

# n4ce Professional Module

For the discerning user with specialist needs, n4ce Professional provides extra facilities in Design and 3D presentations. Using the same platform as Lite, extra tools are available to create Models using Templates and Batter calculations. With backcloths users can register and “draw over” Photographs, Models and CAD, snapping onto detail in the background.



Backcloths bringing various data types together



Data used in these views is by kind courtesy of Getmapping and the Ordnance Survey.

The Professional module includes the following features:

As Lite with the addition of:

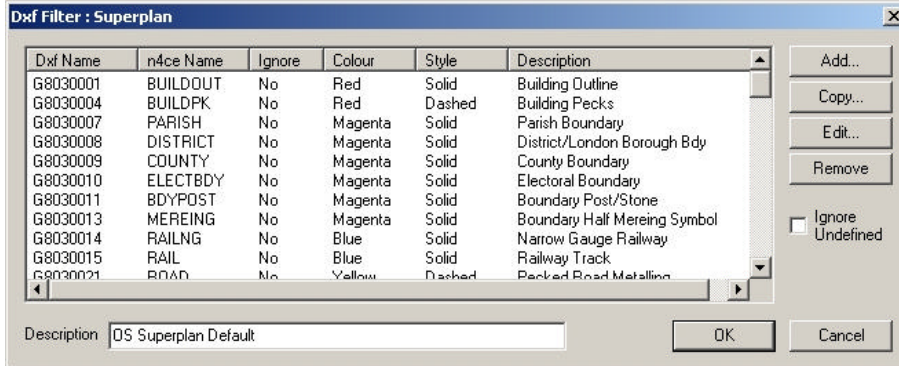
- ? User Defined Icon Bars
- ? Radial Intersection for Building Frontage Surveys
- ? Free Station - Resection calculations
- ? Helmherz Co-ordinate Transformation - applied to Stations, Models and CAD
- ? Reports and Tables
- ? OS LandLine and SuperPlan DXF Import Filters
- ? Backcloths - using CAD, Model and Photography
- ? Point Generation from CAD – selectable elements including Text and Polyline Chainages
- ? Access to Dedicated CAD Backcloths in Models
- ? Extended CAD Functionality, including:
  - Additional Constructions
  - Hatching
  - Dimensioning
  - Multi Section Plotting and Editing
  - Visibility Analysis
- ? Point Selection – Element, Rectangle and Lists
- ? Changing Point Attributes – Colour, Style and Size
- ? Overlapping Height Text Filter
- ? Projected Feature Points - CAD or other Feature
- ? Point Snap – from selectable points
- ? Create, Copy and Recode Features
- ? Committing Features to a CAD Backcloth
- ? Feature edits on Line, Symbols and Shapes
- ? DTM Creation with Reporting on DTM Errors
- ? Extra DTM Editing - including Feature Inserts
- ? Model Merging, Copying, Grids and Isopachytes
- ? Recognises MX Alignment Design Strings
- ? Surface Design tools, including:
  - Parallel Strings
  - Batter Intercepts to Reference Surfaces
  - Automatic de-Cusping
  - Densification/Filtering/Chainages Strings
  - Extending, Merging and Cut-back Strings
- ? Volumes by:
  - Prisms
  - Sections
  - Feature Boundary
  - Contours
- ? Dedicated CAD Backcloth Tools, for:
  - Tables – Points and Stations
  - Hatching String Features and Shapes
  - Hatching Groups
  - Hatching Between Contours intervals
  - Isopachytes
  - Cut and Fill
  - Section Cut Lines
- ? Sections by:
  - Long
  - Point
  - Feature
  - Cross
  - Radial and
  - River (EA special)
- ? Section Exports to Excel TRS format
- ? Real-time Viewing of 3D Models using:-
  - Single or Multiple images
  - Render or Wire Frame
  - Draping of Aerial Photography
- ? Site Plans – Drawings with Viewports

## Client Templates, Drawing Templates and Bitmap Images

**Client Templates** are empty Projects that contain their own set of defaults. These can relate to a particular job or client. When opening a new Project a set of master defaults is copied into the Project. Any changes to default settings relate to that Project unless the user elects to save them.

**Drawing Templates** are pre-defined Drawings (sheets of paper) with Title Box details and possibly user notes.

**Bitmap** images can be introduced to Drawings, including company logos and digital photography.



Superplan DXF Filter



Drawing Template Bitmaps

## OS Landline™ and Superplan™ DXF Filters

n4ce Professional allows the import of **OS DXF** files in **Landline** and **Superplan** data format. These files have predefined layer names, colours and line styles, which can be changed using a filter. Unwanted layers can be filtered out and/or given appropriate names.

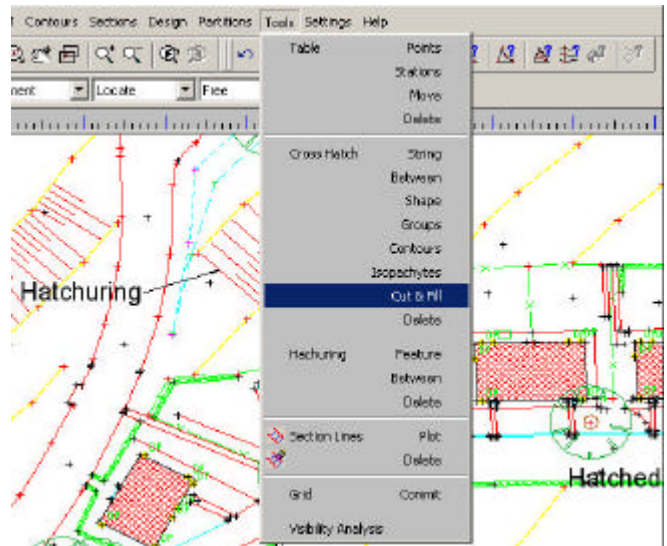
## Advance CAD and Backcloths

With n4ce's software toolbox philosophy, data can come from a number of sources and combined to make up a composite image. In some cases it helps if data can be used as a **Backcloth**, especially when creating designs, or extracting points from CAD data. Combinations of **CAD**, **Models** and **Photo Images** can be used as Backcloths.

A **Dedicated CAD Backcloth** is available with each Model, accessed using the Pencil Icon. This is where **Tables**, **Hatching**, **Dimensioning**, **Curve Fitted Contours** and **Committed Model** elements will be stored. See the **Tools** menu opposite.

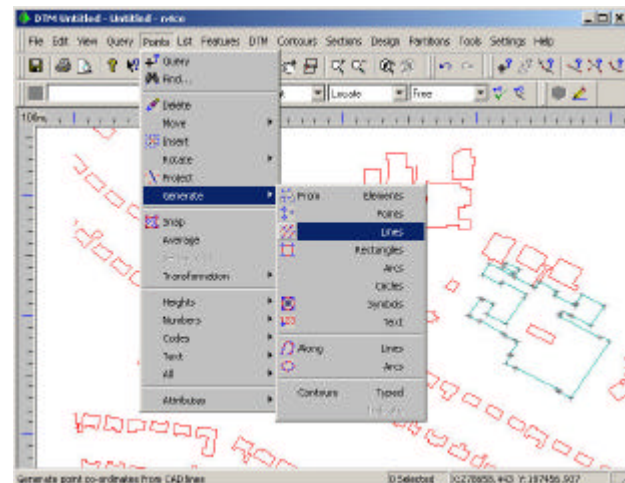
With **CAD** and **Model** Backcloths, **Lock Modes** are available, allowing you to snap to **Backcloth** detail.

n4ce Professional includes extended CAD options over the Lite edition, not discussed here.



Tools Menu – Dedicated CAD Backcloth Options

## Points from CAD



Point Extraction from CAD

CAD Backcloths are used in the extraction of points from CAD data. This CAD data can be imported from external files or created with n4ce's own CAD editor.

Detail can be isolated by turning Layers On/Off and **individually** selected or within a **rectangle**, using the Pick Options.

The process finds nodes along **polylines**, centres of **circles**, ends of **arcs**, at **symbol** origins or from **text**.

Heights can be as assigned by the CAD element, entered manually dropped onto a DTM or in the case of Text, taken from the text value itself. Additional points can be linearly interpolated along strings.

In the special case when individual line segments form a multi-segment line, as opposed to a polylines, duplicate points may be created. These are filtered.

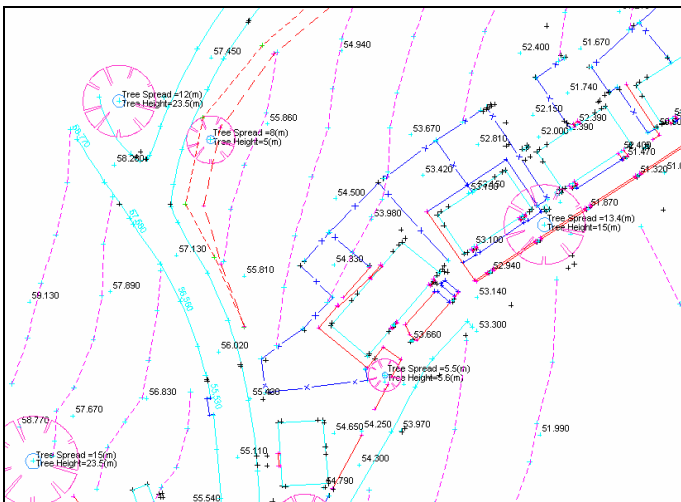
## Advanced Modelling with Text, Points and Features

Time can be lost when editing surveys. n4ce has a number of tools that will make this process less erroneous and time consuming.

These mainly relate to Point and Feature handling and include **Insert, Move and Delete Points; Close, Gap, Break, Split, Extend, Intersections and Cut Back Lines.**

A **Densify** option allows you to add additional points along feature lines, selecting different ways of determining new heights including linear and DTM interpolation.

All these options work on existing features adding points and **Comma Codes**, where necessary. Any changes made graphically will be seen in the Control Grid where edits can also be made, if more appropriate.



Feature and Text Plotting

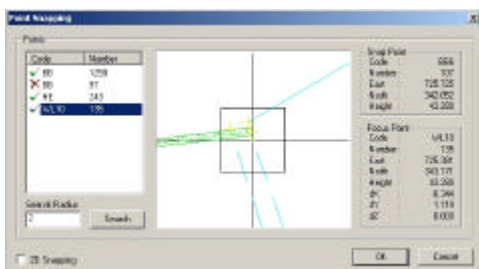
### List and Pick Options

A power tool called, **Select List**, allows you to identify Survey Points using different criteria, including Codes, Feature, and Polygon etc. This tool is accessible via the Control Grid or Graphics and works in conjunction with the **Pick** option.

In graphics the Pick points can be set to **Element, Rectangle** or **List**. Any editing will take place based on this selection such as move and delete points or set **Point Attributes**, including Size, Colour and Style of points.

SURVEY POINTS			
Number	Cant	Slope Distance	Offset
9	-0.100	0.100	0.009
10	-0.100	0.101	0.011
11	-0.100	0.101	0.011
12	-0.100	0.101	0.012
14	-0.100	0.100	0.008
15	-0.100	0.101	0.012
16	-0.100	0.102	0.020

Table of Offsets



Point Snapping

### Text Handling

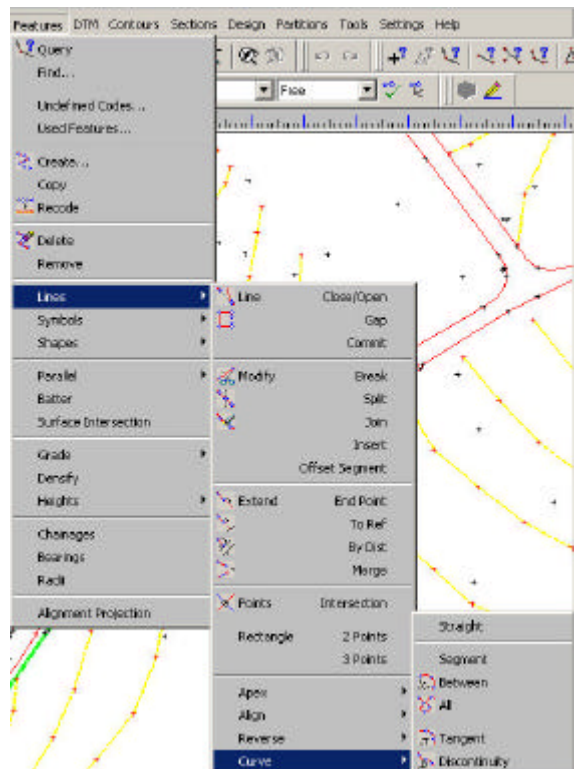
Windows Text fonts are used, with sizes being defined in **mm** at a **final plot scale**.

Text will appear upright with respect to the horizon. Text plotting is controlled by the Code Table and can be aligned to feature strings.

Besides the standard **Height, Code and Number**, a **Text Macro** allows the placing of Co-ordinates, Dimensions and Remarks alongside points.

An automatic **Height Text Filter** uses priority weighting to remove overlapping height text, placing points on a **List**.

Further Text editing tools are available for **Moving, Deleting and Rotating Annotation**.



Features Edit Menu

### Dimensions and Tables

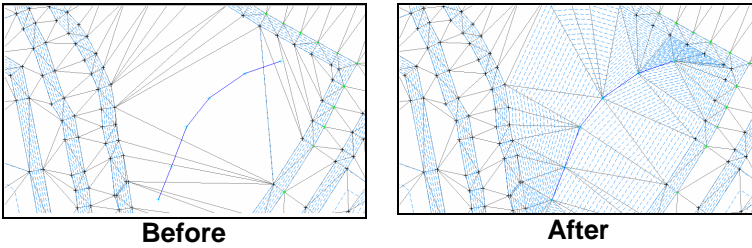
Another powerful feature of n4ce is a **Dimension**, where points hold additional attributes, normally in the form of numeric data. This can be user generated or created by n4ce, such as Chainages or offsets from other strings. The results of calculations can appear in Dimensions which can be Printed in a report or plotted in a Table as shown opposite.

### Point Snap and Average Functions

n4ce has two features which are very similar. The first is **Snap**, which allows you to move points to a common point where features meet. The second, called **Average**, allows you to replace grouped points with a single point. Offsets from this averaged common point are given in both cases and can be seen in a dialog box, as shown opposite.

### Advanced DTM Editing and Volumes

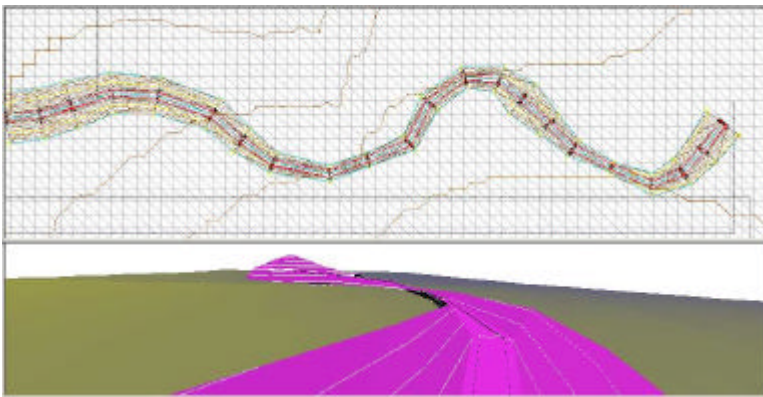
The Professional edition has extended DTM editing options, including Delete, Insert and Force options.



The **Force Feature** shown above allows you to stitch new features into a DTM. A **Force Line** option creates new break lines, where line features may be missing.

Other useful options include **Apex Raise**, **Remove** and **Include**, with automatic reforming of the DTM around points.

The **Insert** options allow you to manually stitch individual points into an existing DTM (see **merge** below).

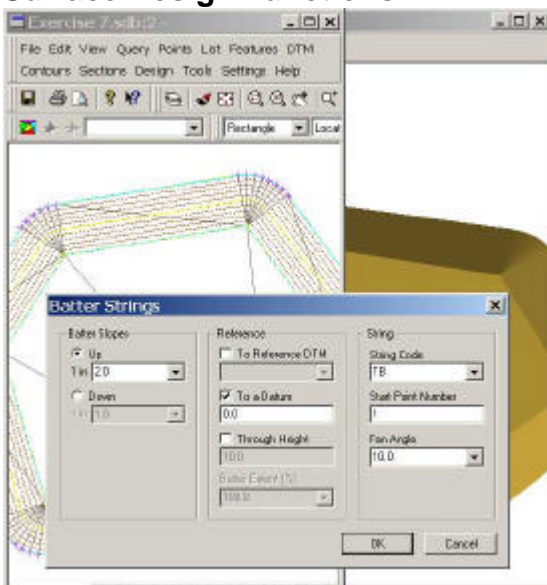


Merging Models

The merge option effectively cuts model A into model B to create a third model C. Points underlying the merge model will be replaced and its DTM stitched into the base model, as shown above. An **Isopachytes** option allows you to create a height difference DTM.

**Volume** options include **Prisms**, **Sections**, **Feature Strings** and **Contours**. These later options are a variation of **Prisms** with different boundary constraints and are particularly useful for mounds and holes.

### Surface Design Functions



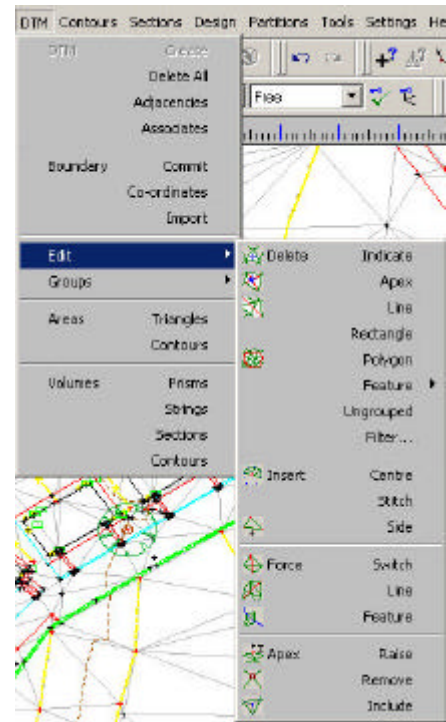
Fanning Batter Slopes on Corners

Options are available within n4ce Professional to create new design, interactively, using a number of different tools including **Templates**. Backcloths, discussed earlier, are very useful here in Model, CAD or Aerial Photography form. Strings can be created using a **Copy** option from a Backcloth, **Parallel** and **Batter** strings from existing line features.

In the example shown left, a batter string was generated from a reference base string. The dialog box associated with this option allows you to set the **Batter Slope**, the closing **Reference Surface**, **Code** and **Fan Angle**.

Existing strings can be **Densified** by nominating a regular chainage or where stings cut the sides of a DTM, Extended and Cut back. Where strings are created parallel to other strings, there may be overlapping of points at re-entrant corners. Automatic de-cusping is applied.

**Note:** where heights are required these can be taken off another DTM, linear interpolated from existing strings or set to a predefined value.



DTM Edit Menu – Notice Icon Options

### Added Model Creation Options

Options allow you to **Create**, **Copy** and **Merge** Models. Point can also be copied into models using the clip board.



Model Creation Options

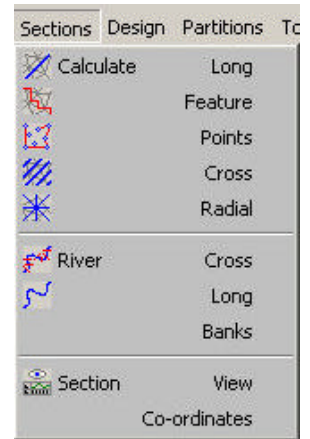
## Sections

Sections can be positioned by a number of different means, depending upon the option selected. Likewise, heights along the section can be found using **Points** as selected, **DTM** facets intersection or where they intersect with a 3D **Feature** string. Sections can pass through multiple Models.

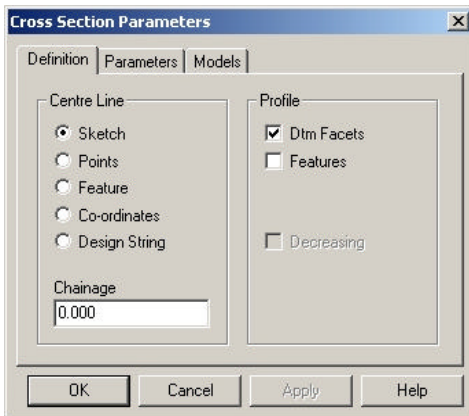
Three basic methods of taking sections are, **Long** (single profile), **Cross** (multiple - perpendicular to a reference line) and **Radial** (multiple - fanning angularly from a reference point). The **Feature** and **Points** options in the Sections Menus are variations of the Long Section, but use levels found in these elements.

A special application has been developed for **River Sections**. Here, sections will be created directly from coded strings, without the need for a DTM. Each section will have a unique string number and 2 base line points for reference. No DTM is required but if present, levels can be extracted from these surfaces.

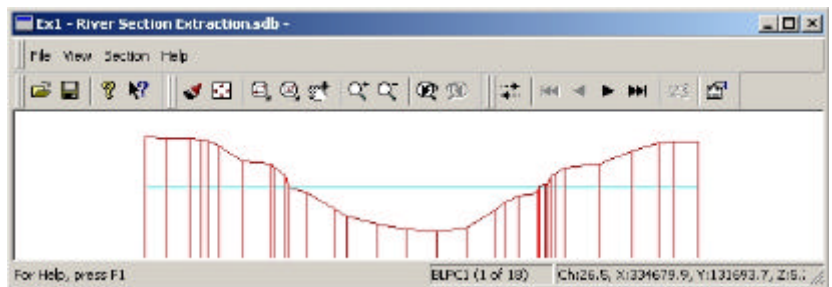
A **River Long Section** can be extracted from the River Cross-Sections.



Sections Menu



Cross-Section Taking Dialog Box

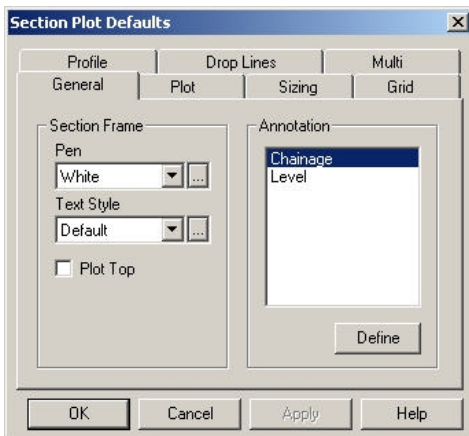


Section Quick Viewer – with Multiple Controls and Flipping

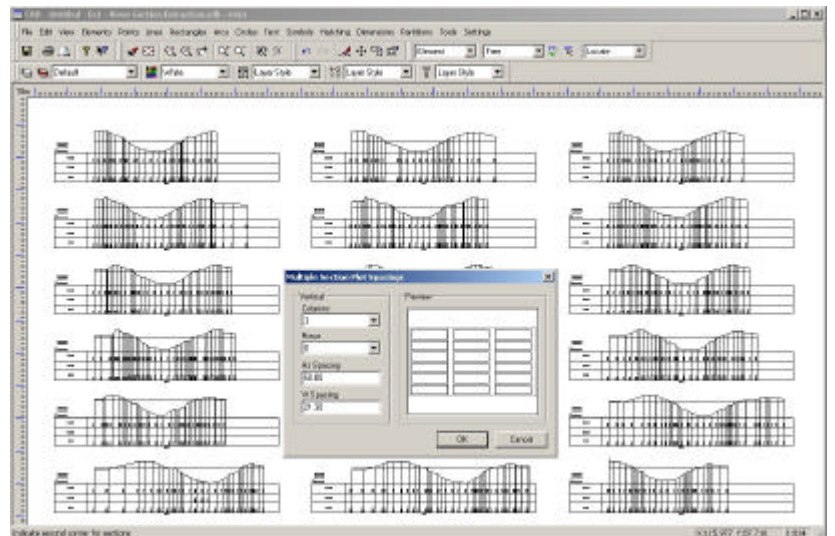
A **Section Viewer** displays the calculated profile. In the case of multiple sections, you may step through using arrow controls. The chainage and coordinates of the cursor are shown bottom right. The above is an example from the automatic **River Section** extraction.

## Section Plotting

Sections can be plotted in **CAD** (Model Space) or **Drawings** (Paper Space).



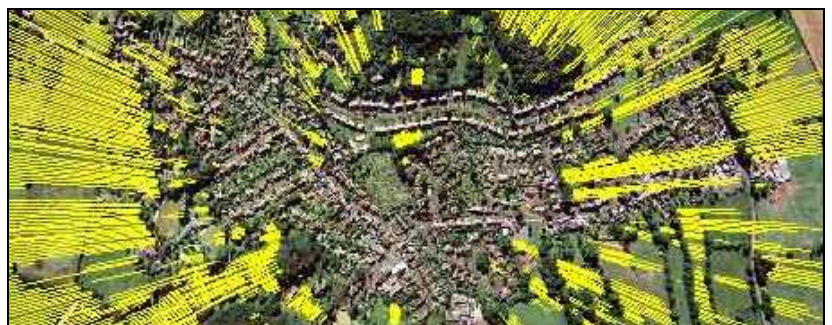
Setting Section Plotting Defaults Dialog Box



Multi-Sections Plot

Multi-section or individual plots can be created as shown opposite, with automatic filtering of drop lines and overlapping text.

A special option allows Radial sections to be used to plot **Lines of Sight** that can be super-imposed onto a DTM and aerial photography for **Visibility Analysis**. The Red lines indicate blocked line of sight, the light green visible lines of sight.



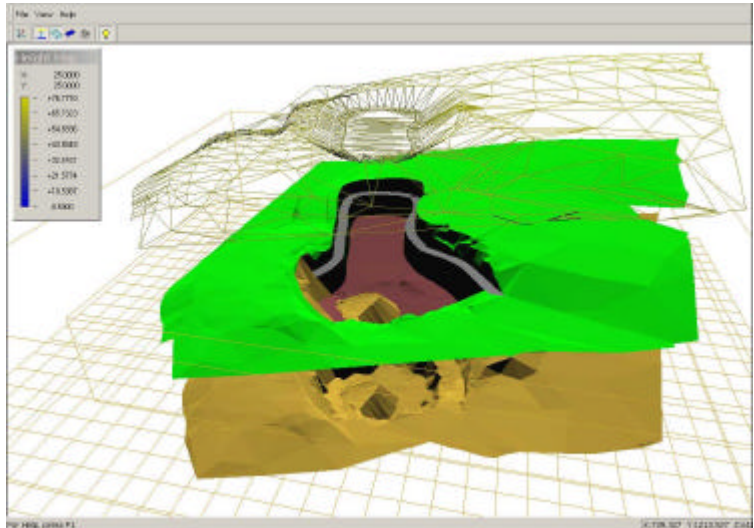
Radial Section used In Visibility Analysis

## Advanced 3D Viewing

The Professional edition has added options for visualising 3D Models. Multiple models can be viewed in 3D, with a “cut-in” feature allowing a merge of models with one model being forced into the foreground.

A mixture of wire frame and normal render, as shown opposite, allows two or more models to be viewed together. As each model may be roughly at the same level, models can be given a **false offset** so that they may be viewed apart.

A grid reference and **Height Map** for height rendered images gives scale to these images. An exaggerate height scale can be provided to exaggerate the 3<sup>rd</sup> dimension.



Interactive 3D Viewer



Photo Realism with Lidar 3D Viewing

Whilst n4ce can handle mass data there are situations where the data format is used to aid storage. This is particularly beneficial with **Lidar** and **OS Profile Gridded** data.

With these data sets, interesting 3D visuals can be created, including the addition of aerial photography, which can be draped over the Model, as shown opposite. This model also has a proposed development superimposed for impact studies.

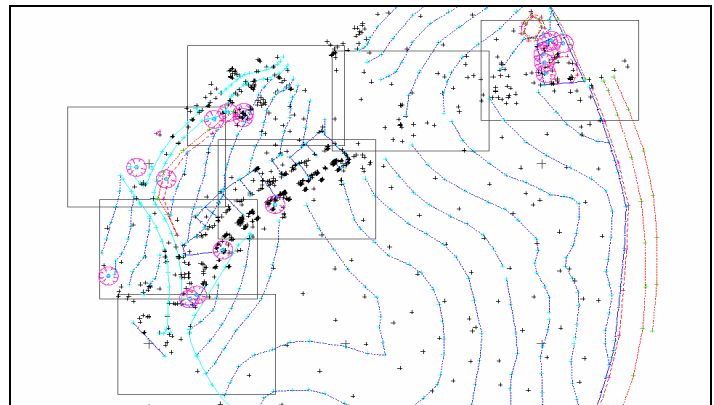
For more dynamic presentations, data can be exported to **Criterion 4D** for VR fly-throughs.

## Key Plans

When projects stretch over a number of drawing sheets, or when zooming into a survey with View Ports, it may be difficult to see where exactly a Drawing is being created.

A facility in Professional allows the automatic creation of **Drawings** by splitting up a model into Sheets, called **Partitions**. A **Key Plan** showing Partitions is shown opposite.

If changes are made to any part of the Project, these **Partitions** are **automatically** updated. If the position or sizing of the **View Port** in the Partition is changed in the Drawing the Key Plan will be updated.



Key Plan with Partitions

Registered Dealer



[www.appsincadd.co.uk](http://www.appsincadd.co.uk)

Applications in CADD Ltd,  
21 Britannia St, Shepshed,  
LOUGHBOROUGH,  
Leicestershire, LE12 9AE, ENGLAND

Tel: +44 (0) 1509 504501  
Fax: +44 (0) 1509 600079  
e-mail: [enquiries@appsincadd.co.uk](mailto:enquiries@appsincadd.co.uk)