

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

## SCIRT AutoCAD Customisation Manual - General Tools

**Story:** AutoCAD and 12d Design Tools

**Theme:** Design

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A manual which provides SCIRT AutoCAD users with general guidance about how to use AutoCAD.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit [www.scirtlearninglegacy.org.nz](http://www.scirtlearninglegacy.org.nz)



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# SCIRT AutoCAD Customisation Manual General Tools

10001-SC-GE-RP-0007

**Revision:** A

**Date:** October 2013

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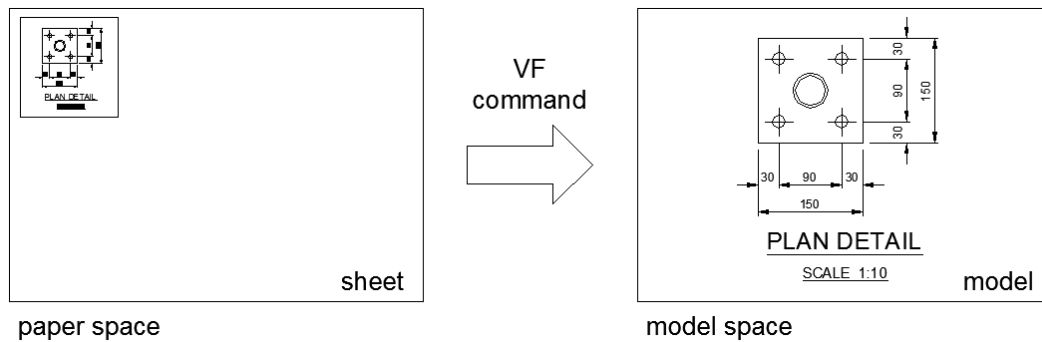
## Revision History

Revision	Date	Name	Brief Description of Change
A	18/09/2013	B. Stewart	Manual split from original document.

## 1. Model View and Viewport Tools

### 1.1. VF - Viewport Finder

Locates selected viewport (in PSpace), switches to Model space and zooms to same view. This command saves a VIEW of the viewport so UCS rotation is also switched when in Modelspace.



#### Tool Access Methods

**Ribbon:** N/A

**Command Line:** VF

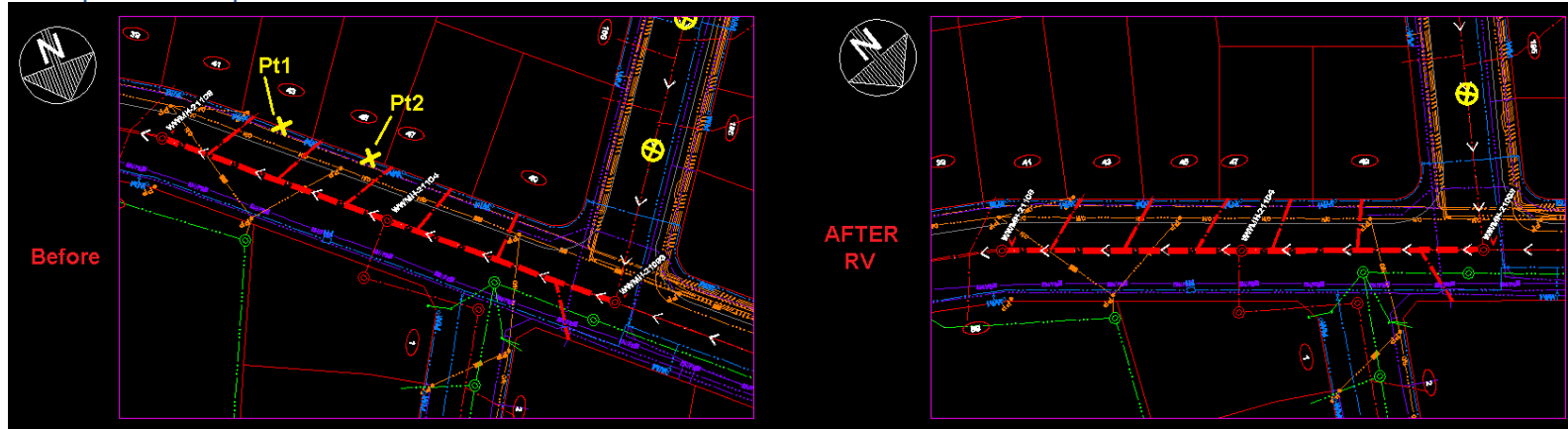
**Menu:** SCIRT Tools → Viewport FINDER

**Toolbar:** N/A

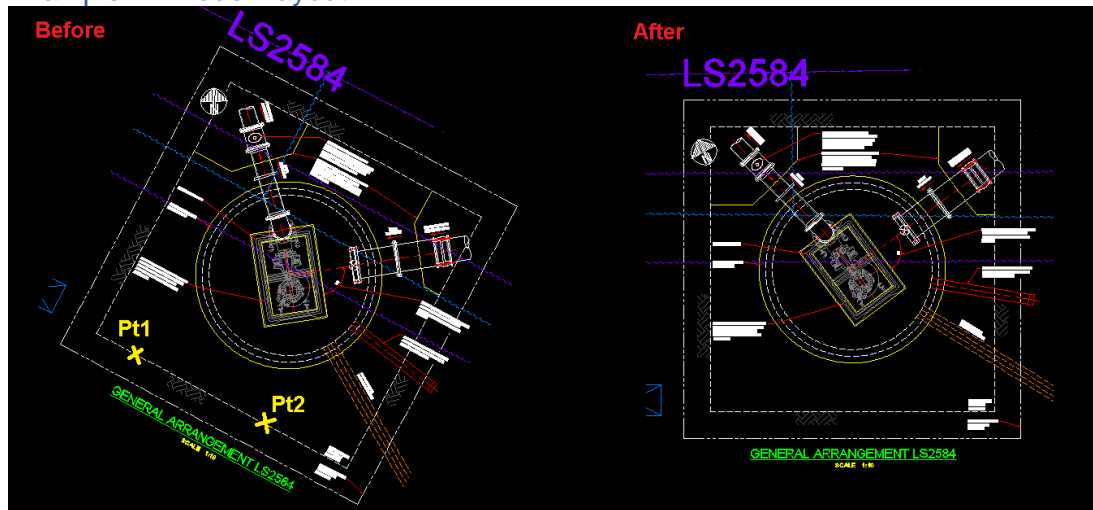
## 1.2. RV - Rotate View

Rotate View using 2 points. Works in Viewport or Model Layout. Scale factor will remain unchanged.

### Example 1: Viewport

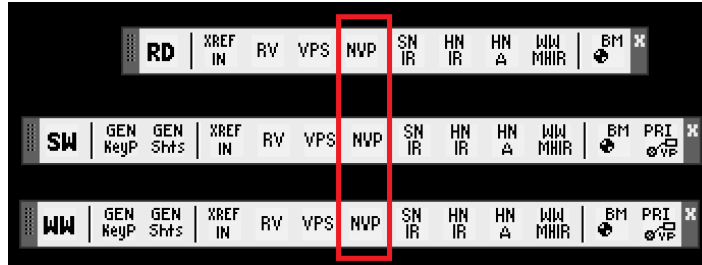


### Example 2: Model Layout



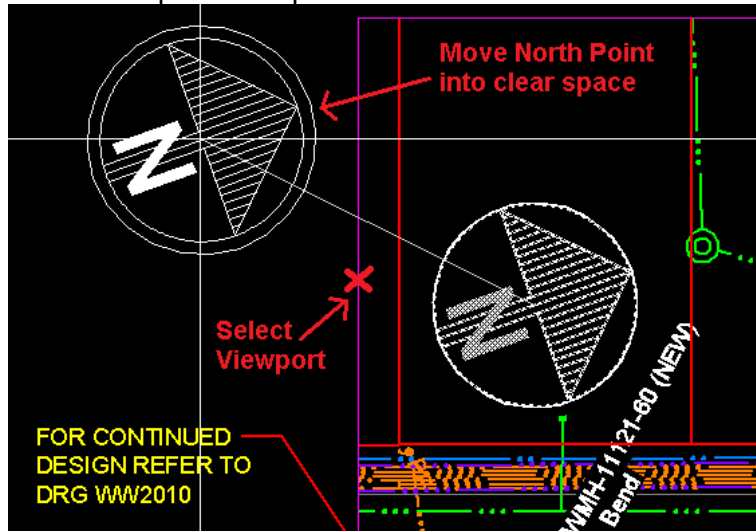
### 1.3. NVP - North Viewport & NPX- North Point XRef

Toolbar access:

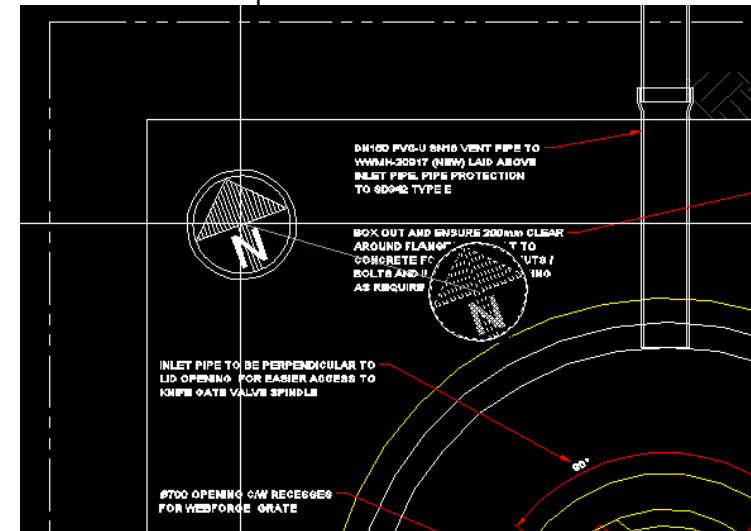


Select Viewport and North Point appears (aligned correctly) at the cursor for moving into a clear space. WIPEOUT has been applied.

NVP - Viewport Example:



NPX - XRef Example:



NPX – North Point XRef. If the reference drawing has been manually rotated, use NPX to find the original XRef north point direction.

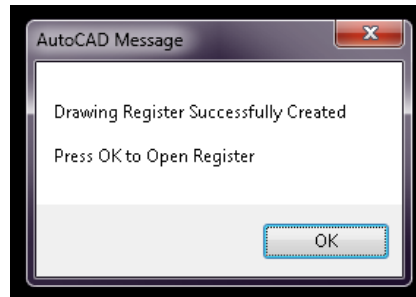


## 2.2. CDR - Create Drawing Register

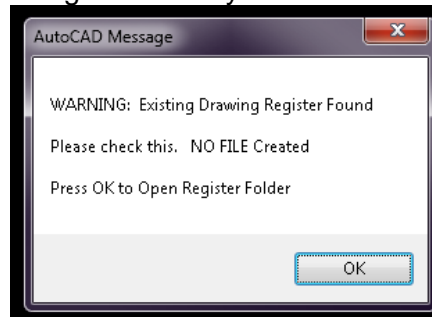
To use this tool, a drawing must be open in a valid SCIRT Project (nnnnn).

Opens drawing register called “nnnnn Drawing Register.xlsx”. This file is stored in the ..\Drawings\Admin\ folder.

### If Successful



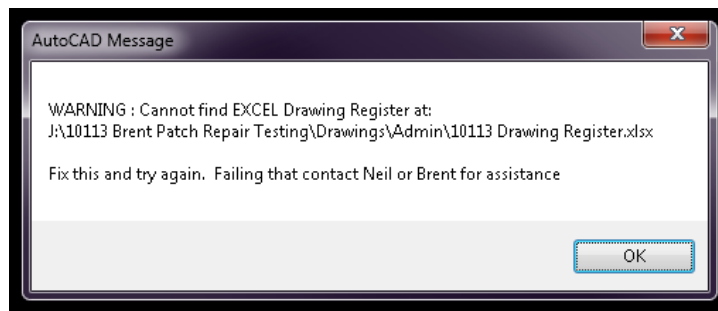
### If register already exists



## 2.3. OER - Open Excel Register

Open current project drawing register in Excel. If the register is not found, a warning is displayed showing what file is required.

Otherwise Excel loads register for editing. Note: SAVE & EXIT register before updating drawings.



## 2.4. Ettl - Extract Multiple drawing Titleblocks to Excel .CSV file

Extract existing drawings in current project to .CSV file format ready for import into project Drawing Register.

File created in current \Drawings\ folder: Titleblock\_Extract\_Tags\_Temp.csv

Information extracted so far:

```
"10113-DE-WW-DG-1004", "INFRASTRUCTURE REBUILD HILLMORTON AND HOON HAY CATCHMENT", "WASTEWATER REPAIR & LINING LAYOUT PLAN - SHT 1", "WW1004"
```

## 2.5. TTL - Current Drawing Titleblock update

Opens Drawing Register in Excel in background and extracts information to populate titleblock of **current** drawing.

## 2.6. MTTL - Multiple Titleblock update

Opens Drawing Register in Excel in background and extracts information to populate titleblock of **selected** drawings

## 2.7. SRL - Set Revision Lines

Lines are re-instated for current revisions visible. Automatically reads and locates last revision line and thaws appropriate layers.

**Before**

B ISSUED FOR APPROVAL			
A PRELIMINARY			
ISSUE	AMENDMENTS	SIGNED	DATE
SCIRT PROJECT REF. 11121		ORIGINAL SHEET SIZE A1	SCALES 1:500 HORZ 1:50 VERT
CPG CAD DRAWING FILE REF. --		DRAWING No. WW2007	
CPG PROJECT FILE NUMBER --			

**After**

B ISSUED FOR APPROVAL			
A PRELIMINARY			
ISSUE	AMENDMENTS	SIGNED	DATE
SCIRT PROJECT REF. 11121		ORIGINAL SHEET SIZE A1	SCALES 1:500 HORZ 1:50 VERT
CPG CAD DRAWING FILE REF. --		DRAWING No. WW2007	
CPG PROJECT FILE NUMBER --			

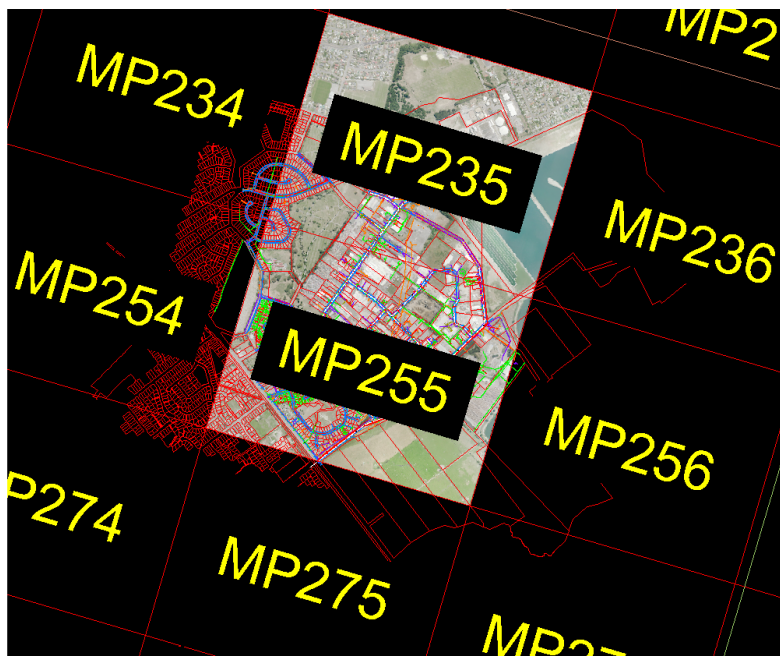
### 3. Aerial Imagery, XTrim, XRef inserting

#### 3.1. PREQ / POSTQ ON or OFF - Aerial Imagery ON / OFF for Pre or Post Quake

Load Pre or Post Quake Aerial Imagery from a Grid system. Uses XRef Image Attached. To remove an image, use XRef Detach and select image tile number(s) as shown below or relevant to your project.

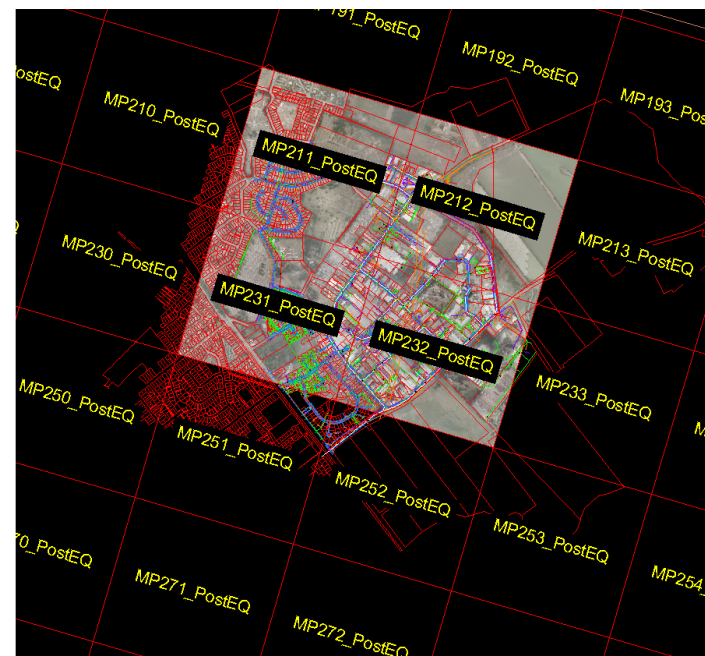
Image Grid is displayed on screen and user types in just the number of the tile to load. Ie. 235 255 or 211 212

Pre-Quake – PREQON



```
Enter PRE-Earthquake Image no. to Turn ON: (eg 210 only): 255
Enter PRE-Earthquake Image no. to Turn ON: (eg 210 only): 235
Enter PRE-Earthquake Image no. to Turn ON: (eg 210 only):
```

Post-Quake - POSTQON

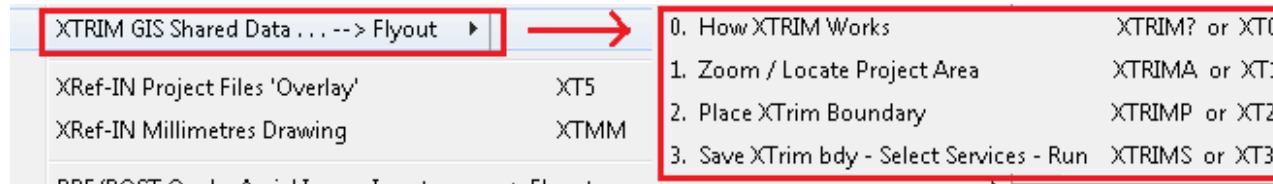


```
Enter POST-Earthquake Image no. to Turn ON: (eg 210 only): 212
Enter POST-Earthquake Image no. to Turn ON: (eg 210 only): 211
Enter POST-Earthquake Image no. to Turn ON: (eg 210 only):
```

Images are placed on layer **XRef\_Aerial\_Images** and sent to back with ImageFrame turned OFF. Brightness is set to 70%.

### 3.2. XTrim - Shared GIS and 12d data

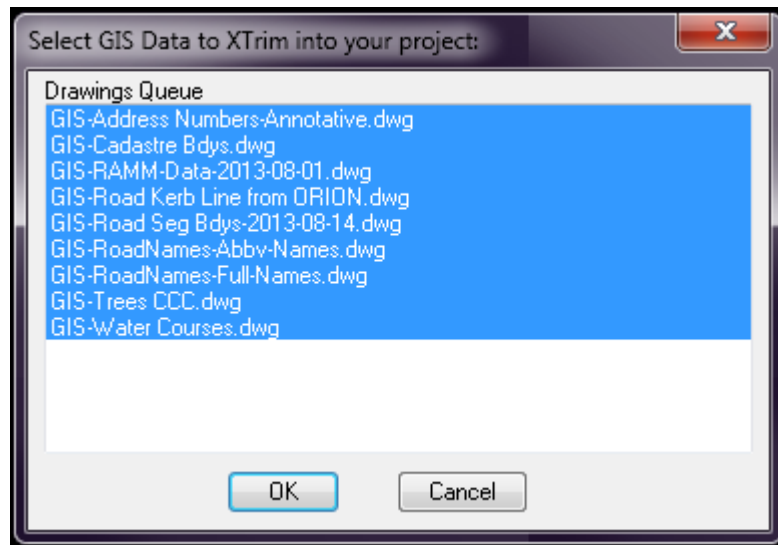
Command: From SCIRT Tools pull-down menu



Place (XT2) boundary around your project area and make approx. 25% larger to capture enough information

Save (XT3) boundary and select your GIS data to capture.

The suggestion is to XTrim all the files below so these are available to other tools when required. Default selection is all (highlighted).



### 3.3. XT5 - XRef Overlay

This tool will add reference drawings from the current folder into the current drawing. The settings OVERLAY and NO PATHS are preset. It is discouraged using NESTED XRefs as this slows the performance of the drawing.

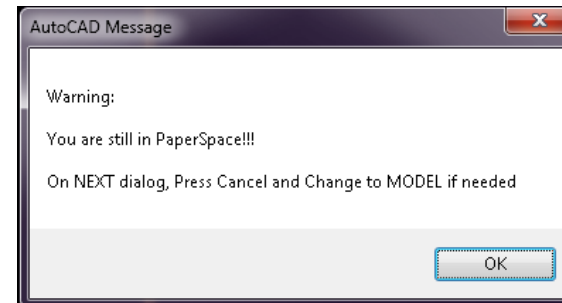
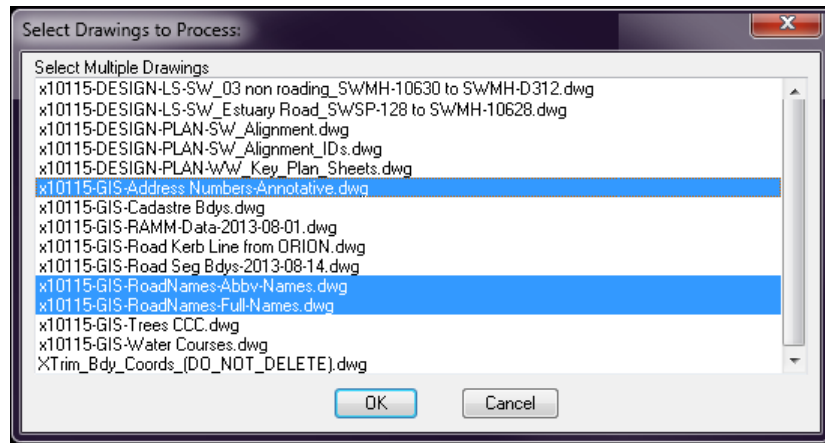
Command: From SCIRT Tools pull-down menu

XRef-IN Project Files 'Overlay'	XT5
XRef-IN Millimetres Drawing	XTMM

Choose either metres (XT5) or millimetres (XTMM) based on your XRef unit settings.

XRefs are placed in using WORLD UCS.

XRef in anything except the following (highlighted): [other tools bring these in for you]



**NOTE:** Make sure the correct tilemode is active (Model vs Paperspace) before using command.

This dialogue appears to warn the user.

## 4. Drawing Auto-insert Rotate Tools

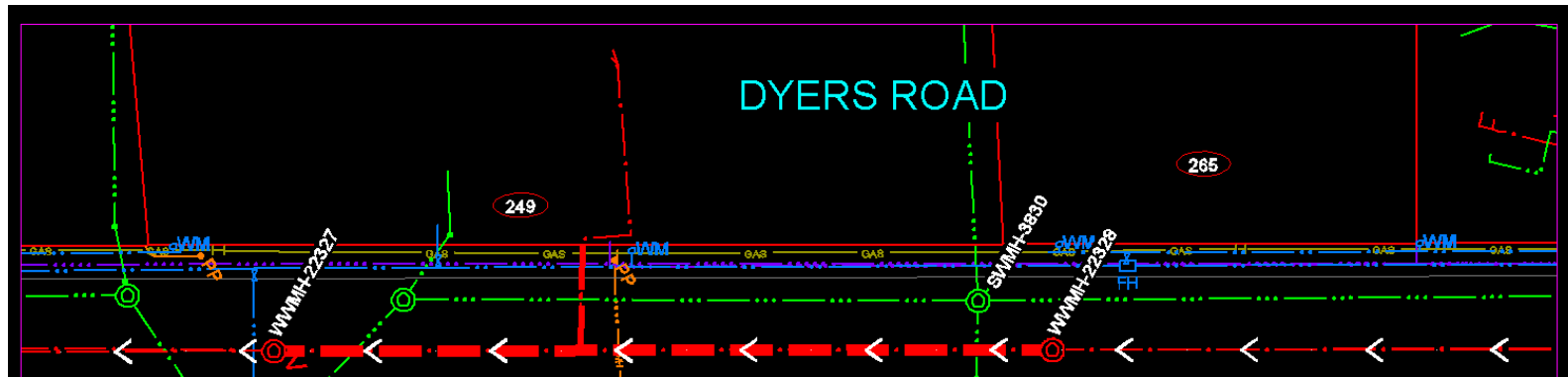
### 4.1. HNIR - House Number Insert Rotate

### 4.2. HNA - House Number Align

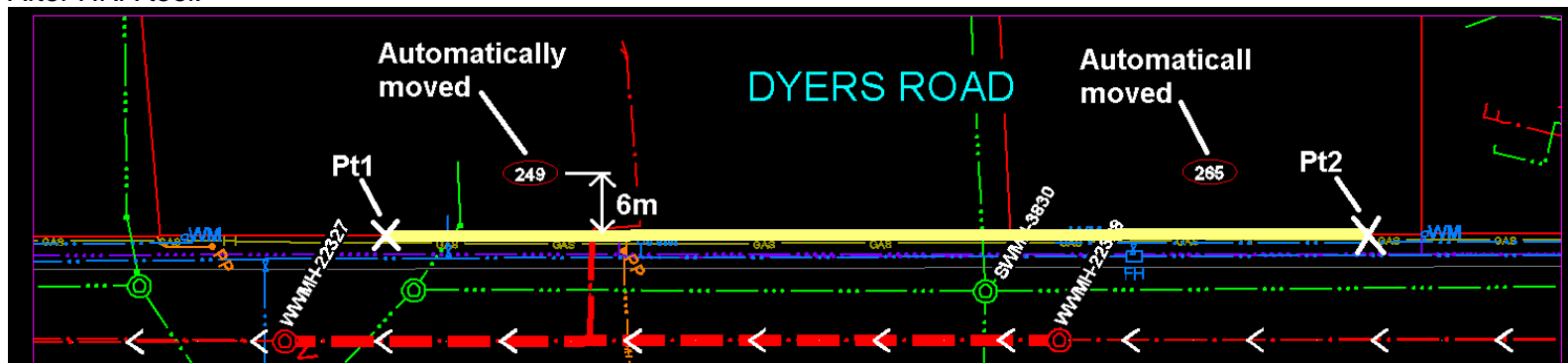
Pick Point Pt1 and Pt2 along boundary making sure line is longer than house numbers shown.

Tool automatically selects house numbers within 18m of line and moves them to 6m offset from that line.

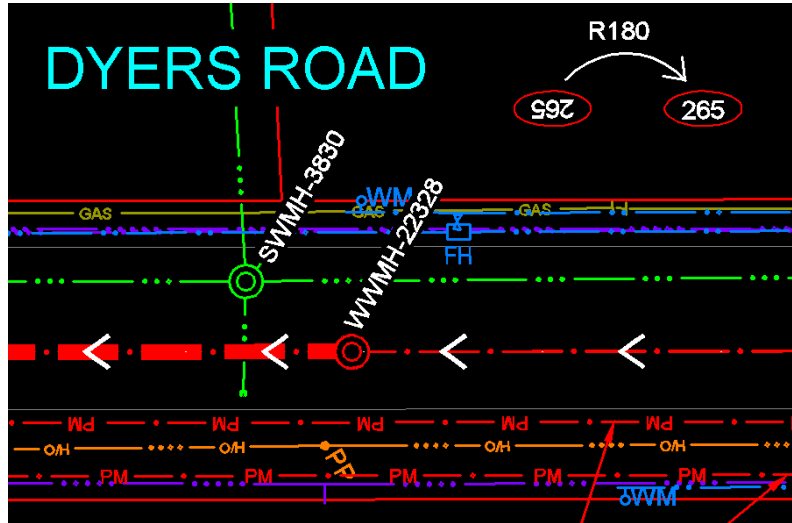
Before:



After HNA tool:

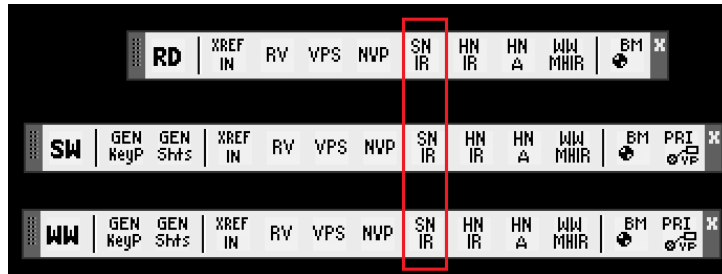


### 4.3. R180 – Rotate 180 degrees



#### 4.4. SNIR - Street Name Inserter

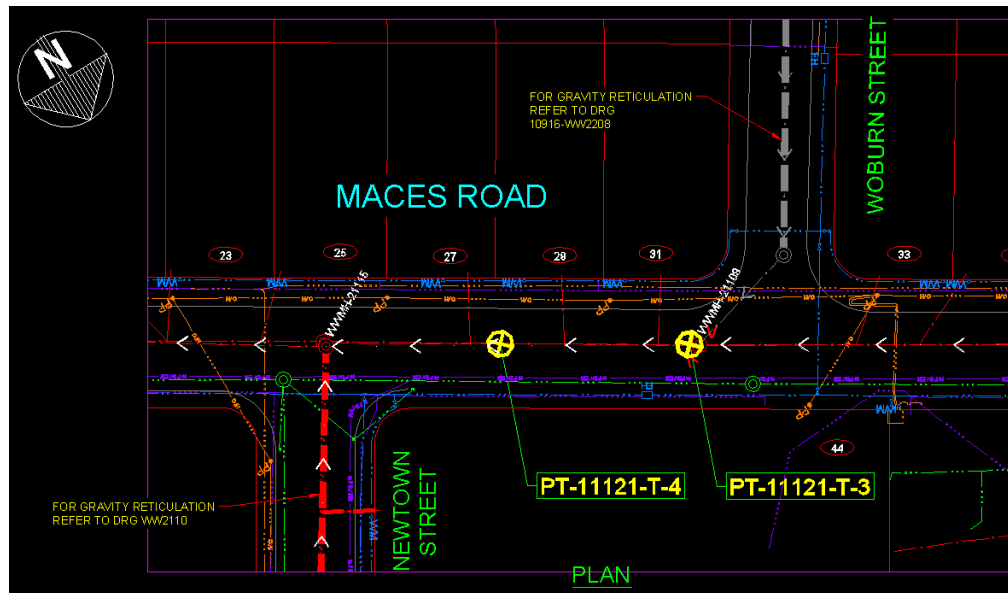
Toolbar access:



Choose type of plan you are preparing.

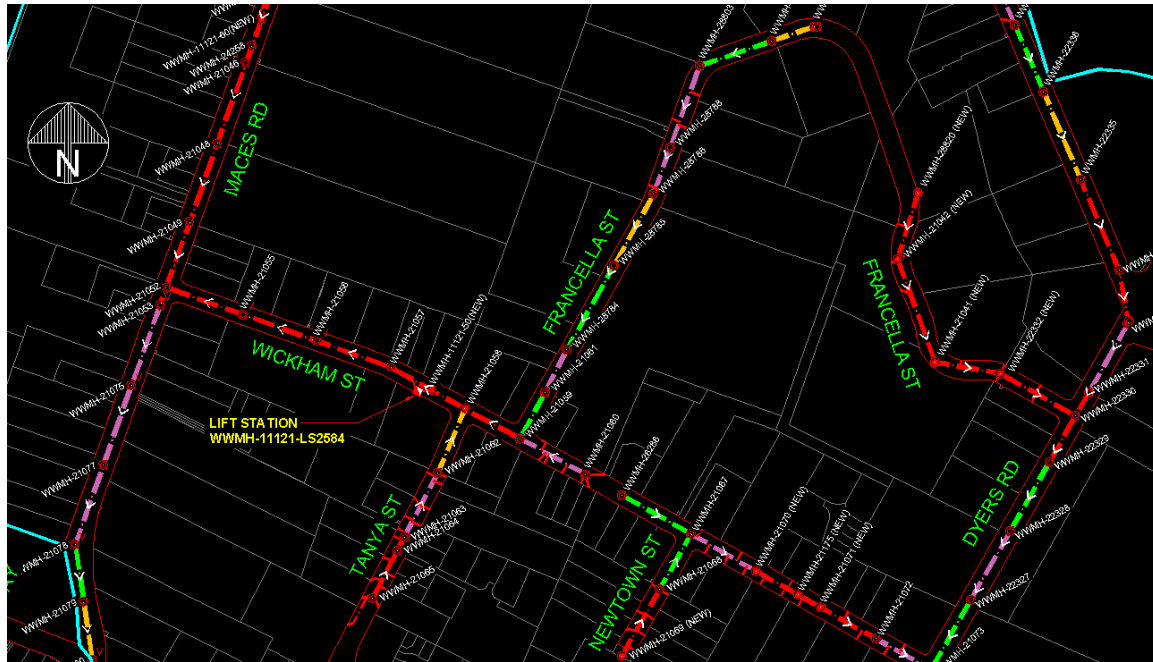


- **Plan/Long Section** uses xNNNNN-GIS-RoadNames-Full-Names.dwg (1:500 or less)
- **Layout Plan Only** uses xNNNNN-GIS-RoadNames-Abbv-Names.dwg (1:1000 or greater)



Result of **Plan/Long Section**:

- Full Street name are used.
- Horizontal names are made 7mm text height.
- Vertical names are 5mm.
- Background Mask is applied automatically.



**Result of Layout Plan Only:**

Abbreviated Street Names are used.

All names are made 5mm text height.

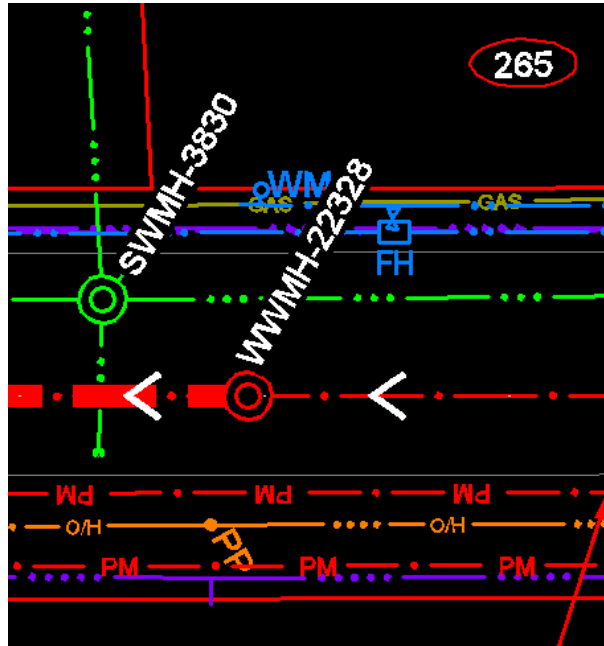
Use TA, T0 and T90 to rotate text and place in best position. TA (Text angle) is best for most text alignments. It allows 2-point angle then floats the text at the cursor for user placement.

Text MASK 1.2mm is applied by default to all street names.

#### 4.5. WWMHIR and SWMHIR – WW or SW Manhole Insert Rotate

Insert Manhole IDs into viewport and rotate text to 60 degree angle.

Text is converted to MText, Mask 1.2 is applied and IDs are sent to front of all other objects.

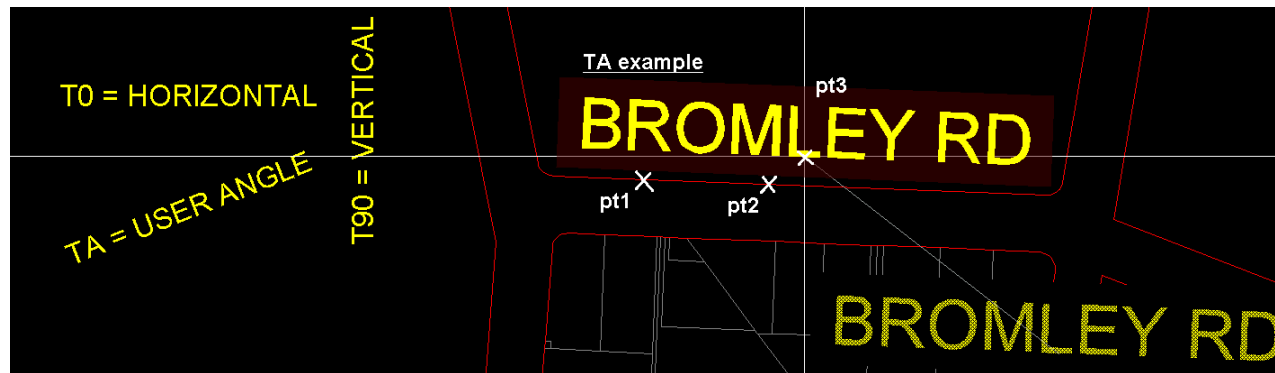


## 5. Text Manipulation Tools

### 5.1. TA, T0, T90 - Text Angle, Text 0°, Text 90°

T0 and T90 are handy to force text to horizontal or vertical in one hit.

TA saves time from rotating text manually. Select Text, pick **pt1** and **pt2** on an object to set the new alignment angle (uses NEarest OSnap override). Text will float at the cursor for user repositioning. Very useful after SNIR.



## 5.2. MASK, MASK11 & MASK15 - MText, MLeader, DIM background masks

SCIRT TEXT/MLeader menu and Command Line access.

All MASK commands work with MText, MLeaders and Dimensions (DText must be converted to MText with T2M or T2MM).

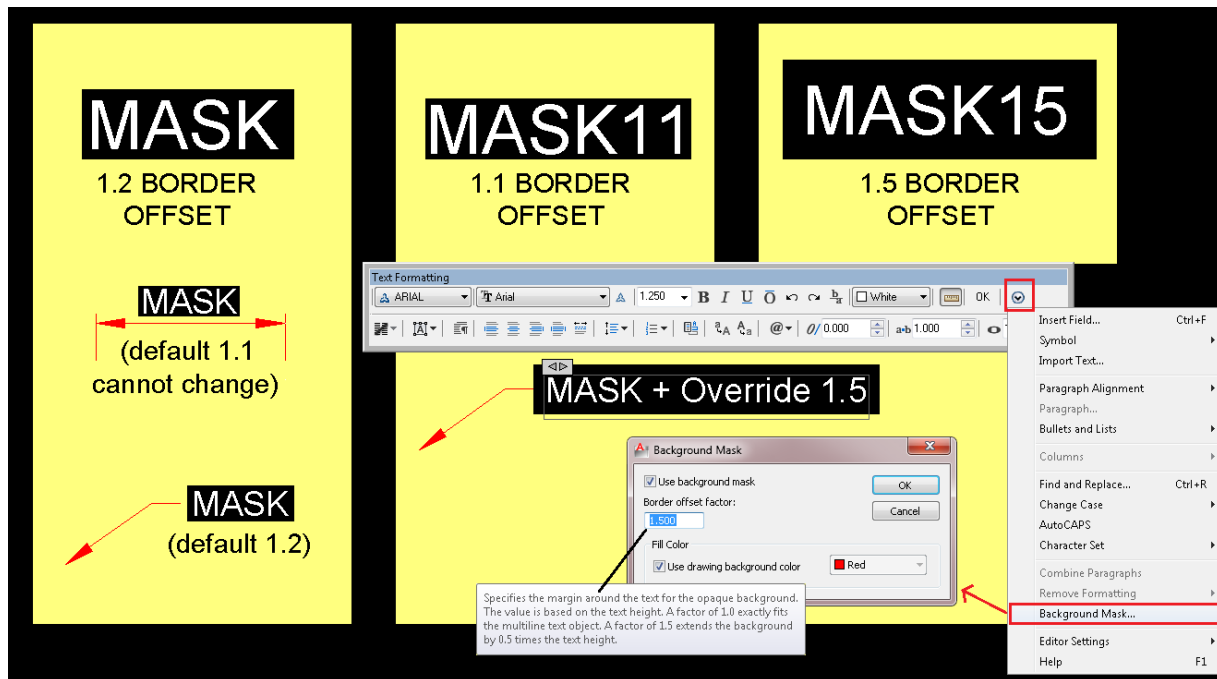
MASK applies 1.2 border offset.

MASK11 applies 1.1 border offset.

MASK15 applied 1.5 border offset.

Dimensions only have one default border offset of 1.1. This cannot be changed.

MLeaders mask have a pre-set default of 1.2. This can only be overridden this by manually changing the Background Mask as shown below.



### 5.3. AINC - Automatic Increment – For ATTRIBs and TEXT

Automatic Text Increment works with DText, MText and ATTRIBs within Blocks.

Note: First item selected stays unchanged and current value is used as the start number.

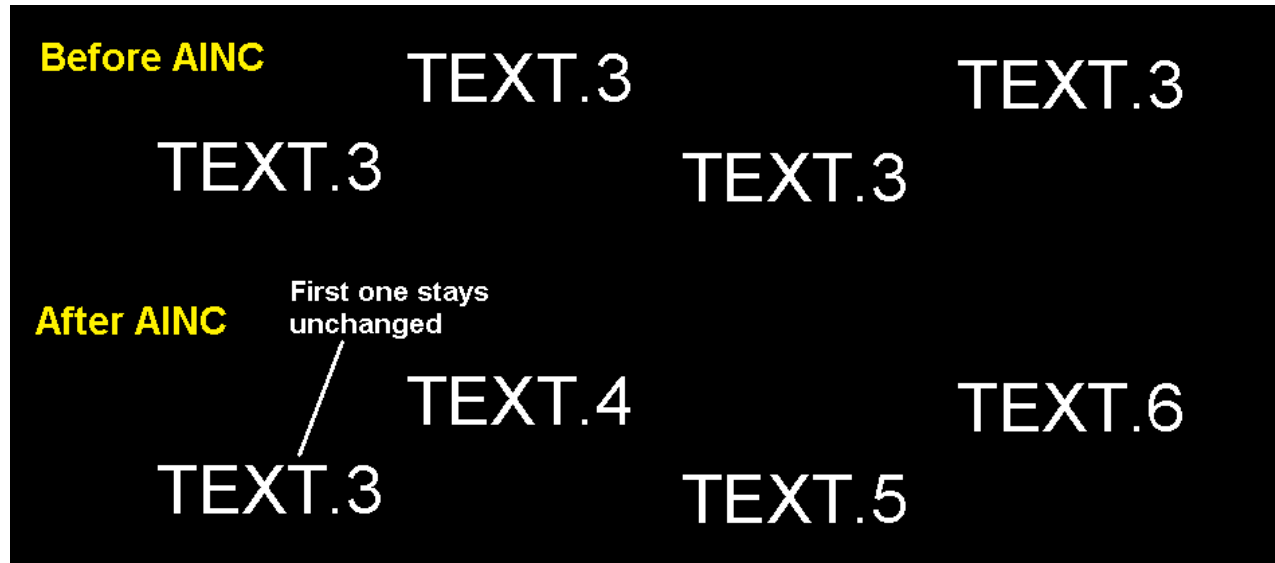
Select text items in the order you wish to increment them. NO crossing or window selections are permitted.

Enter increment value (integer) <1>: Default is 1, but any value may be entered.

Example AINC usage 1: ATTRIBs



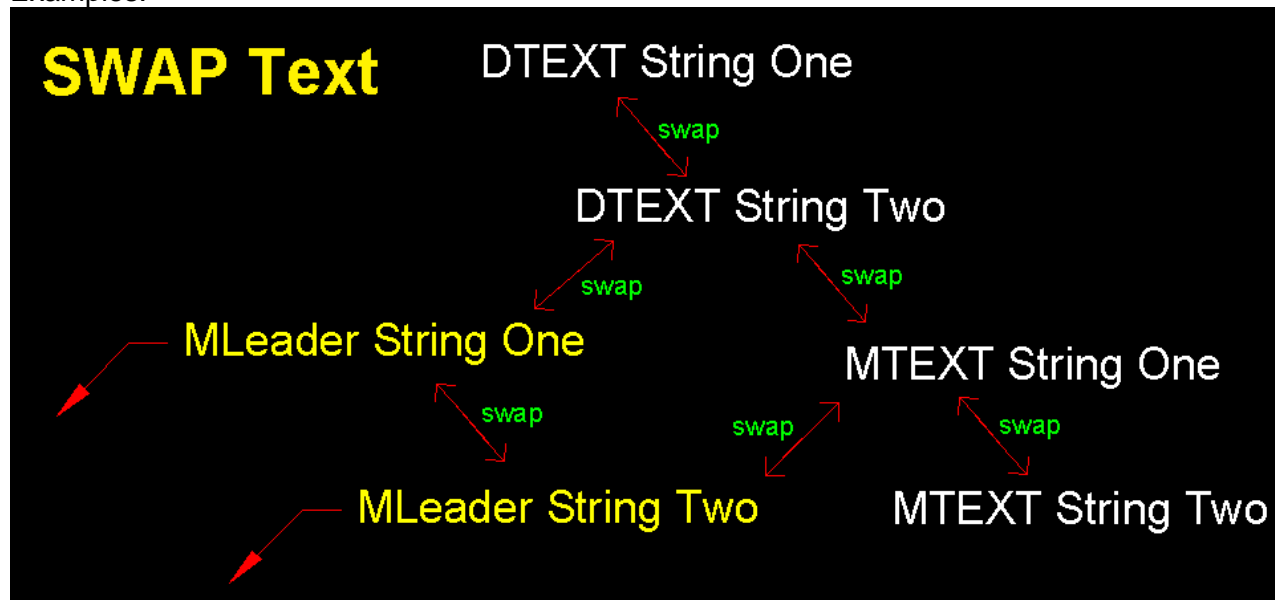
Example AINC usage 2: DText or MText



## 5.4. SWAP - Text

Swap existing text strings with DText, MText and MLeaders between each other.  
Only the text string is swapped, NOT the colour, size or layer.

Examples:

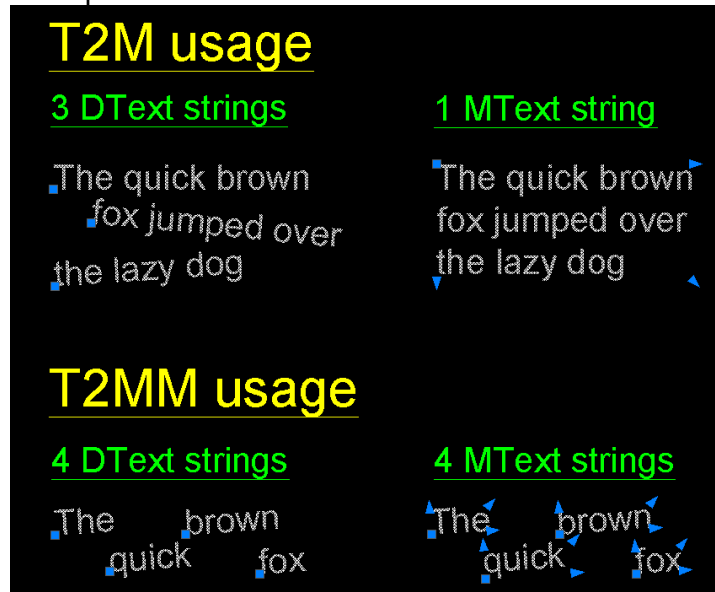


### 5.5. T2M / T2MM - DText to MText – Multi-line and Single conversion

T2M converts multiple lines of DText into ONE MText string. First string is used as base.

T2MM converts multiple lines of DText into individual MText.

Examples:

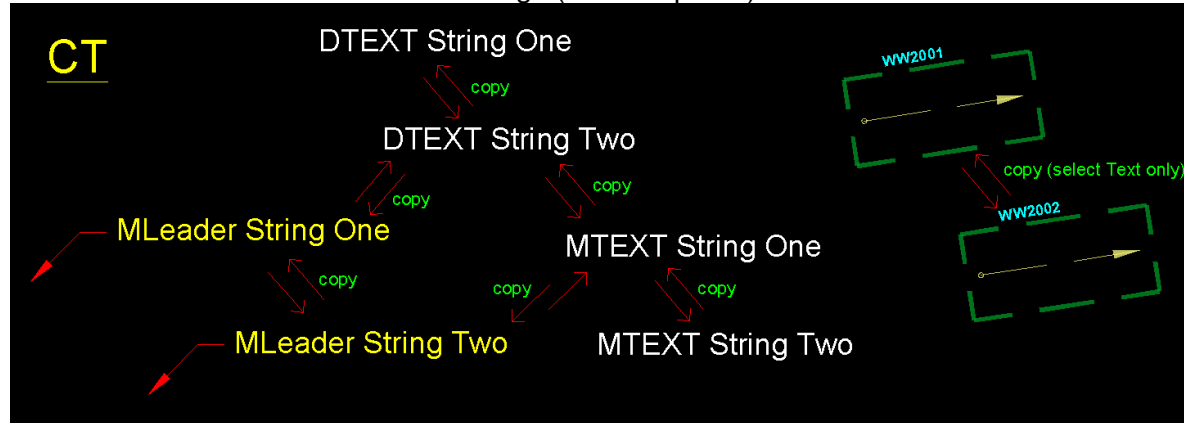


MASK Text can now be applied if required.

### 5.6. CT - Copy Text to another string – DText, MText, MLeader, ATTRIBs

Copy Text from one string to another. This tool works out the appropriate object types..

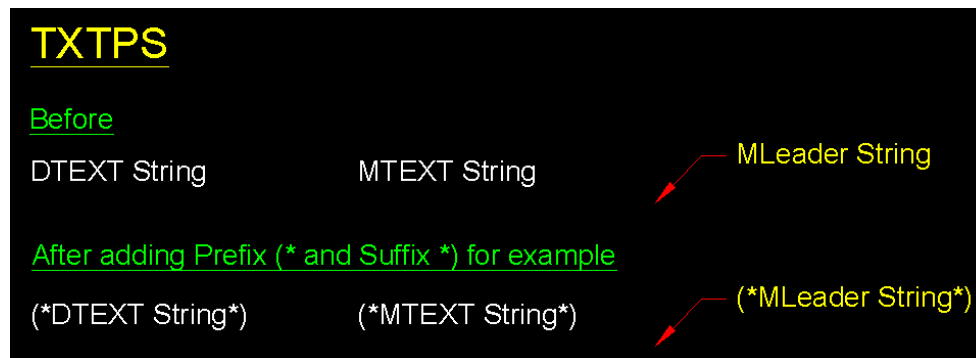
ATTRIBs must be NON-Multi-Line strings (Future update)



### 5.7. TXTPS - Text Prefix / Suffix

Add Prefix and/or Suffix to existing text string.

Works with DText, MText and MLeaders all at once if selected.

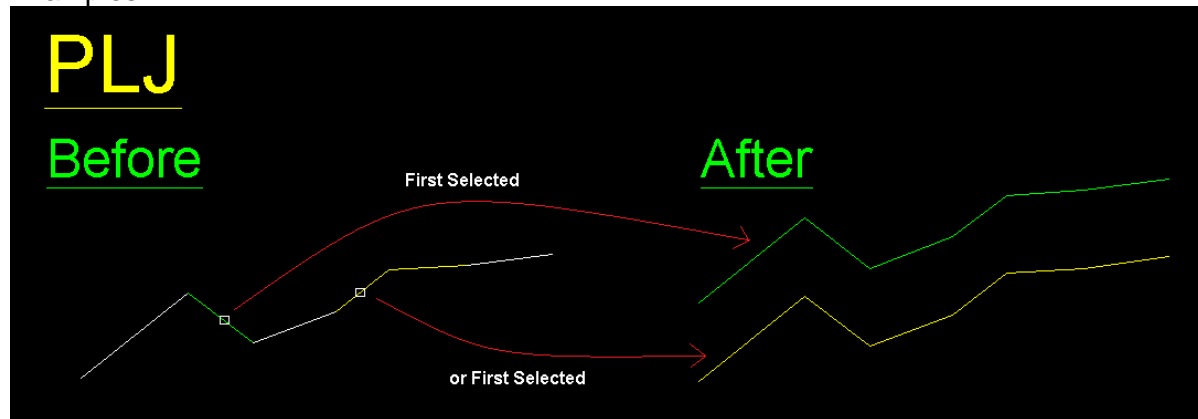


## 6. Draw and Object Manipulation Tools

### 6.1. PLJ - PLine Join Automatic

Join lines or polylines automatically based on the first selected line.

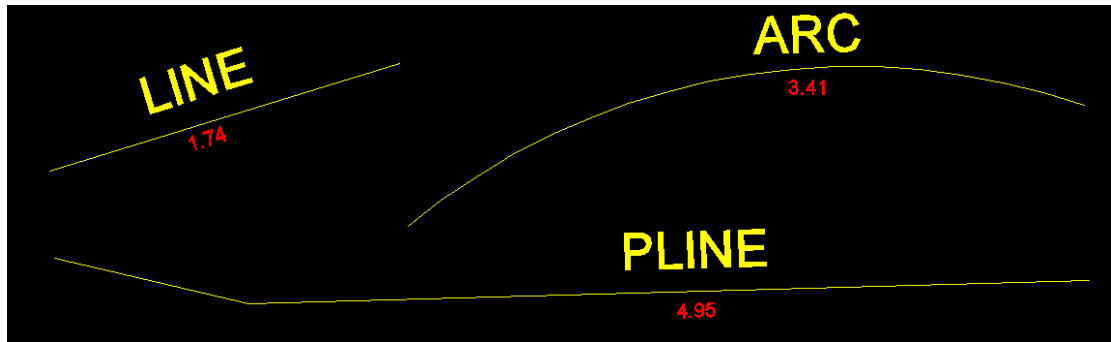
Examples:



## 7. Query and Settings

### 7.1. ADDLEN - Calc Line/PLine/Arc Lengths

Adds combination of lines, polylines and arcs together as one Total.

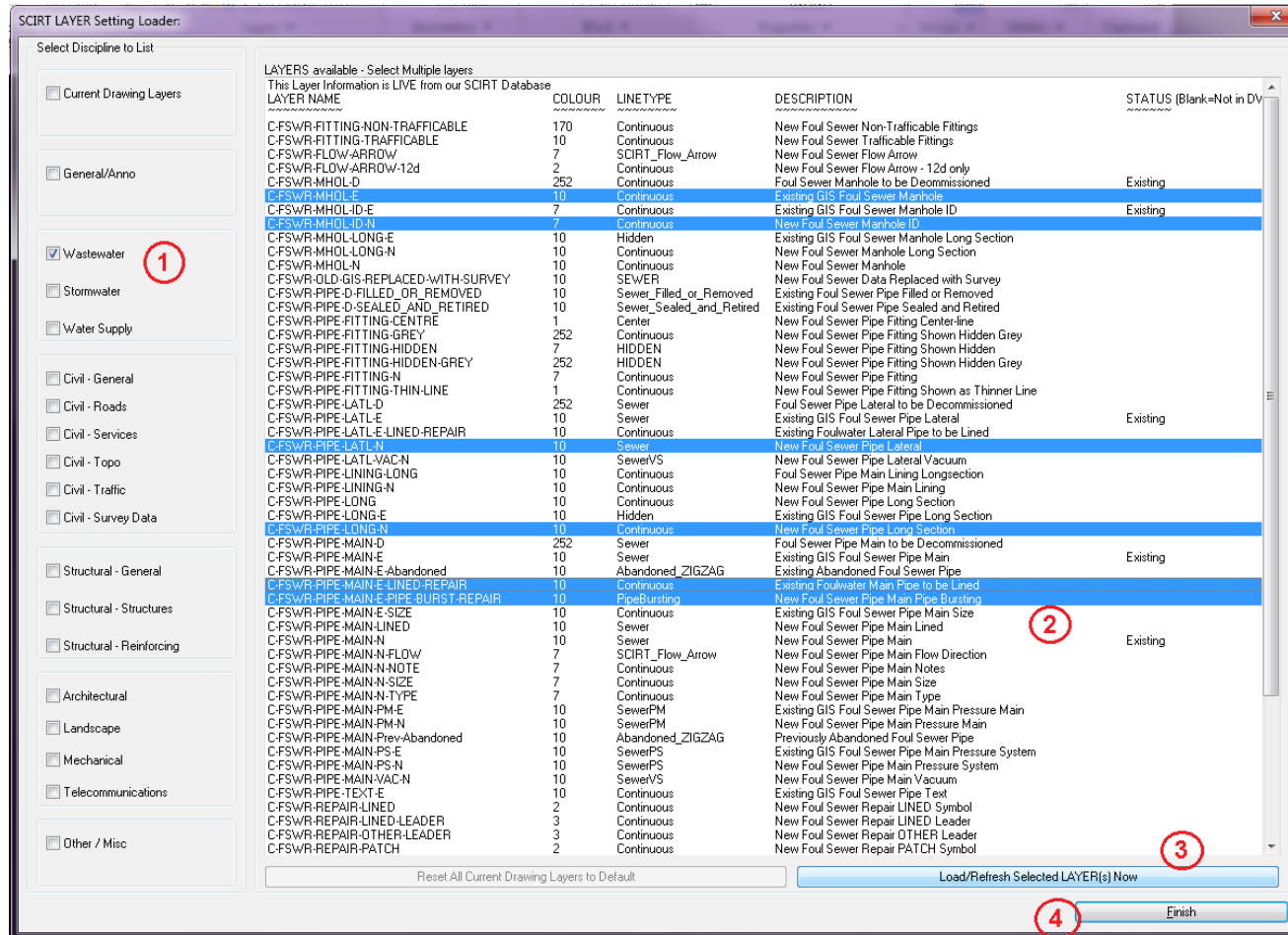


Selecting all objects gives:

```
Command:  
Total length is: 10.10
```

## 7.2. LL - Layer Load

Discipline specific layer loader tool gives quick access to latest LAYER settings from SCIRT database. Choose Discipline (1), select Layer(s) you require (2), and click Load/Refresh button (3). Continue to choose another discipline until Finished (4).



Line Types are automatically loaded if they don't exist in the current drawing.

STATUS tells you the layer already exists in the drawing. If suspected existing layer(s) settings are wrong, click on the affected layer(s) and the setting are refreshed.

If new layers or changes to layers are required, contact the CAD Manager.

### 7.3. Linetype Loader - Under Development