

King and Campbell Pty Ltd

Michael Ward

CLIENT: Gwynvill Trading Pty Ltd

SCOPE:

Manufactured over-50s home estate comprising 260 dwellings, Office, Managers Residence, Community Club and Workshop/Maintenance Shed.

12d DIMENSIONS:

- Surveying and Construction

Ocean Club Resort

Lake Cathie



Site Plan of Ocean Club Resort

Project Summary

Manufactured home estate comprising 260 dwellings, Office, Managers Residence, Community Club and Workshop/Maintenance Shed (refer attached Site Master Plan for details).

Stage 1 Construction included the upgrade of Ocean Drive (Regional Road) and the design of five public roads and 13 private roads including all associated infrastructure. Lake Cathie is situated near Port Macquarie in NSW.

Design was commenced in 2010 and construction continues on this 'Five Star living for over 50s' resort.

For more information

To find out more about how you can create better designs faster with the 12d Model solution for civil engineering design, visit www.12d.com.



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The Challenge

The challenge of this project was to complete the design of the 19 roads and 40 kerb returns in a cost-effective and timely manner.

The initial construction program required that 14 of these roads also be fully documented for construction.

The Solution

At the start of this project, King and Campbell had been using 12d Model for approximately eight years and had undertaken a moderate level of customisation during that time, including custom tool bars and standardised long and cross section plot parameter files.

This project provided the opportunity to further customise King and Campbell's usage of 12d Model, including updating how customisation was managed between users.

Their user customisation was centrally stored on a server; however this data was copied (as part of the logon process for users) to a local drive. This enabled customisation to be updated automatically, with the added protection that if users accidentally deleted data, this would only affect the individual user's PC (and a restart would usually fix the problem).

Design of the Roads

- Standard road templates were used with a zero width for the pavement. This allowed the same template to be used for all roads, irrespective of their width.
- All of the road design was undertaken using the Apply Templates Function (Apply Many) and utilising modifiers. The first modifier inserted the correct template with the second modifier correcting the width (this was modified to a line created in another package as part of the original development application process).
- The ability to copy data between modifiers was used to simplify the process by creating one MTF file and then transferring the modifiers to all subsequent files.
- The use of high/low dropped chainage of strings was used to specify start/end chainages where possible, to facilitate design changes.
- The approach of these standard road templates resulted in their being adopted across the organisation for all road designs.



Design of Kerb Returns

- The design of the Kerb Returns was also undertaken using the Apply Templates Function with the same road template described above.
- The Apply Many process was simplified by ensuring a naming convention was followed and creating one standard MTF that was copied and renamed in Windows Explorer for the other 39 kerb returns.
- The option to start and end the modifiers with the reference string “Start (ref)” and “End (ref)” was undertaken to avoid the necessity of specifying actual numerical values which would vary between the different Kerb Returns.

Documenting the Design

- The same approach was applied for the documentation of the design. As standardised names were used for all Road and Kerb Return Alignments, Sections and Strings default *.plotppf and *.xplotppf files were created that included all of the base information (standard AutoCAD file, Corridor models, Cuts through Strings).
- The functionality of 12d Model to relate to colours in other packages simplified the production of these long and cross sections by mapping information to meaningful layers in other packages.
- All services were similarly coloured to ensure their correct transfer into other packages. The colours adopted for this project were then standardised across all of King and Campbell's designs. The colours were developed by modifying the colours.4d file and ensuring the RGB values were the same in 12d Model and other packages.

Result

Lessons learnt and future Revisions/Options

- Adopting a uniform naming convention from the commencement of the project proved beneficial both for the design and the subsequent documentation and setout for construction.
- The design was undertaken around the same time that 12d Model released its Chains functionality. It would be beneficial in future to set up Chains to run the numerous Apply Many and plot functions. This would simplify the process if/when changes are made to the design.
- Simple procedures and customisation implemented at the commencement of a project provide efficiencies through the life of the project and beyond.
- Time spent on customisation and standardisation within 12d Model provided ongoing benefit to King and Campbell by simplifying the calculation and documentation process.



Photo of resort, from <https://oceanclubresort.com.au/>



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.

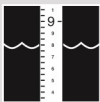
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



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.

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