

## How to remodel the NYC 3D Model without contour elevation

The buildings in NYC's 3D model are at elevation, meaning that their bases sit on an invisible contoured surface. While this can be positive in some instances, many planners and designers prefer all of their buildings to sit on a flat base.

This document provides basic instructions for how to **combine multiple faces into 3d object buildings**, and **align all their bases to a flat surface**.

- 1) Copy all the faces [*Building\_Rooftop*, *Building\_Footprint* and *Building\_Facade*] into a single layer.
  - a) In the Layers panel on the right side of the screen, create a new layer.
  - b) Select the layers [*Building\_Rooftop*, *Building\_Footprint* and *Building\_Facade*] within the layers panel (hold with SHIFT key to select multiple) and right-click to select '**Select Objects in Layer**'. All the planar surfaces would be selected in the Rhino window.
  - c) Toggle over the new layer created in 1(a), right-click to select '**Copy Objects to Layer**'.
- 2) Join faces into objects.
  - a) **JOIN** faces into polysrfs.
    - i) This would ideally work for a small file size. However, for a large file, it is recommended to run this command in batches.
    - ii) To do so, an easy way to select the buildings would be with the **LASSO** tool. In Top View (toggle through tabs on bottom of viewport), use **LASSO** to custom select area intended before **JOIN** surfaces.
- 3) In an ideal scenario all planar surfaces would be joined into complete 3d polysrfs. However, it is very likely there will be a few discrepancies in the JOIN. To check and ensure a clean file:
  - a) Move all newly joint polysrfs to a new layer (Select new layer in right toolbar and right-click the layer to select '**Change Object Layer**'). Name it '*Buildings\_Combined*'.
  - b) Toggle the visibility and lock function of the other layers to turn off.
  - c) **SELECTCLOSEDPOLYSRF** to determine if there are any massings that did not get combined fully. (This may happen especially for roof details). Scan through the model to see if the roof details are not combined with the base massing. Uncombined walls can be ignored as they will not affect the objective of this exercise.
  - d) If the command in 3c does not show uncombined roof details, skip this step to 3e. Select an uncombined roof detail- and **ZOOMSELECT** to zoom to the object. Usually, the detail does not combine when it itself is closed at the base plane. **EXPLODE** the object to break up the surfaces, deselect the base plane, and **JOIN** the object again, removing the base plane from the joined object. Delete the base plane, and join the object to the base building. If the object does not join, the roof plane of the base building might not have a footprint for the detail to join to. In this case, select the base building, **SPLIT** and select the detail polysrf as the object to split with.

Delete the footprint of the detail from the roof plane, and **JOIN** the detail polysrf to the base building polysrf.

- e) **SELECTSRF** to determine if there are any roof planes that did not combine with the building. If the command does not show any uncombined roof planes, skip this step to 3f. Uncombined walls can be ignored as they will not affect the objective of this exercise. Select the uncombined roof plane and **JOIN** with the base building. If the JOIN was not successful, **CAP** the base building and delete the uncombined roof plane.
  - f) Repeat steps 2 and 3 for all remaining batches, putting them into the '*Buildings\_Combined*' layer. When the file gets too heavy, **HIDE** the polysrfs from the completed previous batches.
- 4) To align all polysrf to a flat z-axis plane.
- a) **SHOW** to reveal all polysrfs in '*Buildings\_Combined*' Layer.
  - b) Toggle to Top Viewport. **PLANE** to create a reference plane to align all the buildings to. You can **MOVE\_VERTICAL** to move plane to a desired point in the z-axis in the Perspective Viewport after. Select the plane and **LOCK** it.
  - c) Right-click on the '*Buildings\_Combined*' Layer in the layer panel to select '**Select Objects in Layer**'.
  - d) Toggle to Right or Front Viewport. **ALIGN\_BOTTOM** to align buildings to the plane you have created in 4b.
  - e) **UNLOCKSELECTED** to unlock the plane. Delete it.