MONTANA
Department of Transportation

ENVIRONMENTAL WETLAND DELINEATION

Contents

Overview

The wetland survey locates wetland boundaries and the ordinary high-water mark. This survey data is imported into ArcGIS Pro and exported as shape files. This process steps through uploading the shape files to ACC/BIM 360 and creating a Civil 3D drawing deliverable with wetland and/or the ordinary high-water mark for display on MDT plans.

Process Provenance

- Date of development: 9/23/2025
- Revision date: *N/A*
- Application/Tool(s): *AutoCAD / Civil 3D*
- Version(s): *Civil 3D 2024 and 2024 update versions*
- Environment(s): *MDT Civil 3D State Kit r2024 v2.2.1+*
- Author: *MDT EngOps Workflow Steering Committee*
- Support: MDT Service Desk - Open a Case

Statement of Need

The wetlands and/or ordinary high-water mark needs to be displayed on MDT Road and MDT Right-of-Way plans. This process results in a consistent deliverable for consumption by Road Design and Right-of-Way design teams.

Acronyms/Definitions Used in This Document

ACC/BIM 360 – Autodesk Construction Cloud (ACC) is Autodesk's cloud-based platform for construction project/file management, which supersedes the earlier BIM 360 platform that it was built upon.

Autodesk Desktop Connector - an application that creates a "connected drive" on your PC, linking your local Windows File Explorer to Autodesk cloud services like Autodesk Docs.

References

Autodesk Desktop Connector Start Up Guide

Coordinate System Settings

BIM 360 User Guide

Autodesk Civil 3D Naming Standards, File Types & Referencing Relationships

Process Description and Examples

Section I. Accessing Project Files in Autodesk Docs

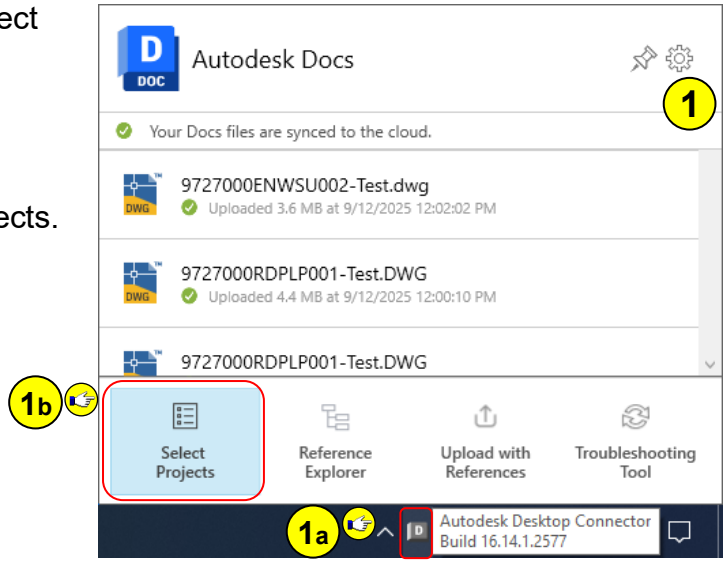
After gaining permissions to the ACC/BIM 360 project, it must be synced to your local Autodesk Docs folder using Autodesk Desktop Connector. The Autodesk Desktop Connector Start Up Guide provides start up information for first time use.

Procedure – Sync Project to Autodesk Docs Folder

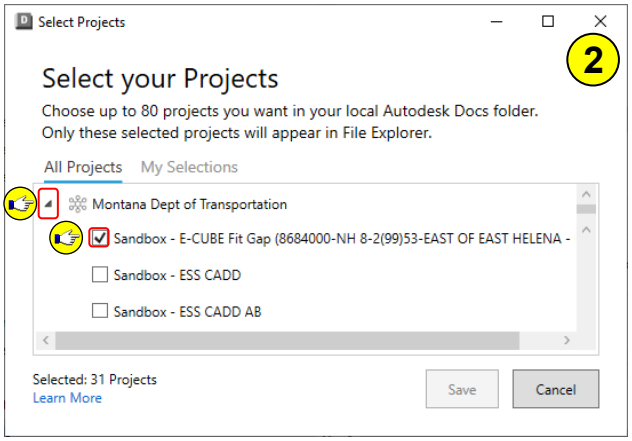
1. Access the Autodesk Desktop Connector:

   a. From the System Tray, select the Autodesk Desktop Connector icon.

   b. From the Autodesk Docs window, select Select Projects.



2. Select projects by expanding the Montana Dept of Transportation group from the Select Projects dialog then selecting the desired project(s).



Procedure – Upload Shape Files to Autodesk Docs

Shape files must be placed in the Autodesk Docs project folder prior to accessing them within Civil 3D.

*Note: Shape files exported from ArcPro **must be exported in the same coordinate system** as the project's DWG files. Examine the coordinate system assigned to the project's survey file ([UPN#]CSMAP001.dwg or [UPN#]DIMAP001.dwg) as shown in the Coordinate System Settings support document via MAPSTATUSBAR command to match it.*

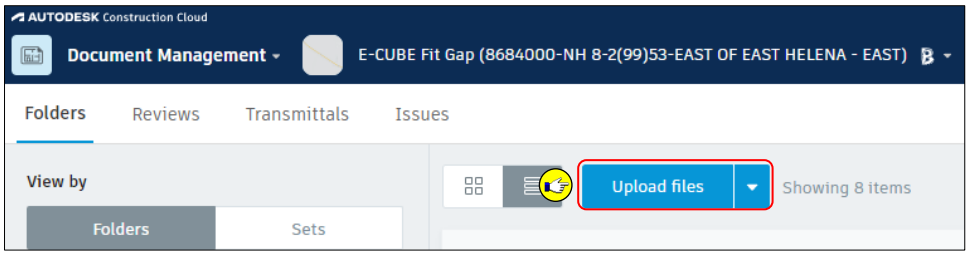
1. Open Windows Explorer and navigate to the location of the exported shape files.

2. Select the shape files (.shp) and associated files (i.e., .cpg, .dbf, .idx, .prj, .sbn, .sbx, .shx) to copy > type CTRL+C to copy or right click and select copy.

3. Navigate to Autodesk Docs > Montana Dept of Transportation > ~Project Name~ > Project Files > EN – Environmental > paste copied shape files (.shp)

   Note: To organize the project file, a sub folder can be created for the shape file within the EN-Environmental folder.

   An additional method would be to Upload the shape files from BIM 360 web interface. *See BIM 360 User Guide.*



Section II. Importing Shape Files in Civil 3D Drawing

Procedure – Create a New Drawing

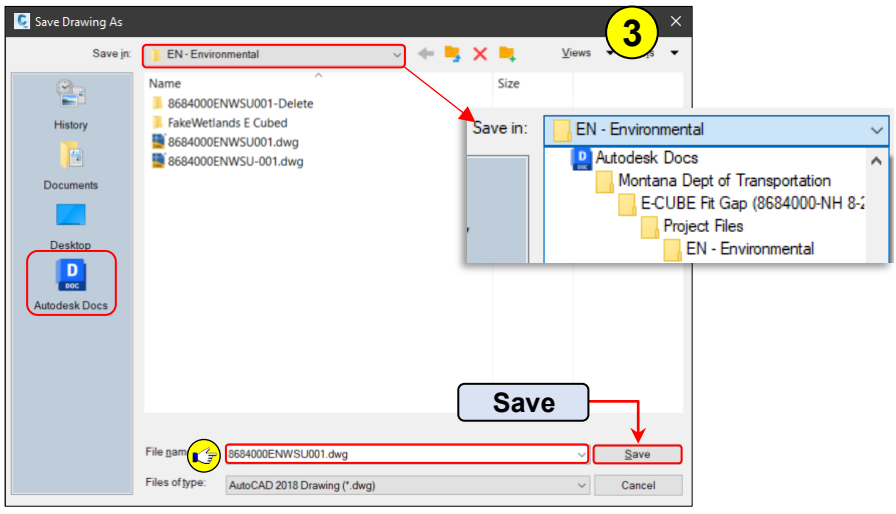
Note – Autodesk Civil 3D does not save automatically, so it is best to save often to avoid losing your work.

1. Open Civil 3D 2024 Montana by double clicking the desktop icon.

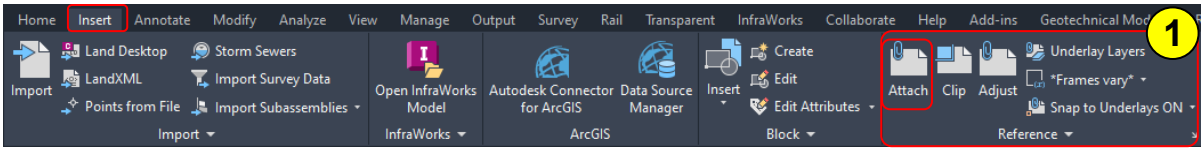
2. Access the Start tab at the top of the window
   a. Select the down arrow next to “New”.
   b. Select design-start.dwt to create a new drawing.

3. Set the file’s coordinate system according to the Coordinate System Settings Support guide.

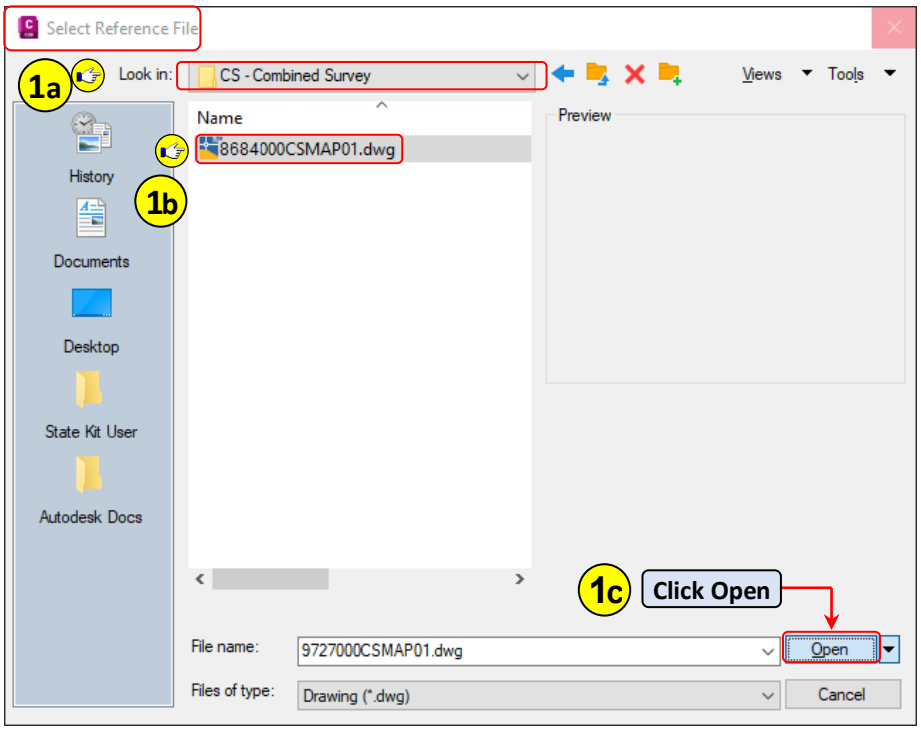
4. Save the drawing to Autodesk Docs > Montana Dept of Transportation > ~Project Name~ > Project Files > EN-Environmental and name the file according the Autodesk Civil 3D Naming Standards, File Types & Referencing Relationships, e.g. 8684000ENWSU001.dwg).



Procedure – Attach External References (XREF)



1. Navigate to the Insert tab > Reference panel and select Attach.
   a. Navigate to the drawing on Autodesk Docs (Montana Dept of Transportation > ~Project Name~ > Project Files > CS-Combined Survey (or DI – District Survey if a file is not found)).
   b. Select the CSMAP, e.g. 8684000CS MAP001.dwg (or DIMAP, e.g. 8684000DIMAP001.dwg).
   c. Click Open.



2. From the Attach External Reference dialog box, verify the following parameters:

   Reference Type: Overlay

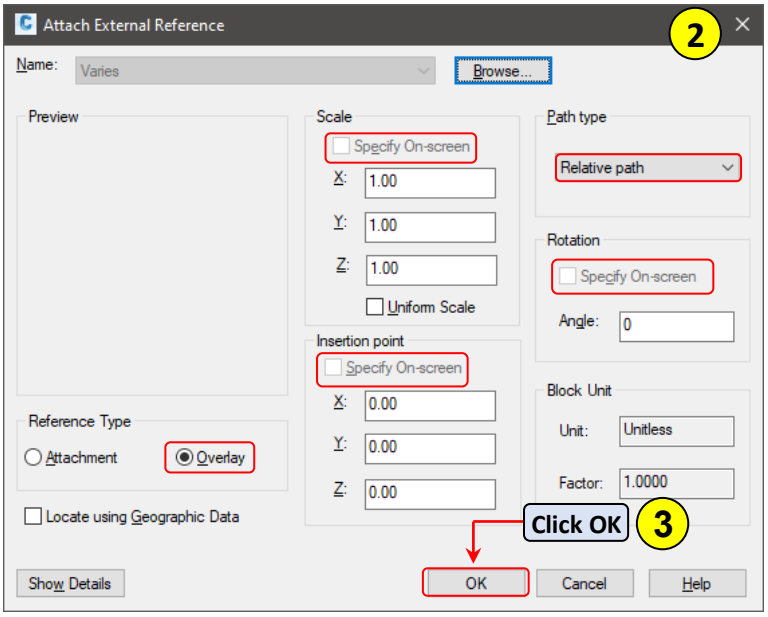
   Scale: Specify On-screen is unchecked

   Insertion point: Specify On-screen is unchecked

   Path type: Relative path

   Rotation: Specify On-screen is unchecked

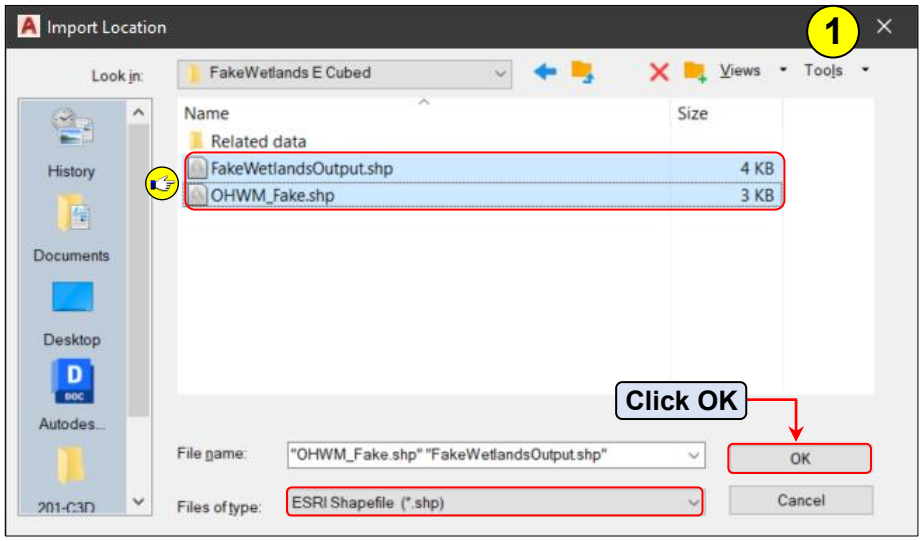
3. Click OK.



Procedure – Import Shape Files

Note - Shape files must be placed on Autodesk Docs within the project folder. See previous "Uploading Shape Files to Project" steps.

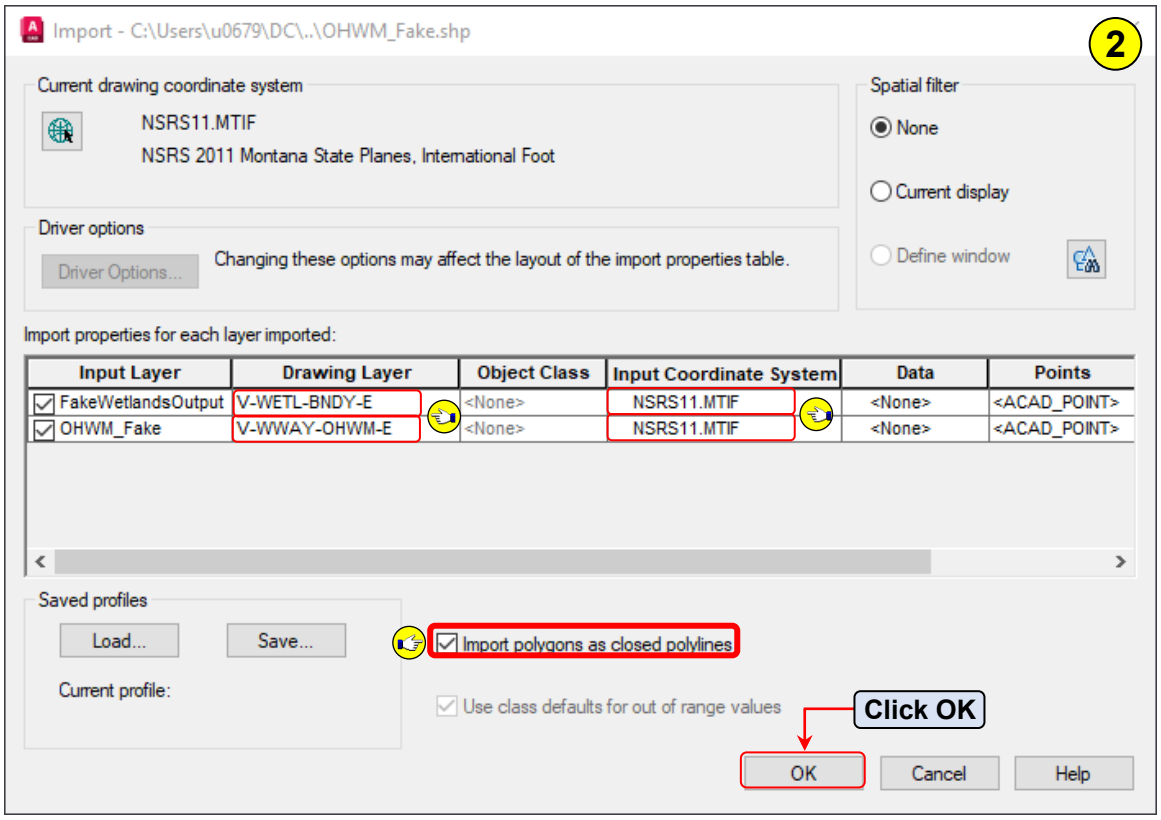
1. Type MAPIMPORT at the command line, browse to the Autodesk Docs location of the shape file(s) for the specific project *(Procedure - Upload Shape Files to Autodesk Docs)*, select the shape file(s), click OK.



Note: Files of type may need to be changed to ESRI Shapefile (.shp) at the bottom of the dialog box)*

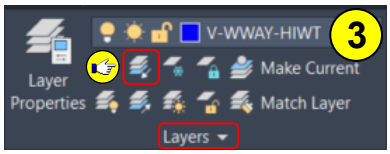
Note – Multiple files can be selected at once by using the Ctrl or Shift keys on the keyboard.

2. From the import dialog box verify the settings shown, click OK. (To change the settings, select the cell you want to change > click the drop down to pull up the options. Each column will have different ways to present options).

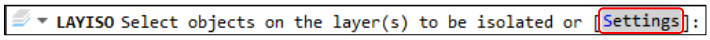


Note: For the "Input Coordinate System" column > select the cell > select browse button > from the coordinate system dialog box > type NSRS11.MTIF (Or appropriate coordinate system matching the survey file if not NSRS11.MTIF) in the search box > select the coordinate system > click Select. Repeat for all Layers.

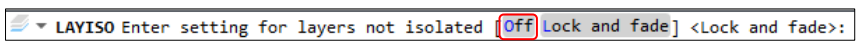
3. Navigate to Home tab > Layers panel, select Layer Isolate.



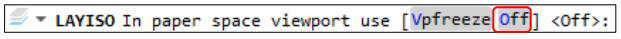
4. From the command line > select Settings.



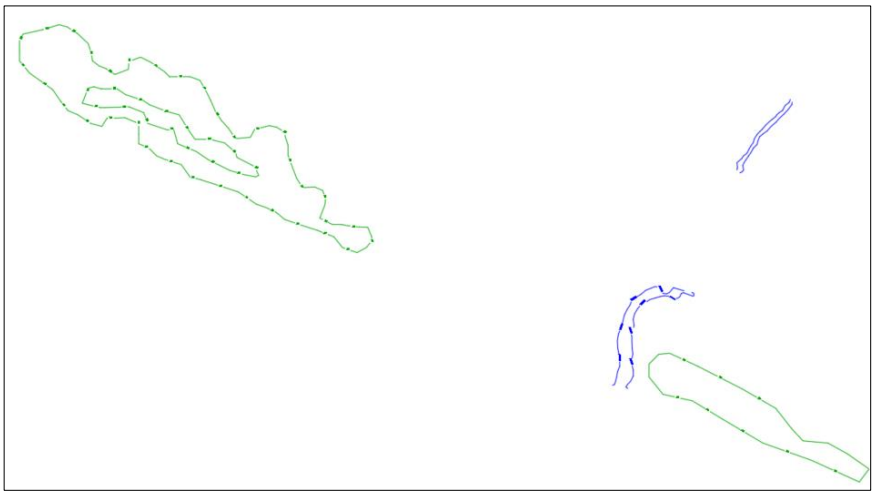
5. From the command line > select Off for layers not isolated.



6. From the command line > select Off for paper space viewport.

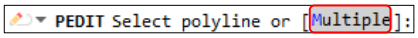


7. From model space > select a single object on layer V-WETL-BNDY-E and V_WWAY-OHWM-E, select Enter to isolate the layers.



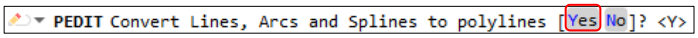
8. Type PE (PEDIT) at the command line > select Enter to invoke the command.

9. From the command line > select Multiple.

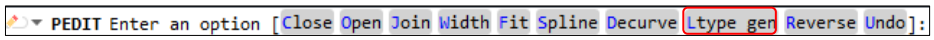


10. Select all the objects from model space > select Enter to invoke the command.

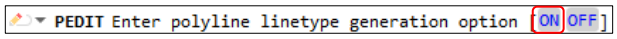
    Note: If prompted to Convert lines, Arcs and Splines to polylines > select Yes from the command line.



11. From the command line > select Ltype gen.



12. From the command line > select ON.



    Note - This will display the text in the line type correctly.

13. Select Enter to end the command.

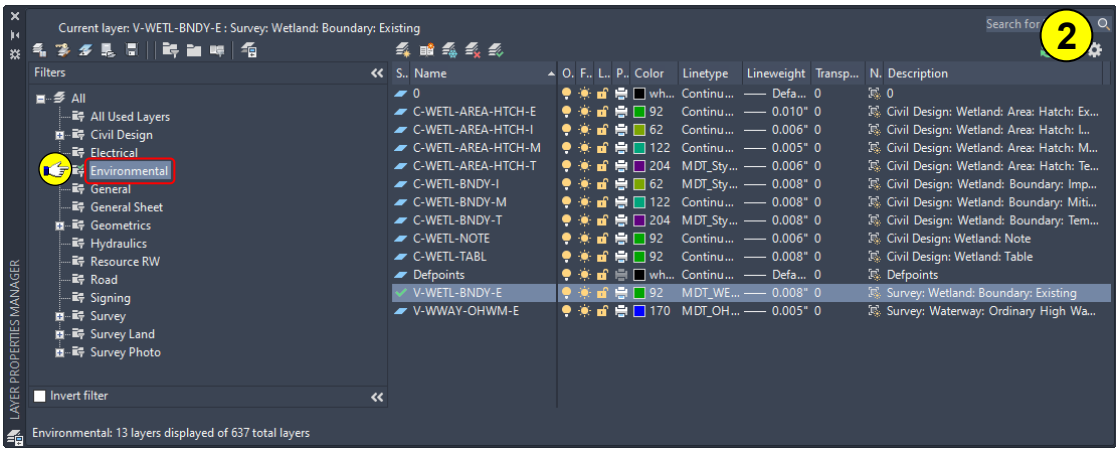
14. Type RE (Regen) > select Enter to invoke the command.

15. Save the drawing.

Section III. Hatching Wetland Areas

Procedure – Hatch Shapes

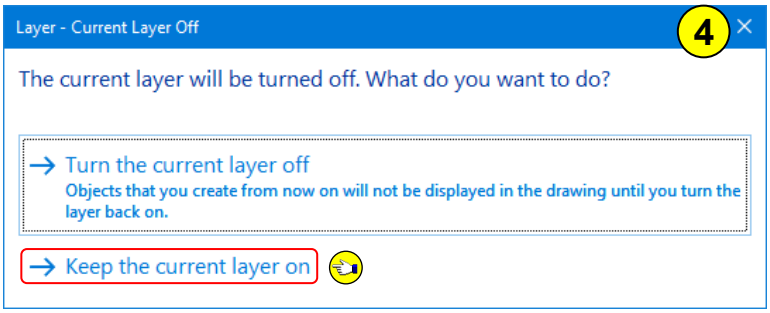
1. Navigate to the Home tab > Layers panel then select Layer Properties.



2. From the Layer Properties Manager, select Environmental layer filter.

3. Double click on C-WETL-AREA-HTCH-E to make the layer current.

4. From the Layer – Current Layer Off dialog box, select Keep the current layer on.



5. Close the Layer Property Manager.

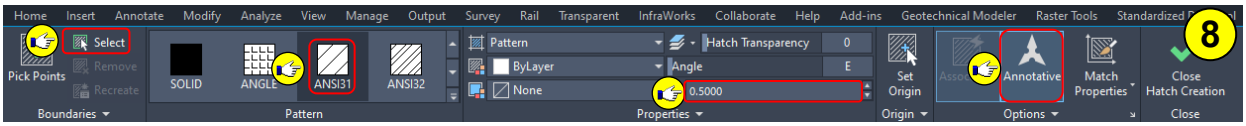
6. Navigate to Home tab > Draw panel then select Hatch.

7. On the Hatch ribbon, verify the following, select Select.

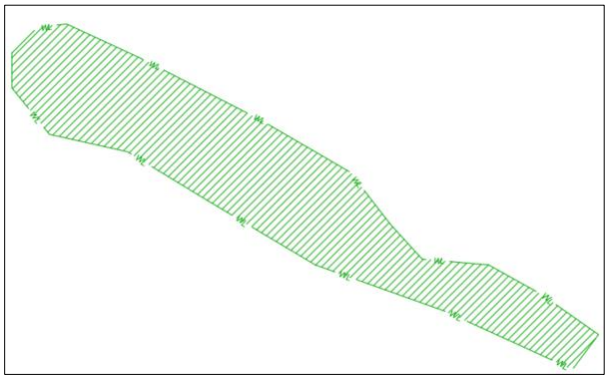
   Pattern: ANSI31

   Scale: 0.5000

   Options: Annotative



8. Select the wetlands boundaries to hatch.



Note – If there is an internal shape, select the internal shape(s) first, then the outside shape.