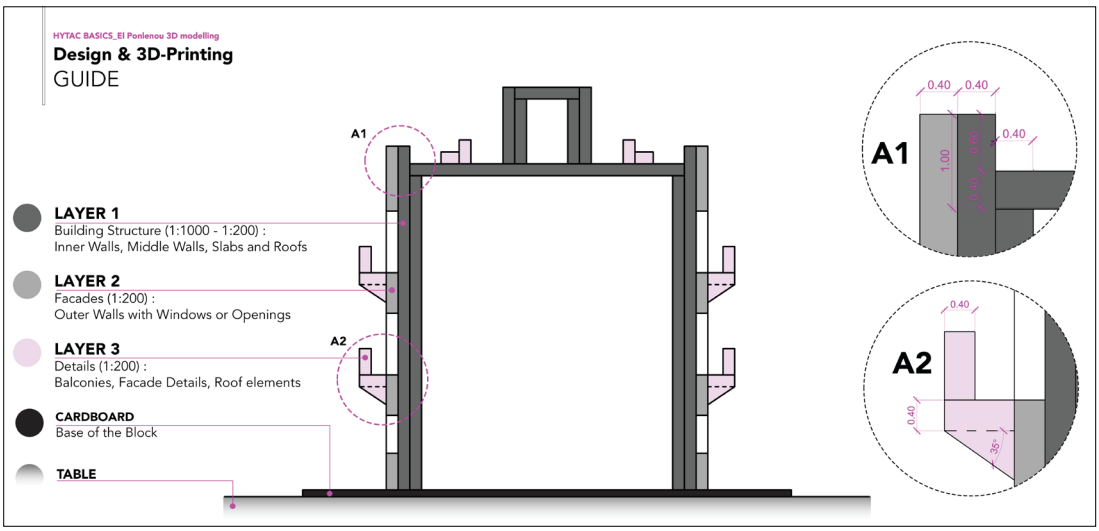
ETH zürich
HYTAC
Hybrid Techniques for Architecture Design
www.hytac.arch.ethz.ch
Doz. Jonathan Benhamu D-ARCH ETHZ

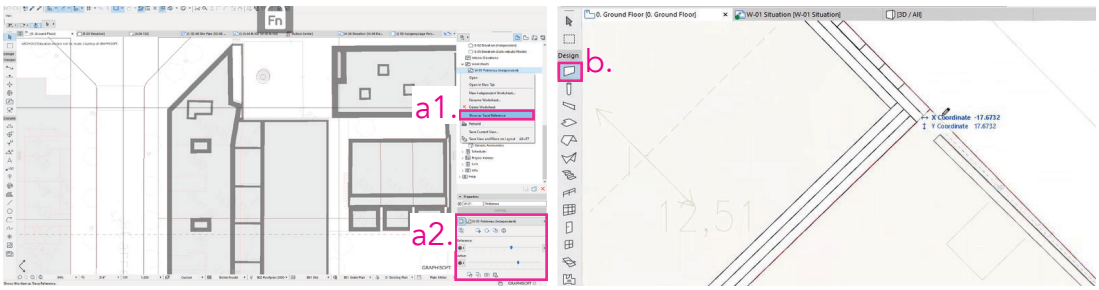
HYTAC Basics SS 23 _ Workflows

02_Design Workflow : Walls

0



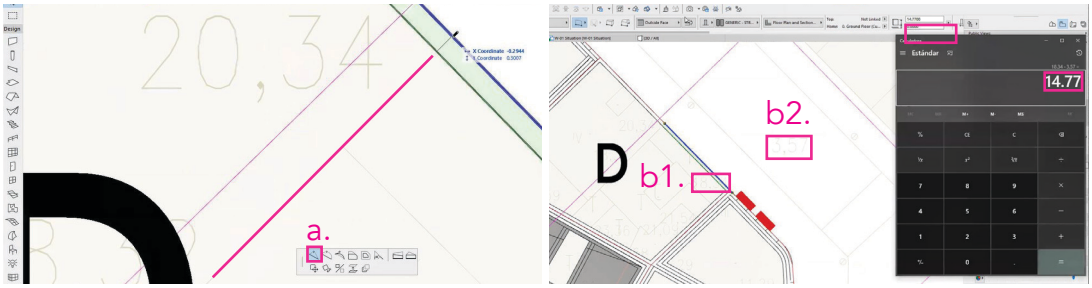
1



a. Go to the **GroundFloor**, and in the **Project Map**, find the Worksheet named "**W-01 Pobleneu**", right-click on it and select **Show as Trace Reference**(**a1.**). On the **Trace Reference Window** (**a2.**) you can adjust the opacity of the plan.

b. Using this Trace Reference Plan, start creating the walls of the buildings using the **Wall Tool**. **Thickness** = **0.4**m (minimum) and **Layer = "XXX Group XXX Layer 2"**

2



a. Create corners using the option " **Insert new node** " from the **Pet Palette** and make sure to create separate wall boundaries for each building, since they may differ in height. There are cases that the walls of the same building are different in height. In this case use the " **Insert new node** " tool and adjust the height at each point.

b. To find the **Wall Height** on each location, calculate the height level of the roof (**b1**) minus the height level of the street (**b2**), according to the numbers that are visible on the plan.

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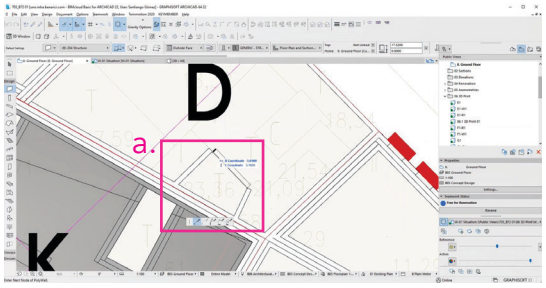
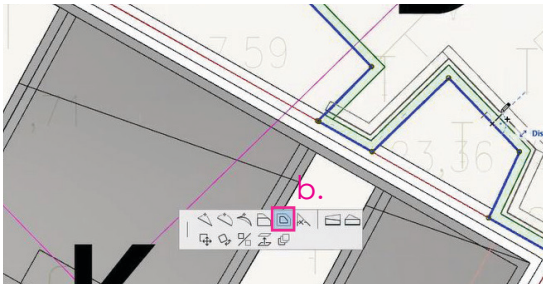
02_Design Workflow : Slabs & Roofs

3

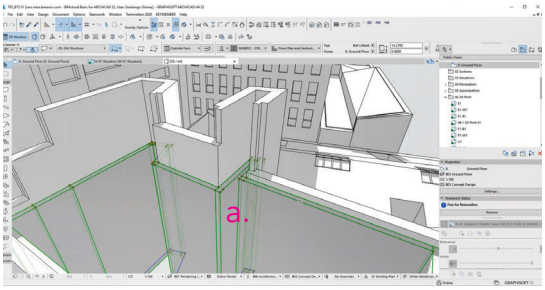


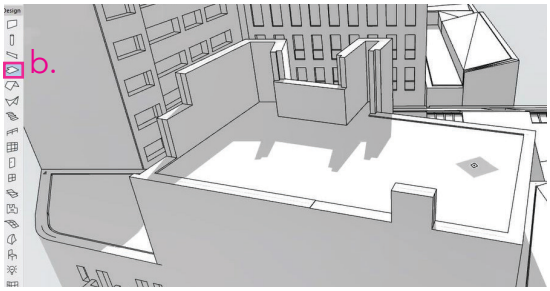


a. In case a building has extra roof-elements, shape them by creating new walls that start from the roof base and reach the height that is written on the plot.

b. Select the exterior wall of each building, and using the **Offset Tool** from the **Pet Palette,** offset the wall 2 times to the inside. As a result you should have **3 layers of walls**. **Assign the 2 Inner Walls to "XXX Group XXX Layer 1"**

4

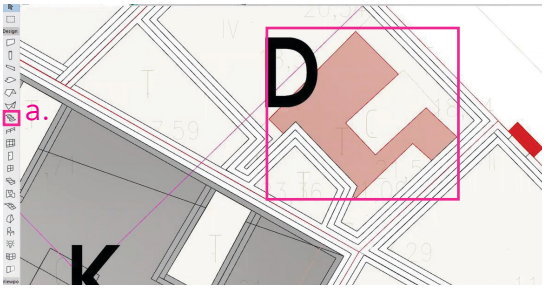


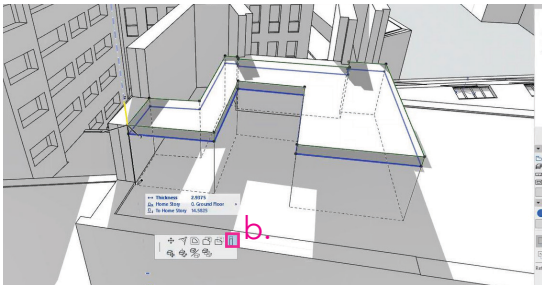


a. Select the inner wall, and set its height **1 m** lower than the lowest wall of the facade. This wall will be used to support the roof during the assembly of the 3d-printed parts.

b. Create the base of the roof using the **Slab Tool** (Design Toolbox/Slab Tool). Trace the slab boundaries over the outline of the inside wall. Set the height of the Slab to **0.4 m** and set **the Layer to "XXX Group XXX Layer 1" .**

5





a. Continue by shaping the **Roof-Slabs** of the other buildings, following the same steps. Also create the smaller slabs that cover the roof elements designed in step 3a.

b. You can adjust the roof **heights** using the **Stretch Height** tool from the Pet Palette.

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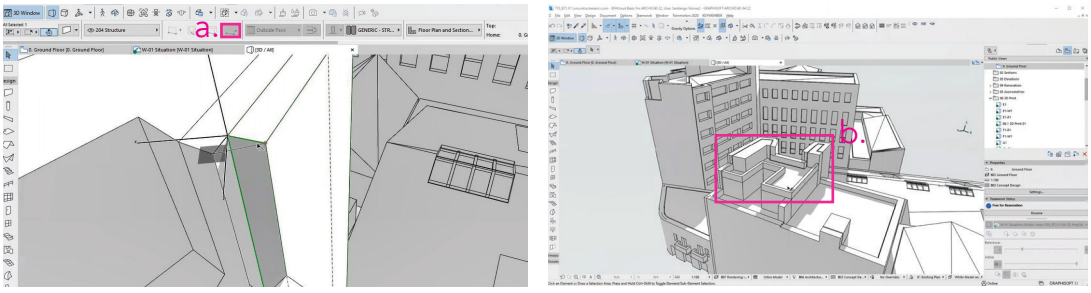
02_Design Workflow : Slabs & Roofs

6

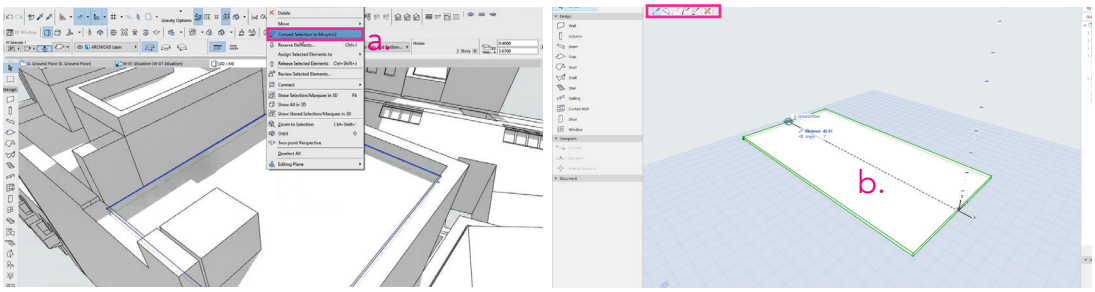


a. Refine the corners of the walls and add detail, by assigning the wall as a **Polygon** (Wall Properties/Geometry Method/Polygonal).

b. To add details on the roof elements, like parapets, modify the wall heights using the **Stretch Height** tool from the Pet Palette.

c. If you need to preview only a selection of elements in 3D, you can **Isolate** them by selecting the elements and clicking **F4**.

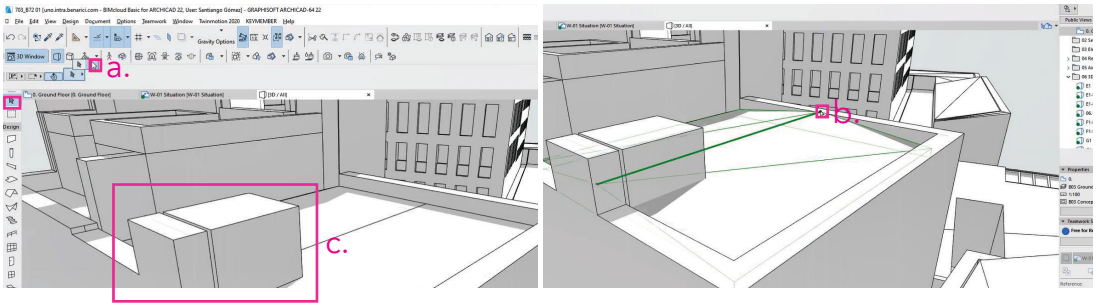
7



a. To create a tilted Roof or a more complex shape, select the slab and **Convert it to a Morph** (Right click/Convert Selection to Morph).

b. From the Pet Palette, you can **Add a Polyline** , and draw on the solid the line that defines the ridge of the roof. (PP/Add Polyline)

8



a. Press Esc, to unselect the morph and **Modify your cursor** by selecting the white cursor icon in the Toolbox (Toolbox/Arrow Tool/Selection Type: Subelement).

b. Now, select the edge you have created and **move it** upwards to create the tilted roof. (Select/Ctrl+D) .

c. If needed, you can add small Roof elements and details using the Wall and the Slab Tool. These 3D details should be assigned to **the Layer to "XXX Group XXX Layer 3" .**

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02_Design Workflow : Openings & Details

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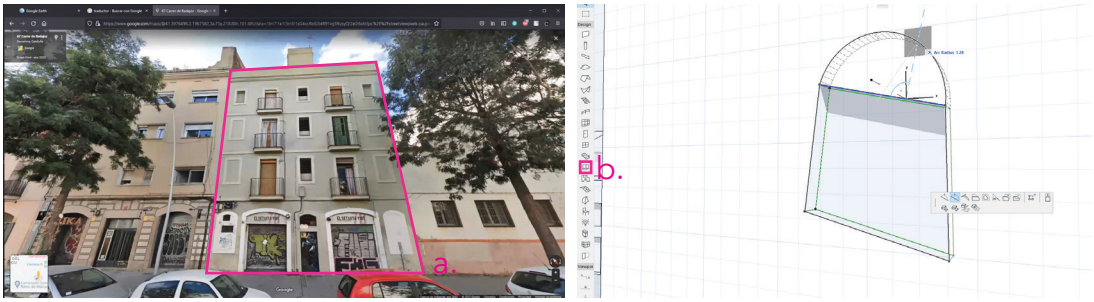
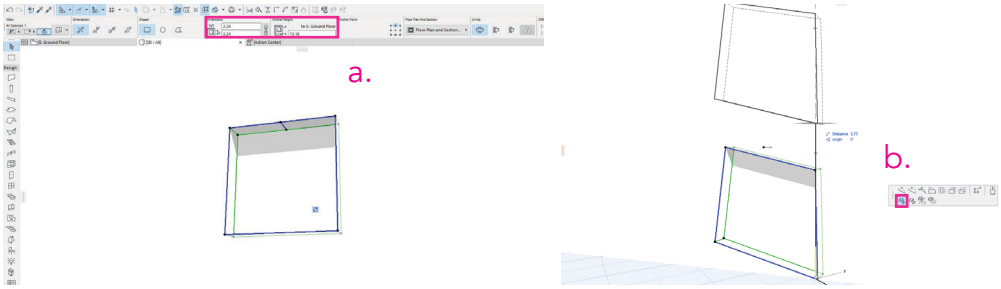


a. To add windows and openings to the building facades, go to **Google Maps**, locate your block and view the buildings in **Street View** for reference.

b. To add openings, use the **Opening Tool**. (Toolbox/Design/Opening Tool)

In the Opening Settings, you can select among square, circle or complex shapes. You can use the Pet Palette to create round edges (Fillet) or other details.

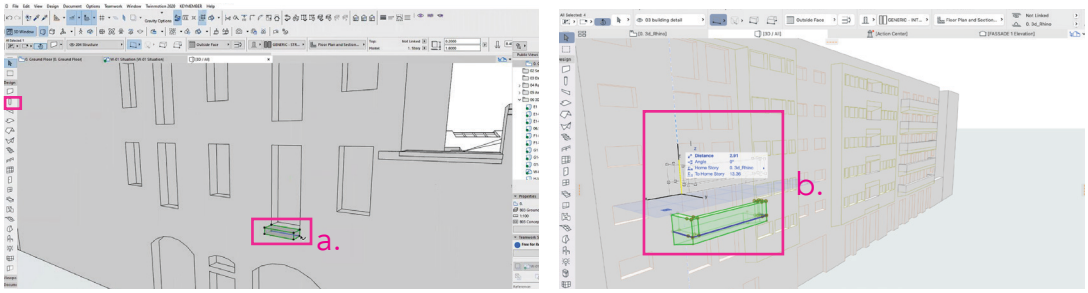
10



a. In the **Opening Properties** you can modify the **Opening Dimensions** and the **Height**.

b. For repetitive openings on your facade, **copy** the opening you created and paste the duplicated openings according to your Google reference.(Select Opening/Pet Palette/ Drag/Press Ctrl or Ctrl+D)

11



a. To add balconies, lintels or other facade details, you can use the **Slab** or **Wall tool**.

All these 3D elements should be assigned to Layer 3 (e.g."XXX Group XXX Layer 3")

b. In order to achieve 3d-printable balconies, we need to create a **45° angle** as shown on the screenshot above. That can be made by converting the element to Morph and moving the edge with the cursor. Use the **Copy&Paste** command for repetitive balconies.