## **Brisbane City Council**

Streets Upgrade / Services

END USER: Brisbane City Council CLIENT: Brisbane City Council START DATE: 2012 COMPLETION: 2012

#### BRISBANE CITY COUNCIL SCOPE:

Road reconstruction and improvements associated with the Hale Street Link Project.

12d DIMENSIONS:

- Roads
- Surveying

## **Project Summary**

Road reconstruction and improvements associated with the Hale Street Link Project from Peel Street to Vulture Street, along Merivale and Cordelia Street in South Brisbane. Service co-ordination and impact assessment was required for all underground services.

## The Challenge

Existing underground services had to be identified, and service covers compared with existing crowns to NSL (including designed FSL). After survey, CTTV of BCC stormwater and Dial Before You Dig information was gathered, as well as service locators for pot holed services at regular 20-40m intervals in the work area of 2-3km of road, over 1km<sup>2</sup> in busy South Brisbane.

Identification of critical services (age, depths, and condition) was required for

## For more information

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# Hale Street Link Associated Project

Merivale-Cordelia Streets Upgrade/Services



BCC and service authorities to determine relocation costs in advance of road works. As a result, it was necessary to compare any relocation costs estimated by authorities' versus redesigning, to avoid excessive costs.

After trialling initial manual methods, considering time restraints, the size of area, number of services within the area and manual work required, while reducing manual human errors, a better automated method was required.

## The Solution

Designers used 12d Model software to 3D model all actual services in location, depths sizes, and number of conduits to allow for assessment of critical covers and impacts with existing services and proposed works.

A 12d macro solution was developed to identify, label and report existing critical crown depths (AHD) for services to NSL (>0.6-0.75m cover adopted) which also included a comparison to the proposed design FSL. An input of left and right corridor search distance width allowed one control line chainage reference. This meant that each depthed vertices/fitting could be identified in coordinates, chainage, and the change in height from NSL and design FSL, whether positive or negative.

The Work Area was divided in to four areas of manageable sizes. A unique naming, labelling and identifying system was required for each service string/model and node/vertex by a numbering and prefix ID, using an automated labelling attributes macro, prior to running the main service depth macro.

A report was computated with each potholed vertex for depths of services, MH, pit corners, water values, metrer, fire hydrants, gas valves, *etc.*, so that each node could be identified in coordinates with the change in height to the design FSL.

Reports for all service information were collated with data sorts in Excel tables to display on individual service plans, showing 50mm depth range polygon differences for a visual image of NSL to FSL changes. This allowed quick identification of problem areas with each service, assisting project managers and service authorities to identify relocations required, with confirmation of existing and design cover.

Being armed with detailed information on existing service covers, including the proposed design FSL, allowed easier communication with authorities, including boldly requesting funding for relocation of existing shallow services, saving both BCC and ratepayers money, and authorities investigation and assessment decision time, hence further reducing costs and expected delays with any service works and programming.

One drawback was sorting too much information if gathered at once, initially with too many symbols, if all checking macro elements were used at once for multiple services. Hence adopting a model naming convention and running with one service at a time was found to be best.

## Result

The final product was a comprehensive assessment of all services, critical depths allowing determination of the effects of existing and proposed design cover with limited manual calculations. These plans allowed assessment and decisions to be made for service authorities, and client and project managers to make decisions on design and redesign due to service relocation costs. Plans were also used in estimating and allowing BCC and service authorities to make quicker impact decisions for their own as-constructed assets prior to works (special thanks for program works by Peter Murray of BCC).





#### **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.



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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.

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#### Rail

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#### 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.

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#### **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.



#### **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.



#### Ports and Dredging

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#### 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.

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#### 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.

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#### 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.



#### 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.



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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.

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