

BRIDGE REPLACEMENT - PPCB
BRF-003-5(77)--38-12
BUTLER CO.

LETTING DATE
 11-20-2018

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet and 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.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 3
E Sheets	Side Road Plan and Profile Sheets
* E.1	Elm Avenue
F Sheets	Dike Plan and Profile Sheets
* F.1	Dike
G Sheets	Survey Sheets
G.1	Reference Ties and Bench Marks
G.2	Horizontal Control Tab. & Super for all Alignments
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan and Staging Notes
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 3	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 15	IA 3
X Sheets	Side Road and Dike Cross Sections
X.100 - 102	Elm Avenue
X.200 - 212	Dike
	* Color Plan Sheets



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
BUTLER COUNTY
BRIDGE REPLACEMENT - PPCB
 West Fork Cedar River 0.8 mi E of Co Rd T16

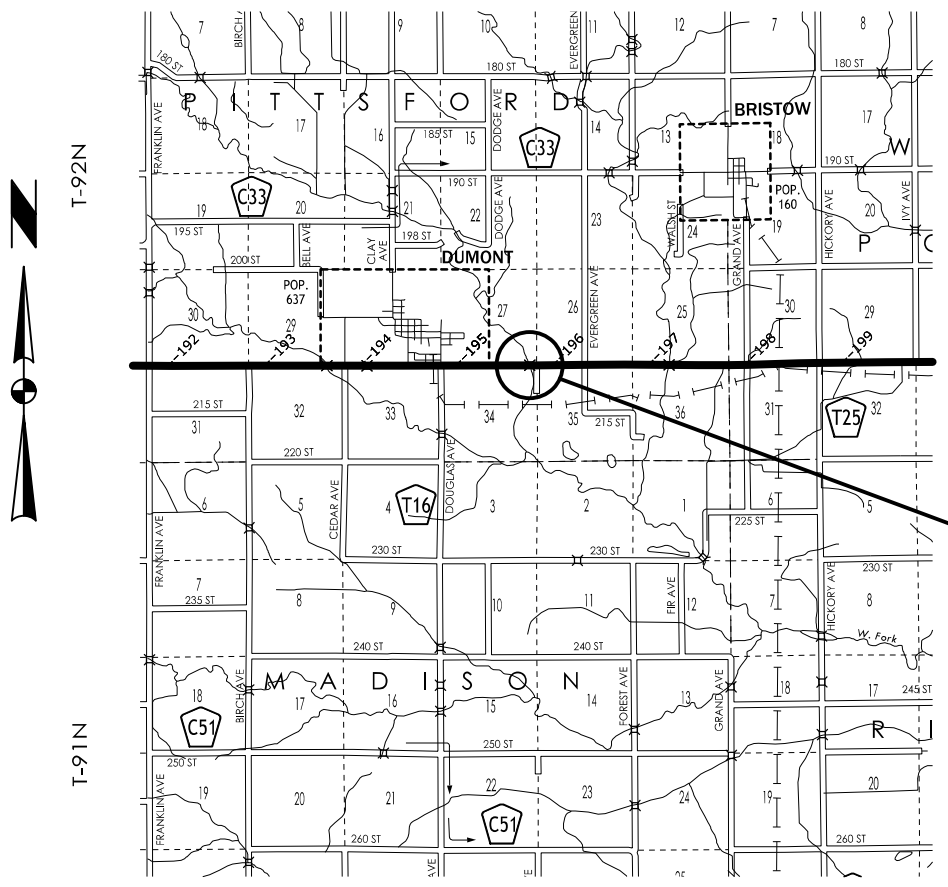
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

REVISIONS

TOTAL	45
PROJECT IDENTIFICATION NUMBER	14-12-003-010
PROJECT NUMBER	BRF-003-5(77)--38-12
R.O.W. PROJECT NUMBER	NHSN-003-5(78)--2R-12



PROJECT LOCATION
 Design # 118
 FHWA # 016500
 Bridge Maint. # 1295.7S003

DESIGN DATA RURAL			
2019 AADT	2000	V.P.D.	
2039 AADT	2100	V.P.D.	
20-- DHV	--	V.P.H.	
TRUCKS	19	%	
Total Design ESALs	--		

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Paul W. Flattery	Primary Signature Block

PRELIMINARY PLANS

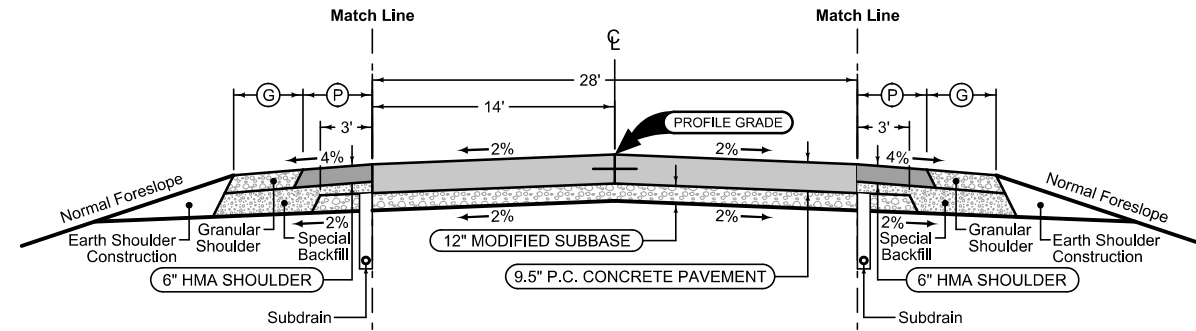
Subject to change by final design.

D5 PLAN - Date: 2-28-17

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		2_C_ Modified	
		(P) Feet	(G) Feet
201+00.00	204+87.11	4.0	4.0
Bridge			
211+26.89	217+75.00	4.0	4.0



Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

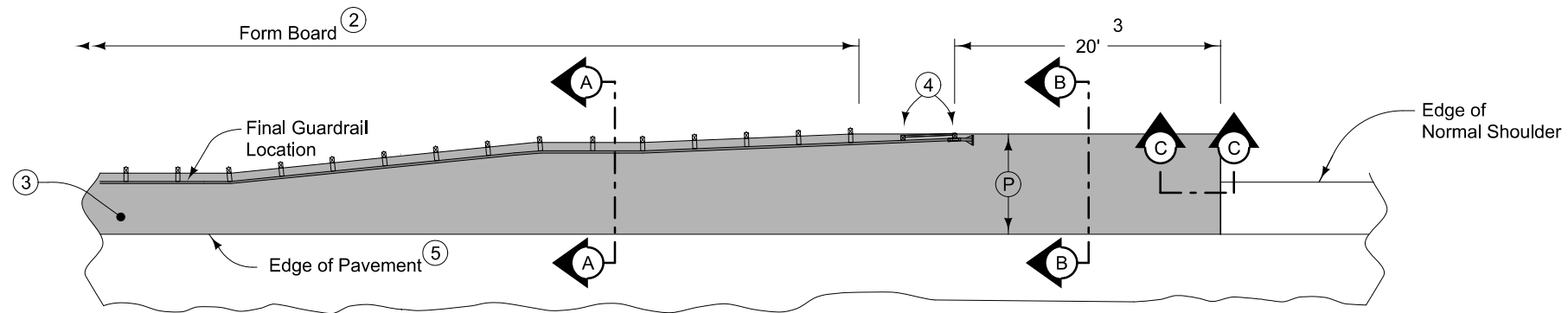
STATION TO STATION		2_C_ Modified	
		(P) Feet	(G) Feet
201+00.00	204+87.11	4.0	4.0
Bridge			
211+26.89	217+75.00	4.0	4.0

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

STATION TO STATION		2P_ 10-19-10	
201+00.00	204+87.11		
Bridge			
211+26.89	217+75.00		

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

IA 3



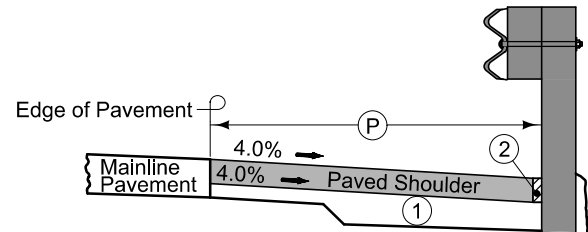
PLAN VIEW

9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

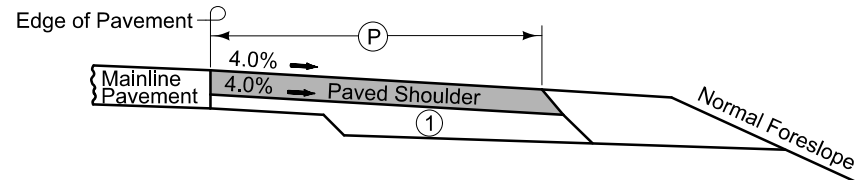
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal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

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

Refer to Tabulation 112-9 for shoulder quantities.



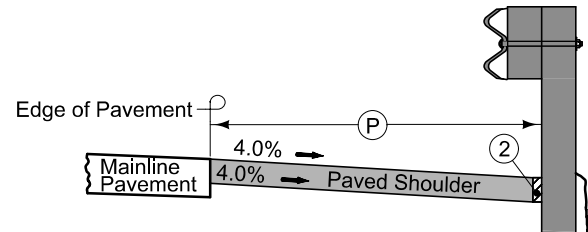
Section A-A



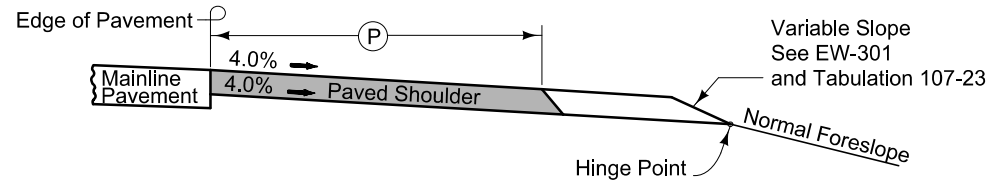
Section B-B

NEW CONSTRUCTION

- 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.
- ⑤ 'KT-1 joint for PCC shoulder. 'B' joint for HMA shoulder.

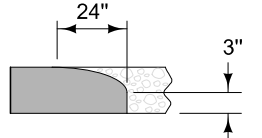


Section A-A



Section B-B

EXISTING SHOULDER



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

PAVED SHOULDER AT GUARDRAIL

SURVEY SYMBOLS

- ▲ PI Tangent Point
- ▲ SCR Section Corner
- ▲ PCP Photo Control Point
- ▲ BM Bench Mark
- CP Control Point
- ROW Right of Way Mark
- FENO FENO Monument
- PLG Location of General Photo
- TP TPD Telephone Pedestal
- PPA Power Pole Co. 1
- x— FW Wire Fence
- SIGN SI Sign
- PIP Pipe Culvert
- OUT Tile Outlet
- Tile — TIL Tile Line
- LIN Miscellaneous Line
- TOP Top of Bridge Pier
- CUL Culvert
- PR Electric Riser Pole
- EHW Extreme High Water
- EP Edge of Paved Roads (ML or SR)
- SH Paved Shoulder
- - - - - ENU Edge Unpaved Entrance & Parking
- - - - - ENT Centerline BL of Entrance
- SNP Unpaved Shoulder
- > D Centerline Draw or Stream (Down)
- GU Gutter In Front of Curb
- CU Back of Curb
- - - - - EG Edge of Gravel Road
- ENP Edge Paved Entrance & Park Lot
- ⚡ DIK Centerline of Dike or Dam
- ← DU Centerline Draw or Stream (Up)
- F0 — FO1D Fiber Optic Co. 1 - Quality D
- SOP Size of Pipe or Culvert
- PRO Profile Shot
- BD Bridge Deck
- BCL Bridge Centerline
- - - - - BL Topo Breakline

UTILITY LEGEND

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations
 QLA Quality Level A Highest guideline quality level
 QLD Quality Level D Lowest guideline quality level

- TP TPD Dumont Telephone Company
- PPA MidAmerican Energy
- PR MidAmerican Energy
- F0 — FO1D Dumont Telephone Company - Quality D

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

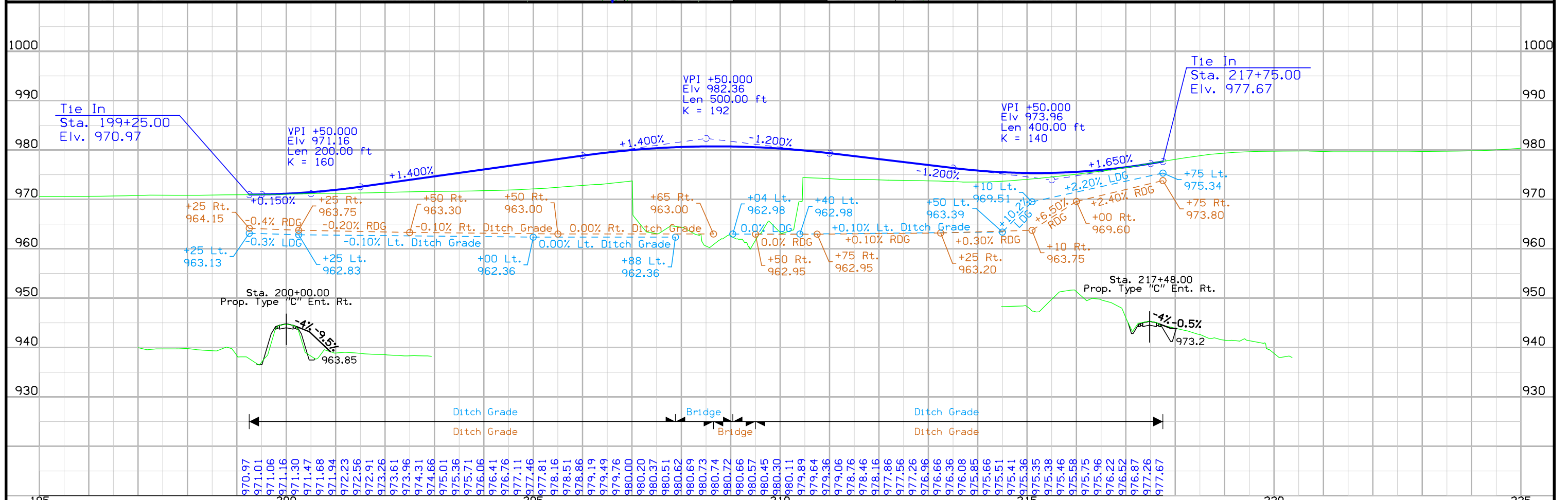
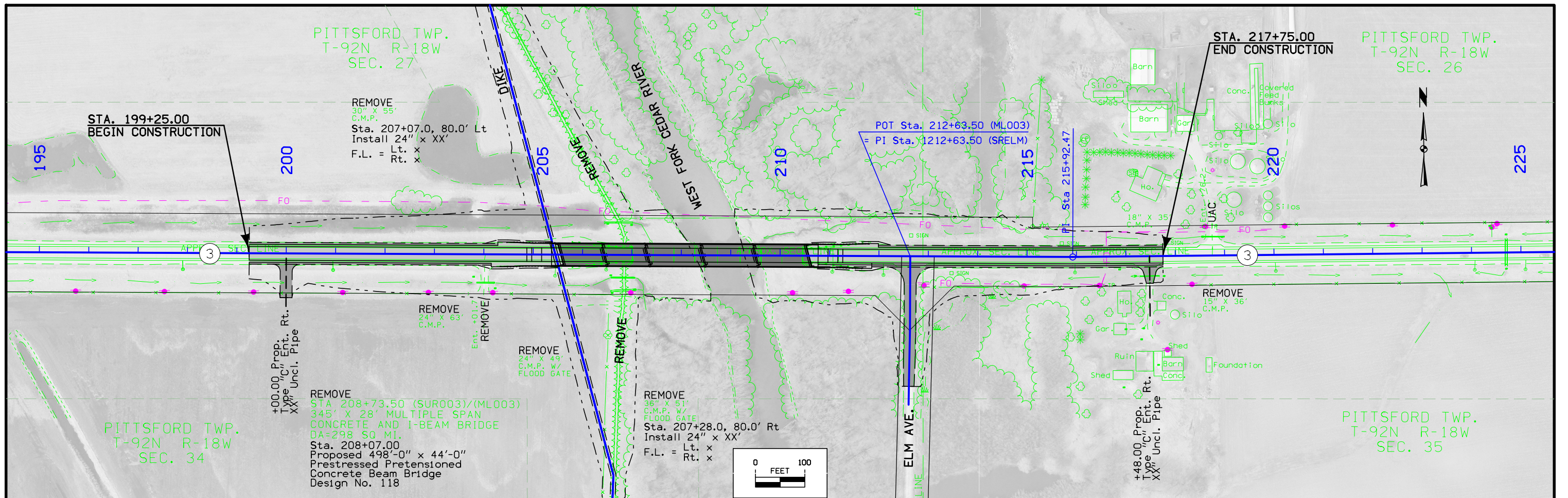
Station — Survey Line

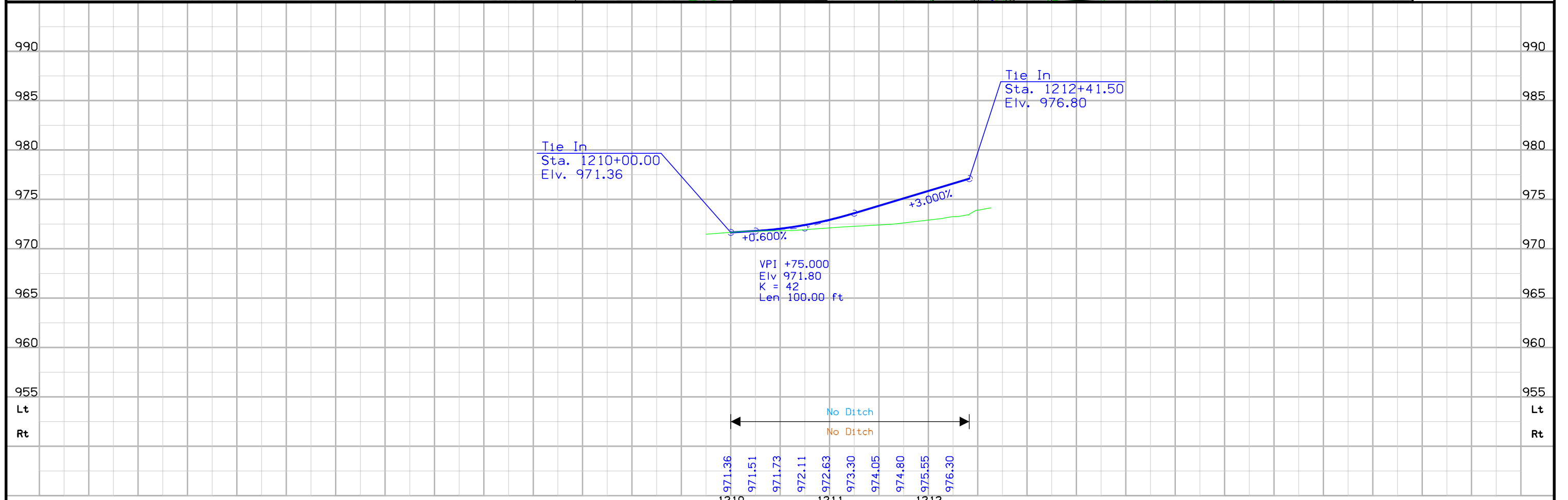
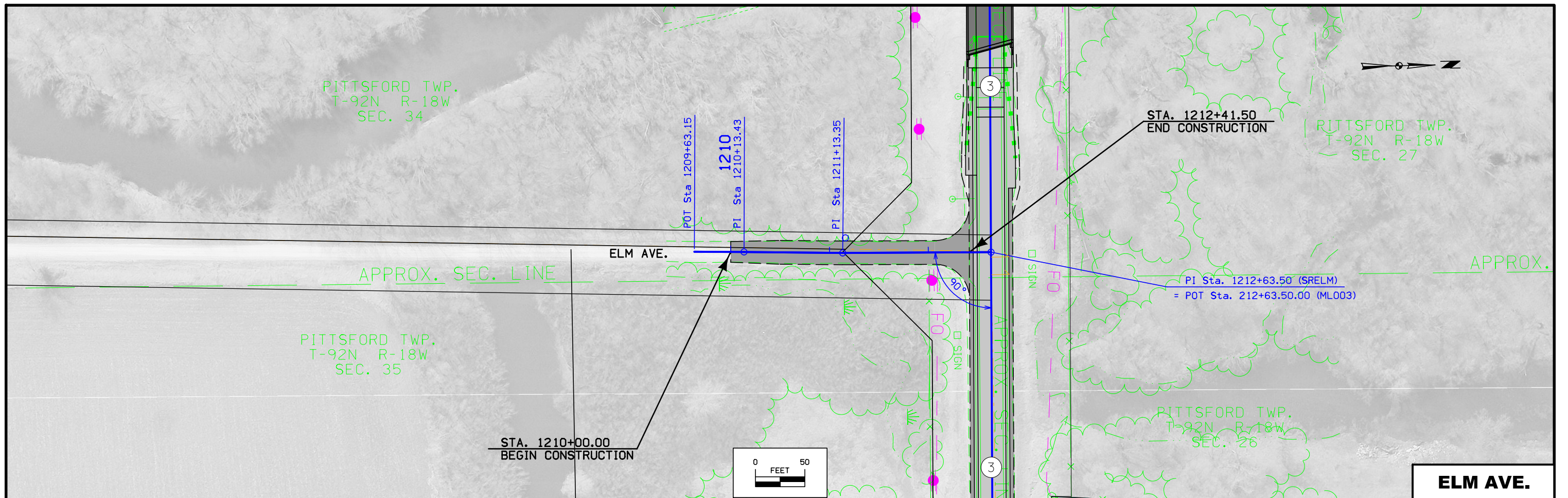
- ▲ Section Corner
- - - - - Ground Line Intercept
- ▨ Saw Cut
- ▬ Guardrail
- ▬ Trench Drain
- High Tension Cable Guardrail
- ~ Sheet Pile
- ▨ Pavement Removal
- ▨ Clearing & Grubbing Area

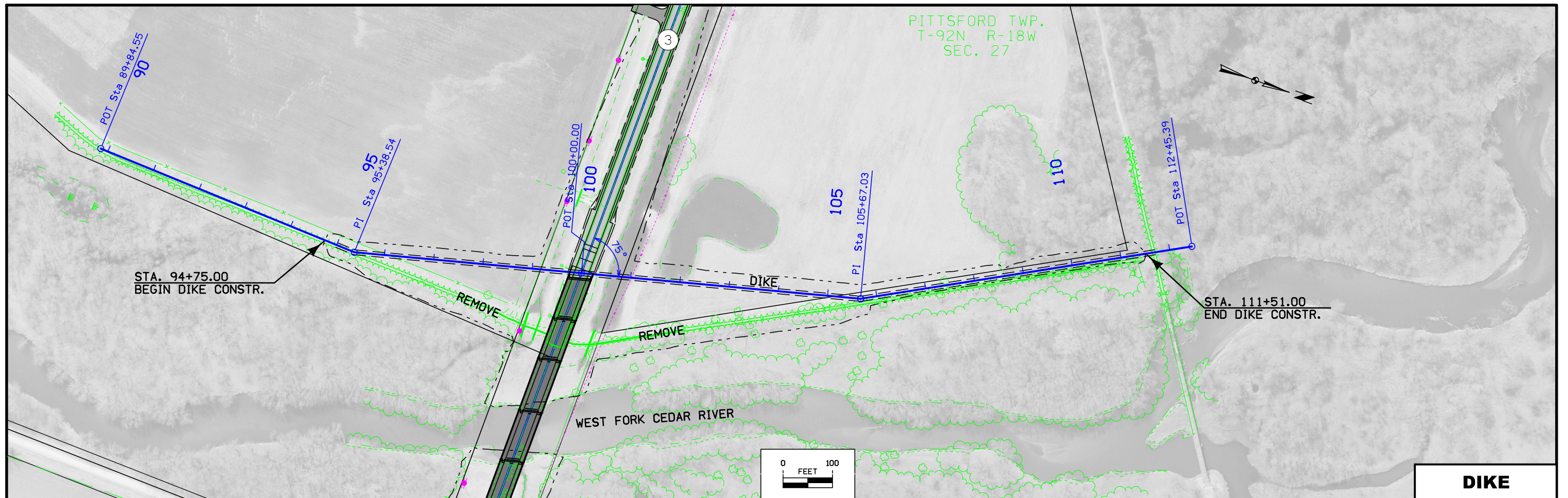
RIGHT-OF-WAY LEGEND

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

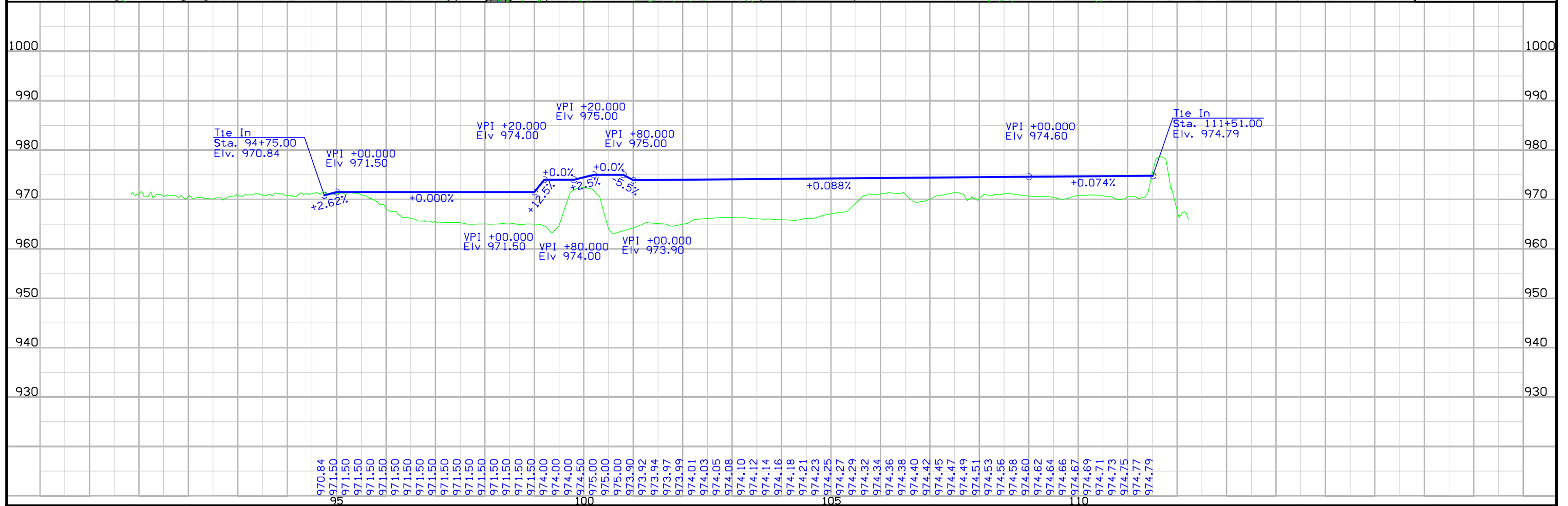
PLAN AND PROFILE
 LEGEND AND SYMBOL
 INFORMATION SHEET
 (COVERS SHEET SERIES D, E, F, & K)







DIKE



FILE NO.	ENGLISH	DESIGN TEAM	Flattery \ Bottjen \ Crystal	BUTLER COUNTY	PROJECT NUMBER	BRF-003-5(77)--38-12	SHEET NUMBER	F.1
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Survey Information

Butler County
 BRF-003-5(77)--38-12
 West Fork Cedar River 0.8 mi E of Co Rd T16
 PIN 14-12-003-010
 Sap-0821

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction on Butler County Hwy 3 over West Fork Cedar River 0.8 miles East of County Road T16. This project is a Partial DTM with Photo control

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). GRS80 Ellipsoidal Height was computed at project Pt. 12001 by doing 6 hour static observations. The project control is relative to nearby Iowa RTN Base Stations.

This survey observed 1 County GPS control and 1 NGS Control Monument with published NAVD88 heights to compare to local ground control:

Butler County GPS Network mark designated 0113 has a published Elev. Of 971.14
 Survey Elev. = 971.14

NGS 2nd. order class 0 mark designated N 29 has a published Elev. Of 1027.78
 Survey Elev. = 1027.92

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 5 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting a six hour static observation. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to point 12001.

Name	Northing (USft)	Grid Easting (USft)	Elevation (USft)
12001	8935284.619	15313570.272	978.795
N29	8944648.63	15322189.734	1027.922
113	8930113.158	15307568.111	971.144

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. FN-502. Survey stationing was equated to the plan PI at STA 215+92.47 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 160+08.92 Project No. FN-502.
 Survey PI Sta. 160+09.44

PI Sta 186+23.25 Project No. FN-502.
 Survey PI STA 186+24.15

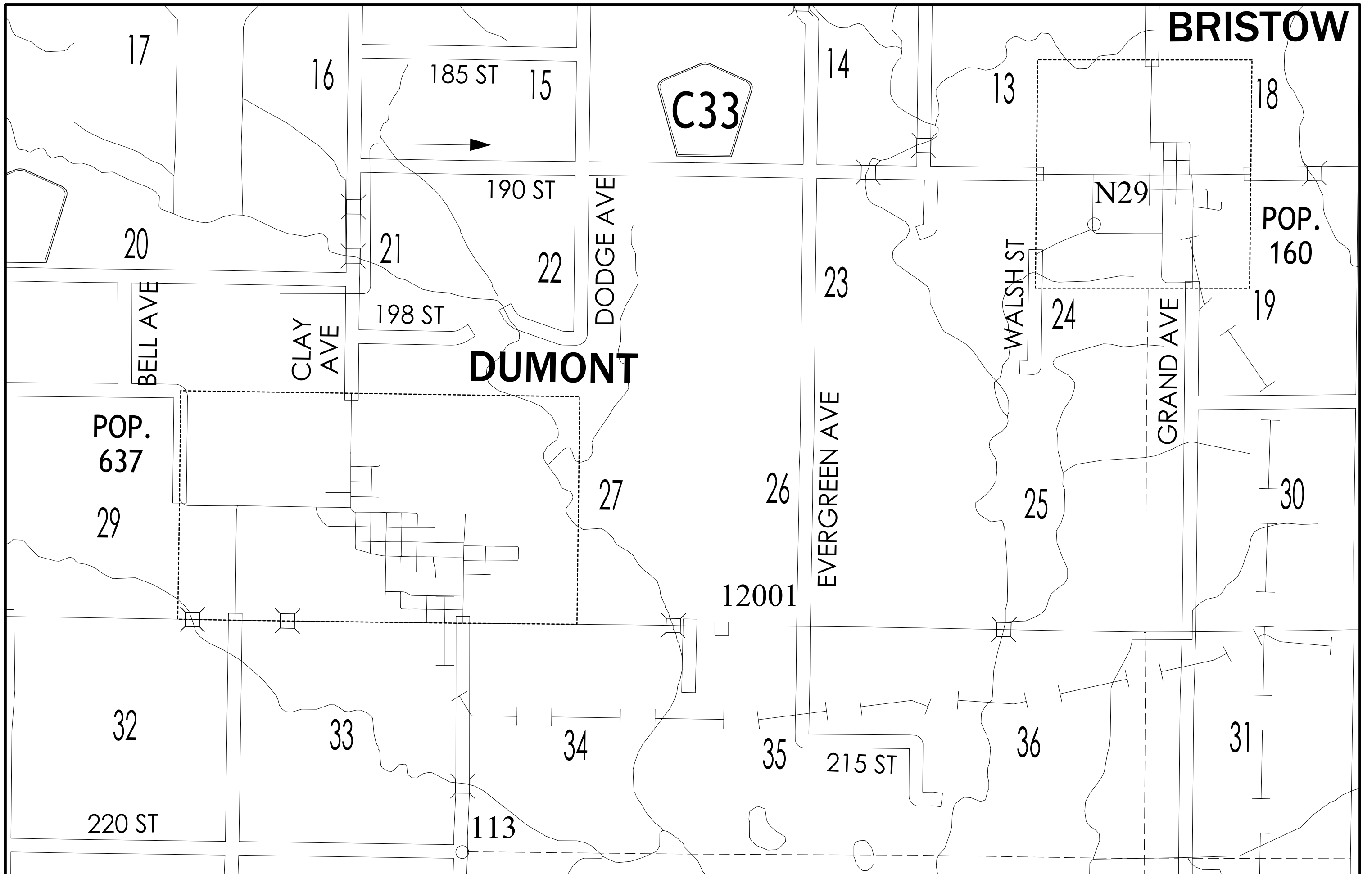
PI STA 215+92.47 Project No. FN-502
 Survey PI STA 215+92.47

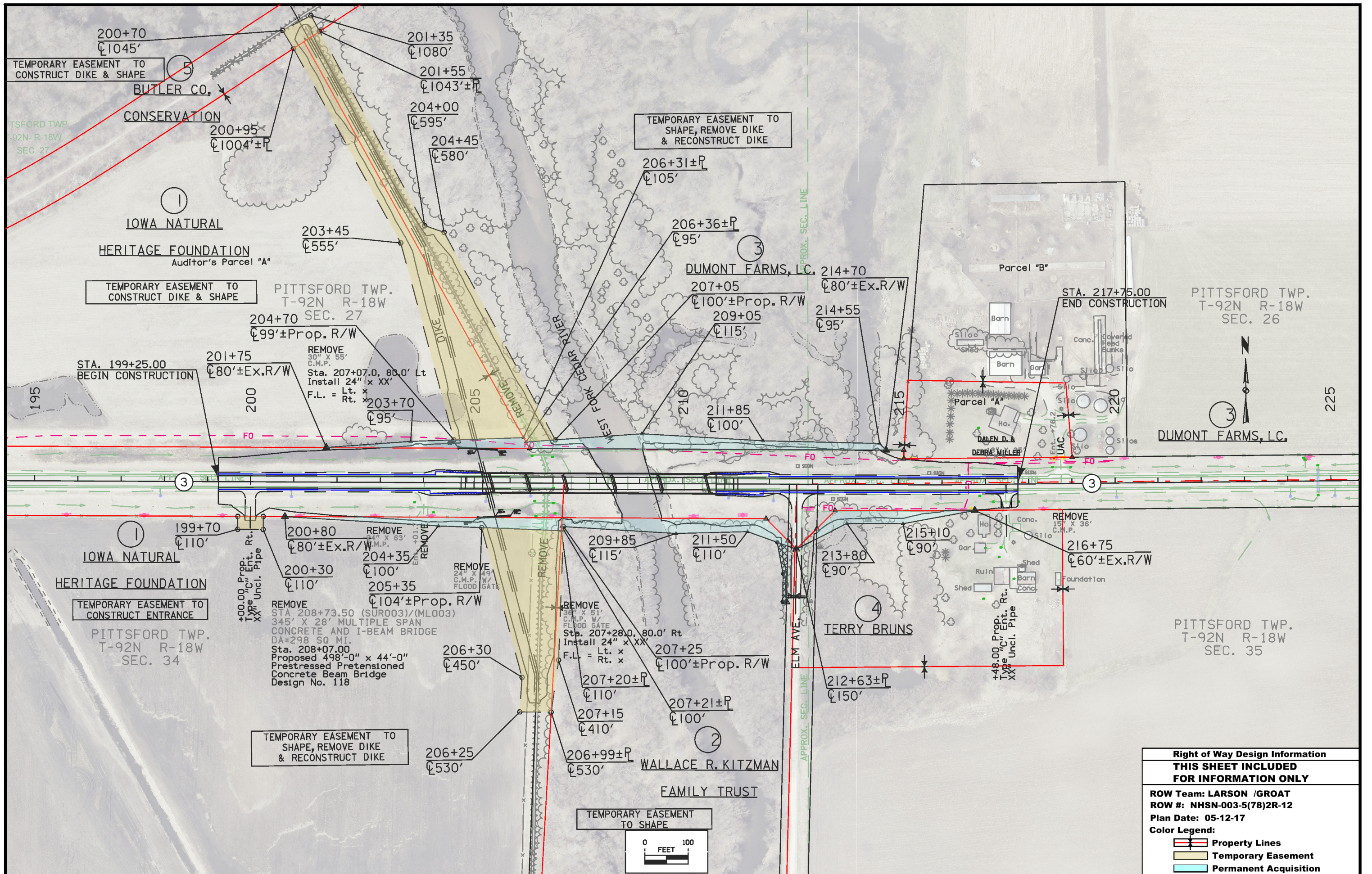
PI STA 238+90.50 Project No. FN-502
 Survey PI STA 238+92.41

PI STA 317+95.50 Project No. FN-502
 Survey PI STA 317+93.05

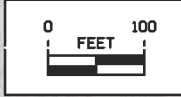
VERTICAL CONTROL

Point	North	East	Elevation	Feature	Description
113	8930113.1580	15307568.1100	971.1440	CP	BUTLER COUNTY GPS NETWORK MARK DESIGNATED 0113
12001	8935284.6190	15313570.2700	978.7950	FENO	SET FENO TYPE MONUMENT
N29	8944648.6300	15322189.7300	1027.9220	CP	NGS 2ND. ORDER CLASS 0 MARK DESIGNATED N 29





Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: LARSON /GROAT	
ROW #: NHSN-003-5(78)2R-12	
Plan Date: 05-12-17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



2

WALLACE R. KITZMAN

FAMILY TRUST

1211+29± Prop. R/W
C 45'

1210+55
C 30'

1209+90
C 30'

PITTSFORD TWP.
T-92N R-18W
SEC. 34

PITTSFORD TWP.
T-92N R-18W
SEC. 27

ELM AVE.

APPROX. SEC. LINE

ELM AVE.

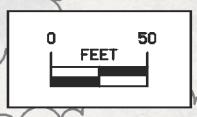
APPROX.

PITTSFORD TWP.
T-92N R-18W
SEC. 35

4

TERRY BRUNS

PITTSFORD TWP.
T-92N R-18W
SEC. 26



Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: LARSON /GROAT
ROW #: NHSN-003-5(78)--2R-12
Plan Date: 05-12-17

Color Legend:

- Property Lines
- Temporary Easement
- Permanent Acquisition

108-23A
08-01-08

TRAFFIC CONTROL PLAN

Traffic will be maintained via an off-site detour. Proposed Detour: IA 3 / County Road T-16 north / County Road C-33 east / County Road T-24 south / IA 3. Out of distance travel is 4.2 miles.

The contractor will be responsible for maintaining access to property owners on Elm Avenue at all times during construction.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

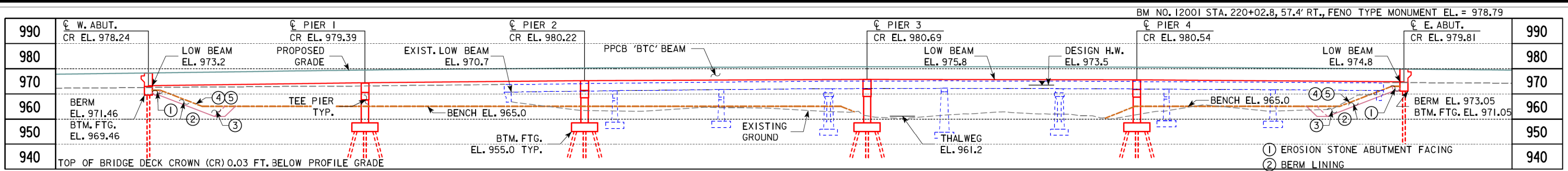
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			None Provided									

111-01
04-17-12

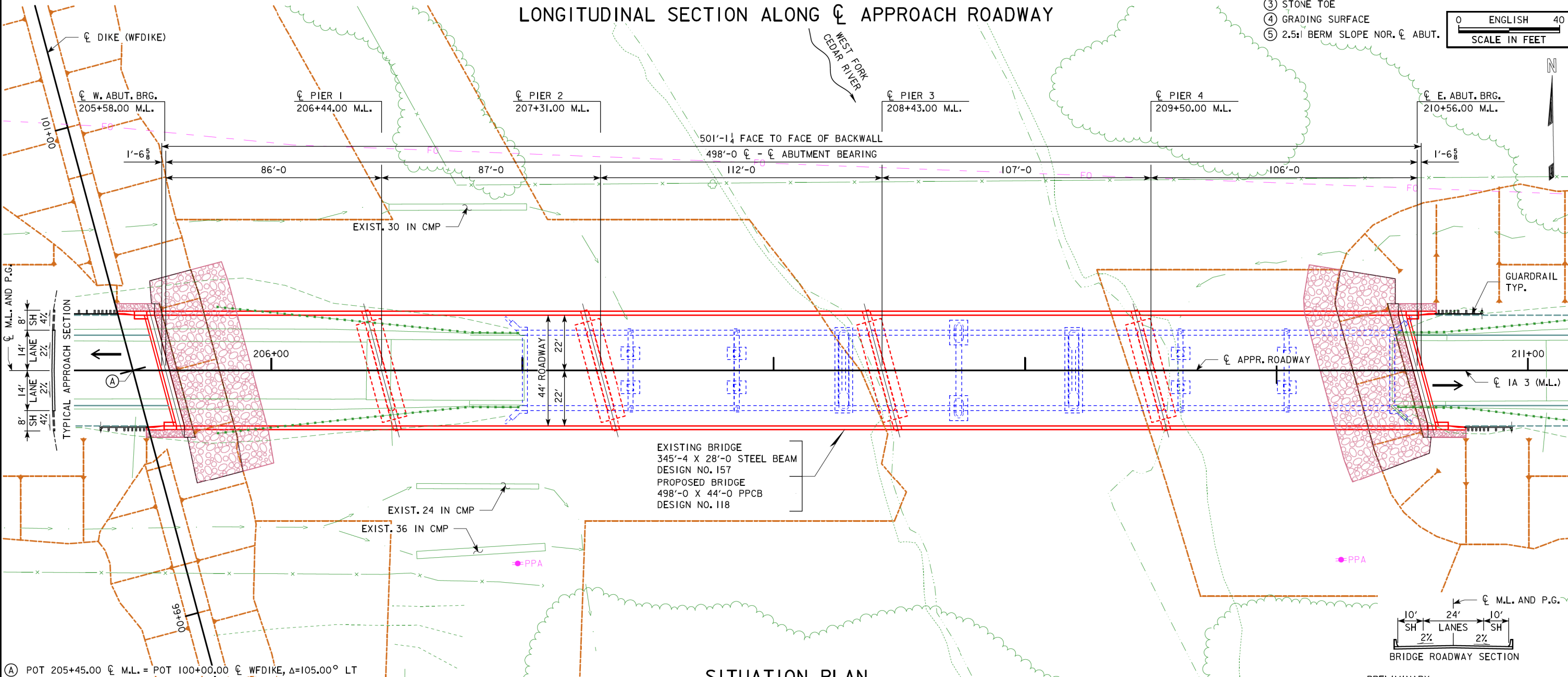
COORDINATED OPERATIONS

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	



LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY



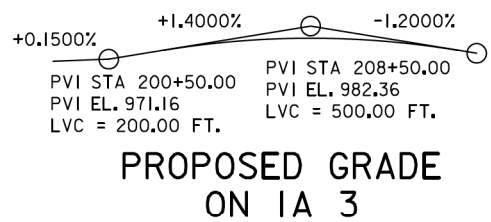
SITUATION PLAN

LOCATION
 IA 3 OVER WEST FORK CEDAR RIVER
 T 92 N R 18 W
 SECTION 34
 PITTSFORD TOWNSHIP
 BUTLER COUNTY
 BRIDGE MAINT. NO. I295.7S003
 FHWA NO. [016500]
 STA. 208+07.00 CL M.L.
 LATITUDE 42.744880°
 LONGITUDE -92.948446°

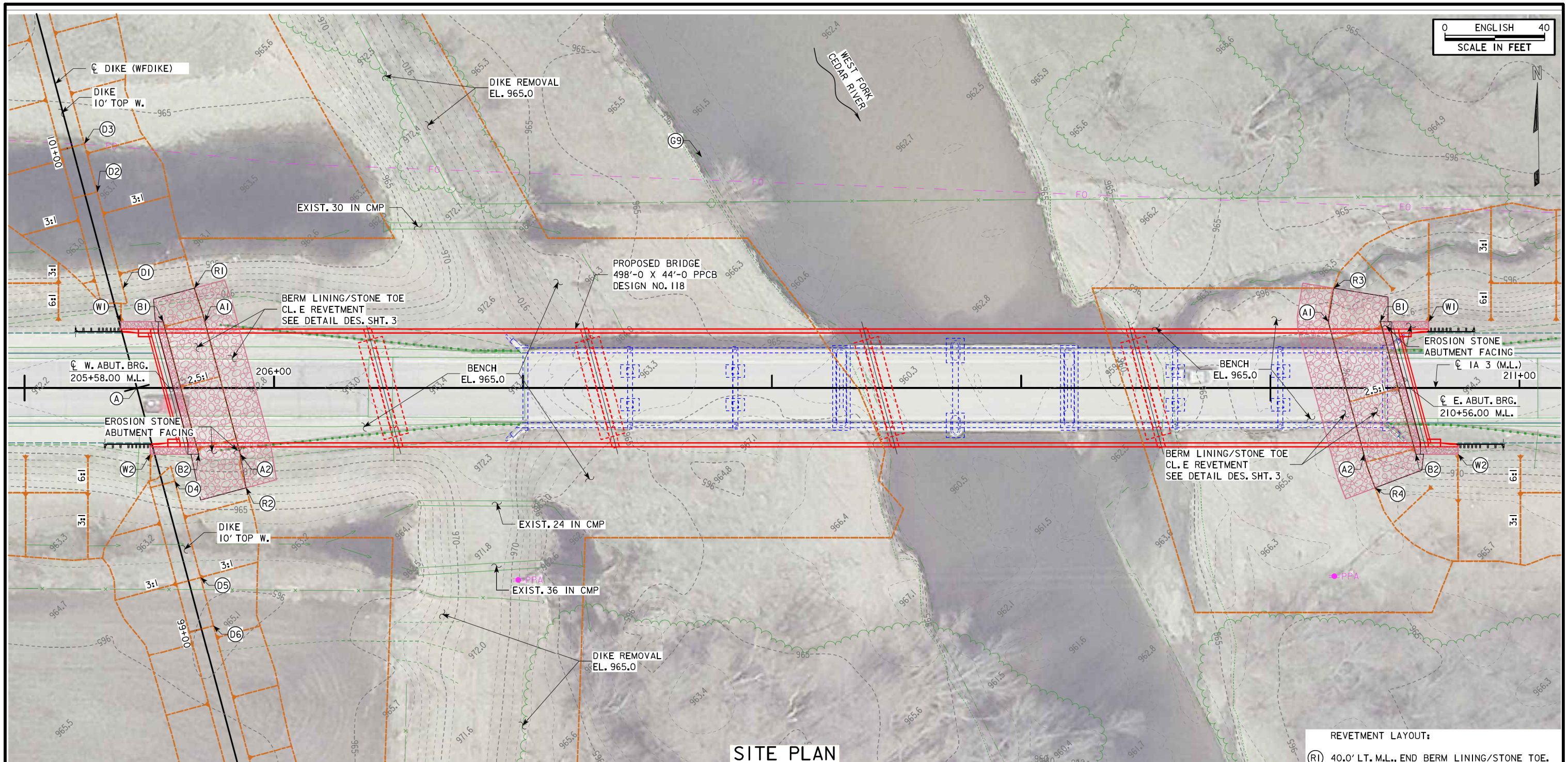
UTILITIES LEGEND
 FO - BURIED FIBER OPTIC DUMONT TEL. COMPANY
 PPA - POLE ELECTRIC MID-AMERICAN ENERGY

TRAFFIC ESTIMATE
 2019 AADT 2,000 V.P.D.
 2039 AADT 2,100 V.P.D.
 2039 DHV -- V.P.H.
 TRUCKS 19%
 TOTAL DESIGN ESALS --

**PRELIMINARY
 PRIOR BI COMPLETION**



DESIGN FOR 15° SKEW (R.A.)
**498'-0" X 44'-0" PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 86', 106' END SPANS BTC BEAMS 87', 112', 107' INT. SPANS
SITUATION PLAN
 STATION: 208+07.00 IA 3
BUTLER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 3 FILE NO. 31394 DESIGN NO. 118



0 ENGLISH 40
SCALE IN FEET

SITE PLAN

(A) POT 205+45.00 CL M.L. = POT 100+00.00 CL WFDIKE, Δ=105.00° LT

GRADING CONTROL:

- (D1) 100+40.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 975.0 = 205+39.5 M.L., 39.9' LT.
- (D2) 100+80.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 975.0 = 205+29.1 M.L., 78.6' LT.
- (D3) 101+00.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 973.9 = 205+24.0 M.L., 97.9' LT.
- (D4) 99+60.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 974.0 = 205+60.2 M.L., 37.3' RT.
- (D5) 99+20.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 974.0 = 205+70.5 M.L., 76.0' RT.
- (D6) 99+00.0 WFDIKE, 5.0' RT., TOP/EDGE DIKE, EL. 971.5 = 205+75.7 M.L., 95.3' RT.

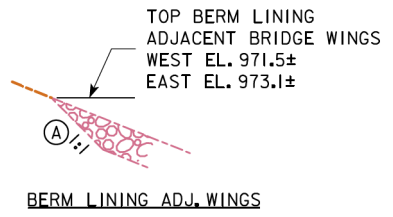
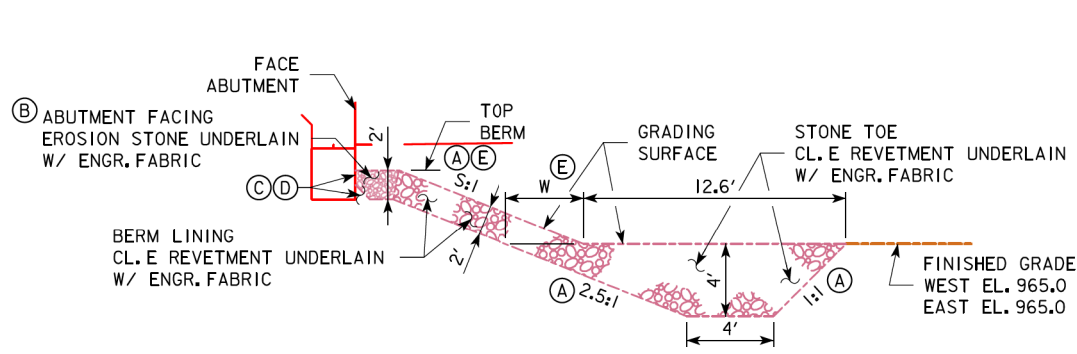
- REVETMENT LAYOUT:
- (R1) 40.0' LT. M.L., END BERM LINING/STONE TOE.
 - (R2) 40.0' RT. M.L., END BERM LINING/STONE TOE.
 - (R3) 40.0' LT. M.L., END BERM LINING/STONE TOE.
 - (R4) 40.0' RT. M.L., END BERM LINING/STONE TOE.

BERM SLOPE LOCATION TABLE						
W. ABUTMENT			E. ABUTMENT			
STATION	OFFSET	ELEV	STATION	OFFSET	ELEV	
A1	205+72.26	26.58' LT	965.00	210+23.38	26.58' LT	965.00
A2	205+86.50	26.58' RT	965.00	210+37.62	26.58' RT	965.00
B1	205+55.54	26.58' LT	971.46	210+44.22	26.58' LT	973.05
B2	205+69.78	26.58' RT	971.46	210+58.46	26.58' RT	973.05
W1	205+38.61	26.58' LT	977.41	210+63.61	26.58' LT	979.17
W2	205+50.39	26.58' RT	977.57	210+75.39	26.58' RT	979.05

BERM SLOPE ELEVATIONS REFLECT GRADING SURFACE

**PRELIMINARY
PRIOR BI COMPLETION**

PRELIMINARY
DESIGN FOR 15° SKEW (R.A.)
**498'-0 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
86', 106' END SPANS BTC BEAMS 87', 112', 107' INT. SPANS
SITUATION PLAN - SITE
STATION: 208+07.00 IA 3 NOV. 2018
BUTLER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 3 FILE NO. 31394 DESIGN NO. 118



HYDRAULIC DATA

DRAINAGE AREA = 303.5 SQ. MI.
 STREAM SLOPE = 2.27 FT./MI.
 AVG. LOW WATER STAGE = EL. 962.7

Q₅₀ = 14,000 CFS (14,000 CFS)
 STAGE = EL. 973.5
 REGULATORY LOW BEAM = EL. 975.8
 BACKWATER = 0.23 FT./0.83 FT.
 AVG. BRIDGE VELOCITY = 3.2 FPS

Q₁₀₀ = 15,969 CFS (16,300 CFS)
 STAGE = EL. 973.9
 OPERATIONAL LOW BEAM = 973.2
 BACKWATER = 0.42 FT./1.06 FT.
 AVG. BRIDGE VELOCITY = 3.5 FPS

Q₂₀₀ = 18,351 CFS (20,200 CFS)
 STAGE = EL. 974.3
 BACKWATER = 0.56 FT./ -
 AVG. BRIDGE VELOCITY = 3.9 FPS
 CALCULATED DESIGN SCOUR = EL. 952.0

Q₅₀₀ = 19,365 CFS (22,200 CFS)
 STAGE = EL. 974.5
 AVG. BRIDGE VELOCITY = 4.1 FPS
 CALCULATED CHECK SCOUR = EL. 951.6

ROADWAY OVERTOP= 14,000 CFS
 UPSTREAM DIKE LOW EL. 973.9
 ROADWAY OVERTOP EL. 970.5
 STA. 194+00

DISCHARGE IN PARANS. REPRESENTS TOTAL STREAMFLOW.
 BACKWATER REFERENCES CHANGE FROM EXISTING/PRE-DEVELOPMENT CONDITION NEAR FIRST HIGH-DAMAGE POTENTIAL DEVELOPMENT UPSTREAM OF PROJECT SITE (RESIDENCE N.E. OF BRIDGE).

SECTION THROUGH STONE TOE AND BERM LINING

- (A) SLOPE NOR. ϕ ABUT. / GRADING CONTROL LINE (PT. A1-A2).
- (B) EXTEND FACING OUT TO LIMITS OF WING ARMORING.
- (C) 1' X 1' SOIL WEDGE AT FACE ABUTMENT.
- (D) CARRY ENGR. FABRIC UP SOIL WEDGE AND FACE ABUTMENT.
- (E) BERM/DIKE SLOPE S:1
 S=2.5:1 W=5.4'
 S=3:1 W=6.3'
 S=3.5:1 W=7.2'

ESTIMATED BERM ARMORING QUANTITIES

REVEMENT TYPE - LOCATION	REVEMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM LINING\STONE TOE - WEST	381.2	19.6	321.6	250.4
BERM LINING\STONE TOE - EAST	407.1	19.6	344.1	266.6
TOTALS	788.3	39.2	655.7	517.0

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.
 REVEMENT AND EROSION STONE ESTIMATED AT 1.6 TON/CY

PRELIMINARY
PRIOR BI COMPLETION

PRELIMINARY

DESIGN FOR 15° SKEW (R.A.)

**498'-0 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

86', 106' END SPANS BTC BEAMS 87', 112', 107' INT. SPANS

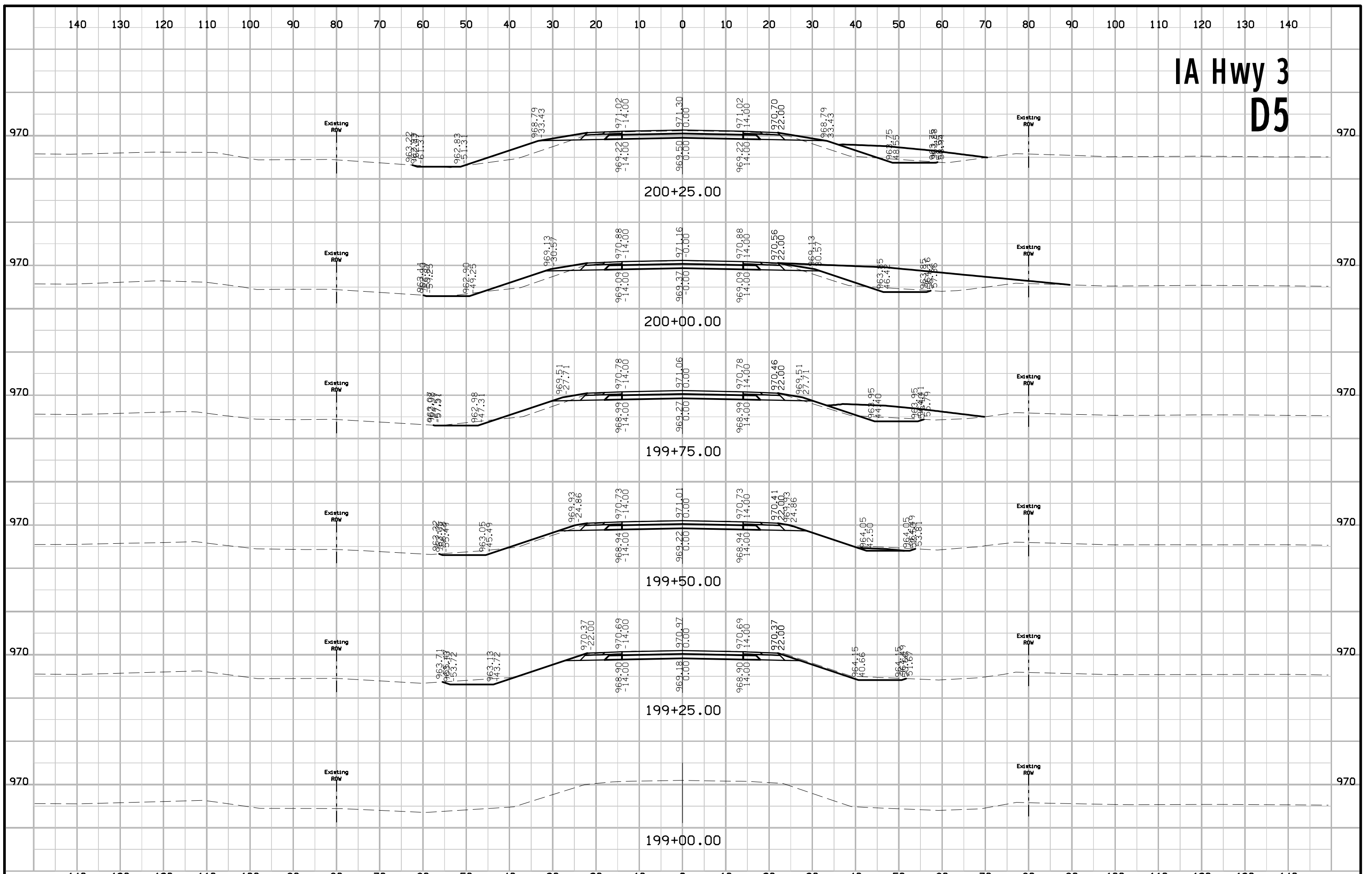
SITUATION PLAN - MISCELLANEOUS

STATION: 208+07.00 IA 3 NOV. 2018

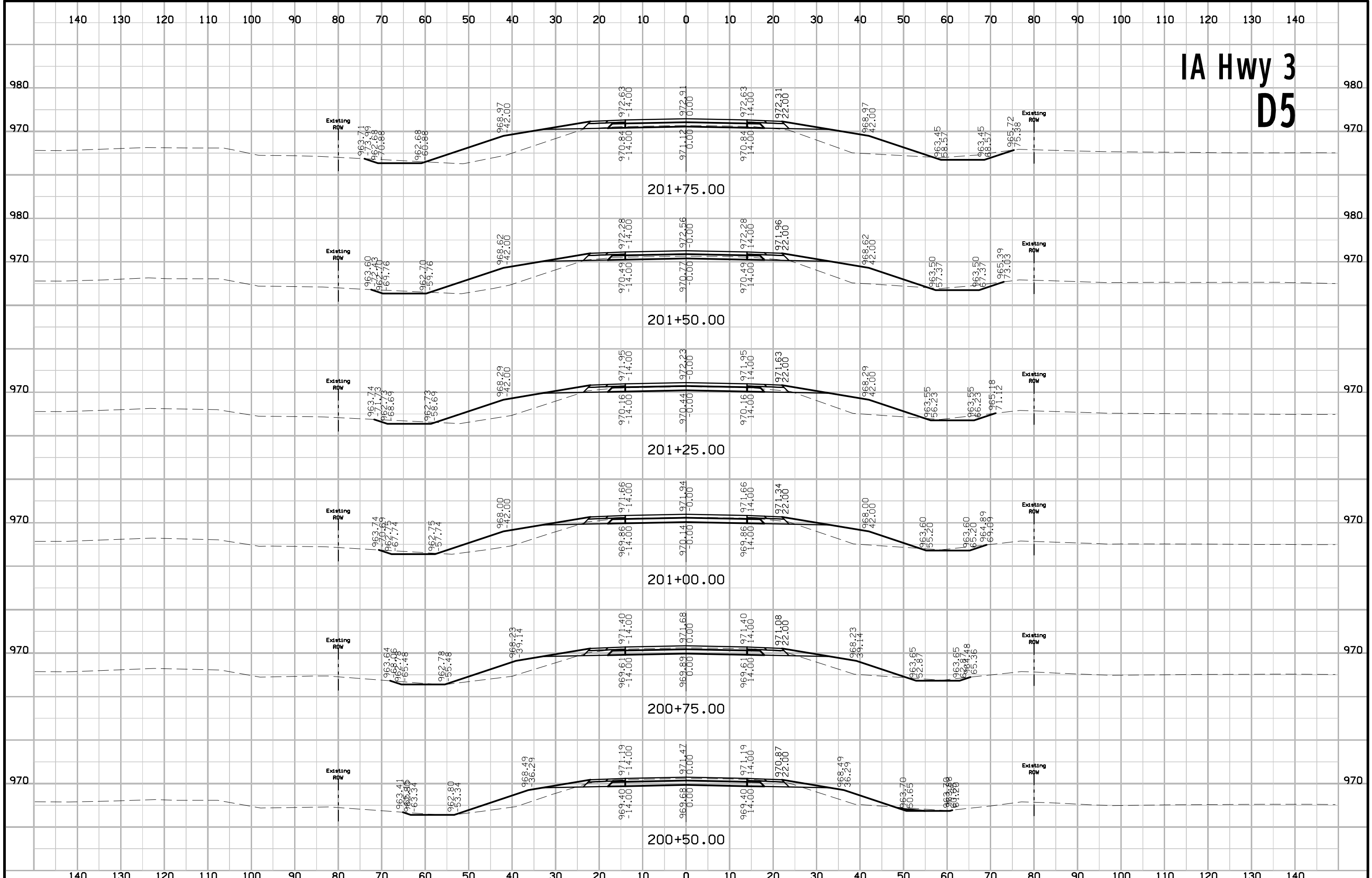
BUTLER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 3 FILE NO. 31394 DESIGN NO. 118

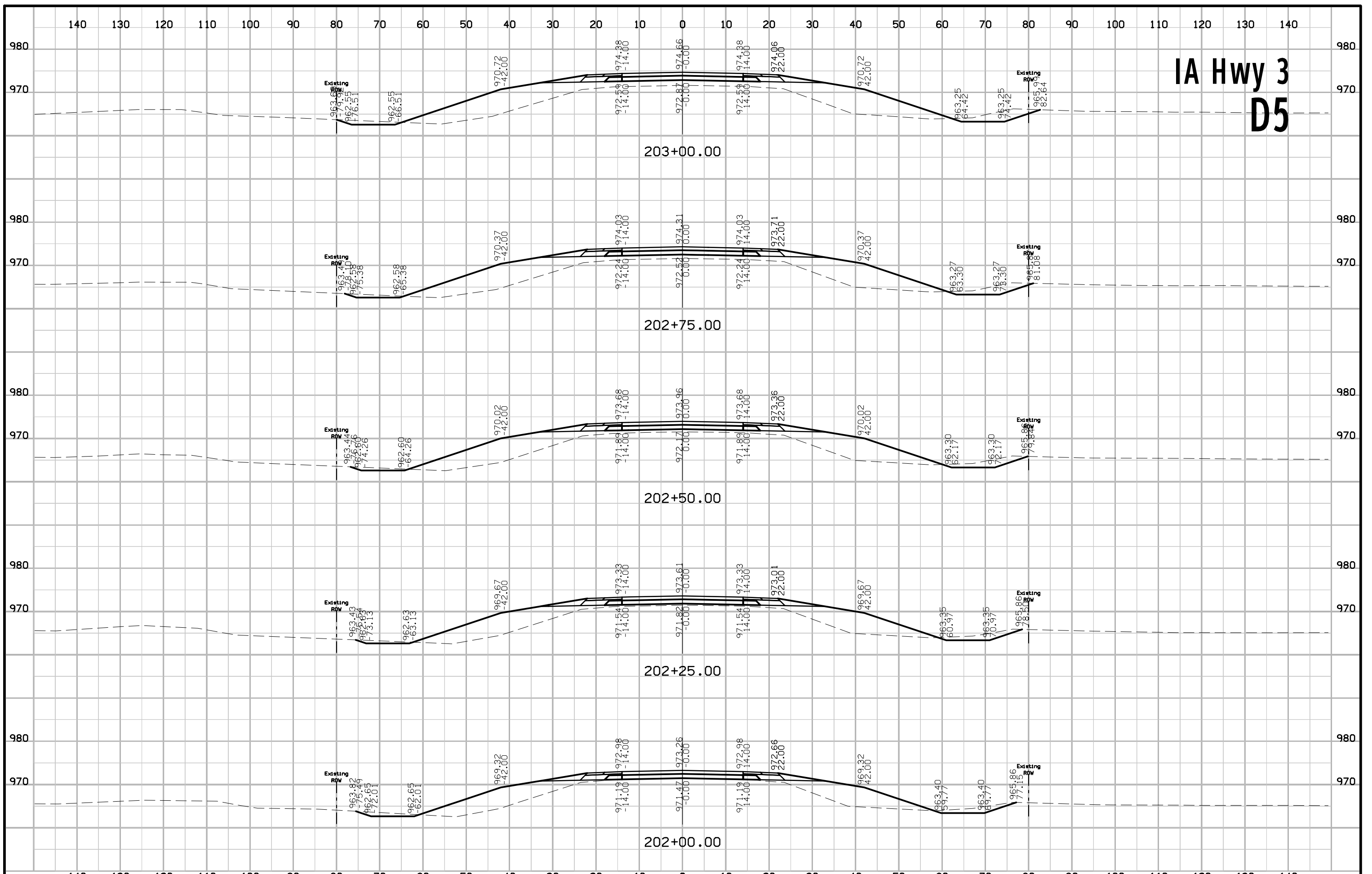
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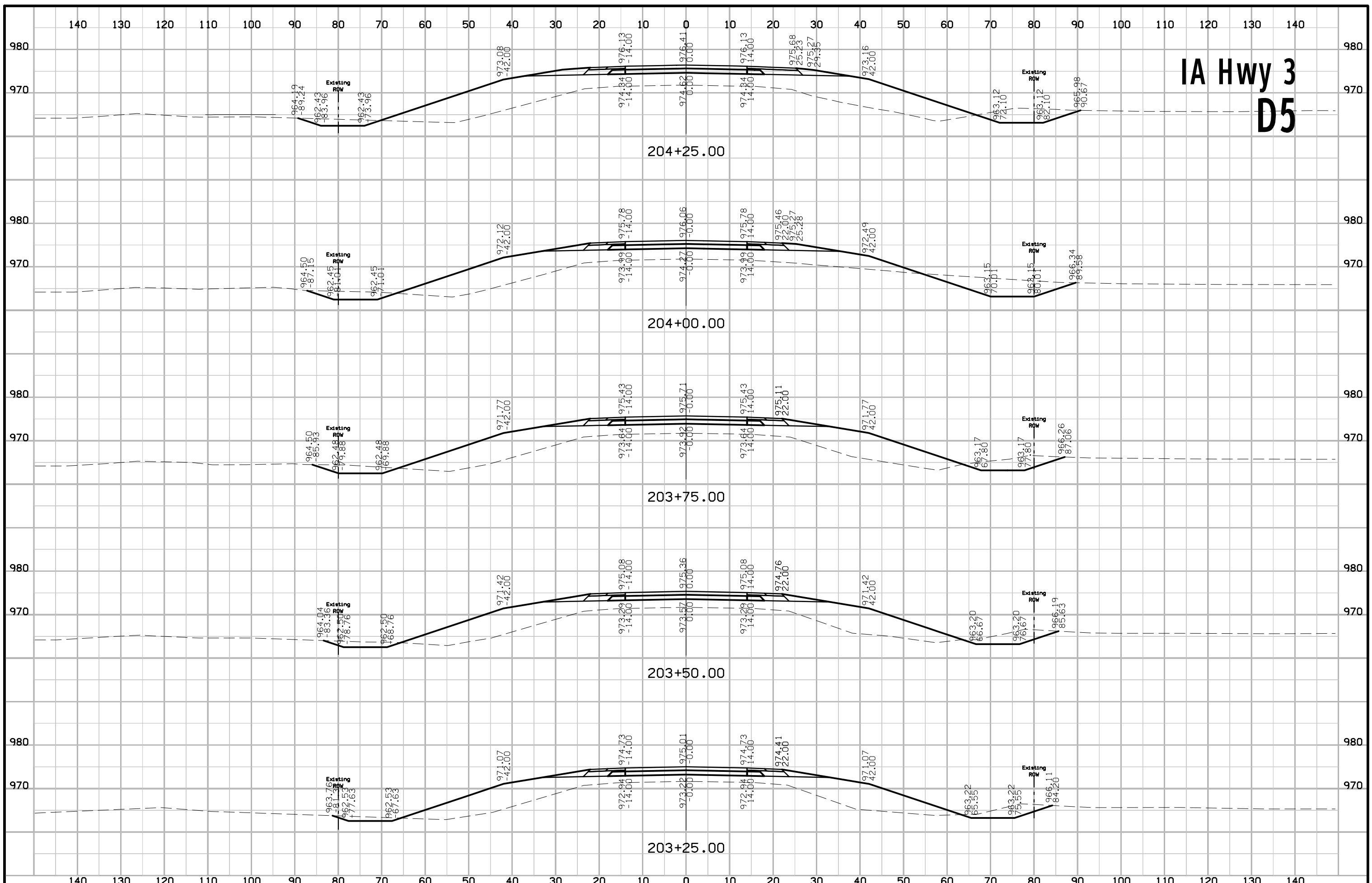
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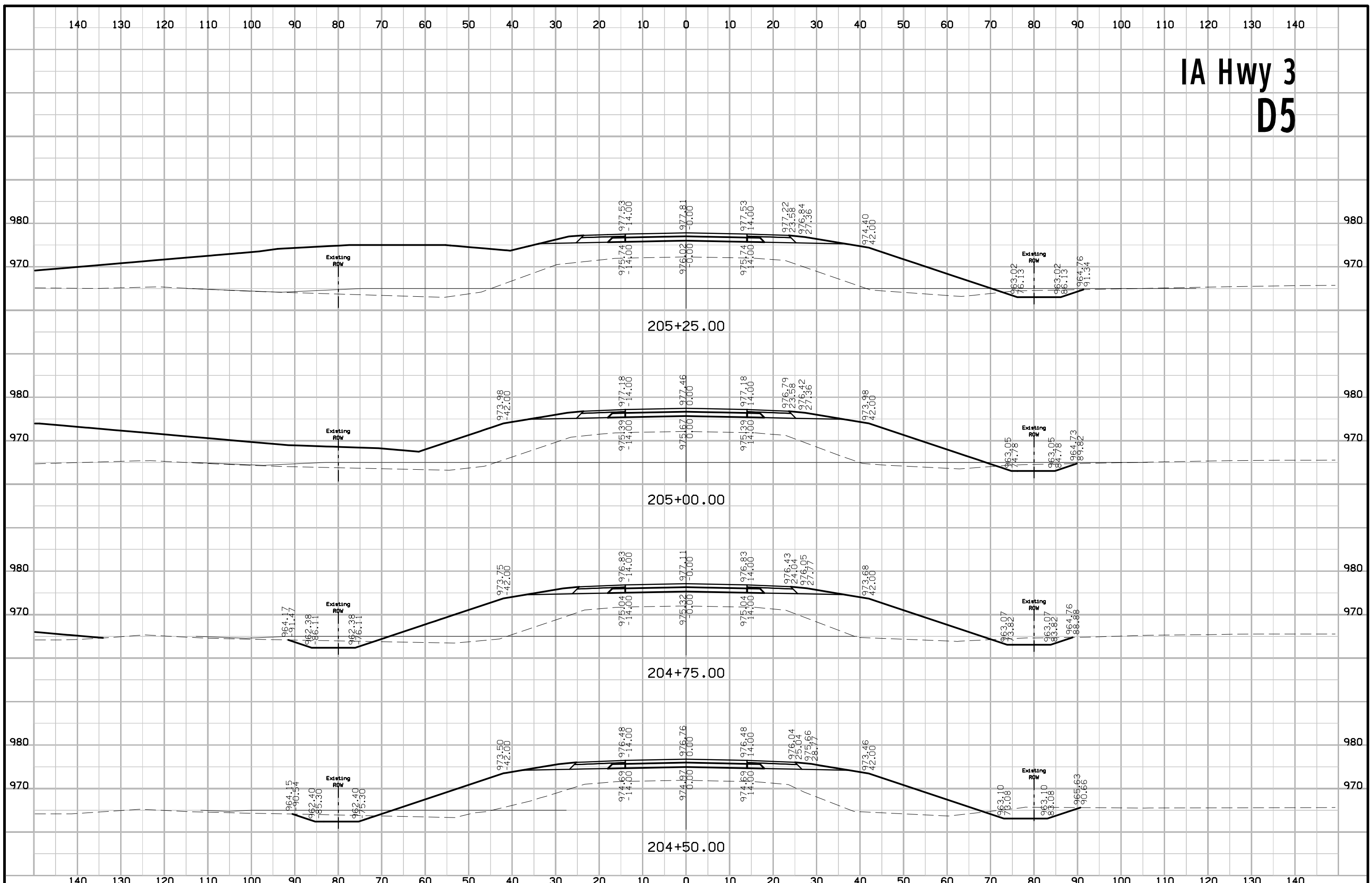
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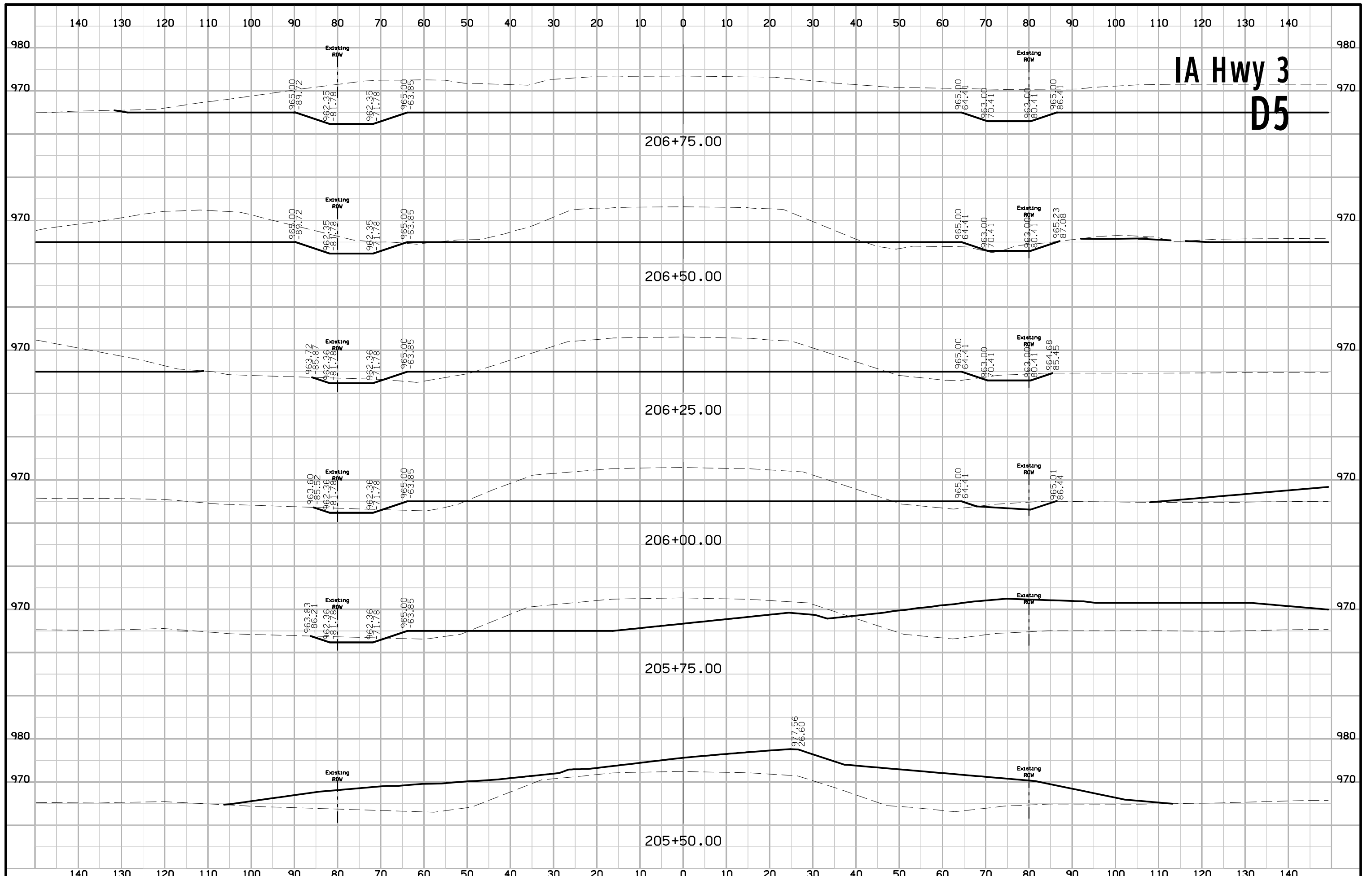


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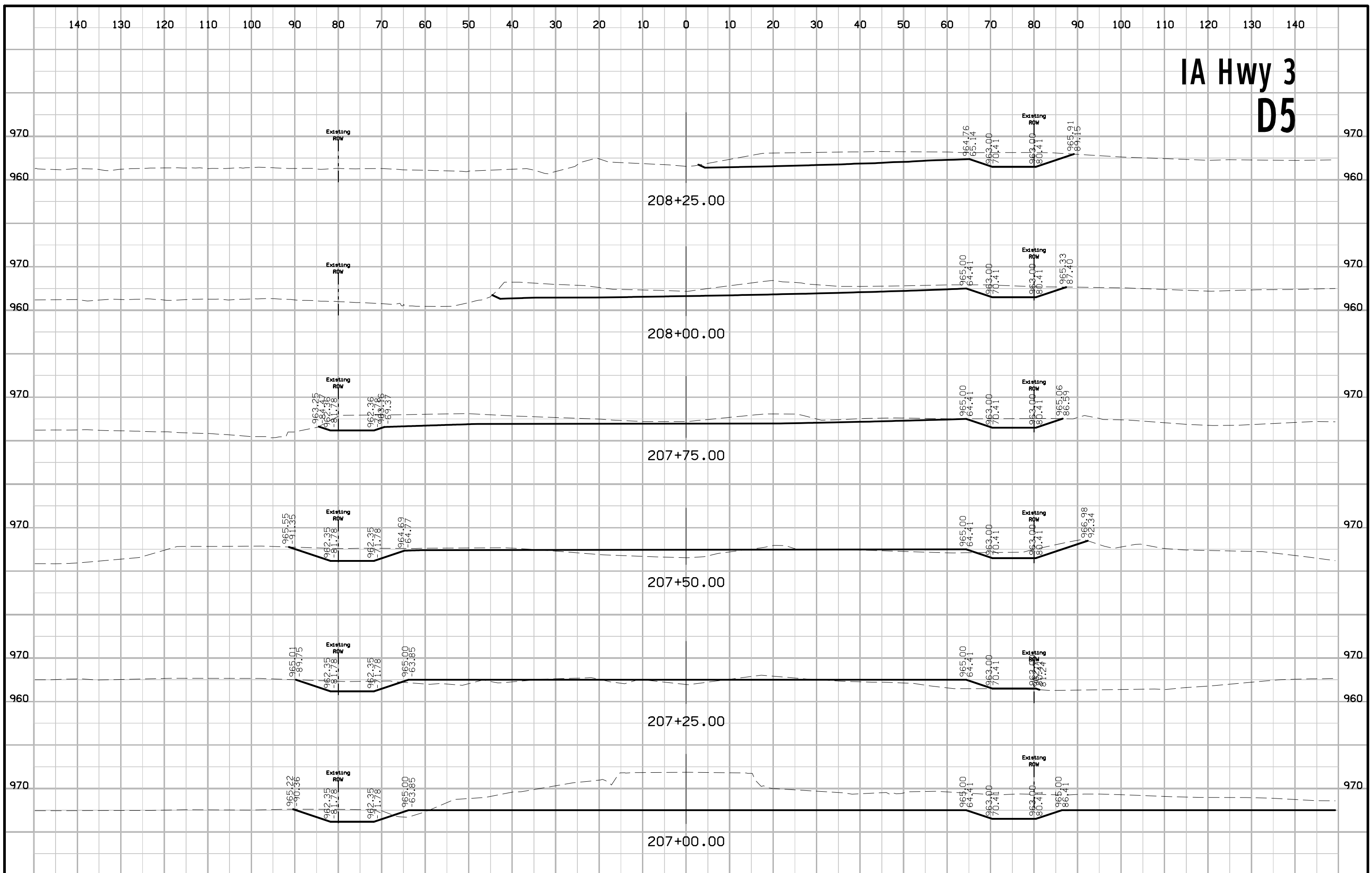


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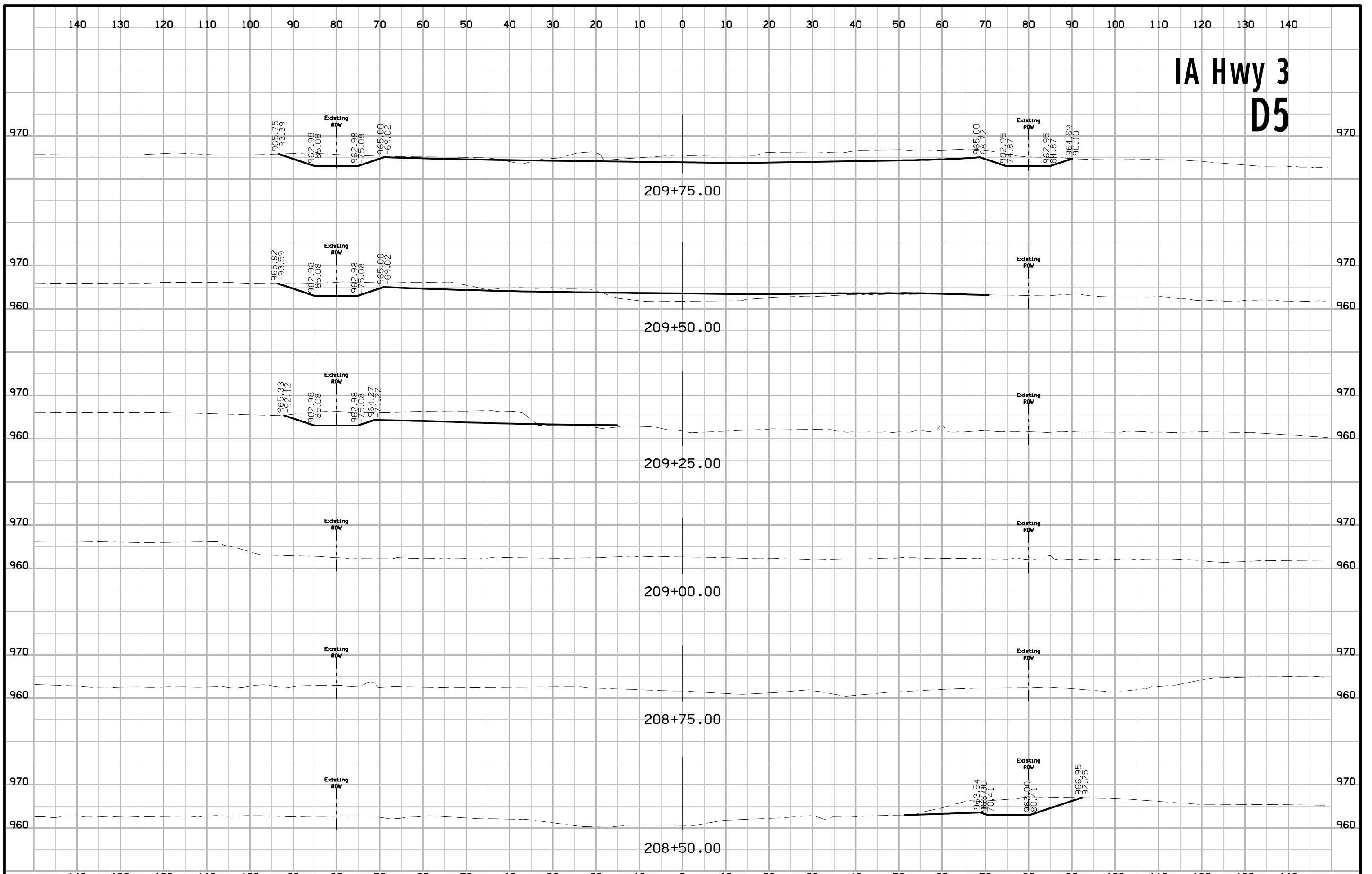




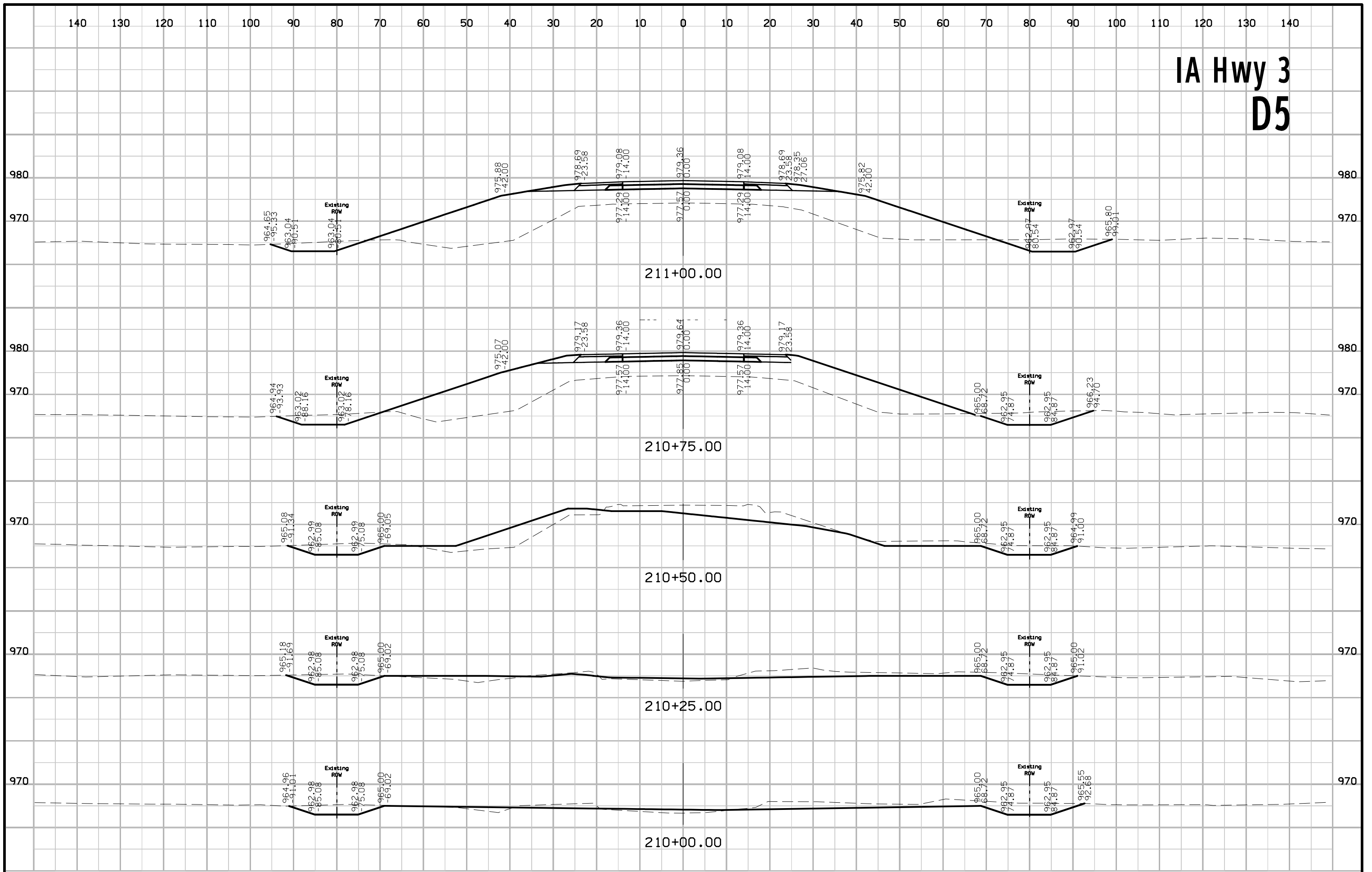
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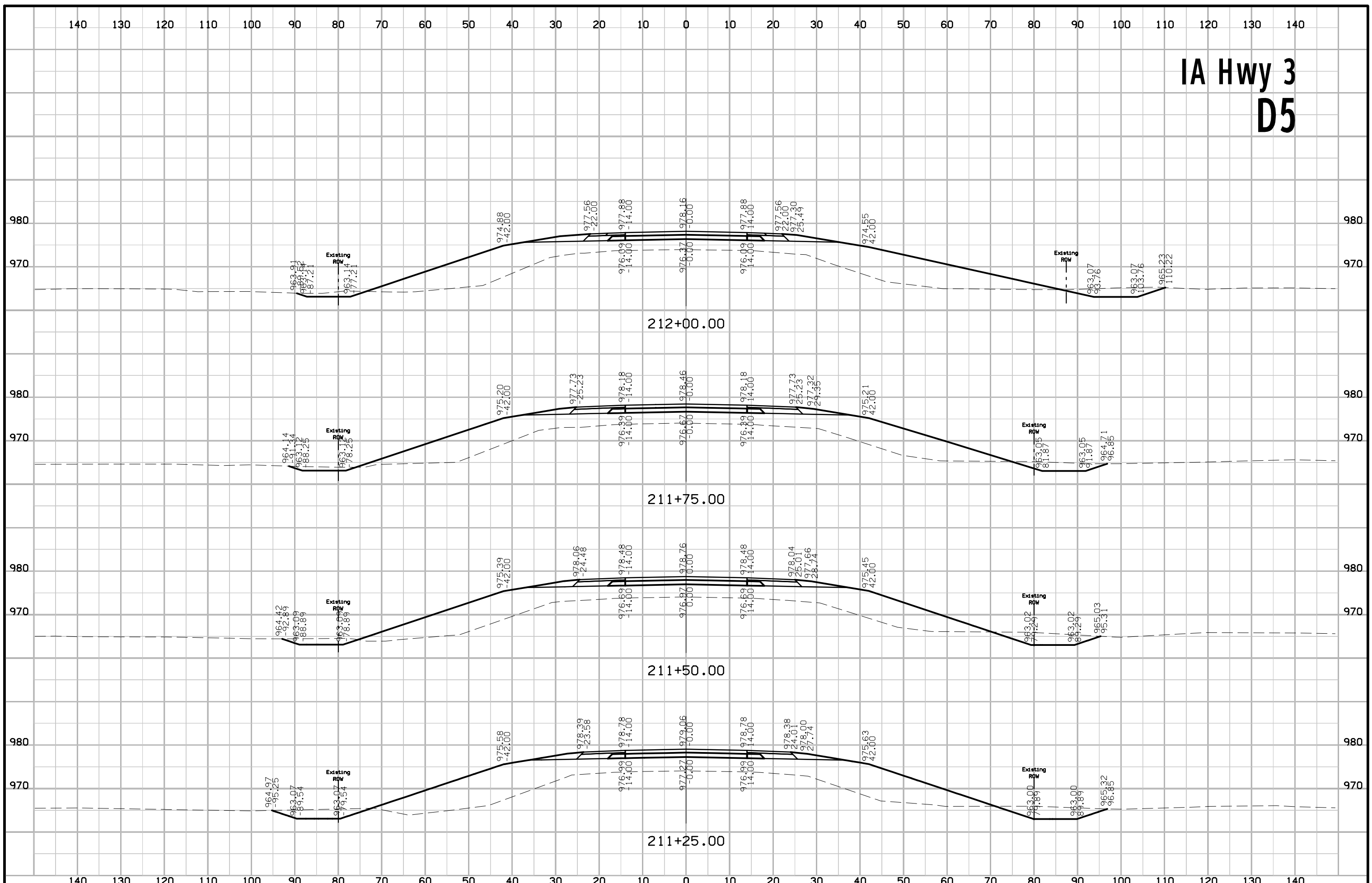
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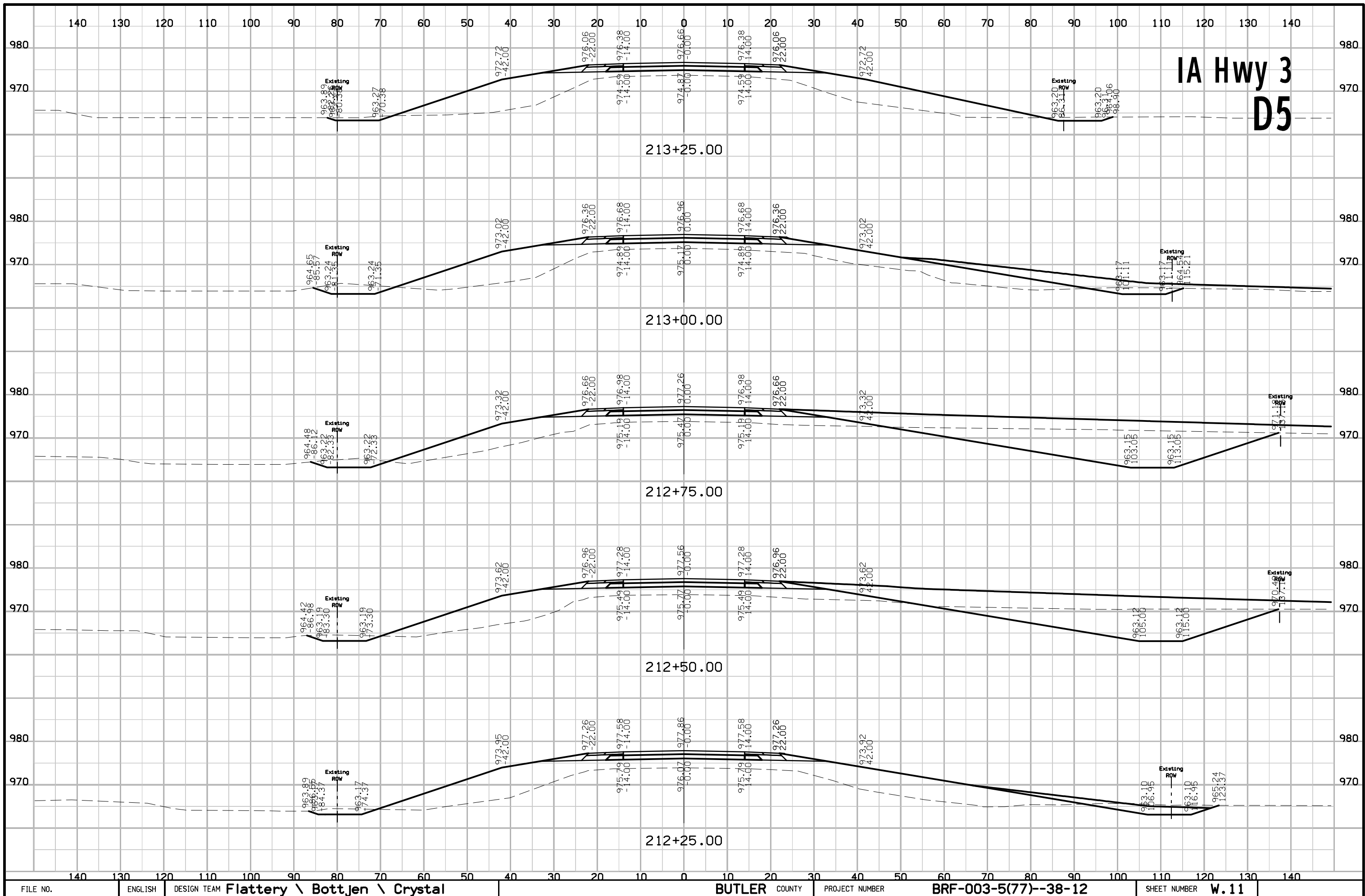


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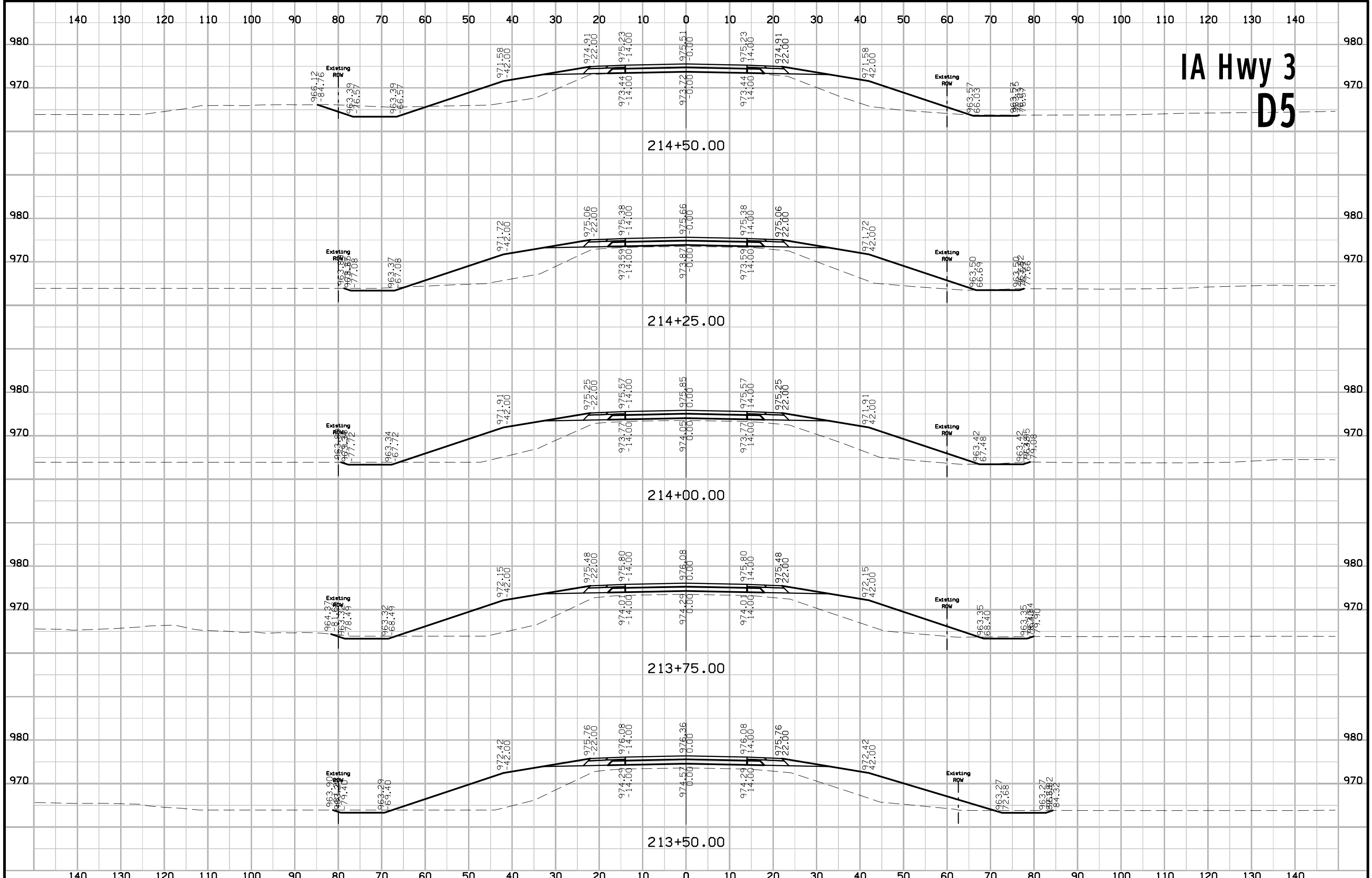


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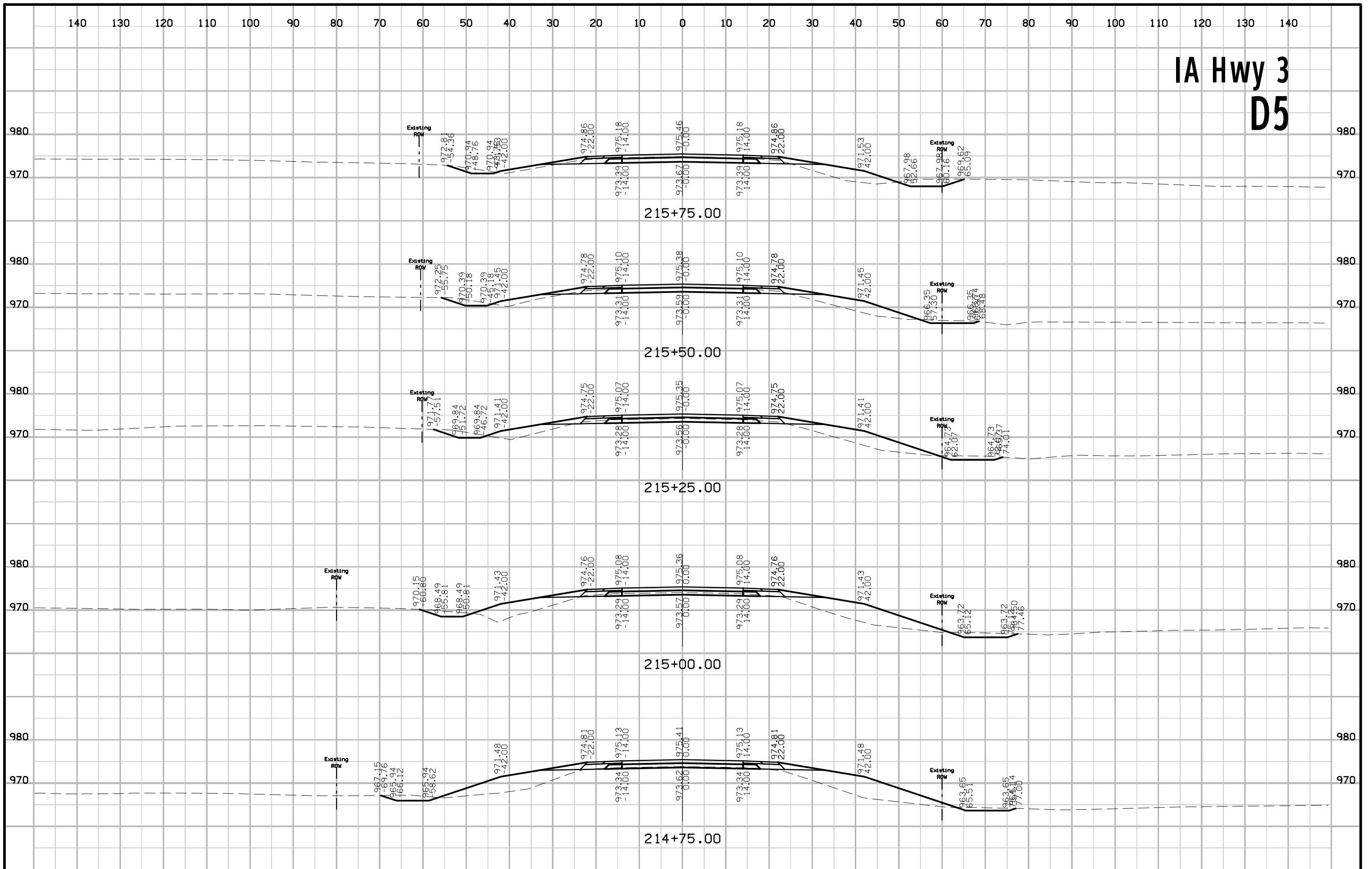




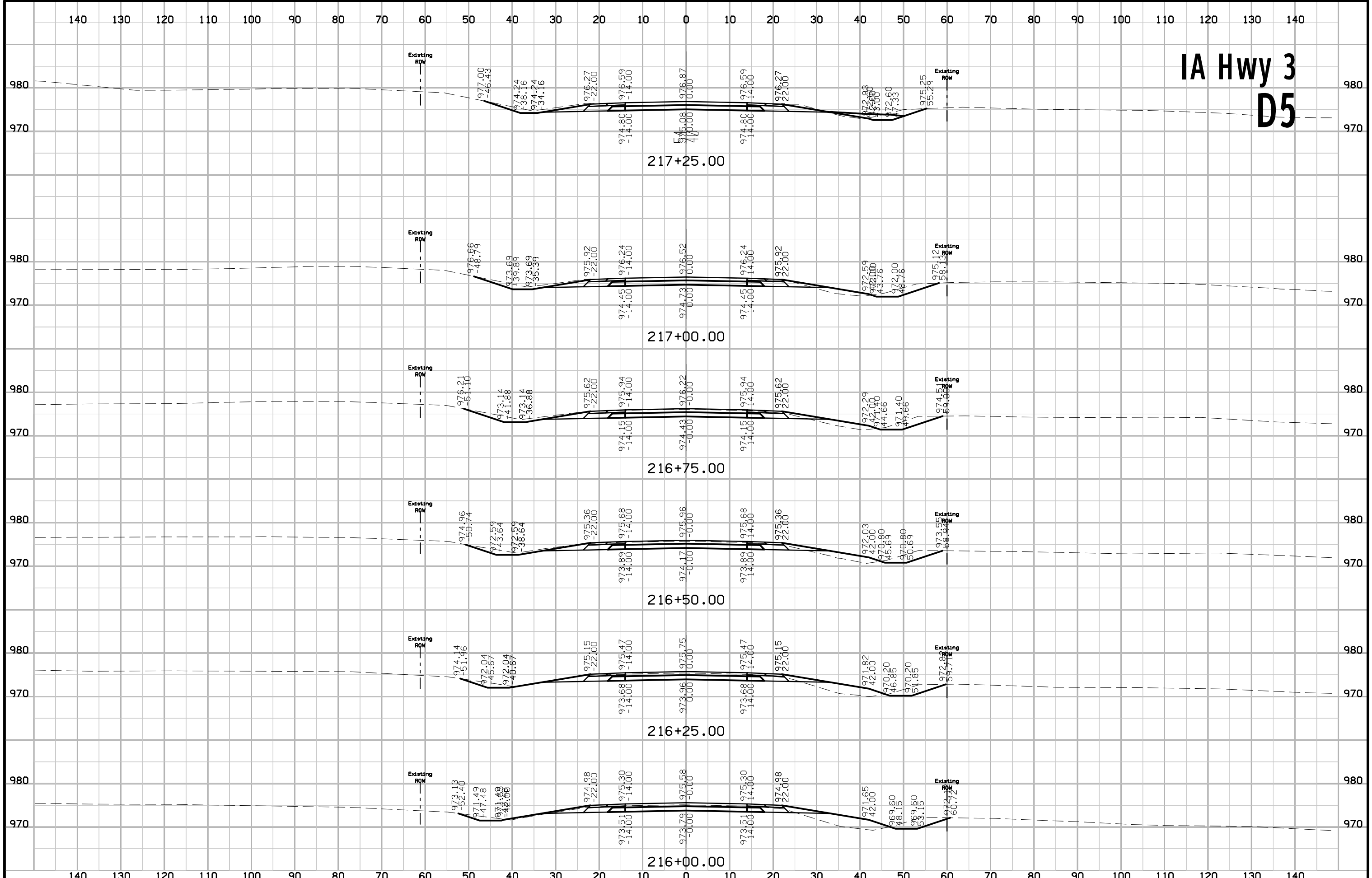
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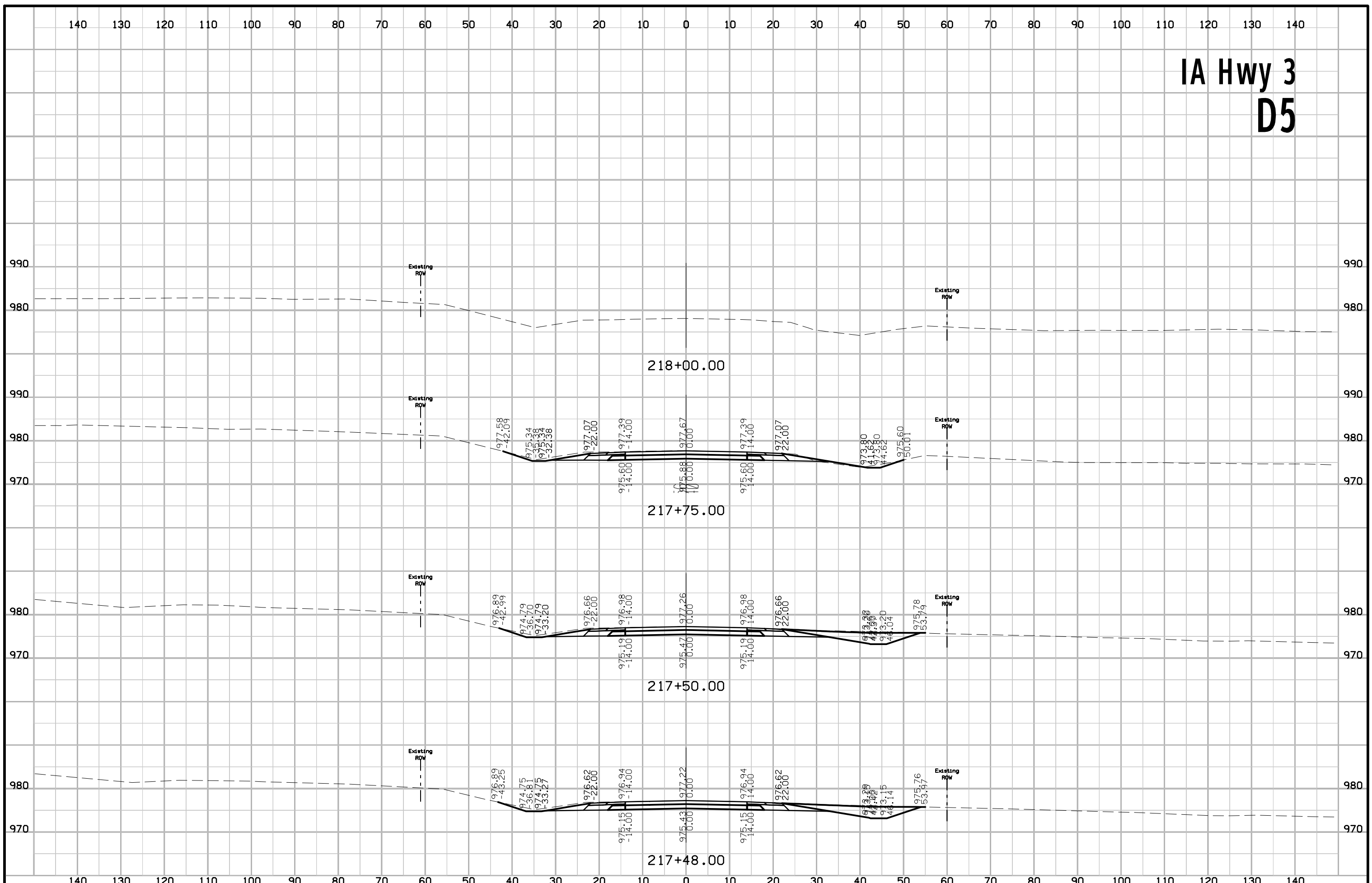
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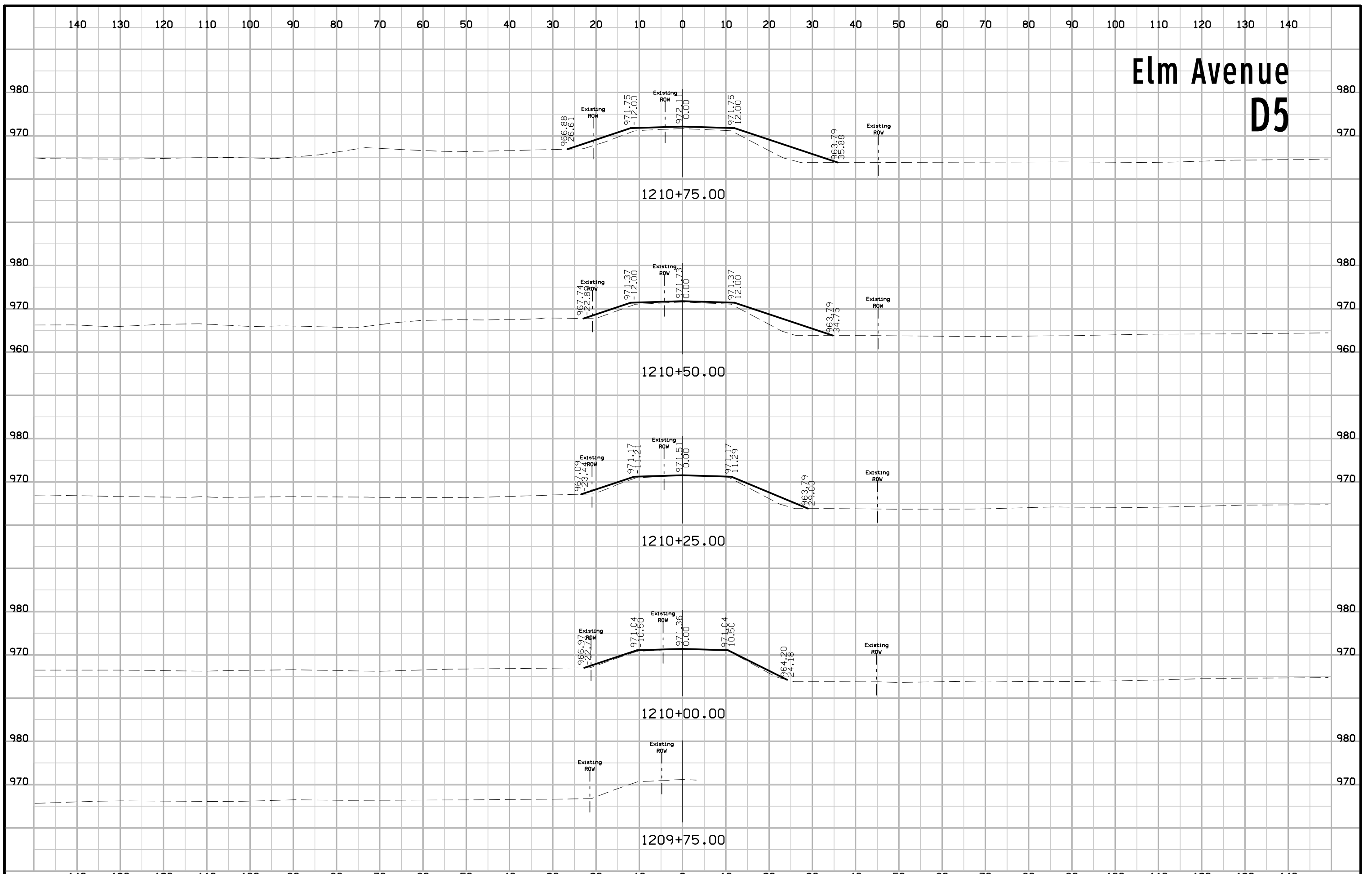
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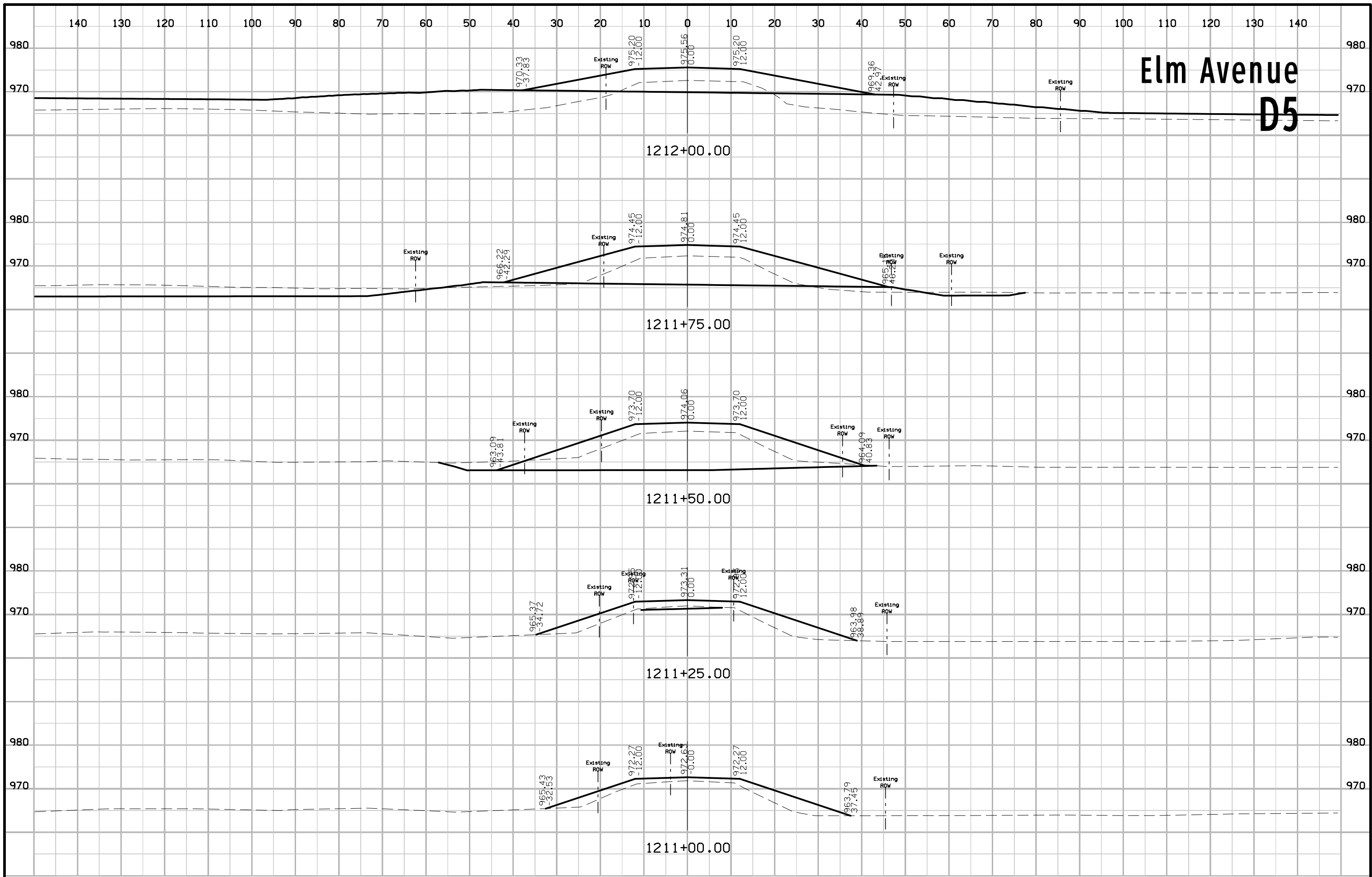


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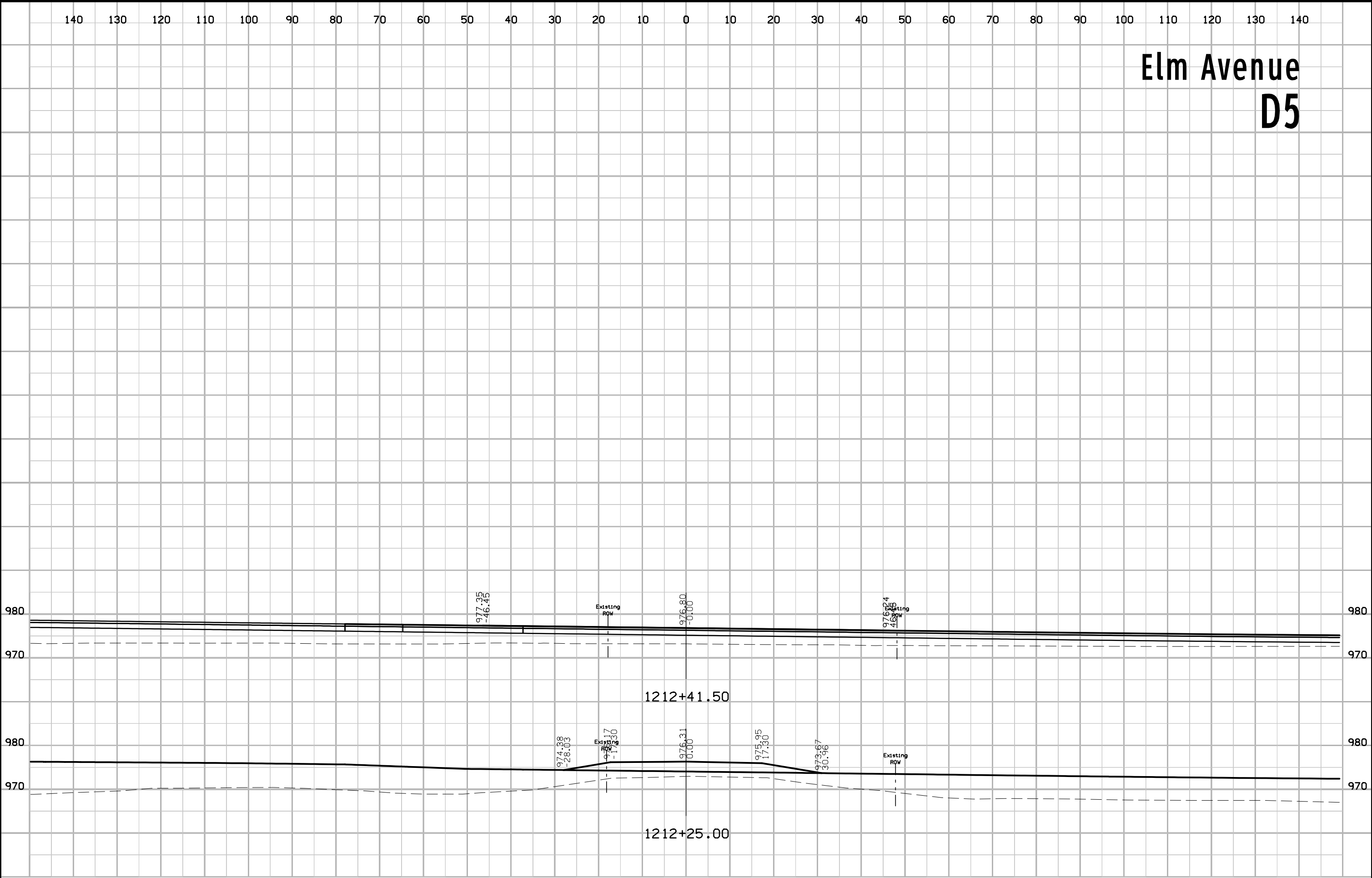


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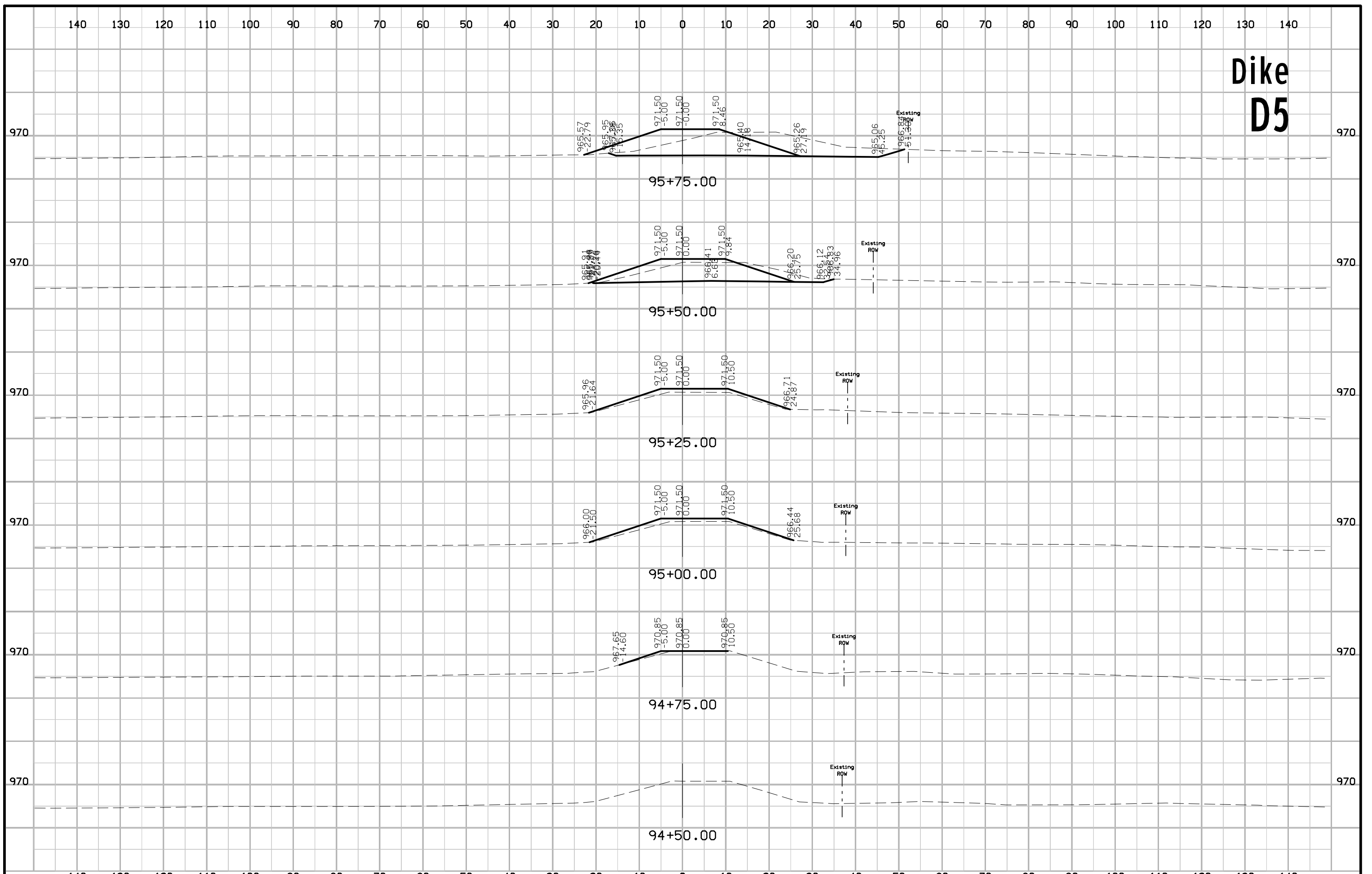




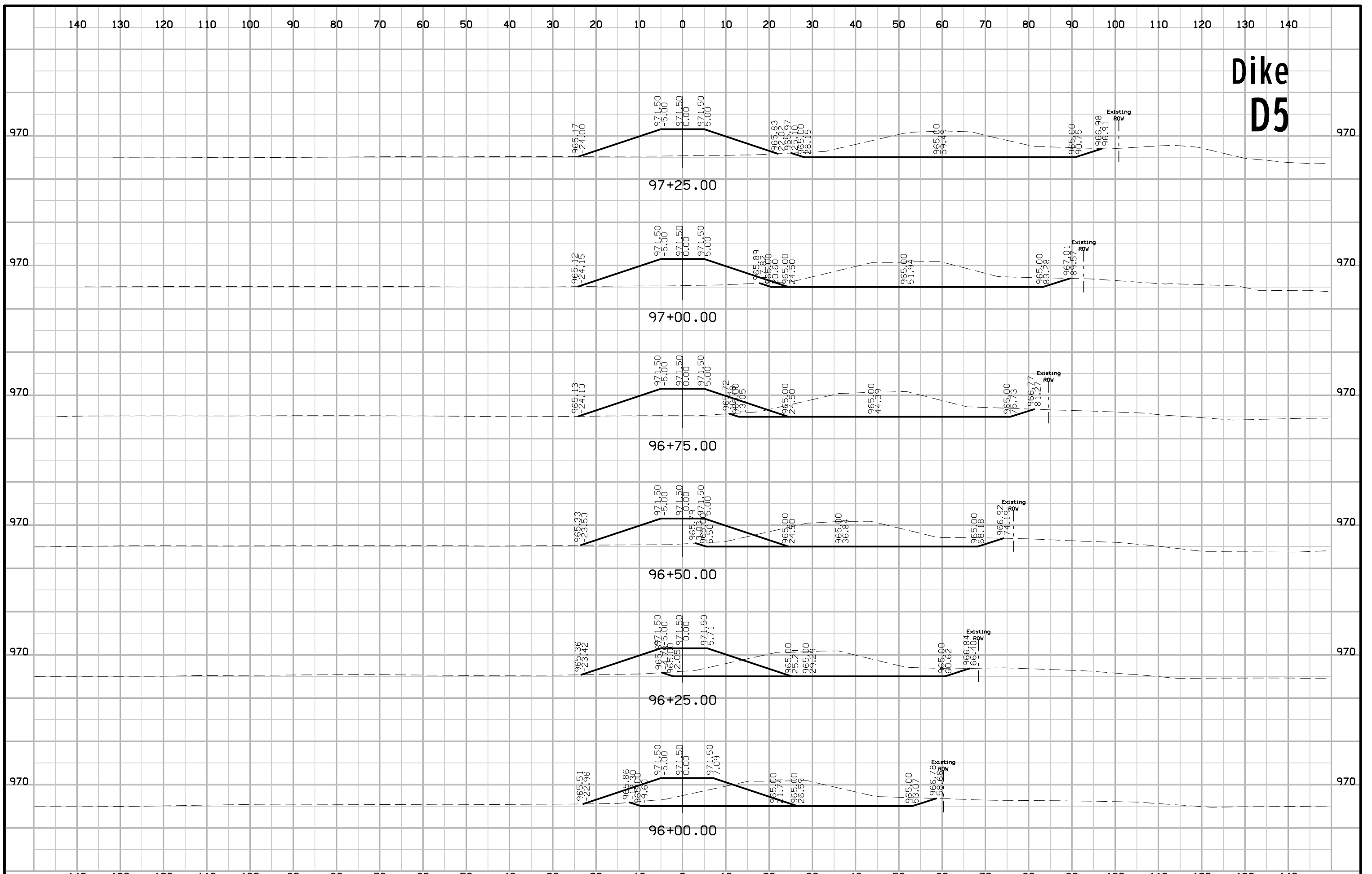
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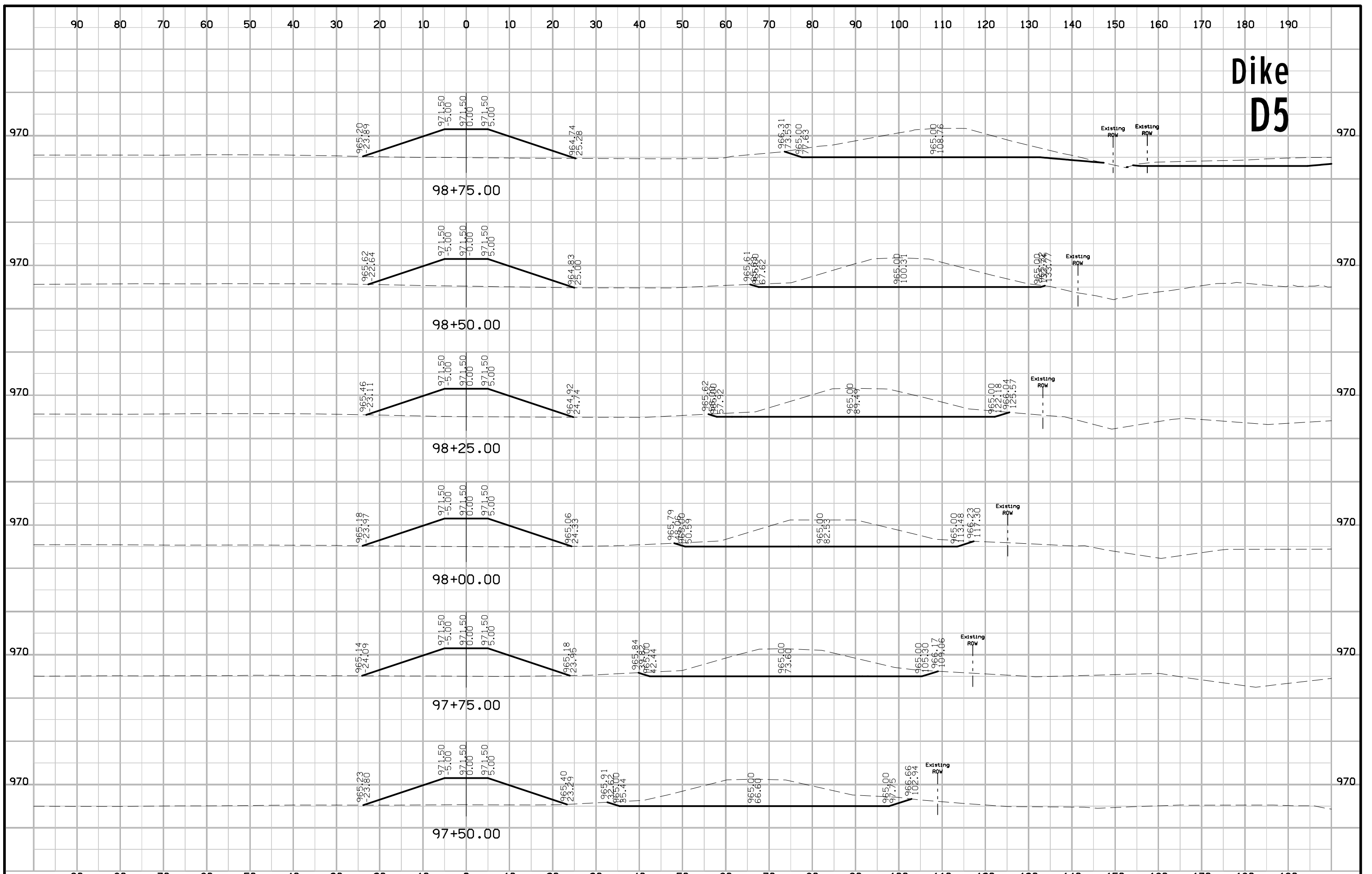
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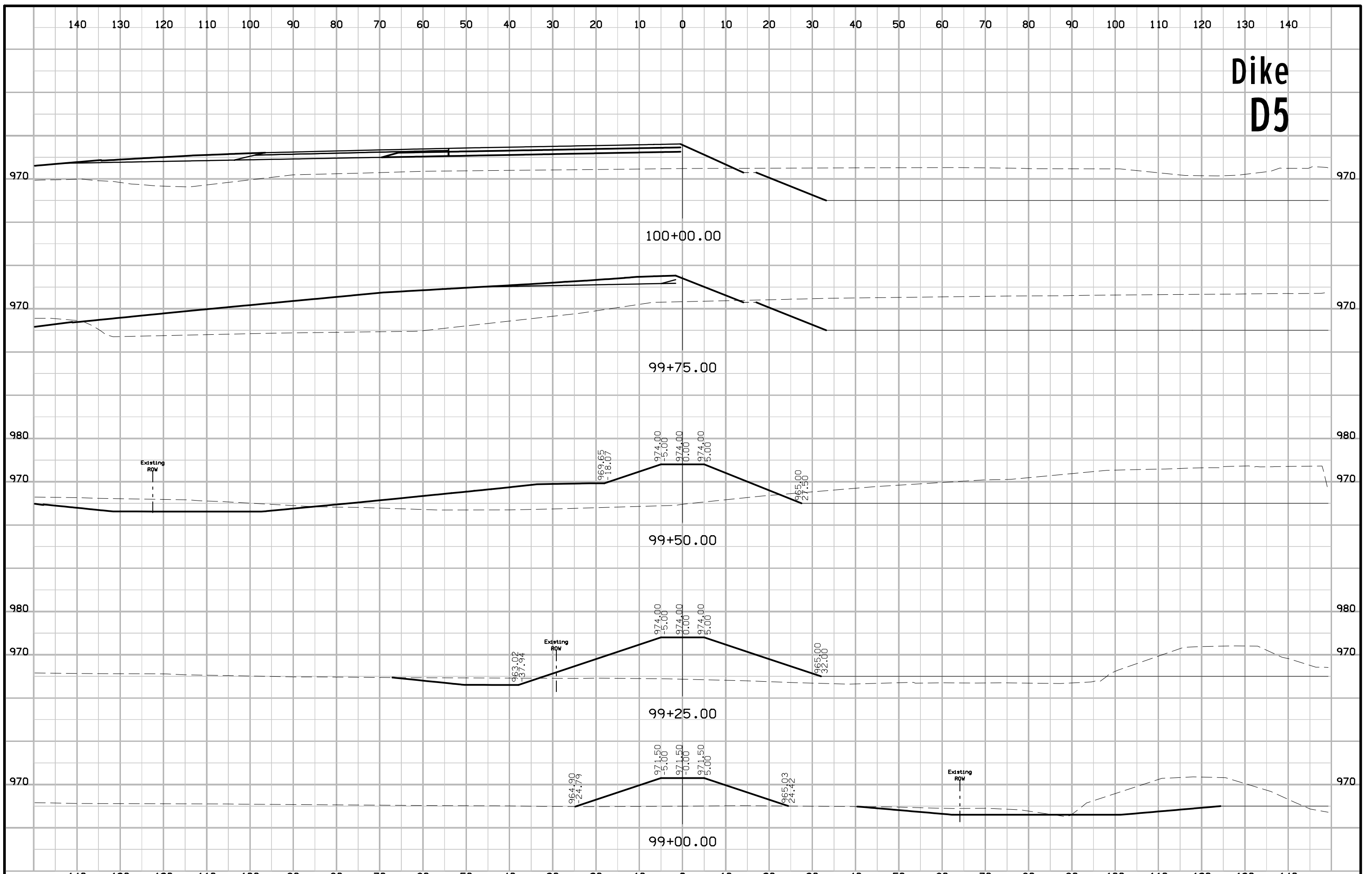
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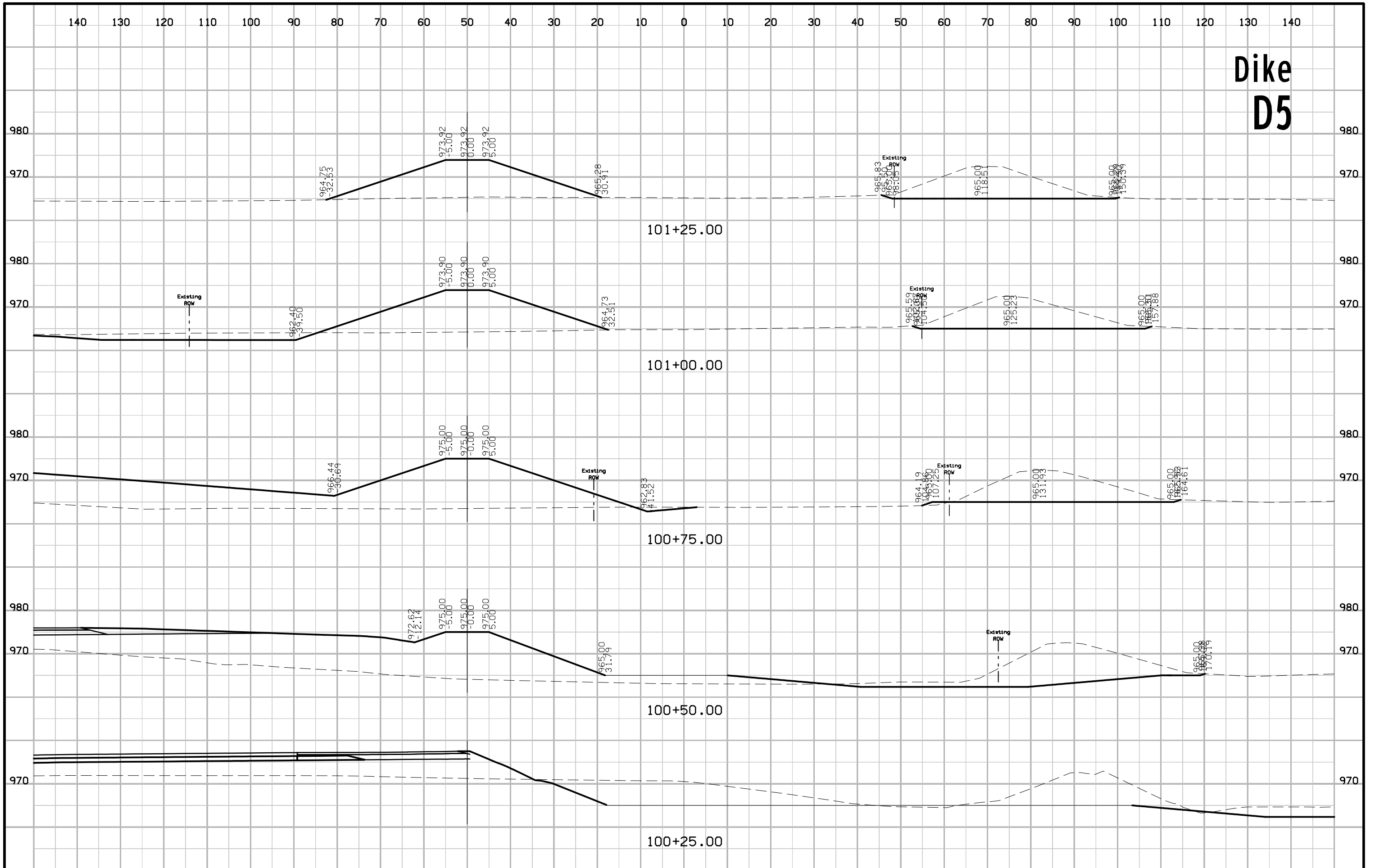
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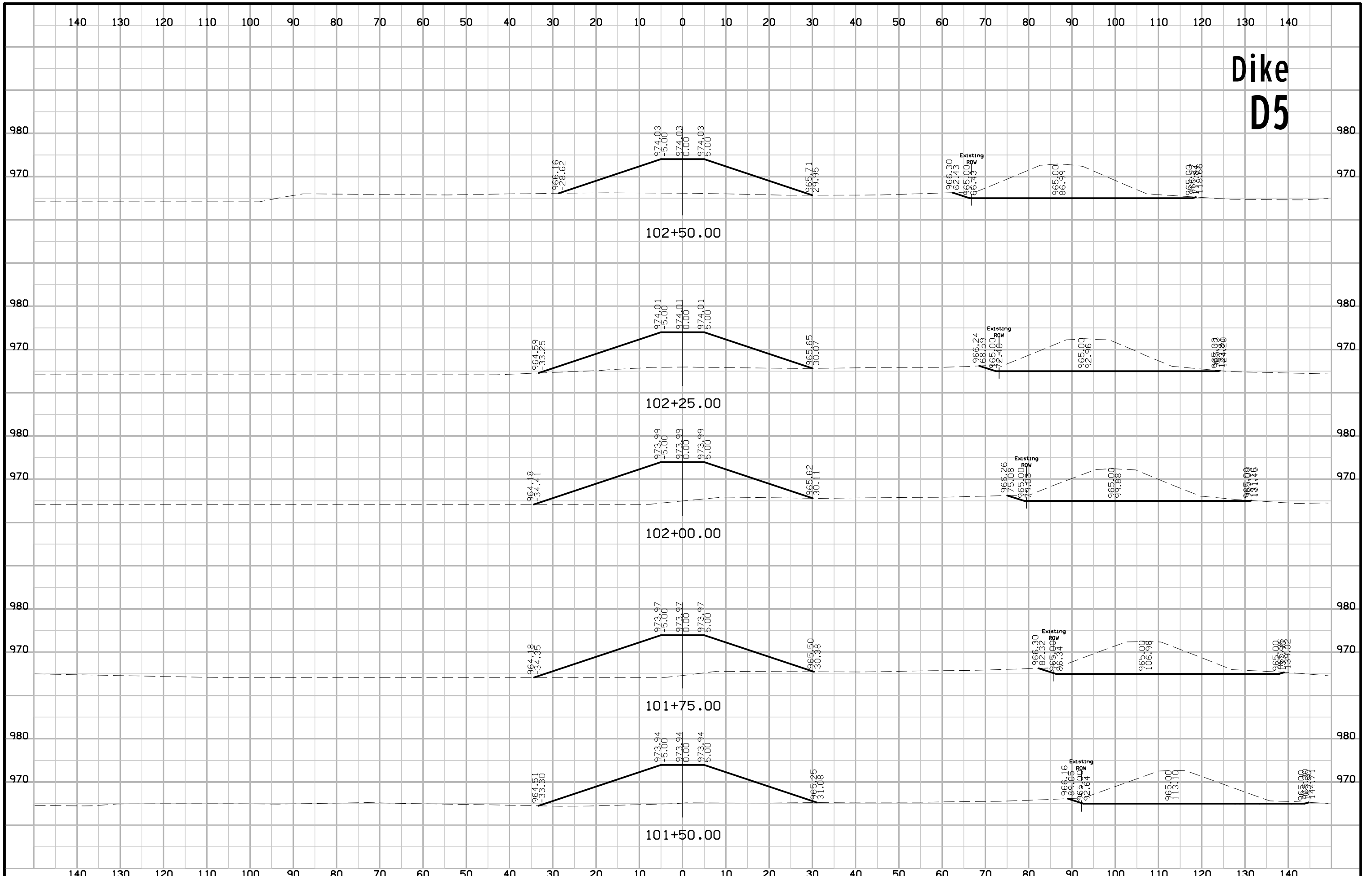
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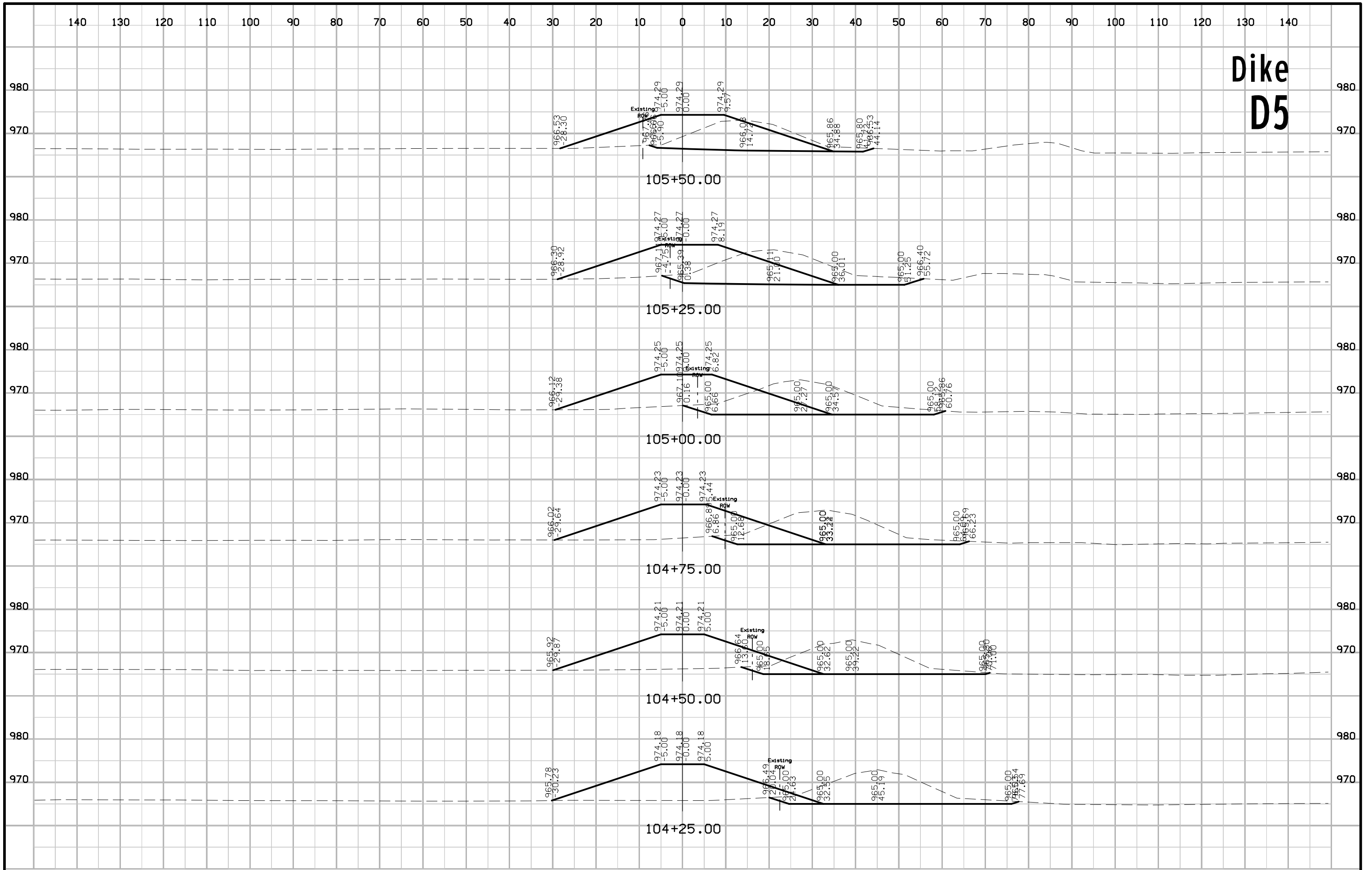
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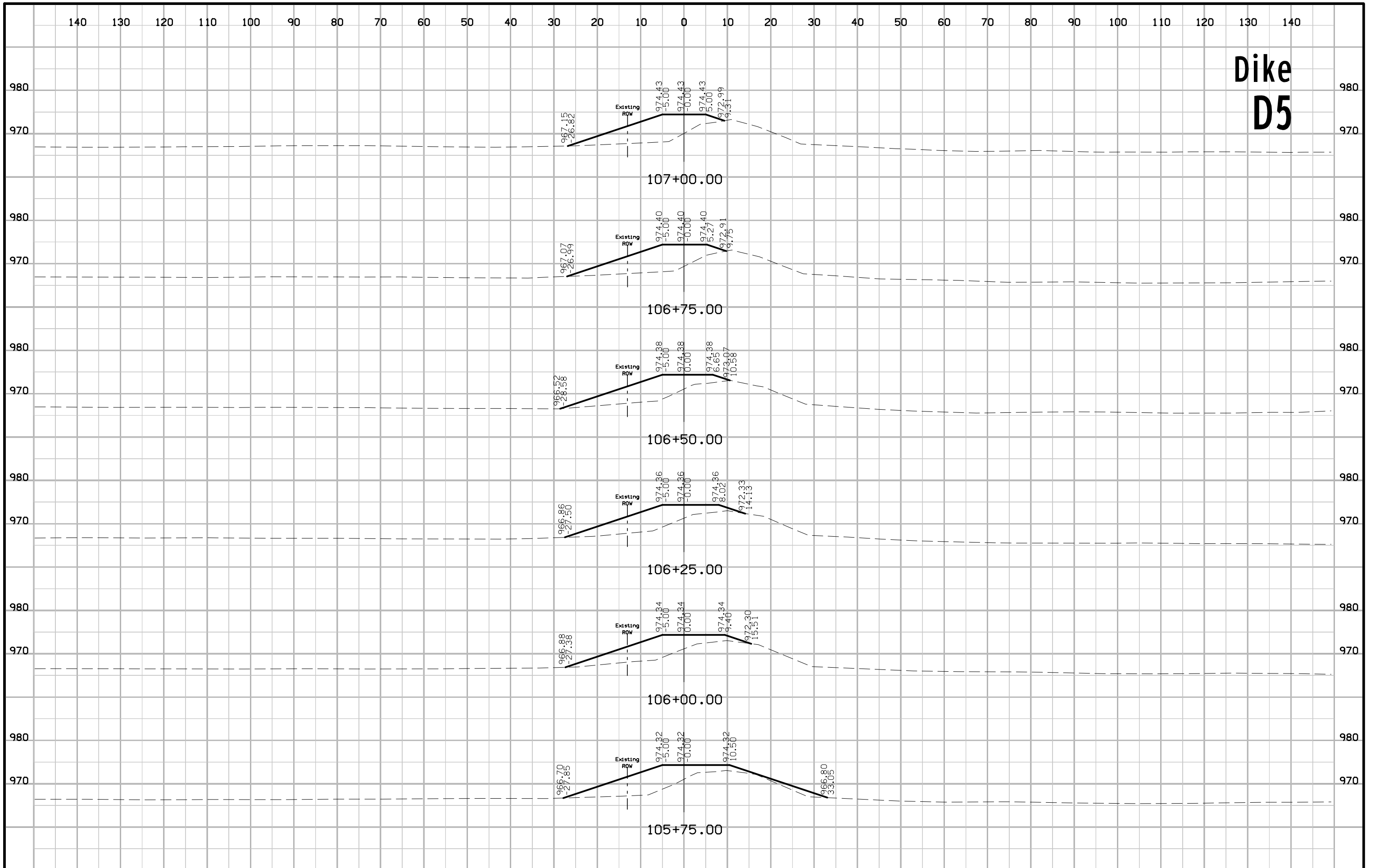
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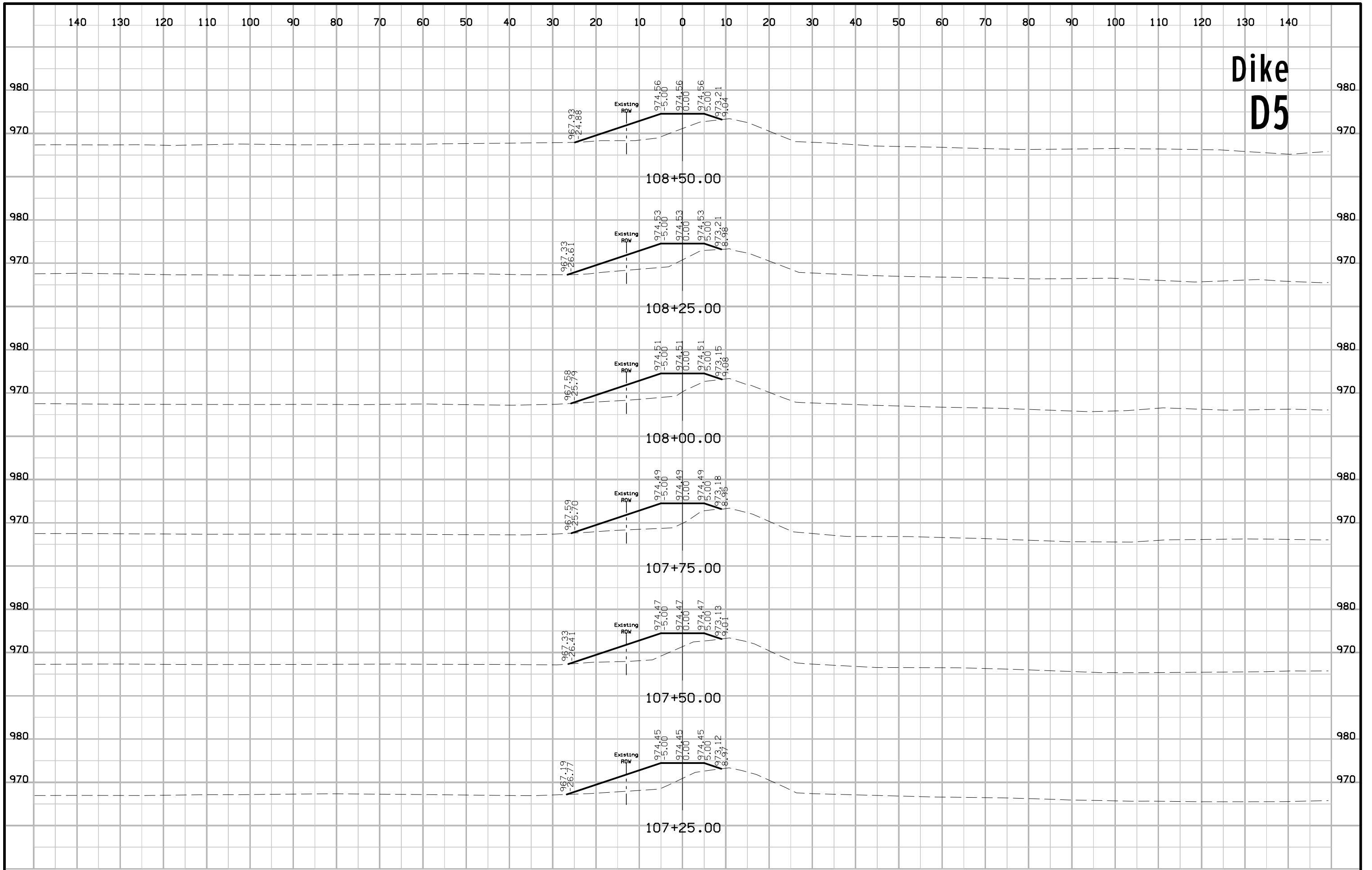
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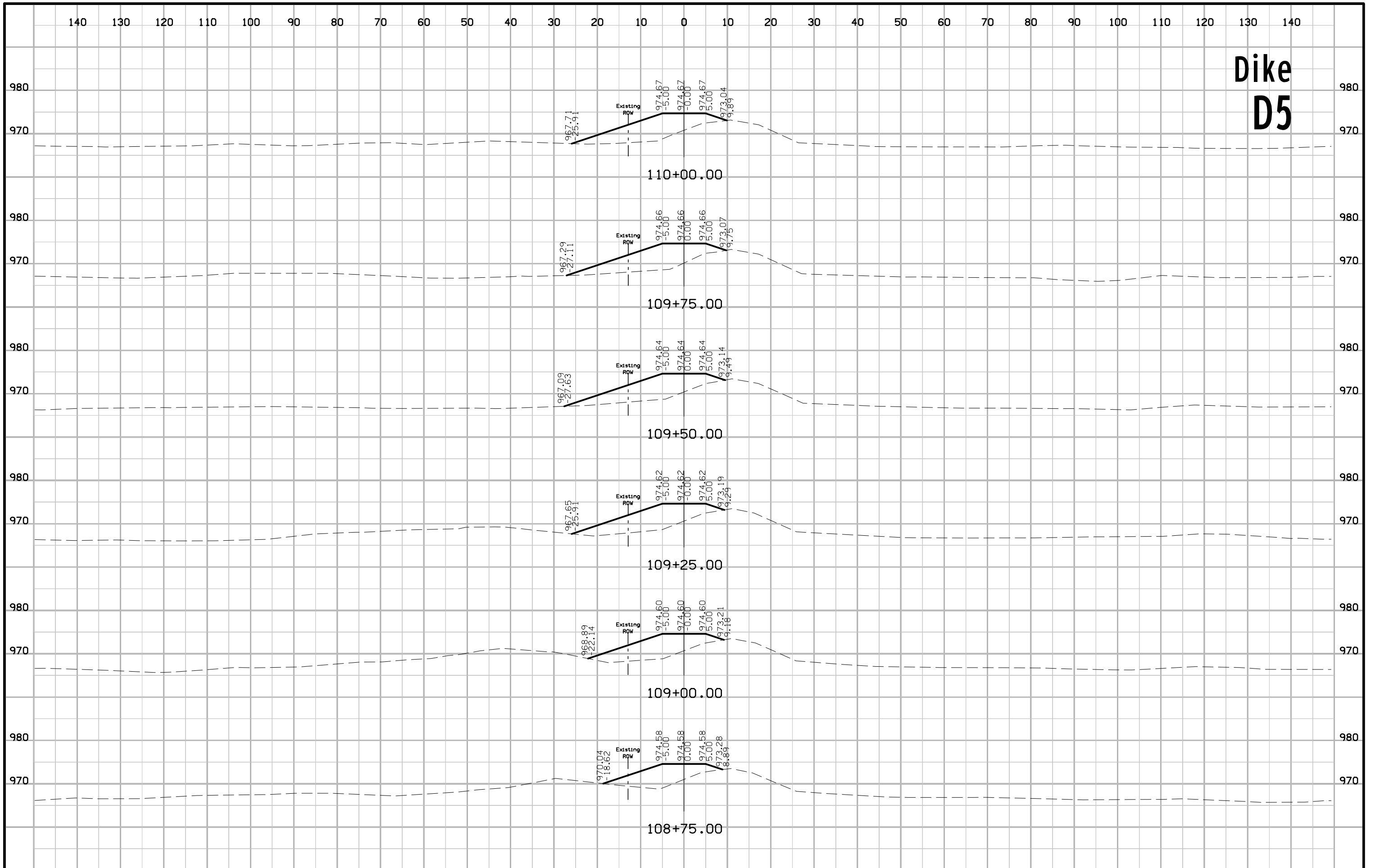
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Dike D5

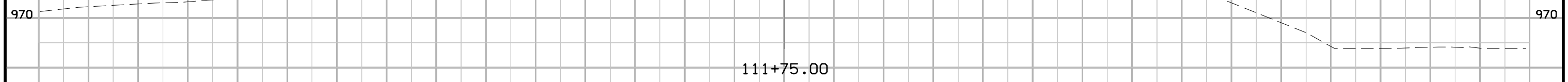


Dike D5



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Dike D5



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