

# Southern Land Works Remotely to Deliver Land Development Projects

*Southern Land Development Consultants is a team of land development and subdivision consultants with offices in Auckland, Wanaka, and Queenstown (New Zealand). This case study of their work on the Clearview Wanaka project demonstrates how such teams can work from anywhere in the world to deliver land development projects from end-to-end using 12d software.*

## Project Summary



***Aerial photo – Clearview Wanaka***

Clearview Wanaka involved 119 residential lots and around 40,000 cubes of earthworks – a large undertaking for Grant Wandel and his team.

## The Challenges

The team had to do ‘a bit of everything’ on this job – drainage, sewage, stormwater, service reticulation, earthworks, tricky site management controls, etc.

Southern Land was responsible for:

- Lot Layout/Scheme Plan Design
- Civil Design Package
- Contract Administration
- Environmental Management

- Construction Observation
- Set-out/as-built survey
- Land transfer survey.

One of the interesting challenges specific to this site was that with the view being so beautiful, and the team needed to find a way to show prospective purchasers the aspects they were going to see from their lots.

## The Solutions

### **Working Remotely**

The 12d Synergy Sync Tool was used to manage all 12d Customisations throughout their offices by pushing out all nodes files, User Library files, feature code libraries, updates, *etc.* to any of their 12d users' local hard drives, from anywhere in the world.

Working remotely became especially important to Grant during this project. He actually did most of the earthworks and civil design from an apartment in Slovakia! This incredible freedom to be able to travel when necessary, but be able to continue working, was a real game-changer. Then, once the pandemic hit, needing to work remotely became vital for their other staff as well. The flexibility offered by 12d Synergy with 12d Model has revolutionised the way they work.

### **Automation All the Way**

Southern Land has been developing their 12d Synergy workflows over the past few years. Their data gets pushed into 12d Synergy as Attributes, which are used all the way down to plotting and drafting, as well as for reporting. Their documents and templates come out of 12d Synergy, automatically saving an incredible amount of time. This project had up to 80,000 file changes and so certainly needed to be properly tracked! 12d Synergy also proved to be invaluable for sharing out 12d Model projects.

12d Model's dynamic design capabilities have been vital to Southern Land on this project. Grant spoke of 12d Model helping the team to be adaptable to the changes that inevitably happen throughout a project, and because they've been able to automate so many of their systems, not let drafting time impact this.

### **12d 'From Go to Whoa'**

Southern Land produced the full civil design for the project within 12d Model , including scheme plans, road and earthworks design, drainage, dynamic stormwater modelling, and Multi-Page Plots.

Using 12d Model, Southern Land created superTINs from topographic surveys (from a variety of sources), UAV Imagery, and LiDAR Point Cloud Data from their local Authority.

The team utilised many other tools within 12d Model for design and surveying including the 3D Viewer, lot labelling in Estate Lots, CAD Tables (very useful for being able to update something within a CSV file and then recalculate that CSV file in a table on the Plan face), and Chains to automate drafting as much as possible.

## Earthworks and Roads



### *Earthworks from the project*

Southern Land's use of 12d Model's Super Alignment Computators meant their alignments were 'talking to each other' – that is, if they adjusted one alignment, the elevations would all change around. This was another huge time-saver for them.

Grant has three MTF Snippets that he has customised from what comes 'out of the box' (with a few edits for their local Authority), to help the team assemble road designs very quickly.

The Pavement Manager tool in 12d Model also proved very useful. It creates trimeshes so Visualisation works automatically, and the trimeshes were used to run quantities for scheduling.

Chains were employed again, for roading and earthworks design, and for generating plots. This continued automation of drafting meant that Grant could apply Attributes

within Snippets to automate the drafting of any changes he made (change of kerb type, automatic label, label map file, labels at kerb type, etc.).

Once all these systems were up and running, when a change was made, not much else had to be done except running the Chains. This saved a great deal of time.

## **Visualisation**

With the Trimeshes (straight out of Pavement Manager), Southern Land could perform all their drainage modelling through the Drainage Network Editor, with no extra effort required to get their Building Platform Visualisation up and running and have things looking great.

As mentioned above (and shown below), the view on this project was amazing, and the team needed to show each prospective purchaser what aspect they were going to see from their lot. By exporting KML to Google Earth, prospects could pan around in Google Earth and easily see the views from their lots. Most of this was automated, so Southern Land did not have to spend a lot of time to get something that looked fantastic.



***The view over Lake Wanaka***

Clash Detection and Augmented Reality were also very useful – Southern Land tested this with roading Trimeshes and drainage networks, and were able to see clashes underground before putting the pipes in the ground.

## Drainage

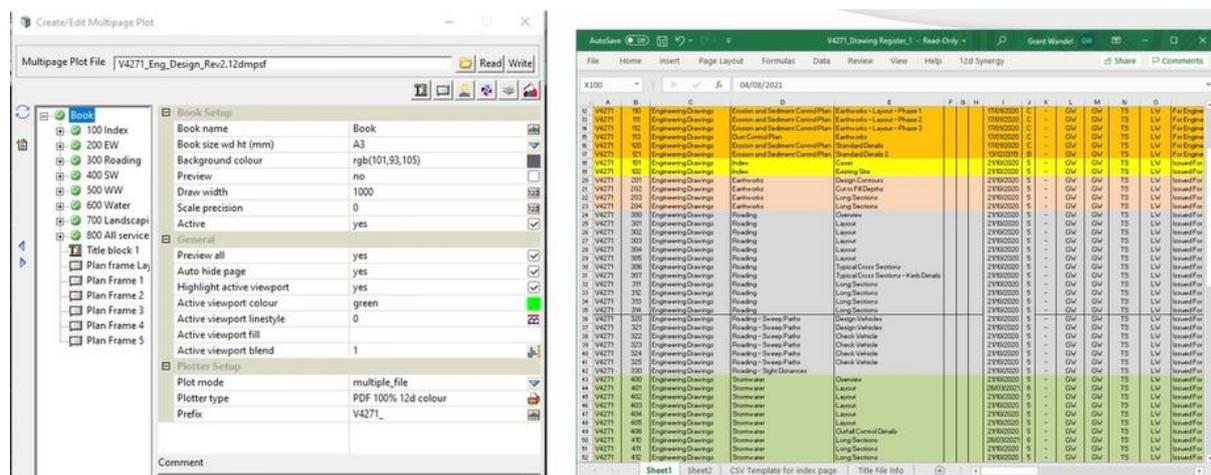
12d Model's Drainage tools are incredibly powerful. The Southern Land team first used the Rational Method for all their pipe sizing. On this project, there was a centralised stormwater attenuation system, and Dynamic Analysis was run against this.

Grant found that it was very efficient to have all these features in one software package – they could do all their drafting, update a road or surface and rerun dynamic calculations to compute invert level changes, tweak orifices and weir elevations, check heights needed for an overflow, and much more. Being able to tweak the model without using any other software really sped up the process in this stage of detailed design.

The team also used RoadFlow 2D to perform overland flood analysis and automated calculations and graphs for reporting, and again relied heavily upon 12d Model's capabilities for automated drafting to assist with their drainage design.

## Multi-Page Plots

The next step was to bring all this together onto a Plan face. What the contractor and the Council were going to see was all dependent on plotting. The solution was 12d Model's Multi-Page Plots.



The team found View Favourites particularly useful when it came to plotting. In addition, they again utilised 12d Model's automated drafting tools for dynamic dimensioning, dynamic leaders, string attribute labels, etc. They also found the Drawing Register vital for keeping track of where revisions were in the project.

For this project, they had 57 sheets in their final 'Issue For Construction' set, so the ability of 12d Model's Multi-Page Plots to plot by chapter or even individual page, instead of having to go through the whole sheet, was another massive time-saver. 'Combine PDF Files' was invaluable for updating single sheets in an existing set.

## Construction Preparation, Machine Control and QA

Quantity calculations were automated, as was scheduling. 12d Model also produced all of Southern Land's Machine Control Files and survey setout data.

A great deal of Quality Assurance (QA) had to be performed throughout the project, and 12d Model assisted with this. For their MDM compaction tests, they were able to convert to CSV in 12d Synergy, then read this straight into 12d Model through Attributes.

## As-Built Data

Southern Land's local Authority no longer takes AutoCAD files, but instead uses GIS data or 12dXML. The team used 12d Model's Attribute Manipulator to convert the as-built survey data into the attribute format required by the Authority, and then wrote out a 12dXML file.

They were able to do a lot of the Attribute mapping from their already QAd data they had checked throughout the project. Not having to recreate this data in any way saved a lot of time.

## Land Transfer Survey

Southern Land performed all their land transfer surveys in 12d Model. Their Land Transfer Data Preparation was all produced in 12d Model's Traverse Spreadsheets and uploaded to LINZ. Being able to do all the prep in 12d Model was particularly useful for checking the cadastral surveyor's pre-calculations in advance, and shared models were used across the design project to see where pegs would land, in order to work out any potential clashes during construction.



## Document Control and Remote Data Access

The other questions that arose on this project were how to deliver this volume of data to the right people, and how to keep track of it. For Southern Land, the answer to all this was simple... 12d Synergy.

For project delivery, the Issue Files functionality was very useful as it is great for large document transfers, and automatically keeps track of document control through Document Transmittals. Issuing file sets really helped the process when the team had multiple projects running and were trying to remember which data had gone out. It became so easy to check.

Using 12d Synergy's templates with pre-populated attributes and having a single point of entry drastically reduced administration time, especially in the cases of inspection reports and completion certificates. All the data came out of the Attributes from within 12d Synergy.

## The Results

As a civil designer for this project, Grant was incredibly happy with the way 12d Model and 12d Synergy worked seamlessly together – the team could automate everything, make it adaptable, and limit the time spent drafting.

This project was mostly completed during a six-week lockdown and an eight-week trip to Europe. Being able to work from anywhere created flexibility that would have been beyond imagination just a few years ago.

*To learn more about working remotely with 12d products, and much more, register for the On-Demand 12d Tech Forum 2021 at <https://12dtechforum.com/>.*