

LETTING DATE
 03-17-2020
PIPE CULVERTS
NHSN-018-2(124)--2R-21

CLAY CO.



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
CLAY COUNTY
PIPE CULVERTS

0.3 mi E of E Jct US 71 in Spencer

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
44

PROJECT IDENTIFICATION NUMBER

19-21-018-010

PROJECT NUMBER

NHSN-018-2(124)--2R-21

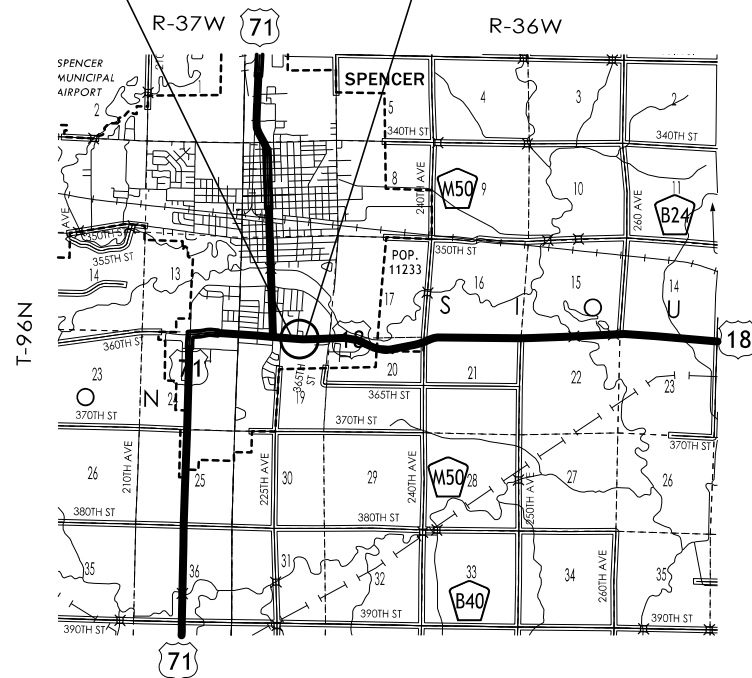
R.O.W. PROJECT NUMBER

NHSN-018-2(125)--2R-21

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.1	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1	Typical Cross Sections and Details
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C.1	Estimated Project Quantities
C.1	Estimate Reference Information
C.2	Standard Road Plans
C.2	General Notes
C.3	Tabulations (beg. with tab. of incidentals if needed)
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D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	US 18
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* J.2 - 3	Staging and Traffic Control Sheets
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* RR.1 - 3	Erosion Control Legend and Symbol Information Sheet
T Sheets	Earthwork Quantity Sheets
* T.1A - 1B	Earthwork Legend Sheets
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V Sheets	Bridge and Culvert Situation Plans
* V.1 - 2	Bridge and Culvert Situation Plans
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W.1 - 14	Mainline Cross Sections
X Sheets	Entrance Cross Sections
X.1	Entrance Cross Sections
	* Color Plan Sheets

Begin Project Sta. 22+50.00 End Project Sta. 35+80.00



DESIGN DATA RURAL

2017	AADT	5300	V.P.D.
20--	AADT	--	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	6	%
	Total		
	Design ESALs	--	

LOCATION MAP SCALE



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 Revision PLAN - Date: 11-06-19

FILE NO. 31675

ENGLISH

DESIGN TEAM J1a \ Miller \ Schoenrock

CLAY COUNTY

PROJECT NUMBER

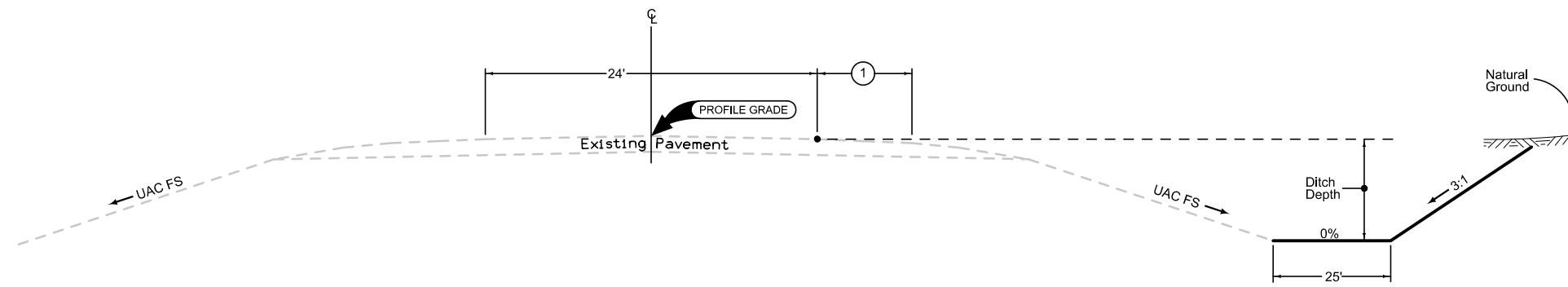
NHSN-018-2(124)--2R-21

SHEET NUMBER

A.1

1:44:08 PM 11/6/2019 koriley

pw:\ntPw\nt1.dot.int.lan:PWMain\Documents\Projects\2101801019\Design\CADD_Files\Sheet_Files\21018124_A01.dgn



2 LANE GRADING

Foreslope/Ditching

2_G 10-21-14	
STATION TO STATION	
22+50.00	35+80.00

① Existing Shoulder


US 18

SHRINKAGE DATA		
Material	%	Remarks
ENTIRE PROJECT	30%	
TOPSOIL	40%	
BOULDER ESTIMATE		3 CU. YDS.

103-7
08-01-08

EMBANKMENT WITH MOISTURE CONTROL
Moisture Control is required for all Class 10 fill placed in all locations and depths. Stability berms placed outside the normal foreslope template and topsoil will not require Moisture Control.

103-6
10-17-17

GEOTECHNICAL 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: <u>Mark A. Dell</u> Date: <u>10/10/19</u>
	Printed or Typed Name: <u>Mark A. Dell</u>
	My license renewal date is December 31, 2019
Pages or sheets covered by this seal: <u>CS.1</u>	

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves the replacement of four 48" CMP culverts with a twin 12' x 4' RCB culvert and channel reshaping along the south side of US 18 in Spencer.

100-0A
10-28-97

**ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2101-0850002	CLEARING AND GRUBBING	UNIT	61	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	364	
3	2102-2710090	EXCAVATION, CLASS 10, WASTE	CY	4861	
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	3	
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	2379	
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	280	
7	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE	TON	133.4	
8	2507-3250005	ENGINEERING FABRIC	SY	196.8	
9	2507-6800061	REVTMENT, CLASS E	TON	121	
10	2528-8445110	TRAFFIC CONTROL	LS	1	
11	2528-8445113	FLAGGERS	EACH	See Proposal	

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2101-0850002	CLEARING AND GRUBBING Refer to Tab. 110-17.
-	-	-
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW Refer to T Sheets.
-	-	-
3	2102-2710090	EXCAVATION, CLASS 10, WASTE Refer to T Sheets. Bid quantity includes an additional 75.6 CY of material for channel protection shown in the situation plan on the Culvert Sheets.
-	-	-
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS A. Refer to Tab. 103-7 on Sheet CS.1. B. Dispose of excess material according to Article 1106.07 of the current specifications.
-	-	-
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD Refer to Tab. 103-10 and the T Sheets.
-	-	-
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL Refer to Tab. 103-6 on Sheet CS.1. Cubic yards shown on the contract documents as determined by the template fill volume. Shrinkage will not be included in the moisture control quantity.
-	-	-
7	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE Refer to Tab. 102-3.
-	-	-
8	2507-3250005	ENGINEERING FABRIC Refer to the situation plan on the Culvert Sheets.
-	-	-
9	2507-6800061	REVTMENT, CLASS E Refer to the situation plan on the Culvert Sheets
-	-	-
10	2528-8445110	TRAFFIC CONTROL Refer to Traffic Control Plan on Sheet J.1.
-	-	-
11	2528-8445113	FLAGGERS - -

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
EW-501	10-20-15	Rural Entrance
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-212	10-15-19	Spot Location Lane Closure with Flaggers

262-6
10-18-05

UTILITIES (NOT A POINT 25 PROJECT)

This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

SEE RC SHEETS FOR ADDITIONAL BID ITEMS AND QUANTITIES.

ACCESS POINTS AND SAFETY RAMPS

Refer to Cross-Sections

Length of Unclassified Pipe calculated is based on using Corrugated Metal Pipe.

- ① Refer to MI-210
- ② Refer to EW-501.
- ③ Refer to EW-501 or EW-502.

*Predetermined for access point not constructed with this project.

Location		Type	Length of Opening ①			Pipe Culvert ③			Aprons	Driveway Surface Area		Driveway Surfacing Material	Remarks				
Station	Side	A, B, C, Safety Ramp, or Predetermined*	Case	1½" Dropped Curb	3" Dropped Curb	W	① PR	② SR		H	Size			Pipe Length	Lt.	Rt.	HMA
			1 or 2	LF	LF	FT	FT	FT	FT	IN	LF	LF		LF	No.	SY	SY
29+15.00	RT	C				26.0											133.4

CLEARING AND GRUBBING

Location		Direction of Travel	Work and Material Type	Trees, Stumps, and Logs and Down Timber Material Diameters													All Other Materials		Estimated Quantities			Remarks
Station to Station or Ref. Loc. Sign to Ref. Loc. Sign or Description				3"-6"	>6"-9"	>9"-12"	>12"-15"	>15"-18"	>18"-24"	>24"-30"	>30"-36"	>36"-42"	>42"-48"	>48"-60"	>60"-72"	>72"	Length	Width	Units	Area	Herbicide Application	
																	FT	FT	Units	Acres	Each	
22+50.00 to 35+80.00		EB	Trees - Clearing and Grubbing	38														61.0				

TOPSOIL STRIPPING AND PLACEMENT

Location				Topsoil Stripping Thickness	Topsoil Placement Thickness	Remarks
Road Identification	Dir. of Traffic	Begin Station	End Station	IN	IN	
US 18	EB	22+50.00	35+80.00	12.0	8.0	

SURVEY SYMBOLS

- BNK Stream Bank
- > D Centerline Draw or Stream (Down)
- BL Topo Breakline
- EW Edge of Water
- CON Concrete or A/C Slab
- PIP Pipe Culvert
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- SIGN SI Sign
- x--- FW Wire Fence
- +--- PPA Power Pole Co. 1
- +--- GU Gutter In Front of Curb
- +--- CU Back of Curb
- FO--- FO1D Fiber Optic Co. 1 - Quality D
- TP TPD Telephone Pedestal
- T1--- TL1D Telephone Line Co.1 - Quality D
- ◇ TLNR Tree Line Right
- E1--- Electric Line
- G--- Gas Line

UTILITY LEGEND

- TP Centurylink
- T1--- Steve Parker
2103 E. University Ave
Des Moines, IA 50317
(515) 265-0968
- G--- Black Hills Energy
Brad Fleming
1102 E First St
Papollian, NE 68046
(402) 221-2714
- E1--- Spencer Municipal Utilities
Jason Remillard
520 2nd Ave E
Spencer, IA 51301
(712) 580-5861

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
- ▲ Section Corner
- Ground Line Intercept
- //// Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

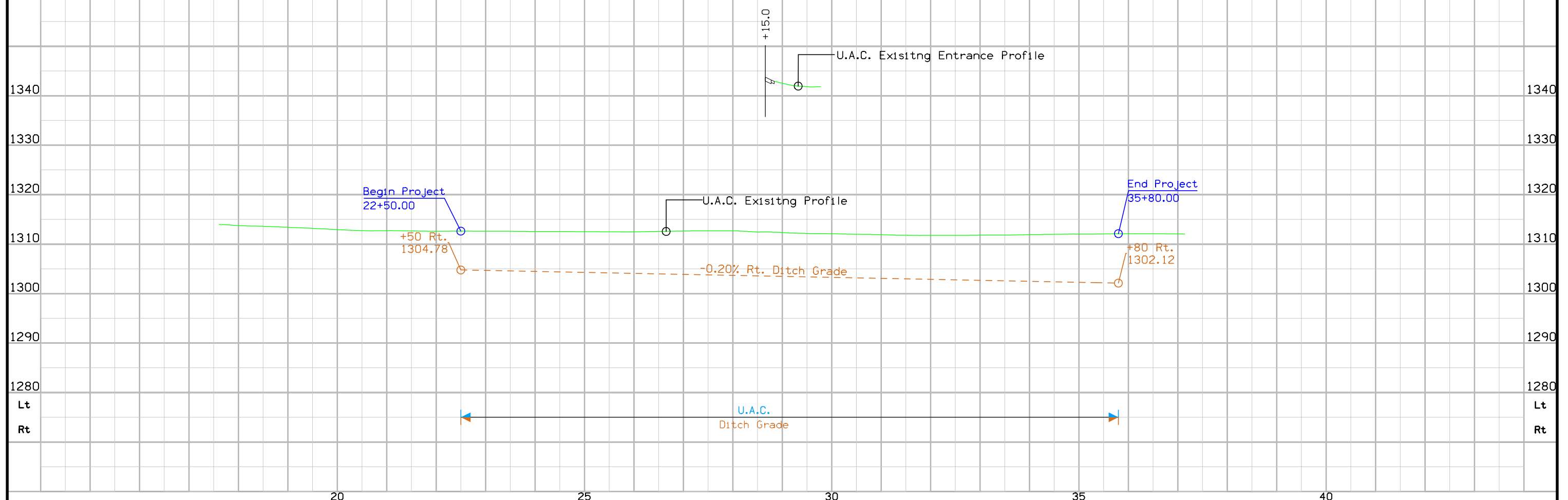
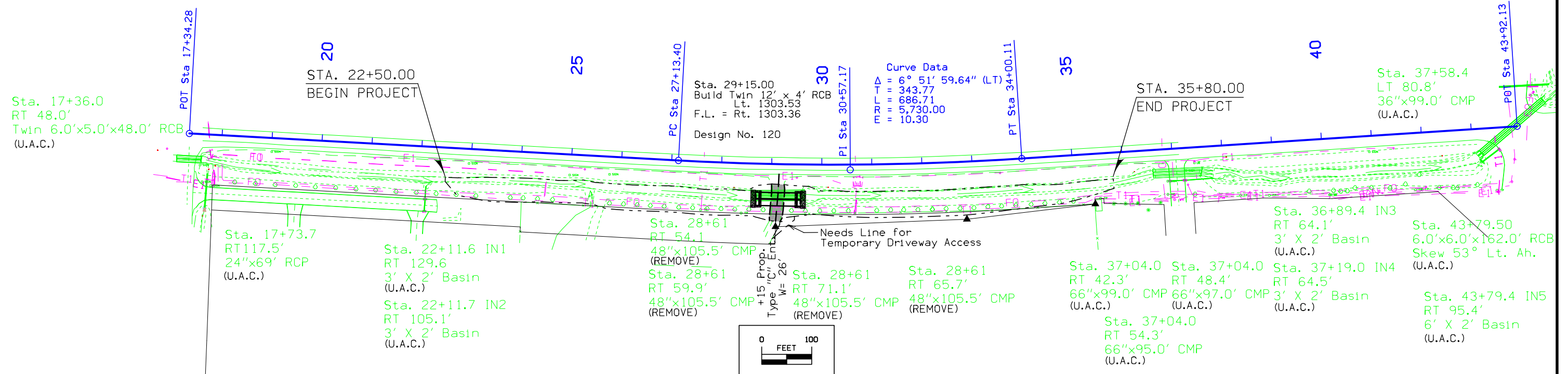
RIGHT-OF-WAY LEGEND

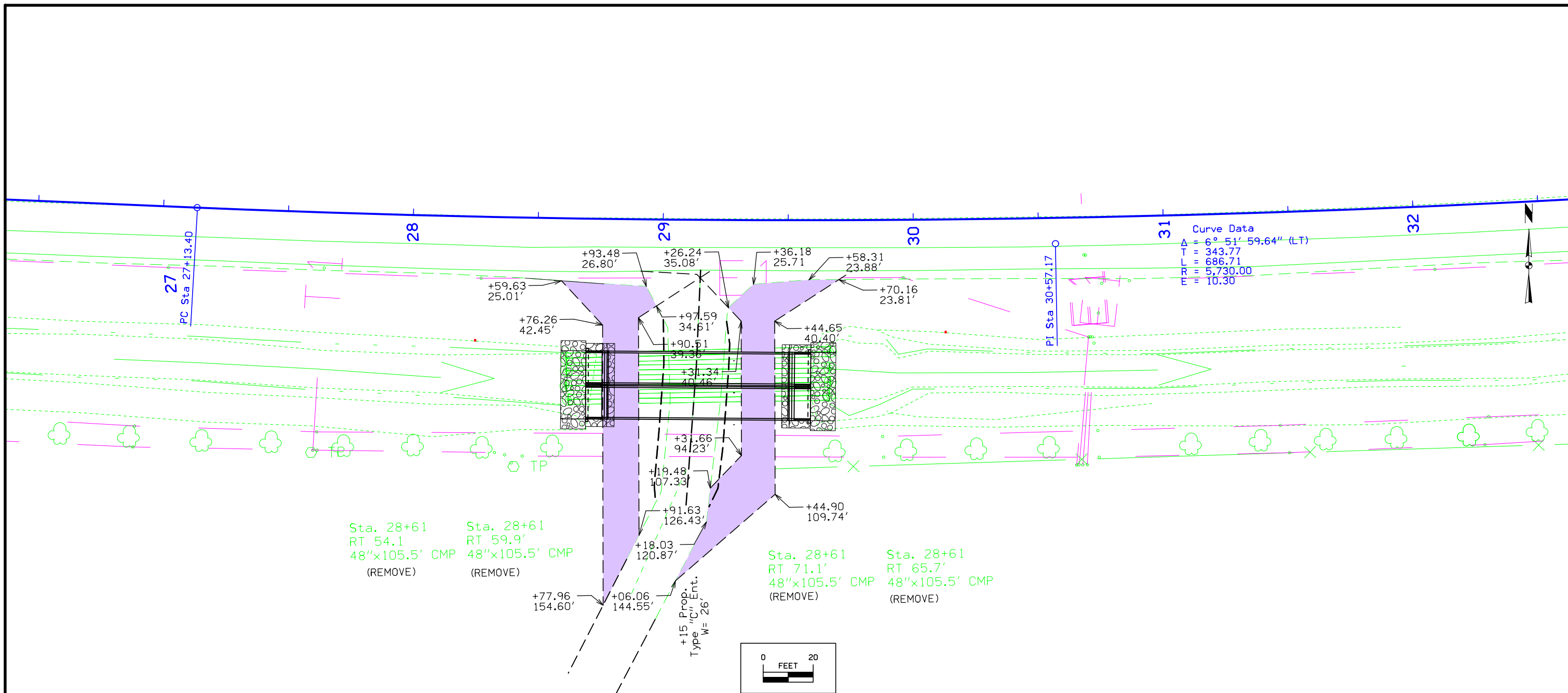
- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- ← Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

Sioux TWP.
T-96N R-36W
SEC. 18





Survey Information

Clay County
NHSN-018-2(124)--2R-21
RCB Culvert Replacement Single Box
PIN 19-21-018-010
Sap-514.3

Party Personnel

Jeffrey Duncan- Party Chief
Kris Bliven- Party Chief

Date(s) of Survey

Begin Date 01/07/2019
End Date 02/06/2019

General Information

Measurement units for this survey are US survey feet. This survey is for proposed culvert replacement along US Highway 18. Project datum and control information is provided by Design Survey Office. This project is a Full DTM without Photo control.

Vertical Control

The vertical datum is NAVD88. Vertical Control was established on 3 monuments designated as points CP1, 7040, and 7051. These monuments are expected to hold vertical reasonably well. Datum was transferred from Iowa RTN reference stations to the projects monuments by using concurrent 6-hour static measurements and post processing connecting vectors. Geoid 12 B was used in processing.

This survey observed 2 local area county Control Monuments with published NAVD88 heights to compare to local ground control:

Clay County Control mark GPS 7040 has a published Elev. of 1316.19
Survey Elev. = 1316.36

Clay County Control mark GPS 7051 has a published Elev. of 1353.13
Survey Elev. = 1353.36

Horizontal Control

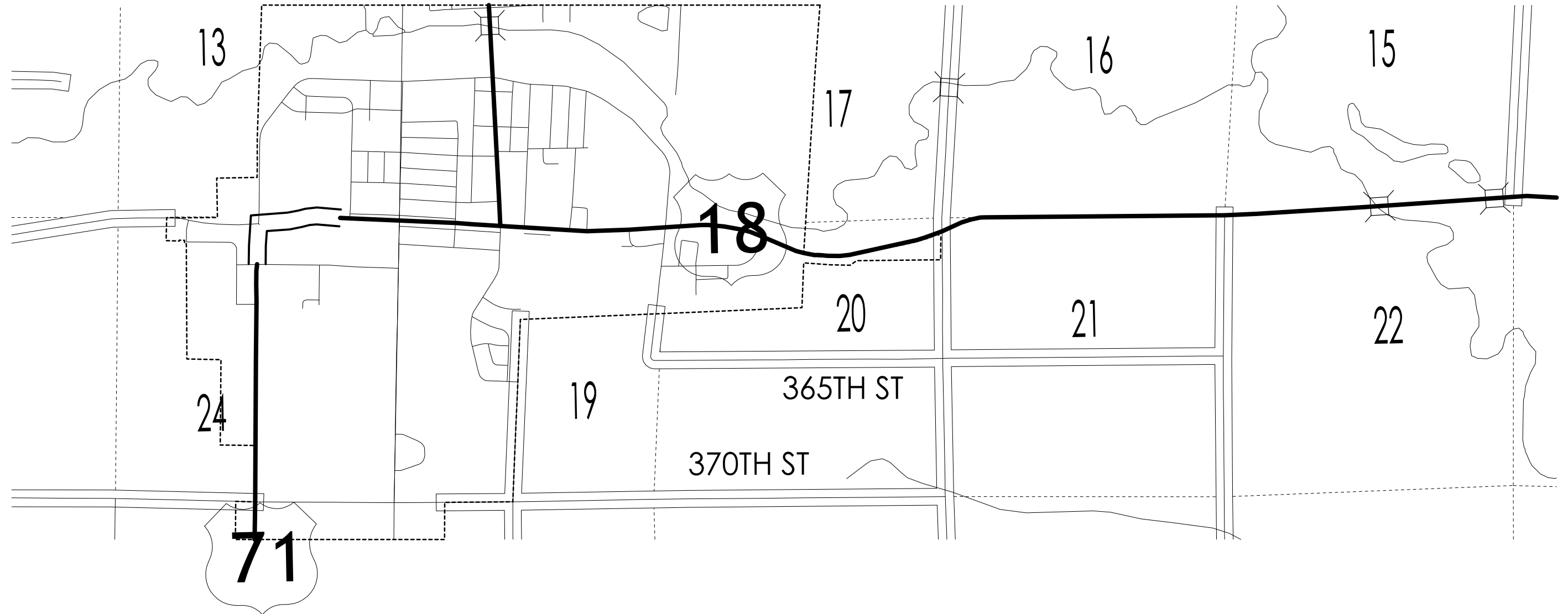
The project coordinate system for this survey is Iowa RCS Zone 1 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinate are relative to the National Reference Station network datum NAD83 (2011) for Epoch 2010.00. Coordinates were determined by using concurrent 6-hour static measurements and post processing connecting vectors. Additional control points were placed throughout the project using a GNSS Base-Rover setups.

Alignment Information

The horizontal alignment for this survey is provided by District 3 ROW.

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points
Primary control is for use with RTK base stations and for RTN validation.
Future surveys will use primary project control to establish temporary
control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 1

Coordinate listing from next sheet will be used with 1aRTN for monument
recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

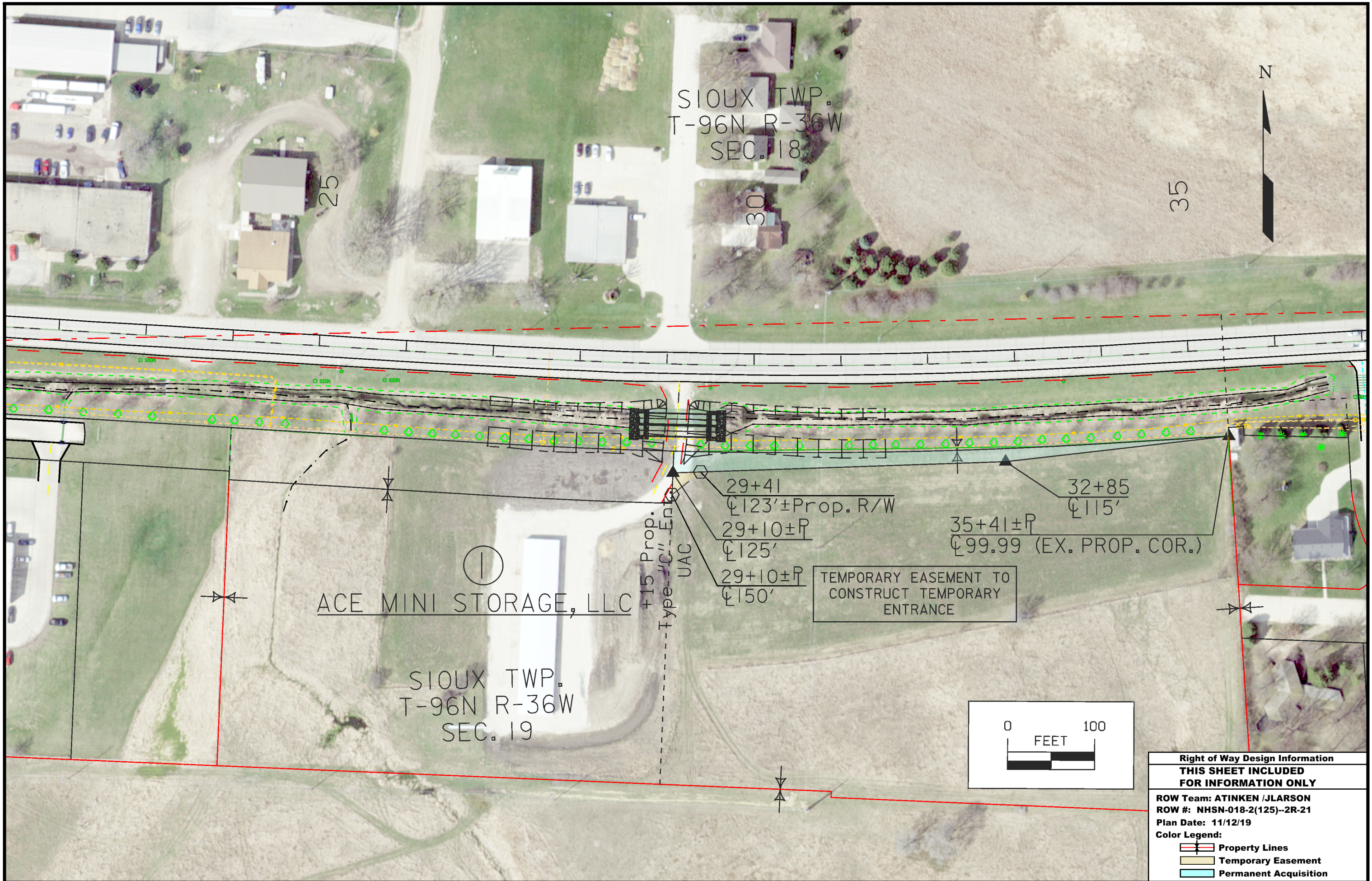
HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 1

Point Name	North Coordinate	East Coordinate	Elevation	Feature Code-Description
CP1	9570771.628	11523673.45	1341.56	CP FD TPOST 89.5FT NNW REBAR WITH YELLOW DOT CAP 45FT WSW REBAR WITH YELLOW DOT CAP 40FT N CL 18TH ST
7040	9572890.567	11527034.38	1316.36	CP CO GPS MON 75.5FT SW BUILDING CORNER 22.5FT SE SW COR PARKING LOT 12FT S EDGE OF PARKING LOT
7051	9573315.128	11542089.61	1353.36	CP CO GPS MON 100FT S CL US 18 94FT E CL 250TH AVE 52.5FT W WITNESS POST

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



SIoux TWP.
T-96N R-36W
SEC. 18

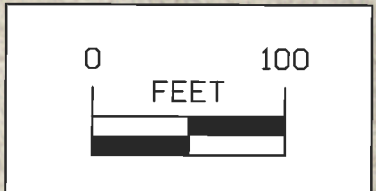
ACE MINI STORAGE, LLC

SIoux TWP.
T-96N R-36W
SEC. 19

29+41
±123'±Prop. R/W
29+10±R
±125'
29+10±P
±150'

32+85
±115'
35+41±P
±99.99 (EX. PROP. COR.)

TEMPORARY EASEMENT TO
CONSTRUCT TEMPORARY
ENTRANCE



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: NHSN-018-2(125)--2R-21	
Plan Date: 11/12/19	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

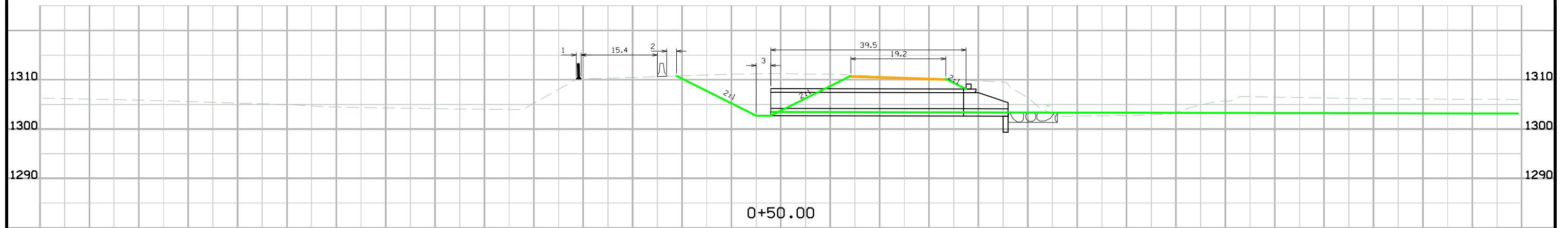
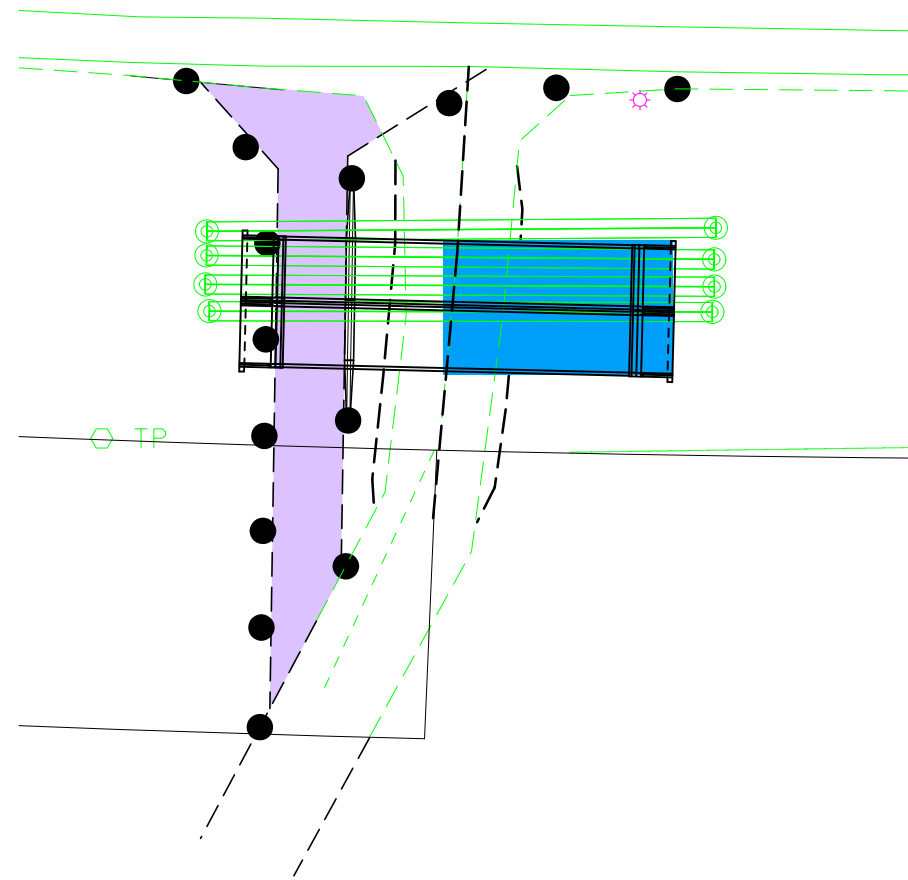
108-23A 08-01-08
TRAFFIC CONTROL PLAN
US 18 traffic shall be maintained at all times. Access to entrance at Sta. 29+15 shall be maintained at all times.

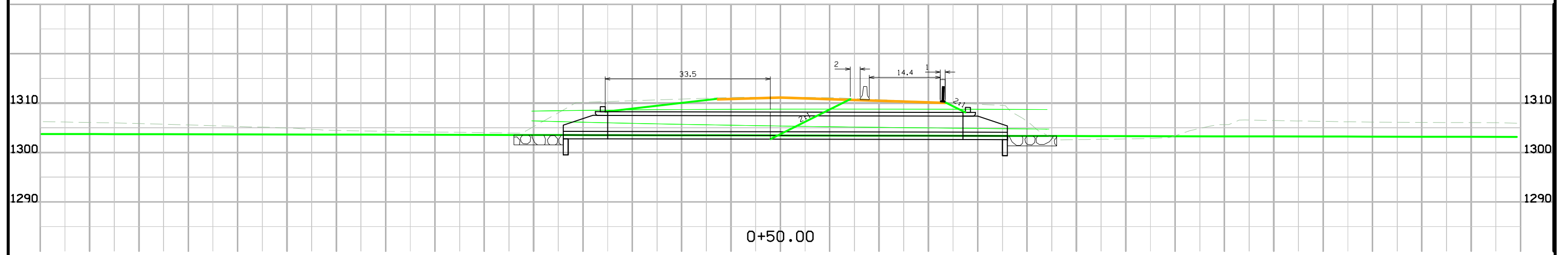
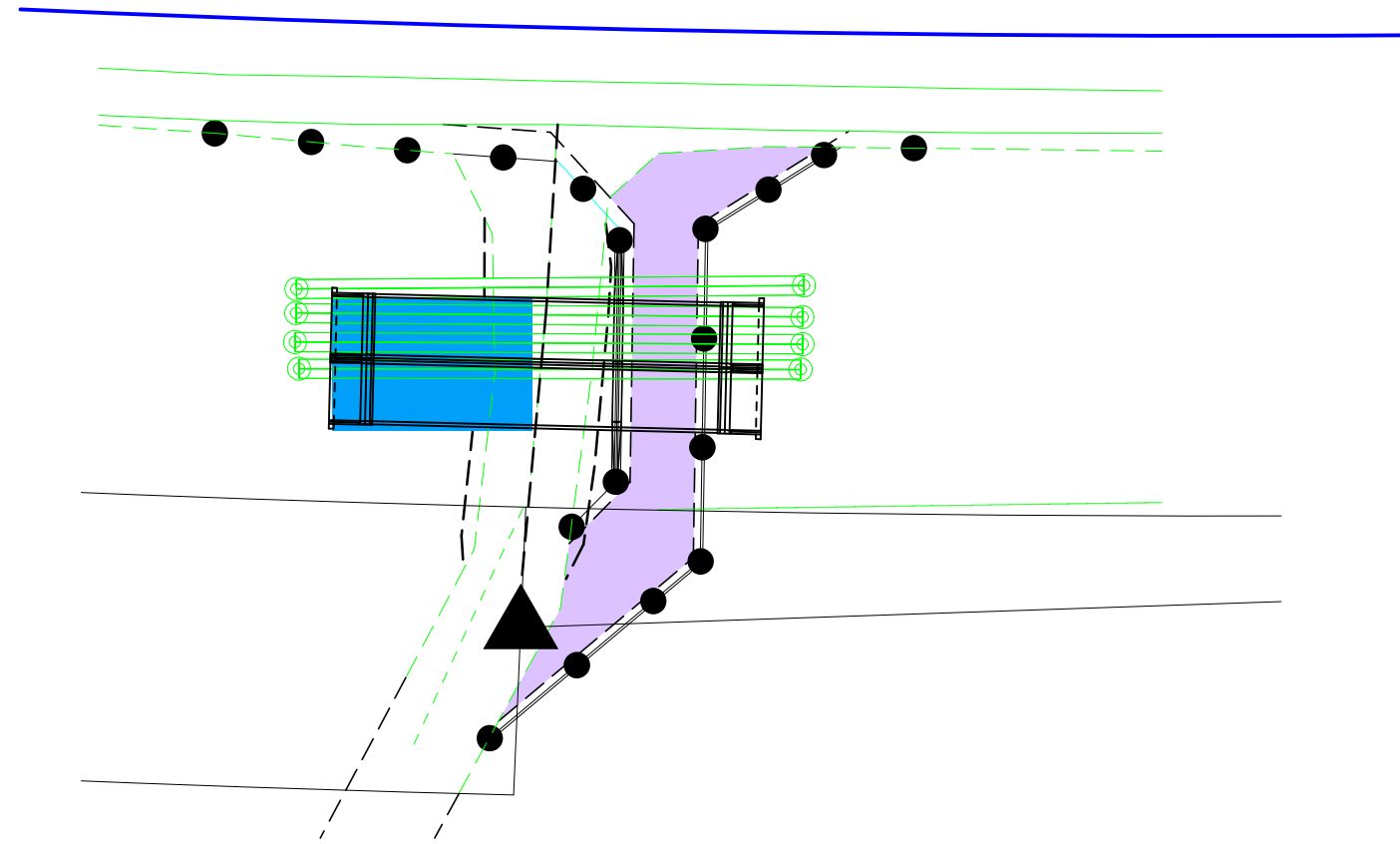
111-01 04-17-12	
COORDINATED OPERATIONS	
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.	
Project	Type of Work
None Provided	

108-26A 08-01-08
STAGING NOTES
<u>Stage Construction for Box Culverts</u> Stage 1A: Construction: Place granular material west of existing driveway Traffic: On existing driveway Stage 1B: Construction: * East half of the culverts * Placed granular material for use in stage 2 Traffic: On granular path placed in stage 1A Stage 2: Construction: West half of the culverts Traffic: On granular path placed in stage 1B Stage 3: Construction: Trim off excess gravel and regrade foreslope on the east side Traffic: On new entrance

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
			No travel restrictions expected.									

Stage 1



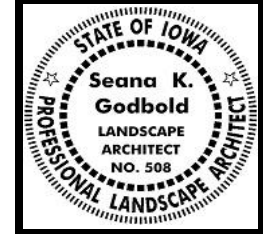


**ESTIMATED PROJECT QUANTITIES
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2601-2633100	MOWING	ACRE	16.8	
2	2601-2634100	MULCHING	ACRE	3.1	
3	2601-2636015	NATIVE GRASS SEEDING	ACRE	2.8	
4	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.3	
5	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	3.1	
6	2602-0000020	SILT FENCE	LF	975.0	
7	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	325.5	
8	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	1,300.5	
9	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	130.1	
10	2602-0000150	STABILIZED CONSTRUCTION ENTRANCE, EC-303	LF	100.0	
11	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	
12	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1	

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2601-2633100	MOWING Estimate is based on six mowings of all native grass seeded areas. In areas inaccessible to field equipment, cut with appropriate hand equipment and keep current with the mowing of adjacent areas. Mow all seeded area 3 times the first year if establishment. Mowings when the vegetation is between 12 and 18 inches tall. Mow vegetation to a height between six inches. Mow all seeded area 3 times the second year if establishment. Perform second year mowings when the vegetation is between 12 and 18 inches tall. Mow native vegetation to a height of 10 inches.
2	2601-2634100	MULCHING Perform mulching according to Article 2601.03, E, 2, of the Standard Specifications. Anchor mulch into the soil using mulch anchoring equipment with a minimum of two passes. Item is included for areas requiring reshaping and seedbed preparation. Use mulch that is Certified Noxious Weed Seed Free Mulch as certified by the Iowa Crop Improvement Association or adjacent states Crop Improvement Associations. Mulch Rate: 1 1/2 tons of dry cereal straw or native grass straw per acre.
3	2601-2636015	NATIVE GRASS SEEDING Seed all areas outside eight feet adjacent to outside shoulder along mainline, side roads, and infield areas at interchanges with "Native Grass Seeding". Supply all seed for "Native Grass Seeding". Apply all forb seed through the native grass drill wildflower or small seed box. Do not mix and apply Forb seed with the native grass seed. Apply cover crop through the cool season or through cover crop seed box. Do not mix and apply cover crop seed with the native grass seed. Remove seed remaining in the drill at the end of each day. At the completion of all seeding, remove remaining seed from the drill by vacuum or other means. Hand broadcast remaining seed on the project. The Engineer will review the limits with the Contractor prior to seeding.
4	2601-2636043	SEEDING AND FERTILIZING (RURAL) Seed and fertilize all areas 8 foot adjacent to the shoulder mainline, medians, and side according to Article 2601.03, C, 3, of the Standard Specifications. Use ground driven equipment.
5	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING Item is included for disturbed areas. Seed and fertilize all disturbed areas according to Article 2601.03, C, 1, of the Standard Specifications.
6	2602-0000020	SILT FENCE Refer to Tab. 100-17. The tabulation includes estimated locations for placement of "Silt Fence" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.

LANDSCAPE DESIGN	
	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed professional landscape architect under the laws of the state of Iowa.
	Signature: <i>Seana K. Godbold</i> Date: 10/14/2019
Printed or Typed Name: Seana K. Godbold My license renewal date is June 30, 2021	
Pages or sheets covered by this seal: RC1 - 5; RR1 - 3	

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
7	2602-000030	SILT FENCE FOR DITCH CHECKS Refer to Tab 100-18. The tabulation includes estimated locations for placement of "Silt Fence for Ditch Checks" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and replacements.
8	2602-000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence and silt fence for ditch check removal required for staging reasons, removal to allow for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
9	2602-000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the project.
10	2602-000150	STABILIZED CONSTRUCTION ENTRANCE, EC-303
11	2602-0010010	MOBILIZATIONS, EROSION CONTROL
12	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
EC-201	10-15-19	Silt Fence
EC-502	04-21-15	Seeding in Rural Areas
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)

111-25
10-18-11

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
RC Sheets		
100-1A	ESTIMATED PROJECT QUANTITIES (1 DIVISION PROJECT)	RC.1
100-4A	ESTIMATE REFERENCE INFORMATION	RC.1 - RC.2
100-17	TABULATION OF SILT FENCES	RC.3
100-18	SILT FENCES FOR DITCH CHECKS	RC.3
100-34	STORMWATER DRAINAGE BASIN AND STORAGE	RC.3
105-4	STANDARD ROAD PLANS	RC.2
110-12	POLLUTION PREVENTION PLAN	RC.4 - RC.5
111-25	INDEX OF TABULATIONS	RC.2

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HERBICIDE

For all herbicide applications, the following provisions shall apply.

- Follow all laws, rules and regulations related to the handling of pesticides, including but not limited to:
 - Follow all herbicide label directions, restrictions, and precautions.
 - The company responsible for the herbicide applicator must be licensed with Iowa Department of Agriculture and Land Stewardship (IDALS) as a commercial pesticide applicator company.
 - The person applying the herbicide must be certified through IDALS as a pesticide applicator in Category 6, Right-of-Way. For herbicide applications that require an aquatic certification, the applicator must also be certified as a pesticide applicator in Category 5, Aquatics.
 - Use herbicide and adjuvant products labeled for the application site:
 - For applications on the primary highway right-of-way, use only products labeled for use on highway rights-of-way or roadsides.
 - For applications to or over water, use only products labeled for corresponding use in aquatic sites, unless intermittent pockets of standing water, such as tire ruts, and the product is labeled for such use.
 - For applications to areas in the water conveyance portion of the ditch that do not contain water at the time of application, use only products labeled for non-irrigation ditch banks or aquatic sites.
 - Do not apply any herbicide to or over standing or flowing water unless required coverage is obtained under a National Pollutant Discharge and Elimination System (NPDES) Pesticide Discharge Permit through Iowa DNR. If standing or flowing water is encountered in areas when they need to be sprayed, notify Iowa DOT (Roadside Development) to determine if submittal of a Notice of Intent (NOI) is required.
- Schedule work according to weather conditions and take measures to avoid off-target damage, such as runoff, leaching, drift and volatilization.
 - Do not spray herbicide 24 hours prior to forecast precipitation that is expected to cause significant runoff conditions.
 - For areas with saturated soil, such as ditch bottoms, do not spray herbicide 24 hours prior to forecast precipitation, unless using products labeled for aquatic sites.
 - For conventional applications, avoid applications when wind speed exceeds 10 mph. For invert applications, avoid applications when wind speed exceeds 15 mph.
 - For conventional foliar applications, use a drift retardant and maintain drift control throughout the application period by adding more to the tank as it breaks down from agitation.
 - Avoid spraying volatile products when temperatures are forecast to exceed 85° F within 3 days.
 - Check the IDALS Sensitive Crops Directory and do not spray adjacent to a listed operation when wind is blowing towards it.
- Respond to allegations of any off-target damage attributed to handling and spraying of herbicide.
- Provide the following documents to the Engineer for approval not less than 2 weeks prior to the application.
 - A copy of the herbicide and adjuvant labels, including any applicable supplemental labels.
 - A copy of the herbicide and adjuvant Material Safety Data Sheets (MSDS.)
- Have copies of the herbicide and adjuvant labels and MSDSs on-hand and at locations of storage, transport, and application.
- Schedule work to maximize efficiency of the herbicide application in relation to weather conditions and plant growth stage. Follow any label recommendations given as "for best results."
 - For weed applications:
 - To determine if weeds are "actively growing," use as a guideline that there needs to have been at least 1 hour of temperature above 65° F and 1 hour of sun in the day prior to, of, or forecast before a rain the day after the application.
 - For spring applications to thistles, apply after basal leaves of Canada thistles are fully extended, and after rosettes of musk thistle are at least 8 inches diameter, but before flower stage.
 - For fall applications to thistles, apply prior to the second hard freeze of 28° F, unless otherwise listed in the label directions.
 - For tree and brush applications:

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HERBICIDE

- For foliar applications and cut stump/surface applications with water-soluble products, apply after leaves are fully opened in the spring and prior to leaf discoloration in the fall.
- For cut stump applications with oil soluble products, do not apply during periods of heavy sap flow. Use as a guideline that heavy sap flow occurs in late winter to early spring when nighttime temperatures below 32° F are followed by daytime temperatures above 32° F with sunny conditions.
- For cut stump and basal bark applications, add sufficient dye so that treated areas are visible to inspection 7 days after application.

- Notify the Engineer prior to calibrating, mixing and applying herbicides, including incidental items.
- Provide copies of daily spray logs to the RCE at the end of each week of spraying (form provided by Iowa DOT).
- If Contractor does not complete spray item on schedule, the Engineer may adjust the schedule.

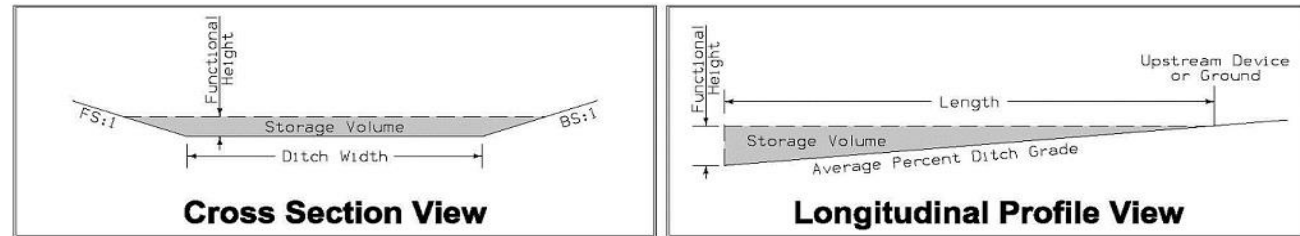
STORMWATER DRAINAGE BASIN AND STORAGE

Refer to EC Standards and 570s Details.

Basin No.	Drainage Basin Location					Summary of Stormwater Storage							Remarks
	Station to Station	Side	Discharge Point		Total Disturbed Area Acres	Disturbed Area with Storage Provided Acres	Disturbed Area without Storage Provided Acres	Best Management Practice	Total Storage Volume Provided CF	Total Storage Volume Required CF	Storage Volume Met? Yes/No		
			Station	Side									
1	22+50.00	35+80.00	RT	35+80.00	RT	1.6		1.6	Silt Fence for Ditch Check (EC-201)	10233.0	5760.0	Yes	

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: $[0.5 * Spacing * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation LF	Maintenance LF	Removal LF	Foreslope FS:1	Backslope BS:1	Ditch Width FT	Avg. % Slope Ditch Grade	Volume* CF	
1	1	27+00.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
1	1	27+75.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
1	1	28+50.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
1	1	29+25.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
1	1	29+85.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
1	1	30+60.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
1	1	31+35.00	Rt	31.0	3.1	31.0	3.0	3.0	25.0	2.0%	1462.0	
SFDC Tab Totals:				217.0								
SFDC Bid Totals:				325.5	150% of Tab Total							
SFDC Maintenance Totals:				32.6	10% of Bid Total							
SFDC Removal Totals:				325.5	100% of Bid Total							

TABULATION OF SILT FENCES

Refer to EC-201

Location			Length LF	Remarks
Begin Station	End Station	Side		
26+90.00	28+80.00	Rt	190.0	Lt of CL of ditch
26+90.00	28+80.00	Rt	190.0	Rt of CL of ditch
29+50.00	31+50.00	Rt	200.0	Lt of CL of ditch
29+30.00	31+30.00	Rt	200.0	Rt of CL of ditch
SF Tab Totals:			780.0	
Silt Fence Bid Totals:			975.0	125% of Tab Total
Silt Fence Maintenance Totals:			97.5	10% of Bid Total
Silt Fence Removal Totals:			975.0	100% of Bid Total

POLLUTION PREVENTION PLAN

This project is regulated by the requirements of the Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 OR an Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) individual storm water permit. The Contractor shall carry out the terms and conditions of this permit and the Pollution Prevention Plan (PPP).

This Base PPP includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed per plan revisions or by contract modification, will be readily available for review.

All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The prime contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

I. ROLES AND RESPONSIBILITIES

- A. Designer:
 - 1. Prepares Base PPP included in the project plan.
 - 2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.
 - 3. Is signature authority on the Base PPP.
- B. Contractor:
 - 1. Signs a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
 - 2. Designates a Water Pollution Control Manager (WPCM), who has the duties and responsibilities as defined in Section 2602 of the Standard Specifications.
 - 3. Submits an Erosion Control Implementation Plan (ECIP) and ECIP updates according to Section 2602 of the Standard Specifications.
 - 4. Installs and maintains appropriate controls. This work may be subcontracted.
 - 5. Supervises and implements good housekeeping practices.
 - 6. Conducts joint required inspections of the site with inspection staff. When Contractor is not mobilized on site, Contractor may delegate this responsibility to a trained or certified subcontractor. Contracting Authority also may waive joint inspection requirement during winter shutdown. In both circumstances, WPCM (or trained or certified delegate from the Contractor) is still responsible to review and sign inspection reports.
 - 7. Complies with training and certification requirements of Section 2602 of the Standard Specifications.
- C. Subcontractors:
 - 1. Sign a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP if responsible for sediment or erosion controls or involved in land disturbing activities. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
 - 2. Implement good housekeeping practices.
- D. RCE/Project Engineer:
 - 1. Is Project Storm Water Manager.
 - 2. On projects where DOT is the Contracting Authority, is current with erosion control training or certification.
 - 3. Takes actions necessary to ensure compliance with storm water requirements including, where appropriate, issuing stop work orders, and directing additional inspections at construction project sites that are experiencing problems with achieving permit compliance.
 - 4. Orders the taking of measures to cease, correct, prevent, or minimize the consequences of non-compliance with the storm water requirements of the Applicable Permit.
 - 5. Supervises all work necessary to meet storm water requirements at the Project, including work performed by contractors and subcontractors.
 - 6. Requires employees, contractors, and subcontractors to take appropriate responsive action to comply with storm water requirements, including requiring any such person to cease or correct a violation of storm water requirements, and to order or recommend such other actions as necessary to meet storm water requirements.
 - 7. Is familiar with the Project PPP and storm water site map.
 - 8. On projects where DOT is Contracting Authority, is responsible for monitoring inspection reports on a monthly basis, to determine whether deficiencies identified in inspection reports were adequately and timely addressed, and if not, has the authority and responsibility to direct immediate actions to correct the deficiencies.
 - 9. Is the point of contact for the Project for regulatory officials, Inspector, contractors, and subcontractors regarding storm water requirements.
 - 10. Is signature authority on Notice of Discontinuation.
- E. Inspector:
 - 1. Updates PPP whenever there is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants from the project.
 - 2. Maintains an up-to-date record that identifies contractors and subcontractors as co-permittees.
 - 3. Makes these plans available to the DNR upon their request.
 - 4. Conducts joint required inspections of the site with the contractor/subcontractor.
 - 5. Completes an inspection report after each inspection.
 - 6. Is signature authority on storm water inspection reports.

II. PROJECT SITE DESCRIPTION

- A. This Pollution Prevention Plan (PPP) is for the construction of a Pipe Culverts in Clay County.
- B. This PPP covers approximately 3.2 acres with an estimated 1.45 acres being disturbed. The portion of the PPP covered by this contract has 1.45 acres disturbed.
- C. The PPP is located in an area of Galva - Pringhar and Everly - Wilmonton - Letri soil association. The estimated weighted average runoff coefficient number for this PPP after completion will be 0.30.
- D. Storm Water Site Map is located in the R sheets. Proposed slopes are shown in cross sections, details, or standard road plans. Supplemental information is located in the Tabulations in the C or CE sheets.
- E. The base storm water site map is amended by contract modifications and progress payments (fieldbook entries) of completed erosion control work. Also, due to project phasing, erosion and sediment controls shown on project plans may not be installed until needed, based on site conditions. For example, silt fence ditch checks will typically not be installed until the ditch has been installed. Installed locations may also be modified from tabulation locations by field staff. Installed locations will be documented by fieldbook entries.
- F. Runoff from this work will flow into the through the road ditch eventually entering the Little Sioux River.

POLLUTION PREVENTION PLAN

III. CONTROLS

- A. The Contractor's ECIP specified in Article 2602.03 of the Standard Specifications for accomplishment of storm water controls should clearly describe the intended sequence of major activities, and for each activity define the control measure and the timing during the construction process that the measure will be implemented.
- B. Preserve vegetation in areas not needed for construction.
- C. Sections 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used and installed locations may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water monitoring inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B of the Standard Specifications.
- 1. EROSION AND SEDIMENT CONTROLS
 - a. Stabilization Practices
 - 1) Site plans will ensure that existing vegetation or natural buffers are preserved where attainable and disturbed portions of the site will be stabilized.
 - 2) Initialize stabilization of disturbed areas immediately after clearing, grading, excavating, or other earth disturbing activities have:
 - a) Permanently ceased on any portion of the site, or
 - b) Temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.
 - 3) Staged permanent and/or temporary stabilizing seeding and mulching shall be completed as the disturbed areas are completed. Incomplete areas shall be stabilized according to paragraph III, C, 1, a, 2, b above.
 - 4) Permanent and Temporary Stabilization practices to be used for this project are located in the storm water site map (when included), Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C sheets. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation (105-4) in the C sheets.
 - 5) Preservation of existing vegetation within right-of-way or easements will act as vegetative buffer strips.
 - 6) Preservation of topsoil: Bid items to be used for this project are located in the Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C sheets. Additional information may be found in the Tabulations in the C or T Tabulation sheets, or is referenced in Section 2105 of the Standard Specifications.
 - b. Structural Practices
 - 1) Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Additionally, structural practices may include: silt basins that provide 3600 cubic feet of storage per acre drained or equivalent sediment controls, outlet structures that withdraw water from surface when discharging basins, and controls to direct storm water to vegetated areas.
 - 2) Structural practices to be used for this project are located in the storm water site map (when included), Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B sheets or are referenced in the Standard Road Plans Tabulation (105-4) located in the C sheets.
 - c. Storm Water Management
 - 1) Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. This may include velocity dissipation devices at discharge locations and along length of outfall channel as necessary to provide a non-erosion velocity flow from structure to water course. If included with this project, these items are located in the storm water site map (when included) and Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation. The installation of these devices may be subject to Section 404 of the Clean Water Act.
- 2. OTHER CONTROLS
 - a. Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.
 - 1) Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.
 - 2) Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.
 - 3) Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.
 - 4) Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.
 - 5) Spill Prevention and Control - Implement chemical spill and leak prevention and response procedures to contain and clean-up spills and prevent material discharges to the storm drain system and waters of the state.
 - 6) Concrete Residuals and Washout Wastes - Waste shall not be discharged to a surface water and is not allowed to adversely affect a water of the state. Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located. Designated washout areas should be located at least 50 feet away from storm drains, streams or other water bodies. Care should be taken to ensure these facilities do not overflow during storm events.
 - 7) Concrete Grooving/Grinding Slurry - Do not discharge slurry to a waterbody or storm drain. Slurry may be applied on foreslopes or removed from the project.
 - 8) Vehicle and Equipment Storage and Maintenance Areas - Perform on site fueling and maintenance in accordance with all environment laws such as proper storage of onsite fuels and proper disposal of used engine oil or other fluids on site. Employ washing practices that prevent contamination of surface and ground water from wash water. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.
 - 9) Litter Management - Ensure employees properly dispose of litter. Minimize exposure of trash if exposure to precipitation or storm water would result in a discharge of pollutants.
 - 10) Dewatering - Properly treat water to remove suspended sediment before it re-enters a waterbody or discharges off-site. Measures are also to be taken to prevent scour erosion at dewatering discharge point.
- 3. APPROVED STATE OR LOCAL PLANS
 - During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

IV. MAINTENANCE PROCEDURES

The Contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

POLLUTION PREVENTION PLAN

V. INSPECTION REQUIREMENTS

- A. Inspections shall be made jointly by the Contractor and the Contracting Authority at least once every seven calendar days. Storm water monitoring inspections will include:
 1. Date of the inspection.
 2. Summary of the scope of the inspection.
 3. Name and qualifications of the personnel making the inspection.
 5. Review of erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
 6. Major observations related to the implementation of the PPP.
 7. Identification of corrective actions required to maintain or modify erosion and sediment control measures.
- B. Include storm water monitoring inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found within 3 calendar days of the inspection and complete within 7 calendar days following the inspection. If it is determined that making the corrections less than 72 hours after the inspection is impracticable, it should be documented why it is impracticable and indicate an estimated date by which the corrections will be made.

VI. NON-STORM WATER DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of headwalls or blocks, Class A stone, erosion stone or other appropriate materials. This also includes uncontaminated groundwater from dewatering operations, which will be controlled as discussed in Section III of the PPP.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

VIII. DEFINITIONS

- A. Base PPP - Initial Pollution Prevention Plan.
- B. Amended PPP - May include Plan Revisions or Contract Modifications for new items, storm water monitoring inspection reports, and fieldbook entries made by the inspector.
- C. IDR - Inspector's Daily Report - this contains the inspector's daily diary and bid item postings.
- D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).
- E. Signature Authority - Representative authorized to sign various storm water documents.

CERTIFICATION STATEMENT





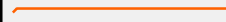
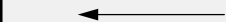

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature








Seana K. Godbold

Print Name

LINE STYLE LEGEND OF EROSION CONTROL SHEETS

-  Silt Fence
-  Perimeter and Slope Sediment Control Device (9")
-  Perimeter and Slope Sediment Control Device (12")
-  Perimeter and Slope Sediment Control Device (20")
-  Open-Throat Curb Intake Sediment Filter
-  Concentrated Flow
-  Sheet Flow

CELL LEGEND OF EROSION CONTROL SHEETS

















-  Temporary Sediment Control basin
-  Erosion Control for Circular Intake or Manhole Well
-  Erosion Control for Rectangular Intake or Manhole Well
-  Grate Intake Sediment Filter Bag
-  Silt Basin
-  Silt Fence Tail
-  Stormwater Drainage Basin Discharge Point

PLAN VIEW COLOR LEGEND OF EROSION CONTROL 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
Black	(0)	Permanent Erosion Control Features
Blaze Orange	(222)	Temporary Erosion Control Features

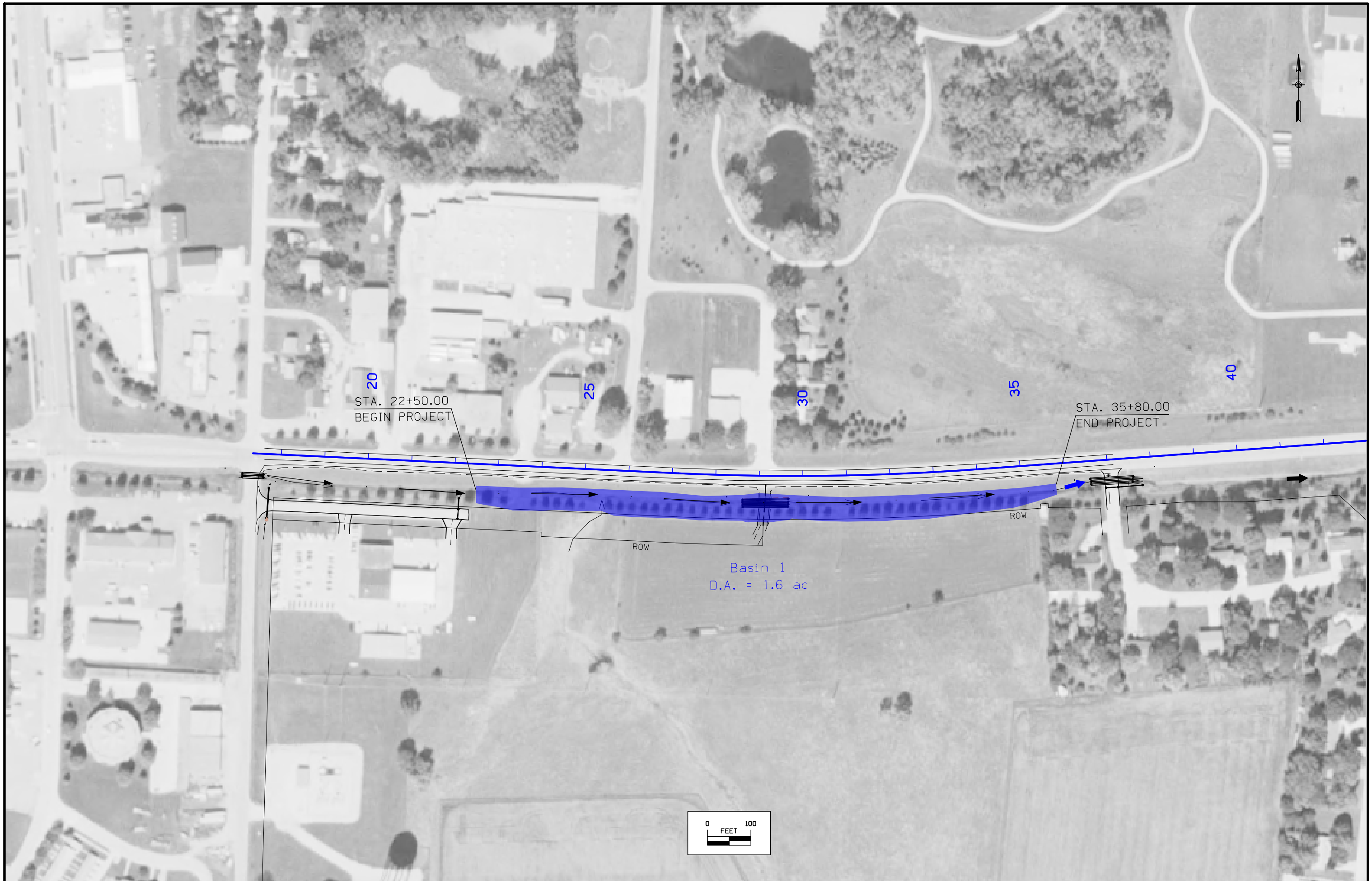
SHADING	Design Color No.		Transparency
Citron	(234)	Mulching, All Types	50%
Light Brown	(238)	Special Ditch Control, Wood Excelsior Mat	0%

PATTERN LEGEND OF EROSION CONTROL SHEETS

-  Seeding and Fertilizing
-  Seeding and Fertilizing (Rural)
-  Seeding and Fertilizing (Urban)
-  Native Grass Seeding
-  Salt Tolerant Seeding
-  Wetland Grass Seeding
-  Wildflower Seeding
-  Sodding
-  Turf Reinforcement Mat Type 1
-  Turf Reinforcement Mat Type 2
-  Turf Reinforcement Mat Type 3
-  Turf Reinforcement Mat Type 4
-  Slope Protection, Wood Excelsior Mat
-  Transition Mat
-  Rock Features, Permanent
-  Rock Features, Temporary

EROSION CONTROL LEGEND AND SYMBOL INFORMATION SHEET

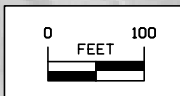
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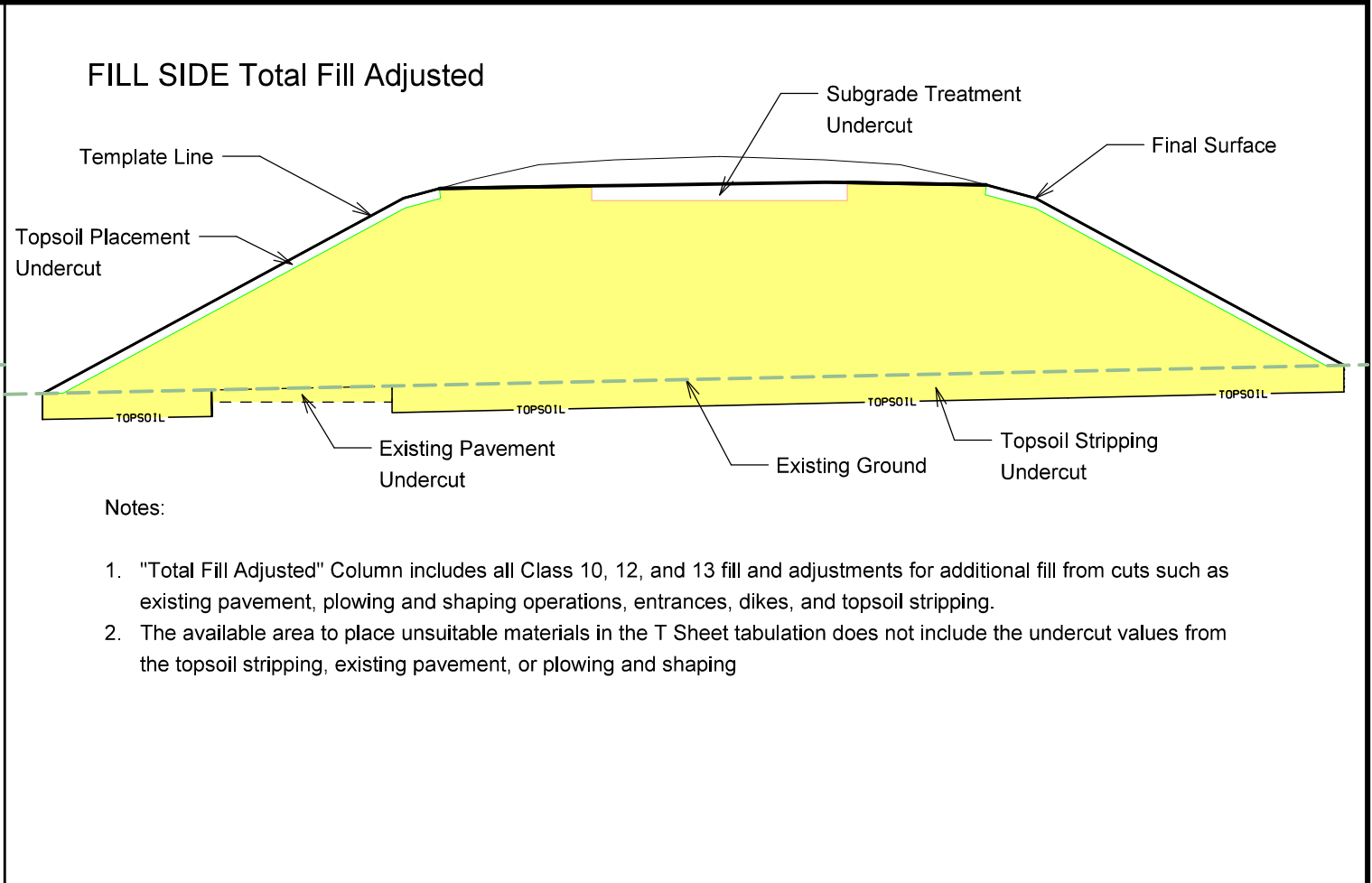
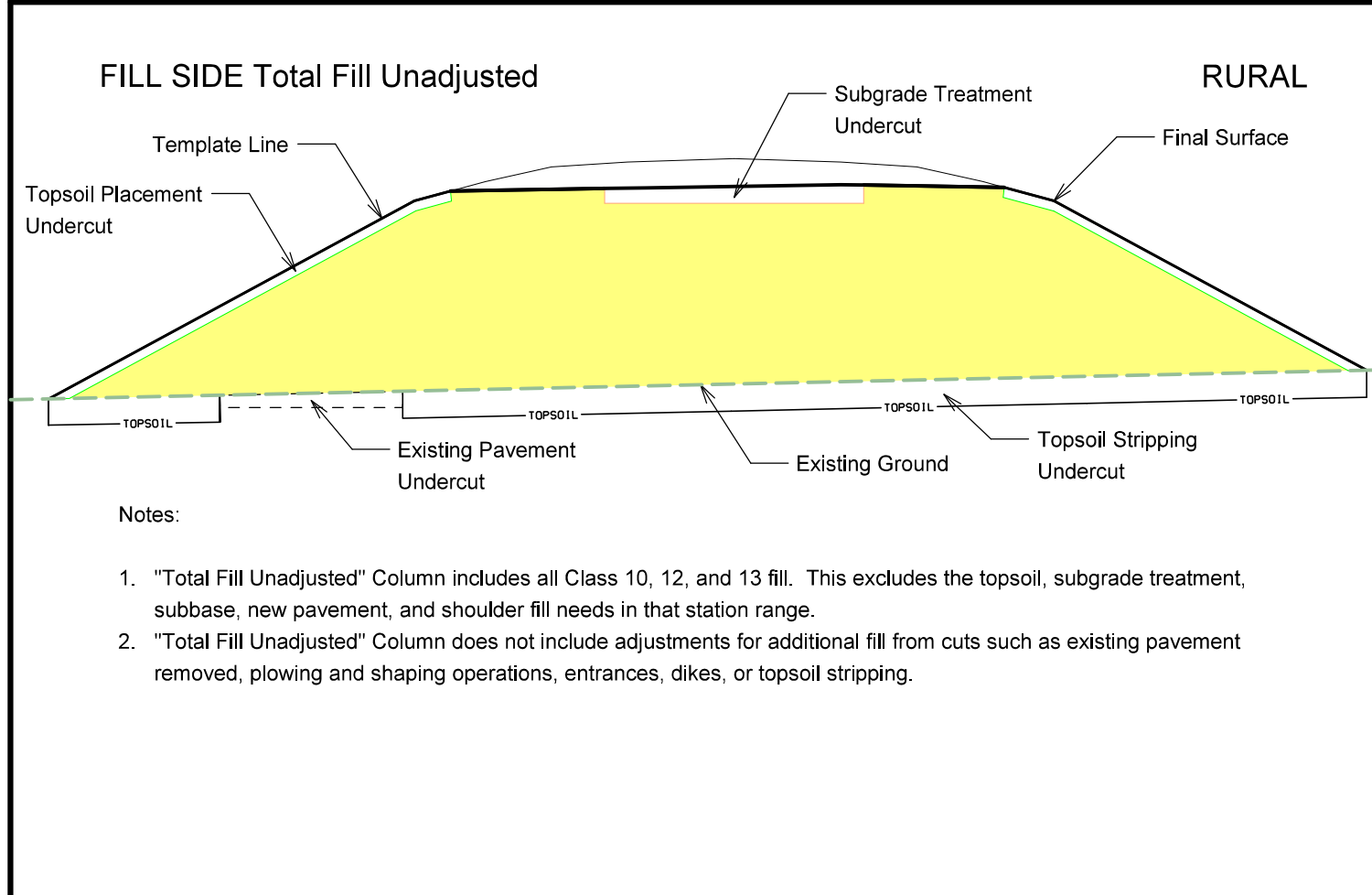
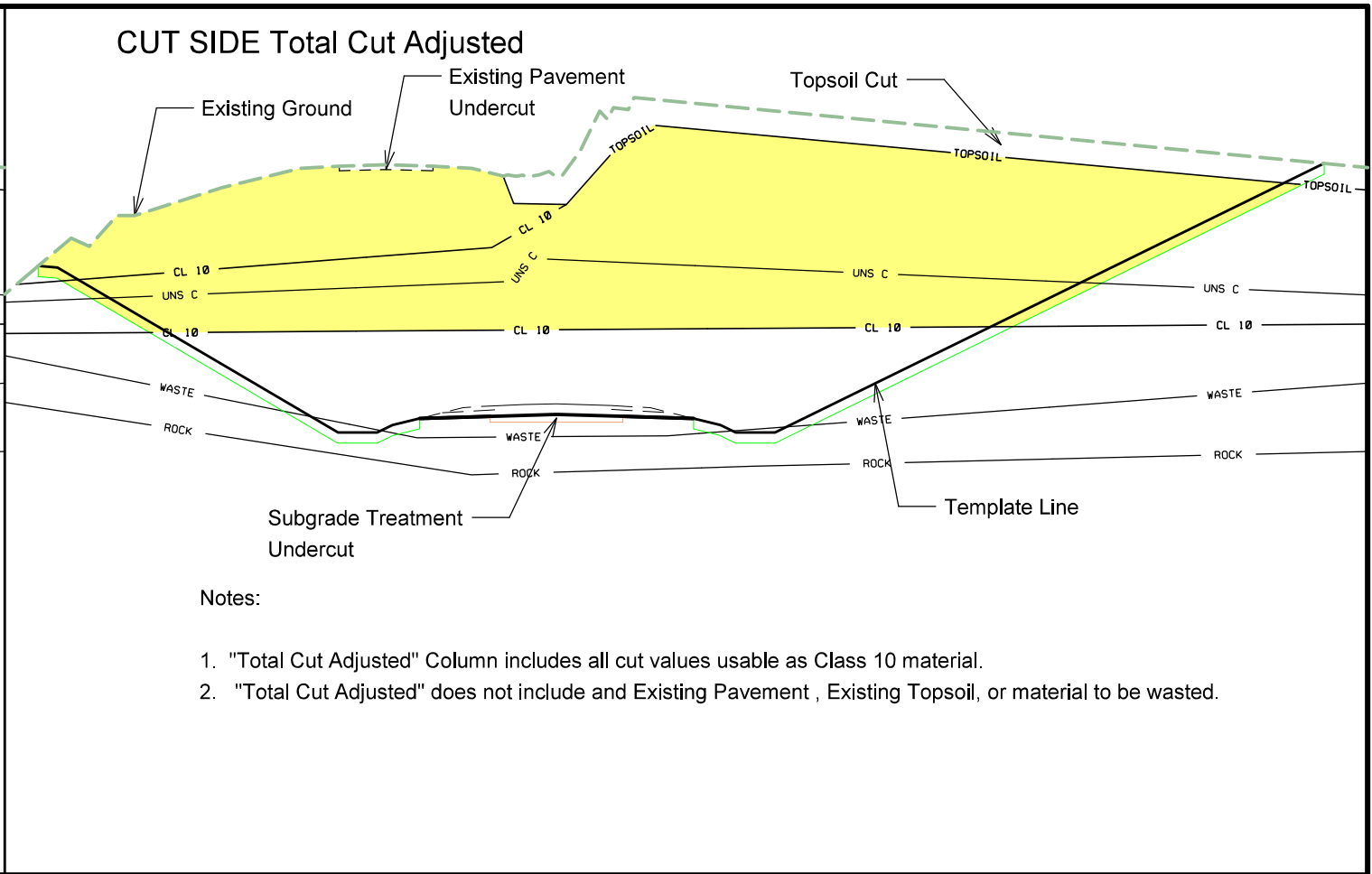
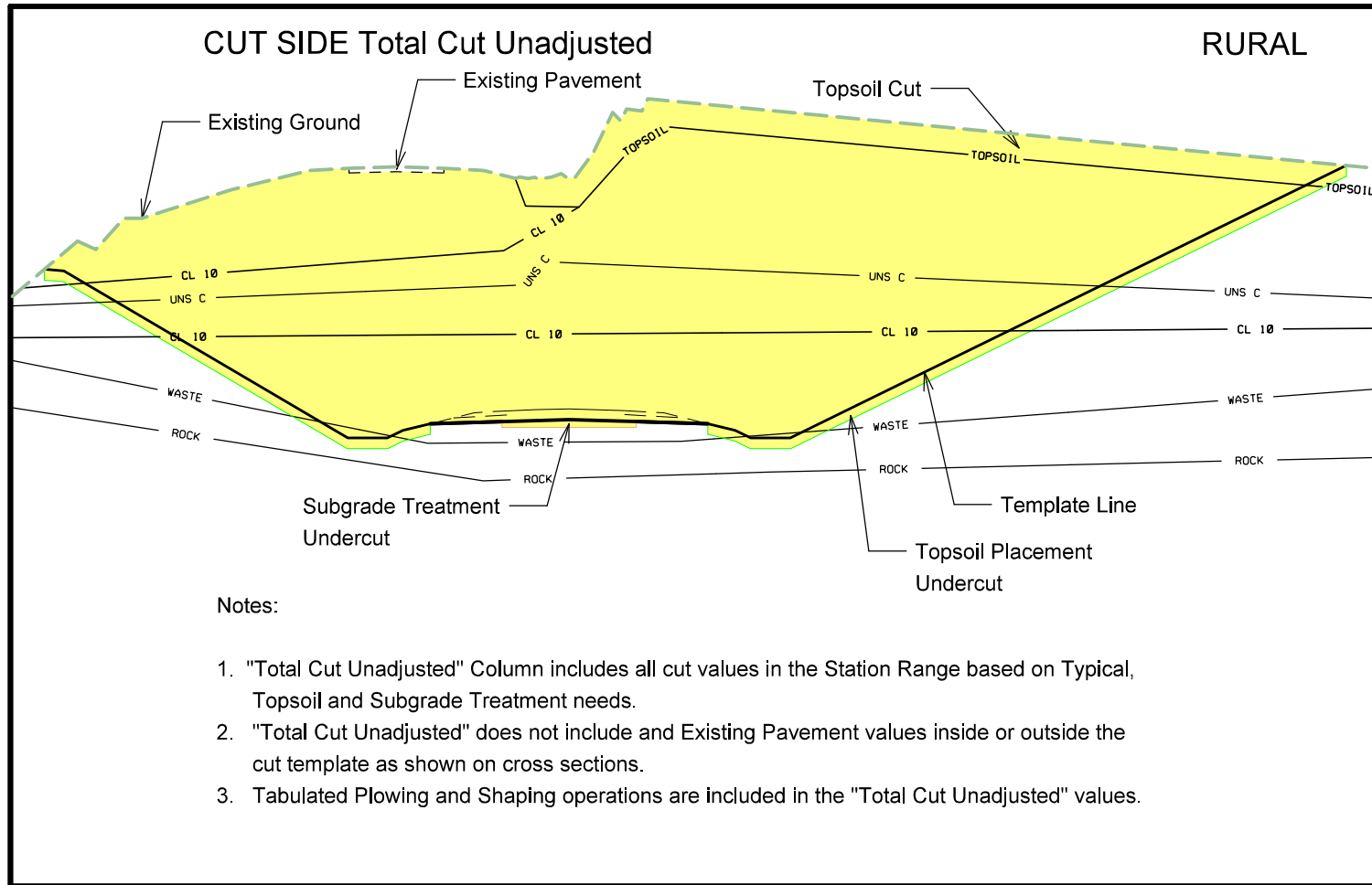


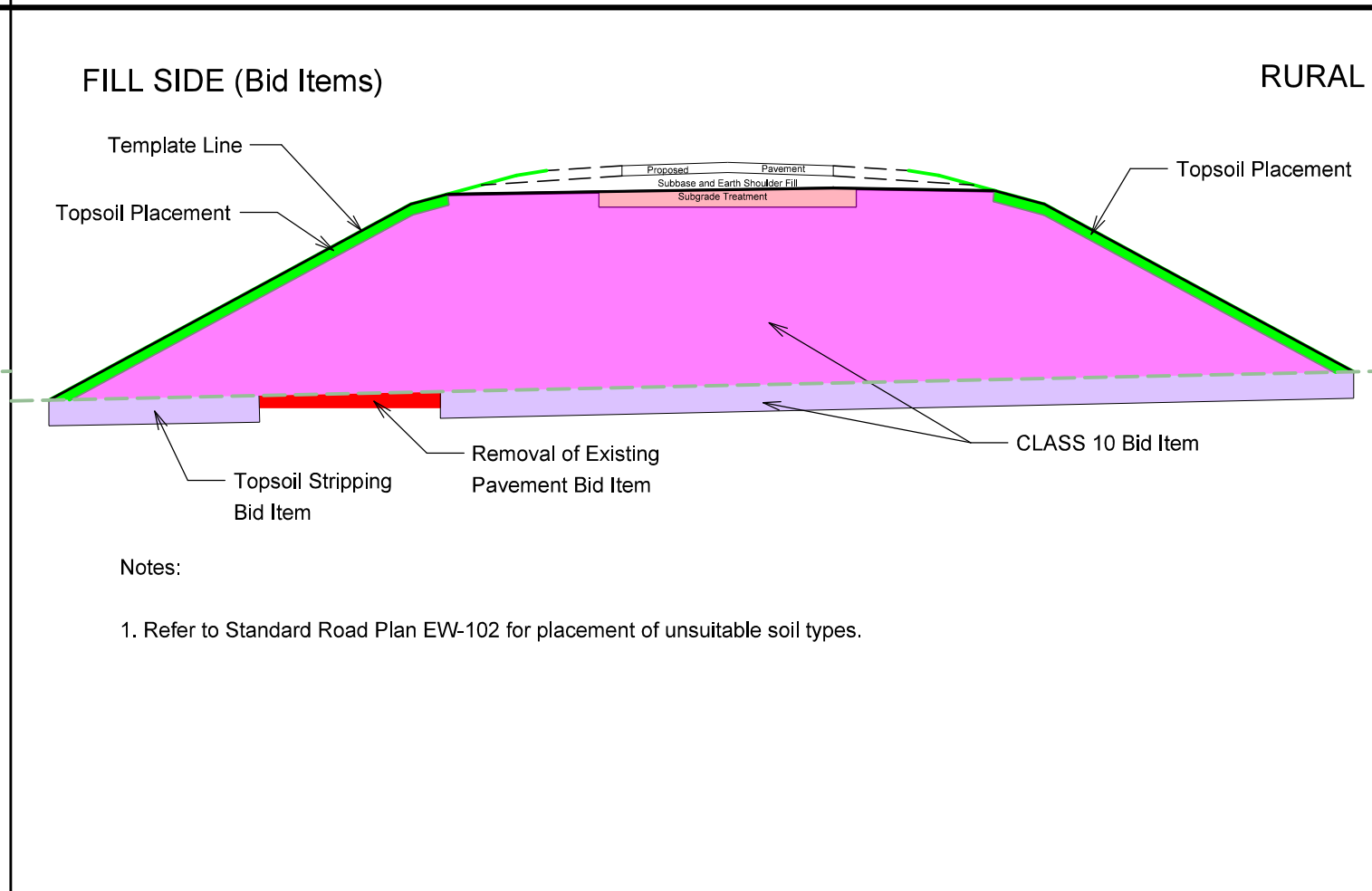
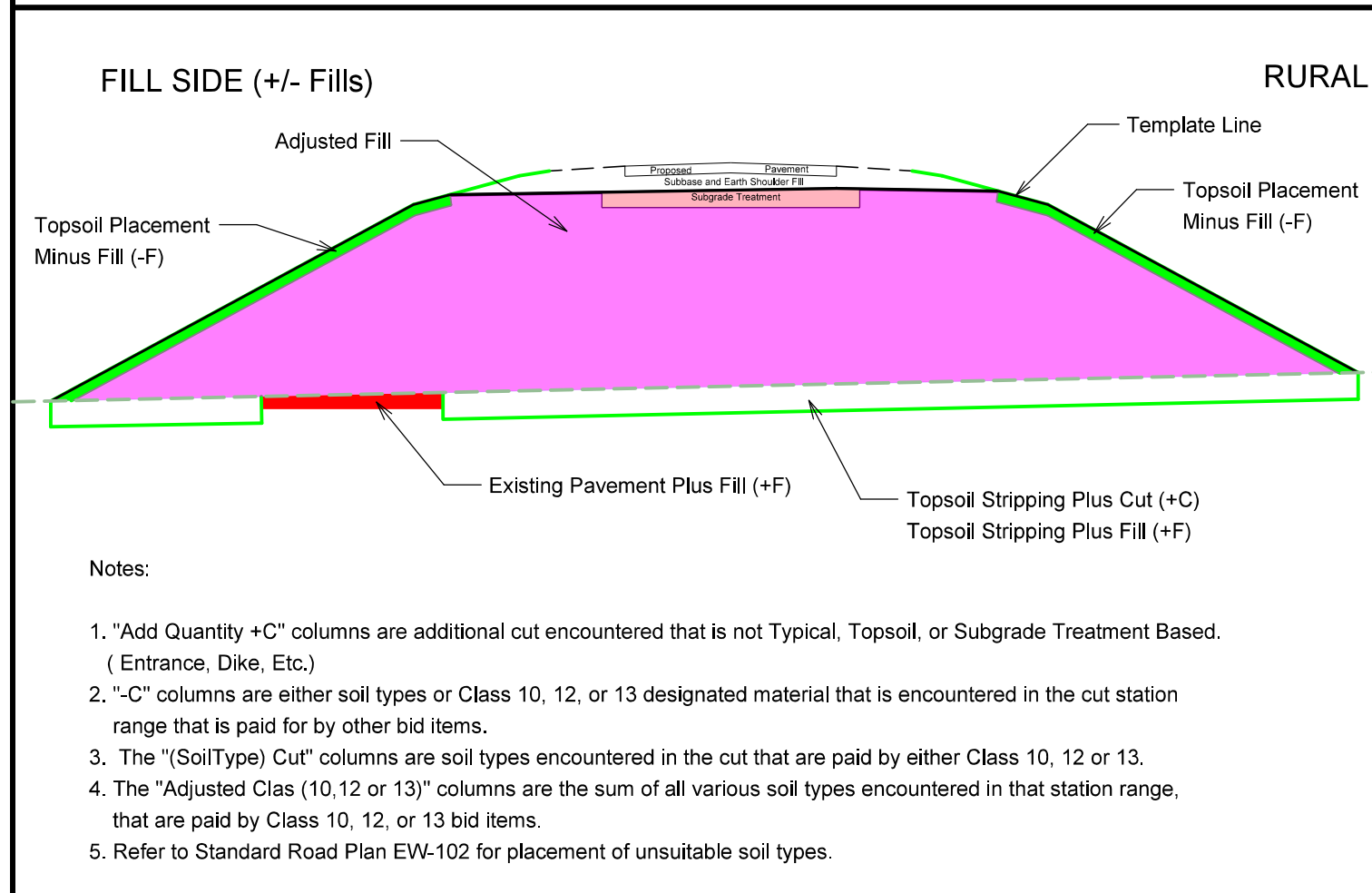
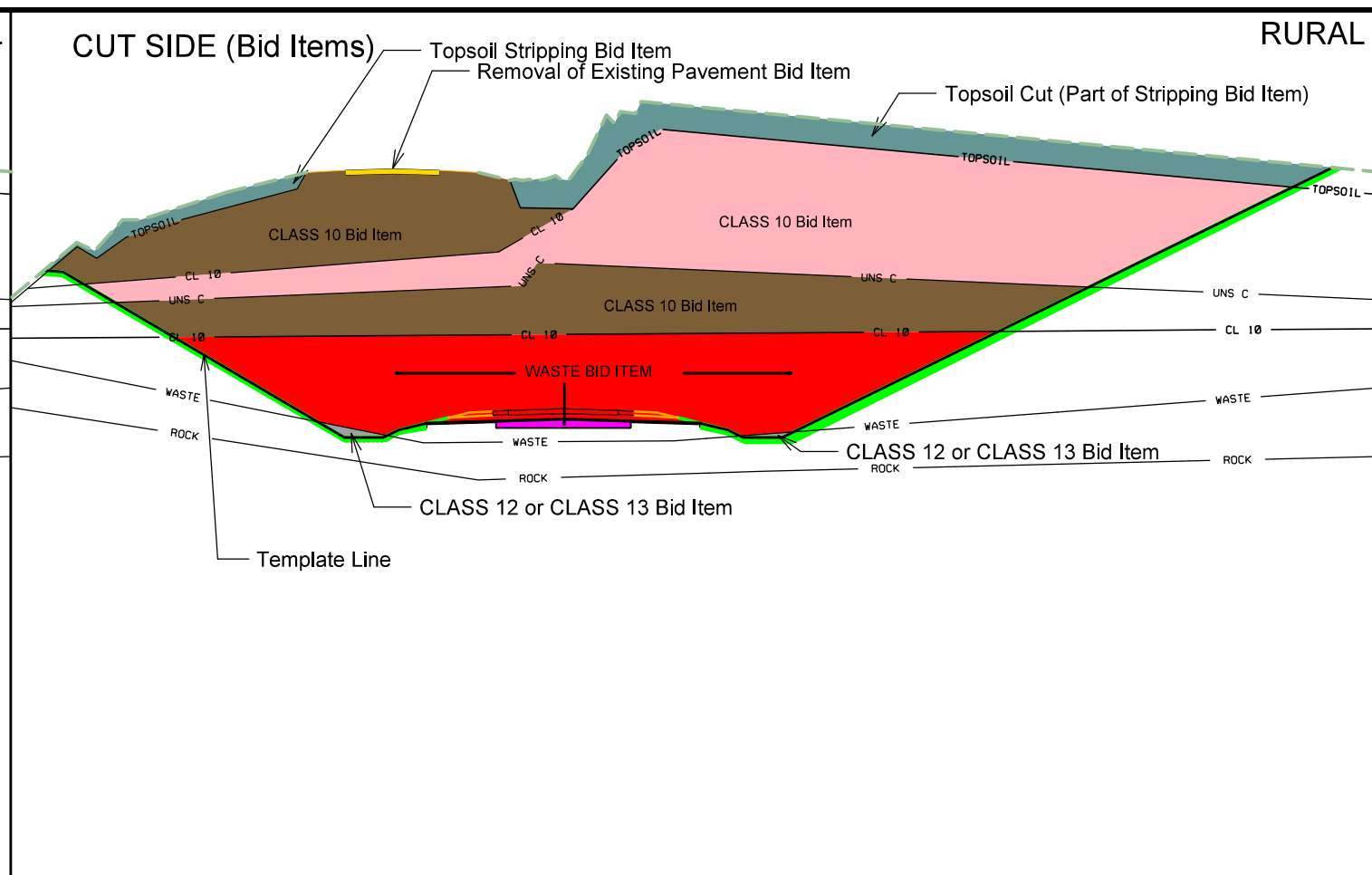
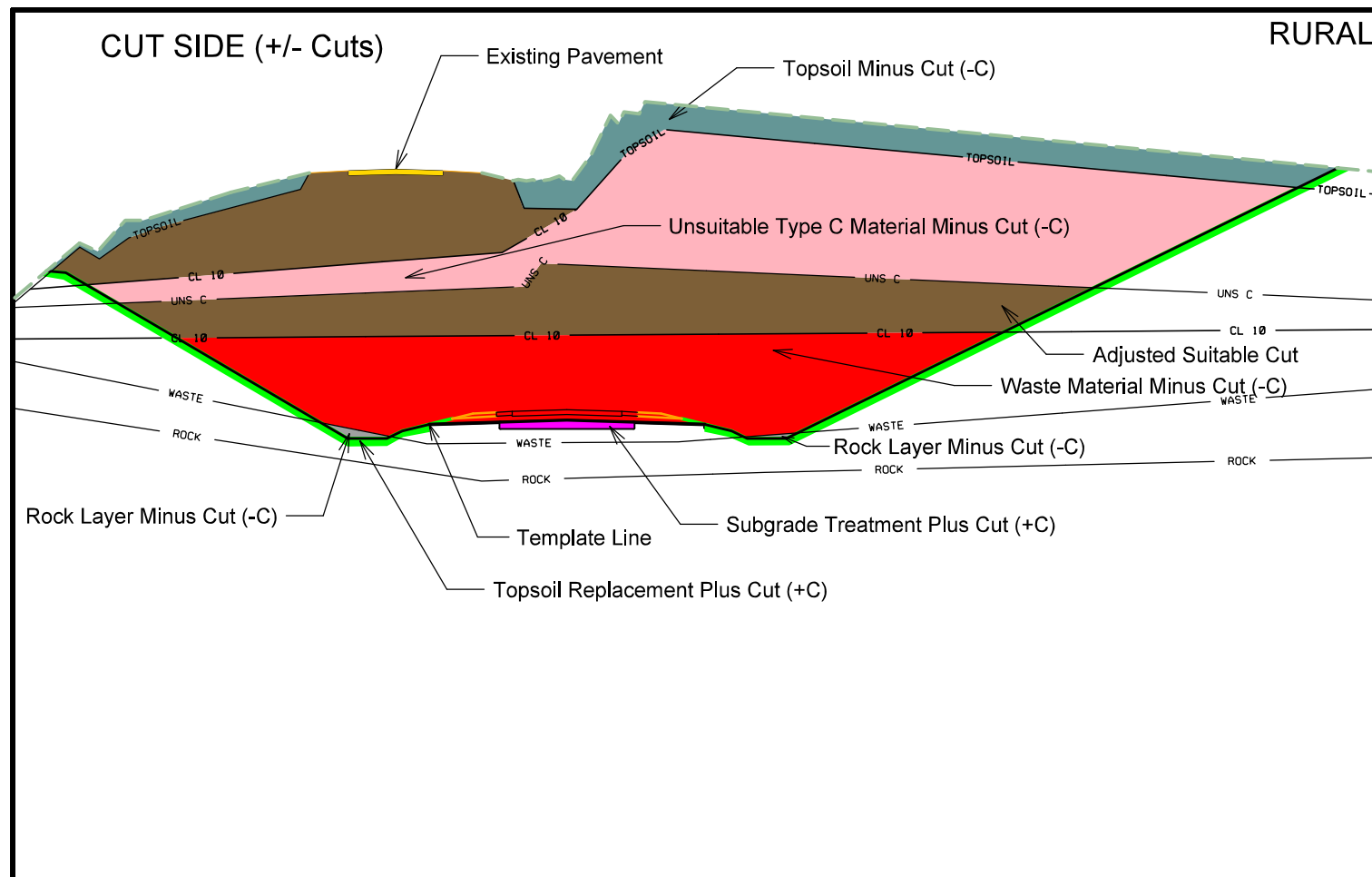


STA. 22+50.00
BEGIN PROJECT

STA. 35+80.00
END PROJECT



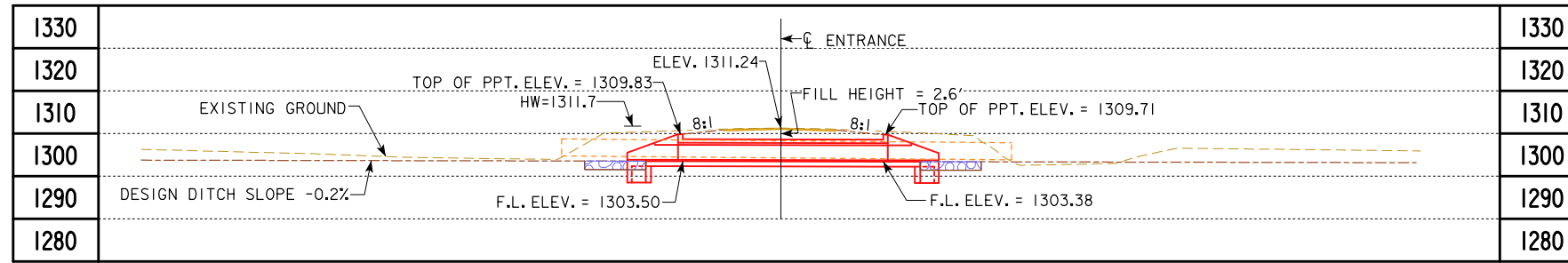




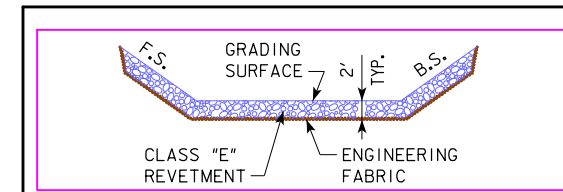
TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut					Fill						Checks (EW-102)		Topsoil								
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Manually Calculated Cut Adjustments (+/- Cut)	Total Cut Adjusted	Total Fill Unadjusted Volume	Existing Topsoil Stripping Undercut (+ Fill)	Manually Calculated Fill Adjustments (+/- Fill)	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink					
Summary:																						
ML018	8,540	6,157	2,379	-1,008	5,149	20	174	86	280	364	4,785	0	0	2,379	1,685	2,359	21					
Project Totals:	8,540	6,157	2,379	-1,008	5,149	20	174	86	280	364	4,785	0	0	2,379	1,685	2,359	21					
Bid Item Quantities Excavation, Class 10, Roadway and Borrow: 364 [10] Excavation, Class 10, Waste: 4,785 [11] Topsoil, Strip, Salvage and Spread: 2,379 [14] Compaction with Moisture Control: 280 [9]																						

BENCH MARK NO. 7040, 9572890.567 NORTH, 11527034.378 EAST, ELEV. 1316.358, CP CO GPS MON 75.5 FT SW BUILDING CORNER, 22.5 FT SE SW COR PARKING LOT, 12 FT S EDGE OF PARKING LOT



LONGITUDINAL SECTION ALONG CULVERT

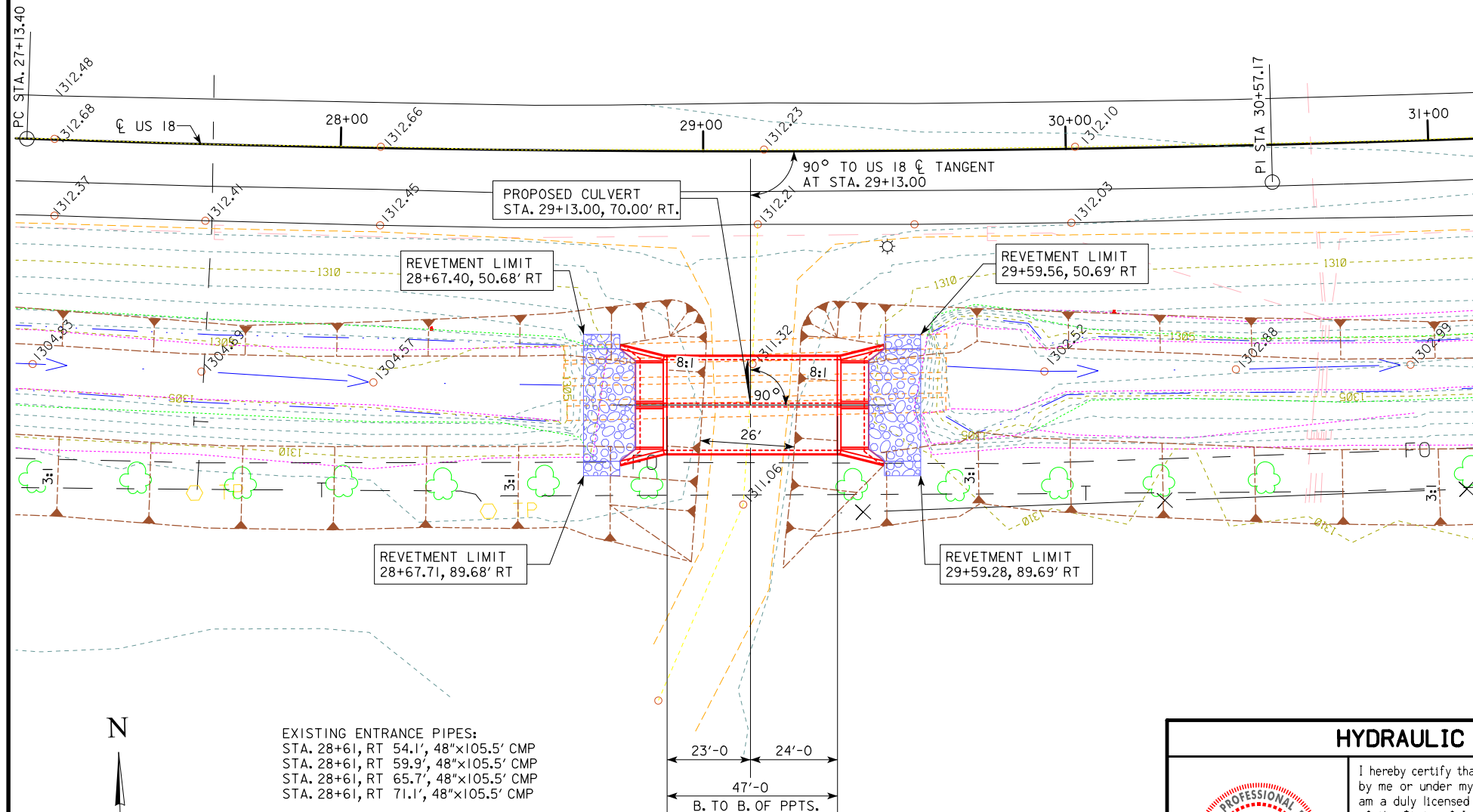


TYPICAL CHANNEL PROTECTION

ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVTMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	60.9	80.0	38.1
OUTLET	60.9	80.0	38.1
TOTALS	121.8	160.0	76.2

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.



SITUATION PLAN

EXISTING ENTRANCE PIPES:
 STA. 28+61, RT 54.1', 48"x105.5' CMP
 STA. 28+61, RT 59.9', 48"x105.5' CMP
 STA. 28+61, RT 65.7', 48"x105.5' CMP
 STA. 28+61, RT 71.1', 48"x105.5' CMP

UTILITIES LEGEND:

FO - FIBER OPTIC
 TI - TELEPHONE LINE
 EI - ELECTRIC

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

CURVE DATA

PI STA. 30+57.17
 $\Delta = 6^{\circ}51'59.64"$ (LT)
 T = 343.77
 L = 686.71
 R = 5730
 E = 10.3
 PC STA. 27+13.40
 PT STA. 34+00.11

U.A.C. EXISTING PROFILE
 PROPOSED PROFILE
 GRADE US 18

HYDRAULIC DATA

DRAINAGE AREA = 2.3 SQ. MI.
 Q100 = 1320 CFS
 DESIGN DITCH CAPACITY = 500 CFS
 DESIGN HW ELEV. = 1311.7
 ENTRANCE OT ELEV. 1311.1

TRAFFIC ESTIMATE

2017 AADT	5300	V.P.D.
202_ AADT	-	V.P.D.
202_ DHV	-	V.P.H.
TRUCKS	6	%
TOTAL DESIGN ESALS	-	

LOCATION

US 18 IN SPENCER
 SOUTH ENTRANCE AT STA. 29+15
 T-96N R-36W
 SECTION 19
 SIOUX TOWNSHIP
 CLAY COUNTY
 FHWA NO. 900275
 LATITUDE 43.126012°
 LONGITUDE -95.137565°

PRELIMINARY

DESIGN FOR 0° SKEW
**TW 12'x4'x47' REINFORCED
 CONCRETE BOX CULVERT**

SITUATION PLAN

STATION 29+13.00, 70' RT (US 18) SEPTEMBER 2019

CLAY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 1 FILE NO. 31675 DESIGN NO. 120

HYDRAULIC DESIGN



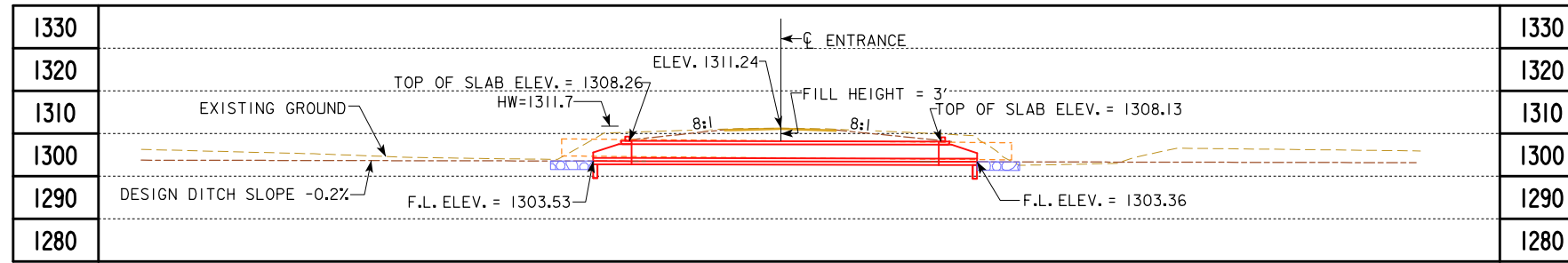
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Patricia G. Schwarz 9-13-19
 Signature Date
 Printed or Typed Name Patricia G. Schwarz

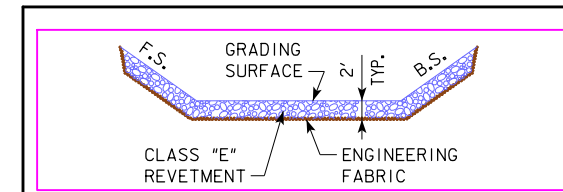
My license renewal date is December 31, 2020

Pages or sheets covered by this seal: 1 OF 1

BENCH MARK NO. 7040, 9572890.567 NORTH, 11527034.378 EAST, ELEV. 1316.358, CP CO GPS MON 75.5 FT SW BUILDING CORNER, 22.5 FT SE SW COR PARKING LOT, 12 FT S EDGE OF PARKING LOT



LONGITUDINAL SECTION ALONG CULVERT

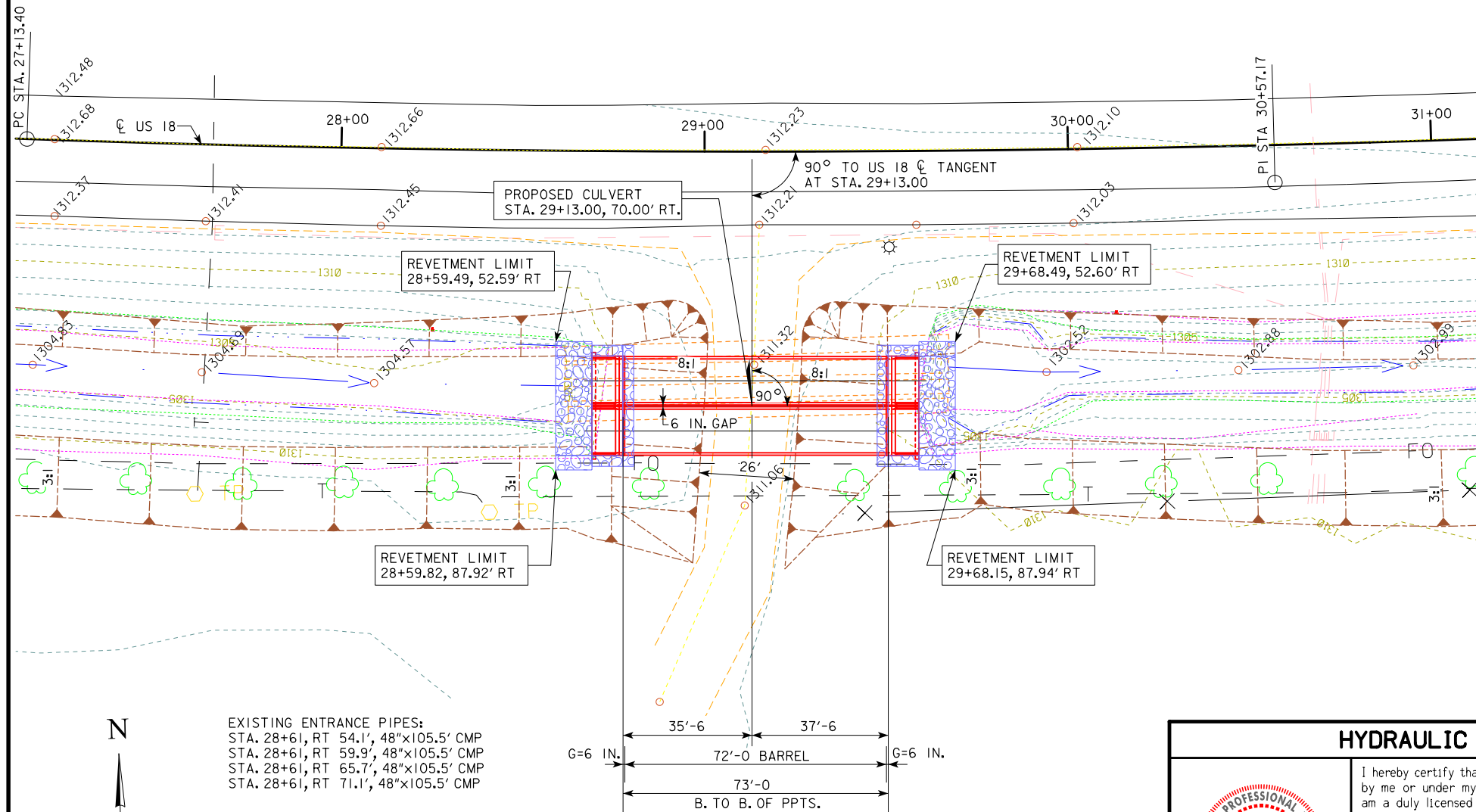


TYPICAL CHANNEL PROTECTION

ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	60.5	98.4	37.8
OUTLET	60.5	98.4	37.8
TOTALS	121.0	196.8	75.6

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.



SITUATION PLAN

EXISTING ENTRANCE PIPES:
 STA. 28+61, RT 54.1', 48"x105.5' CMP
 STA. 28+61, RT 59.9', 48"x105.5' CMP
 STA. 28+61, RT 65.7', 48"x105.5' CMP
 STA. 28+61, RT 71.1', 48"x105.5' CMP

UTILITIES LEGEND:

FO - FIBER OPTIC
 TI - TELEPHONE LINE
 EI - ELECTRIC

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

CURVE DATA

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 $\Delta = 6^\circ 51' 59.64''$ (LT)
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 L = 686.71
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 E = 10.3
 PC STA. 27+13.40
 PT STA. 34+00.11

U.A.C. EXISTING PROFILE
 PROPOSED PROFILE
 GRADE US 18

HYDRAULIC DATA

DRAINAGE AREA = 2.3 SQ. MI.
 Q100 = 1320 CFS
 DESIGN DITCH CAPACITY = 500 CFS
 HW ELEV. = 1311.7
 ENTRANCE OT ELEV. 1311.1

TRAFFIC ESTIMATE

2017 AADT	5300	V.P.D.
202_ AADT	-	V.P.D.
202_ DHV	6	V.P.H.
TRUCKS	6	%
TOTAL DESIGN ESALS	-	

LOCATION

US 18 IN SPENCER
 SOUTH ENTRANCE AT STA. 29+15
 T-96N R-36W
 SECTION 19
 SIOUX TOWNSHIP
 CLAY COUNTY
 FHWA NO. 900275
 LATITUDE 43.126012°
 LONGITUDE -95.137565°

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.

Patricia G. Schwarz 9-13-19
 Signature Date
 Patricia G. Schwarz
 Printed or Typed Name

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: 1 OF 1

PRELIMINARY

DESIGN FOR 0° SKEW
 TW 12'x4'x73' PRECAST REINFORCED
 CONCRETE BOX CULVERT

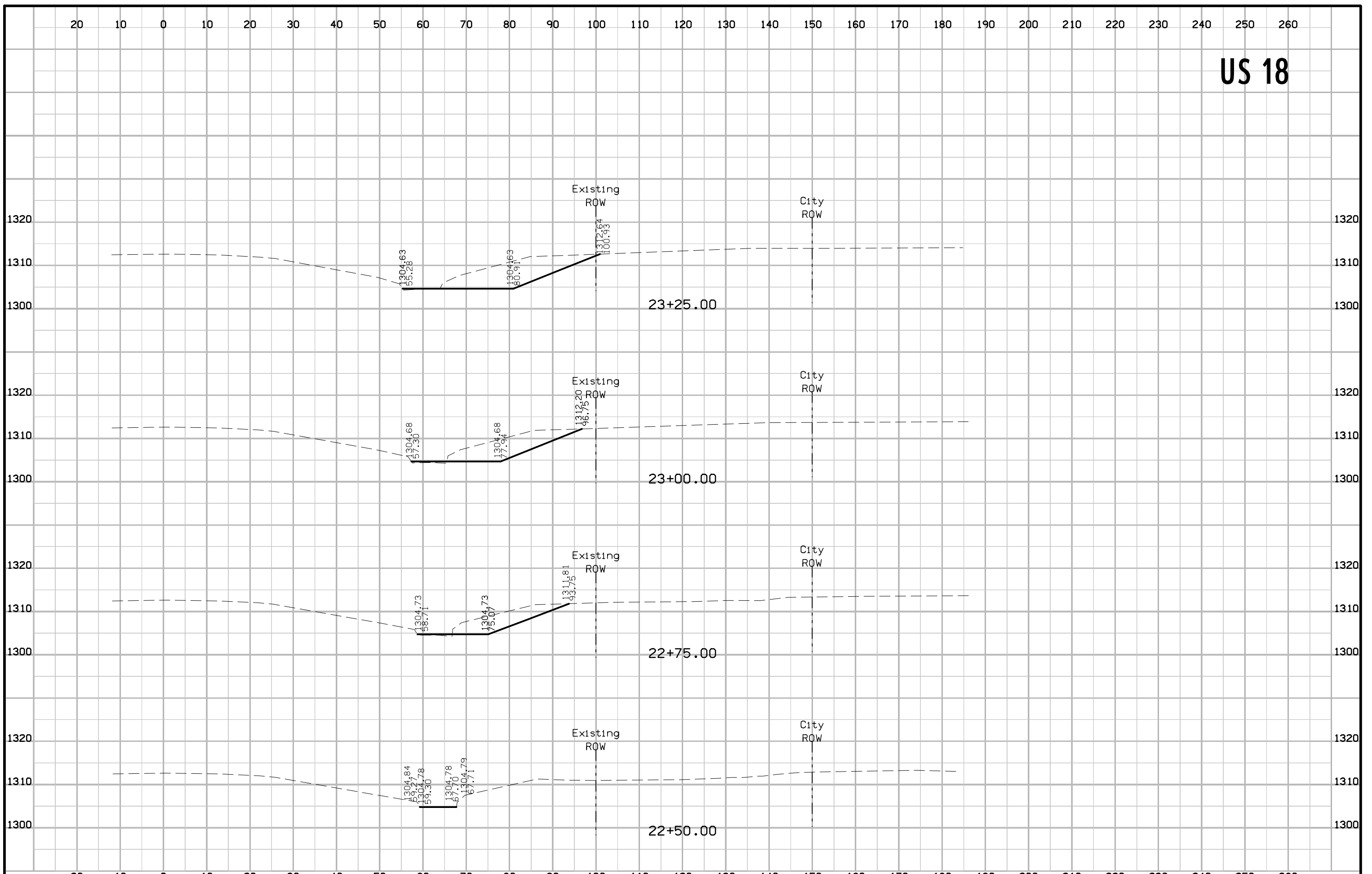
SITUATION PLAN

STATION 29+13.00, 70' RT (US 18) SEPTEMBER 2019

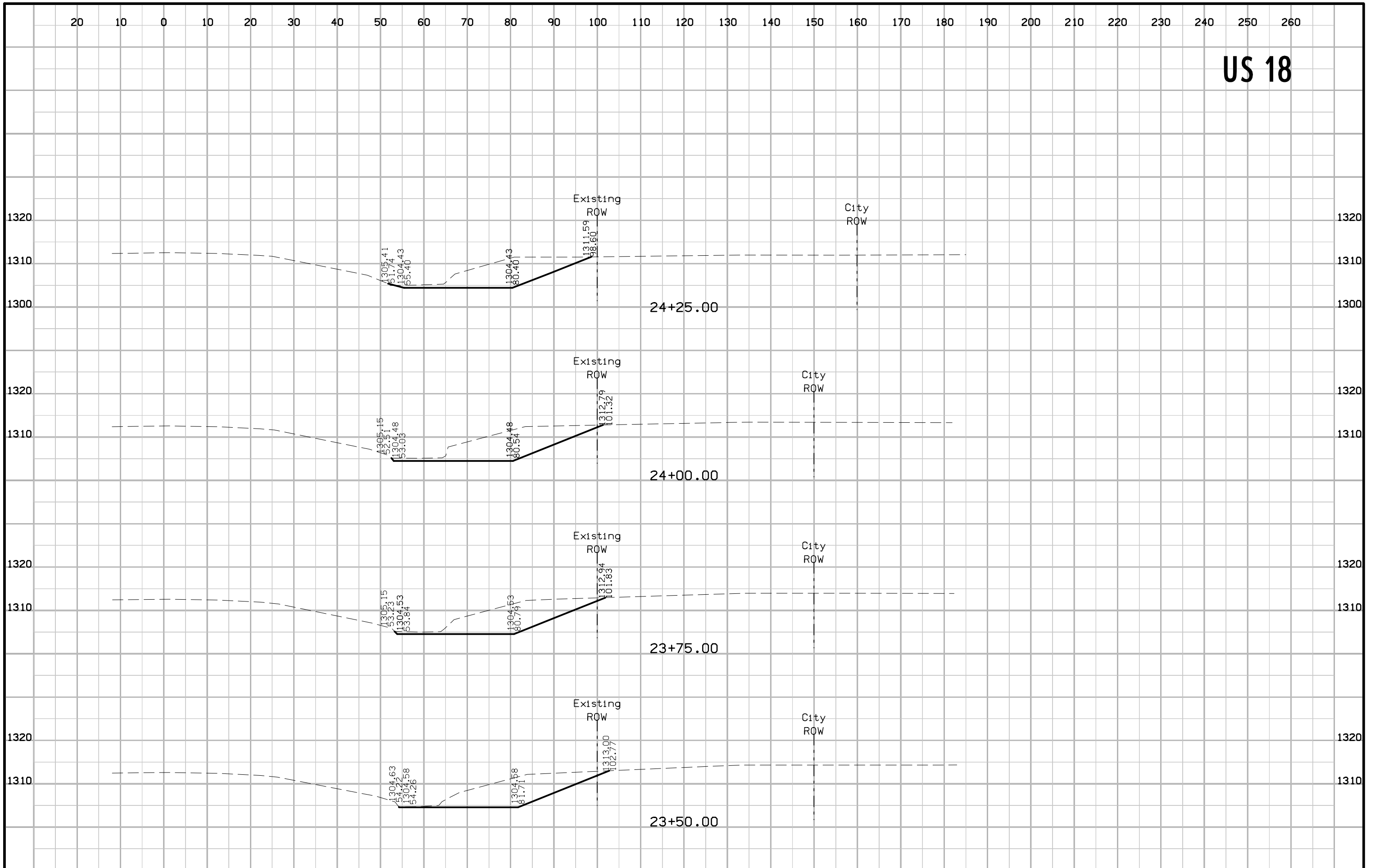
CLAY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 1 FILE NO. 31675 DESIGN NO. 120

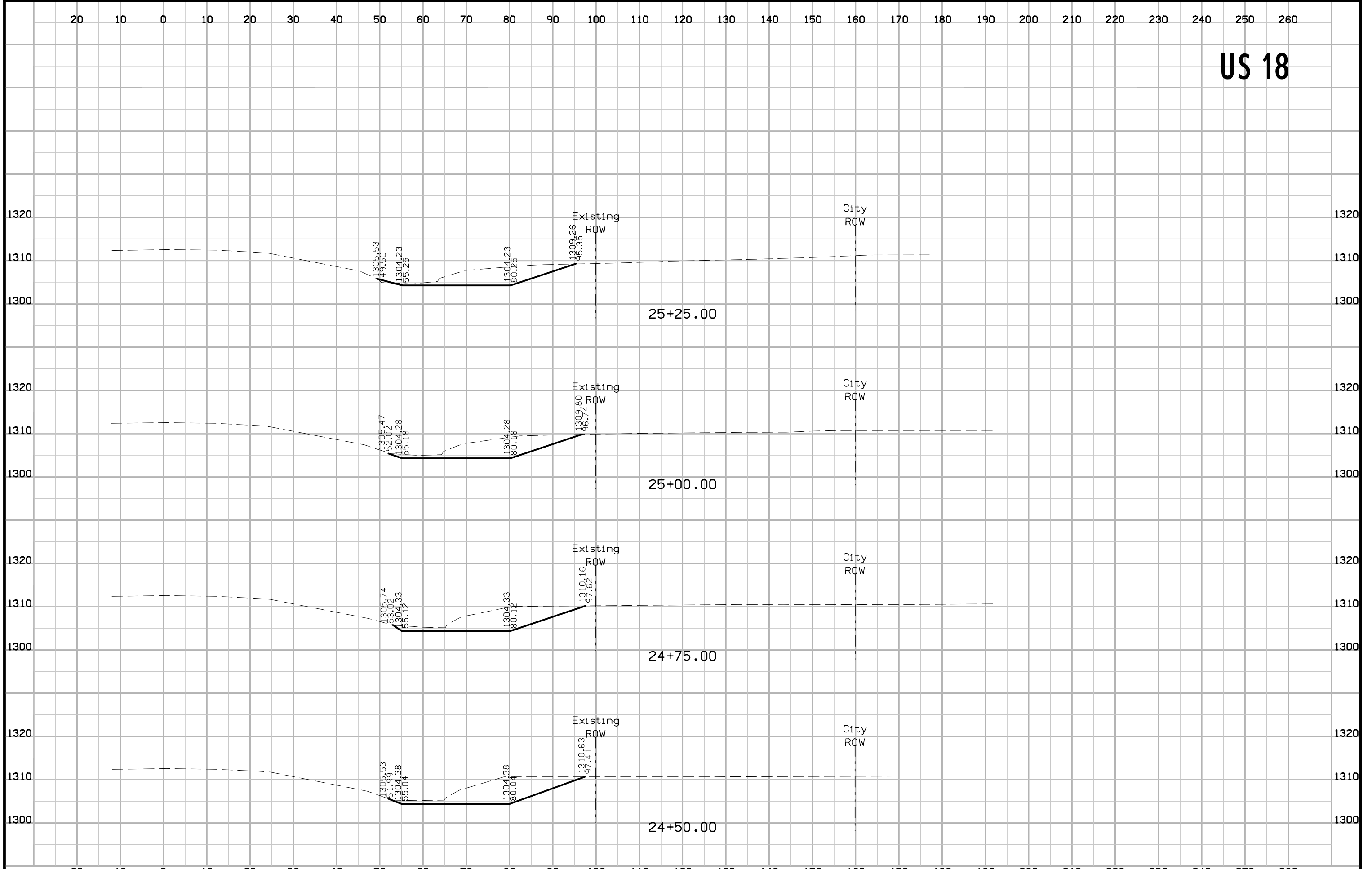
US 18



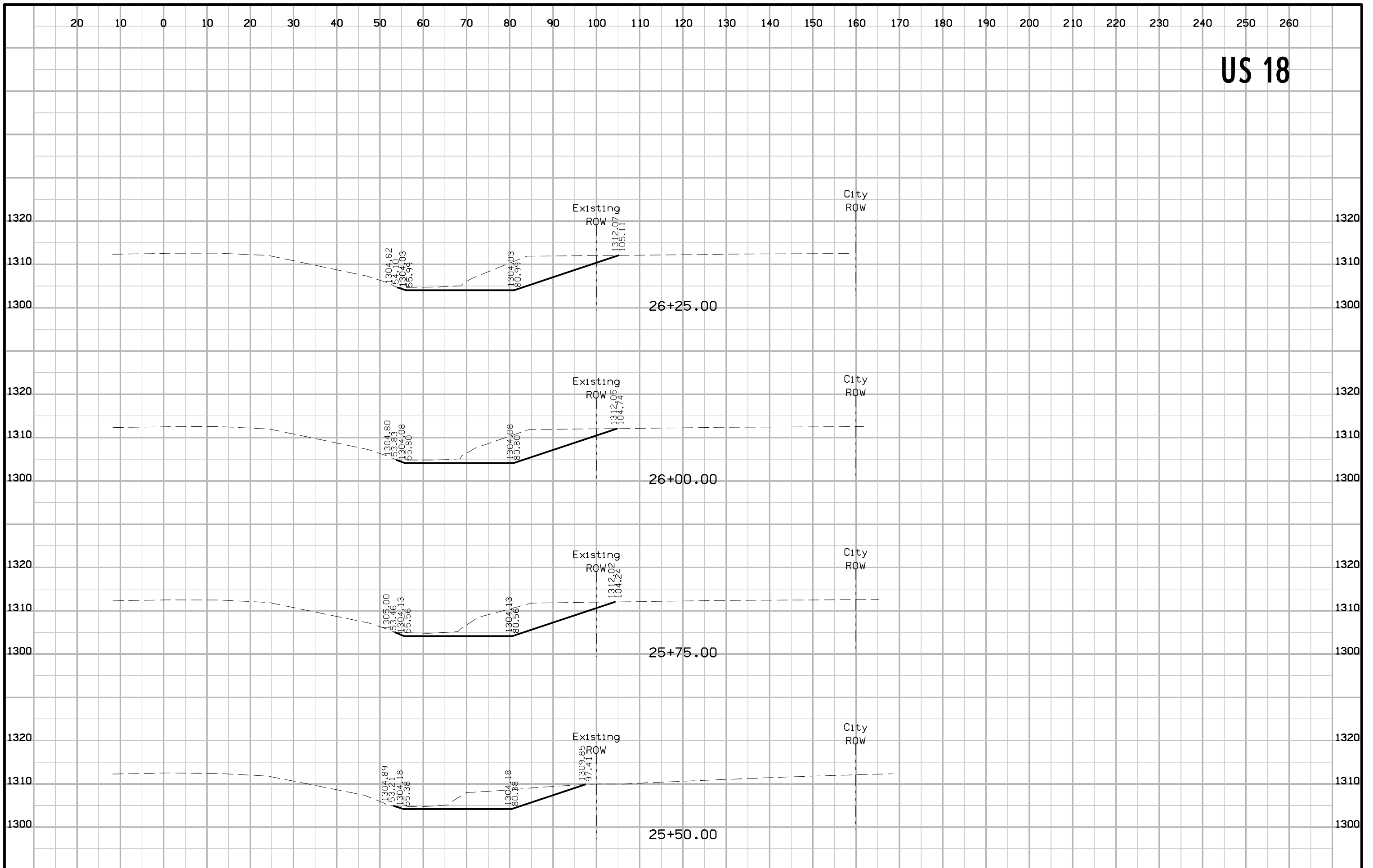
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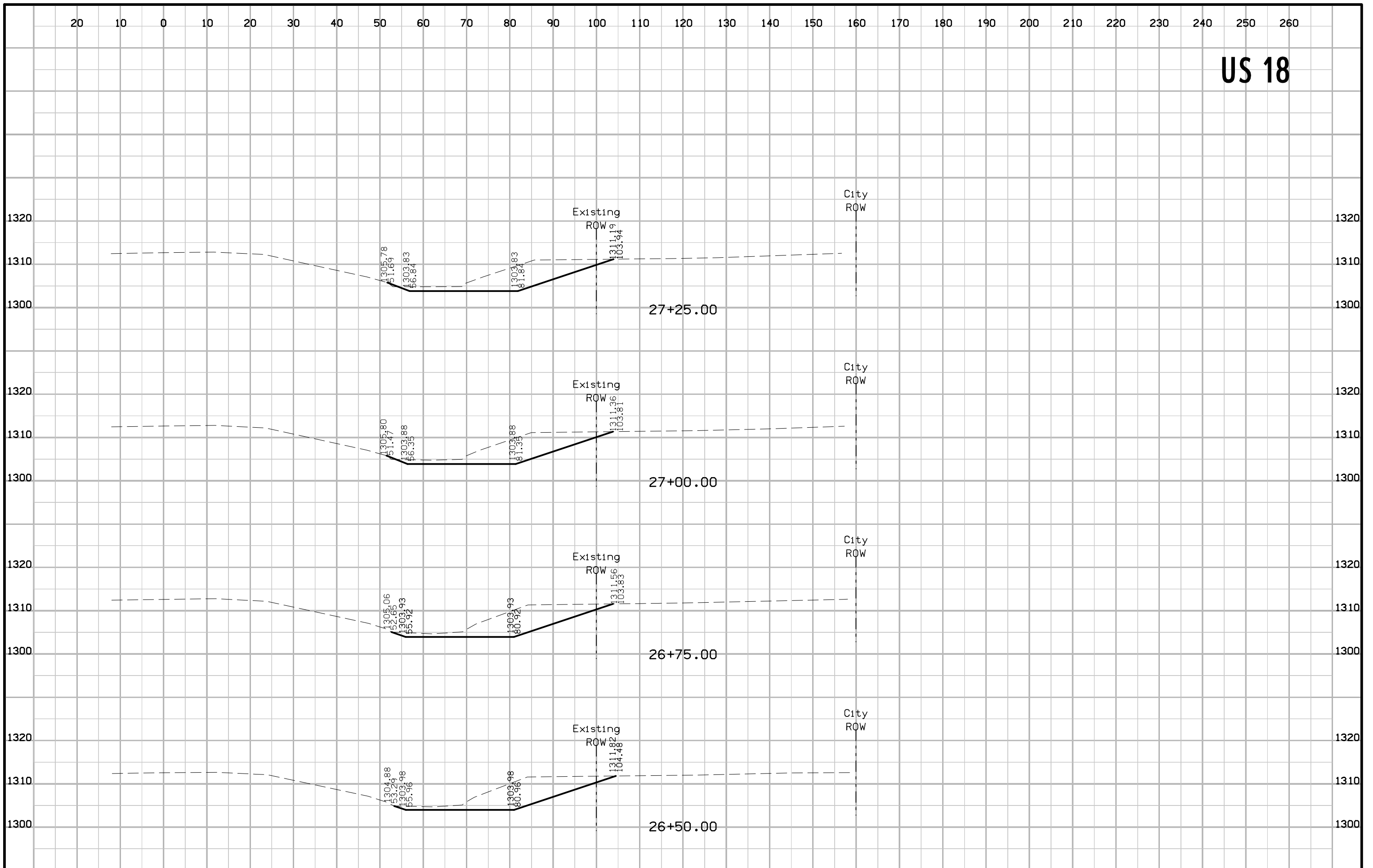
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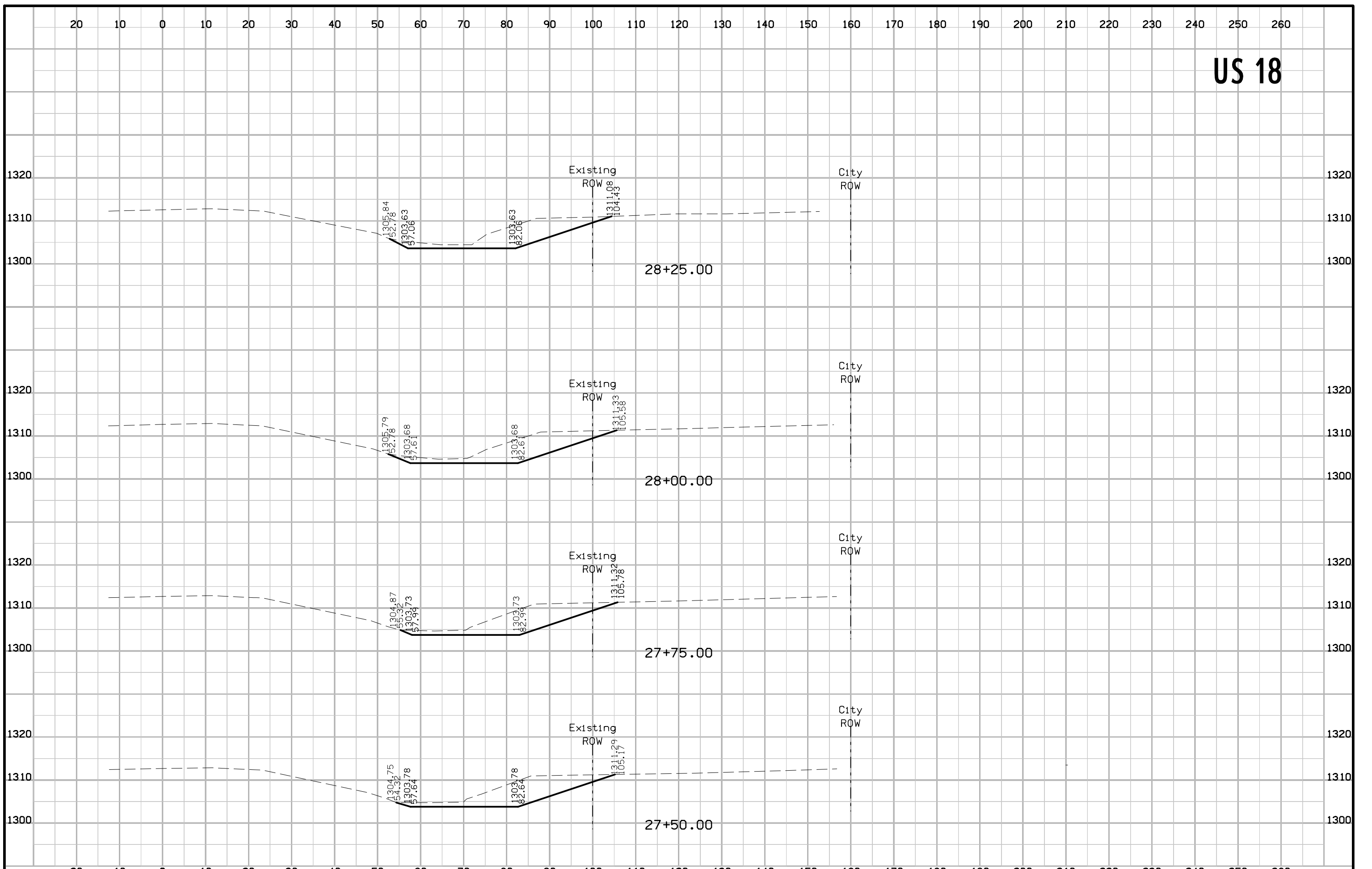
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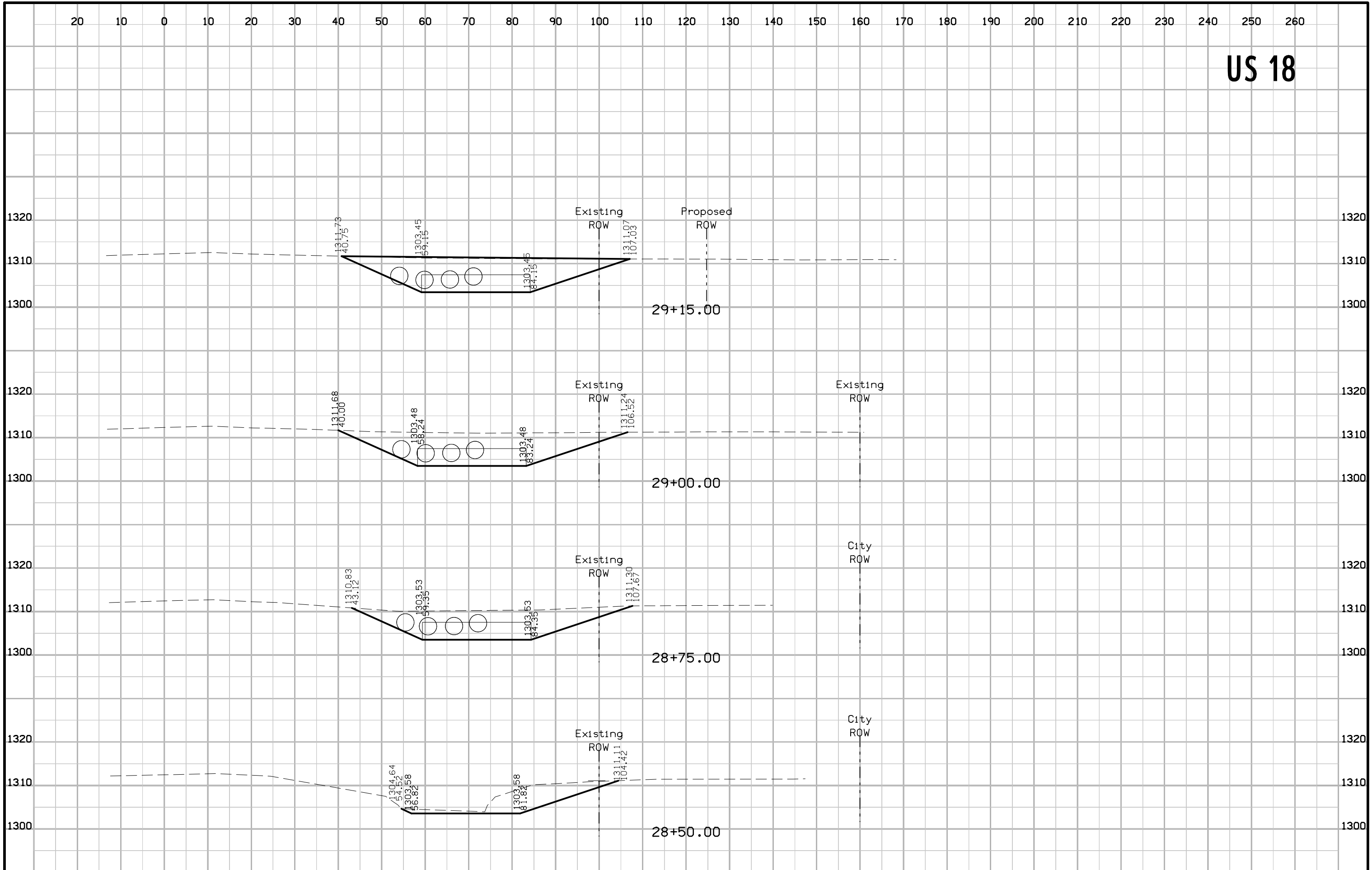
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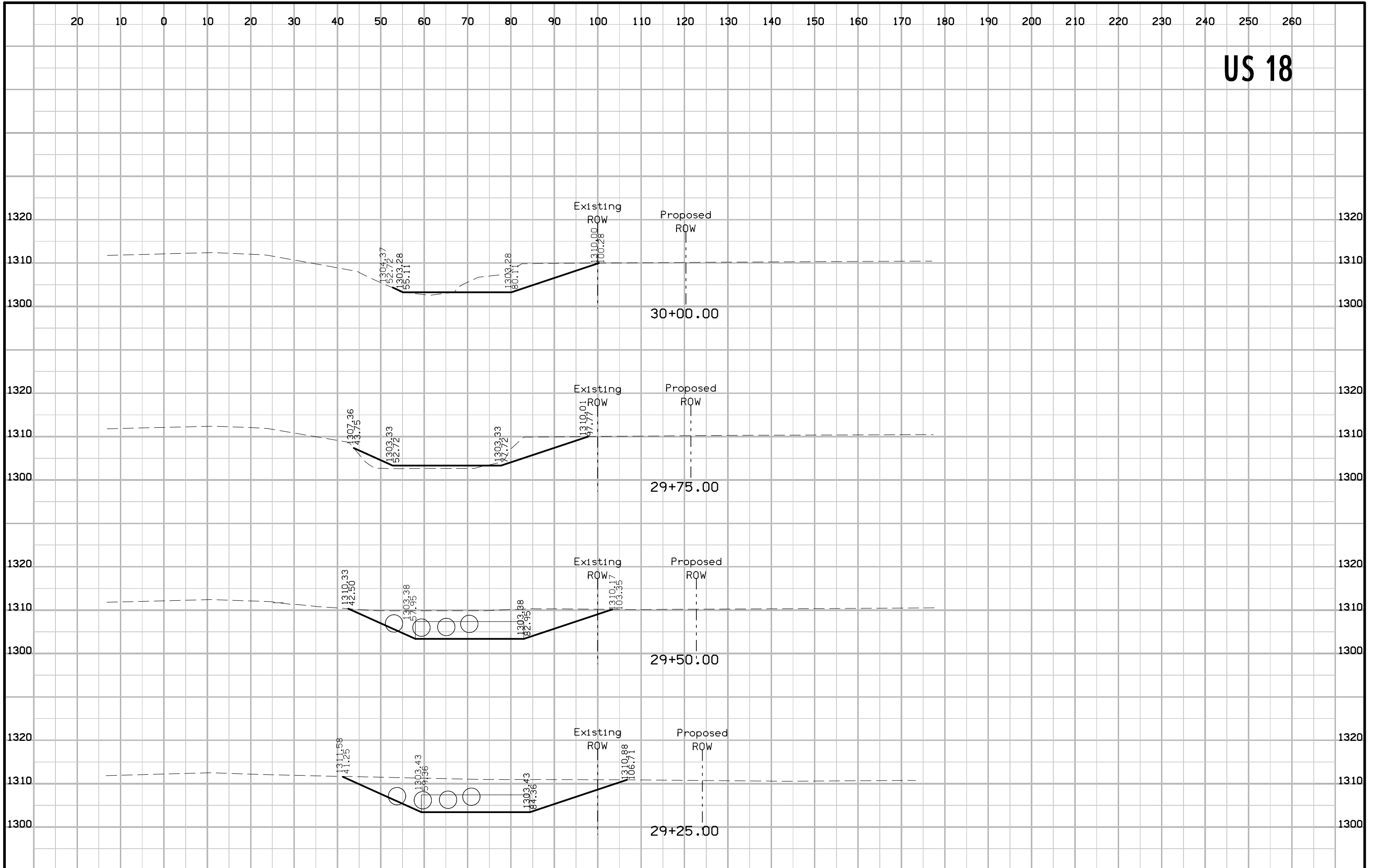
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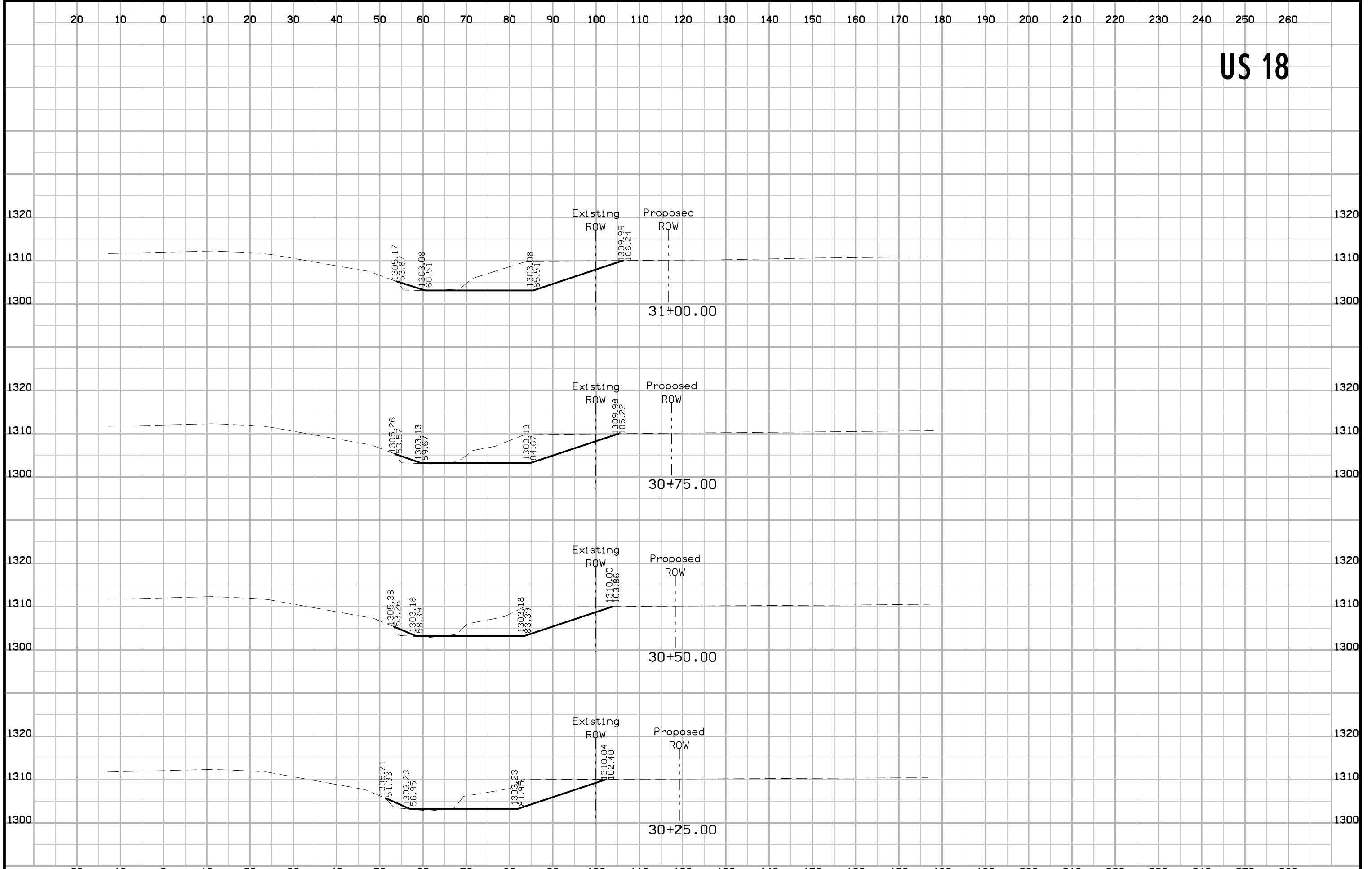
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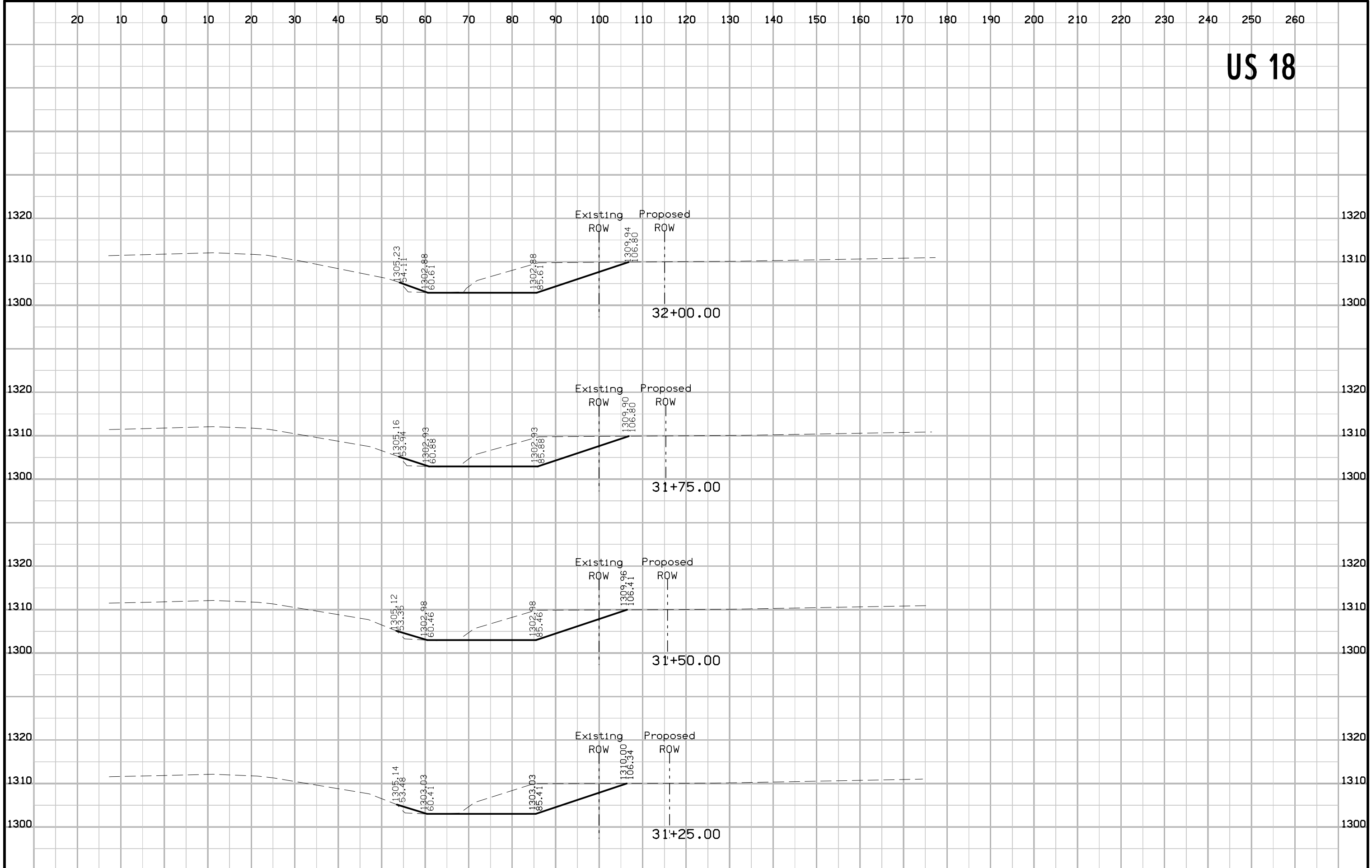
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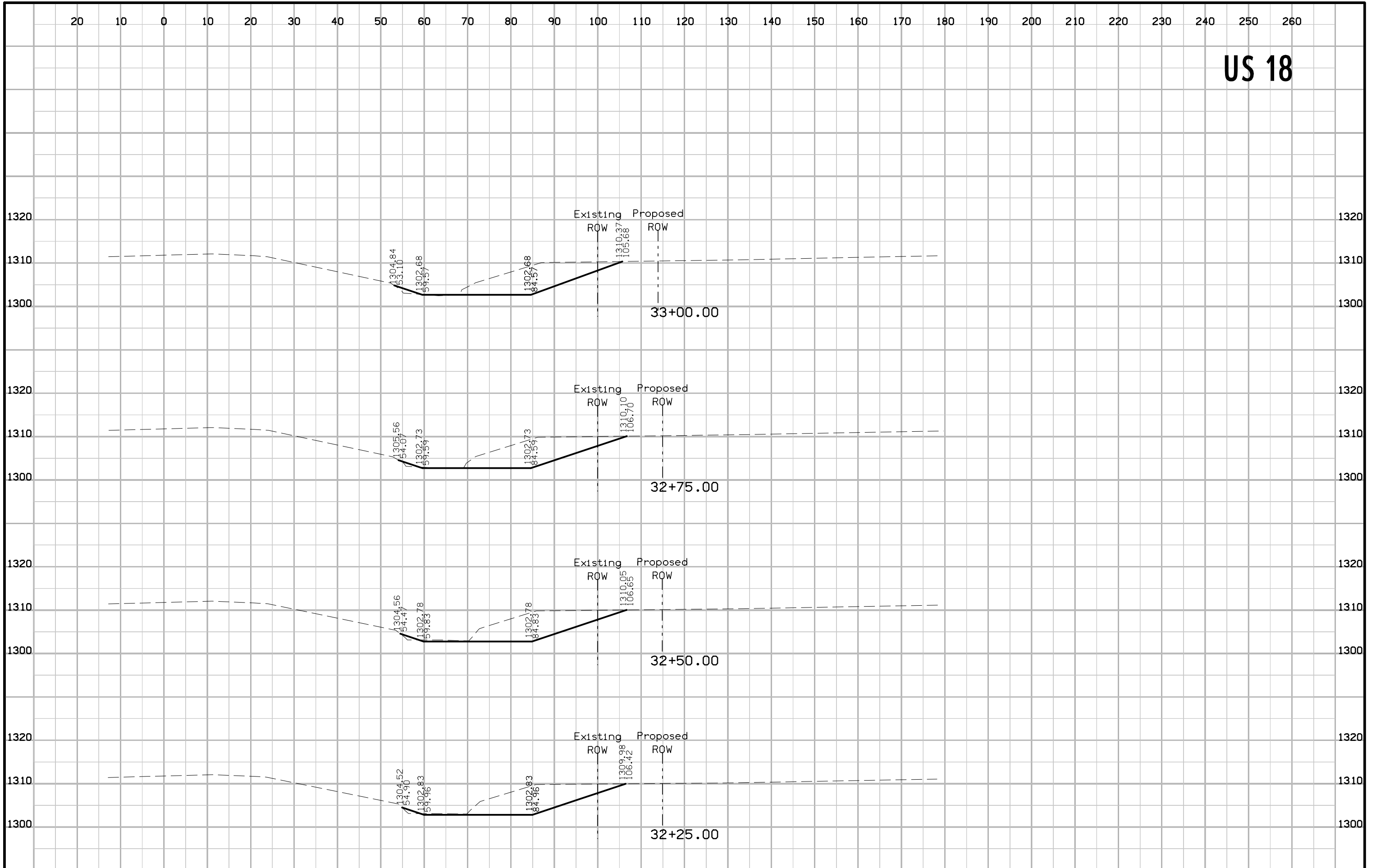
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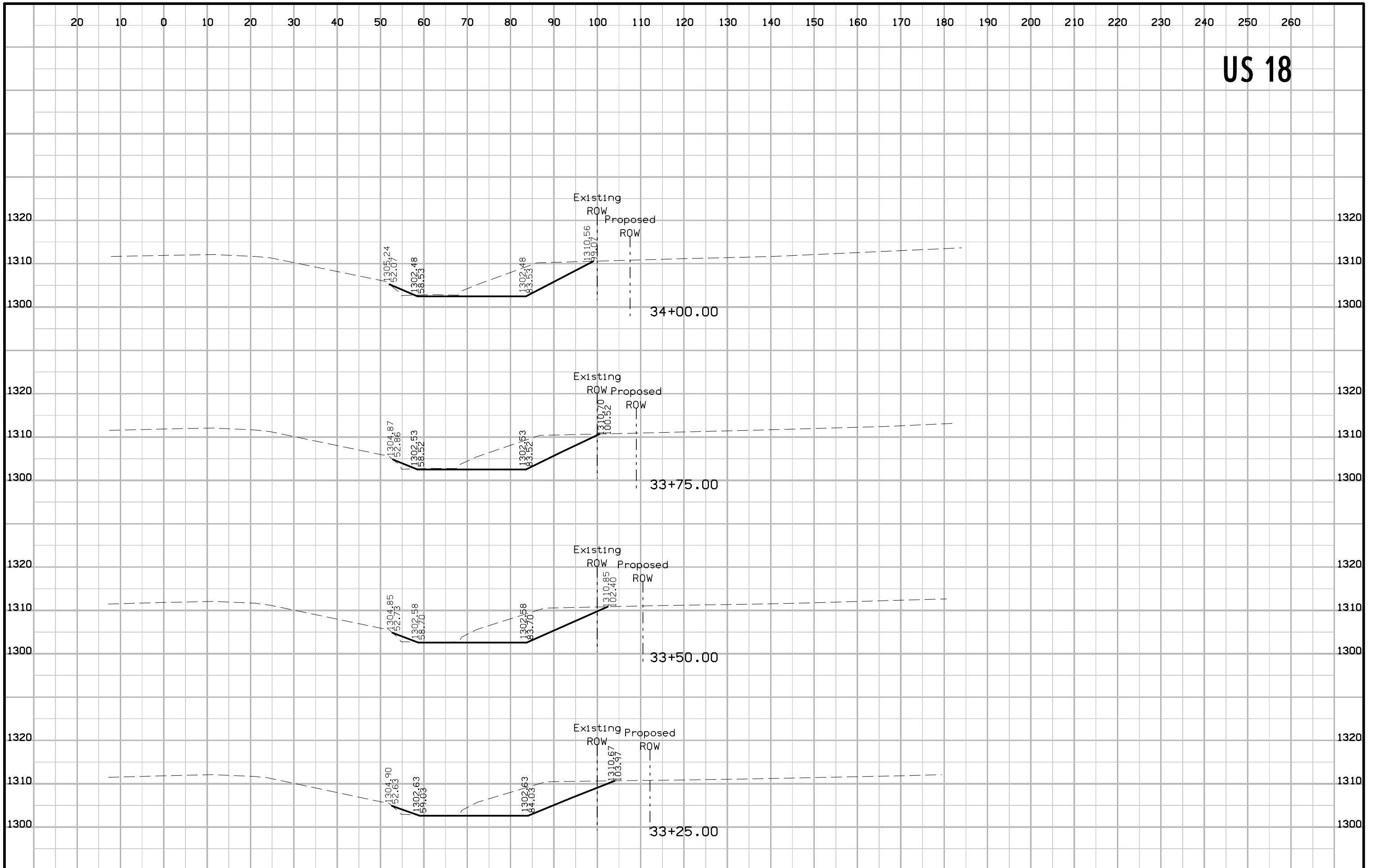
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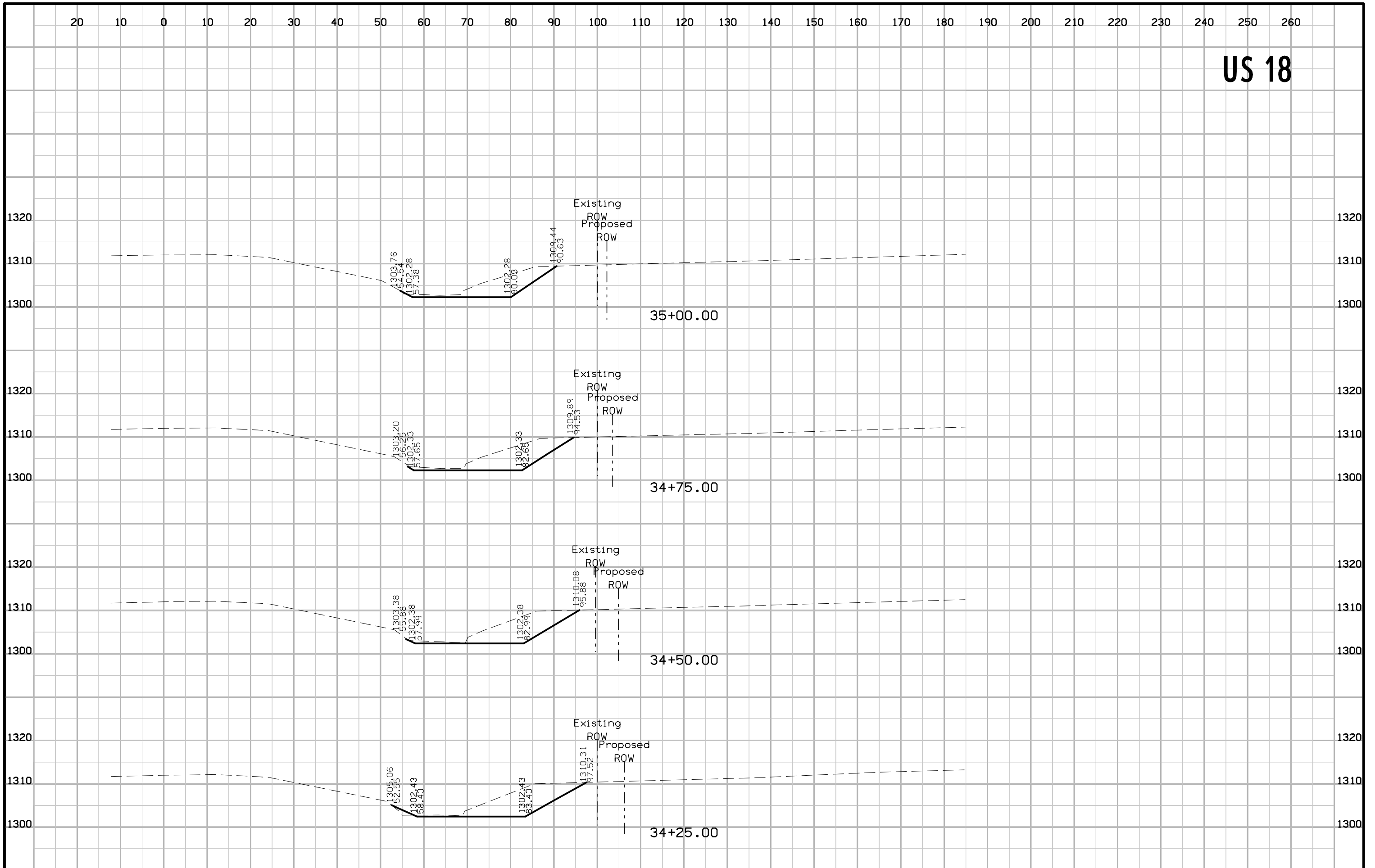
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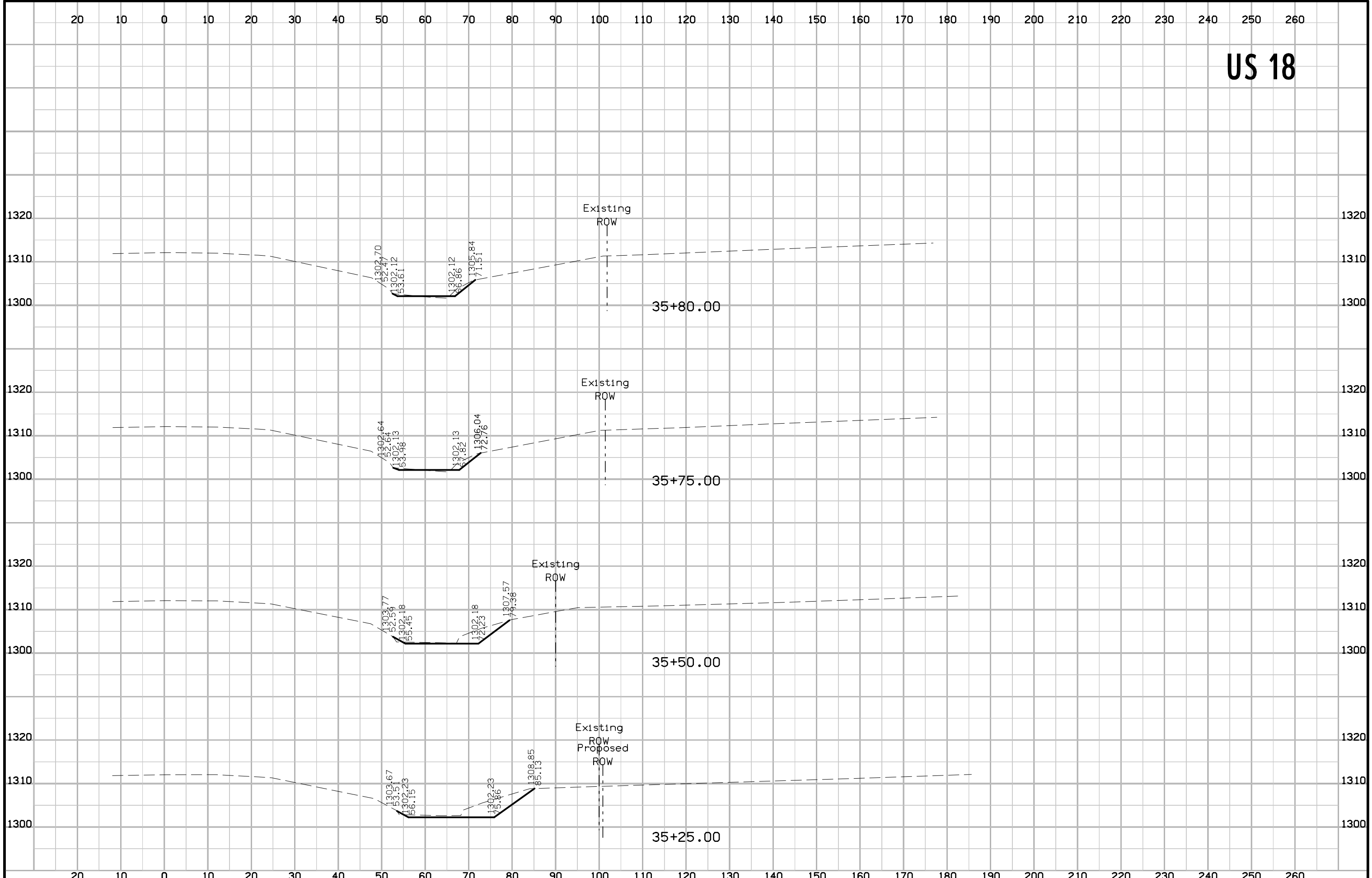
US 18



US 18

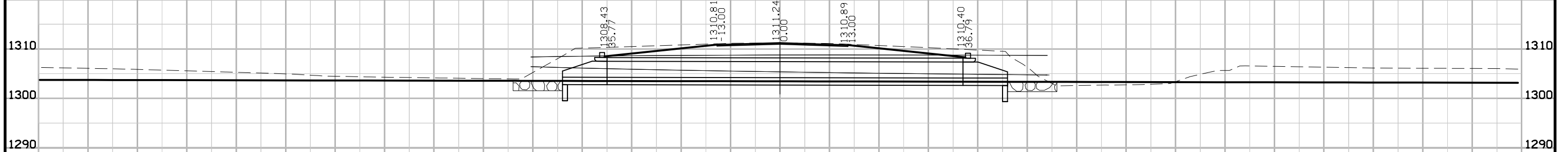


US 18



140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Ent



0+50.00