

# CIRCULAR THINKING

**Digital Craftsmanship:  
Growing Buildings as Eco-Systems**

---

*Arthur Mamou-Mani AAdip, ARB/RIBA, FRSA*





# PRACTICALITIES OUR ECO-SYSTEMS



MAMOU-MANI



fabpub

— **WeWantToLearn.net**

Diploma Studio 10 at Westminster University School of Architecture and the Built Environment

 Silkworm

**SimplyRhino**  
*sales, training and support*

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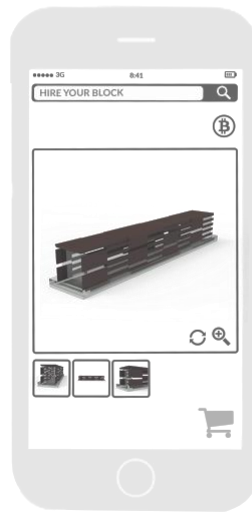
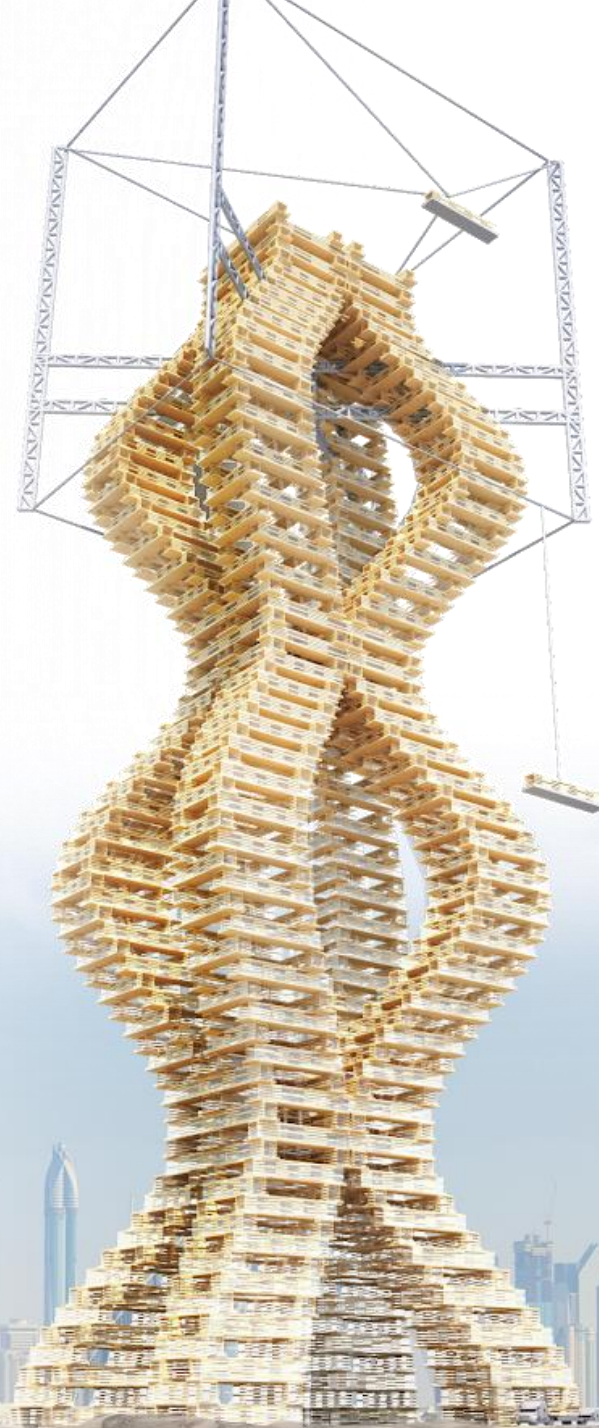


**DIGITAL  
FABRICATION  
UNDERSTANDING  
AND WORKING  
WITH THE  
MACHINES**





**DIGITAL  
FABRICATION:  
HOW CAN WE  
SCALE IT UP TO  
BUILDINGS?**

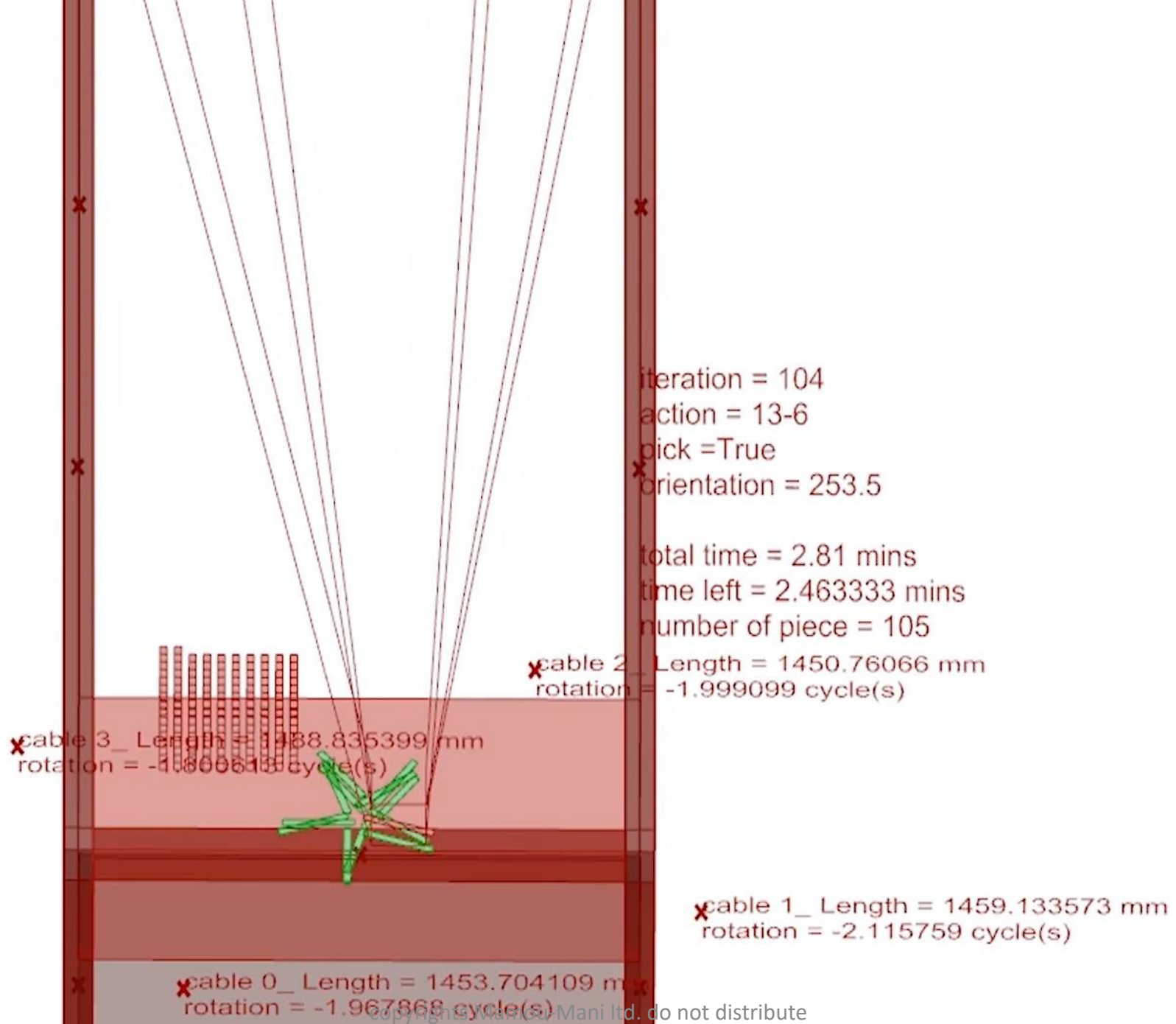




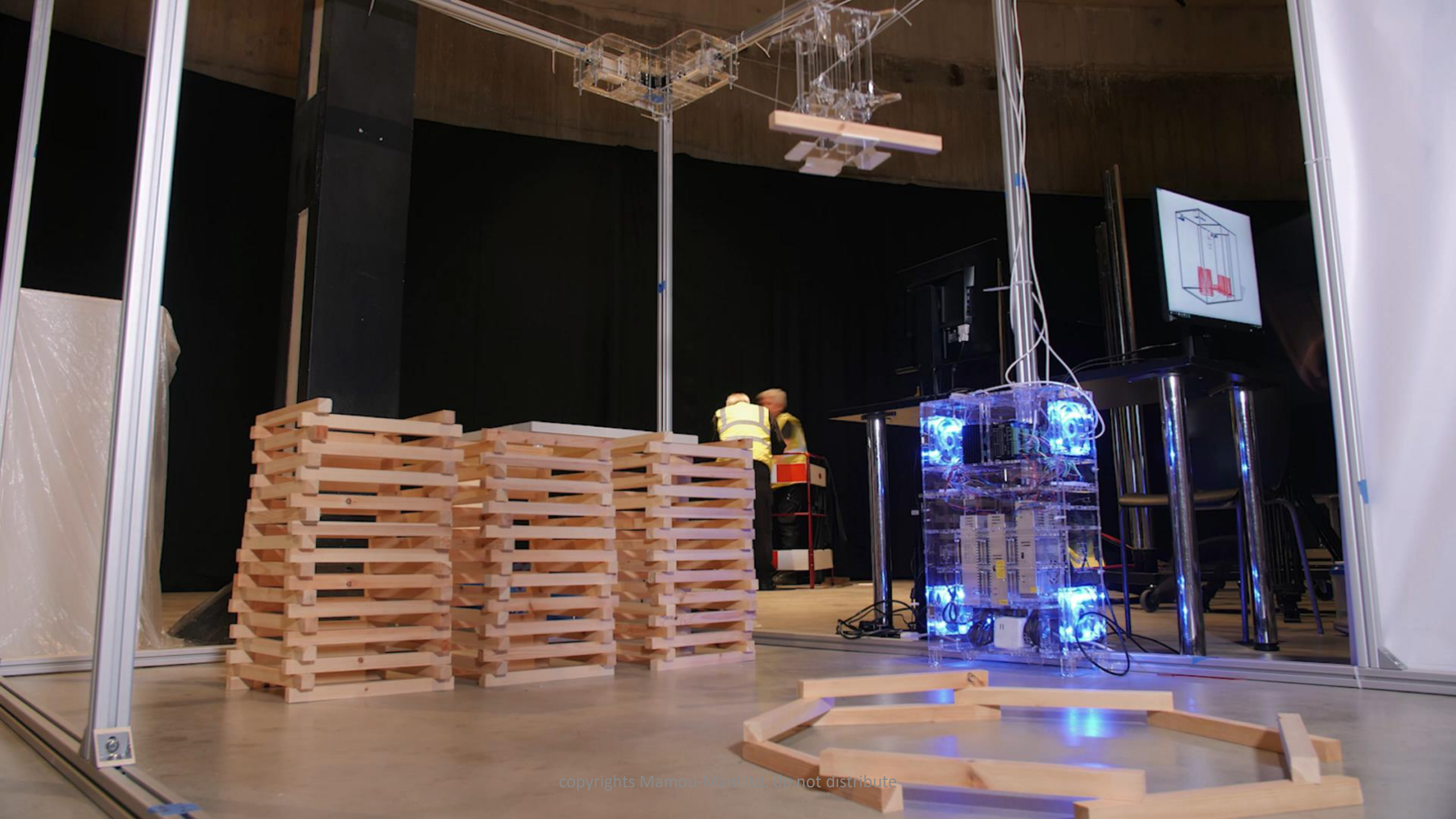
**VERTICAL TIMBER TOWERS**  
**BUILT AND UNBUILT**  
**DEPENDING ON THE**  
**ECONOMY**













**BUILDING  
&  
BURNING  
NOT BEING  
SCARED OF THE  
TEMPORARY**







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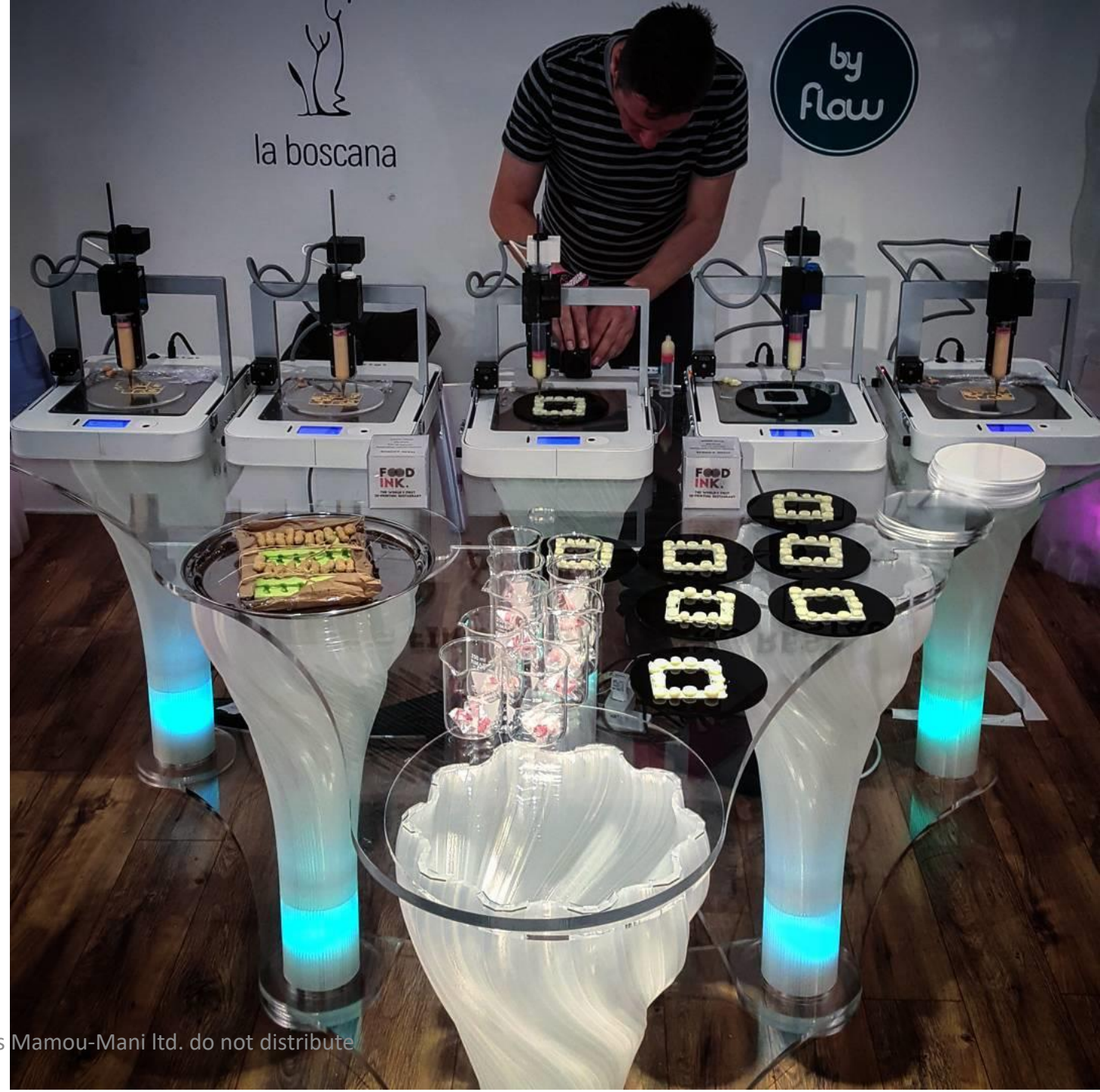
**WE DON'T  
ALWAYS BURN  
WORKING  
WITH THE  
DREAMS**



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**A HOLISTIC APPROACH TO  
DESIGN WHICH INCLUDES  
3D PRINTING FOOD**





**AND BEING THE  
MAKERS  
OF OUR OWN  
PROJECTS**





**CREATING  
ARCHITECTURE  
GROWING  
FROM  
PARAMETERS**



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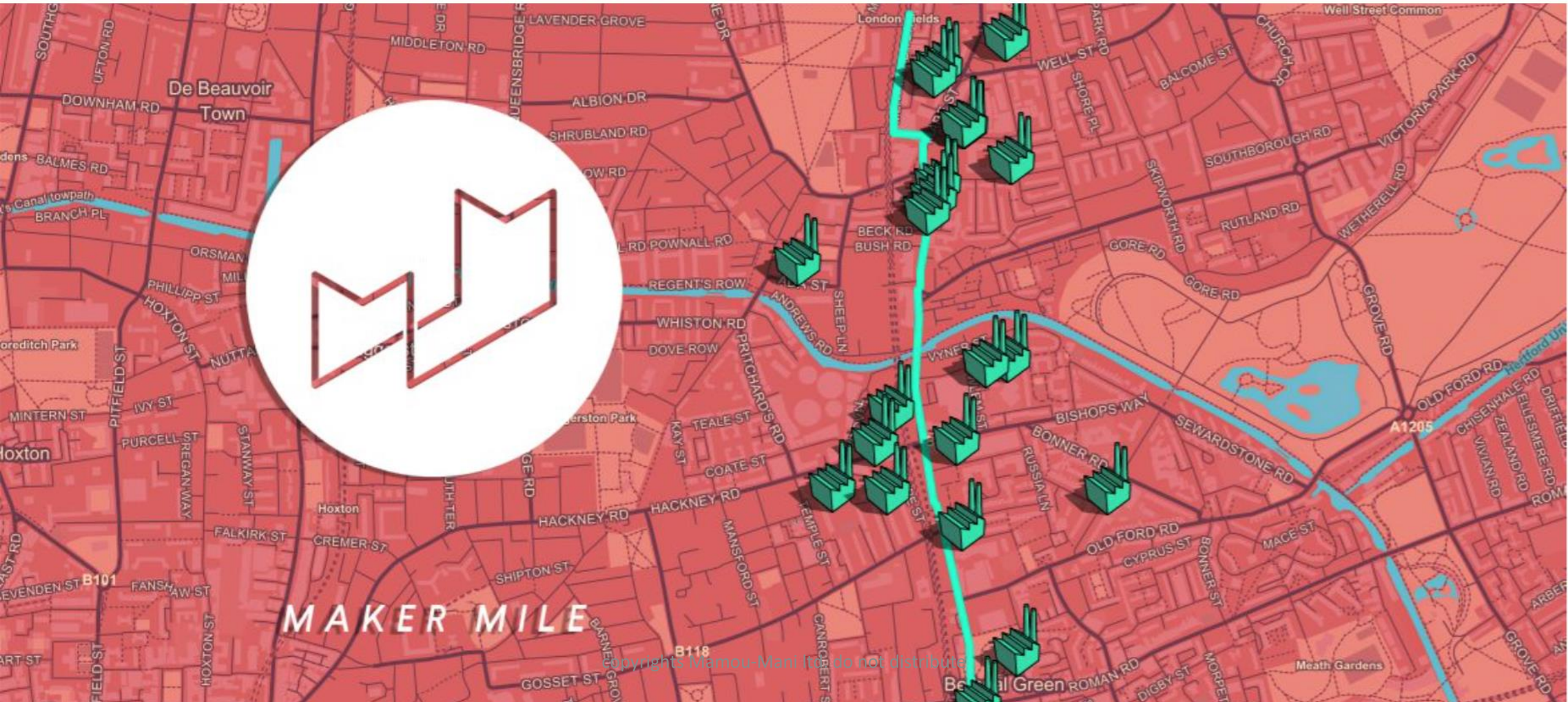


# PARAMETRIC DESIGN IS AN ECO-SYSTEM OF TOOLS





# WE REALISE AND SHARE OUR DESIGNS IN **THE MAKERMILE**



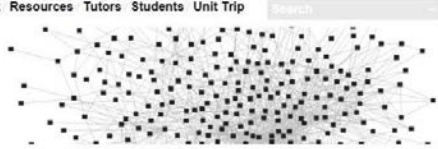


# SHARING DESIGN IDEAS AND TECHNIQUES AROUND THE WORLD

## — WeWantToLearn.net

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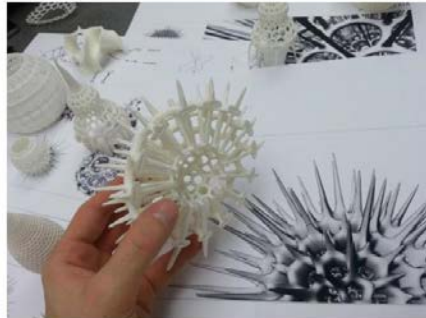
BURNING MAN Brief Work Resources Tutors Students Unit Trip



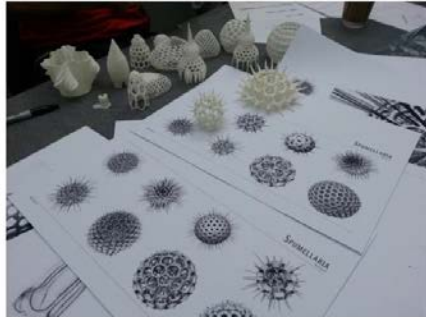
By Arthur Mamou-Mani  
October 17, 2013  
Tutorials, Work  
1 Comment  
Edit

### 17th October 2013 Tutorials

Another wonderful Thursday! Here are some pictures of the day. Keep it up guys, beautiful work.



Andrei Jipa's RepRap 3d printed radiolaria with digital model



Andrei Jipa's RepRap 3d printed radiolaria with some variations of one type



#### Contact Us

info@WeWantToLearn.net

#### Blog Stats

633,942 Learners since 2011/09/01

"Tell me and I forget, teach me and I may remember, involve me and I will learn." Xun Kuang (312-230 BC)

#### Delivered

We've done it! - We built two stunning projects in the desert with our students. Thank you so much to all our generous donors!



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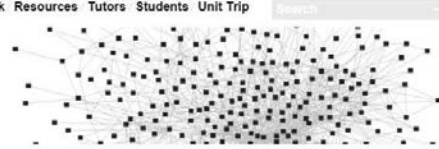
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### Archive

#### System Development: Spidron

By benajackson  
November 9, 2014

Uncategorized

1 Comment

Edit

### Tag Archives: Fabrication

First developed in 1979 by Dániel Erdélyi the Spidron is created by recursively dividing a 2-dimensional hexagon into triangles, forming a pattern that consists of one equilateral followed by one isosceles triangle. The resulting form is of six Spidron legs that, when folded along their edges, deform to create a 3-dimensional Spidron.



Initial investigations into the Spidron system using paper resulted in irregular shapes that could not be predicted, and therefore replicated precisely. Progressing onto using rigid materials allowed the system to be broken down into six components, removing unnecessary triangulated fold lines, and developing latch folded Spidron that is precisely the same as that formed parametrically.



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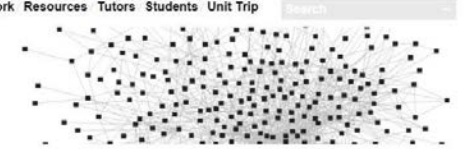
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### Archive

#### 16/05/14 DS10 Final Cross-Crit

By Arthur Mamou-Mani  
May 15, 2014

Critics, Work

Leave a comment

Edit

### Critics

We had our final crit today! Great projects concluding our [biterzo:Realize](#). Here are couple pictures. Thank you very much to our external critiques Dawaha Kang (Associate Zaha Hadid Architects), Lawrence Friesen (GenGeo), Stephen Melville (Director Ramboll UK), James Solly (Buro Happold), Michael Clarke and to our colleagues Anna Liu and Roberto Botazzi.



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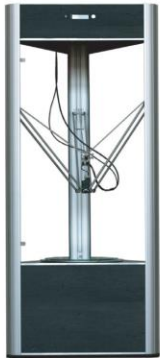


# EMPOWERING ALL MAKERS WITH MACHINES



SERVICES ▾ BOOKINGS ABOUT CONTACT HELP

## 3D PRINTING



STEP 1



CHOOSE YOUR MACHINE

STEP 2



SELECT A DATE AND TIME

STEP 3



MAKE A PAYMENT

STEP 4



CONFIRM YOUR BOOKING



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**WASP  
HUB**



# NO LONGER WAITING FOR THE ONE CLIENT: PROJECTS AS ENTREPRENEURS

KICKSTARTER

## Crowdfunding Campaign for Tangential Dreams Burning Man 2016

by Arthur Mamou-Mani



37

backers

£5,684

pledged of £15,000 goal

14

days to go

Back This Project

★ Remind me

This project will only be funded if at least £15,000 is pledged by Thu, Jul 21 2016 10:08 AM BST.

Arthur Mamou-Mani

🕒 First created | 20 backed

🌐 mamou-mani.com

[See full bio](#) [Contact me](#)



📍 Black Rock City, NV

🏷️ Public Art

👍 Project We Love

Tangential Dreams is an Architectural Installation for the Burning Man Festival 2016 and a statement for a new kind of Architecture.

Share:

🐦 Tweet

📘 Share

📺 Embed

📌 Pin

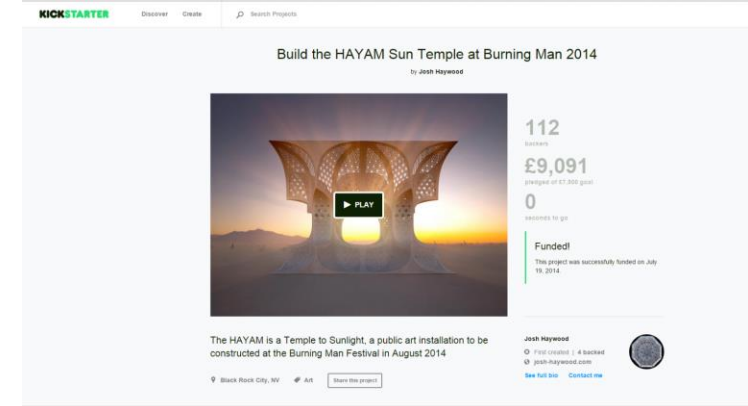
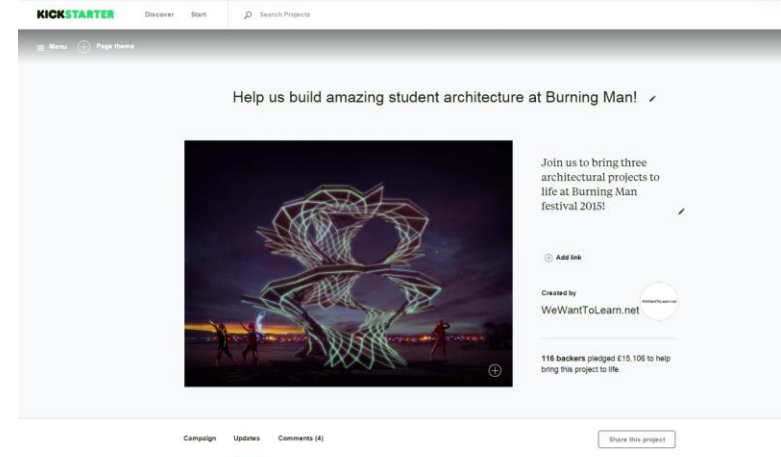
📄 Post

Campaign

Updates <sup>2</sup>

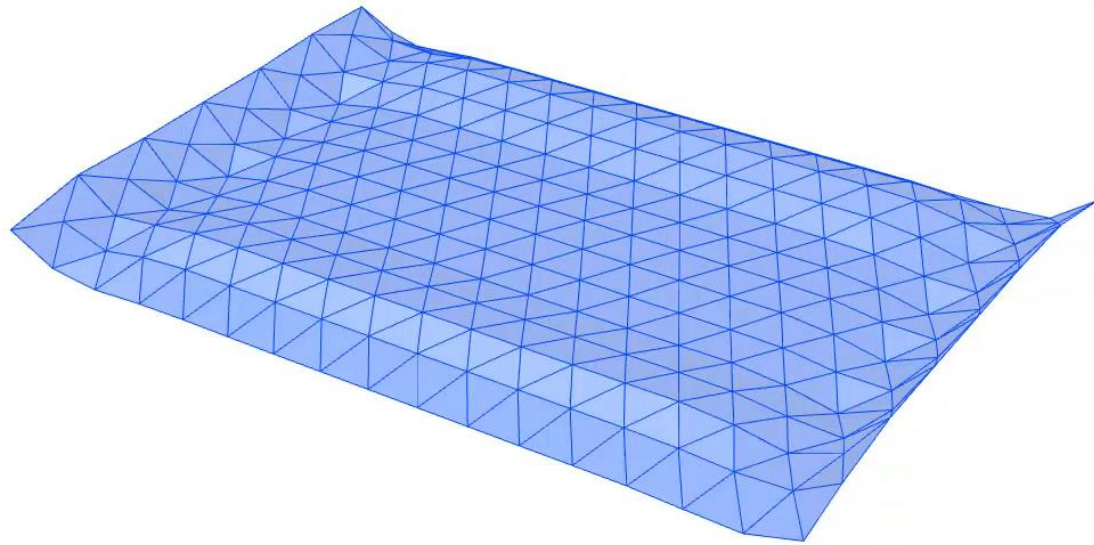
Comments <sup>0</sup>

Community





# KAREN MILLEN THE MAGIC GARDEN

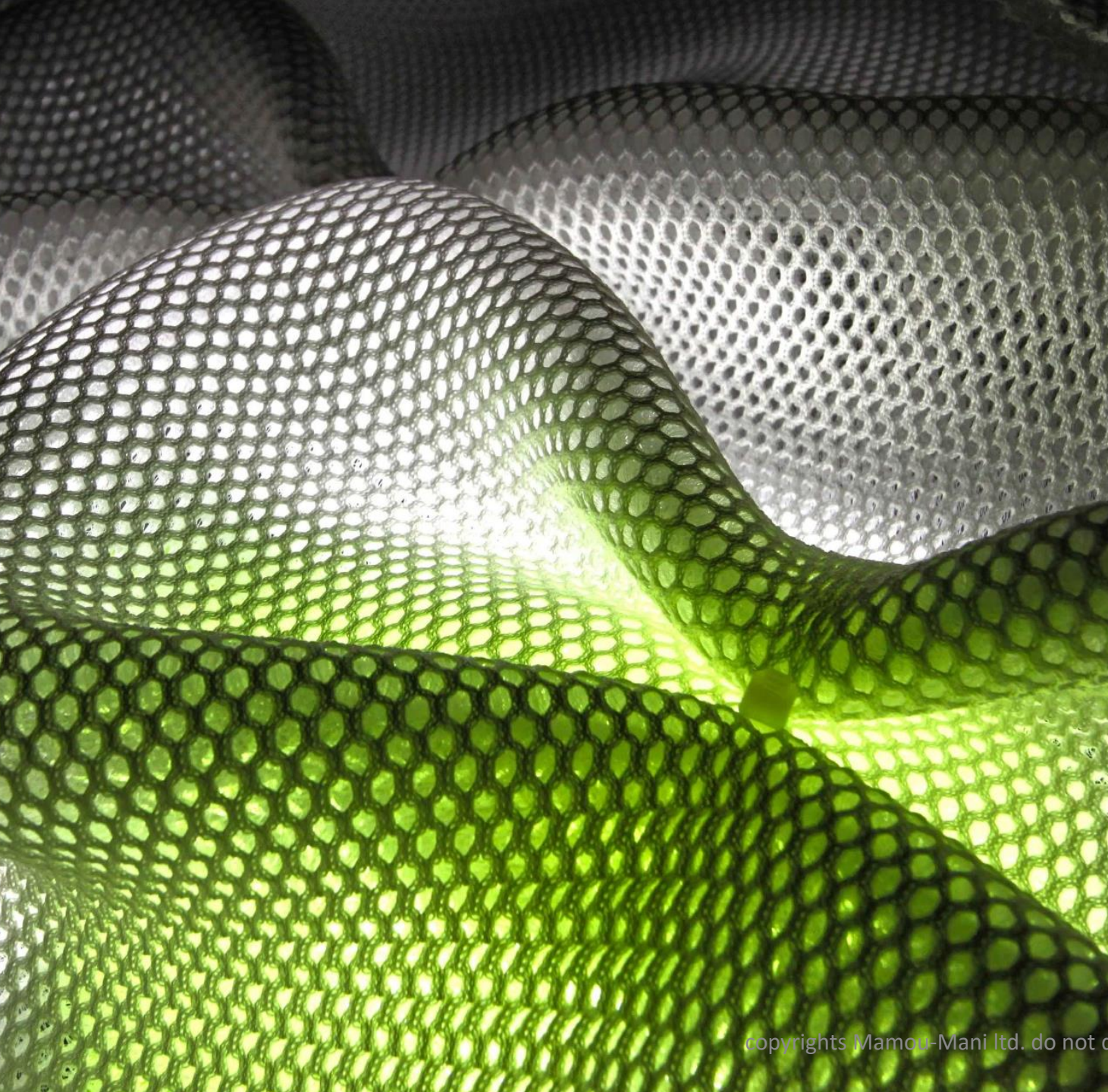


**KAREN MILLEN**  
**MAMOU-MANI**  
3D Spacer Fabric  
Physics Simulation

Vertices: 238  
Rest Angle: 45 Degrees  
Pinch Points: 4















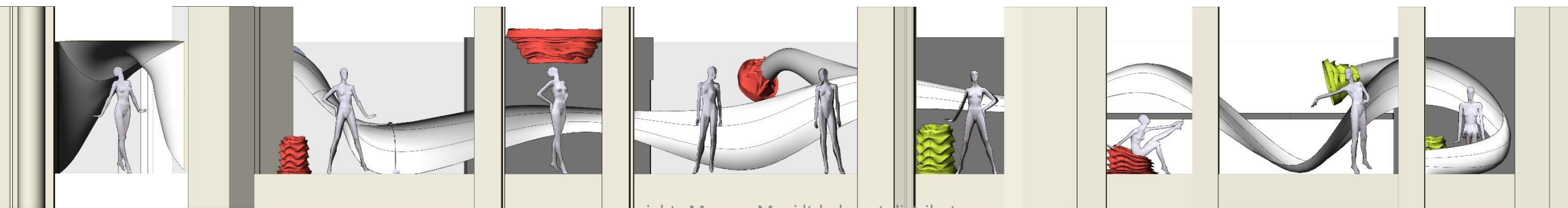
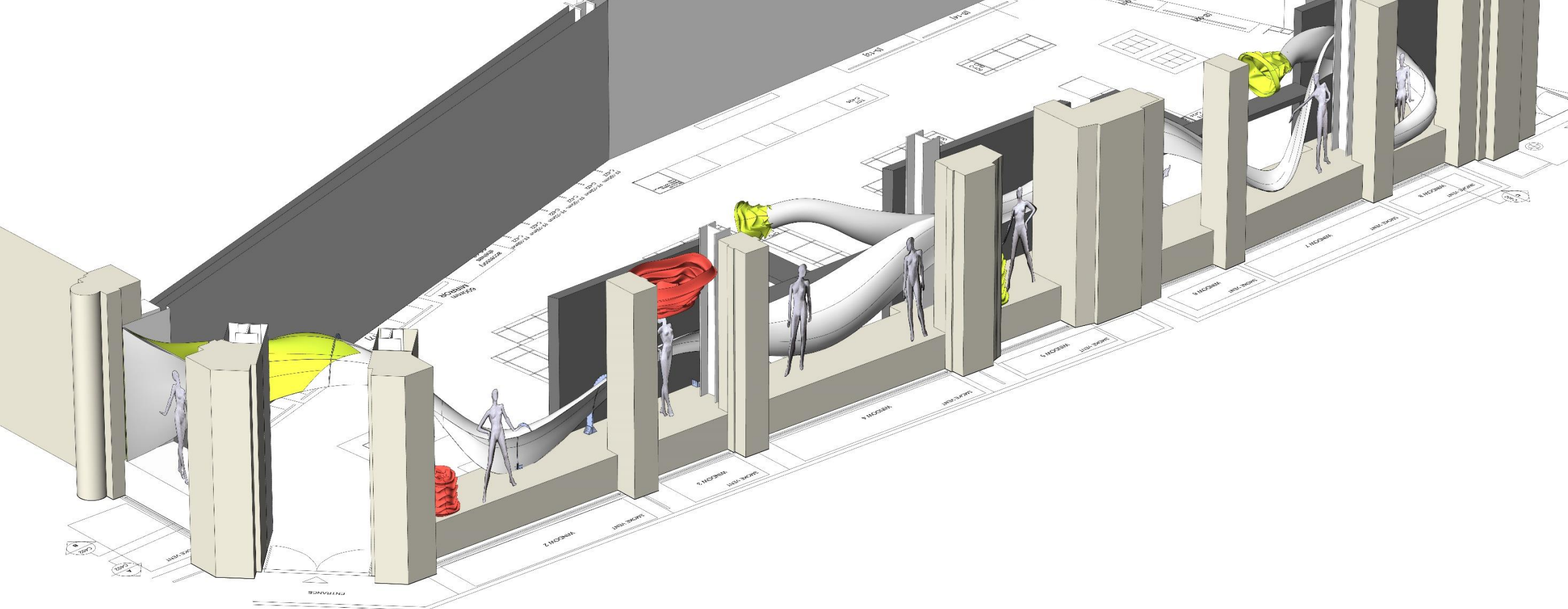
PRINCES STREET

KAREN MILLEN

KAREN MILLEN







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THE GATE

THE REVEAL

THE SKY

THE FLOWER

THE HEDGE

THE HOLLOW

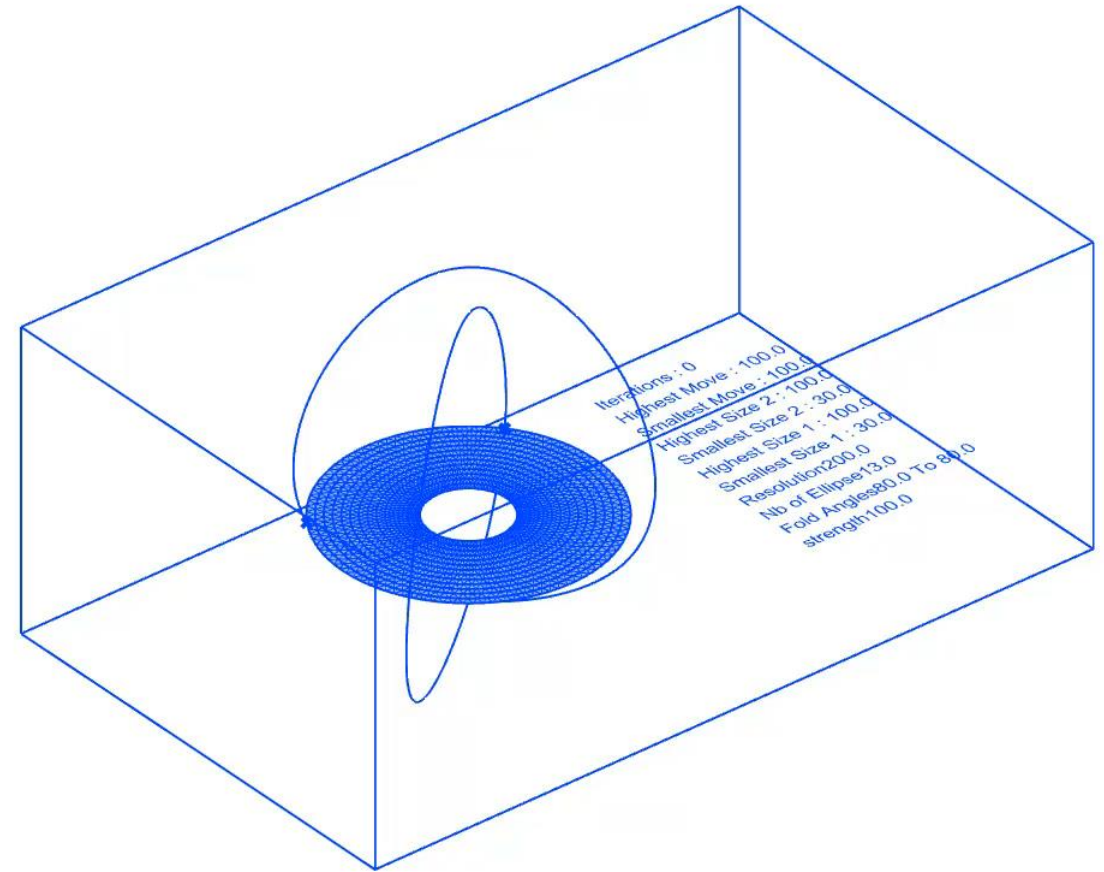
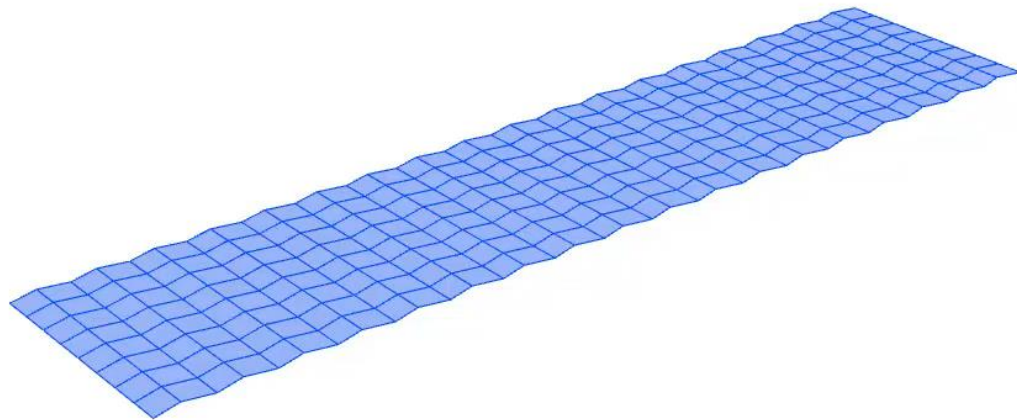
THE BOUNCE

THE SHELL

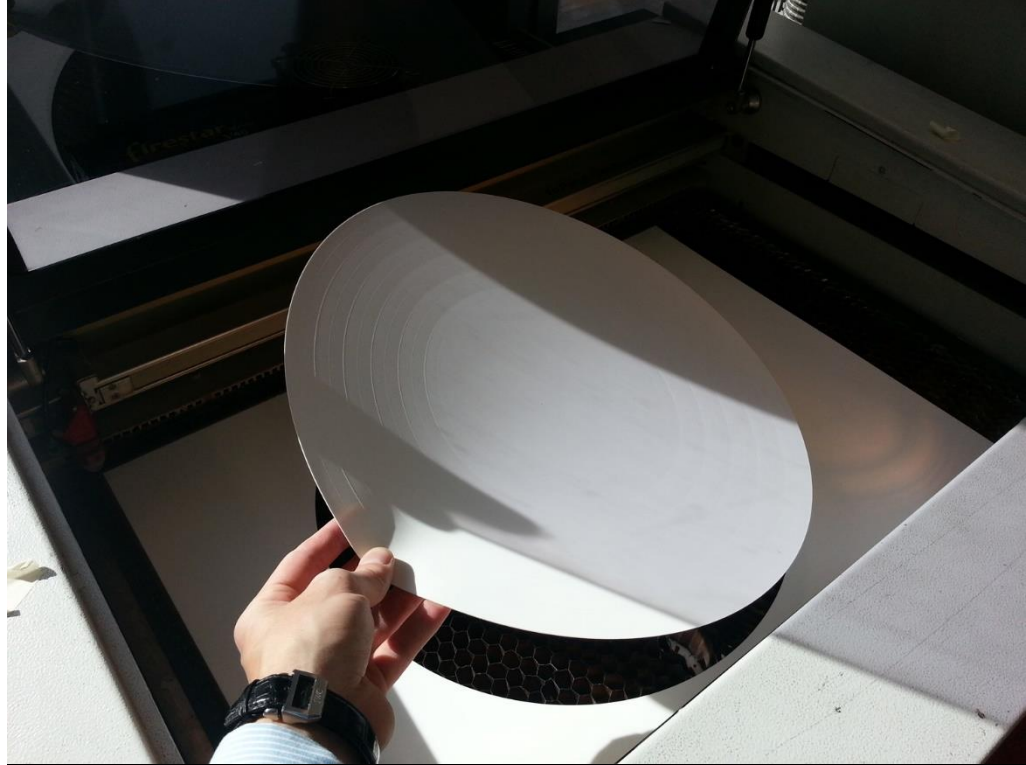


# Karen Millen X-Mas Window Display

## DIGITAL ORIGAMIS

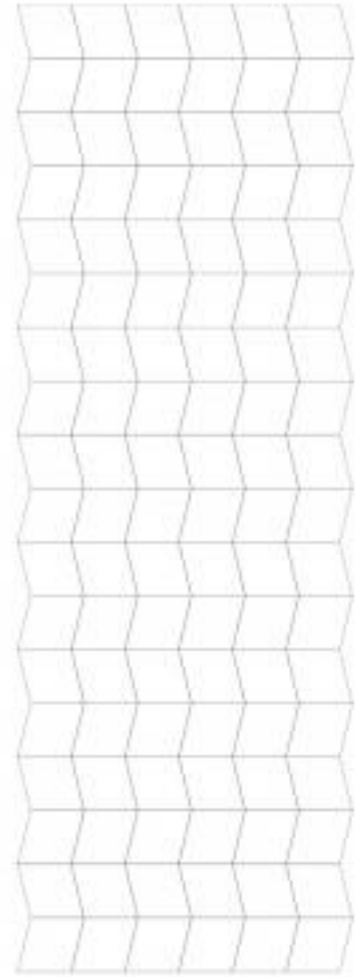
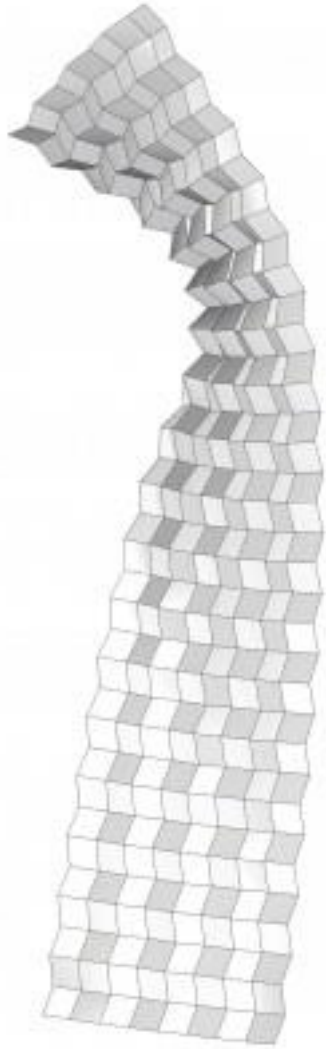
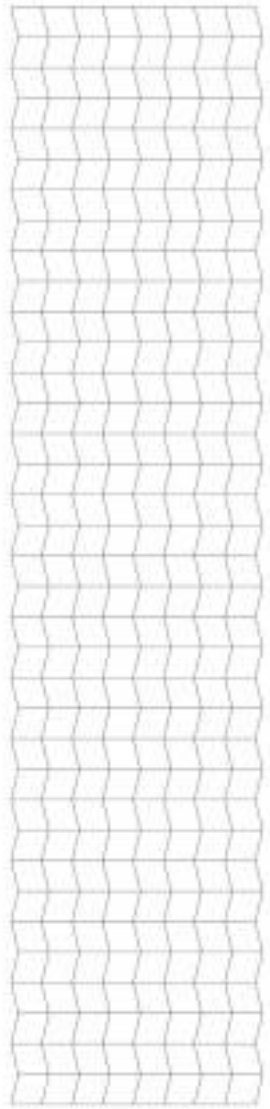




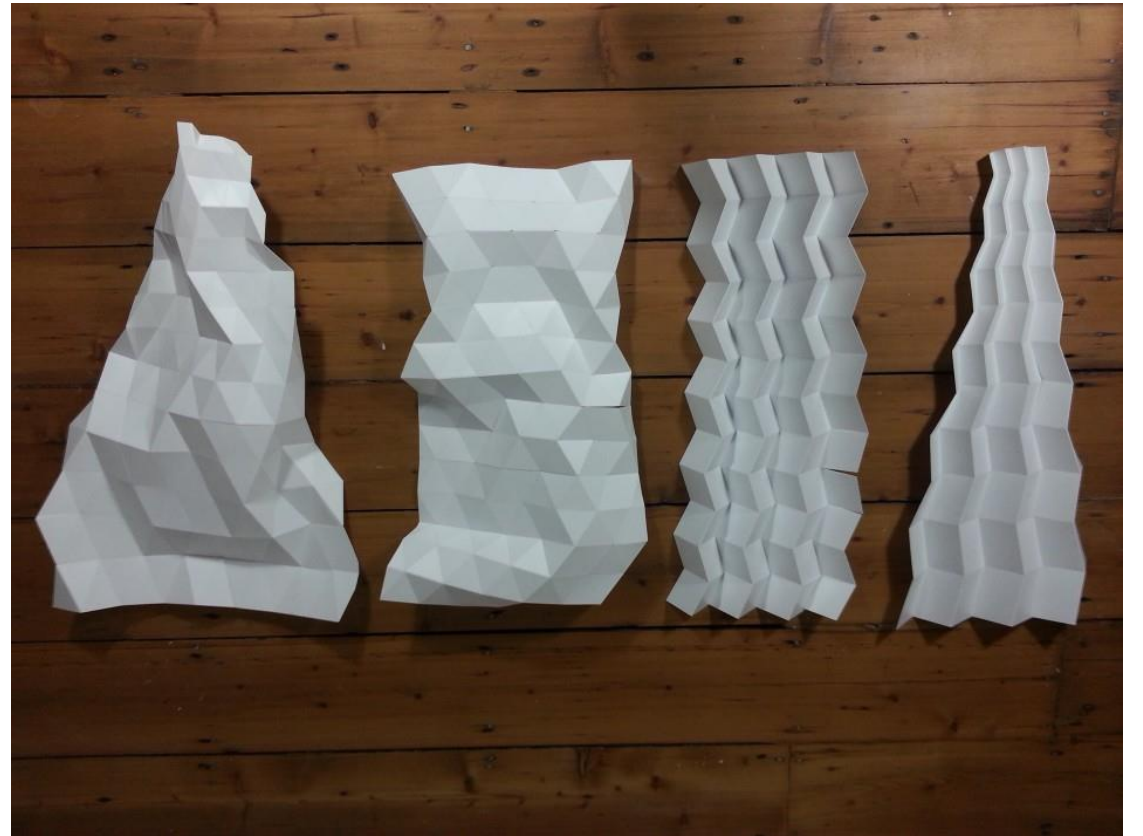


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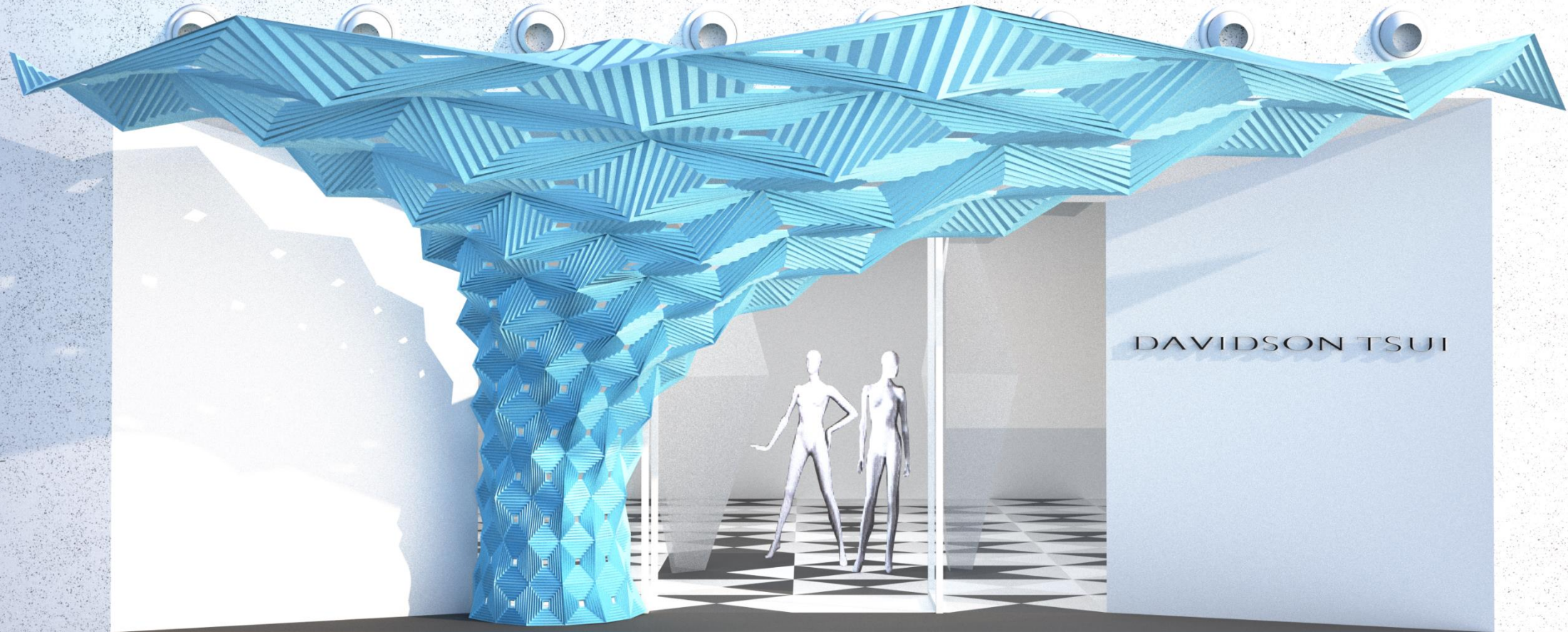




KAREN MILLEN

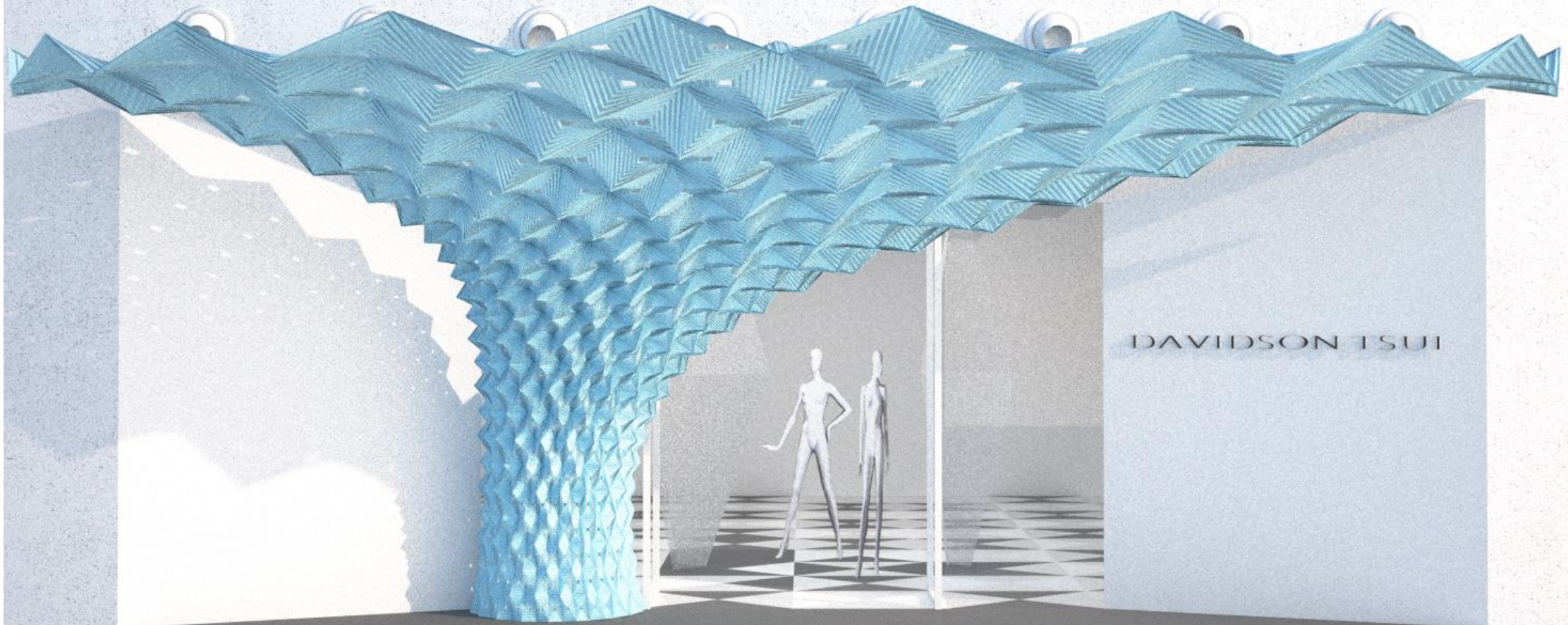
KAR





DAVIDSON TSUI





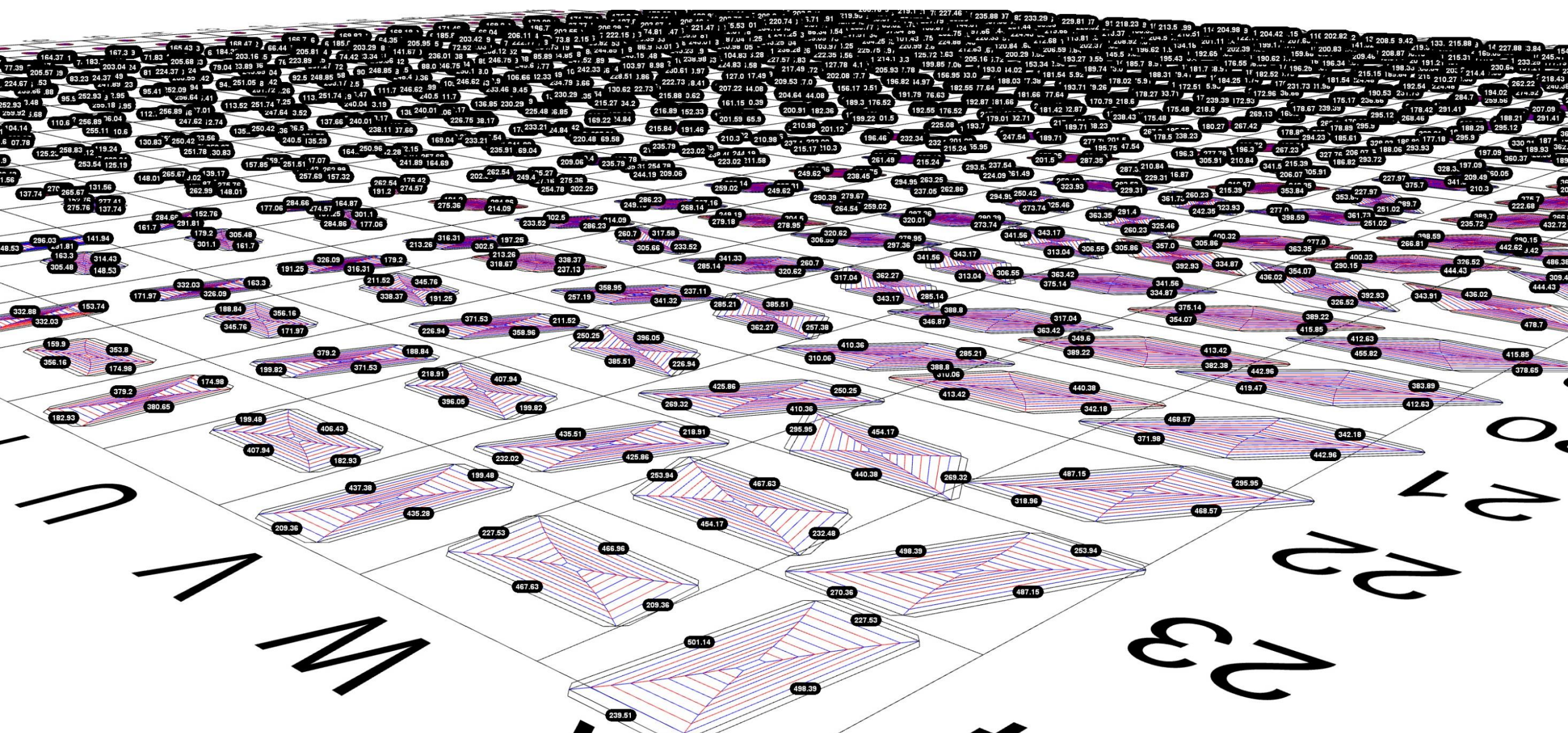
DAVIDSON TSUI





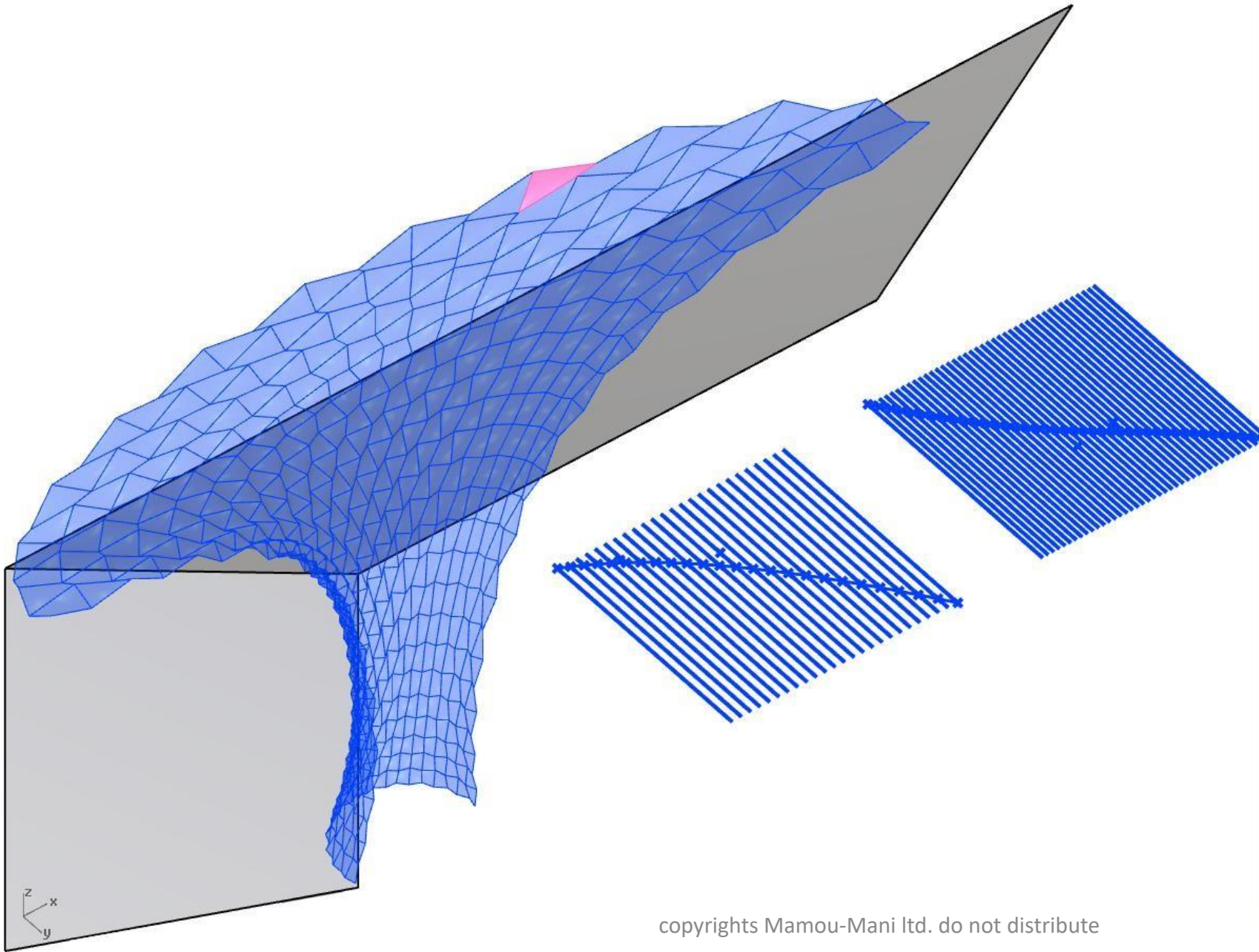
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Rhinoceros

Grasshopper

DATA

Total Number of Component  
576

Shortest Edge of Biggest Component  
311.917747

Shortest Edge  
69.612733

Largest Edge  
543.273769

Area in m2  
16.998881

PARAMETERS

U Count 24

V Count 40

0.2 X coordinate

0.100 Y coordinate

0.5 X coordinate

Y coordinate 0.286

X coordinate 0.45

Y coordinate 0.620

0.620 X coordinate

Y coordinate 0.600

Domain start 30

Domain end 150

0 Shift

Shift 19

A 40

B 17

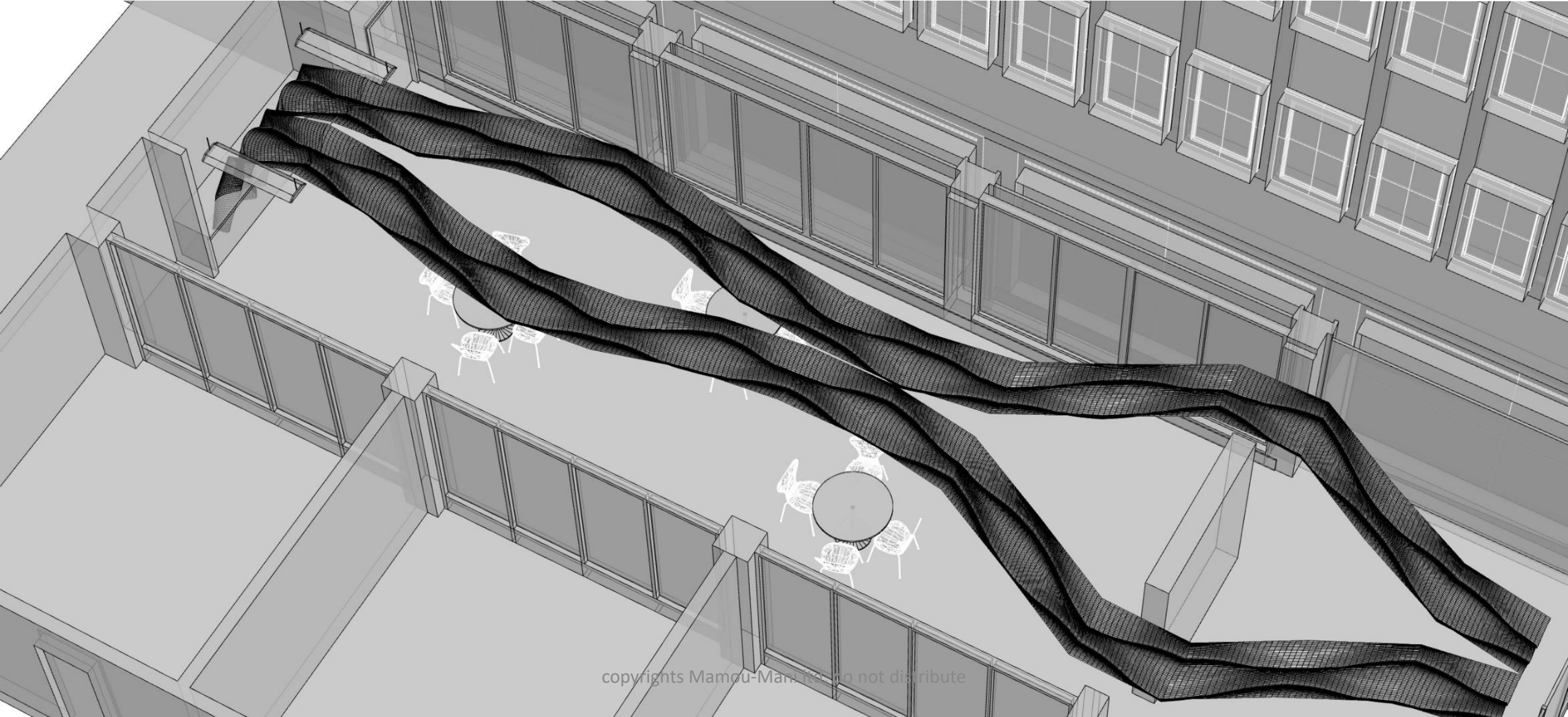


# WOODEN WAVES

## BUROHAPPOLD HEADQUARTERS

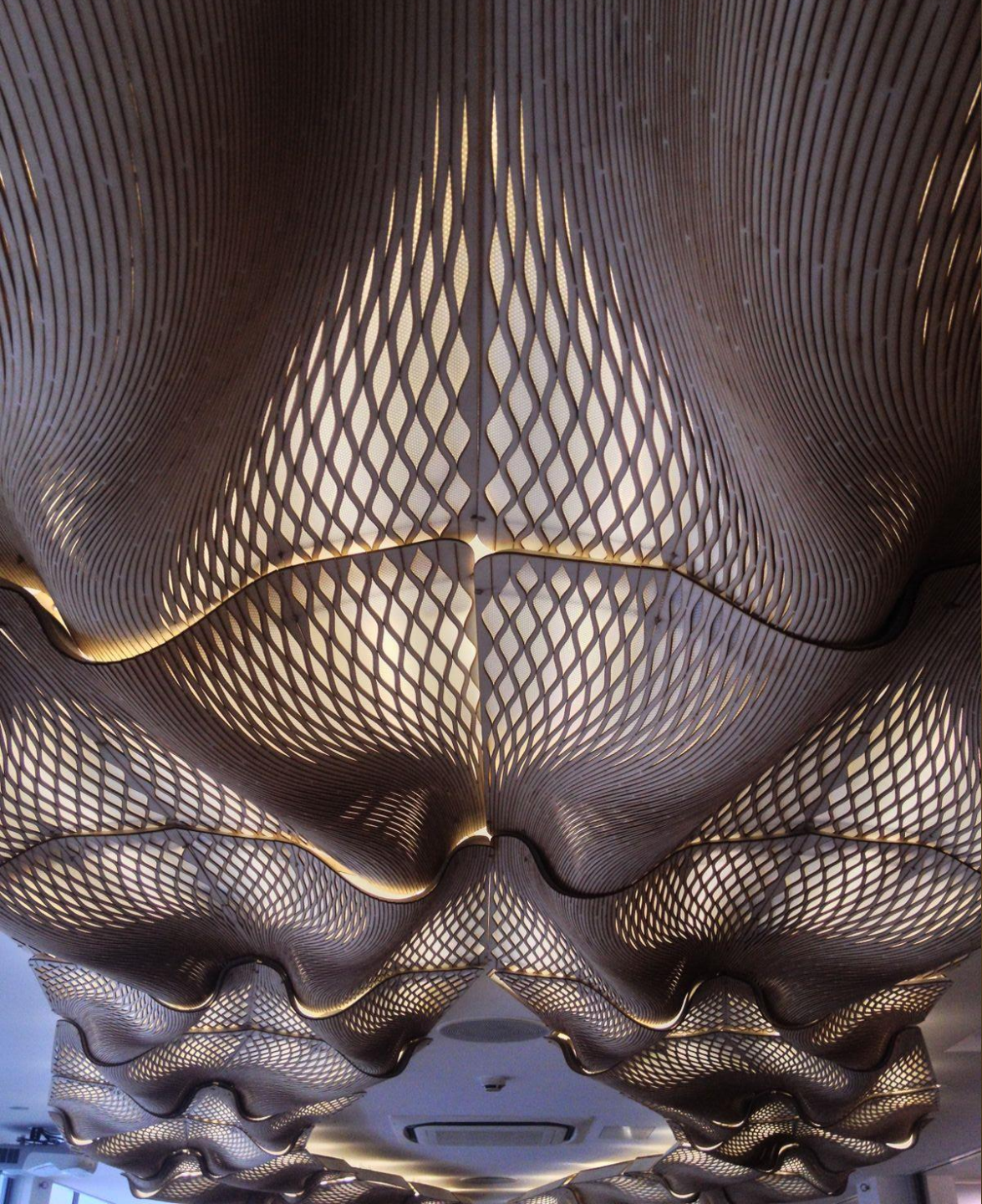
2016  
AMERICAN  
ARCHITECTURE  
PRIZE™

GOLD WINNER

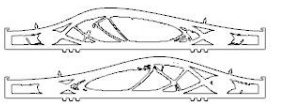
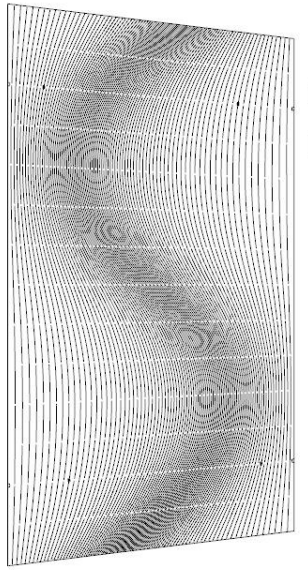
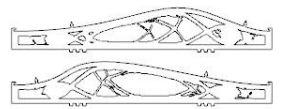
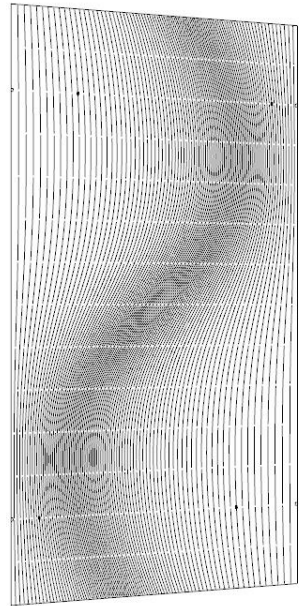
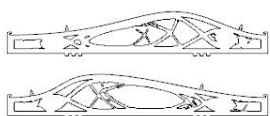
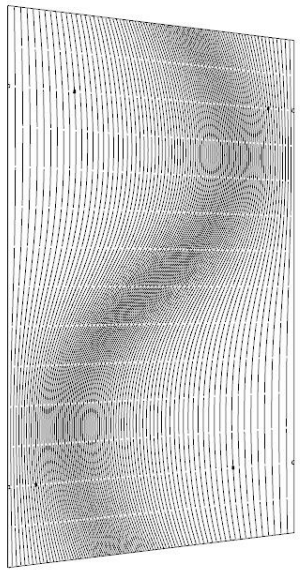
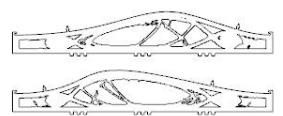
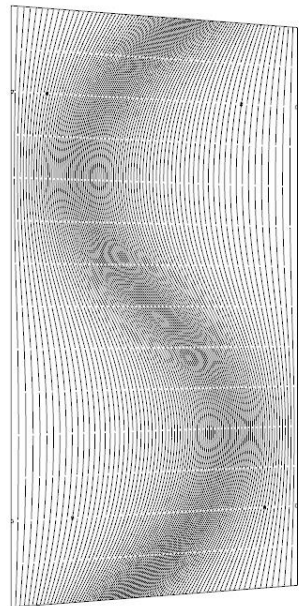


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Handwritten notes and diagrams on the wooden surface, including a small grid diagram and text such as "DA=1/2", "DB=3/4", "MC=5/16".

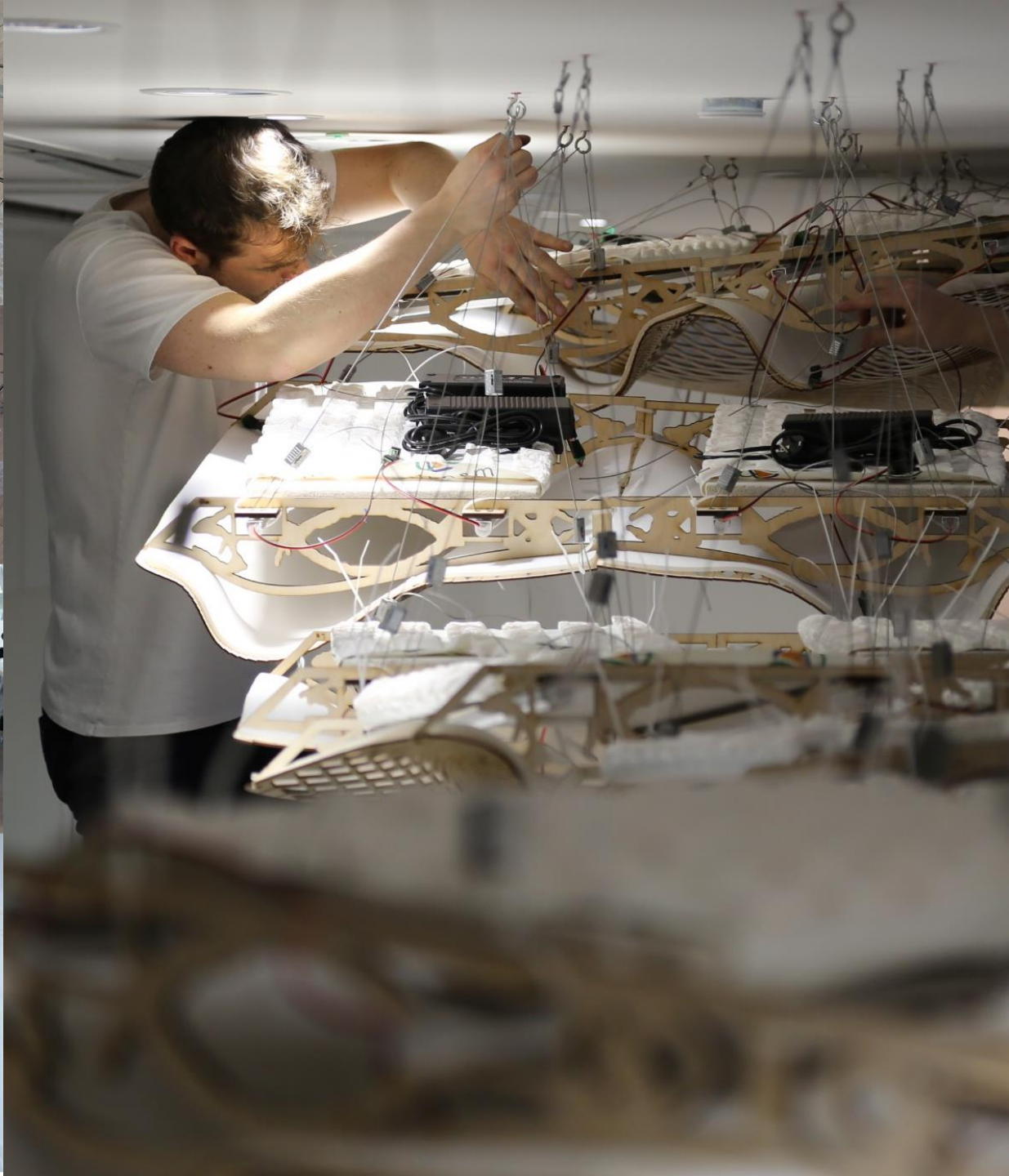
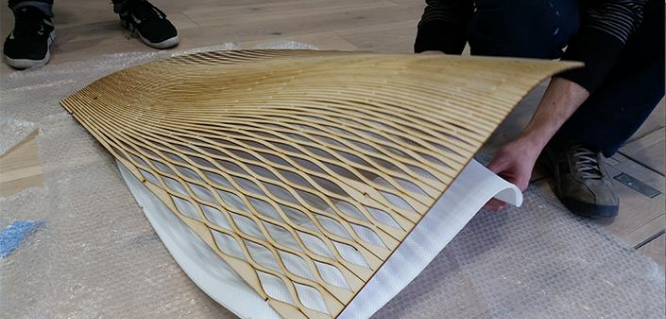
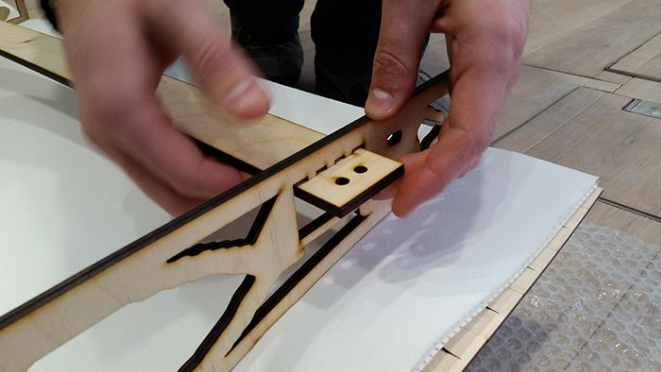
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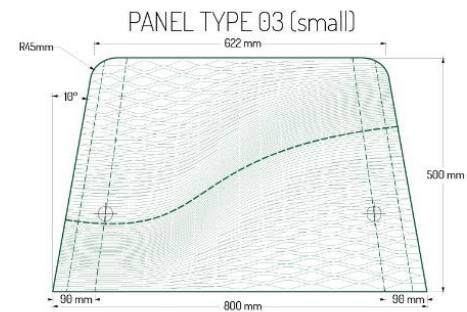
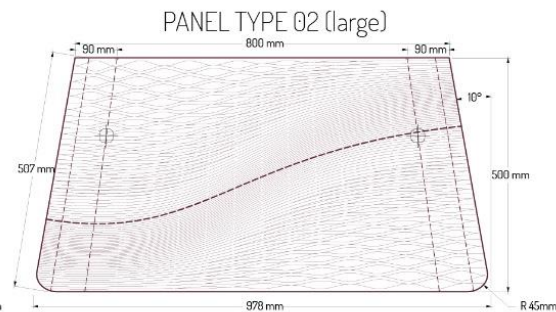
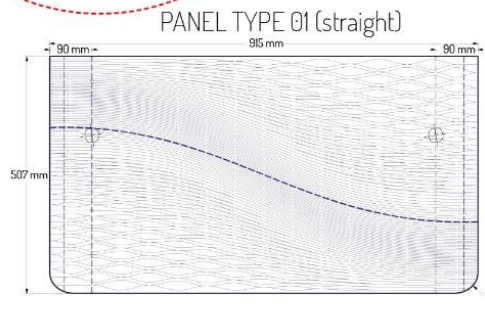
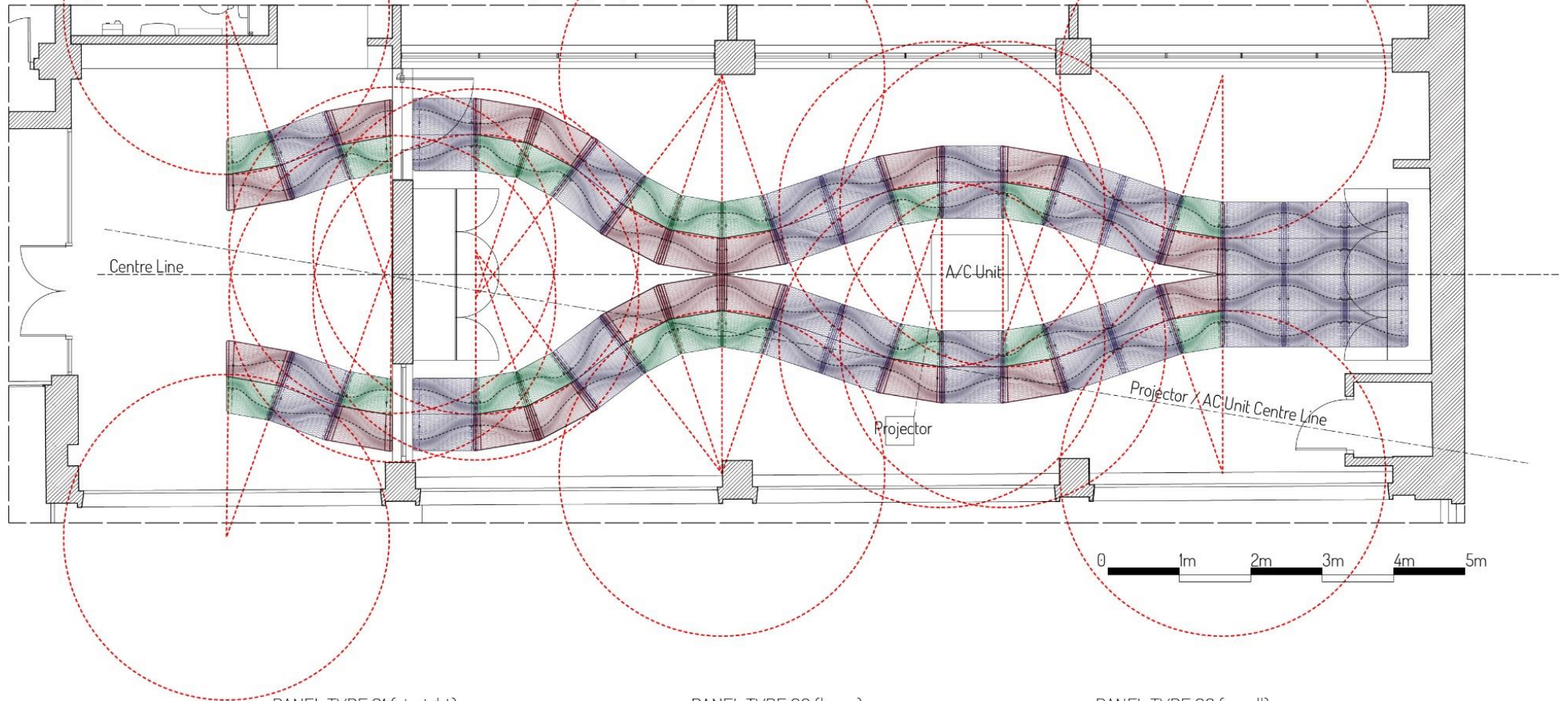




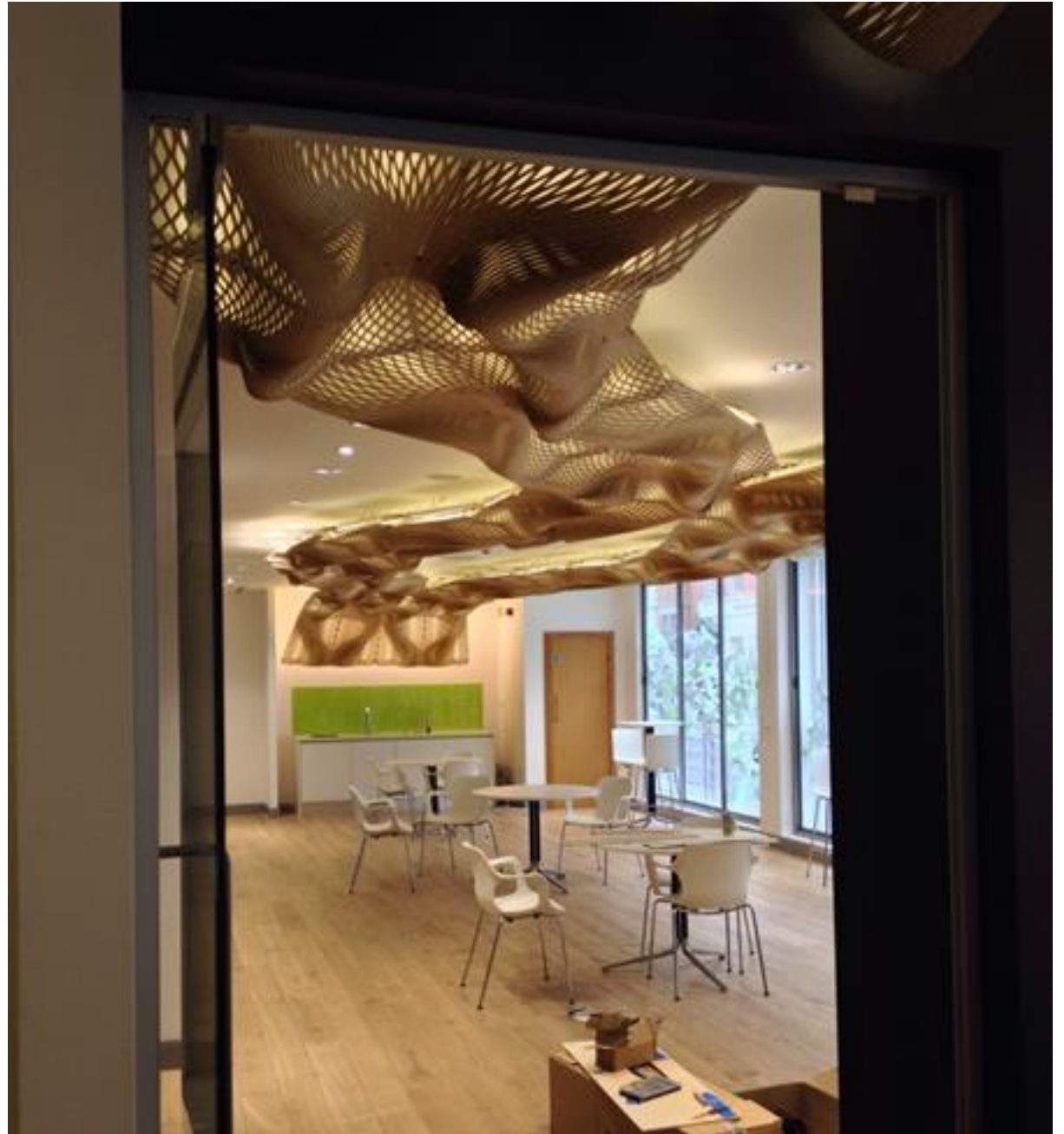
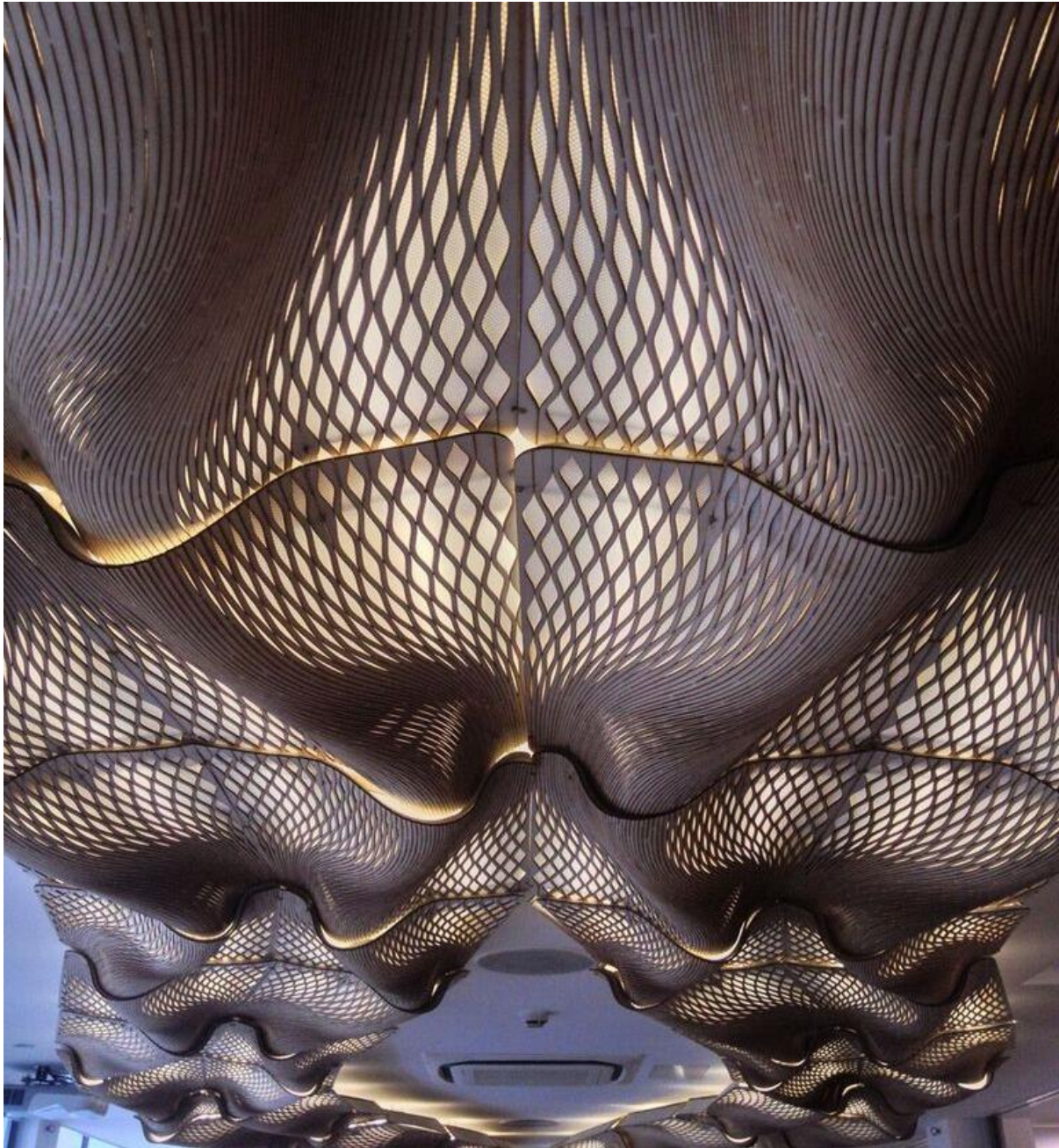




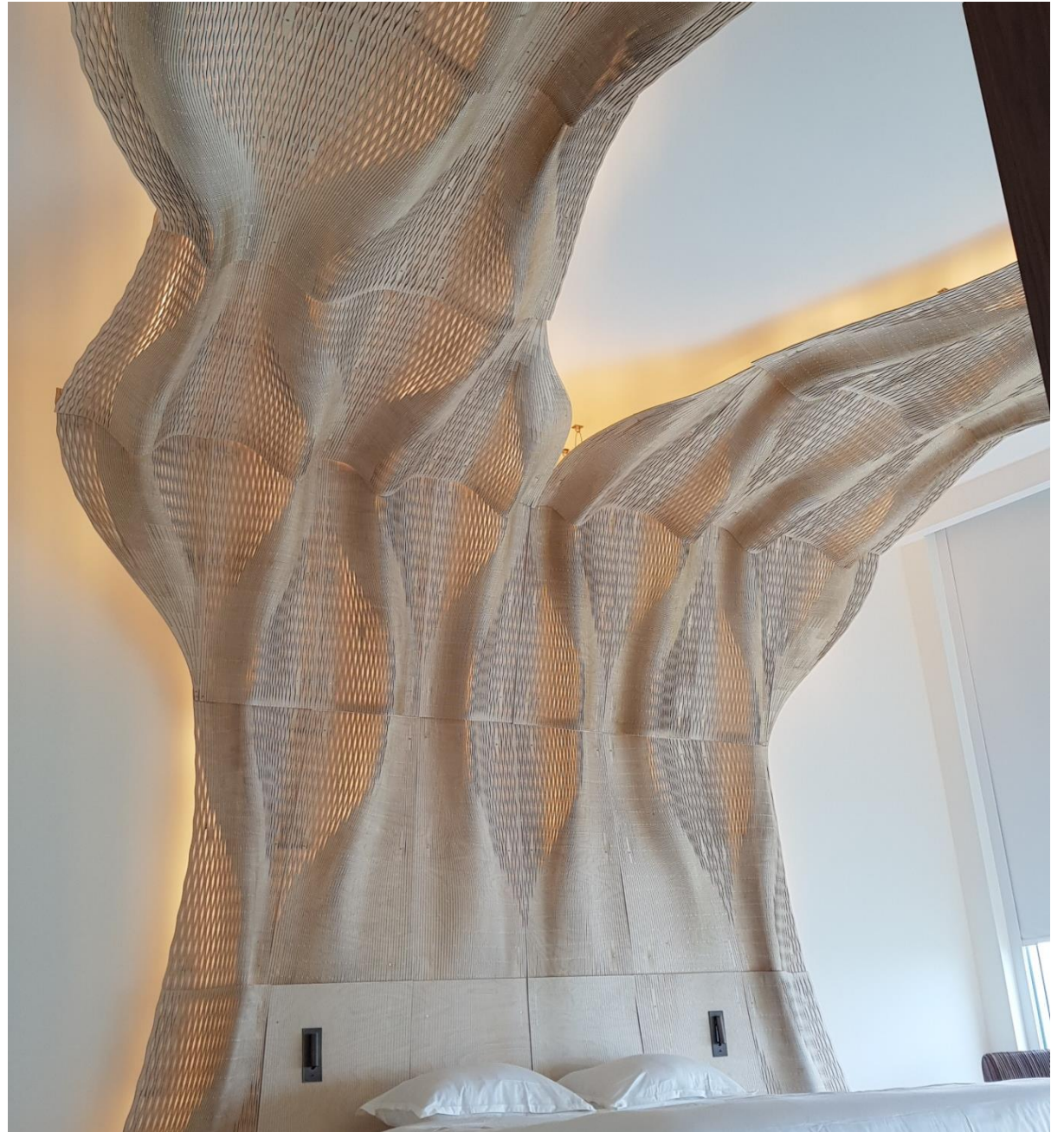
All setting out circles have the same 2280mm radius, resulting in only 3 types of panels









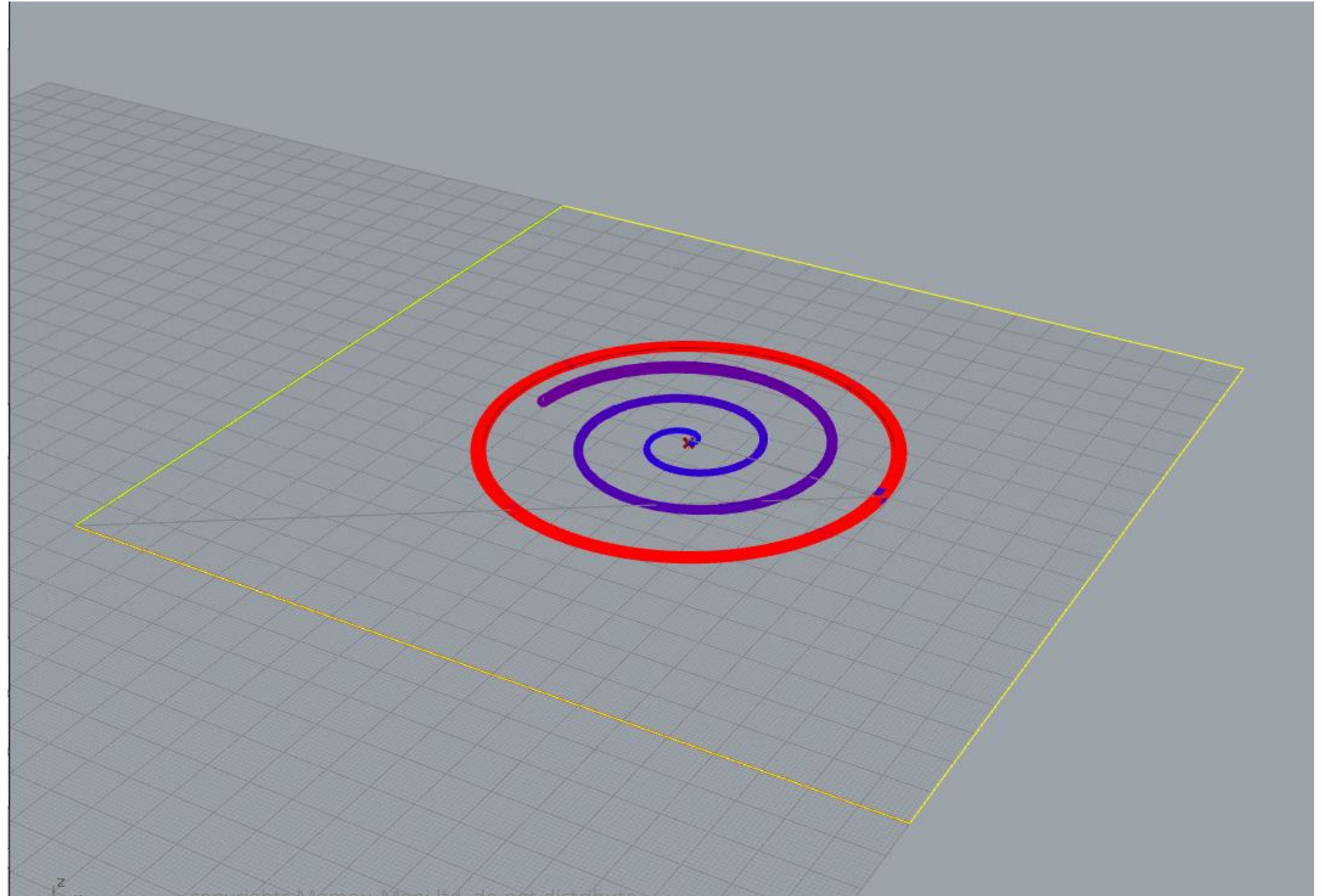




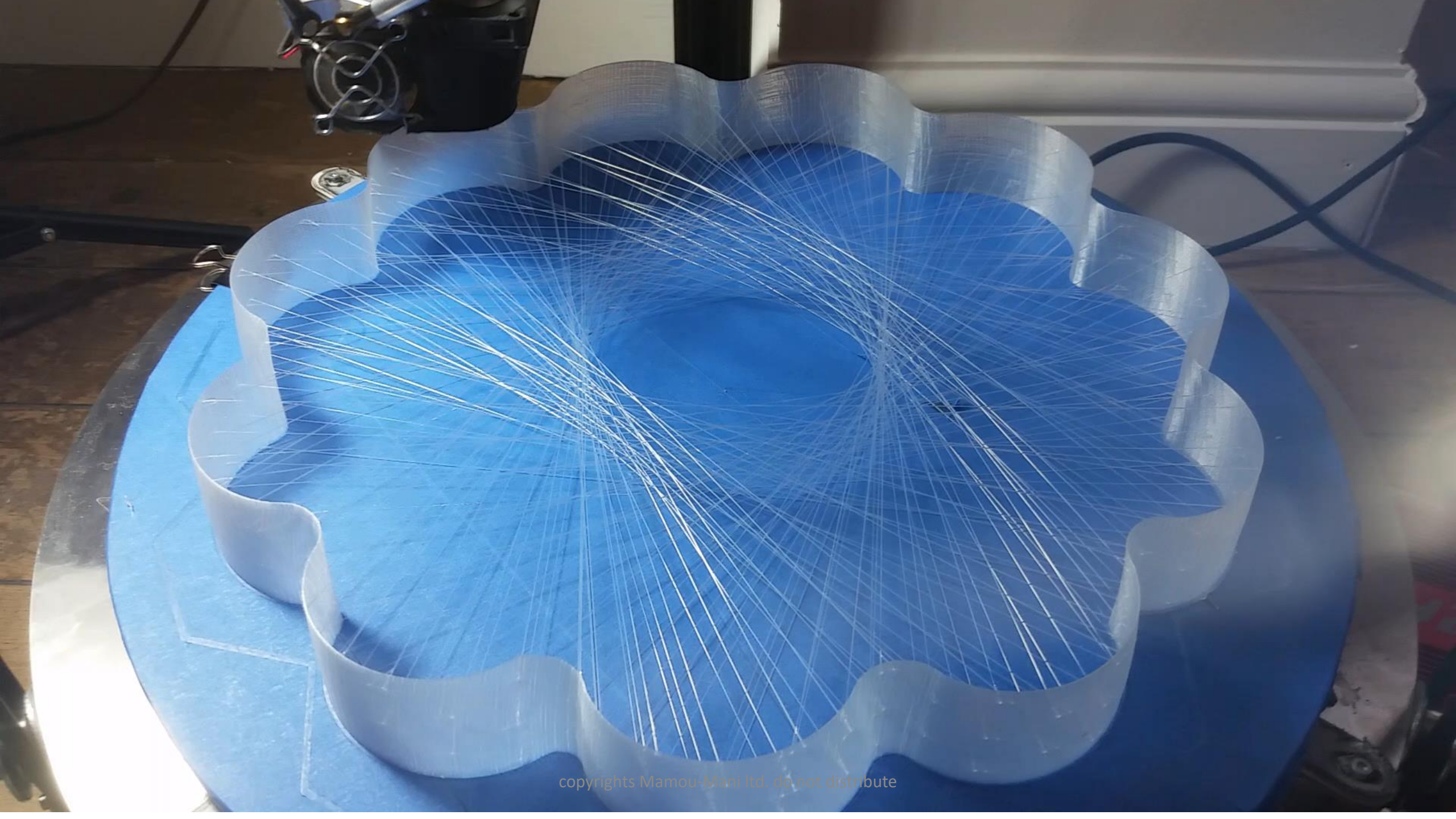
# SILKWORM G-CODE **LEARNING TO SPEAK WITH MACHINES**



```
G28 ; home all axes
M82 ; use absolute distances for extrusion
G90 ; use absolute coordinates
G21 ; set units to millimeters
G92 E0 ; reset extrusion distance
M104 S185 ; set temperature
M109 S185 ; wait for temperature to be reached
G1 Z0.0 F360 E1
G92 E0
G1 F6000 X148.65 Y99.4 Z0
G1 F1200 X148.58 Y101.63 Z0 E0.18
G1 F1200 X148.4 Y103.88 Z0 E0.37
G1 F1200 X148.12 Y106.16 Z0 E0.55
G1 F1200 X147.73 Y108.46 Z0 E0.74
G1 F1200 X147.22 Y110.77 Z0 E0.94
G1 F1200 X146.59 Y113.08 Z0 E1.13
G1 F1200 X145.85 Y115.39 Z0 E1.33
G1 F1200 X144.98 Y117.69 Z0 E1.53
G1 F1200 X143.99 Y119.96 Z0 E1.73
G1 F1200 X143.45 Y121.09 Z0 E1.84
G1 F1200 X142.87 Y122.2 Z0 E1.94
G1 F1200 X142.27 Y123.31 Z0 E2.04
G1 F1200 X141.64 Y124.4 Z0 E2.14
G1 F1200 X140.98 Y125.48 Z0 E2.25
G1 F1200 X140.29 Y126.55 Z0 E2.35
G1 F1200 X139.57 Y127.6 Z0 E2.45
G1 F1200 X138.83 Y128.64 Z0 E2.56
G1 F1200 X138.05 Y129.65 Z0 E2.66
G1 F1200 X137.25 Y130.65 Z0 E2.77
G1 F1200 X136.42 Y131.63 Z0 E2.87
G1 F1200 X135.57 Y132.59 0 E2.98
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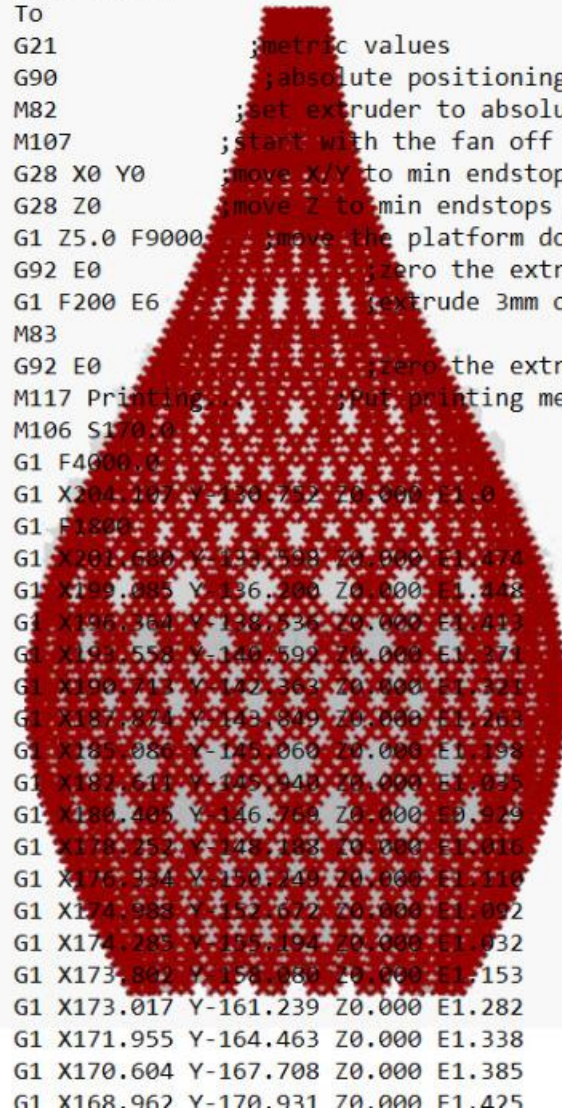
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```

M301 P46.87 I3.91 D140.55
M92 E44.0
M190 S50.0
M109 S190.0
To
G21          ;metric values
G90          ;absolute positioning
M82          ;set extruder to absolute mode
M107        ;start with the fan off
G28 X0 Y0   ;move X/Y to min endstops
G28 Z0      ;move Z to min endstops
G1 Z5.0 F9000 ;move the platform down 15mm
G92 E0      ;zero the extruded length
G1 F200 E6  ;extrude 3mm of feed stock
M83
G92 E0      ;zero the extruded length again
M117 Printing ;Put printing message on LCD screen
M106 S170.0
G1 F4000.0
G1 X204.107 Y-130.752 Z0.000 E1.0
G1 F1800
G1 X201.600 Y-133.508 Z0.000 E1.474
G1 X199.085 Y-136.260 Z0.000 E1.948
G1 X196.364 Y-138.534 Z0.000 E1.413
G1 X193.558 Y-140.592 Z0.000 E1.271
G1 X190.713 Y-142.363 Z0.000 E1.321
G1 X187.871 Y-143.849 Z0.000 E1.263
G1 X185.086 Y-145.060 Z0.000 E1.198
G1 X182.611 Y-145.943 Z0.000 E1.035
G1 X180.405 Y-146.769 Z0.000 E0.929
G1 X178.252 Y-148.183 Z0.000 E1.010
G1 X176.334 Y-150.249 Z0.000 E1.110
G1 X174.983 Y-152.672 Z0.000 E1.092
G1 X174.283 Y-155.194 Z0.000 E1.032
G1 X173.802 Y-156.880 Z0.000 E1.153
G1 X173.017 Y-161.239 Z0.000 E1.282
G1 X171.955 Y-164.463 Z0.000 E1.338
G1 X170.604 Y-167.708 Z0.000 E1.385
G1 X168.962 Y-170.931 Z0.000 E1.425

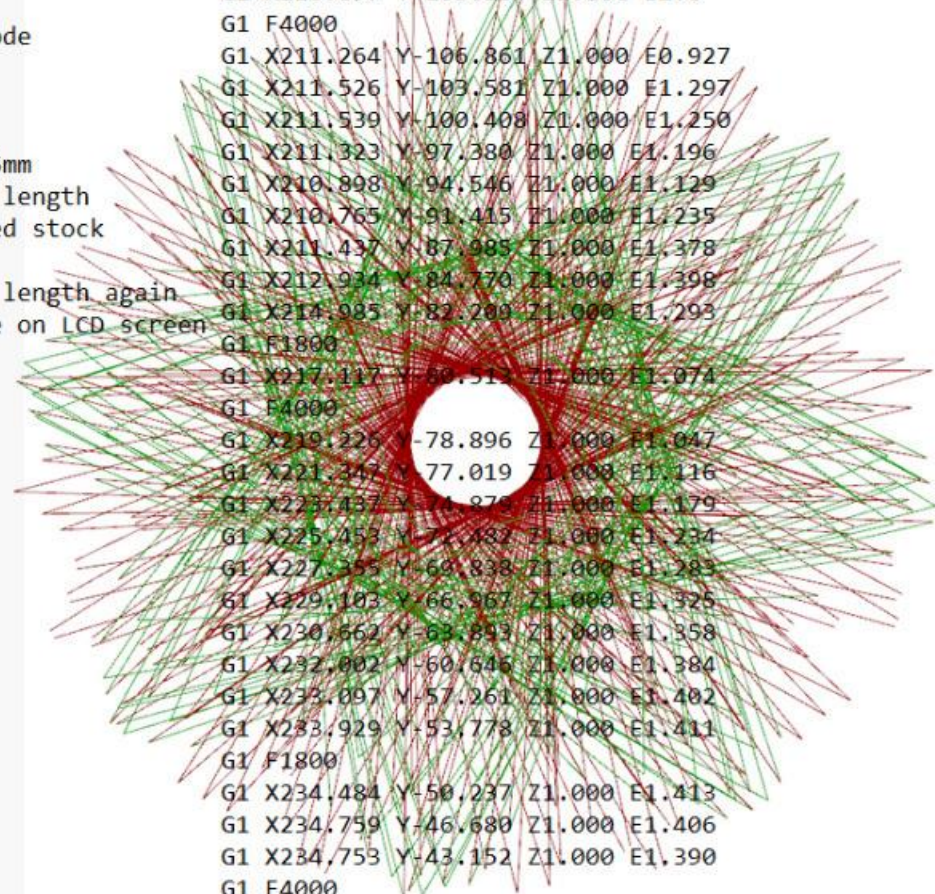
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G1 X229.530 Y-11.328 Z0.000 E1.290
G1 X230.201 Y-10.310 Z0.000 E0.481
G1 X-231.359 Y61.084 Z0.000 E184.042
G1 X-230.509 Y63.157 Z0.000 E1.0
G1 F4000
G1 X210.897 Y-109.183 Z1.000 E93.363
G1 X210.897 Y-109.183 Z1.000 E1.0
G1 F4000
G1 X211.264 Y-106.861 Z1.000 E0.927
G1 X211.526 Y-103.581 Z1.000 E1.297
G1 X211.539 Y-100.408 Z1.000 E1.250
G1 X211.323 Y-97.380 Z1.000 E1.196
G1 X210.898 Y-94.546 Z1.000 E1.129
G1 X210.765 Y-91.415 Z1.000 E1.235
G1 X211.437 Y-87.985 Z1.000 E1.378
G1 X212.934 Y-84.770 Z1.000 E1.398
G1 X214.985 Y-82.209 Z1.000 E1.293
G1 F1800
G1 X217.117 Y-80.512 Z1.000 E1.074
G1 F4000
G1 X219.226 Y-78.896 Z1.000 E1.047
G1 X221.347 Y-77.019 Z1.000 E1.116
G1 X223.437 Y-74.870 Z1.000 E1.129
G1 X225.453 Y-72.482 Z1.000 E1.234
G1 X227.355 Y-69.838 Z1.000 E1.283
G1 X229.103 Y-66.967 Z1.000 E1.325
G1 X230.662 Y-63.893 Z1.000 E1.358
G1 X232.002 Y-60.646 Z1.000 E1.384
G1 X233.097 Y-57.261 Z1.000 E1.402
G1 X233.929 Y-53.778 Z1.000 E1.411
G1 F1800
G1 X234.484 Y-50.237 Z1.000 E1.413
G1 X234.759 Y-46.680 Z1.000 E1.406
G1 X234.753 Y-43.152 Z1.000 E1.390
G1 F4000
G1 X234.477 Y-39.694 Z1.000 E1.367
G1 X233.946 Y-36.346 Z1.000 E1.336
G1 X233.182 Y-33.146 Z1.000 E1.297
G1 X232.213 Y-30.125 Z1.000 E1.250

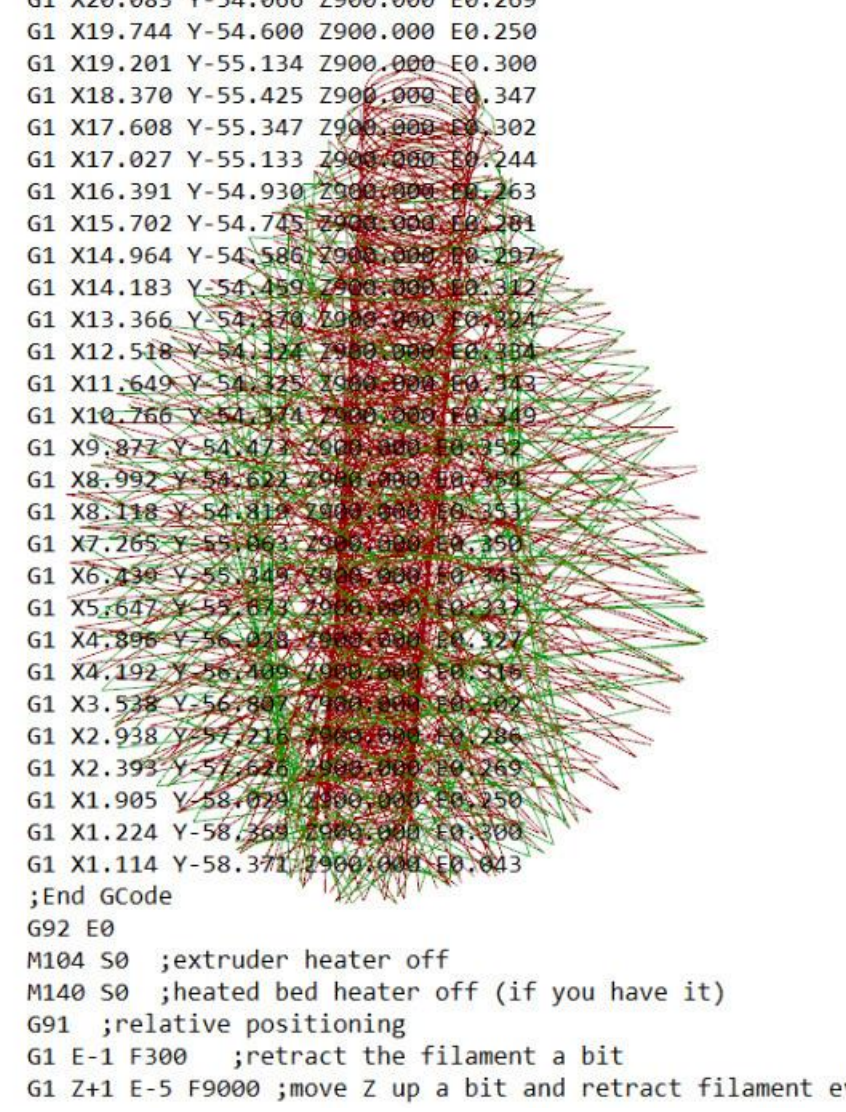
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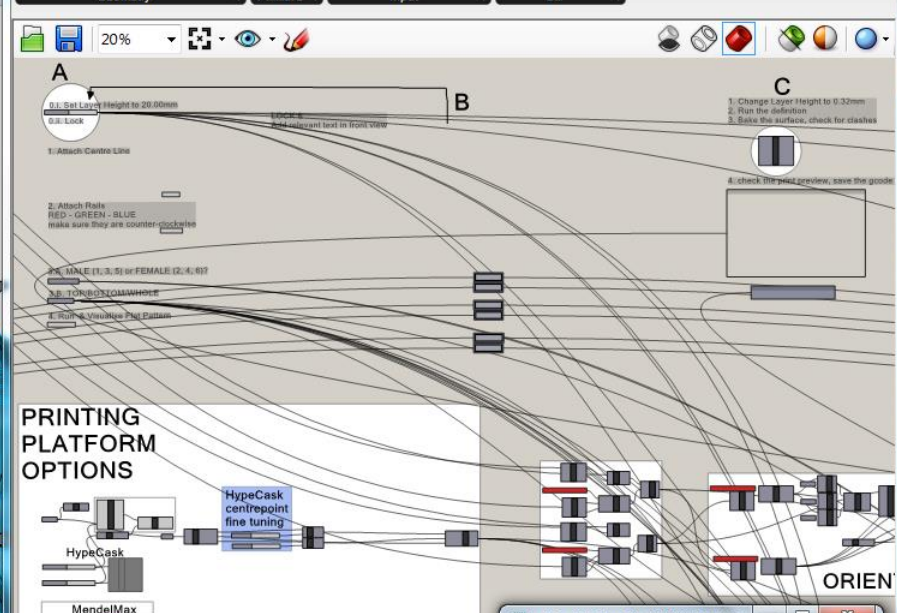
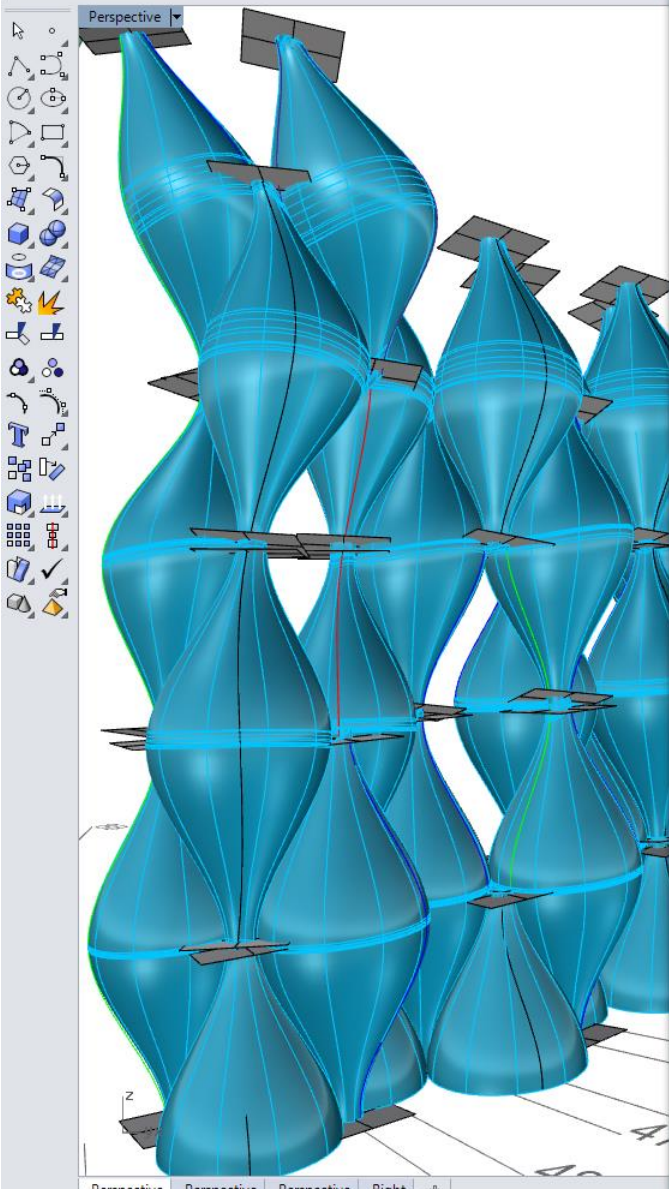
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G1 X21.970 Y-51.773 Z900.000 E0.327
G1 X21.418 Y-52.353 Z900.000 E0.316
G1 X20.919 Y-52.934 Z900.000 E0.302
G1 X20.475 Y-53.508 Z900.000 E0.286
G1 X20.083 Y-54.066 Z900.000 E0.269
G1 X19.744 Y-54.600 Z900.000 E0.250
G1 X19.201 Y-55.134 Z900.000 E0.300
G1 X18.370 Y-55.425 Z900.000 E0.347
G1 X17.608 Y-55.347 Z900.000 E0.302
G1 X17.027 Y-55.133 Z900.000 E0.244
G1 X16.391 Y-54.930 Z900.000 E0.263
G1 X15.702 Y-54.745 Z900.000 E0.281
G1 X14.964 Y-54.586 Z900.000 E0.297
G1 X14.183 Y-54.459 Z900.000 E0.312
G1 X13.366 Y-54.370 Z900.000 E0.324
G1 X12.518 Y-54.224 Z900.000 E0.384
G1 X11.649 Y-54.125 Z900.000 E0.343
G1 X10.766 Y-54.074 Z900.000 E0.349
G1 X9.877 Y-54.072 Z900.000 E0.352
G1 X8.992 Y-54.022 Z900.000 E0.354
G1 X8.118 Y-54.819 Z900.000 E0.353
G1 X7.265 Y-55.063 Z900.000 E0.350
G1 X6.430 Y-55.349 Z900.000 E0.345
G1 X5.647 Y-55.673 Z900.000 E0.337
G1 X4.896 Y-56.023 Z900.000 E0.327
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G1 X3.538 Y-56.807 Z900.000 E0.302
G1 X2.938 Y-57.216 Z900.000 E0.286
G1 X2.393 Y-57.626 Z900.000 E0.269
G1 X1.905 Y-58.029 Z900.000 E0.250
G1 X1.224 Y-58.368 Z900.000 E0.300
G1 X1.114 Y-58.371 Z900.000 E0.043
;End GCode
G92 E0
M104 S0 ;extruder heater off
M140 S0 ;heated bed heater off (if you have it)
G91 ;relative positioning
G1 E-1 F300 ;retract the filament a bit
G1 Z+1 E-5 F9000 ;move Z up a bit and retract filament ev

```







PARAMETERS

Printer Dimensions

Print Parameters

Component Dimensions

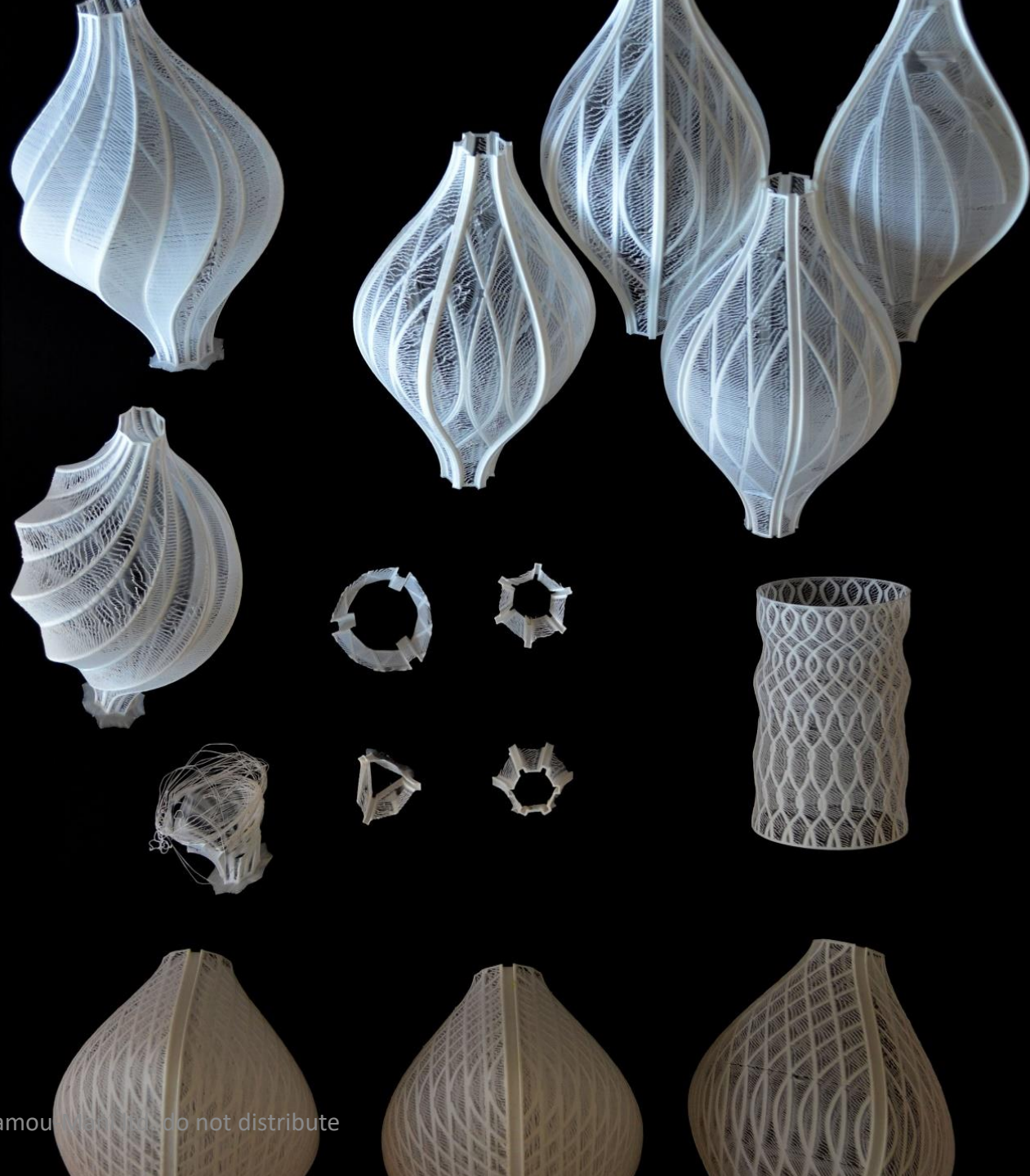
Rail Dimensions

Pattern Parameters

File	Edit	Format	View	Help
G1	x83.015	Y-58.772	Z0.000	E0.082
G1	x89.201	Y-65.980	Z0.000	E0.133
G1	x89.991	Y-67.179	Z0.000	E0.020
G1	x-112.583	Y-7.186	Z0.000	E2.964
G1	x-101.774	Y-3.894	Z0.000	E0.158
G1	x-102.051	Y0.764	Z0.000	E0.065
G1	x-116.304	Y3.313	Z0.000	E0.203
G1	x26.671	Y113.241	Z0.000	E2.530
G1	x25.898	Y98.620	Z0.000	E0.205
G1	x30.371	Y97.290	Z0.000	E0.065
G1	x37.802	Y110.107	Z0.000	E0.208
G1	x99.706	Y-60.132	Z0.000	E2.541
G1	x86.201	Y-54.597	Z0.000	E0.205
G1	x83.470	Y-58.381	Z0.000	E0.065
G1	x90.249	Y-66.279	Z0.000	E0.146
G1	x91.037	Y-67.479	Z0.000	E0.020
G1	x-113.619	Y-6.874	Z0.000	E2.994
G1	x-101.949	Y-3.320	Z0.000	E0.171
G1	x-102.157	Y0.174	Z0.000	E0.049
G1	x-116.936	Y2.817	Z0.000	E0.211
G1	x27.297	Y113.728	Z0.000	E2.552
G1	x26.497	Y98.589	Z0.000	E0.213
G1	x29.852	Y97.591	Z0.000	E0.049
G1	x37.535	Y110.843	Z0.000	E0.215
G1	x99.963	Y-60.885	Z0.000	E2.563
G1	x85.974	Y-55.152	Z0.000	E0.212
G1	x83.925	Y-57.990	Z0.000	E0.049
G1	x91.293	Y-66.575	Z0.000	E0.159
G1	x92.080	Y-67.775	Z0.000	E0.020
G1	x-114.650	Y-6.561	Z0.000	E3.024
G1	x-102.124	Y-2.746	Z0.000	E0.184
G1	x-102.262	Y-0.417	Z0.000	E0.033
G1	x-117.399	Y2.290	Z0.000	E0.216
G1	x-117.566	Y2.815	Z0.000	E0.002
G1	x27.940	Y114.209	Z0.000	E2.575
G1	x27.908	Y113.913	Z0.000	E0.004
G1	x27.096	Y98.557	Z0.000	E0.216

Name	Current	On	Material	Line
SA_Col.42_Row.01_FEMALE				Conti
SA_Col.41_Row.02_MALE				Conti
SA_Col.41_Row.01_MALE				Conti
SA_Col.40_Row.03_FEMALE				Conti
SA_Col.40_Row.01_FEMALE				Conti
SA_Col.39_Row.02_FEMALE				Conti
SA_Col.39_Row.01_MALE				Conti
SA_Col.38_Row.02_FEMALE				Conti
SA_Col.38_Row.01_FEMALE				Conti
SA_Col.37_Row.02_MALE				Conti
SA_Col.37_Row.01_MALE				Conti
SA_Col.36_Row.03_FEMALE				Conti
SA_Col.36_Row.01_FEMALE				Conti
SA_Col.35_Row.02_MALE				Conti
SA_Col.35_Row.01_MALE				Conti
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SA_Col.25_Row.01_MALE				Conti
SA_Col.24_Row.02_FEMALE				Conti
SA_Col.24_Row.01_FEMALE				Conti
BKP				Conti
A_Rails - NOT TOUCHING				Conti
A_Rails - Copy				Conti
A_Rails				Conti
A_Axes				Conti
A tops				Conti
A hidden				Conti
A Components				Conti
A bottoms				Conti
Su_SA_Col.80_Row.02_FEMALE				Conti
Site				Conti
Default				Conti
TEXT Samples				Conti
Numbering				Conti
NEW NUMBERING				Conti





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IPUX

2014-9-3  
17:06:36

电子地图

镜头列表

编号	镜头名称
01	11







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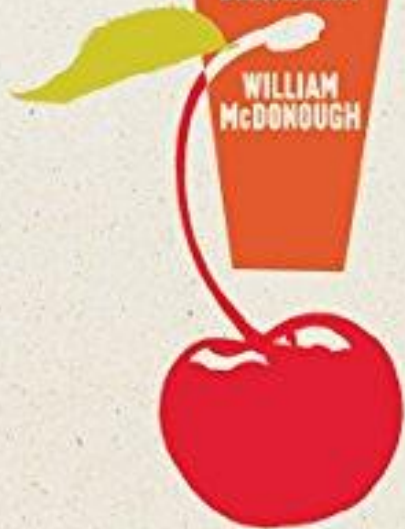
THE INTERNATIONAL BESTSELLER

# CRADLE TO CRADLE

RE-  
MAKING  
THE WAY  
WE  
MAKE  
THINGS

MICHAEL  
BRAUNGART

WILLIAM  
McDONOUGH



VINTAGE

'The business book to read right now'  
*GQ.com*

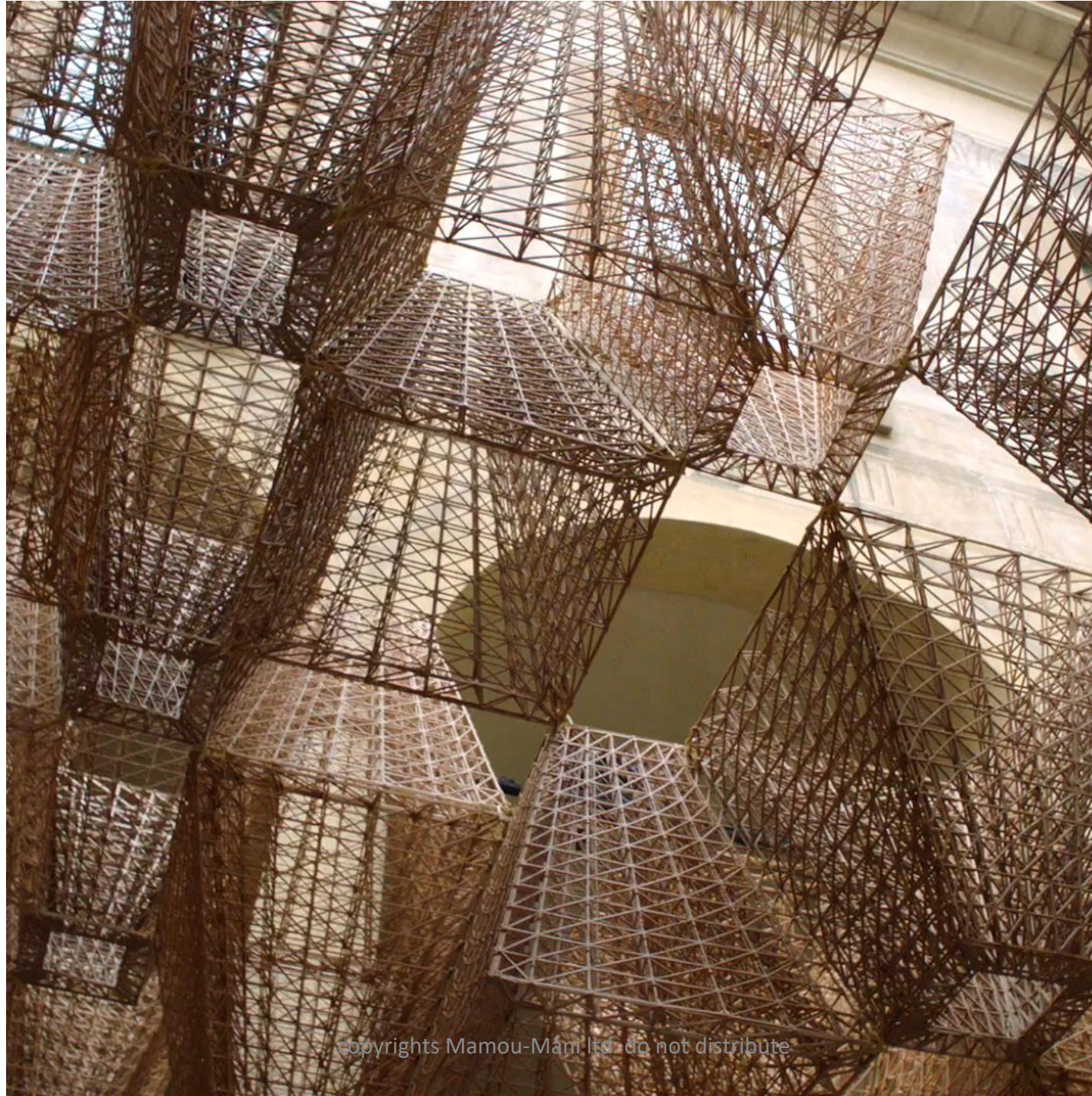
# MAKERS

## The New Industrial Revolution

Bestselling author of *The Long Tail*

# CHRIS ANDERSON





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# COS x MAMOU-MANI CONIFERA

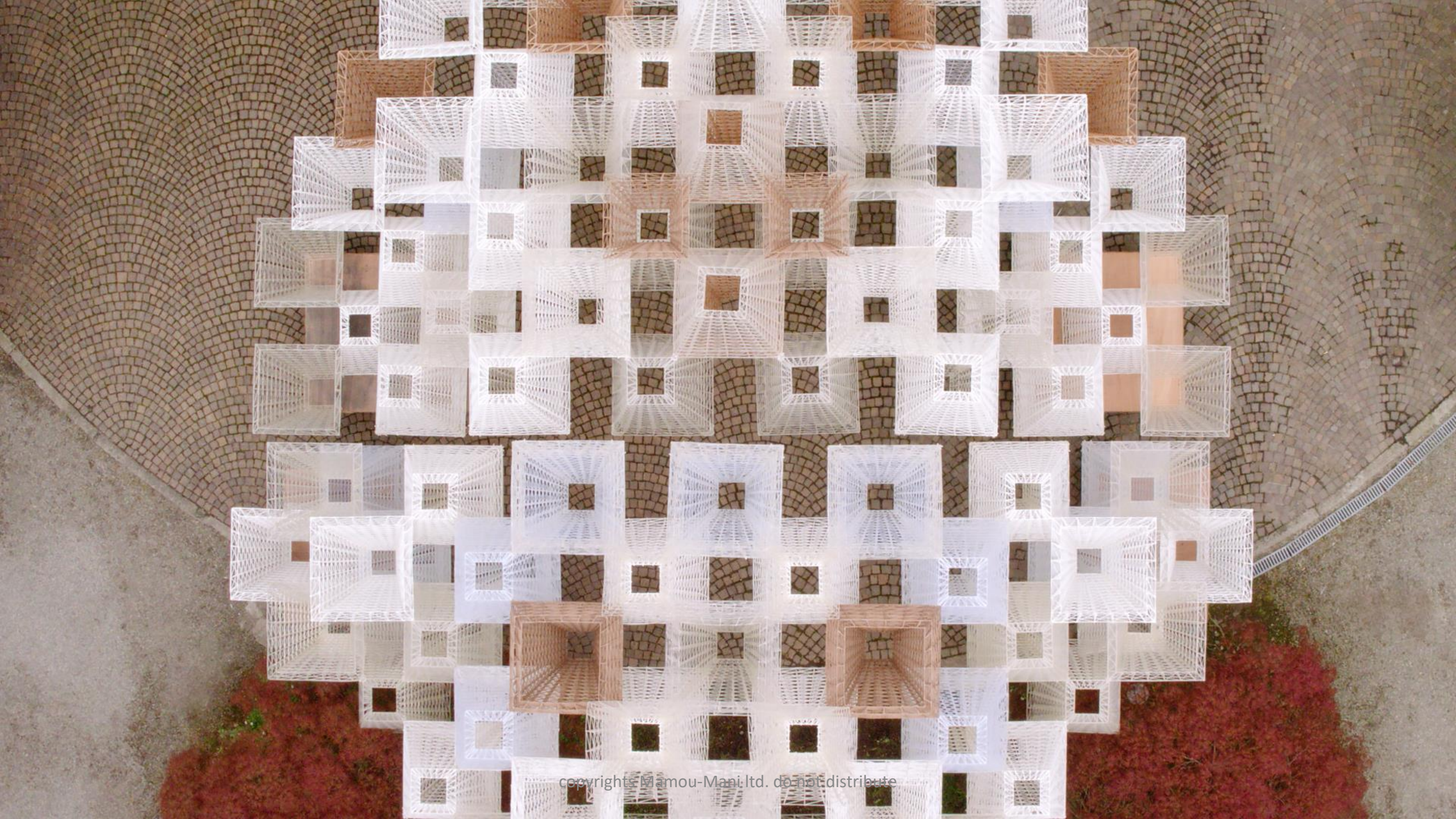






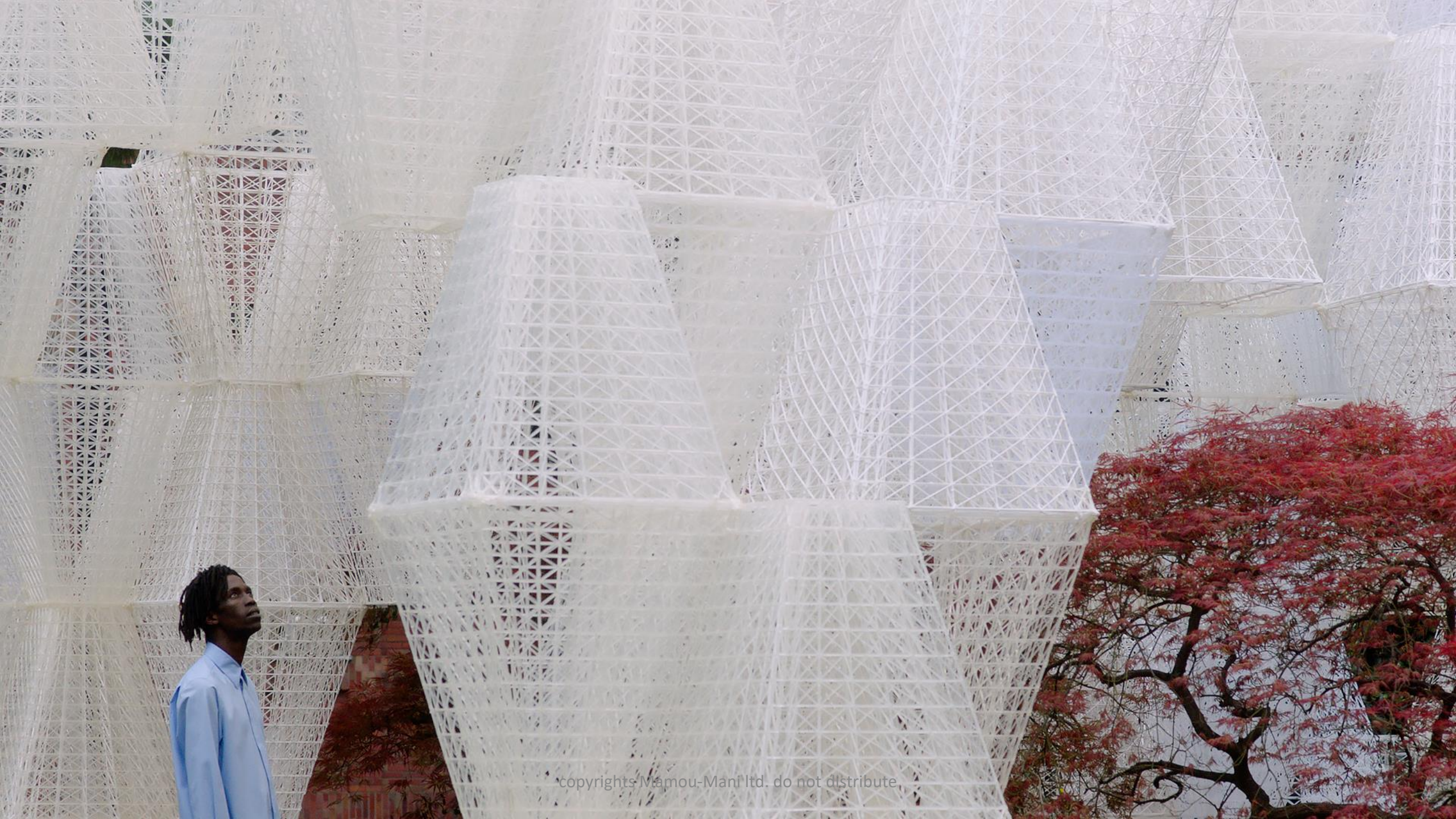
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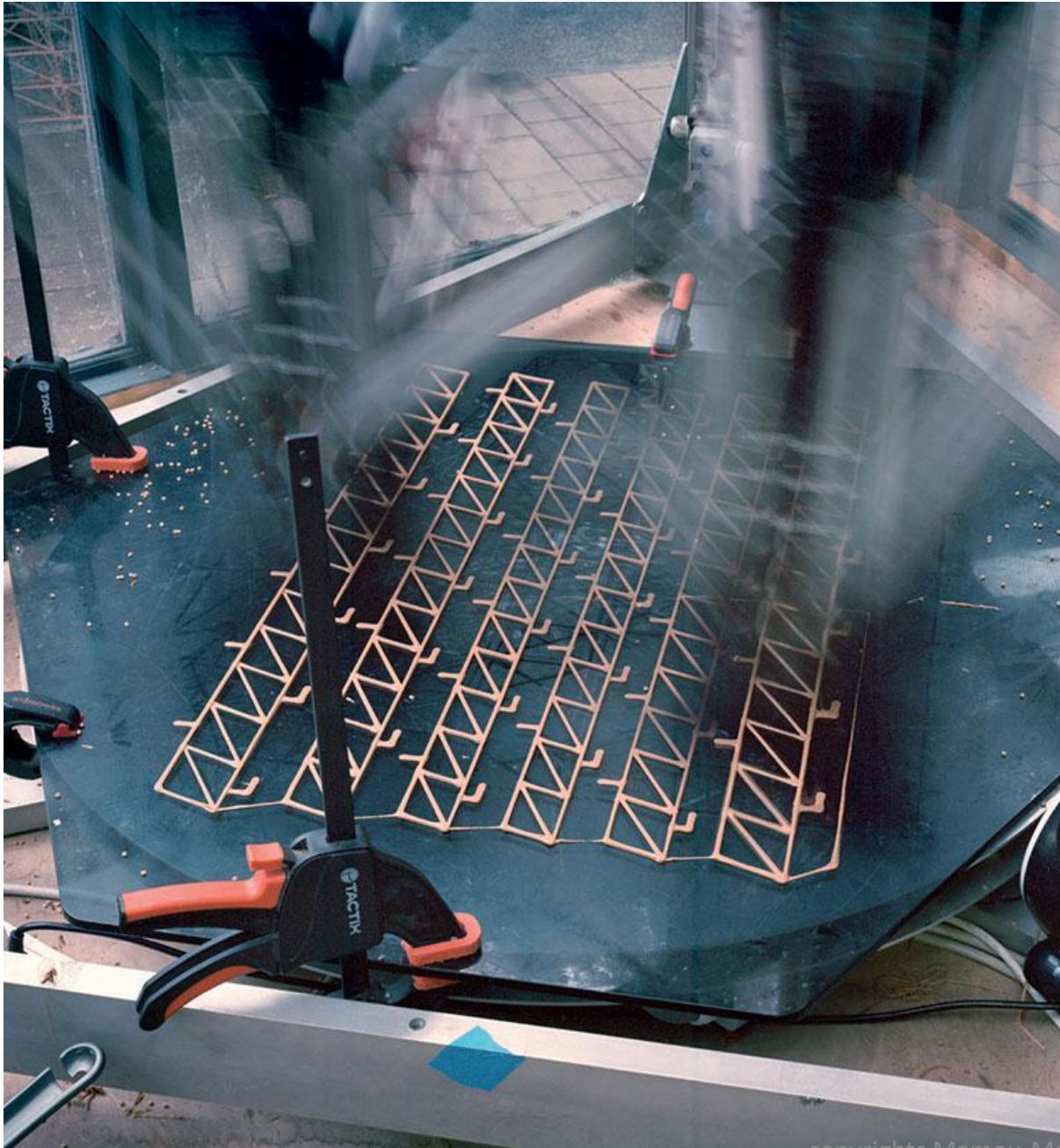


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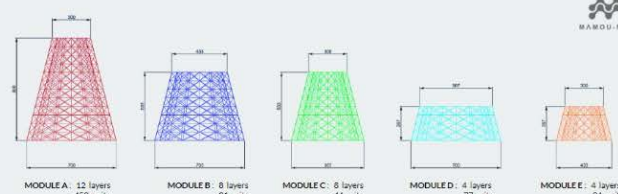






## DESIGN CONCEPT TIMELINE

NUMBER OF COMPONENTS:  
Structural: 433 units  
Non-Structural: 272 units



**RAWING ABOVE TO REDO**

**TOTAL MODULE A 439**

Courtyard: 179

Interior: 108

Garden: 147

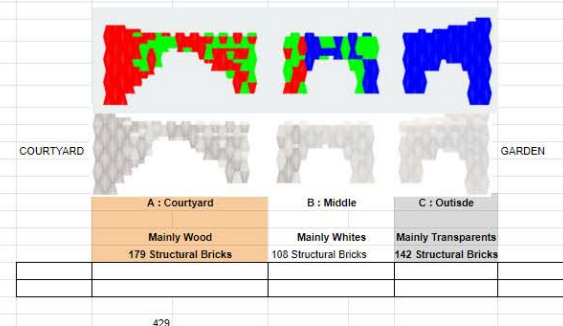
IMPORTANT WELD RULES: <https://docs.google.com/document/d/1yOJ8S-qmhTwKM5TcWj6HDWWhJvLHAc-8a0PUzshZPU/edit>

MANUAL FOR V5: [https://drive.google.com/open?id=1ZwiBqTBP\\_HZPI4UeLtmZ3IzY3ocU2QVf](https://drive.google.com/open?id=1ZwiBqTBP_HZPI4UeLtmZ3IzY3ocU2QVf)

Remember these are structural elements within a large assembly of parts and some units have to carry LARGE loads. With this in mind, the quality of fabrication at welded connections and particularly corners is critical to ensure the integrity of the whole structure

Current Printing Time (min) V5		Current Printing Time (min) V6	
Inner faces	27	Inner faces	18
Verticals	21	Verticals	21
Outer faces	29	Outer faces	19
Top And Bottom	24	Top And Bottom	24

	Wood	White	Transparent	Total
London	75	0	43	118
Venice	120	0	0	120
Milan	0	0	88	88
Macerata	0	113	0	113
<b>TOTAL STRUCTURAL PRODUCED</b>	<b>195</b>	<b>113</b>	<b>131</b>	<b>439</b>
<b>STRUCTURAL NEEDED</b>	<b>179</b>	<b>112</b>	<b>142</b>	
V4	0	0	0	
V5	60	2	98	
V6	119	110	44	
<b>STRUCTURAL PRODUCED</b>		179	112	
V4	17	26	42	
V5	69	36	66	171
V6	126	77	65	
<b>FINAL BALANCE</b>		195	113	
V4	-17	-26	-42	
V5	-9	-34	32	-11
V6	-7	35	-21	5
				-6

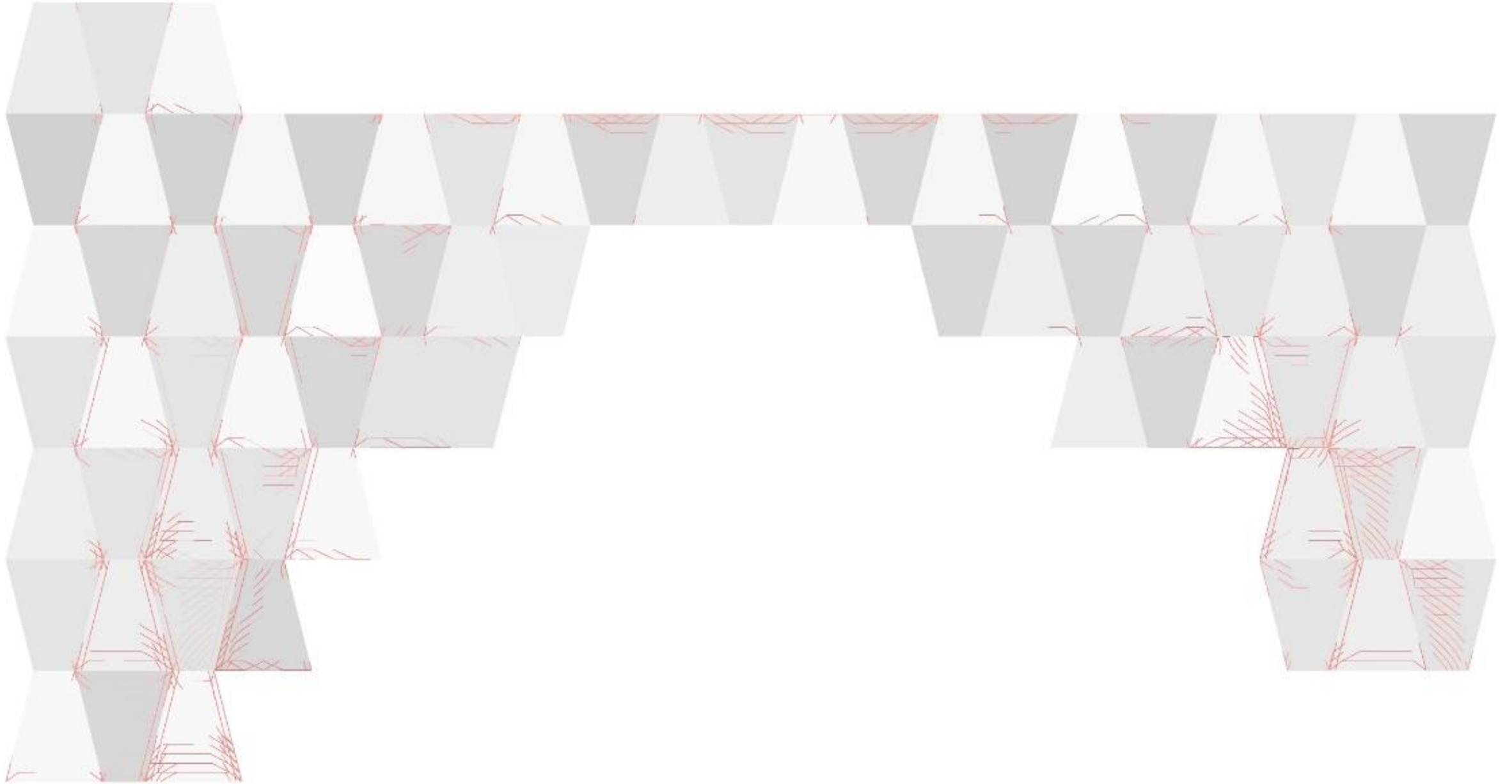


	8	2	12
	33	12	16
-C left	25	10	4
	17	6	12
	37	27	18
-B left	20	21	6
	1	2	0
-B) -(D,C)	5	11	2
DO FULL A	56	42	32
PRODUCE	22	31	69
EFT	34	11	-37
			8
DECORATIVE	22	27	69



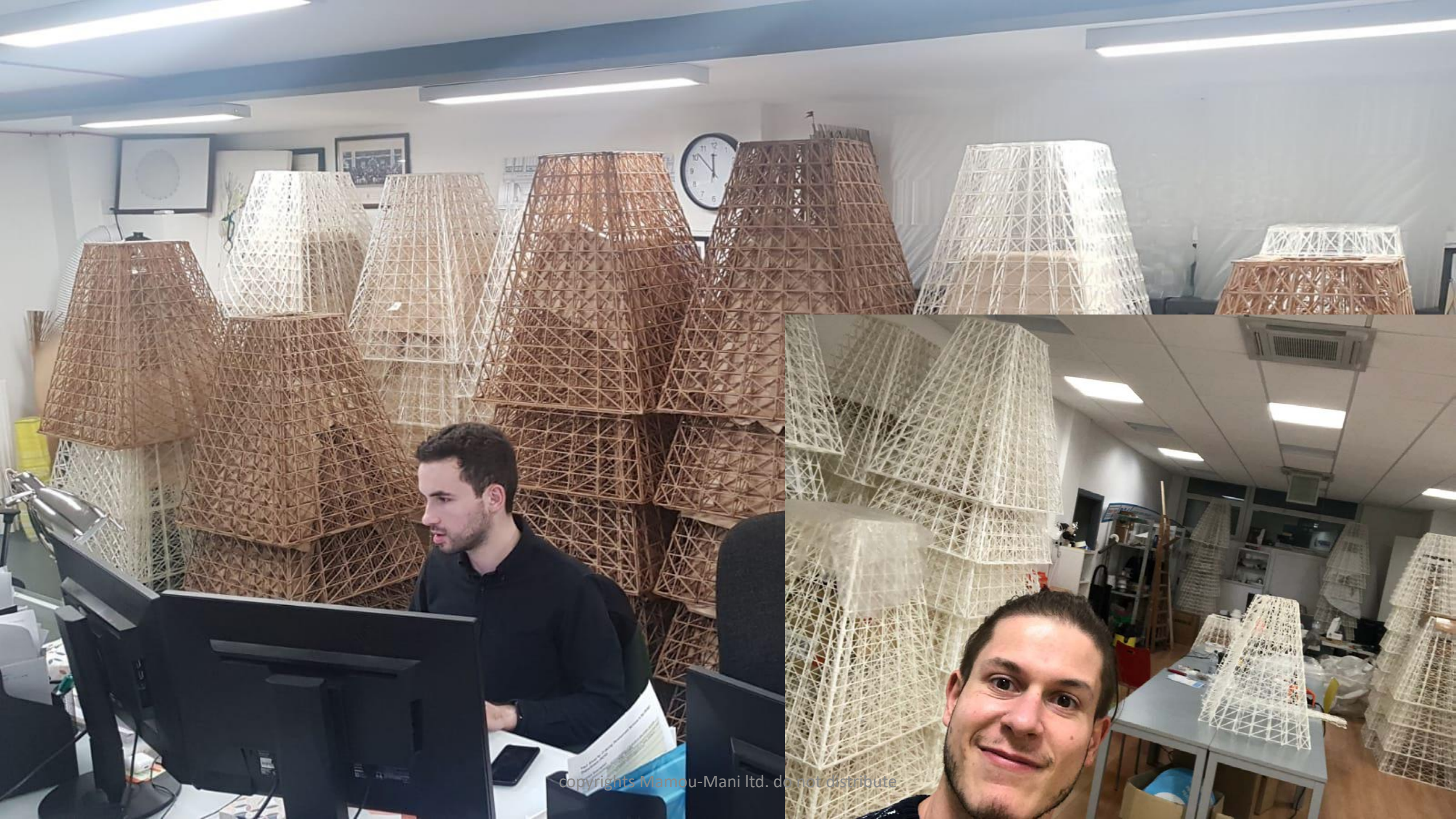






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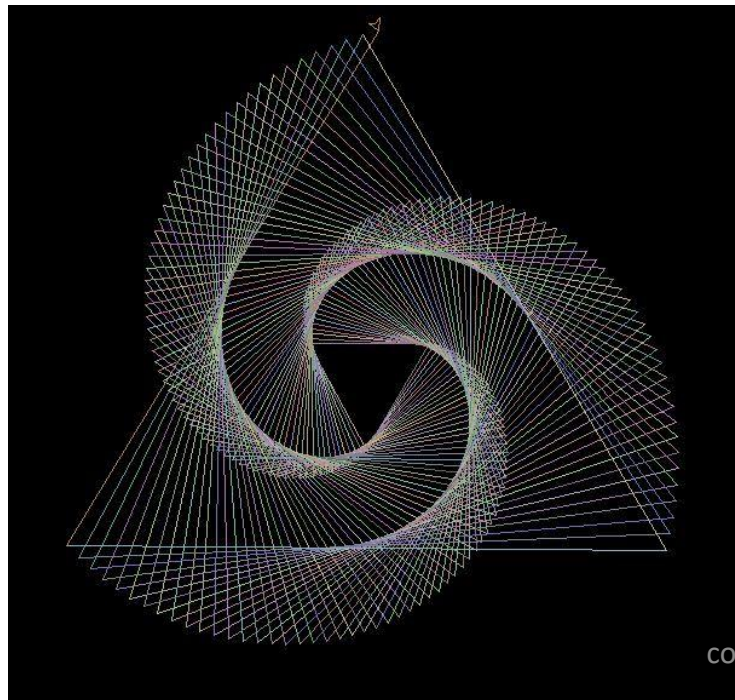




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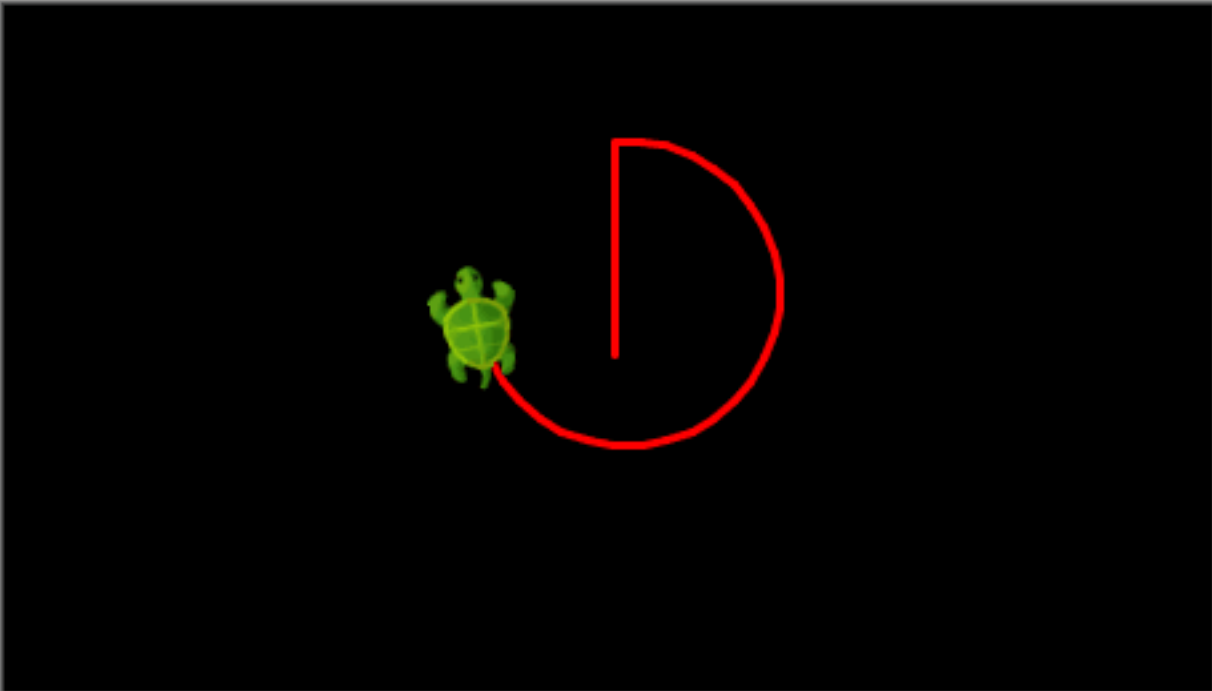


# COMPUTERS GET US CLOSER TO NATURE AND SPIRITUALITY




PythonTurtle

File Help



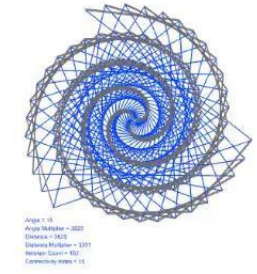
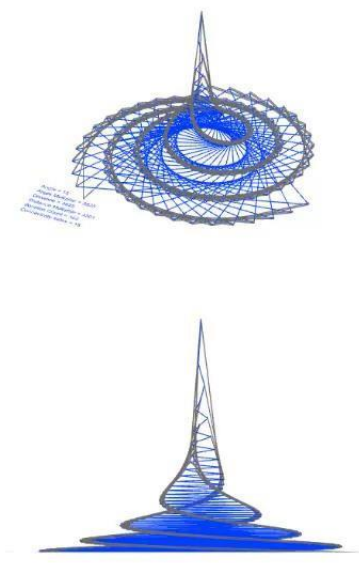
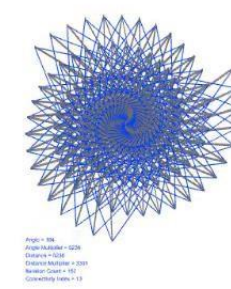
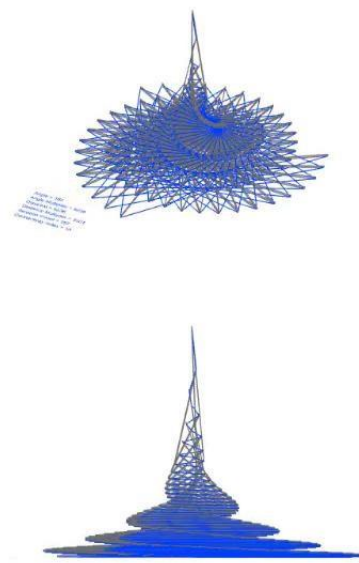
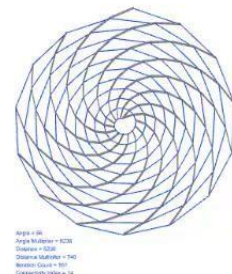
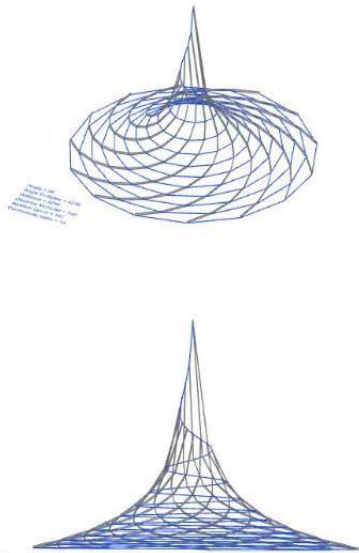
```
>>> go(80)
>>> turn(90)
>>> for i in range(26):
...     go(10)
...     turn(10)
...
>>>
```

Teach me

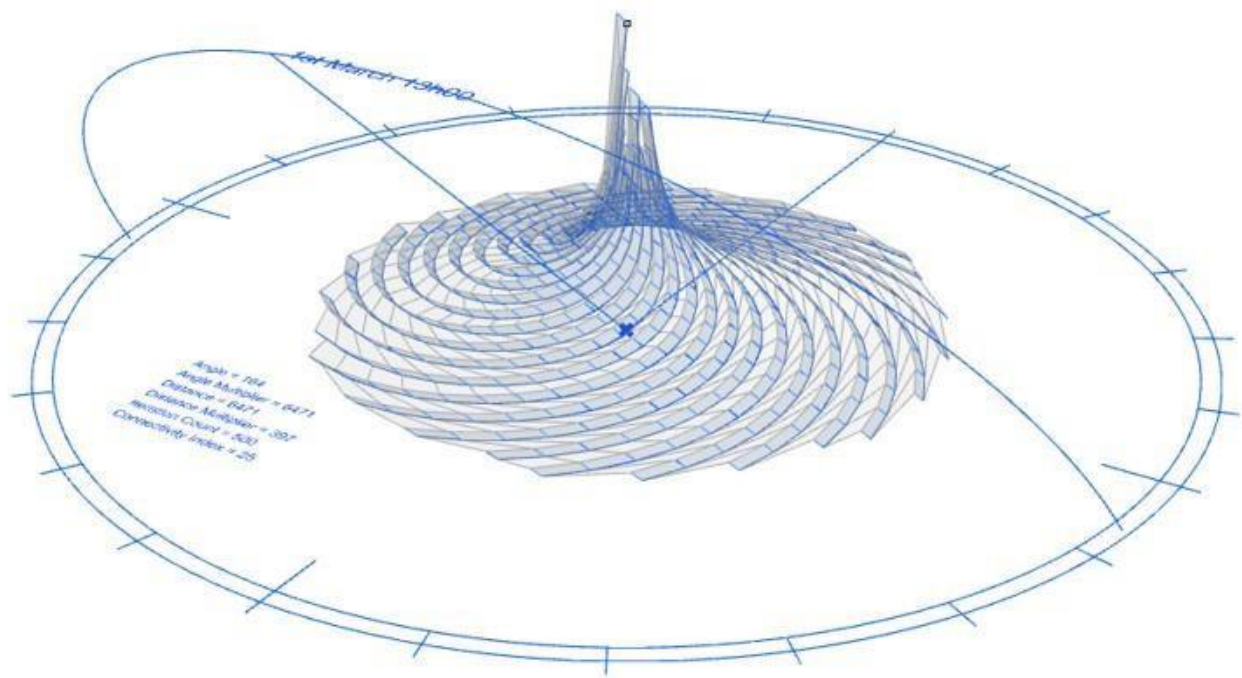
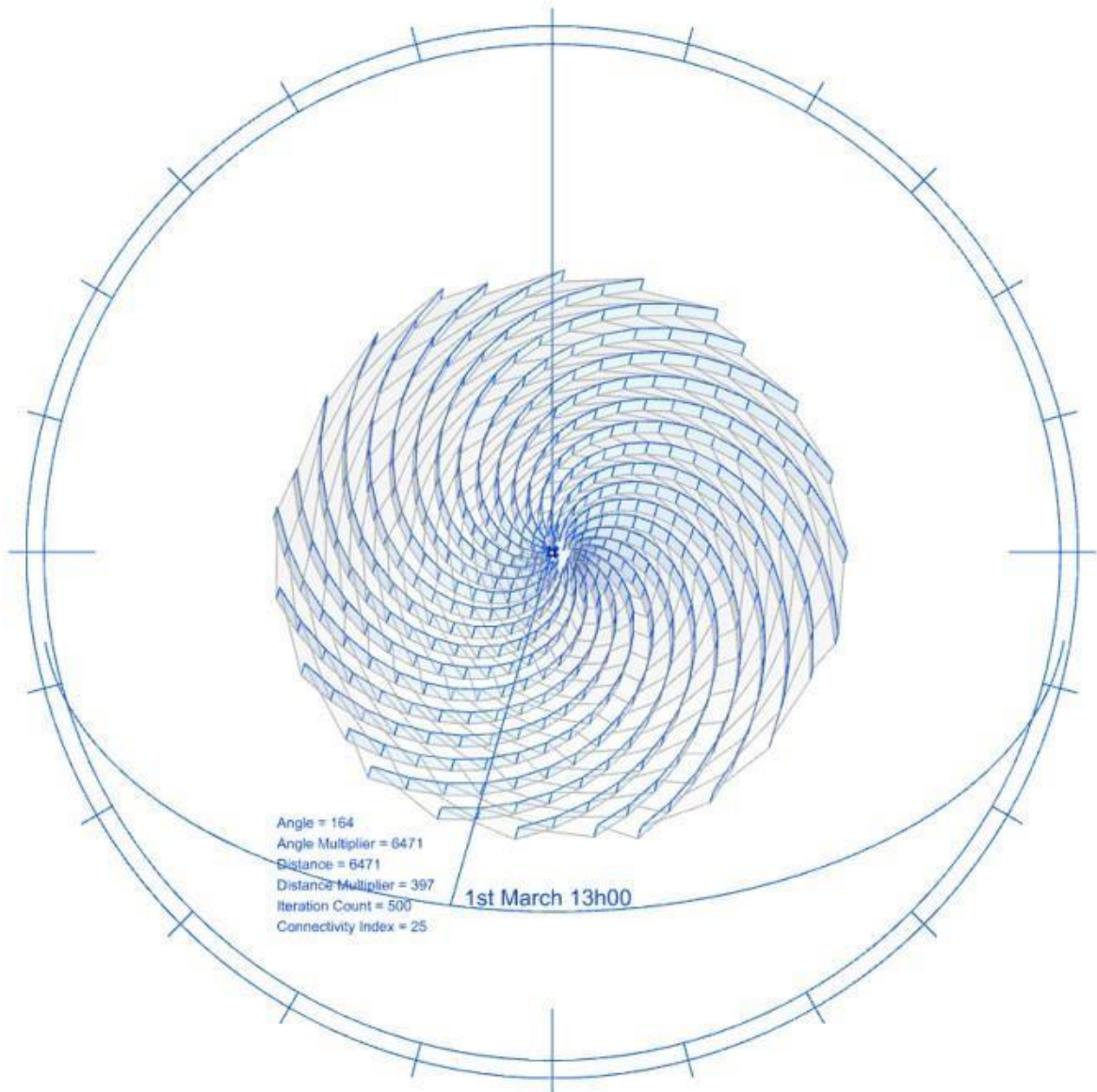




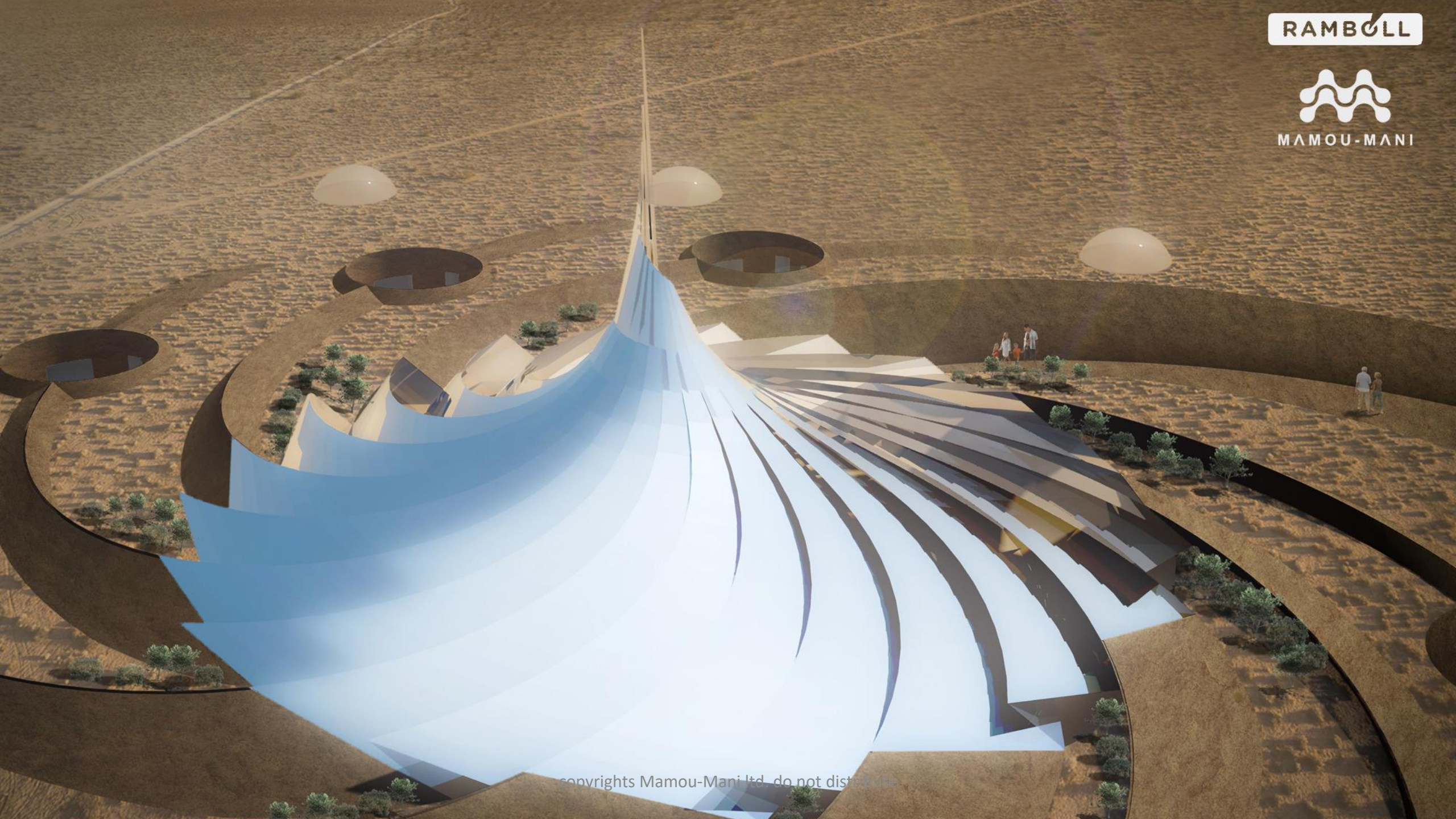
# VIRGIN GALACTIC



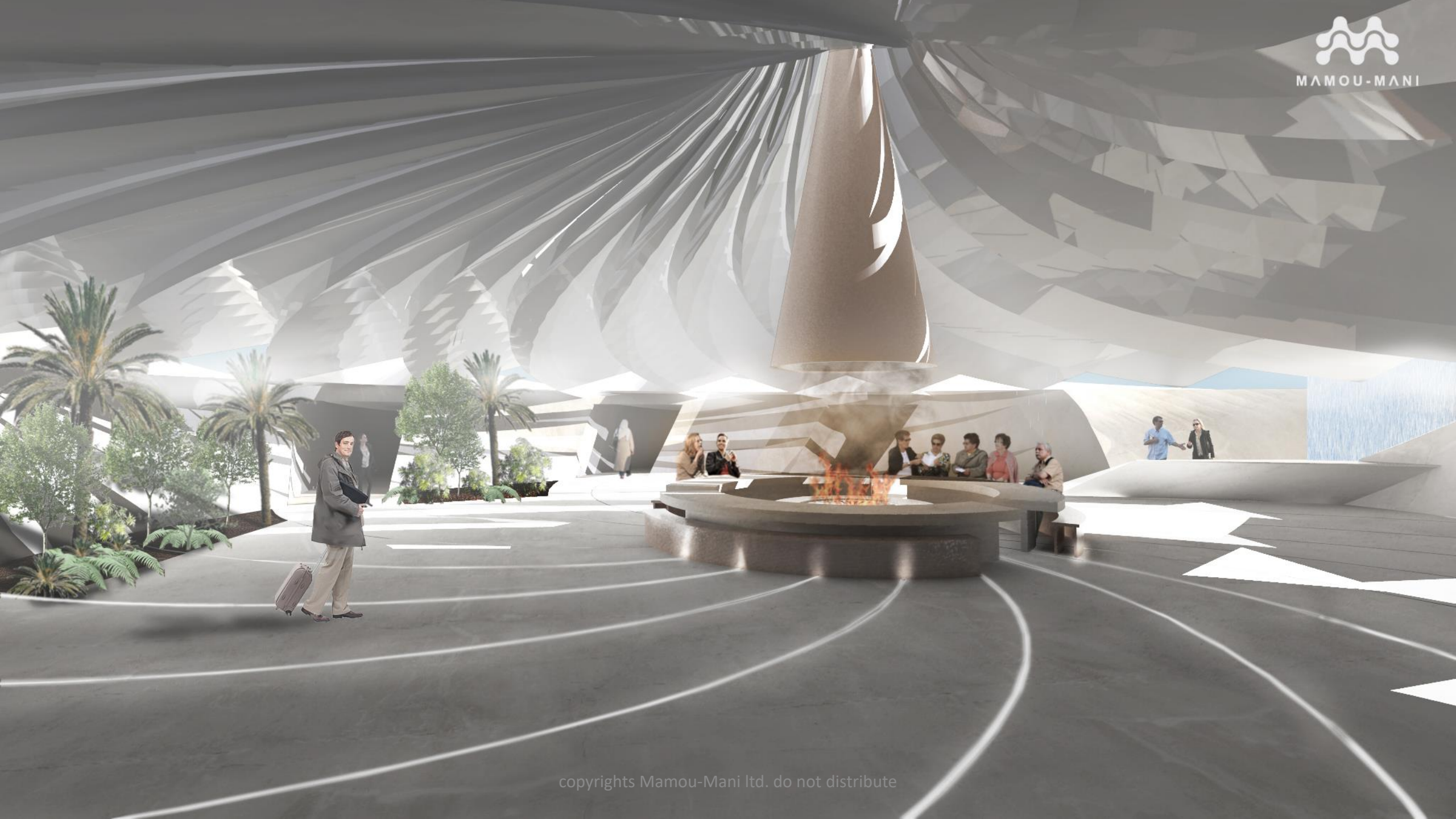














# Manifesto for Code Builders

1. The future of construction will be in **robotic technologies**.
2. Buildings and cities should leave **no physical traces**.
3. Construction can be **participatory**.
4. Code building with parametric and robotic tools **dissolve the ego** of the architect and **break boundaries** between design, engineering and building professions.
5. Parametric designs are infinitely malleable, they have **a life of their own**, similar to natural systems.
6. Construction and demolition will be subsumed into a **cyclical building process**.
7. Code Building should enable a renaissance of craft and **a return of the masterbuilder**.
8. The distinction between **designer and maker** will be dissolved.
9. Buildings, materials and tools will be part of the **circular and sharing economy**.
10. **Code and algorithms** will replace all forms of architectural drawing.
11. The democratisation of code and robotic tools enables **constant iteration** and development, leading to innovation.





***"Tell me and I forget, teach me and I may remember, involve me and I will learn."*** inspired by Xunzi (312-230 BC), Ruxiao (The Teachings of the Ru)

**— WeWantToLearn.net**

Diploma Studio 10 at Westminster University School of Architecture and the Built Environment





# 10 PRINCIPLES OF BURNING MAN

- **RADICAL INCLUSION.**
- **GIFTING.**
- **DECOMMODIFICATION.**
- **RADICAL SELF-RELIANCE.**
- **RADICAL SELF-EXPRESSION.**
- **COMMUNAL EFFORT.**
- **CIVIC RESPONSIBILITY**
- **LEAVING NO TRACE.**
- **PARTICIPATION.**
- **IMMEDIACY.**



# RADICAL SELF-EXPRESSION

**'Instead of doing art about the state of society, we do art that creates society around it.' Larry Harvey**





# EMERGENT CREATIVITY

“We see culture as a self-organising thing.” Larry Harvey



Identity Alchemy workshops “Let go of who you think you are”



## CITY AS **INCUBATOR FOR COMMUNITY**

Well it seems to me, that all real communities grow out of a shared confrontation with survival. Communities are not produced by sentiment or mere goodwill. They grow out of a shared struggle. Our situation in the desert is an **incubator for community**. Larry Harvey

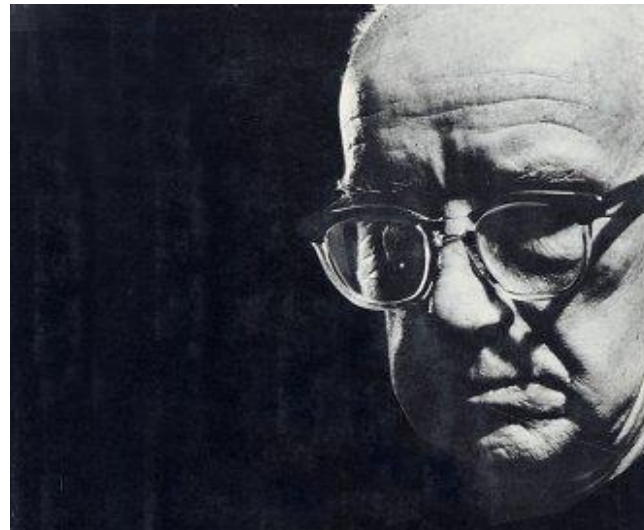
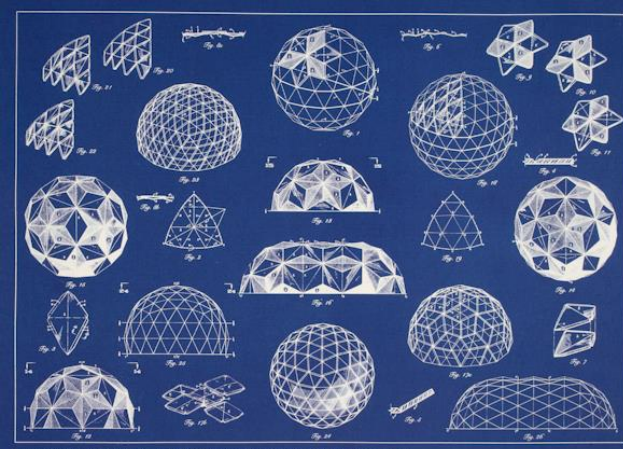


Summer Burkes





# BUCKMINSTER FULLER (1895 – 1983)

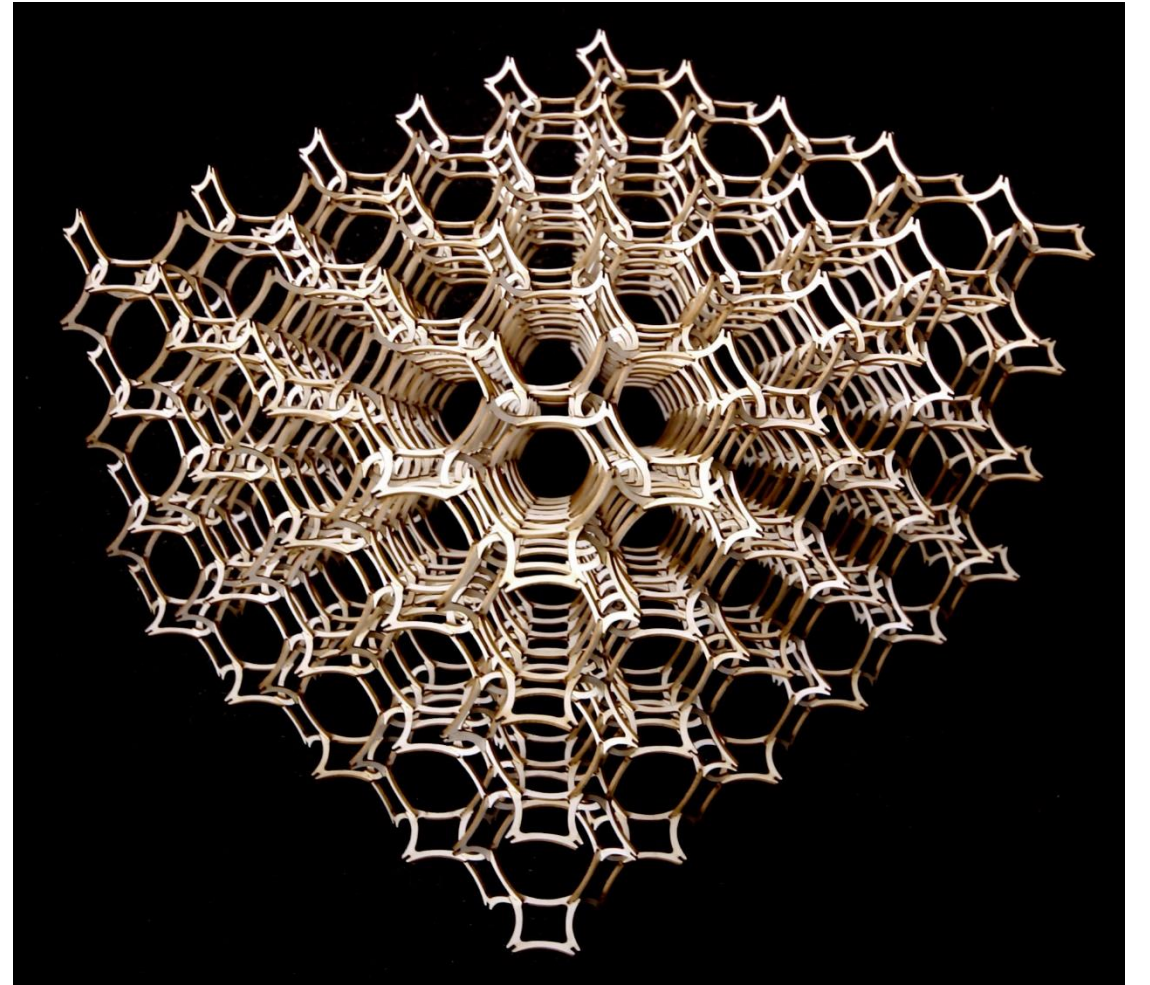
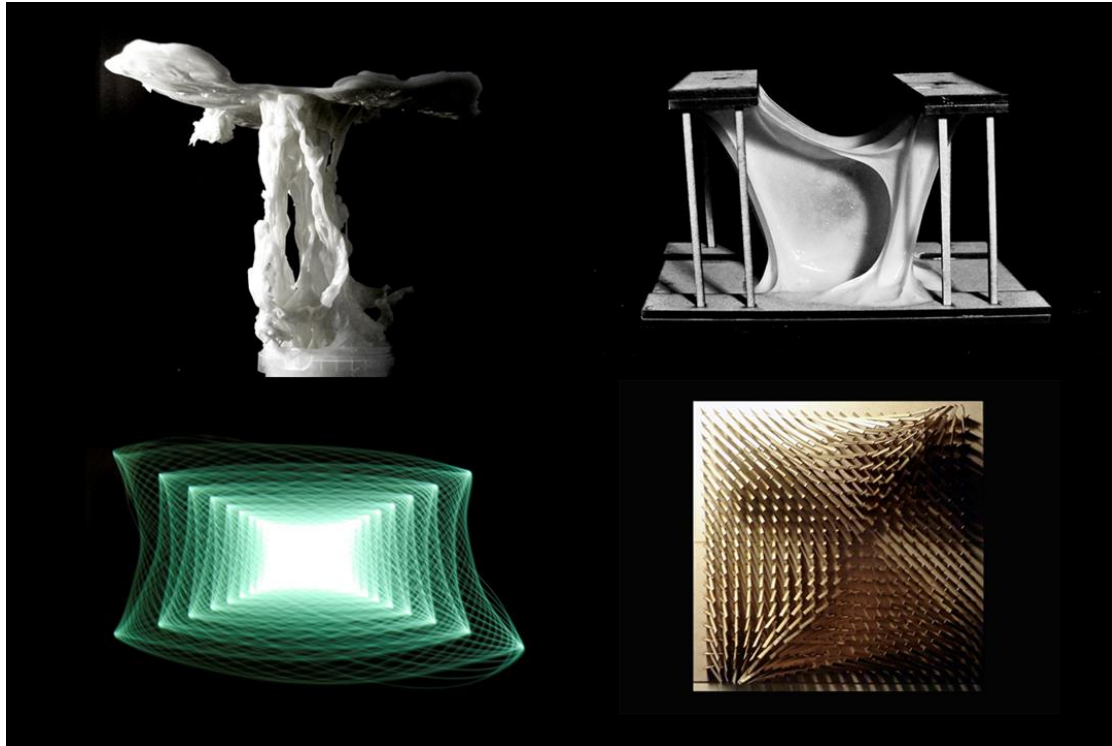


r. buckminster fuller  
*operating manual*  
for  
*spaceship earth*

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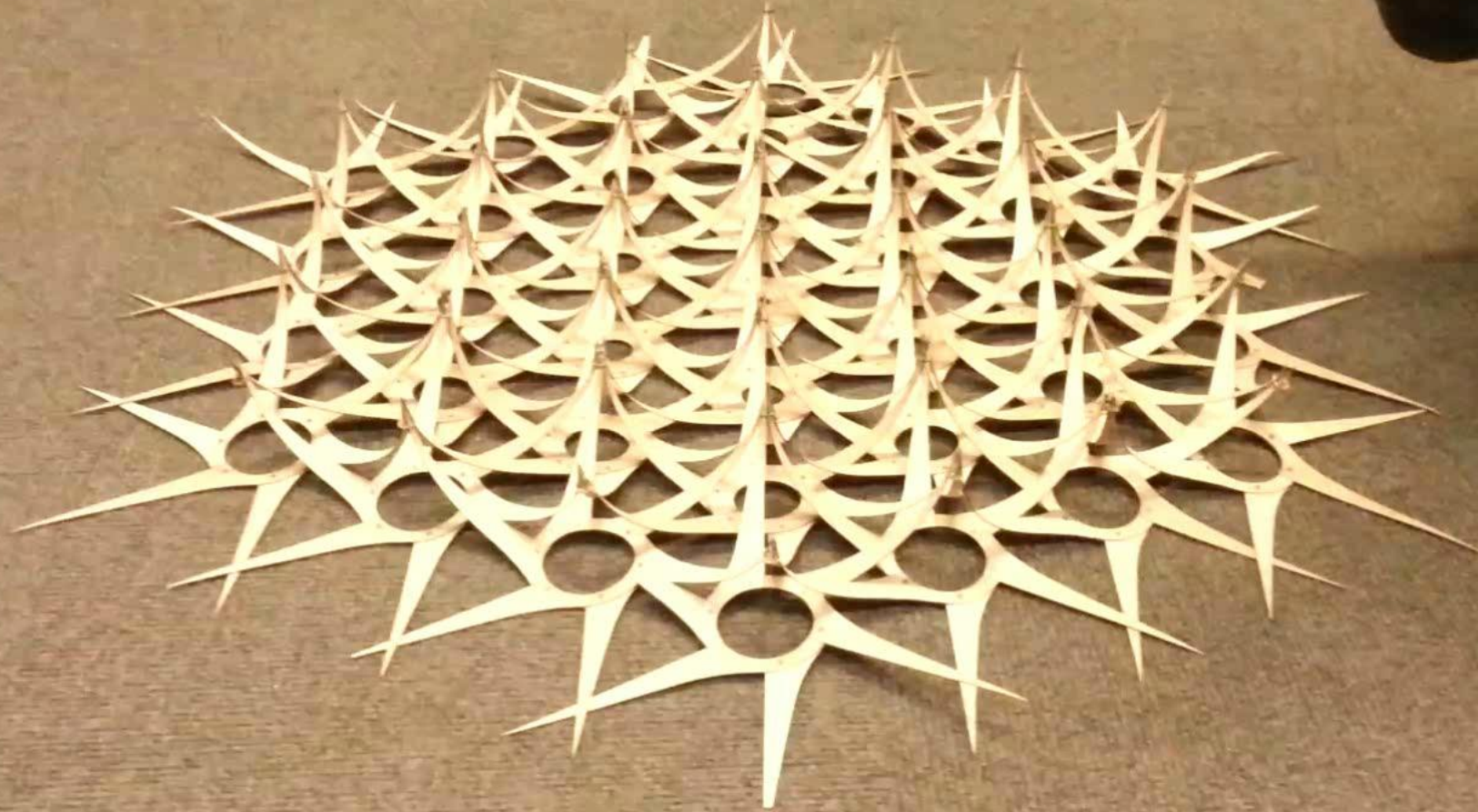






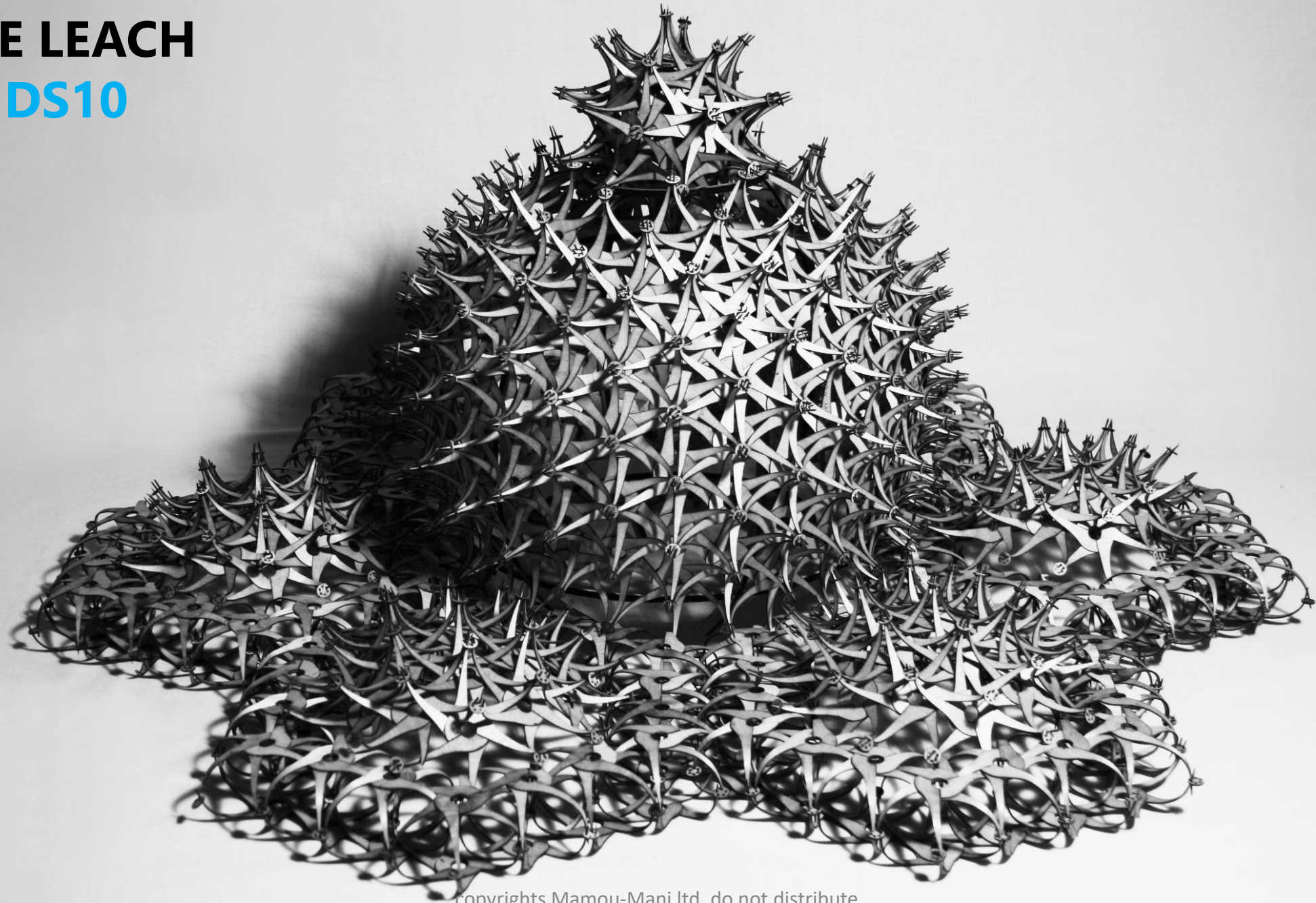


**JOE LEACH**  
**DS10**





**JOE LEACH**  
**DS10**



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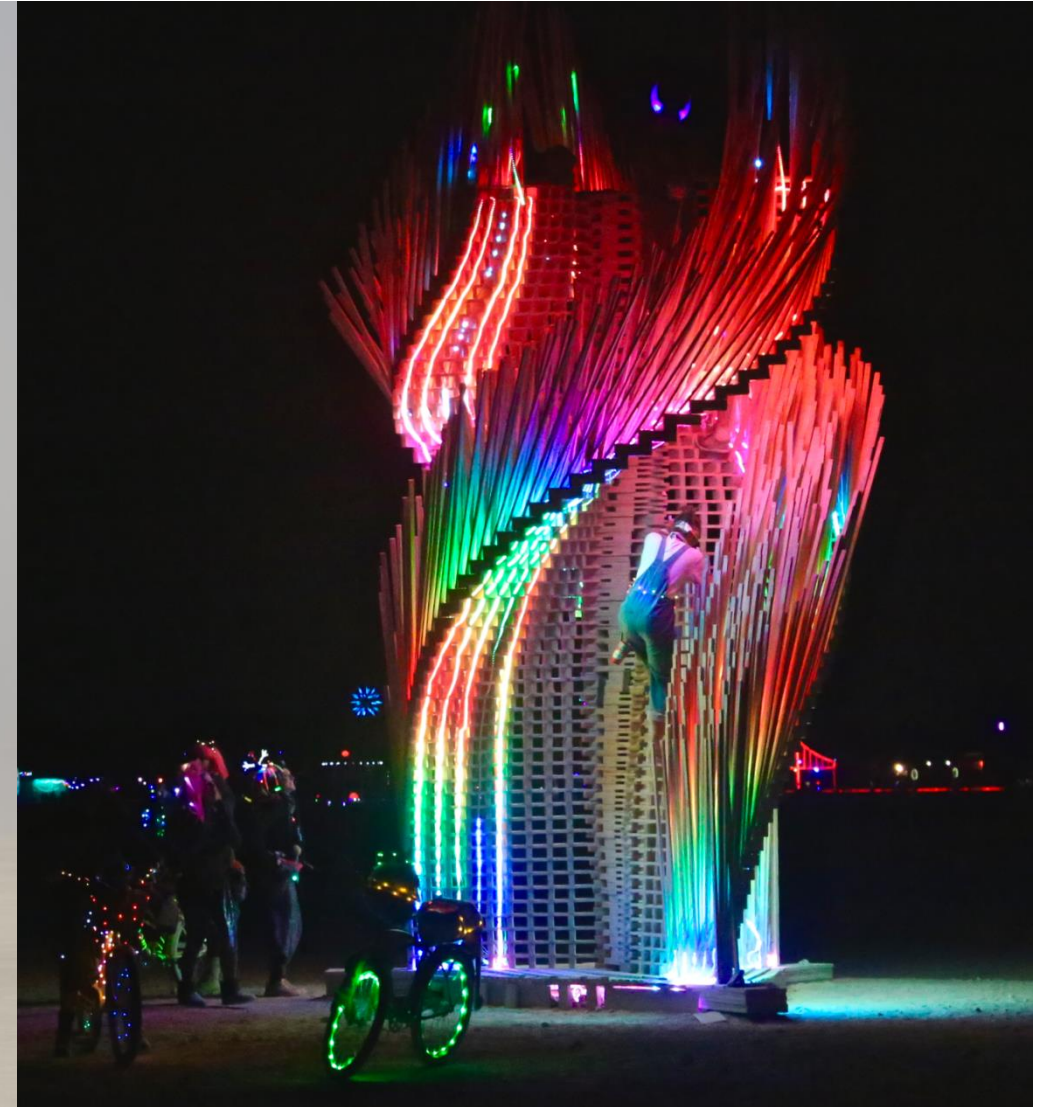
**DS10**



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# TAGENTIAL DREAMS BURNING MAN 2016





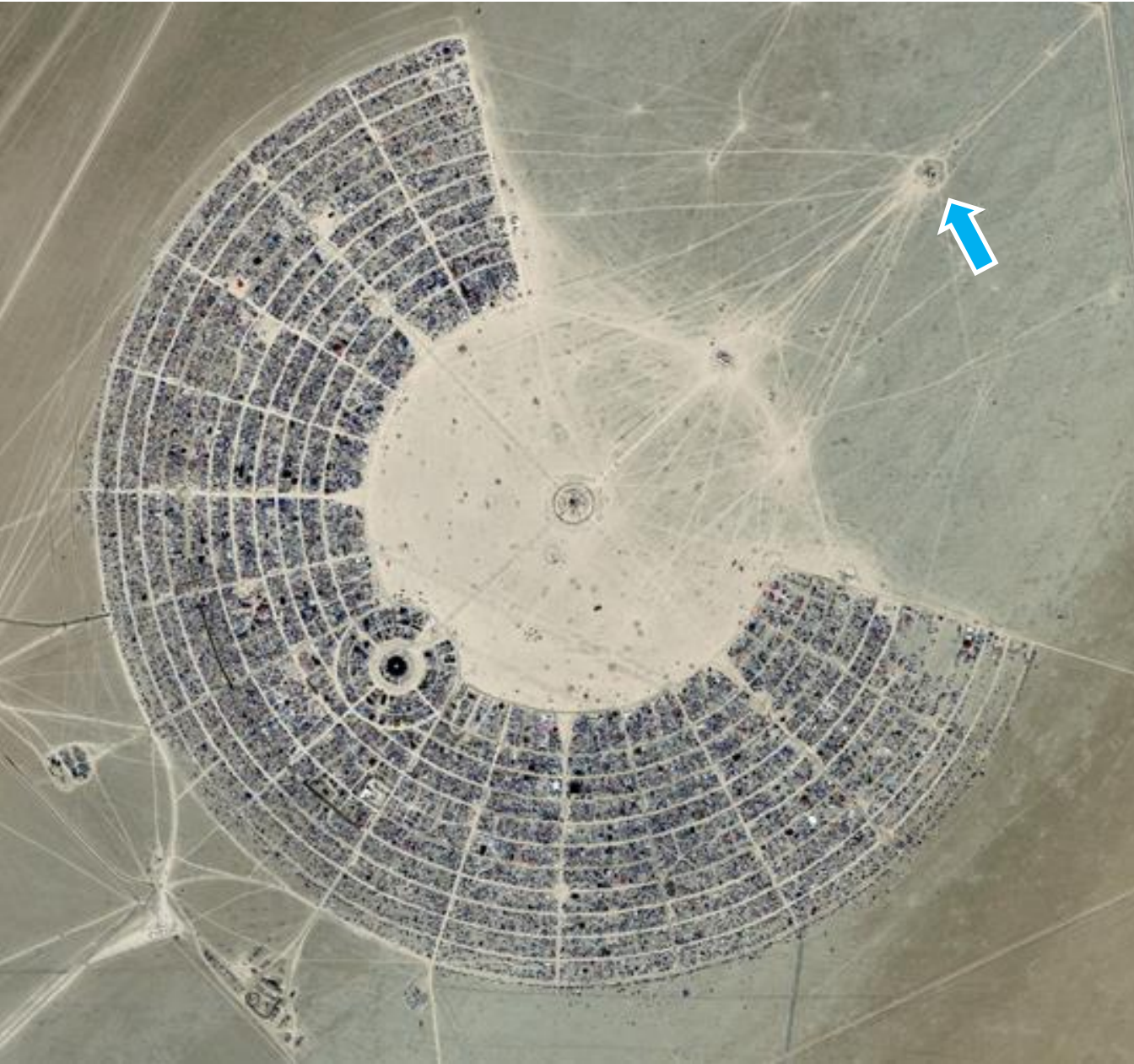








# THE BURNING MAN TEMPLE





BE SURE YOU...  
DOO

Go away Cancer  
I am tired of  
holding you.  
Please let go of me.

I Give  
You My  
Strength  
Solos













G A L A X I A









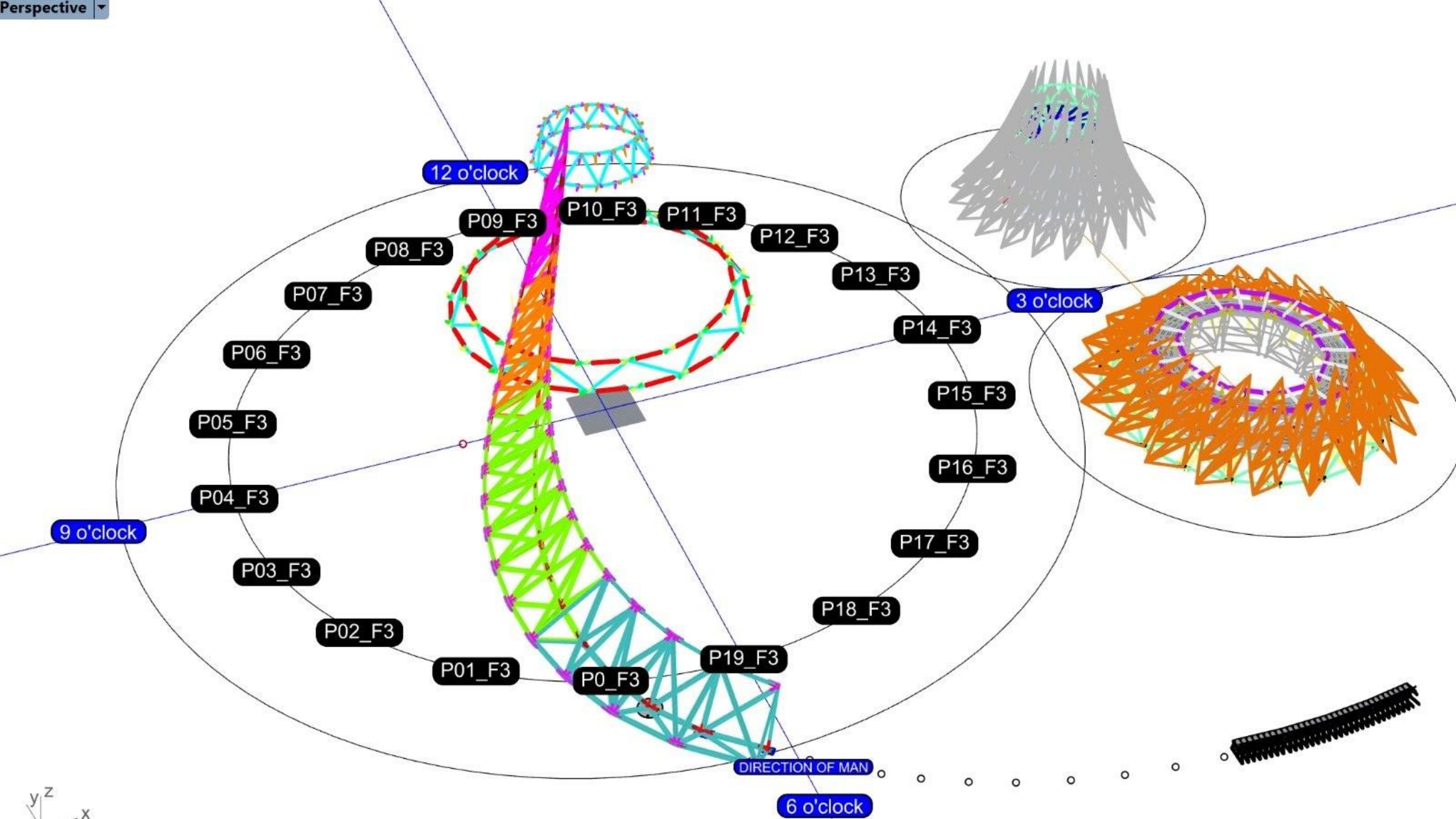












9 o'clock

12 o'clock

3 o'clock

6 o'clock

DIRECTION OF MAN

y  
z  
x

- P09\_F3
- P08\_F3
- P07\_F3
- P06\_F3
- P05\_F3
- P04\_F3
- P03\_F3
- P02\_F3
- P01\_F3
- P0\_F3

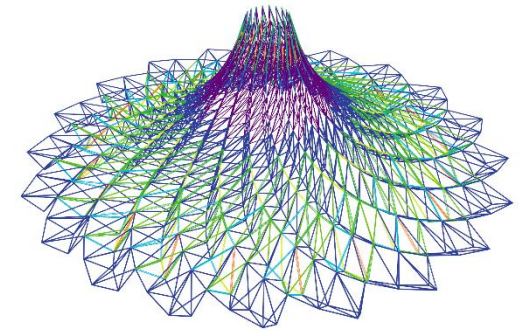
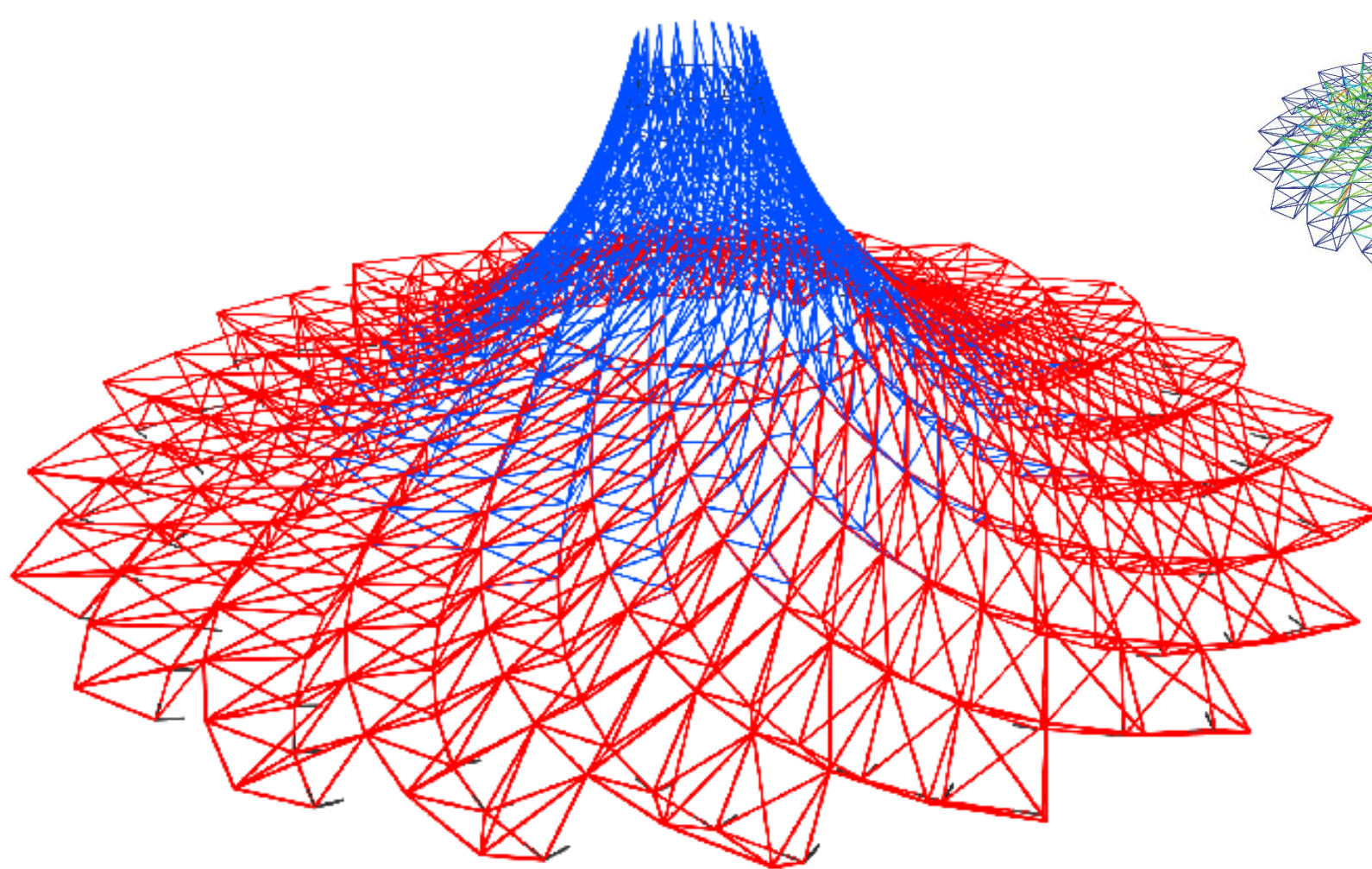
- P10\_F3
- P11\_F3
- P12\_F3
- P13\_F3
- P14\_F3
- P15\_F3
- P16\_F3
- P17\_F3
- P18\_F3
- P19\_F3





4x4 inch

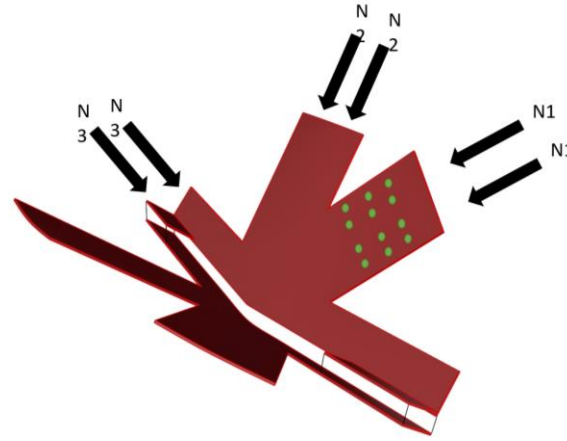
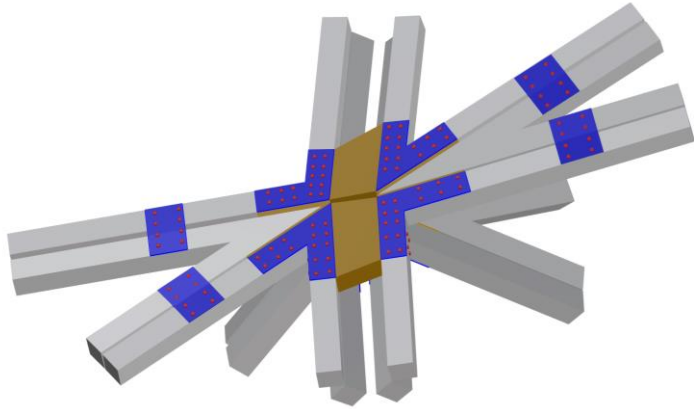
2x4 inch



Bottom Part optimized using "Triangle"

Mass: 61 810 kg



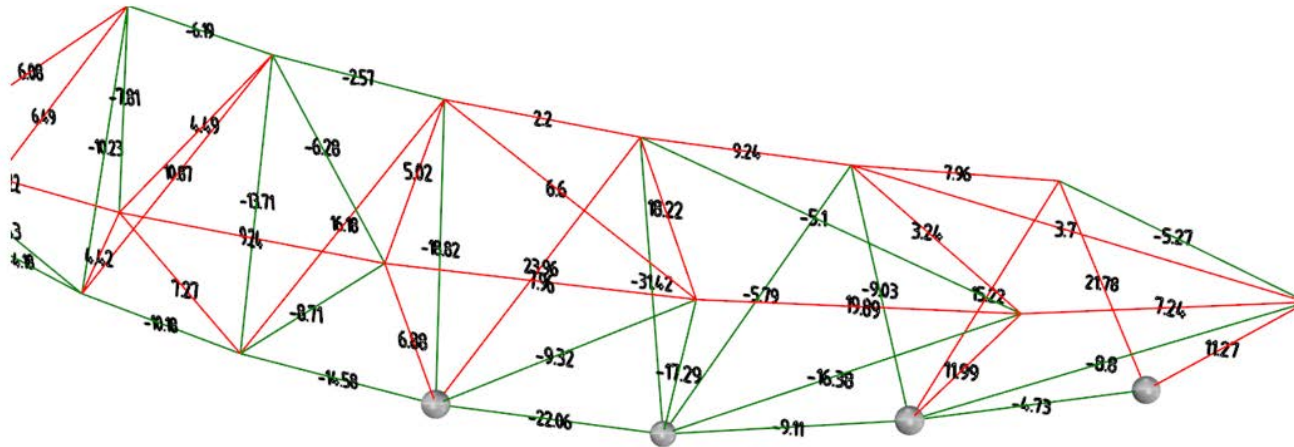


$$n^{\circ} \text{ screws} = \frac{2N}{1.8} * \cos(\alpha)$$

for compression element  
( negative value )

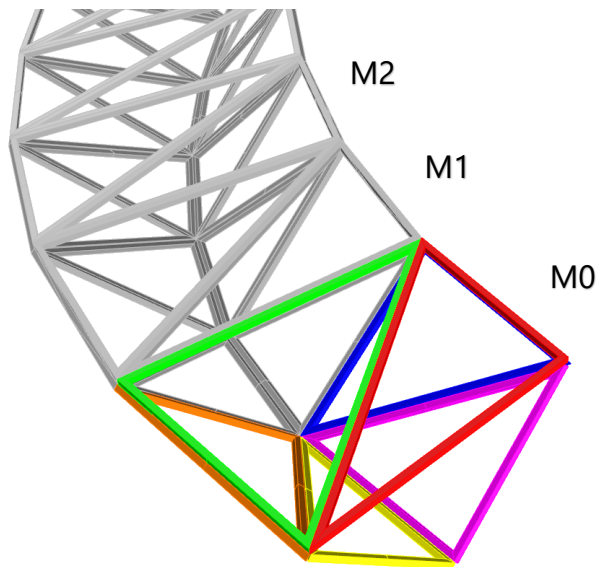
$$n^{\circ} \text{ screws} = \frac{2N}{1.8}$$

for tension element  
( positive value )

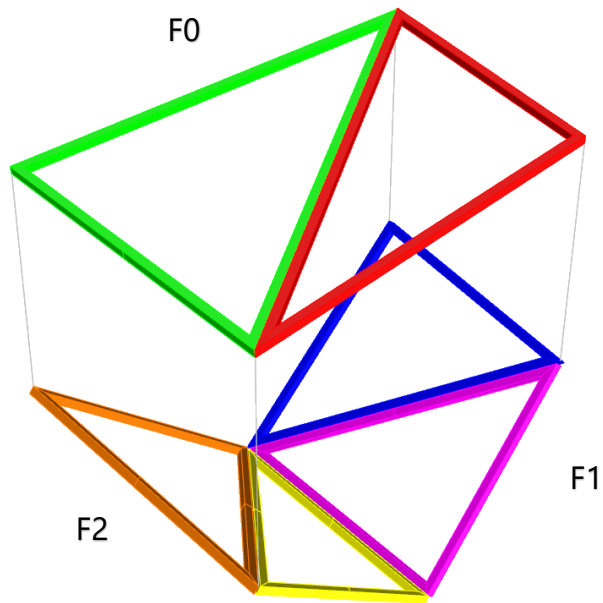


4 folding plate connection

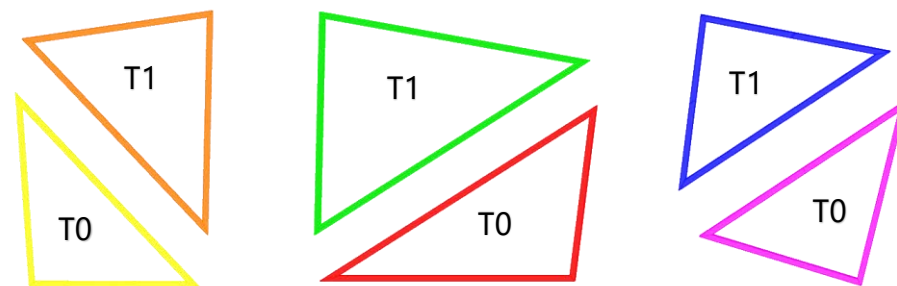
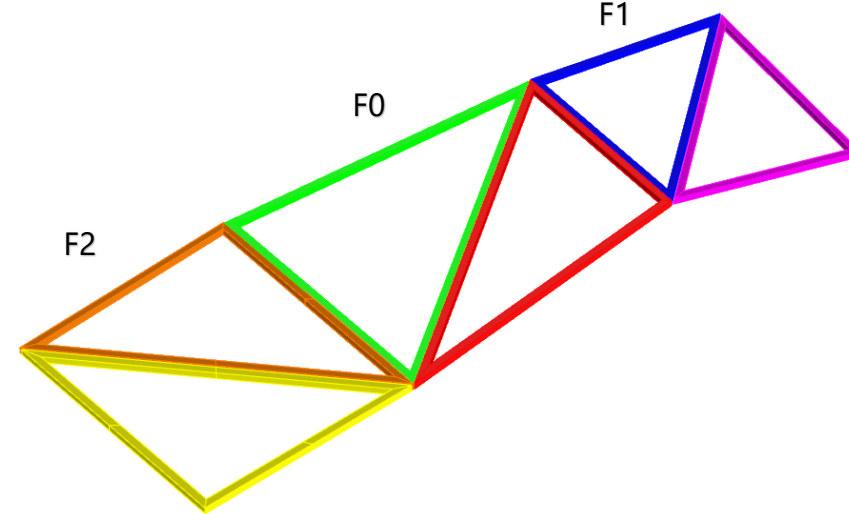




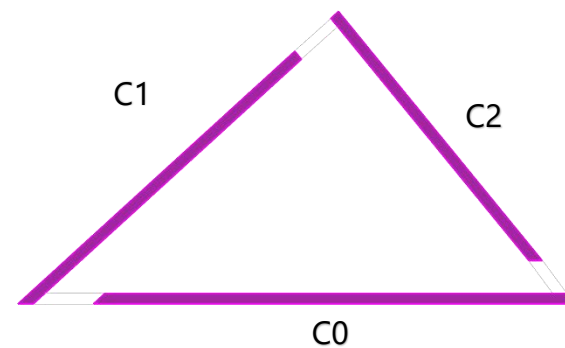
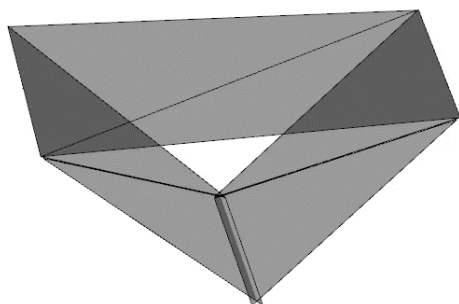
20 Modules per petal



3 faces per module



2 triangles per face

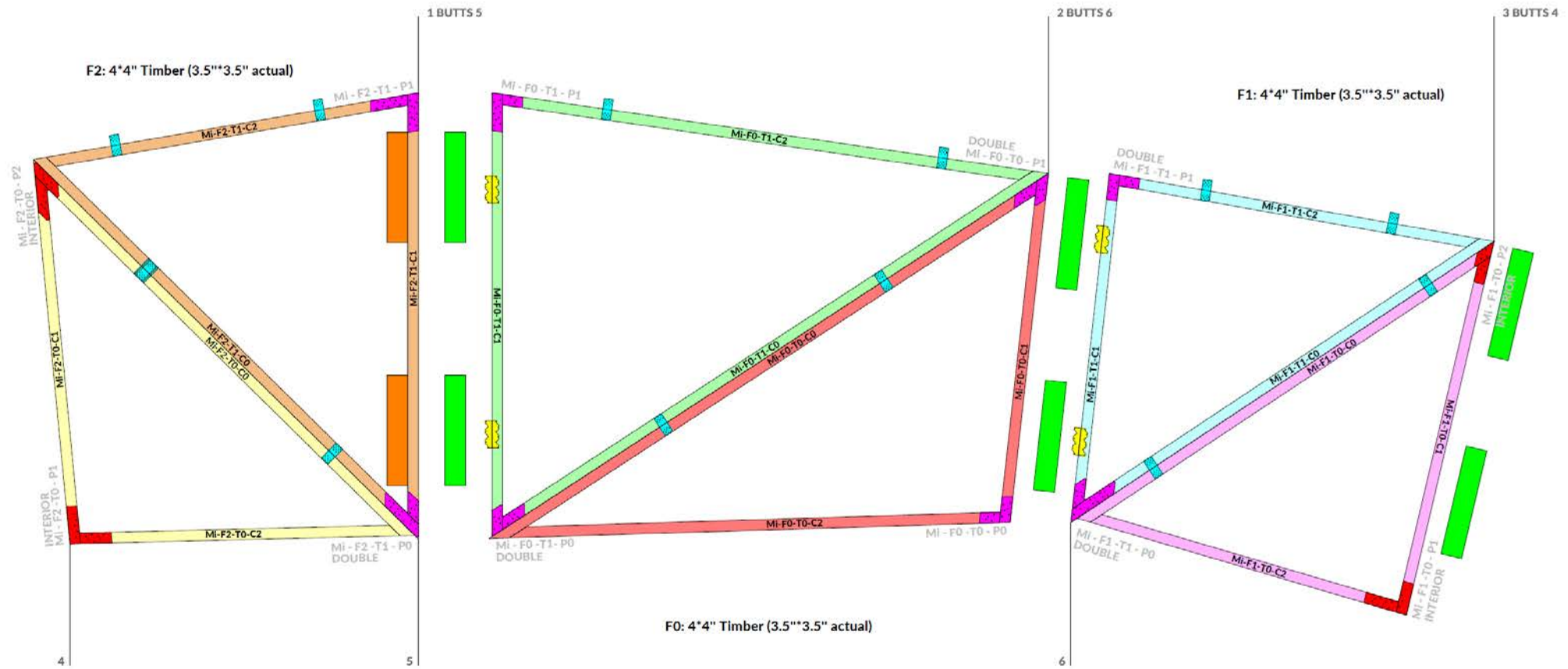


3 components per triangle



# GALAXIA - BURNING MAN TEMPLE 2018

FABRICATION DRAWINGS V10  
MODULE I



CONNECTION 0	CONNECTION 1	CONNECTION 2	CONNECTION 3	CONNECTION 4	CONNECTION 5
<p>Skewable angle: SIMPSON LS90</p> <p>Screw: Deck Screw (#6) 2" length</p>	<p>2x4 TIMBER: Plate: SIMPSON HTP3Z Screw: For HTP: SIMPSON SD #9 x 1.5" Adjacent: SDWS 6"</p> <p>4x4 TIMBER: Bolts: 3/8"-24 dia hex, 8" length Nut: 5/16", 1/4" length Washer: 5/16" x 0.688" OD, 1/8" thick</p>	<p>SINGLE PLATE: Bespoke 12GA single Screw: SDS 1.5" SDWS 3"</p> <p>DOUBLE PLATE: Bespoke 12GA double Bolts: 5/16"-24 dia x 2 1/2" hex 5/16"-24 dia x 4.5" hex Nut: 5/16", 1/4" length</p>	<p>SINGLE PLATE: Bespoke 12GA single Screw: SDS 1.5" SDWS 3"</p> <p>DOUBLE PLATE: Bespoke 12GA double Bolts: 5/16"-24 dia x 2 1/2" hex 5/16"-24 dia x 4.5" hex Nut: 5/16", 1/4" length</p>	<p>Screw: SDWS 5"</p>	<p>Screw: SDWS 6"</p>









WOOD  
MATERIALS  
CO.  
1000  
1000  
1000





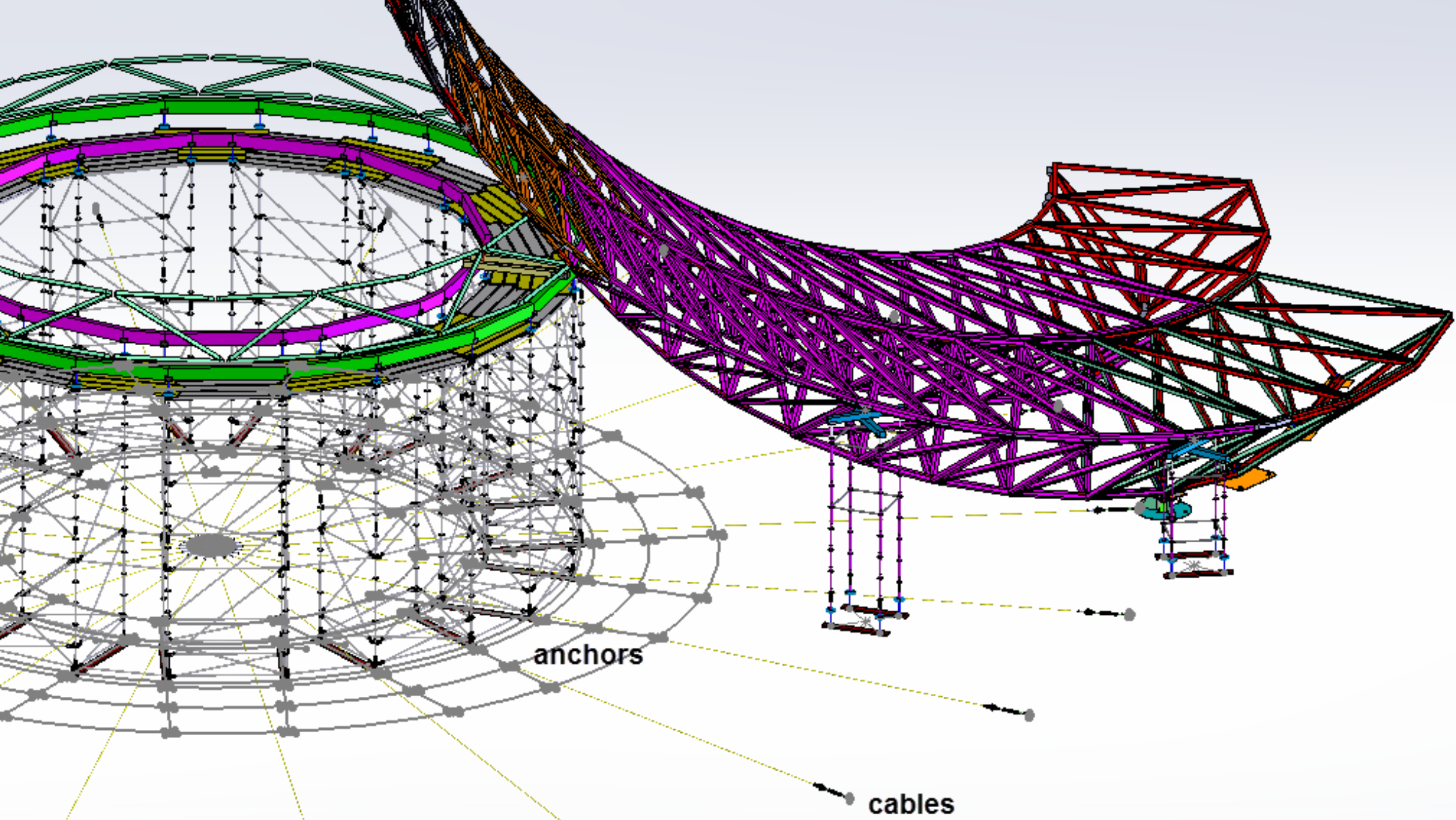
































Ps  
I really  
really really  
miss your  
Spagetti











**Imagine there's no countries  
It isn't hard to do**

**Nothing to kill or die for  
And no religion, too**

**Imagine all the people  
Living life in peace**

**You, you may say I'm a dreamer  
But I'm not the only one**

**I hope someday you will join us  
And the world will be as one**

**Imagine no possessions  
I wonder if you can**

**No need for greed or hunger  
A brotherhood of man**

















A person is holding a large, rectangular sign made of white cardboard. The sign has handwritten text in black marker. The person is wearing a dark t-shirt with a graphic of a woman's face and a red and black patterned skirt. The background is a bright, outdoor festival setting with wooden structures and other people.

If you need a HUG,  
I AM HERE FOR YOU.



LET'S DO THIS, **TOGETHER**

@Fab.Pub

@MamouMani.com

