



# Tools for Green Design



**AAK** | PROMOTING EXCELLENCE  
IN THE BUILT ENVIRONMENT



# About the Speaker

## Babu Brian

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- Architect and Technology Manager – Symbion Consulting Group
- Founder: ARQI Solutions Studios

Architect with a focus on innovation specializing in Urban & Master planning, Green Design and Building Information Modelling.

Evidence-based analytical and capacity building solutions to existing and emerging challenges across the built environment.

Using new innovative hardware and software packages to assist professionals in the built environment integrate site conditions, energy, lighting, and solar analysis into their workflow and leverage sophisticated simulation engines helping empower AEC professionals to make smart, data-driven design choices.



The construction industry is changing fast

How do we scale to face the challenges  
ahead?

How do we bring every part  
every team closer together?

# Tools for Green Design

## Trends in the Construction Industry?

- Manual Labour — Automation
- Drawing Interpretation — Building Information Modelling
- Cost Estimation — BIM Take off
- Artisans — Printed Manufacturing

# BIM vs Traditional

Impact on Costs

Costs of CI

Effort

Preliminary Design

Concept Design

Detailed Design

Construction Detail

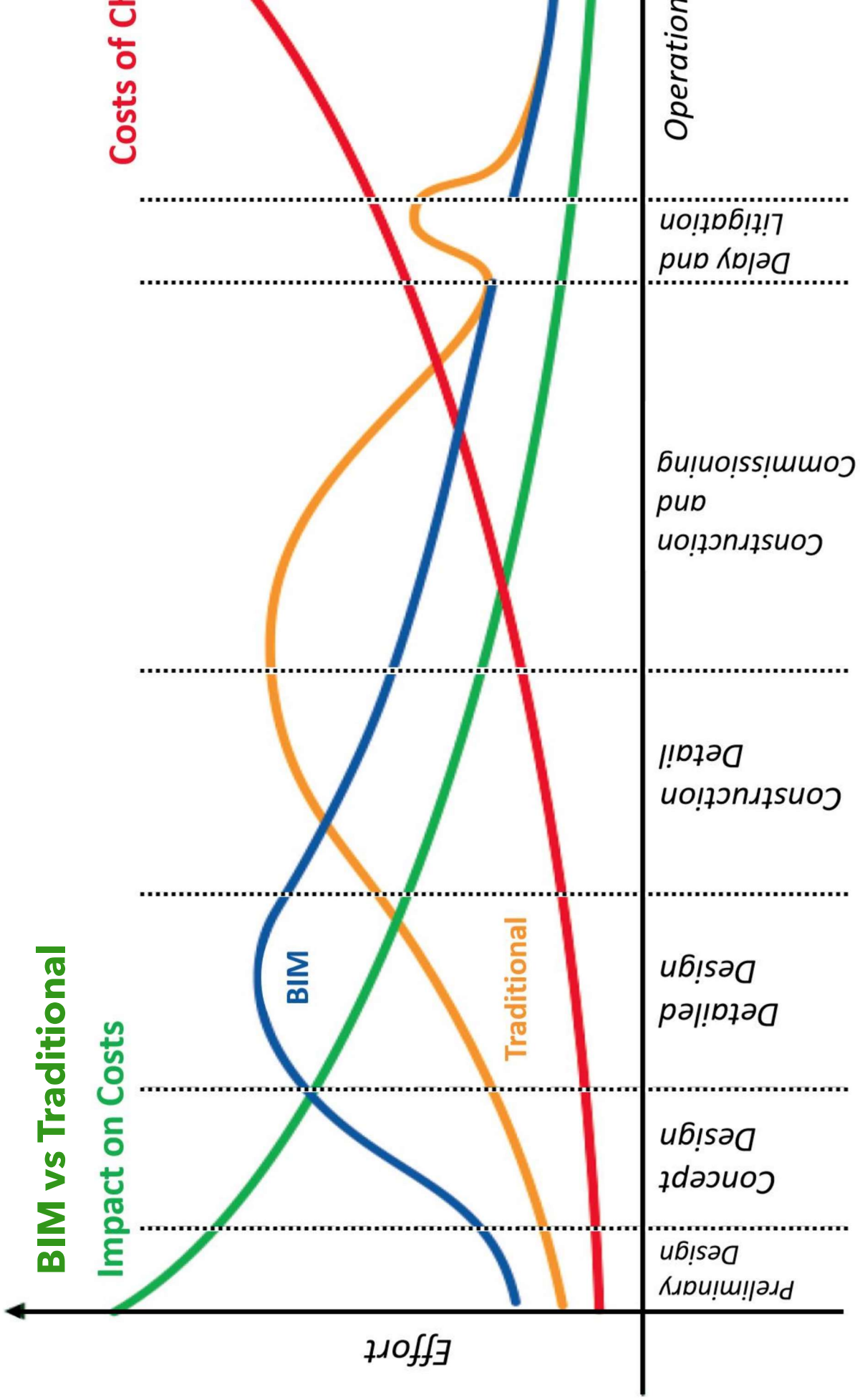
Construction and Commissioning

Delay and Litigation

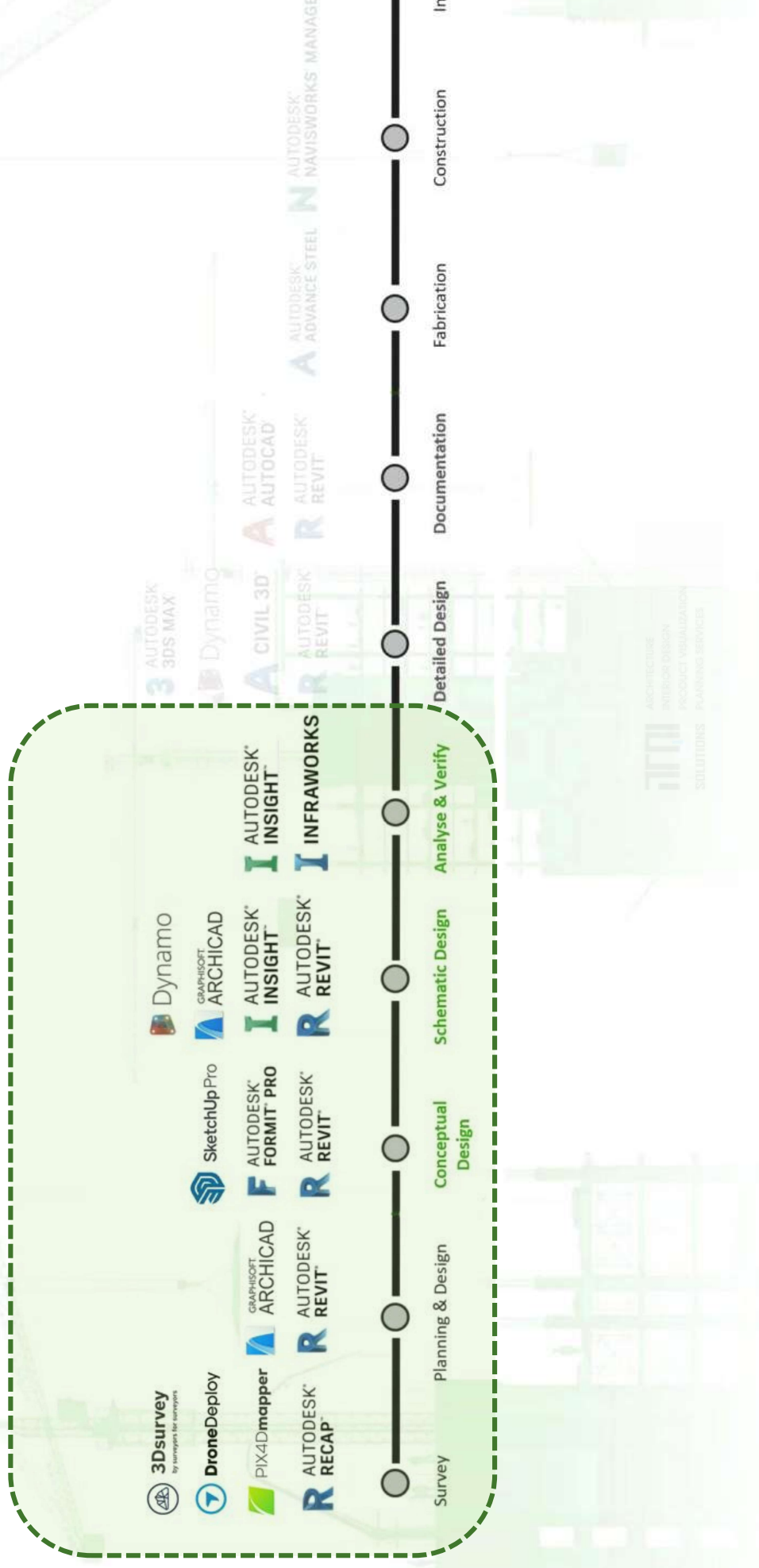
Operation

BIM

Traditional

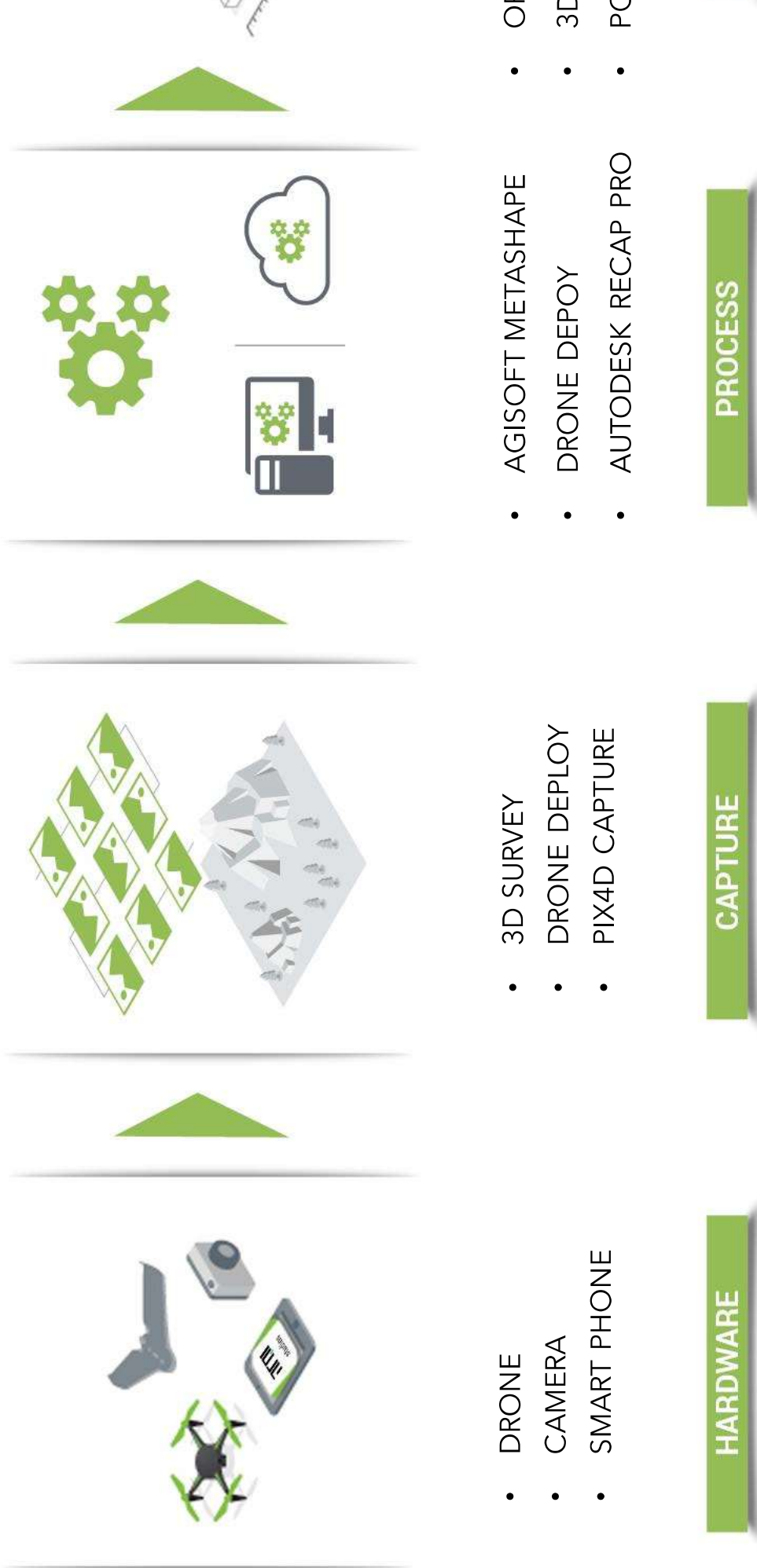


# Green Design Tools



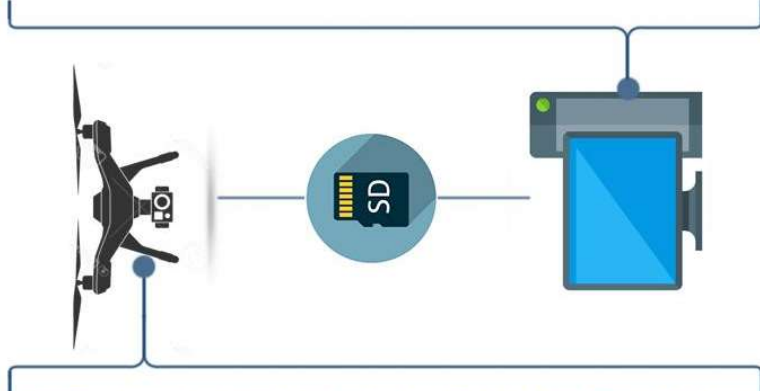
# SURVEY

## Tools to conduct a survey - Photogrammetry



# SURVEY

5 Acre: Approx 400 Photos





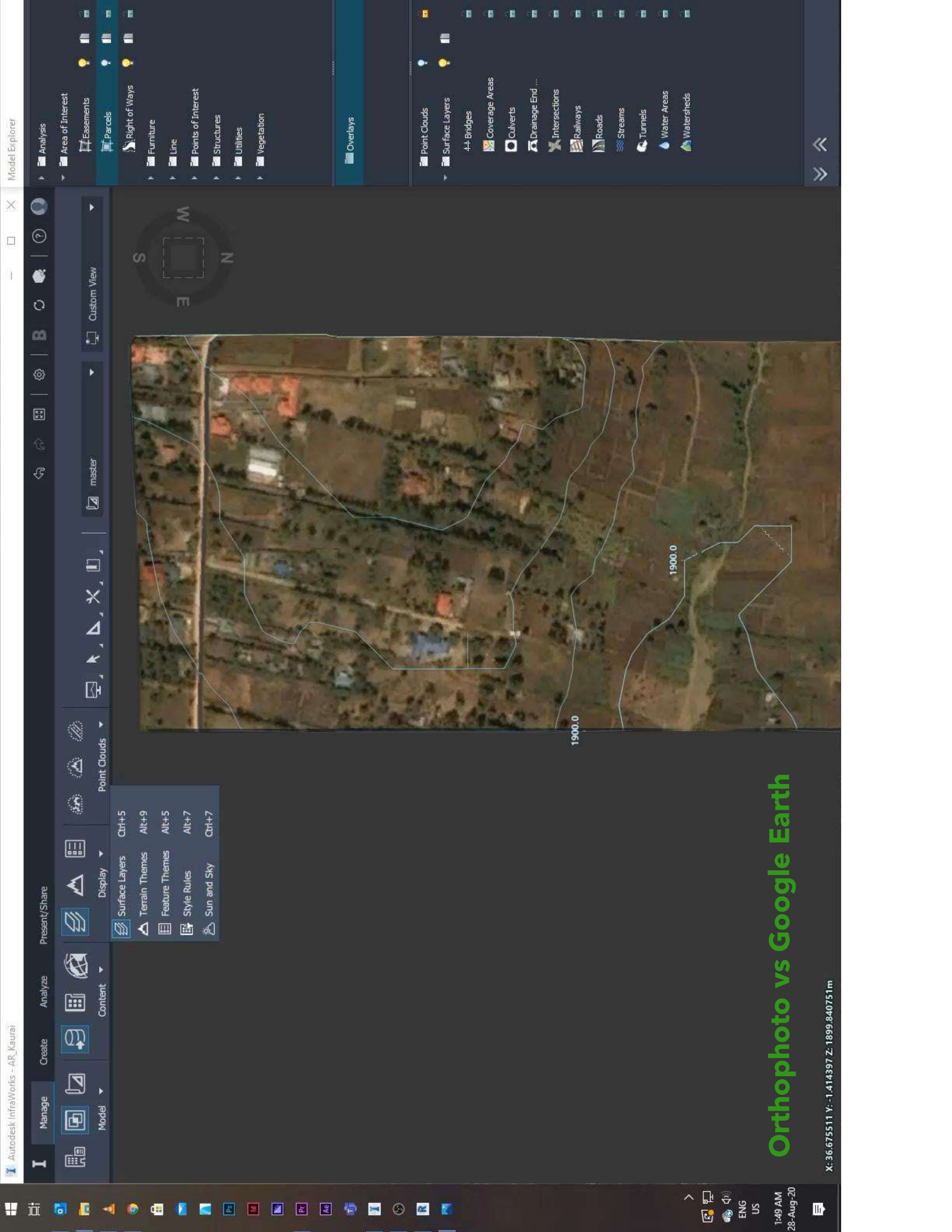
# Photogrammetry

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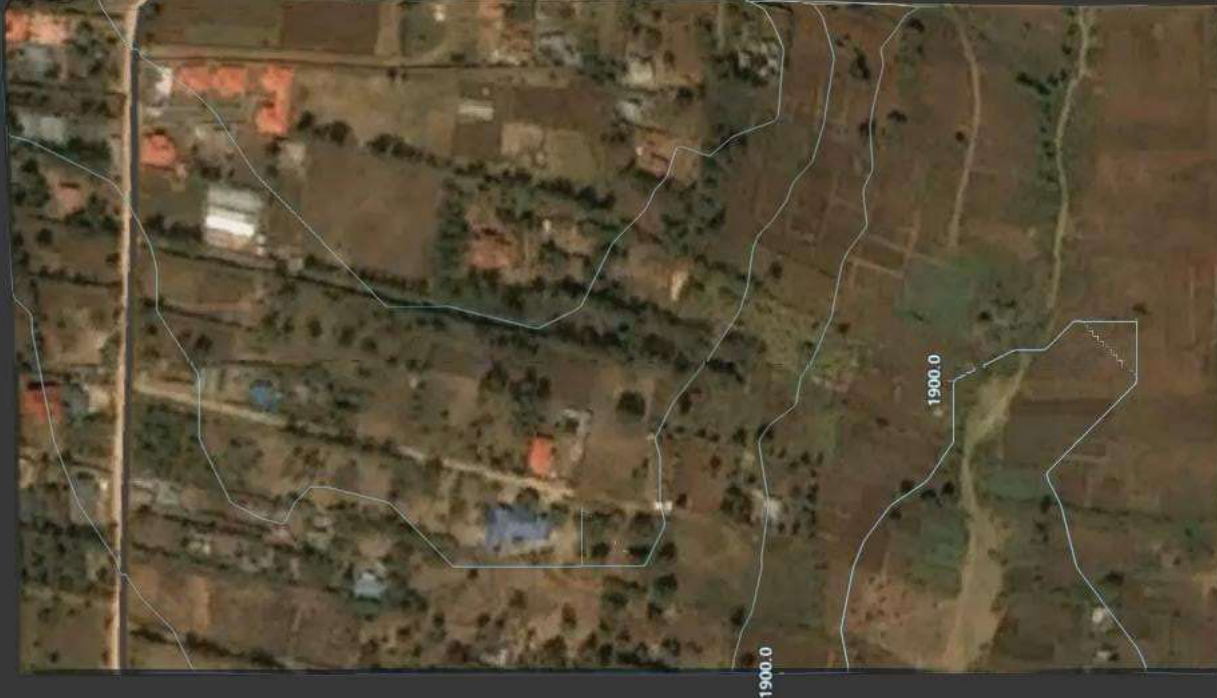
With today's drone technology, it's now very easy to obtain current, high quality aerial imagery from any project site.

- Area Covered:  
37417 sqm / 0.0374 sqkm
- Processing Time:  
1 hours 40 minutes 20 seconds
- Software: ReCap Photo, ReCap Pro, InfraWorks





- Surface Layers Ctrl+5
- Terrain Themes Alt+9
- Feature Themes Alt+5
- Style Rules Alt+7
- Sun and Sky Ctrl+7

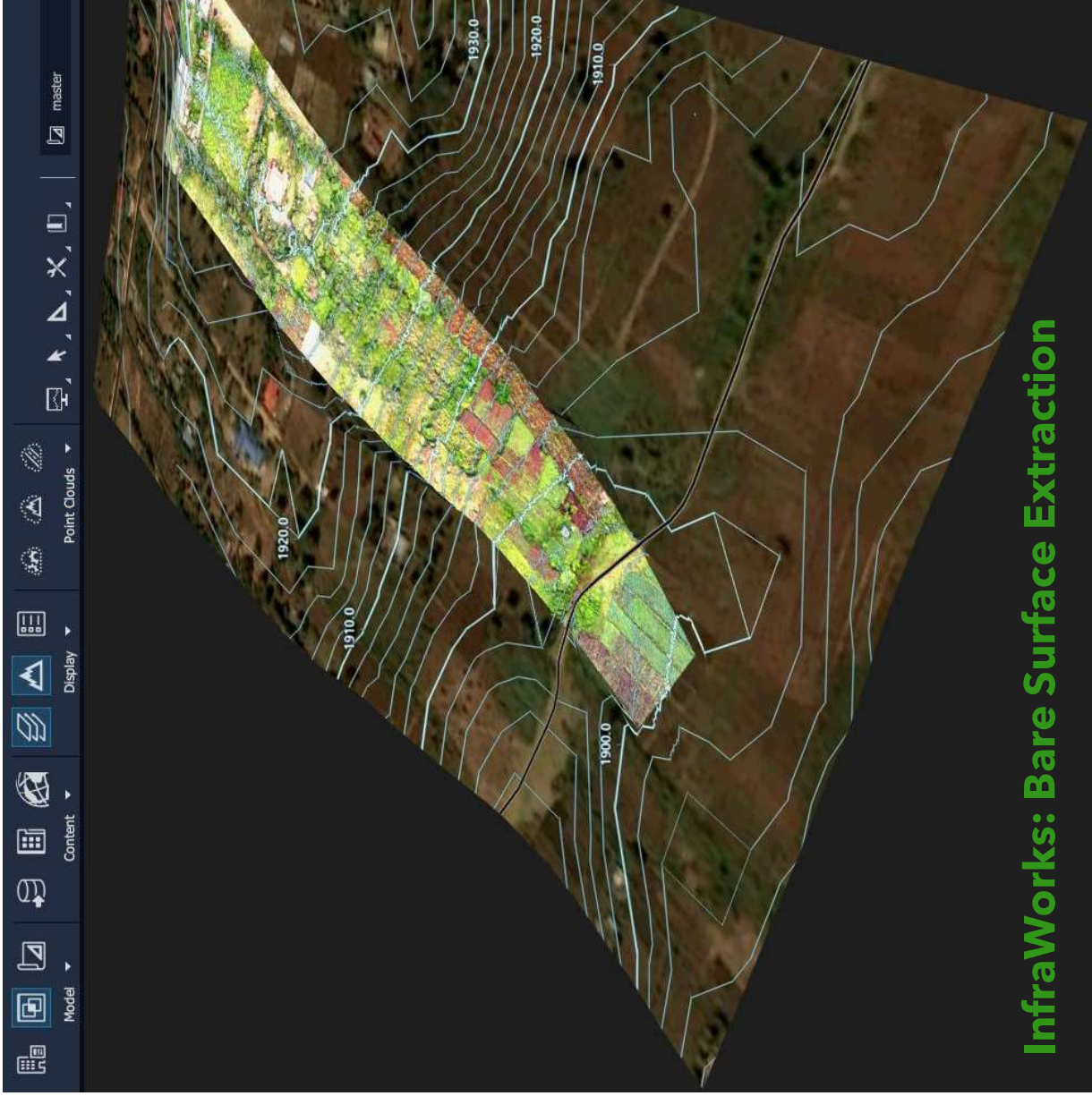
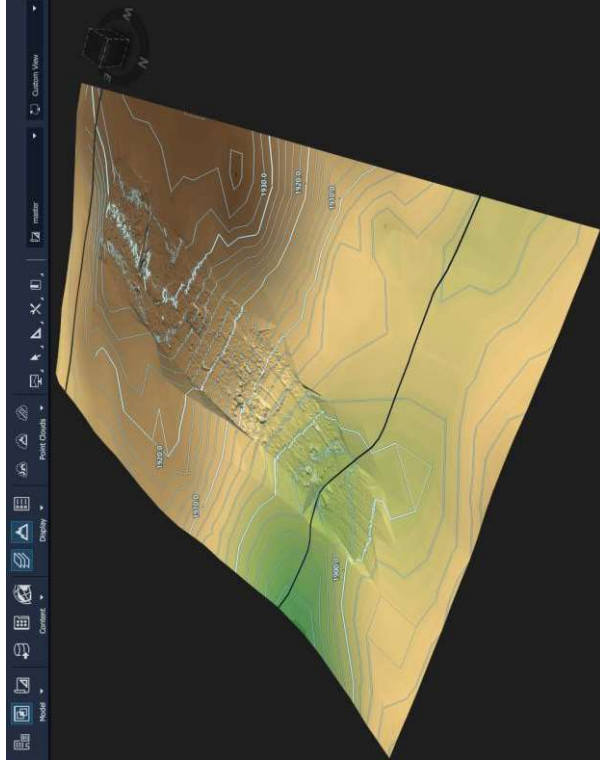
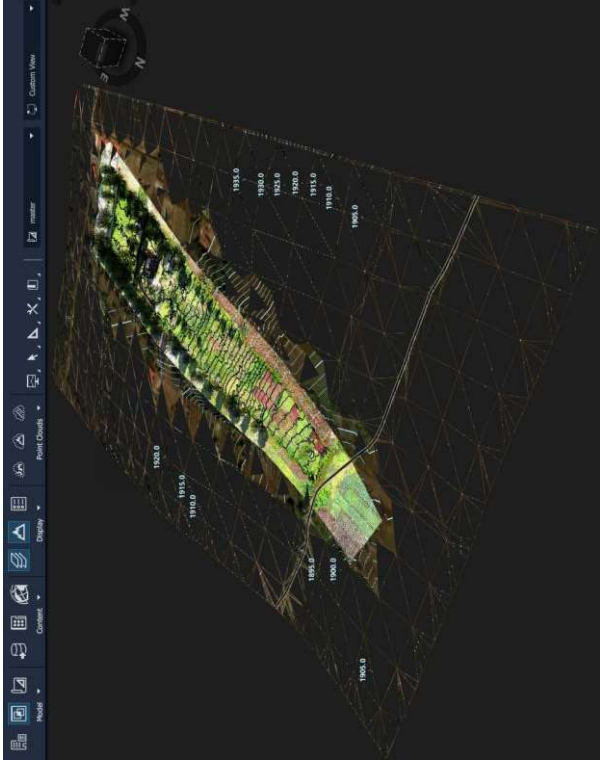


Overlays

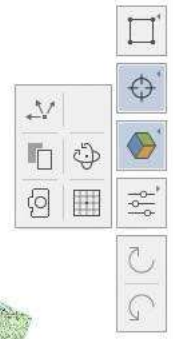
- Point Clouds
- Surface Layers
- 4-4 Bridges
- Coverage Areas
- Culverts
- Drainage End ...
- Intersections
- Railways
- Roads
- Streams
- Tunnels
- Water Areas
- Watersheds

# Orthophoto vs Google Earth

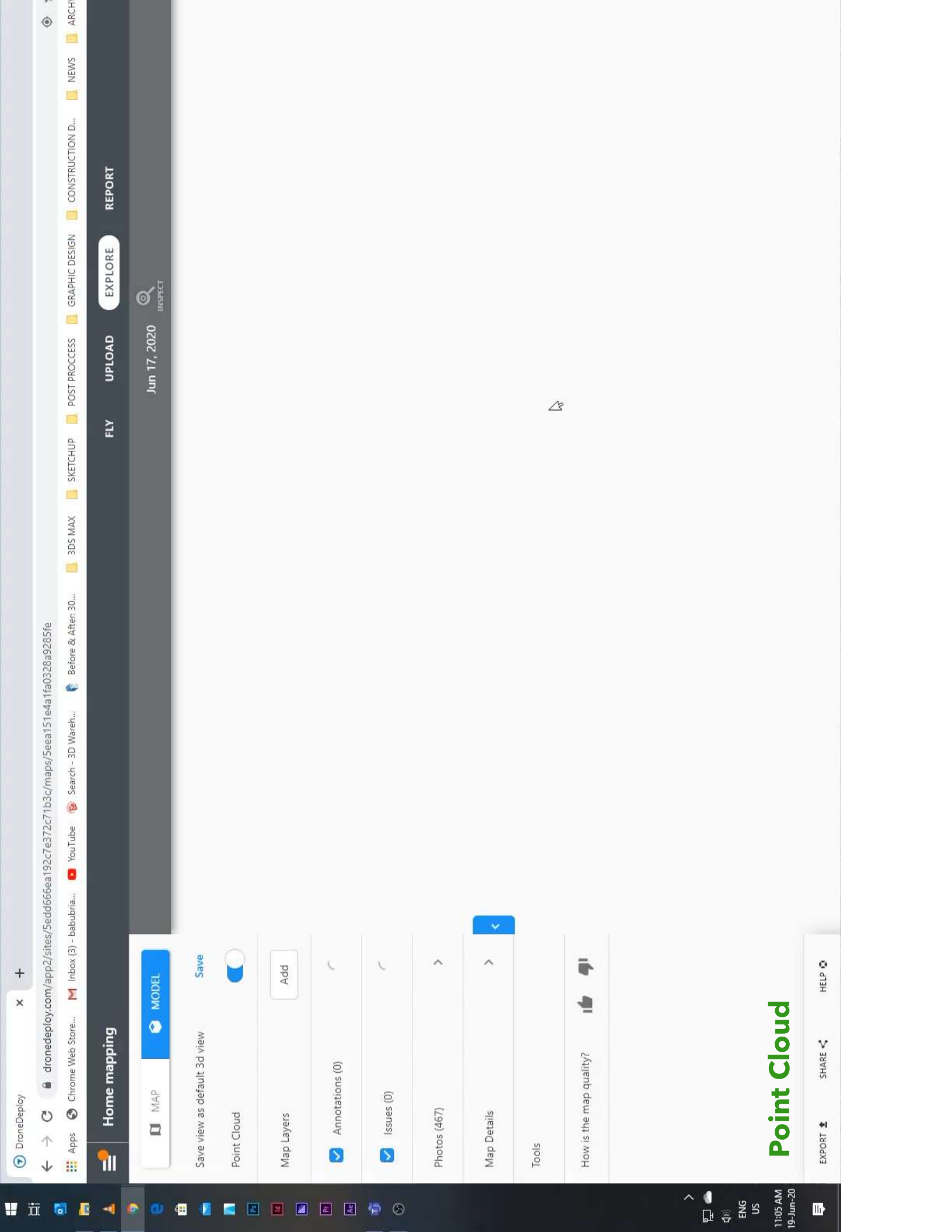
X: 36.675511 Y: -1.414397 Z: 1899.840751m



# InfraWorks: Bare Surface Extraction



# 3D Site Map (Mesh)



MAP MODEL

Save view as default 3d view Save Point Cloud

Map Layers Add

Annotations (0)

Issues (0)

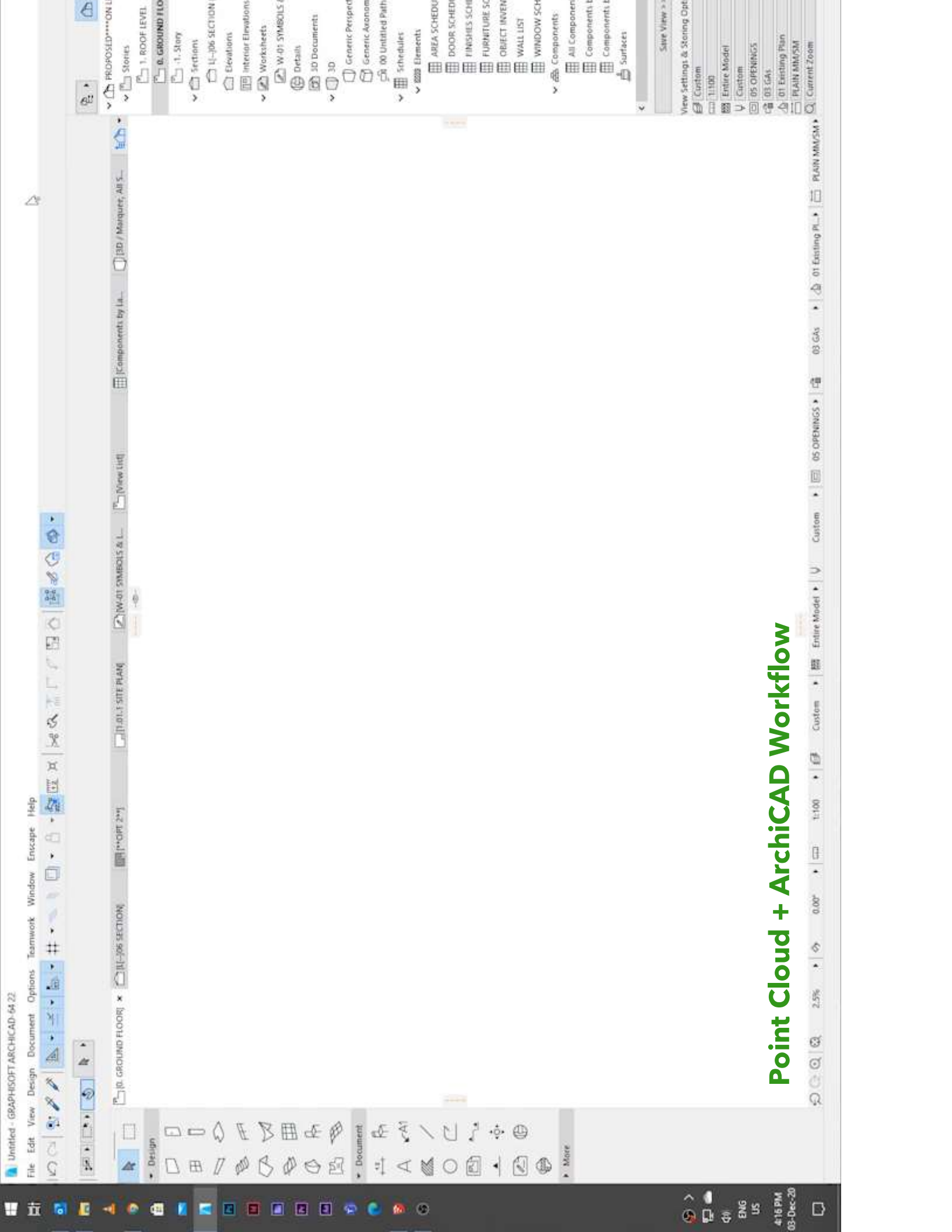
Photos (467)

Map Details

Tools

How is the map quality?

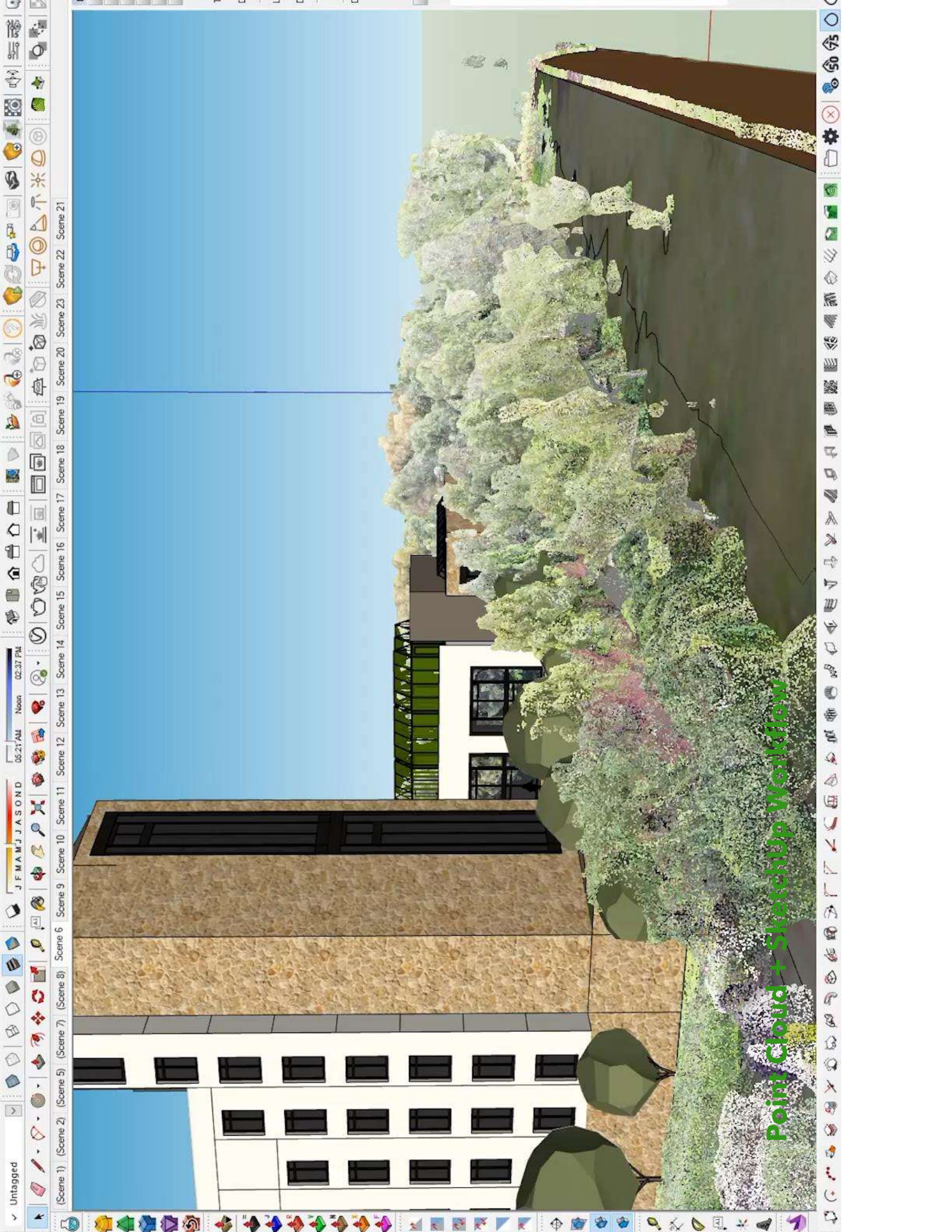
# Point Cloud



# Point Cloud + ArchiCAD Workflow



Point Cloud + SketchUp Workflow



Point Cloud + SketchUp Workflow



## Point Cloud

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The end user can be several people.

Different applications support point clouds natively.

Use integrated workflows that allow you to work more efficiently, improve project team collaboration, and offer more value-added services to your designs.

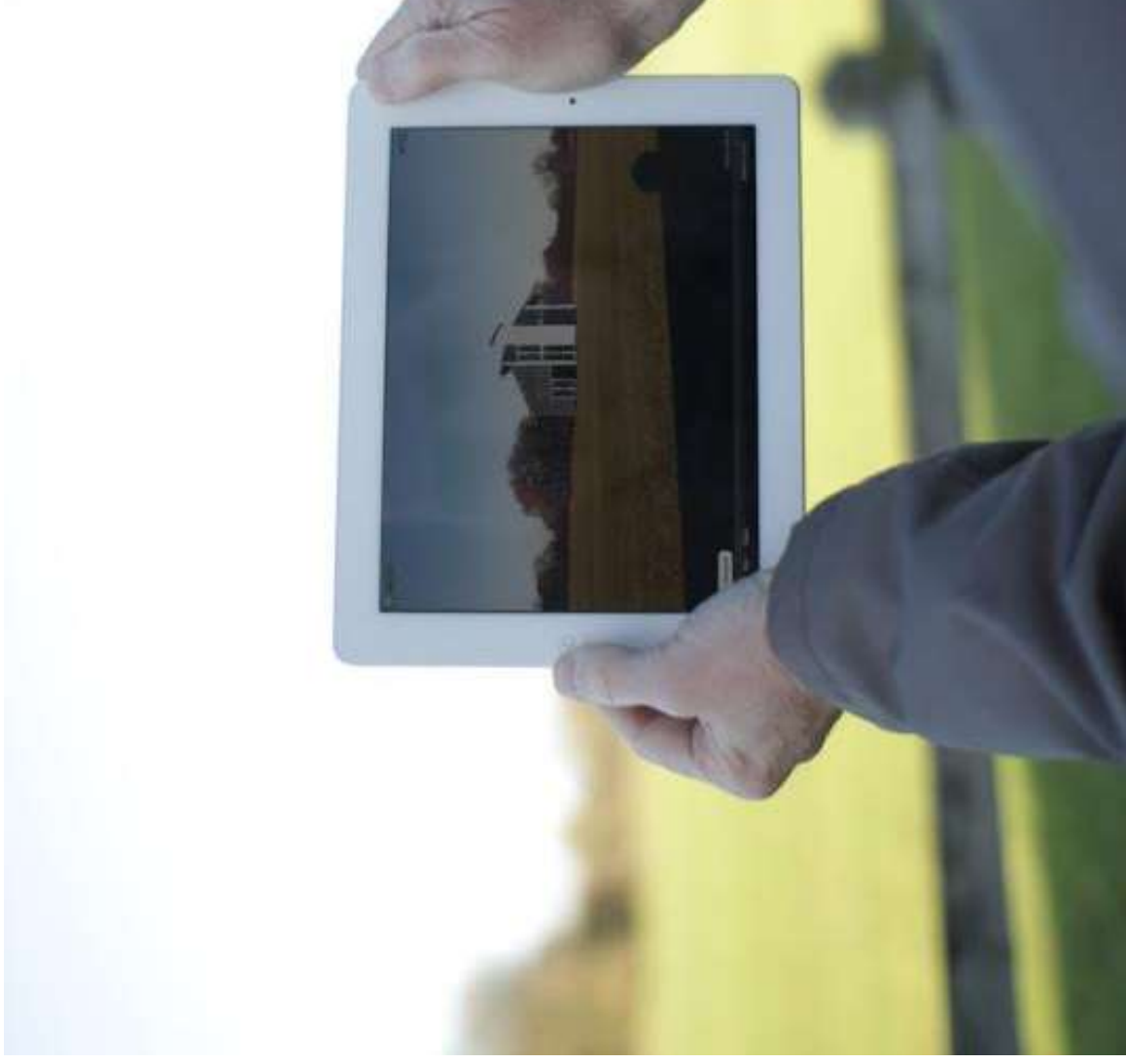


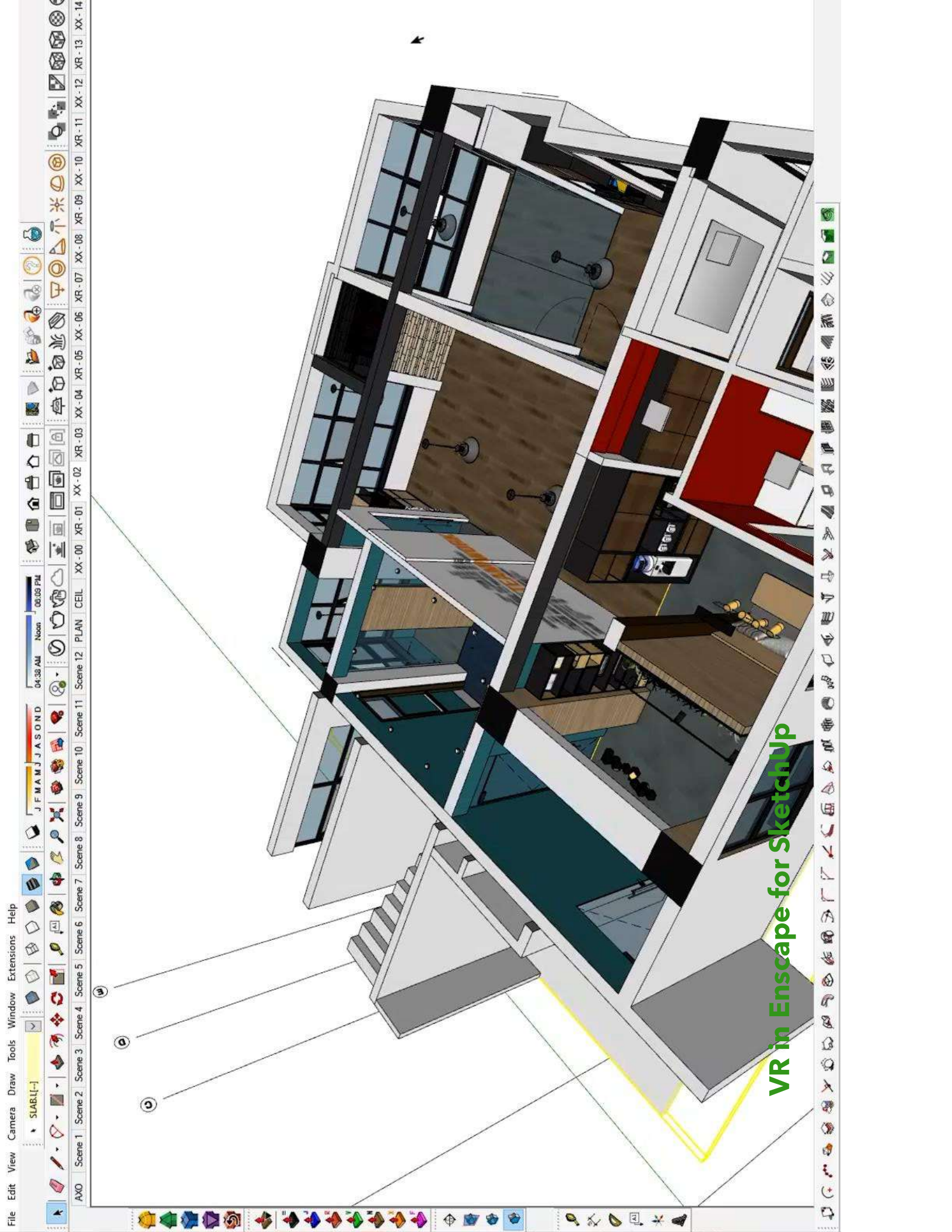
## VR & AR

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Both AR and VR can enhance collaboration among project stakeholders before the construction work begins.

A construction manager or contractor would be able to use AR to do a walk-through of a site whilst viewing an overlay BIM model on top of the physical view.





File Edit View Camera Draw Tools Window Extensions Help

SLABLI[-]

J F M A M J J A S O N D

04:39 AM Noon 08:09 PM

AXO Scene 1 | Scene 2 | Scene 3 | Scene 4 | Scene 5 | Scene 6 | Scene 7 | Scene 8 | Scene 9 | Scene 10 | Scene 11 | Scene 12 | PLAN CEIL XX-00 XR-01 XX-02 XR-03 XX-04 XR-05 XX-06 XR-07 XX-08 XR-09 XX-10 XX-11 XX-12 XR-13 XX-14

VR in Enscape for SketchUp

# 360° Camera

Photo documentation in construction has evolved from physical photo albums to digital photos saved on local machines, then photos saved on file sharing systems and finally to 360° photos stored in the cloud.

The latter has created a lot of conversation within the industry, as 360° cameras became the second most used capturing device on construction sites in 2018.

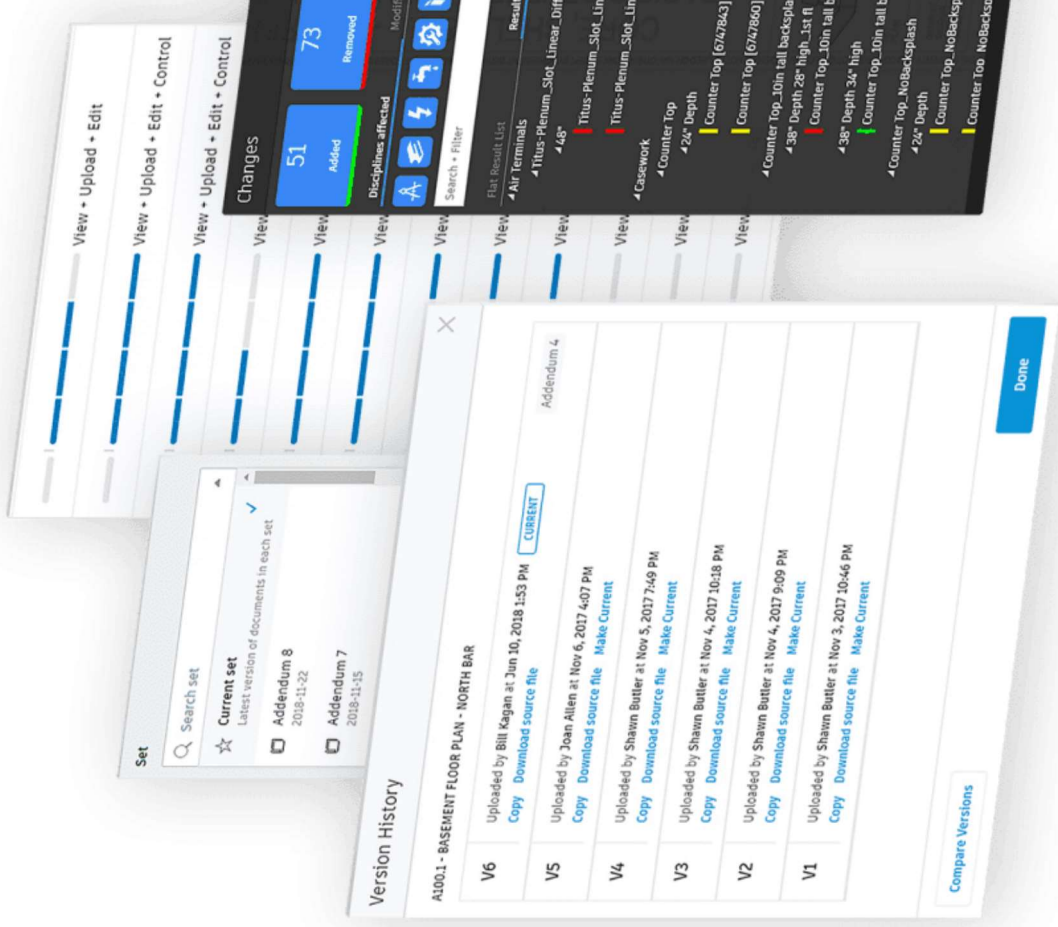




360 Camera for Documentation

# CLOUD Collaboration

By making project information accessible to the project team when and where they need it, BIM 360 Docs turns document management from a necessary task to the foundation for project success.





**THANK YOU**

**Q & A**



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