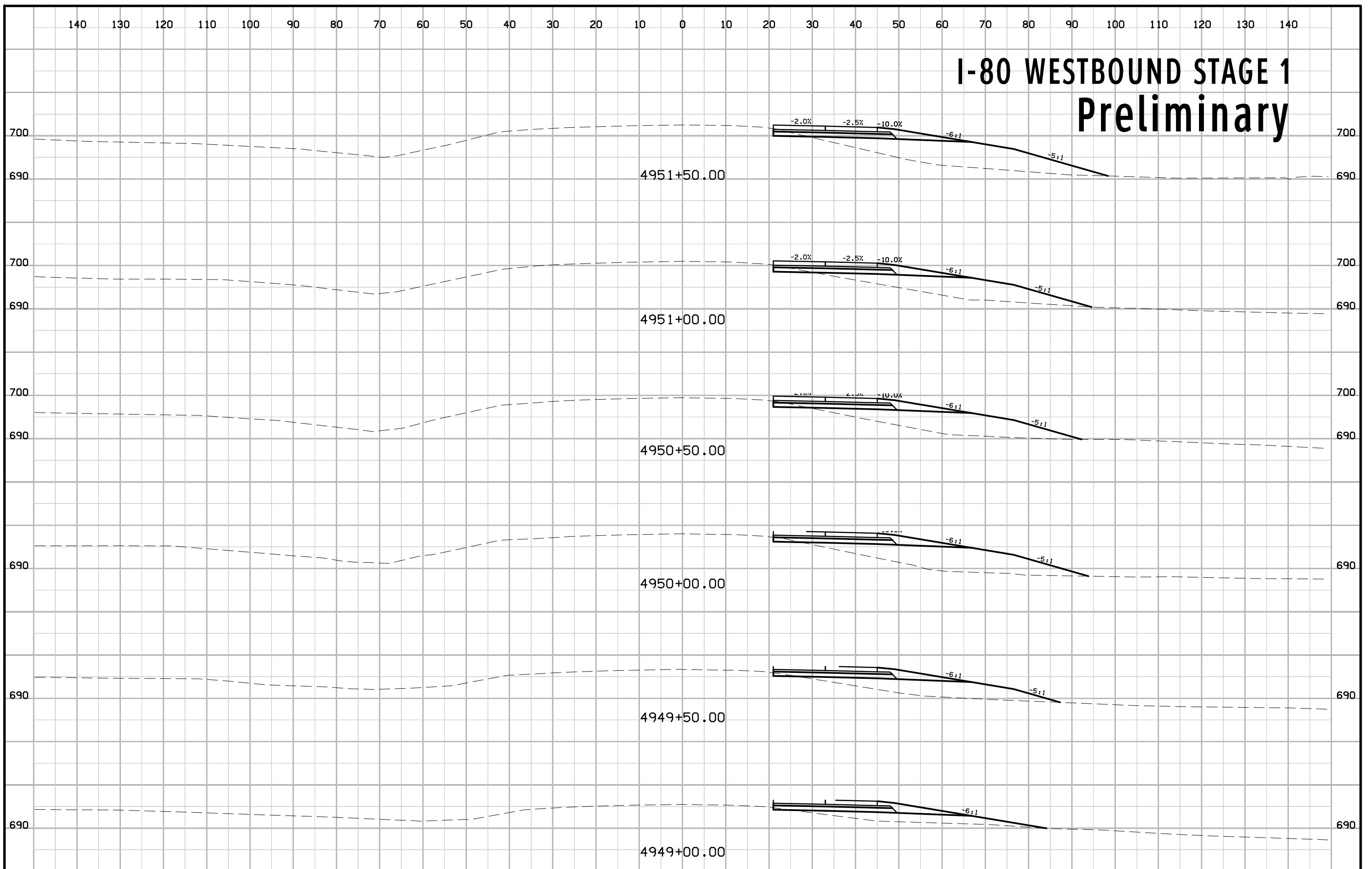
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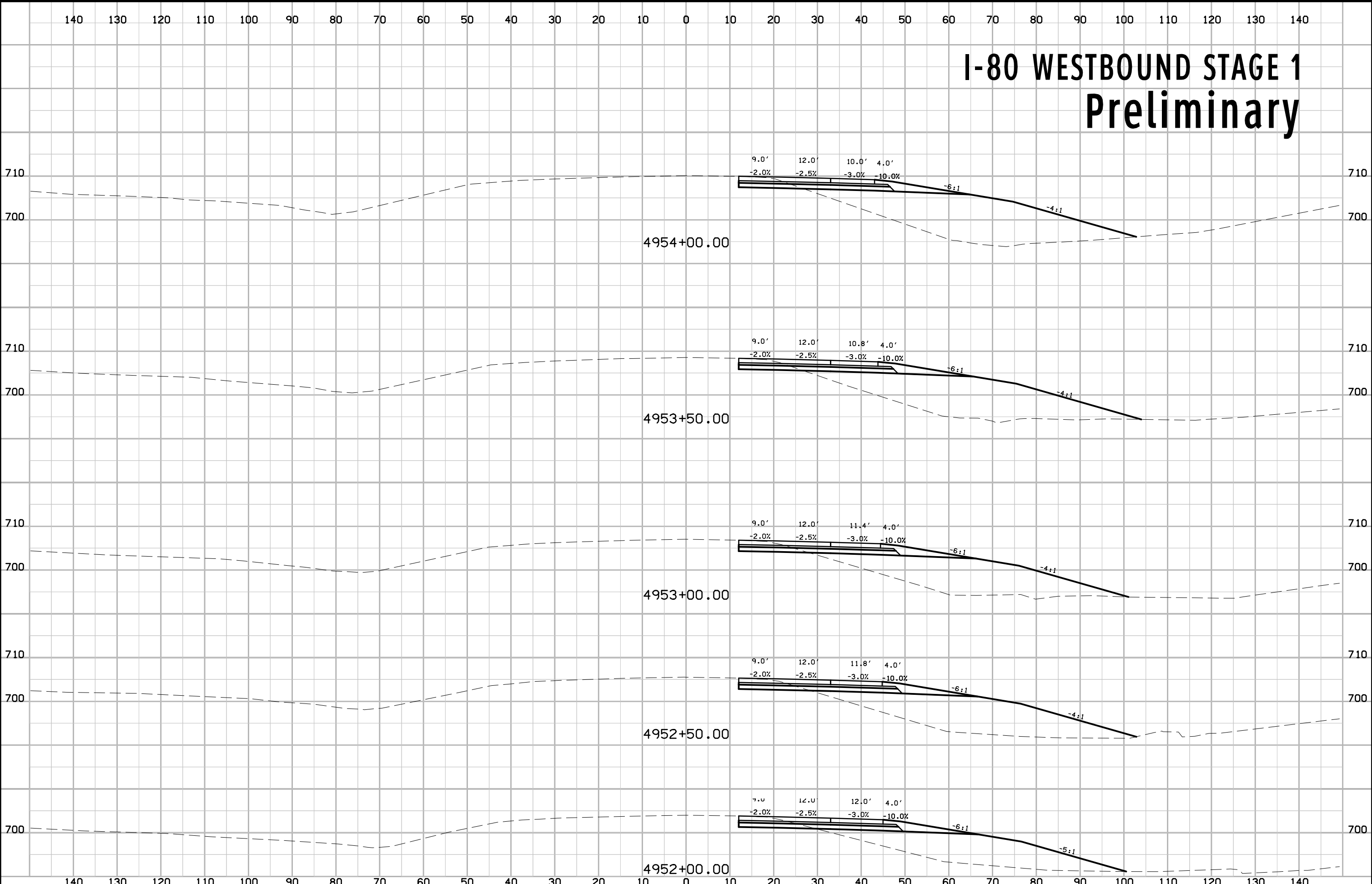
I-80 WESTBOUND STAGE 1 Preliminary



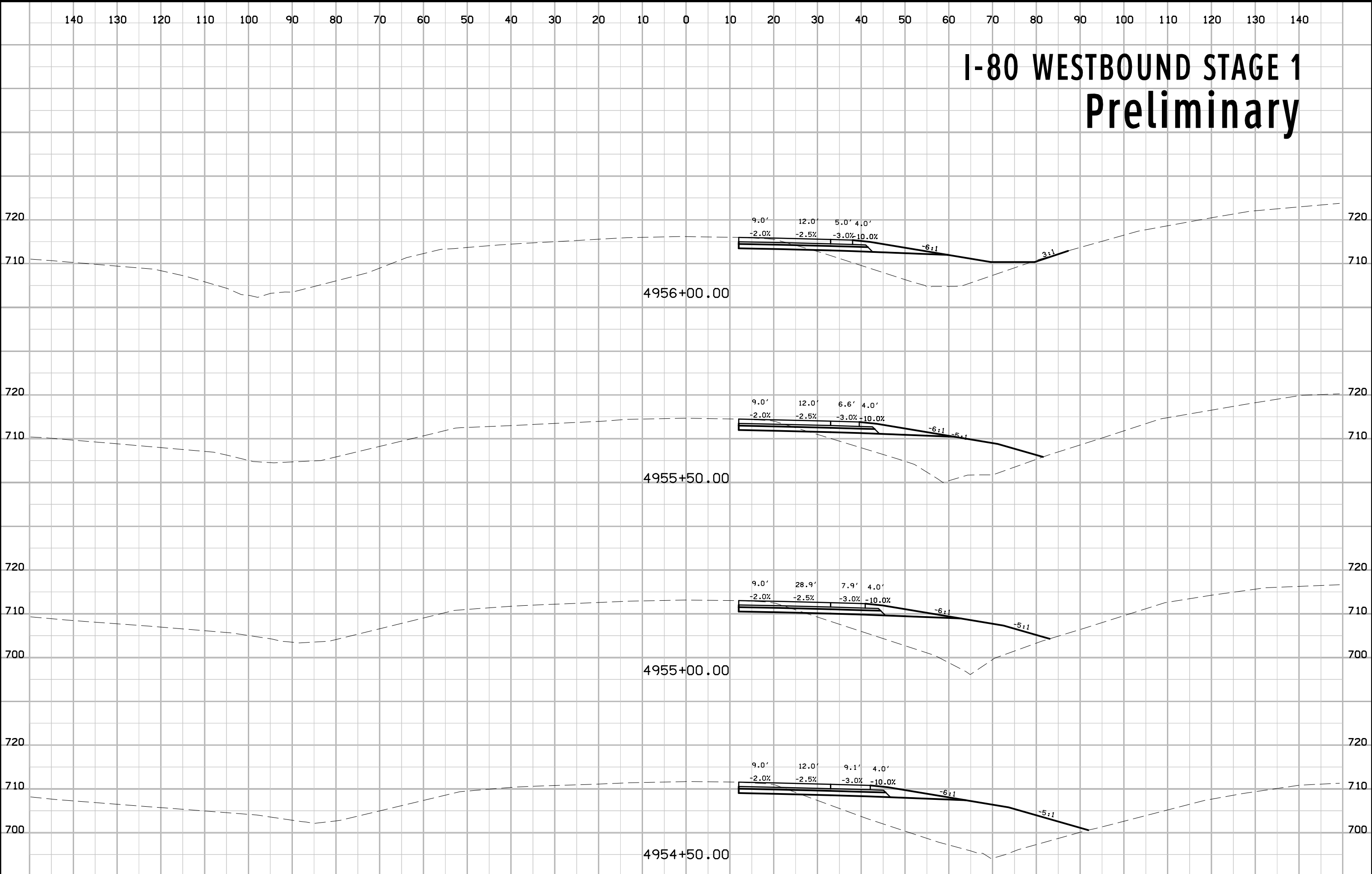
I-80 WESTBOUND STAGE 1 Preliminary



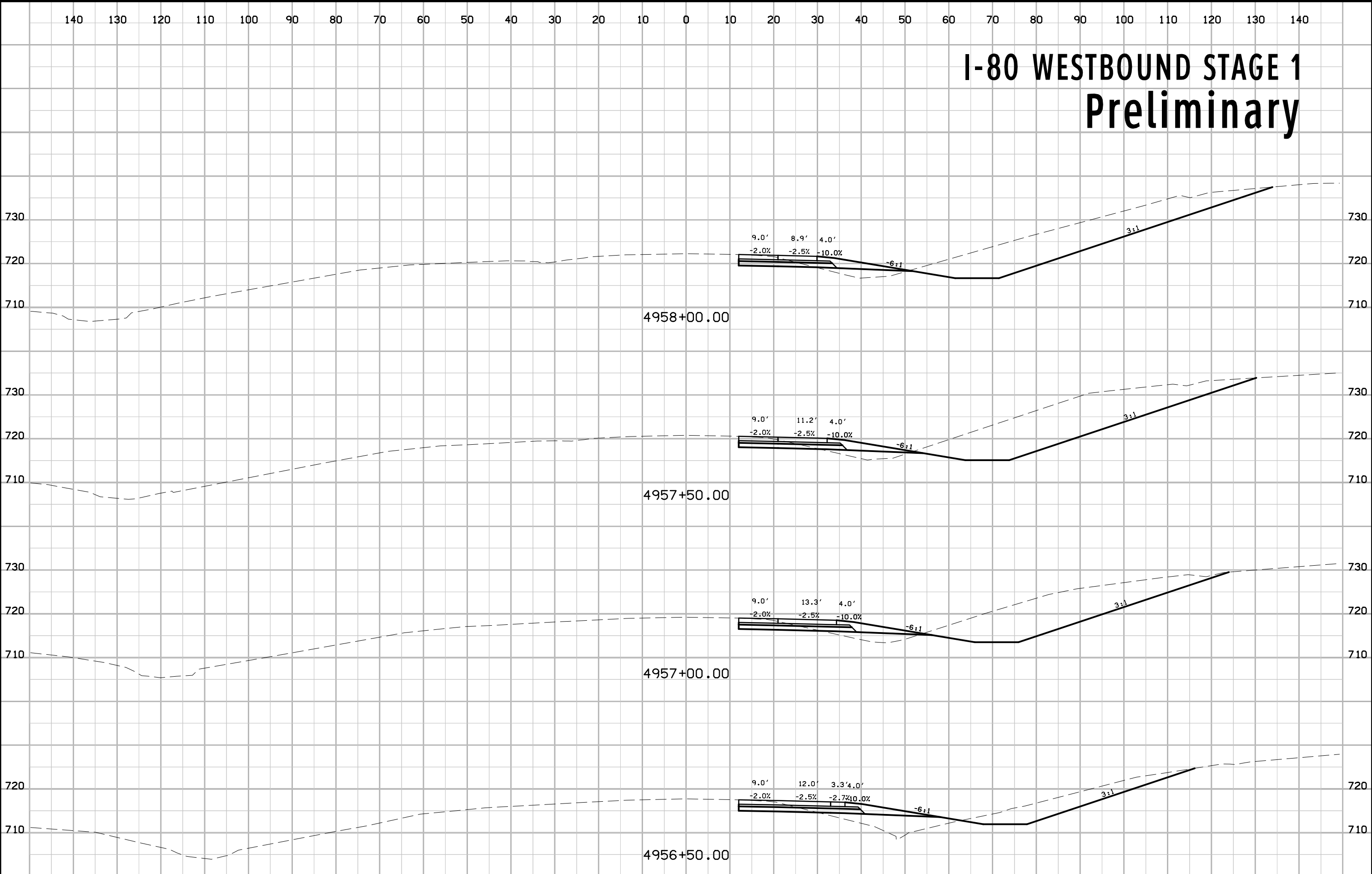
I-80 WESTBOUND STAGE 1 Preliminary



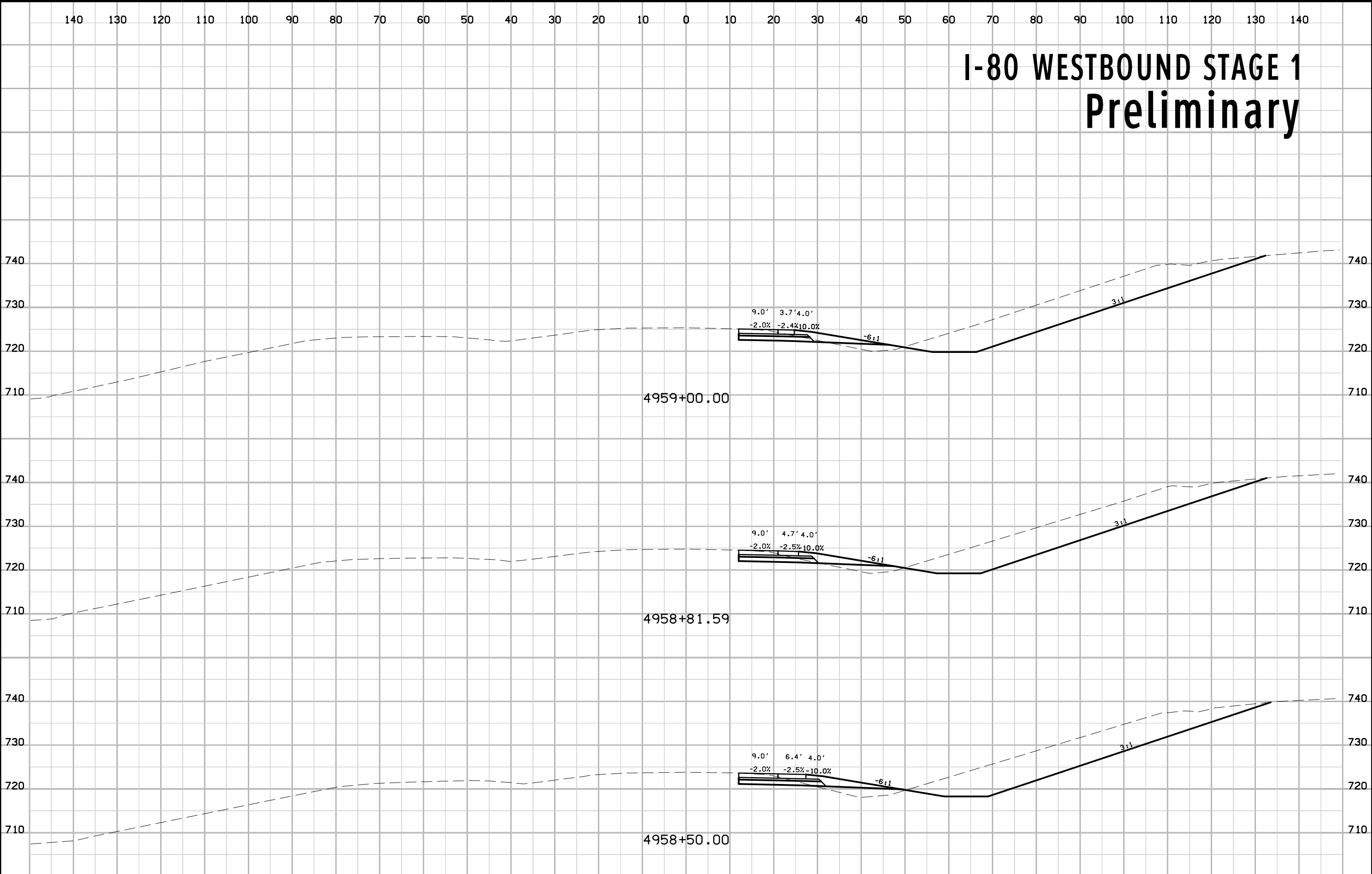
I-80 WESTBOUND STAGE 1 Preliminary

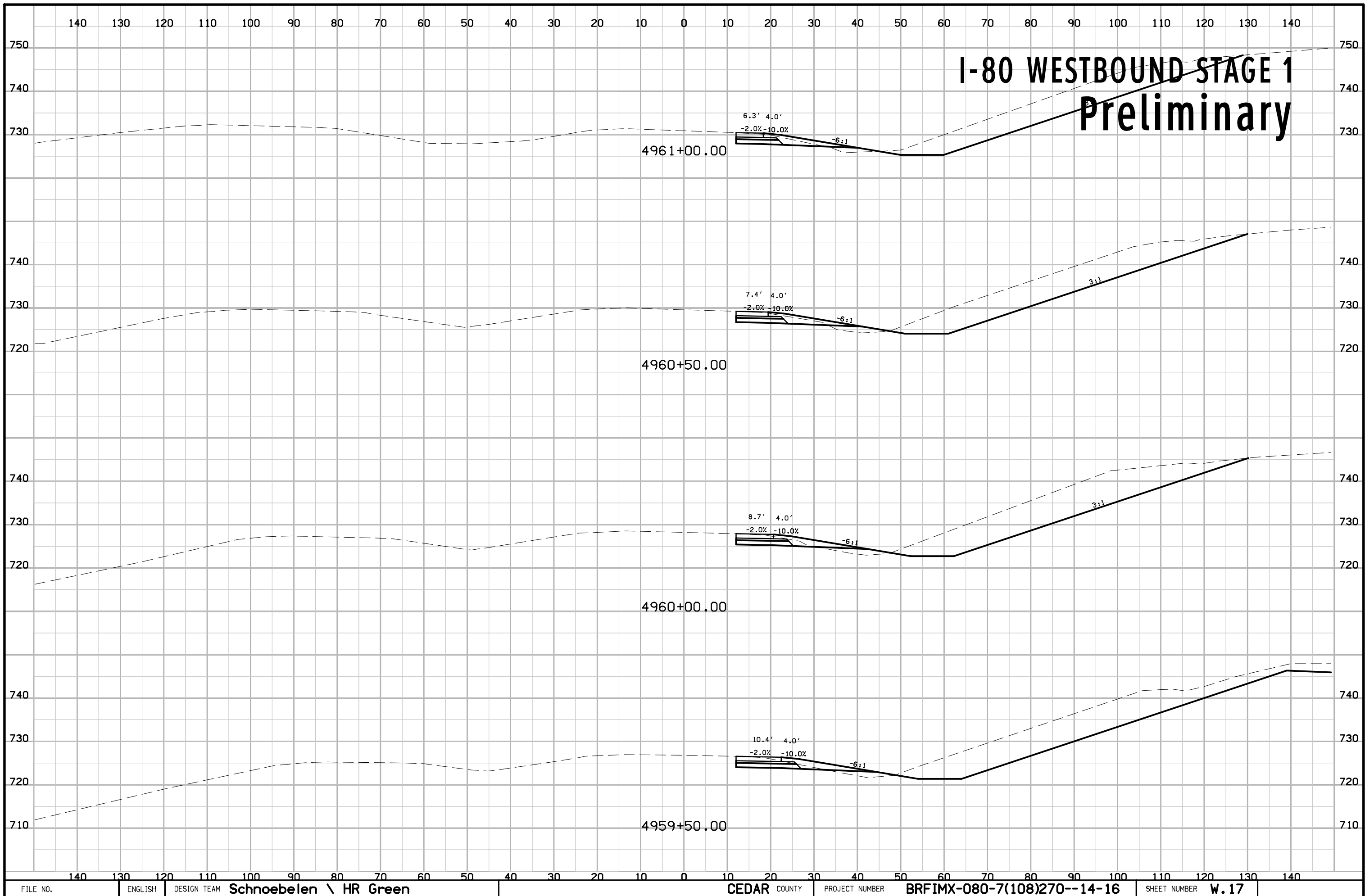


I-80 WESTBOUND STAGE 1 Preliminary

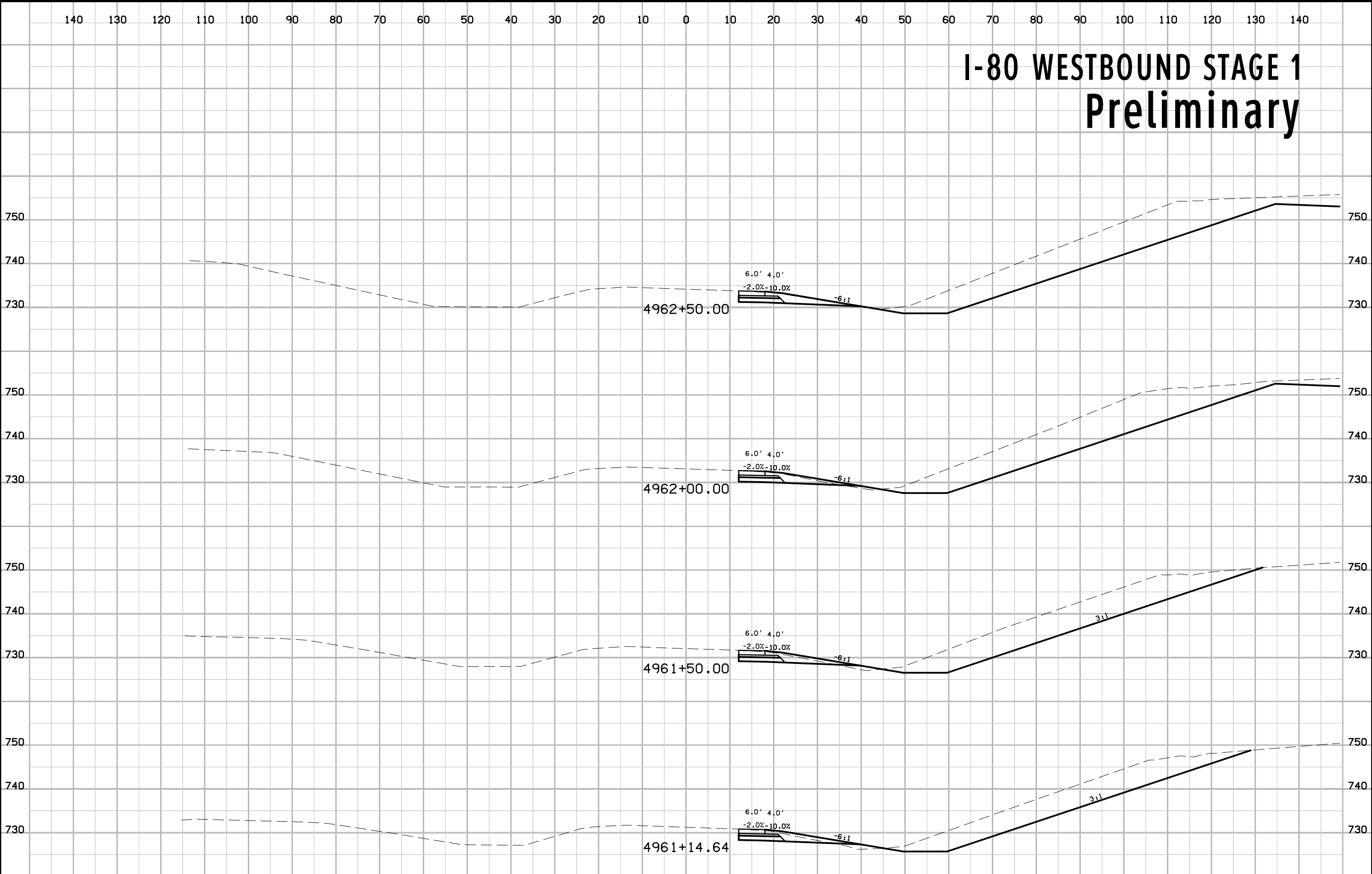


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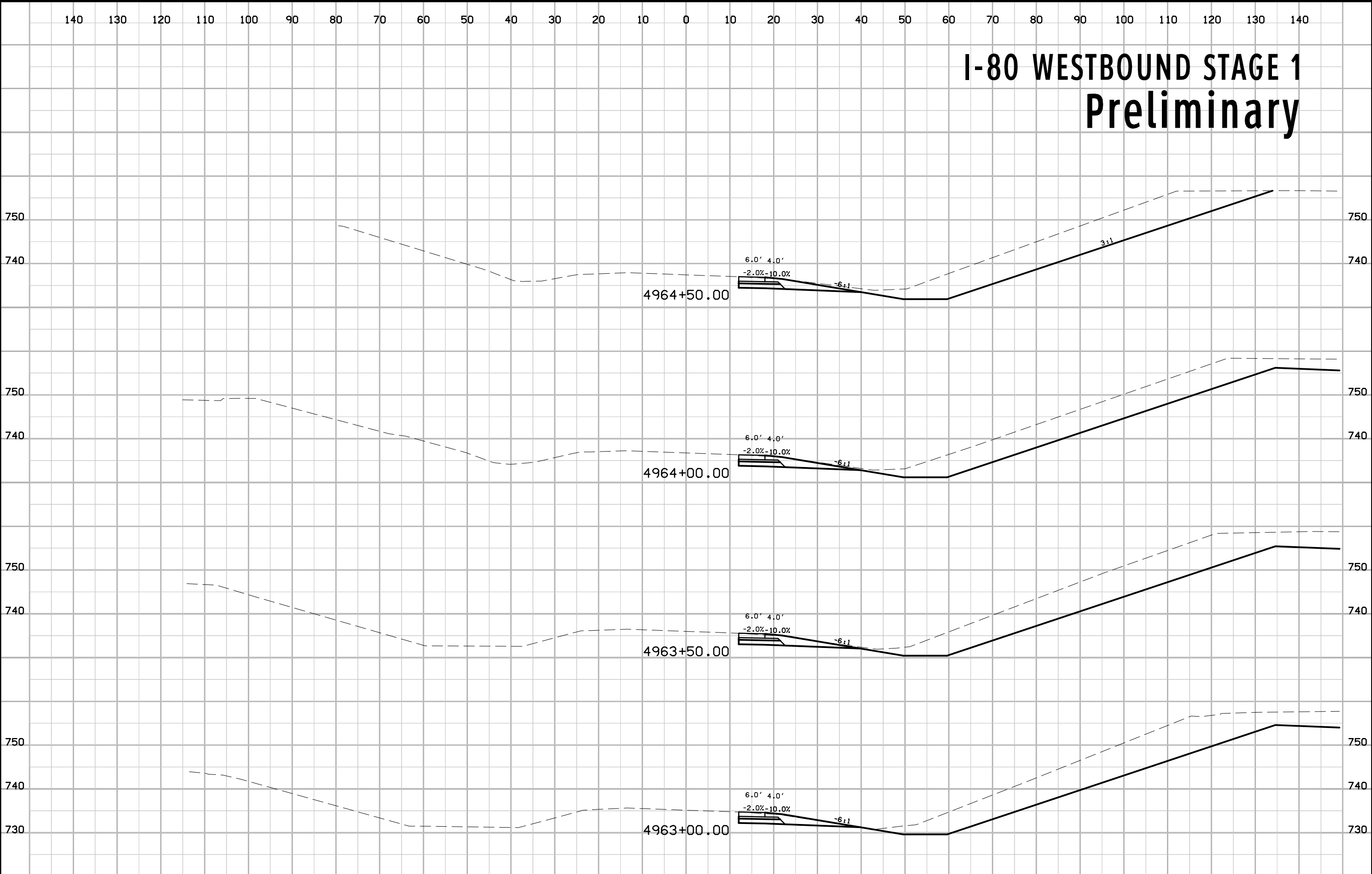




I-80 WESTBOUND STAGE 1 Preliminary

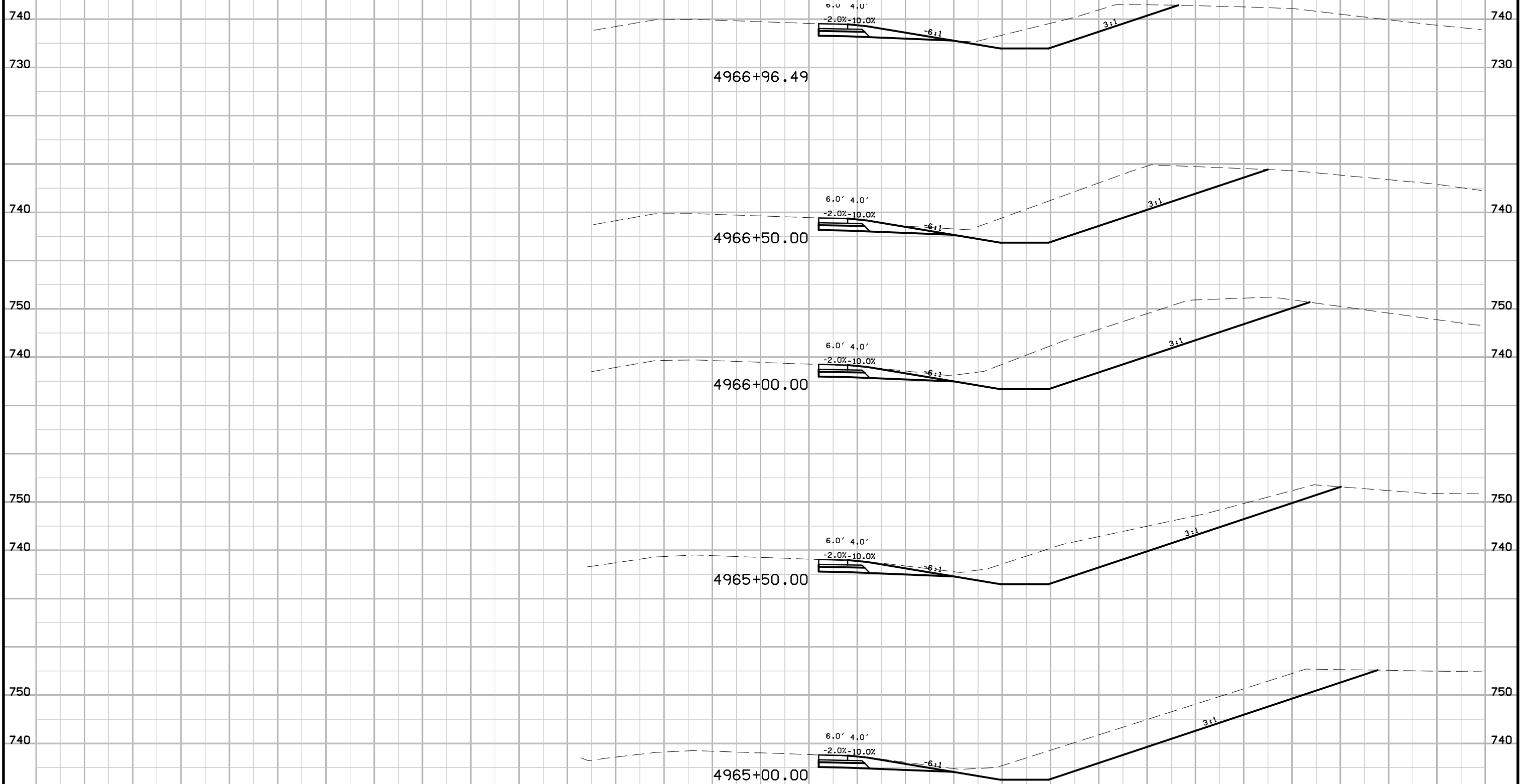


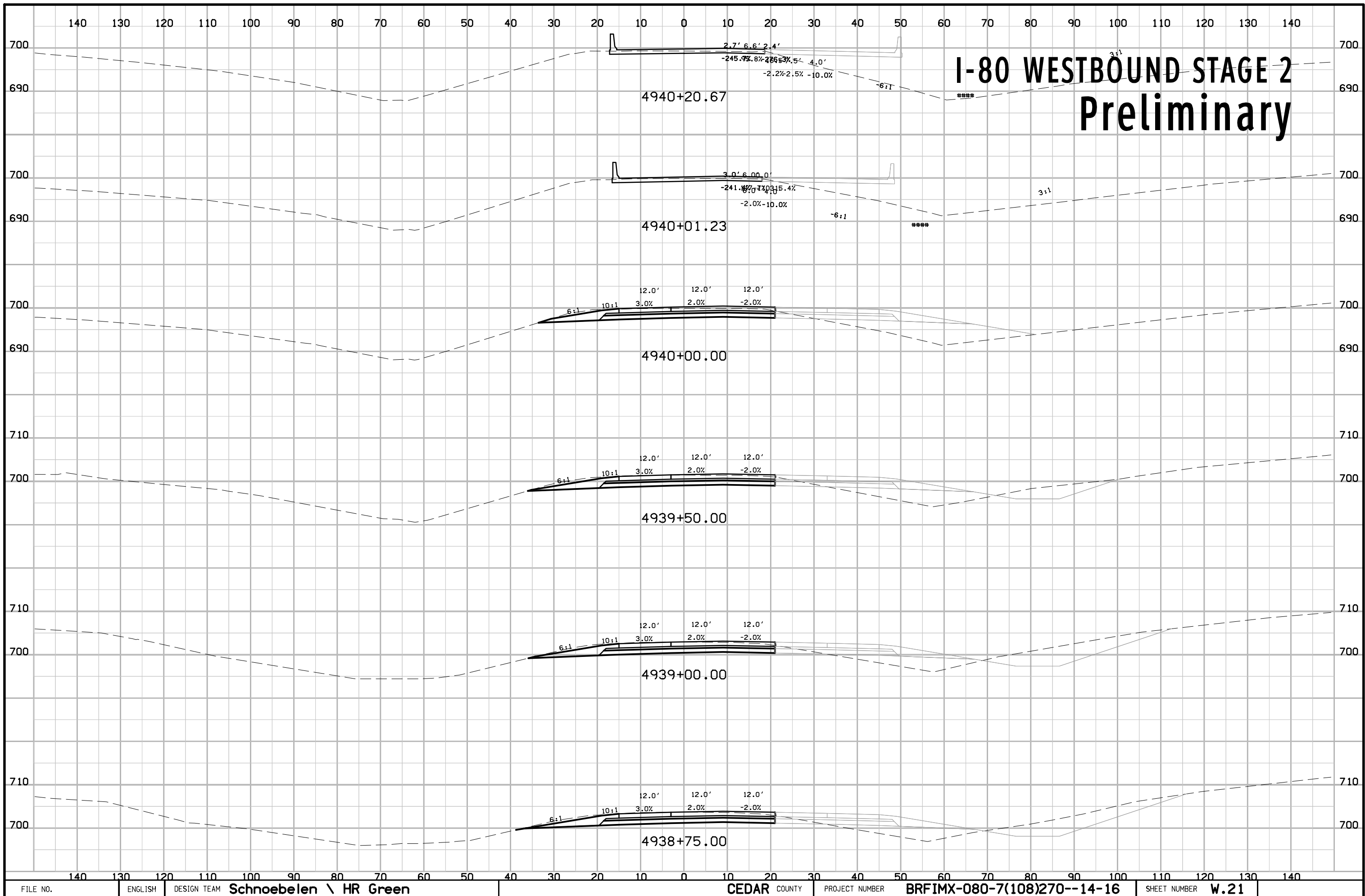
I-80 WESTBOUND STAGE 1 Preliminary

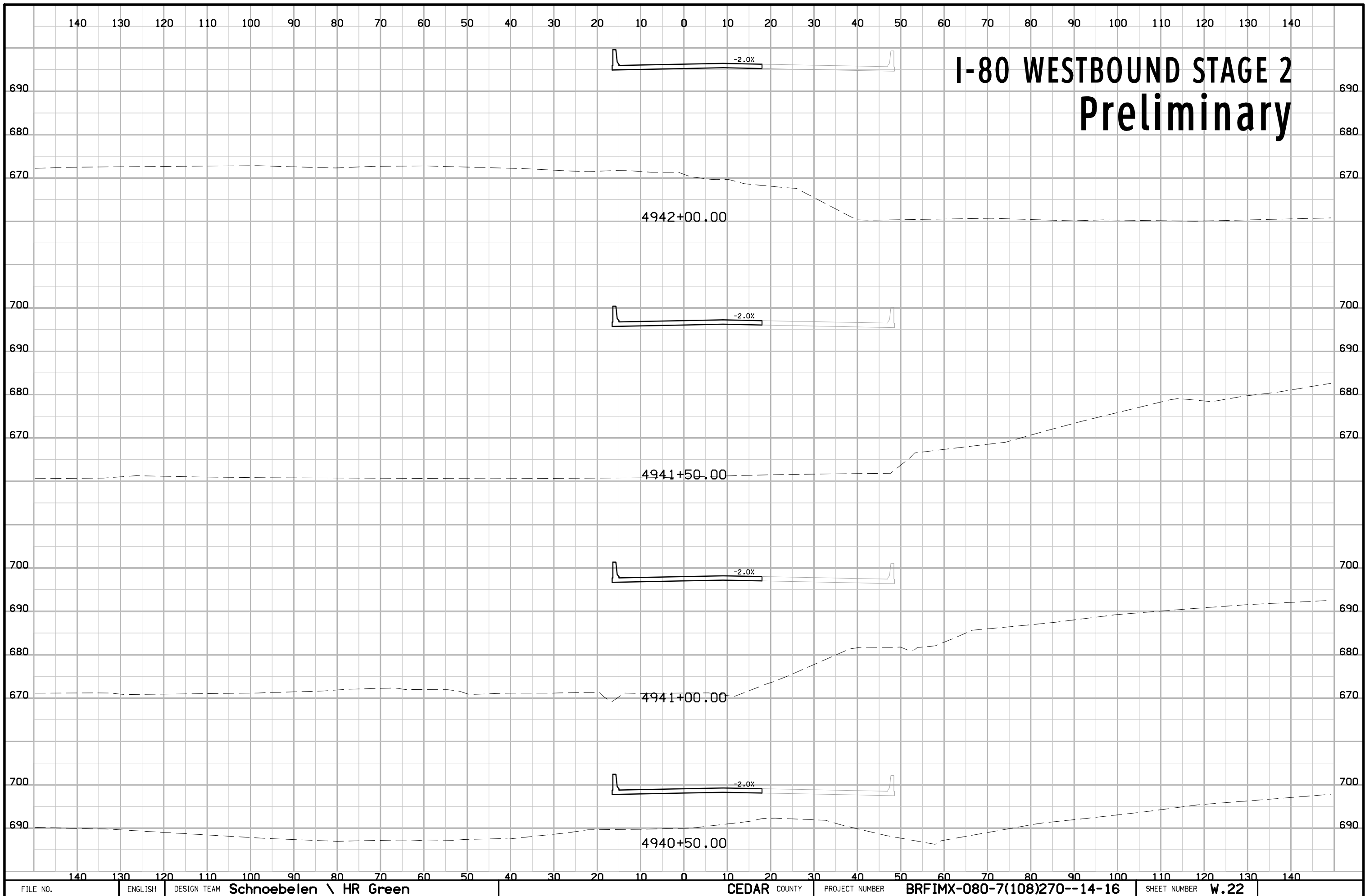


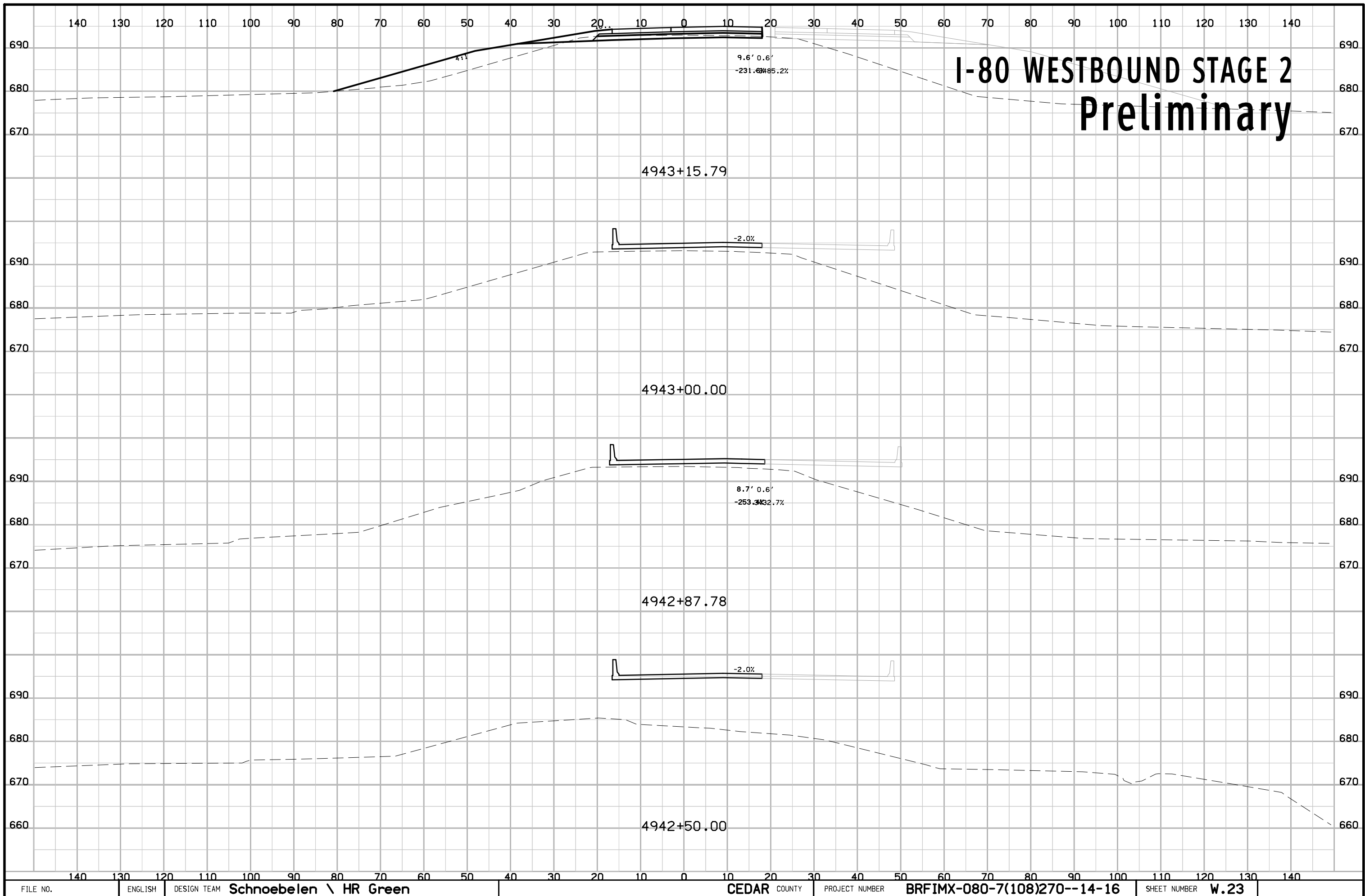
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I-80 WESTBOUND STAGE 1 Preliminary

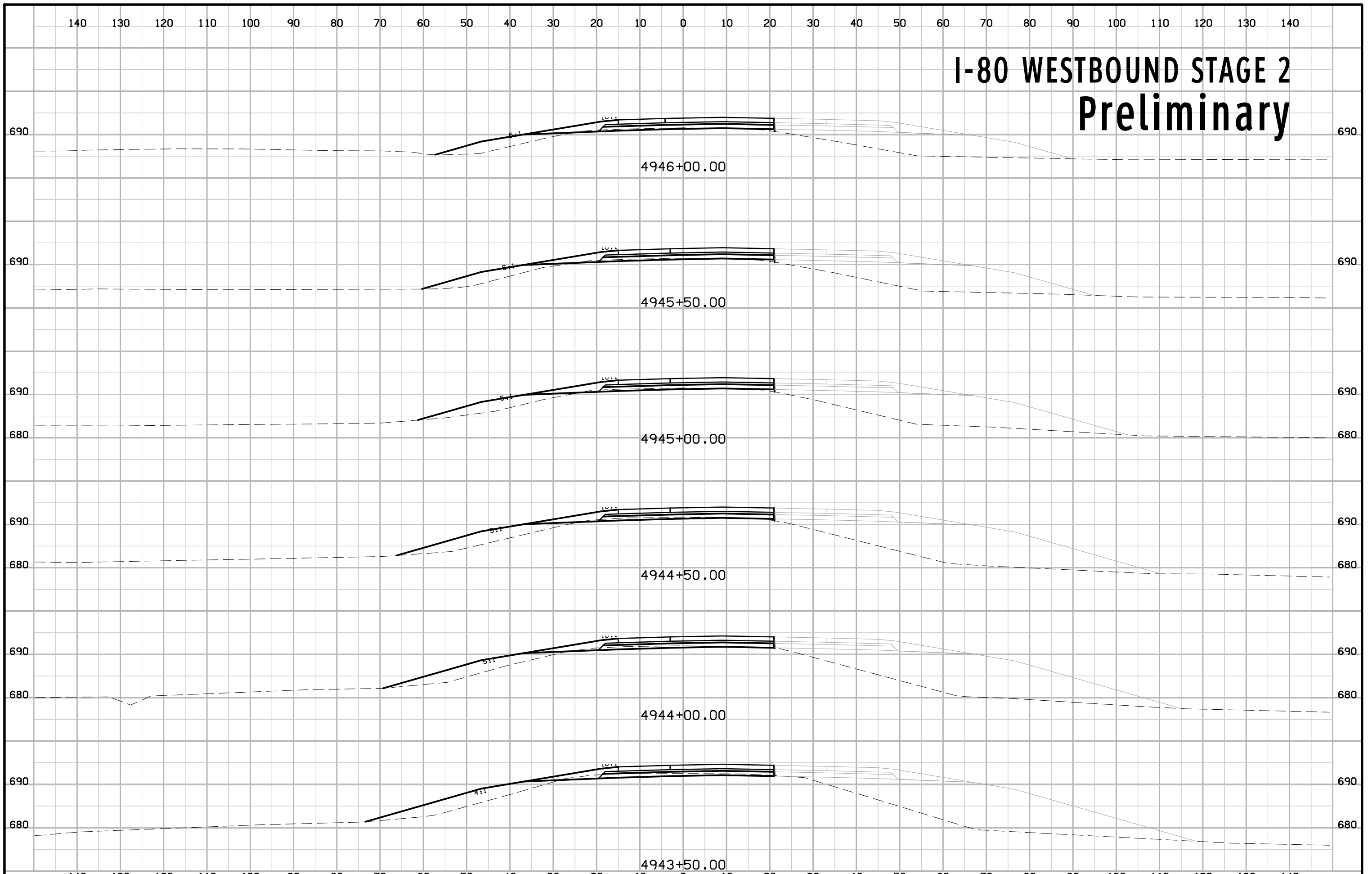




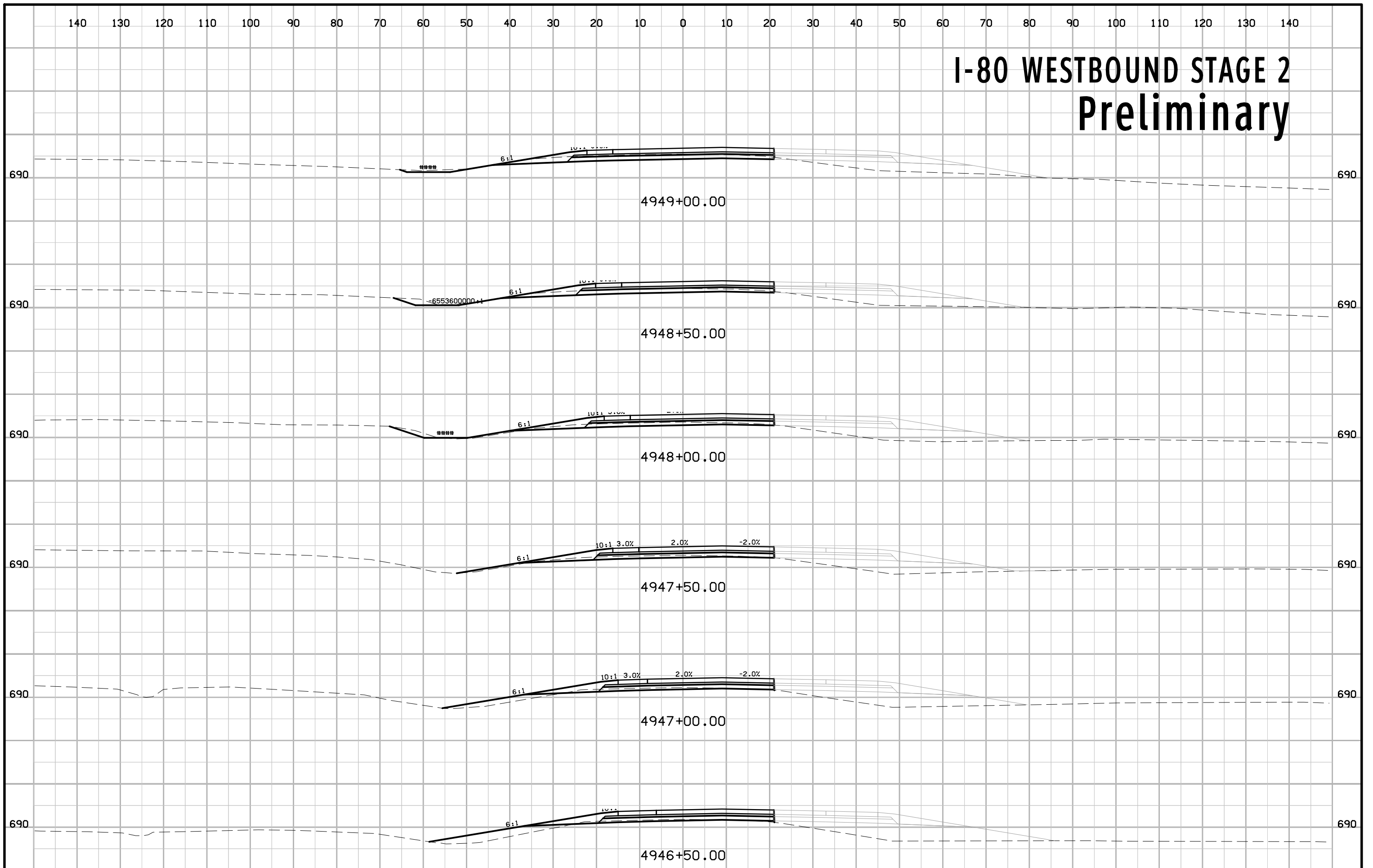




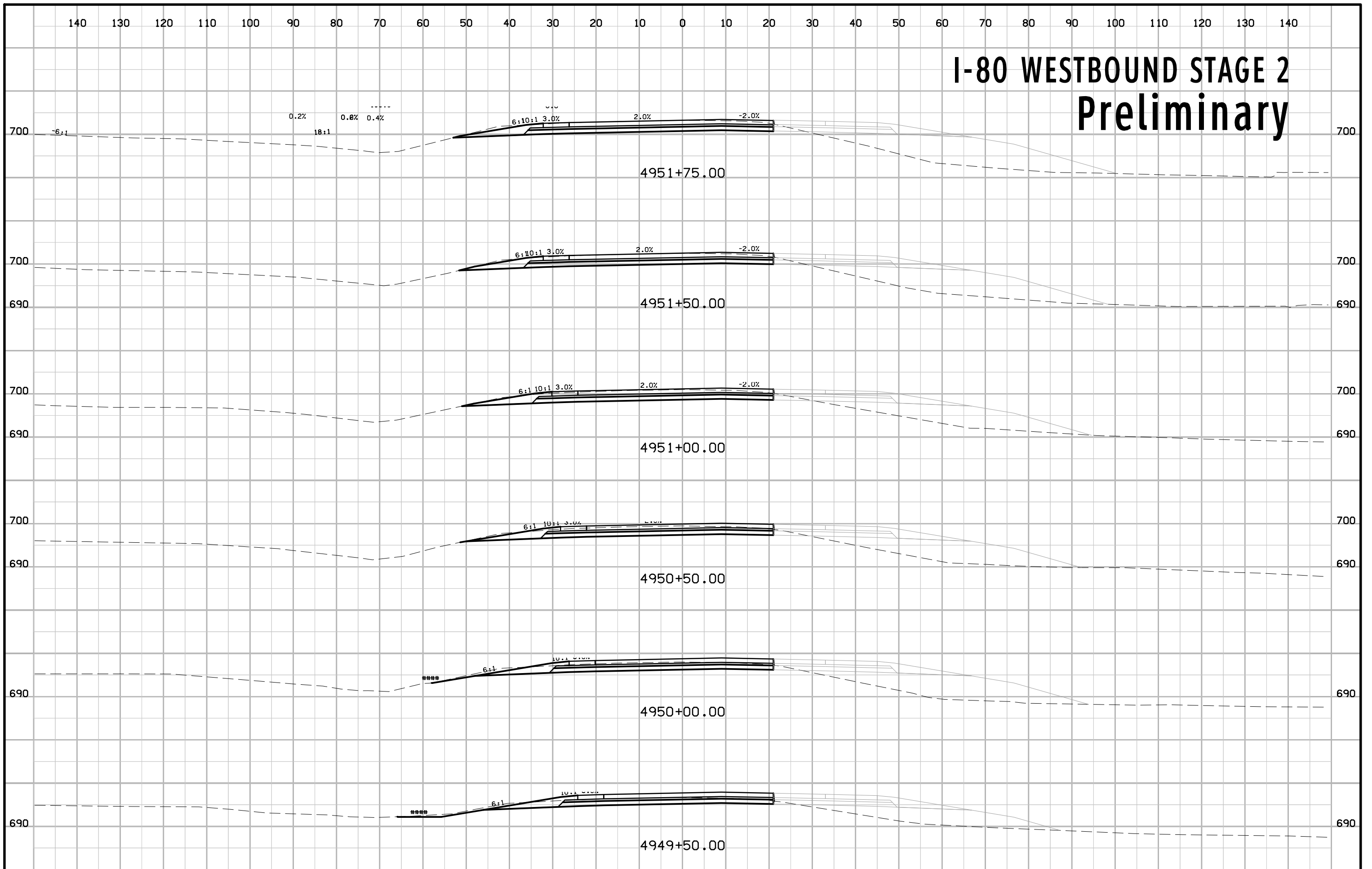
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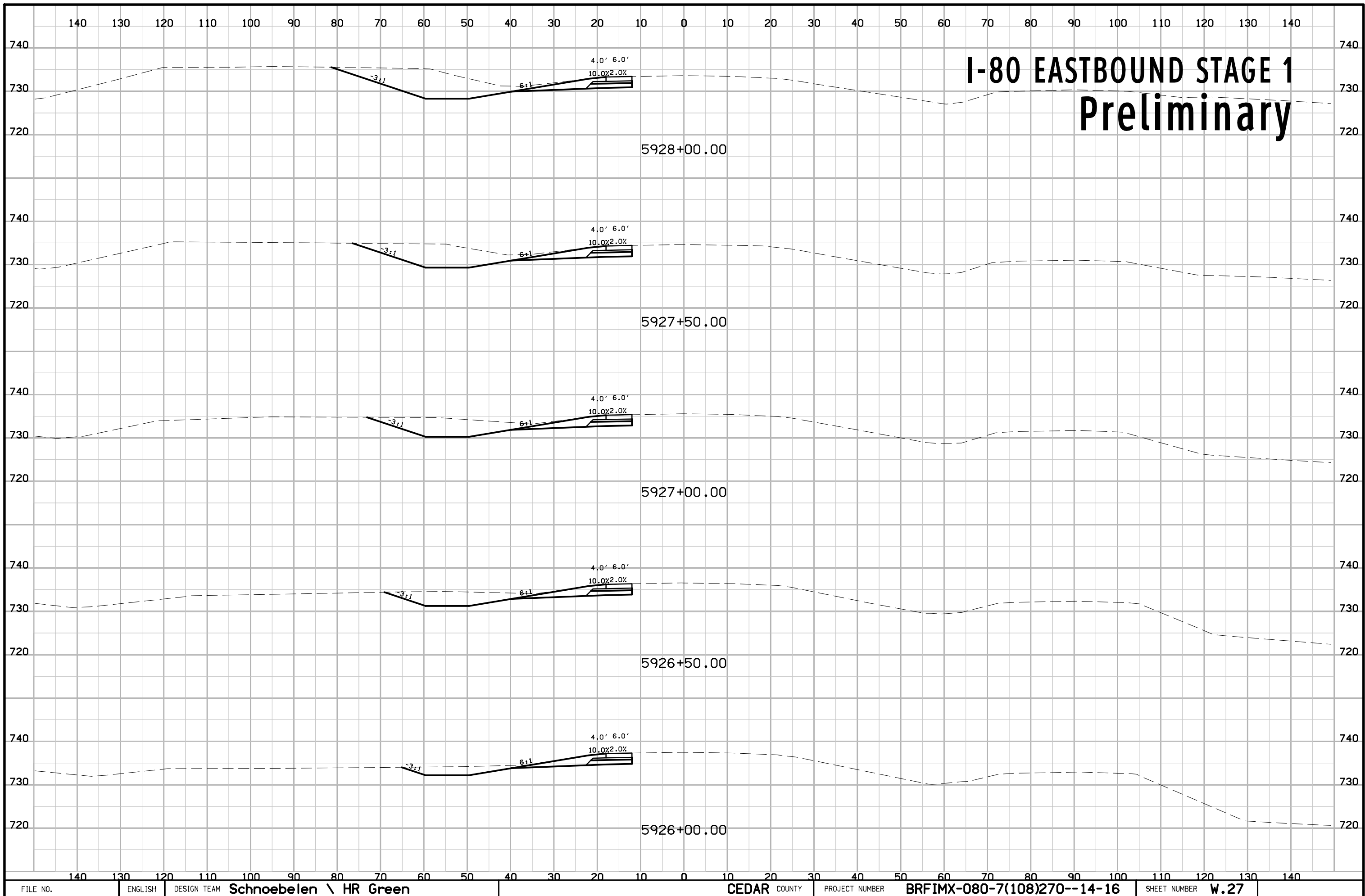


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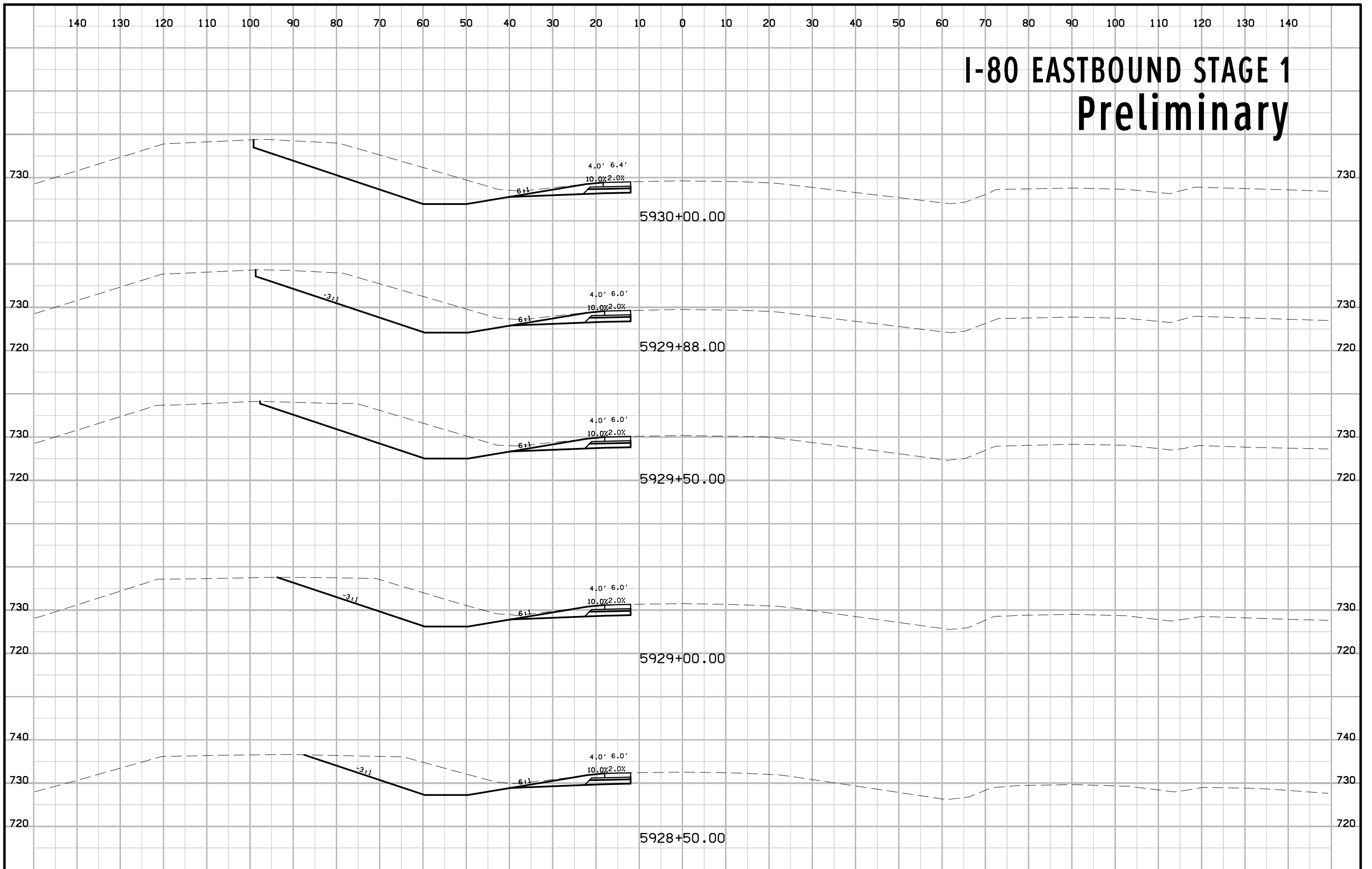


I-80 WESTBOUND STAGE 2 Preliminary



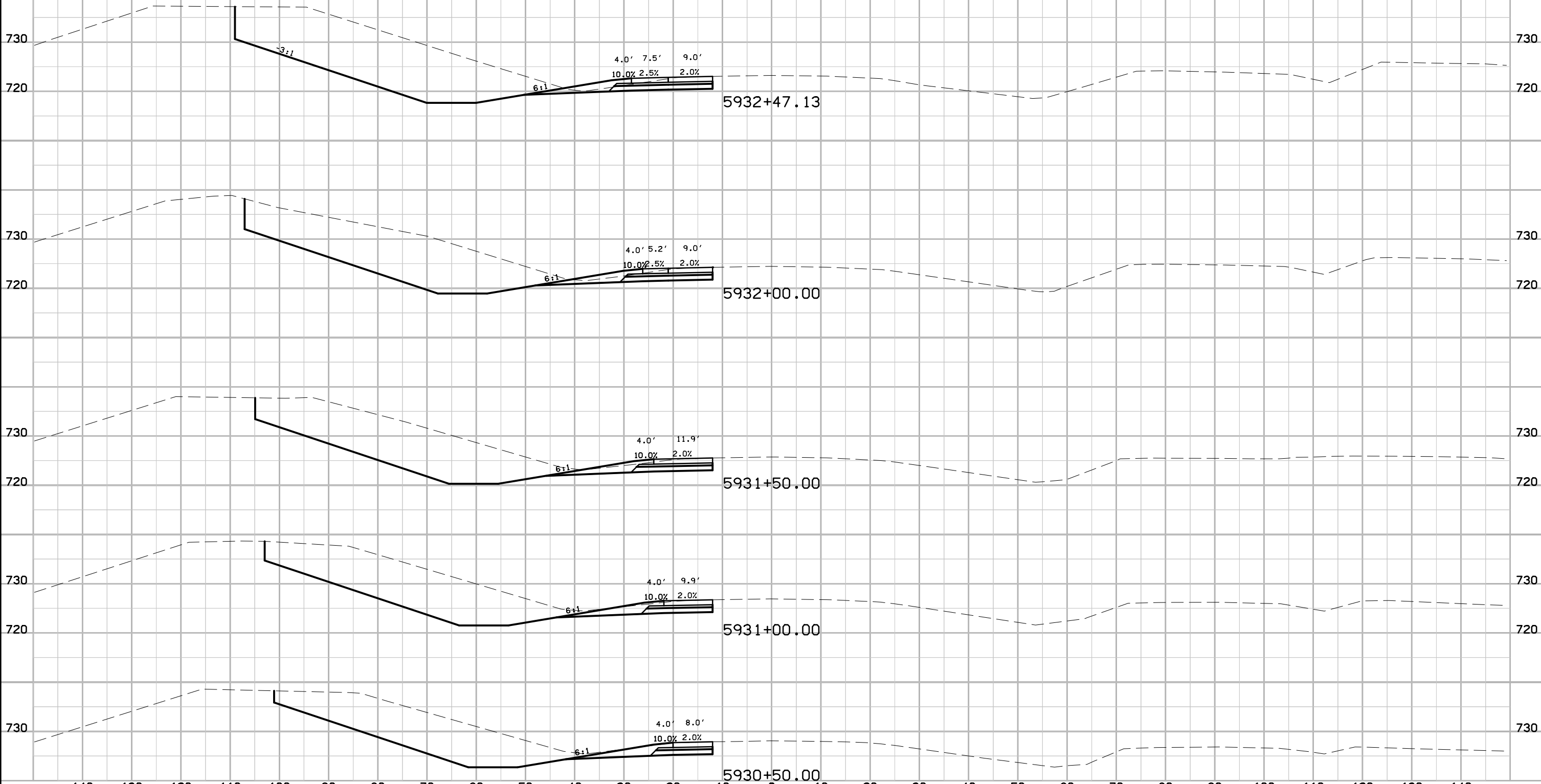


I-80 EASTBOUND STAGE 1 Preliminary

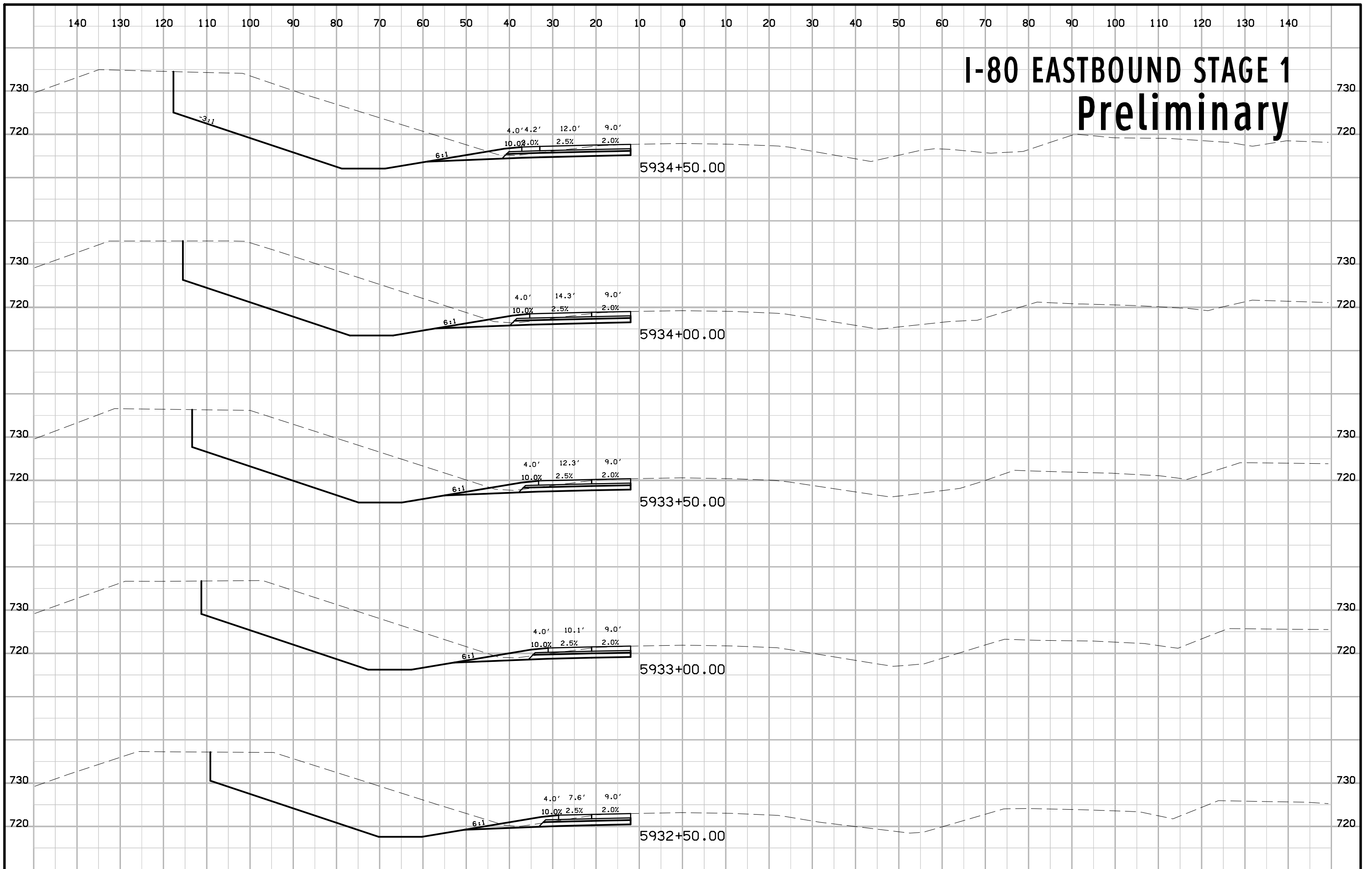


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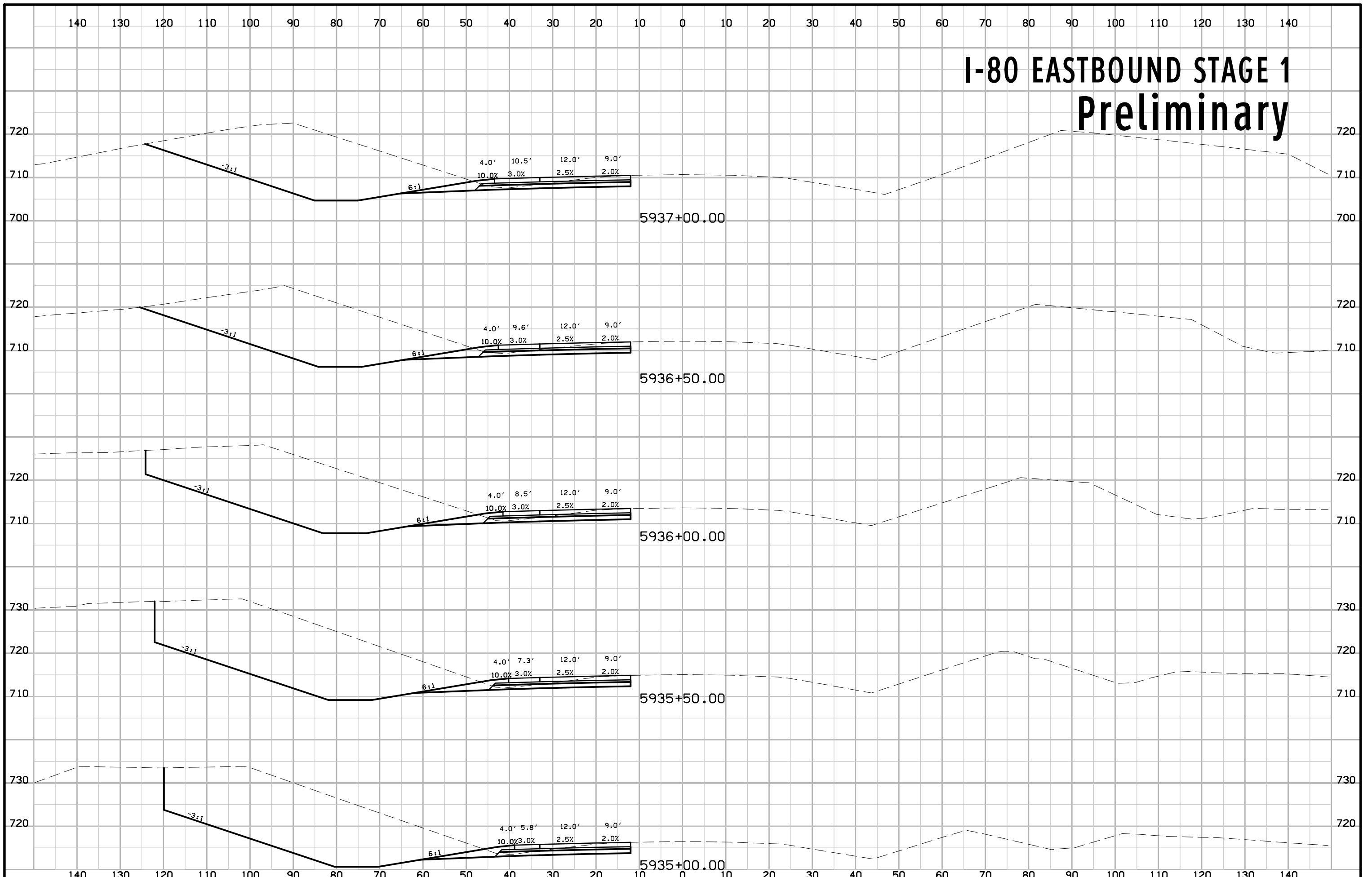
I-80 EASTBOUND STAGE 1 Preliminary



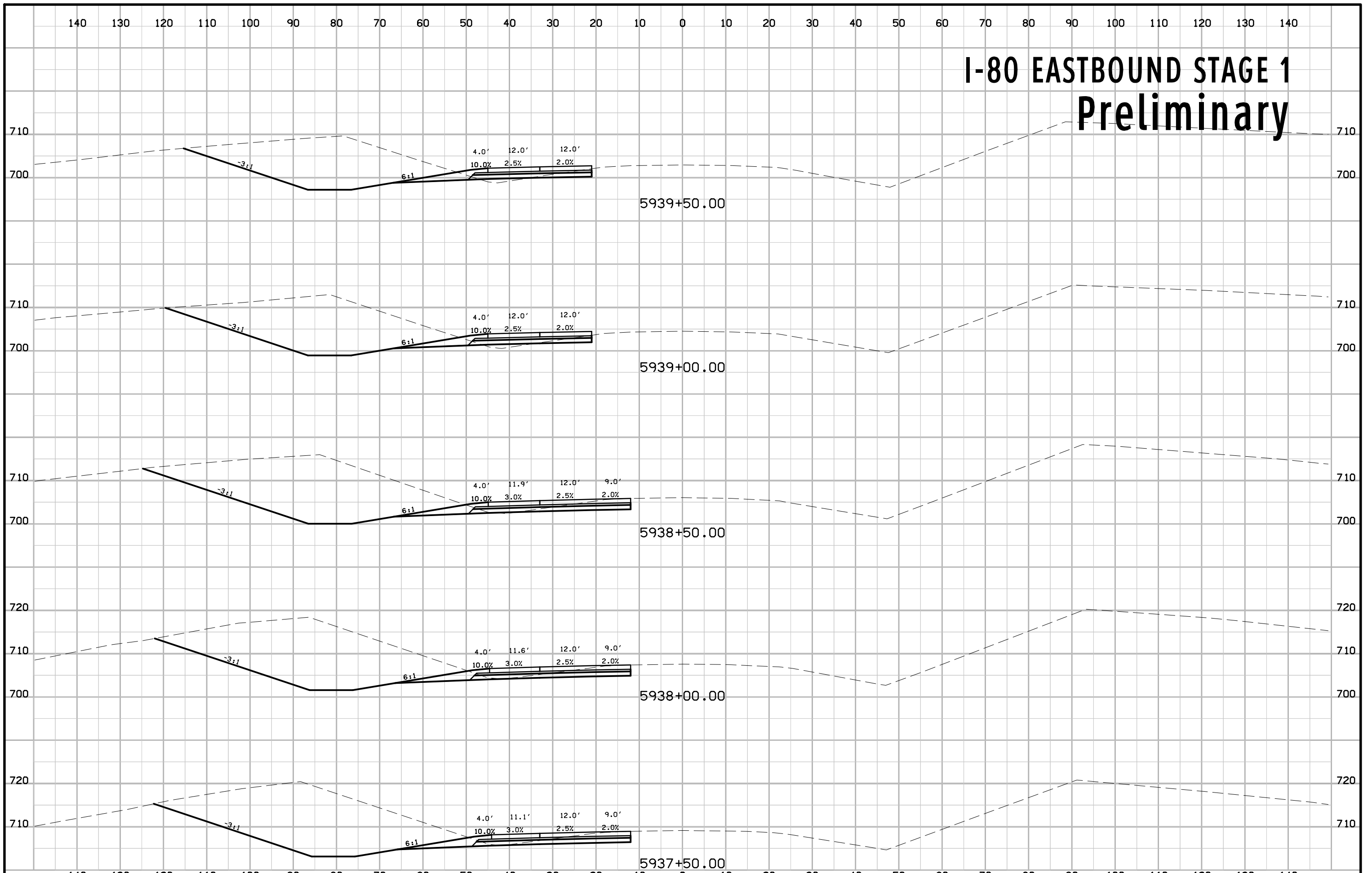
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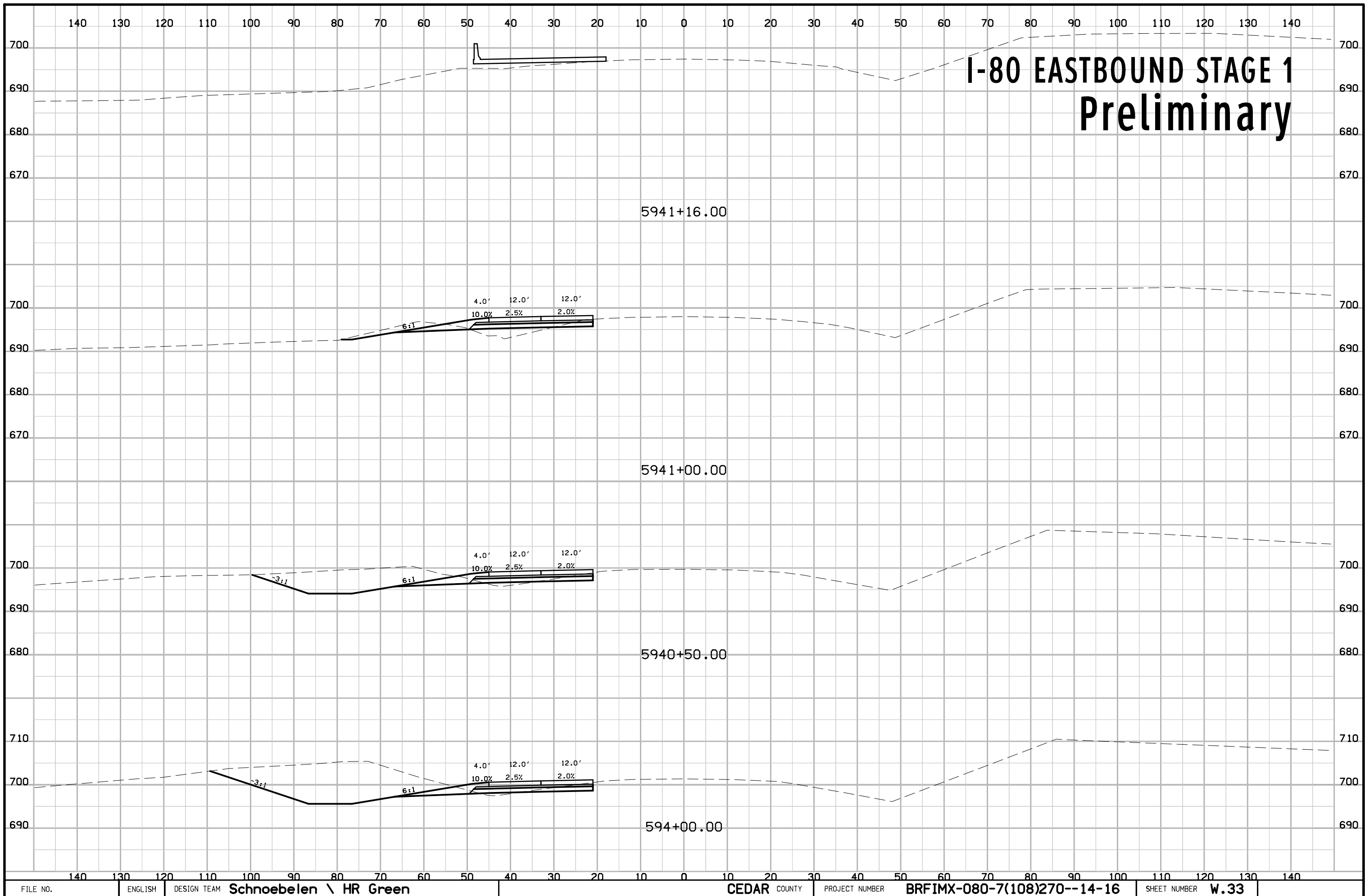


I-80 EASTBOUND STAGE 1 Preliminary

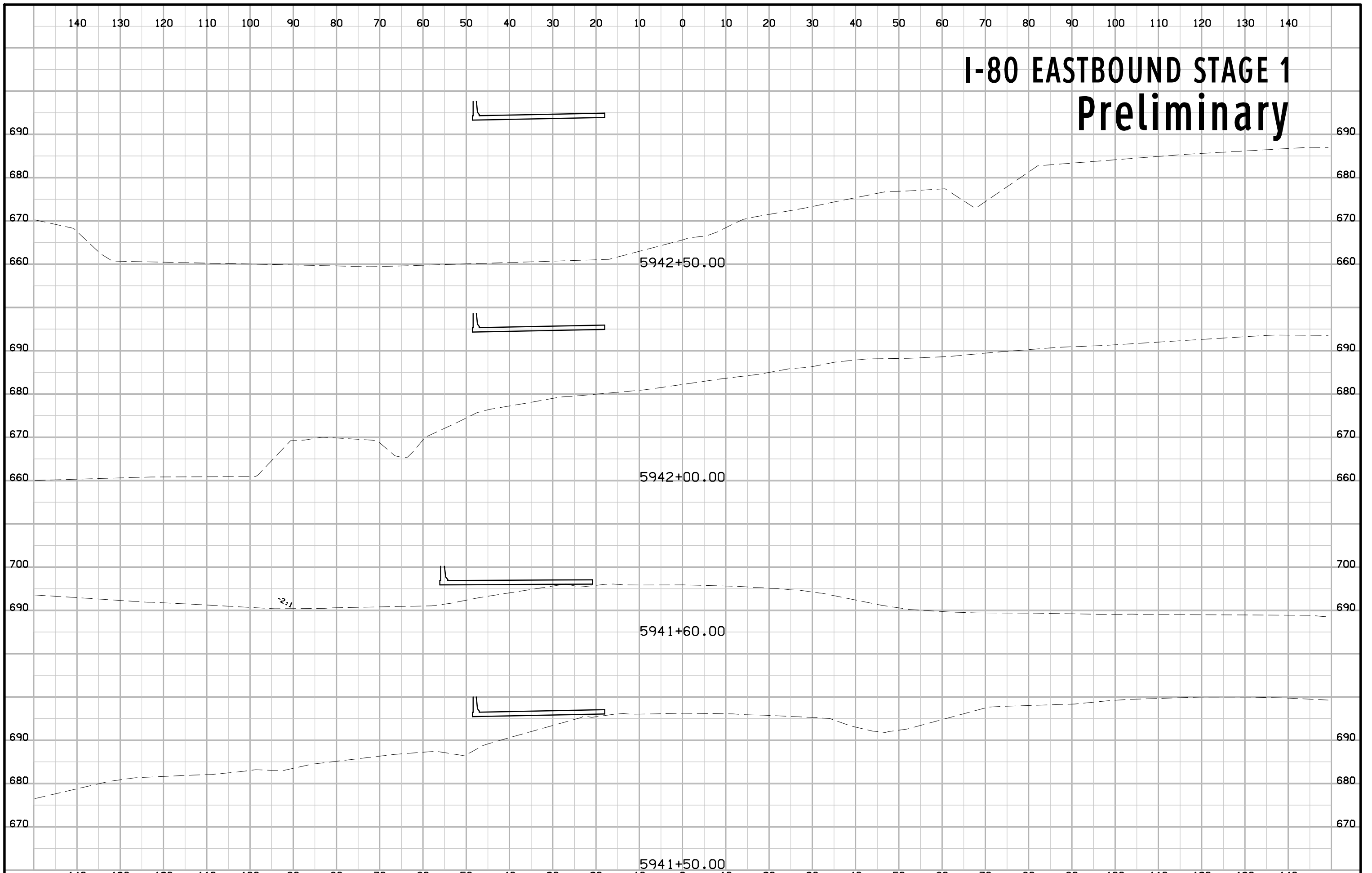


I-80 EASTBOUND STAGE 1 Preliminary



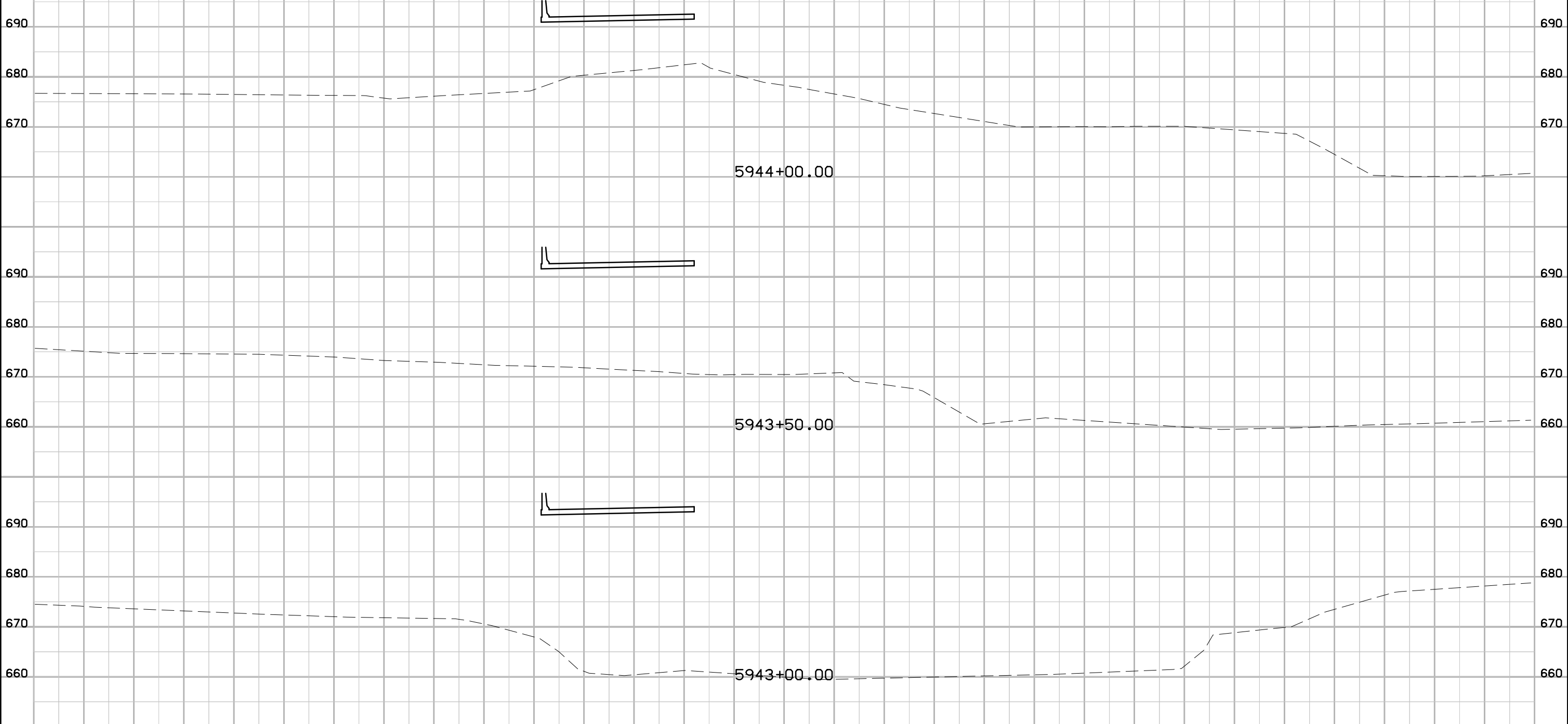


I-80 EASTBOUND STAGE 1 Preliminary

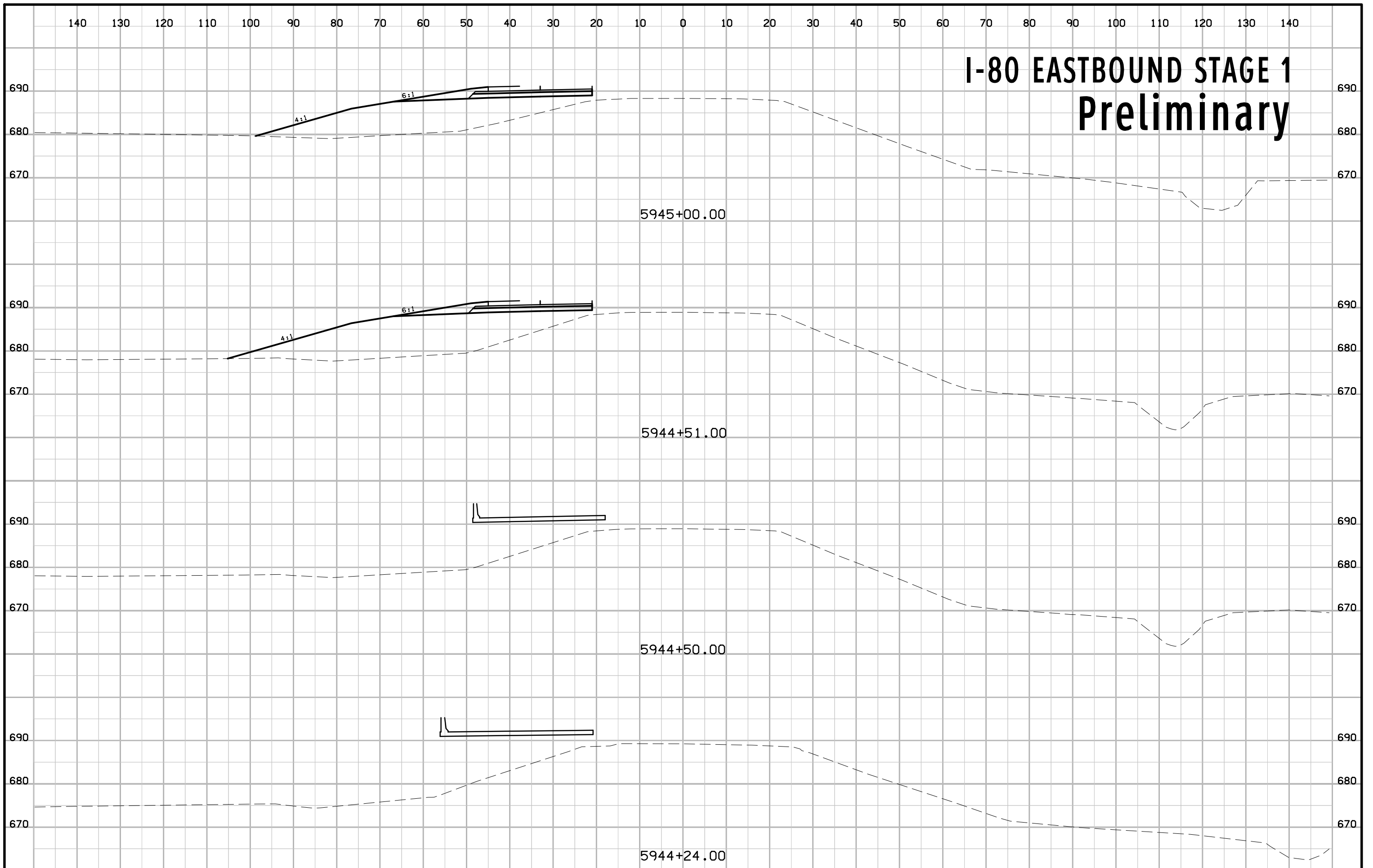


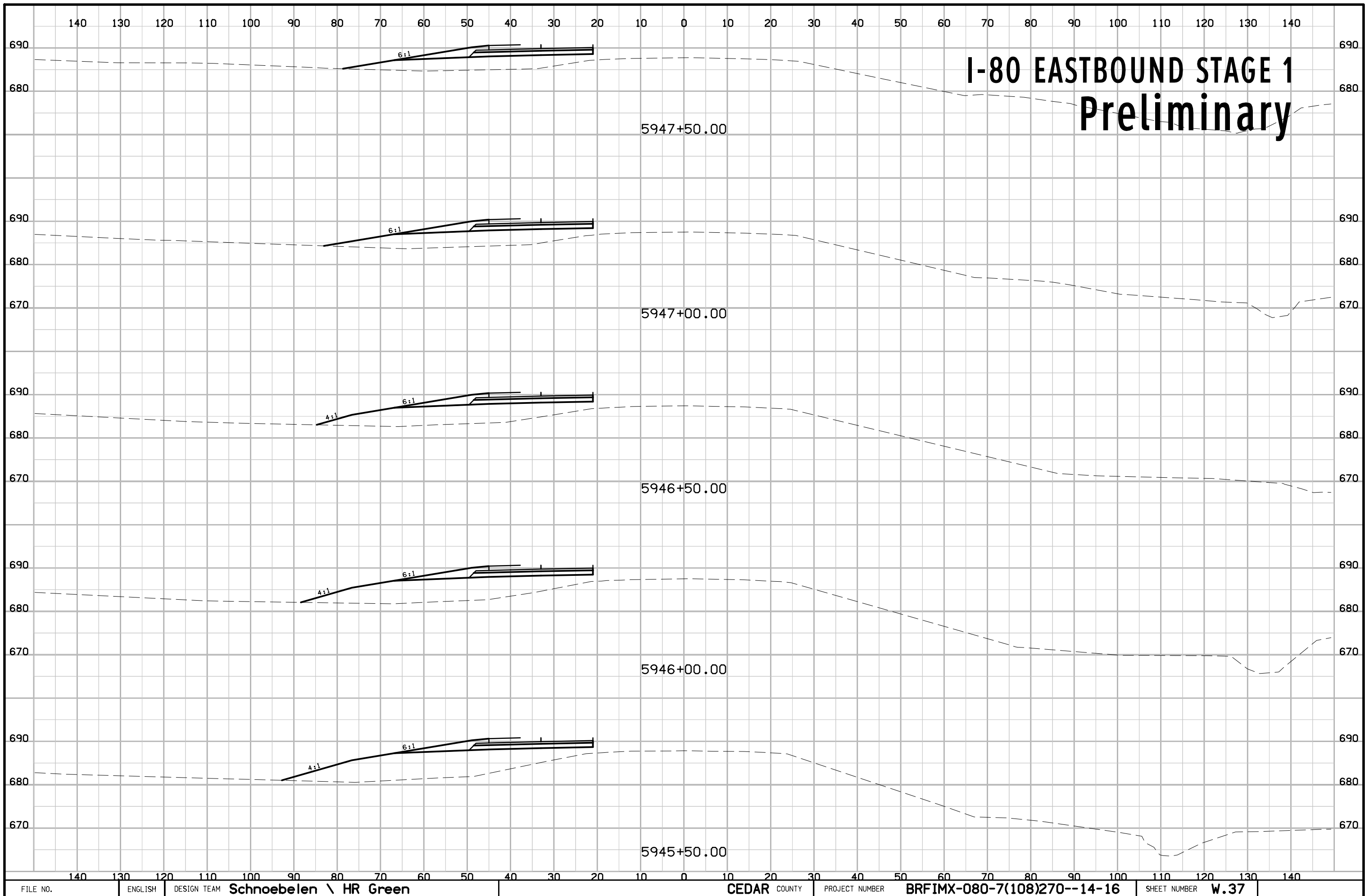
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I-80 EASTBOUND STAGE 1 Preliminary

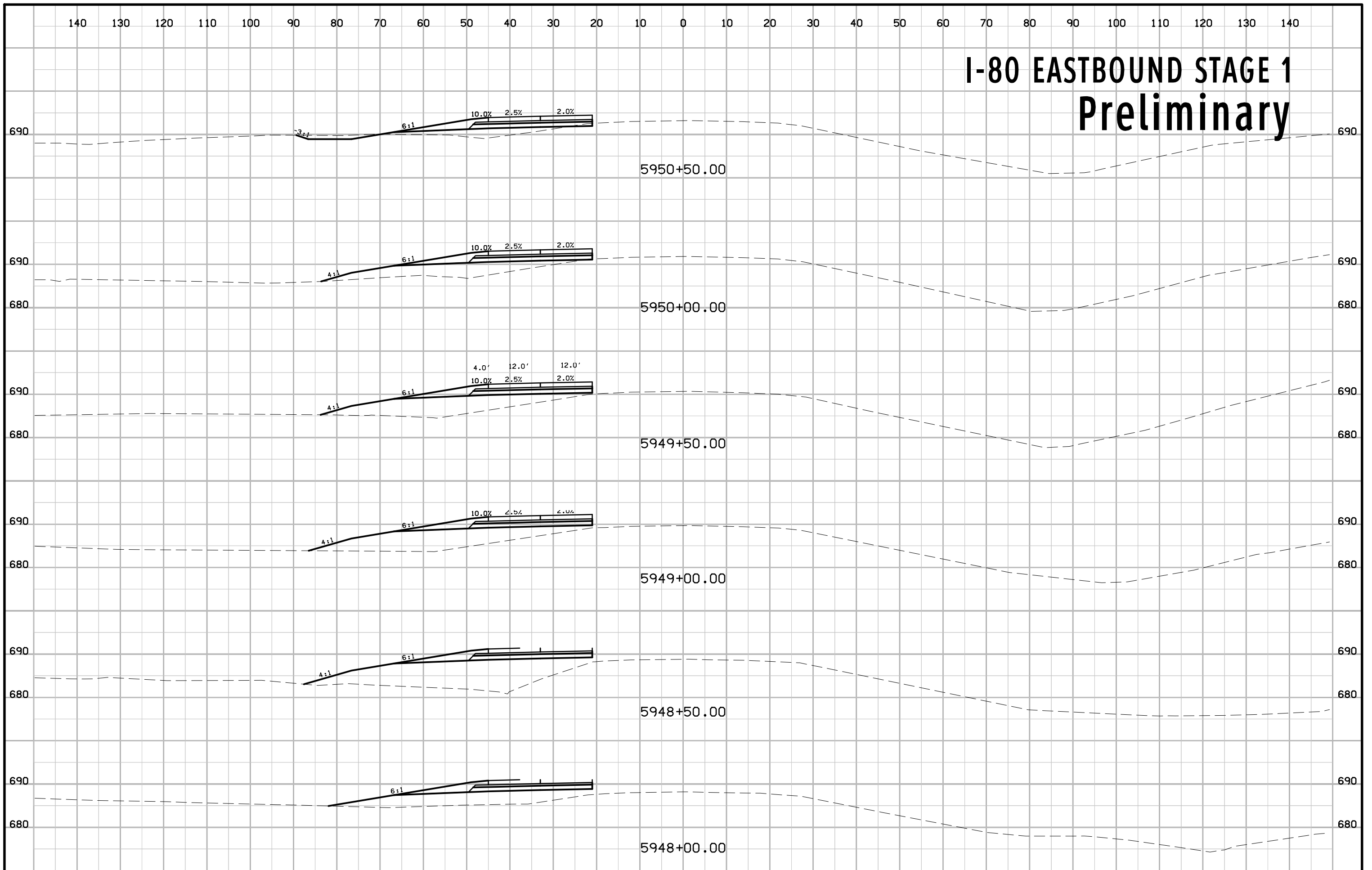


I-80 EASTBOUND STAGE 1 Preliminary

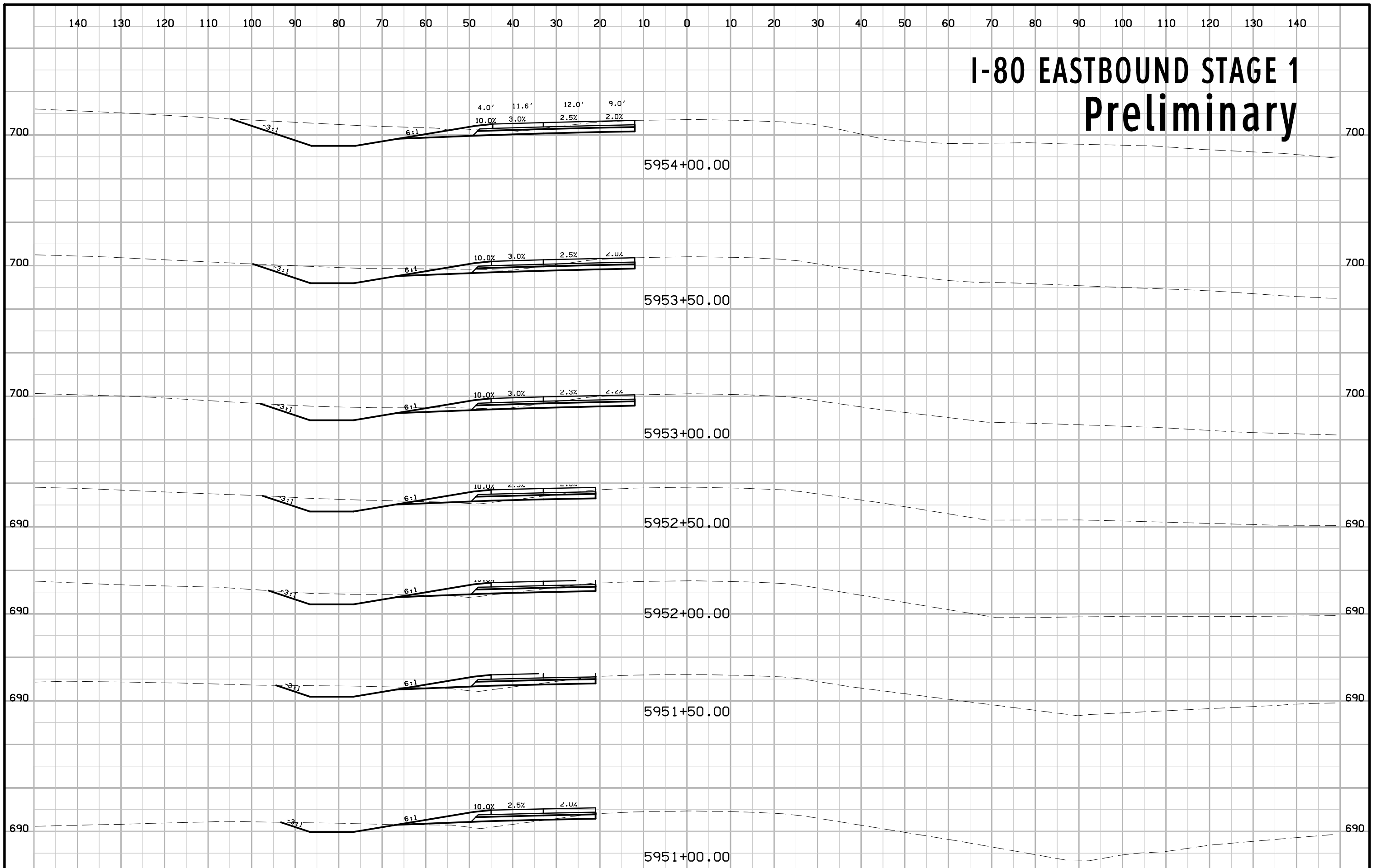




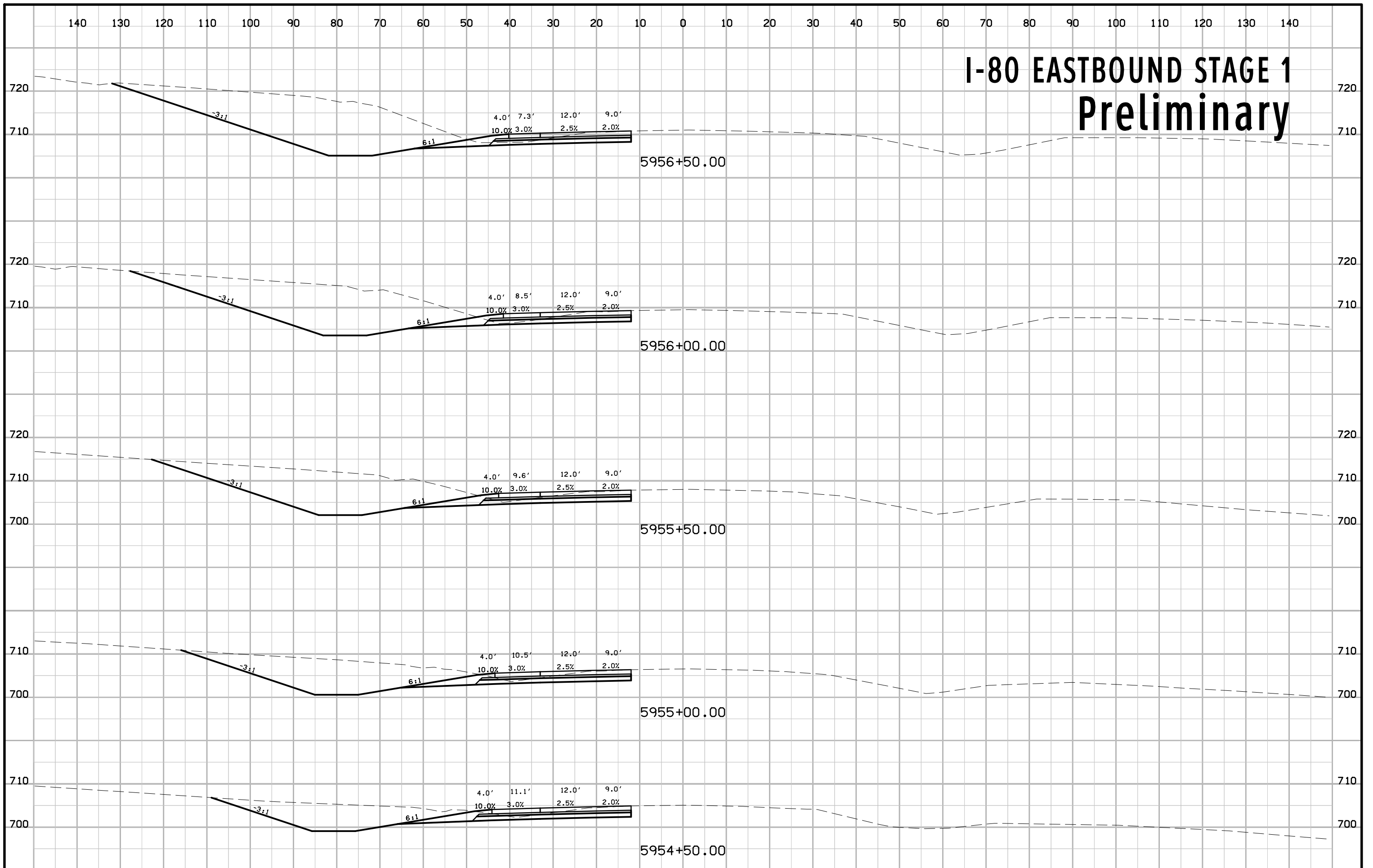
I-80 EASTBOUND STAGE 1 Preliminary



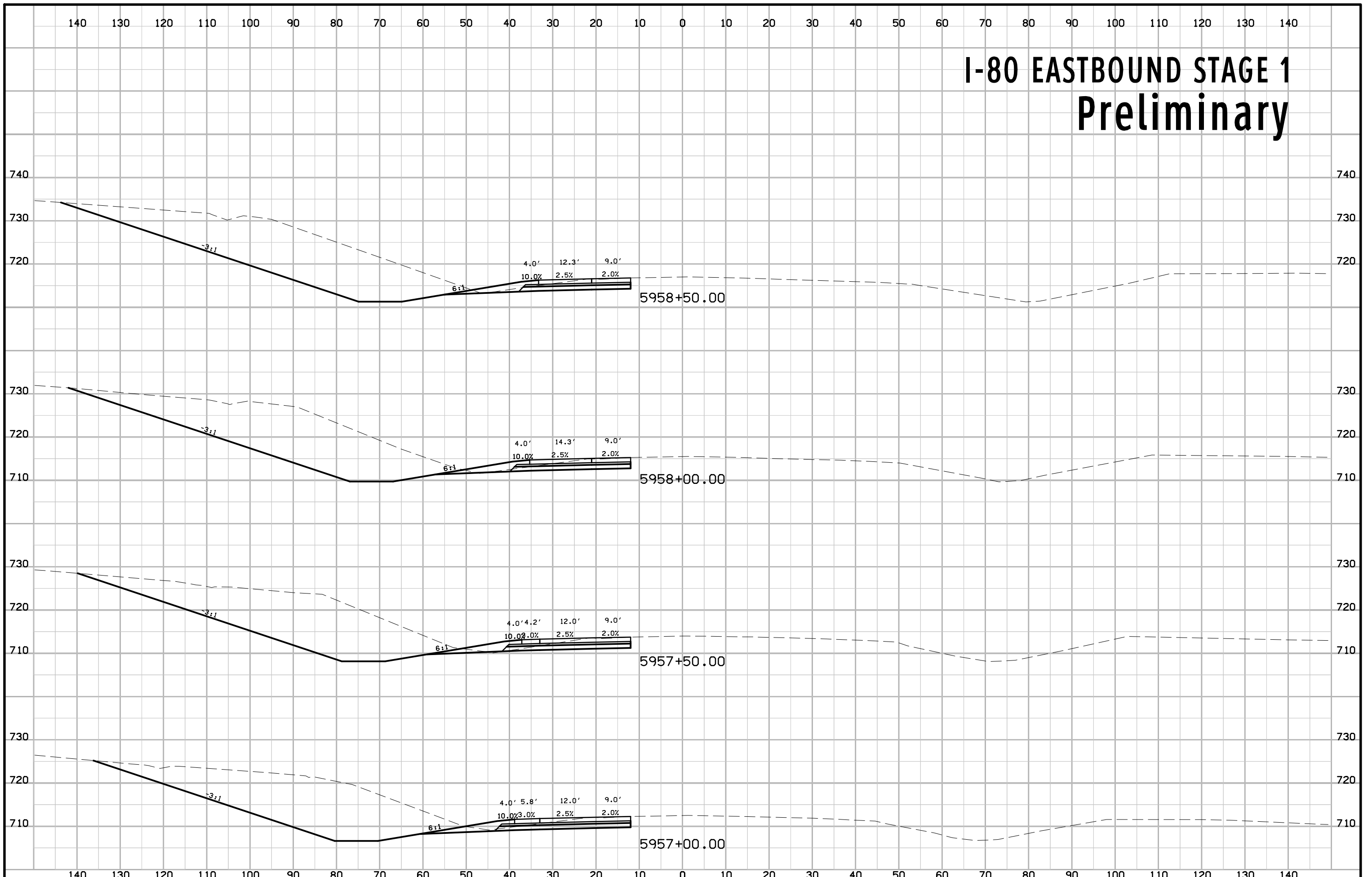
I-80 EASTBOUND STAGE 1 Preliminary



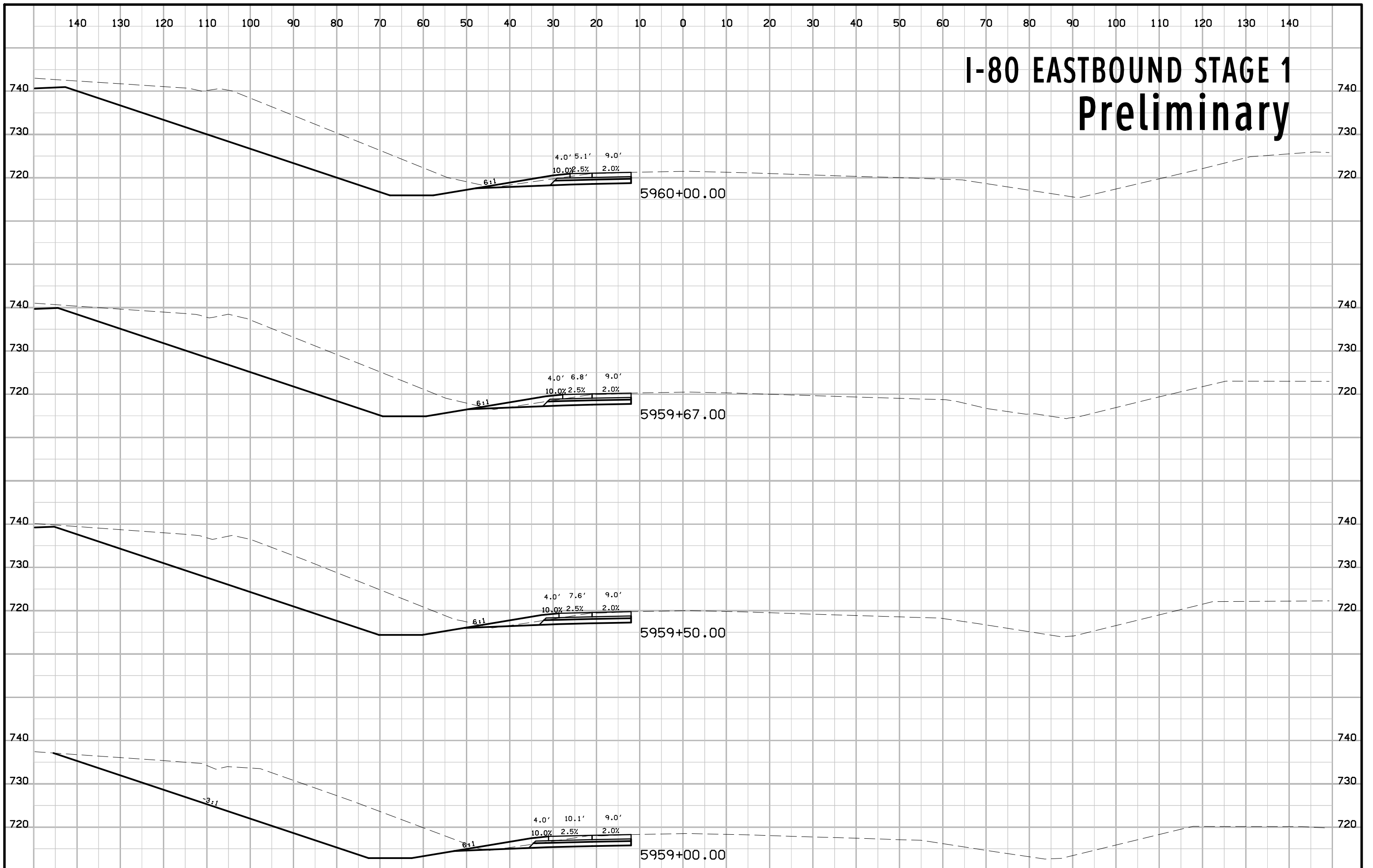
I-80 EASTBOUND STAGE 1 Preliminary



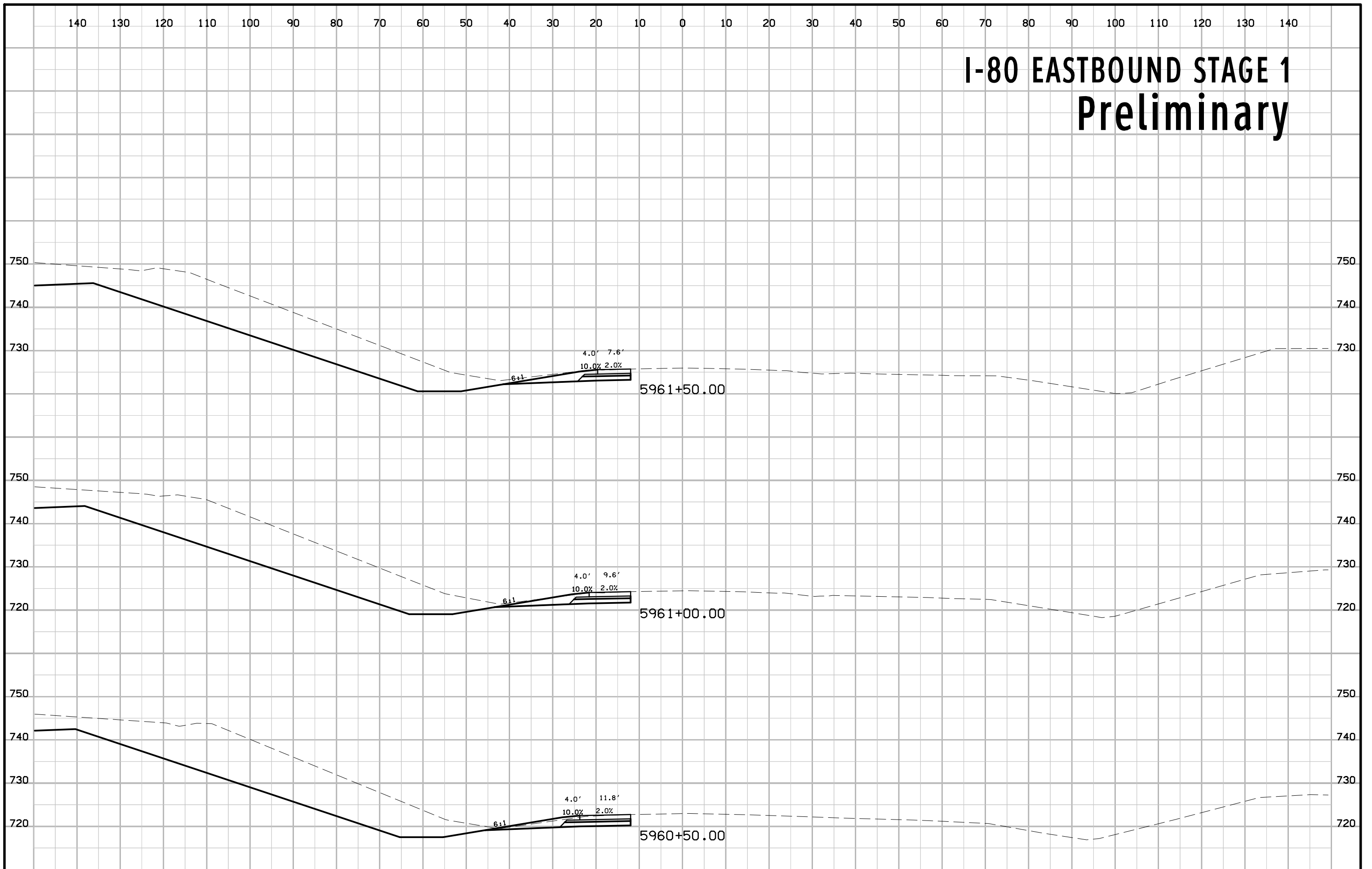
I-80 EASTBOUND STAGE 1 Preliminary



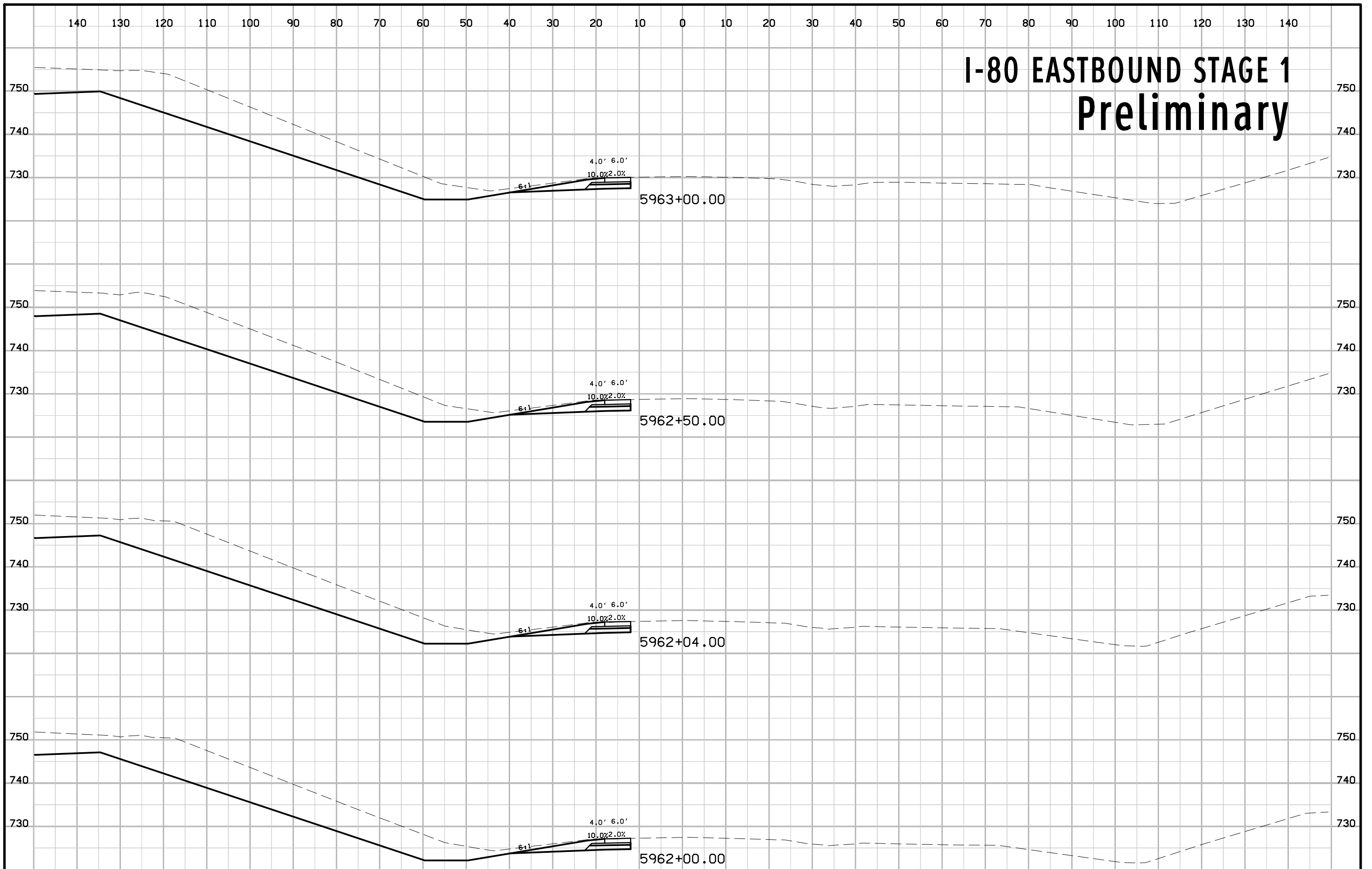
I-80 EASTBOUND STAGE 1 Preliminary



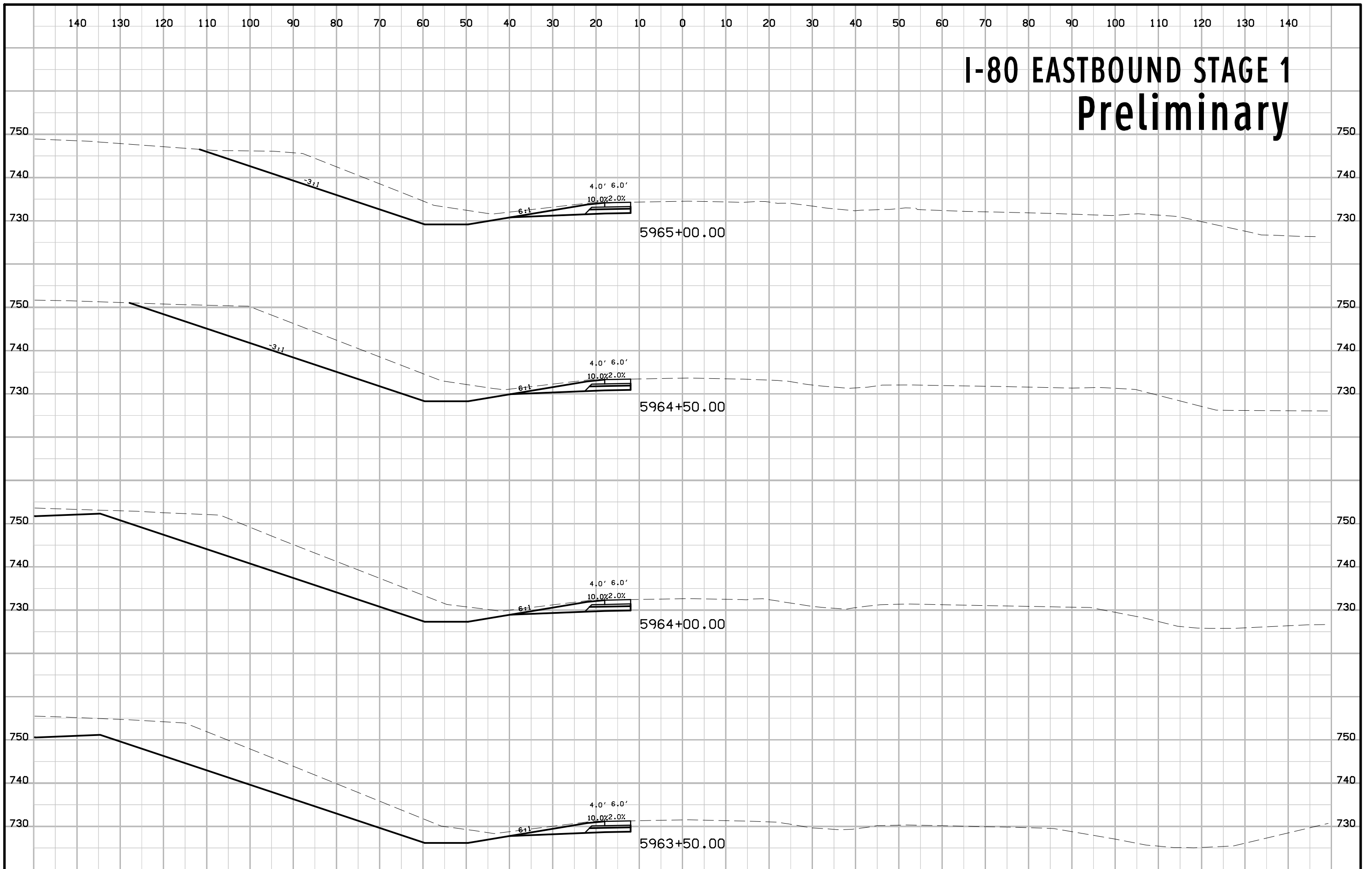
I-80 EASTBOUND STAGE 1 Preliminary



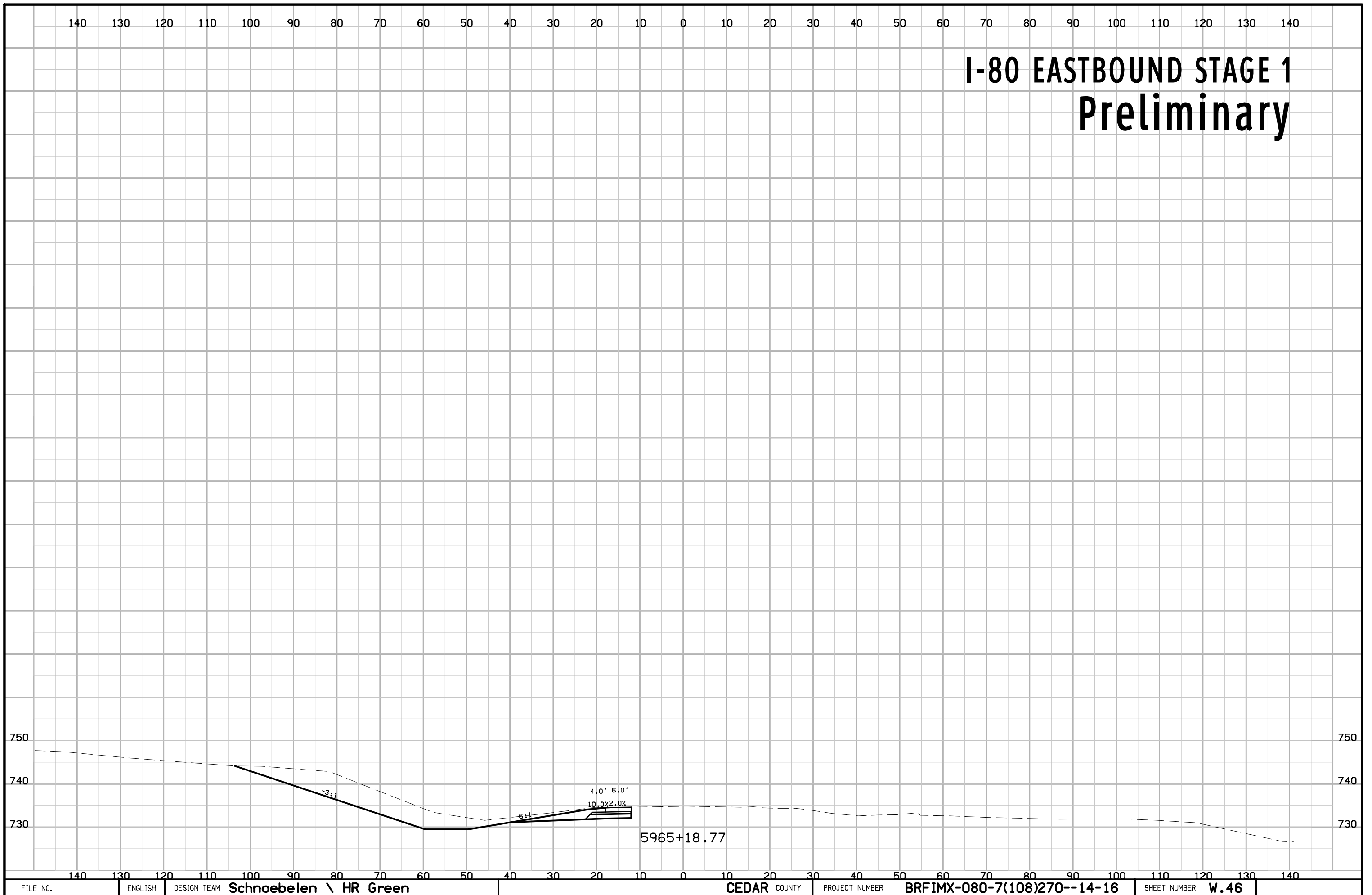
I-80 EASTBOUND STAGE 1 Preliminary



I-80 EASTBOUND STAGE 1 Preliminary

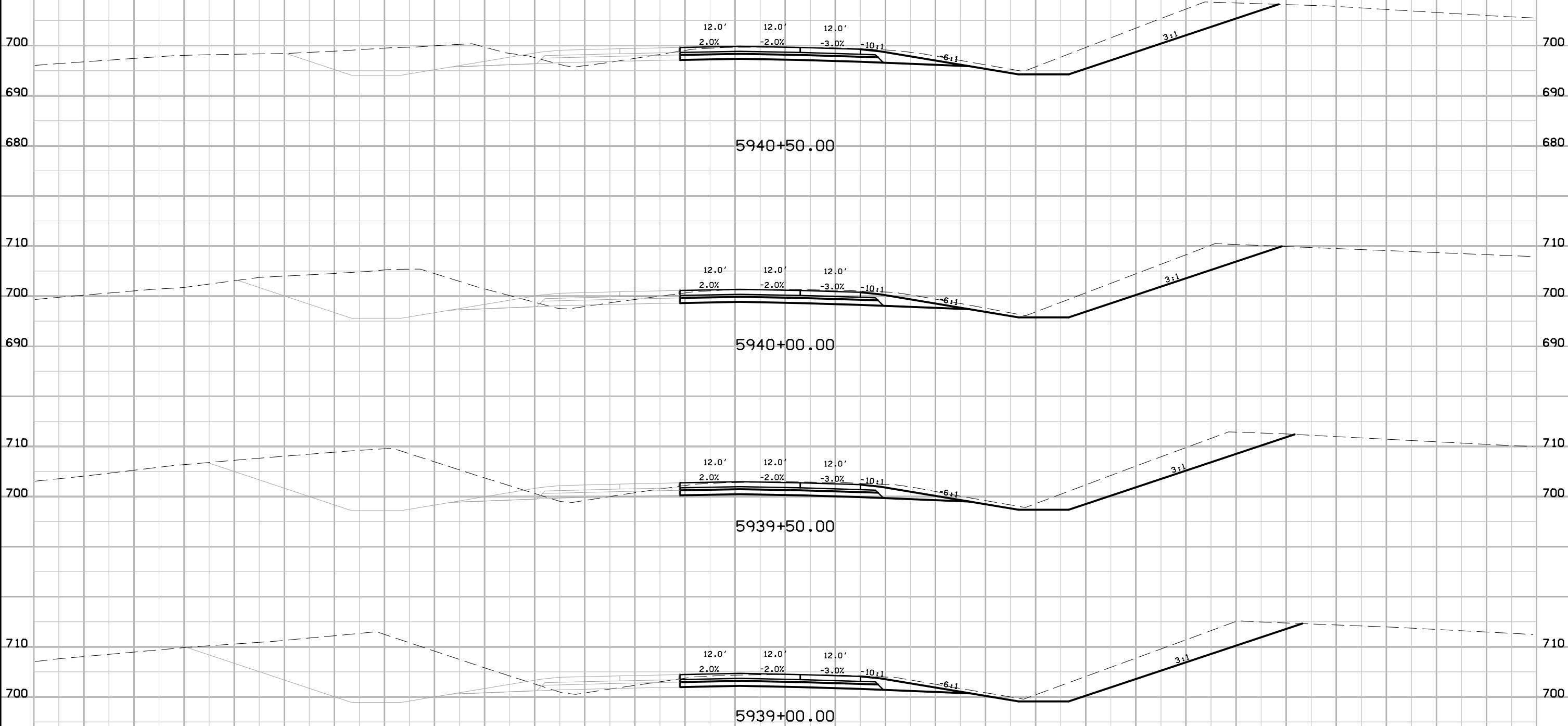


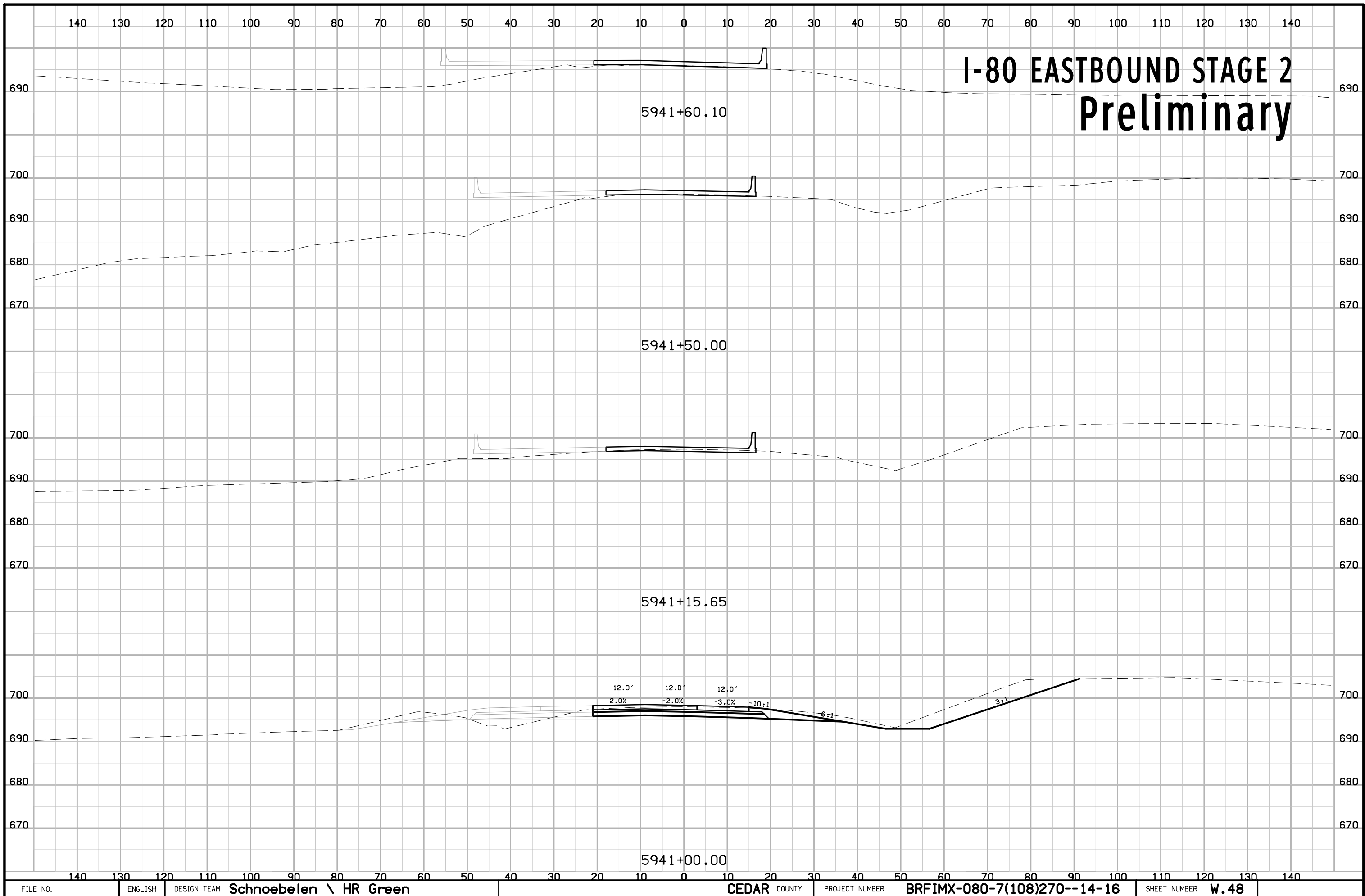
I-80 EASTBOUND STAGE 1 Preliminary



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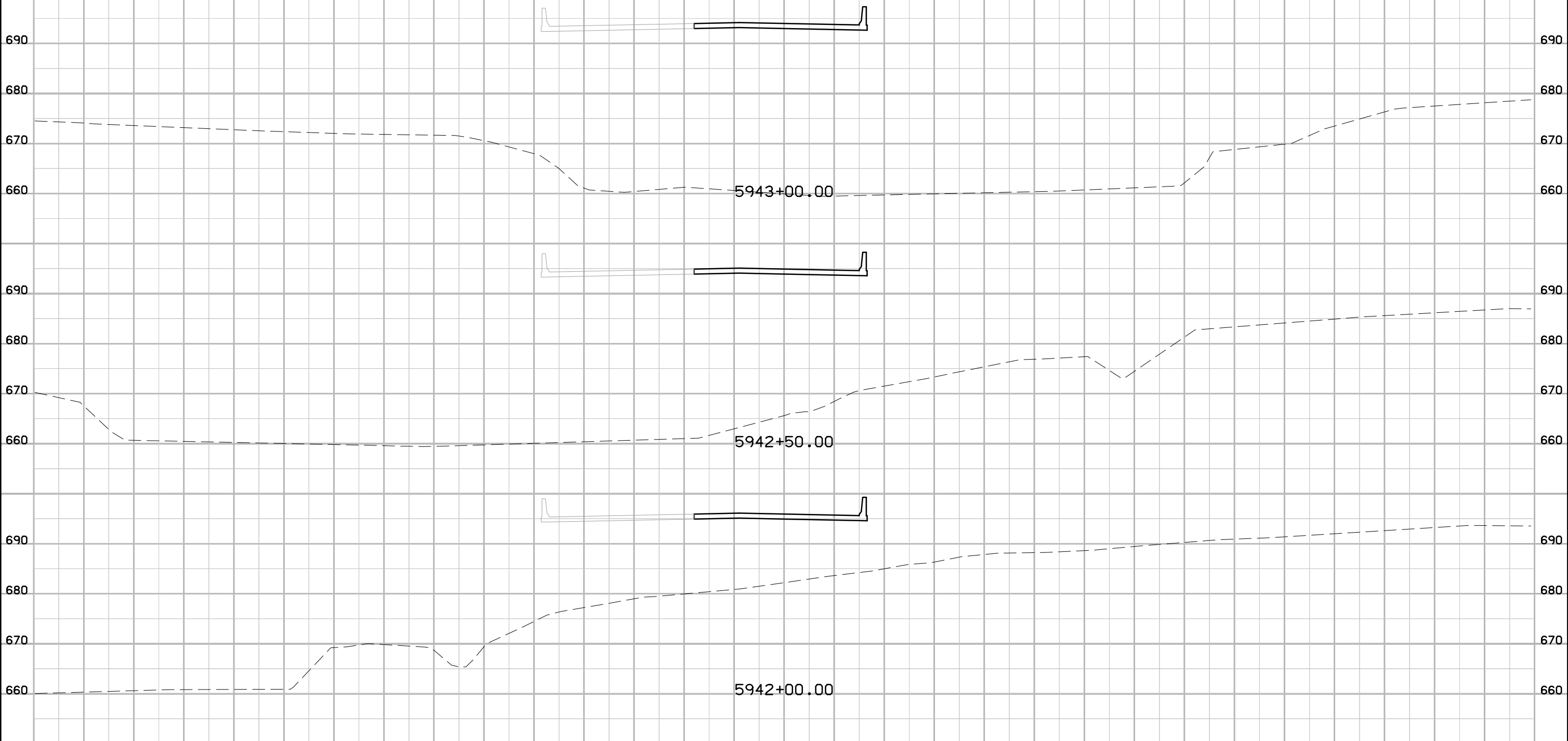
I-80 EASTBOUND STAGE 2 Preliminary





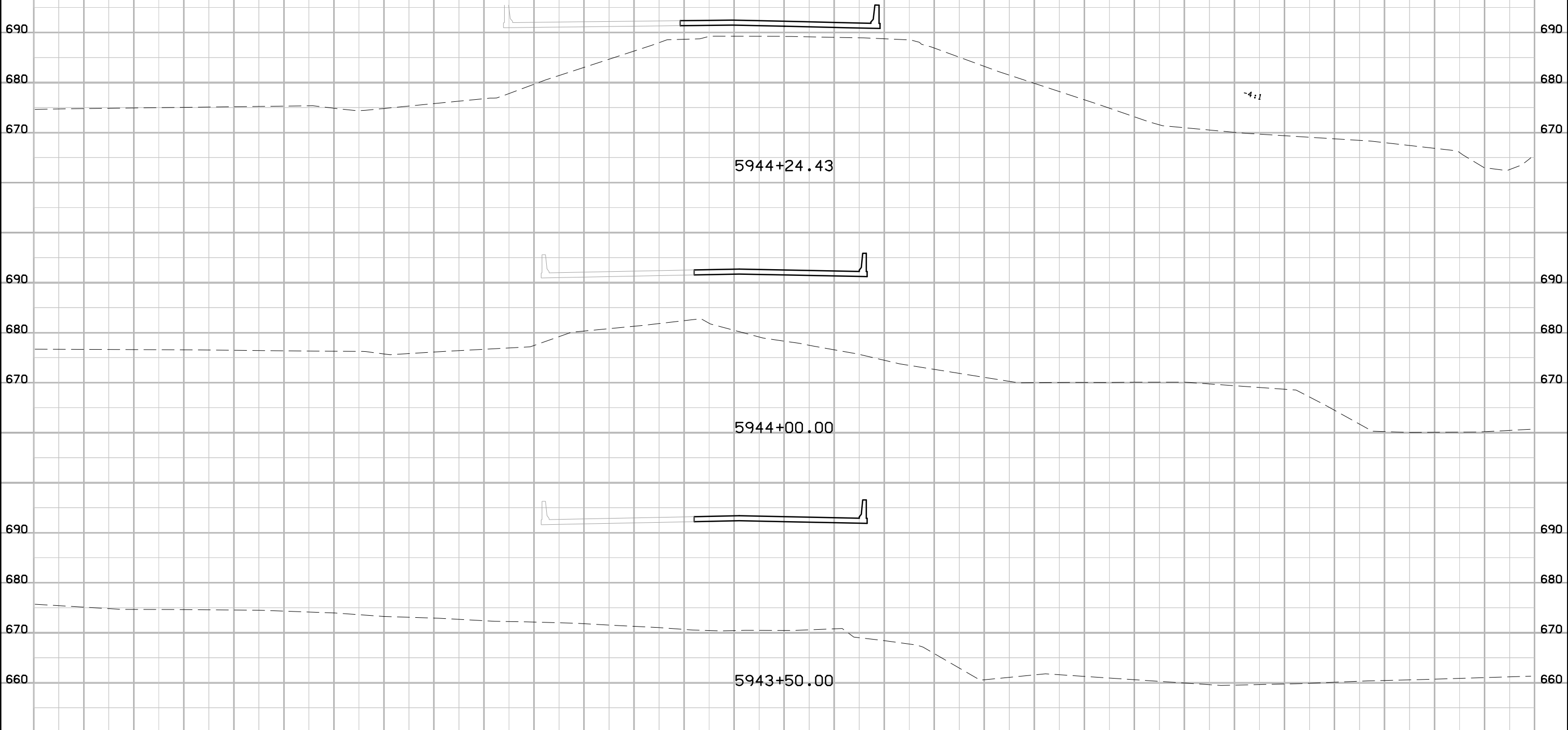
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I-80 EASTBOUND STAGE 2 Preliminary



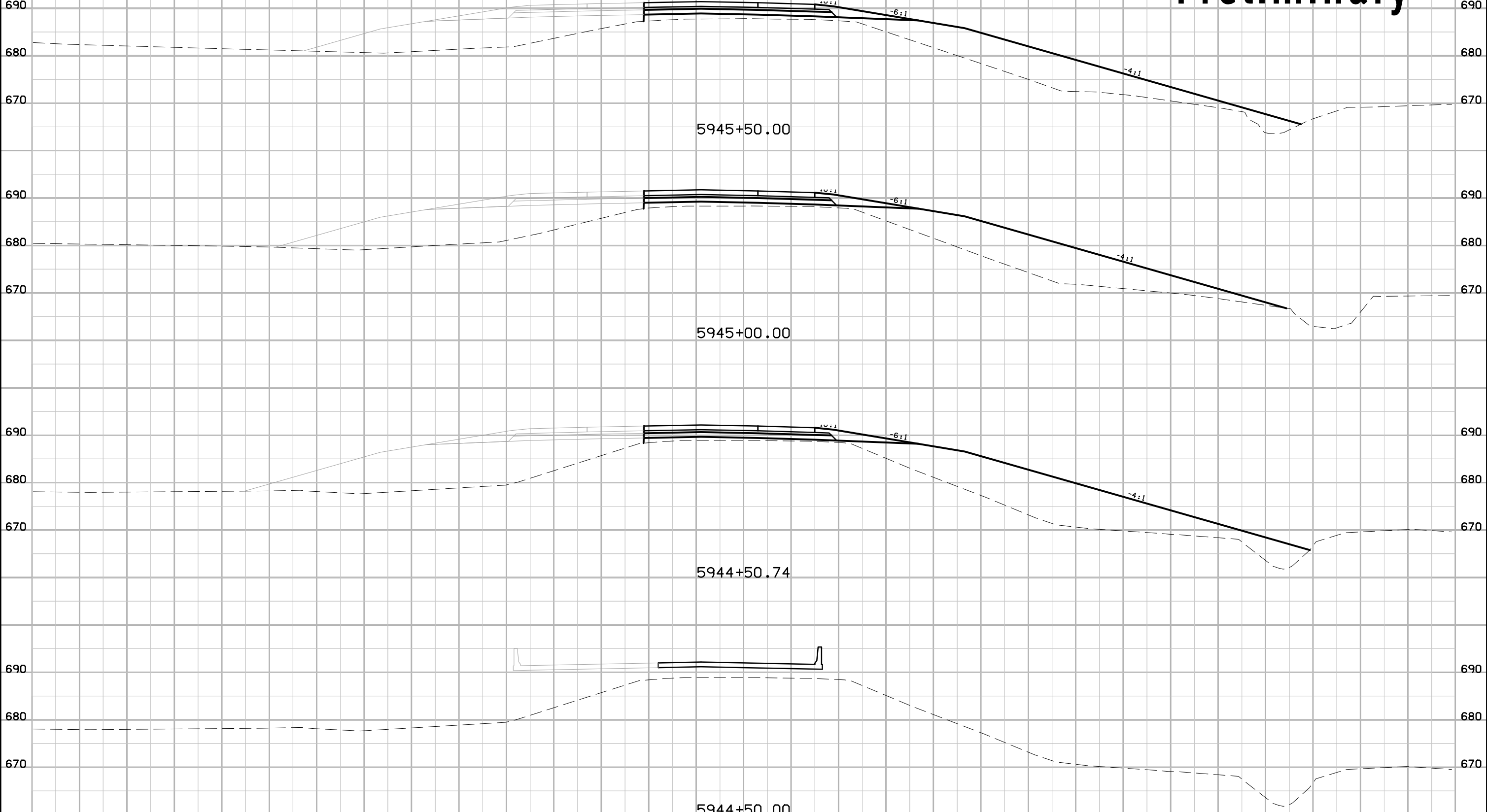
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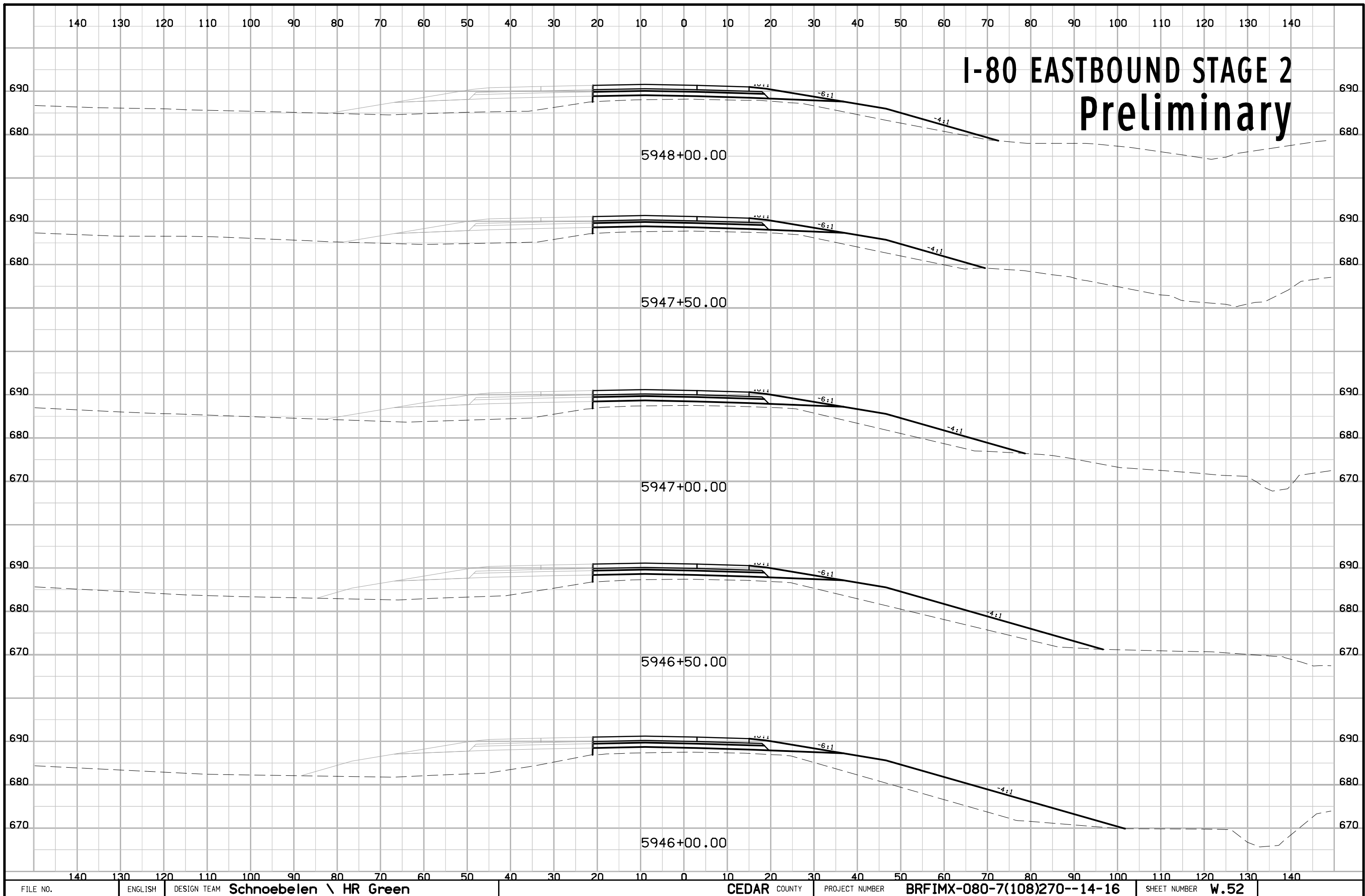
I-80 EASTBOUND STAGE 2 Preliminary



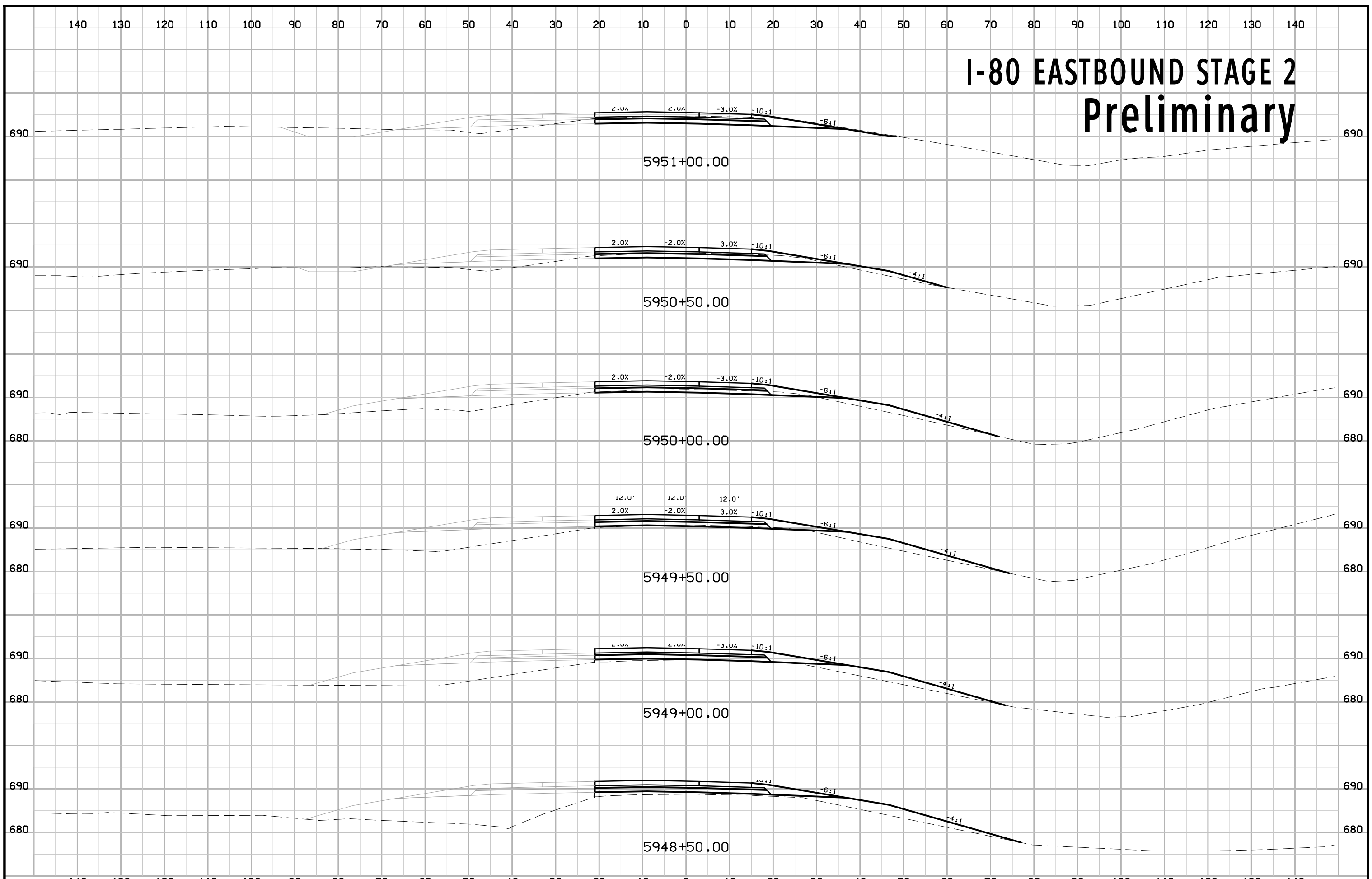
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I-80 EASTBOUND STAGE 2 Preliminary





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