AUTODESK UNIVERSITY 2014

PD6092-P: Simplify As-Built Modifications in Plant 3D: Autodesk® ReCap® and AutoCAD® Plant 3D

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PD6092-A Use ReCap software to register your point clouds for use in AutoCAD Plant 3D software. ReCap software simplifies the process of adding new equipment and piping to an existing plant. As-builts can be difficult and getting field measurements that are precise and thorough can be very time-consuming. Using laser scans can ease the pain of this task and make modeling new equipment and piping in as-builts fun again!

Learning Objectives

At the end of this class, you will be able to:

- Understand ReCap® software
- Learn how to import registered scans into AutoCAD® Plant 3D software
- Learn how to add piping and equipment to your as-built AutoCAD® Plant 3D model
- Understand some of the functionality available in ReCap® software

About the Speaker

Scott Hallmark is a Senior Applications Specialist with Applied Software Technology, Inc. Scott is an Inventor 2015 Certified Professional. Scott has been in the Autodesk reseller channel for 6 years working for Applied Software in Atlanta, Georgia, and for ALACAD in Birmingham, Alabama. As a Senior Application Specialist, Scott traveled into Canada and the eastern United States instructing users on AutoCAD P&ID and Plant 3D software and Inventor software and performing installations, implementations, and customizations for many industries utilizing the applications.

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Understand ReCap® software

What is Autodesk® ReCap®?

ReCap® stands for Reality Capture. ReCap® is not the scanning tool or software used to generate the scans. ReCap® is used to manipulate the scans once they have been generated by a scanning tool, such as a FARO Laser Scanner Focus 3D X Series . (pictured below)

Easily process point clouds in the field with targetless registration and open scanner support, and create target-based accuracy reports. Cut project time by more than 50% without compromising data accuracy.

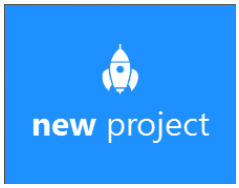
How do I get Autodesk® ReCap®?

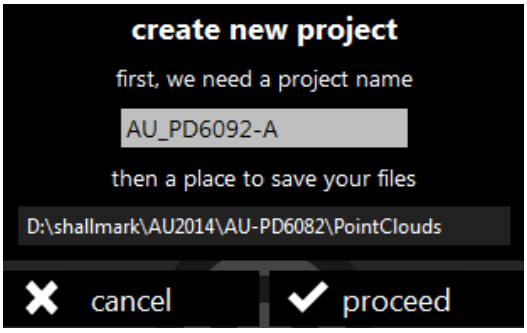
You can download a free trial of ReCap at http://www.autodesk.com/products/recap/free-trial

Learn how to import registered scans into AutoCAD® Plant 3D software

First, let's create a new project!

Open Autodesk® ReCap® and in the upper left corner look for this →





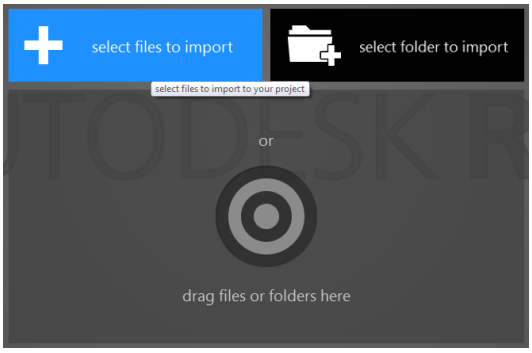
You will be prompted for a name and path for a new project. Give the project a descriptive name.

TIP! ***I typically create the project in a "PointClouds" subfolder in my Plant 3D project location.***

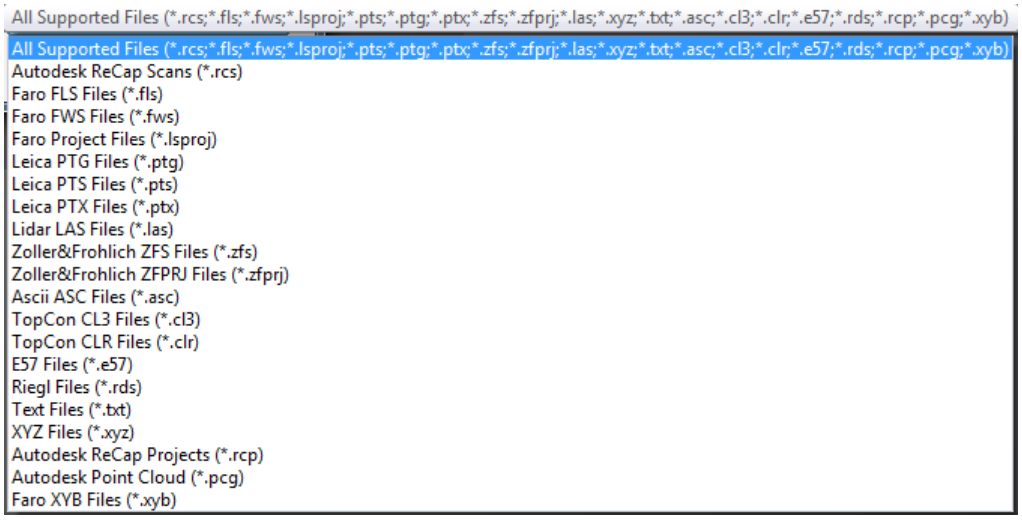
Second, let's import the scan files!

Determine how you will get the files into ReCap next:

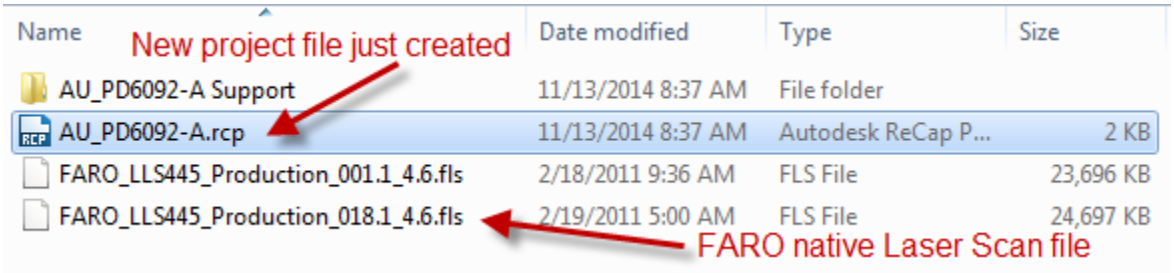
1. ***Select files to import***
2. ***Select folder to import***
3. ***Drag files or folder here***



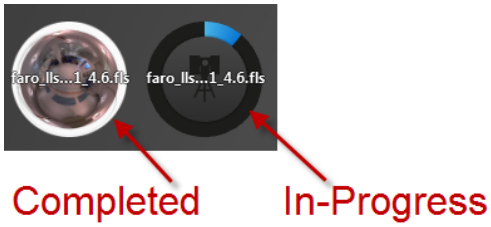
When selecting files to import, be sure to look at the files of type that you can import.



In this example, we are using FARO laser scan files (FLS extension). I can select both files to import at once. In the image below, also see the project file that is created (RCP extension).



The files will begin importing into ReCap. You will see a progress circle around the files being imported. Notice the difference between a completed import and an in-progress import.

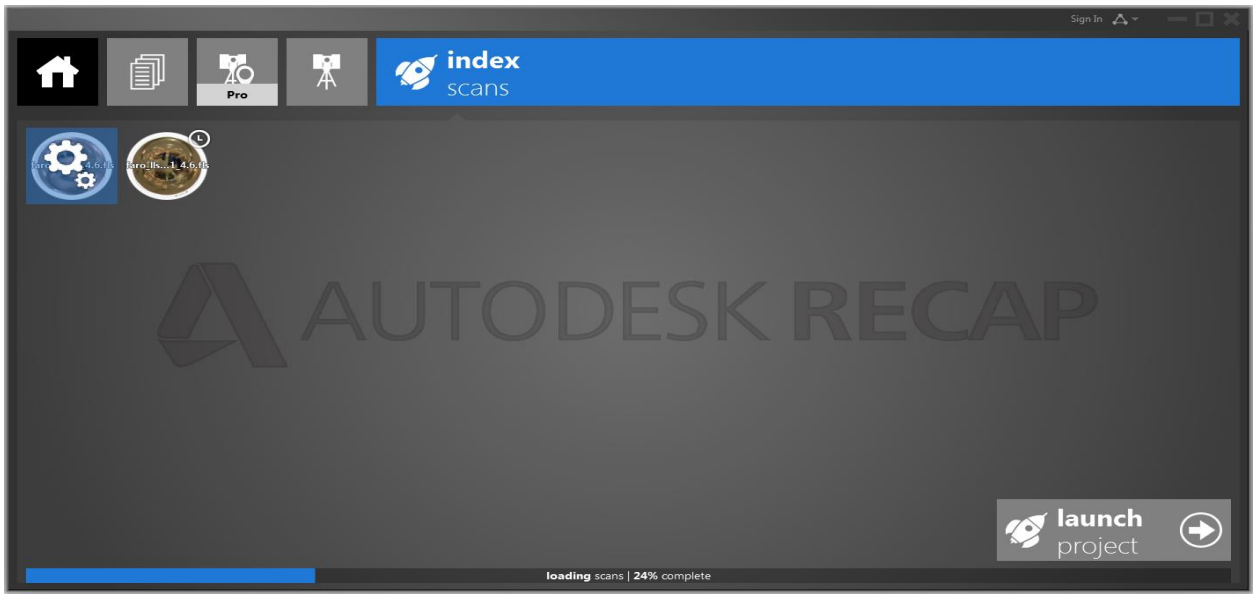


Repeat the process by selecting the large + icon if you need to include additional scans from other folders or the same folder.

Third, let's index the scans!

So far, it is a simple process and it just gets easier! Index the scans you just imported by selecting this →

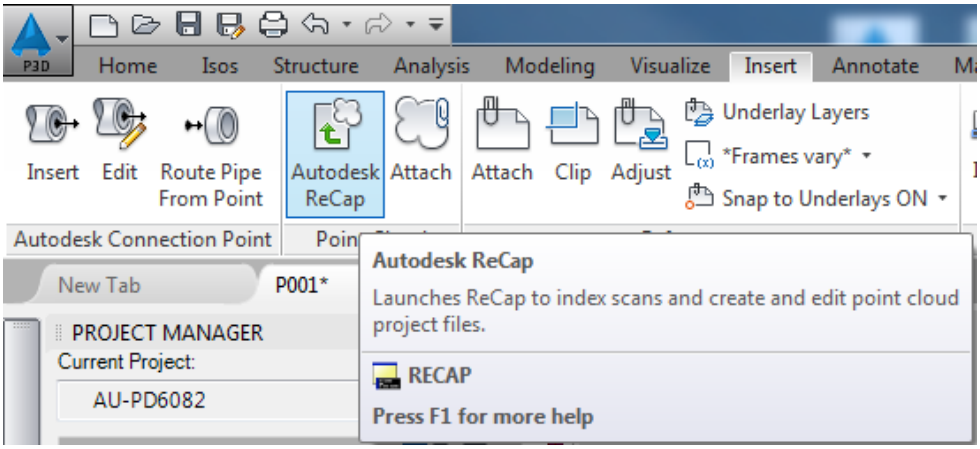
This will take a few minutes based on how many scans you have and how large they are. You will see a progress bar at the bottom of the application letting you get a good estimate on whether you have time to grab a coffee or not. When it is complete, click LAUNCH PROJECT.



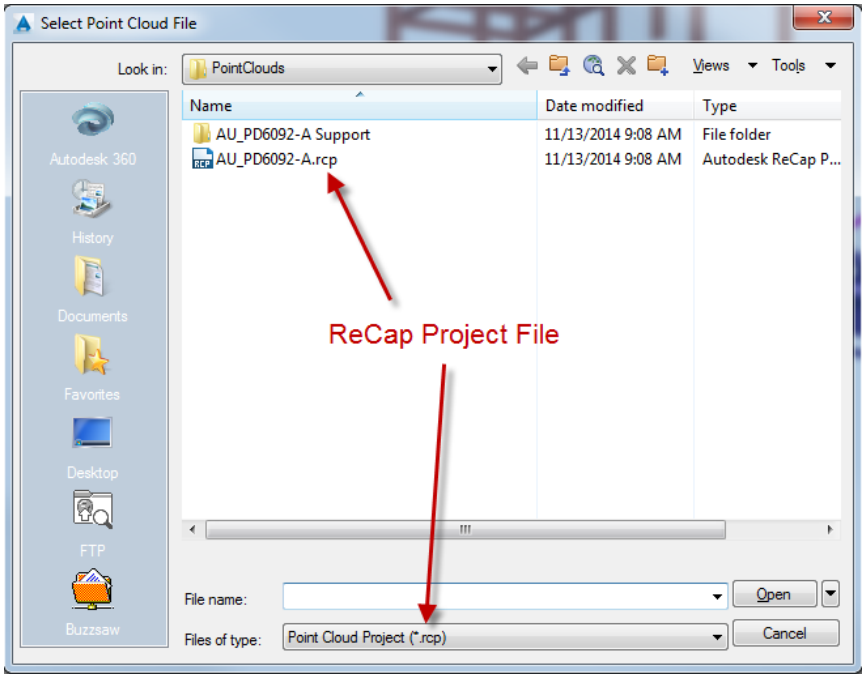
Learn how to add piping and equipment to your as-built AutoCAD® Plant 3D model

Let's go to Plant 3D now!

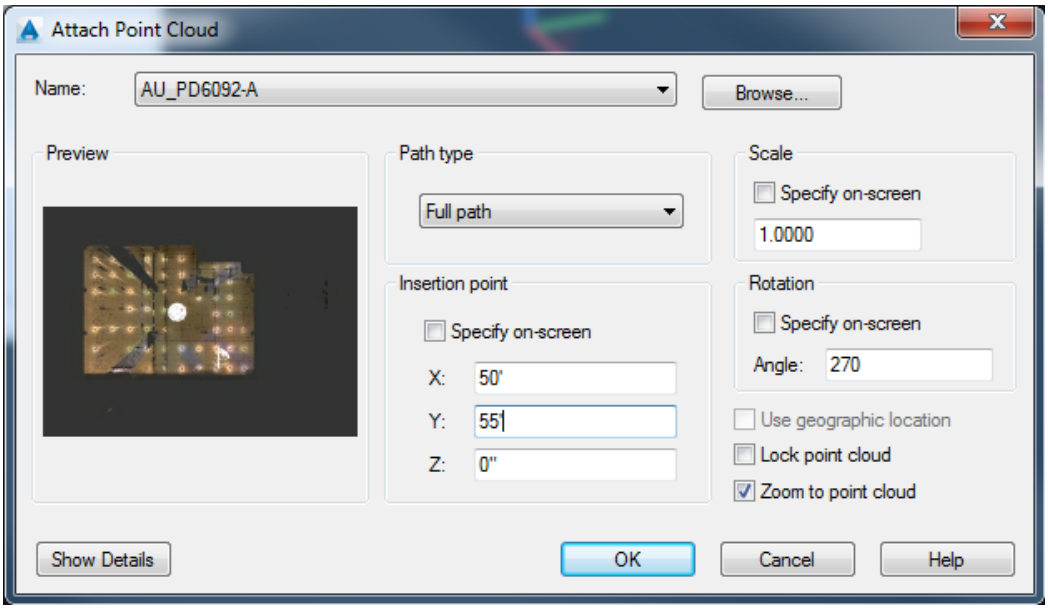
If you have not gone thru the steps above and are already in Plant 3D, you can launch ReCap from the INSERT tab in the ribbon. You will see a button in the POINT CLOUD category labeled Autodesk ReCap.



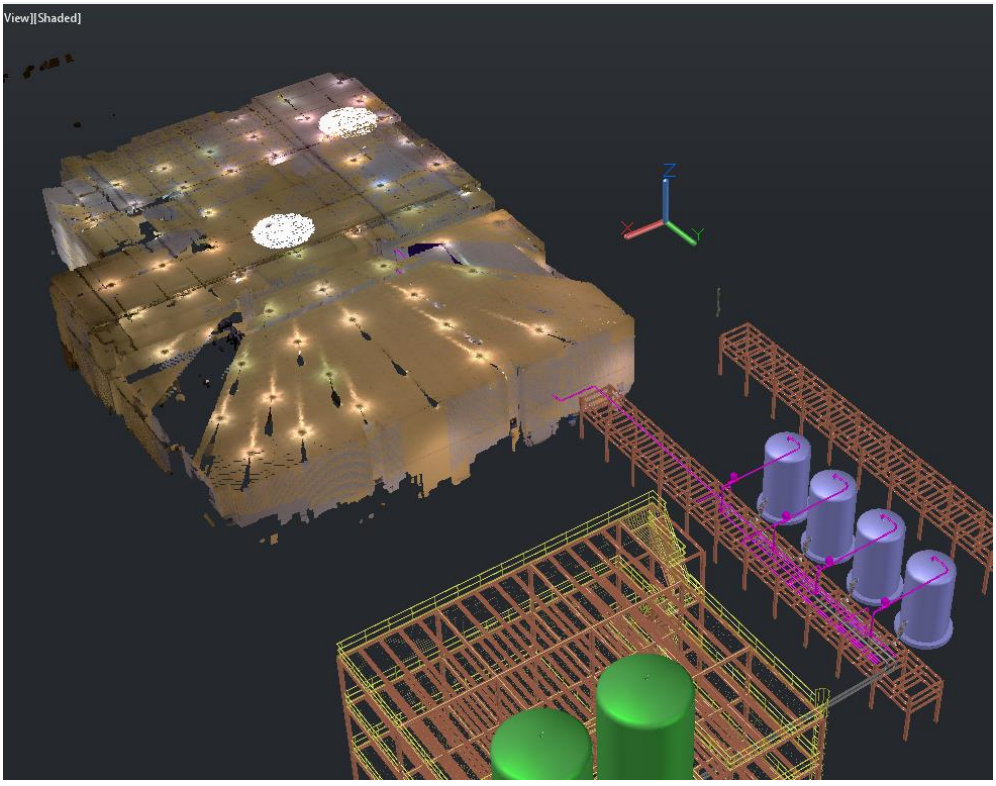
To the right of that button is ATTACH and that allows you to attach the newly created Point Cloud Project from ReCap. (RCP Extension)



Insertion of your Point Cloud should be determined ahead of time. If you want to insert based on specific coordinates, use your X-Y-Z options to locate the Point Cloud. You should not have to SCALE the scan as it is already to scale!

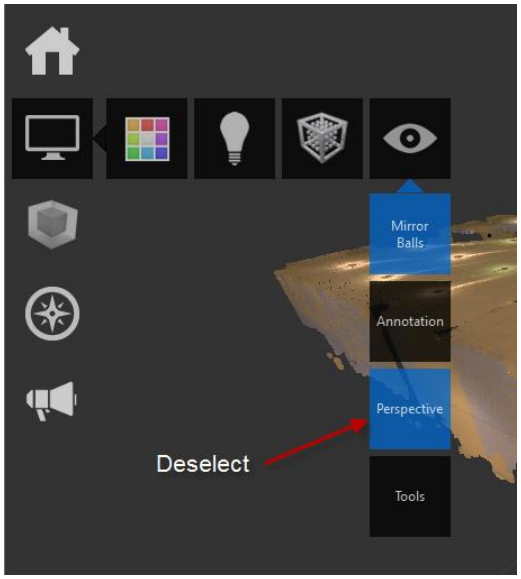


Once the scan is inserted, you will see the Point Cloud in AutoCAD Plant 3D with your model.



The Point Cloud brings in everything! The As-Built conditions are all there. Explore it and look at the area you will need to place new equipment and piping. It can get a little crowded with all those millions of points. We are looking at the entire building when we really just need to work in a specific area. With ReCap, you can create REGIONS which are sort of like layers in AutoCAD. Let's create a few regions in ReCap to make this next step of placing equipment and piping much easier.

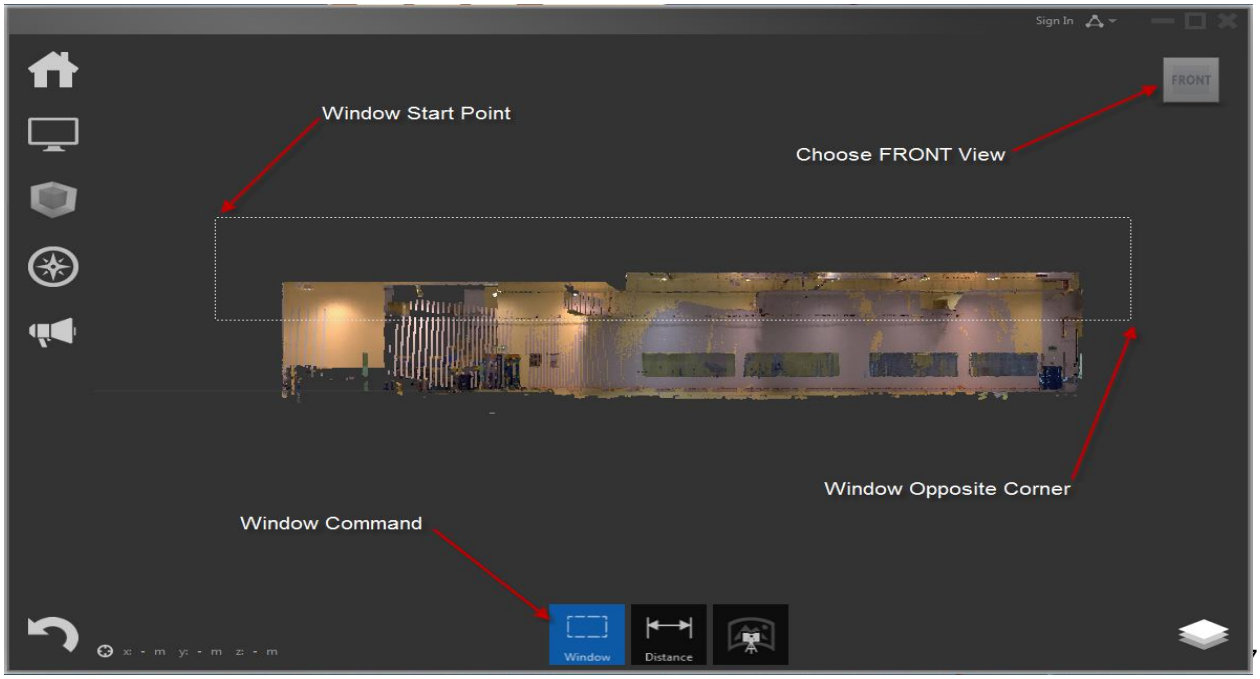
TIP! ***Close the plant model that you have inserted the Point Cloud into. You do not need to close down Plant 3D. The Point Cloud while in AutoCAD is "in use" and any changes you make in ReCap will not be saved if the file is "in use" in AutoCAD.***



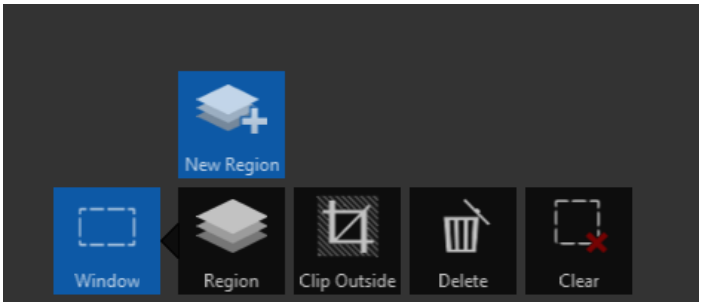
In ReCap, when we start creating Regions, we need our view to NOT be set to PERSPECTIVE. Why? We will be creating windows around the points we want to assign as a Region and if perspective is set, you are not able to grab points orthogonally, but rather at perspective angles. Trust me on this one!

The View Cube will be your best friend in ReCap while creating Regions. The predefined views make it simple to grab a window of points.

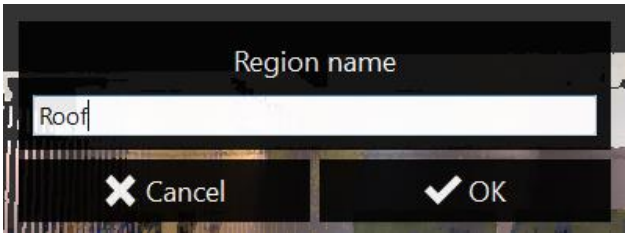
Select the FRONT view on the View Cube and the use the WINDOW icon at the bottom of the ReCap application to create a window around a group of points.



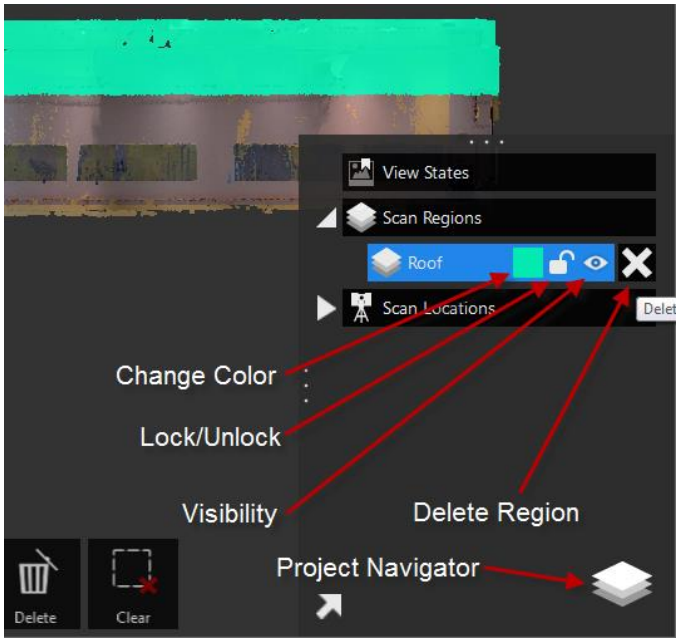
This will highlight the points. At the bottom of the application is a REGION icon. Hover over it and select the NEW REGION option.



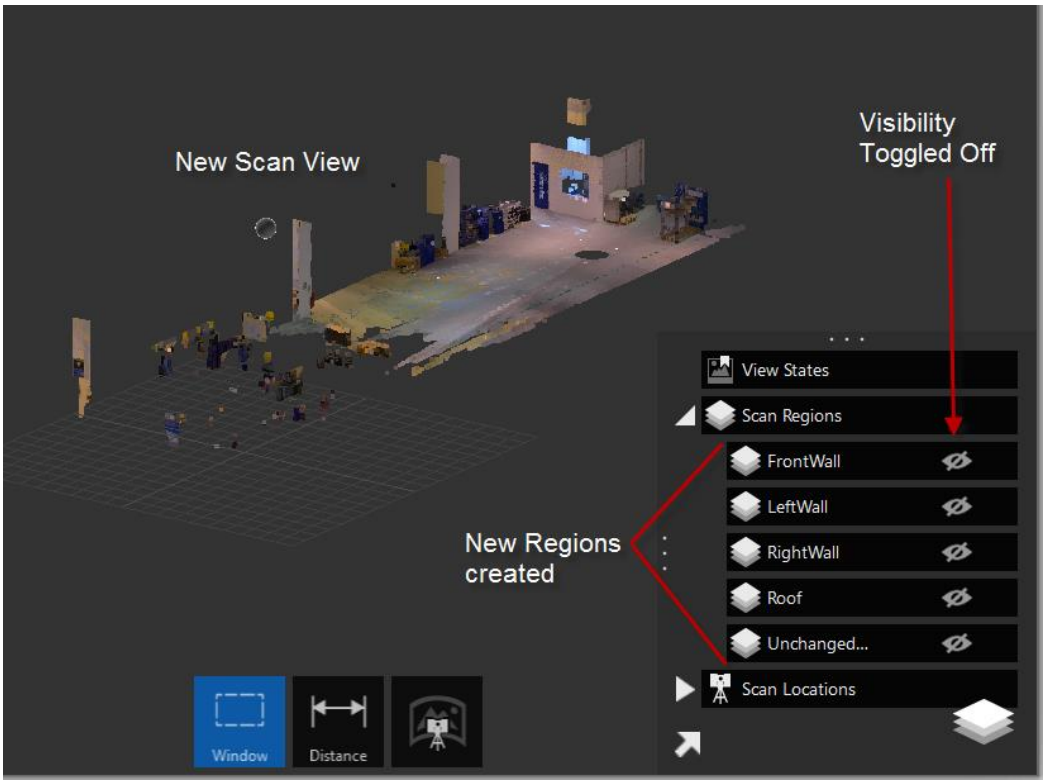
Enter a name for the REGION you would like to create. Make it descriptive!



Hover over the Project Navigator (Q) icon on the bottom right of the application. You will see a menu of options appear, one being SCAN REGIONS. Expand it and see the new region you created. From here, you can change the color of the region, lock or unlock it, and turn off/on visibility. We will use the visibility option in AutoCAD Plant 3D.

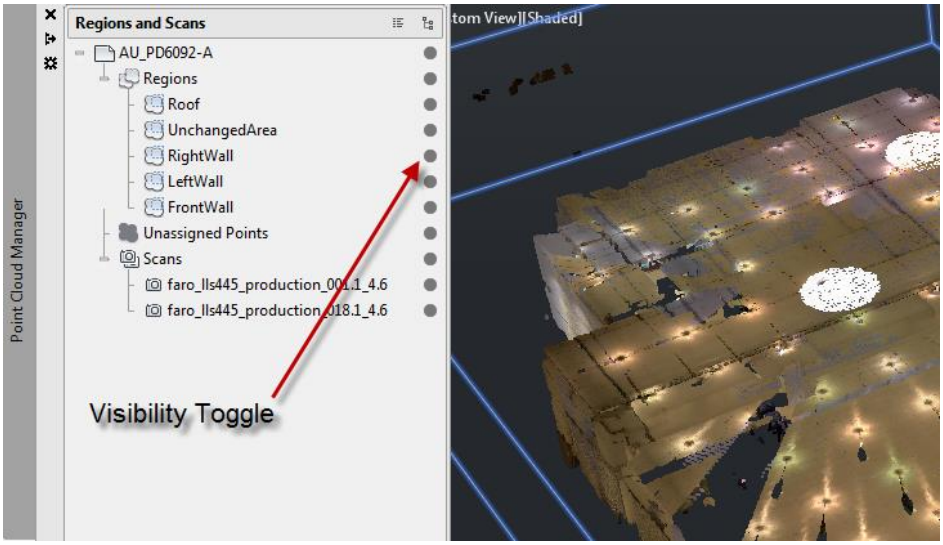


Continue to create more regions as needed. You can toggle off the visibility of the regions to provide more clarity of the as-built area you will be working in.

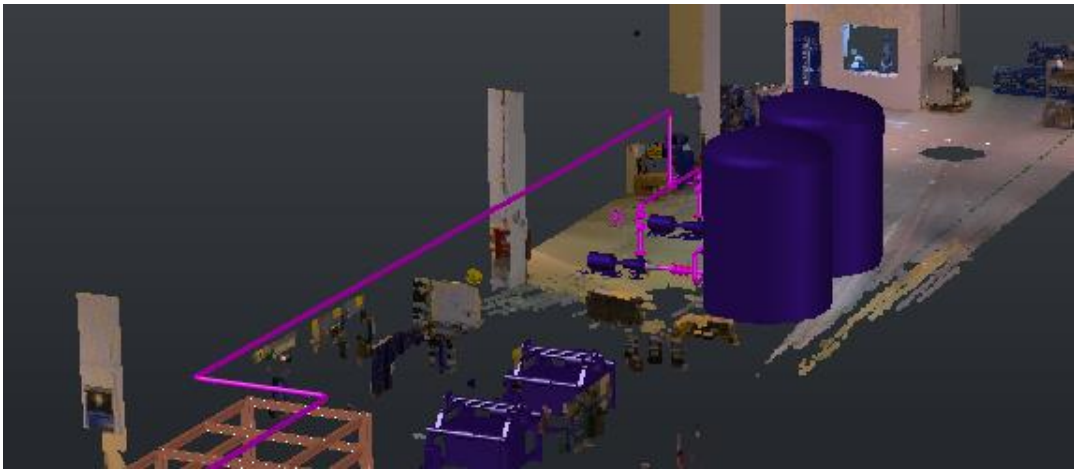


Save the ReCap Project and go back to AutoCAD Plant 3D.

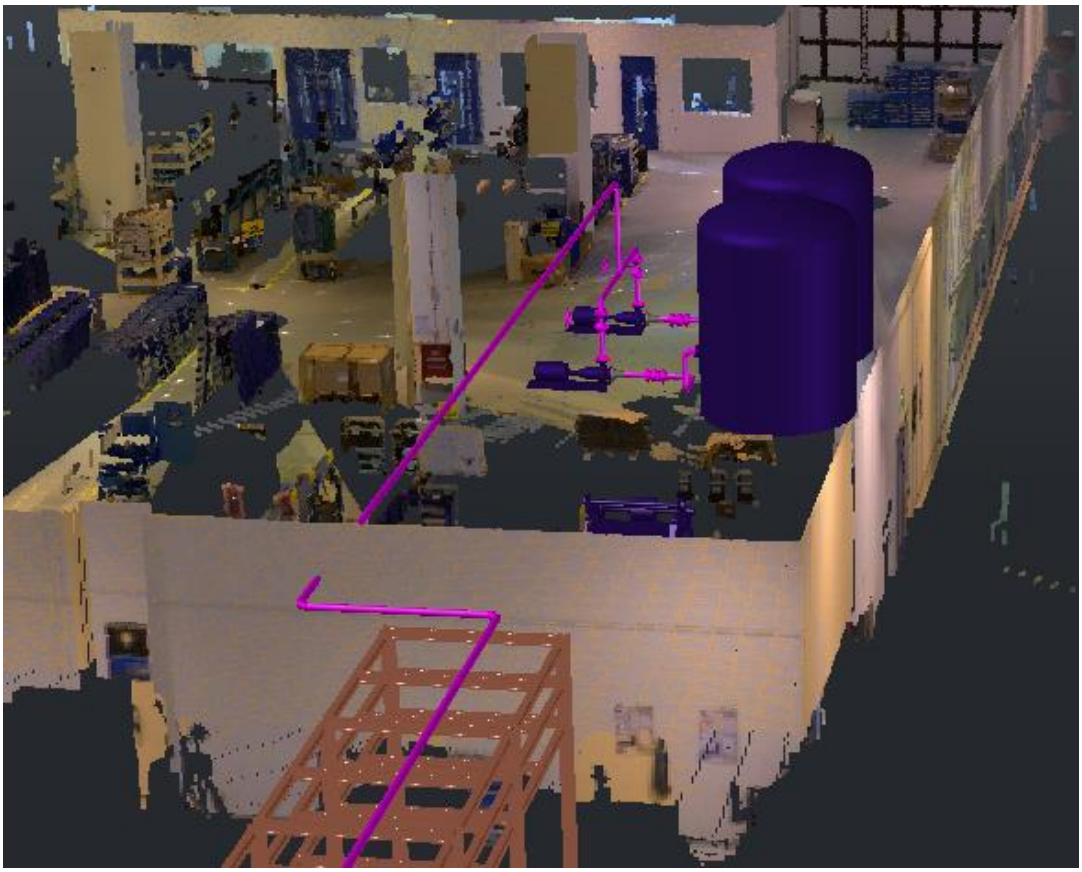
In AutoCAD Plant 3D, right-click on the Point Cloud and select POINT CLOUD → POINT CLOUD MANAGER. This will open a new Dialog Box containing the Region and Scan options. The single DOT to the right of each Region and Scan is the Visibility Toggle.



With the Regions now toggled off, you can work in the area you need to place new equipment and piping in much more effectively. I have added two tanks, two pumps and routed pipe connecting the new equipment to existing equipment in the model.



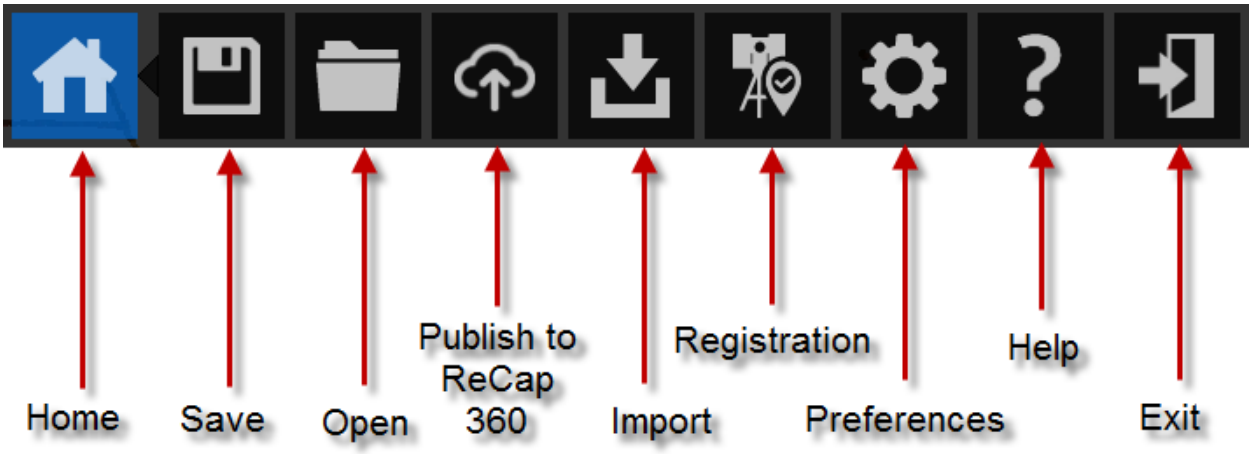
In this view, I have turned on all the Regions except the ROOF Region so that I can check for any visible interference. If I want to do a true Clash Detection, I will open up all of the Plant 3D files, including the Point Cloud, in Navisworks Manage (part of the Plant Design Suite Ultimate).



Understand some of the functionality available in ReCap® software

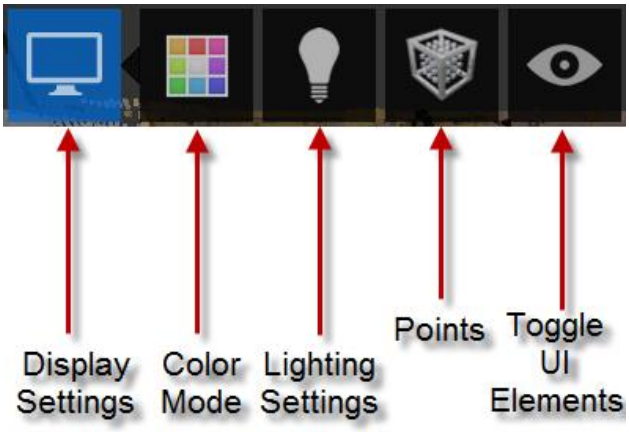
The Left-Side Menu - HOME

These are your standard "File" type commands. Some do have fly-down menus that you may want to look at but for the most part, very standard commands.



The Left-Side Menu – DISPLAY SETTINGS

The Display Settings fly-out menu has several commands you will want to experiment with. From the Color Mode options like RGB, Elevation and Scan Location, to the Point Display Slider, to the ability to turn off Perspective View. Another list of important tools show up in the Toggle UI Element fly-down menu: Toggle View Cube, Navigation, and the Scanorama View.



The Left-Side Menu – NAVIGATION

The Navigation Settings have nice instructions for you to know how to use them.

The Bottom Menu – SELECTIONS, MEASURING and SCANORAMA

Selections are simply selecting a group of points. Measuring allows you to select points to get distances, angles and placing notes. Scanorama allows your to see the photo realistic scan from the scanner locations.

The Bottom Menu – SELECTIONS initiate REGIONS

Make a Window Selection and the Regions options appear. You can create, unassign and delete Regions, as well as add a selection to an existing Region.