HH DESIGN TECHNOLOGY

2025 NY DT Intern

Early-Stage Design Workflow Research

HART HOWERTON

TERESA XINYAN LI

About me

Harvard GSD

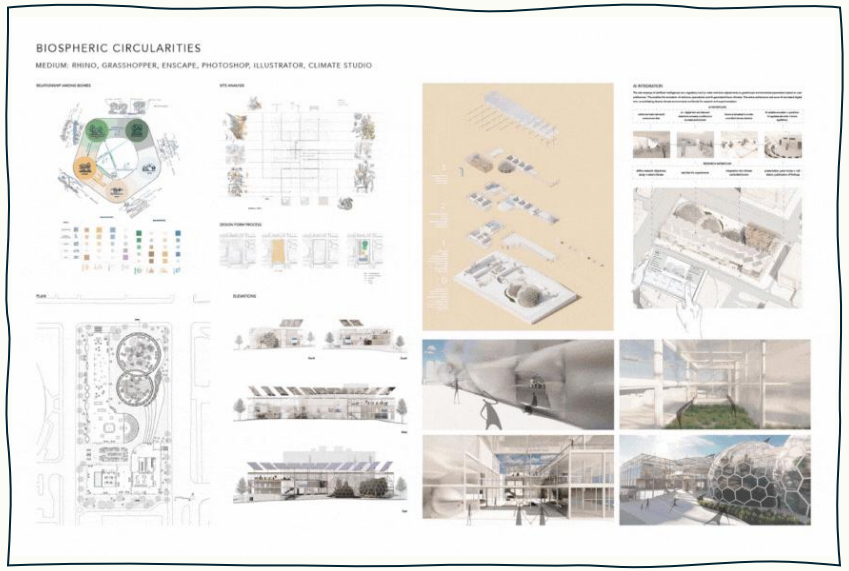
Landscape Architecture + Design Studies in Ecologies

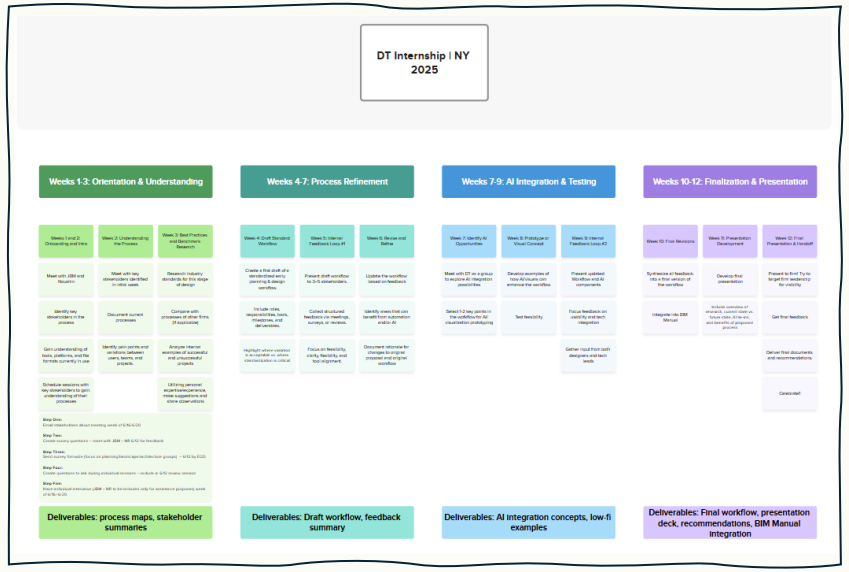
Georgia Tech

Architecture + Sustainable Cities

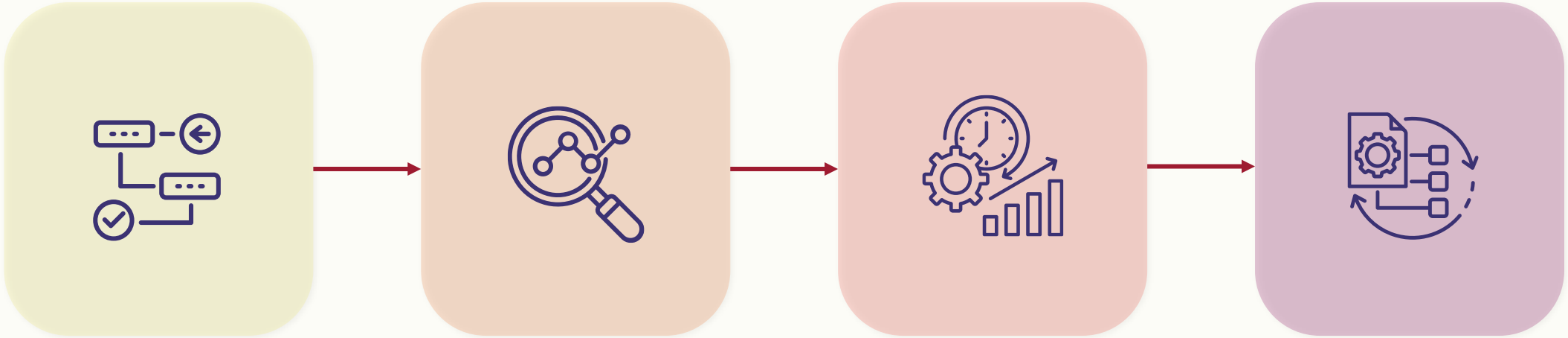
HH DT Summer Internship

Early-Stage Design Workflow





What's our goal



extract current internal early-stage planning and site workflow

find pain points and research potential solutions

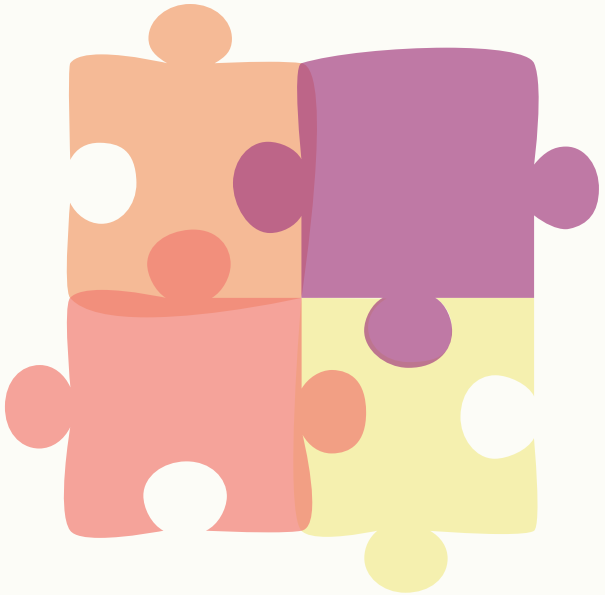
automate redundant steps and streamline workflow

guideline and toolkit for early-stage design process

Why we decided to look into this

1

Improve Team Coordination



2

Increase Efficiency

3

Optimize Tool Use

4

Support Stronger Project Outcomes

Hearing from the Team

01. Workflow and Tools

Understanding workflow and tools during the early stages of a project

02. Process and Format

Common collaboration processes and formats used for information handoff within and across teams

03. Pain Points and Gaps

Design or documentation workflows that involve repetitive or inefficient tasks that may benefit from automation

Talks

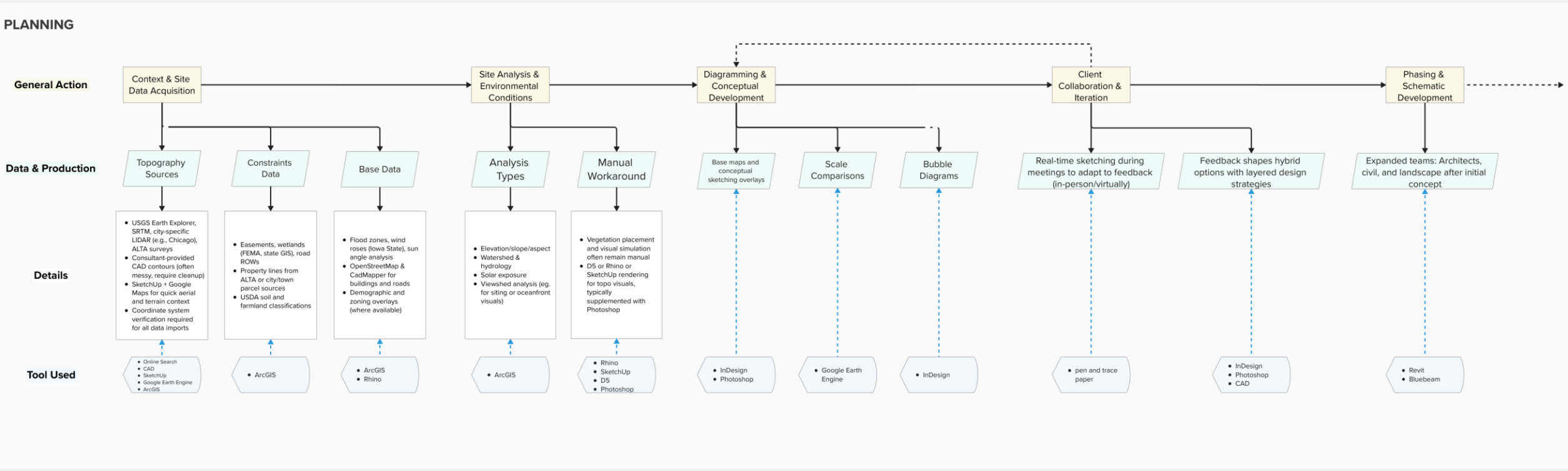
12 People

10+ hours

Teams

Hearing from the Team

Current Workflow [Planning]

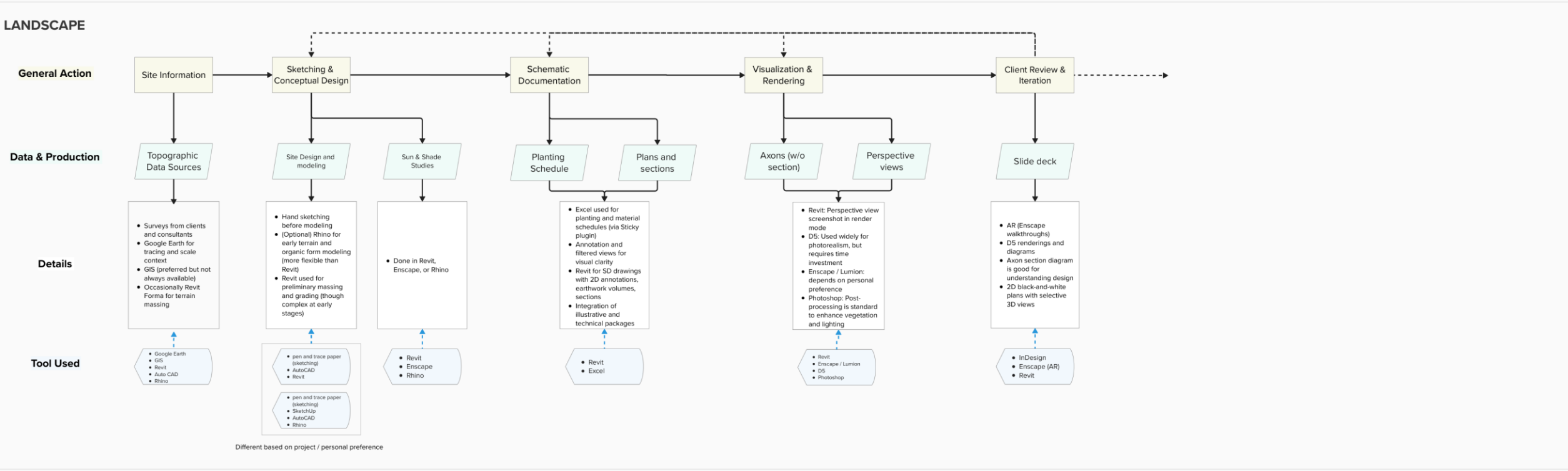


Mature, standardized workflow

Efficient deliverables

Consistent tools & outputs

Current Workflow [Landscape]

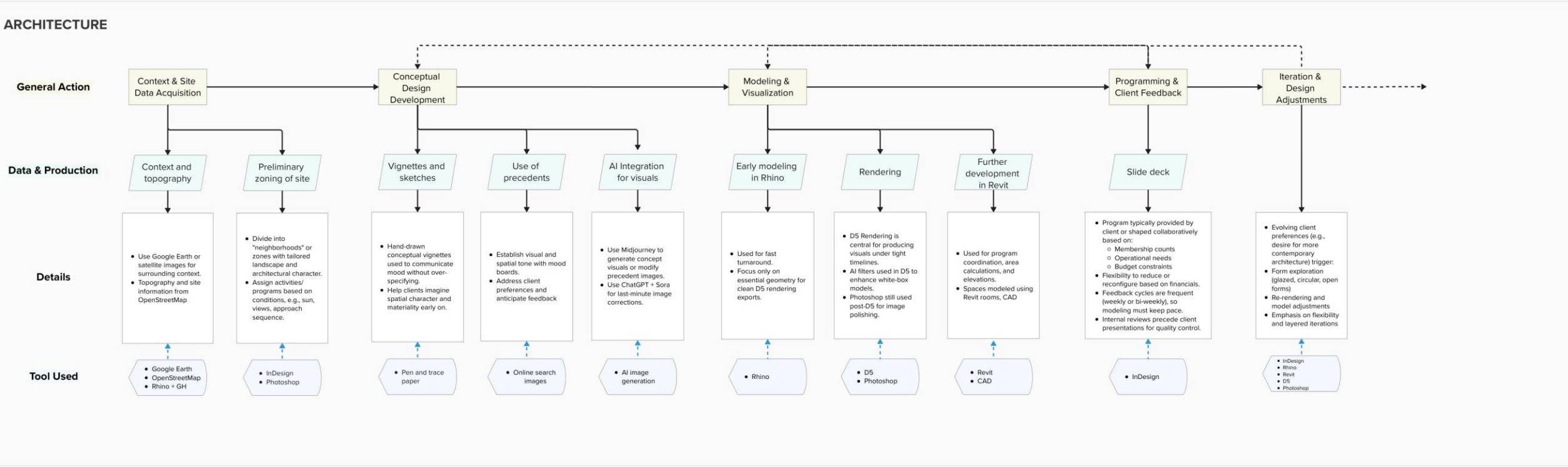


Workflow still developing, varies by person

Revit adoption ongoing, skill levels uneven

Processes not yet unified, learning in progress

Current Workflow [Architecture]



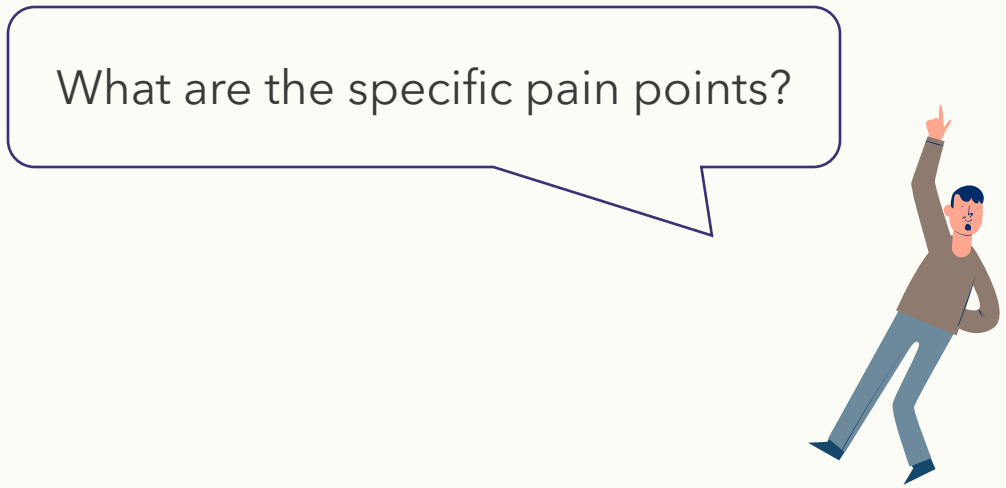
Experienced with established patterns

Strong daily workflow consistency

Less efficient in early-stage site data acquisition

Hearing from the Team

- Shared Cultural Traits
- Workflow maturity varies by discipline
- Opportunities for cross-team learning



Hearing from the Team

[Information Finding / Data Sourcing]

I don’t have a survey now - where and how can I get accurate topo contours to create a terrain model?

How can I create a larger context site model just for rendering and diagramming my conceptual design proposal?

Hearing from the Team

[Design Tools / Process]

Editing topography and grading in Revit is a nightmare!

How can I bring a Rhino file into Revit so it's automatically aligned?

Is there a quick way to identify the areas of my coastal site that have the best ocean views?

Hearing from the Team

[Communication between teams]

I'm more proficient in Rhino

I prefer to work directly in Revit

I use Forma to get site context

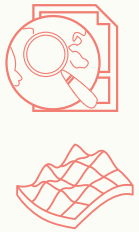
I use SketchUp to get a 3D site model

I use ArcGIS Pro to get a terrain model

Specific problems to tackle with

[Information Finding / Data Sourcing]

Get site context information and create terrain model



[Design Tools / Process]

File translation

Planning: viewshed analysis tool

Landscape: terrain model tool

[Communication Across Teams]

Knowledge sharing

[Information Finding / Data Sourcing]

Get site context information and create terrain model

[Design Tools / Process]

File translation

Planning: viewshed analysis tool

Landscape: terrain model tool

[Communication Across Teams]

Knowledge sharing

[Information Finding / Data Sourcing]

Get site context information and create terrain model

Blender Blosm plugin + Google 3D tiles

SketchUp + Add Location command

Open Street Map + Rhino + Grasshopper Elk plugin

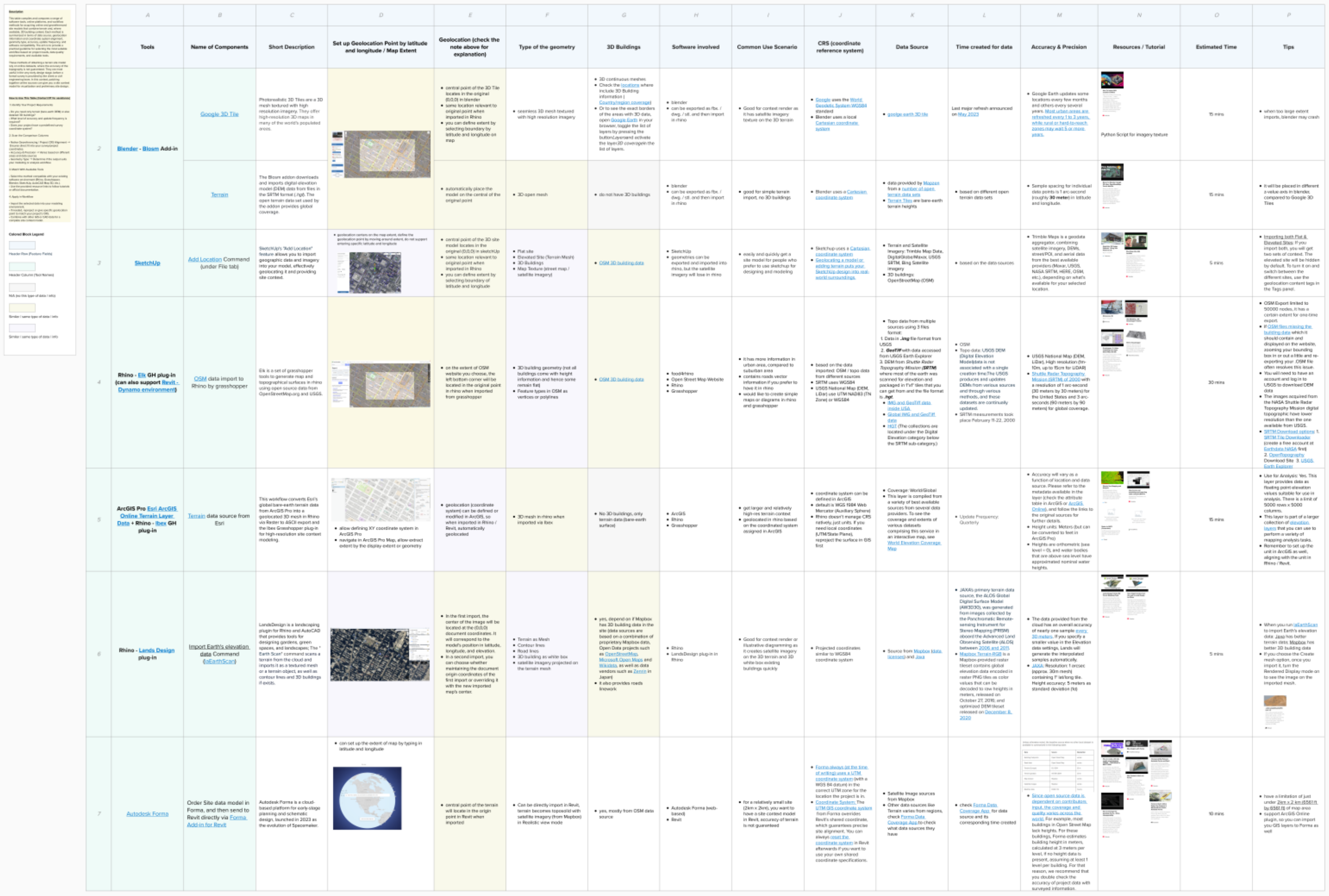
Lands Design Rhino plugin + laEarthScan command

ArcGIS Pro + ArcGIS Online + Rhino + Grasshopper Ibex plugin

Autodesk Forma

[Information Finding / Data Sourcing]

Get site context information and create terrain model



Guideline for Acquiring Site Model Workflows: A Comparative Table of Tools, Features, and Data Sources

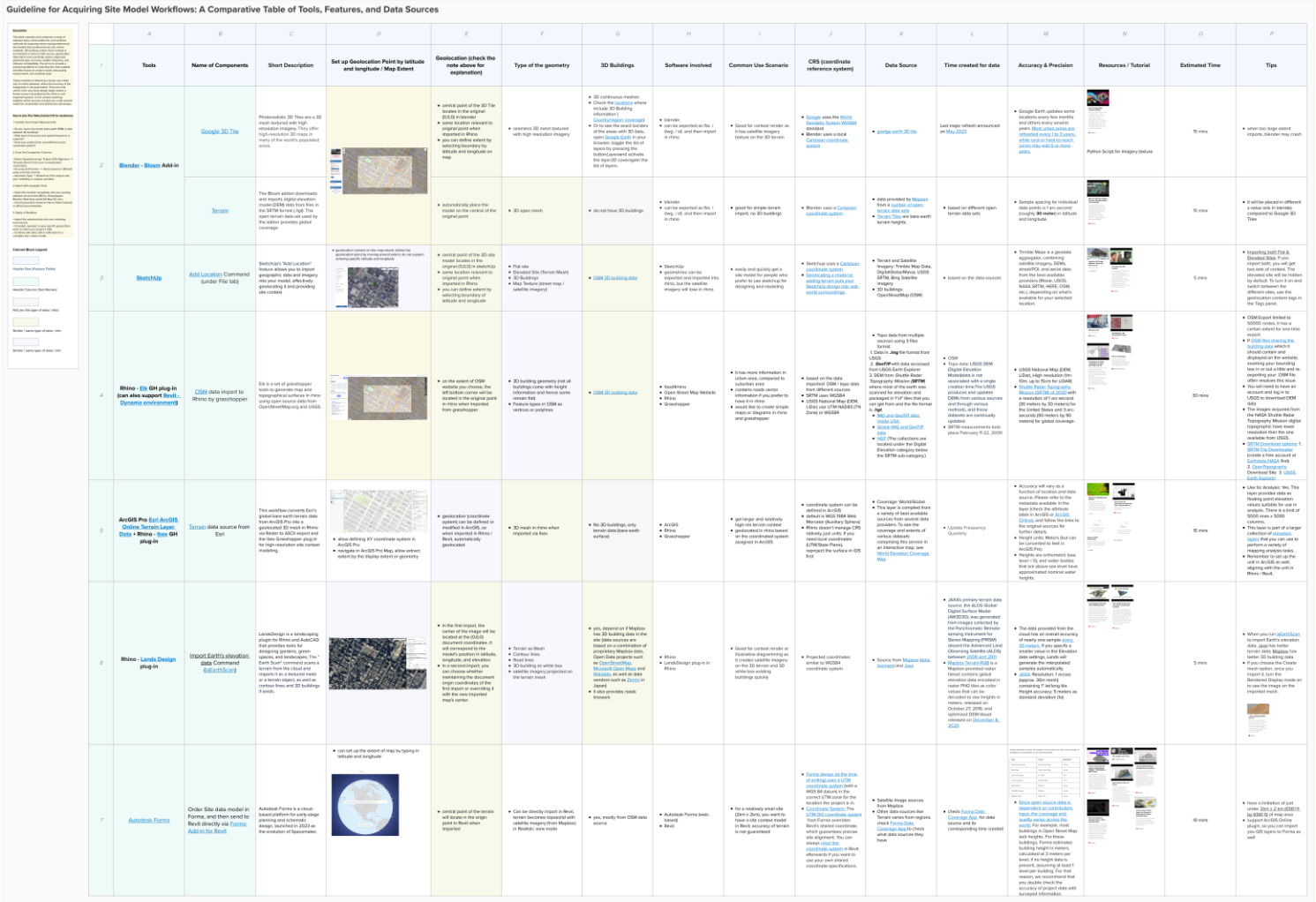
	Tools	Name of Components	Short Description
2	Blender - Blosm Add-in	Google 3D Tile	Photorealistic 3D Tiles are a 3D mesh textured with high resolution imagery. They offer high-resolution 3D maps in many of the world's populated areas.
		Terrain	The Blosm addon downloads and imports digital elevation model (DEM) data from files in the SRTM format (.hgt). The open terrain data set used by the addon provides global coverage.
3	SketchUp	Add Location Command (under File tab)	SketchUp's "Add Location" feature allows you to import geographic data and imagery into your model, effectively geolocating it and providing site context.
4	Rhino - Elk GH plug-in (can also support Revit - Dynamo environment)	OSM data import to Rhino by grasshopper	Elk is a set of grasshopper tools to generate map and topographical surfaces in rhino using open source data from OpenStreetMap.org and USGS.
5	ArcGIS Pro Esri ArcGIS Online Terrain Layer Data + Rhino - Ibex GH plug-in	Terrain data source from Esri	This workflow converts Esri's global bare-earth terrain data from ArcGIS Pro into a geolocated 3D mesh in Rhino via Raster to ASCII export and the Ibex Grasshopper plug-in for high-resolution site context modeling.
6	Rhino - Lands Design plug-in	Import Earth's elevation data Command (laEarthScan)	LandsDesign is a landscaping plugin for Rhino and AutoCAD that provides tools for designing gardens, green spaces, and landscapes; The " Earth Scan" command scans a terrain from the cloud and imports it as a textured mesh or a terrain object, as well as contour lines and 3D buildings if exists.
7	Autodesk Forma	Order Site data model in Forma, and then send to Revit directly via Forma Add-in for Revit	Autodesk Forma is a cloud-based platform for early-stage planning and schematic design, launched in 2023 as the evolution of Spacemaker.

Further column headers: Set up Geolocation Point by latitude and longitude / Map Extent; Geolocation (check the note above for explanation); Type of the geometry; 3D Buildings; Software involved; Common Use Scenario; CRS (coordinate reference system); Data Source; Time created for data; Accuracy & Precision; Resources / Tutorial; Estimated Time; Tips

"T:\10.0_Design_Technology\DT INTERNSHIP\2025\NY\Guideline for Acquiring Site Model Workflows_pdf_embedded_links.pdf"

[Information Finding / Data Sourcing]

Get site context information and create terrain model



Guideline for Acquiring Site Model Workflows: A Comparative Table of Tools, Features, and Data Sources

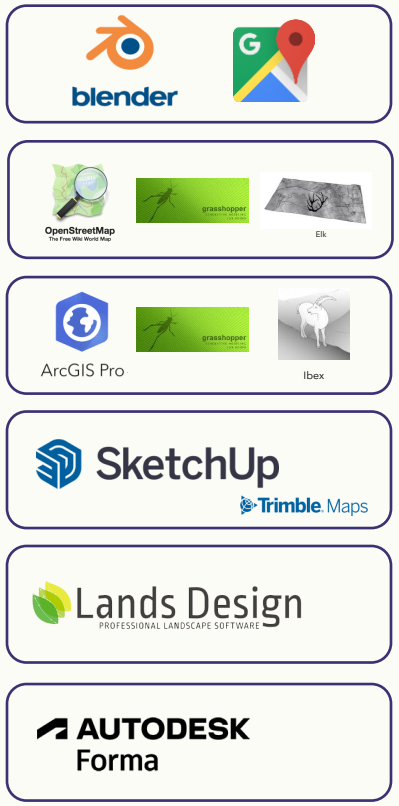
Tools	Name of Components	Short Description	Set up Geolocation Point by latitude and longitude / Map Extent	Geolocation (check the note above for explanation)	Type of the geometry	3D Buildings	Software involved	Common Use Scenario	CRS (coordinate reference system)	Data Source	Time created for data	Accuracy & Precision	Resources / Tutorial	Estimated Time	Tips
Blender - Bloom Add-in	Google 3D Tile	Photorealistic 3D Tiles are a 3D mesh textured with high resolution imagery. They offer high-resolution 3D maps in many of the world's populated areas.		• central point of the 3D Tile locates in the original (0,0,0) in blender • some location relevant to original point when imported in Rhino • you can define extent by selecting/boundary by latitude and longitude on map	• seamless 3D mesh textured with high resolution imagery	• 3D continuous meshes • Check the locations where include 3D Building Coverage Country/region coverages • Or to see the exact borders of the areas with 3D data, open Google Earth in your browser, toggle the list of layers by pressing the button/Layersand activate the layer/3D coverageon the list of layers.	• blender • can be exported as fbx. / dwg. / dxf. and then import in rhino	• Good for context render as it has satellite imagery texture on the 3D terrain	• Google and the World Geodetic System WGS84 standard • Blender uses a local Cartesian coordinate system	• google earth 3D tile	Last major refresh announced on May 2023	• Google Earth updates some locations every few months and others every several years. Most urban areas are refreshed every 1 to 3 years, while rural or hard-to-reach zones may wait 5 or more years.	Python Script for imagery texture	15 mins	• when too large extent imports, blender may crash
	Terrain	The Bloom addon downloads and imports digital elevation models (DEM) data from Mapzen's the SRTM format (.hgt). The open terrain data set used by the addon provides global coverage.		• automatically place the model on the central of the original point	• 3D open mesh	• do not have 3D buildings	• blender • can be exported as fbx. / dwg. / dxf. and then import in rhino	• good for simple terrain import, no 3D buildings	• Blender uses a Cartesian coordinate system	• data provided by Mapzen from a number of open terrain data sets • Terrain Tiles are bare-earth terrain heights	• based on different open terrain data sets	• Sample spacing for individual data points is 1 arc-second (roughly 30 meters) in latitude and longitude.		15 mins	• it will be placed in different z-value axis in blender, compared to Google 3D Tiles
SketchUp	Add Location Command (under File tab)	SketchUp's "Add Location" feature allows you to import geographic data and imagery into your model, effectively geolocating it and providing site context.		• central point of the 3D site model locates in the original (0,0,0) in sketchUp • some location relevant to original point when imported in Rhino • you can define extent by selecting/boundary of latitude and longitude	• Flat site • Elevated Site (Terrain Mesh) • 3D Buildings • Map Texture (street map / satellite imagery)	• OSM 3D building data	• SketchUp • geometries can be exported and imported into rhino, but the satellite imagery will lose in rhino	• easily and quickly get a site model for people who prefer to use sketchup for designing and modeling	• SketchUp uses a Cartesian coordinate system • Rhino uses a custom or existing terrain.obj in your SketchUp design into real-world surroundings.	• Terrain and Satellite Imagery: Trimble Map Data, DigitalGlobe/Maxar, USGS SRTM, Bing Satellite imagery • 3D buildings: OpenStreetMap (OSM)	• based on the data sources	• Trimble Maps is a geodata aggregator, combining satellite imagery, DEMs, streetPOI, and aerial data from a variety of sources and providers (Maxar, USGS, NASA SRTM, HERE, OSM, etc.), depending on what's available for your selected location.		5 mins	• Importing both Flat & Elevated Sites: If you import both, you will get two sets of context. The elevated site will be on top hidden by default. To turn it on and switch between the different sites, use the geolocation content tags in the Tags panel.
Rhino - Elk GH plug-in (can also support Revit - Dynamo environment)	OSM data import to Rhino by grasshopper	Elk is a set of grasshopper tools to generate map and topographical surfaces in rhino using open source data from OpenStreetMap.org and USGS.		• on the extent of OSM website you choose, the location number will be added on the original point in rhino when imported from grasshopper	• 3D building geometry (not all buildings come with height information and hence some remain flat) • Feature types in OSM as vertices or polylines	• OSM 3D building data	• food4rhino • Open Street Map Website • Rhino • Grasshopper	• it has more information in urban area, compared to suburban area • contains roads vector information if you prefer to have it in rhino • would like to create simple maps or diagrams in rhino and grasshopper	• based on the data imported: OSM / topo data from different sources • SRTM uses WGS84 • USGS National Map (DEM, LiDar) use UTM NAD83 (Tm Zone) or WGS84	• Topo data from multiple sources using 3 files format: 1. Data in .bag file format from USGS 2. GeoTIFF with data accessed from USGS Earth Explorer 3. DEM from Shuttle Radar Topography Mission (SRTM) where most of the earth was scanned in 11 days in 2000 and packaged in TIF files that you can get from and the file format is .hgt • Web and GeoTiff data inside USA • Global (WS) and GeoTiff data • HGT (The collections are located under the Digital Elevation category below the SRTM sub-category.)	• OSM • Topo data: USGS DEM (Digital Elevation Models)data is not associated with a single creation date. The USGS 3DEP program integrates elevation data from various sources and through various methods, and these datasets are continually updated. • SRTM measurements took place February 11-22, 2000	• USGS National Map (DEM, LiDar), High resolution (3m-10m, up to 1foot for LiDAR) • Shuttle Radar Topography Mission (SRTM) provides data with a resolution of 1 arc-second (30 meters) for 30 meters for the United States and 3 arc-seconds (90 meters by 90 meters) for global coverage.		30 mins	• OSM Export limited to 50000 nodes, it has a certain extent for one time export. • If OSM files missing the building data which it should contain and displayed on the website, zooming your bounding box in or out a little and re-exporting your OSM file often resolves this issue. • You will need to have a Microsoft and login for the USGS to download DEM data • The images acquired from the NASA Shuttle Radar Topography Mission digital topographic have lower resolution than the one available from USGS. • SRTM Download options: 1. SRTM Tile Downloader (create a free account at Earthdata NASA first) 2. OpenTopography
ArcGIS Pro Esri ArcGIS Online Terrain Layer Data + Rhino - Ibex GH plug-in	Terrain data source from Esri	This workflow converts Esri's (gdal) base-earth-terrain data from ArcGIS Pro into a geolocated 3D mesh in rhino via Ibester to ASCII export and the Ibex Grasshopper plug-in for high-resolution site context modeling.		• geolocation (coordinate system) can be defined or modified in ArcGIS, so when imported in Rhino / Revit, automatically geolocated	• 3D mesh in rhino when imported via Ibex	• No 3D buildings, only terrain data (bare-earth surface)	• ArcGIS • Rhino • Grasshopper	• get larger and relatively high-res terrain context • geolocated in rhino based on the coordinated system assigned in ArcGIS	• coordinate system can be defined in ArcGIS (default is WGS 1984 Web Mercator (Auxiliary Sphere) • Rhino doesn't manage CRS natively, just units. If you need local coordinates (UTM/State Plane), reproject the surface in GIS first	• Coverage: World/Global • This layer is compiled from a variety of best available sources from several data providers. To see the coverage and extents of various datasets comprising this service in an interactive map, see World Elevation Coverage Map	• Update Frequency: Quarterly	• Accuracy will vary as a function of location and data source. Some data sources have metadata available in the layer (check the attribute table in ArcGIS or ArcGIS Online), and follow the links to the original sources for further details. • Height units: Meters (but can be converted to feet in ArcGIS Pro) • Heights are orthometric (sea level = 0), and water bodies that are above sea level have approximated nominal water heights.		15 mins	• Use for Analysis: Yes. This layer provides data as floating point elevation values suitable for use in analysis. There is a limit of 10000 rows x 10000 columns. • This layer is part of a larger collection of elevation layers that you can use to perform a variety of mapping-analysis tasks. • Remember to set up the unit in ArcGIS as well, aligning with the unit in Rhino / Revit.
Rhino - Lands Design plug-in	Import Earth's elevation data Command (lsEarthScan)	LandsDesign is a landscaping plugin for Rhino and AutoCAD that provides tools for designing gradians, green spaces, and landscapes; The 'lsEarthScan' command scans a terrain from the cloud and imports it as a textured mesh or a terrain object, as well as contour lines and 3D buildings if exists.		• In the first import, the center of the image will be located at the (0,0,0) document coordinates. It will correspond to the model's position in latitude, longitude, and elevation. • In a second import, you can choose whether maintaining the document coordinates of the first import or centering it with the new imported map's center.	• Terrain as Mesh • Contour lines • Road lines • 3D building as white box • satellite imagery projected on the terrain mesh	• yes, depend on if Mapbox has 3D building data in the site (data sources are Mapbox, Microsoft Open Maps, a number of proprietary Mapbox data, Open Data projects such as OpenStreetMap, Microsoft Open Maps and Wikidata, as well as data vendors such as Zenrin in Japan) • it also provides roads linework	• Rhino • LandsDesign plug-in in Rhino	• Good for context render or illustrative diagramming as it creates satellite imagery on the 3D terrain and 3D white-box existing buildings quickly	• Projected coordinates: similar to UTM coordinate system	• Source from Mapbox Mobs, licensed and Java	• JAXA's primary terrain data source, the ALOS Global Digital Surface Model (AW3D30), was generated from images collected by the Panchromatic Remote-sensing Instrument for Stereo Mapping (PRISM) optical sensor on the Advanced Land Observing Satellite (ALOS) between 2006 and 2011. • Mapbox Terrain-RGB is a Mapbox-provided raster tileset containing global elevation data encoded in raster PNG tiles as color values that can be decoded to raw heights in meters, released on October 27, 2016, and optimized DEM tileset released on December 8, 2020	• The data provided from the cloud has an overall accuracy of nearly one sample every 30 meters (98 feet), with a smaller value in the Elevation data settings, Lands will generate the interpolated samples automatically. • JAXA: Resolution 1 arcsec (approx. 30m mesh) containing 1° tall/long tile. Height accuracy: 5 meters as standard deviation (%)		5 mins	• When you run lsEarthScan to import Earth's elevation data, keep how better terrain data Mapbox has better 3D building data • If you choose the Create mesh option, once you import it, turn the Rendered Display mode on to see the image on the imported mesh.
Autodesk Forma	Order Site data model in Forma, and then send to Revit directly via Forma Add-in for Revit	Autodesk Forma is a cloud-based platform for early-stage planning and schematic design, launched in 2023 as the evolution of Spacemaker.		• central point of the terrain will locate in the origin point in Revit when imported	• Can be directly import in Revit, terrain becomes topocad with satellite imagery (from Mapbox) in Realistic view mode	• yes, mostly from OSM data source	• Autodesk Forma (web-based) • Revit	• for a relatively small site (2km x 2km), you want to have a site context model in Revit, accuracy of terrain is not guaranteed	• Forma always at the time of writing) uses a UTM coordinate system (with a WGS 84 datum in the correct UTM zone for the location the project is in. • Coordinate System: The UTM GIS coordinate system from Forma overrides Revit's shared coordinate, which guarantees precise site alignment. You can change the coordinate system in Revit afterwards if you want to use your own shared coordinate specifications.	• Satellite Image sources from Mapbox • Other data sources like Terrain varies from regions, check Forma Data Coverage App to check what data sources they have	• check Forma Data Coverage App for data source and its corresponding time created	Since open source data is dependent on contributors input, the coverage and quality varies across the world. For example, most countries in the Mapbox Map lack heights. For these buildings, Forma estimates building height in meters, calculated at 3 meters per level, if no height data is present, assuming at least 1 level per building. For that reason, we recommend that you double check the accuracy of project data with surveyed information.		10 mins	• have a limitation of just under 2km x 2 km (6561 ft by 6561 ft) of map area • support ArcGIS Online plugin, so you can import you GIS layers to Forma as well

- Geolocation
- Types of Geometries
- 3D Buildings
- Terrain Data Source
- Data Accuracy and Precision
- Tutorials
- Embedded Links for Further Reference

"T:\10.0_Design_Technology\DT INTERNSHIP\2025\NY\Guideline for Acquiring Site Model Workflows_pdf_embedded_links.pdf"

[Information Finding / Data Sourcing]

Get site context information and create terrain model

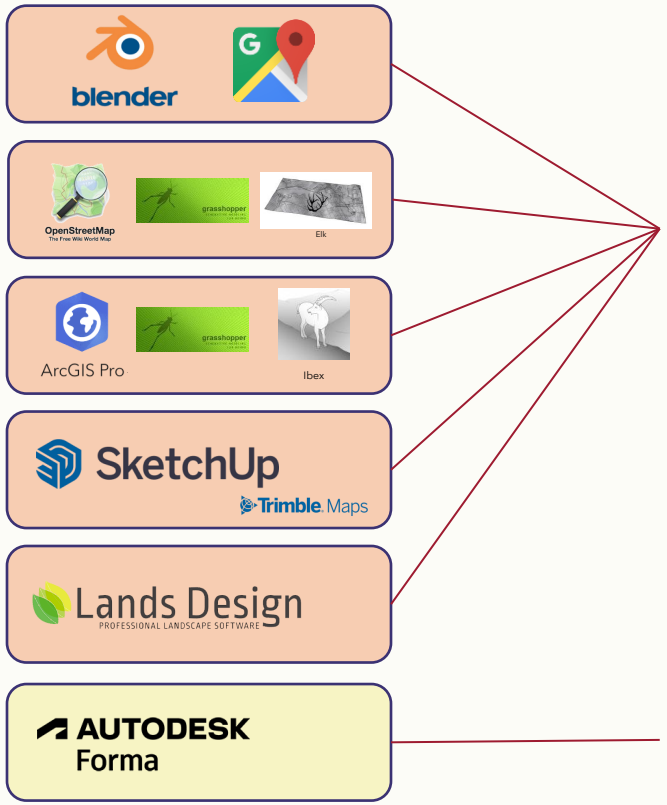


- Delivering 3D terrain models
- Supporting multiple 3D modeling environments

  (e.g., Rhino, SketchUp, Blender, Revit)
- Accessing globally available data sources

[Information Finding / Data Sourcing]

Get site context information and create terrain model



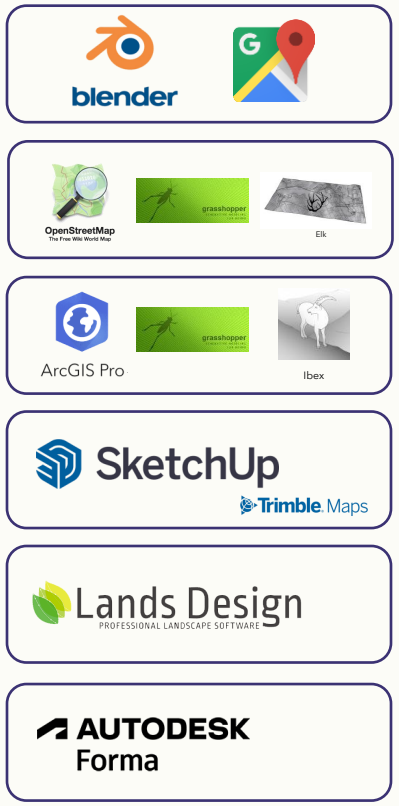
- Revit interoperability
- Rhino.Inside.Revit + Grasshopper
- Supports importing terrain meshes into Revit

Rhino.Inside®.Revit

- Import into Revit directly (size limit to 2km by 2km)

[Information Finding / Data Sourcing]

Get site context information and create terrain model - *Scenario 1*



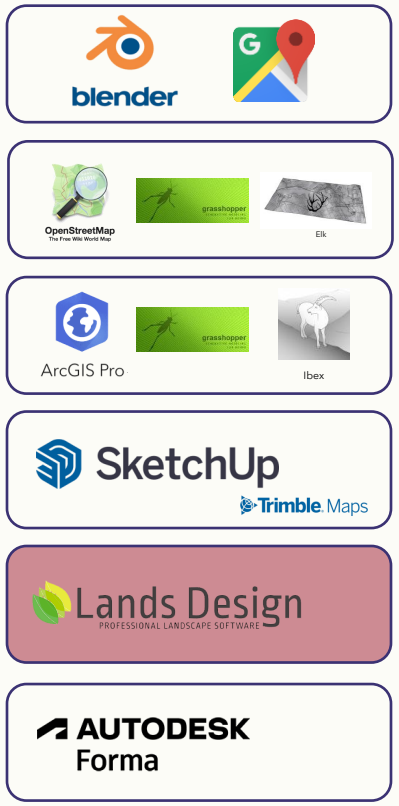
- Project: Inn at Perry Cabin

- *"As an architect working on an early-stage concept, I need a quick way to create a **3D contextual site model** for client presentations. For example, at the Inn at Perry Cabin, the goal is simply to show context for renders and diagrams—not survey-level accuracy."*

- **Challenge**: The only available survey is from 2013, outdated, hard to clean, and lacks a survey point for georeferencing.

[Information Finding / Data Sourcing]

Get site context information and create terrain model - Scenario 1

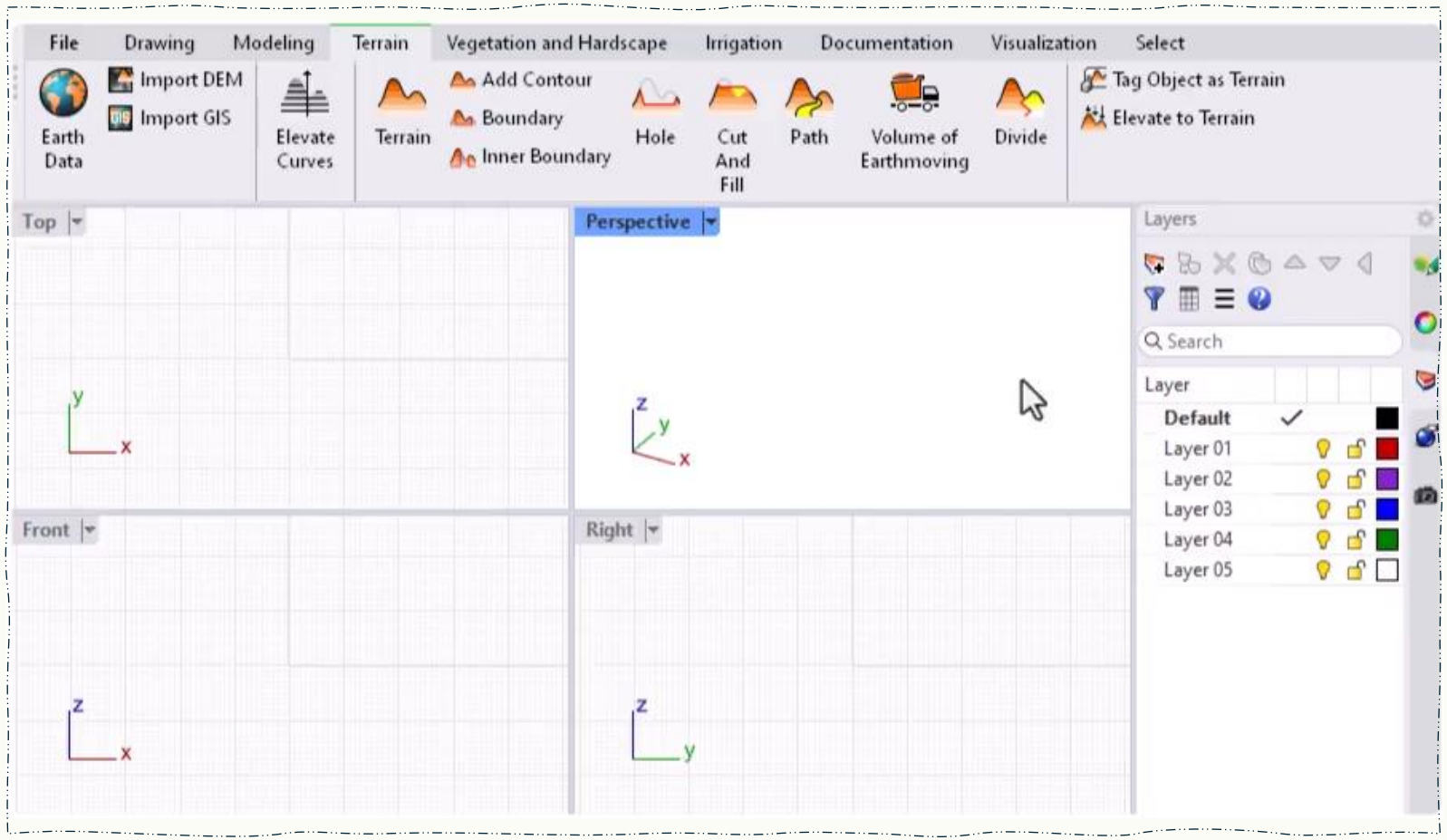


- Project: Inn at Perry Cabin

- Options Considered:
  - **ArcGIS Pro**: Good for importing geolocated terrain, but limited license access and does not provide existing 3D buildings.
  - **Lands Design (Rhino plugin)**: Quick to generate terrain, 3D buildings (via Mapbox), and satellite imagery projected on the terrain. While not geolocated, it provides a fast, abstract site model suitable for early-stage needs. Also, it allows quick manipulation of terrain or adjustment of existing buildings in Rhino.

[Information Finding / Data Sourcing]

Get site context information and create terrain model - Scenario 1



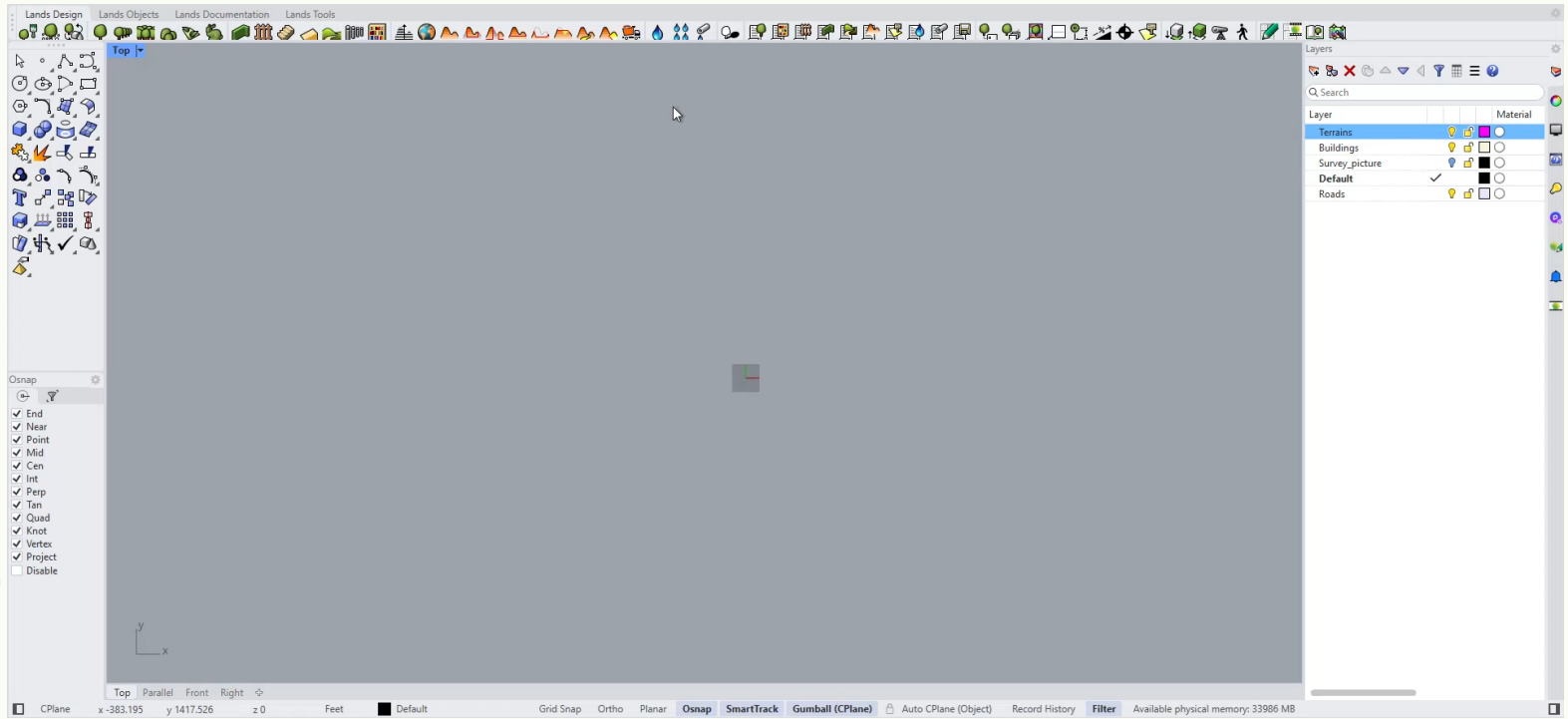
- Tutorial from *Lands Design*

- Import **3D terrain** by specifying site location on a map
- Integrate **real-world topographical data** for accurate context
- Obtain **urban areas with buildings and terrain** in just a few clicks
- Use **Earth Scan tool** to bring in roads and buildings quickly
- Streamline design workflows for **landscape architects and urban planners**

Lands Design
PROFESSIONAL LANDSCAPE SOFTWARE

[Information Finding / Data Sourcing]

Get site context information and create terrain model - Scenario 1

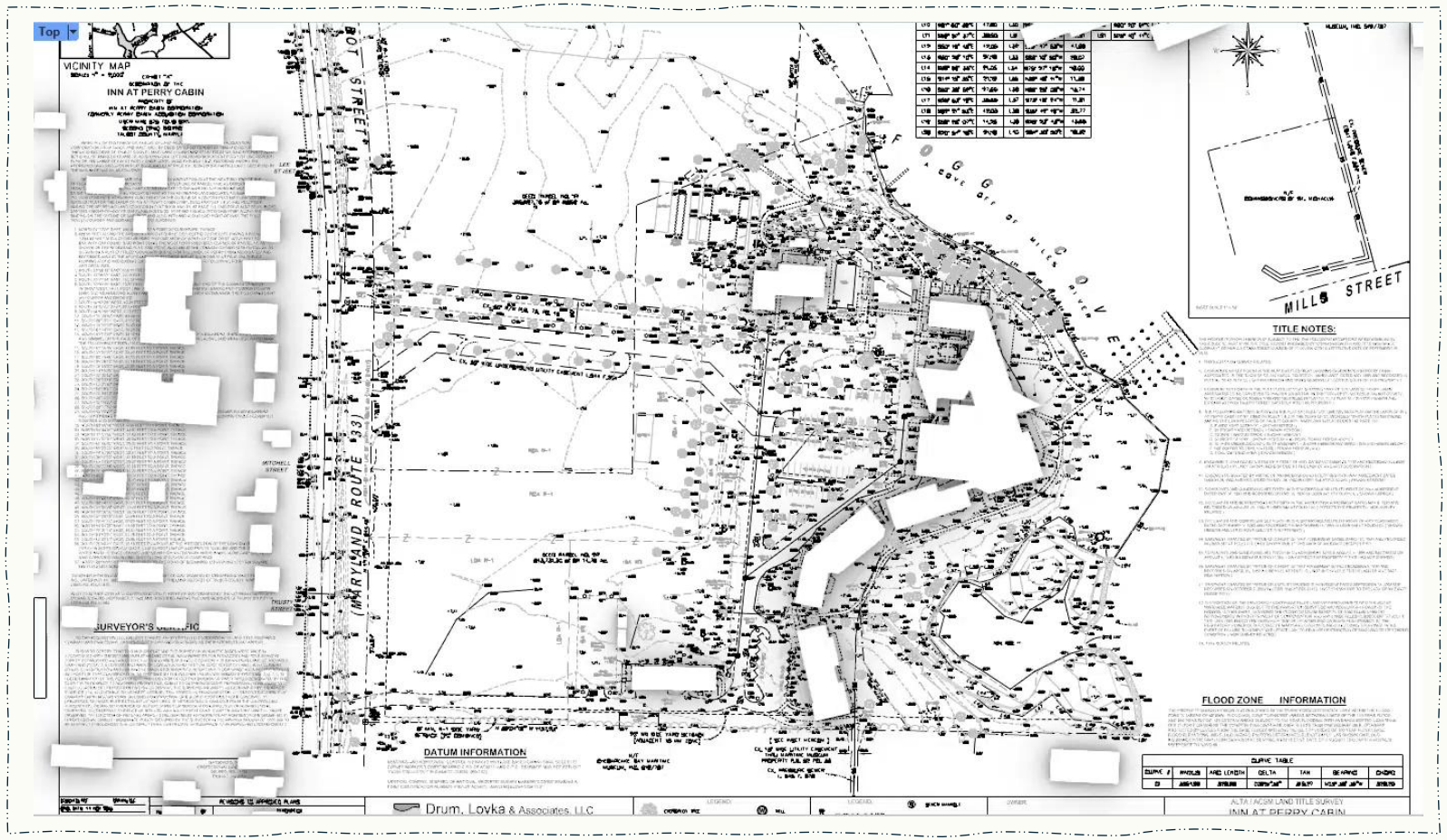


1. Use Lands Design to generate terrain, buildings, and imagery.

Lands Design
PROFESSIONAL LANDSCAPE SOFTWARE

[Information Finding / Data Sourcing]

Get site context information and create terrain model - Scenario 1

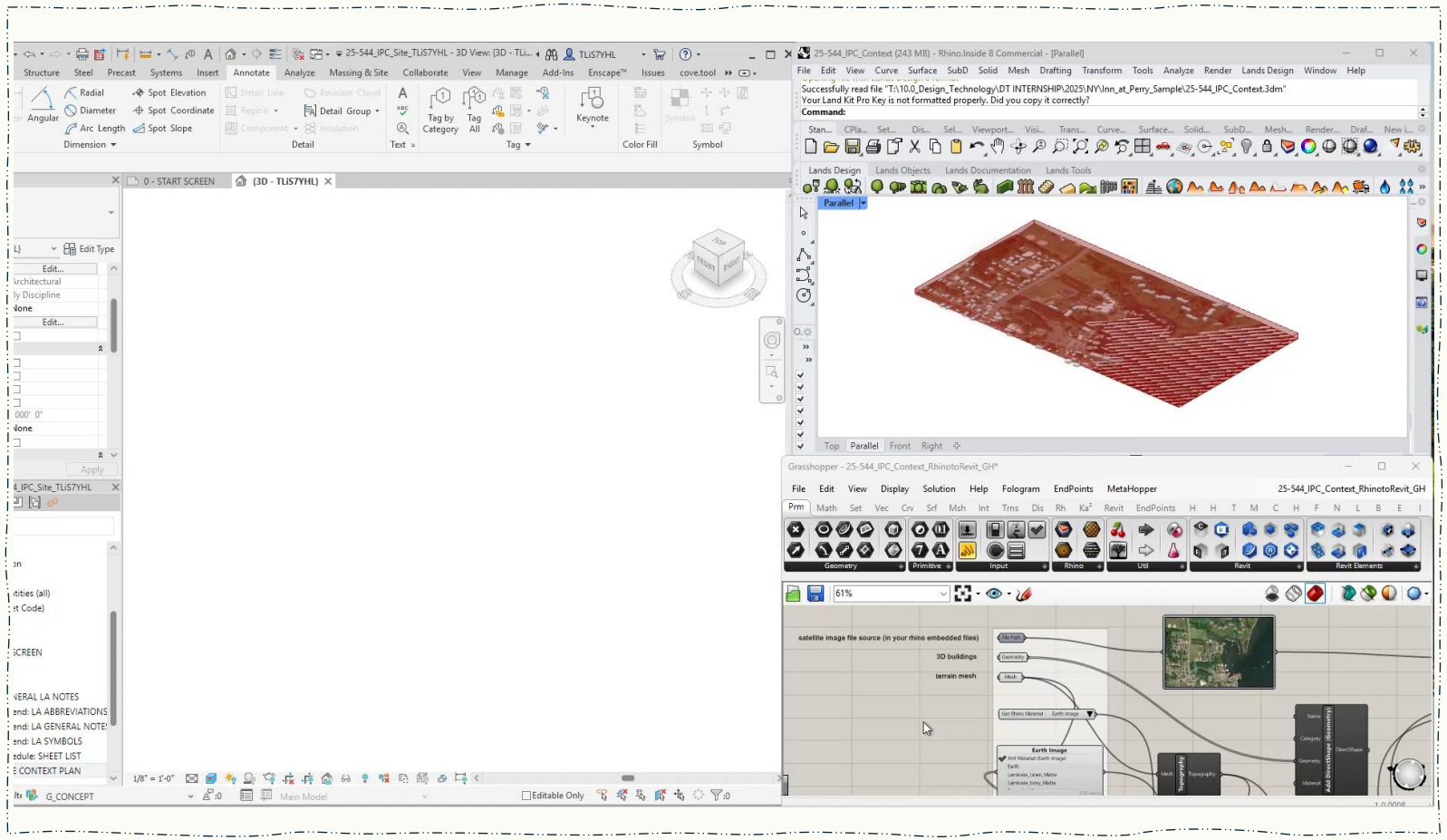


2. Compare overlay with the 2013 survey – overall similar, with slight building footprint differences.

Lands Design
PROFESSIONAL LANDSCAPE SOFTWARE

[Information Finding / Data Sourcing]

Get site context information and create terrain model - Scenario 1



3. Bring this model into Revit via Rhino.Inside.Revit:

(we created grasshopper script!)

- Open Rhino file in Revit.
- Run an existing Grasshopper script.
- Assign meshes, geometry, and images.
- Automatically generate Revit toposurface with terrain, building massing, and satellite imagery as surface material.

Lands Design PROFESSIONAL LANDSCAPE SOFTWARE
Revit
Rhino.Inside®.Revit

[Information Finding / Data Sourcing]

Get site context information and create terrain model

[Design Tools / Process]

File translation

Planning: viewshed analysis tool

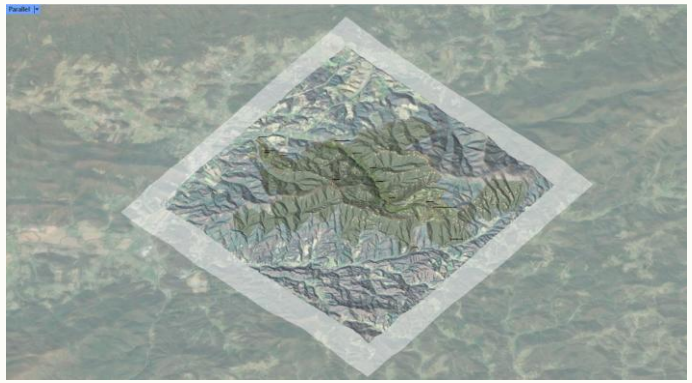
Landscape: terrain model tool

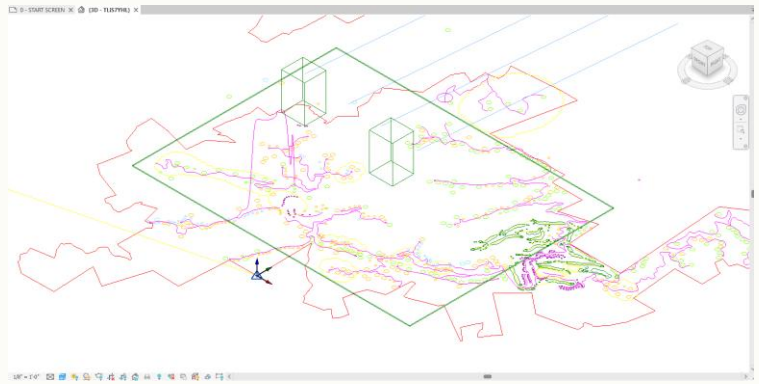
[Communication Across Teams]

Knowledge sharing

[Design Tools / Process]

File translation – Terrain from Rhino to Revit - Scenario 2



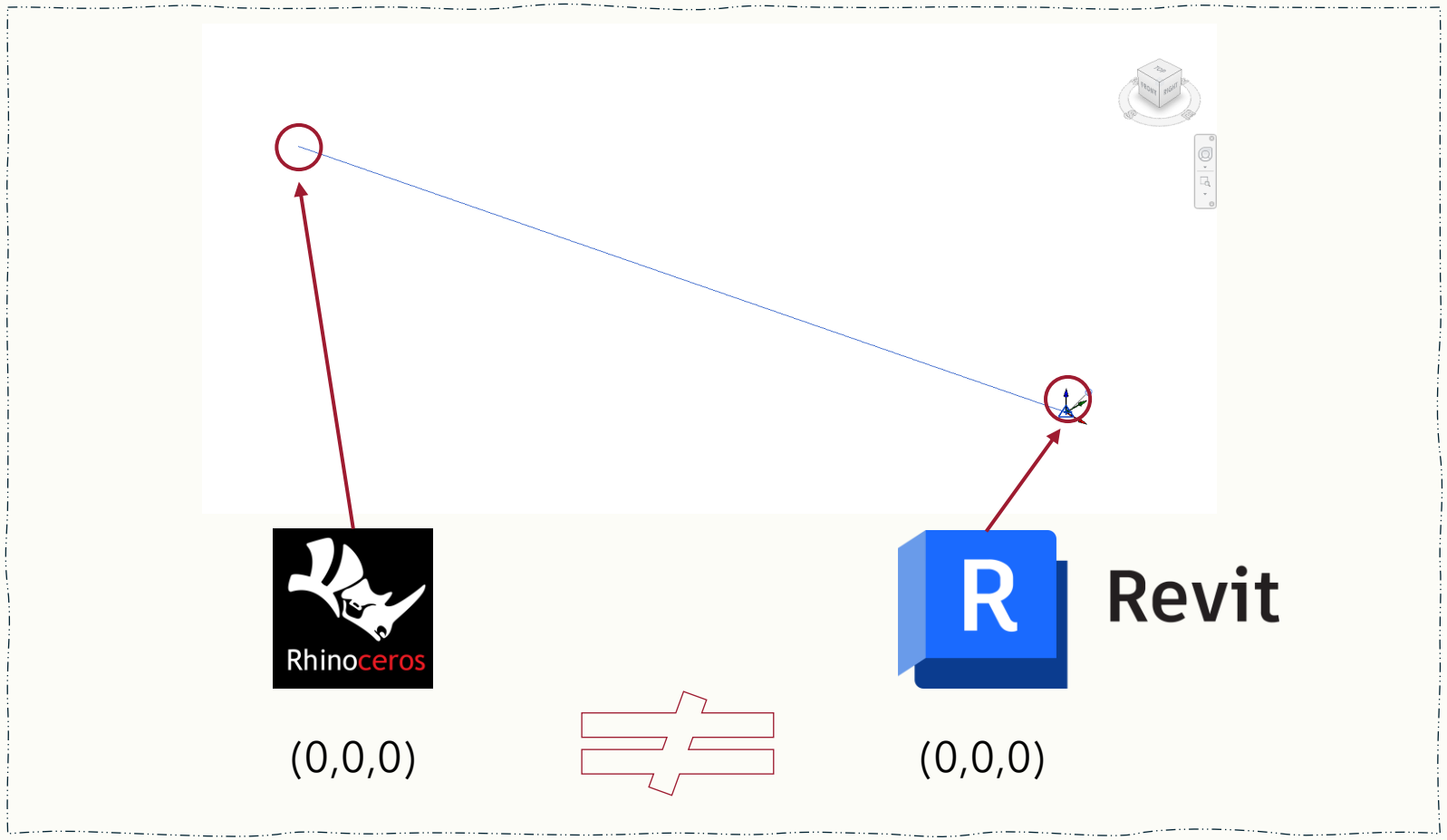


Rhinoceros → Revit

- Project: Forge Mountain
- *"As a landscape architect, I need to bring terrain prepared by the planning team into Revit for further site design. In the Forge Mountain project, the planning team exported existing terrain and context from ArcGIS into Rhino, and it's geolocated."*

[Design Tools / Process]

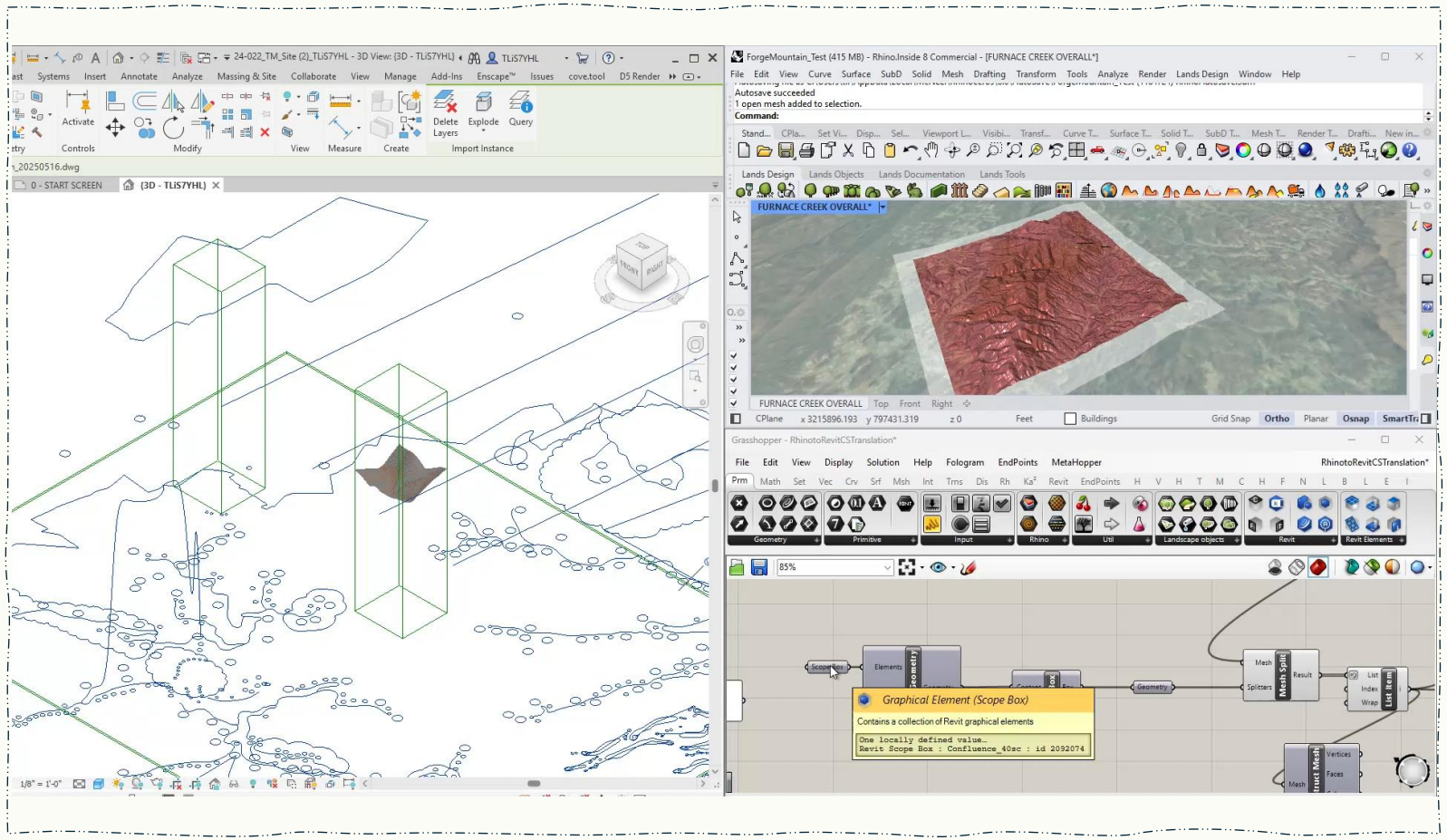
File translation – Terrain from Rhino to Revit - Scenario 2



- Project: Forge Mountain
- **Challenge**: Rhino and Revit use different origin systems:
  - Rhino has a simple 0,0,0 world origin.
  - Revit has a more complex system: Internal Origin, Project Base Point, and Survey Point.
  - Direct imports cause misalignment because the origins don't match.

[Design Tools / Process]

File translation – Terrain from Rhino to Revit - Scenario 2



- Developed a coordinate system transition script in Grasshopper. Using Rhino.Inside.Revit, we can:
- Open the Rhino terrain model inside Revit.
- Run the Grasshopper script to translate Rhino coordinates to Revit's coordinate system, anchored to the Survey Point.
- Convert Rhino meshes into a Revit Toposurface / Toposolid, preserving geolocation.

Rhino.Inside®.Revit

[Information Finding / Data Sourcing]

[Design Tools / Process]

[Communication Across Teams]

Get site context information and create terrain model

File translation

Planning: viewshed analysis tool

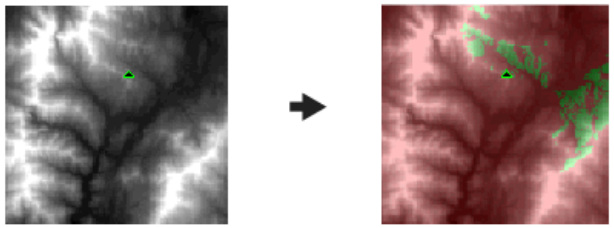
Landscape: terrain model tool

Knowledge sharing

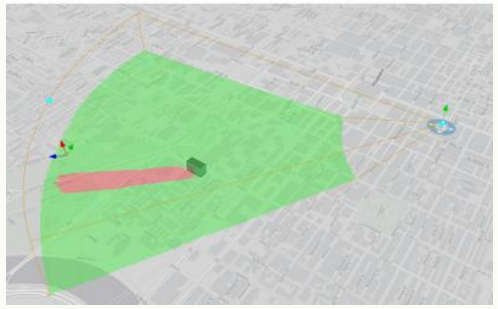
[Design Tools / Process]

Planning: viewshed analysis tool

ArcGIS Pro

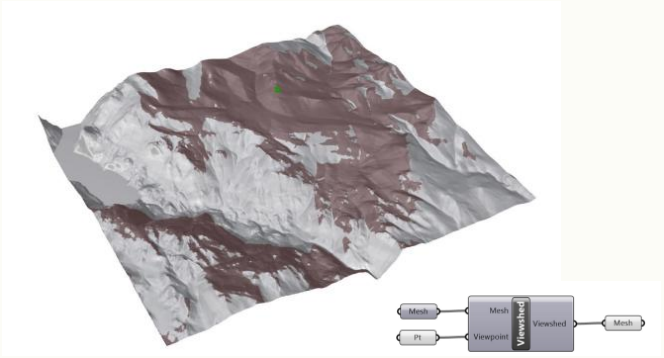


Viewshed Analysis



Interactive 3D Viewshed Analysis

GH + Bison

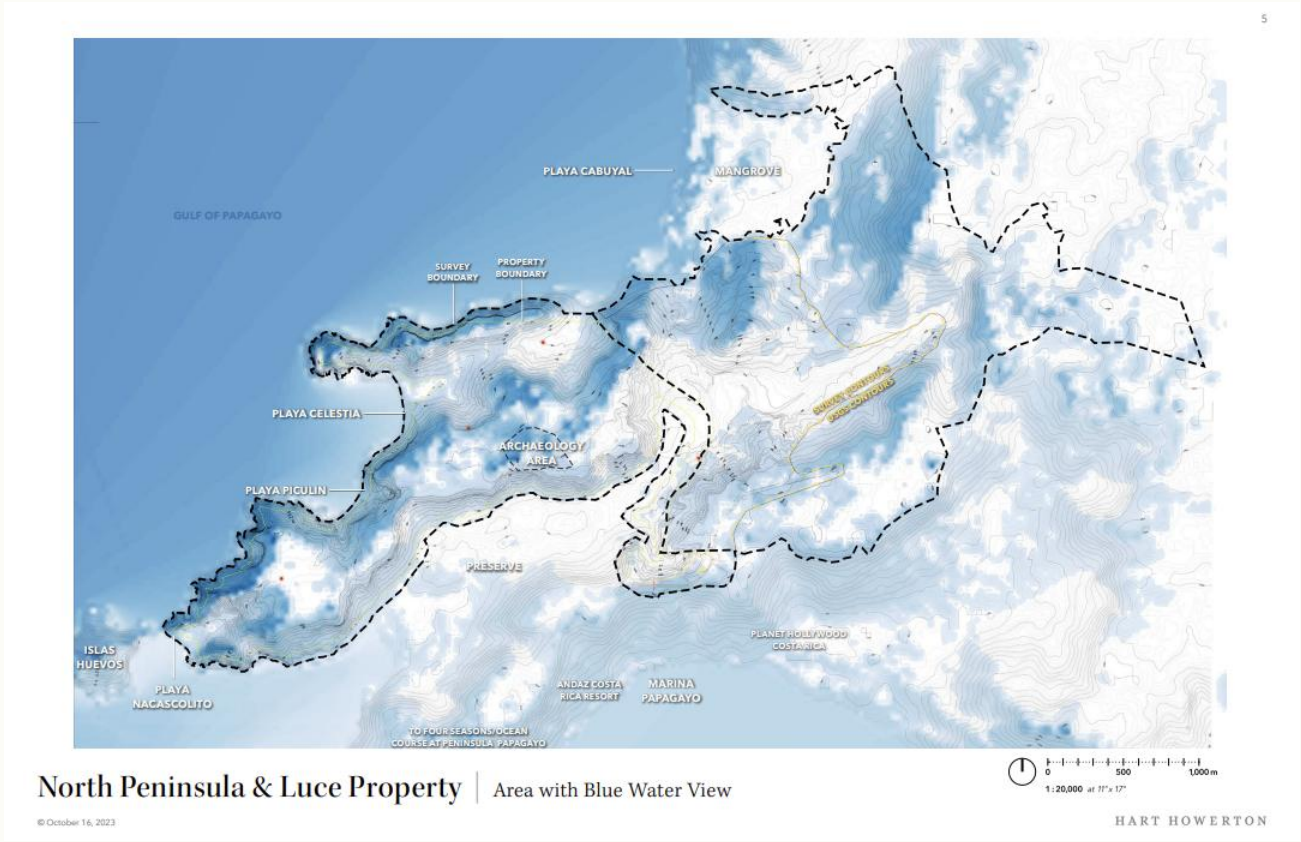


Existing tools on standard viewshed analysis

- "Standard" viewshed
  - What can be seen from points (e.g. E.g. if I'm stood on top of a mountain, what will my view be?)
- "Reverse" viewshed
  - Where can see the points (E.g. if I'm stood on top of a mountain, who can see me?)
- The sightlines are reciprocal between the two points

[Design Tools / Process]

Planning: viewshed analysis tool - Scenario 3



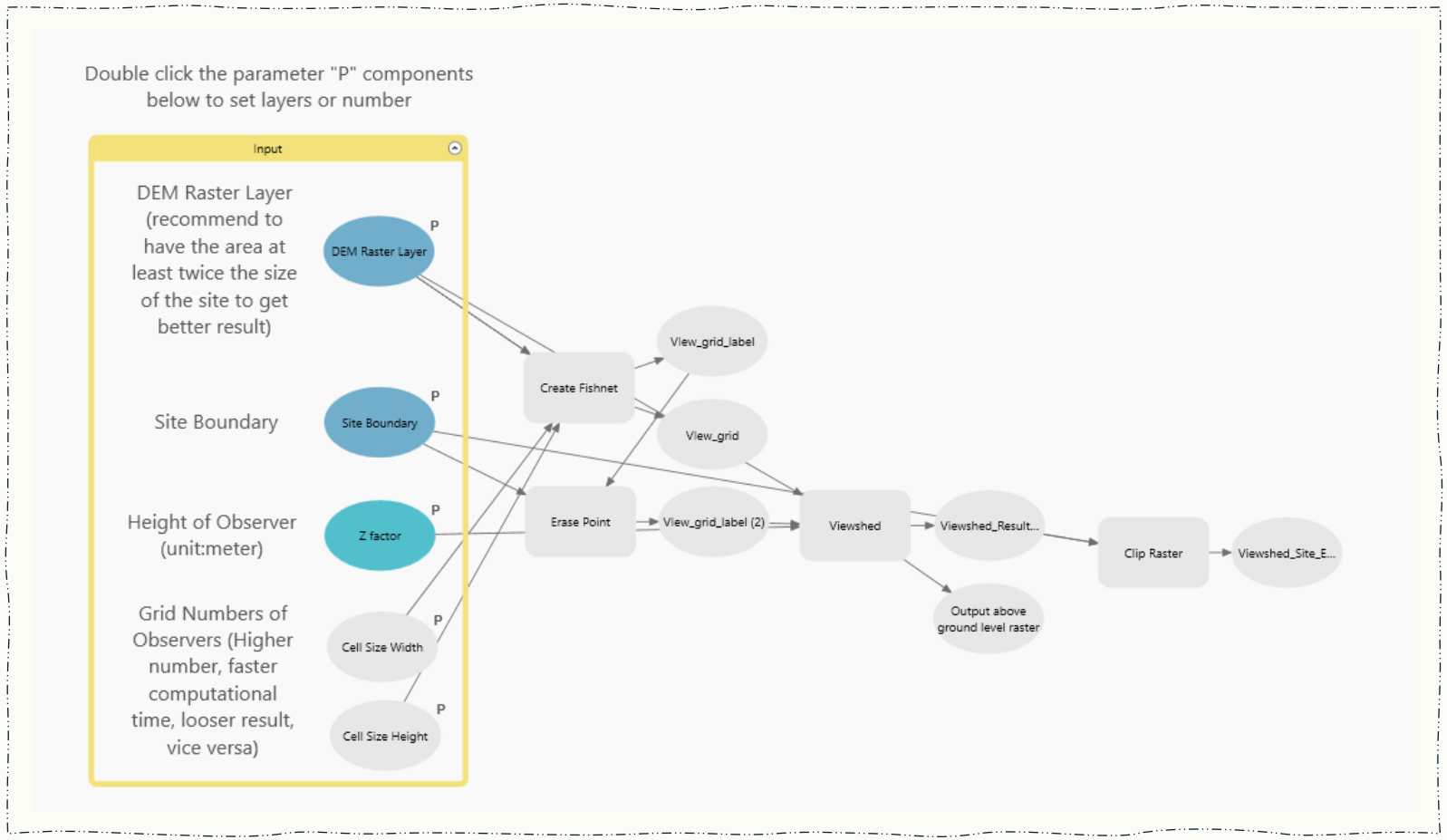
- Project: North Peninsula Papagayo MasterPlan

- Manual method → ~2–3 hrs
- Darker blue = better ocean view

ArcGIS Pro

[Design Tools / Process]

Planning: viewshed analysis tool - Scenario 3

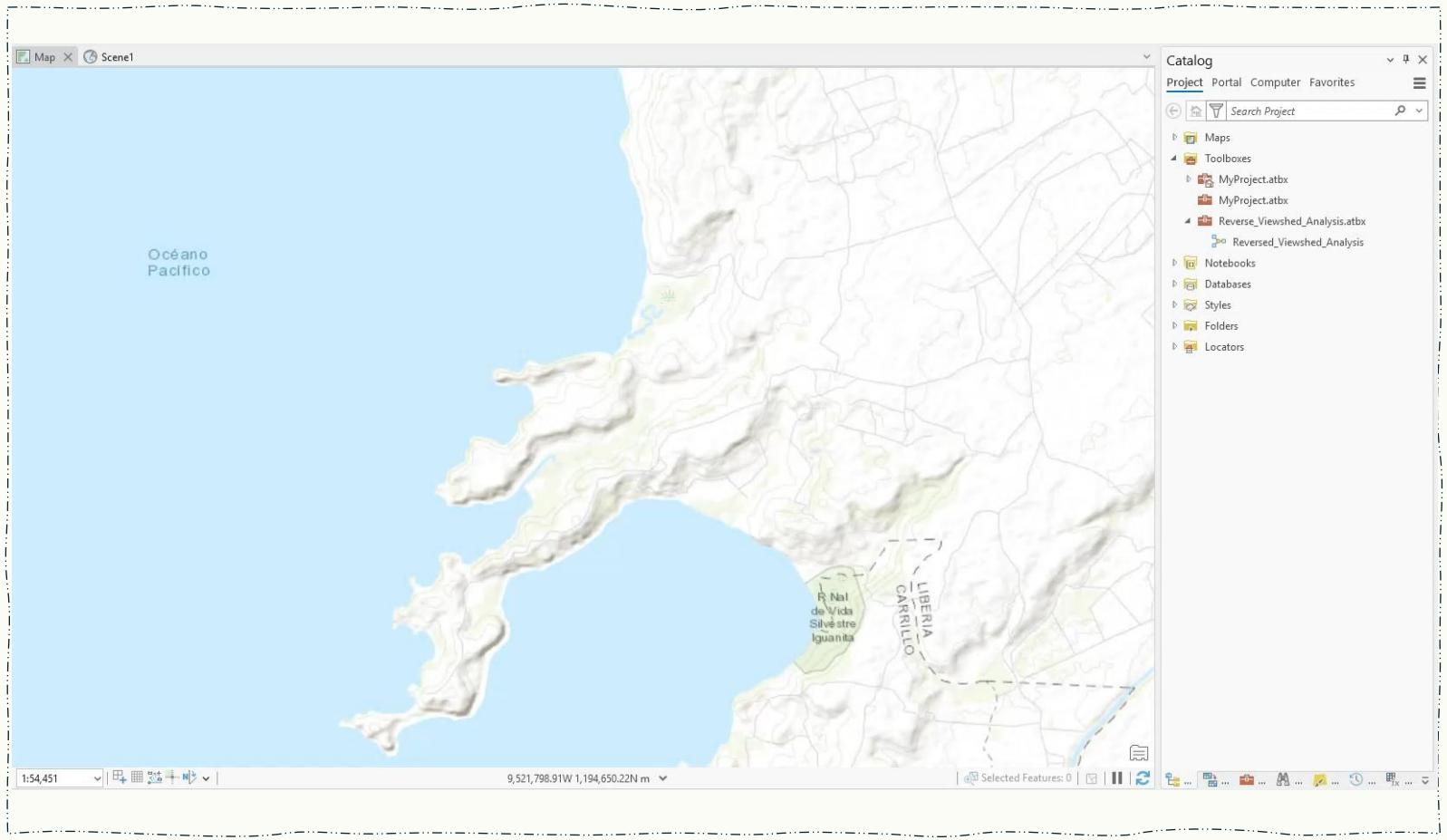


- Project: North Peninsula Papagayo MasterPlan
- Automated with ArcGIS **ModelBuilder**
- Visual workflow chaining geoprocessing tools
- Batch tiled points + viewshed
- Result in ~5 mins (vs. 2–3 hrs)
- Benefits: automation, efficiency, flexibility

ArcGIS Pro

[Design Tools / Process]

Planning: viewshed analysis tool - Scenario 3



- Project: North Peninsula Papagayo MasterPlan
- DEM + site boundary input
- Run predefined tool with parameters
- Output: darker areas = better ocean views
- Adjustable symbology & visualization

ArcGIS Pro

[Information Finding / Data Sourcing]

[Design Tools / Process]

[Communication Across Teams]

Get site context information and create terrain model

File translation

Planning: viewshed analysis tool

Landscape: terrain model tool

Knowledge sharing

Terrain Model

[Design Tools / Process]

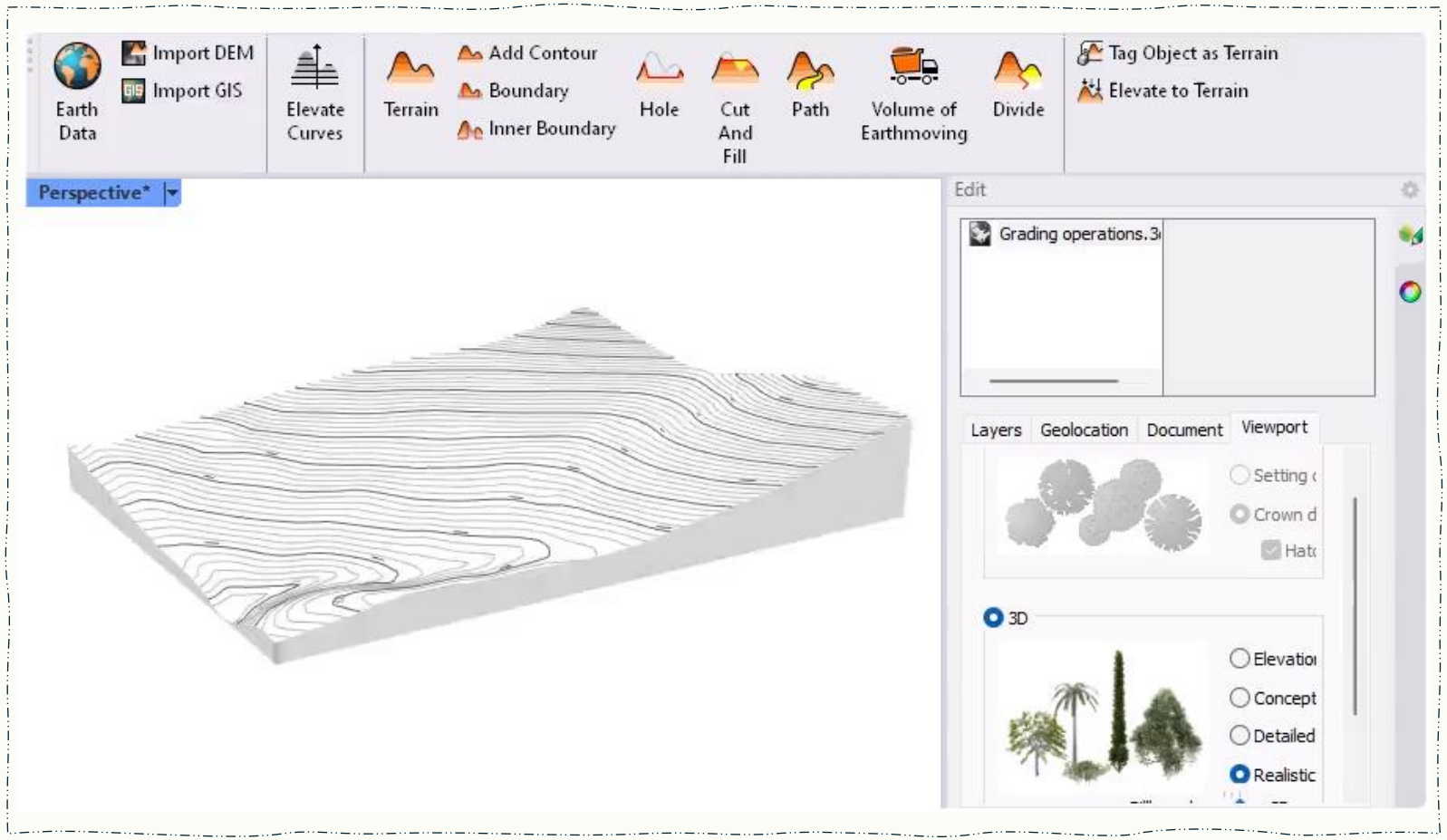
Landscape: terrain model tools

Tools	Platform	Description	Pros	Cons	Need license?	Links to download	links to learn
Artisan Organic Toolset	Sketchup	for organic modeling, think terrain sculpting, landforms, furniture, characters, or any freeform shape	• Intuitive "digital clay" sculpting • good for sketch-level terrain	• only in sketchup • no BIM integration or documentation	Need subscription	https://artisan4sketchup.com/terrain/	https://artisan4sketchup.com/
SoftEditSrf	Rhino	The SoftEditSrf command moves the surface area surrounding the selected point smoothly relative to the distance from selected point.	• Lightweight freeform surface manipulation • Great for smoothing edits post-grading	• only for surface, not for mesh; for mesh, use DRAPE to convert to surface first • not intended for terrain grading	Free	Rhino Built-in Command	https://docs.mcneel.com/rhino/9/help/en-us/commands/softeditsrf.htm
Bison	Rhino + Grasshopper	for terrain mesh creation, analysis, editing, and annotation	• Raster-based procedural grading • Supports slope zones, paths, contour generation	• need to script in grasshopper • less UI friendly	Free	https://www.bison.la/releases/Bisonv09Reference.pdf	https://www.bison.la/releases/Bisonv09Reference.pdf https://www.youtube.com/watch?v=O1UJIqbxNXA&list=PLRcN4qwyVex1C_XZ99dNbQHOIXpLItxXS&index=8
Docofossor	Rhino + Grasshopper	focuses on parametric transformations of a digtial terrain model by point, path, area or surface on a digital terrain model (DTM)	• Simulates slope-based grading with constraints • Good for cut/fill logic and performance grading	• need to script in grasshopper • less UI friendly	Free	https://www.food4rhino.com/en/app/docofossor	https://www.youtube.com/watch?v=SmnAkOMc78c&list=PLRcN4qwyVex1C_XZ99dNbQHOIXpLItxXS&index=4
Lands Design	Rhino / AutoCAD/ Civil 3D Plugin	BIM-style landscape design, modelling a 3D landscape project and providing 2D technical drawings of landscape projects	• can import terrain directly from the plugin • Full landscape toolset: terrain, planting, irrigation • Good BIM support • extensible in GH	• when the site is too big, it takes longer time to run any commands, and rhino might crash (it's better to set the site boundary first) • do not have a good tool for retaining walls, but can use cut and fill to achieve	Need subscription	https://rhinolands.com/	https://www.youtube.com/watch?v=DvSJ7M_aZ7I https://www.youtube.com/watch?v=PtSpPrOzFns https://www.youtube.com/watch?v=tehfcIlrr1Y
Rhino.Inside Revit + Lands Design	Rhino + Grasshopper +Revit	enhances Revit with parametric tools for terrain, vegetation, and site elements, enabling integrated landscape modeling, analysis, and documentation within the BIM workflow.	• support a quicker transition between rhino and revit when there is a design change in rhino	• need a few more steps to set up	N/A	https://www.food4rhino.com/en/resource/lands-design-objects-revit	https://www.youtube.com/watch?v=_efrxcZodR8
Land Kit (Topo workflow)	Rhino + (Grasshopper)	Parametric site modeling and grading via Grasshopper 3D Modeling, Design, and Visualization processes,	• built-in interface in Rhino • extensible in GH • parametric control over site geometry • Rule-based grading zones (paths, swales, slopes) • has tool for retaining walls	• need some GH knowledge(Topo Workflow doesn't need grasshopper knowledge)	Need subscription	https://www.landkit.design/ https://www.landkit.design/topo	https://www.landkit.design/workflow-packages/topo-2
Rhino.Inside Revit + LandKit	Rhino + Grasshopper + Revit	combines Grasshopper-based parametric landscape tools with Revit's BIM environment	offers flexible parametric control for terrain	• once release from the rhino and import in the revit, it can't be modify by the direct shape geometry from revit	N/A	https://www.landkit.design/workflow-packages/topo-2	https://www.landkit.design/workflow-packages/topo-2 https://www.youtube.com/watch?v=mAKv4a6KZ7I&t=25s

"T:\10.0_Design_Technology\DT INTERNSHIP\2025\NY\Landscape_Terrain_Modeling_Tools_Comparison_Table.pdf"

[Design Tools / Process]

Landscape: terrain model tools

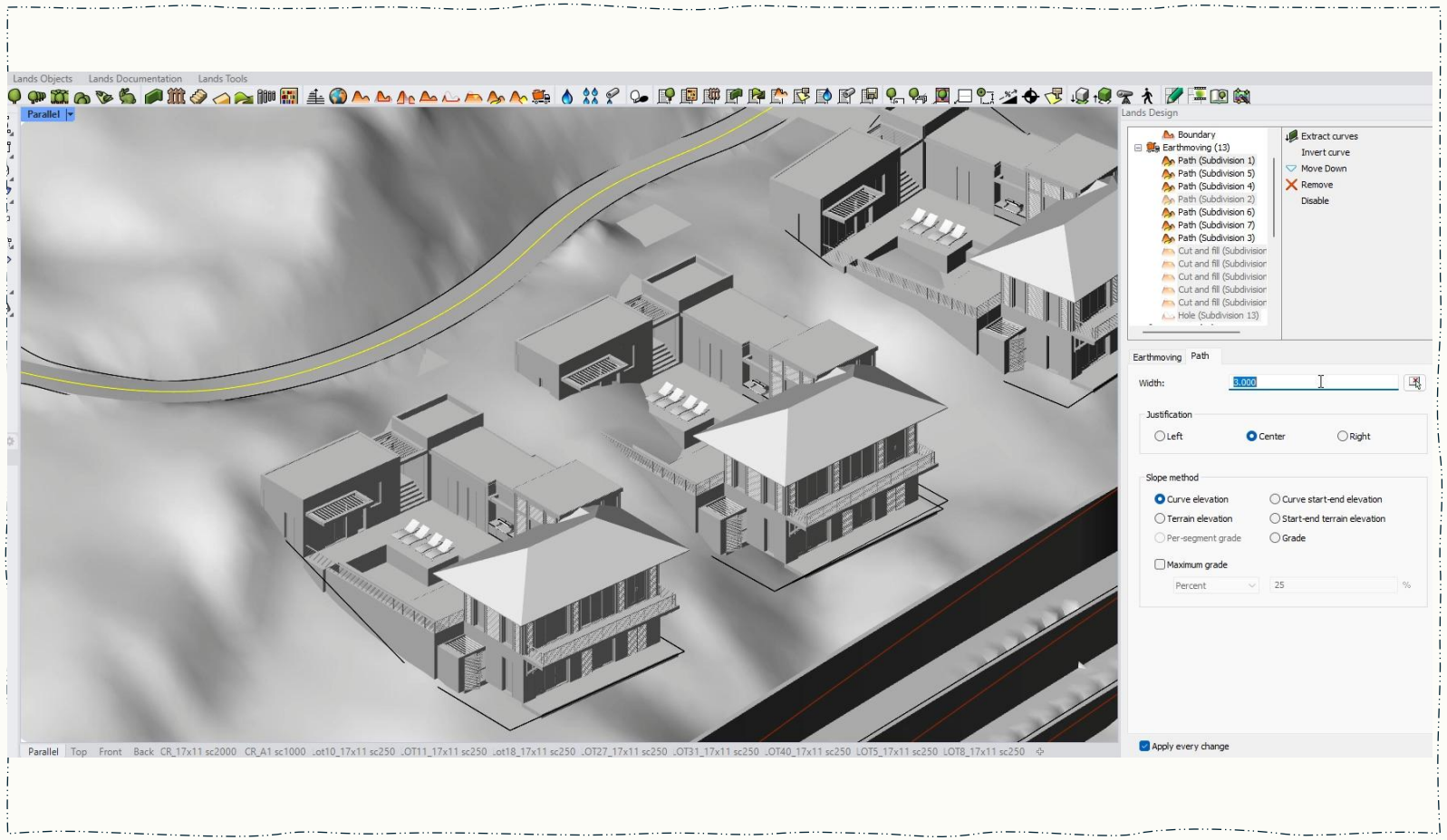


- Add Contour
- Pick Boundary
- Inner Boundary
- Divide
- Add Hole
- Add Cut and Fill
- Add Path

Lands Design
PROFESSIONAL LANDSCAPE SOFTWARE

[Design Tools / Process]

Landscape: terrain model tools - Scenario 4



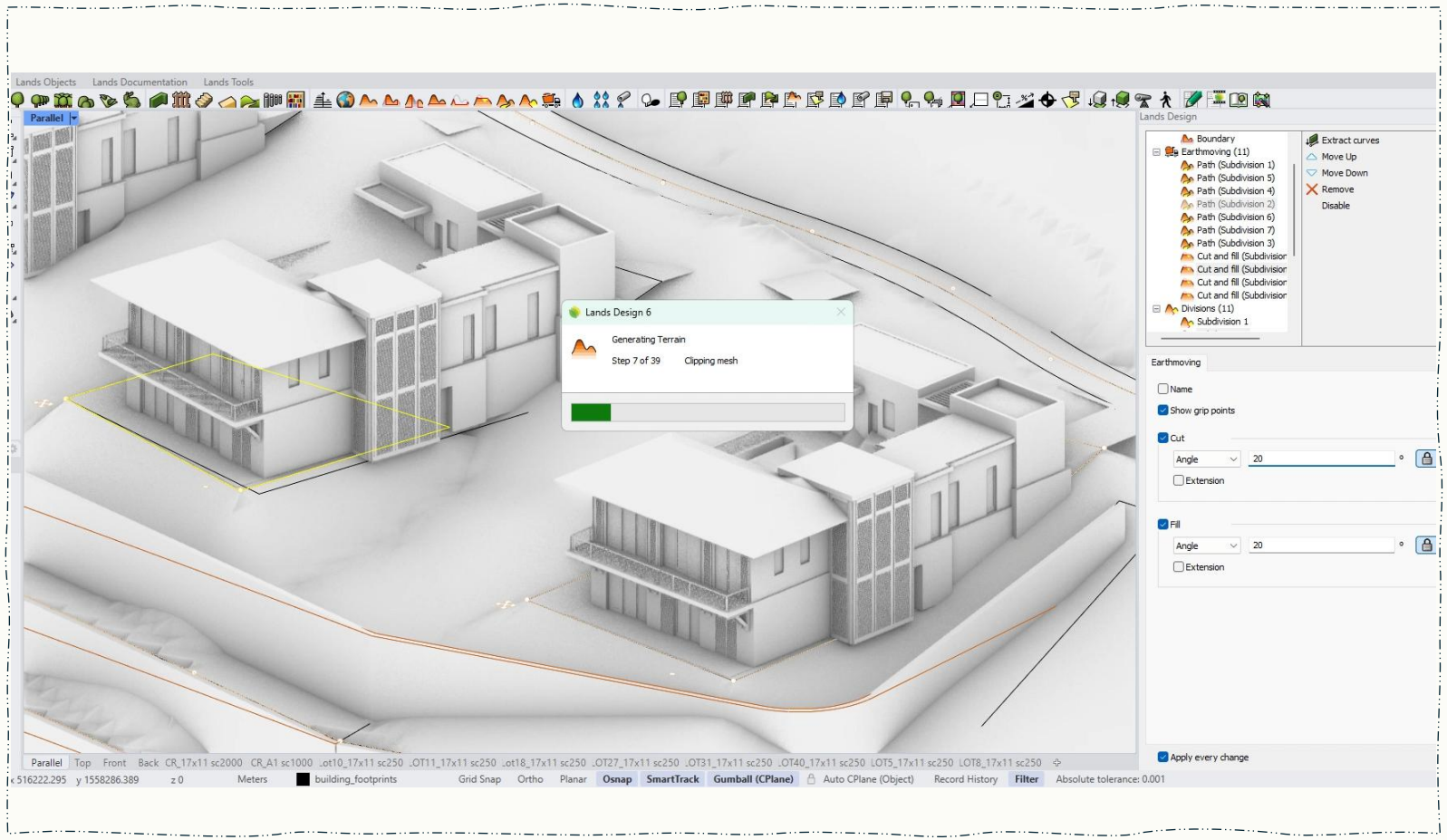
- Project: Cabot St. Lucia Hillside Villas

- Draw curve → Add Path → automatic grading
- Adjust width/slope parameters dynamically
- Closed curve → Cut & Fill

Lands Design
PROFESSIONAL LANDSCAPE SOFTWARE

[Design Tools / Process]

Landscape: terrain model tools - Scenario 4



- Project: Cabot St. Lucia Hillside Villas
- Cut & Fill based on sloped planar curve
- Add Hole → cut terrain to fit building footprint

Lands Design
PROFESSIONAL LANDSCAPE SOFTWARE

[Information Finding / Data Sourcing]

Get site context information and create terrain model

[Design Tools / Process]

File translation

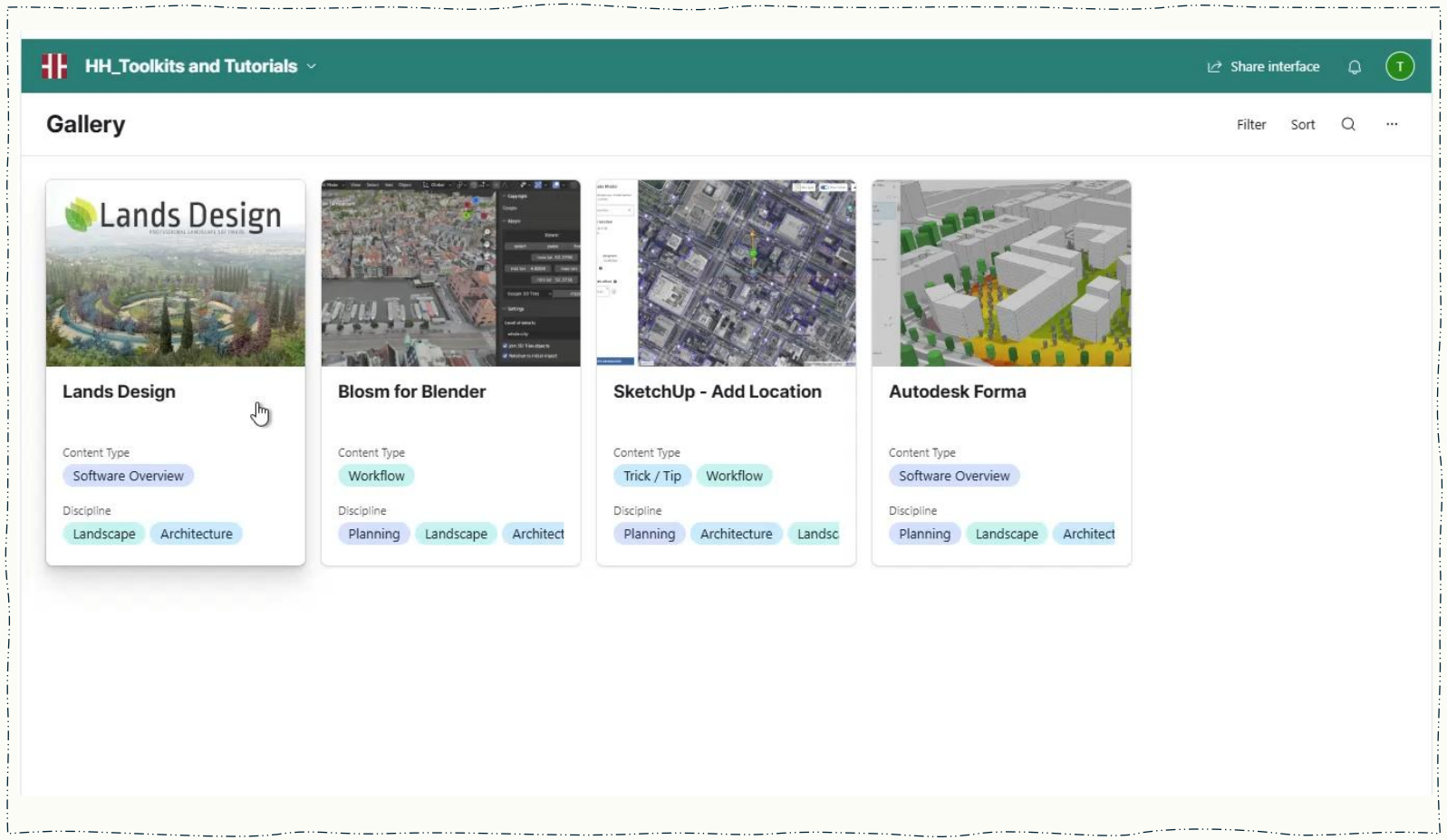
Planning: viewshed analysis tool

Landscape: terrain model tool

[Communication Across Teams]

Knowledge sharing

[Communication Across Teams]



- Airtable
- Centralized toolkit & tutorials for easy access
- Live, expanding database that updates as knowledge grows
- Encourages sharing across teams and improve collaboration

https://airtable.com/apph7v71WPpM3hobc/shryGExuyJTiA88I4

Takeaways

- Future Steps:
  - Query Tool of Topo Workflow
  - Viewshed Analysis Automation Tool – upgrade version
  - Airtable HH Toolkits and Tutorials Expanding…

- Adaptability
  - Flexible across contexts and project scales
- Scalability
  - Shareable across offices, teams, and disciplines
- Transparency:
  - Knowledge open and accessible to empower more people

THANKS!

HART HOWERTON