G3W-SUITE Documentation

Release 0.1

GIS3W Team

May 16, 2022

INSTALLATION AND DEPLOY

1 Raw installation **3**
1.1 Installation of node.js and Yarn . . . 3
1.2 Create virtualenv . . . 3
1.3 Virtualenv creation . . . 4
1.4 Install G3W-SUITE . . . 4
1.5 Deploy G3W-SUITE . . . 5
1.6 Manual installation steps . . . 6
1.7 Continuous integration testing . . . 7

2 Dockerization **9**
2.1 Configuration . . . 9
2.2 Build . . . 9
2.3 Run . . . 10
2.4 Ports . . . 10
2.5 Volumes . . . 11
2.6 First time setup . . . 11
2.7 Caching . . . 11
2.8 Style customization . . . 11
2.9 Performances optimization . . . 11
2.10 PostgreSQL administration . . . 12

3 Settings **13**
3.1 Base settings . . . 13
3.2 Frontend portal setting . . . 14
3.3 General layout settings . . . 14
3.4 Client layout settings . . . 15
3.5 Editing settings . . . 17
3.6 Caching settings . . . 17
3.7 Filemanger settings . . . 18
3.8 Qplotly settings . . . 18
3.9 Openrouteservice settings . . . 18

4 Introduction **21**
4.1 Version . . . 23
4.2 Main contributors . . . 23

5 Technological infrastructure **25**

6 Management and organization of geographic data and QGIS projects **29**
6.1 Data on DB Server . . . 29
6.2 Data on SpatiaLite or OGR format . . . 30

7 Hierarchical organization of WebGis services and types of Users (roles) 33
7.1 Types of Users (Roles) . . . 34
7.2 Hierarchical organization of contents . . . 34
7.3 Summary table of access/administration policies . . . 36

8 QGIS: project settings 39
8.1 QGIS: project property . . . 39
8.2 Print layouts . . . 43
8.3 QGIS: layer properties . . . 43
8.4 Performances optimization . . . 48

9 G3W-FRONTEND: the front end portal 49
9.1 The login portal sessions . . . 49

10 G3W-ADMIN: the Administration panel 53
10.1 Description of the interface . . . 53
10.2 Front end portal customization . . . 54
10.3 Users and Users Groups management . . . 58
10.4 Macro Cartographic Groups . . . 61
10.5 Cartographic Groups . . . 63
10.6 Publication of new WebGis services . . . 67
10.7 Update/ Manage WebGis services . . . 70
10.8 Widget management . . . 71
10.9 Multilinguage . . . 77

11 G3W-CLIENT: the cartographic viewer 81
11.1 Generic aspects . . . 81
11.2 Navigation and interaction with the map . . . 82
11.3 Tools panel . . . 86

12 Editing on line 93
12.1 Activation and configuration . . . 93
12.2 Online editing tools at cartographic client level . . . 102

13 Introduction 111

14 Download demo data 113
14.1 Modify the QGIS project title . . . 115

15 Access the online service 117

16 Publish the QGIS project as a WebGis service 119
16.1 QGIS project . . . 120
16.2 ACL Users . . . 120
16.3 Default base layer . . . 121
16.4 Description data . . . 121
16.5 Options and actions . . . 121

17 Update the published WebGis service 123

18 Activation of additional functions 125
18.1 Widget management . . . 125
18.2 Search widget creation . . . 127
18.3 Plots widget . . . 129

19 Editing on line 133

G3W-SUITE is a frame-work, based on Django and written in Python language, which allows to manage in an integrated way the different components of QGIS for the realization of its own Geographic Information System and for the publication on WebGis of its own projects in a simple and intuitive way.

G3W-SUITE is entirely based on tested Open Source software components built around QGIS:

- **QGIS Desktop:** for cartographic data management, editing and realization of high quality graphic projects
- **QGIS Server:** for the publication of QGIS projects as OGC services

The current development policy provides for the compatibility of the G3W-SUITE application only with the latest LTR version of QGIS

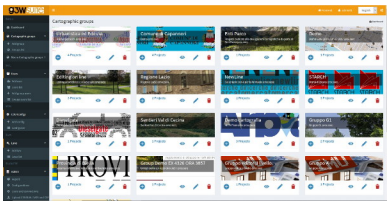
The current release (3.2) is compatible with QGIS 3.16 LTR (Server and Desktop).

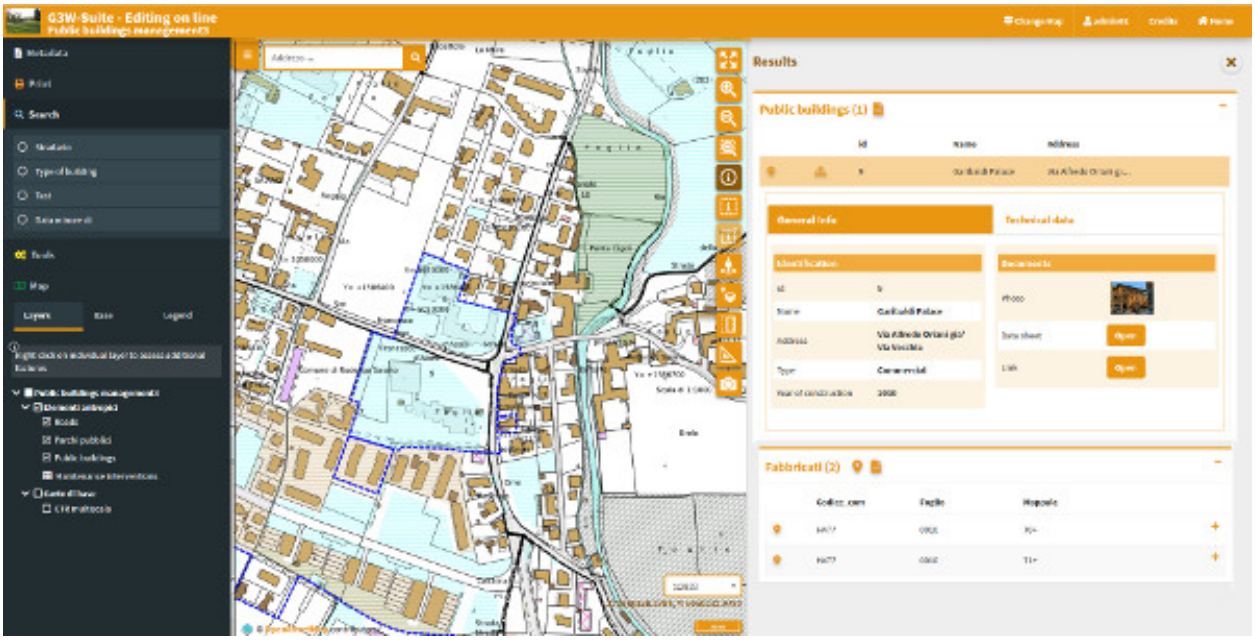
G3W-SUITE is a modular client-server application for the publication and management of QGIS cartographic projects, consisting of 3 components:

- **G3W-ADMIN:** Administration component (project management, ACL, OGC proxy server, API rest server)
- **G3W-CLIENT:** Cartographic client for consultation and interaction with OGC services
- **Front-end geographic portal:** access to information, thematic groups and WebGis services

Through the web interface of the G3W-SUITE framework it is possible to:

- **publish QGIS projects** directly on WebGis in a structured way
- **organize webgis services in thematic-functional containers** of various levels
- **manage users and groups of users** by defining each of them **different functional roles**
- **create and manage research methods**
- allow **online editing**
- activate **specific functional modules**
- **define permissions to access services and to use functional modules** at the individual user level




G3W-Suite - Editing on line
Public buildings management
Results
Public buildings (1)
Fabbricati (2)

CHAPTER

ONE

RAW INSTALLATION

The following instructions are for a Ubuntu 18.04 LTS.

1.1 Installation of node.js and Yarn

G3W-ADMIN use javacript package manager **Yarn** and **Node.js**

```
sudo apt-get install -y nodejs-legacy npm
```

for install Yarn follow main installation instructions:

https://yarnpkg.com/en/docs/install#debian-stable

> **note**
>
> If your account is connected to the provider, we'll try to setup the webhook automatically. If something fails, you can still setup the webhook manually.

1.2 Create virtualenv

Virtualenv

The following instructions are for python 3.6

Install python pip

```
sudo apt-get install python3-pip
```

now we can install virtualenvwrapper

```
sudo pip3 install virtualenvwrapper
```

To activate virtuenvwrapper on system login, add follow lines to 'bashrc' config file of your user

```
nano ~/.bashrc
....
export WORKON_HOME=<path_to_virtualenvs_directory>
source /usr/local/bin/virtualenvwrapper.sh
```

1.3 Virtualenv creation

To create a virtualnenv is sufficent call mkvirtualenv commando follow by the identification name for virtualenv (to use QGIS API into a virtualenv only solution is to give access python system site-packages to it using *–system-site-packages* option)

```
mkvirtualenv g3wsuite
```

1.4 Install G3W-SUITE

First step is install dev libraries packages for python module to install with requiriments.txt

```
sudo apt-get install -y \
    libxml2-dev \
    libxslt-dev \
    postgresql-server-dev-all \
    libgdal-dev \
    python-dev
```

after is necessary install the correct python module for GDAL library, check your version and install correct module

```
export CPLUS_INCLUDE_PATH=/usr/include/gdal
export C_INCLUDE_PATH=/usr/include/gdal

pip install GDAL==<installed_version or closest>
```

1.4.1 Set local_config.py file

G3W-ADMIN is a Django application, and to work is necessary set a config.py file. To start copy local_settings.example.py and set the databse and other:

```
cd g3w-admin/g3w-admin/base/settings
cp local_settings_example.py local_settings.py
```

set database, media root and session cookies name:

```
...

DATABASES = {
    'default': {
        'ENGINE': 'django.contrib.gis.db.backends.postgis',
        'NAME': '<db_name>',
        'USER': '<db_user>',
        'PASSWORD': '<db_user_password>',
        'HOST': '<db_host>',
        'PORT': '<db_port>',
    }
}

...

DATASOURCE_PATH = '<static_path_to_gis_data_source>'
```

(continues on next page)

(continued from previous page)

```
...

MEDIA_ROOT = '<path_to_media_root>'

...

SESSION_COOKIE_NAME = '<unique_session_id>'
```

1.4.2 With paver commands

G3W-ADMIN has a series of paver CLI commands to administrate the suite. After prepared environment if sufficient invoce paver *install* task

```
paver install
```

1.4.3 Run G3W-SUITE

To run the application with paver

```
paver start
```

and for stop

```
paver stop
```

G3W-ADMIN is a django application so is possibile run app by standard django manage.py commands

```
./manage.py runserver
```

1.5 Deploy G3W-SUITE

As other Django application, G3W-SUITE can be deployed by its wsgi capabilities. On the web if simple to find tutorial for deploy a Django application.

The simpler way is to use Apache2 as server WEB and its mod_wsgi module.

Alternative solutions are:

- Apache2 + mod_proxy + Uwsgi
- Apache2 + mod_proxy + Gunicorn
- Nginx + Uwsgi
- Nginx + Gunicorn

1.6 Manual installation steps

The preferred installation is by using the `paver` script as mentioned above, but in case you need to customize the installation process, here are the build and setup steps:

1.6.1 Build static js code

```
# Install yarn (requires root):
curl -sS https://dl.yarnpkg.com/debian/pubkey.gpg | apt-key add -
echo "deb https://dl.yarnpkg.com/debian/ stable main" | \
    tee /etc/apt/sources.list.d/yarn.list
apt-get update && sudo apt install -y yarn
# Back to unprivileged user, from the repository directory, run:
yarn --ignore-engines --ignore-scripts --prod
nodejs -e "try { require('fs').symlinkSync(require('path').resolve('node_modules/
↪@bower_components'), 'g3w-admin/core/static/bower_components', 'junction') } catch␣
↪(e) { }"
```

Make sure build components are available in static and collected later

```
cd g3w-admin/core/static
ln -s "../../../node_modules/@bower_components" bower_components
```

1.6.2 Install requirements

Possibily within a virtual env:

```
pip install -r requirements.tx
```

1.6.3 Django setup

ATTENTION!

To migrate from V.3.1.x to v.3.2.x to avoid migration issues follow instructions below:

before run *migrate* django commands

```
psql <connection_to_g3w_suite_db> -f db_scripts/pre_migration_v3.1.x_to_v3.2.x.sql
```

run **migrate** django command

```
python3 manage.py migrate
```

after run **migrate** django command

```
psql <connection_to_g3w_suite_db> -f db_scripts/post_migration_v3.1.x_to_v3.2.x.sql
```

```
python manage.py collectstatic --noinput
python manage.py migrate --noinput
```

Install some fixtures for EPSG and other suite options:

```
for FIXTURE in 'BaseLayer.json' 'G3WGeneralDataSuite.json' 'G3WMapControls.json'
↪'G3WSpatialRefSys.json'; do
    python manage.py loaddata  core/fixtures/${FIXTURE}
done
```

Sync menu tree items (re-run this command in case you installed optional modules and they are not visible in the admin menu tree):

```
python manage.py sitetree_resync_apps
```

1.7 Continuous integration testing

CI tests are automatically run on CircleCI for the `dev` branch only.

The Docker compose configuration used in the CI tests is available at docker-compose.yml.

Another configuration for running local tests is provided with docker-compose-local.yml and can also be used for local testing by running:

```
docker-compose -f docker-compose-local.yml up
```

The testing image is built from the dependency image and it will run all install and build steps from the local repository.

The dependency image is built from the Dockerfile.deps.

CHAPTER

TWO

DOCKERIZATION

This dockerization is based on project of Alessandro Pasotti (elpaso, https://github.com/elpaso).

2.1 Configuration

Create a file `.env` (or copy `.env.example` and rename it in `.env`) and place it in the main directory, the file will contain the database credentials (change `<your password>`) and other settings:

```
# External hostname, for docker internal network aliases
WEBGIS_PUBLIC_HOSTNAME=demo.g3wsuite.it/
WEBGIS_DOCKER_SHARED_VOLUME=/tmp/shared-volume-g3w-suite


# DB setup
G3WSUITE_POSTGRES_USER_LOCAL=g3wsuite
G3WSUITE_POSTGRES_PASS=<your_password>
G3WSUITE_POSTGRES_DBNAME=g3wsuite
G3WSUITE_POSTGRES_HOST=postgis
G3WSUITE_POSTGRES_PORT=5432

# Caching
G3WSUITE_TILECACHE_PATH=/shared-volume/tile_cache/
TILESTACHE_CACHE_BUFFER_SIZE=256

# URL of the QGIS Server
G3WSUITE_QDJANGO_SERVER_URL=http://qgisserver/ows/

# Set G3W-SUITE debug state
G3WSUITE_DEBUG = 1 (0 default)
```

2.2 Build

2.2.1 G3W-SUITE

The main suite image can be built with:

```
docker build -f Dockerfile.g3wsuite.dockerfile -t g3wsuite/g3w-suite-dev:latest --no-
↪cache .
```

The container image is build from `https://github.com/g3w-suite/g3w-admin.git --branch dev`

The Docker hub name for this image is `g3wsuite/g3w-suite-dev:latest`

2.2.2 Postgis

Postgis image can be built with:

```
docker build -f Dockerfile.postgis -t g3wsuite/postgis:11.0-2.5 .
```

The Docker hub name for this image is `g3wsuite/postgis:11.0-2.5`

2.2.3 QGIS Server

QGIS Server image is built from `https://github.com/elpaso/qgis-server-docker/tree/production`

The Docker hub name for this image is `g3wsuite/qgis3-server:ltr-ubuntu`

2.2.4 HTTPS additional setup

- check the domain name in the `.env` file and in `config/nginx/django_ssl.conf`
- run `mkdir -p /shared-volume/ssl/certs/`
- run `sudo openssl dhparam -out /shared-volume/ssl/certs/dhparam-2048.pem 2048`
- run: `docker pull certbot/certbot`
- launch `./run_certbot.sh`
- make sure the certs are renewed by adding a cron job with `crontab -e` and add the following line: `0 3 * * * /home/g3w-suite/rl.g3wsuite.it/run_certbot.sh`
- if you disabled HTTPS, you can move `config/nginx/django_ssl.conf` back to its original location now, and restart the Docker compose to finally enable HTTPS

2.3 Run

```
docker-compose up -d
```

2.4 Ports

- web application: 8080

2.5 Volumes

Data, projects, uploads and the database are stored in a shared mounted volume `shared-volume`, the volume should be on a persistent storage device and a backup policy must be enforced.

2.6 First time setup

- log into the application web administation panel using default credentials (*admin/admin*)
- change the password for the admin user and for any other example user that may be present

2.7 Caching

Tile cache can be configured and cleared per-layer through the webgis admin panel and lasts forever until it is disabled or cleared.

> Tip: enable cache on linestring and polygon layers.

2.8 Style customization

Templates can now be overridden by placing the overrides in the `config/g3w-suite/overrides/templates`, a Docker service restart is required to make the changes effective.

The logo is also overridden (through `config/g3w-suite/settings_docker.py` which is mounted as a volume), changes to the settings file require the Docker service to be restarted.

A custom CSS is added to the pages, the file is located in `config/g3w-suite/overrides/static/style.css` and can be modified directly, changes are effective immediately.

2.9 Performances optimization

General rules (in no particular order: they are all mandatory):

1. set scale-dependent visibility for the entire layer or for some filtered features (example: show only major roads until at scale 1:1E+6)
2. when using rule-based/categorized classification or scale-dependent visibility create indexes on the column(s) involved in the rule expression (example: "create index idx_elec_penwell_ious on elec_penwell_ious (owner);")
3. start the project with only a few layers turned on by default
4. do not turn on by default base-layers XYZ such as (Google base maps)
5. do not use rule-based/categorized rendering on layers with too many categories (example: elec_penwell_public_power), they are unreadable anyway
6. enable redering simplification for not-point layers, set it to `Distance 1.2` and check `Enable provider simplification if available`

2.10 PostgreSQL administration

Postgres is running into a Docker container, in order to access the container, you can follow the instruction below:

2.10.1 Check the container name

```
$ docker ps | grep postgis
84ef6a8d23e6        g3wsuite/postgis:11.0-2.5       "/bin/sh -c /docker-..."   2 days␣
↪ago          Up 2 days           0.0.0.0:5438->5432/tcp           g3wsuitedocker_
↪postgis_1
```

In the above example the container name is `g3wsuitedocker_postgis_1`

2.10.2 Log into the container

```
$ docker exec -it g3wsuitedocker_postgis_1 bash
```

2.10.3 Become postgres user

```
root@84ef6a8d23e6:/# su - postgres
```

2.10.4 Connect to postgis

```
postgres@84ef6a8d23e6:~$ psql
psql (11.2 (Debian 11.2-1.pgdg90+1))
Type "help" for help.

postgres=#
```

CHAPTER

THREE

SETTINGS

The following variables can be added to or edited in the project's `local_settings.py`:

3.1 Base settings

3.1.1 G3WADMIN_PROJECT_APPS

Custom django map server module other than *qdjango* (QGIS-Server provider)

3.1.2 G3WADMIN_LOCAL_MORE_APPS

Custom django modules that is possible to add, i.e. `g3w-admin-frontend` (https://github.com/g3w-suite/g3w-admin-frontend) module and other third part django modules. G3W-SUITE accessory modules:

- `g3w-admin-frontend` (https://github.com/g3w-suite/g3w-admin-frontend)
- `caching`
- `filemanager`
- `editing`

3.1.3 DATASOURCE_PATH

Path to geo data directory (shp, Spatialite, raster, etc..).

Important: Last part of path could be common with QGIS project datasource path. I.e.:

QGIS project: <datasource>/<path>/<to>/**project_data**/<geodata>.shp</datasource>

local_settings.py: DATASOURCE_PATH = /<local_server_<path>/<to>/**project_data**

Mandatory.

3.1.4 G3WADMIN_VECTOR_LAYER_DOWNLOAD_FORMATS

Default is *['shp', 'xls']*, set download data format. Values possible:

- *shp*: download into Esri Shape format.
- *xls*: download into Excel format
- *gpx*: download into GPS format (only for Point and Line layers)

3.1.5 RESET_USER_PASSWORD

Default is *False*, set tot *True* to activate reset user password by email workflow. If set to True remember to set Django emailing settings (https://docs.djangoproject.com/en/2.2/topics/email/).

3.1.6 CLIENT_OWS_METHOD

Default is *'GET'*, set to *'POST'* to change default http call method.

3.2 Frontend portal setting

3.2.1 FRONTEND

Default is `False`, set to `True` for activate **G3W-SUITE** frontend portal like `g3w-admin-frontend`. If it's set to `True` base url path for G3W-SUITE admin section become */admin/*.

3.2.2 FRONTEND_APP

Module name added to `G3WADMIN_LOCAL_MORE_APPS` to use as *portal-frontend*. I.e.:

```
G3WADMIN_LOCAL_MORE_APPS = [
    ...
    'frontend',
    ...
]

FRONTEND = True
FRONTEND_APP = 'frontend'
```

3.3 General layout settings

3.3.1 G3WSUITE_POWERD_BY

Default is `True`, set to `False` for don't show bottom *attribution* informations.

3.3.2 G3WSUITE_CUSTOM_STATIC_URL

A custom url from to load custom static files as images, css, etc..

3.3.3 G3WSUITE_MAIN_LOGO

Main admin section logo image. Mandatory is set `G3WSUITE_CUSTOM_STATIC_URL`

3.3.4 G3WSUITE_RID_LOGO

Main admin section reduced logo image. Mandatory is set `G3WSUITE_CUSTOM_STATIC_URL`

3.3.5 G3WSUITE_LOGIN_LOGO

Login logo image. Mandatory is set `G3WSUITE_CUSTOM_STATIC_URL`

3.3.6 G3WSUITE_CUSTOM_TITLE

G3W-SUITE html page title. If is not set, title is: *g3w-admin* for admin section and *g3w-client* for webgis client.

3.3.7 G3WSUITE_FAVICON

Favorite icon image. Mandatory is set `G3WSUITE_CUSTOM_STATIC_URL`

3.3.8 G3WSUITE_CUSTOM_CSS

A list of custom css files added to *admin* pages and to the *client*. Mandatory is set `G3WSUITE_CUSTOM_STATIC_URL`. I.e.:

```
G3WSUITE_CUSTOM_CSS = [
    G3WSUITE_CUSTOM_STATIC_URL +'css/custom.css'
]
```

3.4 Client layout settings

3.4.1 G3W_CLIENT_SEARCH_TITLE

Custom webgis client *search* section title.

3.4.2 G3W_CLIENT_SEARCH_ENDPOINT

Search url endpoint for 'searches calling', default *ows*.

- *ows*: by wms search;
- *api*: by g3w-suite layer vector API.

3.4.3 G3W_CLIENT_HEADER_CUSTOM_LINKS

A list of dict of custom links to add into main top bar of webgis client. I.e.:

```
 G3W_CLIENT_HEADER_CUSTOM_LINKS = [
     {
         'url': 'https://gis3w.it',
         'title': 'Gis3W company',
         'i18n', True, #(False as default value)
         'target': '_blank'
         'img': 'https://gis3w.it/wp-content/uploads/2016/10/logo_qgis-1-100x100.png?
↪x22227'
     },
     {
        'title': 'Modal 1',
        'content': '<p>Html example content to show in modal</p>',
        'type': 'modal',
        'position': 10
    },
]
```

i18n (optional) set True if you want lent client try to translate title.

3.4.4 G3W_CLIENT_LEGEND

A dict to customize **QGIS-server** legend image generate with WMS *GetLegendGraphics* request. I.e.:

```
G3W_CLIENT_LEGEND = {
   'color': 'red',
   'fontsize': 8,
   'transparent': True,
   'boxspace': 4,
   'layerspace': 4,
   'layertitle': True,
   'layertitlespace': 4,
   'symbolspace': None,
   'iconlabelspace': 2,
   'symbolwidth': 8,
   'symbolheight': 4
}
```

3.4.5 G3W_CLIENT_RIGHT_PANEL

Custom properties settings for webgis right panel section (default, width 33%). A the moment only *width* is managed. I.e.:

```
G3W_CLIENT_RIGHT_PANEL = {
    'width': 33
}
```

3.4.6 G3W_CLIENT_NOT_SHOW_EMPTY_VECTORLAYER

Default is `False`. Set to `True` for remove from webgis TOC vector layer empty, without data.

3.5 Editing settings

Settings params for `editing` module.

3.5.1 EDITING_SHOW_ACTIVE_BUTTON

Default is `True`. Set to `False` for not show editing button activate/deactivate into layers project list.

3.5.2 EDITING_ANONYMOUS

Default is `False`. Set to `True` to render possible give to *anonymous user* editing permissions.

3.5.3 EDITING_LOGGING

Default is `False`. Set to `True` to log users editing action into database.

3.6 Caching settings

Settings params for `caching` module

3.6.1 TILESTACHE_CACHE_NAME

A name to identify caching

3.6.2 TILESTACHE_CACHE_TYPE

Default is `Disk` to save tile on a disk. Set to `Memcache` for to use *Memcached* caching framework (https://www.memcached.org/)

3.6.3 TILESTACHE_CACHE_DISK_PATH

Path to disk space where to save tile created by tilestache if `TILESTAHCE_CACHE_TYEPE` is se to `Disk`.

3.6.4 TILESTACHE_CACHE_TOKEN

Mandatory, strign to use as token for internal WMS call for caching module.

3.7 Filemanger settings

Settings params for `filemanager` module.

3.7.1 FILEMANAGER_ROOT_PATH

Mandatory, path to disk space where to CRUD geo data files i.e. Shp Raster, etc.

3.7.2 FILENAMANAGER_MAX_N_FILES

Default is 5, max number files to upload simultaneously.

3.8 Qplotly settings

3.8.1 LOAD_QPLOTLY_FROM_PROJECT

Default is `False`, set to `True` to import DataPlotly settings from QGIS project.

3.9 Openrouteservice settings

3.9.1 ORS_API_ENDPOINT

Default is `http://localhost:8080/ors/v2/`, this is the endpoint for Openrouteservice API.

3.9.2 ORS_API_KEY

Openrouteservice API key, optional, can be blank if the key is not required by the endpoint.

3.9.3 ORS_PROFILES

List of available Openrouteservice profiles, default: `("driving-car", "driving-hgv")`

CHAPTER

FOUR

INTRODUCTION

G3W-SUITE is a modular client-server application for the management and publication of interactive map projects.

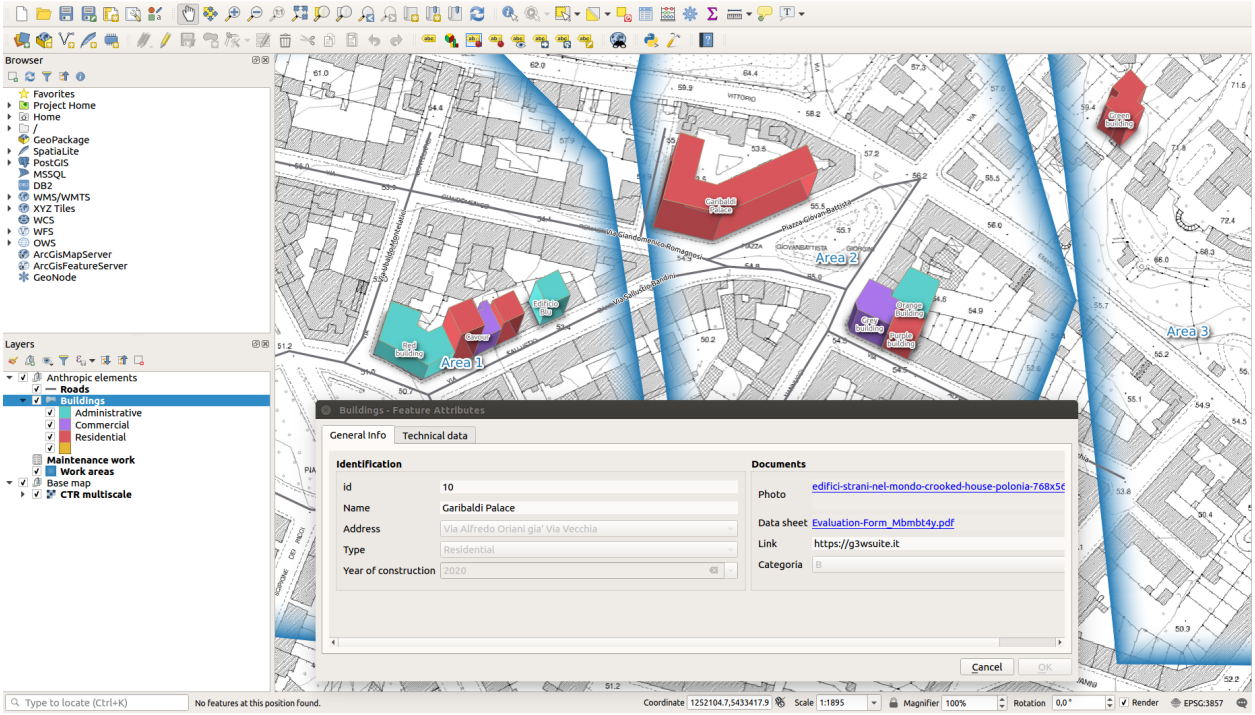
The framework was born from the need to have a software capable of **publishing, in total autonomy and in a simple and fast way on a webgis client, cartographic projects realized with QGIS.**

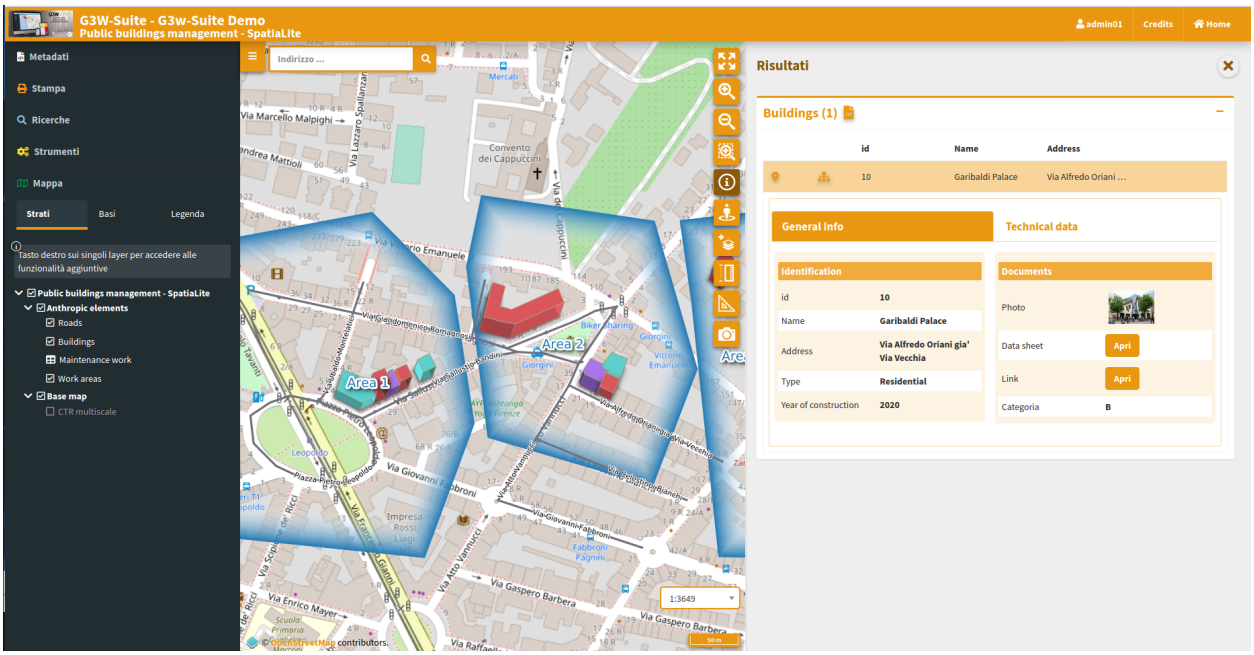
The following aspects will be analyzed within the manual:

- **organization and optimization of data and QGIS projects for web publishing**
- **organization of cartographic contents in a hierarchical way: macro groups and cartographic groups**
- **user management and access control systems for consultation and management of webgis services**
- **management of the online editing function for the creation of web cartographic management systems**
- **publishing and managing QGIS projects as WebGis services**
- **creation of searches, visualization of graphics created with the DataPlotly plugin and definition of constraints (geographic and alphanumeric) on visualization and editing permissions**

The current release (3.2) is compatible with `QGIS 3.16.x LTR` (Server and Desktop).

NB: The filter function (based on features selection) at the print level is supported only with QGIS 3.18


Browser
Favorites
Project Home
Home
GeoPackage
SpatiaLite
PostGIS
MSSQL
DB2
WMS/WMTS
XYZ Tiles
WCS
WFS
OWS
ArcGisMapServer
ArcGisFeatureServer
GeoNode
Layers
Anthropic elements
Roads
Buildings
Administrative
Commercial
Residential
Maintenance work
Work areas
Base map
CTR multiscale
Area 1
Area 2
Area 3
Buildings - Feature Attributes
General Info
Technical data
Identification
id
10
Name
Garibaldi Palace
Address
Via Alfredo Oriani gia' Via Vecchia
Type
Residential
Year of construction
2020
Documents
Photo
edifici-strani-nel-mondo-crooked-house-polonia-768x56
Data sheet
Evaluation-Form_Mbmbt4y.pdf
Link
https://g3wsuite.it
Categoria
B
Cancel
OK
Type to locate (Ctrl+K)
No features at this position found.
Coordinate
1252104.7,5433417.9
Scale
1:1895
Magnifier
100%
Rotation
0.0 °
Render
EPSG:3857


G3W-Suite - G3w-Suite Demo
Public buildings management - SpatiaLite
admin01
Credits
Home
Metadati
Stampa
Ricerche
Strumenti
Mappa
Strati
Basi
Legenda
Tasto destro sui singoli layer per accedere alle funzionalità aggiuntive
Public buildings management - SpatiaLite
Anthropic elements
Roads
Buildings
Maintenance work
Work areas
Base map
CTR multiscale
Indirizzo ...
Area 1
Area 2
Risultati
Buildings (1)
id
Name
Address
10
Garibaldi Palace
Via Alfredo Oriani ...
General Info
Technical data
Identification
id
10
Name
Garibaldi Palace
Address
Via Alfredo Oriani gia' Via Vecchia
Type
Residential
Year of construction
2020
Documents
Photo
Data sheet
Apri
Link
Apri
Categoria
B
1:3649
© OpenStreetMap contributors.

4.1 Version

At the moment it's not used a classic versioning system for the suite, this branches are avialable.

4.2 Main contributors

- Walter Lorenzetti - Gis3W (@wlorenzetti)
- Leonardo Lami - Gis3W (@leolami)
- Francesco Boccacci - Gis3W (@volterra79)
- Alessandro Pasotti - QCooperative (@elpaso)
- Luigi Pirelli - QCooperative (@luipir)
- Mazano - Kartoza (@NyakudyaA) (Dockerization refactoring)

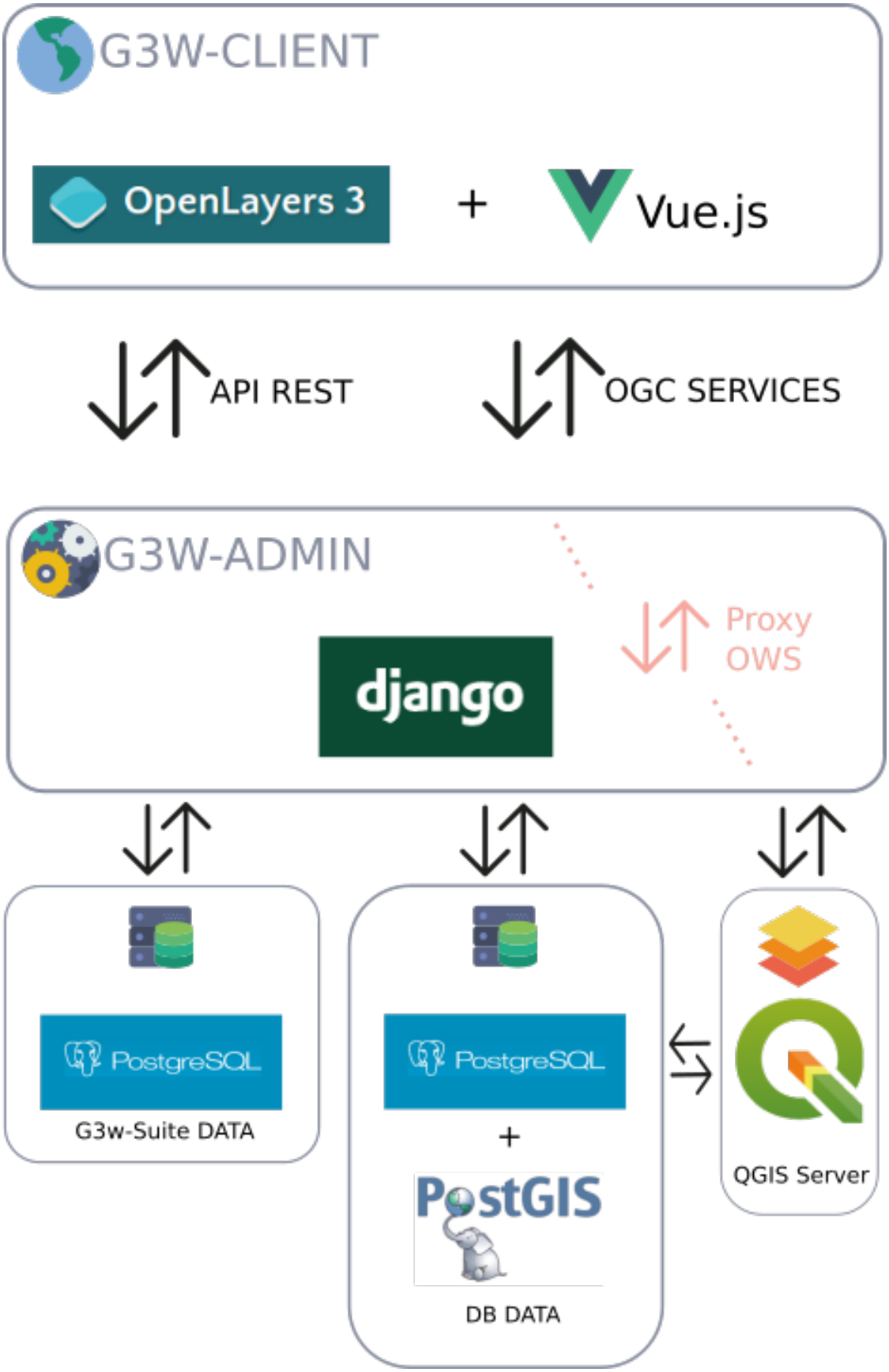
CHAPTER

FIVE

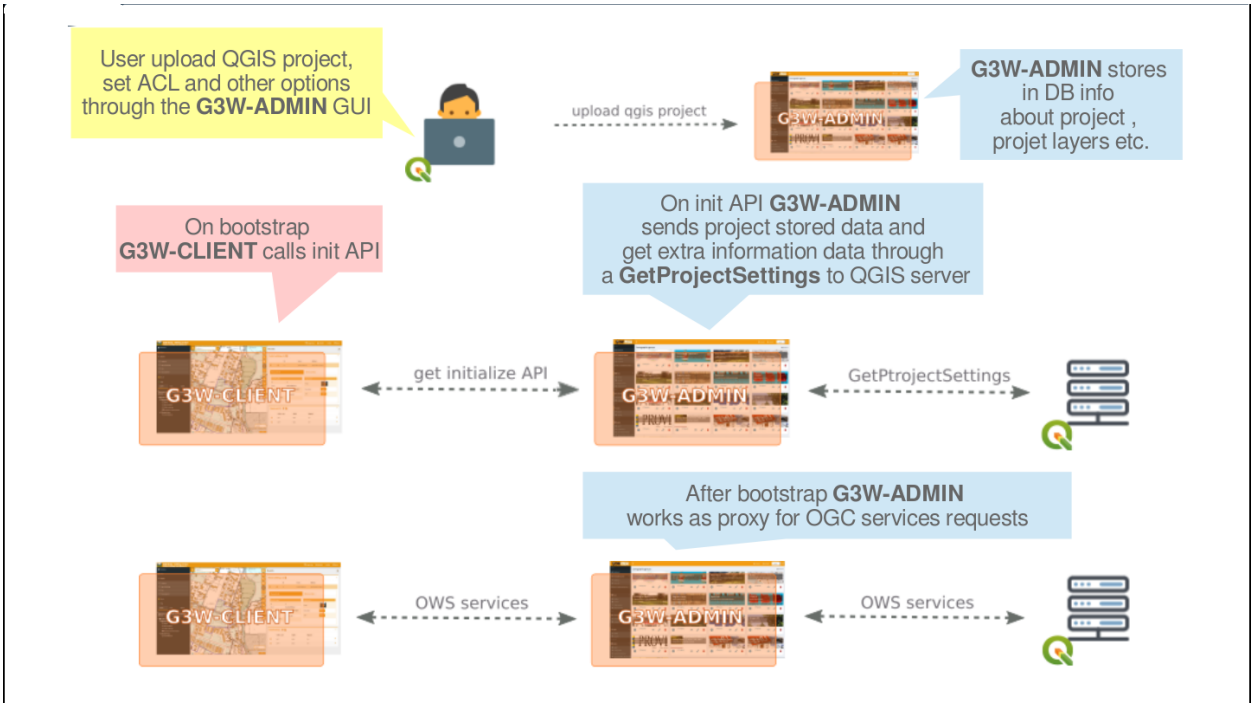
TECHNOLOGICAL INFRASTRUCTURE

The publishing system is based on a series of OS tools and software

- **`PostgreSQL/PostGis`**: for the management of application data
- **`PostgreSQL/PostGis` or `SpatiaLite`**: for the management of gegraphic data
- **`QGIS Server LTR`** as OGC services server
- **`G3W-ADMIN` - the Administration component**: developed in **`Python`** using **`Django`**
- **`G3W-CLIENT` - the Cartographic client**: based on **`OpenLayer3`** and developed with **reactive tecnology by `Vue.js`**
- The main libraries used for the management and the visualization of the geographical part and the interaction with the user are: **`OpenLayer, Boostrap, jQuery, Lodash` and `Vue.js`**.
- **`Gulp.js`** as task runner


G3W-CLIENT
OpenLayers 3
+
Vue.js
API REST
OGC SERVICES
G3W-ADMIN
Proxy
OWS
django
PostgreSQL
G3w-Suite DATA
PostgreSQL
+
PostGIS
DB DATA
QGIS Server

Below is a diagram relating to the standard workflow



CHAPTER

SIX

MANAGEMENT AND ORGANIZATION OF GEOGRAPHIC DATA AND QGIS PROJECTS

This section describes how to organize QGIS data and projects locally and how to synchronize them on the server environment for publication purposes

Thanks to the integration with the APIs of QGIS it is now possible to manage the main formats (geographically and not) supported by QGIS Server:

- **reading and editing mode**
  - PostGreSQL/PostGis
  - Oracle Spatial (compiling QGIS Server)
  - SQLite/SpatiaLite
  - GeoPackage
  - ShapeFile
- **reading mode**
  - SQL Server
  - Virtal layer

The suite also allows you to manage in consultation ed editing:

- **simple join data**
- **1:N relation data**

6.1 Data on DB Server

If your geographical data are stored on `Server DB`, it will be sufficient to allow access to the DB from the IP address on which the application is installed.

6.2 Data on SpatiaLite or OGR format

If your geographical data are stored on `SpatiaLite` or on physical files (`.gpkg`, `.shp`, `.kml`, `.tif...`) located on your local PC, you will need:

- **organize data and projects** in predefined localy directories and subdirectories
- **upload/synchronize geographic data to the corresponding folder located on the server** where the application is installed

Of course, mixed solutions with geographical data on PostGreSQL/PostGis, SpatiaLite and other formats will also be possible.

6.2.1 Organization of data and projects

Data on physical files and / or on GeoDB SpatiaLite and QGIS cartographic projects must be organized in compliance with the following indications:

- a **main directory** named and positioned in according to need's user
  - a **`project_data` sub-directory** that must contain the **geographic data** used for the various cartographic projects, such data can also be organized in subdirectories with no nesting limits.
  - a **`projects` sub-directory** that must contain the **QGIS cartographic projects** (.qgz or .qgs files)

NB: The name of the local directory dedicated to geographic data must correspond to the name defined for the **`DATASOURCE_PATH`** variable set during installation. See dedicated paragraph.

That directory is also used to contain **images used in the print layouts** associated with the QGIS cartographic projects.

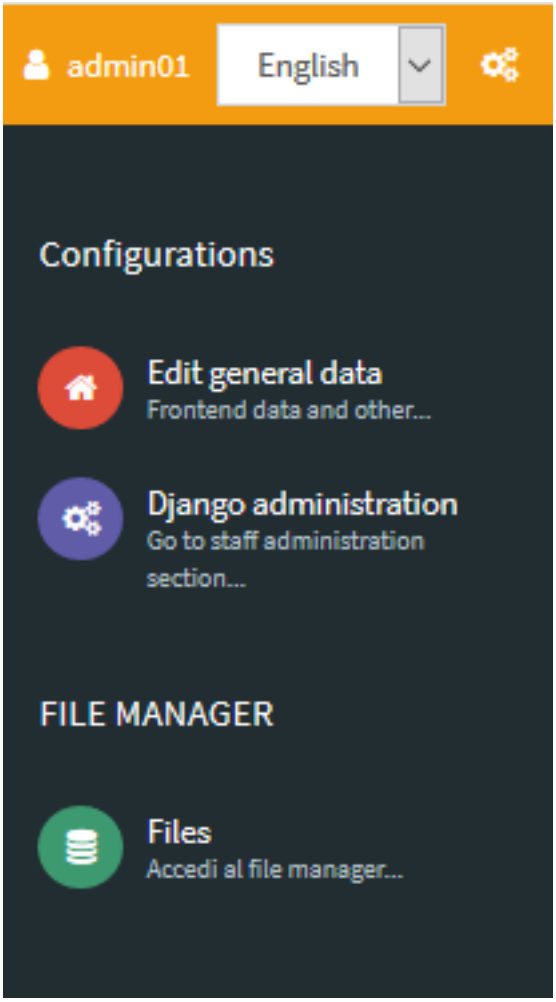
6.2.2 Geographic data synchronization on the server

The data stored in the local **`project_data`** directory must be synchronized on the server where the G3W-SUITE application is installed.

The geographic data stored in the local **`project_data`** folder must be loaded, reflecting any subdirectory structure.

To synchronize your data access to the Administration panel of G3W-ADMIN and click on the **`Configurations`** **icon** located in the upper right corner.

Choose the **`File Manager`** item in the linked menu.



Using this tool it is possible to manage the physical geographic data on the server in a simple and intuitive way.

The root directory of the File Manager corresponds to the local `project_data` directory

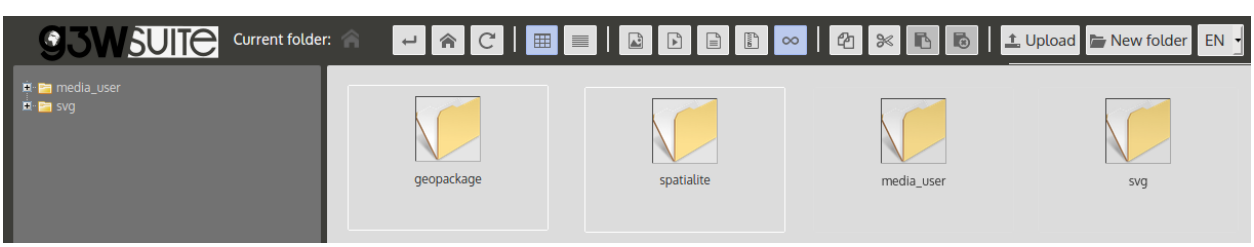
It will therefore be necessary, in the case of using geographic files on the file system, to synchronize the contents of the local **`project_data`** directory (and any sub-directories) before proceeding with the publication of QGIS projects.

Two specific directories can also be created within the root directory of the File Manager:

- **`media_user`**: a directory exposed on the web, to store your **multimedia files**
- **`svg`**: a directory to store **extra SVG icons** used your QGIS projects

All the directories can be organized in subdirectories with no nesting limits.

NB: The names of these directories are defined by the basic settings set during the installation of the suite. See dedicated paragraph.



The example shows the case in which in the local **project_data** directory there are two directories (**geopackage** and **spatialite**) in addition to the two system directories (**svg** and **media_user**).

CHAPTER

SEVEN

HIERARCHICAL ORGANIZATION OF WEBGIS SERVICES AND TYPES OF USERS (ROLES)

This paragraph allows you to understand how G3W-SUITE makes it possible to manage the individual WebGis services in a structured and hierarchical way.

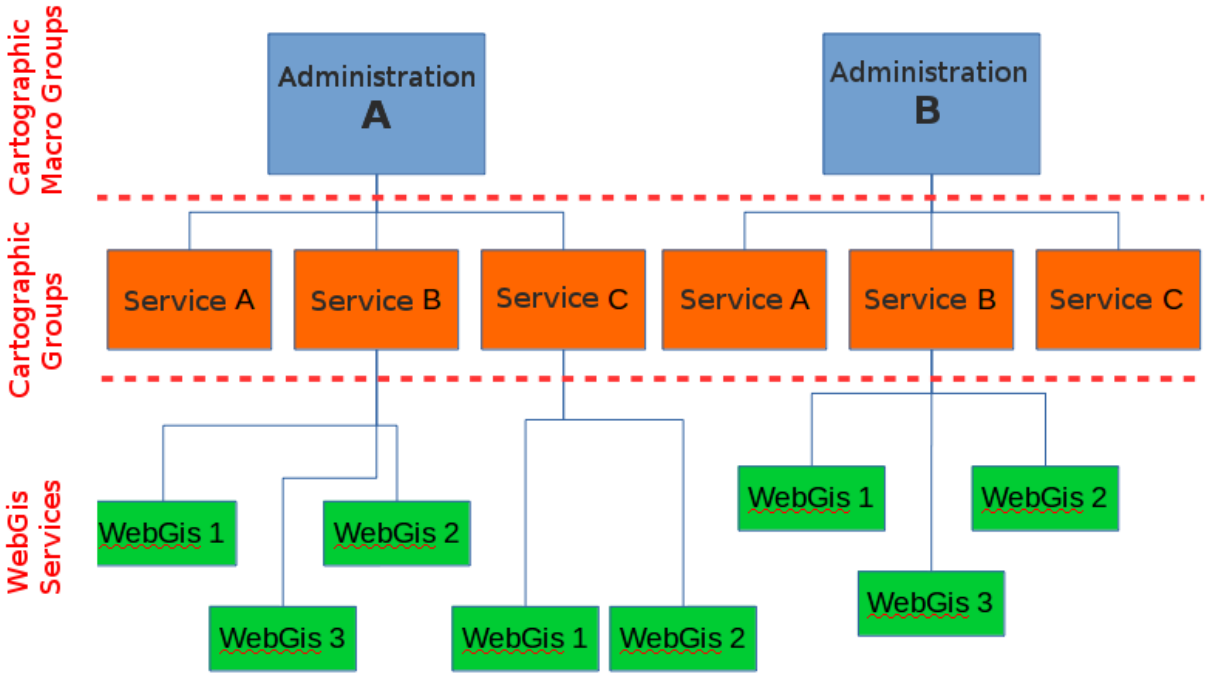
In G3W-SUITE it is possible to organize WebGis services on two thematic/functional levels

- **`Cartographic MacroGroups`**
  - **`Cartographic groups`**

These organizational levels can be associated with different types of users (Editor 1, Editor2 and Viewer) in order to manage the access/management powers to the individual elements in a granular way.

The following image shows an example of the functional use of these organizational levels within a Union of Municipalities.

Access policies and individual functional modules may be associated with each WebGis service.



7.1 Types of Users (Roles)

In G3W-SUITE you can create **Users** and **Users Groups** and associate them with specific roles:

- **`Admin1:`** user with full powers **including** Django administration (basic suite configuration)
- **`Admin2:`** user with full powers **excluding** those of Django administration (basic configuration of the suite)
- **`Editor1:` administrator of one or more Cartographic MacroGroups** for which it will be possible:
  - create users and/or user groups
  - create Cartographic Groups and, if necessary, assign them to an Editor 2 user
  - publish WebGis services and define their access policy
  - activate and configure some functional modules
- **`Editor2:` administrator of one or more Cartographic Groups** for which it will be possible:
  - publish/update WebGis services and define their access policy
  - activate and configure some functional modules
- **`Viewer:`** user with access permission in **consultation on WebGis service**s characterized by authentication. This user can also use individual functional Modules if the relative permissions have been attributed to him
- **`Anonymus User:`** user to be associated with WebGis services and/or functional modules **with free access**

7.2 Hierarchical organization of contents

The following paragraph is dedicated to better understanding the relationships between the different types of users and the different elements of the suite (MacroGroups, Map Groups, WebGis services . . .).

In G3W-SUITE it is possible to manage Webgis services in a more or less structured way

- **an organizational level** (Cartographic Groups):
- **two organizational levels** (MacroGroups and Cartographic Groups)

These hierarchical levels can be used for **organizational purposes** (thematic containers) and/or **functional** (containers managed by different users/roles).

It is in fact possible to associate the two types of containers (MacroGroups and Cartographic Groups) to users with different roles/powers (Editor1 and Editor2) who will thus become the Administrators of all their contents.

In particular **Editor1 users will also be able to create/manage users who can be associated with the Cartographic Groups and WebGis services present in the reference MacroGroup**.

The cases relating to one or two organizational levels will be better described below.

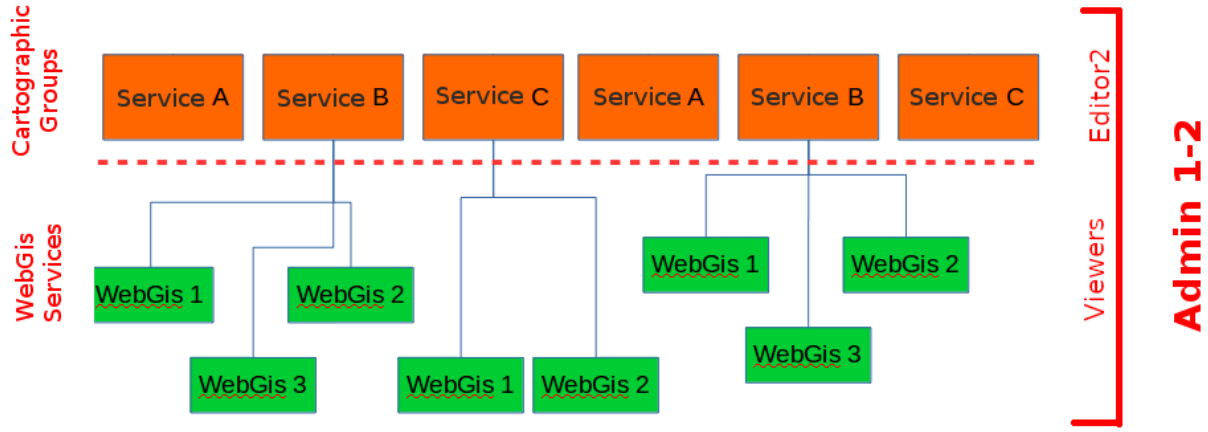
7.2.1 One organization level (absence of MacroGroups)

In case it is not need use MacroGruppi, the Admin user will be the only administrator of the suite and can therefore:

- create users (individuals and/or groups) of various types
- create **Cartographic Groups**
- publish **WebGis services** within the individual **Cartographic Groups**
- activate some specific modules on individual WebGis services

When creating a cartographic group, the Admin user can define:

- the eventual user (individual/group) **Editor 2** to associate the Group with
- **Viewers** users (individuals/groups) who will have access to this container



In the event that the Cartographic Group is assigned to **Editor 2** (single or group users), they will may autonomously publish/update WebGis services inside in this container.

Editor 2 users will also be able to define the access policies to the published WebGis services, limited to the Viewers users associated with the Cartographic Group by the Admin user.

Even the **Admin** user can publish **WebGis services** within a Cartographic Group and, if necessary, associate them with a user (single and/or group) of **Editor 2** type.

7.2.2 Two organization levels (presence of MacroGroups)

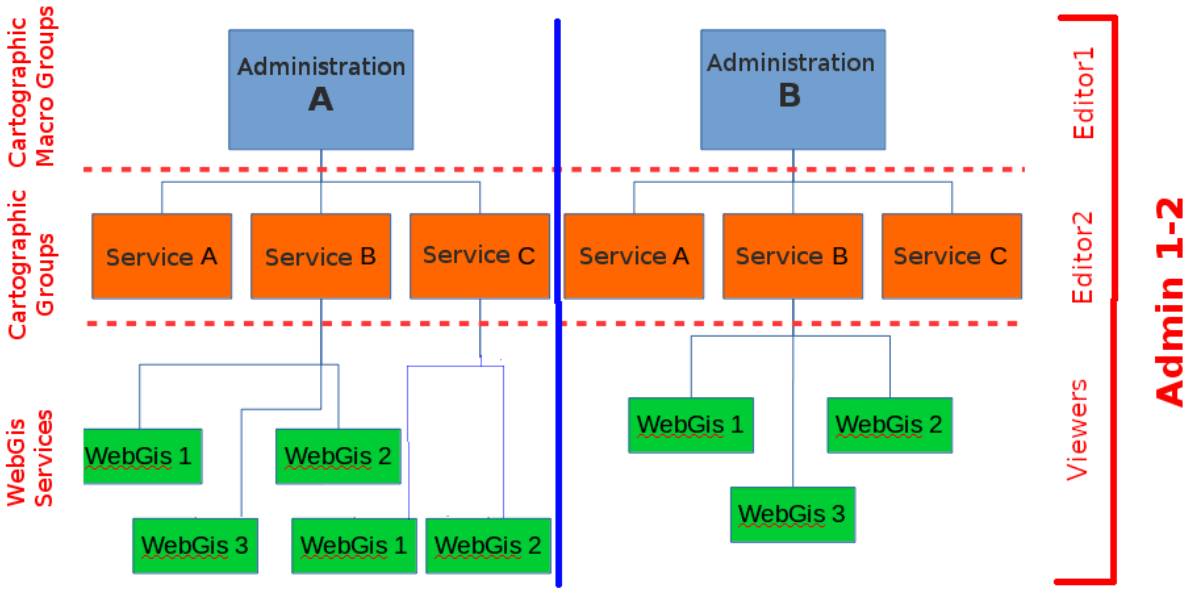
Macrogroups can be created only by **Admin** users.

Each **Macrogroup** can be associated with only one **Editor1** user.

Each MacroGroup can be considered as a watertight compartment within which the associated Editor 1 user (administrator of the MacroGroup), will be able to create users and user groups that will be made available to define access permissions for content (Groups Maps, WebGis services, functional modules . . .) of the reference MacroGroup only.

In this way it will be possible to create totally independent entities, the MacroGroups, which will be managed exclusively by the user Editor 1 associated with them.

Clearly the Admin users (1 and 2) will continue to have full powers on all groups present in the system.



As previously specified, **Editor 1** user will be able to:

- create **users** (single and/or groups) of type Editor2 and Viewer
- create **Cartographic Groups** within its **Macro Group**
- publish **WebGis services** within his **Cartographic Groups**
- activate **specific modules** on individual **WebGis services**

When Editor 1 user creates a Cartographic Group, he can define:

- the eventual **Editor2** user (individual/group) to associate with this Group
- **Viewers** users (individuals/groups) who will have access to this container

7.3 Summary table of access/administration policies

Below is a summary table of the powers associated with the different roles.

Role	Description	Users	Cartographic MacroGroups	Cartographic Grups	WebGis Services	Editing
Admin1	Advanced administrator with possibility to act on the Django Administration component	Manages Editor1, Editor2 and Viewer users	Create and manage Cartographic MacroGroups and associate them with user Editor1	Create and manage Cartographic Groups Manages access/management permissions on the Group	Publish/manage WebGis services Manages access/management permissions on the service	It acts on all the layers on which the editing function is activated
Admin2	Basic administrator	Manages Editor1, Editor2 and Viewer users	Create and manage Cartographic MacroGroups and associate them with Editor1	Create and manage Cartographic Groups Manages access/management permissions on the Group	Publish/manage WebGis services Manages access/management permissions on the service	It acts on all the layers on which the editing function is activated
Editor1	Advanced manager user	Manages Editor2 and Viewer users Users created by an Editor1 user cannot be managed by other Editor1 users	Manages contents of the Cartographic MacroGroup assigned to him	Creates and manages Cartographic Groups within the Cartographic MacroGroup assigned to him Manages access/management permissions on the Group limited to users created by him	Publishes/manages WebGis services within the Cartographic Groups assigned to him Manages access/management permissions on the service limited to users created by him	It acts on the layers on which the editing function is activated, if contained in the Cartographic MacroGroup assigned to him
Editor2	Simple user manager	-	-	Manages Cartographic Groups assigned to him	Publishes/manages WebGis services within Cartographic Groups assigned to him	It works on the layers on which the editing function is activated, if contained in the Cartographic Groups assigned to him
Viewer	Viewer user	-	View Cartographic MacroGroups on the front end based on associated credentials	View Cartographic Groups on the front end based on the associated credentials	View WebGis services based on associated credentials	It acts on all the layers on which the editing function is activated, based on the associated credentials

CHAPTER

EIGHT

QGIS: PROJECT SETTINGS

This section describes how to optimize your QGIS projects to publish as a WebGis service.

Thanks to the integration with QGIS Server, all the symbology aspects associated with the singoly layers are automatically reproduced on the WebGis service

In the QGIS cartographic projects you can set some parameters and options that affect functionalities and contents in the derivative WebGis service, such as:

- the **webgis service identification name**
- the associated **basic metadata**
- the **capabilities of the service**
- the **geographical extension** displayed when the WebGis service starts
- the **projection systems** for which the OGC services are available
- the possibility to **exclude some associated print layouts** on the WebGis service
- which layers are **queryable and searchable**
- which vector layers can be **queried using WFS**
- which **fields** (for each vector data) and with which **aliases** are made visible following interrogation on the WebGis service
- the **structure of the query form** visible on the WebGis service
- the associated print layouts

The following paragraphs describe which QGIS project settings are more relevant in relation to the published WebGis service.

8.1 QGIS: project property

From the `Project` → `Properties` menu, you can access the `Project Properties` window and the three submenus of our interest:

- **General**
- **Data sources**
- **QGIS server**

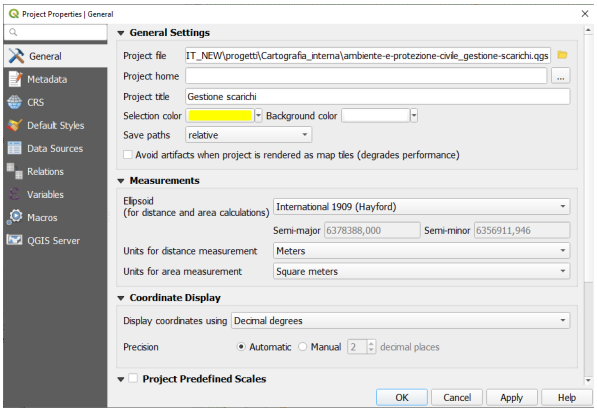
8.1.1 General

General Settings

In this section it is possible to define the title of the project, consequently the `title of the WebGis service`.

This title will be used at the G3W-SUITE application level to uniquely identify the published project; for this reason **it will not be possible to assign the same name to different projects published on the WebGis service**.

We advise against using special characters, or numbers in the project name.



8.1.2 Data sources

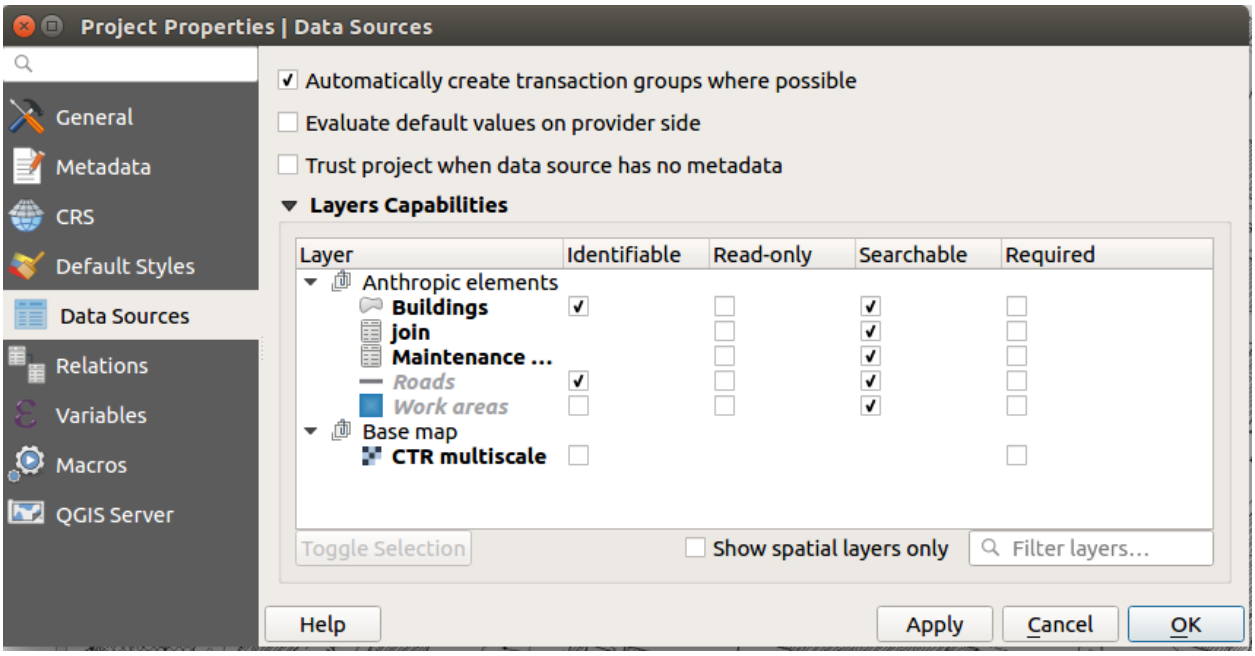
The option **`Automatically create transaction group where possible`** is automatically inherited in the online editing function.

Layers Capabilities

This submenu defines the querable and/or searchable layers at the WebGis service level.

- Check the **`Identifiable`** column if you want that the layer will be searchable on the WebGis
- Check the **`Searchable`** column if you want that the layer will be querable on the WebGis

NB: this differentiation is only possible by using the QGIS APIs such as Search URL endpoint. See dedicated paragraph.



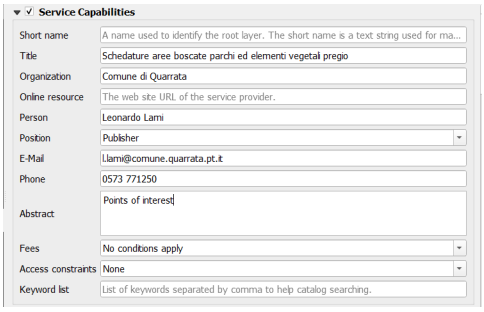
8.1.3 QGIS Server

Service capabilities

In this section it is possible to define the `capabilities of the service`.

This information, together with info about the structure of the attribute tables of the layers present in the project, will be displayed in the **Metadata session** of the cartographic client.

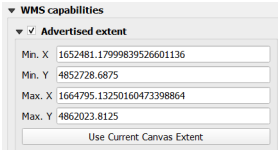
See also dedicated paragraph



Capabilities WMS - Advertised extent

In this section it is possible to define the `geographical extension` displayed when the WebGis service starts.

To define it, set the desired geographical view on the map and then click on the **'Use Current Canvas Extent'** button.

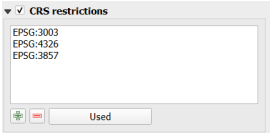


WMS Capabilities - CSR restrictions

In this section it is possible to define the `projection systems` for which the project is available in relation to `OGC services`.

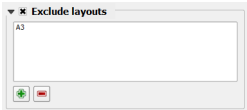
It is clearly necessary to insert the projection system on which the project was made, this SR is added by clicking on the **'Used'** button.

Other geographic reference systems can be implemented by clicking on the **'+'** button and choosing from the list of reference systems.



Capabilities WMS - Exclude layouts

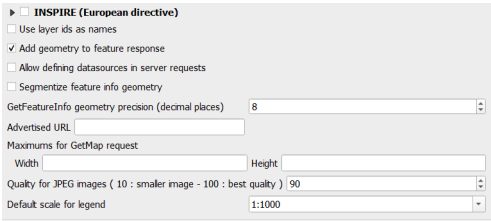
In this section it is possible to `exclude some of the print layouts` that are associated with the cartographic project from the availability of the WebGis service.



Capabilities WMS - General aspects

Two further aspects are manageable with regard to WMS capabilities

- in general it is recommended to check `use the layer ids as names` option
- the option `Add geometry to feature response` must be checked to activate the **zoom to the features** on the WebGis service



WMTS Capabilities

In this section it is possible to define which `layers are exposed as WMTS services` defining the various options

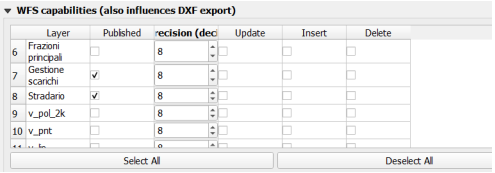
WFS Capabilities

In this section it is possible to define which `layers are exposed as WFS services.`

The WFS service is needed if you want activate following types of query:

- **bbox query**
- **bypolygon query**

It is sufficient to check only the **`Published`** column



WCS Capabilities

In this section it is possible to define which `rasters are exposed as WCS services`

8.2 Print layouts

Any print layouts associated with the published QGIS project will automatically be associated with the published WebGis service.

Print layouts can contain more than one `Map` items and panoramic maps.

Atlas and report are also supported.

Any images present in the print layouts must be placed in the local **`project_data`** folder (in any subdirectory) and synchronized on the server.

See also the dedicated paragraph Geographic data synchronization on the server.

8.3 QGIS: layer properties

8.3.1 Simbology

The rendering style associated with the individual layers is replicated autonomously on the WebGis service.

If external SVG icons are used (added to the basic ones of QGIS, via the **`Settings -> Options -> System -> SVG paths`**), these must be uploaded to the server (through the **`File Manager`** tool) in order to be used by QGIS Server.

Layer style

The suite manages the presence of multiple styles associated with a layer.

It will be possible to dynamically choose the style on the cartographic client.

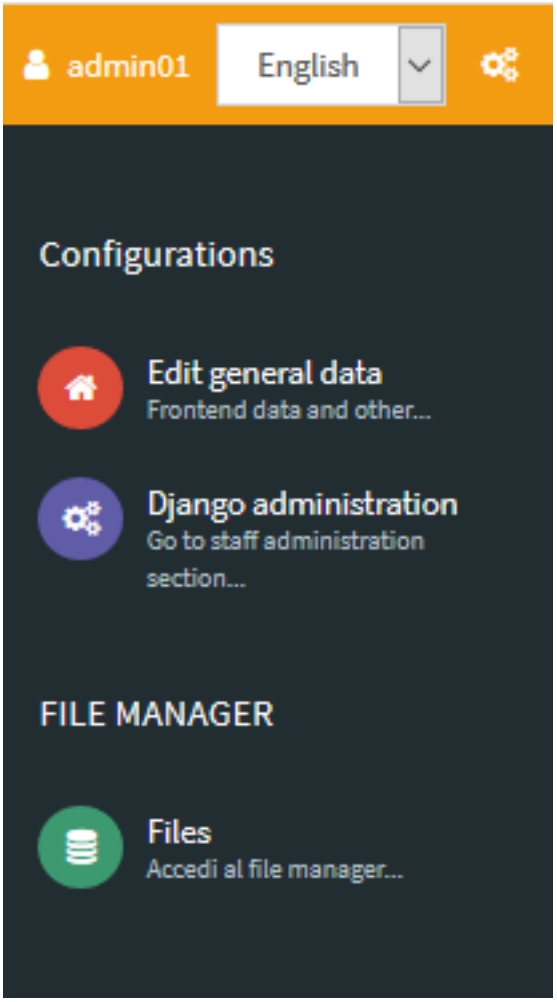
It will be possible to manage the styles associated with a layer from the Administration component, also by **loading .qml file styles** and **setting the default style** among those present.

Manage custom SVG icons

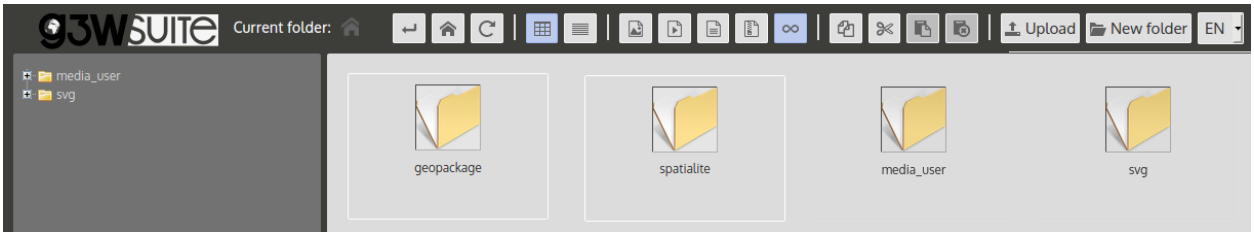
In the installation procedure of the G3W-SUITE application, an **`svg`** named directory is created on the server.

Within this directory it is therefore possible to store SVG icons, also organized in subdirecory.

The **`Configurations icon`** , located in the upper right corner of the **Administration Panel**, allows you to access a menu that includes the **`File Manager`** item.



Through this tool it is possible to manage SVG icons on the server in a simple and intuitive way.



The SVG folder on the server must reflect the structure in any subfolders present locally.

NB: The name of this directory is defined by the basic settings set during the installation of the suite. See dedicated paragraph.

PS: remember that the **`File Manager`** tool also allows you to manage the synchronization of geographical data (in the case of using physical files) and the management of multimedia files.

See also dedicated paragraph

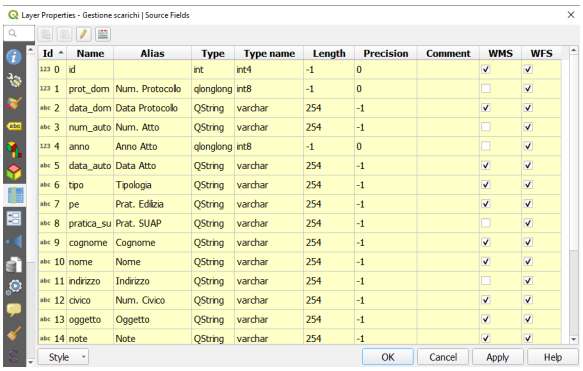
8.3.2 Definition of the fields that can be consulted for each layer

Within the QGIS project it is also possible to define, for each layer, which fields are available following query on the WebGis service.

To define these settings, you access the properties of one of the vectors previously defined as searchable and choose the **`Source Fields`** submenu in the **`Layer Properties`** window.

This submenu lists the fields associated to the table of the vector.

The check box relating to the **`WMS`** column defines whether or not the values contained in this field will be available following the query on the WebGis service.



8.3.3 Legend

The activation of the **`Filter legend by Map content`** option on the QGIS project is automatically applied to the derived WebGis service.

8.3.4 Groups of layers

The activation on the QGIS project of the **`Mutually exclusive group`** option for the layers groups is automatically applied to the derived WebGis service.

8.3.5 Viewing multimedia content

Multimedia contents (images, pdf, web URL . . .) can be viewed interactively on the map client following publication of the QGIS project.

In the case of web links, simply insert them (preceded by the prefix **`http://`** or **`https://`**) within the dedicated attribute fields

In the case of multimedia files it is necessary:

- **upload the media file to the `media_user` folder** (folder exposed on the web) accessible through the **`File Manager`** tool in the Suite Administration Panel
- **insert the web link to this file in the dedicated attribute field**

The link to the file can be obtained in the following way:

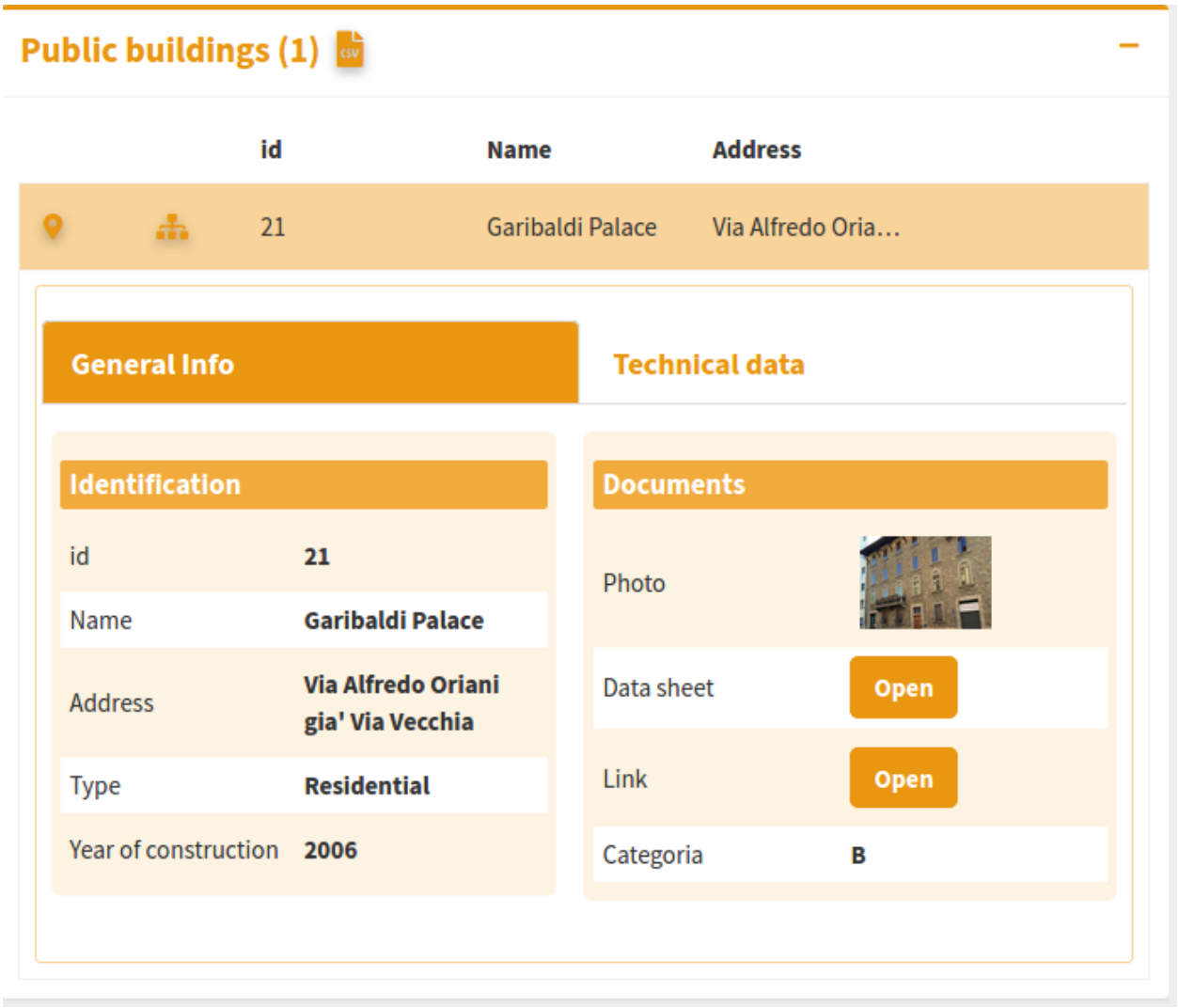
- **`application domain + media_user + path of the file + file name`**

Example:

- application domain: **`https://dev.g3wsuite.it`**
- file **`file_A.pdf`** located in the folder **`/media_user/form/`**
- web link: **`https://dev.g3wsuite.it/media_user/form/file_A.pdf`**

Following queries at the cartographic client level, we will have different behaviors based on the type of content:

- **image**: preview display in the form, click on the preview to display the image in real size
- **web link or other multimedia file**: display of an **Open** orange button to allow consultation of the content

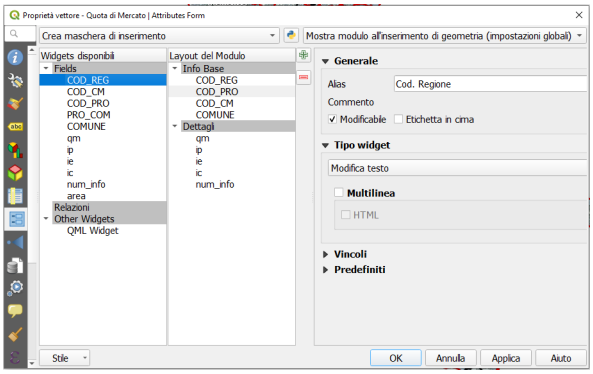


8.3.6 Definition of the attribute display form

For each layer it is possible to define the structure of the attributes form associated with displaying the results following query operations.

On QGIS we can build a personalized form (query form) by creating thematic tabs and groups and defining the distribution of the individual fields and their aliases.

This structural organization will be replicated directly on the query form on the WebGis service.



8.4 Performances optimization

8.4.1 Mandatory rules

- PostGreSQL/PostGis, SQLite/Spatialite and GeoPKG layers must have a **primary key**
- **not use numeric type** field in PostGreSQL/PostGis layer
- the primary key field and all fields involved in search, join, 1:n relation or editing function have to be **published as WMS**
- **don't use commas for aliases** associated with layers
- style settings defined at the auxiliary data level are not supported

8.4.2 Tips

- when using rule-based/categorized classification **create indexes on the column(s) involved** in the rule expression
- start the project with **only a few layers turned on** by default
- do not exceed three nesting levels in the groups of layers defined in the TOC

CHAPTER

NINE

G3W-FRONTEND: THE FRONT END PORTAL

This section describes the different sections of the access portal and how to login to the Administration Panel

9.1 The login portal sessions

The G3W-SUITE application is accessible via any internet browser (FireFox and Chrome recommended) via the URL address defined during installation

If you have also installed the front-end portal from the GitHub repository, access to the application will be via the portal itself.

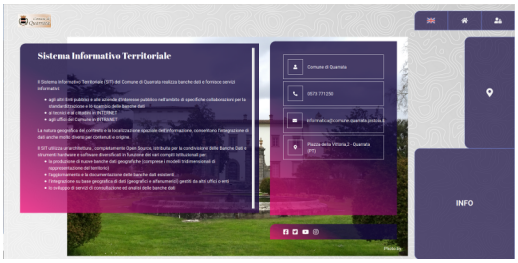
The home page will contain, in addition to a brief and customizable presentation of the service, also:

- a **menu at the top right side** with the following items:
  - **`Change language`**
  - **`Go back to the home page`**
  - **`Login`**
- a **panel menu on the right** with the following items:
  - **`Maps`**
  - **`Info`**

Most of the information shown in the access portal can be defined from the **`Configurations -> Edit General Data` session**, accessible from the icon located in the upper right corner of the Administration Panel.

9.1.1 Info

The **Info** session can contains a small introduction and contact information for your company or public facility.



9.1.2 Maps

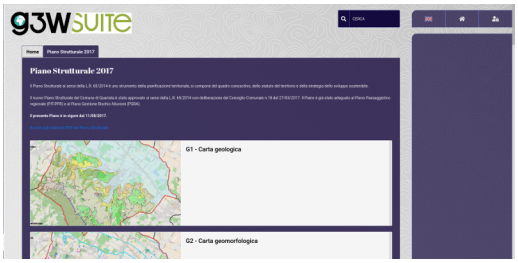
Within G3W-SUITE it is possible to organize webgis services in hierarchical containers (**Cartographic Macrogroups and Cartographic Groups**)

By accessing the **Maps** session, the **Macrogroups** (if present) will be displayed, access to the Macrogroup will allow you to view the associated **Cartographic Groups** and from these access the list of individual **WebGis services**.

The MacroGroups, Groups and WebGis services listed will be those defined as free access.

If you have a user for access, you can authenticate yourself through the **Login session**.

Following authentication, the **Maps** page will also show the MacroGroups, Groups and WebGis services with restricted access and on which the user has access permissions.



9.1.3 Login

If you have a user with login credentials, you can authenticate yourself through this session by entering your user and password.

If you are an **Administrator** or **Editor** of 1 or 2 level, you can also access the Administration session.

Once logged in, you access the **Admin** session and from here, via the **"Backend"** button to the Administration panel

g3wsuite
Accesso al sistema di amministrazione
USERNAME
PASSWORD
ACCESSO

CHAPTER

TEN

G3W-ADMIN: THE ADMINISTRATION PANEL

This section describes how to manage the various aspects and features of the Suite:

- ***customization of the access portal***
- ***user creation and management (individuals and groups)***
- ***creation of MacroGroups and cartographic Groups and definition of access and management policies***
- ***publication of QGIS projects as WebGis services***
- ***updating and management of WebGis services (search tool and additional functions)***

10.1 Description of the interface

The Administration Panel allows you to manage all aspects related to the publication of QGIS projects and configuration of related WebGis services

The main page of the Administration Panel shows:

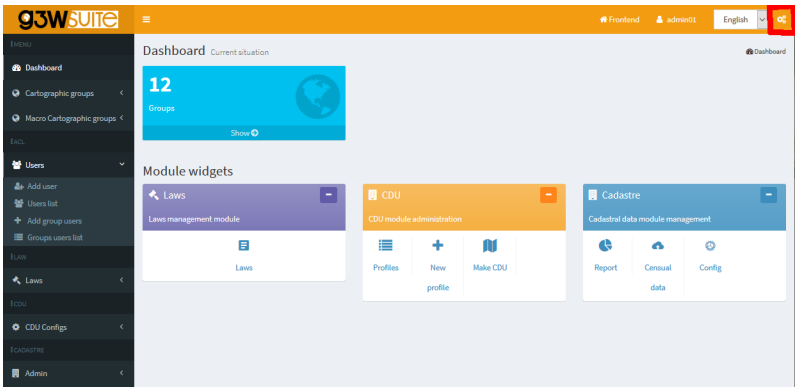
- **`a bar at the top:`**
  - **Frontend:** to return the landing page portal
  - **Username:** to edit your profile and log out
  - **Language:** to choose the interface language
  - **A gear icon** : to access a menu with:

    –> Edit general data: to set informations shown in the front-end portal

    –> Django Administration (only for Admin01 user): to configure Django advanced settings

    –> Files: to access the File Manager tool
- **`a text menu on the left:`**
  - **Dashboard:** Administration dashboard
  - **Cartographic Groups:** to create/manage cartographic groups
  - **Macro Cartographic Groups:** to create/manage Cartographic MacroGroups
  - **Users:** to create/manage single users and/or user groups
  - **List of active modules:** to activate/manage the functional modules active in your installation

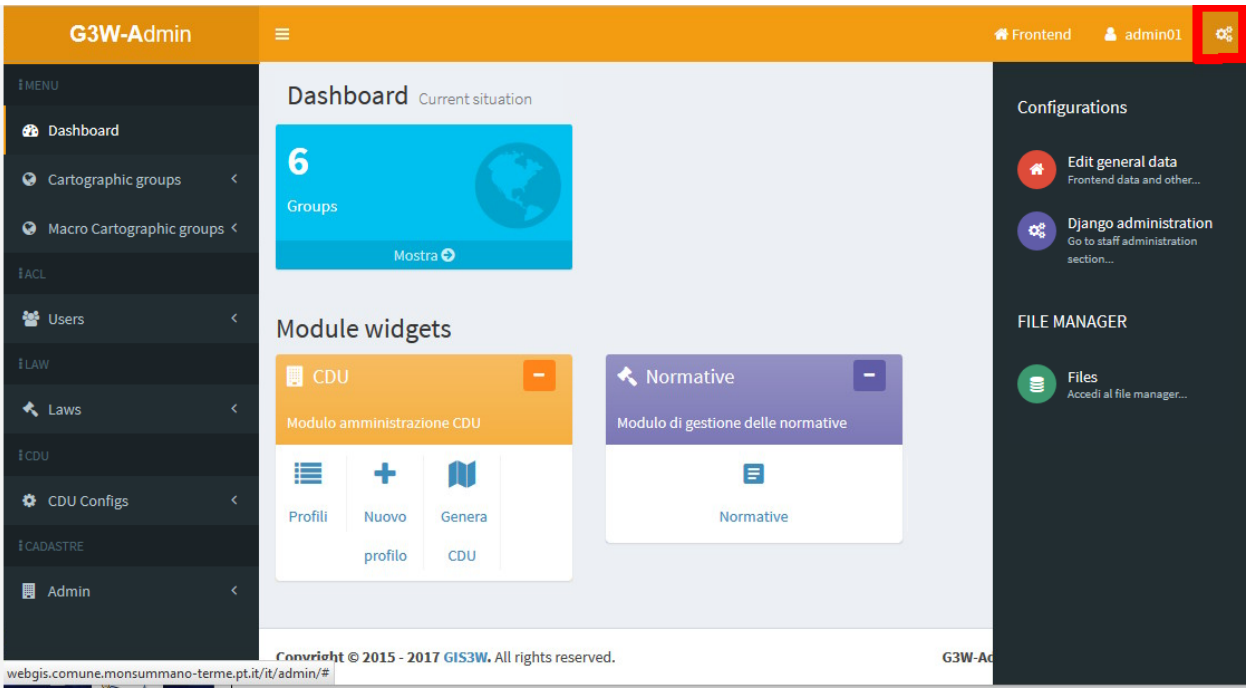
- **a dashboard in the center of the page**
  - **Dashboard:** to access to list of Cartographic Groups
  - **Module list:** to access the respective settings



10.2 Front end portal customization

From the main page of the **Administration Panel** it is possible to customize the information shown on the Front End Portal.

Click on the **Configurations** icon located at the rigth bottom and choose the item **Edit general data** which will appear in the menu below.



In the **General suite data** form you can define all the informations that will appear on the portal home page

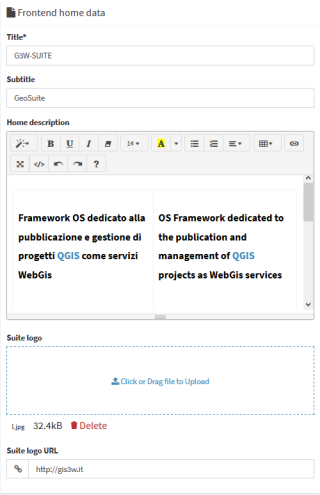
- **Home data:** info that will appear on the front end landing page

- **`About data:`** info that will appear in the **About it** session
- **`Group map data:`** info that will appear in the **Maps** session
- **`Login data:`** info that will appear in the **Login/Administration** session
- **`Social media data:`** links to the social channels that will appear in the **About it** it session
- **`Map Client data:`** main title to be displayed in the cartographic client bar

10.2.1 Front End Home Data

Informations that will appear on the front end landing page

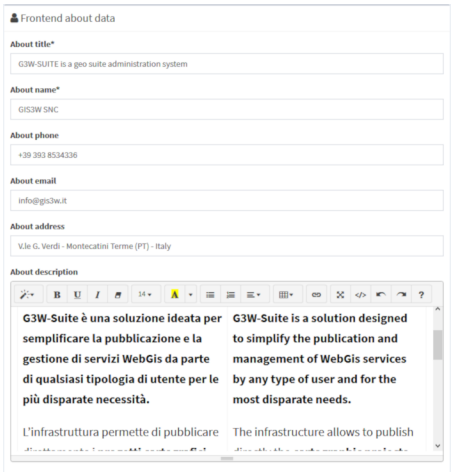
ATTENTION: contents marked with * are mandatory.



10.2.2 Front End About Data

Informations that will appear in the **Info** session

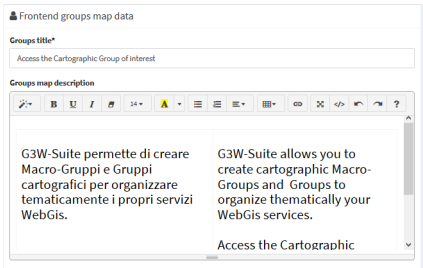
ATTENTION: contents marked with * are mandatory.



10.2.3 Frontend Groups Map Data

Information that will be displayed in the **Maps** session

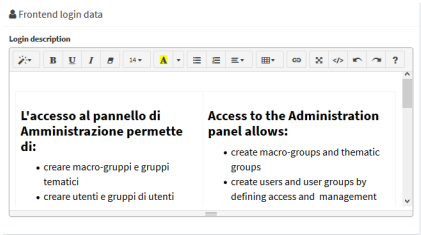
ATTENTION: contents marked with * are mandatory.

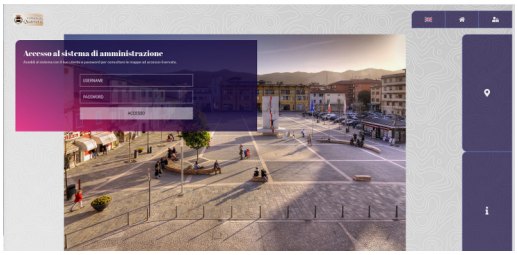


10.2.4 Front End Login Data

Information that will be displayed in the **Login/Administration** session

ATTENTION: contents marked with * are mandatory.





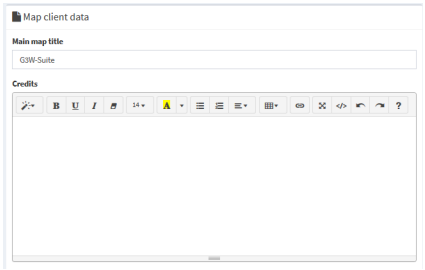
10.2.5 Front End Social Data

Links to the social channels that will be displayed in the **About it** it session

ATTENTION: contents marked with * are mandatory.

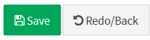
10.2.6 Map client data

Main title to be displayed in the cartographic client bar



In the **Credits** subsection it is possible to define additional text for the publishing aspects.

After filling in the various form, click on the **Save button** to confirm your choices.



10.3 Users and Users Groups management

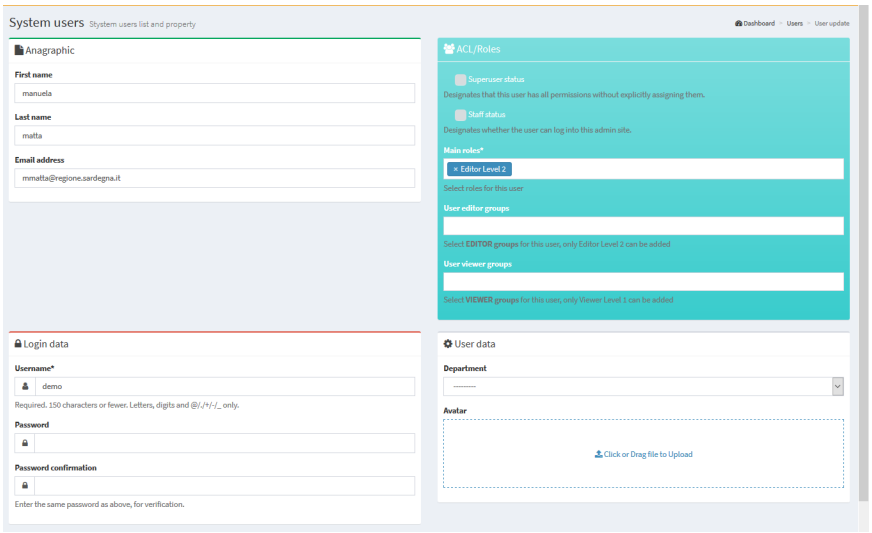
In the left side menu there is the **Users** item with four sub-items:

- **Add user**
- **Users list**
- **Add groups users**
- **Groups users list**

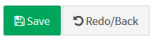
10.3.1 Add user

Through this form it is possible to insert new users and define their characteristics.

- **`Anagraphic`**: first name, last name and email address
- **`Login`**: username and password
- **`User backend`**
- **`ACL/Roles`**
  - **Superuser status** (Admin1 and Admin2 users only)
  - **Staff status**: deep administration of the application (Admin1 users only)
  - Main roles (**Editor1, Editor2 or Viewer**)
  - **User Editor groups**: any Editor2 user group they belong to
  - **User Viewer groups**: any Viewer user group they belong to
- **`User data`**:
  - Departments and image to be associated with the profile



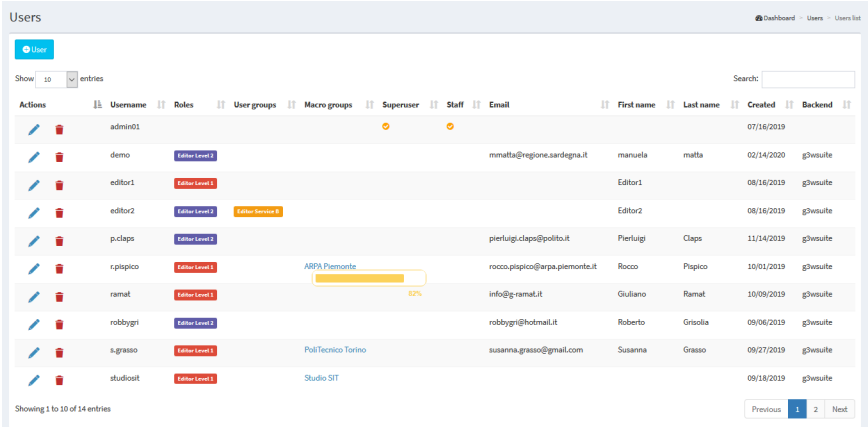
After filling in the various form, click on the Save button to confirm your choices.



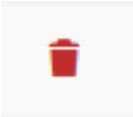
10.3.2 Users list

Through this form you can consult the list of enabled users and their characteristics:

- Username
- Roles
- User groups to which they belong
- Associated Cartographic MacroGroups (only for Editor1 users)
- Super user and/or Staff privileges
- Email, name and surname
- Creation date
- Info on user creation (G3W-SUITE or LDAP)



The icons at the head of each row, allow you to:

- **Modify:** to modify the characteristics of the user
-  **Delete:** to permanently delete a user

10.3.3 Add Group Users

Through this form it is possible to insert new user groups and define their role.

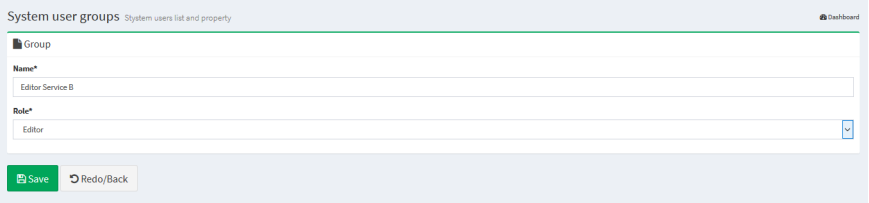
It is possible to create only two types of user groups:

- **`Editor`:** in which only Editor2 users can be inserted
- **`Viewer`:** in which only Viewer users can be inserted

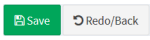
The association between user and user groups is made at the individual user management level.

In the specific form for creating user groups, the following info are defined:

- **Name**
- **Role** (Editor or Viewer)

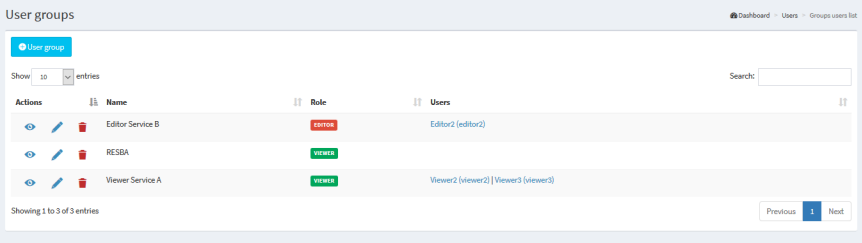


After filling in the from, click on the **Save** button to confirm your choices.



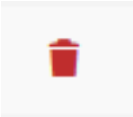
10.3.4 Groups users list

Through this form it is possible to consult the list of enabled user groups, their characteristics and the individual users belonging to the group.



Using the icons at the head of each row, you can:

- **Show details:** to consult the characteristics of the user group

- **Modify:** to modify the characteristics of the group
-  **Delete:** to permanently delete a group and therefore association with users belonging to the group itself

10.4 Macro Cartographic Groups

In this section it is possible to view the list of Cartographic Macrogroups, manage them and create new ones.

ATTENTION: use the Cartographic MacroGroups only if you need them.

See chapter Hierarchical organization of WebGis services and types of Users to learn more about this aspect.

For example, you can create a **Macrogroup** to collect a series of **Cartographic Groups** belonging to the same Administration (single Municipality within a Union of Municipalities) or more simply to have main containers that contain second level groupings (Groups).

In the left side menu there is the **MacroGroup Cartographic** item with two sub-items:

- **Add MacroGroups:** to create a new Cartographic MacroGroup
- **MacroGroups list:** to access the list of MacroGroups present

10.4.1 Add MacroGroups

Through this item, available only for the **Admin** users, it will be possible to **create a new Cartographic MacroGroup and associate it with an Editor1 type user who will become its administrator**.

Let's see in detail the various sub-sessions of the group creation form.

ACL users

`Editor users`: you define the **Editor1 user** who will become the **MacroGroup administrator**. This user will can manage the MacroGroup by creating Cartographic Groups, publishing projects and creating Users or User Groups.

General data

- **`Identification name *`:** a generic internal identification name (not show in the front end)
- **`Title *`:** descriptive title of the MacroGroup (will appear in the list of MacroGroups) and, eventually, in the client header
  - **Use title for client** option
  - **Use logo image for client** option
- **`Description`:** the description to be associated with the MacroGroup in the frontend
- **`Logo img*`:** the logo to be associated with the MacroGroup in the frontend and, eventually, in the client header

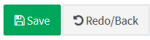
By default, the map client header, for each WebGis service, is composed of:

- main title (if set at General Data management level)
- logo and title associated with the **Cartographic Group**
- title of the WebGis service

If you select the **Use MacroGroup title and logo for the client** options, the map client header, for each WebGis service, will instead consist of:

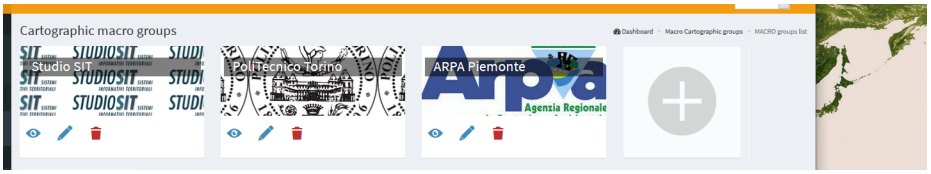
- main title (if set at General Data management level)
- logo and title associated with the **Cartographic MacroGroup**
- title of the WebGis service

After compiling the form, click on the **Save button** to confirm your choices.

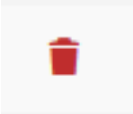


10.4.2 MacroGroups list

The menu provides access to the list of cartographic macro-groups present.



There are a series of icons to access specific functions:

- **Show the details** of the MacroGroup
- **Change** characteristics of the MacroGroup
-  **Delete** MacroGroup

ATTENTION: the removal of the Cartographic MacroGroup group will result in:

- the **removal of all the Cartoghraphic Groups** contained in it
- the **removal of all the cartographic projects** contained in the individual Groups
- the **removal of all the widgets** (eg searches) that would remain orphaned after the removal of the cartographic projects contained in the group. See the Widget chapter for more information.

Define the MacroGroups order on the FrontEnd

Through the Drag & Drop function it is possible to define the order of the MacroGroups in the list. This order will be reflected in the FronEnd.

10.5 Cartographic Groups

In this section it is possible to view the list of Cartographic Groups present, manage them and create new ones.

A Cartographic Group is create to **collect a series of cartographic projects belonging, for example, to the same theme** (Urban Planning Regulations, tourist maps . . .) and characterized by the same projection system.

It should be remembered that it will be possible to switch from one webgis service to another, leaving the same geographical extension and scale, only between the projects contained in the same cartographic group.

In the left side menu there is the **Cartographic Groups** item with two sub-items:

- **Add Group:** to create a new Cartographic Group
- **Group List:** to access the list of groups present

You can also access the list of groups by clicking on the **"Show"** button in the **Cartographic Groups** box on the **Dashboard**.

10.5.1 Add Group

Through this item it is possible to create a new Cartographic Group.

During creation, some functional characteristics and tools that the WebGis interface will show for all cartographic projects published within the group are also defined.

Let's see in detail the various sub-sessions of the group creation form.

General data

- **`Name *:`** a generic internal identification name (not show in the front end)
- **`Title`***: descriptive title of the Group (will appear in the list of Cartographic Groups)
- **`Description`**: description of the content
- **`Language`***: interface language

Logo/Picture

- **`Header logo img`***: the logo to be displayed in the header del client cartografico
- **`Use logo image for client`** option
- **`Logo link:`** a eventual link to associate with the logo

REMEBER

By default, the map client header, for each WebGis service, is composed of:

- main title (if set at General Data management level)
- logo and title associated with the **Cartographic Group**

- title of the WebGis service

If you select the **Use MacroGroup title and logo for the client** options, the map client header, for each WebGis service, will instead consist of:

- main title (if set at General Data management level)
- logo and title associated with the **Cartographic MacroGroup**
- title of the WebGis service

If you select the **Use Group logo for the client** options, the map client header, for each WebGis service, will instead consist of:

- main title (if set at General Data management level)
- title associated with the **Cartographic MacroGroup**
- logo associated with the **Cartographic Group** (if MacroGroup logo option is active this options takes precendence)
- title of the WebGis service

ACL Users

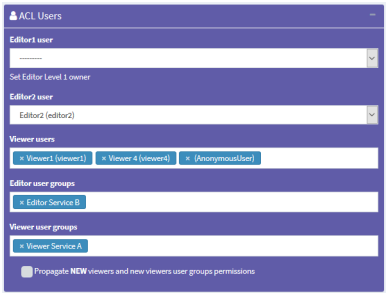
Access and modification powers are managed.

The options present will vary according to the type of user (Admin or Editor1) who creates/manages the Group

- **`Editor1 User:`** defines the **user (Editor1) manager of the Group**. The entry is present only when the Admin type user creates the Group If the Group is created by a user of type Editor1, the Group is associated directly with that user
- **`Editor2 User:`** defines the **user (Editor2) manager of the Group**.
- **`Viewers users:`** define the individual **users (Viewers) who have the credentials to view the contents of the group**. By choosing the anonymous user (AnonymusUser) the group will be free to access
- **`Editor user groups:`** define the **user groups (Editor2) who manage the Group**.
- **`Viewer user groups:`** you define the **user groups (Viewer) which have the credentials to view the contents of the group**.

The option **`Propagate viewers user (single and groups) permissions`** allows you to propagate the Viewer users (individuals and/or groups) associated to the Group to ALL the WebGis services present in it.

This option cancels any differentiation in the access policies applied to the WebGis services contained in the Group.



MacroGroups

Possible definition of the belonging MacroGroup.

This option is available only if Cartographic macro groups have been created

In the event that the Group is created by an Editor1 type user, the Group will be automatically associated with the MacroGroup associated with the same Editor1.

GEO data

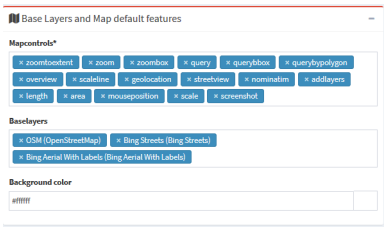
Projection system associated with the group.

N.B. All projects loaded into the group must be associated with this SRID.

Base layers and Map default features

In this box you can define:

- **`Mapcontrols`***: list of tools available on the WebGis client:
  - **zoomtoextent:** zoom to the initial extension
  - **zoom:** zoom in and zoom out
  - **zoombox:** zoom tool based on drawing a rectangle
  - **query:** puntual query of geographical layers
  - **querybbox:** query via bounding box (**N.B. for the layers to be queried according to this method it is necessary that they are published as WFS services on the QGIS project**)
  - **querybypolygon:** it will be possible to automatically query the features of one or more layers that fall inside a polygonal element of a guide layer. (Eg what's inside a cadastral parcel?). - **N.B. searchable layers must be published as WFS services on the QGIS project**
  - **overview:** presence of a panoramic map
  - **scaleline:** presence of the scale bar
  - **scale:** tool for defining the display scale
  - **mouseposition:** display of mouse position coordinates
  - **geolocation:** geolocation tool (available only with https certificate)
  - **nominatin:** address search tools and toponyms based on OSM
  - **streetview:** Google StreetView on your map (available only with GoogleMaps API Key)
  - **length:** linear measuring instrument
  - **area:** surface measuring instrument
  - **addlayers:** tool for temporarily uploading GeoJson, KML and SHP (zipped) vector layers to WebGis
  - **screenshot:** tool to take a screenshot of the map area
- **`Baselayer`:** choice of the base maps that will be available on the WebGis client
- **`Background color`:** choice of the background color of the maps (default white)



With regard to the **Base Layers**, it is specified that the external services available by default are:

- **OSM**
- **Bing Street**
- **Bing Aerial**

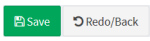
It is possible to create/add **customized Base Layers** starting from the cache of the single layers present in published webgis

See **Caching layer** paragraph in the **Widget management** session.

Copyrigth

`Terms of use:` description of the terms of use of the map and any other info **`Link to terms:`** link to text

After filling in the various form, click on the **Save** button to confirm your choices.

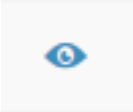
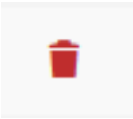


10.5.2 Groups List

From this item you can access the list of the created cartographic groups.

For each group, the Title and Subtitle defined at the time of creation are shown.

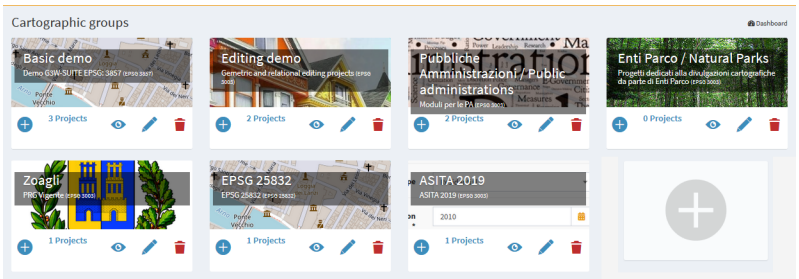
There are also a series of icons to access specific functions:

- **Add a new project** to be published on the WebGis service
- Number and links to projects published within the Group
-  **Show group details**
- **Change** group characteristics
-  **Delete** group

ATTENTION: the removal of the cartographic group will involve:

- the **removal of all the WebGis services** contained therein
- the **removal of all widgets** (eg searches) that would be orphaned after the removal of the WebGis services contained in the group. See the Widget chapter for more information.

A large **+ icon** is available to access the form for creating a new group.



Define the Groups order on the FrontEnd

Using the Drag & Drop function it is possible to define the order of the Groups in the list.

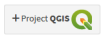
This order will be reflected within the belonging MacroGroups.

NB: currently in the list of Groups it is not present in the subdivision in the belonging MacroGroups but the fact that a Group can be associated with only one MacroGroup still allows you to manage intuitively what will be the complessive display order.

10.6 Publication of new WebGis services

10.6.1 To publish a new QGIS cartographic project

It is possible to publish new QGIS projects:

- **from the list of cartographic groups:** click on the icon located under the box of the cartographic group in which you want to publish the project.
- **from the list of cartographic projects published within a group:** by clicking on the the buttom 

In the dedicated form we could define the charatteristicsof the project being published:

QGIS project

`QGIS file`*: load the QGIS cartographic project to be published (.qgz or .qgs file)

ACL Users

Management of access and/or modification permissions

The options present will vary according to the type of user (Admin, Editor1 or Editor2) who creates / manages the WebGis service.

- **`Editor1 user`:** defines the **user (Editor1) manager of the WebGis service**.

The entry is present only when the WebGis service is created by Admin or Editor1 user.

In the event that the WebGis service is published by a user of type Editor1, the WebGis service is associated directly with that user

- **`Editor2 User`:** defines the **user (Editor2) manager of the WebGis service**.

  The item is present only when the user of the Admin or Editor1 type creates the service WebGis. In the event that the WebGis service is published by a user of type Editor2, the WebGis service is associated directly with that user

- **`Viewers users`:** define the individual **users (Viewers) who have the credentials to view the WebGis service**. By choosing the anonymous user (**AnonymusUser**) the group will be freely accessible.
- **`Editor user groups`:** define the **user groups (Editor2) who manage the service**.
- **`Viewer user groups`:** you define the **user groups (Viewer) which have the credentials to view the content of the service**.

Default base layer

In this session you define which base layer should be active at startup.

The choice is limited to the list of base layers activated for the cartographic group in which you work.

It is also possible not to define any active base layer at startup.

Description data

- **`Public title`:** title of the WebGis service, it will appear at the font end level and in the header of the client.
- **`Description`:** Description of the project, it will appear at the public portal level.
- **`Thumbnail (Logo)`:** logo to associate with the project. This image will be viewable in the list of projects within the cartographic group
- **`URL alias`:** a human readable URL for the map. Only alphanumeric characters, not white space or special characters.

The title associated with the WebGis service follows this definition logic:

- Public title: if set

- QGIS project title: if set on the **General session** of **QGIS project properties**
- Name of the QGIS project file

Options and actions

- **`User QGIS project map start extent as webgis init extent`**: check this control if you want set initial extent from QGSI project initial extent

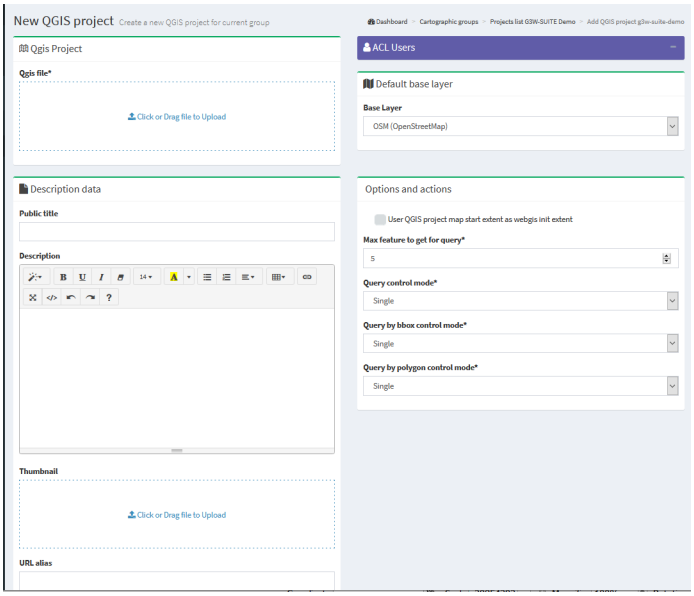
Otherwise the initial extension will correspond to the maximum one defined on the basis of the extension associated with the WMS capabilities of the QGIS project (**Project properties -> QGIS Server -> WMS capabilities (Advertised extent)**)

- **`Tab's TOC active as default`**: set tab's TOC (Layers, Base layers, Legend) open by default on startup of webgis service
- **`Automatic zoom to query result features`**: if in the results of a search there are only features of a layer, the webgis automatic zoom on their extension

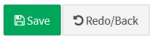
The next options allow you to define the type of WMS / WFS query to be carried out and the maximum number of results obtainable following a query.

- **`Max feature to get for query`***: max number of feature to get for single or multiple mode
- **`Query control mode`***: single or multiple
- **`Query by bbox control mode`***: single or multiple
- **`Query by polygon control mode`***: single or multiple

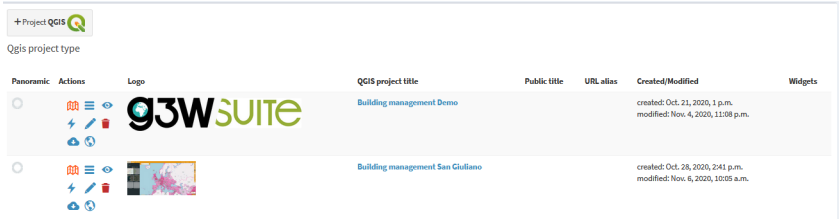
ATTENTION: contents marked with * are mandatory.

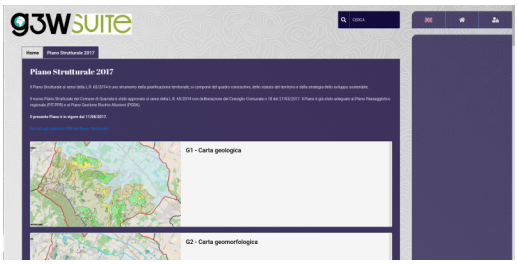


After filling in the various form, click on the Save button to confirm your choices.



If the operation is successful we will see the new project appear in the list of projects in in the working Cartographic Group.





10.6.2 Define the Groups order on the FrontEnd

The individual WebGis services will be arranged, within the Thematic Groups to which they belong, in alphabetical order based on the title of the service.

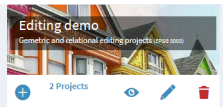
10.7 Update/ Manage WebGis services

To **update** a published WebGis service, access the list of projects in the Cartographic Group.

Click on the **Edit** icon placed at the top of the WebGis service and reload the QGIS file with the changes made in the relevant form.

Click on the **SAVE** button to confirm the change.

Always starting from the list of WebGis services, it is possible to manage numerous functional aspects associated with them.



10.7.1 Basic tools

In this section it is therefore possible to view the list of cartographic projects present, view them, manage them and create new ones.

Through the single icons, placed at the level of each project, it is possible to:

- **Display the cartographic project on the WebGis interface:** to check the display by the user
- **Access the list of layers** present within the project and define their functional aspects
- **View the project specifications**

- **Test the WMS Capabilities** of the project
- **Update a project:** update of the QGIS file and other options related to the project
- **Remove a cartographic project Warning:** removing a project also removes all the widgets (e.g. searches) that would be orphaned after the project has been removed
- **Download of the QGIS project**
- **List of OGC services** associated with the project

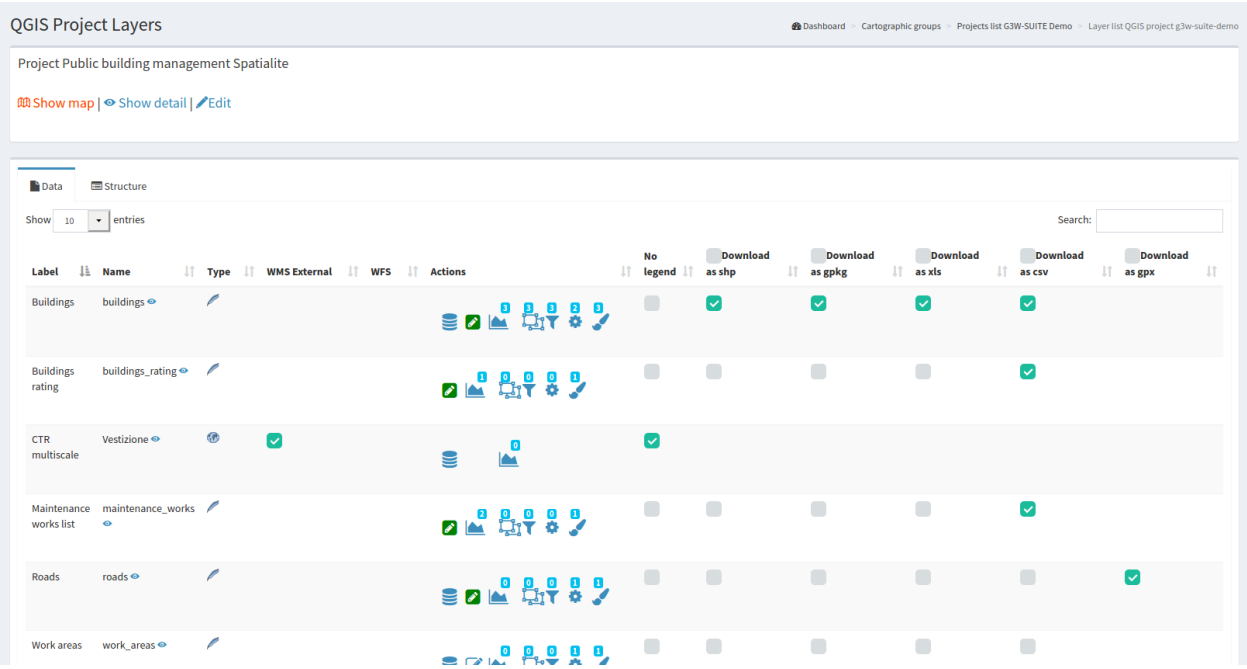
10.7.2 Setting up the overview map for WebGis services

In this session it is also possible to define which of the cartographic projects loaded within the group will be used as a panoramic map.

To set the panoramic map, choose the projects and tick the check box in the **`Overview`** column.

10.8 Widget management

Once a cartographic project has been published, thougth the icon it is possible to access the list of the geographical states that compose it and define some functional aspects that will be enabled at the cartographic client level.



Next to each layer are a series of icons and checkboxes:

- **Label:** layer alias applied at the QGIS project level

- **Name:** name of the layer (file or DB table)
- **Type:** illustrates the type of data (WMS, PostGis, SpatiaLite, GDAL / OGR . . .)
- **WMS external:** to speed up loading, the WMS layers present in a QGIS project are managed directly by Django and not by QGIS-Server. However, this method prevents the application of any styling (e.g. opacity level) defined at the project level. The choice of the external WMS option means that the WMS layer is managed directly by QGIS-Server and therefore the associated styling is applied.
- **WFS:** a check mark shows whether the layer is published as a WFS service or not
- **Actions:** a series of icons dedicated to various functions
  - **Caching Layer:** allows you to activate and manage the cache of the single layer at the project level
  - **Editing layer:** shows if the online editing function is active on the layer and allows you to activate and define it
  - **Manage alphanumric constraints:** create or manage editing and visualization alphanumeric-constraints
  - **Manage geo-contsraints:** create or manage editing geo-constraints
  - **QPlotly widget:** add or manage plots created with DataPlotly QGIS plugin
  - **List of widgets:** shows how many widgets (eg searches) are associated with this layer and allows you to activate new ones
  - **Manage layer styles:** manage multi-style layer
- **No legend:** it allows to define if the layer must have published the legend at TOC level of the WebGis client
- **Download:** allows the download of the geographic and not geographic layers in various formats
  - **Download as shp:** for geographic (shp) or not geographic (dbf) layers
  - **Download as GPK:** for geographic or not geographic layers
  - **Download as xls:** for all types of layers, in .xls format
  - **Download as csv:** for all types of layers, in .csv format
  - **Download as gpx:** for geographic layers, in .gpx format

The number above each Action icon shows if and how many related objects are present.

The functions present in the **Actions session** are described below.

10.8.1 Editing layer

Through this icon it is possible to activate the online editing function on the individual layers and define the permissions for individual / groups of users

See the dedicated paragraph in the Editing on line session.

10.8.2 Display and editing constraints

Through the **Manage geo-contsraints** and **Manage alphanumric constraints** widgets it is possible to define editing and display filters for users authorized to consult/edit the project.

See the dedicated paragraph in the Editing on line session.

10.8.3 Caching layer (Base Map)

With this icon it is possible to **activate/manage the cache of the single layers** and **create XYZ Tiles layer**

The form allows you to:

- **enable cache** on the layer
- **reset the cache of the single layer**
- **reset the cache of all the layers of the project**
- **create an XYZ Tiles layer** (to use as a **base layer** for your projects) starting from the cached layer

In this last case you have to set:

- Base layer title
- Base layer description
- Base layer attribution

The newly created base layer will be available to be associated with those available for the various Cartographic Groups.

10.8.4 Plots from DataPlotly QGIS plugin

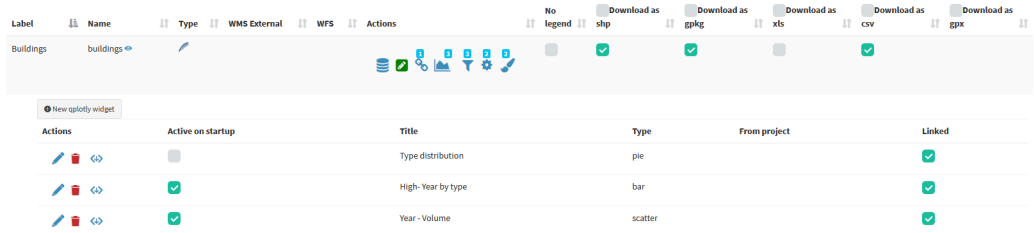
View plots created using QGIS DataPlotly (a great plugin developed by Matteo Ghetta) in the cartographic client.

The module, based on the Plotly library, manages **plots saved as xml**.

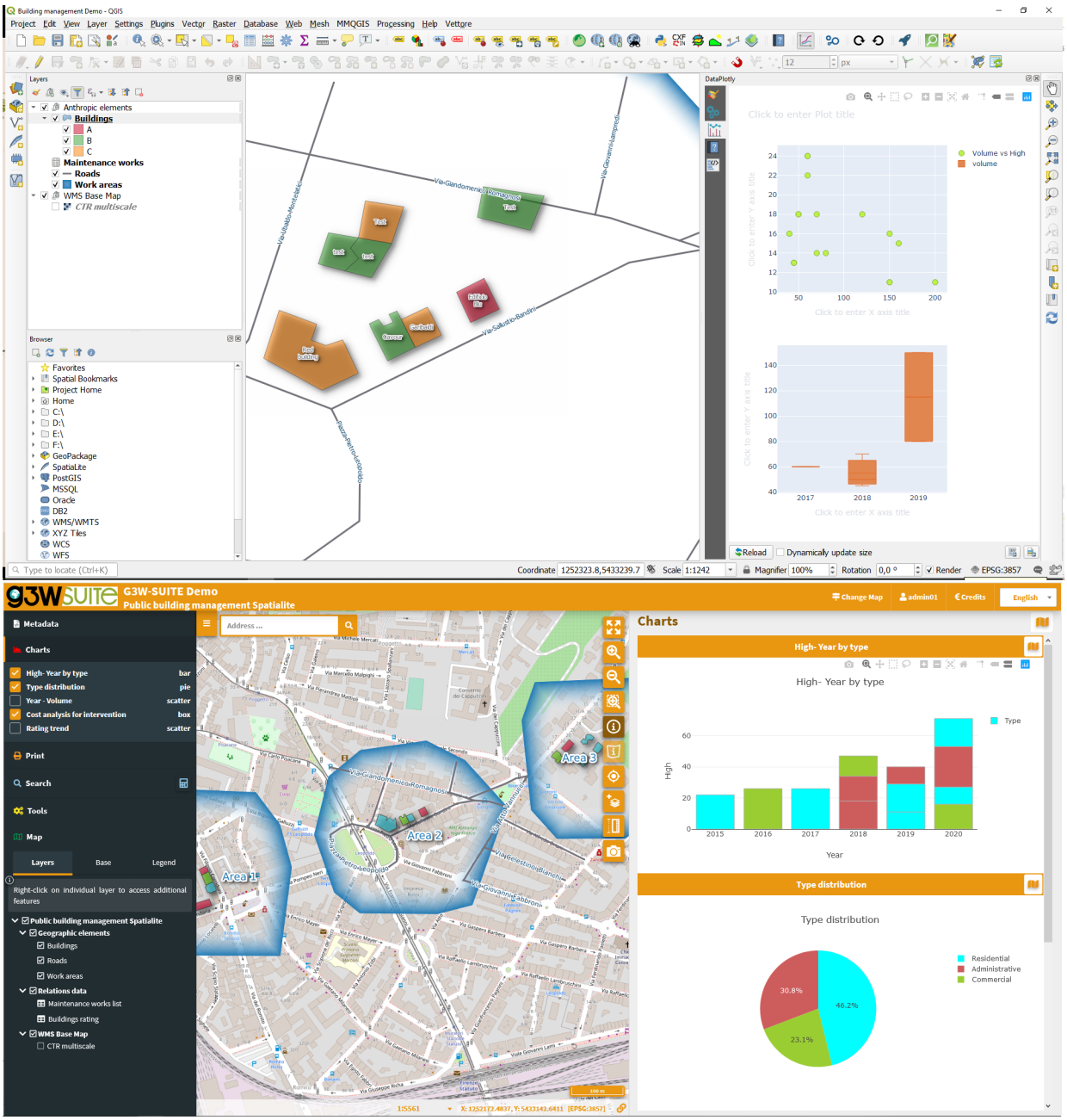
The plots are connected to the layers defined on the QGIS project, in this way, as for the searches and the constraints, it is possible to activate (checkink the **Linked** checkbox) the same plots on all WebGis services in which the reference layer is present.

It is also possible:

- download the plot XML file to reuse it in QGIS
- define the activation status of the plots when the WebGis service is started



The title of the chart, defined at the plugin level, will be the unique identifier.

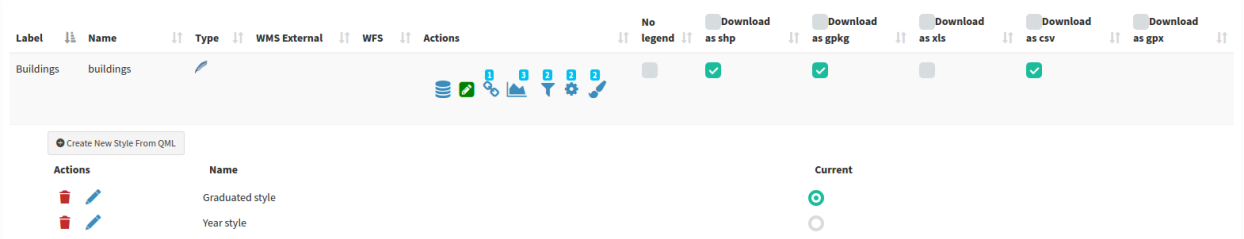


It will be possible to **filter plots based on the geometries visible on the map and/or selected by the user**.

10.8.5 Manage layer styles

If **multi styles have been associated with the same layer** in the QGIS project, they will be exposed.

It will be possible to associate new layers by **loading related QML files** and **set the style to be used as default**.



10.8.6 Search widget setting

In G3W-SUITE it is possible to create search widgets.

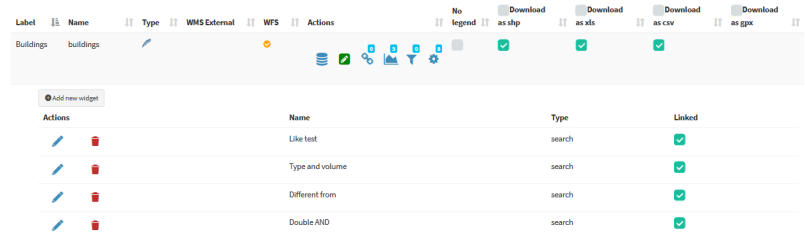
By default, searches can be built on individual vector layers based on the fields of the table associated with the layer.

NB: it is possible to create searches based on fields derived from simple joins (1:1/n:1) switching form WMS to QGIS API method. See dedicated paragraph.

Every search widget will be saved by referring to the layer identifiers (for example the DB parameters: IP, DB name, schema, layer name).

This aspect allows, once a search widget for a layer has been created, to have it available on all the projects in which the layer is present, without having to rebuild the widget from scratch each time.

In the list of layers present within the project, **identify the layer on which to create and associate the search widget** and click on the icon



By clicking on the icon, the list of already active (or activatable) widgets associated with the layer will be shown.

These widgets can be **modified, deleted or disconnected** using the appropriate icons.

ATTENTION: deleting a search will delete it from all projects in which that search is active.

To **deactivate a search** from a project, simply disconnect it using the check-box on the right.

To **create a new search**, click on the link `New widget`.

In the pop-up that appears, the **`Search` type** have to be chosen.

In the related form we can define:

- **Form Title**
  - **`Type`:** "Search"
  - **`Name`:** name that G3W-SUITE will use to internally register the search widget.
- **General configuration of research and results**
  - **`Search title`:** title that will become available in the **'Research'** panel of the WebGis interface
- **Search fields settings**
  - **`Field`:** field on which to carry out the research
  - **`Widget`:** method of entering the value to be searched `InputBox`: manual compilation `SelectBox`: values shown via drop-down menu `AutoCompleteBox`: values shown through auto-complete mode
  - **`Alias`:** alias assigned to the field that will appear in the search form
  - **`Description`:** description assigned to the field
  - **`Comparison operator`:** comparison operator (**=, <,>,> <,> =, <=, LIKE, ILIKE**) through which the search query will be carried out.
  - **`Dependency`:** this parameter (optional) allows, only in the case of SelectBox widgets, to list the list of values of a field filtered according to the value defined for the previous fields. The tool allows, for example, to display, in the drop-down menu dedicated to the choice of cadastral particles, only the particles connected to the sheet chosen in the previous option. This function is only available for PostGis or SpatiaLite layers.

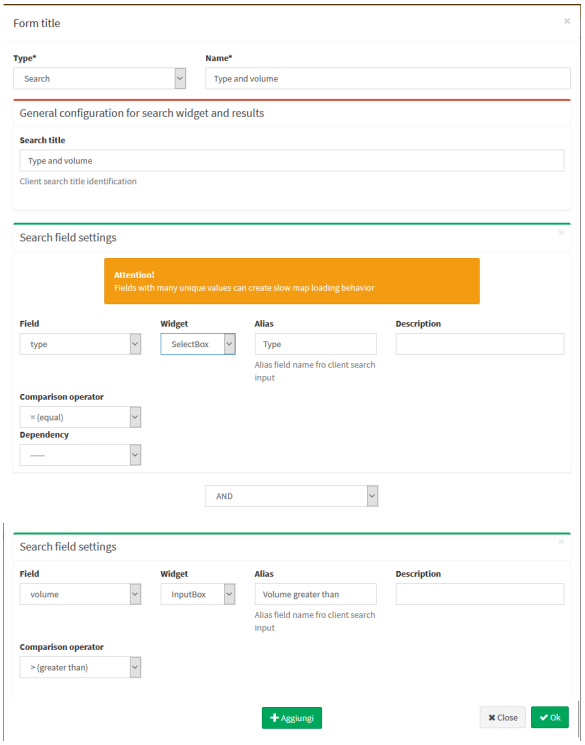
Warning: in the case of fields with more than 100 unique values, the WMS service does not allow to obtain the complete list of values. In this case it is recommended not to use the `SelectBox` method

Alternatively, you can use the QGIS API as a search method to overcome this limitation. See dedicated paragraph.

The button

allows you to add additional fields for the construction of the search query currently manageable through **AND/OR operators**.

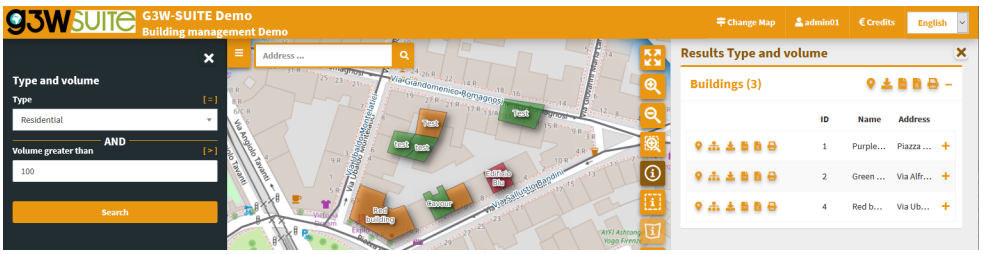
The example below shows the compilation of the form for creating a search widget dedicated to a cadastral cartography layer.



Once the form has been filled in, click on the OK button to save the settings.

Once the settings are saved, the created widget will appear in the list of Widgets associated with the layer.

The widget will already be `connected` and therefore **available in the WebGis interface**.



IMPORTANT: the created search widget will now be available (disconnected) for all projects in which the layer with which it has been associated will be present.

This will allow you not to have to recreate the widget several times and to decide in which projects to activate the search and in which not.

10.9 Multilinguage

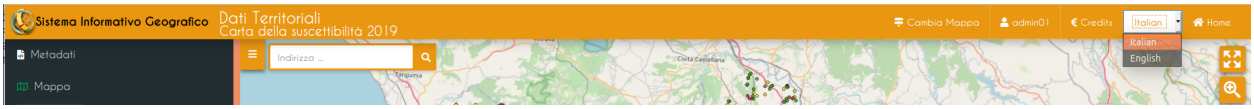
y default the suite manages four languages:

- English
- Italian
- Finnish
- Swedish

Other languages can be added.

10.9.1 Map client

On the top bar you can choose, through a drop-down menu, the language of the entire client interface.



10.9.2 Administration

Also for the Administration panel, through the same drop-down menu, it is possible to define the language of the entire interface of the console.

10.9.3 Front end

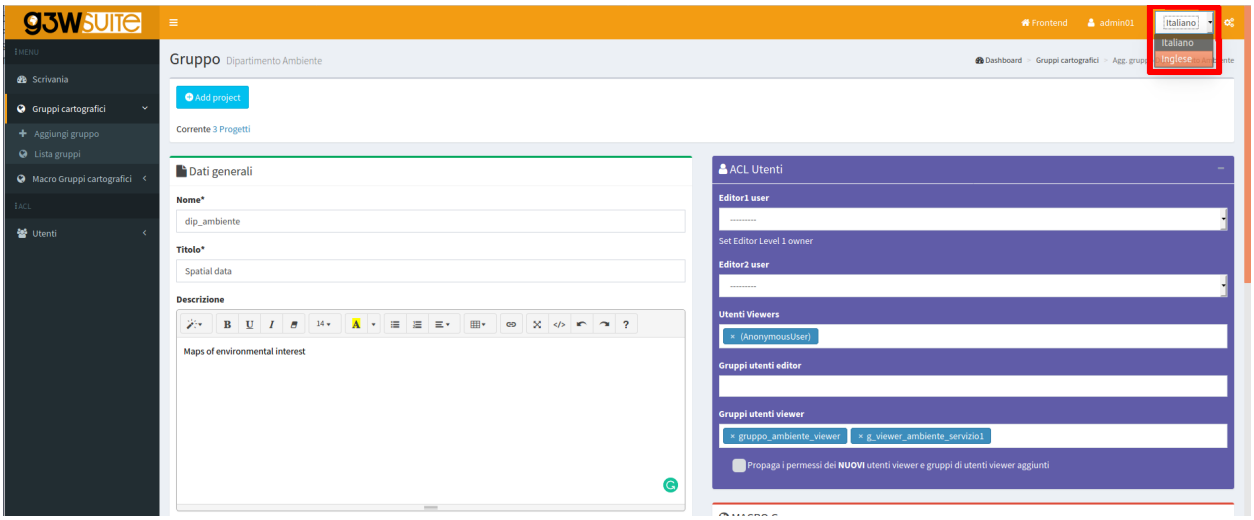
Fixed front end content is already available in the four basic languages.

Variable contents, i.e. user-definable contents, are instead translated:

- Sessions **`Home`**, **`About`**, **`Maps`** and **`Login`**: content that can be defined and translated in the **Edit General Data** session of the Control Panel Administration
- Sessions **`MacroGroups Cartogarfici`**, **`Groups Cartogarfici`** and **`WebGis Services`**: contents definable and translatable in the form defining these elements, limited to the items:
  - **Public Title**
  - **Description**

To carry out the translation of these contents, proceed as follows:

- access to the form for creating the element (**MacroGroup, Group or WebGis Service**)
- define one of the available languages from the drop-down menu at the top right
- fill in the form in the chosen language
- save the settings



Then:

- access the form again in modification
- change the language
- fill in the translatable content in the new language
- save the new settings

Titles and Descriptions of the various elements in the defined languages will be available on the front.

CHAPTER

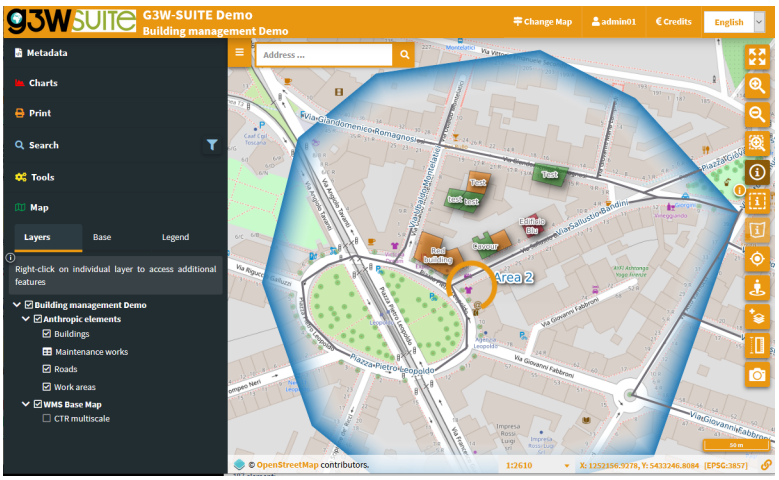
ELEVEN

G3W-CLIENT: THE CARTOGRAPHIC VIEWER

11.1 Generic aspects

The application has a responsive interface consisting of expandable and reducible sessions.

The color of the interface depends on the type of user logged in.

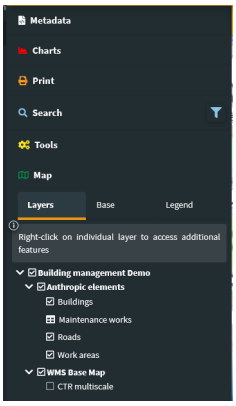


The header contains the following elements:

- **Logo, title and subtitle**, deriving from:
  - main title (set at General Data level) or MacroGroup name, according to the settings
  - Cartographic Group name
  - WebGis service title
- **Change map:** which allows you to switch from one WebGis service to another (located within the same Cartographic Group) while maintaining extension and display scale
- **User ID:** if you have logged in to the system
- **Credits**
- **Home:** to access the FrontEnd
- **Language:** the choice of language is reflected in the individual menus of the map client and on the contents of the access portal. The languages available are those activated by the Administration.

The **Tools panel** is located on the left and containing the following objects:

- **Metadata:** content defined on QGIS project
- **Print:** printing tool based on the layouts defined on the QGIS project
- **Search:** with the search tools defined through the Administration panel
- **Tools:** session that collects the various tools that may be activated on the WebGis service
- **Map:** containing:
  - **Layers:** structured list of layers, defined on the QGIS project
  - **Base:** choice of the base map from those defined at the creation level of the Thematic Group
  - **Legend:** graphic legend of the various layers



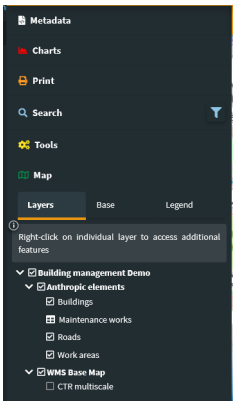
The centrally located **`map area`** presents the various navigation and map interaction controls, this controls are defined at the Cartographic Group level.

11.2 Navigation and interaction with the map

11.2.1 Map area

At the base of the map area there is an information bar showing:

- **display scale**
- **mouse coordinates**
- **project projection system**
- **icon to copy the URL with the references to the extension currently displayed**



11.2.2 Map controls

The icons and description of the functions of the various `MapControls` activated at the thematic group level are shown below.

- **`zoomtoextent`:** zoom to the initial extension
- **`zoom`:** zoom in and zoom out
- **`zoombox`:** zoom tool based on drawing a rectangle
- **`query`:** puntual query of geographical layers
- **`querybbox`:** query via bounding box - **N.B.** for the layers to be queried according to this method it is necessary that they are published as WFS services on the QGIS project
- **`querybypolygon`:** it will be possible to automatically query the features of one or more layers that fall within a polygonal element of a guide layer. (Eg what's inside a cadastral parcel?). - **N.B.** the questionable layers must be published as WFS services on the QGIS project
- **`geolocation`:** geolocation tool (useful for consultation from tablet)
- **`nominatin`:** search tools for addresses and toponyms based on OSM
- **`streetview`:** Google StreetView on your map
- **`length`:** linear measuring instrument

- **`area:`** tool for measuring surfaces
- **`addlayers:`** tool for temporarily uploading GeoJson ,KML and SHP (zipped) vector layers to WebGis
- **`snapshot:`** tool for taking snapshots of the map area

It should be noted that the query function acts, by default, with the coring method, providing information relating to all the layers underlying the point where you click with the mouse or draw a box.

To query a single layer, it must be previously selected at the TOC level.

Remember that query modes based on **querybbox** and **querybypolygon** require the publication of all the layers involved as WFS services at the QGIS project level.

NB: Remember that, after viewing the results, it will be possible to zoom on the feature associated with the individual results only if the option **`Add geometry to object response`** has been activated at the QGIS project level (**`Project`** → **`Properties, QGIS Server session`**).

11.2.3 Attributes form

In the QGIS project (**`Vector properties`** → **`Attributes Form`**), you can create custom attribute forms (tabs, groups . . .)

The same structured form will be reported at the query level on the cartographic client.

The window is resizable.

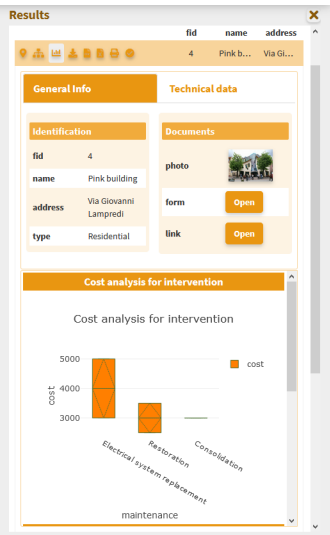
Any links to photos will determine the display of a clickable preview, any links to links or other multimedia content will determine the display of the Open button that will allow consultation of the link.

For further information on this point, see the **dedicated paragraph**.

The orange bar above the query results shows the following icons:

- **Zoom to features:** if the function is activated on the Properties of the QGIS project
- **Show relations (1: N):** if present on the QGIS project

- **Show relation charts:** display of plots related to 1: N related data. Only if 1: N relationships are associated with the interrogated layer and plots have been activated on the referencing tables.
- **Download Shapefile, GPK, GPX, CSV, XLS:** if activated in the administration session
- **Print Atlas:** prints the atlas sheet (if set on QGIS project) related to the queried feature
- **Add/Remove selection:** add/remove the features to the current selection



11.2.4 Display of 1:n relation data

In the event that, at the QGIS project level, **one or more type 1:n relations** have been associated with a layer, the icon **View Relationships** will be shown in the attribute form.

By clicking on the icon you will access the **list of 1:N relations** present and, from these, the list of child records associated with the individual relationships.

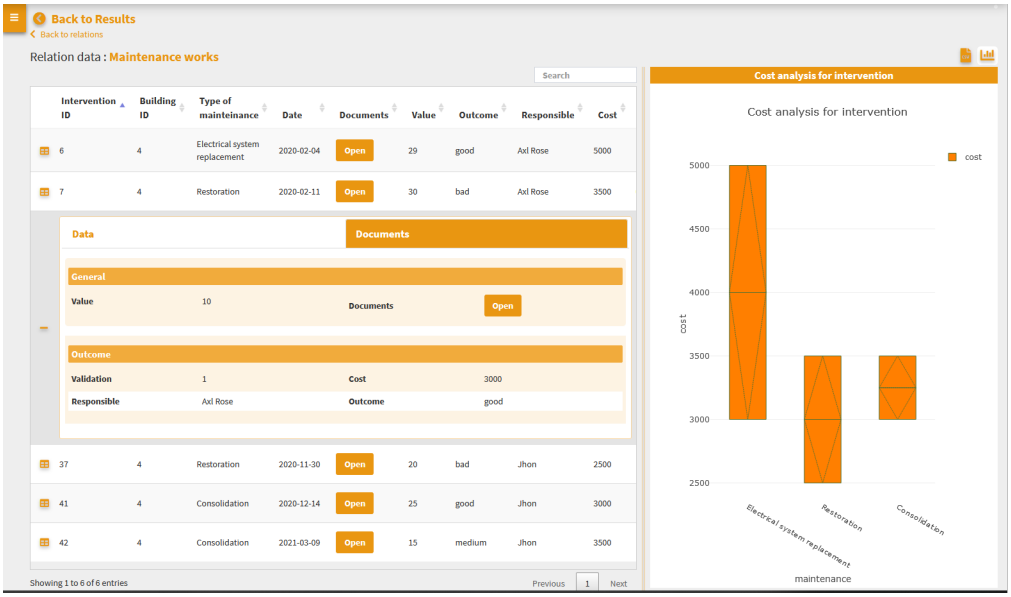
In the case of a **simple 1:1 or N:1 joins**, the joined records will be displayed directly in the main form.

In the new frame, a filter, applied generically to the contents of all fields, will allow you to filter the list of child records.

The icon to the left of each record allows you to switch from the classic table view to the one based on any form defined on the QGIS project

In the case of **links to multimedia contents**, the previews of the images and/or the **`Open` button** will be displayed for consultation of different types of content.

In case of **active plots** on the related table, these will be displayed through **`Show charts`** at the top right.



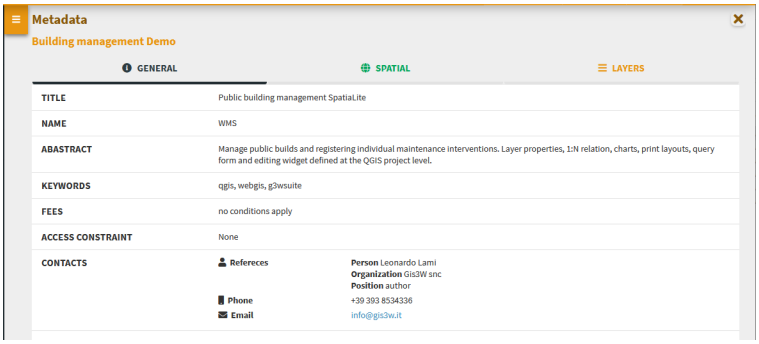
11.3 Tools panel

11.3.1 Metadata

The metadata reported in this session derive from those set at the QGIS project level.

This content is divided into three sessions: **General, Space Info and Layers.**

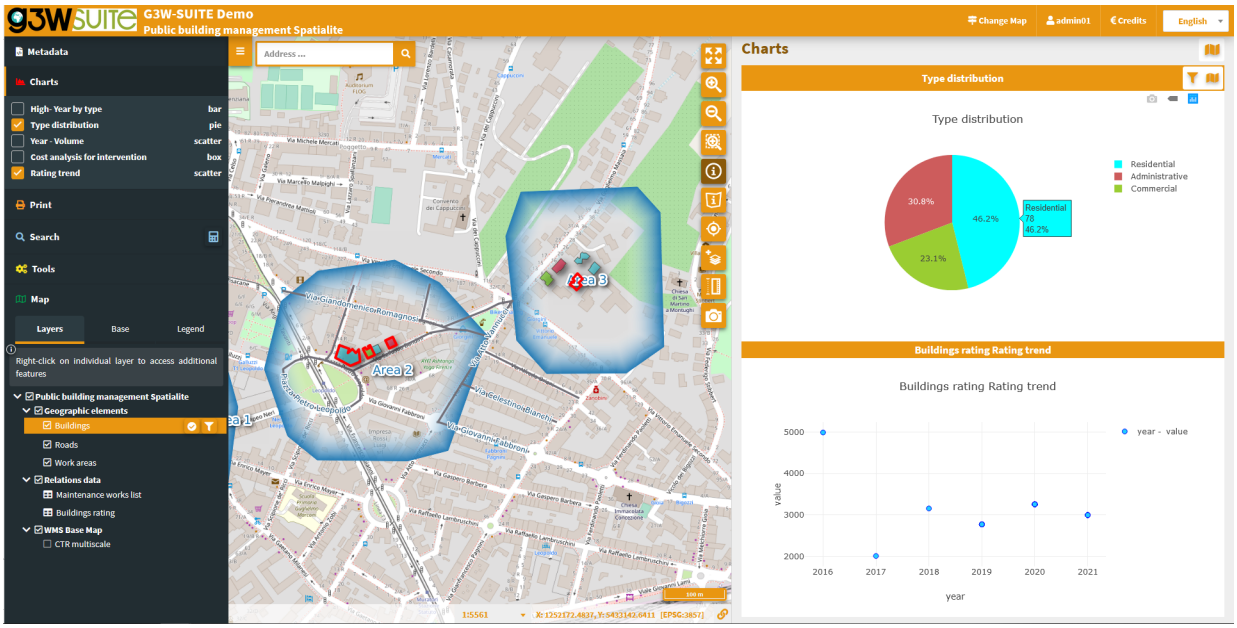
- **`General:`** reports the **metadata defined on the QGIS project** in the item: **`Project`** → **`Properties (QGIS Server session, Service Capabilities)`** In case of login as anonymous user the URL of the WMS service is shown.
- **`Spatial:`** reports the **EPSG code** of the projection system associated with the QGIS project and the **BoundingBox** relating to the initial publication extension, defined in the item: **`Project`** → **`Properties (QGIS Server session, WMS Capabilities, Advertised extent)`**
- **`Layers:`** reports **simple metadata associated with the individual layers**.



11.3.2 Charts

View graphs created using QGIS DataPlotly and activated at the admin session level.

Check the plots in the list and consult them on the rigth panel.



The graphs are filterable based on the:

- features visible on the map
- filter based on the selected features

These **filters** are also **reflected on the plots associated to the related data** (in 1:N mode) based on the visible and/or selected parent features.

The **filter based on the map content** can be activated globally on all plots (icon at the top of the panel dedicated to charts) or on only some specific plots (icon placed at the level of the individual plots).

The plots will automatically update after pan and zoom operations on the map

If activated, the **filter based on the selected features** is automatically activated on all related plots (associated with the same layer and with the 1:N relationed tables)

Appropriate **messages** at the single plots level will indicate the activation of these filters.

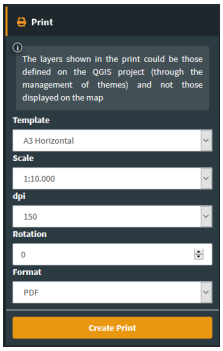
11.3.3 Print

Printing tool based on layouts defined on QGIS project.

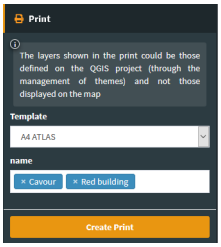
The tool allows you to choose:

- **Template:** print layout among those associated with the published QGIS project
- **Scale:** print scale
- **DPI:** print resolution
- **Rotation:** rotation angle
- **Format:** print to PDF or JPEG

On the map, a lit rectangular area will allow you to define the print area.



If an **Atlas type print layout** is associated in the QGIS project, the layout reference will be available. The cards to be printed are defined by referring to the atlas identifier defined in the print layout.

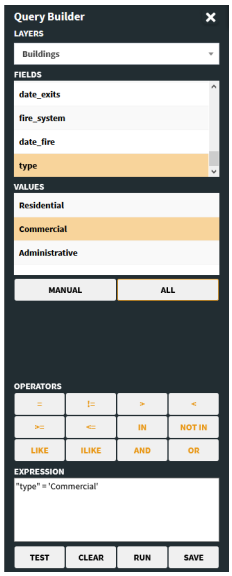


11.3.4 Search and Query Builder

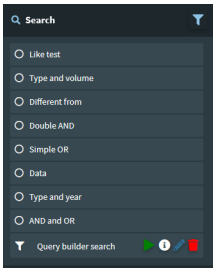
A classic Query Builder is present at the Search menu level. Through this tool it is possible to:

- carry out alphanumeric searches on geometric layers
- save the query to reuse it until the end of the work session
- edit a previously saved query

The saved query will be available until the browser cache is cleared



The Search menu contains the list of search tools defined through the Administration panel and custom searches created with the Query Builder.



You choose the search you are interested in, fill in the required fields and click on the **`Search` button**.

The **panel with the list of results** will open on the right side of the client, for each result the first three fields of the associated table will be displayed.

By positioning on the individual results, the corresponding features will be highlighted on the map; clicking on the individual results you can consult all the attributes.

Zoom to features and download icons are available for results (single or cumulative)

11.3.5 Map

This session has three tabs:

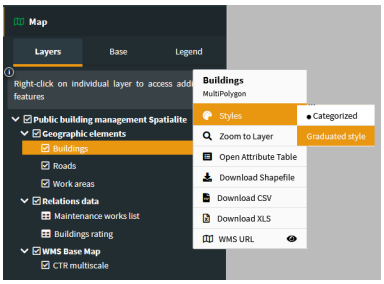
- **Layers:** structured list of layers, defined on the QGIS project
- **Base:** choice of the base map from those defined at the Cartographic Group creation level
- **Legend:** graphic legend

Layers

In the list of layers, right click on the name of the single layer shows the following items:

- **Styles:** to choose the style to be applied to the layer, in the case of multi-style layers
- **Name and kind of geometry** of the layer
- **Zoom to layer:** to zoom in on the extension of the layer
- **Open attribute table:** to consult the associated attribute table
- **Download shapefile:** to download the layer as a shapefile; function activable from the administration panel
- **Download GeoPackage:** to download the layer as a GeoPackage; function activable from the administration panel
- **Download CSV:** to download the layer as a CSV; function activable from the administration panel

- **Download XLS:** to download the layer as a XLS; function activable from the administration panel
- **WMS URL:** URL of the WMS service relative to the project or URL of the external WMS

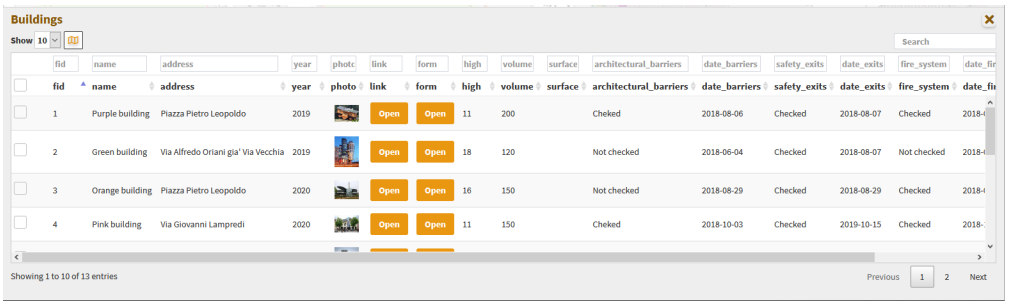


Attribute table

The attribute table (resizable) is equipped with **paging function, highligth function and zooming** to the associated features.

In the case of links to **multimedia content**, the previews of the images and/or the **Open** button will be displayed for consultation of different types of content.

The window is resizable.



A **generic filter**, positioned at the top right, is applied generically to the contents of all the fields and it will allow you to filter the list of displayed records.

Filters based on the contents of the individual fields are available at the top of each column.

The **Show features visible on the map** icon allows you to filter the records of the table according to the features visible in the map.

From this version it is possible to **select the features of the individual layers and apply filters** that will affect:

- on the map content
- on the attribute table content
- on the contents of the plots
- on print contents (only with QGIS 3.18)

The selection of features can be made:

- at the attribute table level (through the checkboxes on the left of each records)
- on the results of a query (add / remove from current selection)
- on the results of a query (add / remove from current selection)

At the same time, additional icons appear:

- on the layer attribute table
- to the right of the layer on the TOC
- at the level of the relevant plots

Aggiungi immagine: g3wclient_selection.png The icons in the attribute table allow you to:

- Clear selection
- Invert selection
- Add/Remove filter

The icons to the right of the layer on the TOC allow you to:

- Clear selection
- Add/Remove filter

When one or more features are selected, they appear highlighted in red on the map. Activation of the filter is reflected:

- on the map content
- on the attribute table content
- on the data displayed by plots
- on the print contents (only with QGIS 3.18)

Base layer

The list shows the active base layers at the cartographic group level.

If the user has created base layers starting from cached layers, these may also be present.

Legend

if the option is activated on the QGIS project, the legend is filtered on the map content.

CHAPTER

TWELVE

EDITING ON LINE

12.1 Activation and configuration

Thanks to the integration with the APIs of QGIS it is now possible to manage the main formats (geographically and not) supported by QGIS Server:

- **reading and editing mode**
  - PostGreSQL/PostGis
  - SQLite/SpatiaLite
  - GeoPackage (not recommended for multi-user editing)
  - ShapeFile
- **reading mode**
  - SQL Server
  - Virtal layer

The suite also allows you to manage **`1:N relational editing`**.

Be careful: in this release editing is not available on simple join (1:1/n:1) data

The **editing settings** are defined partly at the **QGIS project level** (**editing form structure, widgets associated with individual attributes, 1:n relationships**) and partly at the **Administration level** (users with editing power, activation scale, alpha and geo constraints).

It should be noted that this function manages **`multi-user editing`** through a **features-lock system**.

When an enabled user activates the editing function at the map client level, the **features visible on the map at that time will be blocked**, in relation to the editing aspect, **for all the other enabled users** who will still be able to edit features present outside this geographical extension. .

This block will be deactivated when the user exits the editing mode.

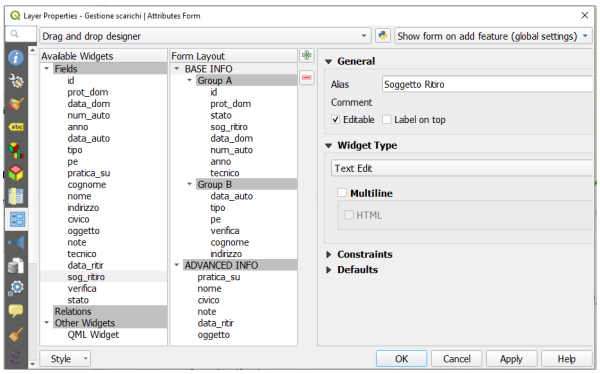
12.1.1 QGIS project settings

Definition of the attribute editing form

In the QGIS project, for each layer it is possible to **define the structure of the attribute display module**.

The same structure will be used in the cartographic client when editing attributes.

The definition of the form structure can be managed, on QGIS, from the **`Properties of the vector`, in the `Attributes Form section`**.



Definition of editing widgets associated with individual attributes

At the QGIS project level (always from **`Vector Properties`**, **`Attribute Form`** section) it is possible to define an alias and an editing widget for each attribute.

The alias and editing widgets defined at the project level will be available during web editing with some limitations.

Below are the available widgets and any limitations:

- **`Checkbox`**
- **`Date/time:`** management of the date only
- **`Attachment`**
- **`Range`**
- **`Text edit`** with this excluded options:
  - multiline
  - html
- **`Unique values`**: this widget will be equipped with a **pick layer** tool at the cartographic client level
- **`Value map`**
- **`Value relations`** with this excluded options:
  - sort by value
  - allow multiple selections
  - filter expression

With regard to the **`Attachment widget`**, it is necessary to specify that the association of a multimedia file with a feature requires that this file is uploaded to a dedicated space (exposed on the web) on the server and that the association takes place via a URL that refers to that file.

This solution allows you to consult the associated attachments also from QGIS or from other GIS software.

Additional settings at single layer level

In the **`Attribute Form`** section of the **`Layer Properties`** it is also possible to define for every field:

- **enable/disable editing**
- **mandatory and/or unique constraints**
- **range of acceptable values** through the **Range** widget
- **default values**

Definition of 1:n relations

In the event that, at the QGIS project level, one or more 1: n type relationships have been associated with a layer (**`Project menu`** → **`Properties...`**, **`Relations`** **section**), it will be possible to carry out relational editing also on the webgis platform.

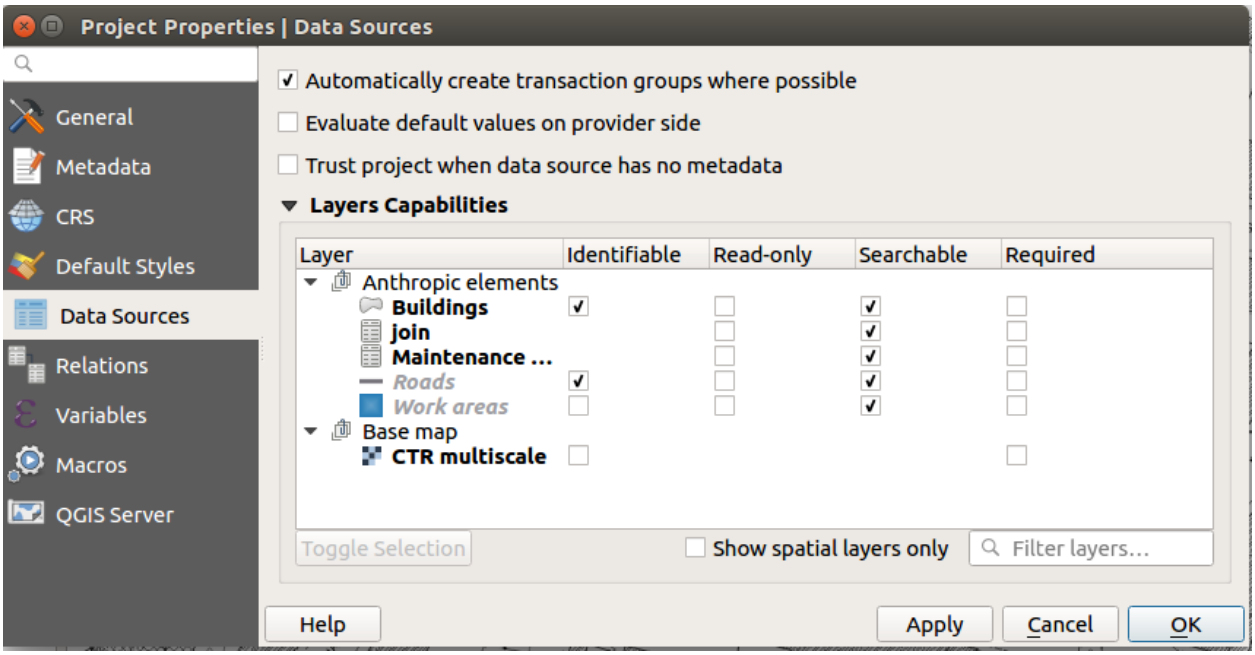
Also for the tables related in 1:n mode it will be possible to define the **attribute form structure, aliases and editing widgets** in the QGIS project.

These configurations and tools will automatically available on the webgis platform.

Transaction Group

Use transaction group to edit, save or rollback multiple layers changes at once

When working with layers with the same source (es. layer from the same PostGreSQL database), activate the **`Automatically create transaction groups where possible`** option in **`Project`** → **`Properties...`** → **`Data Sources`** to sync their behavior (enter or exit the edit mode, save or rollback changes at the same time).



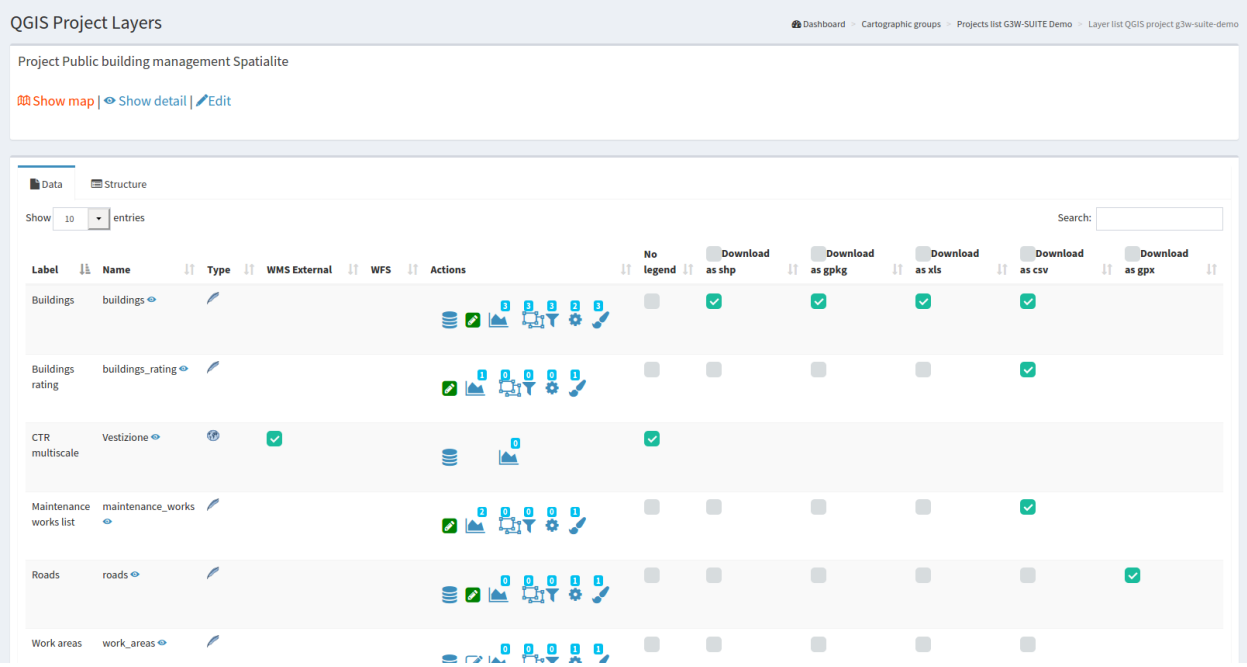
12.1.2 Administration settings

Activation of layer editing

To activate the online editing functions, access the **`Layer list`** section of the project within the administration panel of G3W-ADMIN.

Identify the layer on which you want to activate the editing function and click on the **`Editing layer icon`** located on the left.

Attention: check the list of formats supported by QGIS for editing.



Identify the layer on which you want to activate the editing function and click on the **`Editing layer icon`** located on the left

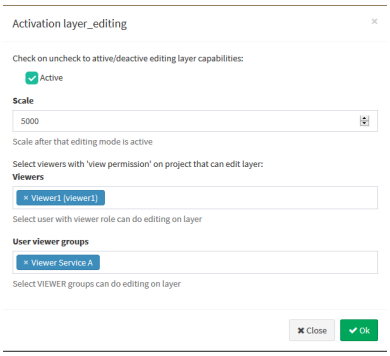
Attention: check that the layer format is among those supported by QGIS for the editing function

Clicking on the icon will open a modal window that will allow you to:

- **define the editing activation scale** (only for geometric tables)
- **define the Viewer users** (individuals or groups) **enabled** for online editing

With regard to the last aspect, it should be noted that:

- **Viewers users** (individuals or groups) **available** in the drop-down menu **will be limited to those who have allowed access in consultation to the WebGis project**
- **Editor1 and Editor2 users**, **owners** of the project, are **enabled by default** to the online editing function



1:N relational editing

To allow editing on the related table in mode 1: n , the **editing function must also be activated** (always in the same way) **also for the related table** present in the project layers list.

Constraints setting

G3W-SUITE allows you to manage two types of constraints:

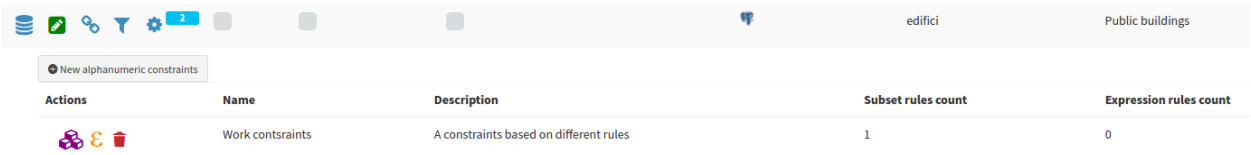
- **alphanumeric / QGIS expressions constraints** that operate both in terms of visualization and editing
- **geographic constraints** that operate only at the editing level

Alphanumeric / QGIS expressions Constraints

Alphanumeric / QGIS expression constraints allow you to define, for each published layer, the subset of features that can be viewed and edited by individual users and/or groups of users.

To activate this type of constraint, you must click, always at the level of the list of project layers, on the **`Alphanumeric constraints list` icon** .

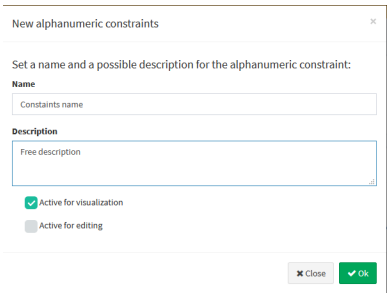
Clicking on the icon will show the list of any existing alphanumeric constraints and the item **`+ New alphanumeric constraint`** to create a new constraints.



Clicking on the item **`+ New constraint`** will open a modal window which will allow you to define a name and a description for the new constraint.

In the form it is possible to specify whether this filter will act at the level:

- display only
- of editing only
- in both cases



After clicking the OK button, the constraint will appear in the list and can be parameterized using two ways of defining the rules:

- **Provider's language / SQL dialect**
- **QGIS Expression**

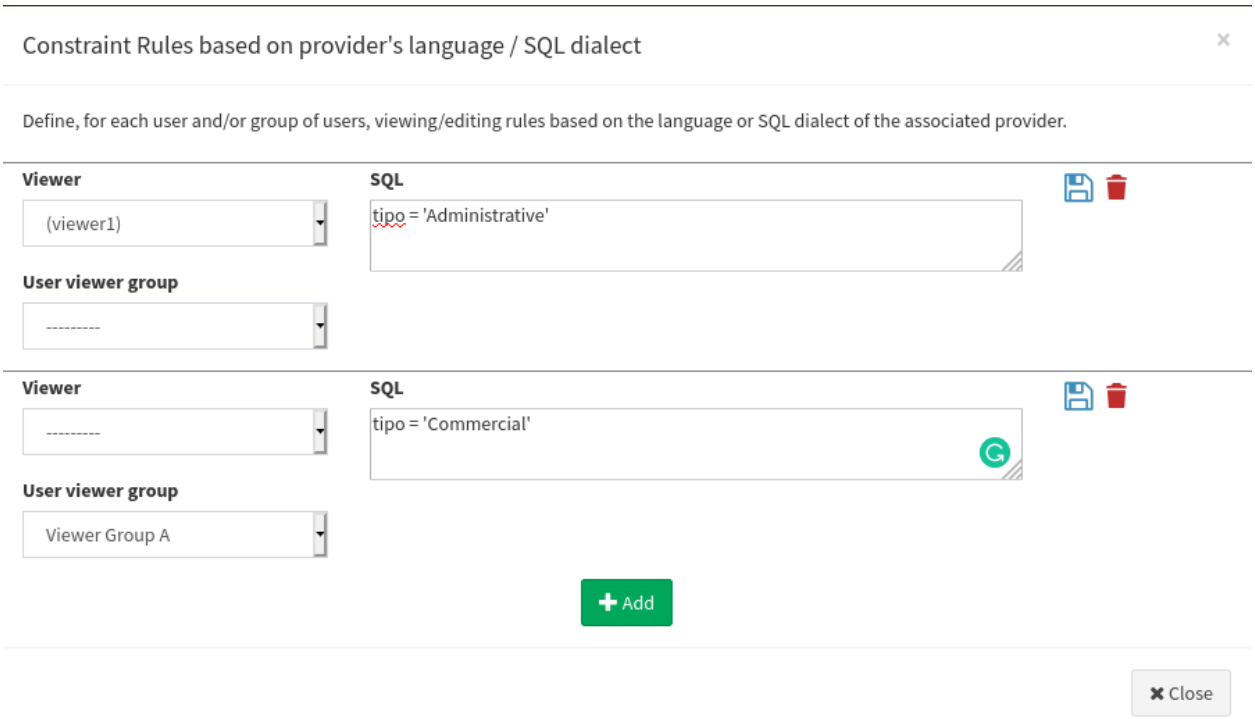
Provider's language / SQL dialect Rules

Clicking on the icon will open a modal window which, by pressing the green button , it will allow you to **define, for each user and/or group of users, the rules of the constraints**.

The individual rules must be defined via the **`Provider's language`** or the **`SQL dialect Rules`** associated with the format of the geo-constraints layer (es. use standard SQL if your layer is a PostGis layer)

The single rules must refer to the layer's attributes and values.

The **`Save icon`** will allow you to validate the rules, in order to ensure proper functioning of the constraints itself.



Once all the constraints have been entered and validated, click on the **Close button** to confirm the rules.

QGIS Expressions Rules

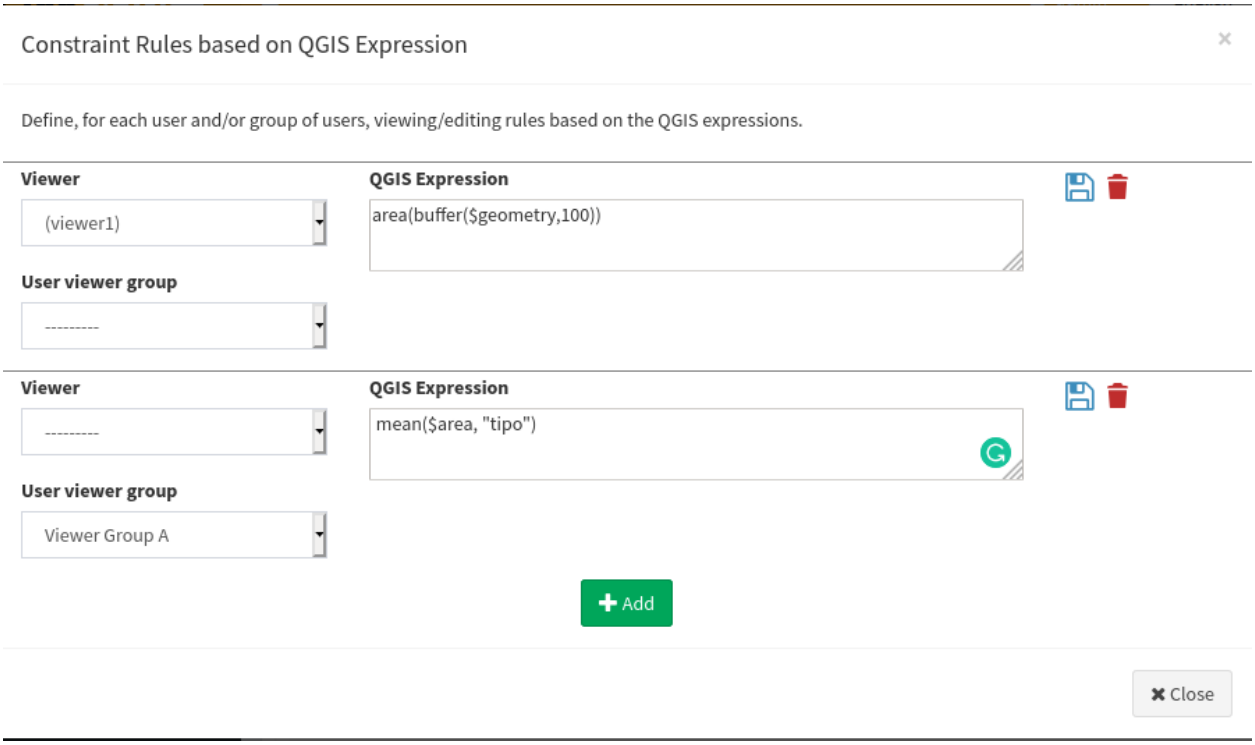
Clicking on the icon **QGIS expression rules** will open a modal window which, by pressing the green button

, it will allow you to **define, for each user and/or group of users, the rules of the constraints**.

The individual rules must be defined via **`QGIS expression`** and this allows to have a great degree of freedom in the ways in which to set these rules.

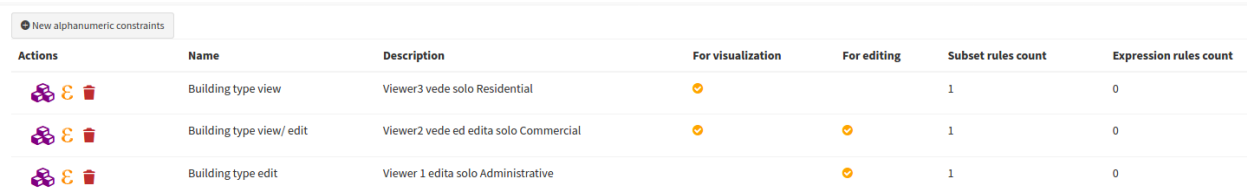
See the paragraph dedicated to the functions available directly on the QGIS manual.

The **`Save icon`** will allow you to validate the rules, in order to ensure proper functioning of the constraints itself.



Once all the constraints have been entered and validated, click on the **Close button** to confirm the rules.

In the dedicated panel it will be possible to check, modify and delete the defined rules.



Geo-constraints

The online editing function also allows you to manage geo-constraints that allow the user to insert/modify features only if they intersect or are contained within specific features of a second polygonal layer.

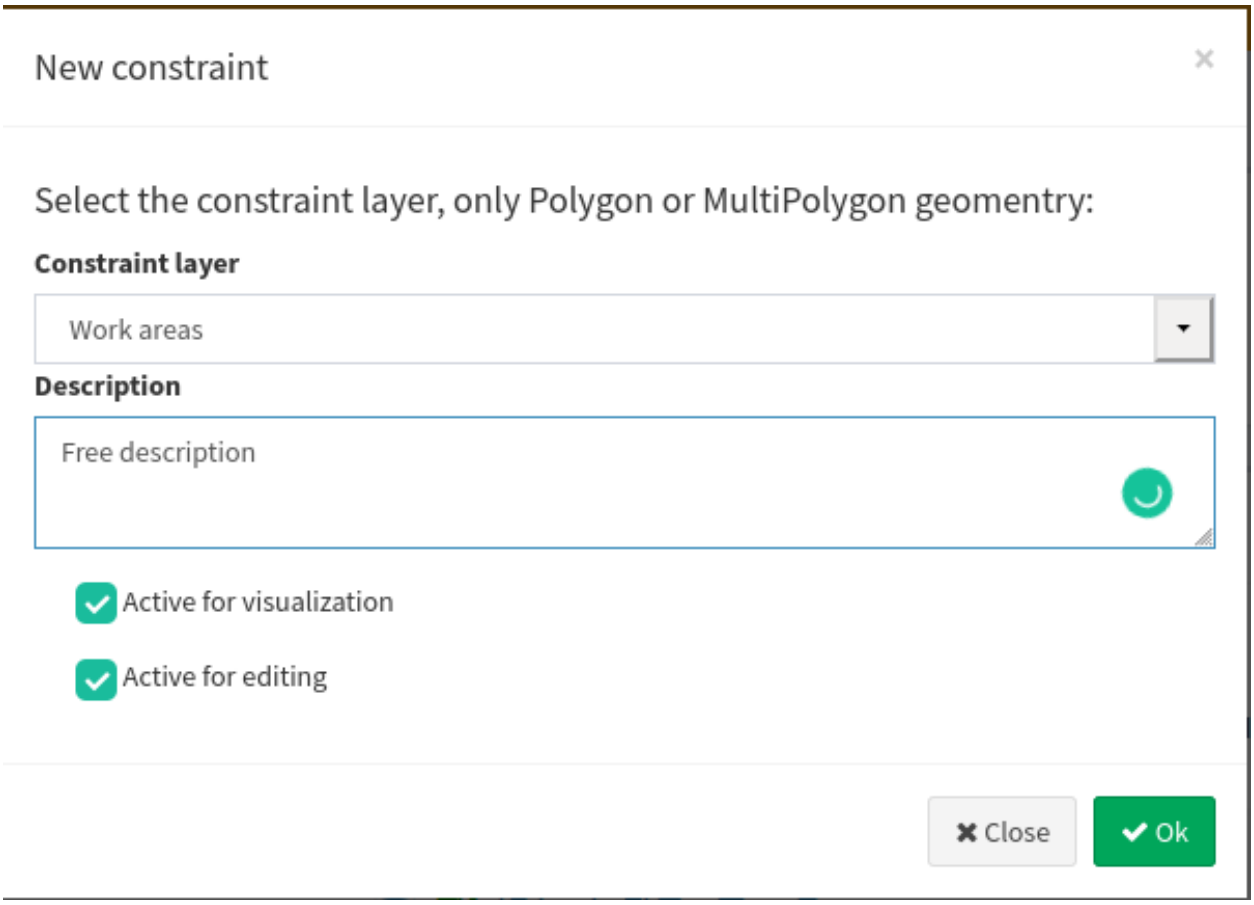
To activate a geographical constraint, you must click, always at the level of the list of project layers, on the **`Manage Geo-Constraints` icon** which will appear once the online editing function is activated.

Clicking on the icon will show the list of any existing constraints and the item **`+ New geo-constraint`** to create a new geo-constraints.

Clicking on the item **`+ New geo-constraint`** will open a modal window which will allow you to **define the polygonal layer** (among those present in the project) **on which the constraint itself must be based**.

In the form it is possible to specify whether this filter will act at the level:

- display only
- of editing only
- in both cases



Once the layer has been defined, the constraint will appear in the list and can be parameterized using the **Rules icon**

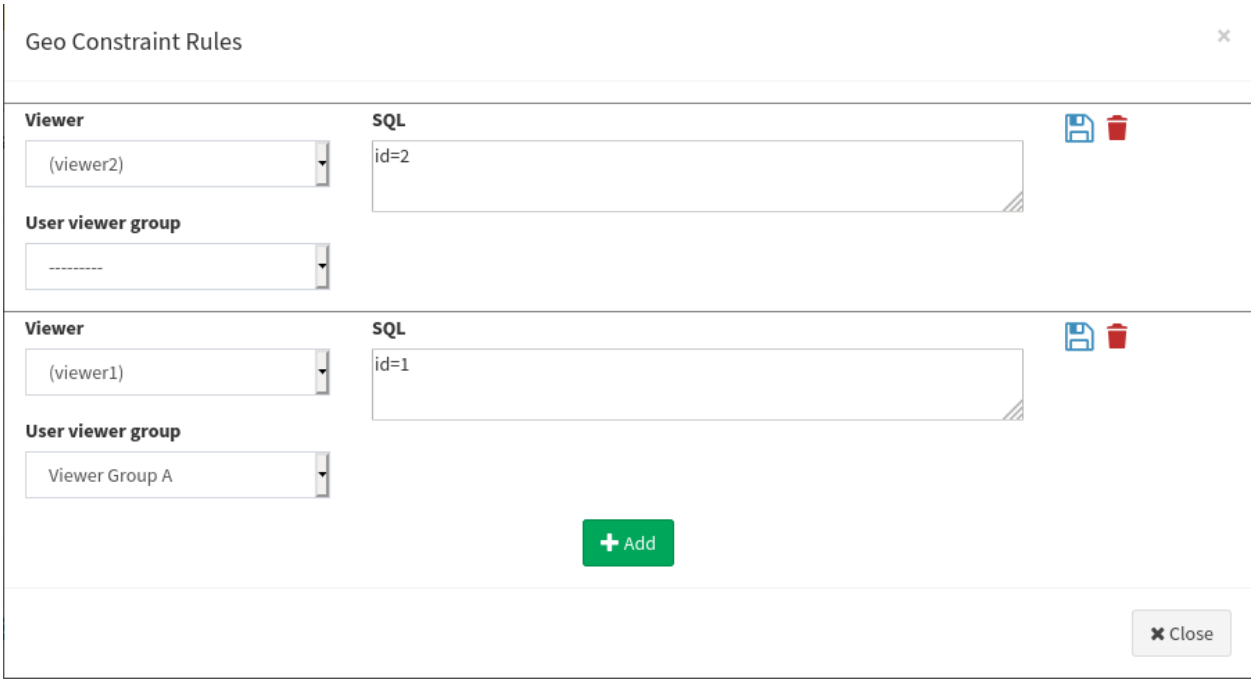
Clicking on this icon will open a modal window which, by pressing the green button

, it will allow you to **define, for each user and/or group of users, the rules of the constraints**.

The individual rules must be defined via the **`Provider's language`** or the **`SQL dialect Rules`** associated with the format of the geo-constraints layer (es. use standard SQL if your geo-constraint layer is a PostGis layer)

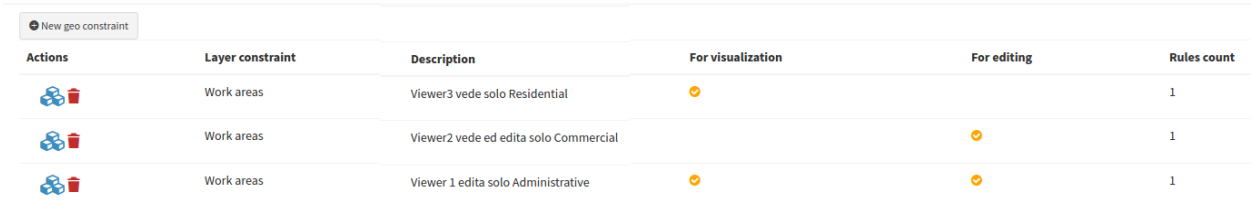
The single rules must refer to the layer's attributes and values.

The **`Save icon`** will allow you to validate the rules, in order to ensure proper functioning of the constraints itself.



Once all the constraints have been entered and validated, click on the **Close button** to confirm the rules.

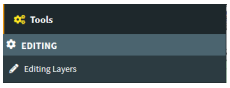
In the alphanumeric constraints list you can see a summary of the setted rules.

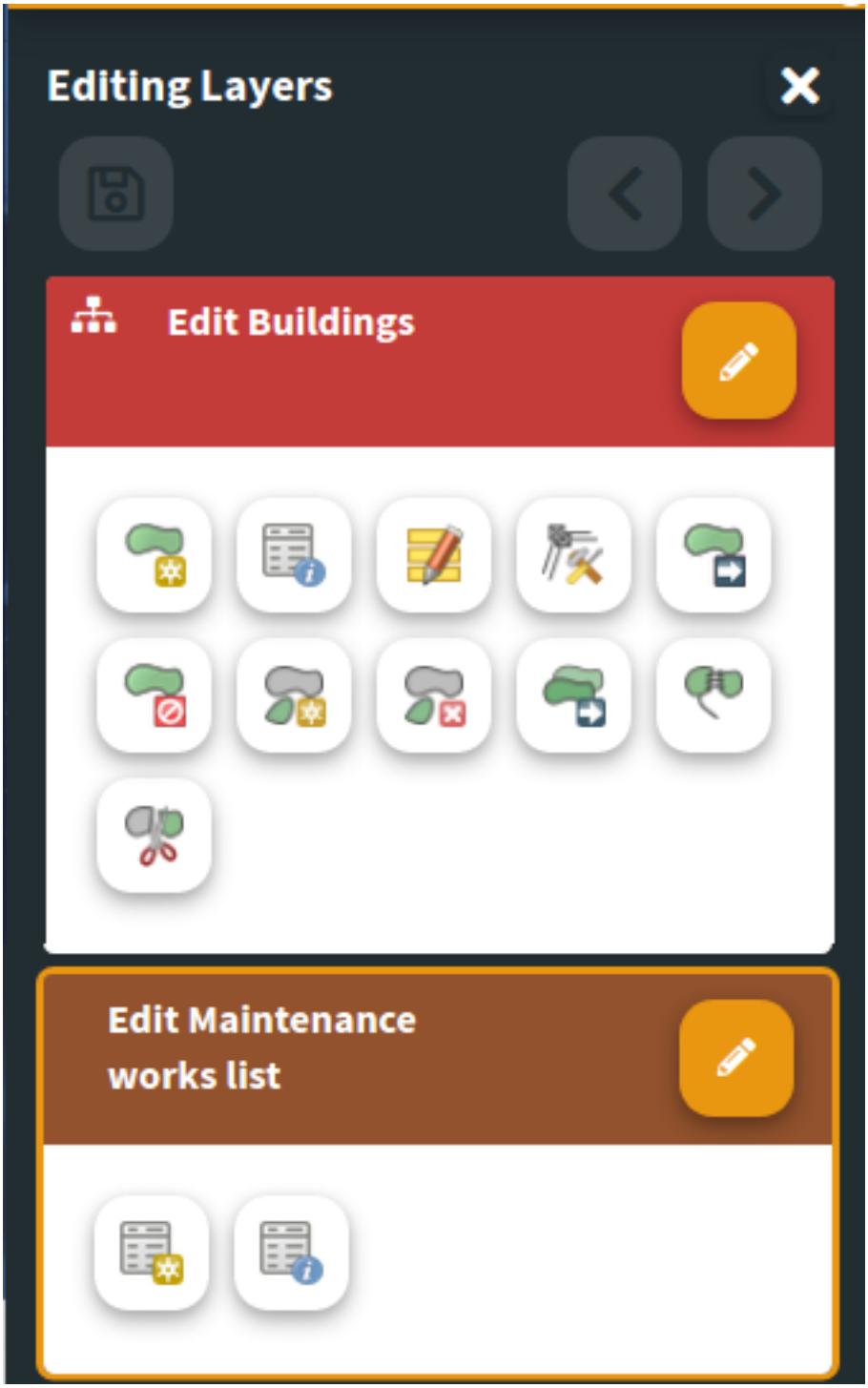


12.2 Online editing tools at cartographic client level

12.2.1 Geographic and alphanumeric editing

Once the online editing function has been activated and configured on one or more layers of a WebGis project, the `Editing` item, inside the `Tools` menu of the cartoographic client, will be shown.





By clicking on the **`Data Layers`** item, the side menu will show the editing tools for all the layers on which this function is activated.

The actual activation of the editing function for the individual layers will take place by clicking on the **`Edit layer`** icon.

Create and edit features

The tools available are the following:

Geometric layers

- **Add feature:** to add a feature
- **Modify feature:** to modify the attribute values associated with an existing feature
- **Update attributes for selected features:** to modify the attribute values associated with more than one features
- **Update feature vertex:** to modify the shape of a geometry
- **Move feature:** to move a feature
- **Remove feature**
- **Add part** of a multi-geometry
- **Delete part** of a multi-geometry
- **Copy features:** to move one or more features
- **Dissolve features:** to dissolve two or more features
- **Split features:** to split one or more features

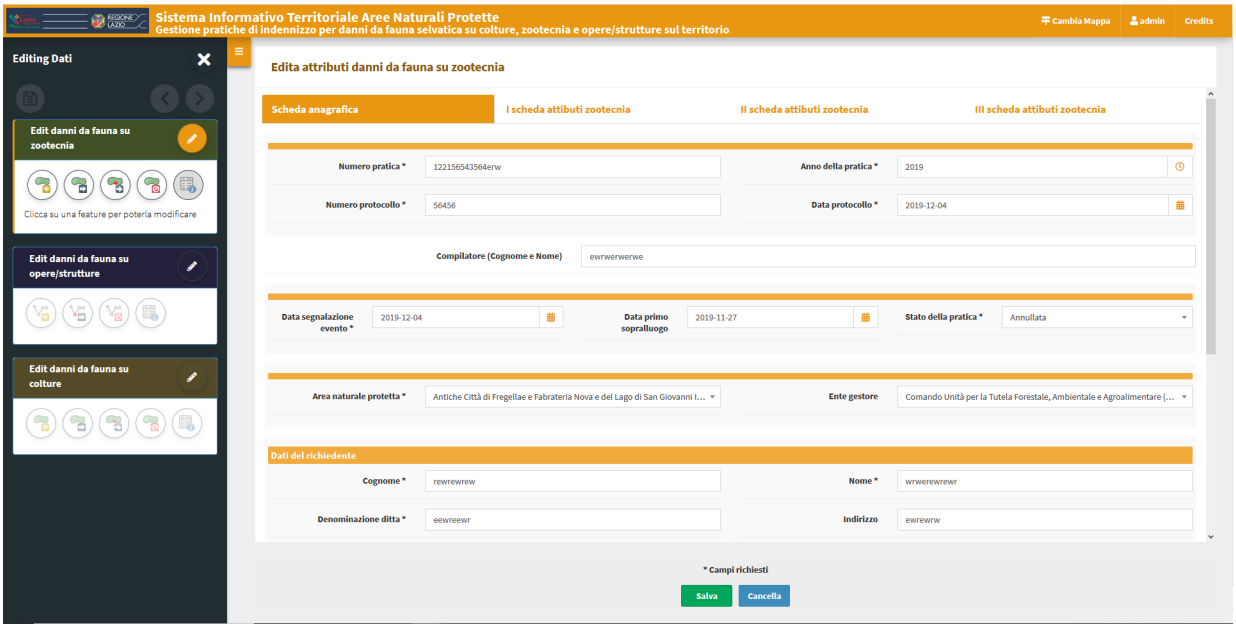
Activating the **Add features** and **Update feature vertex** tools allows you to activate the snap intralayer function.

A help panel will describe the steps to take for copy, dissolve and split operations.

Alphanumeric layer

- **Add feature:** to add a record to the alphanumeric table
- **Modify features:** to modify the attributes of an existing record

Whenever a new feature/record is added or an existing feature/record is update, the attribute editing form and the respective editing widgets will be displayed as defined at the QGIS project level.



Any **mandatory fields will be marked with an asterisk**.

Any **unfulfilled constraints will be highlighted** with specific warning messages shown **in red**.

The changes made can be saved only after satisfying any constraints of mandatory and/or uniqueness.

For this reason the green button **SAVE** will be disabled until all constraints are met.

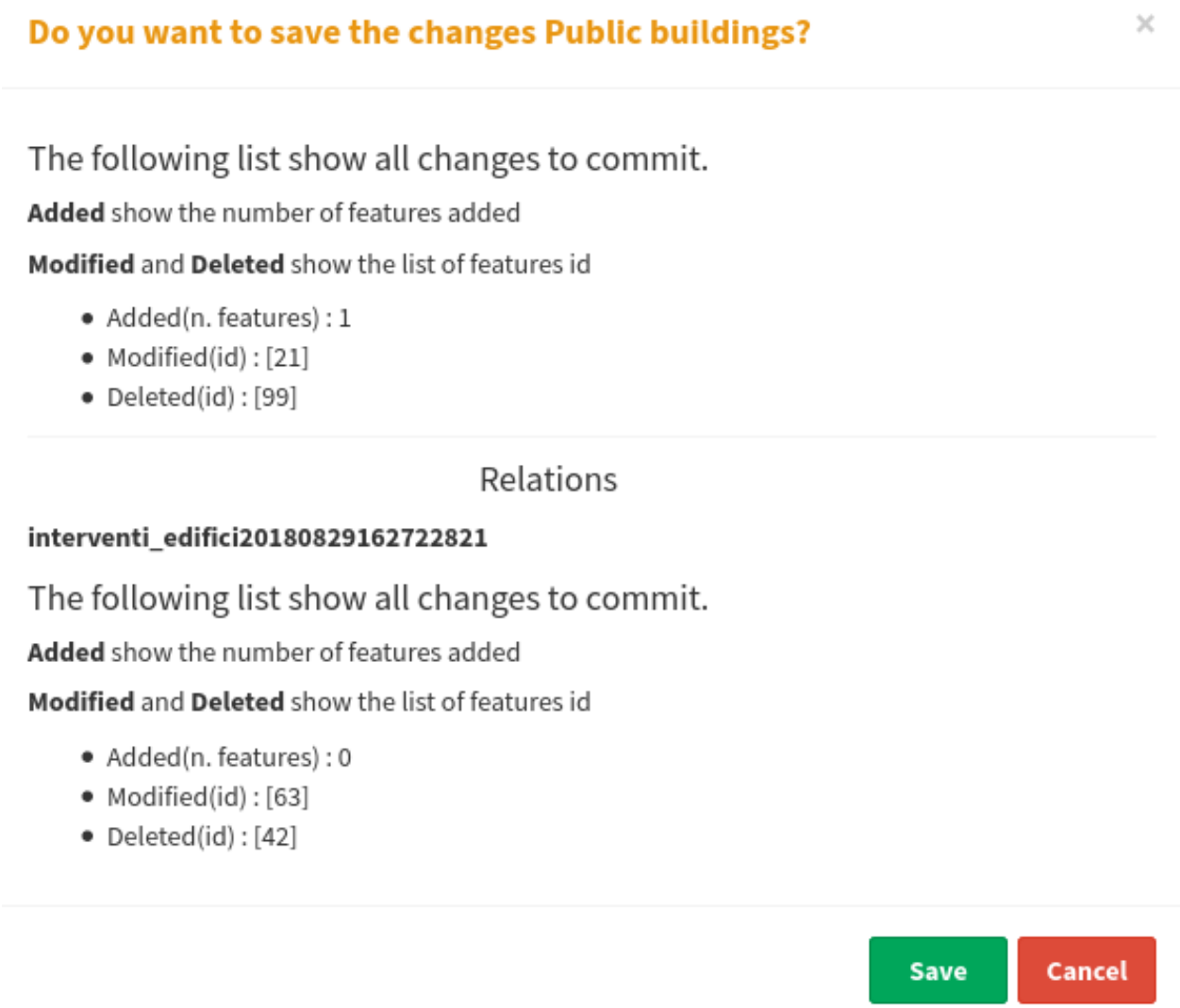
Saving changes

Saving all the changes made in an editing session can be done in two ways:

- by clicking on the **`diskette icon`** placed at the top right. The changes made will be saved and you can continue making new changes

- by deactivating the editing by clicking on the **`Edit layer icon`** .

By deactivating the editing function, a modal window will be displayed which will show the **list of changes made** and the request for confirmation or not of saving them.



Remember that during the editing phase the **`undo/redo icons`** allow you to delete/restore the latest changes made.

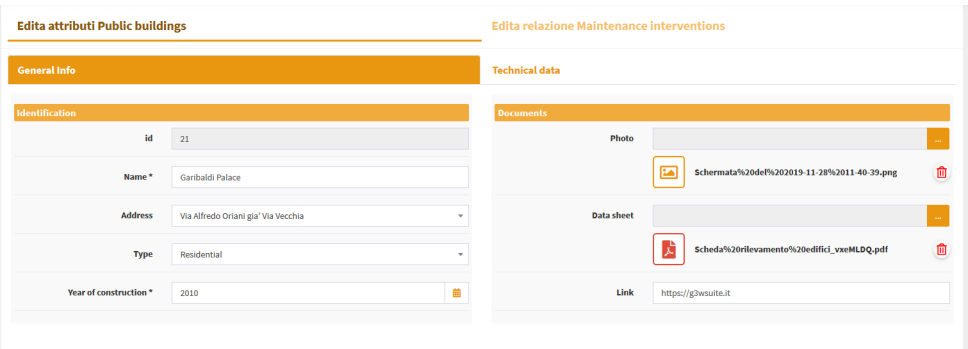
12.2.2 1:N related tables editing

G3W-SUITE allows for relational editing; for this to be possible it is necessary that:

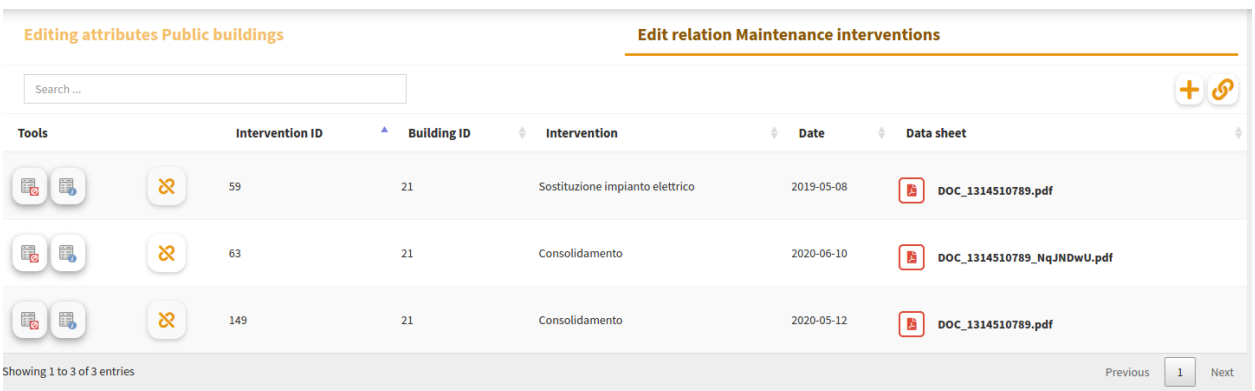
- on the published QGIS project there are one or more geographic layers related (1: n) with one or more alphanumeric tables
- on the administration panel the editing function has been activated both on the parent layer and on the child layers
- the operator user is enabled for the editing function on these layers

The activation, at the cartographic client level, of the editing mode on the parent layer automatically determines the possibility of also managing the information on the related table.

The insertion of a new geometry or the modification of an existing one determines the display of the attribute form divided into two or more macro tabs, one for the parent layer and the other for the child layers



Moving on the macro tab relating to one of the child layers, the list of records already associated with the edited feature will be displayed



In this macro tab it will be possible to:

- **create and add a new records** related to the edited feature
- **associate an existing records** (linked to other features or orphan) to the edited feature
- **modify the records** currently associated with the edited feature

Creation of a new related records

By clicking on the icon **`Create and link a new relation`** (located at the top right) it will be show the attribute form to insert a new record.

You can fill in the individual attributes and save the new record. **The change must be validated by clicking on the `Save` button at the bottom of the form.**

Association of an existing record

By clicking on the icon **`Join a relation to this feature`** (located at the top right) you can associate a record, already linked to other features or orphaned, to the edited feature.

In the new window displayed:

- the list of all orphaned or already associated records will be displayed;
- a generic filter will allow you to locate the record of interest;
- by clicking on the individual records these will be associated with the edited features and, possibly, dissociated from other features

Modification of an already associated record

A series of icons appear to the right of each record associated with the edited feature:

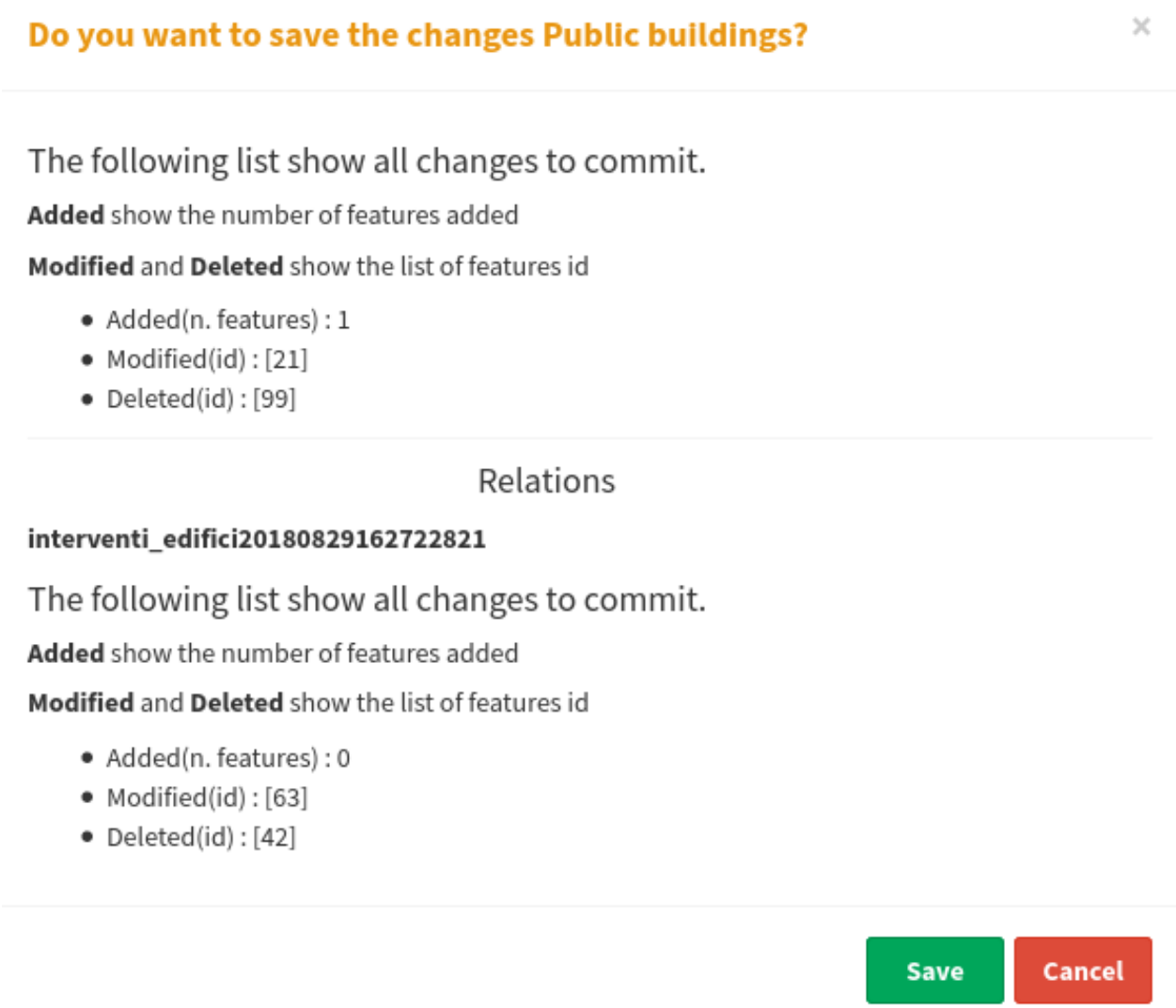
- **Unlink relation:** to dissociate the record from the edited feature, the record will not be deleted but will become an orphan
- **Delete feature:** permanently delete the record
- **Update feature:** modify the values associated with the attributes of this record; the change must be validated by clicking on the Save button at the bottom of the form.

Saving changes

Saving changes made at the level of related tables is managed by saving made at the level of the parent layer:

- by clicking on the **`diskette icon`** placed at the top right. The changes made will be saved and you can continue making new changes
- by deactivating the editing by clicking on the **`Edit layer icon`** .

By deactivating the editing function, a modal window will be displayed which will show the list of changes made and the request for confirmation or not of saving them.



CHAPTER

THIRTEEN

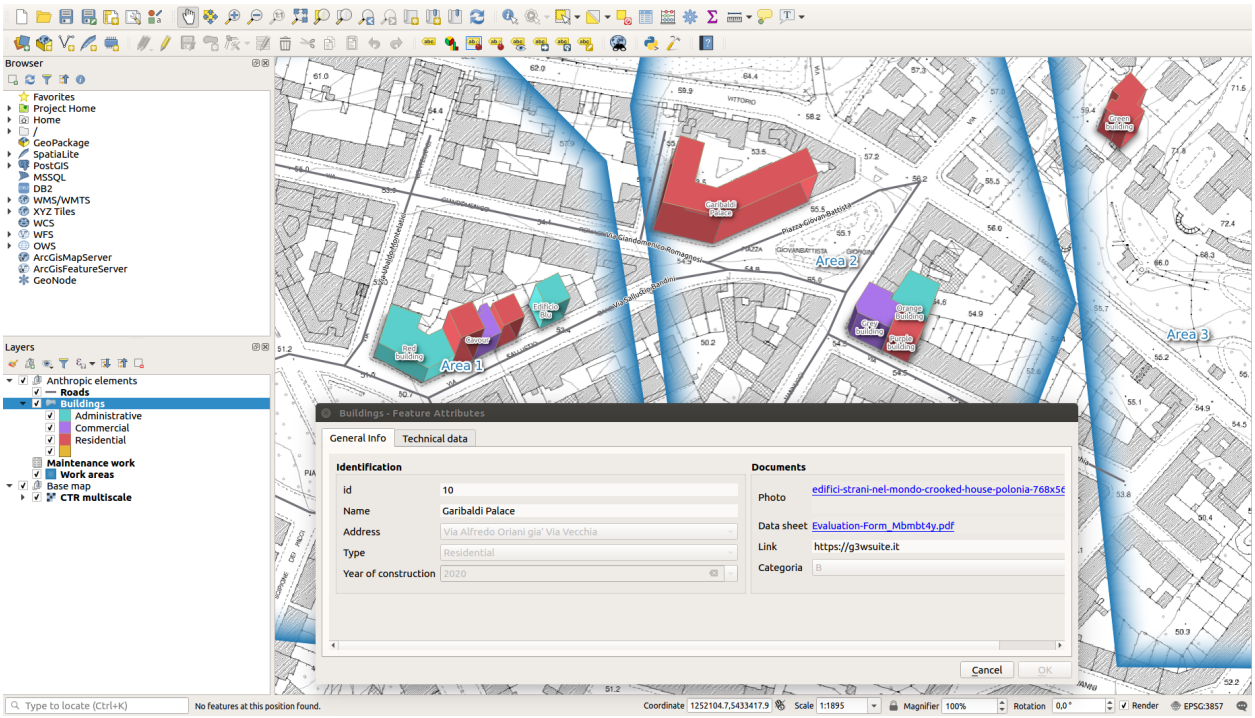
INTRODUCTION

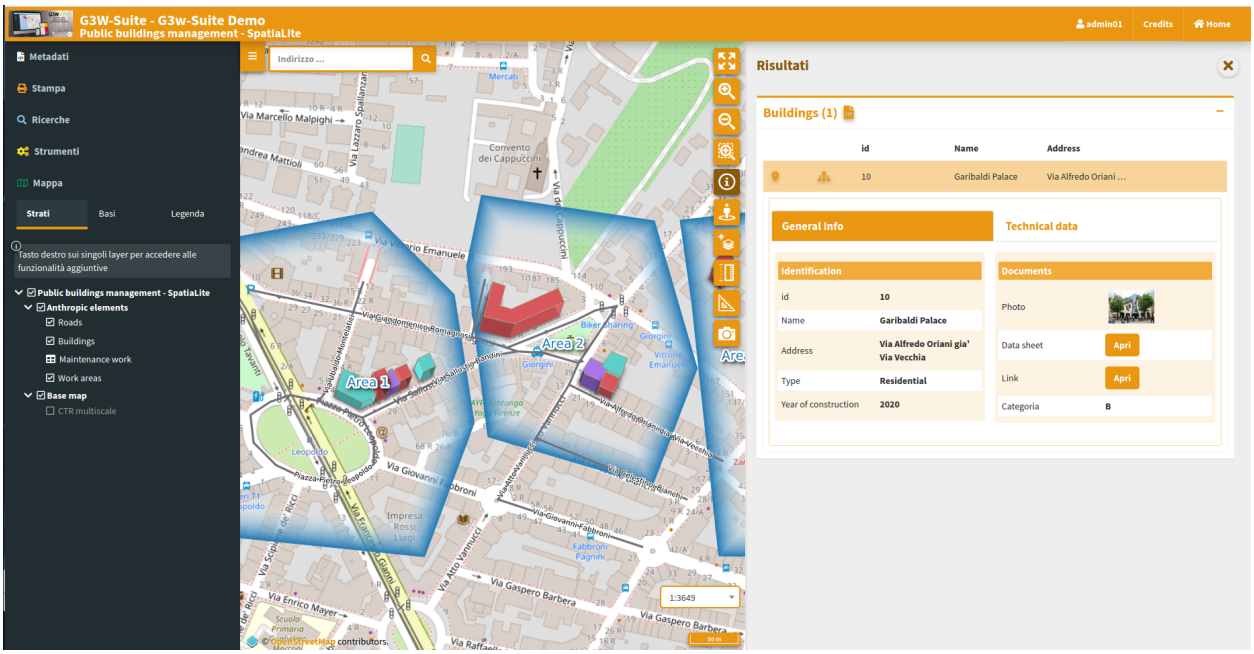
The tutorial is based on a QGIS project dedicated to the management of a layer representing a series of buildings located on the territory.

In addition to the geographical aspects, the project involves the management of numerous and diversified attributes and of the related maintenance interventions through a 1: n type relationship.

Through the tutorials it will be possible to:

- customize the various graphic-functional aspects of the basic project
- publish the project as a WebGis service
- create personalized searches
- add plots made with DataPlotly QGIS plugin
- activate the editing functionality by customizing associated forms and widgets




G3W-Suite - G3w-Suite Demo
Public buildings management - SpatiaLite
admin01
Credits
Home
Metadati
Stampa
Ricerche
Strumenti
Mappa
Strati
Basi
Legenda
Tasto destro sui singoli layer per accedere alle funzionalità aggiuntive
Public buildings management - SpatiaLite
Anthropic elements
Roads
Buildings
Maintenance work
Work areas
Base map
CTR multiscale
Indirizzo ...
Area 1
Area 2
Risultati
Buildings (1)
id
Name
Address
10
Garibaldi Palace
Via Alfredo Oriani ...
General Info
Technical data
Identification
id
10
Name
Garibaldi Palace
Address
Via Alfredo Oriani gia' Via Vecchia
Type
Residential
Year of construction
2020
Documents
Photo
Data sheet
Apri
Link
Apri
Categoria
B
1:3649

CHAPTER

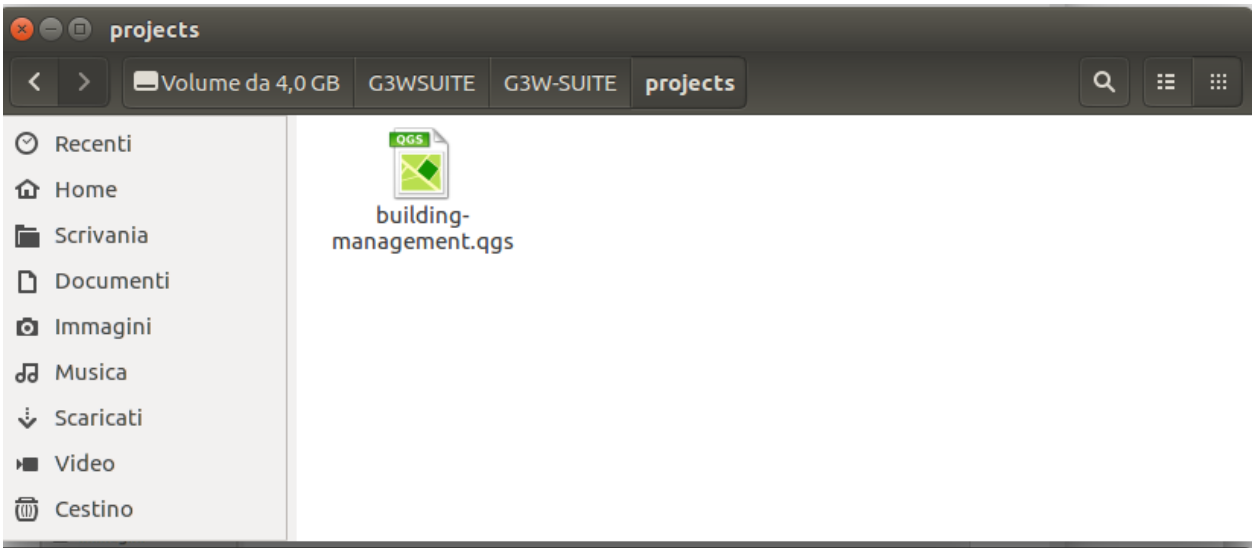
FOURTEEN

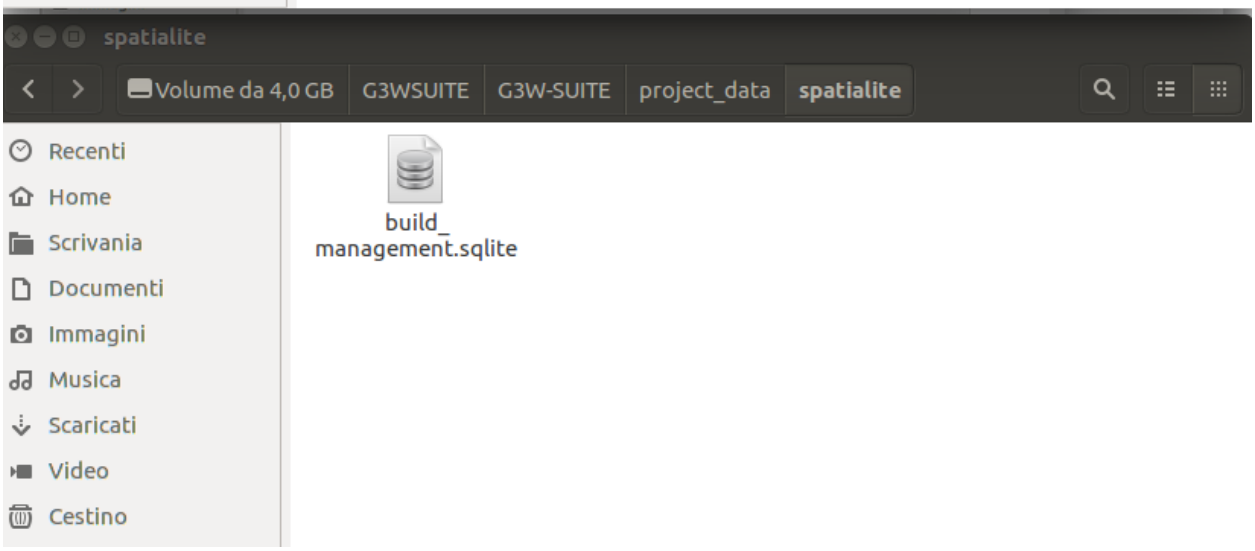
DOWNLOAD DEMO DATA

The tutorial is based on predefined data and QGIS 3.16.x LTR project **downloadable from this link**.

The .zip file contains the **`G3W-SUITE`** directory with three sub directories:

- **`projects:`** containing a QGIS project (**`buildings_management.qgz`**) already optimized for the tutorial
- **`project_data/spatialite`**: containing a SpatiaLite DB with basic data (**`build_management.sqlite`**)
- **`plots`**: containing a a series of plots created with the **DataPlotly** plugin and saved in xml format





Inside the **`build_management.sqlite` SpatiaLite DB** there are the following layers:

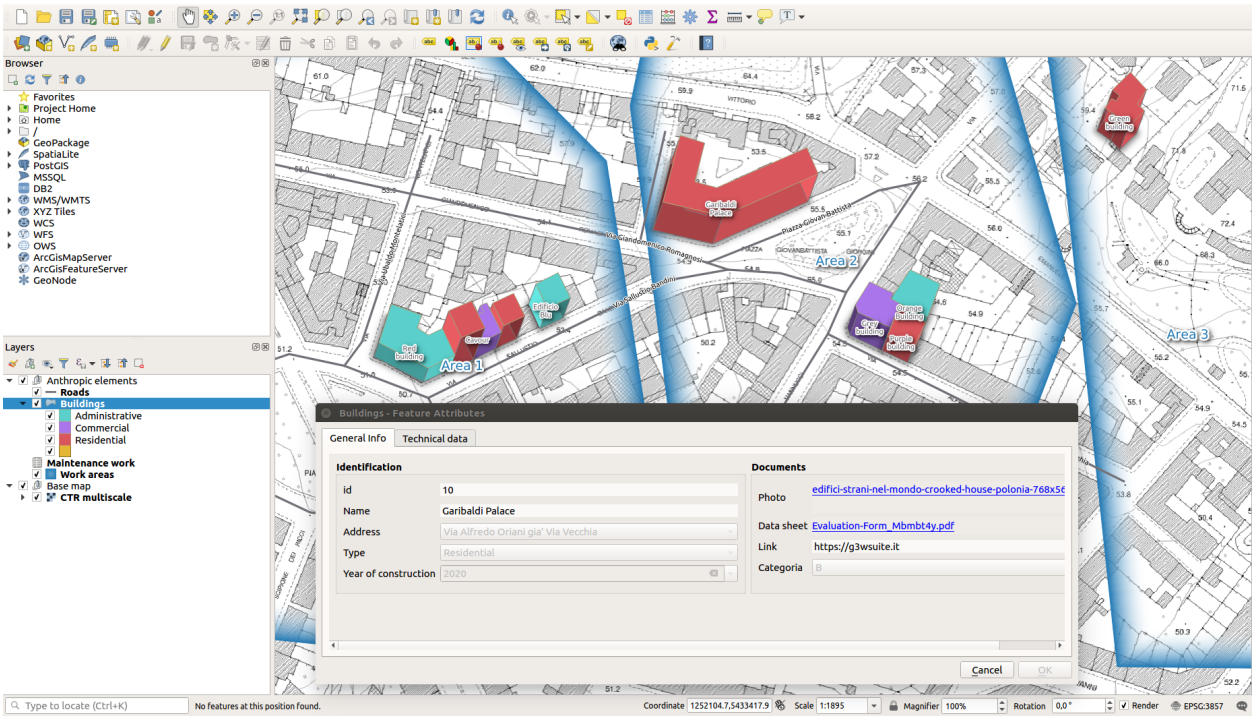
- **`buildings` (polygon layer):** reference layer for editing aspects
- **`maintenance_works` (alphanumeric table):** with the maintenance interventions associated with the individual buildings
- **`buildings_rating` (alphanumeric table):** with the annual assessments relating to individual buildings
- **`work_areas` (polygon layer):** with the perimeter of work areas to be used to define any geo-constraints

IMPORTANT: a copy of this data are present on the server, you can not change your local data copy

The project (**based on QGIS LTR 3.16.x**) foresees:

- a **dressing categorized by the `buildings` layer** based on the categorical field **`type`**
- the presence of a **1: n relationship** between the **`buildings`** layer and the alphanumeric **`maintenance_works`** and **`buildings_rating`** tables
- pre-developed **query forms** for the **`buildings`** layer and the **`maintenance_works`** table
- predefined **editing widgets** for the fields of the two main layers: **`buildings`** , **`maintenance_works`** and **`buildings_rating`** tables

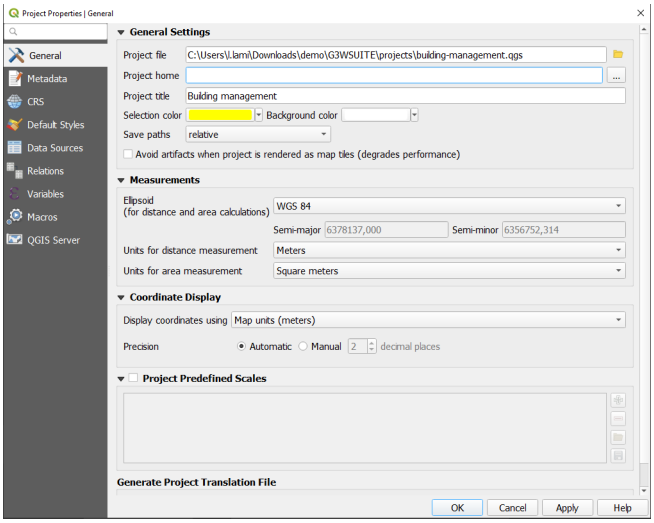
- two standard **print layout** in A4 and A3 and an two **atlas print layout** based on buildgs layer features



14.1 Modify the QGIS project title

The publication system provides for the use of the **title of the project** as the **unique identifier of the WebGis service**.

So, before publishing the project, it will be NECESSARY to change the title associated with the basic project (`Project -> Properties ... - Session: General`)



CHAPTER

FIFTEEN

ACCESS THE ONLINE SERVICE

To publish the project, you can **access the G3W-SUITE test application** via the following URL: `https://v32.g3wsuite.it`

To access the **Administration Panel** it is necessary to log in using the following credentials:

- user: `demo`
- password: `G3wsuite!`

In case of login problems, report the problem to `info@gis3w.it`

CHAPTER

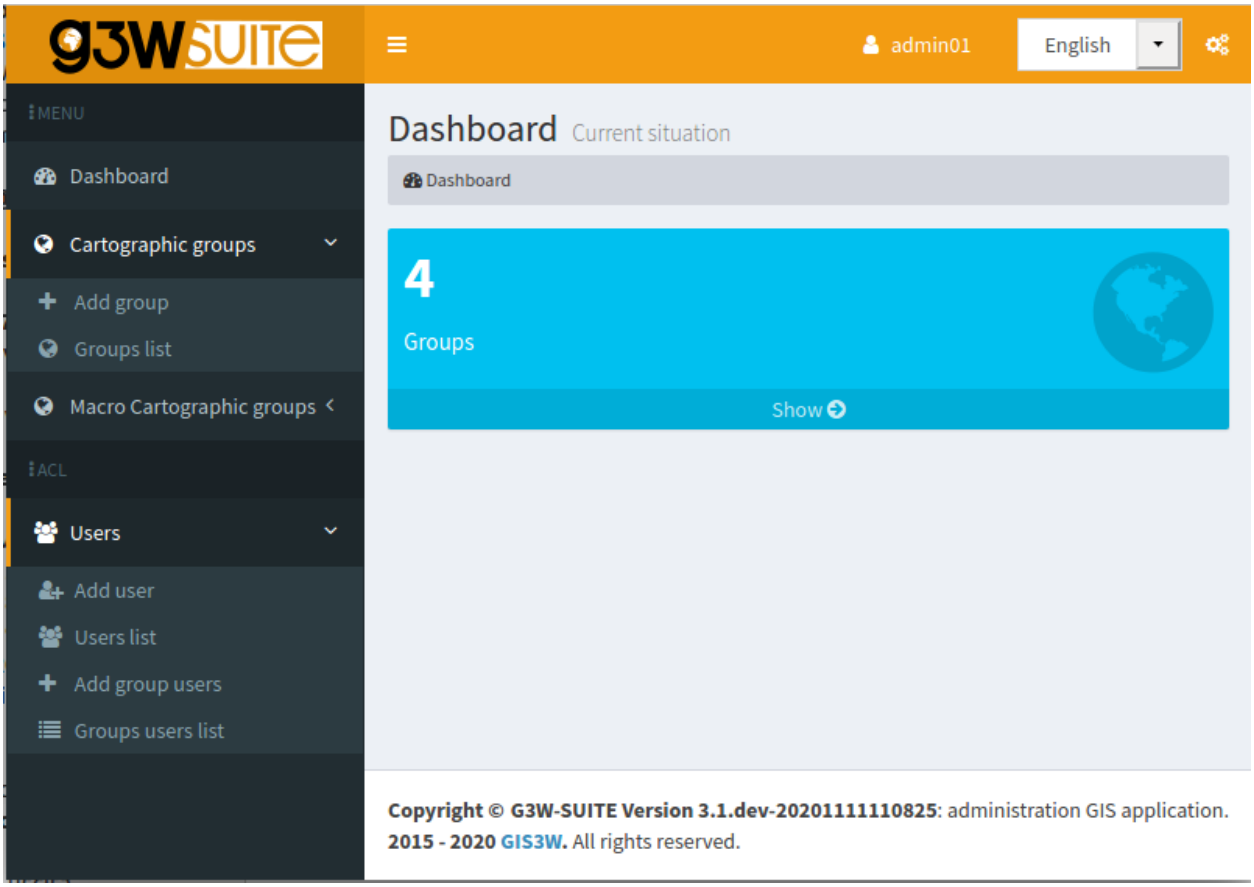
SIXTEEN

PUBLISH THE QGIS PROJECT AS A WEBGIS SERVICE

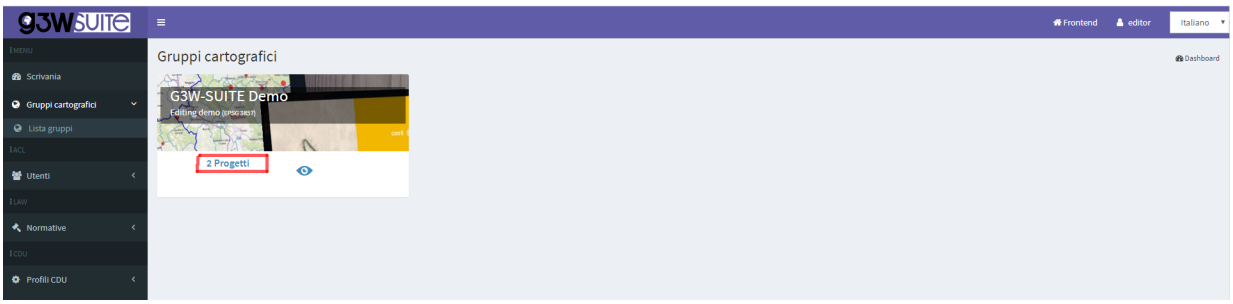
After authentication it will be possible to access the **`Administration session`** and view the **Dashboard**.

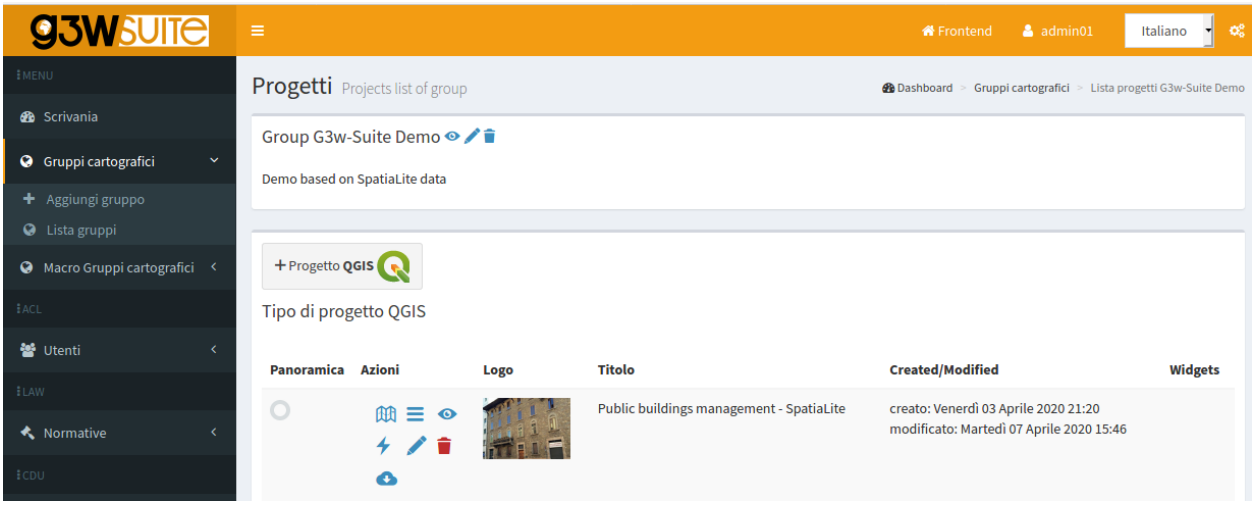
In the Dashboard there will be the menu for access to the **Cartographic Groups** pertaining to your user and the menus relating to additional modules not active in this demo.

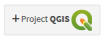
Click on the **`Show`** item in the ligth blue **Groups** box to acces at the list of available Cartographic Groups.



Access the list of webgis in the Cartographic Group **`G3W-SUITE Demo`** clicking on the project number shown.





Now click on the button  to publish your **QGIS project**.

Fill out the form defining the various aspects to be associated with the WebGis service being published:

16.1 QGIS project

`QGIS file`: load the QGIS cartographic project to be published (.qgz or .qgs file)

16.2 ACL Users

Management of access permissions

- **`Viewers users`:** define the individual users (Viewers) who have the credentials to view the WebGis service. By choosing the anonymous user (**AnonymusUser**) the group will be freely accessible.
- **`Viewer user groups`:** you define the user groups (Viewer) which have the credentials to view the content of the service.

16.3 Default base layer

In this session you define which **`base layer` should be active at startup**.

The choice is limited to the list of base layers activated for the cartographic group in which you work.

It is also possible not to define any active base layer at startup.

16.4 Description data

- **`Public title:`** Title to be associated with the project and displayed on the client header. If left blank, the title associated with the QGIS project will be used or, in the absence of this, the name of the project file
- **`Description:`** Description of the project, it will appear at the public portal level.
- **`Thumbnail (Logo):`** logo to associate with the project. This image will be viewable in the list of projects within the cartographic group
- **`URL alias:`** a human readable URL for the map

ATTENTION: contents marked with * are mandatory.

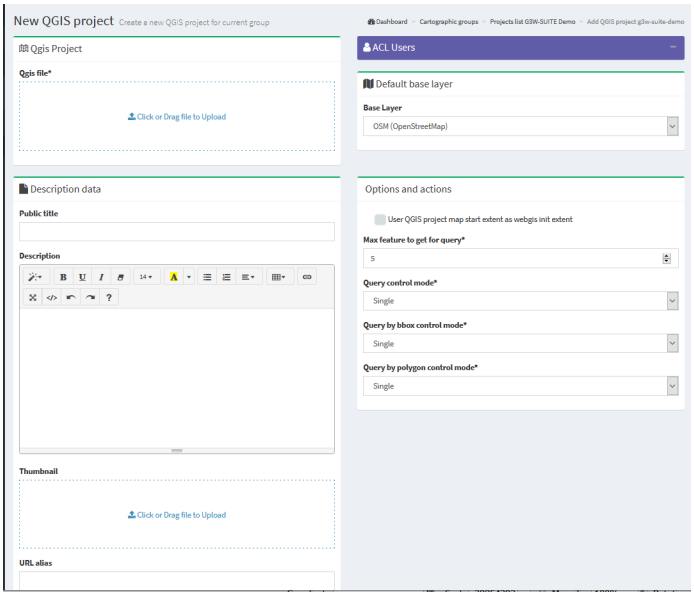
16.5 Options and actions

- **`User QGIS project map start extent as webgis init extent`**: check this control if you want set initial extent from QGSI project initial extent

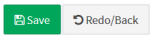
Otherwise the initial extension will correspond to the maximum one defined on the basis of the extension associated with the WMS capabilities of the QGIS project (**Project properties -> QGIS Server -> WMS capabilities (Advertised extent)**)

The next options allow you to define the type of WMS / WFS query to be carried out and the maximum number of results obtainable following a query.

- **`Max feature to get for query`***: max number of feature to get for single or multiple mode
- **`Query control mode`***: single or multiple
- **`Query by bbox control mode`***: single or multiple
- **`Query by polygon control mode`***: single or multiple

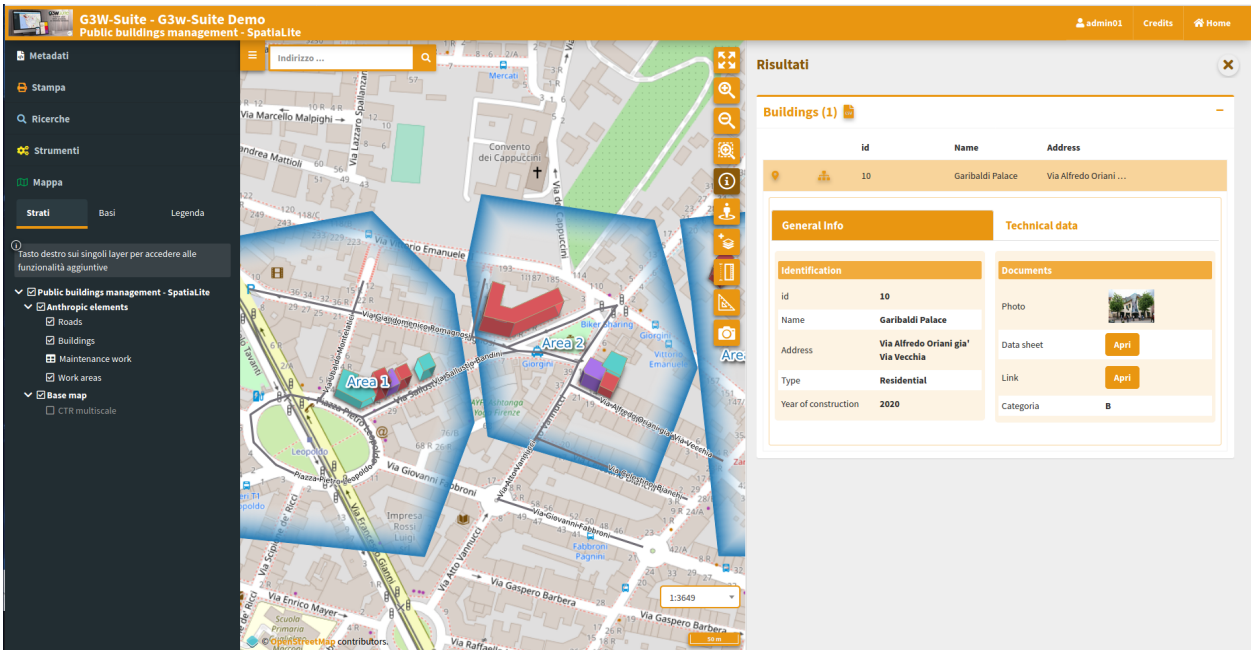


After filling in the various form, click on the **`Save button`** to confirm your choices.



If the publication was successful, the QGIS project will appear in the list of projects in the Cartographic Group.

Clicking on the **`View map`** icon will access the WebGis service in consultation.



CHAPTER

SEVENTEEN

UPDATE THE PUBLISHED WEBGIS SERVICE

If you want to modify some graphic-functional aspects of your WebGis service, modify your QGIS project and update the WebGis service by clicking on the **`Modify`** icon .

Reupload the QGIS project with your changes, click on the **Save button** and see the resuts on the cartographic client.

CHAPTER

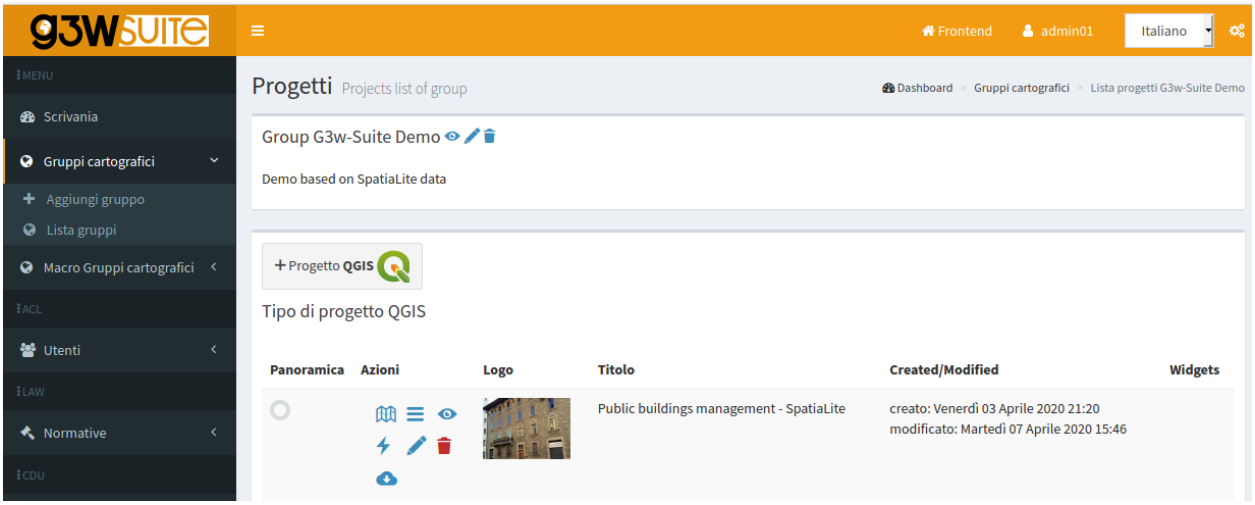
EIGHTEEN

ACTIVATION OF ADDITIONAL FUNCTIONS

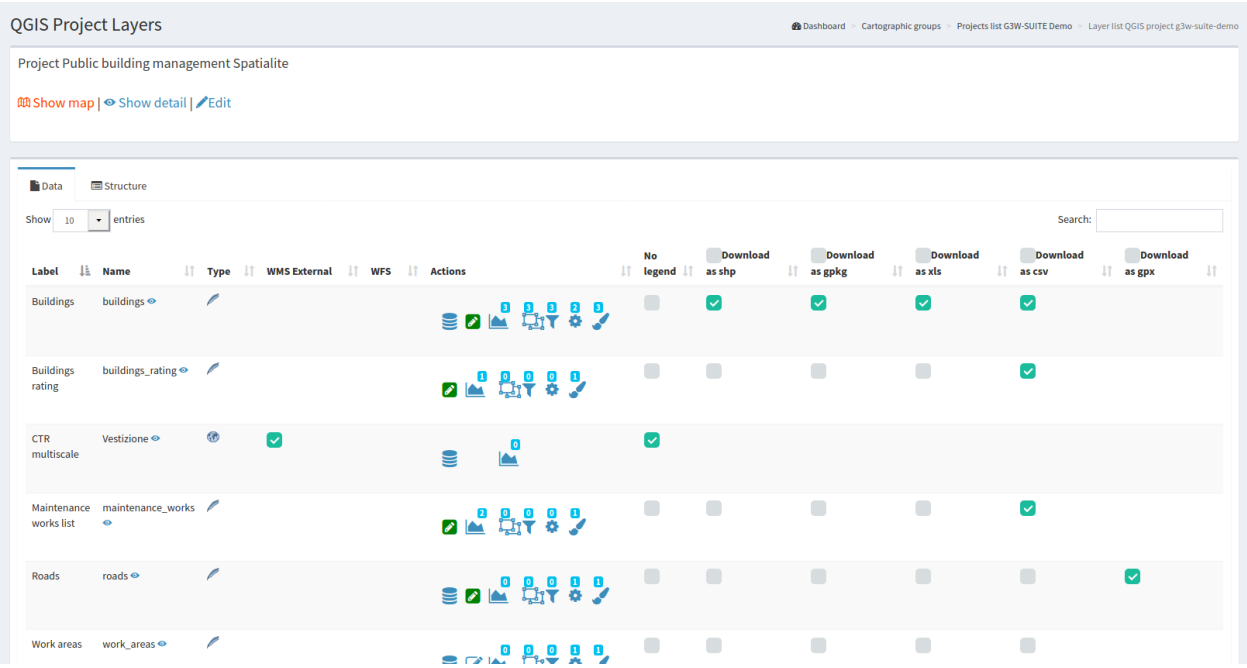
Once your project has been published, you can access the list of widgets and additional functions to enrich your WebGis service.

18.1 Widget management

Thougth the **`Layers list` icon** it is possible to access the list of the geographical states that compose it and define some functional aspects that will be enabled at the cartographic client level.



The new session will show you the **list of the layer** present in the published QGIS project



- **Label:** layer alias applied at the QGIS project level
- **Name:** name of the layer (file or DB table)
- **Type:** illustrates the type of data (WMS, PostGis, SpatiaLite, GDAL / OGR . . .)
- **WMS external:** to speed up loading, the WMS layers present in a QGIS project are managed directly by Django and not by QGIS-Server. However, this method prevents the application of any styling (e.g. opacity level) defined at the project level. The choice of the external WMS option means that the WMS layer is managed directly by QGIS-Server and therefore the associated styling is applied.
- **WFS:** a check mark shows whether the layer is published as a WFS service or not
- **Actions:** a series of icons dedicated to various functions
  - **Caching Layer:** allows you to activate and manage the cache of the single layer at the project level
  - **Editing layer:** shows if the online editing function is active on the layer and allows you to activate and define it
  - **Manage geo-contsraints:** create or manage editing geo-constraints
  - **QPlotly widget:** add or manage plots created with DataPlotly QGIS plugin
  - **Manage alphanumric constraints:** create or manage editing and visualization alphanumeric-constraints

-

List of widgets: shows how many widgets (eg searches) are associated with this layer and allows you to activate new ones

- **No legend:** it allows to define if the layer must have published the legend at TOC level of the WebGis client
- **Download:** allows the download of the geographic and not geographic layers in various formats
  - **Download as shp:** for geographic (shp) or not geographic (dbf) layers
  - **Download as GPK:** for geographic or not geographic layers
  - **Download as xls:** for all types of layers, in .xls format
  - **Download as csv:** for all types of layers, in .csv format
  - **Download as gpx:** for geographic layers, in .gpx format

The number above each Action icon shows if and how many related objects are present.

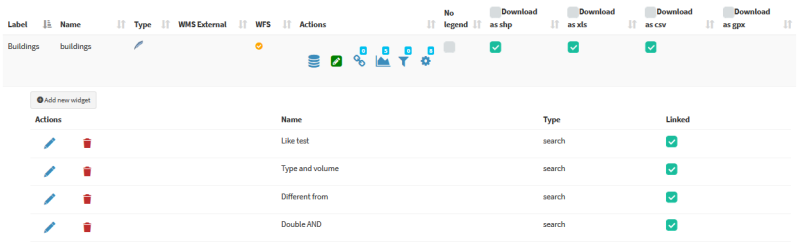
Try to activate the available options and test the result on the WebGis

18.2 Search widget creation

To create a search tool available at WebGis level, **choose the vector layer** on which to apply the tool and **click on the `Widget list icon`**

NB: there may be a number of searches created by other users for the same layer.

You can activate them by **clicking on the `Linked` chekbox**.



The listed searches can be **modified, deleted or unlinked** using the appropriate icons.

To **create a new search**, click on the blue link **`New widget`**.

In the related form we can define:

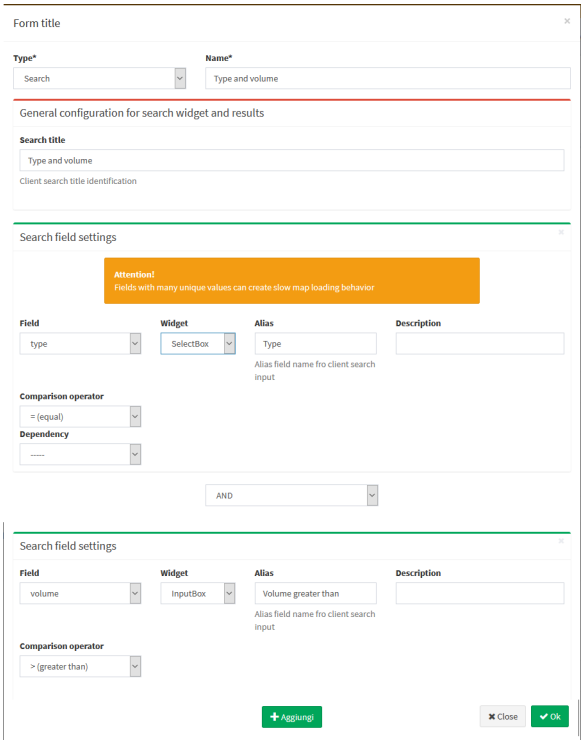
- **Form Title**
  - **`Type`:** "Search"
  - **`Name`:** name that G3W-SUITE will use to internally register the search widget.
- **General configuration of research and results**
  - **`Search title`:** title that will become available in the **'Research'** panel of the WebGis interface
- **Search fields settings**
  - **`Field`:** field on which to carry out the research

- **`Widget:`** method of entering the value to be searched `InputBox`: manual compilation `SelectBox`: values shown via drop-down menu `AutoCompleteBox`: values shown through auto-complete mode
- **`Alias:`** alias assigned to the field that will appear in the search form
- **`Description:`** description assigned to the field
- **`Comparison operator:`** comparison operator (**=, <,>,> <,> =, <=, LIKE, ILIKE**) through which the search query will be carried out. The LIKE and ILIKE operators will only be available for PostGis or SpatiaLite layers
- **`Dependency:`** this parameter (optional) allows, only in the case of SelectBox widgets, to list the list of values of a field filtered according to the value defined for the previous fields. The tool allows, for example, to display, in the drop-down menu dedicated to the choice of cadastral particles, only the particles connected to the sheet chosen in the previous option. This function is only available for PostGis or SpatiaLite layers.

Warning: in the case of fields with more than 100 unique values, the WMS service does not allow to obtain the complete list of values. In this case it is recommended not to use the `SelectBox` method

The button allows you to add additional fields for the construction of the search query currently manageable through AND/OR operators.

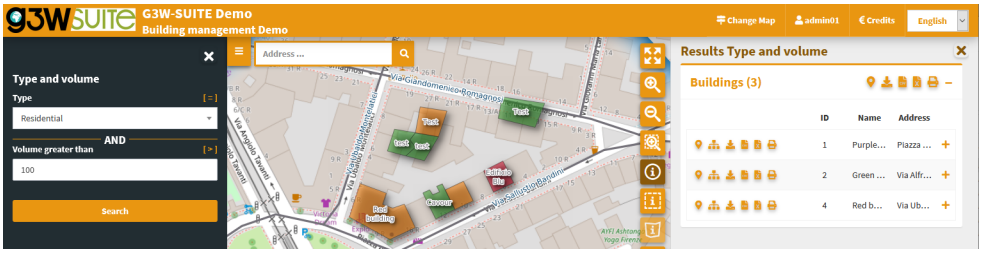
The example below shows the compilation of the form for creating a search widget dedicated to a cadastral cartography layer.



Once the form has been filled in, click on the **`OK button` to save** the settings.

Once the settings are saved, the created widget will appear in the list of Widgets associated with the layer.

The widget will already be `linked` and therefore available in the WebGis interface on the left panel.



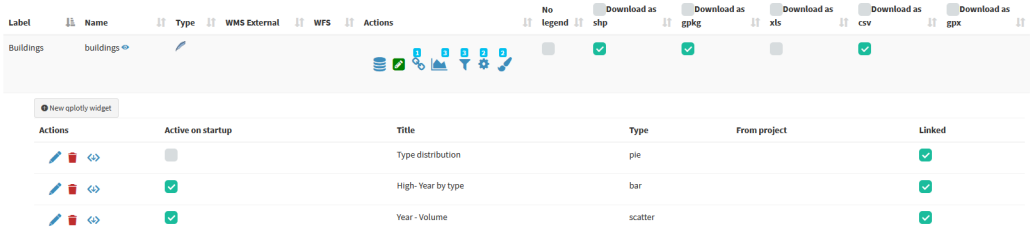
18.3 Plots widget

Add plots created using QGIS DataPlotly (a great plugin developed by Matteo Ghetta) in the cartographic client.

The module, based on the Plotly library, manages **plots saved as xml**.

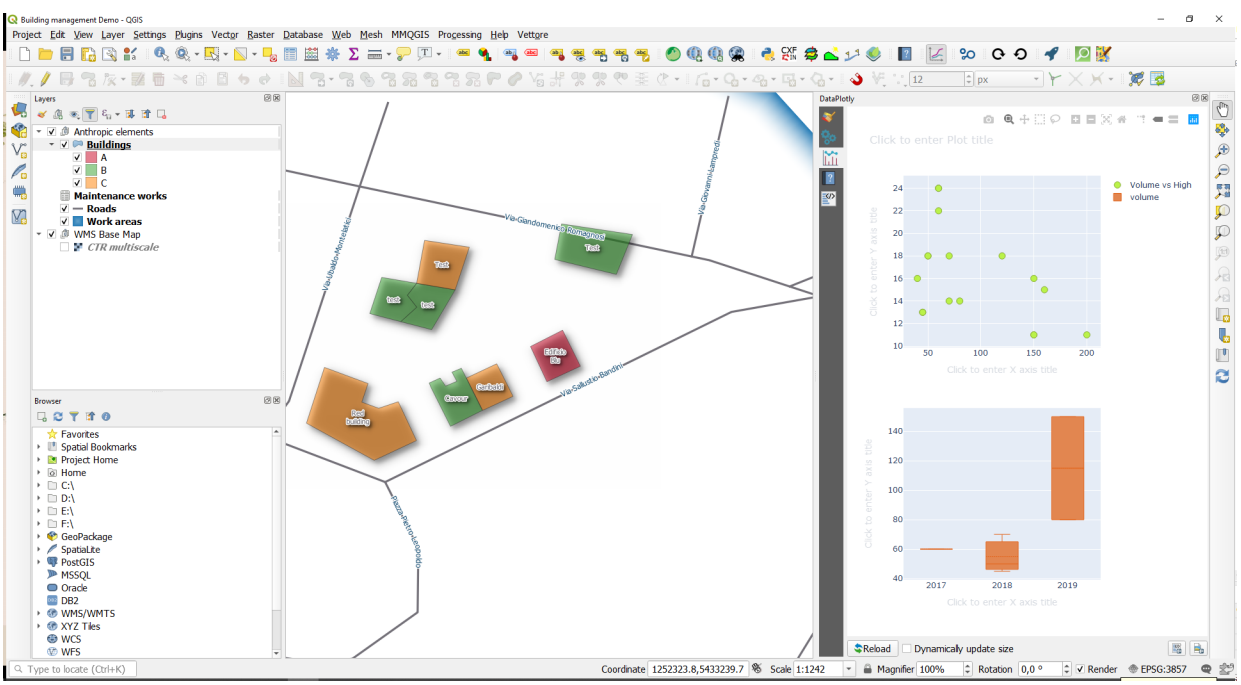
The plots are connected to the layers defined on the QGIS project, in this way, as for the searches and the constraints, it is possible to activate the same plots on all WebGis services in which the reference layer is present.

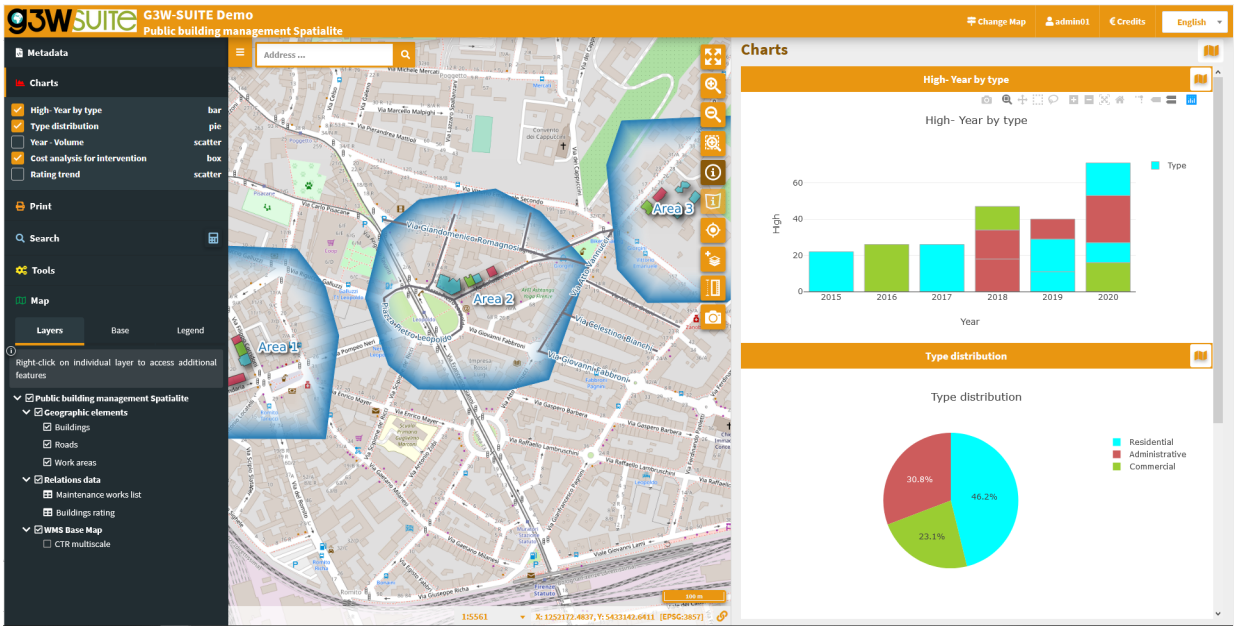
For this reason, there may be some plots created by other users for the same layer. You can activate them by **clicking on the `Linked` chekbox**.



The title of the chart, defined at the plugin level, will be the unique identifier.

Try to create your plots in the QGIS project, save them as .xml and upload them to view the resluts on the webgis.





The graphs are filterable based on the:

- features visible on the map
- filter based on the selected features

These **filters** are also **reflected on the plots associated to the related data** (in 1:N mode) based on the visible and/or selected parent features.

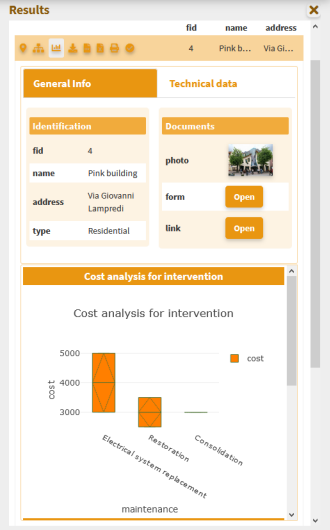
The **filter based on the map content** can be activated globally on all plots (icon at the top of the panel dedicated to charts) or on only some specific plots (icon placed at the level of the individual plots).

The plots will automatically update after pan and zoom operations on the map

If activated, the **filter based on the selected features** is automatically activated on all related plots (associated with the same layer and with the 1:N relationed tables)

Appropriate **messages** at the single plots level will indicate the activation of these filters.

If 1: N relationships are associated with the interrogated layer and plots have been activated on the referencing tables, it will also be possible to consult these plots by querying the referenced layer and clicking on the **Show relation charts** icon present in the results form.



Show relation charts: display of graphs related to 1: N related data. Only if 1: N relationships are associated with the interrogated layer and graphics have been activated on the boy tables.

CHAPTER

NINETEEN

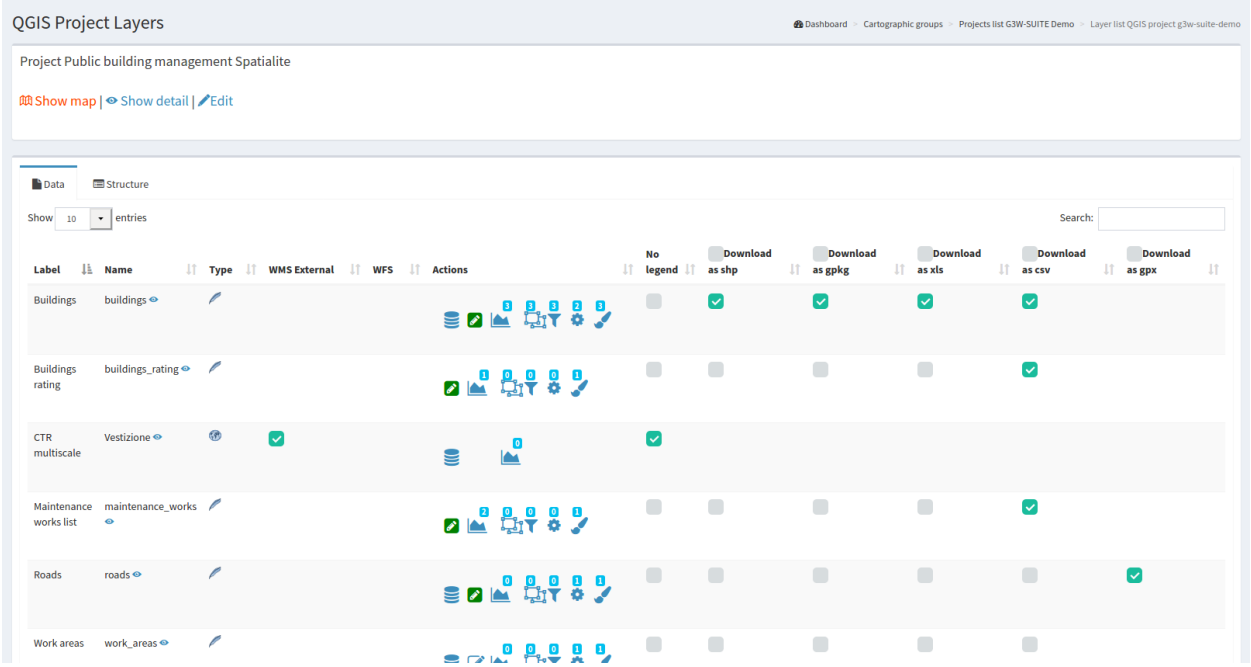
EDITING ON LINE

Forms and editing widgets are already defined on the project associated with the tutorial for the geometric layer of buildings and for the alphanumeric table related interventions_maintenance.

- **`Buildings`**
  - **id** (integer - primary key): autogenerate
  - **name** (text NOT NULL): text edit
  - **address** (text): Value relation (roads layer - code/name fileds)
  - **year** (integer NOT NULL): unique values (2015,2016,2017,2018,2019,2020)
  - **photo** (text): attachment
  - **link** (text): text edit
  - **form** (text): attachment
  - **high** (integer NOT NULL): range (10-30 step 2)
  - **volume** (integer): range (50-200 step 10)
  - **surface** (integer): text edit
  - **architectural_barriers** (text): Checkbox (Checked - Not checked)
  - **date_barriers** (date): date (yyyy/MM/dd)
  - **safety_exits** (text): checkbox (Checked - Not checked)
  - **date_exits** (date): date (yyyy/MM/dd)
  - **fire_system** (text): Checkbox (Checked - Not checked)
  - **date_fire** (date): date (yyyy/MM/dd)
  - **type** (text NOT NULL): unique values (Administrative, Commercial, Residential)
- **`Maintenance_works`**
  - **id** (integer - primary key): autogenerate
  - **id_buildings** (text - relation key): text edit
  - **maintenance** (text NOT NULL): unique values
  - **date** (date): date (yyyy/MM/dd)
  - **form** (text): attachment
  - **value** (integer): range (10-30 step 2)
  - **outcome** (text): unique values (good, medium, bad)

  - **responsible** (text): text edit
  - **cost** (integer): range (1000-5000 step 1)
  - **validation** (boolean): checkbox (0/1)
- **`Buildings rating`**
  - **id** (integer - primary key): autogenerate
  - **id_buildings** (text - relation key): text edit
  - **date** (date): date (yyyy/MM/dd)
  - **value** (integer): range (1000-4000 step 500)
  - **year** (integer): range (2018-2022 step 1)

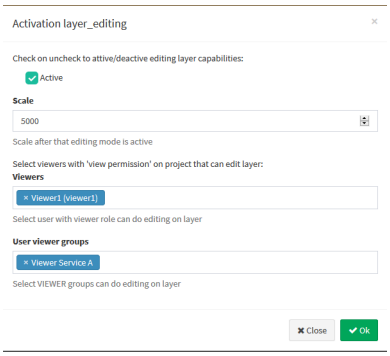
To activate the editing function on webgis, access the list of layers and identify the three layers shown above.



Clicking on the icon **Editing layer** (placed at the left of each rows) will open a modal window that will allow you to:

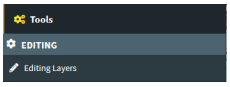
- define the **`editing activation scale`** (only for geometric tables)
- define the **`Viewer users`** (individuals or groups) **`enabled`** for online editing

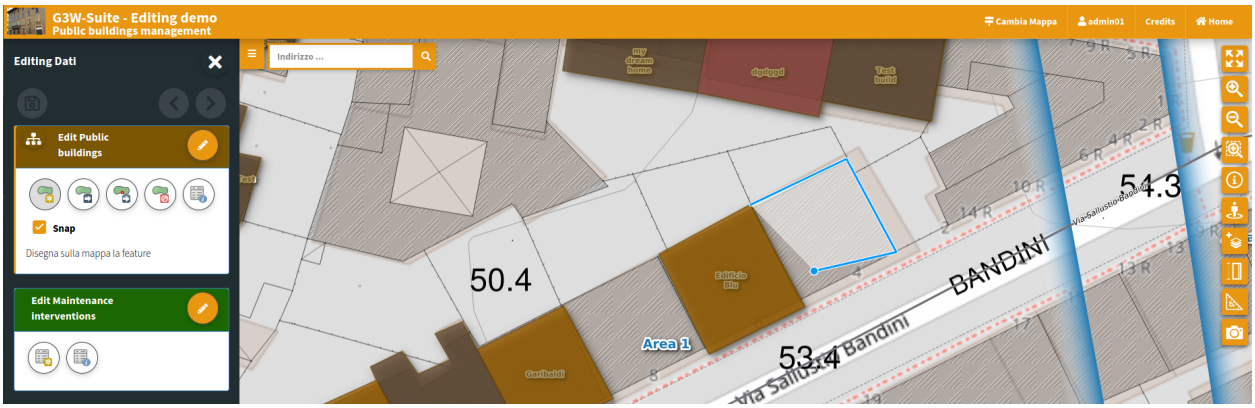
With regard to the last aspect, it should be noted that **Viewers users** (individuals or groups) **available** in the drop-down menu **will be limited to those who have allowed access in consultation to the WebGis project**

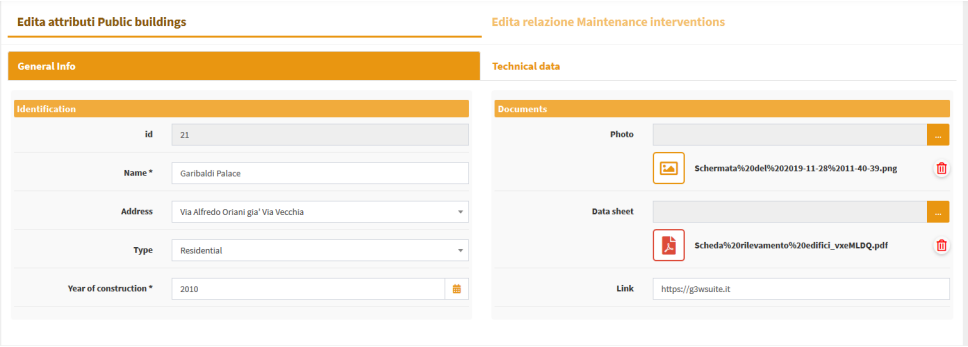


Once the editing function is activated, updating the service, the **`Tools menu`** **will appear on the left panel.**

By activating the editing function it will be possible to edit the geometries and attributes of the Public Buildings layer and the related interventions.







For **further information** on the web editing function, read the **dedicated chapter on the manual**

CHAPTER

TWENTY

PERSONALIZE YOUR DEMO

Do you want to test the online editing function more deeply?

Redefine attribute forms, aliases and editing widgets associated with the individual fields and reload the project to check the new settings.

It is advisable to consult the paragraph dedicated to the list and limitations of the individual editing widgets inheritable from the QGIS project.