



Detailed Alignment

The Alignment module is essential for users who need to model complex projects such as highways, intersections, urban and rural roads, subdivisions and associated works.

12d Model is your ideal detailed alignment solution!

Alignment design adds another dimension to 12d Model, providing the tools to carry out a full range of civil design work including local roads, intersections, highways and motorways with interchanges.

The 'Detailed Alignment' design module provides design capability and string modifier operations to allow interactive design of the most complex civil situations.

12d Model allows designers to easily check their design as it progresses using the three dimensional perspective view.

Collaborate easily with other civil disciplines.

Many civil projects require collaboration between a number of different disciplines or between organisations. From surveyors, road designers, hydraulic and flood modellers to construction contractors, 12d Model data can be shared seamlessly between all 12d Model users.

Should an organisation or department you are collaborating with not have 12d Model, 12d Model users can export information to other packages through the input/output module, to their preferred package.

Super Alignments

Harness the power of 'Element' design and update your alignment geometry at the click of a button.

'Alignment' design is fully interactive, changes can be made with the design at any stage and these changes will be automatically reflected in other segments of your projects (*i.e.* volume calculations, cut & fill sections).

The 'Super Alignment' is 12d's next generation of alignment evolving from the previous IP based design through to 'Element' design.

There are 3 types of 'Element' design and they are as follows:

- Fixed – can stand on its own
- Free – are dependent on at least 2 other elements
- Floating – requires one other element

Errors can be easily detected and 12d Model will specify exact errors if an element is placed in a position where it does not work in the design.

'Element' design in alignment geometry is an alternative method of placing an alignment to the basic Intersection Point method. Element method design is only available through the alignment module.

Special element types, known as 'Computators', can define their geometry from other strings in the model so all your geometry can be updated at the press of a button.

Computators

Computators provide parametric design capability by allowing elements to be linked to other 12d Model objects. Rather than having the geometry defined by values manually and entered by the user, the geometry can be automatically calculated and modified based on other points, strings or surfaces.

By using computators, the geometry becomes more flexible and layout changes can be quickly and easily accommodated by the designer.



The Detailed Alignment module is packed with powerful tools to increase efficiency, such as: Apply Many, Boxing, Elements, Components...and many more!

Detailed Alignment



Users can adjust/change one piece of information and subsequently the entire design will re-adjust accordingly. Error checking, combined with chains (*i.e.* other linked designs) can be run either manually or automatically and this can save a designer extraordinary amounts of time in re-calculating jobs on demand.

Kerb Returns

Vertical geometry of kerb returns can be automatically created based on the grades, crossfalls and levels at each end.

This enables the user to rapidly create and edit kerb return alignments and gives the ability to immediately see the effects of the entire intersection design.

Design Tables and Super Elevation

Easily create and apply horizontal and vertical geometry to ensure your alignment meets the design standards of the road authority or client. 12d Model can automatically set the horizontal and vertical curves, superelevation and lane widening based on the design speed of your road.

Design standards can be applied for the entire length of the road or can be tailored in sections to suit the project and varying requirements.

Design standards for roads differ depending on the road type and between regions, often causing confusion for users. 12d Model allows the user to select and apply the design standard for a particular case to their design with the confidence that the geometry will meet those design standards.

Users no longer need to memorise or look up tables of values for each road. 12d Model takes the effort out of designing to a standard.

A superelevation and lane widening diagram is dynamically displayed and updated in long section views, so users can immediately see the effects of any design changes.

Chainage Equalities

12d Model also supports the creation of chainage equalities (also called station equations) for an alignment so that multiple chainage systems can be used. Chainage equalities are often used where two chainage systems meet or where multiple chainage systems are needed. This functionality is particularly useful for rail designers where multiple tracks and alignments often split and join; chainage equalities are often called 'k-posts' in these situations.

12d Model's alignment functionality allows designers to create chainage equalities based on coordinates, chainage, relative distance or internal equality. This gives users the maximum flexibility in designing for multiple chainage systems.

Efficiency with design 'Components'

Components take the idea of relational geometry to a whole new level with items such as design intersections placed into the model in a single step!

Reduce many hours or even days of work into a few seconds with this great feature. If you do not require a full new intersection, then choose from the library of components to create left turn slip lanes, highway entry and exit ramps and even bus bays. All components can be customised to local requirements.

Components essentially provide a basic design map that can be placed into your new or existing design and as a result are a great planning and setup tool.

Designers can customise and create their own components on the fly and build their library over time.

This is a great first pass design that can be later modified and edited. Specific sub-components such as islands and medians can be turned on or off. Designers can see a quite detailed initial design and quickly create preliminary designs or use it as a starting point to begin a detailed, correct and specific design.





Generate and update your design quickly!

The 12d Model 'Apply Many Function' gives designers the ability to update design strings quickly. The list of modifiers is comprehensive for all types of projects.

Examples of modifiers include:

- Table drains calculated between dual carriageways
- An modifying design crossfall, road width and string height between chainages
- Projecting the crossfall between two existing strings
- Widening out to an existing string
- Creating cross sections at user specified chainages
- Modifying the height and/or offset of the hinge string (allows easy design of roads with offset crown).

Use 'Decisions' to decrease complexity

Decisions can be used in the design cross section to allow, among other things, complicated cut and fill requirements (multiple strata), decisions based on depth below one or more strata or strings, multi-level decisions (*i.e.* depth decisions, *etc.*) and extended battering including repetitive battering, fixed width batters and battering relative to a string or strata.

Detailed pavement quantities for contract schedules through 'Boxing'

Once a design surface is modelled, the Boxing feature allows designers to attach multiple layers of materials to model the full depth of the road and output quantities for contract schedules.

A good subgrade model is essential to be able to calculate accurate volumes and to check for construction clearances to such things as stormwater pipes and other utilities. Hold-ups during construction are very costly and it is easier to change levels in the design model than it is to relocate or replace real pipes.

Chains

Chains are ordered processes and can be used to recalculate items such as control lines and kerb returns. These help save time and improve efficiency for processes that are repetitive tasks. Chains can be created for plotting long and cross sections, creating output to other programs or resolving and recalculating design tasks such as strings or control lines.

Chains are individual processes that link individual commands that already exist within 12d Model. Chains can be run within chains. Composite or master chains can be used to run an entire project, to clean models, delete models and delete external files.

Manage design accuracy with a range of design and analysis tools.

The alignment module is equipped with a range of design analysis tools such as:

- Vehicle Turning Paths
- Sight Distance Checks
- Stopping Distance Checks
- Design Tables
- Edit easily using toolbars
- All Super Alignment properties are completely editable
- Easily access creation tools for IPs
- Undo/Redo as a standard feature
- Information is easily accessed at points based on mouse rollover
- Recalculation and error check functions create efficiency in resolving your alignment
- Delete the entire horizontal or vertical geometry
- Easily copy and re-adjust Super Alignments accordingly
- Save and edit or quit without saving your super alignment

The record function means that designers can record the task they are performing to ultimately create a chain.



Roads and Highways

12d Model's design option is the smarter solution for the design, modification and maintenance of Road and Highway projects.

Enjoy advanced 3D tools to design local and major roads, intersections, roundabouts, highways, interchanges and much more.



Ports and Dredging

12d Model is the solution for port infrastructure and dredging, easily managing the very large datasets and complex volume calculations often required by these projects.

A complete range of flexible and customisable volume calculation tools allow teams to extract and present the information quickly and easily.



Land Development

12d Model is the most versatile solution for the creation of sustainable land development projects, including residential, commercial and industrial developments, recreational areas, landfills, and agriculture projects.

Easily manage all aspects of your land development project from earthwork quantities, road design utilities and drainage design.



Airport Infrastructure

12d Model provides a solution for the design, construction and analysis of new airports, as well as the upgrade and maintenance of existing runways and airport infrastructure.

Easily manage large airport infrastructure projects and share data across multi-disciplinary teams.



Rail

12d Track has been specifically designed for the survey, design and construction of light, heavy and high speed rail projects.

Extensive railway tools in 12d Track allow the rail designer to quickly and easily design their projects. These options are built on the existing 3D modelling and design tools available in 12d Model.



Mining Infrastructure

12d Model's powerful set of exploration, site investigation, survey and analysis tools are crucial for the initial design, construction and ongoing operation of mining projects.

Comprehensive tools for the survey, design and construction of access roads, railways, earthworks and services allow for the coordinated design and management of mining infrastructure from within 12d Model.



Drainage, Sewer and Utilities

12d Model provides comprehensive tools for the design, analysis and optimisation of stormwater and sewer projects using rational, dynamic (hydrograph) and 2d drainage methods.

Powerful clash detection management allows for efficient 3D modelling of service networks such as gas, electricity, telecommunications and water prior to construction.



Surveying

12d Model is a complete surveying package providing the tools to manage all facets of surveyed data including LIDAR, topographical, as-built, conformance, traversing, geodetics, data mapping, labelling and much more.

The 12d Field option runs on a ruggedized tablet and gives the user access to full 12d Model functionality, allowing you to take the entire project into the field with the most comprehensive pick-up and set-out tools.



Oil and Gas

12d Model assists with the design, construction and mapping of oil and gas pipelines, original site exploration and the wide range of infrastructure required for oil and gas projects.

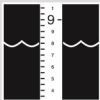
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



Construction

12d Model is the ultimate software for construction with powerful set-out options, direct interfaces to machine control and detailed conformance reporting and auditing.

Manage 3D data and control volumes, quantities and progress claims with 12d Model. Set-out your project and undertake conformance and as-built surveys live on-site using 12d Field.



Rivers, Dams and Hydrology

12d Model handles very large datasets and interfaces with a wide range of analysis packages, making it perfect for flood studies and the management of rivers and dams.

12d has partnered with industry leading analysis software, allowing users to apply 2D drainage analysis from within 12d Model.



Environmental

12d Model's ability to handle very large datasets combined with flexible and comprehensive 3D analysis and modeling tools make it perfect for a wide variety of environmental projects.

Existing workflows can adopt 12d Model easily as it allows users to directly interface with GIS systems and most software packages and file formats.

Why Choose 12d?

- **Powerful data processing & intelligent functionality.**
- **Modular, easy to update & completely customisable.**
- **Seamless integration with major industry software and hardware.**
- **Used in over 55 countries worldwide.**
- **Friendly support & training from industry experts.**

CONTACT US TODAY

E info@12d.com
P +61 2 9970 7117

W www.12d.com

12d Solutions Pty Ltd PO Box 351
Narrabeen NSW 2101 Australia
© 2018 12d Solutions Pty Ltd

