Chapter Forty-Seven

GUIDELINES FOR PREPARING UTILITY PLANS

MONTANA RIGHT-OF-WAY
DESIGN MANUAL

Chapter Forty-Seven
GUIDELINES FOR PREPARING UTILITY PLANS

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Chapter Forty-Seven
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47-1 UTILITY PLANS OVERVIEW

Utility plans are created when existing utilities lie within the construction limits of a project. The primary purpose of the plans is to highlight the utilities and their relationship to the other project data. The plans are used by Utility Engineering Specialists as they coordinate with the utility companies to determine the extent of relocation necessary within a given project. The plans are also used to create exhibits that become part of the final utility agreements.

47-1.1 Typical Plan Set

1. Title Sheet
2. Table of Contents, Notes, Linear and Level Data Sheet(s)
3. Control Diagram and Abstract Table Sheet(s)
4. Ownership Sheet(s)
5. Typical Section Sheet(s)
6. Summary Sheet(s) – Included in the utility plan set when utility items requiring adjustments such as valves, manholes, or fire hydrants are noted on plan and profile sheets.
7. Detail Sheet(s)
8. Plan and Profile Sheet(s)
9. Bridge General Layout Sheet(s) – Included in the utility plan set when bridge work is included in the project.

Sheet requirements, level lists, and color lists used as examples in this guide are partial and are not typical of every project.

47-2 UTILITY PLANS PREPARATION

47-2.1 Title Sheet

The title sheet should show the project location on the state map and in more detail on the county map. It should include the project beginning and ending stations; bridge stations, if any, and clearly identify the route number and county. A plan legend will also be included showing standard symbols and symbology shown on the utility plans. Related and associated projects along with the FHWA/MDT approval and R/W map revised block are also included. Design data, federal R/W project number, project name, county and project length are shown on the utility title sheet.

All reference to design files assumes proper DMS naming conventions have been followed. In this and all other procedures 1234000 represents the 7-digit project control number.

EXAMPLE: 1234000RDPLN001.DGN

UPN Number	Work Area	Work Area	Series Number	File Type
1234000	RD	PLN	001	DGN

Creating the utility title sheet:

(Legacy Workspace)

1. Download the title sheet from the RD workgroup in DMS usually named 1234000RDTTL001. Copy this file to the c:\dgn\ref directory for referencing.

2. Download the title sheet from the RO workgroup in DMS usually named 1234000ROTTL001. Copy this file to the c:\dgn\ref directory for referencing.

3. Open RD Title sheet, save it as UT title sheet (ex. 1234000**UTTTL001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, then compress the file.

4. Attach UTILITYV8_0.tbl (color table), UTILITYV8_0E.cel (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

5. In ‘Active file’ ‘View Attributes’, turn on Level Overrides.

6. In ‘Reference’ ‘Settings’ ‘Level Display’, choose MTSTD:PLANE.REF, set filter to UTTTL.

7. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF, set all style and weight attributes to off, all color attributes to 0 except as follows:

Name	Number	Color
S_BOT_UT_TITLE Legend Gas	10608	56
S_BOT_UT_TITLE Legend Power	10606	3
S_BOT_UT_TITLE Legend San Sewer	10611	2
S_BOT_UT_TITLE Legend Telephone	10607	6
S_BOT_UT_TITLE Legend TV	10609	5
S_BOT_UT_TITLE Legend Water	10610	1
S_BOT_UT_TITLE Wetland Hatch	10603	40

8. ‘Clip Mask’ the text in the design data box in the upper right corner from MTSTD:PLANE.REF.

9. Turn off levels designating “Scales” and “Title North Arrow” in MTSTD:PLANE REF.

10. Attach RD Title Sheet as a reference with RDTTL-1 as the logical name.

11. Copy the project location arrow into the active file.

12. Clip boundary around the county map and related project information. Move as necessary to display properly.

13. Attach RD Title Sheet as a reference with RDTTL-2 as the logical name.

14. Clip boundary around RDTTL-2 to display only the design data in the upper right corner.

15. Attach RO Title Sheet as a reference with ROTTL-1.

16. Clip boundary around ROTTL-1 to show data for associated projects, map revised and FHWA/MDT approval boxes.

17. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000, 50000.

18. Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

19. Attach cell “TTLSHTDF” from cell library. It is inserted at XY=50000, 50000.

20. Fill in the data for the title sheet. This cell contains the county name, project name, project number and project length data fields for the main title area under MONTANA DEPARTMENT OF TRANSPORTATION.

21. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the color to 0, line weight and symbology override to off in RDTTL-1, RDTTL-2, ROTTL-1 and the active file.

(Enhanced Workspace)

1. Download the title sheet from the RD workgroup in DMS usually named 1234000RDTTL001.
2. Download the title sheet from the RO workgroup in DMS usually named 1234000ROTTL001.
3. Create a new UT Title sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTTTL001**.DGN).
4. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.
5. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose the active file, ensure all style and weight attributes to off, all color attributes to 0 except as follows:

Name	Number	Color
S_BOT_UT_TITLE Legend Gas	10608	56
S_BOT_UT_TITLE Legend Power	10606	3
S_BOT_UT_TITLE Legend San Sewer	10611	2
S_BOT_UT_TITLE Legend Telephone	10607	54
S_BOT_UT_TITLE Legend TV	10609	5
S_BOT_UT_TITLE Legend Water	10610	1
S_BOT_UT_TITLE Wetland Hatch	10603	40

6. Attach RO Title Sheet as a reference.
    - Within the Reference dialog, choose “Tools”, “Attach”
    - Within the Attach Reference dialog, select the RO Title Sheet, then choose “Open”.
    - Insert ROTTL-1 as the logical name
    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “Copy Attachments”, then choose “OK”.
    - Select each occurrence of “REF1”, then choose “Tools”, “Detach”.
    - Check reference prefixes and fix as needed or use the reference macro.
7. Clip boundary for the RO Title Sheet reference file.

- Within the Reference dialog, select the ROTTL-1 reference file, then choose “Tools”, “Clip Boundary”, set clip method to “Element”, then accept the pink shape outlining the Associated Projects and Map Revision dates.

8. Attach RD Title Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”
    - Within the Attach Reference dialog, select the RD Title Sheet, then choose “Open”.
    - Insert RDTTL-3 as the logical name (Note: RDTTL-1 and RDTTL-2 were copied from the RO Title Sheet in the steps above.)
    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “No Nesting”, then choose “OK”.
    - Within the Reference dialog, select the RDTTL-3 reference file, then choose “Tools”, “Clip Boundary”, set clip method to “Element”, then accept the pink shape outlining the design data in the upper right corner.
    - Check reference prefixes and fix as needed or use the reference macro.

9. Run the Active File Settings macro to fill in the data for the title sheet for the main title area under MONTANA DEPARTMENT OF TRANSPORTATION. Use the data field text editor to move text as needed and fill in the Federal Aid Project Name on the first line, Work Location on the second line, and County on the bottom line. Project name, project UPN, project number, and sheet number fields for the bottom of all pages will be labeled with the Plan Sheets CPB Labeler macro after all sheets have been created; see MDT_Plan_Sheets_CPB_Labler.pdf for help using the Plan Sheets CPB Labeler. Delete the cell placed in the upper right sheet corner for traffic data if either of these macros is used to label the title sheet.

10. Ensure the proper north arrow from the RD Title sheet is shown or add one from the cell library.

11. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the color to 0, line weight and symbology override to off in RDTTL-1, RDTTL-2, RDTTL-3, ROTTL-1 and the active file.

47-2.2 Table Contents, Notes Sheet

The table of contents is unique to the utility plans and lists all sheets contained in the utility plans package. All sheets in the utility plans begin with a capital “U” in the page number sequencing, with the exception of the cross sections, they are a direct copy from the road design plans and numbered accordingly. Other items that may be included on this sheet are notes, skew diagram, clear zone table and linear & level data.

The following procedure assumes the table of contents is to be included as page 2 in the title sheet file “1234UTTTL001”. All references to design files assume proper DMS naming convention has been followed.

(Legacy Workspace)

Use the following procedure for creating the utility table of contents sheet:

1. Open design file 1234UTTTL001 and window area to view sheet 2.
2. Attach RD Title Sheet as a reference with RDTTL-3 as the logical name.
    - Clip boundary around RDTTL-3 to display only the NOTES section.
3. Attach cell “TOCMID” from cell library. It is inserted at XY=50000, 50000.
    - Move as needed to fit page.
    - Drop status and fill in the information when known.
4. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the color to 0, line weight and symbology override to off in RDTTL-3 and the active file.

(Enhanced Workspace)

Use the following procedure for creating the utility table of contents sheet:

1. Open design file 1234UTTTL001 and window area to view sheet 2.
2. Attach RD Title Sheet as a reference with RDTTL-4 as the logical name.
3. Set clip boundary for the Road Design title sheet reference file.
    - Within the Reference dialog, select the RDTTL-4 Road Design title sheet reference file, then choose “Tools”, “Clip Boundary”, set clip method to “Element”, then accept the pink shape outlining the notes in sheet 2. Adjust the element shape as necessary to fit notes on page with Table of Contents.

- Check reference prefixes and fix as needed or use the reference macro.

4. Drop status on Table of Contents cell and fill in the information when known.

5. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the color to 0, line weight and symbology override to off in RDTTL-4 and the active file.

6. The Notes Sheet included in the reference may include the Linear and Level data described in the next section. If the Linear and Level data is already referenced the references for an additional Linear and Level data sheet may be skipped.

47-2.3 Linear and Level Data Sheet

(Legacy Workspace)

Use the following procedure for creating the utility linear and level data sheet:

1. Open design file 1234UTTTL001 and window area to view sheet 3.
2. Attach RD Title Sheet as a reference with RDTTL-4 as the logical name.
3. Clip boundary around RDTTL-4 to display only the Linear and Level Data section.
4. Move as needed to fit page.
5. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the color to 0, line weight and symbology override to off in RDTTL-4 and the active file.

(Enhanced Workspace)

Use the following procedure for creating the utility linear and level data sheet if it was not included when referencing the Notes sheet of the previous step:

1. Open design file 1234UTTTL001 and window area to view sheet 3.
2. Attach RD Title Sheet as a reference with RDTTL-5 as the logical name.
3. Set clip boundary for the Road Design title sheet reference file.
    - Within the Reference dialog, select the RDTTL-5 Road Design title sheet reference file, then choose “Tools”, “Clip Boundary”, set clip method to “Element”, then accept the pink shape outlining the Linear and Level Data in sheet 3.
    - Check reference prefixes and fix as needed or use the reference macro.
4. Move reference as needed to fit page.
5. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the color to 0, line weight and symbology override to off in RDTTL-5 and the active file.

47-2.4 Control Diagram and Abstract Sheet

The control diagram is used to establish a permanent, recoverable horizontal and vertical control system for highway design and construction. All topography and design data, including utilities, hydrology, right-of-way, bridge and miscellaneous data, is tied to the control diagram. The control abstract gives the coordinates and elevation of each control point along with a brief description of how to find or reach the control point. The control diagram and abstract are made available to utility companies for use in engineering utility relocation work and are included in the utility plans package.

All reference to design files assumes proper DMS naming conventions have been followed. The following procedure assumes a new utility design file is to be made for the control diagram and abstract, and the control diagram abstract will fit on one sheet. Modifications to this procedure, the procedure itself, or portions of the procedure may need to be repeated, if more than one sheet is needed for the complete control diagram and abstract.

(Legacy Workspace)

Use the following procedure for creating the utility control diagram and abstract sheet:

1. Download the traverse file from the RD workgroup in DMS, usually named 1234000RDTRV001. Copy this file to the c:\dgn\ref directory for referencing.

2. Open RD Traverse sheet, save it as UT traverse sheet (ex. 1234000**UTTRV001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, then compress the file.

3. Attach UTILITYV8_0.TBL (color table) and UTILITYV8_0E.CEL (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

4. In ‘Active file’ ‘View Attributes’, turn on Level Overrides.

5. In ‘Reference’ ‘Settings’ ‘Level Display’, choose MTSTD:PLANE.REF, set filter to UTDET.

    - Turn of level “Detail Title Block” for bottom, mid and top.

6. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF, set all style and weight attributes off, color attributes to 0 (white).

7. Attach RD Traverse Sheet as a reference with RDTRV-1 as the logical name.

    - Clip boundary around the reference to display the Control Diagram & Abstract sheet.

8. Attach all survey, utility map and right of way files (PH, DI, UTSUE, UTMAP, ROMAP etc.) if not already attached.

    - Scale, Rotate, and Move the files to fit the displayed control points of the traverse.

    - Turn on levels from survey map files to show general topography such as fences, buildings, streams, PTW, mailboxes, etc.

    - Turn on levels from utility map files to show the utilities.

    - Turn on levels from right of way map files to show section lines.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, for the survey files set the color to 80, line weight and symbology override to off, except utility features.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, for the utility files set the line weight and symbology override to off and the color symbology as follows:

Water levels	color 1
Sanitary sewer levels	color 2
Power levels	color 3
TV levels	color 5
Communication levels	color 6
Gas levels	color 56
Drainage levels	color 0

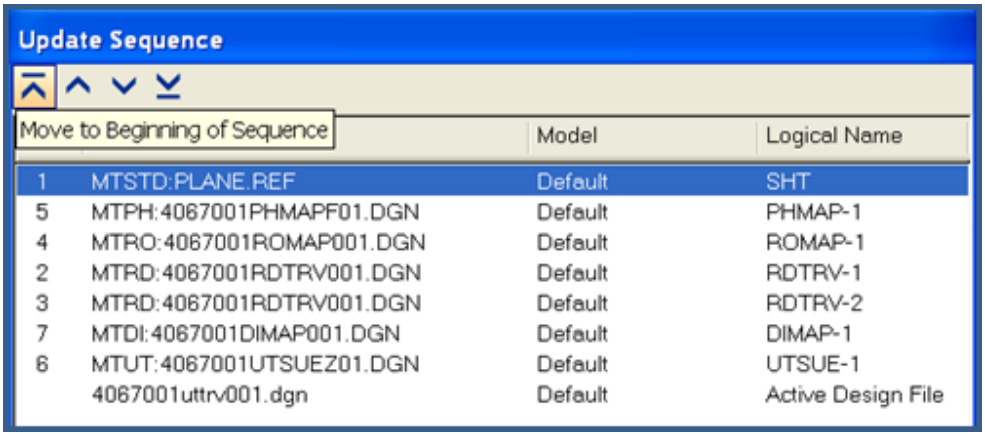
    - In ‘Reference’ ‘Settings’ ‘Level Manager’, for the right of way files set the color to 0, line weight and symbology override to off.

9. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000, 50000.

10. Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

11. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose active file and set all style and weight attributes off, color attributes to 0 (white).

12. In ‘Reference’ ‘Settings’ ‘Update Sequence’ and change update sequence as follows:



(Enhanced Workspace)

Use the following procedure for creating the utility control diagram and abstract sheet:

1. Download the traverse file from the RD workgroup in DMS, usually named 1234000RDTRV001. Copy this file to the c:\dgn\ref directory for referencing.

2. Create a new UT Traverse sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTTRV001**.DGN).

3. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.

4. Attach RD Traverse Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”
    - Within the Attach Reference dialog, select the RD Traverse Sheet, then choose “Open”.
    - Insert RDTRV-1 as the logical name.
    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “Copy Attachments”, then choose “OK”.
    - Select each duplicated occurrence of RDSHEET.REF but leave “SHT”, then choose “Tools”, “Detach”.
    - Check reference prefixes and fix as needed or use the reference macro.

5. Turn off sheet labels from the RD Traverse Sheet, typically level “P_Sheets_Plan_Label_Sheet_Text” and

"S_SHEETS_DesignBlock_Data_Fields". If the labels are on a different level, adjust accordingly or mask the reference file as outlined below.

- Select the pink clip boundary around the bottom of the first sheet to create a fence. Within the Reference dialog, select the RDDET-1 Road Design detail sheet reference file, then choose "Tools", "Clip Boundary then accept the pink shape outlining the plan data fields in sheet 1.

- Repeat for sheet 2 and sheet 3 as needed.

6. Attach all survey, utility map and right of way files (PH, DI, UTSUE, UTMAP, ROMAP etc.) if not already attached.

    - Scale, Rotate, and Move the files to fit the displayed control points of the traverse.

    - Check reference prefixes and fix as needed or use the reference macro.

    - Turn on levels from survey map files to show general topography such as fences, buildings, streams, PTW, mailboxes, etc.

    - Turn on levels from utility map files to show the utilities.

    - Turn on levels from right of way map files to show section lines.

    - In 'Reference' 'Settings' 'Level Manager', for the survey files set the color to 80, line weight and symbology override to off, except utility features.

    - In 'Reference' 'Settings' 'Level Manager', for the utility files set the line weight and symbology override to off and the color symbology as follows:

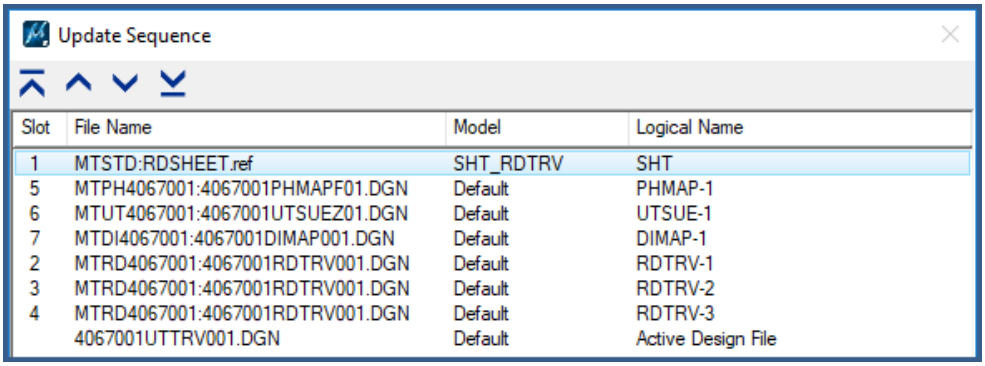
	Water levels	color 1
	Sanitary sewer levels	color 2
	Power levels	color 3
	TV levels	color 5
	Communication levels	color 54
	Gas levels	color 56
	Drainage levels	color 0

    - In 'Reference' 'Settings' 'Level Manager', for the right of way files set the color to 0, line weight and symbology override to off.

7. Adjust drawing scale as necessary for line style and text annotation scale.

8. In 'Reference' 'Settings' 'Level Manager', choose active file and ensure all style and weight attributes are off, color attributes are 0 (white).

9. In ‘Reference’ ‘Settings’ ‘Update Sequence’ and change update sequence as follows:



47-2.5 Ownership Sheet

The ownership sheet gives the names and addresses of the adjacent property owners along the highway construction project. The ownership sheet also states the right-of-way, easement and construction permit areas needed from each property owner for the proposed construction project. The property owners are shown by parcel numbers and cross-referenced to the utility plan sheets. Also shown with the ownership sheet are the FHWA/DOT approval date and the date of the last revision to the right-of-way map.

All reference to design files assumes proper DMS naming conventions have been followed. The following procedure assumes a new utility design file is to be made for the ownership sheet, and the ownerships will fit on one sheet. This procedure may need to be repeated, if more than one sheet is needed for the complete ownerships of the project.

Use the following procedure for creating the utility ownership sheet:

(Legacy Workspace)

1. Download the ownership file from the RO workgroup in DMS that contains the ownership data, usually named 1234000ROOWN001. Copy this file to the c:\dgn\ref directory for referencing.

2. Open RO Owner sheet, save it as UT owner sheet (ex. 1234000**UTOWN001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, then compress the file.

3. Attach UTILITYV8_0.TBL (color table) and UTILITYV8_0E.CEL (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

4. In ‘Active file’ ‘View Attributes’, turn on Level Overrides.

5. In ‘Reference’ ‘Settings’ ‘Level Display’, choose MTSTD:PLANE.REF, set filter to UTOWN.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF, set all style and weight attributes off, color attributes to 0 except as follows:

    - Levels 10647, 10632, and 10636 to color 40 (gray).

6. Attach RO Ownership Sheet as a reference with ROOWN-1 as the logical name.

    - Clip boundary around ROOWN-1 to display the ownership information, no page numbers.

- In ‘Reference’ ‘Settings’ ‘Level Manager’, for the set the color to 0, line weight and symbology override to off.

7. Attach RO Ownership Sheet as a reference with ROOWN-2 as the logical name.

   - Clip boundary around ROOWN-2 to show data for associated projects, map revised and FHWA/MDT approval dates.

   - In ‘Reference’ ‘Settings’ ‘Level Manager’, for the set the color to 0, line weight and symbology override to off.

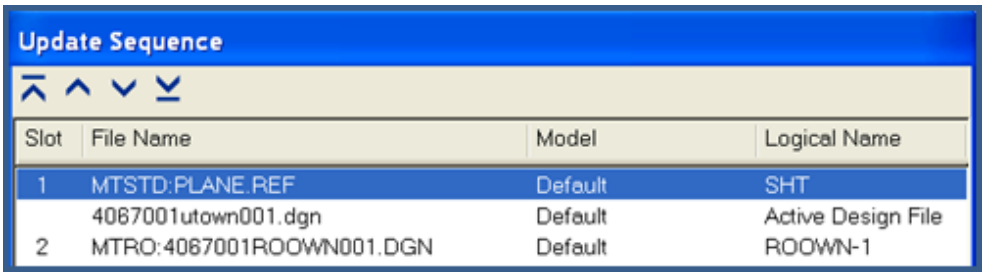
8. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000, 50000.

   - Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

9. Attach cell “UTOWNDF1” from cell library. It is inserted at XY=50000, 50000.

   - Fill in the data for the utility plans page numbers when known. The parcel numbers are shown on the plan and profile sheets. This cell contains data fields under the SHEET NO. heading of the ownership data for sheet 1. If creating more than one ownership sheet, the number of the cell will increment with the sheet (UTOWNDF2 for sheet 2, etc.).

10. In ‘Reference’ ‘Settings’ ‘Update Sequence’, change the update sequence as follows:



(Enhanced Workspace)

1. Download the ownership file from the RO workgroup in DMS that contains the ownership data, usually named 1234000ROOWN001. Copy this file to the c:\dgn\ref directory for referencing.

2. Create a new UT Ownership sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTOWN001**.DGN).

3. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.

4. Attach RO Ownership Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”
    - Within the Attach Reference dialog, select the RO Ownership Sheet, then choose “Open”.
    - Insert ROOWN-1 as the logical name.
    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “Copy Attachments”, then choose “OK”.
    - Check reference prefixes and fix as needed or use the reference macro.

5. Set clip boundary for the RO Ownership sheet reference file.

    - Within the Reference dialog, select the ROOWN-1 RO Ownership sheet reference file, then choose “Tools”, “Clip Boundary”, set clip method to “Element”, then accept the pink shape outlining the Owner Information and revision dates but omits page numbers. Adjust clipping as necessary if using ownership data linked from Excel so page numbers can be added from the UT Excel file with sheet numbers only.
    - Within the Reference dialog, select the REF1 Ownership sheet reference file, then choose “Tools”, “Clip Boundary”, set clip method to “Element”, then accept the green shape outlining the Ownership grid. References of REF1 ownership grid may be removed if ownership data is linked from Excel.

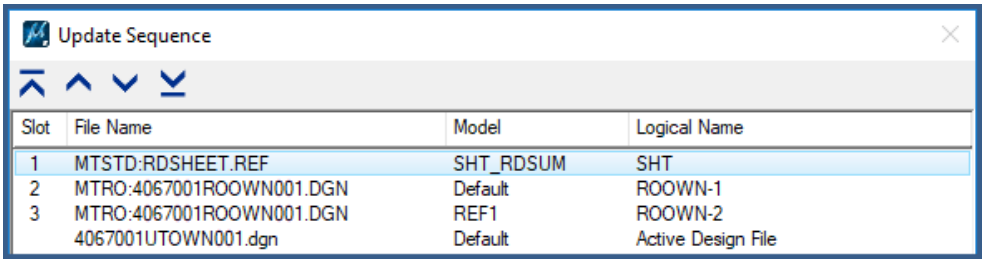
6. Repeat steps above for additional ownership sheets.

7. In ‘Reference’ ‘Settings’ ‘Level Manager’, for the set the color to 0, line weight and symbology override to off for all files.

8. Ensure cell “DF_UTOWNERSHIP” from cell library is inserted and data fields are active in view attributes.

    - Fill in the data for the utility plans page numbers when known. The parcel numbers are shown on the plan and profile sheets.

9. In ‘Reference’ ‘Settings’ ‘Update Sequence’, change the update sequence as follows:


Update Sequence
Slot
File Name
Model
Logical Name
1
MTSTD:RDSHEET.REF
SHT_RDSUM
SHT
2
MTRO:4067001ROOWN001.DGN
Default
ROOWN-1
3
MTRO:4067001ROOWN001.DGN
REF1
ROOWN-2
4067001UTOWN001.dgn
Default
Active Design File

47-2.6 Typical Section Sheet

One or more typical sections are required for each set of plans. Typical sections are used to illustrate the cross section for a roadway section, the basis for surfacing quantities, roadway widths for tangent and super-elevated sections, and cut and fill slope rates. Typical sections also show roadside ditches, curbed and uncurbed sections, median widths, sidewalks, driving lanes, shoulder widths, turn lanes and other roadway surface features.

Note that all reference to design files assumes proper DMS naming conventions have been followed. The following procedure assumes a new utility design file is to be made for the typical sections and that the typical sections will fit on one sheet.

Use the following procedure for creating the utility typical sections:

(Legacy Workspace)

1. Download the typical section file from the RD workgroup in DMS that contains the typical section data, usually named 1234000RDTYP001. Copy this file to the c:\dgn\ref directory for referencing.

2. Open RD Typical sheet, save it as UT typical sheet (ex. 1234000**UTTYP001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, then compress the file.

3. Attach UTILITYV8_0.TBL (color table) and UTILITYV8_0E.CEL (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

4. In ‘Active file’ ‘View Attributes’, turn on Level Overrides.

5. In ‘Reference’ ‘Settings’ ‘Level Display’, choose MTSTD:PLANE.REF, set filter to UTTYP.

6. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF, set all style and weight attributes off, color attributes to 0 (white).

7. In “References’, rename reference that has logical name of (e) to MTRD:1234000RDTYP### where new name matches name of original typical section file before saving as UT.

    - Change the property of the reference attachment to “No Nesting”.

8. Attach RD Typical Section Sheet as a reference with RDTYP-1 as the logical name.

    - Clip boundary around RDTYP-1 to display the typical section information for sheet 1.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, set the colors to 0, line weight and symbology override to off.

9. Repeat steps for all typical section sheets.

10. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000, 50000.

    - Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

(Enhanced Workspace)

1. Download the typical section file from the RD workgroup in DMS that contains the typical section data, usually named 1234000RDTYP001. Copy this file to the c:\dgn\ref directory for referencing.

2. Create a new UT Typical Section sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTTYP001**.DGN).

3. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.

4. Attach RD Typical Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”

    - Within the Attach Reference dialog, select the RD Typical Sheet, then choose “Open”.

    - Insert RDTYP-1 as the logical name.

    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “Copy Attachments”, then choose “OK”.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, set the colors to 0, line weight and symbology override to off for all reference files.

    - Check reference prefixes and fix as needed or use the reference macro.

5. Select “RDTYP-1”, “b”, “c”, and “d”, then choose “Tools”, “Detach”. The scaled typical sections will still be referenced from the RD Typical file if logical “e” for the scaled sheet area is still attached.

47-2.7 Summary Sheet

When plan and profile sheets contain manholes, valves and/or fire hydrants requiring adjustment or relocation, a summary sheet shall be included in the utility plan set. The summary sheet contains tables showing the station, left or right offset from centerline, and the ownership of each item type. It also contains the funding level of the adjustments which varies from project to project. The utility agent determines the funding source and percentage of the state's participation from procedures established by law.

Note that all reference to design files assumes proper DMS naming conventions have been followed. The following procedure assumes a new utility design file is to be made for the summaries and that they will fit on one sheet.

(Legacy Workspace)

1. Download the summary sheet file from the RD workgroup in DMS that contains the summary sheet data, usually named 1234000RDSUM001. Copy this file to the c:\dgn\ref directory for referencing.

2. Open RD Summary sheet, save it as UT typical sheet (ex. 1234000**UTSUM001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, then compress the file.

3. Attach UTILITYV8_0.TBL (color table) and UTILITYV8_0E.CEL (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

4. In 'Active file' 'View Attributes', turn on Level Overrides.

5. In 'Reference' 'Settings' 'Level Display', choose MTSTD:PLANE.REF, set filter to UTDET.

    - Turn off the level "Detail Title Block" for bottom, mid and top.

6. In 'Reference' 'Settings' 'Level Manager', choose MTSTD:PLANE.REF, set all style and weight attributes off, color attributes to 0 (white).

7. Attach RD Summary Sheet as a reference with RDSUM-1 as the logical name.

    - Clip boundary around the reference to display the summary items as needed. Only show those tables that reflect items requiring adjustment as noted above.

    - In 'Reference' 'Settings' 'Level Manager', set the colors to 0, line weight and symbology override to off.

8. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000, 50000.

    - Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

(Enhanced Workspace)

1. Download the summary sheet file from the RD workgroup in DMS that contains the summary sheet data, usually named 1234000RDSUM001. Copy this file to the c:\dgn\ref directory for referencing.

2. Create a new UT Summary sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTSUM001**.DGN).

3. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.

4. Attach RD Summary Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”

    - Within the Attach Reference dialog, select the RD Summary Sheet, then choose “Open”.

    - Insert RDSUM-1 as the logical name.

    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “No Nesting”, then choose “OK”.

    - Check reference prefixes and fix as needed or use the reference macro.

5. Turn off sheet labels and designed by labels from the RD Detail Sheet, typically level “P_Sheets_Plan_Label_Sheet_Text” and “S_SHEETS_DesignBlock_Data_Fields”. If the labels are on a different level, adjust accordingly or mask the reference file as outlined below.

    - Select the pink clip boundary around the bottom of the first sheet to create a fence. Within the Reference dialog, select the RDSUM-1 Road Design summary sheet reference file, then choose “Tools”, “Clip Boundary then accept the pink shape outlining the plan data fields in sheet 1.

    - Repeat for sheet 2 and sheet 3 as needed.

6. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the colors to 0, line weight and symbology override to off for all files.

47-2.8 Detail Sheet

Detail sheets are used for those items that require more specific information than can be adequately described on the plan and profile sheets. Details in the utility plans may include: detours, rumble strips, drainage details, signing, electrical or geometric details. Mass diagrams are not included with the utility plans. Each project will have its own unique set of details and inclusion of each detail is determined on a project-by-project basis.

All reference to design files assumes proper DMS naming conventions have been followed. The following procedure assumes a new utility design file is to be made for the details, and the details will fit in one design file.

47-2.8.1 Detail Sheet 1 – No Maps (Legacy Workspace)

1. Download the file from the RD workgroup in DMS that contains the details, usually named 1234000RDDET001. Copy this file to the directory c:\dgn\ref for referencing.

2. Open RD detail sheet, save it as UT detail sheet (ex. 1234000**UTDET001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, and then compress the file.

3. Attach UTILITYV8_0.TBL (color table) and UTILITYV8_0E.CEL (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

4. In ‘Active file’ ‘View Attributes’, turn on Level Overrides.

5. In ‘Reference’ ‘Settings’ ‘Level Display’, choose MTSTD:PLANE.REF, set filter to UTDET.

6. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF, set all style and weight attributes off, color attributes to 0 (white).

7. Attach RD Detail Sheet as a reference with RDDET-1 as the logical name.

    - Clip boundary around RDDET-1 to display the detail information.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, for the set the color to 0, line weight and symbology override to off.

8. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000, 50000.

    - Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

47-2.8.2 Detail Sheet 2 – With Maps (Legacy Workspace)

9. If the profile grid is shown, in ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF and set color attributes to as follows:

    - Levels 10111, 10113, 10202, 10204, 10304, & 10306 to color 40 (gray).
    - Levels 10112, 10114, 10203, 10205, 10305, & 10307 to color 32 (light gray).

10. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose the RD profile reference and set all style and weight attributes to off, color attributes to 0 (white).

11. In ‘Reference’ ‘Settings’ ‘Level Display’, choose the RDMAP and/or other MAP files as necessary and turn on levels showing proposed construction items.

    - Set style, weight attributes to off and color to 0 (white).

12. In ‘Reference’ ‘Settings’ ‘Level Display’, choose the DIMAP and/or other MAP files as necessary and turn on levels showing the general topography.

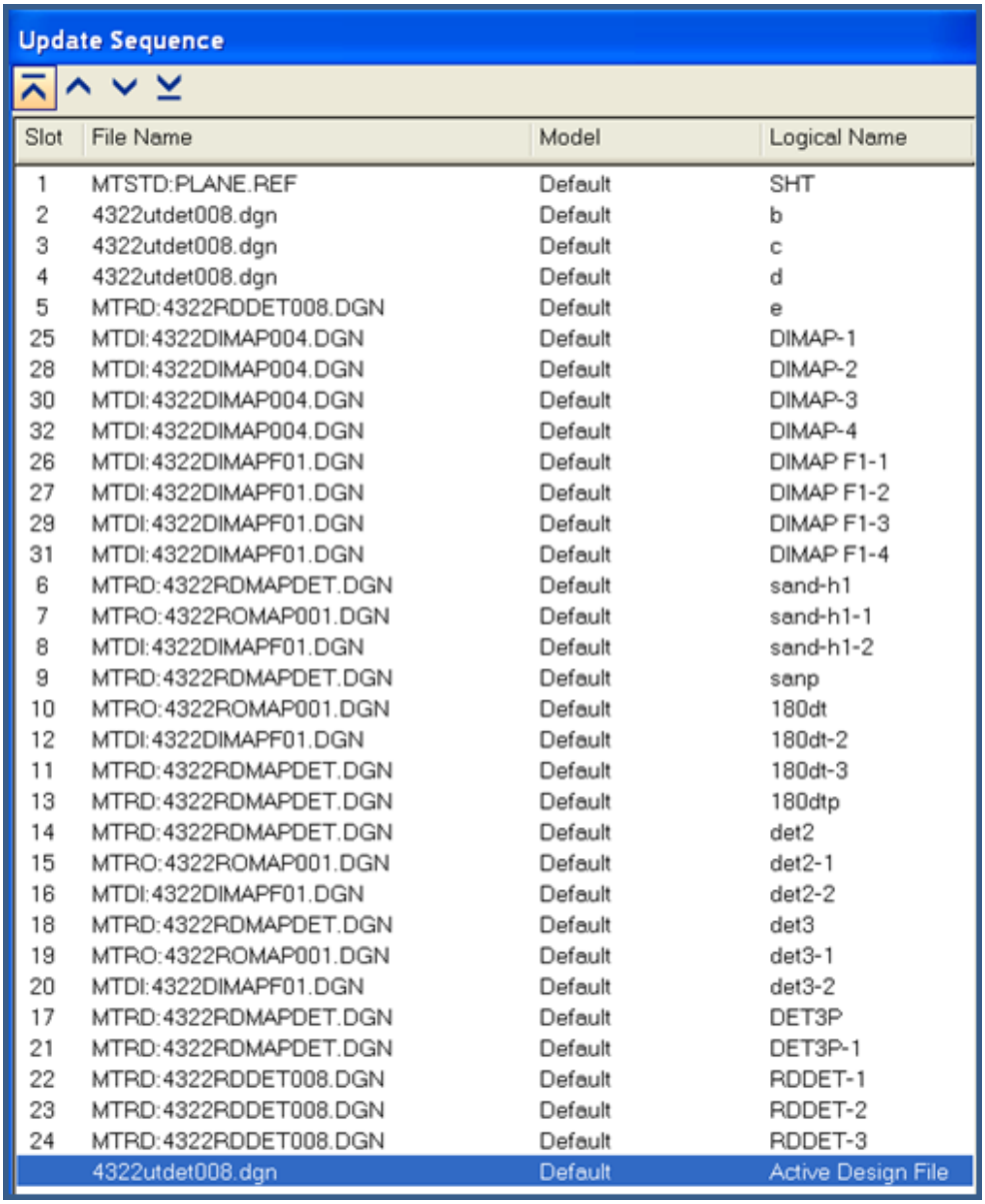
    - Set style, weight attributes to off and color to 80 (gray).

13. In ‘Reference’ ‘Settings’ ‘Level Display’, choose the UTMAP and/or UTSUE files as necessary and turn on levels showing the existing utilities.

    - Set the line weight and symbology override to off and the color symbology as follows:

	Water levels	color 1
	Sanitary sewer levels	color 2
	Power levels	color 3
	TV levels	color 5
	Communication levels	color 6
	Gas levels	color 56
	Drainage levels	color 0

14. In ‘Reference’ ‘Settings’ ‘Update Sequence’, change the update sequence similar to the following:



Slot	File Name	Model	Logical Name
1	MTSTD:PLANE.REF	Default	SHT
2	4322utdet008.dgn	Default	b
3	4322utdet008.dgn	Default	c
4	4322utdet008.dgn	Default	d
5	MTRD:4322RDDET008.DGN	Default	e
25	MTDI:4322DIMAP004.DGN	Default	DIMAP-1
28	MTDI:4322DIMAP004.DGN	Default	DIMAP-2
30	MTDI:4322DIMAP004.DGN	Default	DIMAP-3
32	MTDI:4322DIMAP004.DGN	Default	DIMAP-4
26	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-1
27	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-2
29	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-3
31	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-4
6	MTRD:4322RDMAPDET.DGN	Default	sand-h1
7	MTRO:4322ROMAP001.DGN	Default	sand-h1-1
8	MTDI:4322DIMAPF01.DGN	Default	sand-h1-2
9	MTRD:4322RDMAPDET.DGN	Default	sanp
10	MTRO:4322ROMAP001.DGN	Default	180dt
12	MTDI:4322DIMAPF01.DGN	Default	180dt-2
11	MTRD:4322RDMAPDET.DGN	Default	180dt-3
13	MTRD:4322RDMAPDET.DGN	Default	180dtp
14	MTRD:4322RDMAPDET.DGN	Default	det2
15	MTRO:4322ROMAP001.DGN	Default	det2-1
16	MTDI:4322DIMAPF01.DGN	Default	det2-2
18	MTRD:4322RDMAPDET.DGN	Default	det3
19	MTRO:4322ROMAP001.DGN	Default	det3-1
20	MTDI:4322DIMAPF01.DGN	Default	det3-2
17	MTRD:4322RDMAPDET.DGN	Default	DET3P
21	MTRD:4322RDMAPDET.DGN	Default	DET3P-1
22	MTRD:4322RDDET008.DGN	Default	RDDET-1
23	MTRD:4322RDDET008.DGN	Default	RDDET-2
24	MTRD:4322RDDET008.DGN	Default	RDDET-3
	4322utdet008.dgn	Default	Active Design File

47-2.8.3 Detail Sheet 1 – No Maps (Enhanced Workspace)

1. Download the file from the RD workgroup in DMS that contains the details, usually named 1234000RDDET001. Copy this file to the directory c:\dgn\ref for referencing.

2. Create a new UT Detail sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTDET001**.DGN).

3. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.

4. Attach RD Detail Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”
    - Within the Attach Reference dialog, select the RD Detail Sheet, then choose “Open”.
    - Insert RDDET-1 as the logical name.
    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “Copy Attachments”, then choose “OK”.
    - Adjust the RDSHEET.REF model attachment if needed. Select each duplicated occurrence of RDSHEET.REF but leave “SHT”, then choose “Tools”, “Detach”.
    - Check reference prefixes and fix as needed or use the reference macro.

5. Turn off sheet labels and designed by labels from the RD Detail Sheet, typically level “P_Sheets_Plan_Label_Sheet_Text” and “S_SHEETS_DesignBlock_Data_Fields”. If the labels are on a different level, adjust accordingly or mask the reference file as outlined below.

    - Select the pink clip boundary around the bottom of the first sheet to create a fence. Within the Reference dialog, select the RDDET-1 Road Design detail sheet reference file, then choose “Tools”, “Clip Boundary then accept the pink shape outlining the plan data fields in sheet 1.
    - Repeat for sheet 2 and sheet 3 as needed.

6. Adjust drawing scale as necessary for line style and text annotation scale.

7. In ‘Reference’ ‘Settings’ ‘Level Manager’, set the colors to 0, line weight and symbology override to off for all files except RDSHEET.ref profile grids which should be color 208.

47-2.8.4 Detail Sheet 2 – With Maps (Enhanced Workspace)

8. Within the Reference dialog, double click the SHT reference file and change reference model to SHT_RDSUM if the profile is shown on the entire bottom portion of the page and no detail title block is present.

9. Adjust reference levels from RDSHEET.ref to display necessary profile grids only and turn off all other levels in the duplicated RDSHEET.ref reference file.

10. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose the RD profile reference and set all style and weight attributes to off, color attributes to 0 (white).

11. In ‘Reference’ ‘Settings’ ‘Level Display’, choose the RDMAP and/or other MAP files as necessary and turn on levels showing proposed construction items.

    - Set style, weight attributes to off and color to 0 (white).

12. In ‘Reference’ ‘Settings’ ‘Level Display’, choose the DIMAP and/or other MAP files as necessary and turn on levels showing the general topography.

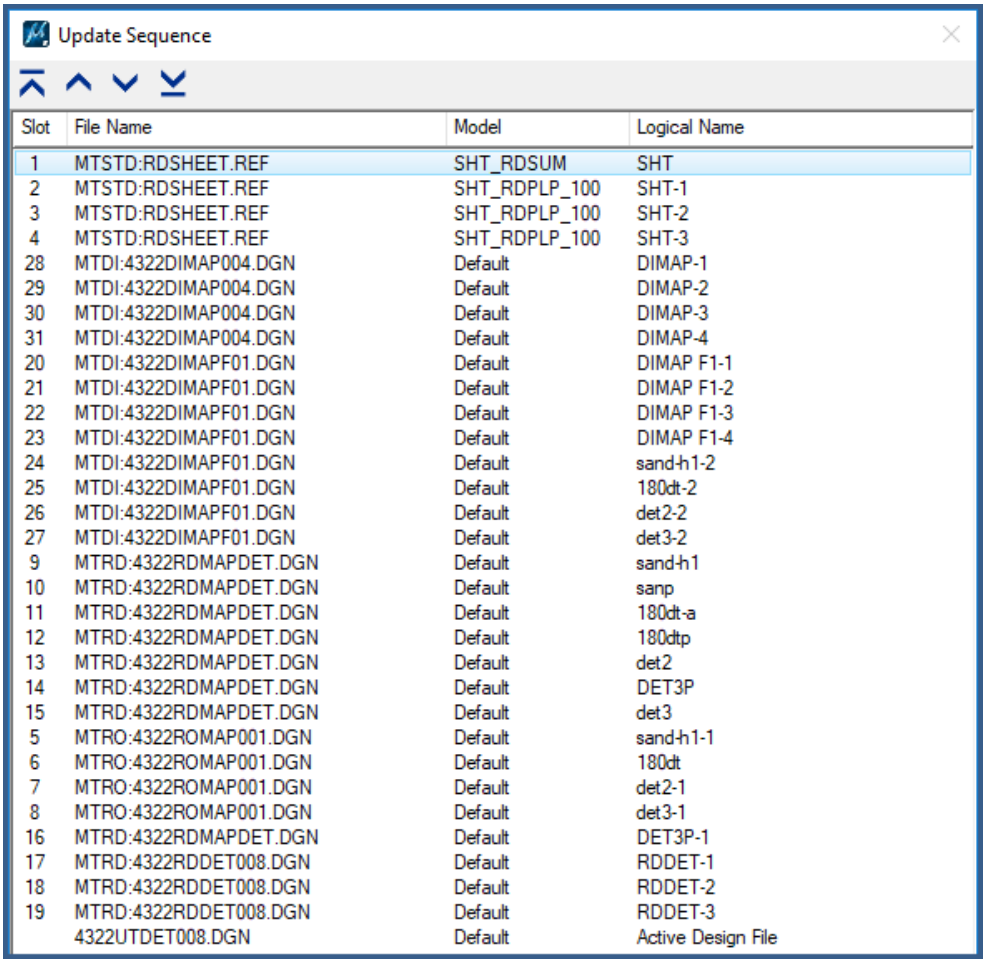
    - Set style, weight attributes to off and color to 80 (gray).

13. In ‘Reference’ ‘Settings’ ‘Level Display’, choose the UTMAP and/or UTSUE files as necessary and turn on levels showing the existing utilities.

    - Set the line width weight and symbology override to off and the color symbology as follows:

	Water levels	color 1
	Sanitary sewer levels	color 2
	Power levels	color 3
	TV levels	color 5
	Communication levels	color 54
	Gas levels	color 56
	Drainage levels	color 0

14. In ‘Reference’ ‘Settings’ ‘Update Sequence’, change the update sequence similar to the following:



Slot	File Name	Model	Logical Name
1	MTSTD:RDSHEET.REF	SHT_RDSUM	SHT
2	MTSTD:RDSHEET.REF	SHT_RDPLP_100	SHT-1
3	MTSTD:RDSHEET.REF	SHT_RDPLP_100	SHT-2
4	MTSTD:RDSHEET.REF	SHT_RDPLP_100	SHT-3
28	MTDI:4322DIMAP004.DGN	Default	DIMAP-1
29	MTDI:4322DIMAP004.DGN	Default	DIMAP-2
30	MTDI:4322DIMAP004.DGN	Default	DIMAP-3
31	MTDI:4322DIMAP004.DGN	Default	DIMAP-4
20	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-1
21	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-2
22	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-3
23	MTDI:4322DIMAPF01.DGN	Default	DIMAP F1-4
24	MTDI:4322DIMAPF01.DGN	Default	sand-h1-2
25	MTDI:4322DIMAPF01.DGN	Default	180dt-2
26	MTDI:4322DIMAPF01.DGN	Default	det2-2
27	MTDI:4322DIMAPF01.DGN	Default	det3-2
9	MTRD:4322RDMAPDET.DGN	Default	sand-h1
10	MTRD:4322RDMAPDET.DGN	Default	sanp
11	MTRD:4322RDMAPDET.DGN	Default	180dt-a
12	MTRD:4322RDMAPDET.DGN	Default	180dtp
13	MTRD:4322RDMAPDET.DGN	Default	det2
14	MTRD:4322RDMAPDET.DGN	Default	DET3P
15	MTRD:4322RDMAPDET.DGN	Default	det3
5	MTRO:4322ROMAP001.DGN	Default	sand-h1-1
6	MTRO:4322ROMAP001.DGN	Default	180dt
7	MTRO:4322ROMAP001.DGN	Default	det2-1
8	MTRO:4322ROMAP001.DGN	Default	det3-1
16	MTRD:4322RDMAPDET.DGN	Default	DET3P-1
17	MTRD:4322RDDET008.DGN	Default	RDDET-1
18	MTRD:4322RDDET008.DGN	Default	RDDET-2
19	MTRD:4322RDDET008.DGN	Default	RDDET-3
	4322UTDET008.DGN	Default	Active Design File

47-2.9 Plan and Profile Sheets

The intent of the utility plan and profile sheets is to clearly distinguish the relationship between construction, right-of-way and other design features with the utilities located along or adjacent to the proposed highway construction project. The utility plan and profile sheet resembles the Department's standard plan and profile sheet, but with the profile portion of the sheet reduced, expanding the plan portion of the sheet.

As a general rule in the utility plan and profile sheets, existing topography items (e.g., buildings, trees, ex. R/W) are shown with gray lines, new items (e.g., const. limits, pipes, new R/W) are shown with black lines and all utilities are shown with the proper color coded lines.

Note that all reference to design files assumes proper DMS naming conventions have been followed. The following procedure assumes that a SUE survey was performed locating all above and belowground utilities and that all mapping and survey files follow CADD standards with regards to levels. The procedure also assumes a new utility design file is to be made for the plan sheets, and the plan sheets will fit in one design file. The procedure will need to be repeated or modified if more than one plan\profile sheet design file is needed.

Use the following procedure for creating utility plan\profile sheets:

(Legacy Workspace)

1. Download the file from the RD workgroup in DMS that contains the plan and profile, usually named 1234000RDPLP001. Copy this file to the directory c:\dgn\ref for referencing.

2. Open RD detail sheet, save it as UT detail sheet (ex. 1234000**UTPLP001**.DGN)

    - Place a fence around all elements in the file, delete the active elements, and then compress the file.

3. Attach UTILITYV8_0.TBL (color table) and UTILITYV8_0E.CEL (cell library) from ftp://ftp.mdt.mt.gov/caddstd/WORKGROUP/UTSTD/ .

4. In 'Active file' 'View Attributes', turn on Level Overrides.

5. In 'Reference' 'Settings' 'Level Display', choose MTSTD:PLANE.REF, set filter to UTPLP.

6. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose MTSTD:PLANE.REF, set all style and weight attributes off, color attributes to 0 (white) except as follows:

    - Levels 10111, 10113, 10202, 10204, 10304, & 10306 to color 40 (gray).

    - Levels 10112, 10114, 10203, 10205, 10305, & 10307 to color 32 (light gray).

Name	Number	Color
S_BOT_RD_ProfileGrid_Hoz_10ft	10111	40
S_BOT_RD_ProfileGrid_Hoz_2ft	10112	32
S_BOT_RD_ProfileGrid_Vert_100ft	10113	40
S_BOT_RD_ProfileGrid_Vert_50ft	10114	32
S_MID_RD_ProfileGrid_Hoz_10ft	10202	40
S_MID_RD_ProfileGrid_Hoz_2ft	10203	32
S_MID_RD_ProfileGrid_Vert_100ft	10204	40
S_MID_RD_ProfileGrid_Vert_50ft	10205	32
S_TOP_RD_ProfileGrid_Hoz_10ft	10304	40
S_TOP_RD_ProfileGrid_Hoz_2ft	10305	32
S_TOP_RD_ProfileGrid_Vert_100ft	10306	40
S_TOP_RD_ProfileGrid_Vert_50ft	10307	32

7. Attach RD Plan Sheet as a reference with RDPLP-1 as the logical name.

    - Clip boundary around RDPLP-1 to display the plan and profile information.

8. Repeat as necessary for remaining plan and profile sheets in the file (RDPLP-2, RDPLP-3).

9. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose RDPLP references, set all style and weight attributes off, color attributes to 0 (white).

10. In ‘Reference’ ‘Settings’ ‘Display’, set all horizontal design references (RDMAP-H#) to display construction related items (Centerline, construction limits, pipes, etc.).

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, set all style and weight attributes off, color attributes to 0 (white) except:

    - Wetland delineation levels to color 40 (gray).

11. In ‘Reference’ ‘Settings’ ‘Display’, choose all vertical design references (RDMAP-V#) and turn off soil boring information.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, set all style and weight attributes off, color attributes to 0 (white) except:

    - Dig out hatching levels to color 40 (gray).

12. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose any Environmental (Wetland) references and set all style and weight attributes off, color attributes to 40 (gray).

13. In ‘Reference’ ‘Settings’ ‘Level Manager’, select the survey map references (PHMAP, DIMAP) and set all style and weight attributes off, color attributes as follows:

**LEVEL DISPLAY ** NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
1100	E_Barrier_Fence_Cattleguard	80
1103	E_Barrier_Fence_Fence	80
1106	E_Barrier_Fence_Gate	80
1112	E_Barrier_Guardrail	80
1118	E_Drainage_Culvert_CulvertInlet	80
1123	E_Drainage_Irrigation_IrrigationFeature	80
1147	E_Drainage_Water_Headgate	80
1131	E_Drainage_Water_InletRound	80
1209	E_Natural_Vegetation_Shrub	80
1211	E_Natural_Vegetation_Tree	80
1222	E_Natural_Water_EdgeofWater	80
1247	E_Natural_Water_FlowLineWithFlow	80
1233	E_Natural_Water_Thalweg	80
1236	E_Natural_Water_WaterEdge	80
1239	E_Natural_Water_WetlandBoundary	40
1260	E_Road_RR_Road_Concrete	80
1266	E_Road_RR_Road_EdgeofRoadGravel	80
1269	E_Road_RR_Road_EdgeofRoadPavement	80
1275	E_Road_RR_Road_Mailbox	80
1296	E_Road_RR_Signs_Sign2Face	80
1302	E_Road_RR_Signs_SignMultiPost	80
1305	E_Road_RR_Signs_SignSingle_Post	80
1322	E_Structure_Misc_Building	80

14. Attach RO Map File (ROMAP-#) if not already attached.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, select the RO Map references and set all style and weight attributes off, color attributes as follows:

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
905	E_RW_EX_RW_And_Ease_Line	80
918	E_RW_Ownership_Dots	80
920	E_RW_Property_Line	80
926	E_RW_Section_Corners	80
927	E_RW_SectionLine_Exterior	80
947	E_RW_SectionLine_Interior	80

15. Attach RO Plan Sheet file (ROPLN-#) if not already attached.

- In 'Reference' 'Settings' 'Level Manager', select the RO Plan references and set all style and weight attributes off, color attributes as follows:

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
901	E_RW_AliquotPart_And_Lot_Call	0
903	E_RW_CountyRd_CityStreet_Name	0
904	E_RW_EX_RW_And_Ease_Dimension	0
906	E_RW_EX_RW_Call_Leader	0
942	E_RW_WaterwayLabel	0
3001	P_RW_AcquisitionCallout	0
3011	P_RW_ConstPmt_Callout_Dim	0
3012	P_RW_ConstPmt_Line	0
3027	P_RW_New_RW_And_Ease_Callout_And_Dim	0
3047	P_RW_New_RW_And_Ease_Line	0
3033	P_RW_Parcel_Number	0

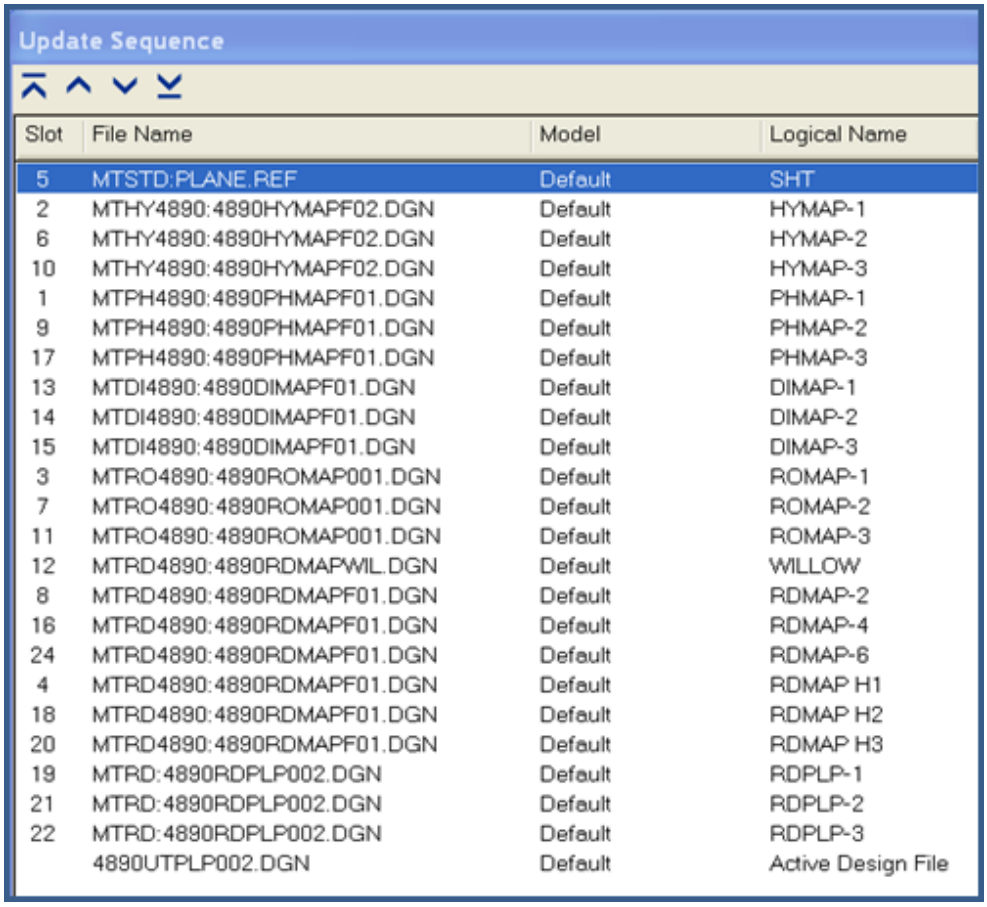
16. Attach UT map file (UTMAP-#) or (UMSUE#) if not already attached.

- In 'Reference' 'Settings' 'Level Manager', select the UT references and set all style and weight attributes off, color attributes as follows:

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
1417	E_Utility_Communication_CableTVOverhead	5
1420	E_Utility_Communication_CableTVUnderground	5
1423	E_Utility_Communication_FiberOpticCableOverhead	6
1426	E_Utility_Communication_FiberOpticCableUnderground	6
1429	E_Utility_Communication_TelegraphPole	6
1431	E_Utility_Communication_TelephoneBooth	6
1433	E_Utility_Communication_TelephoneOverhead	6
1436	E_Utility_Communication_TelephonePedestal	6

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
1438	E_Utility_Communication_TelephonePole	6
1440	E_Utility_Communication_TelephoneUnderground	6
1443	E_Utility_Drainage_SanitarySewer	2
1449	E_Utility_Gas_GasMeter	56
1451	E_Utility_Gas_GasUnderground	56
1454	E_Utility_Gas_GasValve	56
1456	E_Utility_Manhole_ManholeElectric	3
1458	E_Utility_Manhole_ManholeMisc	0
1460	E_Utility_Manhole_ManholeSanitarySewer	2
1464	E_Utility_Manhole_ManholeTelephone	6
1466	E_Utility_Misc_GuyPole	3
1468	E_Utility_Misc_GuyWireAnchor	3
1474	E_Utility_Misc_PedestalBase	0
1477	E_Utility_Misc_Tower	0
1479	E_Utility_Misc_UtilityXingOverhead	0
1481	E_Utility_Misc_UtilityXingUnderground	0
1483	E_Utility_Misc_ValveMisc	0
1485	E_Utility_Power_LightPole	3
1487	E_Utility_Power_PowerOverhead	3
1490	E_Utility_Power_PowerPedestal	3
1492	E_Utility_Power_PowerPole	3
1494	E_Utility_Power_PowerUnderground	3
1500	E_Utility_Power_TransmissionTower	3
1507	E_Utility_Water_FireHydrant	1
1509	E_Utility_Water_WaterHydrant	1
1511	E_Utility_Water_WaterMeter	1
1513	E_Utility_Water_WaterUnderground	1
1516	E_Utility_Water_WaterValve	1
1518	E_Utility_Water_Well	1
1558	E_Utility_Misc_Pole	0

17. In ‘Reference’ ‘Settings’ ‘Update Sequence’, change the update sequence similar to the following:



Slot	File Name	Model	Logical Name
5	MTSTD:PLANE.REF	Default	SHT
2	MTHY4890:4890HYMAPF02.DGN	Default	HYMAP-1
6	MTHY4890:4890HYMAPF02.DGN	Default	HYMAP-2
10	MTHY4890:4890HYMAPF02.DGN	Default	HYMAP-3
1	MTPH4890:4890PHMAPF01.DGN	Default	PHMAP-1
9	MTPH4890:4890PHMAPF01.DGN	Default	PHMAP-2
17	MTPH4890:4890PHMAPF01.DGN	Default	PHMAP-3
13	MTDI4890:4890DIMAPF01.DGN	Default	DIMAP-1
14	MTDI4890:4890DIMAPF01.DGN	Default	DIMAP-2
15	MTDI4890:4890DIMAPF01.DGN	Default	DIMAP-3
3	MTRO4890:4890ROMAP001.DGN	Default	ROMAP-1
7	MTRO4890:4890ROMAP001.DGN	Default	ROMAP-2
11	MTRO4890:4890ROMAP001.DGN	Default	ROMAP-3
12	MTRD4890:4890RDMAPWIL.DGN	Default	WILLOW
8	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP-2
16	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP-4
24	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP-6
4	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP H1
18	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP H2
20	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP H3
19	MTRD:4890RDPLP002.DGN	Default	RDPLP-1
21	MTRD:4890RDPLP002.DGN	Default	RDPLP-2
22	MTRD:4890RDPLP002.DGN	Default	RDPLP-3
	4890UTPLP002.DGN	Default	Active Design File

18. Attach cell “STDSHTDF” from cell library. It is inserted at XY=50000,50000.

    - Fill in the data for the project information. This cell contains the county name, project name, project UPN, project number, scale factor and sheet number data fields for the bottom of the pages.

19. Review & correct all plan and profile sheets for errors and/or omissions, readability, etc.

20. Identify and add utility callouts.

(Enhanced Workspace)

1. Download the file from the RD workgroup in DMS that contains the plan and profile, usually named 1234000RDPLP001. Copy this file to the directory c:\dgn\ref for referencing.

2. Create a new UT Plan and Profile sheet from the UT Seed files found at ..\CaddStdOR\SEED\UT_Plans (ex. 1234000**UTPLP001.DGN**).

3. In ‘Active file’ ‘View Attributes’, ensure Level Overrides are turned on.

4. Attach RD Plan Sheet as a reference.

    - Within the Reference dialog, choose “Tools”, “Attach”

    - Within the Attach Reference dialog, select the RD Plan or Plan sheet, then choose “Open”.

    - Insert RDPLP-1 as the logical name.

    - Select “Coincident – World” from the orientation options. Adjust Nested Attachments option to “Copy Attachments”, then choose “OK”.

    - Select each duplicated occurrence of RDSHEET.REF but leave SHT”, then choose “Tools”, “Detach”.

    - Check reference prefixes and fix as needed or use the reference macro.

5. Turn off sheet labels from the RD Plan Sheet, typically level “P_Sheets_Plan_Label_Sheet_Text” and “S_SHEETS_DesignBlock_Data_Fields”. If the labels are on a different level, adjust accordingly or mask the reference file as outlined below.

    - Select the pink clip boundary around the bottom of the first sheet to create a fence. Within the Reference dialog, select the RDDET-1 Road Design detail sheet reference file, then choose “Tools”, “Clip Boundary then accept the pink shape outlining the plan data fields in sheet 1.

    - Repeat for sheet 2 and sheet 3 as needed.

6. Adjust drawing scale as necessary for line style and text annotation scale.

7. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose RDPLP references, set all style and weight attributes off, color attributes to 0 (white).

8. In ‘Reference’ ‘Settings’ ‘Display’, set all horizontal design references (RDMAP-H#) to display construction related items (Centerline, construction limits, pipes, etc.).

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, set all style and weight attributes off, color attributes to 0 (white) except:

    - Wetland delineation levels to color 40 (gray).

9. In ‘Reference’ ‘Settings’ ‘Display’, choose all vertical design references (RDMAP-V#) and turn off soil boring information.

    - In ‘Reference’ ‘Settings’ ‘Level Manager’, set all style and weight attributes off, color attributes to 0 (white) except:

    - Dig out hatching levels to color 40 (gray).

10. In ‘Reference’ ‘Settings’ ‘Level Manager’, choose any Environmental (Wetland) references and set all style and weight attributes off, color attributes to 40 (gray).

11. In ‘Reference’ ‘Settings’ ‘Level Manager’, select the survey map references (PHMAP, DIMAP) and set all style and weight attributes off, color attributes as follows:

**LEVEL DISPLAY ** NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
1100	E_Barrier_Fence_Cattleguard	80
1103	E_Barrier_Fence_Fence	80
1106	E_Barrier_Fence_Gate	80
1112	E_Barrier_Guardrail	80
1118	E_Drainage_Culvert_CulvertInlet	80
1123	E_Drainage_Irrigation_IrrigationFeature	80
1147	E_Drainage_Water_Headgate	80
1131	E_Drainage_Water_InletRound	80
1209	E_Natural_Vegetation_Shrub	80
1211	E_Natural_Vegetation_Tree	80
1222	E_Natural_Water_EdgeofWater	80
1247	E_Natural_Water_FlowLineWithFlow	80
1233	E_Natural_Water_Thalweg	80
1236	E_Natural_Water_WaterEdge	80
1239	E_Natural_Water_WetlandBoundary	40
1260	E_Road_RR_Road_Concrete	80
1266	E_Road_RR_Road_EdgeofRoadGravel	80
1269	E_Road_RR_Road_EdgeofRoadPavement	80
1275	E_Road_RR_Road_Mailbox	80
1296	E_Road_RR_Signs_Sign2Face	80
1302	E_Road_RR_Signs_SignMultiPost	80
1305	E_Road_RR_Signs_SignSingle_Post	80
1322	E_Structure_Misc_Building	80

12. Attach RO Map File (ROMAP-#) and RO ALN File (ROALN-#) if not already attached.

- In ‘Reference’ ‘Settings’ ‘Level Manager’, select the RO Map and RO ALN references and set all style and weight attributes off, color attributes as follows:

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
905	E_RW_EX_RW_And_Ease_Line	80
918	E_RW_Ownership_Dots	80
920	E_RW_Property_Line	80
926	E_RW_Section_Corners	80
927	E_RW_SectionLine_Exterior	80
947	E_RW_SectionLine_Interior	80
901	E_RW_AliquotPart_And_Lot_Call	0
903	E_RW_CountyRd_CityStreet_Name	0
904	E_RW_EX_RW_And_Ease_Dimension	0
906	E_RW_EX_RW_Call_Leader	0
942	E_RW_WaterwayLabel	0
3001	P_RW_AcquisitionCallout	0
3011	P_RW_ConstPmt_Callout_Dim	0
3012	P_RW_ConstPmt_Line	0
3027	P_RW_New_RW_And_Ease_Callout_And_Dim	0
3047	P_RW_New_RW_And_Ease_Line	0
3033	P_RW_Parcel_Number	0

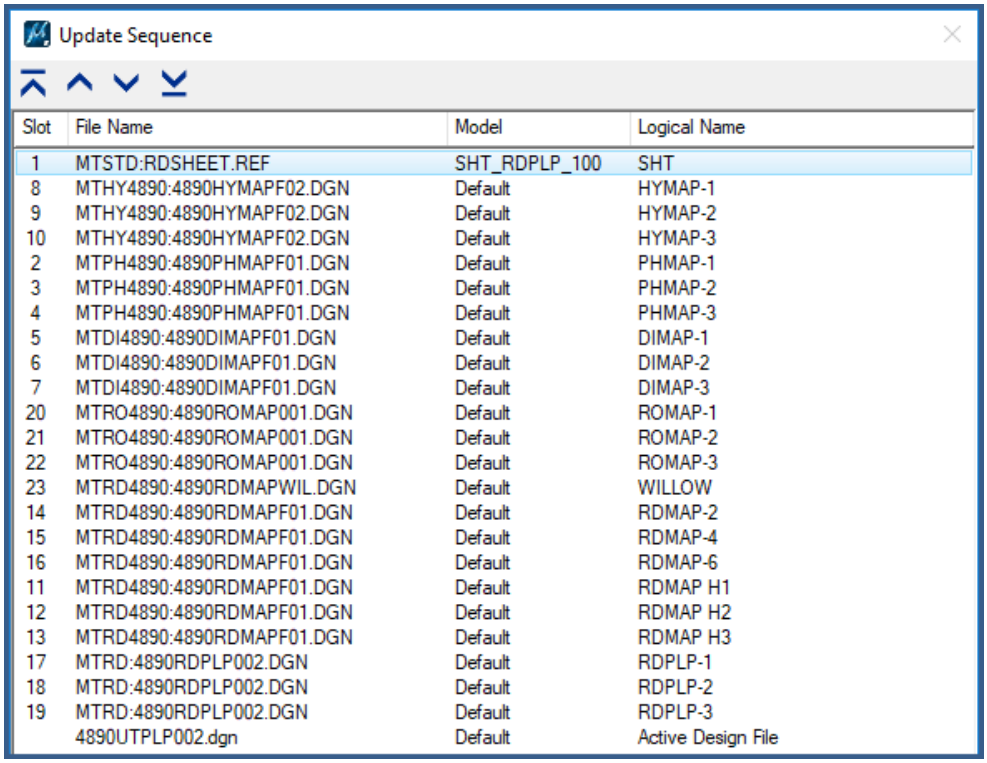
13. Attach UT map file (UTMAP-#) or (UMSUE#) if not already attached.

- In ‘Reference’ ‘Settings’ ‘Level Manager’, select the UT references and set all style and weight attributes off, color attributes as follows:

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
1417	E_Utility_Communication_CableTVOverhead	5
1420	E_Utility_Communication_CableTVUnderground	5
1423	E_Utility_Communication_FiberOpticCableOverhead	54
1426	E_Utility_Communication_FiberOpticCableUnderground	54
1429	E_Utility_Communication_TelegraphPole	54
1431	E_Utility_Communication_TelephoneBooth	54
1433	E_Utility_Communication_TelephoneOverhead	54
1436	E_Utility_Communication_TelephonePedestal	54
1438	E_Utility_Communication_TelephonePole	54
1440	E_Utility_Communication_TelephoneUnderground	54
1443	E_Utility_Drainage_SanitarySewer	2
1449	E_Utility_Gas_GasMeter	56
1451	E_Utility_Gas_GasUnderground	56

LEVEL DISPLAY NOT A COMPLETE LIST, FOR EXAMPLE ONLY		LEVEL MANAGER
NUMBER	NAME	COLOR
1454	E_Utility_Gas_GasValve	56
1456	E_Utility_Manhole_ManholeElectric	3
1458	E_Utility_Manhole_ManholeMisc	0
1460	E_Utility_Manhole_ManholeSanitarySewer	2
1464	E_Utility_Manhole_ManholeTelephone	54
1466	E_Utility_Misc_GuyPole	3
1468	E_Utility_Misc_GuyWireAnchor	3
1474	E_Utility_Misc_PedestalBase	0
1477	E_Utility_Misc_Tower	0
1479	E_Utility_Misc_UtilityXingOverhead	0
1481	E_Utility_Misc_UtilityXingUnderground	0
1483	E_Utility_Misc_ValveMisc	0
1485	E_Utility_Power_LightPole	3
1487	E_Utility_Power_PowerOverhead	3
1490	E_Utility_Power_PowerPedestal	3
1492	E_Utility_Power_PowerPole	3
1494	E_Utility_Power_PowerUnderground	3
1500	E_Utility_Power_TransmissionTower	3
1507	E_Utility_Water_FireHydrant	1
1509	E_Utility_Water_WaterHydrant	1
1511	E_Utility_Water_WaterMeter	1
1513	E_Utility_Water_WaterUnderground	1
1516	E_Utility_Water_WaterValve	1
1518	E_Utility_Water_Well	1
1558	E_Utility_Misc_Pole	0

14. In ‘Reference’ ‘Settings’ ‘Update Sequence’, change the update sequence similar to the following:



Slot	File Name	Model	Logical Name
1	MTSTD:RDSHEET.REF	SHT_RDPLP_100	SHT
8	MTHY4890:4890HYMAPF02.DGN	Default	HYMAP-1
9	MTHY4890:4890HYMAPF02.DGN	Default	HYMAP-2
10	MTHY4890:4890HYMAPF02.DGN	Default	HYMAP-3
2	MTPH4890:4890PHMAPF01.DGN	Default	PHMAP-1
3	MTPH4890:4890PHMAPF01.DGN	Default	PHMAP-2
4	MTPH4890:4890PHMAPF01.DGN	Default	PHMAP-3
5	MTDI4890:4890DIMAPF01.DGN	Default	DIMAP-1
6	MTDI4890:4890DIMAPF01.DGN	Default	DIMAP-2
7	MTDI4890:4890DIMAPF01.DGN	Default	DIMAP-3
20	MTRO4890:4890ROMAP001.DGN	Default	ROMAP-1
21	MTRO4890:4890ROMAP001.DGN	Default	ROMAP-2
22	MTRO4890:4890ROMAP001.DGN	Default	ROMAP-3
23	MTRD4890:4890RDMAPWIL.DGN	Default	WILLOW
14	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP-2
15	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP-4
16	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP-6
11	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP H1
12	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP H2
13	MTRD4890:4890RDMAPF01.DGN	Default	RDMAP H3
17	MTRD:4890RDPLP002.DGN	Default	RDPLP-1
18	MTRD:4890RDPLP002.DGN	Default	RDPLP-2
19	MTRD:4890RDPLP002.DGN	Default	RDPLP-3
	4890UTPLP002.dgn	Default	Active Design File

15. Review & correct all plan and profile sheets for errors and/or omissions, readability, etc.

16. Identify and add utility callouts.

47-2.10 Identifying Utility Conflicts

The utilities identified as conflicts on the utility plan and profile sheets are utility conflicts with respect to the construction limits and other construction related items. MDT's utility engineering specialists use the utility plans to meet with the individual utility companies and determine the extent of each utility company's involvement with the construction project. Right of way, both existing and new, needs to be identified prior to the utility PIH to determine involvement with respect to private easements, highway R/W, and room for relocating the affected utility. Consider the following:

47-2.10.1 Lateral conflicts

Lateral conflicts are defined as those utilities that traverse laterally or parallel to the existing roadway. The utilities involved are typically underground utilities such as telephone, fiber cable, gas, etc. The utility can be on one side or both sides of the roadway with various crossings. To identify the conflict:

- Open utility map file (UTMAP), attach the latest road design strip map (RDMAP) with construction limits level turned on.
- Identify where the utility first crosses into the construction limits then follow the utility and determine where the utility last crosses out of the construction limits. Note whether this is left, right or on both sides of design centerline.
- If the utility crosses in and out or weaves through the construction limits, short segments can be combined into one note. As a general "rule of thumb" gaps less than 50 feet in length can be combined.
- If a pedestal is located just prior to or just after the utility's lateral conflict, adjust the lateral conflict extending it to the pedestal or pedestals.
- Go to the utility plan and profile sheets and place a note indicating the conflict on affected sheets.

47-2.10.2 Spot conflicts

Spot conflicts are defined as a conflict at a specific location. The utilities typically involved include power, telephone, sanitary sewer, etc. and are usually poles, pedestals, manholes etc. The conflict is called out at its station and offset from design centerline. To identify the conflict:

- Open the utility plan and profile sheets (UTPLP) making sure the latest road design strip map file is attached, and with the construction limits and road designer placed utility conflict levels turned on.

- Visually inspect the plan sheet area for pedestals, poles etc. that are inside the construction limits. When conflicts are found place cell (“CALLLT” or “CALLRT”) from the cell library perpendicular to centerline and identify the conflict and its’ relationship to design centerline by station and offset.

- Station callouts should be rounded to the nearest foot and offset distances to the nearest tenth (0.1) foot.

47-2.10.3 Other Conflicts

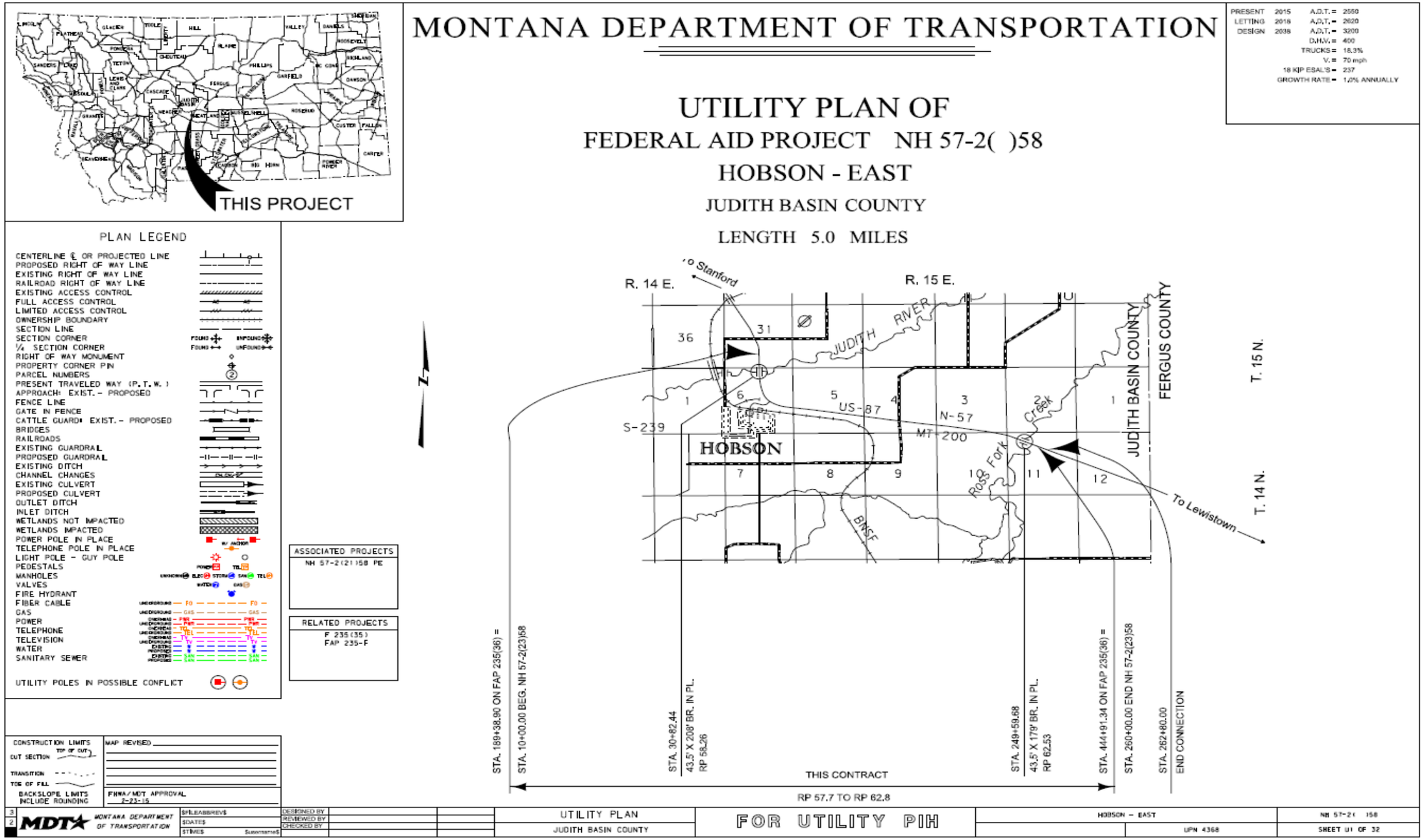
Other conflicts can be defined as utilities having conflicts with the construction project but are not defined as either a lateral or spot conflict. Examples might be a telephone cable attached to an existing bridge that is to be replaced, or a gas line running down a county road to be resurfaced but bid as lump sum, with construction limits not computed or shown. These conflicts should be shown in the utility plan sheets and good judgment exercised when defining them, either as a lateral callout or spot callout.

47-2.10.4 Utility Crossings

Utility crossings may or may not be defined as a conflict but in either case will be called out on the utility plans. Overhead utility crossings should be called out by the station at which the utility crosses the design centerline, the number of wires at the crossing, and clearance measured from the centerline of the existing roadway to the lowest wire. If the wire and clearance information is unknown it should be stated as unknown in the utility crossing note. Underground utility crossings should be called out by station at which the utility crosses the design centerline, depth the utility is buried from the existing roadway to the top of the utility and number of wires or cables if known. Underground gas, water, sewer, duct systems etc. should include the station the utility crosses design centerline, depth the utility is buried from the existing roadway to the top of utility and also include the size of utility if known. See CADD standards for correct placement of utility crossing notes. Utility crossings also need to be depicted visually on the cross sections.

47-2.11 Example Plan Sheets

The following figures (11 in X 17 in sheets) are provided as a visual aid for the preparation of the utility plans package. They are from various projects and are representative of a typical utility plans package.



TITLE

Figure 47-2.11.1

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NOTES

BASIS OF PLAN QUANTITIES

(QUANTITIES FOR ESTIMATING PURPOSES ONLY)

COMP. AGGREGATE WEIGHT =	3625	LBS. PER CUBIC YARD
COMP. WEIGHT OF PL. MIX BIT. SURF. =	4167	LBS. PER CUBIC YARD
ASPHALT CEMENT - GRADE S 3/4" AGG.	5.2	% OF PL. MIX BIT. SURF.
HYDRATED LIME =	1.4	% OF PL. MIX BIT. SURF.
BITUMINOUS MATERIAL =	8.5	LBS. PER GAL.
COMP. WEIGHT OF CTB =	3620	LBS. PER CUBIC YARD
BLOTTER =	1.7	LBS PER SQ. FOOT
CURING SEAL =	0.2	GAL. PER SQ. YARD
TACK (ASPHALT SURFACES) =	0.025	GAL. PER SQ. YARD (UNDILUTED)
TACK (ALL OTHER SURFACES) =	0.05	GAL. PER SQ. YARD (UNDILUTED)
SEAL =	0.42	GAL. PER SQ. YARD
COVER =	25	LBS. PER SQ. YARD

CLEARING AND GRUBBING

CLEAR AND GRUB TO CONSTRUCTION LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN THE UNIT PRICE BID FOR UNCLASSIFIED EXCAVATION.

LIMITED ACCESS CONTROL

THIS PROJECT IS A LIMITED ACCESS CONTROL FACILITY. OBTAIN APPROVAL FROM THE CHIEF OF THE RIGHT-OF-WAY BUREAU PRIOR TO ADDING, DELETING OR RELOCATING ANY APPROACHES.

SOILS INFORMATION

THE SOILS INFORMATION ON THE PLAN AND PROFILE SHEETS IS A BRIEF SUMMARY OF THE SOILS CLASSES. TO OBTAIN THE COMPLETE SOILS INFORMATION CONTACT THE MDT GEOTECHNICAL SECTION AT (406) 444-6281.

WETLANDS

WETLANDS EXIST ADJACENT TO THE ROADWAY AND MAY EXIST BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PERMANENT WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLAND AREAS OUTSIDE OF THE PERMANENT IMPACT AREAS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR.

DELINEATED WETLAND AREAS

PERMITTED WETLAND IMPACTED AREAS

TEMPORARY WETLAND IMPACT AREAS

UTILITIES

CALL THE UTILITIES UNDERGROUND LOCATION CENTER (811) OR OTHER NOTIFICATION SYSTEM FOR THE MARKING AND LOCATION OF ALL LINES AND SERVICES BEFORE EXCAVATING. ALL CLEARANCES OR DEPTHS PROVIDED FOR UTILITIES ARE FROM EXISTING GROUND LINE.

PUBLIC LAND SURVEY MONUMENTS

ALL MONUMENTS TO BE REMOVED AND RELOCATED OR RESET BY STATE FORCES.

WETLAND DELINEATION TABLE

WETLAND DESIGNATION	STATION FROM	STATION TO	WETLAND AREA (ACRES) DELINEATED AREA	** IMPACTED AREA (TEMP.)	IMPACTED AREA (PERM.)	REMARKS
W1-A	28+74	31+23	1.45			
W1-B	29+34	32+64	1.12			
W2	32+12	33+82	0.25			LT.
W3	36+58	38+46	0.18		0.02	LT.
W4	38+13	46+29	2.23		0.70	
W5	44+66	45+02	0.01			RT.
W6	43+56	44+42	0.07			RT.
W7	43+60	44+26	0.09			RT.
W8	38+72	39+13	0.01			RT.
W9	45+94	47+89	0.05			
W10	46+74	48+39	0.03			RT.
W11-A	84+51	85+29	0.04			RT.
W11-B	84+45	86+62	0.08		0.02	LT.
W12-A	71+83	74+70	0.18		0.01	RT.
W12-B	74+20	74+68	0.04		0.01	LT.
W13	197+14	202+71	0.67		0.04	LT.
W14	239+20	242+49	0.21		0.08	RT.
W15-A	247+64	254+55	0.13		0.03	
W15-B	247+95	254+97	0.21		0.02	
W16	249+12	250+53	0.20			LT.
W17	255+67	256+89	0.28			LT.
W18	251+48	257+76	0.20			RT.
W19	258+43	260+00	0.21			RT.
TOTAL			7.95		0.89	

* AREA OF EXISTING WETLAND EXTENDS BEYOND PLAN LIMITS
** TEMPORARY IMPACT AREAS ARE ESTIMATED AND PROVIDED FOR INFORMATIONAL PURPOSES ONLY. TEMPORARY WETLAND IMPACTS SHOWN IN THE TABLE AND ANY OTHER IMPACTS ASSOCIATED WITH CONTRACTOR OPERATIONS ARE TO BE PERMITTED BY CONTRACTOR.

3 / 1	MDT MONTANA DEPARTMENT OF TRANSPORTATION	$FILEABBREV$ / $DATE$ / $TIME$ $username$	DESIGNED BY / REVIEWED BY / CHECKED BY	UTILITY PLAN	FOR UTILITY PIH	HOBSON - EAST	NH 57-2(158
				JUDITH BASIN COUNTY		UPN 4368	SHEET U2 OF 32

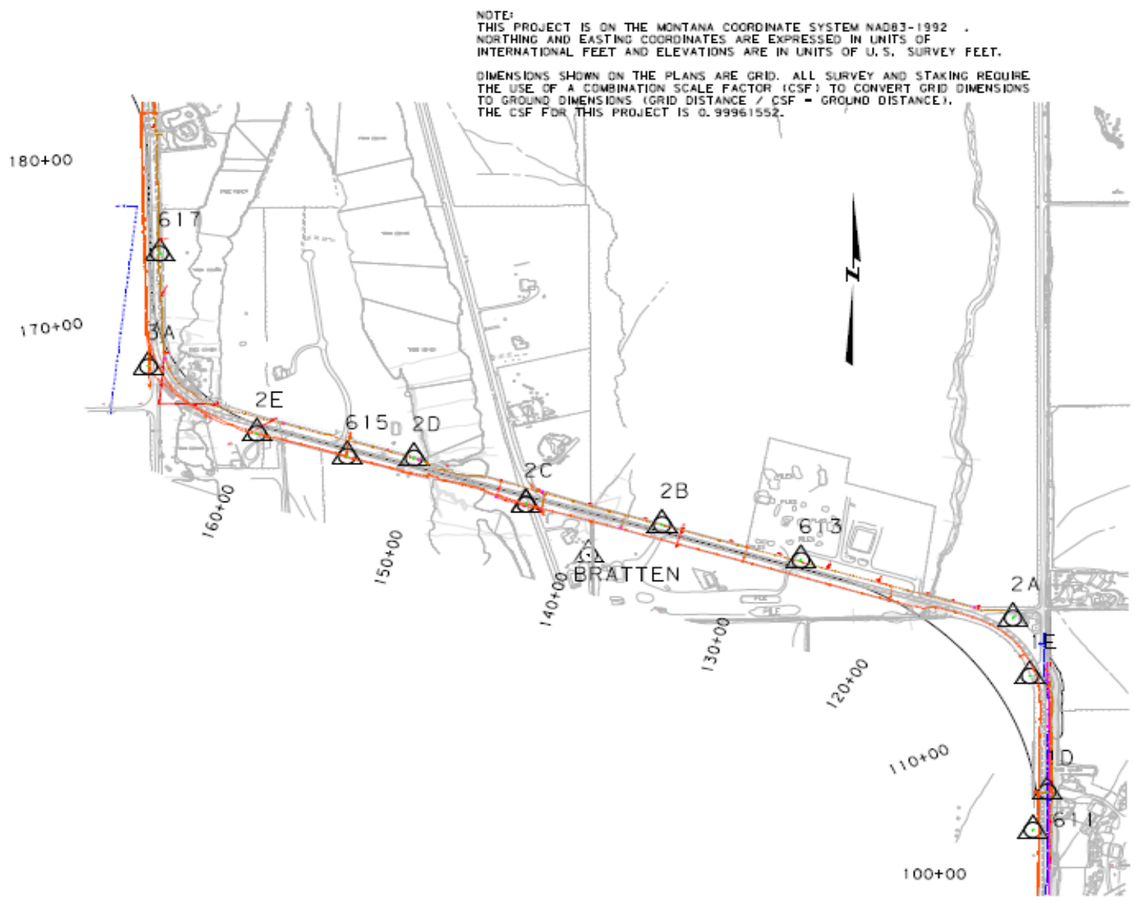
TABLE OF CONTENTS, NOTES, LINERAR AND LEVEL DATA

Figure 47-2.11.2

CONTROL ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
1D	349450.631	2030279.130	5574.48	Set 2" aluminum cap flush with the ground stamped "1D 2004" at MP 1.82 on U.S. Highway 78, access MP 1.82 turn east into Red Lodge Vet driveway, 27' east of Highway 78 PTW, 17' north of Red Lodge Vet driveway, and 5' south of witness post and mailbox.
1E	350211.376	2030179.205	5561.43	Set 2" aluminum cap flush with the ground stamped "1E 2004" at MP 1.97 on U.S. Highway 78, access MP 1.97 turn west into field approach, 52' west of Highway 78 PTW, 16' north of field Road PTW, 1' northwest of railroad tie post at north end of gate.
2A	350591.854	2030079.848	5554.64	Set 2" aluminum cap flush with the ground stamped "2A 2004" at MP 2.05 on U.S. Highway 78, access MP 2.07 turn east onto gravelroad, 91' north of Highway 78 PTW, 44' south of gravelRoad PTW, and 9' south of witness post.
2B	351204.845	2028025.487	5547.08	Set 2" aluminum cap flush with the ground stamped "2B 2004" at MP 2.45 on U.S. Highway 78, access MP 2.45 turn onto approach to state shop, 45' north of Highway 78 PTW, and 4' south of witness post and fence.
2C	351338.867	2027229.739	5542.72	Set 2" aluminum cap flush with the ground stamped "2C 2004" at MP 2.60 on U.S. Highway 78, access MP 2.60 turn south onto Two Willow Lane, 53' south of Highway 78 PTW, 32' west of Two Willow Lane PTW, and 5' north of witness post and fence.
2D	351643.133	2026574.264	5520.03	Set 2" aluminum cap flush with the ground stamped "2D 2004" at MP 2.75 on U.S. Highway 78, access MP 2.78 turn north into approach, 54' north of Highway 78 PTW, and 7' south of witness post.
2E	351803.391	2025655.720	5531.35	Set 2" aluminum cap flush with the ground stamped "2E 2004" at MP 2.92 on U.S. Highway 78, access MP 2.92 turn south into private approach, 53' south of Highway 78 PTW, 20' west of private approach PTW, and 6' north of witness
3A	352244.988	2025020.156	5514.52	Set 2" aluminum cap flush with the ground stamped "3A 2004" at MP 3.00 on U.S. Highway 78, access MP 3.00 turn west onto county road, 68' southwest of Highway 78 PTW, 39' west of county road PTW, 42' south of stop sign on west edge of county road, and 5' north of witness post.
611	349198.183	2030196.420	5578.30	Set 2" aluminum cap flush with the ground stamped "611 2003" at MP 1.75 on U.S. Highway 78, 54' west of Highway 78 PTW, and 4' west of witness post and
613	350970.948	2028837.355	5552.69	Set 2" aluminum cap flush with the ground stamped "613 2003" at MP 2.29 on U.S. Highway 78, 54' north of Highway 78 PTW, and 9' north of witness post
615	351653.926	2026182.876	5527.55	Set 2" aluminum cap flush with the ground stamped "615 2003" at MP 2.80 on U.S. Highway 78, 47' south of Highway 78 PTW, and 8' north of witness post
617	352986.716	2025085.815	5502.50	Set 2" aluminum cap flush with the ground stamped "617 2003" at MP 3.15 on U.S. Highway 78, 51' east of Highway 78 PTW, and 10' west of witness post and
BRATTEN	351006.205	2027596.306	5551.22	Found 3" USDA Forest Service aluminum cap on 30" flared base post, flush with the ground poured in concrete stamped with a "+", at MP 2.59 on U.S. Highway 78, access MP 2.60 turn south onto Two Willow Lane and proceed 525', turn east and proceed to northeast corner of Red Lodge Surveying parking lot, 2' from 3 steelT posts, 17' west of a north/south fence.

CONTROL DIAGRAM



3 / 1	MDT MONTANA DEPARTMENT OF TRANSPORTATION	BHLEABBREVS / SDATES / STIMES Systemwide	DESIGNED BY / REVIEWED BY / CHECKED BY		UTILITY PLAN	FOR UTILITY PIH	RED LODGE - NORTHWEST	STPP 78-11)0
					CARBON COUNTY		UPN 4890	SHEET US OF 45

CONTROL DIAGRAM

Figure 47-2.11.3

OWNERSHIP

PARCEL	NAME	ADDRESS	TOTAL AREA	GROSS R/W AREA	EX. EASE. AREA	NET AREA	REMAINDER LEFT	REMAINDER RIGHT	CONST. PMT. AREA	EASEMENT AREA	SHEET NO.
1	THE NATURE CONSERVANCY	32 S EWING ST, HELENA, MT 59601	160.00+ AC	0.27 AC		0.27 AC	160.00+ AC				U27
2	FM PROPERTIES, LLC	PO BOX 397, LINCOLN, MT 59639	91.21 AC	0.25 AC	0.03 AC	0.22 AC		90.96 AC			U27
3	WENDELL J. HELMS	2310 CHEVROLET DR, LINCOLN, MT 59639	FOR NEGOTIATIONS ONLY								U27
4	LOUIE W. BOUMA, LEE R. BOUMA AND JOHANNA LAUREEN BOUMA	PO BOX 188, LINCOLN, MT 59639		0.24 AC		0.24 AC					U27
5	LYN E. ESCHENBACHER AND MARGARET L. ESCHENBACHER	165 17TH AVE NW, GREAT FALLS, MT 59404	FOR NEGOTIATIONS ONLY								U27
6	MICHAEL WAYNE WIEDERHOLD	PO BOX 264, LINCOLN, MT 59639	8.45 AC	0.23 AC		0.23 AC	8.22 AC		0.12 AC		U27
7	JAMES C. JOHNSON AND SYLVIA A. JOHNSON	PO BOX 155, LINCOLN, MT 59639	108.36 AC	1.49 AC		1.49 AC		106.87 AC			U27-U28
7CE	FIVE VALLEYS LAND TRUST, INC., A MONTANA NON-PROFIT CORPORATION	PO BOX 8953, MISSOULA, MT 59807	108.36 AC	1.49 AC		1.49 AC		106.87 AC			U27-U28
7SI	HI-COUNTRY JERKY - PERMIT NO. 30234	PO BOX 159, LINCOLN, MT 59639	FOR NEGOTIATIONS ONLY								U28
8	DALE R. THURBER REVOCABLE TRUST	5028 MT HIGHWAY 200 E, LINCOLN, MT 59639	1.07 AC	0.01 AC		0.01 AC	1.06 AC		0.07 AC		U27-U28
9	LINCOLN FIRE DISTRICT	PO BOX 1071, LINCOLN, MT 59639	1.60 AC	0.07 AC		0.07 AC	1.53 AC		0.10 AC		U28
10	JULIE E. MEYER AND EDWIN J. GARRITY	33 BROKEN SPOKE LN, GREAT FALLS, MT 59404	7.127 AC						0.01 AC		U28
11	DALE R. SORENSEN AND SHANON C. MCCRACKEN	2026 4TH AVE N, GREAT FALLS, MT 59401	1.00 AC	0.03 AC		0.03 AC	0.97 AC		0.02 AC		U28
12	LAWRENCE TRONSTAD AND BRIAN CROCKETT	PO BOX 632, LINCOLN, MT 59639	5.086 AC	0.01 AC		0.01 AC	5.076 AC		0.06 AC		U28
13	RONALD A. KRUELSKI	PO BOX 815, LINCOLN, MT 59639	0.999 AC	FOR NEGOTIATIONS ONLY							U28
14	SHAWN A. HEINERT	1054 ROAD 15, LOVELL, WY 82431	5.03 AC						0.03 AC		U28
15	SHERRY L. SIDELL	PO BOX 153, LINCOLN, MT 59639	1.03 AC						0.03 AC		U28
16	JENNIFER L. BURNS	7638 HIGHWAY 200 E, LINCOLN, MT 59639	1.03 AC						0.03 AC		U28
17	CRAIG M. BRAYKO	4701 FLOOD RD, GREAT FALLS, MT 59404	1.03 AC	0.01 AC		0.01 AC	1.02 AC		0.03 AC		U28
18	KYLE HANE AND DANITA HANE	5251 TUP LN # 4, LINCOLN, MT 59639	2.62 AC	0.21 AC		0.21 AC		2.41 AC			U28
19	STEVE STOCKS AND VIRGINIA STOCKS	940 W POPLAR ST, OXNARD, CA 93033	1.01 AC	0.02 AC		0.02 AC		0.99 AC			U28
20	DON VAN DE RIET	PO BOX 750, SEELEY LAKE, MT 59868	1.09 AC	0.13 AC		0.13 AC		0.96 AC			U28
21	MICHAEL F. RIDENOUR AND LOUISE B. RIDENOUR	2644 COYOTE RD # 15, LINCOLN, MT 59639	2.00 AC	0.07 AC		0.07 AC	1.93 AC				U28
22	LINDA LEE	415 32ND AVE S, GREAT FALLS, MT 59405	1.62 AC	0.07 AC		0.07 AC		1.55 AC			U28
23	BARNEY VANDEN BOS AND CLAUDETTE VANDEN BOS	PO BOX 763, LINCOLN, MT 59639	1.38 AC	0.14 AC		0.14 AC		1.24 AC			U28
24	ALEX A. SANDRU AND MARLENE M. SANDRU ½ AND STEVEN A. SANDRU ½	PO BOX 1001, LINCOLN, MT 59639 5676 TUP LN, LINCOLN, MT 59639	144.49 AC	1.86 AC		1.86 AC	142.63 AC				U28-U29
24SI	LINCOLN HOTEL LIMITED - PERMIT NO. 02417	PO BOX 26, LINCOLN, MT 59639	FOR NEGOTIATIONS ONLY								U28
25	RANDY A. SHOTNOKOFF AND JULIE K. SHOTNOKOFF	1604 ADAMS BLVD, GREAT FALLS, MT 59404	1.9538 AC	0.13 AC		0.13 AC		1.82 AC			U28
26	WILLIAM S. SKERLOCK AND RHONDA A. SKERLOCK	PO BOX 158, LINCOLN, MT 59639	4.63 AC	0.26 AC		0.26 AC		4.37 AC			U28-U29

CONSTRUCTION LIMITS
CUT SECTION (TOP OF CUT)
TRANSITION
TOE OF FILL
BACKSLOPE LIMITS INCLUDE ROUNDING

MAP REVISED 7/18/12 7/25/12 10/29/12 11/14/12

FHWA/MDT APPROVAL 6/14/12

MDT MONTANA DEPARTMENT OF TRANSPORTATION

$FILEABBREVS
$DATES
$TIMES $username$

DESIGNED BY
REVIEWED BY
CHECKED BY

UTILITY PLAN
LEWIS AND CLARK COUNTY

FOR UTILITY PIH

LINCOLN - EAST
UPN 4322

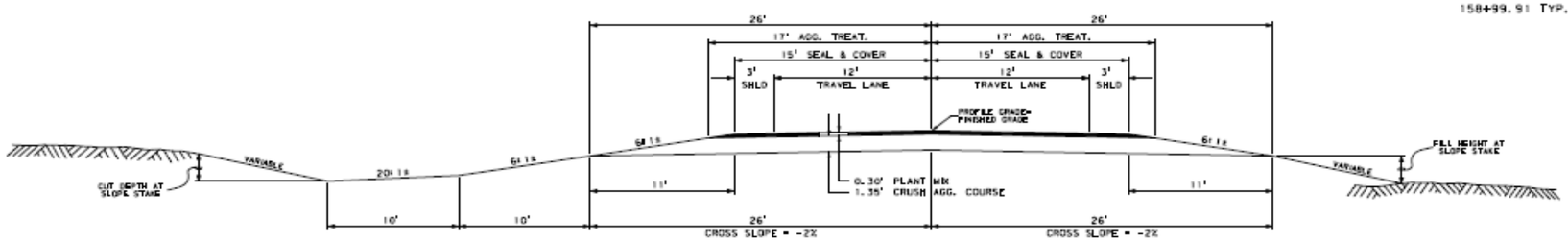
NH 24-3(25)76
SHEET U6 OF 42

OWNERSHIP

Figure 47-2.11.4

TYPICAL SECTION NO. 5

72+00.00 TO 74+00.00 TRANS. TYP. NO. 5 TO TYP. NO. 6
158+99.91 TYP. NO. 5 ONLY, END OF PROJECT



QUANTITIES							
UNIT	AGGREGATE			UNIT	BITUMINOUS MATERIAL		
	COVER	PLANT MIX	CR. AGG. COURSE		ASPHALT CEMENT	SEAL	AGG. TREATMENT
AREA square feet		9.80	58.05	square yards PER STATION		333	378
cubic yards PER STATION		35.6	215.0	tons PER STATION	4.08	0.59	
tons PER STATION		74.2					
square yards PER STATION	333						

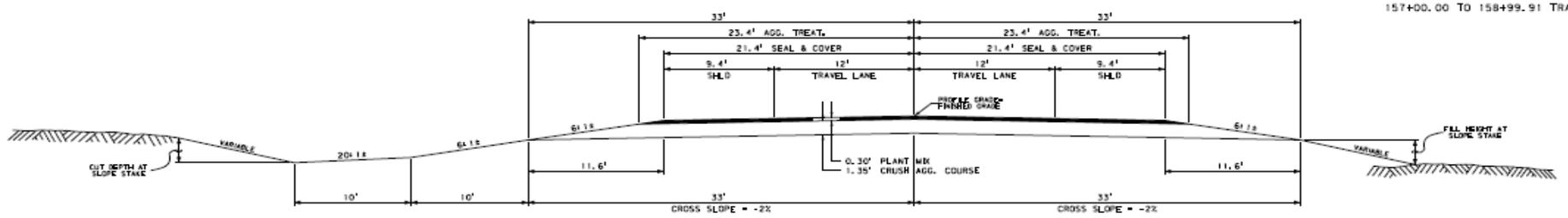
* FILL SLOPES	
0' - 10'	6:1
10' - 20'	4:1
20' - 30'	3:1
OVER 30'	2:1

* BACK SLOPES	
0' - 5'	5:1
5' - 10'	4:1
10' - 15'	3:1
15' - 20'	2:1
OVER 20'	2:1

* SEE CROSS SECTIONS FOR DEVIATIONS

TYPICAL SECTION NO. 6

74+00.00 TO 157+00.00 TYP. NO. 6
157+00.00 TO 158+99.91 TRANS. TYP. NO. 6 TO TYP. NO. 5



QUANTITIES							
UNIT	AGGREGATE			UNIT	BITUMINOUS MATERIAL		
	COVER	PLANT MIX	CR. AGG. COURSE		ASPHALT CEMENT	SEAL	AGG. TREATMENT
AREA square feet		13.44	78.14	square yards PER STATION		475	520
cubic yards PER STATION		49.8	282.0	tons PER STATION	5.71	0.85	
tons PER STATION		103.8					
square yards PER STATION	475						

2	MDT MONTANA DEPARTMENT OF TRANSPORTATION	BFILEARREVS	DESIGNED BY			UTILITY PLAN	FOR UTILITY PIH	LEWISTOWN - EAST	NH 57-3(1) 183
1		$DATE$	REVIEWED BY			FERGUS COUNTY		UPN 4067001	SHEET US OF 18
		$TIME$ Username$	CHECKED BY						

TYPICAL SECTIONS

Figure 47-2.11.5

SUMMARY

WATER VALVE BOXES

STATION	each ADJUST WATER VALVE BOX LEFT	each ADJUST WATER VALVE BOX RIGHT	each RESET WATER VALVE BOX LEFT	each RESET WATER VALVE BOX RIGHT	REMARKS
100+35.6		1			
100+57.9		1			
101+40.1		1			
102+31.4		1			
103+71.9		1			
103+73.4		1			
103+74.9		1			
103+95.1		1			
104+67.9	1				
104+79.5		1			
105+35.2		1			
105+50.0	1				
106+36.8		1			
106+60.6		1			
107+25.7		1			
107+27.6		1			
107+30.1		1			
107+54.5		1			
107+73.4		1			
108+10.5	1				
109+37.2	1				
109+76.8	1				
110+41.0	1				
110+89.7		1			
110+91.3		1			
110+92.8		1			
110+95.9	1				
111+15.6		1			
111+35.3		1			
111+47.0	1				
111+64.6	1				
111+86.4	1				
112+13.7		1			
112+33.7		2			
112+37.0	1				
112+75.1	1				
113+27.0	1				
113+63.5		1			
114+56.1		1			
114+57.4		2			
114+58.8		1			
114+94.8		1			
115+22.7		1			
115+29.3	1				
115+35.2		1			
115+69.9		1			
116+24.3		1			
116+57.2		1			
116+93.8		1			
117+16.4		1			
117+25.0	1				
118+21.7		1			
118+23.3		1			
118+24.7		1			
118+44.4		1			
119+56.5	1				
120+18.5	1				
120+24.3		1			
120+70.4		1			
121+19.1	1				
121+81.3		1			
121+82.5		1			
SUBTOTAL	18	46	0	0	
TOTAL	64		0		
# FUNDING -					

WATER VALVE BOXES

STATION	each ADJUST WATER VALVE BOX LEFT	each ADJUST WATER VALVE BOX RIGHT	each RESET WATER VALVE BOX LEFT	each RESET WATER VALVE BOX RIGHT	REMARKS
121+84.2		1			
122+03.0		1			
123+76.7		1			
125+41.1		1			
125+42.7		1			
125+44.4		1			
125+64.3		1			
126+11.0		1			
126+11.7	1				
126+70.2	1				
126+91.0		1			
127+13.8		1			
127+88.3	1				
128+95.6		1			
128+97.2		1			
128+98.9		1			
129+24.2		1			
130+36.6		2			
130+94.8	1				
130+99.4		1			
131+53.1		1			
131+86.5		1			
132+60.0		1			
132+51.2		2			
132+62.6		1			
132+84.6		1			
133+35.7	1				
135+51.4	1				
136+19.4		1			
136+21.1		1			
136+22.5		1			
136+44.3		1			
137+45.7		1			
138+08.5		1			
139+13.8		2			
139+79.7		1			
139+81.5		2			
139+82.8		1			
140+00.2		1			
140+60.2		1			
141+77.9		1			
142+92.4	1				
143+06.1		1			
143+07.4		1			
143+09.1		1			
143+33.6		1			
143+74.6		1			
145+58.8		1			
146+36.7		1			
146+38.0		1			
146+39.6		1			
146+55.7		1			
146+65.5	1				
149+49.3		1			
149+51.2		1			
149+52.4		1			
149+73.8		1			
151+53.6		1			
151+53.9		1			
151+54.9		1			
151+61.6		1			
151+62.4		1			
SUBTOTAL	8	58	0	0	
TOTAL	66		0		
# FUNDING -					

MANHOLES IN PLACE

STATION	each ADJUST MANHOLE LEFT	each ADJUST MANHOLE RIGHT	each REMOVE MANHOLE LEFT	each REMOVE MANHOLE RIGHT	REMARKS
103+53.9	1				
107+12.6	1				
112+19.0			1		
112+29.1			1		
112+64.7	1				
113+15.8	1				
115+67.1				1	
116+32.3	1				
121+62.6	1				
125+32.8	1				
126+62.7	1				
128+92.2	1				
130+61.0	1				
134+31.6	1				
137+87.7	1				
141+36.3	1				
144+22.9	1				
145+50.5	1				
148+03.9		1			
151+50.9		1			
SUBTOTAL	15	2	2	1	
TOTAL	17		3		
# FUNDING -					

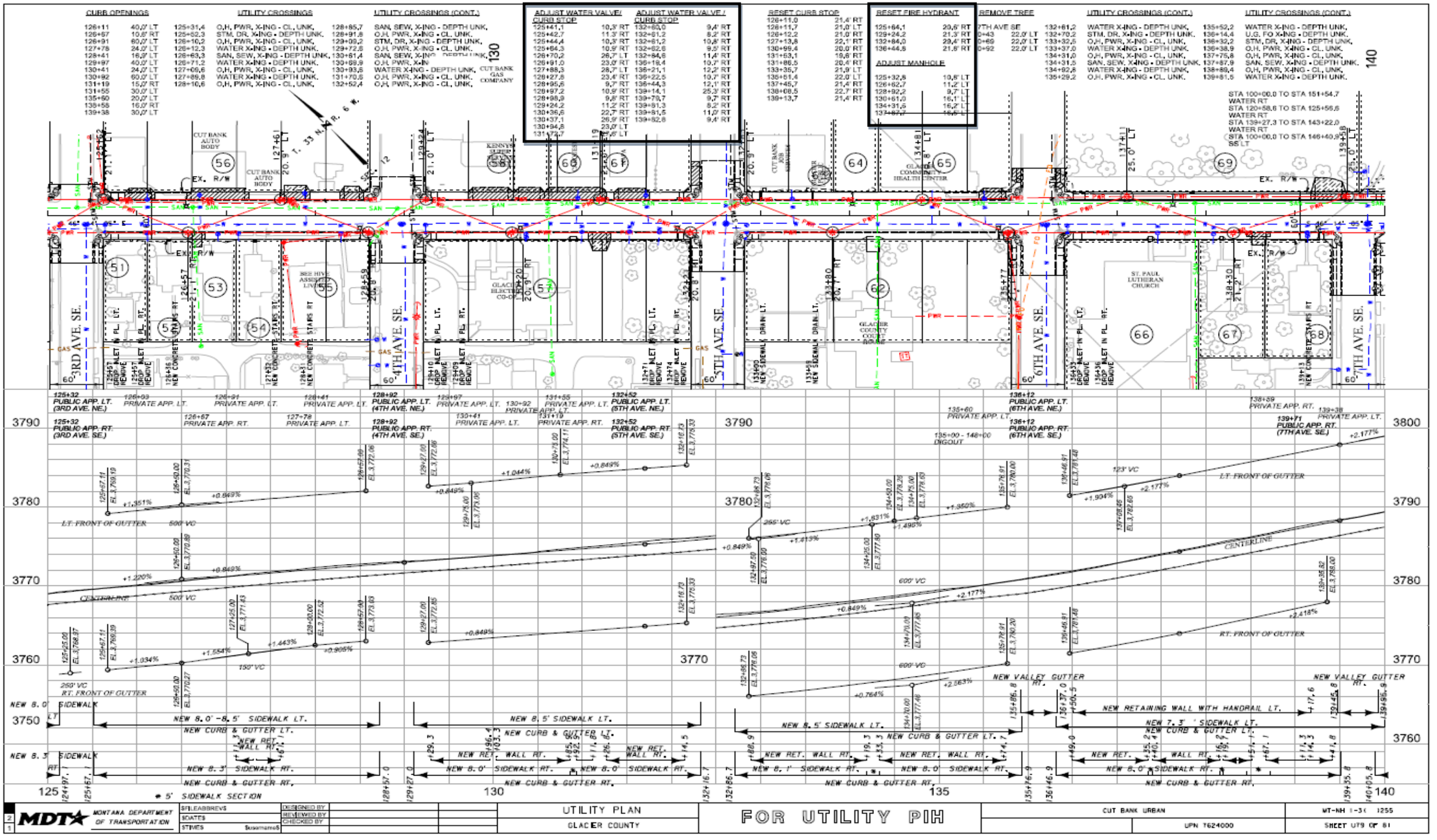
FIRE HYDRANT

STATION	RESET FIRE HYDRANT LEFT	RESET FIRE HYDRANT RIGHT	REMARKS
100+35.9		1	
103+95.8		1	
107+54.9		1	
111+15.2		1	
118+43.7		1	
122+02.6		1	
125+64.1		1	
129+24.0		1	
132+83.5		1	
136+44.8		1	
140+03.1		1	
143+33.6		1	
SUBTOTAL	0	12	
TOTAL	12		
# FUNDING -			

2	MDT MONTANA DEPARTMENT OF TRANSPORTATION	$FILEABBREV$	DESIGNED BY		UTILITY PLAN	FOR UTILITY PIH	CUT BANK URBAN
1		$DATE$	REVIEWED BY		GLACIER COUNTY		UPN 7624000
		$TIME$ $username$	CHECKED BY				SHEET U16 OF 81

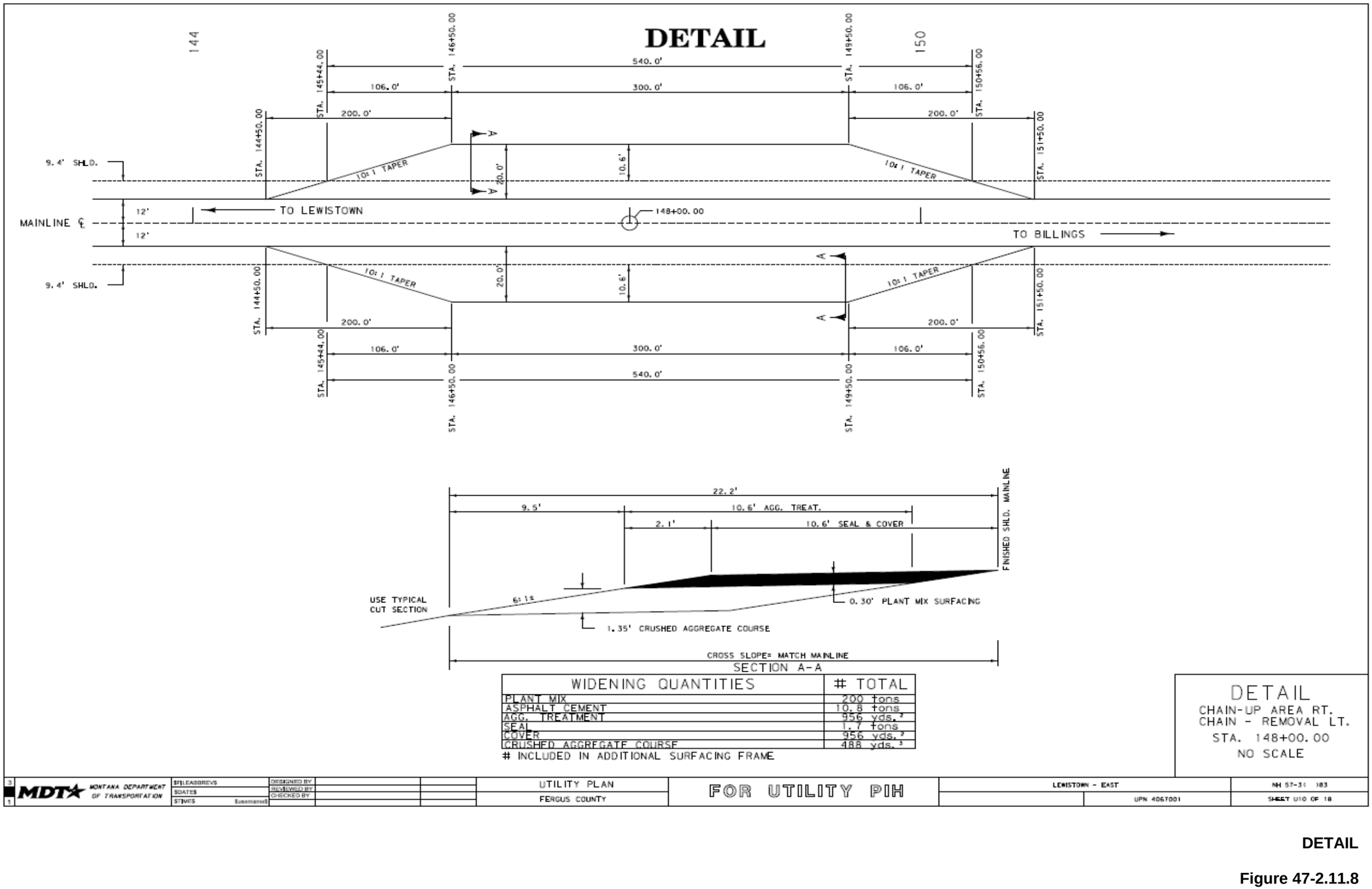
SUMMARY-1

Figure 47-2.11.6



SUMMARY-2

Figure 47-2.11.7



WIDENING QUANTITIES	# TOTAL
PLANT MIX	200 tons
ASPHALT CEMENT	10.8 tons
AGG. TREATMENT	956 yds.²
SEAL	1.7 tons
COVER	956 yds.²
CRUSHED AGGREGATE COURSE	488 yds.³

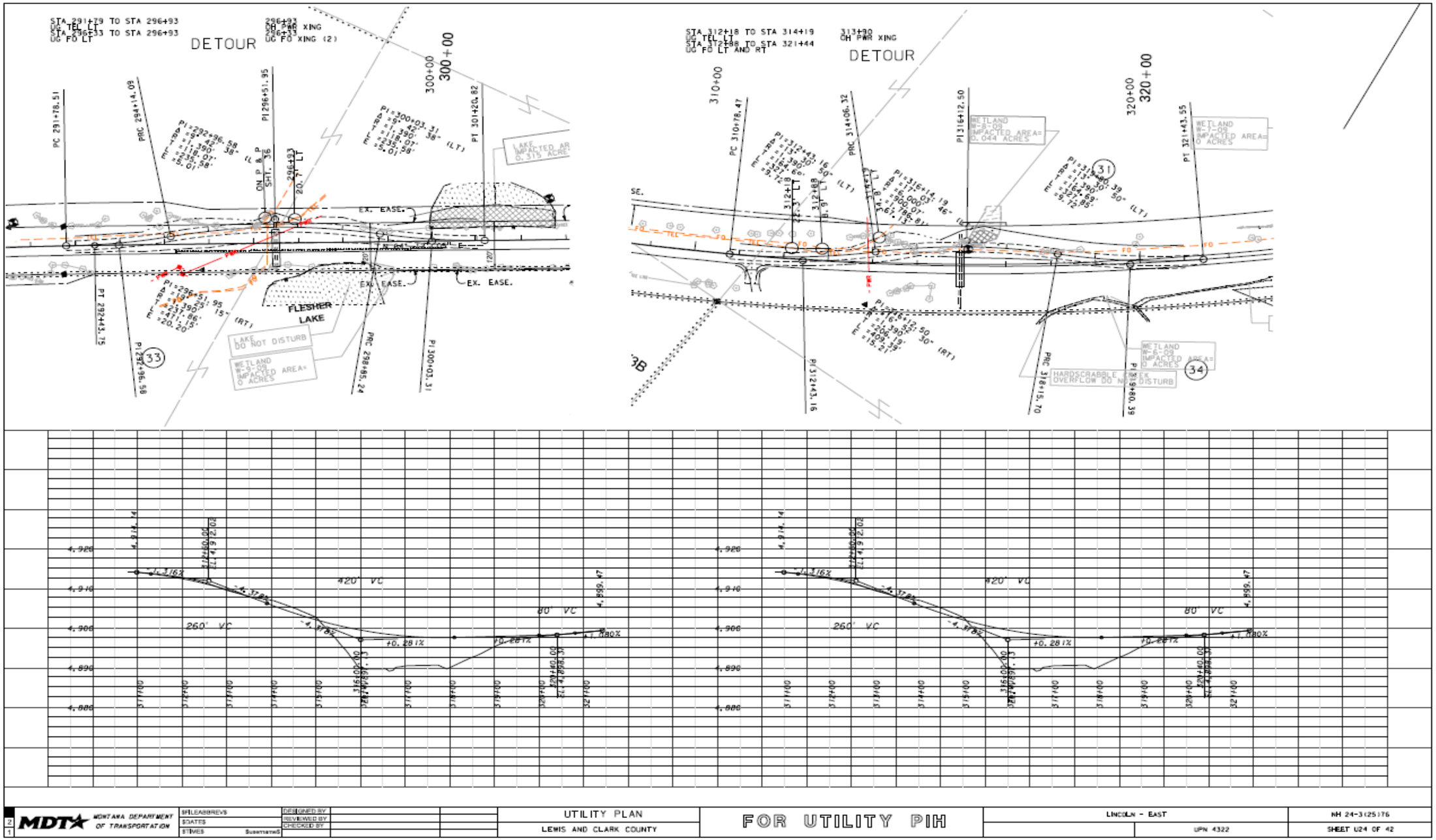
INCLUDED IN ADDITIONAL SURFACING FRAME

DETAIL
CHAIN-UP AREA RT.
CHAIN - REMOVAL LT.
STA. 148+00.00
NO SCALE

MDT MONTANA DEPARTMENT OF TRANSPORTATION | UTILITY PLAN | FERGUS COUNTY | FOR UTILITY PIH | LEWISTOWN - EAST | UPN 4067001 | NH 57-3( )83 | SHEET U10 OF 18

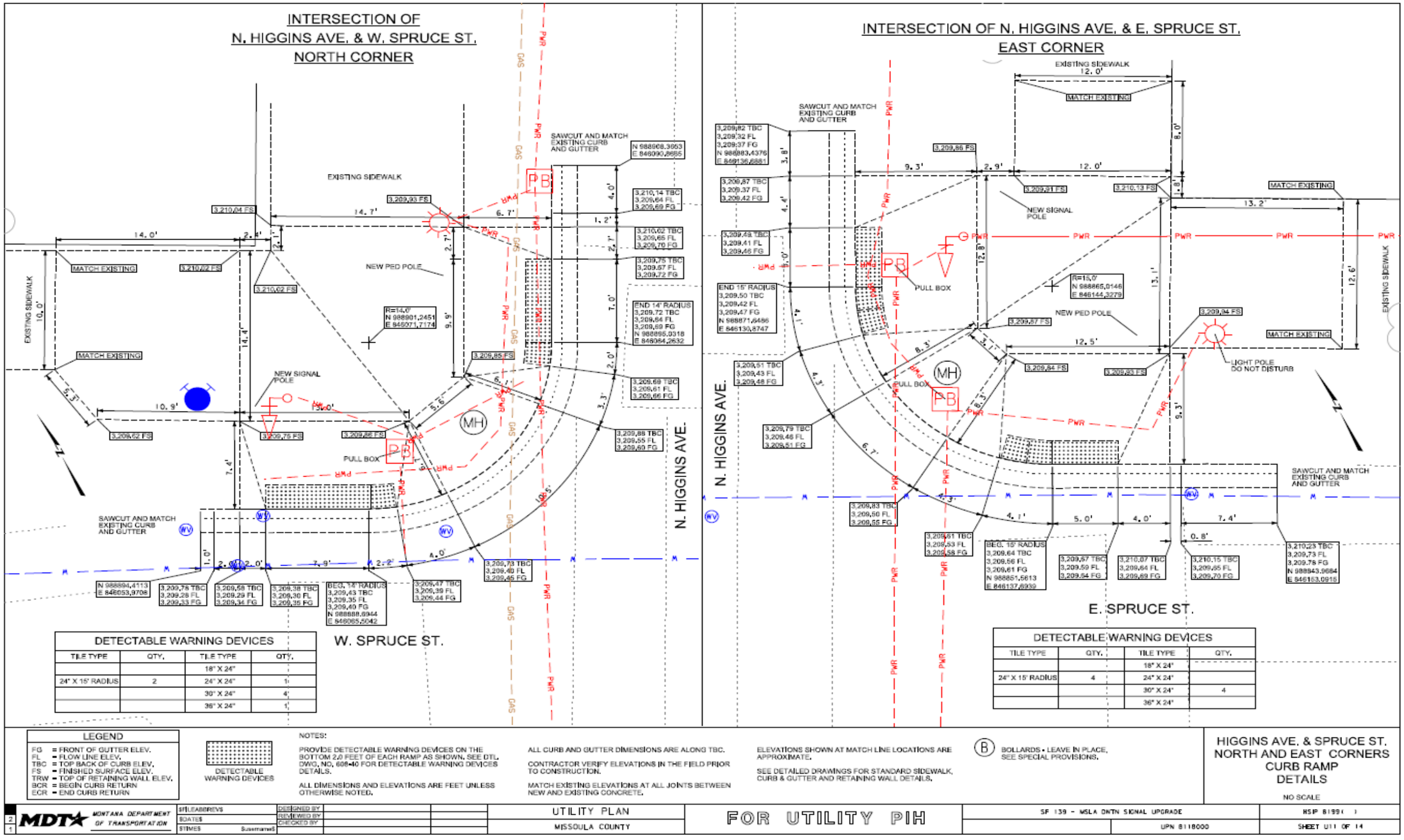
DETAIL

Figure 47-2.11.8



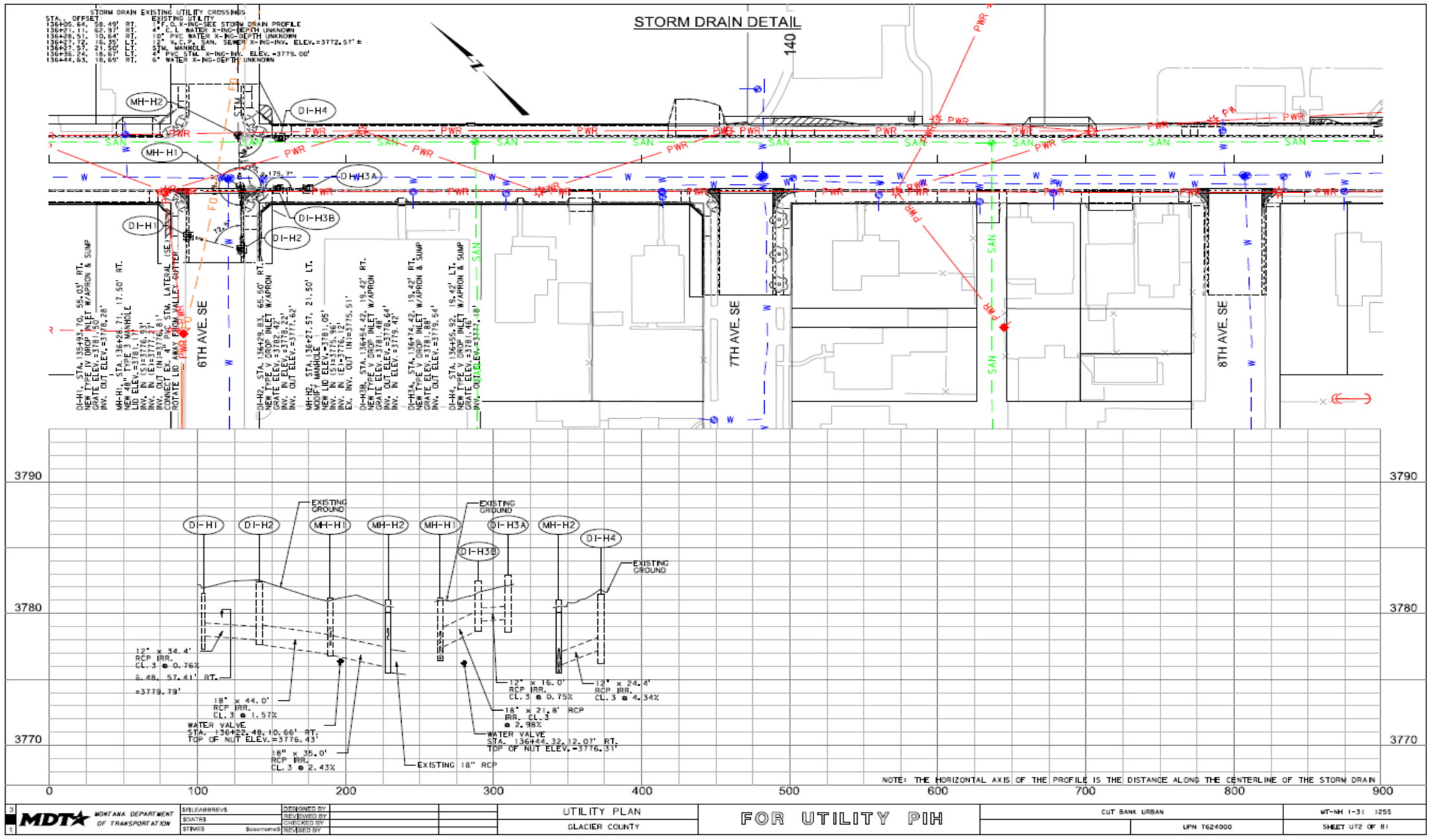
PLAN AND PROFILE DETAIL

Figure 47-2.11.9



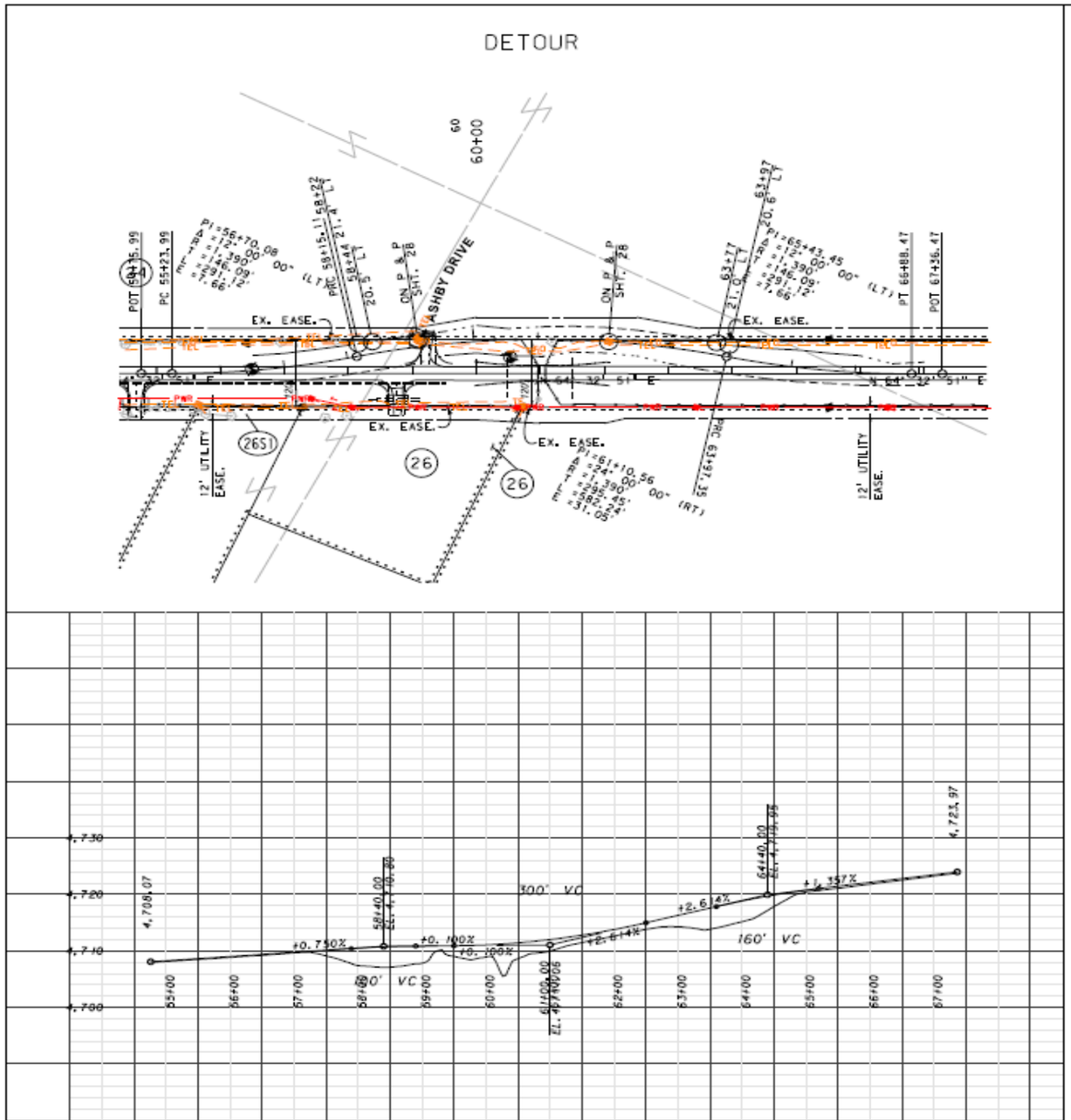
CURB RAMP DETAIL

Figure 47-2.11.10

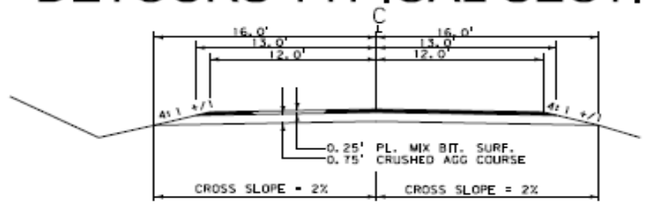


STORM DRAIN DETAIL

Figure 47-2.11.11



DETOURS TYPICAL SECTION



QUANTITIES *							
UNIT	AGGREGATE		UNIT	BITUMINOUS MATERIAL			AGG. TREAT.
	PLANT MIX	CR. AGG. COURSE		ASPHALT CEMENT			
AREA square feet cubic yards PER STATION tons PER STATION square yards PER STATION	6.25 23.1 44.5	21.8 80.7	square yards PER STATION tons PER STATION gallons PER STATION	2.4			286.9

* - FOR INFORMATION ONLY

DETOUR ITEMS #

STATION		QUANTITY	DESCRIPTION
FROM	TO		
54+75.99	67+36.47	1666 CU YDS	EMB+
54+75.99	67+36.47	469 CU YDS	EXC
54+75.99	67+36.47	1197 CU YDS	BORROW-UNCL EXC
54+75.99	67+36.47	561 TONS	PL MIX
54+75.99	67+36.47	1017 CU YDS	CRUSHED AGG COURSE
54+75.99	67+36.47	30.3 TONS	AC

FOR INFORMATION ONLY - QUANTITIES INCLUDED IN LUMP SUM BID

DETOUR ITEMS #

STATION		QUANTITY	DESCRIPTION
FROM	TO		
310+78.47	321+43.55	1909 CU YDS	EXC
310+78.47	321+43.55	5177 CU YDS	EMB+
310+78.47	321+43.55	3268 CU YDS	BORROW-UNCL EXC
310+78.47	321+43.55	474 TONS	PL MIX
310+78.47	321+43.55	860 CU YDS	CRUSHED AGG COURSE
310+78.47	321+43.55	25.6 TONS	AC

FOR INFORMATION ONLY - QUANTITIES INCLUDED IN LUMP SUM BID

DETOUR ITEMS #

STATION		QUANTITY	DESCRIPTION
FROM	TO		
172+00.00	201+97.49	8832 CU YDS	EXC
172+00.00	201+97.49	13,143 CU YDS	EMB+
172+00.00	201+97.49	4311 CU YDS	BORROW-UNCL EXC
172+00.00	201+97.49	36'	24" RCP
172+00.00	201+97.49	1334 TONS	PL MIX
172+00.00	201+97.49	2419 CU YDS	CRUSHED AGG COURSE
172+00.00	201+97.49	71.9 TONS	AC

FOR INFORMATION ONLY - QUANTITIES INCLUDED IN LUMP SUM BID

DETOUR ITEMS #

STATION		QUANTITY	DESCRIPTION
FROM	TO		
354+23.54	366+84.02	32 CU YDS	EXC
354+23.54	366+84.02	11,226 CU YDS	EMB+
354+23.54	366+84.02	11,194 CU YDS	BORROW-UNCL EXC
354+23.54	366+84.02	561 TONS	PL MIX
354+23.54	366+84.02	1017 CU YDS	CRUSHED AGG COURSE
354+23.54	366+84.02	30.3 TONS	AC

FOR INFORMATION ONLY - QUANTITIES INCLUDED IN LUMP SUM BID

DETOUR ITEMS #

STATION		QUANTITY	DESCRIPTION
FROM	TO		
291+78.51	301+20.82	3670 CU YDS	EXC
291+78.51	301+20.82	2386 CU YDS	EMB+
291+78.51	301+20.82	419 TONS	PL MIX
291+78.51	301+20.82	760 CU YDS	CRUSHED AGG COURSE
291+78.51	301+20.82	22.6 TONS	AC

FOR INFORMATION ONLY - QUANTITIES INCLUDED IN LUMP SUM BID

DETOUR ITEMS #

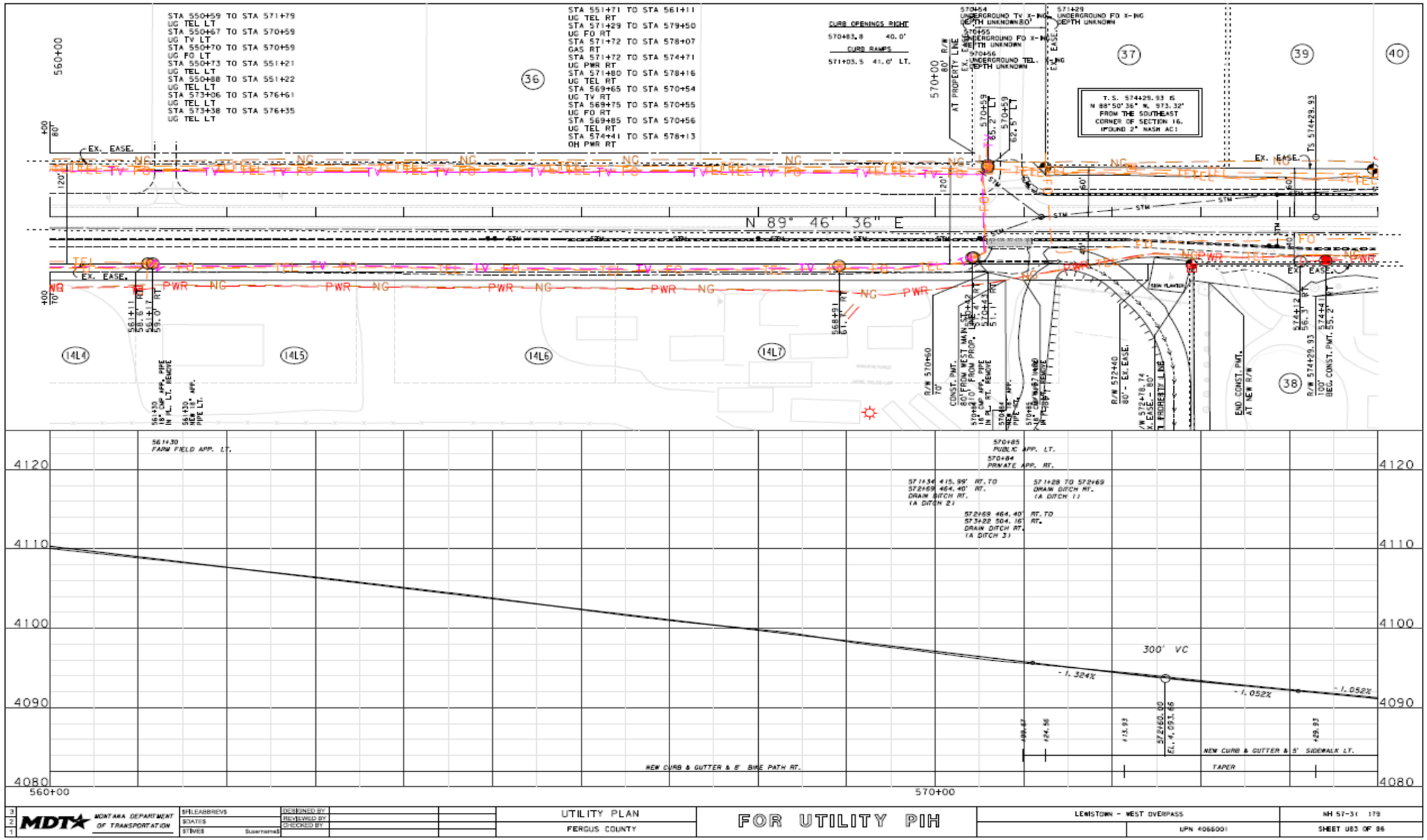
STATION		QUANTITY	DESCRIPTION
FROM	TO		
379+20.46	391+80.94	153 CU YDS	EXC
379+20.46	391+80.94	5210 CU YDS	EMB+
379+20.46	391+80.94	5047 CU YDS	BORROW-UNCL EXC
379+20.46	391+80.94	561 TONS	PL MIX
379+20.46	391+80.94	1017 CU YDS	CRUSHED AGG COURSE
379+20.46	391+80.94	1 EACH	118.51' DET. STRUCT.(MIN)
379+20.46	391+80.94	30.3 TONS	AC

FOR INFORMATION ONLY - QUANTITIES INCLUDED IN LUMP SUM BID

3 2	MDT MONTANA DEPARTMENT OF TRANSPORTATION	SFILEABBREVS SDATES STIMES	DESIGNED BY REVIEWED BY CHECKED BY		UTILITY PLAN LEWIS AND CLARK COUNTY	FOR UTILITY PIH	LINCOLN - EAST UPN 4322	NH 24-3125176 SHEET U22 OF 42

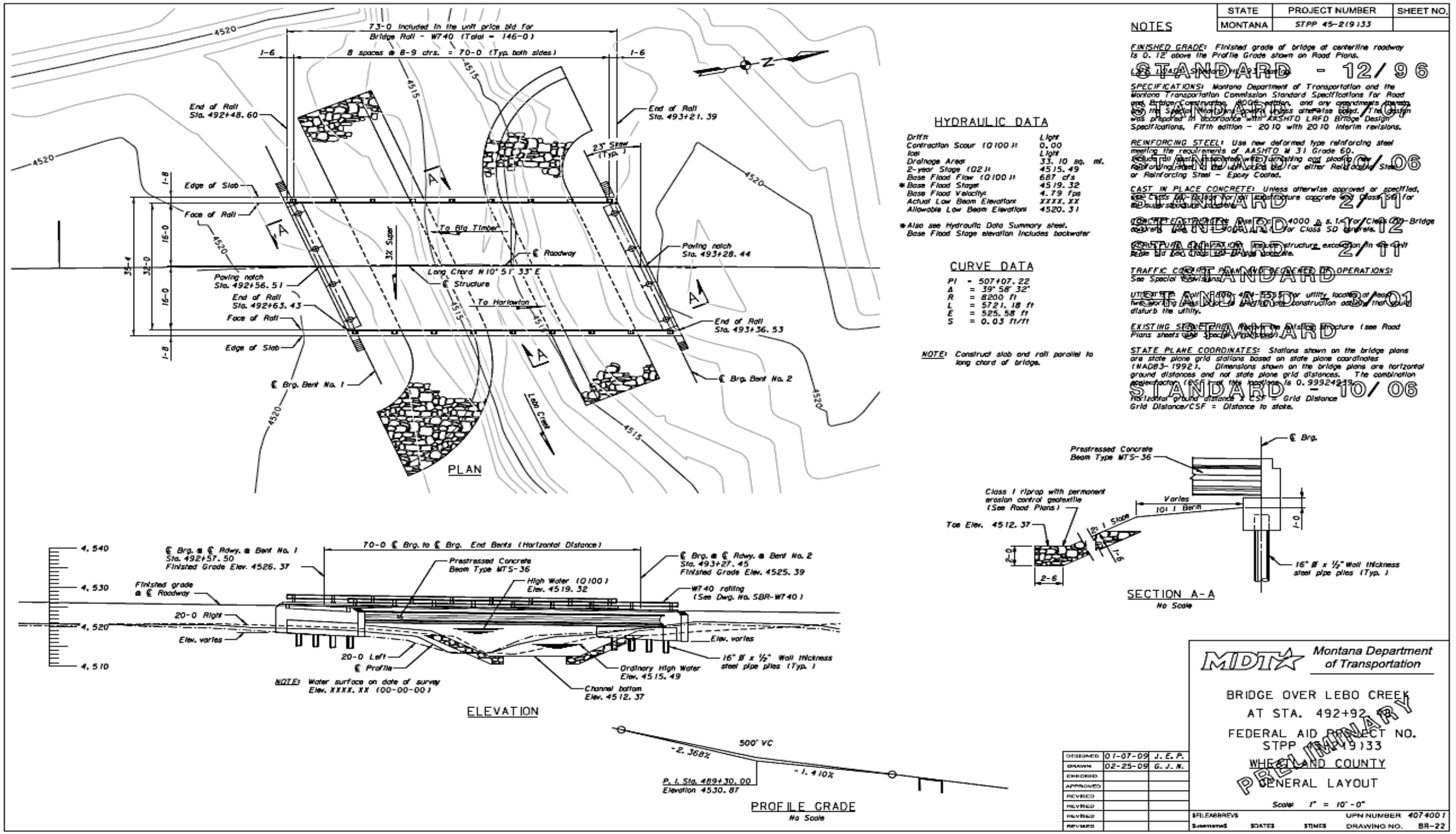
DETOUR DETAIL

Figure 47-2.11.12



PLAN AND PROFILE

Figure 47-2.11.13



BRIDGE GENERAL LAYOUT

Figure 47-2.10.13