Victoria Harbour
Melbourne, Australia

GHD (Hobart)
Andrew Shaw

CLIENT: Lend Lease & Internal GHD Melbourne Office

SCOPE:

Waterfront development

12d DIMENSIONS:
• Surface modelling

Project Aerial Artist Perspective View of Victoria Harbour

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.

Americas: Vancouver
E: americas.sales@12d.com
P: +1 206 905 1464

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

Europe: London
E: sales@12d.co.uk
P: +44 845 051 0372

Project Summary

Victoria Harbour has been labelled the 'jewel in the crown' of Melbourne's Docklands. It is one of the most ambitious waterfront developments being undertaken, with a total project value of 4.5 billion dollars. The project will be developing major CBD streets, laneways, access lanes & public meeting places such as Dock Square. Dock Square is a major centrally located public meeting place with a state-of-the-art library, landscaping and community centre, and a strip of cafés located at the intersection of Collins and Bourke Streets.

Collins and Bourke streets create a vital urban link from Victoria Harbour to the Melbourne CBD – with Collins Street also consisting of a tramway running down a raised central median. The site also consists of a tramway loading platforms. The whole development site brings together a vibrant mix of retail, commercial and residential development.

Some basic site statistics are:
• 30 Hectares in prime real being developed
• 2,800 dwellings
• 21,000 m^2 of retail
• 24,000 m^2 of mixed use space
• 8000 m^2 of community facilities
• Estimated resident population of over 61,000.

The Challenge

The problem faced was to manage the surface modelling on one of Australia's largest urban renewal projects - with an extraordinary high number of stakeholders that have competing and conflicting outcome objectives. As a designer this is never easy mix, as the number of stakeholders involved on projects like this causes a seemingly never-ending circle of design changes and challenges. All of these factors equate to the surface modelling having to be constantly updated and managed throughout the design process.

A few of the major stakeholders involved are Lend Lease (the developer) and the developer's engaged planners, architects, urban designers, landscape architects, cultural / heritage planners and engineers (GHD). It also includes governing authorities such as Placers Victoria & the Melbourne City Council.

Adding to the task above was the need for collaboration of multiple surfaces created by multiple road designers, creating multiple string models working on the project at the same time to meet project deadlines. Also adding to the challenge is working across multiple GHD offices. These included GHD offices Melbourne, Adelaide, Hobart & Manila.

12d® Model

The Solution

Managing the surface modelling was done by completing the following tasks:

1. Setting up the same directory drive structure for each 12d project, on each of the local network drives for all of the GHD offices involved.
2. 12d projects were created for each of the engineering disciplines *e.g* survey, roads, drainage, utilities, tramways etc. 12d discipline projects. These 12d discipline projects were managed by revisions at end of the project name that were updated at critical design stages or layout changes.
3. 12d projects were copied across and updated regularly across the relevant GHD operating centres.
4. Tin and model sharing set up. For example the survey project shared the existing surface into each of the 12d projects.

This is where the process of managing many models to what the designer calls "Single Model Modelling" using a 12d Chain occurs: All the design surface modelling and management was done in the 12d road discipline project. I made use of the 12d Chains facility, to create a 12d chain which duplicates all of the native string models, created after running the apply many functions into a single design string model. Every time a new surface design was done (in any GHD office) using the Apply Many function. The native model is uploaded onto each of the GHD operating centres (trade secret here) however you could use a number of file management software here to prevent the same name model name being used. And also ensuring the latest model is used. The native model was then added to a chain managed by myself located in the GHD Hobart office. The duplication of the newly created apply many model into a single string design model. Is very simple and is just involves creating a .slf (screen layout file) of the data to duplicate located under the 12d utility menu => A-G. This means that each of the native apply many models have been copied into a single string model covering the entire surface design for Victoria Harbour.

The advantage of having a single surface string design model and tin on a project is that it enables other 12d discipline designers to only ever have to worry about sharing a single road surface string model and into a 12d project. Meaning you don't need to keep adding shared models for the surface.

This may not sound like much, but on a project that has a couple hundred apply many functions / models. It saves valuable time in preventing time being wasted by utility, drainage, rail designers etc having to either:

- Read in hundreds of shared models and then sift through model information to find what they are looking for.

OR

- Having to chase surface / road designers about what model name they need to share in.

It also prevents frustration of road designers having to continuously stop and tell other discipline designers that the model name or a particular kerb return, for example.

Result

This simple way of using a chain to create "Single Model Modelling" can be done on the smaller projects and creates efficiency on a project that saves valuable time, energy and money on projects. And simply allows the designers to get on with designing their infrastructure.

The creation of the "DESN STRS" chain also had a number of other things added to the chain which were to delete the model, delete and re-create a design view. Converting apply many design strings to become non tinable *e.g.* lip of kerbs under raised pedestrian ramps.

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.
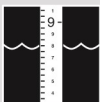
Rivers, Dams and Hydrology

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.

Americas: Vancouver
E: americas.sales@12d.com
P: +1 206 905 1464
Australasia: Sydney
P: sales@12d.com
M: +61 2 9970 7117
Europe: London
E: sales@12d.co.uk
P: +44 845 051 0372

12d Model