Canberra Airport, Australia

Terminal upgrade and associated works

Mott MacDonald
Airport Upgrade

END USER: Canberra Airport Group
CLIENT: Mott MacDonald
START DATE: 2010
COMPLETION: 2013

MOTT MACDONALD SCOPE:

Planning and design for the upgrade of the Canberra Airport.

12d DIMENSIONS:

- Roads and Highways
- Airport Infrastructure
- Drainage, Sewer and Utilities

Finished model of Canberra airport terminal

Project Summary

To construct a larger airport terminal precinct, on a completely new alignment over the top of an existing terminal precinct footprint with minimum disruption to the function of the airport terminal, underground services and roadways.

The Challenge

The detail 3D design and documentation of the civil engineering components of the airport upgrade. This included:

- Design of the internal road network including elevated roadway.
- Design of underground hydraulic services and co-ordination of all services.
- Design of new apron and adjoining overland storm water paths.
- Obstacle Limitation Surface (OLS) management.

The Solution

A multi-user, multi-stage approach was taken to complete the design using 12d Model, capturing all existing site conditions and ensuring they were not disrupted during the construction phase.

The sharing of models, TINs and alignments enabled the site to be split into sectors and stages. Different designers worked on each sector and stage while accessing data from adjoining sections and stages.

The maze of underground utilities was modelled in 12d Model to allow the installation of new utilities within existing corridors as well as ensuring sufficient clearances were provided to new surfaces and critical infrastructure.

The previous apron design was prone to flooding the terminal building. The existing apron was modelled in conjunction with the underground storm water network and overland flows. Storm events were applied to predict and mitigate storm water flows while tying into the existing storm water network.

The Obstacle Limitation Surface (OLS) is the boundary of airspace which surrounds the airport to protect it from intrusion, interference or any effect which could affect the operation of aircraft and aviation safety. A complex series of surfaces was created in 12d Model to ensure construction activities did not encroach on the OLS at any stage of the project.

Result

The level of detail achieved during the design phase allowed the prediction of potential problems that would have hampered the construction effort.

The modelling of elements such as existing utilities and OLS boundaries provided the client with sufficient information to create detailed construction plans and reduce potentially dangerous interference with existing operations.

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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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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