

09 Teng Fengshi STUDY

STUDY - Introduction

My project for this summer quarter is a continuation and development of the work from the spring quarter. We made several changes to the envelope, dividing it into three parts and varying them. We established our own principles and explored their potential. Throughout this exploration, the methodology we used to develop the objects, explore the project's possibilities, and address the problems we encountered was similar to what we learned in the spring.

Compared to our spring work, this quarter we focused more on space, including testing, exploring, and observing it. We introduced and connected our outcomes more to architectural imagery, resulting in surprising works. Finally, I selected three different works as my favorites, each showcasing different possibilities of the objects and the logic behind them.

Finally, I selected three of my favorite pieces from the project. Each one demonstrates distinct possibilities of the objects and the underlying logic, showcasing the diverse potential of our explorations.

OVERVIEW

Starting Point

reference buildings

final spring quarter objects

new spatial differentiations

Space Study

principles

tests

exploration

sets

Reflection

observations

experience

insights

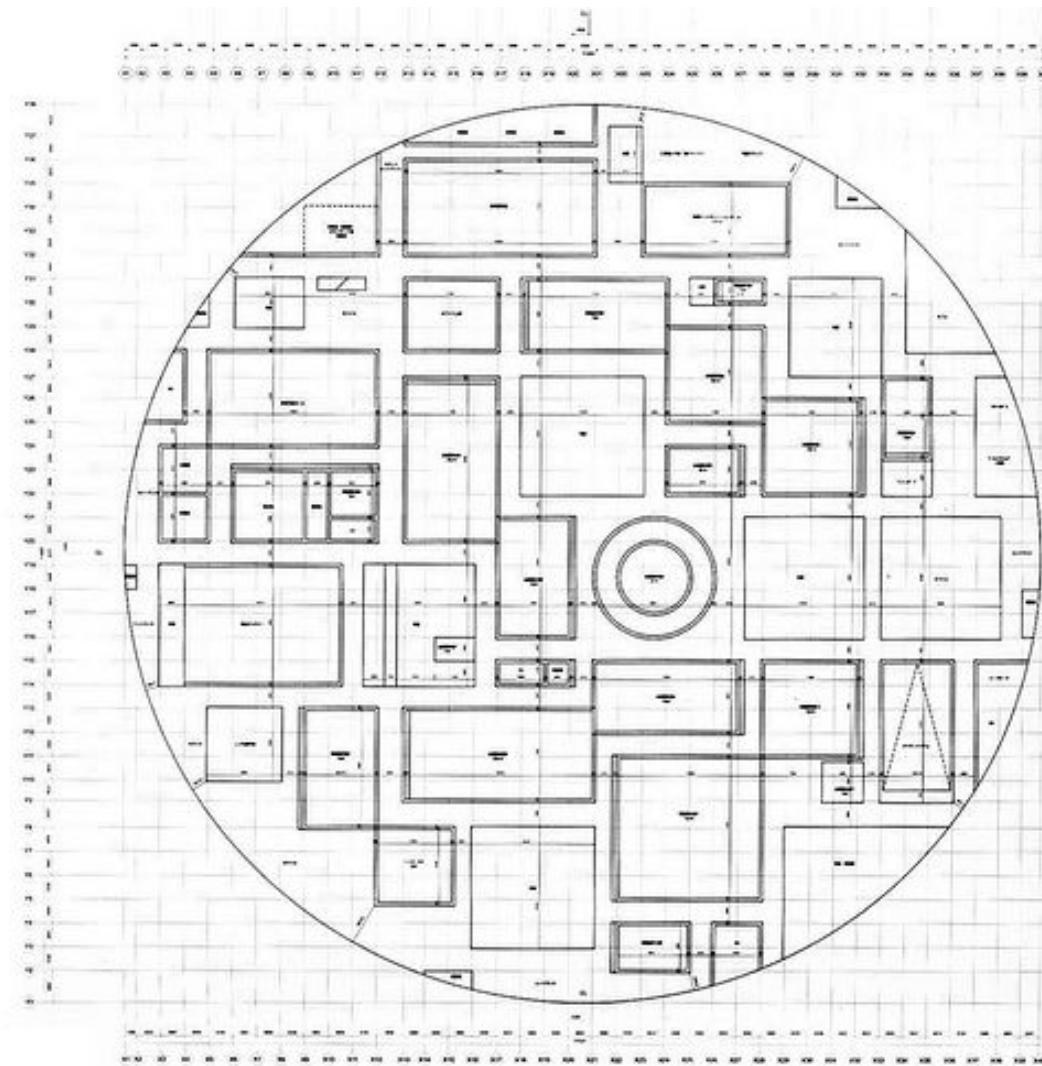
STARTING POINT

The three levels of the object from the spring quarter—base, shape, and grid—serve as an ideal framework for exploration in the summer quarter. The 16 steps of the grid provide a template for advancing the grid to a new level, enabling the creation of diverse and intriguing spatial outcomes based on simple principles.

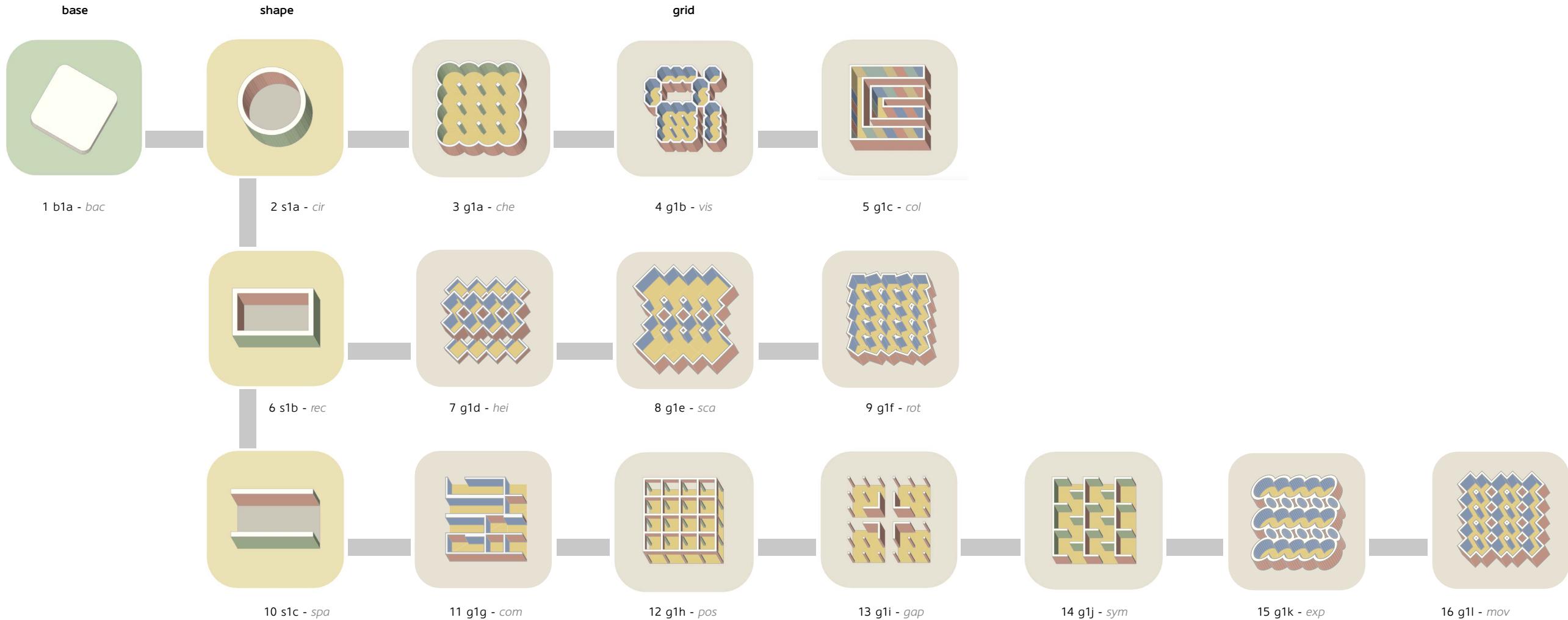
The 21st Century Museum of Contemporary Art serves as an excellent reference, demonstrating the possibilities and logic of various architectural components. From this, we derived the differentiation of Roof, Envelope, and Opening. I chose the Envelope and developed my own principles. I created two shapes and two grids, resulting in fascinating spatial designs.

Reference Building

reference | 21st Century Museum of Contemporary Art, Kanazawa, Japan, SANAA – Sejima+Nishizawa, 1999-2004

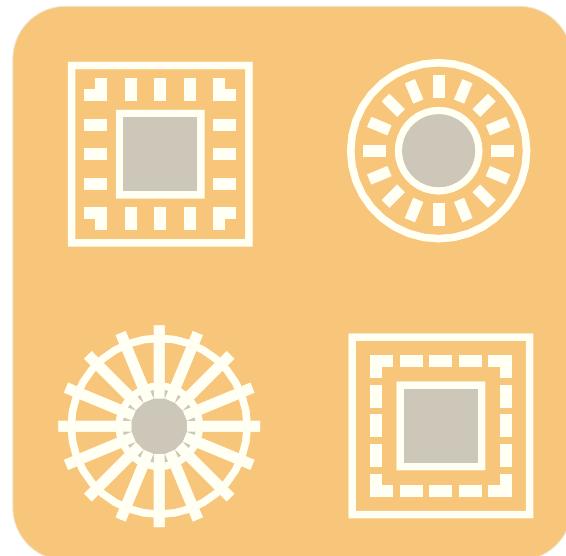


Final Spring Quarter Objects



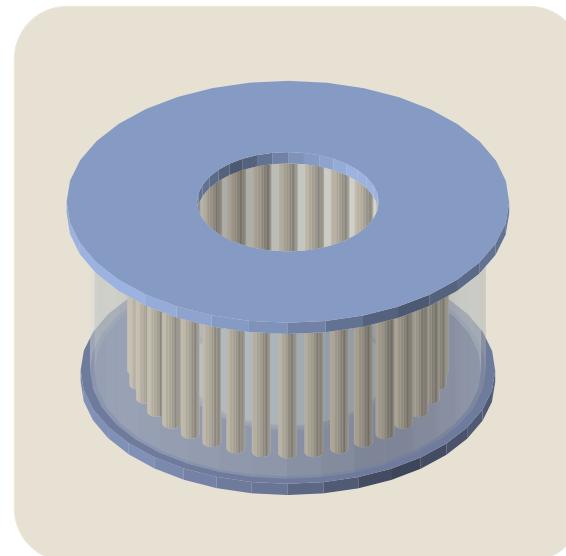
New Spacial Differentiations

principal



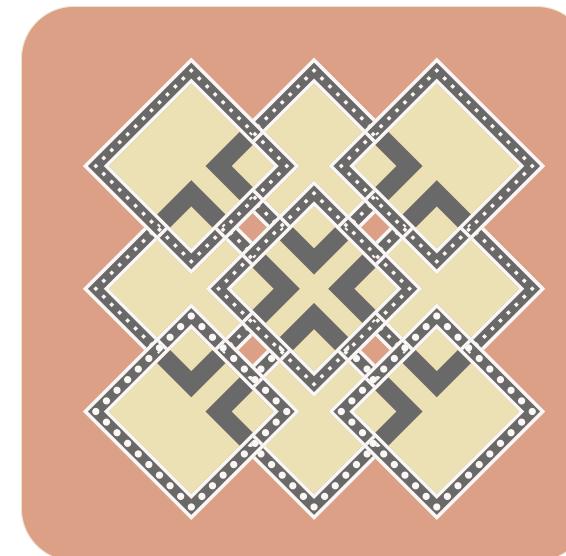
outwall - column - innerwall

shape



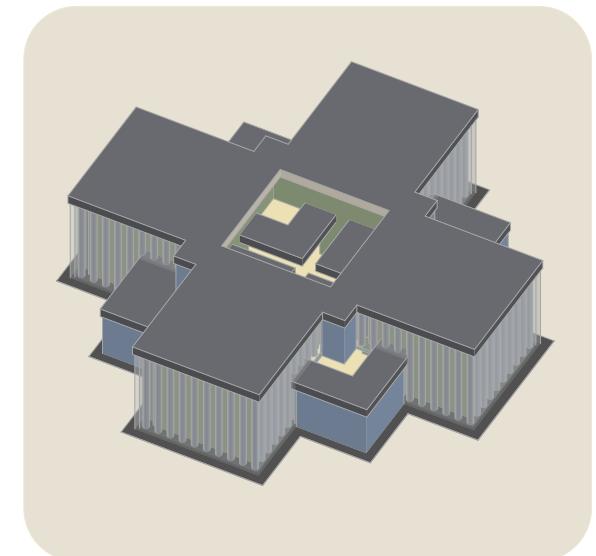
17 s1d - env

principle



roof mass type - envelop mass type - floor mass type
variation & combination

grid



18 g1m - env

SPACE STUDY | PRINCIPLE

To begin, I must establish a clear and determined principle derived from the logic behind the architectural structure. The envelope of the shape consists of three layers: the outer wall, the inner wall, and the columns in between. The location, rotation, size, shape, and number of columns, as well as the roof overhead and the floor beneath, are carefully considered.

At the grid level, my focus is on the mass types of the roof and the envelope, ensuring that adjacent shapes connect seamlessly and logically.

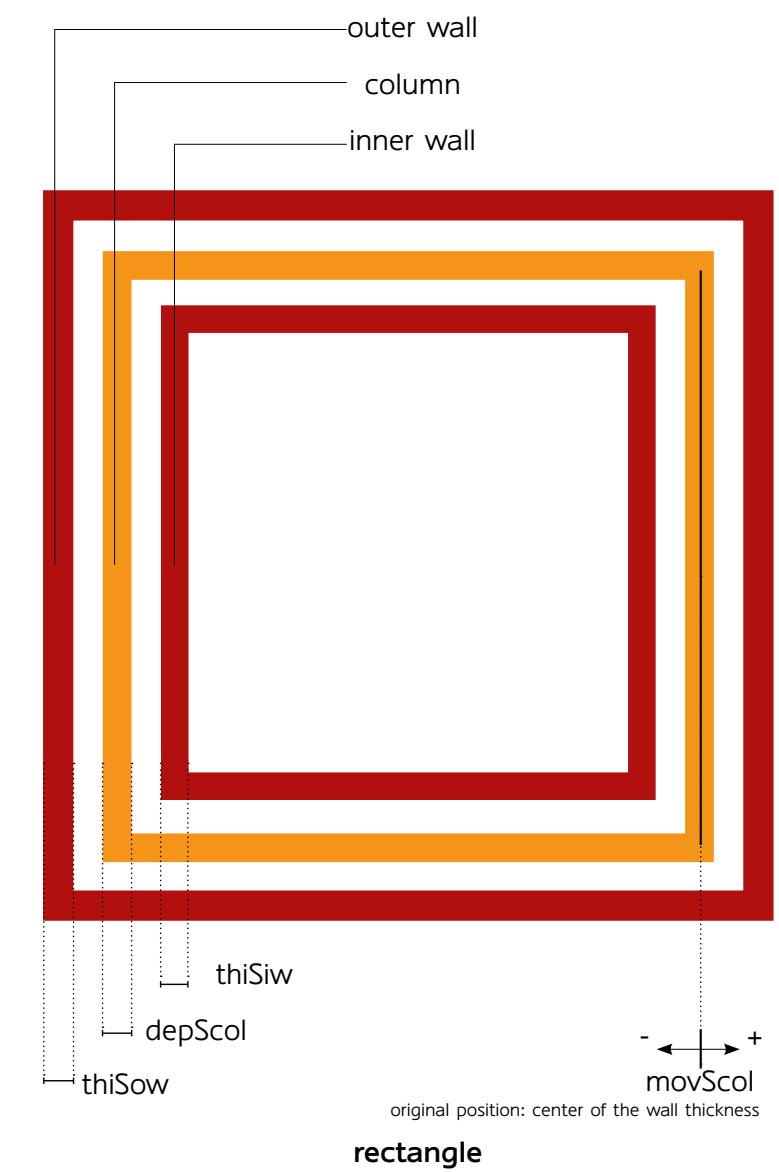
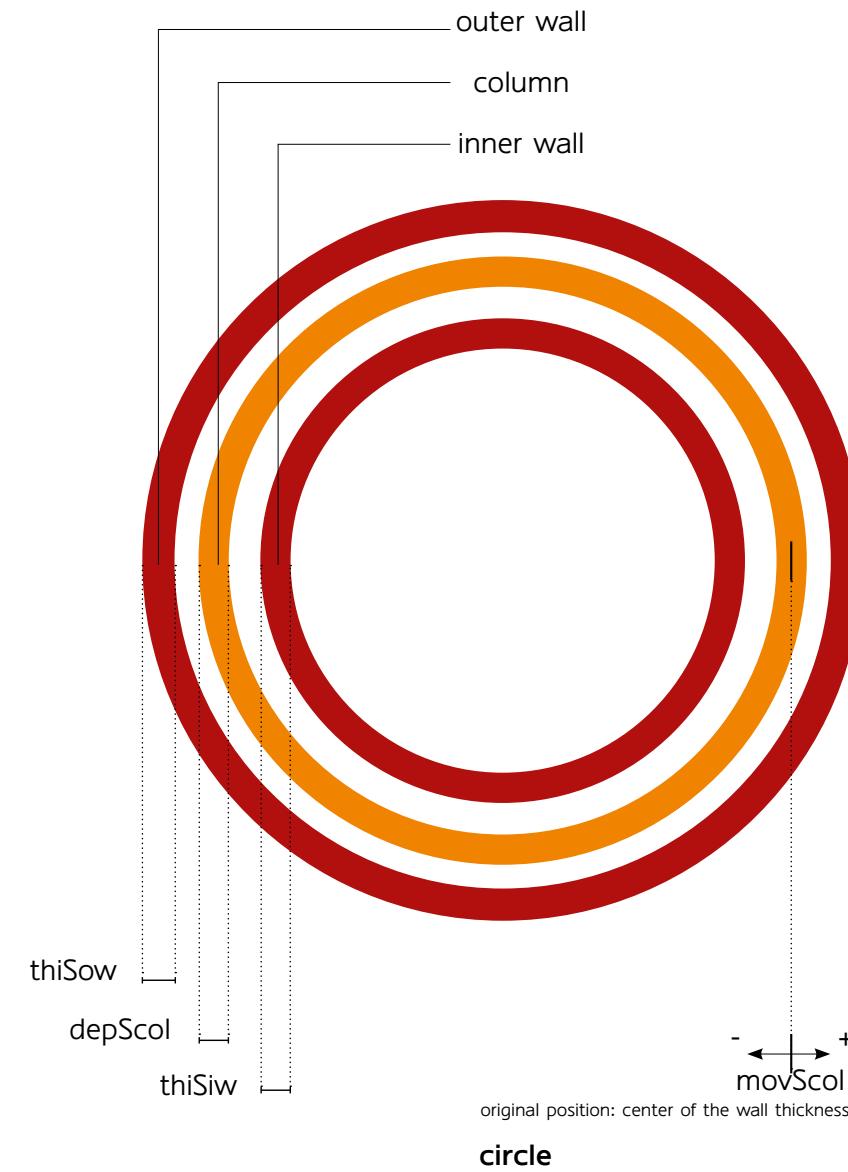
I preserved as many original functions and variations as possible. These, combined with my shape modifications and new variations, resulted in remarkable works.

s1d - env

layers

Envelope Visibility	
<input checked="" type="checkbox"/> visSow	s: show envelope outerwall
<input checked="" type="checkbox"/> visScol	s: show envelope columns
<input checked="" type="checkbox"/> visSiw	s: show envelope innerwall

Envelope Geometry	
<input type="checkbox"/> thiSiw	s: wall inner thickness
<input type="checkbox"/> thiSow	s: wall outer thickness
<input type="checkbox"/> depScol	s: column depth
<input type="checkbox"/> movScol	s: column movement

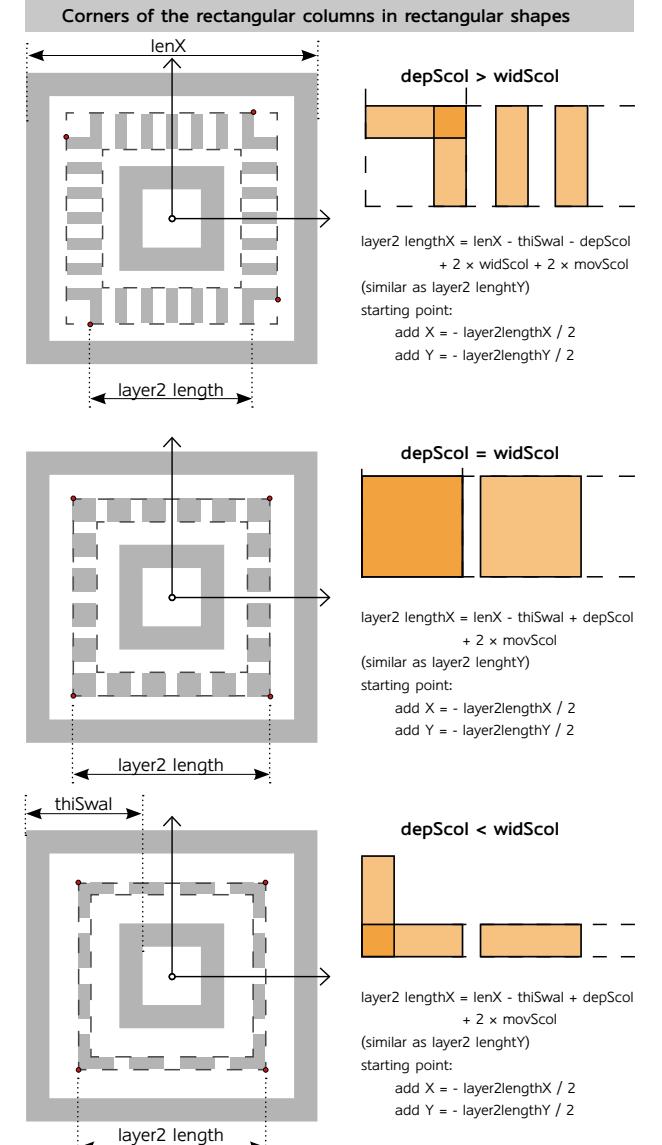
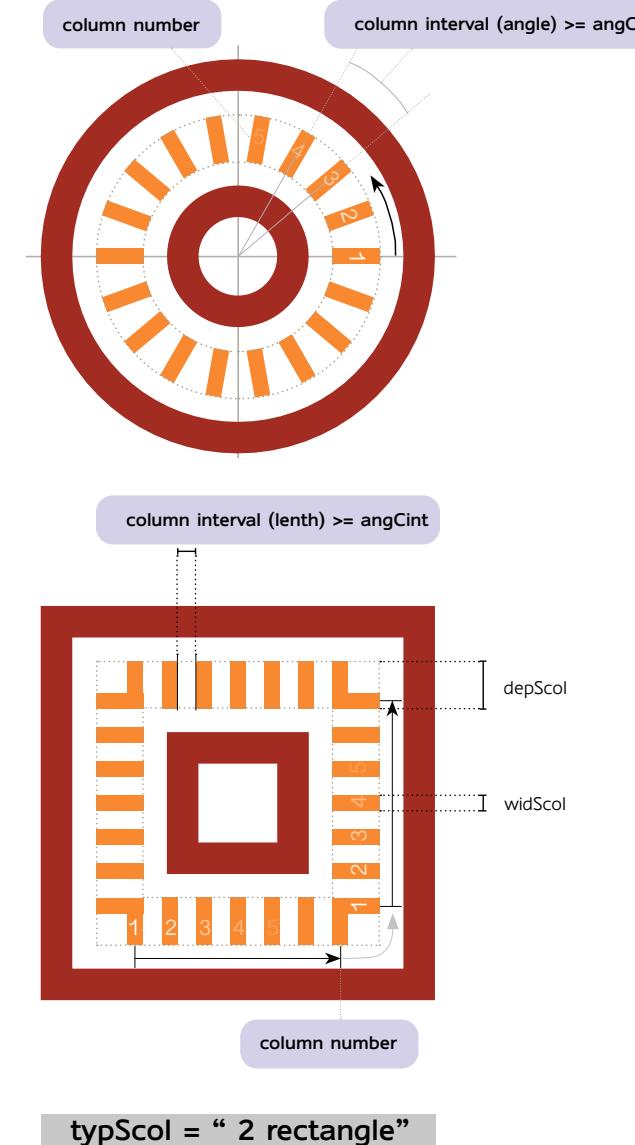
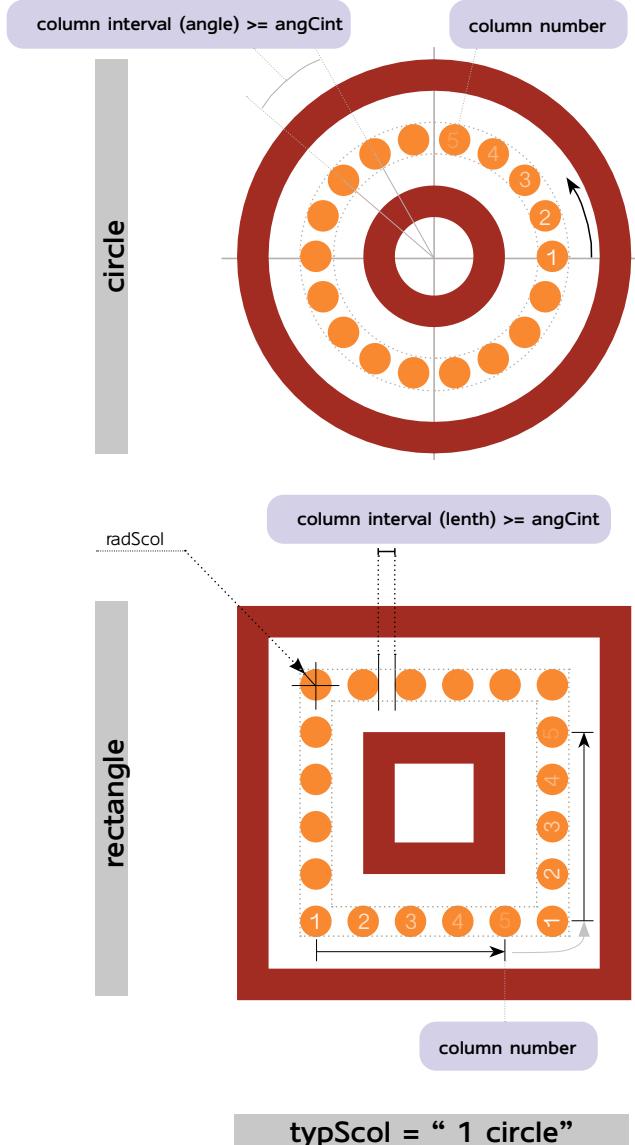
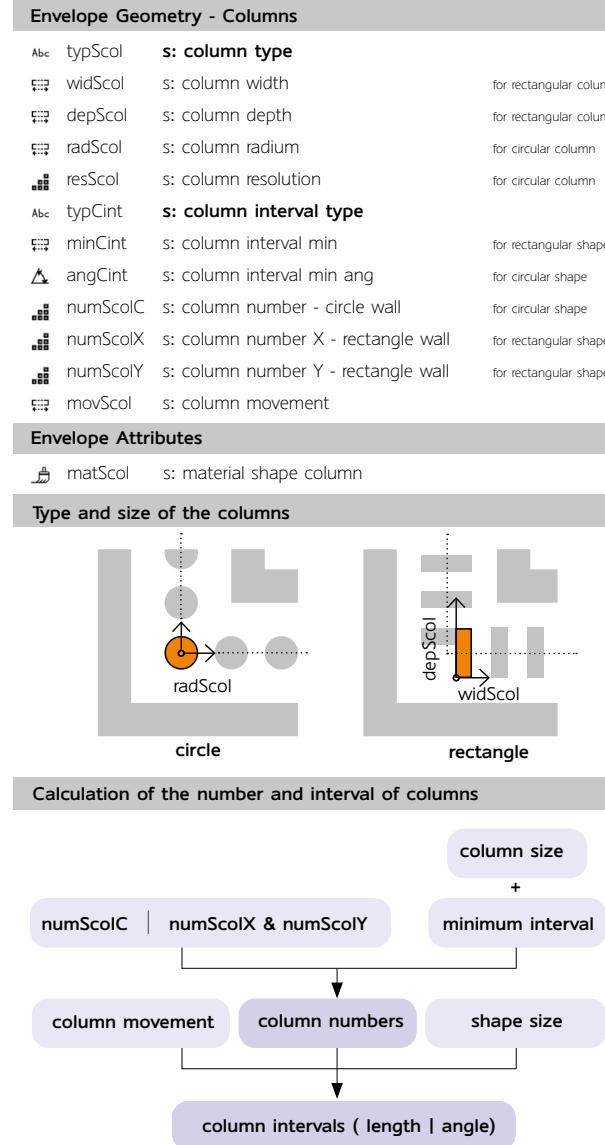


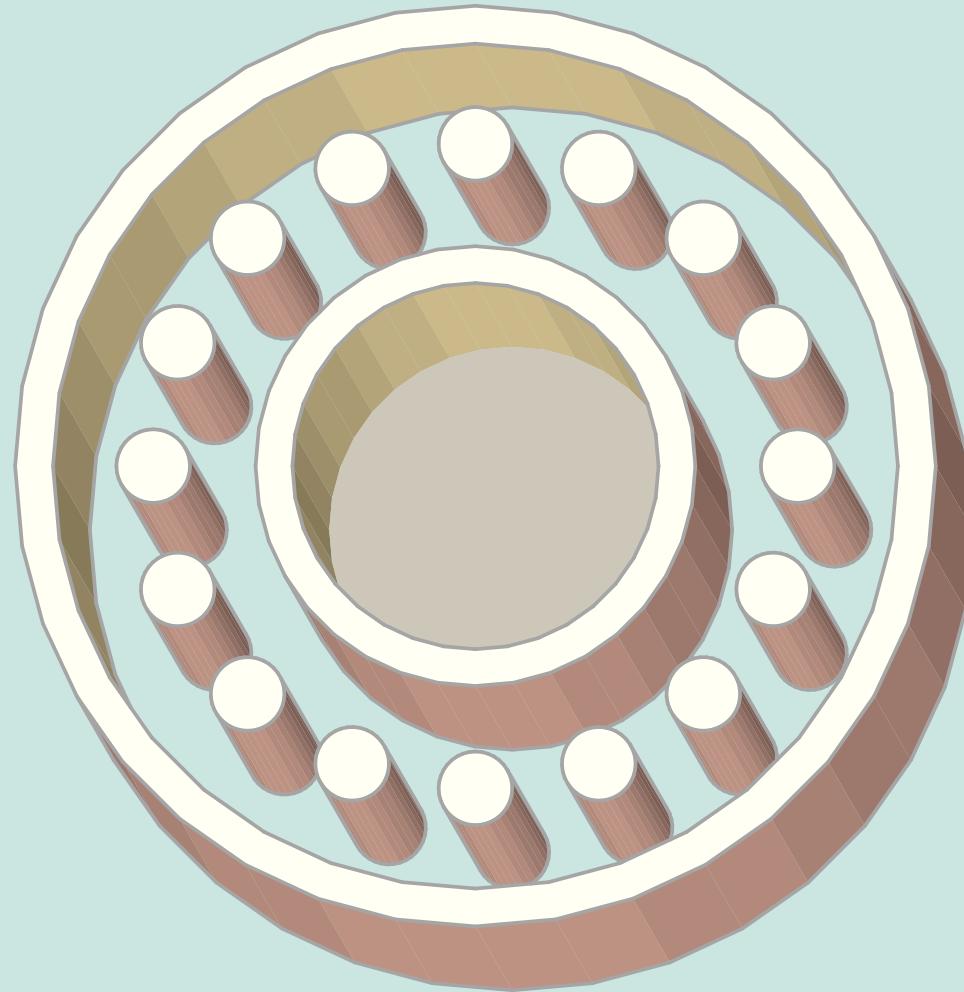
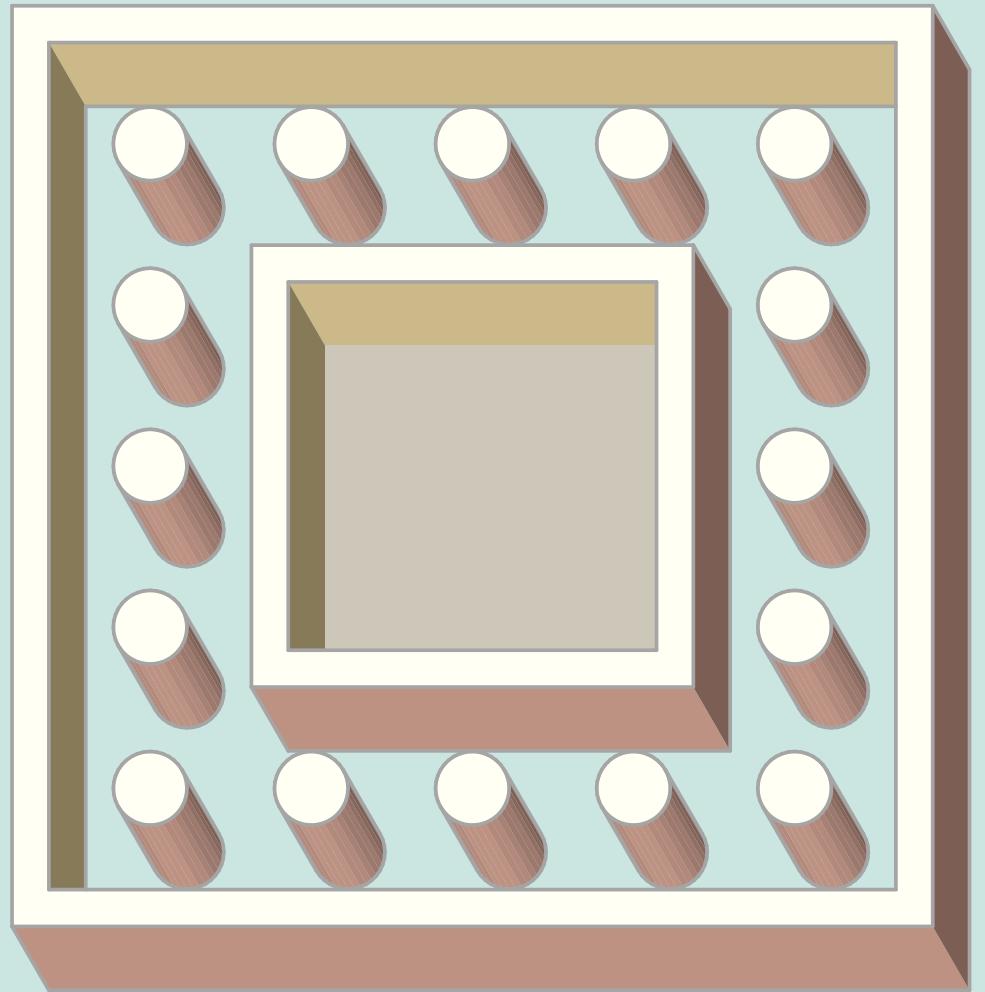
Envelope Visibility	
<input checked="" type="checkbox"/> visSow	s: show envelope outerwall
<input checked="" type="checkbox"/> visScol	s: show envelope columns
<input checked="" type="checkbox"/> visSiw	s: show envelope innerwall

Envelope Geometry	
<input type="checkbox"/> thiSiw	s: wall inner thickness
<input type="checkbox"/> thiSow	s: wall outer thickness
<input type="checkbox"/> depScol	s: column depth
<input type="checkbox"/> movScol	s: column movement

s1d - env

columns

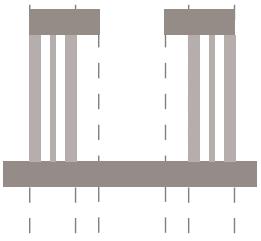
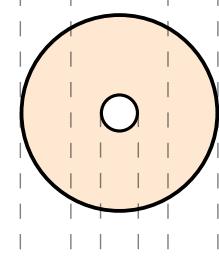
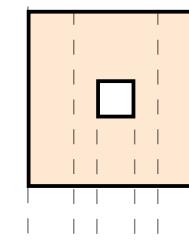
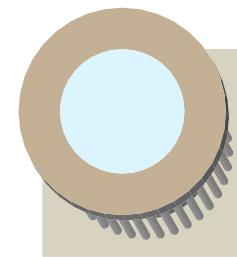
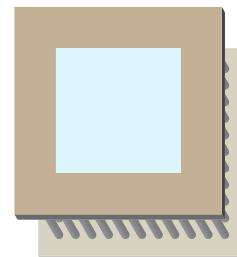
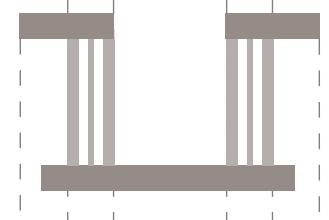
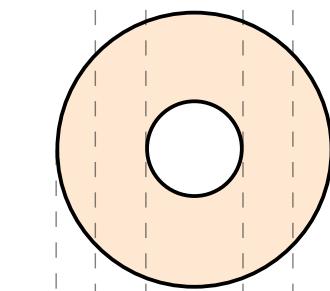
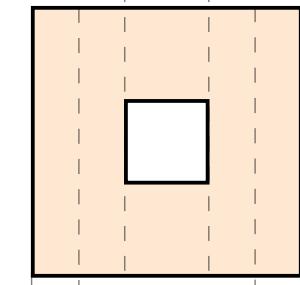
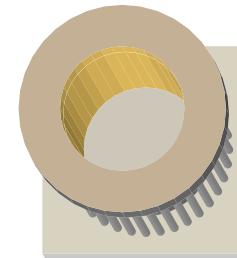
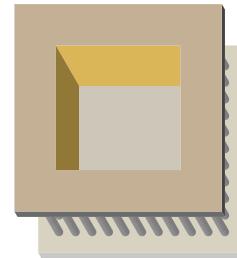
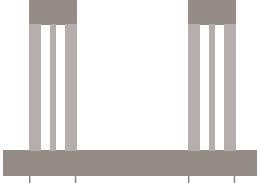
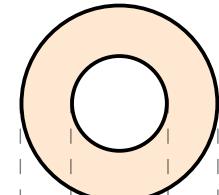
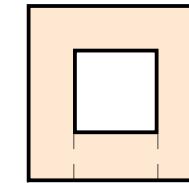
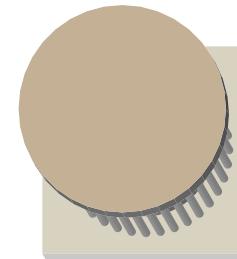
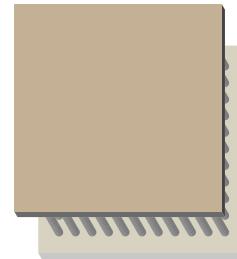




s1d - env

roof

Shape Visibility	
<input checked="" type="checkbox"/> visSroo	s: show shape roof
Envelope Geometry - roof	
Abc	typSroo s: roof type
Exp	expSro s: roof expand out
Exp	expSri s: roof expand in
Envelope Attributes	
Mat	matRhol s: material roof hollow



roof type = " 0 whole"

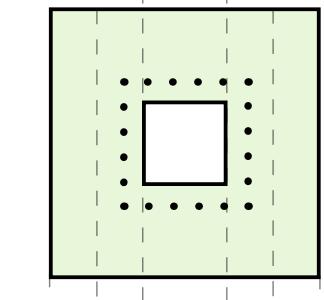
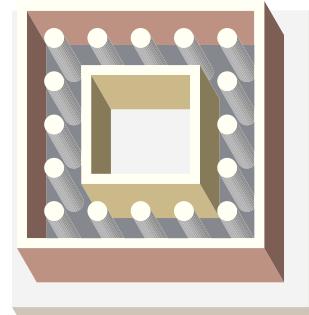
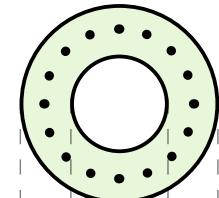
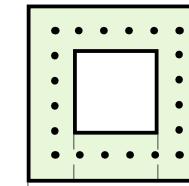
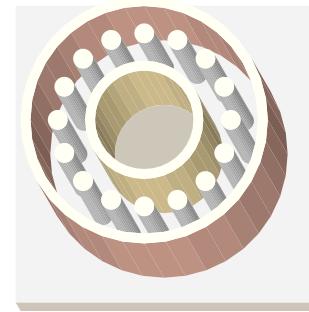
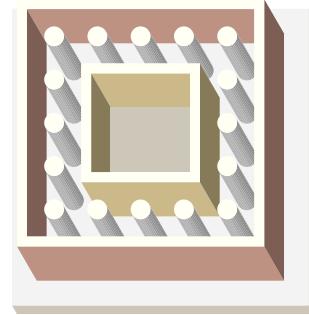
roof type = " 1 hollow"

roof type = " 2 hollow + glass"

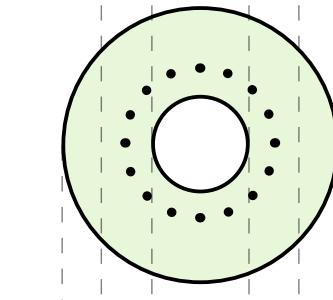
s1d - env

floor

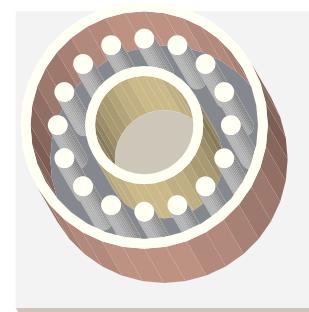
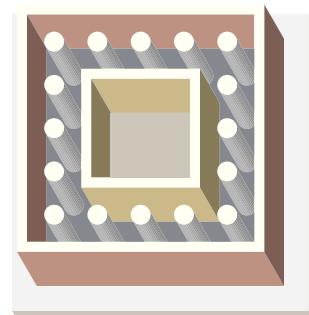
Shape Visibility	
<input checked="" type="checkbox"/> visFlo	s: show shape floor
Envelope Geometry - roof	
abc	typSflo s: floor type
expSfo	s: floor expand out
expSfi	s: floor expand in
Envelope Attributes	
matHol	s: material floor hollow



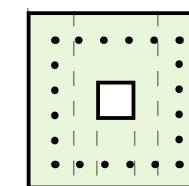
expSfo expSfo



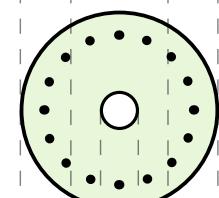
expSfo expSfo



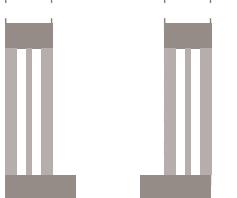
floor type = " 2 void + hollow"



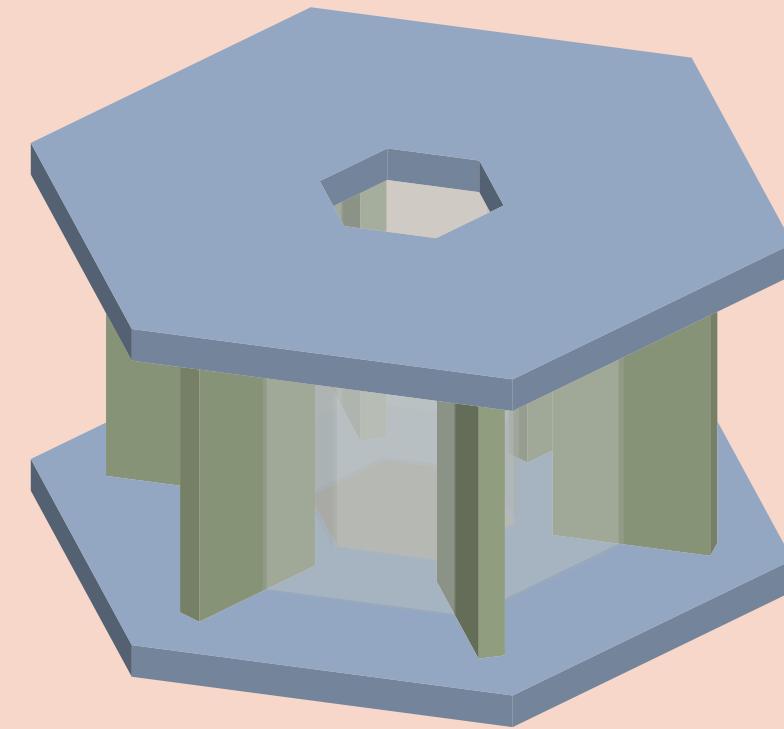
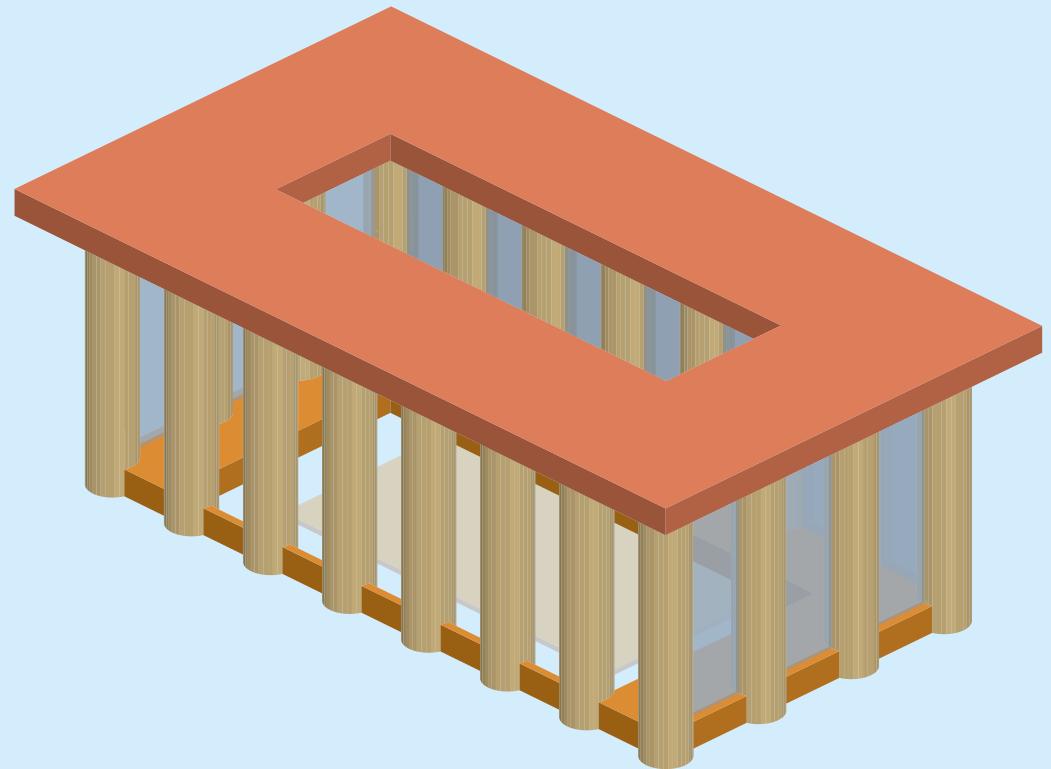
expSfi expSfi



expSfi expSfi



expSfi expSfi

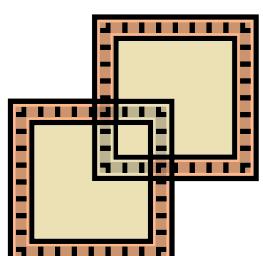
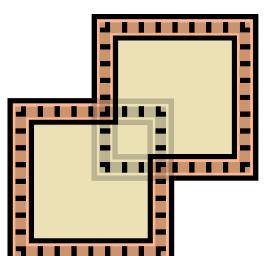
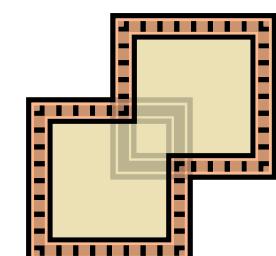
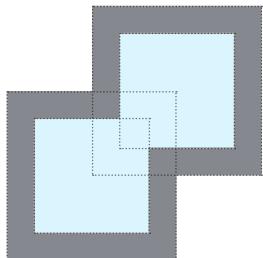
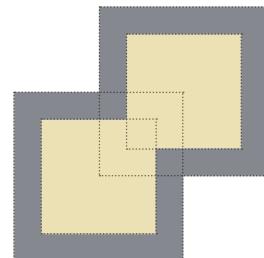
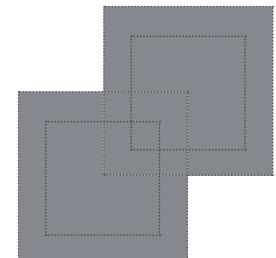
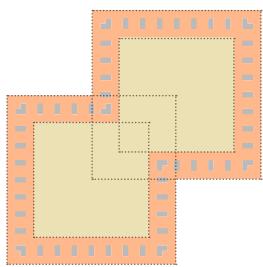
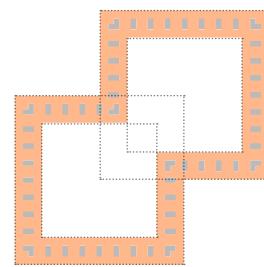
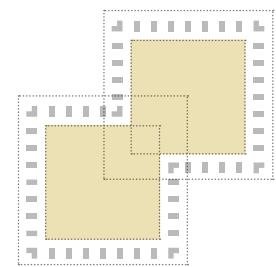
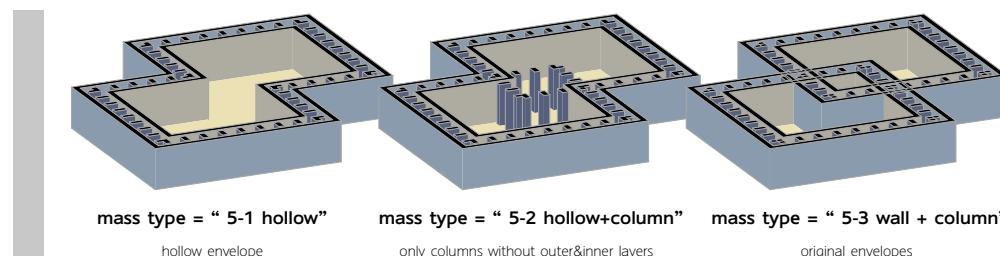
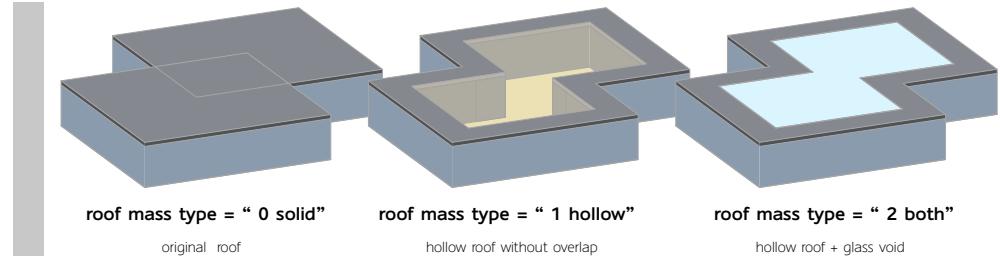
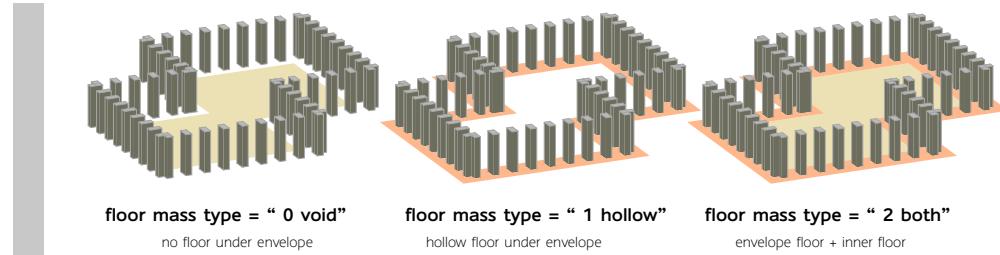


g1m - env

mass type - envelope | roof | floor

Shape General

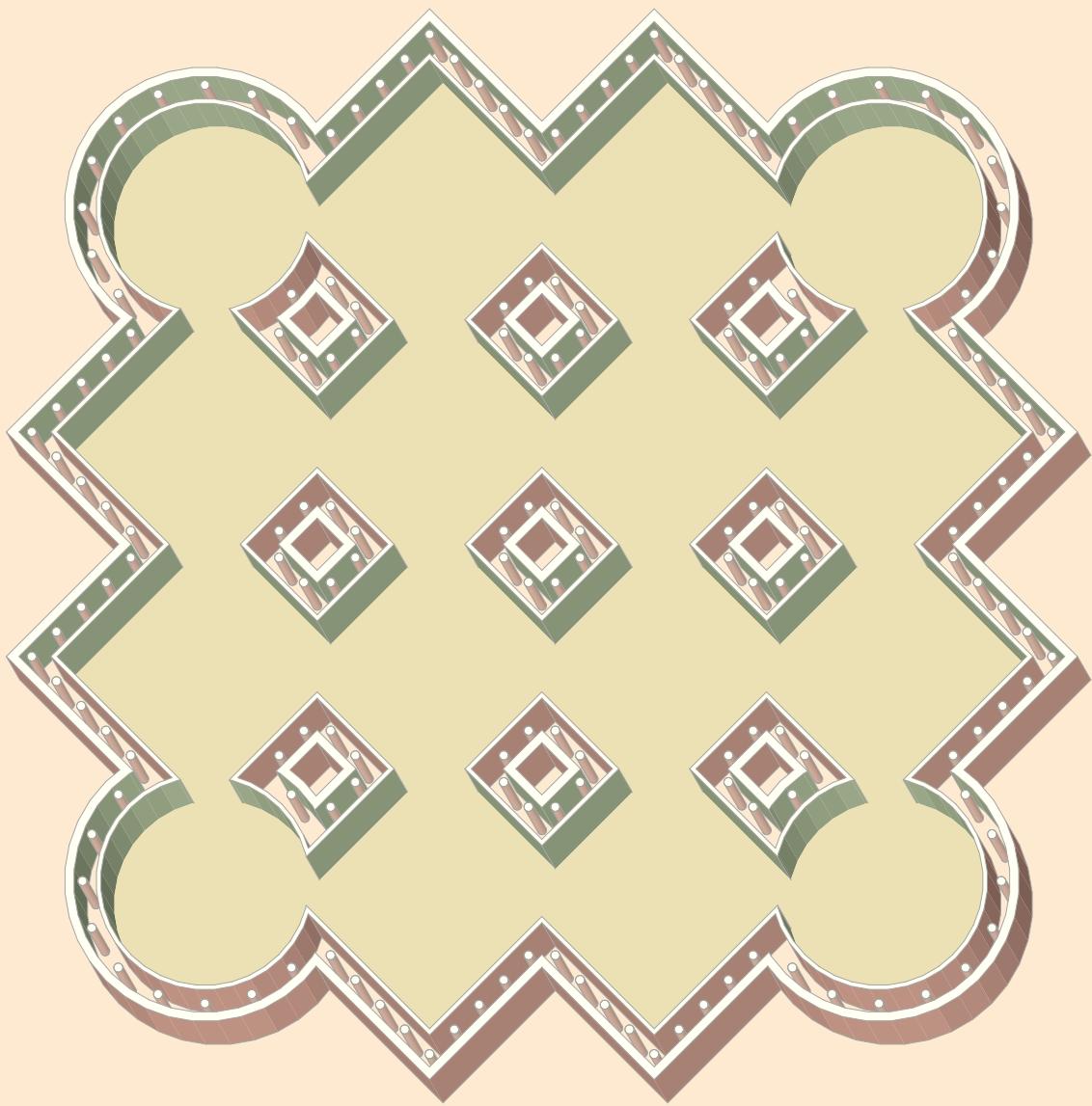
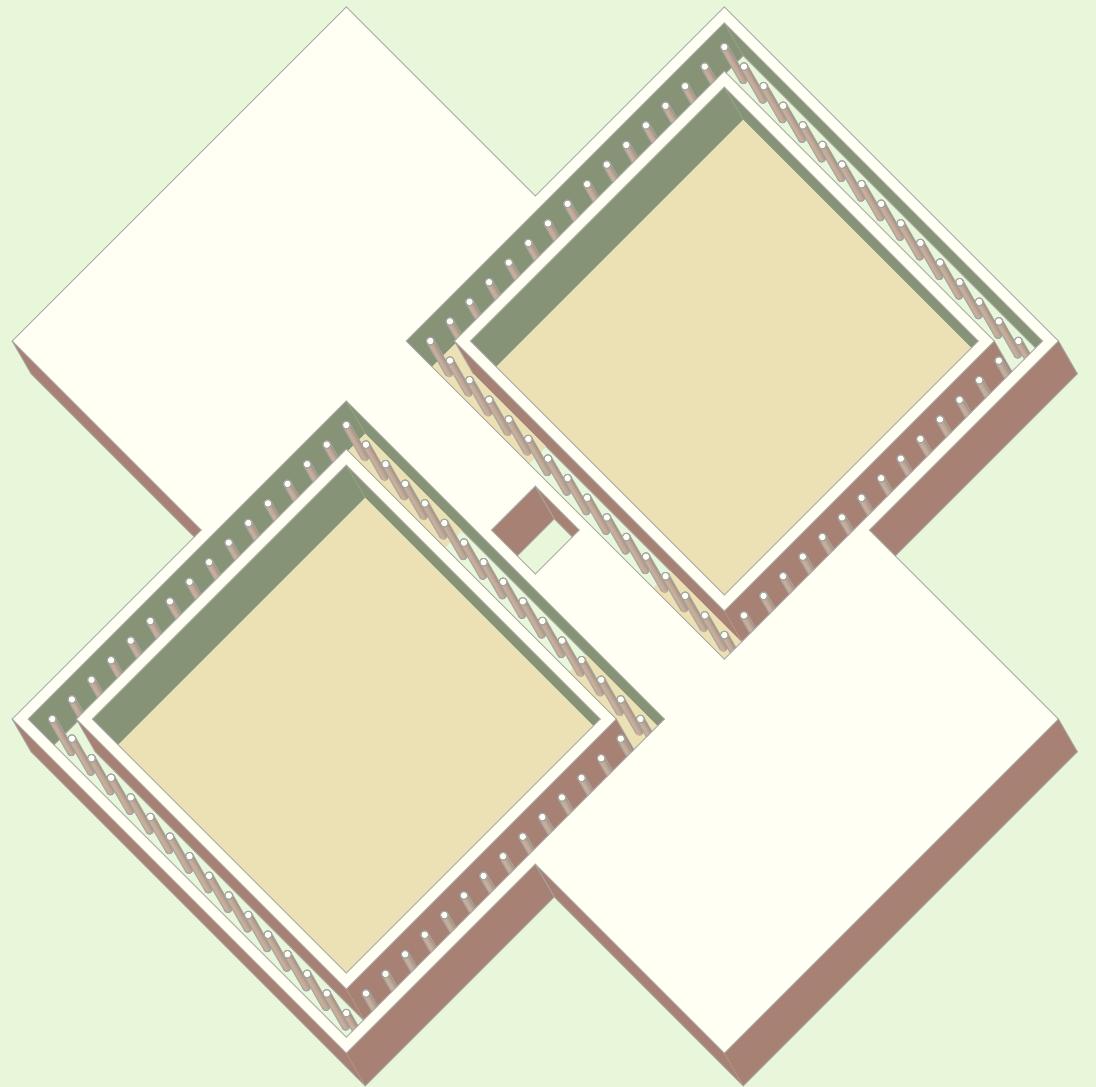
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 Abc masRtyp s: floor mass type
 Abc masFtyp s: floor mass type

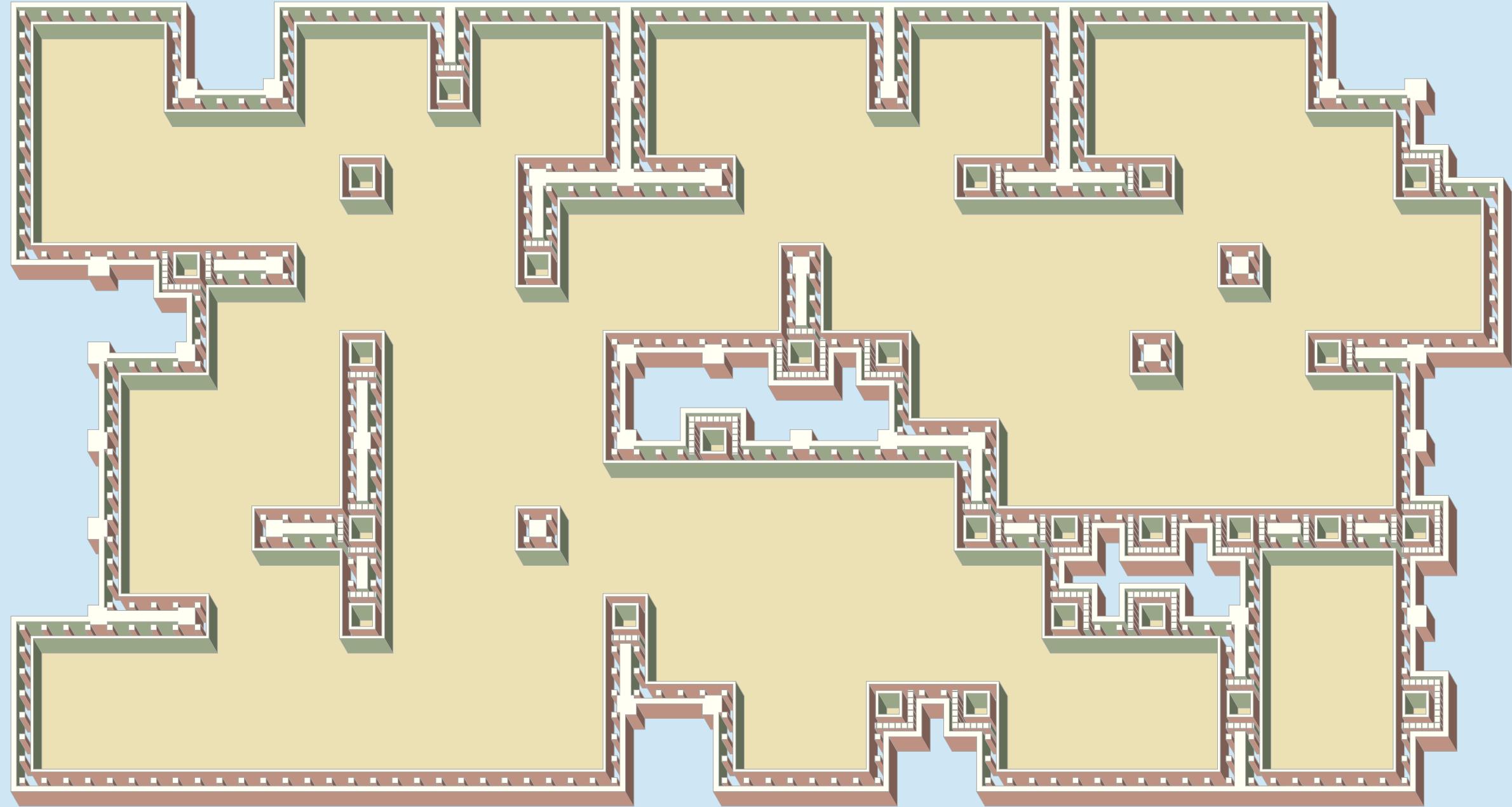


floor mass type

roof mass type

envelope mass type





g1m - env

variations

In addition to the original 17 steps of variation still working, I added 6 new types of variation to the grid level with the new shape updated, in order to create more interesting spaces. These variations basically used the frame of the ones in spring quater and performed very well in my work.

Shape Visibility	
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<input checked="" type="checkbox"/> visSow1	s: show envelope outwall 1
<input checked="" type="checkbox"/> visSiw1	s: show envelope innerwall 1
<input checked="" type="checkbox"/> visScol1	s: show envelope column 1
<input checked="" type="checkbox"/> visSow2	s: show envelope outwall 2
<input checked="" type="checkbox"/> visSiw2	s: show envelope innerwall 2
<input checked="" type="checkbox"/> visScol2	s: show envelope column 2
Abc visCdiv	s: 1 • divide options •
 visCnum	s: divide number of col/row
Abc visCalt	s: 2 • alternate options •
Abc visCrnd	s: 3 • random options •
 visCper	s: 4 percent of value

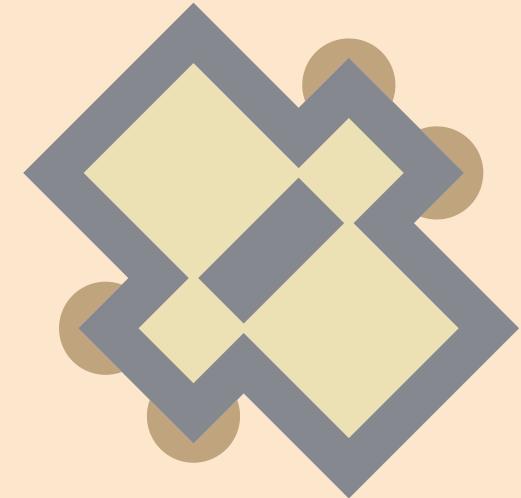
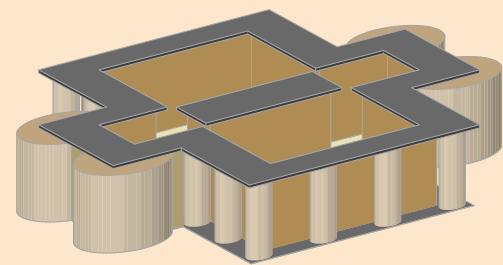
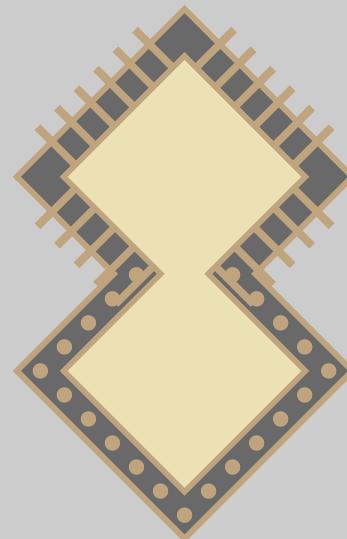
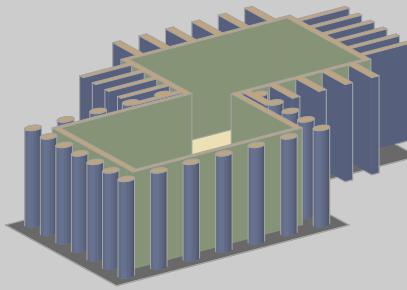
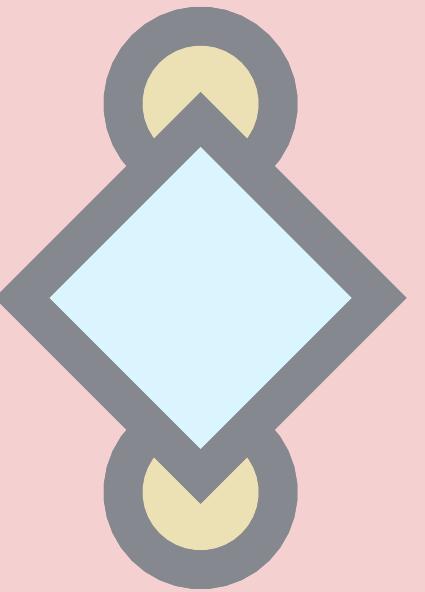
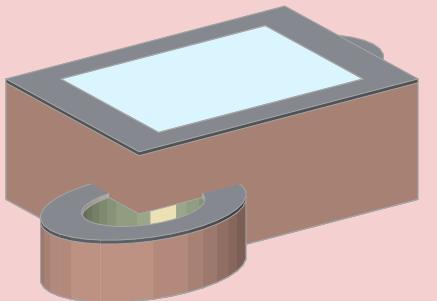
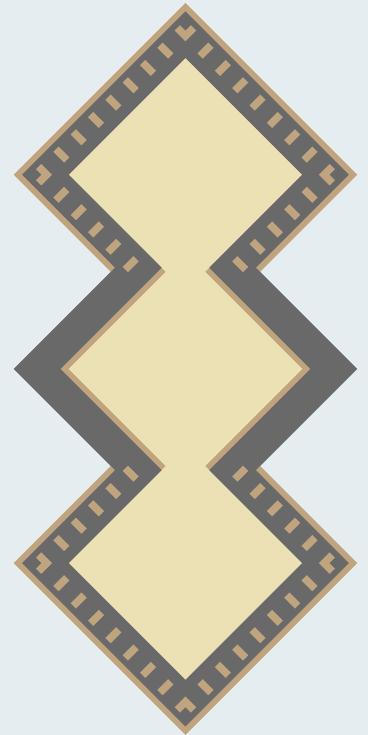
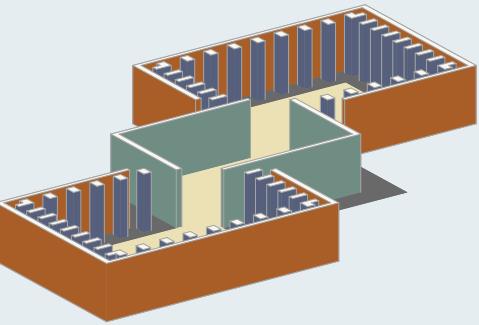
Envelope Geometry - roof	
Abc typRtyp	s: envelope roof variation type
Abc typSroo1	s: envelope roof type 1
Abc typSroo2	s: envelope roof type 2
Abc typRdiv	s: 1 • divide options •
 typRnum	s: divide number of col/row
Abc typRalt	s: 2 • alternate options •
Abc typRrnd	s: 3 • random options •
 typRper	s: 4 percent of value

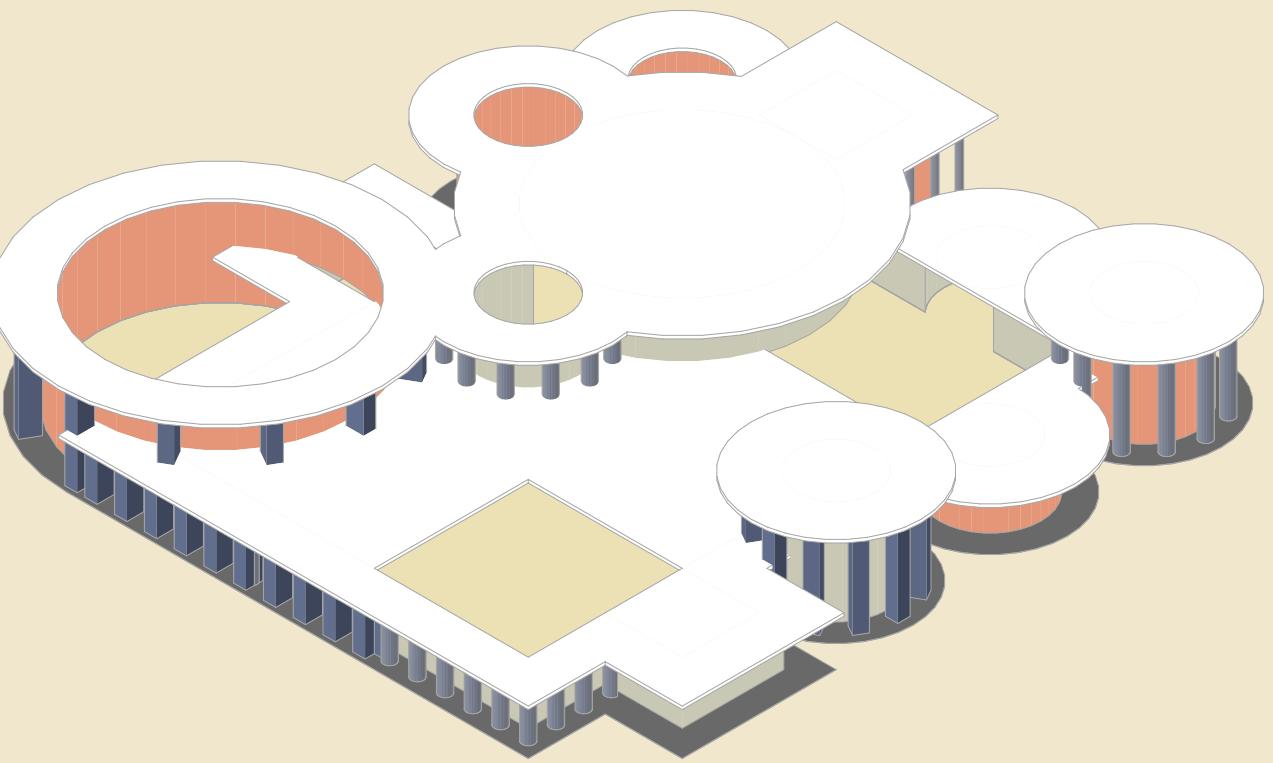
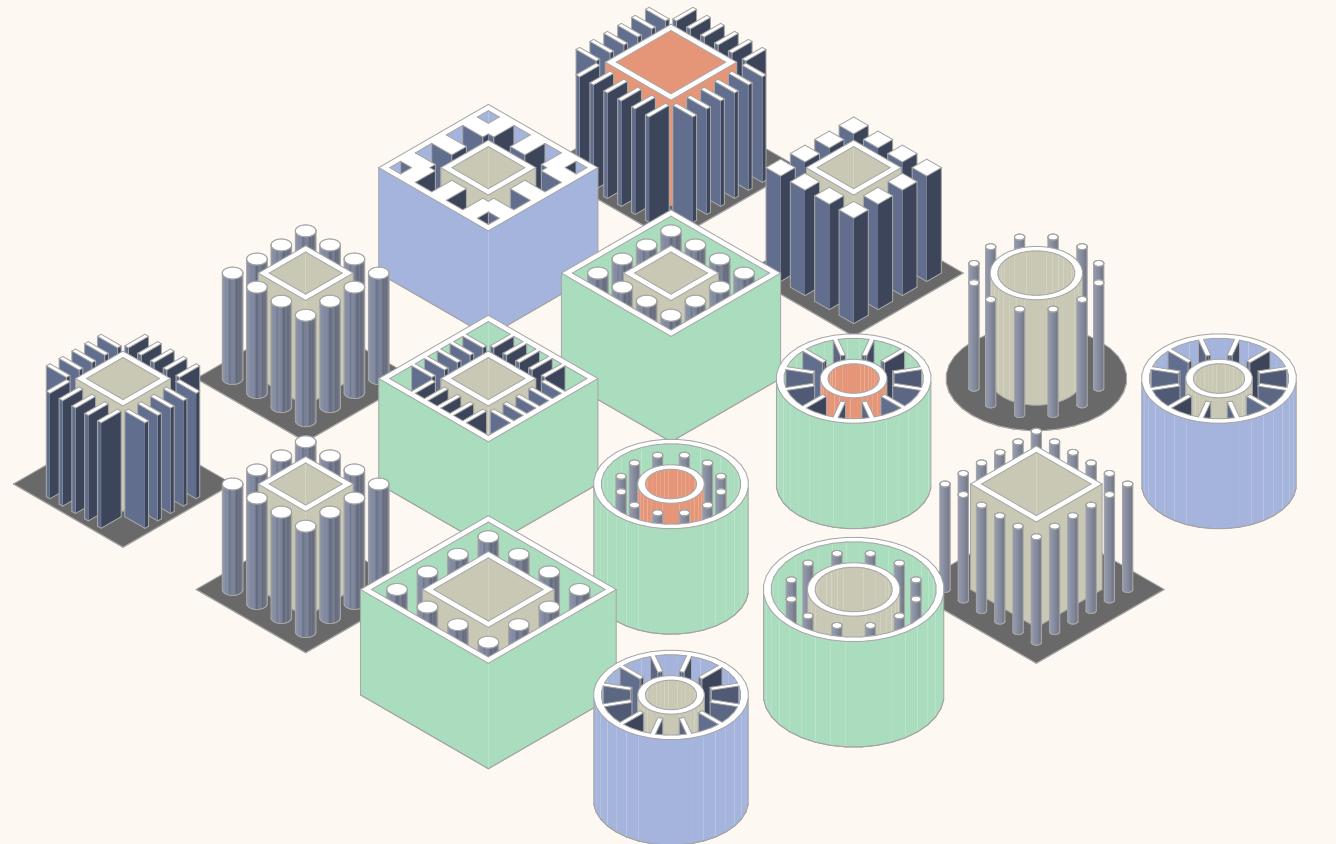
Envelope Geometry - column	
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Abc typScol1	s: envelope column type 1
Abc typScol2	s: envelope column type 2
Abc typCdiv	s: 1 • divide options •
 typCnum	s: divide number of col/row
Abc typCalt	s: 2 • alternate options •
Abc typCrnd	s: 3 • random options •
 typCper	s: 4 percent of value

Envelope Geometry - column	
Abc typCtyp	s: envelope column width variation type
Abc typScol1	s: envelope column width 1
Abc typScol2	s: envelope column width 2
Abc typCdiv	s: 1 • divide options •
 typCnum	s: divide number of col/row
Abc typCalt	s: 2 • alternate options •
Abc typCrnd	s: 3 • random options •
 typCper	s: 4 percent of value

Envelope Geometry - column	
for rectangular column	
Abc typCtyp	s: envelope column depth variation type
Abc typScol1	s: envelope column depth 1
Abc typScol2	s: envelope column depth 2
Abc typCdiv	s: 1 • divide options •
 typCnum	s: divide number of col/row
Abc typCalt	s: 2 • alternate options •
Abc typCrnd	s: 3 • random options •
 typCper	s: 4 percent of value

Envelope Geometry - column	
for circular column	
Abc typCtyp	s: envelope column radius variation type
Abc typScol1	s: envelope column radius 1
Abc typScol2	s: envelope column radius 2
Abc typCdiv	s: 1 • divide options •
 typCnum	s: divide number of col/row
Abc typCalt	s: 2 • alternate options •
Abc typCrnd	s: 3 • random options •
 typCper	s: 4 percent of value





SPACE STUDY | TEST

In order to make sure that my script and object work well in the following study, I made some basic tests of the newly added functions. I mainly tested the basic parameter changes of the envelope in the shape level, the mass types of the roof, floor and envelope and the six new variations.

At the same time, test is also a basic version of exploration and observation, during which I can also find interesting space and patterns.

Shape

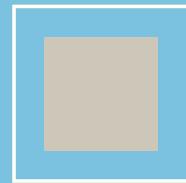
layers visibility

all invisible

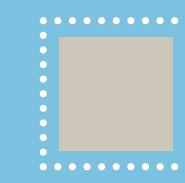


outer wall | inner wall | columns

one visible



outer wall | inner wall | columns

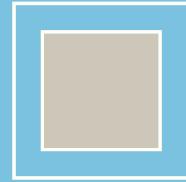


outer wall | inner wall | columns

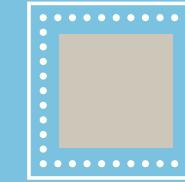


outer wall | inner wall | columns

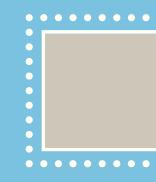
two visible



outer wall | inner wall | columns

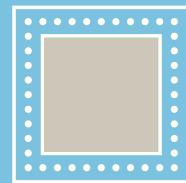


outer wall | inner wall | columns

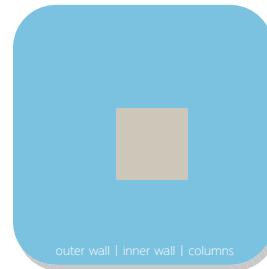


outer wall | inner wall | columns

three visible



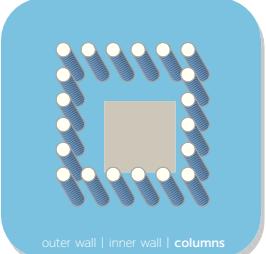
outer wall | inner wall | columns



outer wall | inner wall | columns



outer wall | inner wall | columns



outer wall | inner wall | columns



outer wall | inner wall | columns



outer wall | inner wall | columns

all invisible

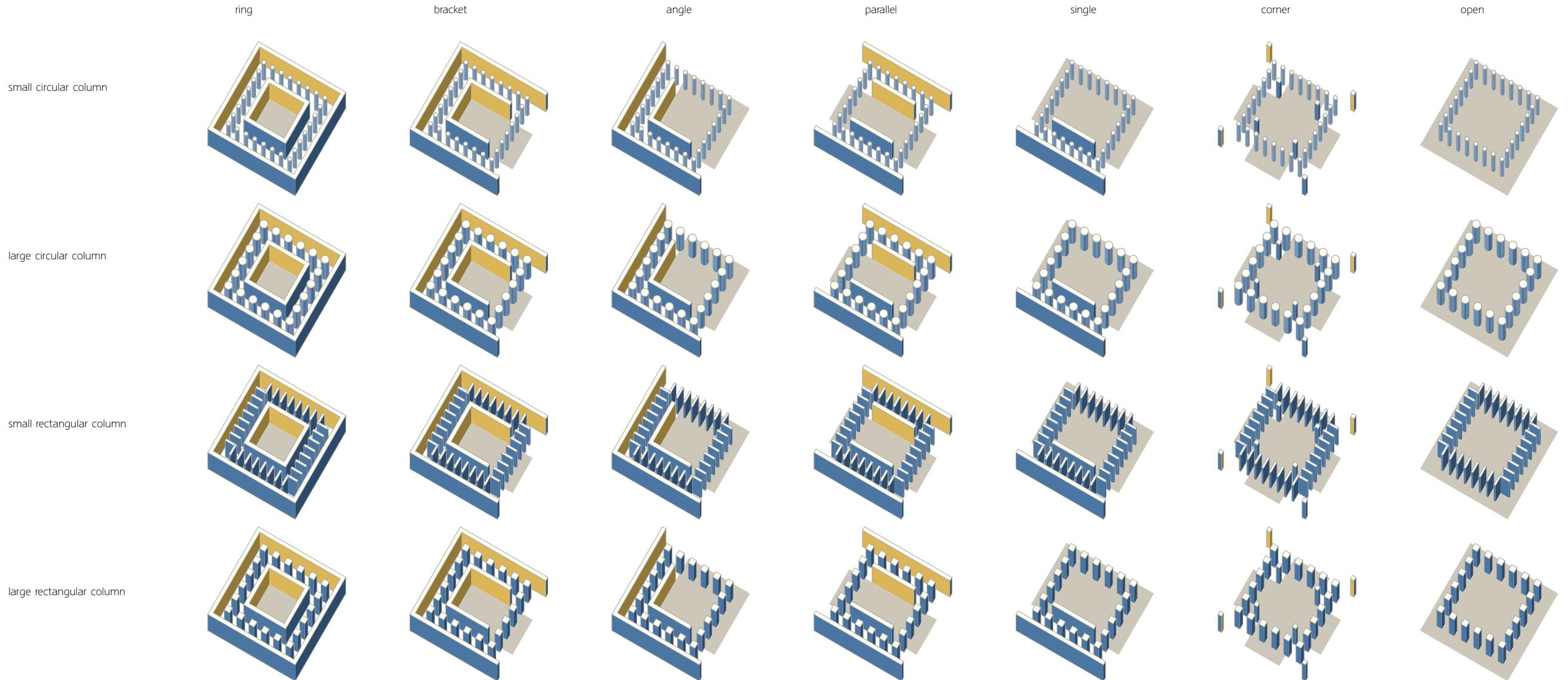
one visible

two visible

three visible

Shape

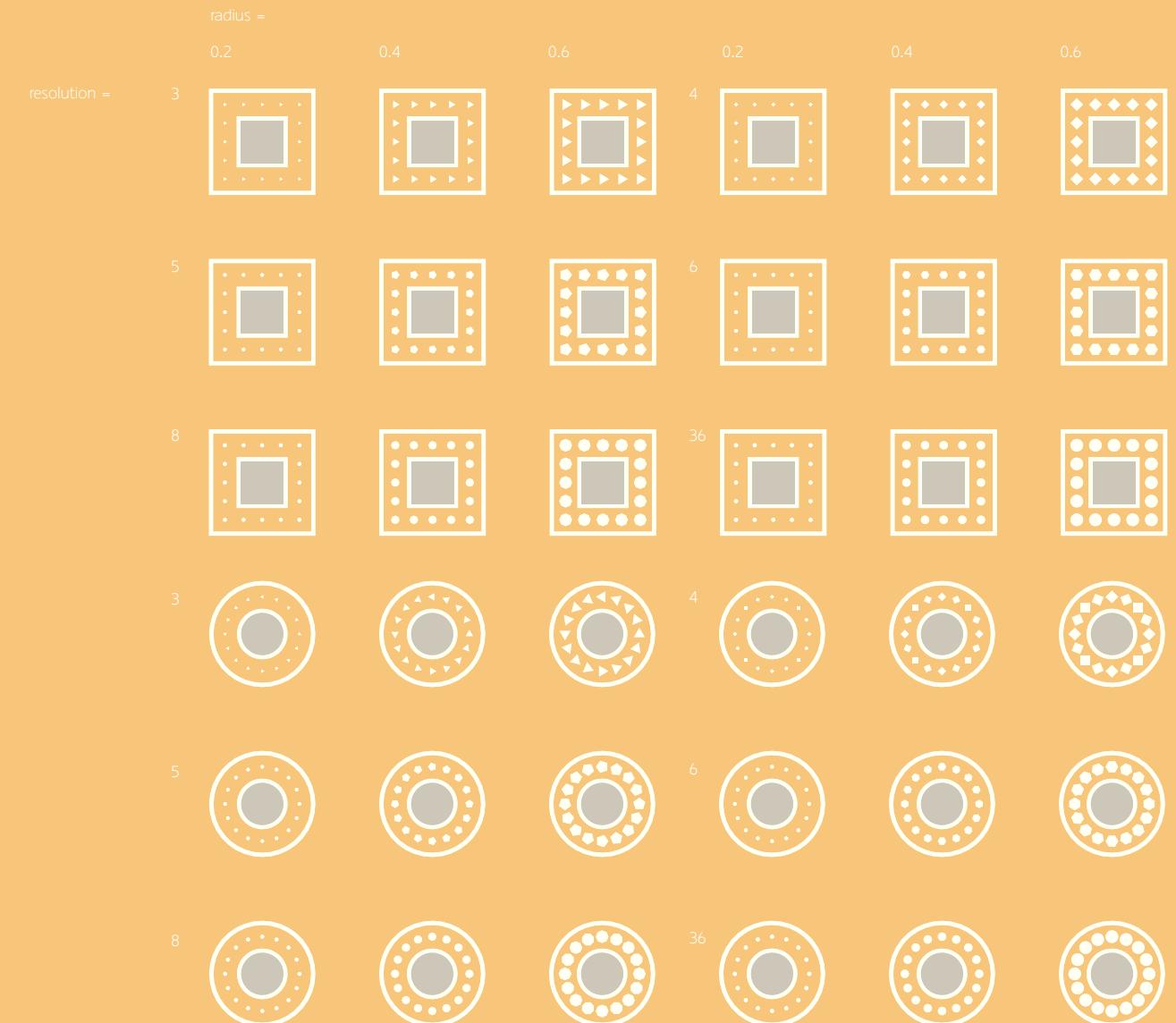
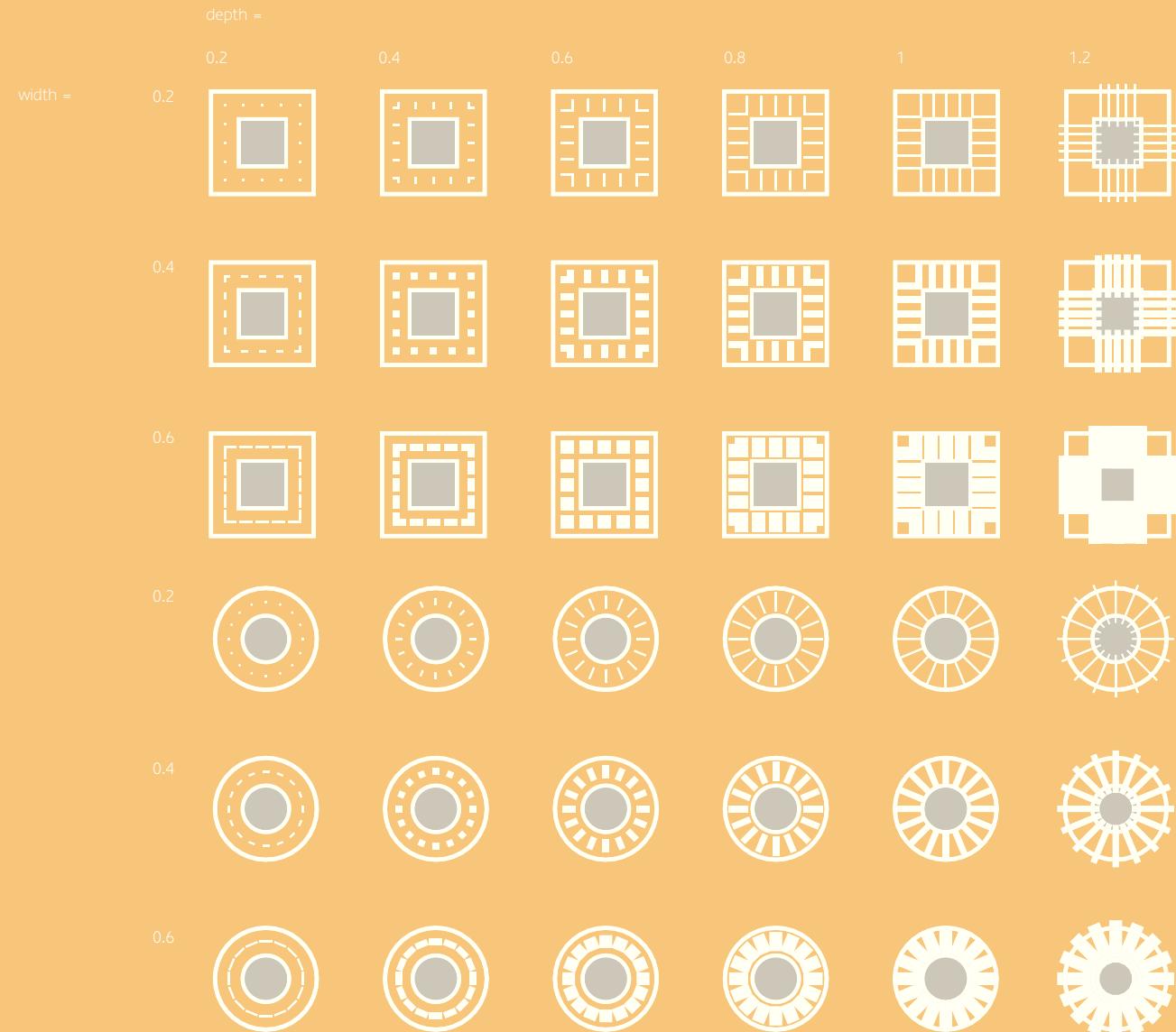
opening type



Shape

column size

column radius & resolution

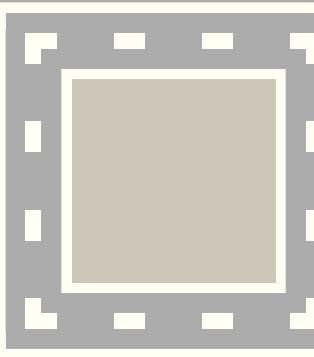
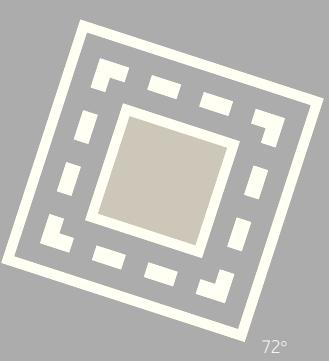
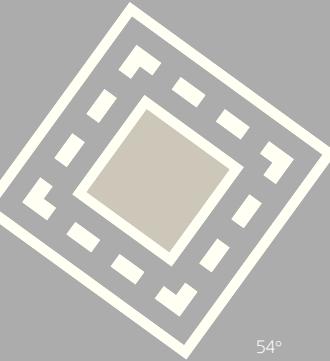
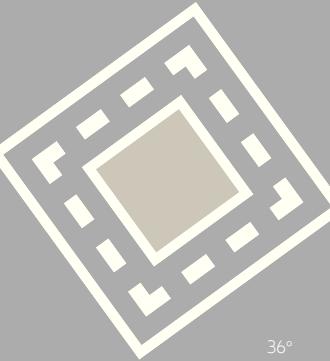
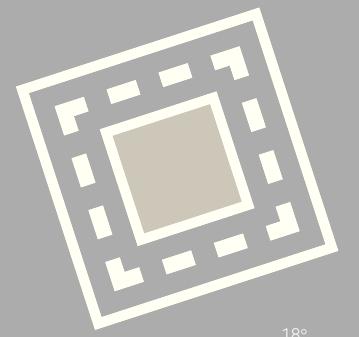
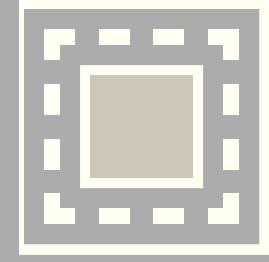
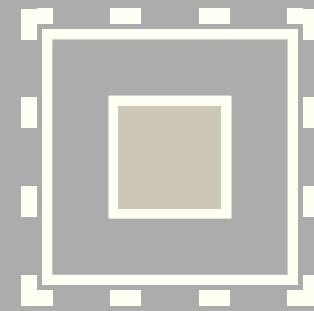
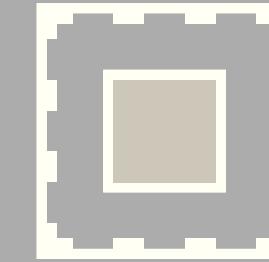
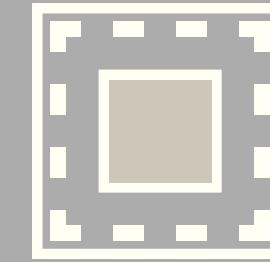
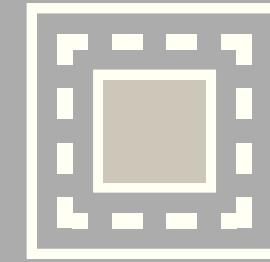
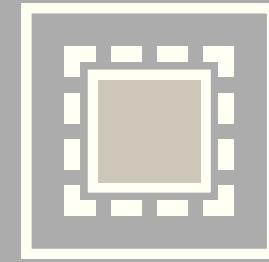
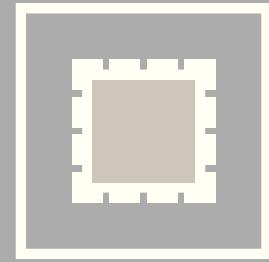


Shape

layer thickness

Shape

column position | rotation | scale



column movement =

-1

-0.5

0

0.5

1

1.5

rotation =

0°

18°

36°

54°

72°

90°

scale =

25%

50%

75%

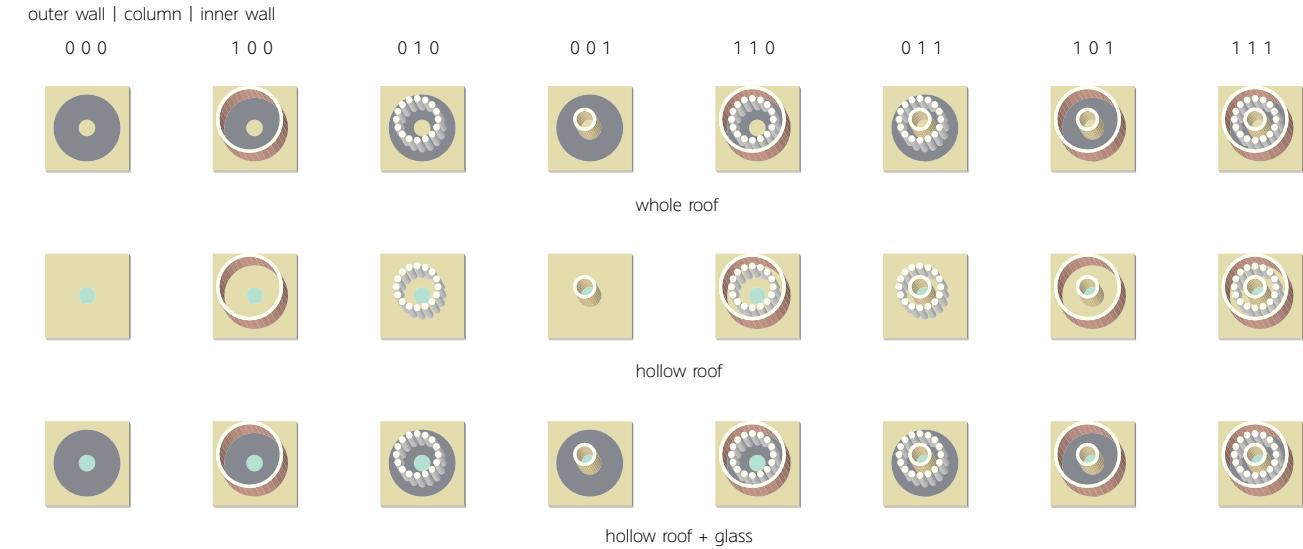
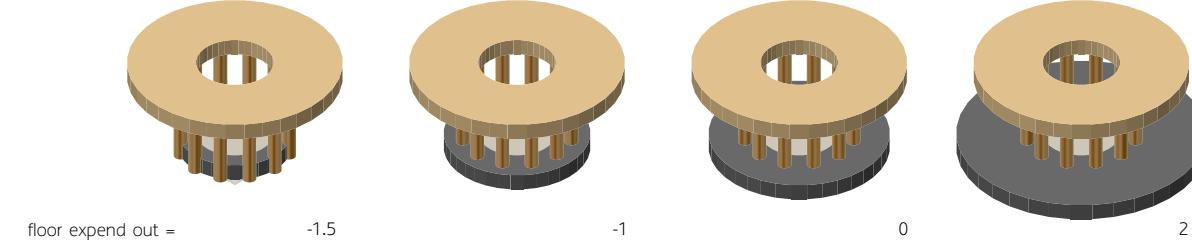
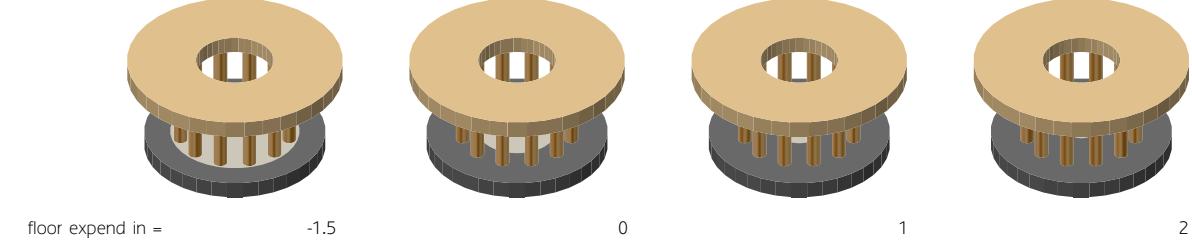
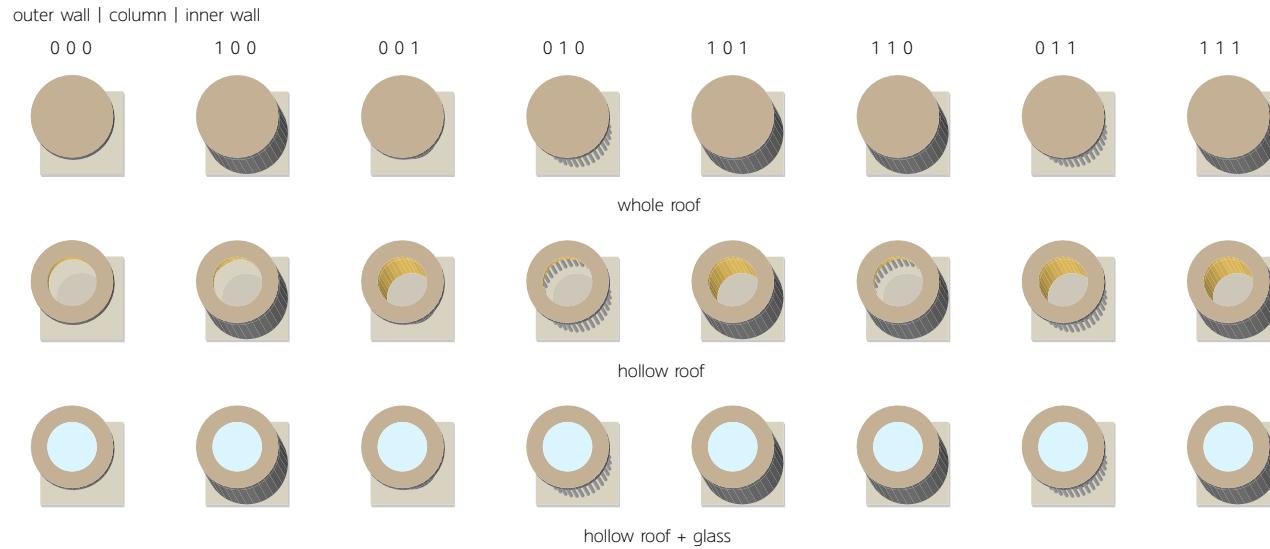
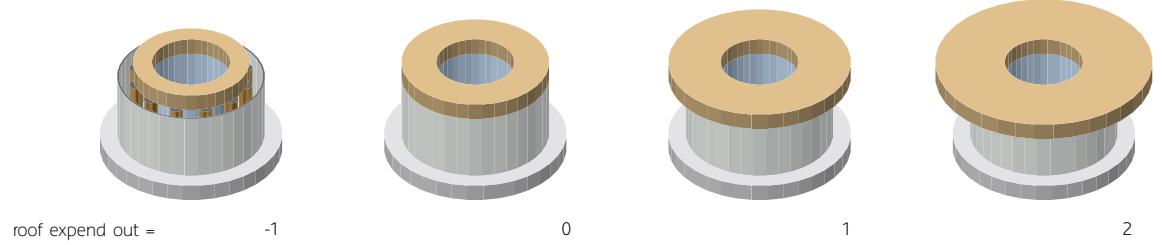
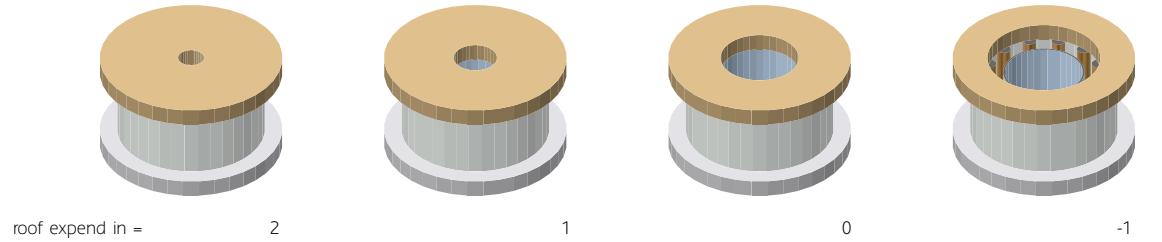
100%

125%

150%

Shape

roof

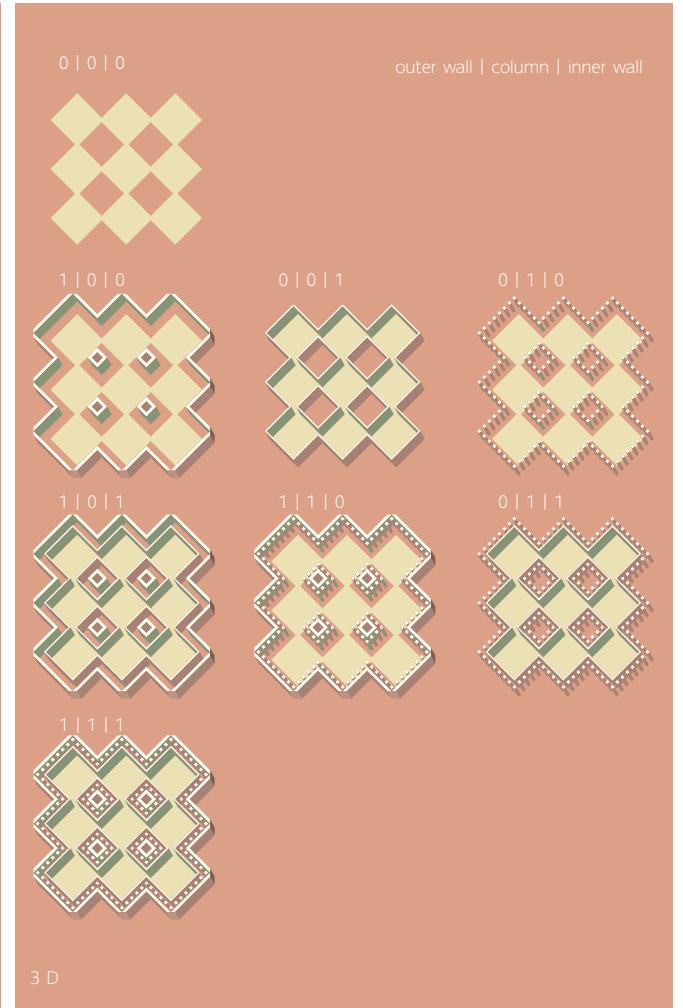
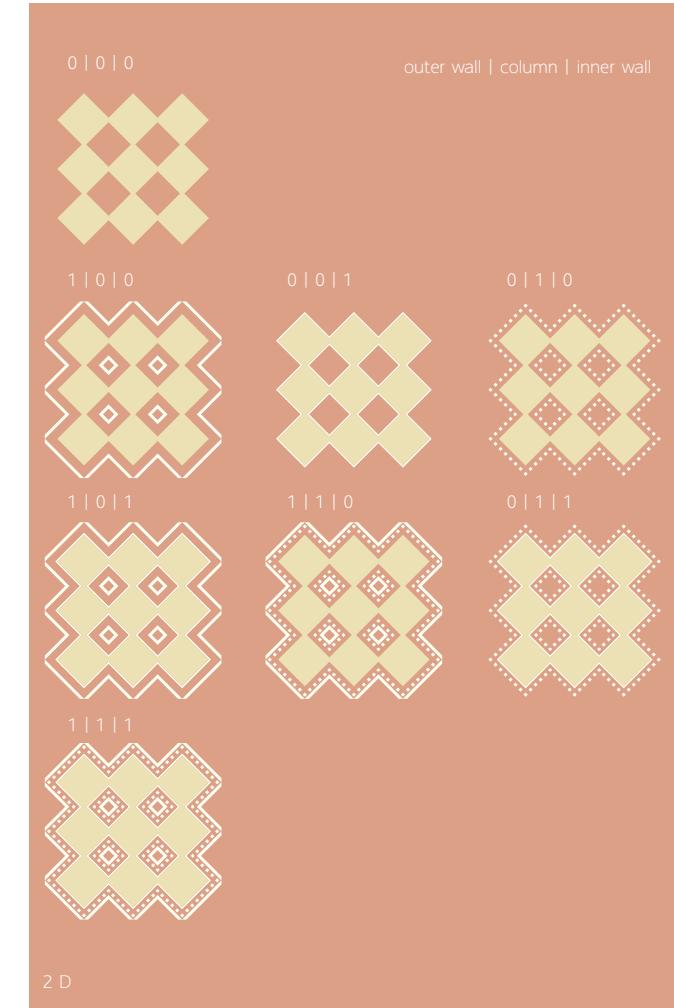
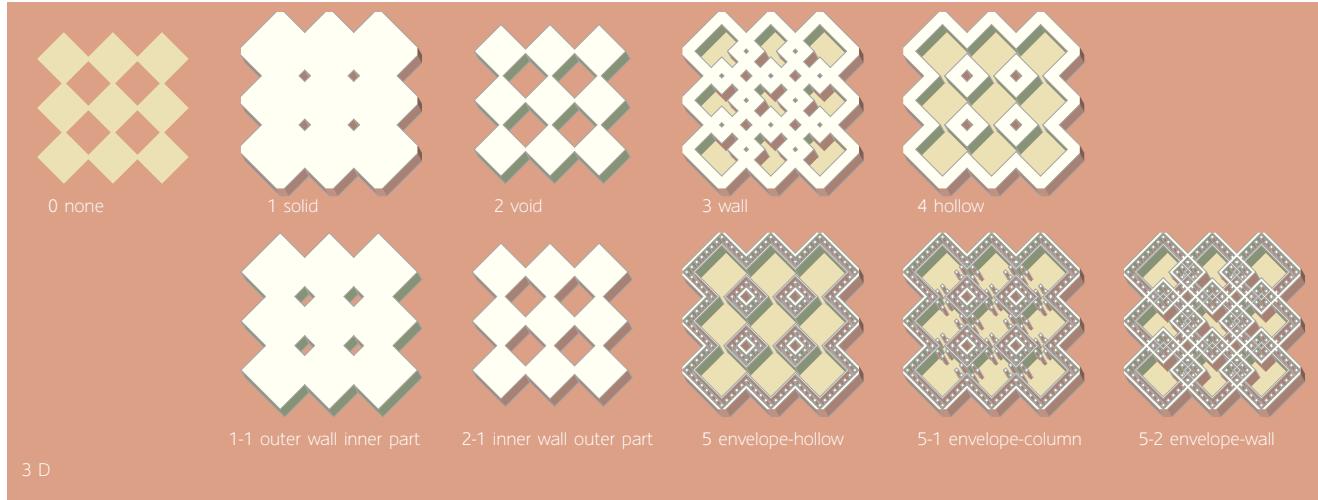
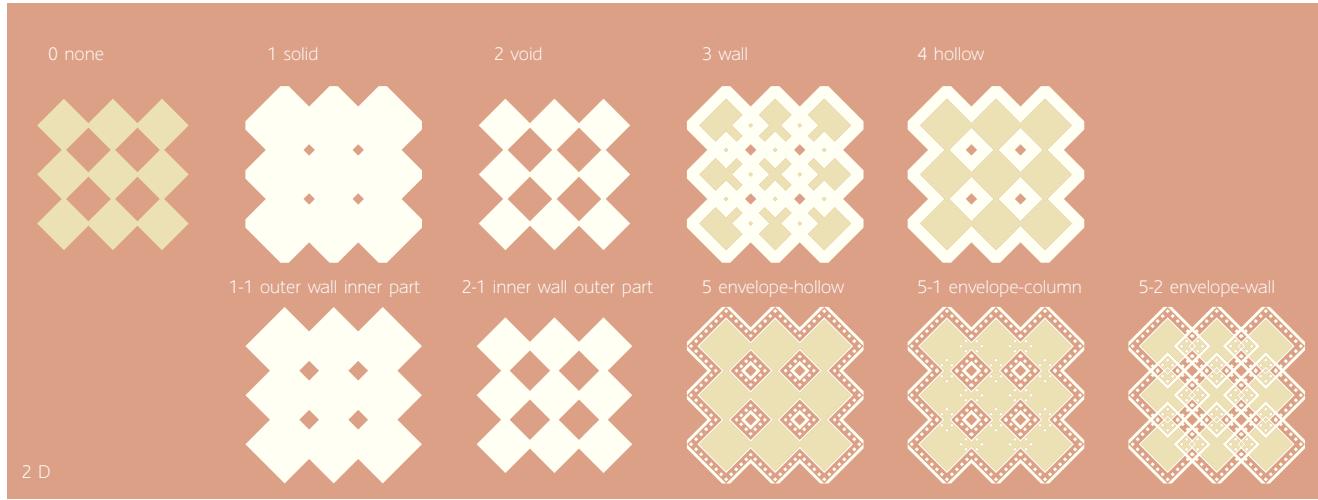


floor

Grid

mass type | envelope

mass type | envelope visibility

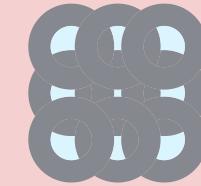
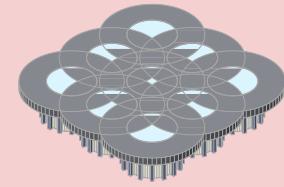
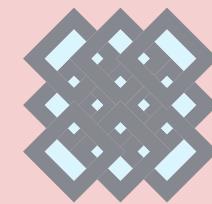
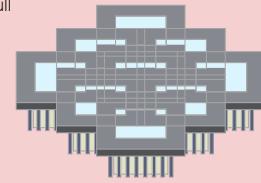


Grid

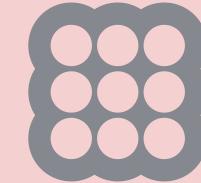
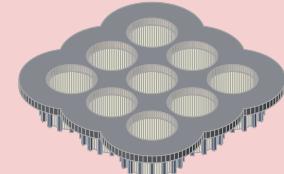
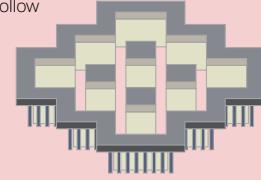
mass type | roof

mass type | floor

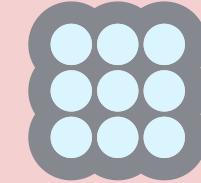
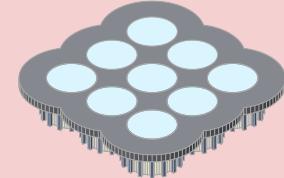
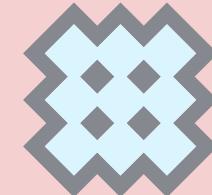
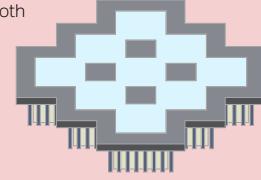
full



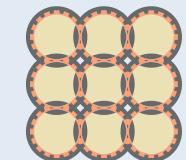
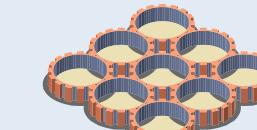
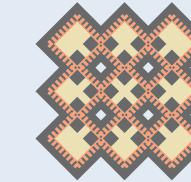
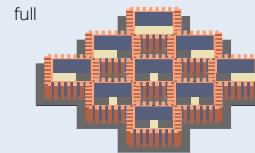
hollow



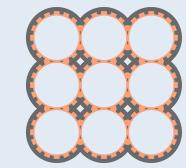
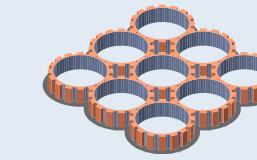
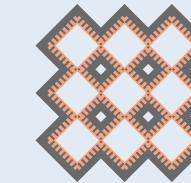
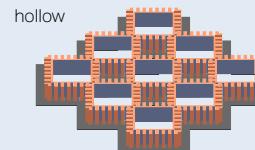
both



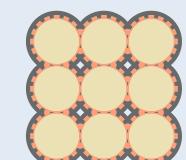
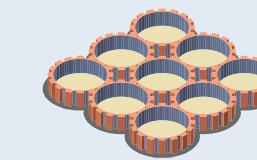
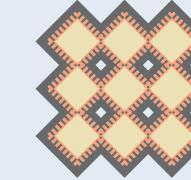
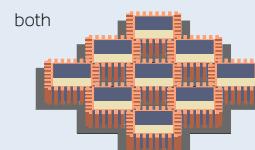
fi



hc

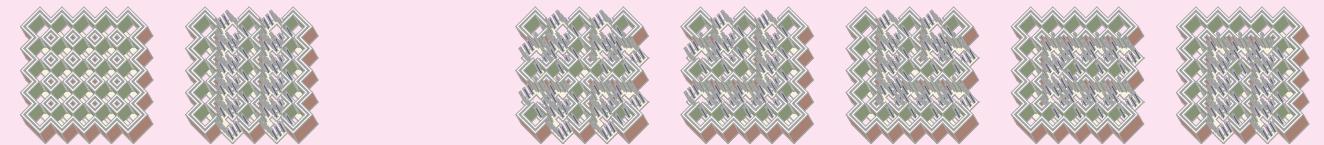


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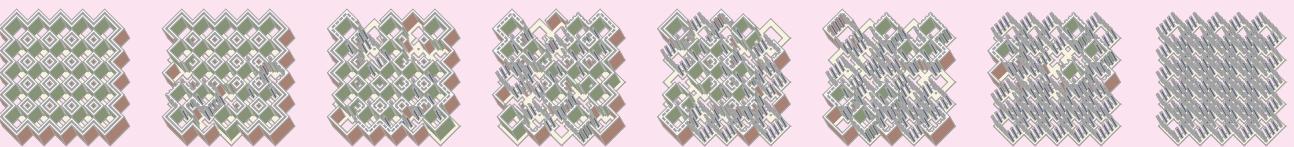


Grid

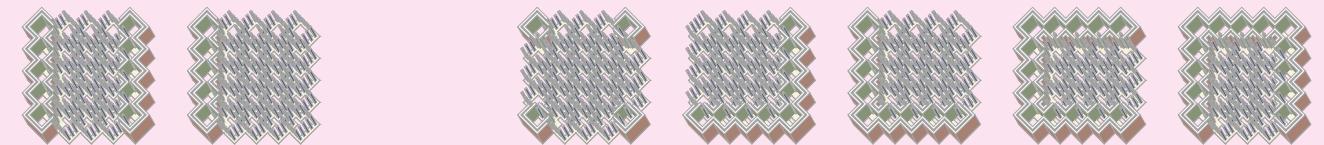
variation | shape visibility



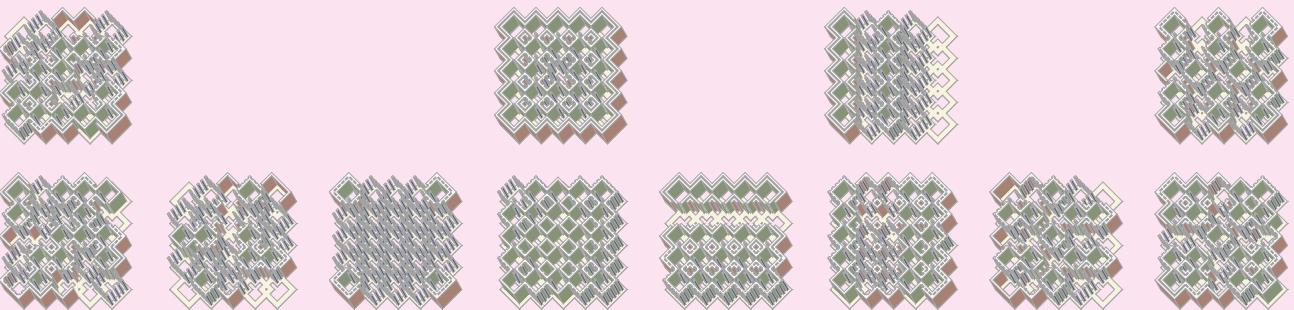
alternate



percer



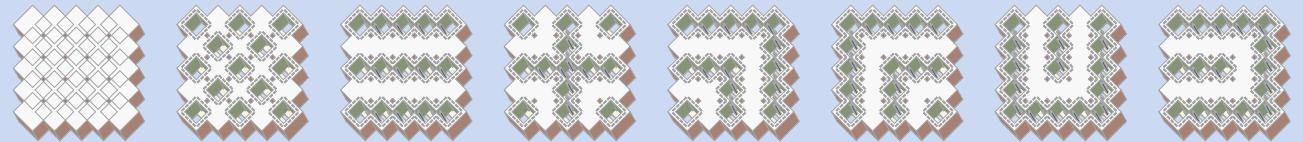
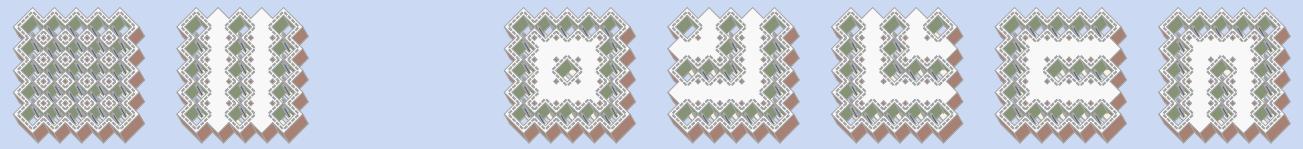
devide



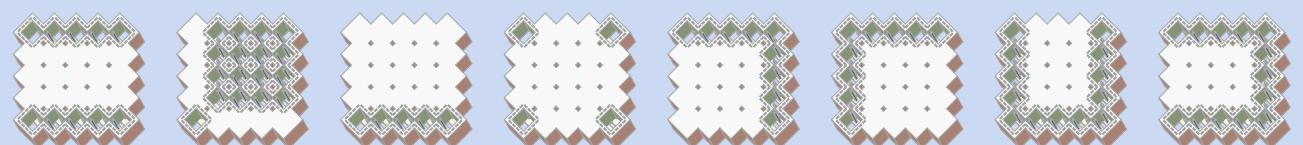
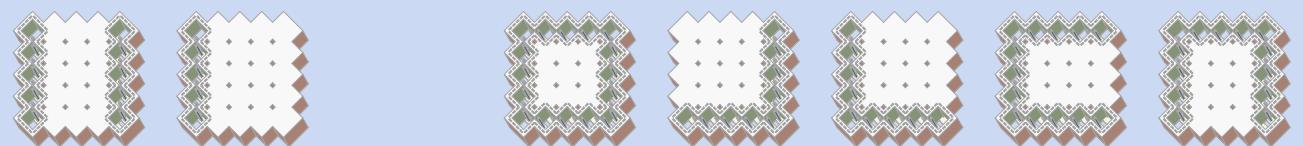
random

Grid

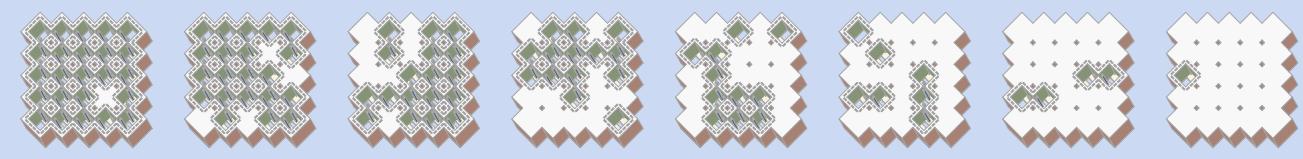
variation | mass type



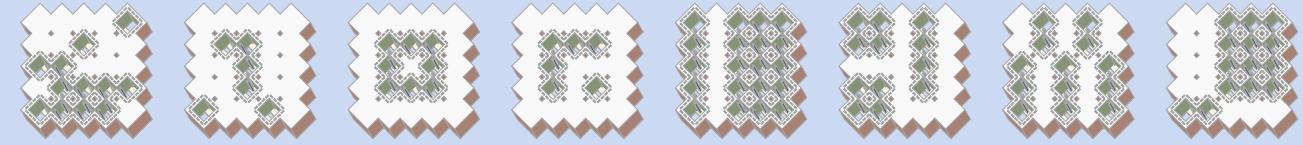
alternate



devide



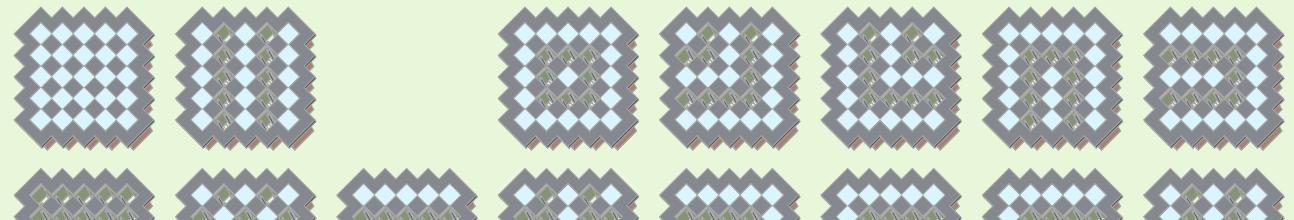
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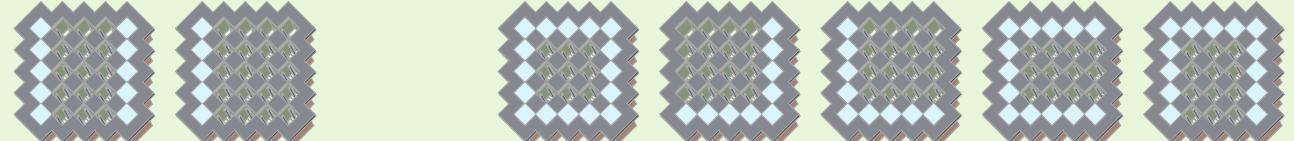
random

Grid

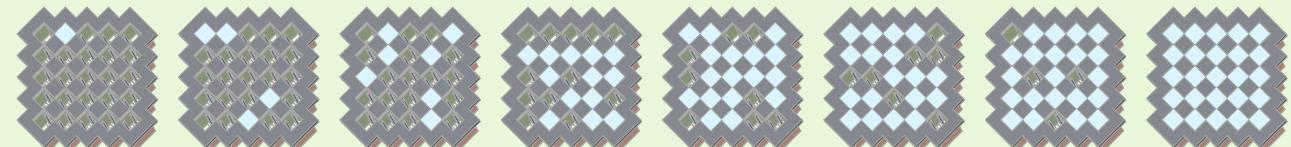
variation | roof type



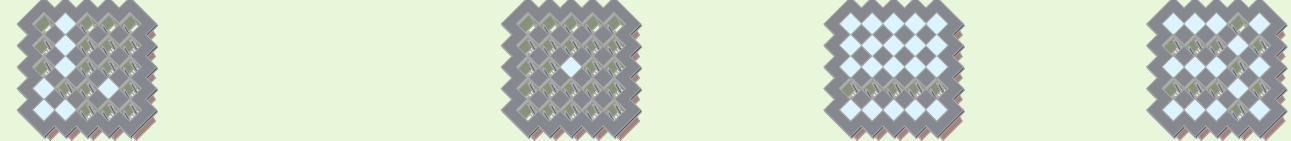
alternate



devide



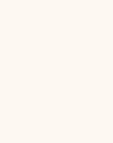
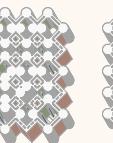
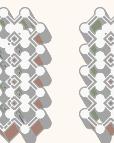
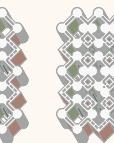
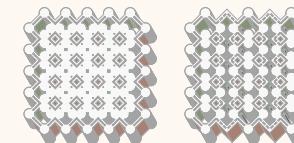
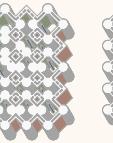
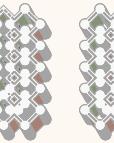
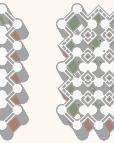
percent



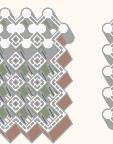
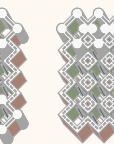
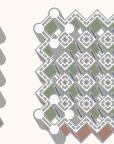
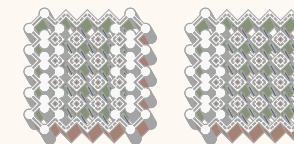
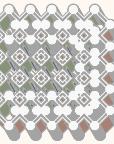
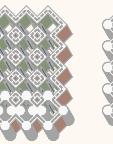
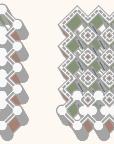
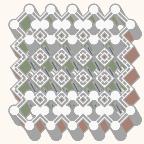
random

Grid

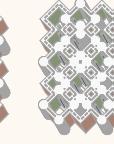
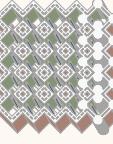
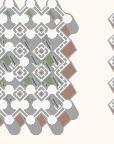
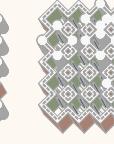
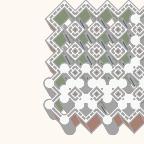
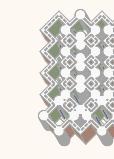
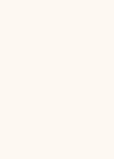
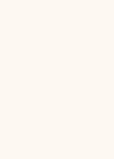
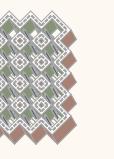
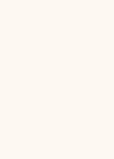
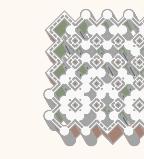
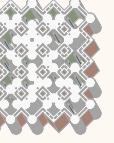
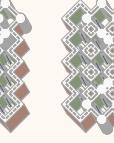
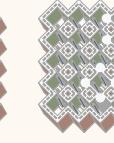
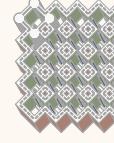
variation | column type&size



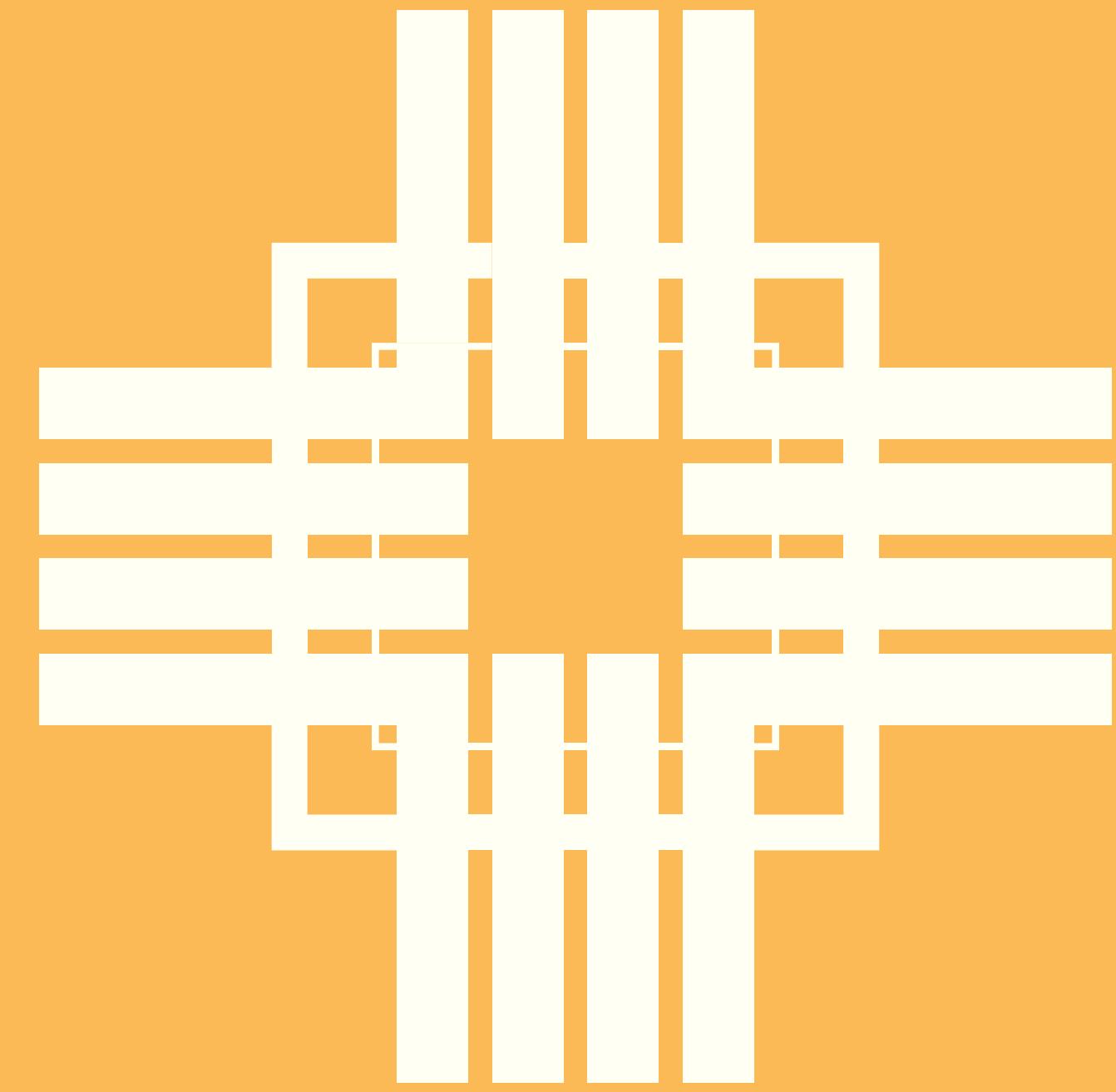
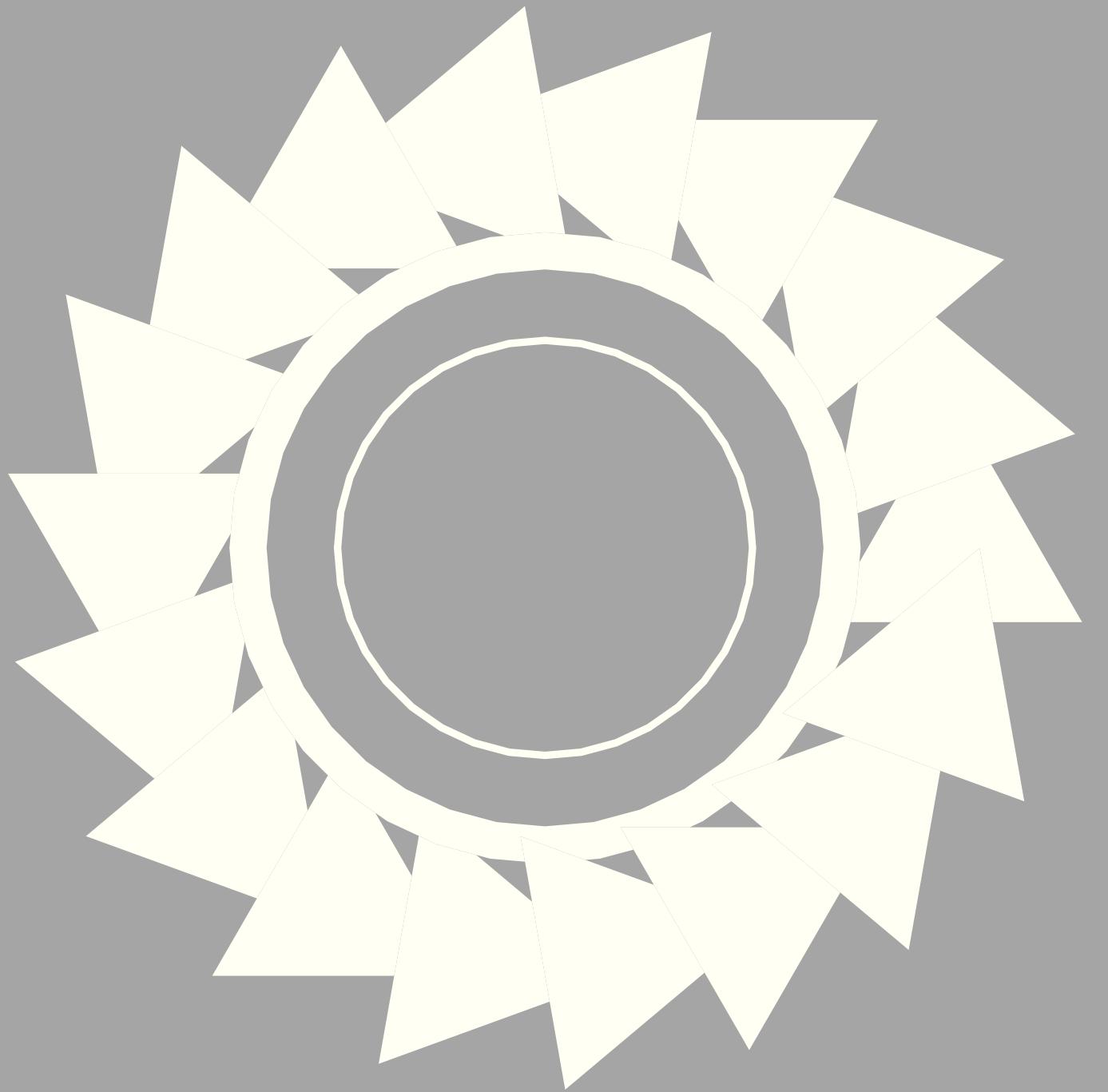
alternate

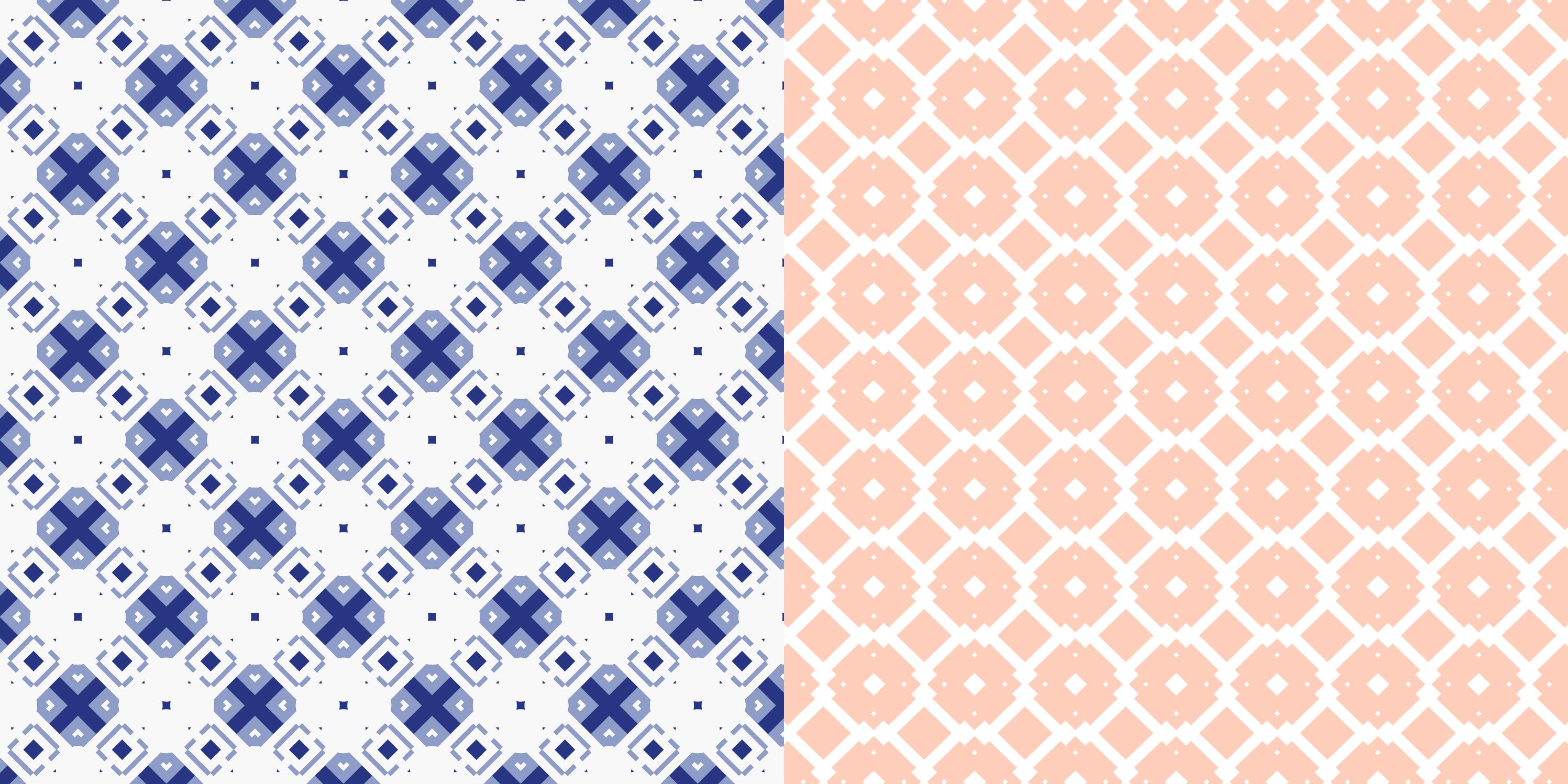


devide



random





SPACE STUDY | EXPLORATION

Now I got a object that can perform perfectly. There are many ways to explore how I can use this to create interesting objects. First, I explore the envelope in a single shape with a logic that the proportion and geometry prameters change sequently and independently. Then I explore how these prameters can co-operate with each other and collect the workout. In the grid level, the variation becomes the most charming and powerful part of creating patterns and space, but I chose to start with two shape as a group to explore the relationships between, based on which several ways of combination can be developed out.

Shape

column resolution



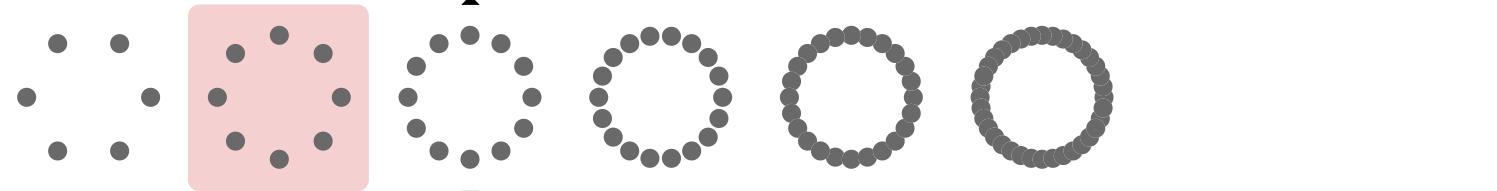
column movement



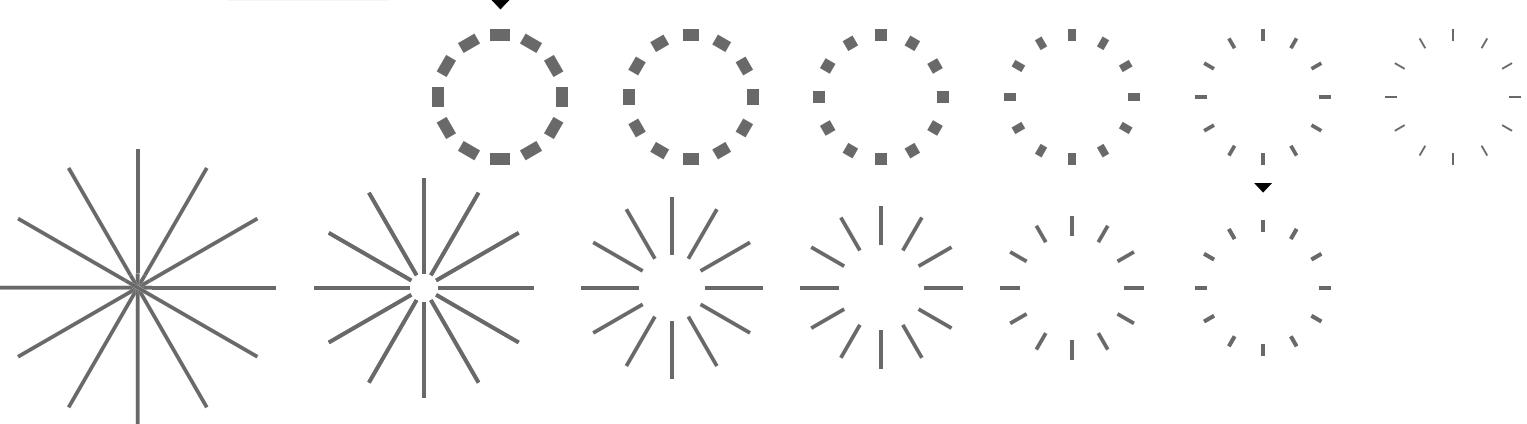
column radius



column interval (minimum angle)



column width



column depth

Shape

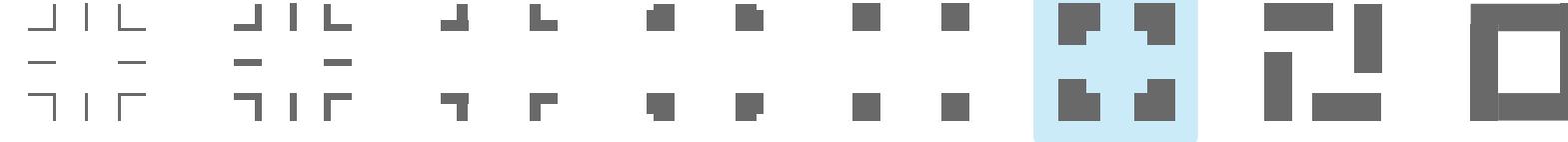
column number (Y)



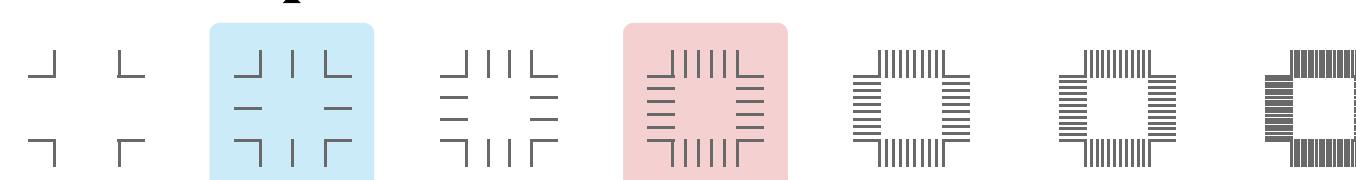
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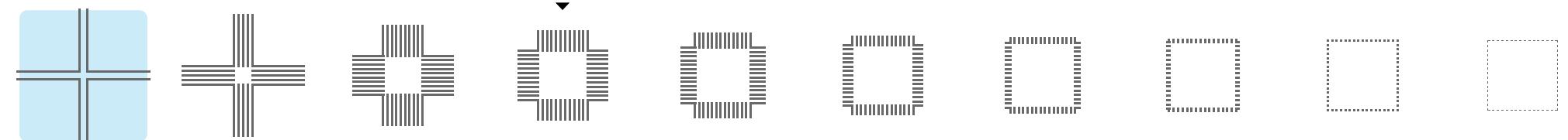
column width



column interval (minimum length)

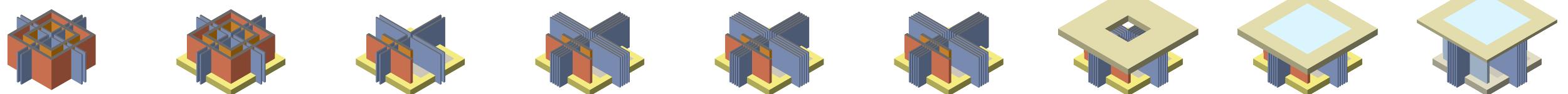
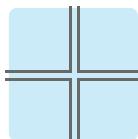
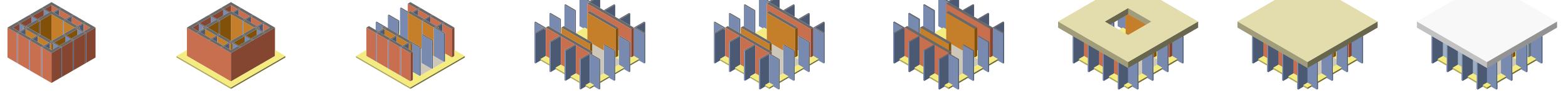
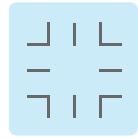
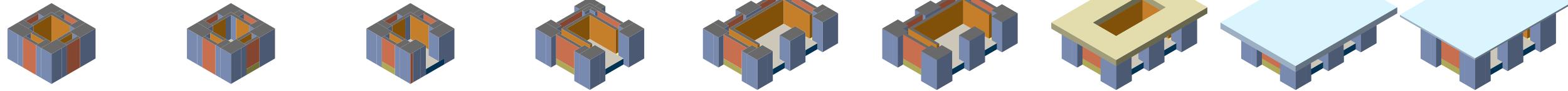
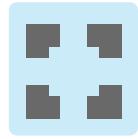
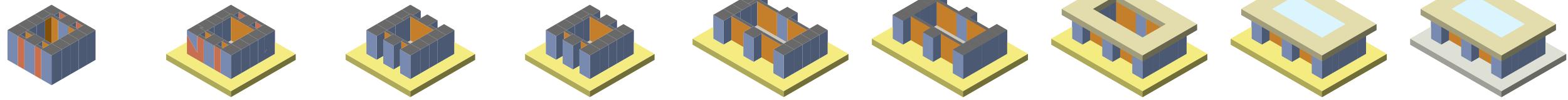


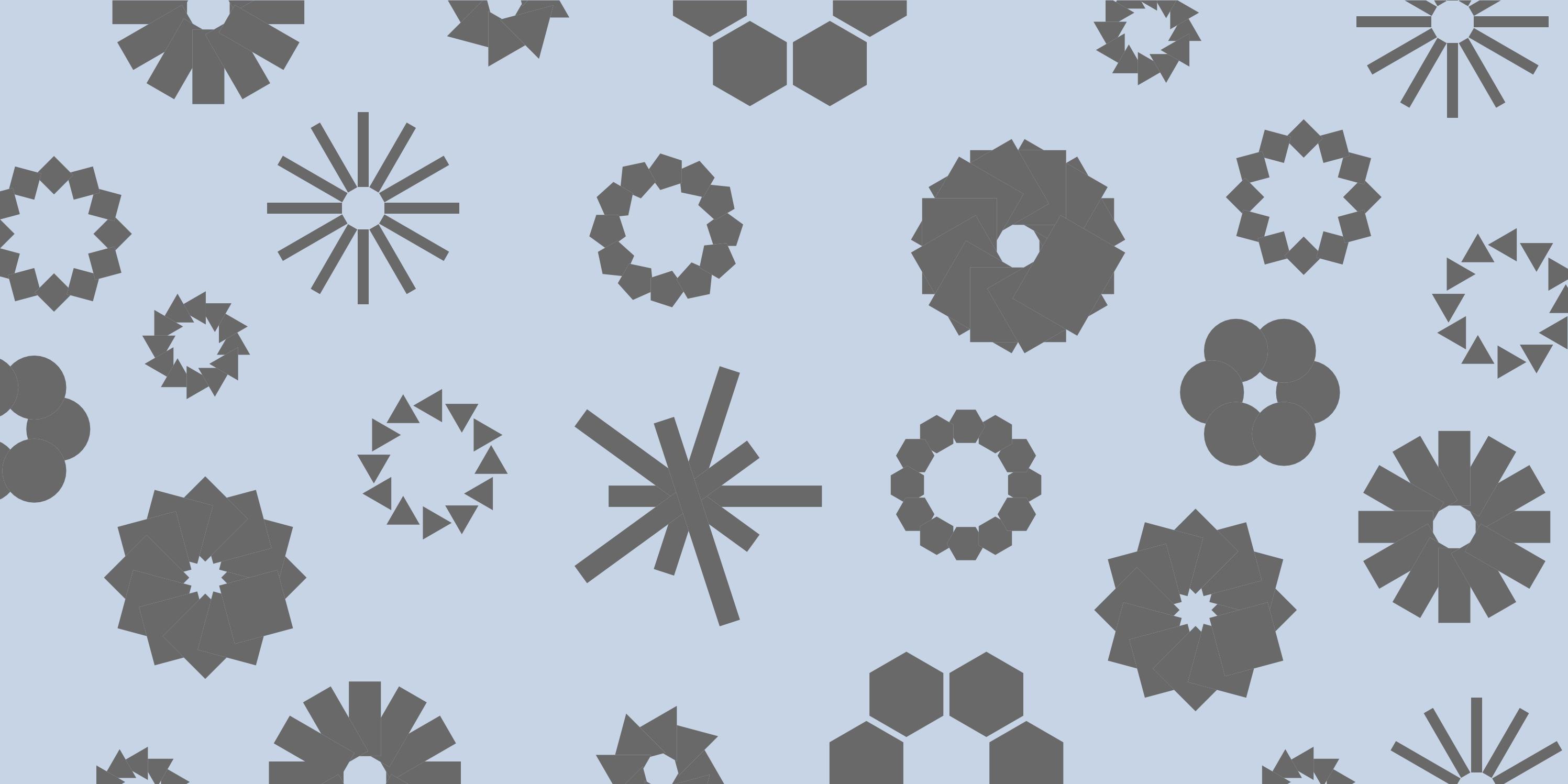
column depth

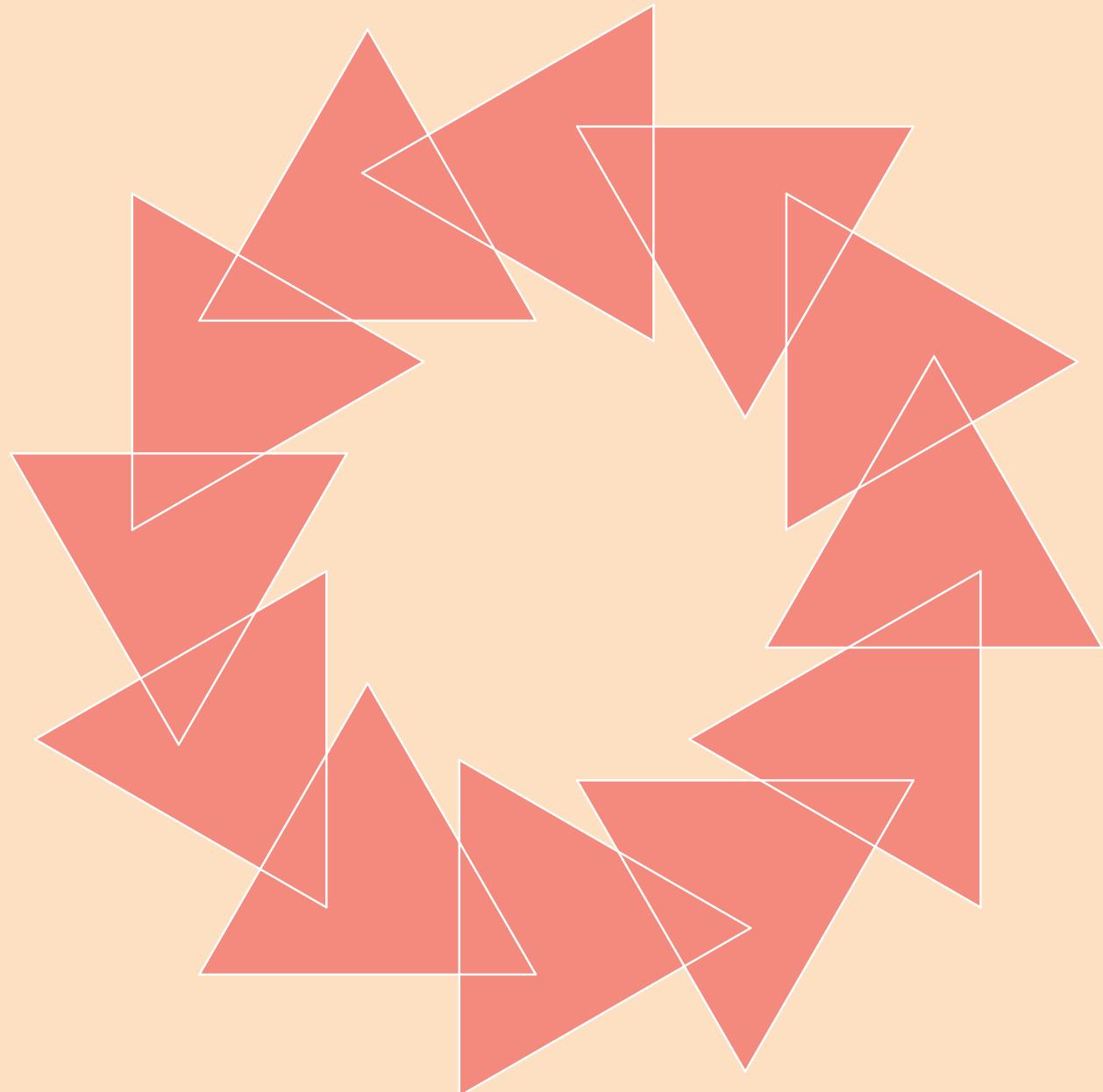
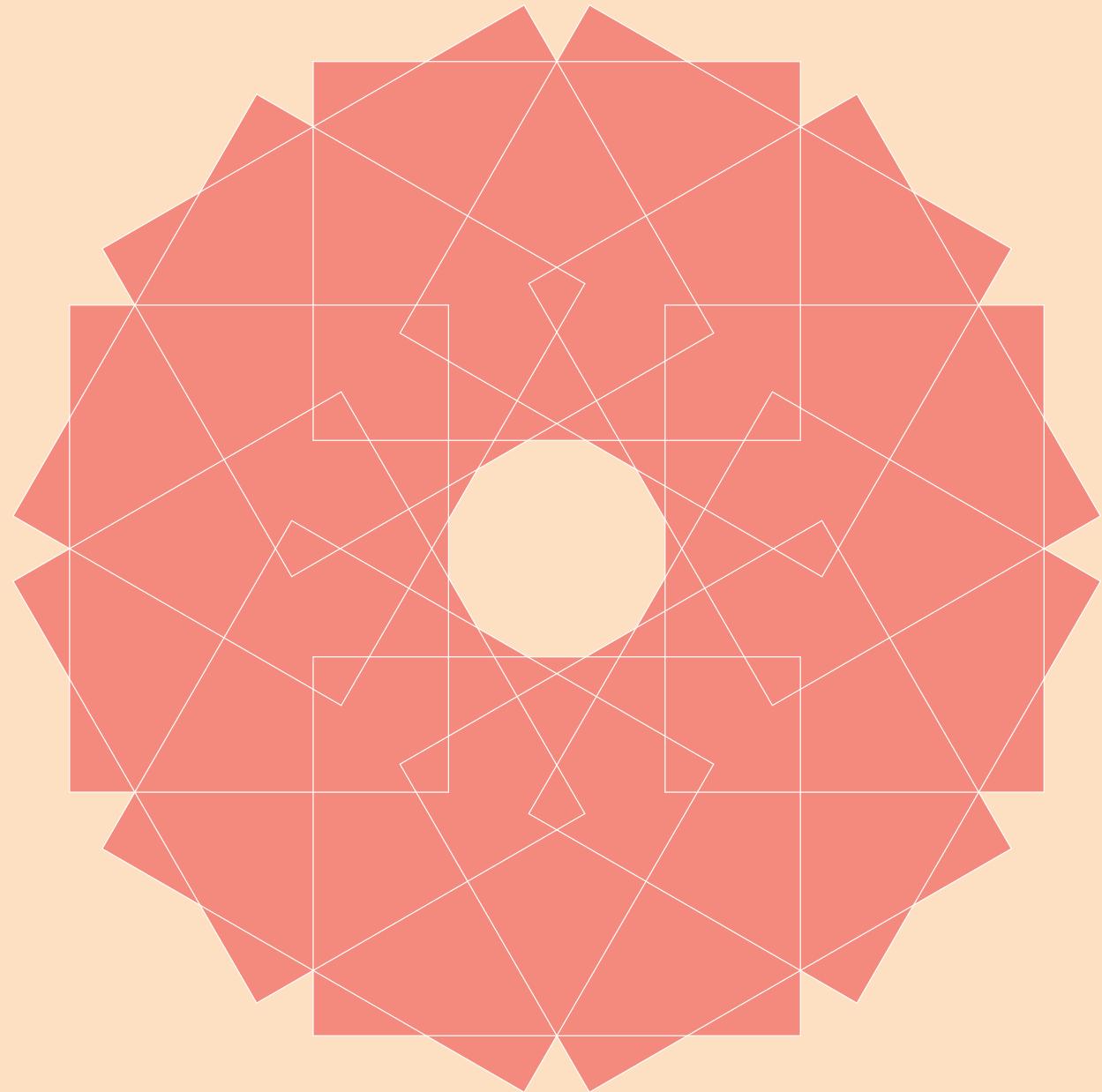


Shape

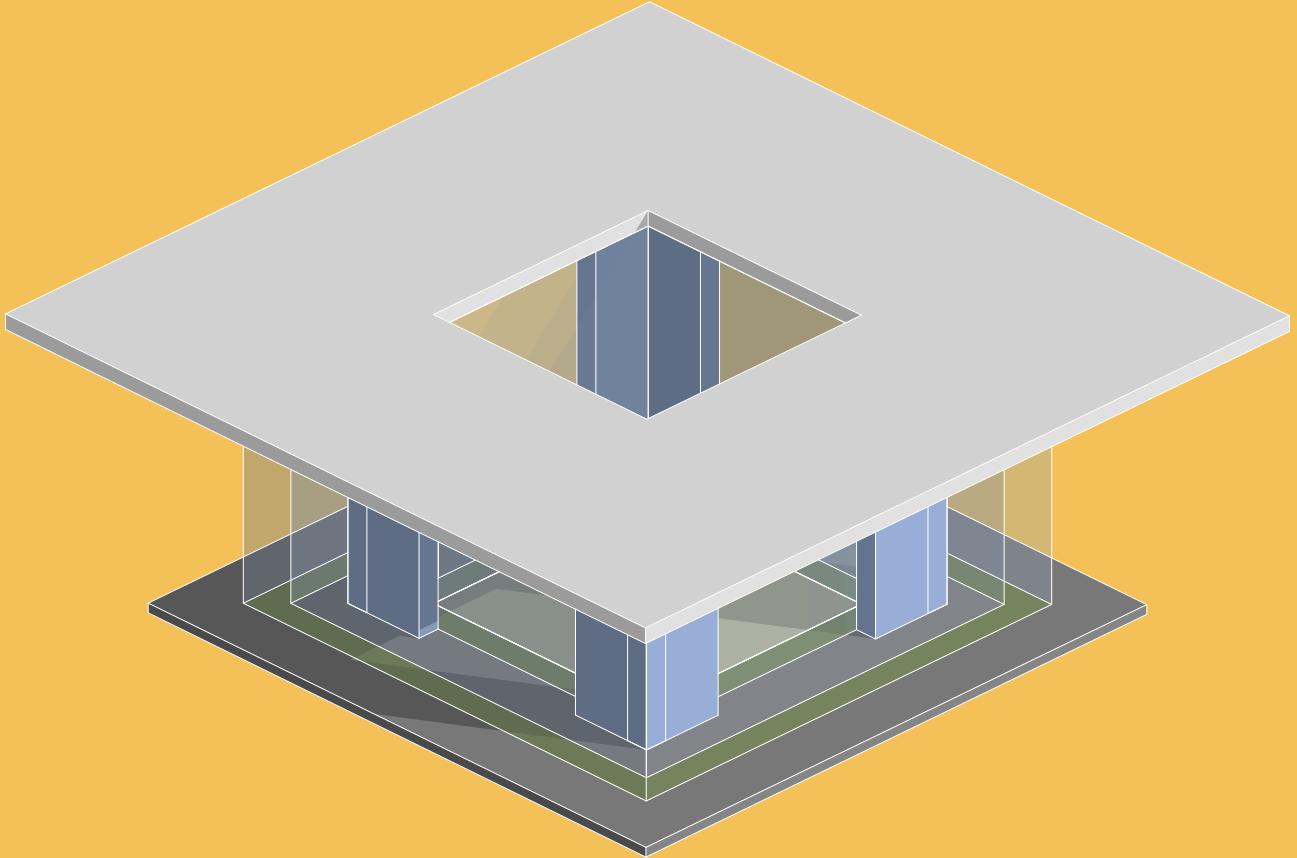
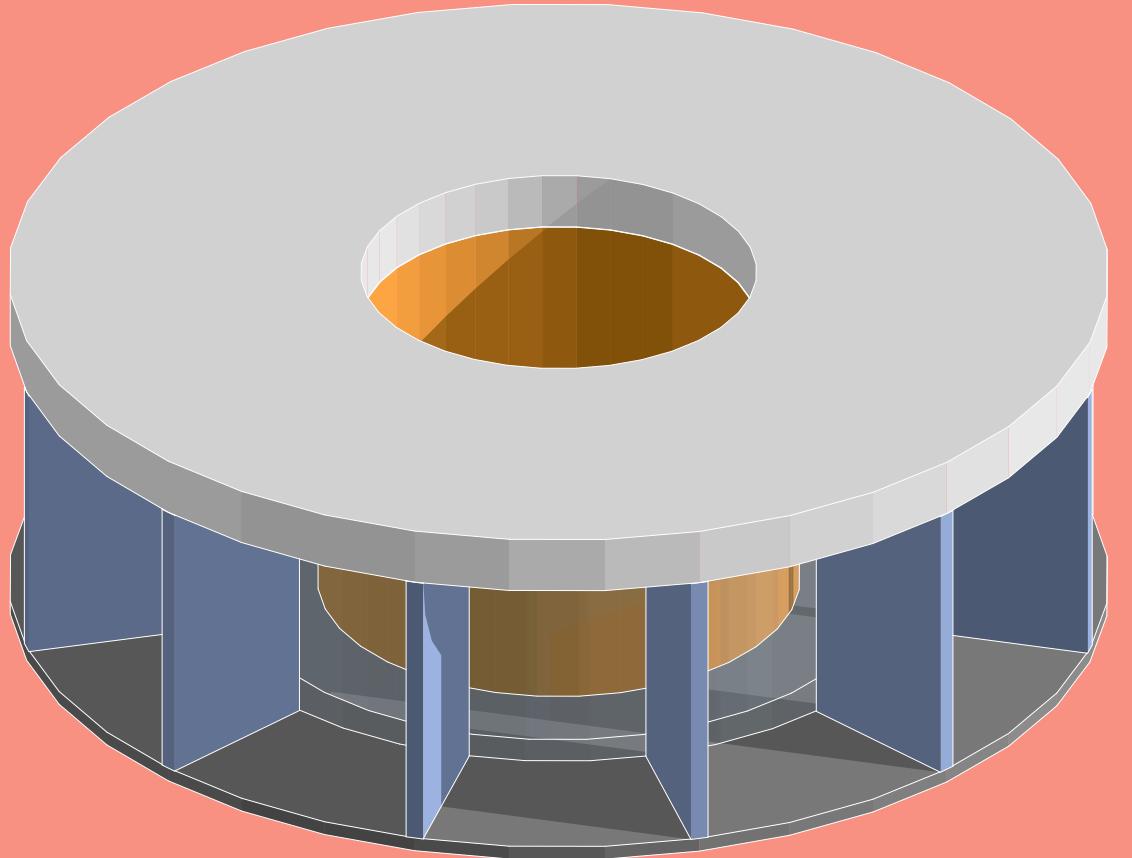
1 Unit

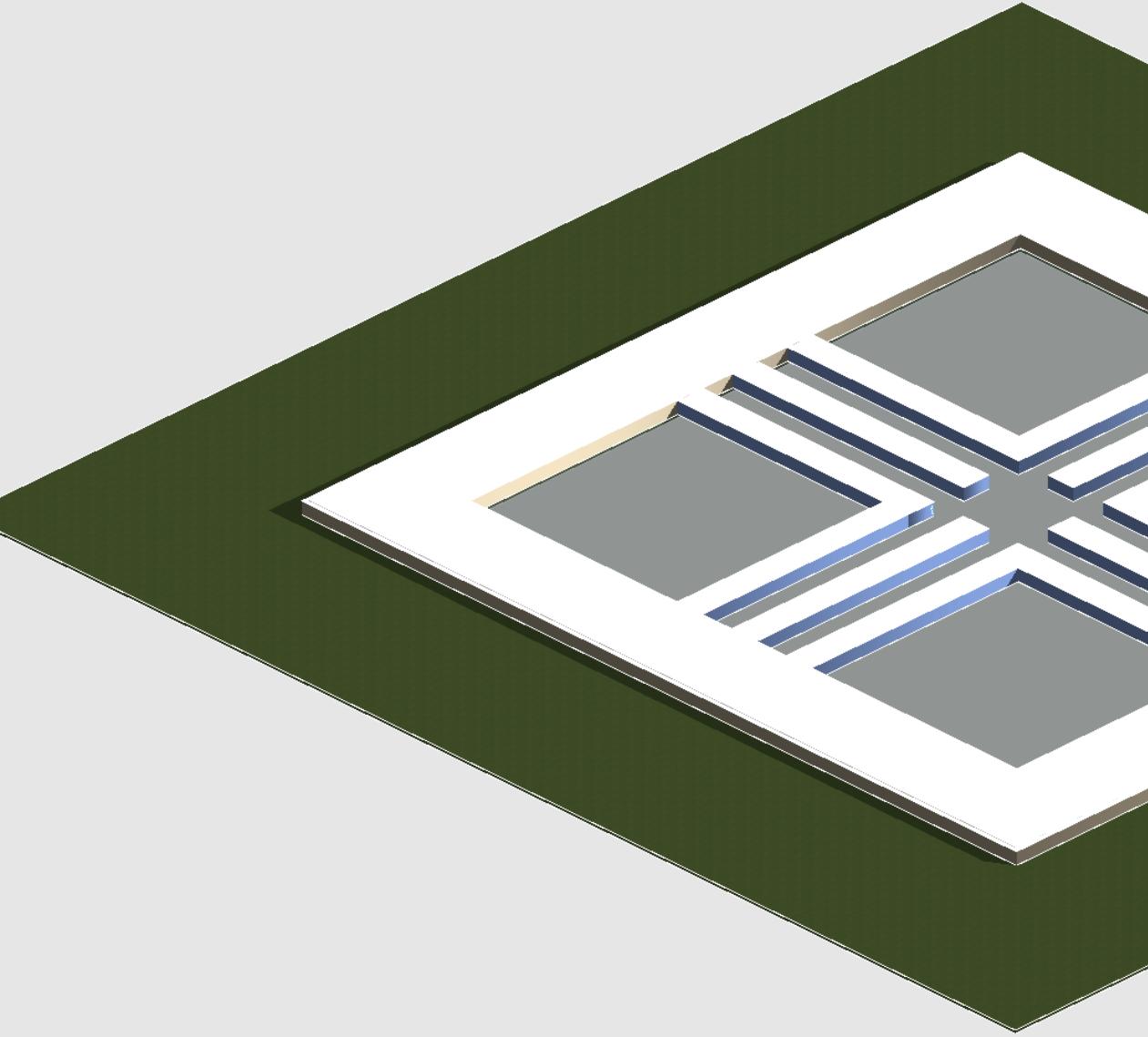
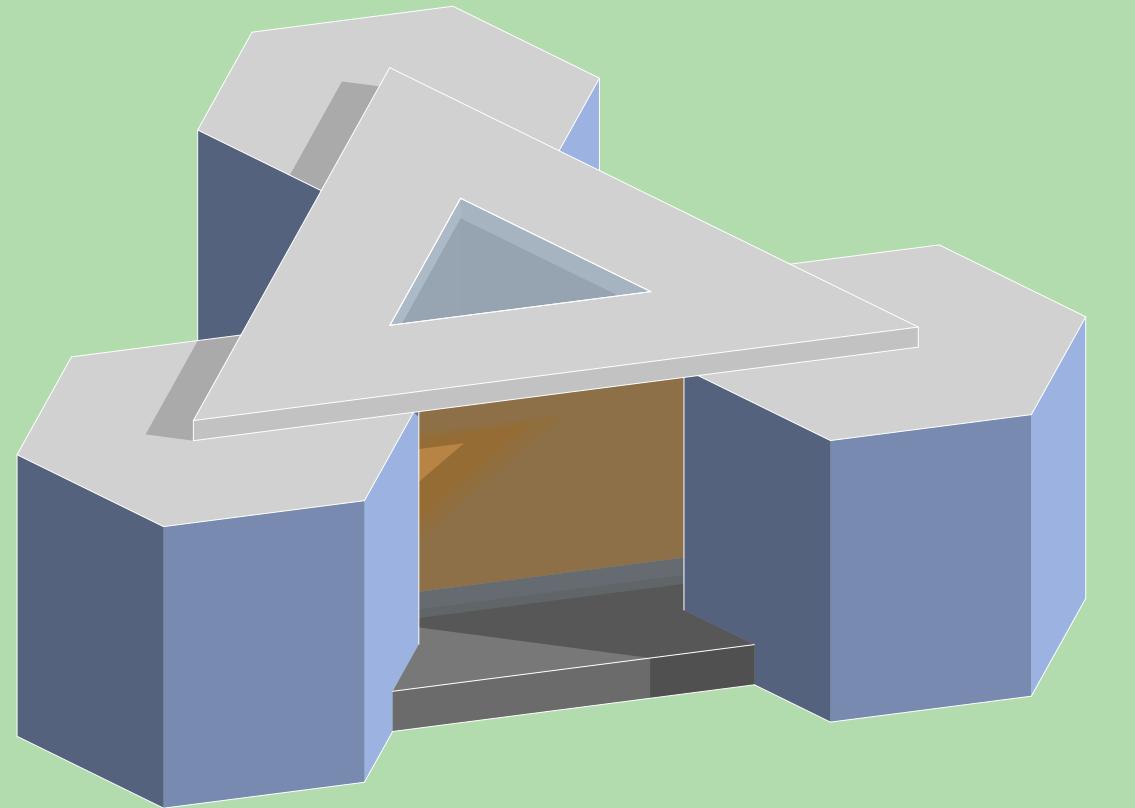








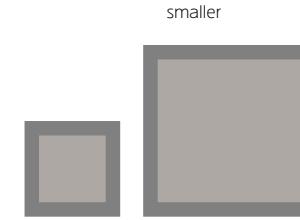
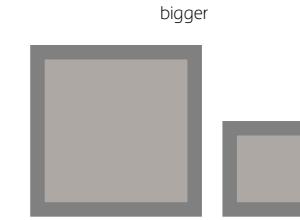
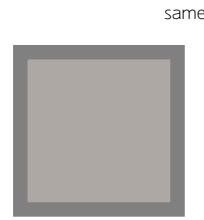




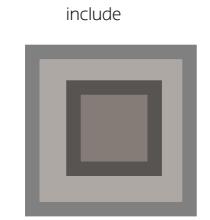
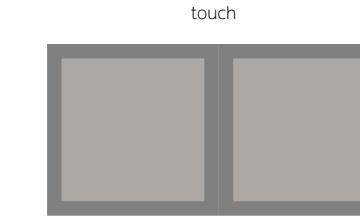
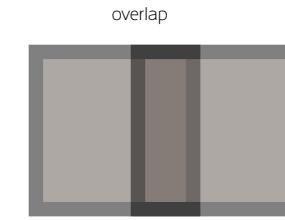
Grid

2 Units | 1 Pair

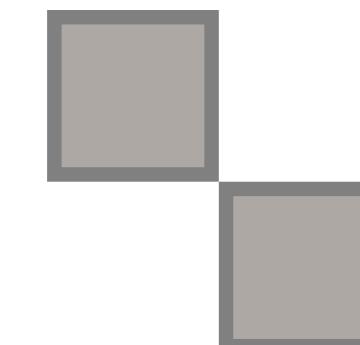
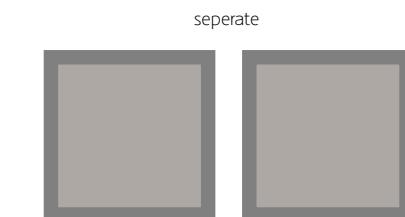
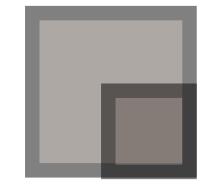
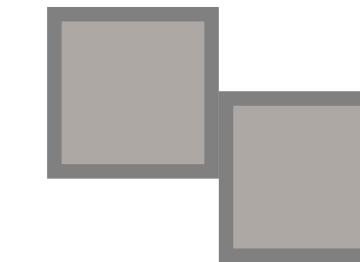
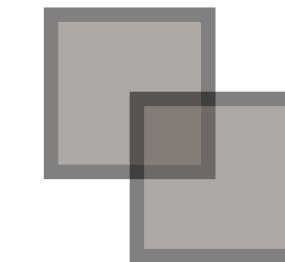
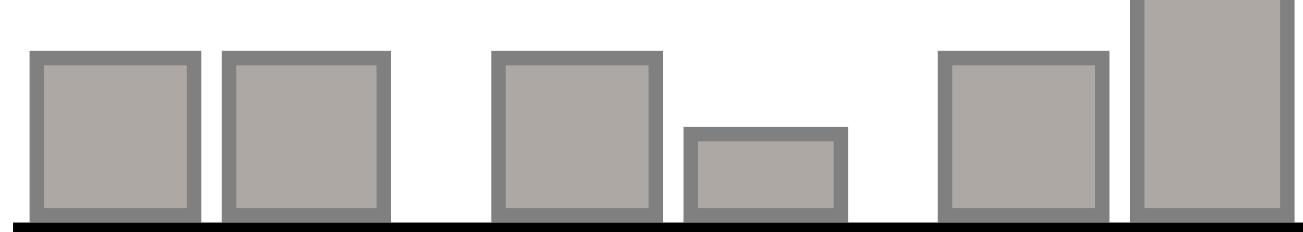
size



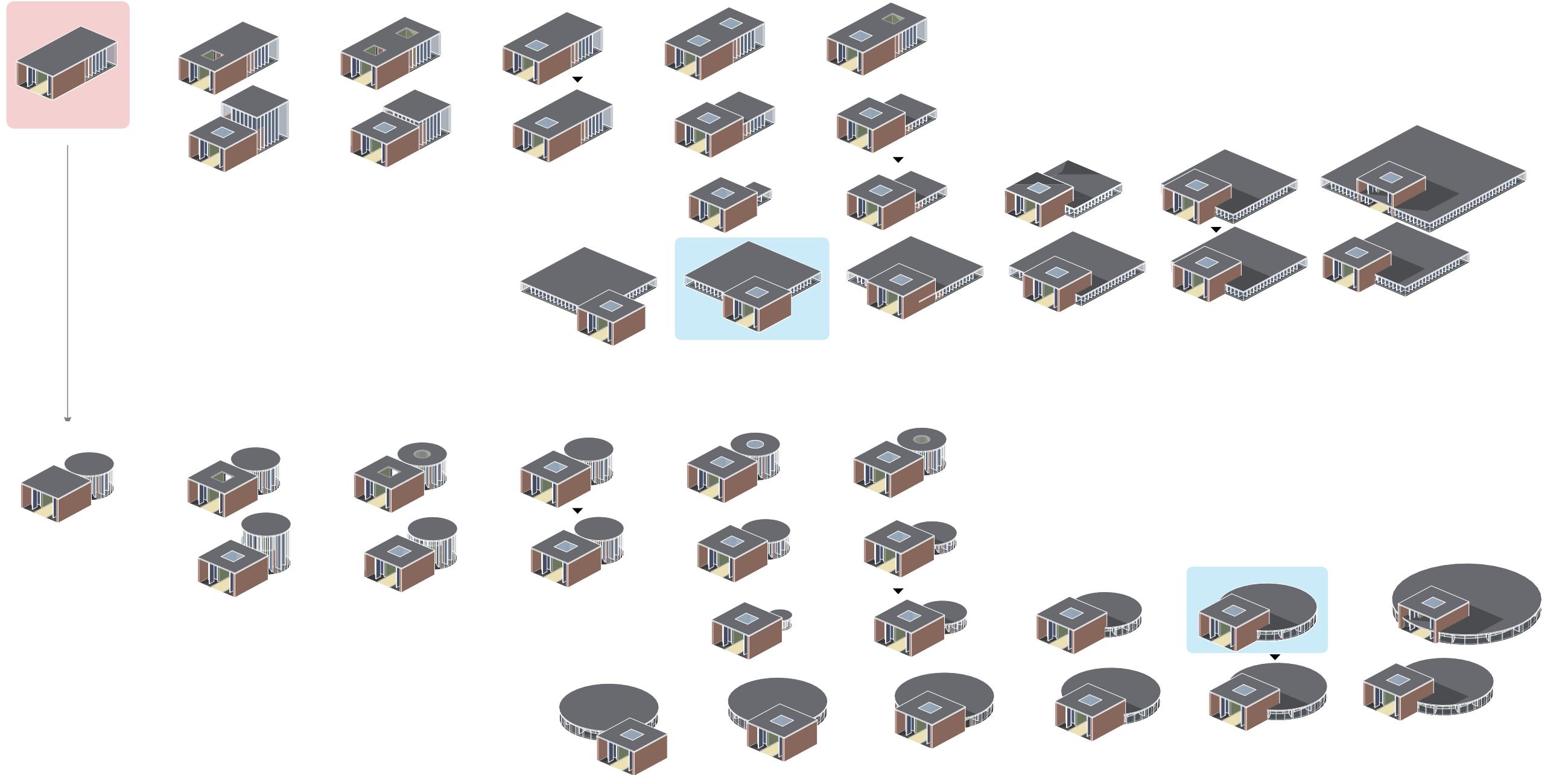
position

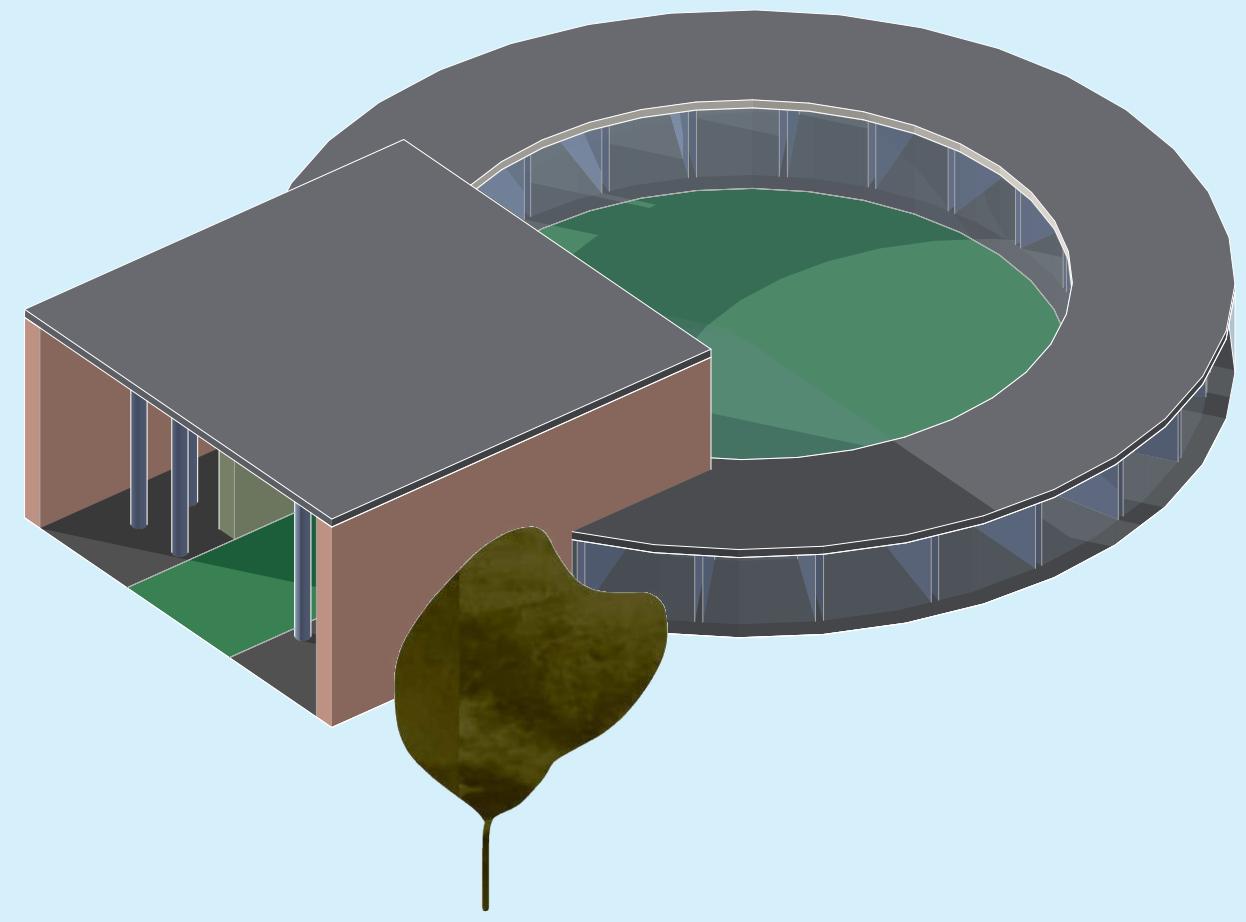
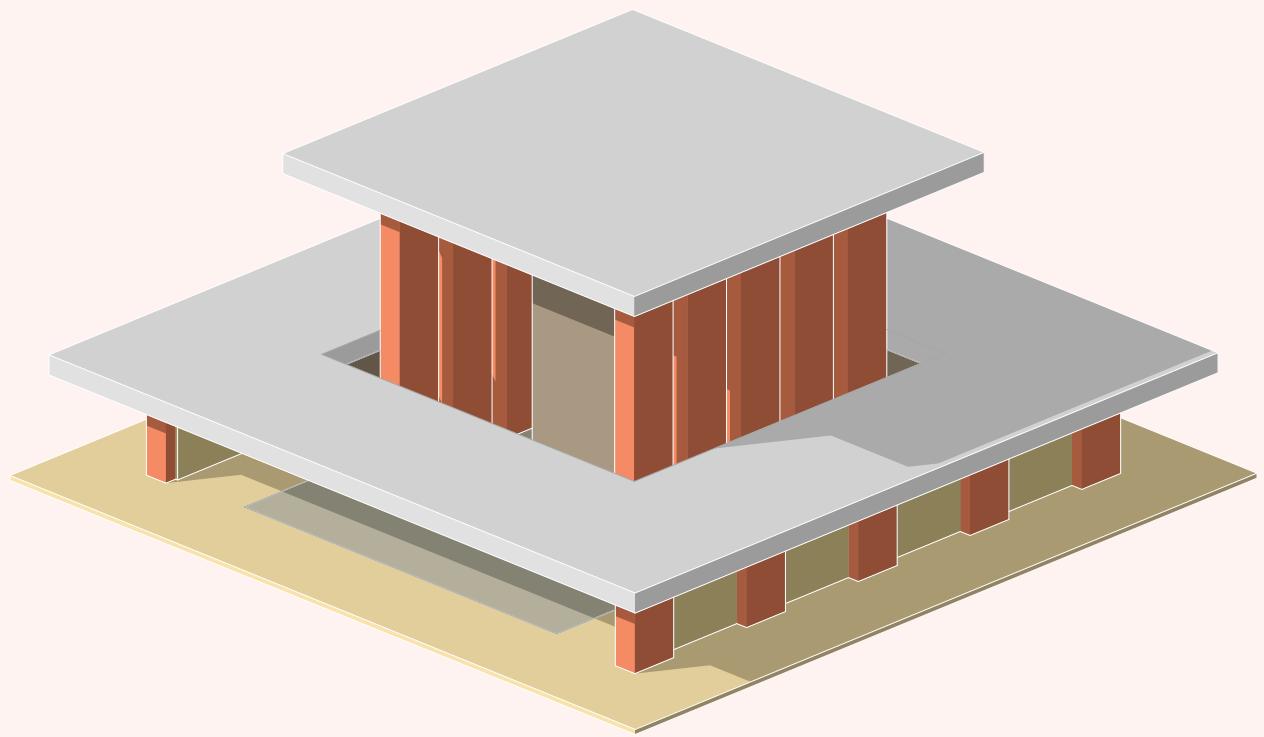


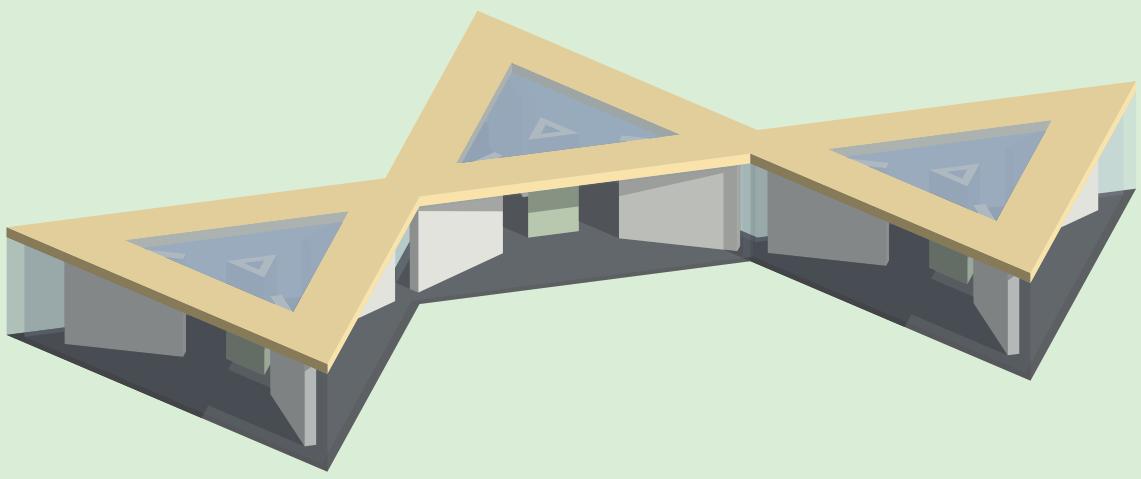
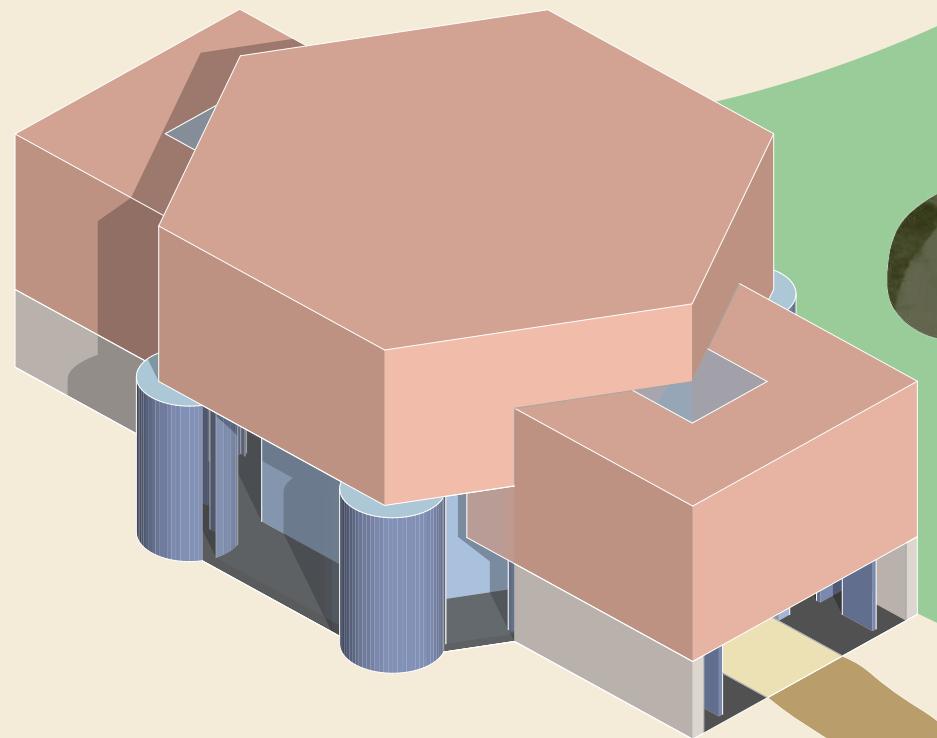
height

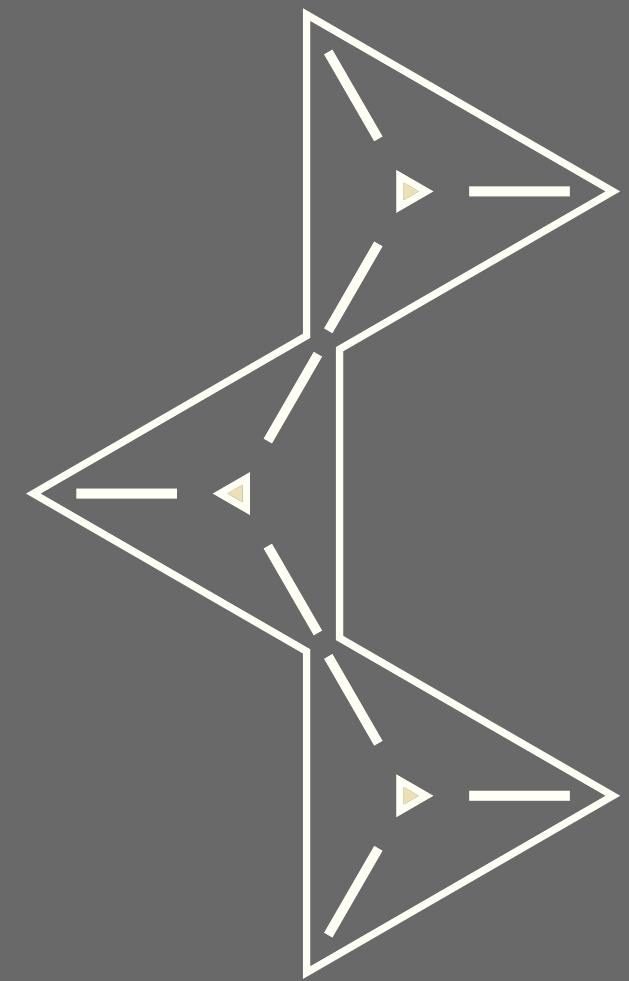
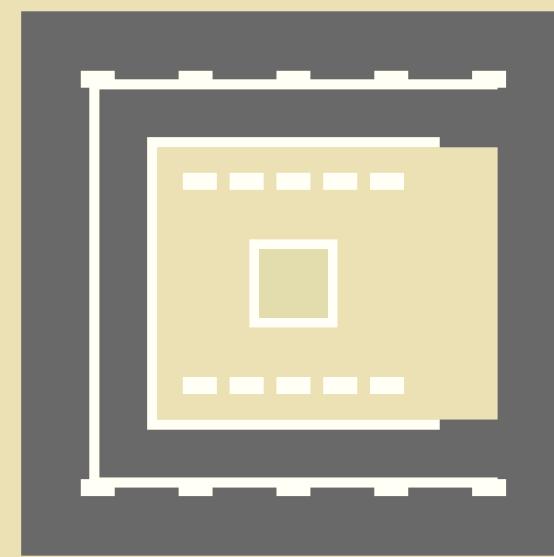
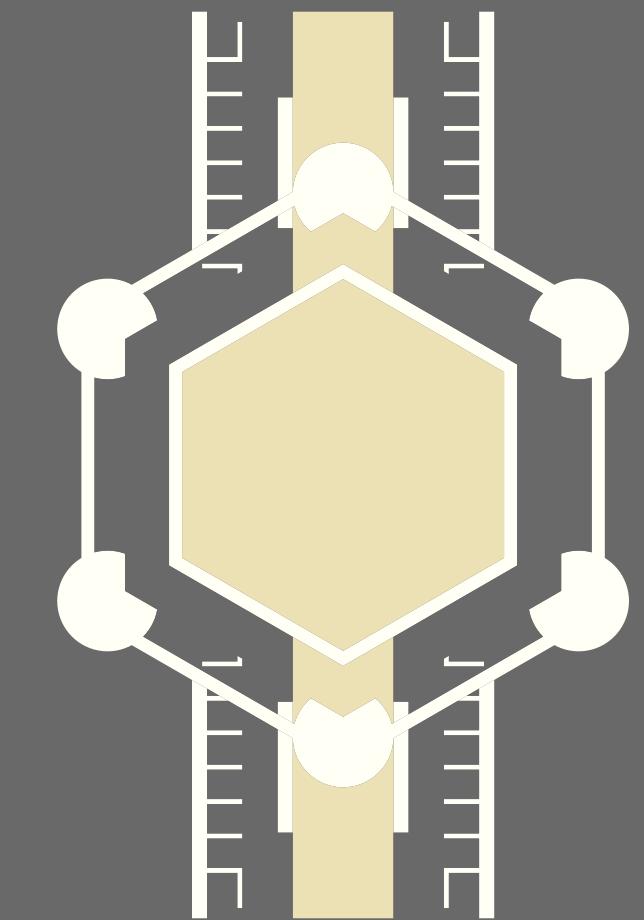
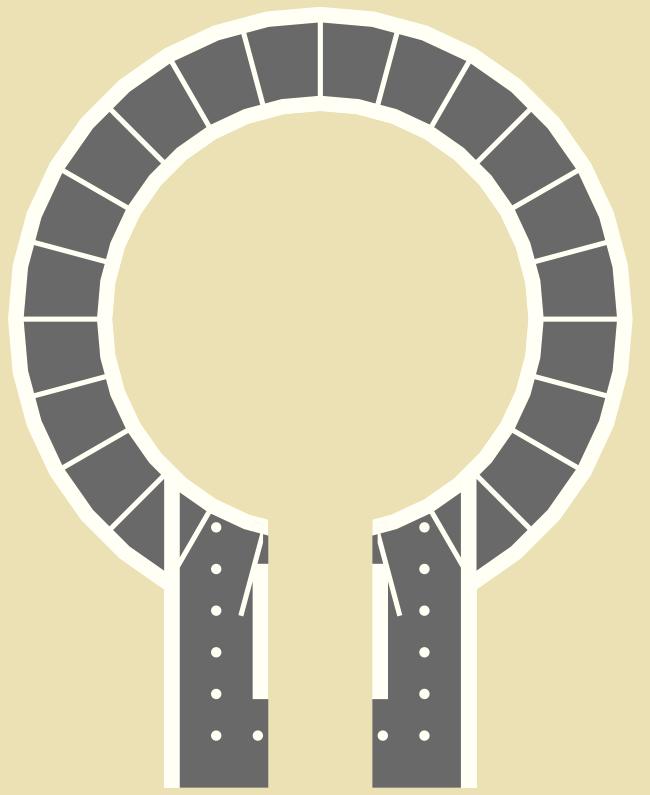


- roof type
-
- mass type
-
- space type
-
- shape
-
- material
-
-





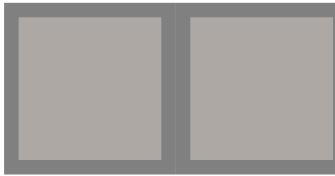




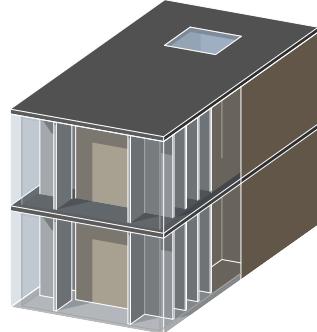
Grid

From 2 to several | Several Pairs

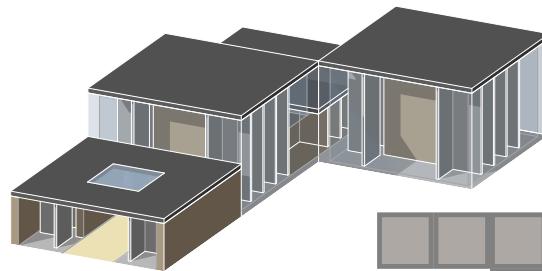
1x2



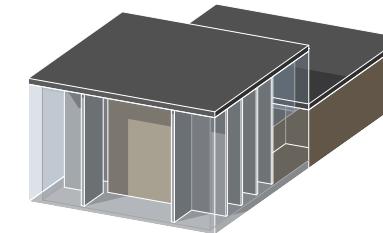
multiple



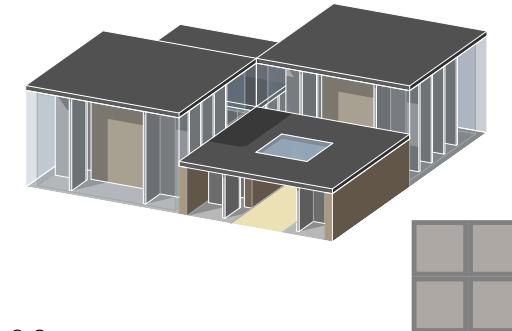
1x2x2



2x3-2



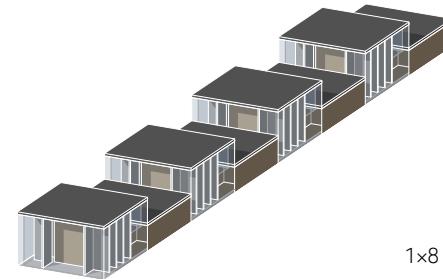
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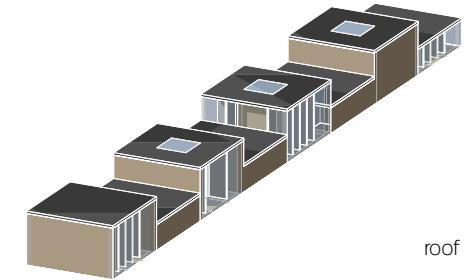
1x4



scale | expand | movement



1x8



roof

• • • • • • •



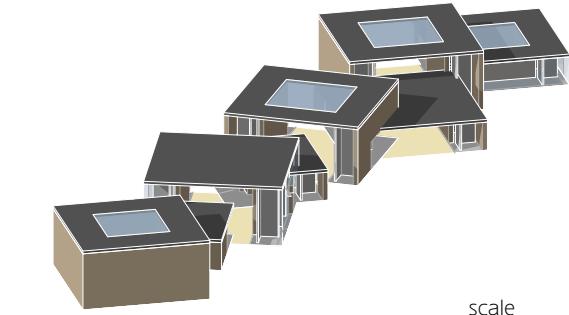
rotation



movement



rotation+movement



scale

