

Harmonization between CityGML and INSPIRE Buildings



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CityGML Workshop
TU Munich, June 21st 2013

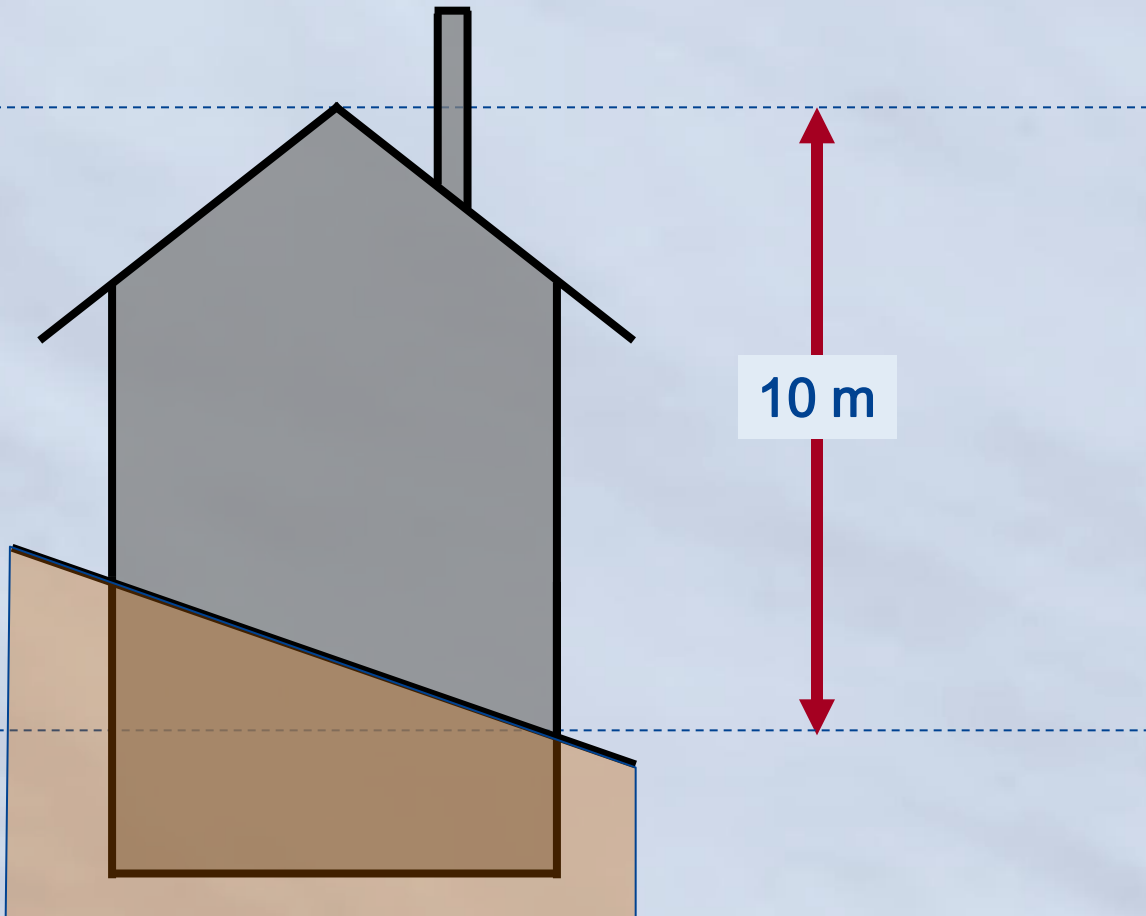
- INSPIRE Building model: developed in the last 3 years
 - Mandatory 2D and 3D profile
 - Focus on environmental applications (Noise, ...)
- **Great influence** of CityGML on INSPIRE Building model
 - 2D profiles: patterns (*Building/BuildingPart*, ...), attributes (*externalReference*, *roofType*, ...)
 - 3D profiles: in addition LoD1 – LoD4 Geometries, *TerrainIntersectionCurve*, ...
- alternative encoding for INSPIRE: **CityGML ADE**
 - TU Munich/University of Bonn/INSPIRE TWG
- INSPIRE: **additional concepts** not contained in CityGML
- INSPIRE extensions: worth to be included in CityGML
 - ➔ harmonization between CityGML and INSPIRE

CityGML Building with height = 10 m

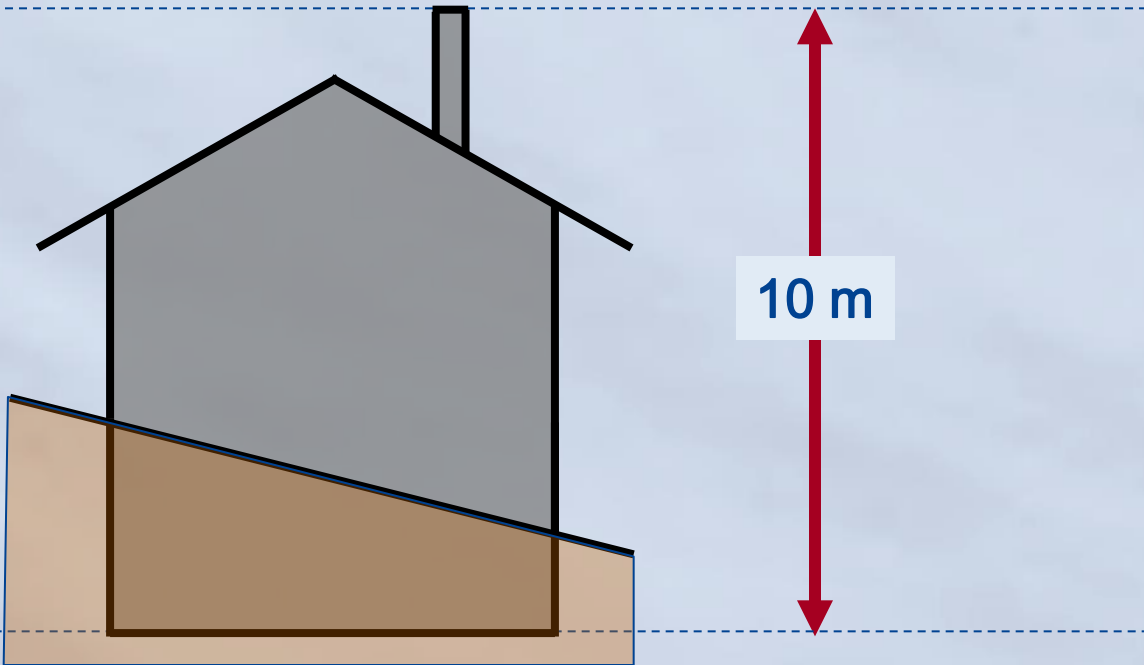


10 m

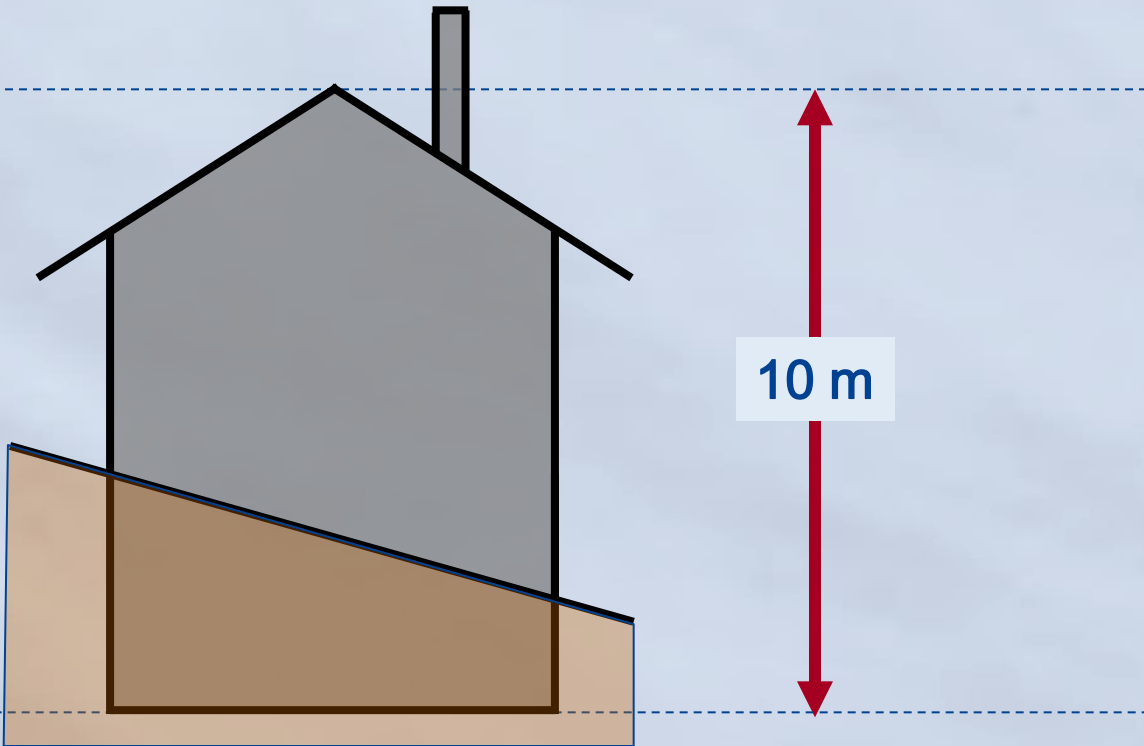
CityGML Building with height = 10 m



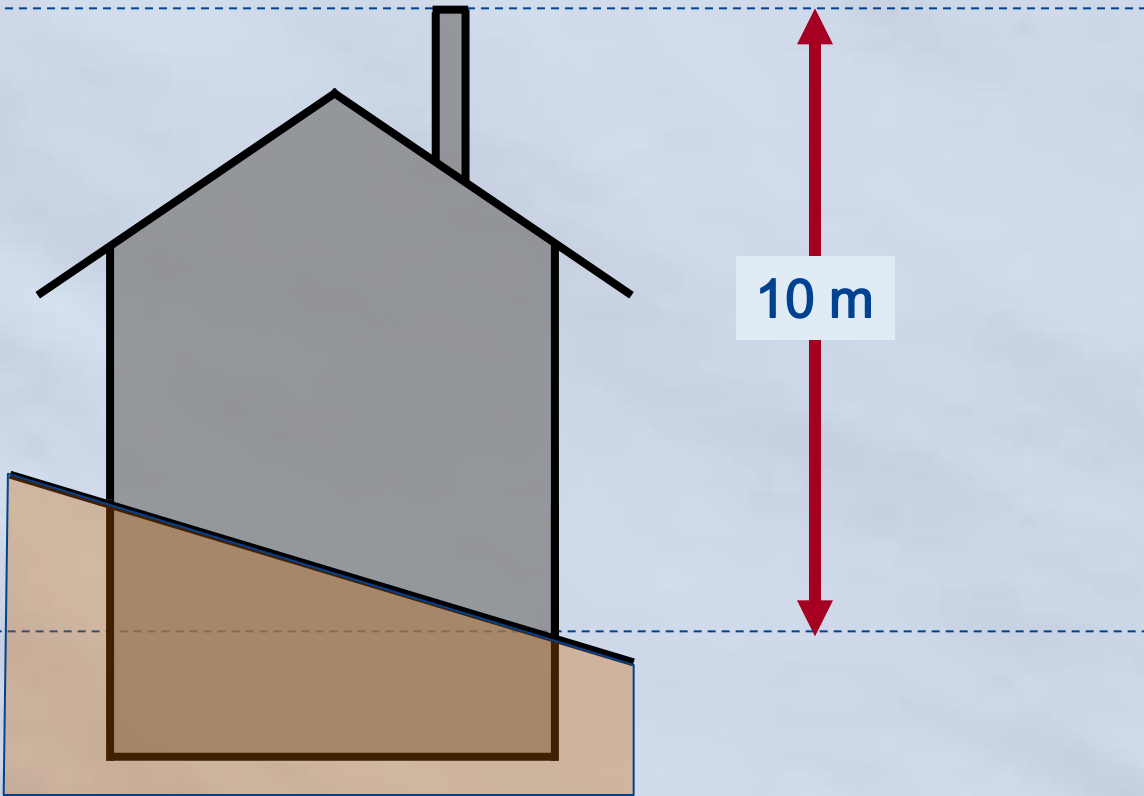
CityGML Building with height = 10 m



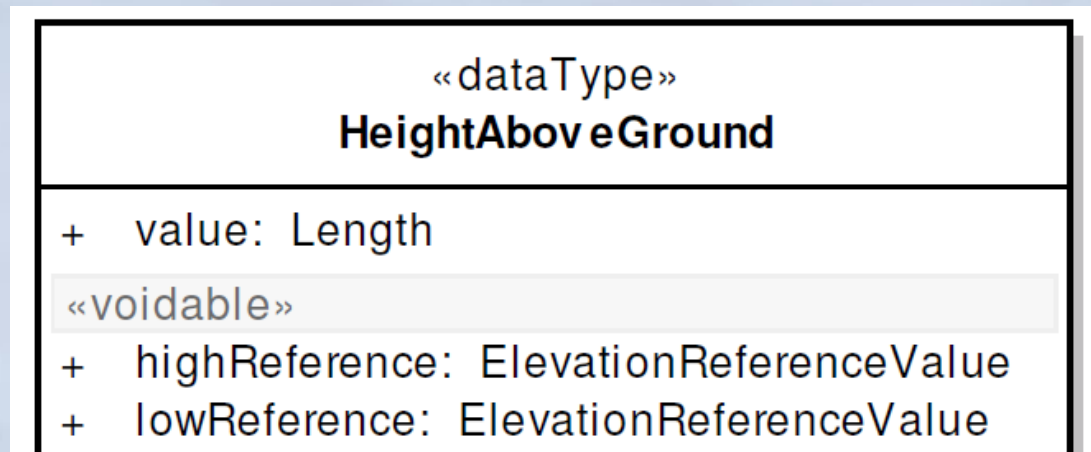
CityGML Building with height = 10 m



CityGML Building with height = 10 m



- CityGML:
 - height: number with unit of measure
 - difficult (if not impossible) to interpret correctly
- INSPIRE: complex data type
 - height: number with unit of measure
 - explicit representation of lower reference level (low reference)
 - explicit representation of upper reference level (high reference)



<p>«dataType» HeightAboveGround</p>
<p>+ value: Length</p>
<p>«voidable»</p>
<p>+ highReference: ElevationReferenceValue</p>
<p>+ lowReference: ElevationReferenceValue</p>
<p>+ status: HeightStatusValue</p>

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topOfConstruction

highestPoint

generalEave

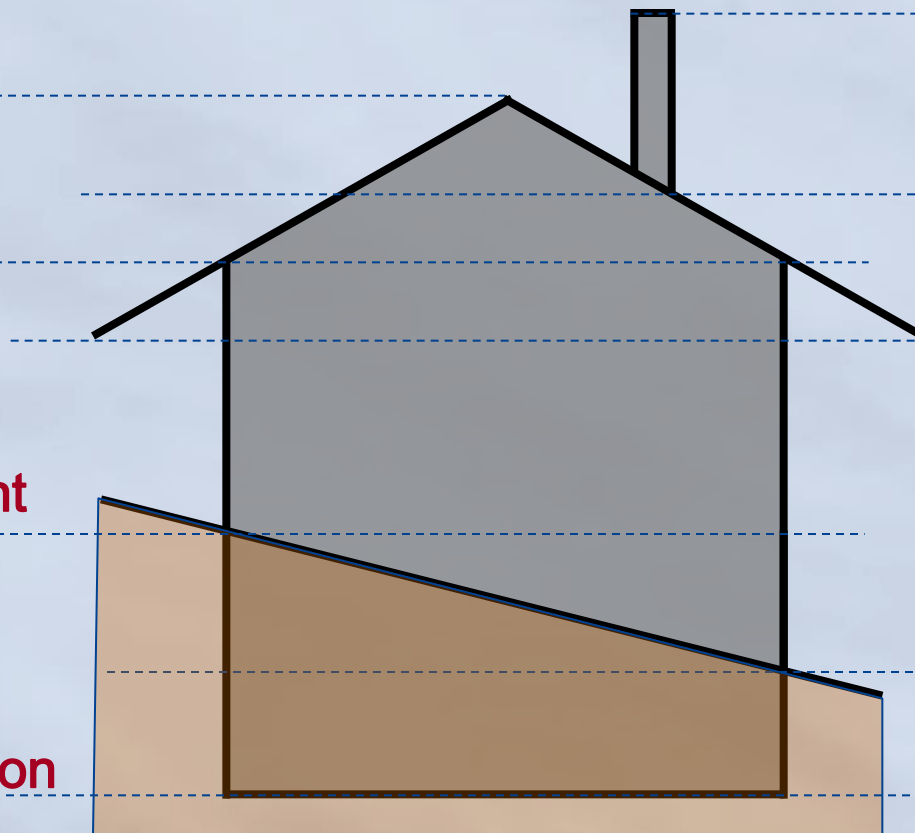
generalRoof

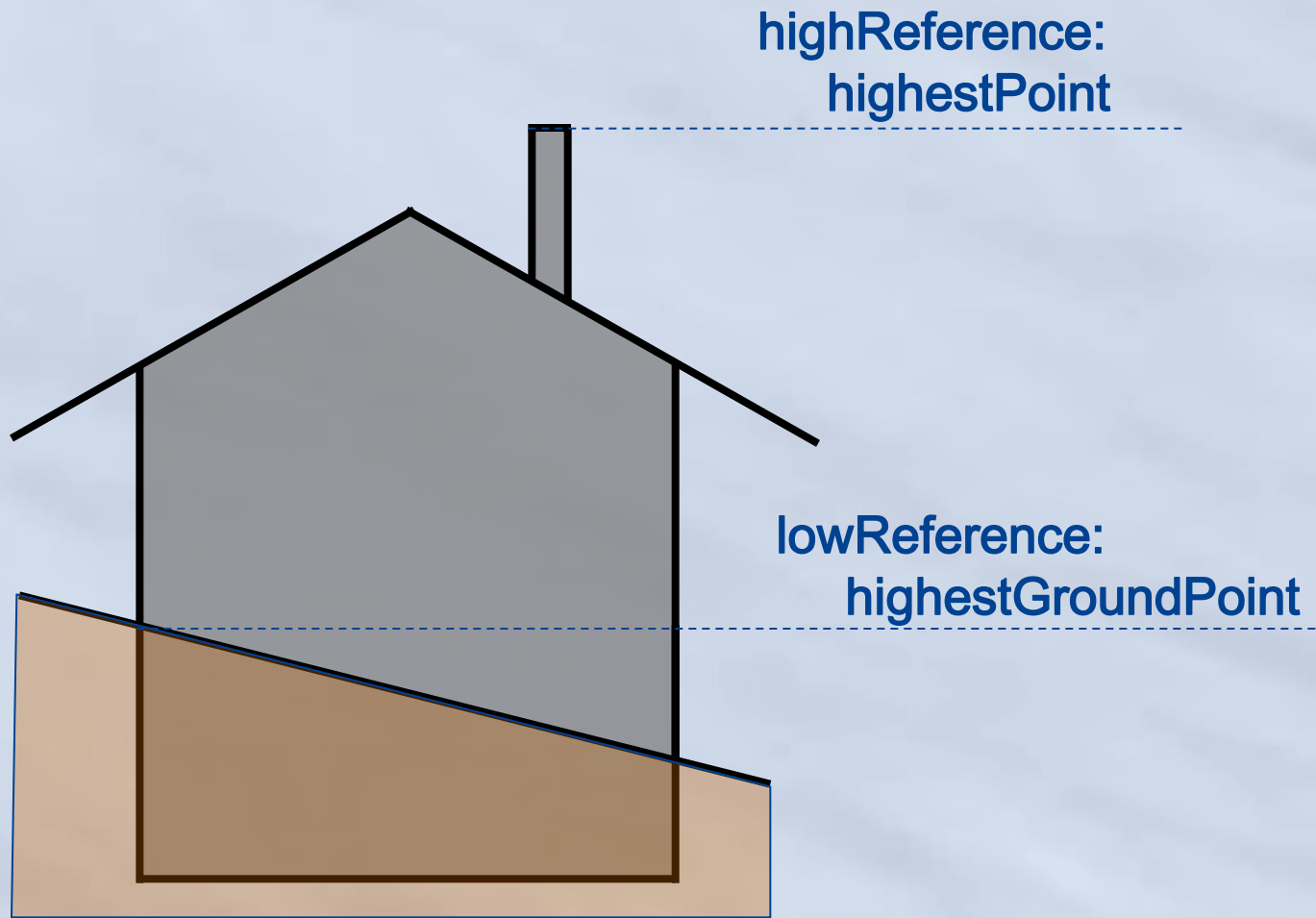
generalRoofEdge

highestGroundPoint

lowestGroundPoint

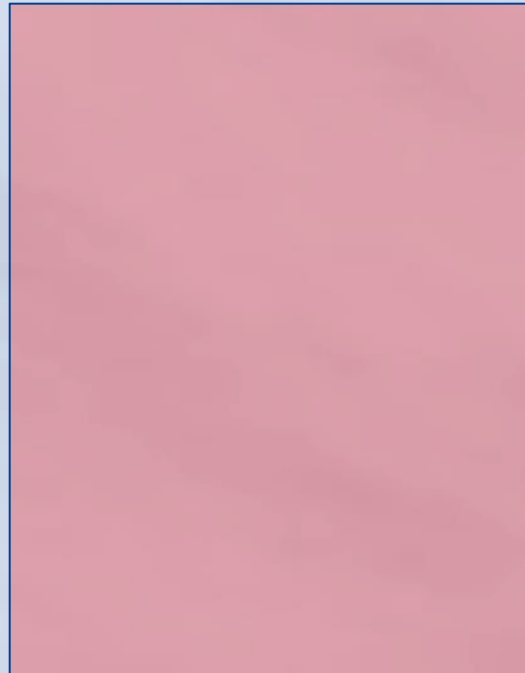
bottomOfConstruction





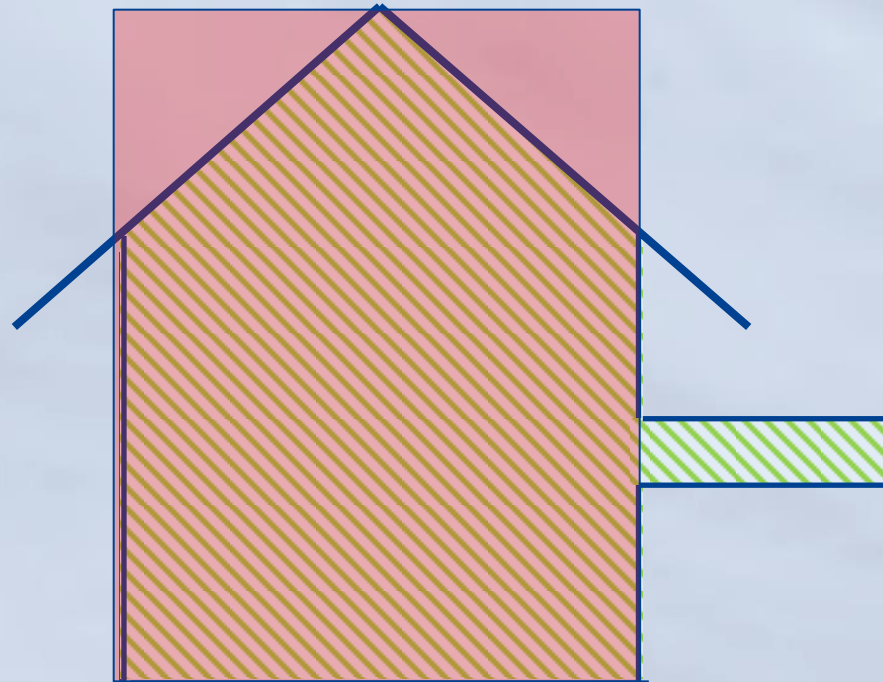
- Reference for **top** of LoD1 block
 - ElevationReference (highestPoint, topOfConstr., ...)
 - LoD1 only (higher LoDs: actual roof shape)
- Reference for **bottom** of geometries
 - ElevationReference (lowest/highestGroundPoint)
 - LoD1 – LoD4
- Bottom reference: overlap/redundancy with
 - TerrainIntersectionCurve
 - relativeToTerrain attribute

LoD1 box (lateral view):

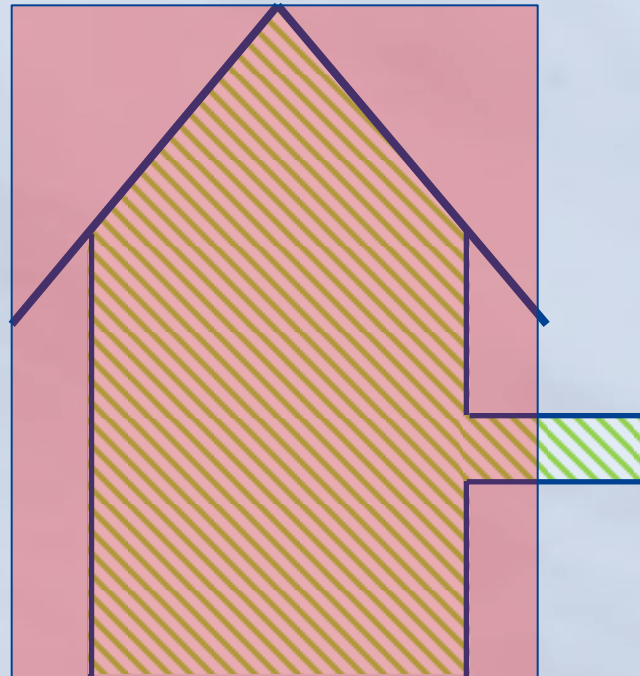


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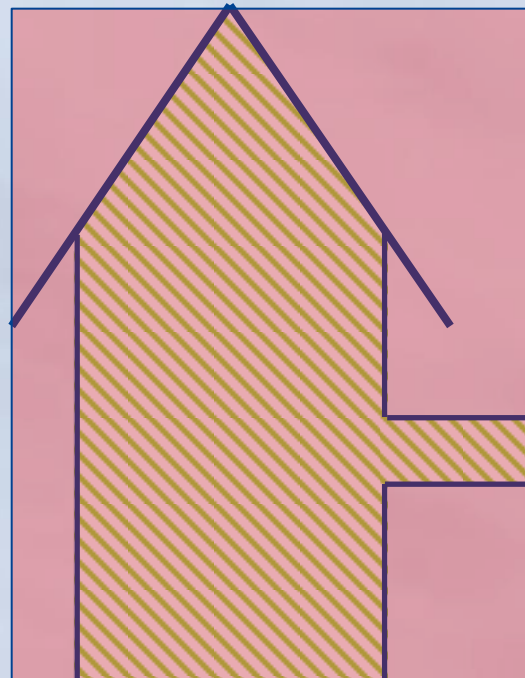
LoD1 box (lateral view):

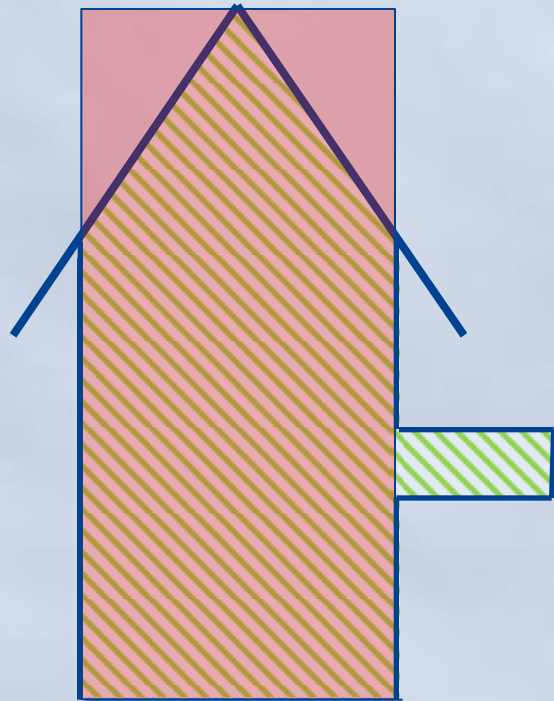


LoD1 box (lateral view):

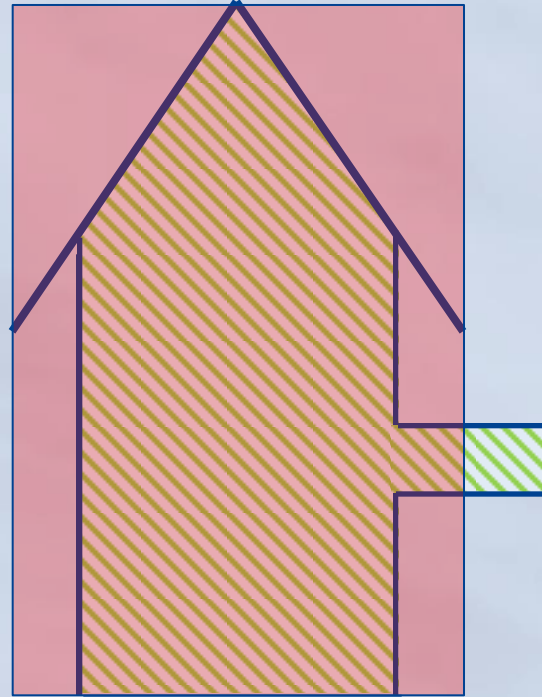


LoD1 box (lateral view):

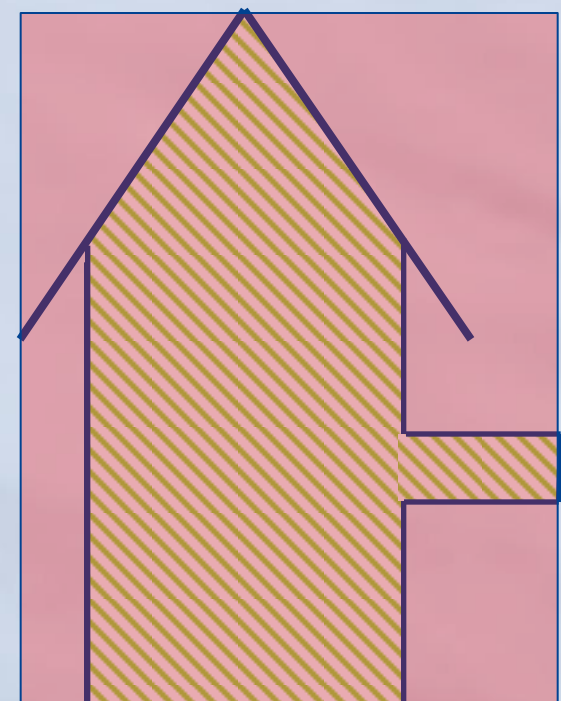




footPrint

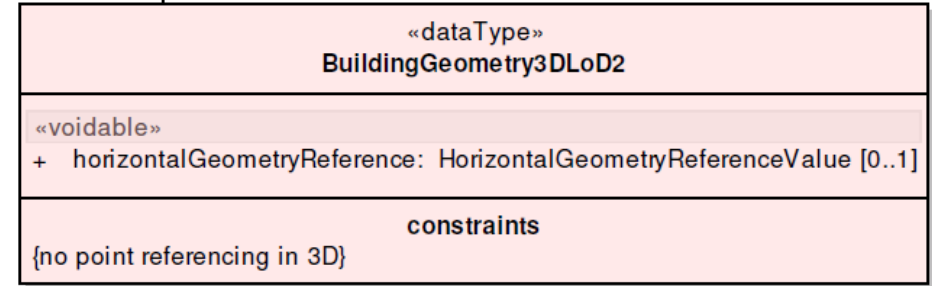
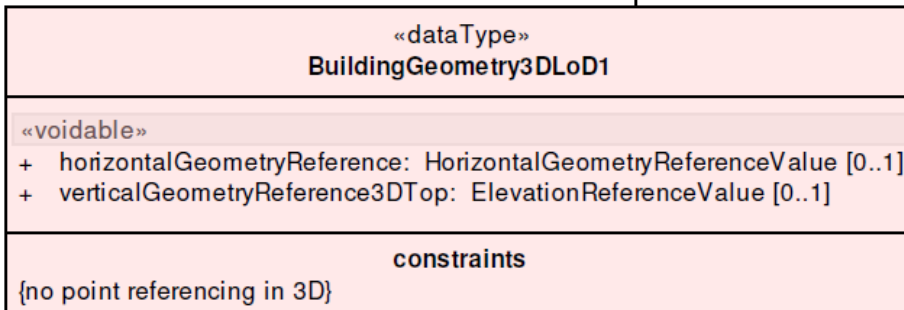
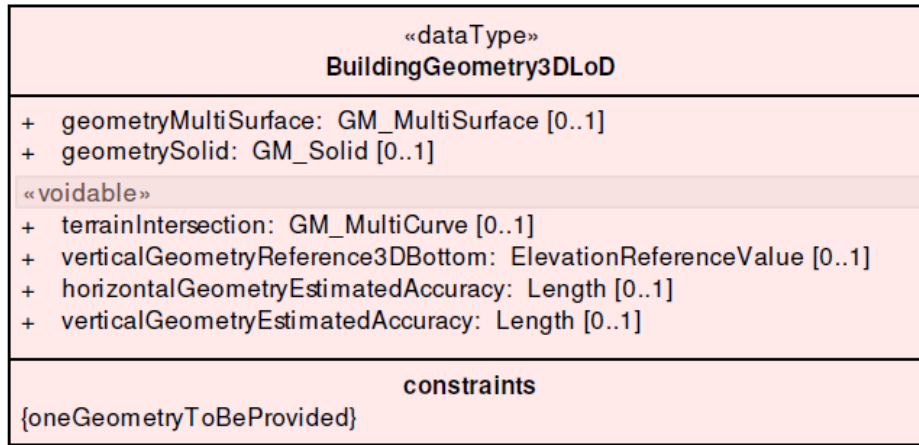


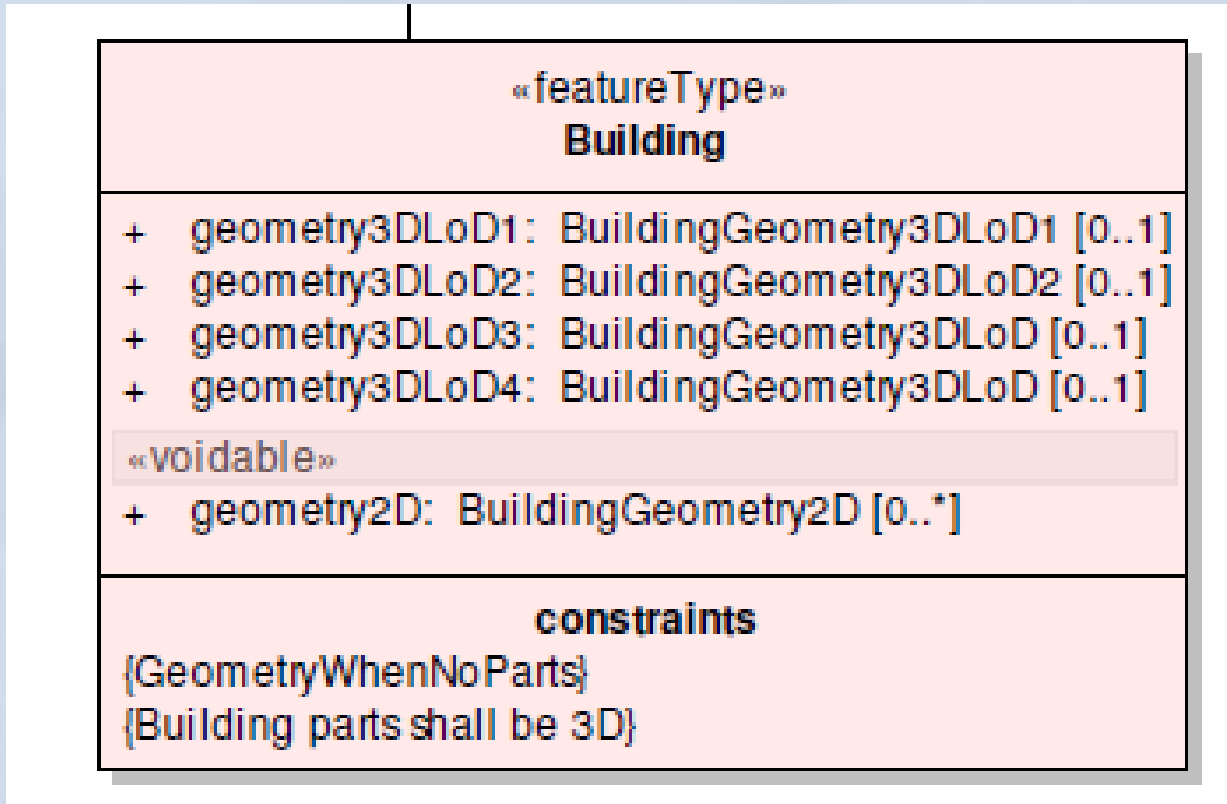
roofEdge



aboveGround
Envelope

- Reference for **top** of LoD1 block
 - ElevationReference (highestPoint, topOfConstr., ...)
 - LoD1 only (higher LoDs: actual roof shape)
- Reference for **bottom** of geometries
 - ElevationReference (lowest/highestGroundPoint)
 - LoD1 – LoD4
- Horizontal reference
 - Values: footprint, roofedge, ...
 - LoD1 and LoD2 only
- Accuracies (x/y and z)





- *BuildingUnits* (Presentation from Karl-Heinz)
- *OtherConstructions* (Presentation from Marie-Lise)
- 2.5D Geometry: non-vertical surfaces, in contrast to CityGML LoD0: horizontal surfaces (2D block)
- no *BuildingParts* of *BuildingParts*
- Metadata in application schema (no ISO 19115 metadata)
- multifaceted attributes (energy, heating system, materials of façade/roof/structure, ...)

- INSPIRE Building Model: enrichment of CityGML attributes and geometries by metadata (complex data types)
- Increasing expressiveness, better (more realistic) interpretation of models
 - in particular for more generalized representations (LoD1, height)
- would provide an added value for CityGML (3.0)