

LISCAD™ SURVEYING & ENGINEERING SOFTWARE

THE SURVEYOR'S CHOICE

WHY
Thousands of
SURVEYORS
in over 100 countries
RELY on LISCAD



VERSATILE



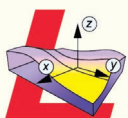
USER FRIENDLY



COMPREHENSIVE



GREAT SERVICE & SUPPORT



INSIDE

LISTECH, developers of Liscad since 1988
Detailed product information
Customer testimonials
www.liscad.com

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LISCAD™ Surveying & Engineering Software is designed and developed by LISTECH, a company which has achieved worldwide recognition for software innovation and quality. LISTECH comprises a highly skilled team of qualified surveyors and engineers with extensive experience and knowledge in these industries.

As a Microsoft® Certified Partner, LISTECH has proven expertise in software development, in particular for the Windows® environment.



When deciding which surveying/engineering software will give you that added advantage, you need to select a system that is flexible and has power to perform.

LISCAD™ offers such capabilities including:

- Totally integrated modules which combine seamlessly to create an extremely powerful and yet easy to use software package. You may tailor the modules to meet your specific requirements.
- Many key advantages including proper support of full geodetic computations.

- Allowing you to form large digital terrain models, perform 3D transformations, transfer data to and from all popular data collectors, total stations and GPS receivers as well as to other surveying, engineering, CAD and GIS software systems.
- NEW powerful and intelligent design features giving you the capabilities you require whether you are building a dam, re-sheeting a road or designing a multi-lane freeway.
- An enviable reputation as a highly flexible and adaptable system.
- A worldwide distribution network with thousands of satisfied customers in over 100 countries.
- An internationally renowned responsive backup and support network.

These are a few of the many features that LISCAD™ has to offer. More detailed descriptions of the features and functions available in the system are contained in this product information booklet.



LISCAD Testimonials
LISCAD Modules

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UTILITIES

5

Configure, organise and manage projects.
(FREE with any LISCAD purchase).

INPUT/OUTPUT (now supporting XML & LandXML)

7

Includes *Field Transfer*, *Data Conversions* and *CAD Output* to transfer data to and from other systems and surveying equipment.

COMPUTATIONS

9

Create, edit and examine points, lines, splines, polygons, text and alignments.

ADJUSTMENT

13

Calculate rigorous least squares solutions for your field survey observations.

TRANSFORMATIONS

14

Perform least squares transformations and also transform between projections.

MODELLING

15

Compute unlimited size Digital Terrain Models and display contours.

3D VISUALISATION

17

The 3D Visualisation module gives you a realistic 3D view of your project.

PROFILES AND DESIGN

19

Create and edit long and cross sectional data and compute end-area volumes. Incorporates an impressive new condition based system for easy generation of virtually any design.

VOLUMES

23

Calculate volumes between any surfaces, auto generate surface intersections, common boundaries and create height difference models.

BACKGROUND IMAGES

25

Raster Background Images can be used to digitize features on-screen or utilised as a location guide for aerial photographs.

CAD

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Create, annotate, move, rotate and plot, to generate final plans.

RESOURCE EDITOR

29

Create and edit symbols, line styles and fonts.

LISCAD Lite

30

An abbreviated version of LISCAD for field data transfer, editing, viewing and transfer to/from other systems.

Getting to know LISCAD
Functionality Summary

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Free 14 day LISCAD License

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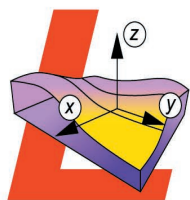
Learning LISCAD

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Sales and Enquires

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LISCAD™ SURVEYING & ENGINEERING
SOFTWARE

THE SURVEYOR'S CHOICE

"Harley Survey Group have used **LISCAD** since Version 1.0. The greatest strength of the program is that it speaks the surveyors language. The intuitive interface was already evident from the outset and it has gotten better from there. **LISCAD** has proven to be very easy to learn and can be used at different levels of know how. "

-John DeSnoo, Harley Survey Group, Albany, WA

"Esperance surveys have used **LISCAD** from day one, day one being about 12 years ago. The ability to purchase by module means you only pay for the particular programs needed for each licence. We use the software from initial transfer of data to total station or GPS and right through the whole range of surveys undertaken including topographic, volumes, construction, cadastral (subdivision and strata) and all our drafting including road design and pre calculation plans. The software is continually updated to reflect new technology and data transfer formats. The telephone and email support is excellent."

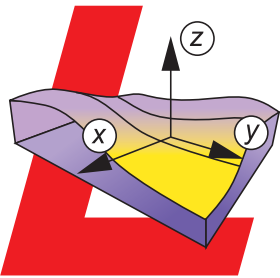
-Greg Thomas, Esperance Surveys, WA

"I have used **LISCAD** for a number of years for all of our surveying needs. I have not found a product equal to **LISCAD**, let alone one that exceeds its capabilities"

- Alex Epstein, Survey Supervisor, Trinidad & Tobago

"No other Surveying program that I have encountered or heard about can create and operate in both the geodetic world of GPS and the plane world of conventional instruments."

**- Robert Coutts, SkyBase Geomatic Solutions Inc
Alberta, Canada**

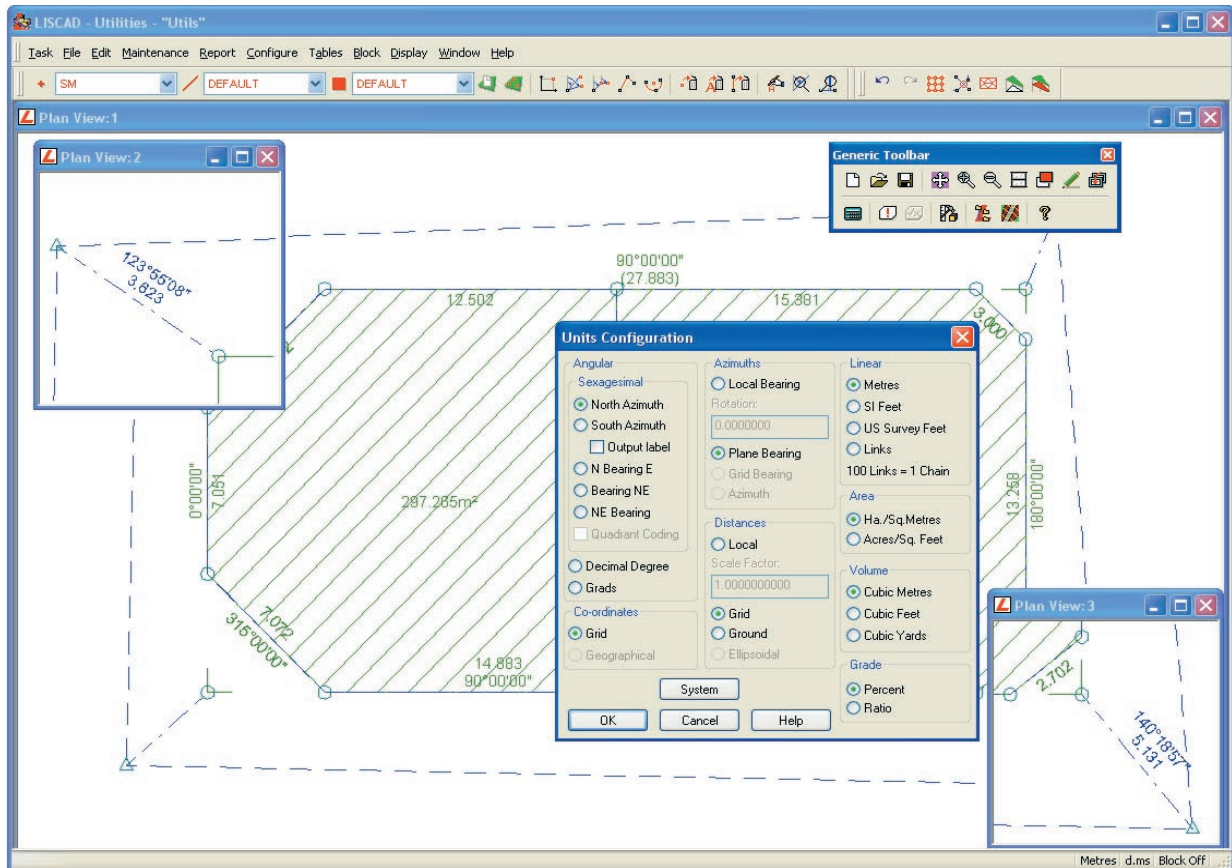


LISCAD Utilities

A Shining Light...

is the symbol of inspiration. LISCAD has many inspirational features.... all designed to improve your workstyle and productivity.

"Utilities" for configuring, organising and managing projects.



The benefits...

CONFIGURE YOUR SYSTEM...

to various international units of distance, angle, bearing, area, volume and map projection.

MULTIPLE DOCUMENT WINDOWS...

provides many different views into the database.

CREATE CUSTOM TOOLBARS...

that can be configured for multiple users and available at all times during data editing or examination.

CONFIGURE SYSTEM SETTINGS...

such as colours, symbols, line styles, polygon symbol or line hatching. They are easily set to your preference.

POWERFUL LISCAD BLOCK...

functionality to assist editing of localised regions.

UNDO AND REDO...

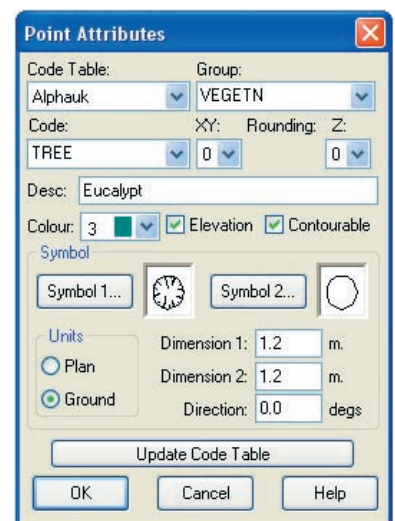
capability throughout the system

Compound File

The LISCAD database is an OLE compound file. To you, this means that instead of having to manage numerous files when copying or archiving a LISCAD project, a single file contains the entire data base.

Code Table Editor

Code Tables are the link between field productivity and the information you want to provide to your client. Attributes for features such as points, lines and polygons are quickly and easily assigned in the Code Table, which can be opened in either Form View, or Table View.



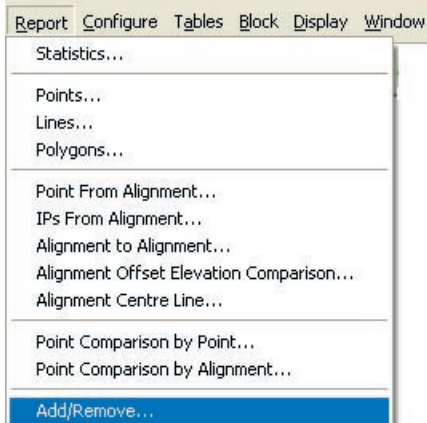
Code	Stringable	Description	Group	Breakline	Boundary	View	Line Style	Colour	Curv. Fact	Bearing
18 BOK	Yes	BACK OF KERB	ROAD	Yes	No	Yes	---	3	50	No
19 BOY BA	No	BOUNDARY LINE	BOUNDARY	No	Yes	Yes	---	4	50	Yes
20 BOY L	No	BOUNDARY LINE	BOUNDARY	No	Yes	Yes	---	4	50	Yes
21 BOY AD	No	BOUNDARY LINE ADJOINING	BOUNDARY	No	Yes	Yes	---	2	50	No
22 BEID	No	BOUNDARY	BOUNDARY	No	Yes	Yes	---	2	50	Yes
23 BI	Yes	BOUNDARY/FENCE INTN	BOUNDARY	No	Yes	Yes	---	3	50	No
24 BL	Yes	BOUNDARY LINE	BOUNDARY	No	Yes	Yes	---	4	50	Yes
25 BLDG	Yes	BUILDING	BUILDING	Yes	Yes	Yes	---	7	50	No
26 BM	No	BUILDING	BUILDING	No	Yes	Yes	---	3	50	No
27 BRGE	Yes	BRIDGE	BUILDING	Yes	No	Yes	---	2	50	No
28 BUND	Yes	BRIDGE UNDERSTRUCTURE	BUILDING	No	Yes	Yes	---	2	50	No
29 CABLE	No	UNDERGROUND CABLE	UNCLASS	No	Yes	Yes	---	2	50	No
30 CB	Yes	CENTRELINE BITUMEN	ROAD	Yes	No	Yes	---	3	50	No
31 CDPY	Yes	CENTRELINE NEW RD	ROAD	Yes	No	Yes	---	2	50	No
32 CF	No	CENTRELINE OF FORMATION	ROAD	Yes	No	No	---	3	50	No
33 CHEK	No	SURVEY	SURVEY	No	Yes	Yes	---	2	50	No
34 CJ	No	ROAD	ROAD	Yes	No	Yes	---	3	50	No
35 CK	Yes	DRAINAGE	ROAD	Yes	No	Yes	---	3	50	No
36 CK BOY	No	BOUNDARY LINE	BOUNDARY	No	Yes	Yes	---	4	50	Yes
37 CK TRAI	No	BOY LINE-CK BANK OR C.L.	BOUNDARY	No	Yes	Yes	---	4	50	Yes
38 CL	No	CENTRELINE NEW ROAD	ROAD	Yes	No	Yes	---	3	50	No
39 COG	No	CHANGE OF GRADE	RELIEF	Yes	No	Yes	---	2	50	No
40 CONC	Yes	EDGE OF CONCRETE	BUILDING	Yes	No	No	---	3	50	No
41 CONF	Yes	RELIEF	BUILDING	Yes	No	Yes	---	2	50	No
42 CORNER	No	BOUNDARY	BOUNDARY	No	Yes	Yes	---	4	50	Yes
43 CSV	No	DEFAULT	DEFAULT	No	Yes	Yes	---	2	50	No
44 CUL	No	DRAINAGE	ROAD	Yes	Yes	Yes	---	2	50	No
45 DAM	Yes	EDGE OF WATER	DRAINAGE	Yes	Yes	Yes	---	3	50	No

When opened in Table View the Code Table is presented in a spreadsheet format, allowing full editing, printing and export capabilities including XML.

Have as many Code Tables stored as you like, allowing different attributes to be allocated, depending on the type of survey undertaken, eg. cadastral, engineering or detail.

Reports

A statistical report is available for each project, plus comprehensive outputs for all element types, including points, lines, polygons and a variety of reports for alignments.



Point Comparison produces a positional comparison report between points in the same or different data bases. This feature is particularly useful for comparing design positions with as built positions. Points may be selected

for comparison based on point identifier, or by radial and elevation search distances. LISCAD's XML support also allows you to create and customise reports to meet your specific requirements for content and presentation including HTML.

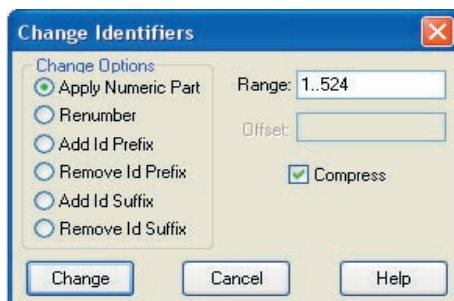
Toolbars

One of the many powerful features of LISCAD is the user definable Toolbars. You can create and edit Toolbars that are always active or that can be tailored to appear only when a particular window type is active. Each toolbar can float or be docked to the application frame.

Change Identifiers

Changes the point identifiers in the currently open data base. Any point identifier duplication conflicts are reported as part of the process. The report may be saved

for future reference



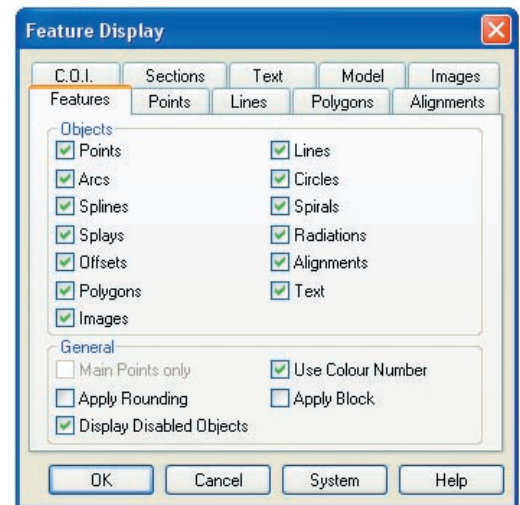
Display Features

An essential tool to provide you with your desired view is the Features Display option.

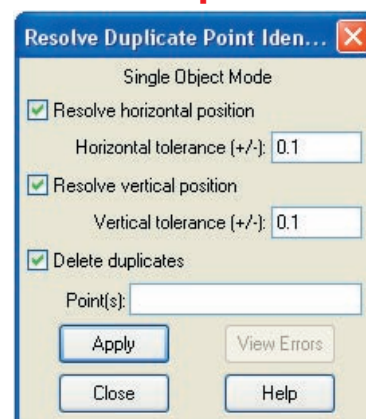
It is easy to control the information displayed in a project.

Point, Line and Polygon attributes are

controlled through the use of a tabbed dialog box, while the addition of a System button allows you to save a default configuration for new projects. You can even access Display Features while using other interactive dialog boxes - just press the shift key and right click the mouse in the graphics window.



Resolve Duplicates



Allows the averaging of points with duplicate identifiers. The process optionally allows averaging for XY position and/or elevation. A new point is created at the average XY position and/or average elevation according to the options selected. Note that duplicate points with the same identifier can only be

created if the Configure/Point Identifiers dialog box is set for non unique identifiers. This command is only active if the data base is set for non unique identifiers.

Optimise Database

Optimises the data base to improve response times. Using this function can substantially improve the time taken to display the objects in the data base.

This function will have the most noticeable effect on large data bases.

Additional Features

Apart from those described above, the Utilities Task also contains these major features:

Filtering Points / Lines

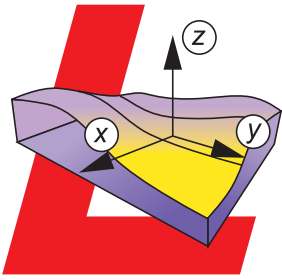
Merging Data Sets

Extracting

System Configuration

Print / Printer Setup

Plotting

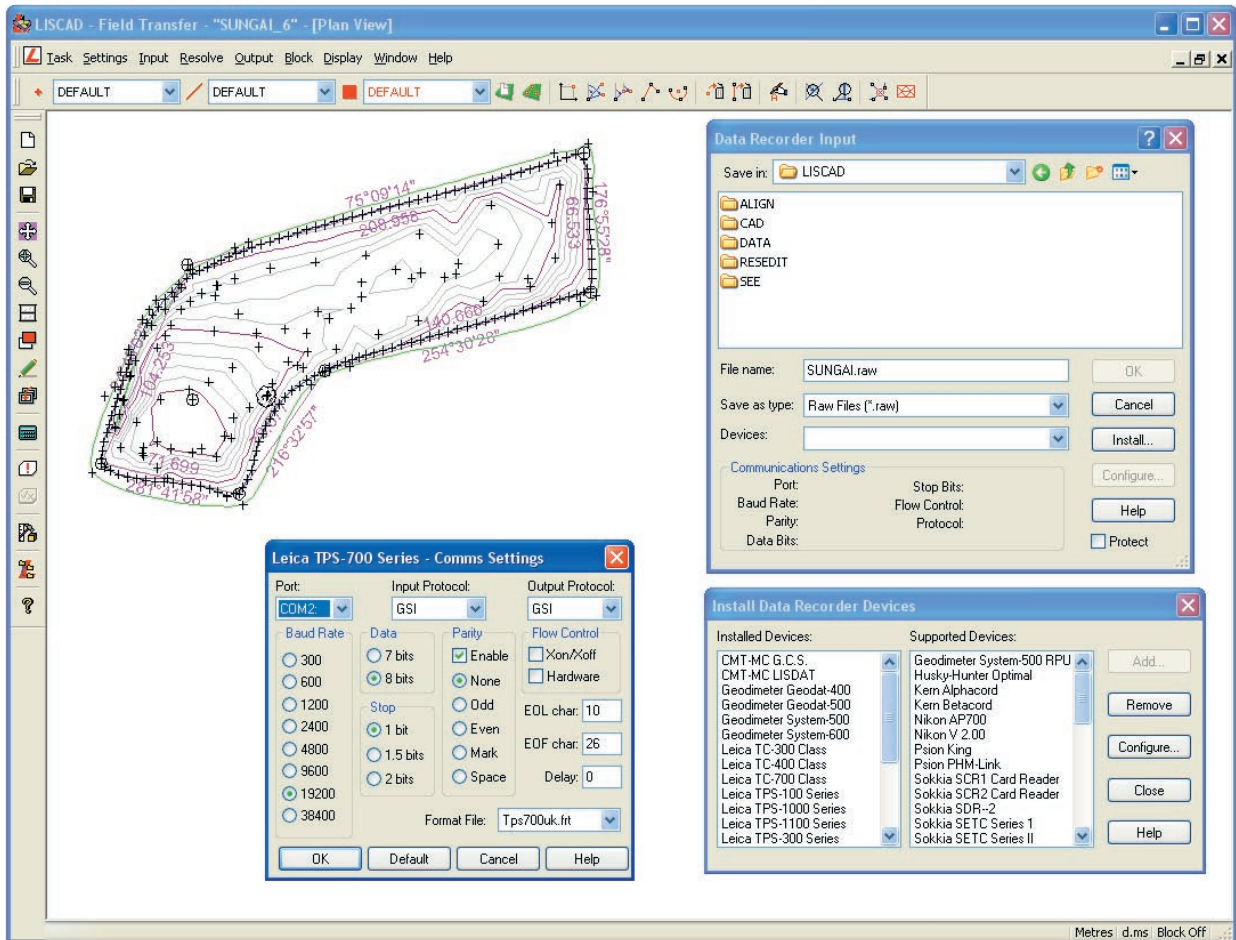


LISCAD Input/Output

Lost in the Translation?

... when trying to make systems talk to one another. LISCAD incorporates many translators ensuring that data collected in the field is conveyed to and from other systems.

"Input/Output" for transferring data to and from other systems and surveying equipment.



The benefits....

POWERFUL TWO-WAY DATA TRANSFER...

for nearly 60 different Data Recorders, including all well known brands.

LISCAD DATA CONVERSIONS SUPPORTS...

AutoCAD DWG & DXF, including AutoCAD 2004/2005, MicroStation DGN, Arc/Info, MX Moss, SKI GPS and many more import/export formats.

POWERFUL USER DEFINABLE TRANSLATOR...

for transferring ASCII data to and from LISCAD.

TRAVERSE ADJUSTMENTS...

by Bowditch, Transit or Crandall's methods.

WRITE YOUR OWN CONVERSION PROGRAMS...

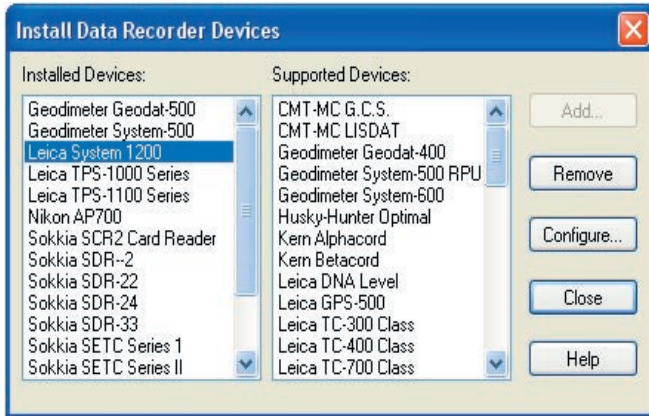
and execute them seamlessly inside LISCAD.

LISCAD IS ALSO XML EMPOWERED...

allowing the import of any XML, LandXML format and export of XML, LandXML, HTML and ASCII text formats. XML support allows for customised reports and data exchange formats to be added by yourself or third parties at any time. LISCAD's powerful XML implementation truly opens the data exchange horizons.

Data Recorder Input / Output

With a wide range of supported Data Recorders, users of LISCAD have an extensive choice of field equipment, plus you can write your own specific data collector input / output reformat program that can run seamlessly within LISCAD.

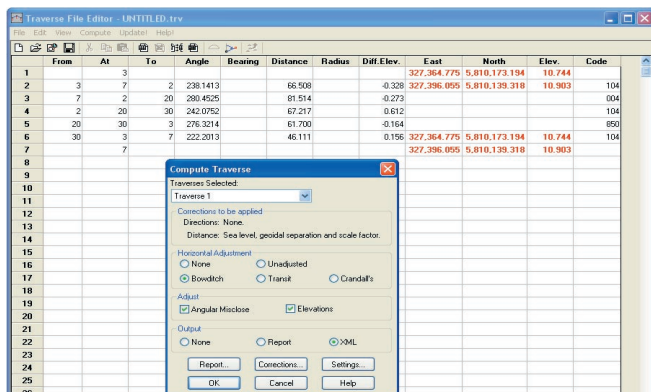


LISCAD's XML functionality means you can readily exchange data with the new generations of field sensors utilising XML exchange formats.

While comprehensive coding facilities are available for all recorders, an enhanced range of Leica Operation Codes allows greater flexibility and speed in the field. A sets summary will compute a mean pointing from angle rounds, while an orientation can be computed from multiple reference stations.

To further automate the reduction process, support is available for the electronic digital level.

Design information can be automatically loaded into the data recorder for set out in the field, or a print out of radiations from nominated stations can be produced for manual set out.



Traverse Adjustment

Traverse information can be automatically extracted from the data recorder and easily processed using one of the standard adjustment techniques, Bowditch, Transit or Crandall's.

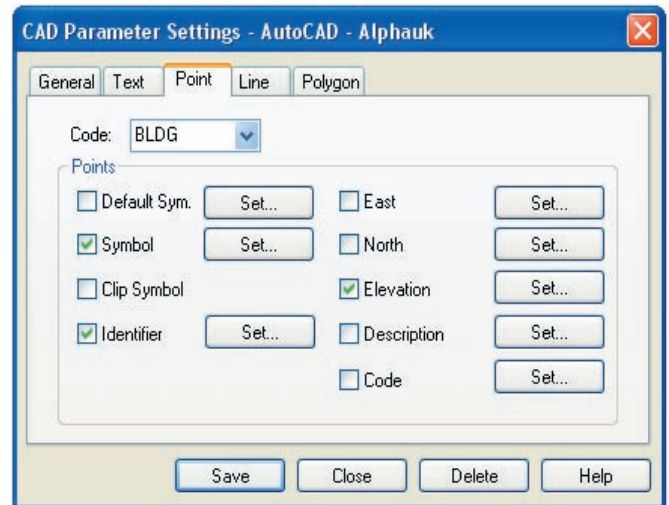
The traverse adjustment supports a traverse network and after adjustment, the resulting coordinates and elevations can be uploaded into the project data base and used to control the reduction of additional survey data. You can directly output your adjustment to XML, enabling you to tailor your own reports and export the traverse to other systems.

Manual Data Entry

For those who do not use total stations for all survey requirements, LISCAD provides an easy to use entry format for all standard manual entry methods.

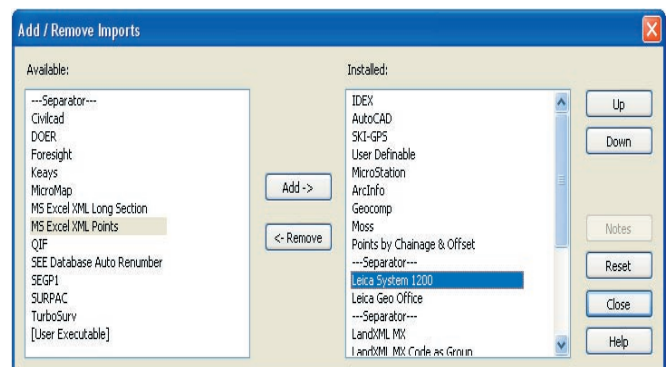
CAD Output

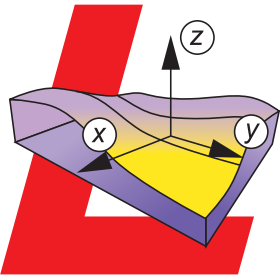
Once the processing is complete, it is important that a CAD file, containing all of the attributes specific to the project, can be easily generated. Comprehensive CAD output libraries cater for all work requirements, including tables, legends, grids, model and alignments, whether it is for AutoCAD, MicroStation or LISCAD CAD for Windows.



Data Conversions

LISCAD contains extensive reformatting capabilities, providing Import / Export options for SKI GPS, plus a wide range of systems, including AutoCAD, Microstation, MX and a host of other surveying / engineering applications. Also, import into your LISCAD project sectional data based on chainage, offset and elevation. For those specific packages that are not directly supported, LISCAD provides a powerful User Definable ASCII option, which can handle almost any format. LISCAD's powerful XML functionality provides support for LandXML, the land industry's standard exchange format. This means you can easily exchange data with any other system that supports a LandXML format. LISCAD truly opens the horizon to exchange data at even the detailed design level.



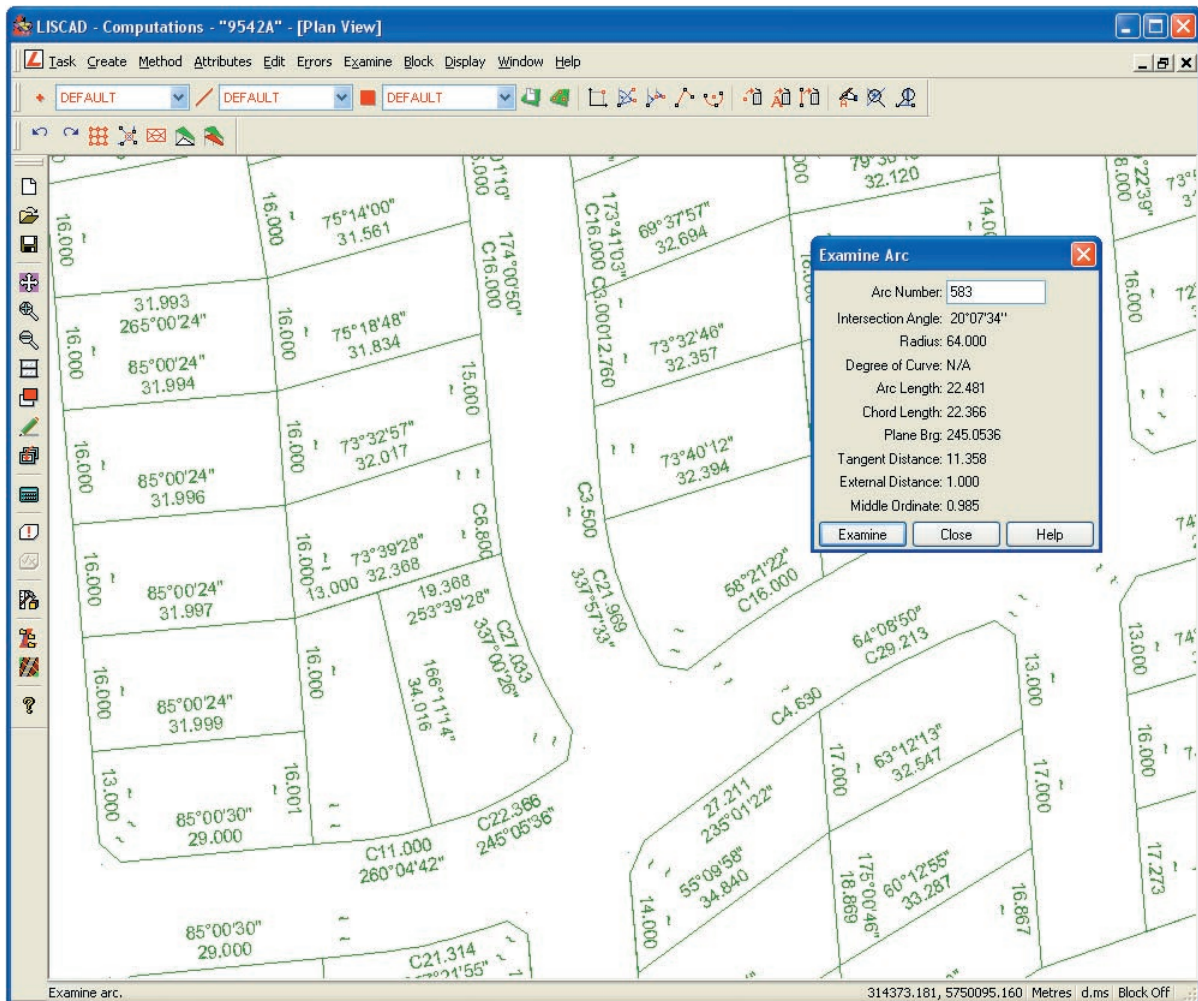


LISCAD Computations

It All Adds Up...

to a good investment when you get maximum use of your software. The powerful and flexible database and comprehensive application software of LISCAD ensures the best investment return.

"Computations" creates, edits and examines points, lines, splines, polygons, text and alignments.



The benefits....

POWERFUL GRAPHICAL INTERFACE...

allowing "See as you do" graphics for easy use.

TOPOLOGICAL DATABASE...

LISCAD's unique topological database design ensures the integrity of your data is always maintained. When editing an object, any other object related to it is automatically updated to maintain the relationships you have established.

AUTOMATICALLY ATTACH ATTRIBUTES...

symbols and line types to points, lines, polygons and alignments.

NO SOFTWARE LIMITATION...

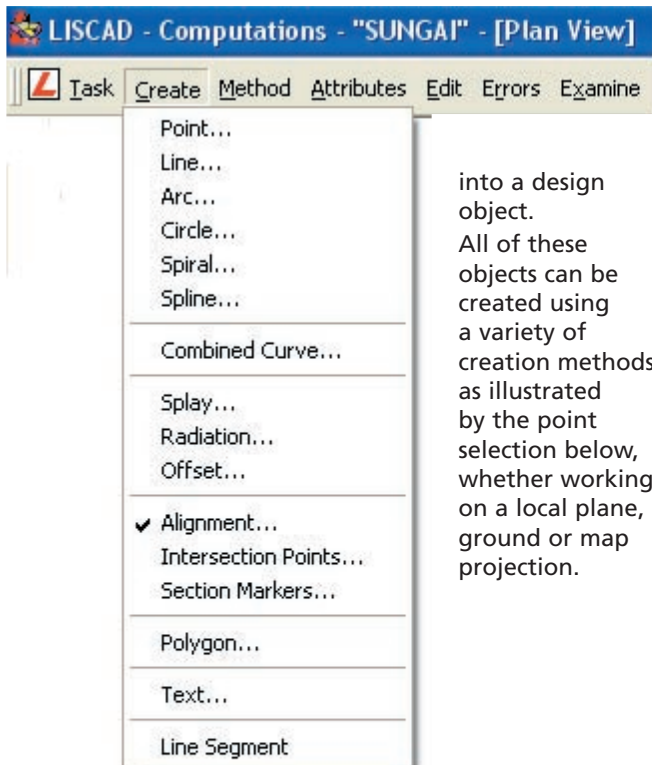
to the size of the 3D database for calculations and results.

POWERFUL COMPUTATION OPTIONS...

for a variety of objects, including points, lines, circles, arcs, splines and spirals.

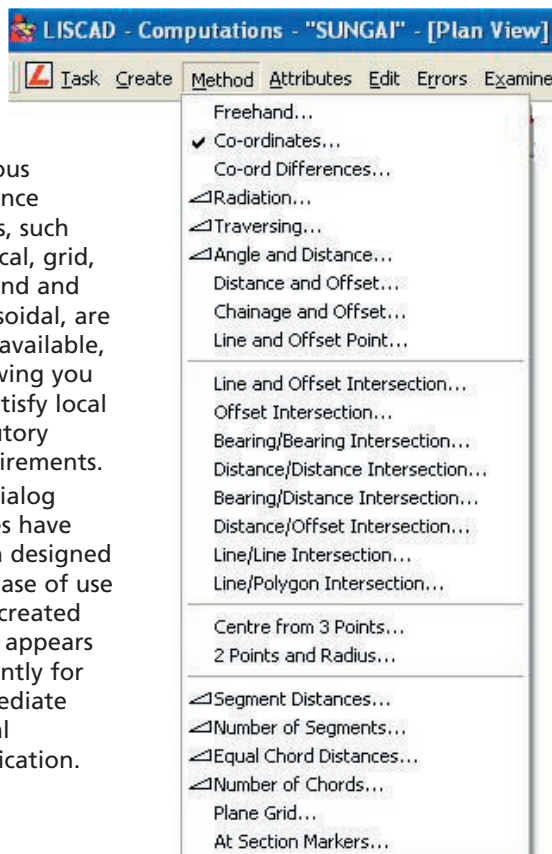
Creation Methods

The powerful Computations Task in LISCAD enables you to create a variety of object types, including points, lines, polygons, circles, arcs, splines and spirals. Complex objects are handled easily through the Combined Curve option, while the Create Alignment option can turn any lines



into a design object. All of these objects can be created using a variety of creation methods, as illustrated by the point selection below, whether working on a local plane, ground or map projection.

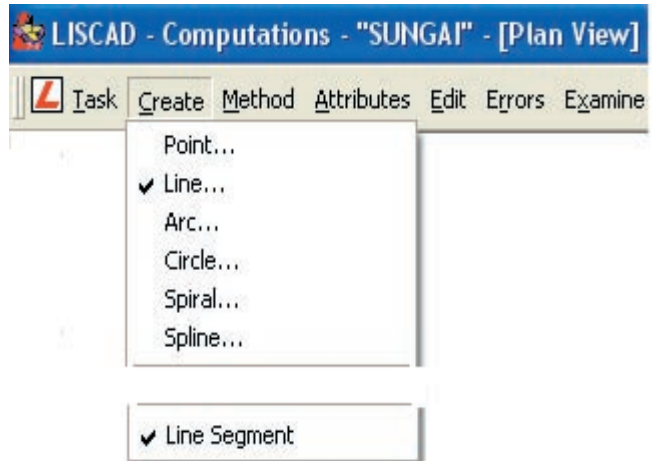
Various distance types, such as local, grid, ground and ellipsoidal, are also available, allowing you to satisfy local statutory requirements. All dialog boxes have been designed for ease of use and created data appears instantly for immediate visual verification.



Create Line Segments

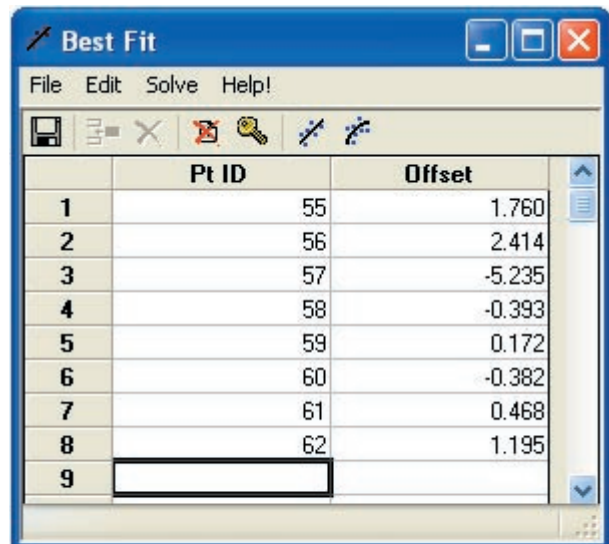
When creating lines, LISCAD is able to create either line strings or line segments.

Creating individual line segments is ideal when forming lot boundaries before creating polygons by element selection.



Best Fit – Line / Arc

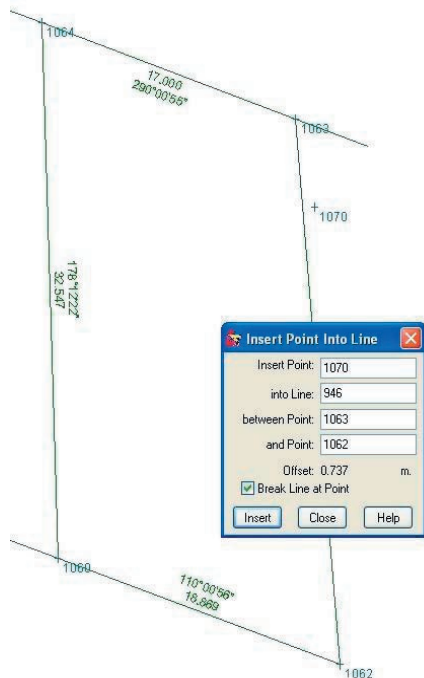
The ability to create best-fit lines / arcs through a series of existing points is an ideal tool for the cadastral surveyor. This option enables you to create a line, or arc, that forms a least squares best fit through a set of specified points.



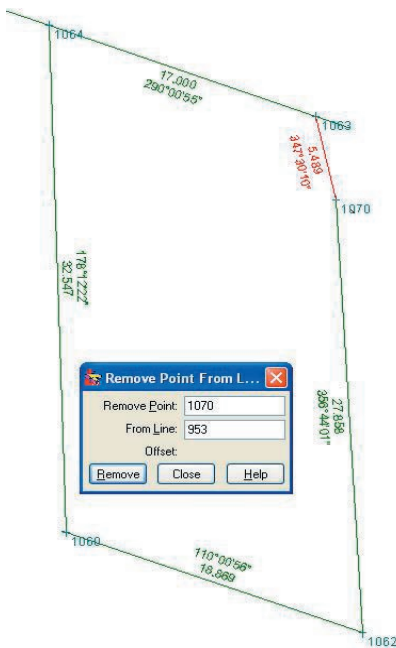
The specified points can be easily selected graphically, while points that the line or arc must pass through can be fixed. Following the computation, offsets from each point to the line or arc are displayed, allowing you to modify selection criteria and repeat the computation until satisfactory results are obtained. The computed line/arc can then be saved in the project database.

Polygon Creation

LISCAD contains powerful options for creating / editing polygons. While polygons are traditionally used for cadastral lot calculations, they can also be utilised when mapping theme areas for GIS applications.



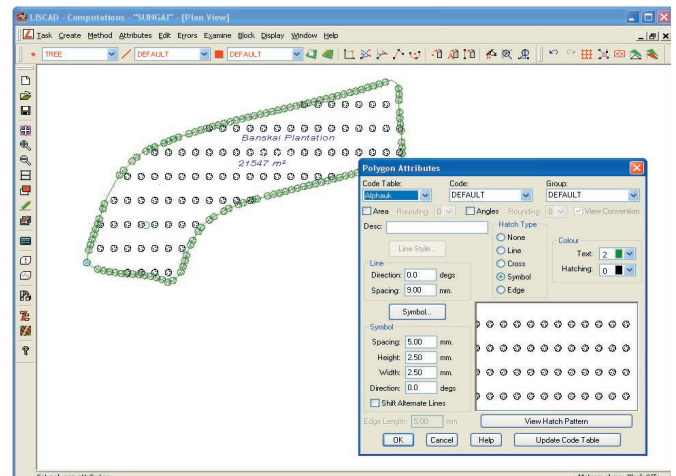
Once polygons have been created, they can be edited dynamically. When points are added, moved or deleted, the polygon dimensions and area are automatically updated.



The polygon areas are computed in accordance with the units that are currently set in the units configuration.

Polygon Attributes

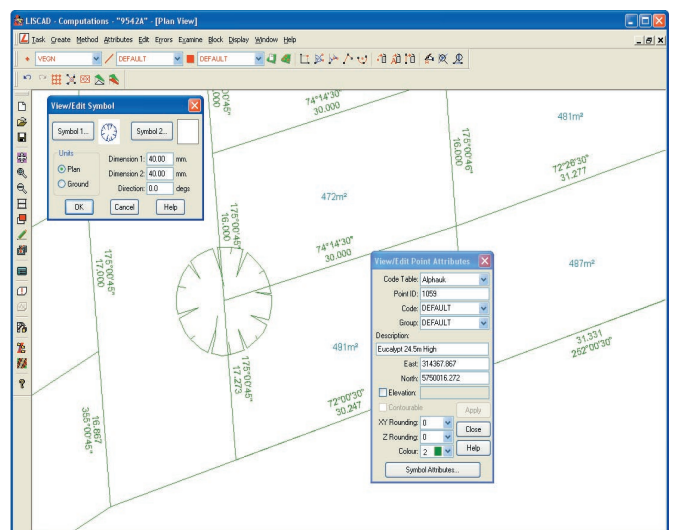
During creation, polygons can be easily enhanced with either line, crossed or symbol hatching.



While elements are computed with the attributes that are set before the computation, LISCAD contains powerful editing options that allow any individual element, or attribute to be edited at any time.

View / Edit

One mouse click is all it takes to examine all the attributes of a point, any one of which can be dynamically edited, with the results immediately displayed on screen. LISCAD now has enhanced editing capabilities to allow you to select multiple ranges of objects when editing.

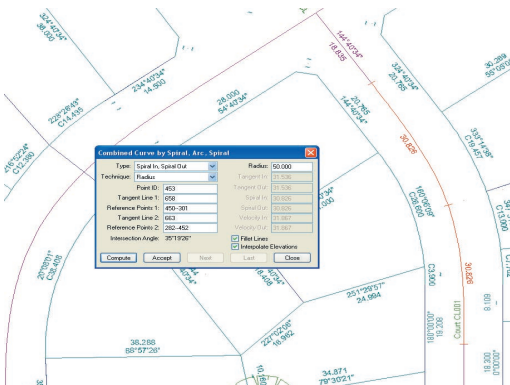


If major changes are required to a whole range of points, then this can also be easily accommodated with LISCAD's powerful editing tools. Any number of elements can be edited, by either block, code, point range, description or group.

Objects can be moved by a variety of methods, rotated or rescaled. Elevations can be updated and any attribute modified.

Combined Curves

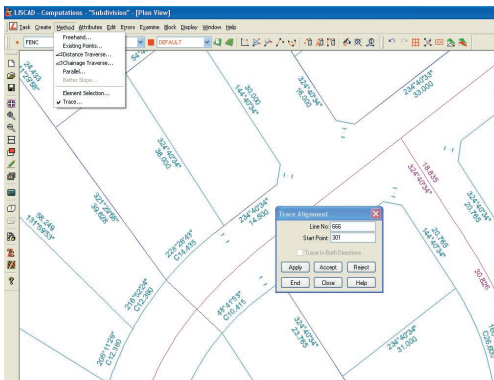
The creation of compound curves for road or engineering alignments is powerful, yet easy to perform in LISCAD



Combinations of arcs and spirals can be generated via one easy to use editor, which allows you to view the curves, and associated design parameters, before accepting the new design.

Alignment Creation

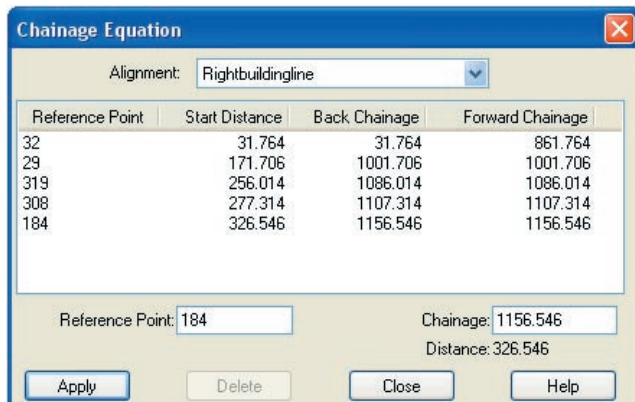
Any number of complex lines can be saved as an alignment, using one of several creation methods. Individual elements of an alignment can be edited, resulting in an automatic update of the alignment.



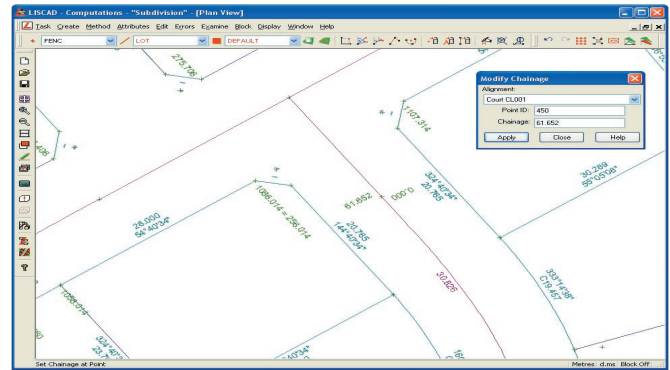
Through the Section Manager, relationships can be set up to establish Primary and Secondary Alignments

Alignment Editing

The chainage of any point can be edited, using the Chainage Equation dialog box, with all subsequent chainages along the alignment being automatically adjusted accordingly.



Alternatively, the entire chainage of an alignment can be changed to suit pre-existing conditions.

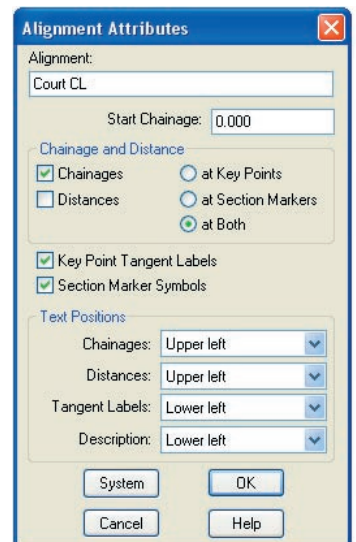


Section Markers

Section marker points may be optionally created and inserted into the alignment. Section Markers can be created at any location along primary alignments, to control the display of chainages and the locations for cross sections.

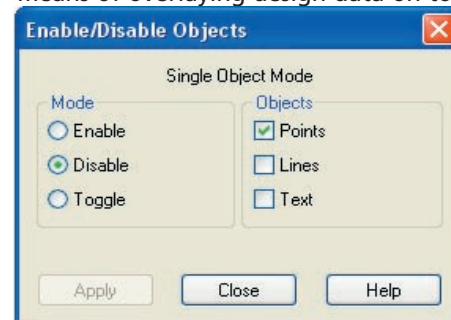
Alignment Attributes

While default attributes can be applied to each alignment, you control the amount and position of data displayed.



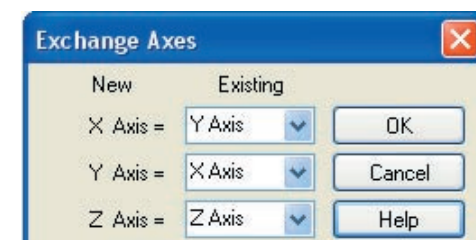
Enabling and Disabling Objects

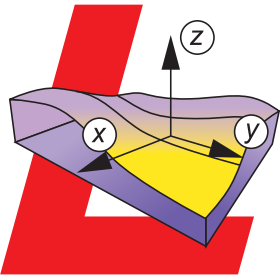
Points, Lines and Text Objects can now be disabled. Disabling objects allows them to be ignored without deleting them or having to put them on a new Group and switching them off. It provides a quick means of overlaying design data on top of existing data, allowing an integrated design model to be generated without interfering with the original data.



Exchanges Axes

Swap the X, Y and Z axes with each other. Ideal for working with façade surveys where it is desirable to view a building from the front rather than from above.





LISCAD Adjustment

The Ultimate Control...

When accuracy is paramount, LISCAD provides the solution.

"Adjustment" calculates a rigorous least squares solution for your field survey observations.

Least Squares Control File Editor - UNTITLED.adj										
File Edit Options Horizontal Elevation Help!										
Stn.	Point ID	East	North	Elevations	Code	Description				
1	5001	1,054.910	1,127.030		DEFAULT					
2	5002	980.971	1,064.084		DEFAULT					
3	5003	1,033.784	1,033.380		DEFAULT					
4	5004	1,014.344	993.674		DEFAULT					
5	5005	1,153.488	977.899		DEFAULT					
Obs	From	At	To	Angular	Distance	Diff.Elev.	Angular SD	Dist. SD	Elev. SD	
1		994001	994002	0.0000	134.398	0.000	0.0010	0.006	0.005	
2		994001	994003	115.5043	141.883	0.000	0.0010	0.006	0.005	
3		994001	5002	89.0151	57.201	0.000	0.0010	0.005	0.005	
4		994001	5001	13.1728	93.817	0.000	0.0010	0.005	0.005	
5		5002	994001	0.0000	57.196	0.000	0.0010	0.005	0.005	
6		5002	994003	222.4047	94.404	0.000	0.0010	0.005	0.005	
7		5002	5001	69.2701	97.094	0.000	0.0010	0.005	0.005	
8		5002	994007	90.2618	87.657	0.000	0.0010	0.005	0.005	
9		5002	5003	140.0205	61.091	0.000	0.0010	0.005	0.005	
10		5002	5004	174.2951	77.927	0.000	0.0010	0.005	0.005	
11		994005	994006	0.0000	107.202	0.000	0.0010	0.006	0.005	
12		994005	5007	23.5555	105.457	0.000	0.0010	0.006	0.005	
13		994005	5006	45.1707	48.915	0.000	0.0010	0.005	0.005	
14		994005	5005	324.5934	57.761	0.000	0.0010	0.005	0.005	

Adjusted Co-ordinates					95% Confidence Limits		Error Ellipse
Point ID	East	North	East	North	Semi Major	Semi Minor	Orientation
2	327378.260	5810075.234	0.004	0.002	0.004	0.002	91°02'53"
STN20	327305.170	5810111.322	0.003	0.004	0.004	0.003	148°40'04"
STN30	327303.305	5810178.514	0.003	0.003	0.004	0.002	20°15'51"

The benefits....

FULLY SUPPORTING BOTH...

horizontal and vertical adjustments.

AUTOMATIC EXTRACTION FROM DATA COLLECTOR...

for fast, accurate retrieval of observations to be adjusted.

MODIFY THE STANDARD DEVIATIONS...

by entering the centering and target errors.

COMPREHENSIVE REPORTING...

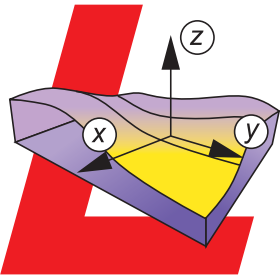
of all major adjustment processes.

AUTOMATICALLY UPDATES...

adjusted points into project database

IMPORT AND EXPORT XML...

data easily into the least squares adjustment editor.

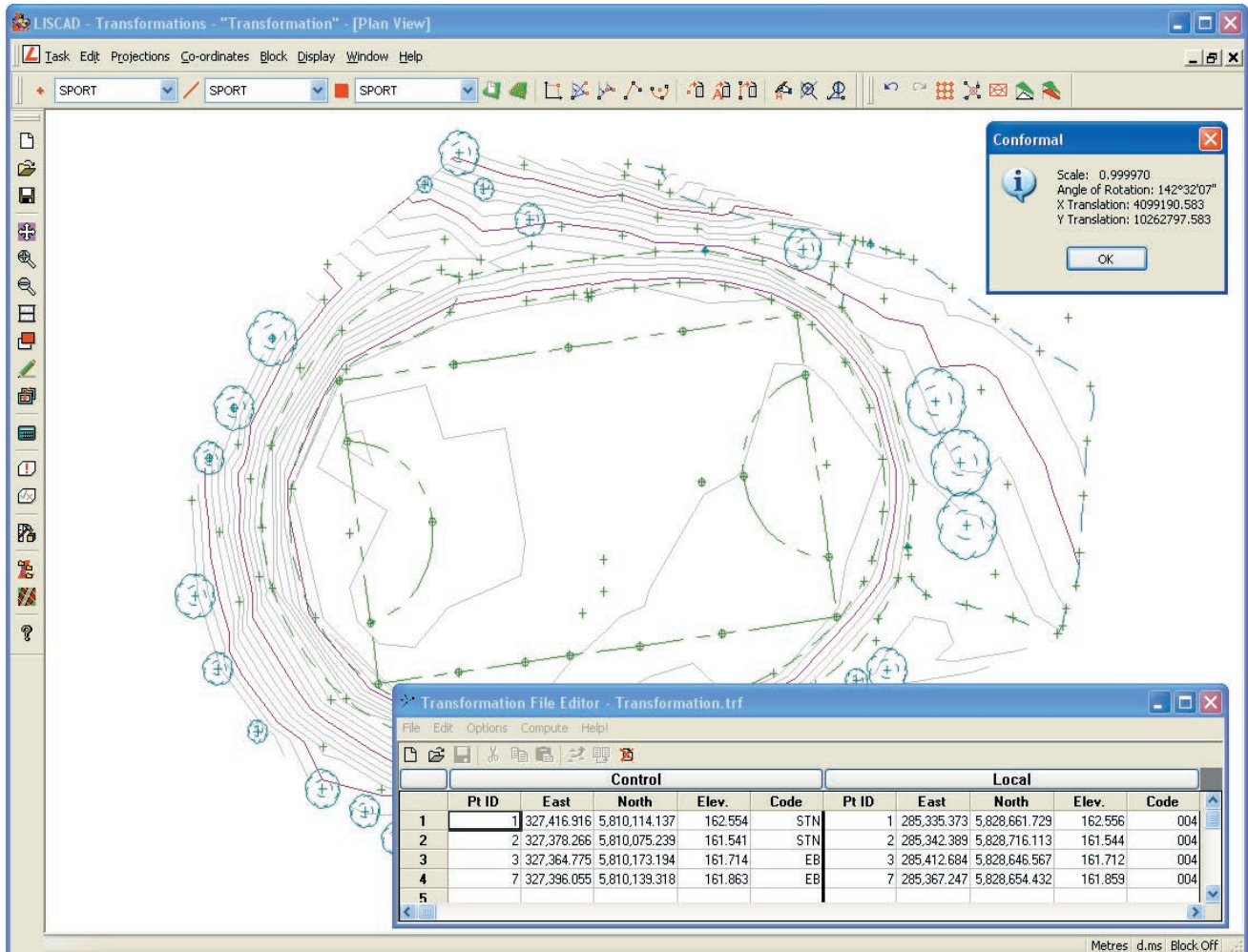


LISCAD Transformations

Where in the World is your Data?

LISCAD provides the easy answer when performing coordinate transformations on your projects.

"Transformations" performs least squares transformations and also transforms between projections.



The benefits...

TRANSFORM BETWEEN ANY DIFFERENT PROJECTION...

using a variety of transformation techniques such as Bursa-Wolf, Molodensky-Badakas, 3 Parameter Shift and Grid File.

FULL REPORTING...

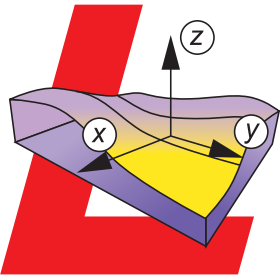
of all transformation parameters.

LEAST SQUARES TRANSFORMATION...

by Conformal, Semi-Affine, Affine or Unscaled methods.

INDEPENDENT WEIGHTING...

of coordinate pairs.

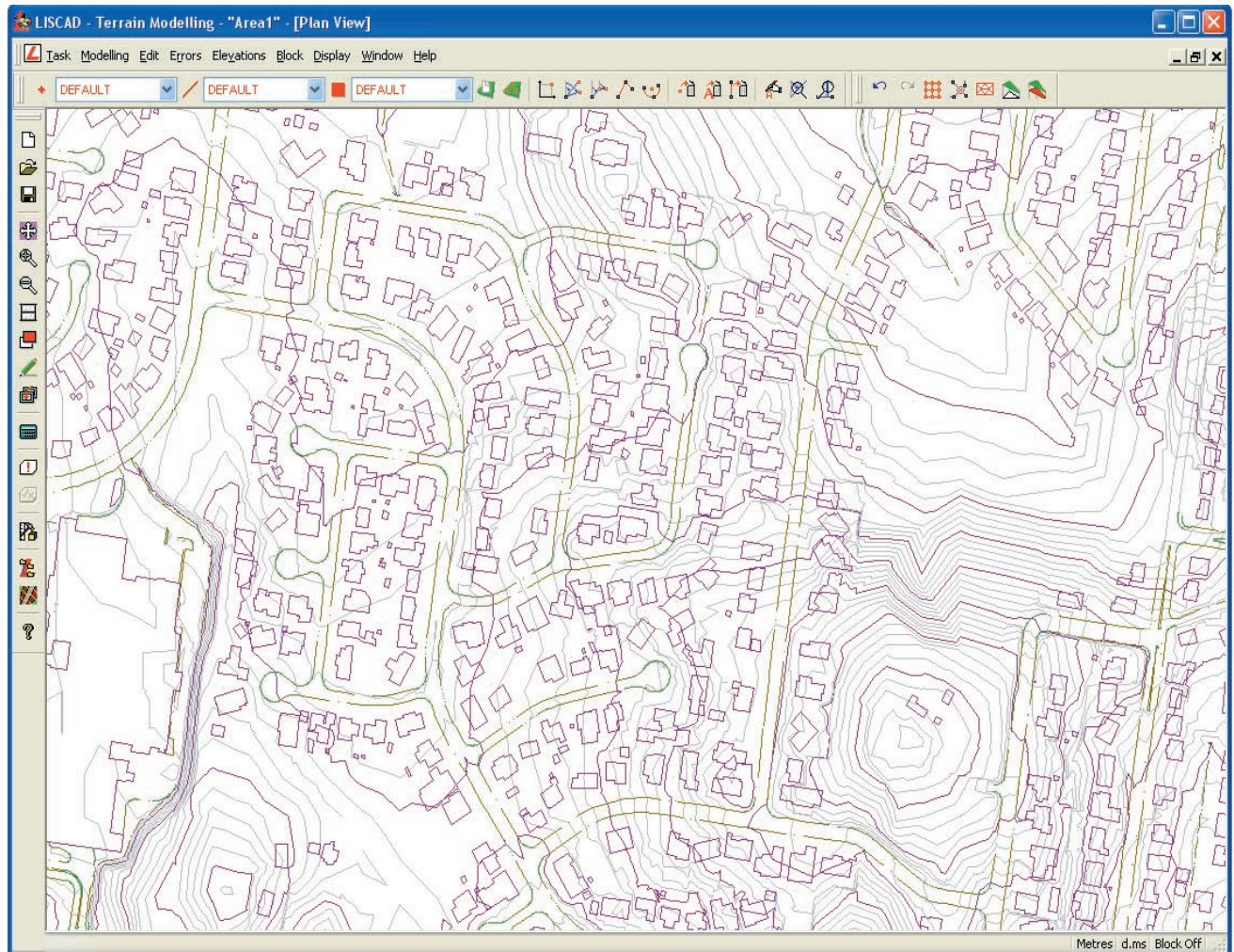


LISCAD Modelling

Want to Move Mountains?...

Then you need Capacity and Power. LISCAD provides both!

"Modelling" computes unlimited size Digital Terrain Models and displays contours.



The benefits...

MAXIMUM SPEED AND FLEXIBLE PROCESSING...

due to modelling method and database design.

No SOFTWARE LIMITATION...

to the number of points to be modelled.

CUSTOMISE THE MODEL...

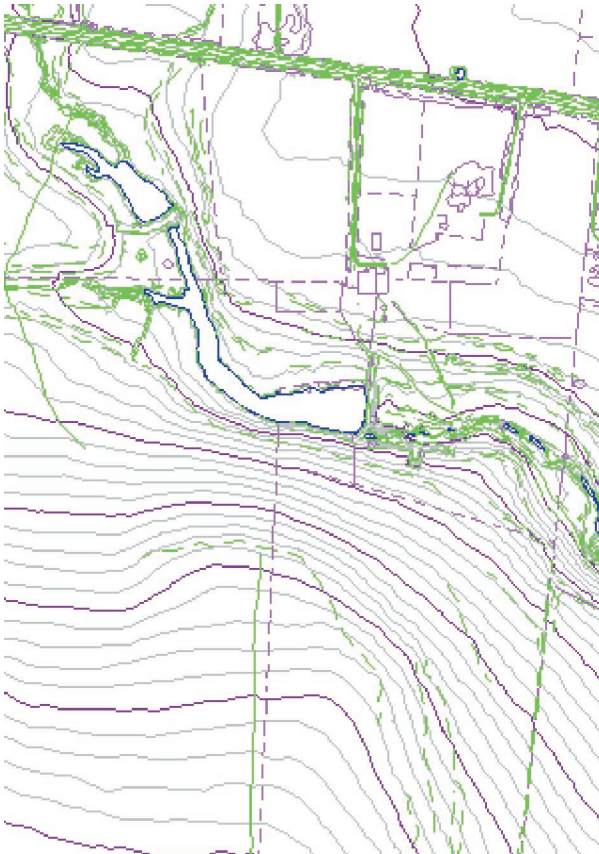
using powerful editing tools, including user definable positioning of contour labels

EXTENSIVE CONTROL ...

over the points to be included in the model creation.

Model Options

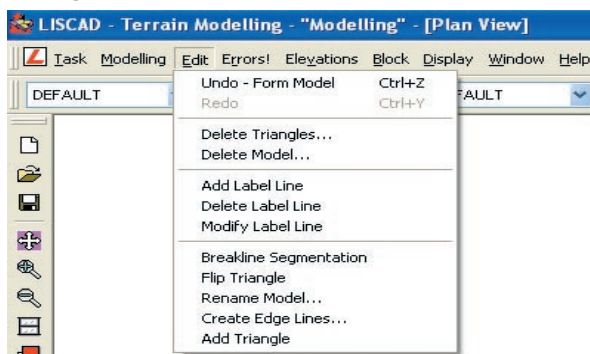
One of the outstanding features of LISCAD is its ability to model virtually unlimited sized data sets quickly and accurately. While a Validation option will check for duplicate elevations, crossing breaklines and unclosed boundaries, the user can form the model without validation.



The limits of a model can be controlled by model boundaries, either nominated in the field via a code, or placed later in the office. Model limits may also be imposed by the Block option, while the modelling of individual surfaces can be controlled by turning on / off different Groups (Layers). Multiple models can be held in each project.

Model Editing

Once the model has been created there are various editing tools available.



Triangles can be added to your DTM by specifying a new base line and apex. You can also delete triangles individually, or by Block, or the entire model can be deleted.

Other useful editing commands such as Flip Triangle and Create Edge line increase the power you have when editing your DTM's in LISCAD.

Label Lines

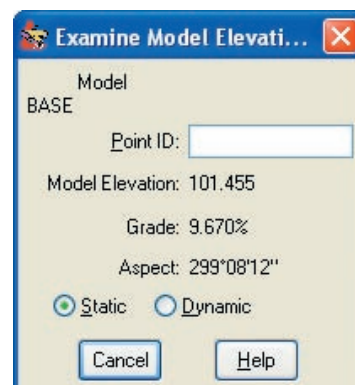
By default the system can place labels at the end of each major contour, however the user can specify graphically where additional labels are to be placed.



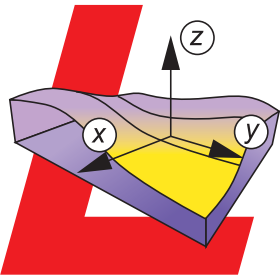
These label lines can be easily moved or deleted.

Examining Models

Elevations in the digital terrain model can be examined, and you can also view triangle aspect and slope.



2D design projects can be laid over a model and elevations interpolated onto each design point via Block-Interpolation. This is an ideal application for cadastral and engineering design.

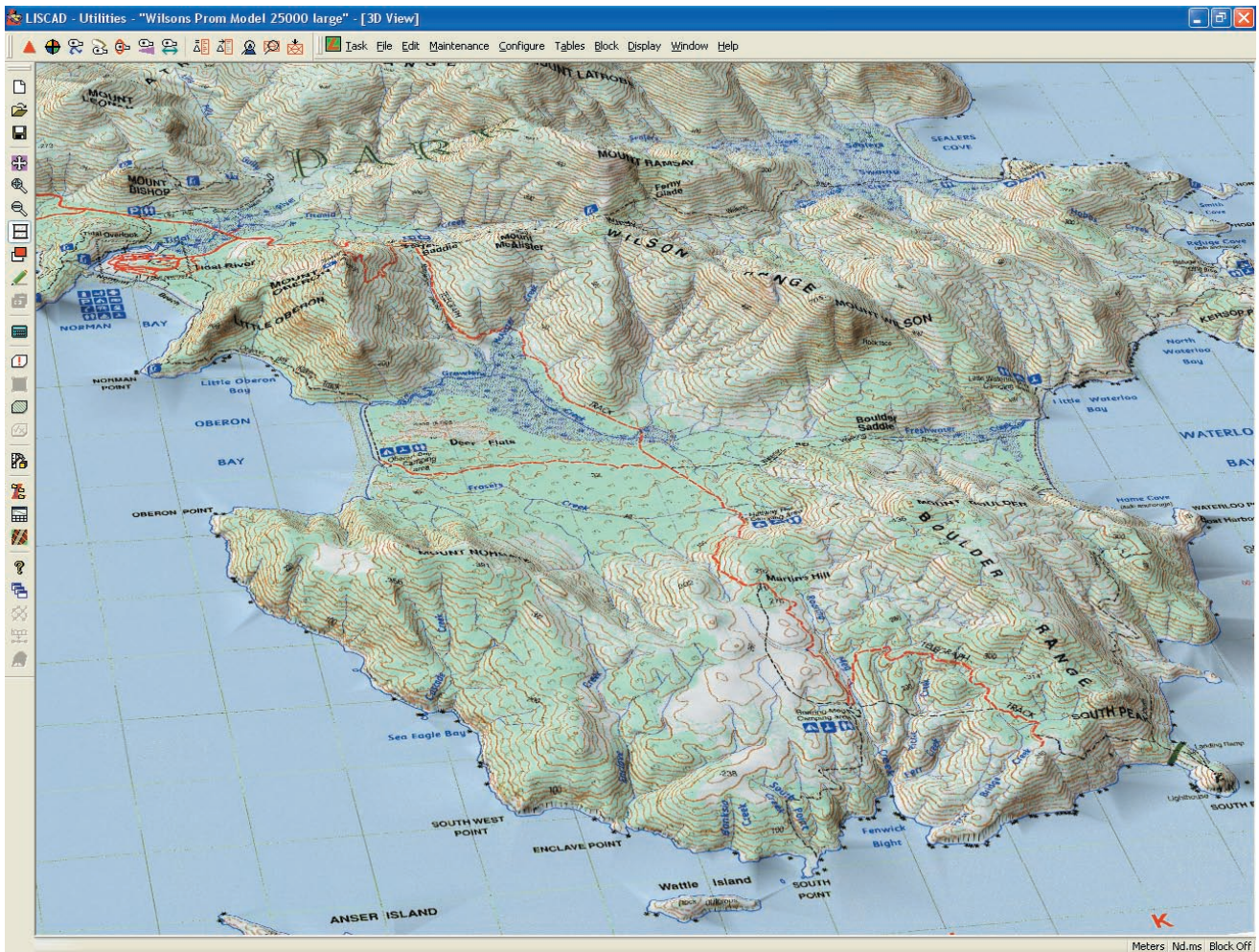


LISCAD 3D Visualisation

See Things In A New Way...

with LISCAD's 3D Visualisation module.

LISCAD's 3D Visualisation allows you to view a project in three dimensions.



The benefits...

Maximise Your Performance...

by configuring the system to get the best performance from your hardware and software.

Easily Navigate...

your way around the model with a choice of five different cameras.

Flexible Display Configuration...

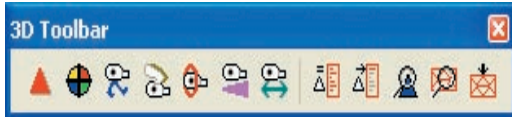
allows you to control what and how objects are displayed.

Drape Images...

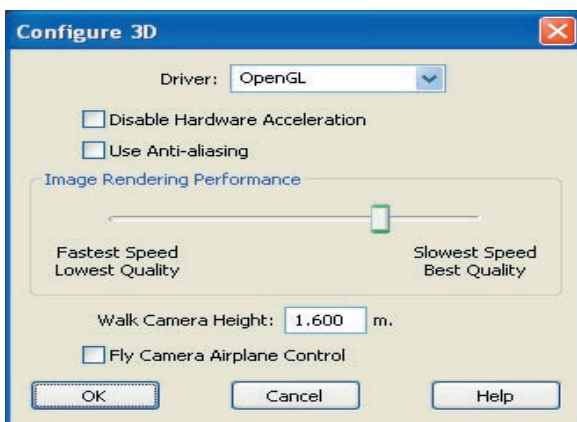
over the 3D model when used in conjunction with the Background Images module.

3D Navigation

LISCAD's 3D Visualisation module allows you to create a realistic 3D view of your LISCAD project. With the choice of Walk, Fly, Orbit, Zoom and Pan camera's, navigating your way around the model has never been easier. Plan Fit, Fit and Window functions allow you to orient the view and easily focus in on your area of interest.

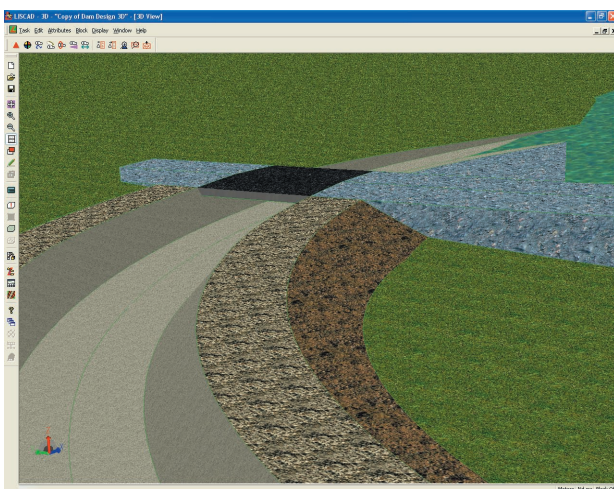


Optimise the performance of your installed hardware and software by configuring the 3D Visualisation module to use either OpenGL, Direct3D or WinGDi as your graphics driver. This will ensure the best balance between speed and quality when rendering models.

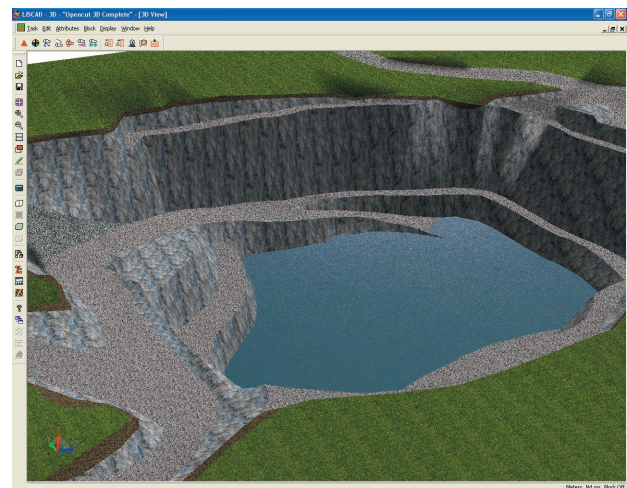


Enhance Your 3D Model

Models can be coloured, textured or have Background Images draped over them and triangles can be easily coloured or textured to give a realistic representation of the model. Texture images are usually small rectangular images that can be tiled seamlessly over the model. A wide range of common image formats can be used to create a texture.

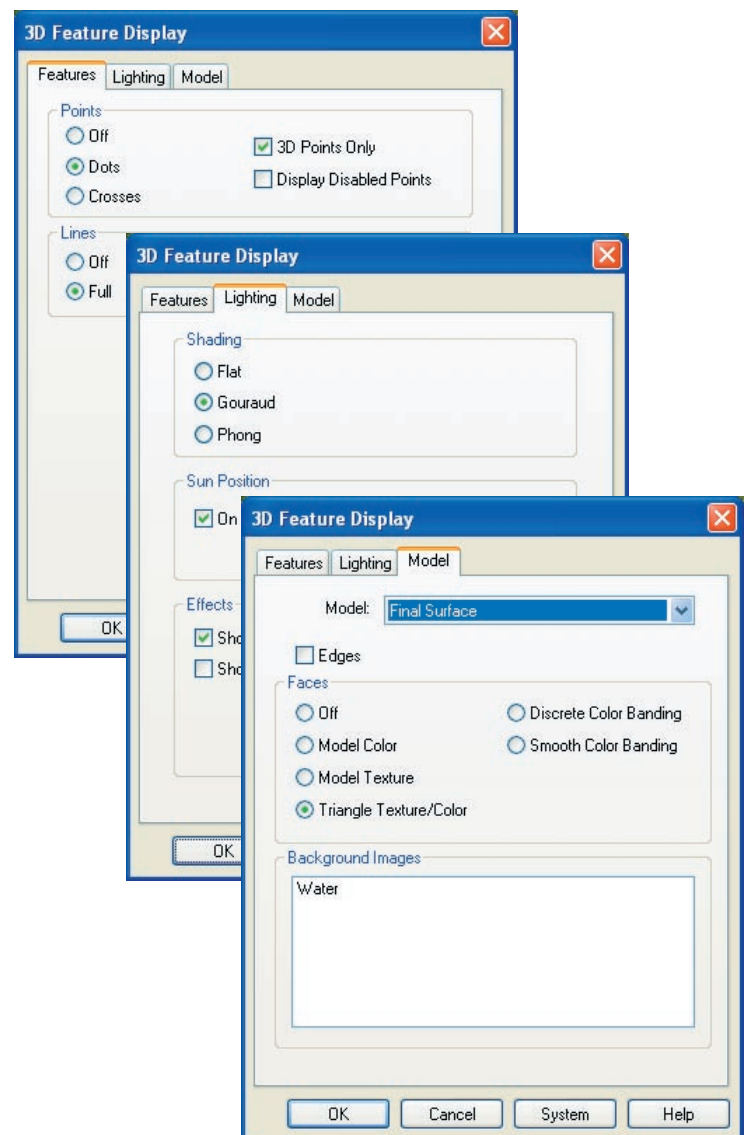


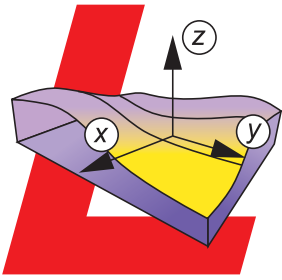
On surfaces that are not particularly undulating, the Vertical Exaggeration can be set to "stretch" the view in the vertical axis.



Flexible Display Options

Complete control over what objects are displayed including how the surface is smoothed, lighting effects, sun position, fog and shadow is yours with the 3D Visualisation module. You can also view multiple 3D models at the same time.





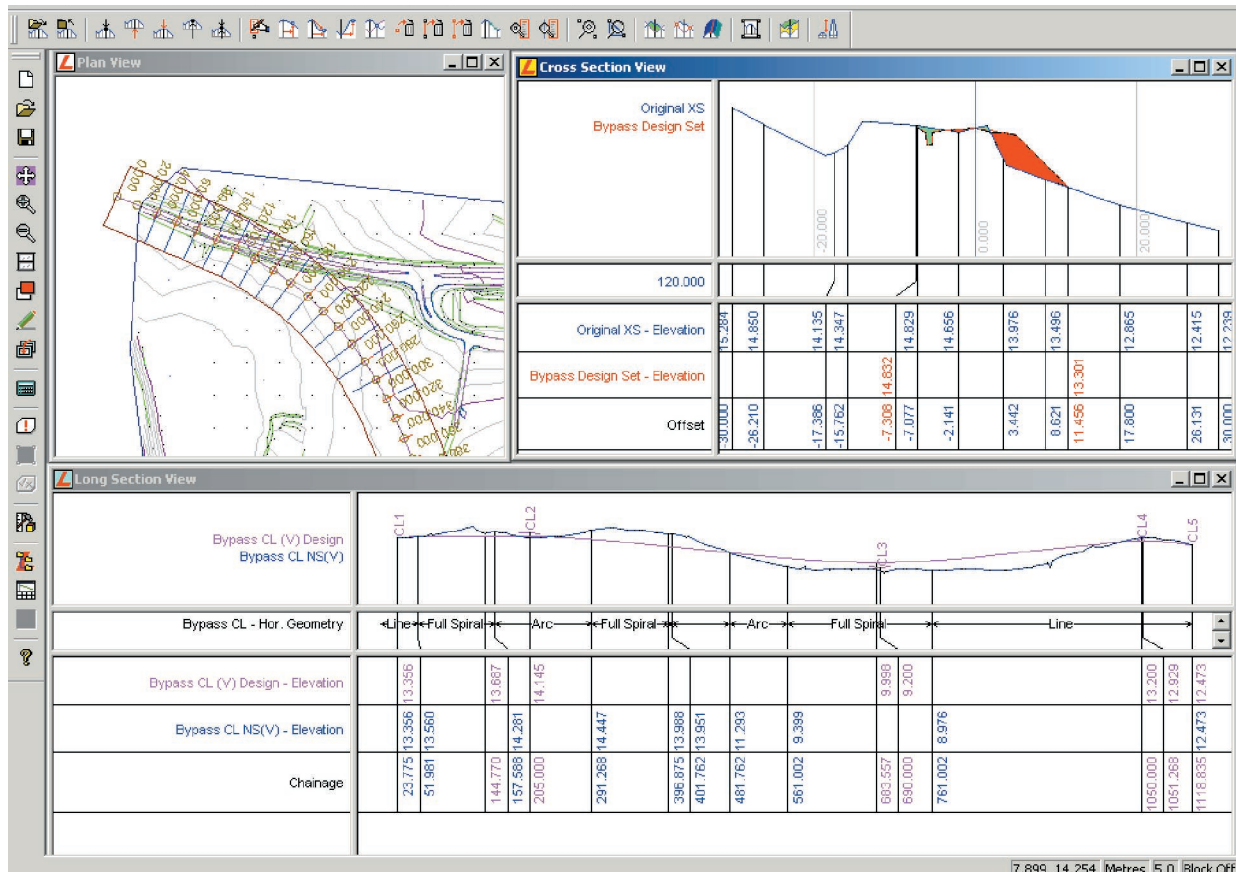
LISCAD Profiles and Design

Present a High Profile....

with the powerful and flexible Profiles and Design module. This module provides the LISCAD user with a fully integrated Surveying and Engineering Software solution.

"Profiles" creates and edits long and cross sectional data and computes end area volumes.

"Design" incorporates an impressive new condition based system for easy generation of virtually any design.



The benefits....

POWERFUL AND FLEXIBLE...

section generation methodology, including tunnel sections.

STRONG EDITING FUNCTIONALITY...

for points and lines, section intersections and dynamic updating of multiple views.

LISCAD SECTION MANAGER...

provides an "Explorer" like facility to control alignments and sections.

INTELLIGENT SURFACE TO SURFACE...

interaction to create end area volumes from cross sections

STRONG USER CONTROL...

over the presentation of long and cross sections to other CAD systems.

TEMPLATE AND STRING DESIGN...

methods for maximum power and flexibility. You can also create customised template libraries.

SEE AS YOU DO...

graphical template display verifies required design will be achieved.

TEMPLATES ARE GENERIC...

and can be quickly applied to other projects.

EASILY APPLY MODIFICATIONS...

such as road widening and super-elevation

The Section Manager provides a view into the LISCAD sectional database. It controls and displays the relationships between alignments, sections and long and cross section windows, in an "Explorer" type format. Primary and secondary alignment relationships can be established through the Section Manager. Secondary alignments are created by attaching them to a primary alignment. Chainages of secondary alignments are then controlled by the primary parent alignment.



Section markers can be created at any chainage, by freehand, or to pass through points in the database.

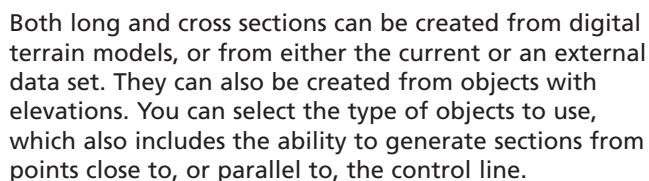


The corridor of interest gives you the ability to control the extent of the cross section generation. Corridors of interest can be created by either freehand or by setting up a table of offsets at defined chainages.

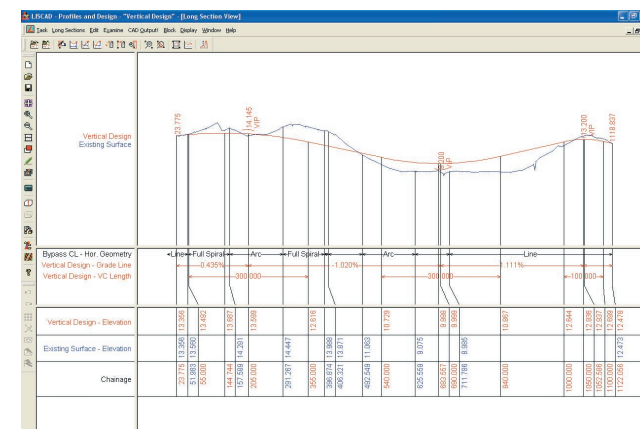
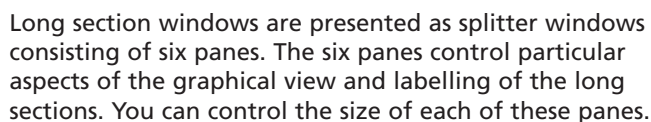


Long sections can be created along the following control-lines:

- Primary and Secondary alignments;
- Line objects;
- Point ranges;
- Two points.



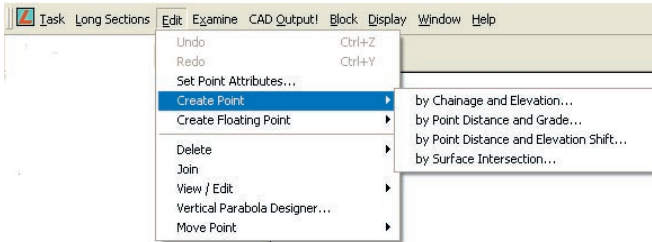
Long Sections



Editing Long Sections

Within a long section, you have the ability to:

- Edit the attributes of point and line objects;
- Create new points by a variety of techniques;
- Delete points and line segments;
- Join points;
- Create and edit floating points;
- Examine object attributes.

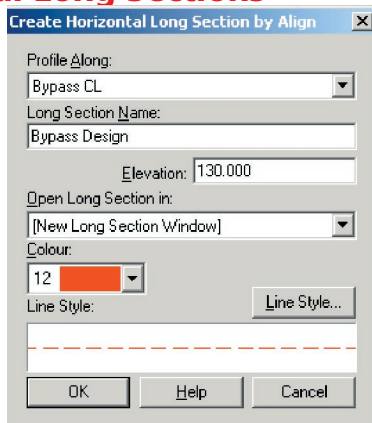


When editing or moving long sections (and also cross sections), LISCAD's Editing behaviour allows you to control their behaviour when such changes are made to them.

Create a user defined report along a nominated length of a long section at all key points or the currently displayed drop lines.

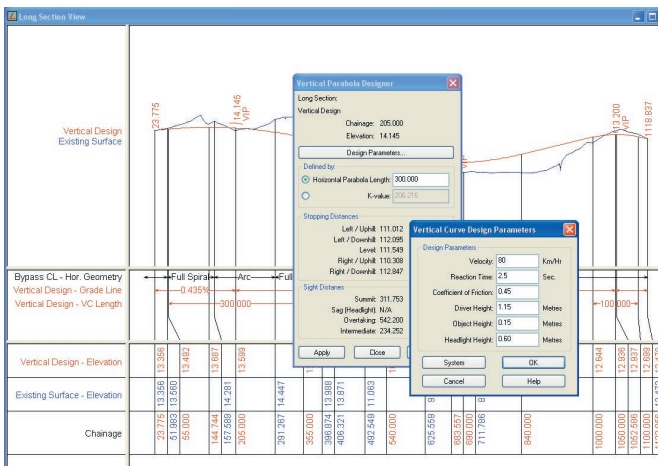
Create Horizontal Long Sections

Vertical long section design is easily achieved by creating a horizontal long section at a nominated elevation. The resulting long section will consist of two points, one at each end of the alignment. The long section can then be edited, allowing you to create your desired vertical design.



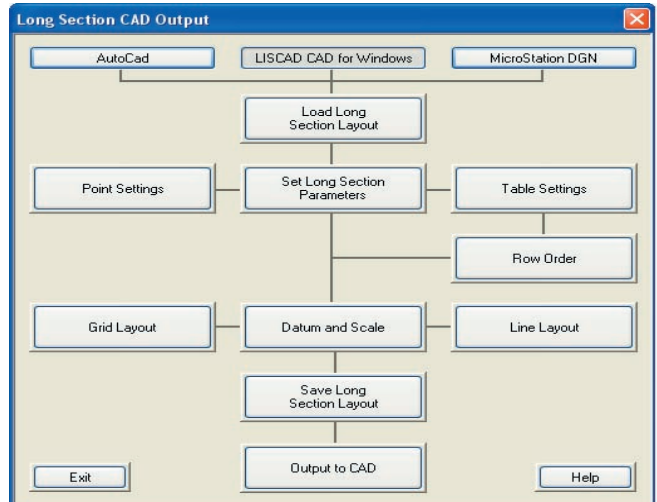
Vertical Parabola Designer

Vertical Parabolas of a nominated horizontal length are easily created by selecting the vertical intersection point. You can then enter the design parameters for the vertical curve and receive feedback on sight and stopping distances.



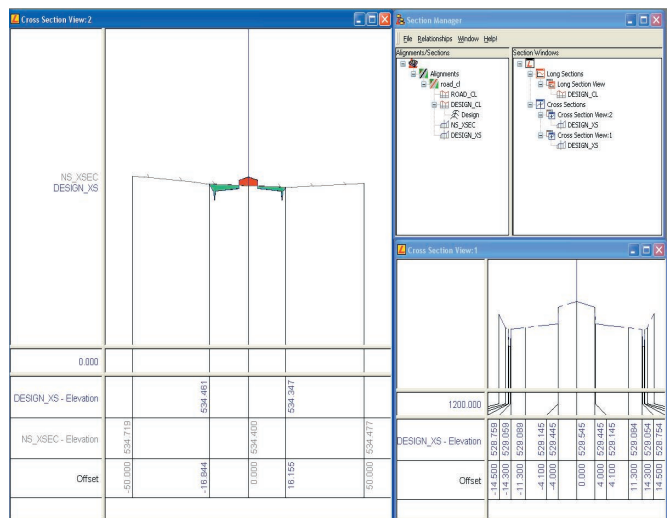
Output to CAD

CAD files can be created for LISCAD CAD, AutoCAD and MicroStation. You are given a high degree of flexibility to cover the multitude of formats for your organisation's requirements.



Cross Sections

Cross section windows provide a view into a set of cross sections. This gives you the ability to step through the cross sections along an alignment or go directly to a specific cross section.



Create a user defined report of each cross section along a nominated length of the cross section set at all key points or the currently displayed drop lines.

Editing Cross Sections

The editing capability is similar to that of long sections with the additional ability to intersect cross sections.

Volumes

Volumes by end area can be computed by nominating two cross section sets.

Define End Areas

Define End Areas By:

- ☐ Do Not Form End Areas
- ☐ Single Surface
- ☒ Two Surfaces

From Surface

NS_XSEC

☐ Check surface for closure

To Surface

DESIGN_XS

☐ Check surface for closure

Internal Holes:

- ☒ Connect across holes in sections
- ☐ Do not incorporate holes into end areas

Display End Areas

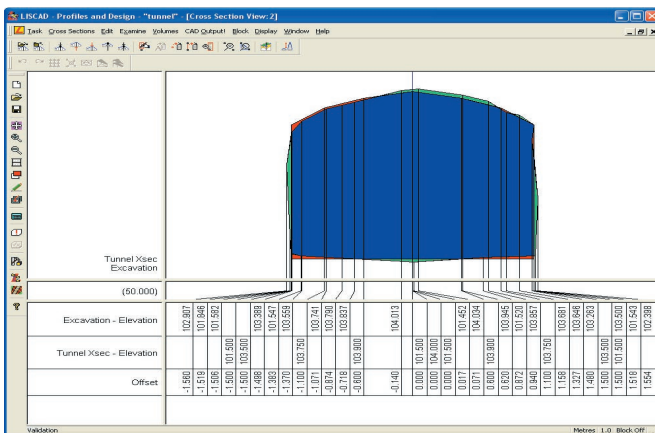
System

OK Cancel Help

Surface Intersection Rules

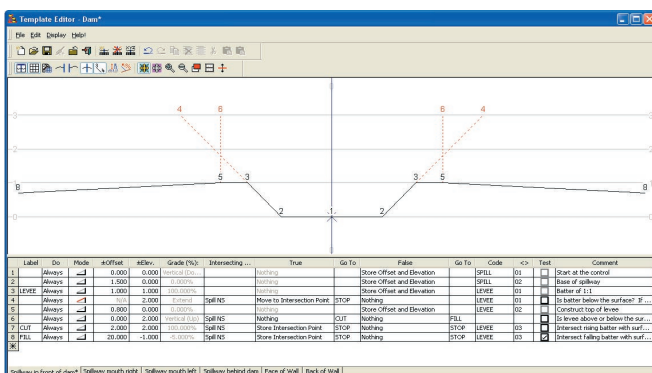
- Stop at outer intersection limit
 - Offset 1: -14.000
 - Offset 2: 14.000
- Stop at first intersection point beyond:
- Project section along end grade:
 - Distance 1: 2.000
 - Distance 2: 3.000
- Apply square cut at section end
- Apply square cut at:
 - Offset 1: -15.000
 - Offset 2: 15.000

End areas can be defined by a set of rules used to control the intersecting extents of the two cross sections. End areas are computed based upon the end areas derived from the cross section intersection rules. Volumes can also be calculated for closed sections, ie. tunnels and boxing. Bulking and compaction factors can be applied in the volume calculation.



Template Editor

Create libraries of design templates for use with different data sets. Extremely powerful and intelligent design system that displays the templates in both tabular and graphical form so you can see exactly what you have designed. LISCAD design templates are generic and can be applied to any number of different data sets.



Template Implementation

A Template Implementation Set controls how templates are applied to a long section or cross section set, to create a set of design cross sections.

Template Implementation

Implementation Set:

Design

Control Parameters...

Attach Templates...

Match Intersecting Surfaces...

Modifications...

Output Parameters...

Open Cross Section in:

[New Cross Section Window]

Cross Section Set Name:

DESIGN_XS

Apply Template Implementation Set

Save Save As... Delete Close Help

Match the template surfaces with alignment, long section and cross sections in the data set. Set the modifications to the templates to be applied at nominated chainages. Then apply the template implementation set to generate a cross section set of the design.

Template Modifications

Label	Start Distance	Start Chainage	End Distance	End Chainage	#Offset	#Elev.	#Grade(%)	Template	Continue	Comment
✓ SUPER	35.045	35.045	81.735	81.735	-0.300	0.000	<-	<-	Yes	
✓ SUPER	35.045	35.045	81.735	81.735	-0.300	0.120	<-	<-	Yes	
✓ SUPER	218.874	218.874	228.878	228.878	-0.300	0.000%	<-	<-	Yes	
✓ SUPER	218.874	218.874	228.878	228.878	-0.300	0.000%	<-	<-	Yes	
✓ SUPER	97.187	97.187	143.877	143.877	0.300	-0.120	<-	<-	Yes	
✓ SUPER	97.187	97.187	143.877	143.877	0.300	0.000	<-	<-	Yes	
✓ SUPER	228.878	228.878	238.882	238.882	0.300	0.000	<-	<-	Yes	
✓ SUPER	228.878	228.878	238.882	238.882	0.300	0.000	<-	<-	Yes	

Label:

☐ Offset and Elevation #Offset:

☐ Grade and Offset #Elevation:

☐ Grade and Elevation #Grade(%):

Start Chainage: Start Distance: Apply To:

End Chainage: End Distance: ☒ Continue

Comment:

Unlike the Templates, which are generic and can be used by any Template Implementation Set, the Template Implementation Set is specific to the current data set and is stored inside the project data base.

Transfer Cross Sections to Plan

Cross Section Set:

DESIGN_XS

Start Chainage:

100.000

End Chainage:

2372.068

Starting Point Identifier:

2000

Default Point Code:

CB

☒ Create Lines Across Sections

Section Line Code:

CF

☒ Create Bounding Lines

Bounding Line Code:

EP

☒ Create Bounding Polygon

Polygon Code:

BCK

Management of Existing Objects

☒ Clip Existing Lines to Bounding Polygon

☒ Disable Contourable Points and Breaklines

☒ Disable Planimetric Points and Lines

☒ Disable Text Objects

☐ Include Objects not Displayed

☐ Allow Lines Between Cross Sections to Cross the Primary Alignment

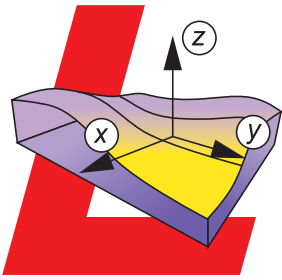
OK

Cancel

Help

Transfer Sections into Plan

Create a set of design cross sections. You can then transfer them into plan, complete with stringing between the sections and at the limit of the design, as well as automatically disabling the existing data within the design area, ready to generate an integrated design model. Transfer the elevations along a long section and then use the existing plan objects to dynamically update the model. This is extremely useful when numerous different designs are being tried and tested.

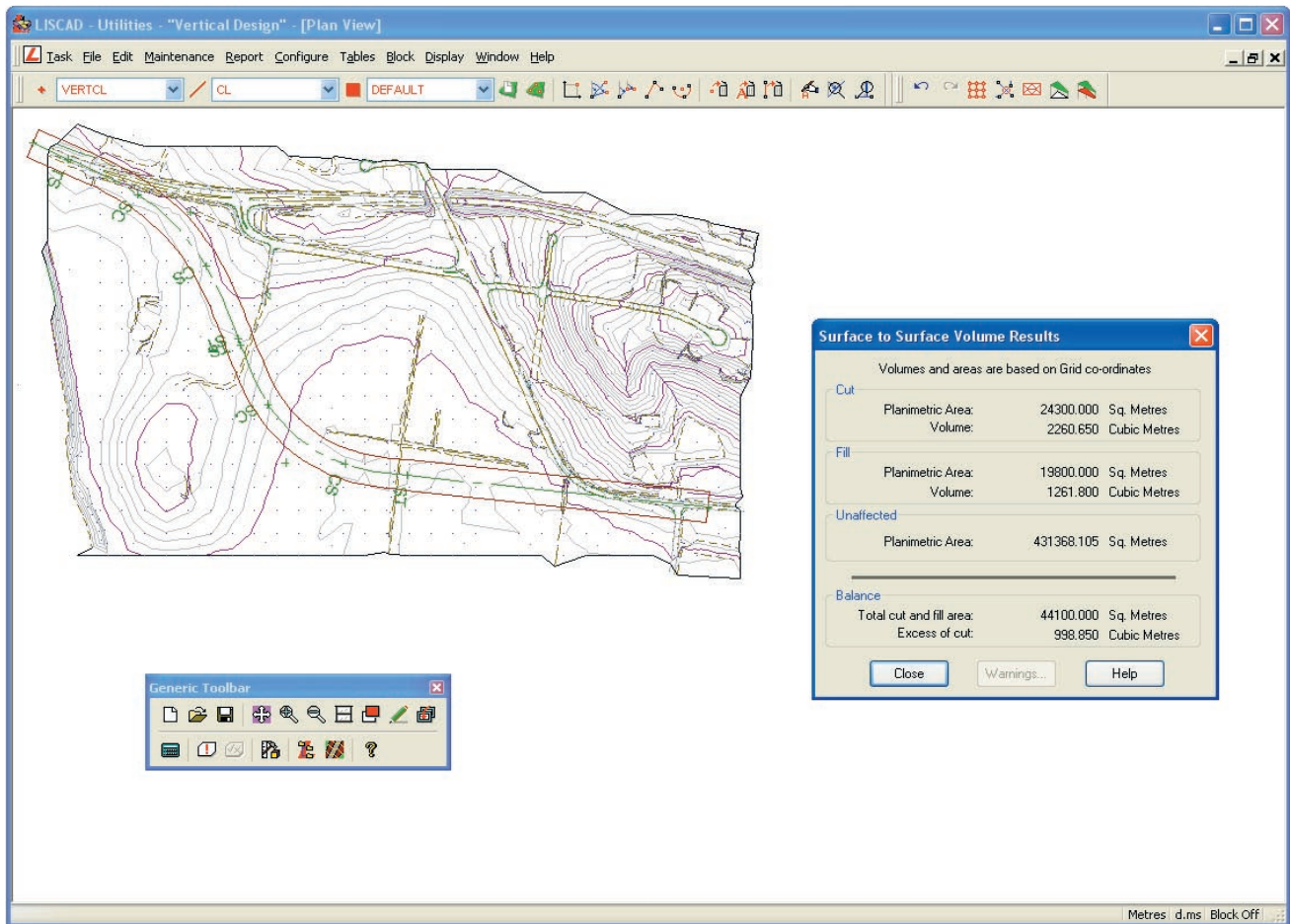


LISCAD Volumes

How Much Material is Left?

The answer is easy with the LISCAD Volume module.

“Volumes” calculates volumes between any surfaces, auto generates surface intersections and common boundaries, and creates height difference models.



The benefits...

VOLUMES TO A BASE PLANE...

computes the volume between the current model and a nominated datum elevation.

DAM CAPACITIES OR PROGRESSIVE PAYMENTS...

are easily calculated by using LISCAD's progressive base plane volumes.

SURFACE TO SURFACE VOLUMES...

with additional ability to:

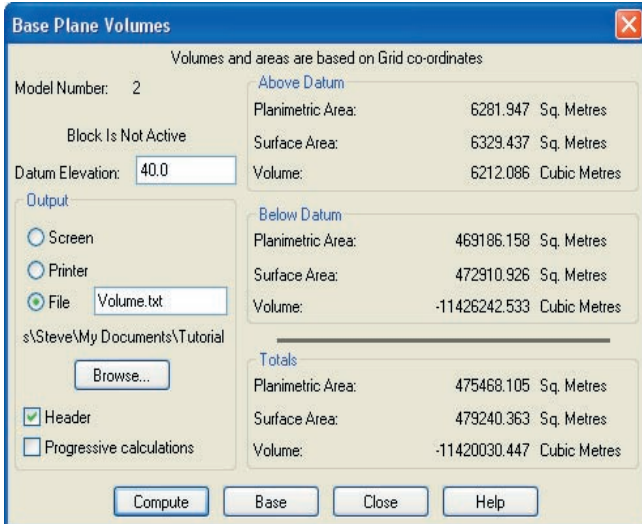
Save No Cut/No Fill lines.

Save Common Boundary lines.

Create third model of height differences.

Base Volumes

Volumes to a plane enable you to quickly and easily compute volumes above and below a given datum elevation. Output to a user specified accuracy is available to the screen, printer or file.



Base Plane Volumes

Volumes and areas are based on Grid co-ordinates

Model Number: 2

Block Is Not Active

Datum Elevation: 40.0

Output:

- ☐ Screen
- ☐ Printer
- ☒ File: Volume.txt

s:\Steve\My Documents\Tutorial

Browse...

☒ Header

☐ Progressive calculations

Compute Base Close Help

Above Datum	
Planimetric Area:	6281.947 Sq. Metres
Surface Area:	6329.437 Sq. Metres
Volume:	6212.086 Cubic Metres

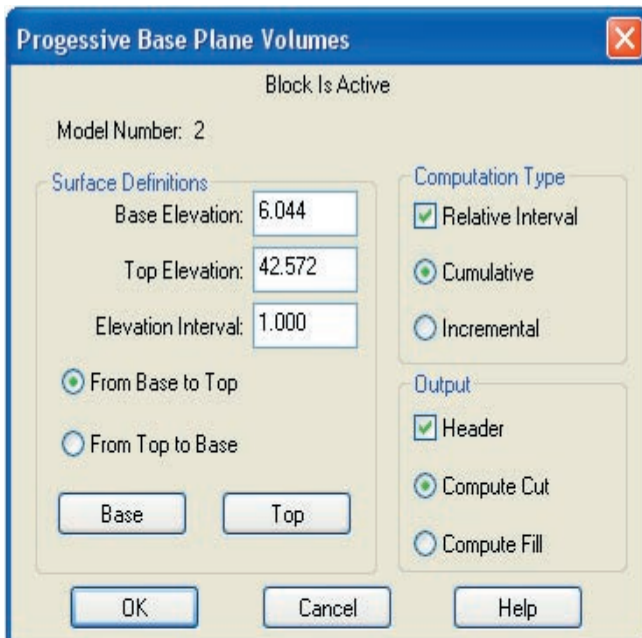
Below Datum	
Planimetric Area:	469186.158 Sq. Metres
Surface Area:	472910.926 Sq. Metres
Volume:	-11426242.533 Cubic Metres

Totals	
Planimetric Area:	475468.105 Sq. Metres
Surface Area:	479240.363 Sq. Metres
Volume:	-11420030.447 Cubic Metres

Many surfaces can be computed for each project, with the currently displayed model being used in the calculation. Calculations on part of a surface can be achieved using the Block option.

Progressive Base Plane Volumes

Compute volumes between base planes at nominated elevation intervals. Ideal for progressive dam and stockpile volumes.



Progressive Base Plane Volumes

Block Is Active

Model Number: 2

Surface Definitions:

Base Elevation: 6.044

Top Elevation: 42.572

Elevation Interval: 1.000

Computation Type:

- ☒ Relative Interval
- ☒ Cumulative
- ☐ Incremental

Output:

- ☒ Header
- ☒ Compute Cut
- ☐ Compute Fill

From Base to Top

From Top to Base

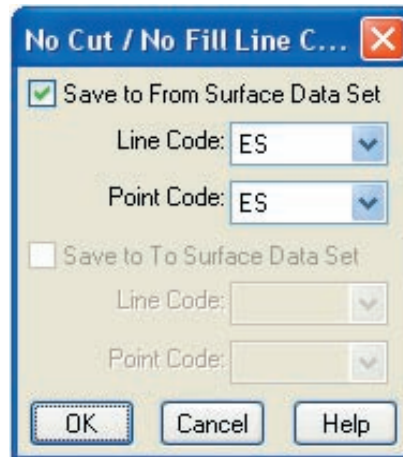
Base Top

OK Cancel Help

Surface to Surface Volumes

For greater flexibility in mining and civil construction projects, it is generally necessary to compare two surfaces, calculate lines of intersection, plus areas of overlap.

The LISCAD Volume module handles this easily and accurately, even when the two models are from different data sets.



No Cut / No Fill Line C...

☒ Save to From Surface Data Set

Line Code: ES

Point Code: ES

☐ Save to To Surface Data Set

Line Code:

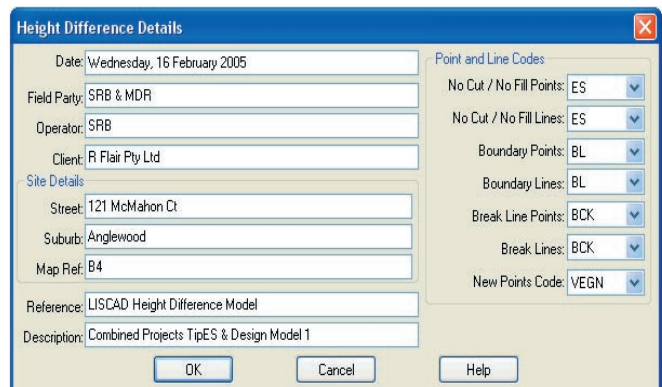
Point Code:

OK Cancel Help

The new points and lines, defining the no cut / fill lines can be added to either, or both, data sets and on a user specified group for later output to a total station, or CAD system.

Height Difference Model

Where height differences are required for evaluation, or set out, on design projects, the LISCAD Volumes module can automatically create a new project which contains all lines of intersection and boundary overlap, plus breakline and DTM points.



Height Difference Details

Date: Wednesday, 16 February 2005

Field Party: SRB & MDR

Operator: SRB

Client: R Flair Pty Ltd

Site Details:

Street: 121 McMahon Ct

Suburb: Anglewood

Map Ref: B4

Reference: LISCAD Height Difference Model

Description: Combined Projects TipES & Design Model 1

Point and Line Codes:

No Cut / No Fill Points: ES

No Cut / No Fill Lines: ES

Boundary Points: BL

Boundary Lines: BL

Break Line Points: BCK

Break Lines: BCK

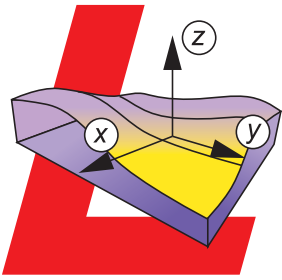
New Points Code: VEGN

OK Cancel Help

The elevations generated in this new data set are the actual differences in height between the two selected models.

A digital terrain model can be created from this new surface, providing height difference contours, which can be colour coded to readily illustrate areas above and below design.

Any of the new points can be uploaded into a total station and used in the field to control earthworks.

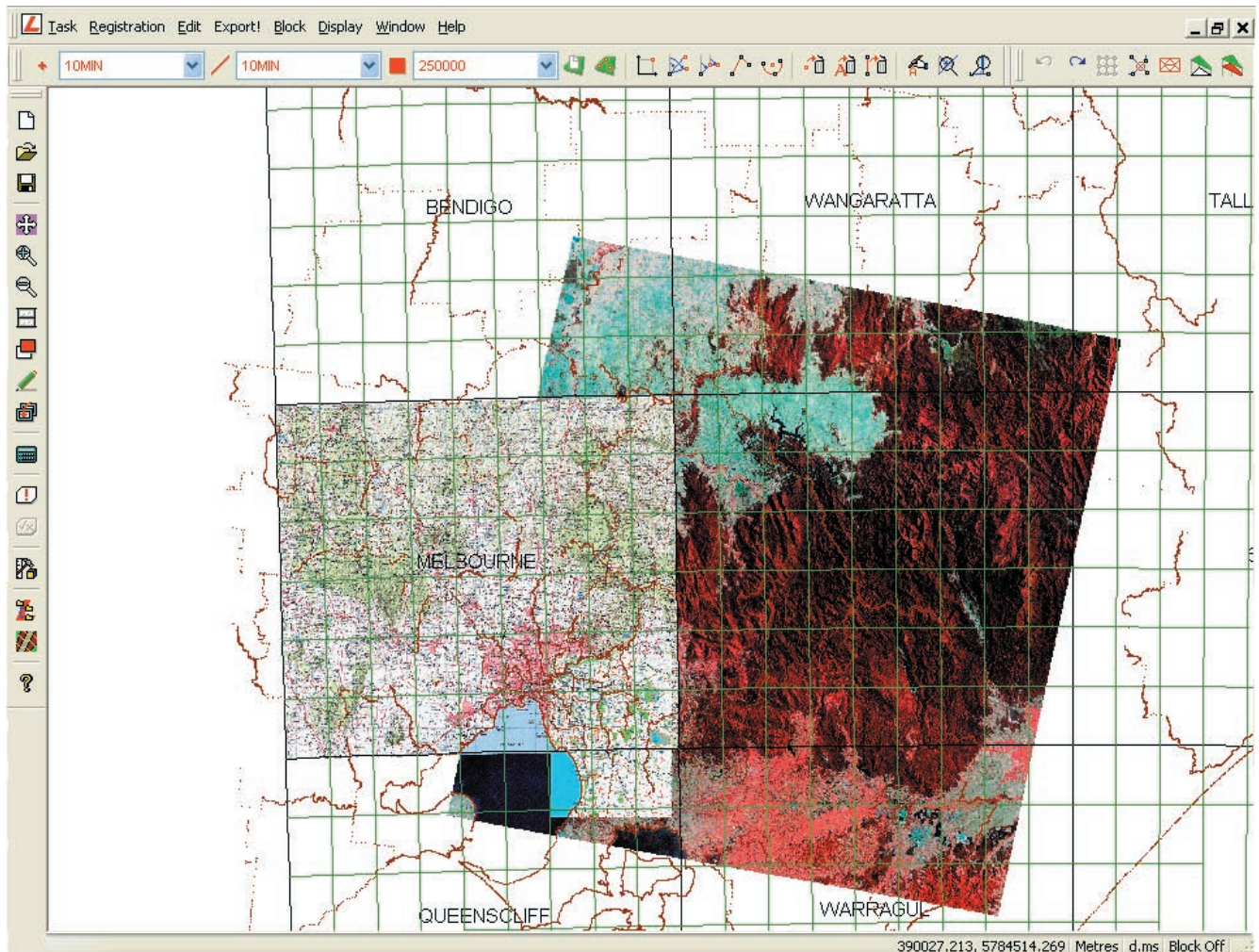


LISCAD Background Images

LISCAD presents a transformed image...

With the new Background Images module you can view your maps, plans and photographic imagery as a backdrop to your vector data.

"Background Images" can be used to digitize information or utilized as a location guide for aerial photographs.



The benefits...

FULLY SUPPORTS...

most image file types including
bmp, jpg, tif and png, as well as

MRSID, ECW AND GEOTIFF IMAGES

NO SOFTWARE LIMITATION...

to the size or number of images used.

NUMEROUS IMAGES...

can be displayed at any one time.

POWERFUL AND SIMPLE...

registration makes it easy to import the
images into LISCAD's coordinate system
utilizing one of the four image
transformation types available.

CONTROL THE ORDER...

in which the images are displayed

ON SCREEN DIGITIZING...

can be achieved using the images in conjunction
with the Computations module.

Background Image Registration

Before an image can be used in the background it must be registered with the coordinate system used by the SEE file.

Registration (georeferencing the image) requires control pixels in the raster image to be assigned co-ordinates that accord with the map datum being used.

Four image transformation techniques are available including Conformal and Affine as well as 2nd and 3rd Order Polynomial Transformations.

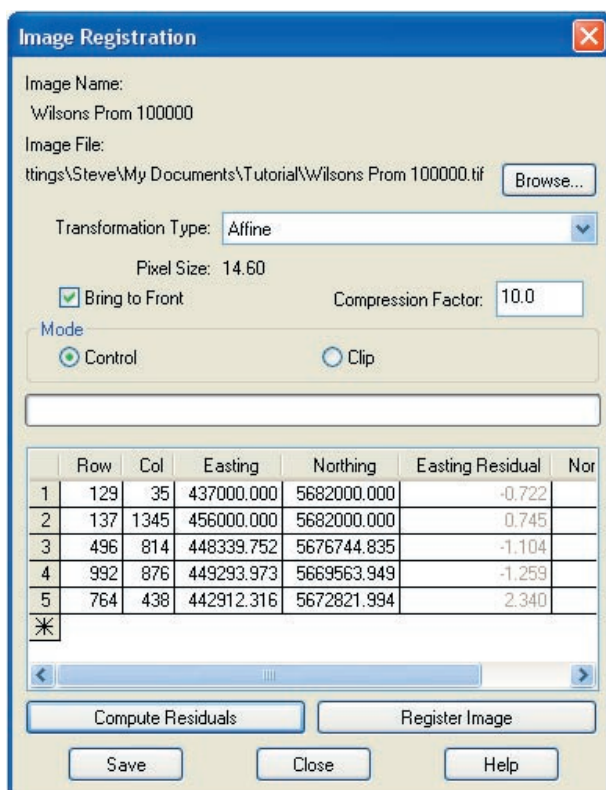


Image Name:
Wilsons Prom 100000

Image File:
ttings\Steve\My Documents\Tutorial\Wilsons Prom 100000.tif Browse...

Transformation Type: Affine

Pixel Size: 14.60

☒ Bring to Front Compression Factor: 10.0

Mode
☒ Control ☐ Clip

	Row	Col	Easting	Northing	Easting Residual	Nor
1	129	35	437000.000	5682000.000	-0.722	
2	137	1345	456000.000	5682000.000	0.745	
3	496	814	448339.752	5676744.835	-1.104	
4	992	876	449293.973	5669563.949	-1.259	
5	764	438	442912.316	5672821.994	2.340	

Compute Residuals Register Image

Save Close Help

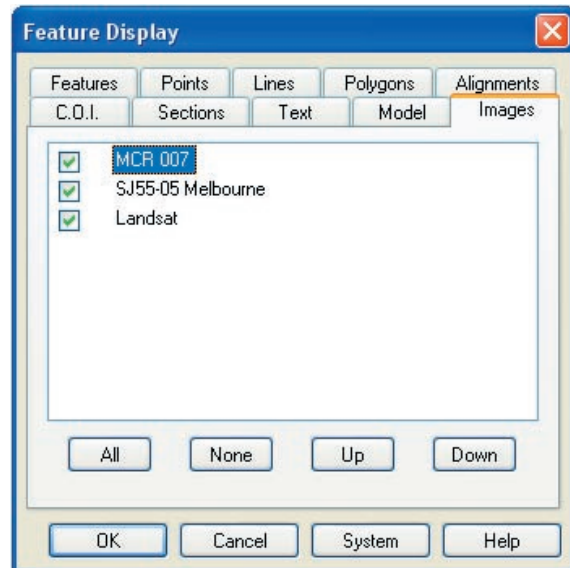
The original raster image is transformed to fit the map datum and the transformed image can then be displayed in the background that registers with the overlying data. If you are working with a MrSID, ECW or GeoTIFF image, the images, along with their georeferenced information are imported ready for transformation.

Checking of Images

Once an image has been registered, the transformed image is copied into the SEE data file. Registration can be checked at any time against the original image file. This also allows for changes to the images size and location to be achieved.

Display and Use of Images

The images are controlled by using Display Features. When multiple images are being displayed concurrently, some images may overlap others and this can be managed by turning them on and off as well as setting the display order.



Feature Display

Features Points Lines Polygons Alignments
C.O.I. Sections Text Model Images

☒ MCR 007
☒ SJ55-05 Melbourne
☒ Landsat

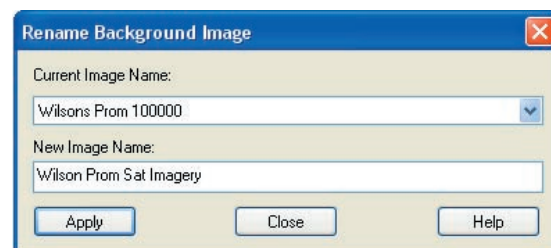
All None Up Down

OK Cancel System Help

From here it is simple using LISCAD's existing computational functionality to digitize information directly from the imagery or check existing co-ordinates in the data file against the image.

Deleting and Renaming Images

Images in the LISCAD data file can be easily renamed.



Rename Background Image

Current Image Name:
Wilsons Prom 100000

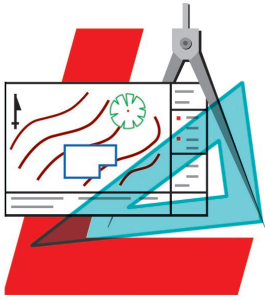
New Image Name:
Wilson Prom Sat Imagery

Apply Close Help

The ability to delete single and multiple images from the file is also available.

Exporting of Images

Images transformed into the LISCAD database can then be exported to most image file types for importing into other systems

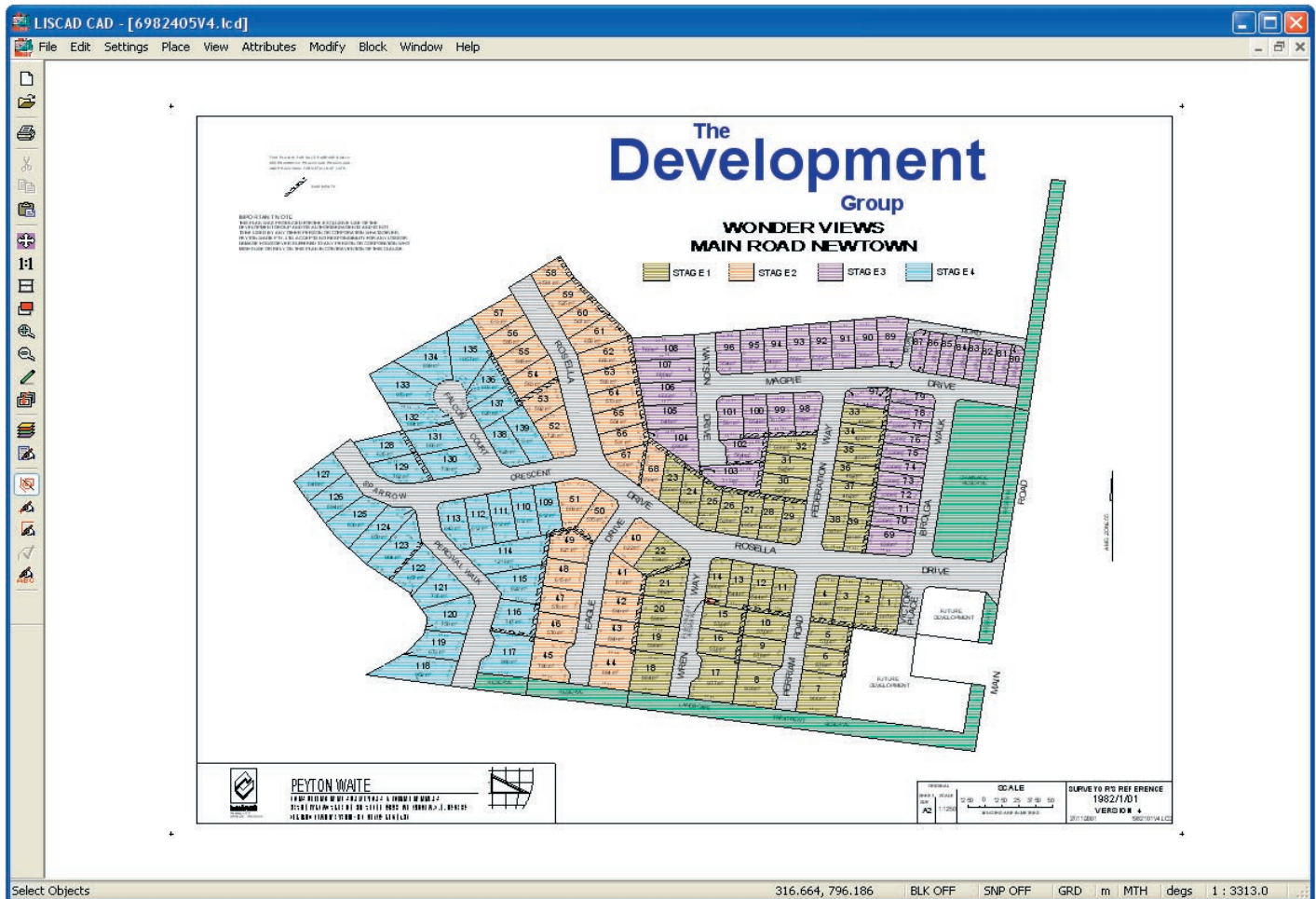


LISCAD CAD

Productivity in Plan Production...

The Windows CAD package designed for Field to Finish Productivity

"CAD" creates, annotates, moves, rotates and plots to generate final plans.



The benefits...

"SEE AS YOU DO"...

graphics for easy use.

DYNAMIC AND GRAPHICAL...

editing of attributes, symbols, line types, polygons and text.

VIEW MULTIPLE WINDOWS...

supporting various scales, for immediate access to any part of the drawing.

STRONG IMPORT / EXPORT...

for DWG & DXF (including AutoCAD 2004/2005) and DGN formats.

SUPPORT FOR WINDOWS TRUE TYPE FONTS...

for more flexibility in your plan production

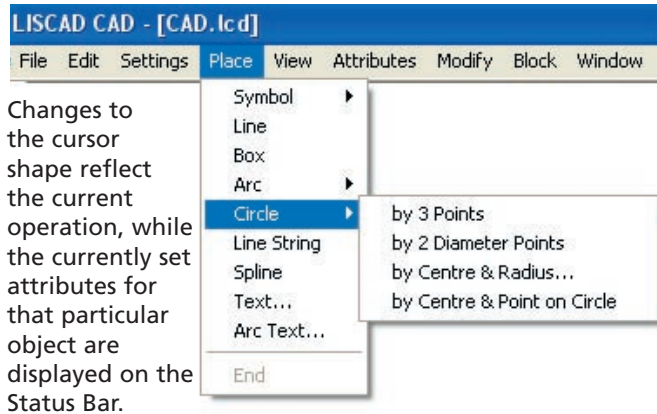
CONTEXT SENSITIVE HELP...

for improved productivity.

Place Objects

LISCAD CAD is a fully functional CAD package, designed for surveyors and engineers, running under the Windows operating system.

Various object types, such as Symbols, Lines, Circles and Text, can be easily placed by different creation methods,



Object Attributes

Comprehensive ranges of attributes, including layer, colour, size, line width and direction are assigned to the object when imported.



However any individual attribute can be changed, either for a single object, a selection of objects, or all objects. When placing objects in CAD, the associated attributes can be set prior to creation, or edited at a later date.

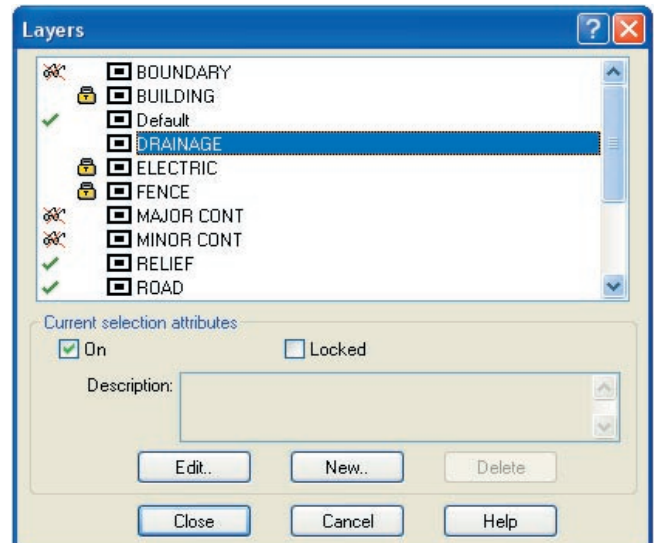
Print / Plot

You are able to output drawings to the plotter or printer currently configured in your Windows settings. To plot a drawing you place sheets that define the plotting area of the drawing.

Variables that determine the plotting area of a sheet are set when setting the plot scale, when configuring the plotter or printer and when placing a plot sheet. Plot Sheets are able to be placed over the drawing, moved and rotated, and their display toggled off and on.

Layers

LISCAD CAD supports a virtually unlimited number of layers, each of which can be created, edited, displayed or locked by a View option.



Each layer can be allocated a Description for ease of identification, while icons alert you to the current status of each layer.

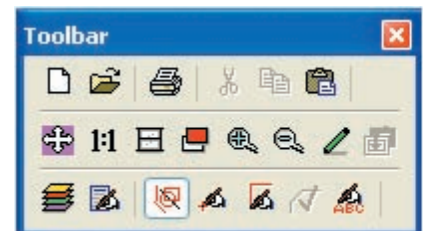
A locked layer can be viewed but is protected from accidental editing.

Toolbar

A dockable Toolbar, fully configurable by you, is available in CAD.

Most CAD menu options can be added to the

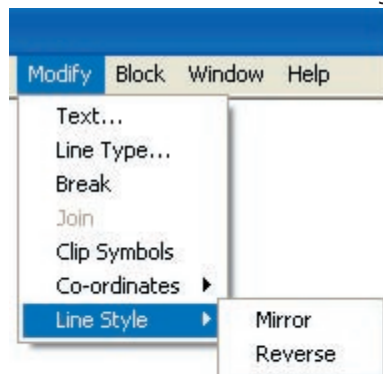
Toolbar, which can be placed on any side of the screen, or left to float free on the CAD desk top.

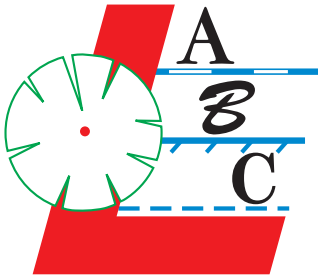


Modify Objects

LISCAD CAD contains a wide range of options for

modifying objects, including the ability to change text, break or join line strings, convert splines to line strings and reverse, or clip lines, move coordinates and modify line styles.



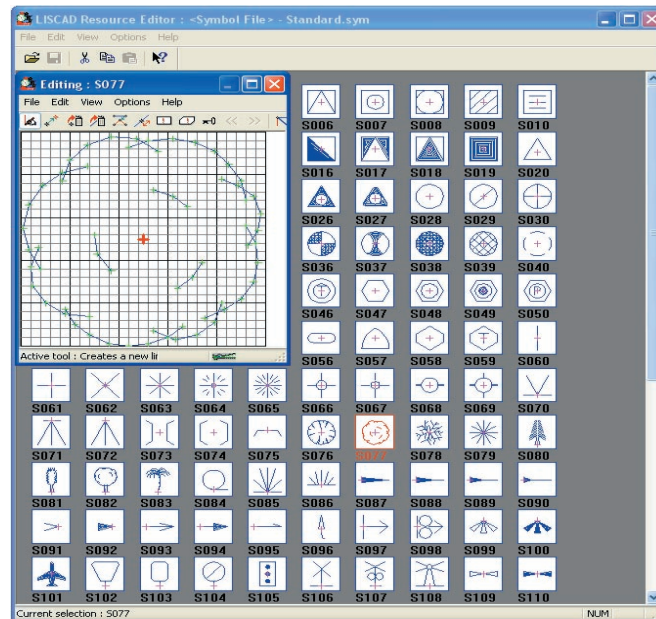


LISCAD Resource Editor

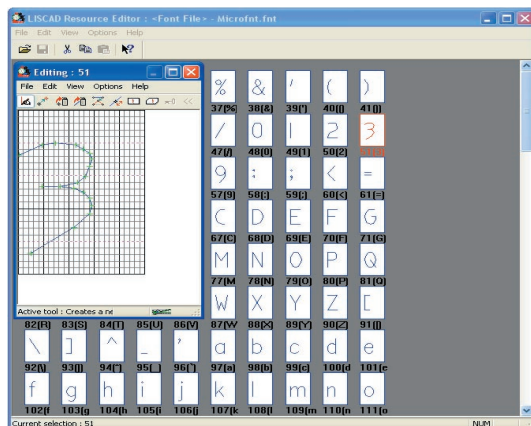
The Ultimate in Personalised Software

The utility program for creating tailored solutions

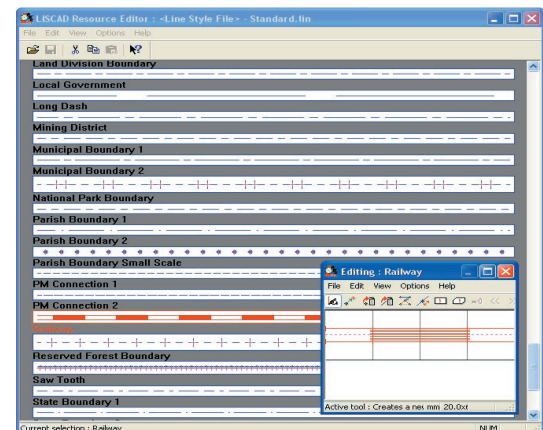
"Resource Editor" creates and edits symbols, line styles and fonts



Font Editor



Line Style Editor



The benefits...

EASILY CREATE USER DESIGNED...

Symbols, Line Styles and Fonts to suit individual users.

EDITING MADE EASY...

with the ability to place or paste symbols into line-styles.

GRAPHICAL EDITOR ...

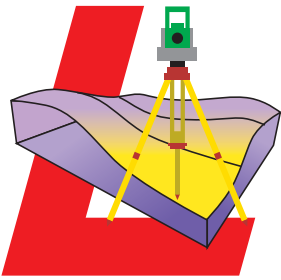
that's functional and easy to use

FLEXIBLE CONTROL...

offered with powerful editing tools

COMPREHENSIVE LIBRARIES...

issued as system defaults.



LISCAD Lite

Low Cost Entry...

LISCAD has an abbreviated version, LISCAD Lite.

LISCAD Lite for field data transfer, editing, viewing and transfer to/from other systems.

The benefits....

A WIDE RANGE of data collectors supported.

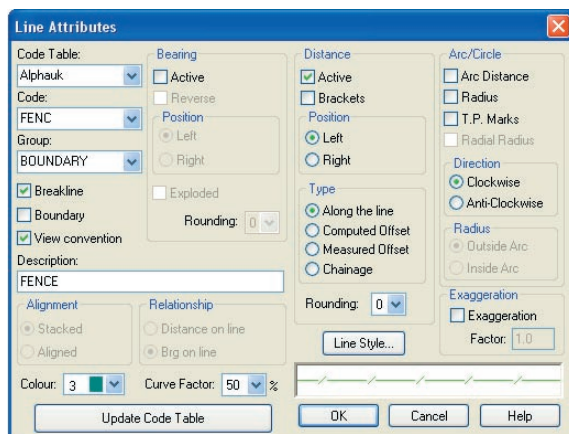
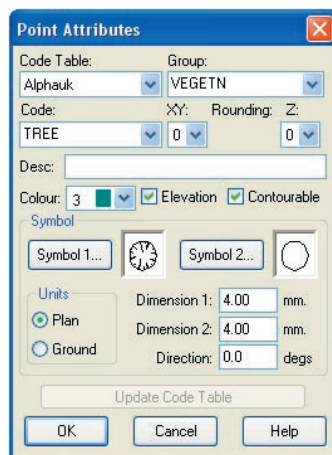
POWERFUL SCREEN HANDLING ICONS provide ease of use for graphical examination and editing of data.

LISCAD Lite provides a low cost field data processing and output solution. The user interface is identical to the full LISCAD Surveying and Engineering Software suite, ensuring the same ease of use and productivity features. If you have a variety of field instruments, you can use LISCAD Lite for all processing. A variety of total station formats and SKI GPS data can be imported into the LISCAD Lite. Configure LISCAD Lite to a system that works best for you. Working unit types, colours for presentation and plans, Grid coordinates and rounding of dimensions are just some of the selections.

Code Tables

Code Tables are the link between field productivity and the information you want to present to your client. Features such as points, lines and splines are coded to represent your specific requirements.

You nominate the symbols, line types, size and colours in the code table. Have as many code tables stored as you like, then you can automate data for your different project requirements. The amount of editing required on your CAD drawing will be minimised by well-organised field coding methods.



USER DEFINED LIBRARIES for streamlined output to LISCAD CAD, DGN, DXF & DWG.

FLEXIBLE USER DEFINABLE ASCII formats for import and export.

UPGRADEABLE to the powerful LISCAD

Create

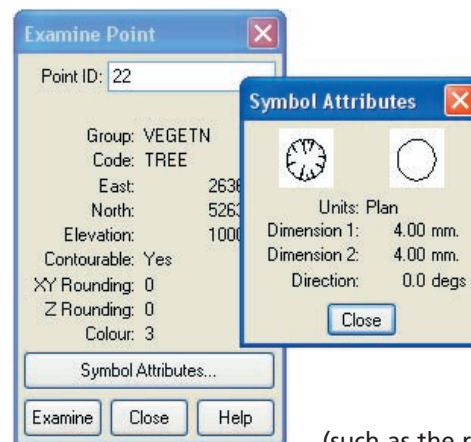
Points, lines, splines, circles and arcs can be created by various methods. You can also add additional information not gathered in your data collector.

Examine

This option provides information about points, lines and geometric relationships

Examining the attribute information of a point or line is an important aspect of the examine function. Positioning of bearing and distance information in relation to a line, or the colour used to draw a point's symbol, are just two examples of the attribute information that can be examined and, of course, edited.

Edit



Any created feature, or attribute attached to the feature with a variety of options can be edited graphically. Any related detail associated with a feature

(such as the rounding off of a distance attached to a line) can also be edited. As with

most functionality in LISCAD Lite, editing is Group (layer) or Block sensitive.

Data Conversions

LISCAD Lite provides the functionality to import data from a variety of systems, including DXF or DGN, providing the ideal tool for transferring CAD design into the total station for field set out. Once data has been collected, the appropriate information can be output to either CAD or other systems for further processing.

LISCAD Lite now operates with standard LISCAD data-files and can be used as a viewer for all LISCAD objects including Long and Cross Sections.

UTILITIES

- File Management*
- Printing / Plotting*
- Edit Undo/Redo*
- Merging Files
- Extracting Files
- Change Point Identifiers
- Resolve Duplicate Points
- Filter Points
- Filter Lines
- Optimise Data Base*
- Clean Data Base*
- Integrity Check*
- Statistics Report*
- Point Report
- Line Report
- Polygon Report
- Tailored Rich Text and HTML Reports
- Alignment Point Report
- Alignment Intersection Point Report
- Alignment to Alignment Report
- Alignment Centre Line Report
- Point Comparison Report by Points
- Point Comparison Report by Alignment
- Configure – Units*, Co-ordinates*, Distances*, Angles*, Areas*, Volumes, Alignments*, Colours*, Toolbars*, Status Bar*, Folders*, Code Tables*, Point Identifiers*, Projections, Earth-Constants*, Fonts*, Text Editor*, Language* & Auto Backup*.
- Code Tables – New & Open (*Form view only)
- Code Table XML Export
- Lookup Tables – New & Open*
- Block – Freehand*, Polygon & All
- Display Features*
- Display Groups*
- Fit, Zoom In & Out, Window, Pan, Redraw, Save View, Restore View & Last View*
- Reverse Polish Notation Calculator*
- New Plan, Long Section & Cross-Section Windows*
- Cascade, Tile and Arrange Icons*
- Section Manager*
- Help*

INPUT / OUTPUT

Field Transfer

- Instrument Settings*
- Code Definition*
- Tolerances*
- Data Recorder Input*
- Manual Input
- Slope Distance*, Horizontal Distance, Stadia, Resection & Intersection
- Create Field File*
- Sets Summary
- Reduce Field File*
- Process Digital Level*
- Traverse Adjustment
 - Traverse File Editor
 - Traverse File Management
 - Extract Field File Observations
 - Print
- Traverse Adjustment (Continued)
 - > Move
 - Save Layout

- Editing Observations – Insert, Delete, Clear, Cut Copy & Paste
- New Traverse
- Delete Traverse
- Move / Copy Traverse
- Traverse Properties
- Retrieve Co-ordinates
- Set Arc
- View – Angles, Arcs, Elevations, Co-ordinates, Codes & Descriptions
- Auto Number
- Set Radiation
- Compute Traverse by Bowditch, Transit-& Crandall's
- Report or XML Output
- Compute Missing Parts
- Update Co-ordinates

- Edit Raw File*
- Edit Field File*
- Data Recorder Output*
- Manual Setout*
- Data Conversions
 - Import* 35+ (19*) methods
 - Export* 35+ (15*) methods
- CAD Output
 - CAD Parameter Files – New, Open & Default*
 - CAD System – LISCAD CAD, AutoCad DWG & DXF, Microstation DGN*
 - Code Settings*
 - Tables – Co-ordinate, Radiation, Arc & Short Line
 - Legend Settings
 - Grid Settings
 - Model Settings
 - Alignment Settings
 - CAD Output Options*
 - Warnings - View & Print

ADJUSTMENT

- Least Squares Control File Editor
- Adjustment File Management
- Extract Field File Observations
- Import XML
- Print
- Save Layout
- Editing Observations – Insert, Delete, Clear, Cut, Copy & Paste
- Fix Observations
- Exclude Observations
- Set Reference Direction
- Set Bearing
- Retrieve Co-ordinates
- Modify Standard Deviations
- Display Elevation Observations
- Display Angle Observations
- Automatically Generate Identifiers
- Automatically Generate Standard Deviations
- View Station Control Window
- View Observation Window
- Horizontal Observation Corrections
- Compute Approximate Horizontal Co-ordinates & Elevations
- Check Horizontal & Vertical Observations
- Horizontal & Vertical Least Squares Adjustment (ASCII report or XML output)
- Update Co-ordinates

- Compute Approximate Elevations
- Check Vertical Observations
- Vertical Least Squares Adjustment
- Update Elevations

COMPUTATIONS

- Create Point – 28 (6*) methods
- Create Line – 14 (1*) method(s)
- Create Arc – 11 (1*) method(s)
- Create Circle – 5 (1*) method(s)
- Create Spiral – 4 methods
- Create Spline – 8 (1*) method(s)
- Create Combined Curve – 8 methods
- Create Splay – 3 methods
- Create Radiation – 2 methods
- Create Offset – 5 methods
- Create Alignment – 8 methods
- Create Section Markers – 3 methods
- Create Polygon – 3 methods
- Create Intersection Points
- Create Text
- Line Segmentation
- Set Attributes for Points*, Lines*, Polygons, Alignments, Section Markers & Text
- Adopt Attributes of Points, Lines, Polygons & Text
- Delete Objects (* Points & Lines)
- Undelete Objects
- Enable / Disable Objects
- Move / Rotate* / Scale
- Exchange Axes*
- Point on Line
- Bets Fit Line & Arc
- Reverse Alignment
- Modify Alignment Chainage
- Trace Alignment
- Break Alignment
- Remove Line from Alignment
- Join Alignments
- Add Line to Alignment
- Edit Alignment Chainage Equations
- Spline to Line
- Line to Spline
- Text to Point
- Edit Object Attributes (*Points-&-Lines)
- View / Edit Objects (*Points)
- Edit Point Identifiers
- Edit Elevations
- Remove Elevations
- Break Line
- Segment Line
- Join Line
- Insert Point into Line
- Remove Point from Line
- Examine Object Attributes (*Points & Lines), Co-ordinates, Co-ordinate Differences, Bearing & Distance*, Offsets*, Angles, Arcs, Spirals & Grades
- Find Objects
- Find Errors
- Validate Alignments

TRANSFORMATIONS

Projections

- Manage and Apply transformations between projections using 5 different transformation techniques

Coordinates

- Define, View and Apply using Conformal, Semi-Affine, Affine, Unscaled, 3D-Conformal & 3D-Unscaled

TERRAIN MODELLING

- Validate Data
- Form Model
- Delete Triangles
- Delete Model
- Add, Delete & Modify Label Lines
- Breakline Segmentation

- Interpolate Elevations
- Examine Elevations

VOLUMES

- Base Plane Volumes
- Progressive Base Plane Volumes
- Surface to Surface Volumes

PROFILES & DESIGN

- Create Section Markers – 3-methods
- Create Corridors of Interest – 2-methods
- Set Section Marker Attributes
- Delete & Edit Section Markers & Corridors of Interest
- Edit & Examine Section Marker Attributes
- Create Long Sections along Alignments, Lines, Point Ranges & Freehand using models or objects.
- Create Cross Section Sets
- Import Cross Section Sets
- View* / Edit Long & Cross Sections
- Create Long & Cross Section Points – 4-methods
- Create Long Section Floating Points – 2-methods
- Move Long & Cross Section Points – 3-methods
- Define End Areas
- Apply Section Intersections
- Volumes by End Areas
- CAD Output of Long & Cross Sections
- Vertical Exaggeration*
- Examine Points, Distance, Elev & Grade
- First, Last, Next, Previous & Go To Cross Sections*
- Long Section Design & Points Reports
- Cross Section Report
- Template Library Editor
- Create Horizontal Long Sections
- Vertical Parabola Designer
- Create / Edit Template Implementation-Sets
- Transfer Long Sections into Plan
- Transfer Long Section Elevations-> Plan
- Transfer Cross Sections into Plan

BACKGROUND IMAGES

Import & Register Image

- Conformal
- Affine
- 2nd & 3rd Order Polynomial
- Check Registration
- Delete Image
- Rename Image
- Export Image

Supports Georeferenced Images

- MrSID
- ECW
- GeoTIFF

3D VISUALISATION

- Fly Camera*
- Walk Camera*
- Pan Camera*
- Zoom Camera*
- Edit Triangle Attributes
- View/Edit Triangle Attributes
- View/Edit Model Attributes
- Copy To Clipboard
- Set Triangle Attributes
- Adopt Triangle Attributes

Ordering Information

Free 14 Day LISCAD license



- Contact your local LISCAD representative to receive a CD with a fully functional FREE 14-day trial system

www.liscad.com

OR

- Download your fully functional FREE 14-day trial system from the LISCAD web site

www.liscad.com/liscad/release.aspx

Learning LISCAD...



- Refer to LISCAD's comprehensive on-line Tutorials via the Help menu

Sales and Enquiries...



- Refer to LISCAD's Help menu for an on-line quotation
- Contact your local LISCAD dealer
www.liscad.com
- Go to the LISCAD web site
www.liscad.com
- Contact LISCAD Information
info@liscad.com

Australia: 1300 650 332

New Zealand: 0800 888 262

USA: 1800 710 6049



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WORLDWIDE
info@liscad.com
www.liscad.com
or contact your local
Leica Geosystems
representative

