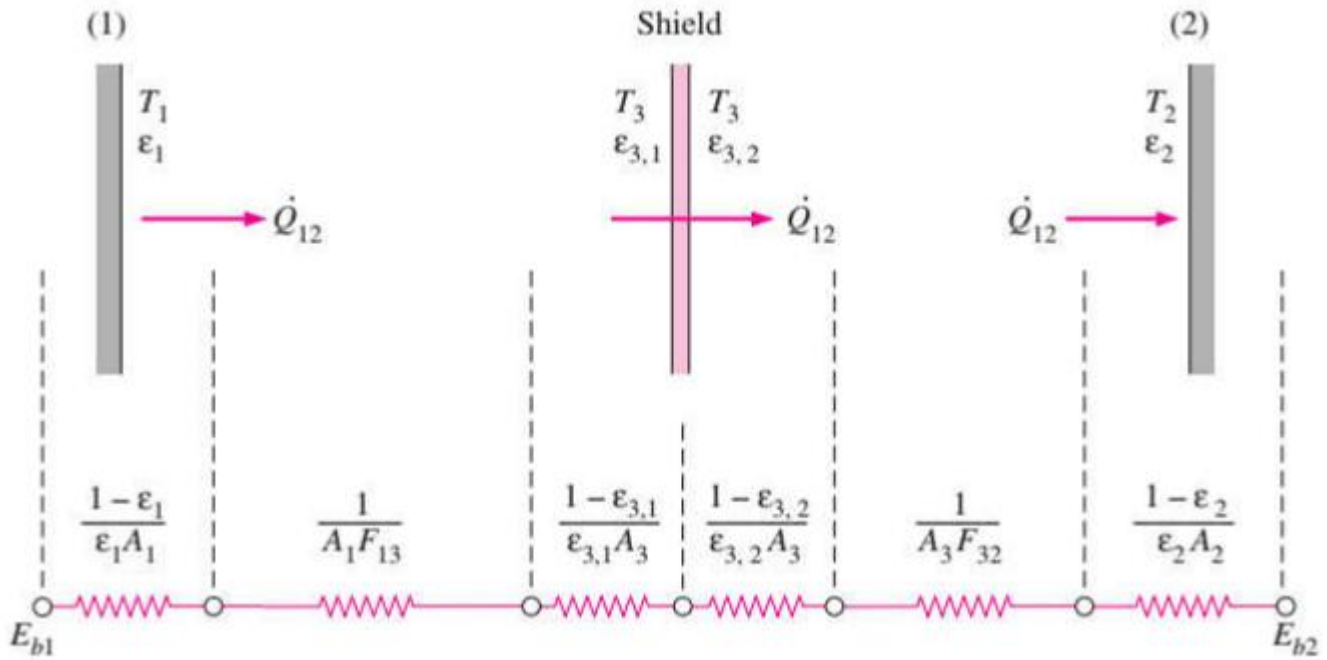
Task 1: Considering the same example you solved in the previous assignment (radiative heat transfer between two parallel plates), how many shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields ?

$$\dot{Q}_{12,\ \text{N shields}} = \frac{A\sigma(T_1^4 - T_2^4)}{(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1) + (\frac{1}{\varepsilon_{3,1}} + \frac{1}{\varepsilon_{3,2}} - 1) + \ldots\ldots + (\frac{1}{\varepsilon_{N,1}} + \frac{1}{\varepsilon_{N,2}} - 1)}$$

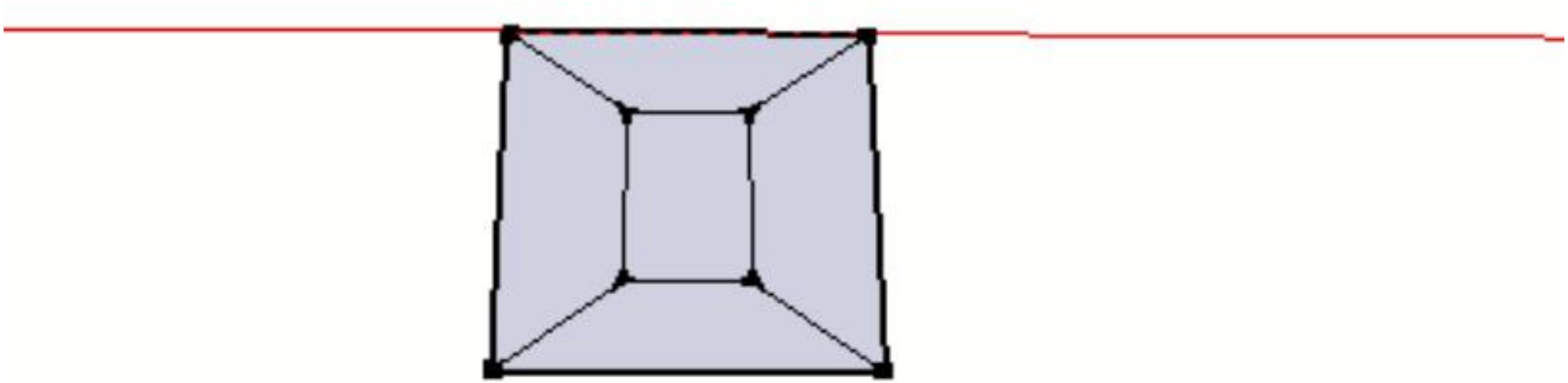
$$\dot{Q}_{12,\ \text{N shields}} = \frac{A\sigma(T_1^4 - T_2^4)}{(\frac{1}{\varepsilon} + \frac{1}{\varepsilon} - 1)(N+1)} = \frac{1}{(N+1)}\dot{Q}_{12,\ \text{N shields}}$$

$if --> N = 99$

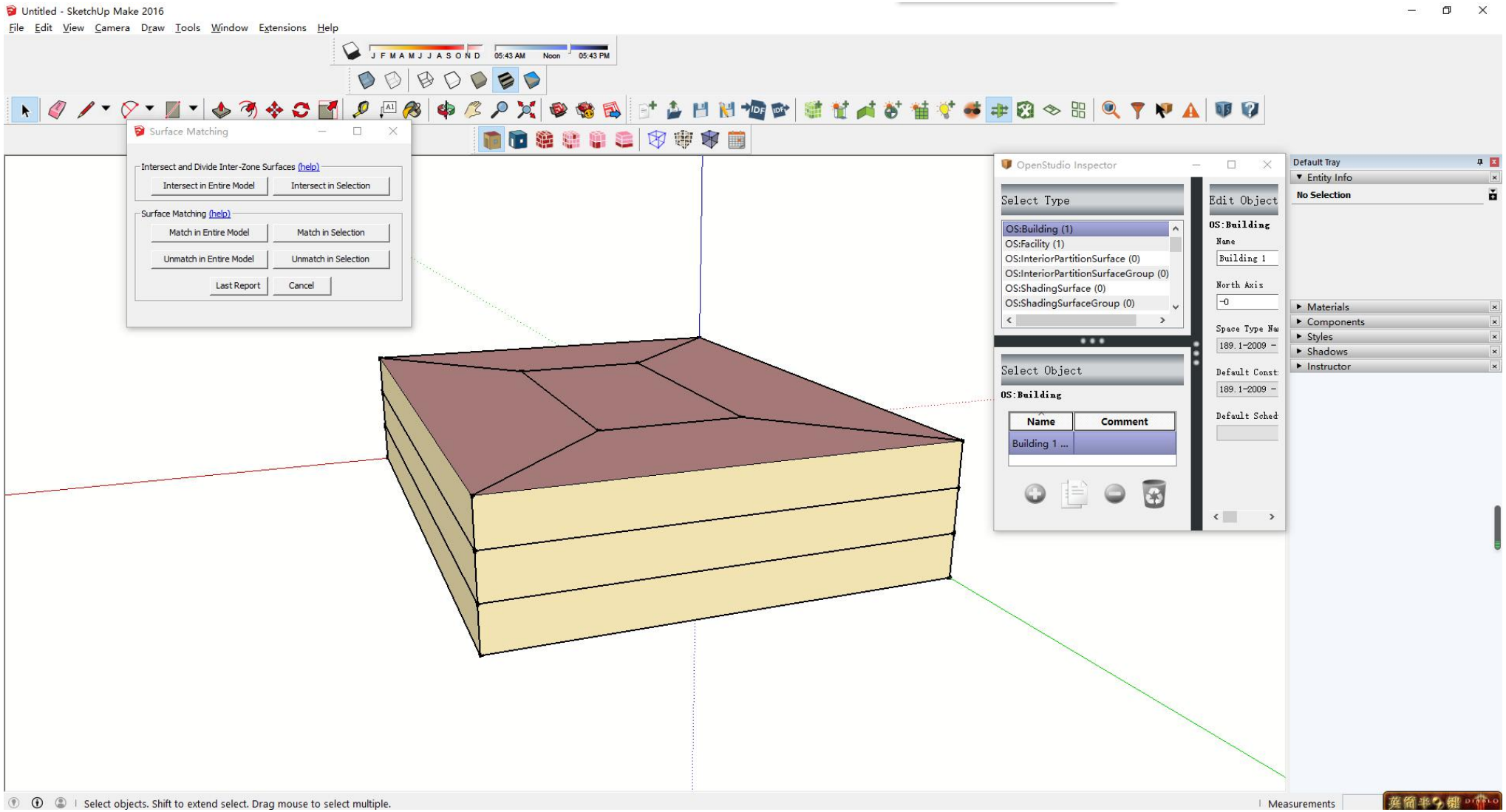
$= 0.01$



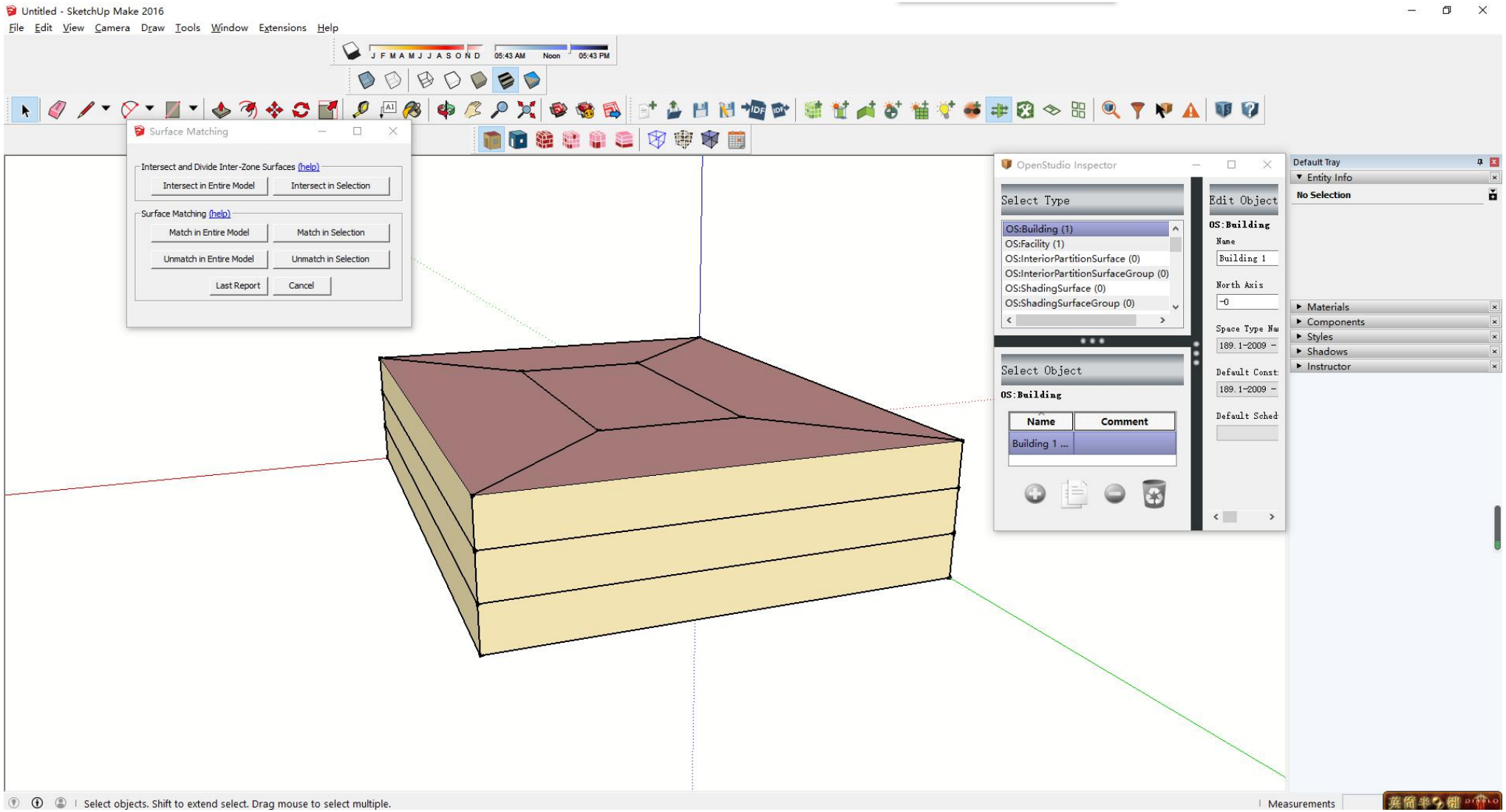
Task 2: You should create a pdf file with screenshots of all of the steps we went through (clearly from your own file) and explain briefly the reason behind the use of each step (in your own words!)



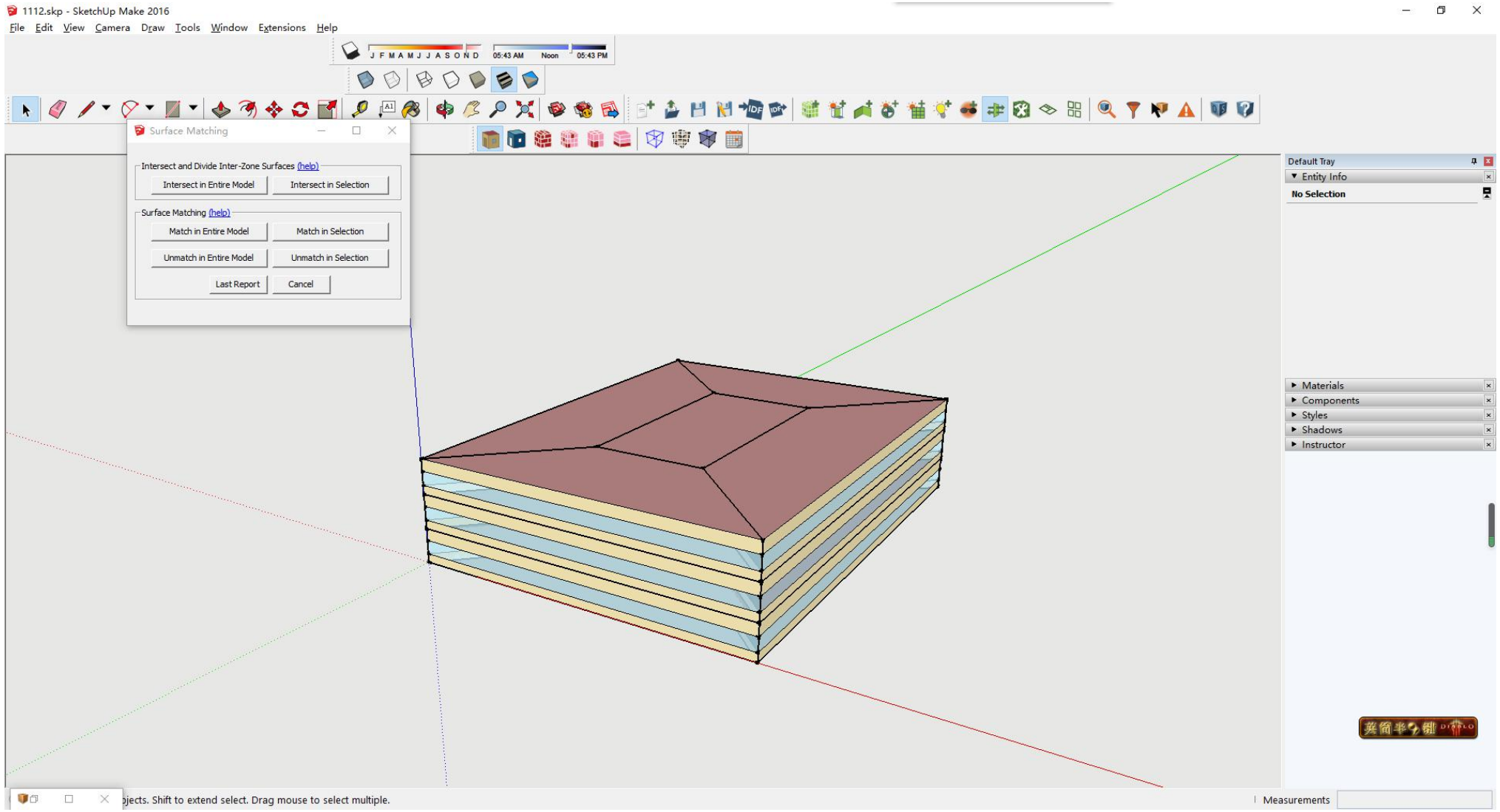
1 Create a simple gon



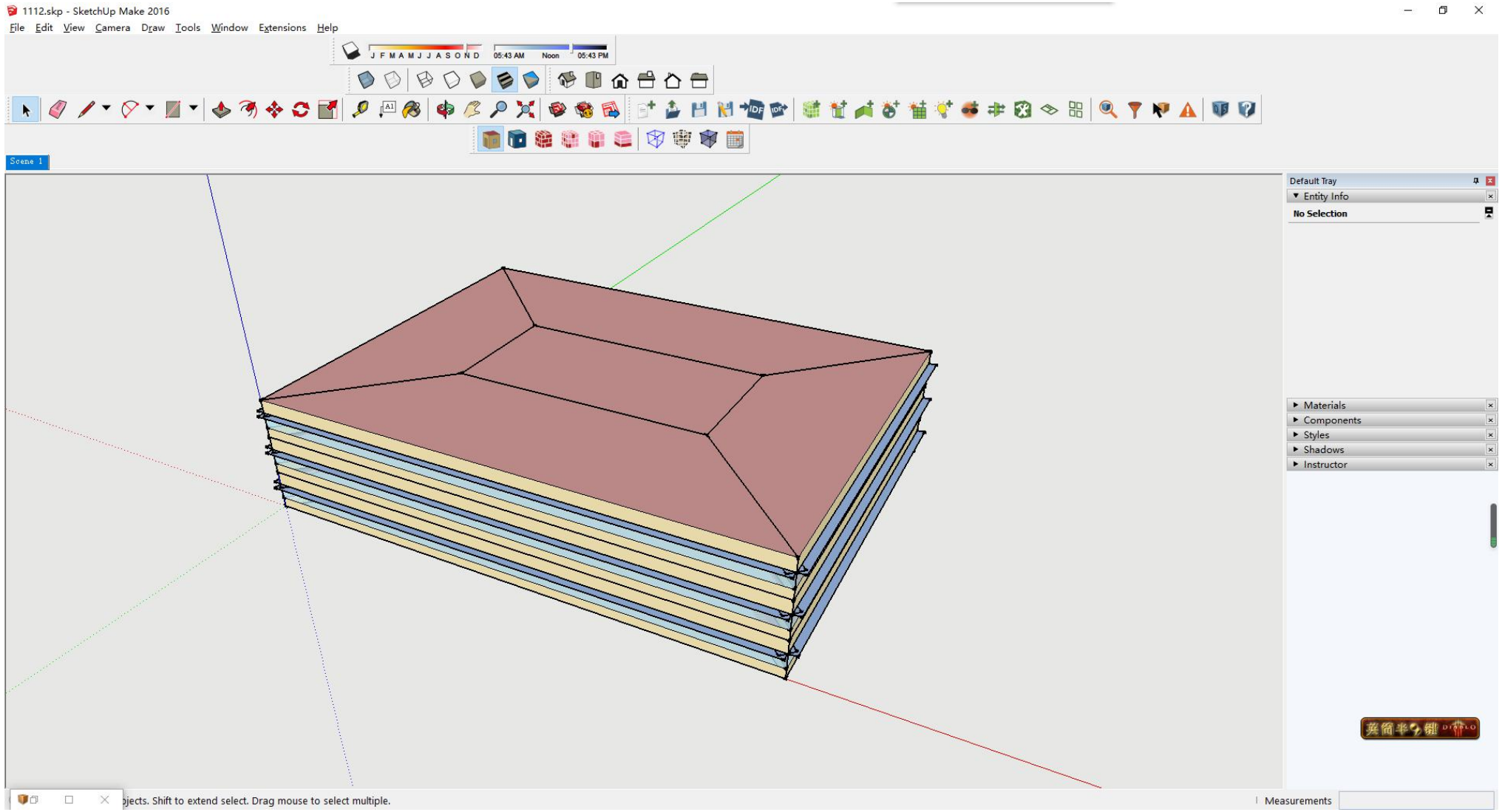
2 press “create spaces from diagram” buttom to create 3m heigh building



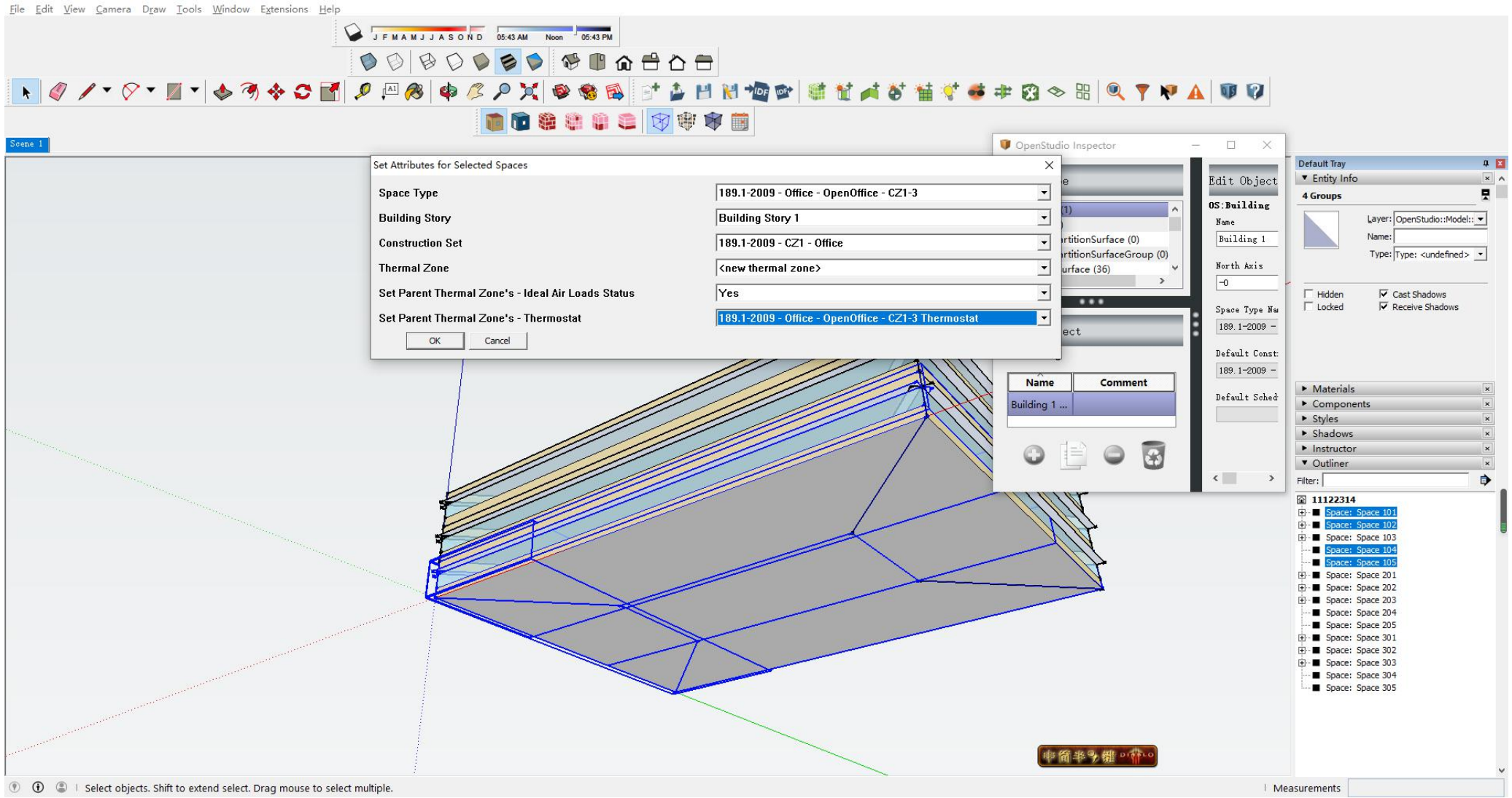
3 press surfaces matching-intersect in entire model to define surfaces



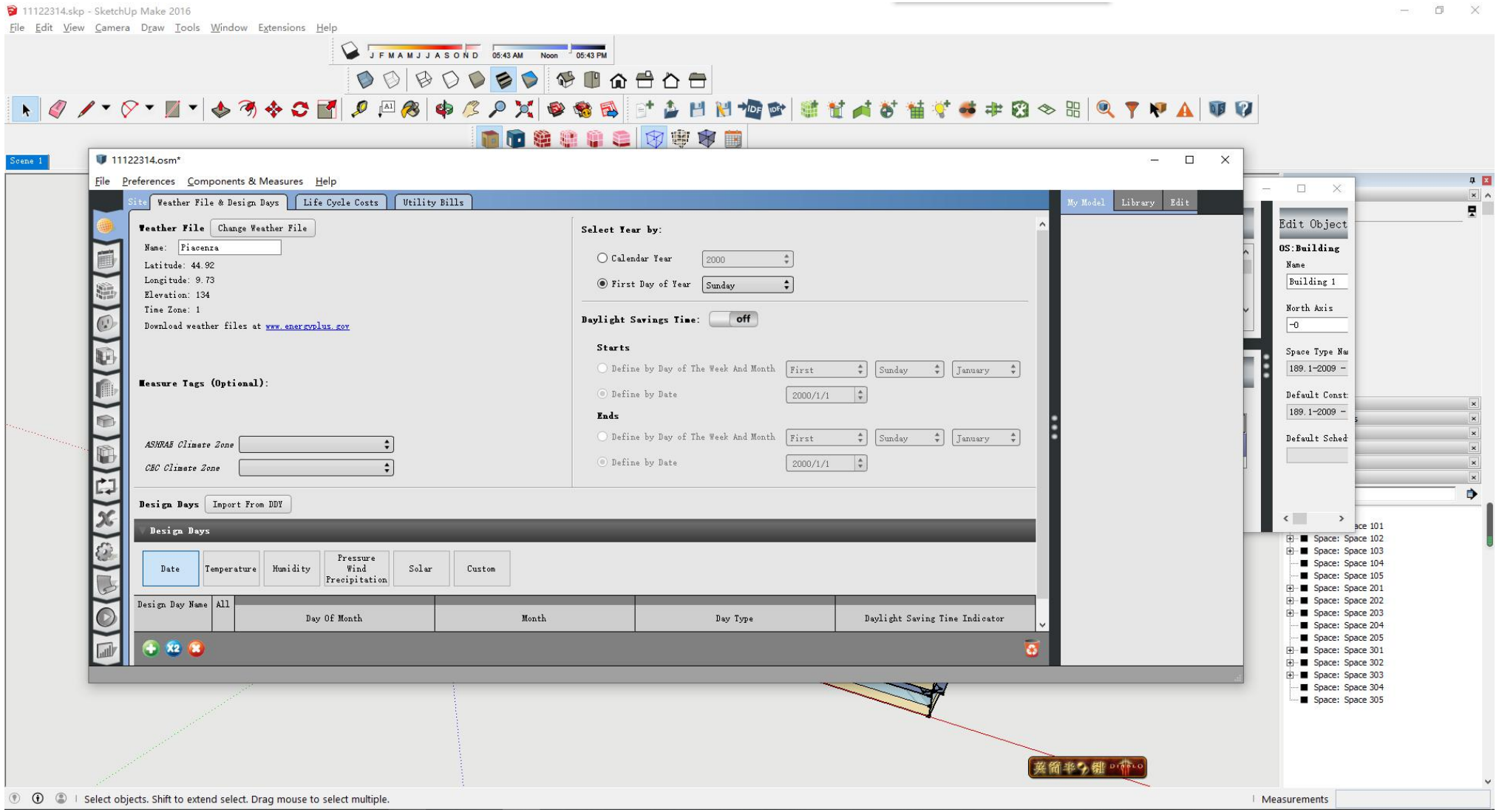
4 press “set windows to wall ratio” to create windows



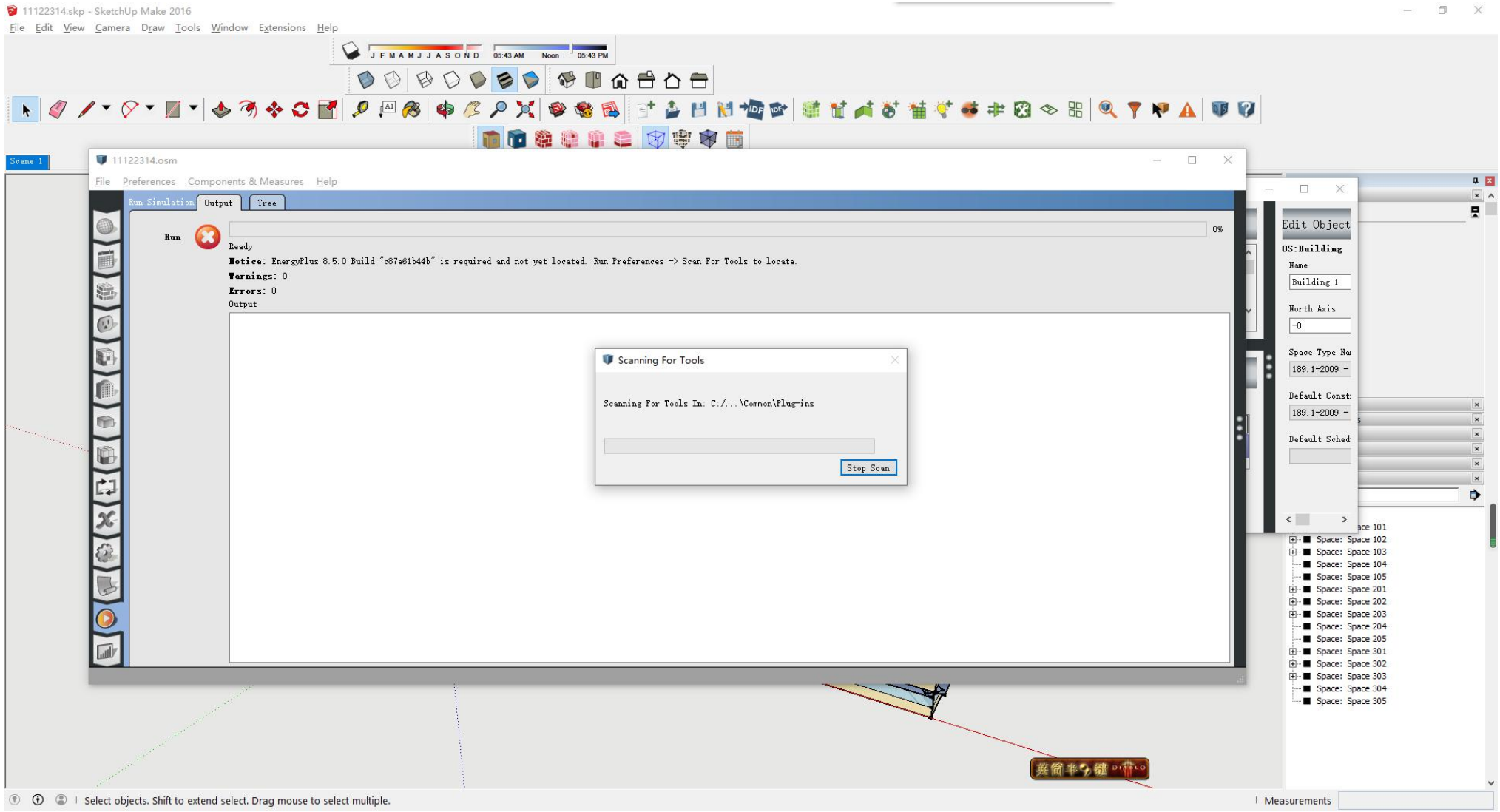
5 select each surfaces except the north side and press “add overhangs by projection factor” to create overhangs



6 create outline and then select space 101 102 103 105
press “set attributes for selected spaces” to build the buttom



7 launch OSM and then add Piacenza weather data



8 Run the model

11122314.osm

File Preferences Components & Measures Help

Results Summary

Reports: OpenStudio Results

Open ResultsViewer for Detailed Reports

- Model Summary
- Annual Overview
- Monthly Overview
- Utility Bills/Rates
- Envelope
- Space Type Breakdown
- Space Type Summary
- Interior Lighting Summary
- Plug Loads Summary
- Exterior Lighting
- Water Use Equipment
- HVAC Load Profiles
- Zone Conditions
- Zone Overview
- Zone Equipment Detail
- Air Loops Detail
- Plant Loops Detail
- Outdoor Air
- Cash Flow
- Site and Source Summary
- Schedule Overview

OpenStudio Results

Model Summary

Building Summary

Information	Value	Units
Building Name	Building 1	building_name
Net Site Energy	558,084	kBtu
Total Building Area	10,764	ft^2
EUI (Based on Net Site Energy and Total Building Area)	51.85	kBtu/ft^2
OpenStudio Standards Building Type		

Weather Summary

	Value
Weather File	Piacenza - ITA IGDG WMO#=160840
Latitude	44.92
Longitude	9.73
Elevation	440 (ft)
Time Zone	1.00
North Axis Angle	-0.00
ASHRAE Climate Zone	

Sizing Period Design Days