

BUENA VISTA CO.
RCB CULV. REP. - TWIN BOX
BRFN-003-2(70)--39-11

LETTING DATE
 Jan. 20, 2021



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

BUENA VISTA COUNTY

RCB CULVERT REPLACEMENT - TWIN BOX

Ditch 0.4 mi W of Co Rd M54

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
36

PROJECT IDENTIFICATION NUMBER

16-11-003-010

PROJECT NUMBER

BRFN-003-2(70)--39-11

R.O.W. PROJECT NUMBER

BRFN-003-2(70)--39-11

INDEX OF SHEETS

| No. | DESCRIPTION |
|-----------------|--|
| A Sheets | Title Sheets |
| A.1 | Title 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 | Channel Plan and Profile Sheets |
| * E.1 | Drainage Ditch |
| G Sheets | Survey Sheets |
| G.1 | Reference Ties and Bench Marks |
| G.2 - 3 | Control Point and Vicinity Map |
| J Sheets | Traffic Control and Staging Sheets |
| * J.1 | Traffic Control Plan |
| Q Sheets | Soils Sheets |
| Q.1 | Soils Sheets IA 3 |
| V Sheets | Bridge and Culvert Situation Plans |
| V.1 - 2 | Bridge and Culvert Situation Plans |
| W Sheets | Mainline Cross Sections |
| W.1 - 2 | IA 3 Cross Sections |
| X Sheets | Drainage Ditch Cross Sections |
| X.1 - 20 | Drainage Ditch Cross Sections |

Project Location

DESIGN DATA RURAL

| | | |
|--------------------|------|--------|
| 2018 AADT | 1800 | V.P.D. |
| 2038 AADT | 2400 | V.P.D. |
| 2038 DHV | 250 | V.P.H. |
| TRUCKS | 33 | % |
| Total Design ESALs | -- | |

INDEX OF SEALS

| SHEET NO. | NAME | TYPE |
|-----------|-----------------|-------------------------|
| A.1 | Mark D. Rooney | Primary Signature Block |
| V.1-V.2 | Brian Sandberg | Hydraulic Design |
| Q.1 | Bhooshan Karnik | Geotechnical Design |

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 11/9/2018

FILE NO.

ENGLISH

DESIGN TEAM IOWA DOT\McCLURE

BUENA VISTA COUNTY

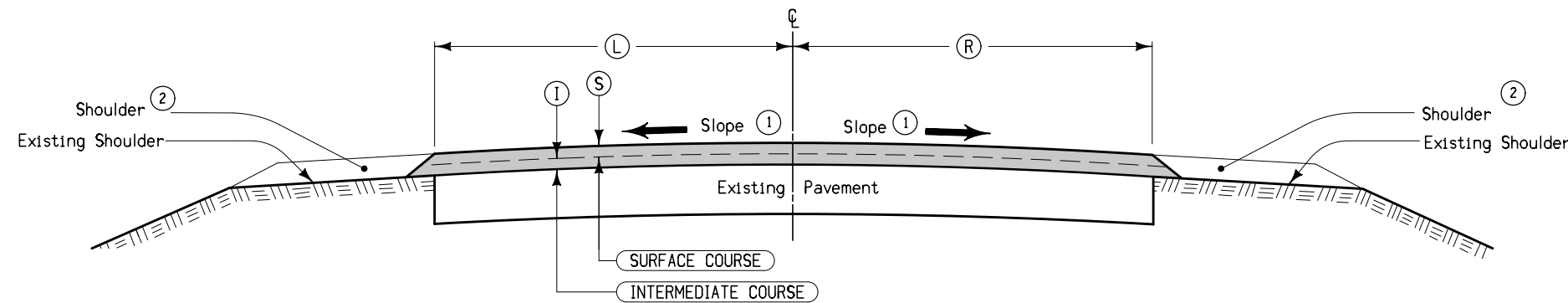
PROJECT NUMBER

BRFN-003-2(70)--39-11

SHEET NUMBER

A.1

SYSTEMTIME SYSTEMDATE USERNAME DGN SPEC

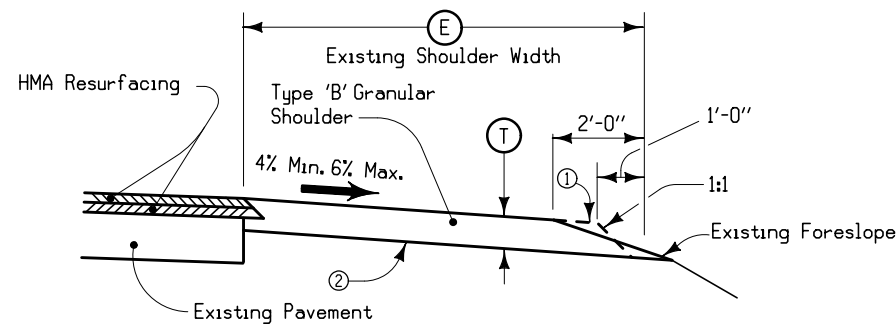


Notes:

- ① Match finished slope to existing pavement, except that the maximum allowable slope is 3.0 %, minimum allowable slope is 2.0 %. Section may be modified as directed by the Engineer through areas of special shaping.
Refer to tabulation listing of superelevated curves and Standard Road Plans for additional requirements through superelevated curves.
- ② Refer to shoulder typicals

| LOCATION | | (S) | (I) | (L) | (R) |
|---------------------|---------------------|--------|--------|------|------|
| ROAD IDENTIFICATION | STATION TO STATION | Inches | Inches | Feet | Feet |
| IA 3 | 400+89.07 405+59.43 | 1.5 | 1.5 | 14.0 | 14.0 |
| | | | | | |
| | | | | | |
| | | | | | |

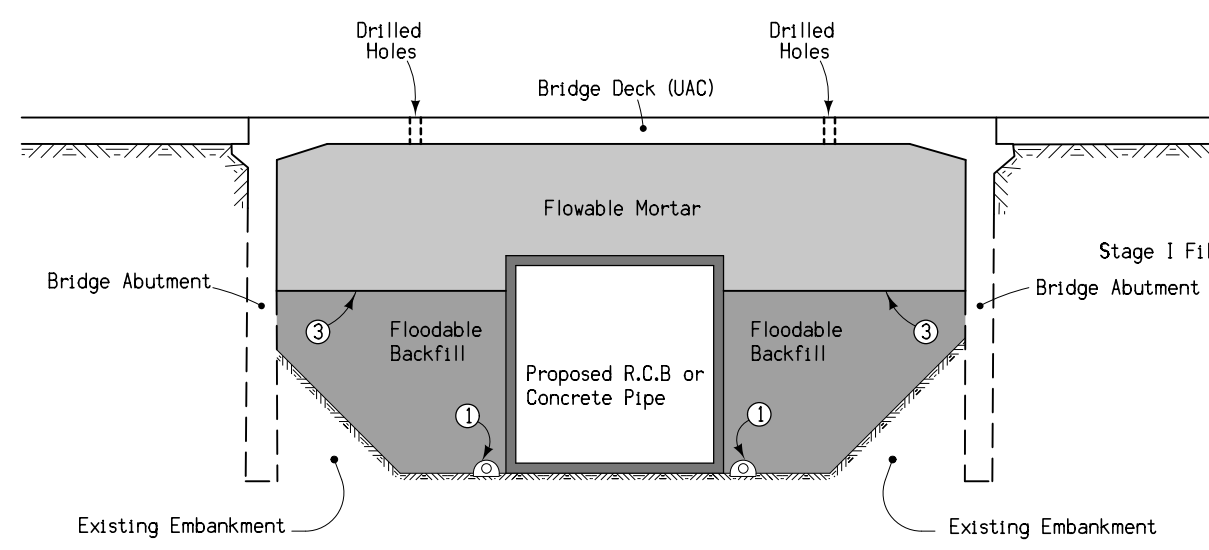
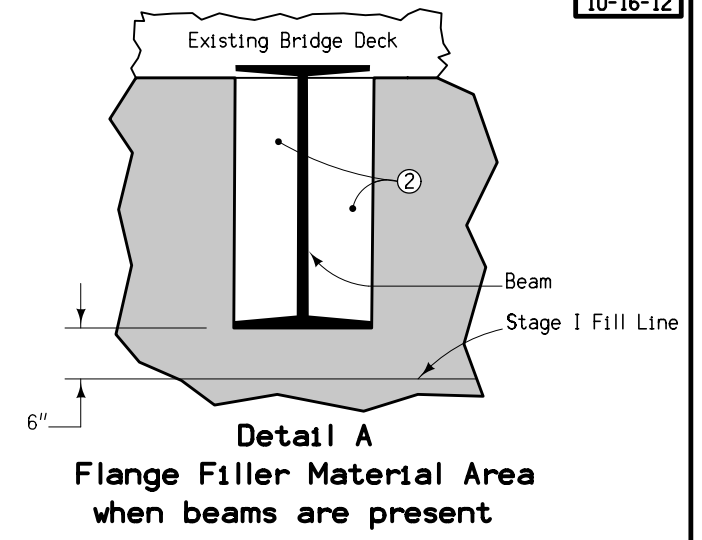
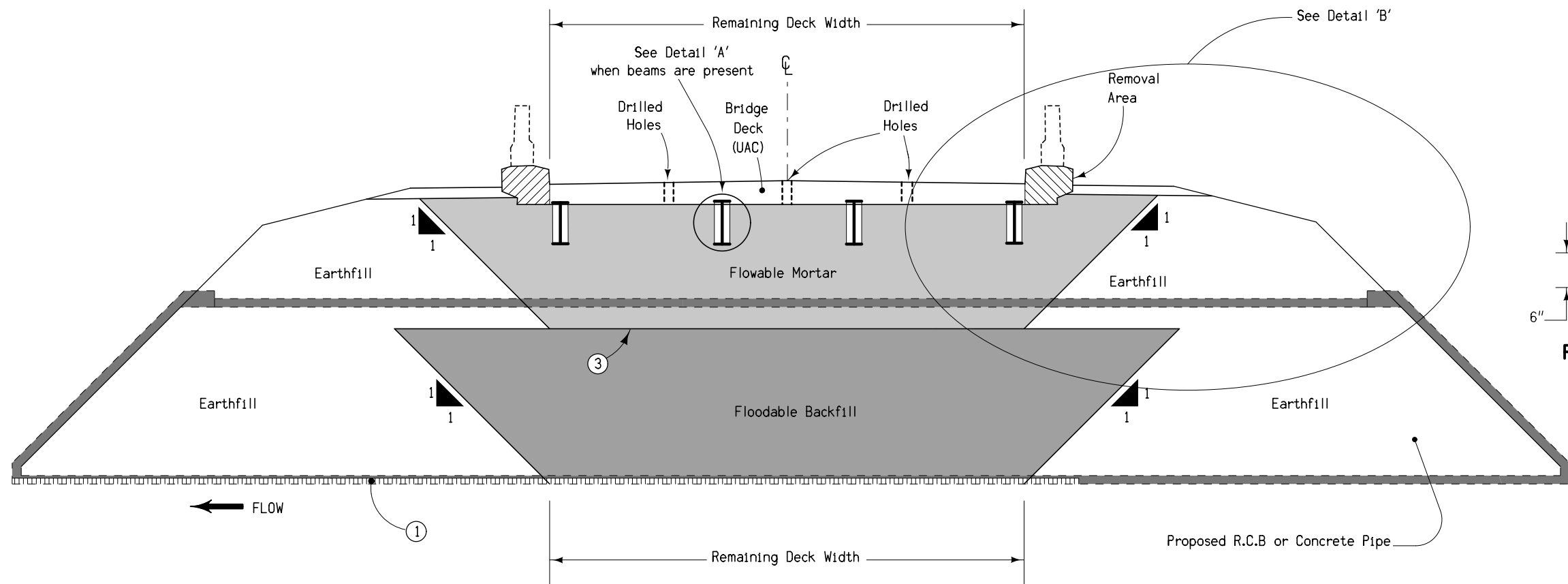
**TYPICAL CROSS SECTION
HMA RESURFACING**



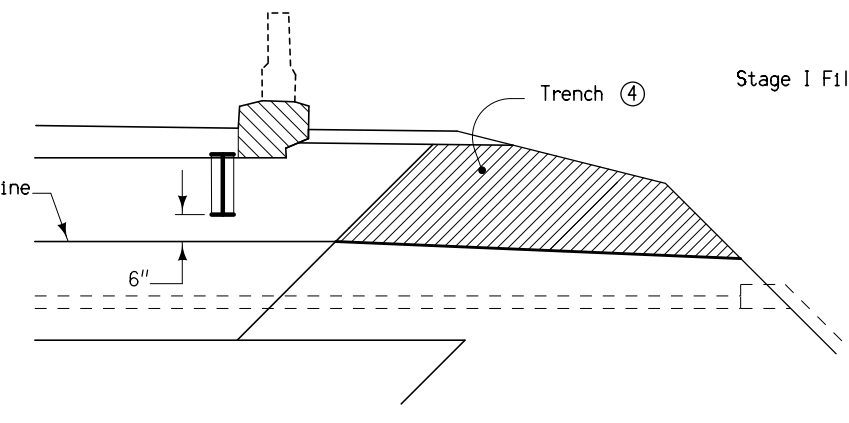
- ① Place and compact material to the dashed lines; then blade and shape to foreslope that portion above the solid line in the outer 2' and roll with loaded truck tire.
- ② Existing shoulder surface to be shaped to a uniform cross slope prior to placing granular shoulder material. Shape to ensure the thickness of the granular shoulder material is not less than the thickness of the resurfacing.

| LOCATION | | | (T) | (E) |
|---------------------|---------------------|------|--------|------|
| ROAD IDENTIFICATION | STATION TO STATION | SIDE | Inches | Feet |
| IA 3 | 400+89.07 402+39.07 | Rt. | 1.5 | 6 |
| IA 3 | 402+39.07 403+09.43 | Rt. | 1.5 | 6 |
| IA 3 | 403+09.43 405+59.43 | Rt. | 1.5 | 6 |
| IA 3 | 400+89.07 402+39.07 | Lt. | 1.5 | 6 |
| IA 3 | 402+39.07 403+09.43 | Lt. | 1.5 | 6 |
| IA 3 | 403+09.43 405+59.43 | Lt. | 1.5 | 6 |
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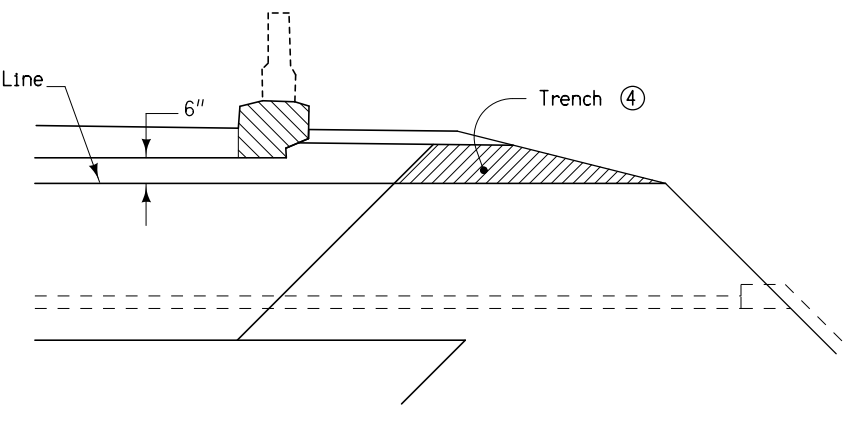
**TYPICAL SECTION
FOR TYPE 'B'
GRANULAR SHOULDER
ADJACENT TO HOT MIX ASPHALT
RESURFACING**



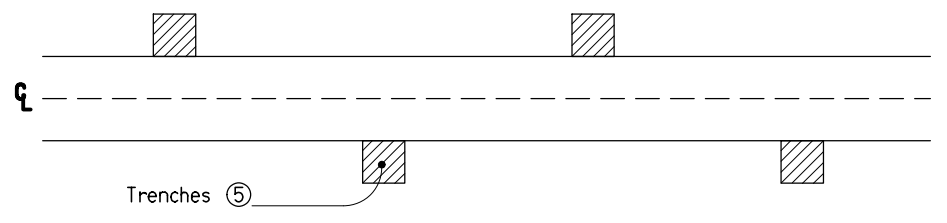
Section along Centerline



Detail B (Beam Bridge)



Detail B (Slab Bridge)

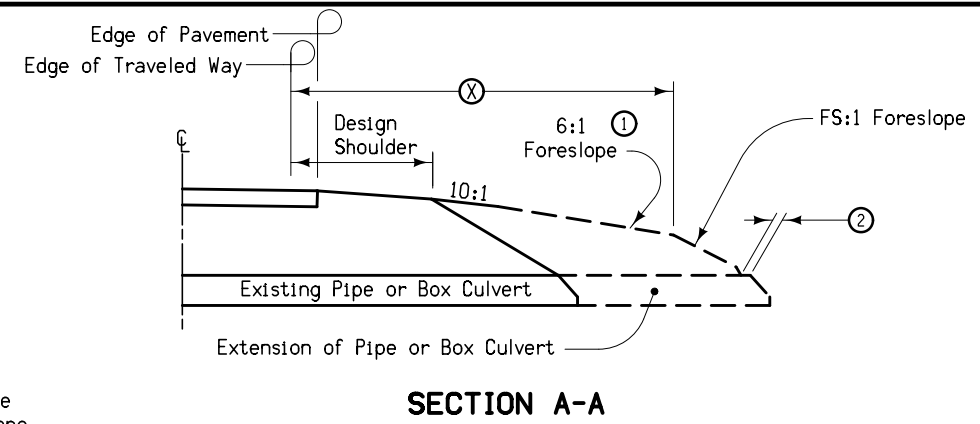
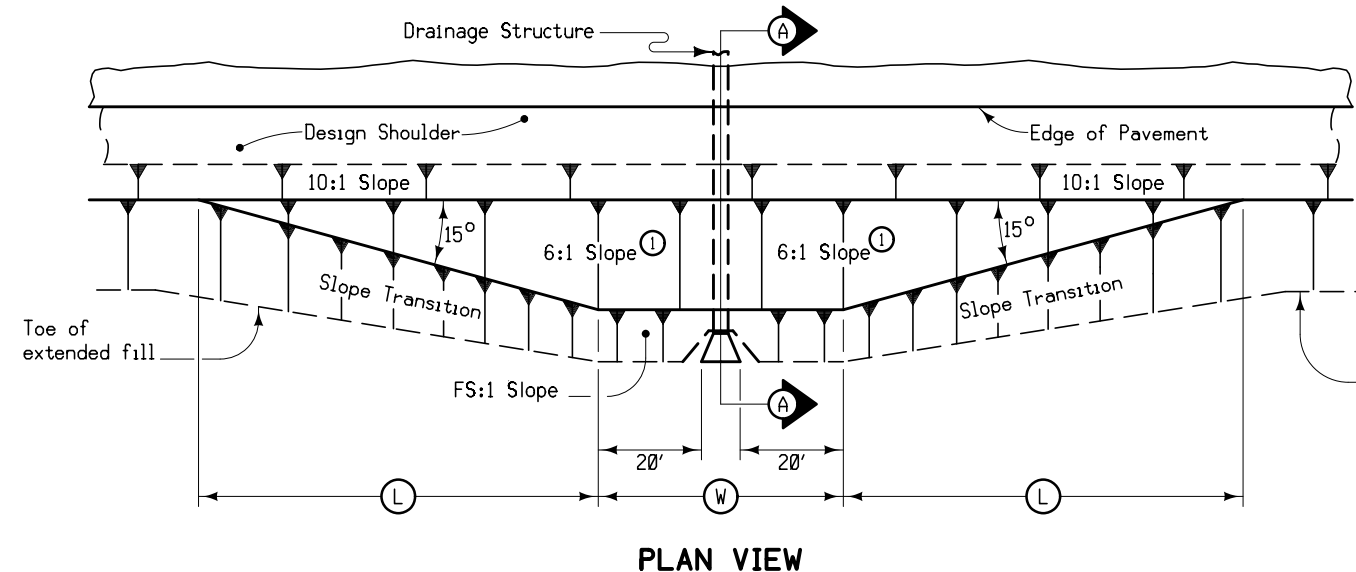


Trench Layout

Denotes pay limits for flowable mortar
 Denotes pay limits for flooded backfill

- ① 4" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
- ② Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.
- ③ Fill void with the maximum amount of Floodable Backfill possible. Distance from Floodable Backfill to bridge beams (when present) or bridge deck shall not exceed 5'.
- ④ Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
- ⑤ Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.

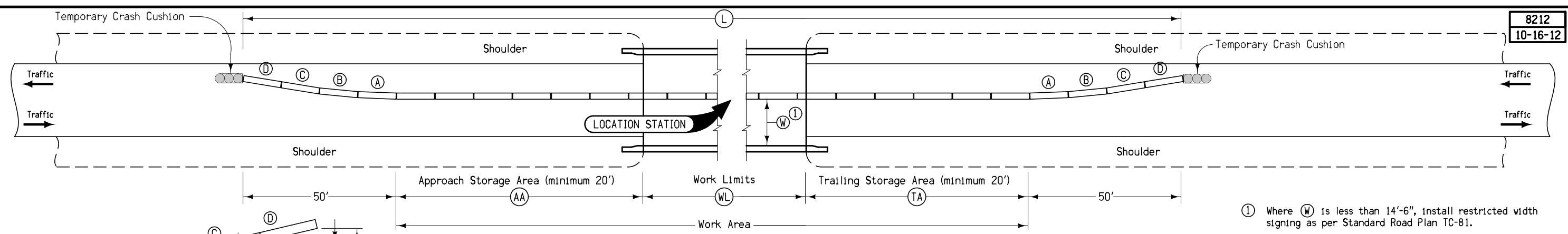
FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS



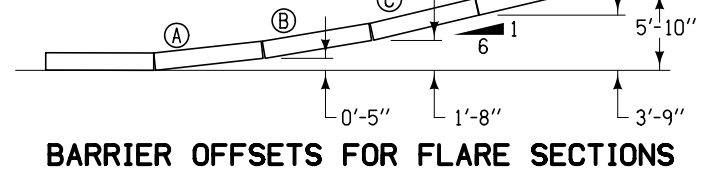
- Notes:
- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6".
 - ① Slope may be flatter than 6:1.
 - ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
 - Ⓜ = Pipe or R.C.B. opening width plus 20 feet each side.

| STRUCTURE LOCATION | | Ⓜ | Ⓛ | Ⓧ | ⓕⓈ |
|--------------------|------|-------|-------|------|----|
| STATION | SIDE | Feet | Feet | Feet | |
| 402+80.60 | LT | 97.84 | 86.16 | 31 | 3 |
| 402+80.60 | RT | 98.56 | 96.31 | 29 | 3 |

BARNROOF FORESLOPE AT DRAINAGE STRUCTURE



- ① Where Ⓜ is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.



| Station | Side | ⓂⓂ | ⓂⓁ | Ⓜⓐ | Ⓜ | Anchored X | Ⓜ | Remarks |
|-----------|------|------|------|------|------|------------|-----------|---------|
| | | Feet | Feet | Feet | Feet | | Ft-Inches | |
| 402+80.60 | | | | | | | 14 | |

TEMPORARY CONCRETE BARRIER LAYOUT for Two-Way Traffic

SURVEY SYMBOLS

- CP Control Point
- PCP Photo Control Point
- WC Wild Card (Misc. Field Shot)
- SNP Unpaved Shoulder
- ==== EP Edge of Paved Roads (ML or SR)
- C Centerline BL of Road (ML or SR)
- - - - - ENU Edge Unpaved Entrance & Parking
- - - - - ENT Centerline BL of Entrance
- ==== CU Back of Curb
- ==== GU Gutter In Front of Curb
- ==== GDL Guard Rail Steel
- ==== CON Concrete or A/C Slab
- ==== BRG Bridge
- BD Bridge Deck
- BCL Bridge Centerline
- SBR Size of Bridge
- TIL Tile Line
- OUT Tile Outlet
- - - - - D Centerline Draw or Stream (Down)
- BL Topo Breakline
- ==== LIN Miscellaneous Line
- BNK Stream Bank
- - - - - DU Centerline Draw or Stream (Up)
- PPA Power Pole Co. 1
- TP TPD Telephone Pedestal
- ==== PIP Pipe Culvert
- SOP Size of Pipe or Culvert
- EW Edge of Water
- DTM Photogrammetry Elv Control Check
- BLS Bridge Low Steel
- BM Bench Mark
- FENO FENO Monument
- ⊗ PCT Photo Control Target
- F0 - FO1D Fiber Optic Windstream - Quality D

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

- PPA Power Pole Iowa Lakes Electric
- F0 - FO1D Fiber Optic Windstream - 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 |

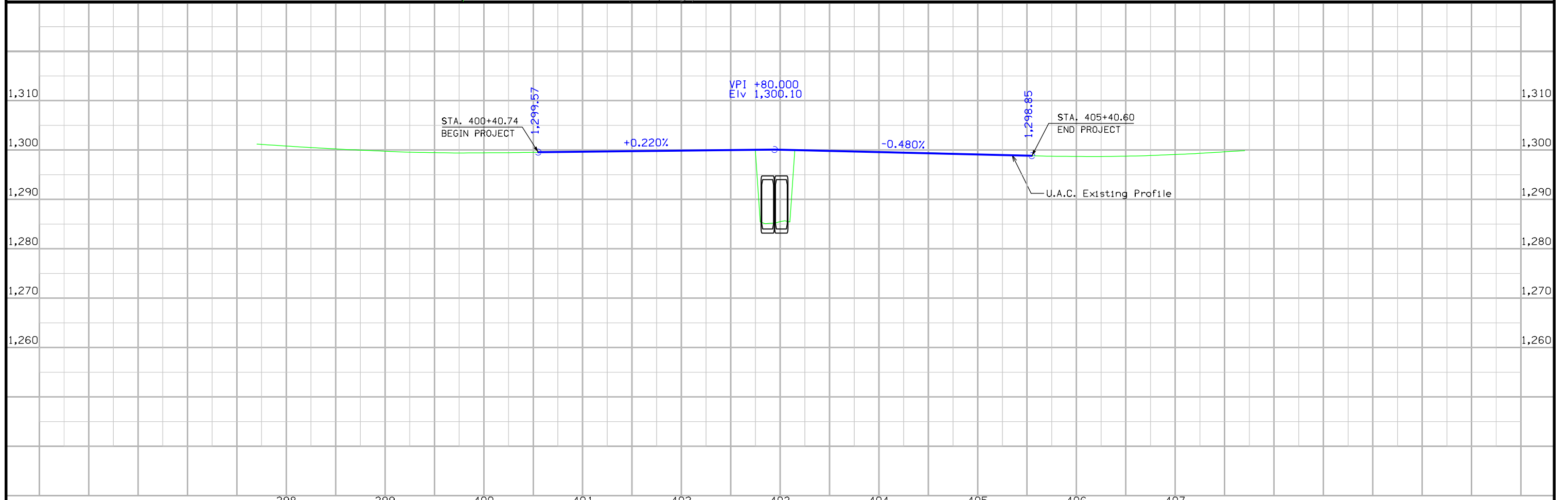
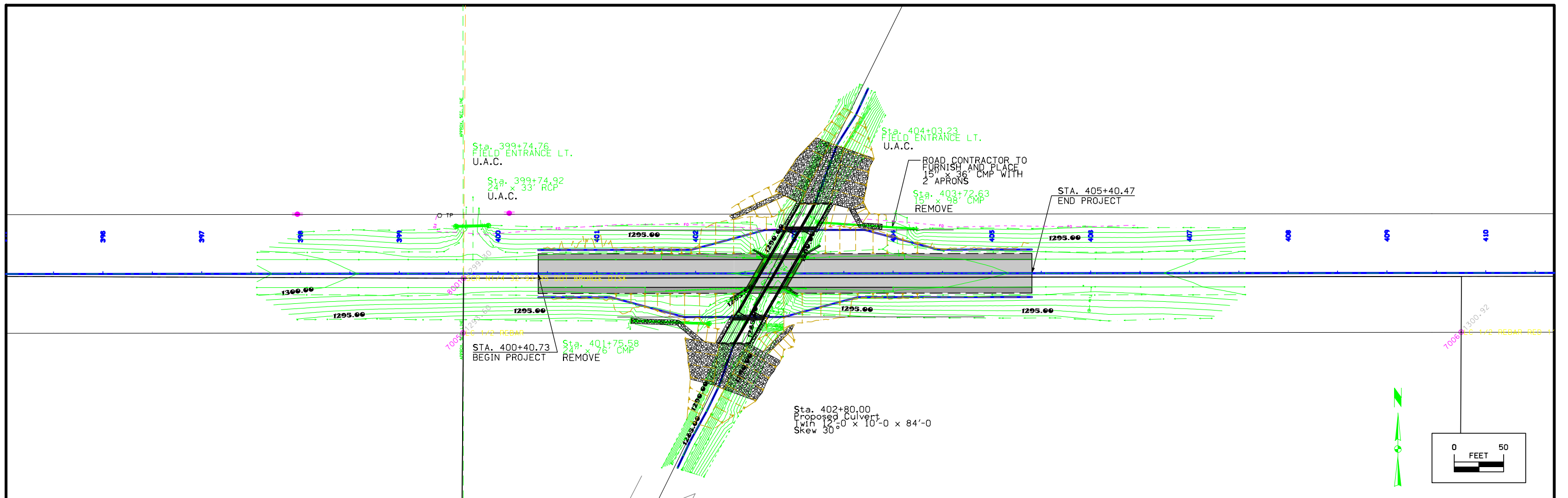
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

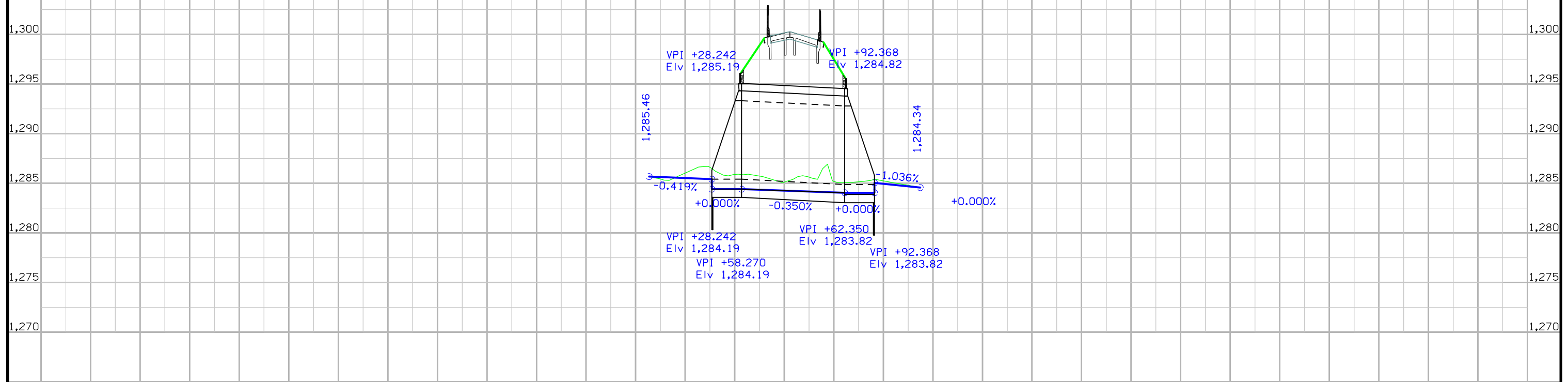
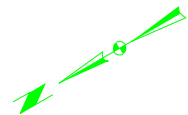
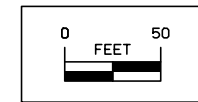
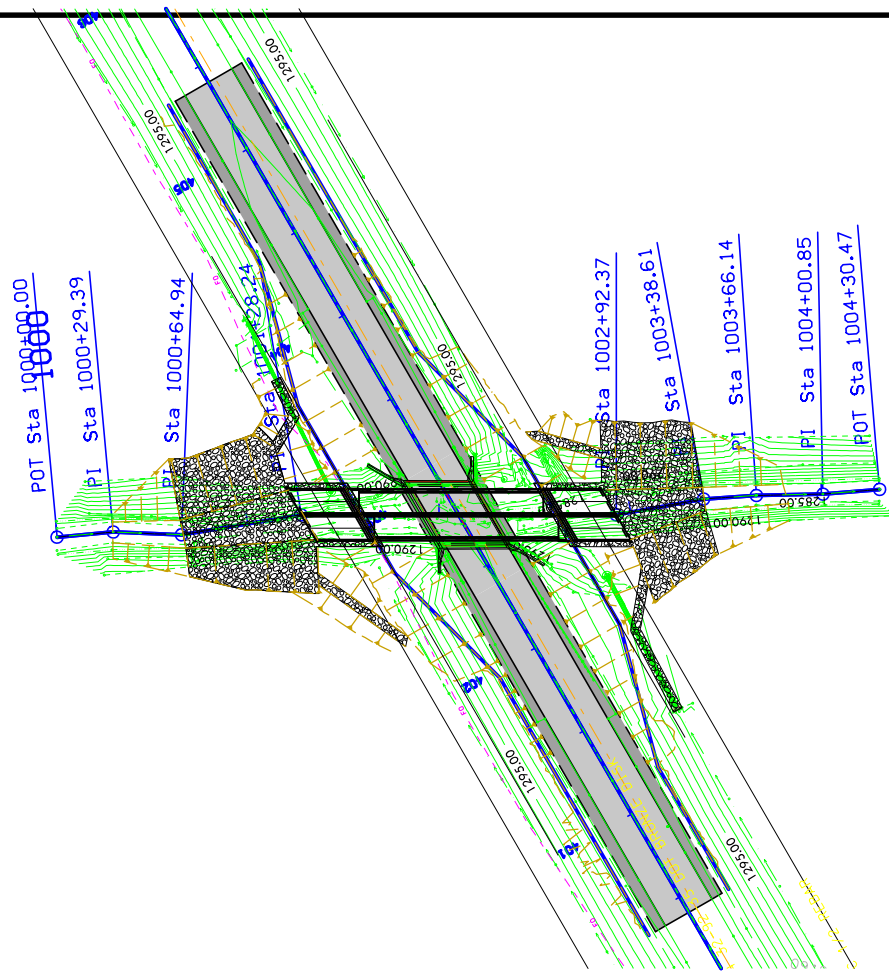
RIGHT-OF-WAY LEGEND

- ▲ 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)





Survey Information

Buena Vista County
BRFN-003-2(70)--39-11
Ditch 0.4mi W of Co Rd M54
RCB Culvert Replacement
PIN 16-11-003-010
Sap-0904

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge replacement along Iowa Highway 3. Project datum and control information is provided by Design Survey Office. UAS Aerial survey was used to develop dirt surface.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12B). GRS80 Ellipsoidal Height was computed at project Pt. FENO_2_2017 by doing 4 concurrent 6-hour static observations on Control Points 1,2, V22, FENO_2_2017. The project control is relative to nearby Iowa RTN Base Stations.

This survey observed 1 NGS Control Monuments with published NAVD88 heights to compare to local ground control:

NGS 2nd. order class 0 mark designated V 22 has a published Elev. Of 1236.07
Survey Elev. = 1236.34

Horizontal Control

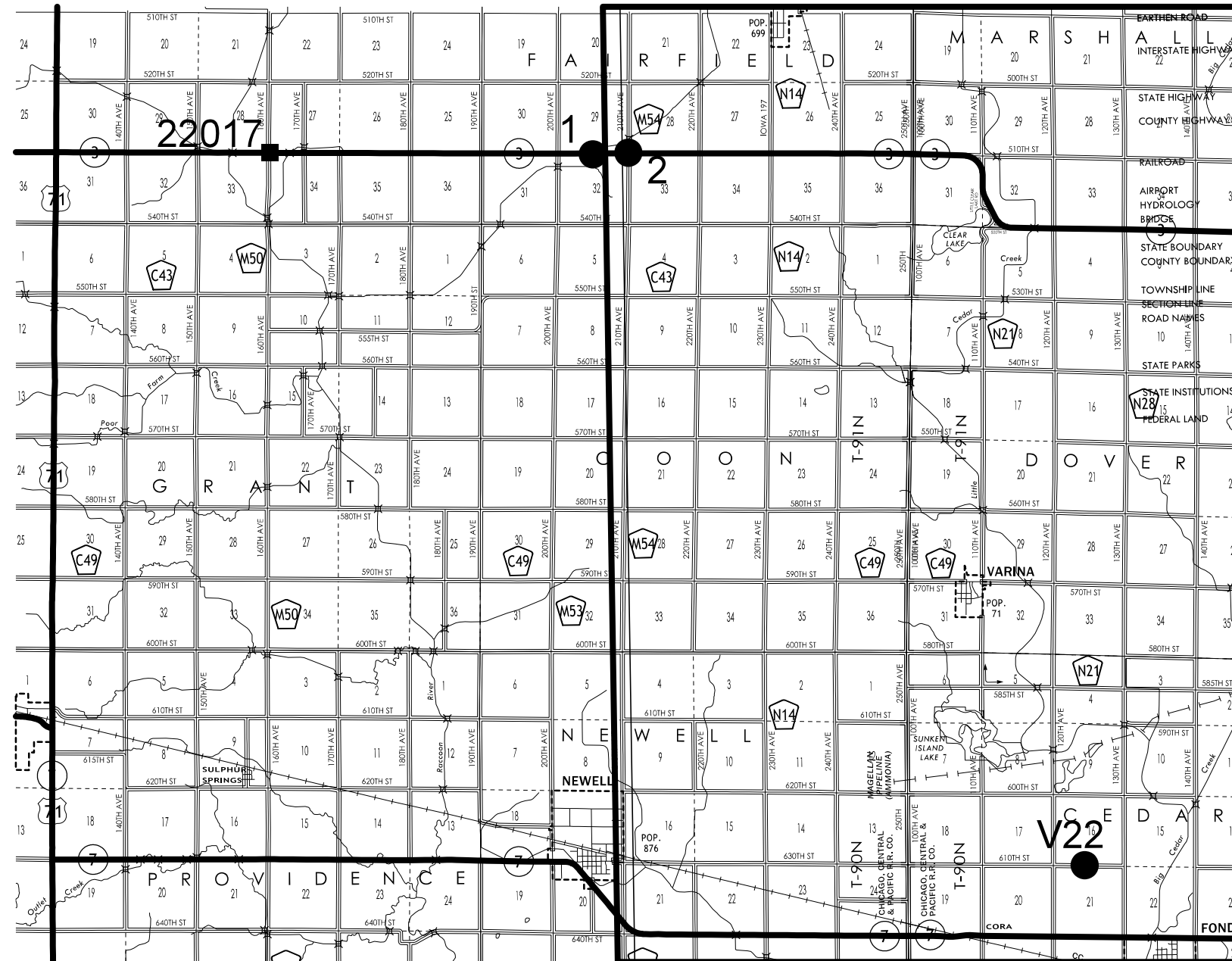
The project coordinate system for this survey is Iowa RCS Zone 4 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting 4 concurrent 6- hour static observations. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to point 1.

Alignment Information

Horizontal alignment was 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 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 4

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 4

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

Fairfield TWP
T92N R35W
Sec. 29



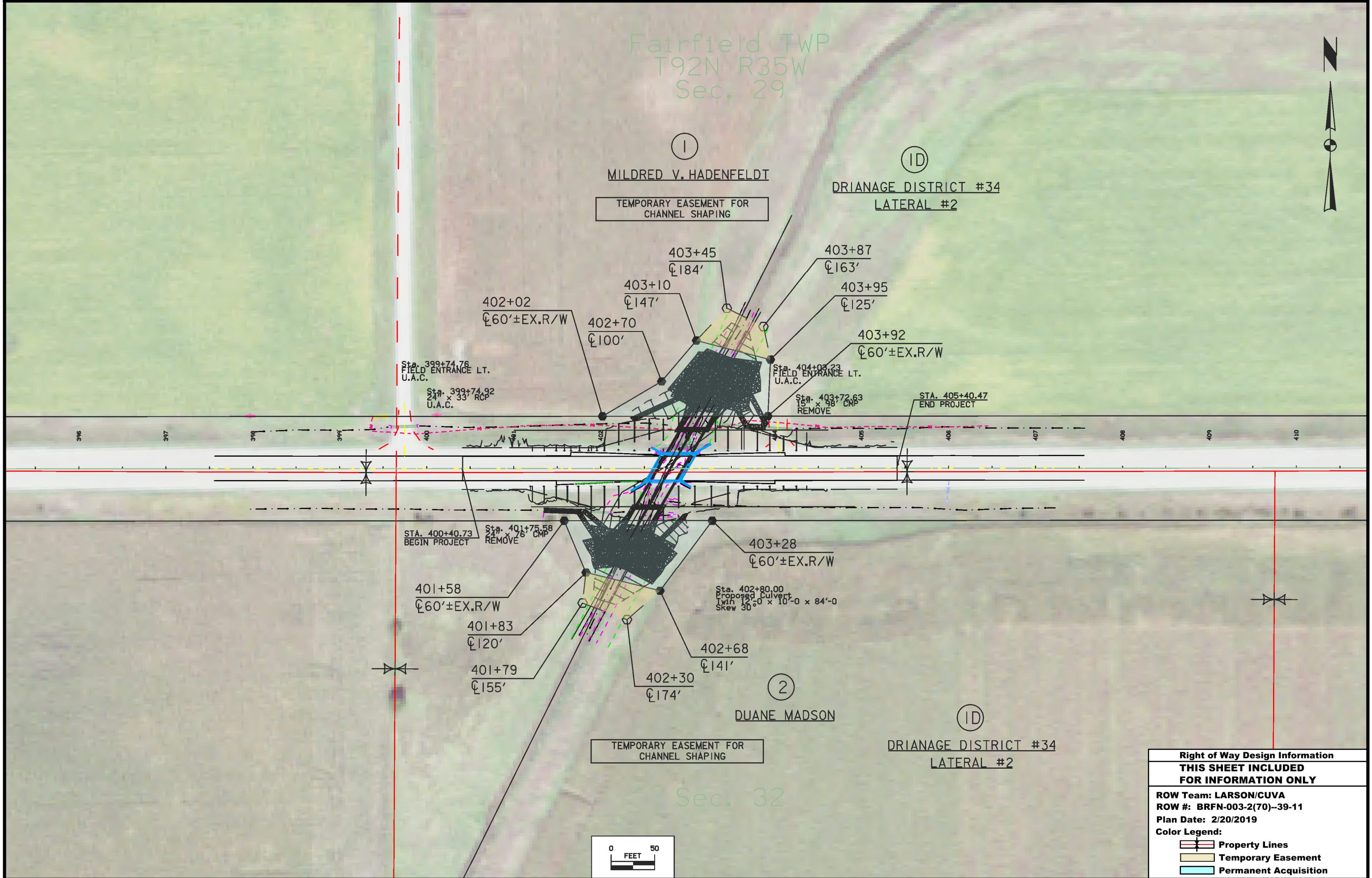
①

MILDRED V. HADENFELDT

TEMPORARY EASEMENT FOR CHANNEL SHAPING

①D

DRIANAGE DISTRICT #34
LATERAL #2



②

DUANE MADSON

TEMPORARY EASEMENT FOR CHANNEL SHAPING

①D

DRIANAGE DISTRICT #34
LATERAL #2

Sec. 32



| | |
|---|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: LARSON/CUVA | |
| ROW #: BRFN-003-2(70)--39-11 | |
| Plan Date: 2/20/2019 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |

108-23A
08-01-08

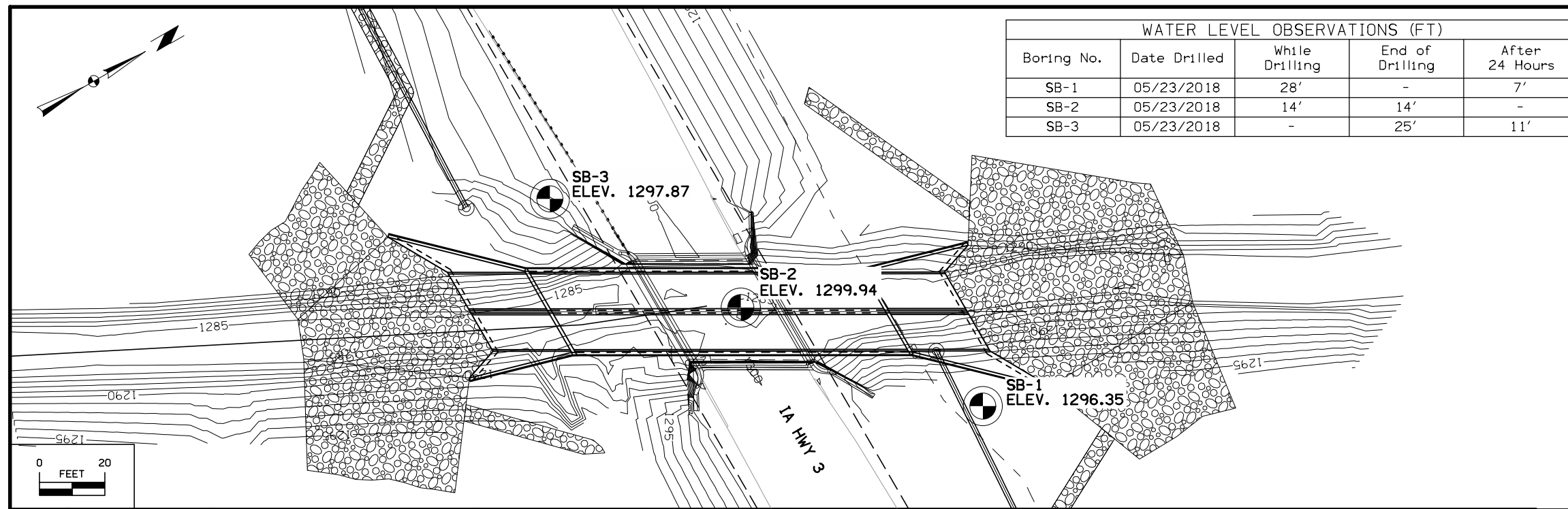
TRAFFIC CONTROL PLAN

Traffic will be maintained at all times. One lane of traffic shall be maintained with the used of flaggers while removal of bridge barrier rail is being completed.

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 are expected. | | | | | | | | | |



| WATER LEVEL OBSERVATIONS (FT) | | | | |
|-------------------------------|--------------|----------------|-----------------|----------------|
| Boring No. | Date Drilled | While Drilling | End of Drilling | After 24 Hours |
| SB-1 | 05/23/2018 | 28' | - | 7' |
| SB-2 | 05/23/2018 | 14' | 14' | - |
| SB-3 | 05/23/2018 | - | 25' | 11' |

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.

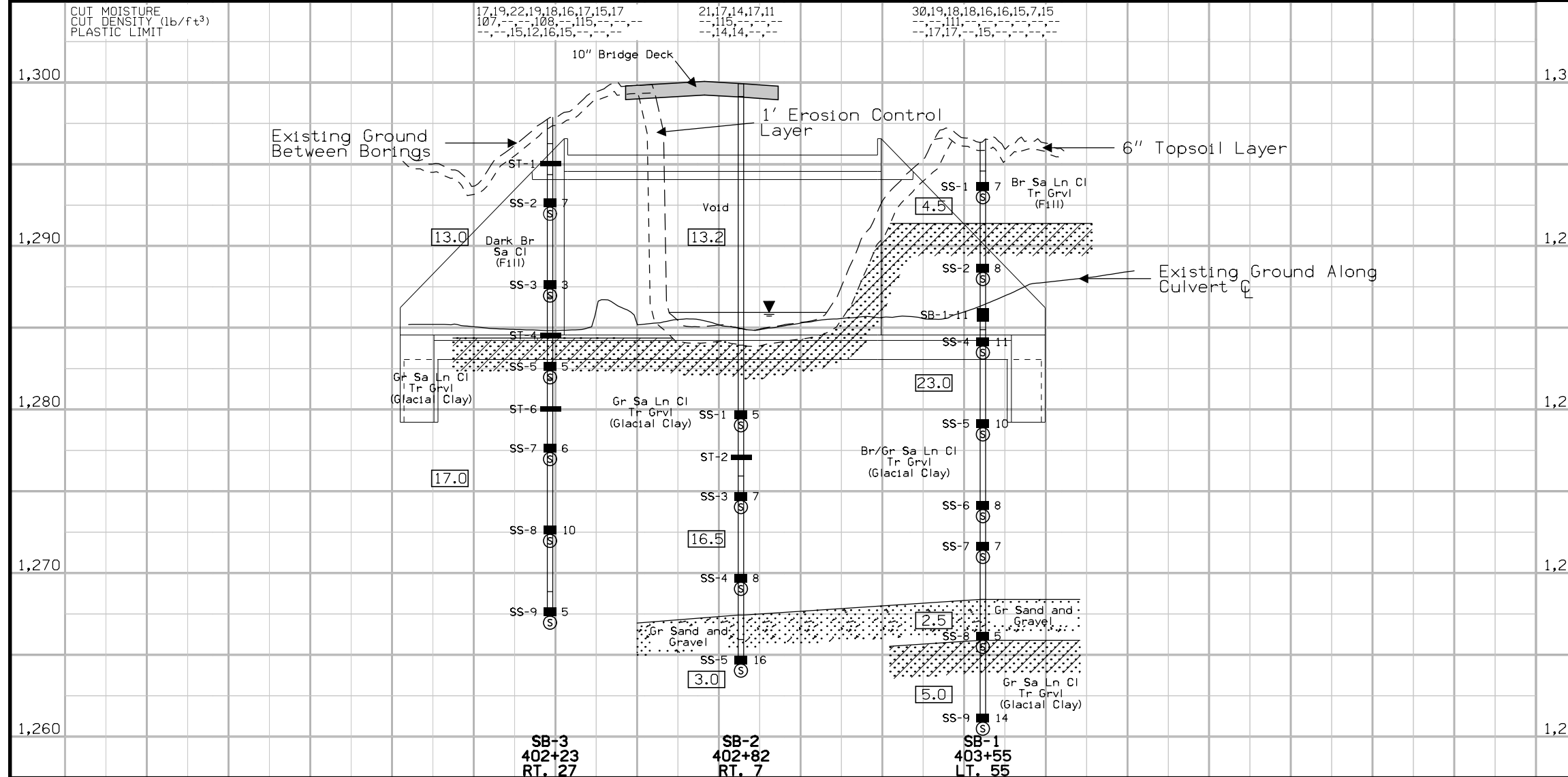
Signature _____ Date _____
 Bhooshan A. Karnik
 Printed or Typed Name
 My license renewal date is December 31, 2019.

Pages or sheets covered by this seal: **Q.1**

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

SHELBY TUBE CORE DATA

| CORE NO. | SB-1-11 |
|---|------------|
| DEPTH IN FEET | 9.0 - 11.0 |
| CLASSIFICATION (AASHTO) | A-6 (6) |
| COEFF. CONSOL. (ft ² /DAY) | - |
| TRIAxIAL COMPRESSION | CU |
| COHESION - PSF (TOT./EFF.) | 432/216 |
| FRICTION ANGLE - DEGREES (TOT./EFF.) | 20.3/31.6 |
| MOISTURE CONTENT % | 18 |
| DRY DENSITY - PCF | 111 |
| CU-CONSOLIDATED UNDRAINED | |
| UU-UNCONSOLIDATED UNDRAINED | |
| UC-UNCONFINED COMPRESSION (σ=1/2 σ _u) | |



LOCATION

IA 3 BRIDGE OVER DRAINAGE DITCH
 T-92N R-35W
 SECTION 29/32
 FAIRFIELD TOWNSHIP
 BUENA VISTA COUNTY
 FHWA NO. 16240
 BRIDGE MAINT. NO. 1189.2S003
 LATITUDE 42.749193°
 LONGITUDE -95.002174°

| [3.0] SOIL LAYER THICKNESS | | ROCK CORE | | BLOW COUNT | | LEGEND | |
|----------------------------|-------------|-----------|-------------|------------|---------------|----------|-------------------------|
| SAMPLE NUMBER | REC'D/ROD'D | NUMBER | REC'D/ROD'D | NUMBER | NO. BLOWS | | |
| RI | 100/85 | RI | 100/85 | SS-2 | 5 | [Symbol] | SOIL REMEDIATION AREA |
| [Symbol] | WATER | [Symbol] | SHELBY | [Symbol] | DIAMOND CORE | [Symbol] | LIMESTONE (L.S.) |
| [Symbol] | DRY | [Symbol] | BLOW COUNT | [Symbol] | SAND | [Symbol] | BROKEN & WEATHERED L.S. |
| [Symbol] | PLUGGED | [Symbol] | DENS. CORE | [Symbol] | GRAVELLY SAND | [Symbol] | SANDSTONE |
| [Symbol] | MOISTURE | [Symbol] | SAMPLE | [Symbol] | BOULDERS | [Symbol] | CLAY |
| | | | | | | [Symbol] | SANDY SOIL |

DESIGN FOR 30° SKEW L.A.

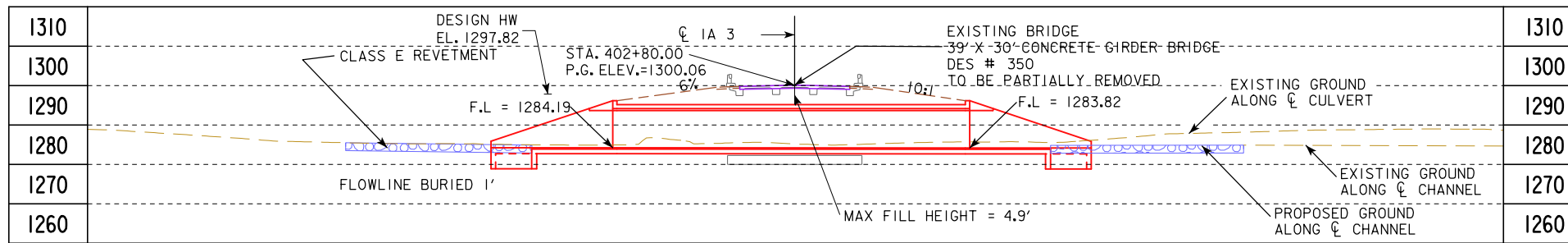
TWIN 12'-0 X 10'-0 X 102'-0 REINFORCED CONCRETE BOX CULVERT

SOIL PROFILE SHEET

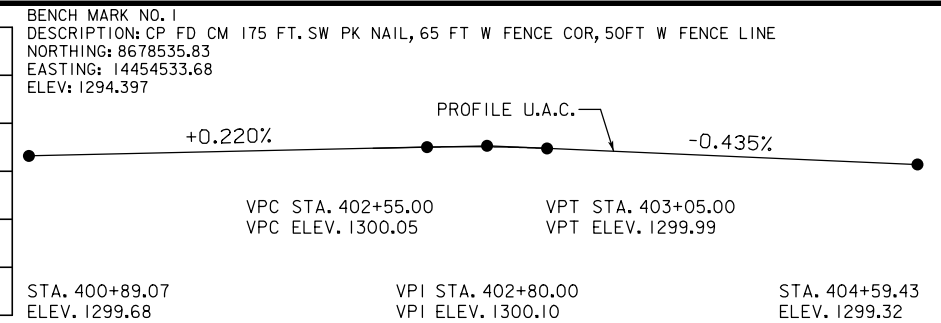
STATION 402+80.00 NOVEMBER 2020

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ___ OF ___ FILE NO. 31631 DESIGN NO. 0121



LONGITUDINAL SECTION ALONG CL CULVERT



PROPOSED PROFILE GRADE ON IA-3 (NOT TO SCALE)

ESTIMATED REVETMENT QUANTITIES

| LOCATION | REVETMENT CL. 'E' (TON) | ENGINEERING FABRIC (SY) | EXCAVATION (CY) |
|----------|-------------------------|-------------------------|-----------------|
| INLET | 658 | 610 | 407 |
| OUTLET | 580 | 537 | 358 |
| TOTALS | 1238 | 1147 | 765 |

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

PROPOSED CHANNEL DATA

| LOCATION | STATION | OFFSET | ELEVATION |
|----------|-----------|------------|-----------|
| A1 | 403+50.24 | 126.91' LT | 1286.11 |
| A2 | 403+36.23 | 131.76' LT | 1285.94 |
| A3 | 403+04.11 | 65.81' LT | 1285.19 |
| A4 | 403+32.02 | 65.79' LT | 1285.19 |
| B1 | 402+28.88 | 117.09' RT | 1284.71 |
| B2 | 402+17.51 | 112.59' RT | 1285.03 |
| B3 | 402+28.00 | 65.81' RT | 1284.82 |
| B4 | 402+55.90 | 65.83' RT | 1284.82 |

UTILITIES LEGEND:

- FO WINDSTREAM COMMUNICATIONS
- Title OWNER UNKNOWN

HYDRAULIC DATA

DRAINAGE AREA = 27.3 SQ. MI.
STREAM SLOPE = 7.3 FT./MI.

Q₅₀ = 2,180 CFS
HW ELEV. = 1,297.82

Q₀₇ = 2,180.02 CFS
HW ELEV. = 1,298.67

Q₁₀₀ = 2,630
HW ELEV. = 1,299.28

TRAFFIC ESTIMATE

| | | |
|--------------------|-----------|--------|
| 2018 AADT | 1800 | V.P.D. |
| 2038 AADT | 2400 | V.P.D. |
| 2038 DHV | 250 | V.P.H. |
| TRUCKS | 33 | % |
| TOTAL DESIGN ESALS | 2,900,000 | |

LOCATION

IA 3 BRIDGE OVER DRAINAGE DITCH
T-92N R-35W
SECTION 29/32
FAIRFIELD TOWNSHIP
BUENA VISTA COUNTY
FHWA NO. 16241
BRIDGE MAINT. NO. 1189.2S003
LATITUDE 42.749193°
LONGITUDE -95.002174°

HYDRAULIC DESIGN

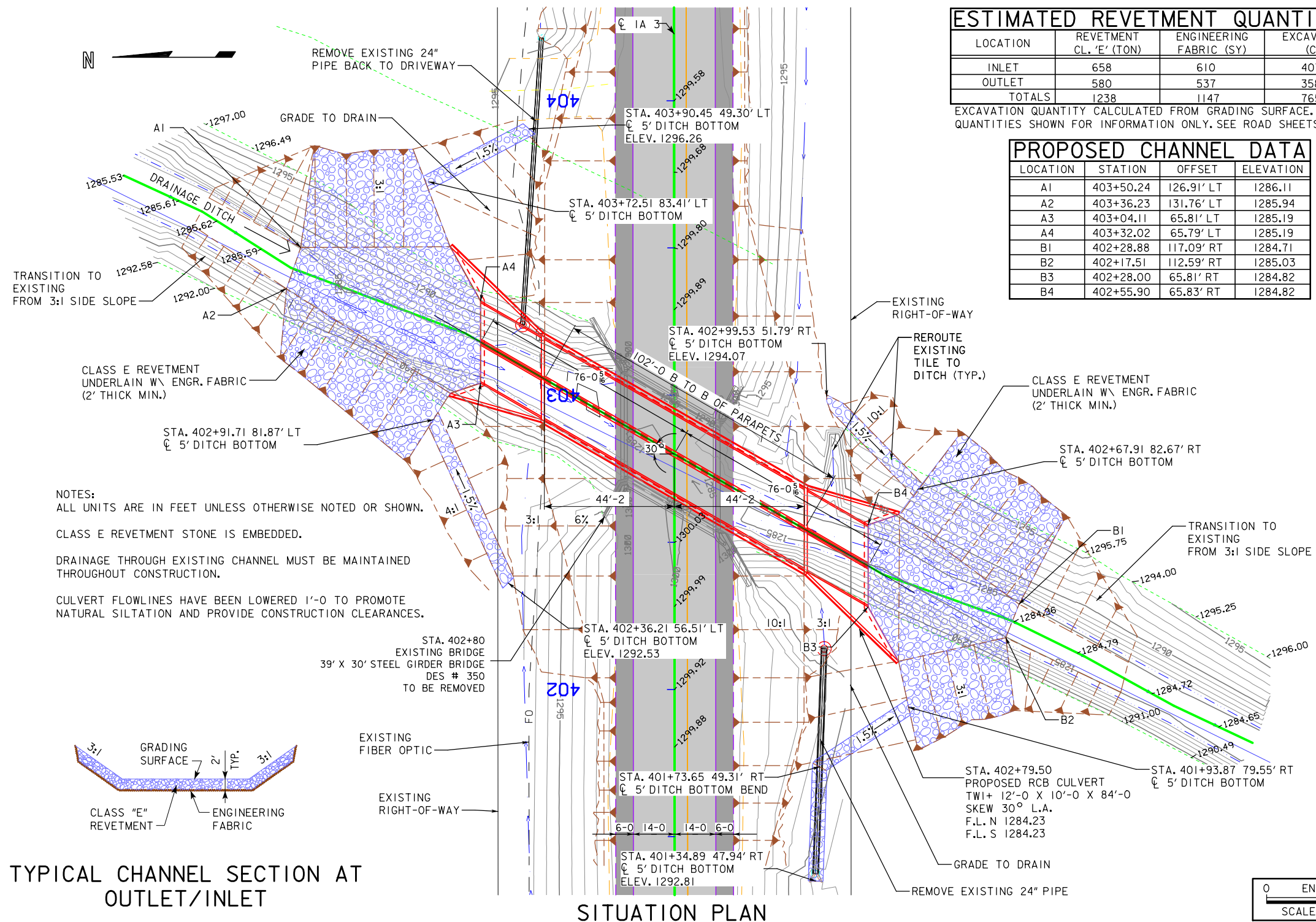


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Brian Sandberg Date _____
Printed or Typed Name
My license renewal date is December 31, 2019

Pages or sheets covered by this seal: V.I

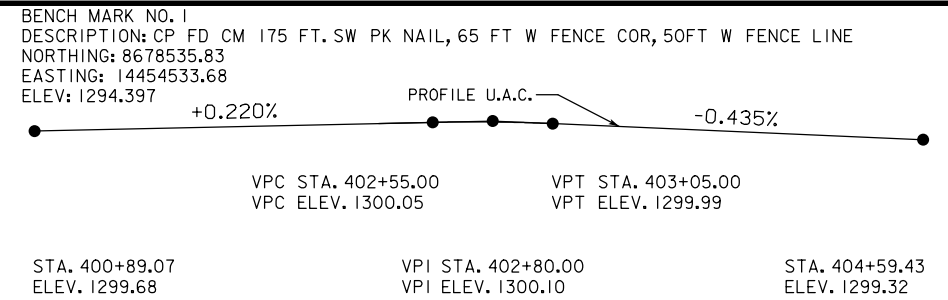
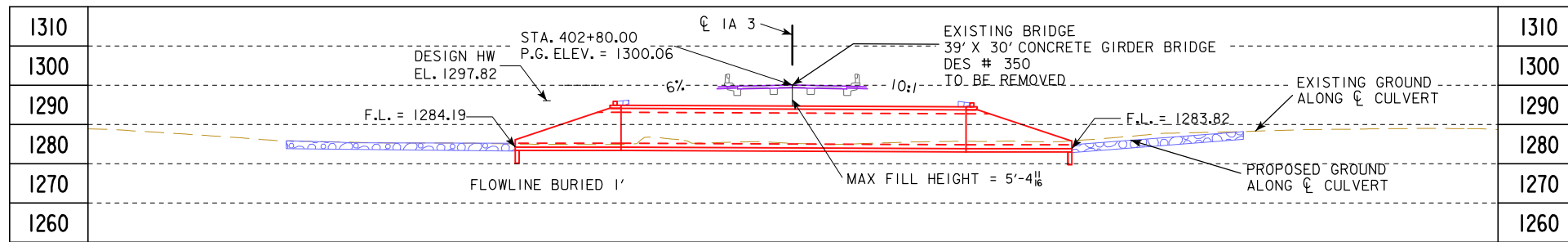
DESIGN FOR 30° SKEW L.A.
**TWIN 12'-0 X 10'-0 X 102'-0
REINFORCED CONCRETE BOX CULVERT**
SITUATION PLAN
STATION 402+79.50 NOVEMBER 2020
BUENA VISTA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 1 FILE NO. 31631 DESIGN NO. 0121



TYPICAL CHANNEL SECTION AT OUTLET/INLET

SITUATION PLAN





LONGITUDINAL SECTION ALONG CL CULVERT

PROPOSED PROFILE GRADE ON IA-3 (NOT TO SCALE)

ESTIMATED REVETMENT QUANTITIES

| LOCATION | REVETMENT CL. 'E' (TON) | ENGINEERING FABRIC (SY) | EXCAVATION (CY) |
|----------|-------------------------|-------------------------|-----------------|
| INLET | 654 | 606 | 404 |
| OUTLET | 524 | 485 | 323 |
| TOTALS | 1178 | 1091 | 727 |

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

PROPOSED CHANNEL DATA

| LOCATION | STATION | OFFSET | ELEVATION |
|----------|-----------|------------|-----------|
| A1 | 403+50.24 | 126.91' LT | 1286.11 |
| A2 | 403+36.23 | 131.76' LT | 1285.94 |
| A3 | 403+06.17 | 71.04' LT | 1285.19 |
| A4 | 403+36.00 | 71.02' LT | 1285.19 |
| B1 | 402+28.88 | 117.09' RT | 1284.71 |
| B2 | 402+17.51 | 112.59' RT | 1285.03 |
| B3 | 402+24.00 | 71.04' RT | 1284.82 |
| B4 | 402+53.84 | 71.06' RT | 1284.82 |

HYDRAULIC DATA

DRAINAGE AREA = 27.3 SQ. MI.
STREAM SLOPE = 7.3 FT./MI.

Q₅₀ = 2,180 CFS
HW ELEV. = 1,297.82

Q_{0r} = 2,180.02 CFS
HW ELEV. = 1,298.67

Q₁₀₀ = 2,630
HW ELEV. = 1,299.28

UTILITIES LEGEND:

— Tile — OWNER UNKNOWN
— FO — WINDSTREAM COMMUNICATIONS

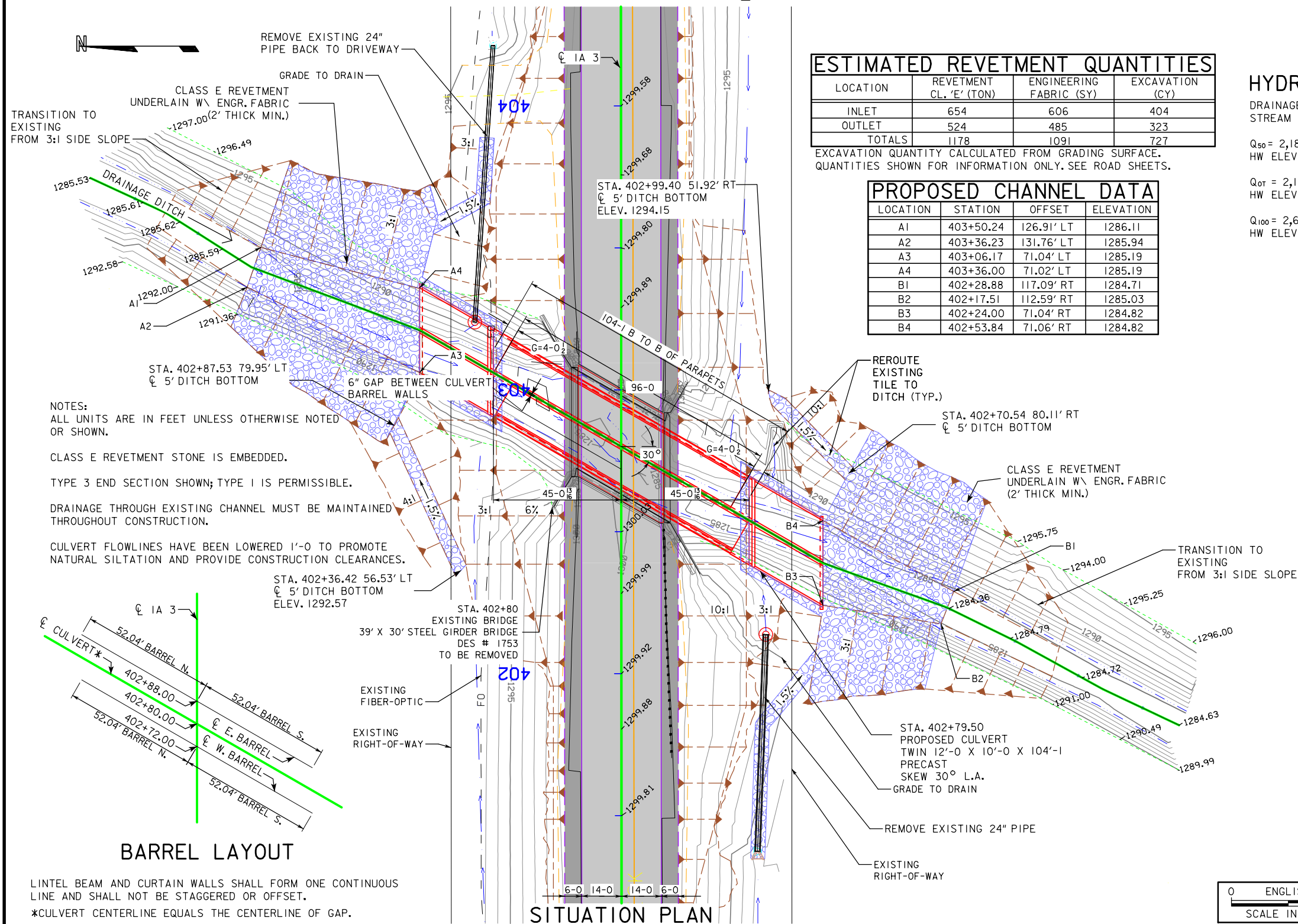
TYPICAL CHANNEL SECTION AT OUTLET/INLET

TRAFFIC ESTIMATE

| | | |
|--------------------|-----------|--------|
| 2018 AADT | 1800 | V.P.D. |
| 2038 AADT | 2400 | V.P.D. |
| 2038 DHV | 250 | V.P.H. |
| TRUCKS | 33 | % |
| TOTAL DESIGN ESALS | 2,900,000 | |

LOCATION

IA 3 BRIDGE OVER DRAINAGE DITCH
T-92N R-35W
SECTION 29/32
FAIRFIELD TOWNSHIP
BUENA VISTA COUNTY
FHWA NO. 16241
BRIDGE MAINT. NO. 1189.2S003
LATITUDE 42.749193°
LONGITUDE -95.002174°



BARREL LAYOUT

SITUATION PLAN

HYDRAULIC DESIGN



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

Signature Brian Sandberg Date _____
Printed or Typed Name
My license renewal date is December 31, 2019

Pages or sheets covered by this seal: V.2

DESIGN FOR 30° SKEW L.A.
**TWIN 12'-0 X 10'-0 X 104'-1
PRECAST CONCRETE CULVERT**

SITUATION PLAN

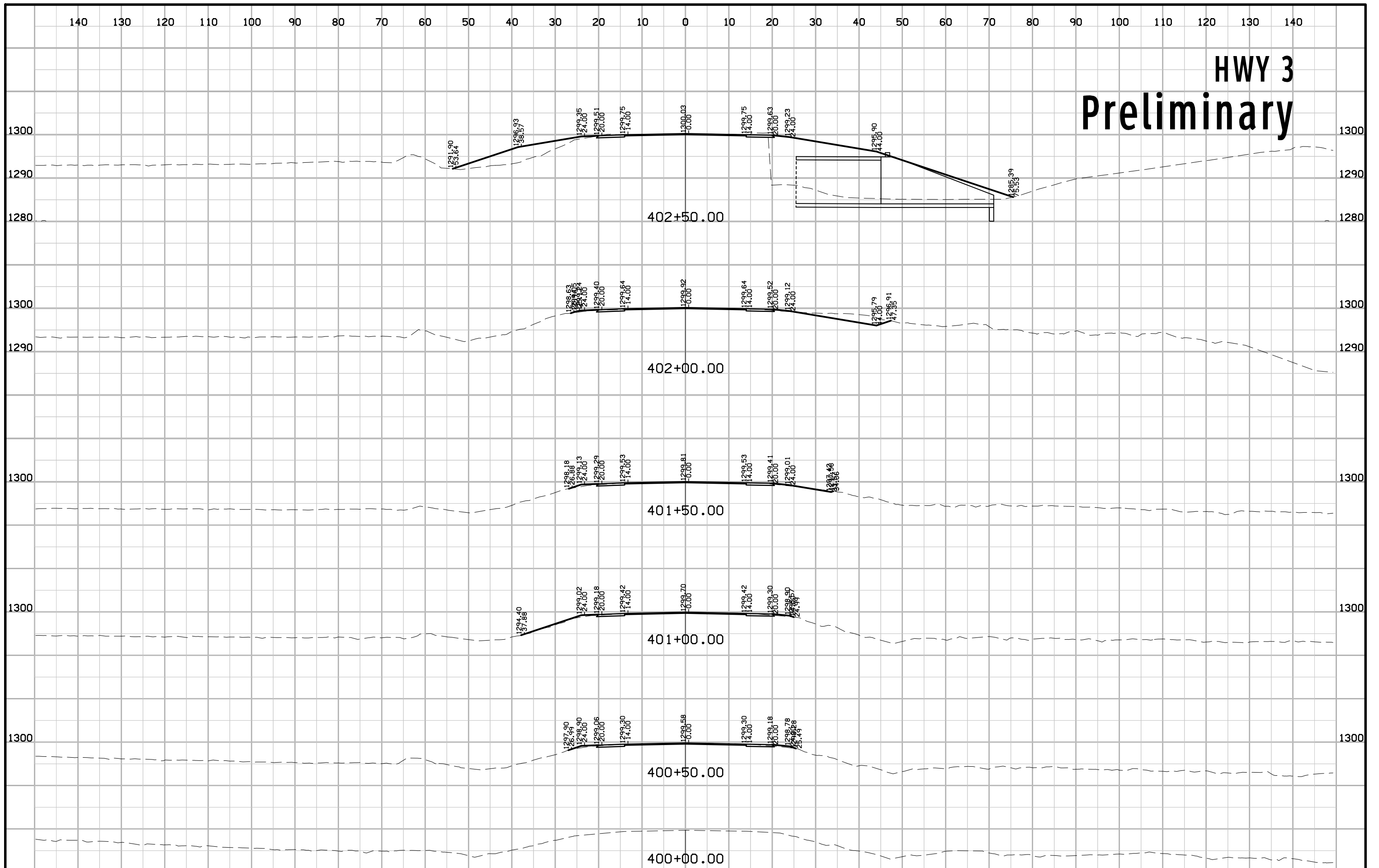
STATION 402+80.00 NOVEMBER 2020

BUENA VISTA COUNTY

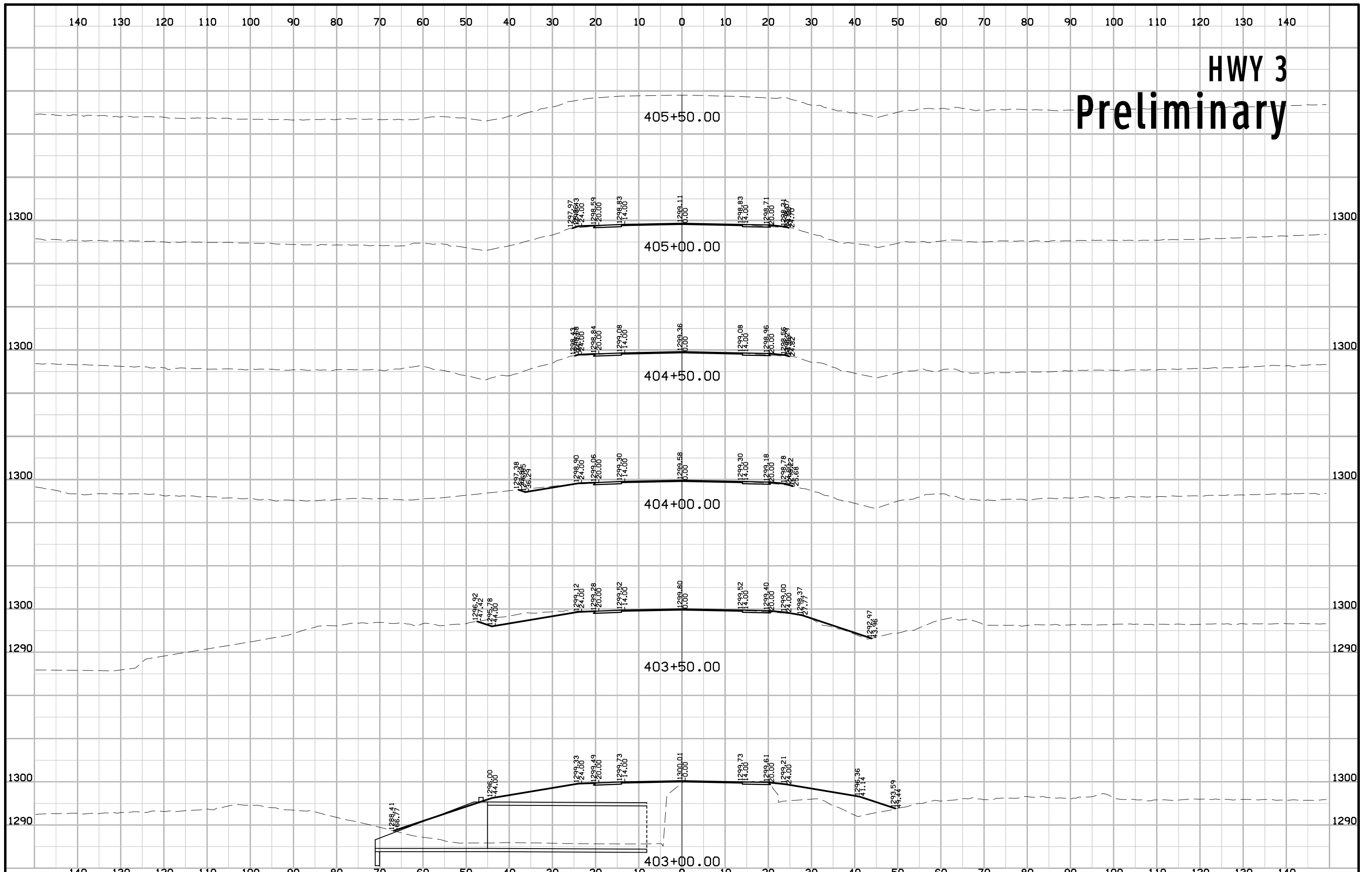
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 1 FILE NO. 31631 DESIGN NO. 0121



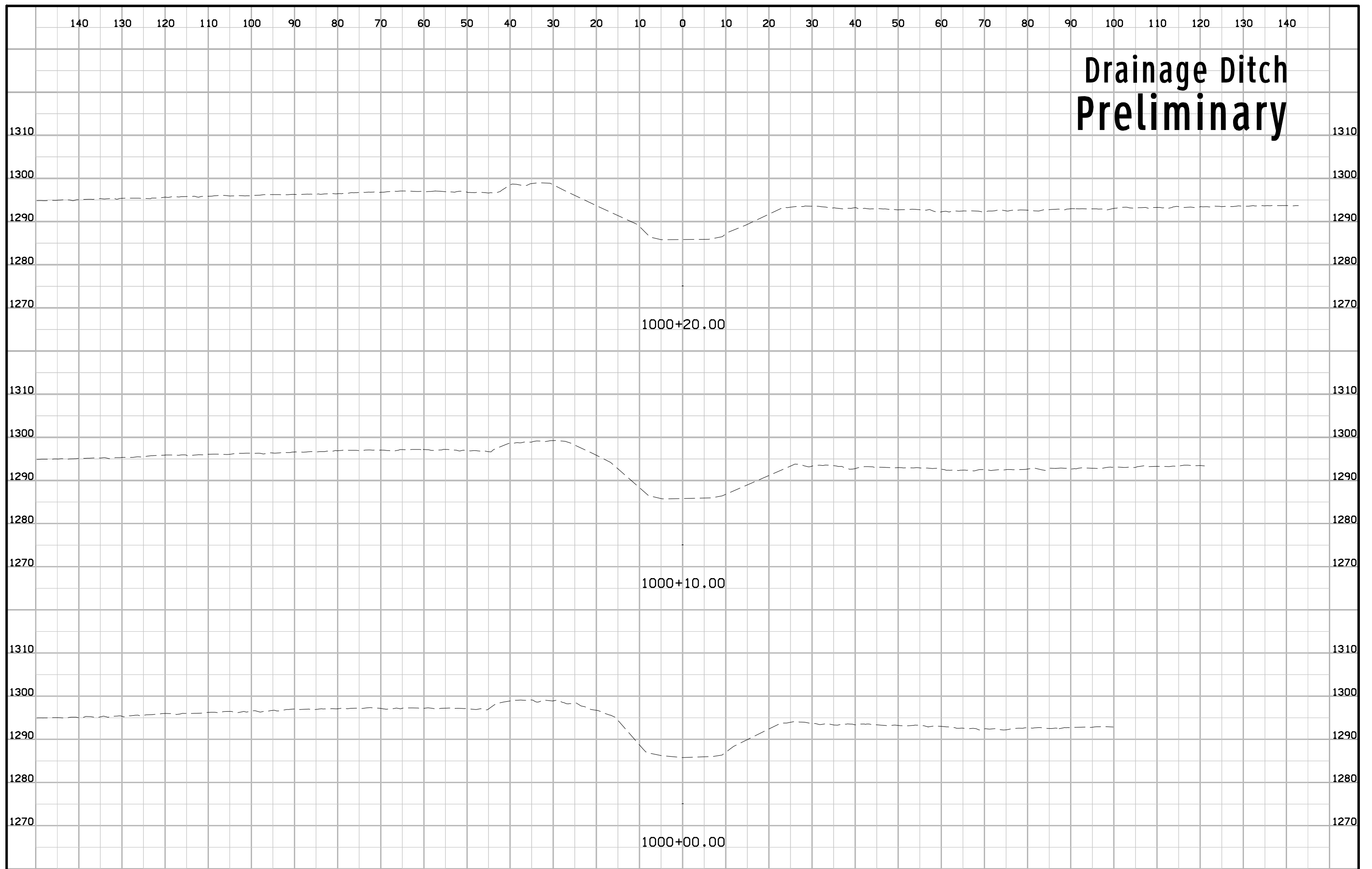
HWY 3 Preliminary



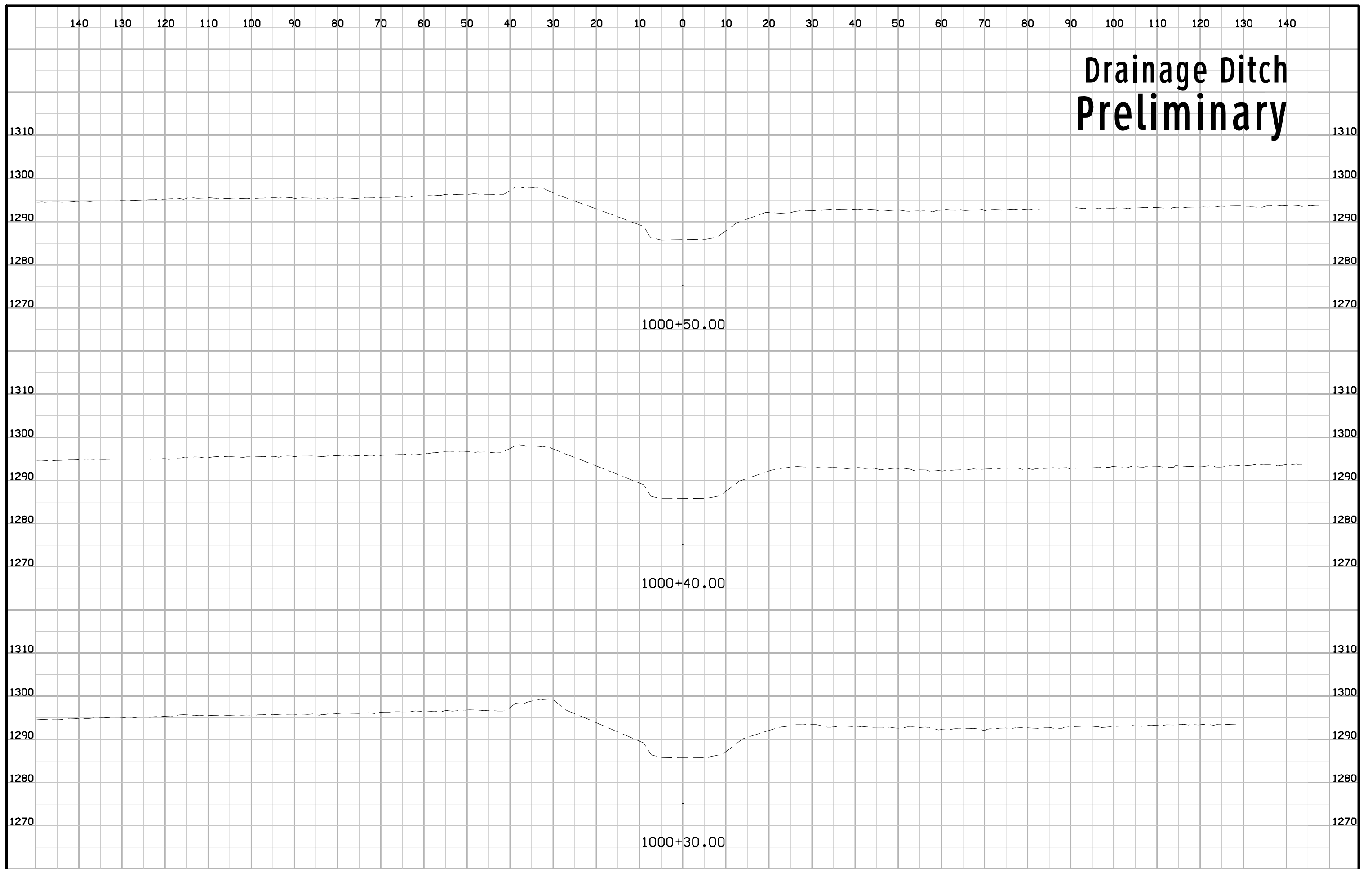
HWY 3 Preliminary



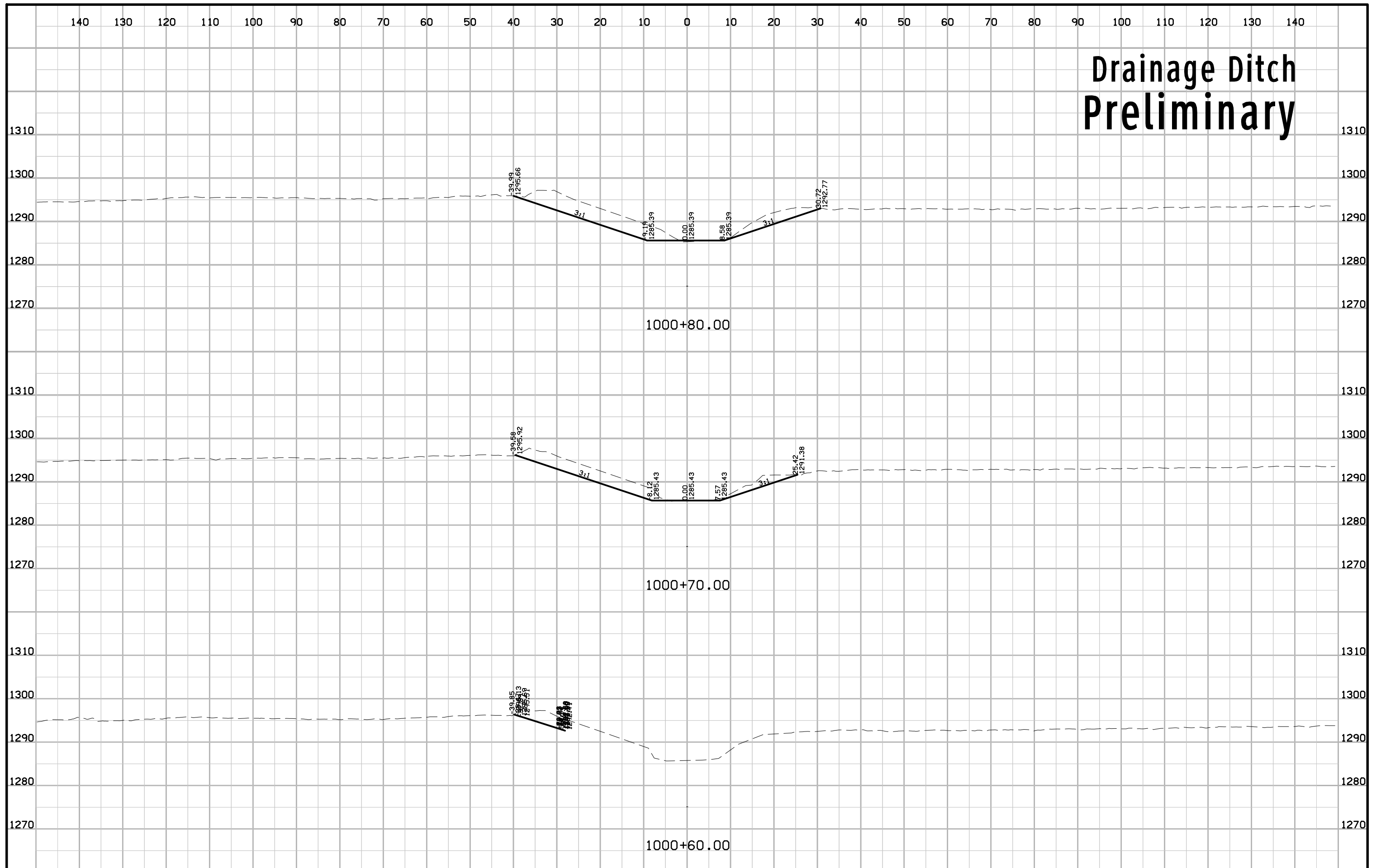
Drainage Ditch Preliminary



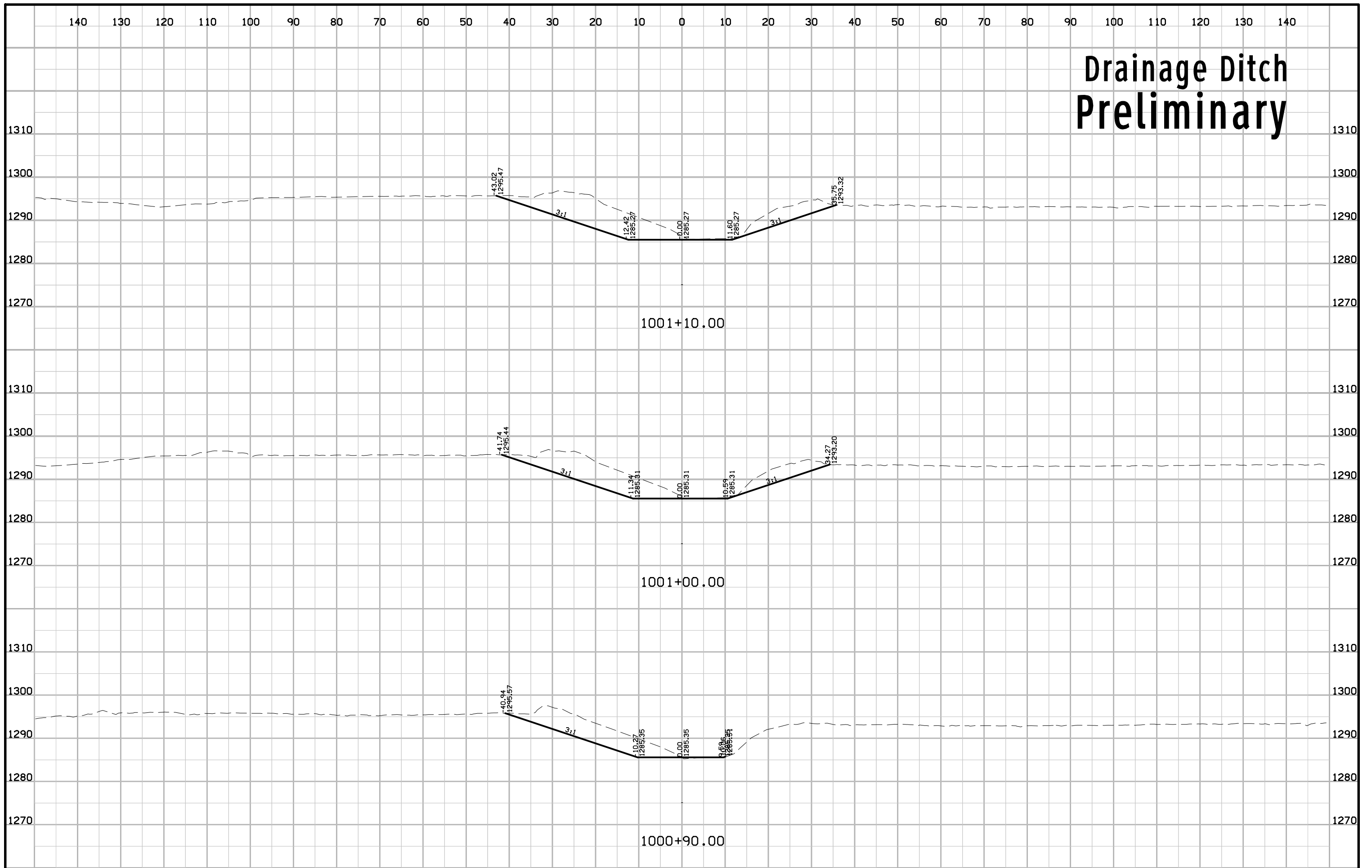
Drainage Ditch Preliminary



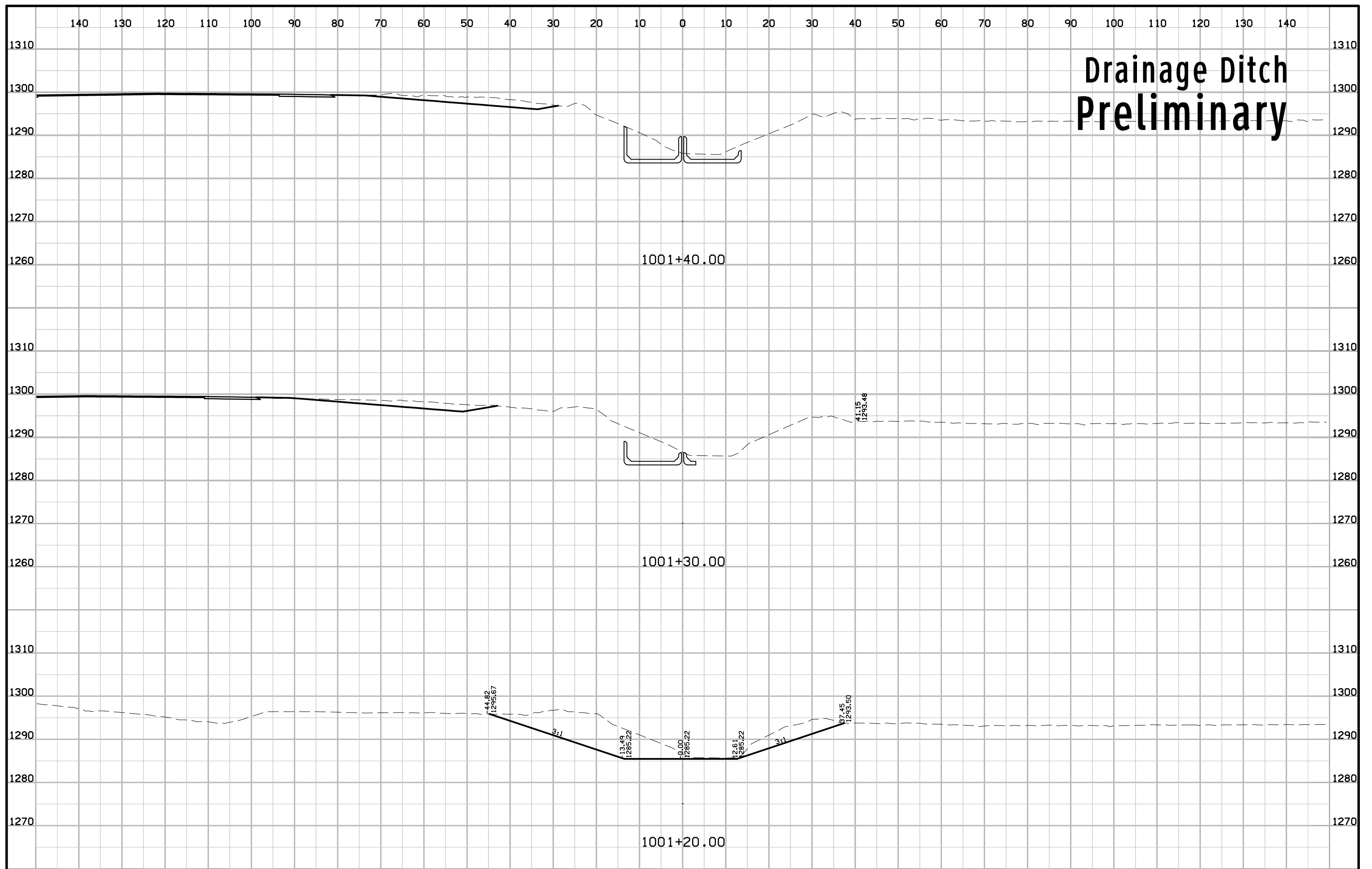
Drainage Ditch Preliminary



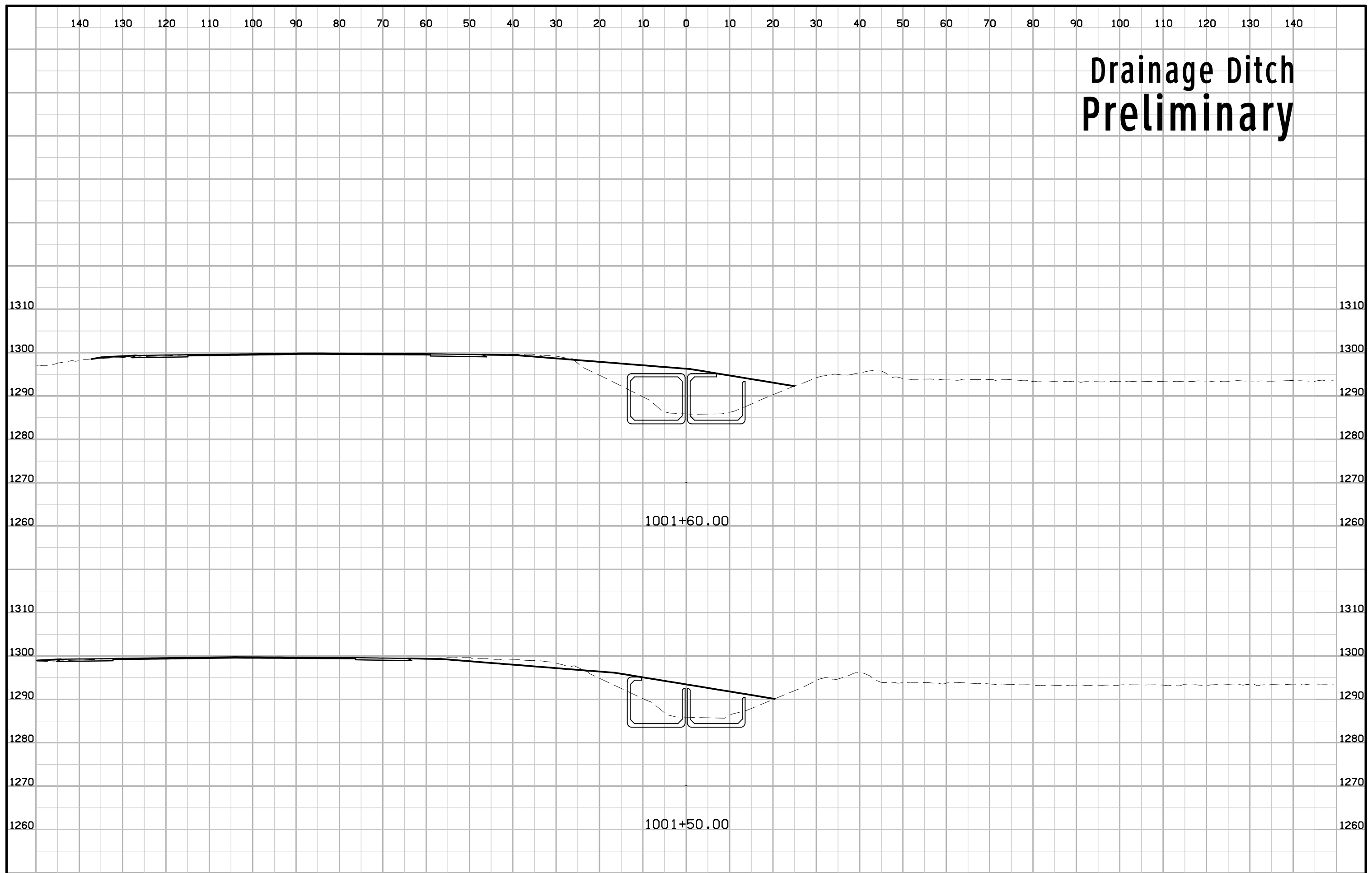
Drainage Ditch Preliminary



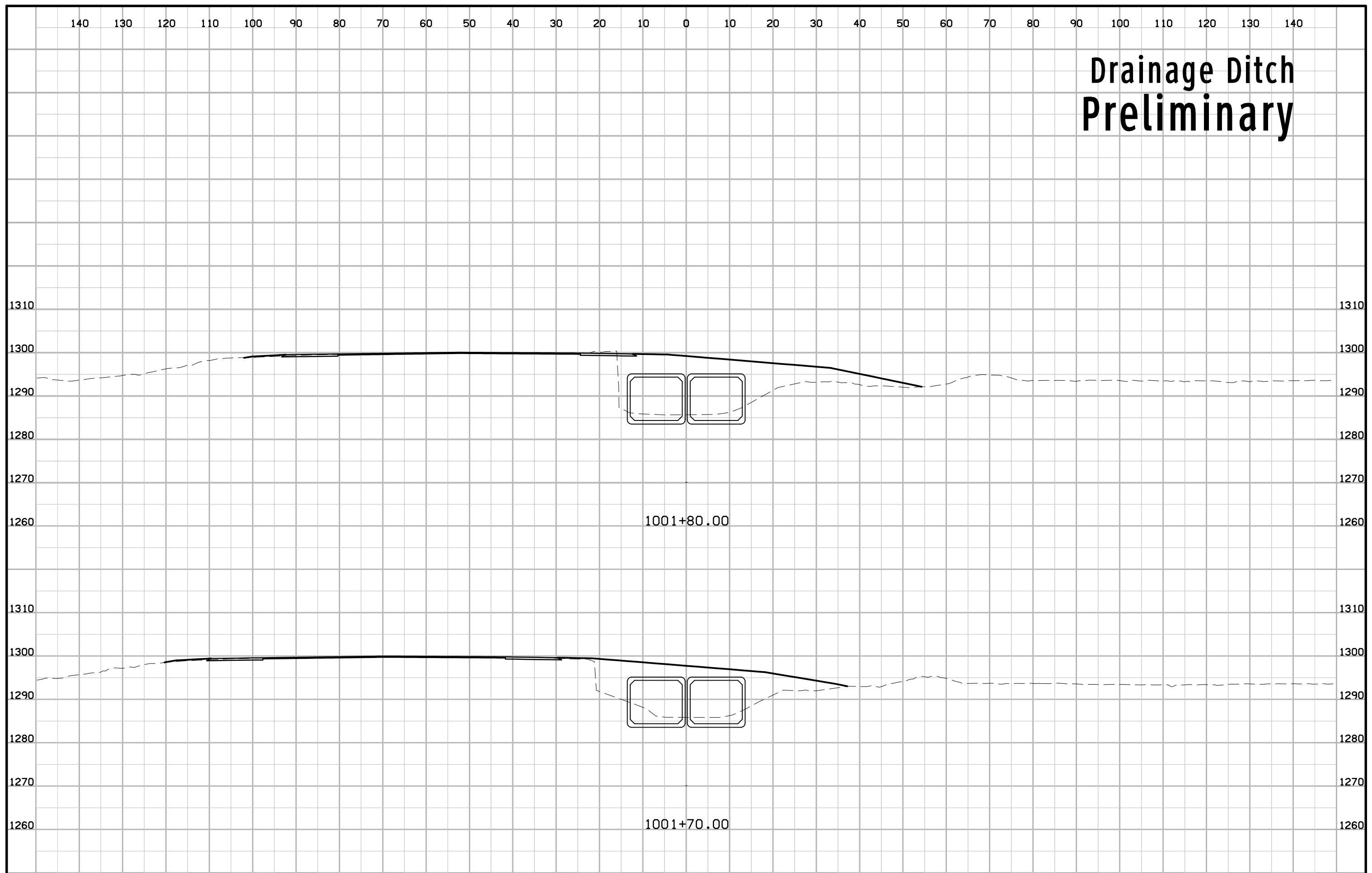
Drainage Ditch Preliminary



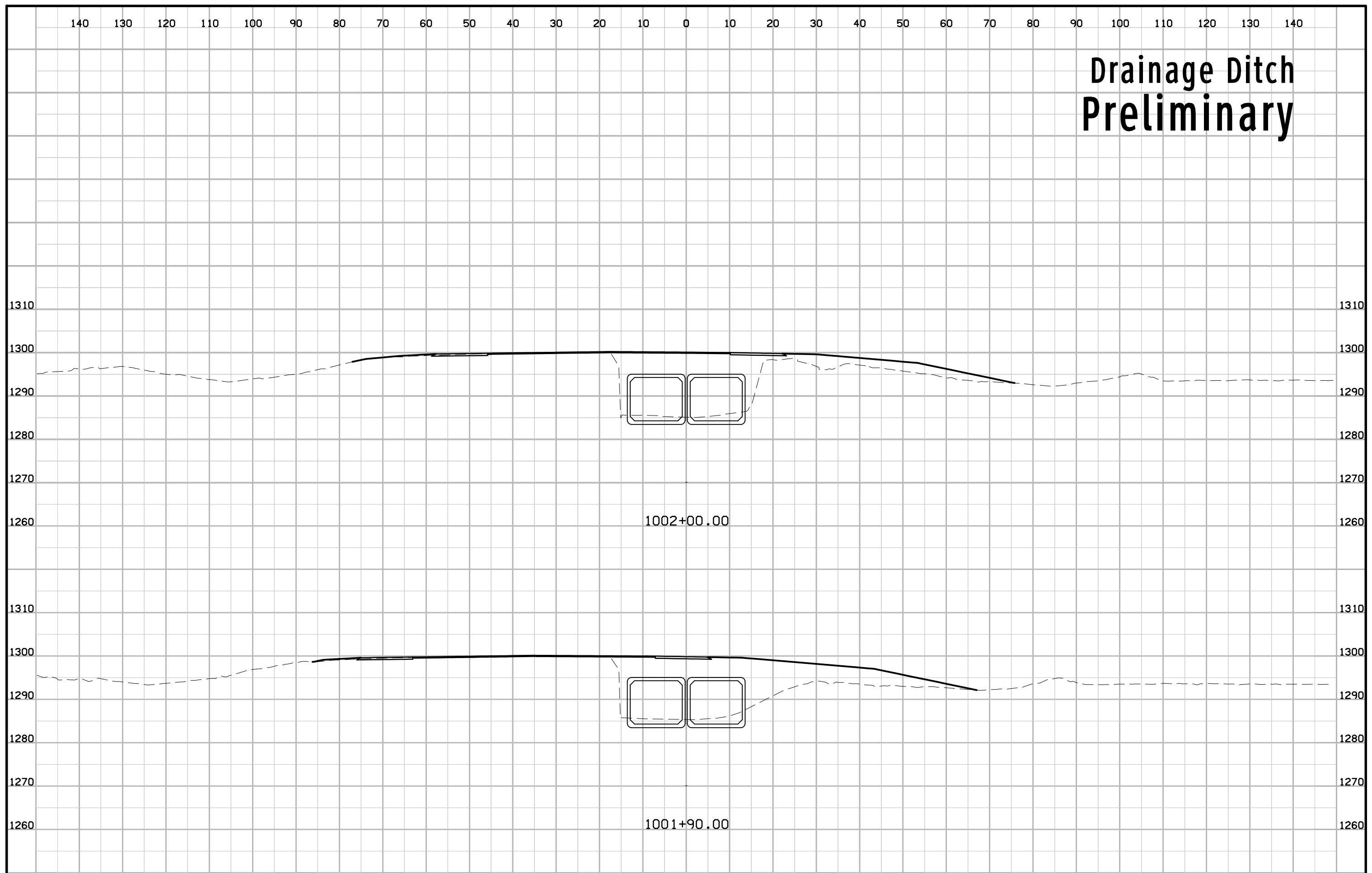
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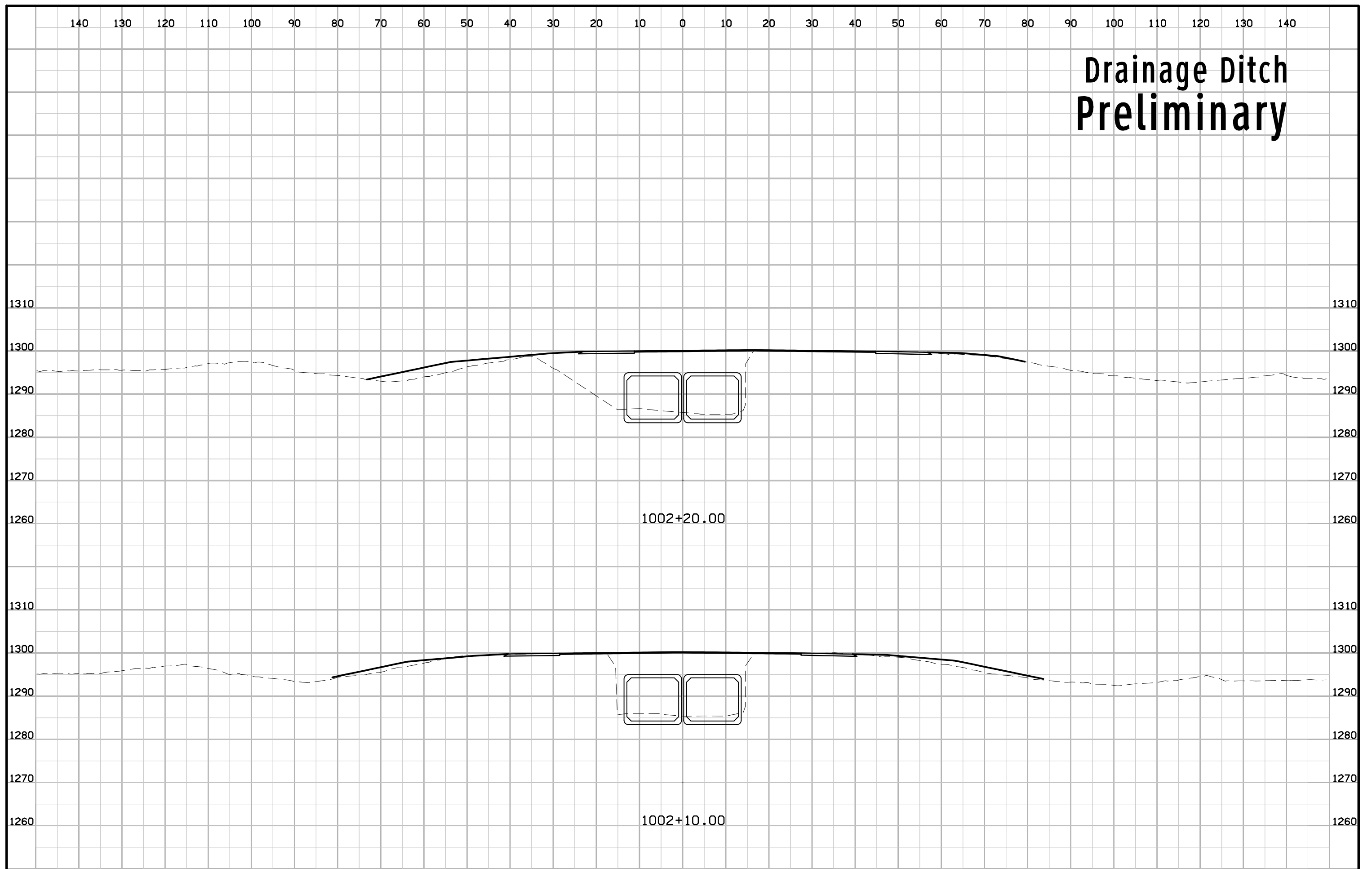
Drainage Ditch Preliminary



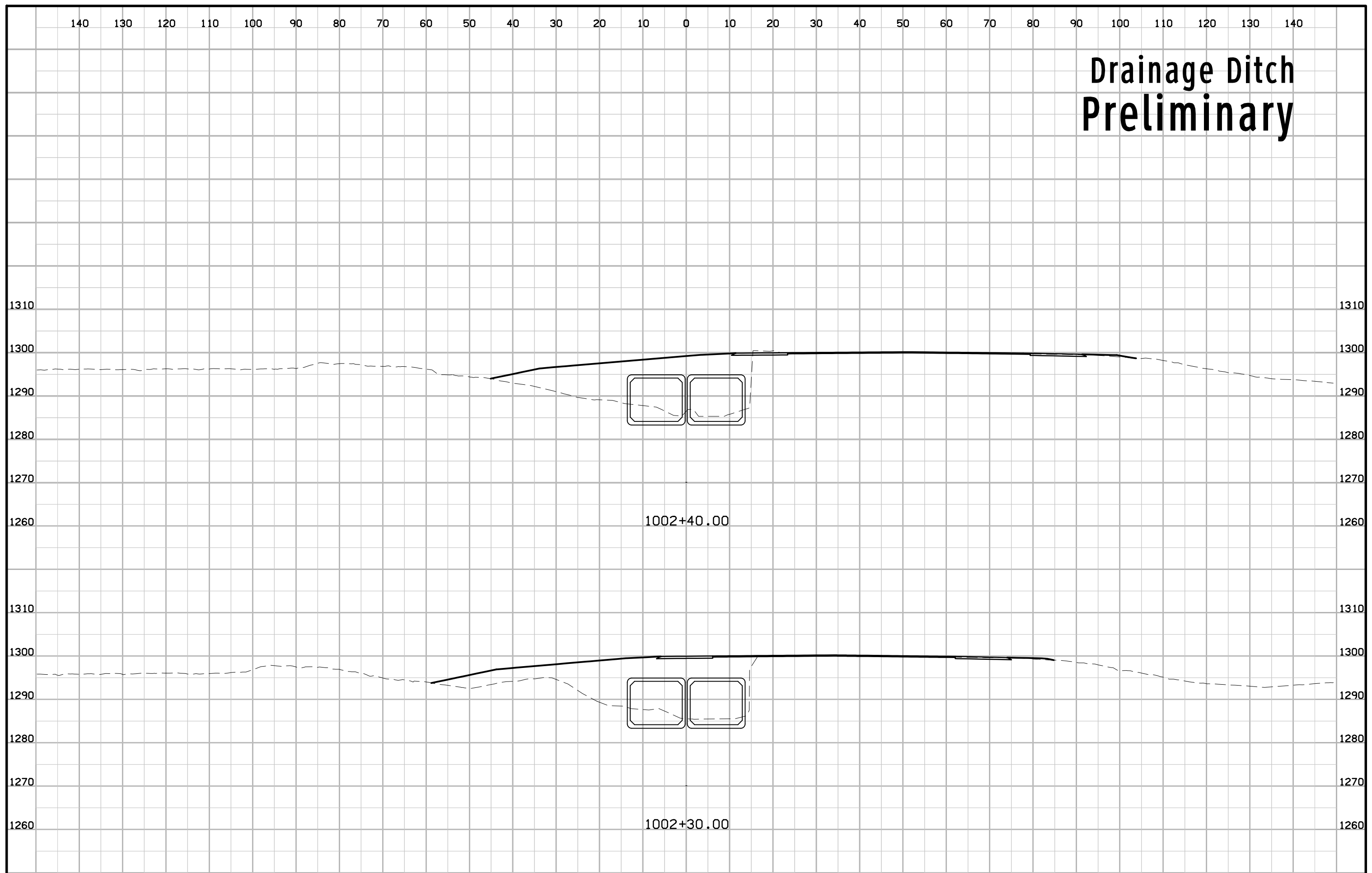
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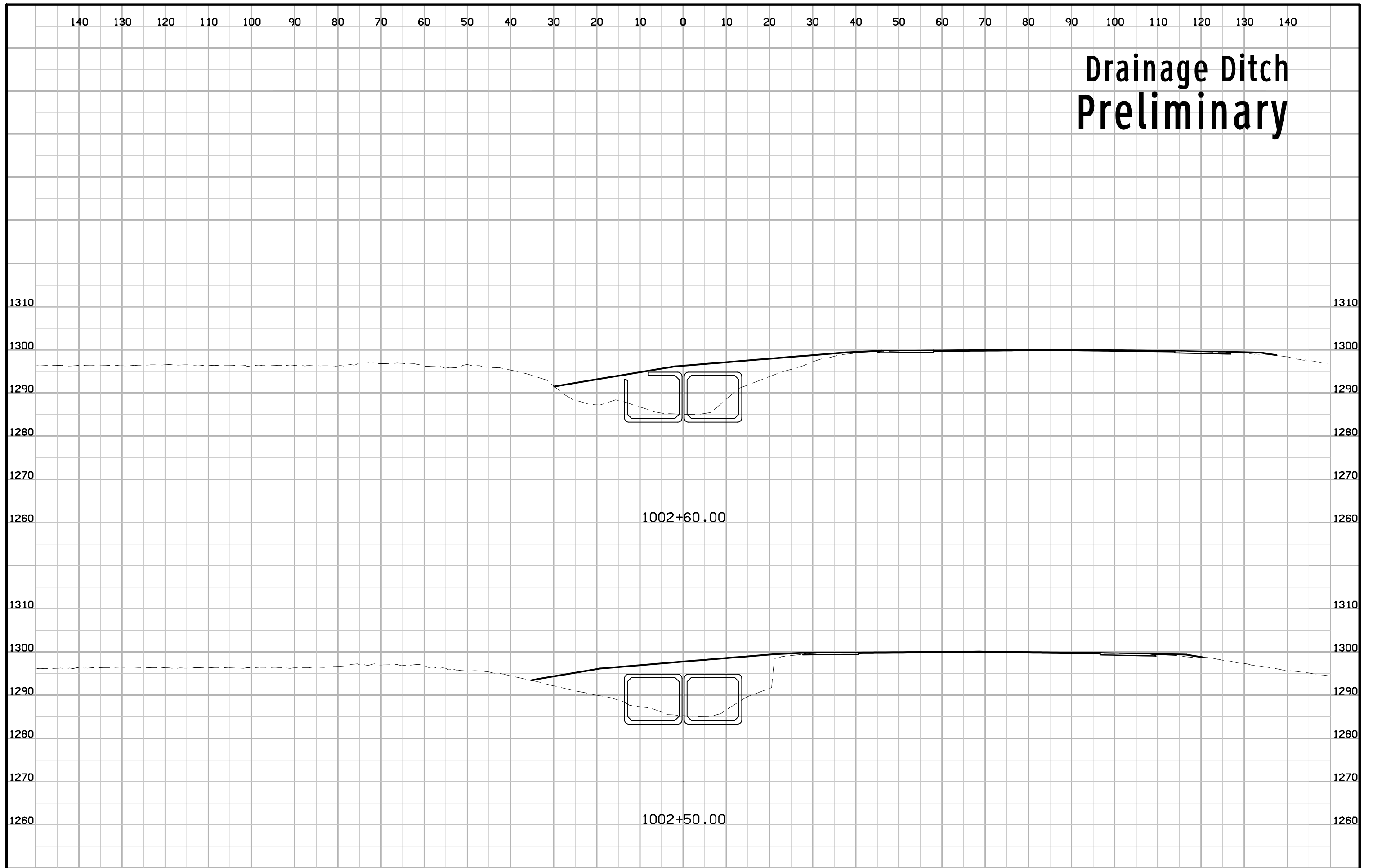
Drainage Ditch Preliminary



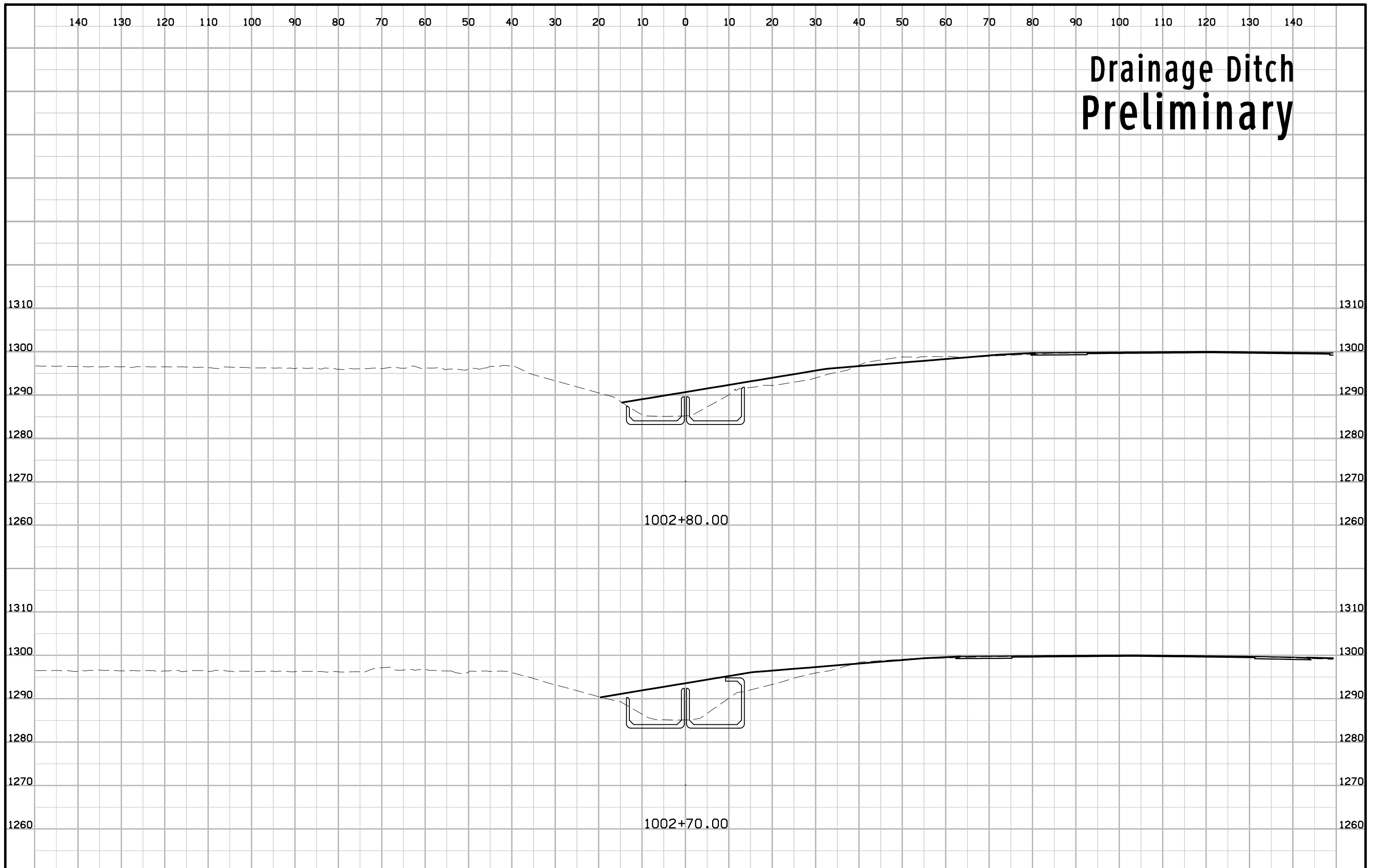
Drainage Ditch Preliminary



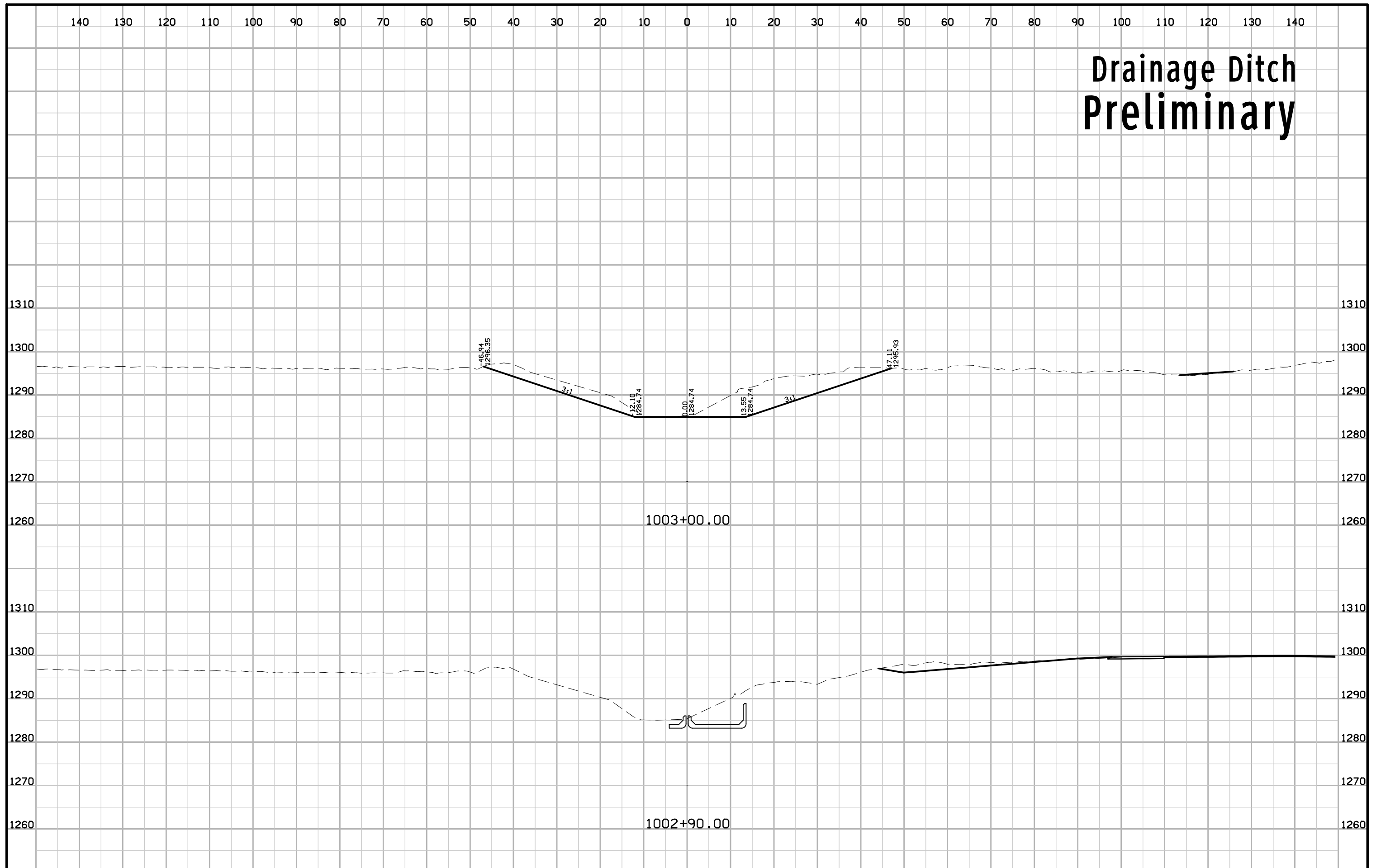
Drainage Ditch Preliminary



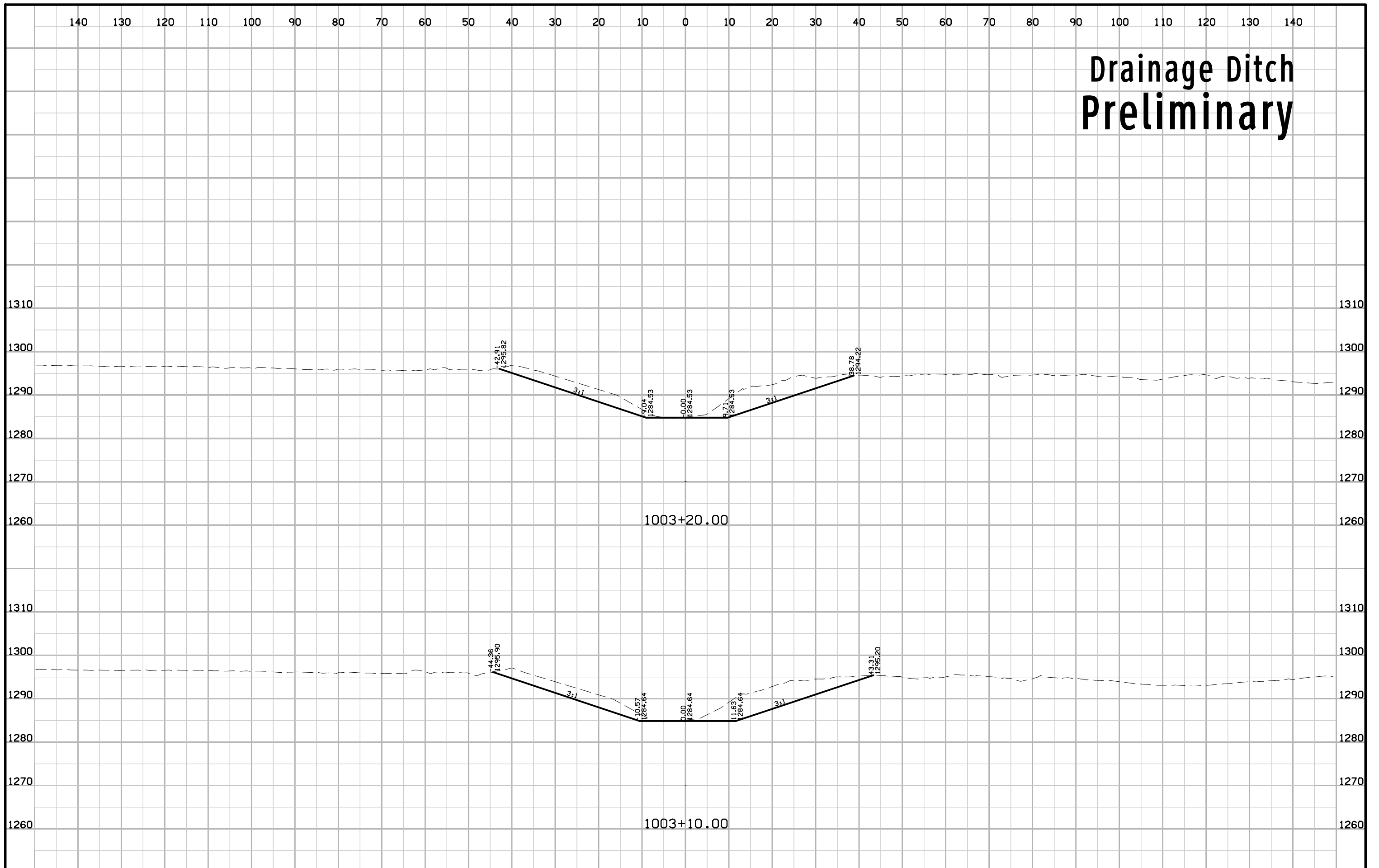
Drainage Ditch Preliminary



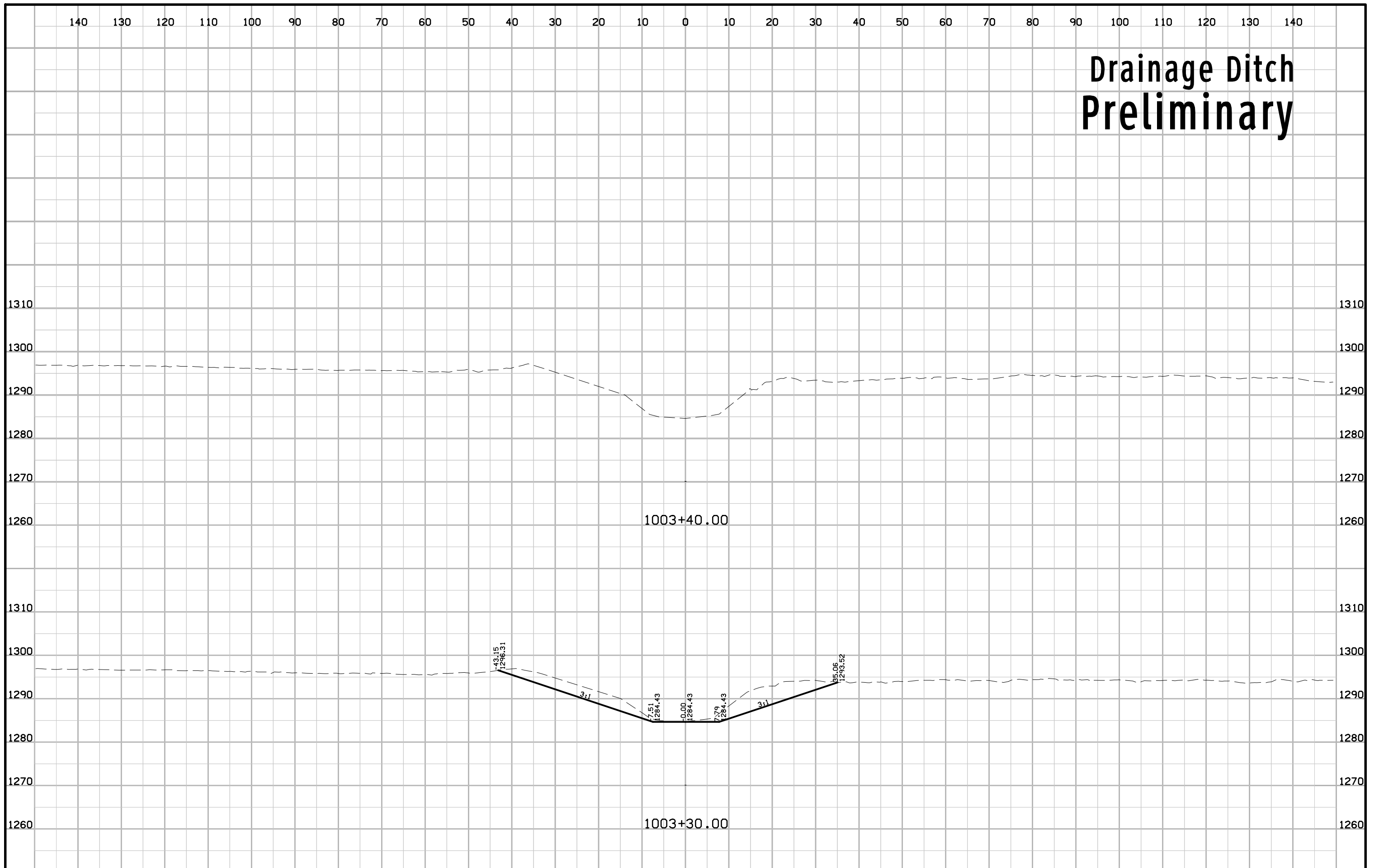
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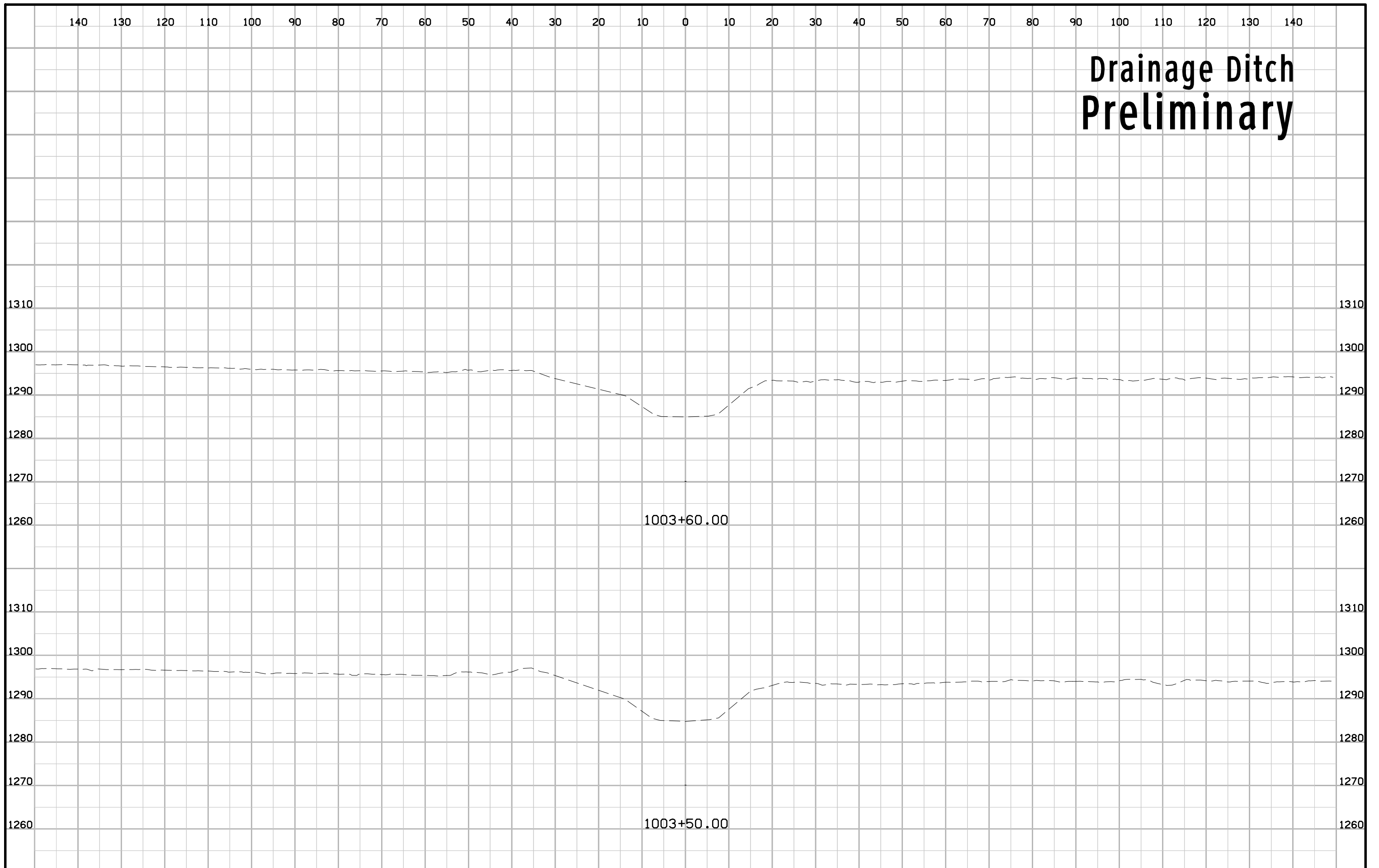
Drainage Ditch Preliminary



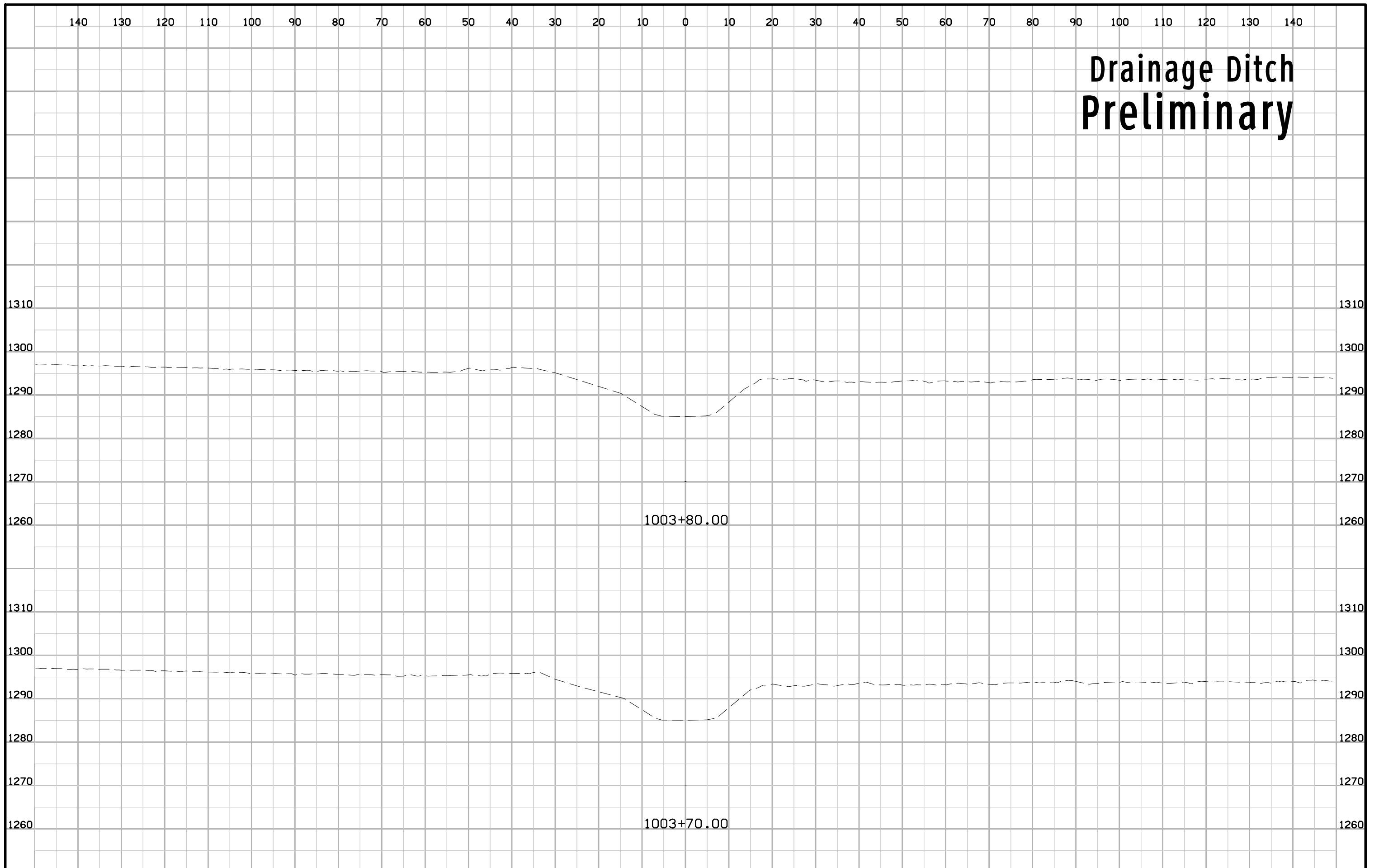
Drainage Ditch Preliminary



Drainage Ditch Preliminary

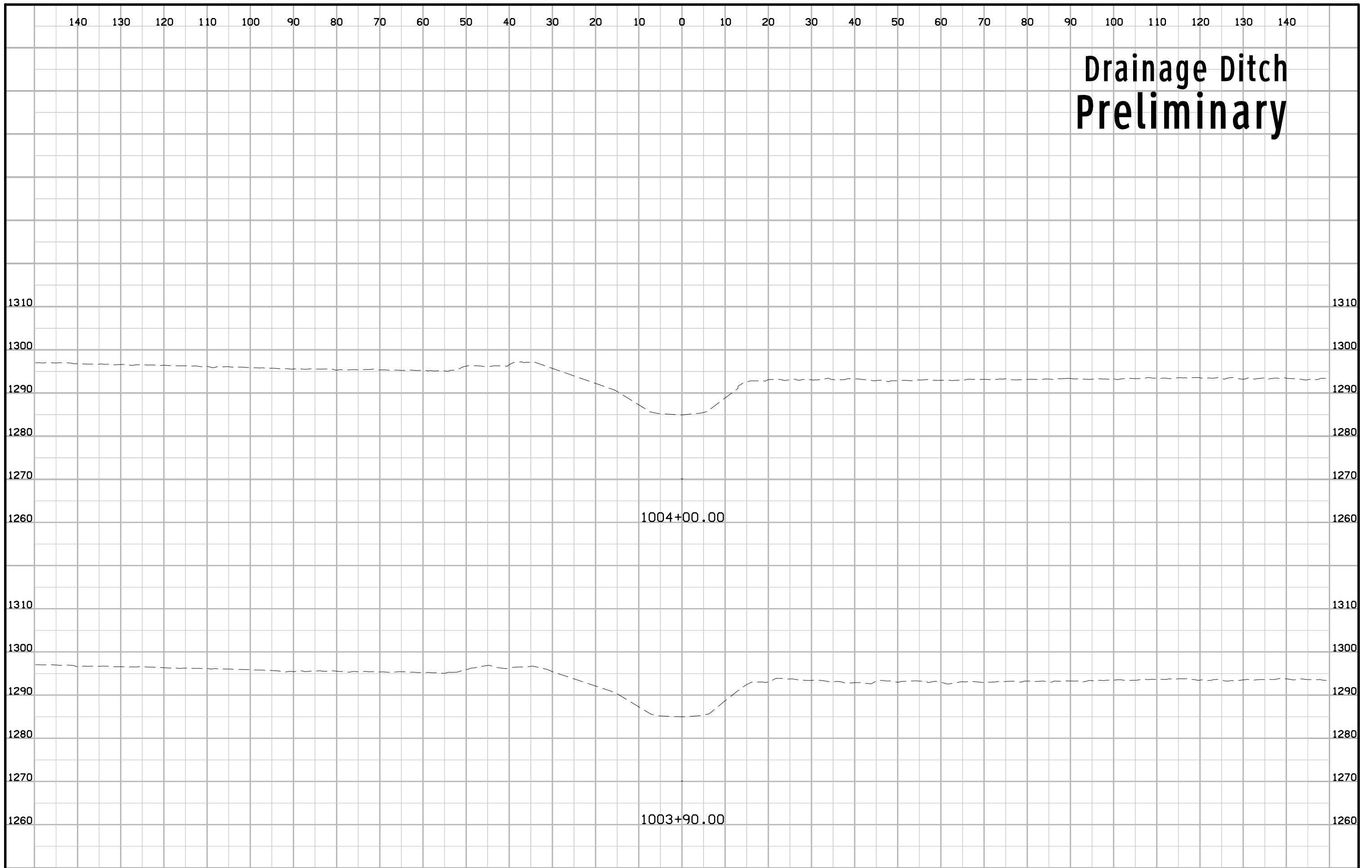


Drainage Ditch Preliminary

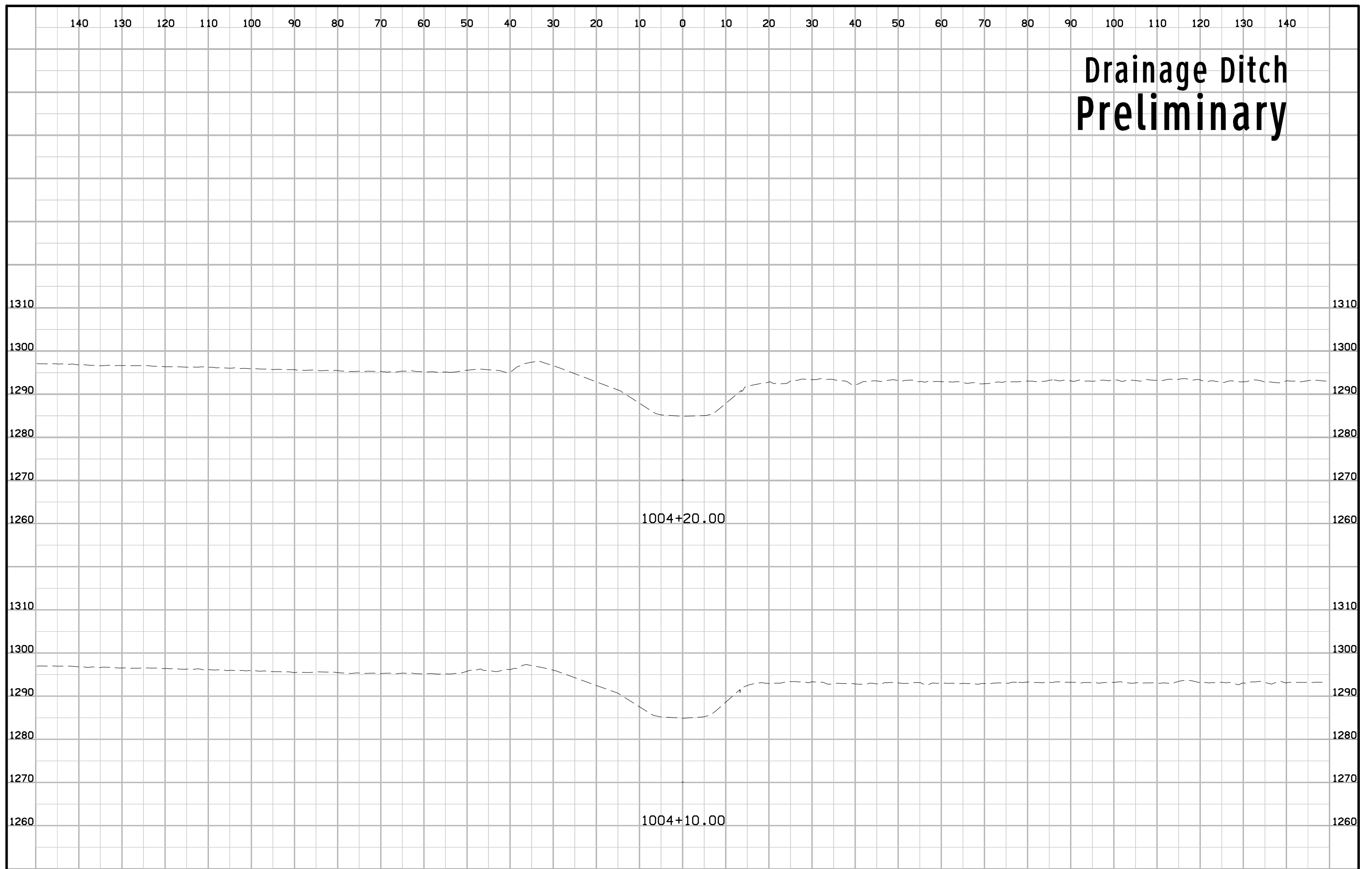


| | | | | | | | | | |
|----------|---------|-------------|------------------|-------------|--------|----------------|-----------------------|--------------|------|
| FILE NO. | ENGLISH | DESIGN TEAM | IOWA DOT\McCLURE | BUENA VISTA | COUNTY | PROJECT NUMBER | BRFN-003-2(70)--39-11 | SHEET NUMBER | X.17 |
|----------|---------|-------------|------------------|-------------|--------|----------------|-----------------------|--------------|------|

Drainage Ditch Preliminary



Drainage Ditch Preliminary



Drainage Ditch Preliminary

