

Preparing a Point Cloud for Civil 3D – Part 2

ReCap Pro

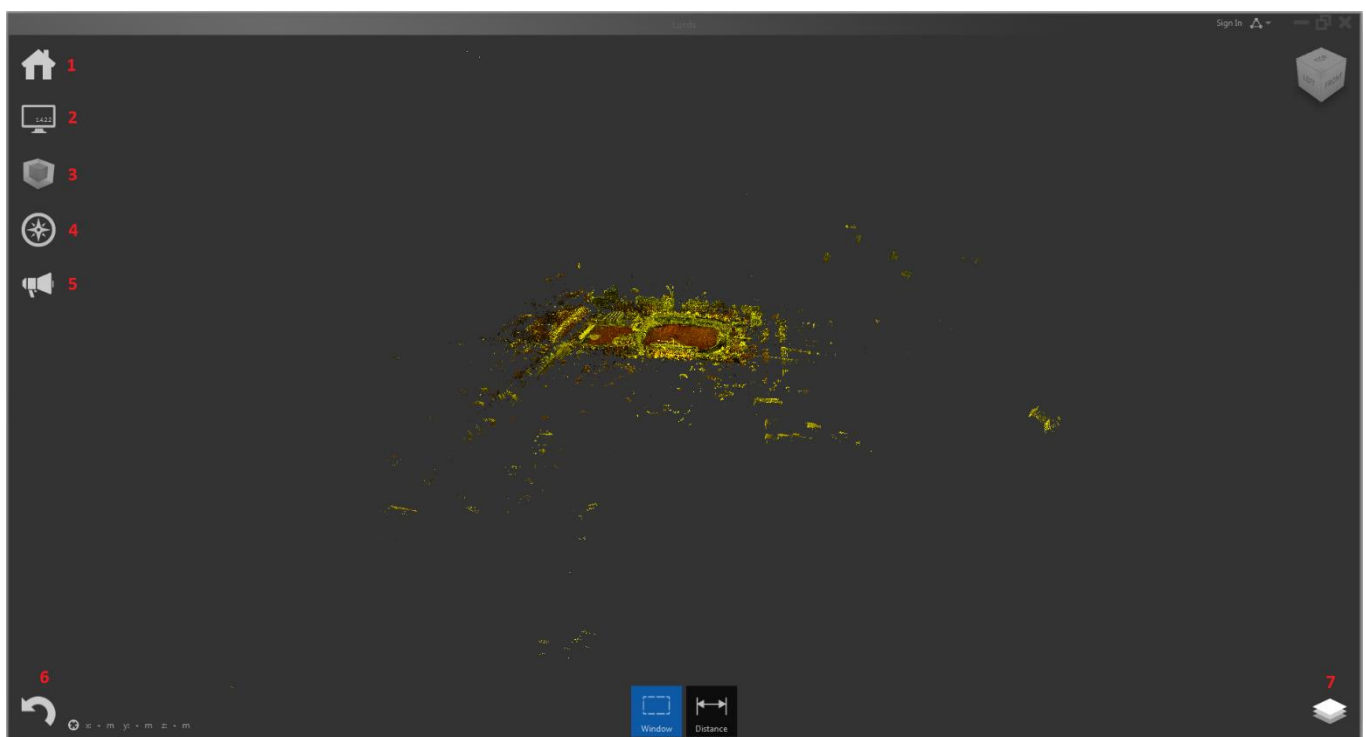
Introduction

This white paper is part 2 of a 3 part series in which I will be covering the full workflow for creating a surface from point cloud data. Part 1 examined the preparation of the point cloud in ReCap for use in Civil 3D. In this white paper (part 2) we will look deeper into the preparation process including removing noise or unwanted areas while part 3 will cover the surface creation process in Civil 3D.

After the Import Process

Having indexed our scans and chosen to launch the project we will be provided an initial view similar to that shown in fig. 1. ReCap uses an interface unlike those utilised in Autodesk's other product offerings with the closest similarity being Infraworks with its Immersive UI. I have numbered each item shown on the homescreen, their functions are detailed below fig. 1.

Fig. 1



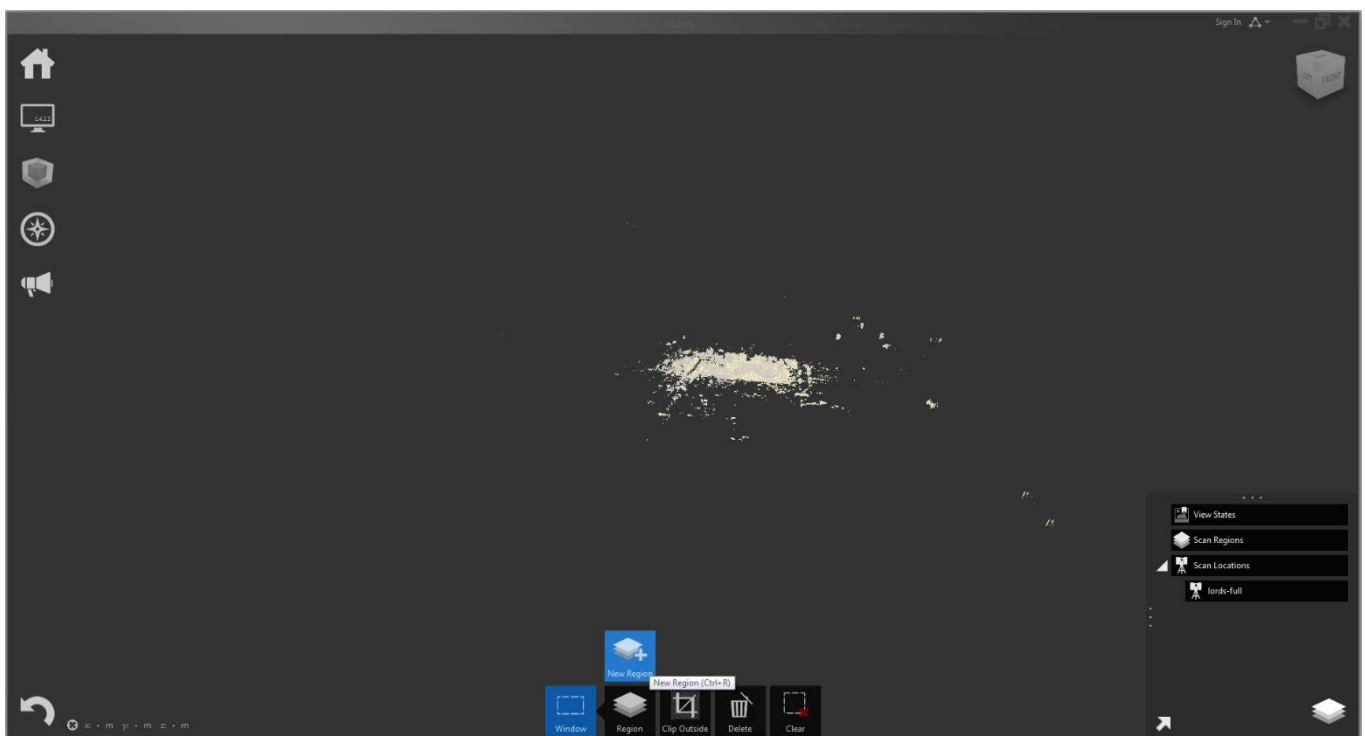
1. **Home** – This menu item allows you to access the open, save, import, export and application preference functions.

2. **Display Settings** – This menu item allows you to customise the way you view the point cloud including the way points are styled, the size they are drawn at, how they are lit and the origin point of the model.
3. **Limit Box** – This menu item allows you to enable and customise the limit box that is applied to the point cloud.
4. **Navigation** – This menu item allows you to access the navigation tools, hovering your cursor over it displays the navigation shortcuts information box.
5. **Feedback** – This menu item allows you to submit feedback on the application to Autodesk.
6. **Undo** – This menu item allows you to access the undo and redo functions.
7. **Project Navigator** – This menu item allows you to access view states, colour and control regions and interrogate scan files. Clicking on this icon will pin the menu open.

Regioning the Scan

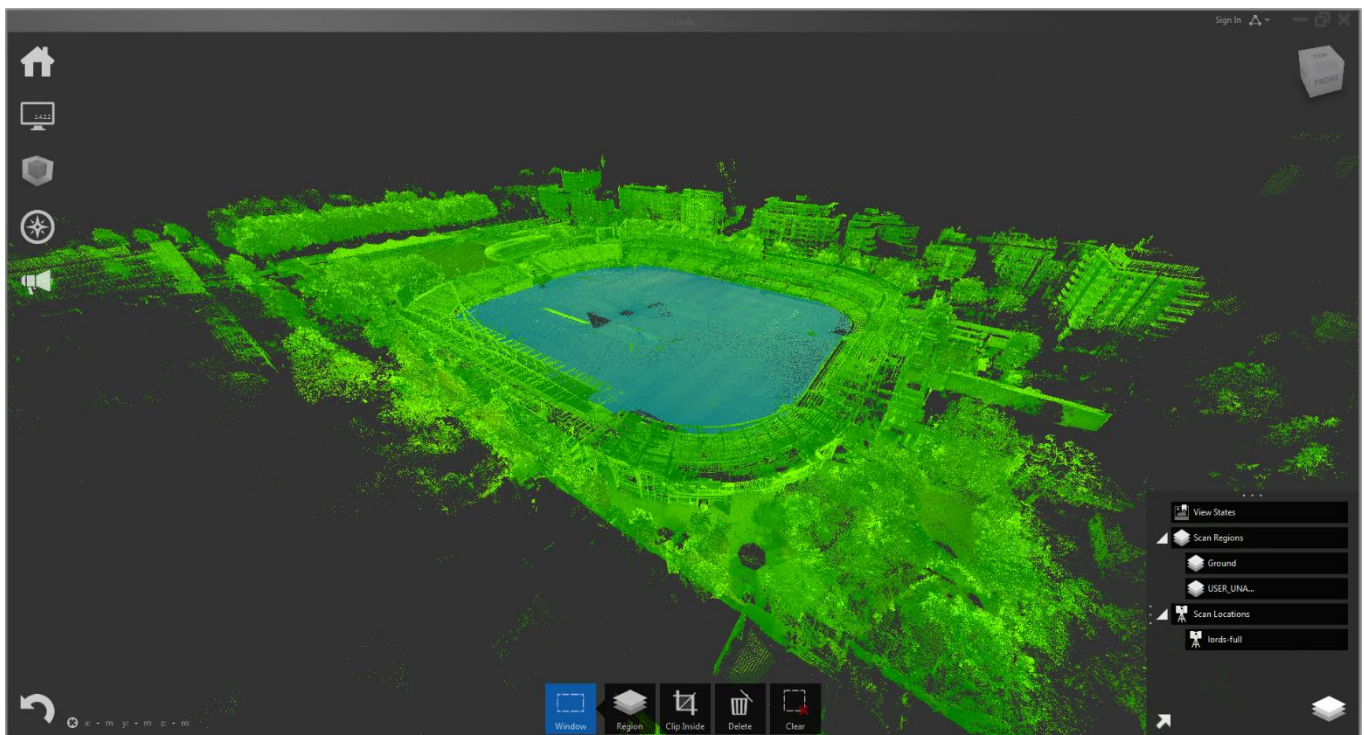
The process of breaking a scan file down into smaller, more relevant or manageable areas is referred to as regioning. It works by selecting points and assigning these to a region that we create and name. We can then export specific areas or objects to separate rcs files. When a project is created it is done so with no regions assigned, if we overlook and just create a region for the points of interest then it can be rather difficult to export just the points we are interested in. Therefore the first step I take when preparing a point cloud is to select every point in the project and create a region called USER_UNASSIGNED_POINTS. This is done by drawing a window around all of the points in the model, when selected they have a white wash applied as shown in fig. 2. I then move my cursor down to the Region button that has appeared at the bottom of the screen and select *New Region*, on the resulting dialog box I enter the name I desire. You can specify a colour for the display of this region in the project navigator though it is worth noting that these colours are only displayed when the points are selected.

Fig. 2



As a Civil Engineer, generally speaking, I am only interested in the ground captured in the point cloud. My next step is to select any points that represent the ground and assign them to their own region so that I am able to export them separately from the other points in my project. Other selection methods can be accessed by hovering your cursor over the Window button in the bottom centre of the screen, the other available methods are fence and plane. I will be utilising the plane tool to select a plane that is 100mm thick from points that I specify on screen. When using the plane tool I have found that it works best by only selecting three points before pressing enter to select the plane, if you need to select additional points to add to your current selection you can do so by holding shift while selecting the points and then pressing enter to confirm the additional selection. This process can be repeated as necessary until you are happy that you have selected all the points you are interested in. My two regions are shown in fig. 3 below with all points selected.

Fig. 3



Exporting a Unified Scan

The export process in ReCap is linked to items that are currently being displayed. This means that if we do not wish for a specific region of points to be carried through to our exported file all we need to do is set any regions that we do not want to see in the export file to not display. This can be done by clicking the eye symbol next to the relevant region(s) in the Project Navigator. When we can only see the points that we wish to export we move our cursor over the Home menu and some additional functions will be displayed, we then move our cursor to the Import icon and finally down to click on the export icon. On the resulting dialog box we are required to give a name and specify a location for the rcs file to be exported to. Having done this we are shown a message stating that a single unified scan file will be created, we also have one last chance to refine the grid of the point cloud we are exporting. Selecting 'let's go! Unify my project scans' starts the process, a status bar is displayed in the middle of the screen for the length of the process. Fig. 4 below shows just my exported scan file having been loaded back into

ReCap. Be sure to join us for part 3 where we will import the processed point cloud into Civil 3D and create a surface directly from the point cloud.

Fig. 4

