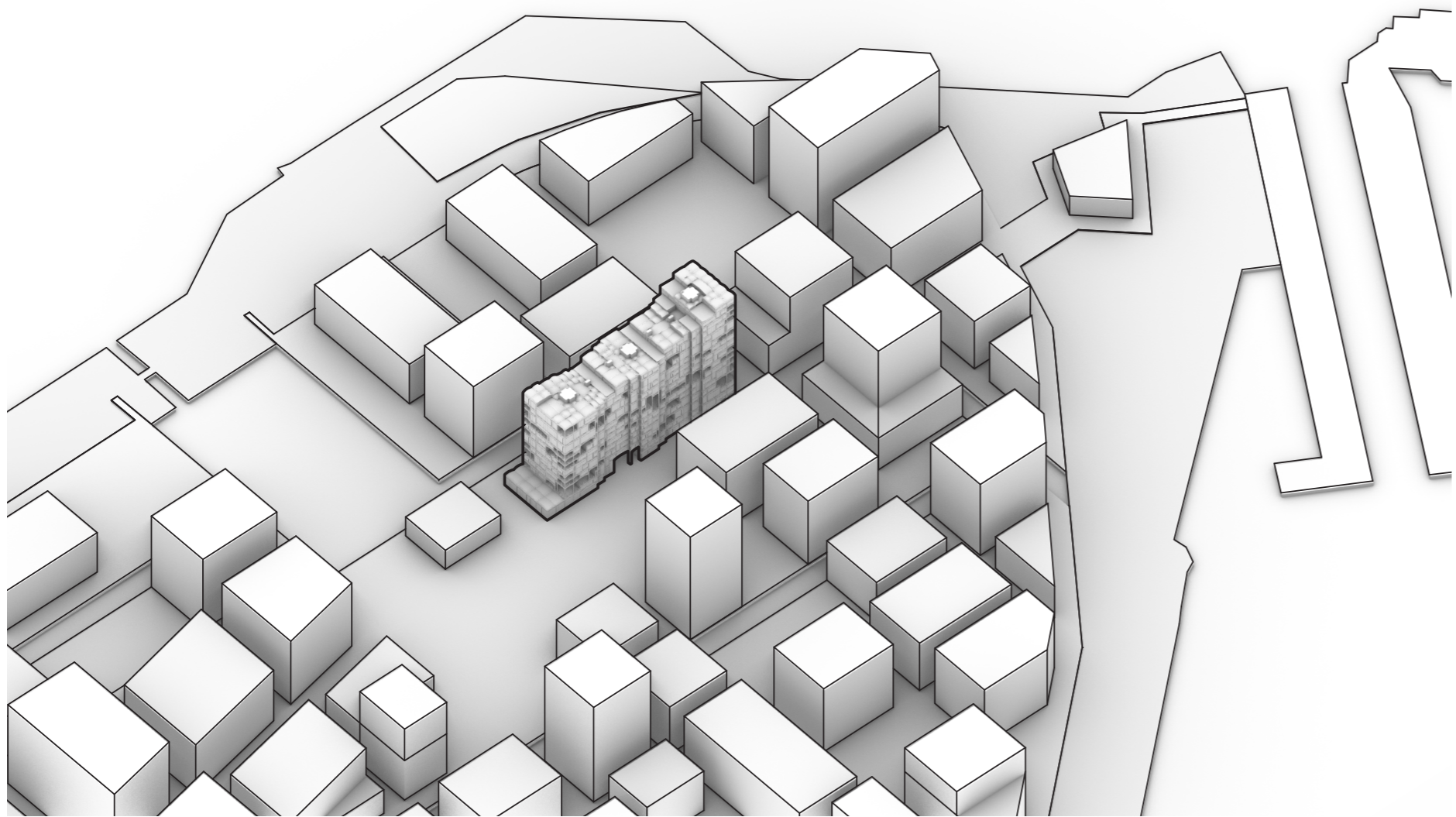


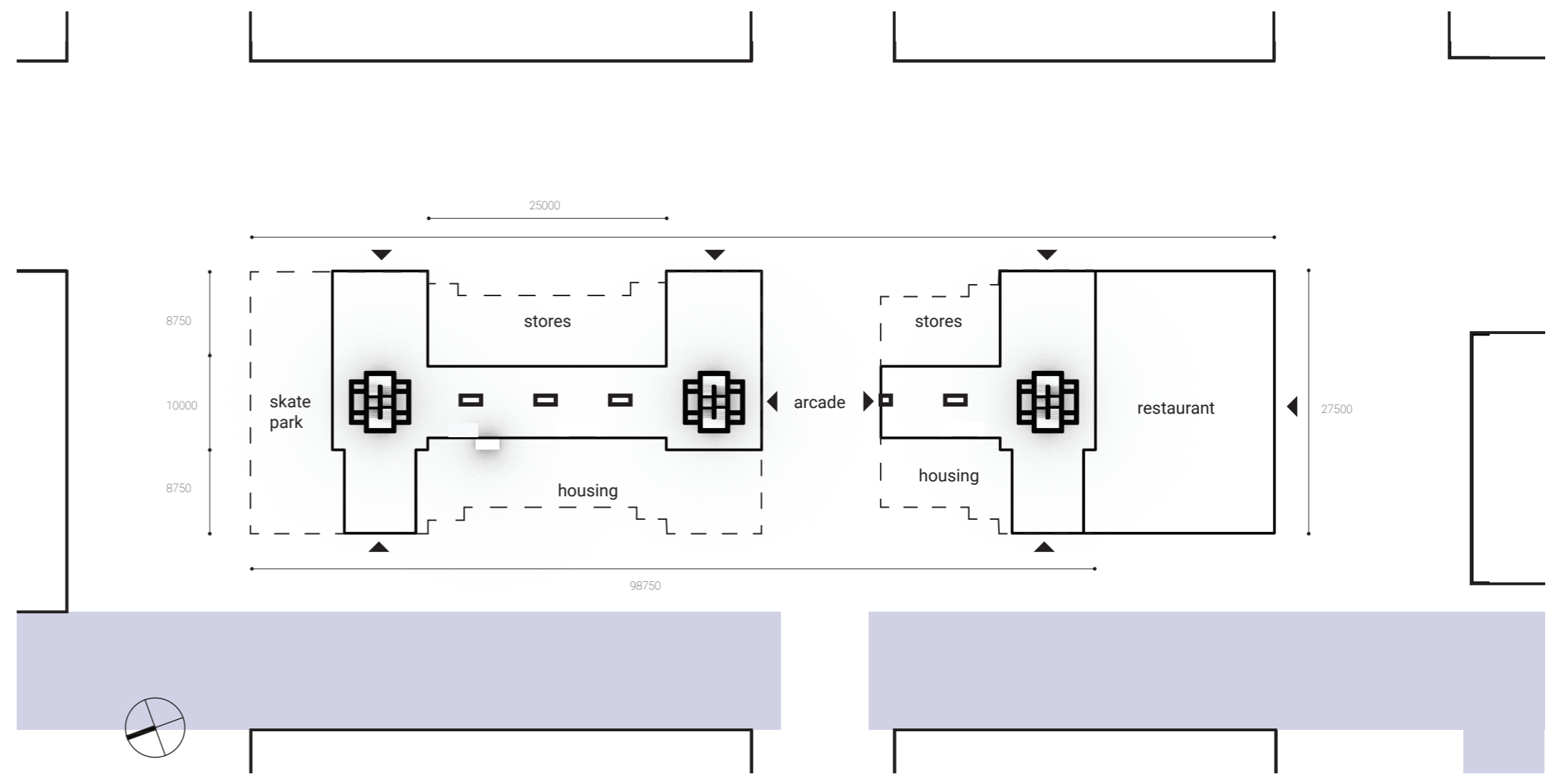
# COMPLEX. a cathedral for living in.

berend  
vos

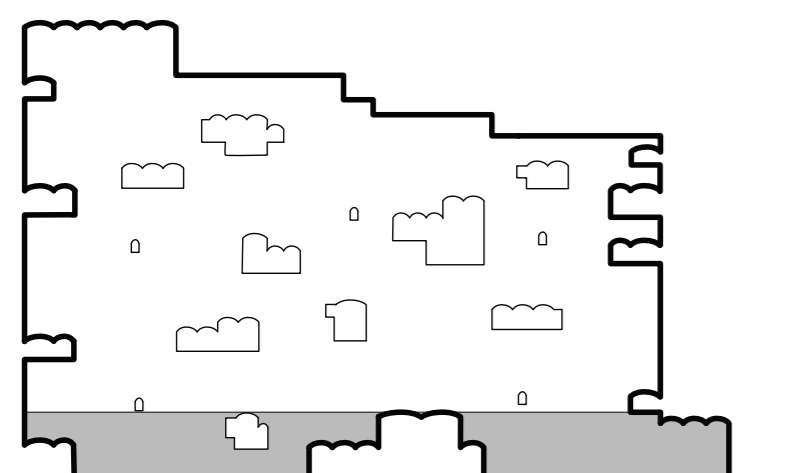
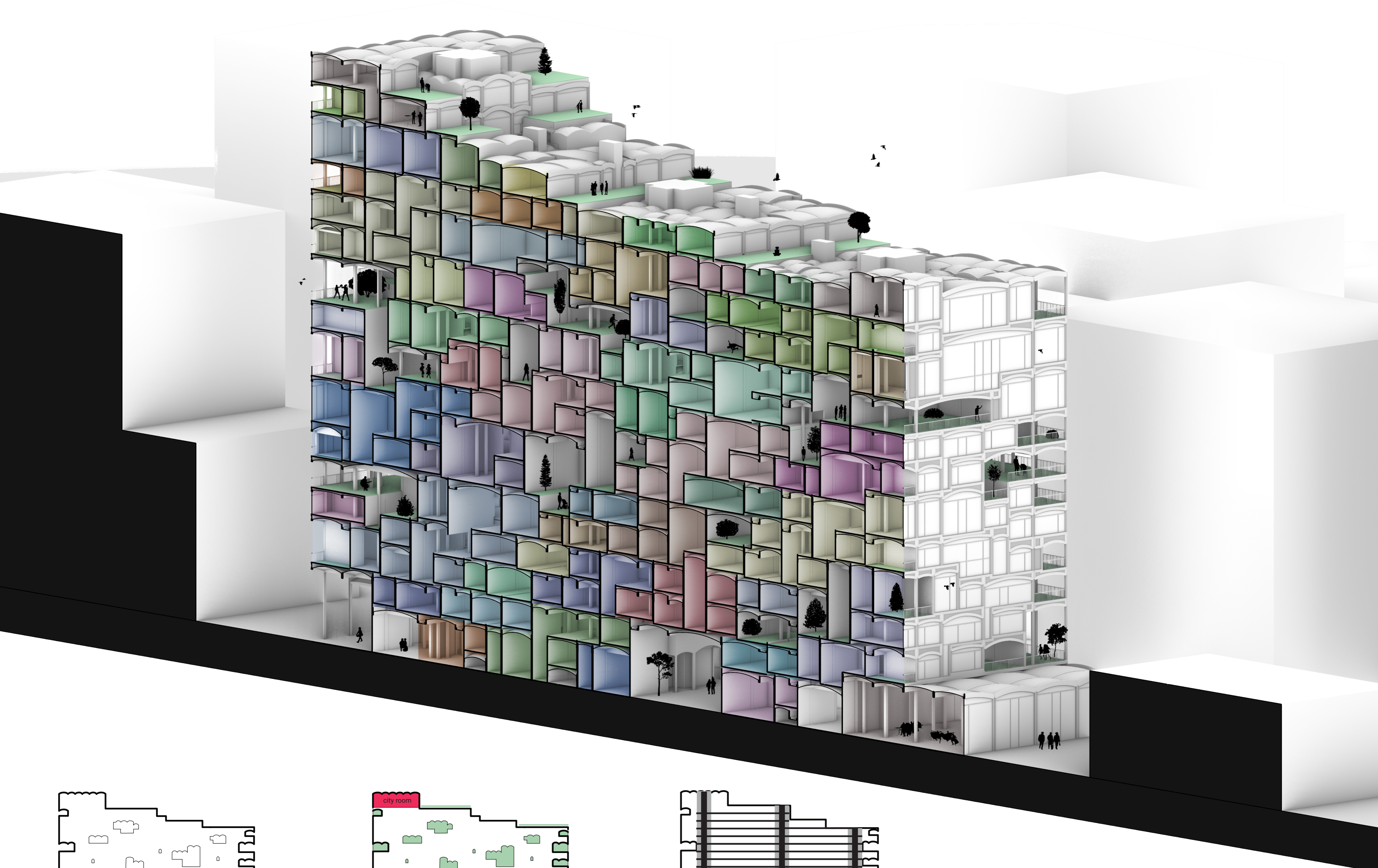
architectural engineering. 17 january 2022.



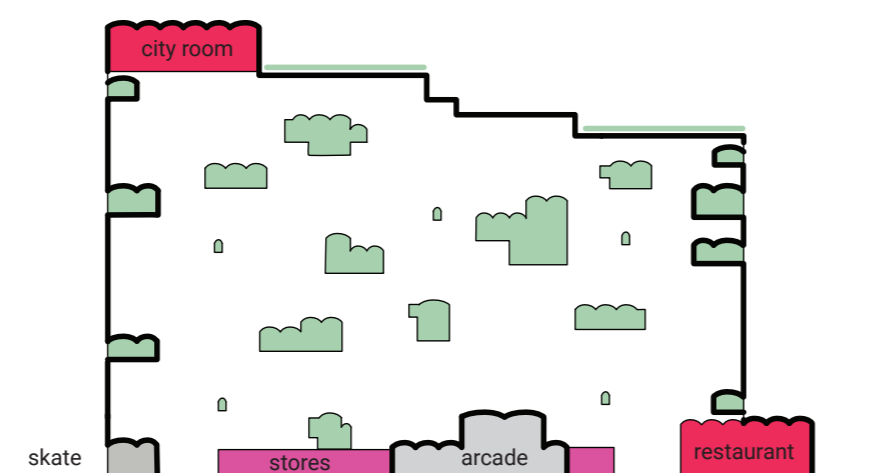
location: the sluisbuurt in amsterdam



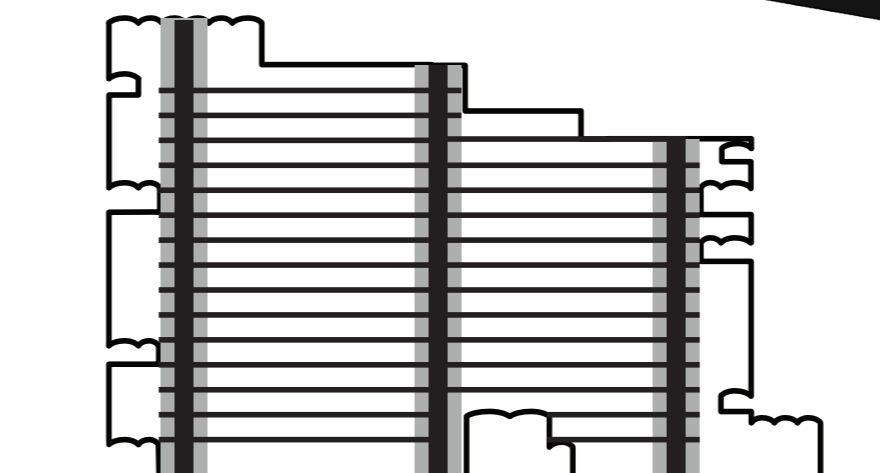
floorplan ground floor



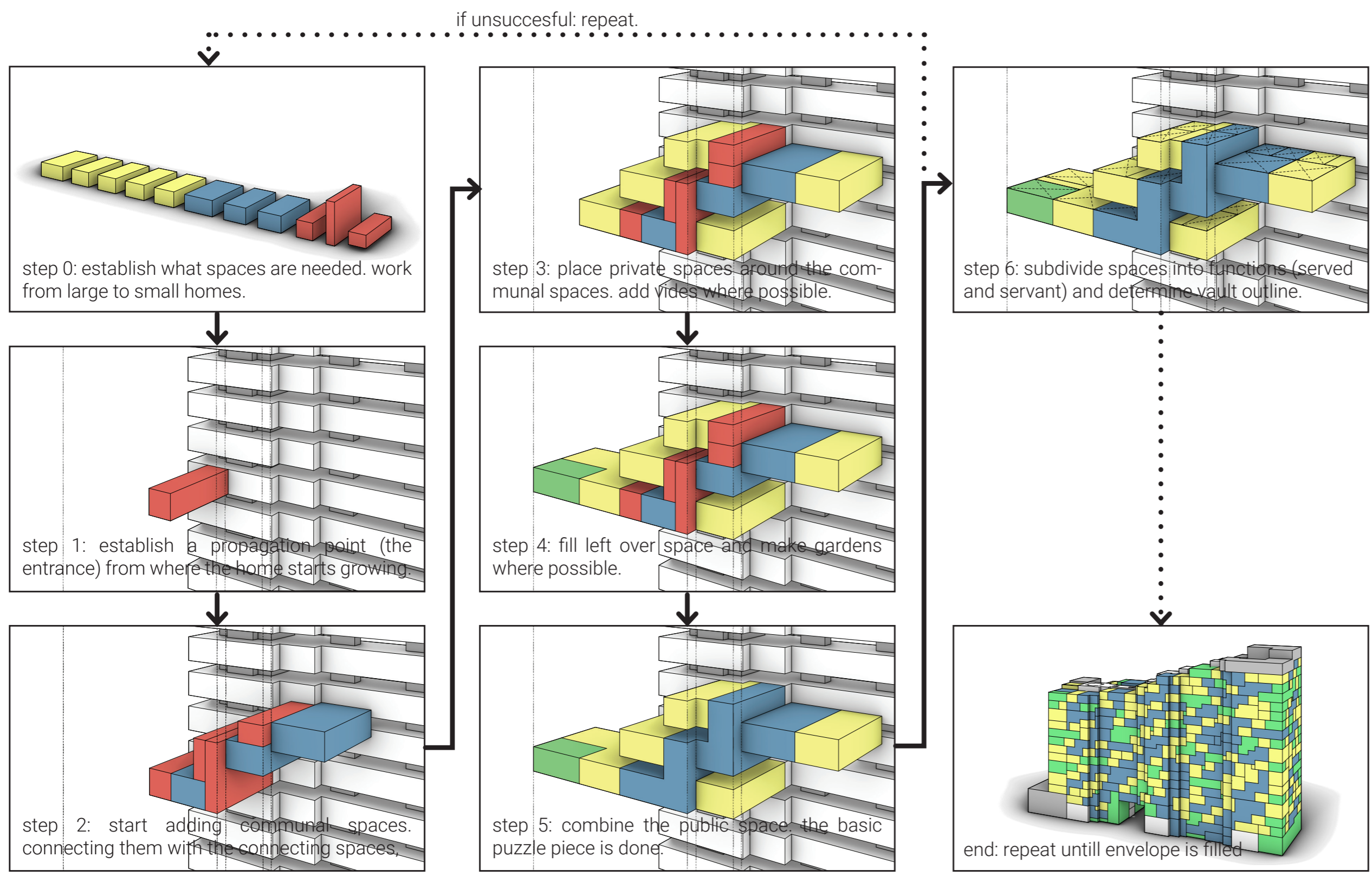
the facade of the building takes on a darker colour in the plint. this shows the difference in function and scale.



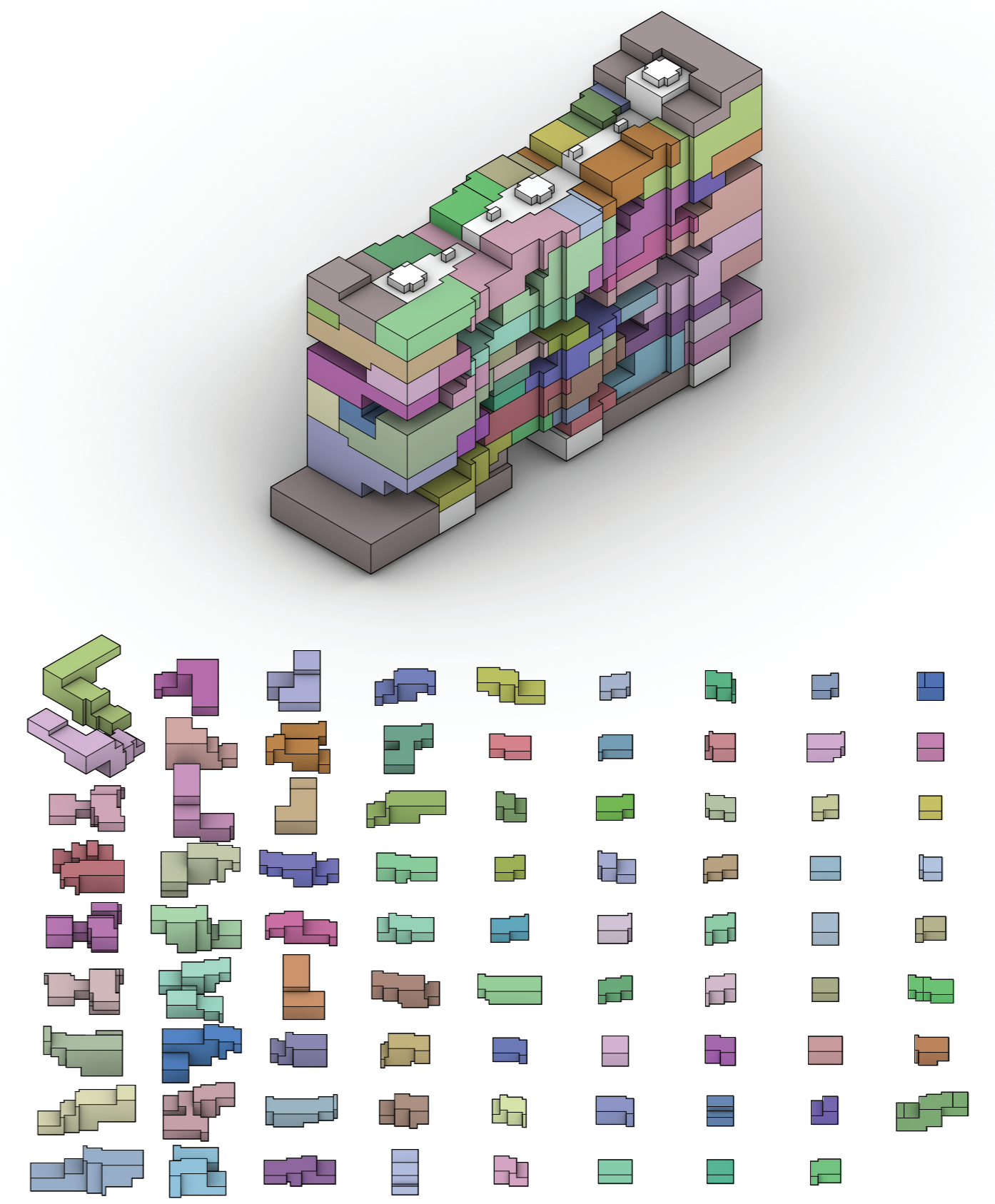
the building consists mostly of housing, the plint and roof are public however.



the circulation of the floors is done with three cores and hallways inbetween. the hallways can be connected with stairs.

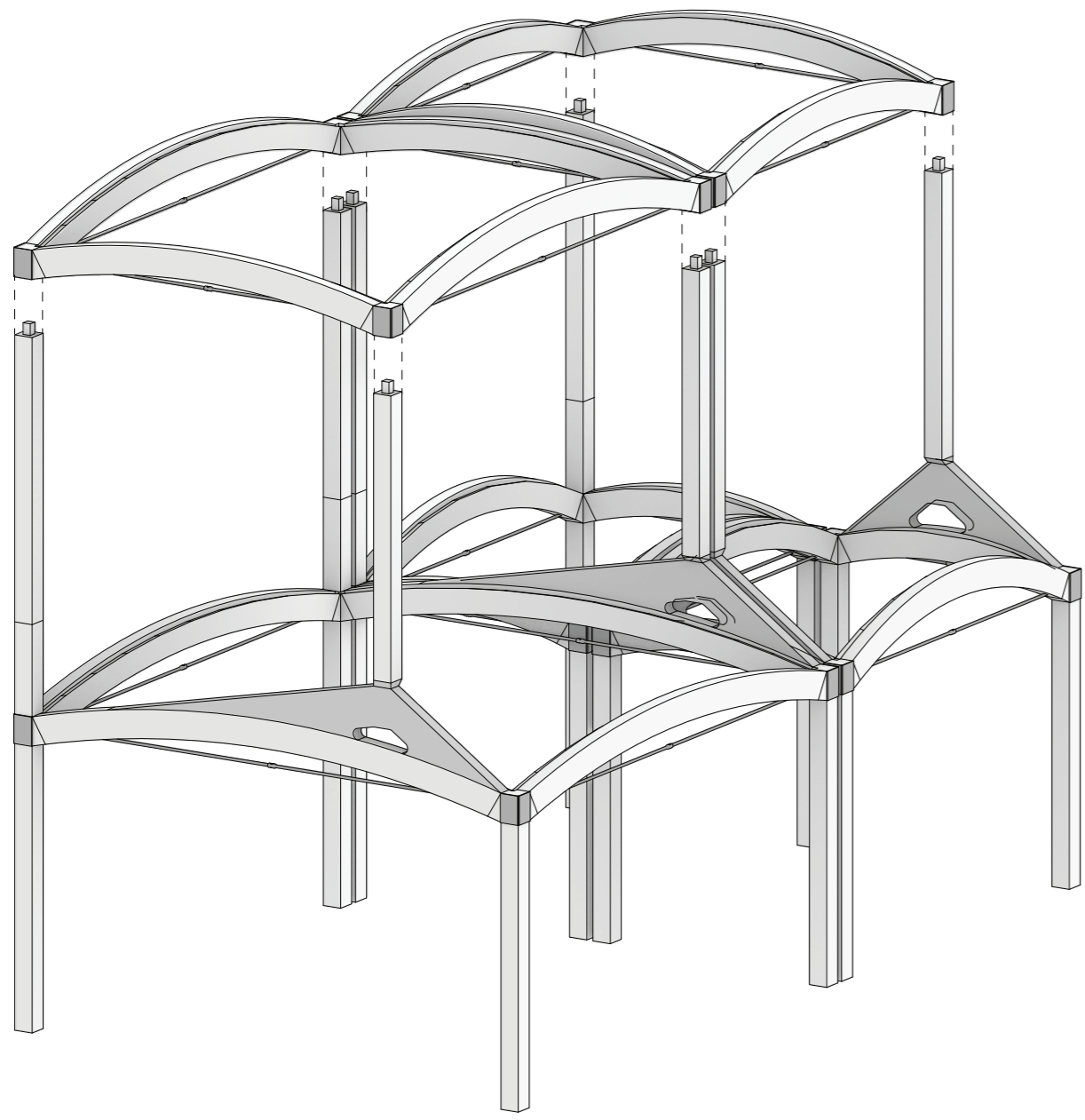


growing algorithm and grammar

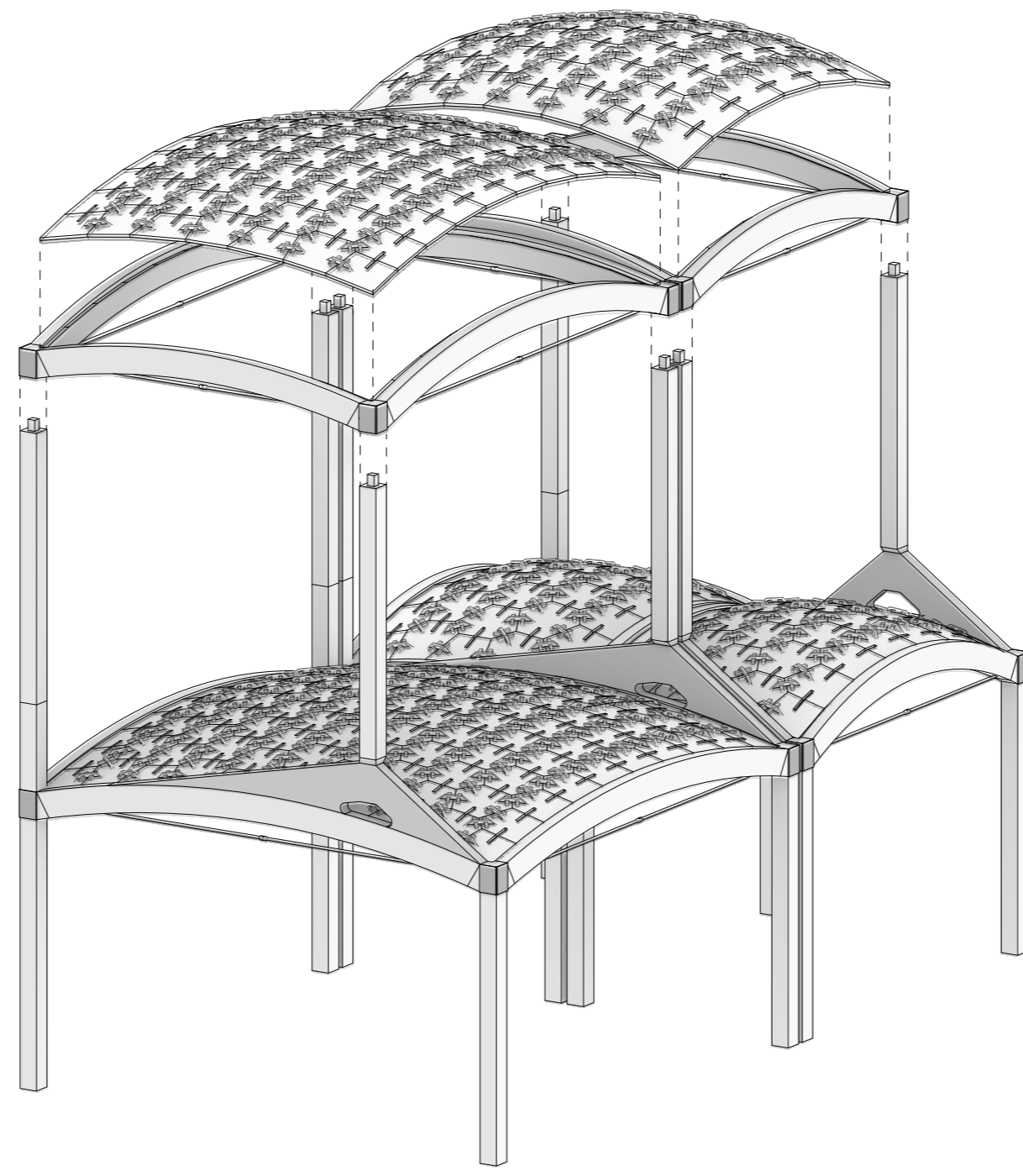


the 80 generated typologies

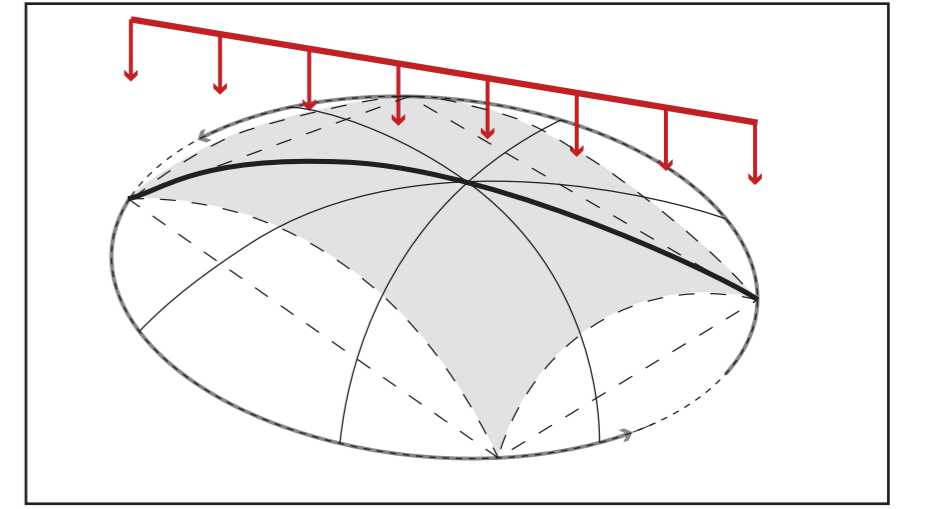




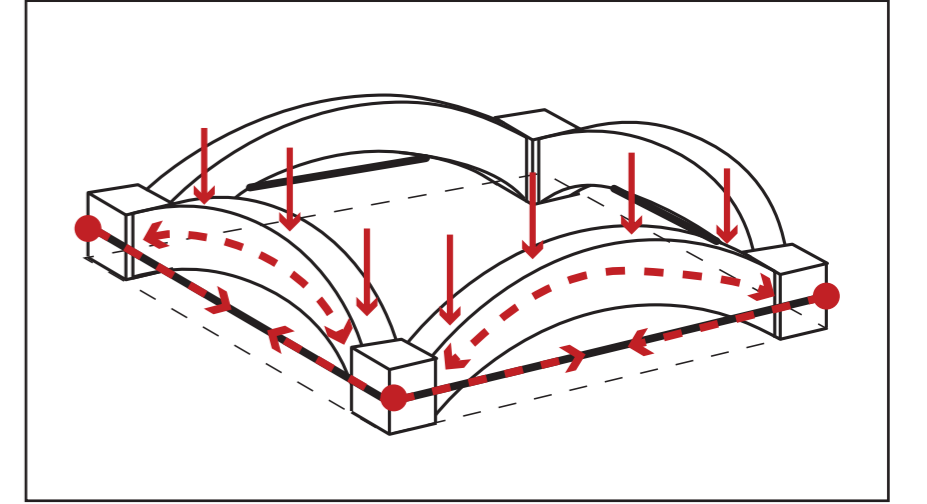
The main structure is made up from columns and arches which form a square. Arches sometimes take on a triangular shape to solve a column intersection.



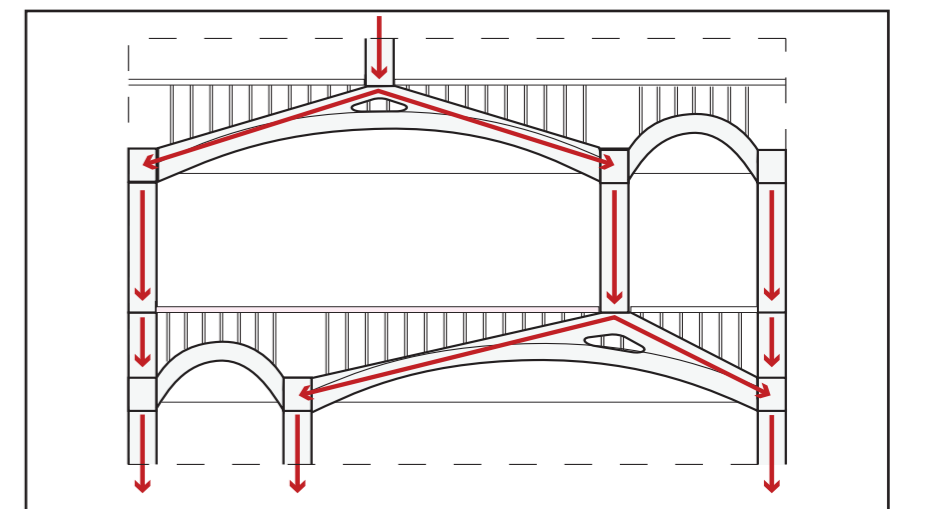
Inbetween the arched square a paraboloid surface made up from hexagonal voissiers is placed. This which form the funicular surface which take on the loads from the floor above. The voissiers are connected with keystone inserts.



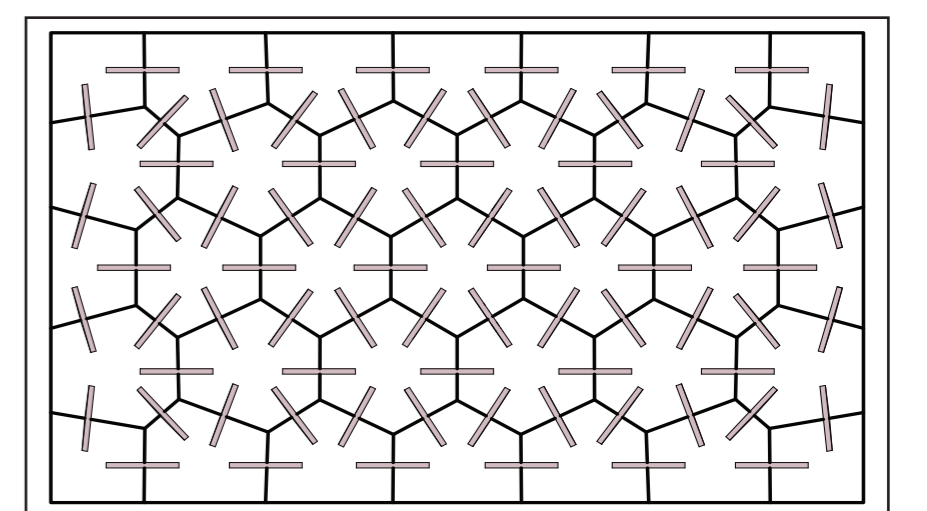
for a continuous loading a parabola is the best shape to follow the forces. the 3d equivalent is a paraboloid.



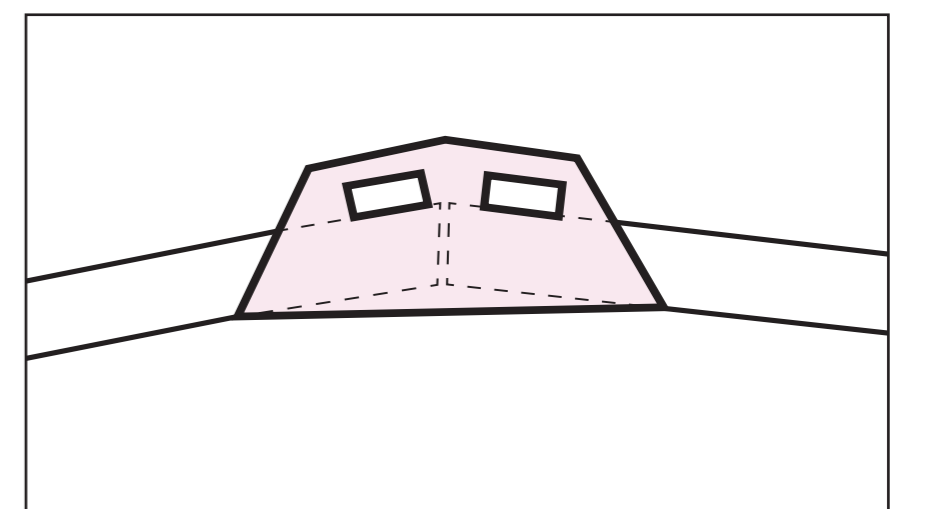
steel rods prevent the arches from deforming and counter the horizontal forces inherent to arches.



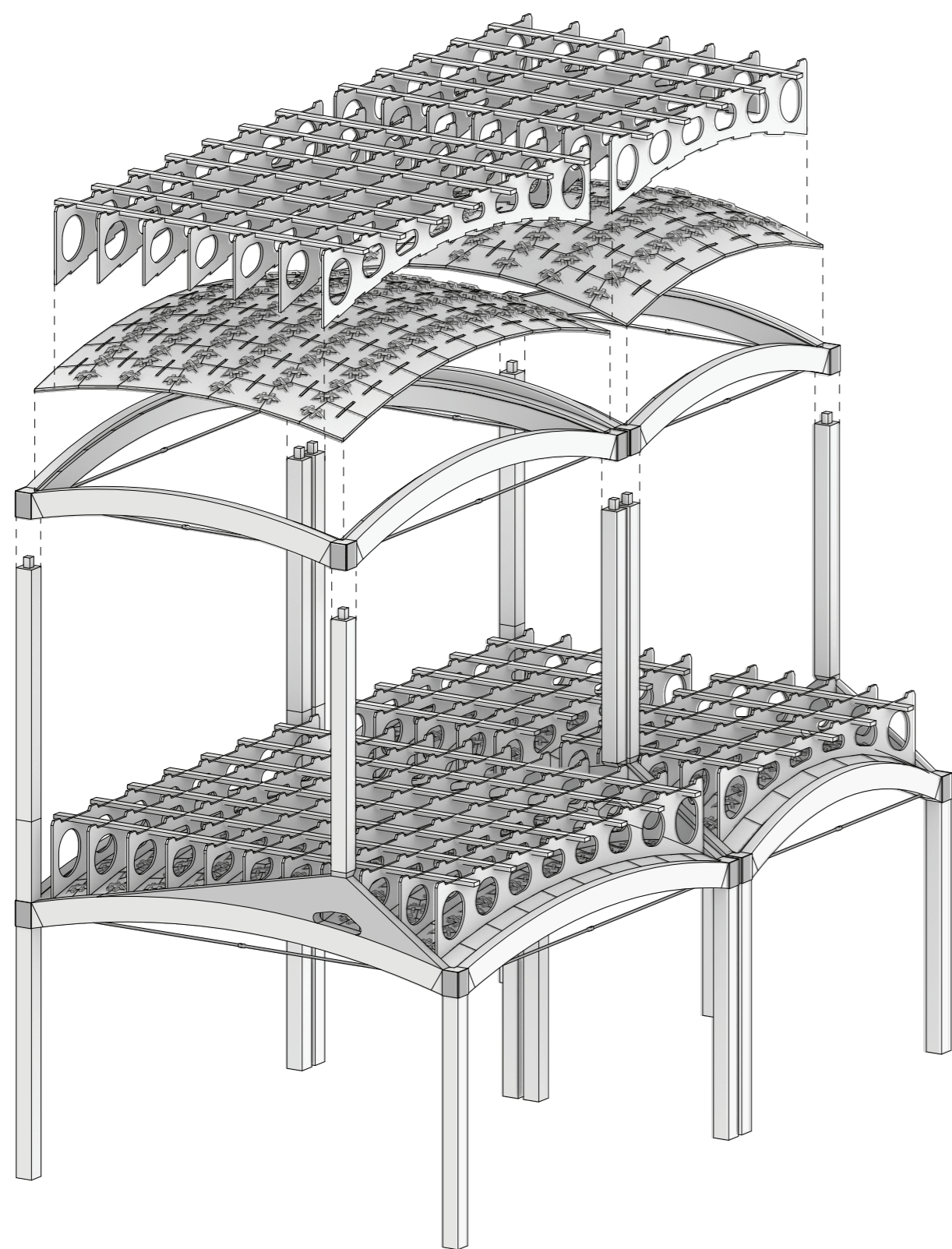
the vertical forces flowing through the building are handled by the larger arches and columns.



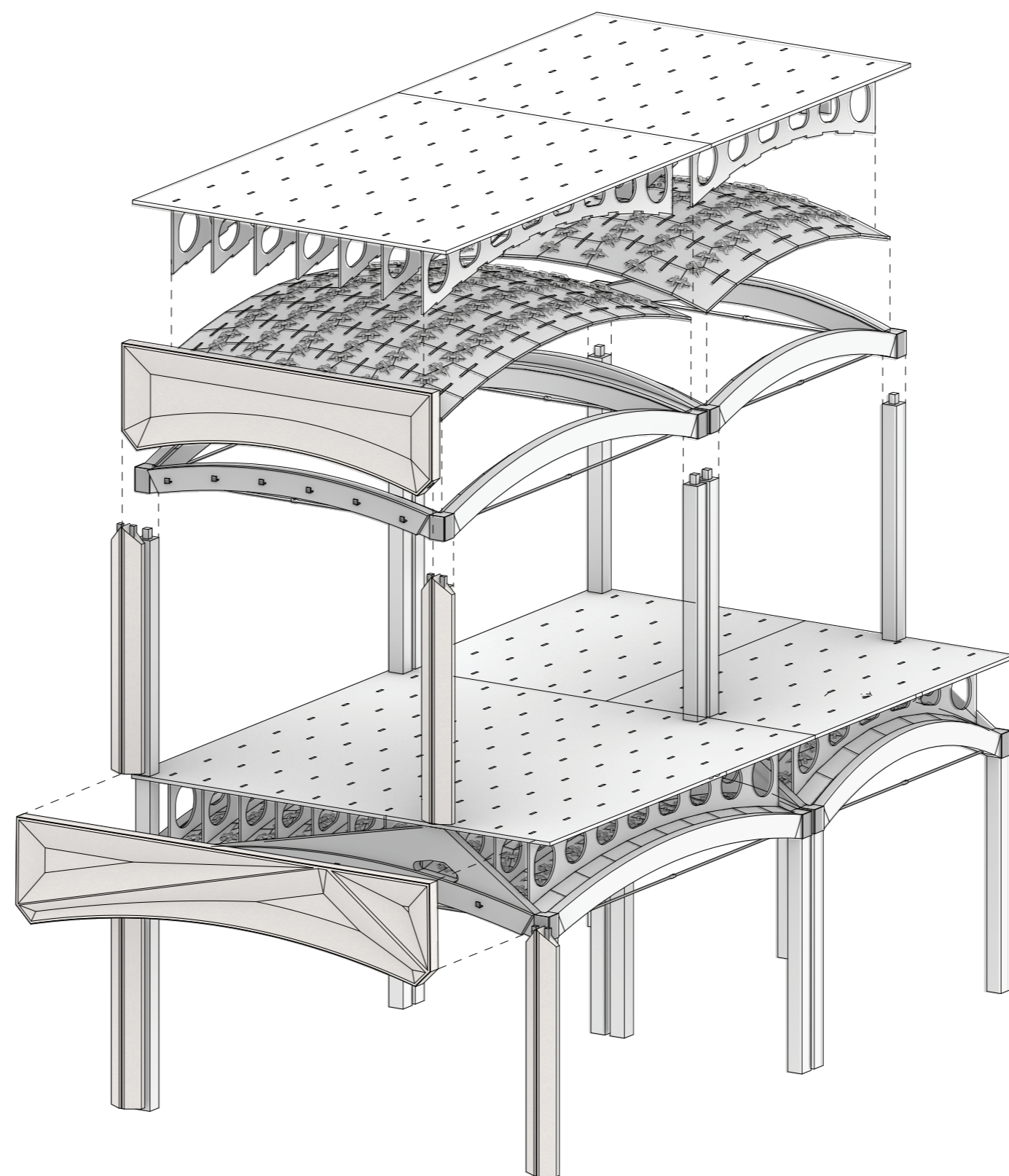
hexagonal centroidal voronoi topology of the voissiers. the dowels expose the triangular centroidal grid.



the voissiers are connected using wooden keystone shaped dowels. this eliminates the need for glue.



Flat spandrel plates can be placed in the voissiers. These plates transfer the vertical load from the floors to the funicular surface.



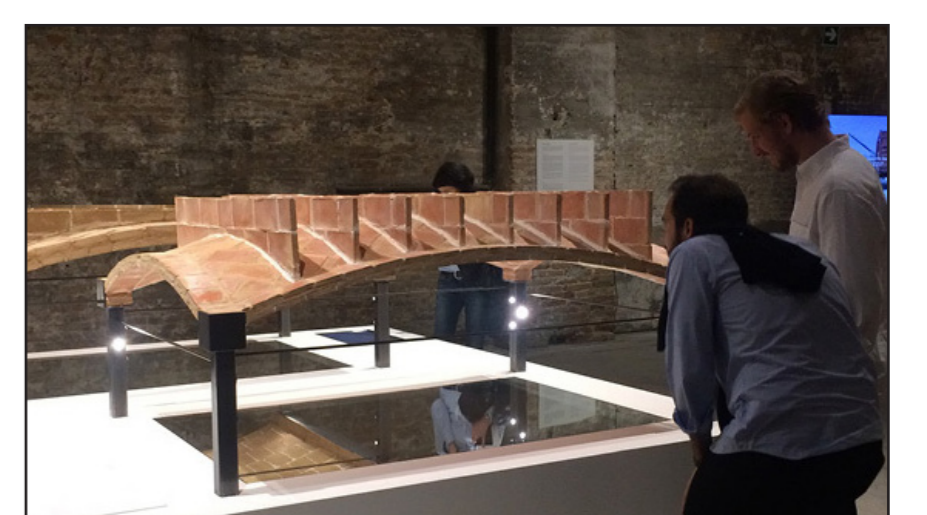
Floors and facade panels can now be added. The facade panels are attached to extra wide arches but also support themselves.



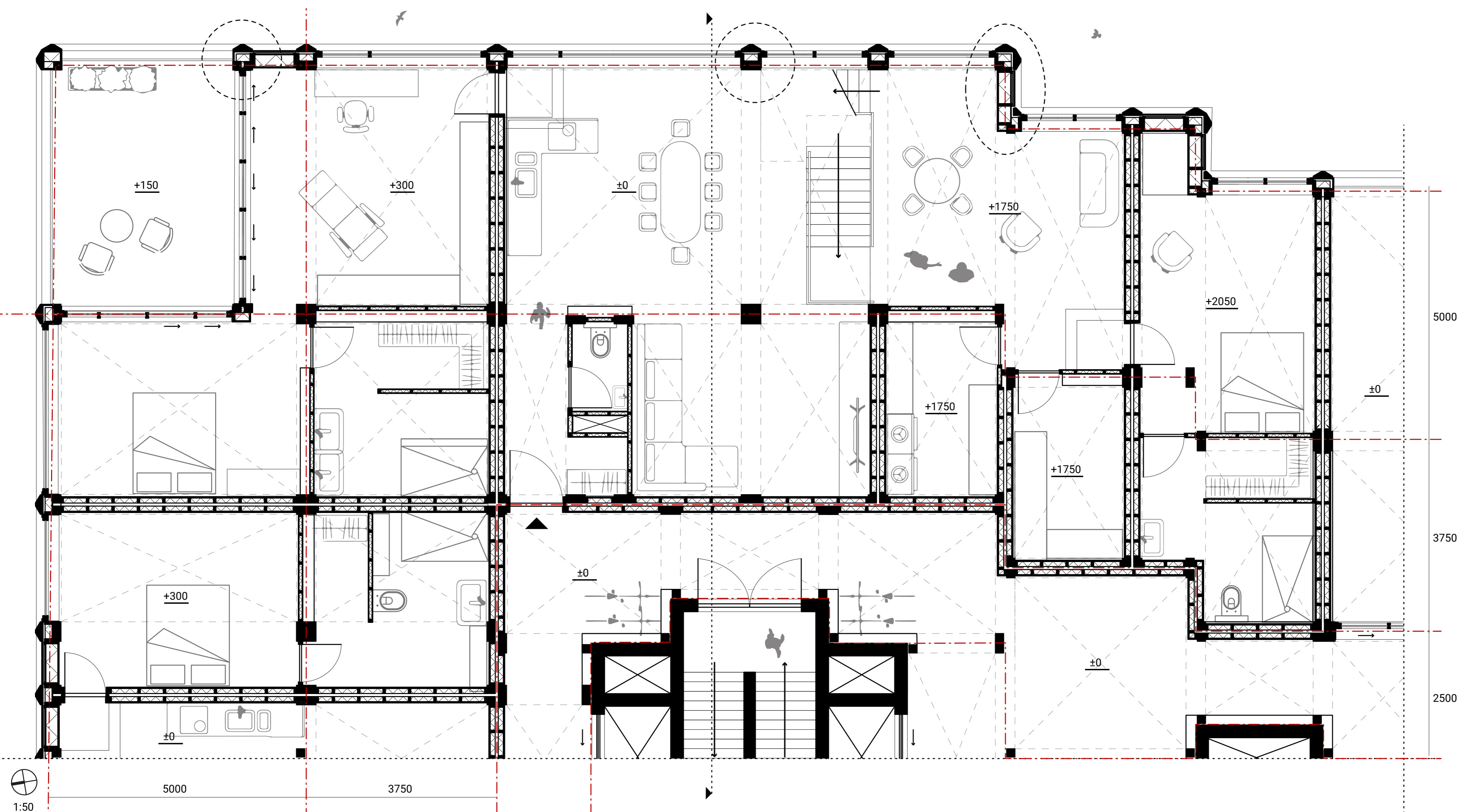
all parts are planar and can be cut out of a sheet of plywood using CNC-technology. (Studio RAP, 2016)



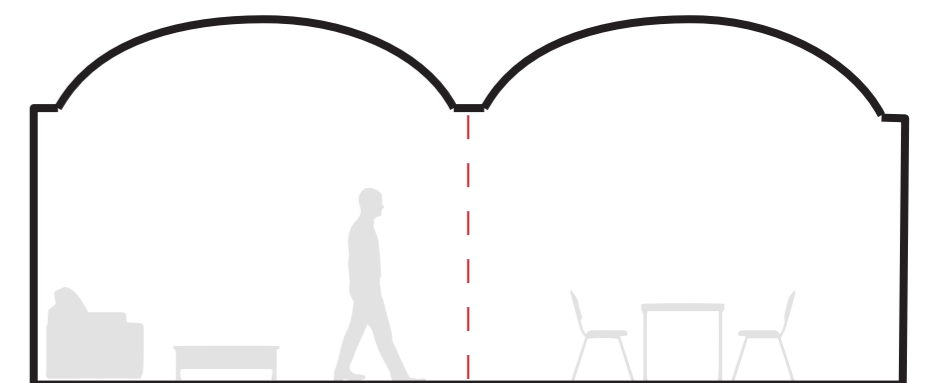
reference of wooden masonry vault. (SkilledIn Office, Studio RAP, 2016)



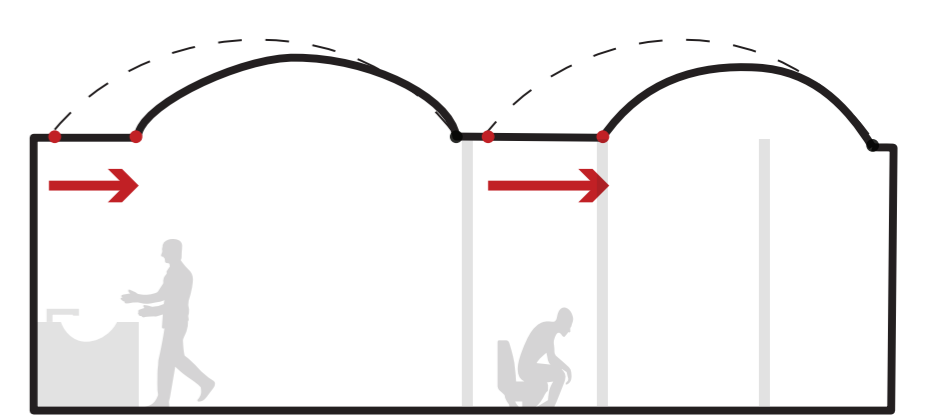
reference of the vaulting system in tiles. (Block Research Group, 2016)



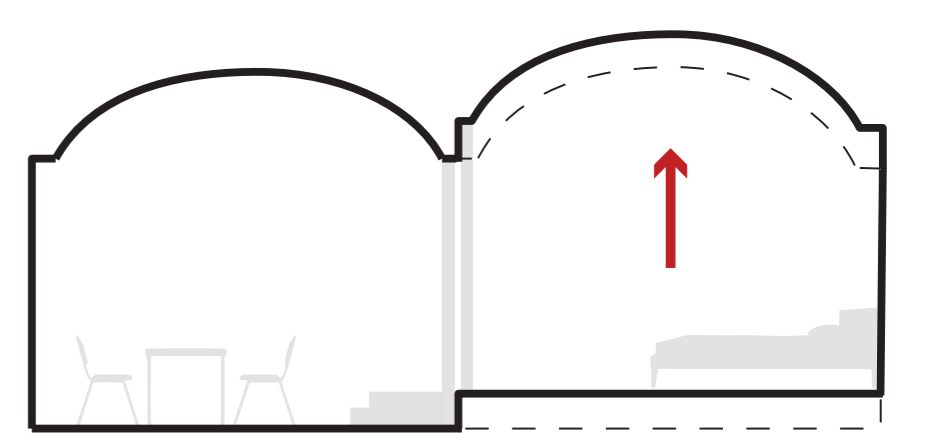
**principles**



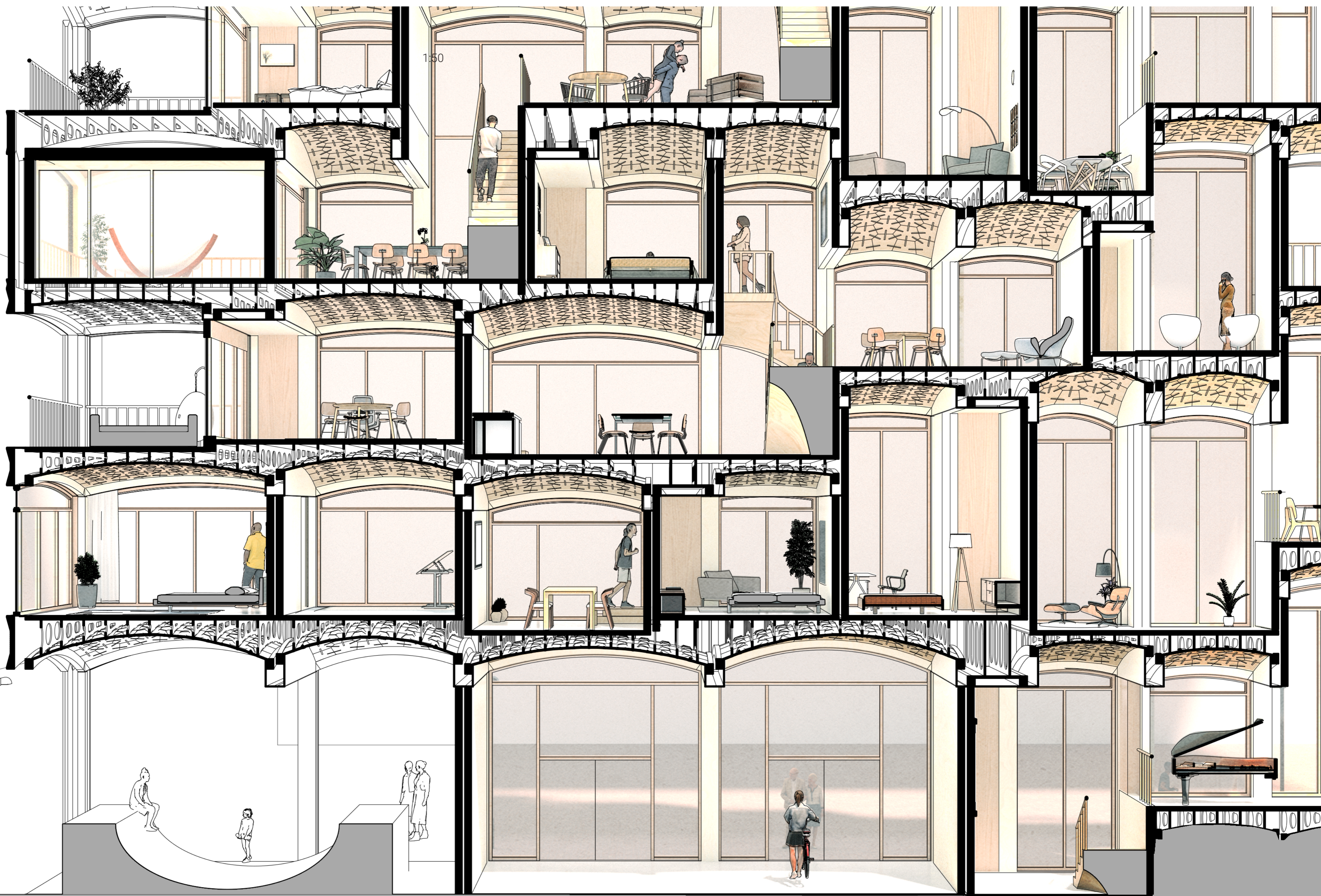
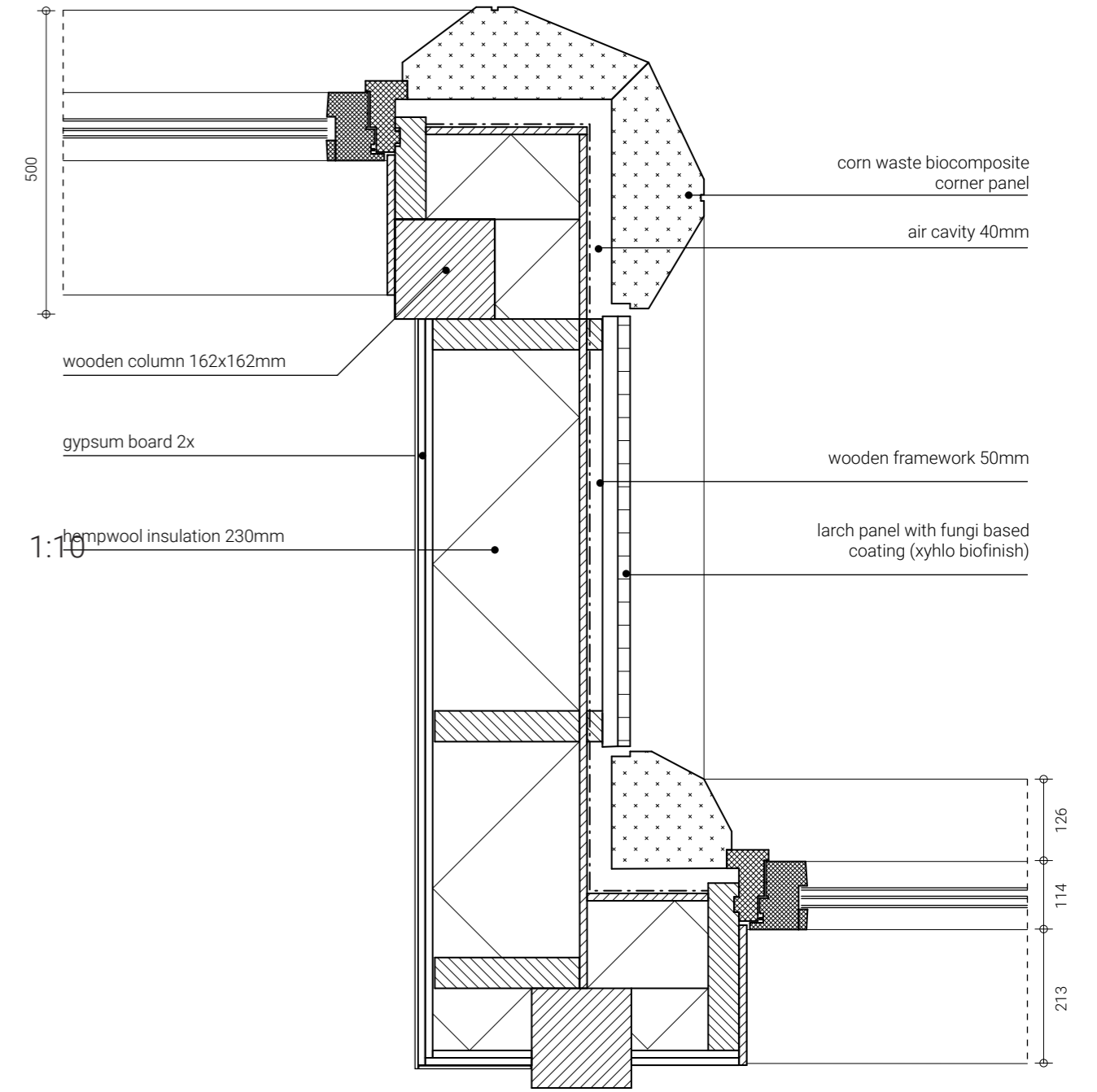
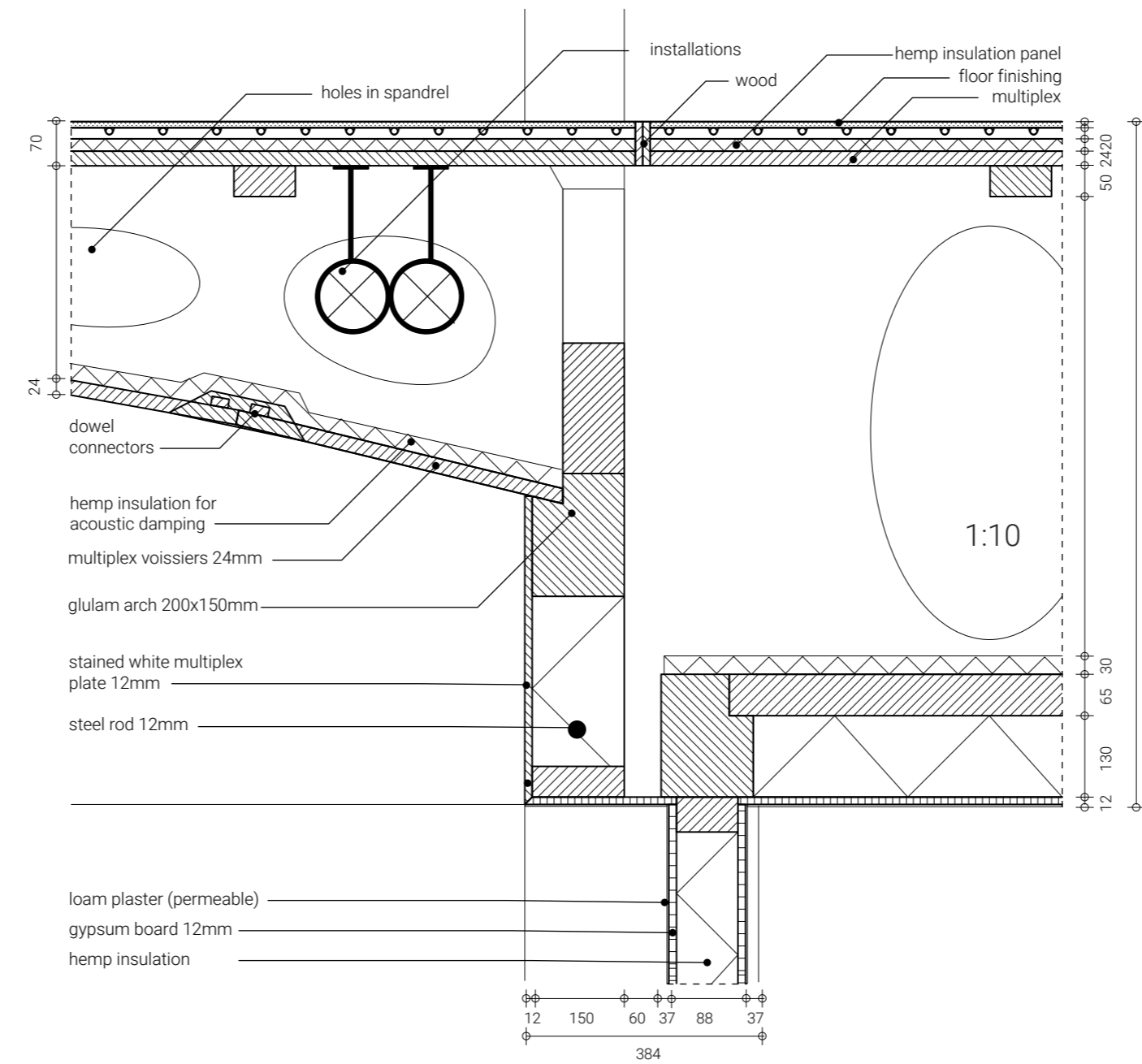
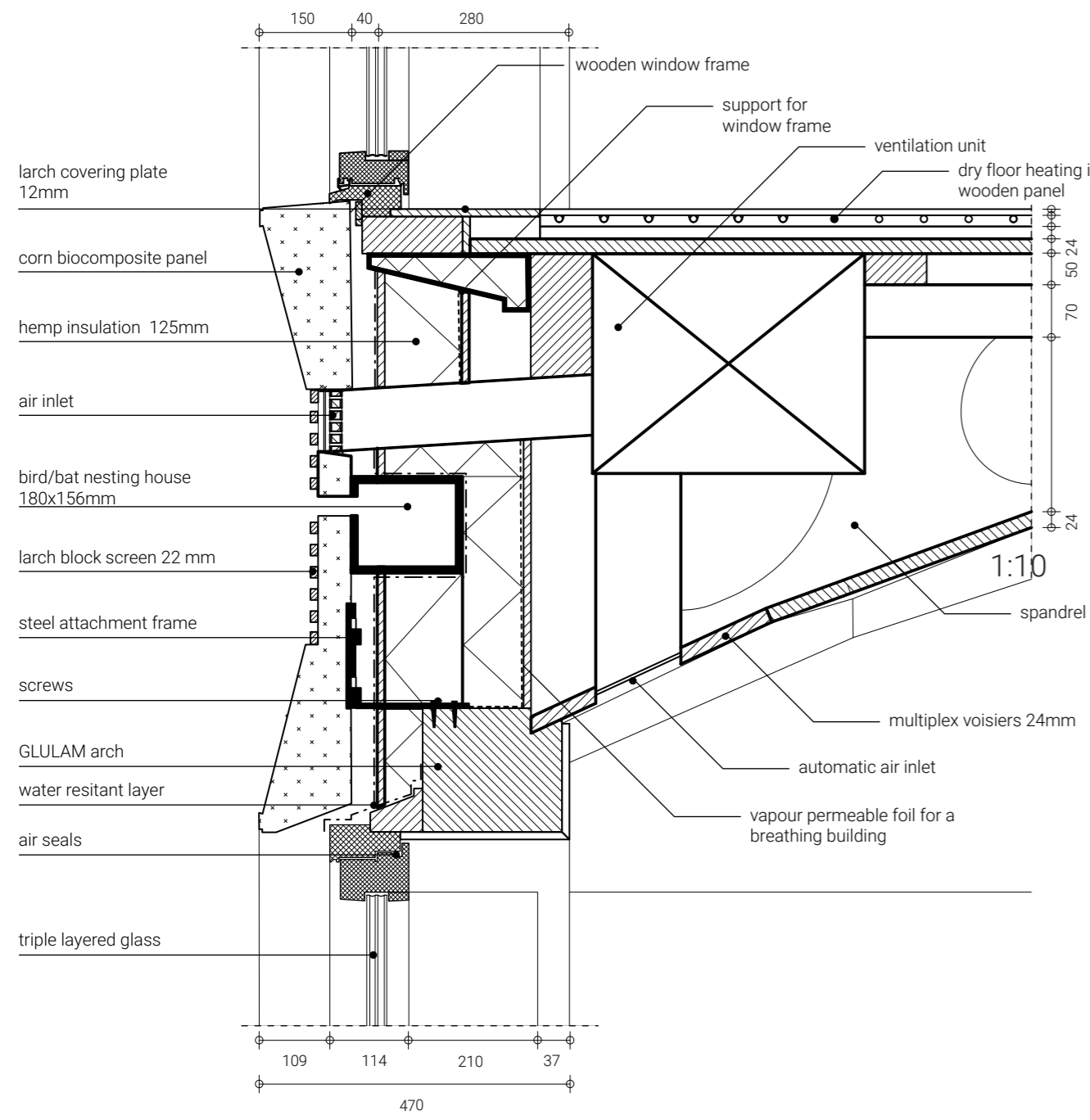
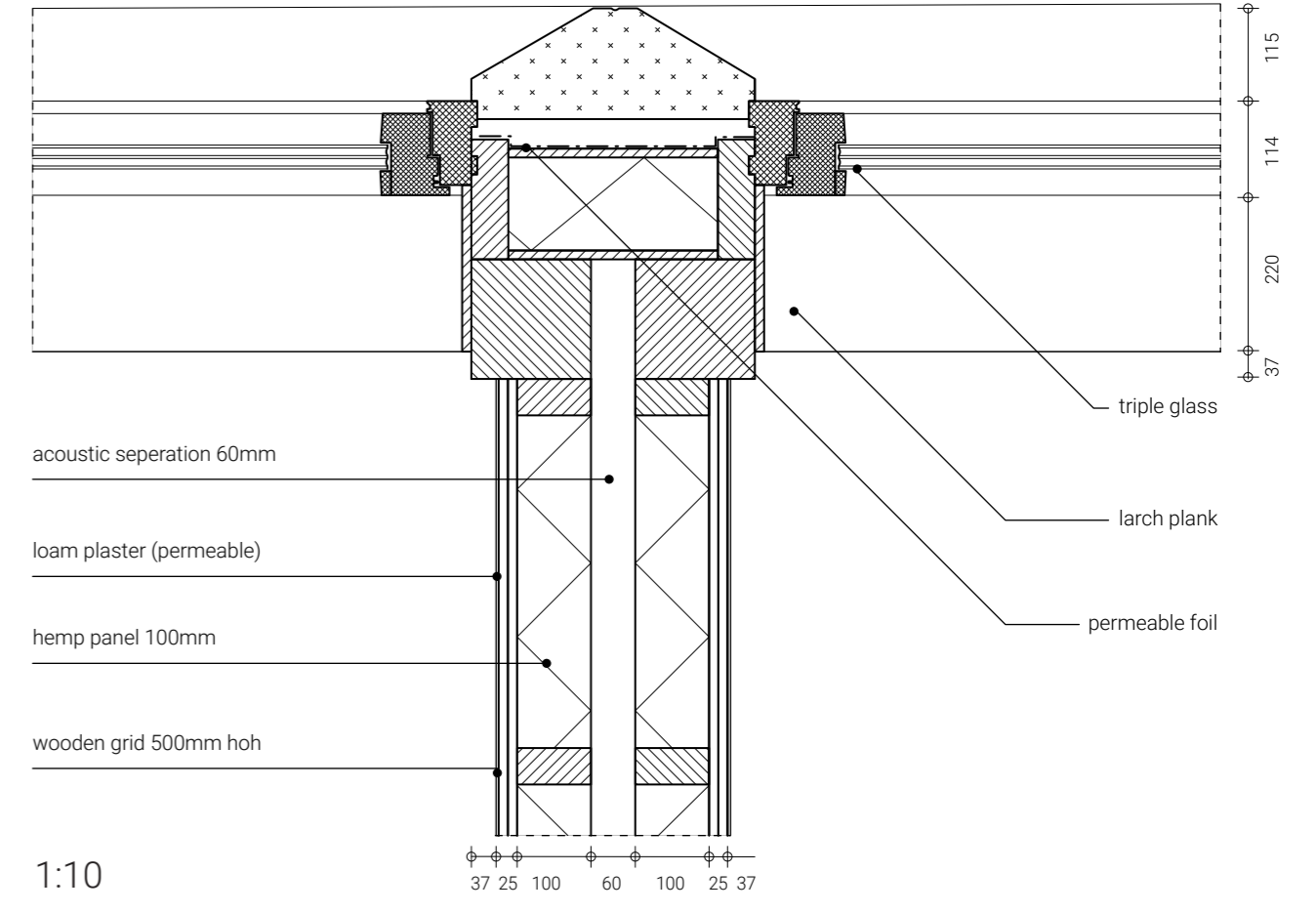
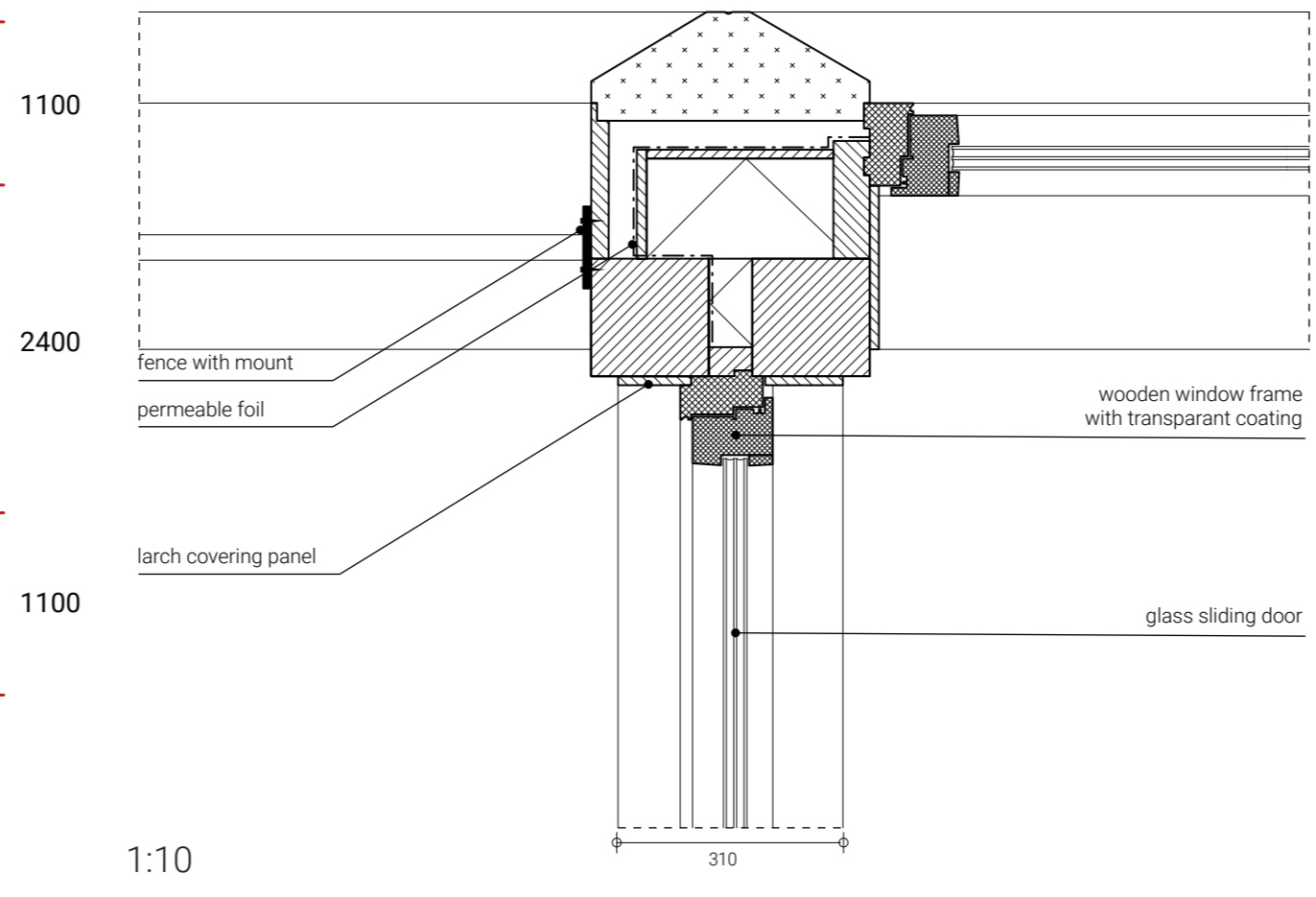
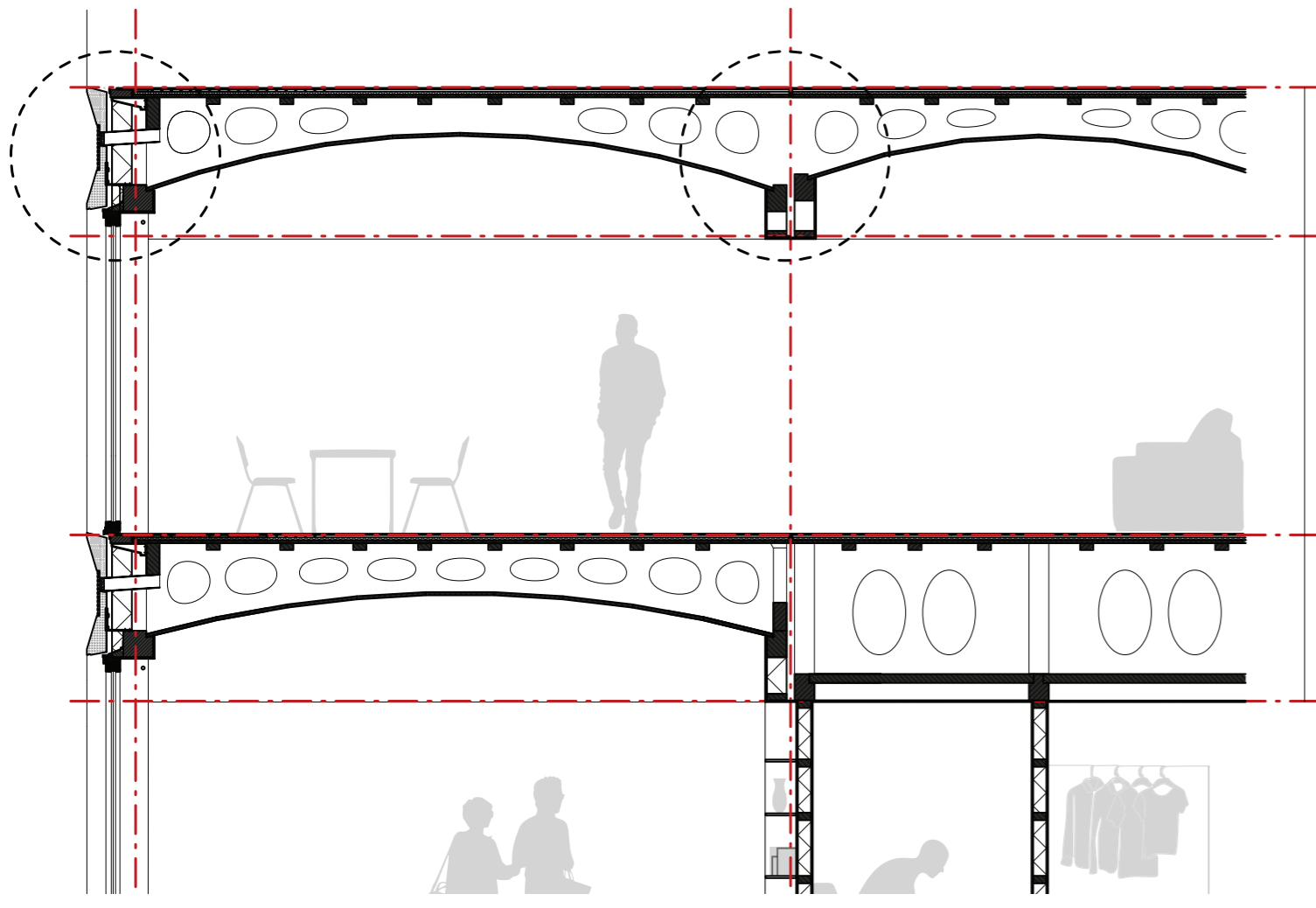
function and structure are connected. The shape of the space helps define it.

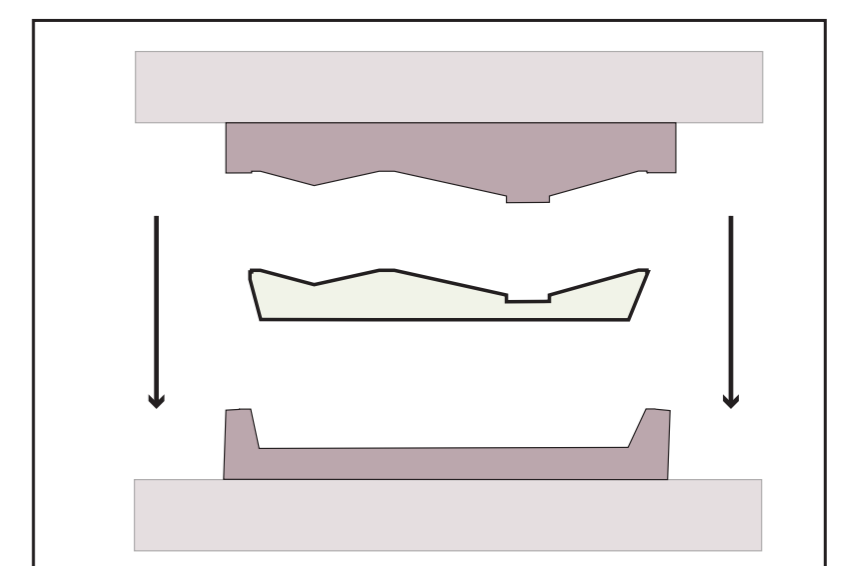
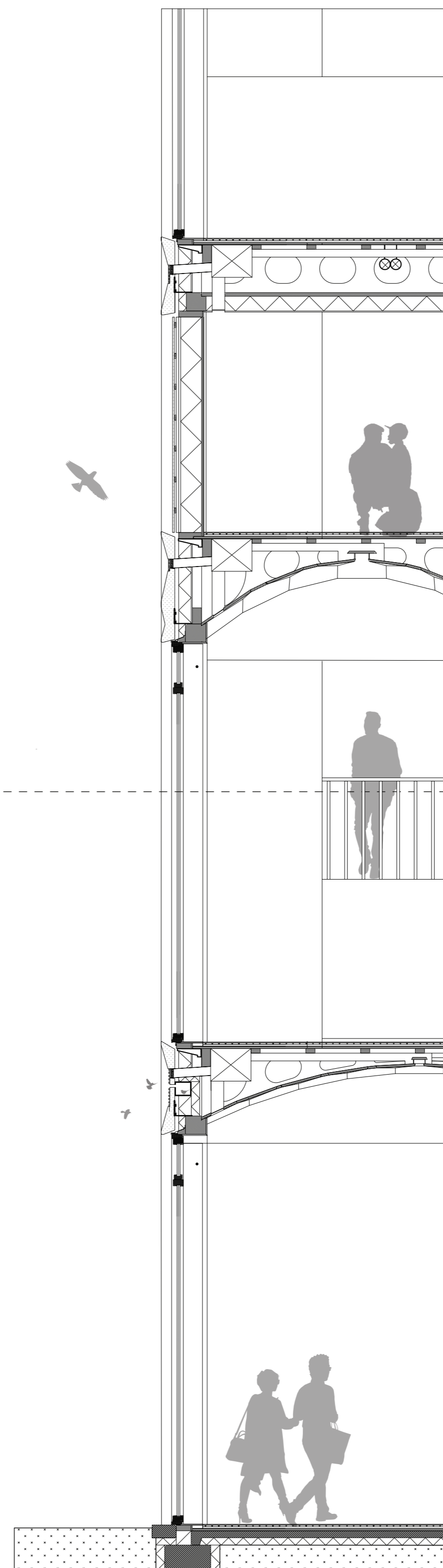
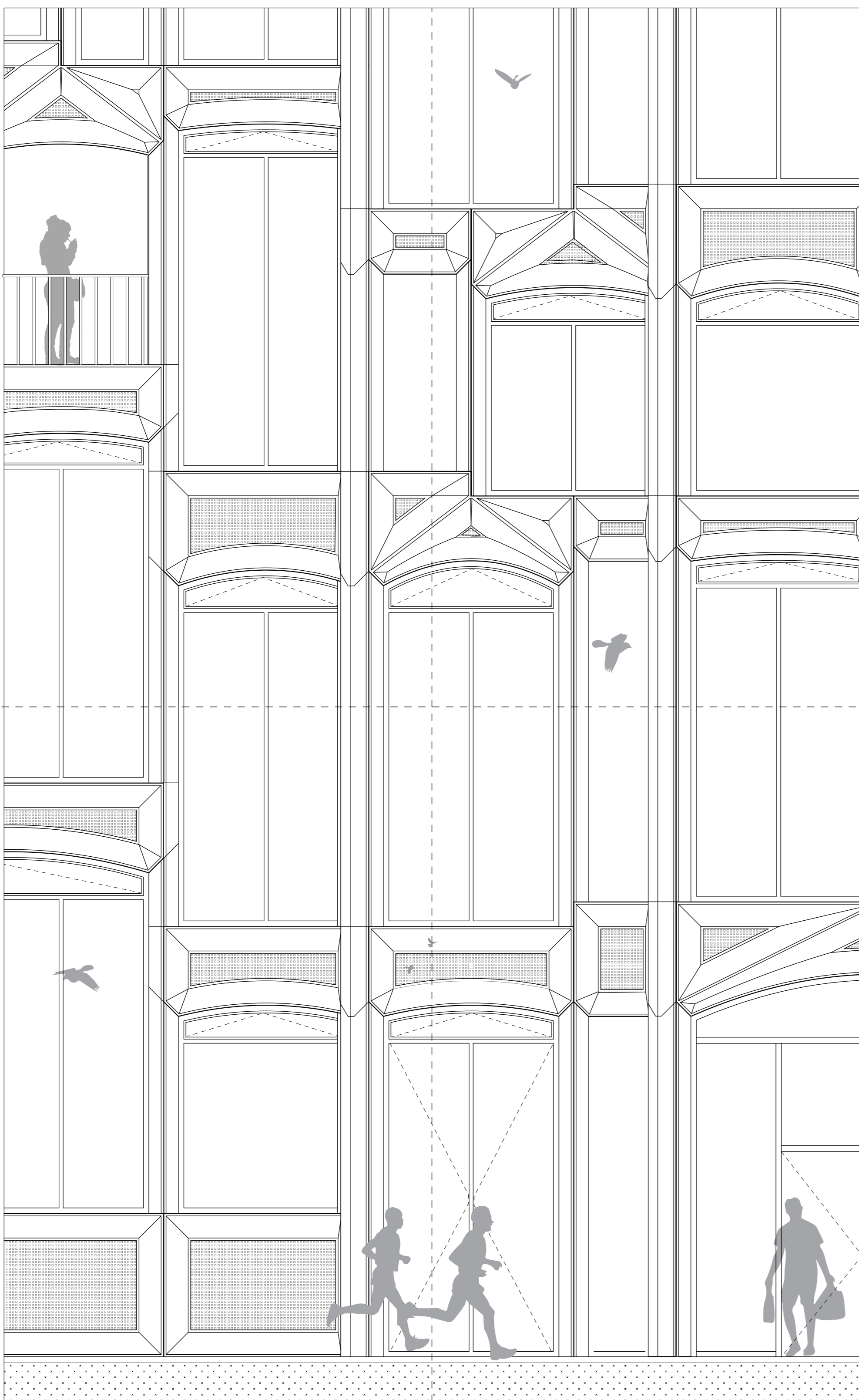
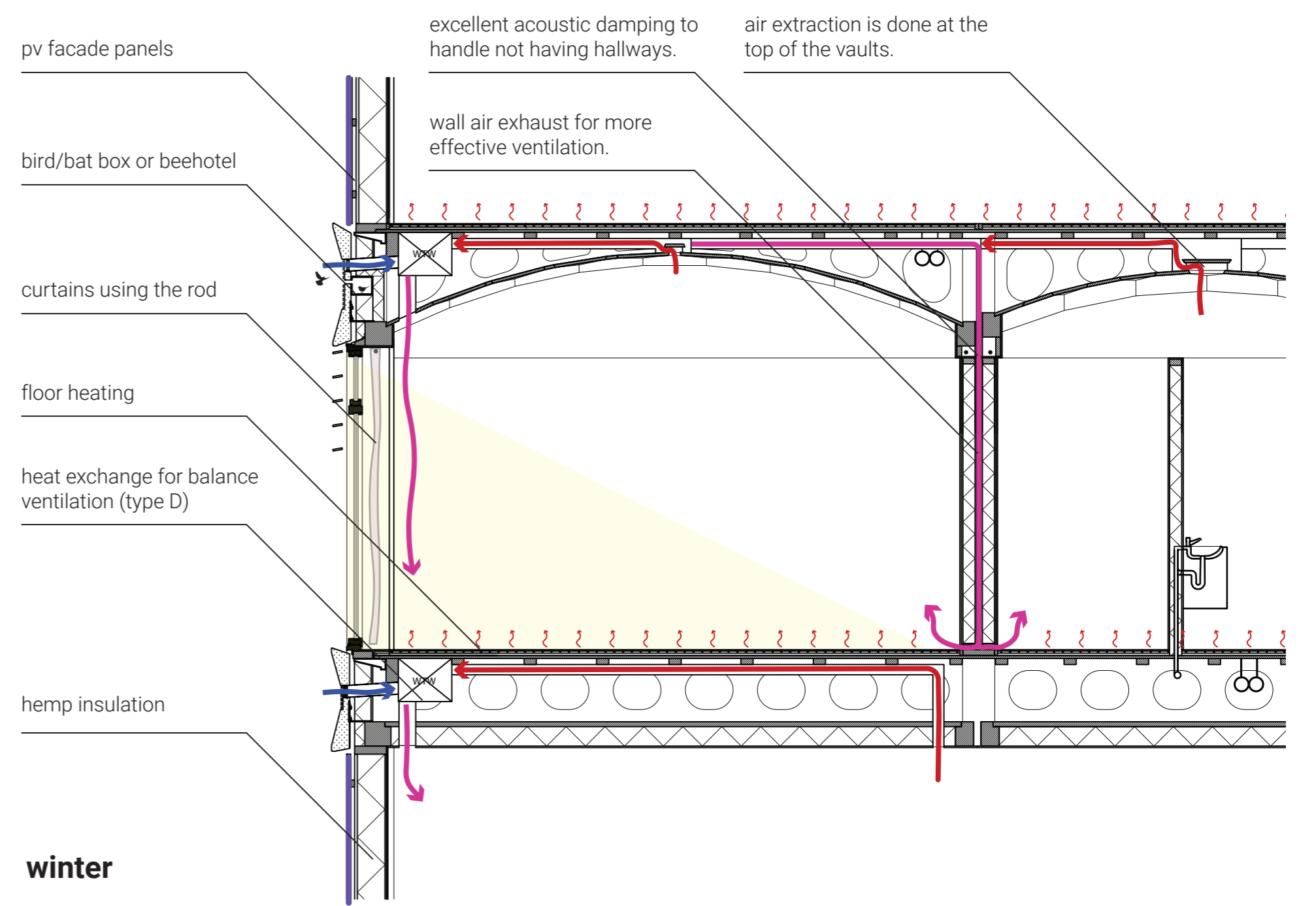
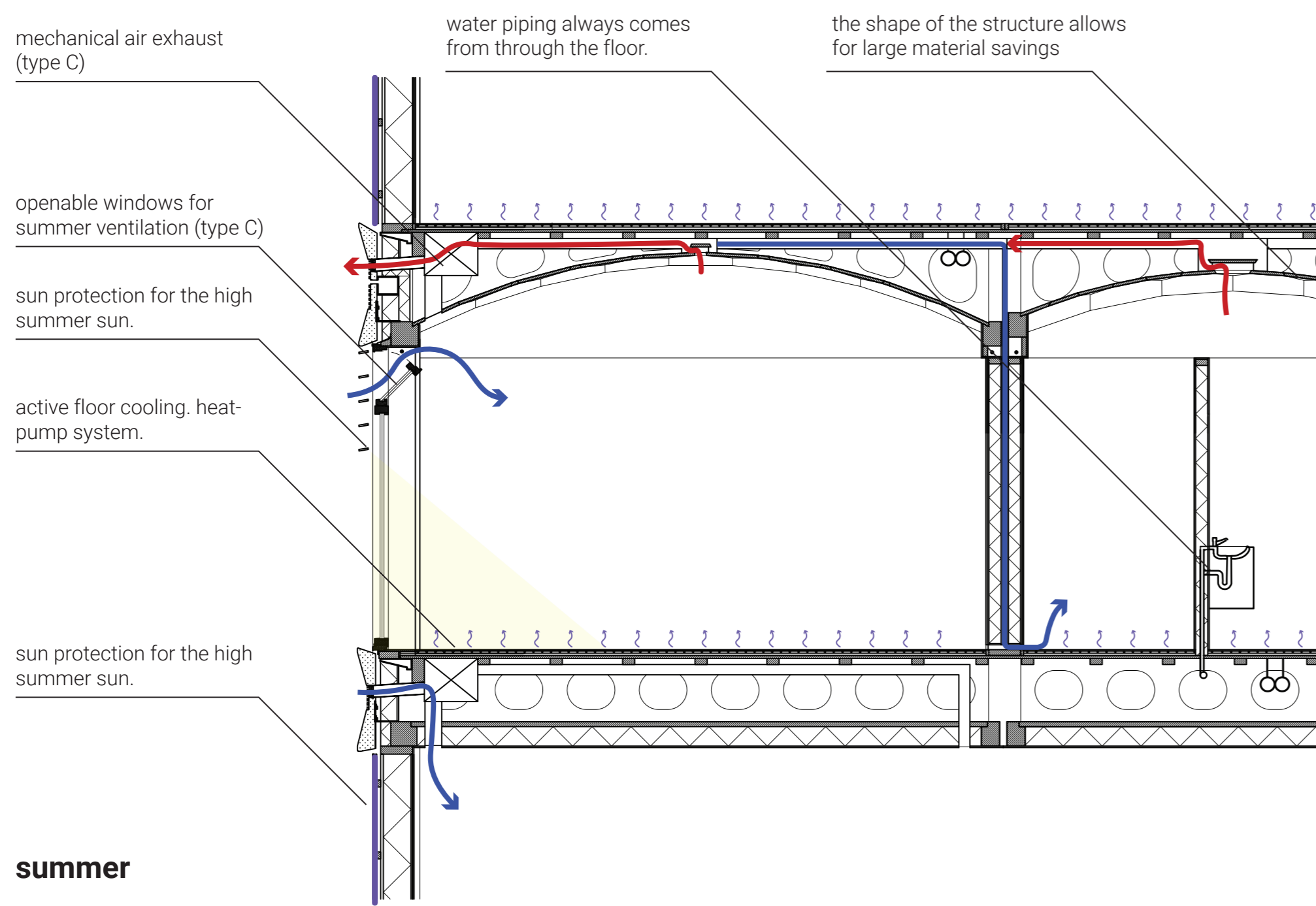


walls can be placed in extended 'inbetween' zones or by stopping short of the vault.



spaces are separated not through wasteful hallways but through small height differences and well insulated walls.

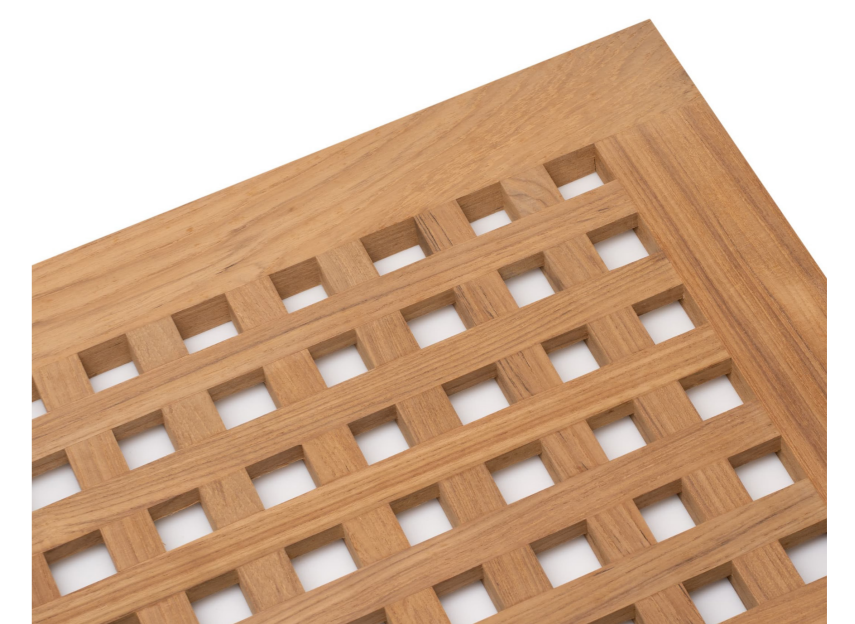




the facade panels are compression molded using CNC-ed molds.



the facade panels are from bio composite made from compressed corn waste with natural resin.



wooden block grids that cover the ventilation inlets and bird/bee hotels.



pv facade panels by for example Mitrex.

