

FINAL PROJECT CONCEPT STATEMENT

U.S. 30 Bridge over a tributary to Boyer River
0.5 miles north of IA 37

Crawford County
Project #BRFN-30-2(148)--39-24
PIN: 09-24-030-120
Maint. No.2438.5S030
FHWA No. 21200

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

December 18, 2009

I. STUDY AREA

A. Project Description

This project involves the replacement of the U.S. Highway 30 bridge (Maint. No. 2438.5S030) over a tributary to the Boyer River, located 0.5 miles north of the intersection with IA 37.



Looking southwest



Looking northeast

B. Need for Project

The existing structure is 32' long x 43' wide concrete beam structure was built in 1926 and widened in 1965. The original deck section was overlaid in 1965 with the widening project. The deck has severe deterioration with exposed reinforcing in the top of the deck. The bridge is structurally deficient due to the deck condition. The original deck and girders were built as one unit. This makes it impractical to replace the deck without replacing the girders. Because of the poor deck condition and the age

of the original superstructure and substructure elements, this bridge should be replaced.

C. Present Facility

The existing structure is a 32' x 43' concrete deck girder bridge constructed in 1926 and widened in 1965.

U.S. 30 in the project area is 24' wide PCC pavement with 8' wide granular shoulders and 3:1 foreslopes, constructed in 1930. HMA resurfacing was accomplished in 1960 and 1984, with another resurfacing project scheduled for 2010.

D. Traffic Estimates

The 2013 and 2033 average daily traffic estimates are 3,400 ADT with 23% trucks and 4,960 ADT with 20% trucks, respectively.

E. Sufficiency Ratings

U.S. 30 is classified as a commercial & industrial route and is a maintenance service level "B" road with a sufficiency rating of 35. The federal bridge sufficiency rating is 84.

F. Access Control

Access rights have been previously acquired for this project.

G. Crash History

During the five-year study period from January 1, 2004 through December 31, 2008, there were zero crashes at this location.

II. PROJECT CONCEPT

A. Feasible Alternative

Alternative #1 – Replace bridge a with twin reinforced box culvert

Replace the existing 32' x 43' concrete deck girder bridge with a twin 12' x 12' x 88' reinforced box culvert. The typical cross section will consist of a 28 ft. roadway with 8 ft. granular shoulders and a 6:1/3.5:1 foreslopes. The existing horizontal and vertical alignment will be maintained. This culvert is overdesigned in order to provide a lower culvert flowline due to its proximity to the Boyer River which is actively degrading. This will also satisfy the Office of Location and Environment's recommendation that the culvert be buried 2' feet below the streambed elevation. Non-standard flat wings are proposed for the outlet headwall so that the railroad bridge will not be impacted

and railroad right of way will not be required. Class E revetment will be place at the ends of the RCB.

Apply erosion control and rural seeding and fertilizing to all disturbed areas. It appears that right of way will be required on the south side only for this project, however district requests the ROW line be staked to verify this assumption.

| <u>Item</u> | <u>Estimated Cost</u> |
|--|-----------------------|
| Twin concrete box culvert, 12' x 12' x 88' | 218,000 |
| Bridge removal | 12,000 |
| Channel excavation to install RCB | 12,000 |
| Staging 30% | 73,000 |
| Revetment | 25,000 |
| Excavation, class 10 | 4,300 |
| Flowable mortar | 4,900 |
| Flooded backfill | 43,400 |
| Special backfill | 1,900 |
| Granular shoulders | 400 |
| 10" PCC | 4,600 |
| Paved shoulders | 47,300 |
| Removal of paved shoulders | 2,700 |
| Temporary concrete barrier rail | 14,400 |
| Temporary traffic signals | 7,300 |
| Temporary lighting | 4,600 |
| Sheet piling | 15,000 |
| ROW | 3,000 |
| Clearing and grubbing | 1,400 |
| Erosion control | 5,000 |
| Stream Mitigation | 50,000 |
| Traffic control @ 5% | 27,500 |
| Mobilization @ 5% | 27,500 |
| M&C @ 30% | <u>165,100</u> |
| Total | \$770,300 |

B. Detour Analysis

There will be no off-site detour. Traffic will be maintained via staged construction with traffic reduced down to one lane using of temporary traffic signals. The bridge will be cut at the inside of the first beam over from centerline. Traffic will use the west-bound lane while a portion of the bridge is removed and the construction of the RCB on the east side begins. Then traffic will be switched to the east-bound lane, while the remainder of the bridge is removed and the RCB is completed. This will require paved shoulders, temporary concrete barrier rail, temporary traffic signals and

temporary lighting. All temporary concrete barrier rail must be anchored if there is less than 4' of clearance to the drop-off. Sheet piling will be required.

C. Recommendations

It is recommended that the present structure be replaced, as described.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Office of Bridges and Structures will coordinate the plan preparation with assistance from the Office of Design.

E. Special Considerations

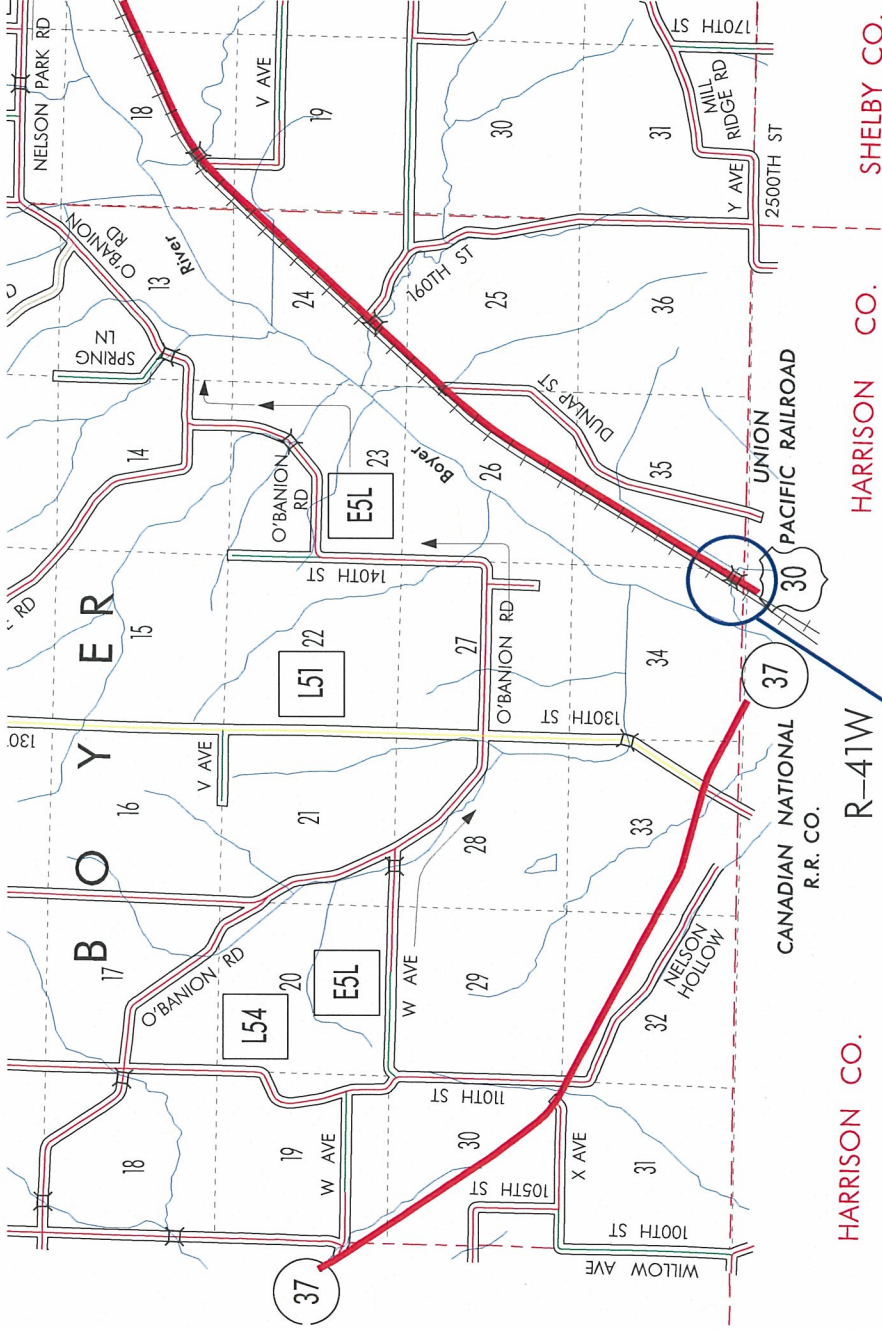
It appears ROW will be required for this project.

The Office of Location and Environment has determined that a Section 404 Permit will be required and this project should be covered by Nationwide Permit #14. Wetland mitigation should not be required because the wetland area is less than one-tenth acre in size. Stream mitigation will be required with this project. A buried culvert is recommended as mitigation for this project.

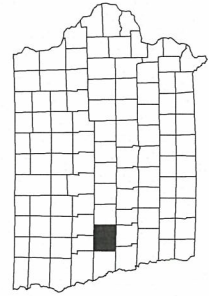
F. Program Status

Site data has been developed by the Office of Design. This project is listed in the 2010-2014 Iowa Transportation Improvement Program, with \$650,000 programmed for replacement in FY 2014. This project is not eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

KKP:als



STA. 28+16.1
 MAINT. 2438.5S030
 FMWA 21200



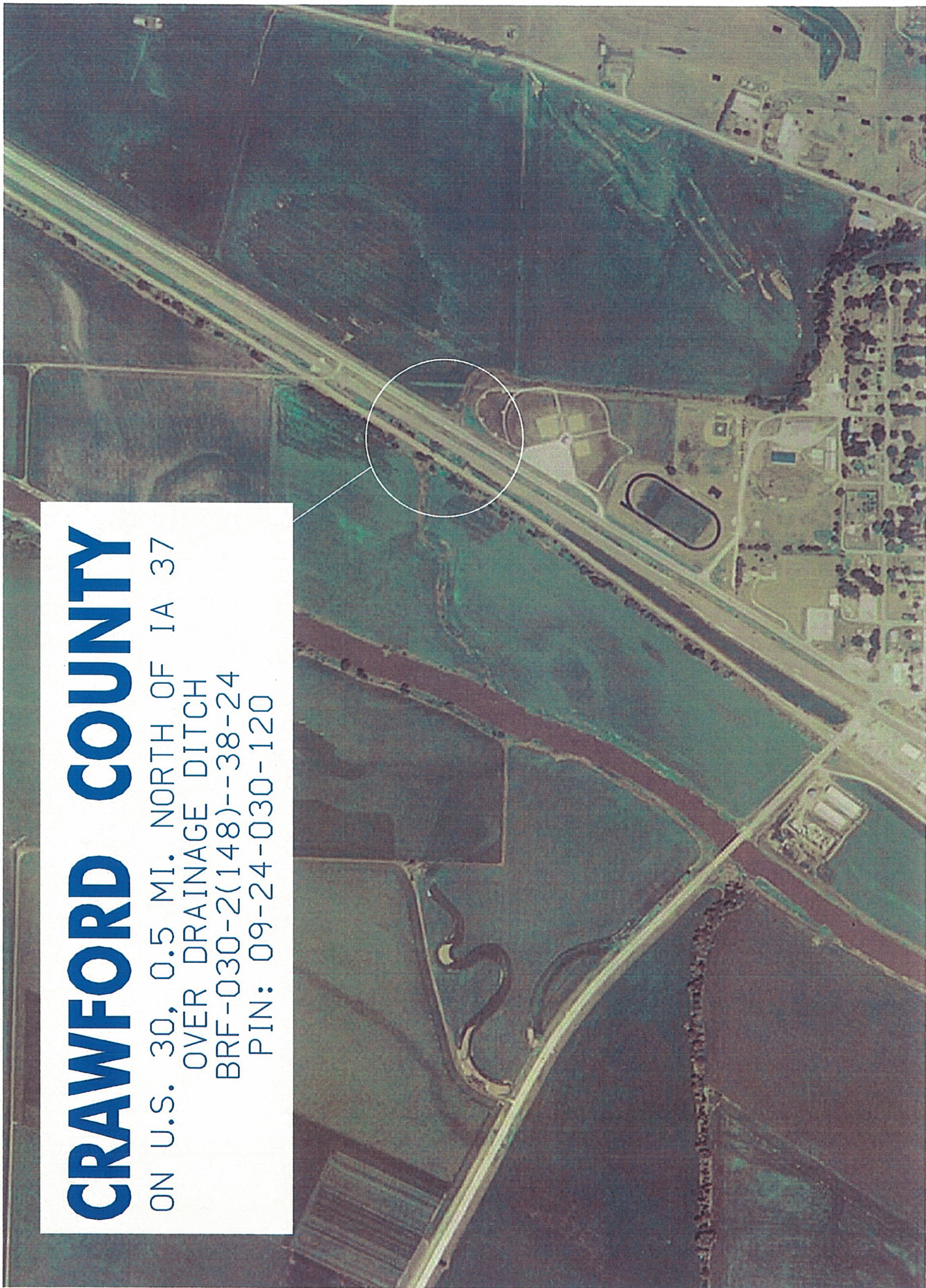
CRAWFORD COUNTY

ON U.S. 30, 0.5 MI. NORTH OF IA 37
 OVER DRAINAGE DITCH
 BRF-030-2(148)--38-24
 PIN: 09-24-030-120

HARRISON CO. R-41W HARRISON CO. SHELBY CO.

CRAWFORD COUNTY

ON U.S. 30, 0.5 MI. NORTH OF IA 37
OVER DRAINAGE DITCH
BRF-030-2(148)--38-24
PIN: 09-24-030-120





Iowa Department of Transportation

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM CRAWFORD COUNTY

RCB CULVERT NEW - TWIN BOX

US 30 Over Drainage Ditch 0.5 Miles N. Of Ia. 37

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

NO MILEAGE SUMMARY



PROJECT LOCATION

D3 EARTHWORK:

| | | |
|------------|---|---------|
| CUT | = | 70 CY |
| FILL + 30% | = | 1965 CY |
| BORROW | = | 1895 CY |

REVISIONS

TOTAL

PROJECT IDENTIFICATION NUMBER

09-24-030-120

PROJECT NUMBER

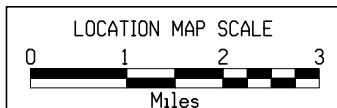
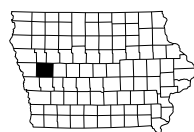
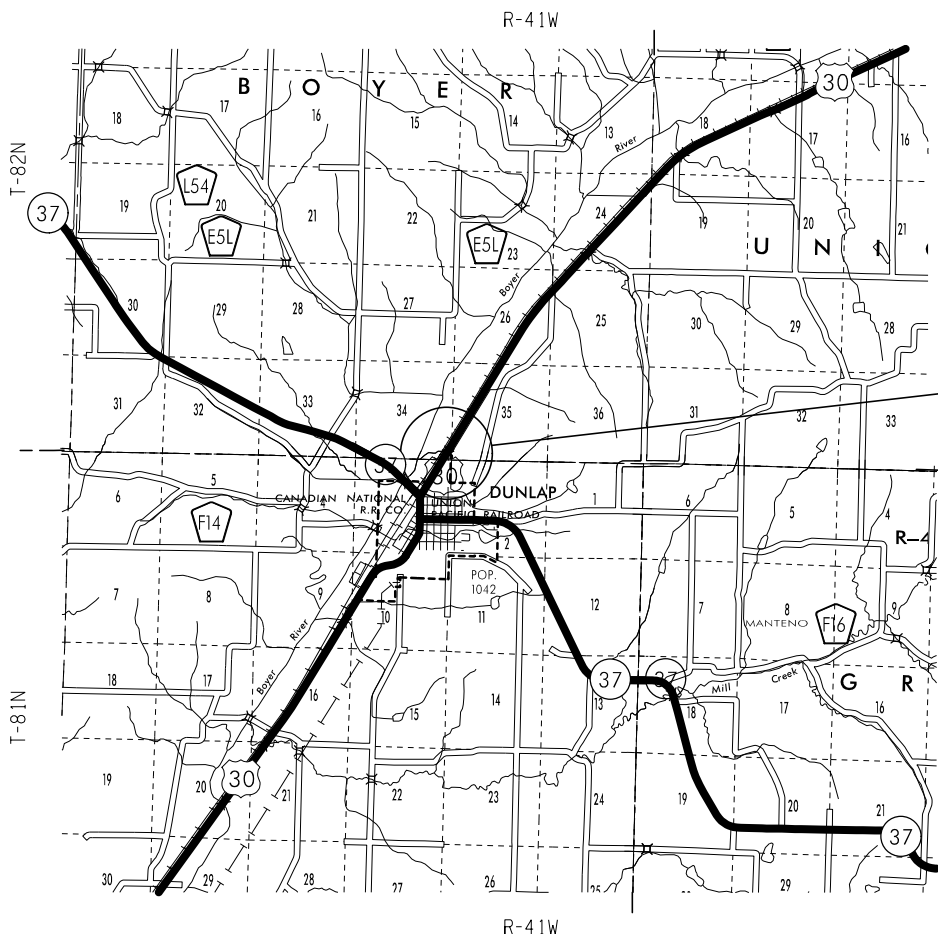
BRFN-30-2(148)--39-24

R.O.W. PROJECT NUMBER

NHSN-030-2(149)--2R-24

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 | U.S. Highway 30 |
| G Sheets | Survey Sheets |
| G.1 | Survey Information |
| G.2 | Horizontal Control Tab. & Super for all Alignments |
| G.3 | Alignment Coordinates |
| J Sheets | Traffic Control and Staging Sheets |
| J.1 | Traffic Control Plan |
| J.1 | Staging Notes |
| J.1 | Tabulation of Special Events |
| W Sheets | Mainline Cross Sections |
| W.1 | Cross Sections Legend & Symbols Information Sheet |
| W.2 - 4 | Mainline Cross Sections |
| | * Color Plan Sheets |



| |
|--------------------------|
| 101-4 |
| 04-30-02 |
| DESIGN DATA RURAL |
| 2013 AADT 3400 V.P.D. |
| 2033 AADT 4960 V.P.D. |
| 2033 DHV 512 V.P.H. |
| TRUCKS 20 % |
| Total Design ESALs -- |

| INDEX OF SEALS | | |
|----------------|------------|-------------------------|
| SHEET NO. | NAME | TYPE |
| A.1 | Kelly Bell | Primary Signature Block |
| | | |
| | | |
| | | |
| | | |

D5 PLAN - Date: 4-16-2012
D4 PLAN - Date: 8-20-2013

PRELIMINARY PLANS

Subject to change by final design.

D3 PLAN - February 9, 2012

LETTING DATE
12-17-2013

RCB CULVERT NEW - TWIN BOX
BRFN-30-2(148)--39-24

CRAWFORD CO.

ENGLISH

IOWA DOT

DESIGN TEAM Flattery\Bell

CRAWFORD COUNTY

PROJECT NUMBER

BRFN-30-2(148)--39-24

SHEET NUMBER

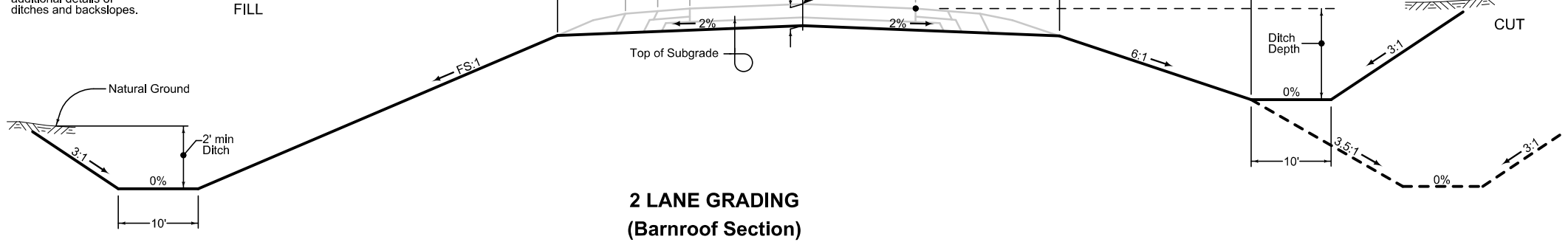
A.1

MODIFIED
07-26-11

| LOCATION | | DIMENSIONS | | | | | |
|---------------------|--------------------|------------|-----------|-------------|-----------|-----------|-----|
| ROAD IDENTIFICATION | STATION TO STATION | Ⓐ Feet | Ⓑ Feet | Ⓒ Inches | Ⓓ Feet | Ⓔ Feet | FS |
| US 30 | 26+65.0 | 27+10.0 | (1) | --- | 6.0 | --- | 3.5 |
| US 30 | 27+10.0 | 27+20.0 | 31.1 | --- | 6.0 | --- | 3.5 |
| US 30 | 27+20.0 | 27+80.0 | 31.1 | (2) | 6.0 | (3) | 3.5 |
| US 30 | 27+80.0 | 28+50.0 | 31.1 | 28.1 | 6.0 | (3) | 3.5 |
| US 30 | 28+50.0 | 29+10.0 | 31.1 | (4) | 6.0 | (5) | 3.5 |
| US 30 | 29+10.0 | 29+50.0 | 31.1 | --- | 6.0 | --- | 3.5 |
| US 30 | 29+50.0 | 30+00.0 | (6) | --- | 6.0 | --- | 3.5 |
| (1) | 25.5 - 31.1 | | | | | | |
| (2) | 26.9 - 28.1 | | | | | | |
| (3) | 0.0 - 13.9 | | | | | | |
| (4) | 28.1 - 26.9 | | | | | | |
| (5) | 13.9 - 0.0 | | | | | | |
| (6) | 31.1 - 25.4 | | | | | | |

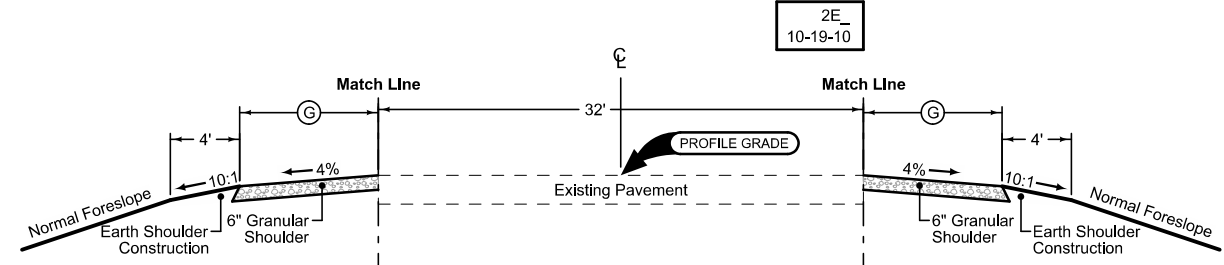
Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.



Granular Shoulder

| 2_G_SR_ 10-19-10 | | |
|--------------------|---------|---------|
| STATION TO STATION | Ⓔ | Feet |
| 26+65.0 | 27+10.0 | 4.6-9.0 |
| 29+50.0 | 30+00.0 | 9.0-4.2 |



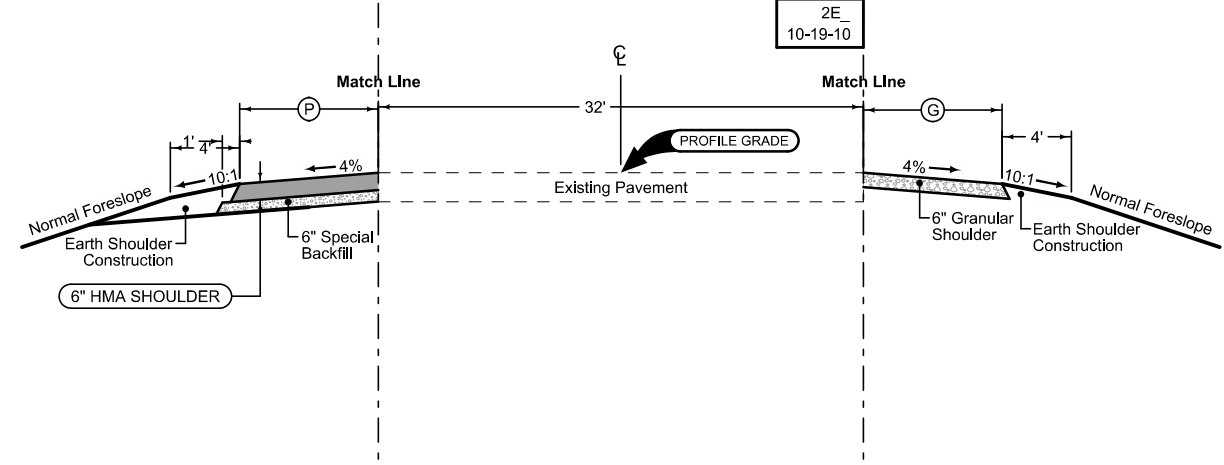
Granular Shoulder

| 2_G_SR_ 10-19-10 | | |
|--------------------|---------|------|
| STATION TO STATION | Ⓔ | Feet |
| 27+20.0 | 29+10.0 | 6.0 |

HMA Shoulder

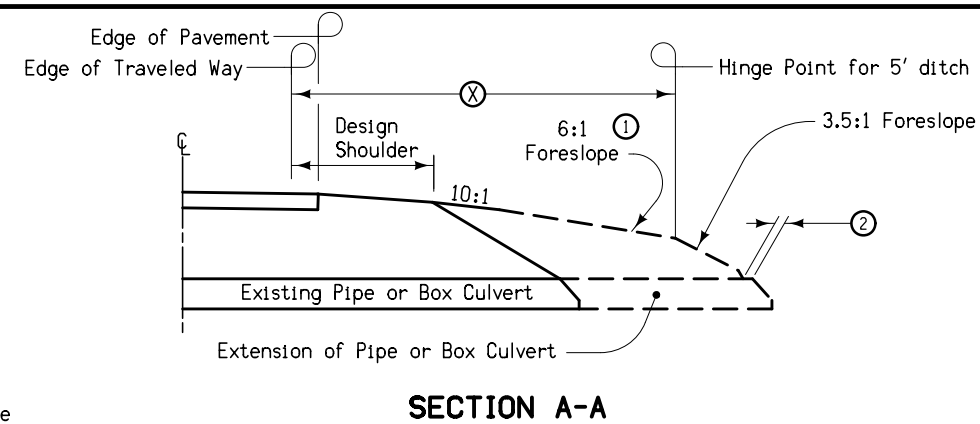
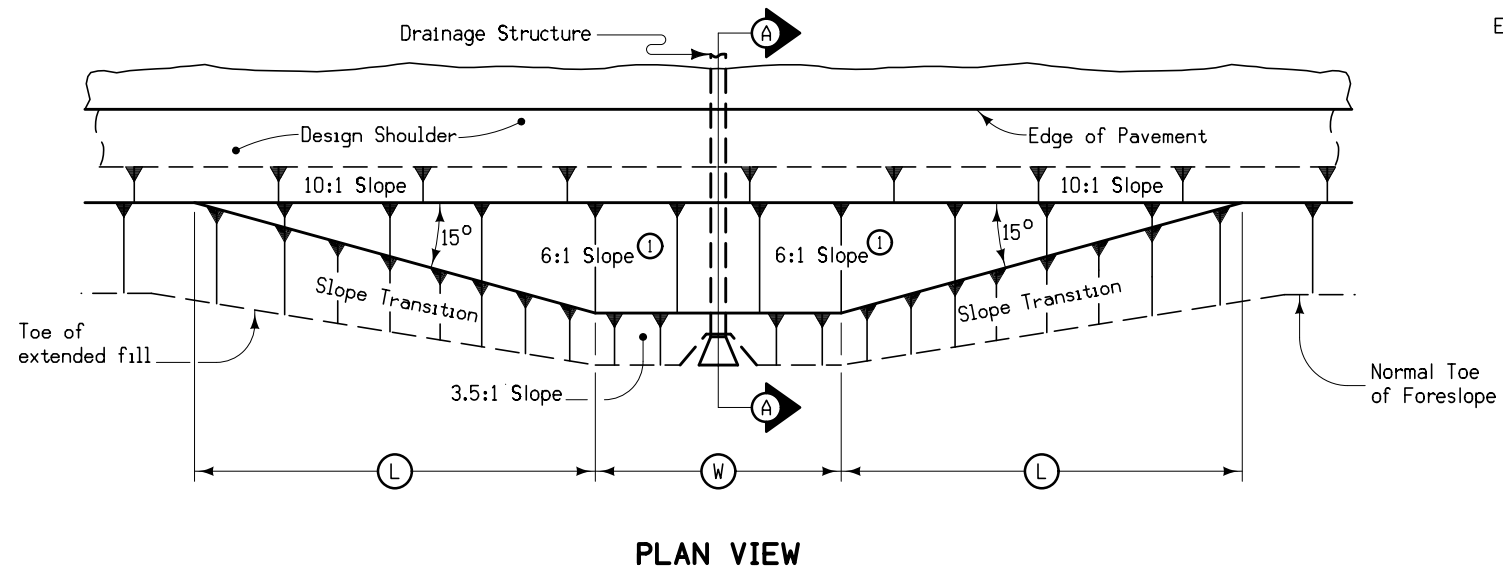
Shoulder Jointing:
Longitudinal joint: B

| 2_P_HMA_ 10-19-10 | | |
|--------------------|---------|------|
| STATION TO STATION | Ⓔ | Feet |
| 27+10.0 | 29+50.0 | 9.0 |



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

U.S. HIGHWAY 30

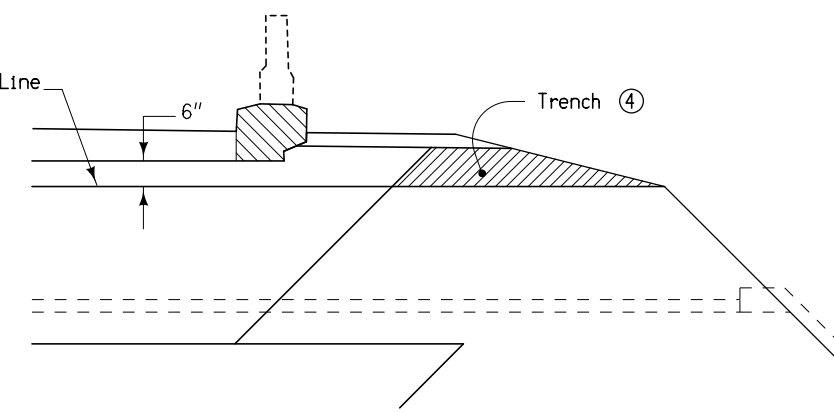
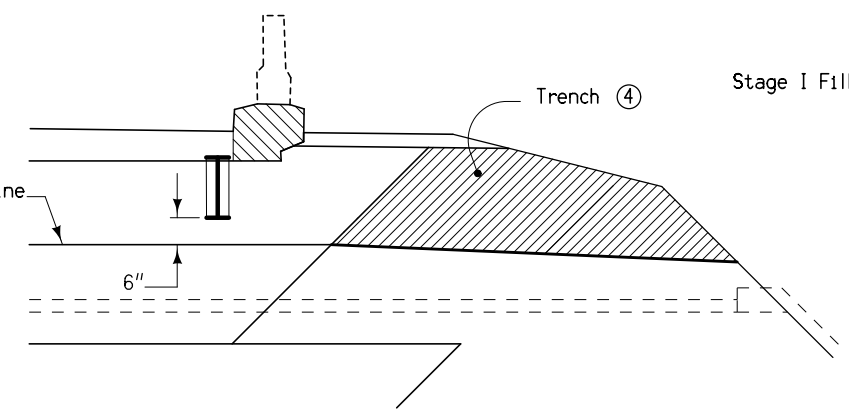
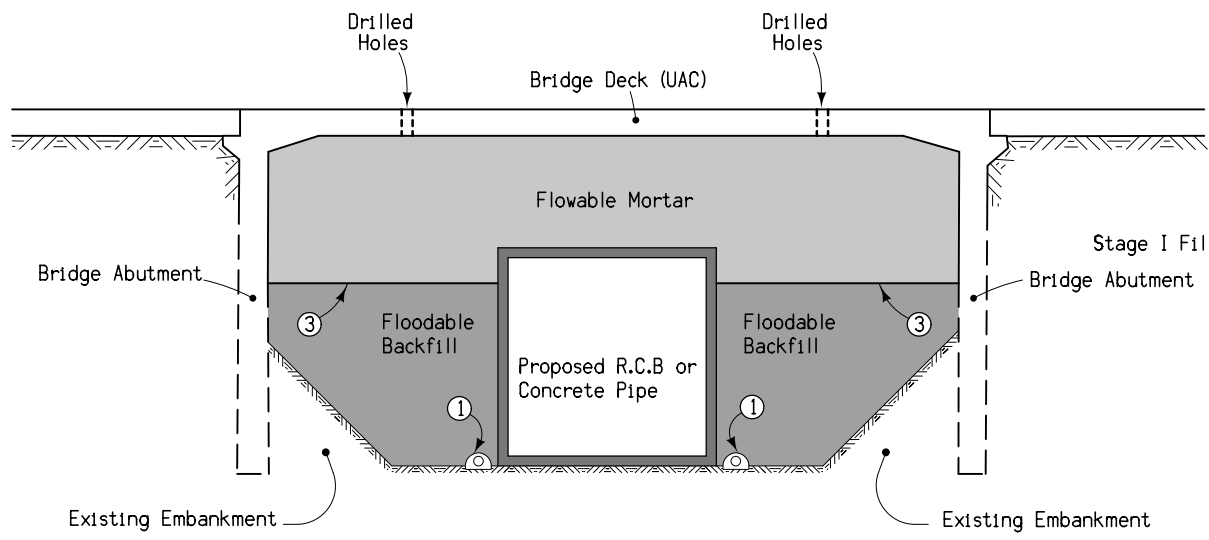
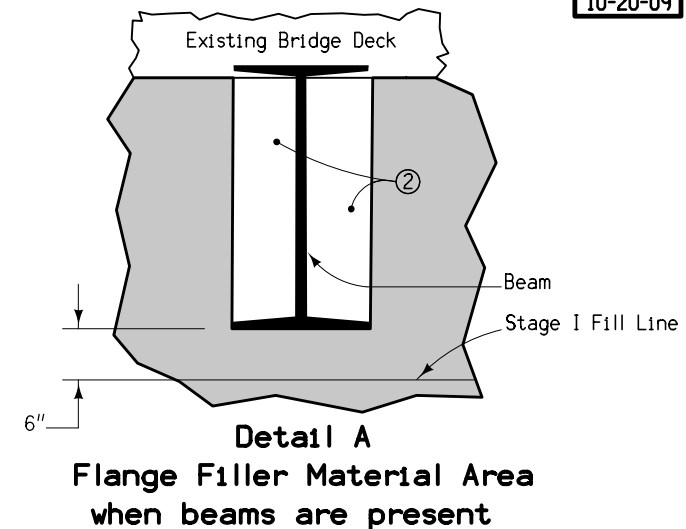
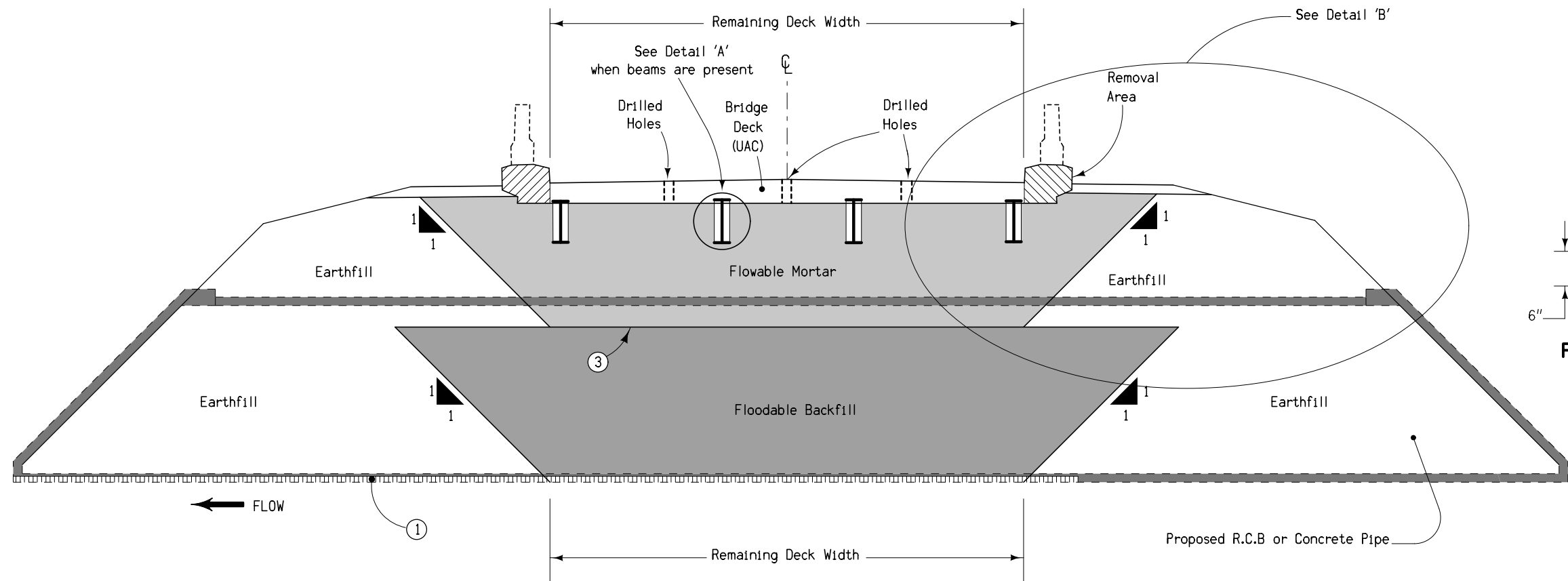


SECTION A-A

| STRUCTURE LOCATION | | (W) | (L) | (X) |
|--------------------|------|------|------|------|
| STATION | SIDE | Feet | Feet | Feet |
| 28+15.50 | R | 70.5 | 59.7 | 30.0 |
| | | | | |
| | | | | |

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

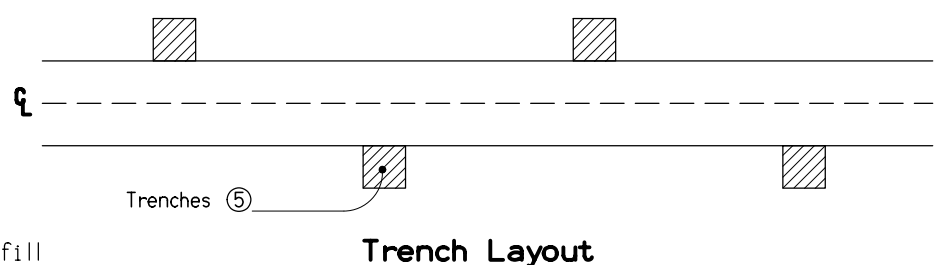
**DETAILS OF
BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE**



Section along Centerline

Detail B (Beam Bridge)

Detail B (Slab Bridge)

























Trench Layout

Denotes pay limits for flooded backfill



- ① 4" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
- ② 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














SURVEY SYMBOLS

-  SH Paved Shoulder
-  BL Topo Breakline
-  C Centerline BL of Road (ML or SR)
-  BRG Bridge
-  RR Centerline of Railroad Tracks
-  MM Mile Marker Post
-  BNK Stream Bank
-  TOP Top of Bridge Pier
-  D Centerline Draw or Stream (Down)
-  DU Centerline Draw or Stream (Up)
-  EP Edge of Paved Roads (ML or SR)
-  GDL Guard Rail (Rail and Cable)
-  SNP Unpaved Shoulder
-  ENU Edge Unpaved Entrance & Parking
-  ENT Centerline BL of Entrance
-  CON Concrete or A/C Slab
-  PPA Power Pole Co. 1
-  OUT Tile Outlet
-  FW Wire Fence
-  TR Telephone Riser Pole
-  EW Edge of Water
-  PIP Pipe Culvert







UTILITY LEGEND

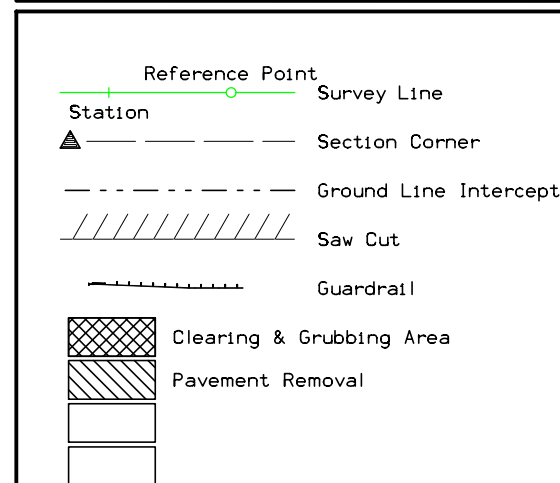
-  Northwest Iowa Power Coop
-  TR Telephone Riser Pole

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 |
| 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 |



RIGHT-OF-WAY LEGEND

-  Proposed Right-of-Way
-  Existing and Proposed Right-of-Way
-  Easement and Existing Right-of-Way
-  Borrow
-  Easement (Temporary)
-  Easement
-  Excess
-  Access Control

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D)

Sta. 28+10.1 Lt. 183.47'
 53' X 14' WOOD & STEEL
 I-BEAM RR BRIDGE
 D.A. = 1306 Acres Plus SD - MTS-F
 (UAC)

HARRISON TWP.
 T-81N R-41W
 SEC. 3

CANADIAN NATL. RR

Sta. 28+07.2 Lt. 83.24'
 50' X 42' CONC. BEAM
 RR BRIDGE
 D.A. = 1306 Acres Plus SD - MTS-F
 (UAC)

STA. 26+65.00
 BEGIN PROJECT

STA. 29+99.00
 END PROJECT

UNION PACIFIC RR

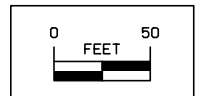
INSTALL
 CABLE GUARDRAIL

+95
 Field Entrance
 (UAC)

REMOVE GUARDRAIL

Sta. 28+15.5
 34' X 42' Conc. Deck Girder Bridge
 D.A. = 1306 Acres - MTS-F
 (UAC)

Sta. 28+07.45 & 28+23.28
 Install Twin 154"x 97"x86' RF-41
 F.L. = Lt. 1086.20
 Rt. 1086.60



Survey Information

Crawford County
 SAP 0657
 BRFN-030-2(148)--39-24
 US 30 Over Drainage Ditch 0.5 Miles North of IA 37 in Crawford County
 PIN 09-24-030-120

General Information

This survey is in English Units.

Control Information – Opus observations and IDOT monuments were utilized as a basis for project control. 14 Control Points were held fixed in the RTK calibration.

- 7 held fixed Vertically; 37,201,202,203,500,502,504
- 3 held fixed Horizontally; 38,46,48,
- 4 held fixed Vertically and Horizontally; 34,36,47,200

Vertical Datum

This survey is relative to NAVD 88 vertical datum. Points 34,47,200 & 37 were statically observed for 4 hours. The OPUS solution values of points 34,47,200 & 37 were held fixed vertically in the RTK calibration. Point number 37 was held on fixed vertically in the level loops that originated and terminated on PN 37. The least squared adjustment values of the marks along the level runs were held fixed on this survey.

Equations:

CP 37 this survey Elev. =1097.708
 =CP 37 Opus Solution Elev. =1097.708 (NAVD 88 NGS Opus)
 =CP 37 Elev. =1097.248 (Computed NGVD 29)

@ Begin of Bridge EI= 1099.78 This Survey
 = Begin of Bridge EI= 1099.50 1929 FA 287 Sheet 6 Paving Plan
 = Begin of Bridge EI= 1099.67 1929 FA 287(3) Sheet 1 of a 1964 Bridge Widening Plan

A level loop South & West along US 30 & Ia 37 originated and terminated on CP 37, the Opus elevation value of 1097.708 was held fixed. The total length of the loop was 1.0 mile with a missed closure of 0.0058 feet.

A level loop North along US 30 originated and terminated on CP 37, the adjusted value of 1097.708 was held fixed. The total length of the 2nd run was 0.5 miles with a missed closure of 0.008 feet.

NGS datasheets show a vertical difference of 0.46' to 0.47' in the area (29 lower than 88) between NAVD88 to NGVD29.

Horizontal Datum

Project Coordinate Transformation

Iowa State Plane North Zone coordinates in US feet were transformed to project ground coordinates using a 1/combined scale factor broadcast about a held point. The held State Plane coordinate and project coordinate at control point 50 are N= 3429655.92 E=4355938.16

1 / GRID = 1.000017621

VERTICAL DATUM = NAVD 88 <> HORIZONTAL DATUM = NAD 83 (1996)

Local Project Plane Coordinate Conversion Equation:

- a. Local Project Coord y = [(State Plane y - hold point y) 1/grid factor] + hold point y
- b. Local Project Coord x = [(State Plane x - hold point x) 1/grid factor] + hold point x

ALL COORDINATES CONVERTED TO ENGLISH UNITS

| POINT | STATE PLANE COORD(Y) | STATE PLANE COORD(X) | POINT SCALE FACTOR | ESTIMATED LOCAL PROJECT PLANE | | GPS DERIVED ORTHOMETRIC HEIGHT |
|-------|----------------------|----------------------|--------------------|-------------------------------|------------|--------------------------------|
| | | | | COORD(Y) | COORD(X) | |
| G034 | 3414680.99 | 4347546.92 | 1.00004695 | 3414680.72 | 4347546.78 | 1099.57 |
| G035 | 3415731.40 | 4348316.51 | 1.00004623 | 3415731.16 | 4348316.38 | 1144.33 |
| G036 | 3418468.83 | 4348687.35 | 1.00004438 | 3418468.63 | 4348687.22 | 1095.83 |
| G037 | 3420610.78 | 4350026.92 | 1.00004293 | 3420610.62 | 4350026.82 | 1097.87 |
| G038 | 3424611.35 | 4352461.30 | 1.00004025 | 3424611.26 | 4352461.24 | 1101.44 |
| G039 | 3409140.95 | 4347104.88 | 1.00005075 | 3409140.59 | 4347104.73 | 1101.64 |
| G040 | 3412076.60 | 4347536.89 | 1.00004873 | 3412076.29 | 4347536.74 | 1115.84 |
| G041 | 3412405.71 | 4350145.12 | 1.00004846 | 3412405.41 | 4350145.02 | 1165.88 |
| G042 | 3412935.76 | 4350193.00 | 1.00004810 | 3412935.46 | 4350192.90 | 1210.19 |
| G043 | 3414508.56 | 4353103.73 | 1.00004698 | 3414508.29 | 4353103.68 | 1287.90 |
| G044 | 3415040.51 | 4351541.00 | 1.00004664 | 3415040.25 | 4351540.92 | 1231.31 |
| G045 | 3416928.81 | 4353887.93 | 1.00004533 | 3416928.59 | 4353887.89 | 1238.31 |
| G046 | 3416961.75 | 4353012.67 | 1.00004532 | 3416961.52 | 4353012.62 | 1228.23 |
| G047 | 3419706.57 | 4351871.28 | 1.00004350 | 3419706.40 | 4351871.21 | 1169.64 |
| G048 | 3422263.22 | 4352556.12 | 1.00004179 | 3422263.09 | 4352556.06 | 1124.29 |
| G049 | 3426813.10 | 4353801.73 | 1.00003879 | 3426813.05 | 4353801.70 | 1100.53 |
| G050 | 3429655.92 | 4355938.16 | 1.00003692 | 3429655.92 | 4355938.16 | 1118.48 |
| G200 | 3422456.23 | 4344188.78 | 1.00004180 | 3422456.11 | 4344188.57 | 1156.25 |

Alignment

The mainline alignment is a retrace of the existing alignment. Stationing was carried backed up & carried forward from POT Sta 24+83.50 found in FA 287(2) AB Paving Plan

Alignment Equations

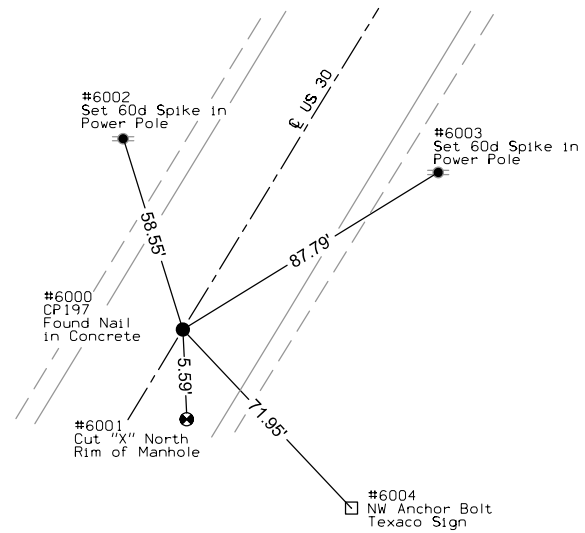
POT Sta 24+83.50 – This Survey (Set CP from X-Ties)
 =POT Sta 24+83.5 - 1929 FA 287 Sheet 6 Paving Plan
 =POT Sta 24+83.5 - 1960 FA 287(2) AB Sheet 4 Paving Plan

PI Sta 0+25.027 This Survey (Fd Nail set in PCC Slab)
 = PI Sta 0+27.00 AB Stationing FN-861 1961 Resurfacing Plan
 = PI Sta 0+27.00 AB Stationing FN-30-1(9)—21-43 1969 Resurfacing Plan

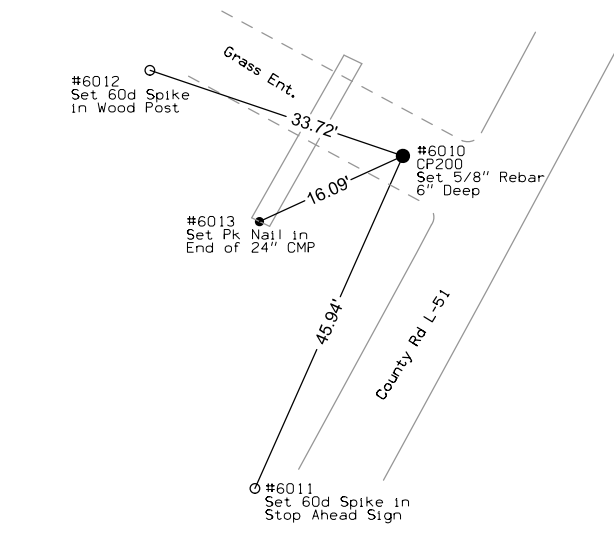
BENCHMARKS

| | | | | | | ELEVATION |
|--------------|-----------|----------|-------------------|---------------|------------------------------------|-----------|
| ----- | | | | | | ----- |
| No. 500 Sta. | 2+57.696 | 1003.235 | Lt. Y:3419024.422 | X:4347918.101 | Fd IHC NE Wing of Brg----- | 1101.341 |
| No. 501 Sta. | 00+77.794 | 160.283 | Lt. Y:3418432.029 | X:4348544.203 | Set RR Spk SW Side PP----- | 1098.016 |
| No. 502 Sta. | 10+26.622 | 41.183 | Rt. Y:3419137.308 | X:4349210.120 | Cut"X" SE Bolt F Hyd----- | 1102.766 |
| No. 503 Sta. | 17+81.968 | 46.371 | Rt. Y:3419779.553 | X:4349607.733 | Set RR Spk W Side PP----- | 1097.695 |
| No. 504 Sta. | 27+91.597 | 22.416 | Rt. Y:3420654.051 | X:4350112.872 | Cut"X" SE Barrier Rail of Brg----- | 1101.651 |
| No. 505 Sta. | 35+64.296 | 45.813 | Rt. Y:3421301.556 | X:4350535.186 | Set RR Spk W Side PP----- | 1094.023 |

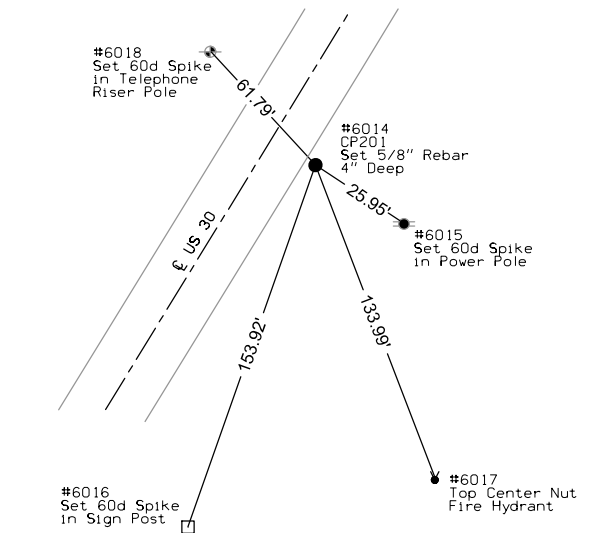
C.P. STA. 0+25.03 RIGHT 0.00
 CP197, Found Nail in Concrete
 XC=4348653.592 YC=3418303.542



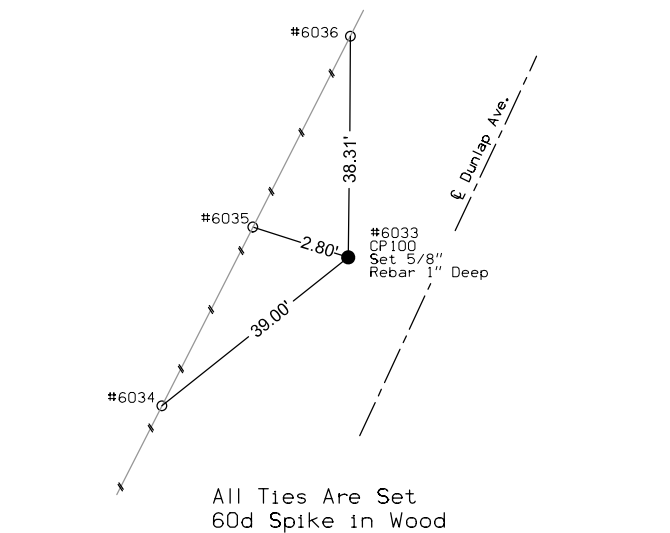
C.P. STA. 12+46.46 LEFT 5973.97
 CP200, Set 5/8" Rebar 6" Deep
 XC=4344188.572 YC=3422456.106



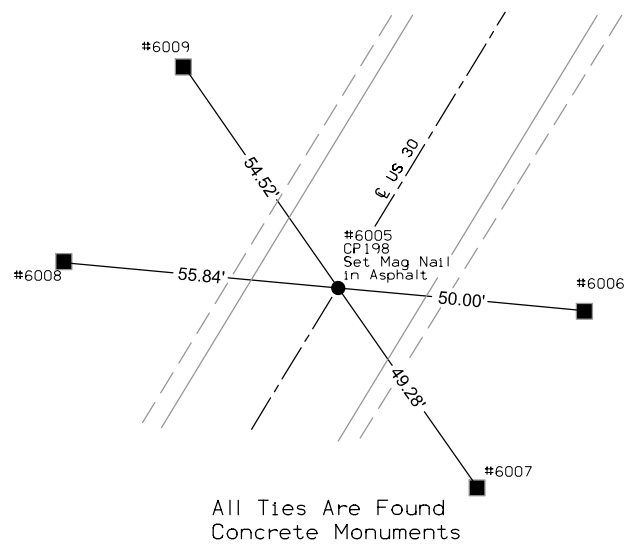
C.P. STA. 21+41.79 RIGHT 20.82
 CP201, Set 5/8" Rebar 4" Deep
 XC=4349773.213 YC=3420100.084



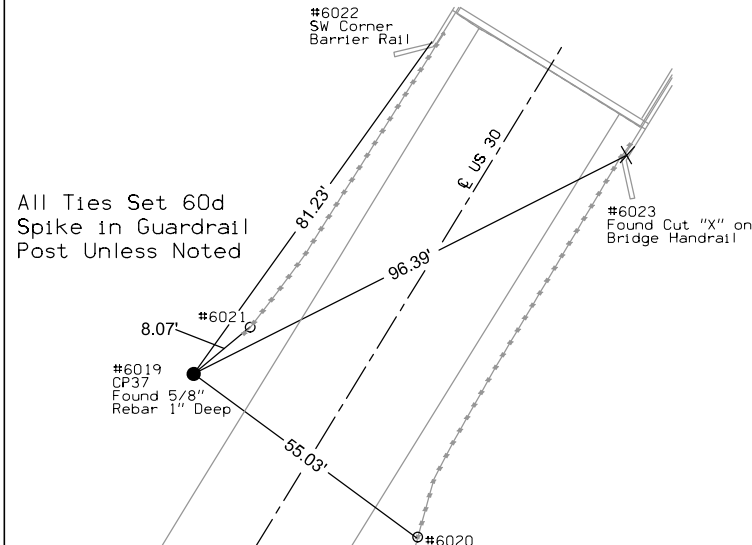
C.P. STA. 22+89.02 RIGHT 2124.95
 CP100, Set 5/8" Rebar 1" Deep
 XC=4351646.443 YC=3419130.522



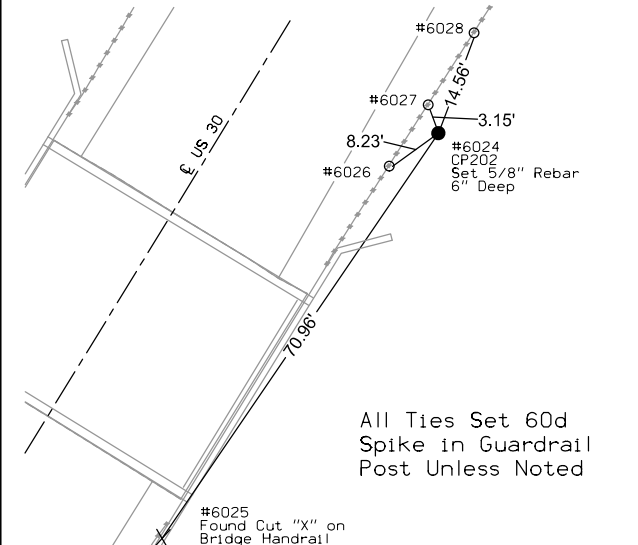
C.P. STA. 24+83.50 RIGHT 0.00
 CP198, Set PK Nail in Asphalt
 XC=4349933.310 YC=3420402.687



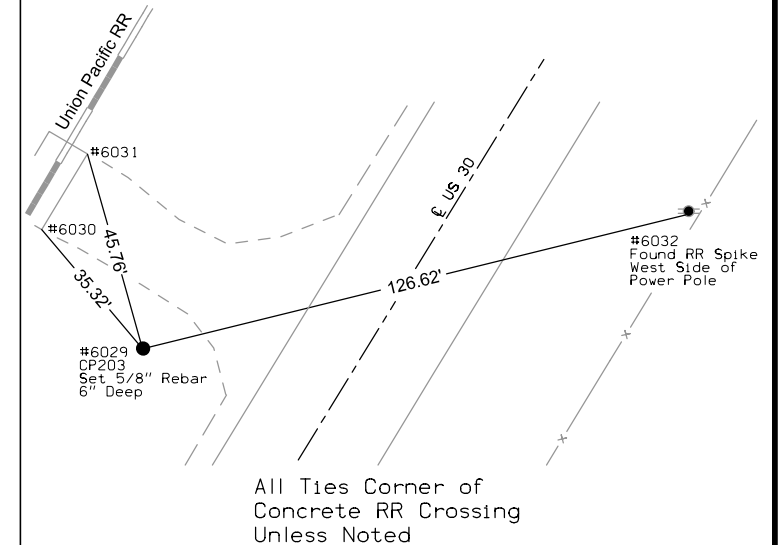
C.P. STA. 27+09.71 LEFT 28.44
 CP37, Found 5/8" Rebar 1" Deep
 XC=4350026.820 YC=3420610.620



C.P. STA. 28+62.47 RIGHT 26.04
 CP202, Set 5/8" Rebar 6" Deep
 XC=4350152.865 YC=3420712.673



C.P. STA. 34+74.40 LEFT 43.37
 CP203, Set 5/8" Rebar 6" Deep
 XC=4350412.240 YC=3421271.247



LEGEND OF CROSS SECTION SHEETS (ROAD)

- - - - - - Existing Ground Line
- ===== Proposed Template
- ===== Proposed Topsoil Placement
- - - - - Additional Topsoil Removal
- ===== Subgrade Treatment
- - - - - Granular Shoulder
- ===== Pavement
- - - - - Existing Pipe\RCB
- ===== Proposed Pipe\RCB
- ===== Proposed Dike
- ===== All Elements Associated with Proposed Entrances

LEGEND OF CROSS SECTION SHEETS (SOILS)

- TS----- Topsoil (Class 10)
- TS A----- Topsoil (Type A Disposal)
- TS B----- Topsoil (Type B Disposal)
- TS C----- Topsoil (Type C Disposal)
- CL 10----- Class 10 Materials
- SEL LO----- Select Loams And Clay-Loams
- SEL SA----- Select Sand
- UNS A----- Unsuitable Type A Disposal
- UNS B----- Unsuitable Type B Disposal
- UNS C----- Unsuitable Type C Disposal
- SHALE----- Shale
- WASTE----- Waste
- B&W LS----- Broken and Weathered Rock
- ROCK----- Solid Rock
- BLDRS----- Boulders

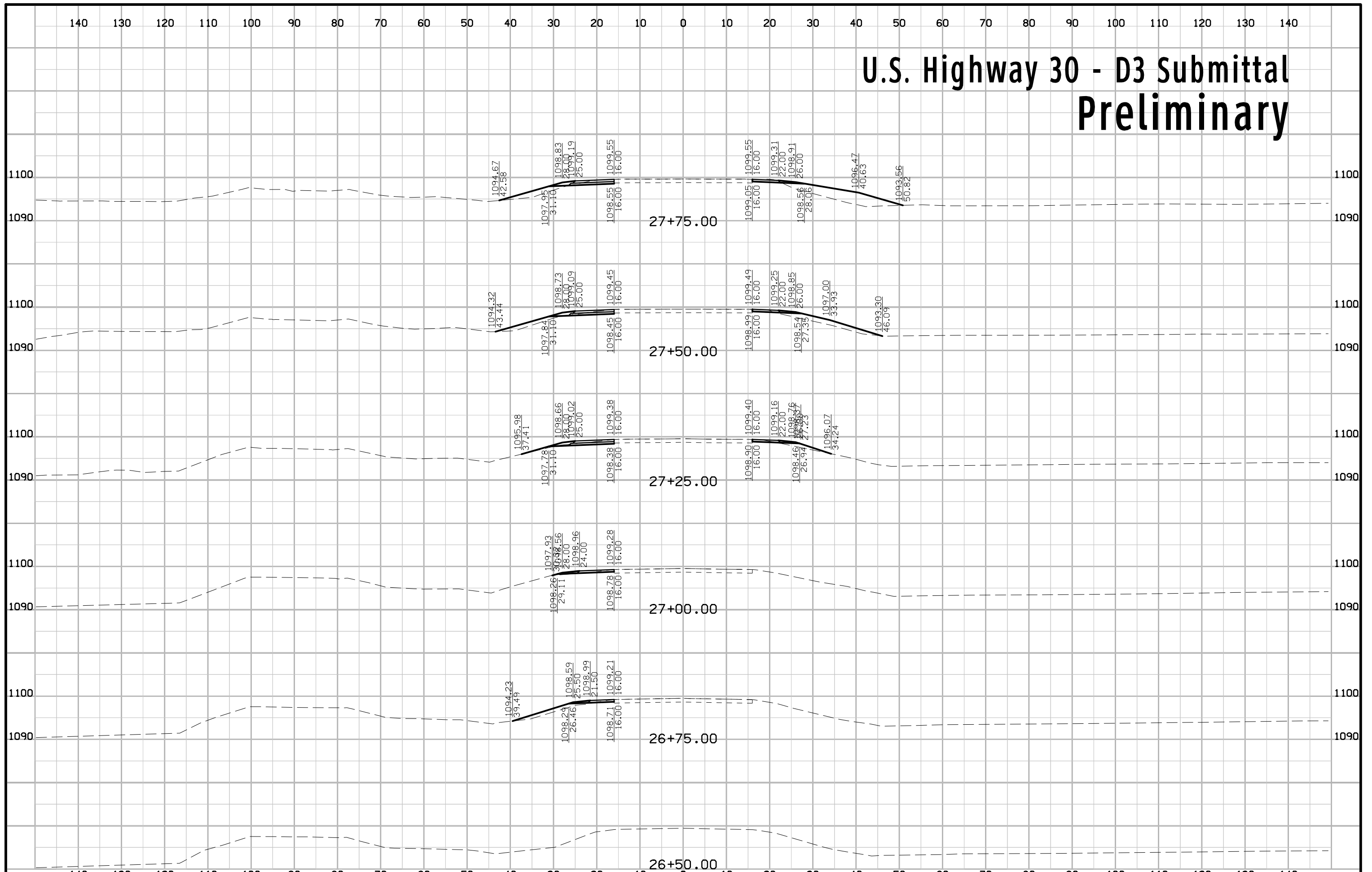
Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

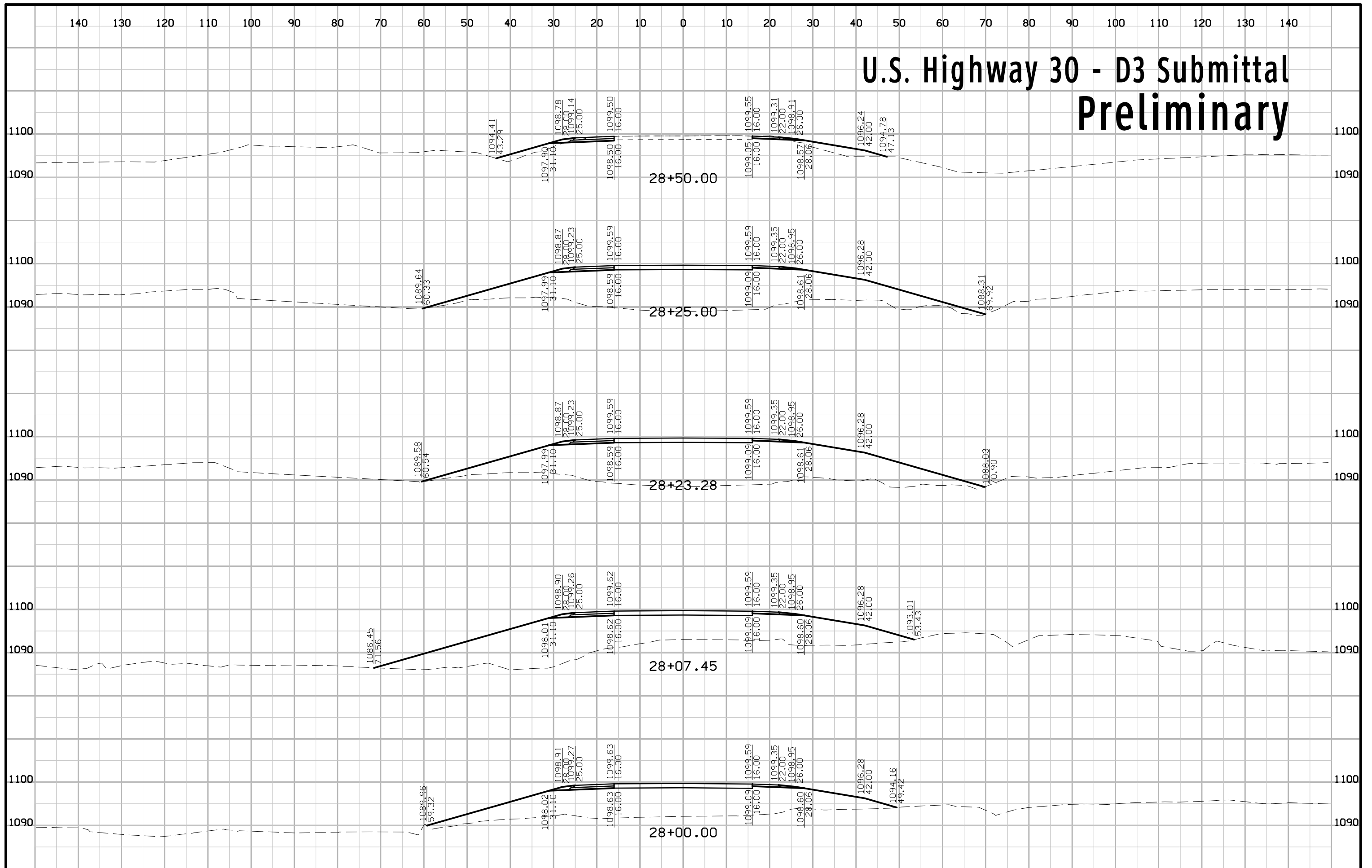
**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

(COVERS SHEET SERIES W)

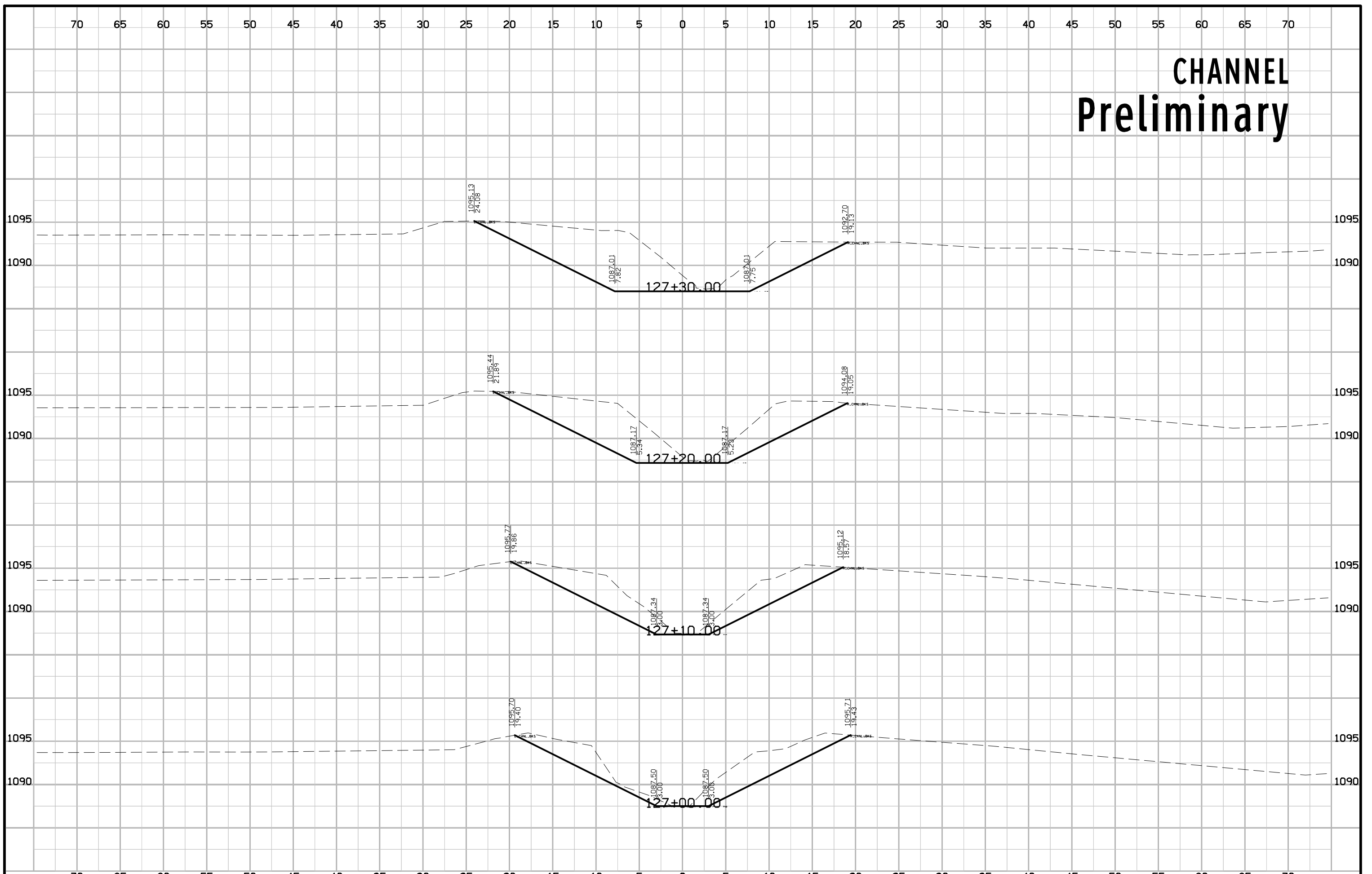
U.S. Highway 30 - D3 Submittal Preliminary



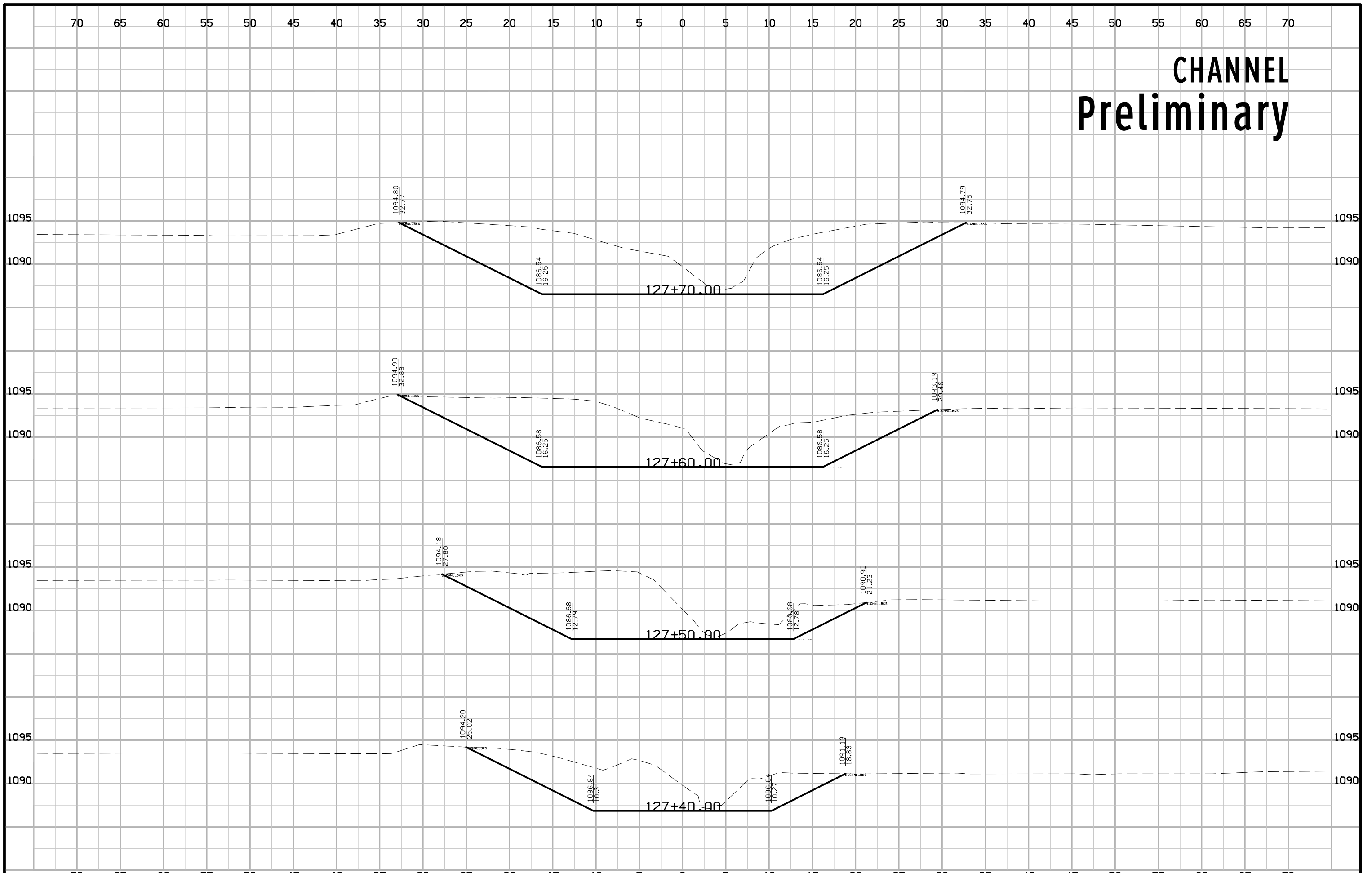
U.S. Highway 30 - D3 Submittal Preliminary



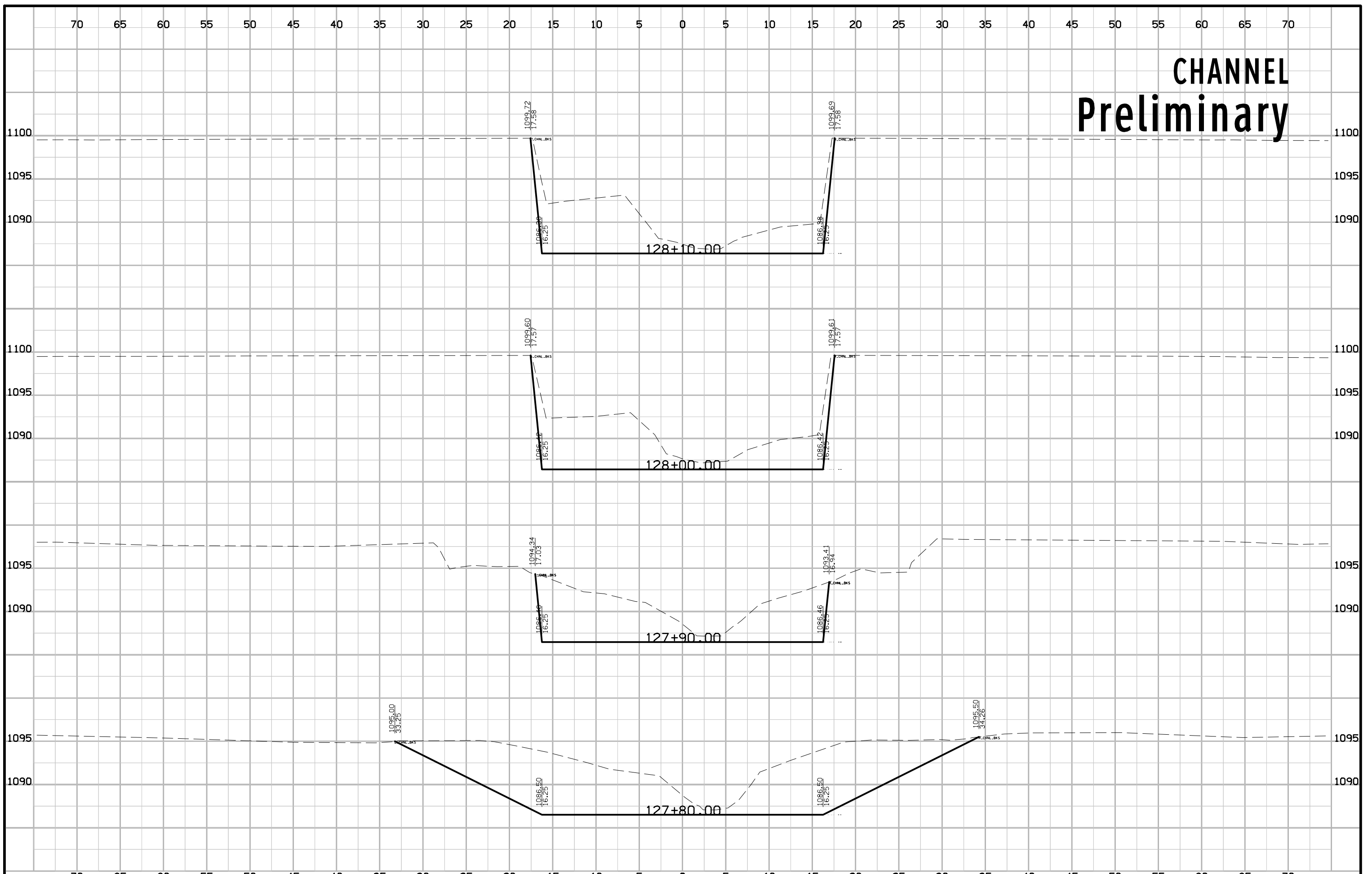
CHANNEL Preliminary



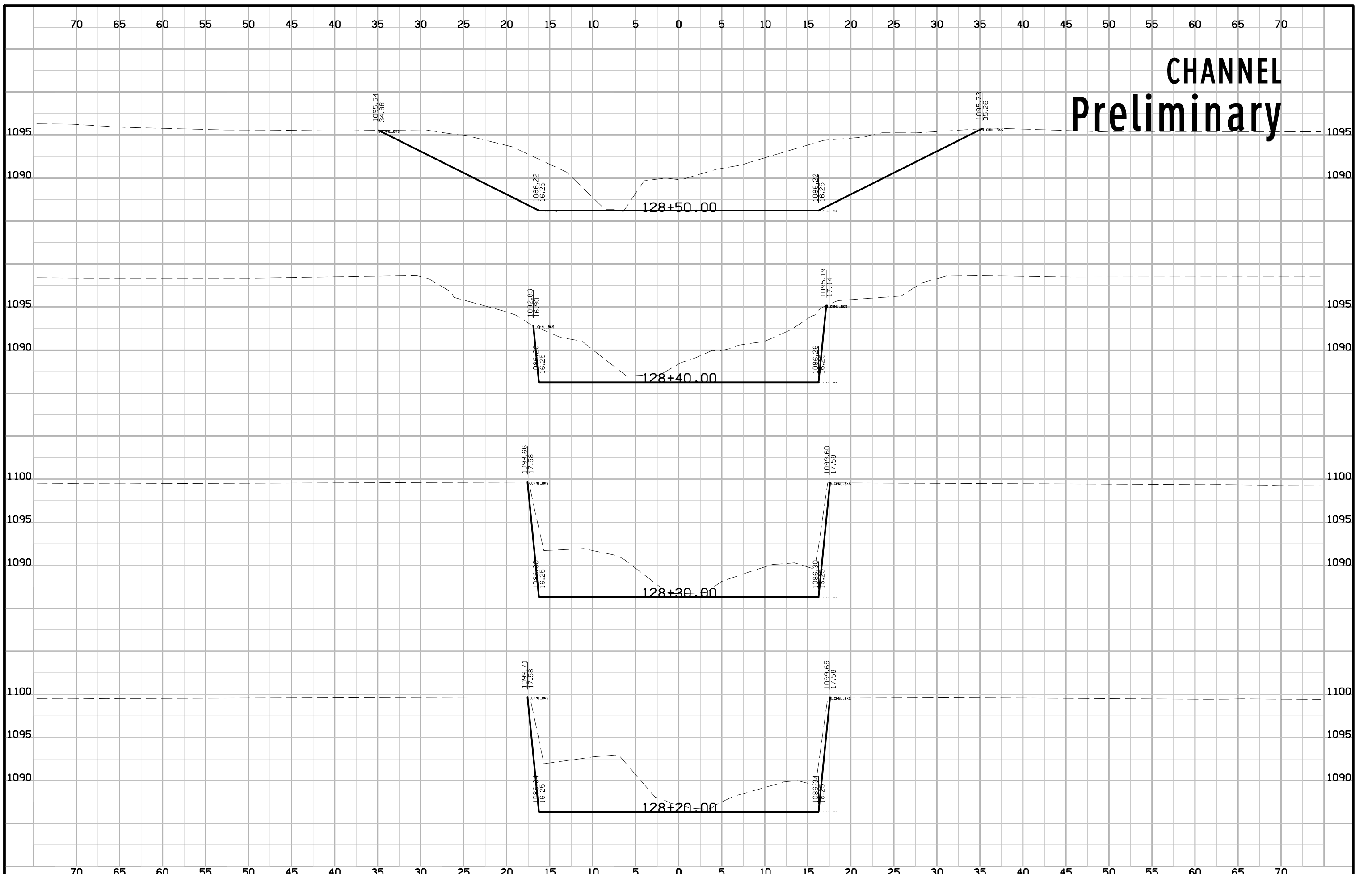
CHANNEL Preliminary



CHANNEL Preliminary



CHANNEL Preliminary



CHANNEL Preliminary

