Aptella ACADEMY

Pocket 3D Instruction Guide

MC-Mobile

SOFTWARE VERSION: 15

SOLUTION READY

Advise | Enable | Support

Foreword

This course is designed to fulfil the needs of users from the surveying, mining and civil industry and has been produced by Aptella. Its contents are informed by many decades of experience in surveying, civil engineering, and related applications, coupled with technical expertise from manufacturer-trained employees. In addition, we acknowledge the input from our customers and former students by assisting us with feedback on the contents of this course.

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Aptella Technical Support

QR Code for Online Resources (Quick Guides, Videos, Manuals)

Technical Support Contact Details

This number will connect you to the closest branch for Technical Support.

National Support Number 1800 898 422

If you are unable to reach our regional support teams, please leave a voicemail so a support ticket is generated in our system. Our support team will get back to you as soon as possible to help with your inquiry.

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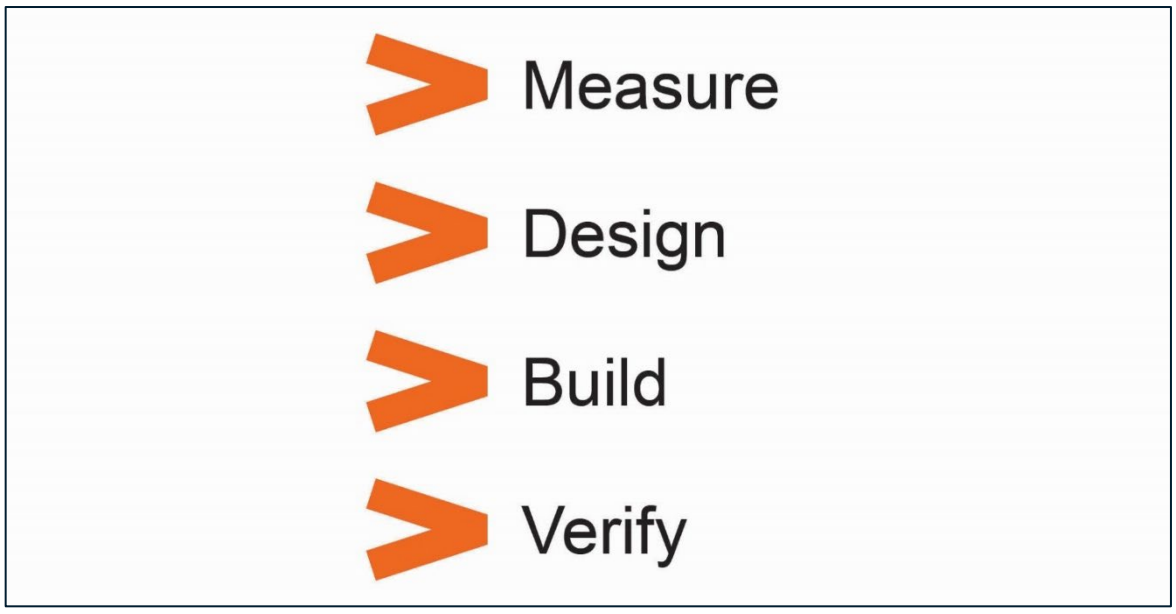


Overview

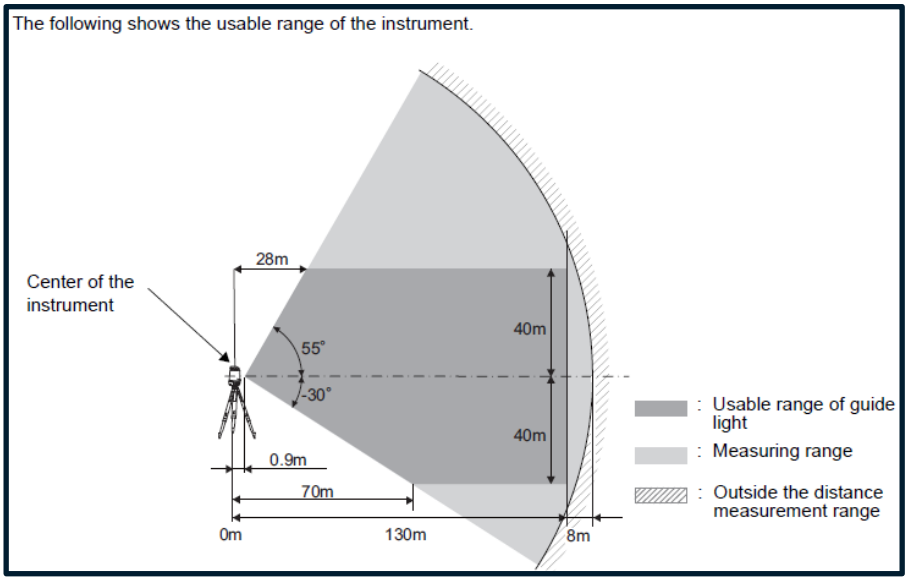
Equipment

General Care of Equipment

- Never place the instrument directly on the ground. Sand or dust may cause damage to the levelling mechanism, screw holes, optics, etc.
- Protect the instrument from heavy shocks or vibration.
- Protect Total Stations/Layout Navigators from wet weather.
- Never carry an instrument on the tripod to another site.
- Turn off power before removing the battery.
- Remove the battery before placing the instrument in the case.
- Make sure that the instrument and protective lining of the carrying case are dry before closing the case. The case is hermetically sealed and if moisture is trapped inside, this may lead to damage to the instrument.
- Always transport the instrument in the carrying case.
- Refer to your instrument manual for specific care instructions.

Layout Navigator LN-150

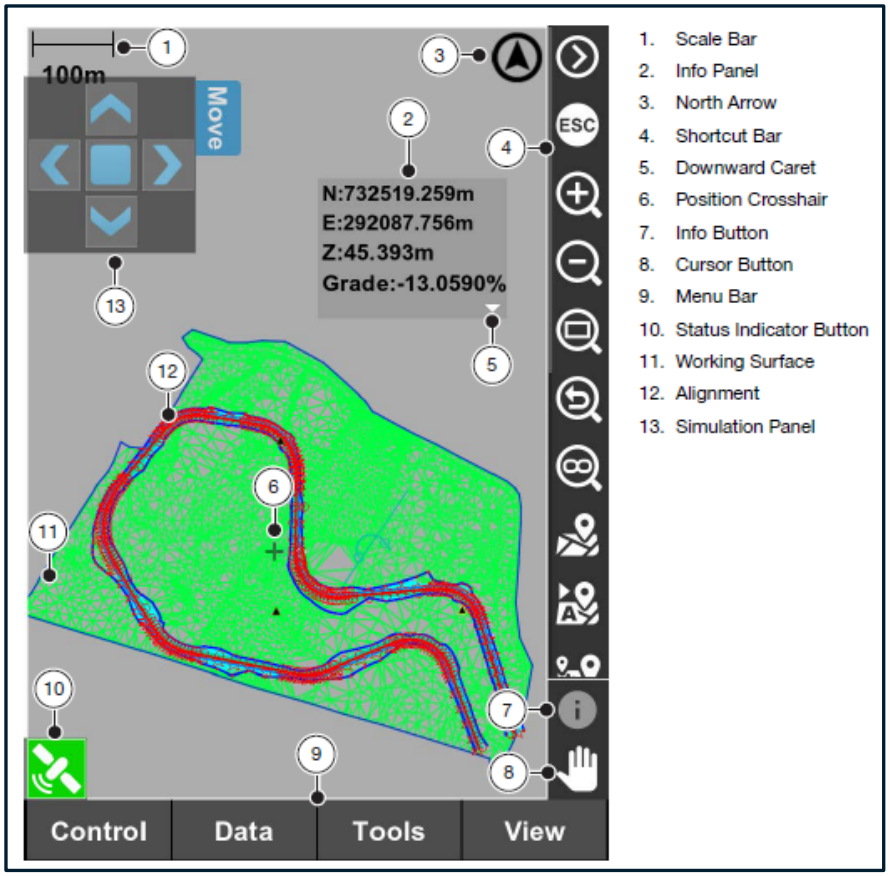
- It is recommended that the LN-150 is serviced & calibrated every 6 months. The next calibration date is shown on the calibration label affixed to the instrument.
- Charging Time: Approximately 8 hours when 2 batteries are charged at the same time.
- Operational Time: Approximately 5 hours
- Measuring Range: 130 metres



Overview of Display Interface

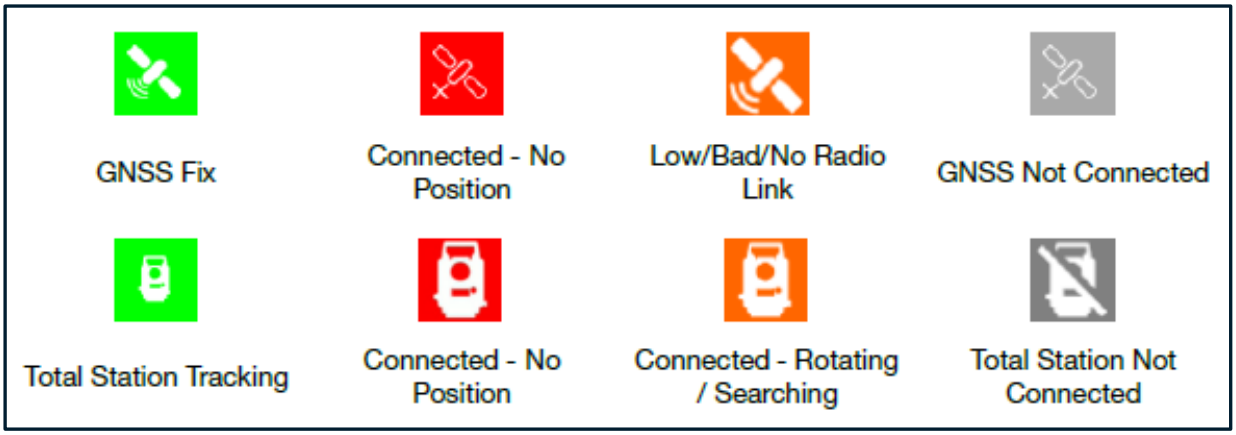
Display Interface

This section provides an overview of the Pocket 3D user Interface.



Status Indicator Button

The Status Indicator displays the status of the instrument.



Main Menus and Shortcuts

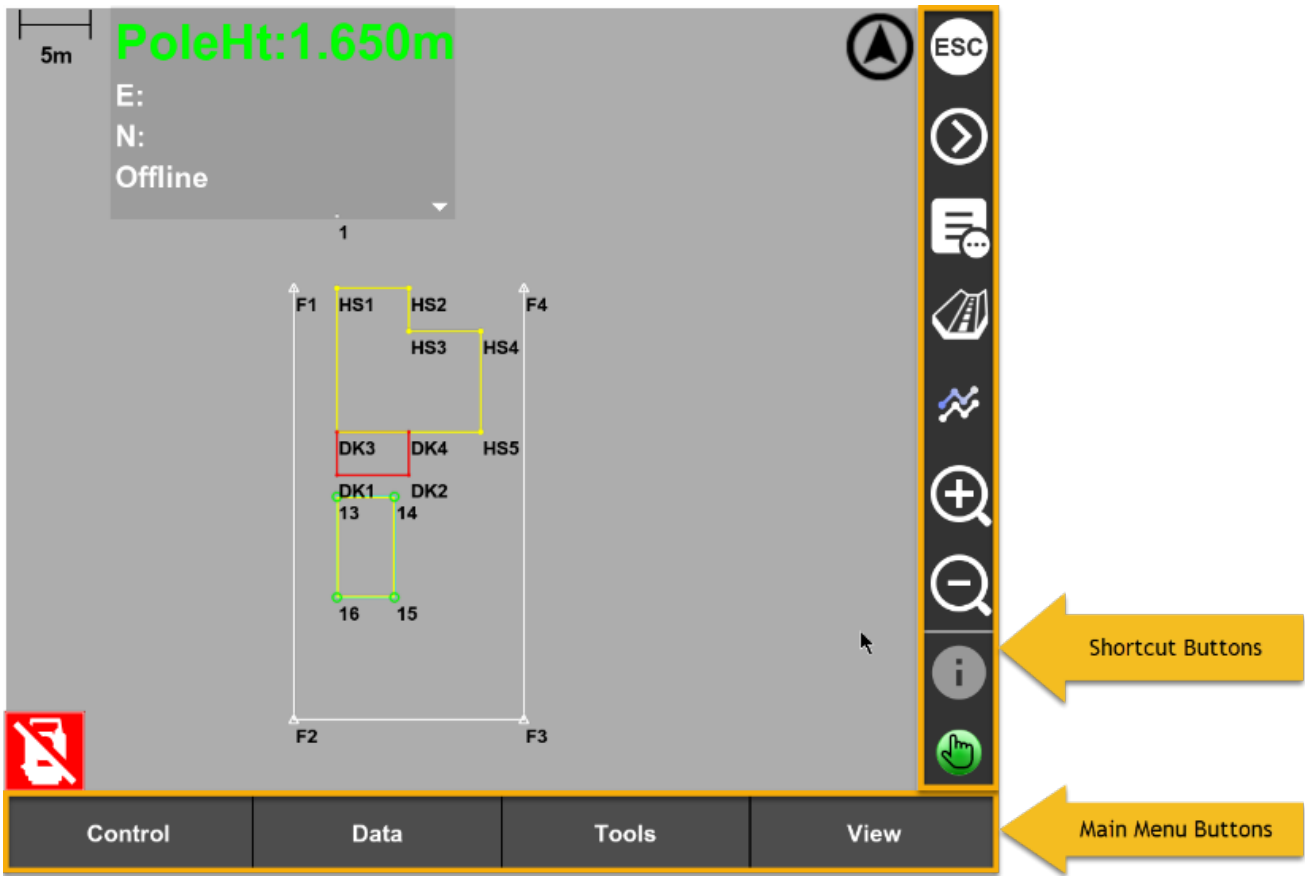
Main Menu Buttons

In the **Control** menu you can create, edit, copy, and delete machine setup files. Set up instruments, change pole height.

In the **Data** menu you can manage and create site data, create and edit layers, select or de-select active surfaces or alignments and use the Calc Wizard.

In the **Tools** menu you can create quick codes, perform pick-up or set-out and configure cut sheets.

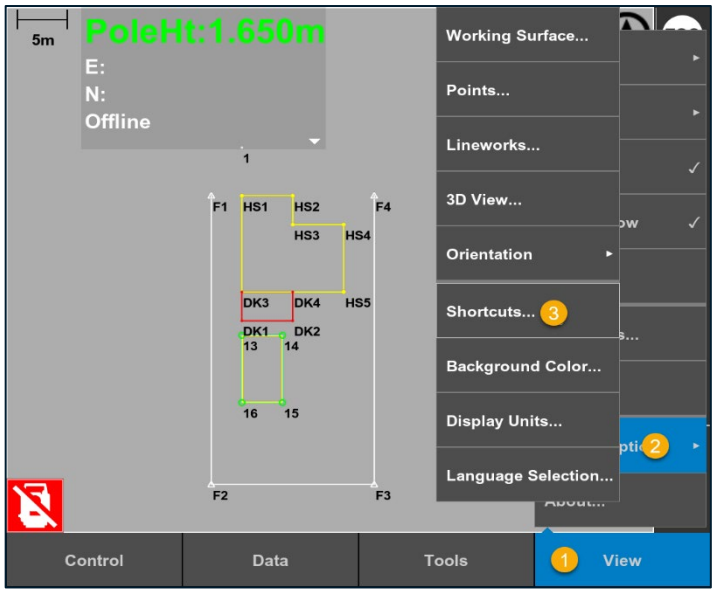
In the **View** menu you can adjust your main screen view layout, select display options for surfaces and points, change how the machine image appears in the main screen, and add/remove shortcut buttons.

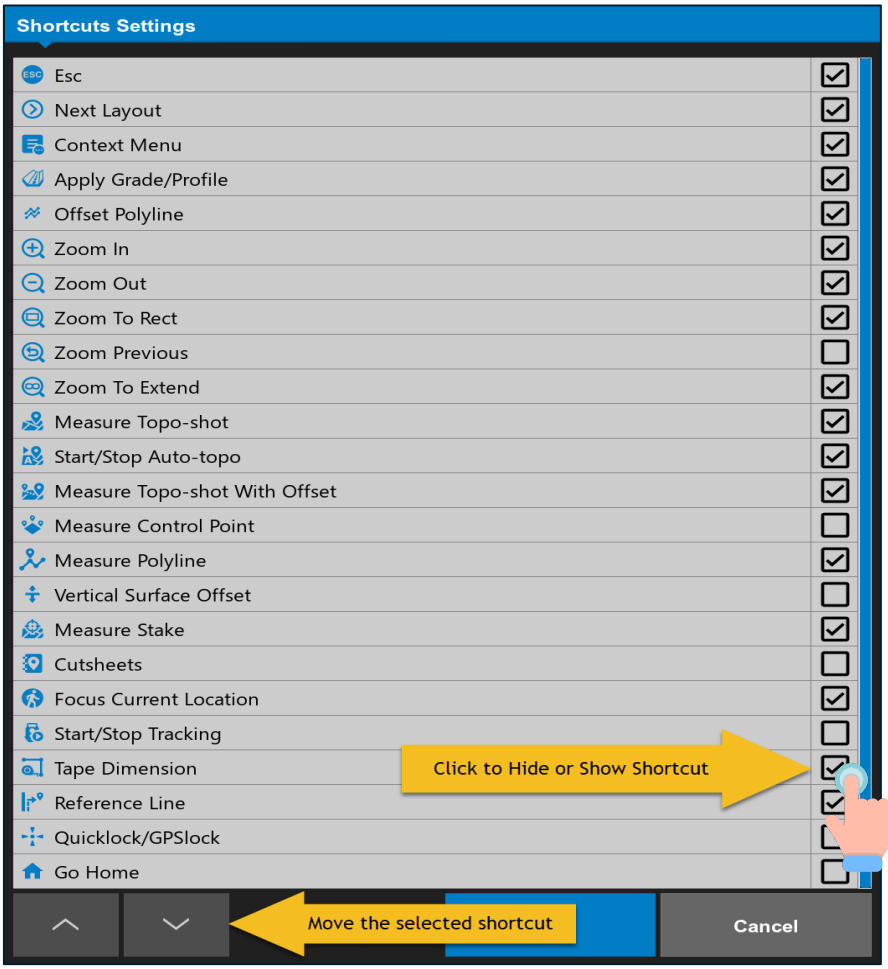


Shortcut Options & Customisation in Pocket 3D

Shortcuts occupy the right-hand side of the screen. Users now have the ability to toggle shortcuts on/off and order them as desired (the most commonly used shortcuts should be at the top).

Select **View** from the **Main Menu,** then tap on **Display Options** to access the **Shortcuts** button.



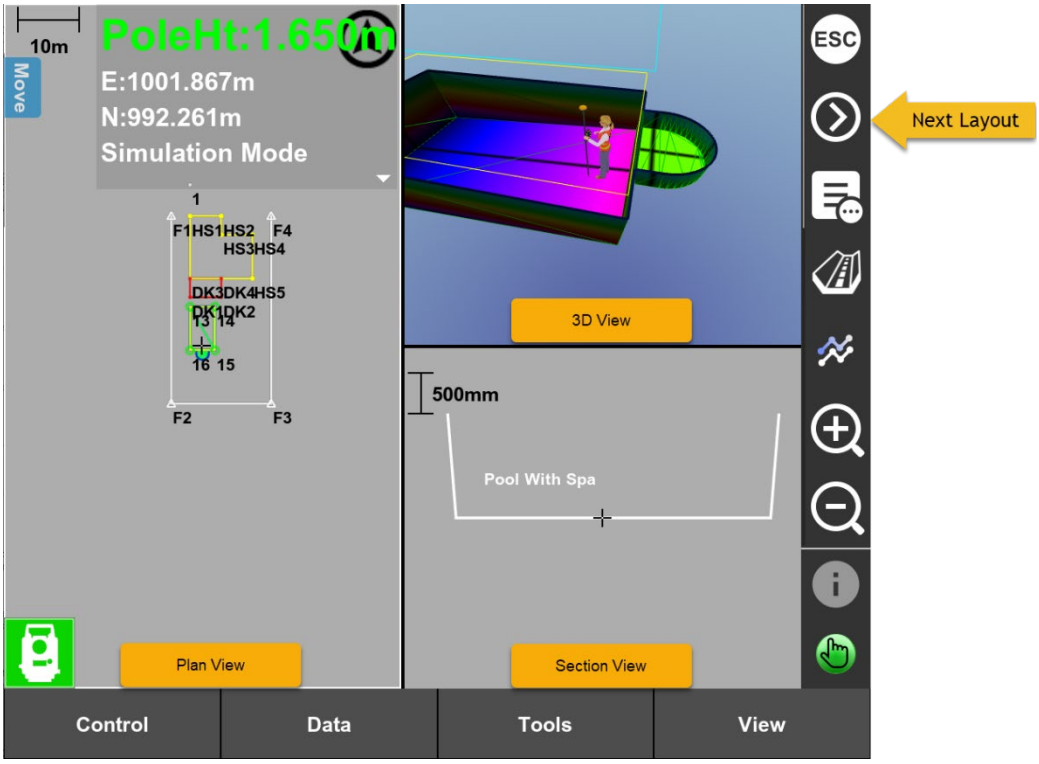


View & Display Functions

Changing Screen Layout Display

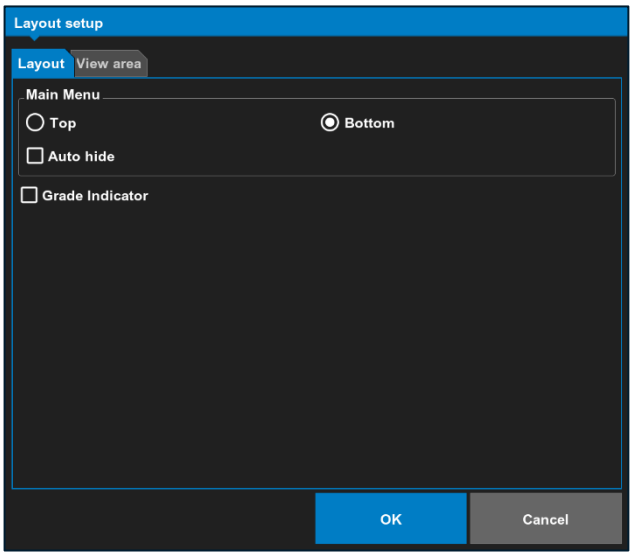
The main screen can be set to different layout configurations to suit the needs of the user.

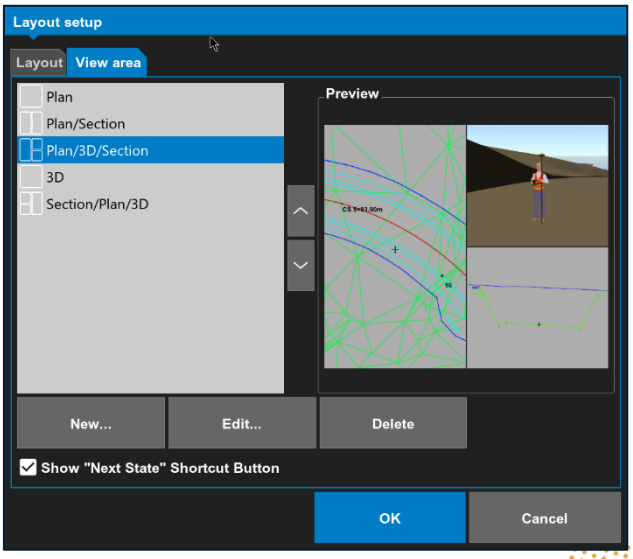
Use the **Next Layout** shortcut to cycle through the different layout configurations.



Configuring the Layout

1. Click **View**
2. Click **Layout**



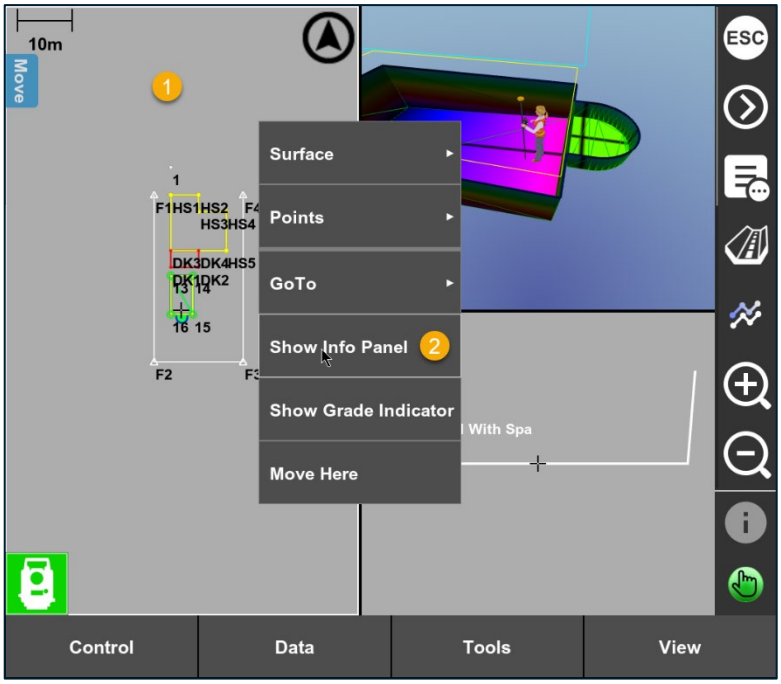


Adding and Changing Display Text

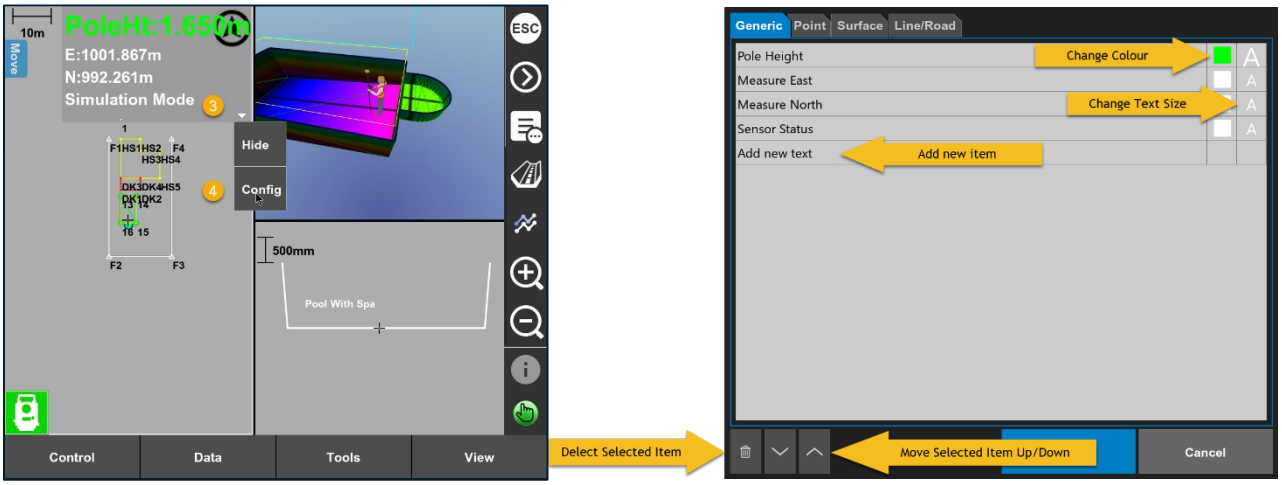
The **Display Text** feature can be used to indicate some additional information to the operator.

To add a new line of text to the display:

1. Select and hold anywhere on the main screen. The **Context Pop-up Menu** appears.
2. Select **Show Info Panel.**



3. Tap the **down arrow.**
4. Tap **Config.**

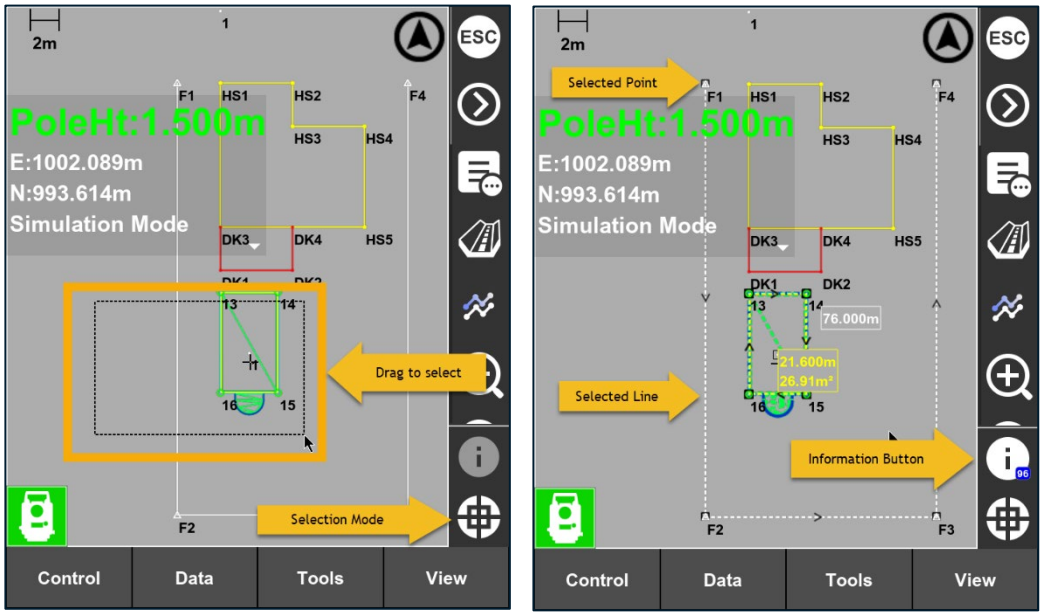


Selection Tools

Drag Selection

Press and hold the screen and drag a box around the area of data you want to select. Selected lines will display as a dashed line, Selected points will have a square box on them.

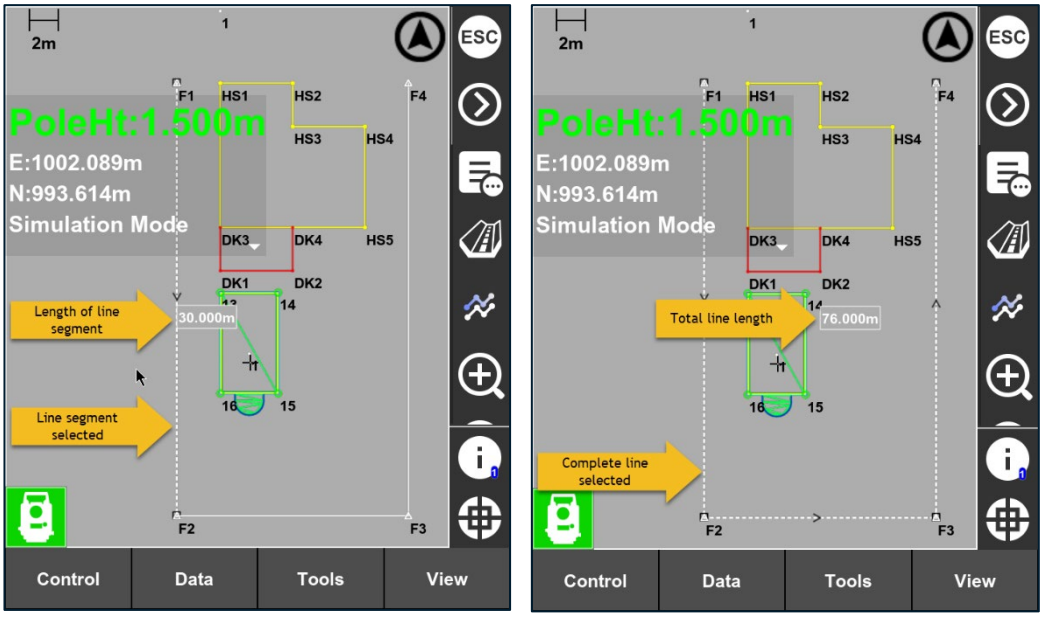
This will also show the length and area of lines selected. The information button will display the number of items selected.



Click Selection

Points: Tap once to select a point then tap once again to deselect.

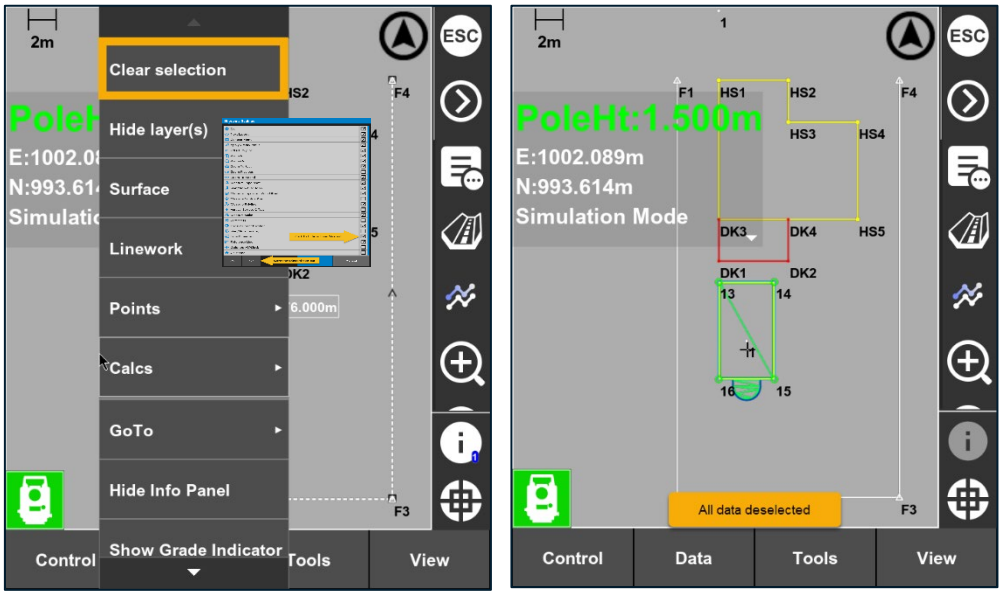
Lines: Tap once to select the line segment. Tap once again to select the complete line then tap once again to deselect the line.



Clear Selection

The **Clear Selection** function allows you to deselect all the selected data at once.

Press and hold the screen then tap **Clear Selection.**

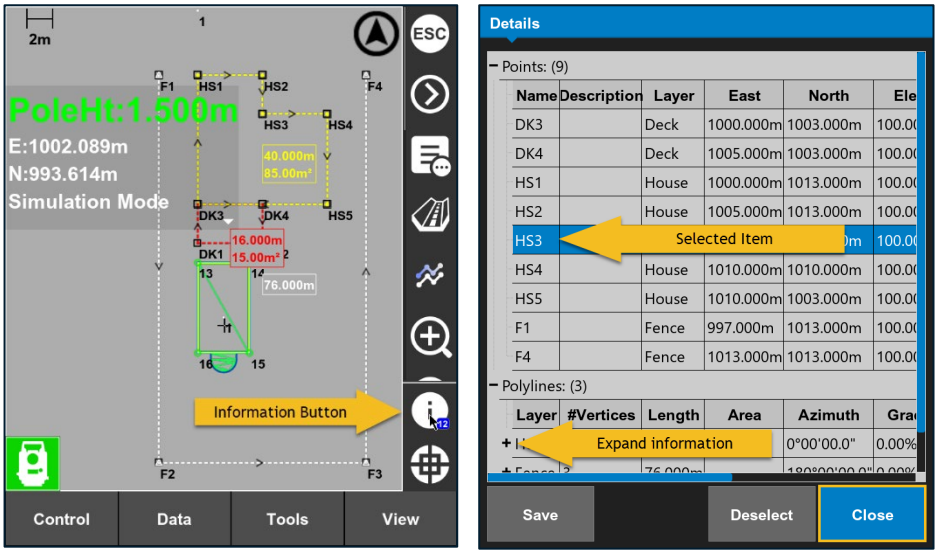


Information Button

The information button shows the number of items selected and allows you to view details on the data selected. The information button also allows you to deselect individual items of data. This is useful when data is very close together, For Example when there are two lines in the same location at different elevations.

Data items may have a "**+**" symbol next to them. Tap the **+** to expand and view more information on this item.

- To view information on the selected data. Tap the **Information Button.**
- To deselect an item of data. Select the item then tap **Deselect.**

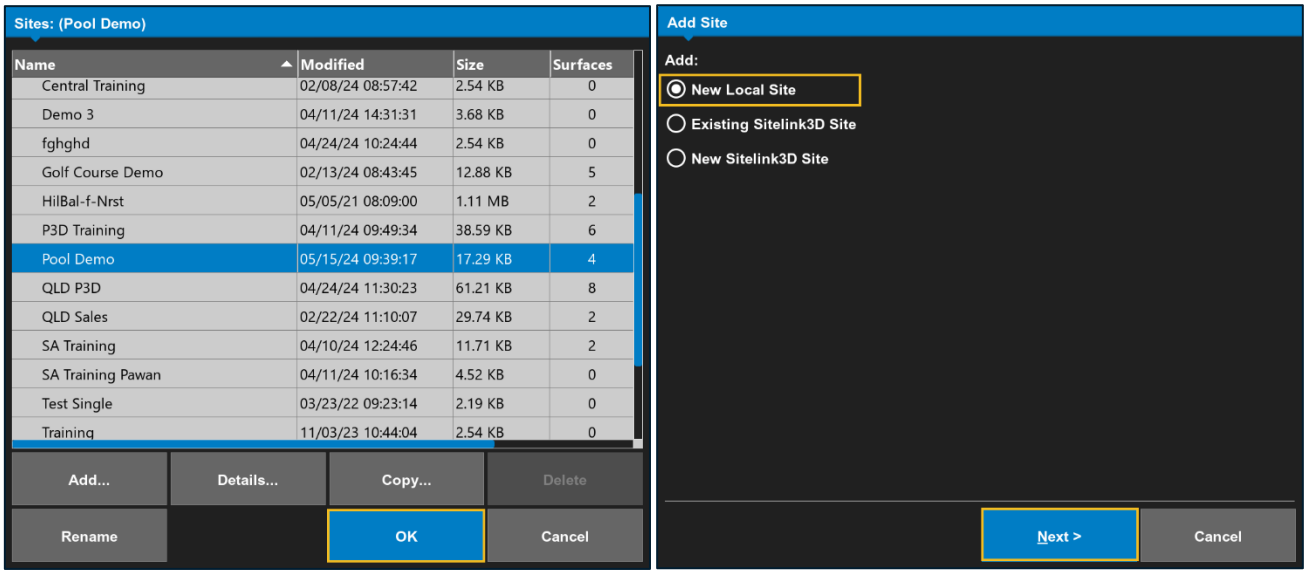


MEASURE

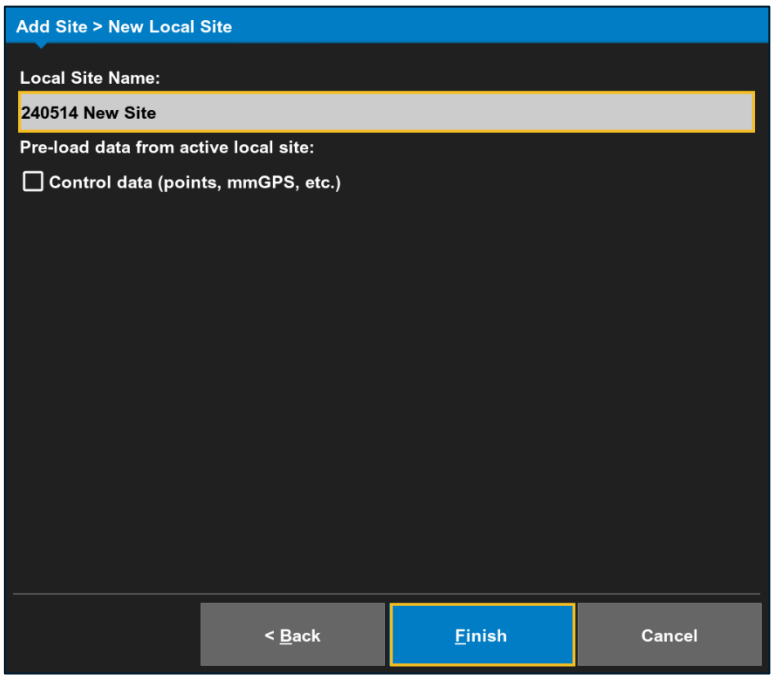
Loading, Selecting & Creating a Site

Creating A Site

To create a new Site, go to the **Data** menu and tap **Add.** Select **New Local Site** then tap **Next.**



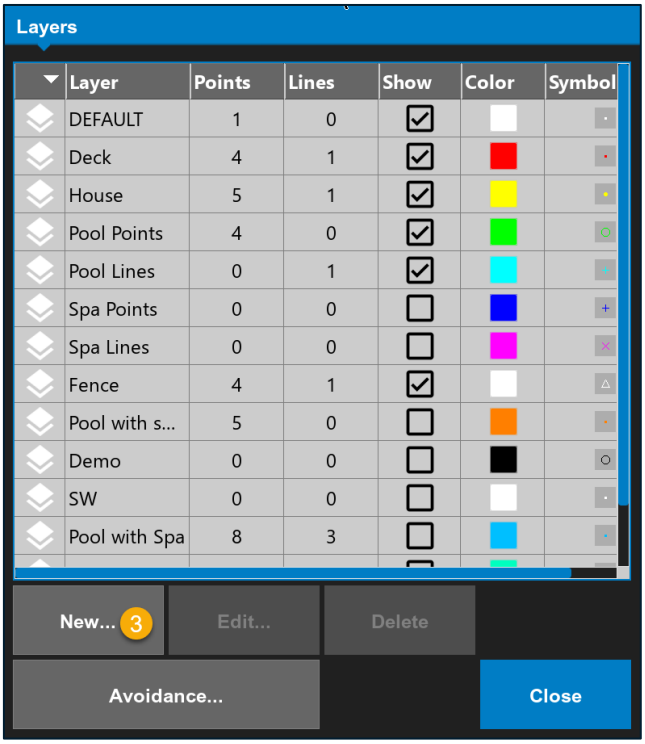
Enter the site name. Starting the site name with the date will make it easier to find previous sites in the future (Year/Month/Day) when saved on USB Drives or Computers.



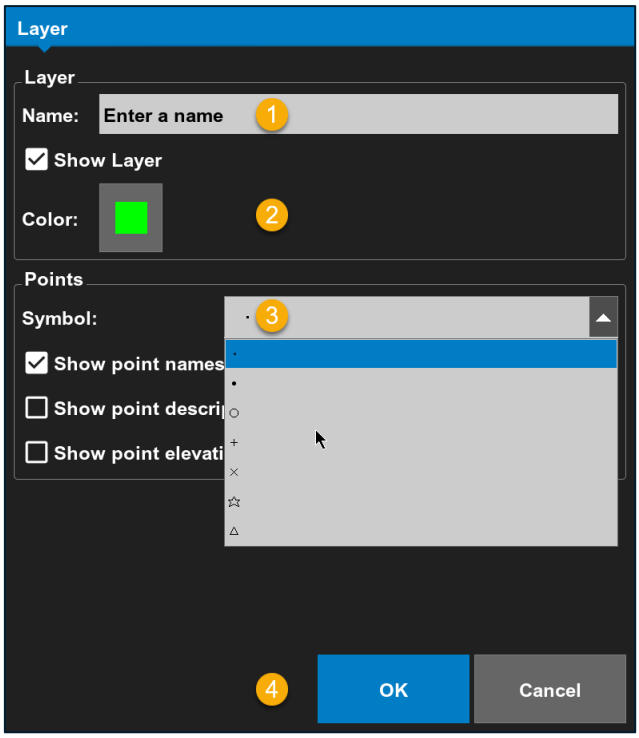
Creating Layers

Layers are used to organise data into different categories, For example : Existing surface, Sewer, Pad. This allows the user to show or hide data to make it easier to view or select specific data.

Tap **Data > Layers > New**



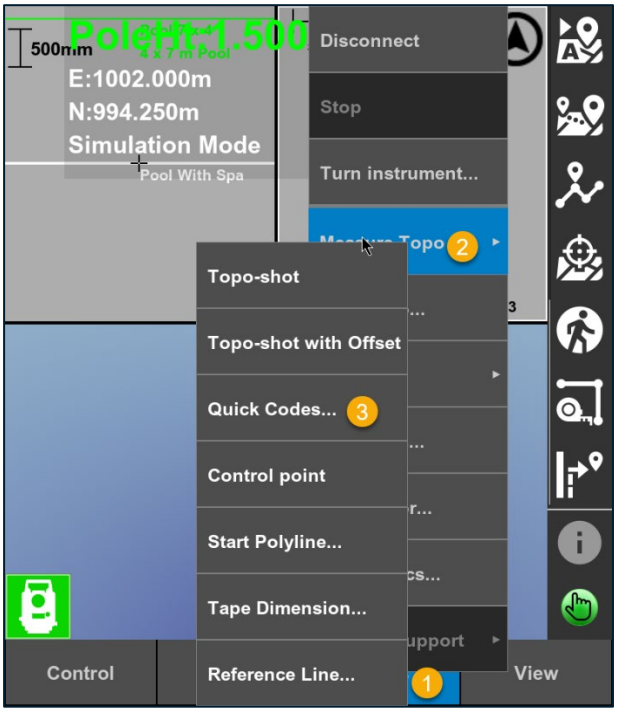
Enter a name for the layer, select a colour and symbol and tap **OK**

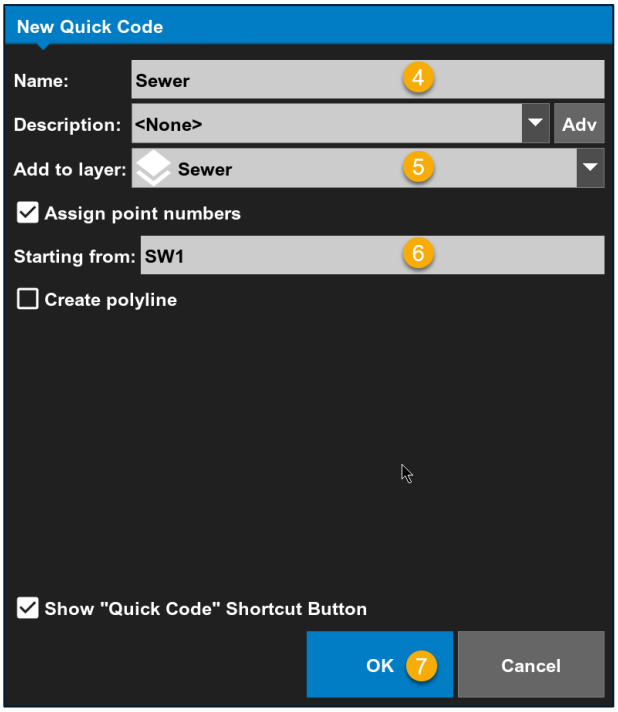


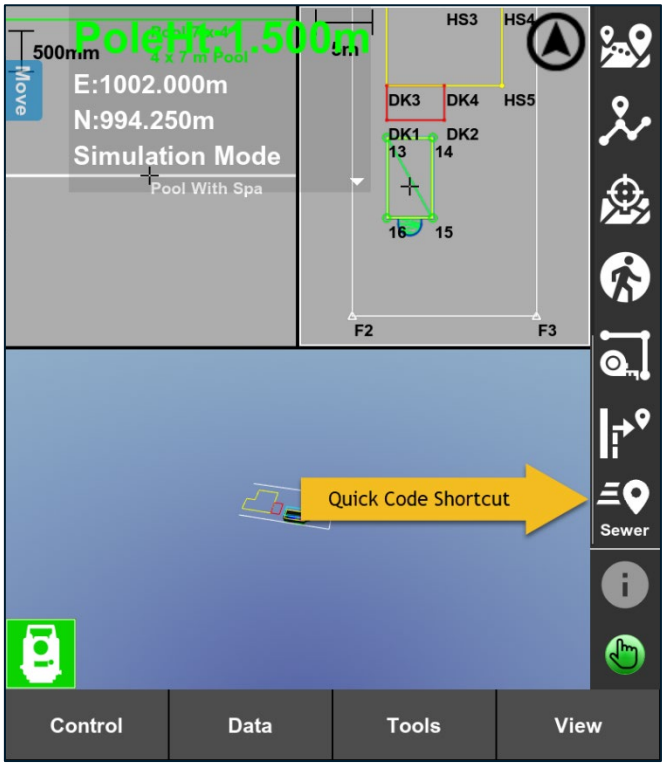
Creating Quick Codes

The Quick Codes function allows you to create shortcuts to take topo-shots quickly with one click. Tap **Tools > Measure Topo > Quick Codes**. Tip : Use short names for the quick codes so they are easily identified in the short cuts.

Enter the **Name** of the Quick Code **>** Select the **Layer** the points/lines will be added to **>** Optionally you can enter what the **Point Numbers** will start with **>** tap **OK**

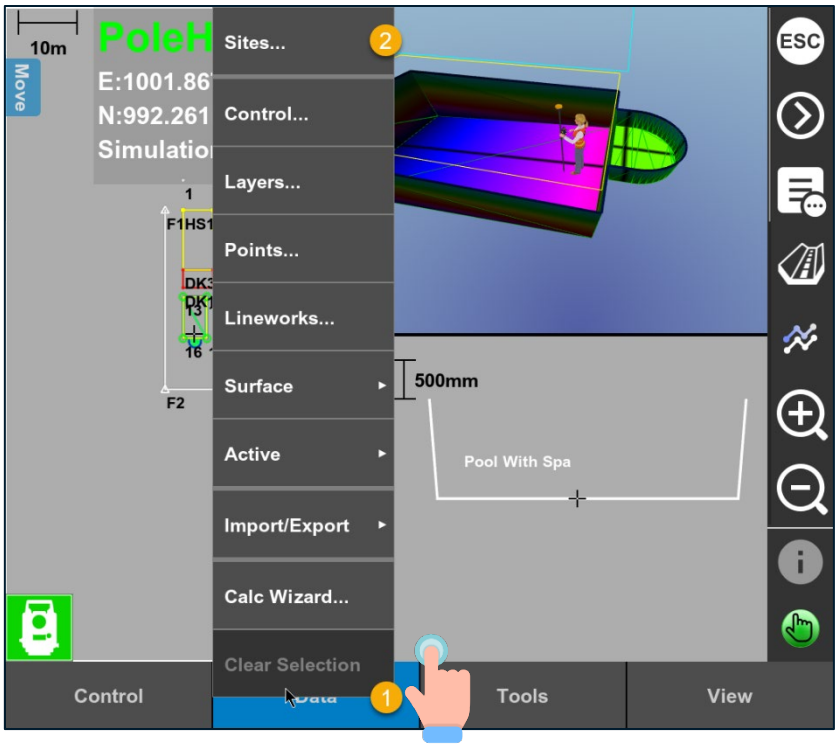




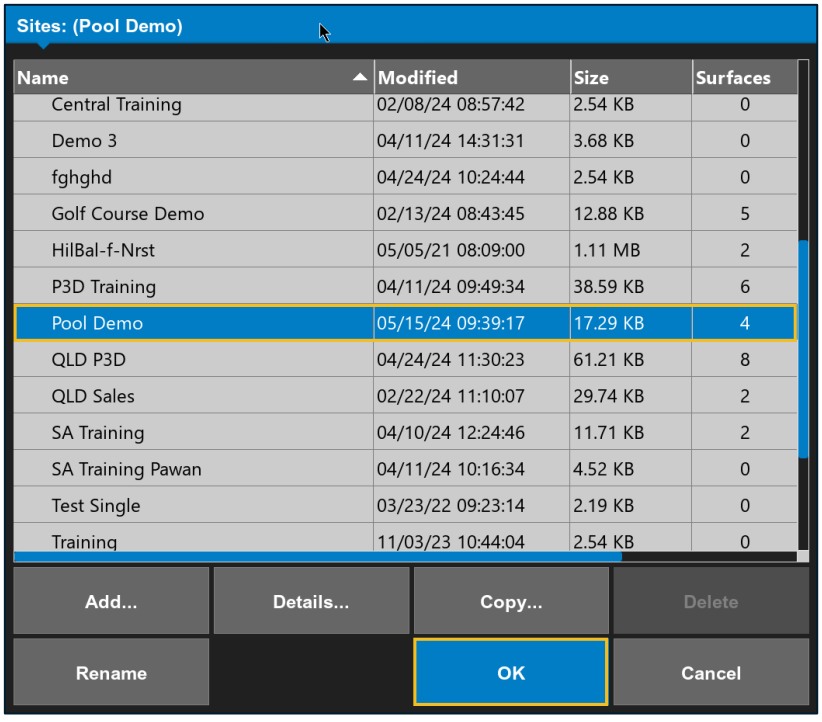


Selecting a Site

Click **Data** then **Sites**.

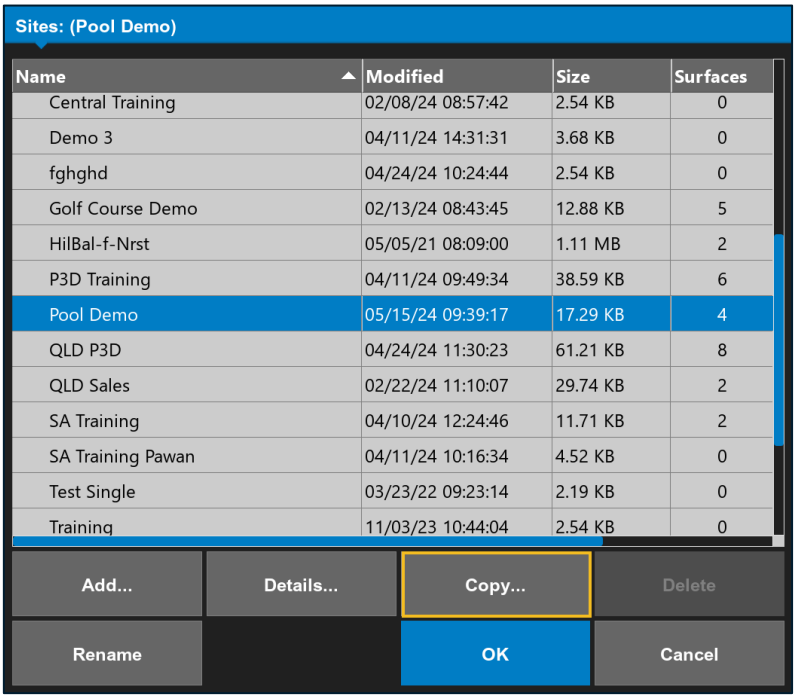


This will open a list view of all the sites on the control box, tap on the required site and press **OK**. The project will load on the screen.

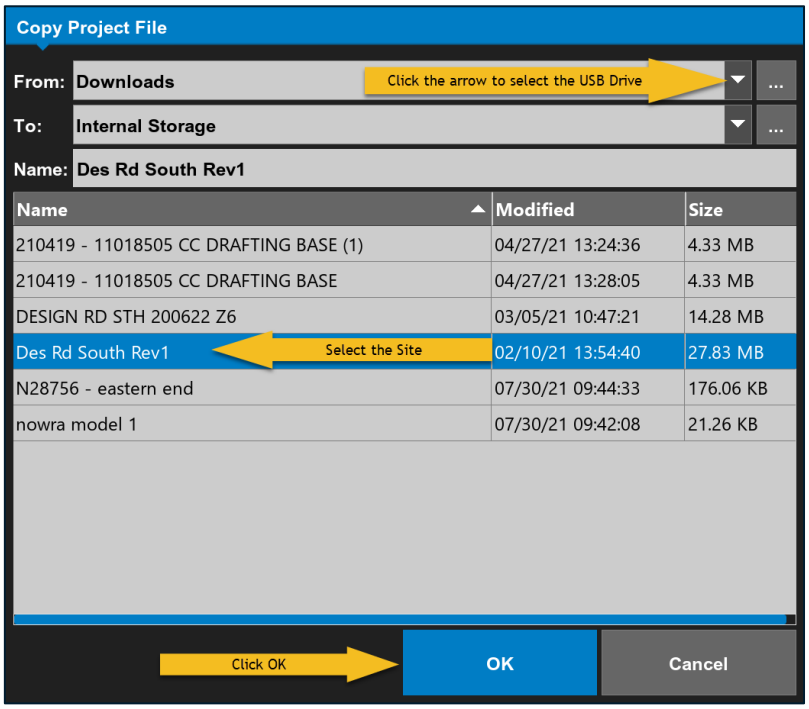


Copying a Site

To copy a site from a USB storage device, insert the USB into the USB port. Go to the **Site Files** and select **Copy.**



Select the pull-down option **From:** and set to **D:/ to 3DMC folder**. This will show a list of project files that are in the root directory of the USB (i.e. not hidden in a folder). Tap on the required site and press **Copy.**



The file will be then listed in the Site Files list to be made active in the software.

Instrument Setup

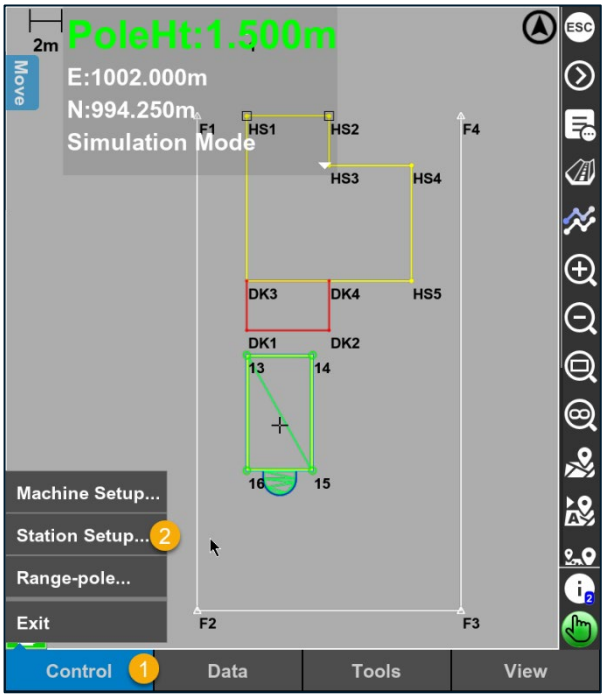
Total Station Setup

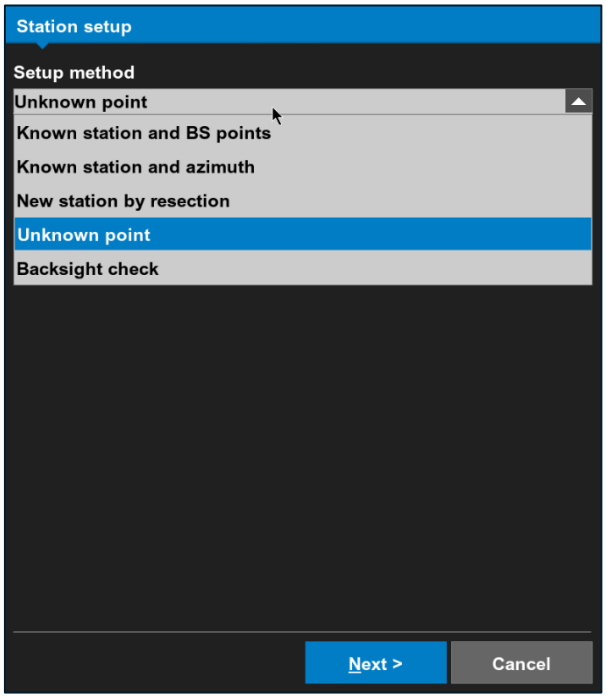
To use a total station for site measurement or stake-out, the position and orientation of the total station must first be set. The **Station Setup** menu allow you to set the position and orientation of a total station in several ways, the two main ways are:

- Unknown Point: This is used for the 1st set up on sites without control/designs to position the instrument.
- New station by resection: This is used on sites with survey control/designs and next day setups to position the instrument.

Total Station Setup : Unknown Point

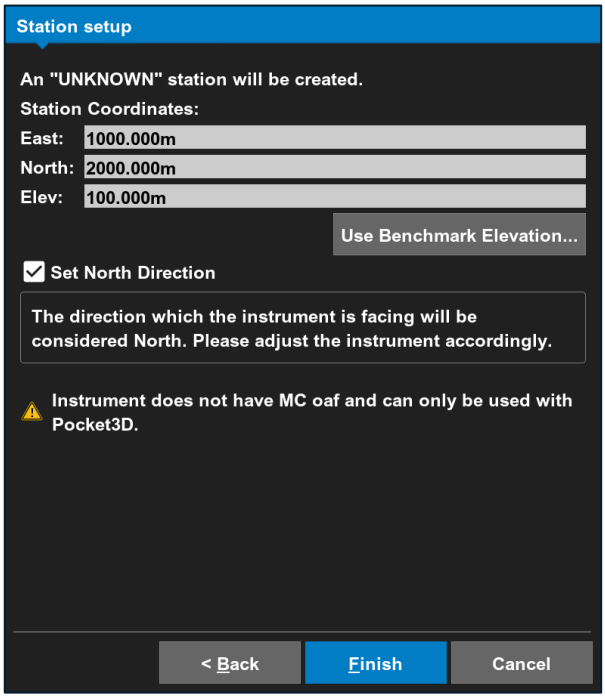
Tap **Control** then **Station Setup** and select setup method **Unknown Point,** tap **Next**





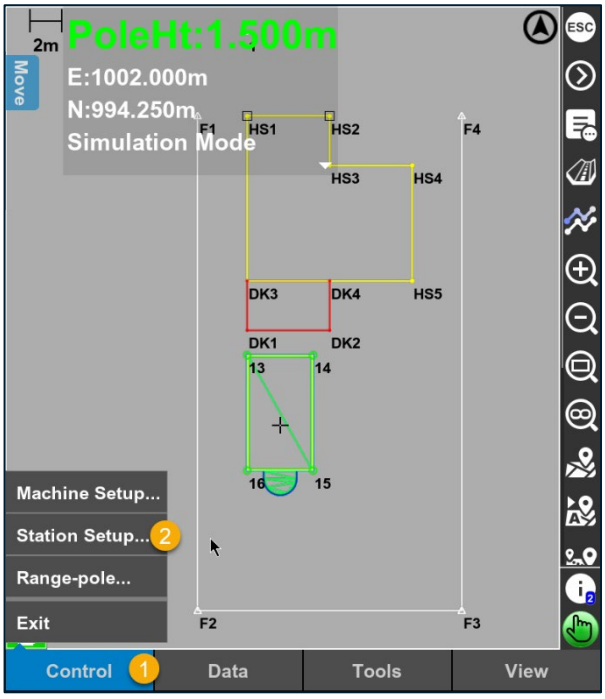
Enter the Station Coordinates.

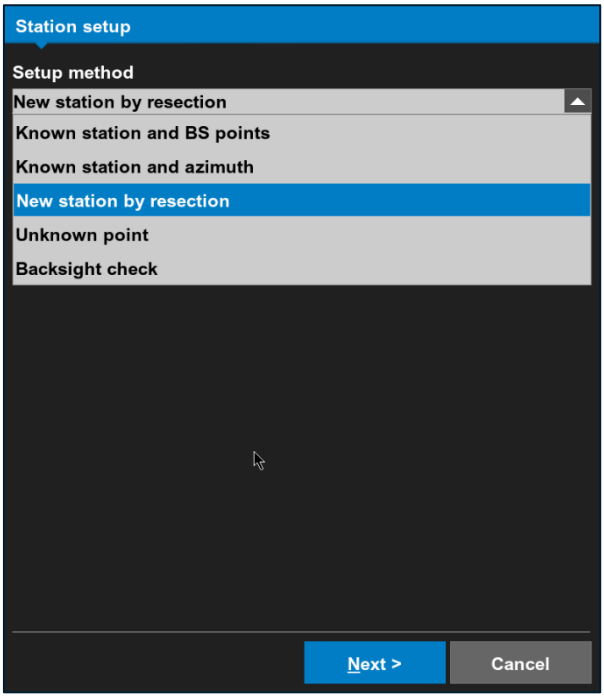
Tip: Using coordinates similar to East 1000, North 2000, Elevation 100, makes it easier to identify direction, errors and is visually easier. Turn the instrument to face along the job to set **North**, this will make it easier to visualize the direction during stake out.



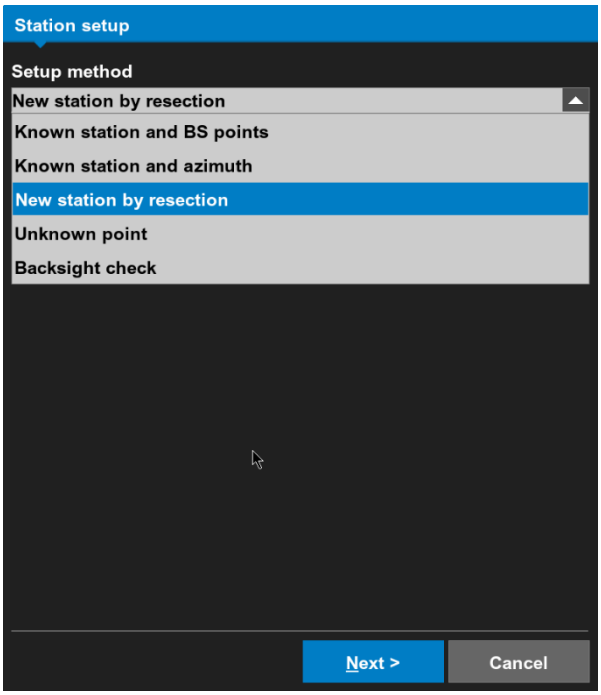
Total Station Setup : Resection

Tap **Control** then **Station Setup** and select setup method **Unknown Point,** tap **Next**

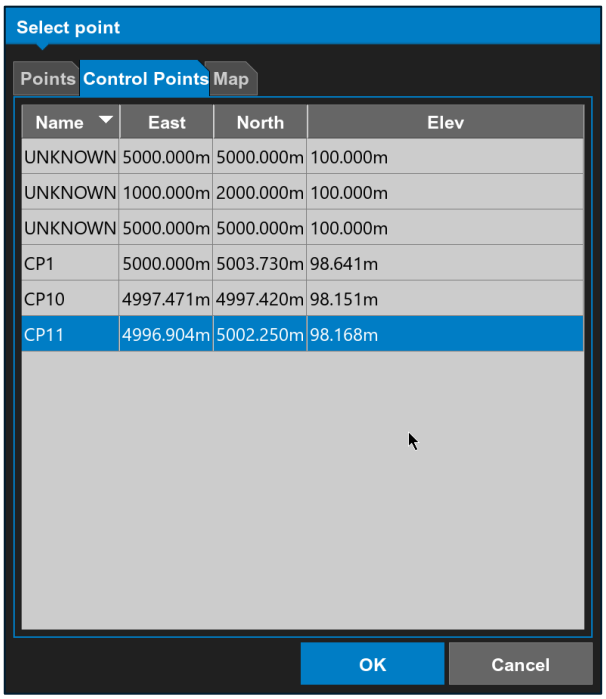




Tap **Next** then **OK.** Tap **Add**

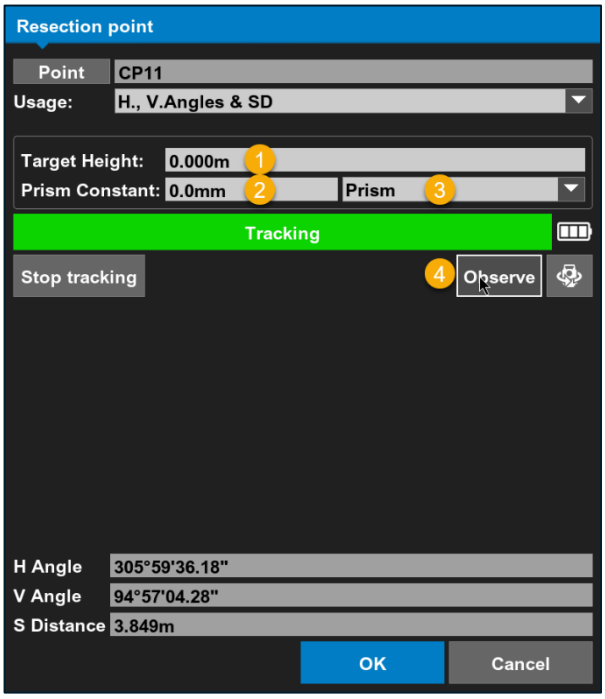


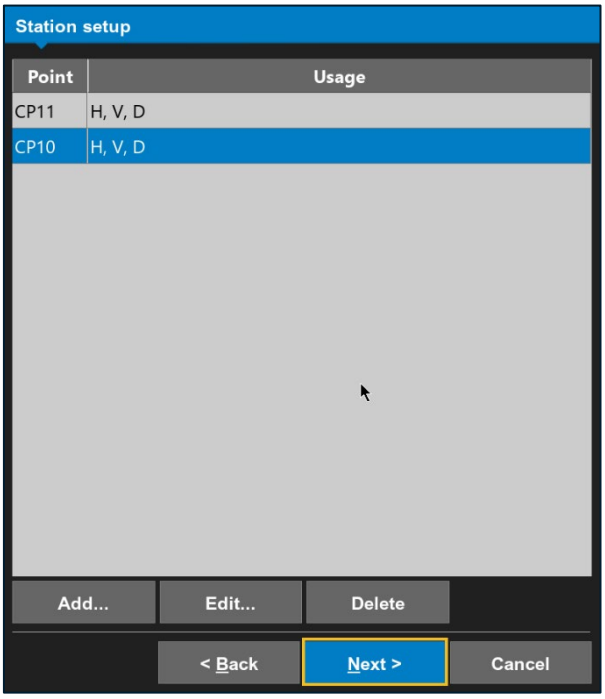
Select the 1st point for the resection. You can select the point from the Point List, Control Point's or through the Map view. If you know the layer or point name you can use the filters to search for the point. Then tap **OK**



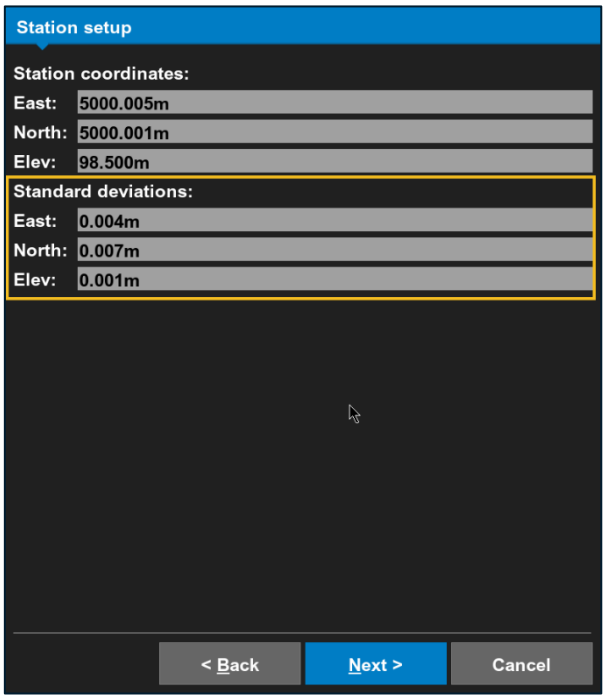
Enter the Target Height (Prism), Prism Constant and select the Prism Type, then tap **Observe.** Check that there is data in the **H Angle, V Angle & S Distance** fields and tap **OK.**

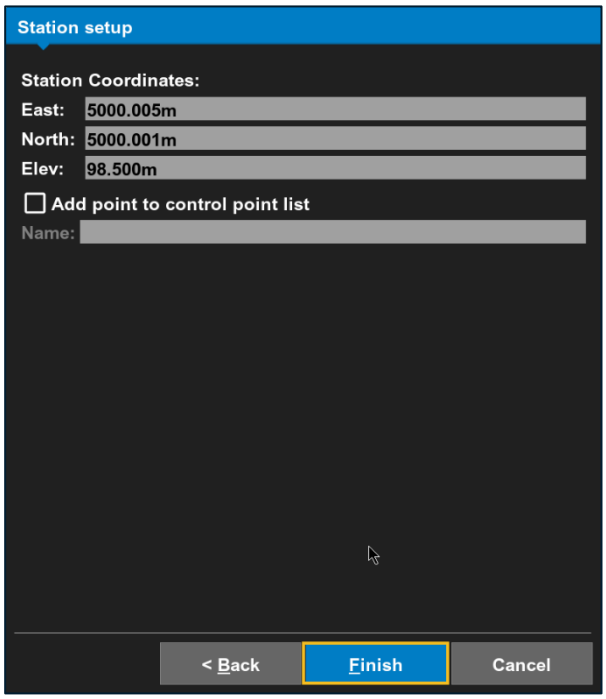
Repeat for all the points being used for the resection then tap **Next.**





Check that that is it an accurate resection and tap **Next.** Then tap **Finish.**





Measure Topo

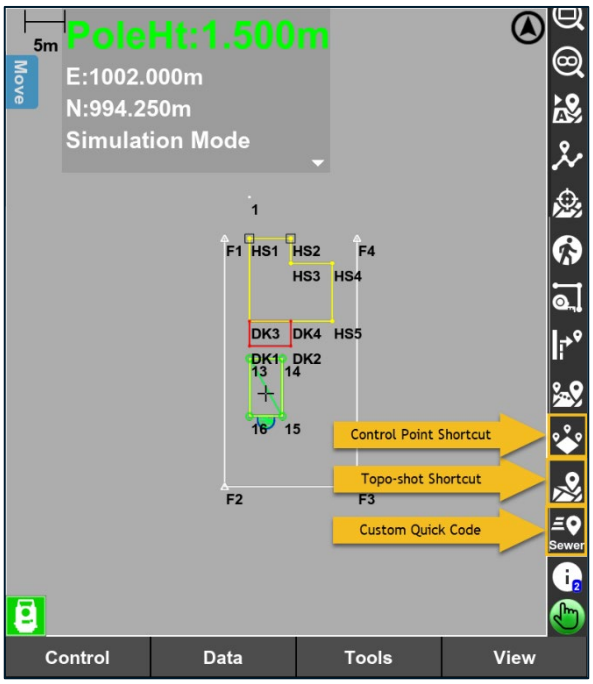
The easiest way to measure points is to use the shortcuts.

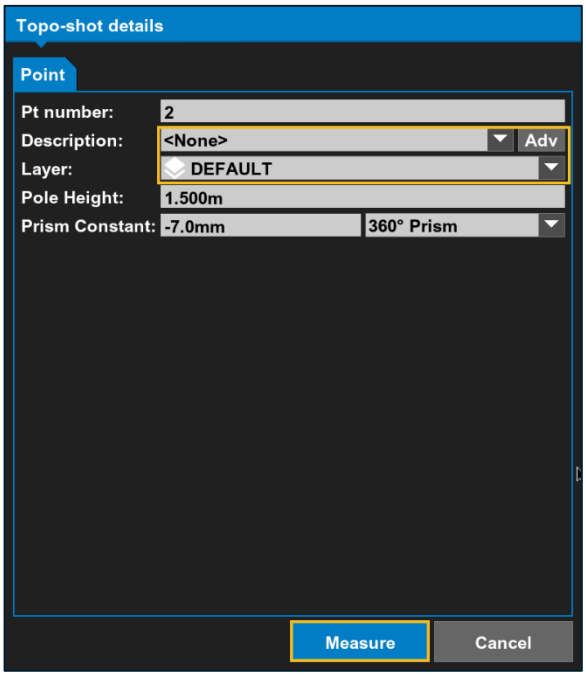
Quick Codes: Tap the **Quick Code** shortcut you have configured to measure a point.

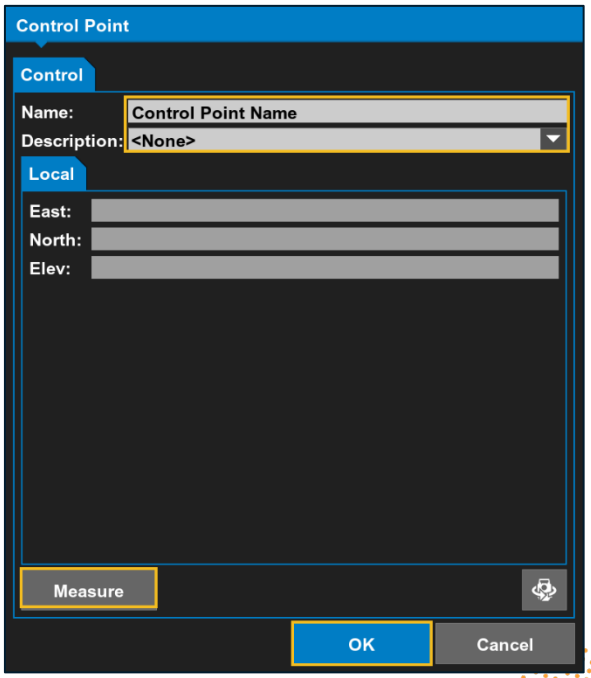
Topo-Shot: Tap the **Topo-Shot** shortcut, select the layer and/or the description then tap **Measure.**

Control Point: Tap the **Control Point** shortcut, enter the name and a description if required. Tap **Measure** then tap **OK.**

Tip: Configure the shortcuts you frequently use together to save scrolling







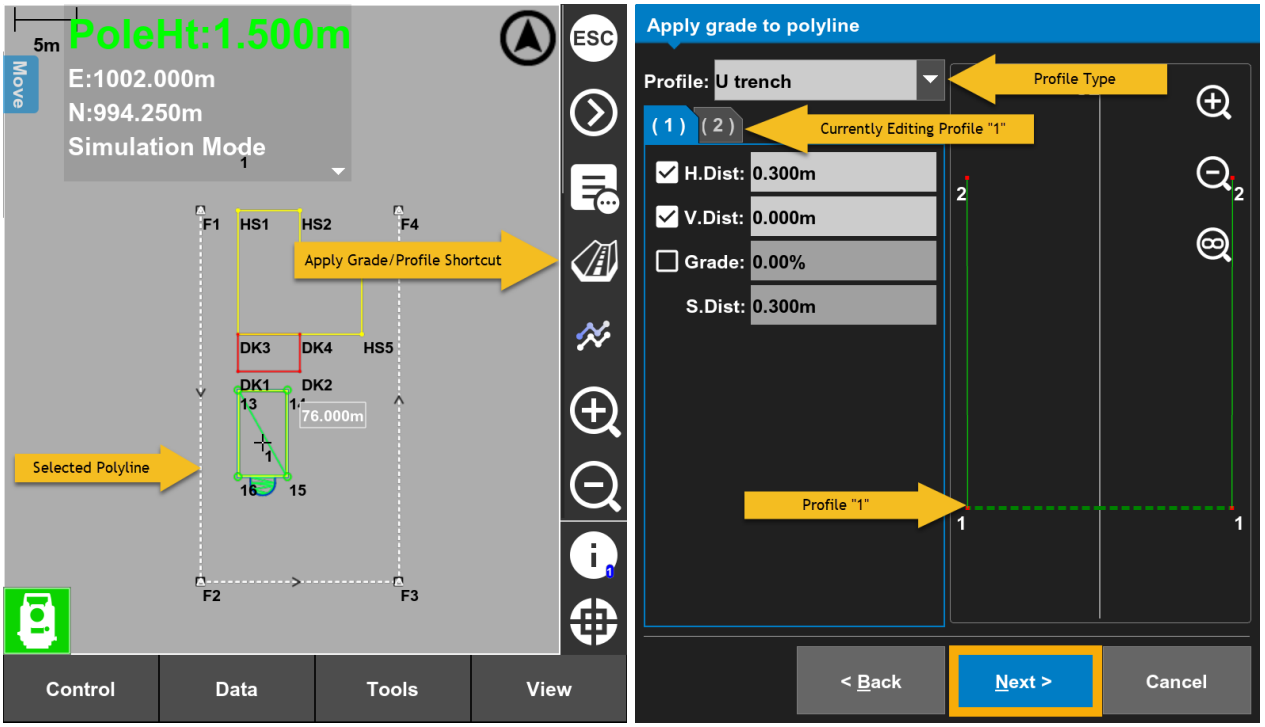
Design

Pocket 3D has an extensive list of tools use to easily create designs and perform calculations. This manual covers the most common tools. Refer to the Pock 3D Reference manual for a comprehensive guide on all the available tools.

Trench Tool (Apply Grade/Profile)

The **Apply Grade/Profile** tool is used to apply profiles to a polyline. It is commonly used to create trenches and basic road profiles.

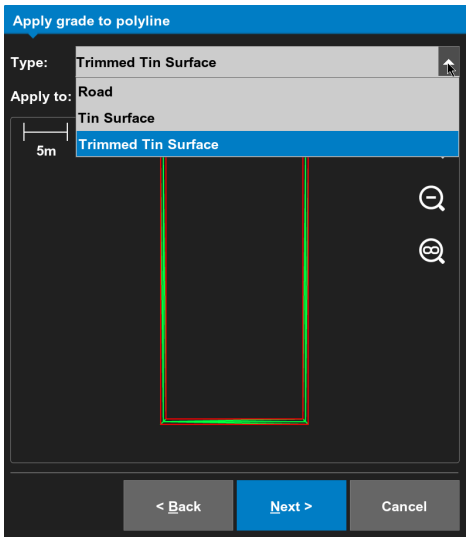
Select a Polyline then tap the **Apply Grade/Profile** shortcut, Select the type of **Profile** then enter the desired parameters for each section of the profile. Then tap **Next.**

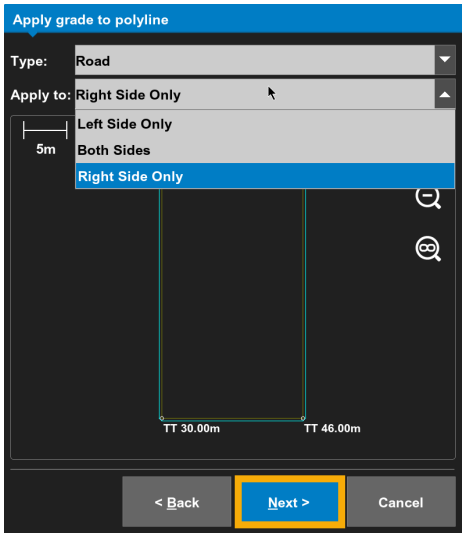


Tip : When creating a trench, the Horizontal Distance cannot be 0.000 as it cannot calculate a grade. Use 0.001 to create a vertical side of trench.

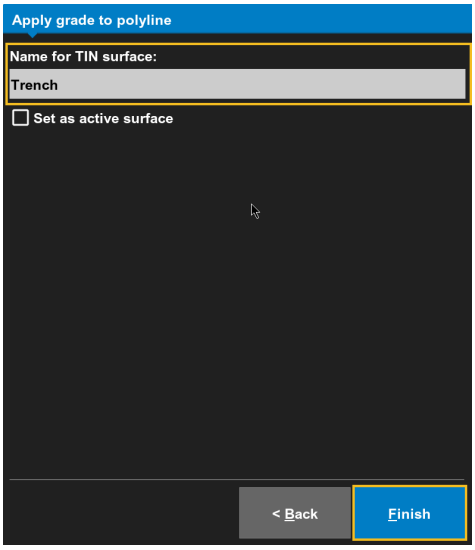
Select the **Type** of Surface to be created. **Road** creates an Alignment. **Tin Surface**, Creates a TIN Surface over the complete area. **Trimmed TIN Surface** used the profile as break lines to create the TIN Surface, This is the most common type used with this tool. Pocket 3D will display what will be created in the lower window.

Apply the profile to the **Left, Right** or **Both Sides** of your polyline, then tap **Next**.

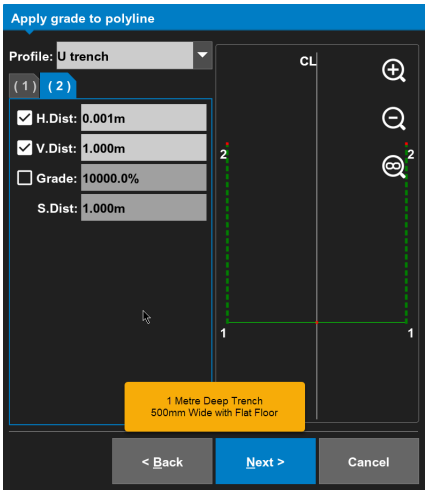


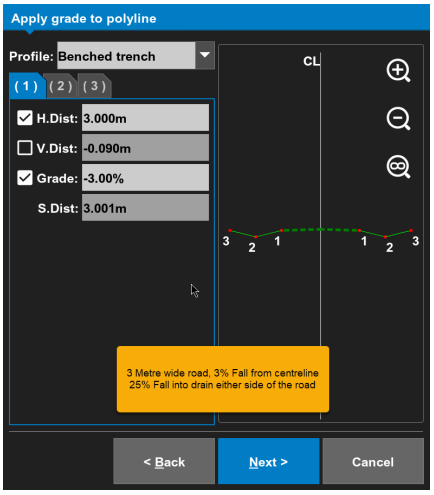


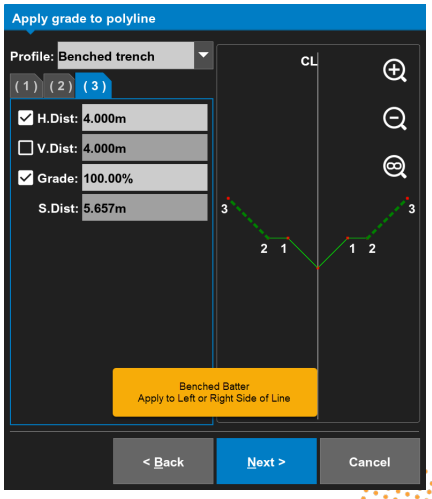
Enter the **Name** of your new surface or alignment. Optionally you can make the surface active for immediate use by checking the **Set as active surface** box. Then tap **Finish.**



Examples of designs using the Apply Grade/Profile tool



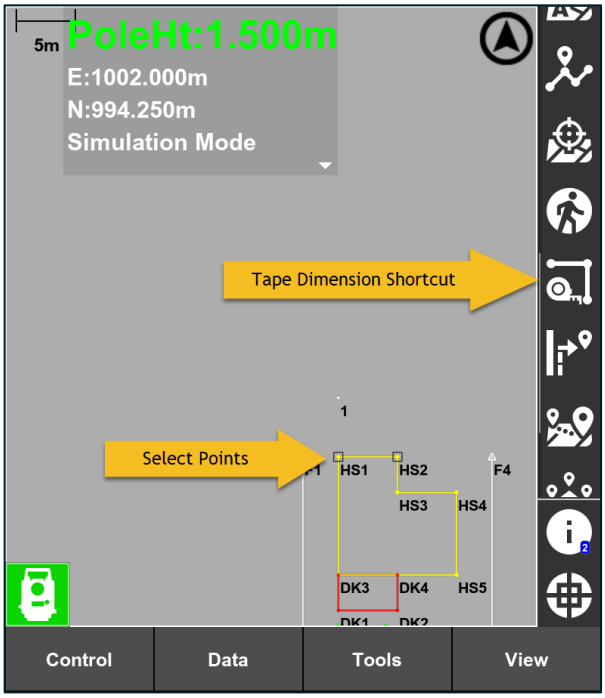


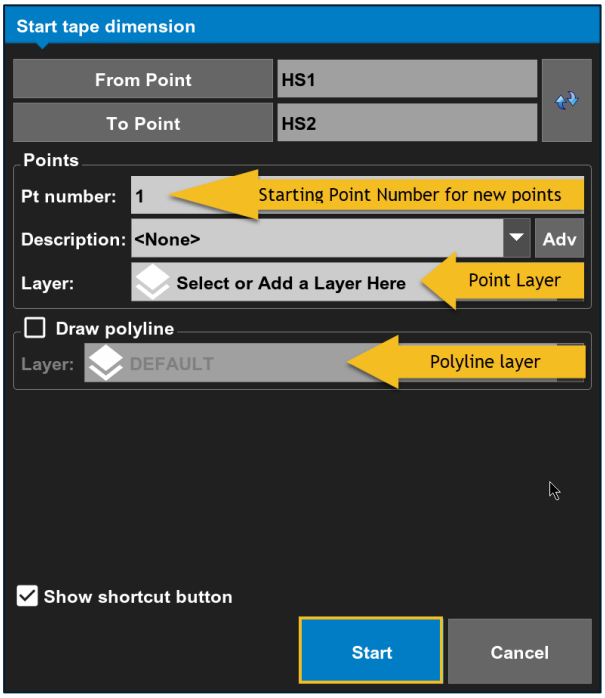


Tape Dimension

The **Tape Dimension** tool can be used to create complex designs off two known points using distances and angles from the initial set of points. This tool can be used to create designs for house slabs, driveways, pools or services such as sewer trenches.

Select 2 points then tap the **Tape Dimension** shortcut. Optionally enter the 1st Point number and Description. Select the layer the new points will be added too. Select if you want to draw a new polyline and which layer the polyline will be added too. Then tap **Start**





Select the **Type.**

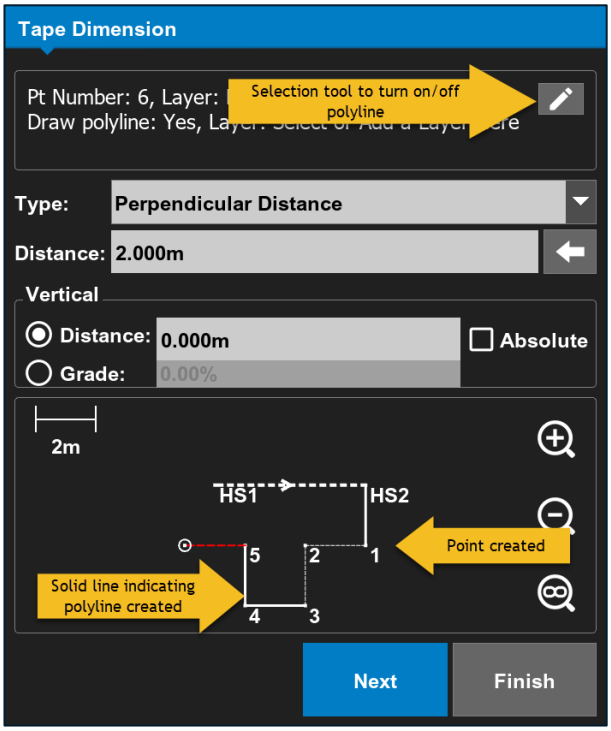
Perpendicular Distance — Select this option to enter a distance that makes the next point 90 degrees from the last point. Tap the **Distance** field to enter the distance. Tap the left/right arrow to toggle the entered tape dimension to the right or left of the last reference point.

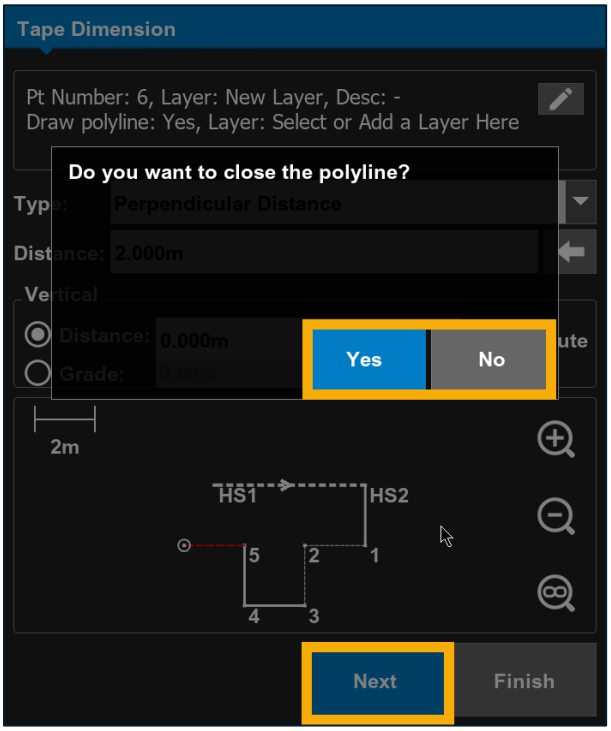
Distance and Offset — Select this option to enter an offset either ahead or behind the last reference point. Tap the **Distance** field to enter the distance. Tap the **Offset** field to then the offset distance. Tap the up/down arrow button to toggle the entered distance either ahead or behind the last reference point.

Distance and Angle — Select this option to enter an angle and length for the nest point. Tap the **Angle** filed to enter an angle (Other than 90 degrees). Tap the **Distance** field to enter the length of the tape dimension to the next point. A negative distance will make the direct towards the left while a positive distance will make the angle direct towards the right. Select **Absolute** to apply and absolute distance.

The lower window will display the points/lines created.

Tap **Next** to create the next point/line and repeat until completed then tap **Finish**. If the draw polyline option was selected, Pocket 3D will prompt to close the polyline, Select **No** to leave the polyline open.

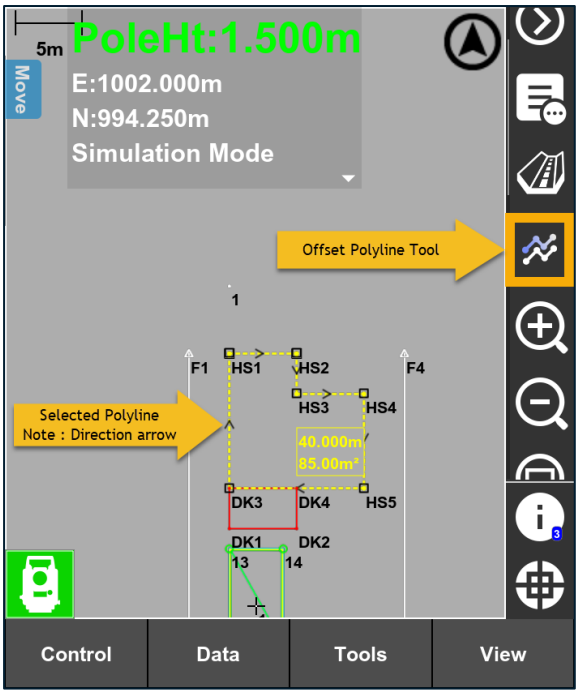


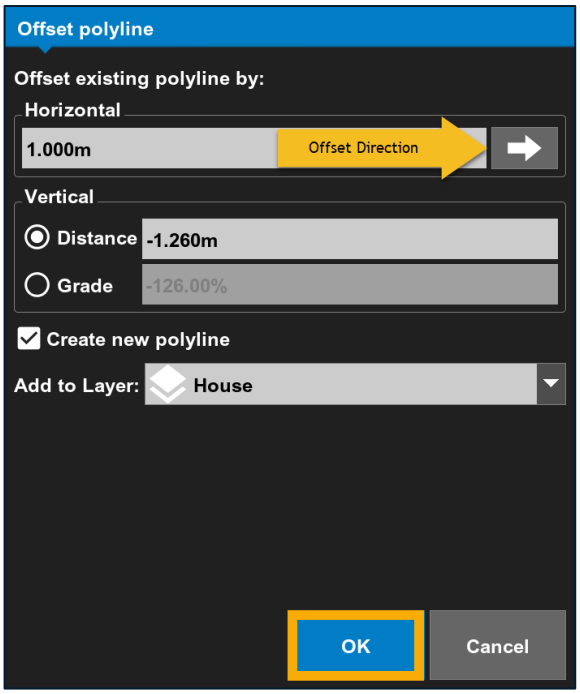


Offset Polyline

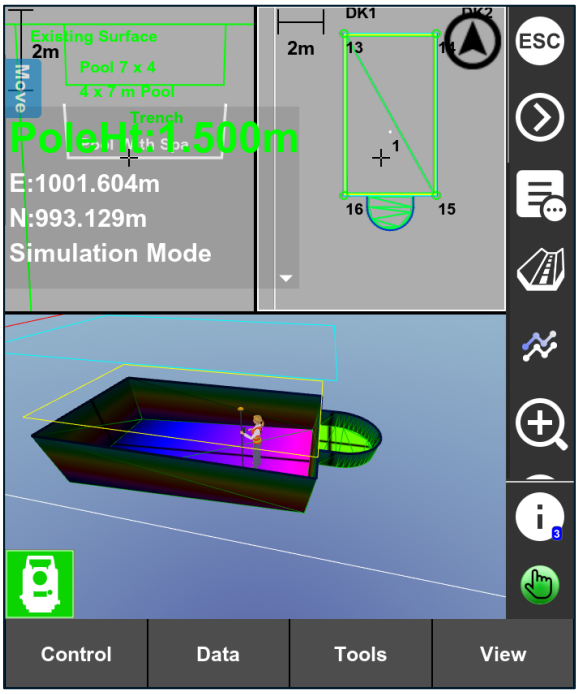
The **Offset Polyline** tool can be used to move or create polylines both horizontally and vertically.

Select a polyline then tap the **Offset Polyline** tool (Note the direction of the polyline). Enter the horizontal distance and the vertical distance.





Example of a designs created using the above tools



BUILD

Swapping from Pocket 3D to MC Mobile

MC Mobile uses wireless connectivity to communicate with Total Stations, GNSS and the Machine System. Refer to the 3DMC Quick Guide or Reference Manual for operation instructions for MC Mobile.

Always disconnect from the Machine, GNSS or Total Station before turning off the equipment.

➢ Tap Tools then tap Disconnect

Swapping From Pocket 3D to Machine

1. In Pocket 3D tap **Tools.**
2. Tap **Disconnect.**
3. Tap **Control.**
4. Tap **Exit.**
5. Start the machine or turn on accessories.
6. Wait 3 minutes for the system on the machine to boot.
7. On the tablet, swipe down and check that Hotspot, Bluetooth and Location is turned on.
8. Tap on the **3DMC** icon.
9. Answer **Yes** to load attachment.
10. The system will connect, and the lower info bars will turn green.

Swapping From Machine to Pocket 3D

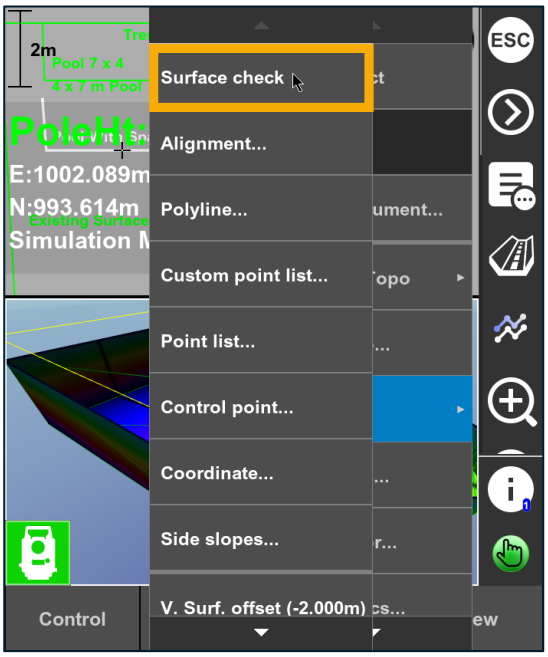
1. In 3DMC tap **Control.**
2. Tap **Disconnect.**
3. Tap **Data.**
4. Tap **Exit.**
5. Turn off the machine.
6. Turn on the instrument (Total Station or GNSS)
7. Tap on the **Pocket 3D** icon.
8. Tap **Tools.**
9. Tap **Connect.**
10. Select the instrument you want to connect too. Note : Pocket 3D remembers the last instrument it was connected too.
11. Tap **Connect.**

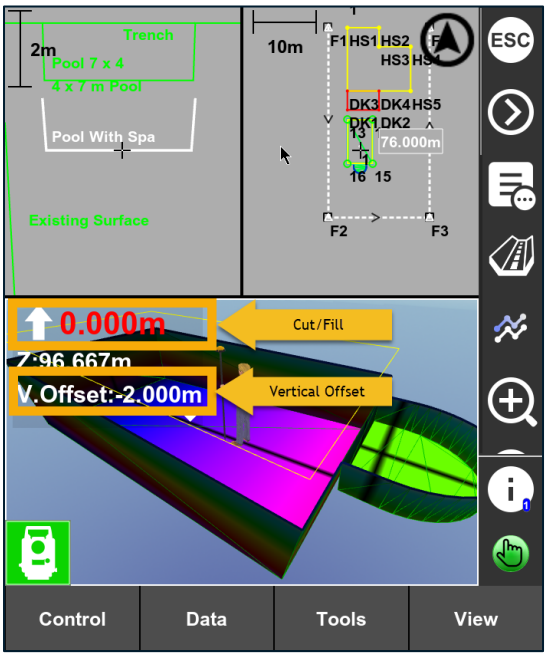
Verify

Stake Out

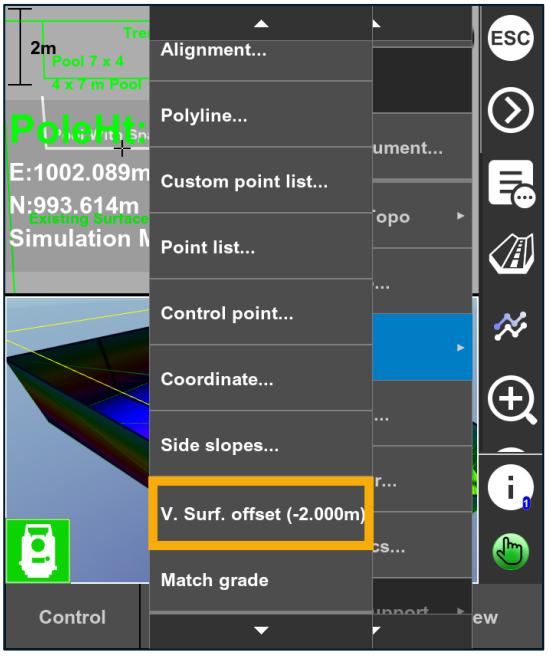
Cut/Fill to a surface

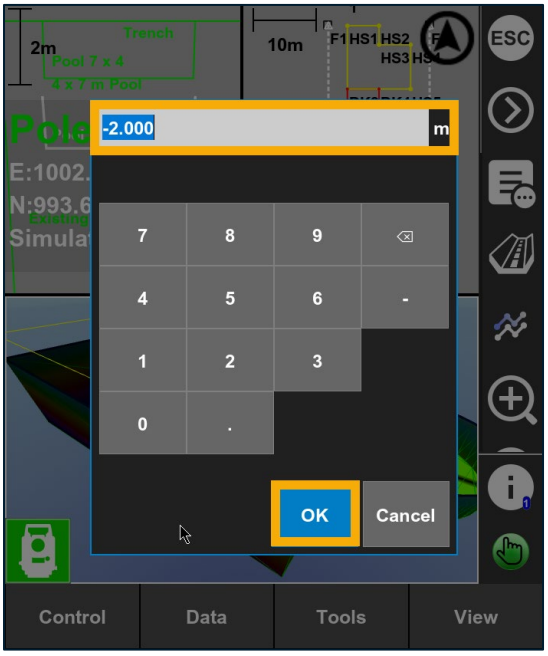
To verify cut/fill to a surface. Tap **Tools** then tap **Stake-out**, then tap **Surface Check.**





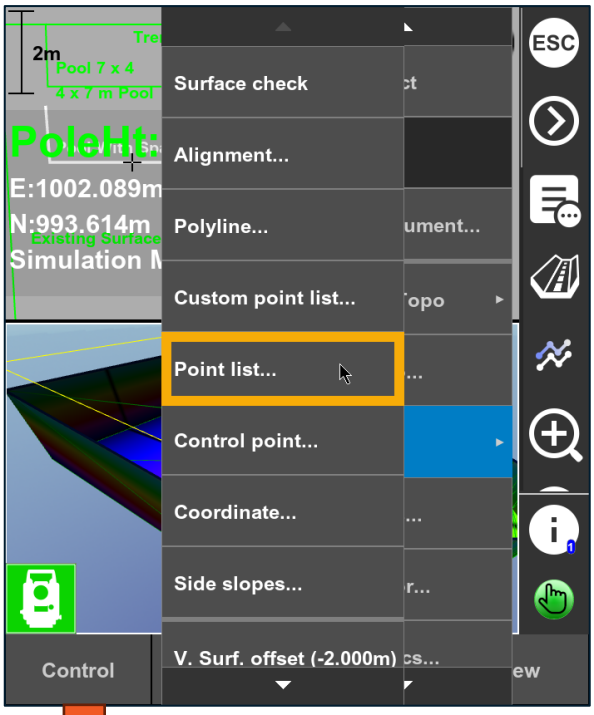
To change the Vertical offset. Tap **Tools** then tap **Stake-out**, then tap **V. Surface offset.** Enter the desired vertical offset then tap **OK.**

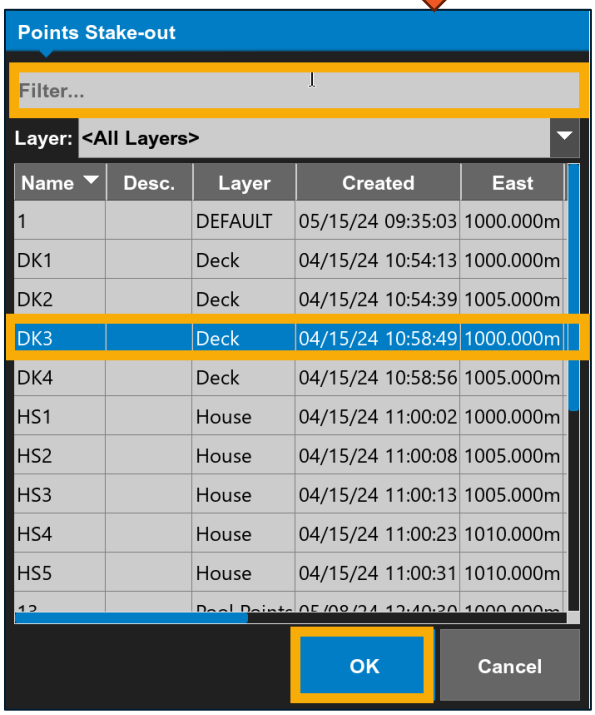


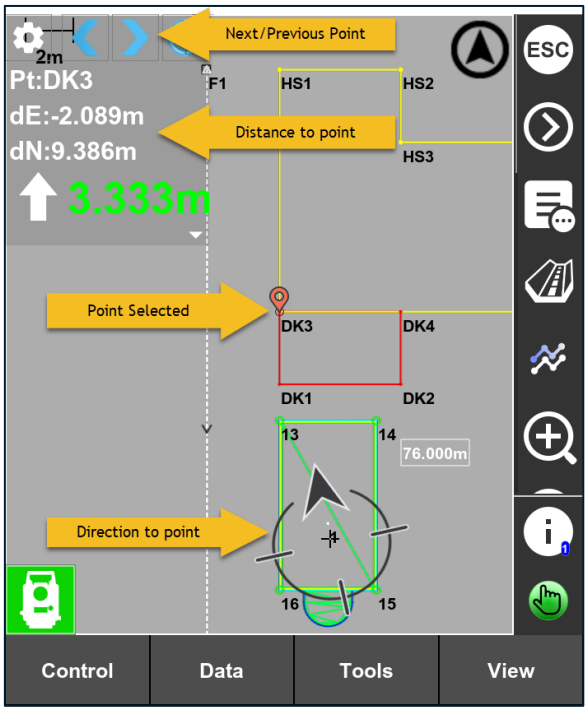


Point Stake Out

Tap **Tools** then **Stake-out** and then **Point list.** Search or select the point then tap **OK.**



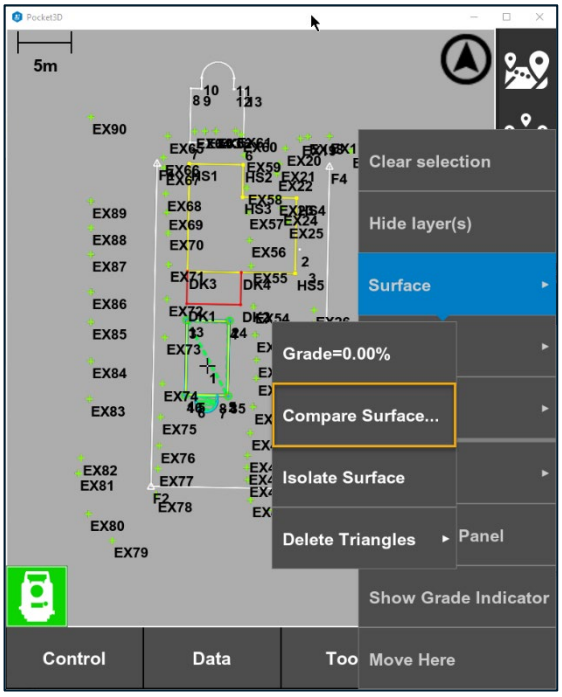


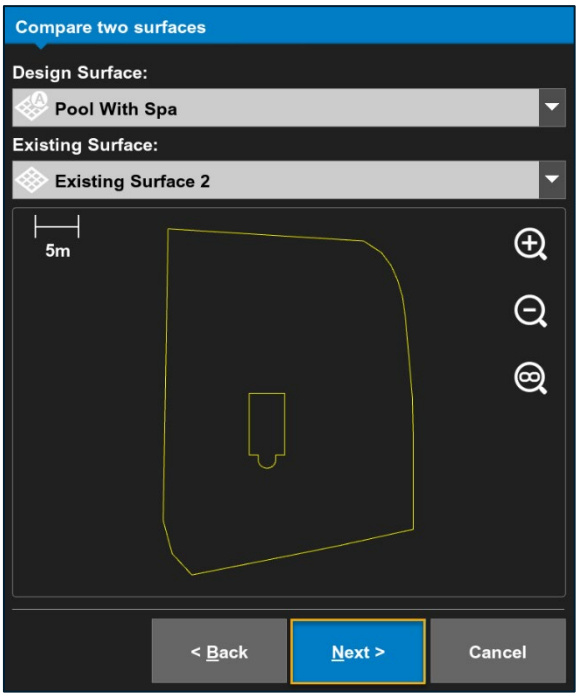


Volume Calculation (Compare Surfaces)

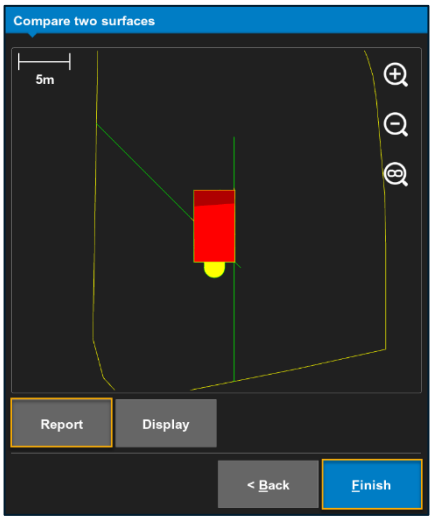
Volume calculations can be performed using the **Calc Wizard** or when you have an active surface from the context menu.

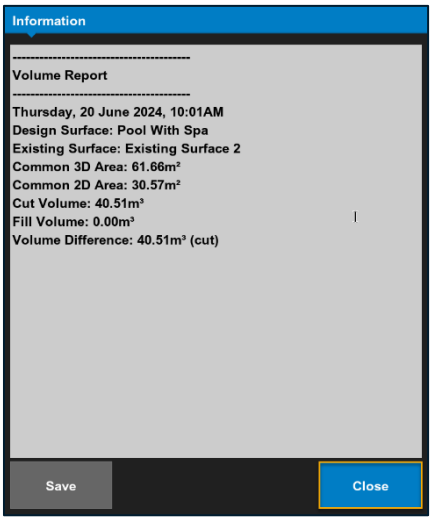
Press and hold the screen and tap **Surface,** then tap **Compare Surface.** Select the two surfaces you want to calculate the volume difference then tap **Next** (Pocket 3D will display the outline of the two surfaces selected).

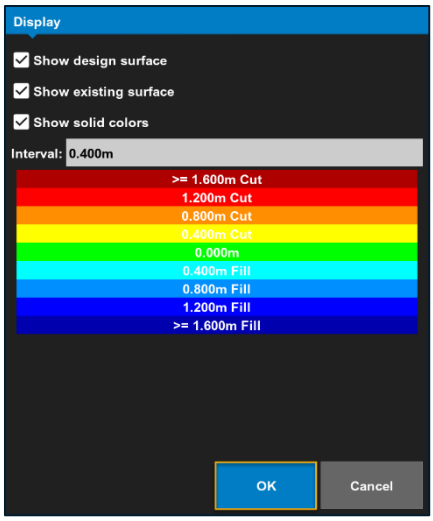




Pocket 3D will display the Cut/Fill between the two surfaces. Tap **Display** to change the colour interval. Tap **Report** to view the Cut, Fill and Volume Difference. Tap **Finish** to exit.







Create a New Surface

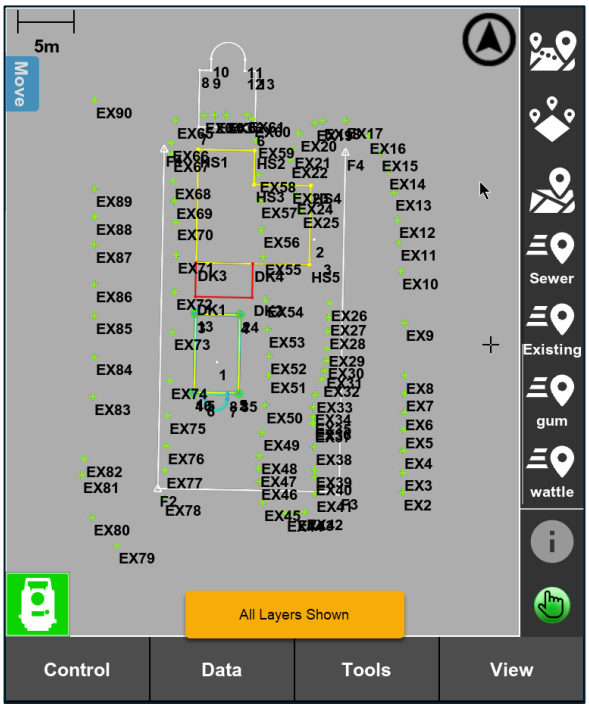
Pocket 3D allows you to create several types of surfaces as shown in the table below.

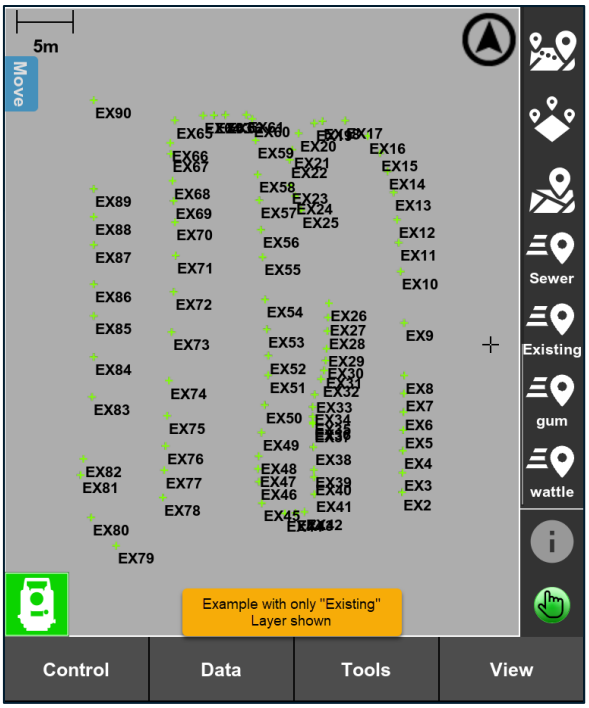
Surface Type	Description
TIN Surface from Points and Lines	Irregular TIN surface created from selected points and linework.
Road (CL, profile, templates)	Road surface created from known horizontal, vertical, and template design information.
Sloping Plane Surface	Planar surface with a point of known elevation and known main-fall and cross-fall slopes.
Best-fit Plane Surface	Planar surface created using best-fit calculation through all selected points (requires at least three points to be selected on main screen).
Crown Road Surface	Simple, straight road surface with constant width, cross-fall, and main-fall.
Partial Road Surface	Partial road surface created by copying part of an existing road surface.
Subgrade of Existing Alignment	Road surface created from an existing road by changing its cross-sections.

The most common type of surface creation is creating a **TIN Surface from Points and Lines** of the existing to calculate volumes. Refer to the Pocket 3D user manual for additional details on surface creation.

Create a TIN Surface from Points and Lines

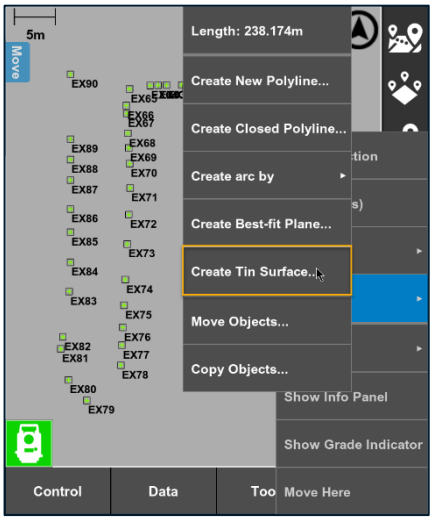
Select the points and/or lines to be used in the new surface. TIP: Turn on/off layers to make it easier to select the data.

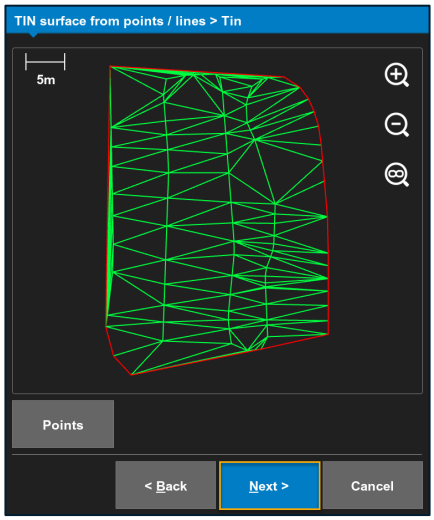


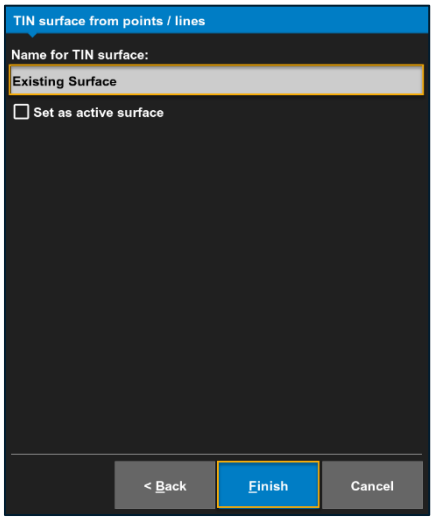


Press and hold the screen, tap **Calcs** then tap **Create Tin Surface.** Pocket 3D will display the created surface, tap **Next**.

Enter a **Name for TIN surface** then tap **Finish**. Optionally you can set this as your active surface for stake out.







Initial Instruction Record

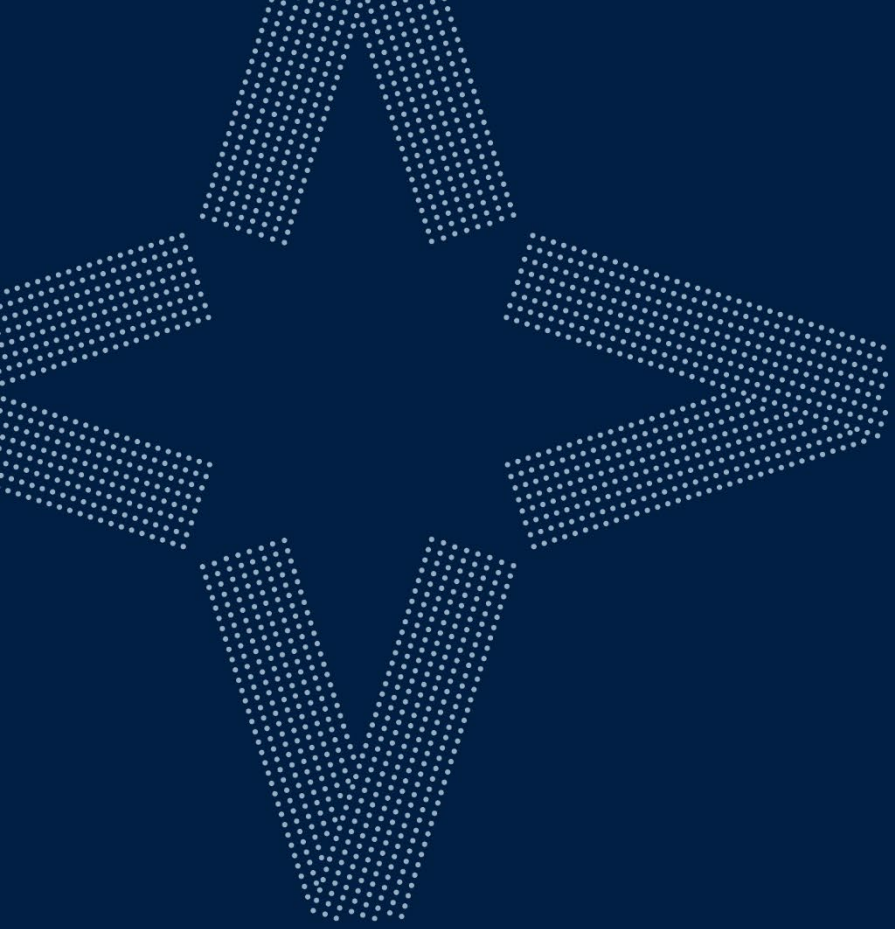
Please fill out the below details once the initial handover instruction has been completed by an Aptella Representative.

WO Number	
Operator Name	
Email Address	
Phone Number	

Operator Name	
Email Address	
Phone Number	

Operator Name	
Email Address	
Phone Number	

Operator Name	
Email Address	
Phone Number	



Aptella

AUTOMATION +
POSITIONING TECH