

Creating 3D Models from 2D Scanned Data

AutoCAD Raster Design / AutoCAD Civil 3D

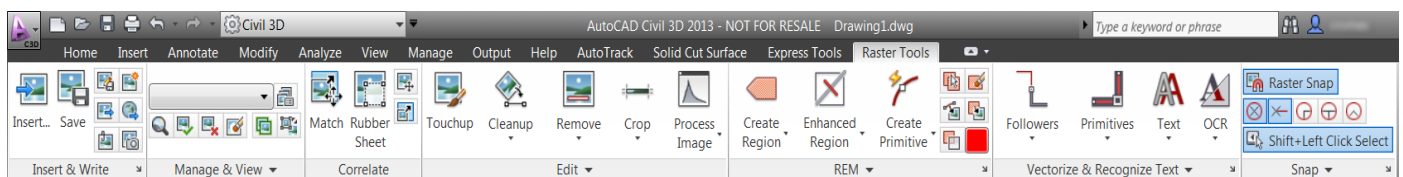
Civil Engineers, designers, drafters & technicians working on transportation land development & water projects

A common problem within the AEC industry is how to utilise 2D paper drawings in an electronic drawing environment. With the shift in the industry towards 3D modelling, this question has naturally evolved to “How can I convert a 2D paper drawing into a 3D model?”

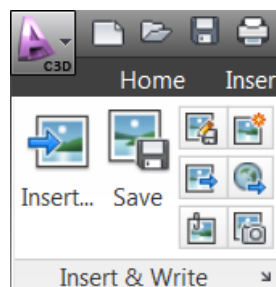
The Autodesk Infrastructure Design Suite (IDS) and in particular AutoCAD Raster Design and AutoCAD Civil 3D, provides that very solution. This whitepaper will guide you through a worked example of how you can utilise the tools provided within AutoCAD Raster Design to take a 2D paper drawing and create electronic line work to convert into 3D.

AutoCAD Raster Design will be used to import an image file into a familiar AutoCAD environment. Raster Design software provides tools to clean up, edit, enhance and maintain scanned drawings and plans easily.

The raster tool set can be utilised within both the AutoCAD and AutoCAD Civil 3D interface.



Selecting the **Insert** button on the **Insert & Write** tab will enable you to browse to your image file.



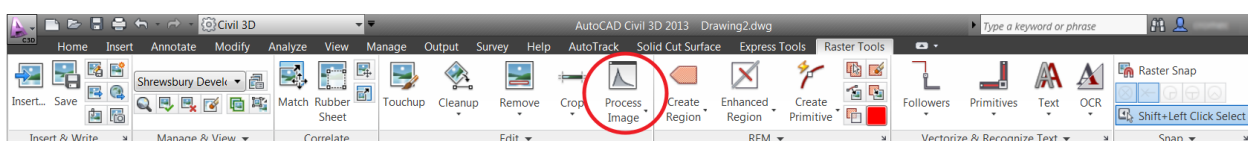
The image file that I will be using to convert is a coloured jpeg, which represents a conceptual development plan showing proposed plot boundaries, watercourses and road layouts combined with existing building footprints.



The data that I wish to extract and convert into AutoCAD entities are the proposed plot boundaries and the proposed watercourses.

My first action needs to be changing the colour density of the image to bitonal, meaning that the image will consist of one background colour and one foreground colour. The desired result is to have the background colour the same colour as my AutoCAD model space background colour (black in my case), which will mean my desired plot and watercourse boundaries will stand out in the foreground as white raster lines.

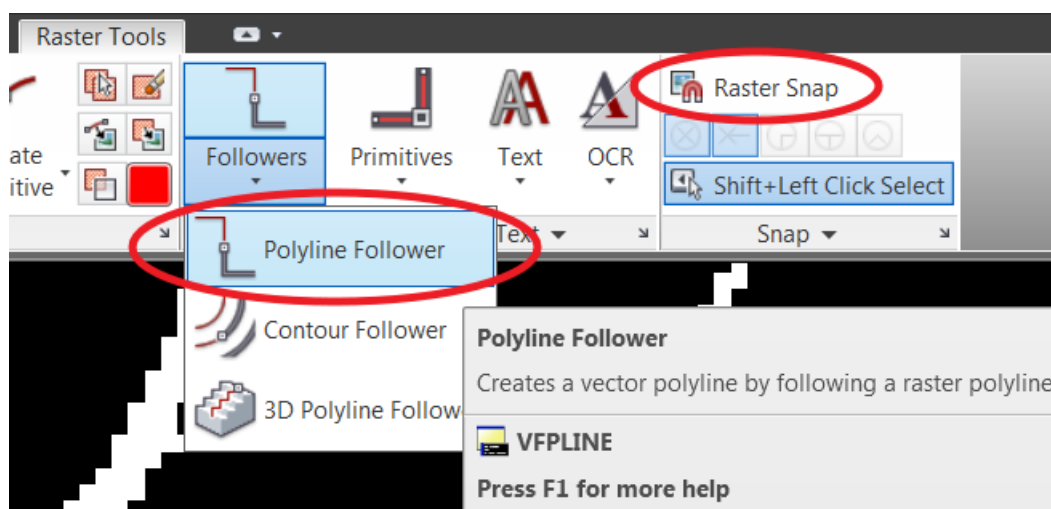
To apply bitonal colours to my image I select the Process Image in the raster tool ribbon.



The image has now been suitably adjusted to allow line work extraction.



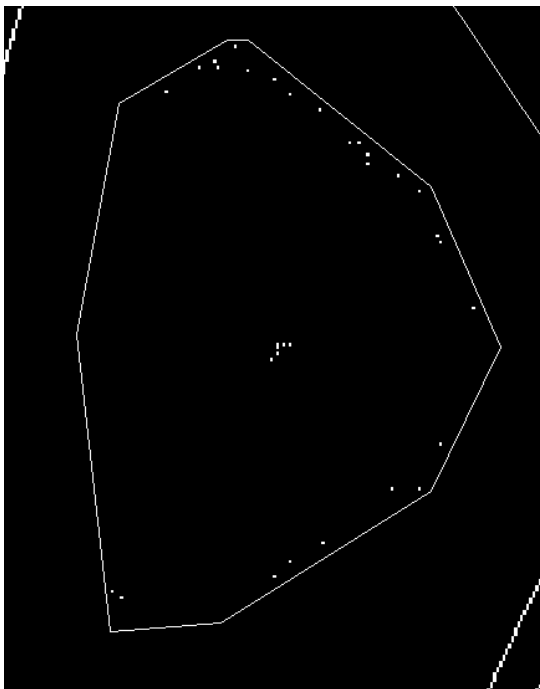
Now, using a combination of Raster Snap and Polyline Follower we can start to convert the raster line work into AutoCAD polylines.



With the raster snap initialised during the polyline follower command it will enable you to snap to each raster line, much like you can snap to standard AutoCAD entities.



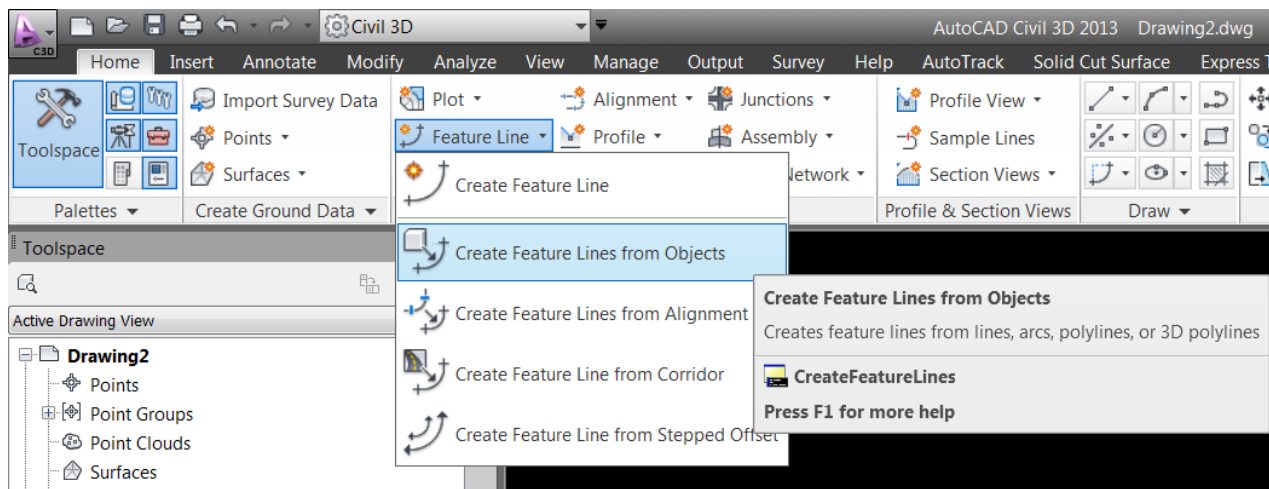
There is the opportunity to convert the raster lines manually by tracing over them with the follower command or to automate the conversion for closed boundaries such as the one shown below. Snap to one part of the closed raster boundary and the entire boundary will be converted to a polyline.



Proceeding through the image converting all the relevant data using the aforementioned process will leave you with all of your AutoCAD line work in 2D. Notice that you are actually converting and replacing the raster data with AutoCAD data, rather than just tracing over the raster image with polylines.

Converting the line work to 3D couldn't be easier using AutoCAD Civil 3D feature lines.

Use the Create Feature Line from Object option in the Create Design panel of the Civil 3D workspace to convert existing AutoCAD elements into feature lines.



With your line work converted to feature lines, you can now use the level editor to design 3D levels to your geometry points.

