

OSM buildings from ordinary photos

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Problem

- High resolution imagery is not everywhere available



Problem

- Some parts of high resolution imagery may be vague or hidden by clouds



Problem

- Some buildings have too complicated structure



Initial approach

- Bundler from the University of Washington
<http://phototour.cs.washington.edu/bundler/>

Bundler is a structure-from-motion (SfM) system for unordered image collections. Bundler takes a set of images, image features, and image matches as input, and produces a 3D reconstruction of camera and (sparse) scene geometry as output.

Bundler: basic principles

- Take a set of images



Bundler: basic principles

- Find features on each image
- Find matches between the image features
- Perform “bundler adjustment” to get 3D reconstruction of cameras and (sparse) scene geometry as output
- Optionally: use Clustering Views for Multi-view Stereo (CMVS) to get more or less dense set of points in 3D space

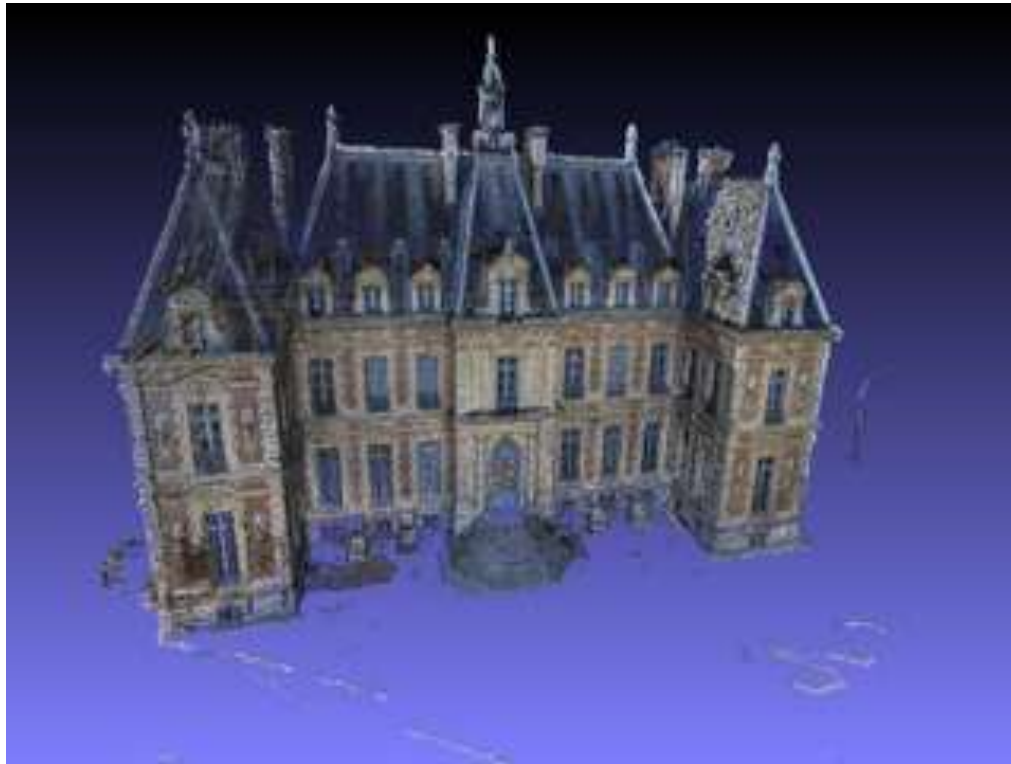
Bundler: results

- 5 pictures:



Bundler: results

- 251 pictures



osm-bundler

- <http://code.google.com/p/osm-bundler/>

Bundler: conclusion

- Unreliable, often one gets just a mess
- The more pictures the more time it takes
- More a tool for researchers than for an ordinary OSMer
- Getting 2D building outline from 3D points is a separate task
- 3D reconstruction is excessive, 2D building outline is enough

Final approach: Google Sketchup plugin

- Install Google Sketchup
- Install OSM Google Sketchup Plugin following the link from http://wiki.osm.org/Google_Sketchup_Plugin
- Learn how to use basic functions of Sketchup
- Learn how to use photo matching feature of Sketchup

Google Sketchup plugin for OSM

- Photo Matching in Google Sketchup allows manual 3D building reconstruction from 1-2 pictures
- Based on the projective geometry laws

Google Sketchup plugin for OSM

- Take a picture from building angle
- The picture must not be cropped!!!

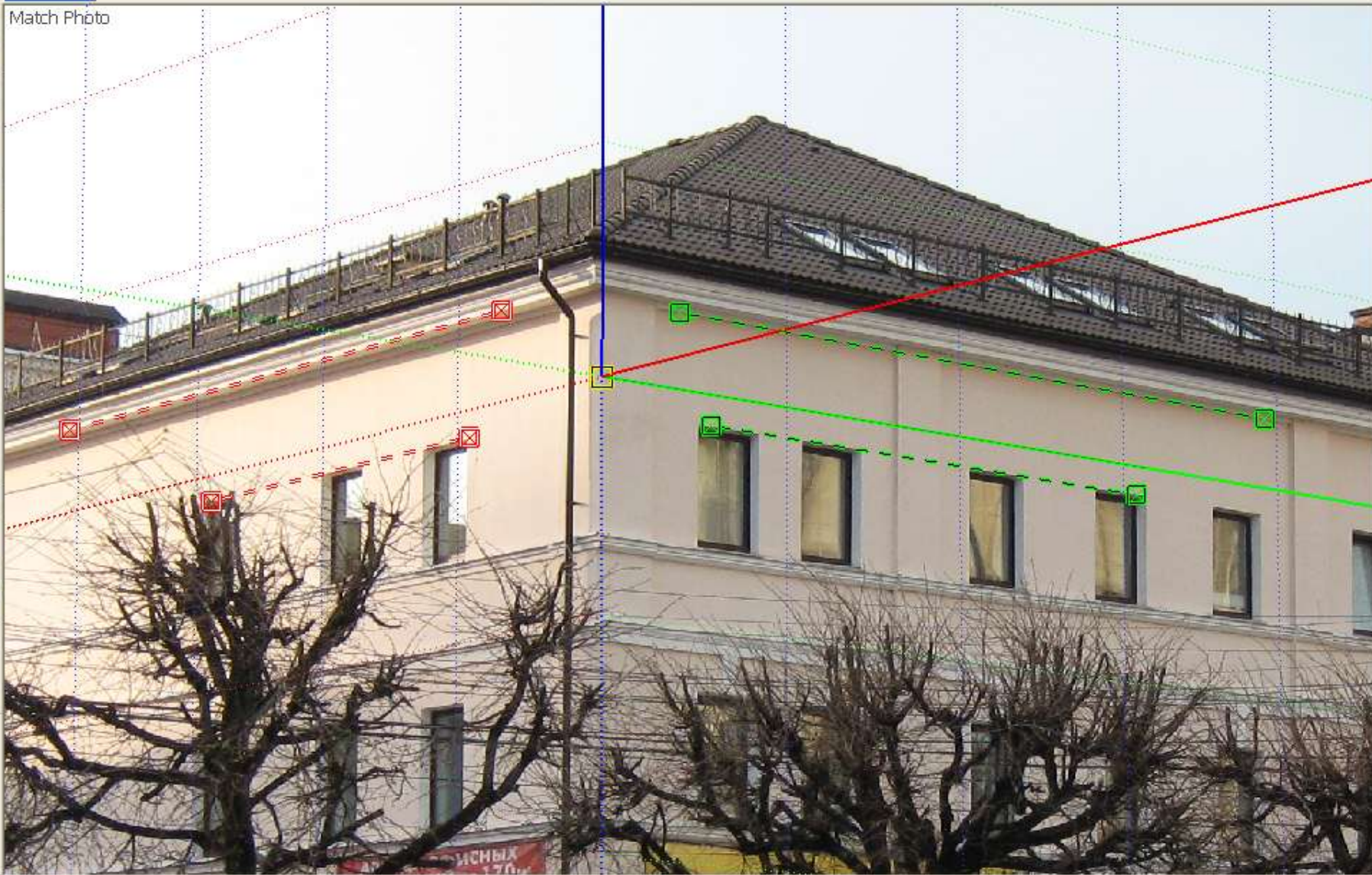




Match Photo

IMG_0172

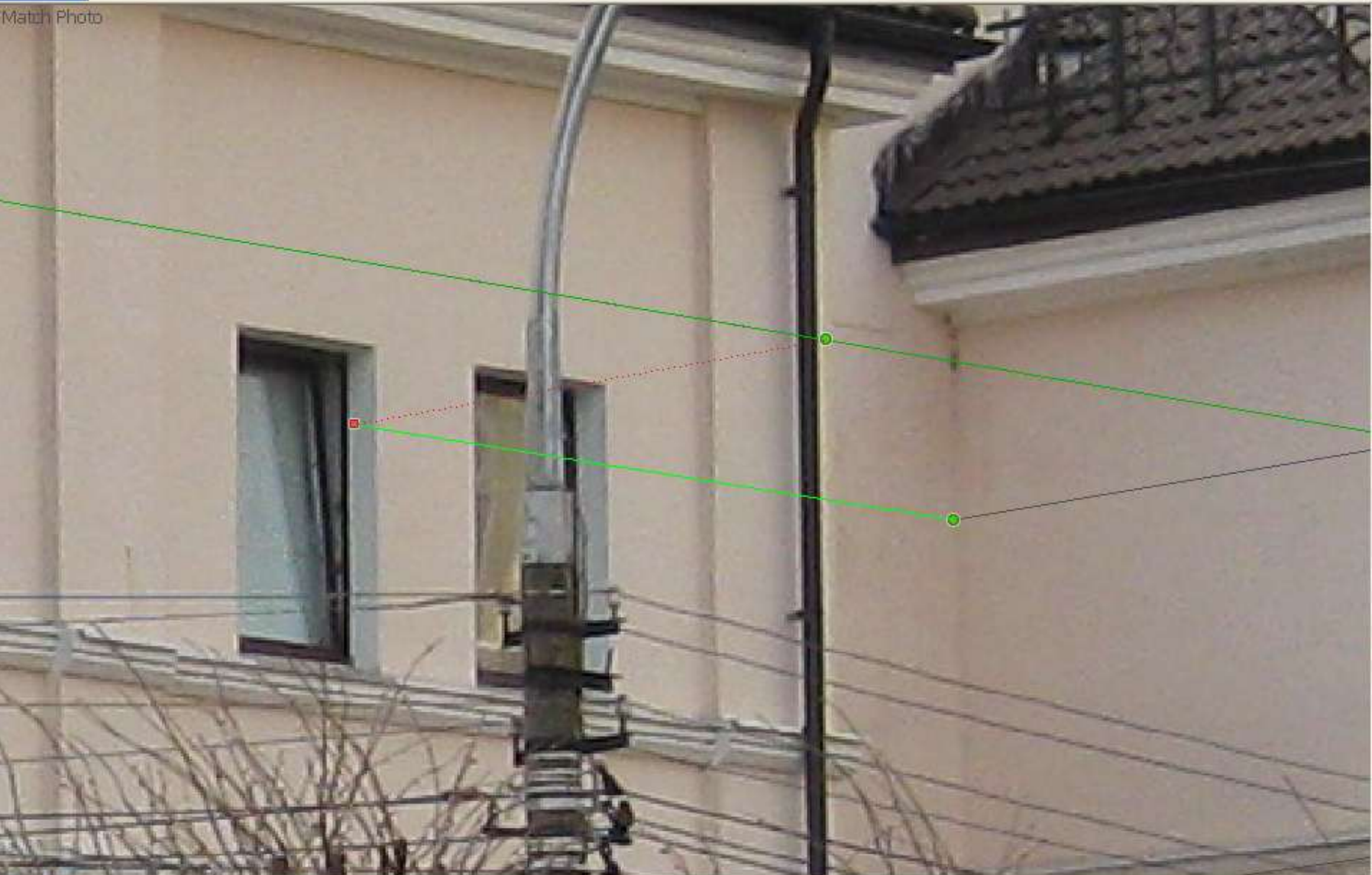
Match Photo





IMG_0172

Match Photo

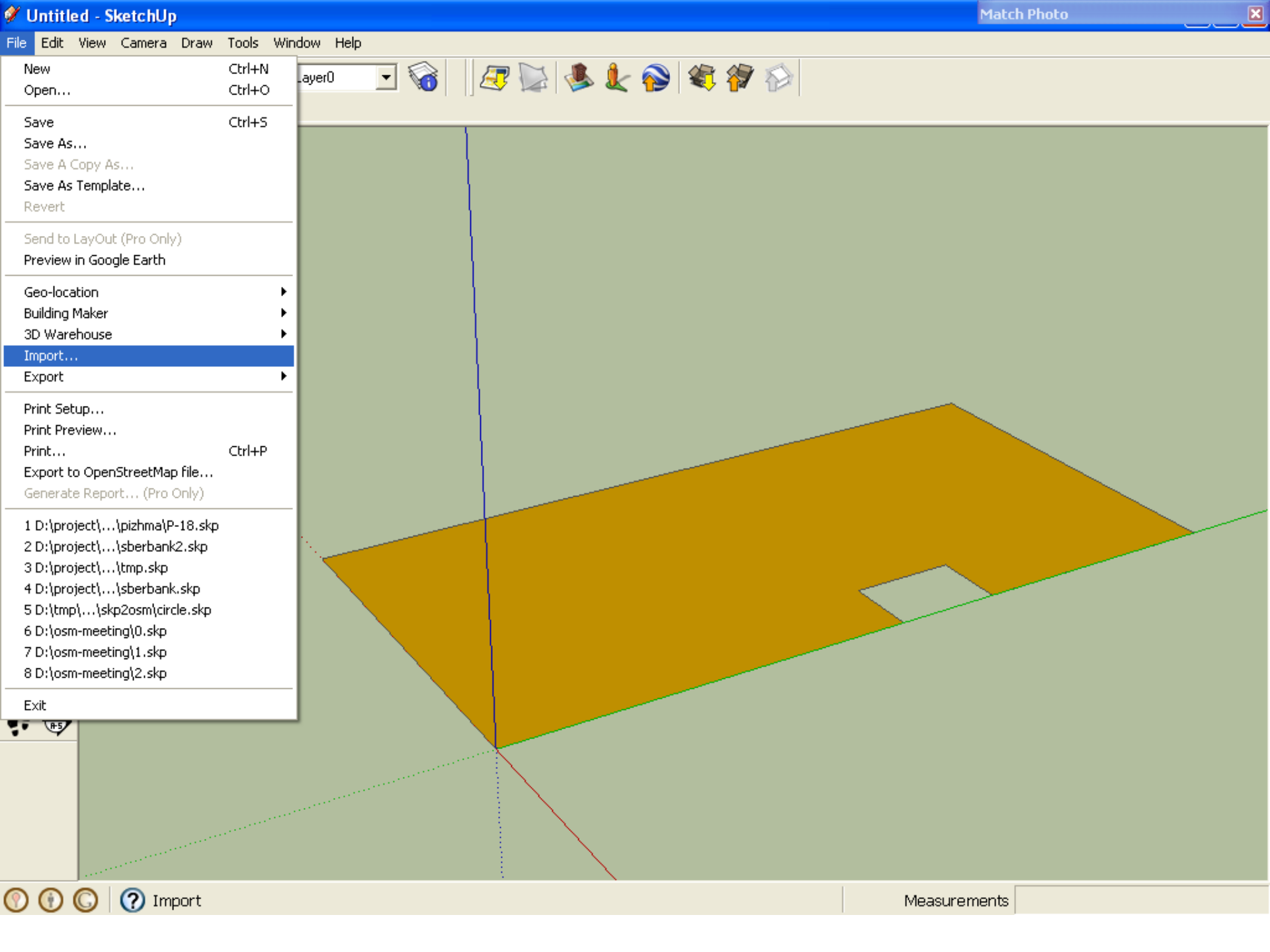




IMG_0172

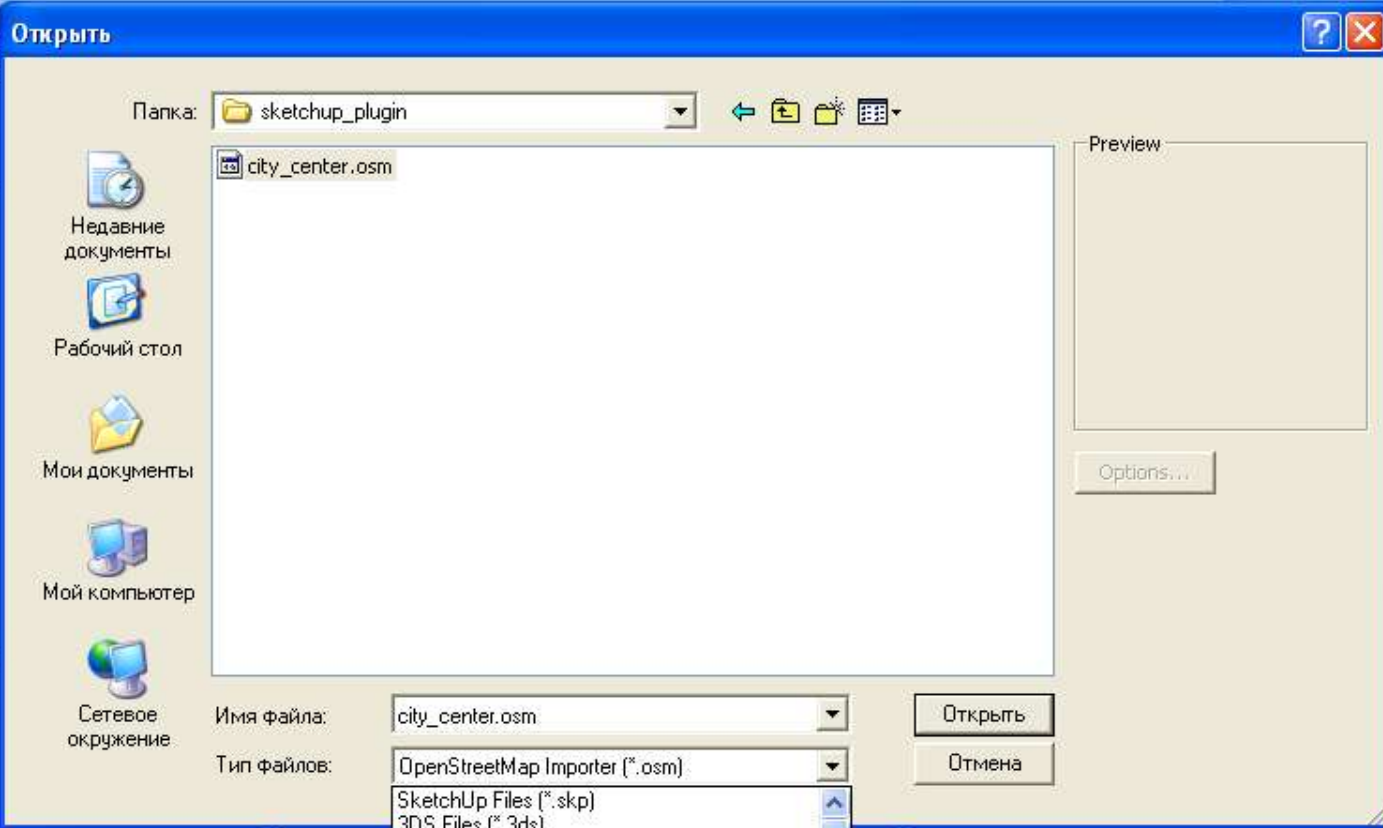
Match Photo







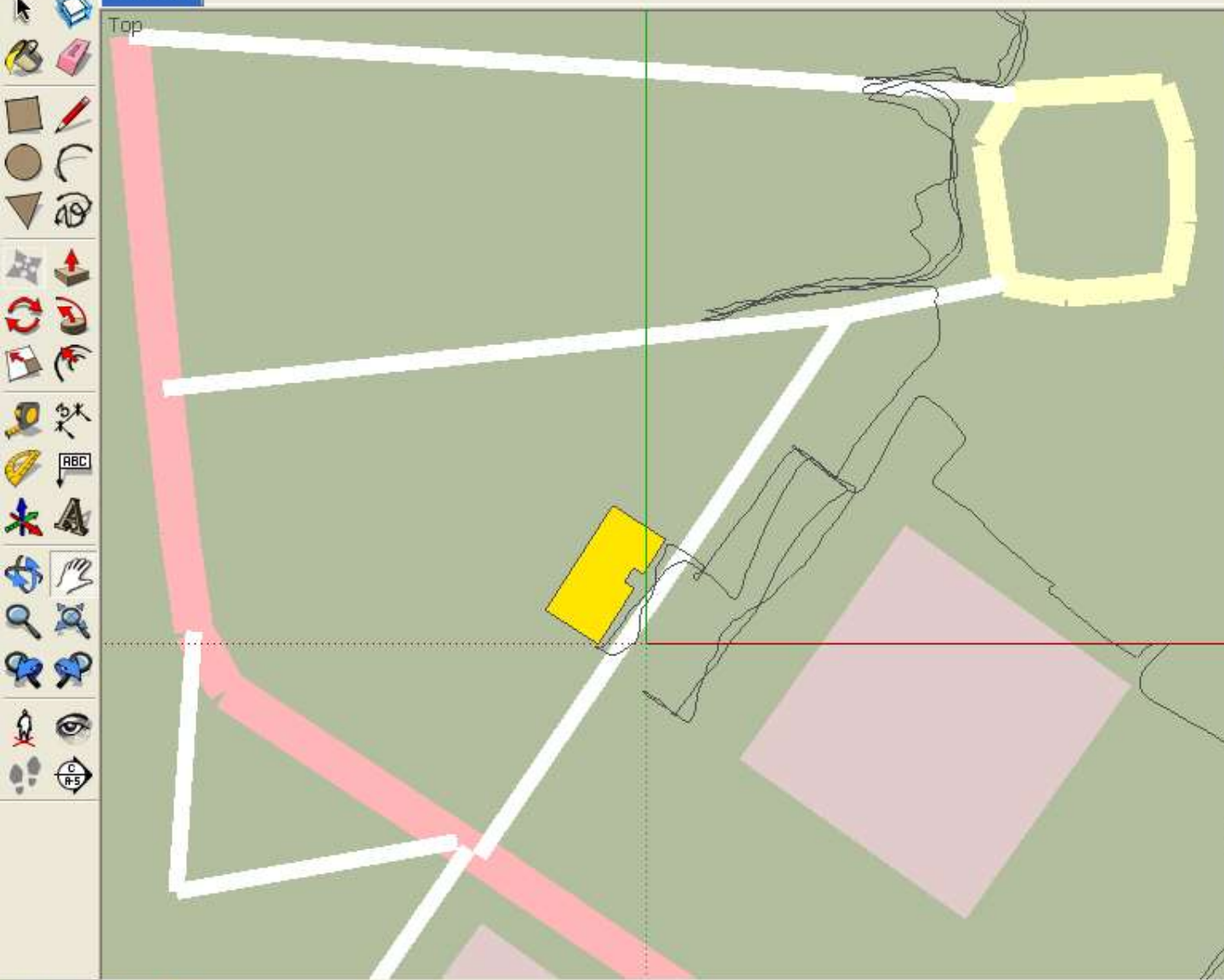
IMG_0172



- SketchUp Files (*.skp)
- 3DS Files (*.3ds)
- DEM (*.dem, *.ddf)
- Google Earth/COLLADA Files (*.kmz, *.dae)
- OpenStreetMap Importer (*.osm)**
- NMEA Importer (*.txt)
- GPX Importer (*.gpx)
- All Supported Image Types
- JPEG Image (*.jpg)
- Portable Network Graphics (*.png)



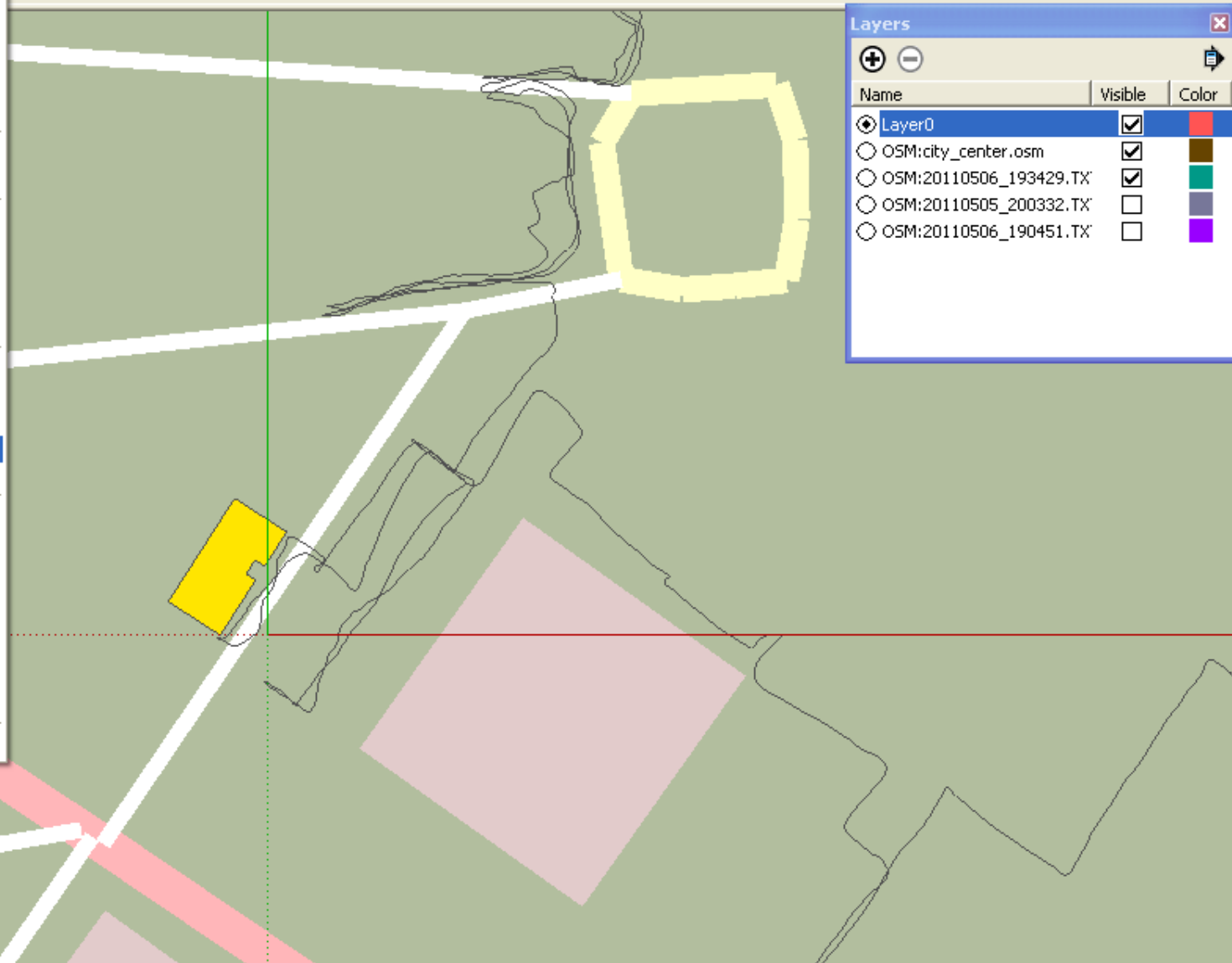
IMG_0172



Layers

Name	Visible	Color
Layer0	☒	
OSM:city_center.osm	☒	
OSM:20110506_193429.TX	☒	
OSM:20110505_200332.TX	☐	
OSM:20110506_190451.TX	☐	

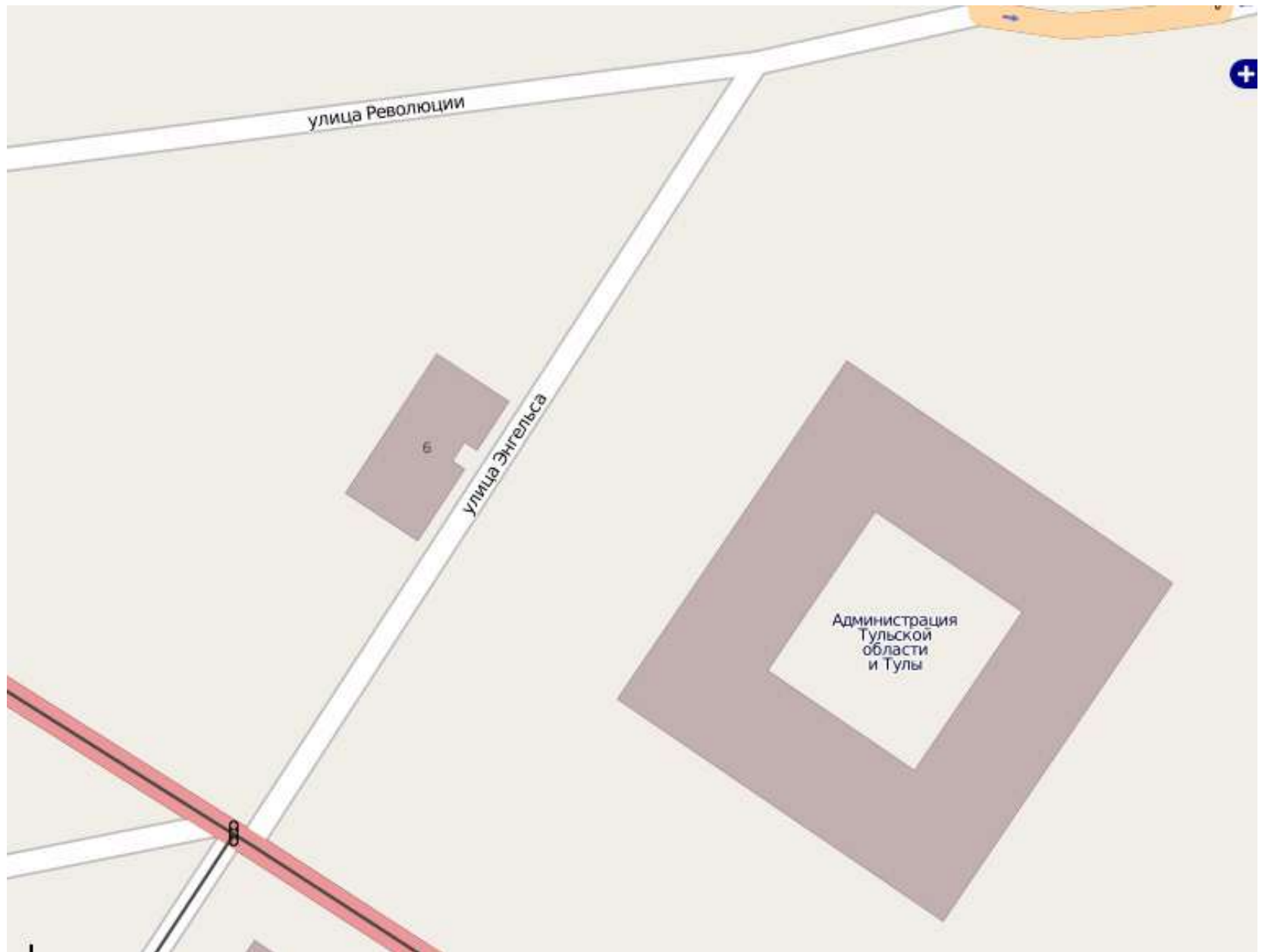
New	Ctrl+N
Open...	Ctrl+O
Save	Ctrl+S
Save As...	
Save A Copy As...	
Save As Template...	
Revert	
Send to LayOut (Pro Only)	
Preview in Google Earth	
Geo-location	▶
Building Maker	▶
3D Warehouse	▶
Import...	
Export	▶
Print Setup...	
Print Preview...	
Print...	Ctrl+P
Export to OpenStreetMap file...	
Generate Report... (Pro Only)	
1 D:\project\...\pizhma\P-18.skp	
2 D:\project\...\sberbank2.skp	
3 D:\project\...\tmp.skp	
4 D:\project\...\sberbank.skp	
5 D:\tmp\...\skp2osm\circle.skp	
6 D:\osm-meeting\0.skp	
7 D:\osm-meeting\1.skp	
8 D:\osm-meeting\2.skp	
Exit	



Layers

Name	Visible	Color
Layer0	☒	
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OSM:20110505_200332.TX	☐	
OSM:20110506_190451.TX	☐	

That's it!



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