

**WAPELLO CO.**  
 BRIDGE REPLACEMENT - PPCB  
 BRF-034-7(137)--38-90  
 LETTING DATE



**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM  
**WAPELLO COUNTY**  
 BRIDGE REPLACEMENT - PPCB

U.S. 34 over Bear Creek  
 3.6 Miles West of U.S. 63

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
11-90-034-010
PROJECT NUMBER
BRF-034-7(137)--38-90
R.O.W. PROJECT NUMBER
NHSN-034-7(138)--2R-90

**INDEX OF SHEETS**

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A.1	Title Sheet
A.2	Location Map Sheet
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1 - 5	Typical Cross Sections and Details
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	U.S. 34
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* F.1	Detour Plan and Profile Sheets
<b>G Sheets</b>	<b>Survey Sheets</b>
G.1	Reference Ties and Bench Marks
G.2	Horizontal Control Tab. & Super for all Alignments
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**EVENT DATES:**

D5 PLAN - DATE: 06-27-2014  
 Letting - Date: 12-15-2015

**PRELIMINARY PLANS**

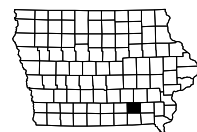
Subject to change by final design.

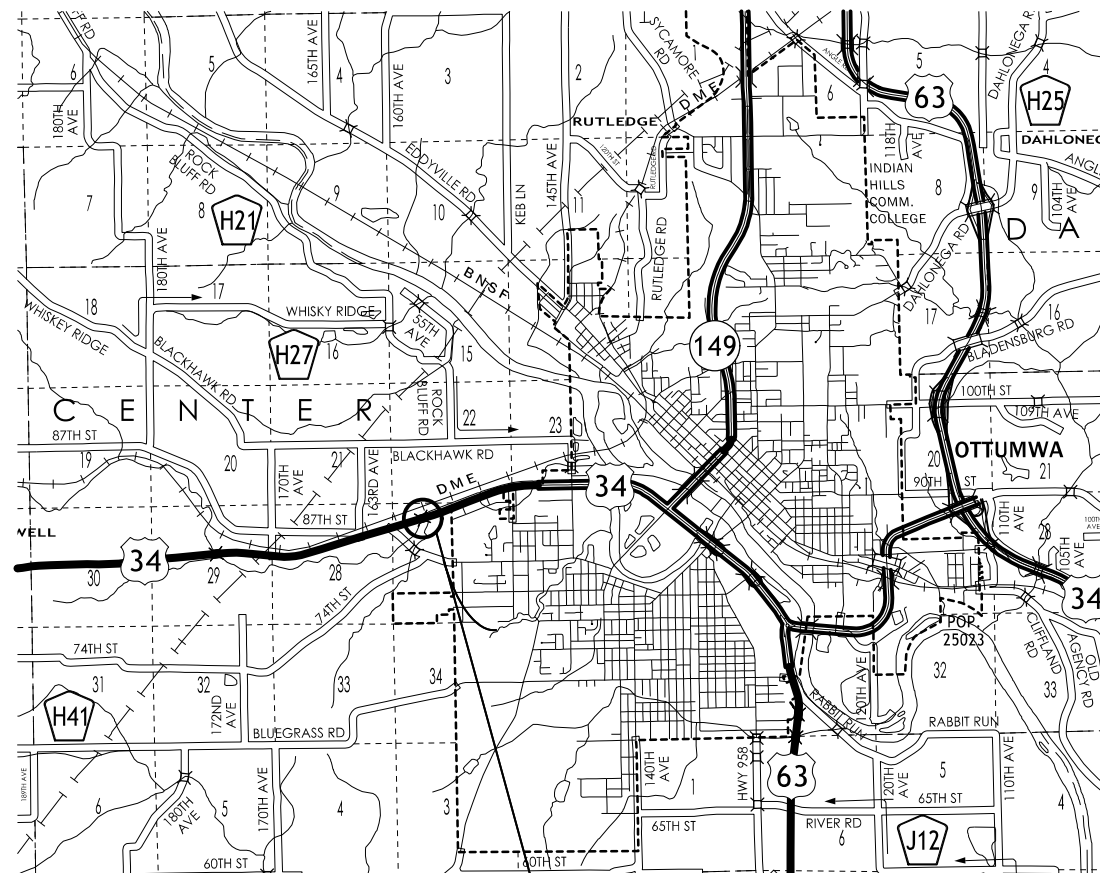
D3 PLAN - Date: 03-21-2014

For Project Location Map  
 Refer to Sheet A.2

DESIGN DATA			
2016	AADT	8,000	V.P.D.
2036	AADT	10,000	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	15	%
	Total		
	Design ESALs	--	

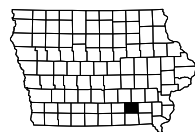
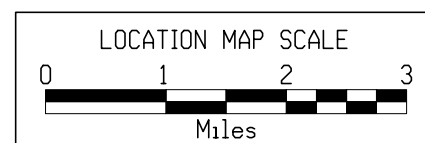
INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	X	Primary Signature Block
X	X	X





Project Location

R-14W

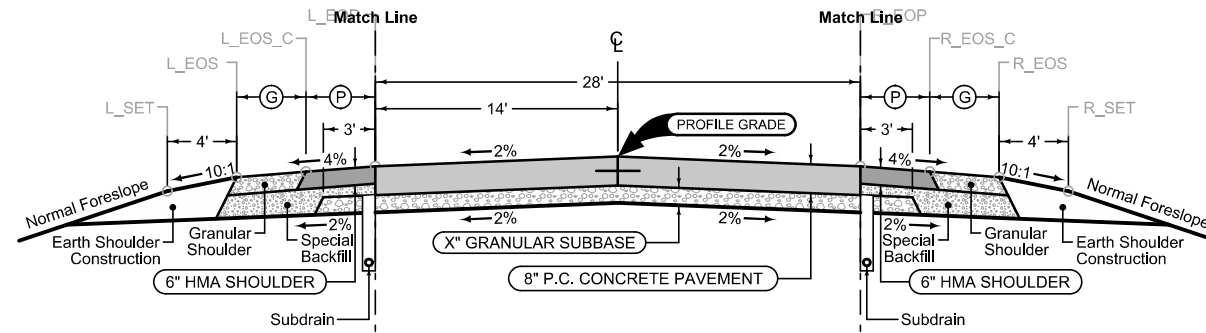




**Combination Shoulder**

Shoulder Jointing:  
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
520+92.33	521+62.33	4'	6'
523+13.67	523+83.67	4'	6'



**Combination Shoulder**

Shoulder Jointing:  
Longitudinal joint: B

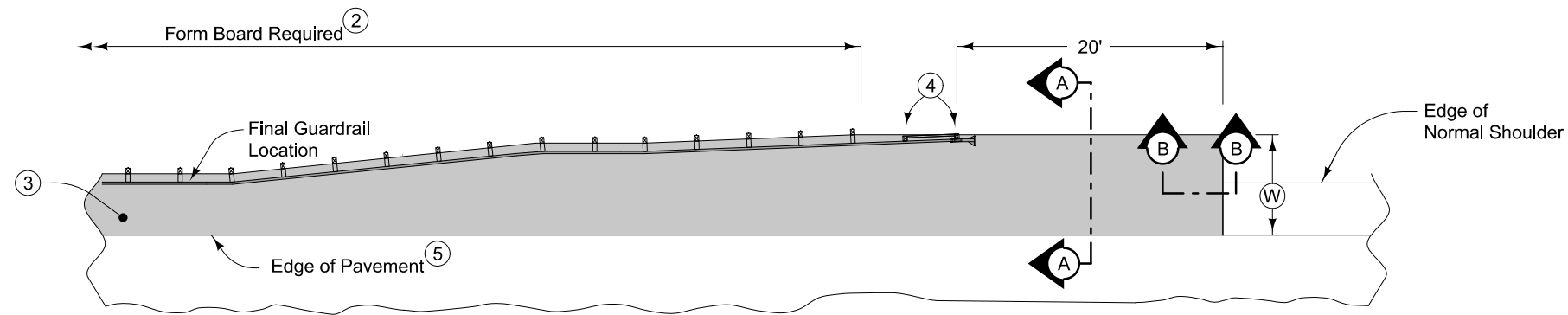
STATION TO STATION		(P) Feet	(G) Feet
520+92.33	521+62.33	4'	6'
523+13.67	523+83.67	4'	6'

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

STATION TO STATION	
520+92.33	521+62.33
523+13.67	523+83.67

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

**ROADWAY IDENTIFICATION**

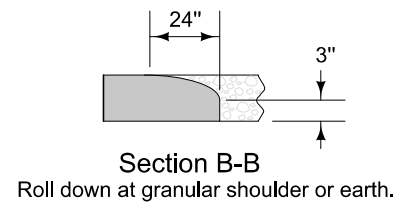
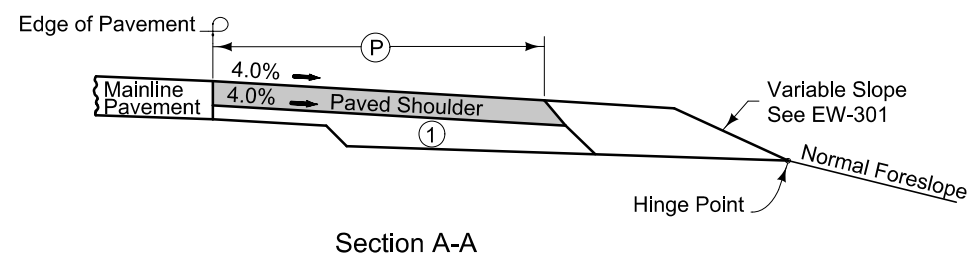
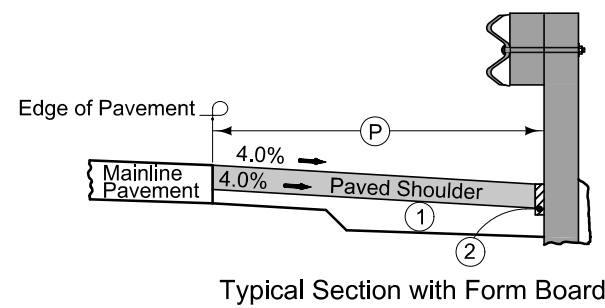


6" HMA Paved Shoulder at guardrail. 7" PCC may be substituted with the following jointing layout:

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.



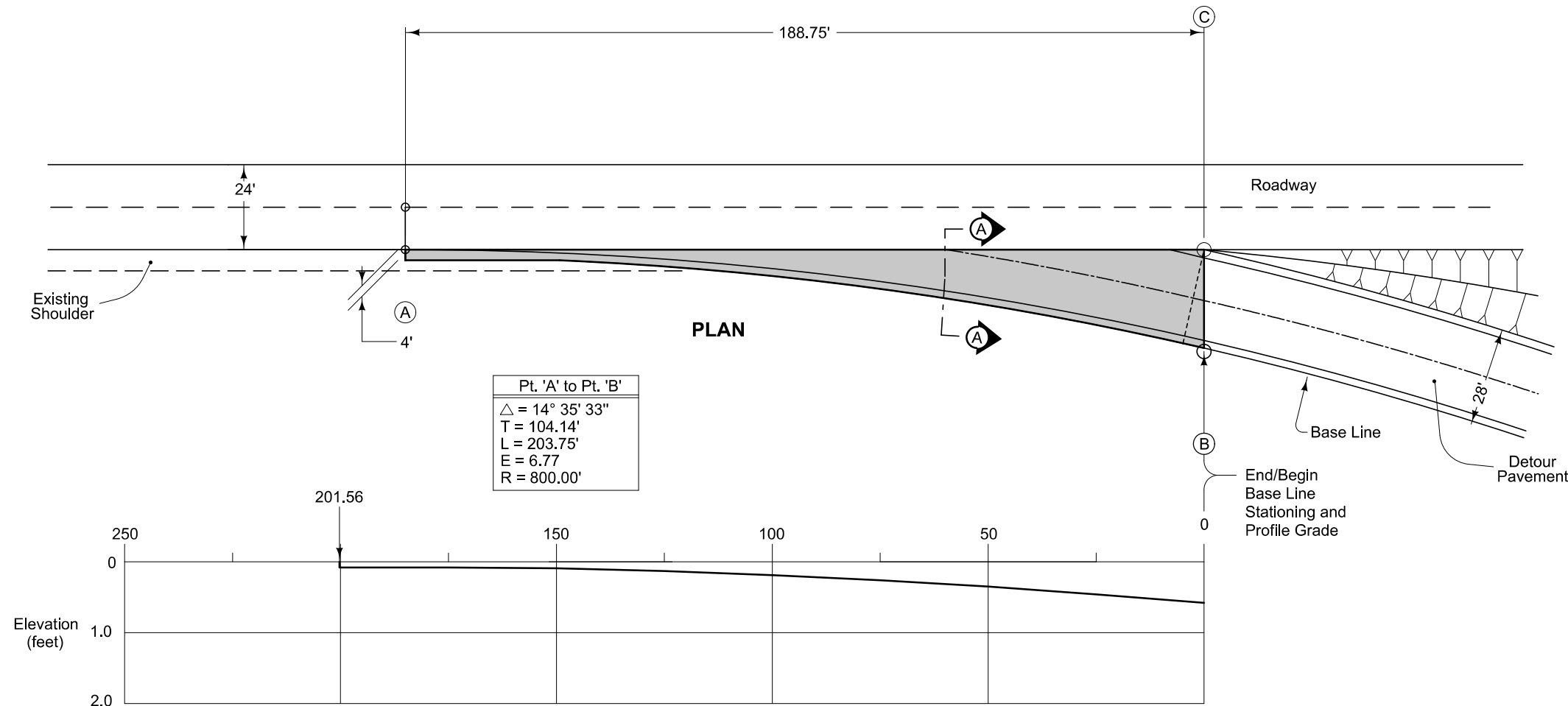
- ① 6" subgrade treatment.
- ② When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function 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

Ramp entrance pavement shown by shaded area is 262.27 square yards.

For joint details, see PV-101

- ① For header construction details at the end of taper, see Typical 7101 or Typical 7102.
- ② Construct subbase for ramp entrance pavement the same thickness as mainline subbase.



NOTE: The algebraic difference between profile grade for Ramp Base Line at (B) and relative profile grade of Mainline at (C) is 0.48%.

**PROFILE**

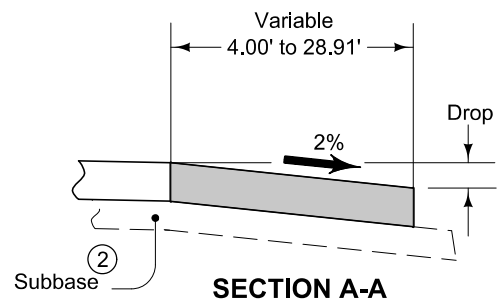


TABLE OF OFFSETS AND DROPS FOR DETOUR PAVEMENT									
DISTANCE (Ft.)	201.56	175	150	125	100	75	50	25	0
OFFSET (Ft.)	4	4	4.67	6.69	9.5	13.11	17.54	22.8	28.91
DROP (Ft.)	0.08	0.08	0.093	0.13	0.19	0.26	0.35	0.46	0.58

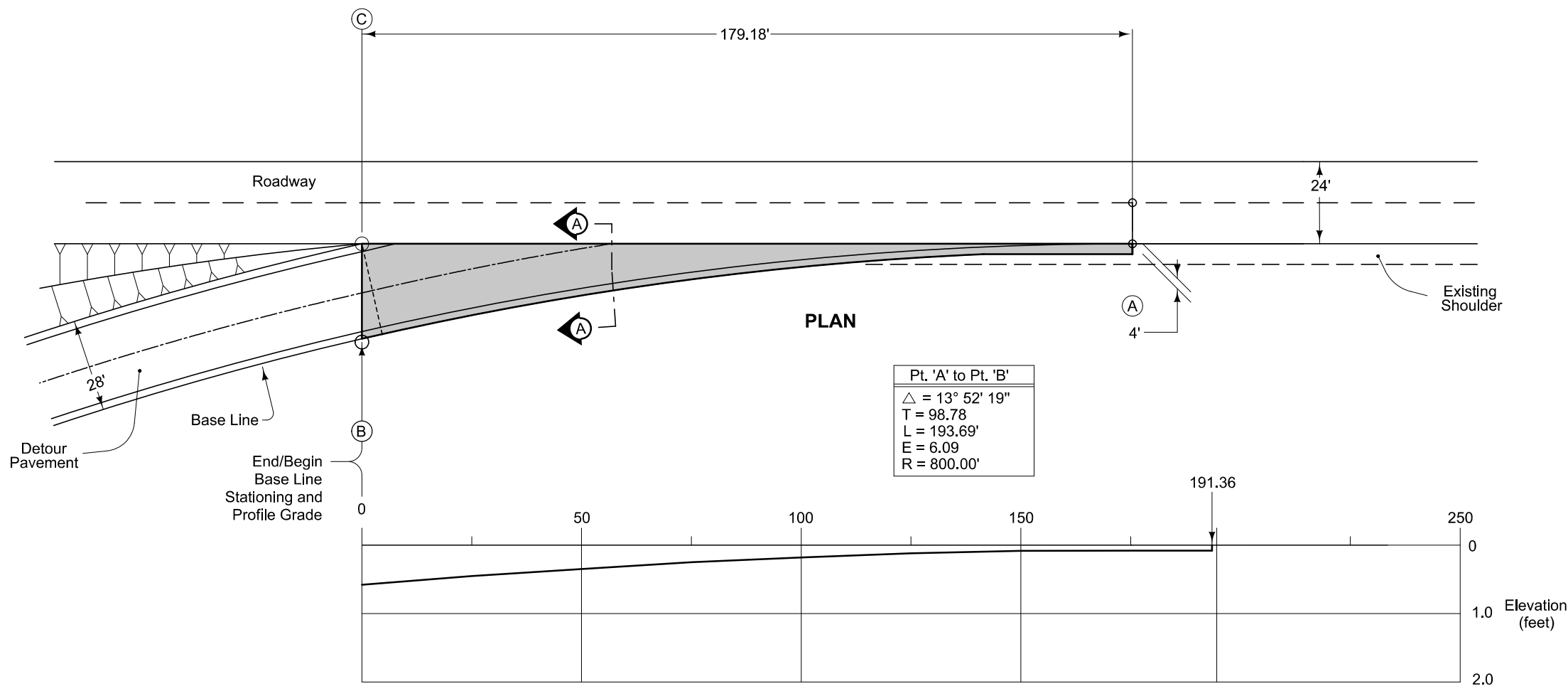
NOTE: The elevations are established by a constant 2% slope across the appropriate detour widths based on a radius of 700'. Drop = (0.02) x (Offset).

<b>MODIFIED</b>	REVISION	
	New	10-15-13
<b>STANDARD ROAD PLAN</b>	<b>PV-428</b>	
	SHEET 1 of 1	
MODIFICATIONS:		
APPROVED BY DESIGN METHODS ENGINEER		
<b>TWO-LANE DETOUR CONNECTION</b>		

Ramp entrance pavement shown by shaded area is 252.12 square yards.

For joint details, see PV-101

- ① For header construction details at the end of taper, see Typical 7101 or Typical 7102.
- ② Construct subbase for ramp entrance pavement the same thickness as mainline subbase.



NOTE: The algebraic difference between profile grade for Ramp Base Line at (B) and relative profile grade of Mainline at (C) is 0.52%.

**PROFILE**

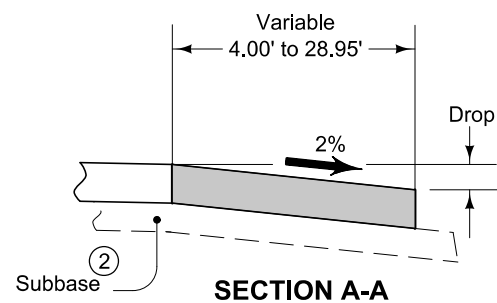
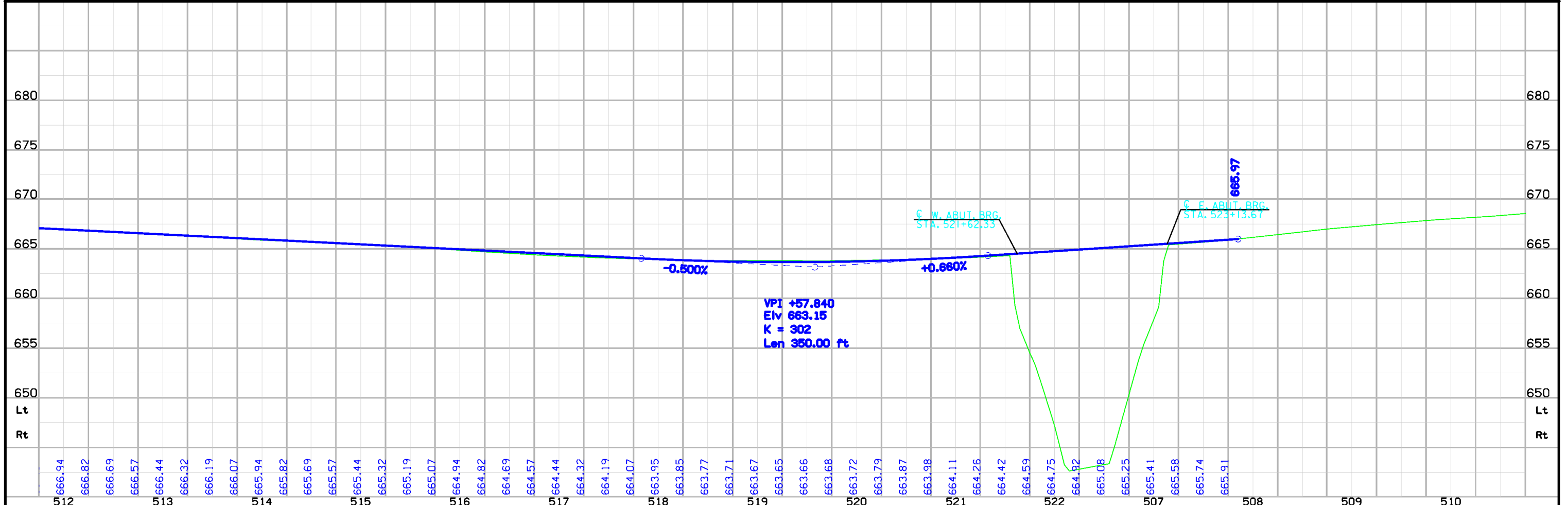
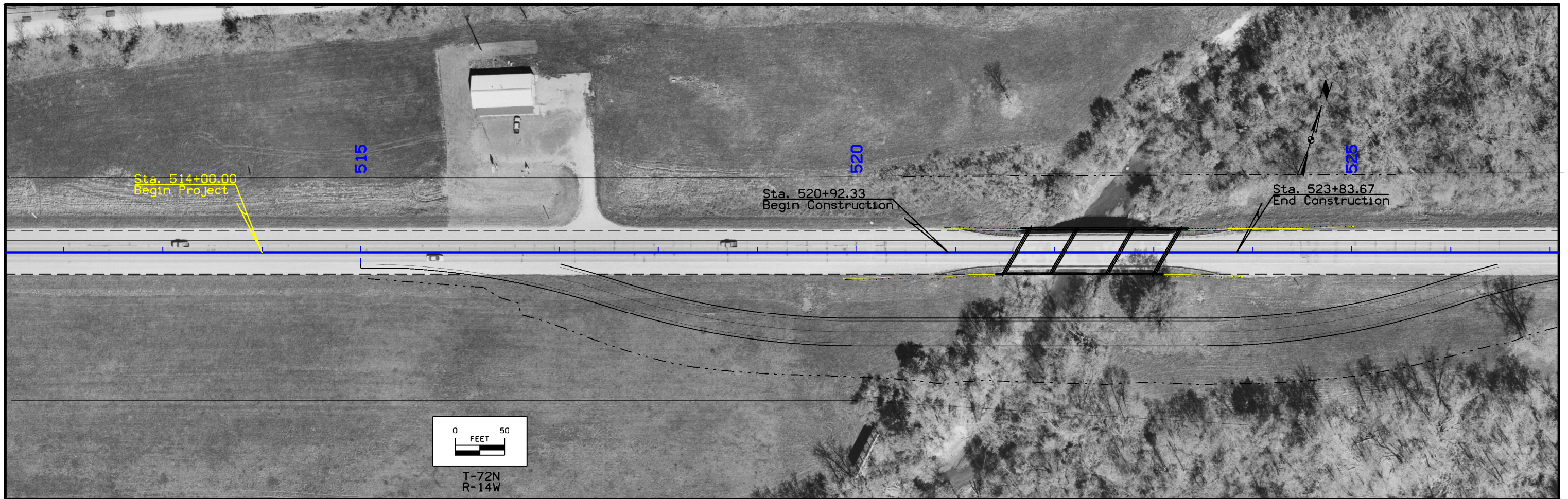


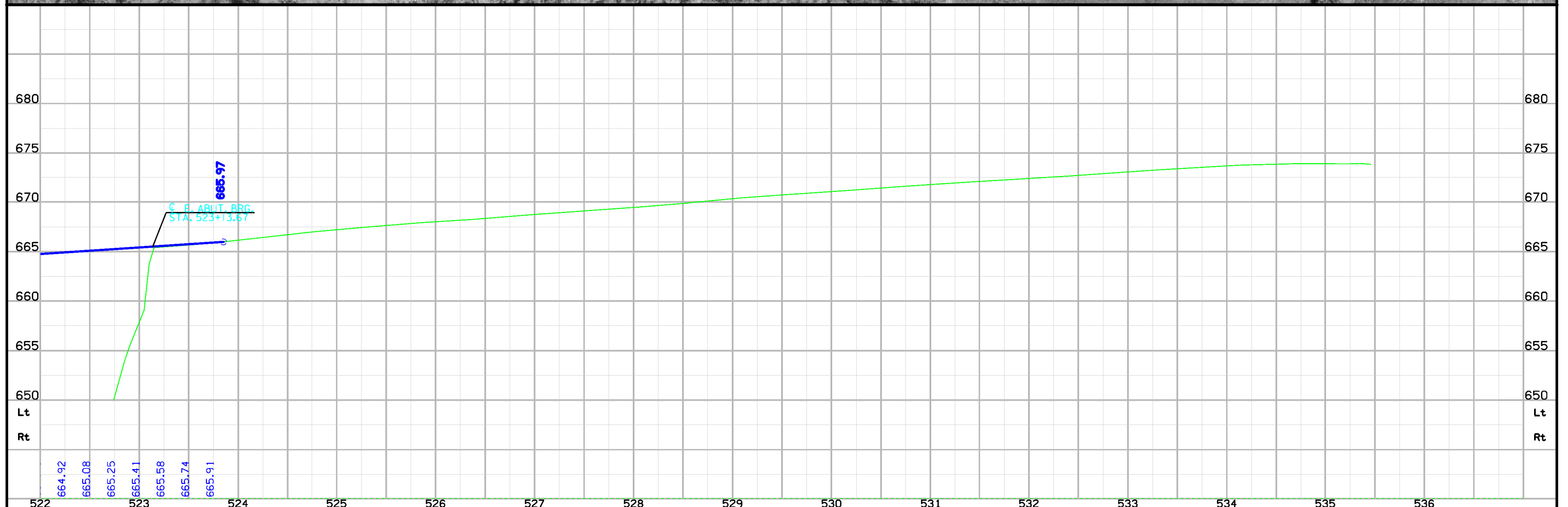
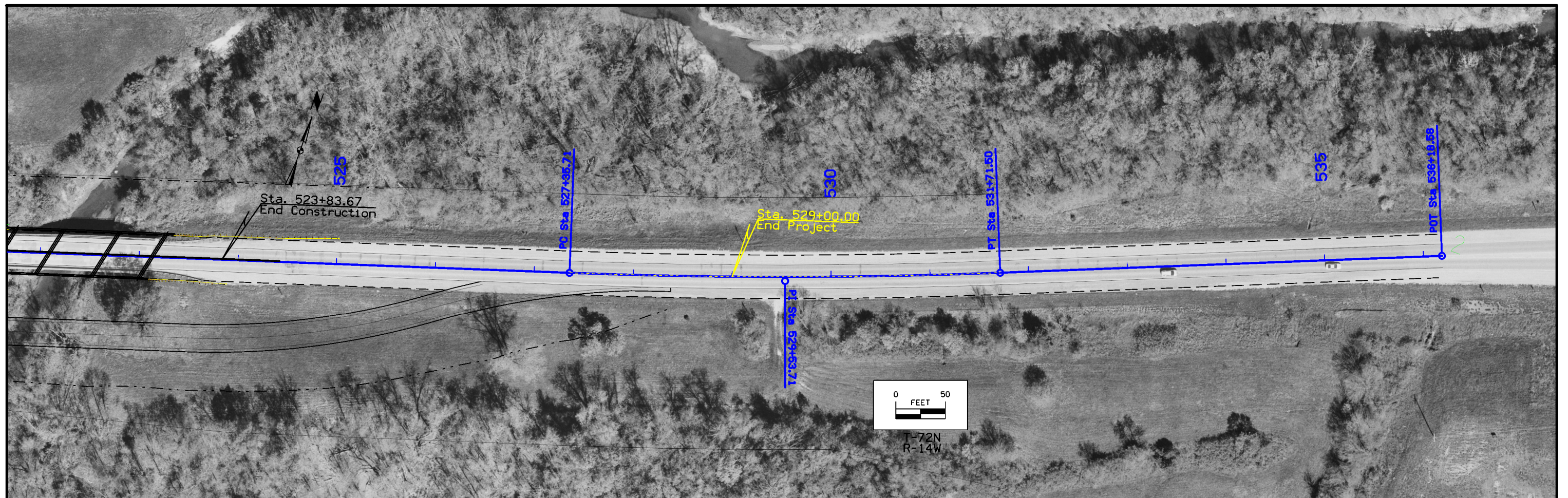
TABLE OF OFFSETS AND DROPS FOR DETOUR PAVEMENT									
DISTANCE (Ft.)	0	25	50	75	100	125	150	175	191.36
OFFSET (Ft.)	28.95	22.40	17.30	12.74	9.00	6.16	4.22	4.02	4.00
DROP (Ft.)	0.58	0.45	0.35	0.25	0.18	0.12	0.084	0.08	0.08

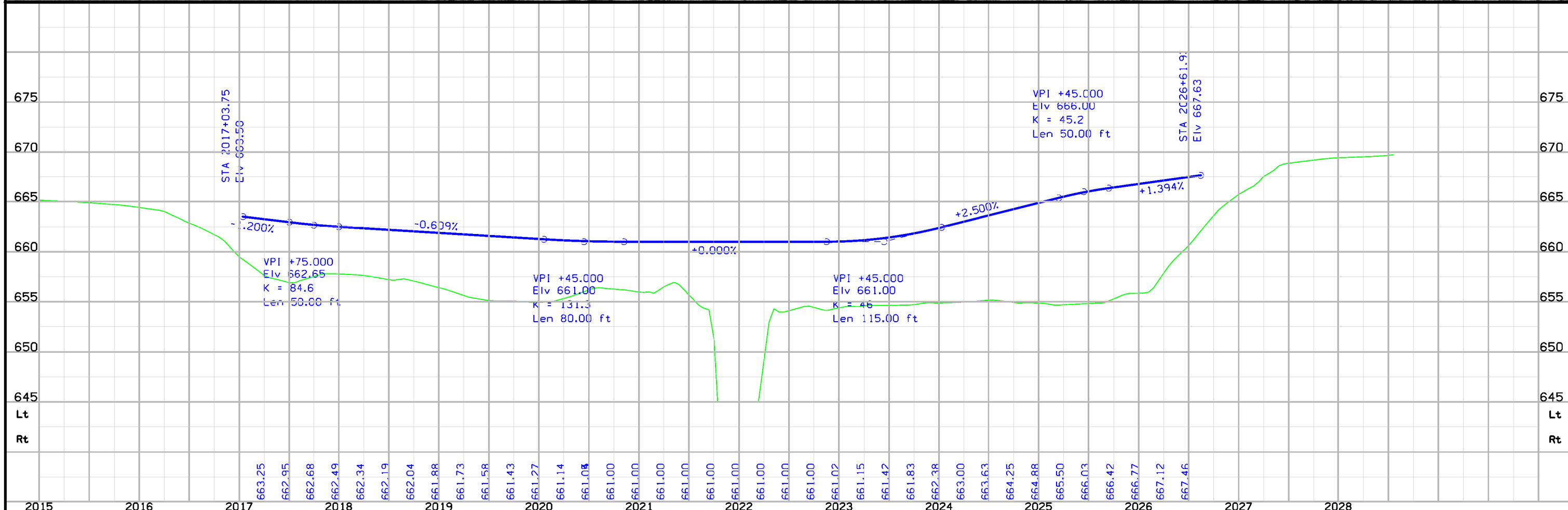
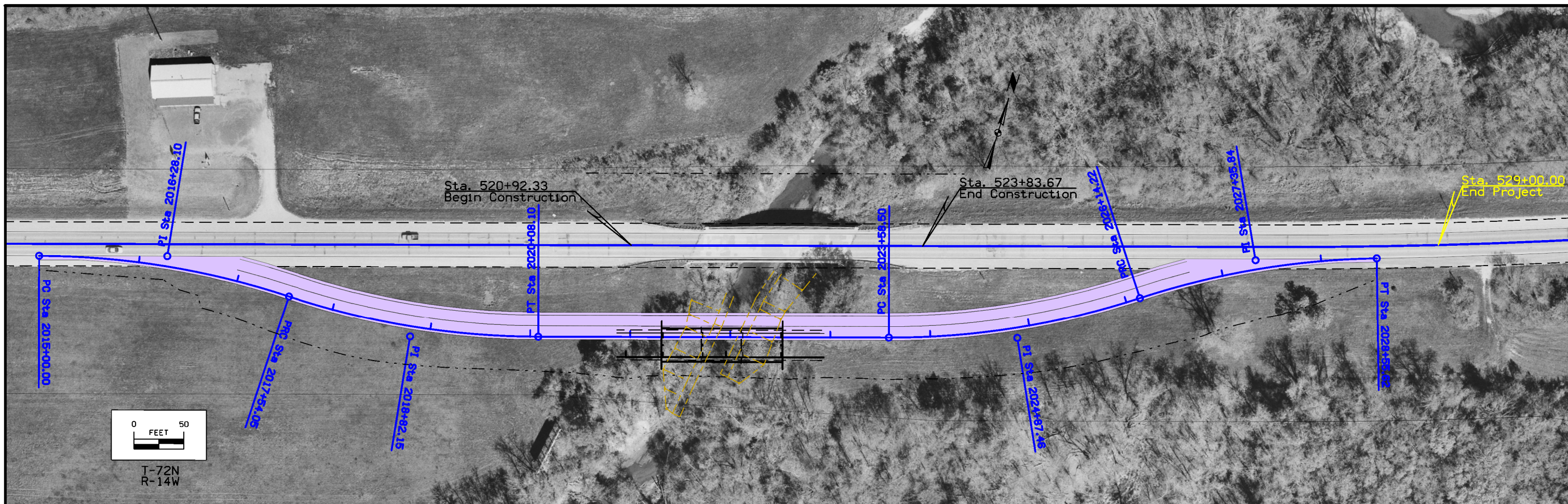
NOTE: The elevations are established by a constant 2% slope across the appropriate detour widths based on a radius of 700'. Drop = (0.02) x (Offset).

<b>MODIFIED</b>	REVISION	
	New	10-15-13
<b>STANDARD ROAD PLAN</b>	<b>PV-428</b>	
	SHEET 1 of 1	
MODIFICATIONS:		
APPROVED BY DESIGN METHODS ENGINEER		
<b>TWO-LANE DETOUR CONNECTION</b>		









## Survey Information

### General Information

Measurement units for this survey are US survey feet. This survey is for a proposed Bridge replacement of the U.S. 34 Bridge over Bear Creek. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM Survey.

The original survey was performed in middle of June. At that time, an asphalt overlay project was commencing. On August 20th, survey crews returned after the overlay project to survey the asphalt road and reconstructed shoulders. Centerline monumentation was re-set after overlay by IDOT District 5 survey crew. This information was incorporated into the current survey.

### Vertical Control

Vertical datum for this survey is relative to NAVD88 (IaRTN-2013 Adjustment) computed using Geoid 12A. US Survey feet.

The survey control is relative to IaRTN reference stations. Multiple Iowa RTN observations were completed on G001. After review of these observations, the shots were manually averaged to establish the site BM elevation. A level run was then completed through project control points and benchmarks. The error was allowable and the error was distributed proportionately among the project monuments.

Vertical equations are as follows:

#### Datum Benchmark

#501 this survey	Elevation = 664.52 NAVD88
BM No. 87 Grading Project #F—1027(10)	Elevation = 664.36
IHC Plug in SW Wing Wall of 150' x 30' I-beam Bridge	

#504 This survey	Elevation = 802.06 NAVD88
NGS Monument Designated as D6/PID MH0054	Elevation = 802.02
Standard Disk in Concrete stamped 802.000 D6 1930	

### Horizontal Control

Measurement units for this survey are US survey feet NAD83(2011) IaRTN-2013 Adjustment. Iowa State Plane South coordinates were transformed to project ground coordinates by applying a 1/combined scale factor from held point G001 at the center of the project to minimize ground distortion.

State Plane Coordinate Zone 1402 (Iowa South)  
 State Plane Coordinate held at Point G001  
 N=371244.57 E=1926582.96  
 Combined Scale Factor (Grid)=0.999953647  
 1 / Grid= 1.000072966

### Local Project Coordinates Conversion Equation:

Local Project Coord y=[(State Plane y-hold point y)/grid factor]+hold point y  
 Local Project Coord x=[(State Plane x-hold point x)/grid factor]+hold point x

Point	STATE PLANE COORDS(Y)	STATE PLANE COORDS(X)	LOCAL PROJECT COORDS(Y)	LOCAL PROJECT COORDS(X)
G001	371244.57	1926582.96	371244.57	1926582.96
G002	371183.27	1926211.27	371183.26	1926211.24
G003	370922.03	1925526.48	370922.01	1925526.40
G004	371504.42	1927265.33	371504.44	1927265.38
G005	371718.29	1927991.84	371718.32	1927991.94

### Alignment Information

The horizontal alignment for this survey is a retrace of As-built Grading Plans No. F—1027(10). Survey stationing was equated to the plan at POT Sta. 506+54.6 and run ahead without equation throughout the survey.

Equations are as follows:

POT Sta. 506+54.6 This Survey  
 = POT Sta. 506+54.6 As-built Plans Project No. F—1027(10)

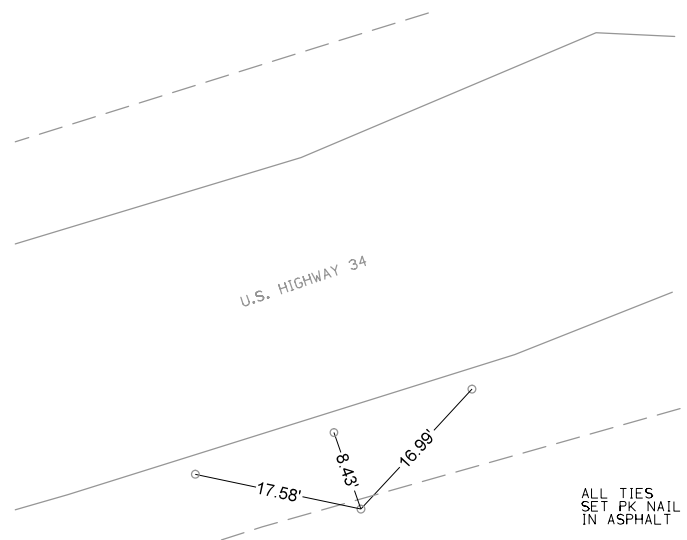
PC STA 527+35.71 this survey  
 = PC STA 527+37.5 Project No. F—1027(10)

PT STA 531+71.50 this survey  
 = PT STA 531+73.3 Project No. F—1027(10)

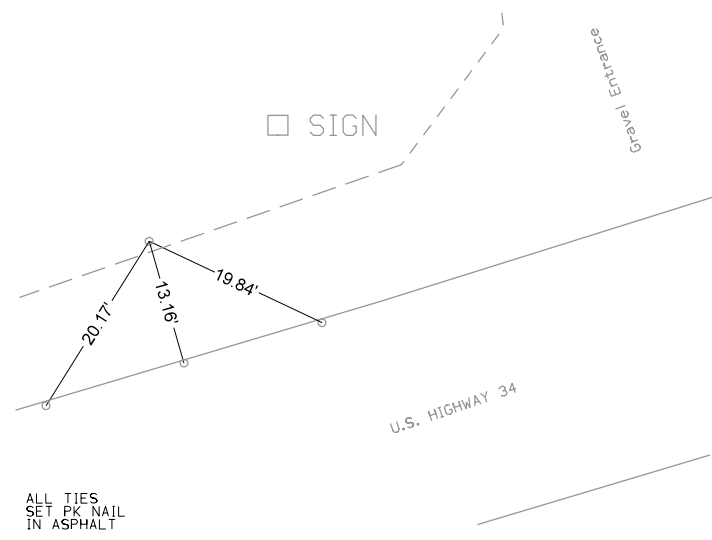
POT STA 536+18.58 this survey  
 = POT STA 536+20.33 Project No. F—1027(10)

## VERTICAL CONTROL

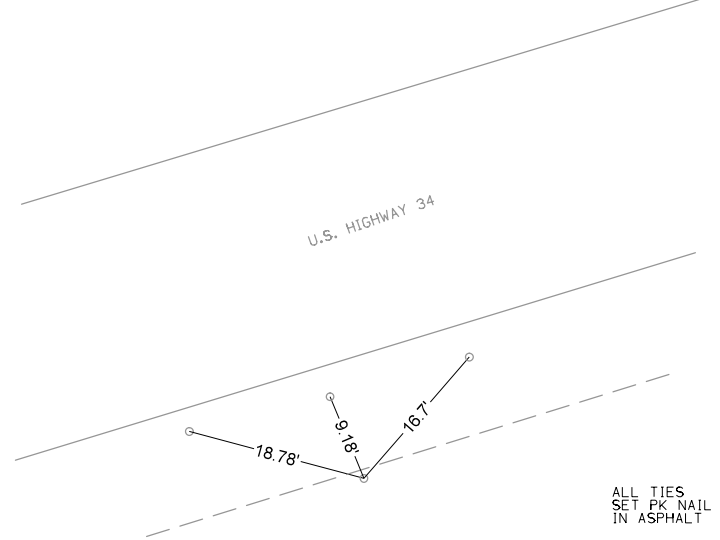
STA. 520+48.36, 24.03' Rt.  
 G001, SET 1/2" REBAR WITH RED CAP  
 N=371244.57 E=1926582.96



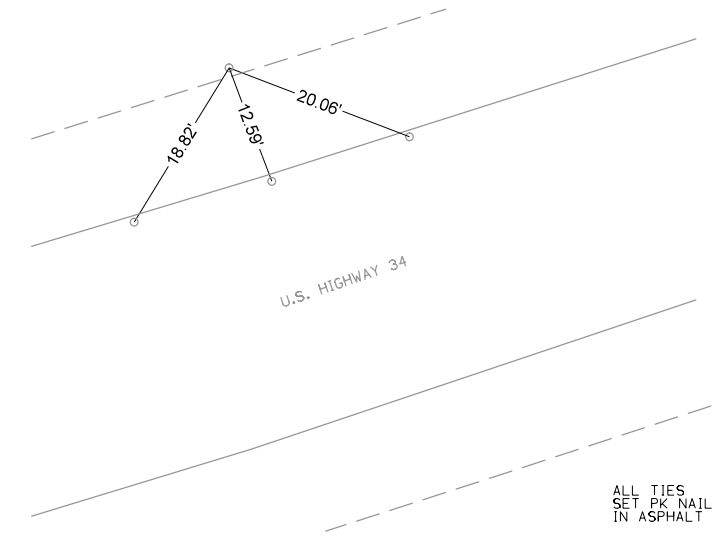
STA. 516+74.90, 25.59' Lt.  
 G002, SET 1/2" REBAR WITH RED CAP  
 N=371183.26 E=1926211.24



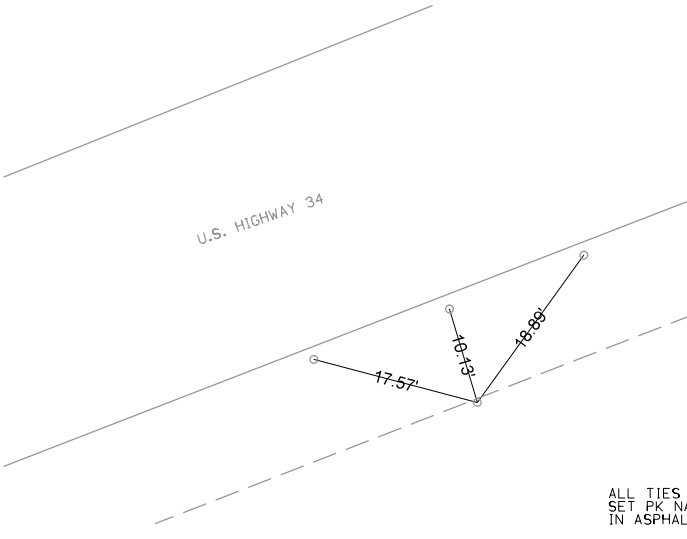
STA. 509+43.67, 24.85' Rt.  
 G003, SET 1/2" REBAR WITH RED CAP  
 N=370922.01 E=1925526.40

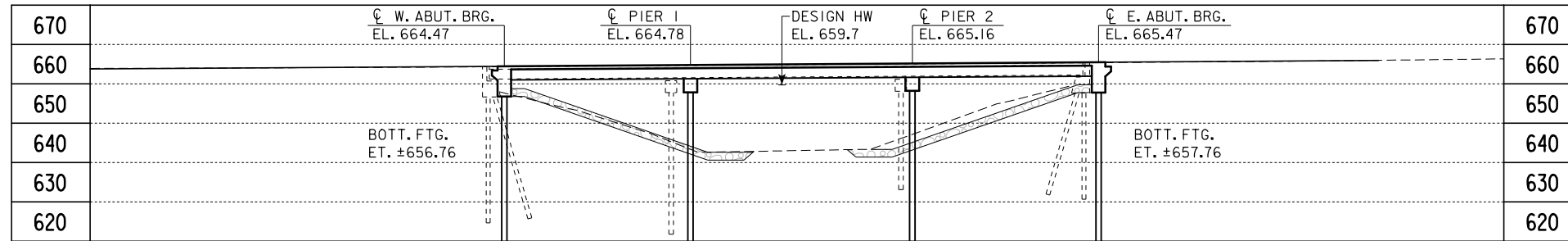


STA. 527+77.07, 25.65' Lt.  
 G004, SET 1/2" REBAR WITH RED CAP  
 N=371504.44 E=1927265.38



STA. 535+33.78, 25.39' Rt.  
 G005, SET 1/2" REBAR WITH RED CAP  
 N=371718.32 E=1927991.94





TOP OF BRIDGE DECK AT CENTERLINE ROADWAY IS 0.03' BELOW THE PROFILE GRADE TO ACCOUNT FOR DECK CROSS SLOPE AND PARABOLIC CROWN.

LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY

-0.5000% 0.6600%

VPI STA = 519+57.84 VC = 350'  
VPI ELEV = 663.15

PROPOSED PROFILE GRADE US 34

HYDRAULIC DATA

DRAINAGE AREA = 22.9 SQ. MI.  
STREAM SLOPE = 4.75 FT./MI.  
AVG. LOW WATER STAGE = 644.1

Q<sub>50</sub> = 5,420 CFS  
STAGE = 659.7  
BACKWATER = 0.6 FT.  
AVG. BRIDGE VELOCITY = 4.5 FPS

Q<sub>100</sub> = 6,130 CFS  
STAGE = 660.7  
BACKWATER = 0.7 FT.

Q<sub>200</sub> = 6,870 CFS  
STAGE = 661.6  
CALCULATED DESIGN SCOUR = ????

Q<sub>500</sub> = 7,740 CFS  
STAGE = 662.6  
CALCULATED CHECK SCOUR = ????

ROADWAY OVERTOP 663.77  
STA. 519+65

DISCHARGES OBTAINED FROM GAGE 05489490

UTILITIES LEGEND:

SYMBOL - TYPE - COMPANY NAME

TRAFFIC ESTIMATE

200_ AADT	_____	V.P.D.
202_ AADT	_____	V.P.D.
202_ DHV	_____	V.P.H.
TRUCKS	_____	%
TOTAL	_____	
DESIGN ESALs	_____	

LOCATION

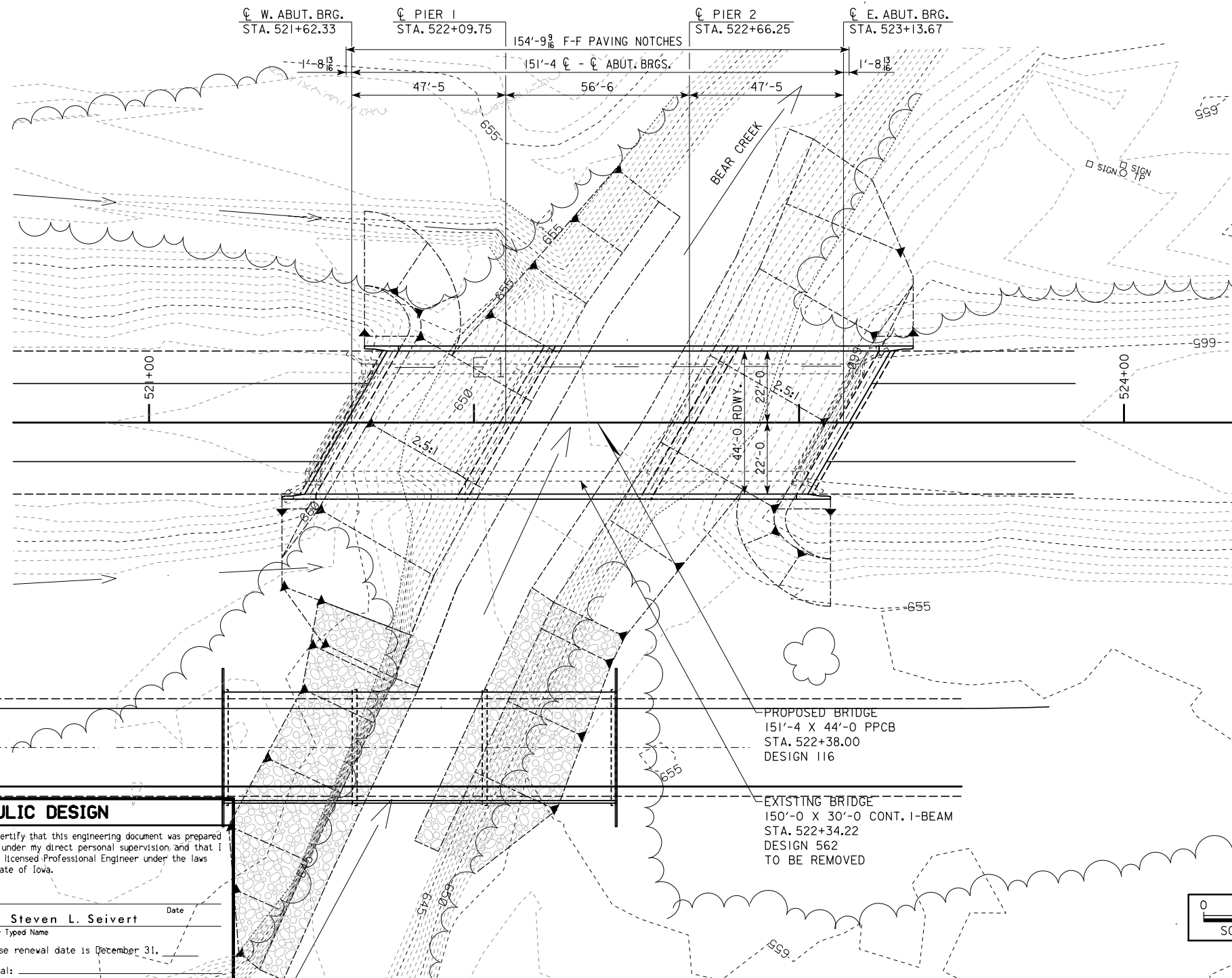
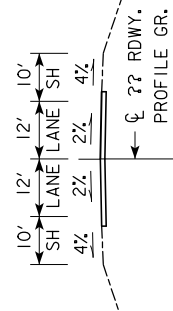
US 34 OVER BEAR CREEK  
T-72N R-14W  
SECTION 27  
CENTER TOWNSHIP  
WAPELLO COUNTY  
FHWA NO.  
BRIDGE MAINT. NO. 9086.2S034  
LATITUDE 41.014504°  
LONGITUDE -92.462359°

PRELIMINARY

DESIGN FOR 30° SKEW (L.A.)  
**151'-4 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
47'-5 END SPANS A BEAM 56'-6 INTERIOR SPAN  
**SITUATION PLAN**  
STATION 522+38.00

WAPELLO COUNTY  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 2 FILE NO. 30769 DESIGN NO. 116

TYPICAL APPROACH SECTION



PROPOSED BRIDGE  
151'-4 X 44'-0 PPCB  
STA. 522+38.00  
DESIGN 116

EXISTING BRIDGE  
150'-0 X 30'-0 CONT. I-BEAM  
STA. 522+34.22  
DESIGN 562  
TO BE REMOVED



HYDRAULIC DESIGN

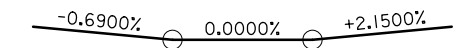
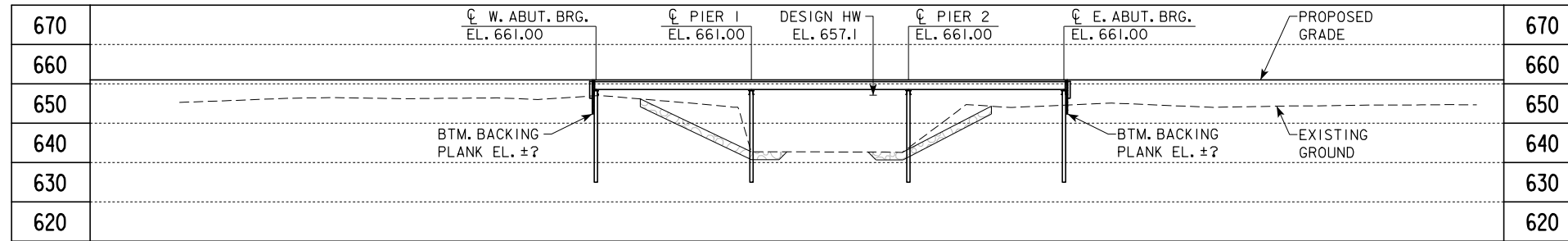
I hereby certify that this engineering document was prepared by me or under my direct personal supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature **Steven L. Seivert** Date \_\_\_\_\_

Printed or Typed Name

My license renewal date is December 31, \_\_\_\_\_

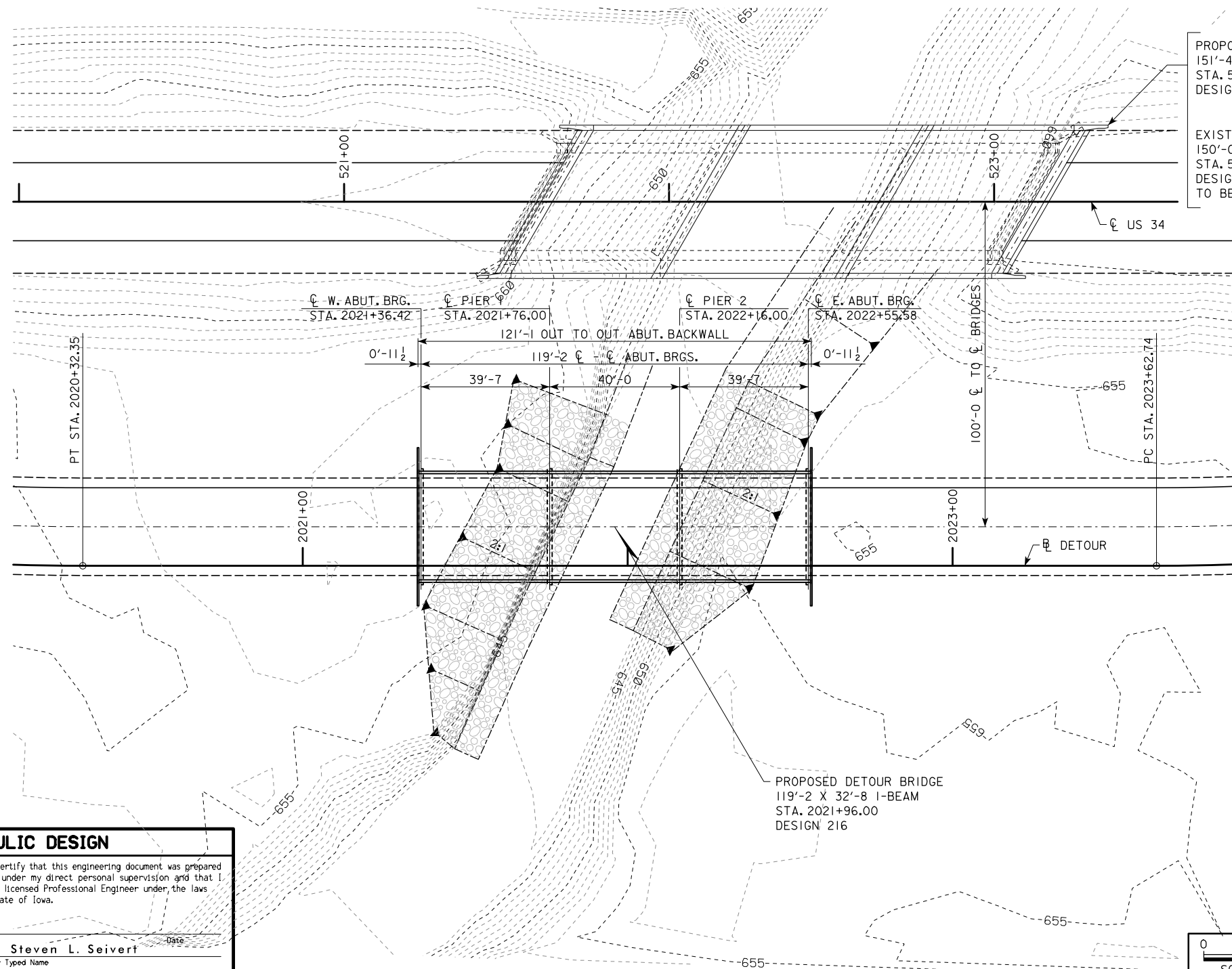
Pages or sheets covered by this seal: \_\_\_\_\_



VPI STA = 2020+21.85 VPI STA = 2023+49.75  
 VPI ELEV = 661.00 VPI ELEV = 661.00  
 VC = 80.25' VC = 115.00'

**PROPOSED PROFILE GRADE ON DETOUR**

**LONGITUDINAL SECTION ALONG CL DETOUR ROADWAY**



PROPOSED BRIDGE  
 151'-4 X 44'-0 PPCB  
 STA. 522+38.00  
 DESIGN 116

EXISTING BRIDGE  
 150'-0 X 30'-0 CONT. I-BEAM  
 STA. 522+34.22  
 DESIGN 562  
 TO BE REMOVED

**HYDRAULIC DATA**

DRAINAGE AREA = 22.9 SQ. MI.  
 STREAM SLOPE = 4.75 FT./MI.  
 AVG. LOW WATER STAGE = 644.1

Q2 = 1,890 CFS  
 STAGE = 652.9  
 BACKWATER = 0.1 FT.  
 AVG. BRIDGE VELOCITY = 4.7 FPS

Q5 = 3,080 CFS  
 STAGE = 655.8  
 BACKWATER = 0.2 FT.  
 AVG. BRIDGE VELOCITY = 5.0 FPS

Q10 = 3,800 CFS  
 STAGE = 657.1  
 BACKWATER = 0.4 FT.  
 AVG. BRIDGE VELOCITY = 5.2 FPS  
 CALCULATED DESIGN SCOUR = ????.?

Q25 = 4,730 CFS  
 STAGE = 658.7  
 CALCULATED CHECK SCOUR = ????.?

ROADWAY OVERTOP 661.00  
 STA. 2019+00

DISCHARGES OBTAINED FROM GAGE 05489490

**TRAFFIC ESTIMATE**

200_ AADT	_____	V.P.D.
202_ AADT	_____	V.P.D.
202_ DHV	_____	V.P.H.
TRUCKS	_____ %	
TOTAL	_____	
DESIGN ESALs	_____	

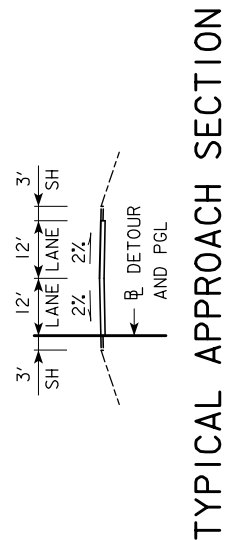
**LOCATION**

US 34 DETOUR OVER BEAR CREEK  
 T-72N R-14W  
 SECTION 27  
 CENTER TOWNSHIP  
 WAPELLO COUNTY  
 FHWA NO.  
 BRIDGE MAINT. NO. 9086.2S034  
 LATITUDE 41.014200°  
 LONGITUDE -92.462442°

PRELIMINARY

DESIGN FOR 0° SKEW  
**119'-2 X 32'-8 STEEL I-BEAM  
 DETOUR BRIDGE**  
 39'-7 END SPANS 40'-0 INTERIOR SPAN  
**SITUATION PLAN**  
 STATION 2021-96.00 (CL US 34 DETOUR)  
**WAPELLO COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 1 OF 1 FILE NO. 30769 DESIGN NO. 216



**TYPICAL APPROACH SECTION**

**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: Steven L. Seivert Date: \_\_\_\_\_  
 Printed or Typed Name: Steven L. Seivert  
 My license renewal date is December 31, \_\_\_\_\_

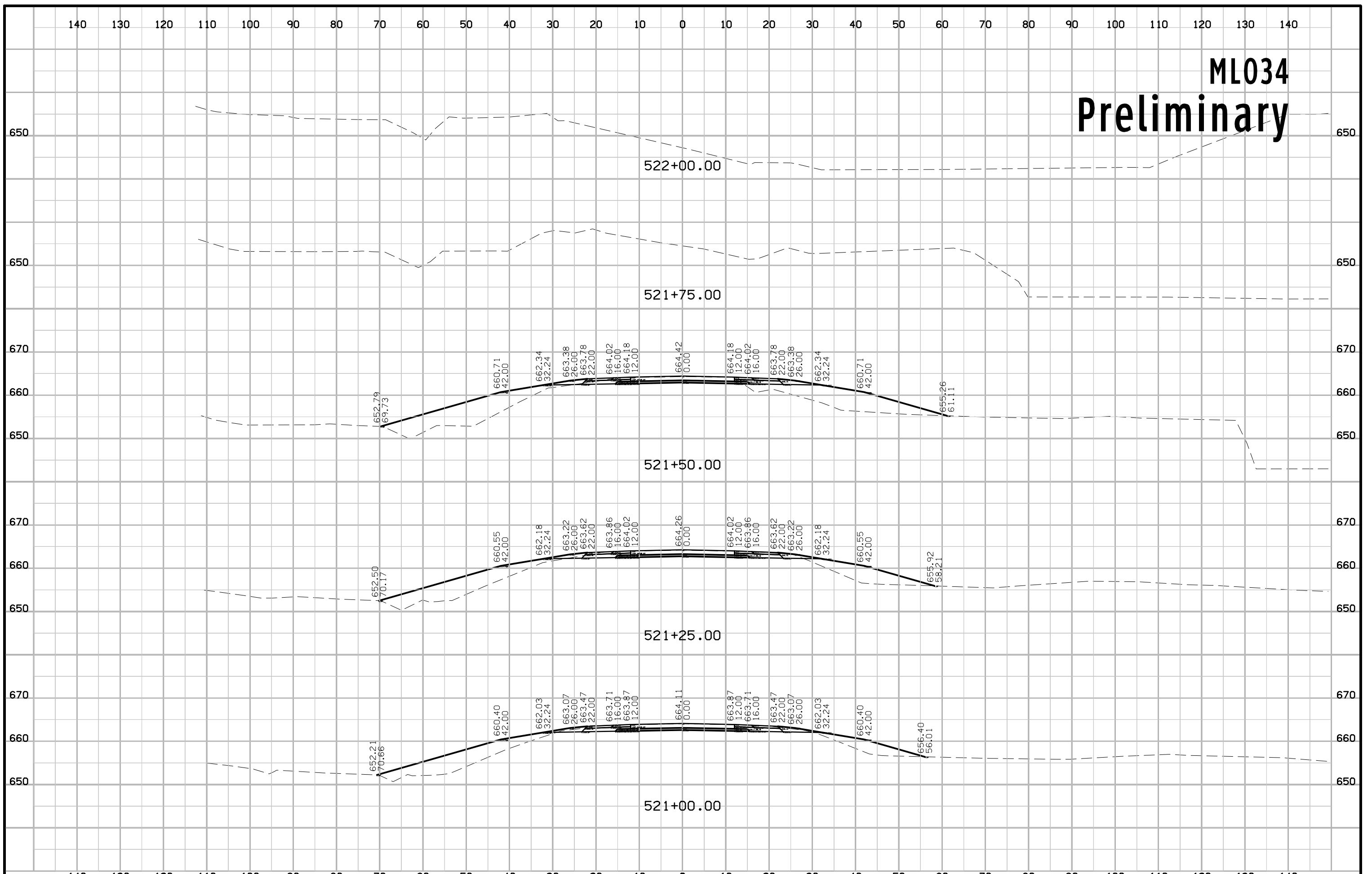
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**SITUATION PLAN**

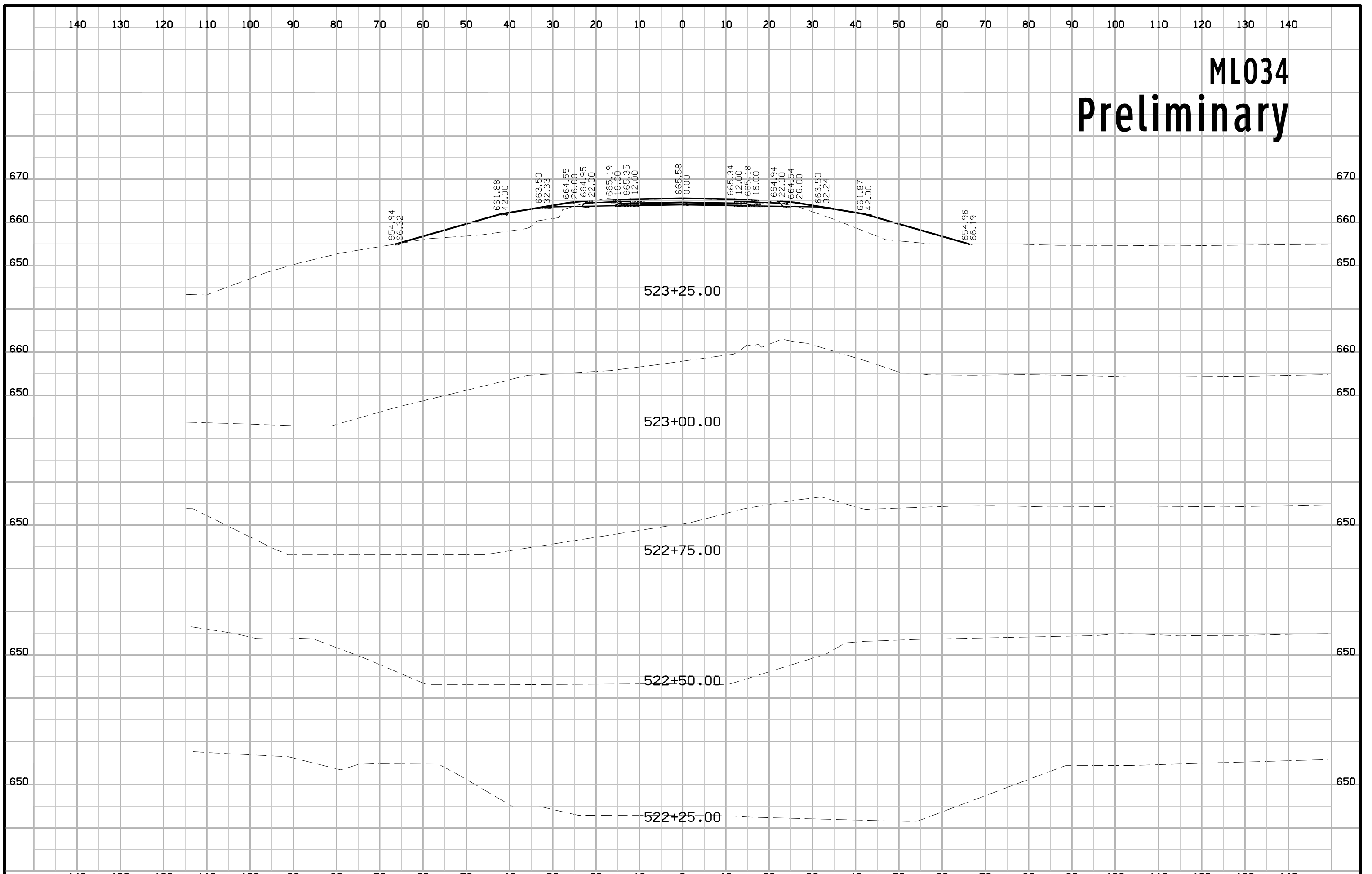
**UTILITIES LEGEND:**  
 SYMBOL - TYPE - COMPANY NAME



# ML034 Preliminary

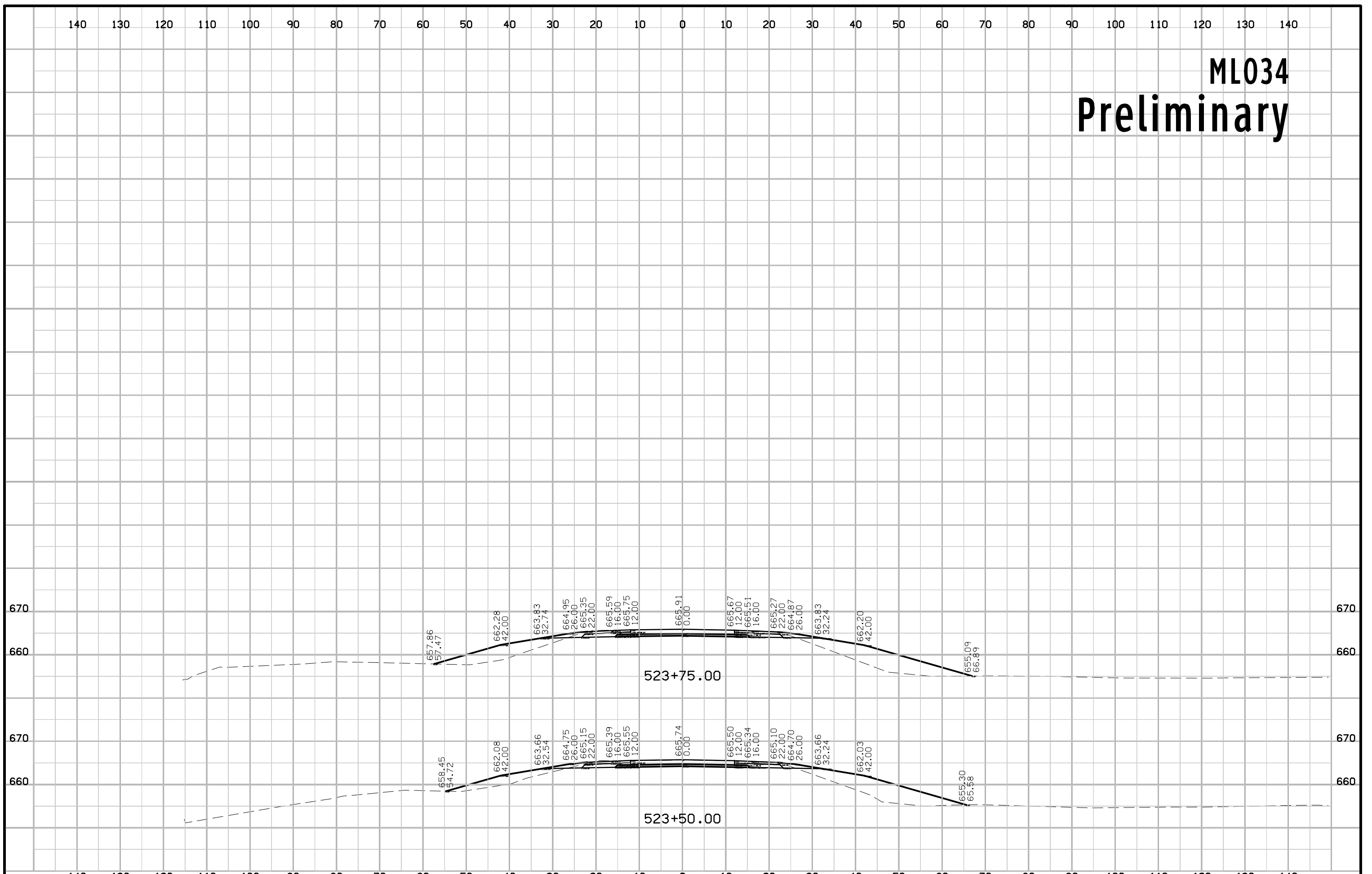


# ML034 Preliminary

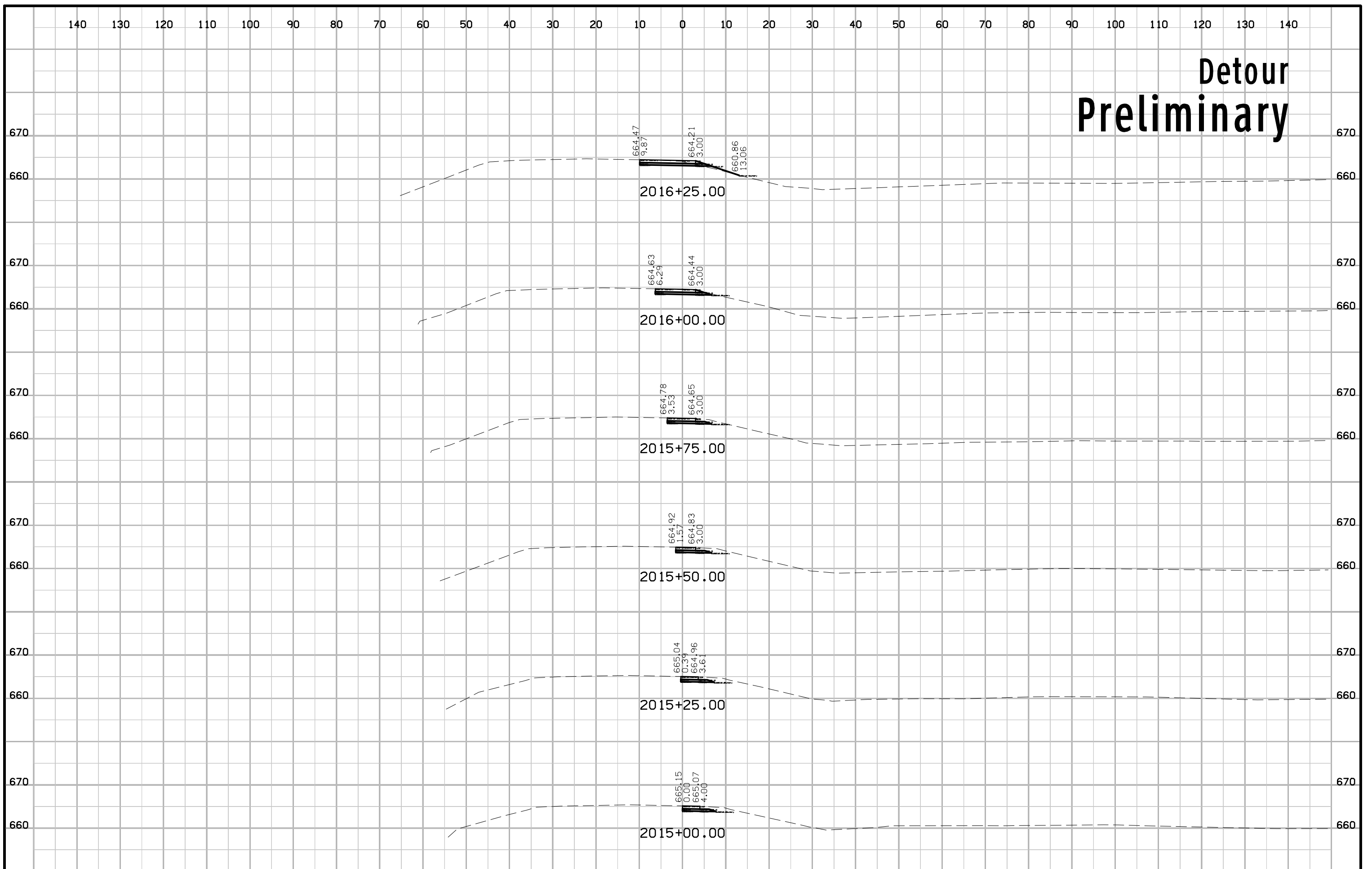




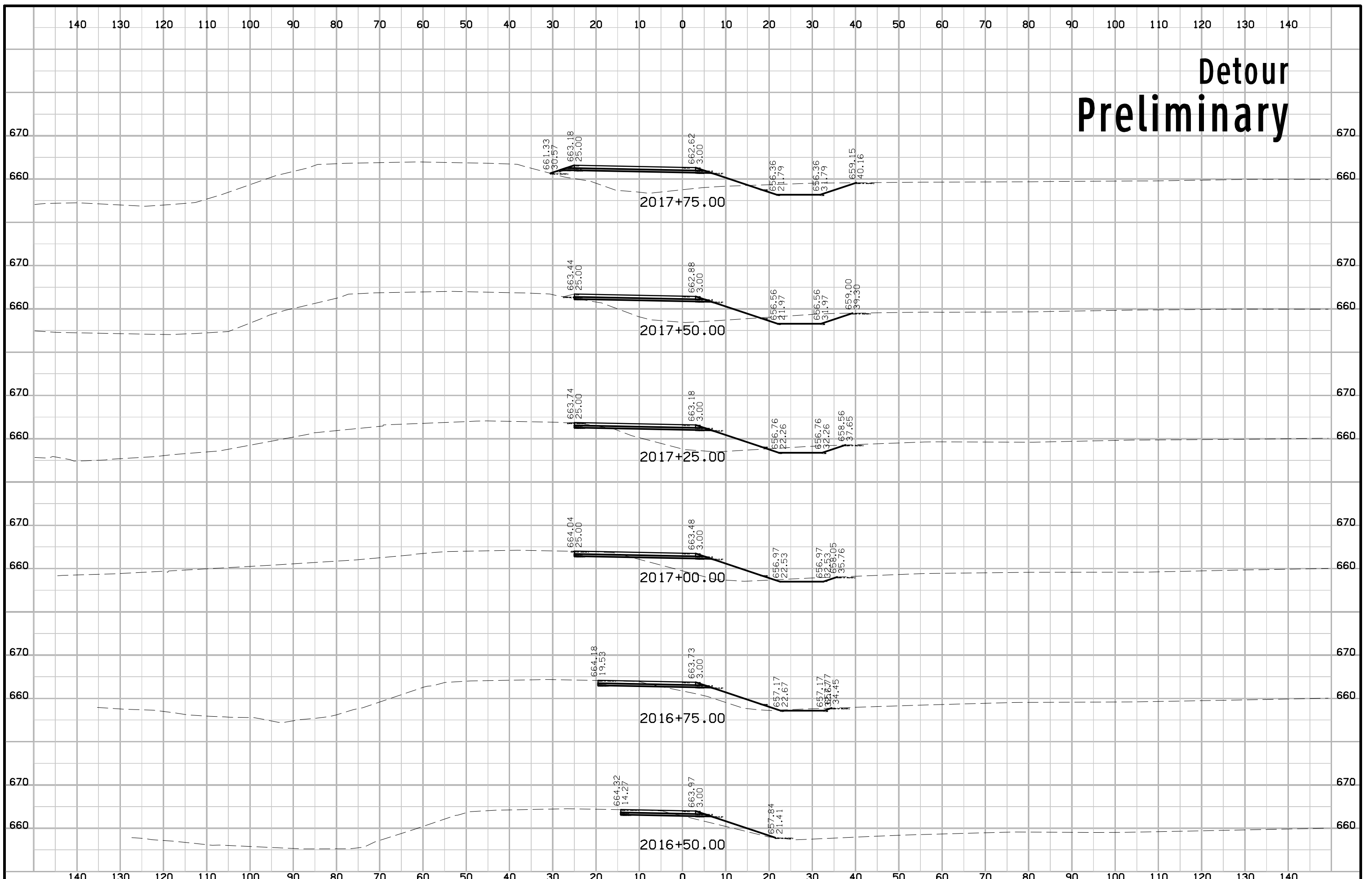
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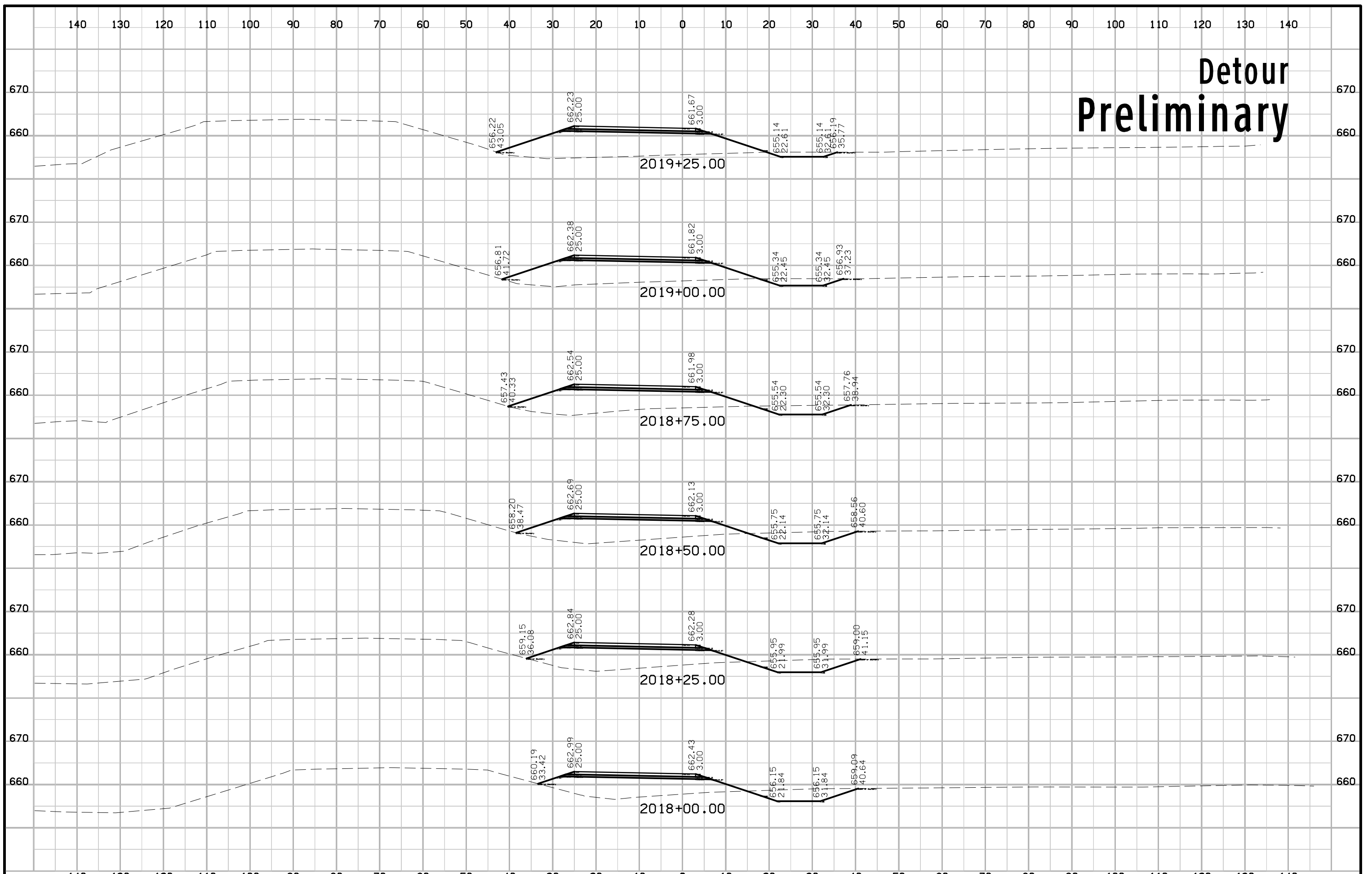
# Detour Preliminary



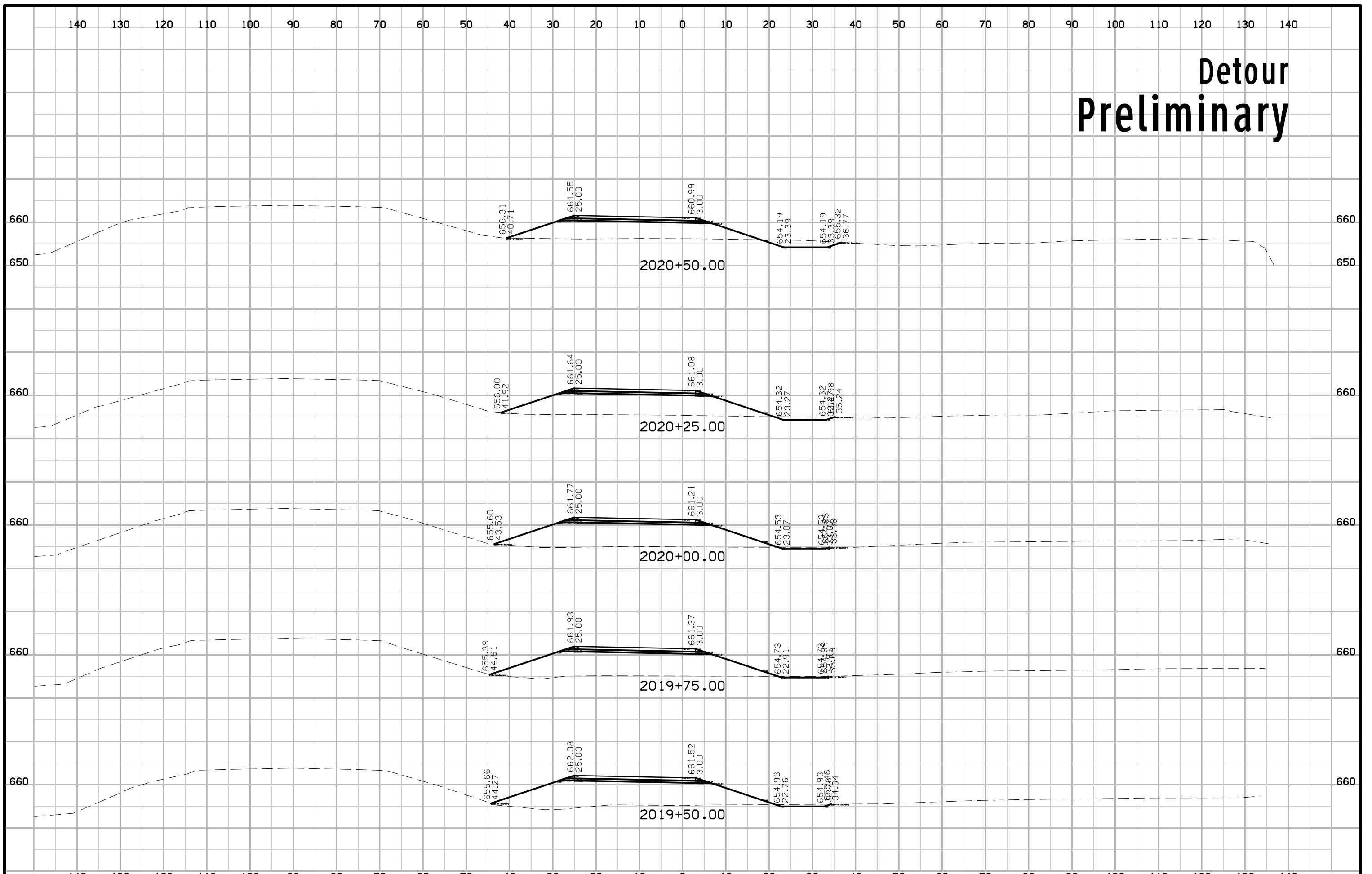
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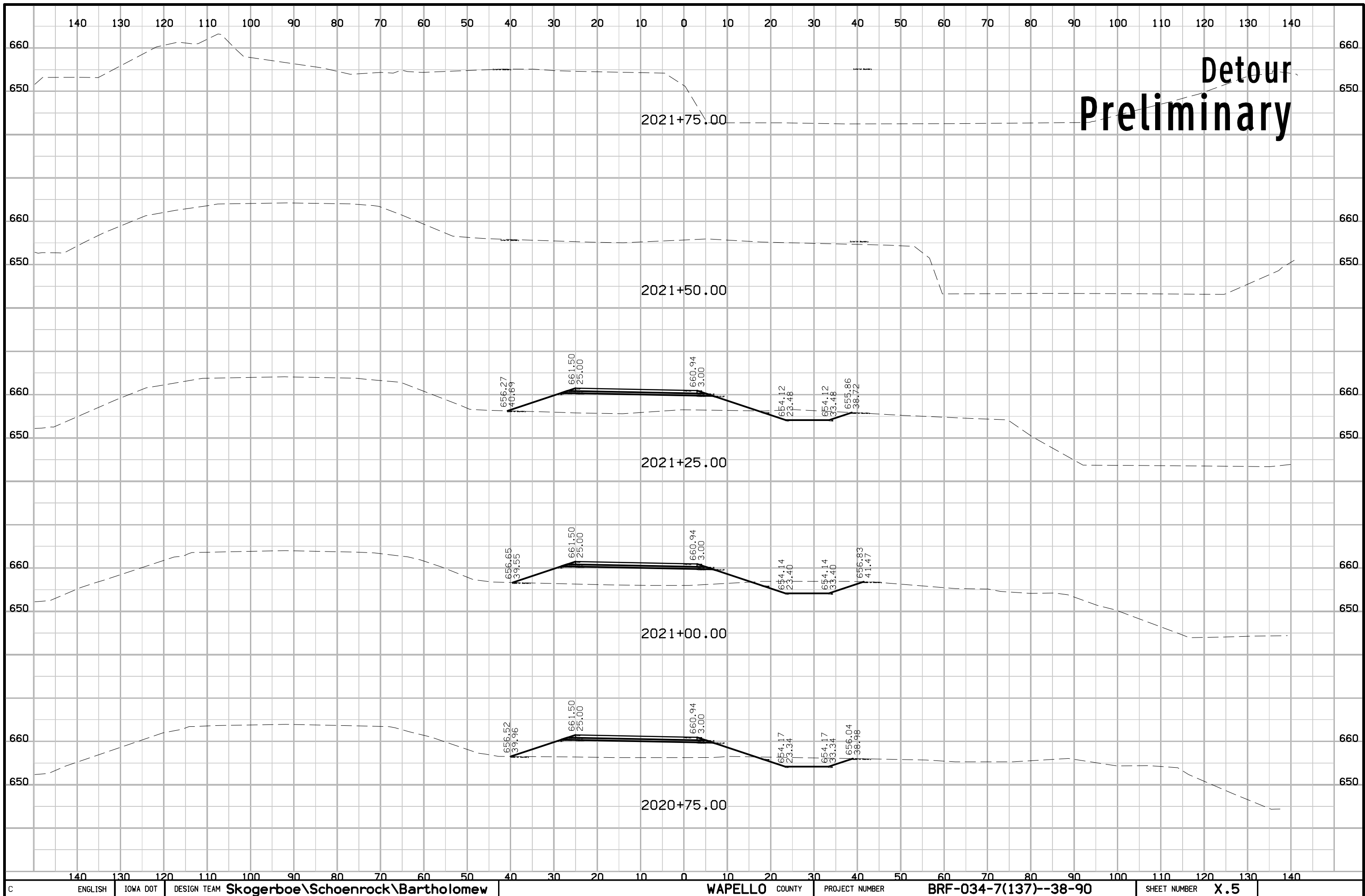


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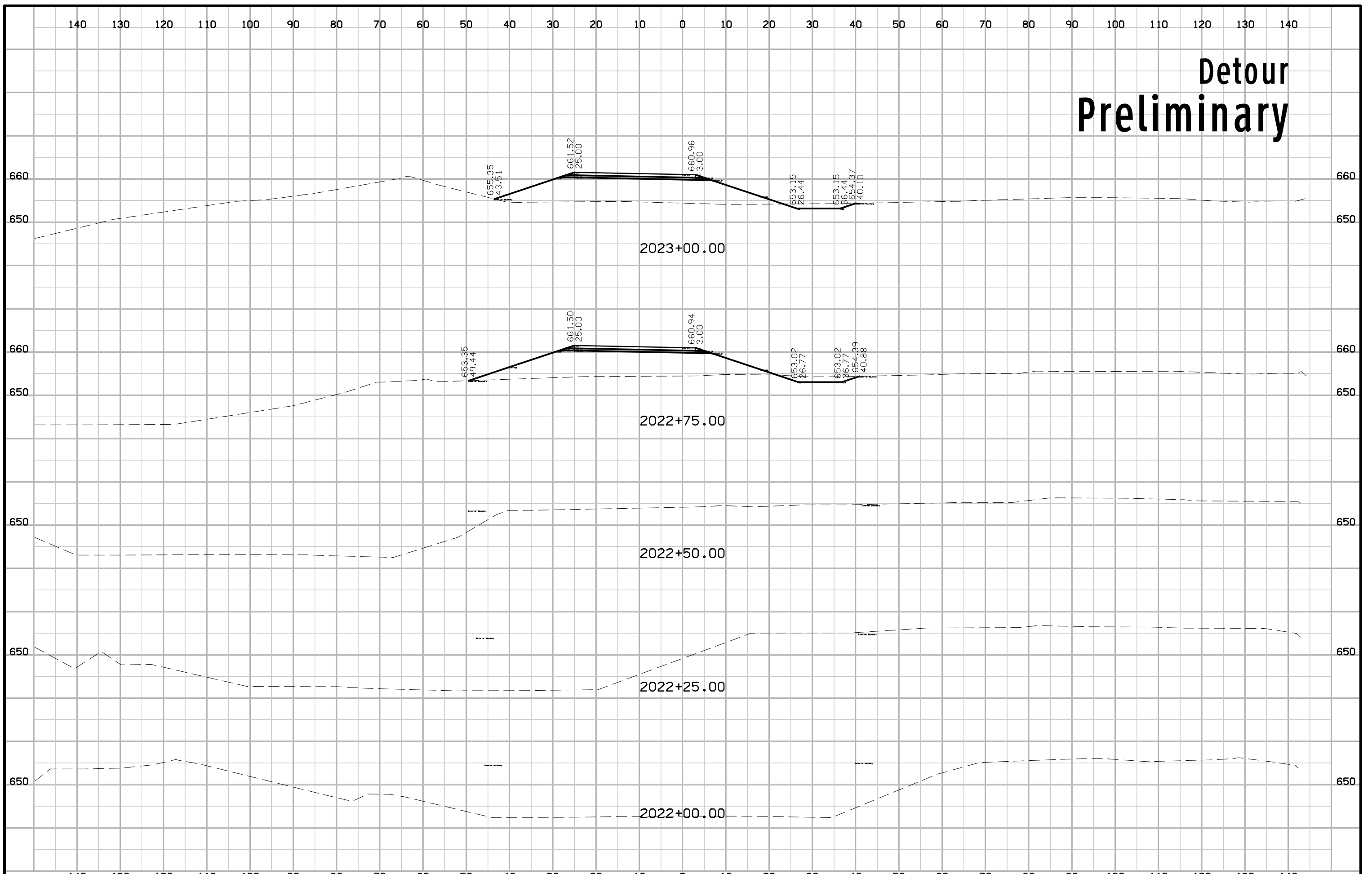


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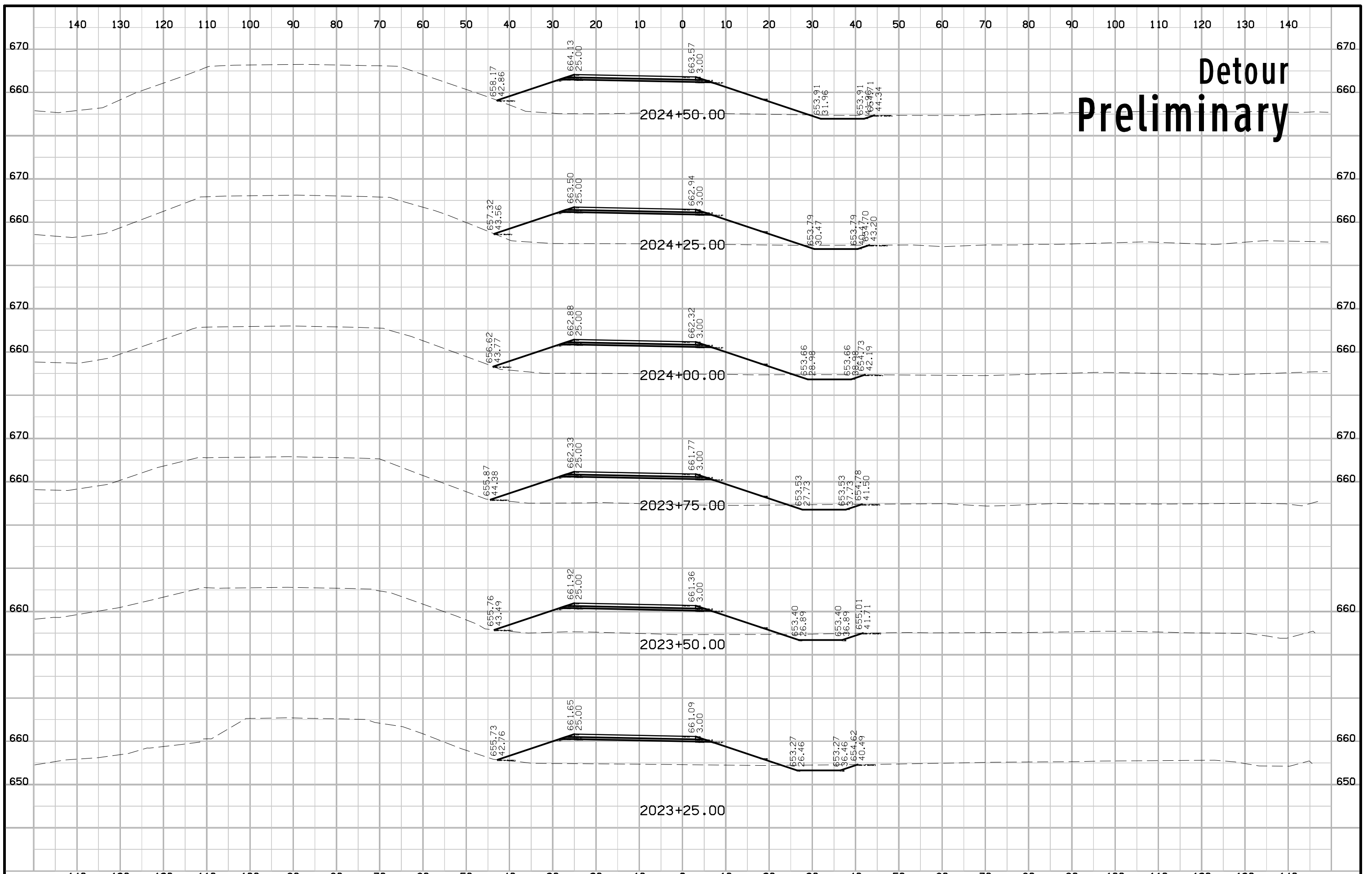




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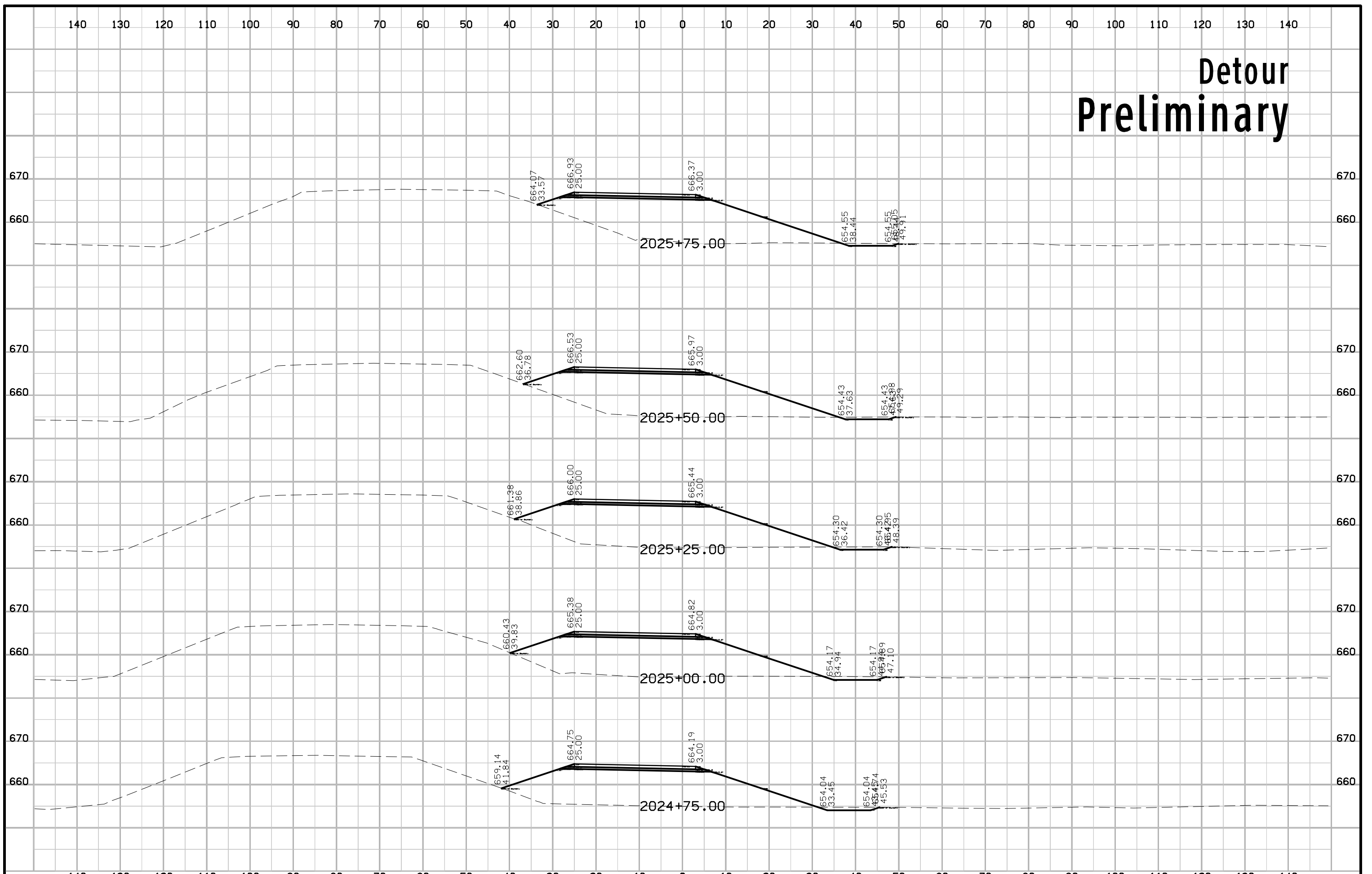


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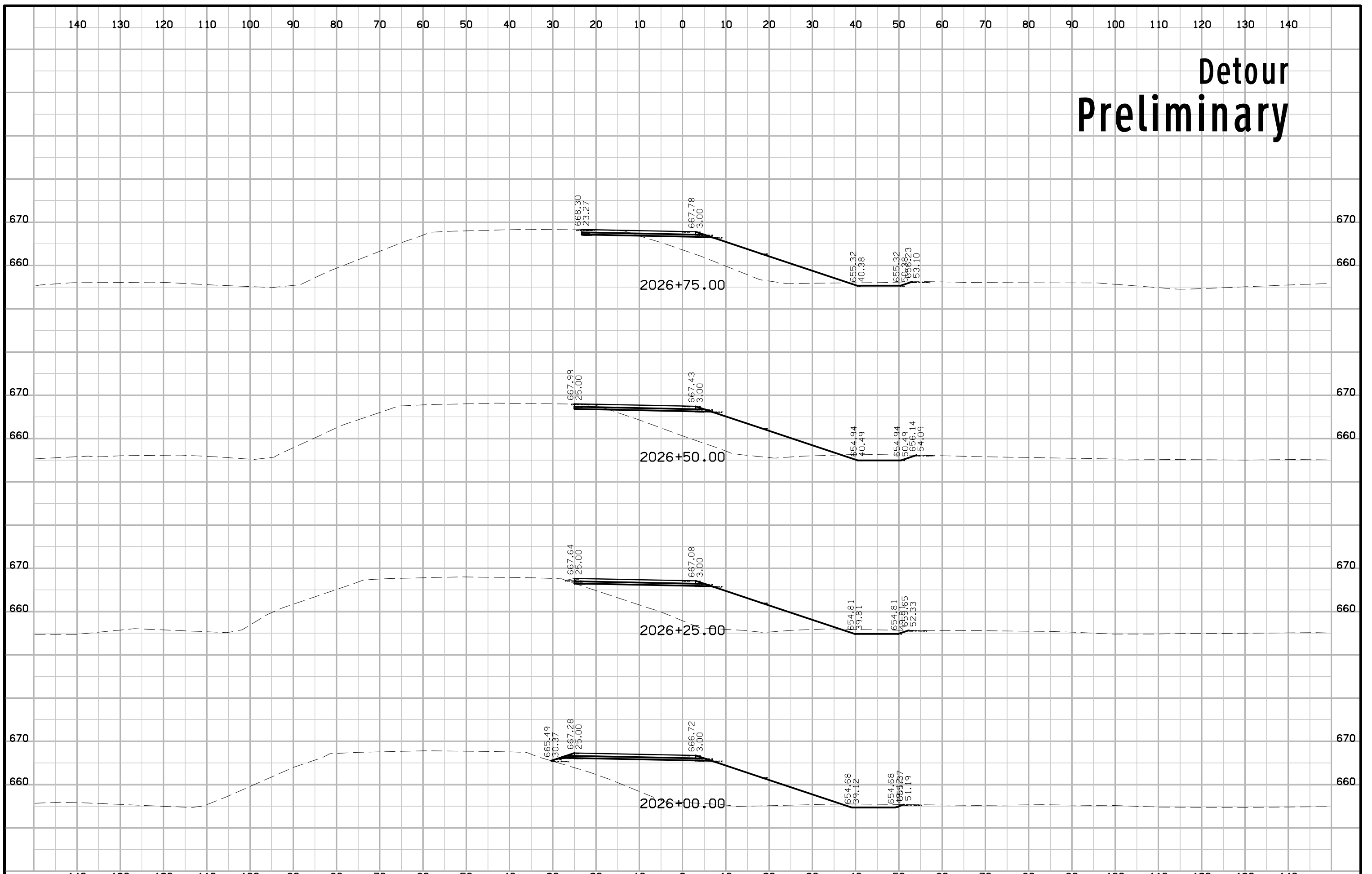




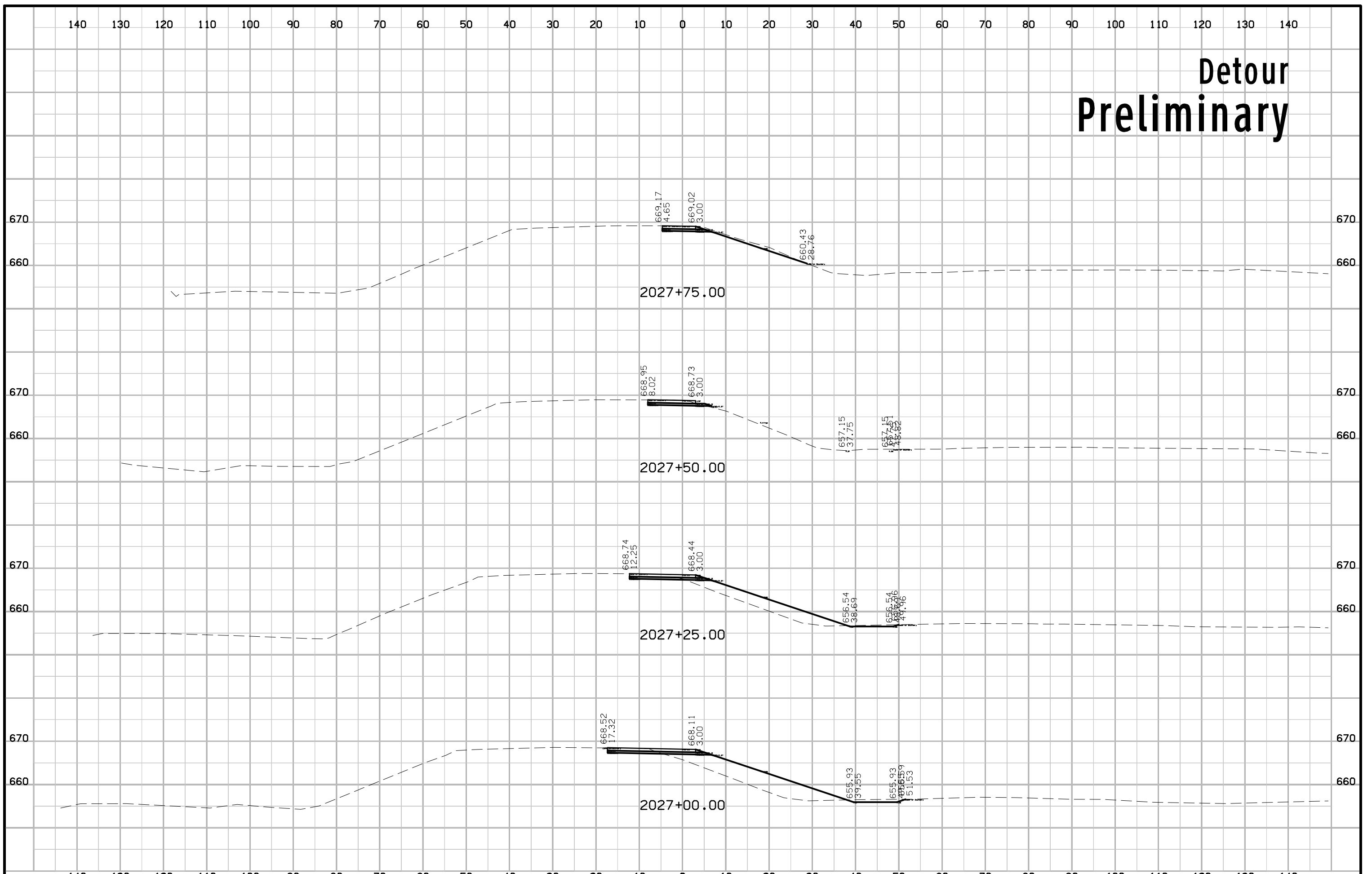
# Detour Preliminary



# Detour Preliminary



# Detour Preliminary



# Detour Preliminary

