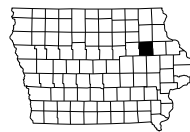


NOT TO SCALE



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
BUCHANAN COUNTY
PIPE CULVERTS

Iowa 150
 Benton County to Fayette County

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.
 Value Engineering Saves. Refer to Article 1105.15 of the Specifications.



REVISIONS

TOTAL

30

PROJECT IDENTIFICATION NUMBER

14-10-150-010

PROJECT NUMBER

NHSN-150-3(72)--2R-10

R.O.W. PROJECT NUMBER

NHSN-150-3(73)--2R-10

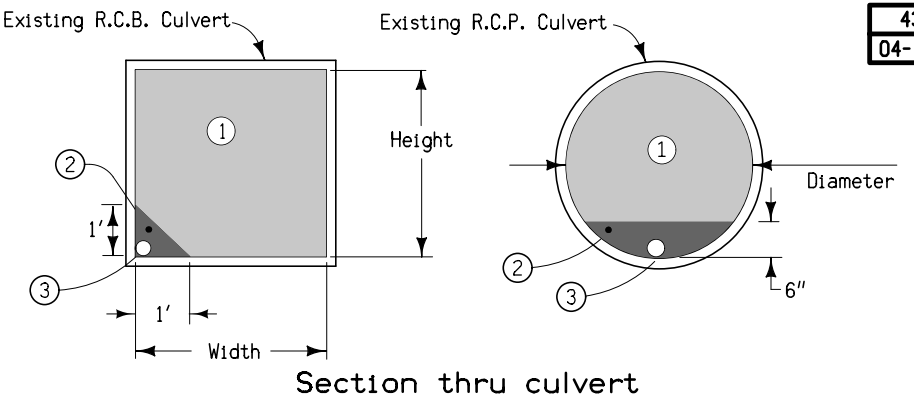
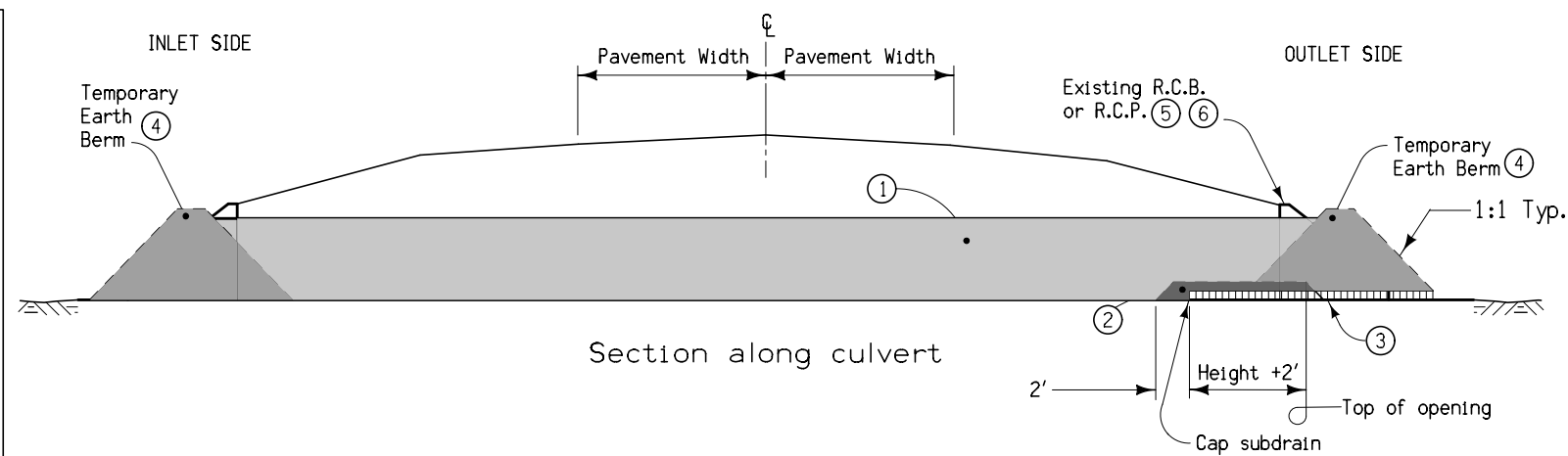
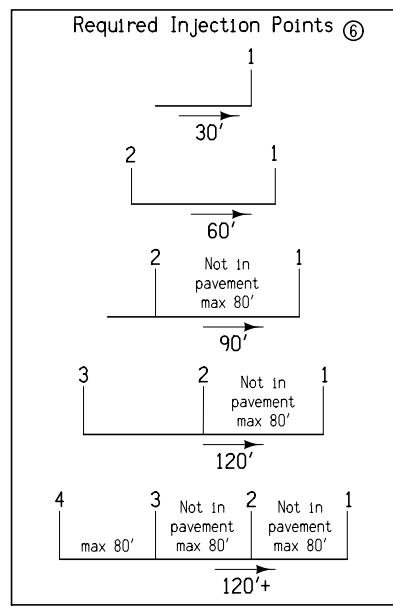
INDEX OF SHEETS

| No. | DESCRIPTION |
|-----------------|---|
| A Sheets | Title Sheets |
| * A.1 | Title Sheet with Location Map |
| B Sheets | Typical Cross Sections and Details |
| B.1 - 2 | Typical Cross Sections and Details |
| C Sheets | Quantities and General Information |
| C.1 - 3 | Tabulations |
| D Sheets | Mainline Plan and Profile Sheets |
| * D.1 | Plan and Profile Legend and Symbol Information Sheet |
| * D.2 - 12 | Aerial and Background Sheets with Proposed Work Areas |
| G Sheets | Survey Sheets |
| G.1 | Alignment Information |
| G.2 | Reference Ties and Bench Marks |
| J Sheets | Traffic Control and Staging Sheets |
| J.1 | Staging Notes and Tabulations |
| M Sheets | Storm Sewer Sheets |
| M.1 | Storm Sewer Tabulations |
| U Sheets | 500 Series, Mod.Stds. and Detail Sheets |
| U.1 | Special Details |
| V Sheets | Bridge and Culvert Situation Plans |
| * V.1 - 7 | Bridge and Culvert Situation Plans |
| | * Color Plan Sheets |

PRELIMINARY PLANS

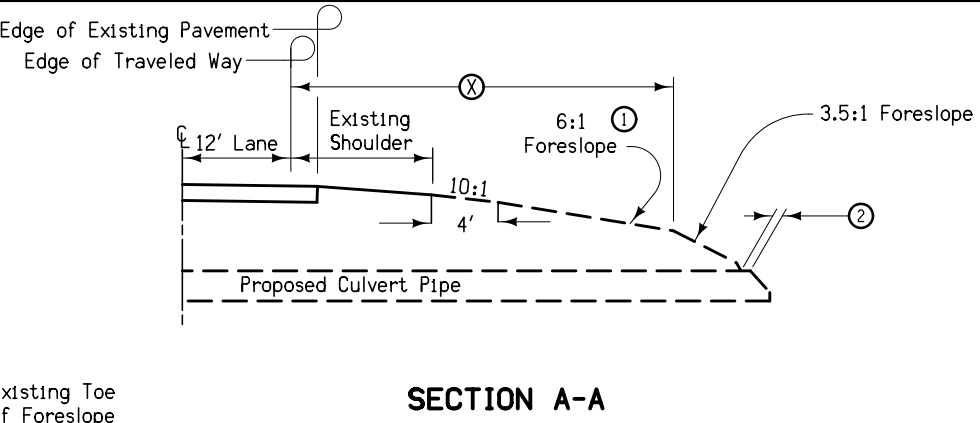
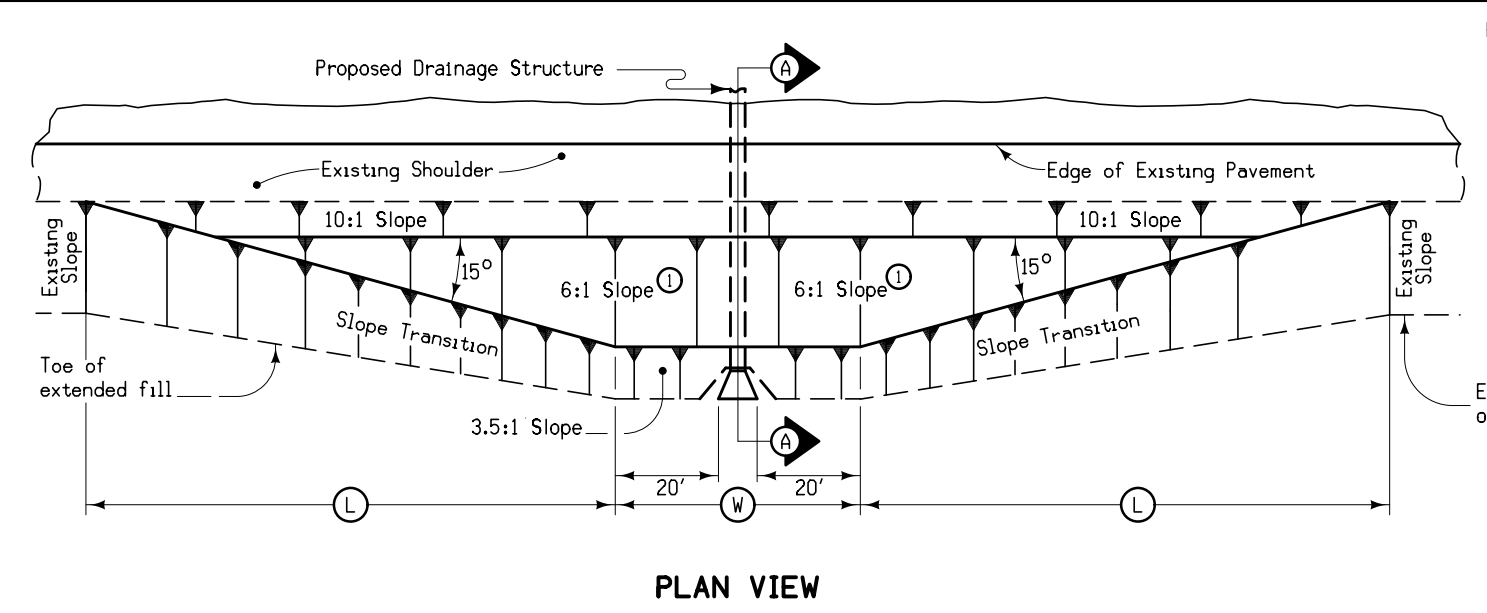
Subject to change by final design.

D5 PLAN - Date: 2-22-2018



- ① Flowable Mortar.
- ② Granular Backfill.
- ③ 4" subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2' plus the height of the culvert. Granular Backfill covers subdrain and extends an additional 2'. Subdrain and granular backfill are incidental to flowable mortar.
- ④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
- ⑤ Removal of headwalls may be required.
- ⑥ Outlet shall be filled first. See injection point detail for additional information.

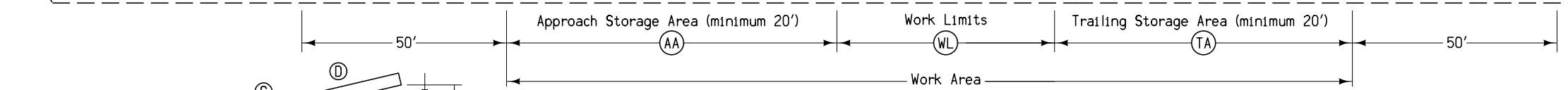
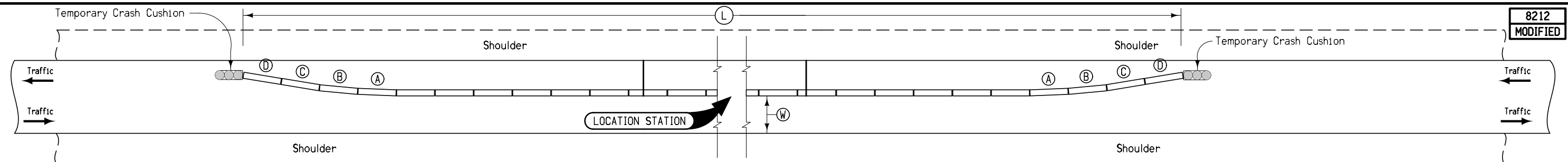
DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures less than 8' in either height or width.
Circular structures less than 10' Dia.)



- Notes:
- At locations where 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.
 - ③ North side: carry full barnroof to side road embankment.
 - Ⓧ = Pipe or R.C.B. width plus 20 feet each side.

| STRUCTURE LOCATION | | Ⓧ | Ⓛ | Ⓧ | FS |
|--------------------|------|------|------|------|------|
| STATION | SIDE | Feet | Feet | Feet | Feet |
| 232+45.25 | B | 47.8 | 81 | 26 | 3.5 |
| 286+05.00 | B | 45.0 | 80 | 26 | 3.5 |
| 365+00.00 | B | 54.5 | 79 | 26 | 3.5 |
| 375+05.90 | B | 45.6 | 81 | 26 | 3.5 |
| 382+25.90 | B | 45.6 | 81 | 26 | 3.5 |
| 397+13.70 | B | 48.9 | 80 | 26 | 3.5 |
| 319+82.00 | B | 45.7 | 73 | 26 | 3.5 |

BARNROOF FORESLOPE AT DRAINAGE STRUCTURE



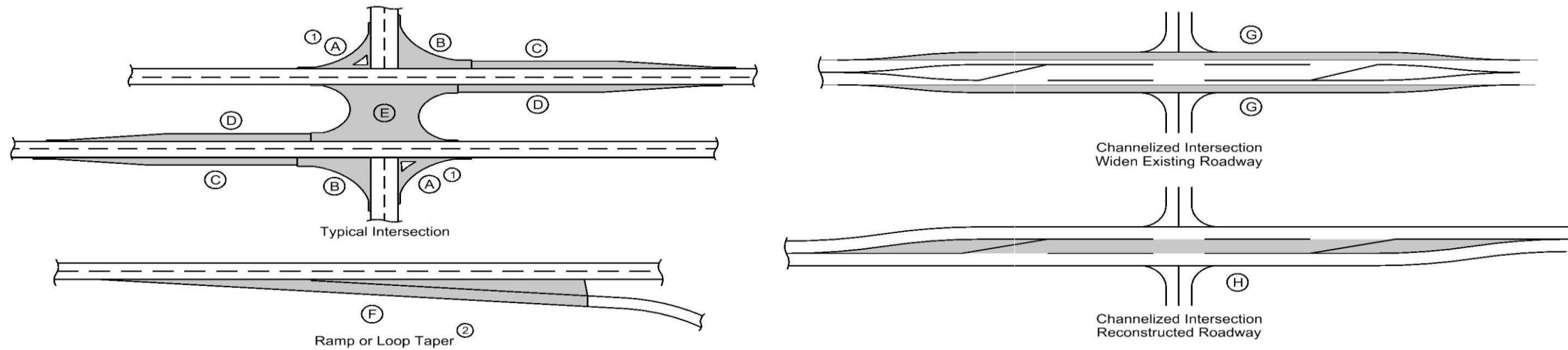
BARRIER OFFSETS FOR FLARE SECTIONS

- ① Place TBR 3 feet left of center line.
- Ⓜ Lane width

**TEMPORARY CONCRETE BARRIER LAYOUT
for Two-Way Traffic**

| Station | Side | ⒶⒶ | Ⓜ | ⒿⒶ | Ⓛ | Anchored X | Ⓜ | Remarks |
|-----------|------|------|------|------|-------|---------------|-----------|---------|
| | | Feet | Feet | Feet | Feet | | Ft-Inches | |
| 17+15.00 | L | 25 | 25 | 25 | 175 | | 12'-0 | ① |
| 67+03.70 | L | 25 | 25 | 25 | 175 | | 12'-0 | ① |
| 286+15.50 | L | 25 | 25 | 25 | 175 | X | 12'-0 | |
| 286+15.50 | R | 25 | 25 | 25 | 175 | X | 12'-0 | |
| 365+11.13 | L | 25 | 37.5 | 25 | 187.5 | X | 12'-0 | |
| 365+11.13 | R | 25 | 37.5 | 25 | 187.5 | X | 12'-0 | |
| 319+92.00 | L | 25 | 25 | 25 | 175 | X | 12'-0 | |
| 319+92.00 | R | 25 | 25 | 25 | 175 | X | 12'-0 | |

PCC PAVEMENT



- ① Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
- ② Refer to PV-410, PV-411, PV-412, and PV-414.
- ③ Quantity includes Pavement Header.

| Road Identification | Location | | Mainline | | | Area ③ | | | | | | | | Total Area By Pavement Thickness | | Special Backfill | Modified Subbase | Granular Subbase | Remarks |
|---------------------|---------------------|-----------------------|----------|--------|------|--------|----|----|----|----|-----|----|----|----------------------------------|-----------|------------------|------------------|------------------|---------|
| | Direction of Travel | Station to Station | Width | Length | Area | A ① | B | C | D | E | F ② | G | H | SY | | | | | |
| | | | FT | FT | SY | SY | SY | SY | SY | SY | SY | SY | SY | 10 IN | 10 1/2 IN | | | | |
| Iowa 150 | B | 285+93.00 - 286+16.00 | 22.0 | 23.0 | 56.2 | | | | | | | | | 56.2 | | | | | |
| Iowa 150 | B | 364+85.50 - 365+14.50 | 22.0 | 29.0 | 70.9 | | | | | | | | | 70.9 | | | | | |
| Iowa 150 | B | 319+73.00 - 319+91.00 | 32.0 | 18.0 | 64.0 | | | | | | | | | 64.0 | | | | | |

SHOULDERS

- ① Lane(s) to which the shoulder is adjacent.
- ② Bid Item
- ③ Applies only for Paved Shoulders constructed on project with existing granular shoulders.
- ④ Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 0, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

| Road Identification | Direction Of Traffic | Location | | | Side | P Width | G Width | L Length | Class 13 Excavation | Hot Mix Asphalt | Binder | Paved Shoulder | Reinforced Paved Shoulder | Quantities | | | | Modified Subbase | Granular Shoulder | | Earth Shoulder Construction Alternates | | | Remarks | | | | | |
|---------------------|----------------------|--------------------|--------------------|--------------------|------|---------|---------|----------|---------------------|-----------------|--------|----------------|---------------------------|------------------|---------------|---------|-------|------------------|-------------------|------|--|---------|-------|---------|---------|---------|---------|----------|----------|
| | | Station to Station | Station to Station | Station to Station | | | | | | | | | | Special Backfill | | CY ② | TON ② | | TON/STA | CY ② | TON ② | TON/STA | CY ② | | TON ② | TON/STA | STA ② | HMA CY ④ | PCC CY ④ |
| | | | | | | | | | | | | | | HMA Alternate | PCC Alternate | | | | | | | | | | | | | | |
| | | FT | FT | FT | | | | | | | | | | CY ② | TON | TON/STA | TONS | | SY ② | SY ② | TON ② | TON/STA | TON ② | | TON/STA | TON ② | TON/STA | TON ② | TON/STA |
| Iowa 150 | SB | 17+04.50 | 17+25.50 | 17+25.50 | L | 4.0 | 21.0 | | | | | | | | | | 2.940 | 14.000 | 0.2 | | | | | | | | | | |
| | NB | 17+04.50 | 17+25.50 | 17+25.50 | R | 4.0 | 21.0 | | | | | | | | | | 2.940 | 14.000 | 0.2 | | | | | | | | | | |
| | SB | 66+95.70 | 67+11.70 | 67+11.70 | L | 4.0 | 16.0 | | | | | | | | | | 2.240 | 14.000 | 0.2 | | | | | | | | | | |
| | SB | 285+93.00 | 286+16.00 | 286+16.00 | L | 4.0 | 23.0 | | | | | | | | | | 3.220 | 14.000 | 0.2 | | | | | | | | | | |
| | NB | 285+93.00 | 286+16.00 | 286+16.00 | R | 4.0 | 23.0 | | | | | | | | | | 3.220 | 14.000 | 0.2 | | | | | | | | | | |
| | SB | 364+85.50 | 365+14.50 | 365+14.50 | L | 4.0 | 29.0 | | | | | | | | | | 4.060 | 14.000 | 0.3 | | | | | | | | | | |
| | NB | 364+85.50 | 365+14.50 | 365+14.50 | R | 4.0 | 29.0 | | | | | | | | | | 4.060 | 14.000 | 0.3 | | | | | | | | | | |
| | SB | 319+73.00 | 319+91.00 | 319+91.00 | L | 4.0 | 18.0 | | | | | | | | | | 2.520 | 14.000 | 0.2 | | | | | | | | | | |
| | NB | 319+73.00 | 319+91.00 | 319+91.00 | R | 4.0 | 18.0 | | | | | | | | | | 2.520 | 14.000 | 0.2 | | | | | | | | | | |

102-3
10-15-13

ACCESS POINTS AND SAFETY RAMPS

Refer to Cross-Sections

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.

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

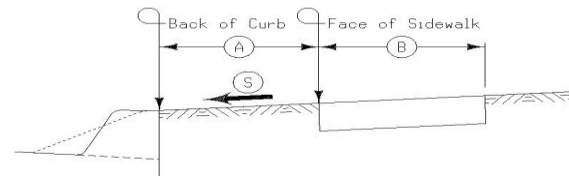
*Predetermined for access point not constructed with this project.

| 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 | 1 1/2" Dropped Curb | 3" Dropped Curb | W | ① PR | ② SR | H | Size | Pipe Length | Lt. | Rt. | | HMA | PCC | TON |
| | | | 1 or 2 | LF | LF | FT | FT | FT | FT | IN | LF | LF | LF | | | | |
| 582+13.80 | RT | | | | | | | | | | | | | | | | Refer to M sheets for drainage information |
| 584+00.00 | RT | | | | | | | | | | | | | | | | |
| 584+61.00 | RT | | | | | | | | | | | | | | | | |

113-1
04-16-13

SIDEWALKS

See MI-220 and S Sheets



| Road Identification | Station to Station | | Side | A | B | S | 4" PCC Sidewalk | 6" PCC Sidewalk | 5" PCC Trail | Detectable Warnings | Remarks |
|---------------------|--------------------|-----------|------|----|------|-------|-----------------|-----------------|--------------|---------------------|---------|
| | FT | FT | | FT | FT | FT | SY | SY | SY | SF | |
| Iowa 150 | 585+68.00 | 585+88.00 | RT | | 8.00 | 1.50% | | | 30.9 | | |

110-1
04-16-13

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5

* Not a Bid Item

| Begin Station | End Station | Side | Pavement Type | Area | | Saw Cut* | Remarks |
|---------------|-------------|------|---------------|------|------|----------|--|
| | | | | SY | LF | | |
| 285+93.00 | 286+16.00 | L | HMA/PCC | 28.1 | 45.0 | | |
| 285+93.00 | 286+16.00 | R | HMA/PCC | 38.3 | 30.0 | | Includes shoulder strengthening removals |
| 364+85.50 | 365+14.50 | L | HMA/PCC | 35.4 | 51.0 | | |
| 364+85.50 | 365+14.50 | R | HMA/PCC | 48.3 | 30.0 | | Includes shoulder strengthening removals |
| 319+73.00 | 319+91.00 | L | HMA/PCC | 32.0 | 50.0 | | |
| 319+73.00 | 319+91.00 | R | HMA/PCC | 32.0 | 32.0 | | |

SURVEY SYMBOLS

- San. SAA Sanitary Sewer Line Co. 1
- T1 TLA Underground Telephone Line Co. 1
- E1 ELA Underground Electric Line Co. 1
- T2 TLB Underground Telephone Line Co. 2
- TV TVA Underground TV Cable Co. 1
- G GLA Underground Gas Line Co. 1
- F0 FOA Underground Fiber Optic Co. 1
- T3 TLC Underground Telephone Line Co. 3
- F02 FOB Underground Fiber Optic Co. 2
- E2 ELB Underground Electric Line Co. 2
- F03 FOC Underground Fiber Optic Co. 3
- G2 GLB Underground Gas Line Co. 2
- St.S. STA Storm Sewer Line Co. 1
- F04 FOD Underground Fiber Optic Co. 4
- G3 GLC Underground Gas Line Co. 3
- ← DU Centerline Draw or Stream (Up)
- D Centerline Draw or Stream (Down)
- EP Edge of Paved Roads (ML or SR)
- SNP Unpaved Shoulder
- CU Back of Curb
- DIK Centerline of Dike or Dam
- RIP Rip-Rap
- GU Gutter In Front of Curb
- SWK Sidewalk
- CON Concrete or A/C Slab
- ENP Edge Paved Entrance & Park Lot
- ENT Centerline BL of Entrance
- ENU Edge Unpaved Entrance & Parking
- BNK Stream Bank
- EG Edge of Gravel Road
- EW Edge of Water
- SH Paved Shoulder
- ⊙ SH SNK Sink Hole
- TP TPD Telephone Pedestal
- PPA Power Pole Co. 1
- SIGN SI Sign
- PIP Pipe Culvert
- FW Wire Fence
- ⊙ PLG Location of General Photo
- TLNR Tree Line Right
- ⊙ IN Storm Sewer Intake
- MIS Miscellaneous
- LUM Luminaire
- ⊙ TDC Tree Deciduous
- BLD Building or Foundation
- PR Electric Riser Pole
- UB Utility Box
- SIGN SL Speed Limit Sign
- ⊙ MH Utility Access (Manhole)
- ⊙ FHD Fire Hydrants
- ⊙ WV Water Valve
- RET Retaining Walls
- FCL Chain Link and Security Fence
- CUL Culvert
- EB EB Electrical Box
- ⊙ SHR Shrub
- ⊙ SEP Septic Tank
- ⊙ TEV Evergreen Tree
- TLNL Tree Line Left
- ⊙ BIN Grain Bin
- ⊙ LP L.P. Tank
- FWD Wood Fence
- ⊙ GV Gas Valve
- ⊙ WEL Well
- GDL Guard Rail Steel
- ⊙ FLG FLG Flag Poles
- WH WHD Water Hydrant
- BB BB Billboard
- OUT Tile Outlet
- GP GP Guard Post (Less Than 4 Posts)
- ⊙ TV TV Satellite TV Dish
- ⊙ MM MM Mile Marker Post
- TVP TVP TV Pedestal
- X LC Lot Corner
- ⊙ INB Storm Sewer Beehive Intake
- ⊙ TFR Tree Fruit

UTILITY LEGEND

- G2(B) - GL2B Gas Line Mid American
- TV2(B) - TV2B TV Cable Century Link
- E2(B) - EL2B Electric Line
- T3(B) - TL3B Telephone Line City of Independence
- TV3(B) - TV3B TV Cable Mediacom
- W(B) - WL1B Water Line
- San.(B) SA1B Sanitary Sewer
- F0(B) - FO1B Fiber Optic Windstream
- F02(B) - FO2B Fiber Optic Century Link
- TV4(B) - TV4B TV Cable Windstream

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 |

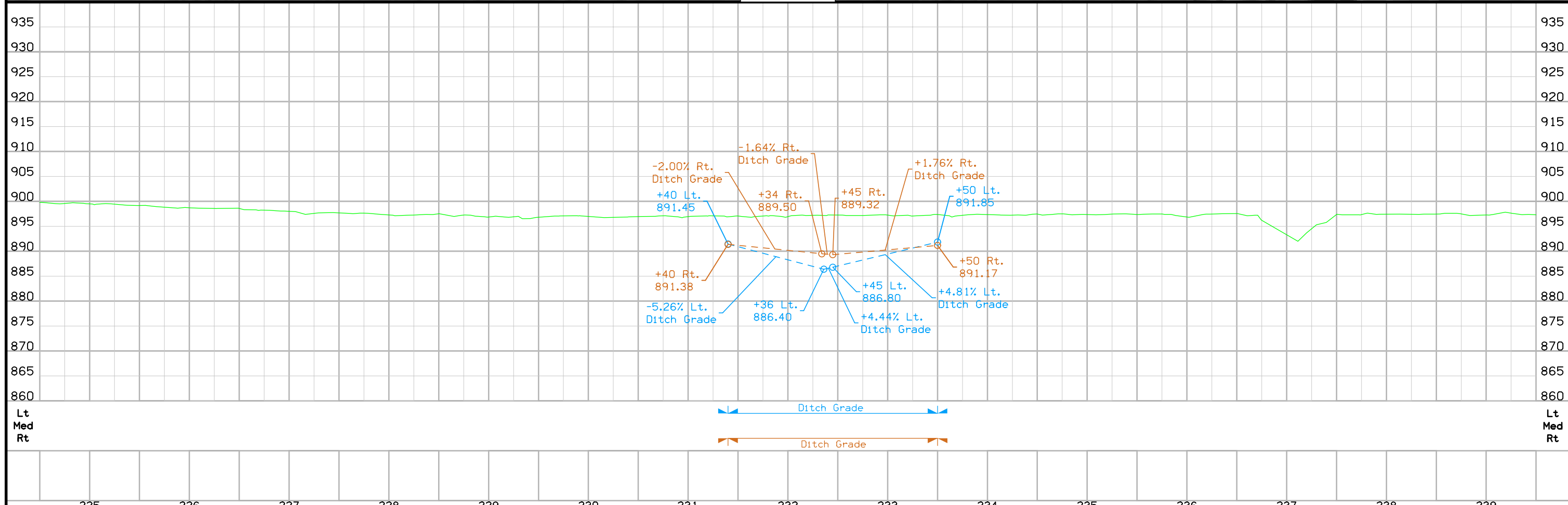
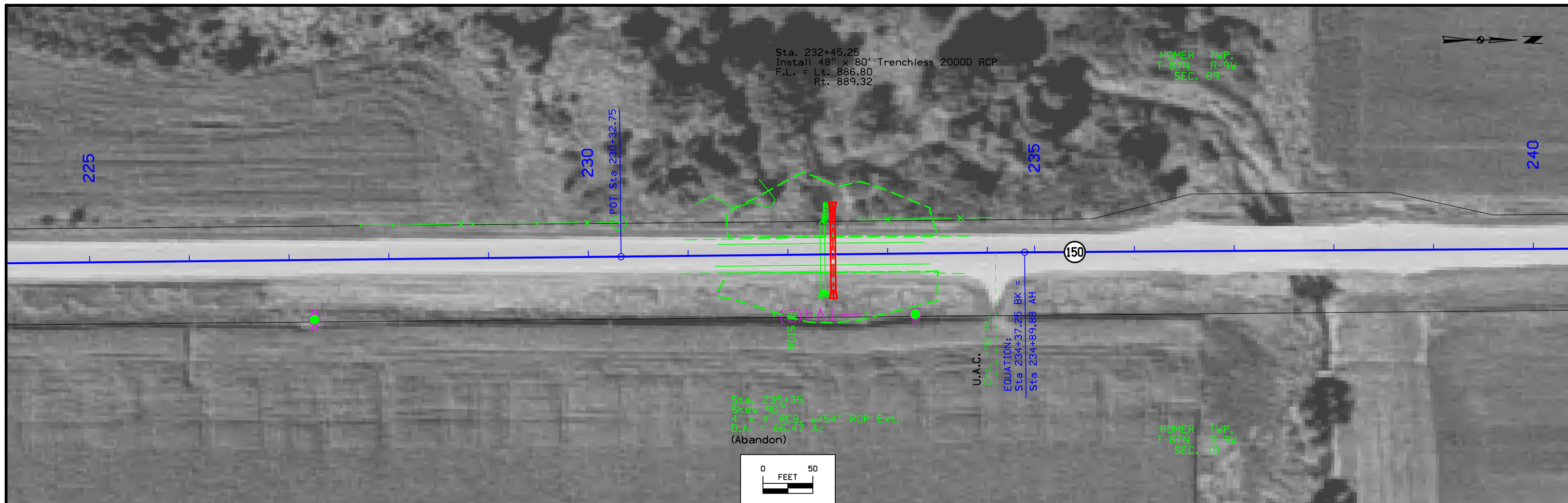
- Reference Point
- Station
- ▲ Section Corner
- — — — — Ground Line Intercept
- /// Saw Cut
- — — — — Guardrail
- — — — — Trench Drain
- — — — — HighTension Cable Guardrail
- — — — — Sheet Pile
- ▨ Pavement Removal
- ▩ Clearing & Grubbing Area

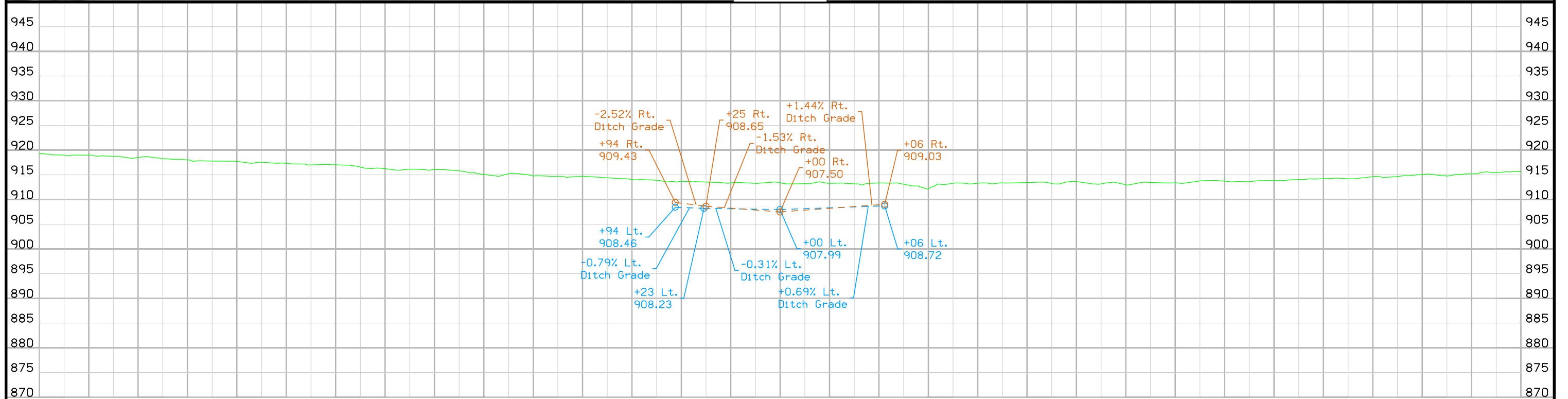
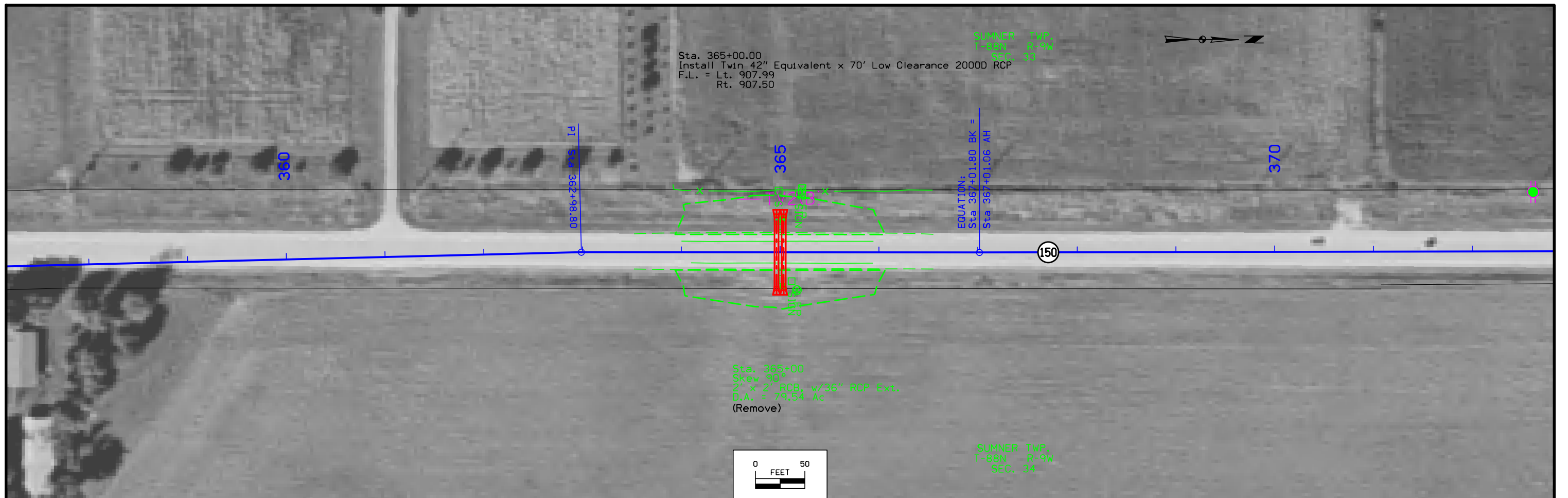
RIGHT-OF-WAY LEGEND

- ▲ 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

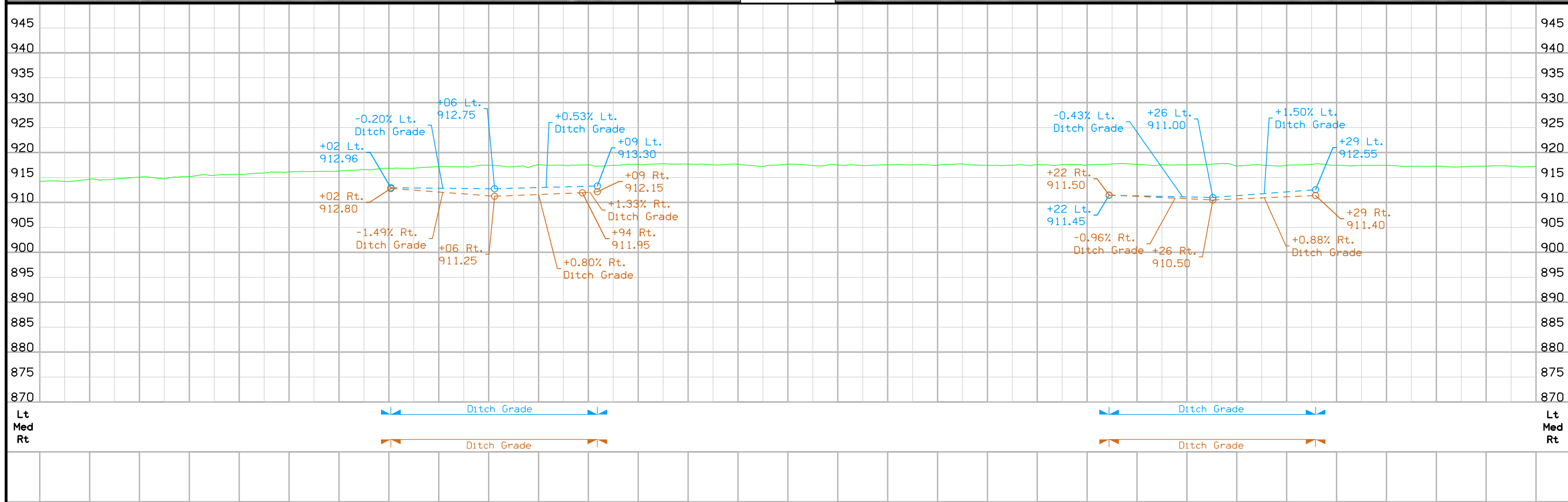
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

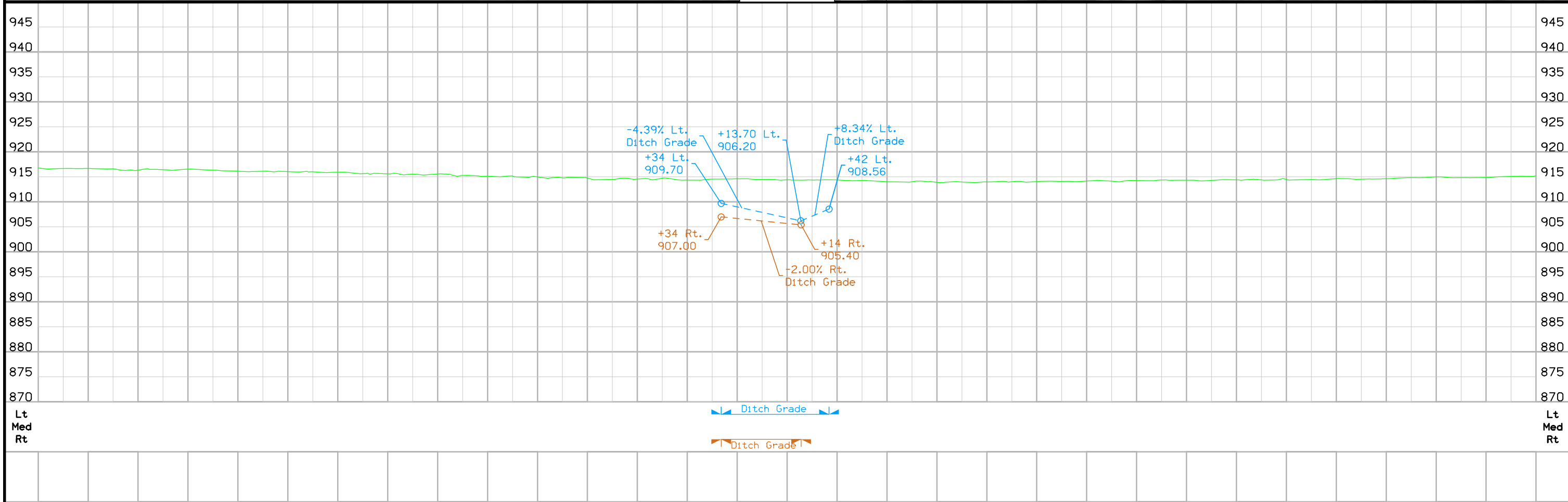
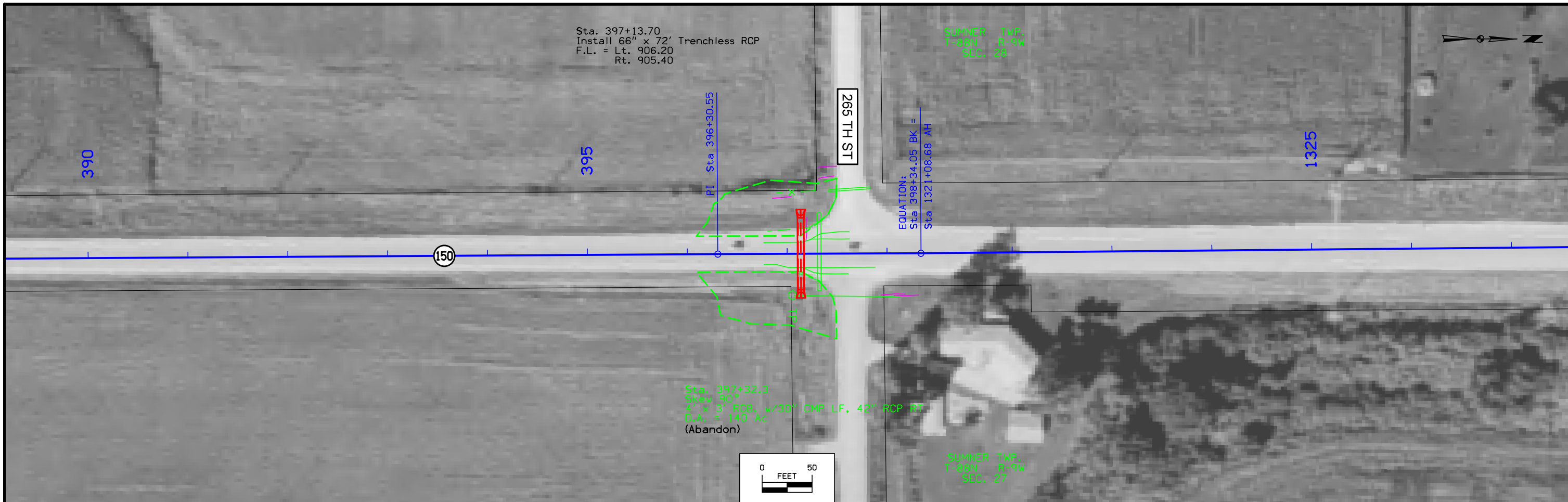
(COVERS SHEET SERIES D, E, F, & K)

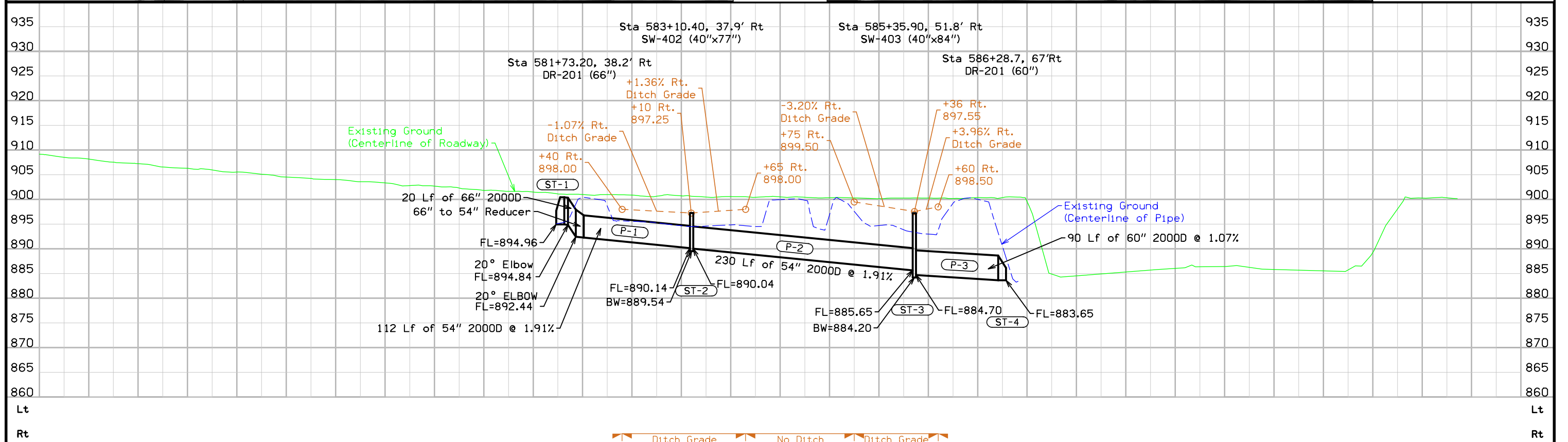
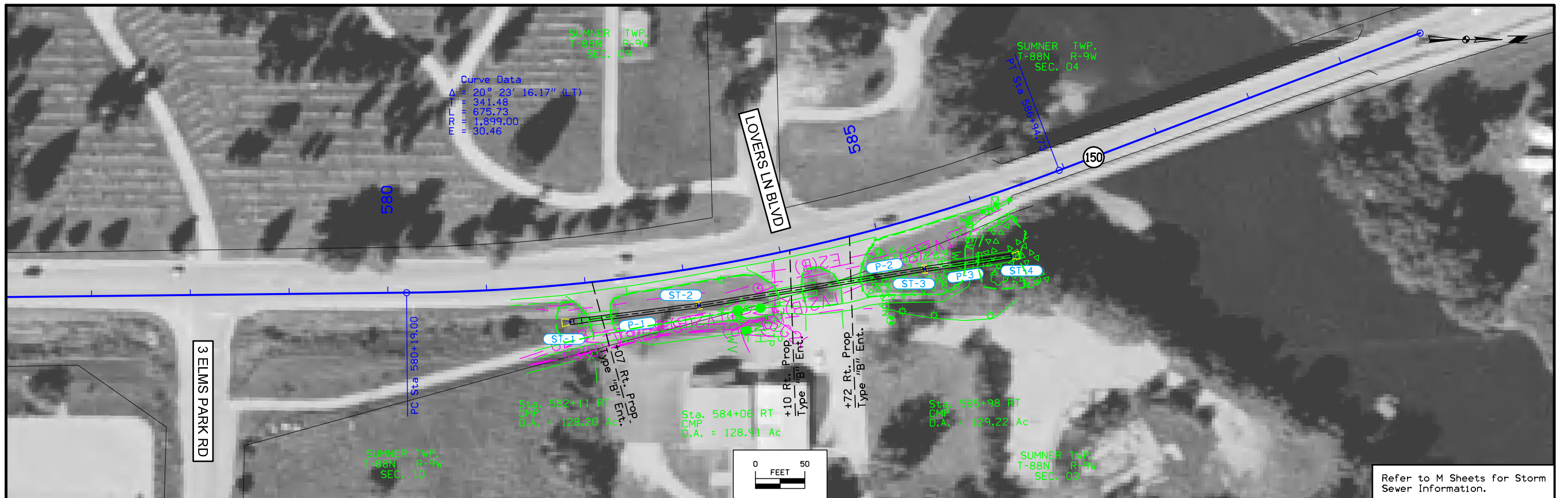


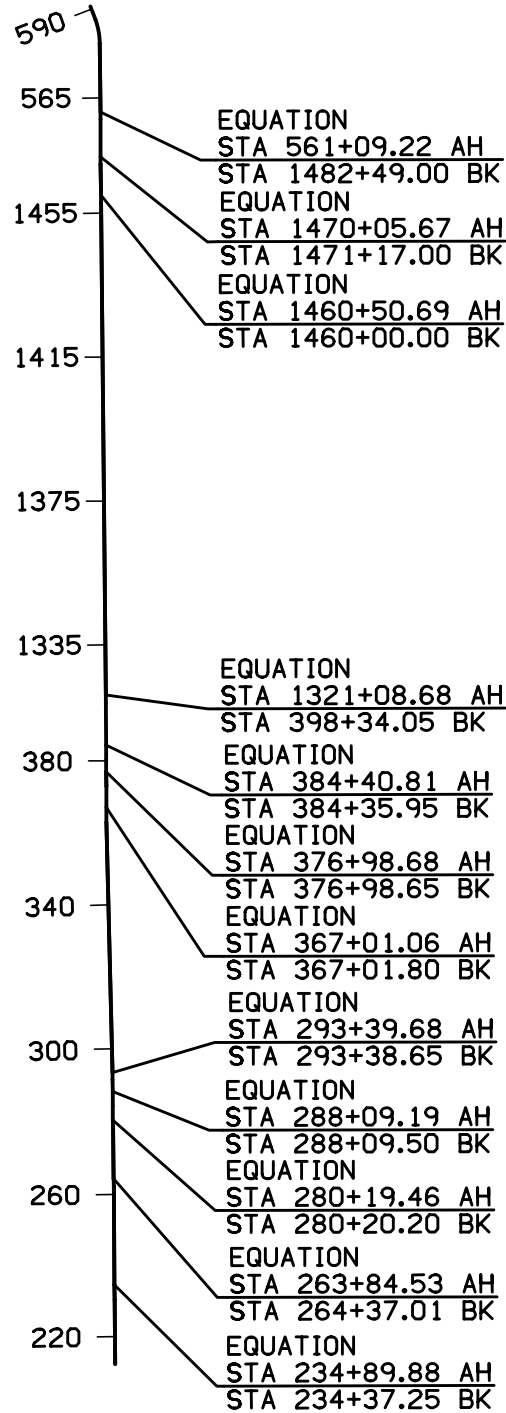


| | | | | | | | | | | | | | | |
|----------|---------|-------------|-----------------------------|-----|-----|-----------------|----------------|-----------------------|--------------|-----|-----|-----|-----|-----|
| FILE NO. | ENGLISH | DESIGN TEAM | SNYDER AND ASSOCIATES, INC. | | | BUCHANAN COUNTY | PROJECT NUMBER | NHSN-150-3(72)--2R-10 | SHEET NUMBER | D.7 | | | | |
| 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 |









| | | | | | | |
|--|---|----------------|---|-----------------|-----------------|--------------|
| Point MLHWY1 | N | 8,793,237.0193 | E | 15,597,513.5218 | Sta | 212+34.83 |
| Course from MLHWY1 to MLHWY2 N 0° 36' 47.12" W Dist 1,797.9182 | | | | | | |
| Point MLHWY2 | N | 8,795,034.8345 | E | 15,597,494.2837 | Sta | 230+32.75 |
| Course from MLHWY2 to 1000 N 0° 36' 47.12" W Dist 404.5001 | | | | | | |
| Equation: Sta 234+37.25 (BK) = Sta 234+89.88 (AH) | | | | | ----- | End Region 1 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 2 | |
| Point 1000 | N | 8,795,439.3114 | E | 15,597,489.9555 | Sta | 234+89.88 |
| Course from 1000 to MLHWY4 N 0° 22' 31.39" W Dist 2,744.1250 | | | | | | |
| Point MLHWY4 | N | 8,798,183.3775 | E | 15,597,471.9769 | Sta | 262+34.01 |
| Course from MLHWY4 to 1001 N 0° 46' 44.34" W Dist 203.0000 | | | | | | |
| Equation: Sta 264+37.01 (BK) = Sta 263+84.53 (AH) | | | | | ----- | End Region 2 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 3 | |
| Point 1001 | N | 8,798,386.3588 | E | 15,597,469.2170 | Sta | 263+84.53 |
| Course from 1001 to MLHWY6 N 0° 37' 28.89" W Dist 1,432.6678 | | | | | | |
| Point MLHWY6 | N | 8,799,818.9414 | E | 15,597,453.5971 | Sta | 278+17.20 |
| Course from MLHWY6 to 1002 N 1° 37' 37.61" W Dist 203.0000 | | | | | | |
| Equation: Sta 280+20.20 (BK) = Sta 280+19.46 (AH) | | | | | ----- | End Region 3 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 4 | |
| Point 1002 | N | 8,800,021.8596 | E | 15,597,447.8329 | Sta | 280+19.46 |
| Course from 1002 to MLHWY8 N 0° 02' 33.05" W Dist 388.0364 | | | | | | |
| Point MLHWY8 | N | 8,800,409.8959 | E | 15,597,447.5450 | Sta | 284+07.50 |
| Course from MLHWY8 to 1003 N 0° 26' 27.46" W Dist 402.0000 | | | | | | |
| Equation: Sta 288+09.50 (BK) = Sta 288+09.19 (AH) | | | | | ----- | End Region 4 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 5 | |
| Point 1003 | N | 8,800,811.8840 | E | 15,597,444.4512 | Sta | 288+09.19 |
| Course from 1003 to MLHWY10 N 0° 43' 25.34" W Dist 326.9592 | | | | | | |
| Point MLHWY10 | N | 8,801,138.8170 | E | 15,597,440.3214 | Sta | 291+36.15 |
| Course from MLHWY10 to 1004 N 0° 37' 34.07" W Dist 202.5000 | | | | | | |
| Equation: Sta 293+38.65 (BK) = Sta 293+39.68 (AH) | | | | | ----- | End Region 5 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 6 | |
| Point 1004 | N | 8,801,341.3050 | E | 15,597,438.1086 | Sta | 293+39.68 |
| Course from 1004 to MLHWY12 N 1° 25' 13.68" W Dist 6,959.1228 | | | | | | |
| Point MLHWY12 | N | 8,808,298.2892 | E | 15,597,265.5969 | Sta | 362+98.80 |
| Course from MLHWY12 to 1005 N 0° 02' 28.58" E Dist 403.0003 | | | | | | |
| Equation: Sta 367+01.80 (BK) = Sta 367+01.06 (AH) | | | | | ----- | End Region 6 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 7 | |
| Point 1005 | N | 8,808,701.2893 | E | 15,597,265.8872 | Sta | 367+01.06 |
| Course from 1005 to MLHWY14 N 0° 07' 01.61" W Dist 595.0876 | | | | | | |
| Point MLHWY14 | N | 8,809,296.3757 | E | 15,597,264.6708 | Sta | 372+96.15 |
| Course from MLHWY14 to 1006 N 0° 18' 45.23" W Dist 402.5003 | | | | | | |
| Equation: Sta 376+98.65 (BK) = Sta 376+98.68 (AH) | | | | | ----- | End Region 7 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 8 | |
| Point 1006 | N | 8,809,698.8700 | E | 15,597,262.4750 | Sta | 376+98.68 |
| Course from 1006 to MLHWY16 N 0° 23' 32.14" W Dist 333.7679 | | | | | | |
| Point MLHWY16 | N | 8,810,032.6301 | E | 15,597,260.1900 | Sta | 380+32.45 |
| Course from MLHWY16 to 1007 N 0° 22' 30.78" W Dist 403.5002 | | | | | | |
| Equation: Sta 384+35.95 (BK) = Sta 384+40.81 (AH) | | | | | ----- | End Region 8 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 9 | |
| Point 1007 | N | 8,810,436.1216 | E | 15,597,257.5476 | Sta | 384+40.81 |
| Course from 1007 to MLHWY18 N 0° 21' 53.58" W Dist 1,189.7361 | | | | | | |
| Point MLHWY18 | N | 8,811,625.8336 | E | 15,597,249.9709 | Sta | 396+30.55 |
| Course from MLHWY18 to 1008 N 0° 14' 35.86" W Dist 203.5000 | | | | | | |
| Equation: Sta 398+34.05 (BK) = Sta 1321+08.68 (AH) | | | | | ----- | End Region 9 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 10 | |

| | | | | | | |
|---|---|------------------|------|-----------------|-----------------|-----------------|
| Point 1008 | N | 8,811,829.3317 | E | 15,597,249.1068 | Sta | 1321+08.68 |
| Course from 1008 to MLHWY20 N 0° 32' 23.73" W Dist 13,689.3178 | | | | | | |
| Point MLHWY20 | N | 8,825,518.0418 | E | 15,597,120.1076 | Sta | 1457+98.00 |
| Course from MLHWY20 to 1009 N 1° 08' 50.97" W Dist 202.0000 | | | | | | |
| Equation: Sta 1460+00.00 (BK) = Sta 1460+50.69 (AH) | | | | | ----- | End Region 10 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 11 | |
| Point 1009 | N | 8,825,720.0012 | E | 15,597,116.0624 | Sta | 1460+50.69 |
| Course from 1009 to MLHWY22 N 0° 41' 05.62" W Dist 864.3145 | | | | | | |
| Point MLHWY22 | N | 8,826,584.2540 | E | 15,597,105.7309 | Sta | 1469+15.00 |
| Course from MLHWY22 to 1010 N 0° 53' 48.18" W Dist 201.9999 | | | | | | |
| Equation: Sta 1471+17.00 (BK) = Sta 1470+05.67 (AH) | | | | | ----- | End Region 11 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 12 | |
| Point 1010 | N | 8,826,786.2291 | E | 15,597,102.5696 | Sta | 1470+05.67 |
| Course from 1010 to MLHWY24 N 0° 06' 41.42" E Dist 1,043.3278 | | | | | | |
| Point MLHWY24 | N | 8,827,829.5550 | E | 15,597,104.6000 | Sta | 1480+49.00 |
| Course from MLHWY24 to 1011 Due North Dist 200.0000 | | | | | | |
| Equation: Sta 1482+49.00 (BK) = Sta 561+09.22 (AH) | | | | | ----- | End Region 12 |
| ----- | | | | | | |
| ----- | | | | | Begin Region 13 | |
| Point 1011 | N | 8,828,029.5550 | E | 15,597,104.6000 | Sta | 561+09.22 |
| Course from 1011 to PC ML 150-1 N 0° 37' 24.07" W Dist 1,909.7783 | | | | | | |
| Curve Data *-----* | | | | | | |
| Curve ML 150-1 | | | | | | |
| P.I. Station | = | 583+60.47 | N | 8,830,280.6870 | E | 15,597,081.3477 |
| Delta | = | 20° 23' 16.17" | (LT) | | | |
| Degree | = | 3° 01' 01.76" | | | | |
| Tangent | = | 341.4758 | | | | |
| Length | = | 675.7301 | | | | |
| Radius | = | 1,899.0000 | | | | |
| External | = | 30.4576 | | | | |
| Long Chord | = | 672.1707 | | | | |
| Mid. Ord. | = | 29.9768 | | | | |
| P.C. Station | = | 580+19.00 | N | 8,829,939.2202 | E | 15,597,083.8229 |
| P.T. Station | = | 586+94.73 | N | 8,830,599.9007 | E | 15,596,960.0699 |
| C.C. | = | | N | 8,829,925.4556 | E | 15,595,184.8728 |
| Back | = | N 0° 24' 55.10" | W | | | |
| Ahead | = | N 20° 48' 11.27" | W | | | |
| Chord Bear | = | N 10° 36' 33.18" | W | | | |
| Course from PT ML 150-1 to MLHWY26 N 20° 48' 11.27" W Dist 390.9229 | | | | | | |
| Point MLHWY26 | N | 8,830,965.3379 | E | 15,596,821.2305 | Sta | 590+85.65 |



Survey Information

BUCHANAN COUNTY
 PIN:14-10-150-010
 NHSN-150-3(72)--2R-10
 PIPE CULVERTS ALONG
 HWY 150 IN BUCHANAN COUNTY
 SAP:0642.1

General Information

Measurement units for this survey are US survey feet. This survey is for the design of improvements relating to the proposed culvert updates for Highway 150 in Buchanan Co. IA. Project datum and control information is provided by Design Survey Office. This project is a complete field survey, except for underground utility information (surface features only).

Vertical Control

Vertical datum for this survey is relative to NAVD88, Geoid 12a (IARTN GPS Derived).

Horizontal Control

Measurement units for this survey are U.S. Survey Feet.

Horizontal datum for this survey is unmodified Iowa State IARCSZONE5 coordinate system. Horizontal positions were established by 120 second averaged observations utilizing the IARTN.

VERTICAL CONTROL

| Point | North | East | Elevation | Feature | Description |
|-------|--------------|---------------|-----------|---------|----------------------------|
| BM1 | 8795329.4530 | 15597552.5700 | 894.1340 | BM | ◇ BENCH MARK |
| BM2 | 8800564.9830 | 15597406.7500 | 894.8560 | BM | 60 D SPIKE PP◇ BENCH MARK |
| BM3 | 8808416.5710 | 15597204.5700 | 912.6110 | BM | NAIL PP◇ BENCH MARK |
| BM4 | 8809544.0000 | 15597202.7500 | 917.1040 | BM | ◇ BENCH MARK |
| BM5 | 8810372.0800 | 15597196.6100 | 916.1100 | BM | ◇ BENCH MARK |
| BM6 | 8830297.2120 | 15597099.6600 | 899.8390 | BM | SE BOTTOM BOLT◇ BENCH MARK |
| BM7 | 8865818.7140 | 15593033.2800 | 991.5260 | BM | CON MON◇ BENCH MARK |

CONTROL POINTS

| Point | North | East | Elevation | Feature | Description |
|-------|--------------|---------------|-----------|---------|------------------------|
| B3780 | 8828069.4920 | 15597044.1400 | 929.5190 | CP | 1/2 IRS◇ CONTROL POINT |
| B3788 | 8811928.1640 | 15597220.6000 | 912.5470 | CP | 1/2 IRS◇ CONTROL POINT |
| CP21 | 8830531.6680 | 15597111.4300 | 900.5690 | CP | ◇ CONTROL POINT |
| CP15 | 8809391.6680 | 15597282.2900 | 915.6720 | CP | ◇ CONTROL POINT |
| CP10 | 8799967.5210 | 15597469.8800 | 894.4710 | CP | ◇ CONTROL POINT |
| CP13 | 8808410.9560 | 15597284.5200 | 912.4470 | CP | ◇ CONTROL POINT |
| CP9 | 8799866.9950 | 15597470.3100 | 894.4210 | CP | ◇ CONTROL POINT |
| CP8 | 8798192.0570 | 15597442.6300 | 900.3560 | CP | ◇ CONTROL POINT |
| CP6 | 8795386.3470 | 15597516.5500 | 896.5570 | CP | ◇ CONTROL POINT |
| CP2 | 8773761.3770 | 15597563.3800 | 941.8390 | CP | ◇ CONTROL POINT |
| CP7 | 8798344.1030 | 15597231.1400 | 895.1650 | CP | ◇ CONTROL POINT |
| CP23 | 8865790.8730 | 15592965.4000 | 989.9220 | CP | ◇ CONTROL POINT |
| CP5 | 8795144.1190 | 15597511.4300 | 895.7040 | CP | ◇ CONTROL POINT |
| CP11 | 8800503.5940 | 15597465.5700 | 895.3830 | CP | ◇ CONTROL POINT |
| CP14 | 8808592.9670 | 15597283.2700 | 912.1750 | CP | ◇ CONTROL POINT |
| CP12 | 8800710.3290 | 15597462.7300 | 895.9790 | CP | ◇ CONTROL POINT |
| CP1 | 8773639.6990 | 15597563.9600 | 942.4430 | CP | ◇ CONTROL POINT |
| CP3 | 8778653.5630 | 15597537.3500 | 921.1330 | CP | ◇ CONTROL POINT |
| CP4 | 8778753.4340 | 15597536.7100 | 922.0200 | CP | ◇ CONTROL POINT |
| CP20 | 8830319.2390 | 15597106.5800 | 900.1170 | CP | ◇ CONTROL POINT |
| CP16 | 8809586.9590 | 15597280.2200 | 916.2960 | CP | ◇ CONTROL POINT |
| CP17 | 8810139.2660 | 15597277.0200 | 916.2410 | CP | ◇ CONTROL POINT |
| CP18 | 8810359.4710 | 15597275.4000 | 916.0800 | CP | ◇ CONTROL POINT |
| B3784 | 8827837.8850 | 15597134.2700 | 928.8110 | CP | 1/2 IRS◇ CONTROL POINT |
| CP19 | 8830131.3740 | 15597135.5700 | 900.0070 | CP | ◇ CONTROL POINT |
| B3792 | 8811665.6970 | 15597223.0100 | 913.0480 | CP | 1/2 IRS◇ CONTROL POINT |
| CP22 | 8865784.0890 | 15593035.3000 | 989.9050 | CP | ◇ CONTROL POINT |

| | | | | | | | | | | | | | | | | | | | |
|------------|--|------|---------|------|------|-------------------|------|--------|------|------|------|-----------|------|------------|-------|-------|-------------|----------|------------|
| Buchanan | ROW: NHSN-150-3(73)--2R-10 | | | | | PIN 14-10-150-010 | | | | | | | | | | | | | |
| | Benton Co to Fayette Co | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | STATE | | | COUNTY | | | | | | TEMP EASE | | BORROW | | | | | |
| PARCEL NO | OWNER NAME | FEE | EASE | FEE | EASE | FEE | EASE | EXCESS | | | | FEE | T.E. | MITIGATION | OTHER | HOUSE | BUILDING(S) | A/C ONLY | TOTAL ACQ. |
| 1 | Shirley A Grover - Fee | | 0.25 AC | | | | | | | | | 0 SF | | | | | | | |
| 2 | Margaret Prahm Kephart - Fee | | 0.01 AC | | | | | | | | | 3178 SF | | | | | | | |
| 3 | Ceramatech Corporation Inc. - Fee | | 0.08 AC | | | | | | | | | | | | | | | | |
| 4 | Daniel Denbeste - Fee | | 0.04 AC | | | | | | | | | | | | | | | | |
| 5 | Lorraine M. Mochal Trust - Fee | | 0.09 AC | | | | | | | | | | | | | | | | |
| 6 | Richard P Wiese - Fee | | 0.06 AC | | | | | | | | | | | | | | | | |
| 7 | Keith Smith - Fee | | 0.25 AC | | | | | | | | | 8370 SF | | | | | | | |
| 8 | Robert D. Crawford - Fee | | 0.04 AC | | | | | | | | | | | | | | | | |
| 9 | Betty J. Anderson - Fee | | 0.04 AC | | | | | | | | | | | | | | | | |
| 10 | K A L M Farms, LLC - Fee Lisa M Patton, REM - Fee Kimberly S Holub, REM - Fee Andrew C Johnson, REM - Fee Melanie K Svoboda, REM - Fee Susan J. Johnson, LE - Fee | | 0.01 AC | | | | | | | | | | | | | | | | |
| 11 | Burco Land, LC - Fee | | 0.09 AC | | | | | | | | | | | | | | | | |
| 12 | Rodney P Brandt - Fee Ronald H Brandt - Fee | | 0.04 AC | | | | | | | | | | | | | | | | |
| 13 | Farmer's Savings Bank - Fee John C Shannon - CP1 | | | | | | | | | | | 217 SF | | | | | | | |
| 14 | City of Independence - Fee | | | | | | | | | | | 865 SF | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 14 Parcels | "TOTALS | 0 AC | 1 AC | 0 AC | 0 AC | 0 AC | 0 AC | 0 AC | 0 AC | 0 AC | 0 AC | | 0 AC | 0 AC | 0 AC | | | | |
| | | 0 SF | | 0 SF | 0 SF | 0 SF | 0 SF | 0 SF | 0 SF | 0 SF | 0 SF | 12630 SF | | | | | | | |

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

ACCESS CONTROL PREVIOUSLY ACQUIRED

HOMER TWP.
T-87N R-9W
SEC. 09

①
SHIRLEY A. GROVER

Sta. 232+45.25
Install 48" x 80' Trenchless 2000D RCP
F.L. = Lt. 886.80
Rt. 889.32

230+85 ϕ 25'±EX R/W
231+95 ϕ 95'
232+15 ϕ 90'
232+70 ϕ 80'
232+95 ϕ 95'
233+45 ϕ 50'
233+75 ϕ 25'±EX R/W

232+05 ϕ 71'± EX R/W
231+95 ϕ 105'
232+20 ϕ 75'
232+95 ϕ 105'
232+80 ϕ 71'±EX R/W
232+60 ϕ 75'

Sta. 235+35
Skew 90°
4' x 4' RCB, w/54" RCP Ext.
D.A. = 66.47 Ac
(Abandon)

U.A.C.
Ent. +92 R/W



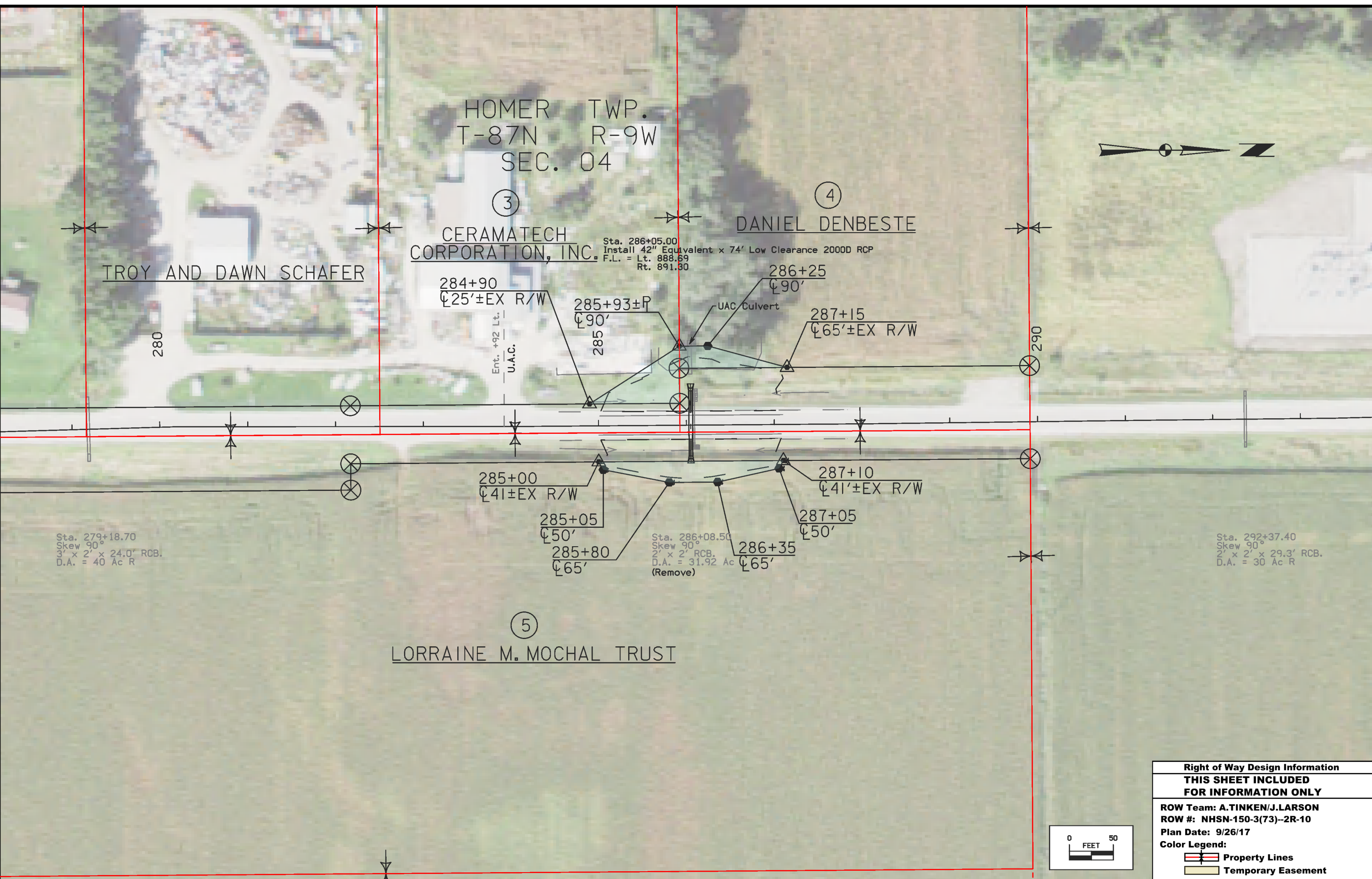
| | |
|---|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: A.TINKEN/J.Larson | |
| ROW #: NHSN-150-3(73)--2R-10 | |
| Plan Date: 9/26/17 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |

HOMER TWP.
T-87N R-9W
SEC. 04



③ CERAMATECH CORPORATION, INC.
④ DANIEL DENBESTE

TROY AND DAWN SCHAFER



Sta. 286+05.00
Install 42" Equivalent x 74' Low Clearance 2000D RCP
F.L. = Lt. 888.69
Rt. 891.30

Ent. +92 Lt.
U.A.C.

UAC Culvert

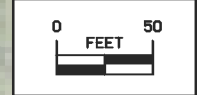
Sta. 279+18.70
Skew 90°
3' x 2' x 24.0' RCB.
D.A. = 40 Ac R

Sta. 286+08.50
Skew 90°
2' x 2' RCB.
D.A. = 31.92 Ac
(Remove)

Sta. 292+37.40
Skew 90°
2' x 2' x 29.3' RCB.
D.A. = 30 Ac R

⑤ LORRAINE M. MOCHAL TRUST

| | |
|---|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: A.TINKEN/J.LARSON | |
| ROW #: NHSN-150-3(73)--2R-10 | |
| Plan Date: 9/26/17 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |

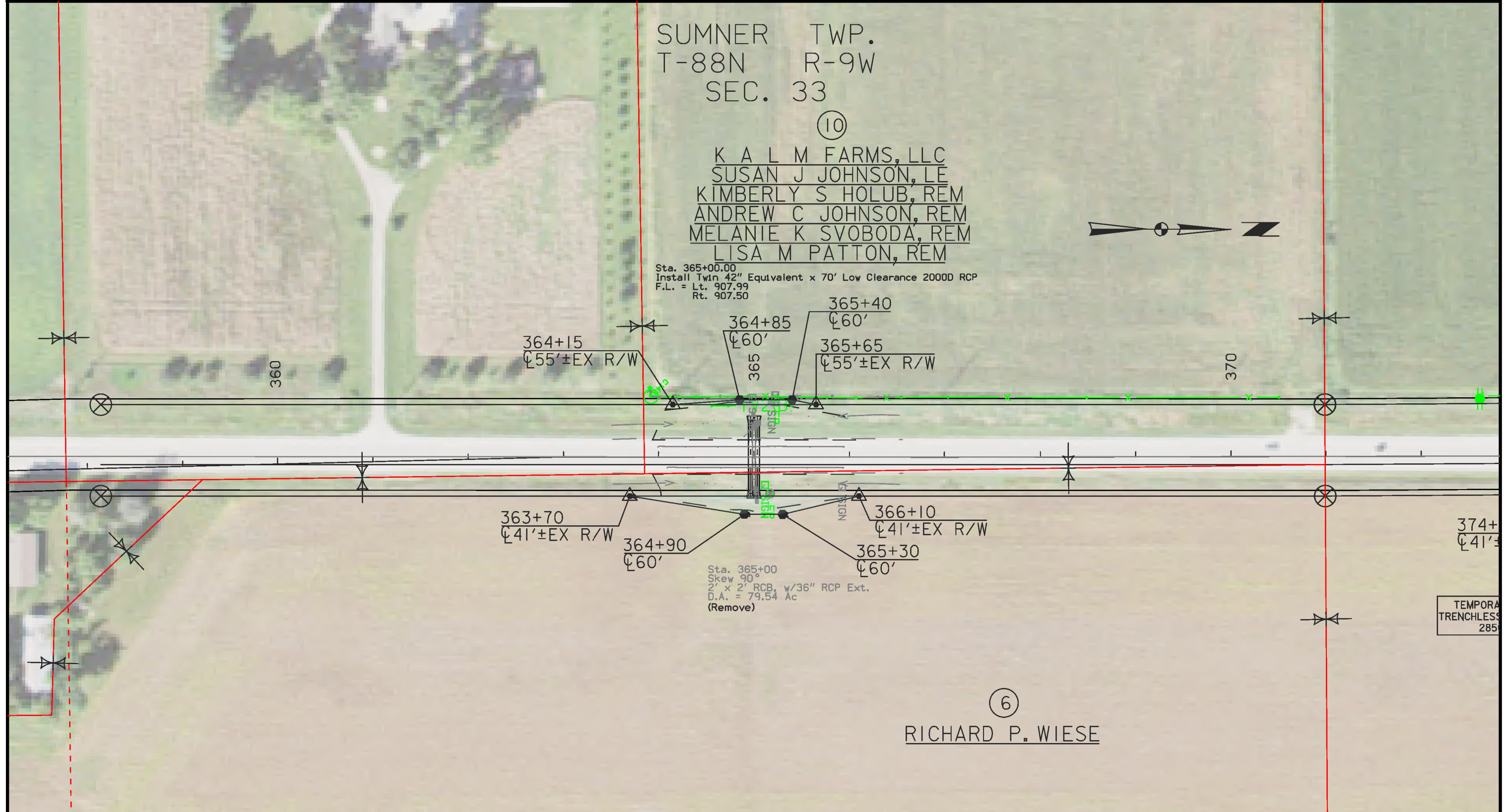
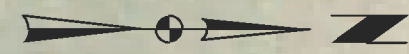


SUMNER TWP.
T-88N R-9W
SEC. 33

(10)

K A L M FARMS, LLC
SUSAN J JOHNSON, LE
KIMBERLY S HOLUB, REM
ANDREW C JOHNSON, REM
MELANIE K SVOBODA, REM
LISA M PATTON, REM

Sta. 365+00.00
Install Twin 42" Equivalent x 70' Low Clearance 2000D RCP
F.L. = Lt. 907.99
Rt. 907.50



Sta. 365+00
Skew 90°
2' x 2' RCB, w/36" RCP Ext.
D.A. = 79.54 Ac
(Remove)

(6)

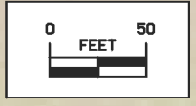
RICHARD P. WIESE

SUMNER TWP.
T-88N R-9W
SEC. 34

Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY

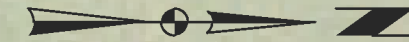
ROW Team: A.TINKEN/J.LARSON
ROW #: NHSN-150-3(73)--2R-10
Plan Date: 9/26/17

Color Legend:
 Property Lines
 Temporary Easement
 Permanent Acquisition



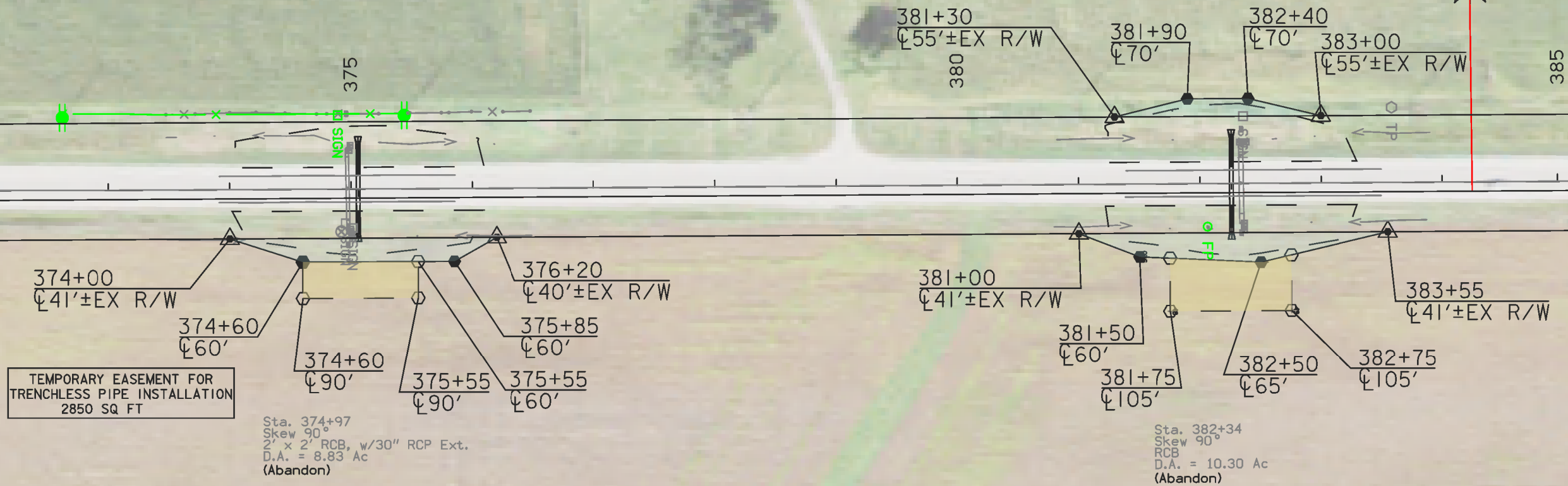
SUMNER TWP.
T-88N R-9W
SEC. 28

9
BETTY J. ANDERSON



Sta. 375+05.90
Install 30" x 74' Trenchless RCP
F.L. = Lt. 912.75
Rt. 911.25

Sta. 382+25.90
Install 30" x 78' Trenchless RCP
F.L. = Lt. 911.00
Rt. 910.50



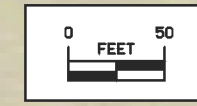
TEMPORARY EASEMENT FOR
TRENCHLESS PIPE INSTALLATION
2850 SQ FT

Sta. 374+97
Skew 90°
2' x 2' RCB, w/30" RCP Ext.
D.A. = 8.83 Ac
(Abandon)

Sta. 382+34
Skew 90°
RCB
D.A. = 10.30 Ac
(Abandon)

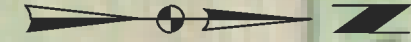
SUMNER TWP.
T-88N R-9W
SEC. 27

7
KEITH AND LINDA SMITH



| | |
|---|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: A.TINKEN/J.LARSON | |
| ROW #: NHSN-150-2(73)--2R-10 | |
| Plan Date: 9/26/17 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |

SUMNER TWP.
T-88N R-9W
SEC. 28



⑧
ROBERT D. CRAWFORD, ETAL

397+21±EX R/W
⌀75'

Sta. 397+13.70
Install 66" x 72' Trenchless RCP
F.L. = Lt. 906.20
Rt. 905.40

396+60
⌀80'

396+20
⌀55'±EX R/W

395

390

1325

396+20
⌀41'±EX R/W

396+30
⌀65'

396+65
⌀105'

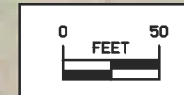
Sta. 397+32.3
Skew 90°
4' x 3' RCB. w/30" CMP LF, 42" RCP RT
D.A. = 140 Ac
(Abandon)

397+23±EX R/W
⌀90'

397+22±EX R/W
⌀105'

⑦
KEITH AND LINDA SMITH

SUMNER TWP.
T-88N R-9W
SEC. 27



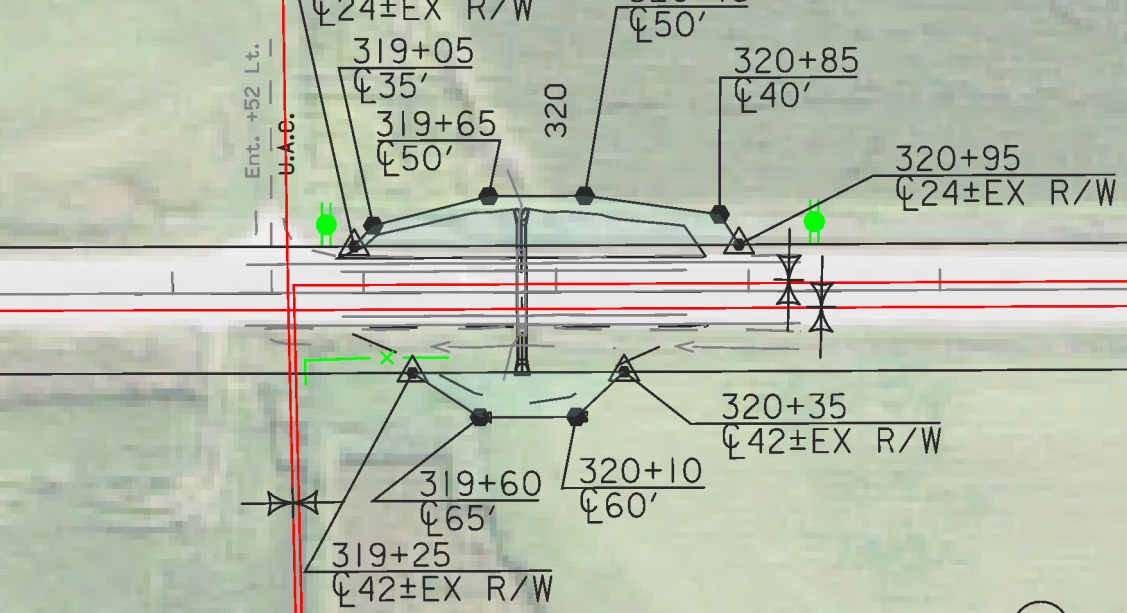
| | |
|---|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: A.TINKEN/J.LARSON | |
| ROW #: NHSN-150-2(73)--2R-10 | |
| Plan Date: 9/26/17 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |

HAZELTON TWP.
T-90N R-9W
SEC. 33



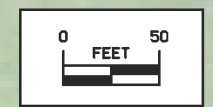
⑪
BURCO LAND LC

Sta. 319+82.00
Install 48" Equivalent x 70' Low Clearance RCP
F.L. = L.t. 986.90
R.t. 988.60



⑫
RODNEY P. AND MARY ELLEN BRANDT
AND RONALD H. AND RUTH E. BRANDT

HAZELTON TWP.
T-90N R-9W
SEC. 34



| | |
|---|-----------------------|
| Right of Way Design Information | |
| THIS SHEET INCLUDED FOR INFORMATION ONLY | |
| ROW Team: A.TINKEN/J.LARSON | |
| ROW #: NHSN-150-2(73)--2R-10 | |
| Plan Date: 9/26/17 | |
| Color Legend: | |
| | Property Lines |
| | Temporary Easement |
| | Permanent Acquisition |



Sta. 582+11 RT
CMP
D.A. = 128.20 Ac.

Sta. 584+06 RT
CMP
D.A. = 128.9

Sta. 585+98 RT
CMP
D.A. = 129.22 Ac

HAZELTON TWP.
T-90N R-9W
SEC. 33

HAZELTON TWP.
T-90N R-9W
SEC. 34

CITY OF INDEPENDENCE

FARMER'S SAVINGS BANK
CP: JOHN C SHANNON

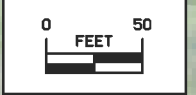
TEMPORARY EASEMENT
TO SHAPE

TEMPORARY EASEMENT
TO SHAPE

**Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY**

ROW Team: A.TINKEN/J.LARSON
ROW #: NHSN-150-2(73)--2R-10
Plan Date: 9/26/17

- Color Legend:**
- Property Lines
 - Temporary Easement
 - Permanent Acquisition



108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. At least one lane of traffic on Iowa 150 shall be maintained at all times.
2. Shoulder closures as necessary to jack pipe or tie joints shall be per Standard Road Plan TC-202.
3. Lane closures as necessary to install trenched pipe, tie joints, or repair collars shall be per Standatr Road Plan TC-217 and details shown elsewhere in these plans.
4. Access to individual properties shall be maintained at all times.

108-26A
08-01-08

STAGING NOTES

Culverts installed by open trench methods shall be constructed half-at-a-time using single lane closures and TBR. Abandon existing culvert once new culvert is complete.

Stage construction of storm sewer system near Sta. 584 such that at least one entrance to the property remains open at all times.

113-2
04-16-13

PEDESTRIAN PATH CLOSURES

Refer to TC-601.

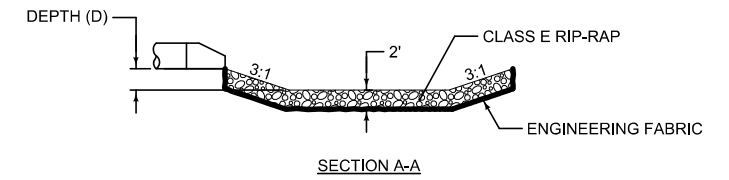
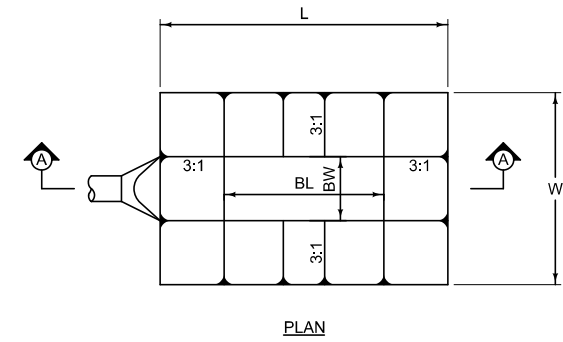
*Assumes 6 foot wide barricade.
Closures may need to be removed and re-established.

| Location | Side | Type III Barricades* | Remarks |
|-------------|------|-------------------------|---------|
| | | No. | |
| Sta. 580+75 | RT | 2 | |
| Sta. 585+50 | RT | 2 | |

STORM SEWER

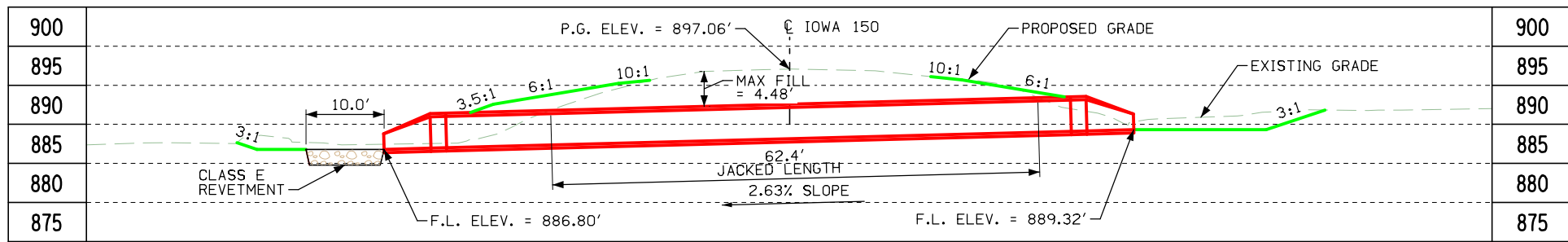
① Diameter or equivalent diameter
* Bid Item
** For SW-545

| INTAKES AND UTILITY ACCESSES | | | | | | | PIPES | | | | | | | | | | | | | |
|------------------------------|-----------------------------|-----------------------------|------------|-------------|--------------------|-----------|--|---------------------------|------|-----------|-------------|-------------|---------------|---------|------------------------------------|------------|--------|--------|------------------------|-------------------|
| | | | | | | | Design Length, Slope, and Flowlines are calculated from center of structure to center of structure along CL of pipe. | | | | | | | | | | | | | |
| No. | Location Station and Offset | *Type or Standard Road Plan | Form Grade | Bottom Well | Extension Length** | Notes | Line Number | Intake/Utility Access No. | | Class 'D' | Pipe Size ① | Bid* Length | Design Length | Slope % | Connected Pipe Joint (DR-121) Type | Flow Lines | | | Pipe Profile Sheet No. | Notes |
| | | | Elev. | Elev. | FT | | | From | To | | | | | | | IN | FT | FT | | |
| 1 | 581+73.2, 38.2' RT | DR-201 | | | | 66" | P1 | 1 | BEND | 2000 | 66 | 4 | 12.0 | 1.00 | | 894.96 | | 894.84 | | 20 DEG BEND |
| 2 | 583+10.4, 37.9' RT | SW-402 | 897.25 | 889.54 | | 40" x 77" | | BEND | BEND | 2000 | 66 | 8 | 8.0 | 30.00 | | | | 892.44 | | 20 DEG BEND |
| 3 | 585+35.9, 51.8' RT | SW-403 | 897.22 | 884.2 | | 40" x 84" | | BEND | RED | 2000 | 66 | 8 | 8.0 | 1.91 | | | | 892.28 | | W 66"-54" REDUCER |
| 4 | 586+28.7, 67.0' RT | DR-201 | | | | 60" | | RED | 2 | 2000 | 54 | 112 | 112.0 | 1.91 | | | 890.14 | | | |
| | | | | | | | P2 | 2 | 3 | 2000 | 54 | 230 | 230.0 | 1.91 | | 890.04 | | 885.65 | | |
| | | | | | | | P3 | 3 | 4 | 2000 | 60 | 90 | 98.0 | 1.07 | | 884.70 | | 883.65 | | |



Refer to Tab 100-23
For further information

SETTLING BASIN



LONGITUDINAL SECTION ALONG C CULVERT

BENCH MARK NO.1
 ELEV. 894.13
 STA. 233+26.73, 61' RT
 60D SPIKE IN POWER POLE



HYDRAULIC DATA

DRAINAGE AREA = 66.47 ACRES
 Q_{50} = 108.35 CFS
 HW ELEV. = 894.18'

LOCATION

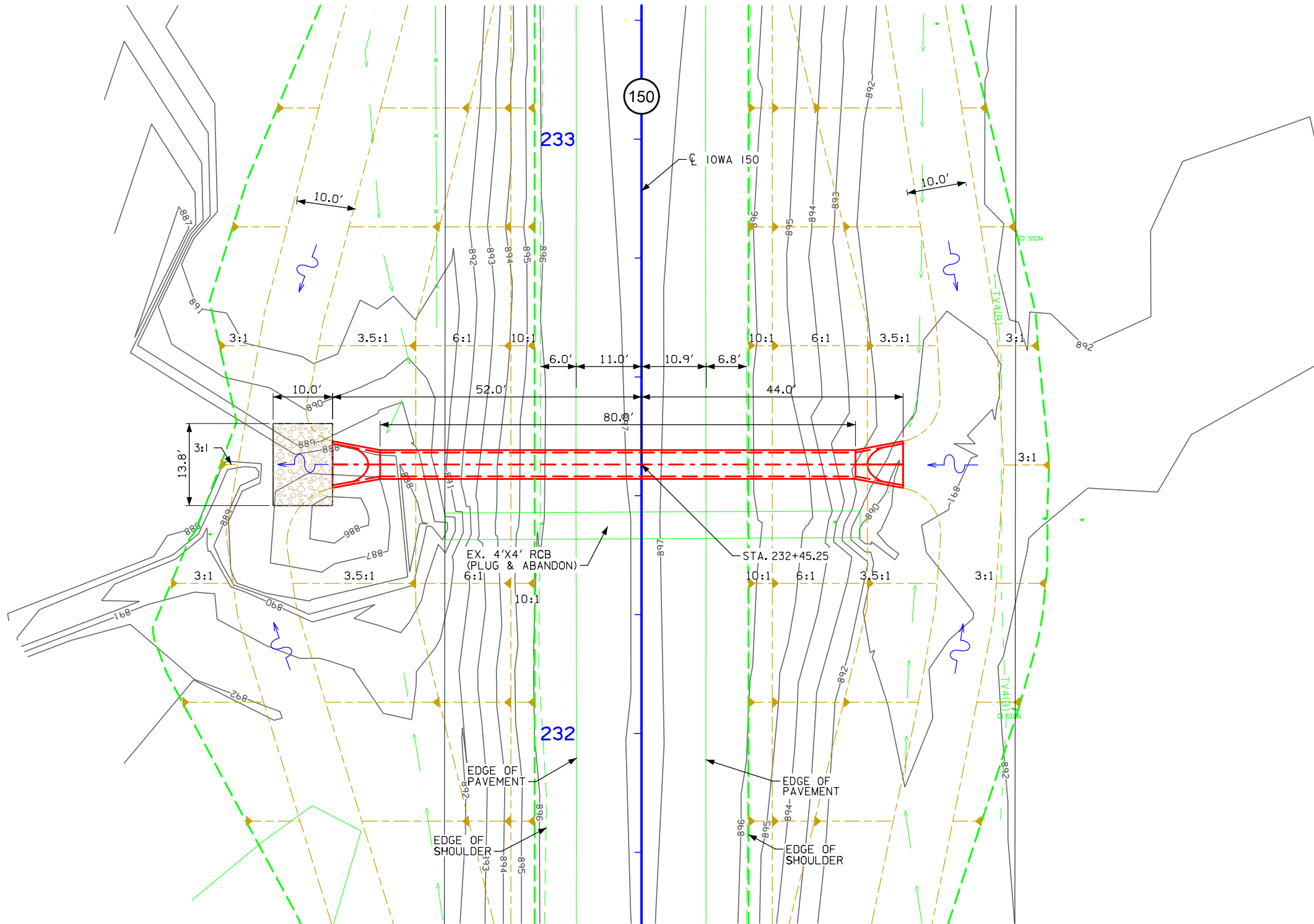
IOWA 150
 T-87N R-9W
 SECTION 9 & 10
 HOMER TOWNSHIP
 BUCHANAN COUNTY

STAGING NOTES:

CULVERT CONSTRUCTION WILL BE STAGED
 TO ALLOW ONE LANE OF TRAFFIC TO BE
 MAINTAINED AT ALL TIMES.

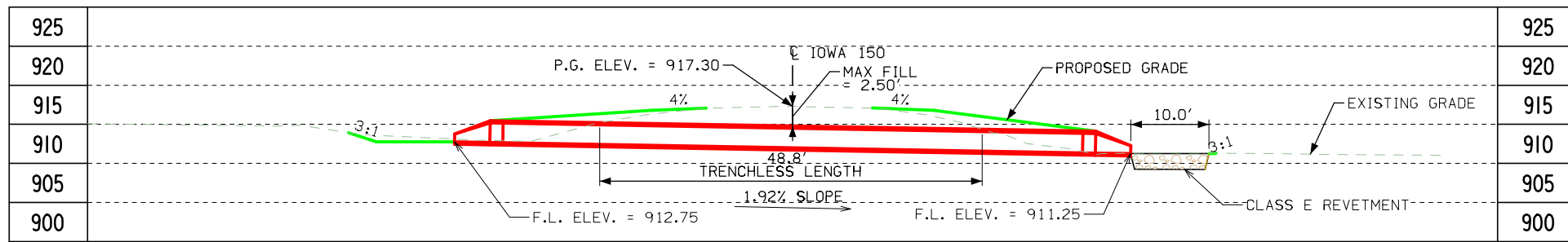
UTILITIES LEGEND:

REFER TO SHEET D.1 FOR UTILITY LEGEND



PLAT PLAN

DESIGN FOR 0° SKEW
48" (TRENCHLESS) X 80'
REINFORCED CONCRETE PIPE
 PLAT PLAN
 STA. 232+45.25 C IOWA 150 DEC. 2018
BUCHANAN COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____



LONGITUDINAL SECTION ALONG CL CULVERT

BENCH MARK NO.4
ELEV. 917.10
STA. 375+44.11, 61' LT
60D SPIKE IN POWER POLE



HYDRAULIC DATA

DRAINAGE AREA = 8.83 ACRES
Q₅₀ = 24.72 CFS

LOCATION

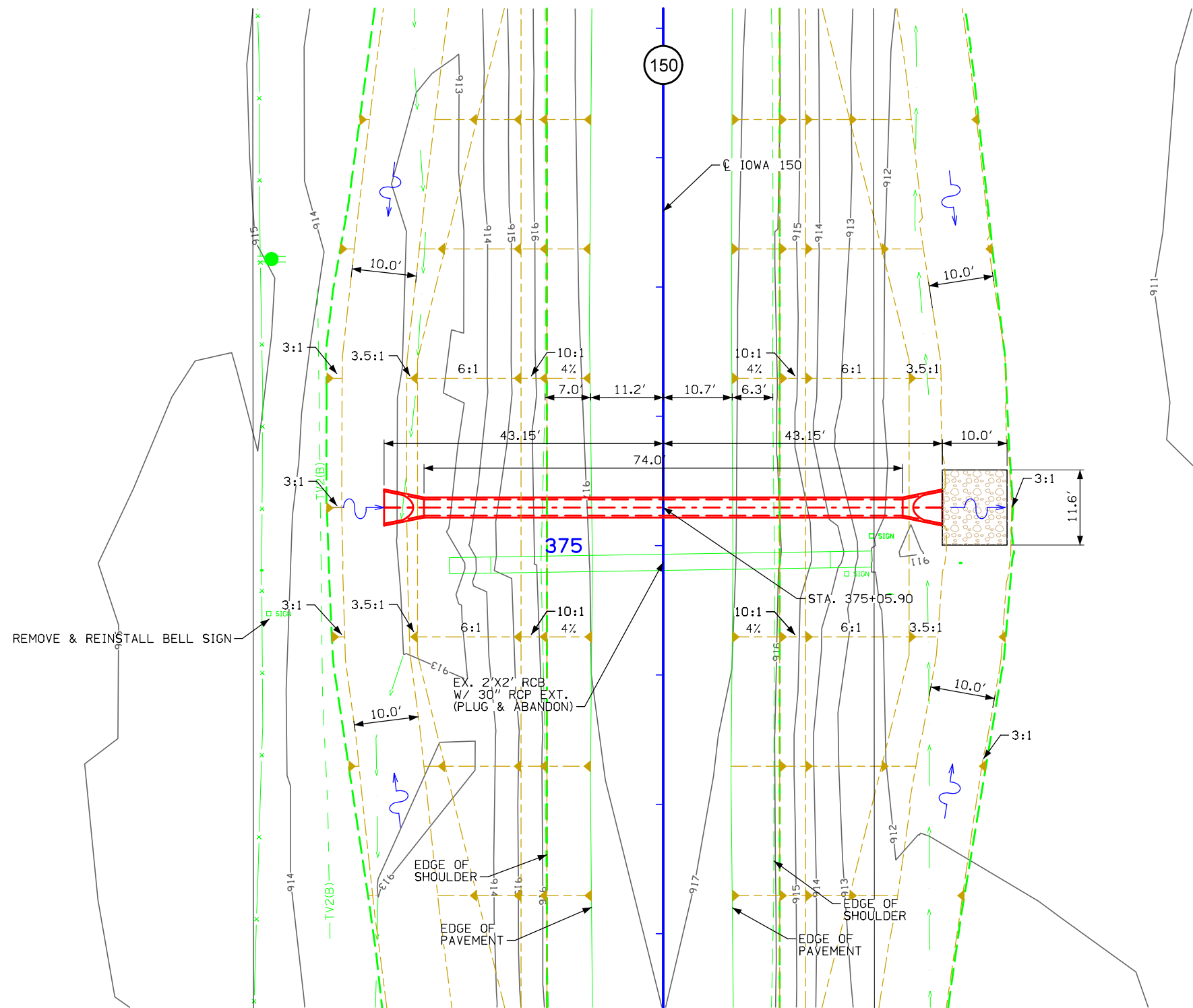
IOWA 150
T-88N R-9W
SECTION 27 & 28
SUMNER TOWNSHIP
BUCHANAN COUNTY

STAGING NOTES:

CULVERT CONSTRUCTION WILL BE STAGED TO ALLOW ONE LANE OF TRAFFIC TO BE MAINTAINED AT ALL TIMES.

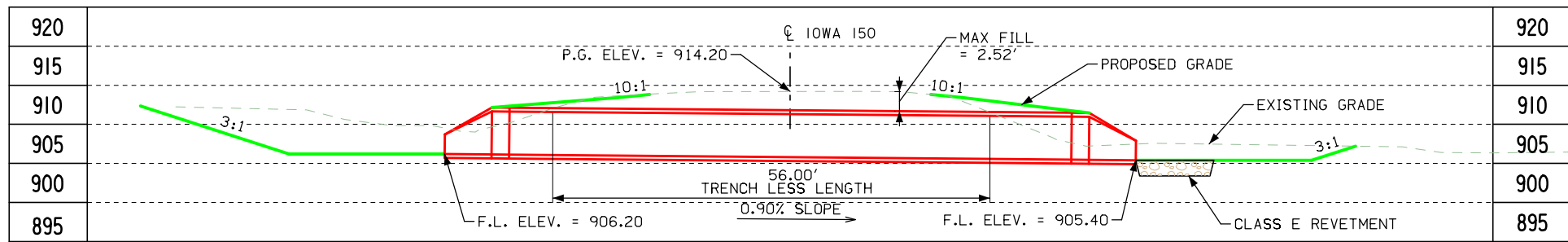
UTILITIES LEGEND:

REFER TO SHEET D.1 FOR UTILITY LEGEND



PLAT PLAN

DESIGN FOR 0° SKEW
**30" (TRENCHLESS) X 74'
REINFORCED CONCRETE PIPE**
PLAT PLAN
STA. 375+05.90 CL IOWA 150 DEC. 2018
BUCHANAN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____



LONGITUDINAL SECTION ALONG ϕ CULVERT

BENCH MARK NO.7
 ELEV. 991.53
 STA. 318+95.66, 33' RT
 2" ALUMINIUM DISC



HYDRAULIC DATA

DRAINAGE AREA = 140 ACRES
 $Q_{50} = 188.00$ CFS

LOCATION

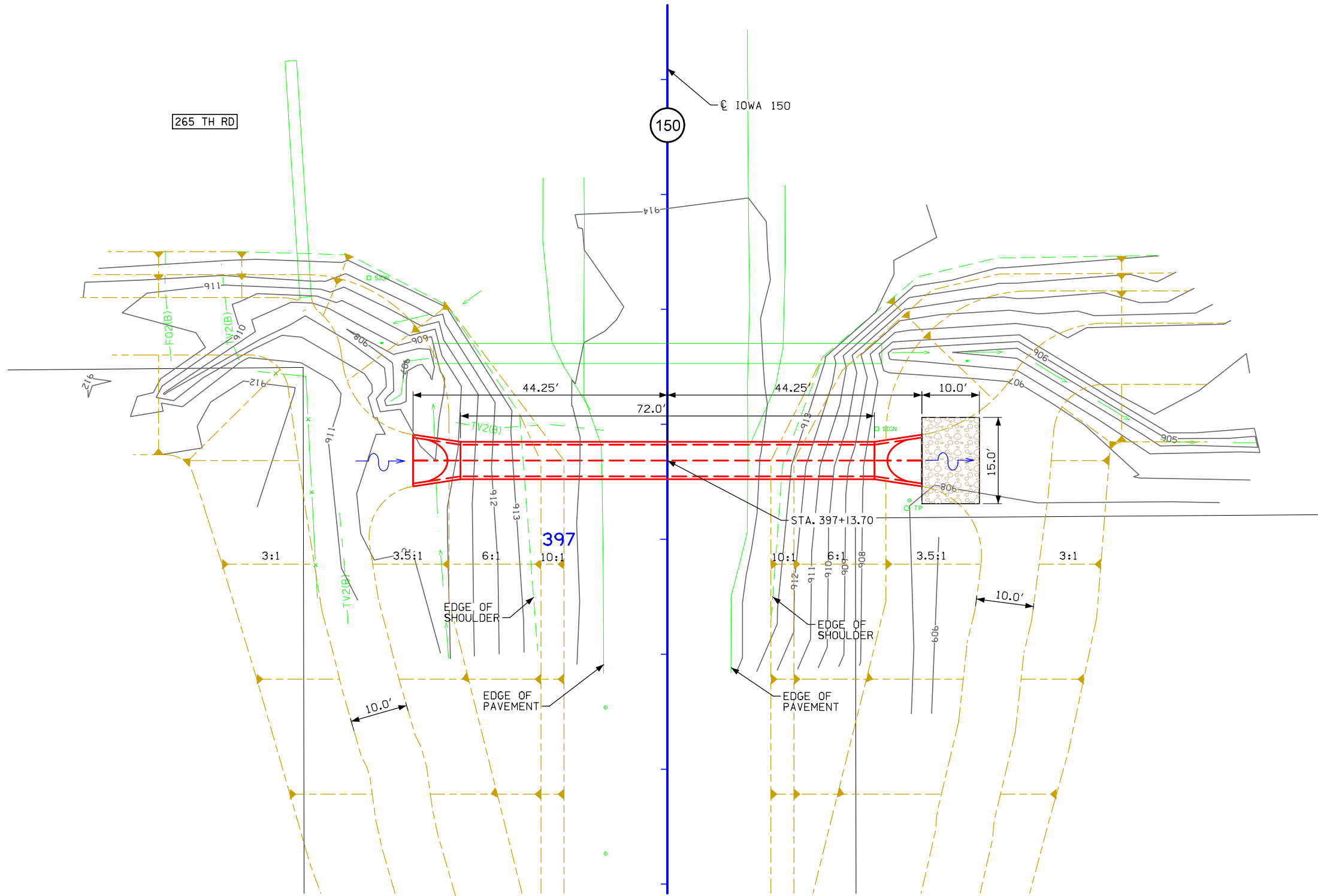
IOWA 150
 T-89N R-9W
 SECTION 3 & 4
 WASHINGTON TOWNSHIP
 BUCHANAN COUNTY

STAGING NOTES:

CULVERT CONSTRUCTION WILL BE STAGED
 TO ALLOW ONE LANE OF TRAFFIC TO BE
 MAINTAINED AT ALL TIMES.

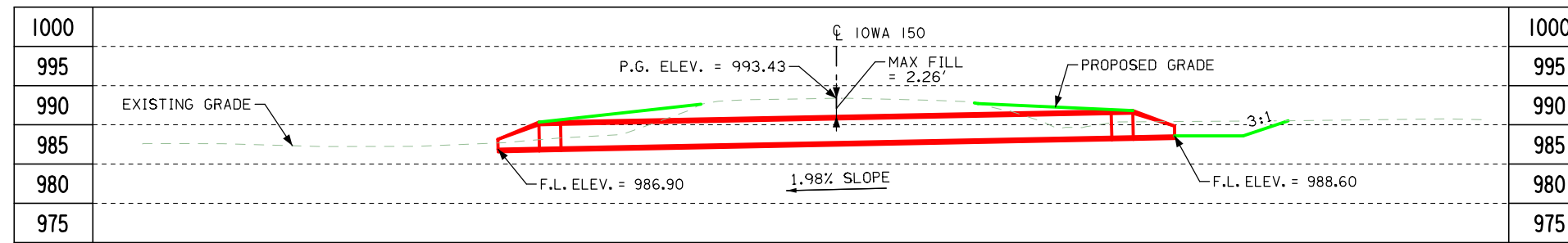
UTILITIES LEGEND:

REFER TO SHEET D.1 FOR UTILITY LEGEND

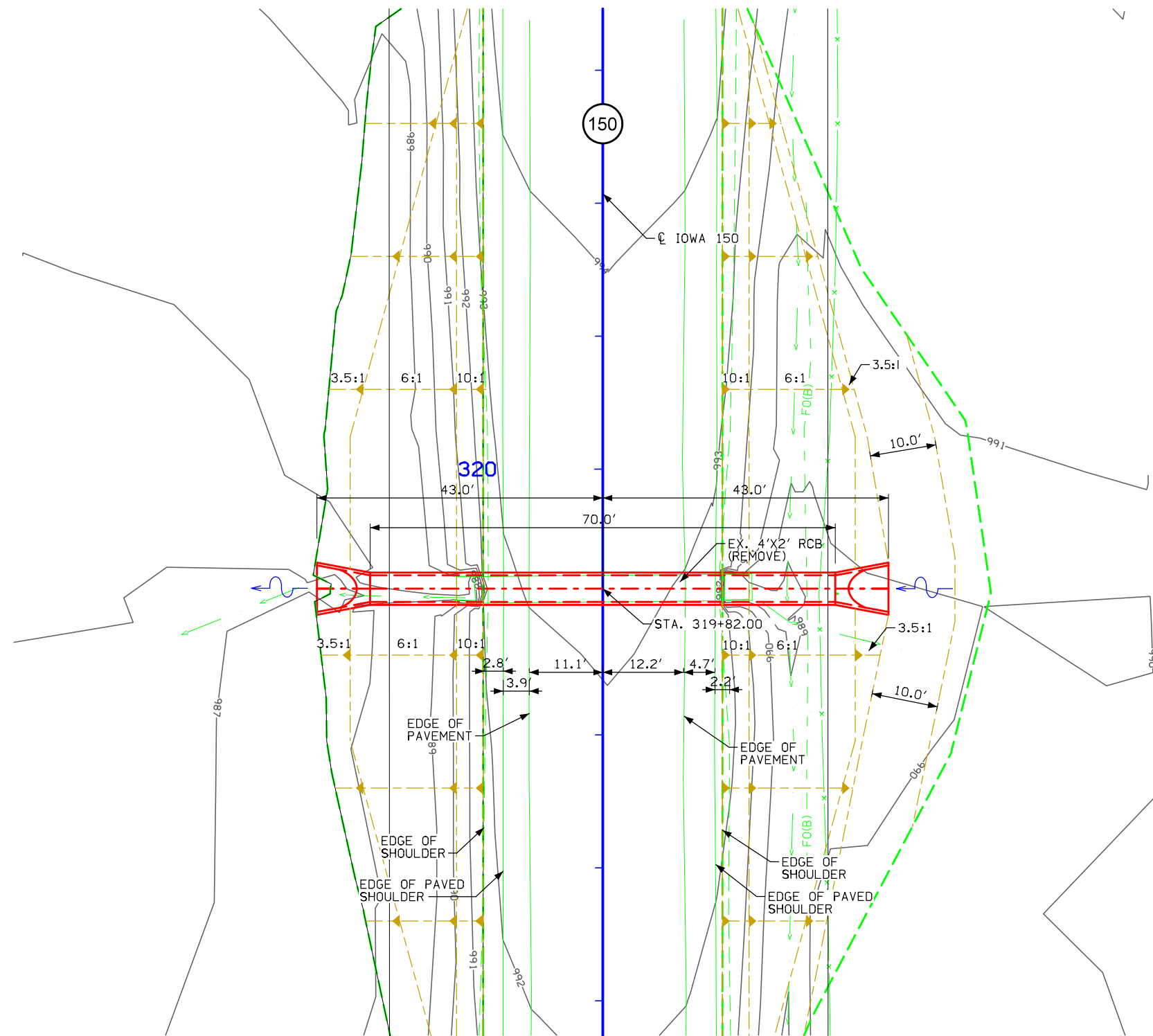


PLAT PLAN

DESIGN FOR 0° SKEW
66" (TRENCHLESS) X 72'
REINFORCED CONCRETE PIPE
 PLAT PLAN
 STA. 397+13.70 ϕ IOWA 150
 BUCHANAN COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____



LONGITUDINAL SECTION ALONG \bar{C} CULVERT



PLAT PLAN

BENCH MARK NO.7
ELEV. 991.53
STA. 318+95.66, 33' RT
2" ALUMINIUM DISC



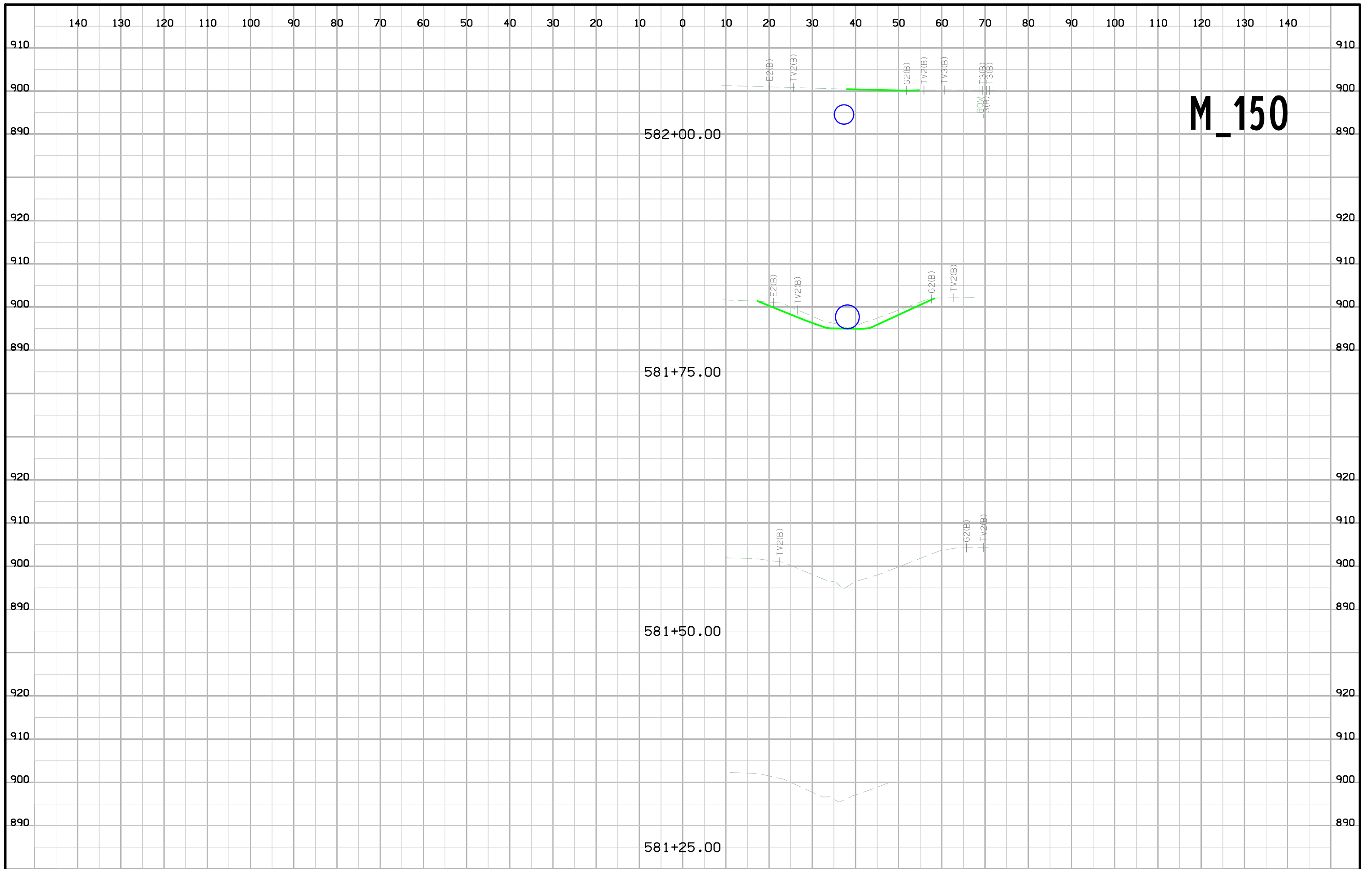
HYDRAULIC DATA
DRAINAGE AREA = 47.59 ACRES
 $Q_{50} = 84.65$ CFS

LOCATION
IOWA 150
T-89N R-9W
SECTION 3 & 4
WASHINGTON TOWNSHIP
BUCHANAN COUNTY

STAGING NOTES:
CULVERT CONSTRUCTION WILL BE STAGED TO ALLOW ONE LANE OF TRAFFIC TO BE MAINTAINED AT ALL TIMES.

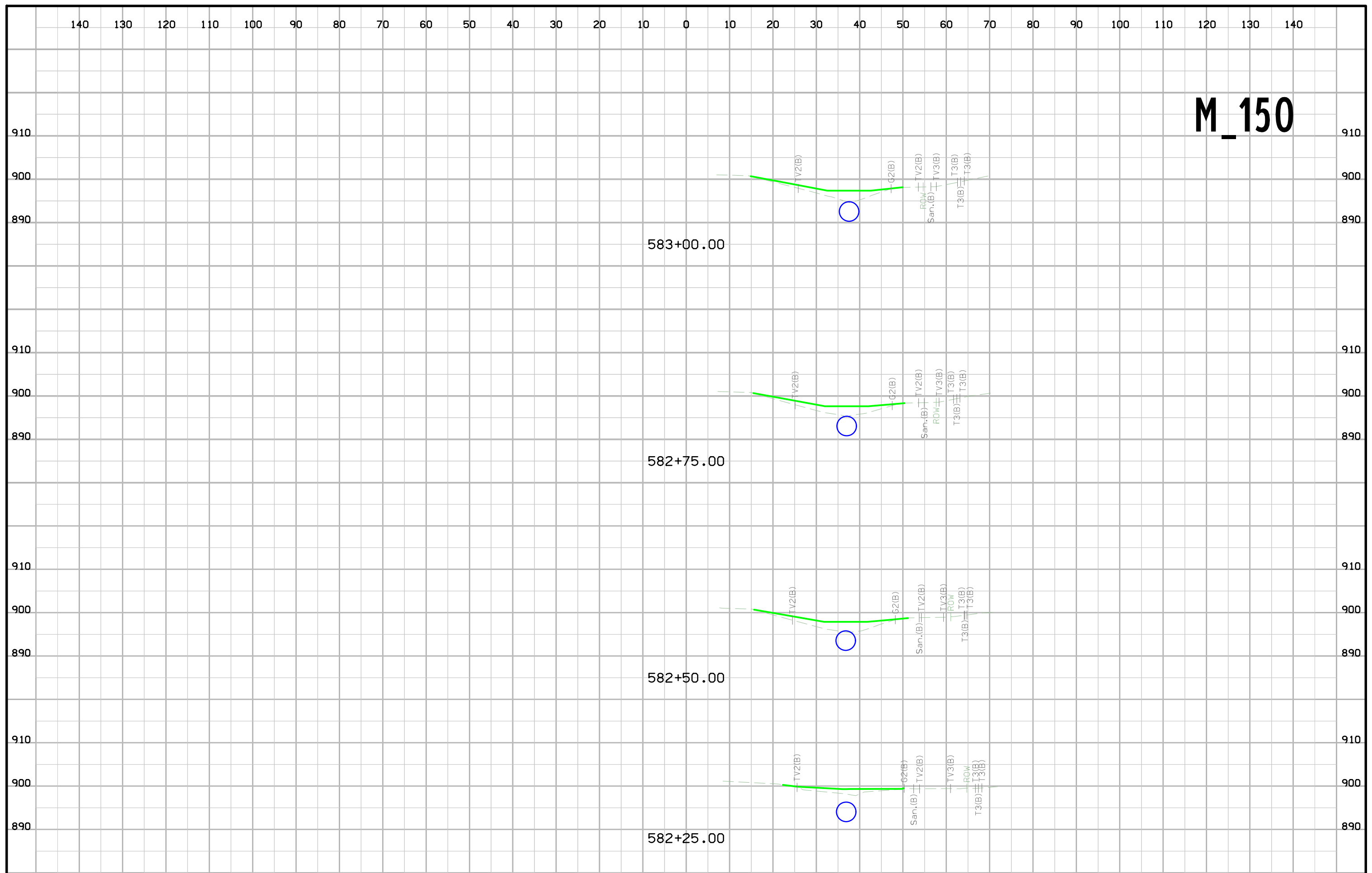
UTILITIES LEGEND:
REFER TO SHEET D.1 FOR UTILITY LEGEND

DESIGN FOR 0° SKEW
48" EQUIVALENT X 70' LOW CLEARANCE REINFORCED CONCRETE PIPE PLAT PLAN
STA. 319+82.00 \bar{C} IOWA 150 DEC. 2018
BUCHANAN COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

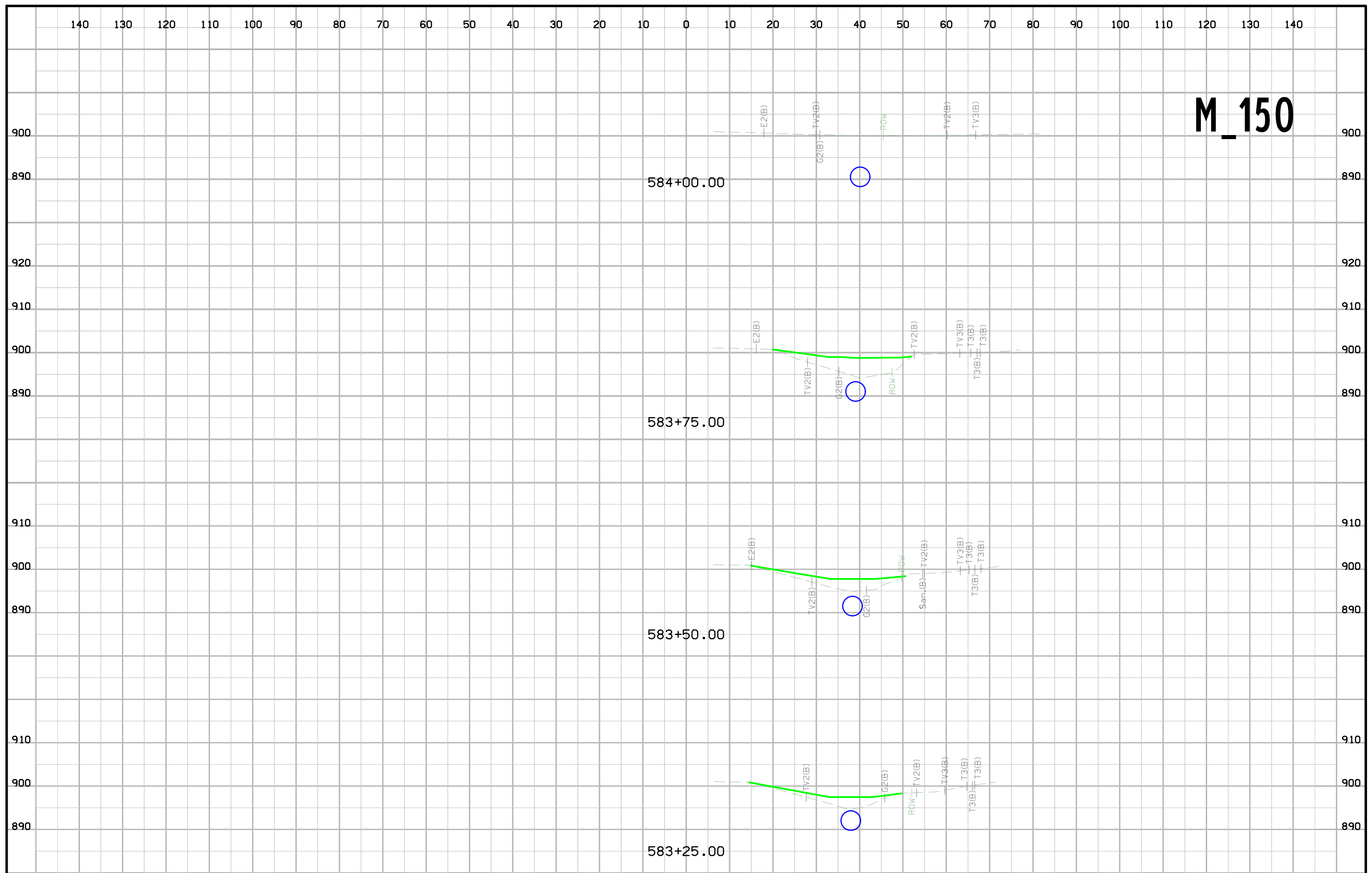


M_150

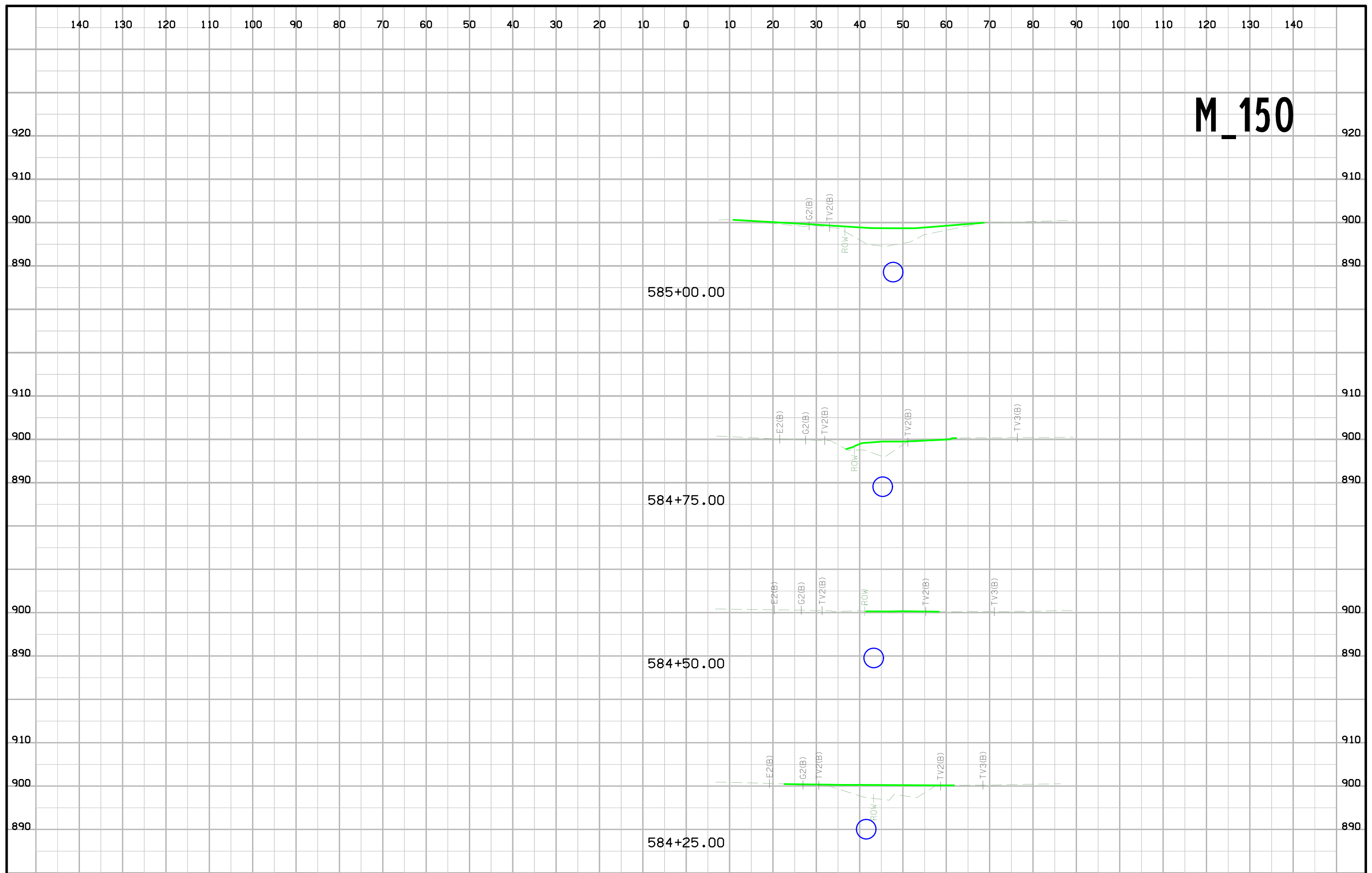
M_150

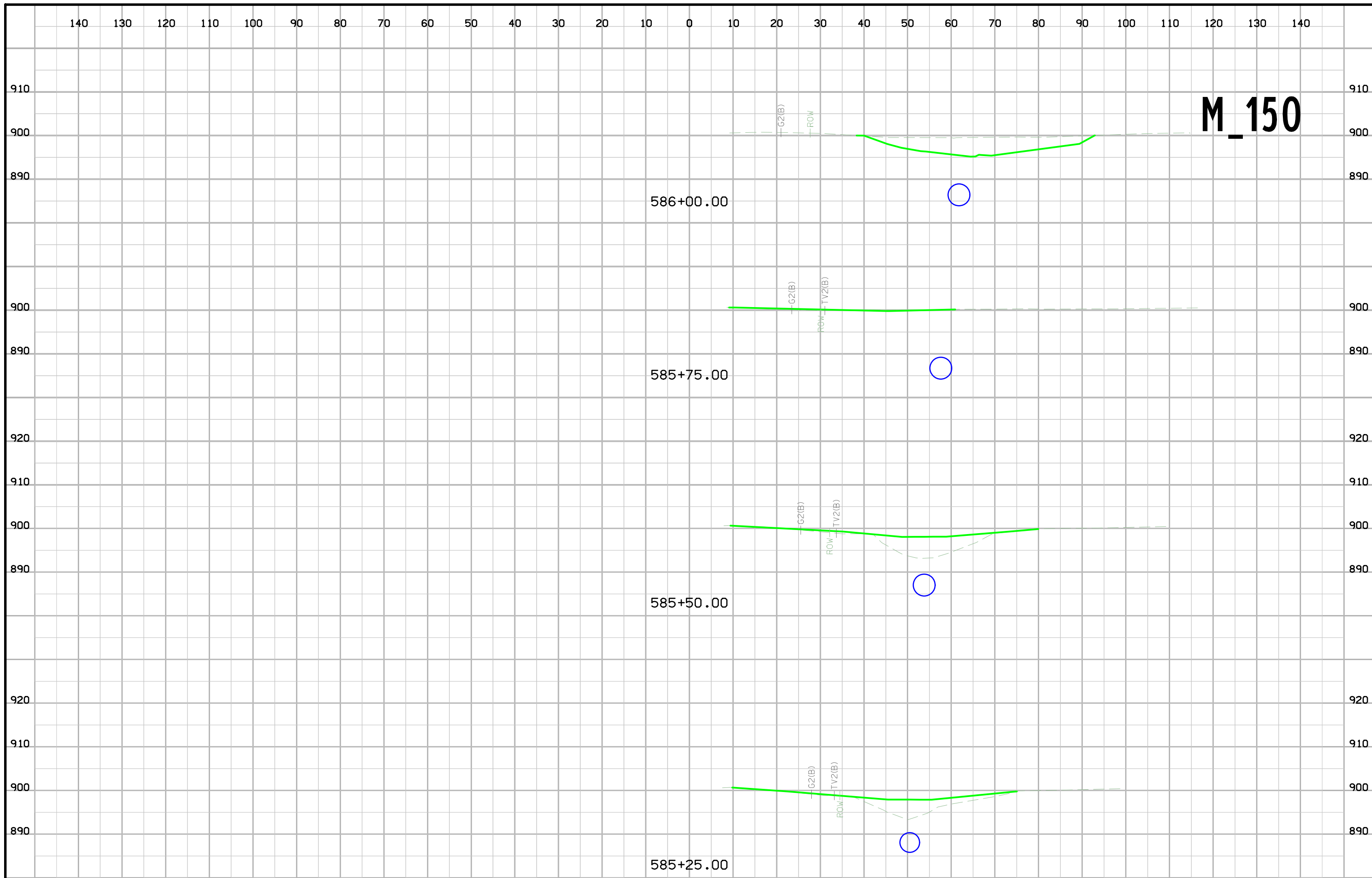


M_150



M_150





M_150

586+00.00

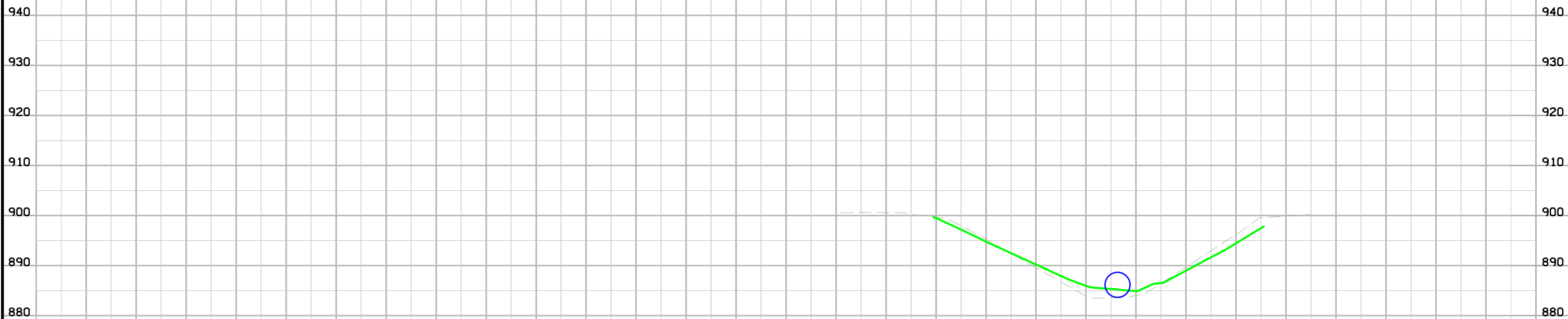
585+75.00

585+50.00

585+25.00

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

M_150



586+25.00