

# Communal Housing Typology On Mars

Group 4

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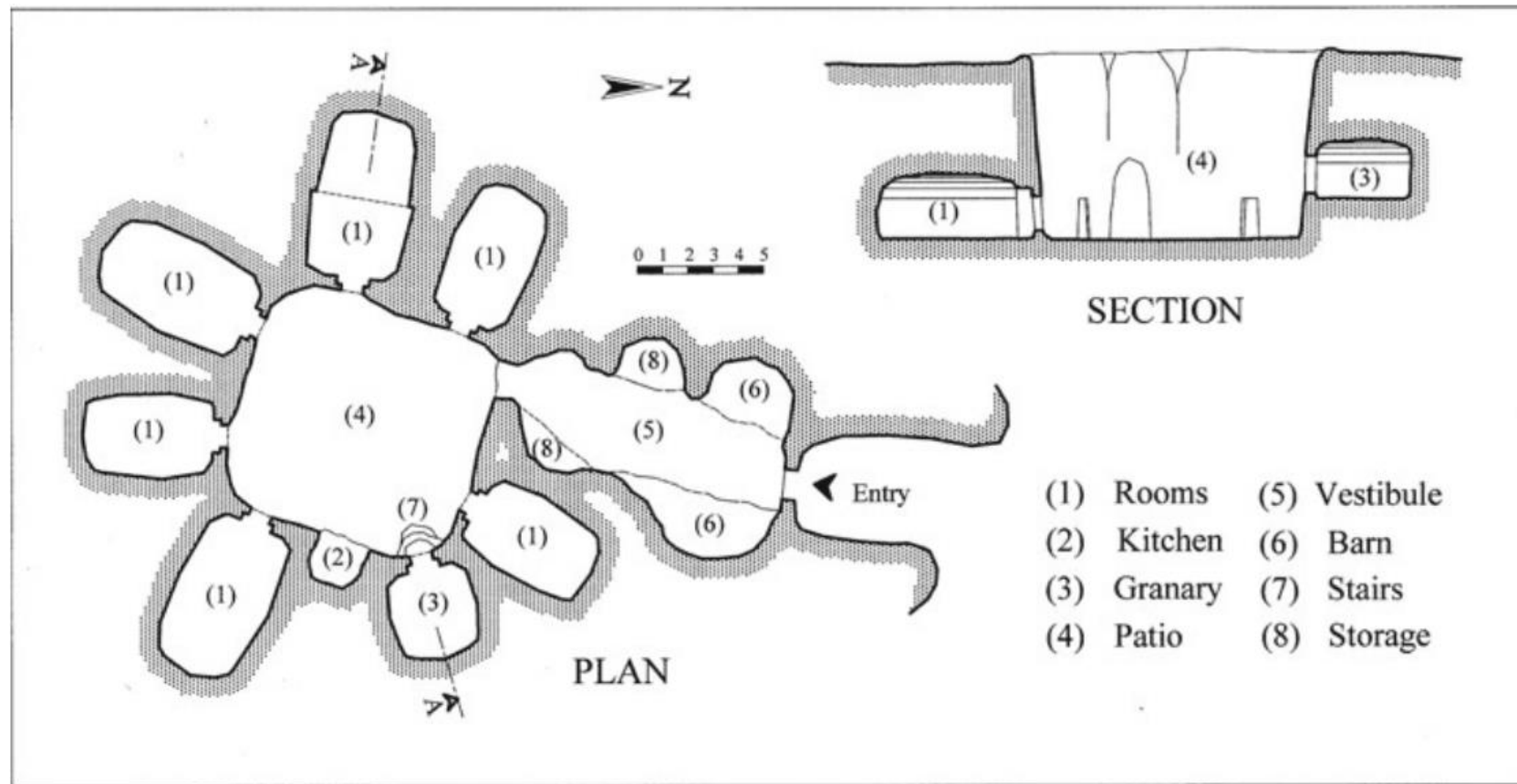


Case study

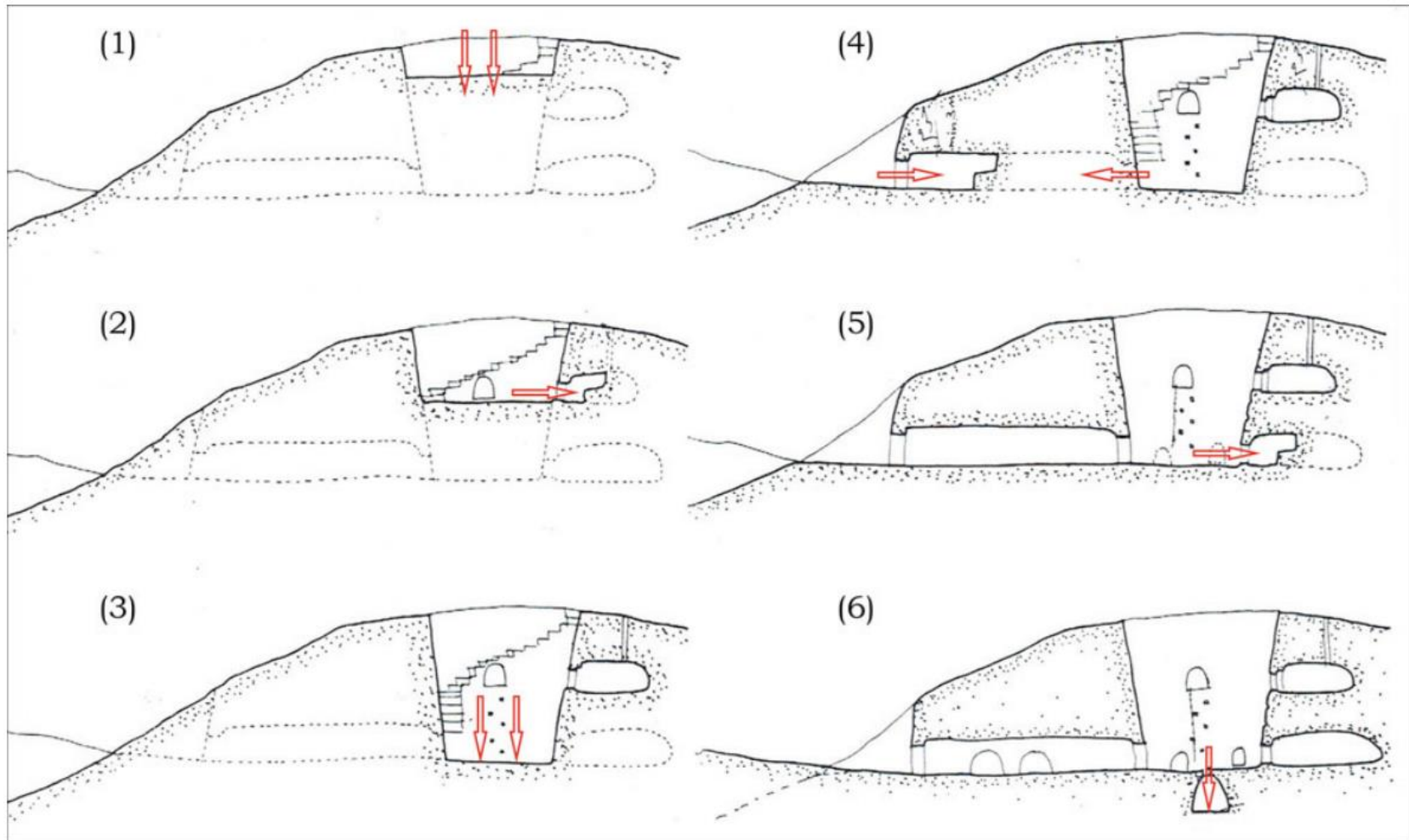




Case study - underground courtyard design

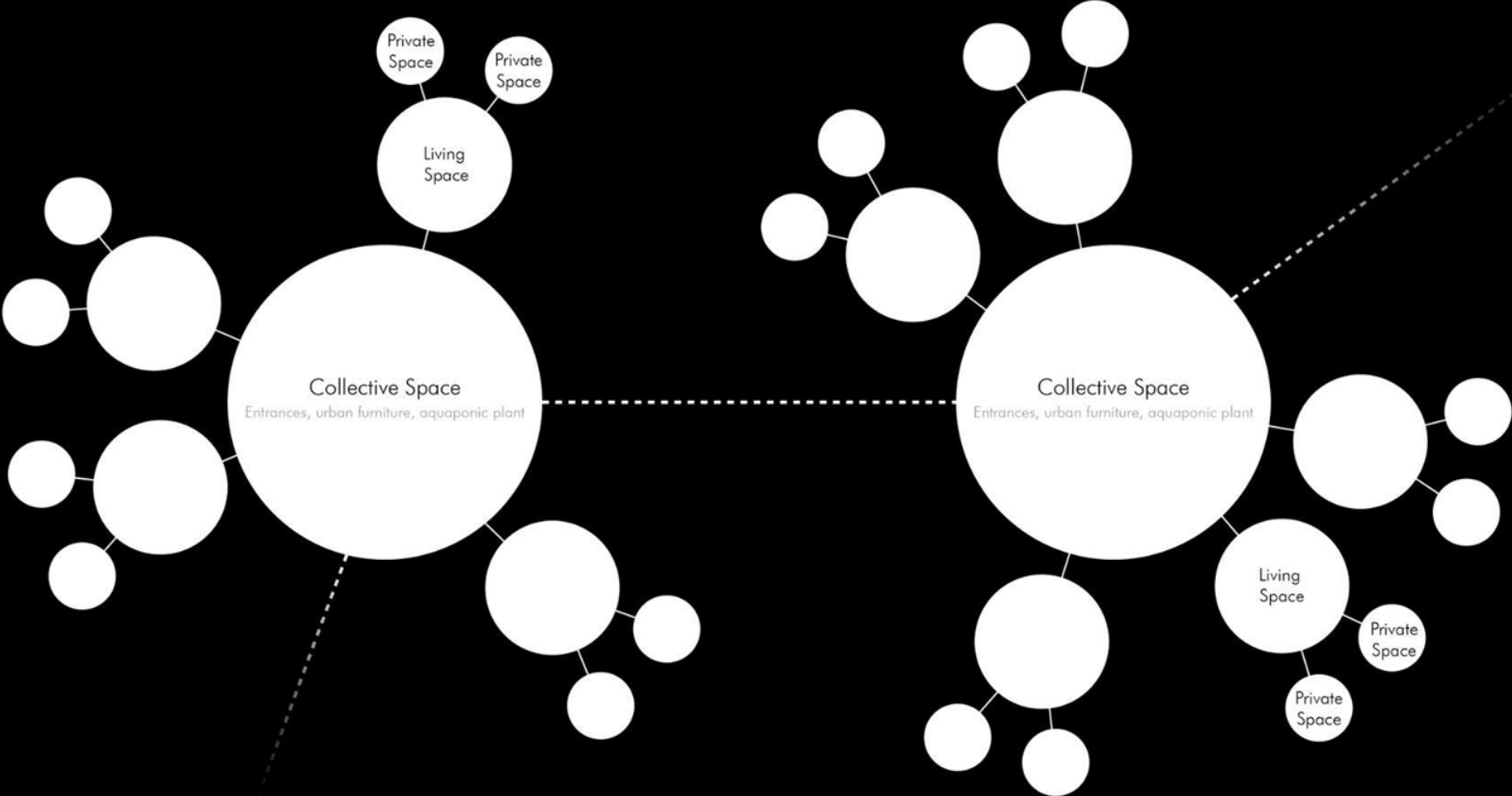






Overall design

Courtyard organization concept



components: courtyard + housings + canopy





courtyard excavation

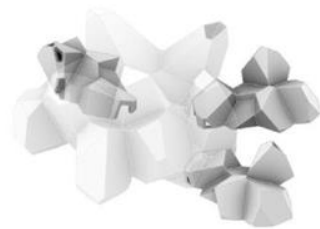
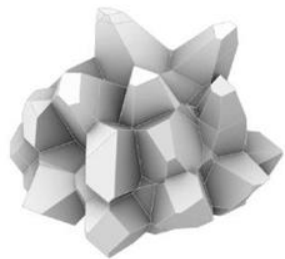
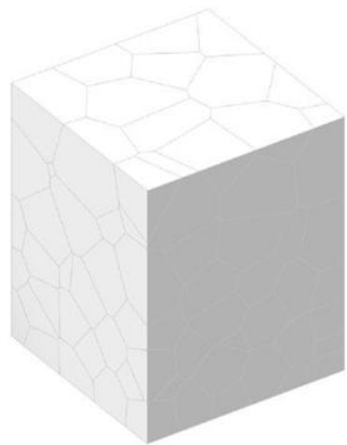




radiation shielding canopy

Overall design process

# Overall voronoi design



Bounding box

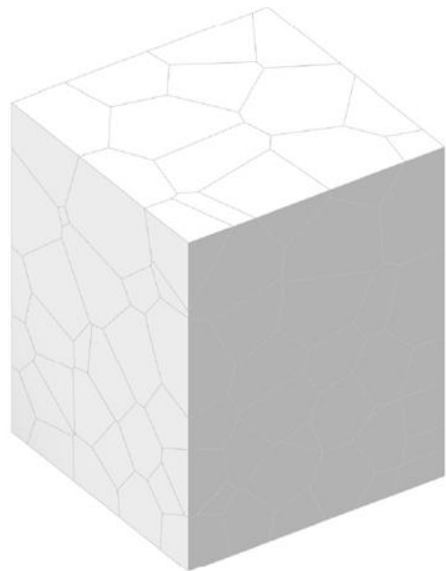
Extraction of courtyard volume

Formation of courtyard and canopy

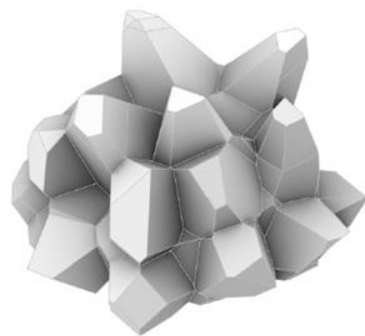
Integration of courtyard and houses



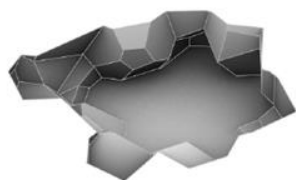
# Box to Voronoi



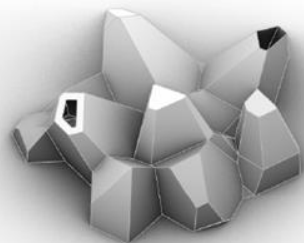
# Voronoi selection



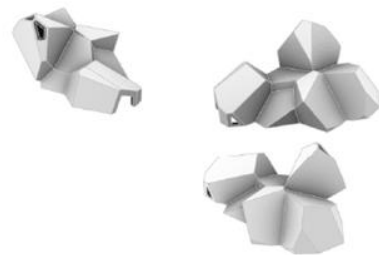
# Creating courtyard



# Creating canopy

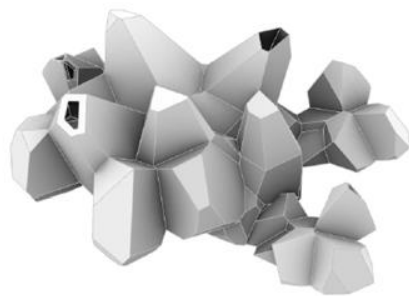


# Creating housing units

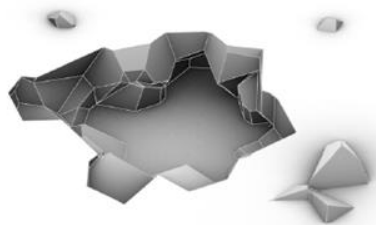


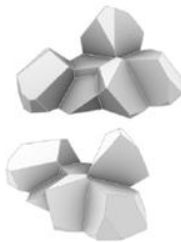


## Attaching the housing units



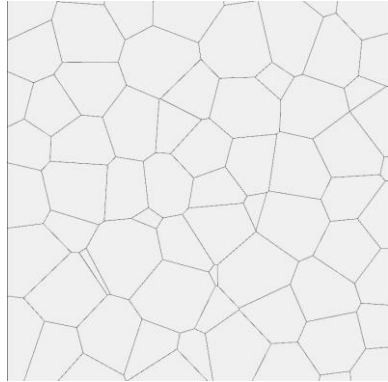
Overall design





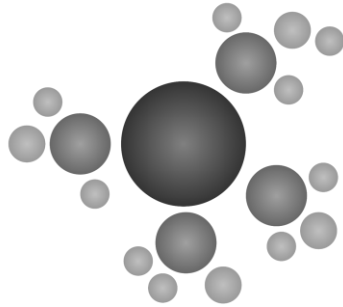
Courtyard design

# Voronoi housings to community

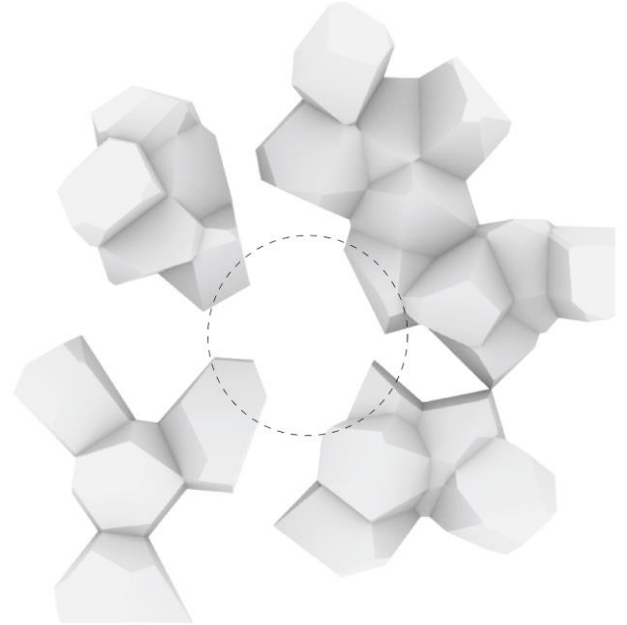


Voronoi cell construction

+



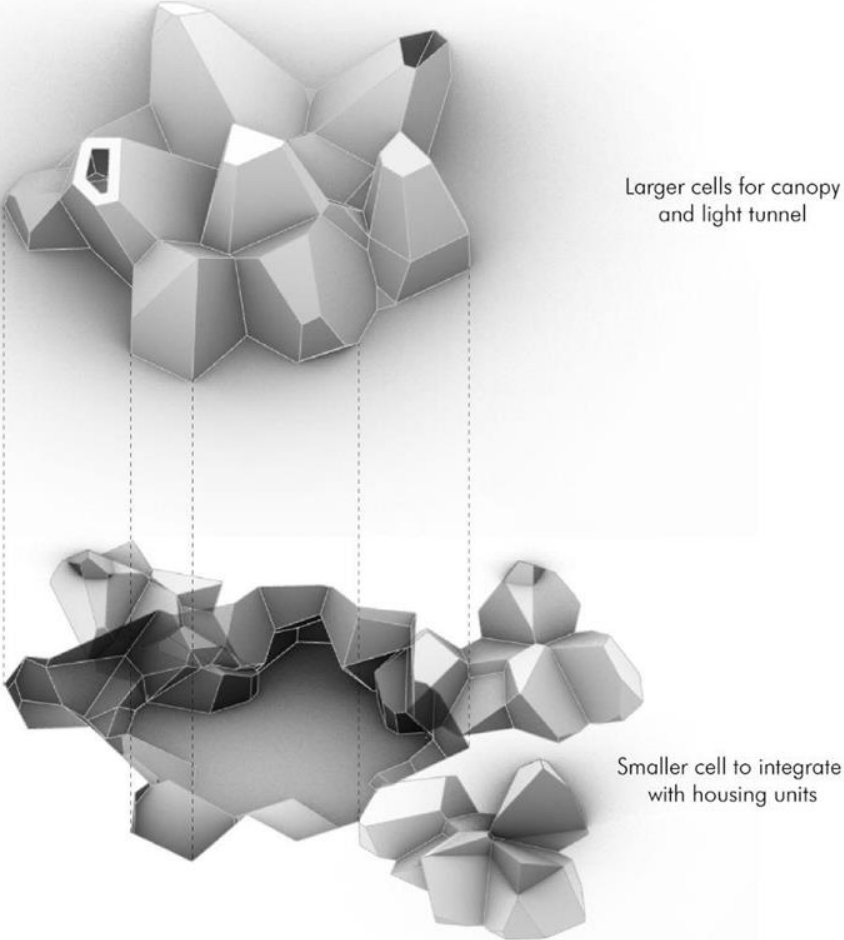
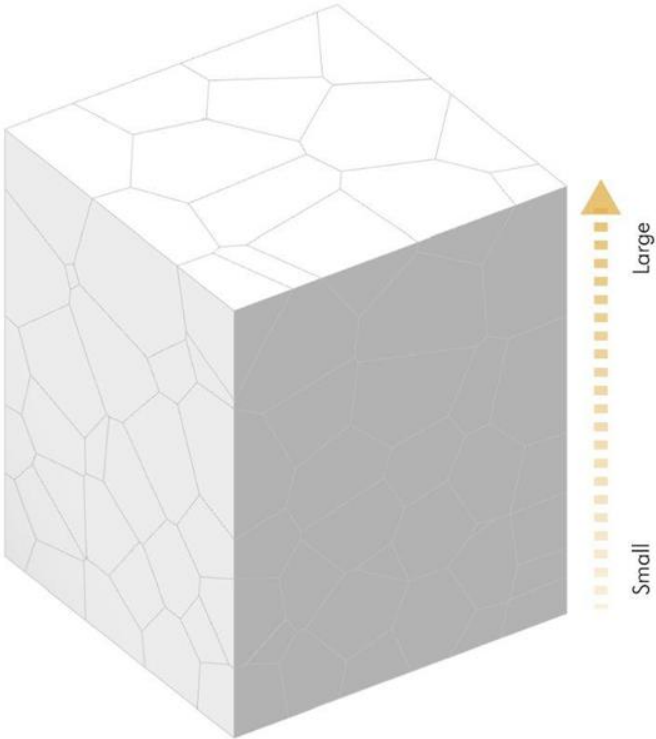
Programme organization



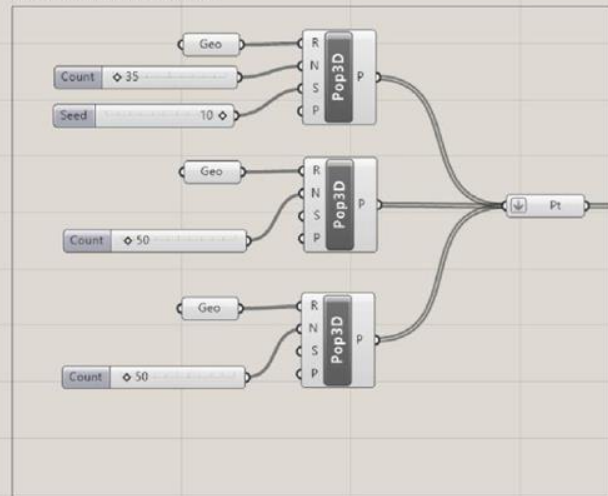
Voronoi cell organization



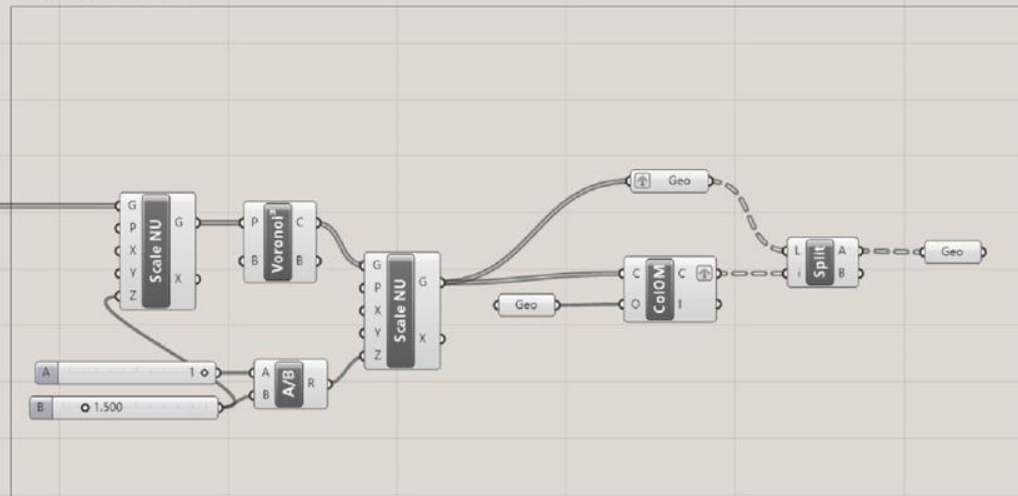
Courtyard voronoi design



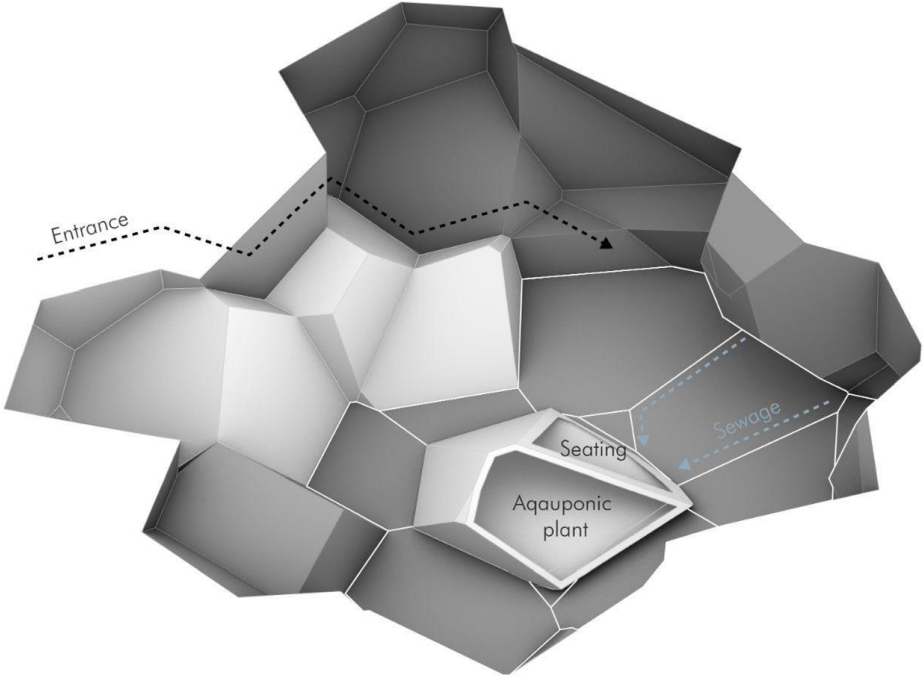
### Control of voronoi size



### Formation of voronoi



Courtyard urban furniture design



Cell stair design



Aquaponic plant

Housing design

# Case study - customization of spaces



Single

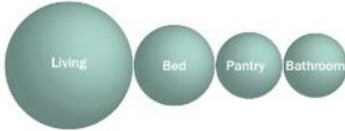


25m2

X2



Couple



30m2

X2



Couple + kid

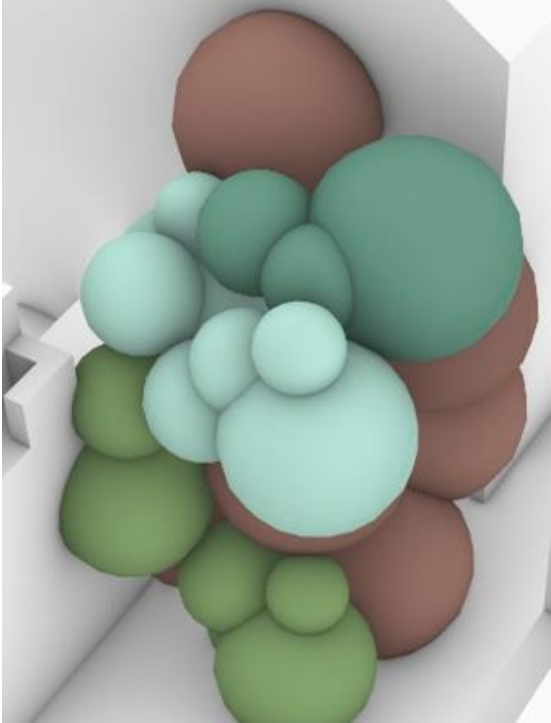


35m2

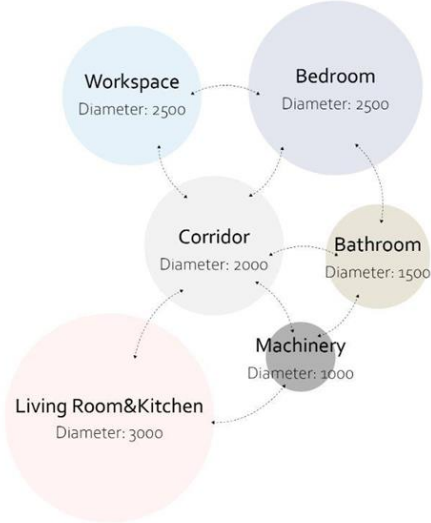
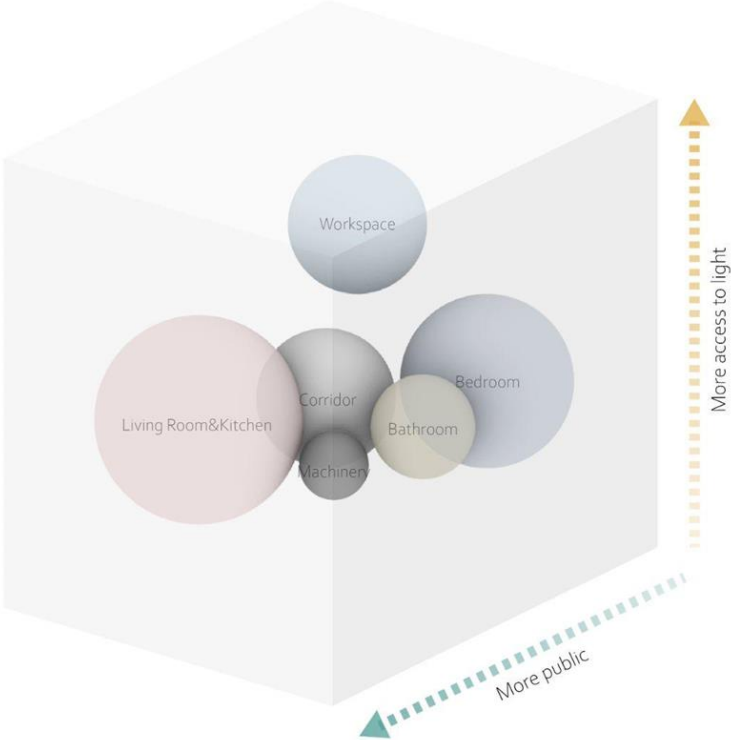
X2



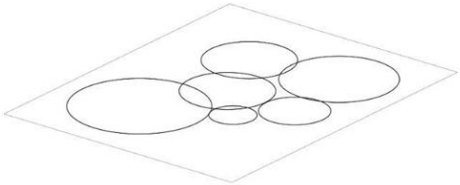
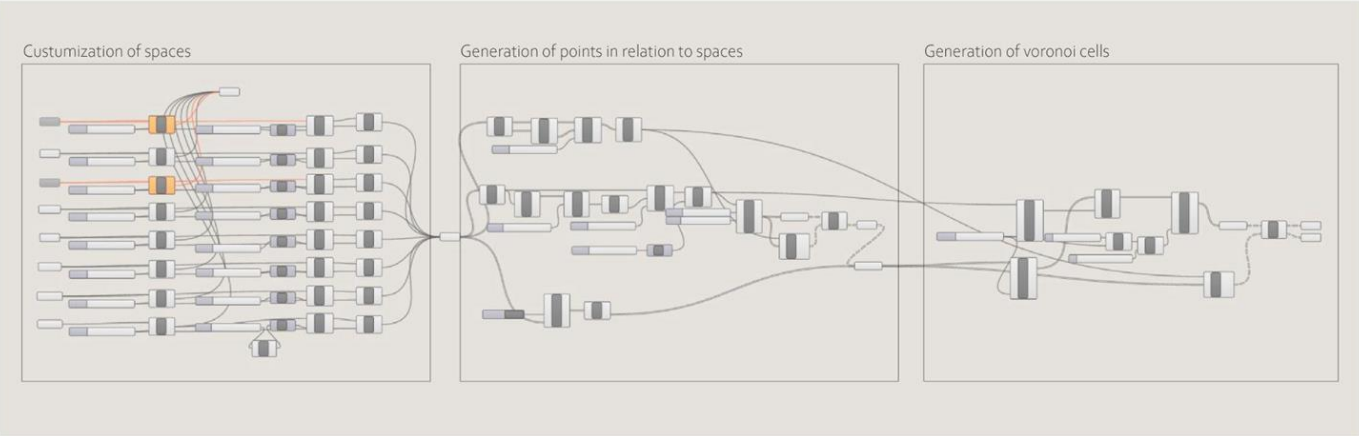
Shared



# Design strategy - customization of volume



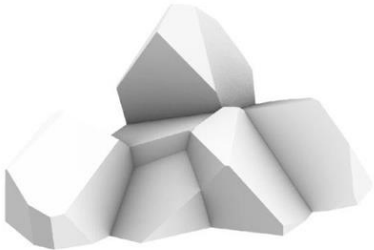
# Translation of volume to voronoi



Zoning of spaces



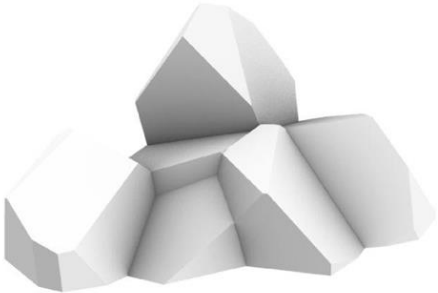
Volumetric arrangement



Voronoi generation



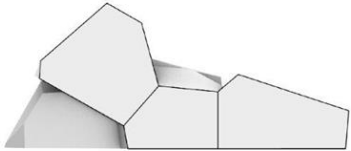
Selection of better options



Voronoi overview



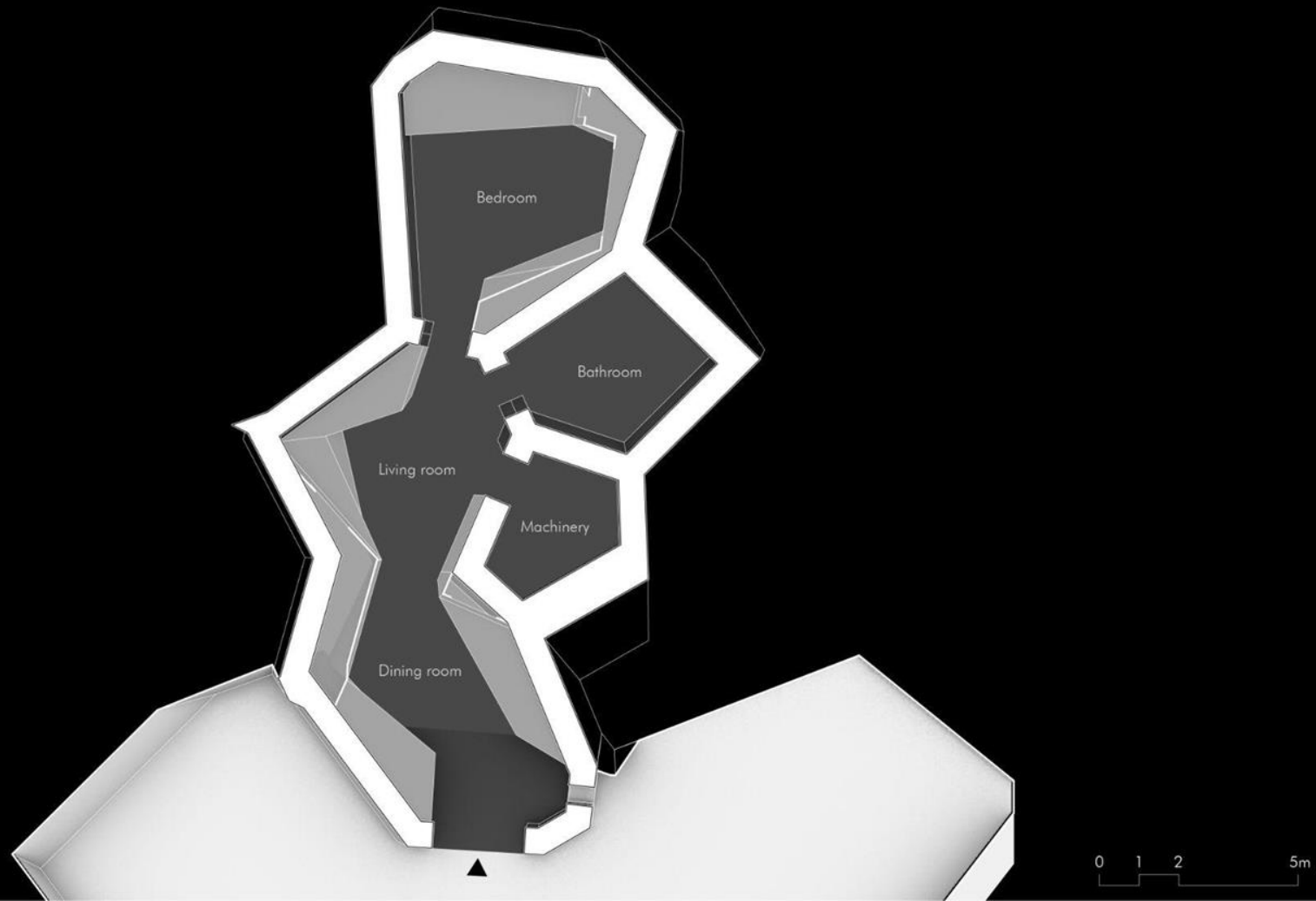
plan



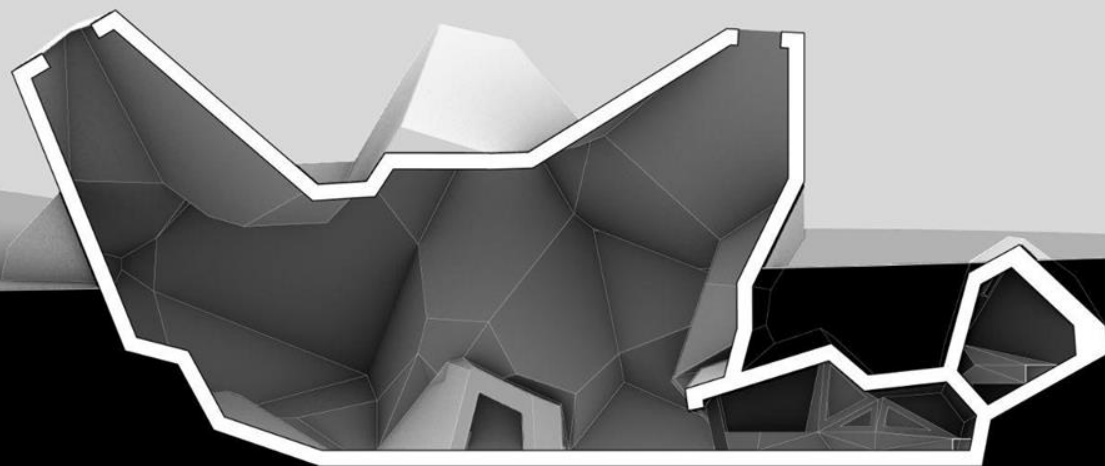
section



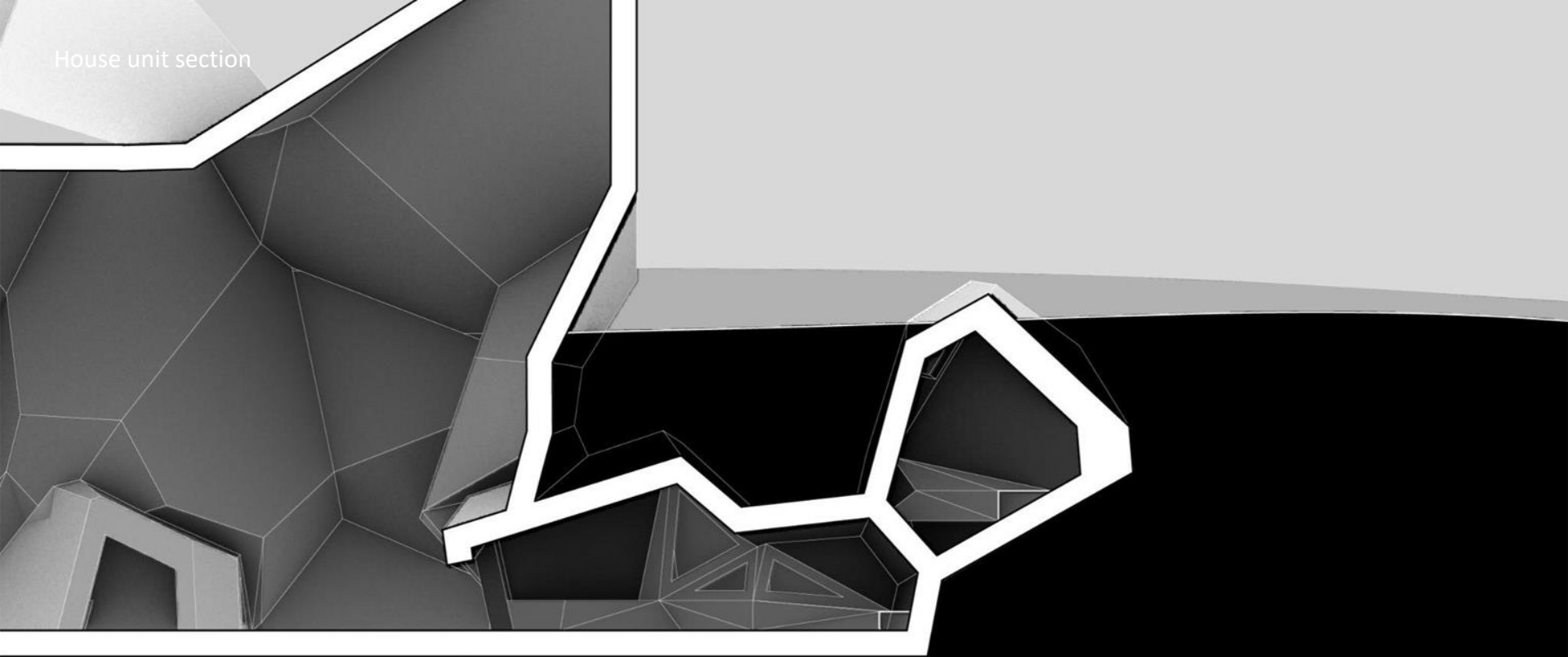
# House unit plan



Courtyard section

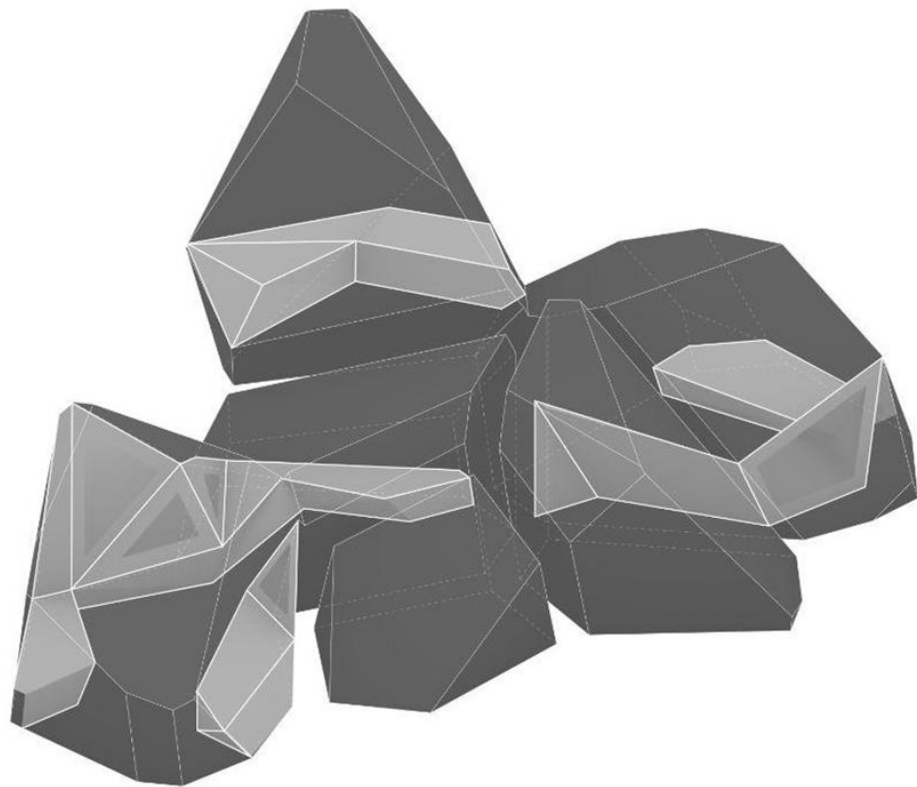


House unit section



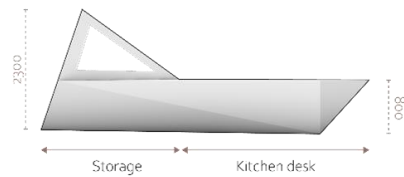
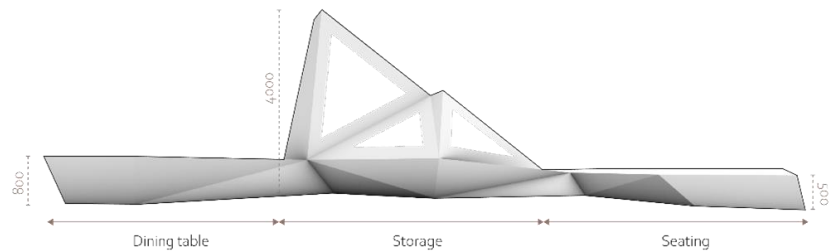
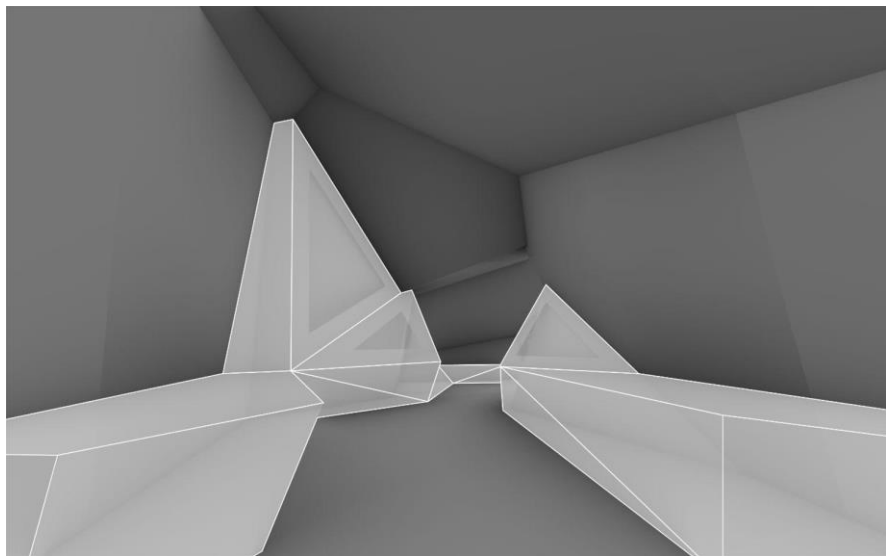
0 1 2 5m

## Furniture design

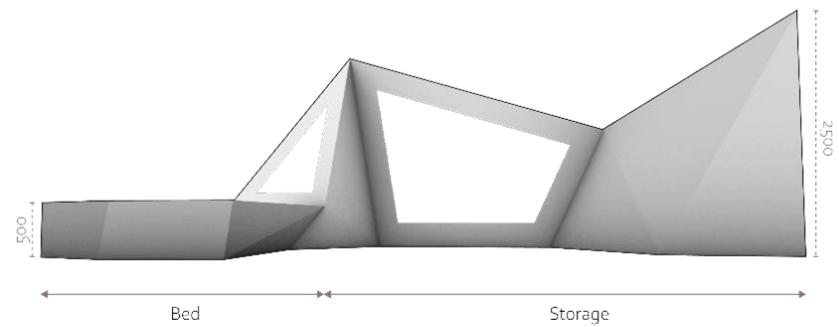
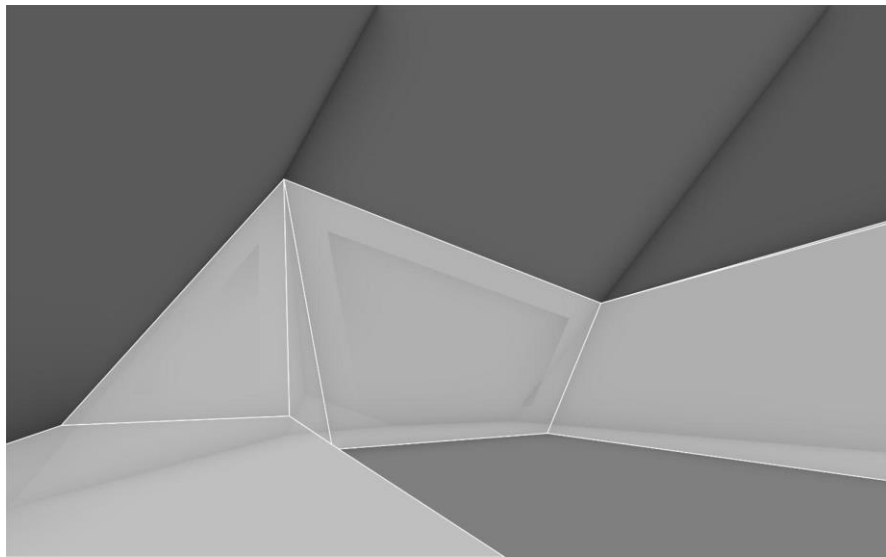


- extended from the wall
- continuous triangulated plane
- variations in form for different usage

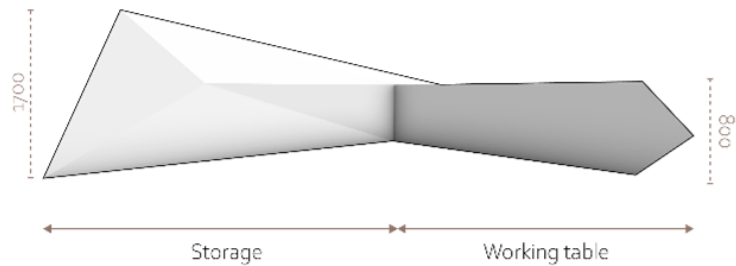
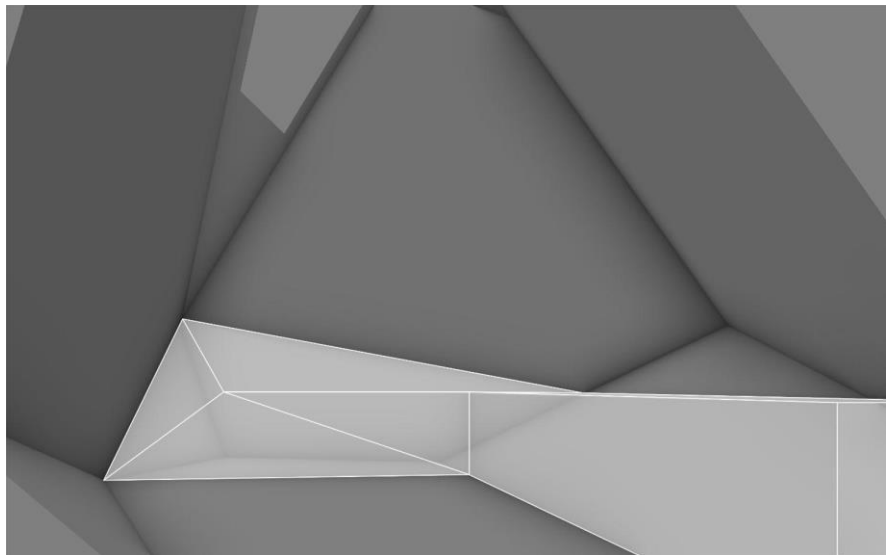
# Furniture design - dining room



# Furniture design - bedroom



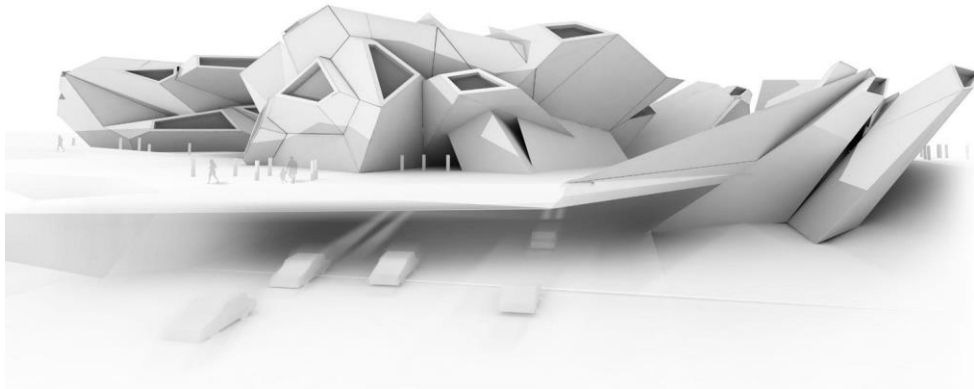
# Furniture design - studio



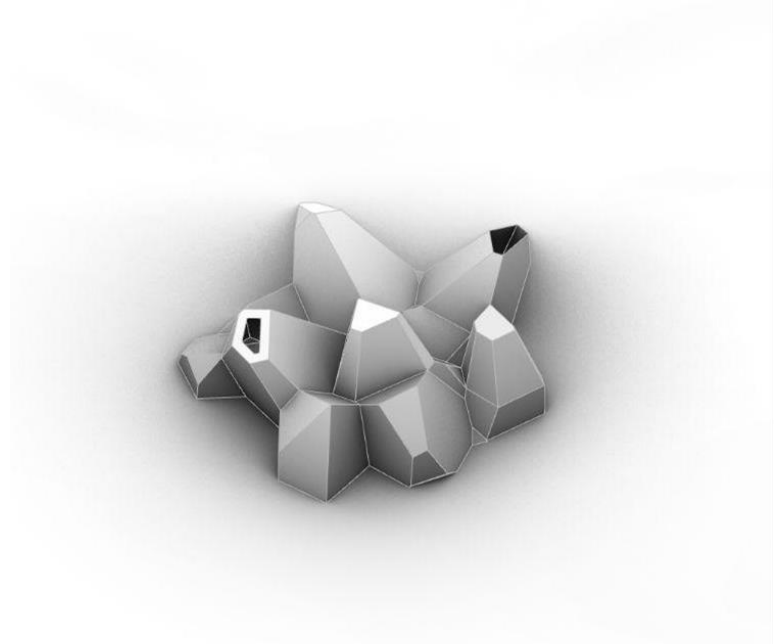
Canopy design



# Inspiration



Student example



Voronoi dome generation



