

# 3D Laser Scanning & Modeling for Condition Assessment & Asset Management/Planning

By:

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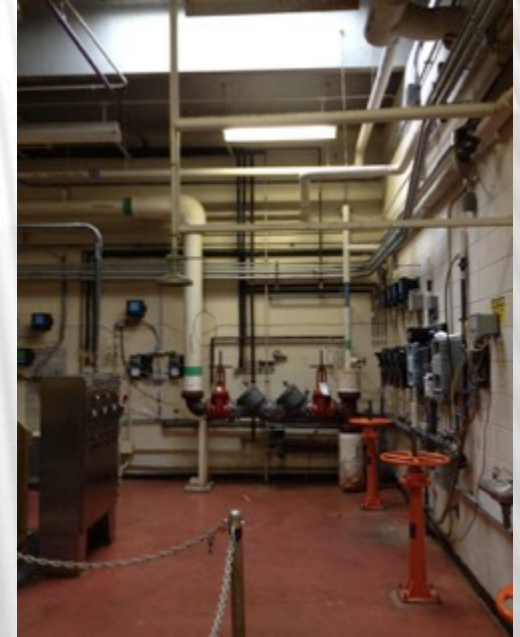


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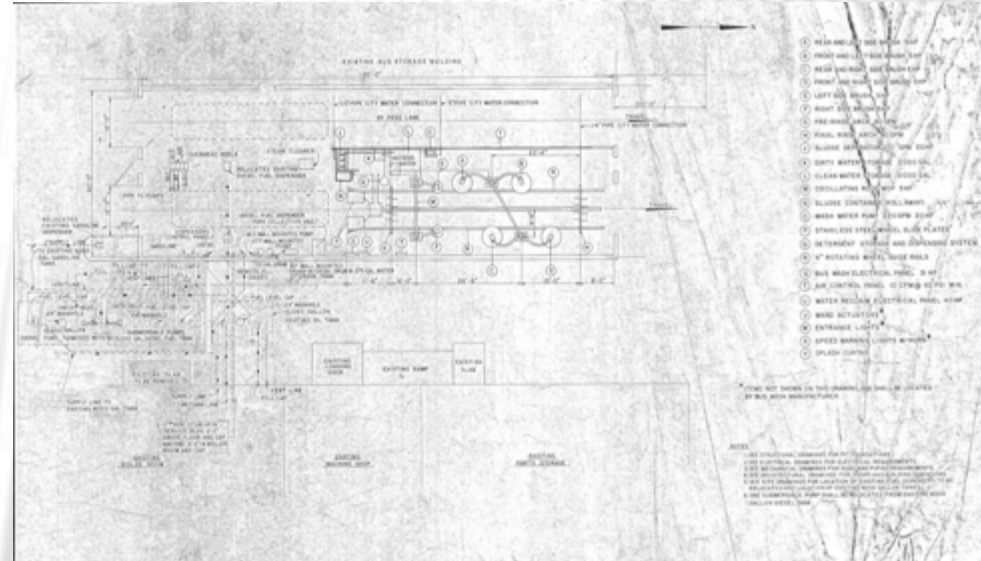
# Traditional Methods of Documentation

- Photographs
- Survey Location
- Tape Measure
  - Can't access
  - Time Consuming
- Existing Plans
  - ACCURACY



# Problems During Design

- Existing As-Built plans are not accurate
- Pipes / components missing
- Return trips
- Improperly located
- Where were measurements taken?
- Existing plans not accurate
- Generally only 2D



# Problems During Construction

- Conflicts
- Equipment won't fit
- On-site fabrication
- Change orders
- Time delays
- Increased cost



# A Better Way: 3D Laser Scanning



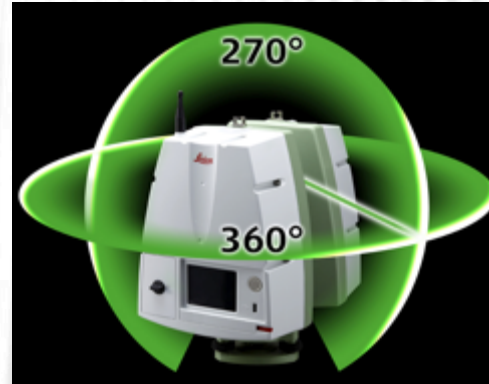
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# What is 3D Laser Scanning?

Also known as LiDAR (Light Detection And Ranging), it is the ability to collect large volumes of spatially accurate data in a short period of time.

Data is collected via phase-based or pulsed-based scanning and can be acquired at a rate of 4 thousand to over 1 million points per second.



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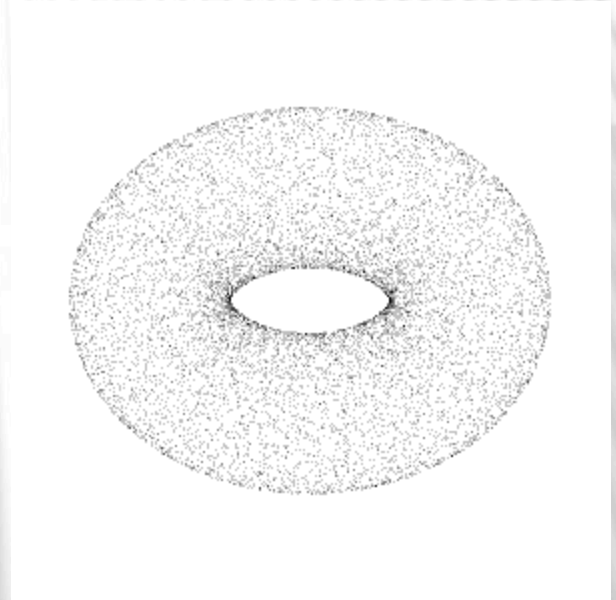


# What is a Point Cloud?

A point cloud is a set of data points, each with a X, Y, and Z value.

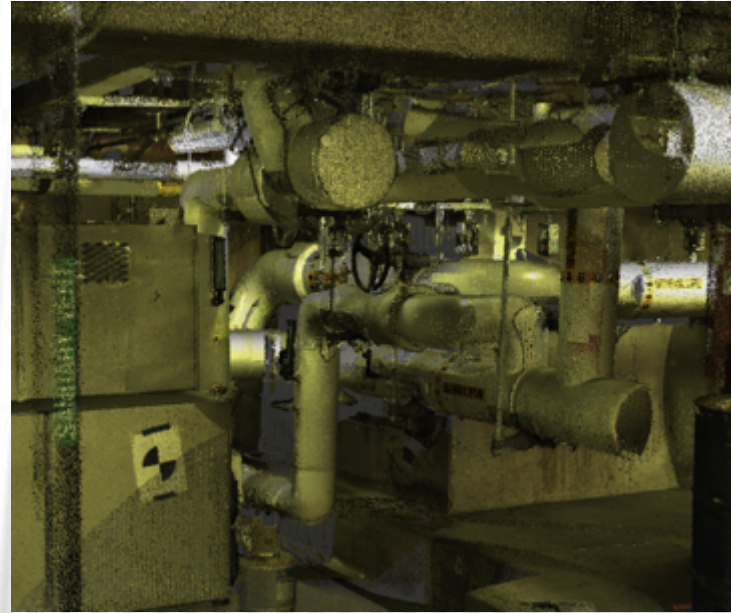
A typical point cloud of a 10'x10' room contains over 200 million points.

Each point can be displayed with real world colors if desired.



# What is Laser Scanning Designed to Do?

- Document existing conditions
- Site Detail
- Construction Monitoring
- As-built Documentation
- Facilities Construction
- Planning and Design Studies
- Facilities Management



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# Why Utilize 3D Laser Scanning?

- All visible components are located
- Components are spatially accurate
- Eliminate return trips
- Conflicts easily identified
- Allow for prefabrication
- Place on a datum of choice
- Work directly from point clouds

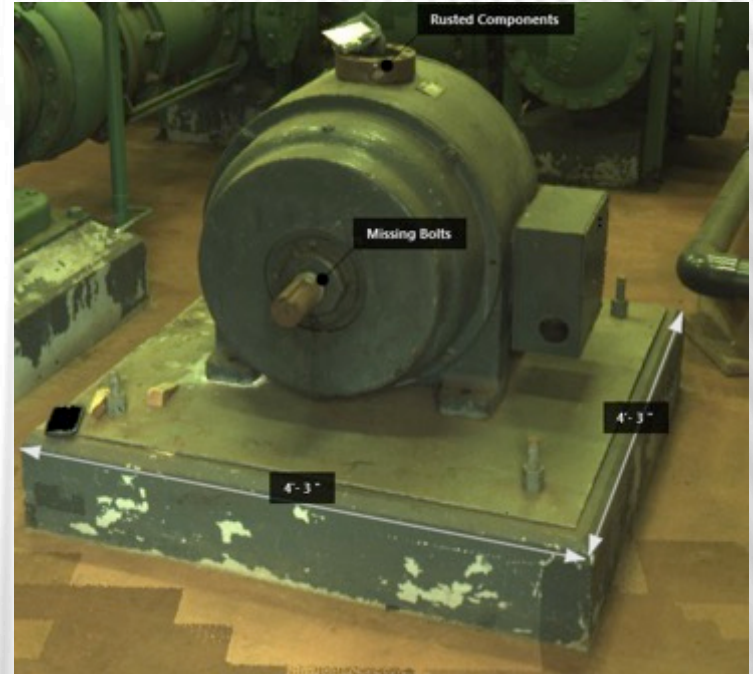


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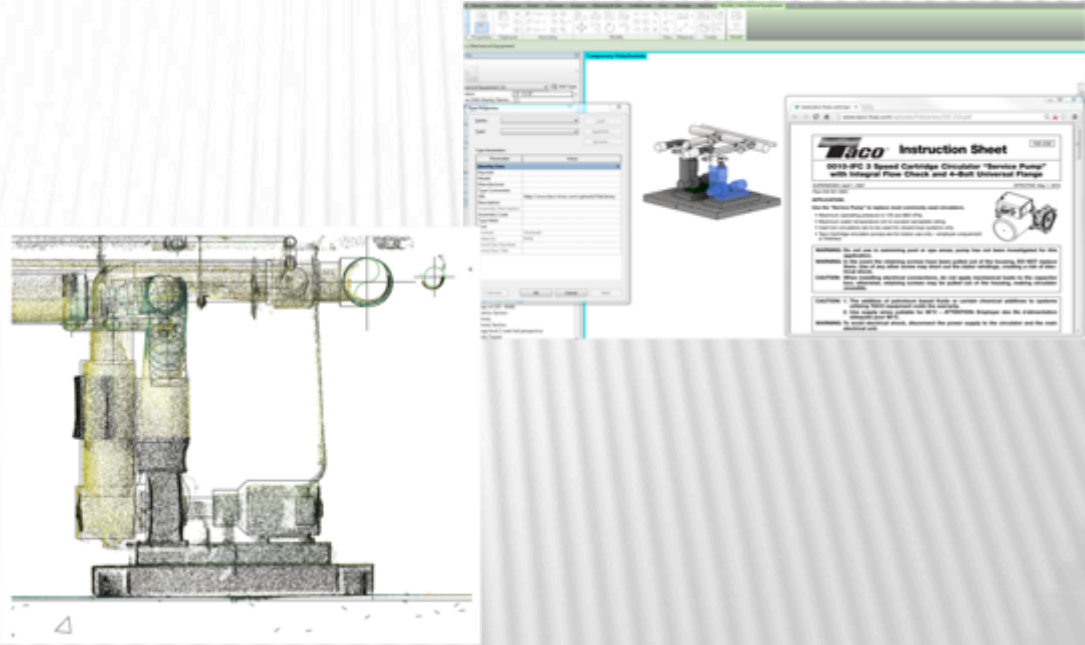
# Condition Assessment

- Use colorized point cloud to visually inspect equipment
- Use ReCap to take measurements and add notes



# Asset Management / Planning

- Laser scanning can be utilized to extend the created model into the life of the building by utilizing it for facilities management.
- Update models with the use of laser scanned data



# Asset Management / Planning

- Document Existing Areas for Space Planning

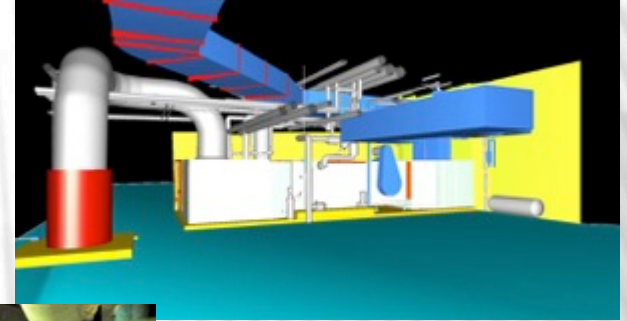


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# Asset Management / Planning

- Document Existing Areas for Space Planning
- Locate Equipment Scheduled for Replacement to Minimize Downtime and Allow Prefabrication

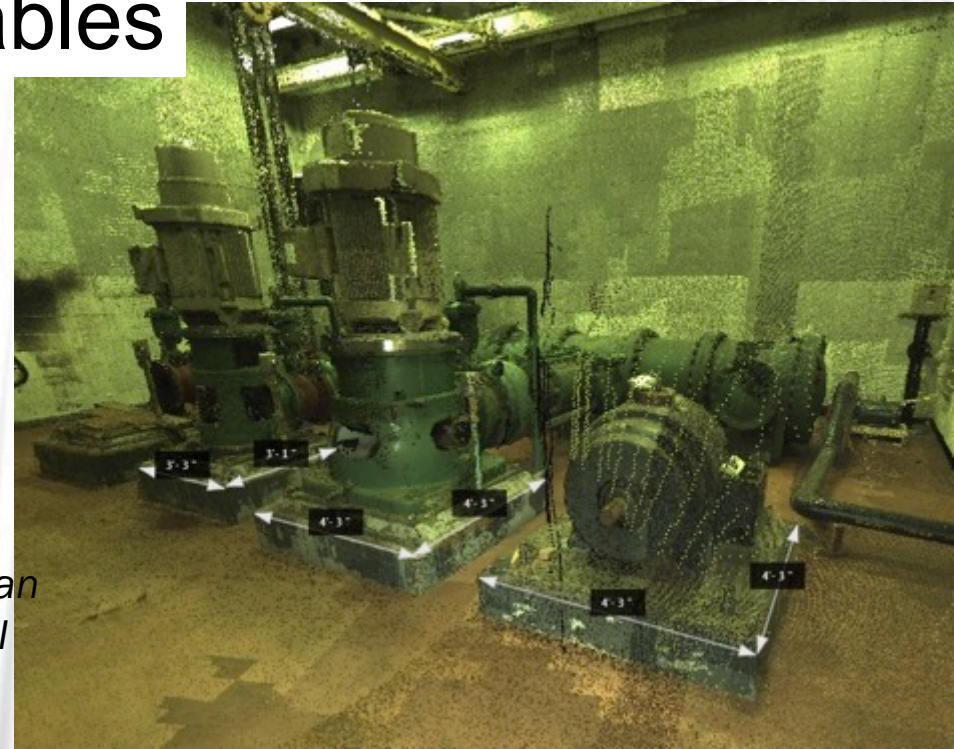


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# Deliverables

- 3D Point Cloud for direct insertion into Revit, AutoCAD, ReCap, Smart Plant or numerous other design packages



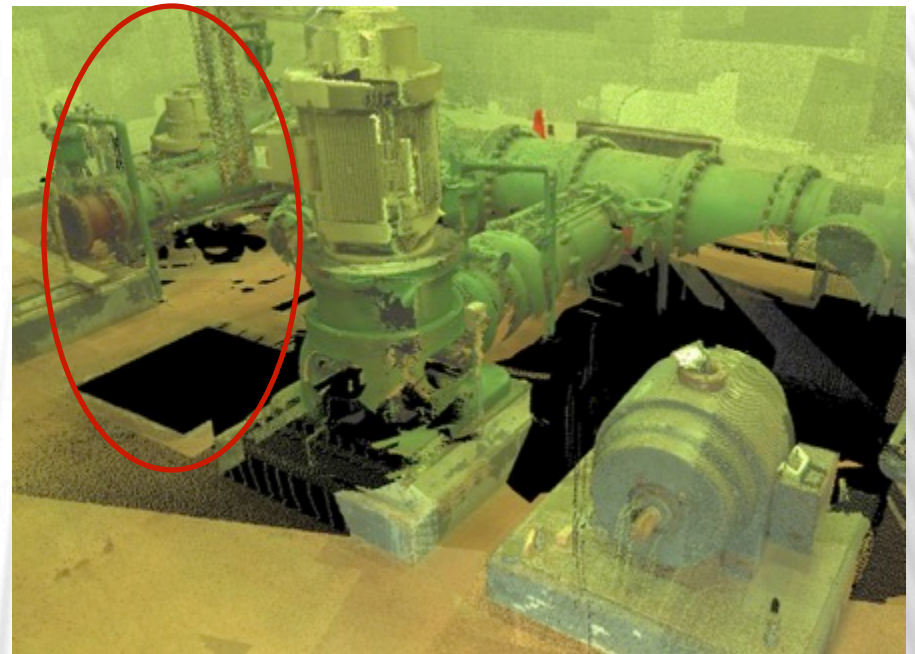
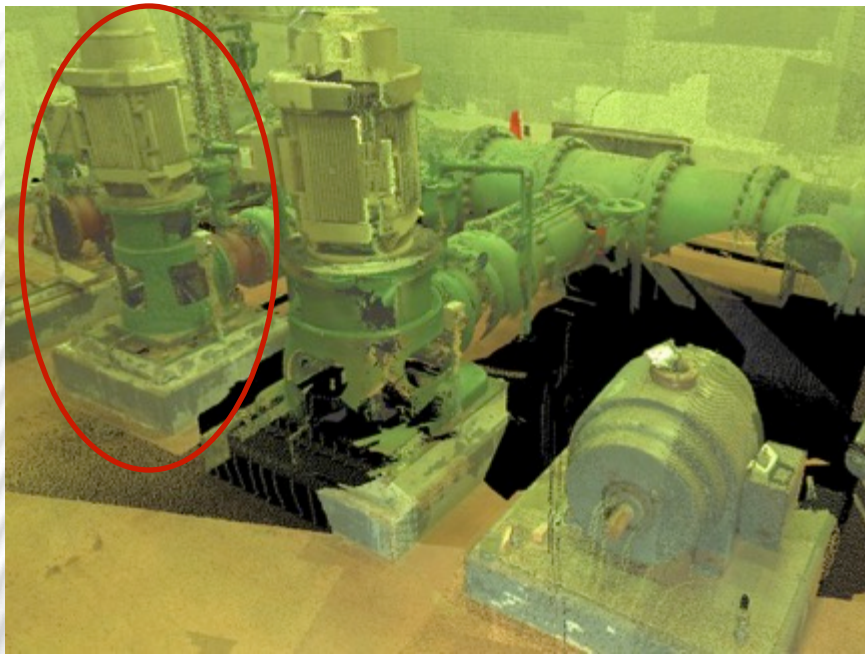
*"I loved being able to just open up the point cloud scan to look at it and get the measurement I needed as if I were back on site."*

– Woody Bailey, Wright-Pierce

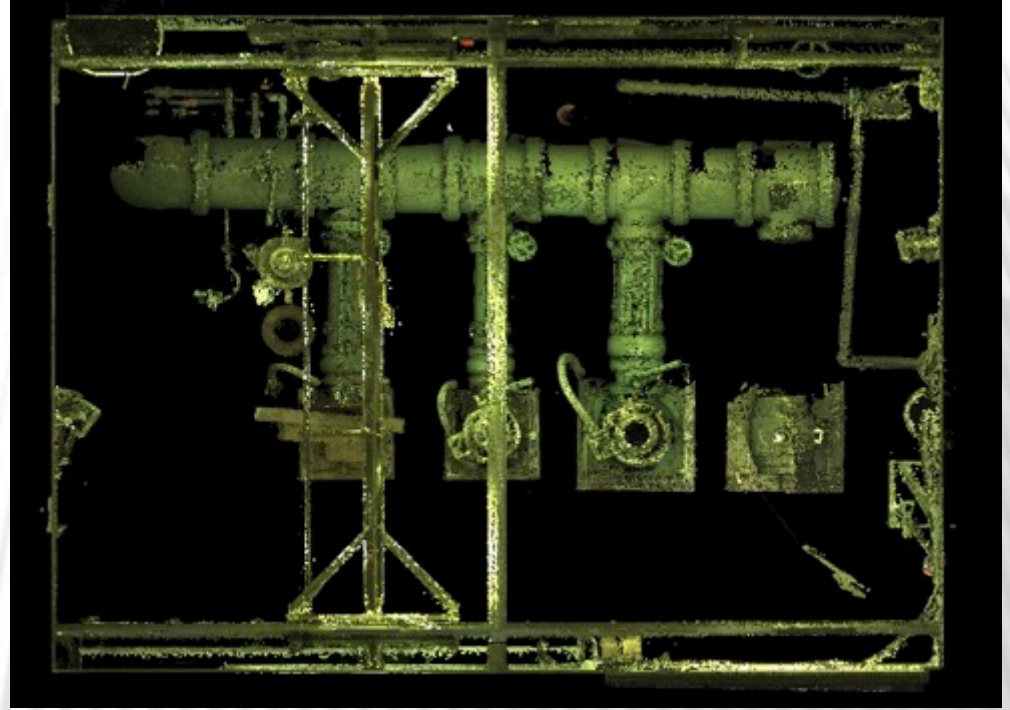


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Easily clip out equipment to be replaced



Create quick site plans and floor plans  
from only the point cloud

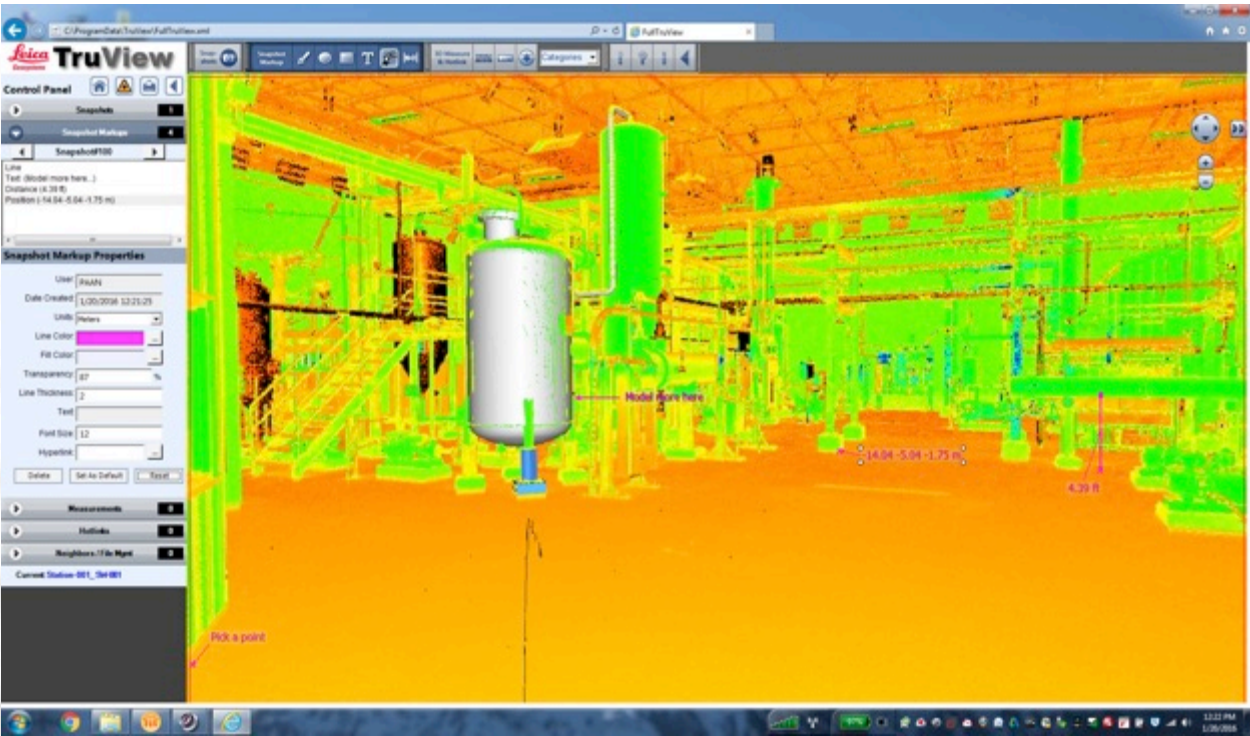


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- Use link to view point cloud within Internet Explorer
- Easily add notes and measurements

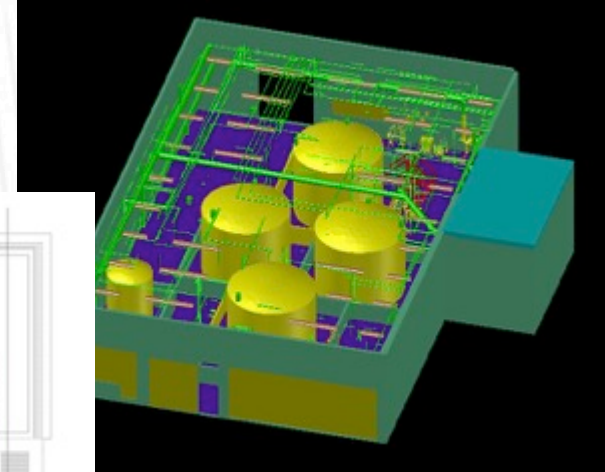
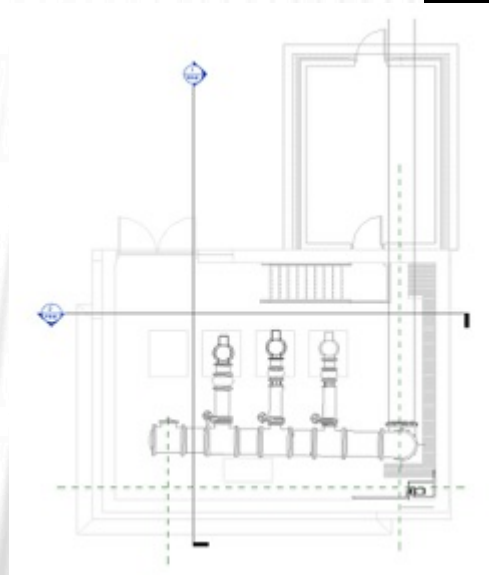


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- Accurate 3D Models prepared in
  - Revit
  - AutoCAD
  - SmartPlant

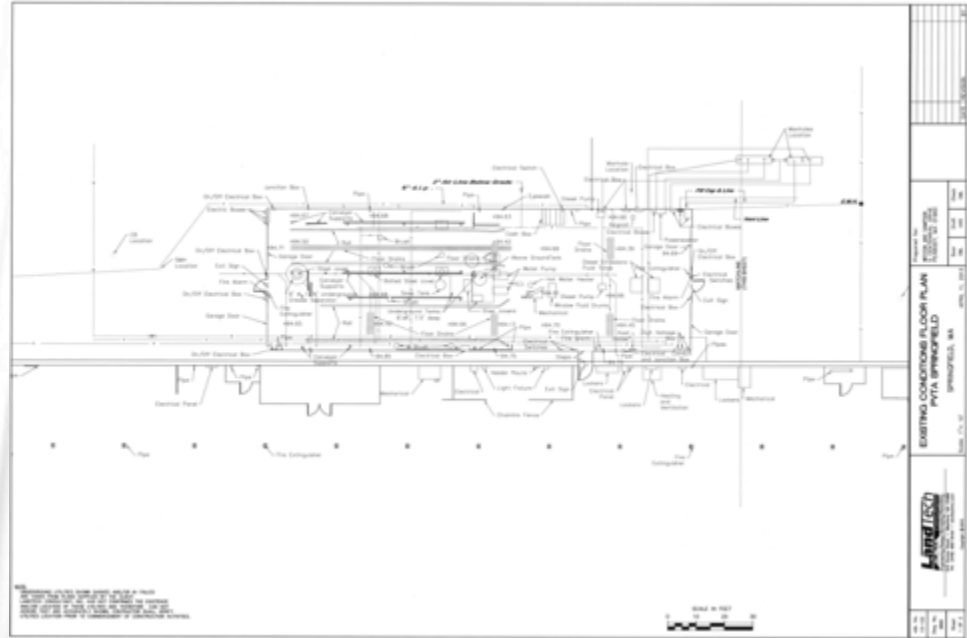


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# Deliverables

- 3D Point Cloud for direct insertion into Revit, AutoCAD, ReCap, Smart Plant or numerous other design packages
- Accurate 3D Models prepared in
  - Revit
  - AutoCAD
  - SmartPlant
- 2D Line Drawings



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# Questions?

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