

# Des cartes au modèle informatif 4D

Des sources pour catalyser la reconstruction historique des villes

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Digital Humanities Institute, EPFL, Lausanne

# **Petit cas d'étude lausannois**

Pourquoi faire de la 3D?





*Société*

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*26.*

Derrière les Feuilles

Rue Caroline

Occident

Place de Saint-Jacques

Place de St. Jacques

La Grande St.

6. 418.

Paroisse publique 583

avenue

9. 5117.

Cour 716

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661

avec eff.

D. 1820.

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avec

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Paroisse

publique

583

avenue

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*Société*

Place de St. Jacques

Place d'Armes

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# Segmentation de la carte



contours

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sémantique





Hospita

Derrière les Jevaux

La Caroline

Occiden

Place de Saint-J

Place de St-Jean

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Pommes pulpeuses  
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avec effluve  
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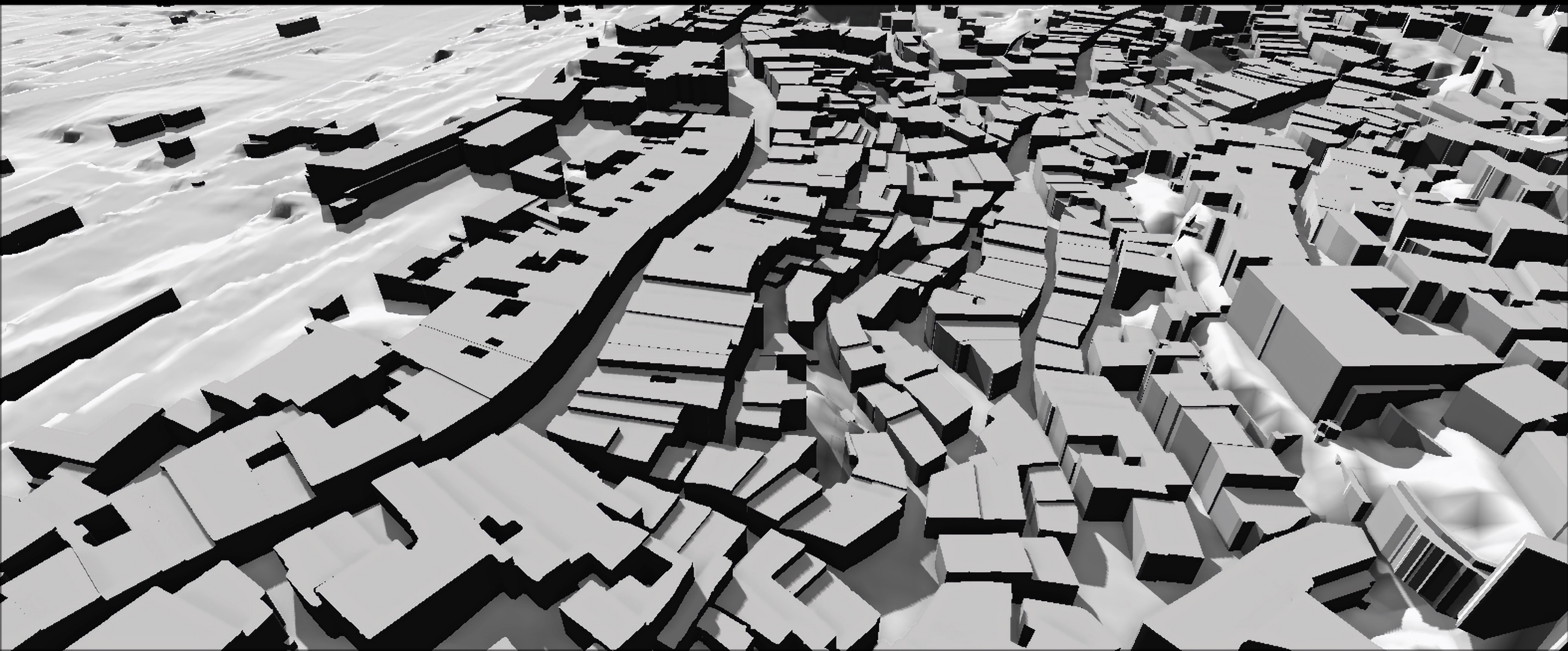
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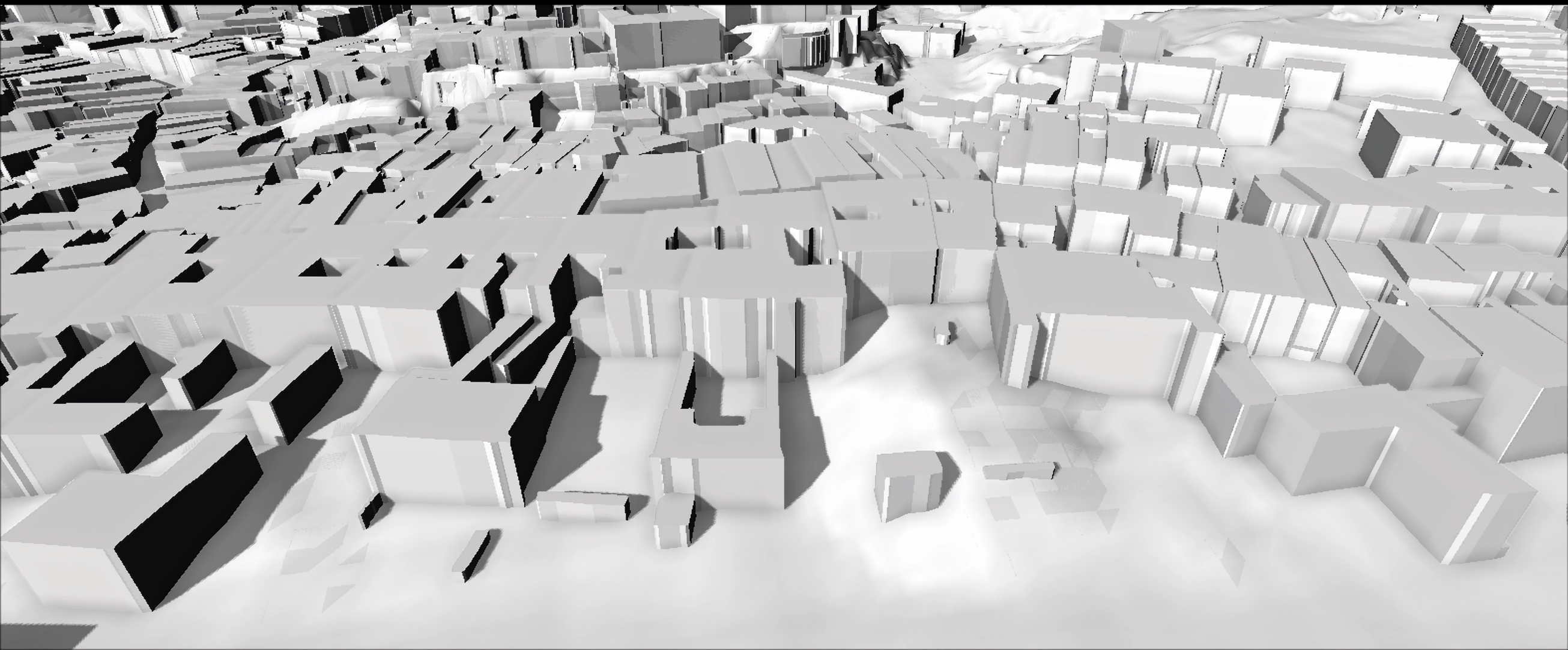
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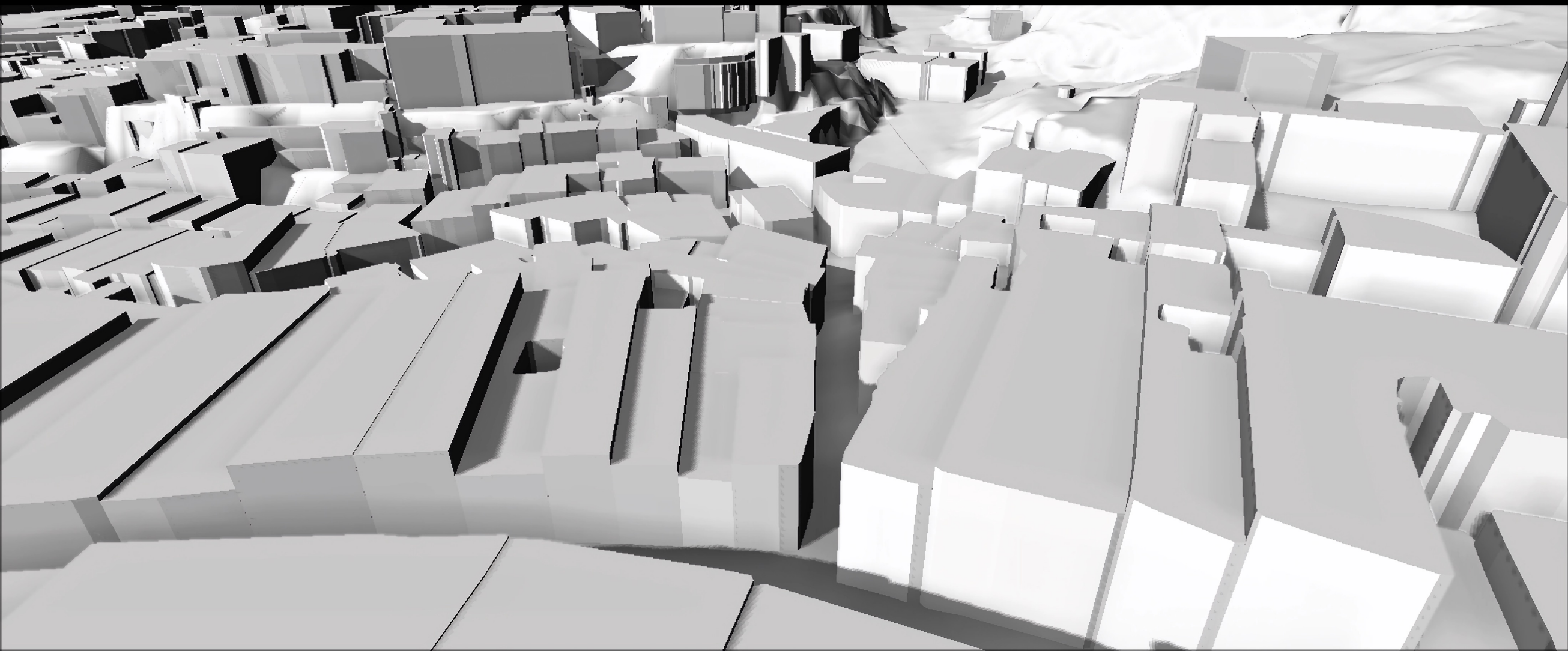






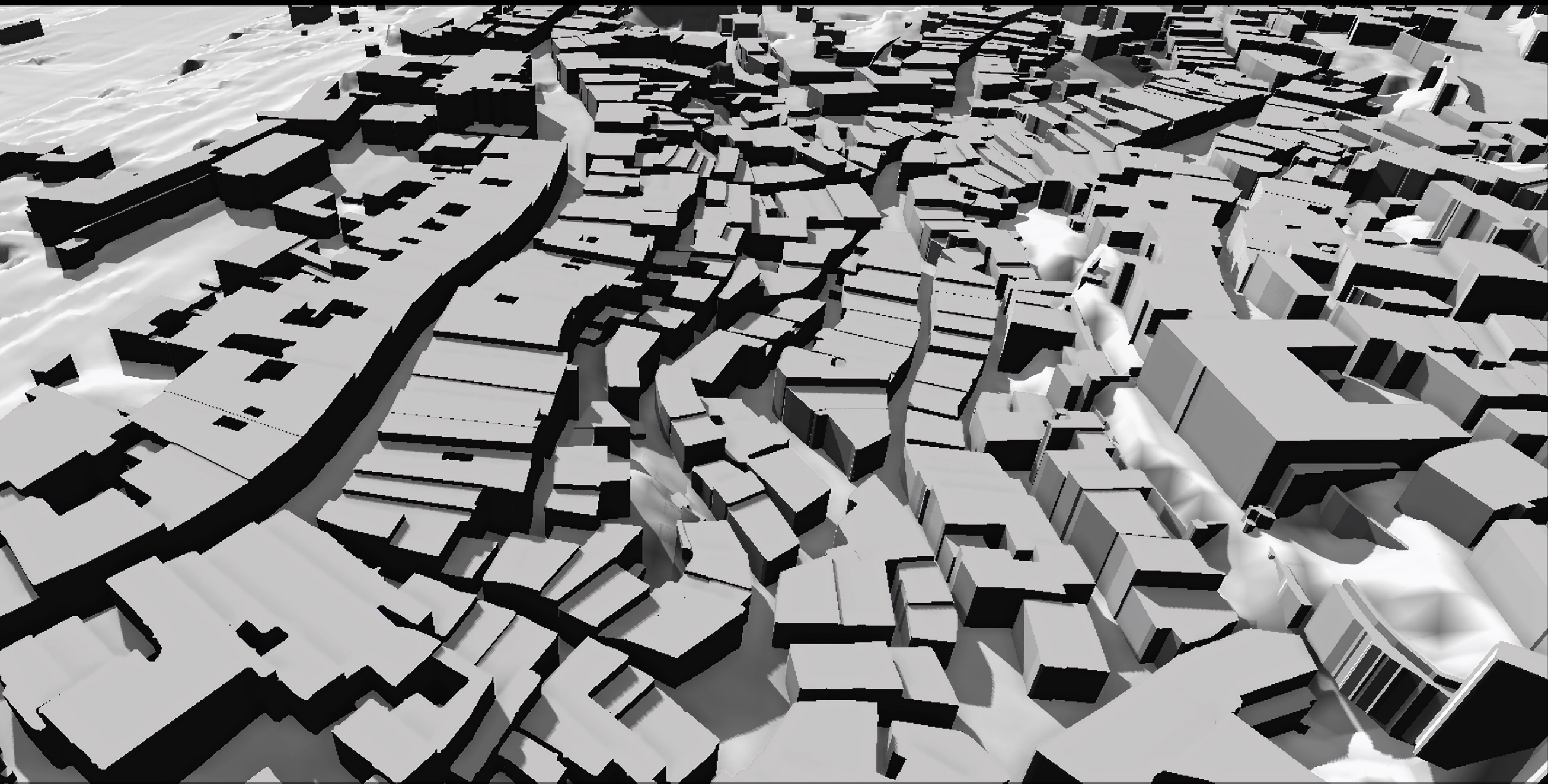












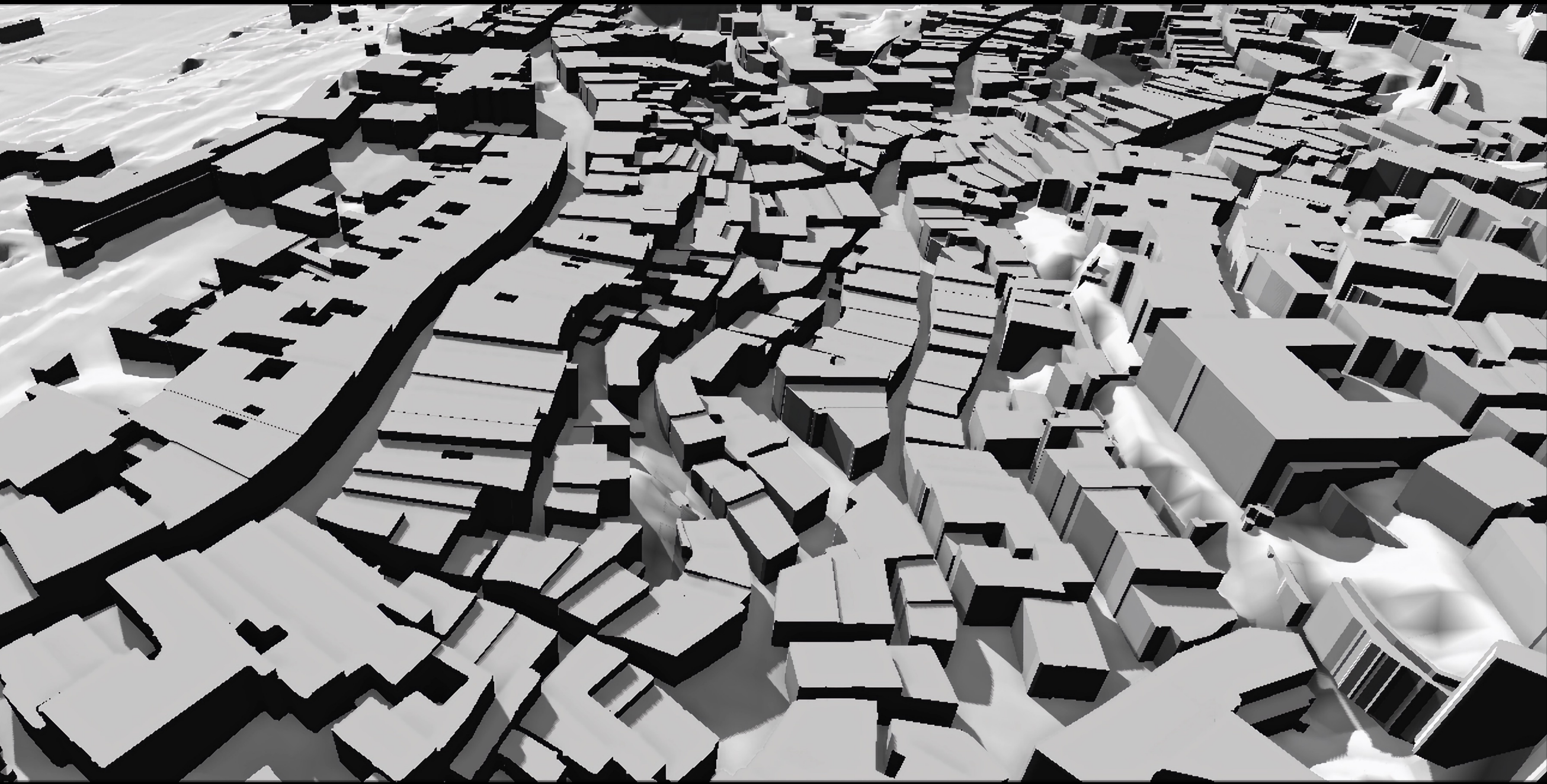






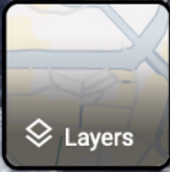
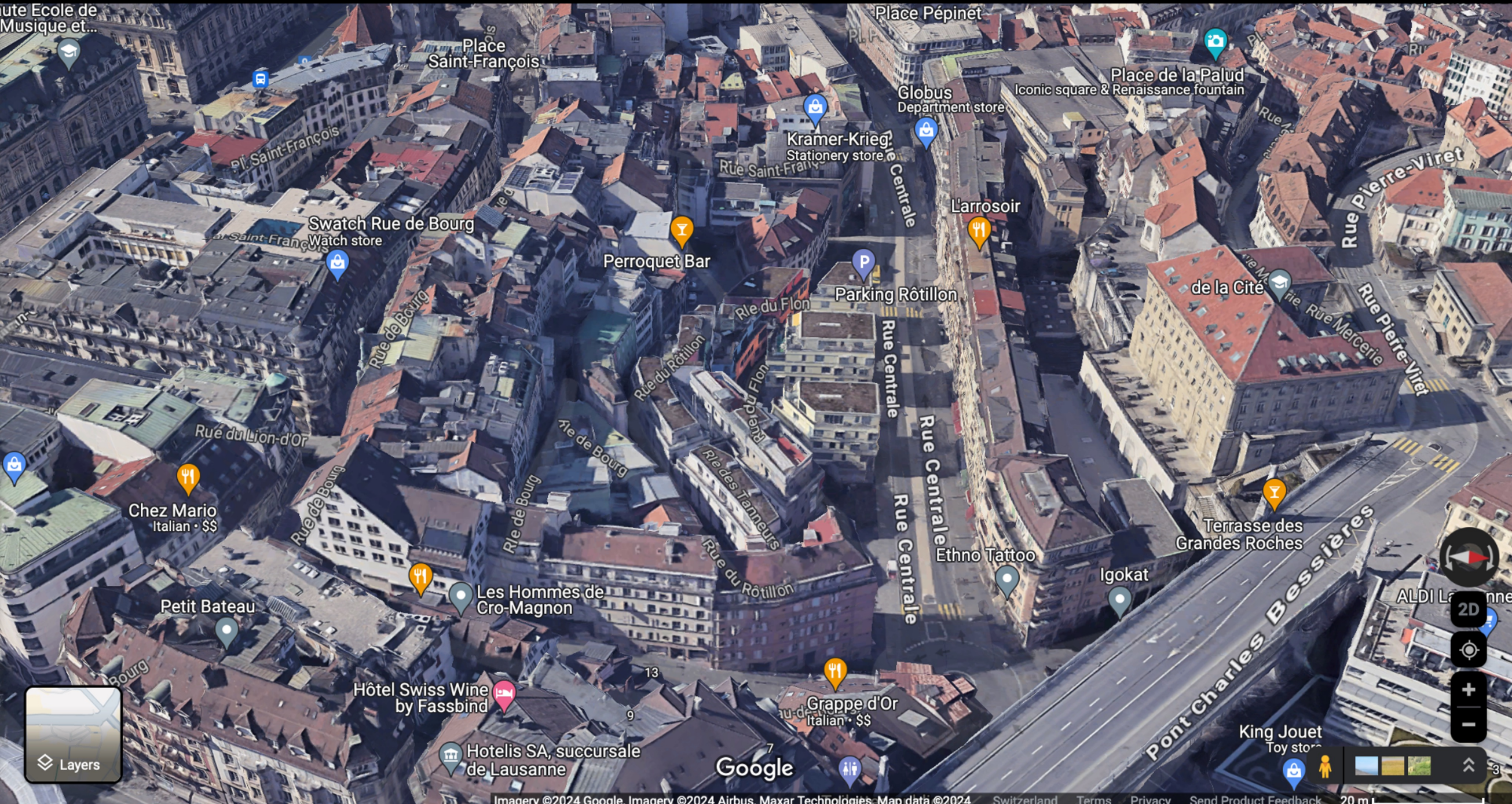






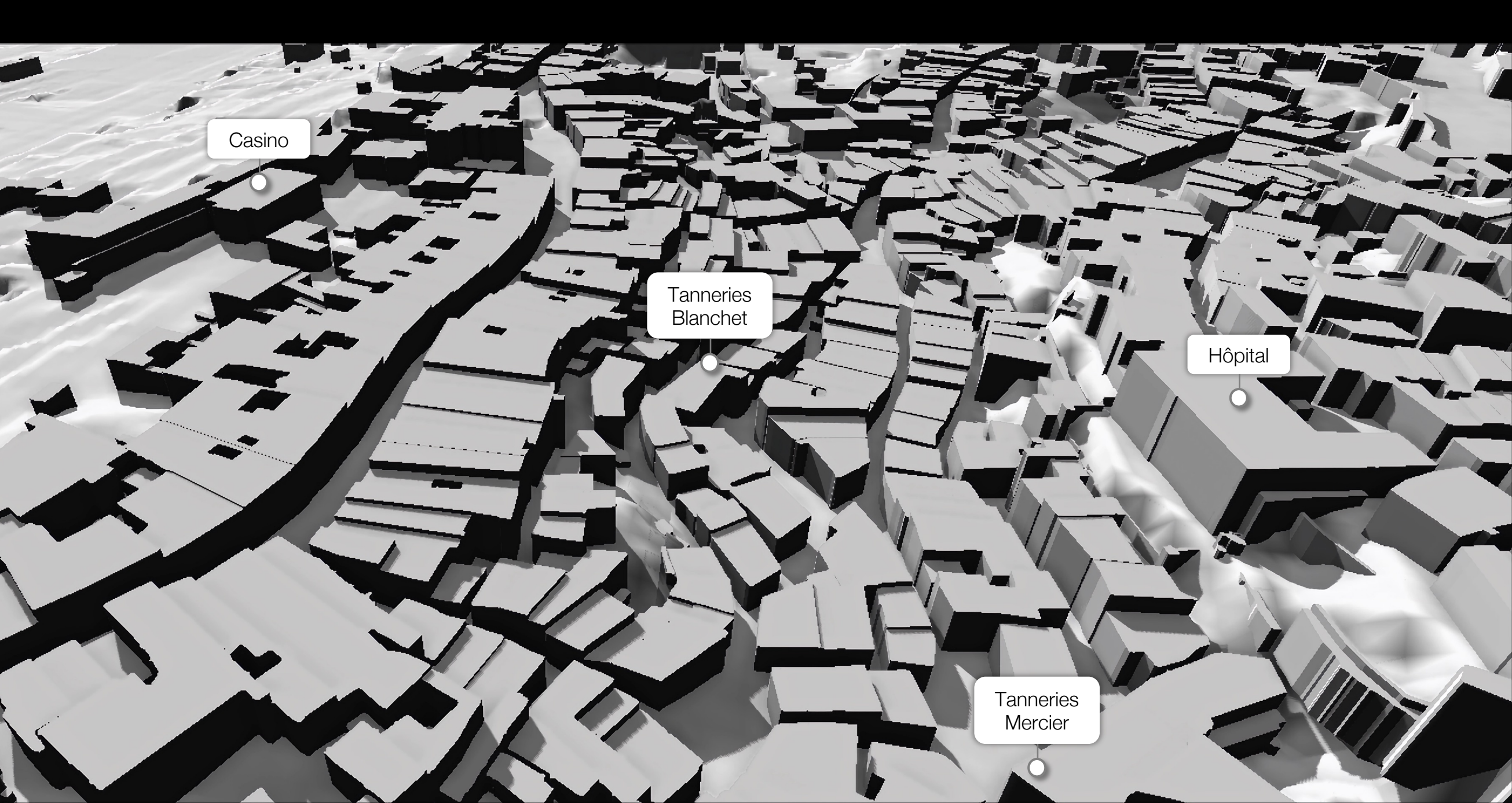


ute Ecole de  
Musique et...



Google





Casino

Tanneries  
Blanchet

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Mercier





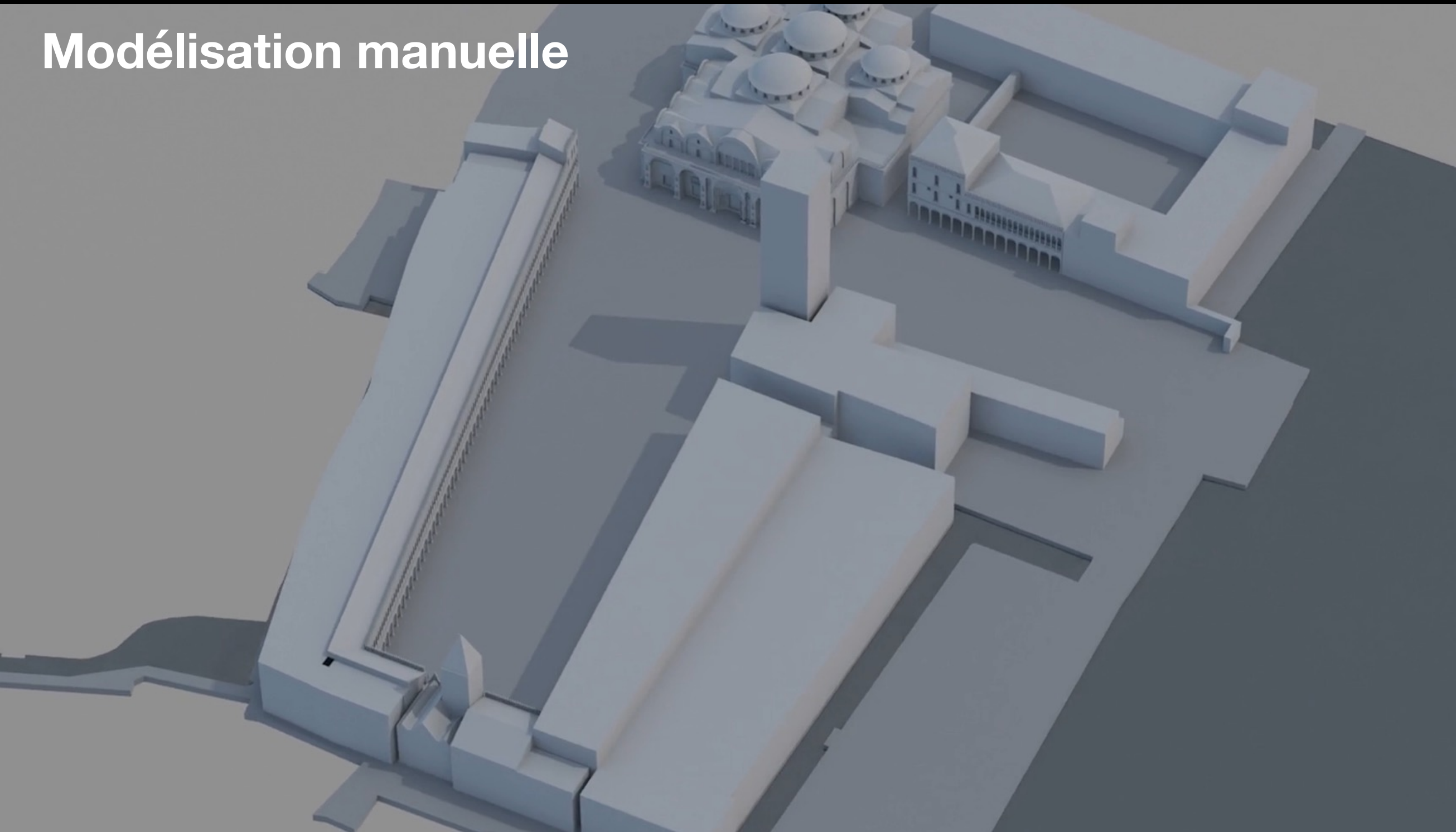


**LA 4D EST UNE REPRÉSENTATION  
ICONIQUE ET INTUITIVE**

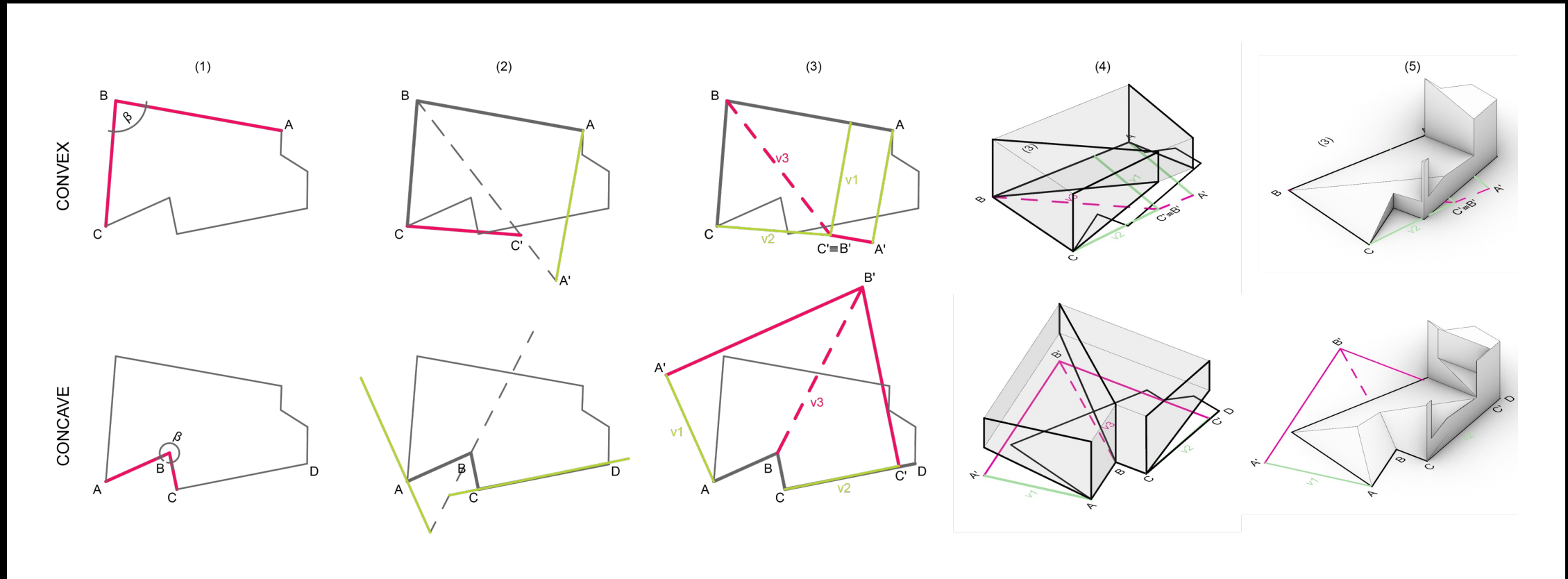
**LA 4D EST UNE REPRÉSENTATION  
GÉOGRAPHIQUE ET ARCHITECTURALE**

**LA 4D EST UNE REPRÉSENTATION**  
**NAVIGABLE ET INFORMATIVE**

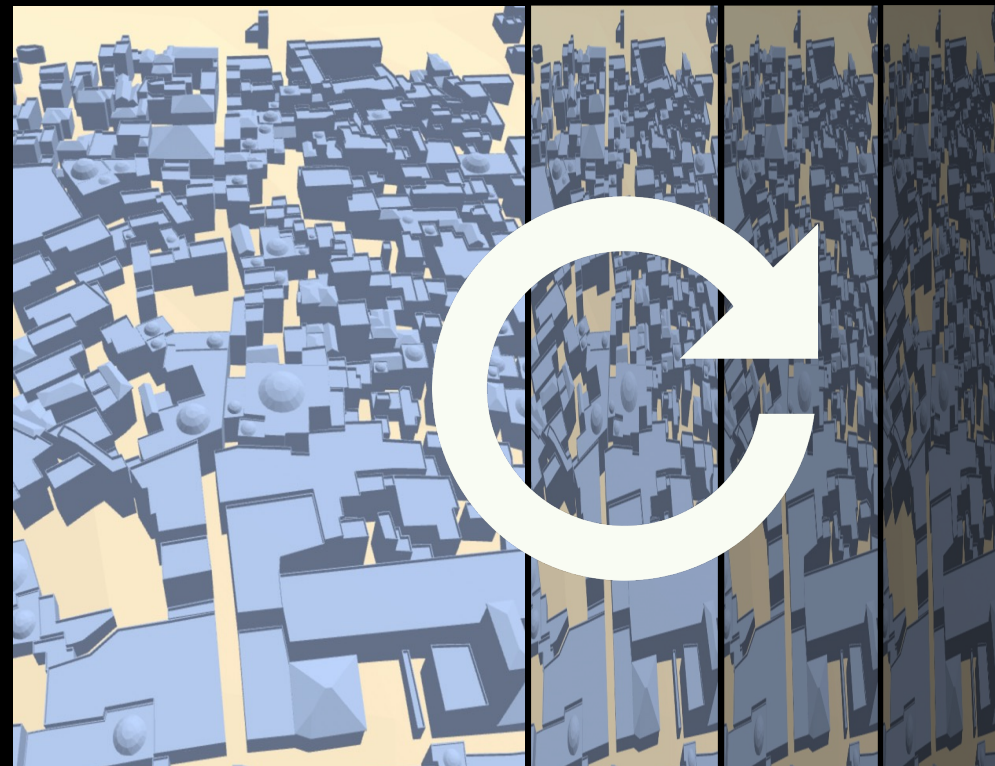
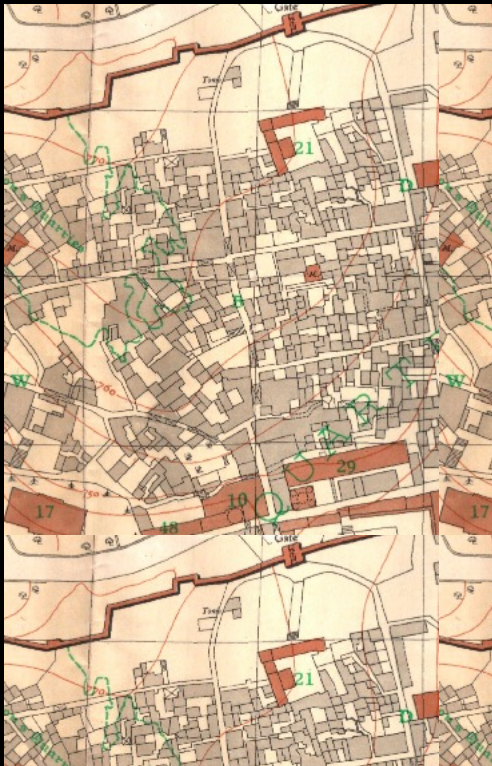
# Modélisation manuelle



# Modélisation procédurale







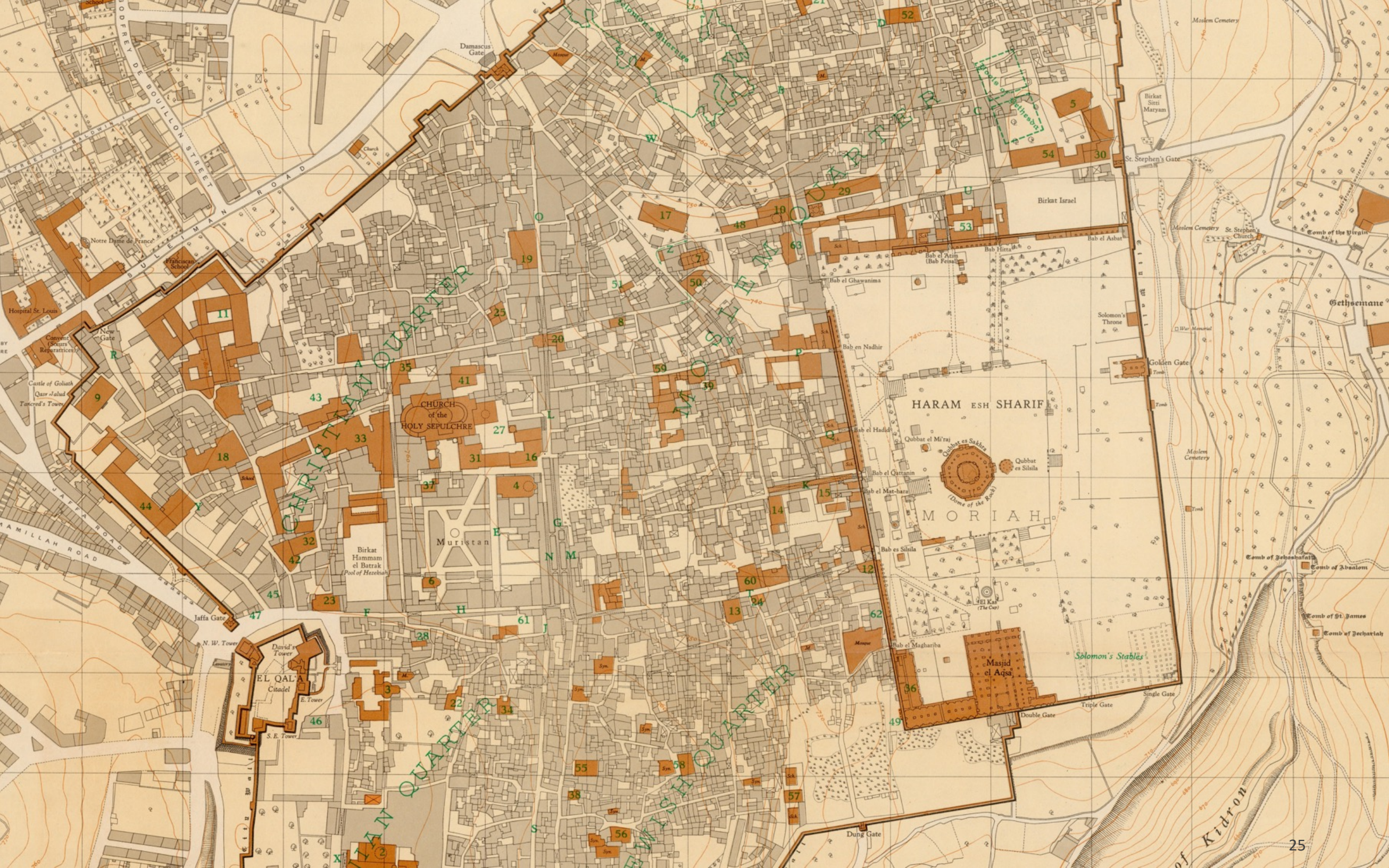
CATALYSER

ITÉRER / AFFINER









CHRISTIAN QUARTER

MUSLIM QUARTER

ARMENIAN QUARTER

JEWISH QUARTER

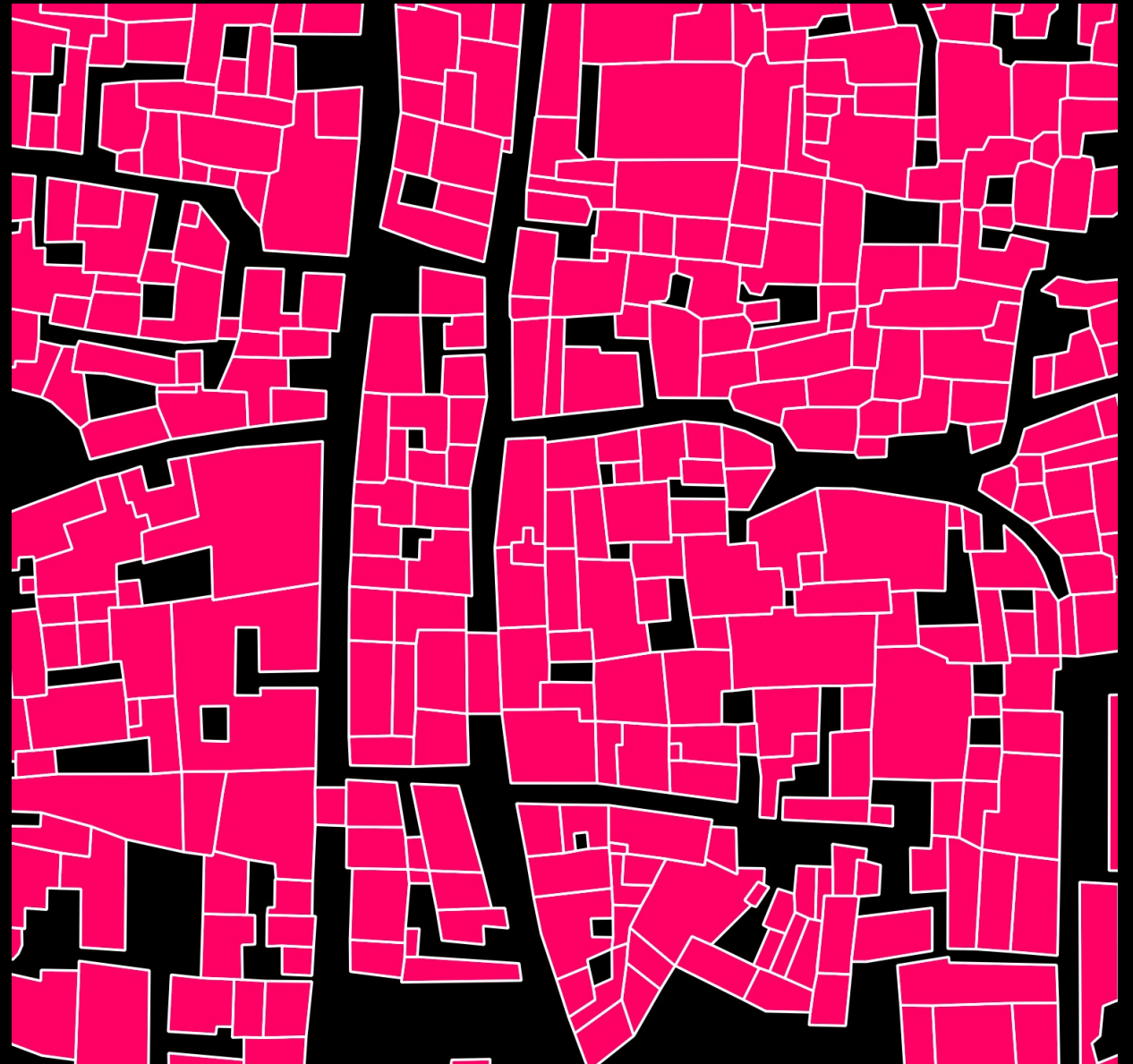
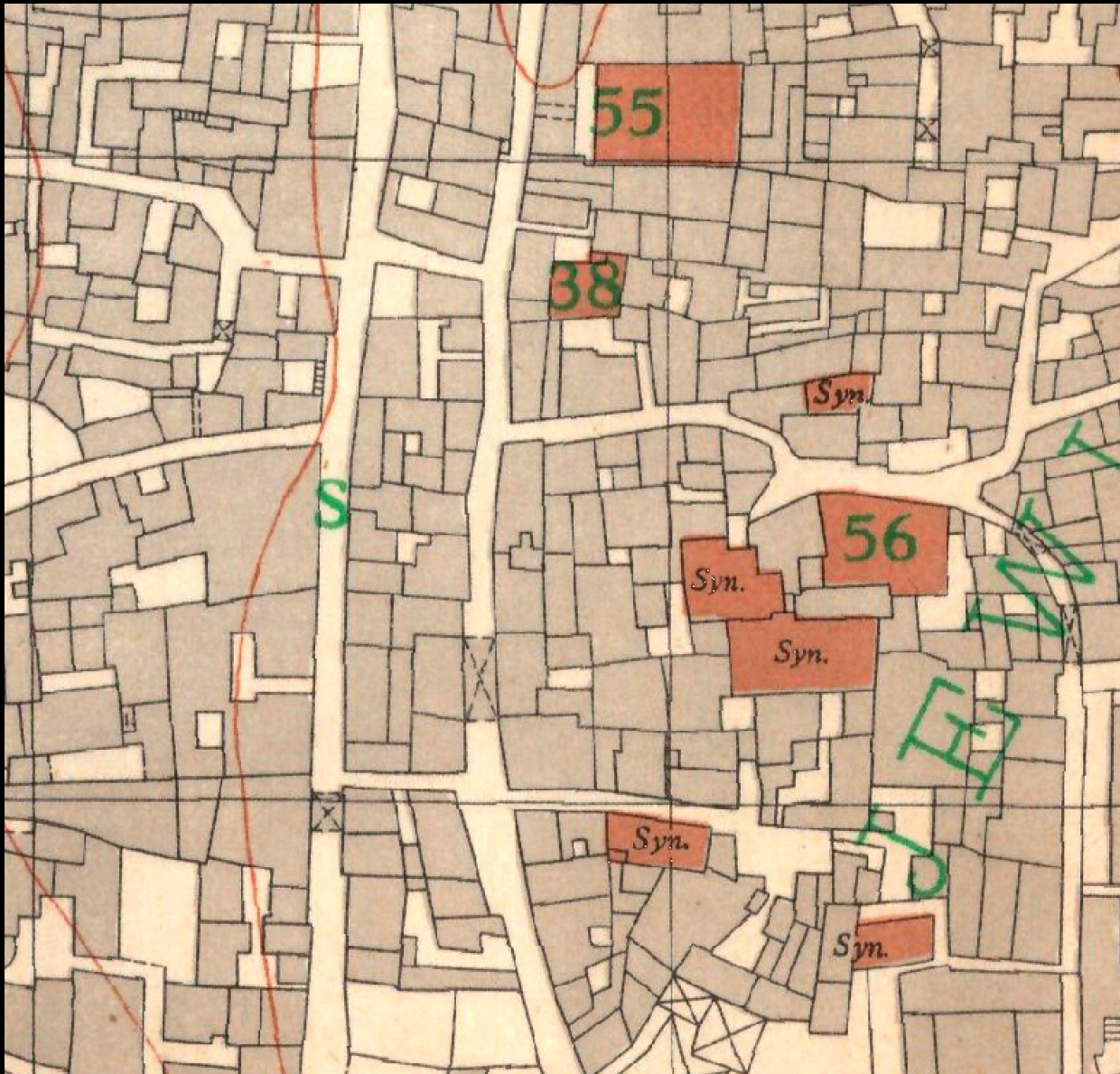
HARAM ESH SHARIF

MORIAH

EL QAL'AT  
Citadel

Solomon's Stables

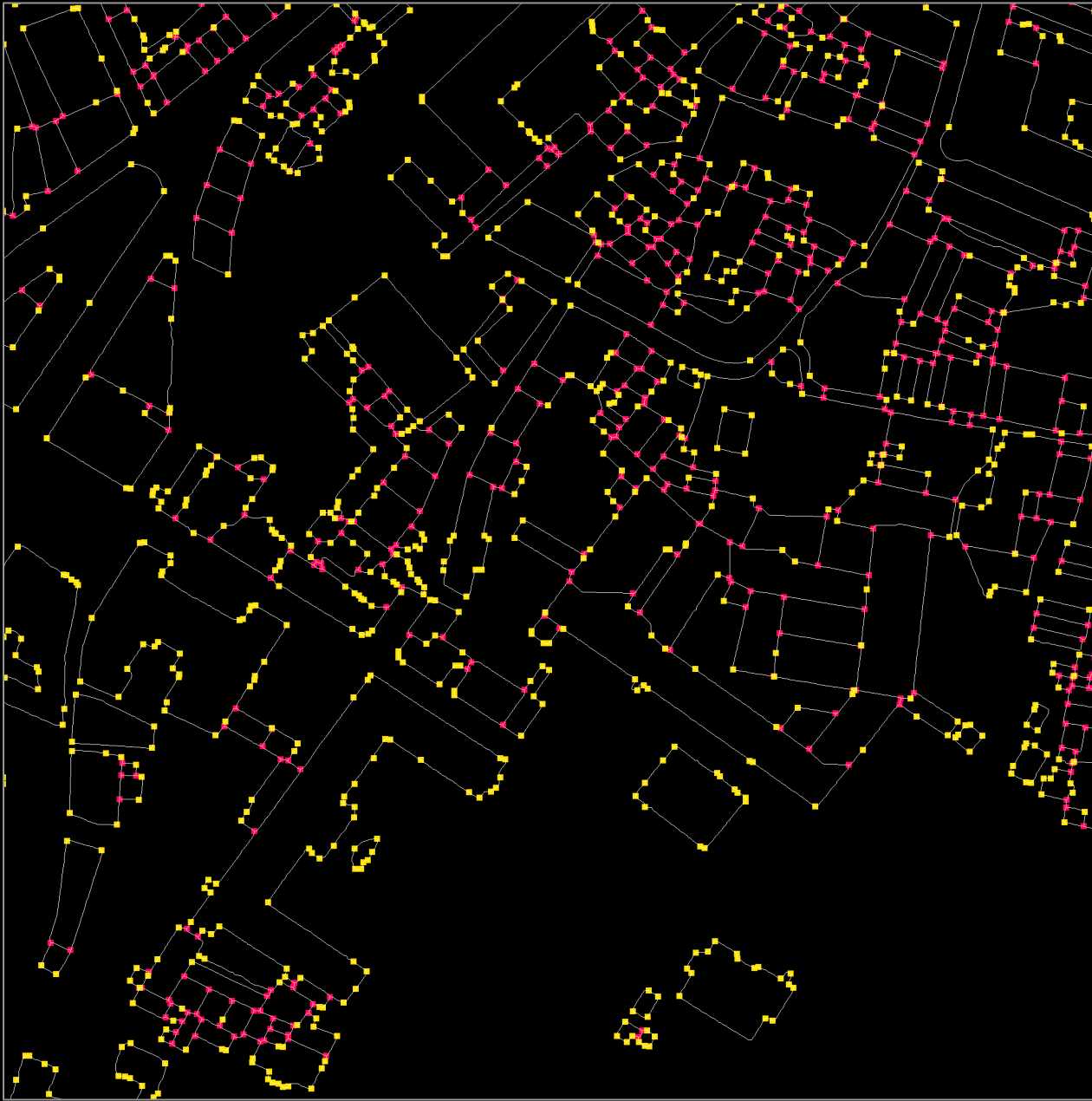






## Segmentation des contours

## Détection des angles



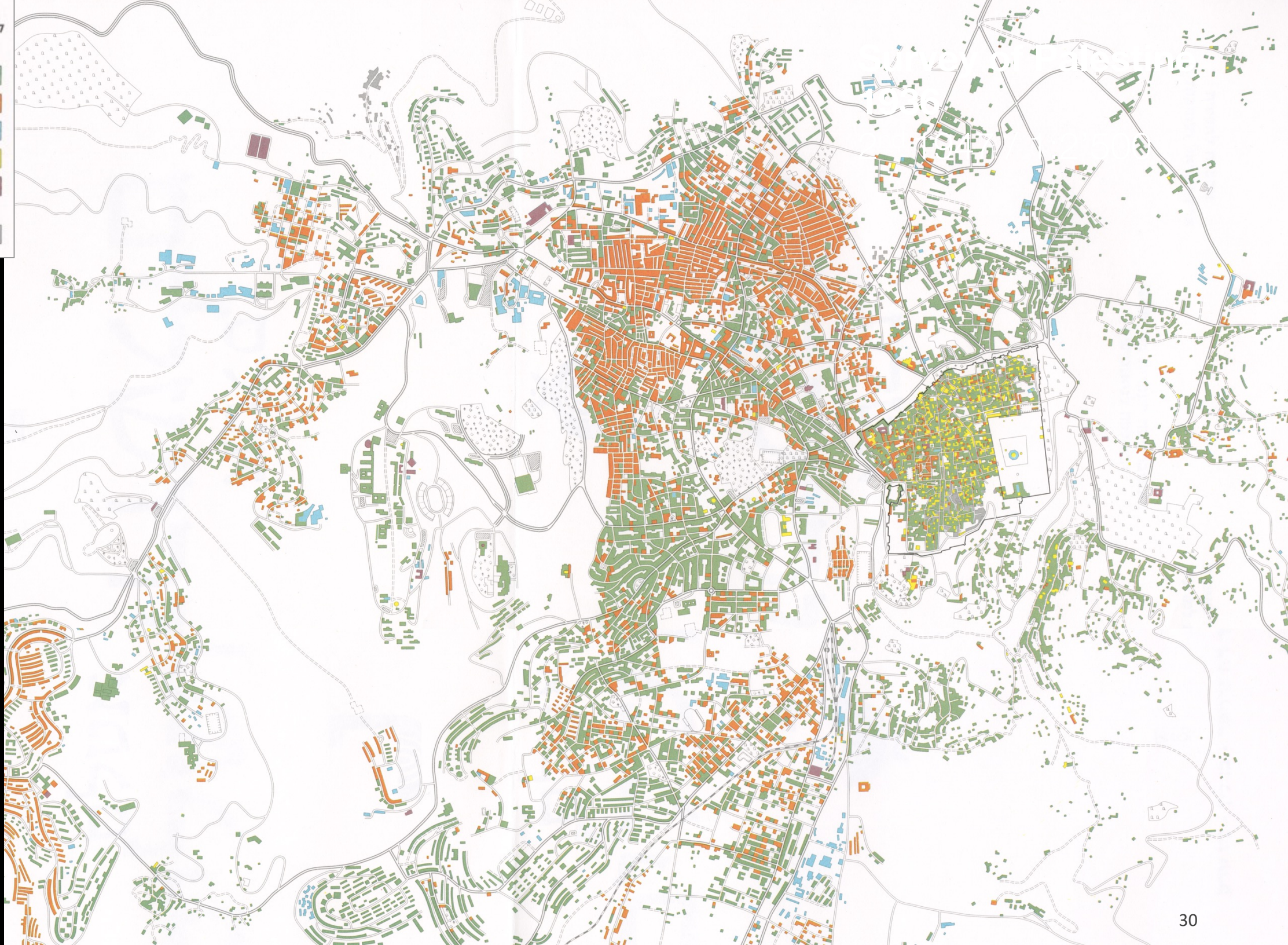


## Vectorisation minimale congruente



TYPE OF ROOF, 1967

- FLAT
- GABLED (TILES)
- SLANTED (OTHER THAN TILES)
- CUPOLA
- OTHER
- DESTROYED BUILDING



Amiran, D. Karmon M.  
*Atlas of Jerusalem*, 1st  
éd. De Gruyter: Berlin,  
1973.



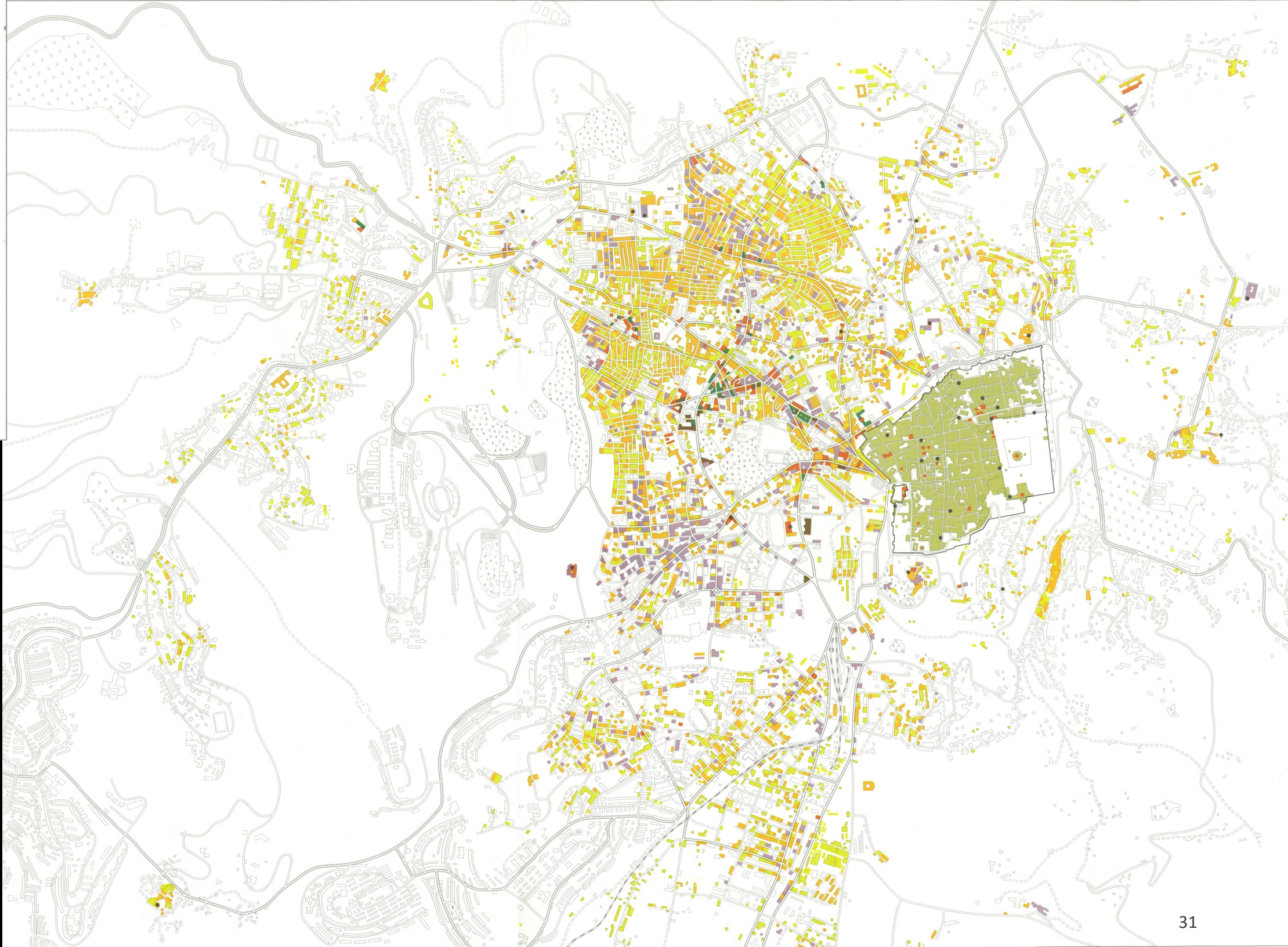
NUMBER OF FLOORS, 1940



OLD CITY:

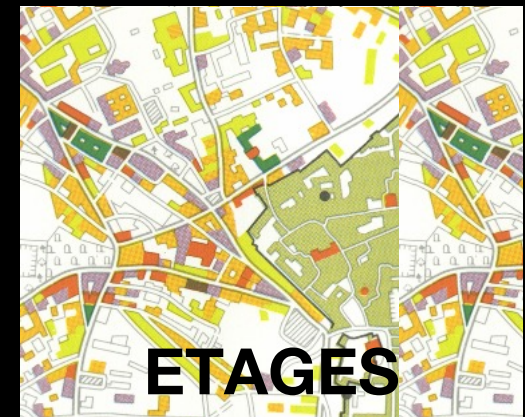
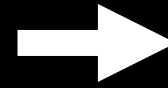


TOWER ●



Amiran, D. Karmon M.  
*Atlas of Jerusalem*, 1st  
éd. De Gruyter: Berlin,  
1973.





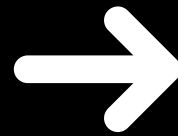
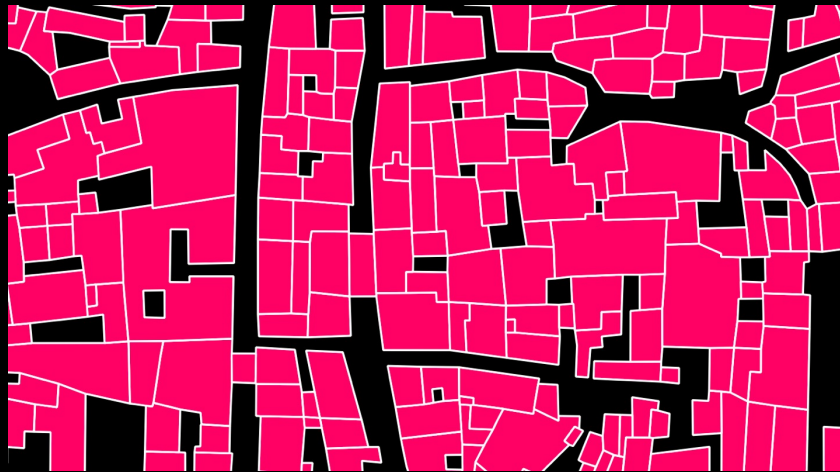


# Attributs

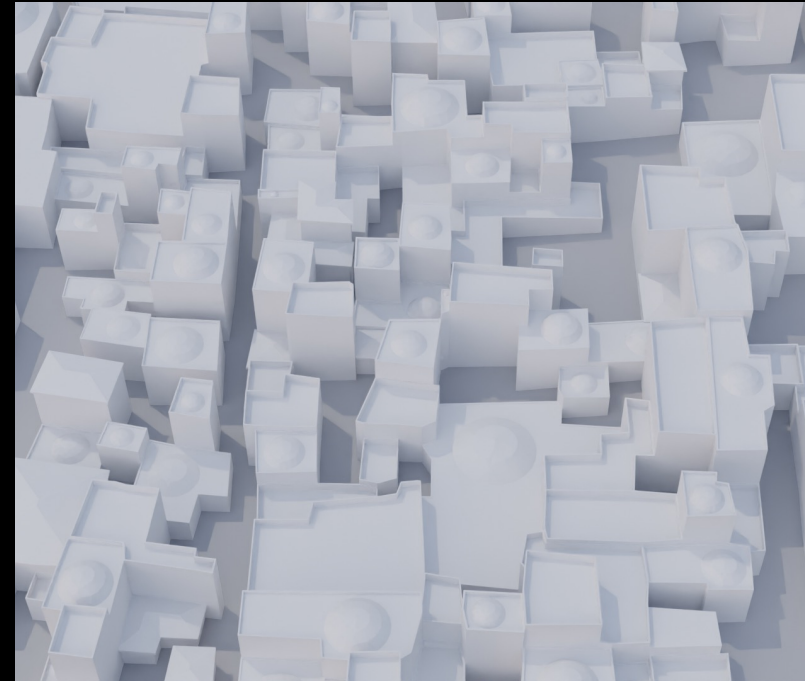
<i>building #25</i>	value	source
number of floors	3	"Atlas of Jerusalem"
height	11.21	"rule-based, inferred from number of floors"
roofType	"hip"	"manual by rem on 23/01/24 15:25"

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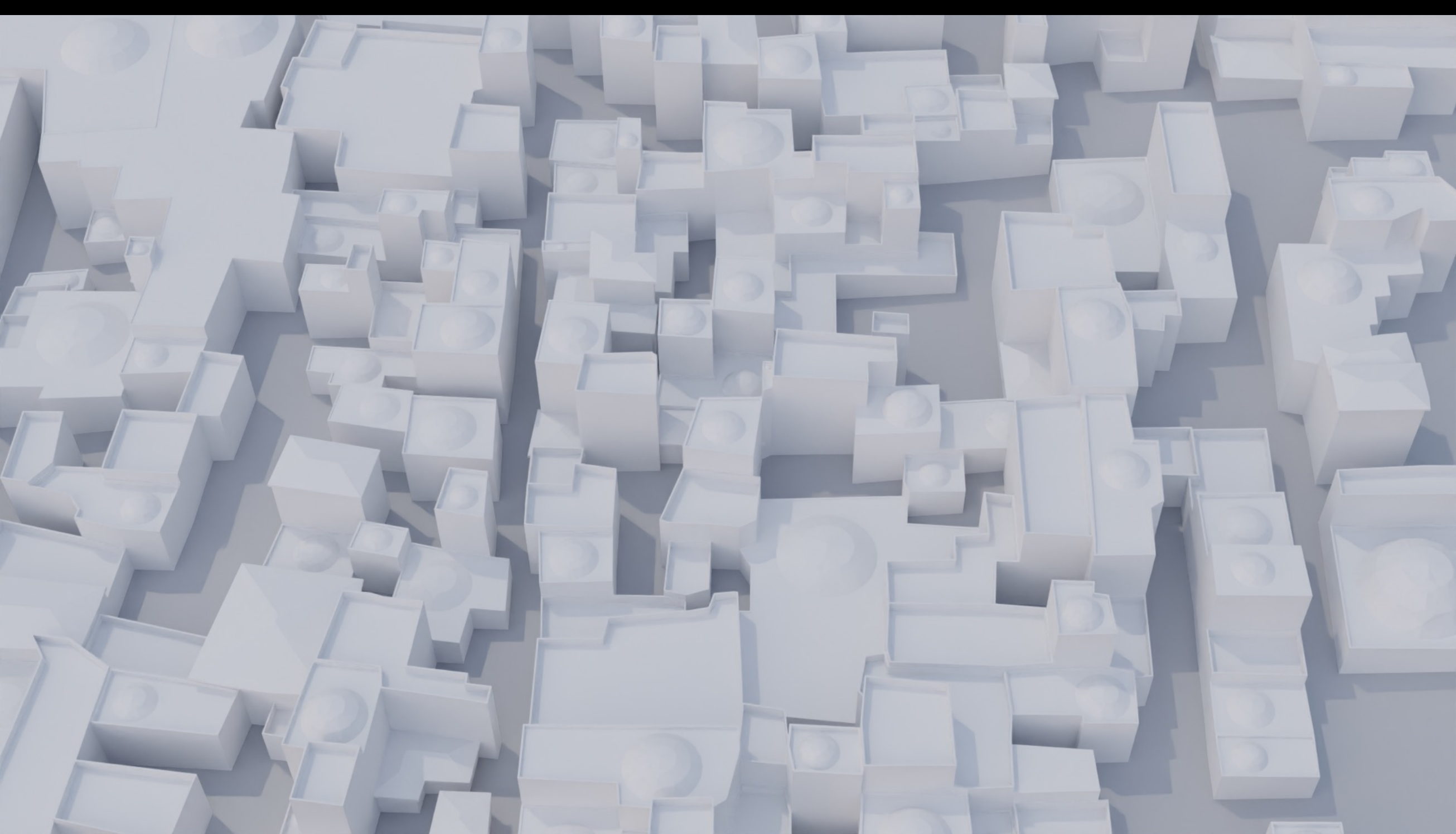
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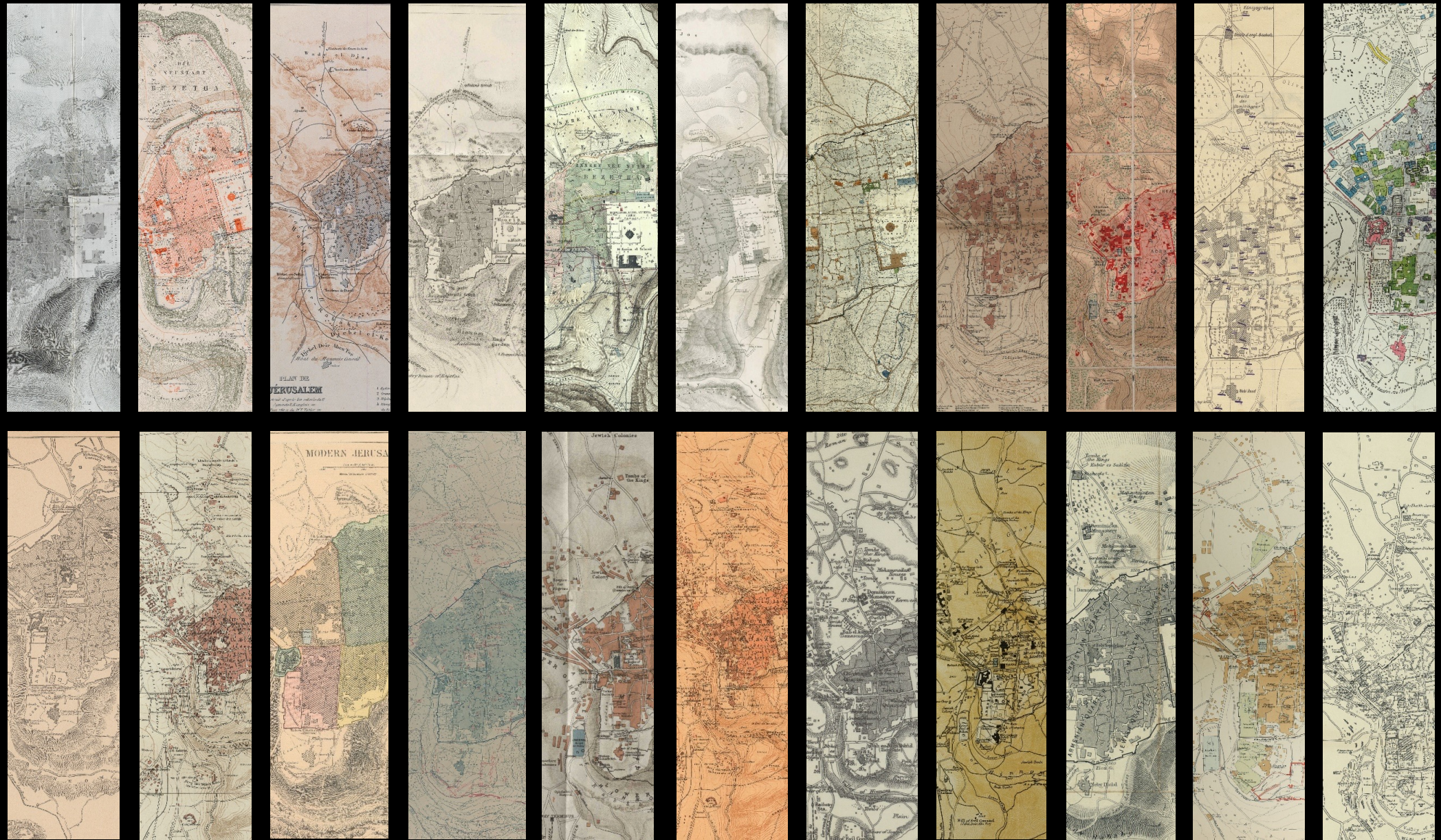
3D



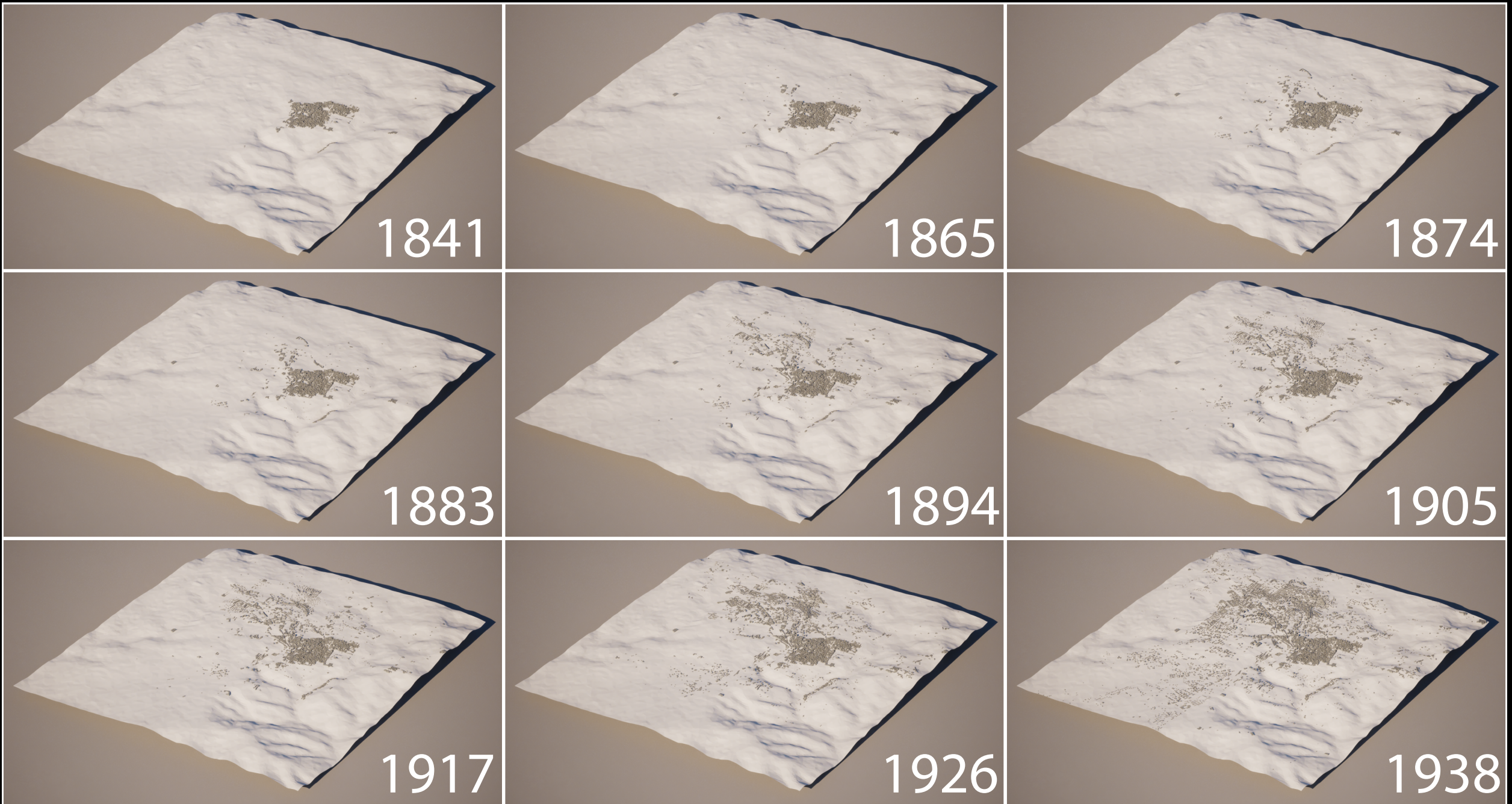






























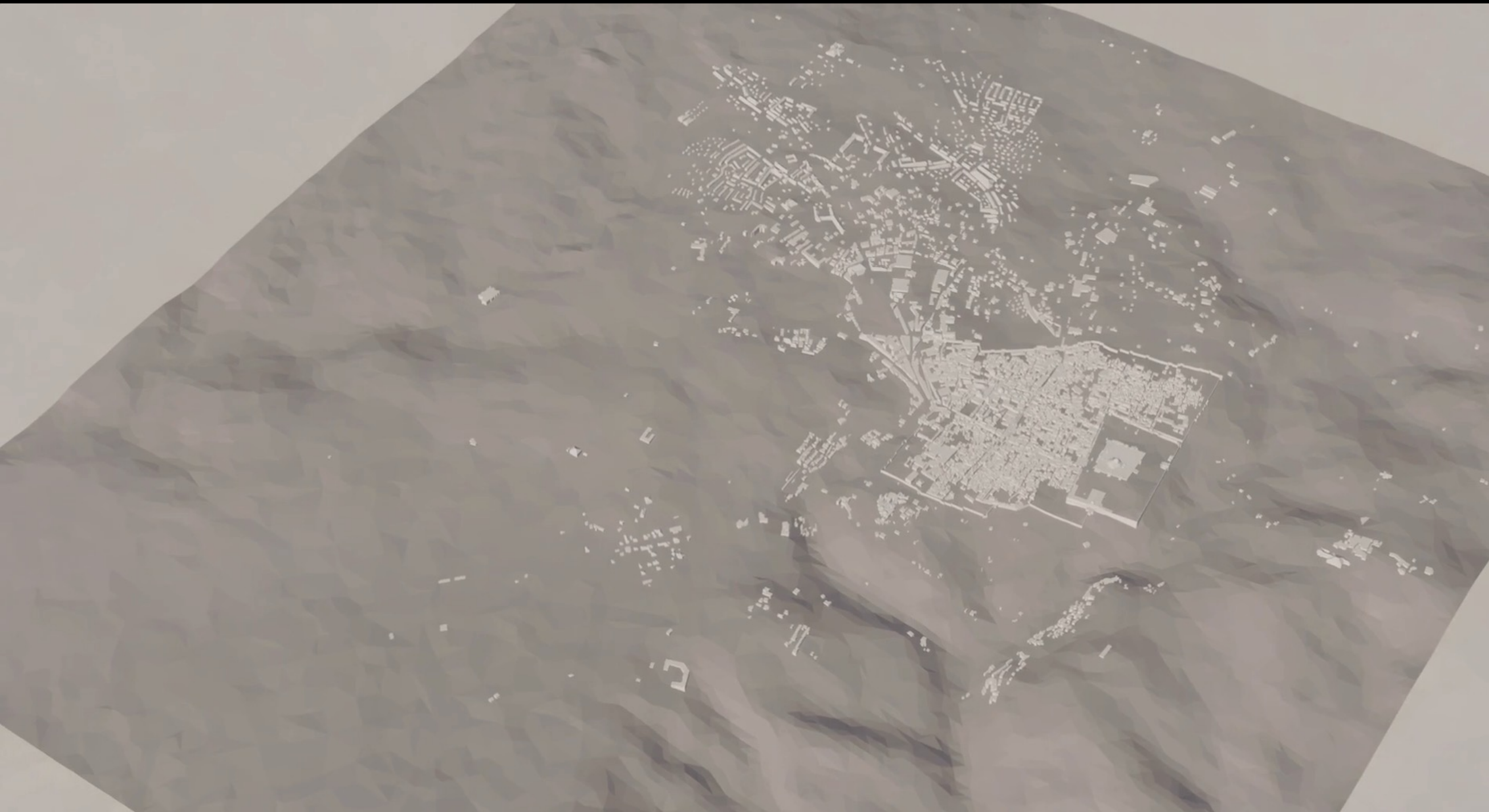


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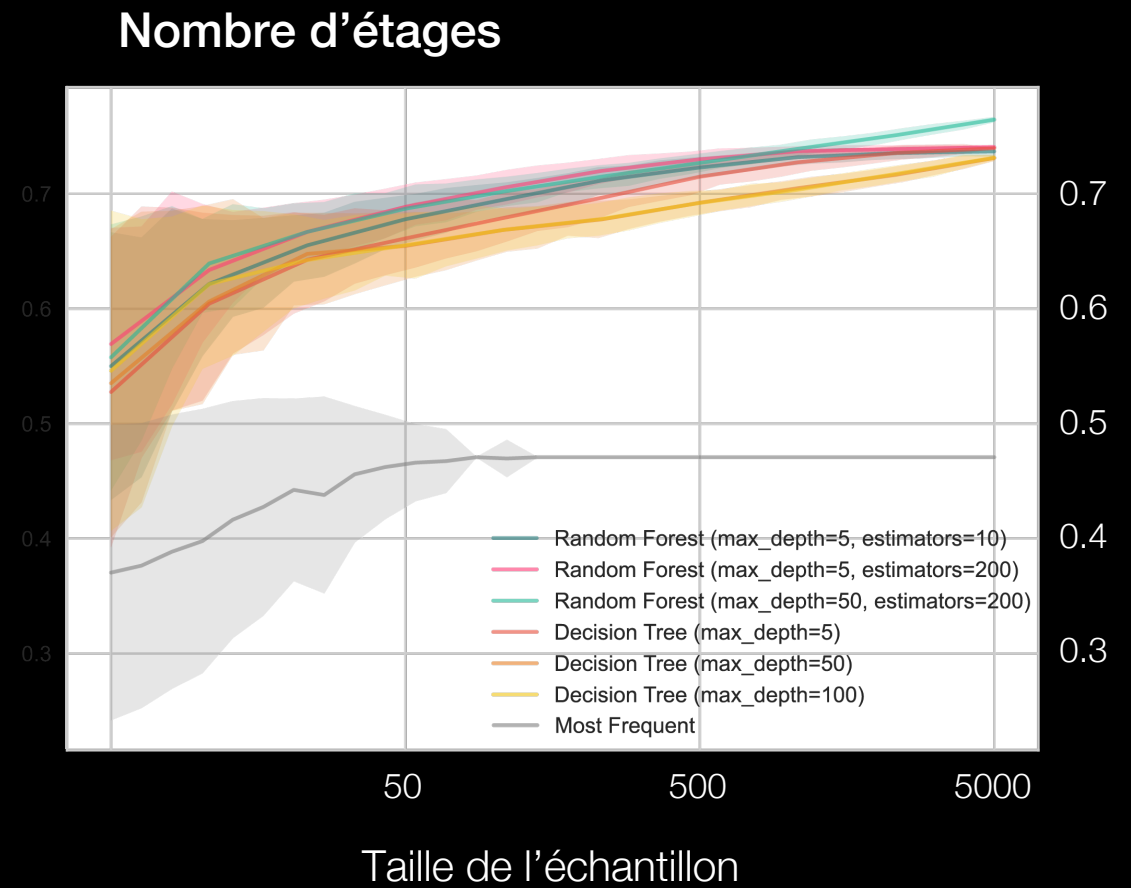
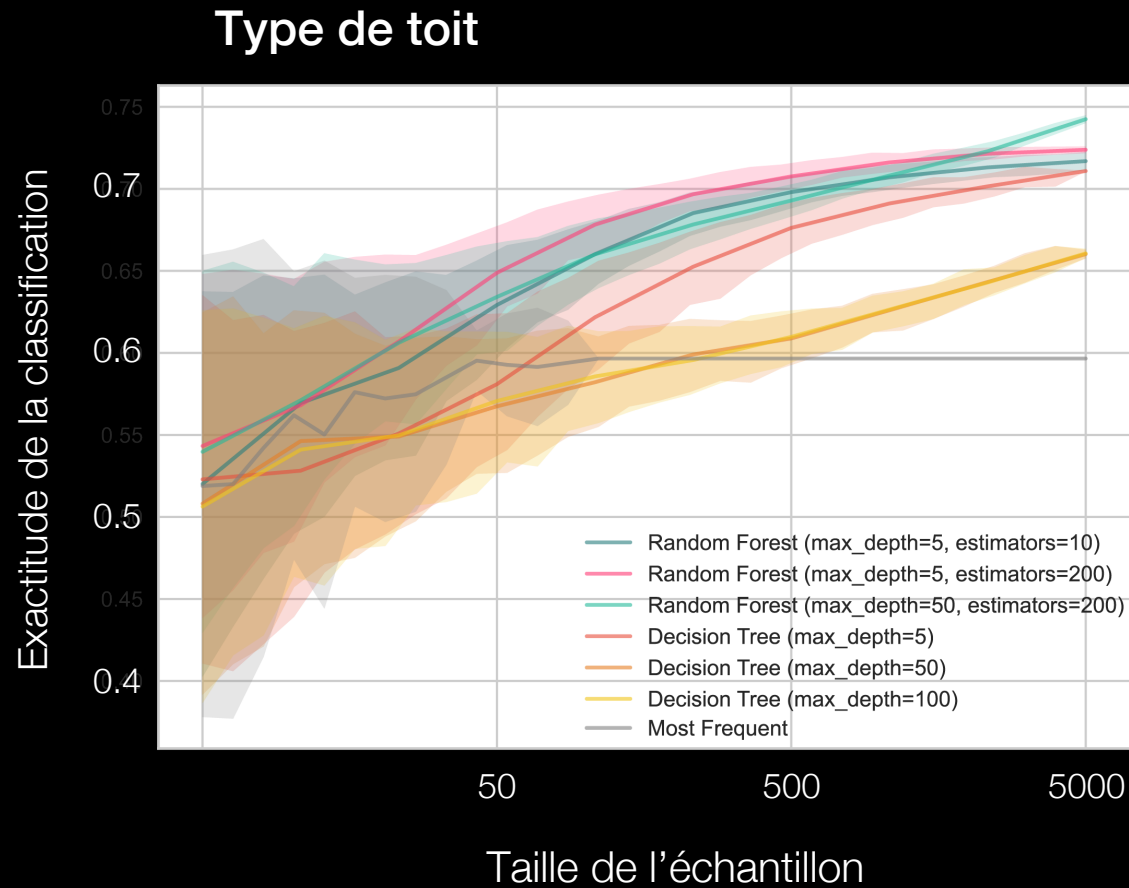




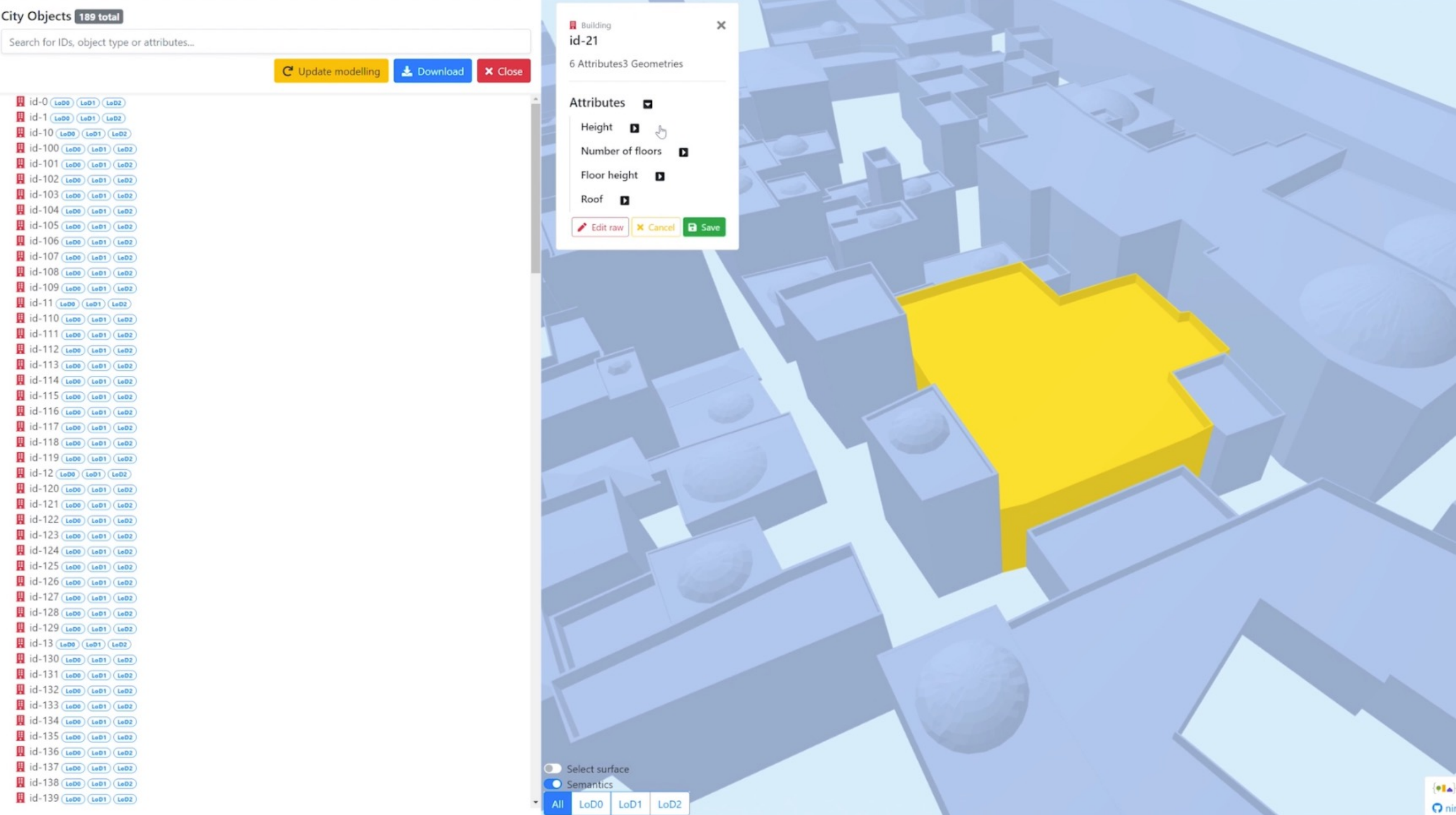
	nFloors	roofType	dateBuilt	coords
<b>building #1</b>	3		1874	(x <sub>1</sub> , y <sub>1</sub> )
<b>building #2</b>		hip	1874	(x <sub>2</sub> , y <sub>2</sub> )
<b>building #3</b>	2	gabled	1935	(x <sub>3</sub> , y <sub>3</sub> )



# Enrichissement par apprentissage machine

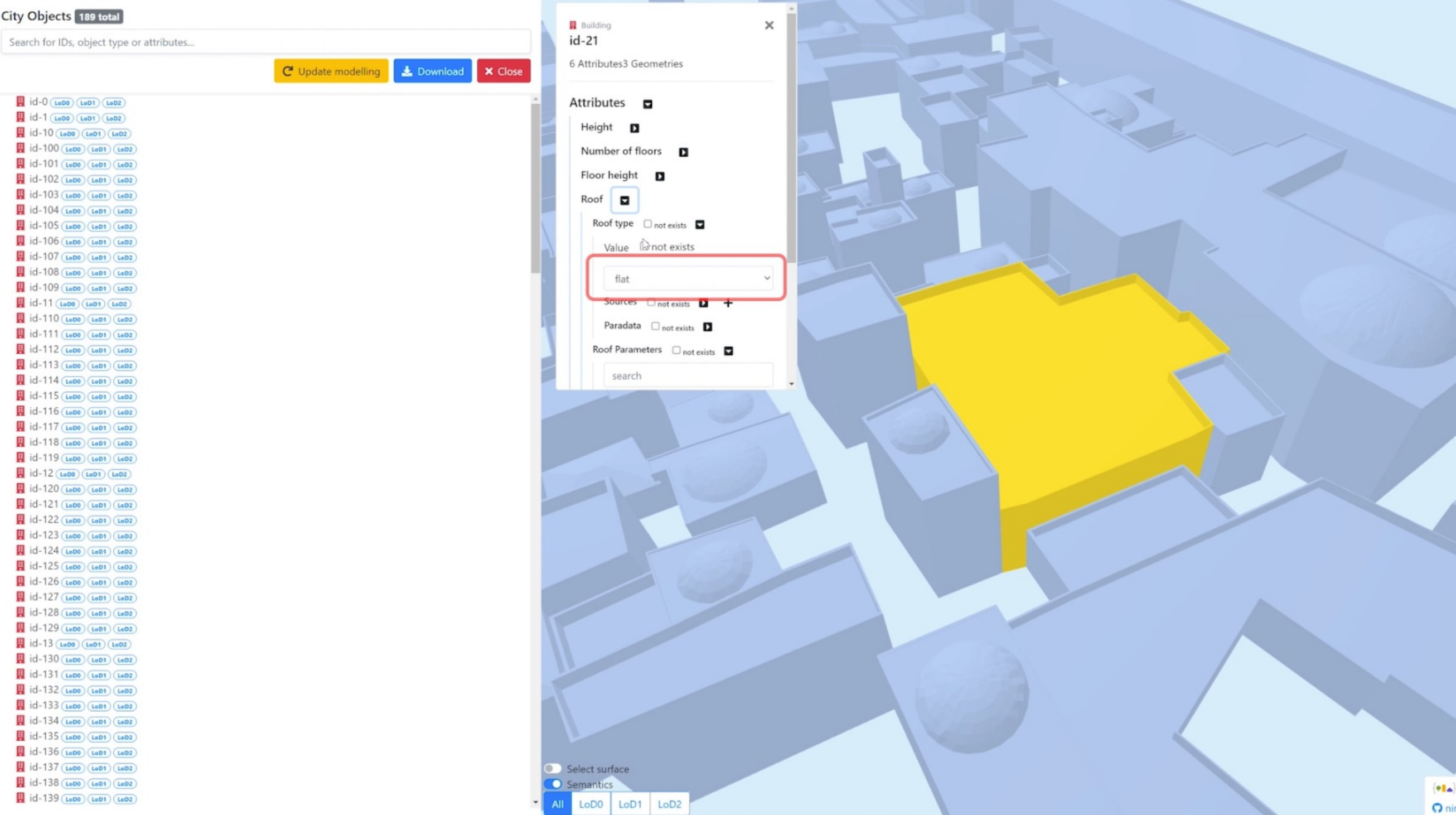




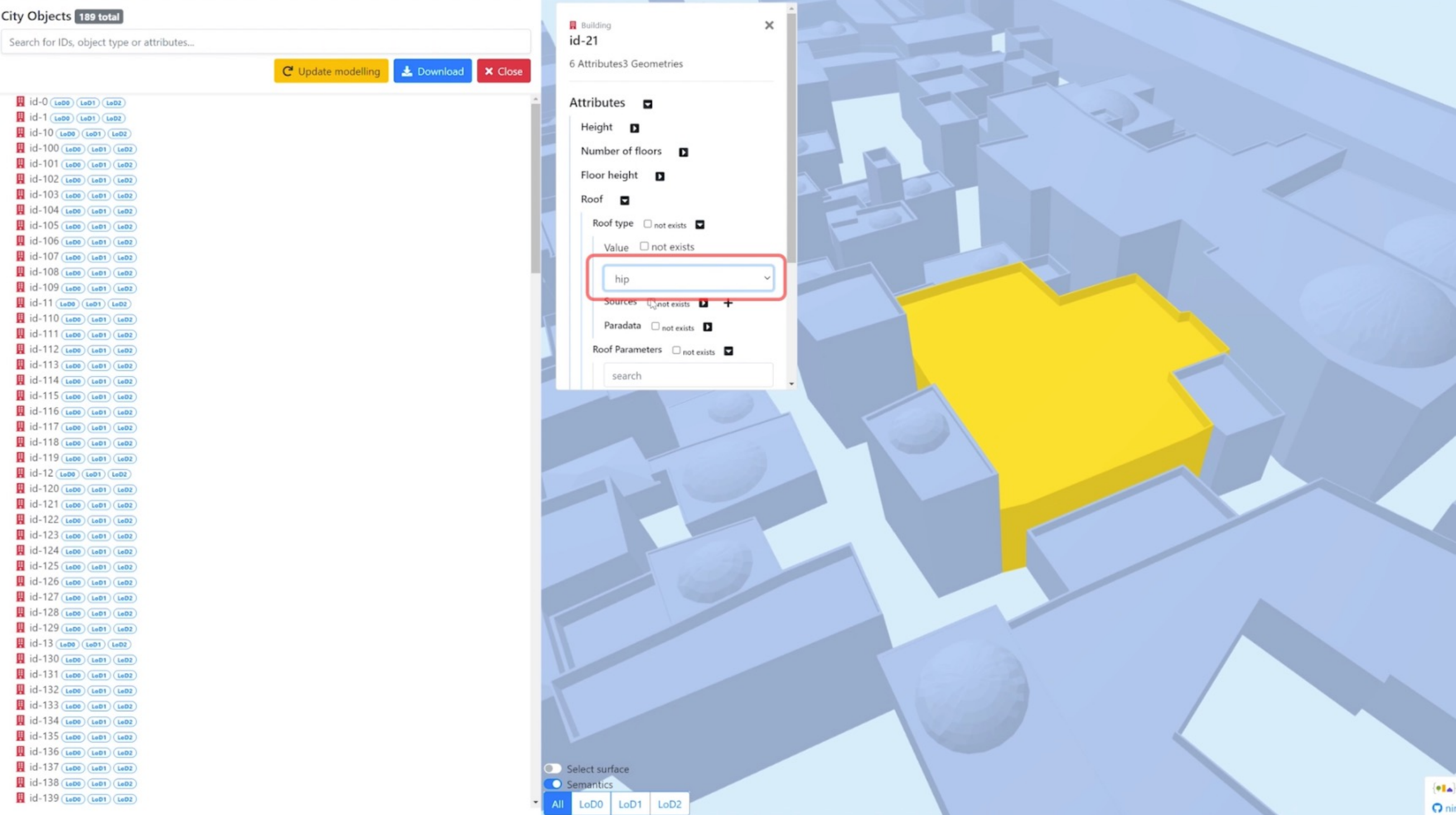


Vaianti B., Guhenec P., Dupertuis D., Petitpierre R. (2023). From Automated Bootstrapping to Collaborative Editing: A Framework for 4D City Reconstruction. In Digital Humanities 2023: Book of Abstracts. Graz, AT. 10-14 Juillet 2023.

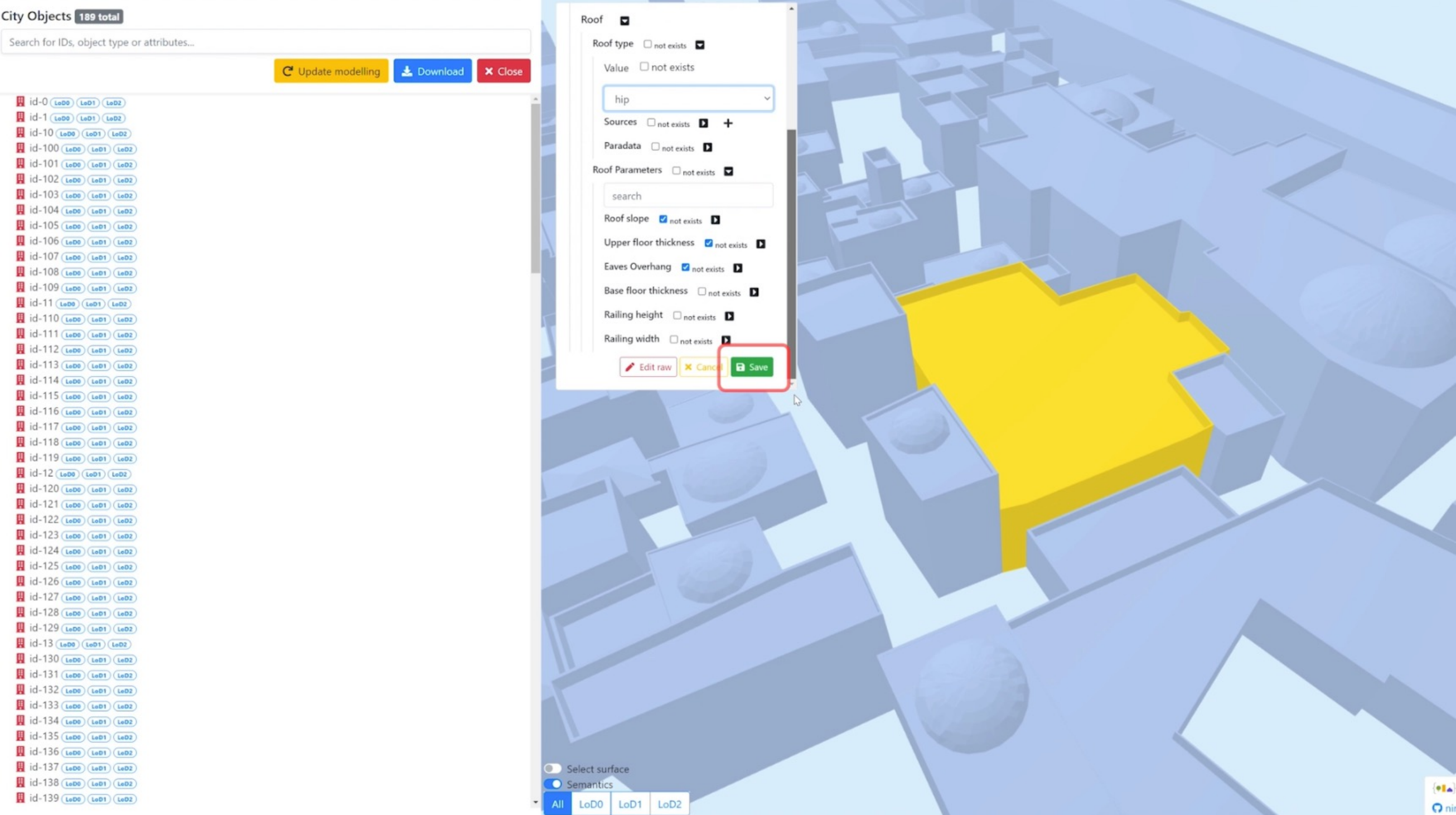












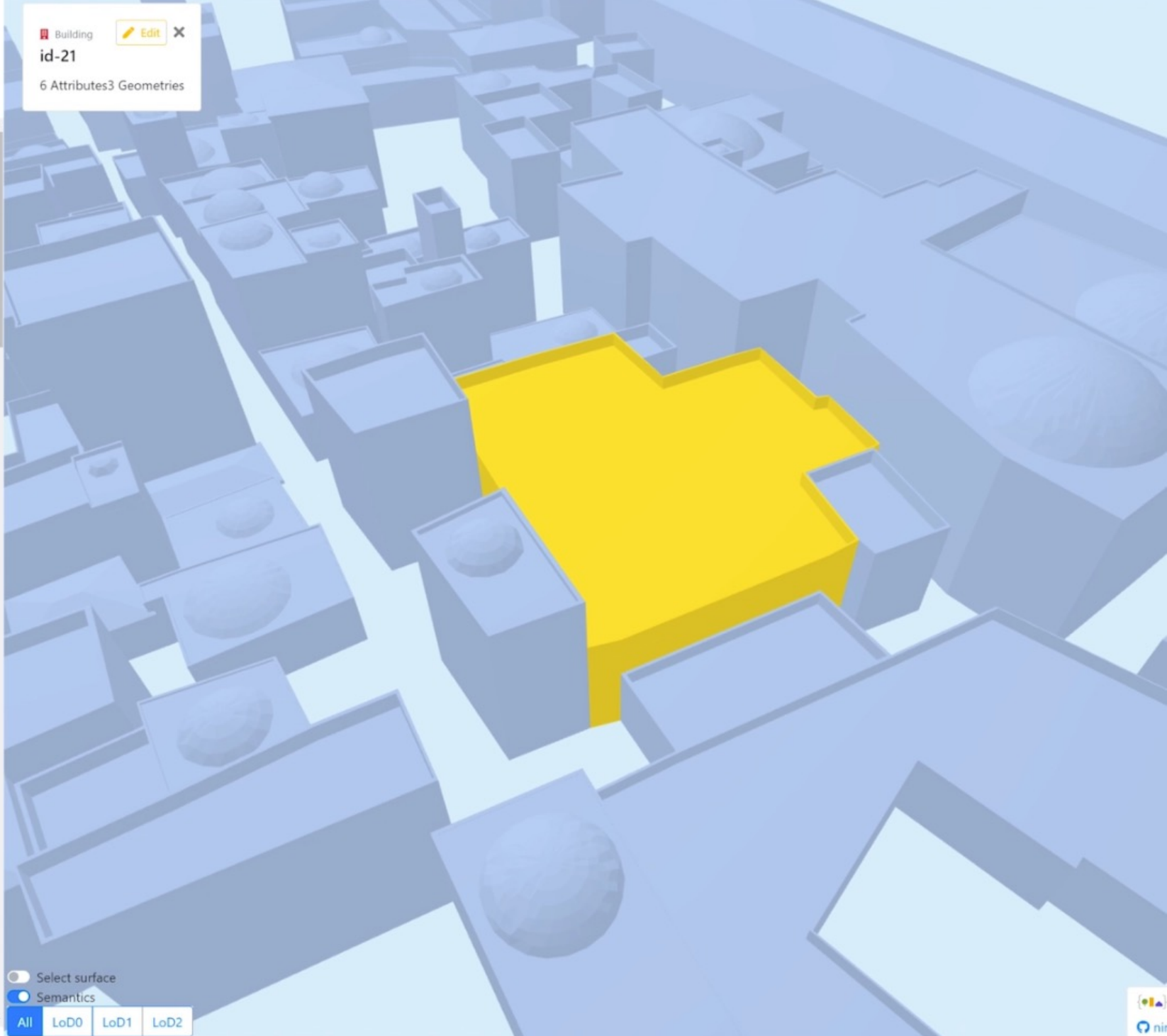


City Objects 189 total

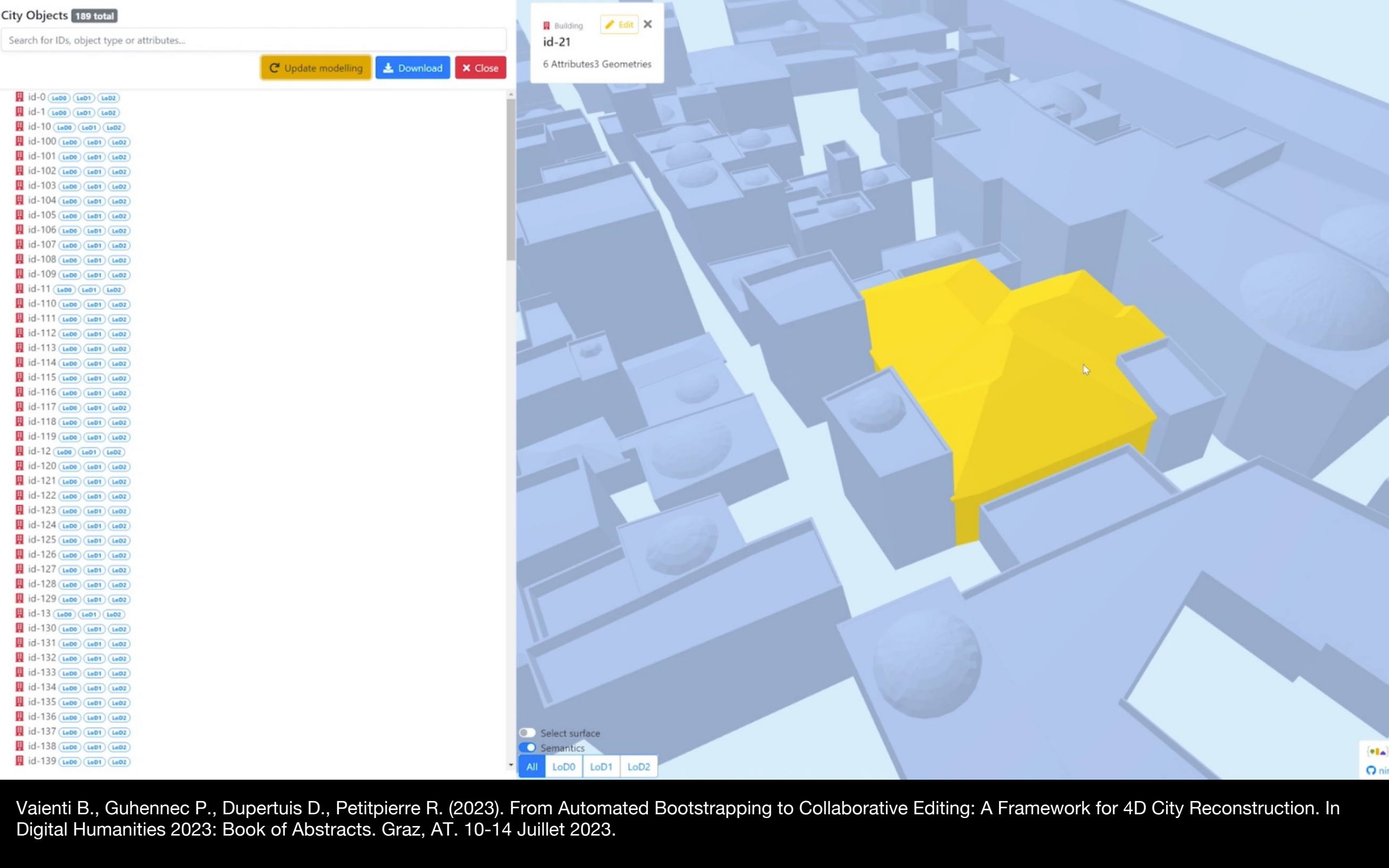
Search for IDs, object type or attributes...

Update modelling Download Close

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- id-139 LoD0 LoD1 LoD2







Vaianti B., Guhenec P., Dupertuis D., Petitpierre R. (2023). From Automated Bootstrapping to Collaborative Editing: A Framework for 4D City Reconstruction. In Digital Humanities 2023: Book of Abstracts. Graz, AT. 10-14 Juillet 2023.



# DÉFIS

INCOMPLÉTUDE  
DES DONNÉES

SPÉCIFICITÉ  
CULTURELLE

NATURE ITÉRATIVE DES  
PROJETS

ÉCHELLE

SUBJECTIVE  
RECONSTRUCTION



**INFÉRENCE ET TRAÇAGE  
DE LA SOURCE**

**INCOMPLÉTUDE  
DES DONNÉES**

**SPÉCIFICITÉ  
CULTURELLE**

**NATURE ITÉRATIVE DES  
PROJETS**

**ÉCHELLE**

**SUBJECTIVE  
RECONSTRUCTION**



PARAMÉTRAGE FLEXIBLE  
DE LA MODÉLISATION  
PROCÉDURALE

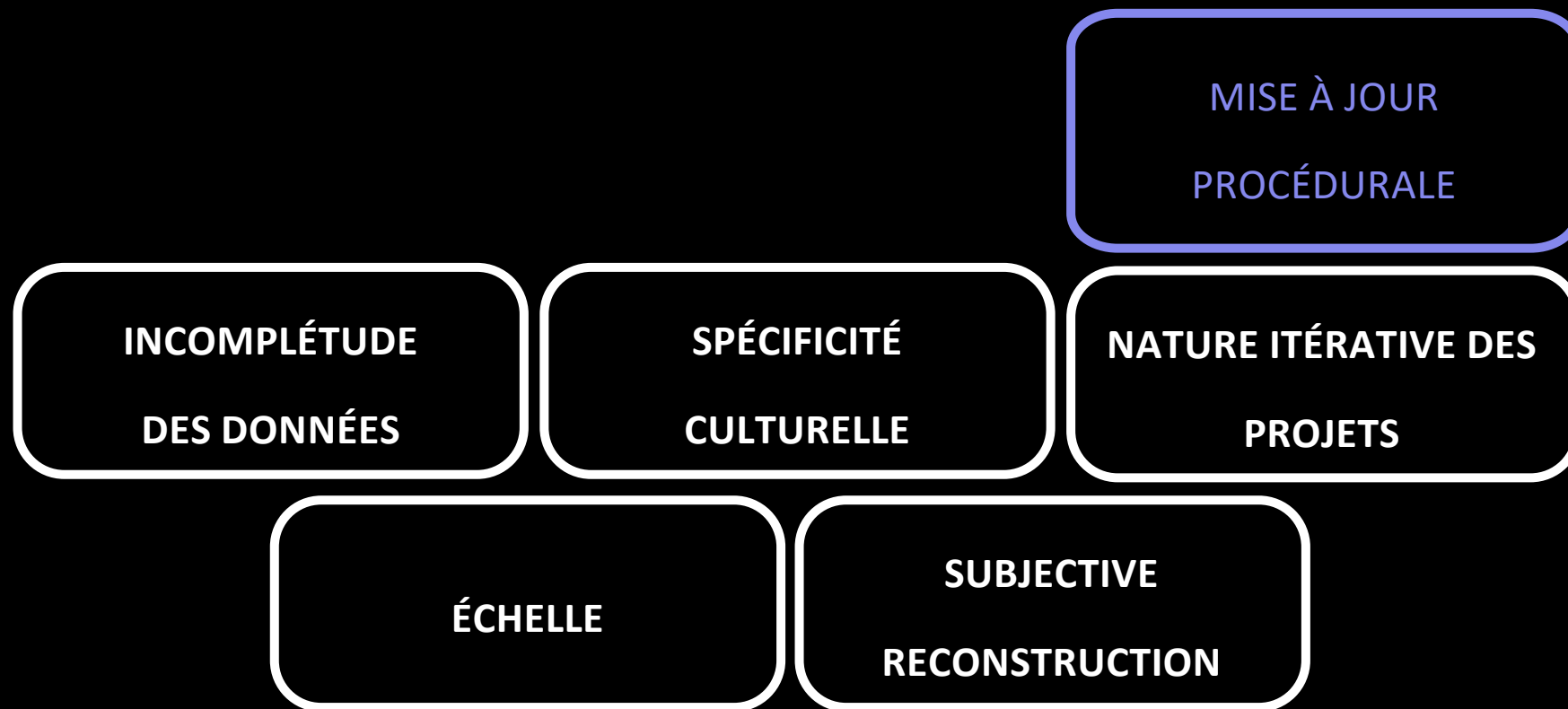
INCOMPLÉTUDE  
DES DONNÉES

SPÉCIFICITÉ  
CULTURELLE

NATURE ITÉRATIVE DES  
PROJETS

ÉCHELLE

SUBJECTIVE  
RECONSTRUCTION





**INCOMPLÉTUDE  
DES DONNÉES**

**SPÉCIFICITÉ  
CULTURELLE**

**NATURE ITÉRATIVE DES  
PROJETS**

**ÉCHELLE**

**SUBJECTIVE  
RECONSTRUCTION**

**VECTORISATION  
AUTOMATIQUE ET  
MOD. PROCÉDURALE**

**INCOMPLÉTUDE  
DES DONNÉES**

**SPÉCIFICITÉ  
CULTURELLE**

**NATURE ITÉRATIVE DES  
PROJETS**

**ÉCHELLE**

**SUBJECTIVE  
RECONSTRUCTION**

**ENREGISTREMENT DES  
MÉTADONNÉES ET  
PARADONNÉES**



