MONTANA
Department of Transportation

UTILITY PLAN CREATION IN CIVIL 3D

Contents

Overview

The process of creating utility plans begins with an assessment of what plan sheets are available from road design and other functional groups. These files will then be saved and renamed as Utility files. Once all the necessary files have been saved to the UT folder on BIM360, edits can be made to begin the change from a road design plan set to a utility plan set. We want the actual design information to be the same but to highlight any potential utility conflicts that exist within the project limits.

Process Provenance

- Date of development: 4/2/2025
- Revision date: *8/6/2025*
- Application/Tool(s): *AutoCAD / Civil 3D*
- Version(s): *13.6.2020.0 Civil 3D 2024.4.3 Update*
- Environment(s): *MDT Civil 3D State Kit r2024 2.2.0*
- Author: *MDT Utilities Section Checker*

Statement of Need

This process is necessary to create visual aids to assist in negotiating utility agreements with any companies that may have utilities within a particular project's limits. These plans help utility agents prepare for Plan – in – Hand meetings and assist utility company representatives to understand the impacts a project may have on their facilities. The following procedure will assist in completion of activities 166 and 813, depending who is responsible for plan creation.

Acronyms/Definitions Used in This Document

PFR, AGR, SOW, PIH – Preliminary Field Review, Alignment and Grade, Scope of Work, Plan in Hand.

RD – Road Design.

References

Utility Plan Creation Manual

Process Description and Examples

Section I. Collection of Pertinent Project Information

Begin by reading the available milestone reports (PFR, AGR, SOW, PIH). There is a Utility section in each of these reports. These 4 are normally available depending on the project scope. Usually, the most recent report will suffice but you might need to review one back further if there isn't sufficient info in the most recent. This gives a good idea of where you should be looking for utilities.

Locate the RD plan files and Right – of – Way ownership files. This is where most files will come from for creating utility plans. We do need to incorporate the Right of Way Ownership file into our plans as well.

Section II. Procedure For Utility PIH Deliverable Creation

1. Now that all pertinent information has been collected it is time to assemble the plan sheets and make necessary updates.

2. Open each RD file and Save As all of them to the UT directory. General list of necessary files:
    a.) Title/note sheet files
    b.) Traverse/control file
    c.) Typical Files
    d.) All Detail Files
    e.) All Plan and Profile sheet files
    f.) Summary files if there are any "adjust manhole" or "utility" specific frames.
    g.) Right of Way Ownership Sheet file
    h.) Some judgement will be necessary to determine if there is any other pertinent info or files needed for our plans.

3. After each file has been saved as a utility file go through and delete all objects that exist within the drawing. Then xref the RD file that you just saved as a Utility file, into the utility file. For example, if you opened 10476000RDPLP001 and saved it as 10476000UTPLP001, you would delete any objects, text, etc from the model space in the 10476000UTPLP001 file and then xref in the

10476000RDPLP001 file. This step serves two purposes: 1.) It allows the objects that are in that file to be un-editable so they can't be accidentally changed. 2.) It provides automatic updates to any of the objects that are in the RD source file since it is now an xref instead of existing in the utility file.

4. A couple MDT Sheet Layouts exist in the MDT Tools tab on the ribbon, specifically, the utility title layout and the utility notes layout. The title layout is critical as it has the legend required for all utility plans. Add a Utility title layout and a Utility notes layout to the newly created utility title file. Much of the other information required for the utility title sheet is the same as what is on the RD title sheet and RD notes sheet.

5. The R/W ownership sheet will have to have the page numbers updated to correlate with the page numbers in the utility plans.

6. Creating a sheet set in the sheet set manager with all the newly saved utility files will help alleviate labeling and relabeling the utility sheets. This newly created sheet set has fields that can be edited with the information we need to put in our plans. Right click on the new sheet set. Go to properties. Then adjust the few standard fields that exist with Utility information. Add custom fields for project PE number and county. These custom fields can be updated in the enhanced attribute editor, shown in Figure 1. These can then be inserted into each sheet as a custom field. The creation of a sheet set saves much time, especially with labeling when a sheet needs to be added or removed from the sheet set.

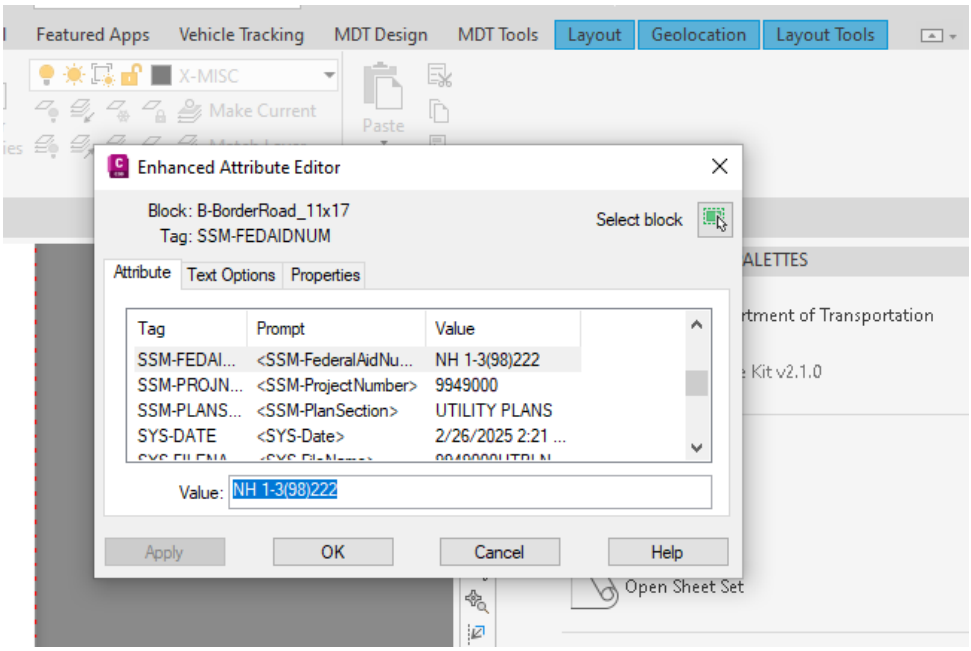

Figure 1. Shows the enhanced attribute editor and where to update fields with utility info.

7. To create a sheet set, type sheet set manager into the command prompt in Civil 3D.

8. Within the sheet set manager, click the sheet selections drop down and select create. An open sheet set is shown in Figure 2.

9. Now you will want to add sheets to the new sheet set. To do so, right click on the sheet set name in the sheet set manager and select import layout as sheet. Do this for all layouts that will be included in the Utility plans. Each selected file will give you the opportunity to import all layouts at once from that file. They can be organized and ordered correctly after all layouts are imported.

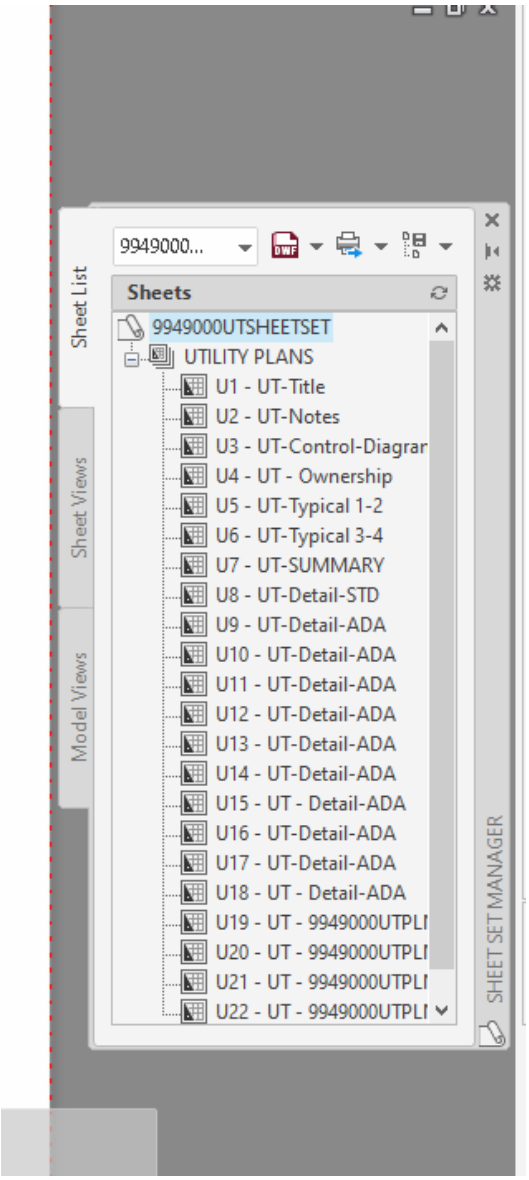

Figure 2. The sheet set manager is seen next to the drawing layout.

10. If there are signing, electrical, traffic, or safety plans these should be included in our plans as well. More information is always better than not enough. Generally, these functional groups create their own pdfs and can be combined with the utility pdf once created.

11. From the Title sheet layout select the project information block. An arrow is visible above this block, as shown in Figure 3. Select this arrow and a dropdown will appear. Now select the appropriate Utility Plan option. The Title block should be updated with the information entered in the previous step. Change all information that says road plans.

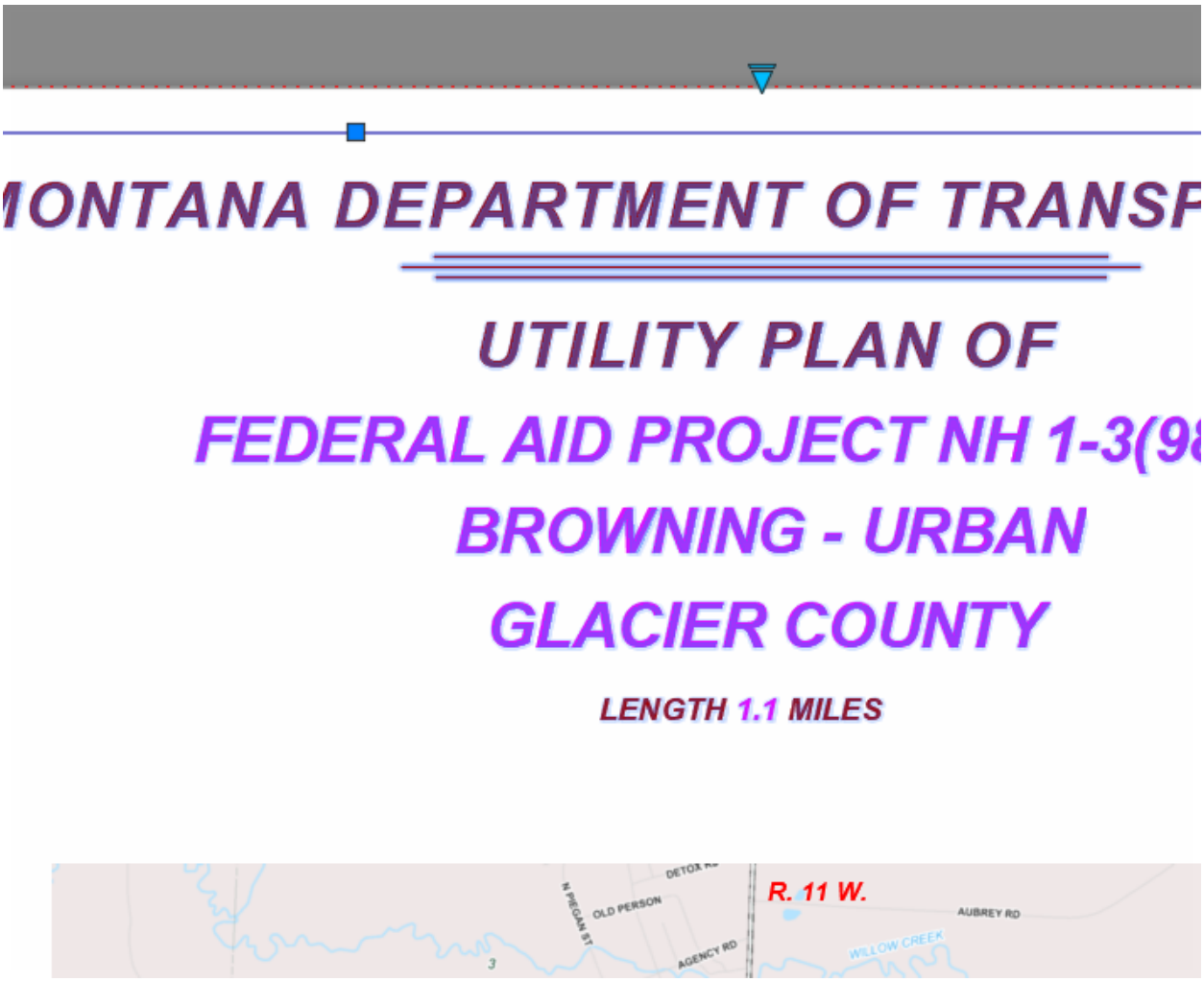

Figure 3. Arrow above the title block that will produce the drop down to select Utility Plan.

12. Now use the Utility Layer Filter group and set the colors of the utility layers per the following True Color RGB codes:
    a.) Fiber Optic – Orange – 255,127,0
    b.) Gas Lines – Tan – 204,102,0
    c.) Powerlines – Red – 255,0,0
    d.) Telephone Lines – Orange – 255,127,0
    e.) TV lines – Pink – 255,0,255
    f.) Sanitary Sewer – Green – 0,255,0
    g.) Water Lines – Blue – 0,0,255
    h.) These colors will need to be set in each file that show utilities. Usually, the traverse/control diagram, some details, and the plan and profile sheets are the primary files that need to have this done. Figure 4

shows the dialogue box where you can change the real or true color. This can be accessed through the layer properties manage

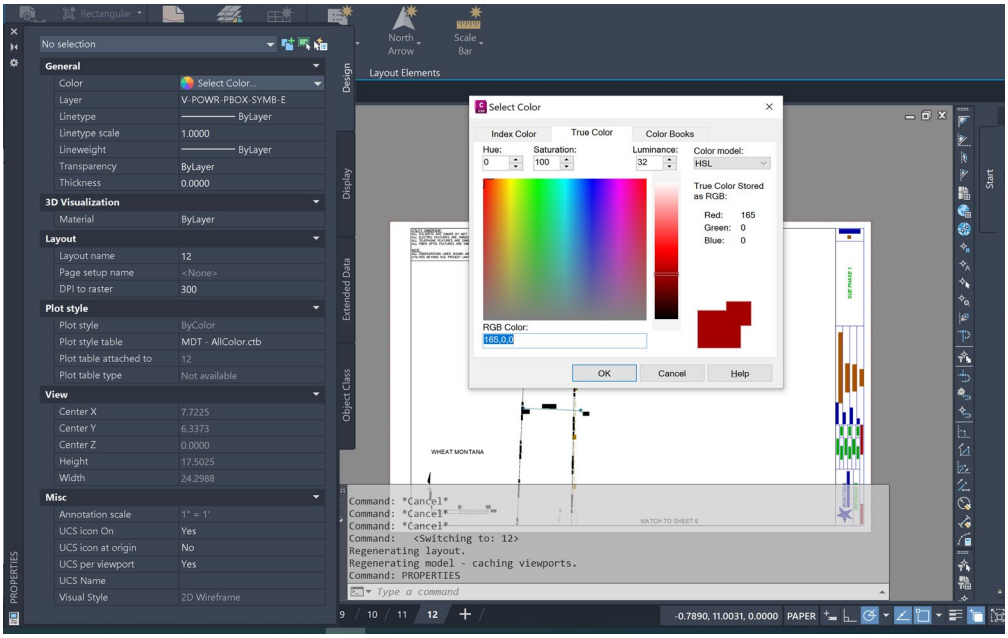

Figure 4. Select color dialogue box accessed from the property's menu of a particular line.

13. These colors will need to be set in each file that show utilities. Usually, the traverse/control diagram, some details, and the plan and profile sheets are the primary files that need to have this done.

14. Once this is done you are ready to walk through the plan and profile sheets and identify potential conflicts. Add Alignment Station/Offset labels on the Plan and Profile sheets using the MDT UTIL-Station and Offset label style for each conflict. (Don't color code based on utility type as this causes more issues for the Utility agents). Figure 5 depicts this.

15. All lateral conflicts should be laid out in a table near the top of each plan and profile sheet that the conflict occurs on. Figure 6 shows an example of this and the information that should be included for this type of potential conflict.

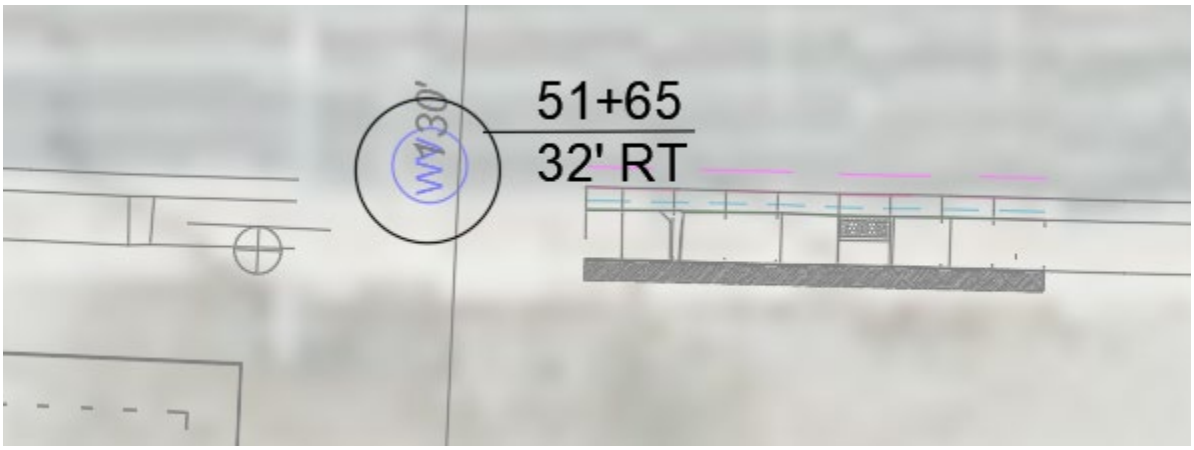

Figure 5. Potential Utility Conflict callout.

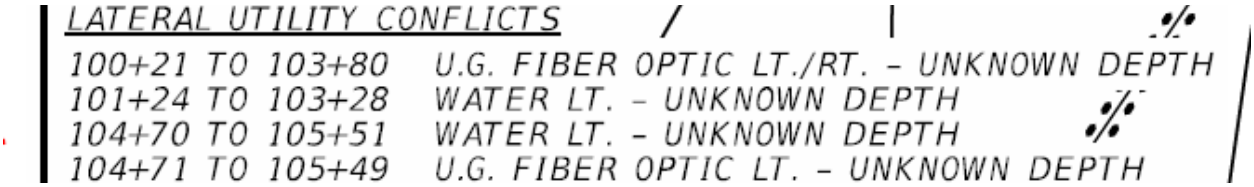

Figure 6. Example of Lateral Utility Conflict callouts.

16. Once all callouts have been made, it is time to create a PDF of all the Utility plan sheets with the Sheet Set we created earlier. This can be done in the sheet set manager using the Publish to PDF function.

17. Combine all necessary extra files with the newly created UT pdf with Adobe Acrobat. (Signing plans, Bridge plans, etc.)

18. Rename this file XXXXXXXXUTPIH001.PDF

    Note: Consultants should name their files according to consultant design file name structure. For example, XXXXXXXXUTPIHZ01.PDF.

19. Finally, go to the RD directory for the project and pull the most recent set of XS's for the project (If the project has them). Sometimes, special circumstances present and a project doesn't have them. Rename them as XXXXXXXXUTXSF001.PDF.