

North Coast Curve Easing

URS
Anthony Scott

CLIENT: ETEJV + ARTC

SCOPE:

Decrease train journey times.

12d DIMENSIONS:

- Roads and Highways



Project Summary

This project's aim was to decrease train times by increasing rail curve radii in order to increase speed on the north coast rail line from Newcastle to Brisbane. The project included a large number of selected sites within this length of rail slewing from 1 to more than 5 curves per site.

The Challenge

The client requested benching/terracing to be modelled in 12d Model for accurate volumes, and construction setout as the rail embankment needed to be constructed in 600mm layers. They had had problems in the past with this area being overlooked and volumes being inaccurate, so URS needed a very easy to apply, uncomplicated dynamic for design changes, and a non-time-consuming way of doing this as it was required on almost all of the 50+ sites for the project.

Setting up a template that would need to be constantly modified by inserting/omitting strings due to changes in heights of the embankment, and also widths of benching, *etc.*, was not optimal, nor was setting up a decisional template as it would be too full of glitches and hard to modify for specific cases, inaccuracies in the survey, *etc.*

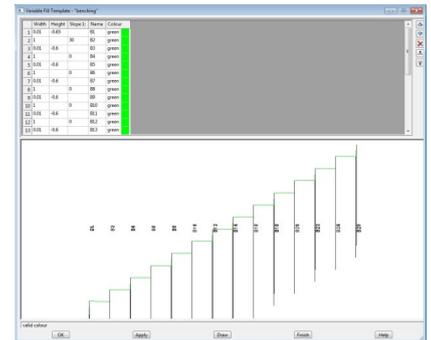
The idea then came to fix the problem by using a variable fill template that would add and omit benching steps as the embankment heights changed, making it dynamic and very easy to work with, plus making it easy to modify benching widths, useful if *e.g.* there were a flat section as part of the embankment.

The Solution

1. A Dummy embankment foundation function was created to be the base of embankment works. This was

hinged off the proposed toe of the embankment and offset due to topsoil removal. A tin was then created from this.

2. A template with the benching/terracing strings placed all within the 'fill' section of the template was created. The template could contain 50+ strings to allow for embankments of any size.



Result

This very simple but effective solution was used in over 50 sites on the project, and worked very well. It is a great example of 12d Modellers 'thinking outside the box'.

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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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.

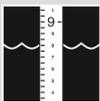
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



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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