

Standard Operating Procedure (SOP) for Roadway DWG File Export

I. INTRODUCTION

This SOP is for use by the engineer/designer of civil construction plans for roadway infrastructure in Ada County. For submittal of record drawings, ACHD requires a data export of the CAD design that is georeferenced to the Ada County Projection (ACP). The DWG features to export include:

- Storm Drain
- Irrigation
- Sidewalk
- Edge of pavement (Lip of Gutter)

The examples use AutoDesk AutoCAD Civil 3D 2016 (hereafter referred to as C3D). Screenshots may appear different given the current software you are using. If the engineer/designer is not using AutoDesk software, the steps will be different; however, DWG files referenced to ACP are still required. Following are the steps for the engineer/designer to verify/convert to ACP and save DWG information requested by ACHD.

II. COORDINATE PROJECTION TO ADA COUNTY PROJECTION (ACP)

For ACHD Capital Projects, the District requires projects be designed to ACP. For development projects, it is encouraged, but not required, that ACP be used. For all projects, CAD data must be verified it correctly uses ACP or converted to ACP if needed.

At least one check is needed for a given surveyor and engineering firm's design process to verify it is on ACP. If the boundary survey section corner tie comes within a 5-ft radius of the referenced section corner as outlined in Part II (C), the projection is good and Part II in this SOP can be skipped for future projects as long as the same surveyor and CAD template are used.

A. Find Section Corner Tie in Design Basemap

1. A survey tie to a found section or $\frac{1}{4}$ corner is required. The tie must have bearing and distance drawn to scale and actual length (no breaks). If a break is used, it must be revised to draw to actual distance to the section or $\frac{1}{4}$ section tie so it references correctly.
2. If a section corner tie with bearing and distance is not provided by the surveyor of record, a licensed Professional Land Surveyor, Professional Engineer, or qualified person under guidance of a PLS or PE must provide a tie to a found section or $\frac{1}{4}$ section corner.
3. Identify and log the Township, Range, Section (T, R, S) the project is located in and the section corner tie for reference below.

B. Download ACHD Section Corners DWG File

4. The ACHD Section Corners reference file is available for download at:

<http://www.achdidaho.org/Departments/Engineering/Design.aspx>

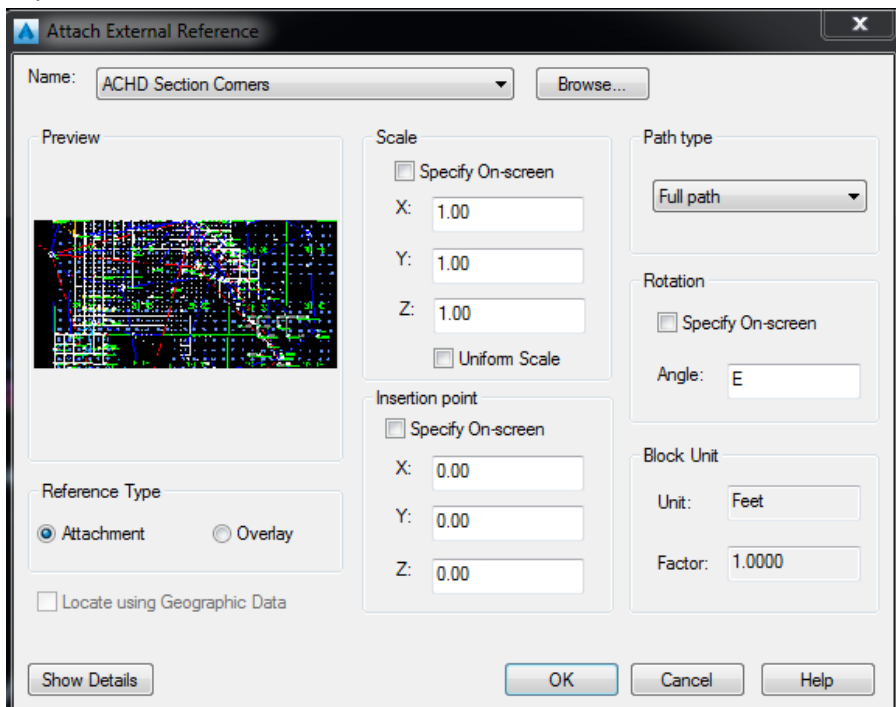
Click the link in the CAD to GIS Procedure section.

The DWG file incorporates Ada County benchmarks from the Ada County Surveying Division in

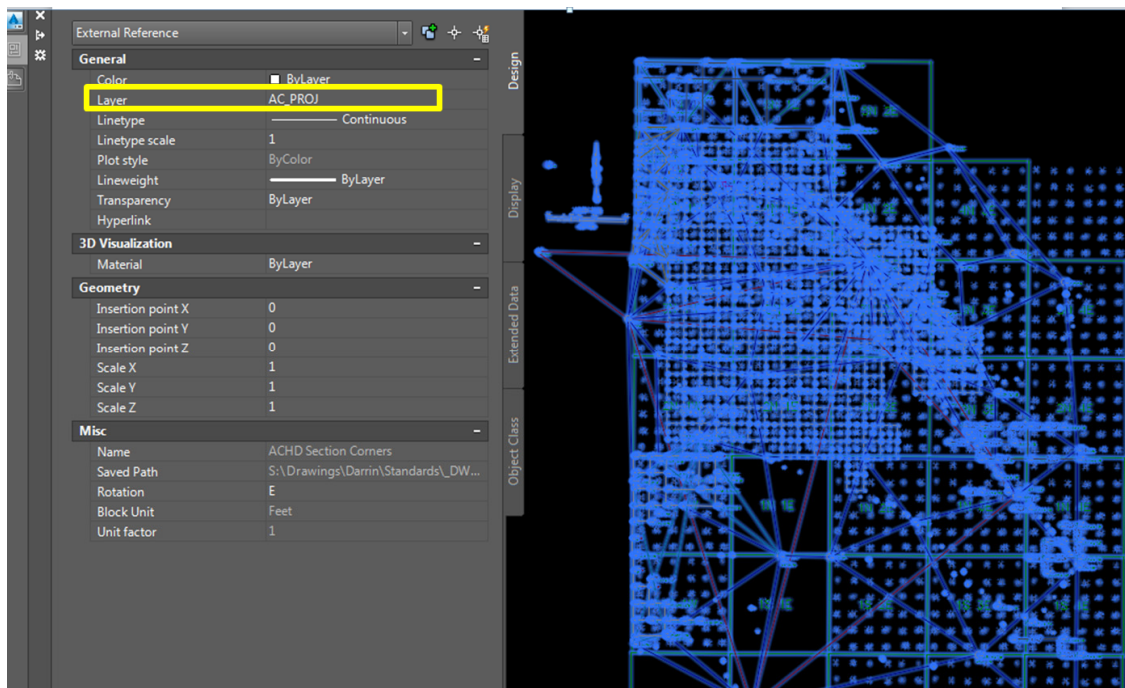
MS Excel format: https://adacounty.id.gov/Portals/0/DVS/SRV/Control/gps_h_vrev.xls

C. Coordinate Projection

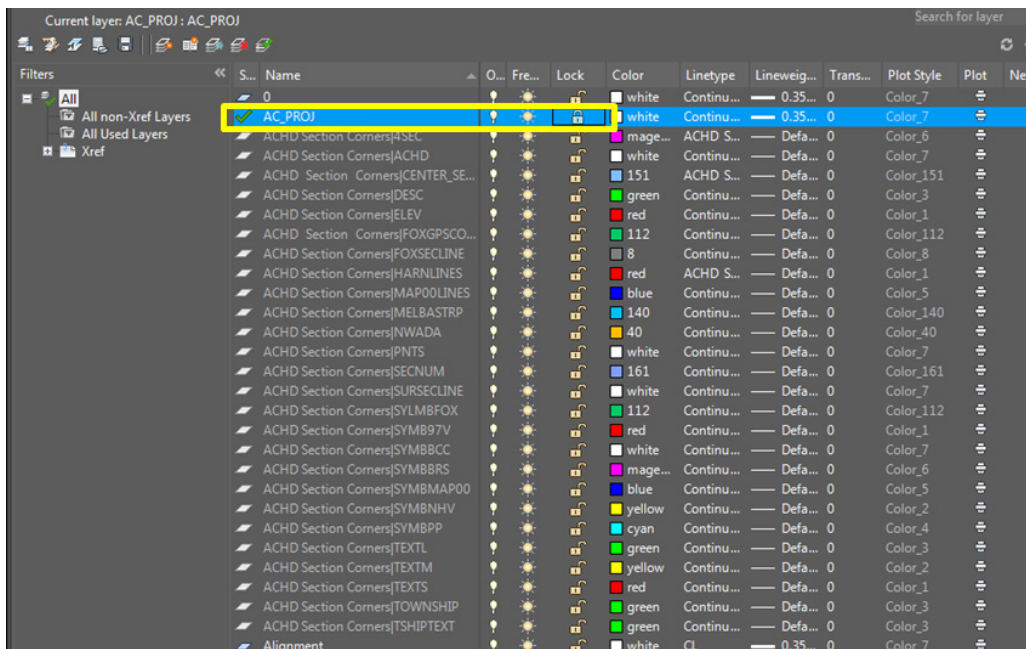
5. Save the base design file as a temporary basemap file (TBF) with the following naming convention <TRS_Sub or Project Name.dwg>. A temp file should be used because the engineer/designer may not want to alter the data in the original design file if coordinates are shifted.
6. Go to Layer Properties.
 - a. Create a layer called "AC_PROJ".
 - b. Set the new AC_PROJ layer as the active layer.
7. Use the XREF command to attach the ACHD Section Corners DWG file into the TBF.
 - a. Browse to the directory where the ACHD Section Corners DWG file is saved and select it.
 - b. Verify Scale is set to X=1, Y=1, Z=1.
 - c. Verify insertion Point is set to X=0, Y=0, Z=0.
 - d. Set Path Type as Full Path.
 - e. Set Reference Type as Attachment.
 - f. Verify Rotation: Angle=E
 - g. Verify Block Unit: Unit=Feet, Factor=1



8. Click OK
9. The ACHD Section Corners file will be inserted into the TBF.
10. Type ZE (Zoom Extents) to view the ACHD Section Corners XREF file.
11. Lock ACHD Section Corners XREF Layers to ensure the data does not get moved in the following tasks.
 - a. Select the ACHD Section Corners XREF block in the TBF.
 - b. Go to Properties to verify the layer the ACHD Section Corners XREF is located on AC_PROJ.



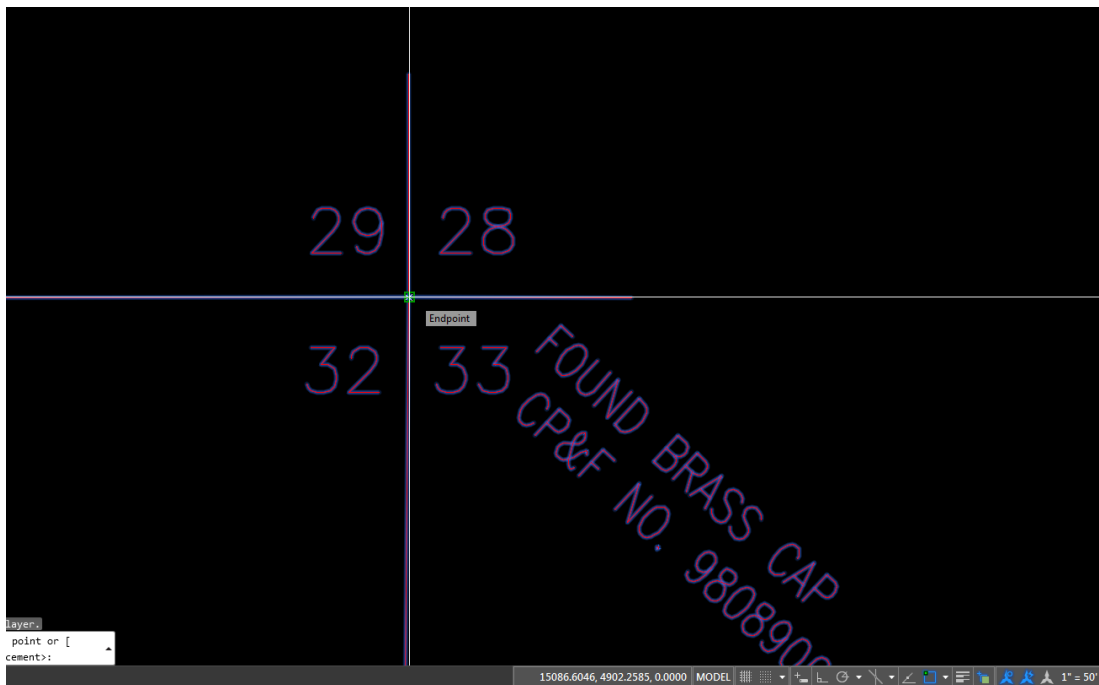
- c. Open the Layer Properties window
- d. Click the Lock on the Lock column for the AC_PROJ layer.



12. Verify all other layers are unfrozen and unlocked. Only the AC_PROJ layer should be locked.

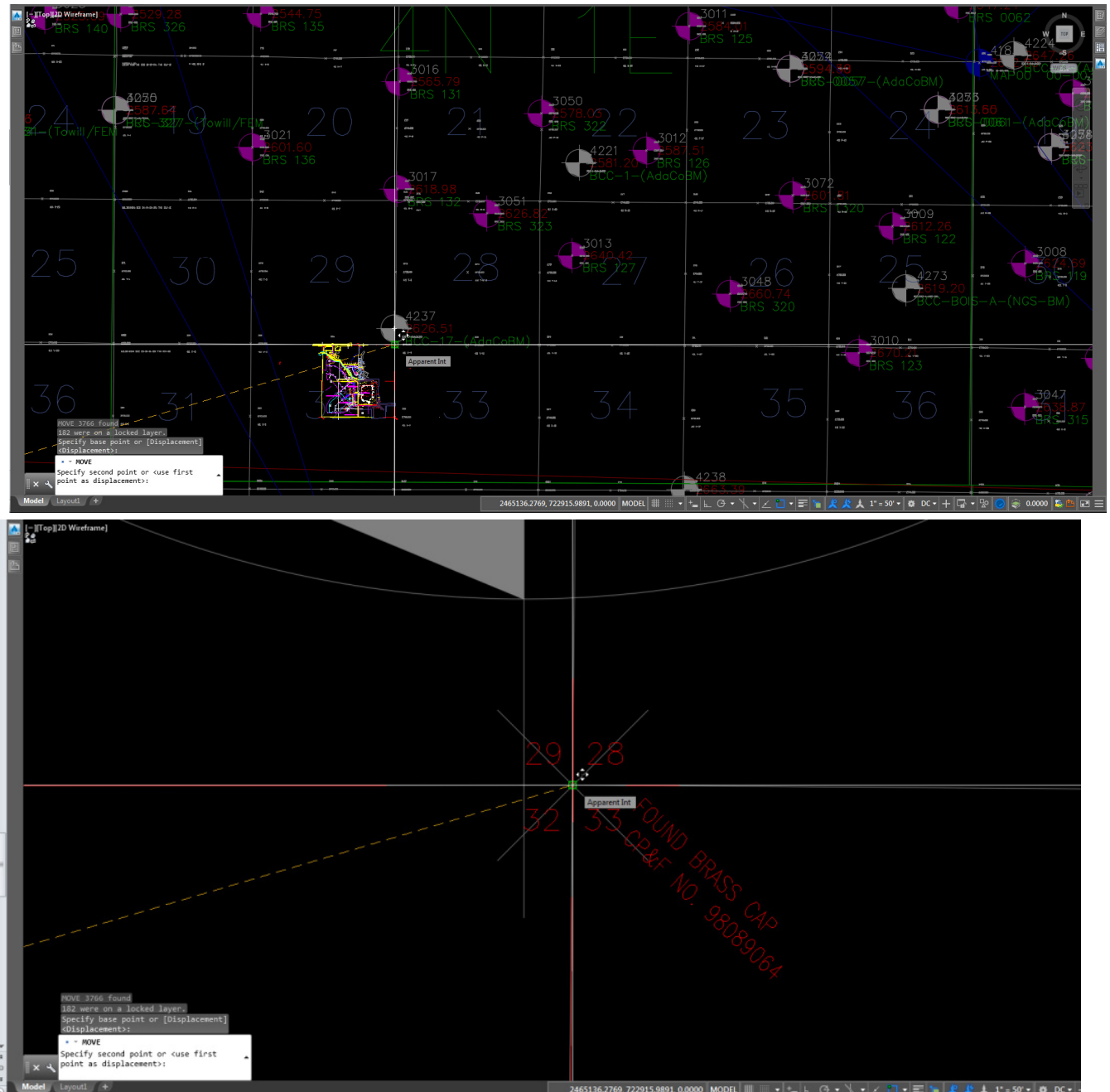
13. Select all items <CTRL> A in the TBF. Note the XREF will also be selected.

14. Enter MOVE command.



15. Select the section corner identified above as the basepoint to move when prompted.

16. Snap the found section corner selected on the MOVE command to the same ACHD section corner in the XREF block.



17. The TBF is now referenced to ACP.

III. DWG CAD FILE EXPORT

18. Repeat the following steps to isolate all CAD features related to these 4 items:

- a. **Storm Drain**
- b. **Irrigation**
- c. **Sidewalk**
- d. **Edge of Pavement (Lip of Gutter)**

Note annotation is not needed. It can be selected from the paper copy and pdf of the record drawings.

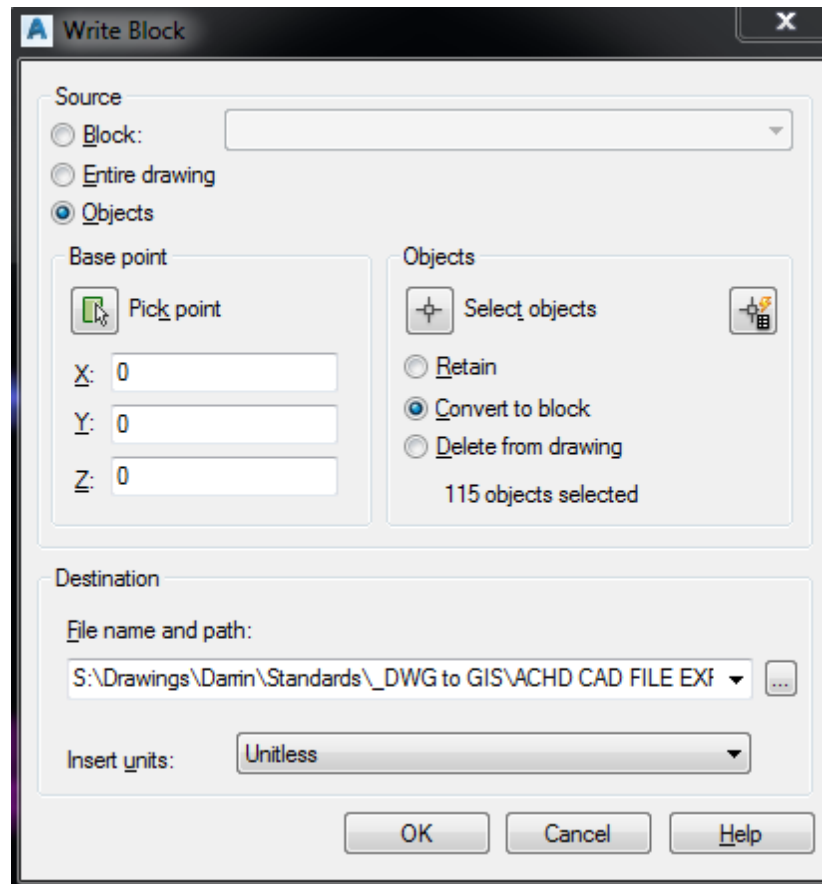
- 1) If all storm drain, irrigation, sidewalk, and edge of pavement (lip of gutter) features are on distinct layers, skip to #19.
- 2) Create a selection set by selecting at least one of each design feature for each item bold item in #18 above.
 - a. Storm drain: pipe, inlet, manhole, sand/grease trap, pond, seepage bed, swale, etc.
 - b. Irrigation: structures (boxes, manholes), pipes
 - c. Sidewalk: Sidewalk, pedestrian ramps. Do not include sidewalk hatch.
 - d. Edge of Pavement (lip of gutter): Edge of Pavement for a rural section, Lip of Gutter for an urban section. If a complete curb/gutter linetype that has lip/flowline/TBC as one line, select it.
- 3) Use the LAYISO command to isolate the layers with the selected features.

19. Use WBLOCK to save the features in the layer or selection set to the filenames shown below.

- a. Select Source as Objects. Select objects when prompted.
- b. Base Point. Verify X=0, Y=0, Z=0
- c. Objects. Convert to Block
- d. Destination. Save with the record drawing files to be provided to ACHD. Use the following naming conventions:

<u>Feature</u>	<u>File Name</u>
Storm Drain	<TRS>_SD_<Project Name>.DWG
Irrigation	<TRS>_IRRIG_<Project Name>.DWG
Sidewalk	<TRS>_Sidewalk_<Project Name>.DWG
Edge of Pavement (lip of gutter)	<TRS>_EP_<Project Name>.DWG

- e. Insert Units. Select Unitless



20. If prompted to include AutoCAD Map information in the export select “Yes.”

21. The Coordinate Projection to ACP and DWG Cad File Export is complete. Submit the 4 above files on CD to ACHD along with the record drawing submittal.

Name	Date modified	Type	Size
04N01E32_EP_Zebulon Village 1	10/21/2016 2:00 PM	AutoCAD Drawing	73 KB
04N01E32_IRRIG_Zebulon Village 1	10/21/2016 2:12 PM	AutoCAD Drawing	78 KB
04N01E32_SD_Zebulon Village 1	10/21/2016 1:50 PM	AutoCAD Drawing	77 KB
04N01E32_Sidewalk_Zebulon Village 1	10/21/2016 2:03 PM	AutoCAD Drawing	78 KB

For any questions regarding GIS imports, contact Gail Jorgenson, GIS Analyst, at 387-6388 or gjorgenson@achdidaho.org.

For questions regarding DWG conversion, contact Darrin Carroll, Design Engineer, at 387-6183 or dcarroll@achdidaho.org.