

Cass Cities

Southwark Industrial Audit (SIA)

Spatial survey methodology

PART 1. The paper map, the spatial “functional unit” and QGIS

PART 2. Updating spatial data in the maps in QGIS

PART 3. Frequently asked questions

PART 1. The paper map, the spatial “functional unit” and QGIS

Context

This training covers the steps to conduct a field survey of industrial “Functional Units” in Southwark. The focus is on **collecting information about the physical characteristics** of the “Building” and “Parcel” where industrial activities take place.

Key definitions

Building. Permanent roofed construction, usually with walls (OS Mastermap Topography Layer).

Parcel. Shapes that show the position and indicative extent of ownership for each registered property at ground level.

Functional Unit. The premises where a uniform industrial activity takes place, disregarding the type of tenure or physical structure of the space that accommodates the activity.

Exterior. A demarcated private land that contains one or more functional units.

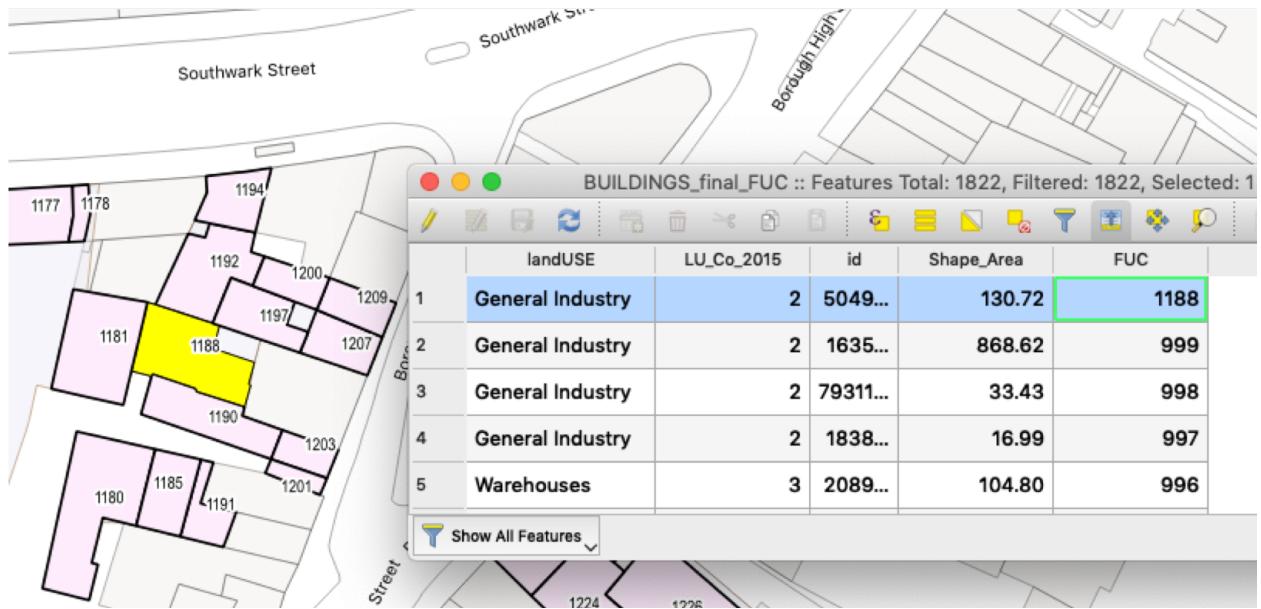
Basemap

The basemap to conduct the survey is composed originally of two polygon layers: “Building” and “Parcel” which we conceptualize as “Functional Unit” and “Exterior” respectively. Polygons are closed shapes from which certain geometric properties can be derived (e.g. area, perimeter). There are more than 1000 “Functional Units” polygons on the basemap of the survey area each of which have a unique identifier, the **Functional Unit Code(FUC)**. Similarly, “Exterior” units polygons have a unique identifier, however these are less polygons because they can have a one-to-many relationship with the “Functional Units” (i.e. multi-units industrial estates).

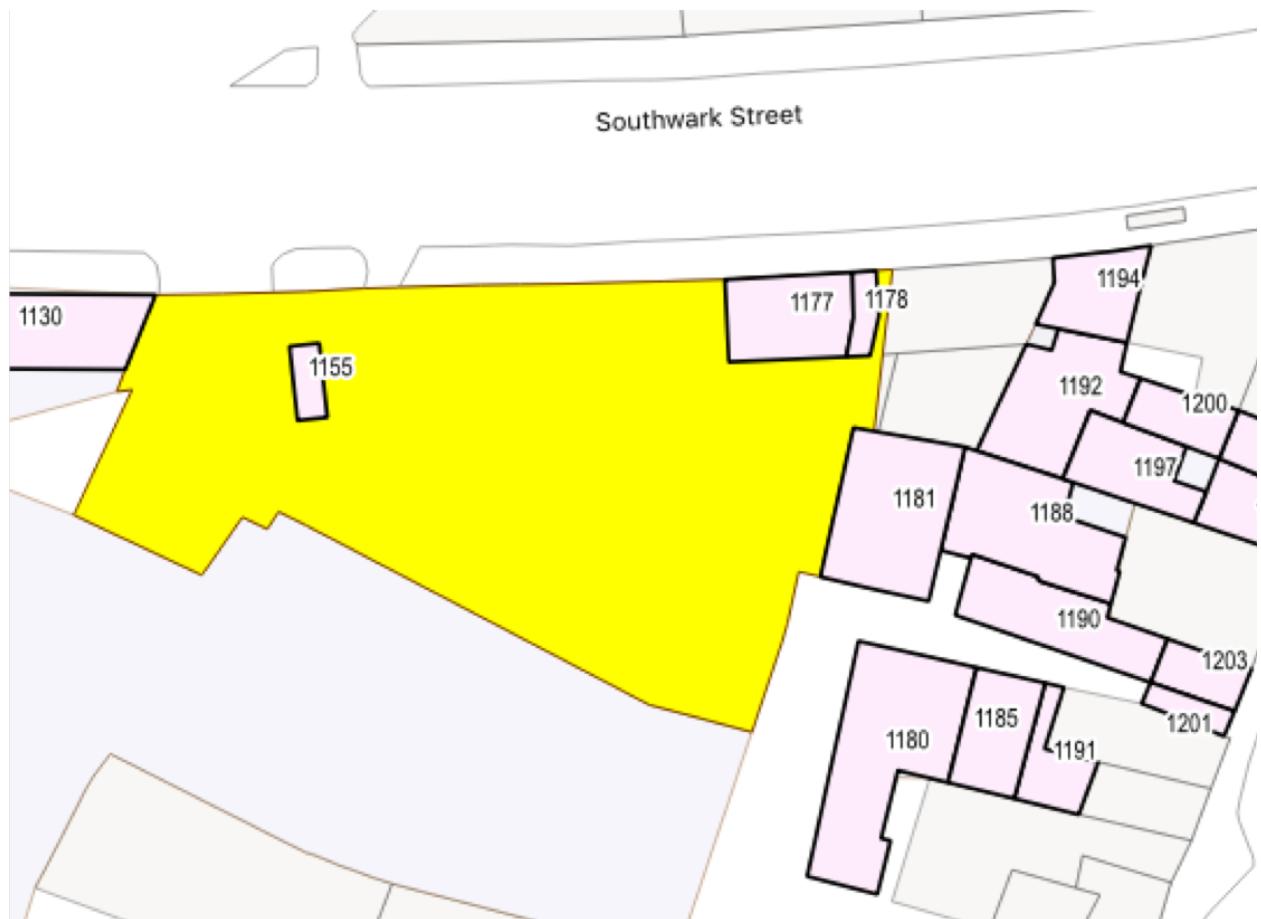


Functional Unit Profile

To conduct the SIA survey we will use a Geographic Information System (GIS) database approach. Essentially, this means that the data we will collect is organised in such a way that each of the “Functional Units” polygons (spatial data) has a set of associated attributes (e.g. the answers to the survey’s questions) structured as a table. In the table each row corresponds to one polygon (with unique identifier) and each column corresponds to an attribute of the polygon.



The “Functional Unit” profile is the set of tabular information collected and the spatial data(polygons), which in some cases is updated or created by the surveyor. The “Exterior” units polygons data is also part of the “Funcional Unit” profile, although they have no associated set of questions. It is expected that the “Exterior” units spatial data is also verified or upadated during the survey to make it consistent with the corresponding “Functional Unit”.

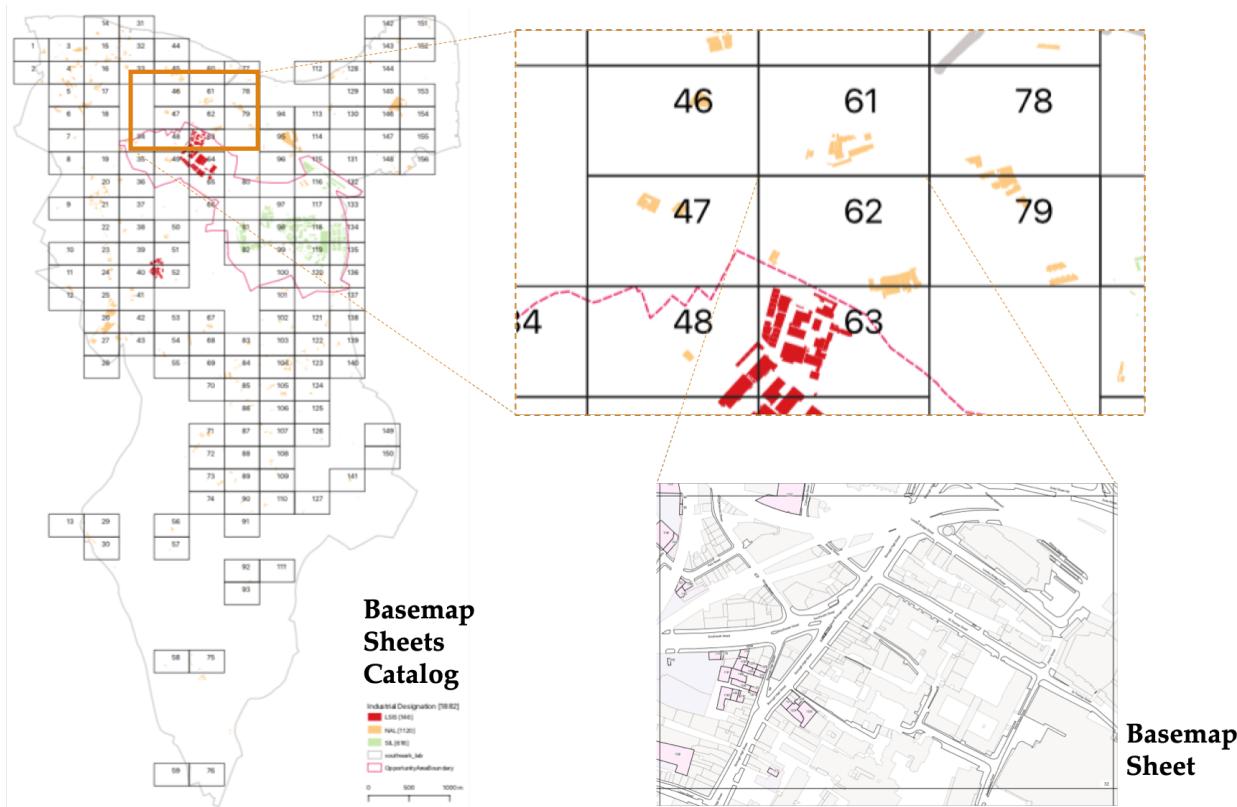


Conducting the survey

The survey questions are classified according to the method used to obtain the answer in: **Verified** (from direct observation) and **Desktop**. The collection of spatial data uses both methods: “Verified” (i.e. what you see on site) and “Desktop” (updating spatial data from your field notes). For the spatial data “Desktop” tasks you will be able to access the survey polygons in vector data digital format (“Functional Unit” and “Exterior”) and you are expected to edit them using a Geographic Information System(GIS) software package QGIS.

Survey organisation

Each surveyor will be assigned one or more basemap sheets that correspond to a cell of a grid that covers the study area of Southwark. The surveyor will be responsible of developing the **Functional Unit Profile** for all the units that are contained on the basemap sheets assigned.



Some polygons located in the boundaries of the basemap sheets are included in two contiguous sheets (see image below). Coordinate among yourselves to determine to whom is more convenient to survey such cases, so that these are not duplicated (FUC is a unique identifier. EpiCollect will only admit unique values).



Survey materials

To conduct the survey you will have a hard copy of the **basemap sheets** showing the “Functional Units” polygons labelled with their **Functional Unit Code** and the “Exterior” units polygons. Each sheet has a unique page number on the bottom right corner (question number 1.1 on the EpiCollect form). Additionally, you will have the questions of the survey loaded on your EpiCollect app accessible through a smartphone.



Also, the digital files for updating the spatial data are part of the survey materials. All items are organised according to the following table in the “Survey and Mapping Materials” shared folder (Note: to open <- link on a new tab *click on link + control key* on Windows, or *click on link + cmd key* on Mac).

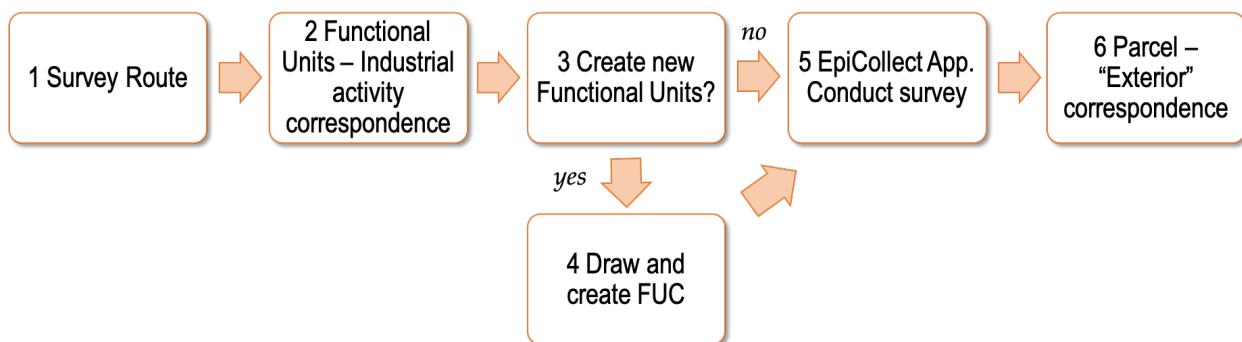
File name	Description
Basemap sheets catalog	Gridded map with basemap sheets numbers
BUILDINGS	Folder with all Building files corresponding with the basemap sheets numbers
PARCELS	Folder with all Parcel files corresponding with the basemap sheets numbers
CONTEXT.gpkg	File containing urban context data of the study area
3 .qml files	Files for styling the map in QGIS

Survey workflow

To conduct the survey is necessary to follow the next sequence in strict order.

1. Study the basemap sheet to identify a convenient survey route. Use online tools to get gain knowledge of the area you will be surveying (e.g. Google Maps 3D views)
2. While on site assess the correspondence between the “Functional Units” polygons on the basemap sheet and the industrial activity you are observing. Hint: Look for clues that can help with your assesment (building directory or intercom, business signs, etc.)
3. If there’s a one-to-one clear correspondance go to step 5. If not, you will need to create new “Functional Units” (go to step 4)

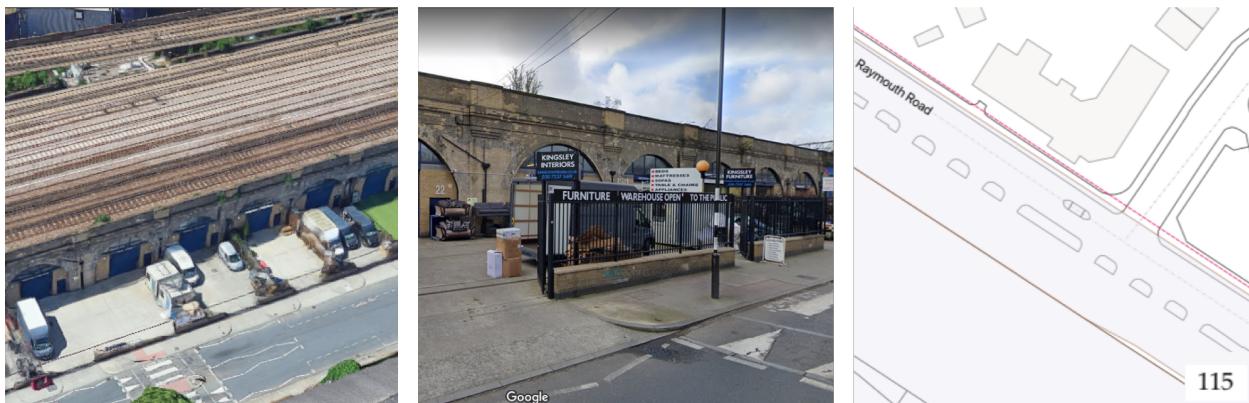
4. To create a new “Functional Unit”, first outline the polygon shape of the unit or units you’re observing in your basemap sheet and label these with a new **Functional Unit Code(FUC)** according to the following rule: original FUC + a unique **4** digit number from 1 to n (including preceding zeros). For example, if your basemap shows one polygon with FUC=76, but you observe that there are 3 “Functional Units” within that polygon, the new ones will be labelled ‘760001’, ‘760002’, ‘760003’.
5. On the EpiCollect app **conduct the survey** by recording the **Functional Unit Code** of the corresponding polygon. Note: In the previous example, this corresponds to one of the 3 new created FUCs. The ‘original’ FUC=76 will not be included on the survey. The first questions can be answered from direct observation (e.g. street name, number).
6. Assess the correspondance between the “Exterior” units on the basemap and the demarcations of the land you are observing (this can be fences, light divisions, paint, etc). In cases that apply, outline the divisions of the “Exterior” units on your map sheet.



Survey's non-existing units (NEU)

To identify the industrial units included on the survey different datasets of different date and source were integrated. For this reason, there could be cases while on site that you spot industrial functions that are not identified on the basemap sheets as Functional Units/Buildings.

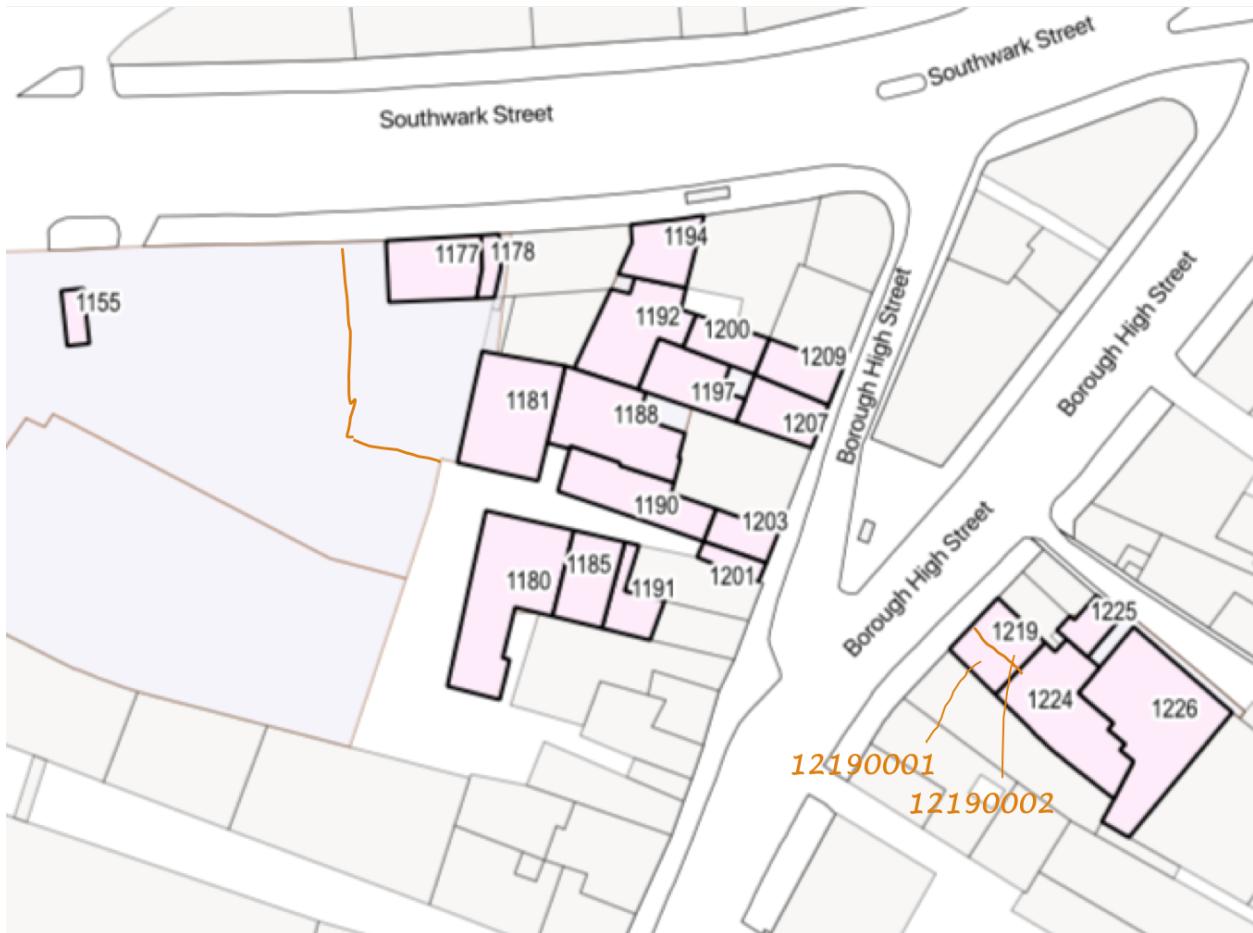
In those cases, like the example below, it will be necessary to draw the polygon describing the extent of the premises and create a new FUC with the following rule: basemap sheet number + a unique **5** digit number from 1 to n (including preceding zeros). So, for example if you observe that there is a functional unit in the area covered by the example below, the new FUC will be ‘11500001’.



PART 2. Updating spatial data in the maps in QGIS

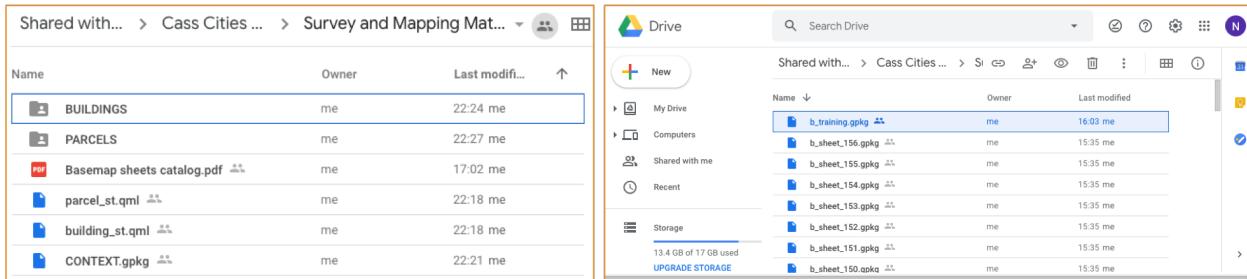
(working through an example)

For the surveys in which you created new “Functional Unit” polygons and updated the “Exterior” unit polygons (step 4 and 6 of the **Survey workflow**) you will need to edit the spatial data digitally according to your field notes. This process will be conducted using QGIS according to the next steps.



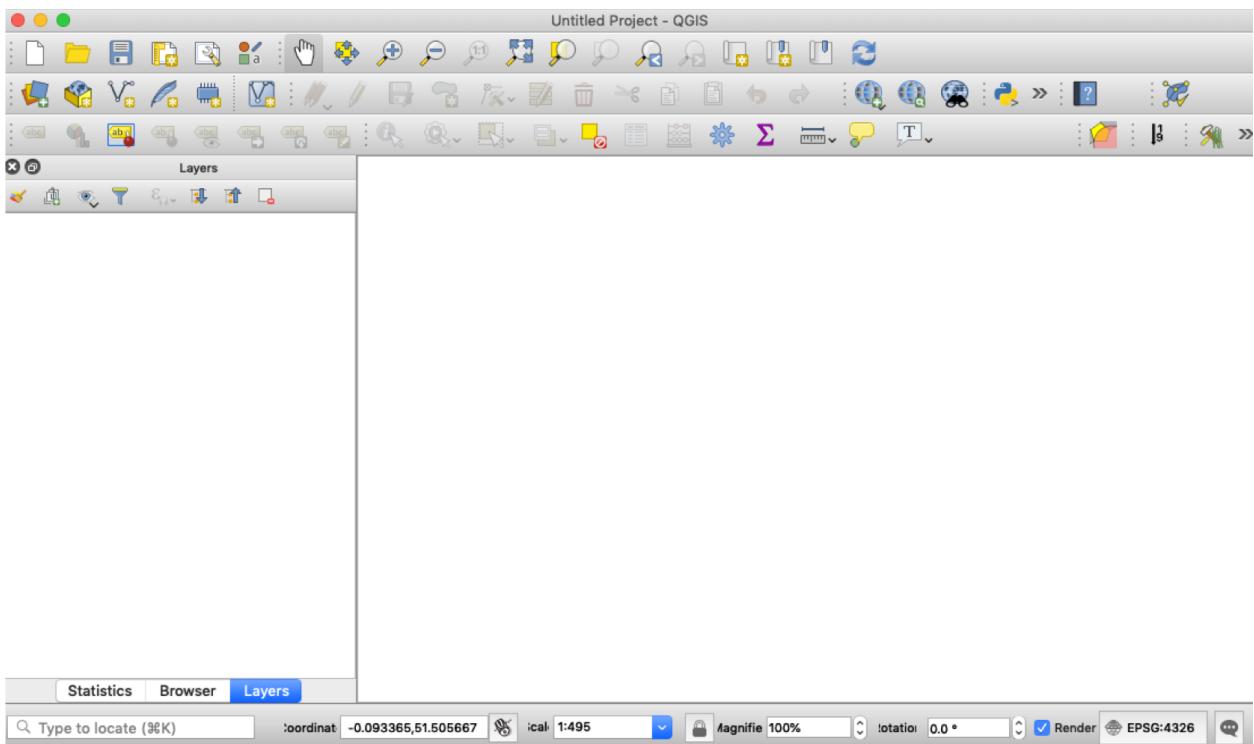
Before starting:

- i) Create a folder on your computer “SIA_mapping” and download the following files from the “Survey and Mapping Materials” shared folder (Note: to open <- link on a new tab *click on link + control key* on Windows, or *click on link + cmd key* on Mac).
 - building_st.qml
 - parcel_st.qml
 - CONTEXT_st.qml
 - CONTEXT.gpkg
 - b_training.gpkg (from the folder “BUILDINGS”)
 - p_training.gpkg (from the folder “PARCELS”)

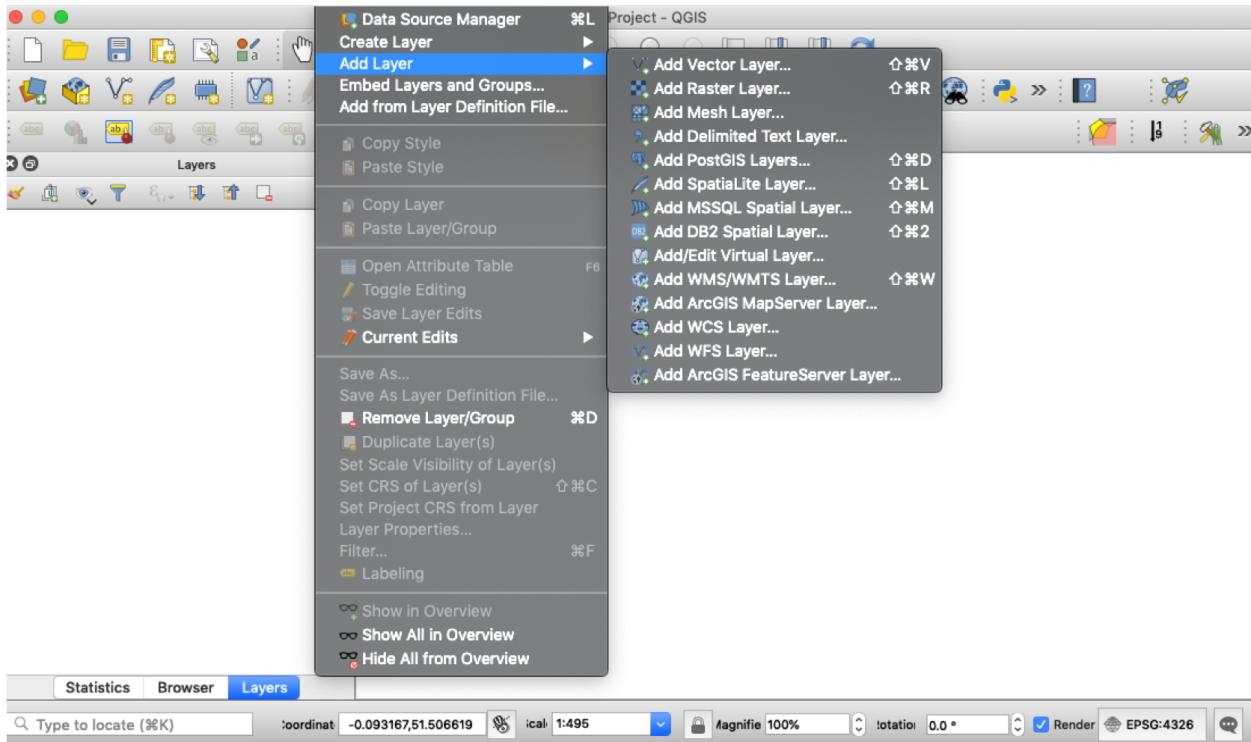


- ii) Inside your “SIA_mapping” folder create two new folders: “BUILDINGS_*your nickname*” and “PARCELS_*your nickname*”
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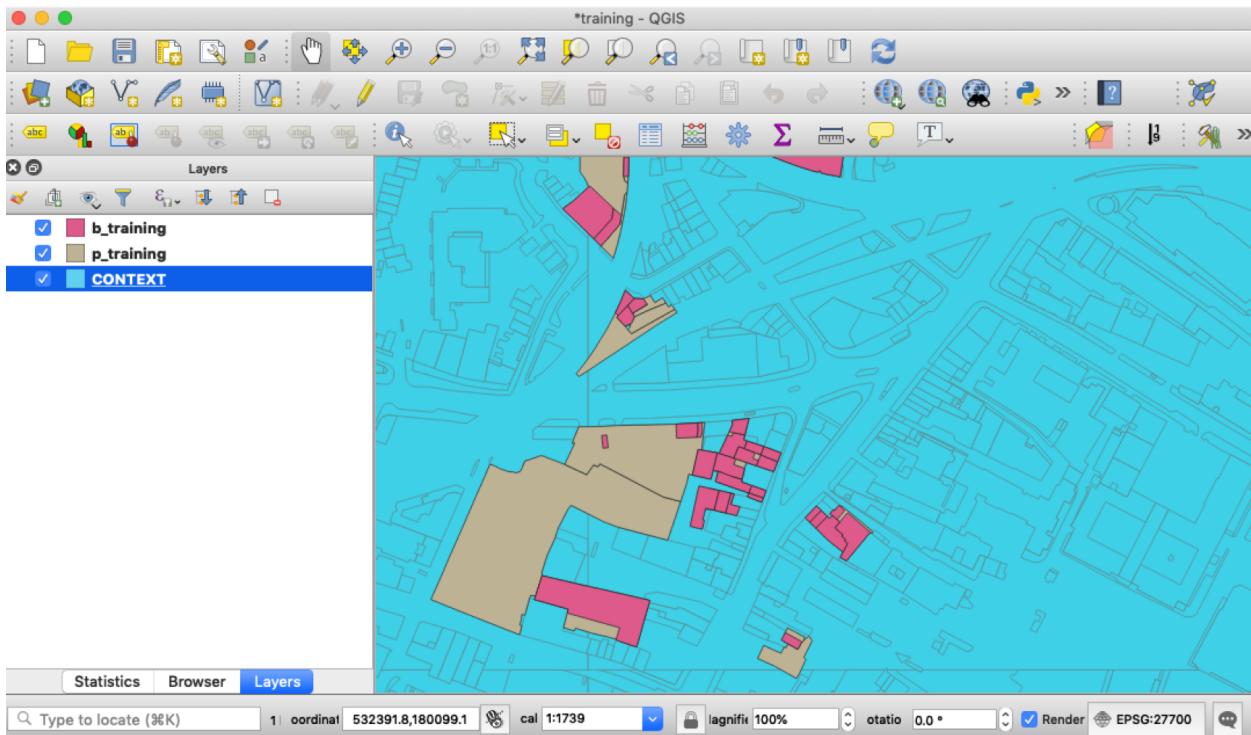
1. Open QGIS.



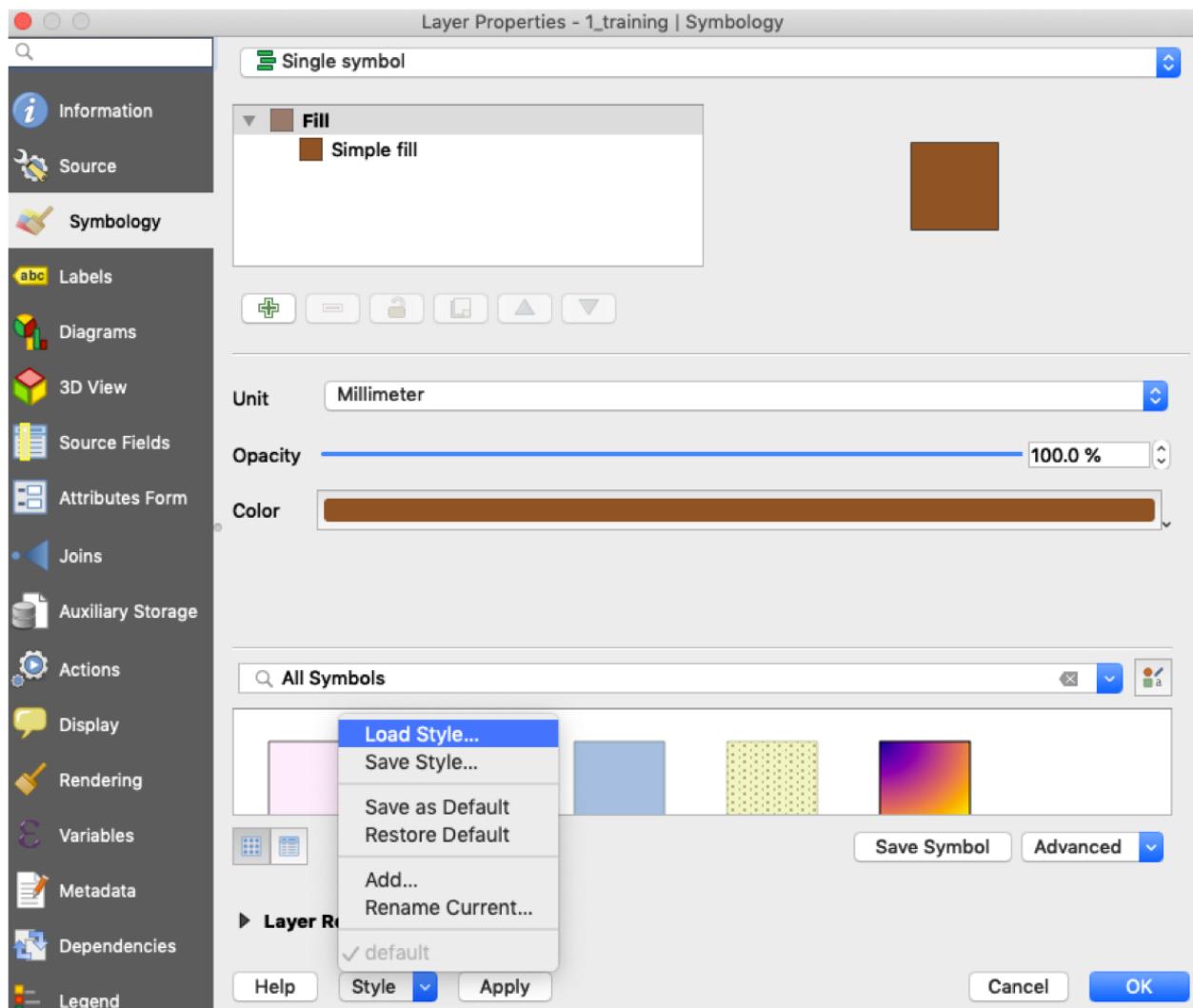
2. Load spatial data layers (the 3 .gpkg files) in your “SIA_mapping” folder. Drag and drop, or Layer / Add Layer / Add Vector Layer...



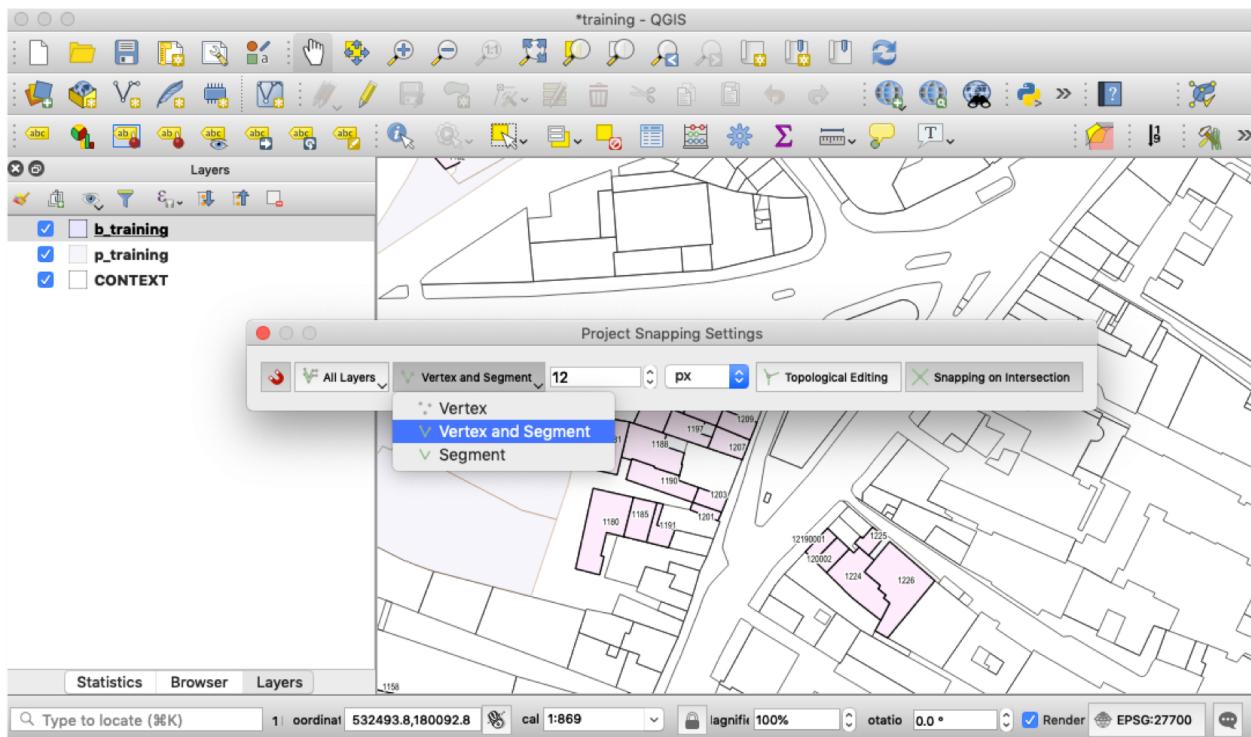
3. Organise the layer on the layers panel using drag and drop in the following order ‘b_training’, ‘p_training’, ‘CONTEXT’. For the updating the spatial data after the surveys from the notes on your basemap sheets you will find the respective file on the “BUILDINGS” and “PARCELS” folder.



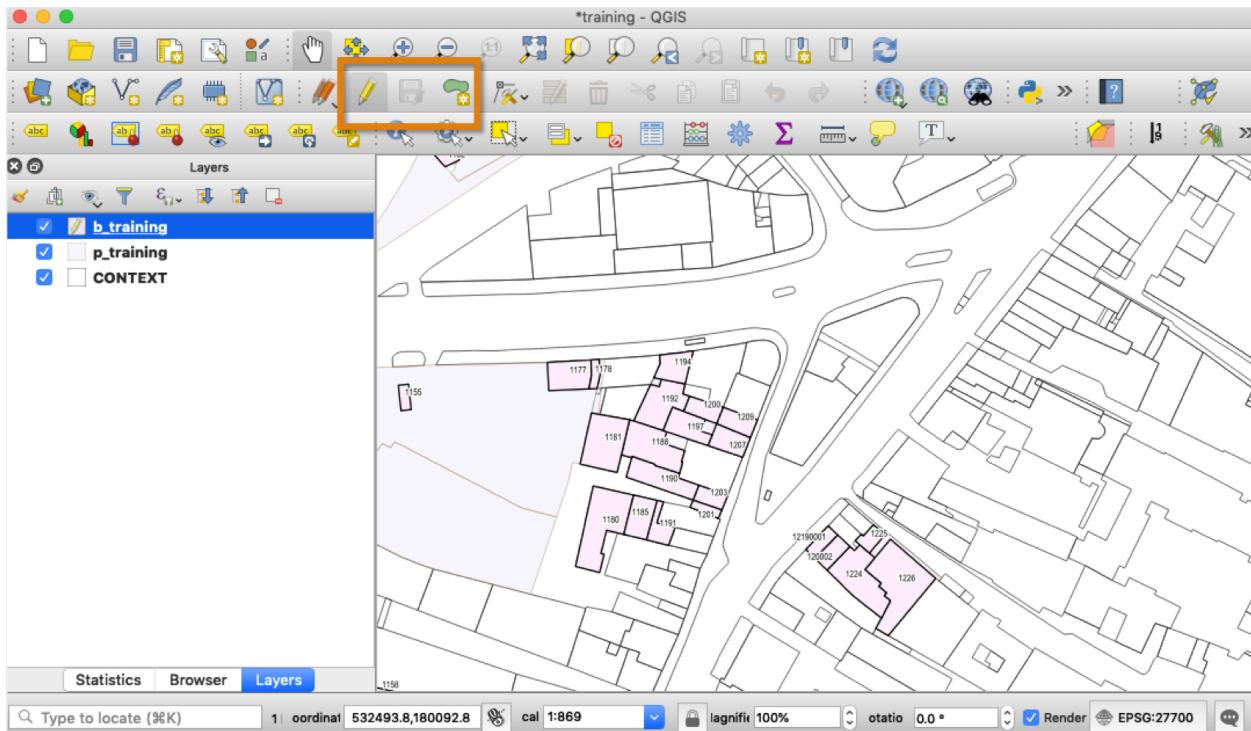
4. Add style to the layers. Select layer on the layer panel [mouse right click] / Properties... , then at the bottom of the Symbology tab / Style / Load Style... in the next window verify that ‘Symbology’ and ‘Labels’ boxes are selected then / File... (browse for the corresponding .qml file – building, parcel and CONTEXT) Open / Load Style / OK .



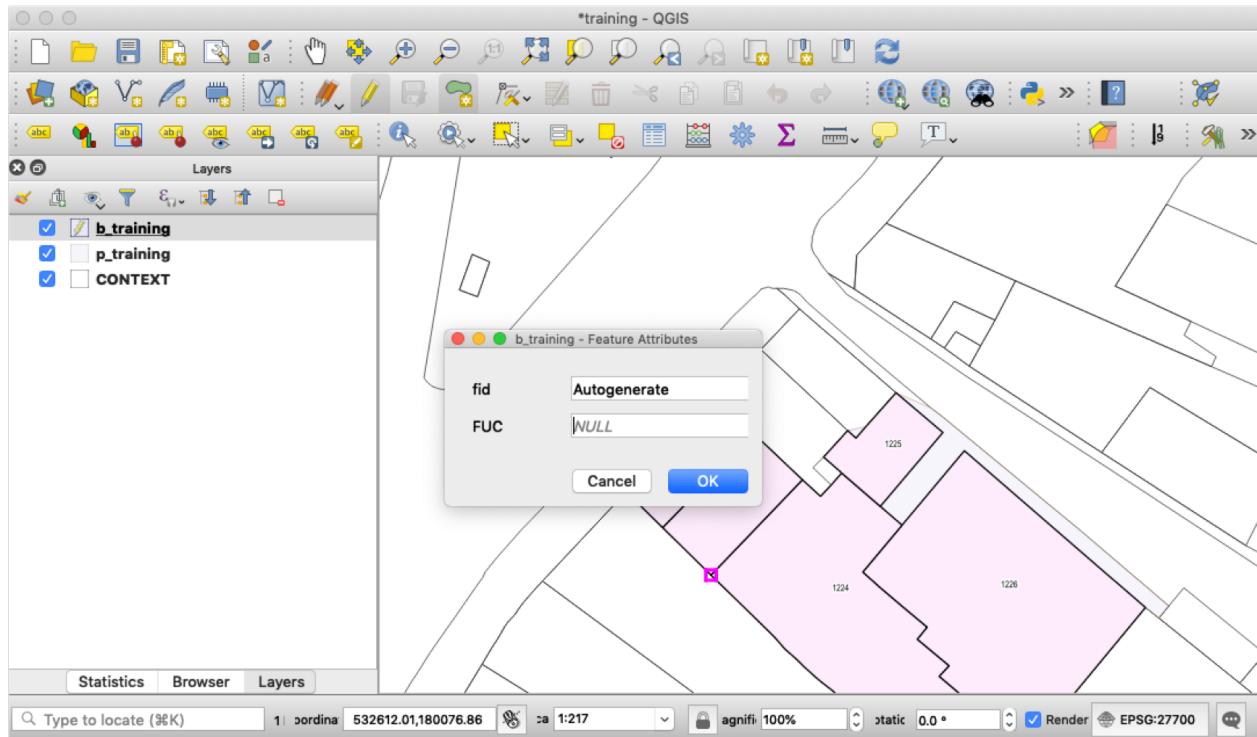
5. Explore the map using the wheel of your mouse to pan and zoom. You will see the same information you have on your basemap sheets.
6. Save the project in your “SIA_mapping” folder. / Project / Save as... (use default settings). Save regularly.
7. Before editing the polygons, enable snapping / Project / Snapping Options . Click on the magnet icon, change the drop down “Vertex” to “Vertex and Segment” and click on “Snapping on intersection” button. Close the window.



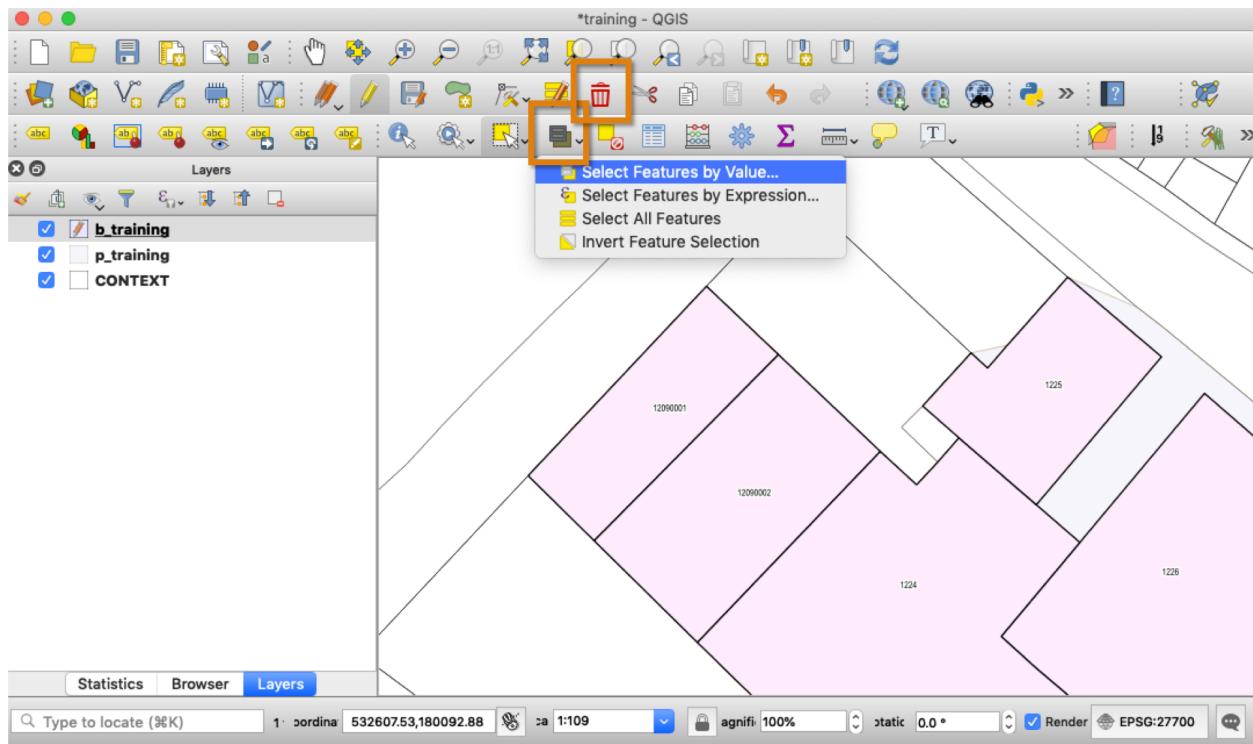
8. To draw new polygons on a layer, select the layer (BUILDING layer then PARCEL layer), turn on the edditing mode (click on the yellow pencil button) and select the Add Polygon Feature (second icon to the right from the yellow pencil). This same procedure should be followed in case of adding non-existing units (NEU).



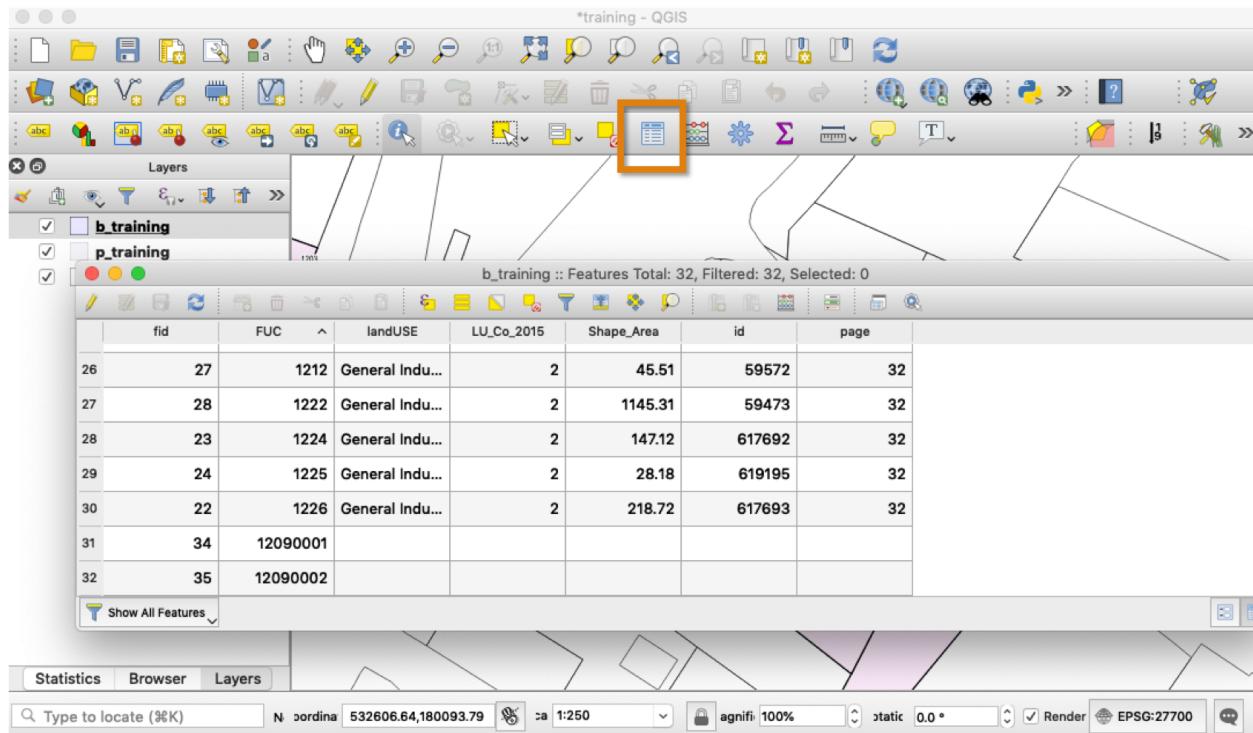
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9. Draw by clicking with the mouse left click and finish the polygon with the mouse right click. Add the corresponding new FUC for the polygon you created (e.g. create two new polygons ‘12190001’ and ‘12190002’ on top of polygon ‘1209’).



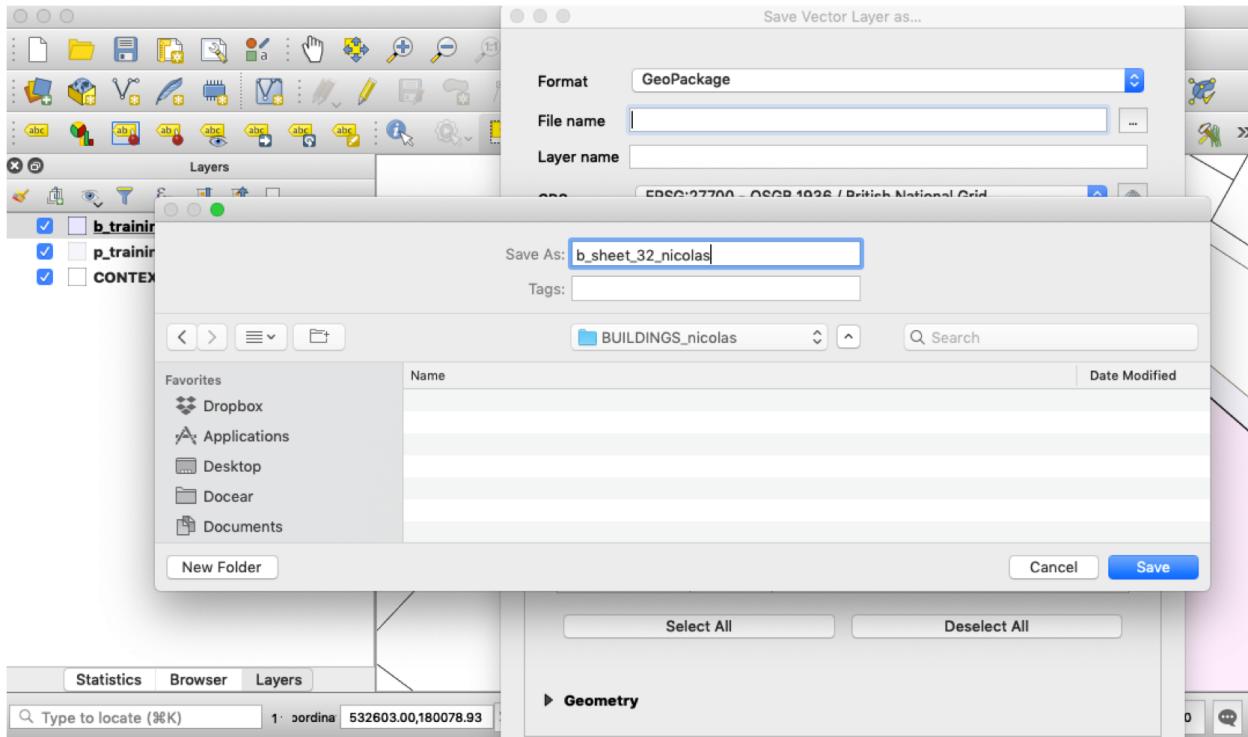
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10. Select and delete the ‘original’ polygon (FUC ‘1209’). Click on button “Select Features by Value...”, then in the “FUC” box write the code you want to delete (e.g. 1209) / Close (the window), and then click on the “Delete Selected” button.



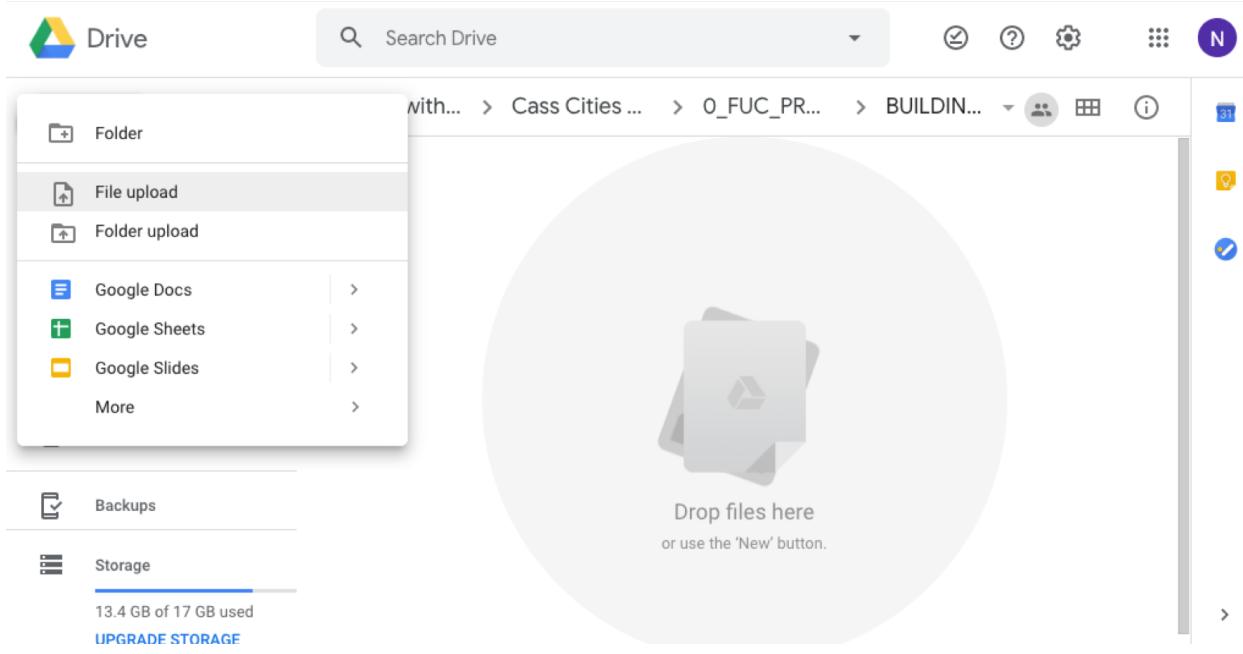
11. Stop editing by clicking again on the yellow pencil button and save changes.
12. Verify that you created and deleted the polygons. Select layer on the layer panel, “Open Attribute Table” and look under the “FUC” column. Close the attribute table.



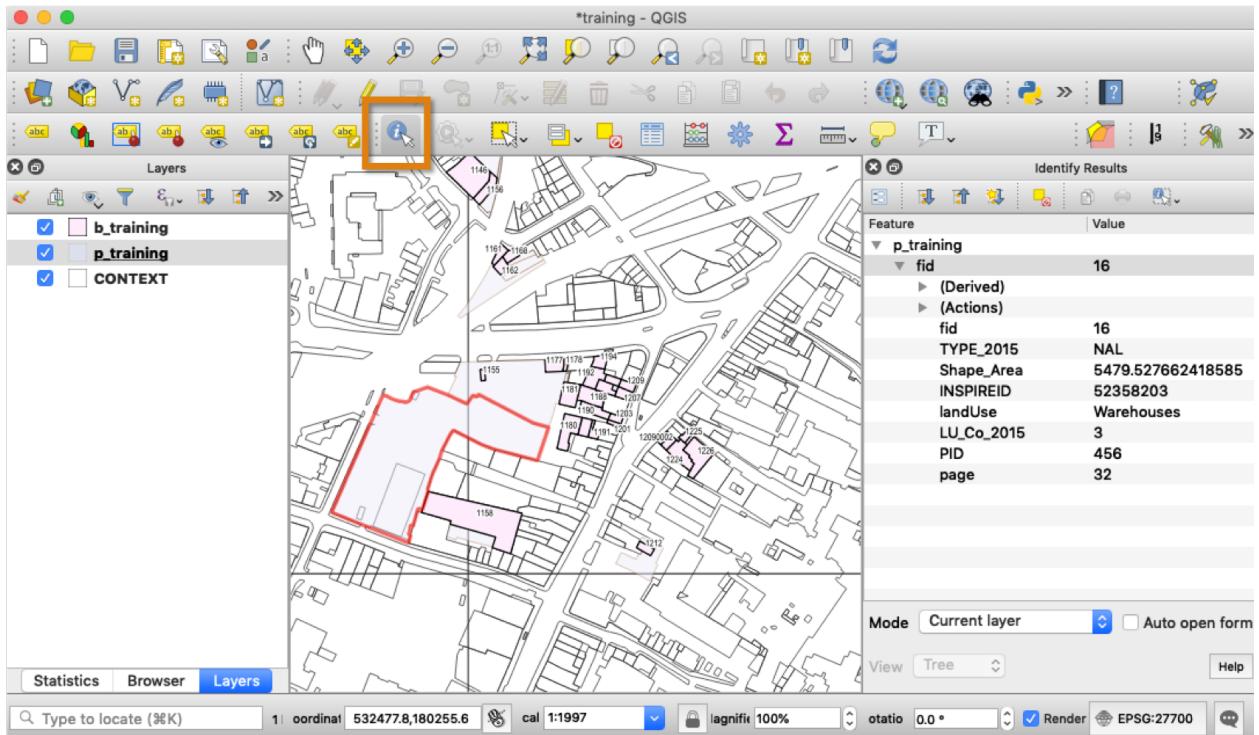
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13. Export the features layer with a new name. Select layer on the layer panel [mouse right click] / Export... / Save Feature As / File name... / (select the SIA_mapping / BUILDINGS (or PARCELS) folder). Save as: *original layer name + _ + your nickname* (e.g. b_training_nicolas or b_sheet_32_nicolas)



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14. Upload your files (e.g. b_training_nicolas or b_sheet_32_nicolas) to the corresponding folder here / 'New' button / File upload. Verify that you are uploading to the appropriate folder (BUILDINGS or PARCELS) and that the content is not duplicated.



15. Reapeat from point 8 choosing the “PARCELS” layer this time (p_training). On the instructions replace “FUC” by “PID” (parcel id) where appropiate.
16. In the case you need to edit the “PARCELS” layers you will need to create new codes for the new polygons you draw. To see the parcel unique indentifer select layer on the layer panel, click on the “Identify Results” button and then on the polygon you want to query. A window “Identify Results” will pop-up and you will see the parcel code next to **PID**. Follow the FUC-code-creation rule to create new codes (e.g. ‘4560001’).



PART 3. Frequently Asked Questions (FAQ)

In case the Functional Unit I see on the basemap sheet was demolished, should I complete the survey form?

Yes, register the FUC (question 1.2), complete question '2.1 Name of organisation' with *Nind* (for not industrial), then describe the case with more details in question '5.4 General Notes':