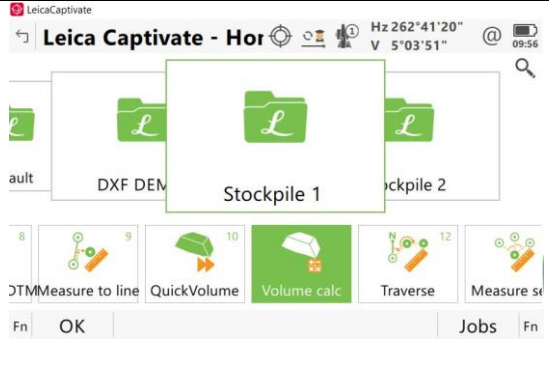
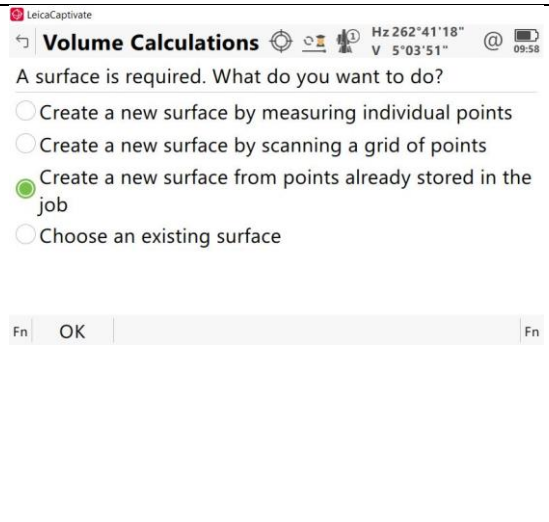
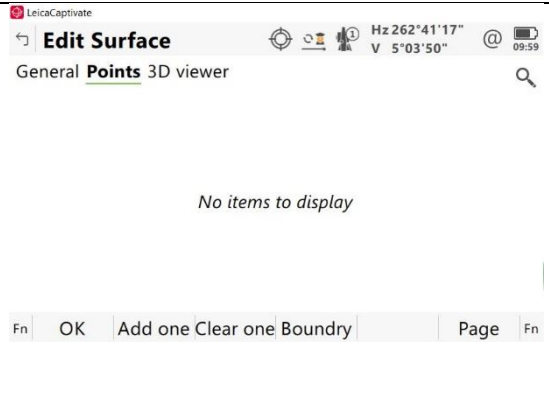


Leica Captivate: Volume calculation. Stockpile and Surface to Surface

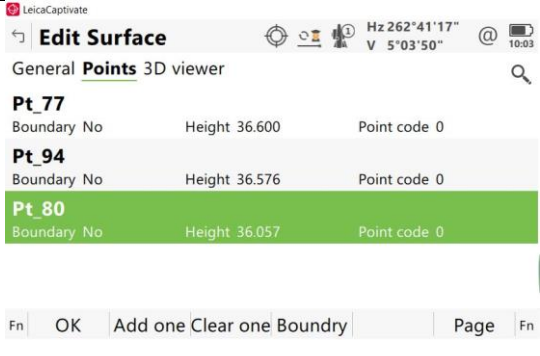
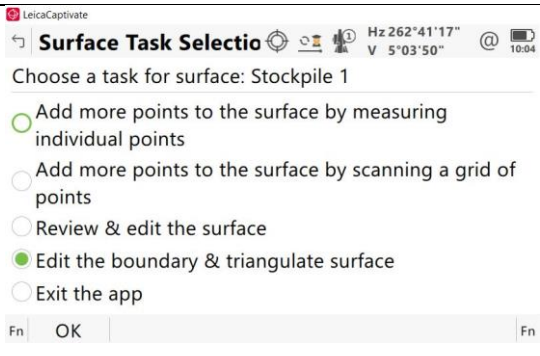
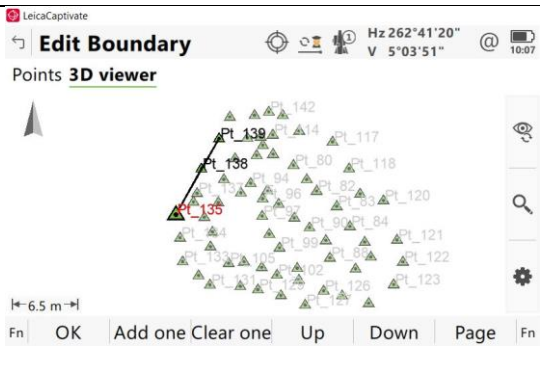
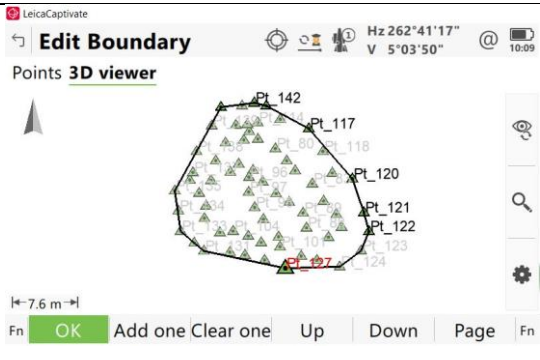
1		<p>The two common ways to calculate a volume are to use points already stored in a working job or to create a volume by measuring points in real time when on site.</p> <p>Look out for the quicker Rubber Band Theory further down this guide.</p> <p>I am doing this calculation with data I have previously surveyed and stored in the job.</p> <p>Open the Volume calc app.</p>
2		<p>Choose the method that you want to use. If you choose the same method as me and you have a lot of data in your job that isn't associated with your volume calc then it can become quite a lengthy process identifying what points you want to use.</p> <p>If you want to have your volumes in the same job as the rest of your data, then you should give the points you're recording a unique PtID so you can create a filter of them later to make life easier.</p> <p>If it is possible use a new job for your calculation.</p>
3		<p>Once you have named your Volume calc you will be directed to the Edit Surface page. Click Add one.</p> <p>You should now see a list of all the points in the job. You need to press Add one for each individual point. You can page across to 3D viewer and add them from here too.</p> <p>If you have given your volume measurements specific PtIDs then you can press Add one, FN – Filter and filter a range of point IDs or wildcard match to speed up the process.</p>

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565

sales@sunbeltsurvey.co.uk www.sunbeltsurvey.co.uk



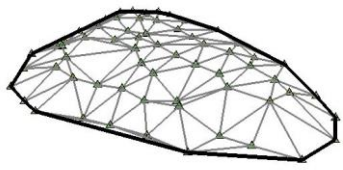



Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales

4	 <p>LeicaCaptivate Edit Surface General Points 3D viewer Pt_77 Boundary No Height 36.600 Point code 0 Pt_94 Boundary No Height 36.576 Point code 0 Pt_80 Boundary No Height 36.057 Point code 0 Fn OK Add one Clear one Boundry Page Fn</p>	Once you have all the surface points added press OK .
5	 <p>LeicaCaptivate Surface Task Selectio Choose a task for surface: Stockpile 1 <input type="radio"/> Add more points to the surface by measuring individual points <input type="radio"/> Add more points to the surface by scanning a grid of points <input type="radio"/> Review & edit the surface <input checked="" type="radio"/> Edit the boundary & triangulate surface <input type="radio"/> Exit the app Fn OK Fn</p>	Edit the boundary & triangulate surface should be highlighted. Press OK .
6	 <p>LeicaCaptivate Edit Boundary Points 3D viewer Pt_139 Pt_142 Pt_117 Pt_118 Pt_120 Pt_121 Pt_122 Pt_123 Pt_124 Pt_127 Pt_126 Pt_125 Pt_124 Pt_123 Pt_122 Pt_121 Pt_120 Pt_118 Pt_117 Pt_116 Pt_115 Pt_114 Pt_113 Pt_112 Pt_111 Pt_110 Pt_109 Pt_108 Pt_107 Pt_106 Pt_105 Pt_104 Pt_103 Pt_102 Pt_101 Pt_100 Pt_99 Pt_98 Pt_97 Pt_96 Pt_95 Pt_94 Pt_93 Pt_92 Pt_91 Pt_90 Pt_89 Pt_88 Pt_87 Pt_86 Pt_85 Pt_84 Pt_83 Pt_82 Pt_81 Pt_80 Pt_79 Pt_78 Pt_77 Pt_76 Pt_75 Pt_74 Pt_73 Pt_72 Pt_71 Pt_70 Pt_69 Pt_68 Pt_67 Pt_66 Pt_65 Pt_64 Pt_63 Pt_62 Pt_61 Pt_60 Pt_59 Pt_58 Pt_57 Pt_56 Pt_55 Pt_54 Pt_53 Pt_52 Pt_51 Pt_50 Pt_49 Pt_48 Pt_47 Pt_46 Pt_45 Pt_44 Pt_43 Pt_42 Pt_41 Pt_40 Pt_39 Pt_38 Pt_37 Pt_36 Pt_35 Pt_34 Pt_33 Pt_32 Pt_31 Pt_30 Pt_29 Pt_28 Pt_27 Pt_26 Pt_25 Pt_24 Pt_23 Pt_22 Pt_21 Pt_20 Pt_19 Pt_18 Pt_17 Pt_16 Pt_15 Pt_14 Pt_13 Pt_12 Pt_11 Pt_10 Pt_9 Pt_8 Pt_7 Pt_6 Pt_5 Pt_4 Pt_3 Pt_2 Pt_1 Fn OK Add one Clear one Up Down Page Fn</p>	Now repeat the process, clicking Add one and choosing the boundary points. I prefer paging across to 3D viewer so I can be sure to select the correct points. You will get a nice visual of the boundary line as you add them.
7	 <p>LeicaCaptivate Edit Boundary Points 3D viewer Pt_142 Pt_117 Pt_120 Pt_121 Pt_122 Pt_123 Pt_124 Pt_127 Pt_126 Pt_125 Pt_124 Pt_123 Pt_122 Pt_121 Pt_120 Pt_118 Pt_117 Pt_116 Pt_115 Pt_114 Pt_113 Pt_112 Pt_111 Pt_110 Pt_109 Pt_108 Pt_107 Pt_106 Pt_105 Pt_104 Pt_103 Pt_102 Pt_101 Pt_100 Pt_99 Pt_98 Pt_97 Pt_96 Pt_95 Pt_94 Pt_93 Pt_92 Pt_91 Pt_90 Pt_89 Pt_88 Pt_87 Pt_86 Pt_85 Pt_84 Pt_83 Pt_82 Pt_81 Pt_80 Pt_79 Pt_78 Pt_77 Pt_76 Pt_75 Pt_74 Pt_73 Pt_72 Pt_71 Pt_70 Pt_69 Pt_68 Pt_67 Pt_66 Pt_65 Pt_64 Pt_63 Pt_62 Pt_61 Pt_60 Pt_59 Pt_58 Pt_57 Pt_56 Pt_55 Pt_54 Pt_53 Pt_52 Pt_51 Pt_50 Pt_49 Pt_48 Pt_47 Pt_46 Pt_45 Pt_44 Pt_43 Pt_42 Pt_41 Pt_40 Pt_39 Pt_38 Pt_37 Pt_36 Pt_35 Pt_34 Pt_33 Pt_32 Pt_31 Pt_30 Pt_29 Pt_28 Pt_27 Pt_26 Pt_25 Pt_24 Pt_23 Pt_22 Pt_21 Pt_20 Pt_19 Pt_18 Pt_17 Pt_16 Pt_15 Pt_14 Pt_13 Pt_12 Pt_11 Pt_10 Pt_9 Pt_8 Pt_7 Pt_6 Pt_5 Pt_4 Pt_3 Pt_2 Pt_1 Fn OK Add one Clear one Up Down Page Fn</p>	Once you have added the boundary points press OK .

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565
 sales@sunbeltssurvey.co.uk www.sunbeltssurvey.co.uk

Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales

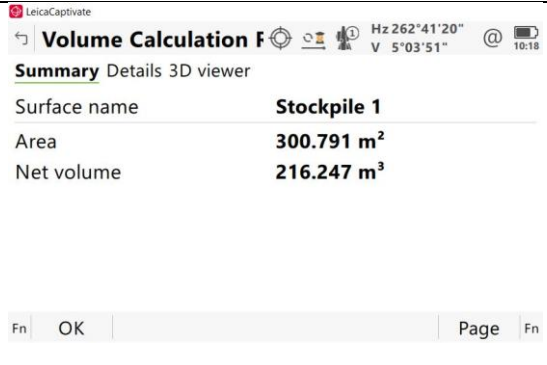

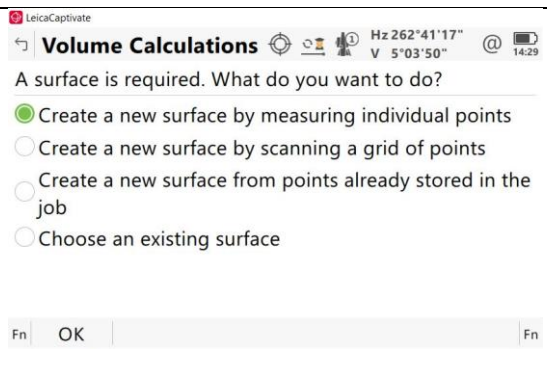
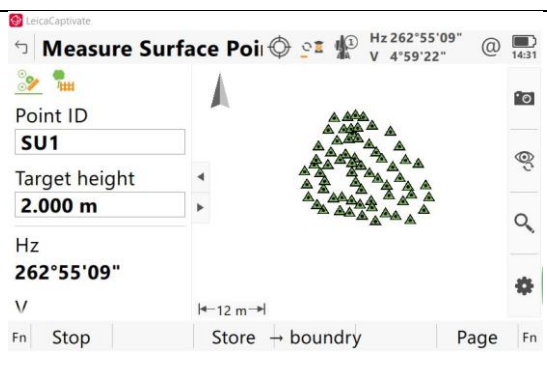
8	<p>LeicaCaptivate</p> <p>Triangulation Results  Hz 262°41'18" V 5°03'51" @ 10:09</p> <p>Summary Details 3D viewer</p> <p>Surface name Stockpile 1</p> <p>Area 300.791 m²</p> <p>Number of triangles 116</p> <p>Number of surface points 81</p> <p>Number of boundary points 14</p> <p>Fn OK Store DTM Store DXF Page Fn</p>	You will see a summary of your work.
9	<p>LeicaCaptivate</p> <p>Triangulation Results  Hz 262°41'20" V 5°03'51" @ 10:11</p> <p>Summary Details <u>3D viewer</u></p>  <p>Fn OK Store DTM Store DXF Page Fn</p>	<p>Page across to details to see more information and page across to 3D viewer for a visual.</p> <p>You can store surface as a DTM or save as a DXF using F3 and F4.</p> <p>Press OK.</p>
10	<p>LeicaCaptivate</p> <p>Surface Task Selectio  Hz 262°41'17" V 5°03'50" @ 10:11</p> <p><input type="radio"/> Add more points to the surface by measuring individual points</p> <p><input type="radio"/> Add more points to the surface by scanning a grid of points</p> <p><input type="radio"/> Review & edit the surface</p> <p><input type="radio"/> Edit the boundary & triangulate surface</p> <p><input checked="" type="radio"/> Calculate the volume</p> <p><input type="radio"/> Exit the app</p> <p>Fn OK Fn</p>	<p>Calculate the volume should be selected.</p> <p>Press OK.</p>
11	<p>LeicaCaptivate</p> <p>Volume Calculation  Hz 262°41'20" V 5°03'51" @ 10:17</p> <p>Surface name Stockpile 1</p> <p>Number of triangles 116</p> <p>Volume calculation method Stockpile </p> <p>Fn OK Fn</p>	<p>Choose what method you want to use. There are different options in the drop down that you can explore. At this stage the surface is saved in the volume calc app, so you are safe to go in and out of the calculations as you please.</p> <p>I am calculating how much material is in the stockpile.</p>

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565

sales@sunbeltsurvey.co.uk www.sunbeltsurvey.co.uk

Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales

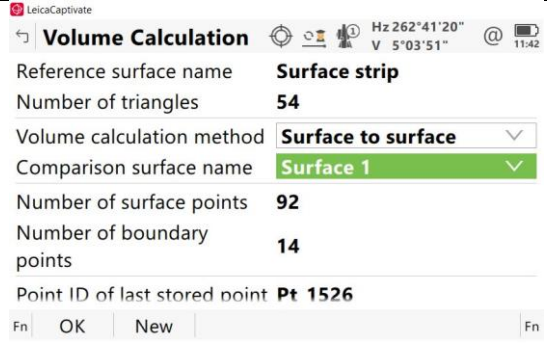
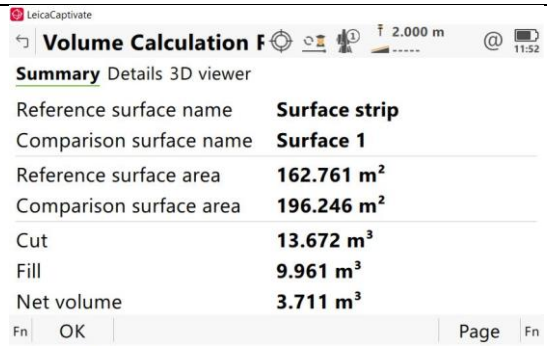
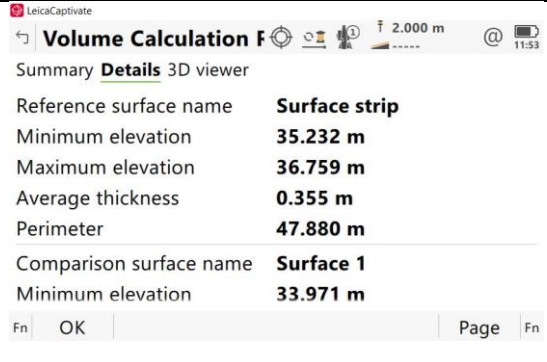
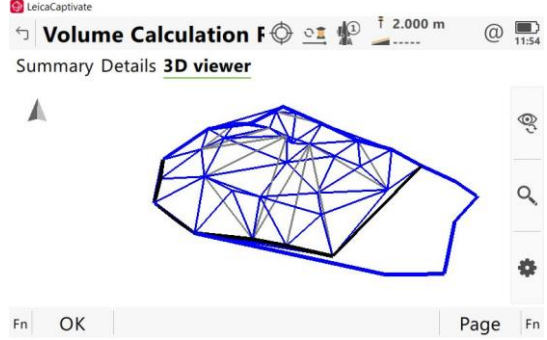
12		<p>Page across to see further detail.</p> <p>As mentioned, you can go into the Volume Calc app and choose existing surfaces and look at this data any time or edit it if you need or wish to.</p>
13		<p>The site has been reducing the size of the Muck heap and I have been asked how much we have taken off site.</p> <p>I can do a simple Surface to Surface calculation however the surface MUST be created in the same job as the last one.</p>
14		<p>This time I am going to measure individual points.</p>
15		<p>You can see at the top it says Measure Surface Points. If you want to do the boundary first press F4 (boundary) and you will see Measure Boundary Points at the top.</p> <p>Record the points and select Done.</p> <p>You can see the points used for the original Volume in the viewer.</p>

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565

sales@sunbeltsurvey.co.uk www.sunbeltsurvey.co.uk

Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales

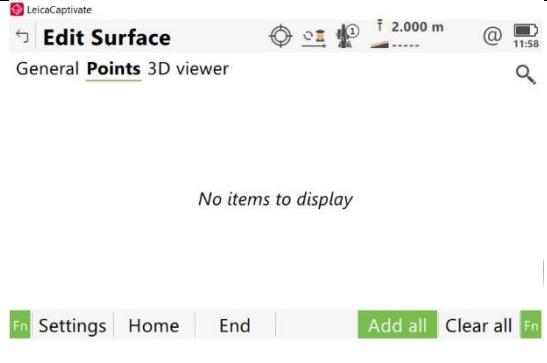

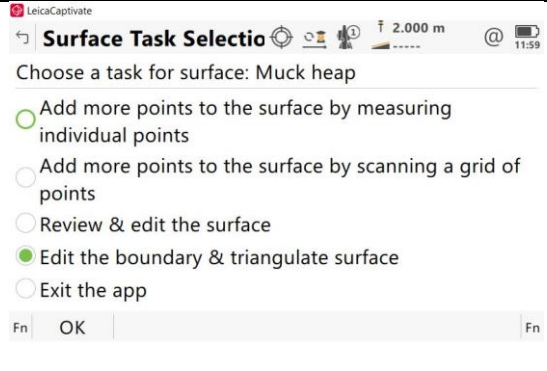
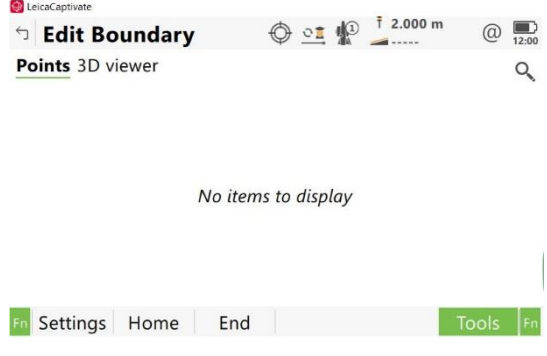
16	 <p>Volume Calculation</p> <p>Reference surface name Surface strip</p> <p>Number of triangles 54</p> <p>Volume calculation method Surface to surface</p> <p>Comparison surface name Surface 1</p> <p>Number of surface points 92</p> <p>Number of boundary points 14</p> <p>Point ID of last stored point Pt 1526</p> <p>Fn OK New Fn</p>	<p>Follow the same steps as before to get to the calculation method. This time I am going to choose Surface to Surface.</p> <p>There won't be a massive difference between my stockpiles due to skills using my simulator.</p> <p>Press OK.</p>
17	 <p>Volume Calculation F</p> <p>Summary Details 3D viewer</p> <p>Reference surface name Surface strip</p> <p>Comparison surface name Surface 1</p> <p>Reference surface area 162.761 m²</p> <p>Comparison surface area 196.246 m²</p> <p>Cut 13.672 m³</p> <p>Fill 9.961 m³</p> <p>Net volume 3.711 m³</p> <p>Fn OK Page Fn</p>	<p>Here are the results.</p> <p>Again, this data is saved in the Volume calc app for future reference or to compare other surfaces.</p>
18	 <p>Volume Calculation F</p> <p>Summary Details 3D viewer</p> <p>Reference surface name Surface strip</p> <p>Minimum elevation 35.232 m</p> <p>Maximum elevation 36.759 m</p> <p>Average thickness 0.355 m</p> <p>Perimeter 47.880 m</p> <p>Comparison surface name Surface 1</p> <p>Minimum elevation 33.971 m</p> <p>Fn OK Page Fn</p>	<p>Details page.</p>
19	 <p>Volume Calculation F</p> <p>Summary Details 3D viewer</p> <p>3D wireframe model of the volume calculation area.</p> <p>Fn OK Page Fn</p>	<p>Looking at the 3D viewer page you can clearly see where the reduction has come from.</p> <p>Press OK to exit.</p>

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565

sales@sunbeltrentals.co.uk www.sunbeltrentals.co.uk

Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales

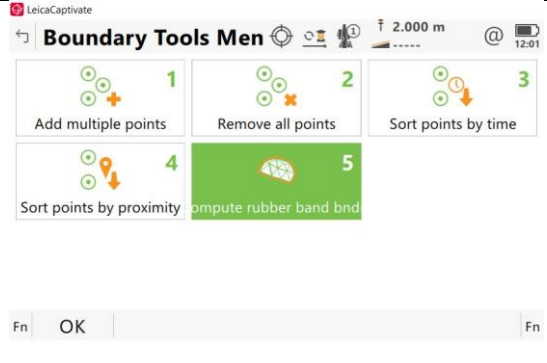
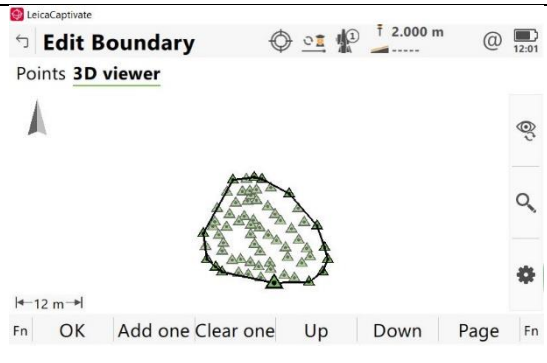
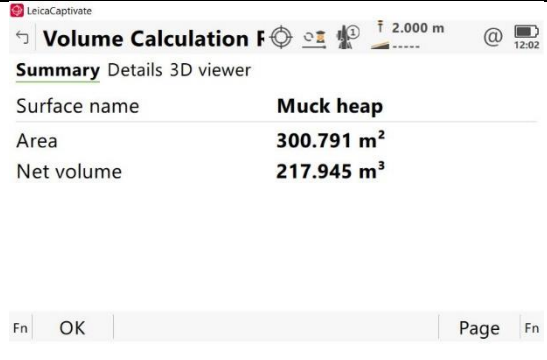
20	 <p>LeicaCaptivate Edit Surface General <u>Points</u> 3D viewer No items to display Fn Settings Home End Add all Clear all Fn</p>	<p>Let's look at a quicker way to calculate a simple stockpile.</p> <p>Open the Volume Calc app and choose Create volume from points already stored in the job.</p> <p>On the first Edit Surface page press Fn – Add all.</p>
21	 <p>LeicaCaptivate Muck heap Points <u>3D viewer</u> 12 m Fn OK Page Fn</p>	<p>All the points are added to the surface list.</p> <p>Press OK.</p>
22	 <p>LeicaCaptivate Surface Task Selection Choose a task for surface: Muck heap <input type="radio"/> Add more points to the surface by measuring individual points <input type="radio"/> Add more points to the surface by scanning a grid of points <input type="radio"/> Review & edit the surface <input checked="" type="radio"/> Edit the boundary & triangulate surface <input type="radio"/> Exit the app Fn OK Fn</p>	<p>Select Edit the boundary & triangulate surface.</p> <p>Press OK.</p>
23	 <p>LeicaCaptivate Edit Boundary Points 3D viewer No items to display Fn Settings Home End Tools Fn</p>	<p>Press Fn – Tools.</p>

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565

sales@sunbeltsurvey.co.uk www.sunbeltsurvey.co.uk

Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales

24	 <p>The screenshot shows the 'Boundary Tools Men' in LeicaCaptivate. It features five numbered options: 1. Add multiple points, 2. Remove all points, 3. Sort points by time, 4. Sort points by proximity, and 5. Compute rubber band bnd. The 'Compute rubber band bnd' option is highlighted in green. The bottom of the screen shows 'Fn', 'OK', and 'Fn' buttons.</p>	Select Compute rubber band boundary .												
25	 <p>The screenshot shows the 'Edit Boundary' screen in LeicaCaptivate. It displays a 3D view of a boundary defined by points, with a scale bar indicating 12 m. The bottom of the screen shows 'Fn', 'OK', 'Add one', 'Clear one', 'Up', 'Down', 'Page', and 'Fn' buttons.</p>	<p>Captivate has created a boundary for us as if a rubber band was placed around the stockpile.</p> <p>You may or may not need to edit one or two points depending on the shape of your area.</p> <p>Press OK.</p>												
26	 <p>The screenshot shows the 'Volume Calculation F' screen in LeicaCaptivate, displaying a summary of calculations for a surface named 'Muck heap'. The data is as follows:</p> <table border="1"> <thead> <tr> <th>Summary</th> <th>Details</th> <th>3D viewer</th> </tr> </thead> <tbody> <tr> <td>Surface name</td> <td colspan="2">Muck heap</td> </tr> <tr> <td>Area</td> <td colspan="2">300.791 m²</td> </tr> <tr> <td>Net volume</td> <td colspan="2">217.945 m³</td> </tr> </tbody> </table> <p>The bottom of the screen shows 'Fn', 'OK', 'Page', and 'Fn' buttons.</p>	Summary	Details	3D viewer	Surface name	Muck heap		Area	300.791 m²		Net volume	217.945 m³		Quick and accurate results.
Summary	Details	3D viewer												
Surface name	Muck heap													
Area	300.791 m²													
Net volume	217.945 m³													

Sunbelt Rentals Survey

3 Orpheus House, Calleva Park, Aldermaston, Reading, RG7 8TA. 0330 678 0181 Support Number: 01293 565565

sales@sunbeltsurvey.co.uk www.sunbeltsurvey.co.uk

Registered Office: Sunbelt Rentals Ltd. 100 Cheapside, London EC2V 6DT. Registered No. 444569 England & Wales