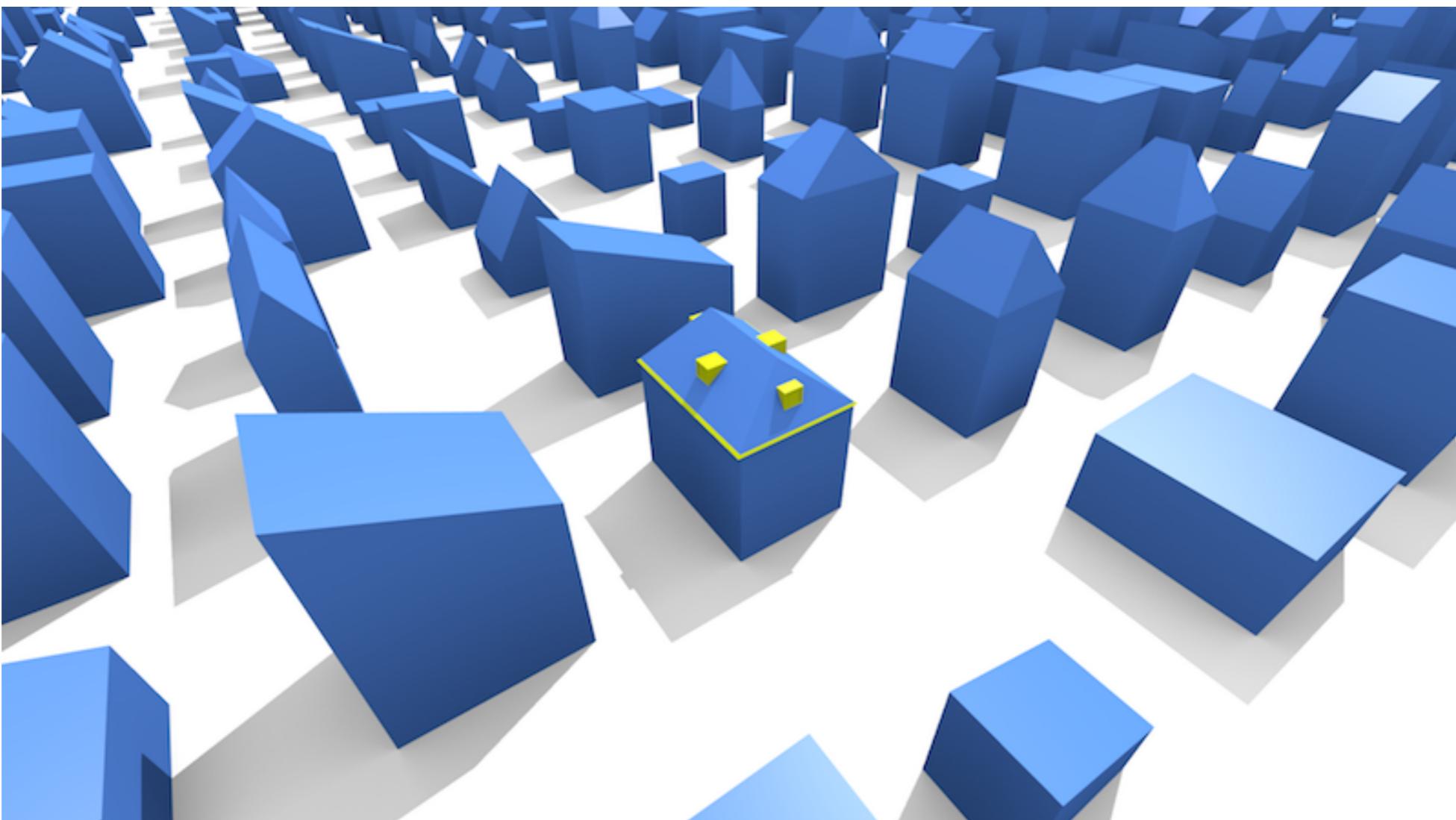
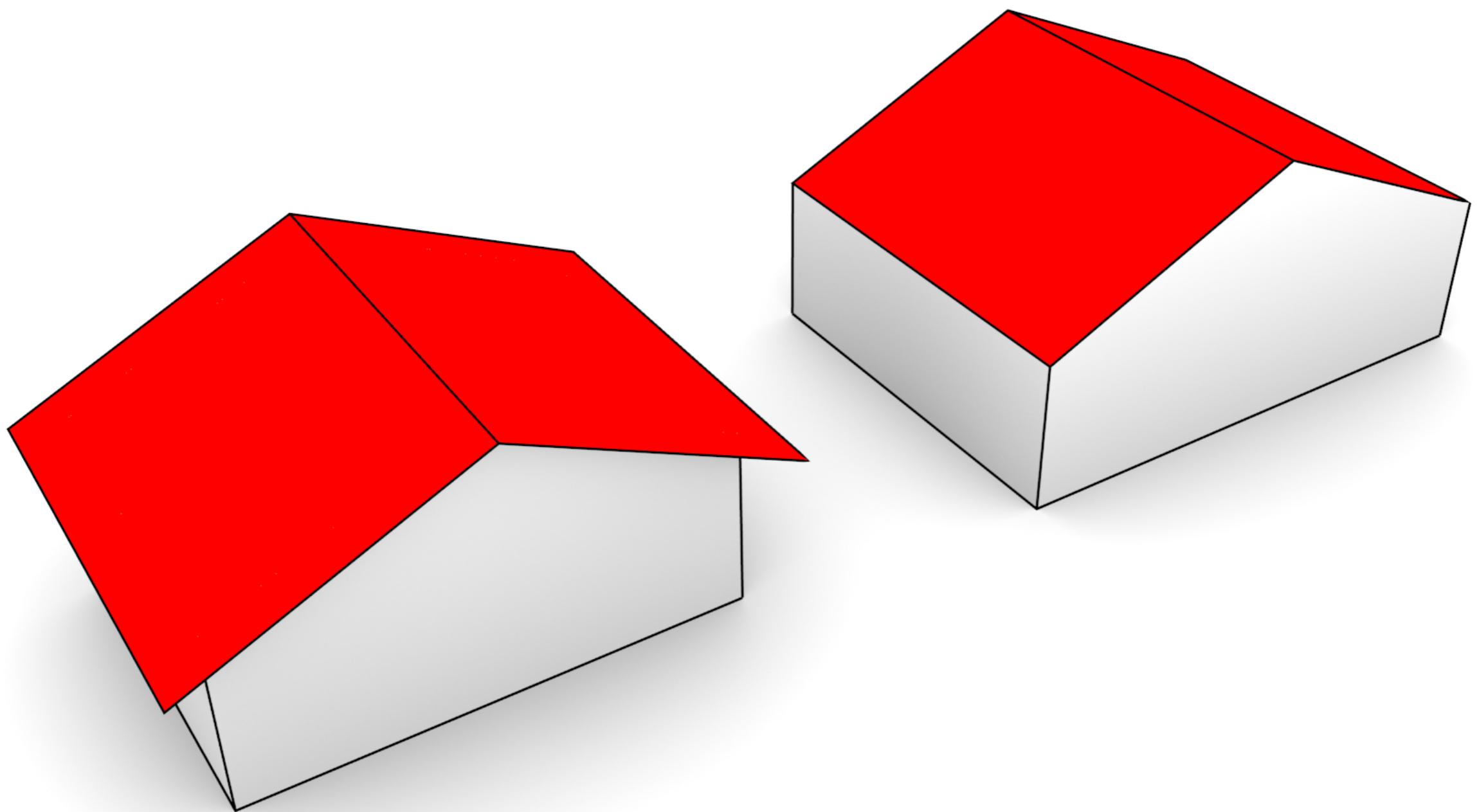


Importance of specifying the geometric complexity

Filip Biljecki, TU Delft

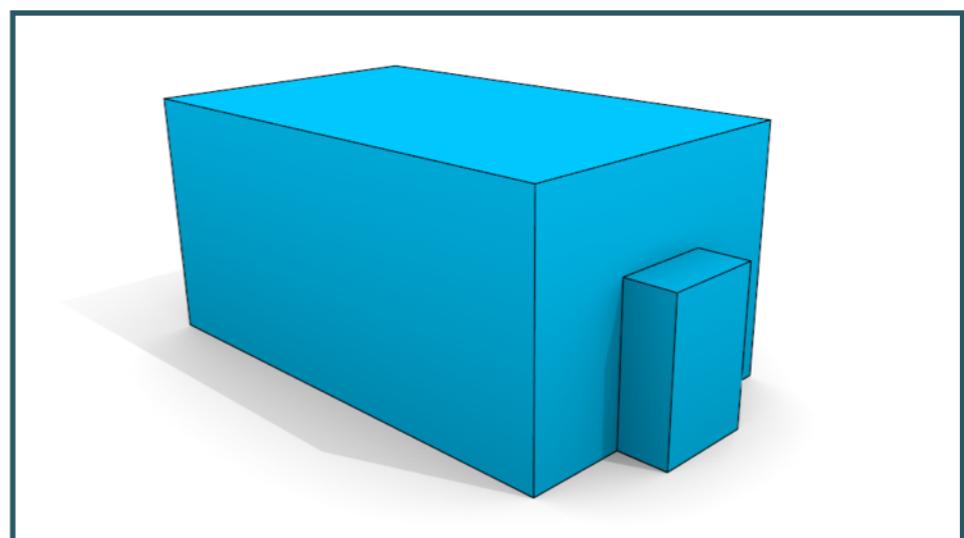
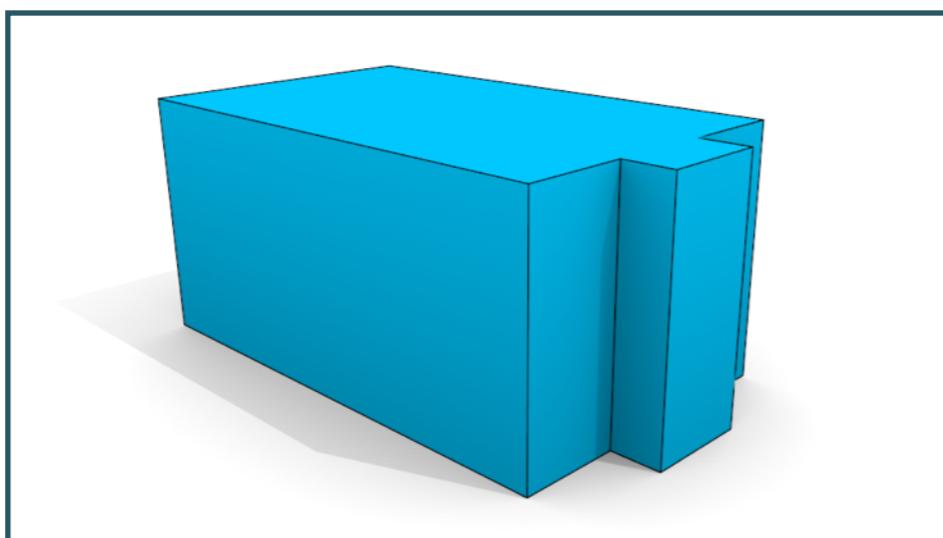
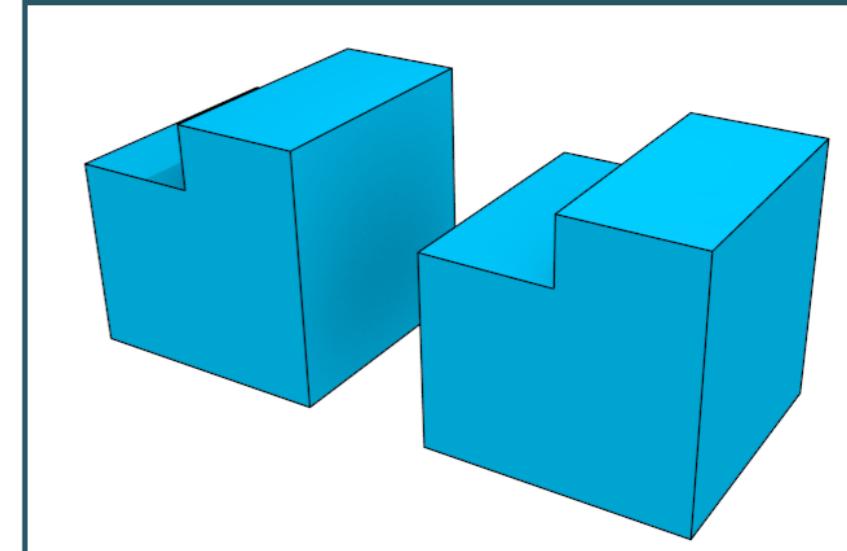
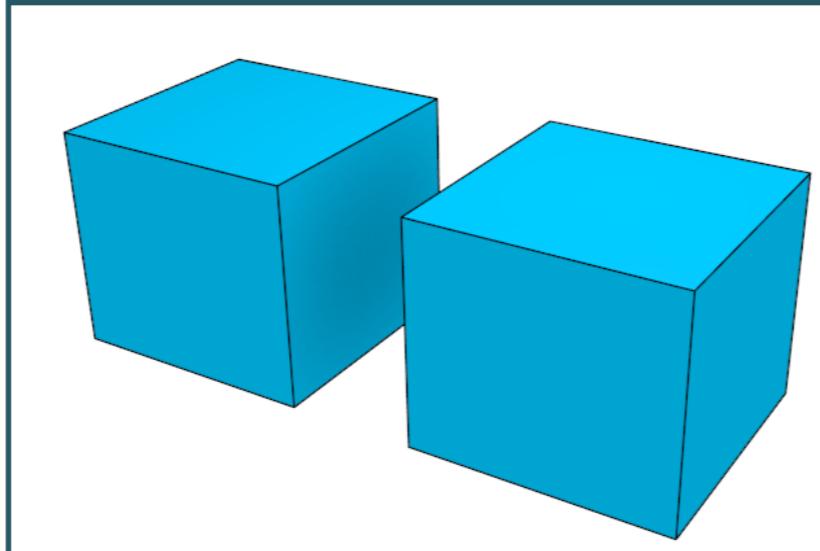
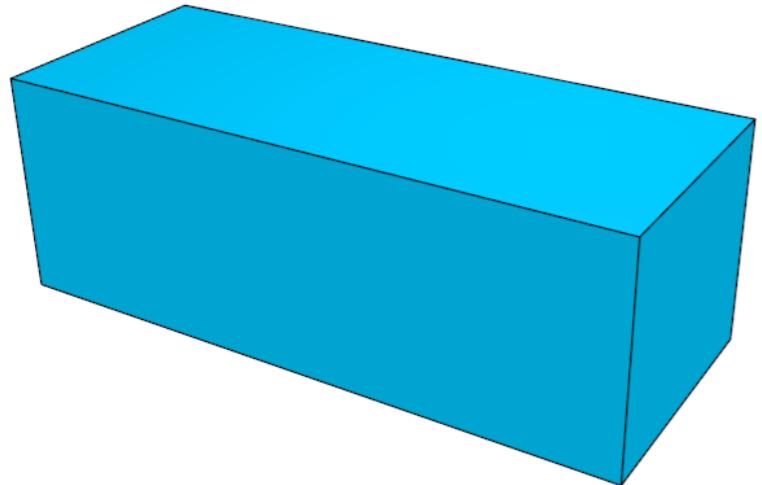




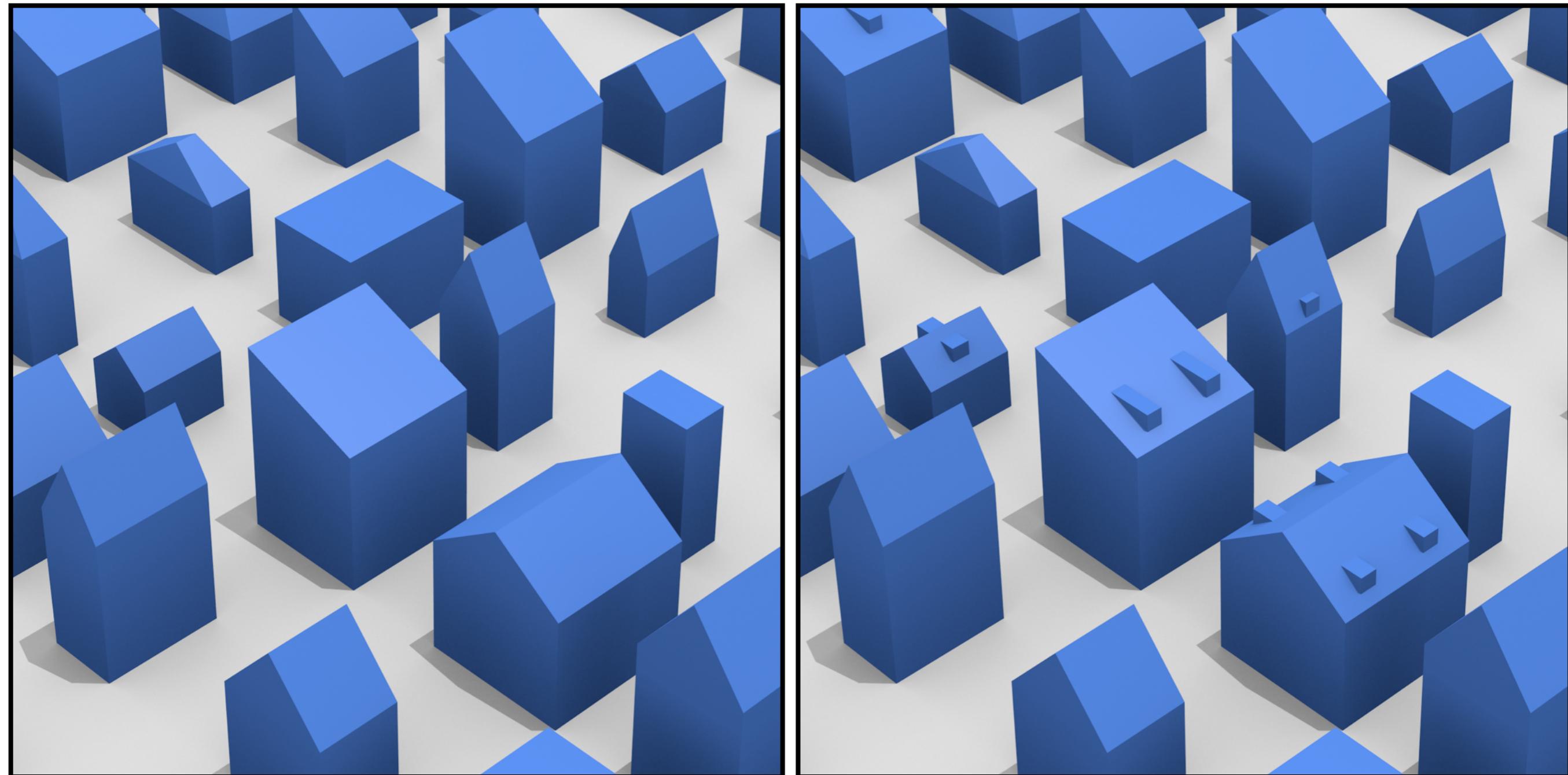
Background and facts

- The geometric aspect (which is orthogonal to the semantics) is overlooked in the WP3 discussions
1. Practitioners refer to the CityGML level of detail concept to express the geometric complexity of a model
 2. Too much ambiguity in CityGML when it comes to the description of the complexity of the geometric representation. What is exactly an LOD2?

LOD1 – multiple variants

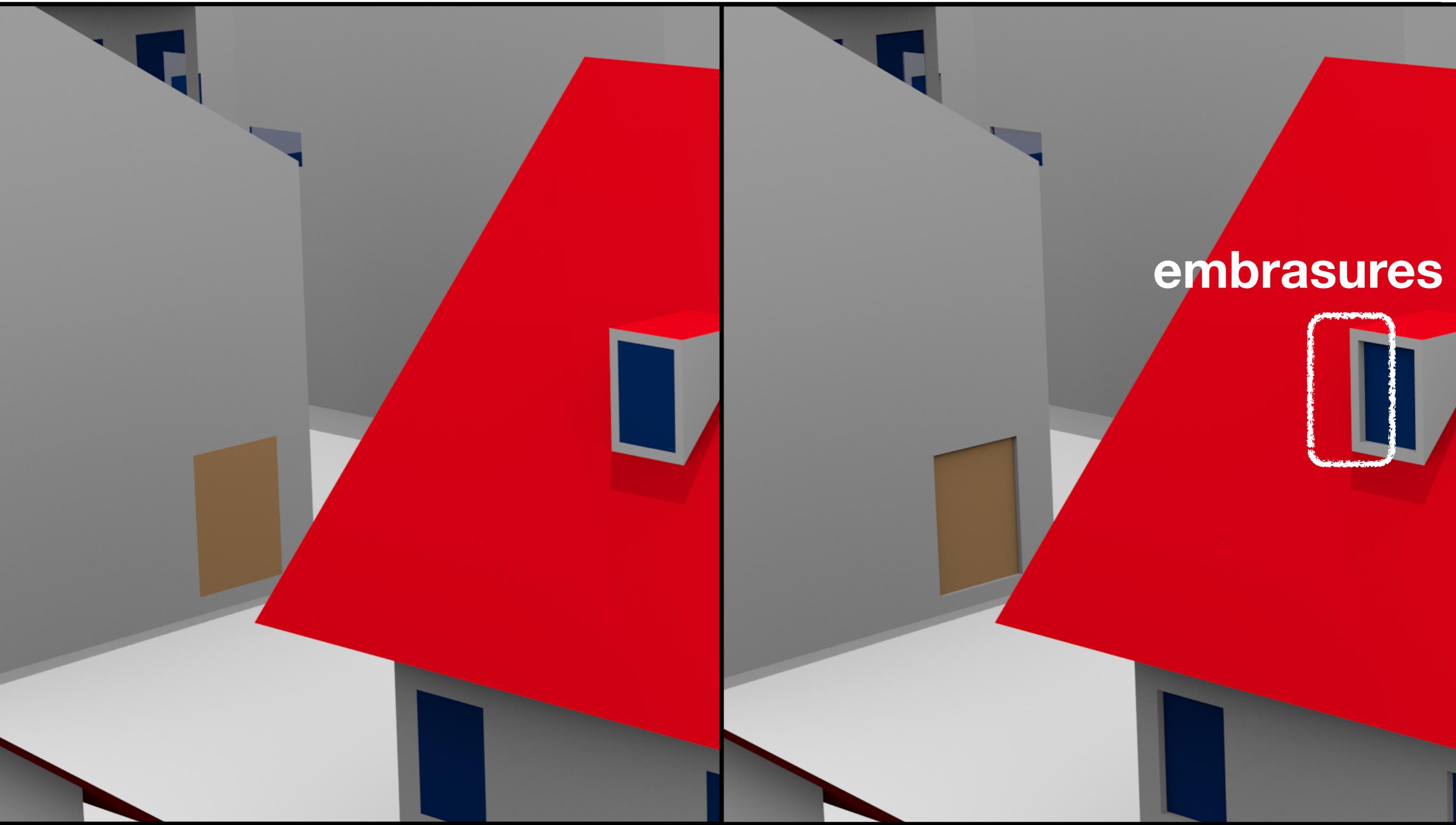


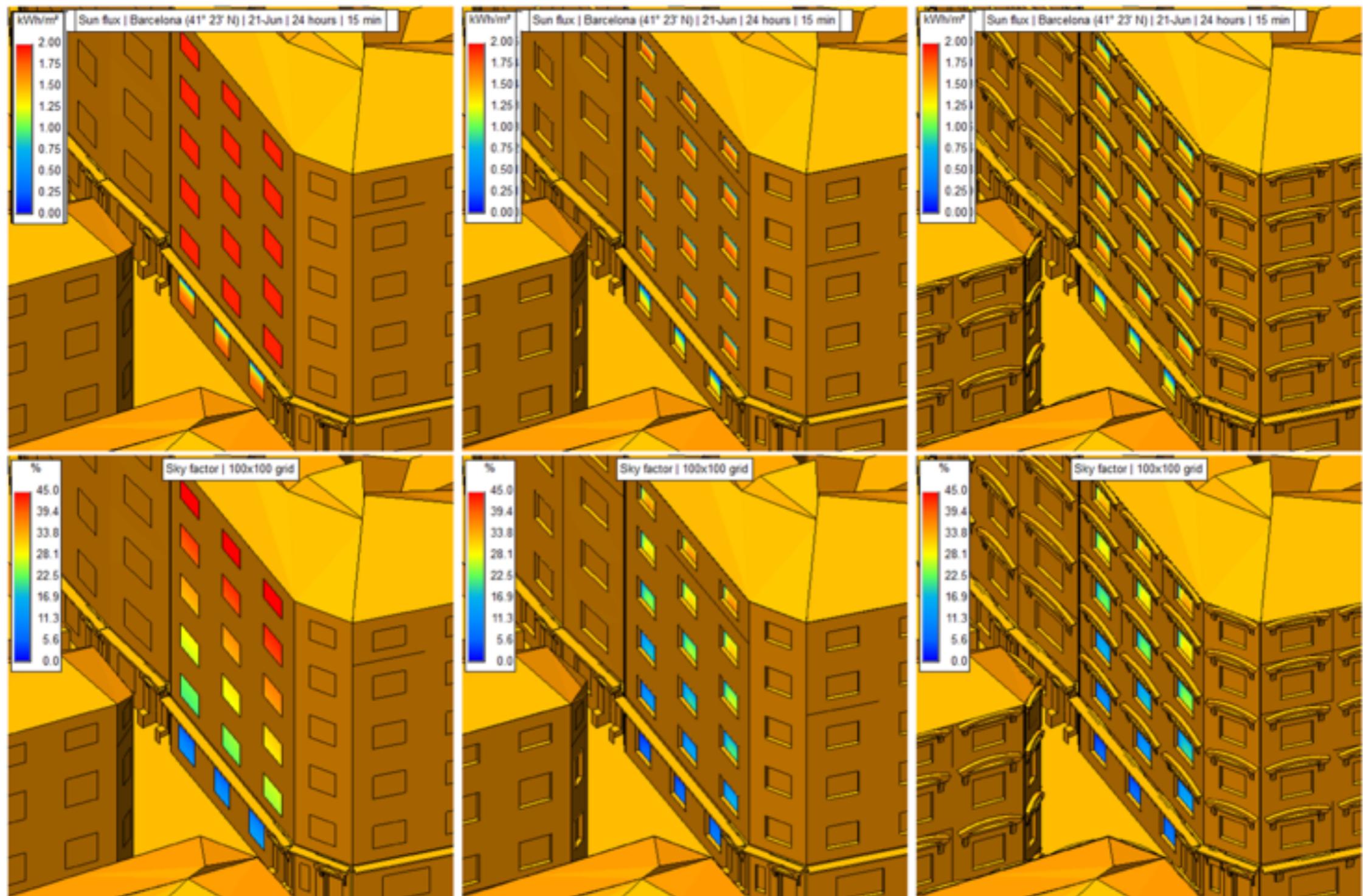
LOD2



Should dormers and overhangs be acquired?

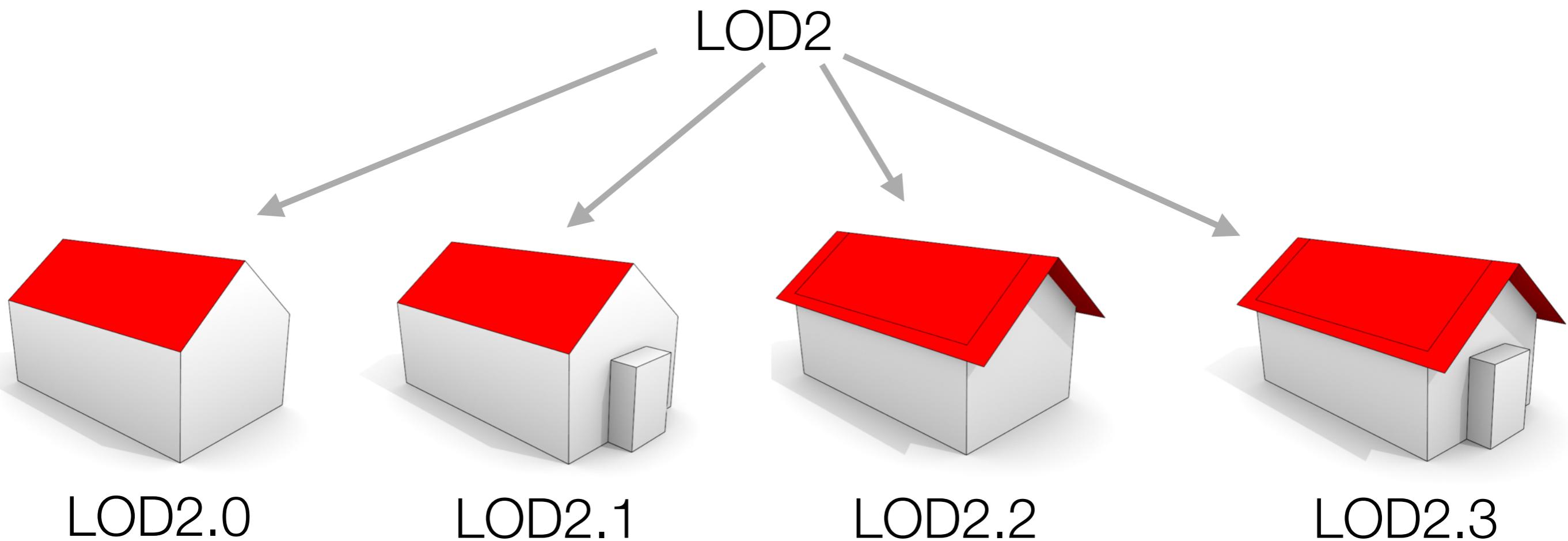
LOD3





Solution

- Retain the current concept for general guidelines
 - e.g. “LOD2 is a simple model containing standard type and simplified roof structures”
- but refine them into multiple geometric representations with less ambiguous definitions and regard them in the metadata. **Only as guidelines.**



Specifications

- Should be realised through two main aspects that regard the actual industry practices:
 - List of features to be acquired (e.g. chimneys, windows on walls)
 - Minimum size of these features to be mapped (e.g. 2 m)

Case of dormers, LOD2 acquisition from an orthophoto of GSD 8cm



Courtesy of Geofoto, Zagreb (Croatia)

Specifications (example)

LOD2	Acquire...	Min. size	Suited for techniques
LOD2.0	Only simple roof shapes	2 m	Aerial LiDAR or photog.
LOD2.2	Simple roof shapes with explicit roof overhangs	0.5 m	Terrestrial LiDAR or cadastre + aerial LiDAR combination

Advantages and conclusion

- Less ambiguity for data producers
- Advanced the popular concept with retaining the general idea (and general levels):
 - LOD0, LOD1, LOD2, LOD3 fully retained
- More or less compatible with other proposals as it supplements the concept with informative guidelines
- Only significant issue: cardinality – not possible to simultaneously store two LOD2 models

Implementation



- Early implementation in my procedural modelling engine Random3Dcity (synthetic CityGML data in multiple LODs)
<http://3dgeoinfo.bk.tudelft.nl/biljecki/Random3Dcity.html>
- Around 15 LODs so far—real data already available!
- I will submit a publication in a few weeks