Gold Coast Rapid Transit

Integrated 12d Design

Arup
Jake Albury

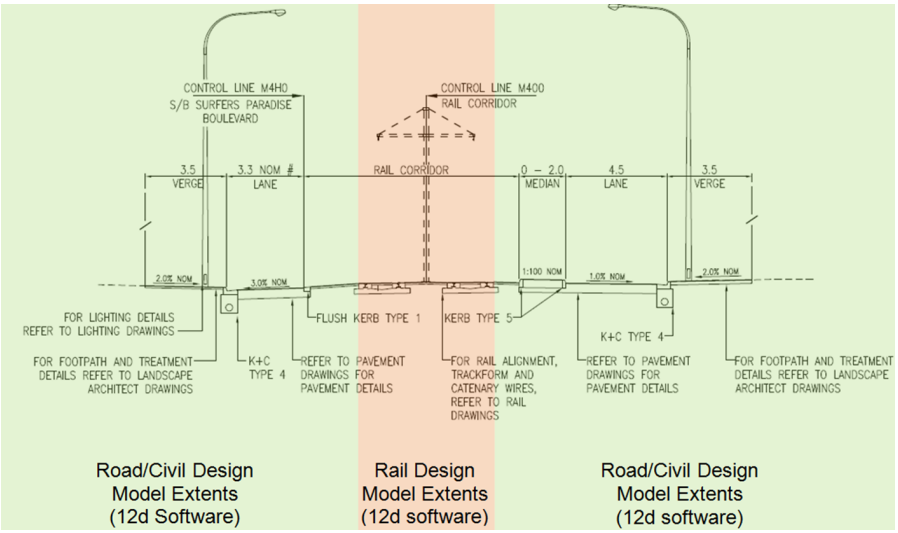
CLIENT: McConnell Dowell

SCOPE:

Deliver the detailed design as a fully integrated 12d project, with 12d design teams including rail, road, stormwater drainage, survey (By Others) and utility services (By Others)

12d DIMENSIONS:

- Road design
- Rail design
- Stormwater Drainage



Project Summary

The Gold Coast Rapid Transit consists of 13km of dual track light rail system in a shared Road and Rail corridor, connecting the Griffith University to Broadbeach. Technically challenging, the light rail system occupies much of the existing road corridor, requiring alterations to the functionality of the road network. This design required very close coordination between the rail and road alignments to ensure an integrated approach. As part of a multi-discipline design team, Arup also delivered the designs for four bridges, numerous retaining walls, track form, stormwater drainage, system conduits and pits, lighting, traffic signals, and more. It was decided the teams would deliver the detailed design as a fully integrated 12d project, with 12d design teams including rail, road, and stormwater drainage.

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.

Australasia: Sydney
P: sales@12d.com
M: +61 2 9970 7117

The Challenge

The project involved many inter-discipline interfaces using 12d Model with 12d design/survey teams including rail alignments, road design, stormwater drainage, survey (MacDow) and utility services (Cardno).

Processes were required to ensure all disciplines were using up to date and controlled information as the design progressed.

Processes were required to allow resources to come onto the project and allow multiple designers to work on the modelling at one time.

The Solution

The decision was made to produce the design in 12d Model to enable all relevant disciplines to work from 12d and utilise the model sharing capability. Doing this would enable a truly coordinated approach to the multi-disciplinary design.

Stringent processes were put in place to utilise model sharing between disciplines. As the different disciplines had varying delivery dates on design packages, control of the information shared was important.

The project was broken down into many small 12d Model projects to allow flexibility for the design teams and resources. To assist with this, the number of design models produced was minimised by consolidating design information where possible (many functions create strings on the one design model). All models were then shared to form the complete design. For this process to run smoothly, a rigid modelling convention was set up and used by the design teams.

The rail alignments team - comprising of five designers - needed to be immediately up-skilled in the use of 12d Model to deliver the rail design. A number of light rail specific macros were developed by 12d in consultation with the Arup team, to address their particular project requirements.

Result

"As Queensland's first ever light rail system, the Gold Coast Light Rail project represents a major step forward in transforming the city into a modern, accessible destination."

—City of Gold Coast website

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

12d Model

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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