

CS320310 - Using InfraWorks 360 for Better Site Logistics: Part 2

Don Josephson

BIM/VDC Manager





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BIM/VDC Manager

Don has been in the construction industry in the Pacific Northwest for almost 13 years. He graduated with a B.S. in Construction Management from **Brigham Young University-Idaho** in 2007. He spent 7 years as a Project Engineer/BIM Coordinator where he learned the ins and outs of many types of commercial construction. He is in his 6th year as BIM Manager for **Howard S. Wright a Balfour Beatty Company**. Through the course of his career, Don has managed and helped manage the coordination process for over \$3 Billion worth of construction comprising more than 30 buildings. Don is dedicated to his family and has a beautiful wife and 5 children. His hobby is spending time with them doing outdoor activities, board games, cooking and camping. Don is also very active in his church and community.

Northwest | Howard S. Wright & Balfour Beatty construction



Howard S. Wright
a Balfour Beatty company

- 134 years in business
- In 2011, acquired by Balfour Beatty Construction
- 2 offices, Seattle and Portland
- \$2.1 billion in LEED Certified projects

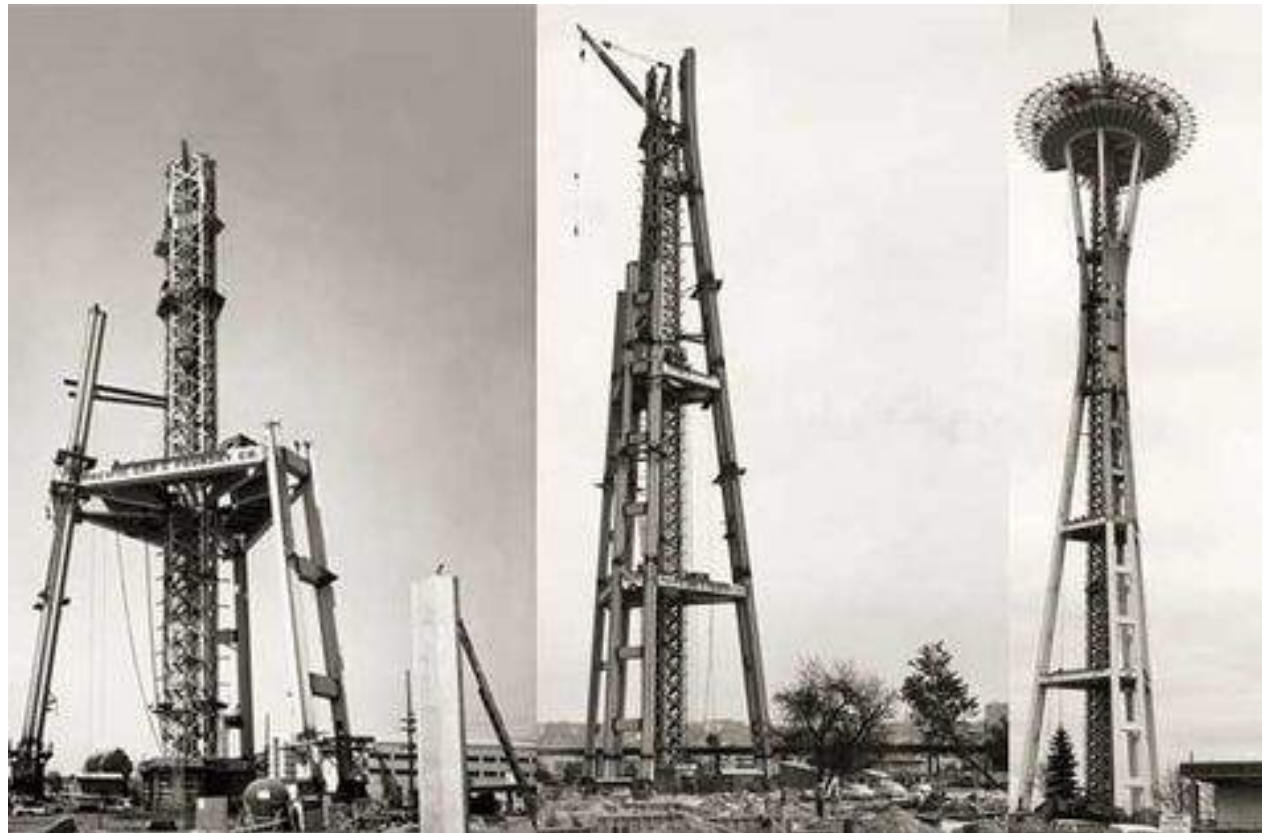
Balfour Beatty

- 4,340 employees nation wide
- \$4.4 billion in annual revenues
- 16 market sectors
- \$7.6 billion in LEED certified projects
- #6 Domestic Builder, Engineering News-Record (ENR) 2018





Howard S. Wright
a Balfour Beatty company



Learning Objectives

LEARNING OBJECTIVE 1:

Learn how to use the relationships between InfraWorks and Civil 3D

LEARNING OBJECTIVE 2:

Learn how to create InfraWorks models using Model Builder, Revit, SketchUp, photogrammetry, and terrain overlays

LEARNING OBJECTIVE 3:

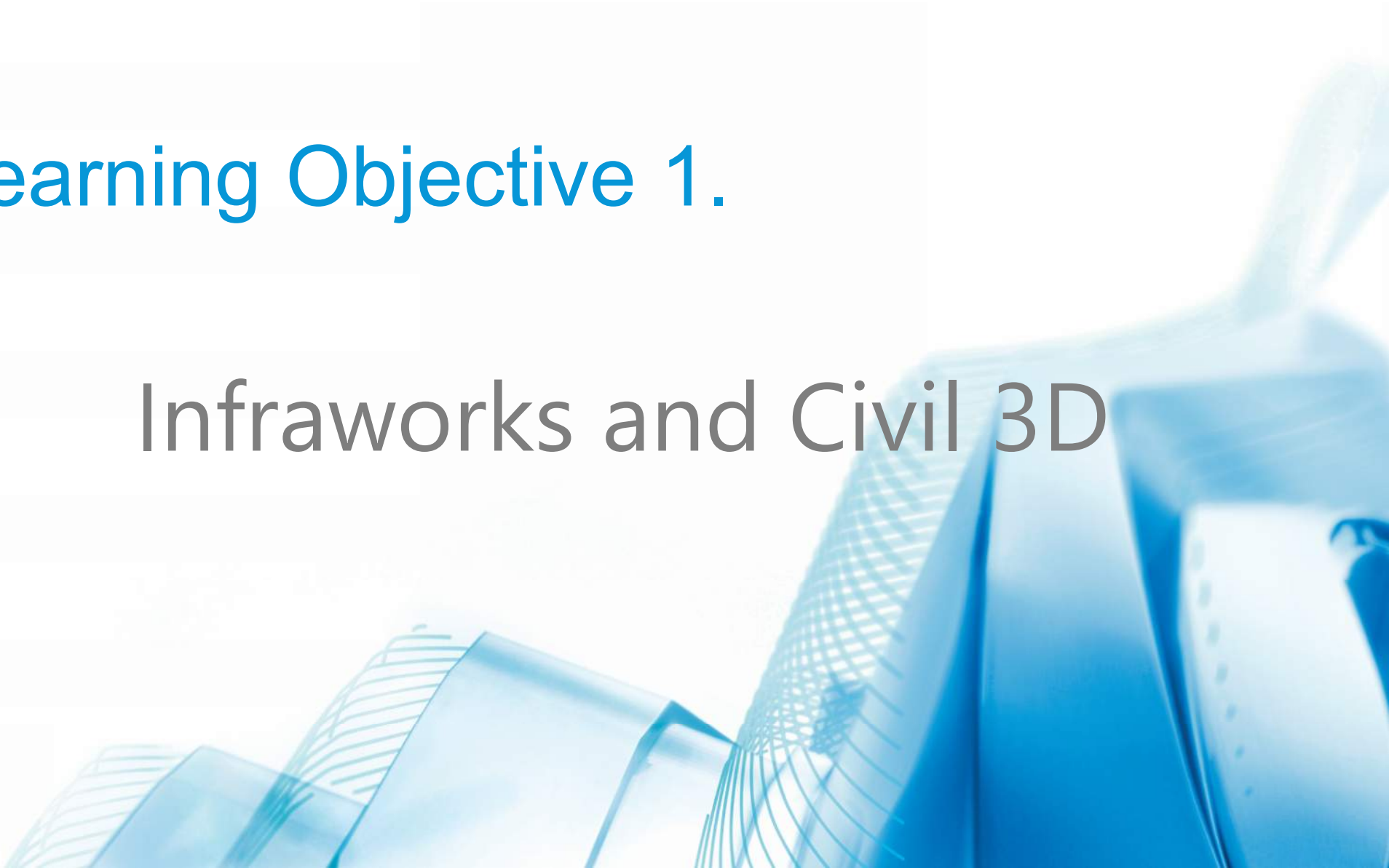
Learn how to enhance models by adding buildings, equipment, roads, fences, signs, people, and more

LEARNING OBJECTIVE 4:

Learn from presentation materials such as storyboards, images, and VR models. Use BIM 360 Docs

Learning Objective 1.

Infraworks and Civil 3D

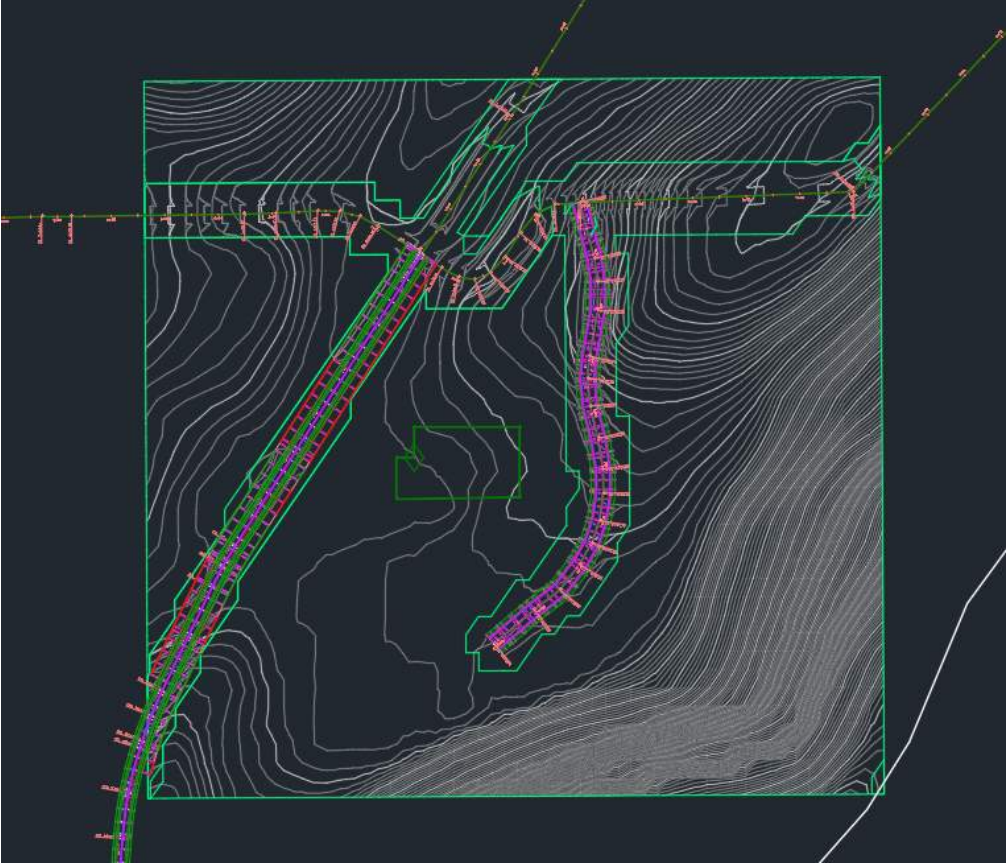


Designed Workflow



Infraworks

Civil 3D



Learning Objective 2.

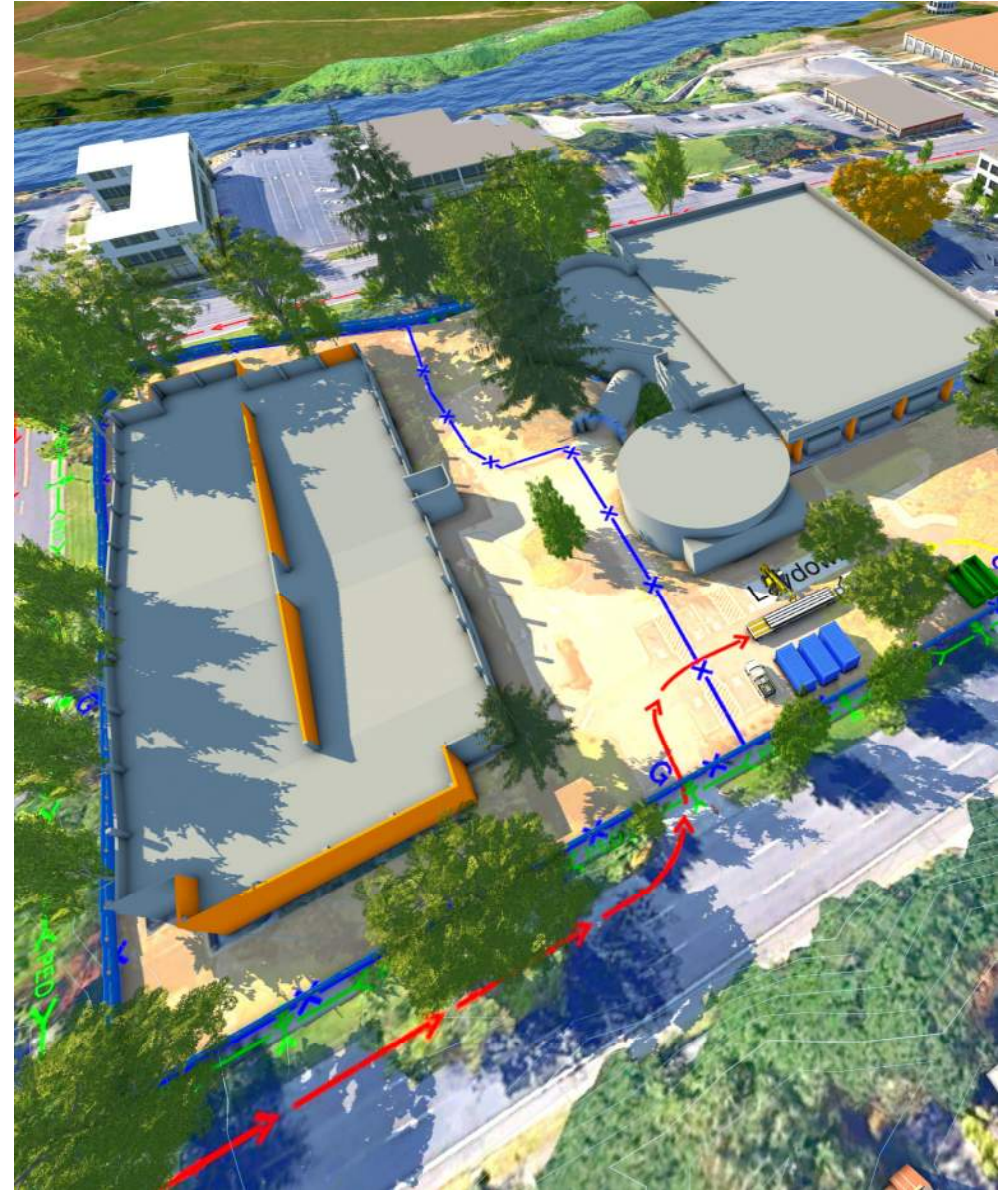
Create InfraWorks Models



Why InfraWorks

To understand why I use InfraWorks, you need to understand 2 things.

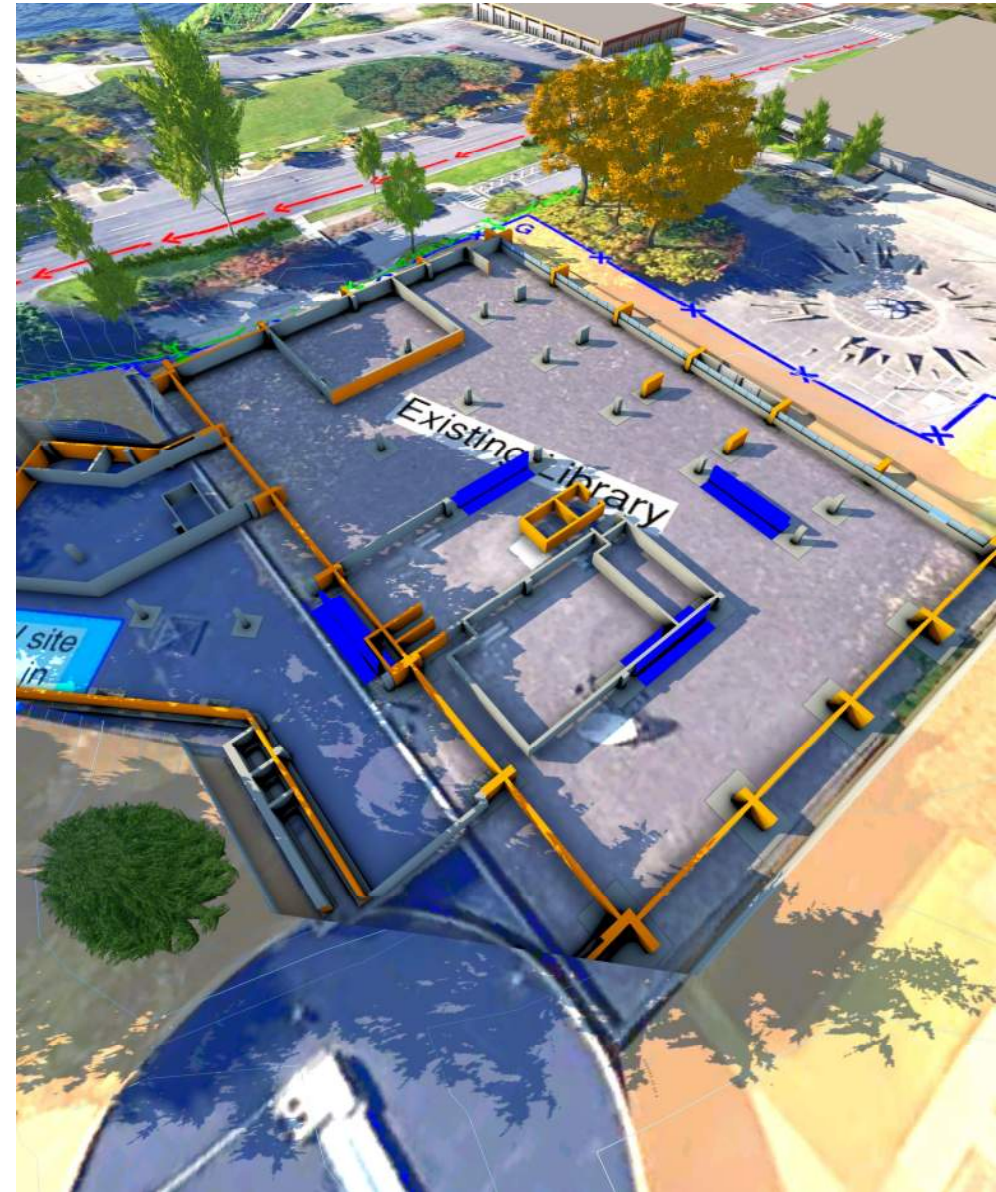
1. What are the goals of the site logistics plan.
2. The Pros and Cons of different workflows



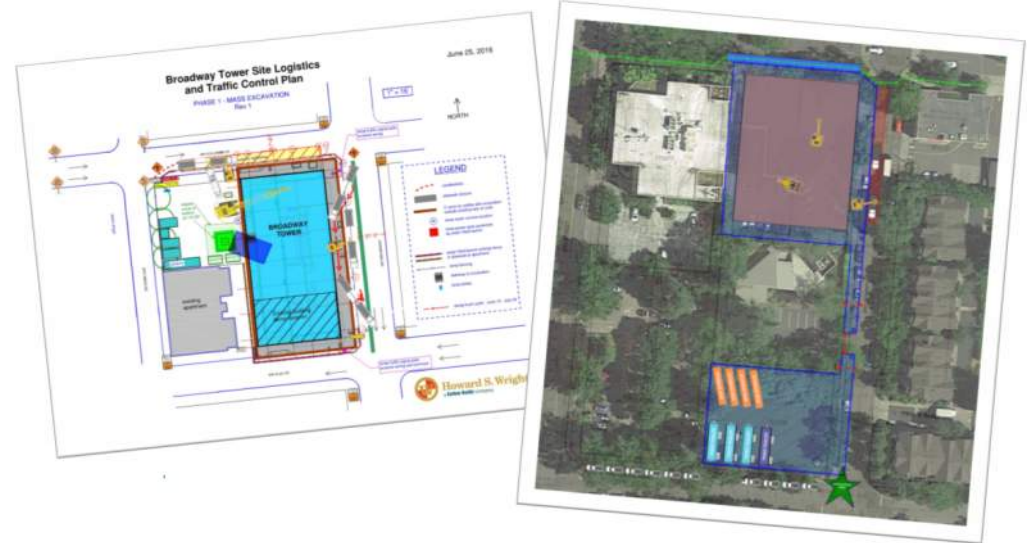
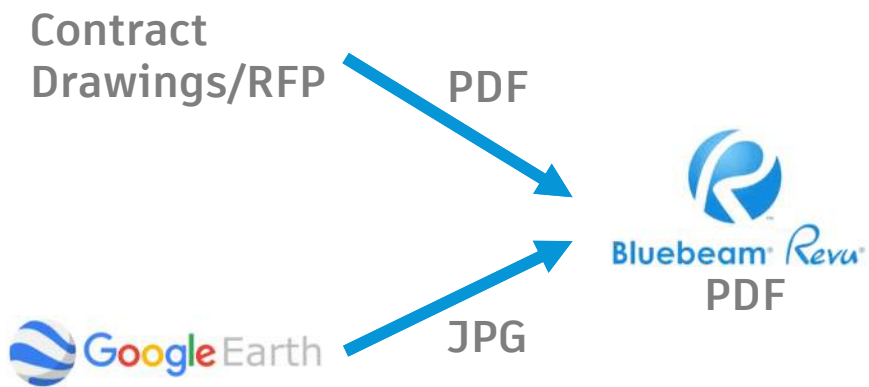
Site Logistics Goals

My goal along this journey has been to create site logistics plans that have the following;

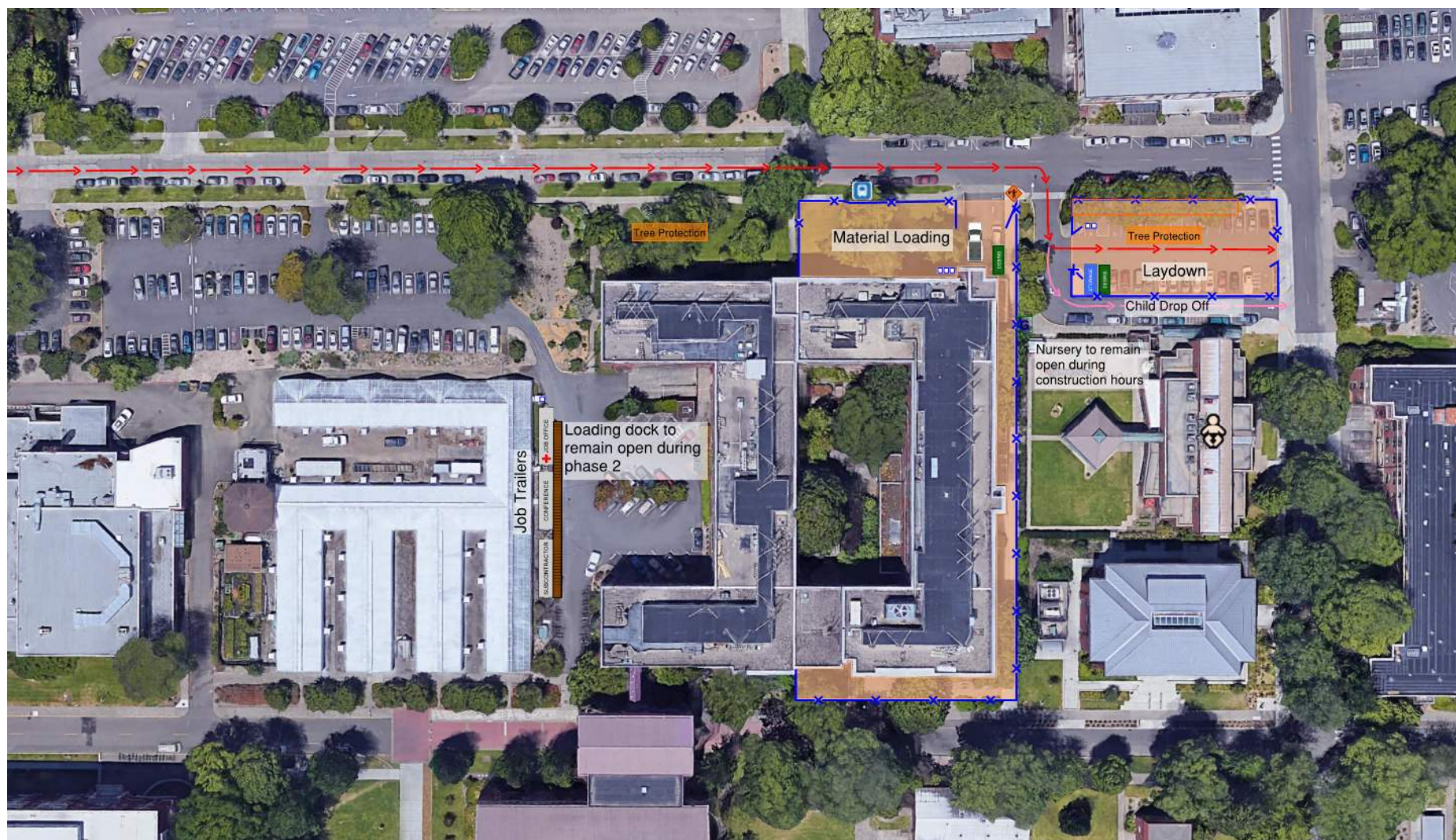
- Realistic backgrounds(with textures)
- Ability to add excavation
- Automatically generated buildings and terrain
- Allows addition of equipment, fences, building etc.
- Reduces effort to create professional results
- Show phased construction
- Can produce 2D plans such as Tower Crane layout drawings.



Workflow 1 - Bluebeam



- Easy and Fast
- Can Annotate
- Draw over plans or satellite image
- Static Image
- Limited Fill Patterns



Workflow 2 - Sketchup



- Very Flexible
- Geo-Locate (doesn't tell you the elevation)
- Large Library
- Scenes can be exported as animation
- Background image lower resolution
- Building creation manual
- Can bog down under large files
- Snapping in 3D and groups can be tricky

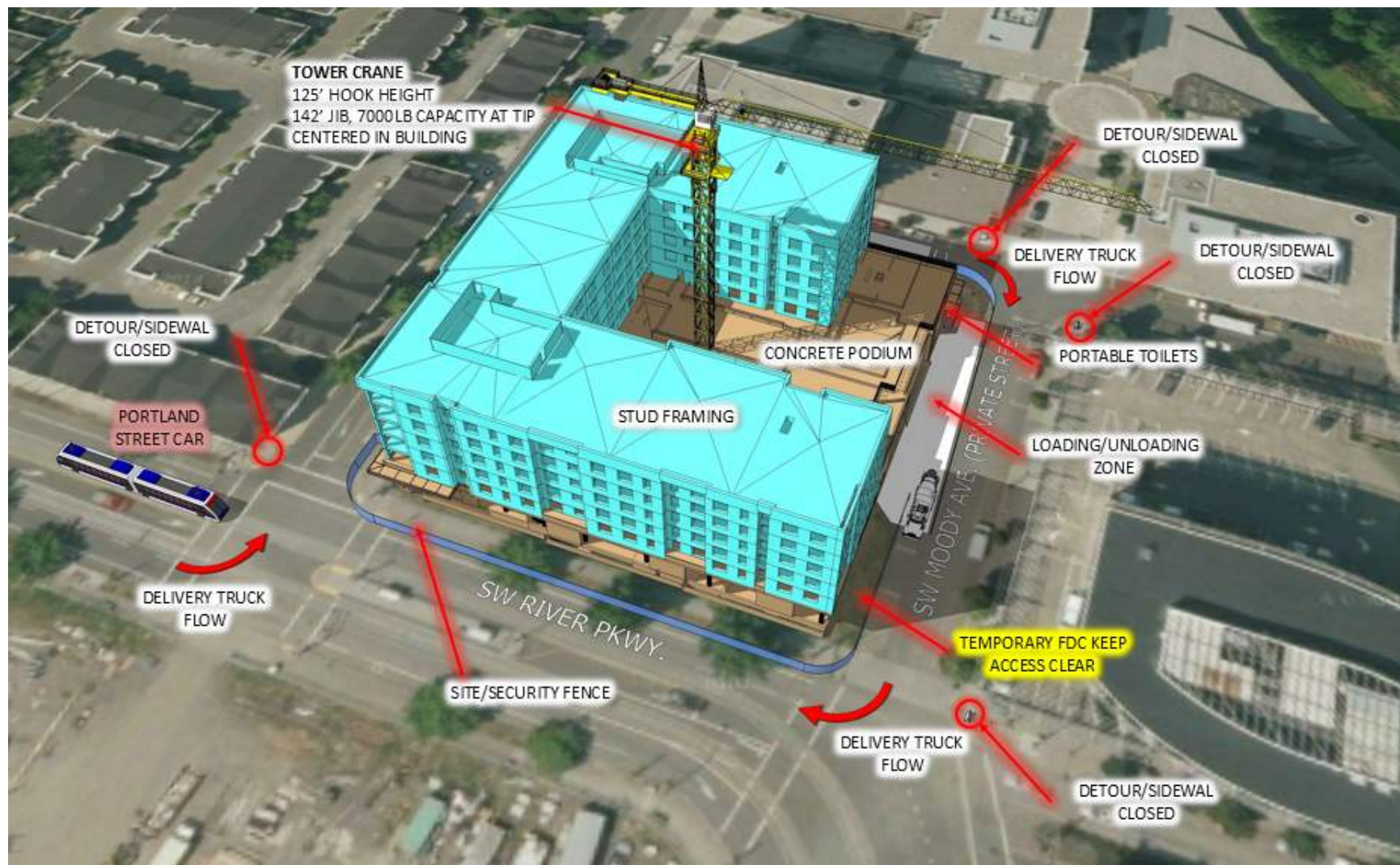
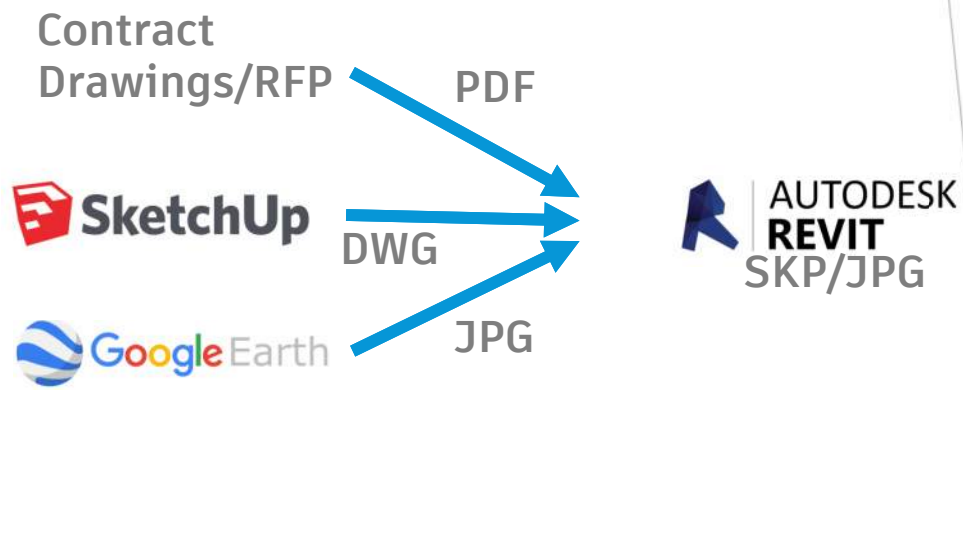




Image NASA

Image © 2014 DigitalGlobe

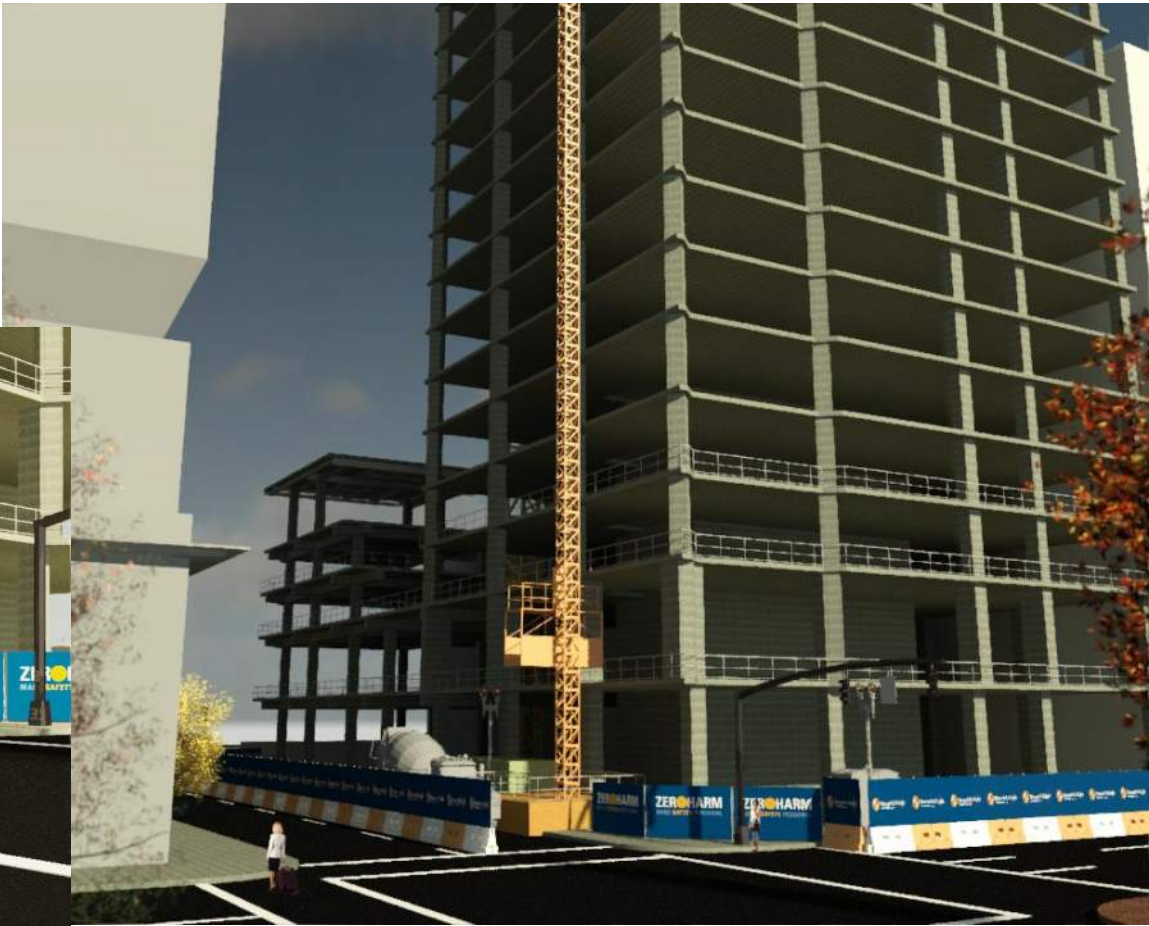
Workflow 3 - Revit



- Can produce 2D Dimensioned Drawings
- Great Rendering and View Control
- Site components Snap to Topo surface
- Need CAD file for Terrain

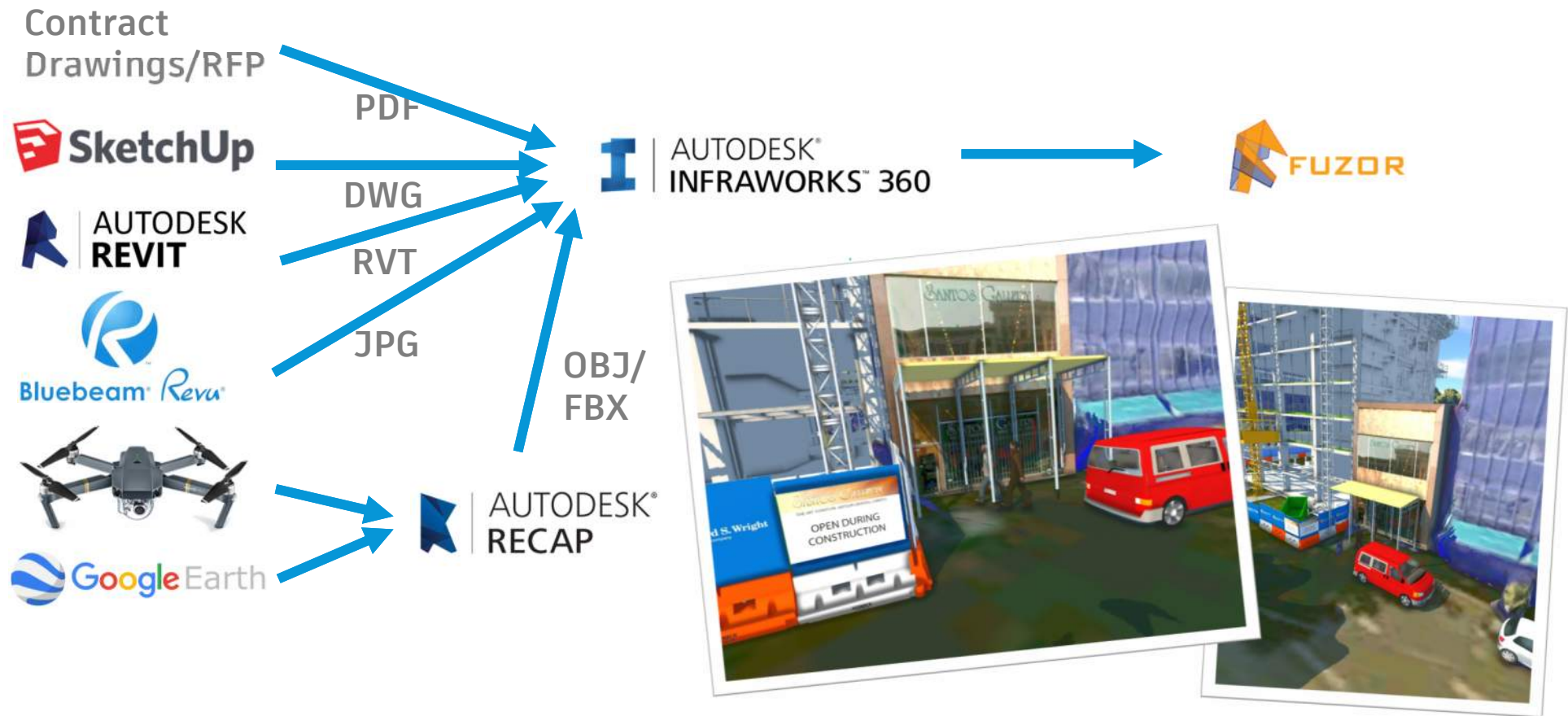
- Equipment models harder to find
- Fencing on sloped sites is difficult
- No Road tools or terrain draping
- Geometry creation is manual







Workflow 4 - InfraWorks



Workflow 4 - InfraWorks

- Model Builder!
- Graphics, sky, water, light
- Barriers
- Excavation/Coverage Areas
- Roads
- 200km² area
- Terrain overlays
- Proposals for phasing
- No dimensioned drawings
- Not made for site Logistics
- Different than AutoCAD/Revit
- Placement and scaling different
- Can't hide individual items!
- No sectioning tool







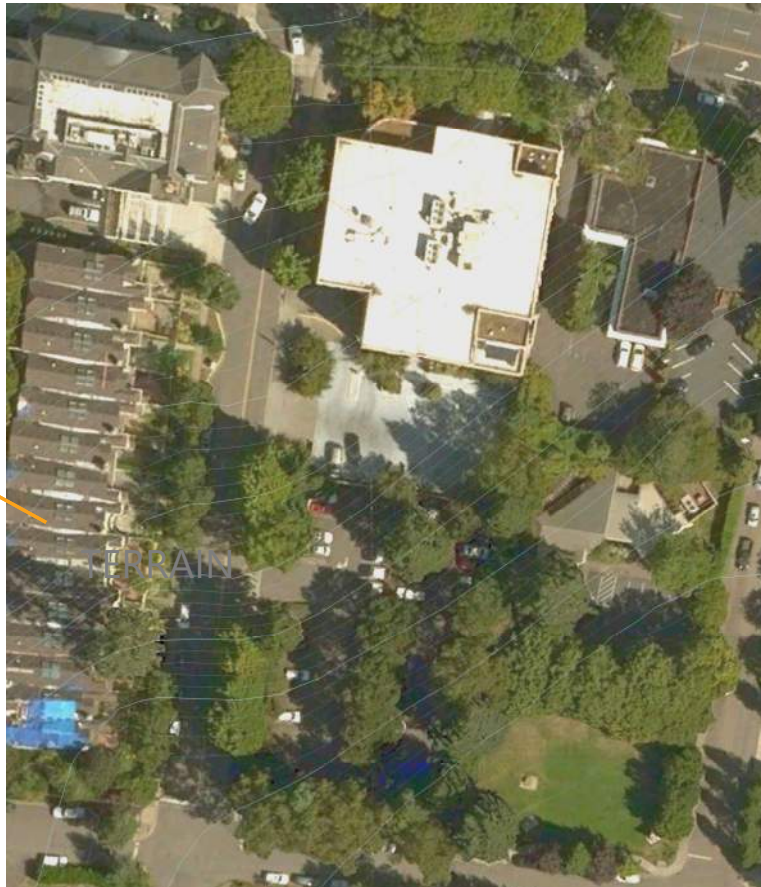
Resolution

One of my first approaches was to use the Geo-Location feature of Sketchup. This works well but one major drawback is the resolution quality of Sketchup vs. InfraWorks

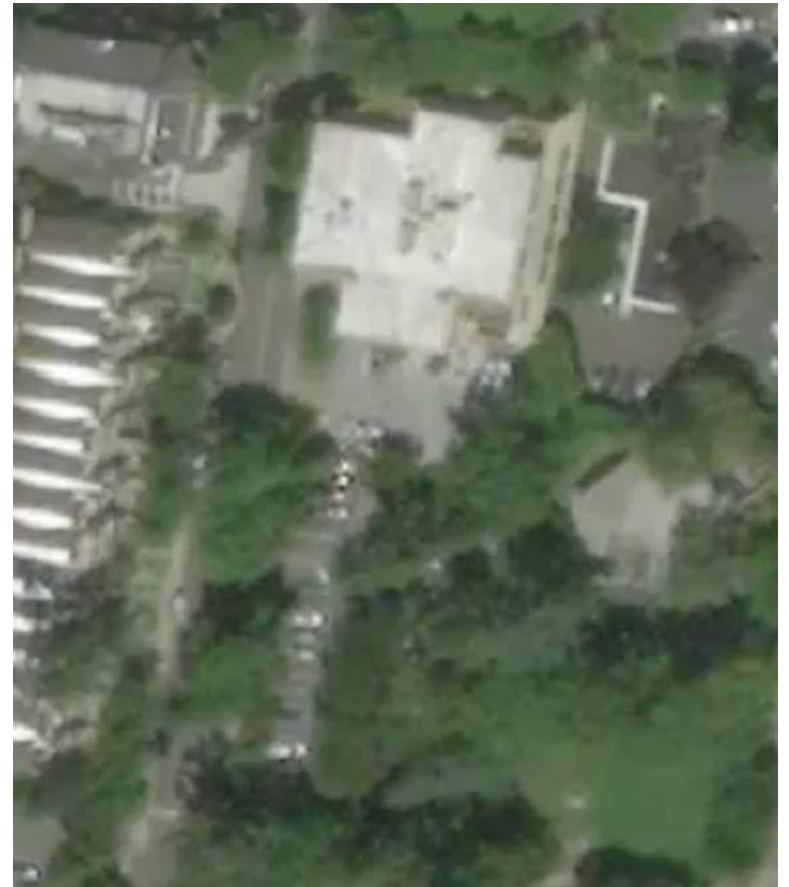


Terrain

Model Builder



Sketchup @ Highest Zoom



Buildings



Background

Google Earth seems to have exactly what I want in terms of look and texture, but there is no export feature. Cannot modify the background even though you can import .kmz files

- Can't excavate or delete buildings
- Imagery can be old
- Trees can be tricky
- Not available for all areas
- Not a modeling tool

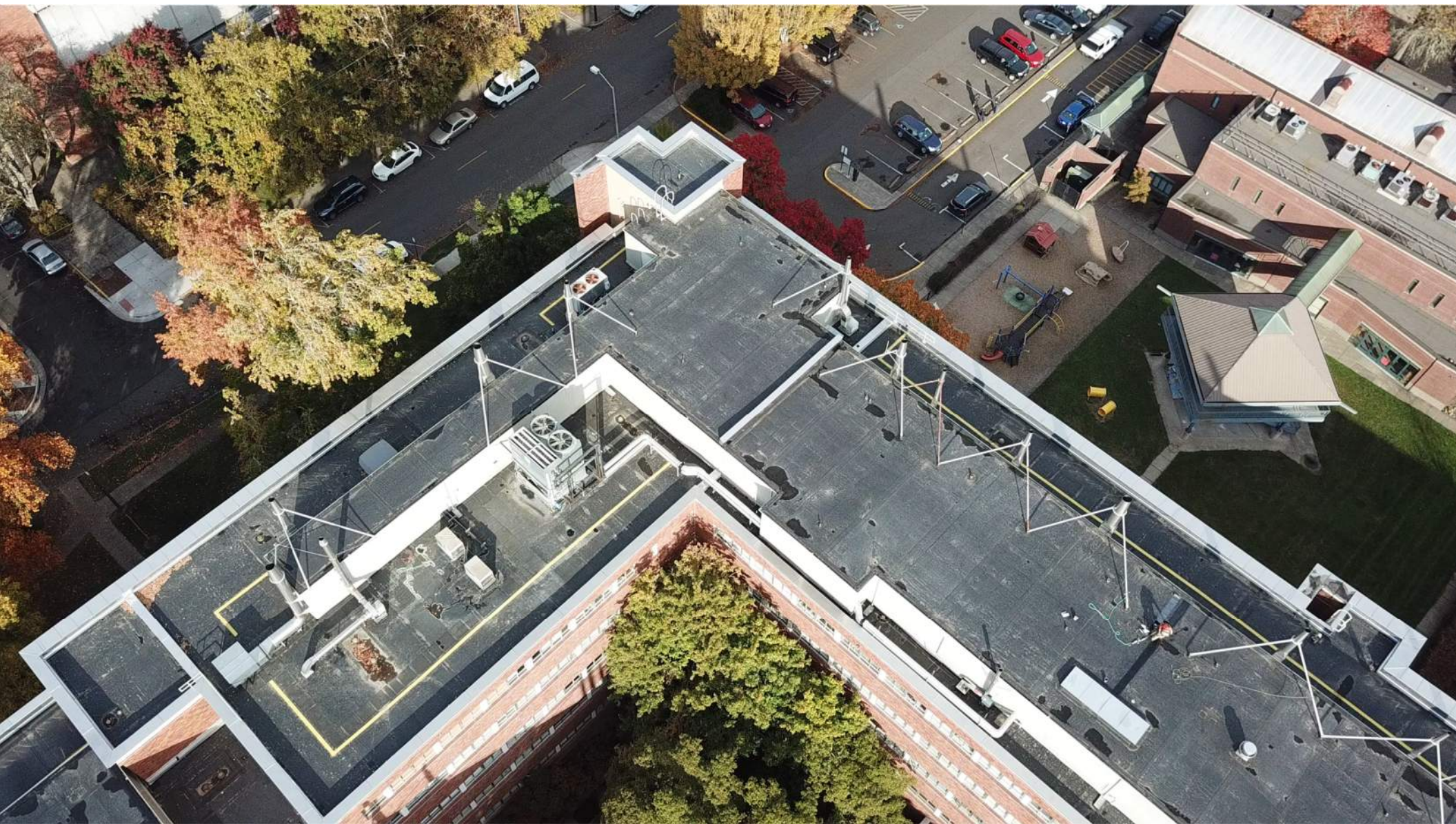




Google Earth

36°07'20.61" N 115°10'19.42" W elev 2099 ft eye alt 3799 ft



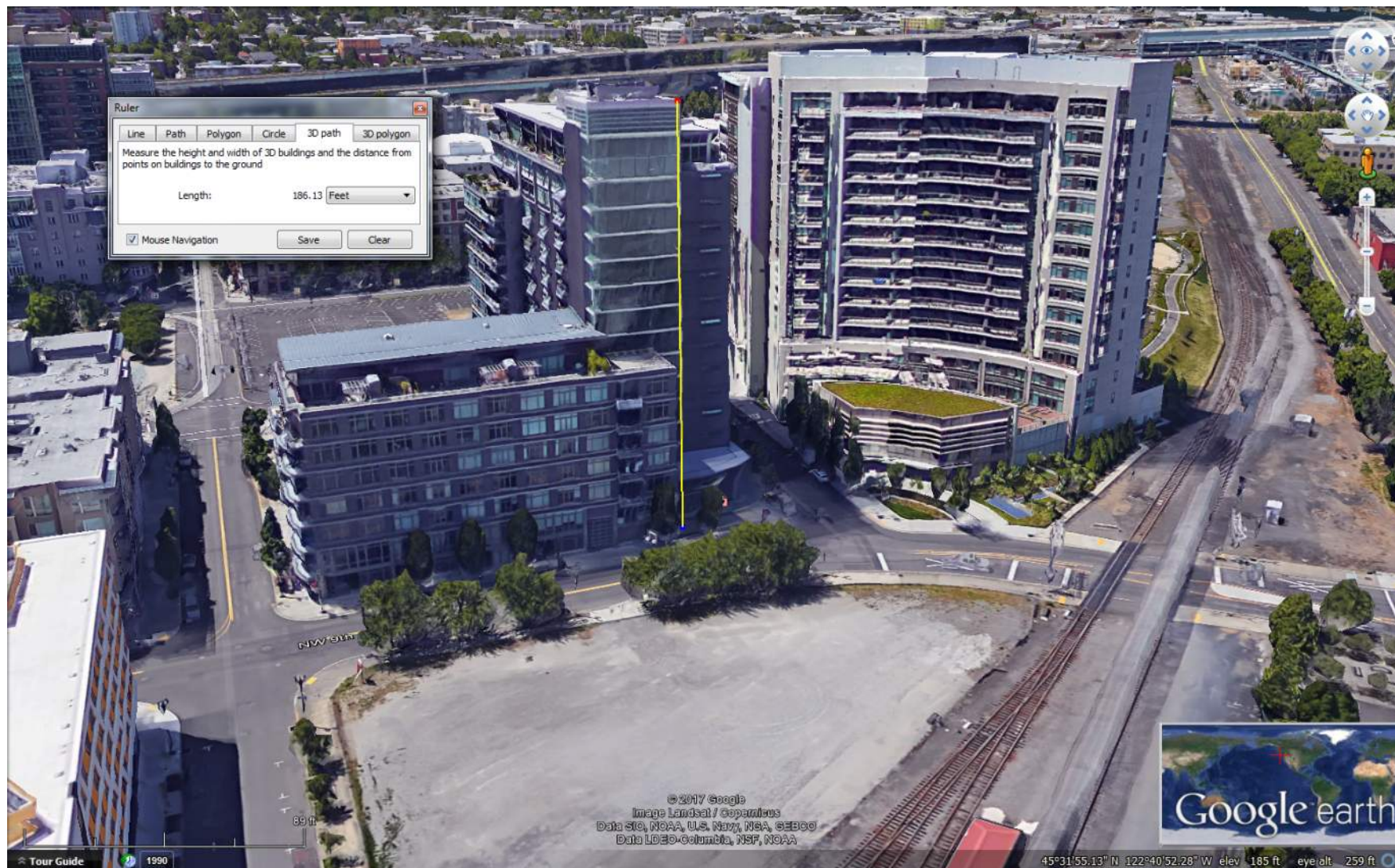


Recap Photo



Recap Photo





Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the height and width of 3D buildings and the distance from points on buildings to the ground

Length: 186.13 Feet

☒ Mouse Navigation Save Clear



© 2017 Google
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Data LEO-Columbia, NSF, NOAA

45°31'55.13" N 122°40'52.28" W elev 185 ft eye alt 259 ft

Model Builder

- Set up BIM 360 Docs Folder/Project
- Create background (Area of Interest)
 - Selecting the BIM 360 Docs Folder
 - Adjust resolution of background
 - Master Proposal (Existing Conditions)
 - Bookmarks
- Roads
 - Adjust Road Style
 - Component Roads
- Buildings
 - Add Sketchup Building
 - Create Building in place

Model Builder

- Terrain Overlays
 - Bluebeam markups
 - Place by reference points
- Recap Photo Model
 - Take Images (Discuss angles and best practices)
 - Create Model
 - Modifying the mesh
 - Scale Mesh
 - Export (OBJ vs. FBX)
 - Import into InfraWorks as fbx, obj, pts

Learning Objective 3.

Enhancing models by adding buildings, equipment, roads, fences, signs, people, and more

Model Builder

- About Moving Objects
- Transform Gizmos
 - Move
 - Rotate
 - Scale/Height
 - Elevation
-
- Styles and Style Catalogs
- About Style Catalogs
- Import catalog
- Create new 3D model

Model Builder

- Objects
 - City Furniture
 - Equipment
 - Signs
 - People
 - Point of Interest
 - Barriers
 - Fences
 - How to create fences out of 3D objects
 - Row of Trees
 - Trees or other items for random placement
 - Stand of Trees

Learning Objective 4.

Create Presentation Materials
Such as Storyboards, Images,
and VR models

Presentation

- Images
- Storyboards/Animations
- Export for VR

The background of the slide is a light blue gradient. On the right side, there is a faint, stylized image of a hand giving a thumbs up. The bottom of the slide features abstract, overlapping geometric shapes in various shades of blue, resembling architectural structures or modern design elements.

Questions?

Don't forget to to take the
survey on the AU App!



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