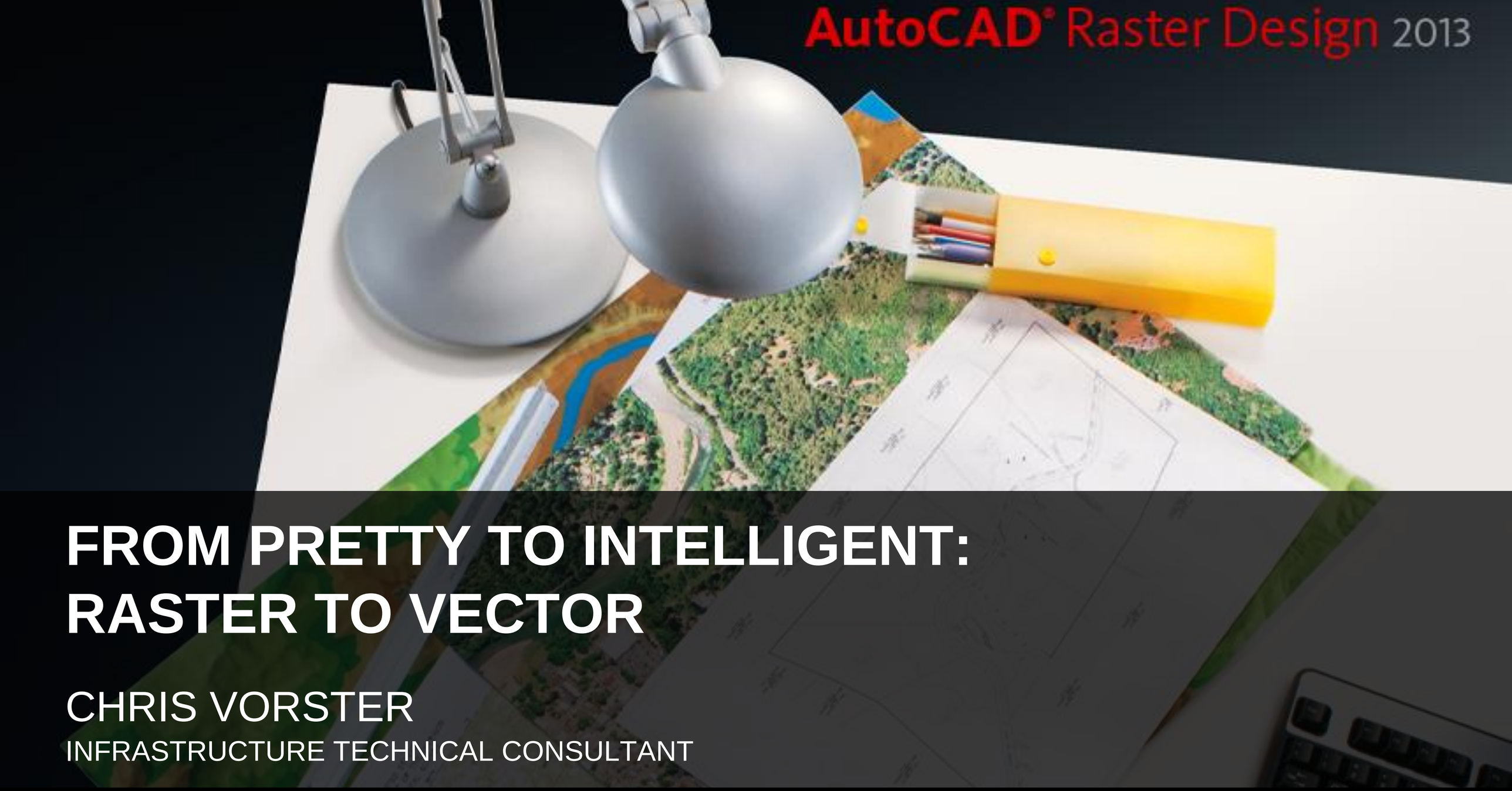


FROM PRETTY TO INTELLIGENT: RASTER TO VECTOR

CHRIS VORSTER
INFRASTRUCTURE TECHNICAL CONSULTANT

About the speaker:

- Technical consultant at Prokon Software Consultants (South Africa)
- 10 successful years doing structural detailing in South Africa
- 6 years programming experience on stand-alone and Autodesk add-on applications
- Expertise at PROKON lies with Autodesk Civil Industry technical support consultations, training on PROKON and Autodesk products, and programming PROKON add-ons for Autodesk products

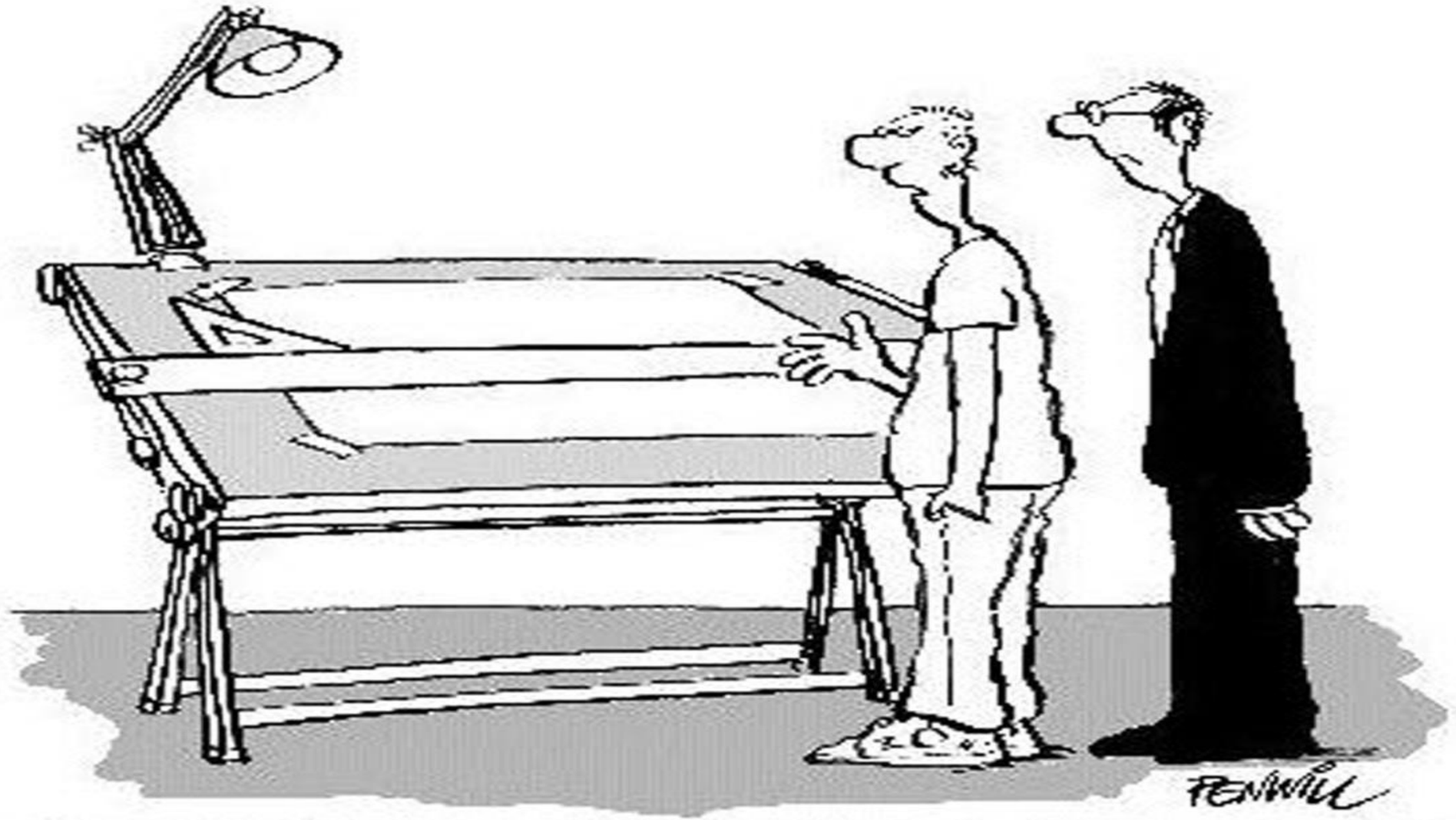
Class Summary

This class will show you how to use AutoCAD® Raster Design 2013 on AutoCAD® 2013 to convert poor quality scanned images to intelligent AutoCAD entities. You will learn to insert, optimize, and convert raster images to vector data using AutoCAD 2013.

Learning Objectives

At the end of this class, you will be able to:

- Explain the 3 main image types in AutoCAD® Raster Design 2013
- Optimize and edit raster images for vectorization using AutoCAD® Raster Design 2013
- Convert Raster data to Vector data using AutoCAD® Raster Design 2013
- Use AutoCAD® Raster Design 2013 OCR to convert raster text to AutoCAD® text (or Mtext)

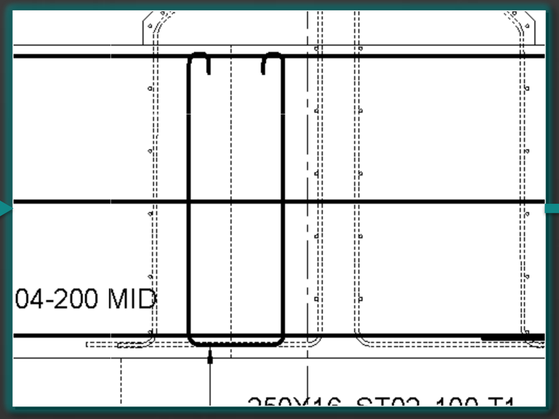


"I HAVEN'T MUCH EXPERIENCE OF SUCH AN EARLY VERSION OF AUTOCAD"

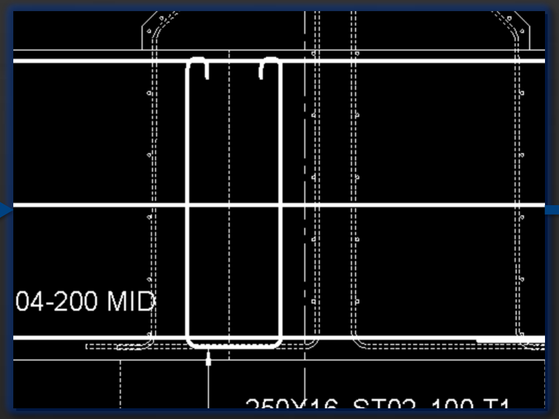
The 3 main image types in AutoCAD Raster Design 2013

Image Types

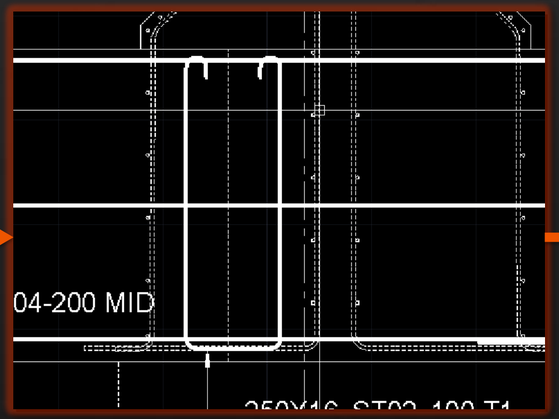
- Bitonal
- Grayscale
- Color



Raster Information	
Entity name	SAMPLE 1
File type	PNG
File size	53 KB
Created	11/9/2012 11:30 AM
Last modified	11/9/2012 11:30 AM
Density	78.740 pixels/centimeter
Color depth	1 bits/pixel
Color type	Bitonal
Pixel width	1557
Pixel height	2258
Editable	Yes
Saveable	Yes



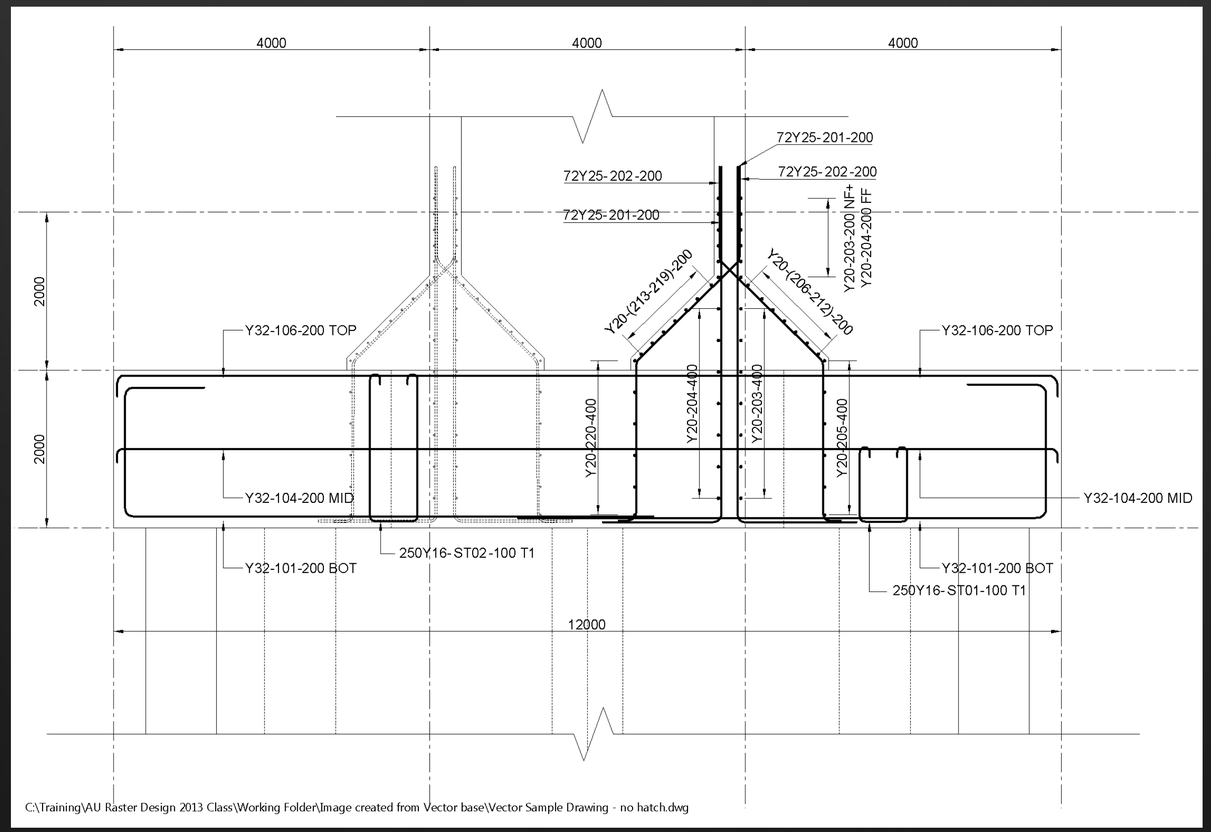
Raster Information	
Entity name	SAMPLE 1
File type	PNG
File size	53 KB
Created	11/9/2012 11:30 AM
Last modified	11/9/2012 11:30 AM
Density	78.740 pixels/centimeter
Color depth	8 bits/pixel
Color type	Grayscale
Pixel width	1557
Pixel height	2258
Editable	Yes
Saveable	Yes



Raster Information	
Entity name	SAMPLE 1
File type	PNG
File size	53 KB
Created	11/9/2012 11:30 AM
Last modified	11/9/2012 11:30 AM
Density	200.000 pixels/inch
Color depth	32 bits/pixel
Color type	Color
Pixel width	1557
Pixel height	2258
Editable	Yes
Saveable	Yes

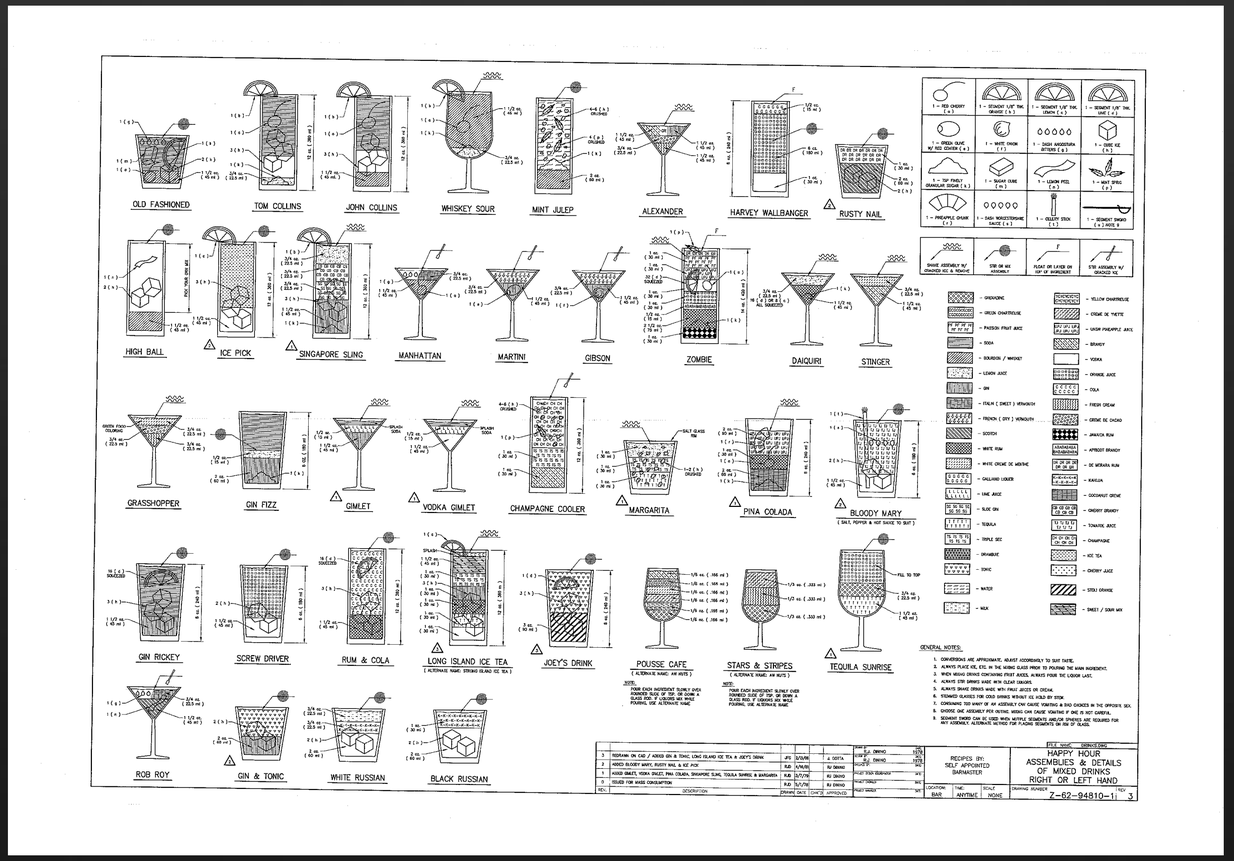
Images used in this class

- PNG format Image created from AutoCAD
- Similar to high quality scanned image



Images used in this class

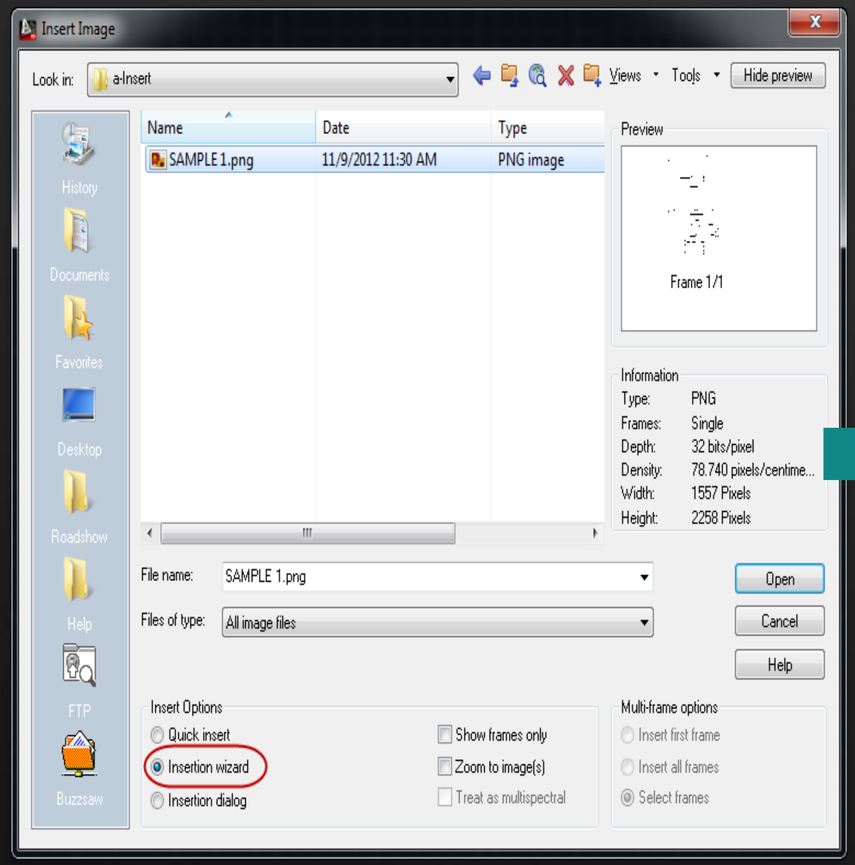
- Scanned image, converted from PDF format to a raster format (PNG)
- Image is of poor quality

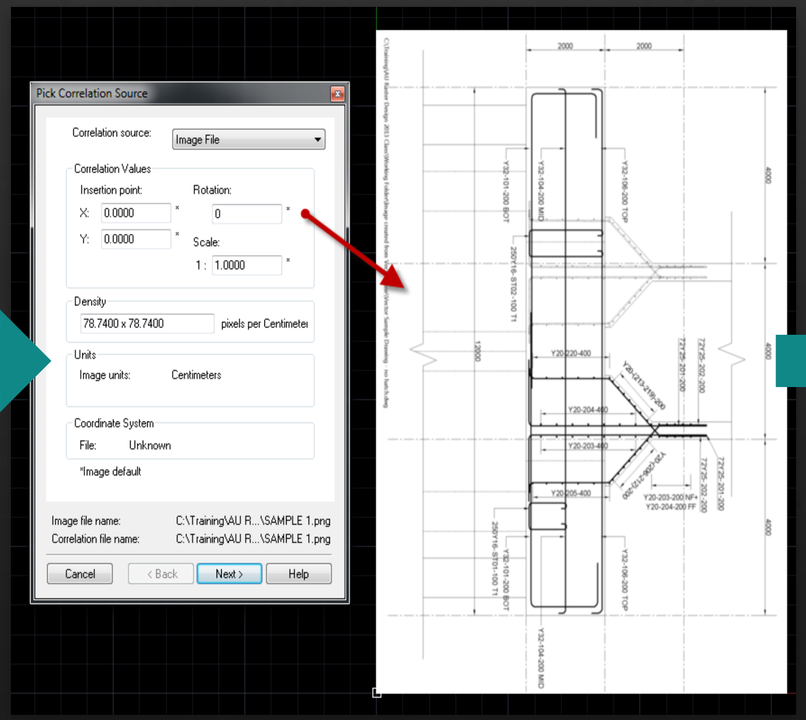


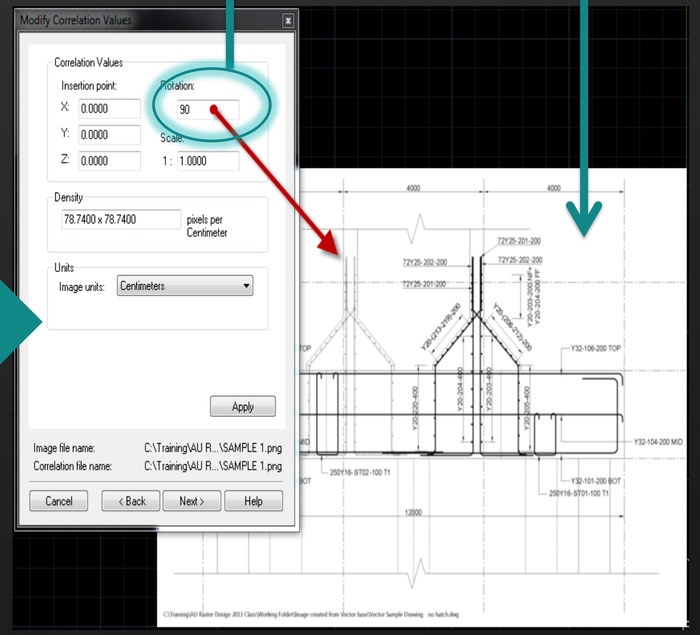
Optimize and edit raster images for vectorization using AutoCAD® Raster Design 2013

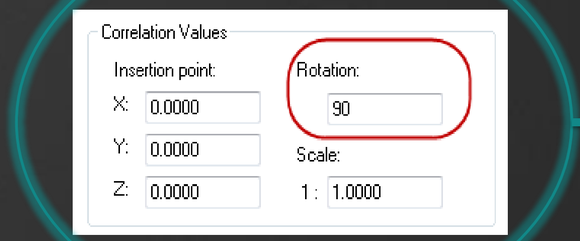
Inserting the image

- Insertion wizard is used to correlate images



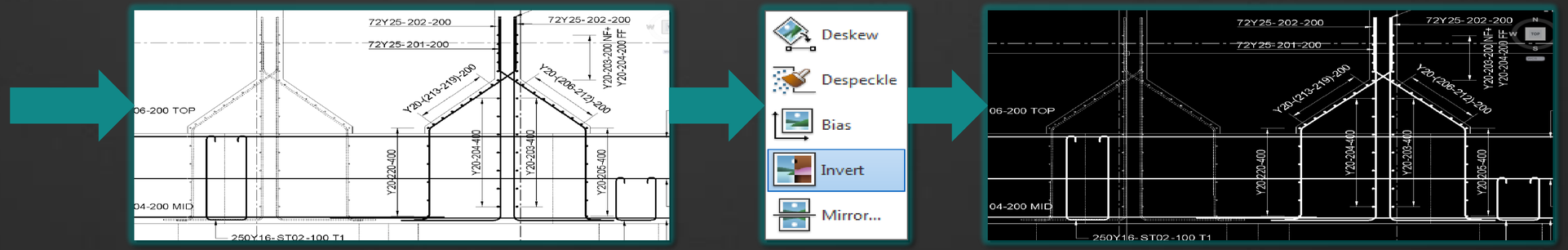




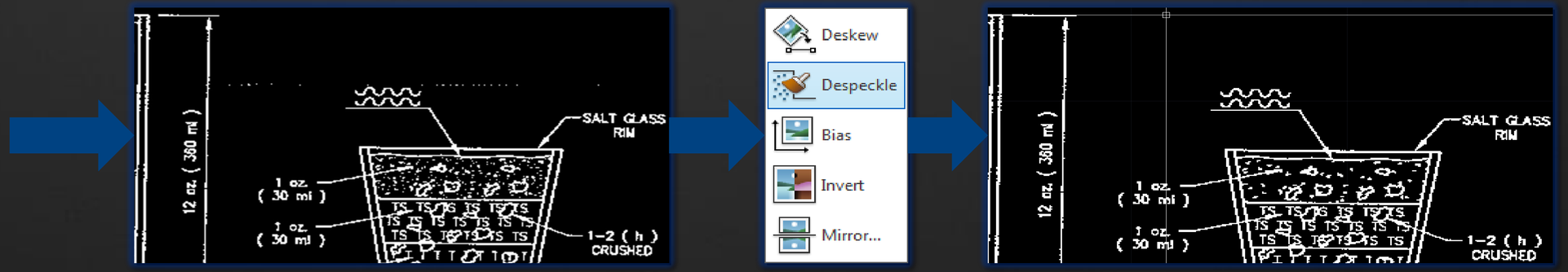


“Cleaning” the image

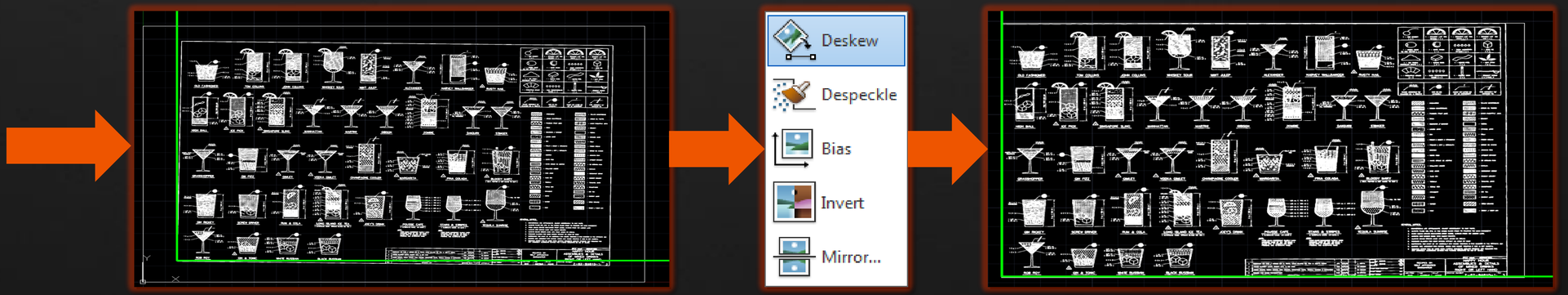
- Invert



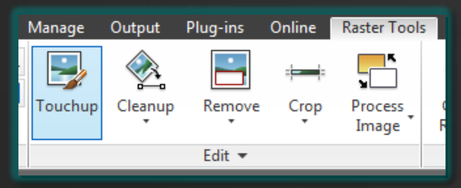
- Despeckle



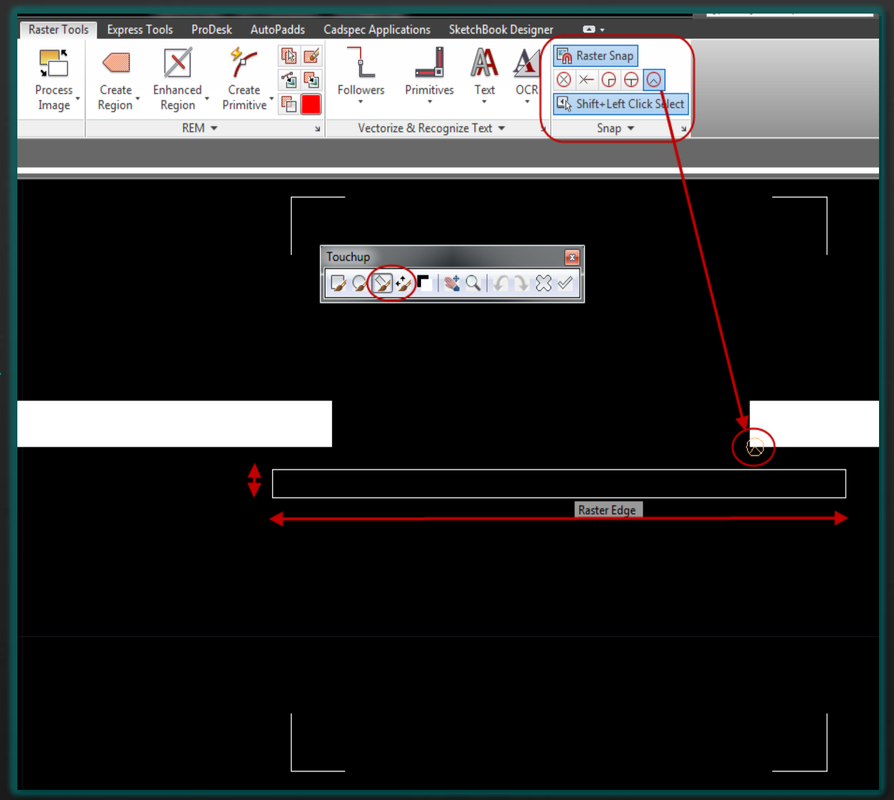
- Deskew

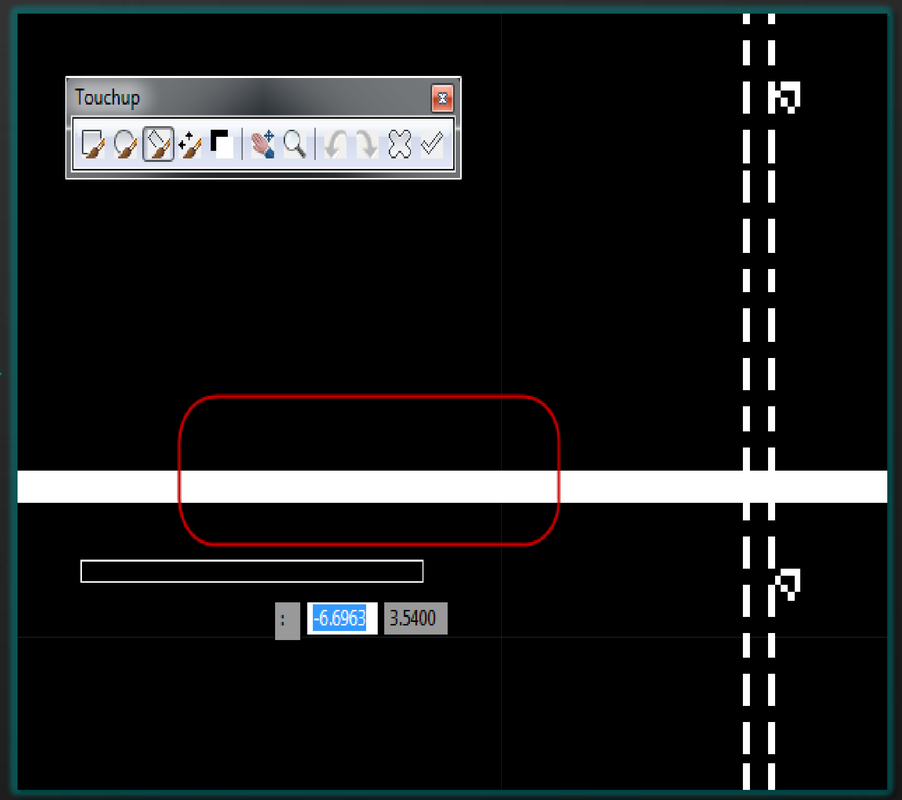


Additional cleanup tools

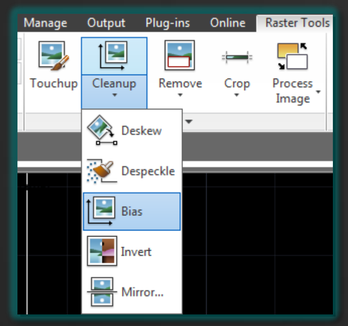


- Touchup

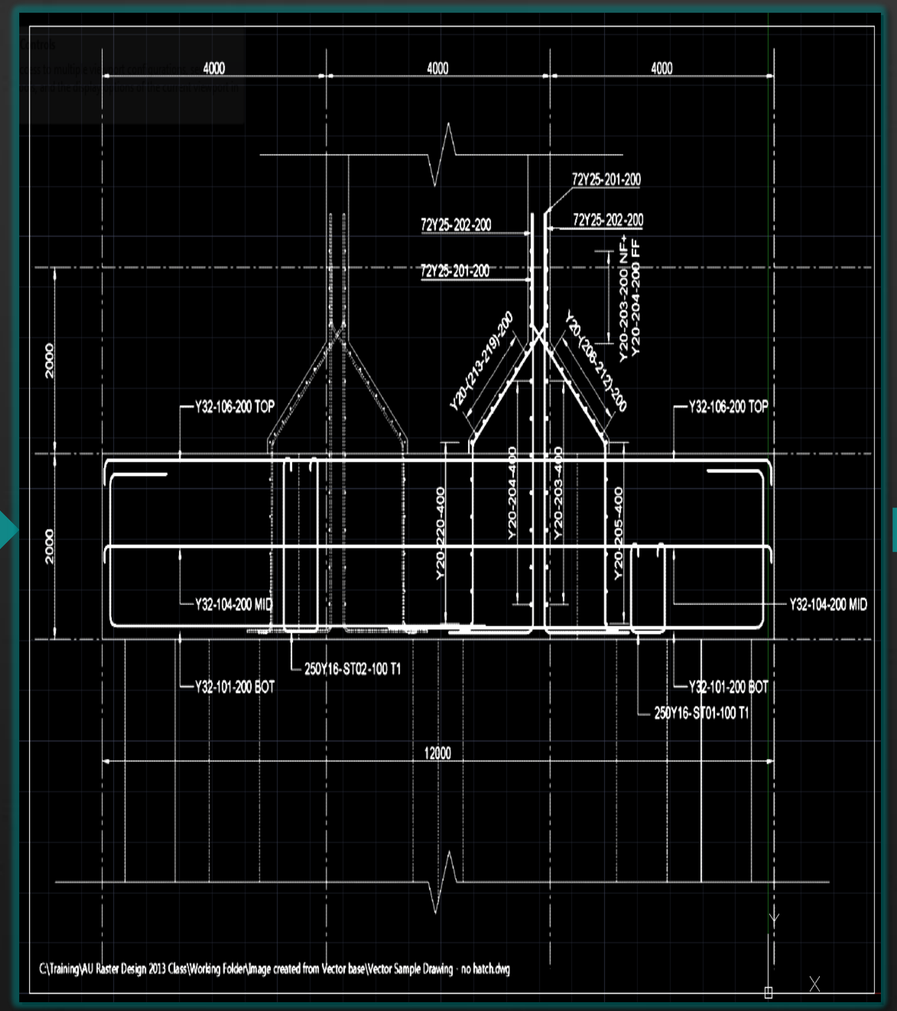


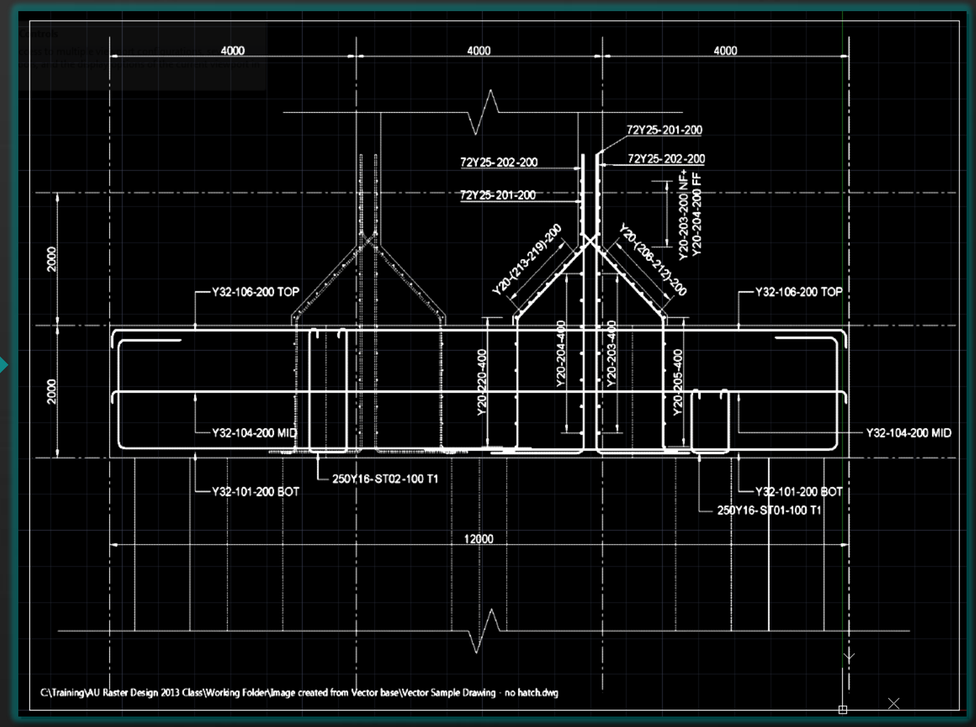


Additional cleanup tools



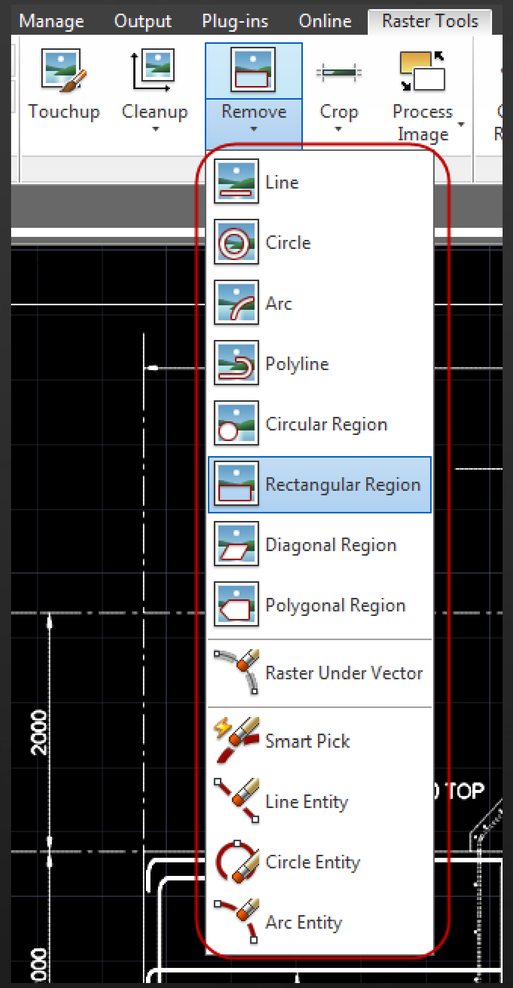
- Bias





Additional cleanup tools

- Remove unwanted regions
- Crop image



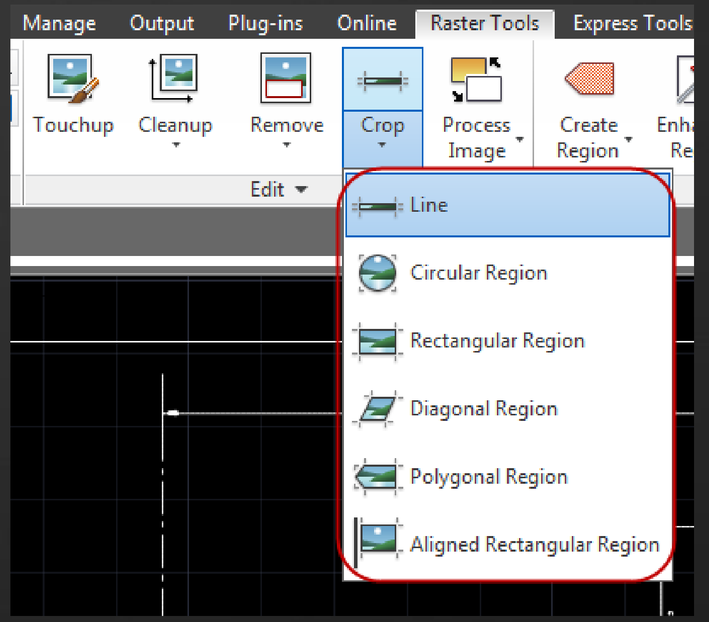
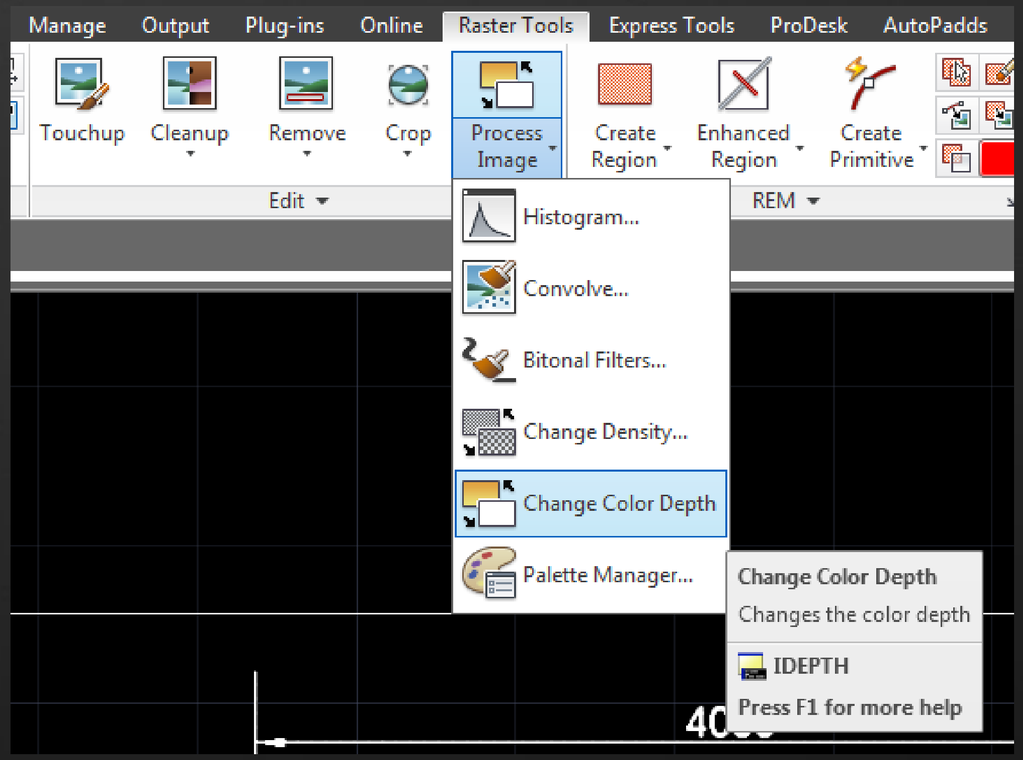
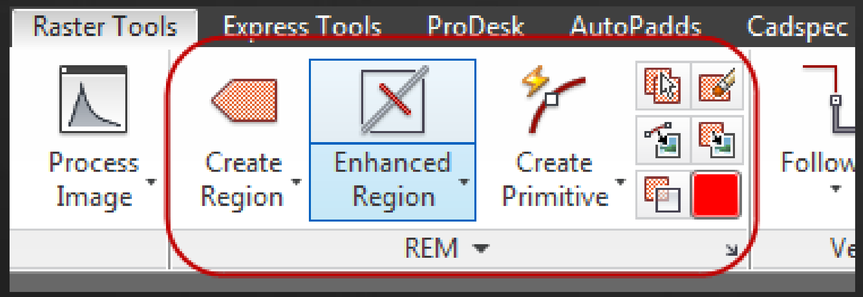


Image processing

- Change color depth of image to Bitonal
- Additional Bitonal filters can be used



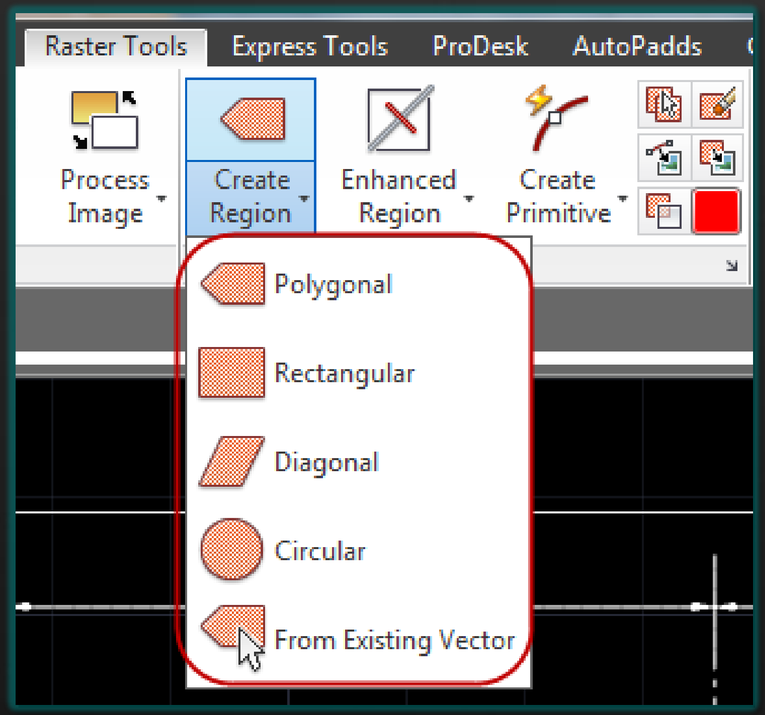
Raster Entity Manipulation (REM)

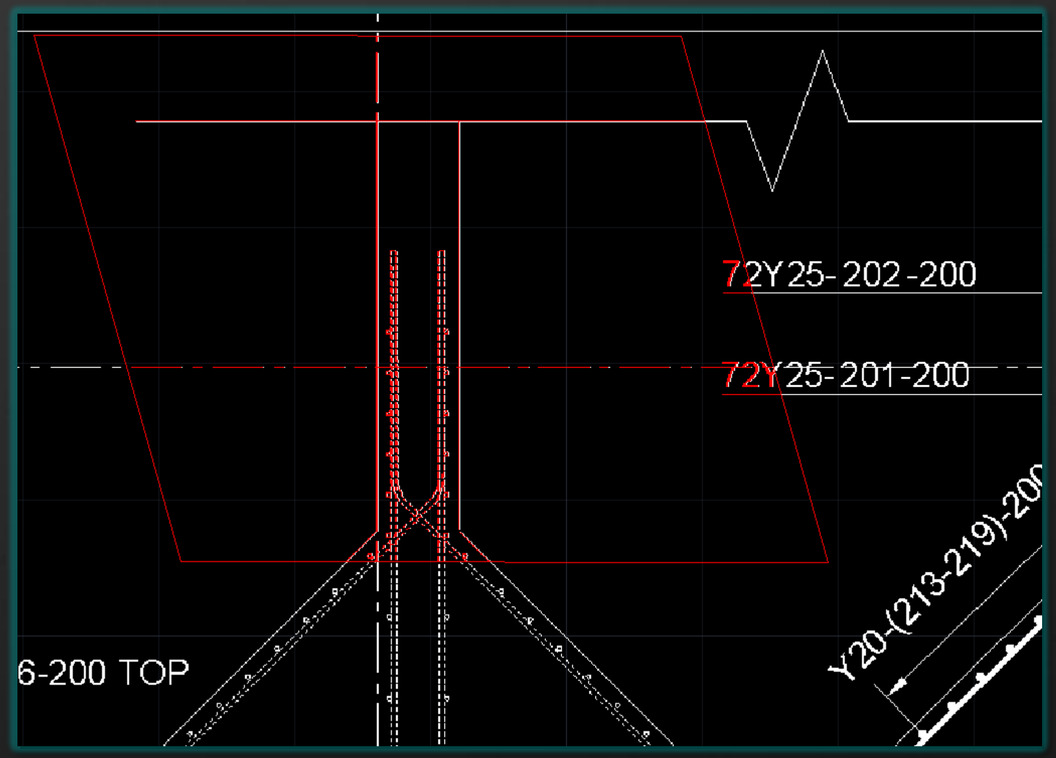


- Used with Bitonal images only
- Creates advanced raster entities enabling CAD-like modifications
- Traces and replaces existing pixels (Primitives)
- Knife, smooth, trim, extend, fillet, offset (Primitives)

Creating REM regions

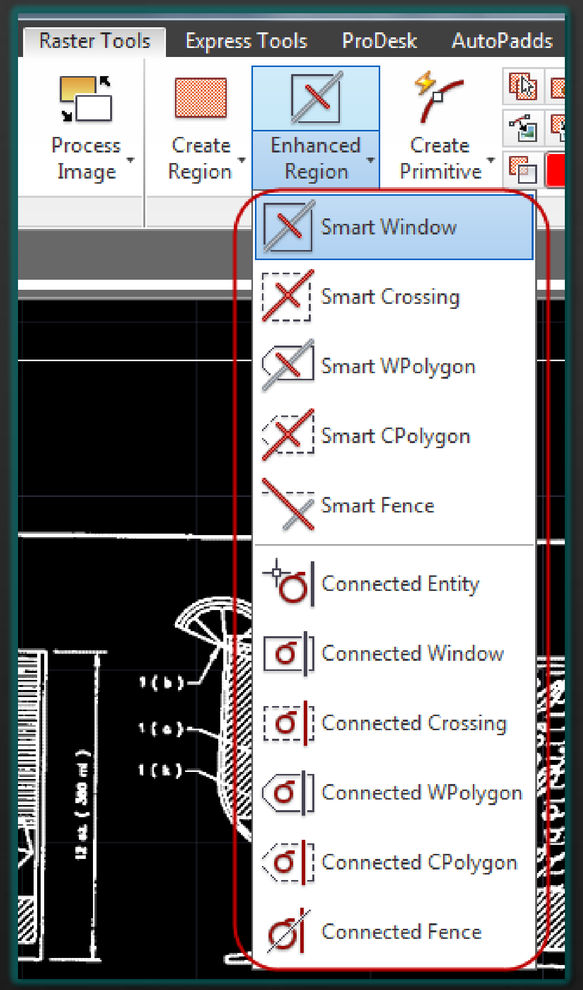
- Window crossing type selection
- Can use existing polylines

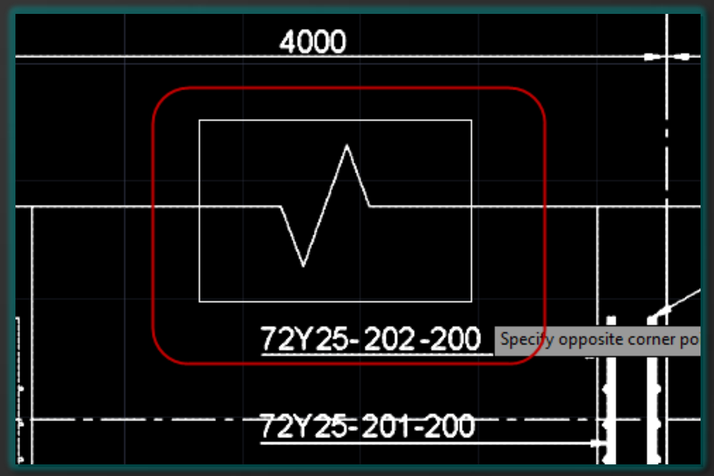


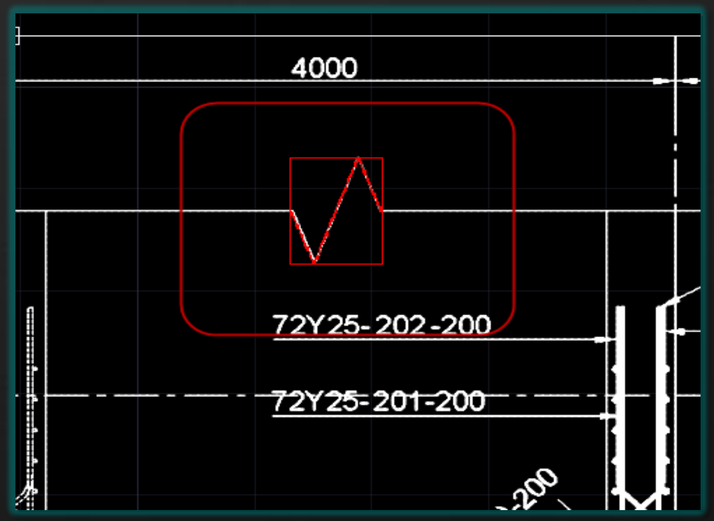


Creating Enhanced REM regions

- Window
- Crossing
- Connected entities





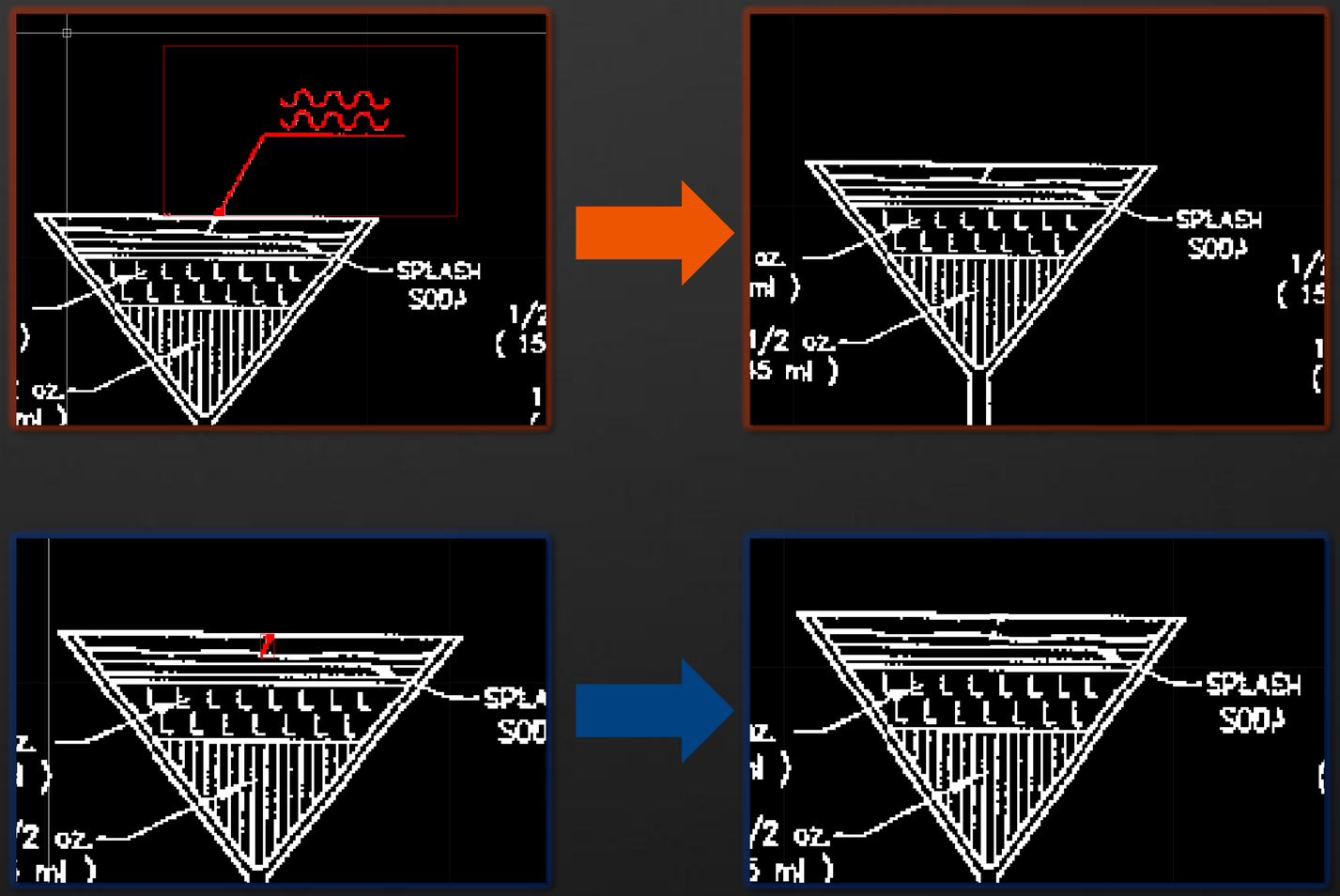


Working with REM objects

- Copy, rotate, scale, delete or move REM objects
- Create primitives to identify and alter rasters
- Merge primitives back to raster
- Edit Primitives

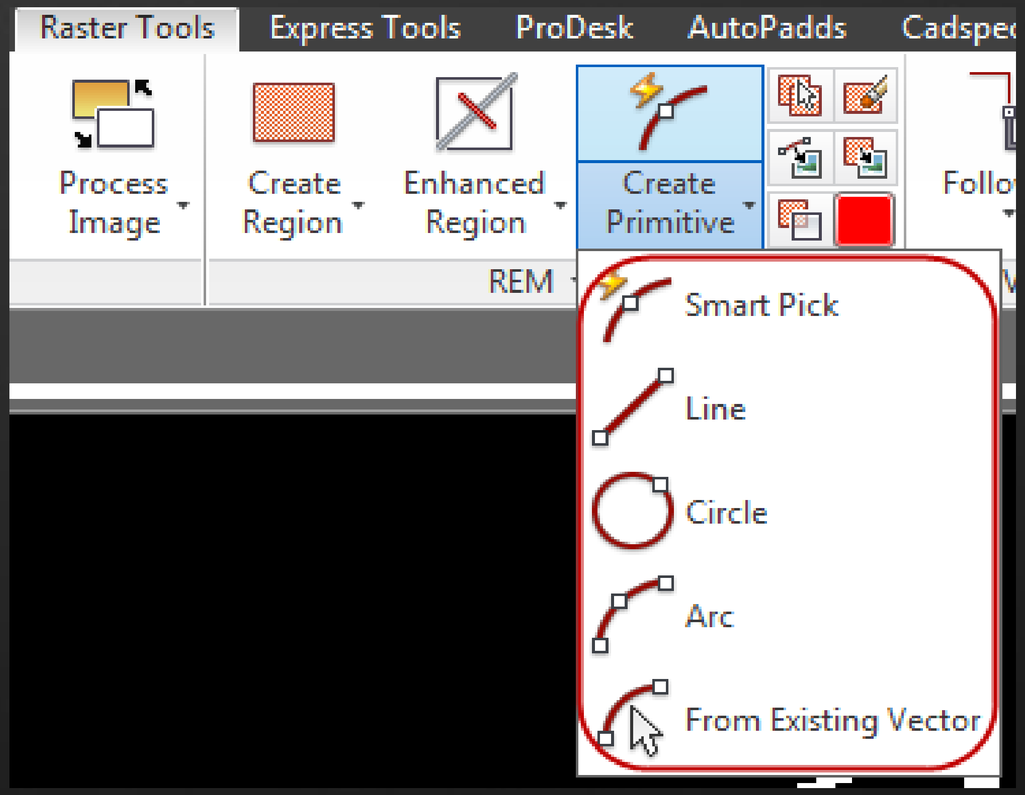
Working with REM objects

- Identify 2 possible methods of specifying REM regions to delete the pixels as shown



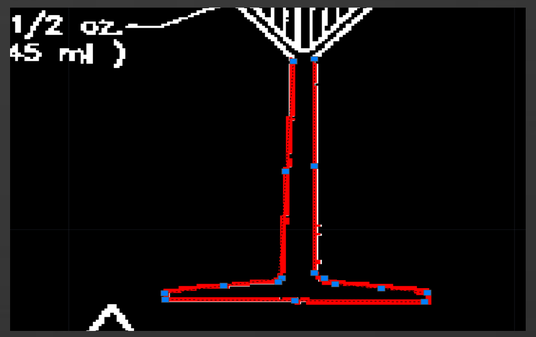
Working with REM objects

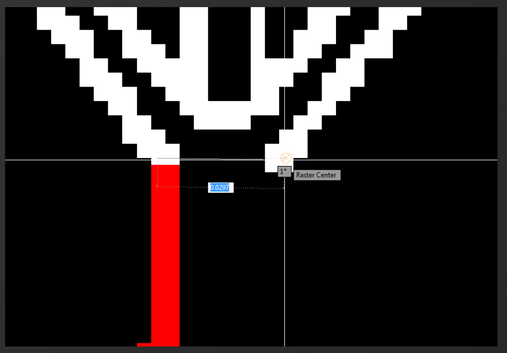
- Lines, Circles and Arcs
- Smart pick to identify automatically
- From existing vector*

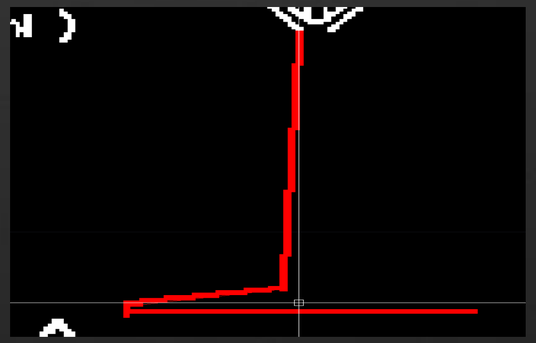


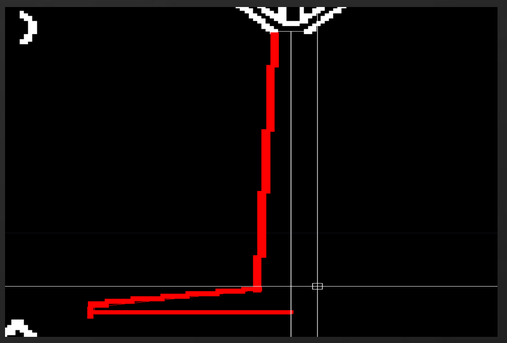
Performing REM editing

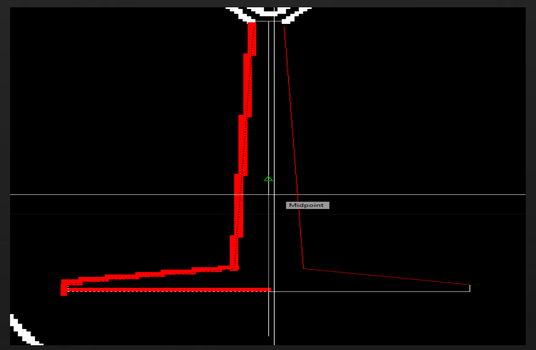
- Create primitives
- Delete pixels
- Edit primitives
- Create AutoCAD entities
- Complete primitive editing

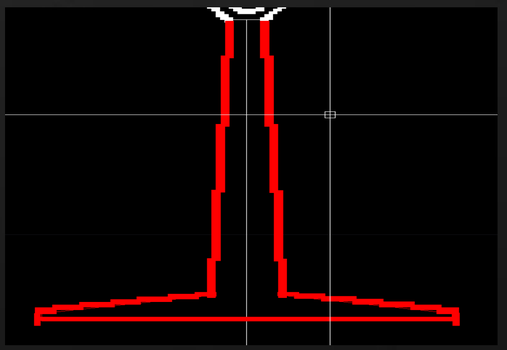






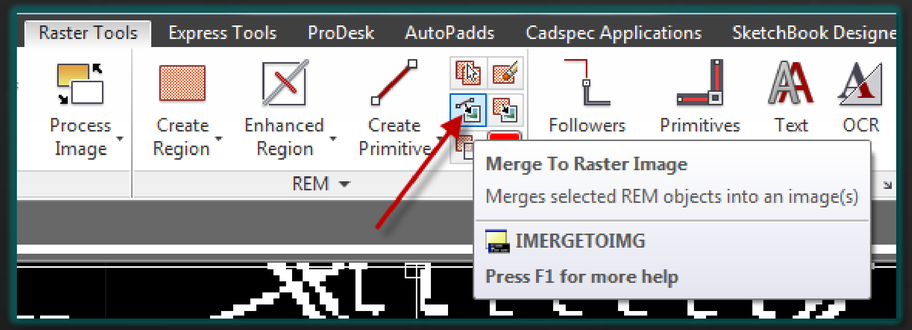


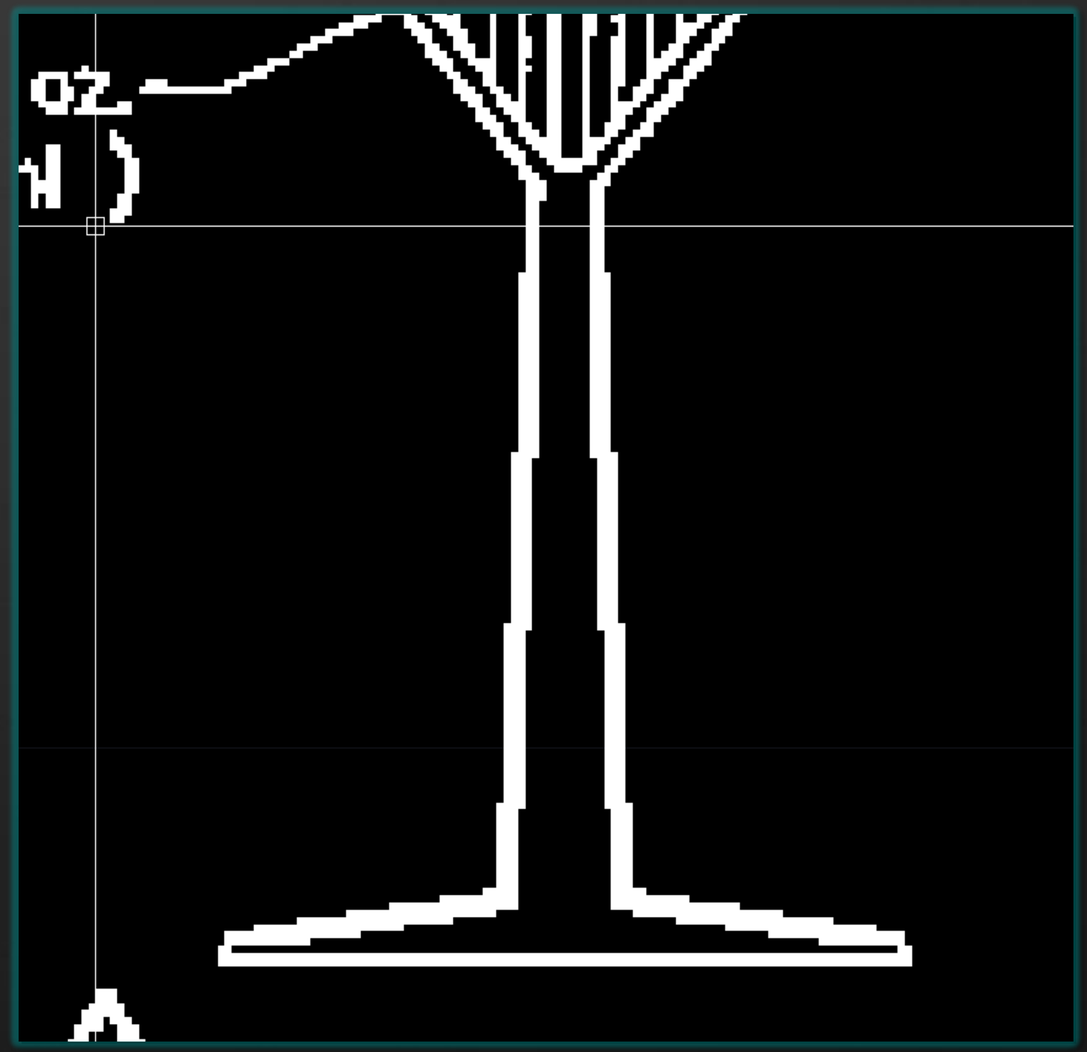




REM editing results

- Improved raster = better vector recognition

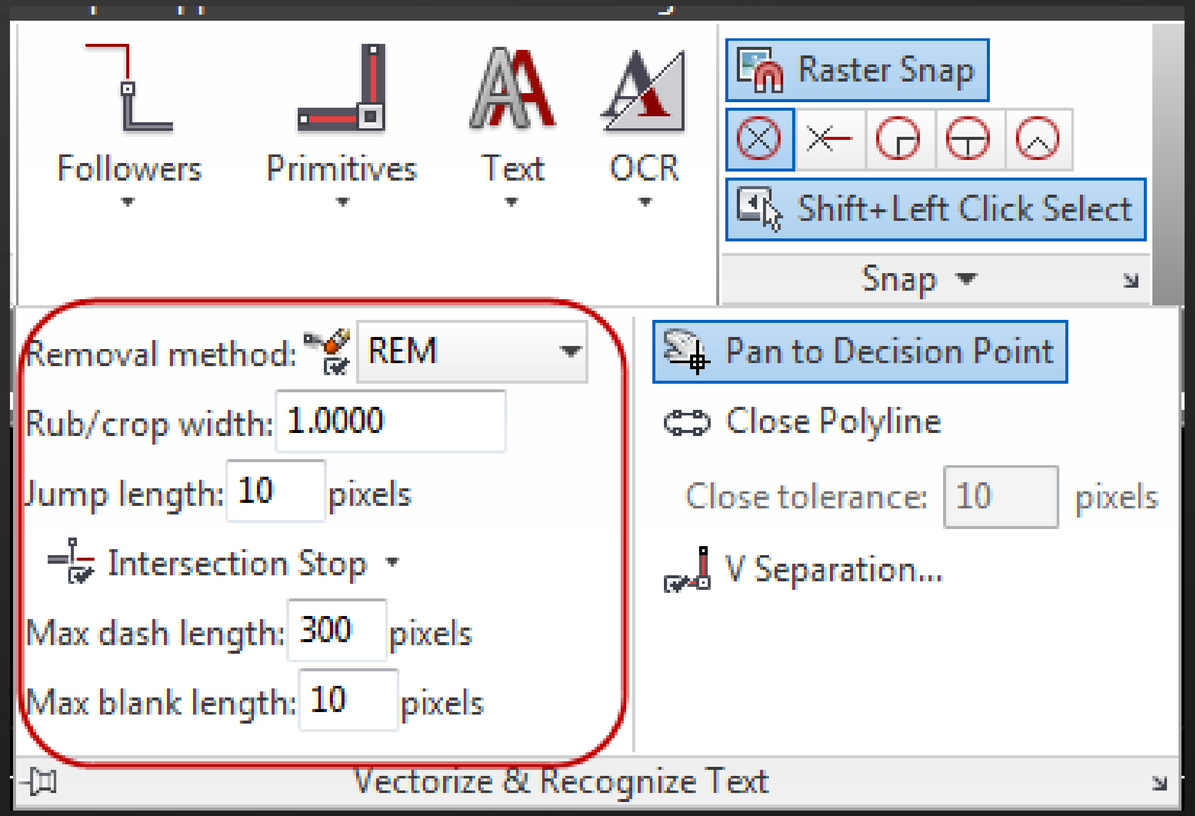




Convert Raster data to Vector data using AutoCAD® Raster Design 2013

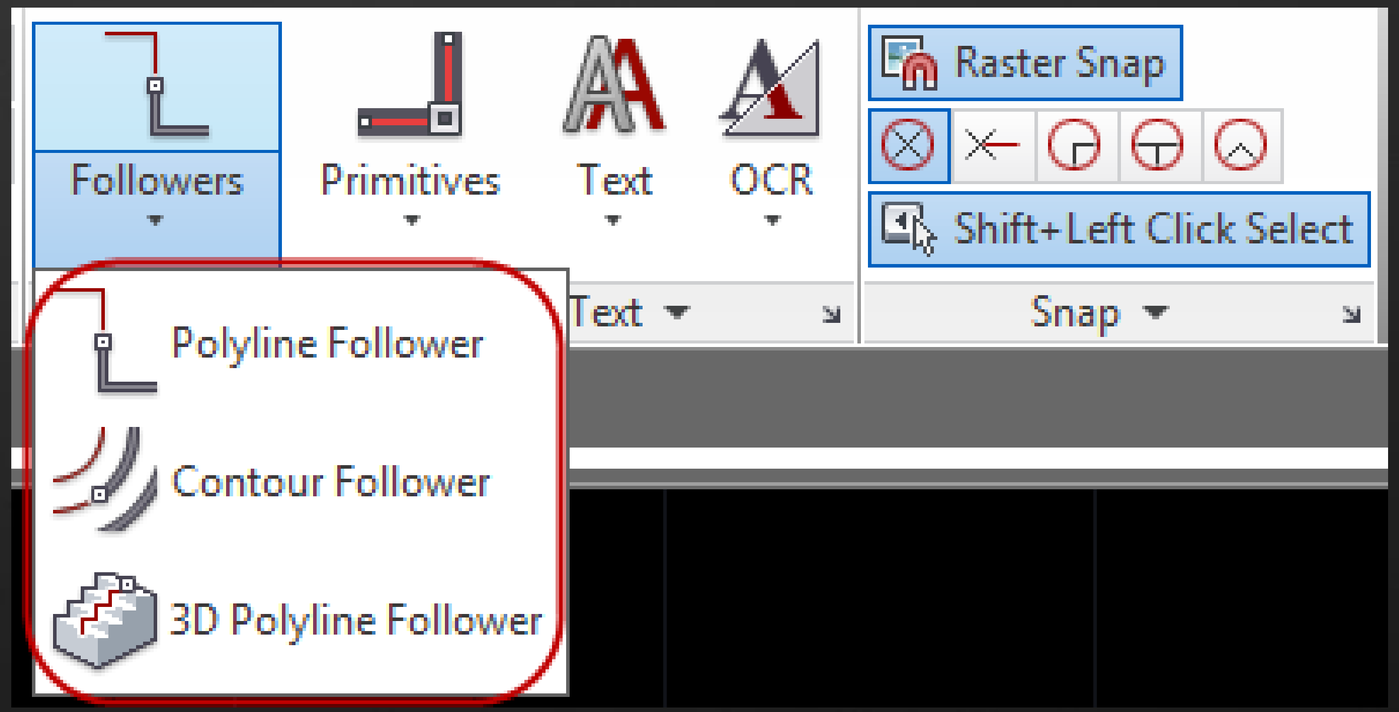
Creating vectors from the raster

- REM, NONE or RUB
- Followers and primitives



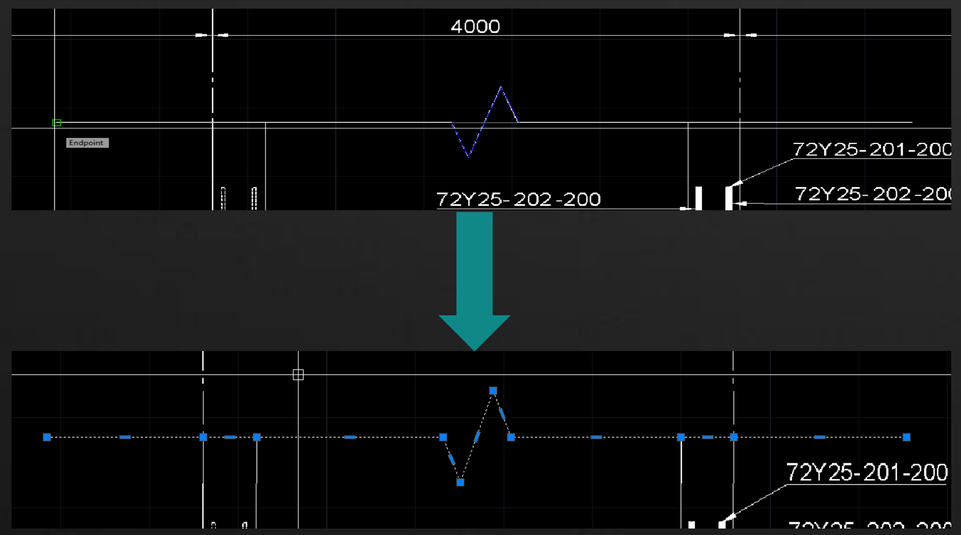
Using followers to create vectors

- Polyline and contour followers
- 3D Polyline followers with prompt for elevations at characteristic points

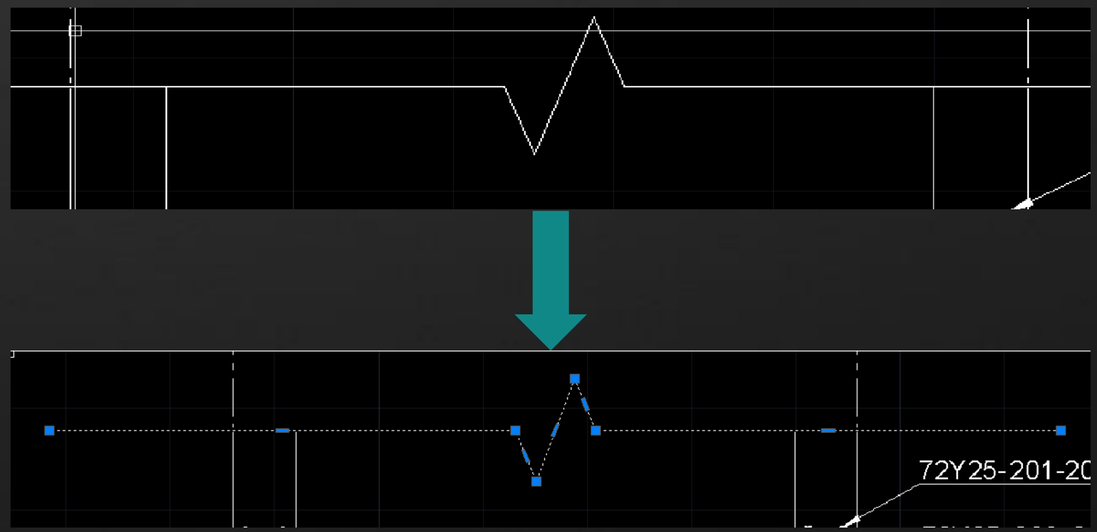


Using followers to create vectors

- Use knife to separate pixels for better followers

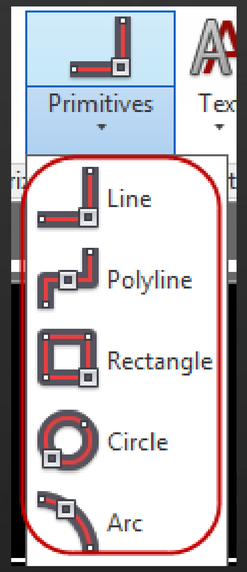


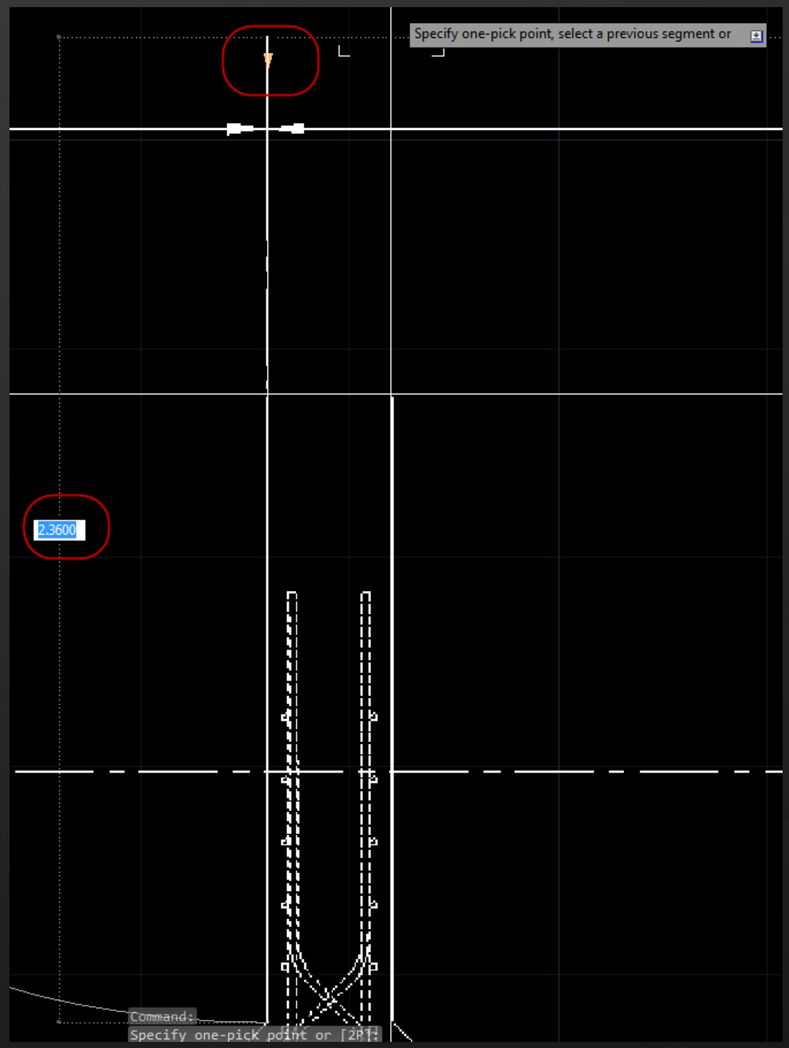
VS



Using vector primitives

- Line, polyline, rectangle, circle, arc
- Use raster snaps
- Indicate direction
- Review dynamic input

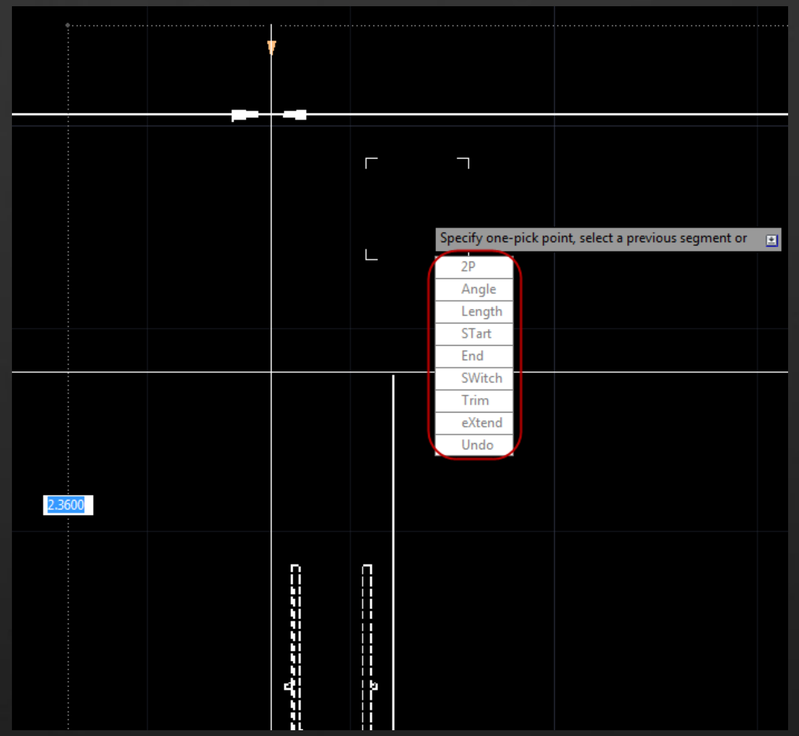


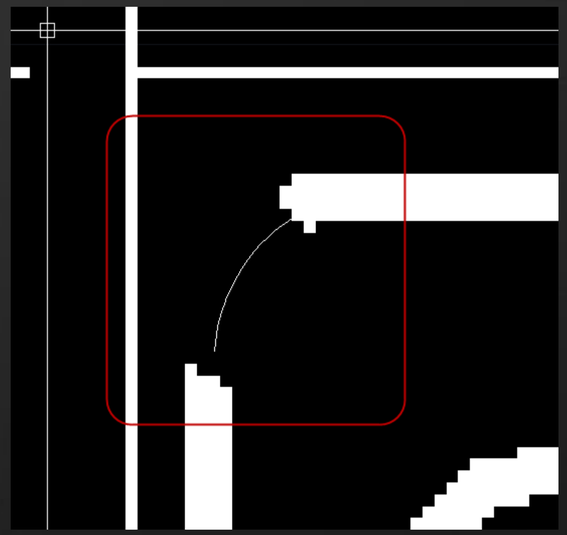


Creating vector primitives

- Additional parameters
- Creating Arcs / Circles

  usually requires more info

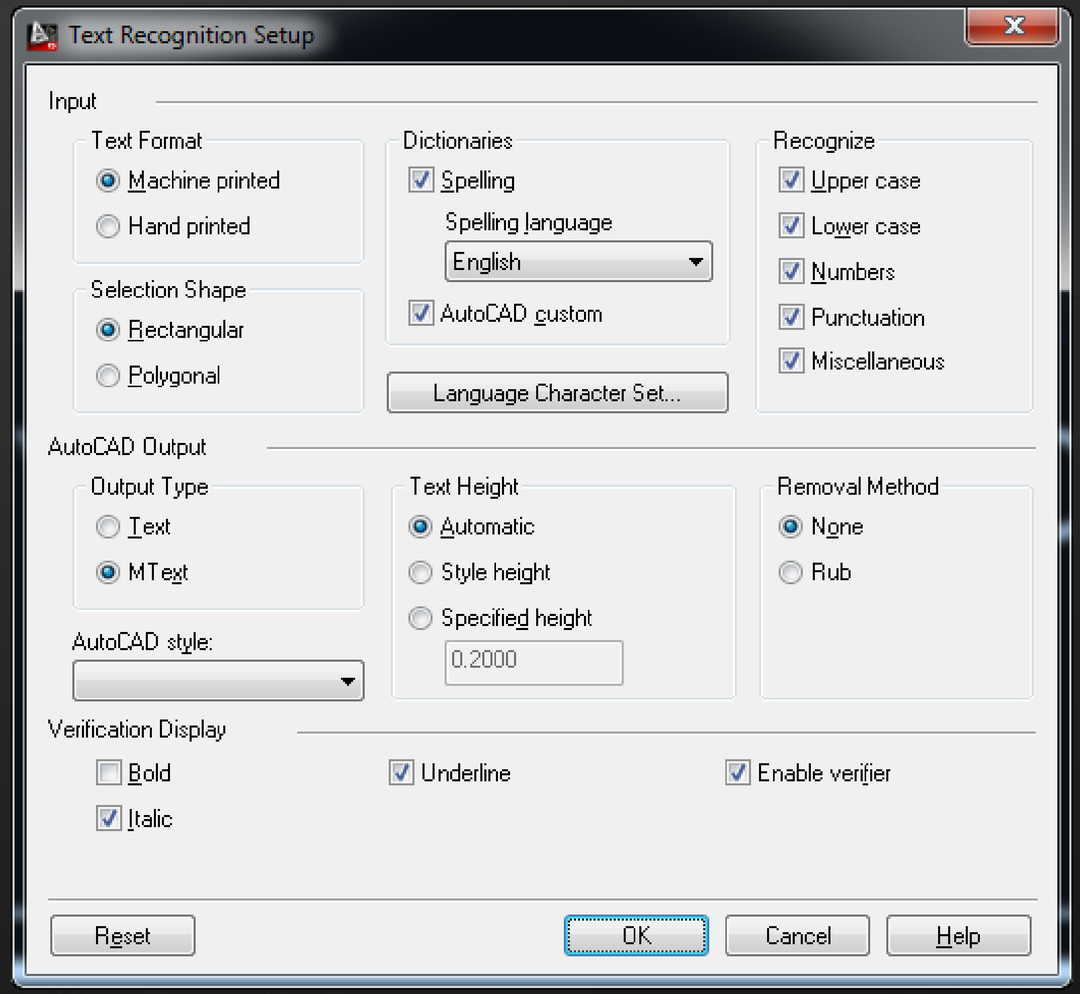




Use AutoCAD® Raster Design 2013 OCR to convert raster text to AutoCAD® text (or Mtext)

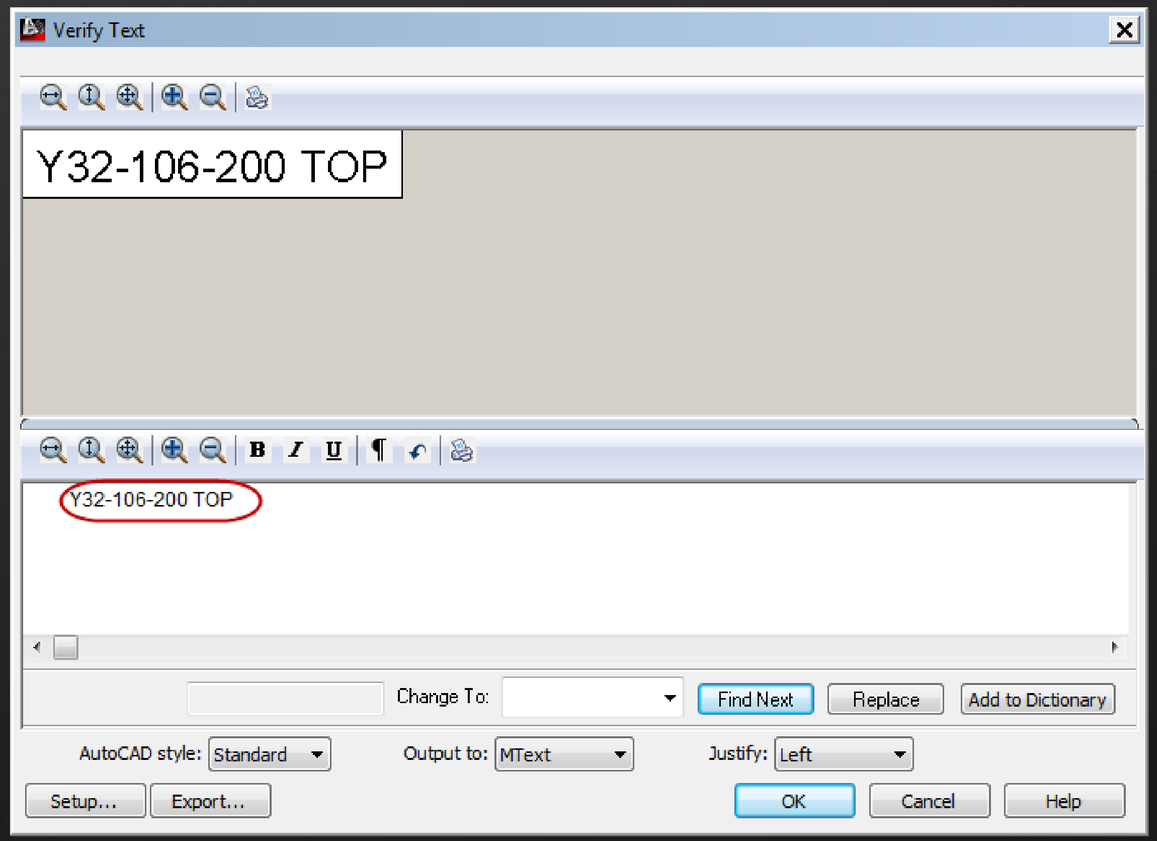
OCR Setup

- Review OCR settings
- Text / Mtext
- Text style
- Additional recognition options



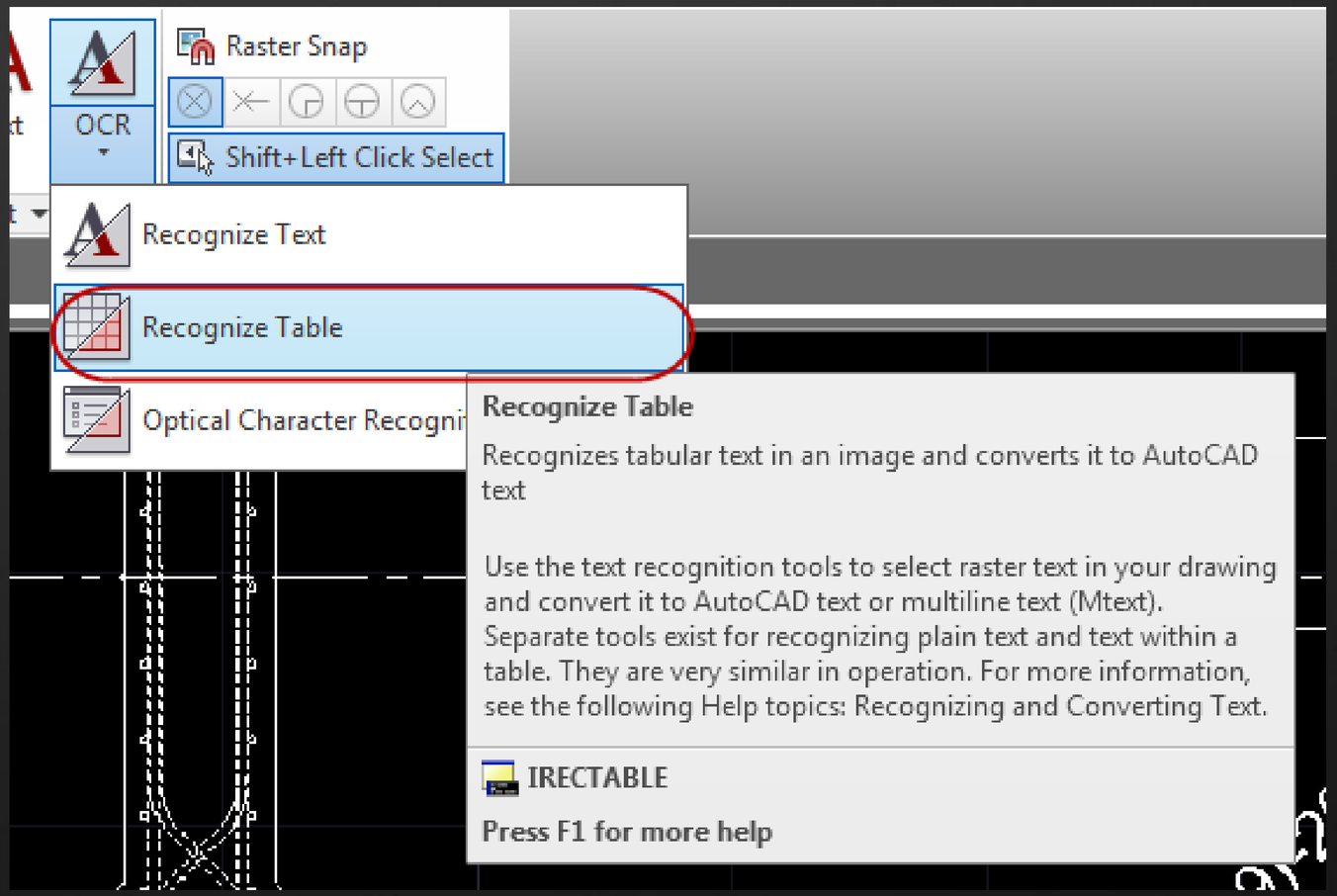
Convert pixels to text

- When to rotate the image for OCR
- Changing the recognized text
- Removing the original pixels



Recognizing tabular text

- Tabular text vs. Tables



Class summary

- 3 Types of images in AutoCAD® Raster Design 2013:

  - Color
  - Bitonal
  - Greyscale

Class summary

- Optimizing raster images using AutoCAD® Raster Design 2013:

  - Correlate
  - Edit
  - REM and REM primitives

Class summary

- Convert raster data to vector data using AutoCAD® Raster Design 2013:

  - Vector settings
  - Followers and primitives
  - Vectorization parameters

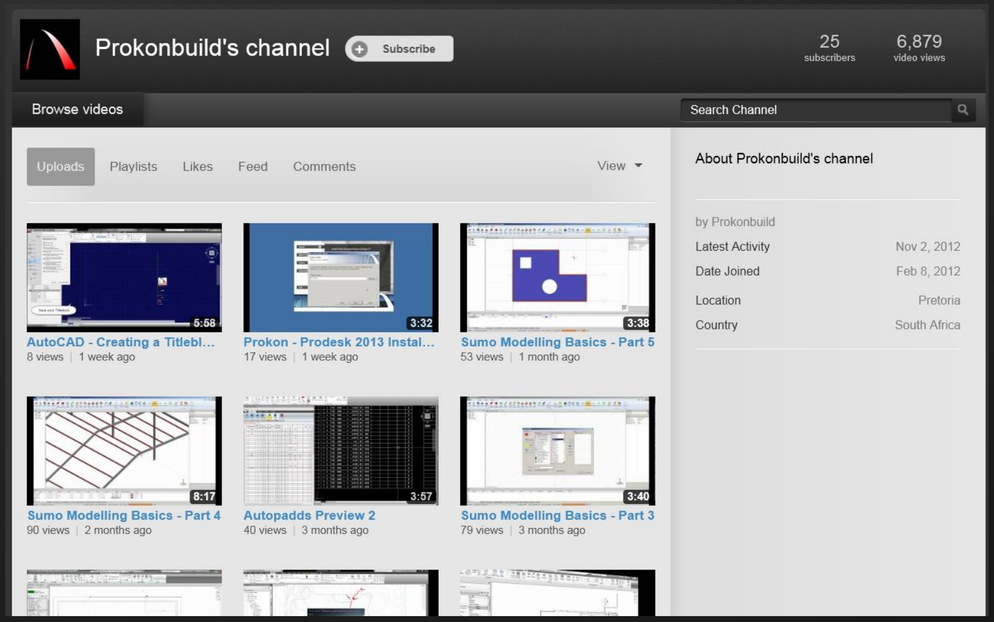
Class summary

- Using OCR in AutoCAD® Raster Design 2013:

  - OCR setup
  - Recognizing text
  - Text orientation
  - Recognizing tabular text

Further study

- http://usa.autodesk.com/adsk/servlet/index?siteID=123112&id=12268308
- http://www.youtube.com/user/Prokonbuild
- chris@prokon.com



Thank you!