



Digital Research Hub

RECAP SLIDES: INTRO. TO SKETCHUP & CITYENGINE

BY DIGITAL RESEARCH HUB, 2023



SketchUp



CityEngine

What we'll cover

- Intro to the SketchUp U.I
- Using SketchUp's main tools
- Importing GIS data

- Intro to the CityEngine U.I
- Navigating in CityEngine
- Getting Map Data



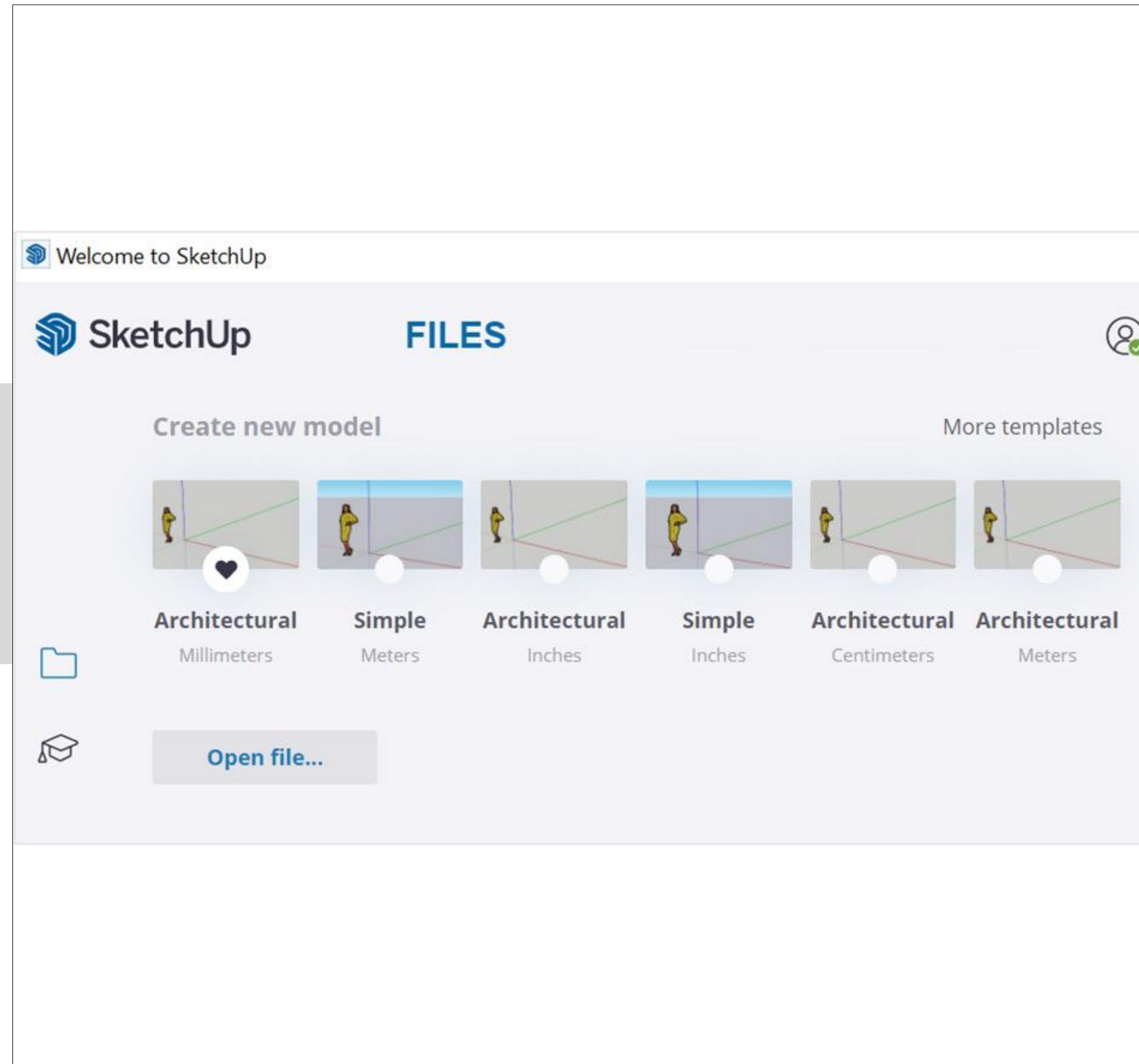
SketchUp



CityEngine

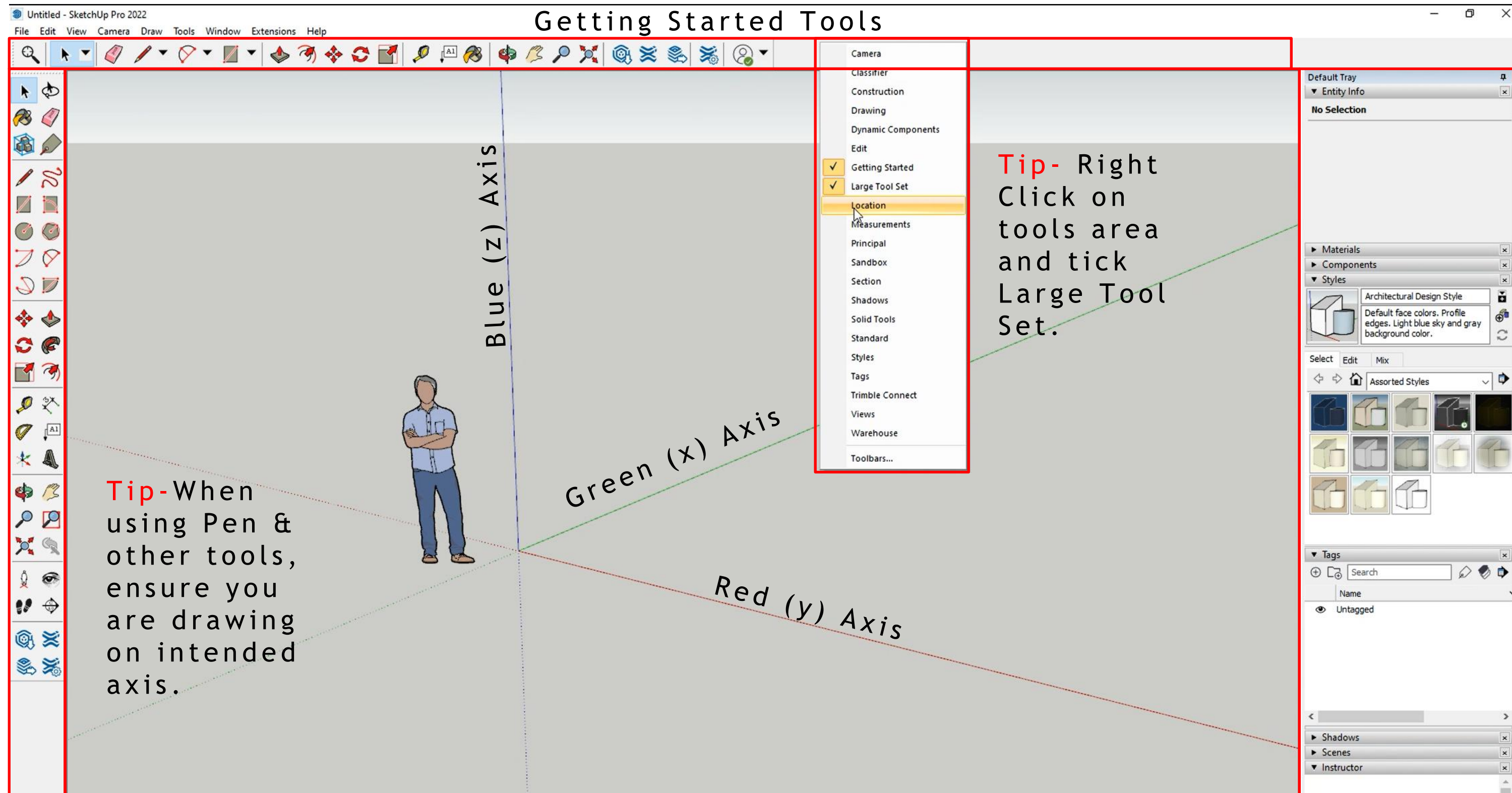
Opening SketchUp

Start with opening SketchUp 1). After opening SketchUp - you can choose a template. Architectural Meters or Millimeters is recommended.



Always remember the template you choose will affect the scale of your model and it's measurements!

SketchUp U.I



Large Tool Set

Tip- When using Pen & other tools, ensure you are drawing on intended axis.

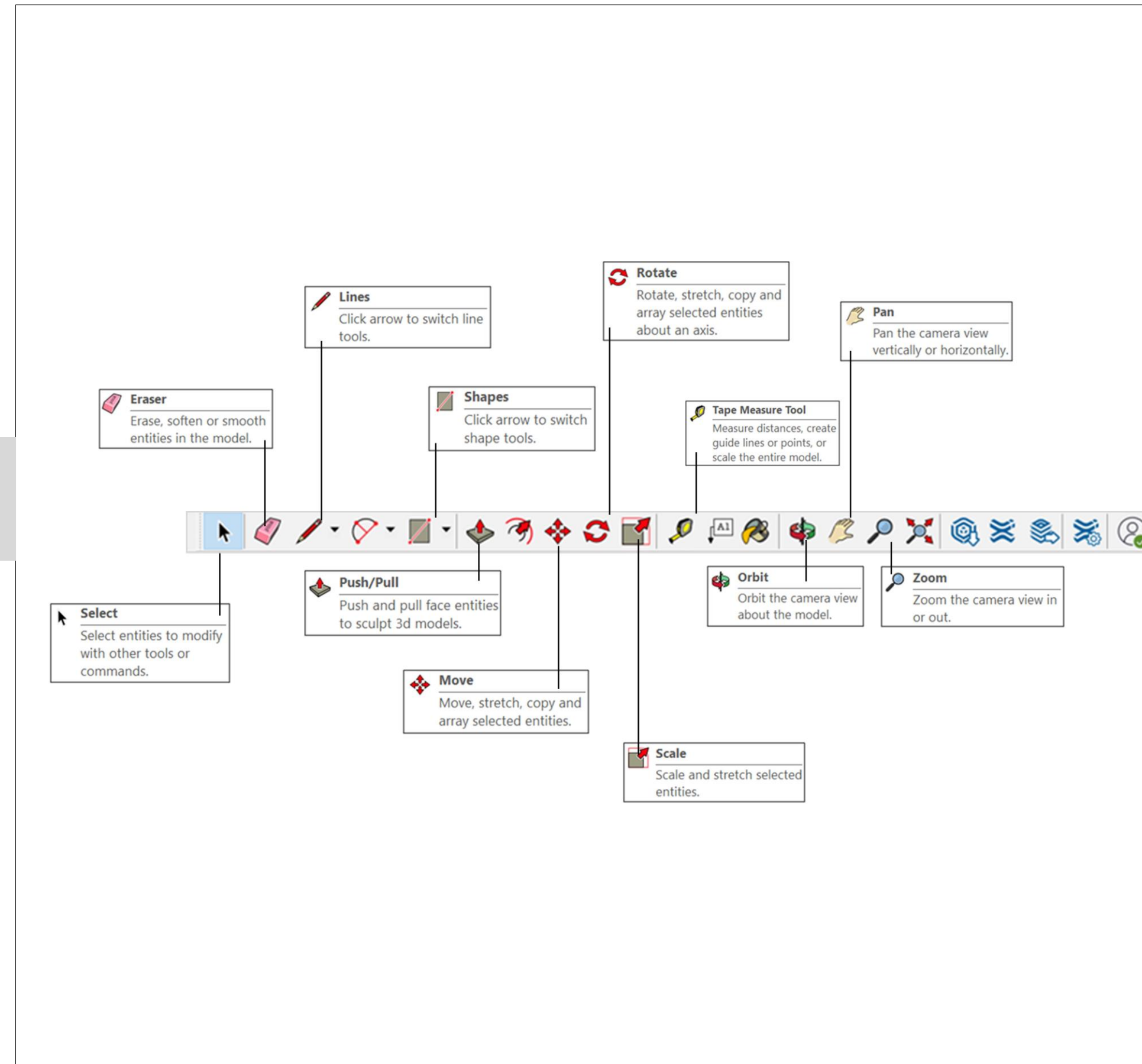
Tip- Right Click on tools area and tick Large Tool Set.

Default Tray- Tags, styles and more.

Workspace

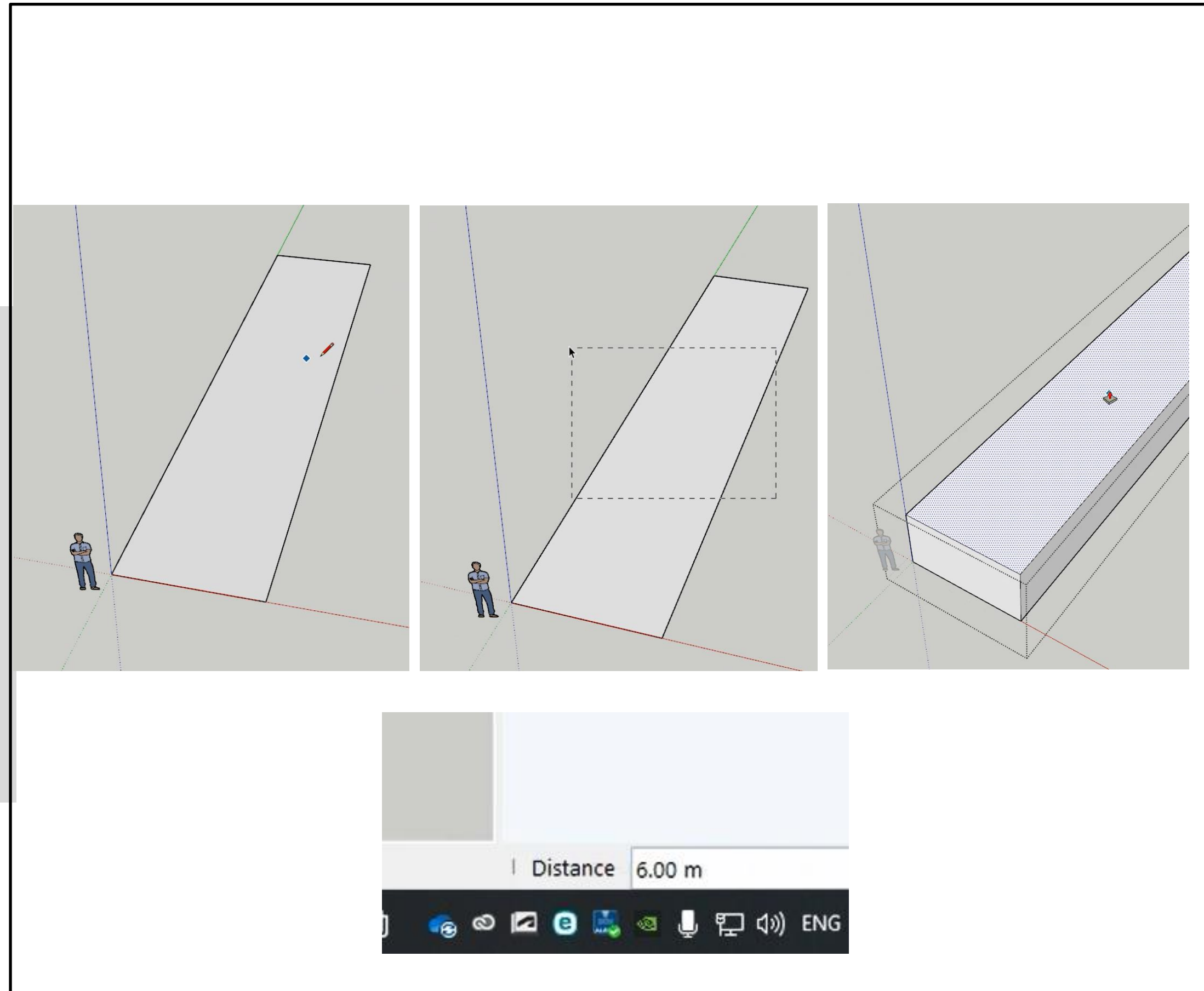
Tools and their functions

Here are the basic tools that are in SketchUp.



Pen Tool and Push-Pull Tool

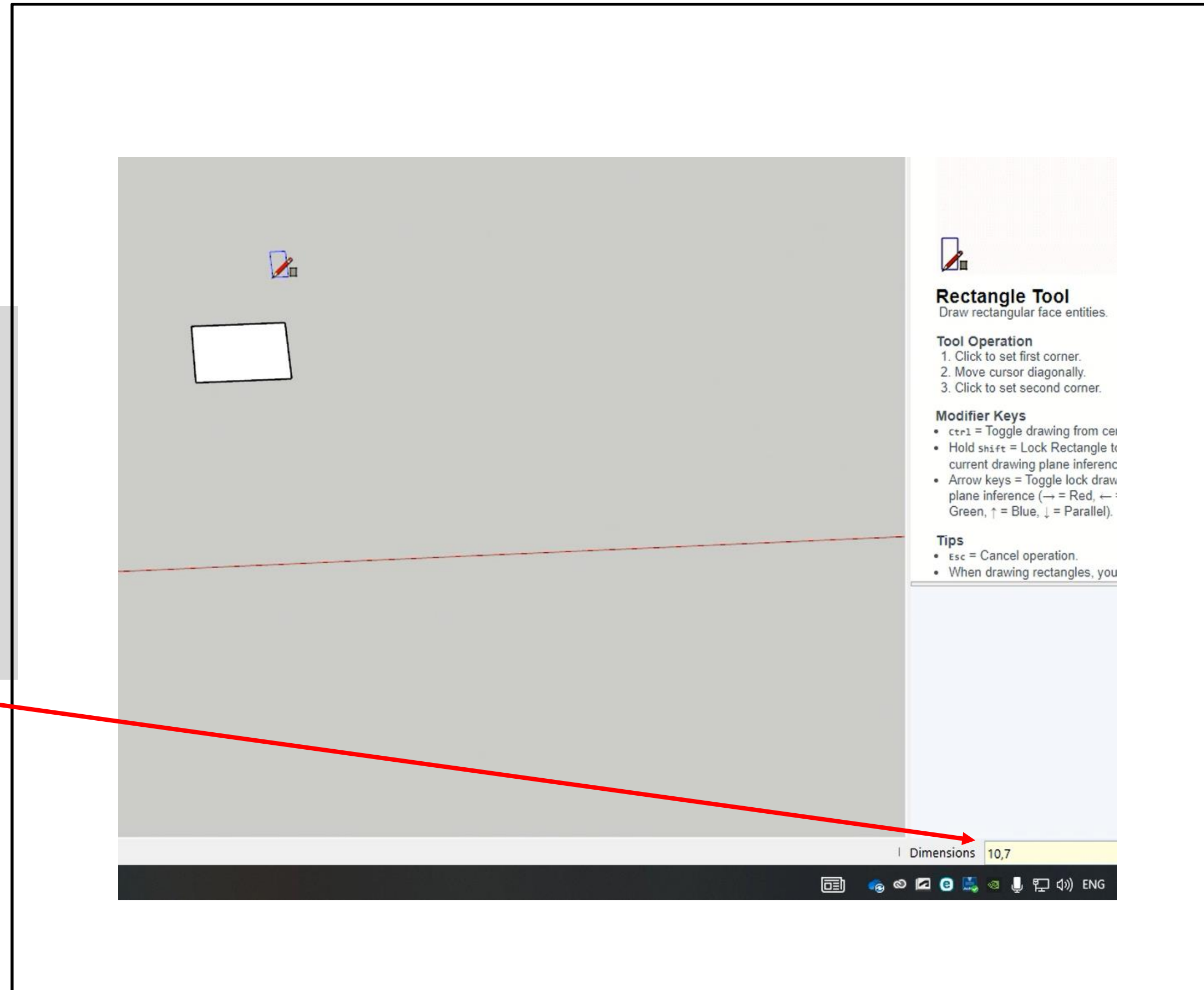
- Use the pen tool to create a building footprint.
- Select the entire drawing and right click on it. Select Make Group.
- Now **double click** on the face to go into isolation mode. Now use the push-pull tool to extrude the footprint.



- To specify a height, pull to a random height and simply type in the value.
- It should appear in the distance text box at the bottom-corner of SketchUp.

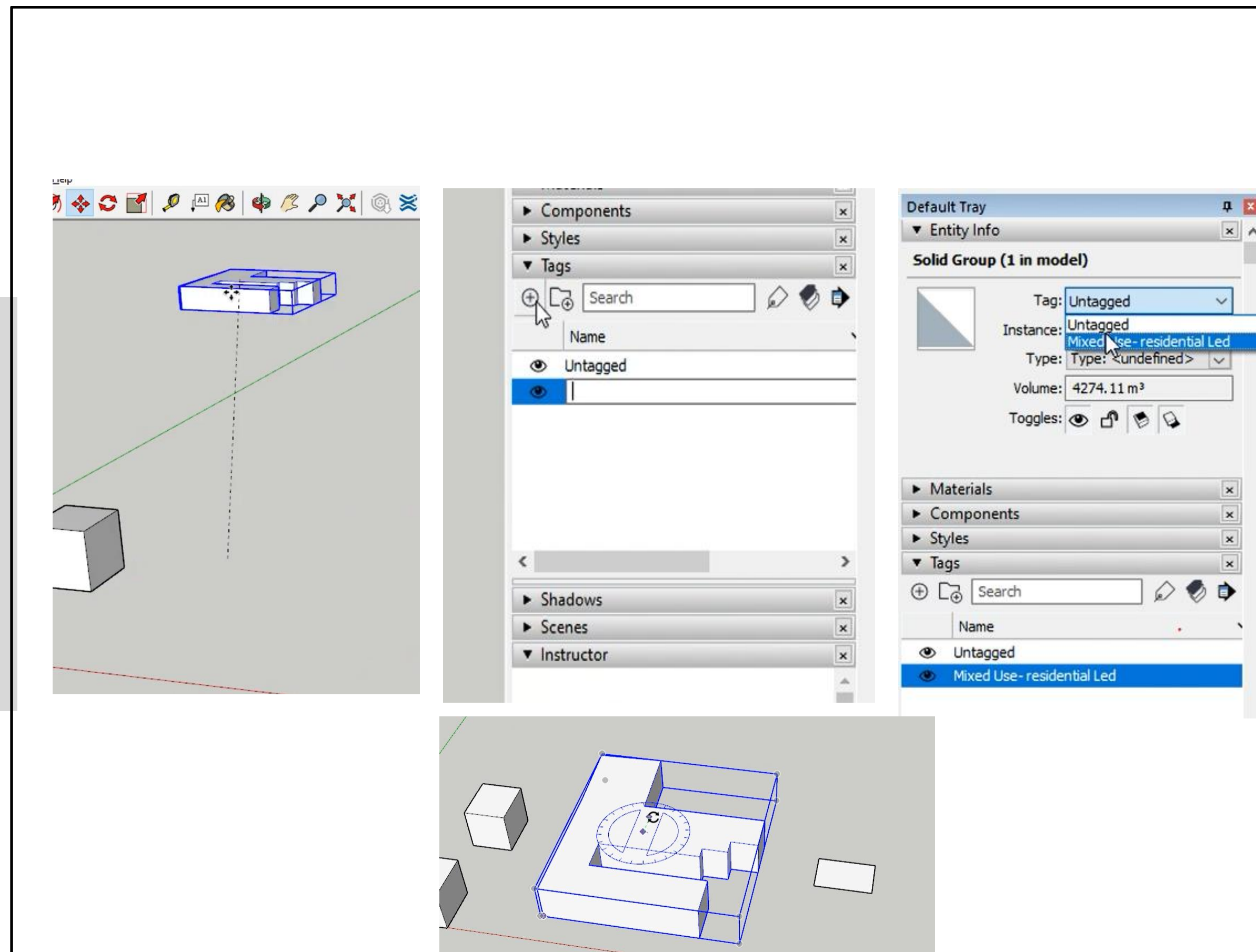
Rectangle Tool

- Use the rectangle tool to create perfect rectangular shapes.
- How to specify dimensions:
- Click once to specify first point of rectangle and then use the format to type: #, #



Move Tool, Tags (layers) & Rotate Tool

- Use the move tool to move models in any direction.
- Create a new tag by clicking on the plus icon
- The blue colour indicates the tag (layer) you are working on.



- To move models into tags, click on them and change their tag in the entity info.
- Use the rotate tool to rotate models.

Importing a DWG into SketchUp

Placing the DWG from GeoMaps (extract with needed layers)

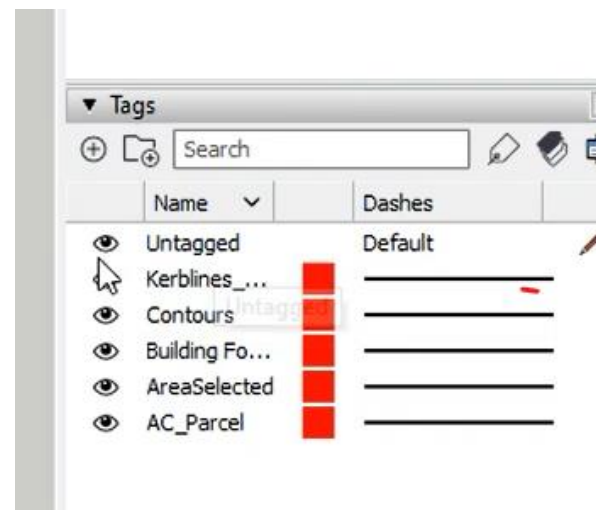
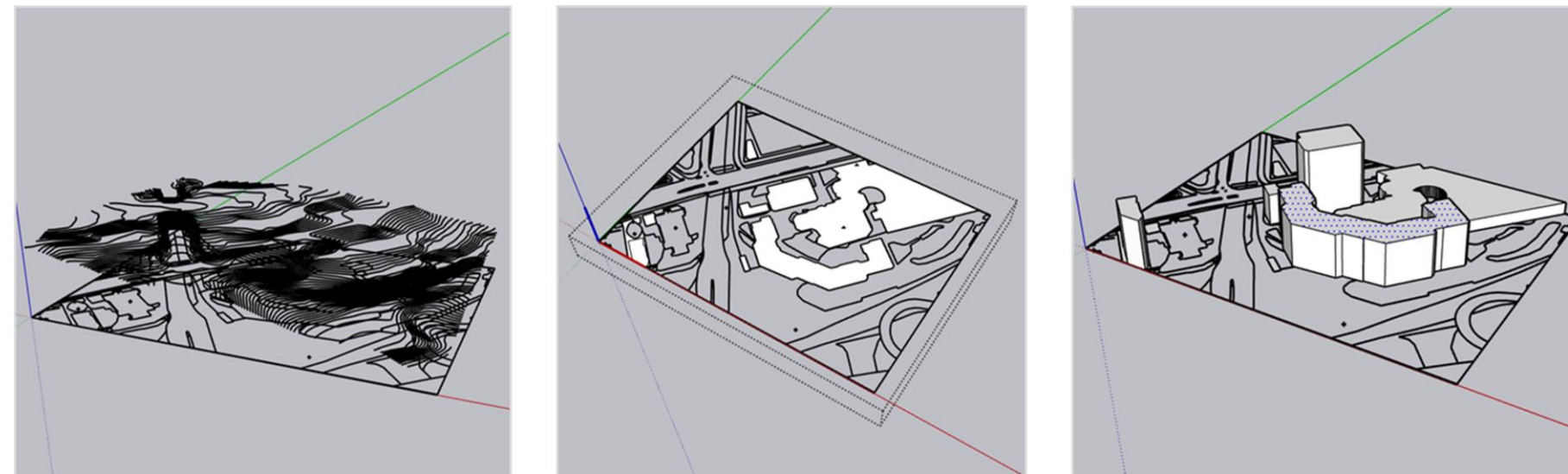
1) File

> Import > Choose the file you want to import, DWG or JPG

2). Select DWG > Import into Model. Remove contour (If needed) or hide it in tags > Right Click > Explode DWG >

Use line tool to draw over lines which will fill the shape. Group face first.

3. Select faces > Right Click > Pull/Push to the desired height



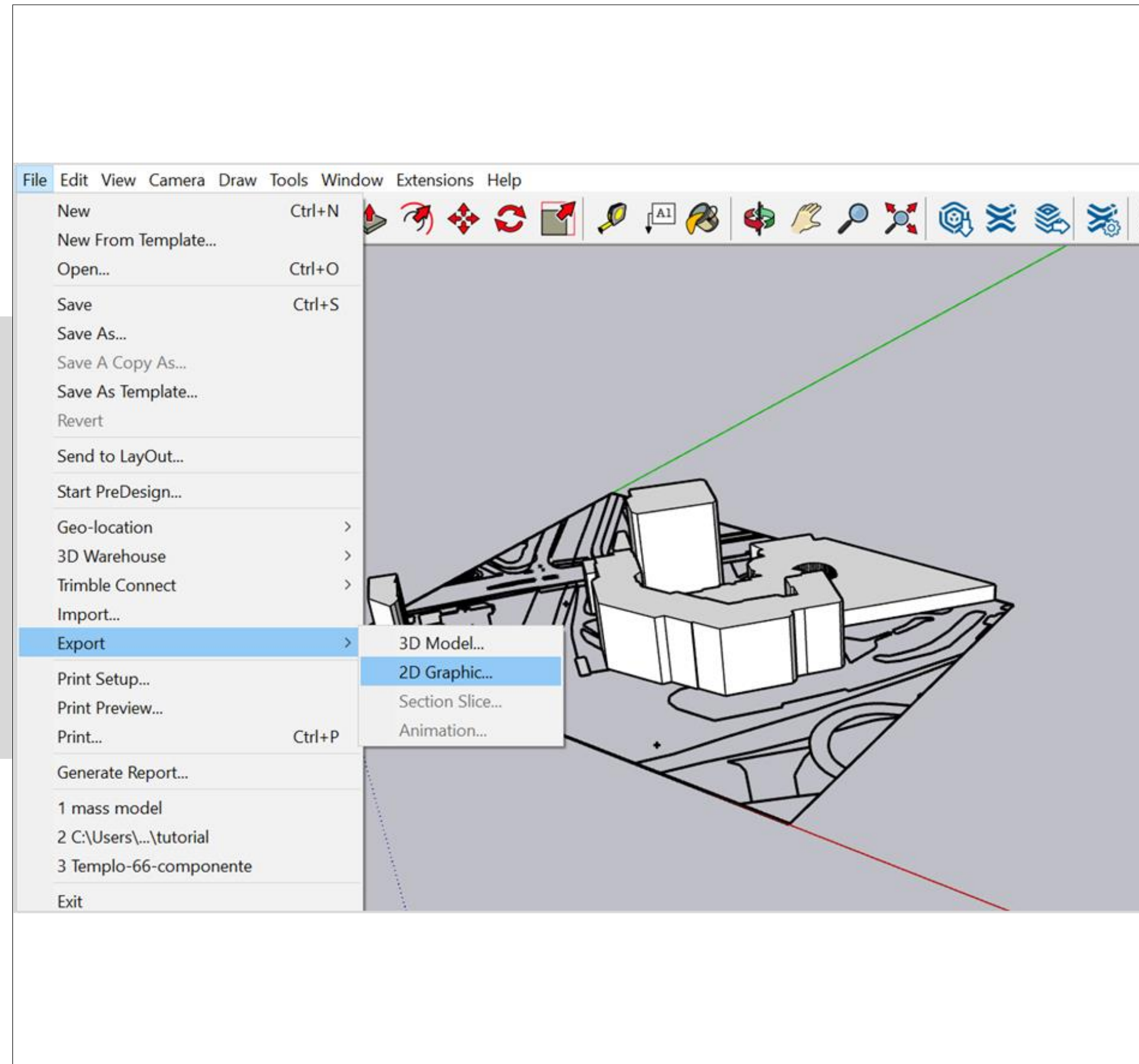
- Use the tags to turn off or on the layers you imported.
- **Please note:** Due to the nature of SketchUp, it is recommended:

To import DWGs, generally stay below 1:5000 for footprints, parcels etc. (also depends on P.C)

For contours, 1:1000 or below is recommended.

Exporting as PDF, JPEG, PNG or DWG

Exporting the Model:
1) File > Export > 2D Graphic
2). Save as a PDF / JPEG / PNG (2D images for editing on Photoshop and Illustrator) or save as a DWG (for modelling software)



Exporting the Model (3D)
1) File > Export > 3D Model
2) Save to the desired file format you want, (OBJ, 3DS, DWG, DXF, etc)

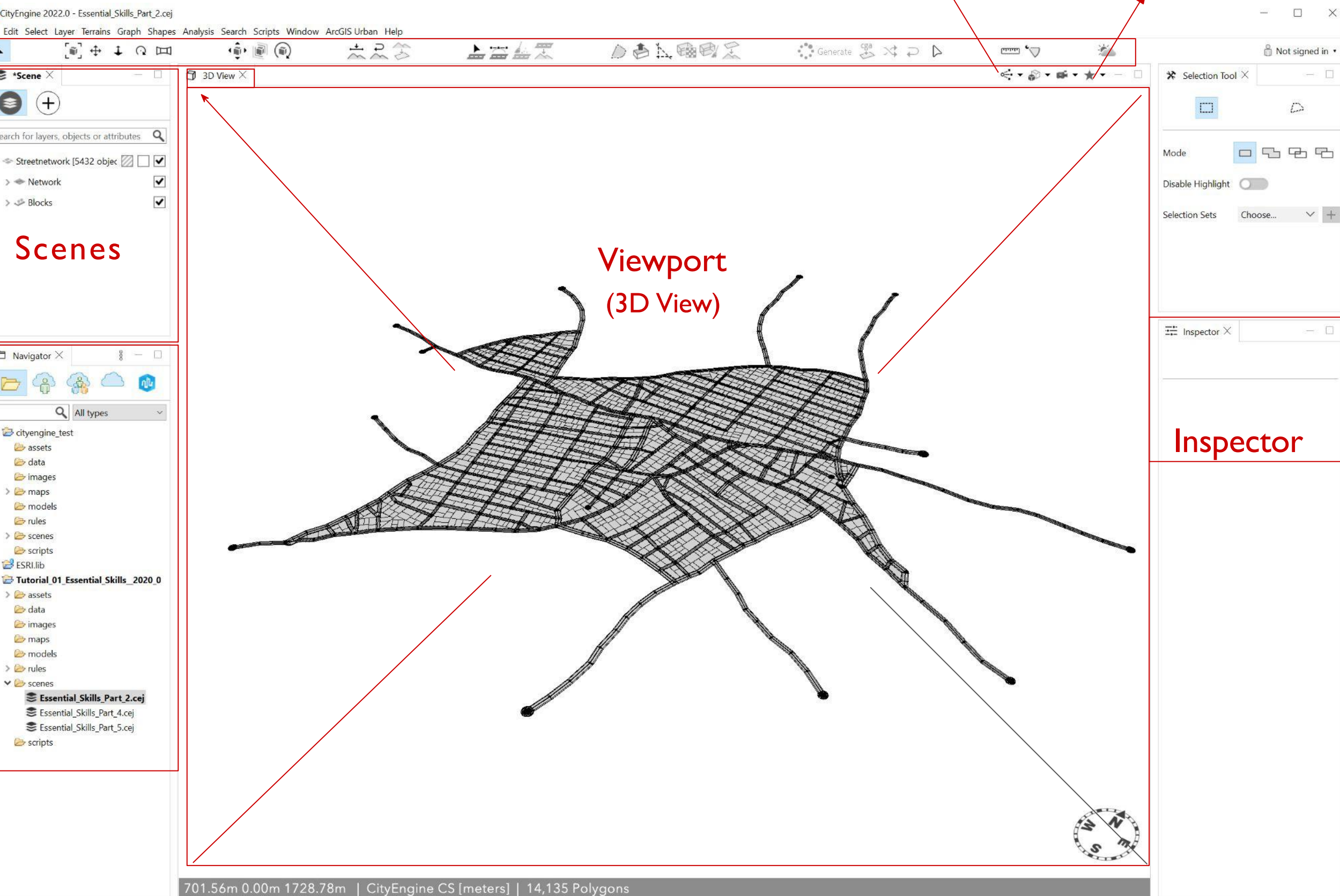


Navigating CityEngine

Toolbar

Scenario

Bookmarks



The screenshot displays the CityEngine 2022.0 software interface. At the top is a menu bar with options: File, Edit, Select, Layer, Terrains, Graph, Shapes, Analysis, Search, Scripts, Window, ArcGIS Urban, Help. Below the menu is a toolbar with various icons for navigation and editing. The main area is a 3D viewport showing a wireframe model of a city street grid. To the left of the viewport is a 'Scenes' panel with a search bar and a list of layers: Streetnetwork [5432 objects], Network, and Blocks. Below the Scenes panel is a 'Navigator' panel showing a hierarchical tree of project files, including 'Tutorial_01_Essential_Skills_2020_0' and 'Essential_Skills_Part_2.cej'. To the right of the viewport is a 'Selection Tool' panel with options for Mode, Disable Highlight, and Selection Sets. Below that is an 'Inspector' panel. At the bottom of the viewport, a status bar shows coordinates: 701.56m 0.00m 1728.78m | CityEngine CS [meters] | 14,135 Polygons. A compass rose is visible in the bottom right corner of the viewport.

Scenes

Viewport
(3D View)

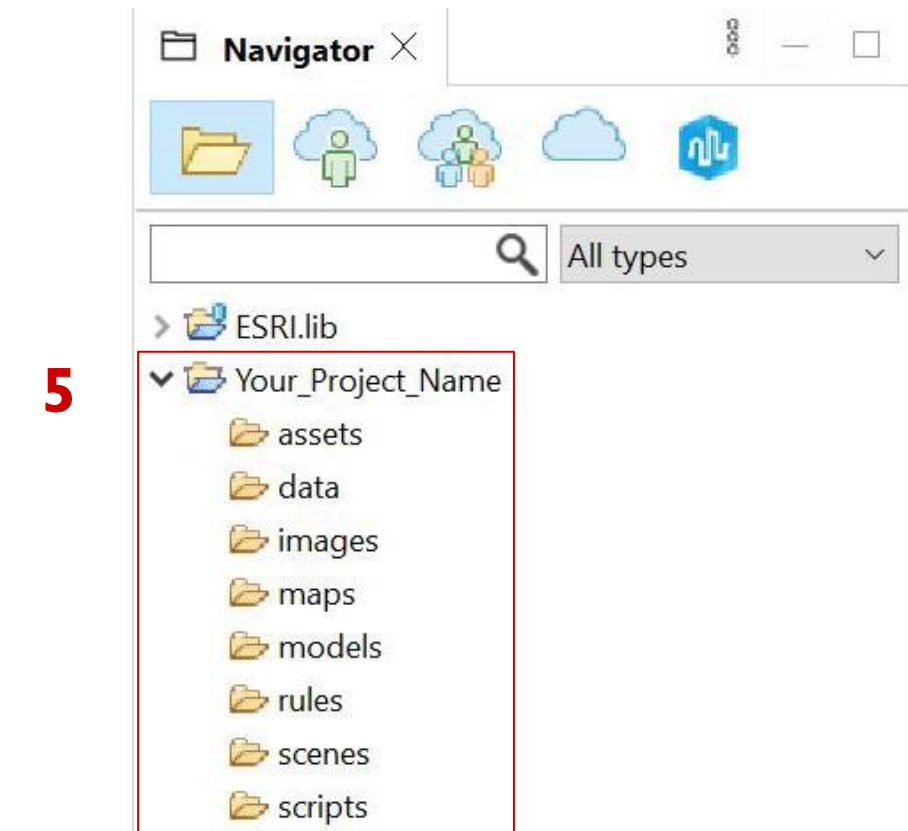
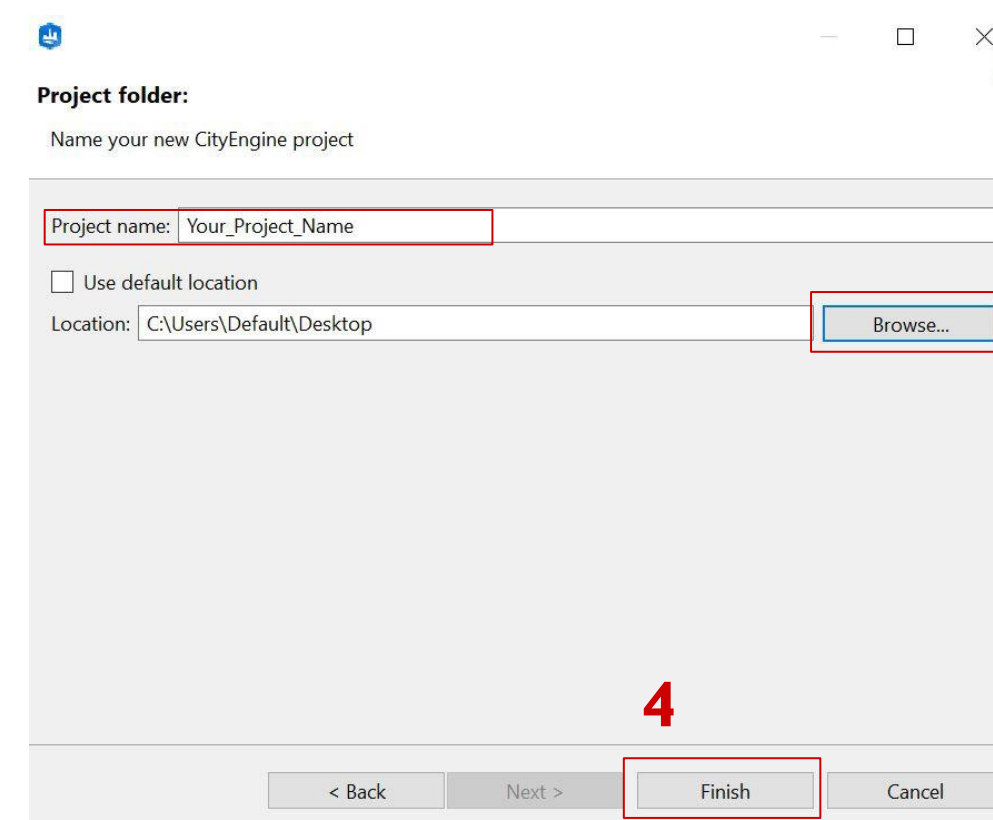
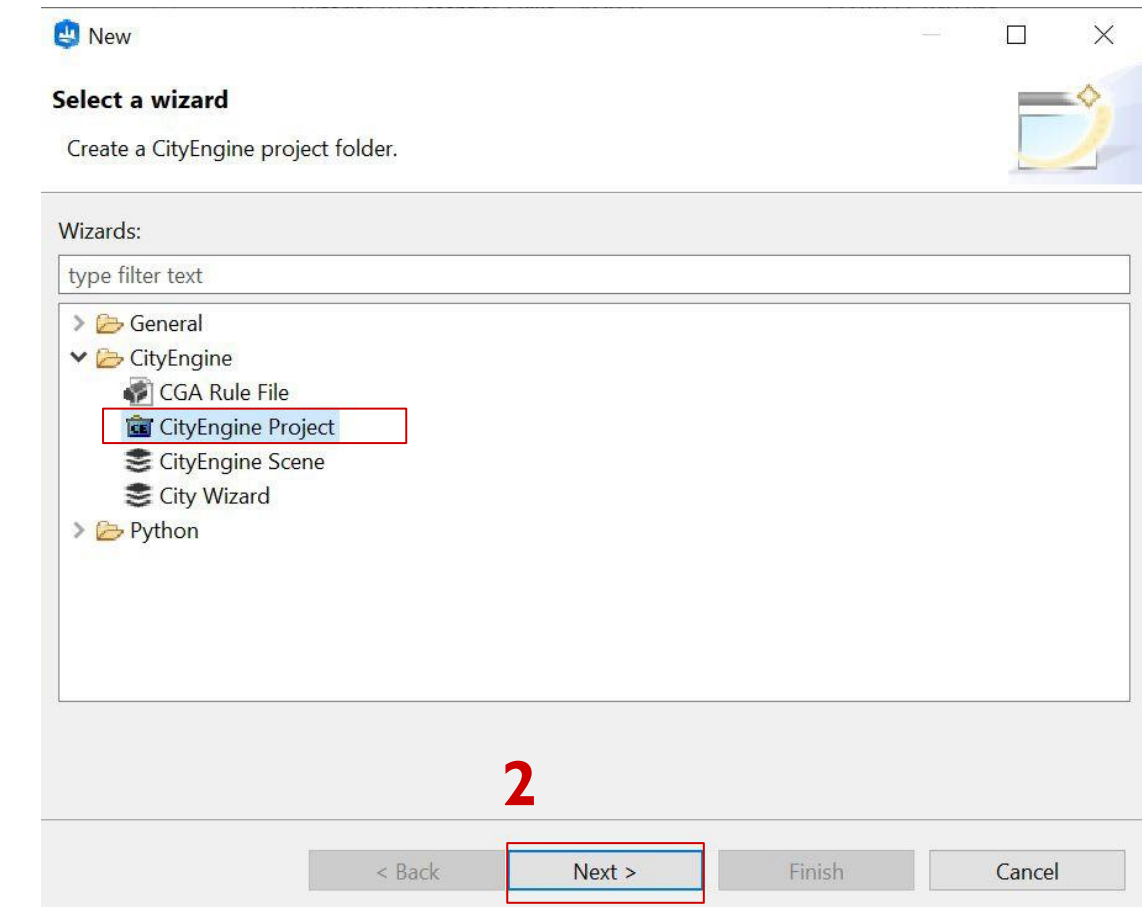
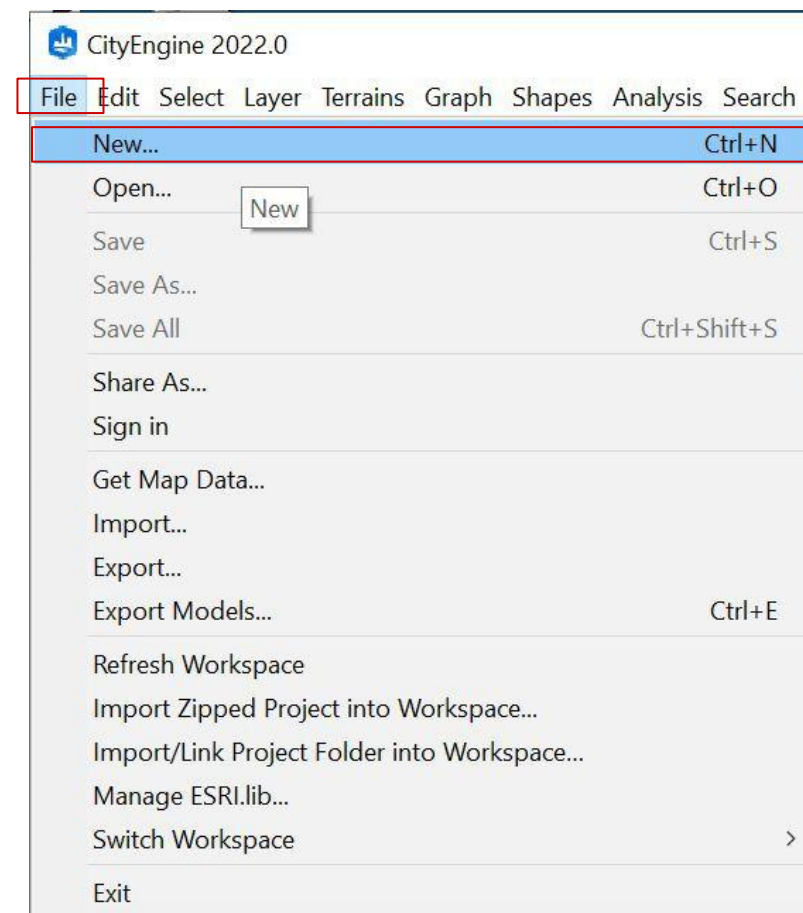
Inspector



Create a project

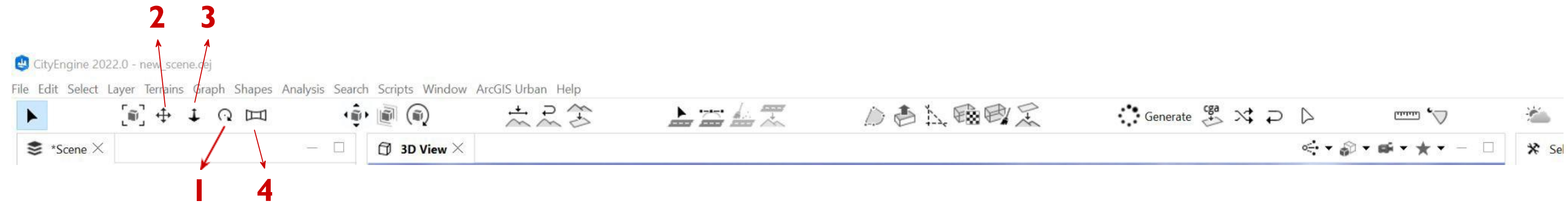
1. Click **File > New > CityEngine > CityEngine Project** to open the Select a wizard dialog box.
2. Click **Next**.
3. In the **Project name** box, type **Your_Project_Name**.
 - a. Click **Browse** to select a folder location or *Use default location*





** make sure to remember where you saved*
4. Click **Finish**.
5. The project is created in the Navigator.





Navigating CityEngine



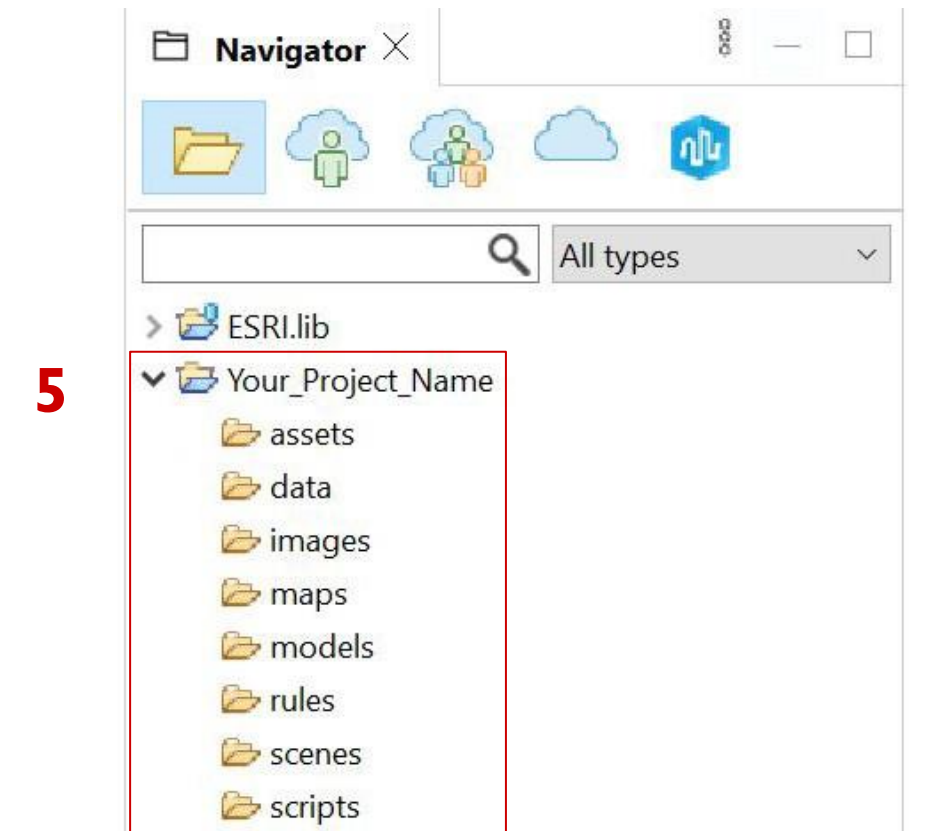
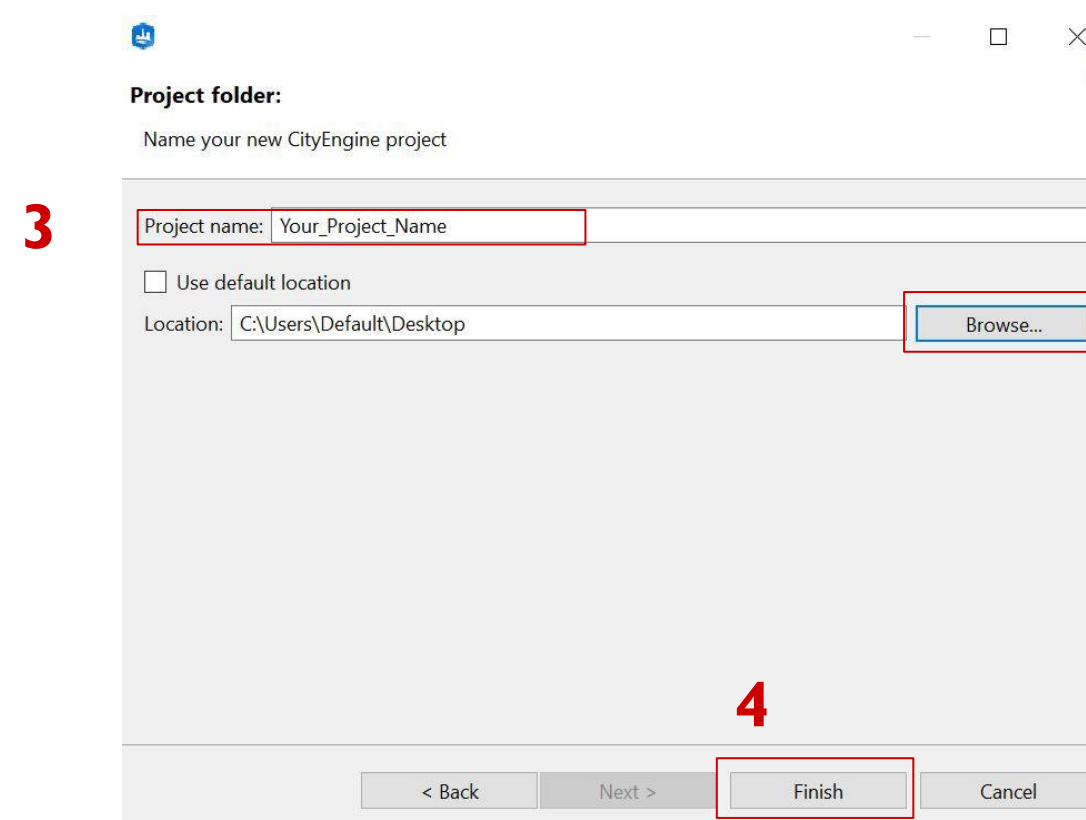
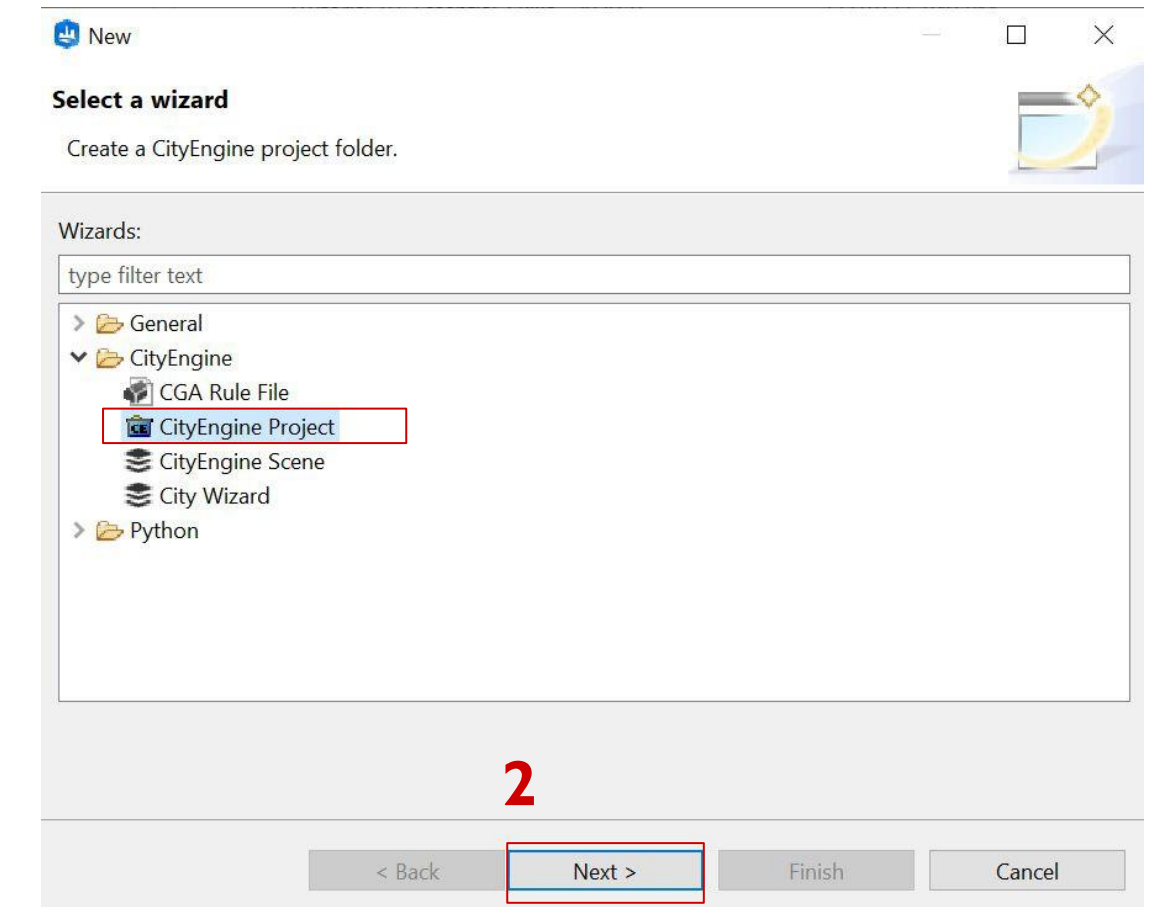
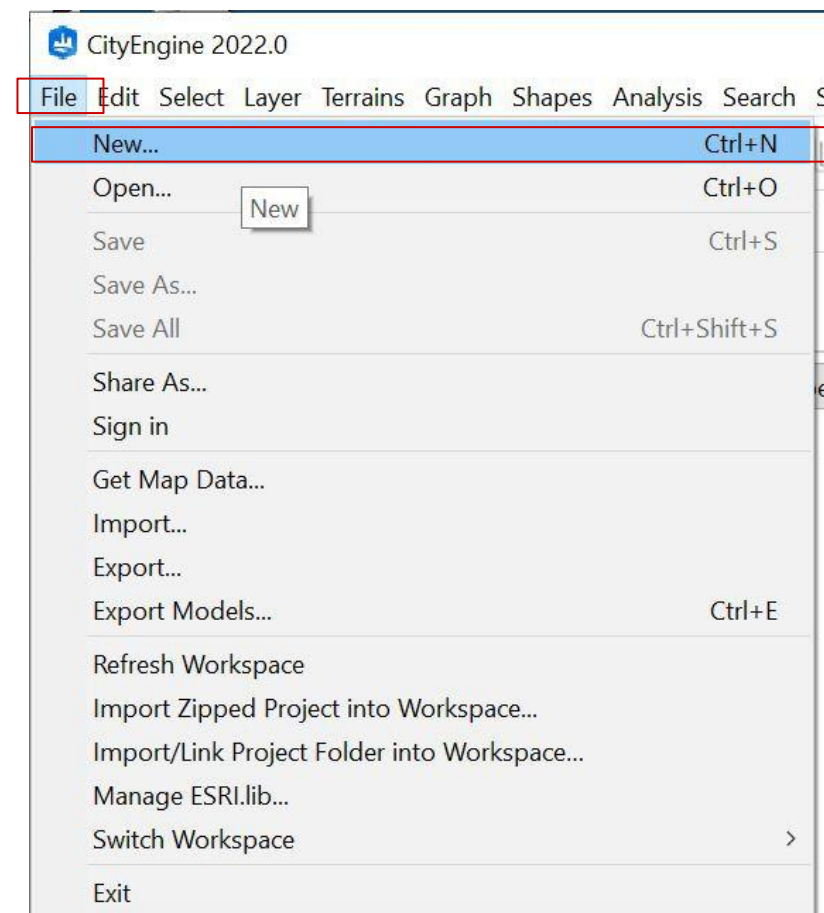
<p>1 Tumble or rotate the scene.</p>	<ul style="list-style-type: none"> ● Click the Tumble/Rotate button  ● Press Alt+click.
<p>2 Move the view left, right, up, or down.</p>	<ul style="list-style-type: none"> ● Click the Pan/Track button  ● Press Alt+click the wheel button. ● Press the arrow keys.
<p>3 Dolly/zoom the camera toward or away from the point of interest.</p>	<ul style="list-style-type: none"> ● Click the Dolly/Zoom button  ● Press Alt and right-click.
<p>4 Rotate the view from the current camera position. This can help create bookmarks that 360 VR exports.</p>	<ul style="list-style-type: none"> ● Click the Look around button  ● Press B+click.



Create a project

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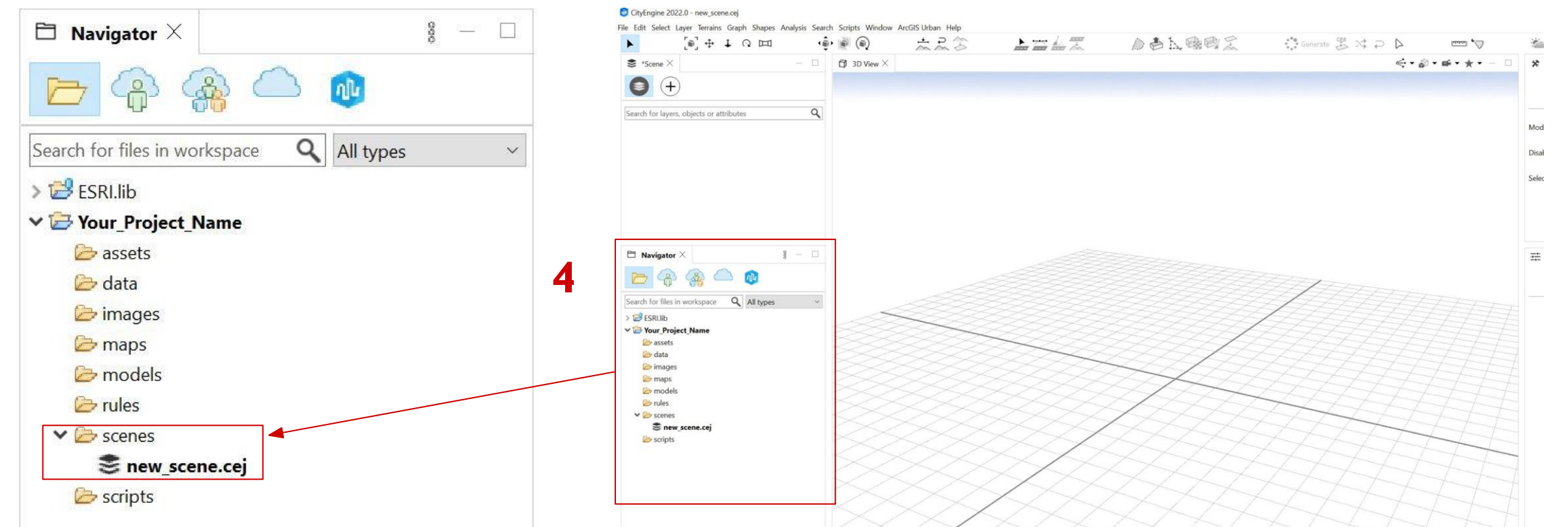
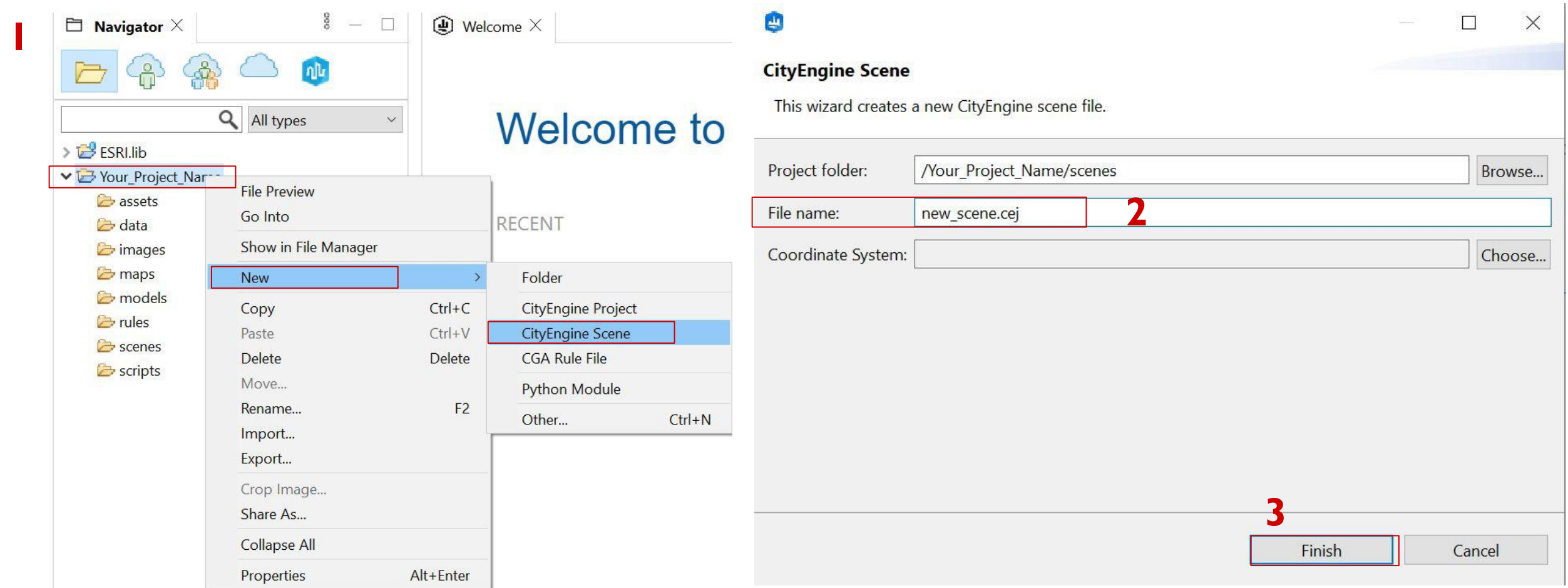
** make sure to remember where you saved*
4. Click **Finish**.
5. The project is created in the Navigator.





Create a scene

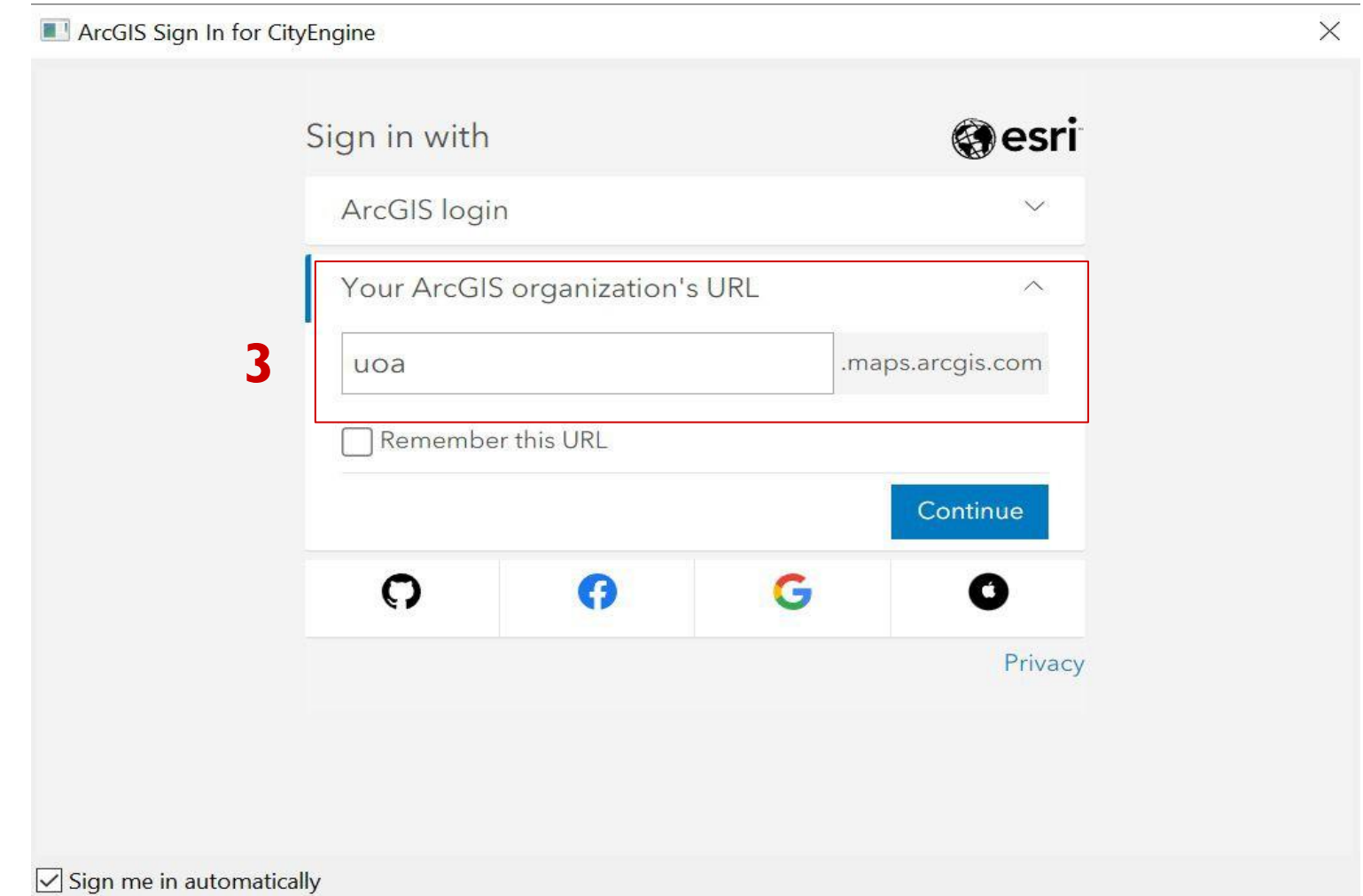
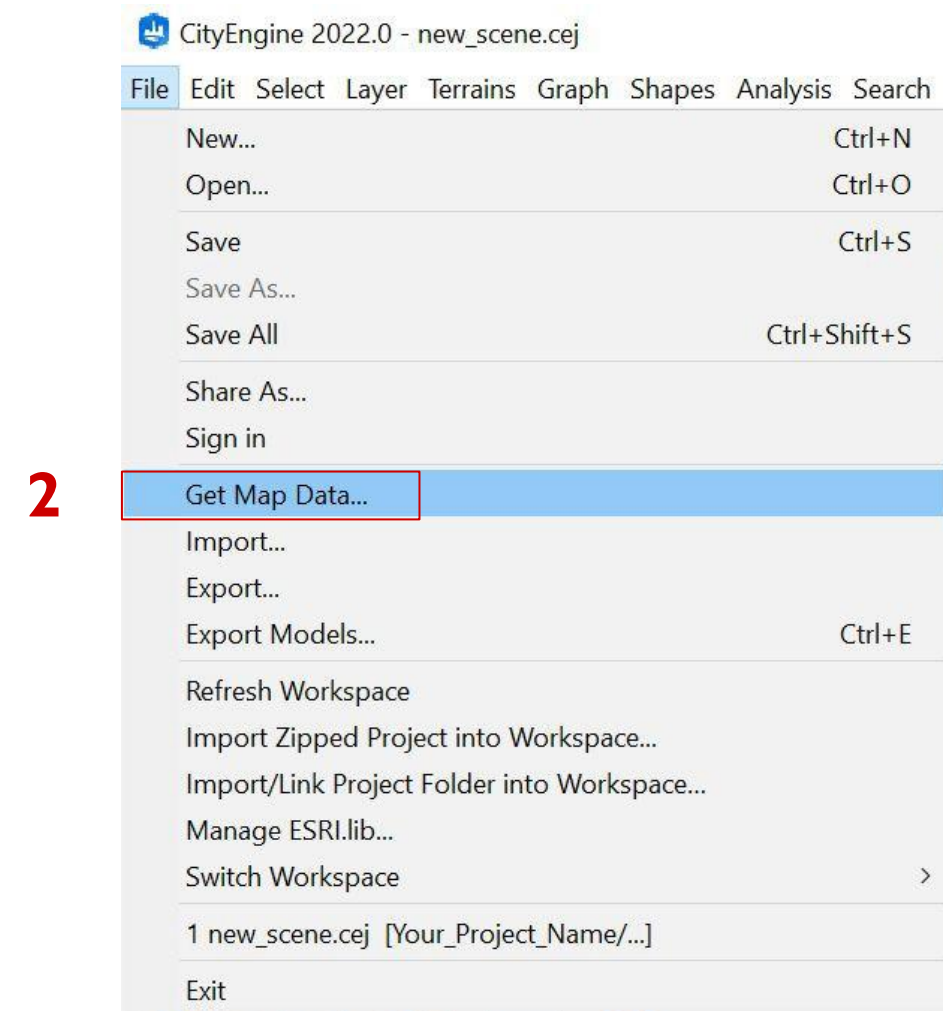
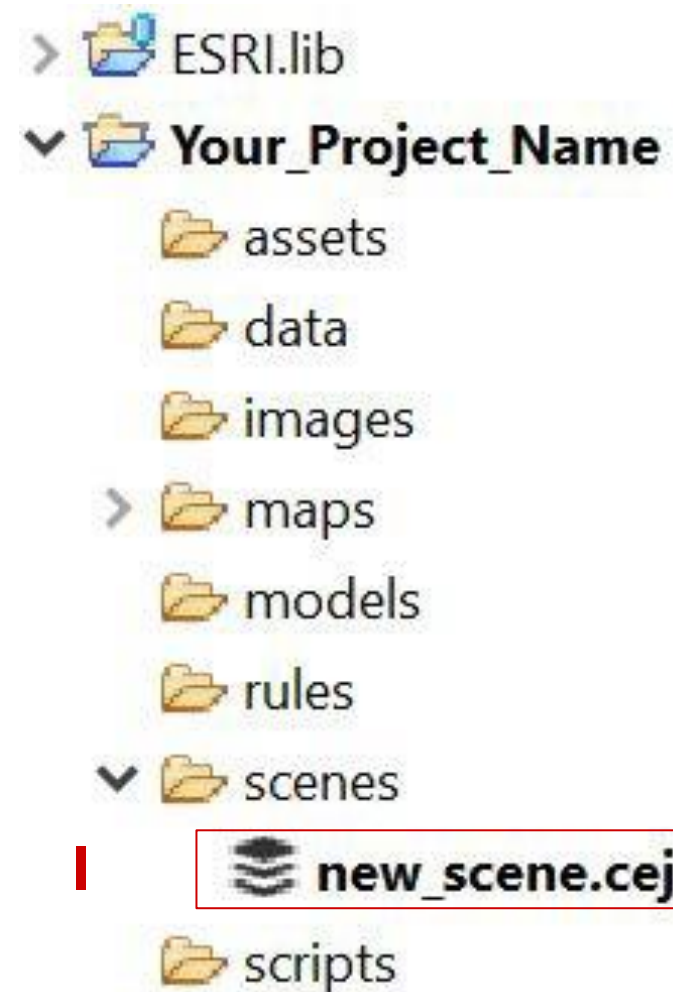
1. Click **File > New > CityEngine > CityEngine Scene** or **right-click** the **Your_Project_Name** folder and select **New > CityEngine Scene** to open the Select a wizard dialog box again.
2. In the **File name** box, type **Your_Scene_Name.cej**. Keep the **Coordinate System** box empty.
3. Click **Finish**.
4. The new scene is created under the project folder.





Get map data

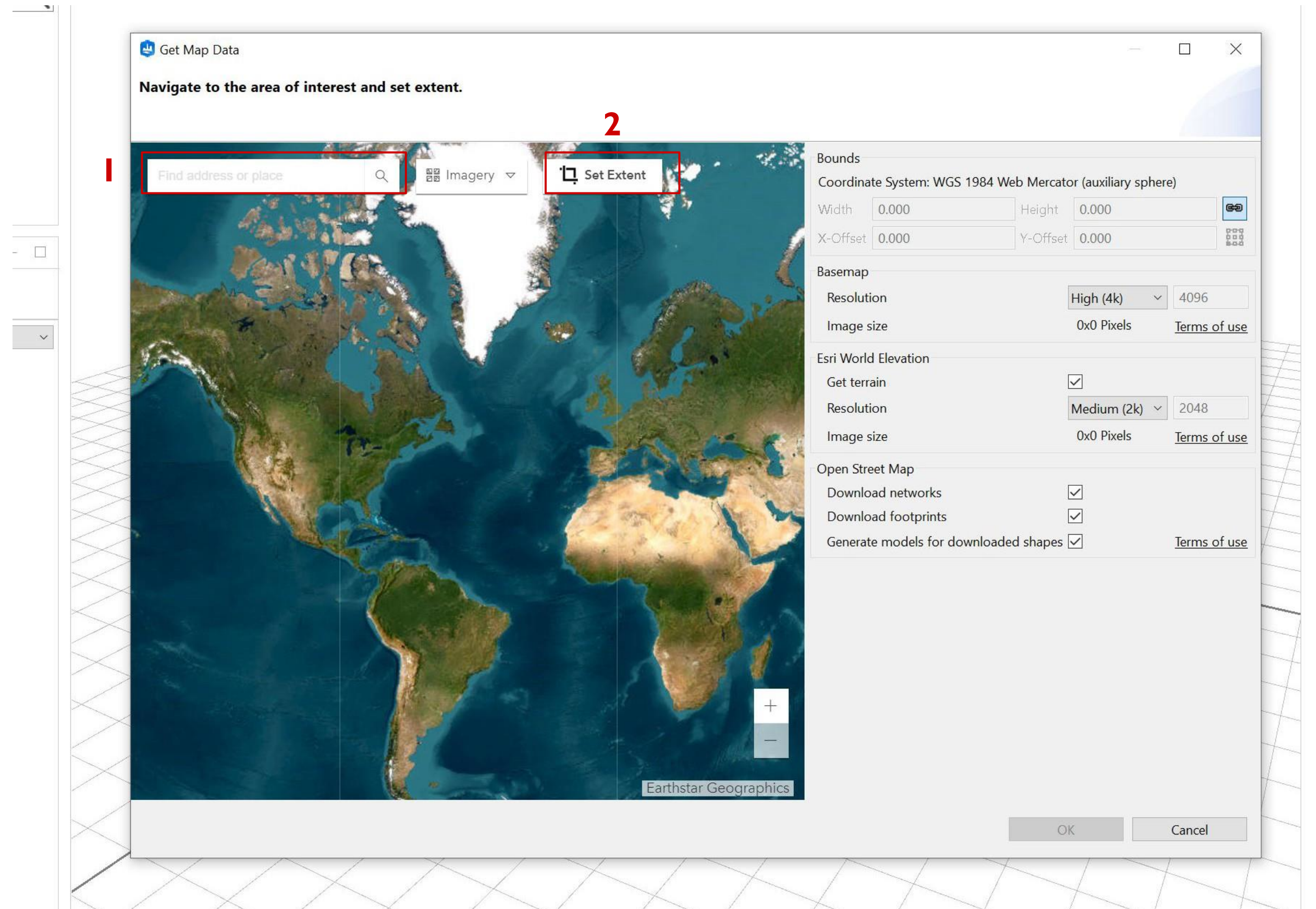
1. Select an existing scene
2. Click **File > Get map data...**
3. 'Your ArcGIS organization's URL' > Type "**uoa**" and Click **Continue**
4. Sign in with your UPI *Please email drh022@aucklanduni.ac.nz if you have any issue with sign in*





Get map data (con.)

1. The **Get map data** dialog opens.
 - Search for an area and then zoom in or out OR
 - Pan with the left mouse button to navigate around the map.
2. Click **Set extent**.



More Information CityEngine Help:

<https://doc.arcgis.com/en/cityengine/2019.0/help/cityengine-help-get-map-data.htm>



Get map data (con.)

1. Select the basemap resolution.

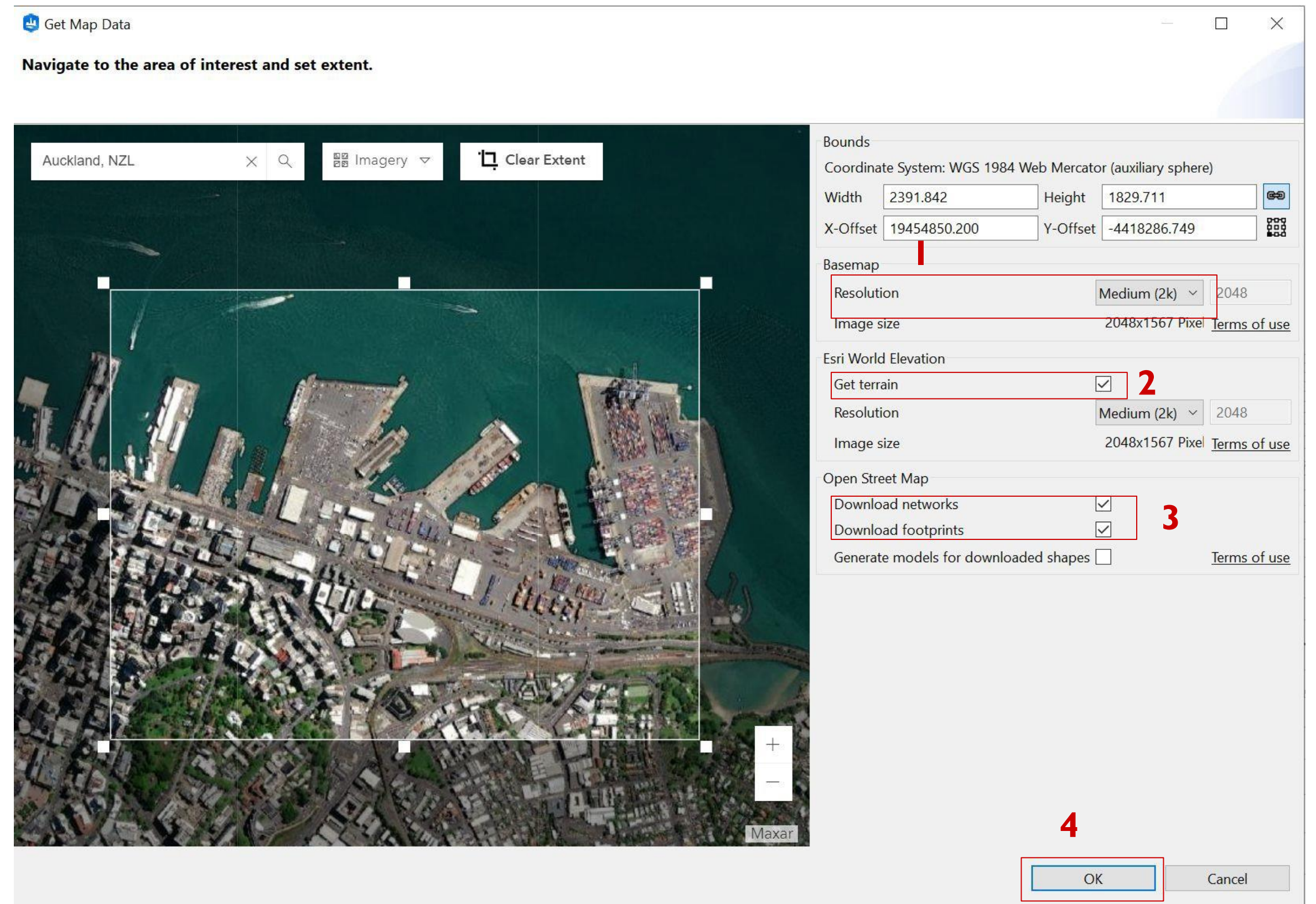
*Note: Recommend to select **Medium (2k)** for smooth downloading.*

2. Tick **Get Terrain** to include elevation data with your map.

3. Add **Open Street Map (OSM)** data to your scene.

- Select **Download networks** for street data
- **Download footprints** for building footprints data.

4. Click **OK**.



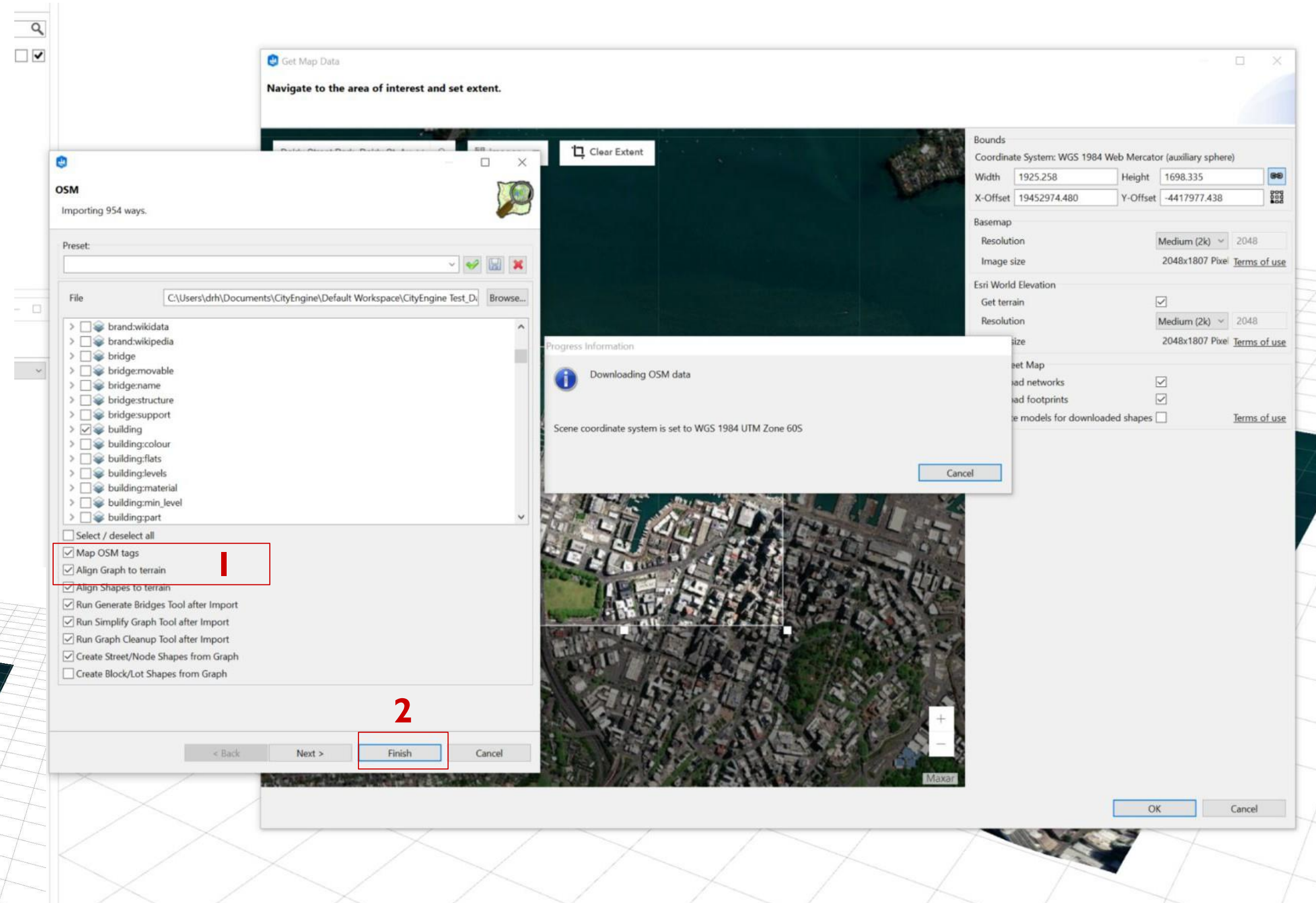
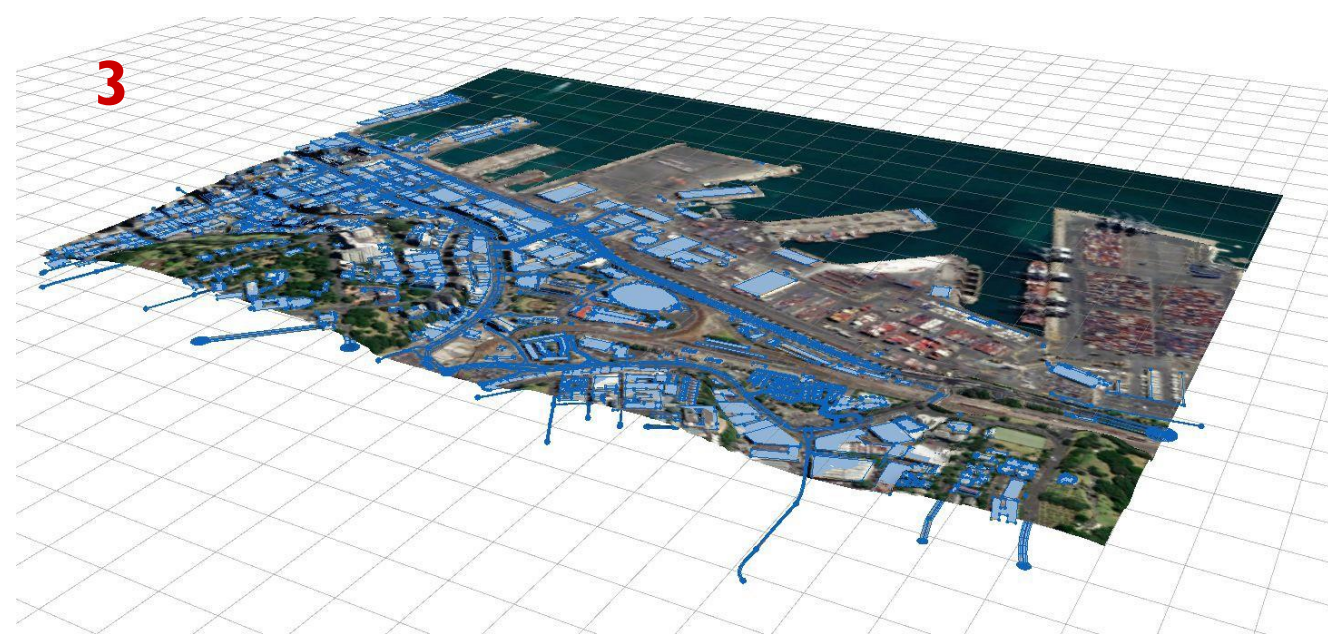


Get map data (con.)

1. OSM dialog opens

We recommend to tick all the boxes highlighted.

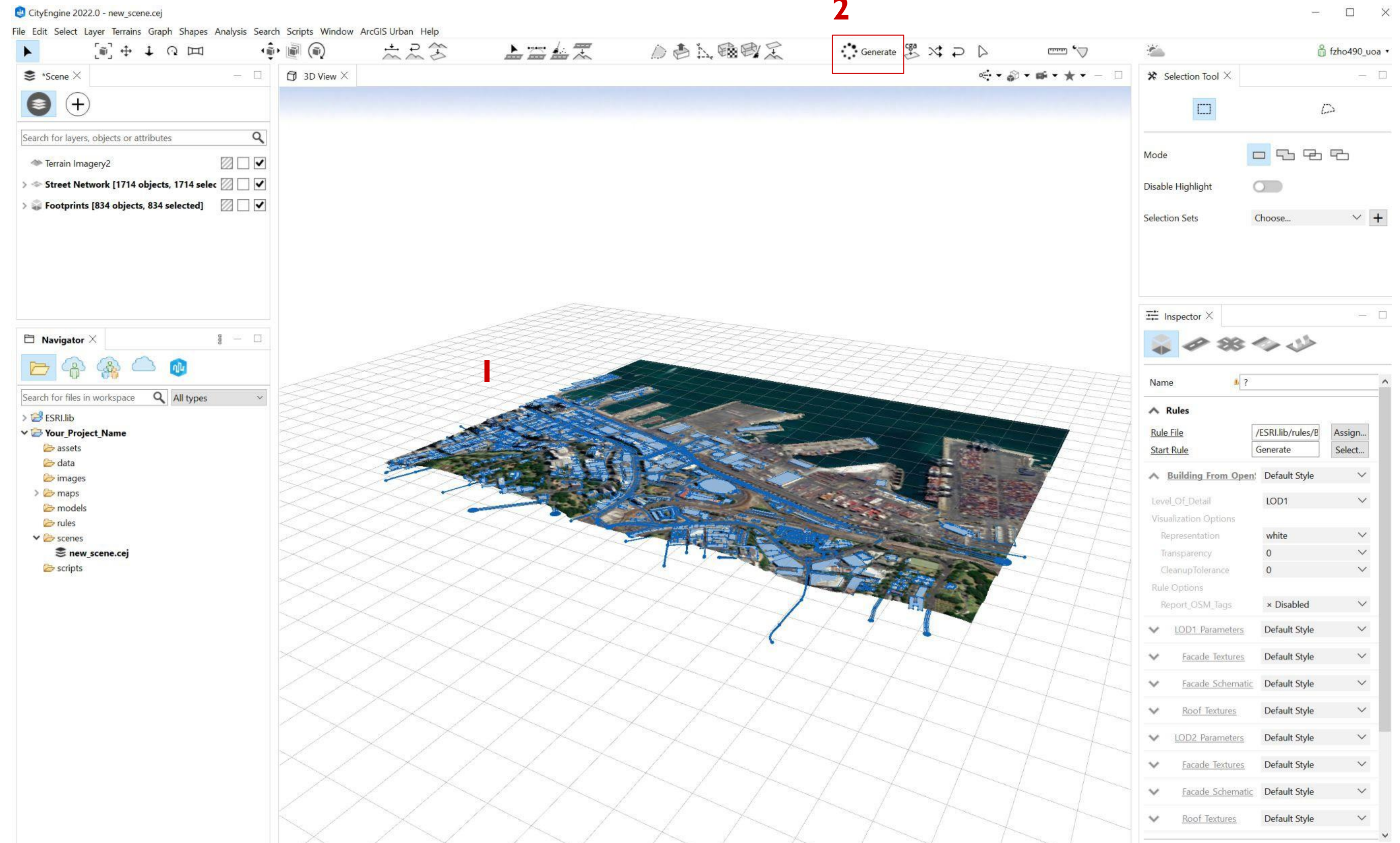
2. Click **Finish**.
3. The map with *terrain, streets, and building footprints* aligned to the elevation data is added to your CityEngine scene.





Building Generation

1. Select all shapes and objects in your scene. (Drag and select OR Control + A)
2. Click **Generate**
 - This will create buildings and street networks based on the ArcGIS data AND CityEngine own built in algorithm.

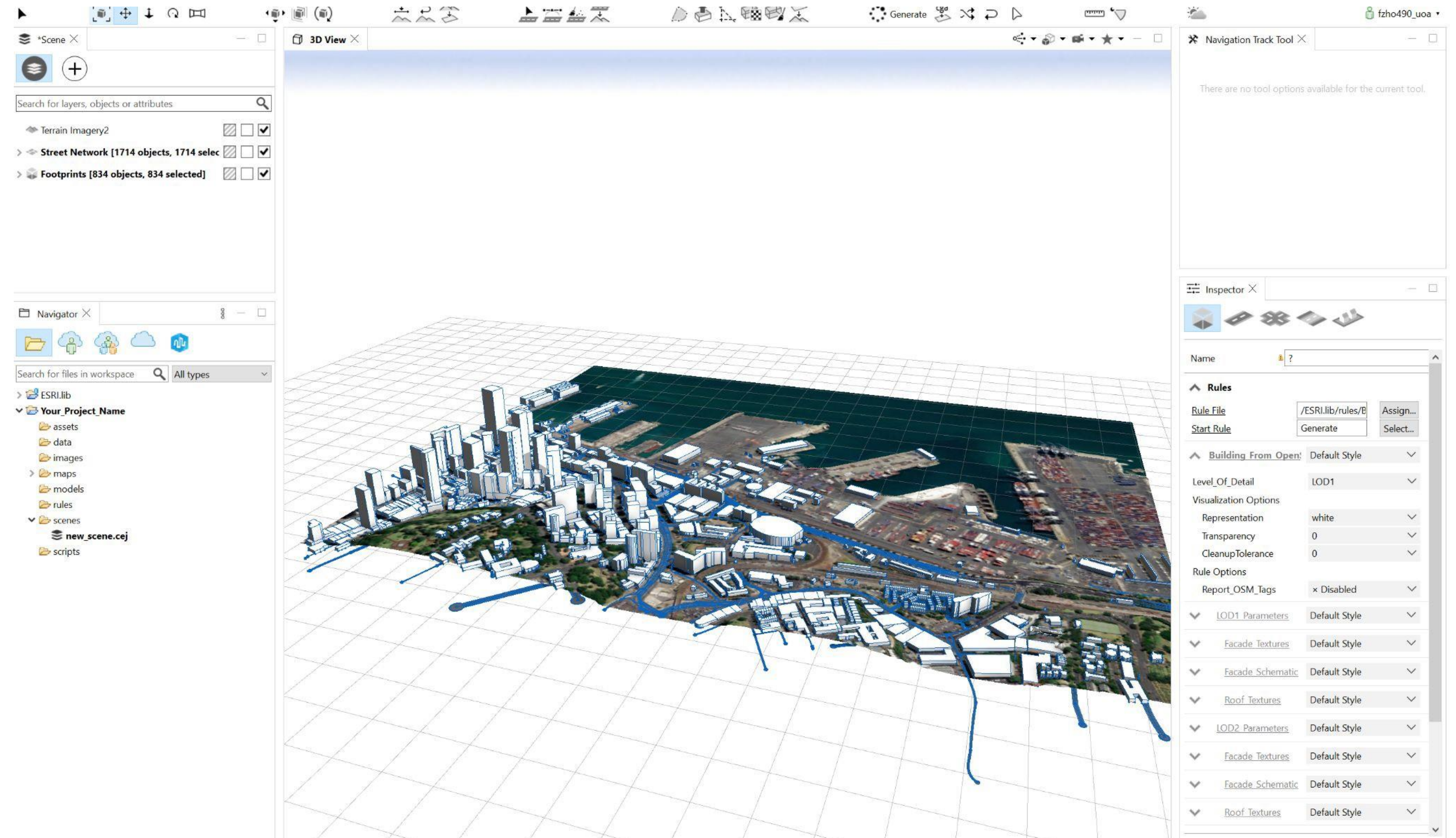




Building Generation

Note:

- *The heights and sizes of the building footprints are **NOT 100% accurate.***
- This is designed to help you with generating quick, conceptual context and shadow studies for your works.





Building Generation

1. For more realistic buildings, select an appropriate style for the building footprints in the **Inspector**.

Inspector Panel (Left):

- Building From Open: GenericMediumTown
 - Default Style
 - GenericMediumTown
 - GenericSmallTown
 - GenericSmallVillage
 - NewYork
 - Vancouver
 - Zurich
 - Wellington
 - Monaco
 - Riomaggiore
 - Add new style...
 - Preview & select styles...
- Level_Of_Detail
- Visualization Options
 - Representation
 - Transparency
 - CleanupTolerance
- Rule Options
 - Report_OSM_Tags
- LOD1 Parameters
- Facade Textures
- Facade Schematic

3D View

Inspector Panel (Middle):

- Representation: realistic with facade textures
 - realistic with facade textures
 - schematic facades
 - solid color
 - white
 - Rule default
 - Connect Attribute...
- Transparency
- CleanupTolerance
- Rule Options
- Report_OSM_Tags
- LOD1 Parameters

Navigation Track Tool

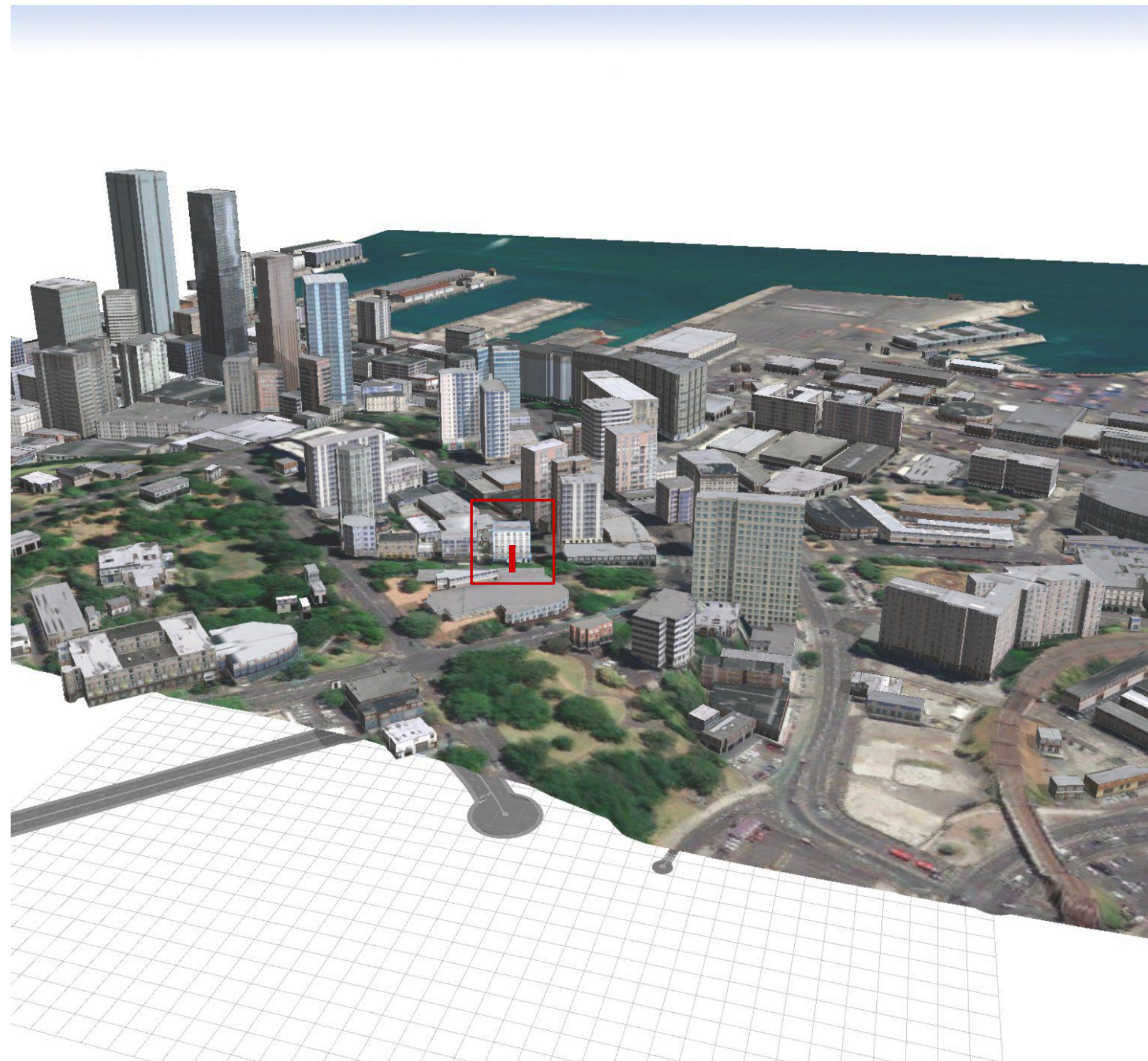
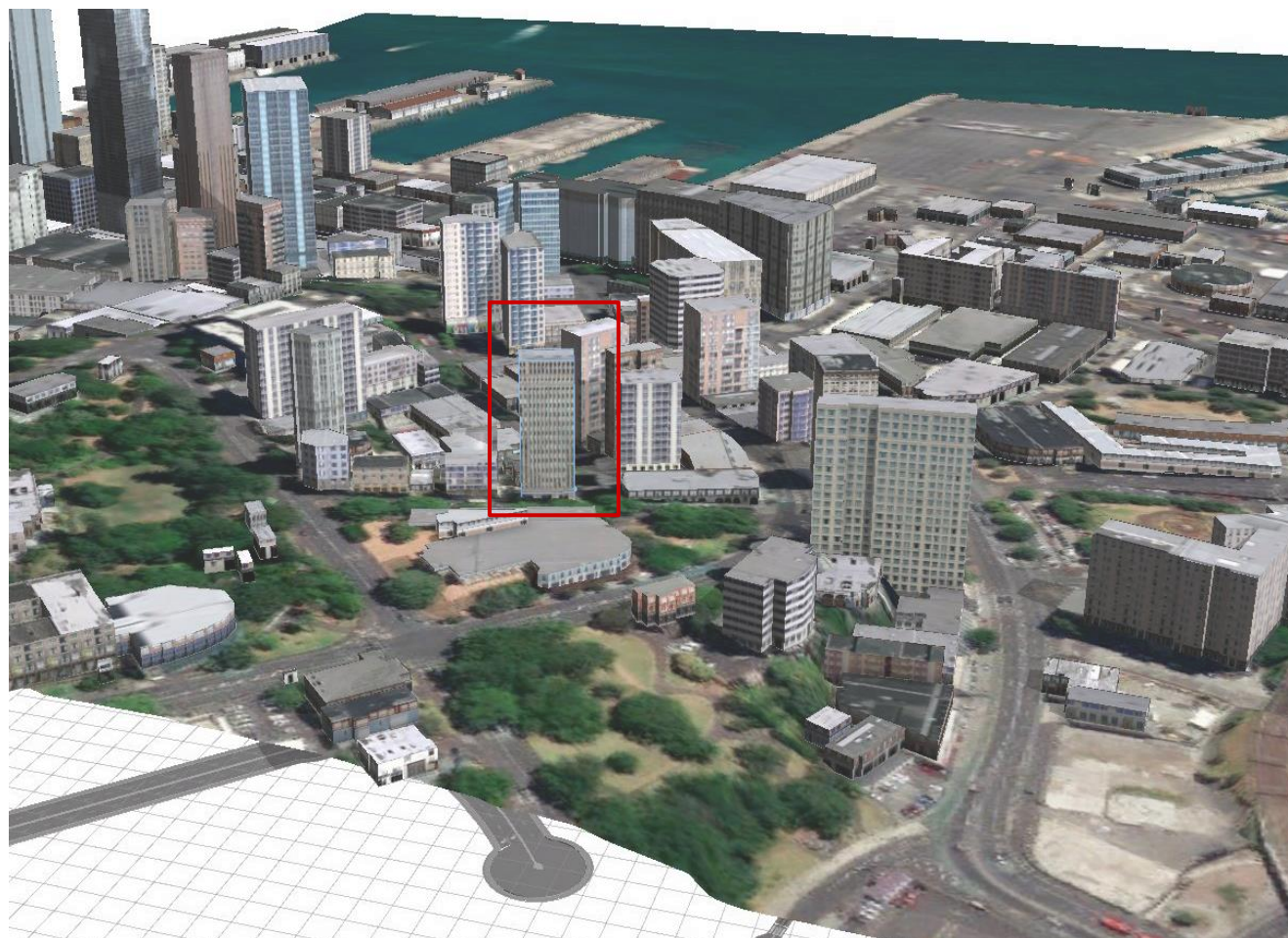
Inspector Panel (Right):

- Name: ?
- Rules
 - Rule File: /ESRI.lib/rules/B
 - Start Rule: Generate
- Building From Open: GenericMediumTown
 - Level_Of_Detail: LOD1
 - Visualization Options
 - Representation: realistic with facade textures
 - Transparency: 0
 - CleanupTolerance: 0
 - Rule Options
 - Report_OSM_Tags: Disabled
 - LOD1 Parameters: Default Style
 - Facade Textures: Default Style
 - Facade Schematic: Default Style
 - Roof Textures: Default Style
 - LOD2 Parameters: Default Style
 - Facade Textures: Default Style
 - Facade Schematic: Default Style
 - Roof Textures: Default Style



Building Height

1. Select a specific building
2. Change *building height* from **Building Settings**



Inspector ×

Name Windsor Towers

Rules

Rule File /ESRI.lib/rules/B Assign...

Start Rule Generate Select...

Building From OpenSt Default Style

LOD1 Parameter Default Style

Building Settings **2**

Fave_Ht 22.2 m

Ridge_Ht

Usage Residential

Building_Form extrusion

Roof_Form flat

Roof_Orientation along

Roof_Direction 0°

Floor_Ht 3.7 m

Underground_Ht 0 m

Min_Ht 0 m

Visualization Options

OverrideColor #ffffff

RoofColor #ffffff

Facade Textures Default Style

Facade Schematic Default Style

Roof Textures Default Style

LOD2 Parameters Default Style

Facade Textures Default Style

Facade Schematic Default Style

Roof Textures Default Style

Reports

Object Attributes

תורת הדיבור