Advanced Road Design

Low Cost – High Performance
Civil Design and Drafting

Contact:
ph: 1300 254 004
email: sales@civilsurveysolutions.com.au

Offices In:
MELBOURNE  SYDNEY  BRISBANE

www.civilsurveysolutions.com.au
Civil Design and Drafting

Here’s how Advanced Road Design can benefit you:

✓ Integrates design and drafting
  - Improve quality and design revision controls – as you make the changes the drafting updates
✓ Modern software with dynamic relationships between objects
  - One change – multiple updates. Save time keeping your objects co-ordinated
✓ All-in-One Program – not modular!
  - Get Surface, Alignment, Road and Pipe tools in the one program
✓ Easy to learn
✓ Low cost

Retrofit your civil design office at a fraction of the cost of using alternate software.

About Advanced Road Design
Advanced Road Design was first developed in 2002 to provide civil engineering design functionality in AutoCAD software. With over 1,500 licenses sold in Australia and Internationally, Advanced Road Design enables you to perform road and drainage design to Australian standards.

Australian road designers are familiar with string and template based road design methodologies. Advanced Road Design provides designers with these tools inside BricsCAD – so design and drafting occurs in the one software program.

Written in modern .NET, Advanced Road Design is fast and dynamic – providing interactive tools so designers can try many “what if” design scenarios.

Advanced Road Design is developed by the team at Civil Survey Solutions with offices in Melbourne, Sydney and Brisbane. Civil Survey Solutions is an Authorised BricsCAD Developer.

Civil Survey Solutions provides expert technical support, customisation and training services, focused on the civil, survey and associated industries.
Surfaces
Surface creation is quick and easy with support for multiple data inputs, intuitive display controls and outputs dynamically represented.

The Surface model inputs support external point data and Land XML files as well as reading 3D data directly from the drawing. Surface display controls are immediately accessible to you, allowing for fast and dynamic adjustments to contour intervals, colours, layers, contour labeling and surface analysis.

When combined with Stringer Survey* the surface creation provides a comprehensive topographical modeling solution, taking raw survey data through to creation of a surface, with breaklines automatically created directly from the surveyed points.

All of the design is displayed inside BricsCAD, ready for plotting and publishing.

Analyse your surface to quickly resolve design issues, with tools to show elevation banding, slope ranges, directions and slope arrows coloured to your design requirements. Create tables of your surface analysis as tables, ready for plotting and publishing.

LandXML file transfer is fully supported so surface data can be imported and exported readily across multiple design platforms, such as AutoCAD Civil 3D, 12d and CivilCAD.

Create and edit your surfaces in Advanced Road Design with the confidence of being able to immediately share that information with the broader design community.

Surface objects can be selected by mouse click in the drawing and edited. Surface data can also be exported to BricsCAD entities as desired, for sharing with any BricsCAD or AutoCAD user.

Obtain volume reports between any two surfaces, including accounting for compaction factors and applying height adjustments. Volume reports can be exported to a text file for re-use in the drawing and for other documentation purposes.

* Stringer Survey is a comprehensive survey product built for BricsCAD and can be purchased as part of a total civil-survey solution or on its own – please contact us for more information.
Alignments

It’s simple and easy in Advanced Road Design – draw a polyline and click to turn it into an alignment object. Labelling is fully automatic and user customisable as is the line, arc and spiral display.

Alignments can be easily edited during the creation process or via the alignment editing tools – users just click to edit an IP and get access to tools to change the spiral lengths, curve lengths and IP position. Add IP’s, delete and move IP’s within the one editing environment.

As you edit the alignment geometry the display updates in the drawing, including the labeling.

Label display is customisable by you, with a simple interface for the addition of blocks, arrows, lines, circles and text in the chainage labeling, on user defined layers. Labels react with the drawing scale in model space so there is less work trying to get the size right for plotting, and labels flip to be plan readable. Set your own standards for labeling including sampling intervals for major and minor chainages.

Create alignment tables when you create or edit your alignment. You select the information to include in Alignment Tables and Curve Tables and then generate tables at the click of a button. As part of the editing process the tables can be updated in the drawing after the geometry of the alignment changes.

As changes are made to the design, the drafting updates in BricsCAD, ready for plotting and publishing.

Data share is made easy via Land XML transfer. Import and export alignment geometry across multiple design platforms, such as AutoCAD Civil 3D, 12d and CivilCAD.
Road Design

Our philosophy of combining template and String based design, as well as automating common design elements such as intersections and cul-de-sacs, provides a familiar and complete set of tools for rapid creation and output of your road subdivision, reconstruction, rural, highway and other design projects.

Create three dynamic and interactive views of your road design.

As you edit your road profile in the Vertical Grading Editor, watch your cross sections and plan drafting update in real time. You can show as many design objects as you like on screen, giving you the power to design multiple objects simultaneously and to immediately assess the interactions between design elements.

With the Vertical Design Windows you get complete access to any selected design element including editing the vertical design and cross-sections, establishing cut/fill bulking factors, generating summary volume reports and creating surface models of your designs.

Comprehensive vertical grading design tools allow you to establish a vertical design based on the surface levels or the vertical design of any other design element. With a centralised design centre accessed from the Vertical Design Window you can easily edit your cross-sections including assigning alignment/String controls, varying widths and crossfalls and establishing design constraints.

With dynamic interactions between elements, the ability to mix cross-section and String elements and the ability to build your own models using any collection of strings and codes from your designed road elements, it is easy to generate designs for any purpose, including road subdivisions, reconstruction works, car parks, open channels, general site regrading, and more.
Advanced Road Design with BricsCAD

Plotting and Publishing to Your Drafting Standards

As you complete section of your design you can publish it in the drawing, ready for plotting your tender and construction plans. Advanced Road Design has all the tools you need to rapidly generate industry standard outputs of your designs directly inside your BricsCAD drawing, ready for immediate plotting.

With Advanced Road Design you can interactively control the sheet layout, scales, layers and linetypes of your long and cross sections as well as what to present in your outputs. Plotting output styles can be saved for reuse, and you can output them to separate drawings or as layouts in the current BricsCAD drawing.

Point setout, plan drafting of the models and slope patterns are all created directly inside your BricsCAD drawing.
Templates

Design cross section templates are easy to create and edit, and can be saved to local or network setting locations for inclusion in any project.

With the Template Editor you can easily create any design cross section shape you require, with completely integrated multi-layer sub grade included. The subgrade tools allow you to accurately represent areas and volumes of infill, full depth pavement and subgrade extension out to table drains and batters.

Road reconstruction and mixed pavement treatment designs can be undertaken with confidence – volume reports are made section by section and account for all subgrade layers. The Cross Section Windows display all subgrade layers during the design process, providing transparency for designers to confirm the behavior at each section.

Multiple templates can be readily applied to any String object at user selected chainages and including transitions between templates via the centralised design data form, Conditional templates can also be applied based on the amount of cut and fill occurring at the design centerline.
Cross Section Editing and String Control

Editing and applying multiple templates isn’t always the quickest or best design approach – Advanced Road Design provides comprehensive support for you to apply String controls wherever they need to, and to assign String controls to any part of a design cross section.

Strings are the building blocks in Advanced Road Design, and any alignment can be quickly converted into a String for you to control the vertical design. You can attach Templates to a String, and you can use a String to control any element of your cross sections, such as for road widening, table drain inverts, retaining walls, and more.

Advanced design tools allow you to calculate String vertical designs from other design elements such as reference surfaces or other road design strings.
You Design It - Advanced Road Design Will Model It

You can create your own design models in the software, applying any combination of roads, kerb returns, cul-de-sacs or other strings at user defined chainage ranges. Advanced Road Design’s modeling tools provide designer freedom – build models of car parks, retaining walls, building foundations, wetlands or any other feature using the Advanced Road Design Model Manager.

Inside the Advanced Road Design Model Manager, users tick on/off design elements to include in a model and have access to trim functions to remove any collection of codes or code groups (perfect for manual intersection trimming and code overlaps). As edits are being applied, the plan drafting in the drawing updates, so you have confidence on your modeling outcomes as you make changes.

There is a click button output to build a surface from any Model. Model results can be represented on your output cross sections for accurate section results. Long sections can be extracted through the model as required.

Advanced Road Design’s modeling tools allow you to put together any collection of roads, strings and cross-section codes, over user-selected chainage ranges, to allow for all your design requirements.
**Road Subdivision Design Tools**

With Advanced Road Design you can automate your common road subdivision design processes using intelligent objects that can handle design elements such as intersections, kerb returns, cul-de-sacs and knuckles.

As you edit any of the subdivision objects the drafting linework updates in the drawing - at the click of a button a surface model is created incorporating all the road, kerb returns, cul-de-sacs and knuckles including all trimming of strings at intersections. As you make changes to Roads, all other intersection and road type objects automatically update to ensure design integrity in the model.

**Intersections**

Intersections are automatically created and incorporated into the road model, including dynamic connectivity for side and crossing roads and inclusion of kerb returns.

Kerb returns automatically and dynamically position themselves both horizontally and vertically to the intersecting roads. Design wizards allow for user creation of single or multi radius kerb returns, or your own alignments. The auto kerb return function creates multiple kerb returns at once, all matched to the intersecting roads and with cross-sections automatically matching between the main and side roads.

You have complete control over the kerb return geometry, with the software managing the connections to the roads start and end – redesign your roads knowing that the intersection geometry will automatically update.
Cul de Sacs and Knuckles
Advanced Road Design has wizard based tools to automate the design of Culs de Sac and Knuckles.

Cul-de-sac design can be parametrically driven with support for circular, asymmetric, tear-drop, Y and T-shaped configurations or your own alignment. After setting the values Advanced Road Design will lay it out horizontally and vertically to match the incoming Road and with cross-sections automatically matching the road at either end.

Localised road widening is easily achieved using the Knuckle tool, which creates a localised widening that stays attached to the road as you make design changes.
Road Reconstruction Tools

Advanced Road Design has been developed with not only road design but also road reconstruction in mind.

Featuring advanced cross-section subgrade tools, independent vertical and/or horizontal control over any part of your cross-section, and the ability to form models using any collection of independently graded strings and cross-section codes, Advanced Road Design is the premium design tool for road reconstruction works.

Specific vertical design tools are included to help automate road reconstruction processes, including creating a vertical design based on resheet/overlay depths, match surface controls and String/code projections, as well as displaying design 'envelopes' (projections from another String/code at grade) in the Vertical Grading Editor Window.

Using the subgrade design tools you can generate accurate volume outputs through multiple layers, with automatic adjustment of pavement layer depths to match existing surfaces.
**Major Road and Highway Design**

When doing larger scale designs that may include service roads, multiple divided carriageways and grade separated intersections you need complete user control. Automating batter design, editing sections, and scalability are critical factors in your design efficiency.

The Advanced Road Design design environment is a proven performer on large scale projects, with customers reporting excellent performance when designing single projects in excess of 50km and incorporating independently graded table drains, superelevation and intelligent batter embankments.

Advanced Road Design includes specific design tools for highway designers in managing grade separated roads, as well as intelligent design tools for managing multiple benching conditions and open drains.
Pipe Design

Advanced Road Design Pipes includes all the tools you need to quickly create your pipe networks and avoid crossing services and other pipe networks.

Working inside AutoCAD you can create and design Stormwater Drainage Networks, Sewer Networks and undertake general pipe design. Service obstruction checks are included in the design process for you to quickly optimise your designs and avoid conflicts between underground services.

Layout and create your pipe network by either clicking on screen or create directly from polylines or alignments. Whilst the initial pipe layout is based on minimum slopes and covers, the multiple Vertical Design Windows allow you to quickly adjust any pipe sizes and levels to achieve your desired outcomes.

From The Vertical Design Window interface you can see all crossing pipes and services, including clash detection. Edit pipes and pits by setting invert/obvert levels or move pipes up and down by increment. Insert in-line pipes wherever you require and review the pit drops and pipe levels.

Advanced Road Design Pipes is synchronised with the Roads module, enabling both the pit levels and offsets to be directly connected to a road element and with dynamic updates as the road element is edited. All pipe networks can be displayed on the road Vertical Grading and Cross Section Windows to confirm locations relative to the road design.

The Reports Manager builds customised reports from any combination of attributes stored by the software and can be exported as comma separated files (CSV) for review in your preferred spreadsheet program or as an BricsCAD table in the drawing. Create pit and pipe schedules directly from your designs.

Using the Long Section plotting tools you can rapidly generate an industry standard output for your designs directly inside the BricsCAD drawing with control over the sheet layout and data included. Publish directly to BricsCAD as separate files or as layouts in the current drawing.
Stormwater Drainage
Built specifically for the Australian stormwater drainage designer and applying the principles of the Australian Rainfall and Runoff manual, Advanced Road Design Pipes is a complete tool for designers wanting to create underground stormwater drainage systems.

Easily create drainage catchments directly from a Surface and polyline – catchment style libraries allow you to easily assign catchment criteria for common catchment types.

When a network is created the design flows are calculated and pipe sizes and levels are automatically assigned to manage the flows as well as minimum cover, slope and flow velocities.

As you make changes to pipe sizes and levels the Hydraulic Grade Line and all design information for each pipe automatically updates.

Using the Long Section plotting tools you can rapidly generate industry standard outputs of your designs directly inside the BricsCAD drawing, complete with HGL and other stormwater details and ready for immediate plotting. Publish directly to BricsCAD as separate files or as layouts in the current drawing.
Sewer Design

Advanced Road Design Pipes incorporates a comprehensive set of sewer pipe design tools.

Sewer house/property connections are included in the design tools and can check depth controls and minimum levels along the sewer network. Each house connection can be viewed in a Vertical Design window for editing and adjustment.

The sewer network will automatically adjust to ensure compliance with the minimum house connection levels, and you will be alerted if sewer pipe edits result in any compliance issues with house/property connections.

Interactive vertical design windows are able to display any branch of pipes in a network and complete with editing tools you can quickly and easily design a system to avoid all conflicts and service the house/property connection. All house connections, service obstructions and other networks display as crossing pipes, including clearance controls - as you make changes to pipe sizes and levels you can immediately identify and address any conflicts.

Detailed and specific reporting tools for sewer designers enable quick identification of any house/property connection issues.

Using the Long Section plotting tools you can rapidly generate industry standard outputs of your designs directly inside the BricsCAD drawing, including house connection controls and ready for immediate plotting. Publish directly to BricsCAD as separate files or as layouts in the current drawing.

Plan drafting occurs directly in the BricsCAD drawing including selected attributes from your design specific to sewer design.
Drafting
You never leave the BricsCAD environment using Advanced Road Design. Since the drafting outputs in the model update as design changes are made, revision control is far easier to manage and with much less risk of forgetting to update outputs when a design change is applied.

You can select the layers to output information.

Long sections and cross sections created from your design can be output to layouts on your preferred title blocks, saving you time between design and final drafting.

Your pipe designs output to long sections in layouts or to external files, and the design tables for setout and documentation can output directly to BricsCAD as BricsCAD tables.

Reports
Advanced Road Design includes a comprehensive set of reports, outputting both as external text files and into the drawing as BricsCAD tables.

Alignment information can be readily outputted to user definable BricsCAD tables – you pick what information you want and how it is arranged and click the button for it to be displayed in BricsCAD ready for plotting. Alignment tables detail the alignment geometry, and curve tables enable quick setout of curves along the alignment.

As part of the road design process users can quickly generate setout reports, section volume reports, cross section listing reports, vertical design reports and more.

For road set out, set out all points for all road design objects at once – label in the drawing, generate BricsCAD tables and display the setout locations on your long sections. Reports are customisable – pick what information to place in each column and output both to the drawing and to file.

The Pipes design processes include a myriad of text and drawing output tables – quickly set up your own output table in BricsCAD showing pipe and pit geometry and hydraulic information suitable for stormwater design.
Links

Advanced Road Design interfaces with other design programs that support Land XML transfer. Via LandXML users can share surface and alignment data, as well as export Road data for upload to survey equipment.

For pipe design, Advanced Road Design shares data with:

- WaterCom Drains: export pit, pipe, catchment and bypass geometry from Advanced Road Design directly to Watercom Drains to save hours setting up your data. Data can also be exported from Drains and imported into Advanced Road Design for plotting of long sections to BricsCAD.
- PC Drain: use the PC Drain link to export pipe, pit and catchment data to PC Drain for further analysis, design and output from PC Drain.

Advanced Road Design for HEC-RAS provides users with the ability to transfer section data to HEC-RAS for river analysis, including assignment of Mannings coefficients, defining overbank areas, skewed sections, houses and ineffective areas. Waterline results can be exported out and back to Advanced Road Design for presentation in the drawing and construction of a water surface.
Services

Training
Advanced Road Design is easy to learn – with most operators able to complete road, drainage, sewer design after only a few days training.

Civil Survey Solutions can provide onsite project based training; classroom training or web based training sessions.

Civil Survey Solutions creates its own training course ware with Australian data sets.

Quick Start Customisation Packages
The software comes complete with a wide variety of presentation styles, which can be easily edited to meet your company standards.

Whilst the drafting outputs are fully customisable, we recognise that you may want a kick-start to getting your company standard drafting results in the settings. In order to address this demand we offer a Quick Start Customisation Package, which includes:

- Consultation with you regarding your work processes and how your outputs are managed
- Analysis of your project outputs and drawings/drawing templates to understand your drafting standards (layers, linetypes, blocks, etc)
- Development and delivery of the following Advanced Road Design settings/standards for immediate use at your organisation:

  ✓ Setting layers used by Advanced Road Design
  ✓ 4 x Surface Styles (includes contour labeling styles)
  ✓ 2 x Alignment Styles and 2 x Annotation/Label Sets
  ✓ 1 x Alignment Table Style
  ✓ 2 x Cross Section Templates
  ✓ Default Road Settings
  ✓ 1 x Road Long Section Plot Style
  ✓ 1 x Road Cross Section Plot Style
  ✓ 1 x Setout Output Style
  ✓ 1 x Rainfall table (ARR Maps or Bureau of Meteorology) added
  ✓ 5 x Pit Types (including pit performance curves, if supplied)
  ✓ 1 x Pipe Long Section Style
  ✓ Default Pipe Settings

About Civil Survey Solutions

Civil Survey Solutions is an accredited BricsCAD Reseller with offices in Queensland, New South Wales and Victoria, focusing on the sale and support of BricsCAD based civil engineering and survey software.
Prices

Product and Subscription

Advanced Road Design for BricsCAD

- Standalone License $2,495 ex GST
- Network License $2,995 ex GST
- Twelve months software subscription and technical support $450 ex GST

BricsCAD Pro

- Standalone License $810 ex GST
- Network License $1,215 ex GST
  Includes twelve months software subscription and technical support

Services

- Quick Start Customisation Package $1,250 ex GST

Training – Classroom

- Three day Road Design (per person) $1,495 ex GST
- One day Pipes – inc. Stormwater and Sewer (per person) $495 ex GST

Training – Custom

- On site custom based training (per day) $1,750* ex GST
  Up to six persons, includes training lab and all technical manuals
  * Travel and accommodation costs may apply