

Eliot Sinclair & Partners Ltd (ESP)

Sam Cech

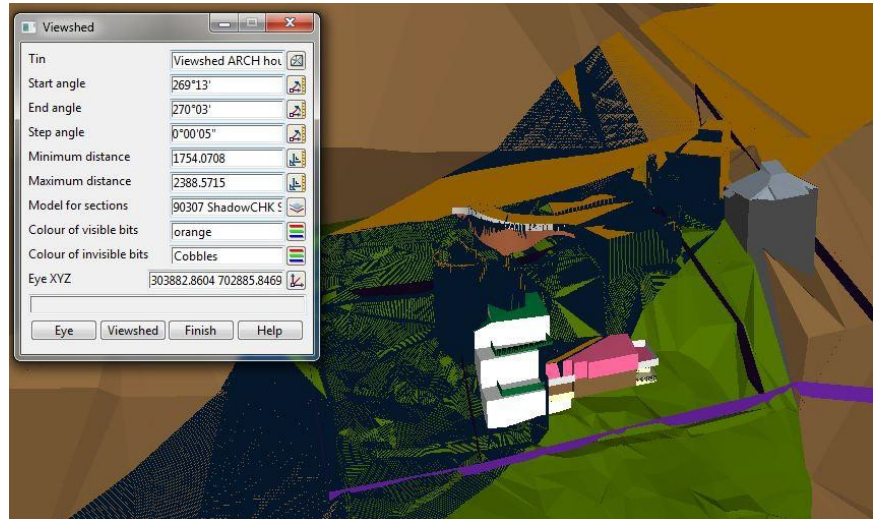
SCOPE:

Surveying a property and evaluating the sun shadow created by the proposed building of a new house.

12d DIMENSIONS:

- Surveying

Sun Shadow Adverse Effects



Project Summary

The client applied to build a new house and access road, parking on a steep hillside. During the consent process, the owners of the neighbouring vacant section to the south suggested the proposal would have adverse effects on their property.

The task of the ESP team was to survey the property and evaluate the sun-shadow the proposal would cause on the existing environment.

Challenges

- Analyse a 3D model of the client property and neighbouring land, and measure the size of expected sun shadows at three different times of a day at maximum summer and winter sun positions.
- Calculate sun position and elevation at specified days (using sun almanacs and online software).
- Cast digital sun rays on the 3D digital model and identify areas of shadow before and after development.
- The team soon identified that the analysis would require a 3D model for the wider region due to the location of the hill section being on eastern elevation of Port Hills.
- The impact of existing established large trees and neighbouring property to the North, as well as the existing legal road, had to be analysed prior testing the effects of the new development.

Solution

The ESP team selected 12d Model software for its ability to cast digital sun rays using the ViewShed option and 3D modelling tools.

The ViewShed option exclusively works on TINs, and the position of the Sun had to be over the same TIN. This was achieved by calculating the bearing and elevation of the sun at the specified dates and times of day and digital point was placed as the

EYE position within ViewShed. It was necessary to model trees, buildings and parking areas, and include these in the same TIN.

Result

- 12d Model ViewShed analysis generated section strings draped on the TIN, with segments coloured blue indicating shadows and segments coloured yellow indicating sun-shine.
- The team manually checked the ViewShed results by generating cross sections, and prepared pairs of plans showing the pre- and post-development shadow effects.
- The results from 12d Model ViewShed, and all their manual checks and verifications, convinced all parties 12d Model was the correct tool to use and the shadow results were accepted as the main argument to show there would be little impact caused on the land south of the subject property.
- Due to the unconventional use of the ViewShed tool, some processes identified limitations within its core functionality. 12d Solutions was able to assist ESP by modifying the ViewShed to allow EYE positions to be as far away from the site as to imitate a SUN. As a result, they managed to reprocess all plans a few days later and meet their deadlines to present the results of this analysis in a hearing.

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

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

Europe: London
E: sales@12d.co.uk



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.

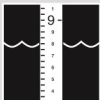
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



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

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

Europe: London
E: sales@12d.co.uk

12d Solutions Pty Ltd
PO Box 351 Narrabeen
NSW 2101 Australia
© 2020 12d Solutions Pty Ltd



12d Model