



Getting started

New drawing

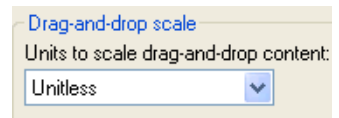
A new drawing should always be started using the KeyTERRA-FIRMA template drawing KTF.dwt (in the KTF support folder) or a modified/renamed version of it. Many drawing settings are made highly appropriate in this template drawing and a warning dialogue appears if some settings are found to be different. Layers may be changed as the supplied layers are examples only. With a normal installation having double clicked on the KTF project shortcut you are starting CAD and KTF in a new (and “empty” drawing) that is a copy of the template. You should never need to “Start from scratch”.

Third party drawings (e.g. Land Surveys)

This is a common requirement and very often the initial operation in the design sequence when a site survey drawing is supplied as an AutoCAD drawing but its organisation and settings may not be very appropriate for subsequent design and modelling requirements within KTF. The one simple technique to adopt that will make the drawing appropriate is to start in a KTF new drawing (i.e. copy of our template drawing where all units, layers and other settings are appropriate) and insert the survey drawing into it :-

```
INSERT          with explode “on”
Insertion point = 0,0
Scale =         1
Rotate =        none
```

Architect’s drawings are often in mm so use a scale of 0.001 to convert to metres. When adding a new drawing into an existing drawing follow the above sequence – this will of course only work if drawings are on the same grid system. Remember that we are working in metres and whole circle bearings (North is 0d00’00” degrees “up the screen”. When starting with a DXF file use the File Open dialogue to directly open the DXF file and then save the drawing (e.g. temp.dwg), close it, go into a new drawing (using the KTF.dwt template) and insert temp.dwg into it “ready exploded”. Note that if the drawing being inserted is not exploded during insertion but exploded subsequently the resulting drawing can be almost twice as big as it should be as it stores the block in addition to all the component entities. Use **UNITS** to set Unitless in the drawing being inserted.



2D only survey drawing

Unfortunately the site survey that the KTF user “inherits” with the scheme on some occasions has not been specified for 3D. The ideal starting point is a mixture of 3D polylines representing channel lines, tops and bottoms of banks etc. and PL level blocks – the advantage being that sections and ground models can be created directly from these entities. However if levels are represented by a 2D point and nearby text use the Distance command to find the typical left and right shift from text insertion point to level position and use menu item :-

3D utilities, Convert 2D entities to KTF levels

Use the default **Text insertion point and text values** option. KTF PL level blocks are added to the drawing – inspect the drawing to check all locations are OK and move the PL blocks when necessary to the level position especially if the site is steep. Note that KTF functions use the level attribute and not the PL block Z value.

Survey data input (3D)

Data may be from any Total Station, Datalogger or GPS equipment subject to KeyTERRA-FIRMA Ltd. confirming that the format is acceptable. The output format must be consistent and the specific input program is written for the user data format (not included on the KTF CD). KTF input functions work on an ASCII file transferred to the PC/Network and KTF does not include any data communications functions.

Data input options

Co-ordinate files from Total stations & GPS
Paper drawing on digitise tablet or raster (Levels)
Paper drawing on digitise tablet or raster (Linear)
Hand entered co-ordinate data

GENIO files from MOSS/MX

Menu items

*Land Survey, User specific observation file Input(s)
Levels, Levels
3D Polylines, from 3D locations
File utilities, .txt Co-ordinate files, Edit and then
File utilities, .txt Co-ordinate files, Input
Translators, MX, MX GENIO to KTF*

Section creation methods

Creating sections in KTF is a two part operation in typical use, first create the section data and store in a .sek file and then draw the section(s) to a variety of user defined styles from the .sek file. Sections are intelligently represented and intended for subsequent enhancement and design activity. Sections are created from :-

1. Drawing entities (3D Polylines and KTF Level blocks)
2. Ground Models
3. Cross section level data files (.dat)

The most accurate method to create individual sections or cross sections from existing roads or rivers and designed roads (or any other design feature) represented as 3D polylines is to use the *Sections, Create Sections from drawing entities* menu items. This will provide more "direct" and accurate "cut" sections than from models.

From data in drawing

Menu items (to create .sek file)

3D Polylines (roads, rivers, banks etc.)

Sections, Create Sections from drawing entities :-

*2D Polyline crossing 3D Polylines
Cross Sections from 2D Polyline & 3D Polylines*

Levels and/or 3D Polyline vertices

Levels along a 2D Polyline

Levels (KTF Level blocks)

Picked Levels

3D Polyline (surveyed centreline, ditch etc.)

3D Polyline

From Ground Model

Ground Modelling :-

Along a 2D Polyline

Create Section

Cross sections at right angles to 2D Polyline

Create Cross Sections

From String Design

Design, Strings :-

Design strings (channels etc. using .stg file)

*Draw
Define or Edit*

Design strings (cross sections using .stg file)

Cross Sections and Reports

Individual strings (channels etc. not using .stg)

*Offset & Gradient from Master String
Gradient to 2D Polyline from Master String
Gradient to 2D Polyline from Levels/3D Polylines
Existing Cross Fall to 2D Polyline
3D Junction*

All the above menu items write section files (.sek) for subsequent drawing of an individual section (e.g. long section) or cross sections. An alternative environment is included in the *Sections, Sections from level data* menu items where data is stored in a section level data file (.dat). This is mainly intended for road overlay design working on surveyed cross sections when there will be no changes to the existing horizontal geometry.

Section drawing

Sections are drawn from files created by the above menu items. Drawing sections may take place in the same drawing that they were created within or in a different drawing so that existing large site drawings are not made any bigger with adding many sections.

Menu items

Draw one section (e.g. long section)

Sections, Draw Section

Draw cross sections

Sections, Draw Cross Sections

Superimpose - adding to existing drawn section(s)

Sections, Superimpose

Note that .sek files include chainage, level, easting & northing. A section (or cross sections) may also be drawn from the .sek file as a 3D Polyline in the "plan" drawing by menu item *Sections, Miscellaneous, 3D Polyline(s) from .sek file.*