



This project is listed in the 2016-2020 Iowa Transportation Improvement Program, with \$2,500,000 for replacement in FY 2019. However, based upon the condition of the bridge it appears the project will be moved to FY 2021 or later. The Office of Bridges and Structures will coordinate plan preparation with assistance from the Office of Design.

KKP: als

Attach.

cc:

J. F. Adam	M. J. Kennerly	K. D. Nicholson
D. L. Maifield	S. J. Megivern	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
M. J. Sankey	R. A. Younie	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	M. Van Dyke	J. R. Webb
J. Huddle	J. D. Owen	C. E. Belgarde
J. R. Phillips	B. M. Clancy	T. Quam
L. Wielenga	FHWA	M. E. Ross
P. Flattery		

## FINAL PROJECT CONCEPT/FIELD EXAM LETTER

U.S. 63 Bridge over Little Soap Creek, 1.9 miles north of the Davis County line

Wapello County  
NHSX-063-2(137)--3H-90  
PIN: 10-90-063-010  
Maint. No. 9028.6S063  
FHWA No. 50600

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 or rehabilitation of the U.S. 63 bridge (Maint. No. 9028.6S063) over Little Soap Creek, 1.9 miles north of the Davis County line.

#### B. Need for Project

The existing bridge is a 217 ft. 6 in. x 30 ft. pretensioned, prestressed concrete beam bridge which was constructed in 1964. This bridge has a sufficiency rating of 50.3.

This section of U.S. 63 was being developed as a 4-lane divided highway; however, this project has been placed on hold and it currently appears it is unlikely that this 4-lane project will move forward in the near term future. Therefore, the District Office recommended that alternative 1 be based upon a 2-lane roadway design. This roadway may eventually become the southbound roadway when the new northbound roadway and bridge are constructed to provide a 4-lane facility.

The original concept was to replace the bridge on a relocated alignment. However, the Office of Bridges and Structures stated as the bridge was considered to be structurally sound other options such as a deck overlay or deck replacement and widening should also be considered.

Therefore, three options were proposed at the concept/ field exam:

1. Replace the existing bridge on relocated alignment with a 299 ft. x 44 ft. pretensioned, prestressed concrete beam bridge. This will require 5,800 ft. of new pavement. Traffic will be maintained on the existing bridge while the new bridge is constructed. The estimated cost of this alternative is \$6,690,500.
2. Replace the existing bridge deck and widen the existing bridge from 30 ft. to 44 ft. wide. It is estimated that this alternative would provide approximately 35 years of additional service life. Traffic will be maintained via staged construction using temporary signals. The estimated cost of this alternative is \$1,357,200.
3. Overlay the existing bridge deck. This alternative would provide approximately 15-20 additional years of service life. Traffic will be maintained via staged construction using temporary signals. The estimated cost of this alternative is \$472,400.

#### C. Present Facility

The existing structure is a 217 ft. 6 in. x 30 ft. pretensioned, prestressed concrete beam bridge constructed in 1964.

U.S. 63 in the project area is 24 ft. wide PCC pavement with 10 ft. wide partially paved shoulders and 3:1 foreslopes, constructed in 1965. HMA resurfacing was accomplished in 2007.



#### D. Traffic Estimates

The 2019 and 2039 average daily traffic estimates are 6,100 ADT with 10% trucks and 6,800 ADT with 11% trucks, respectively.

E. Sufficiency Ratings

U.S. 63 is classified as a “commercial and industrial” route and is a maintenance service level “B” road. The federal bridge sufficiency rating is 50.3.

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 two crashes including, both personal property damage only.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 -New bridge on relocated alignment

Replace the existing 217 ft. 6 in. x 30 ft. pretensioned, prestressed concrete beam bridge with a 299 ft. x 44 ft. pretensioned, prestressed concrete beam bridge.

The typical cross section adjacent to the bridge will consist of a 24 ft. roadway (28 ft. wide pavement) with 10 ft. effective shoulders (2 ft. outside pavement, 4 ft. additional paved and 4 ft. granular) and 6:1/3.5:1 foreslopes.

This bridge will be constructed approximately 80 ft. south of the existing alignment, (centerline to centerline). In order to tie in the proposed alignment approximately 5,800 ft. of new roadway will be required. The length of new roadway required is significant due to the existing rolling terrain, the new flatter tangents required and to provide good sight distance throughout the alignment. However, when the future 4-lane project is built approximately 4000 ft. of this pavement will need to be removed and reconstructed due to the change in horizontal alignment.

New bridge approaches will be constructed. New guardrail will be installed 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 bridge end drains on each end of the bridge.

The existing bridge and existing pavement will be removed and all entrances will be connected to the new alignment. The new alignment will require the removal of 3 barns and the pond at approximate station 660+00.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Right of way will be required. The right of way acquired will be based on the current 2 lane roadway alignment and not the future 4-lane plan.

Two lanes of traffic will be maintained on the existing U.S.63 alignment, with short term one-lane closures to tie in the new alignment to the existing alignment. Temporary signals will be required during the construction of the tie-in pavement. The rolling terrain will require advanced warning signs to be used at the crest vertical curves on each end of the construction work zone.

The field exam plans may be viewed at:

pw:\\projectwise.don.int.lan:PWMain\Documents\Projects\9006301010\Design\Design Events\D2\ D2\_90063137\_plan.pdf

<b>Bridge Items</b>	<u>Estimated Costs</u>
New Bridge	\$1,294,800
Bridge Removal	53,400
Revetment	128,000
Mobilization - 10%	147,700
M & C - 15%	<u>243,600</u>
<b>Bridge Costs</b>	<b>\$ 1,867,500</b>

<b>Roadway Items</b>	
Bridge Approaches	\$ 87,400
Removal of Pavement	136,200
PCC Pavement	1,034,300
Granular Subbase	136,100
Special backfill	68,400
Paved shoulder	181,700
Granular shoulder	59,200
Class 10 roadway & borrow	968,500
Excavation Class 10 Waste	57,500
Class 13 waste	248,600
Guardrail (Includes Removal)	30,100
Paved Shoulders for Guardrail	25,800
Class 10 for Guardrail Blisters	12,000
Bridge End Drains	13,200
Longitudinal subdrains and outlets	72,300
Clearing and Grubbing	23,800
Seeding and Fertilizing	6,200

Temporary traffic signals	17,300
Erosion Control	5,000
Wetland Mitigation	50,000
Traffic Control - 5%	161,700
Mobilization - 5%	161,700
Removal of existing structures and pond (acquire/demo)	25,000
Right of Way	128,000
M & C - 30%	<u>1,113,000</u>
<b>Roadway costs</b>	<b>\$ 4,823,000</b>
 <b>Project Total Estimate</b>	 <b>\$6,690,500</b>

Alternative #2 –Replace the bridge deck and widen the bridge from 30 ft. to 44 ft.

Remove the existing 217 ft. 6 in. x 30 ft. bridge deck and replace with a 44 ft. wide deck. This work is expected to provide a 35 year service life.

The typical cross section adjacent to the bridge will consist of a 24 ft. roadway with 10 ft. effective shoulders. The foreslopes will be used as constructed.

New bridge approaches will be constructed. Place new guardrail and pave the shoulders 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to construct the new guardrail blisters.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Temporary signals will be utilized to maintain one lane of traffic at a time on the bridge during construction. Special signing will be required in advance of the work zone as the minimum width of 14' 6" will not be provided.

Right of way will not be required.

	<u>Estimated Costs</u>
Bridge widening	\$ 464,100
Re-overlay original deck	331,500
Pavement removal	10,000
Guardrail	30,100
Attenuators	3,000
Bridge approaches	87,400
Paved Shoulders for guardrail	25,800
Temporary signals	17,300

Traffic control - 10%	97,000
Mobilization - 10%	97,000
M & C - 10%	97,000
Staging - 10%	97,000
<b>Total Estimated Costs</b>	<b>\$ 1,357,200</b>

Alternative #3 - Overlay the existing bridge deck

Overlay the existing 217 ft. 6 in. x 30 ft. bridge. This work is expected to provide 15-20 years of service.

New bridge approaches will be constructed. Place new guardrail and pave the shoulders 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to construct the new guardrail blisters.

Temporary signals will be utilized to maintain one lane of traffic at a time on the bridge during construction. Special signing will be required in advance of the work zone as the minimum width of 14' 6" will not be provided.

Right of way will not be required.

	<u>Estimated Costs</u>
Overlay cost	\$ 99,500
Class A repairs	26,500
Joint replacement	62,100
Temporary concrete barrier rail	13,300
Temporary floodlighting	5,200
Guardrail	30,100
Paved shoulders for guardrail	25,800
Bridge approaches	87,400
Traffic control - 5%	17,500
Mobilization - 10%	35,000
M & C - 20%	70,000
<b>Total Estimated Costs</b>	<b>\$ 472,400</b>

B. Detour Analysis

There will be no off-site detour. For alternative 1, two lanes of traffic will be maintained on the existing U.S.63 alignment, with short term one-lane closures to tie in the new alignment to the existing alignment. Temporary signals will be required



during the construction of the tie-in pavement.

For alternatives 2 and 3, one-lane of traffic will be provided throughout construction, utilizing temporary traffic signals.

C. Recommendations

It is recommended that the bridge deck be widened and replaced as described in Alternative 2.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. For alternative 1, the Office of Design will coordinate the plan preparation with assistance from the Office of Bridges and Structures. For alternatives 2 and 3, the Office of Bridges and Structures will coordinate the plan preparation with assistance from the Office of Design.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to U.S. 63; therefore, no ADA accommodations are planned in conjunction with this project.

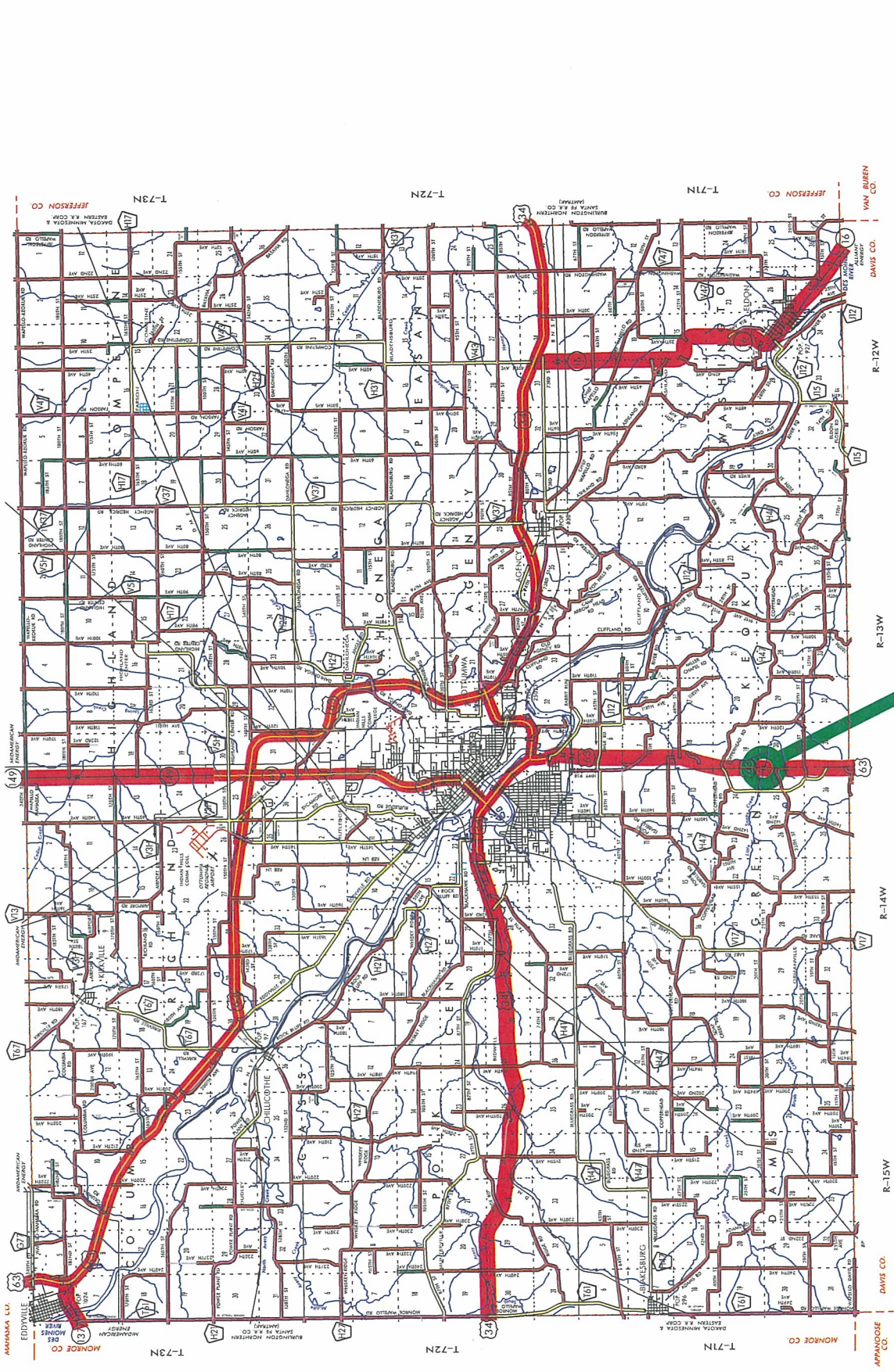
F. Special Considerations

Right of way will be required for alternative 1. The right of way acquired will be based on the current 2 lane roadway alignment and not the future 4-lane plan. No right of way will be needed for alternatives 2 and 3.

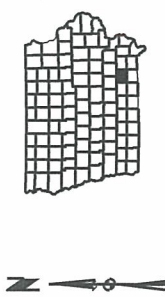
G. Program Status

Site data has been developed by the Office of Design. This project is listed in the 2016-2020 Iowa Transportation Improvement Program, with \$2,500,000 for replacement in FY 2019. However, based upon the condition of the bridge it appears the project will be moved to FY 2021 or later. Costs for this project will not be eligible for bridge rehabilitation funds.

KKP: als



Maint. 9028.6S063, FHWA#50600

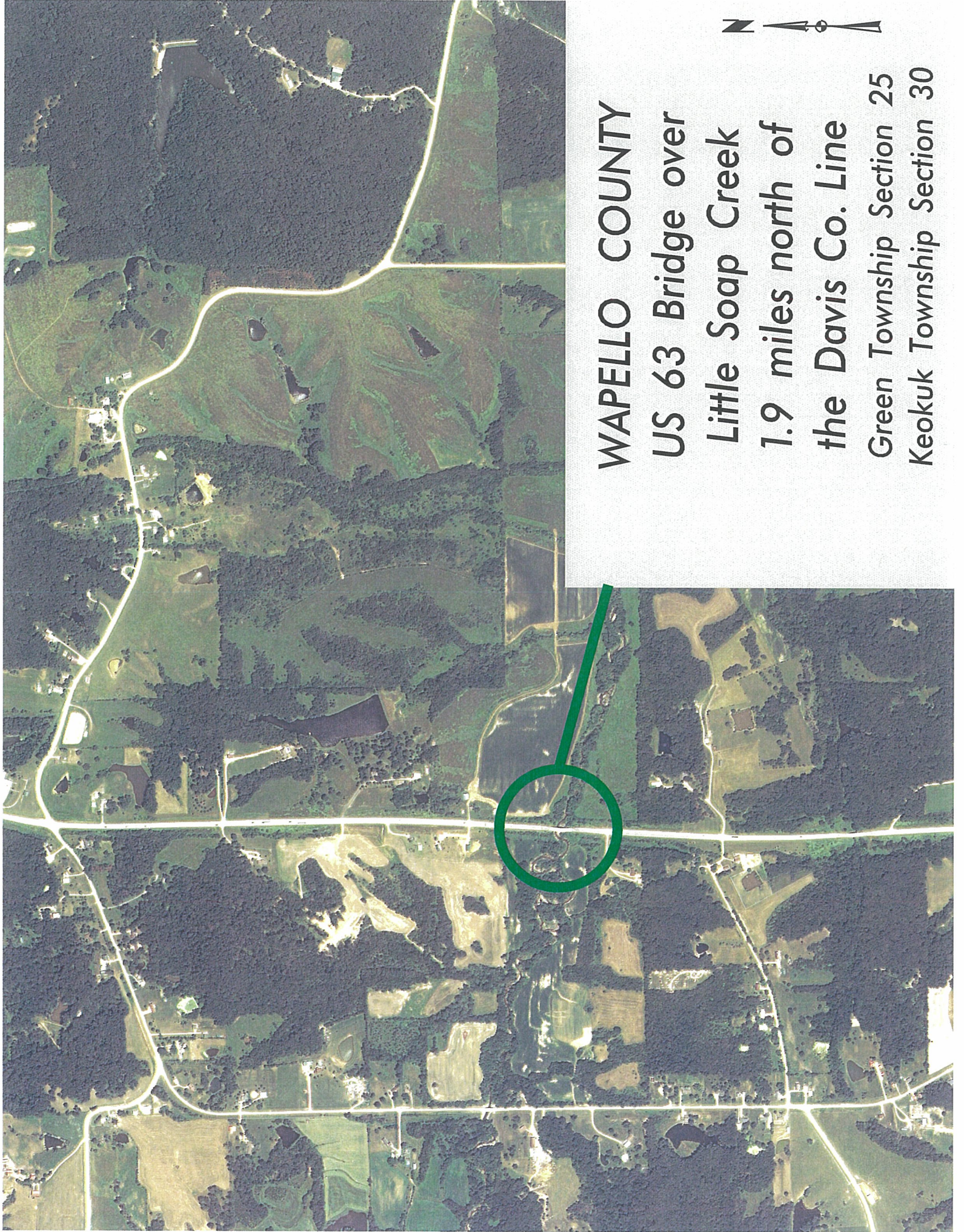


# WAPELLO COUNTY

## US 63 Bridge over Little Soap Creek

### 1.9 miles north of the Davis Co. Line





**WAPELLO COUNTY**

**US 63 Bridge over**

**Little Soap Creek**

**1.9 miles north of**

**the Davis Co. Line**

**Green Township Section 25**

**Keokuk Township Section 30**



**WAPELLO CO.** RECONSTRUCTION - BRIDGE DECK REPLACEMENT  
 NHSX-063-2(137)--3H-90  
 LETTING DATE 11-15-2022



**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM  
**WAPELLO COUNTY**

**RECONSTRUCTION - BRIDGE DECK REPLACEMENT**

Little Soap Creek 1.9 miles N of Davis Co

SCALES: As Noted

REVISIONS

TOTAL

PROJECT IDENTIFICATION NUMBER

10-90-063-010

PROJECT NUMBER

NHSX-063-2(137)--3H-90

R.O.W. PROJECT NUMBER

Refer to the Proposal Form for list of applicable specifications.

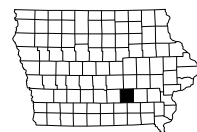
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



INDEX OF SHEETS	
No.	DESCRIPTION
<b>A Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet
A.2	Location Map Sheet
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1	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	"Mainline Name"
<b>J Sheets</b>	<b>Traffic Control and Staging Sheets</b>
J.1	Traffic Control Plan
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
W.1	Cross Sections Legend & Symbol Information Sheet
W.2	Mainline Cross Sections
	* Color Plan Sheets

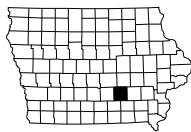
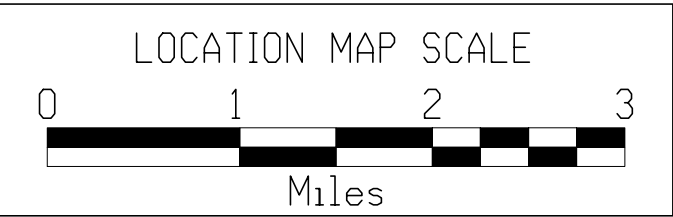
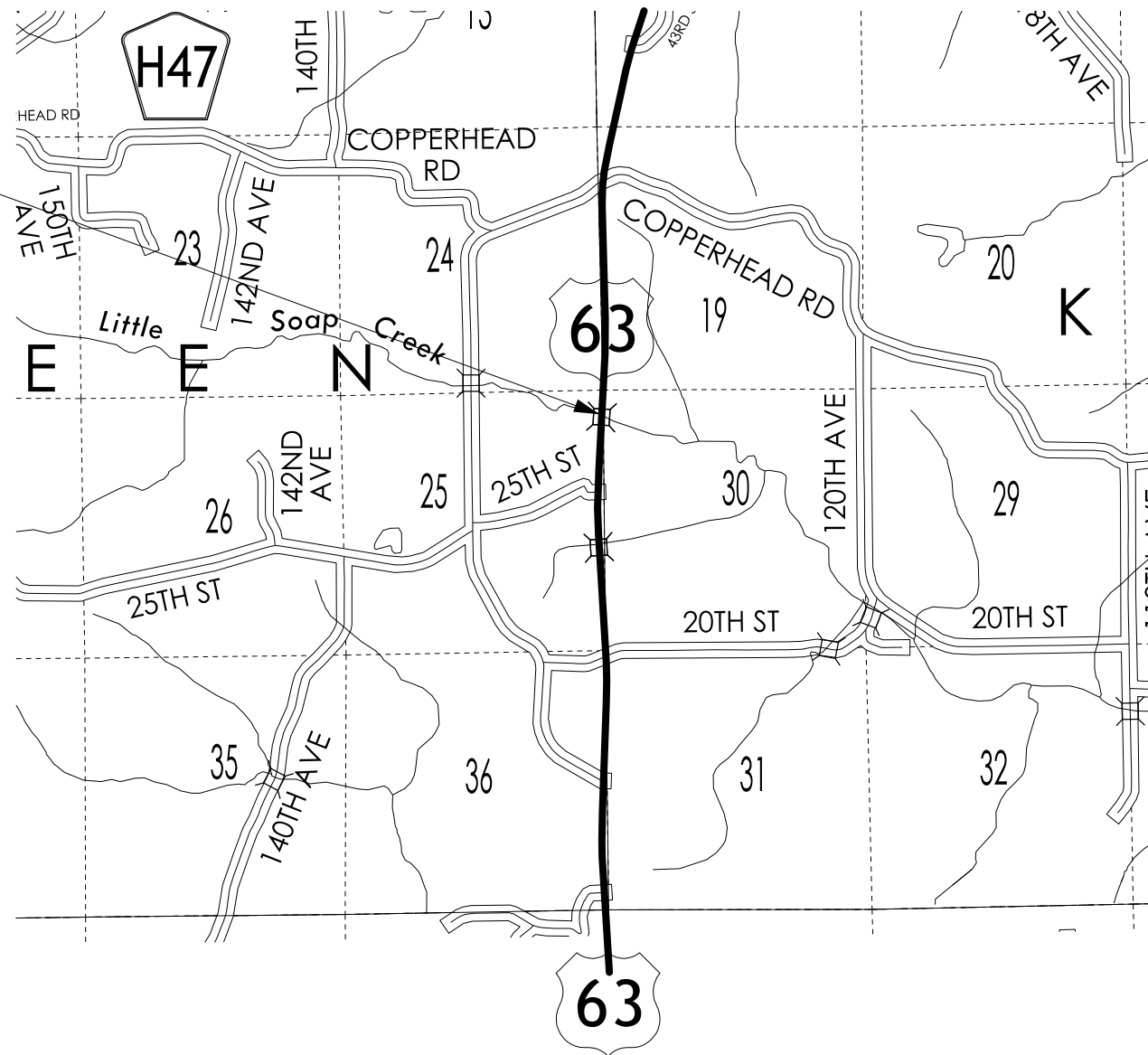
DESIGN DATA RURAL			
2019	AADT	6100	V.P.D.
2039	AADT	6800	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	11	%
	Total		
	Design ESALs	--	

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

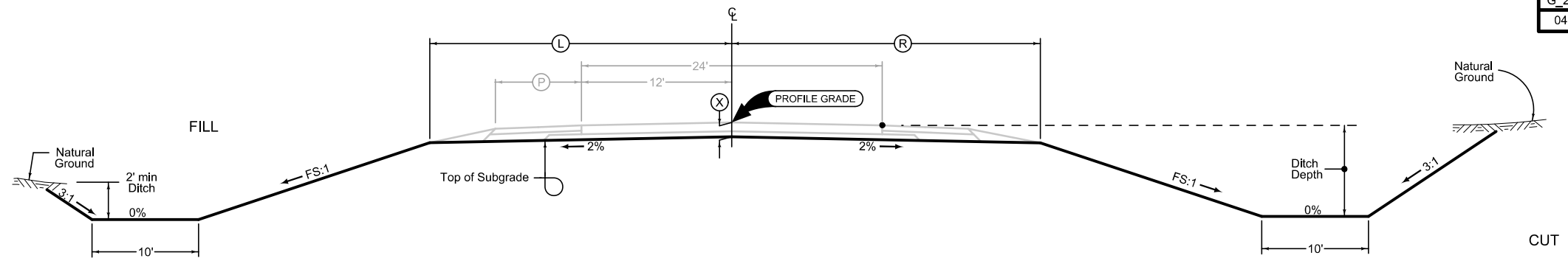


**D3 PLAN - Date: 5-20-2020**

Project Location  
Little Soap Creek Bridge



LOCATION		DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	FS	
US 63	97+46.57	97+76.96		30.4	21.5	3:1
US 63	97+76.96	98+16.82		30.4-28.7	21.5	3:1
US 63	98+16.82	98+41.97		28.7	21.5	3:1
US 63	98+41.97	98+54.40		28.7-27.4	21.5	3:1
US 63	98+54.40	99+07.24		27.4	21.5	3:1
Bridge	99+07.24	101+49.52				
US 63	101+49.52	101+87.43		27.1	21.5	3:1
US 63	101+87.43	102+30.30		27.1-28.6	21.5	3:1
US 63	102+30.30	102+60.07		28.6	21.5	3:1
US 63	98+08.78	98+38.79	28.9		21.5	3:1
US 63	98+38.79	98+78.94	28.9-27.3		21.5	3:1
US 63	98+78.94	99+19.47	27.3		21.5	3:1
Bridge	99+19.47	101+61.73				
US 63	101+61.73	102+14.86	27.7		21.5	3:1
US 63	102+14.86	102+27.79	27.3-28.9		21.5	3:1
US 63	102+27.79	102+52.19	28.9		21.5	3:1
US 63	102+52.19	102+92.07	28.9-30.6		21.5	3:1
US 63	102+92.07	103+22.42	30.6		21.5	3:1



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.

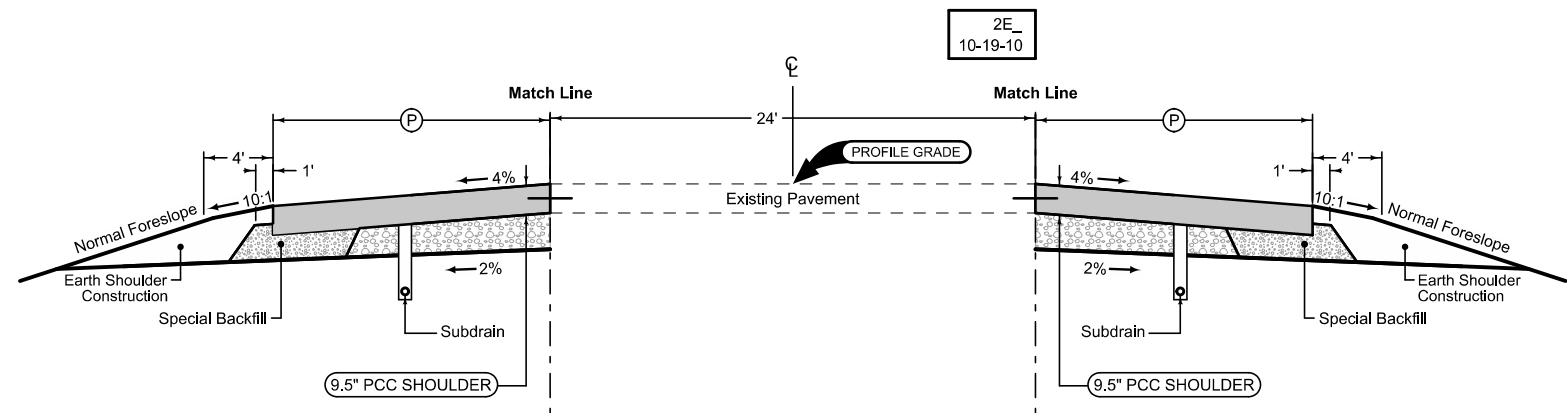
**2 LANE GRADING**

2E\_ 10-19-10

**PCC Shoulder at Guardrail**

Full-Depth Shoulder Jointing:  
 Longitudinal joint: L-2 or KT-2  
 Transverse joints: C at 17' spacing  
 6" Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing

Direction of Travel	STATION TO STATION		(P) Feet
SB	98+08.79	98+54.00	13.1-12.5
	BRIDGE & APPROACHES		
SB	102+14.72	103+22.44	11.9-14.9



**PCC Shoulder at Guardrail**

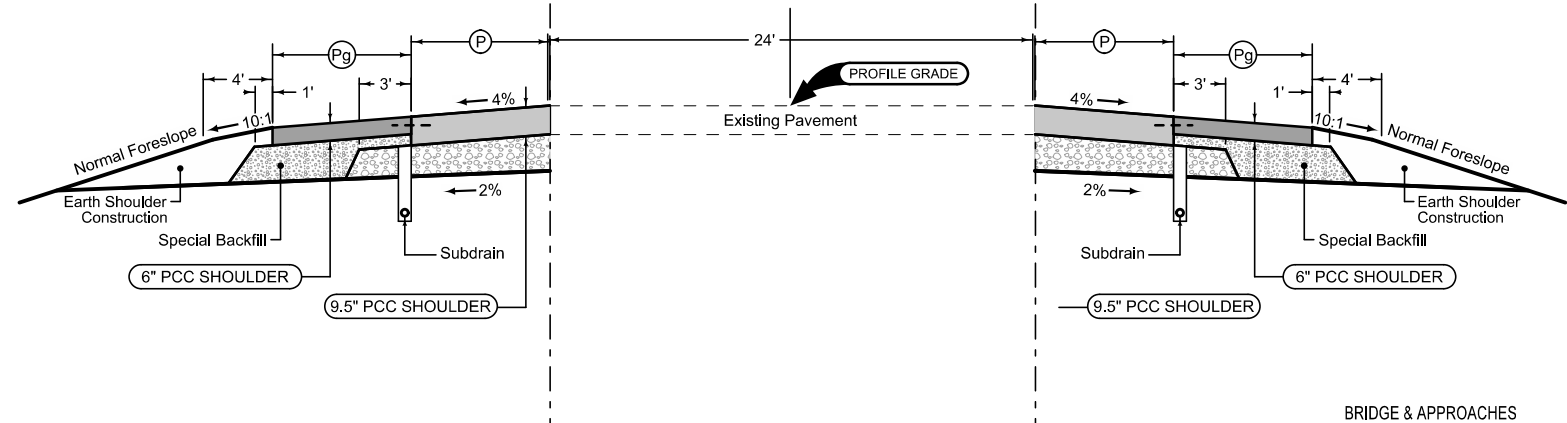
Full-Depth Shoulder Jointing:  
 Longitudinal joint: L-2 or KT-2  
 Transverse joints: C at 17' spacing  
 6" Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing

Direction of Travel	STATION TO STATION		(P) Feet
NB	97+46.57	98+54.00	14.7-11.7
	BRIDGE & APPROACHES		
NB	102+14.72	102+60.70	12.3-12.8

**PCC Shoulder at Guardrail**

Full-Depth Shoulder Jointing:  
 Longitudinal joint: L-2 or KT-2  
 Transverse joints: C at 17' spacing  
 6" Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing

Direction of Travel	STATION TO STATION		(P) Feet	(Pg) Feet
SB	98+08.79	98+54.00	6	7.1-6.5
	BRIDGE & APPROACHES			
SB	102+14.72	103+22.44	6	5.9-8.9



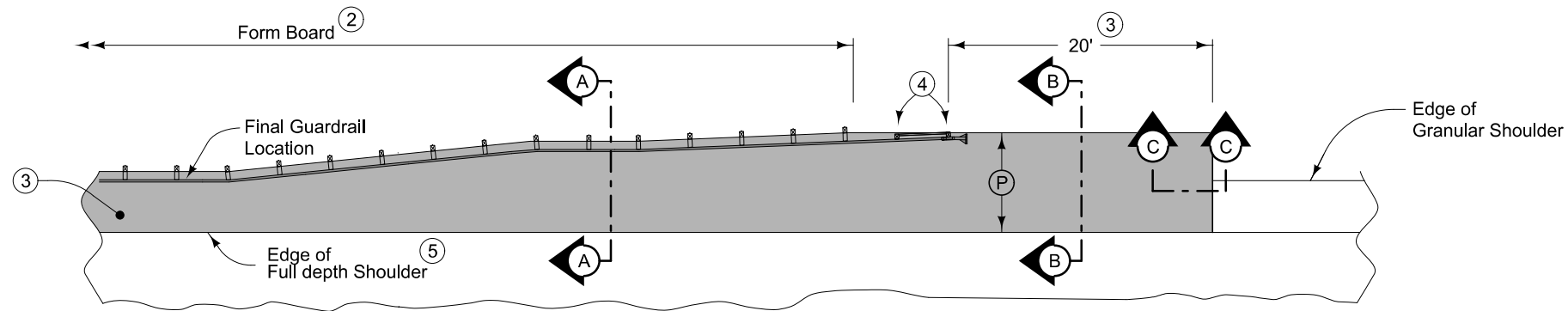
**PCC Shoulder at Guardrail**

Full-Depth Shoulder Jointing:  
 Longitudinal joint: L-2 or KT-2  
 Transverse joints: C at 17' spacing  
 6" Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing

Direction of Travel	STATION TO STATION		(P) Feet	(Pg) Feet
NB	97+46.57	98+54.00	6	8.7-5.7
	BRIDGE & APPROACHES			
NB	102+14.72	102+60.70	6	6.3-6.8

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

**US 63**



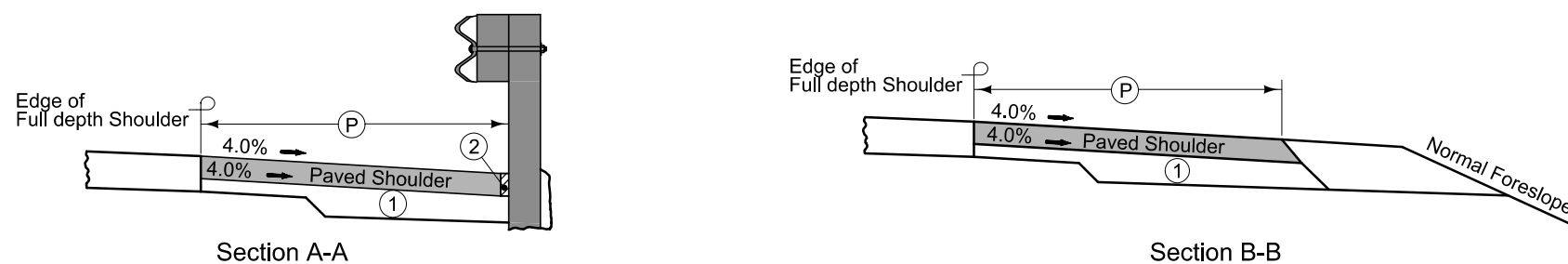
PLAN VIEW

6" PCC Paved Shoulder at guardrail. Use the following jointing layout:

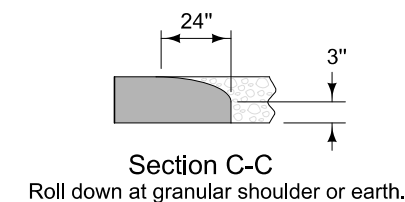
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal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

Refer to Tabulation 112-9 for shoulder quantities.

- ① For subgrade treatment, refer to other details in the plan.
- ② PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown. Refer to note 4 for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20 feet beyond the center of the first post.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.



NEW CONSTRUCTION



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

PAVED SHOULDER AT GUARDRAIL



### SURVEY SYMBOLS

- TEV Evergreen Tree
- SI Sign
- OUT Tile Outlet
- TPD Telephone Pedestal
- TDC Tree Deciduous
- TSB Telephone Switch Box
- EB Electrical Box
- SEP Septic Tank
- WEL Well
- LP L.P. Tank
- CIS Cistern
- MH Utility Access (Manhole)
- PR Electric Riser Pole
- SHR Shrub
- WHD Water Hydrant
- STP Stump
- FW Wire Fence
- FCL Chain Link and Security Fence
- D Centerline Draw or Stream (Down)
- BNK Stream Bank
- DU Centerline Draw or Stream (Up)
- EW Edge of Water
- Existing Guardrail

### UTILITY LEGEND

- F0 Century Link Fiber Optic
- F02 INC Fiber Optic
- Wapello Rural Water

### 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

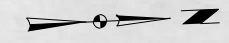
### RIGHT-OF-WAY LEGEND

- 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

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

Green Twp.  
T-71N R14W  
Sec. 25



Sta. 100+35  
Skew 15° Lt. Ahead  
217'-6 X 30' Prestensioned  
Prestrressed Concrete Beam Bridge  
D.A. = 30 SQ Miles H

18" X 84' C.M.P.  
UAC

Sec. 24

Sta. 98+08.79  
Begin SB Shoulder

Sta. 98+54.00  
Begin Bridge Approach

Sta. 102+14.72  
End Bridge Approach

Sta. 103+22.44  
End SB Shoulder

APPROX. SEC. LINE

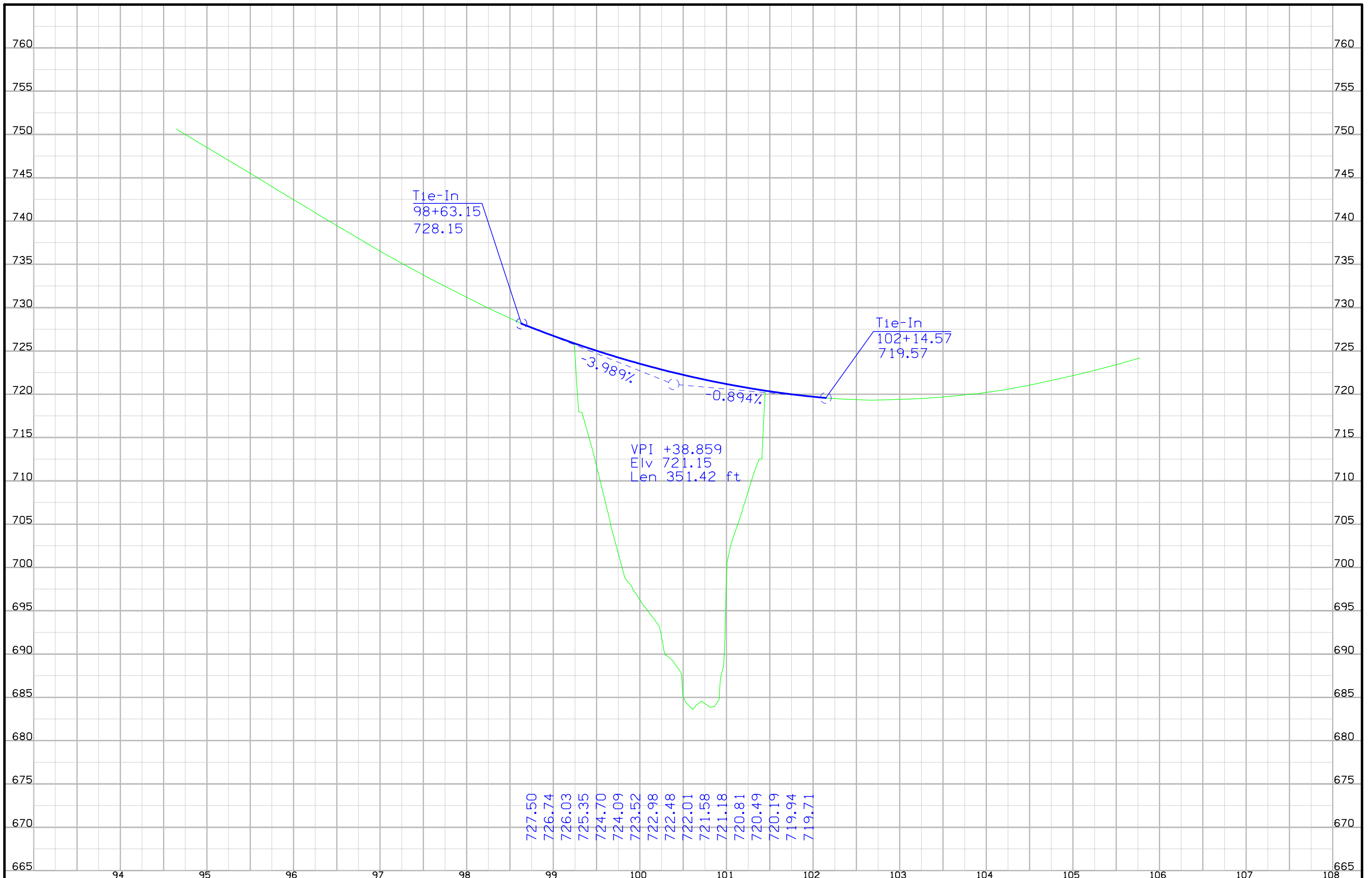
Sta. 97+46.57  
Begin NB Shoulder

Sta. 102+60.70  
End NB Shoulder

Sec. 19

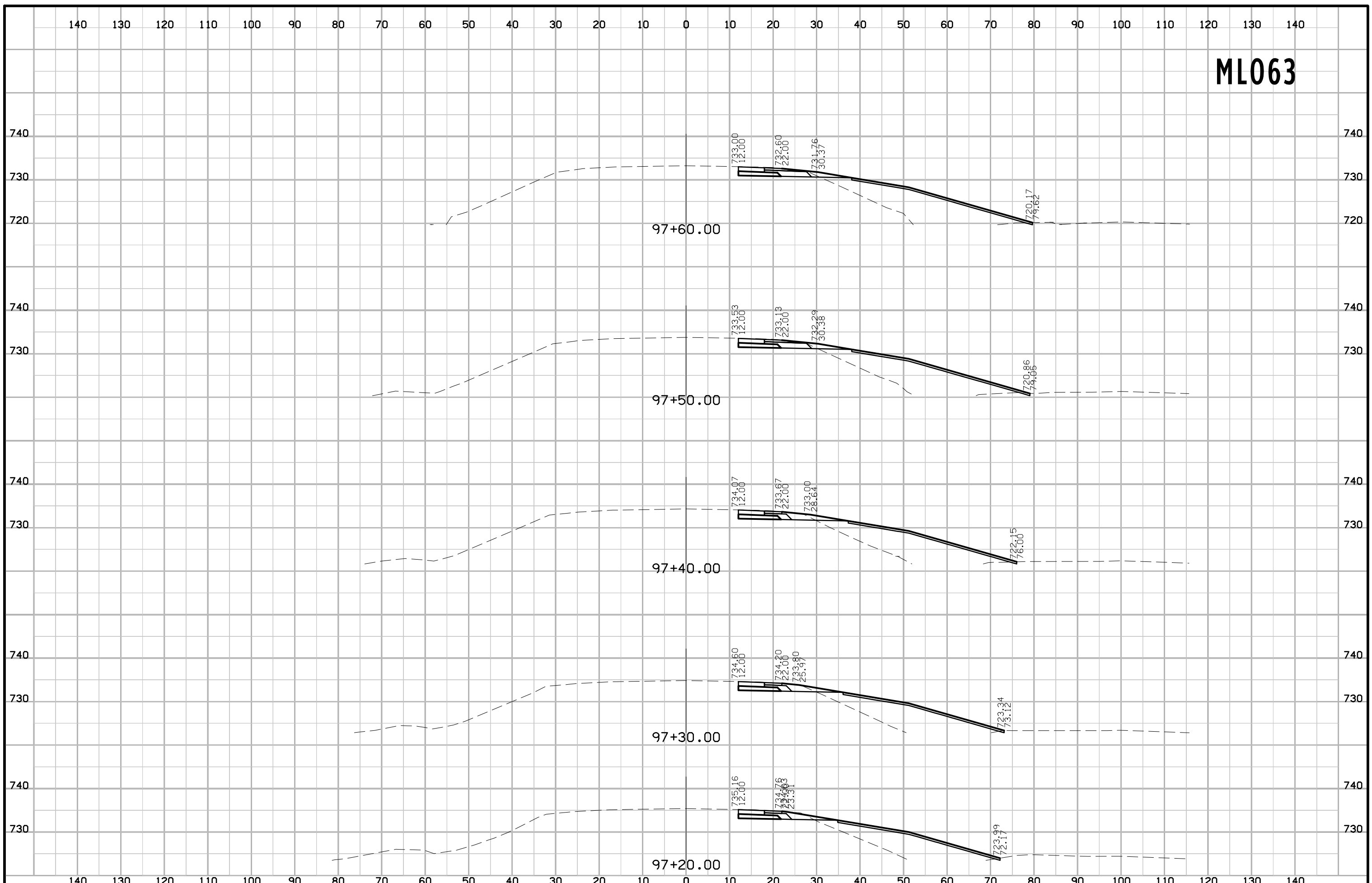
18" X 131' C.M.P.  
UAC

Keokuk Twp.  
T-71N R13W  
Sec. 30

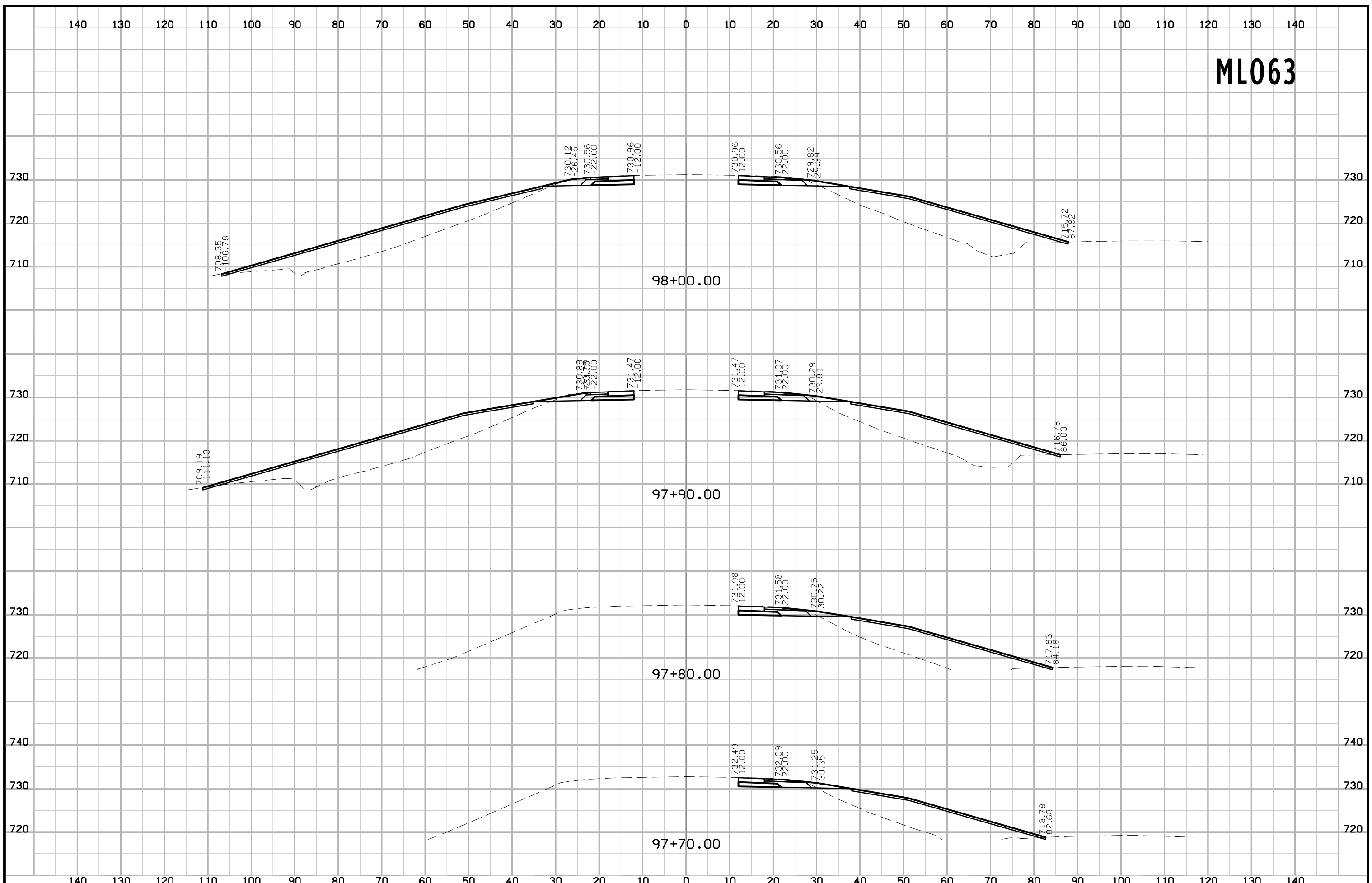




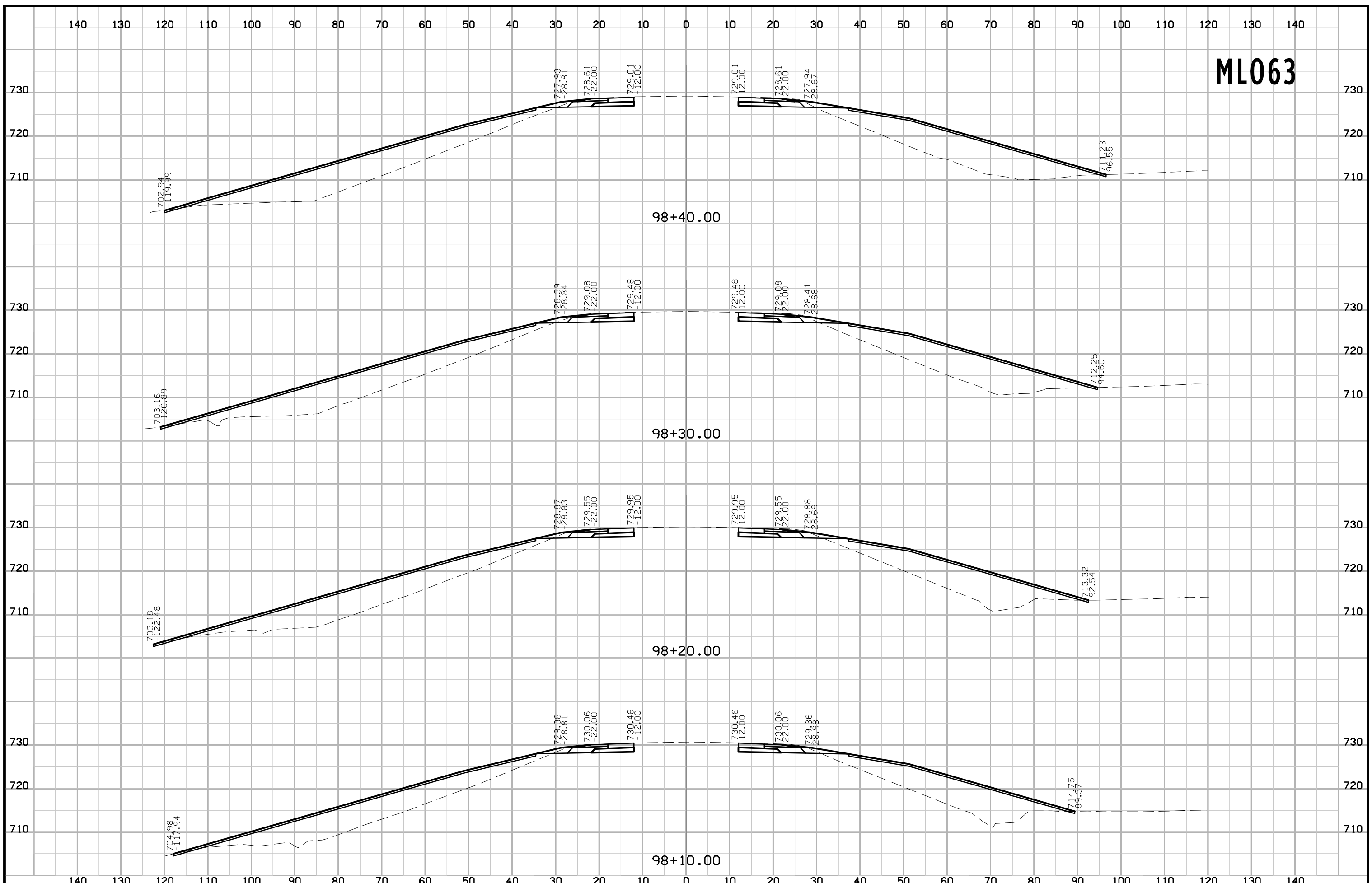
# ML063



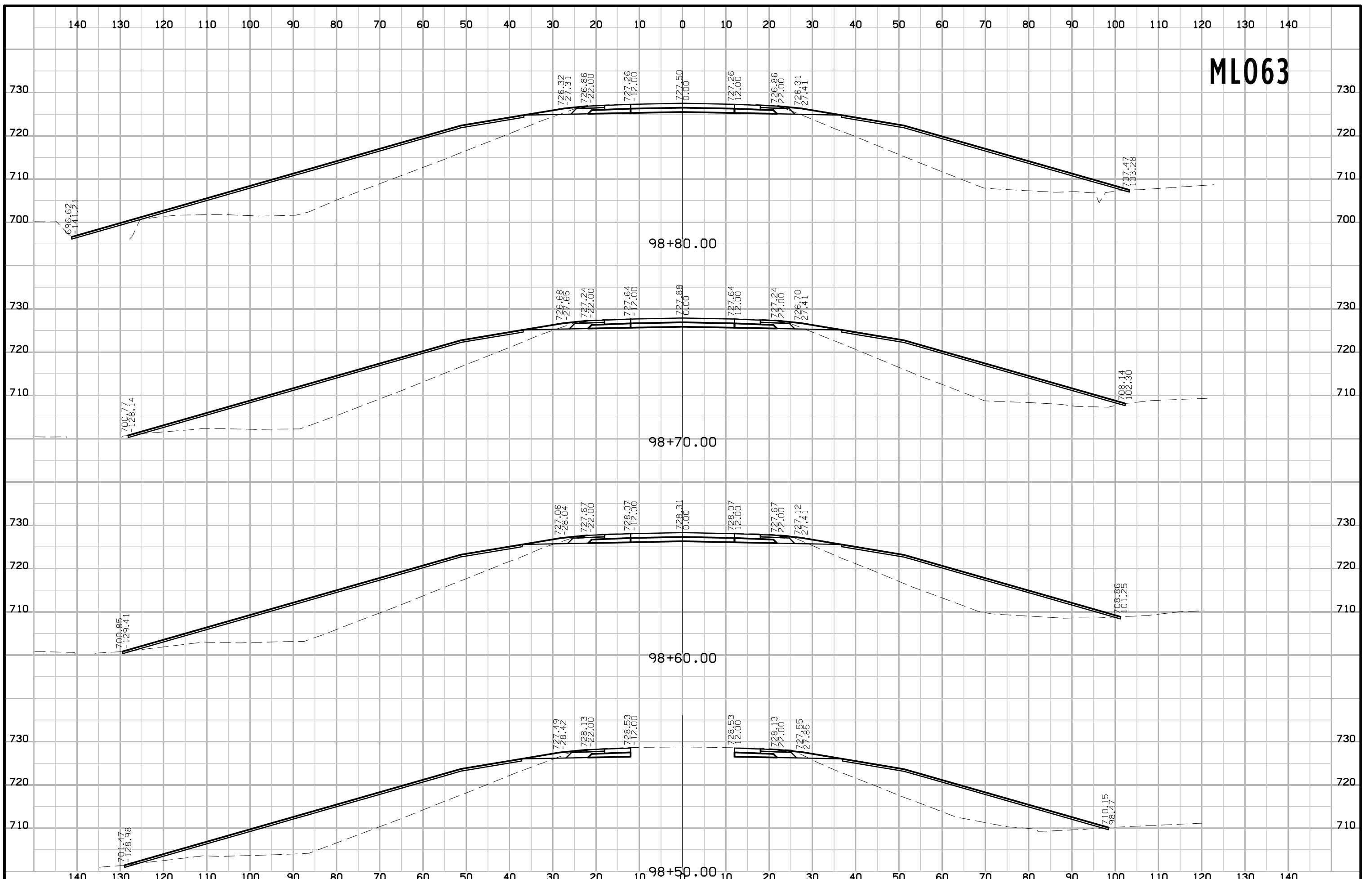
# ML063



# ML063

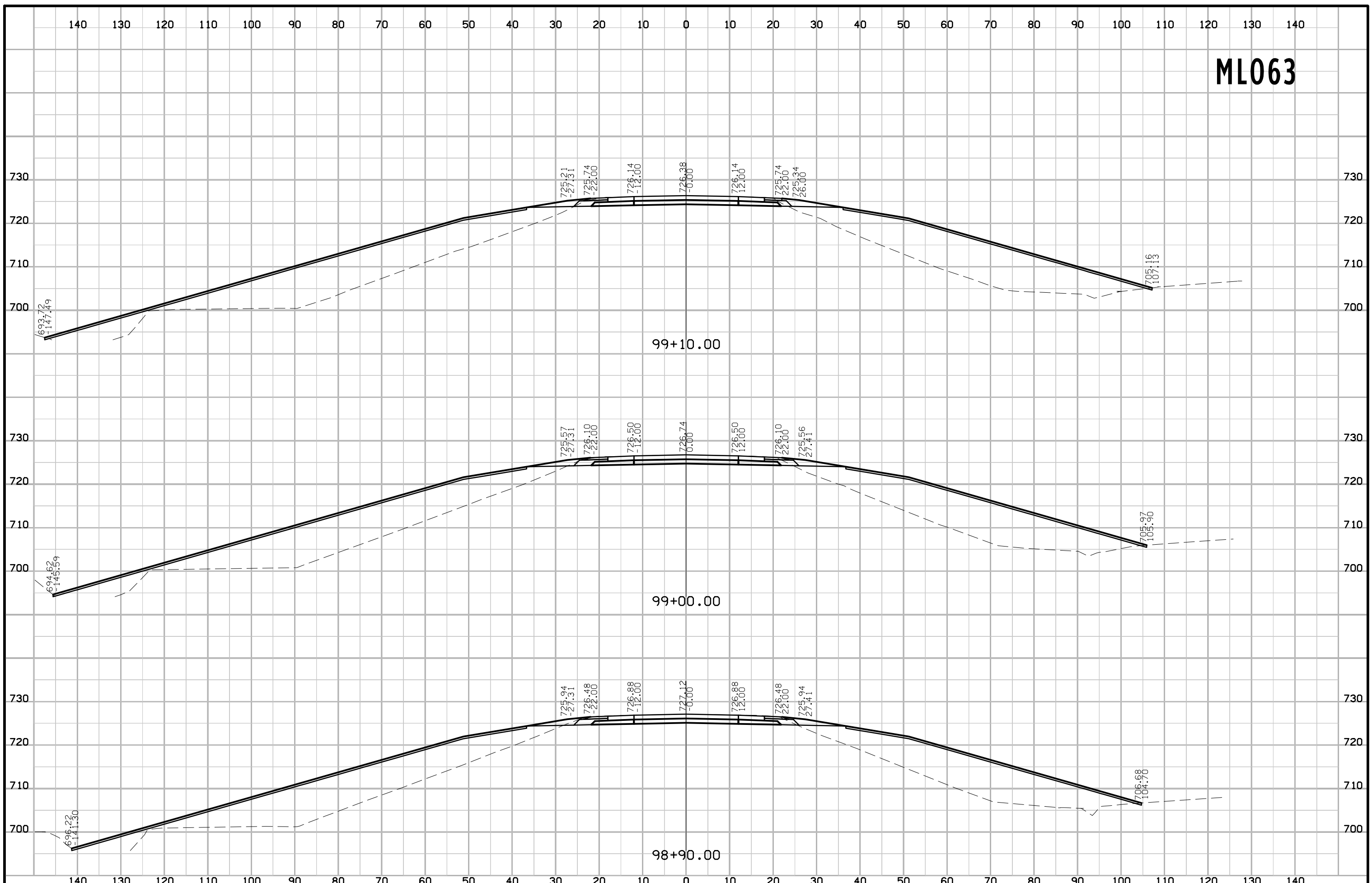


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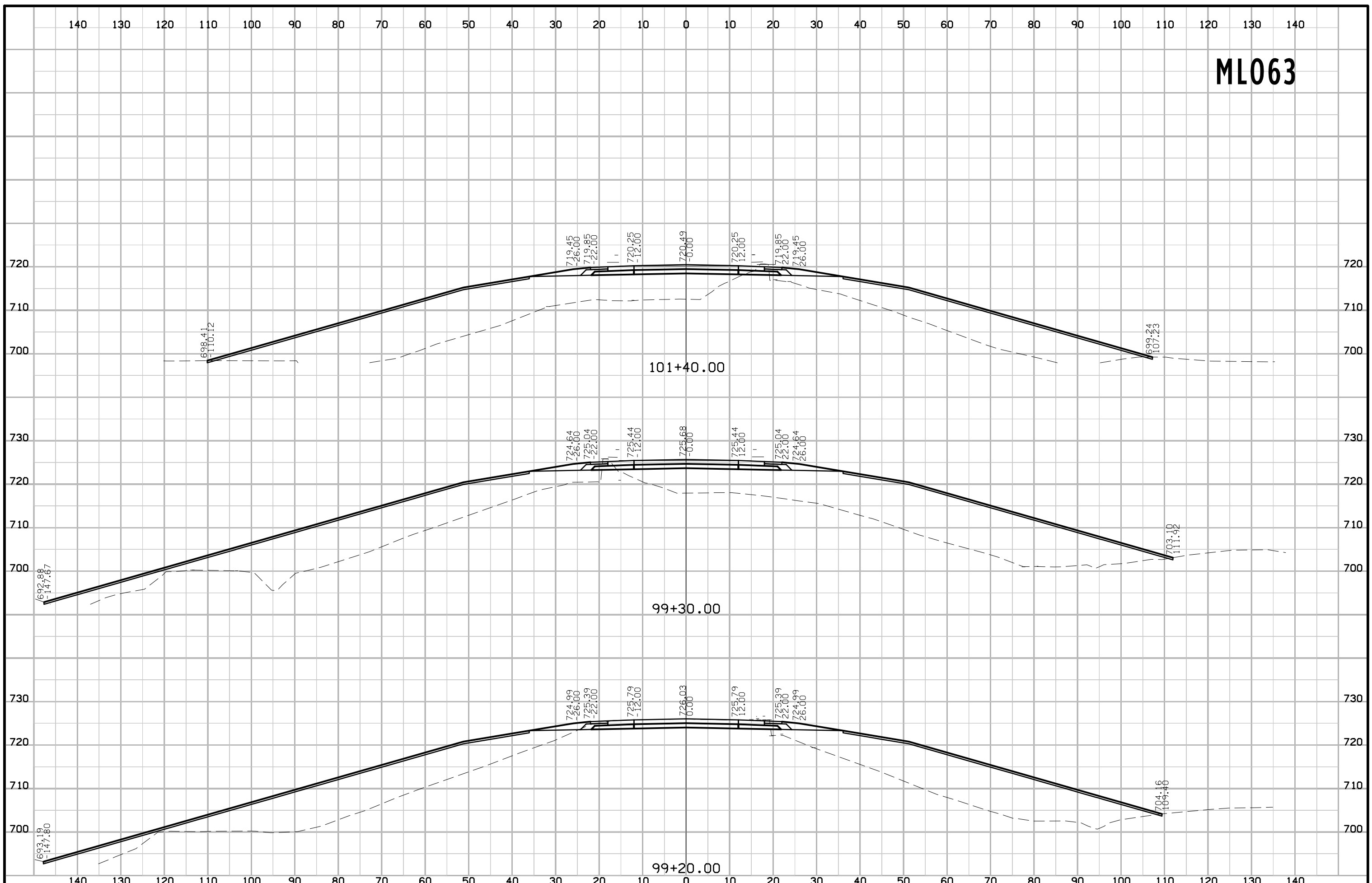




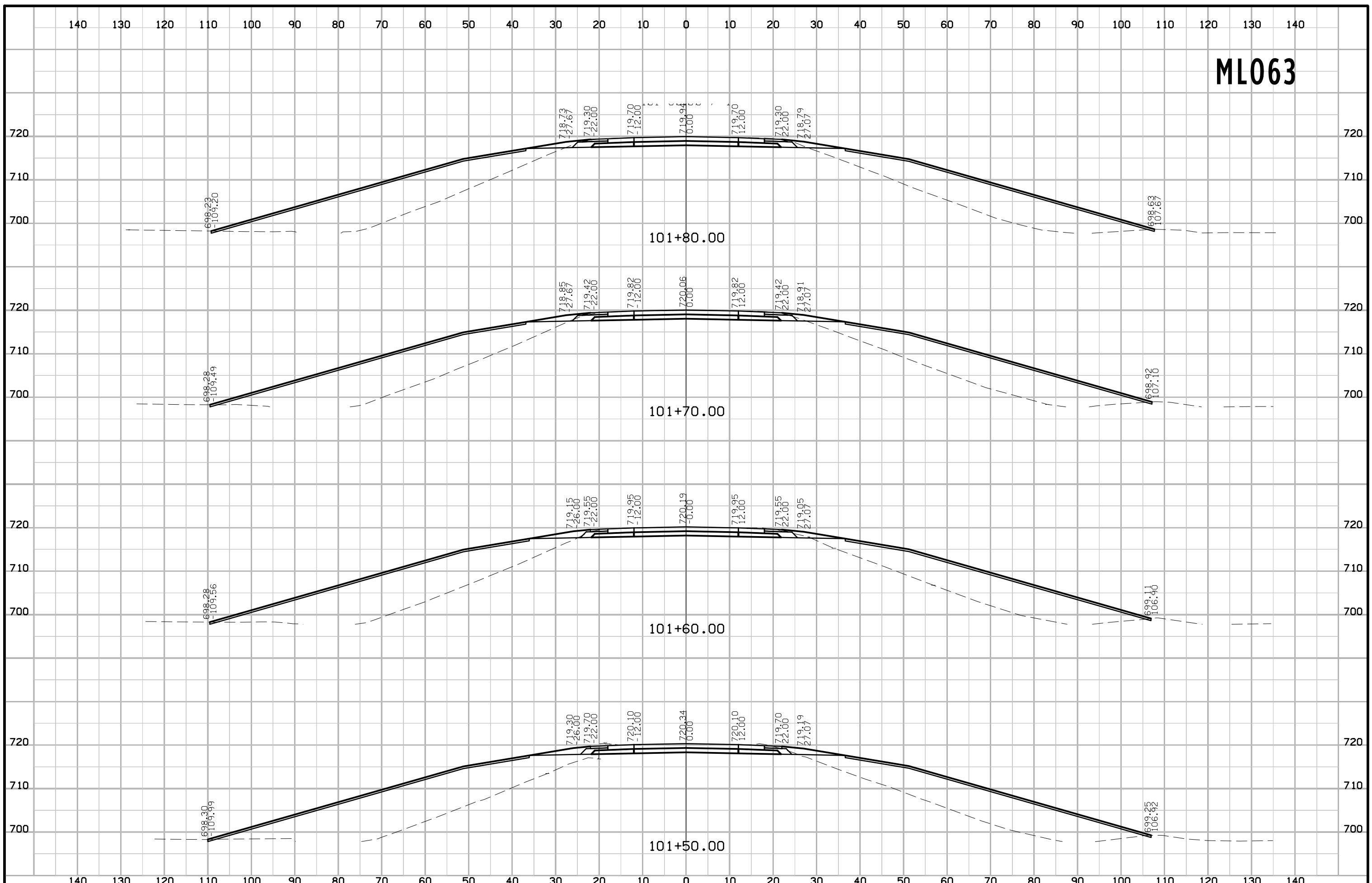
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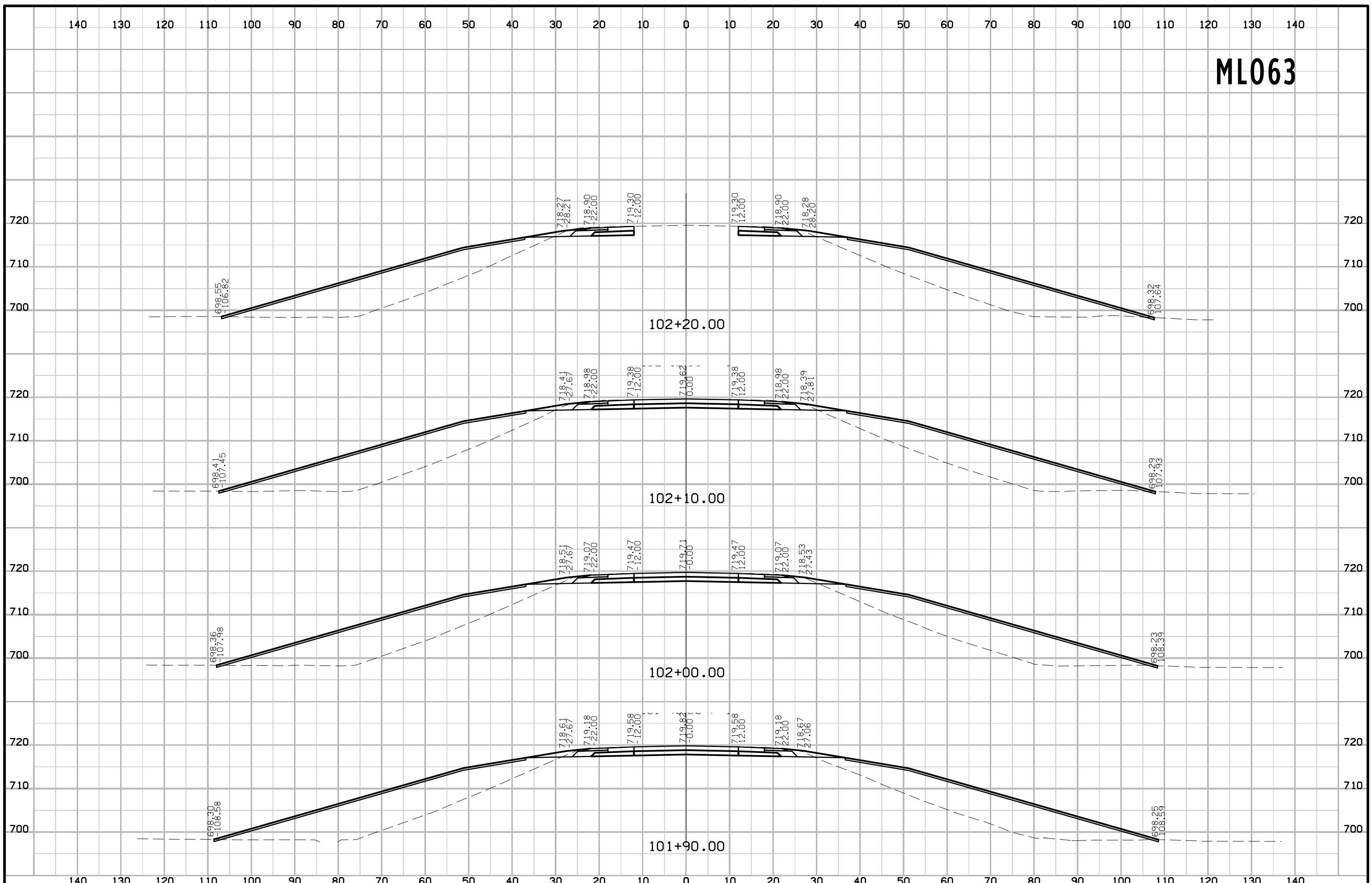
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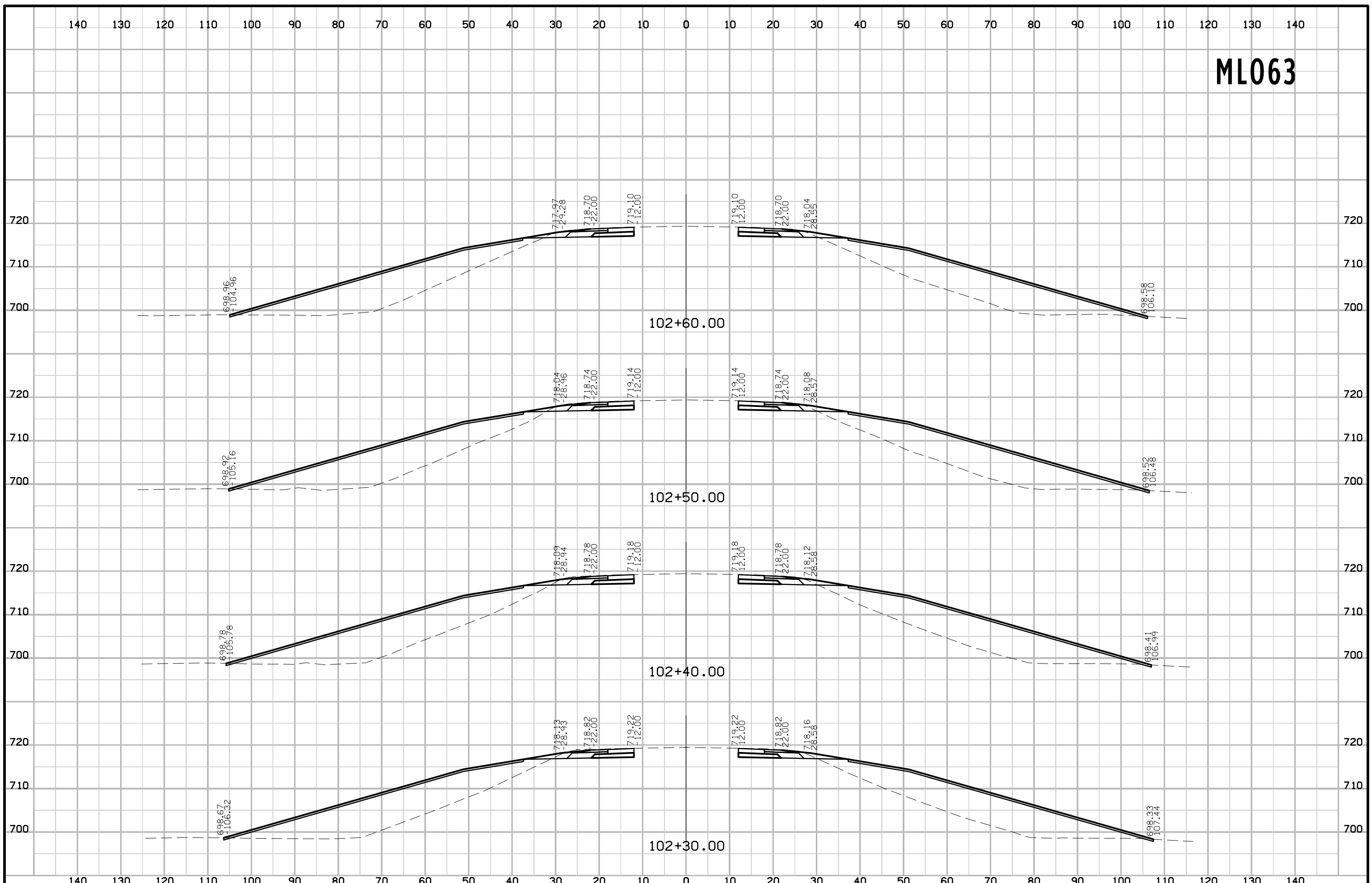
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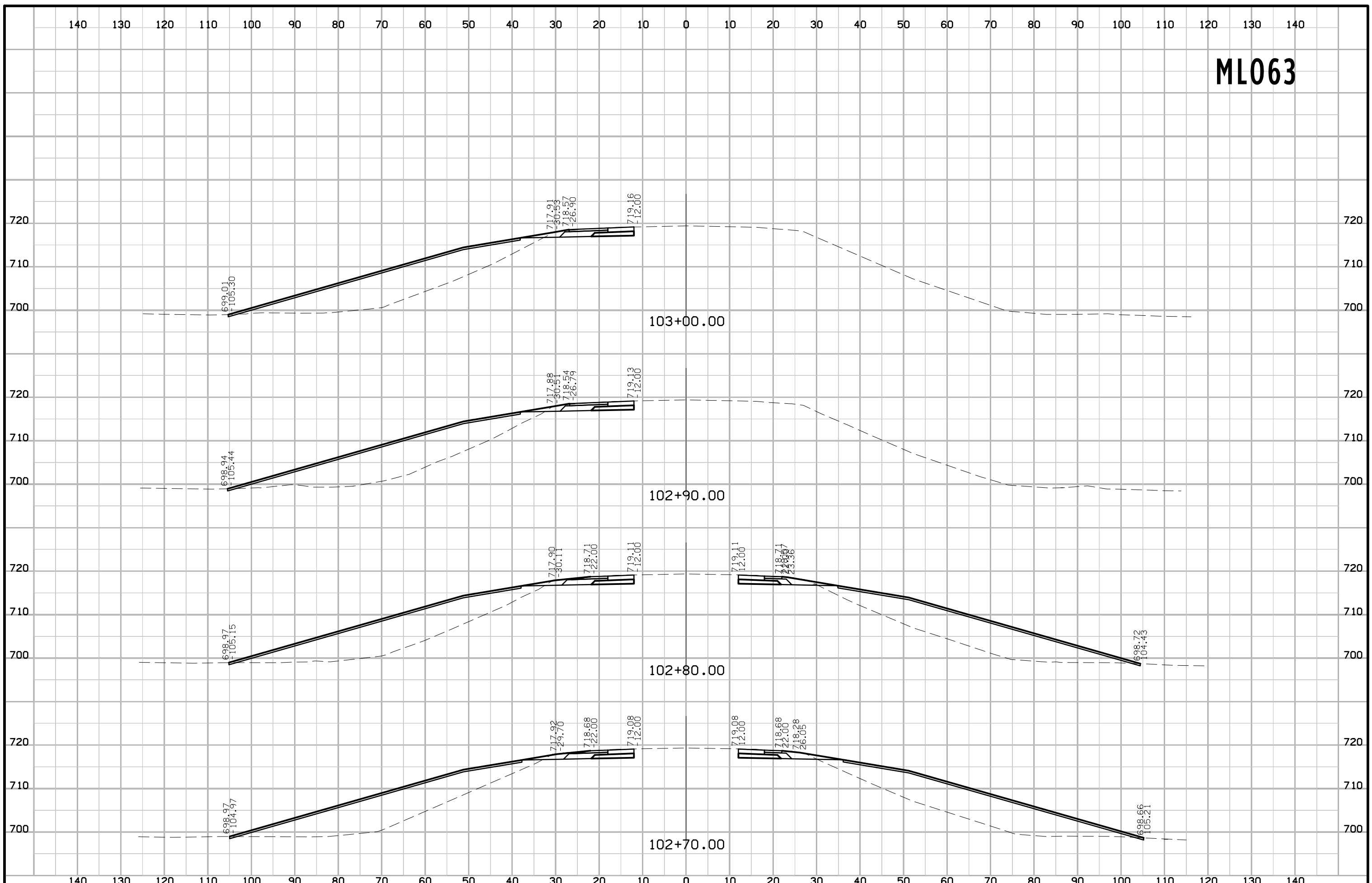
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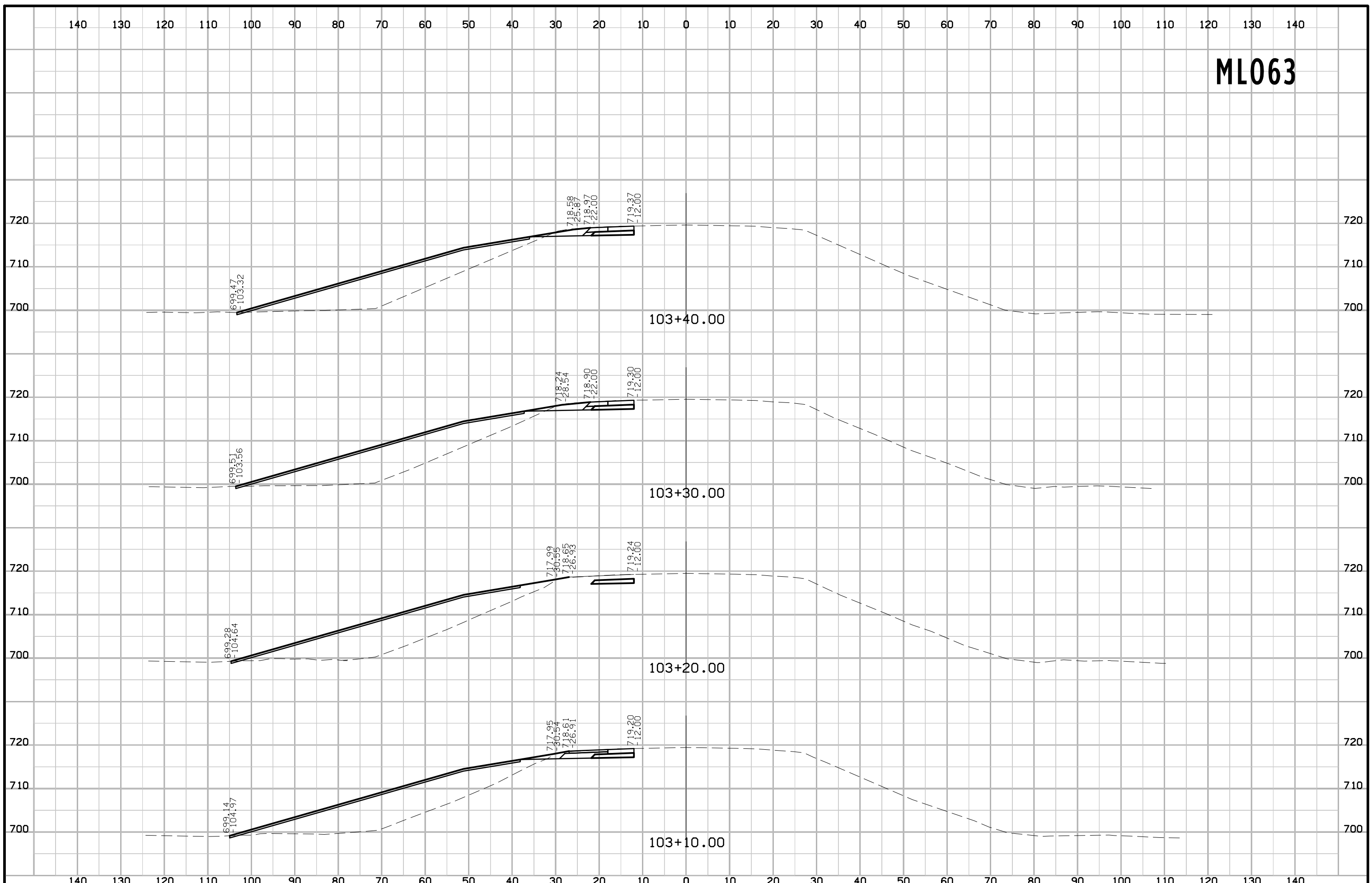
# ML063



# ML063



# ML063



ML063

