

WARREN CO.

**BRIDGE REPLACEMENT
BRF-065-3(66)--38-91**

LETTING DATE



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

WARREN COUNTY

BRIDGE REPLACEMENT

US 65 over South River
2 mi. S. of IA 92

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

NO MILEAGE SUMMARY



REVISIONS

TOTAL

PROJECT IDENTIFICATION NUMBER

11-91-065-020

PROJECT NUMBER

BRF-065-3(66)--38-91

R.O.W. PROJECT NUMBER

STPN-065-3(67)--2J-91

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 3	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.2 - 5	Plan & Profile U.S. 65
E Sheets	Side Road Plan and Profile Sheets
* E.1	McGregor Street
G Sheets	Survey Sheets
G.1	Reference Ties and Bench Marks
G.2	Horizontal Control Tab. & Super for all Alignments
V Sheets	Bridge and Culvert Situation Plans
V.1 - 2	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 17	Cross Sections Legend & Symbol Information Sheet
X Sheets	Side Road Cross Sections
X.1 - 5	Side Road Cross Sections
X.6 - 7	Special Ditching
	* Color Plan Sheets

EVENT DATES:

B1 - Date: 04-10-2014

Letting - Date: 01-20-2016

For Project Location Map
Refer to Sheet A.2

DESIGN DATA RURAL

2012 AADT	5900	V.P.D.
2032 AADT	7400	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	8	%
Total Design ESALs	--	

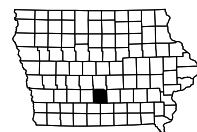
INDEX OF SEALS

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

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 05-7-2014



ENGLISH

IOWA DOT

DESIGN TEAM Skogerboe\Schoenrock\Bartholomew

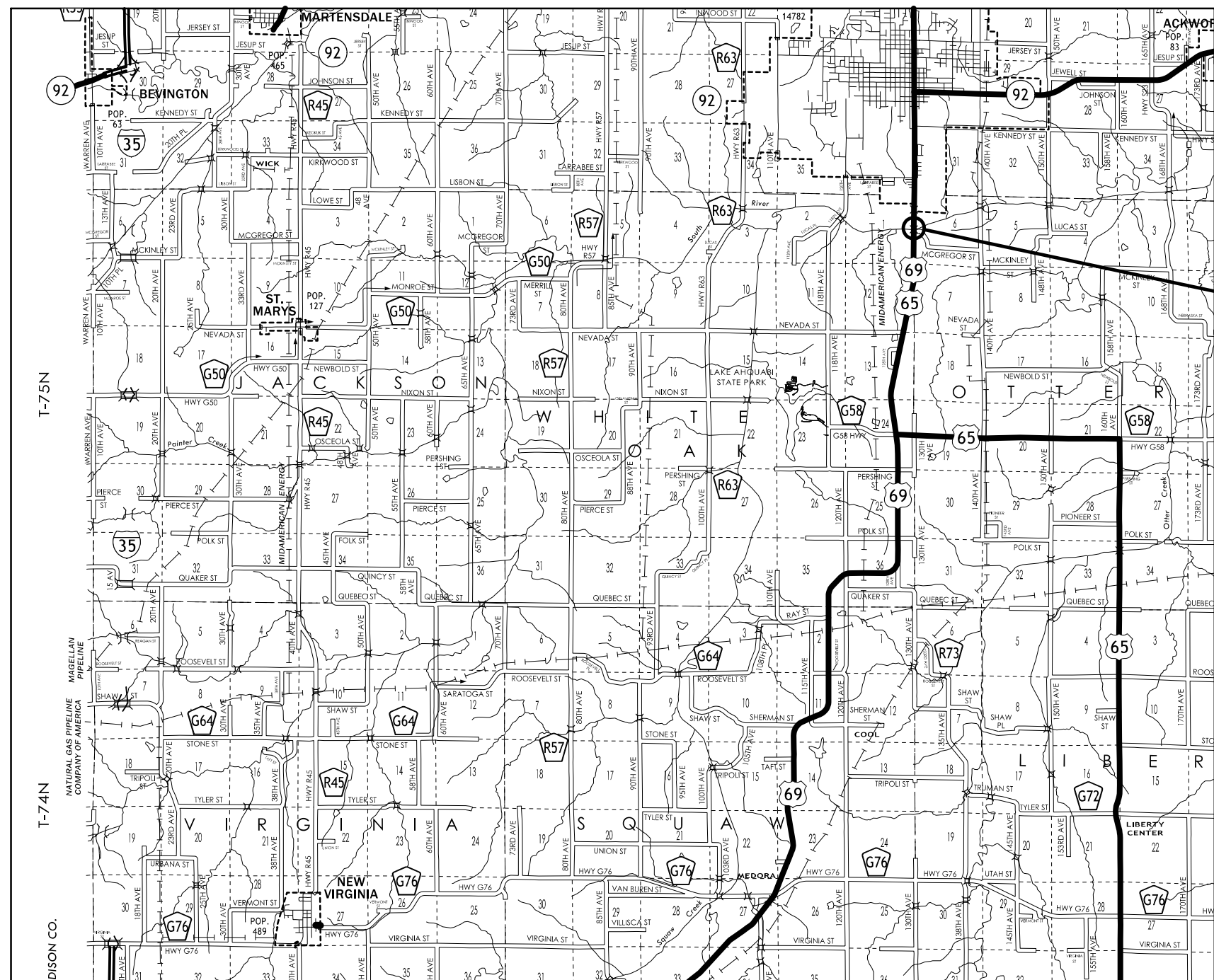
WARREN COUNTY

PROJECT NUMBER

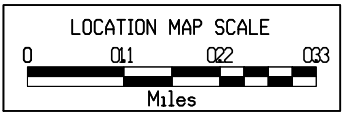
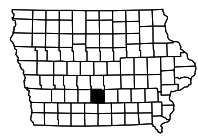
BRF-065-3(66)--38-91

SHEET NUMBER

A.1



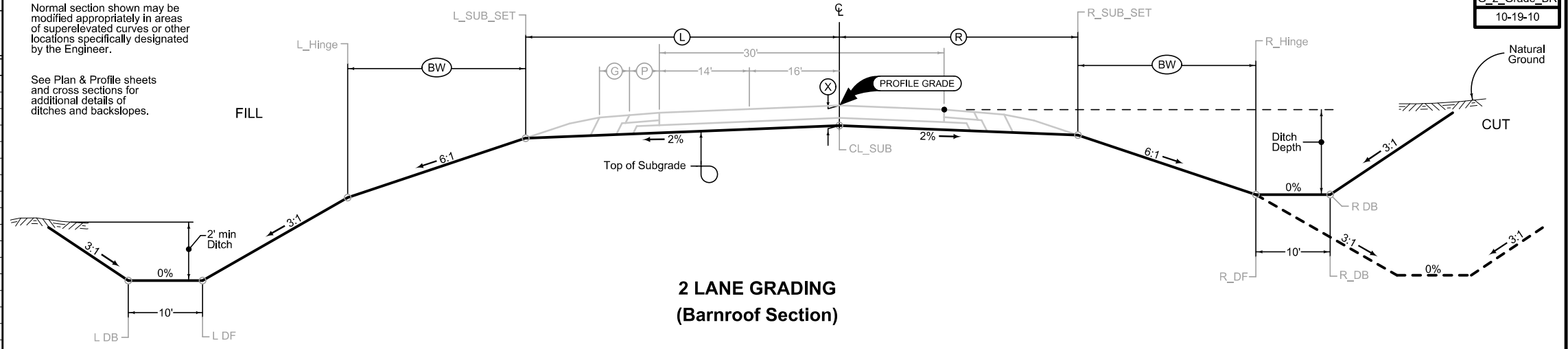
Project Location



LOCATION		DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION	L Feet	R Feet	X Inches	BW Feet	
U.S 65	408+90.00	415+35.00	VARI	32.96	24	9.05
U.S 65	417+15.00	421+92.19	48.96	32.96	24	9.05
U.S 65	421+92.19	428+32.01	VARI	32.96	24	9.05
U.S 65	428+32.01	429+00.00	32.96	32.96	24	9.05

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.



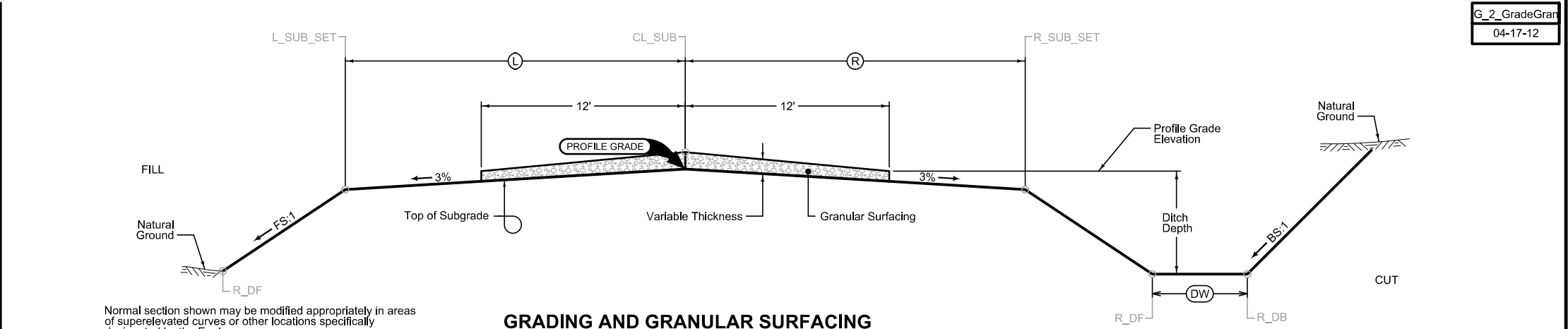
G_2_Grade_BR
10-19-10

LOCATION		DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION	L Feet	R Feet	FS Feet	BS Feet	DW Feet	
McGregor St.	1416+25.00	1423+20.00	15'	15'	3:1	3:1	10'

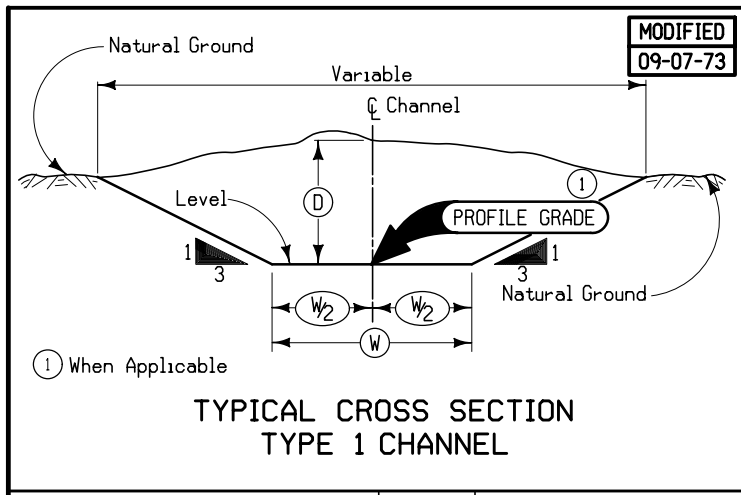
Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.

See plan & profile sheets and cross sections for additional details of ditches and backslopes.

Place Granular Surfacing as follows:
Grading design application rate is ___ tons per mile.
Paving design application rate is ___ tons per mile.



G_2_GradeGran
04-17-12



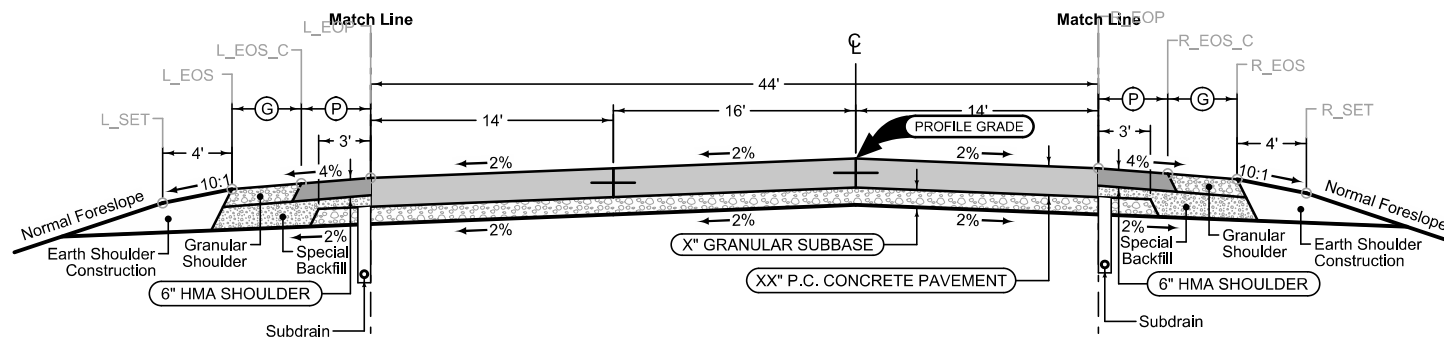
MODIFIED
09-07-73

LOCATION		WIDTH	DEPTH (Average)
STATION	SIDE	(W)	(D)
2419+46.83 to 2421+83.85	Center	10'	4'

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
408+90.00	419+04.36	4'	4'
421+48.36	429+00.00	4'	4'



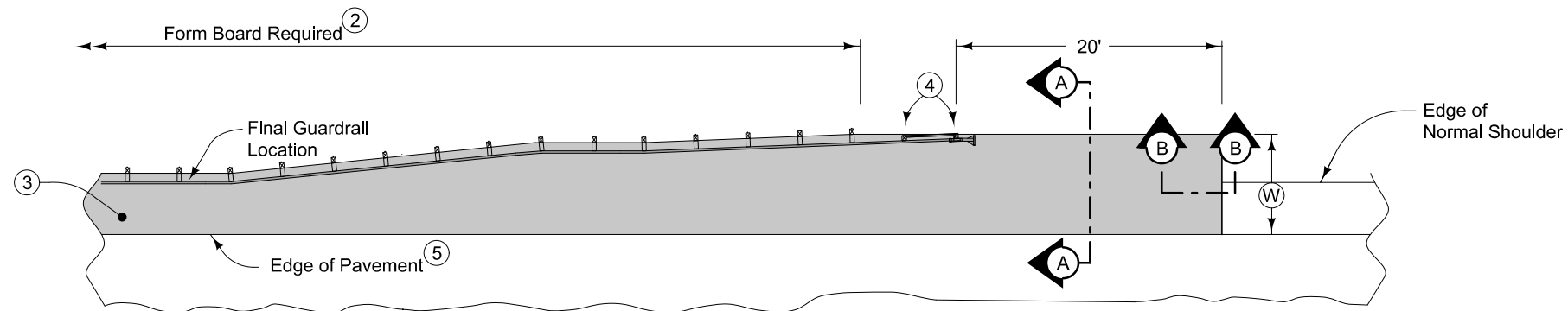
Mainline Jointing:
Transverse joints: CD at 20' spacing
Longitudinal joint: L-2

STATION TO STATION	
408+90.00	419+04.36
421+48.36	429+00.00

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
408+90.00	419+04.36	4'	4'
421+48.36	429+00.00	4'	4'

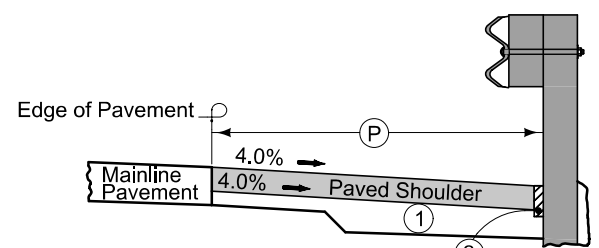


6" HMA Paved Shoulder at guardrail. 7" PCC may be substituted with the following jointing layout:

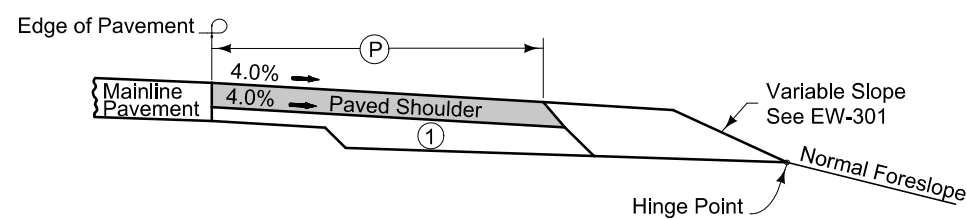
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at W/2 from edge of mainline pavement when W is greater than 10' wide. Terminate longitudinal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

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

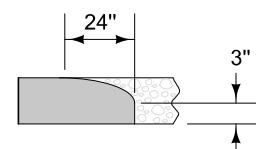
Refer to Shoulder tabulation (112-9) for quantities.



Typical Section with Form Board



Section A-A



Section B-B
Roll down at granular shoulder or earth.

- ① 6" subgrade treatment.
- ② When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.
- ⑤ 'KT-1' joint for PCC shoulder.
'B' joint for HMA shoulder.

PAVED SHOULDER AT GUARDRAIL

Warren County
White Oak TWP.
T-75-N R-24W
SEC. 1

(Remove)
10" X 72.0' Corrugated Plastic Pipe

(Remove)
30" X 56.0' Conc Pipe

Proposed Type "C" Entr. +52
Proposed 30" x 135' Conc/Pipe

Proposed Type "C" Entr. +95
Proposed 24" x 78' C.M.P

400

405

410

415

Sta. 408+90.00
Begin Project

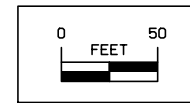
PROX. SEC. LINE

APPROX. SEC. LINE

PROX. SEC. LINE

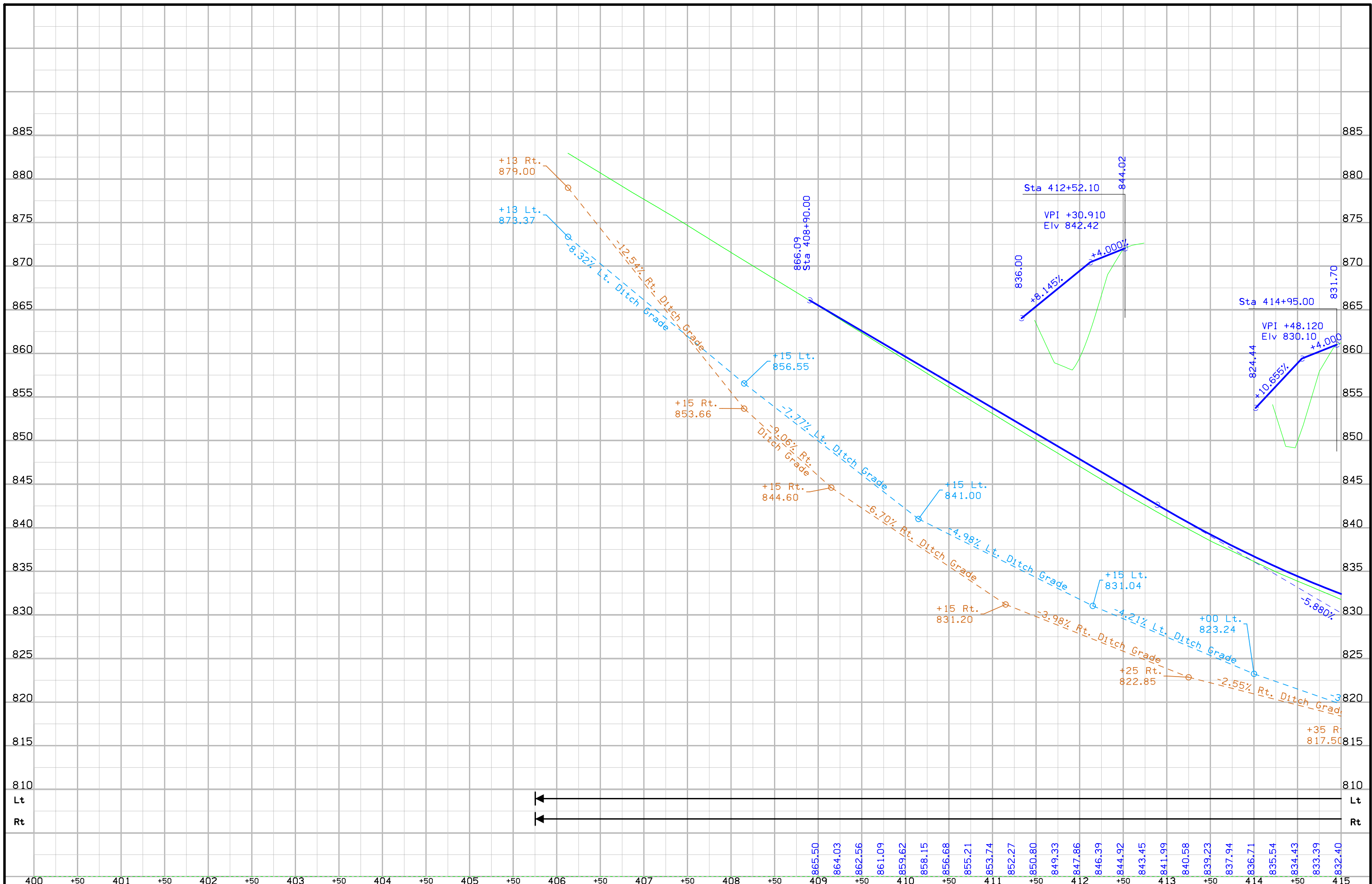
Sta. 403+99.11
24" X 61.0' Conc Pipe
D.A. = 1.4 Ac - H

Sta. 406+00.24, 57.29 Rt.
24" X 72.0' C.M.P.
D.A. = 1.4 Ac - H



T-75N R-23W

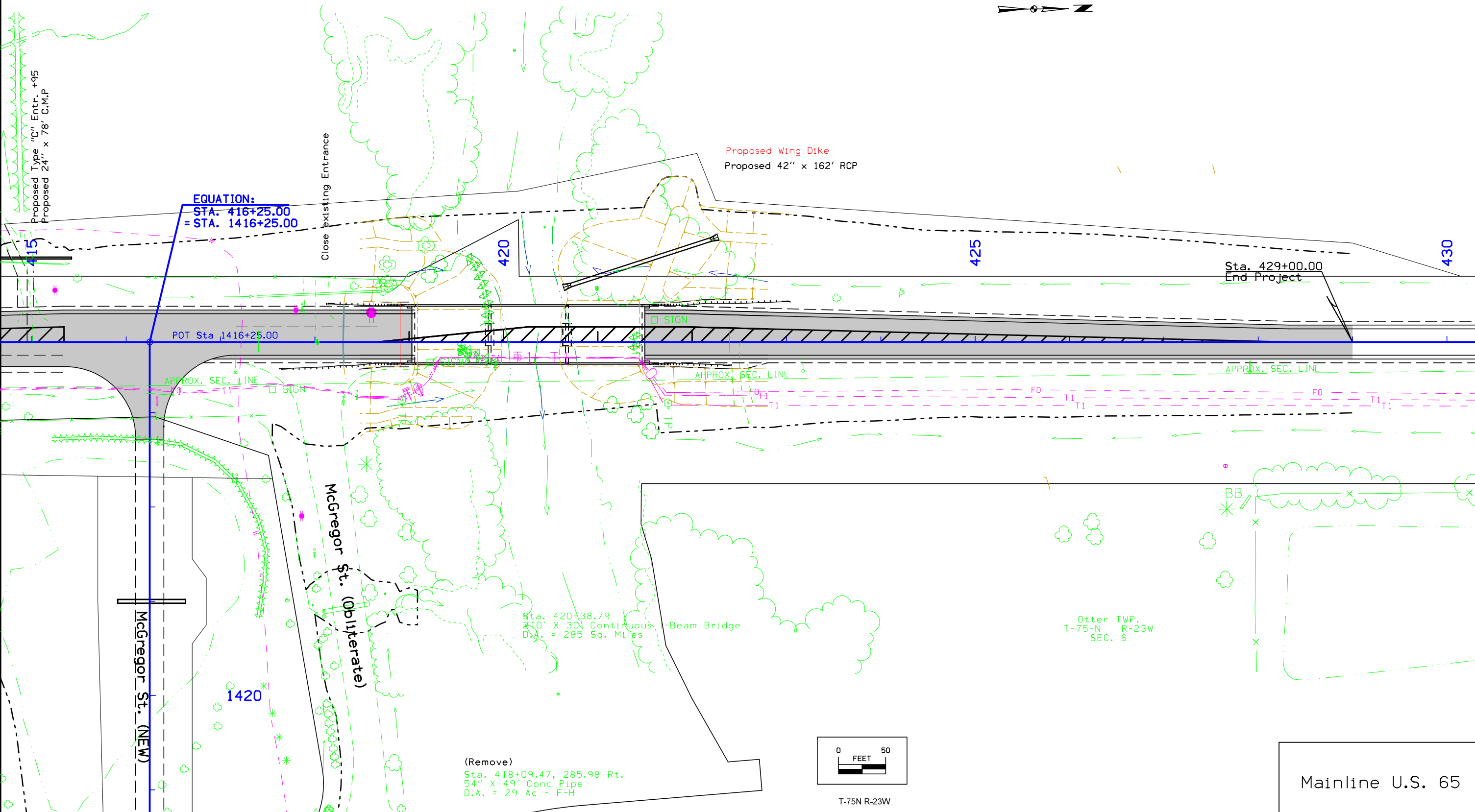
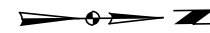
Mainline U.S. 65



Pipe

Warren County
White Oak TWP.
T-75-N R-24W
SEC. 1

(Remove)
24" X 131' C.M.P.



EQUATION:
STA. 416+25.00
= STA. 1416+25.00

Proposed Wing Dike
Proposed 42" x 162' RCP

Sta. 429+00.00
End Project

POT Sta 1416+25.00

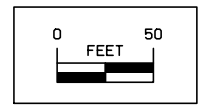
McGregor St. (NEW)

McGregor St. (obliterate)

Sta. 420+38.79
210' X 30' Continuous I-Beam Bridge
D.A. = 285 Sq. Miles

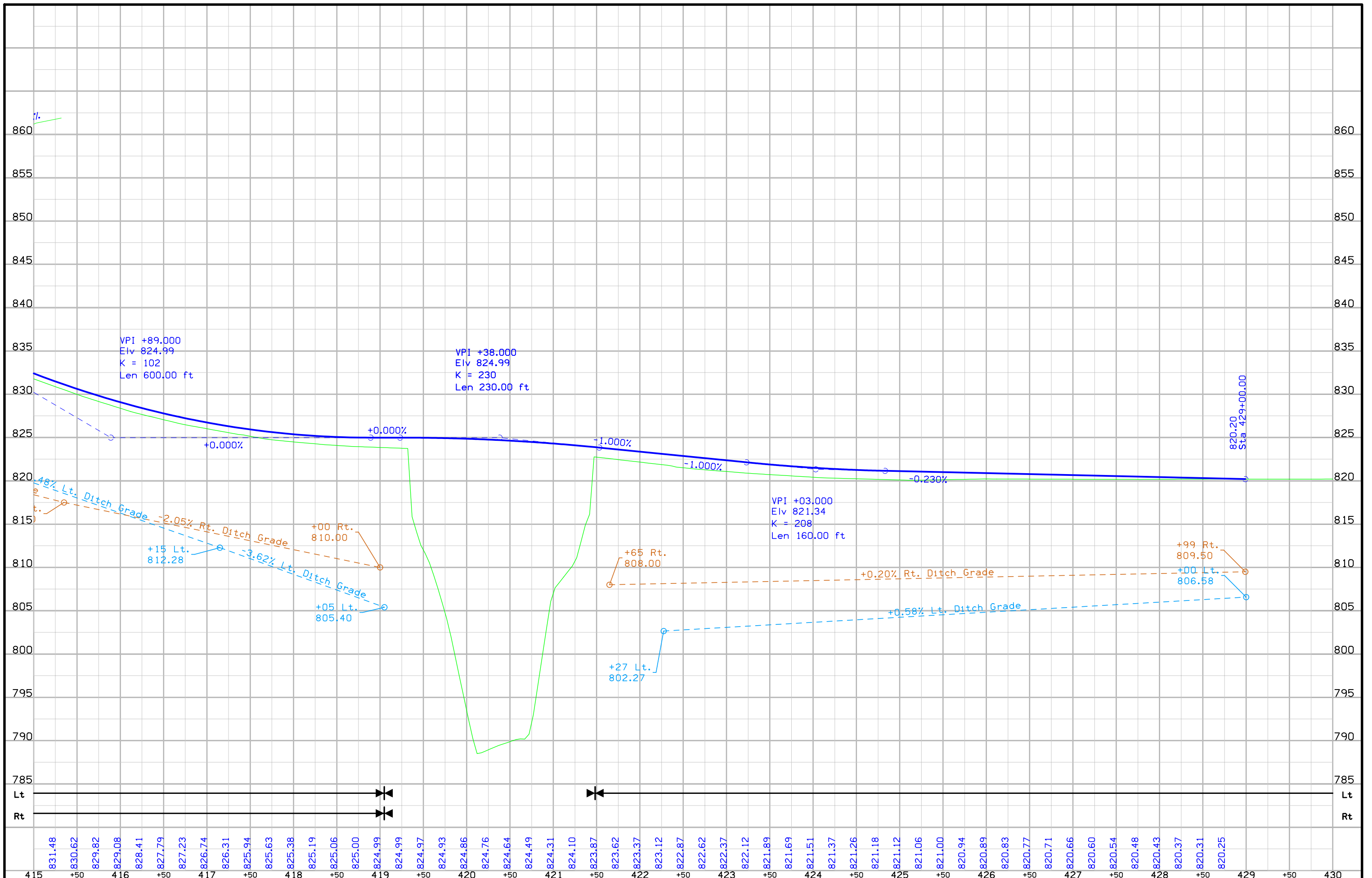
Otter TWP.
T-75-N R-23W
SEC. 6

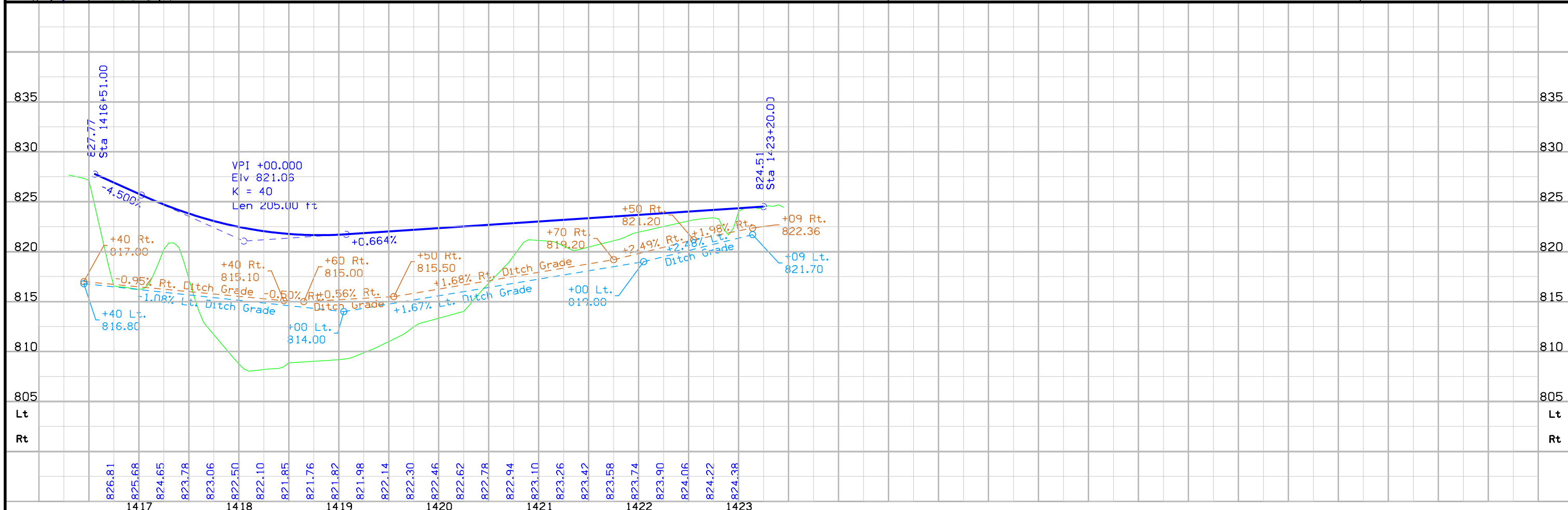
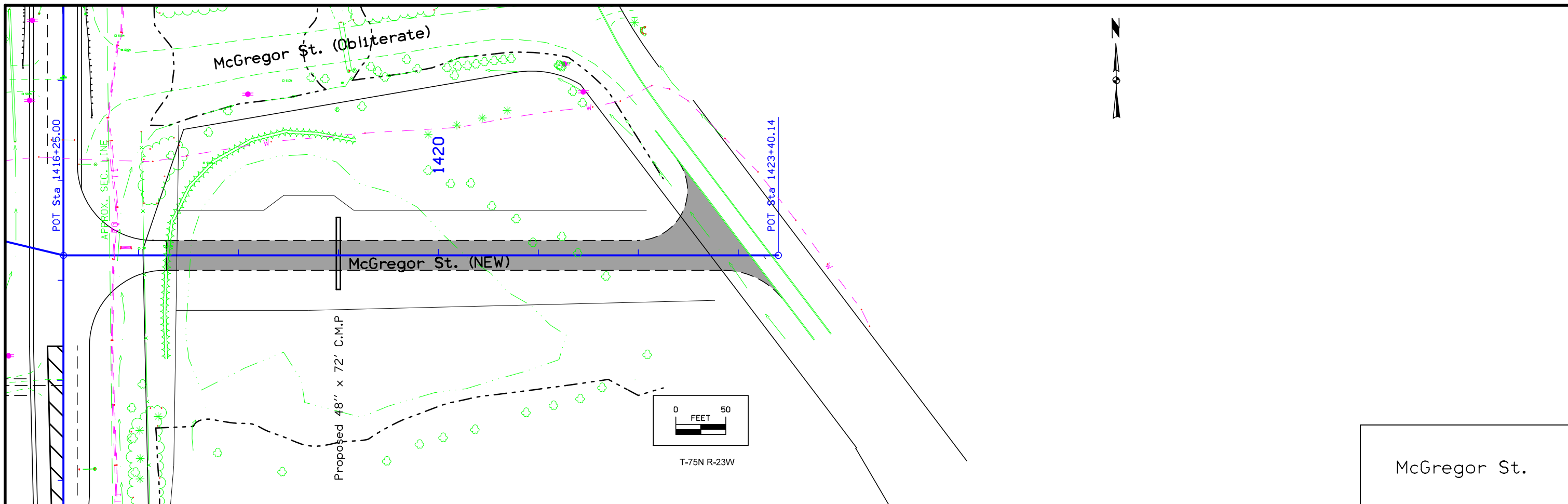
(Remove)
Sta. 418+09.47, 285.98 Rt.
54" X 49' Conc Pipe
D.A. = 29 Ac - F-H

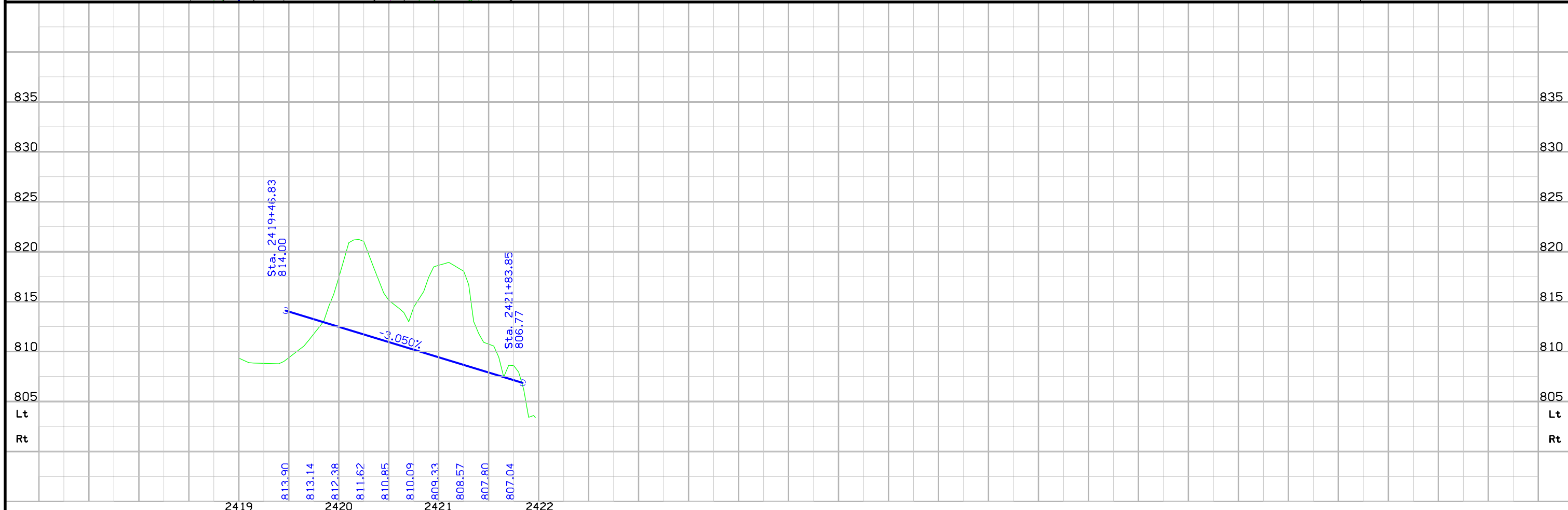
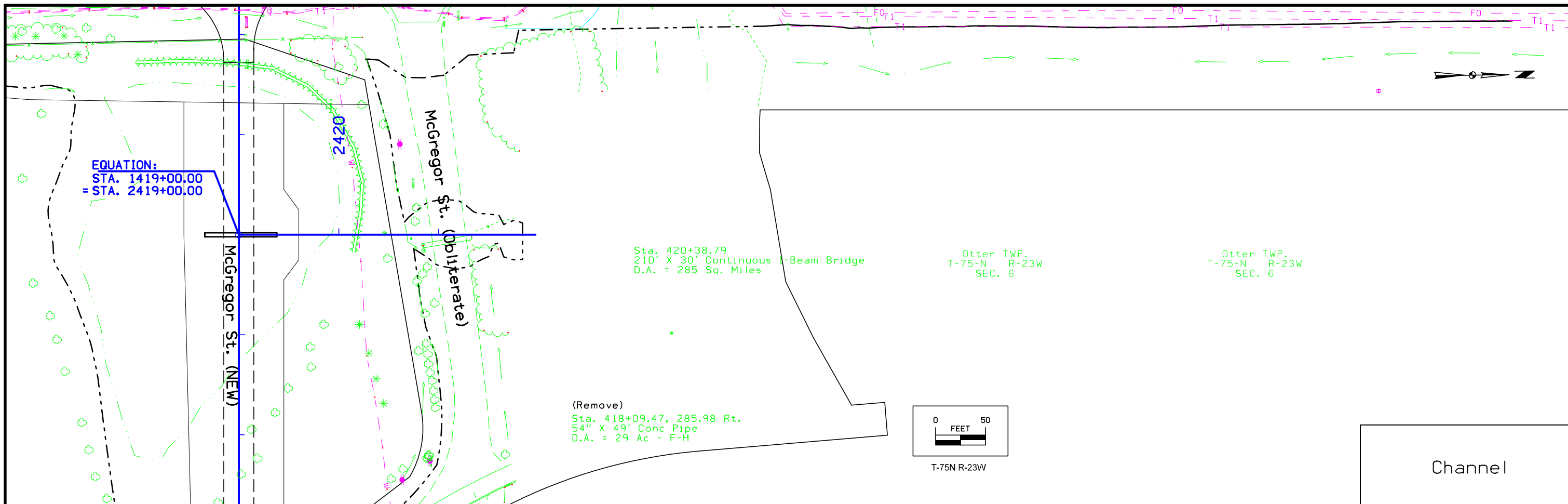


T-75N R-23W

Mainline U.S. 65







Survey Information

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction @ South River and proposed relocation of McGregor St. This project is a complete field survey for the digital terrain model.

Vertical Control

Project ellipsoidal height was established at Pt. 2 by averaging a minimum of five 1a RTN RTK observations with 1 hour or greater time span between each observation. NAVD88 height was computed at Pt. 2 using Geoid 12A. The relative network error of height observations was less than 0.04 ft. at 95% confidence level. Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup at Pt. 2. A minimum of three observations were collected with 1 hour or greater time span between each observation. The local error of these observations relative to Pt. 1 was less than 0.12 ft. at 95% confidence level.

This survey also observed 1 As built plan height to compare with observed survey height: South Bridge seat plan height = 830.74 Project # BRF-65-3(66)--38-91(Plan datum is not specified)
NAVD88 height computed using Geoid 12A = 819.65

Horizontal Control

The project coordinate system is Modified Iowa State Plane South Zone (U.S. Survey Feet) scaled around Pt. 2 at 479981.901 N, 1624392.697 E, 1162.056 (H)eight. 1aRTN datum is adjusted to NAD83(2011) (Epoch 2010.00). Project coordinates were established at Pt. 2 by averaging a minimum of five 1a RTN RTK observations with 1 hour or greater time span between each observation. The relative network error of observations was less than 0.07 ft. at 95% confidence level. Additional control points were placed throughout the project using a GNSS Base-Rover setup at Pt. 2. A minimum of three observations were collected with 1 hour or greater time span between each observation. The local error of these observations relative to Pt. 1 was less than 0.08 ft. at 95% confidence level.

1/Combined Scale Factor of project (State plane grid modified to ground)=1.000089620335

The 1/Combined Scale Factor scaled at Pt. 2 will be used for GPS/GNSS stakeout and location survey in the Project Coordinate system. A scale factor of 1 will be used for total station stakeout and location survey in the Project Coordinate system.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans # Warren Co. Project # 11 (3). Survey stationing was equated to the plan at POT Sta. 446+63.4, and run back and ahead without equation throughout the survey.

Equations are as follows:

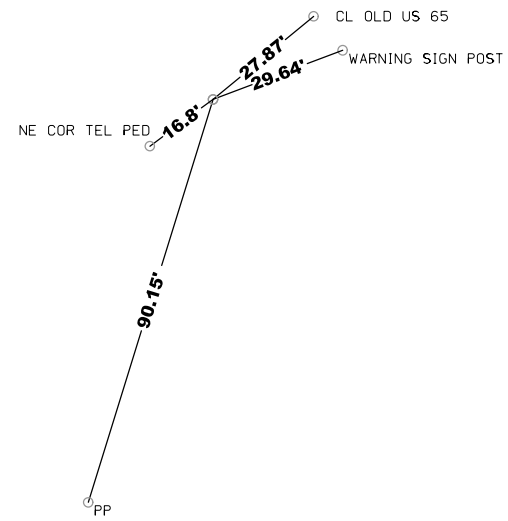
POT Sta. 446+63.4 This Survey
= POT Sta. 446+63.4 As-built Plans # Warren Co. Project # 11 (3)

CP STA 398+06.97 this survey
= PT STA 398+06.7 As-built Plans # Warren Co. Project # 11 (3)

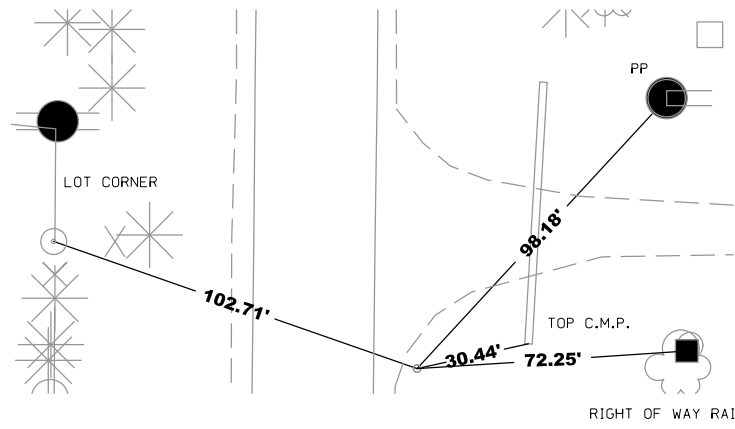
VERTICAL CONTROL

Point	North	East	Elevation	Station	Offset	Feature	Description
500	484154.953	1624360.526	826.399	419+32.14	-16.574	BM	FOUND IHC BUTTON
501	485847.391	1624335.947	818.123	436+24.16	-61.641	BM	IDOT BUTTON SW WING BRIDGE SOUTH RIVER

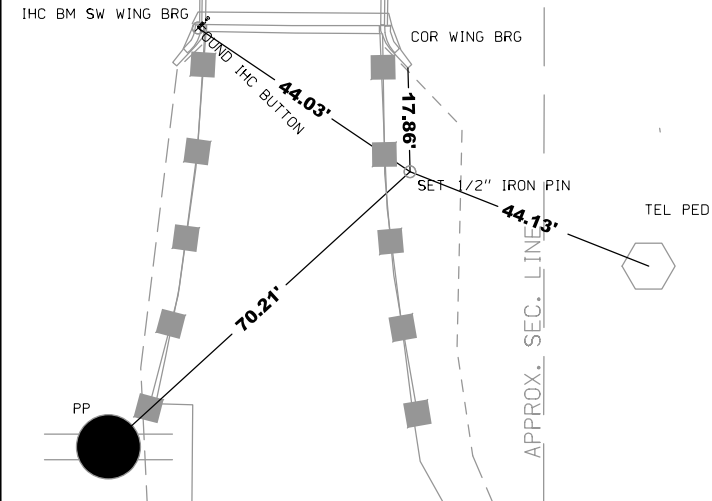
CP Sta. Off Chain
 CP No. 2, Set Feno Monumet
 N=479981.901, E=1624392.697



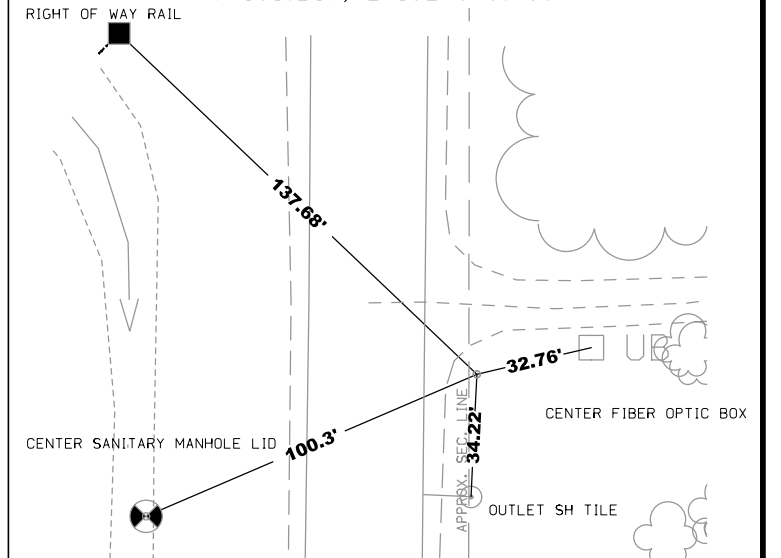
CP Sta. 406+53.24, 27.66 Rt
 CP No. 3, Set Iron Pin
 N=482875.609, E=1624389.276



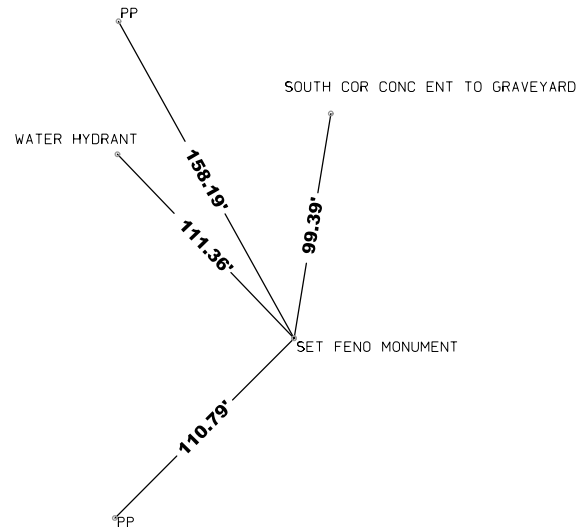
CP Sta. 419+07.85, 20.15 Rt
 CP No. 4, Set Iron Pin
 N=484130.218, E=1624396.956

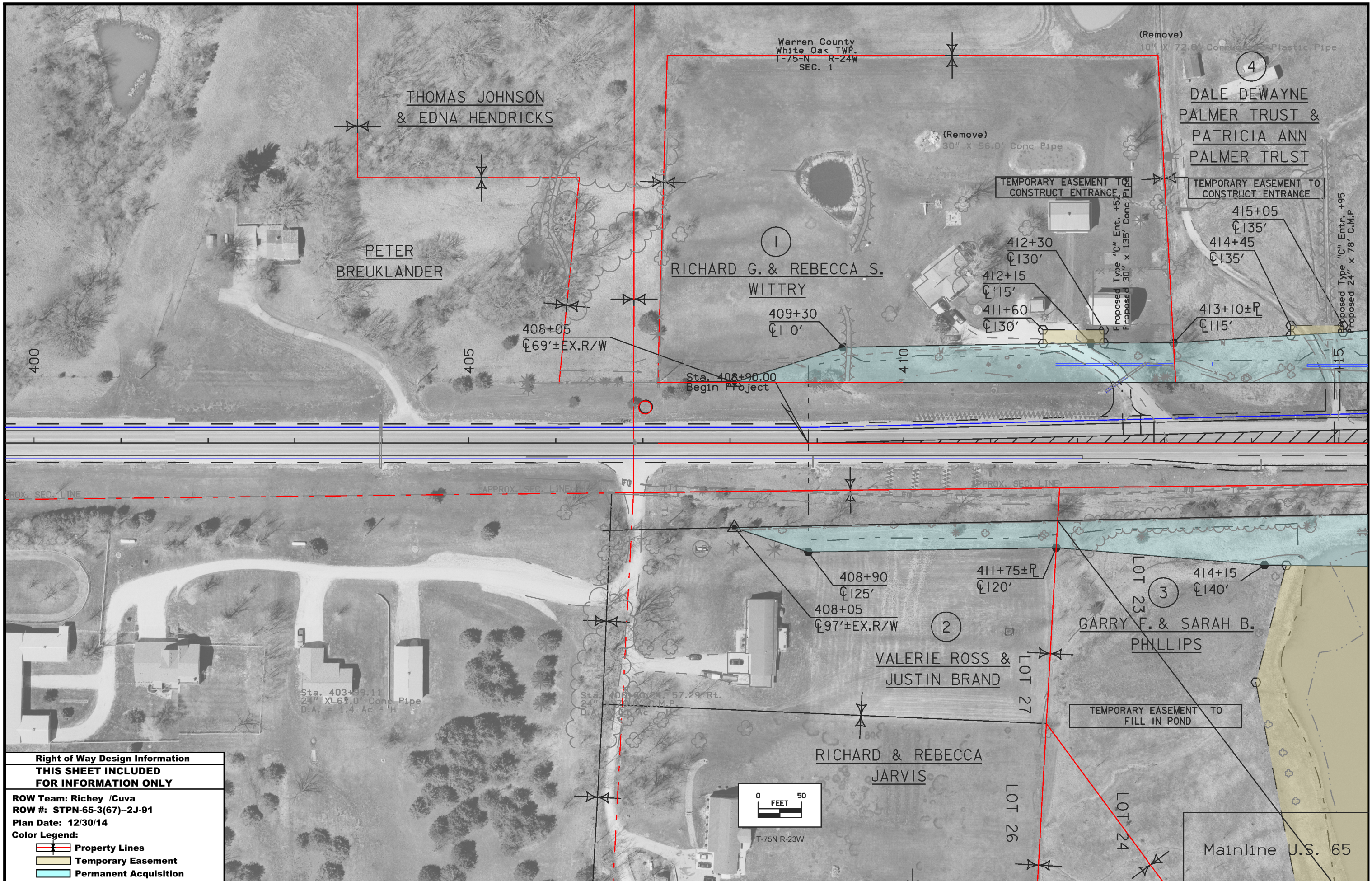


CP Sta. 432+37.17, 30.65 Rt
 CP No. 5, Set Iron Pin
 N=484130.218, E=1624396.956



CP Sta. Off Chain
 CP No. 1, Set Feno Monumet
 N=484130.218, E=1624396.956

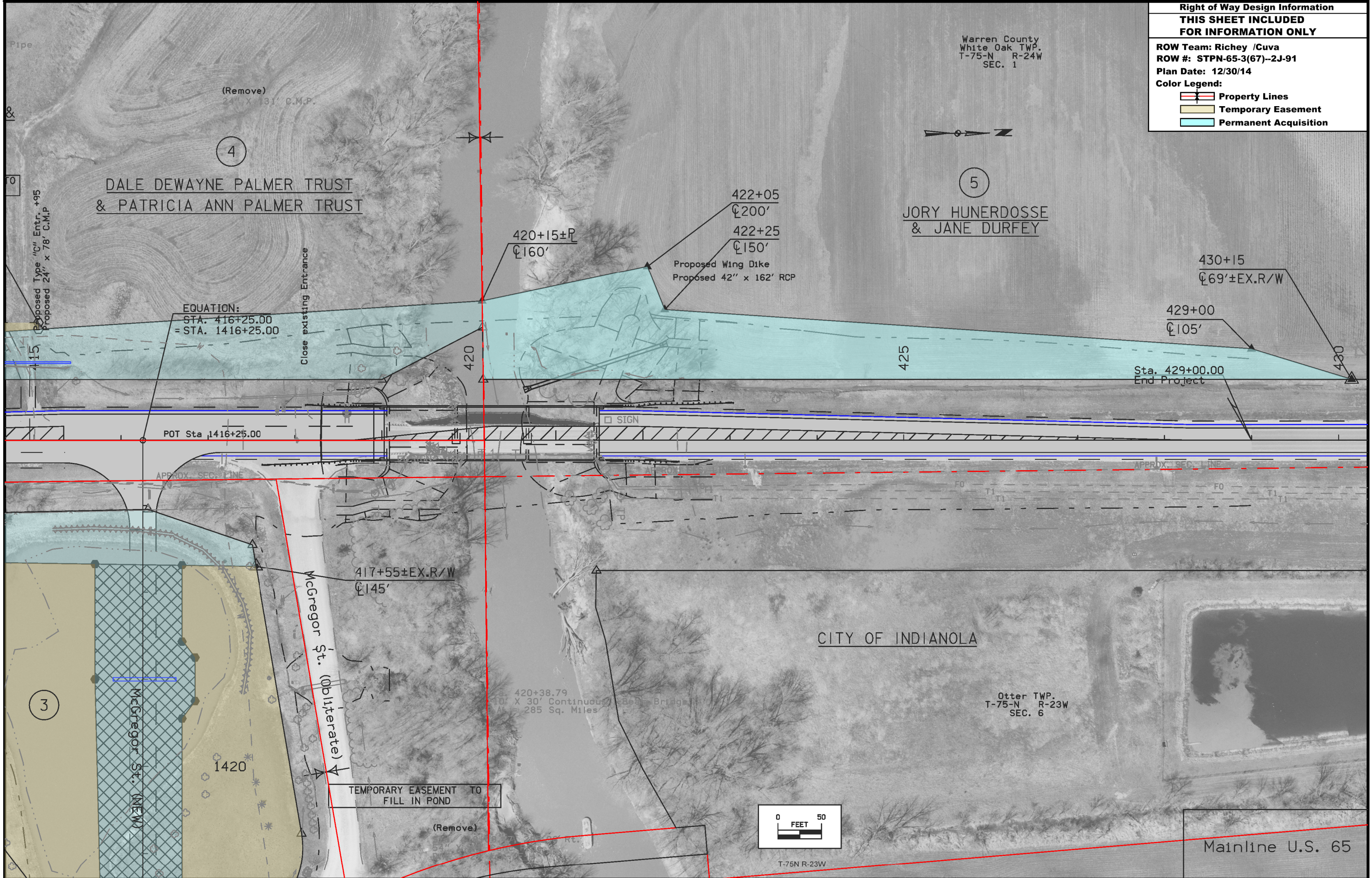
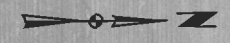




Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: Richey /Cuva	
ROW #: STPN-65-3(67)--2J-91	
Plan Date: 12/30/14	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY
 ROW Team: Richey /Cuva
 ROW #: STPN-65-3(67)-2J-91
 Plan Date: 12/30/14
 Color Legend:
 [Red Line] Property Lines
 [Yellow Area] Temporary Easement
 [Cyan Area] Permanent Acquisition

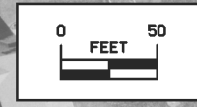
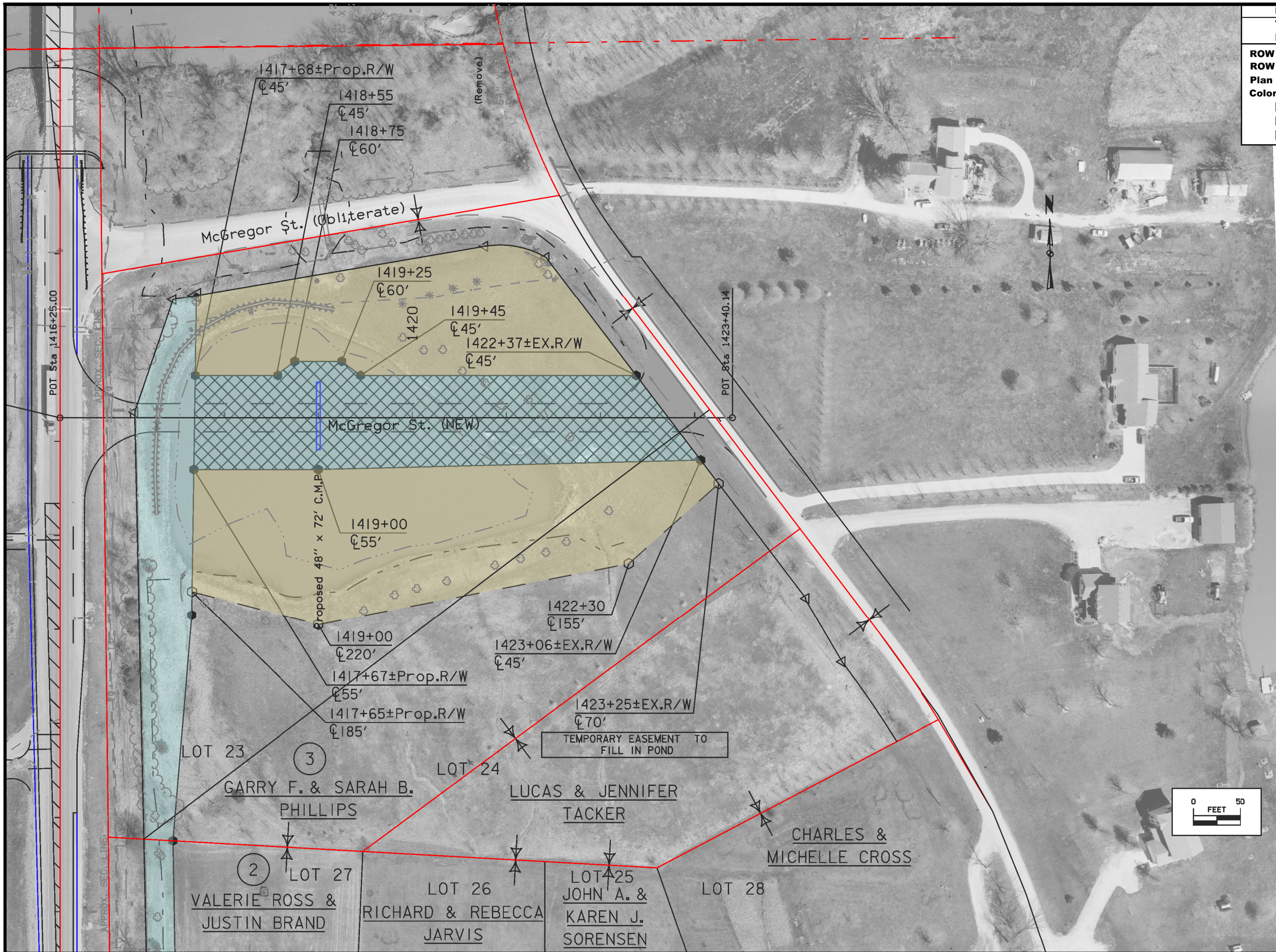
Warren County
 White Oak TWP.
 T-75-N R-24W
 SEC. 1



Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: Richey /Cuva
 ROW #: STPN-65-3(67)-2J-91
 Plan Date: 12/30/14

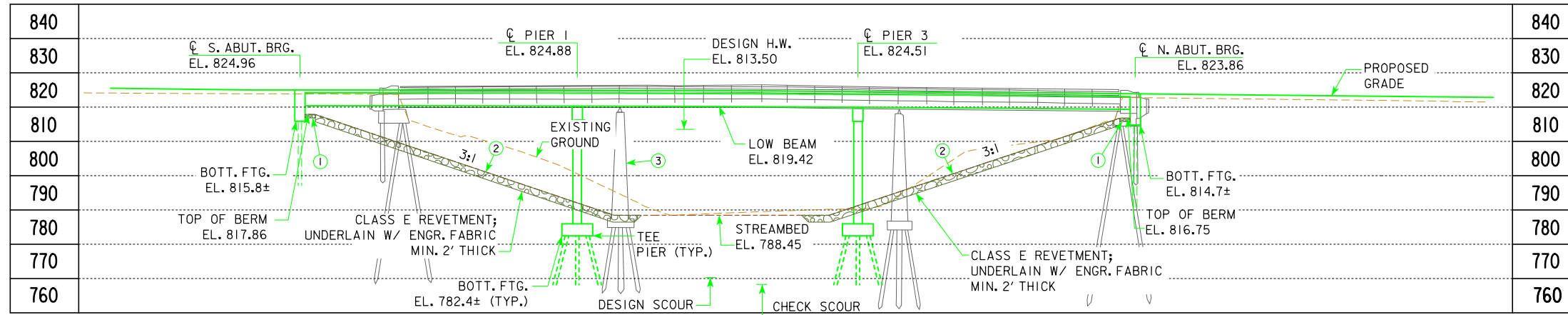
- Color Legend:**
- Property Lines
 - Temporary Easement
 - Permanent Acquisition



McGregor St.

NOTE: TOP OF BRIDGE DECK CROWN 0.03' BELOW PROFILE GRADE.

BENCH MARK NO. 500 STA. 419+32.14, 16.57' LT, EL. 826.399, FOUND IHC BUTTON

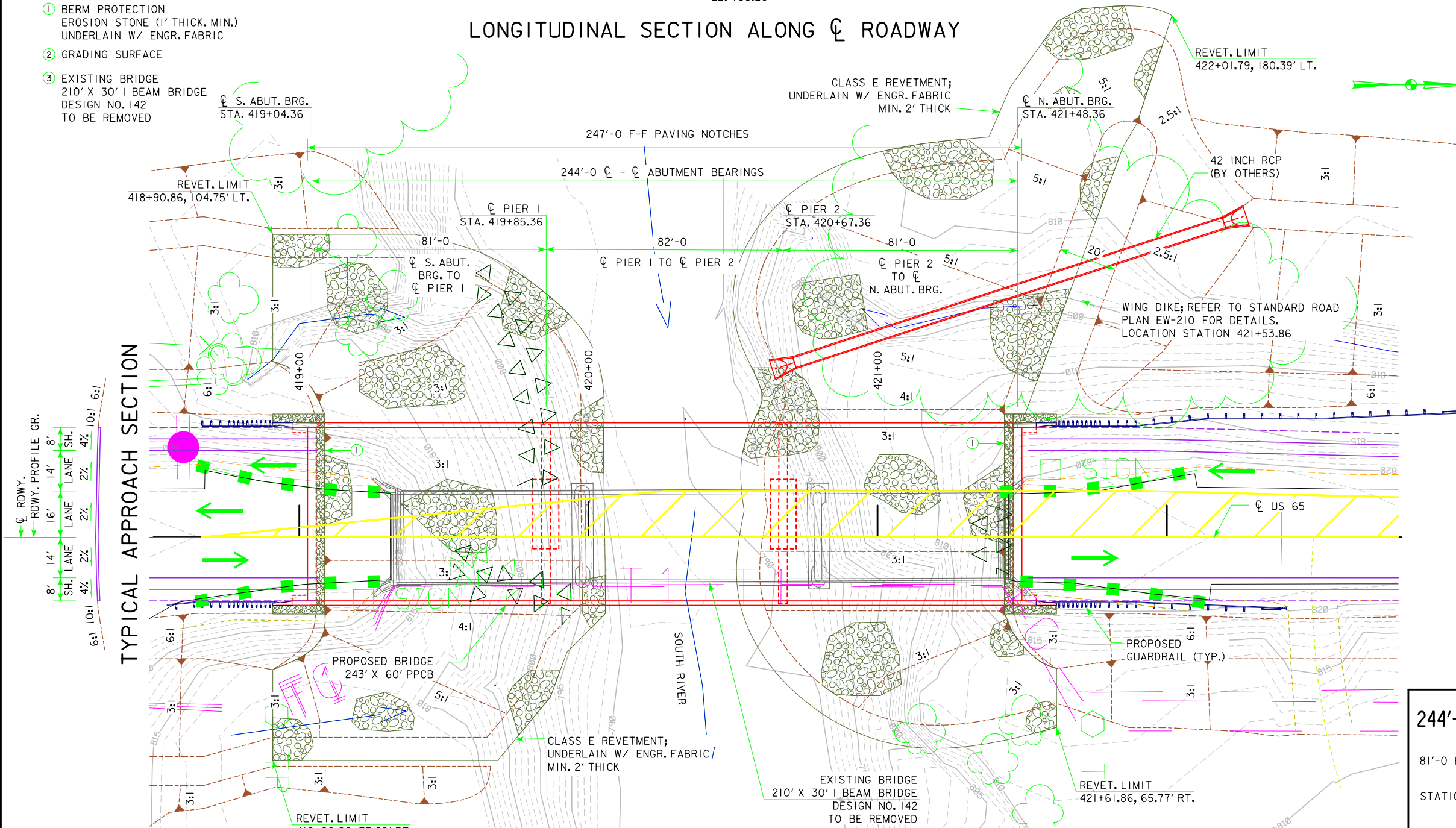


0.000% -1.000%
 VPI STA = 420+38.00 VC = 230'
 VPI ELEV = 824.99
PROPOSED PROFILE
US 65

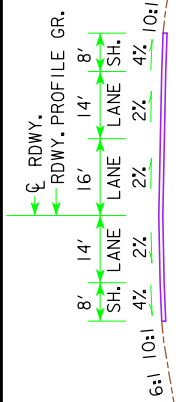
HYDRAULIC DATA
 DRAINAGE AREA = 283 SQ. MI.
 STREAM SLOPE = 3.0 FT./MI.
 Q₂ = 9,100 CFS
 STAGE = 804.97
 CHANNEL VELOCITY = 5.8 FPS
 Q₅₀ = 27,100 CFS
 STAGE = 813.50
 BACKWATER = 0.46 FT.
 AVG. BRIDGE VELOCITY = 8.8 FPS
 Q₁₀₀ = 30,400 CFS
 STAGE = 814.21
 BACKWATER = 0.67 FT.
 AVG. BRIDGE VELOCITY = 9.4 FPS
 Q₂₀₀ = 35,000 CFS
 STAGE = 814.80
 CALCULATED DESIGN SCOUR = 770.26
 Q₅₀₀ = 38,600 CFS
 STAGE = 814.62
 AVG. BRIDGE VELOCITY = 11.8 FPS
 CALCULATED CHECK SCOUR = 768.26
 ROADWAY OVERTOP 820.09
 STA. 425+00

- ① BERM PROTECTION
EROSION STONE (1' THICK, MIN.)
UNDERLAIN W/ ENGR. FABRIC
- ② GRADING SURFACE
- ③ EXISTING BRIDGE
210' X 30' I BEAM BRIDGE
DESIGN NO. 142
TO BE REMOVED

LONGITUDINAL SECTION ALONG C ROADWAY

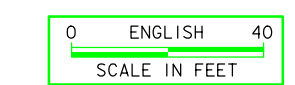


TYPICAL APPROACH SECTION



TRAFFIC ESTIMATE
 2011 AADT 5,700 V.P.D.
 2032 AADT 7,400 V.P.D.
 202_ DHV - V.P.H.
 TRUCKS 8 %
 TOTAL DESIGN ESALS -

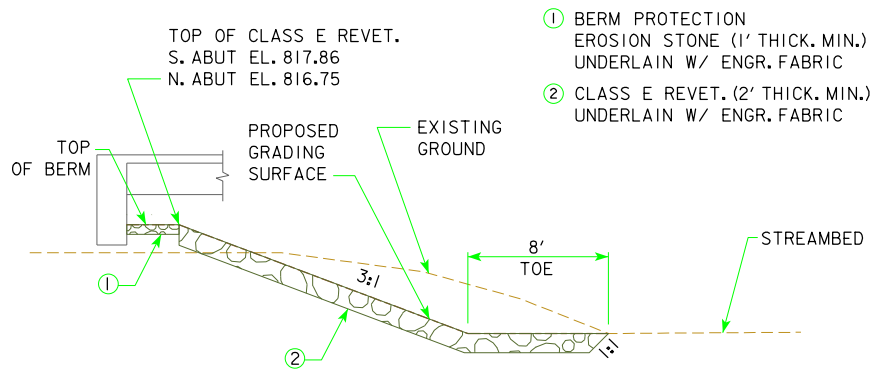
LOCATION
 US 65 OVER THE SOUTH RIVER
 T-75N R-23W
 SECTION 6
 OTTER TOWNSHIP
 WARREN COUNTY
 BRIDGE MAINT. NO. 9156.75065
 FHWA NO. 50891
 LATITUDE 41.329123°
 LONGITUDE -93.558427°



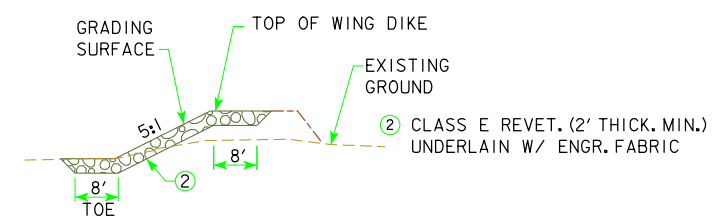
TYPE TL-4 BRIDGE RAILING PROPOSED

DESIGN FOR 0° SKEW
244'-0 X 60'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 81'-0 END SPANS 82'-0 INTERIOR SPAN
SITUATION PLAN
 STATION 420+26.36 BTC BEAM APRIL 2014
WARREN COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 3 FILE NO. 31060 DESIGN NO. 916

SITUATION PLAN



TYPICAL SECTION AT BRIDGE BERM REVETMENT PROTECTION



TYPICAL SECTION AT WING DIKE

UTILITIES LEGEND:
FO - FIBER OPTIC - CENTURYLINK
TI - TELEPHONE - CENTURYLINK
W - WATER - WARREN WATER DISTRICT
- POWER POLE - MIDAMERICAN ENERGY

BERM SLOPE LOCATION TABLE						
SOUTH ABUTMENT			NORTH ABUTMENT			
STATION	OFFSET	ELEV	STATION	OFFSET	ELEV	
A1	419+97.47	42.58' LT	788.45	420+66.98	42.58' LT	788.45
A2	419+97.63	0	788.45	420+60.29	0	788.45
A3	419+94.38	26.58' RT	788.45	420+61.87	26.58' RT	788.45
B1	419+08.86	42.58' LT	817.86	421+43.86	42.58' LT	816.75
B2	419+08.86	0	817.86	421+43.86	0	816.75
B3	419+08.86	26.58' RT	817.86	421+43.86	26.58' RT	816.75
G1	418+90.86	106.74' LT	805.88	420+71.05	109.27' LT	801.00
G2	418+90.86	96.74' LT	805.88	421+43.87	130.75' LT	810.96
G3	419+34.29	106.74' LT	805.00	421+86.57	133.95' LT	816.75
G4	419+39.02	96.74' LT	805.00	421+57.38	54.20' LT	816.75
G5	418+90.86	60.76' LT	817.86	421+61.86	45.48' RT	816.75
G6	419+77.08	80.60' LT	792.19			
G7	418+90.86	45.79' RT	817.86			
G8	418+90.86	69.22' RT	810.05			
G9	418+90.86	79.22' RT	810.05			
G10	419+64.91	69.22' RT	808.00			
G11	419+66.19	79.22' RT	808.00			
W1	418+90.86	42.58' LT	823.92	421+61.86	42.58' LT	822.68
W2	418+90.86	26.58' RT	824.24	421+61.86	26.58' RT	823.00

W - END WING / EROSION STONE
BERM SLOPE TABLE ELEVATIONS REFLECT GRADING SURFACE
G1, G2, G3, G4, G8, G9, G10 AND G11 ARE DITCH FLOW LINE POINTS

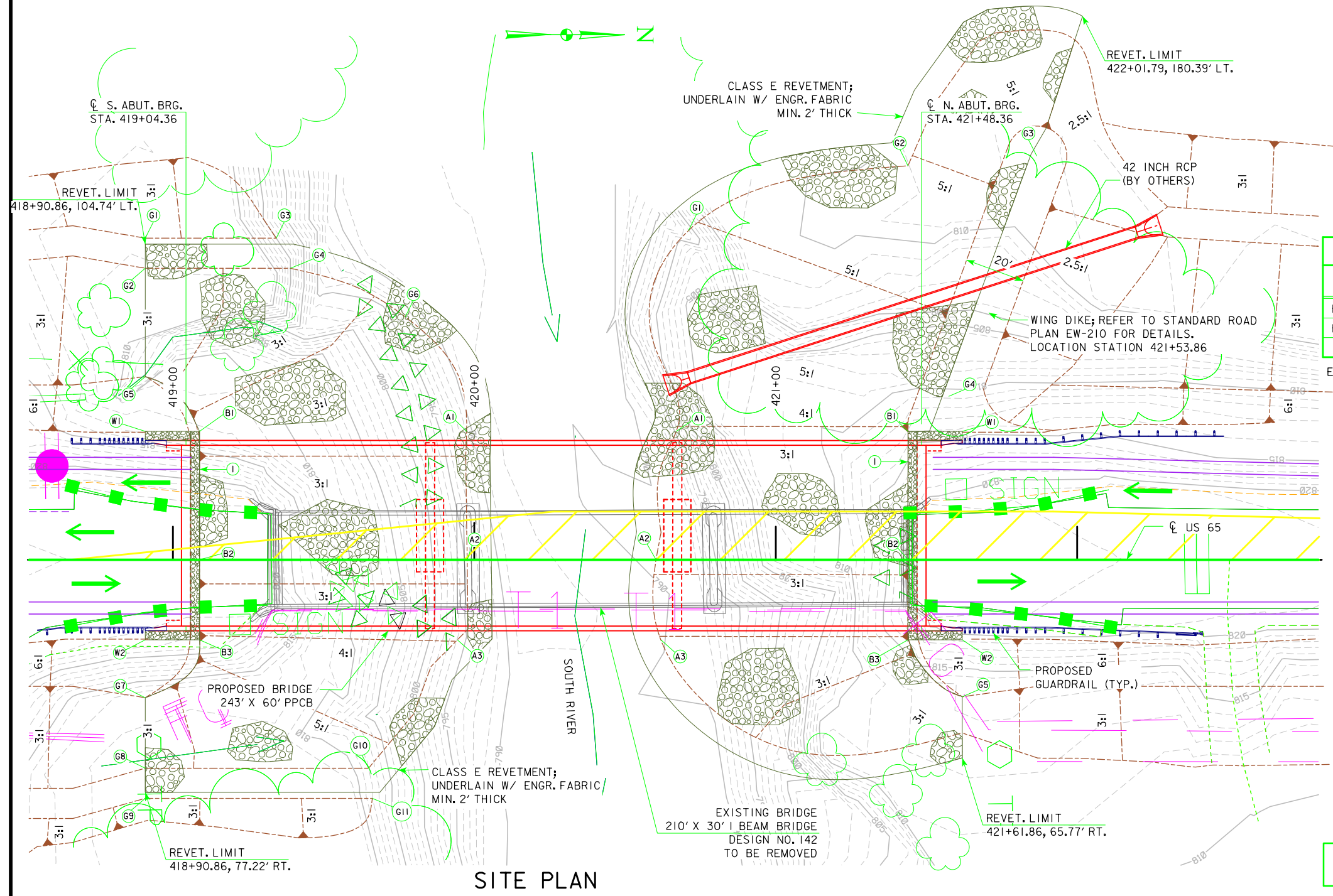
GRADING CONTROL-SOUTH:
POINTS A1, A2 AND A3 ARE BANK GRADING CONTROL LINE

GRADING CONTROL-NORTH:
POINTS A1, A2 AND A3 ARE BANK GRADING CONTROL LINE

NOTE: BANK GRADING CONTROL LINE LOCATED AT BASE OF 3:1 SLOPE

ESTIMATED BERM ARMORING QUANTITIES				
LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM LINING - SOUTH ABUTMENT	2,154	12	2,136	1,340
BERM LINING - NORTH ABUTMENT	2,753	12	2,724	1,707
TOTALS	4,907	24	4,860	3,047

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.



SITE PLAN

HYDRAULIC DESIGN

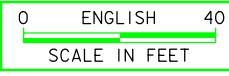
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

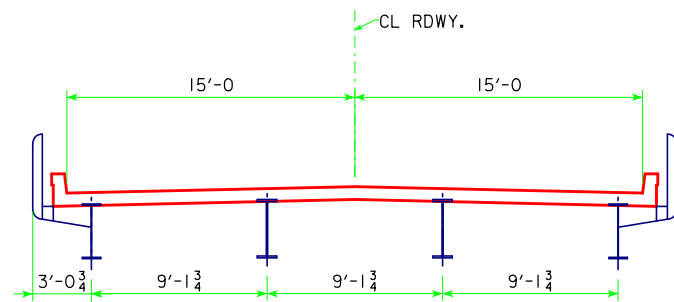
David J. Mulholland 4/9/14
Signature Date
Printed or Typed Name **David J. Mulholland**
My license renewal date is December 31, 2014

Pages or sheets covered by this seal: _____ V.1 AND V.2



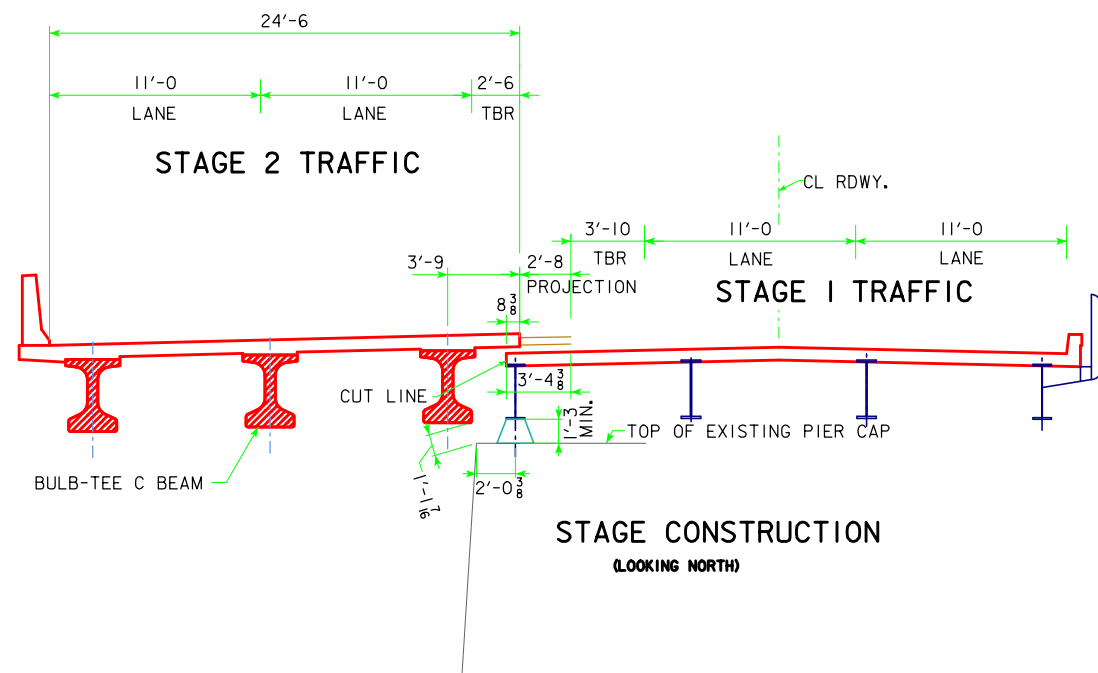
DESIGN FOR 0° SKEW
244'-0 X 60'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
81'-0 END SPANS 82'-0 INTERIOR SPAN
SITUATION PLAN-SITE
STATION 420+26.36 BTC BEAM APRIL 2014
WARREN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 3 FILE NO. 31060 DESIGN NO. 916





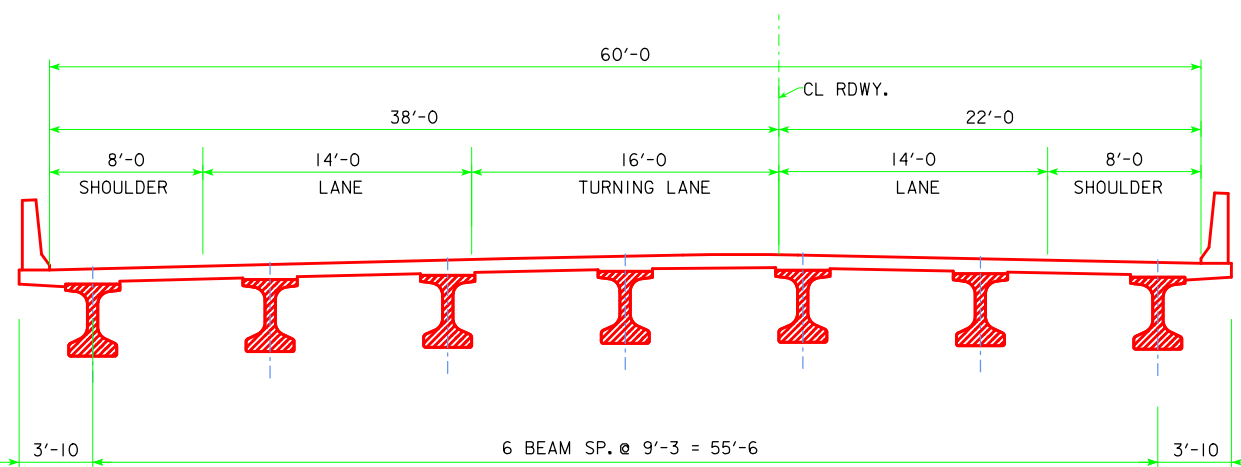
EXISTING CROSS SECTION

(LOOKING NORTH)



STAGE CONSTRUCTION

(LOOKING NORTH)



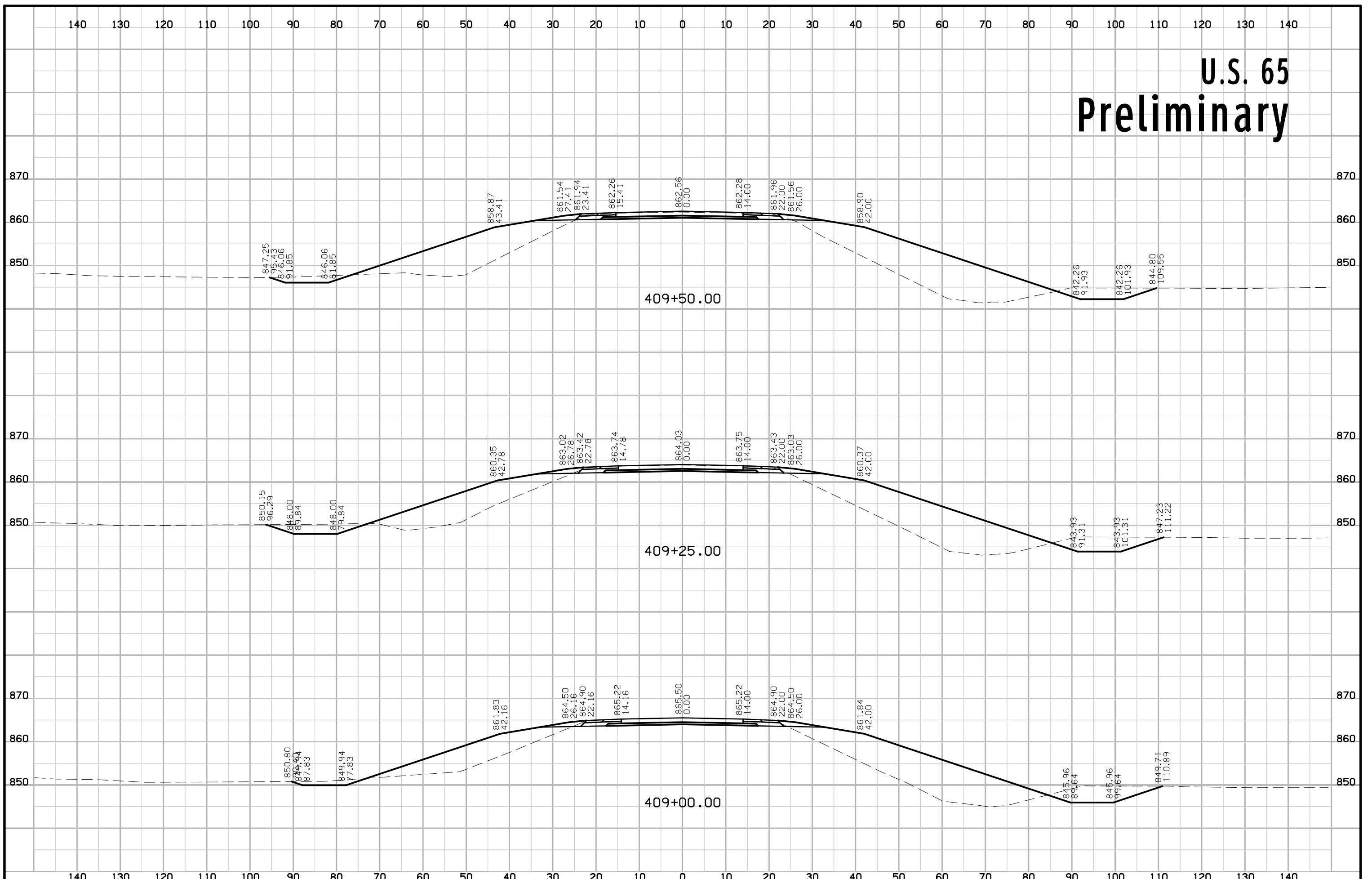
NEW CROSS SECTION

(LOOKING NORTH)

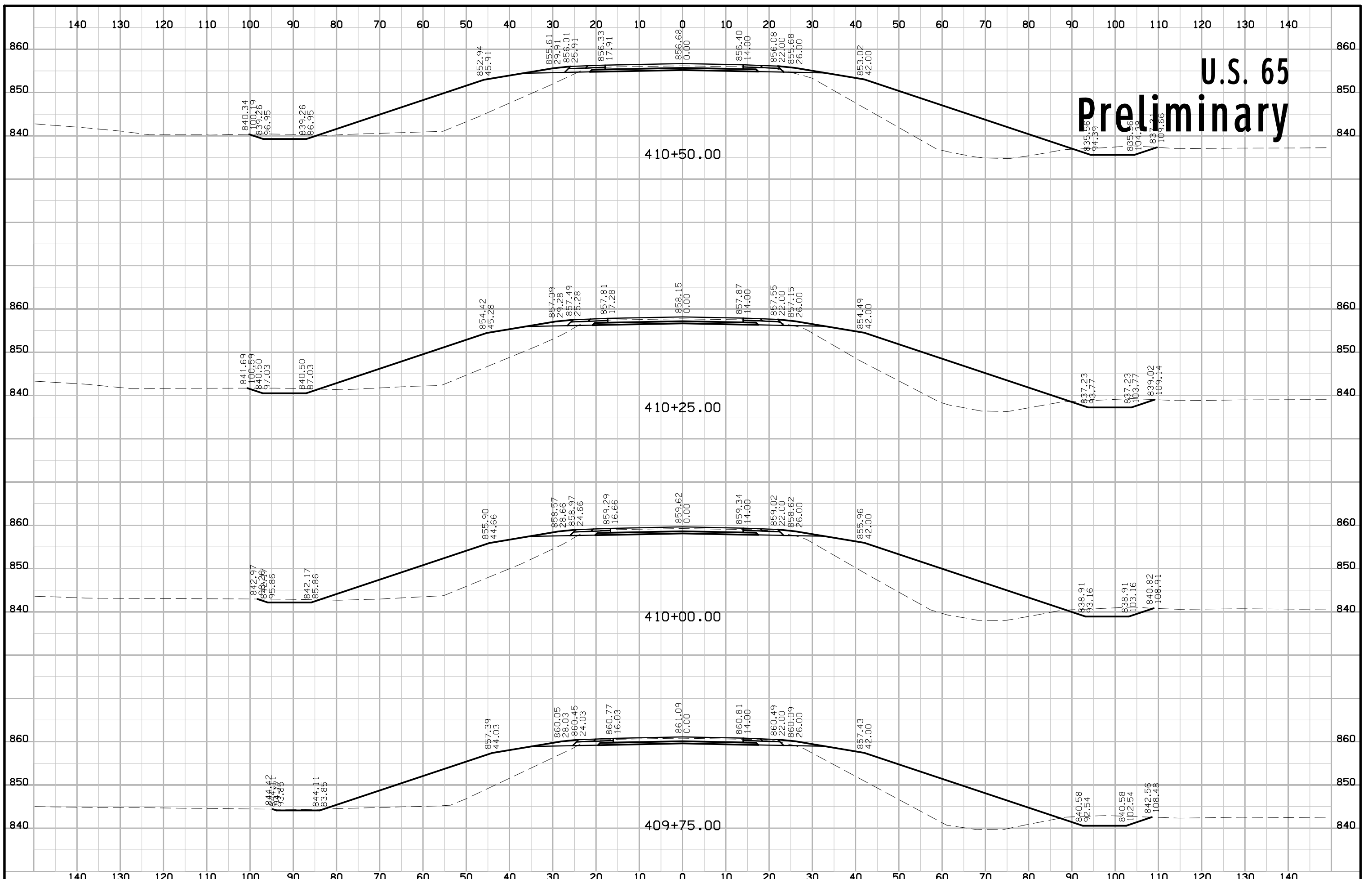
STAGING DETAILS

DESIGN FOR 0° SKEW
244'-0 X 60'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 81'-0 END SPANS 82'-0 INTERIOR SPAN
STAGING DETAILS
 STATION 420+26.36 BTC BEAM APRIL 2014
WARREN COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 3 FILE NO. 31060 DESIGN NO. 916

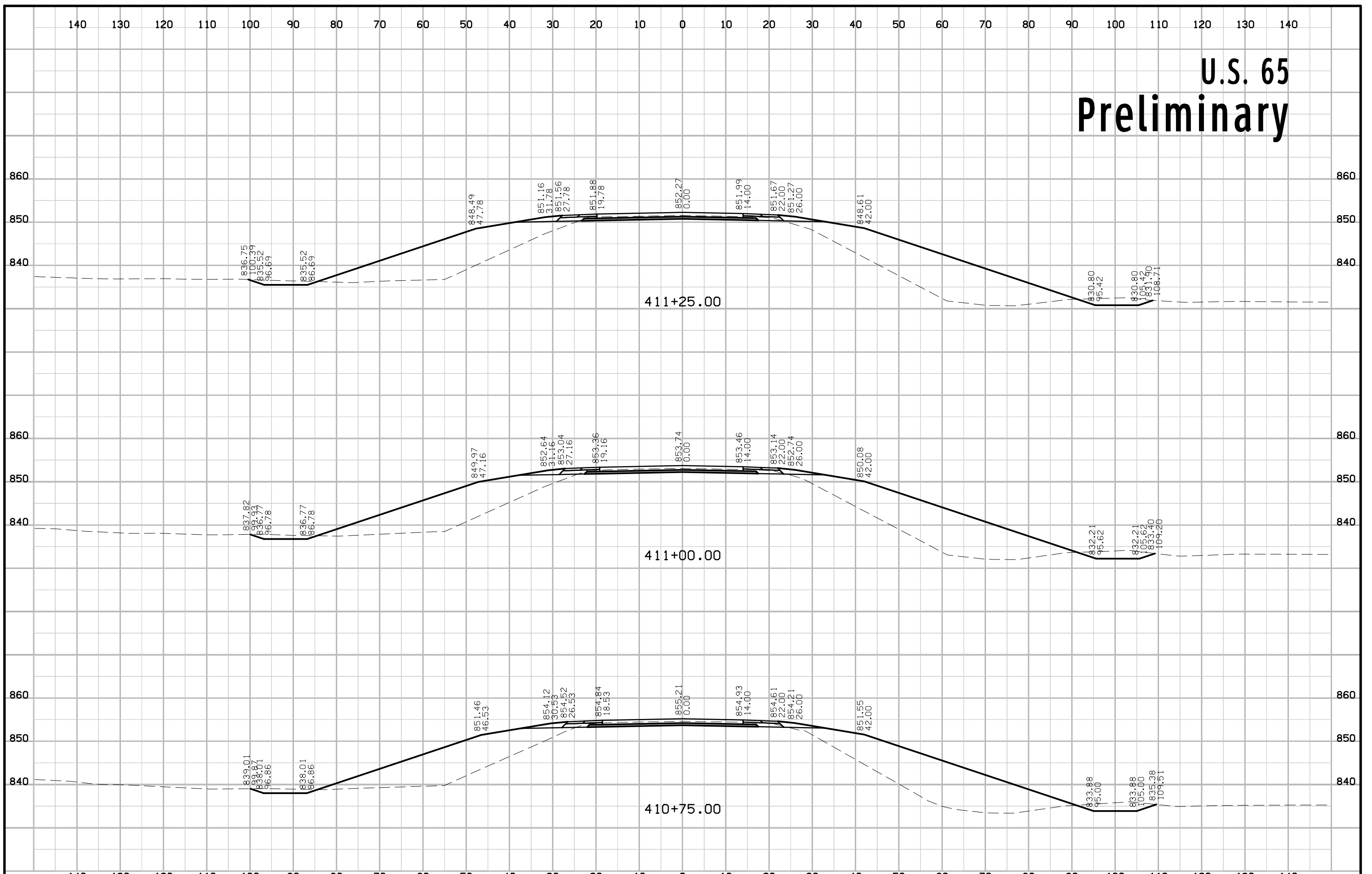
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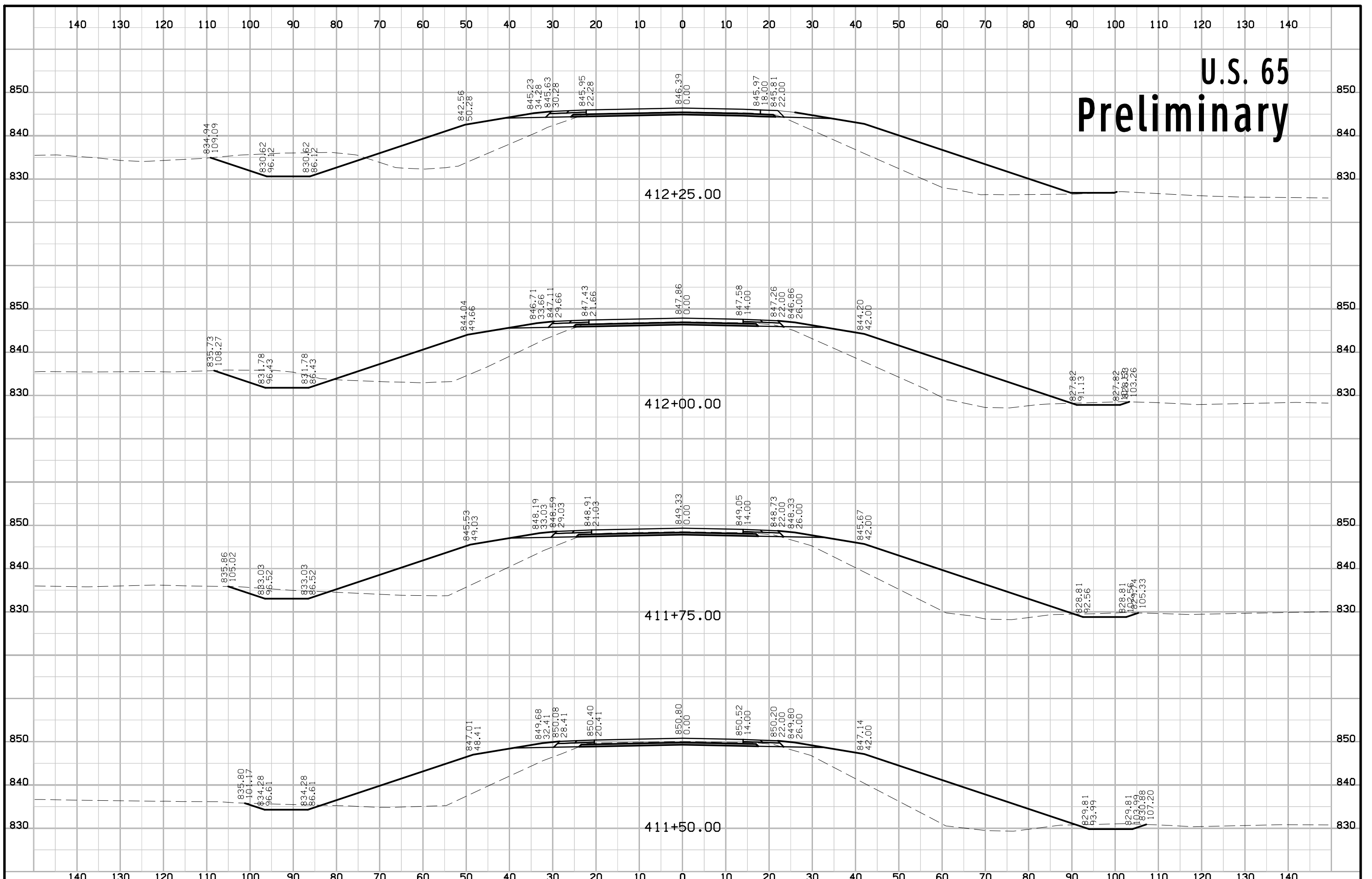
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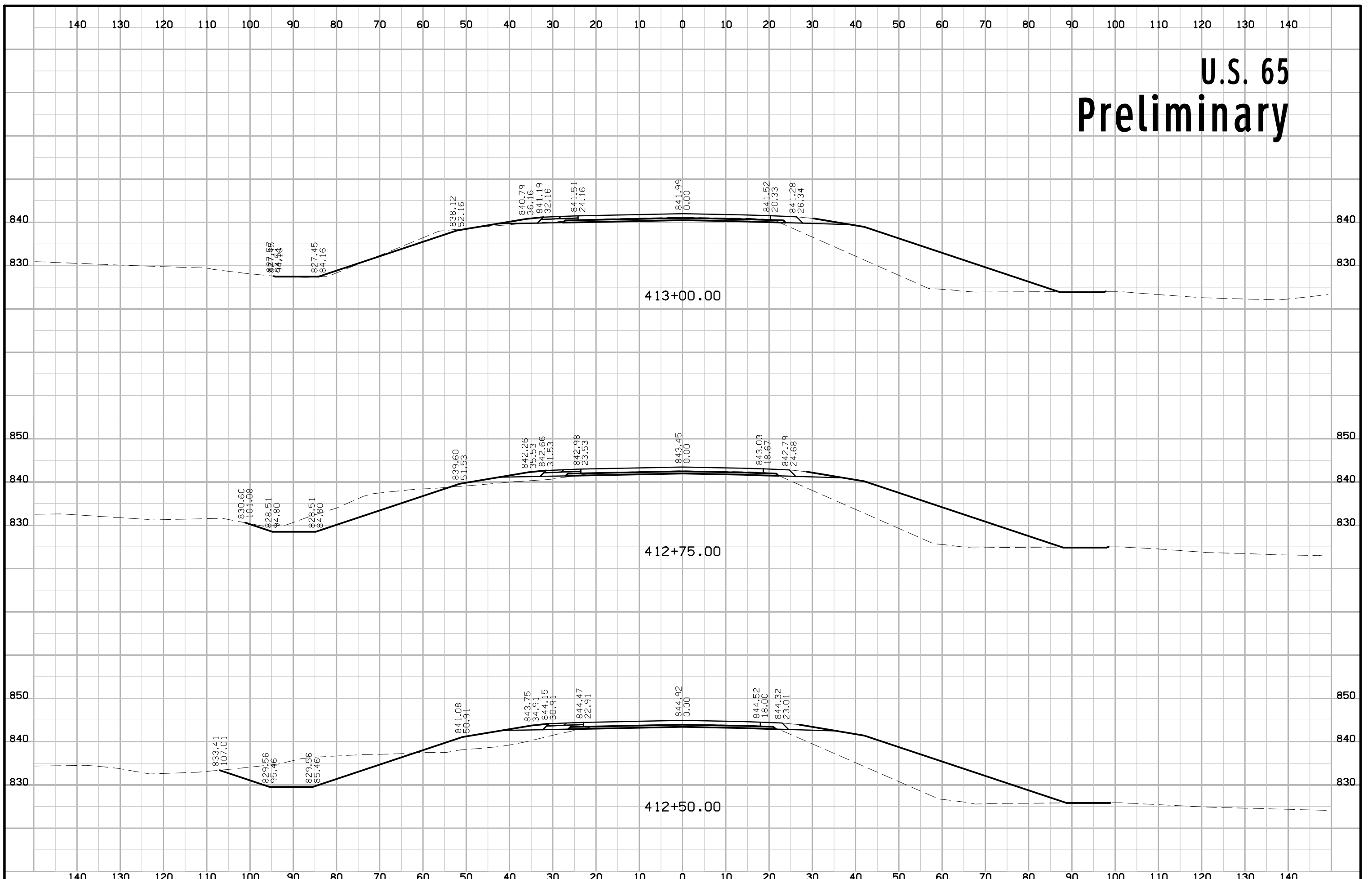
U.S. 65 Preliminary



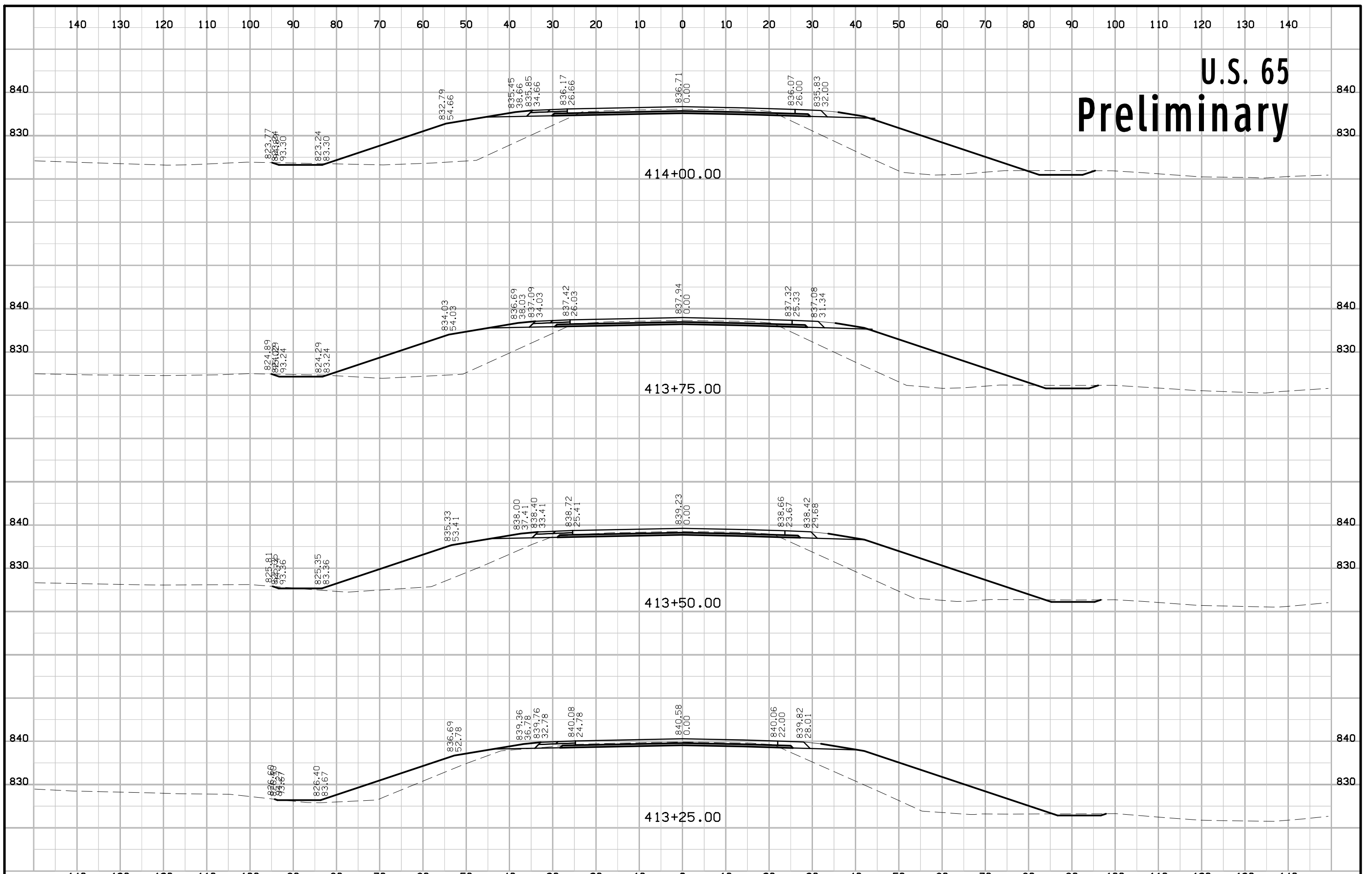
U.S. 65 Preliminary



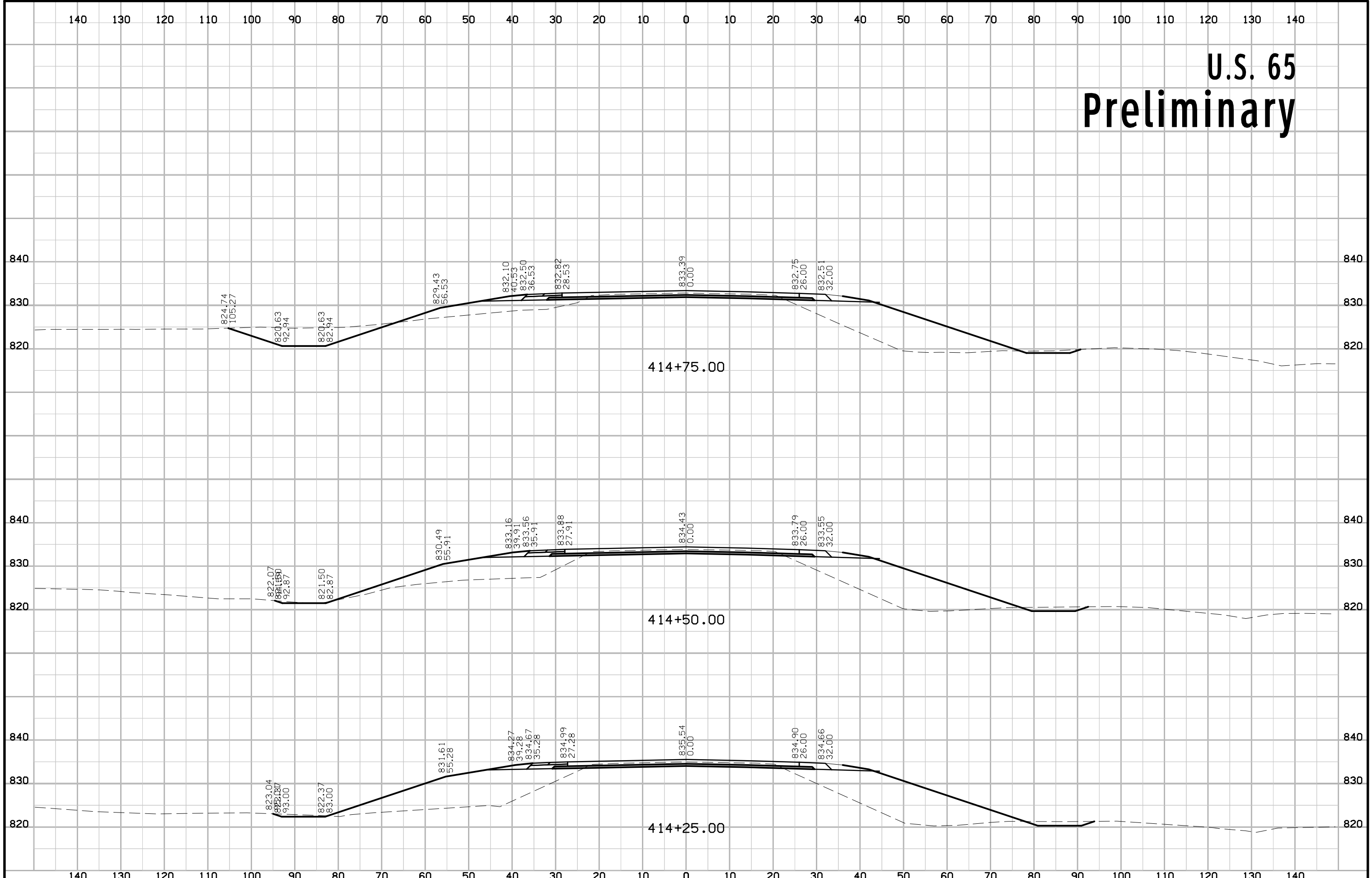
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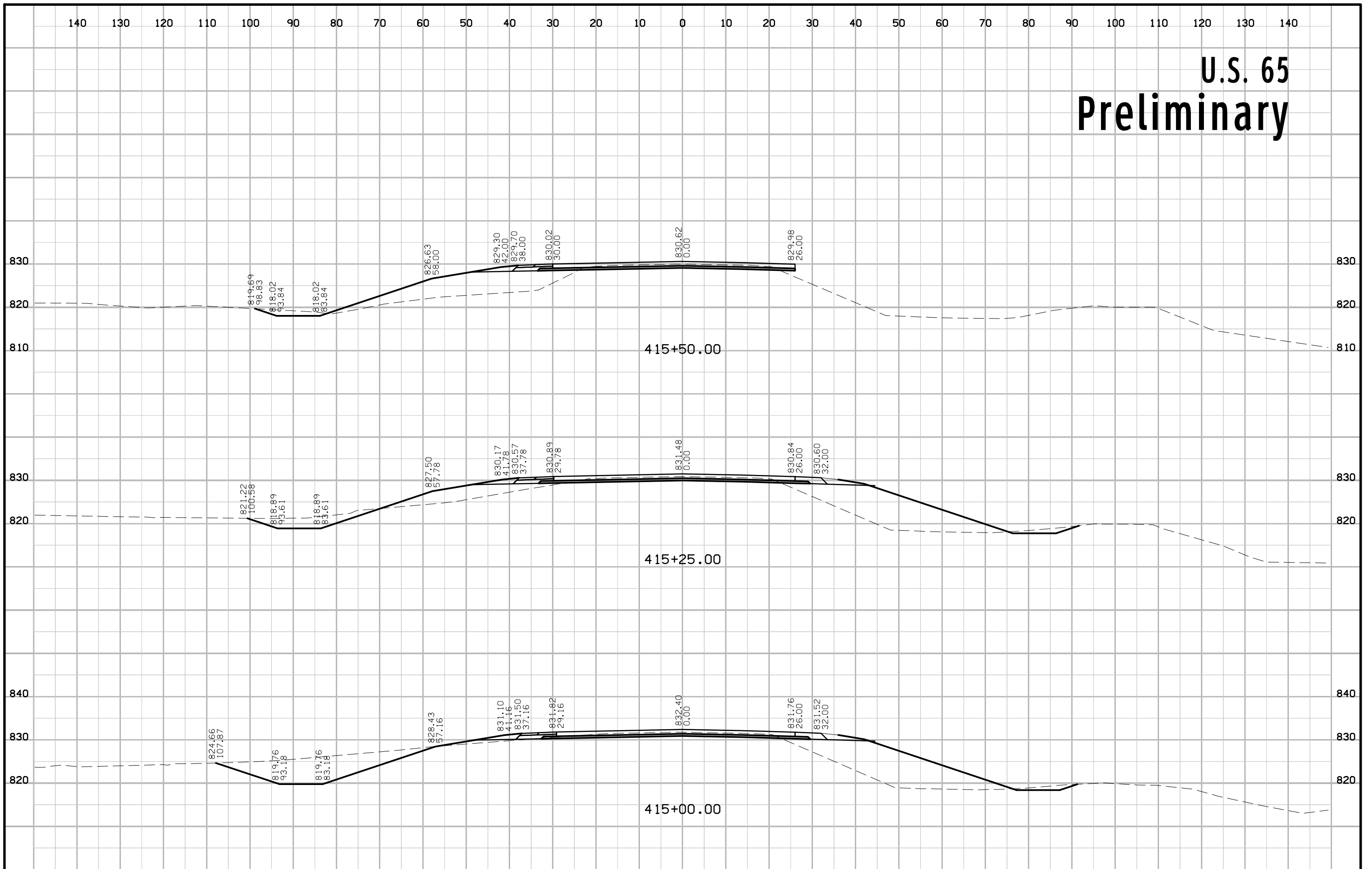
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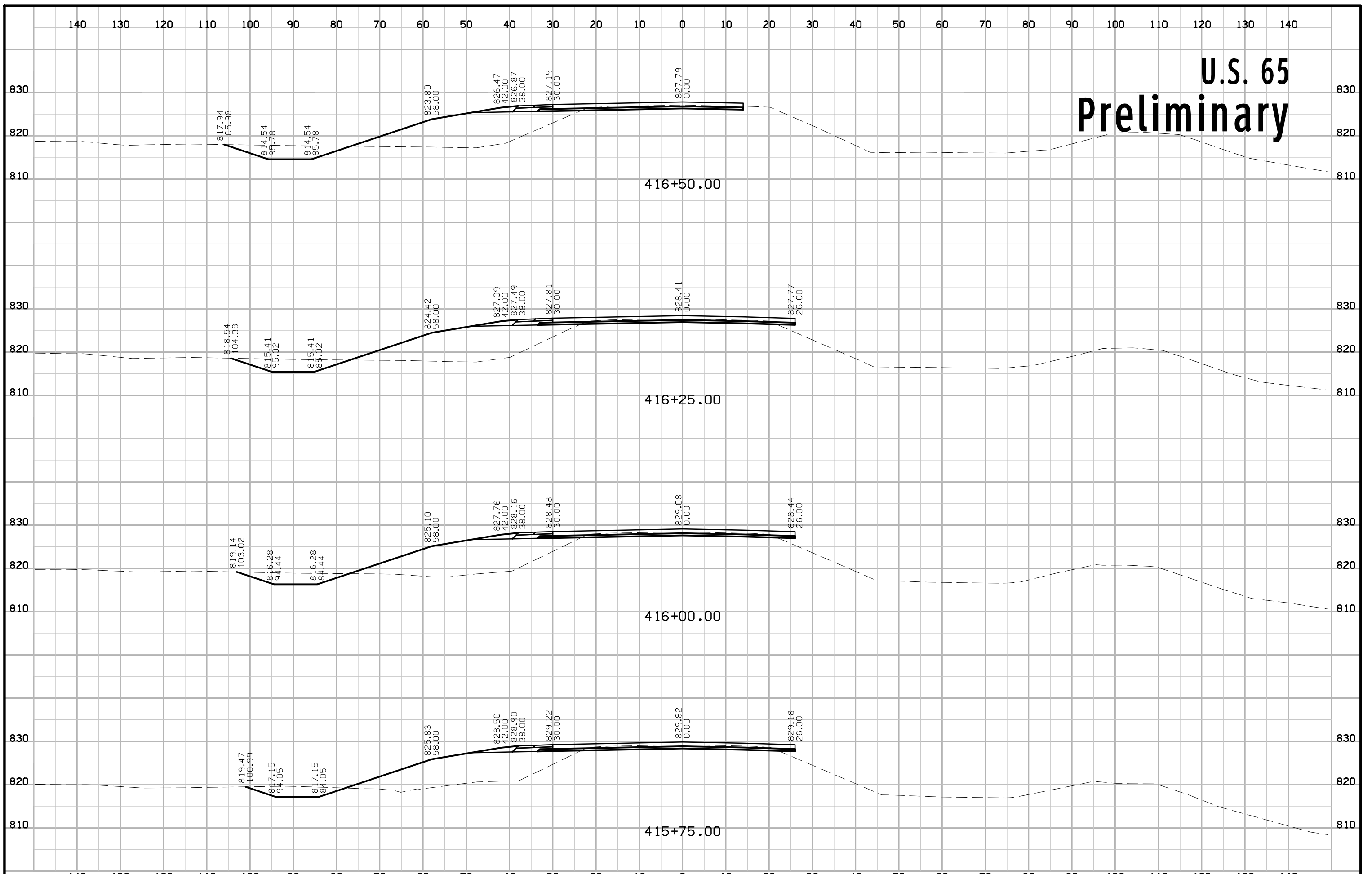
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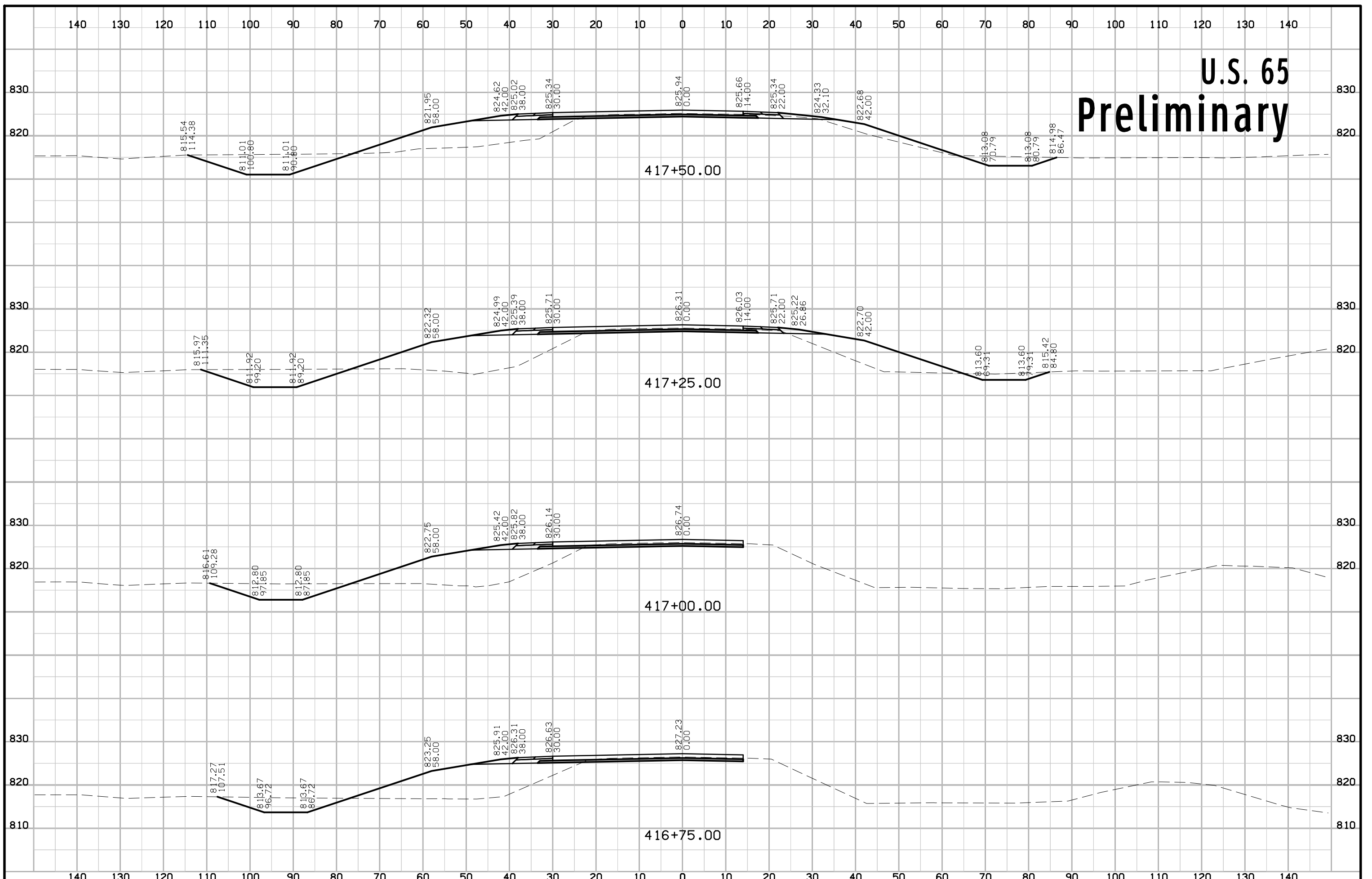
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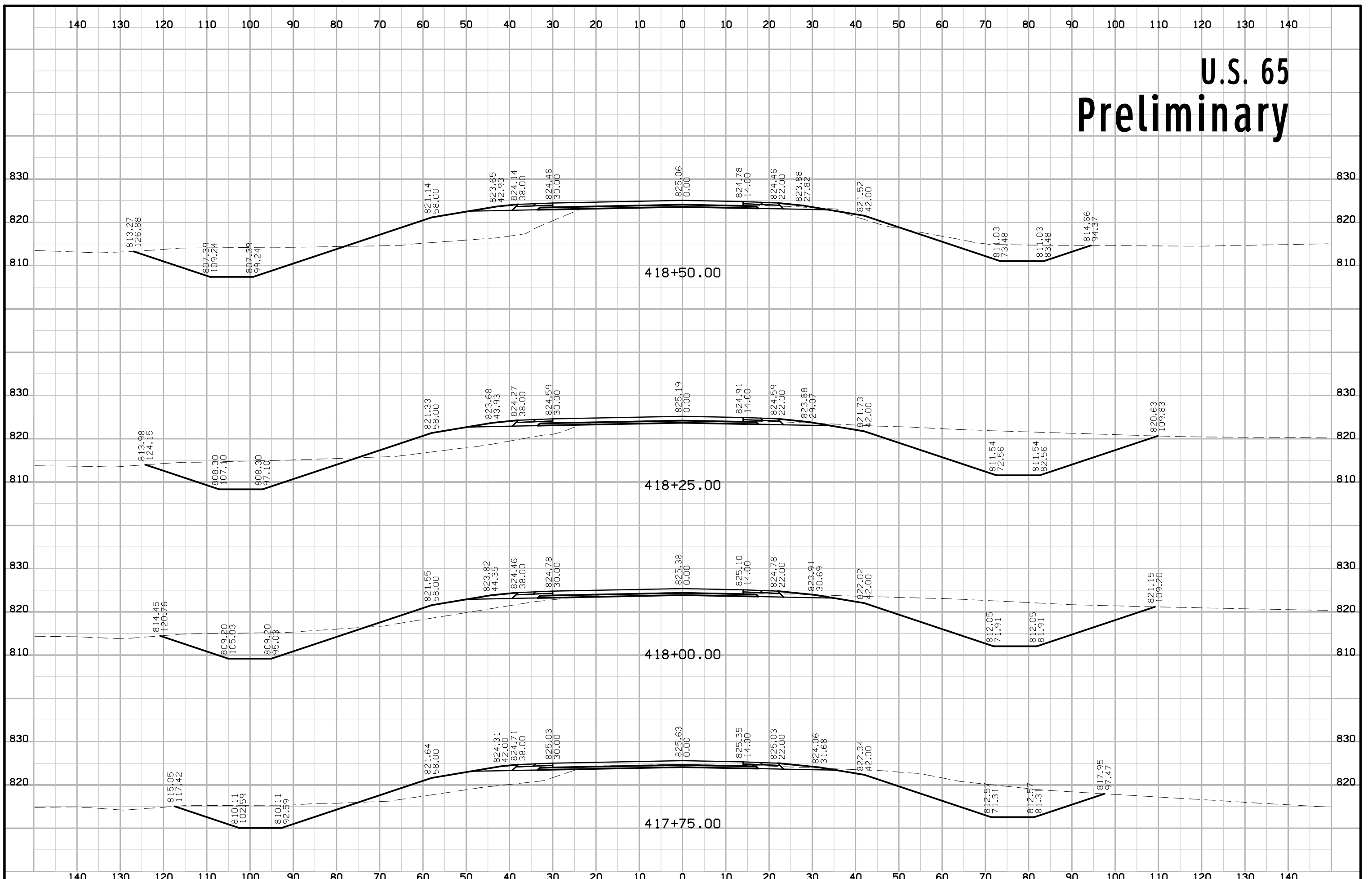
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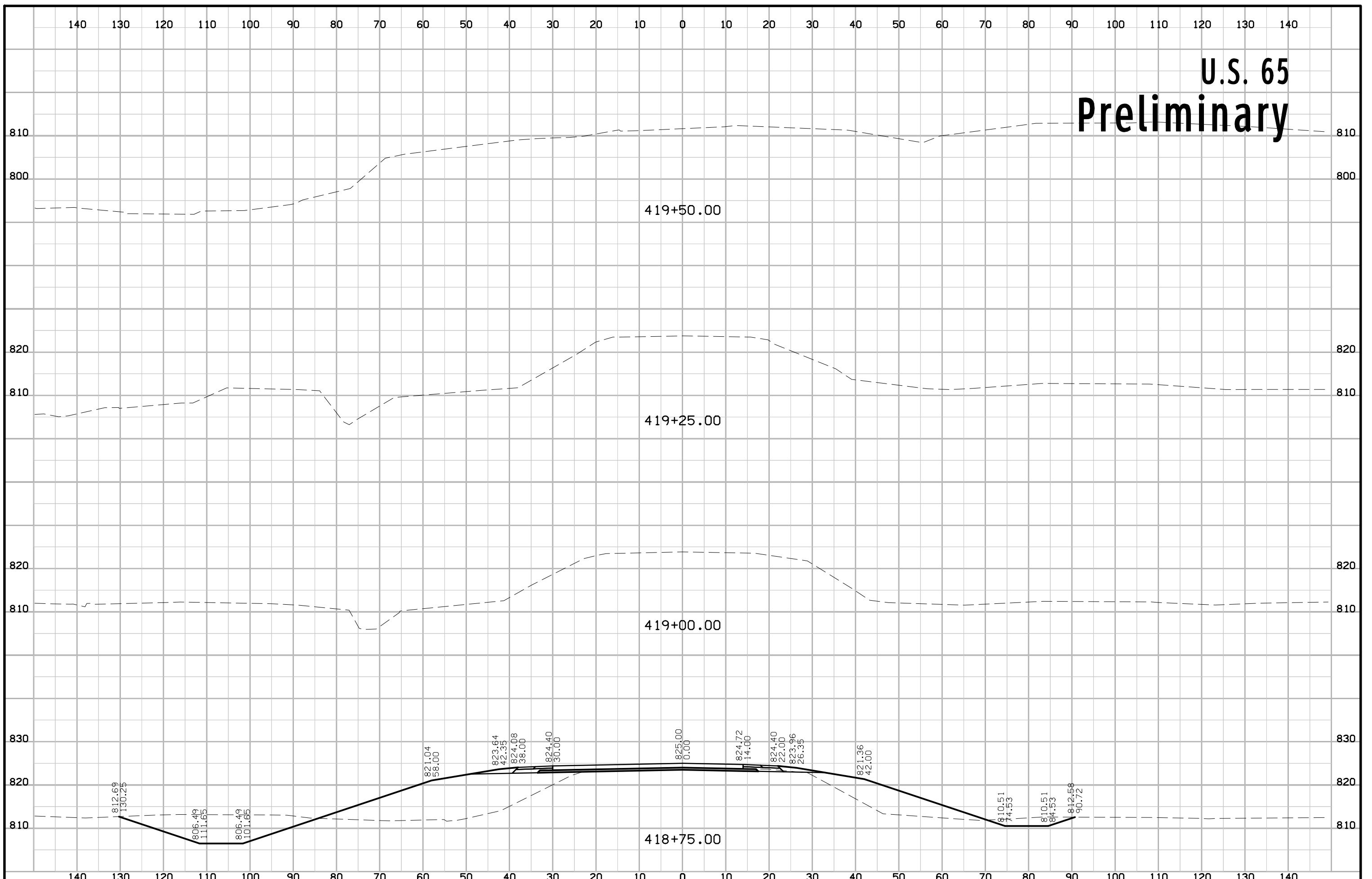
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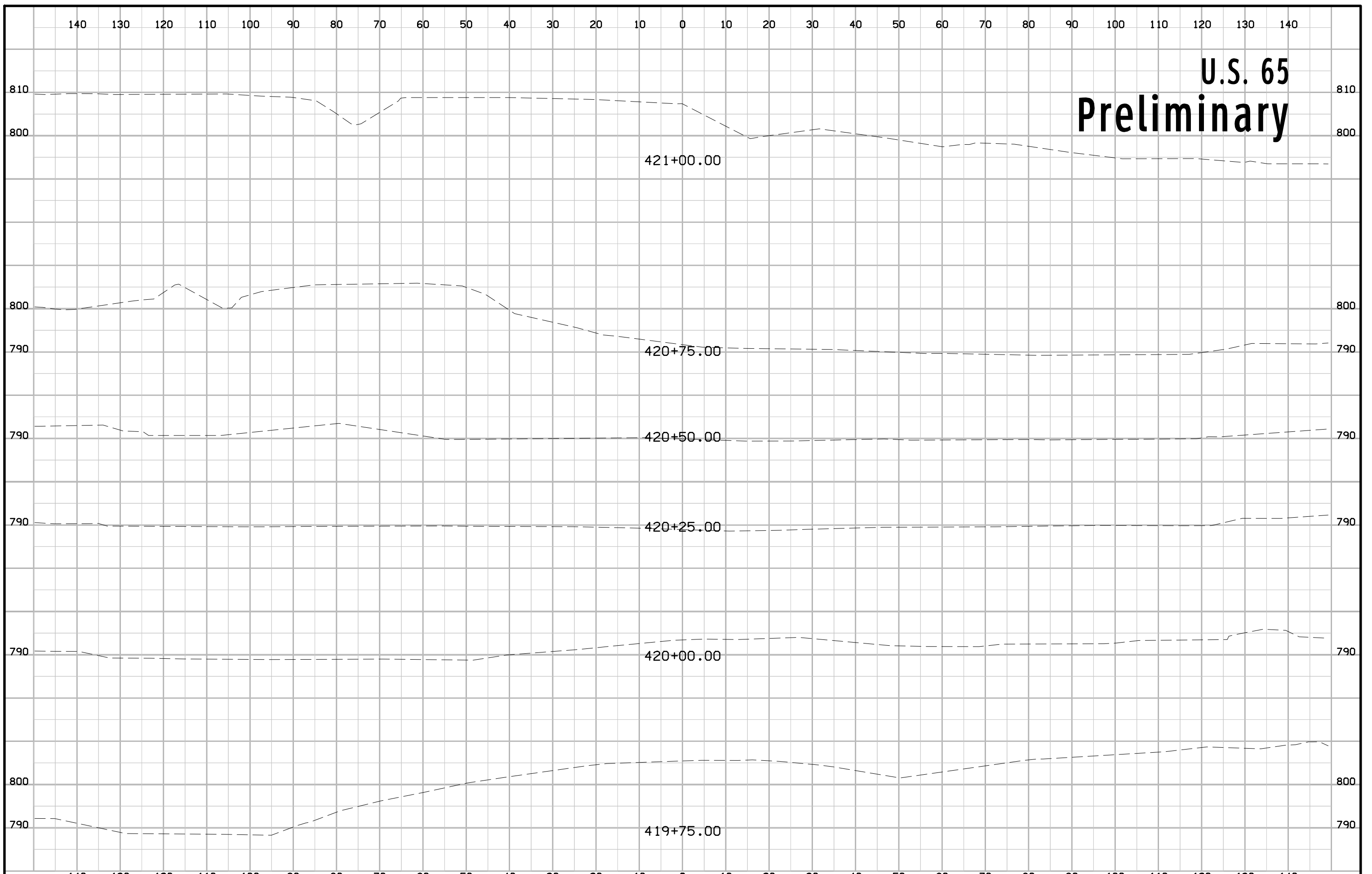
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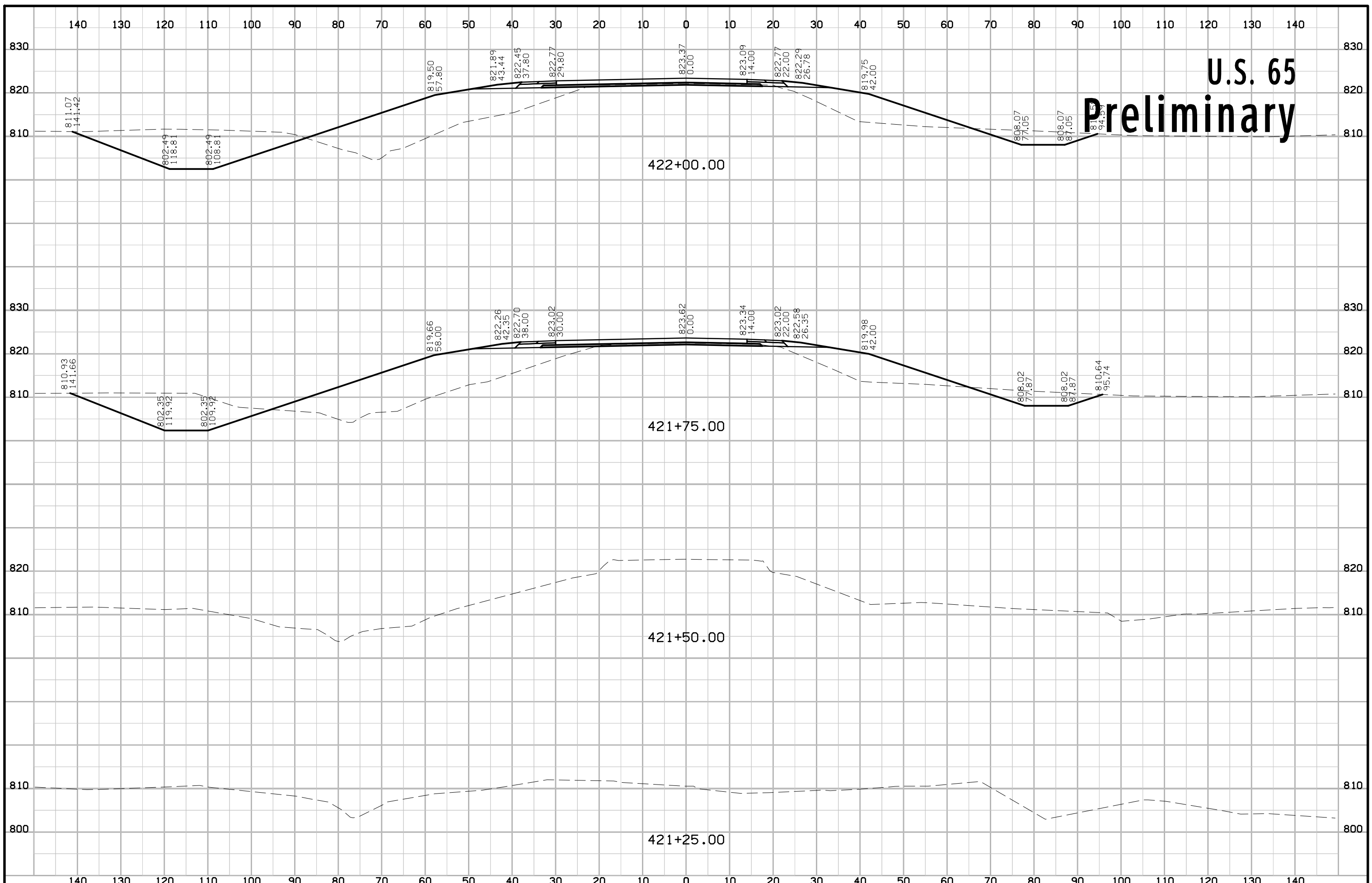
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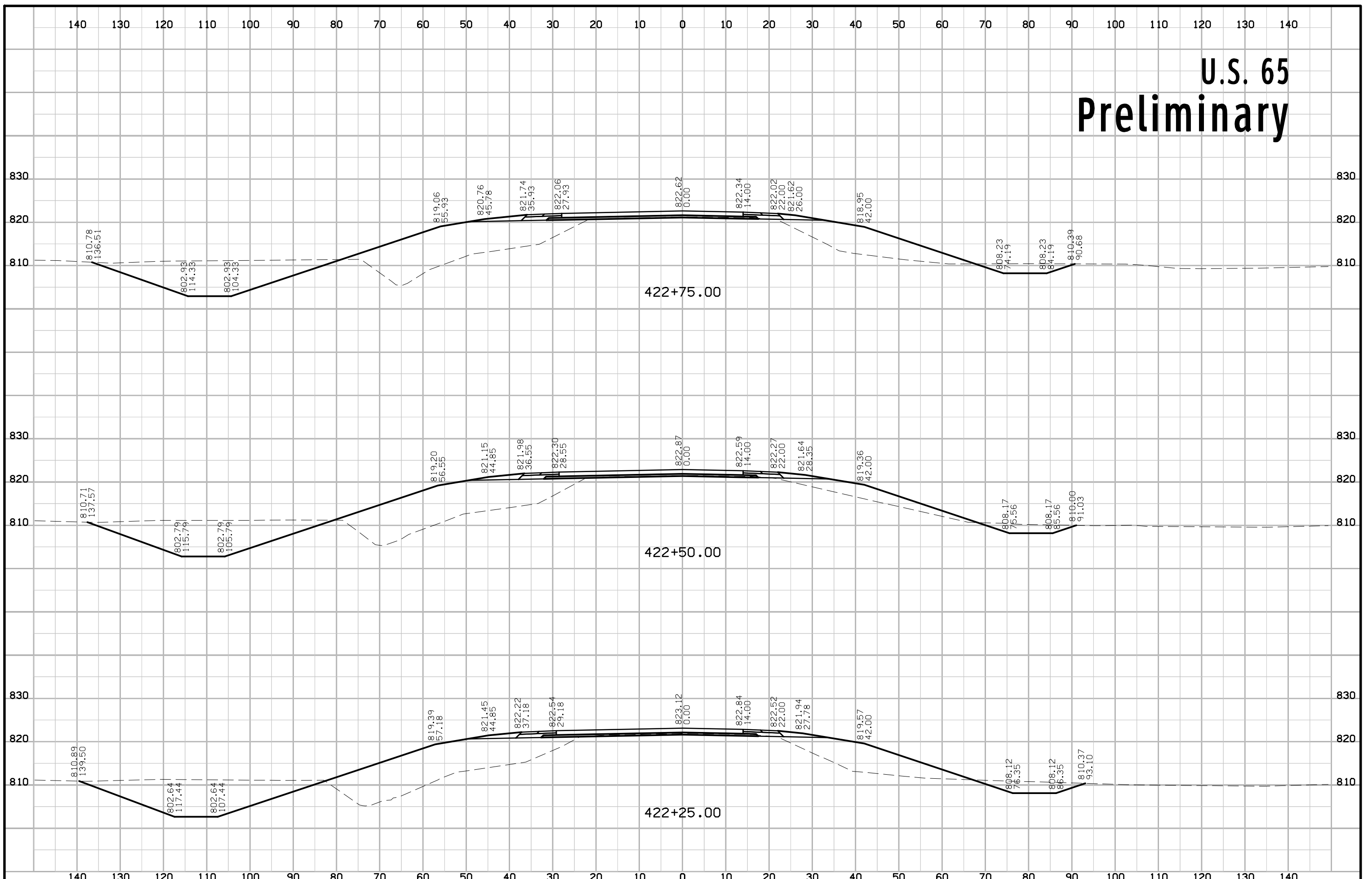
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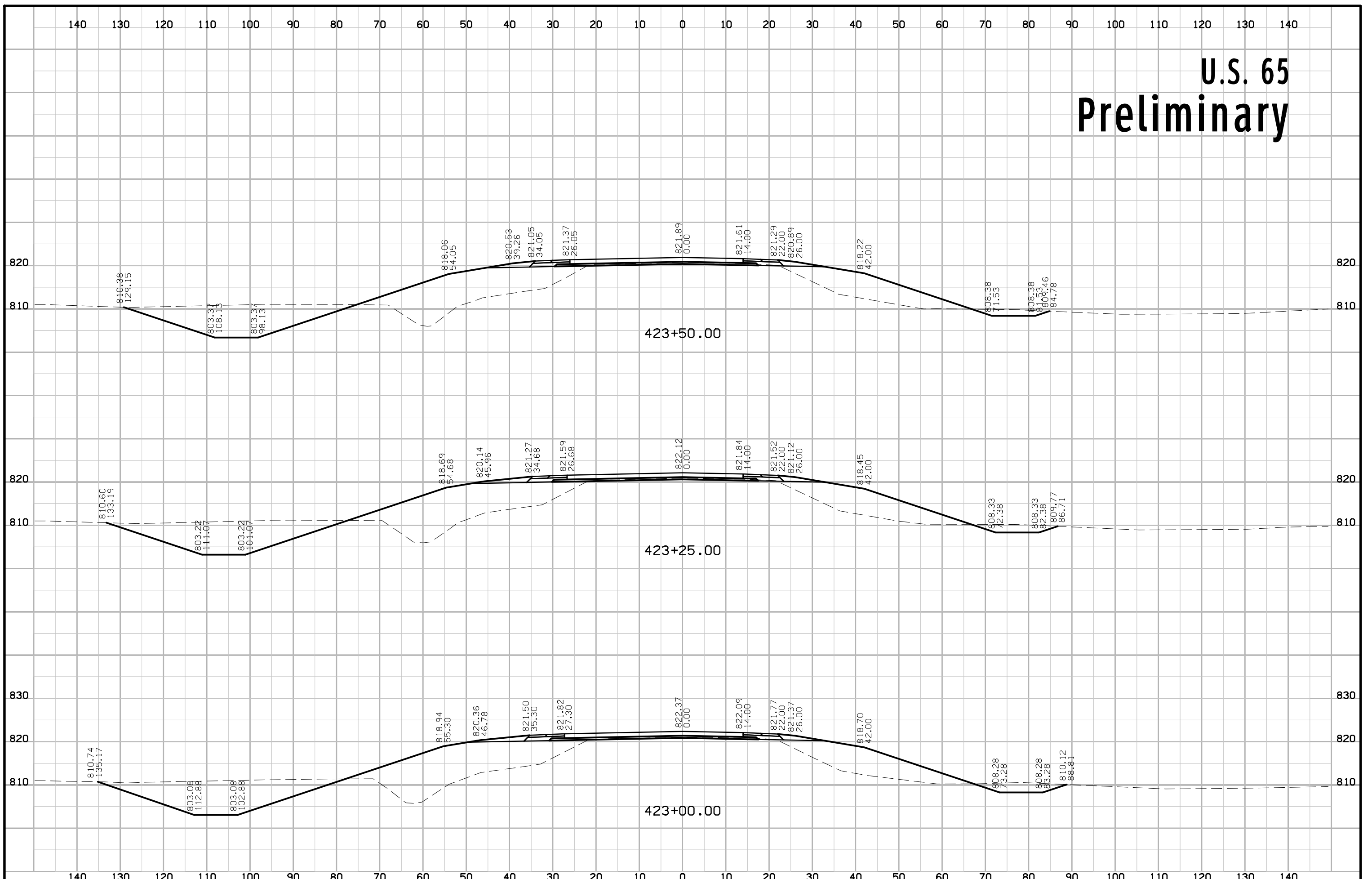
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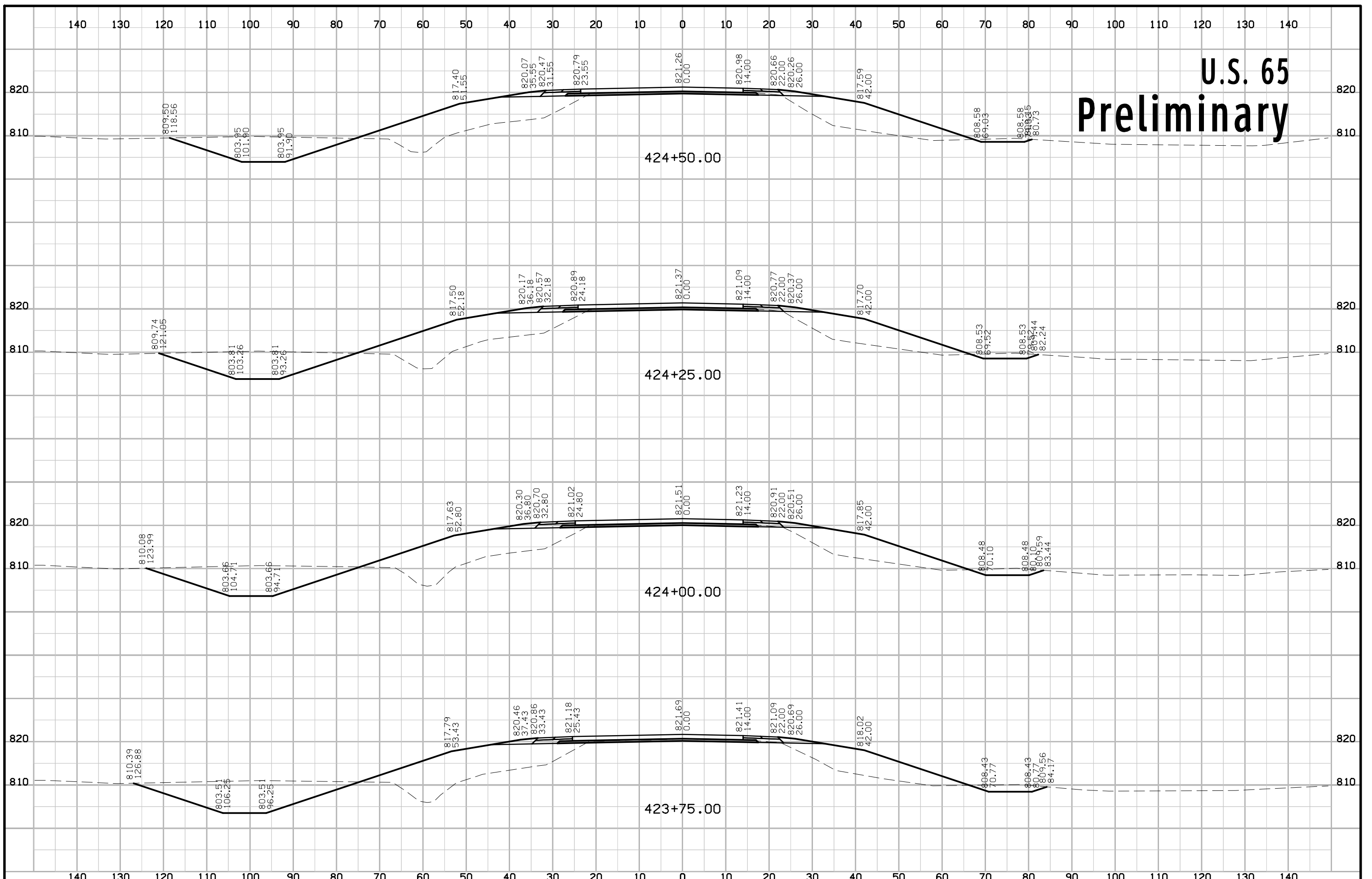
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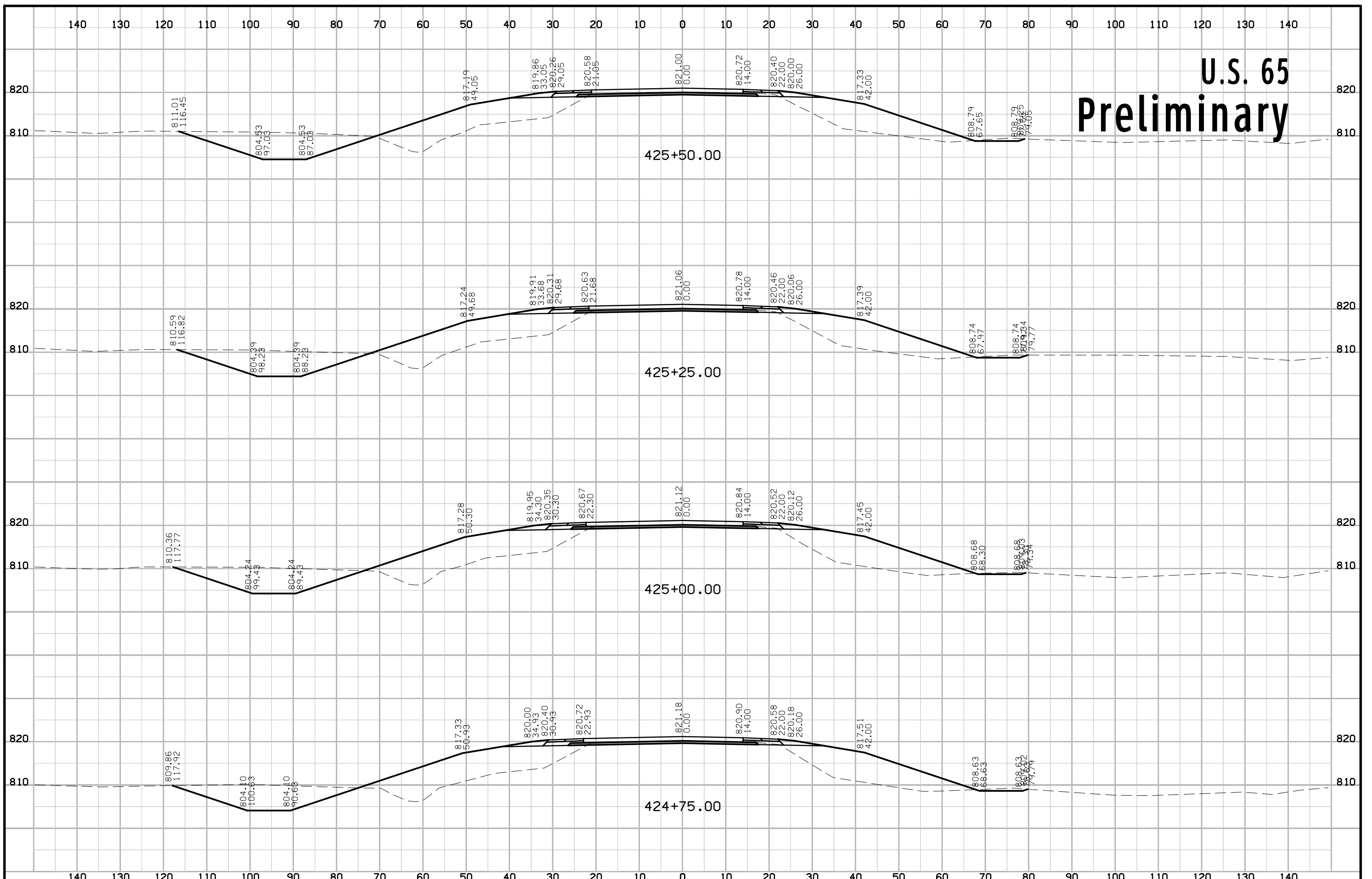
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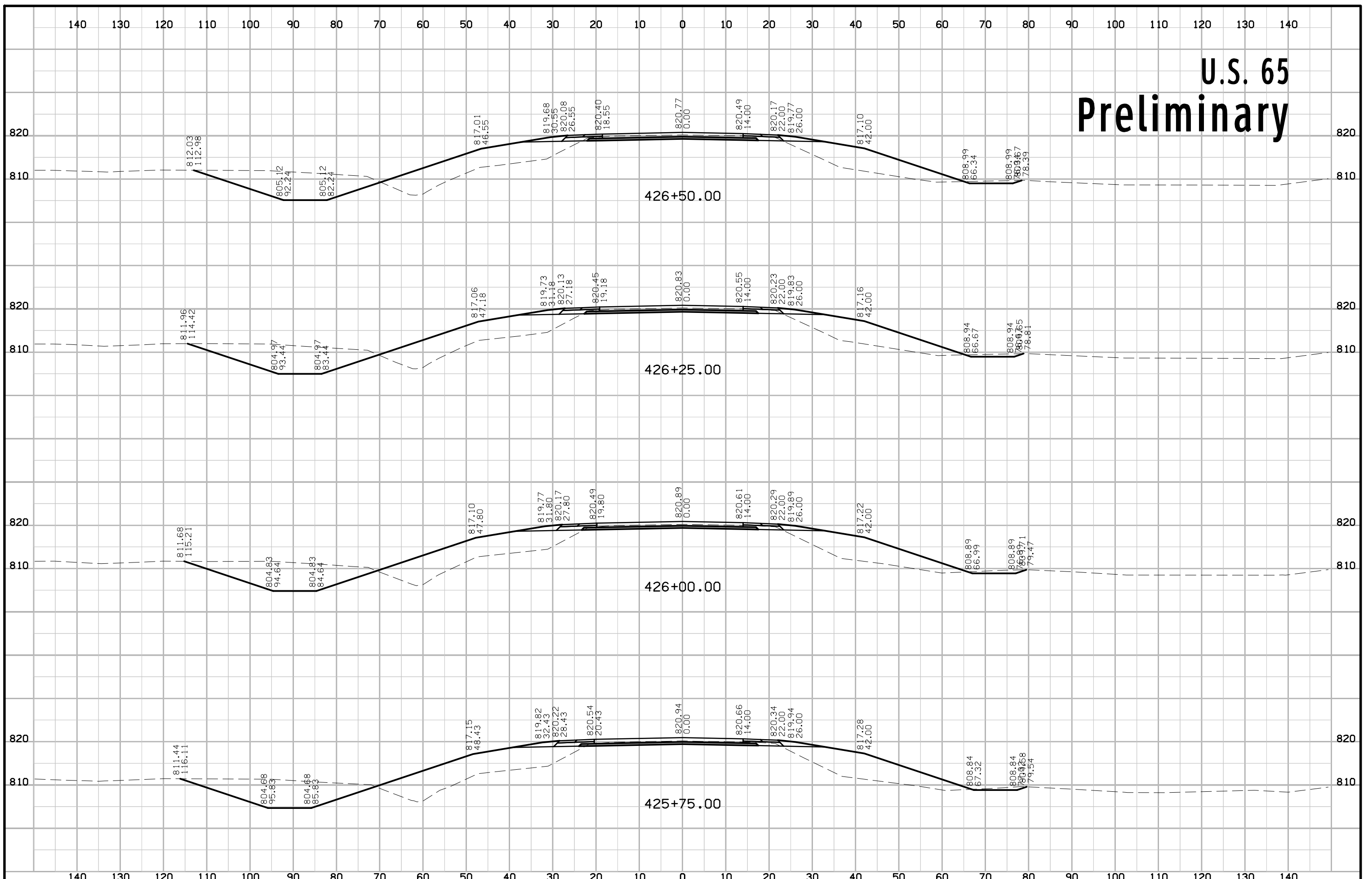
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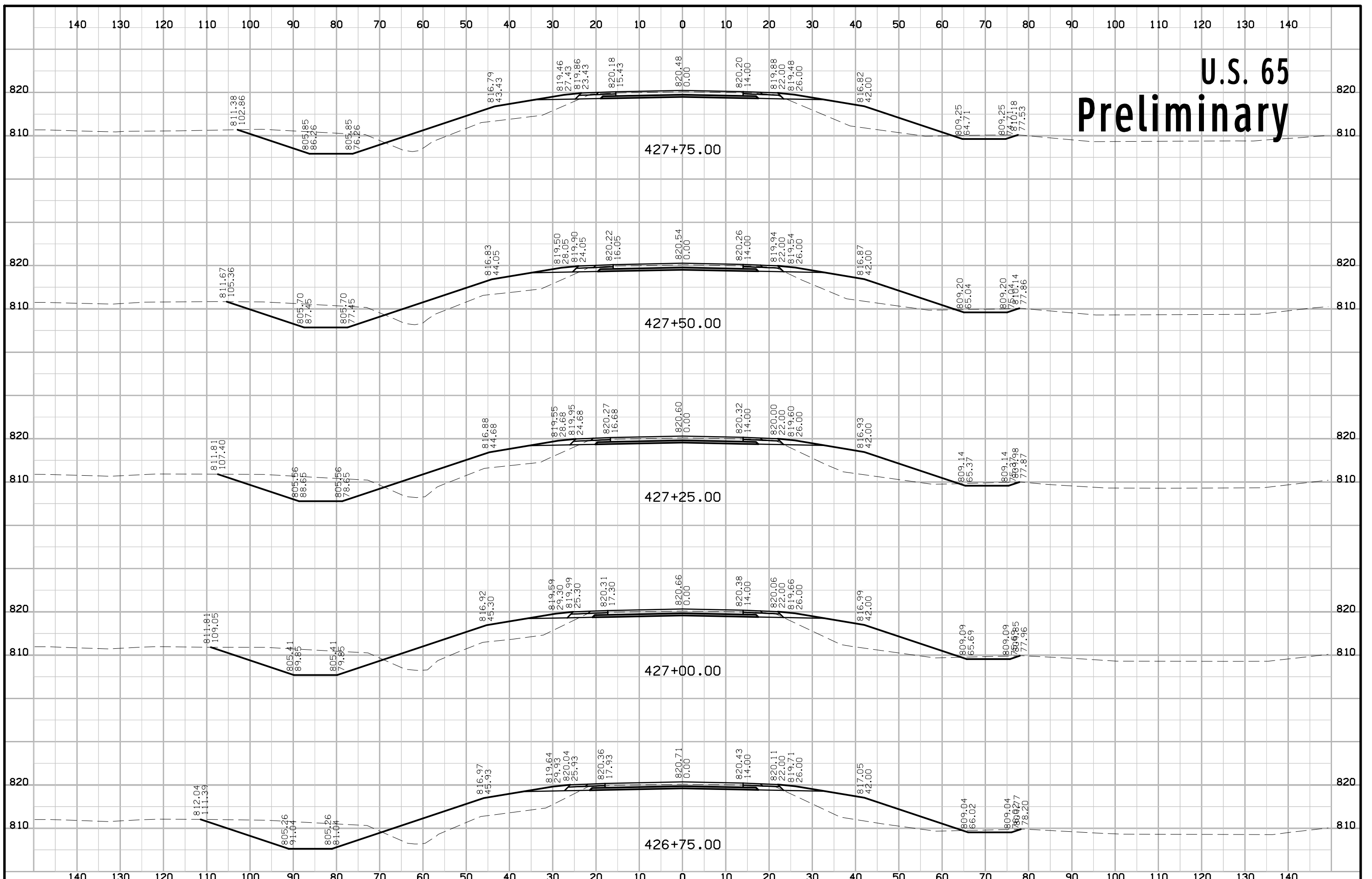
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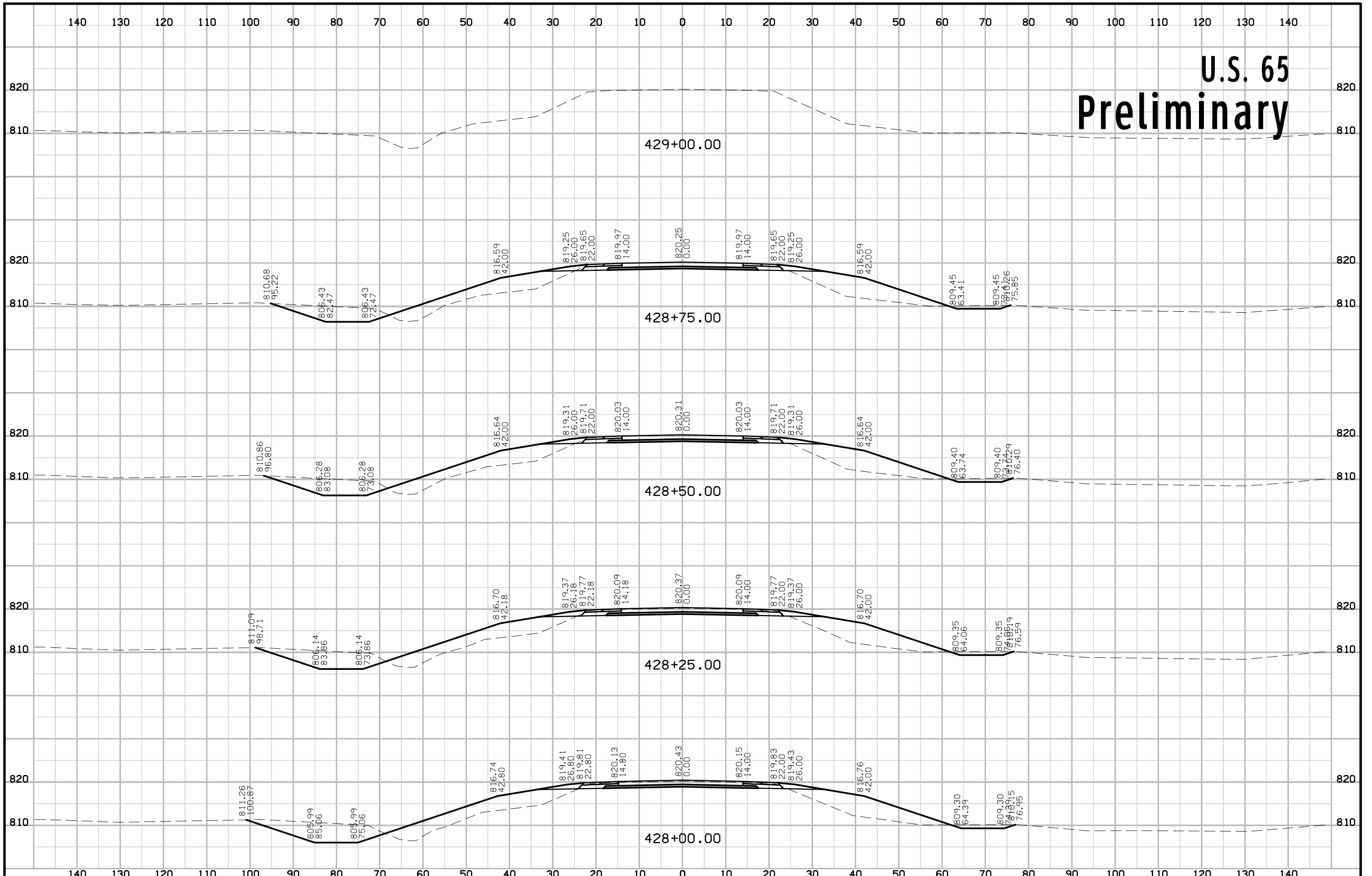
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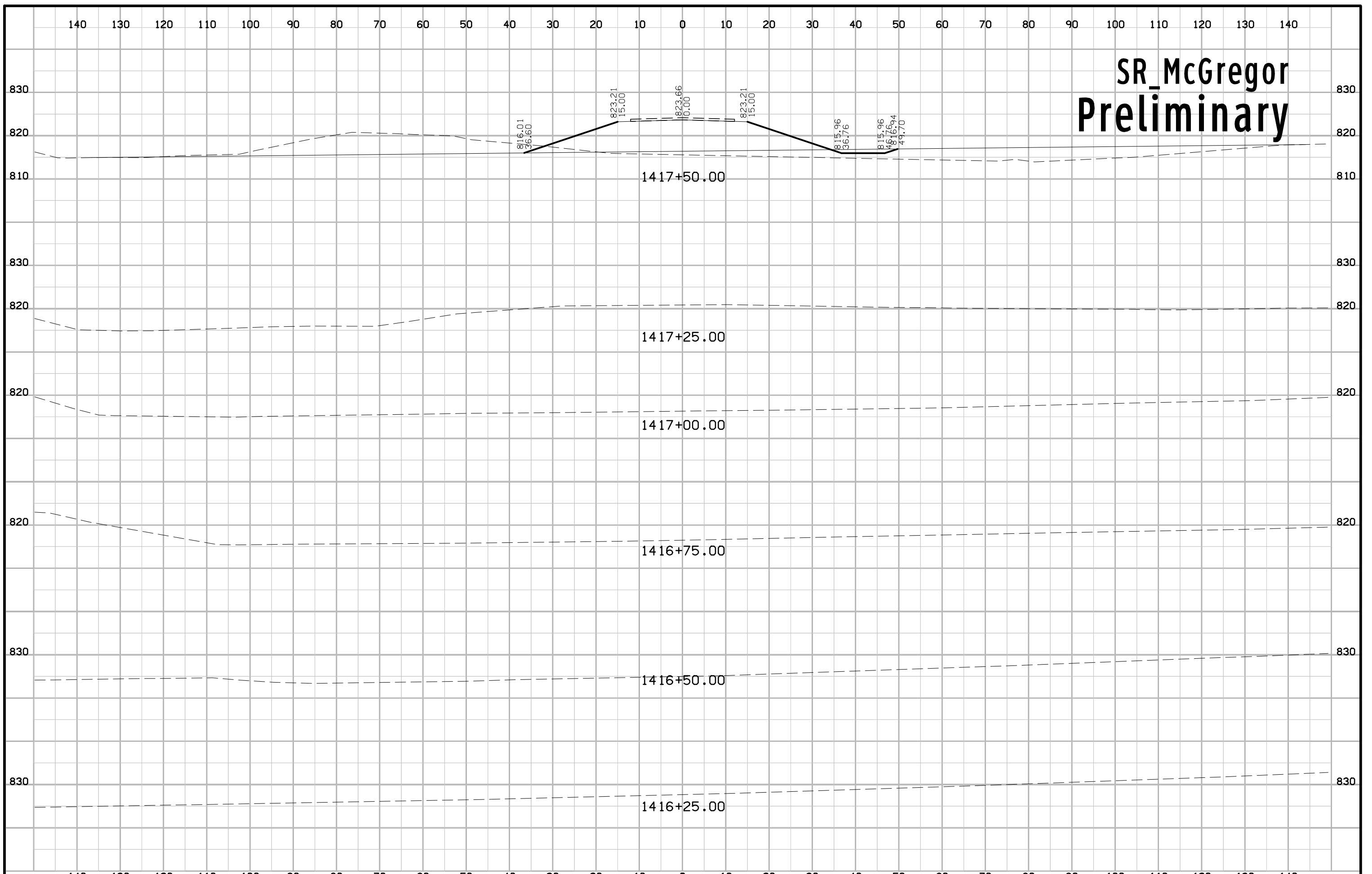
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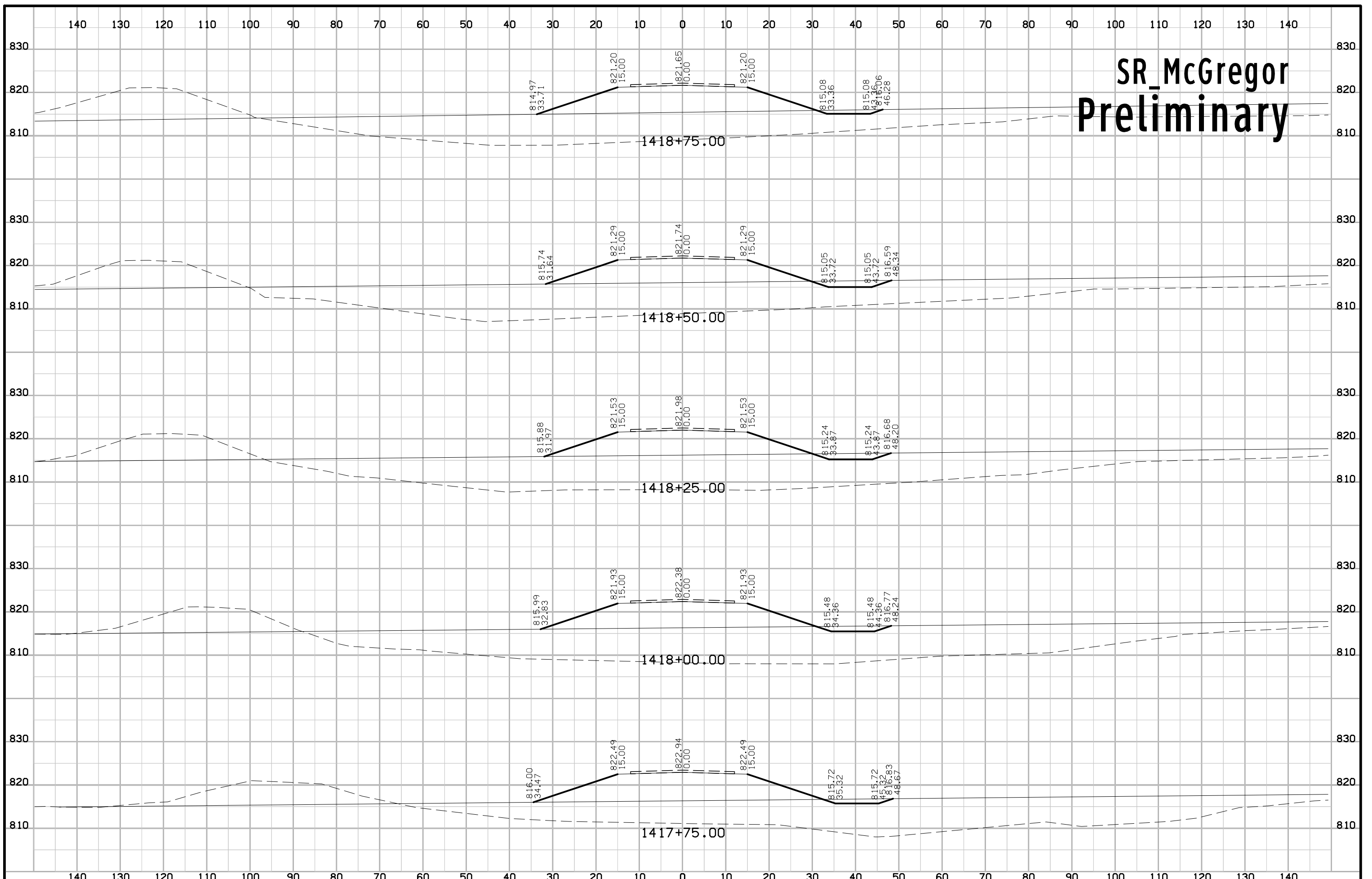
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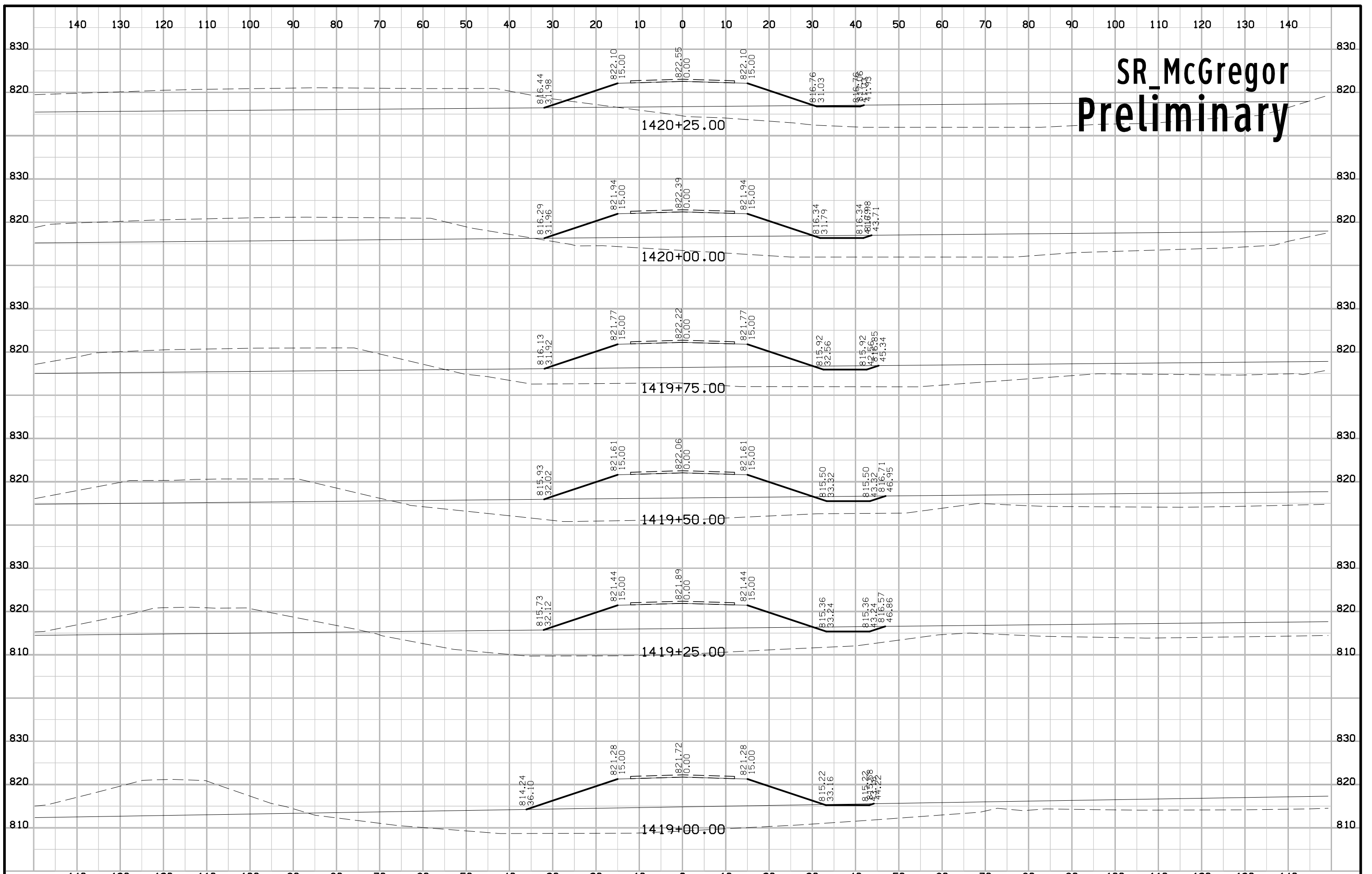
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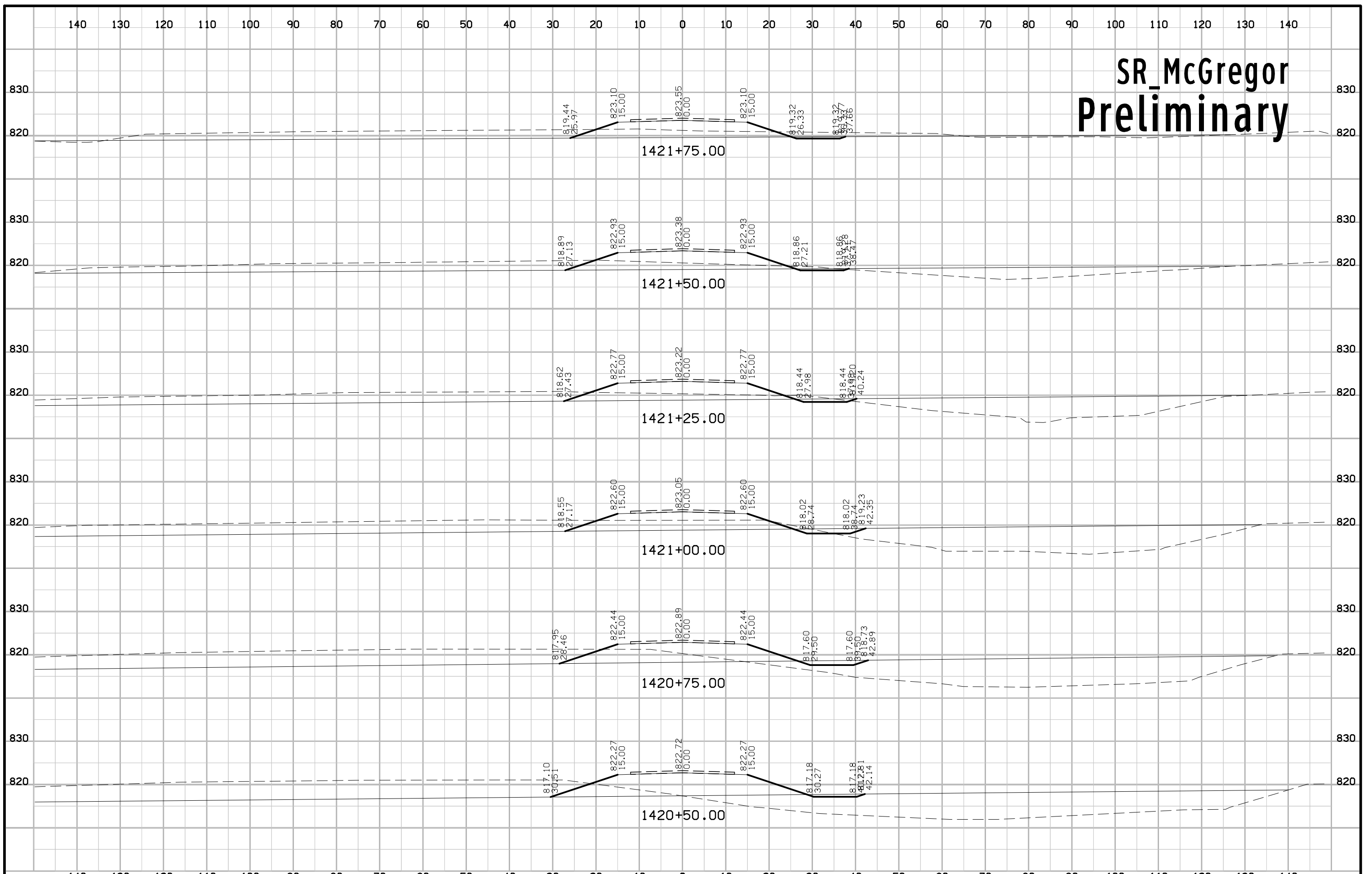
SR_McGregor Preliminary



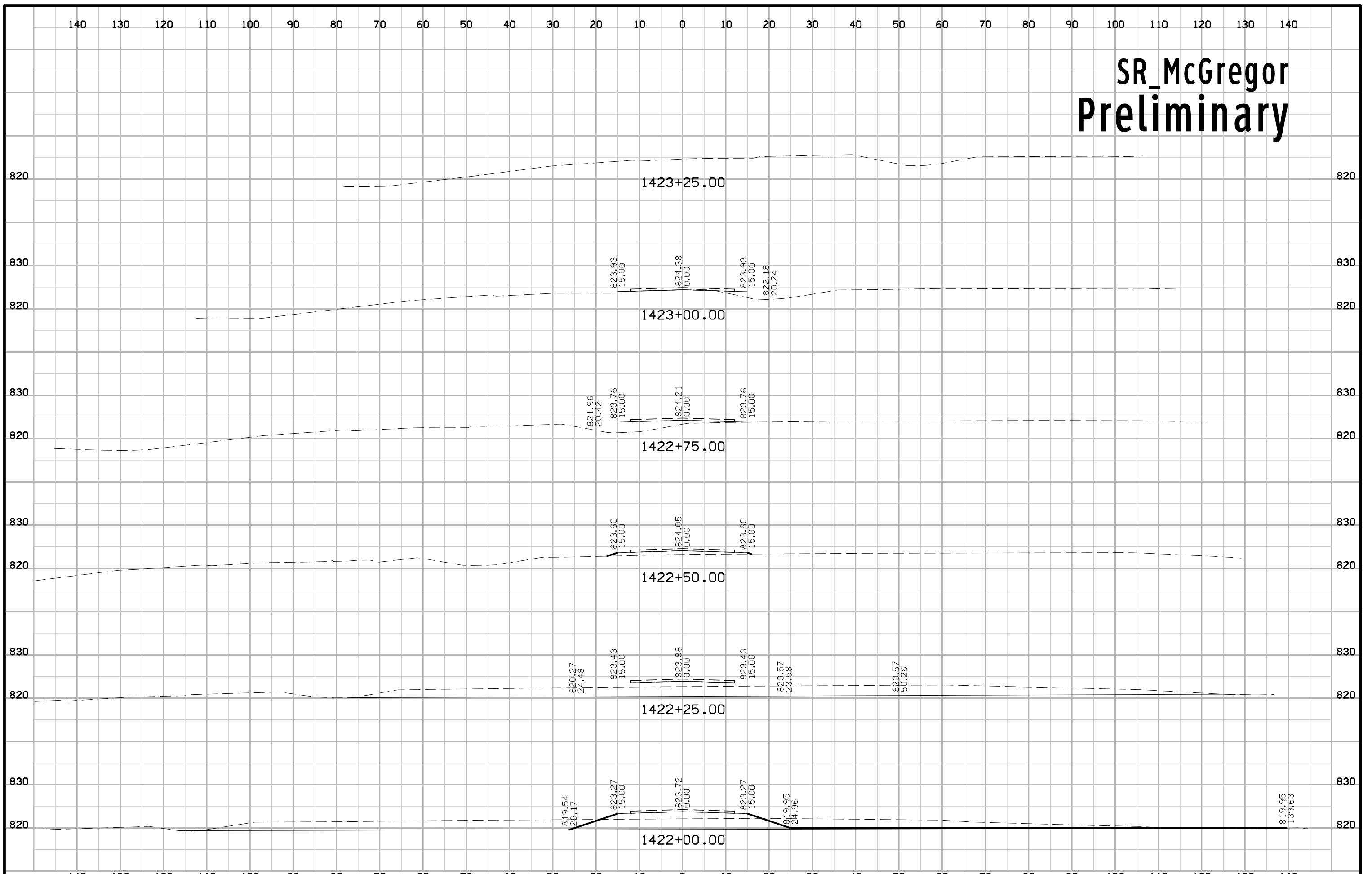
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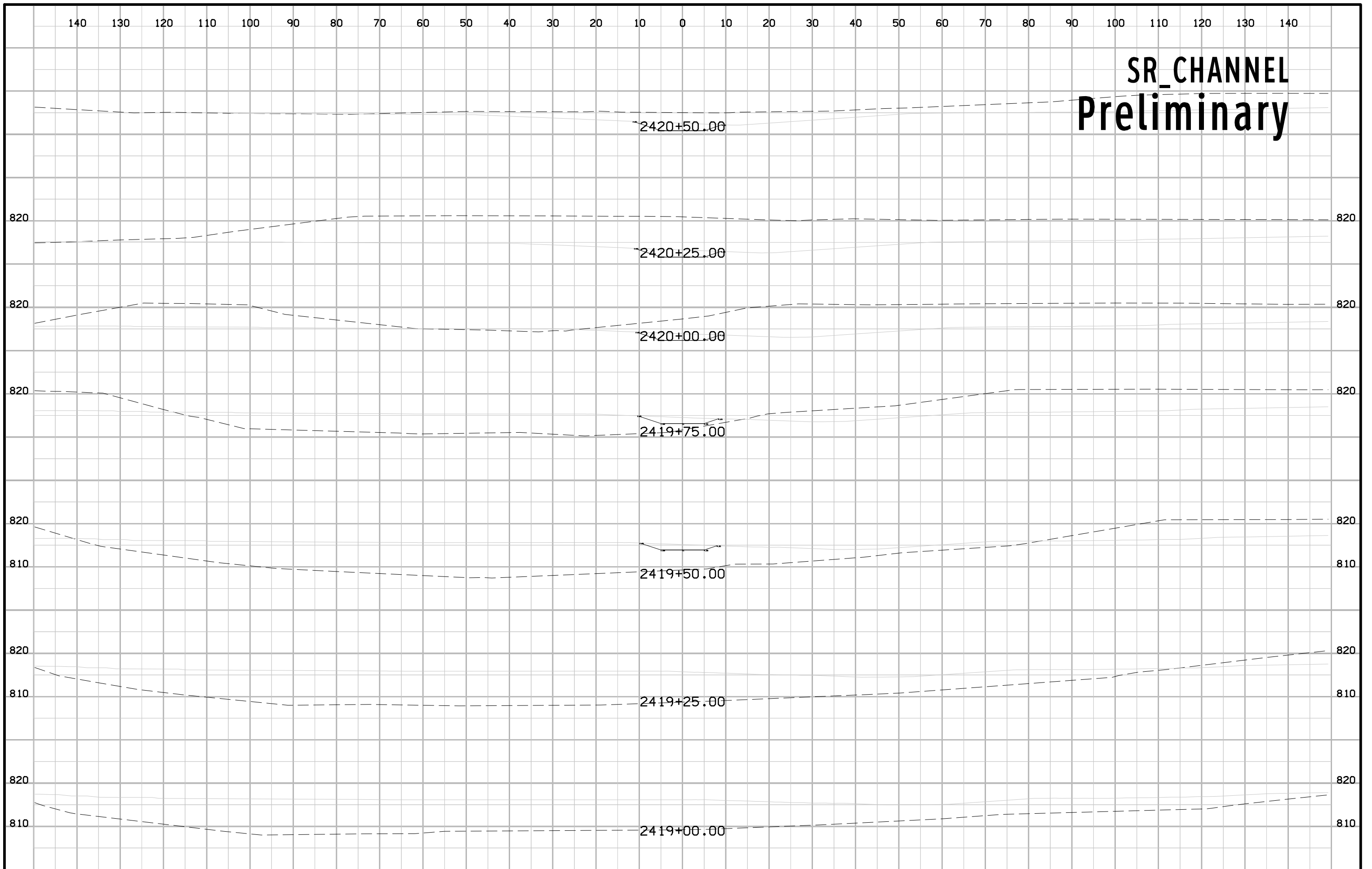
SR_McGregor Preliminary



SR_McGregor Preliminary



SR_CHANNEL Preliminary



SR_CHANNEL Preliminary

