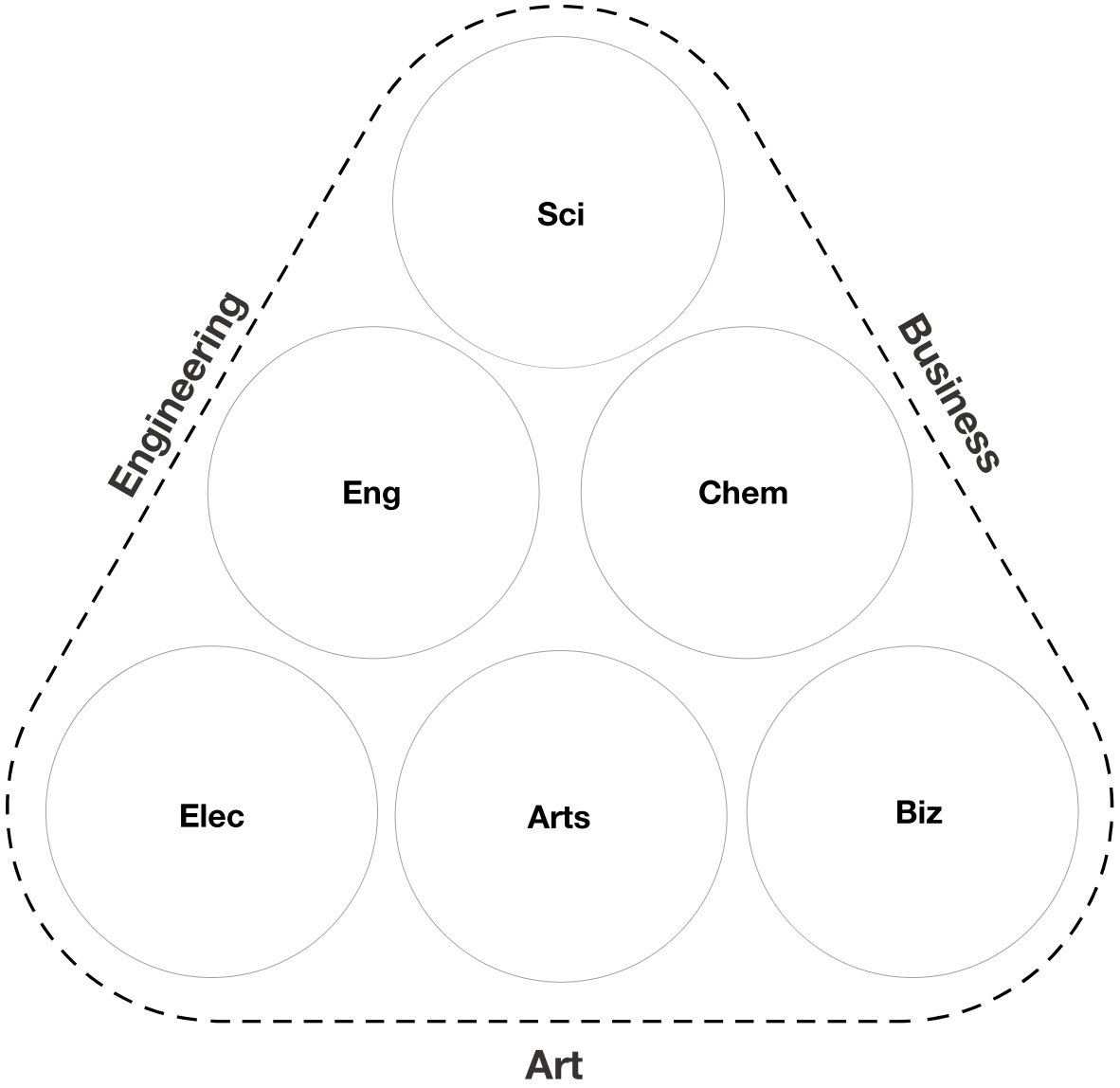
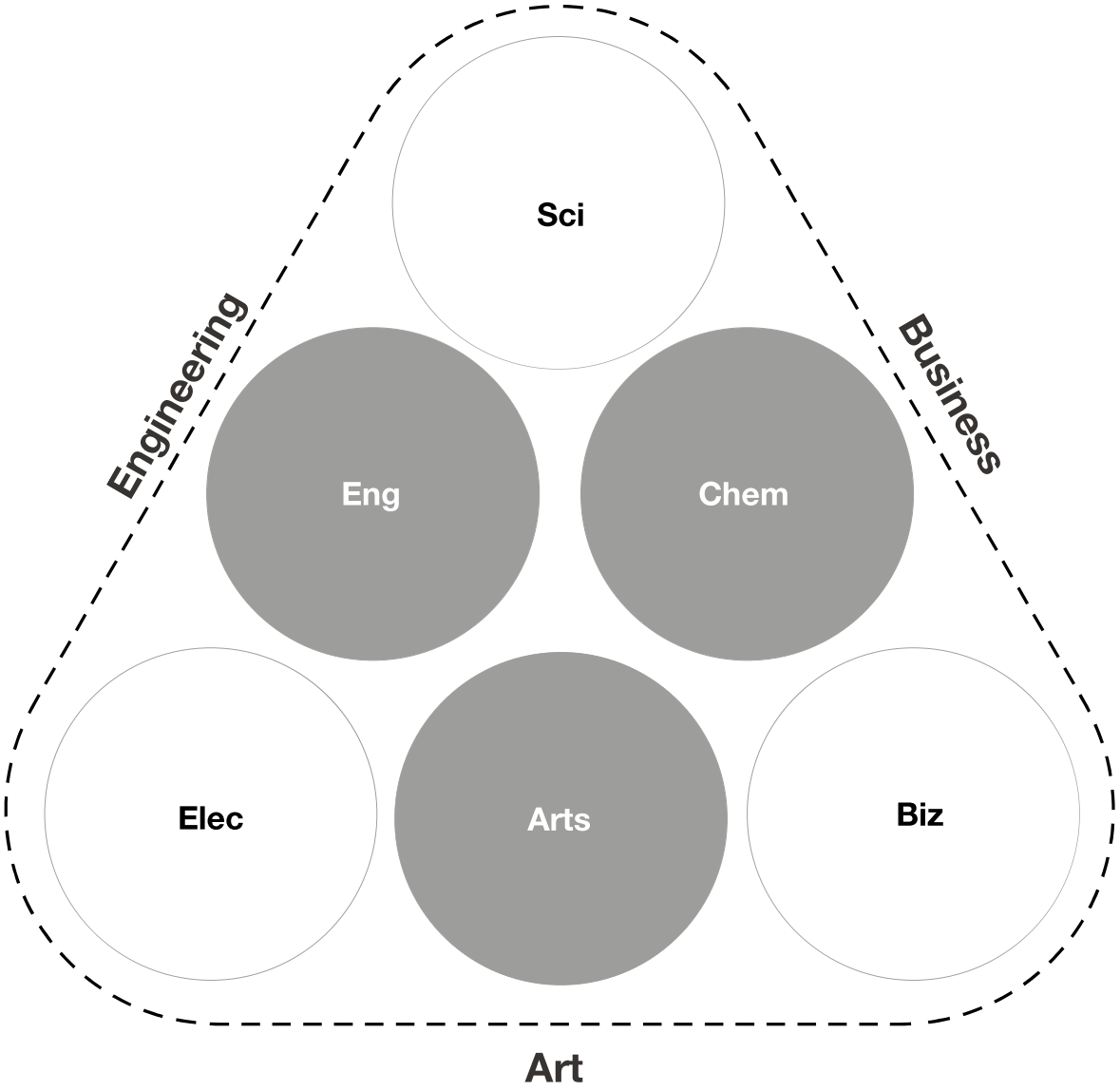
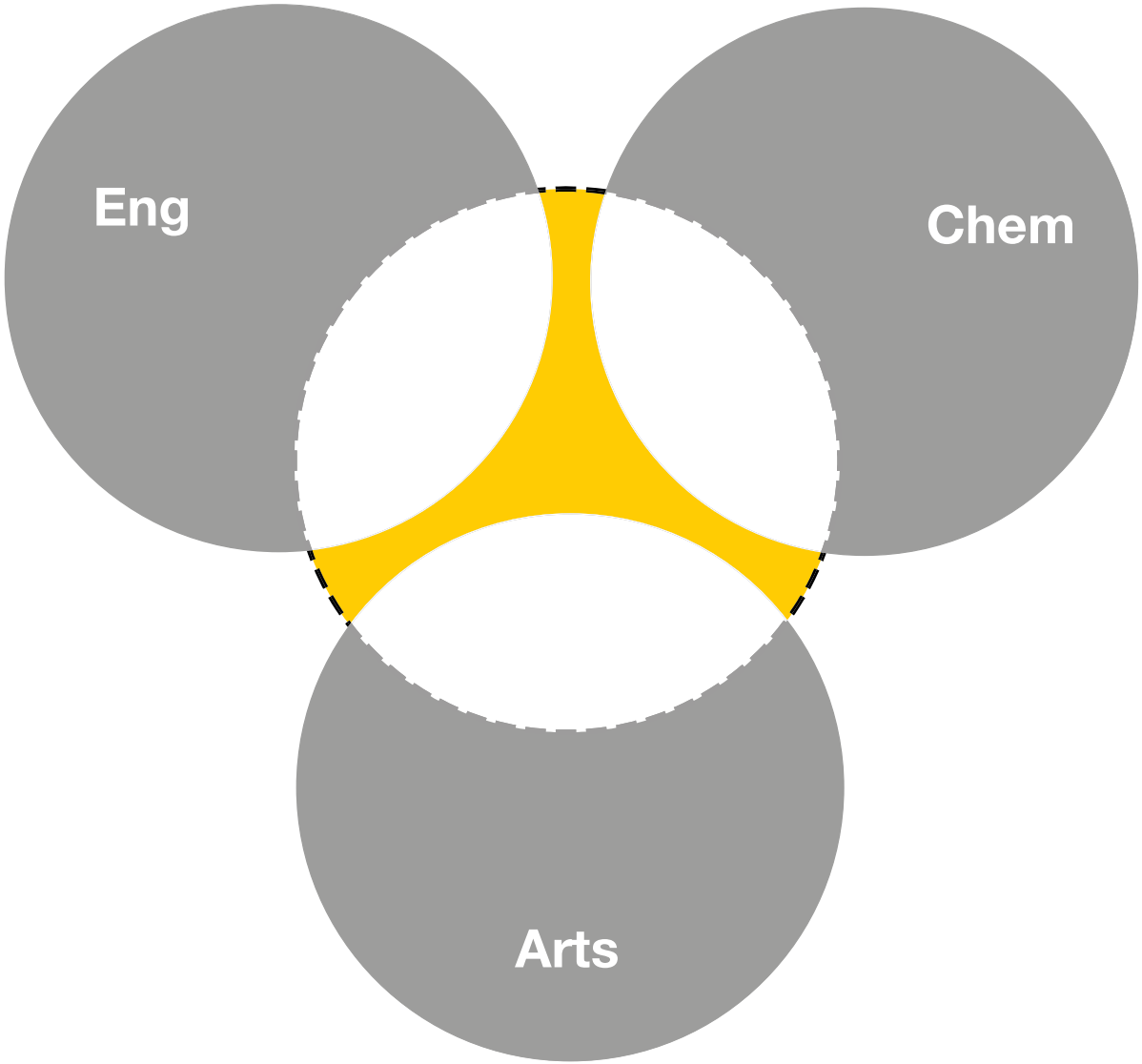
Aalto University - Otaniemi Campus, Alvar Aalto



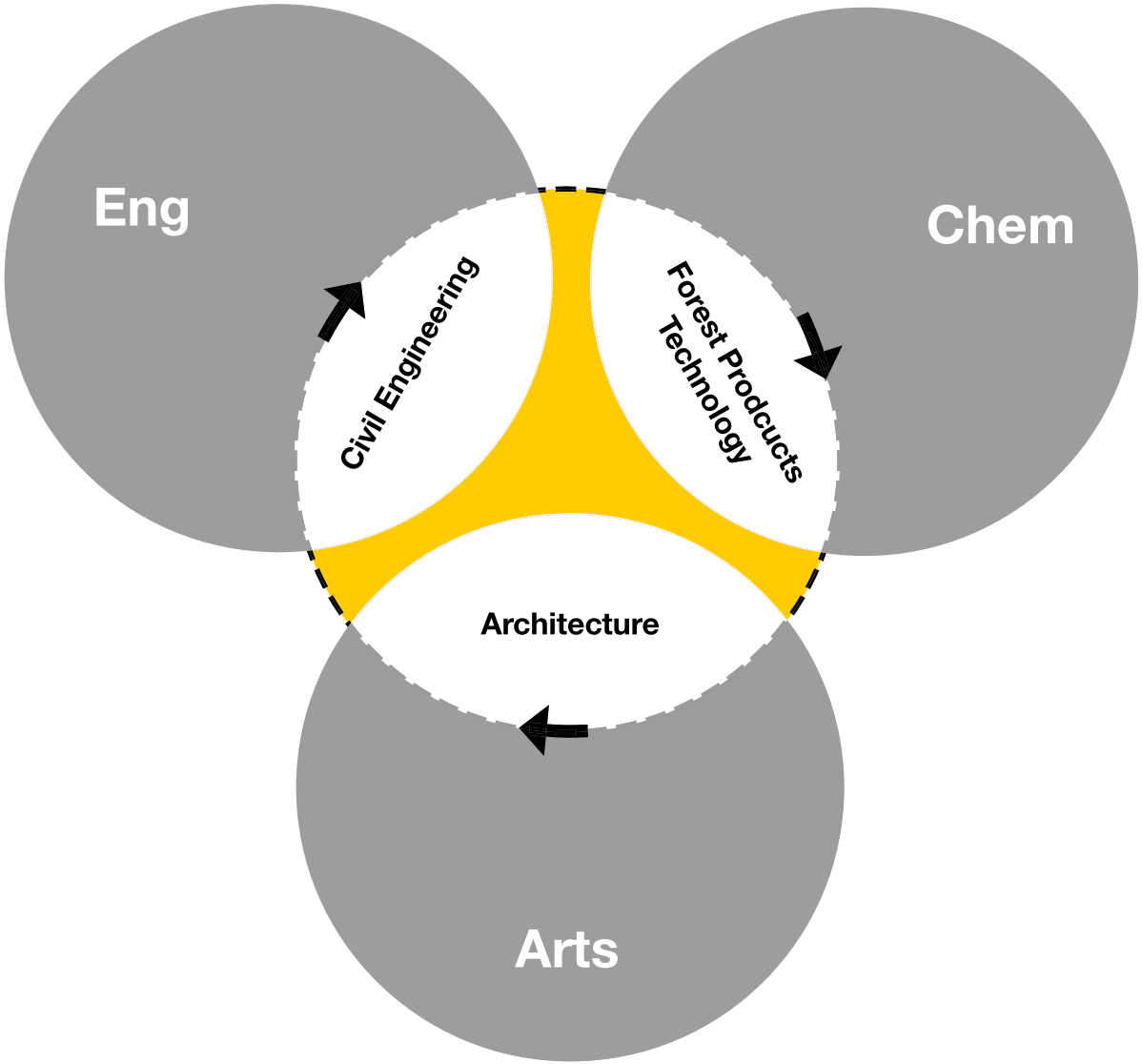
Aalto University



Aalto University



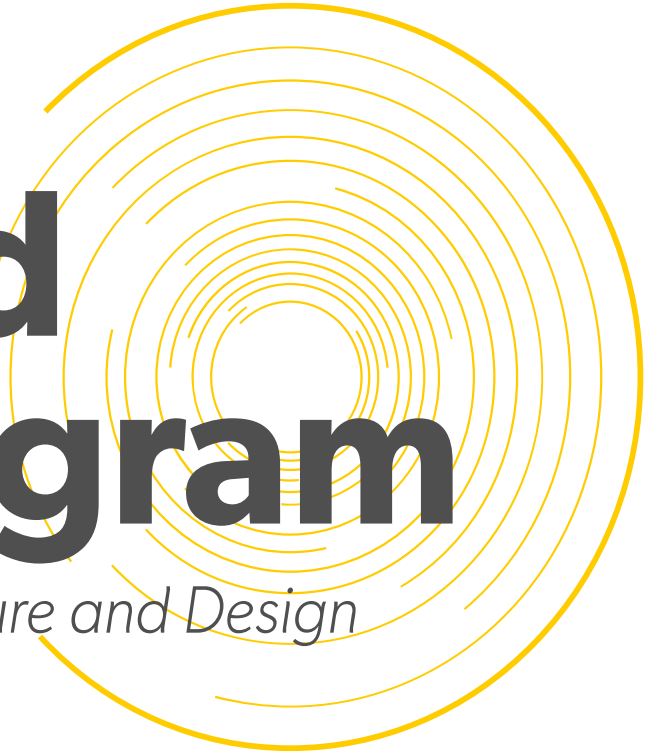
Aalto University



Aalto University

Wood Program

in Architecture and Design



Aalto University
School of Arts, Design
and Architecture







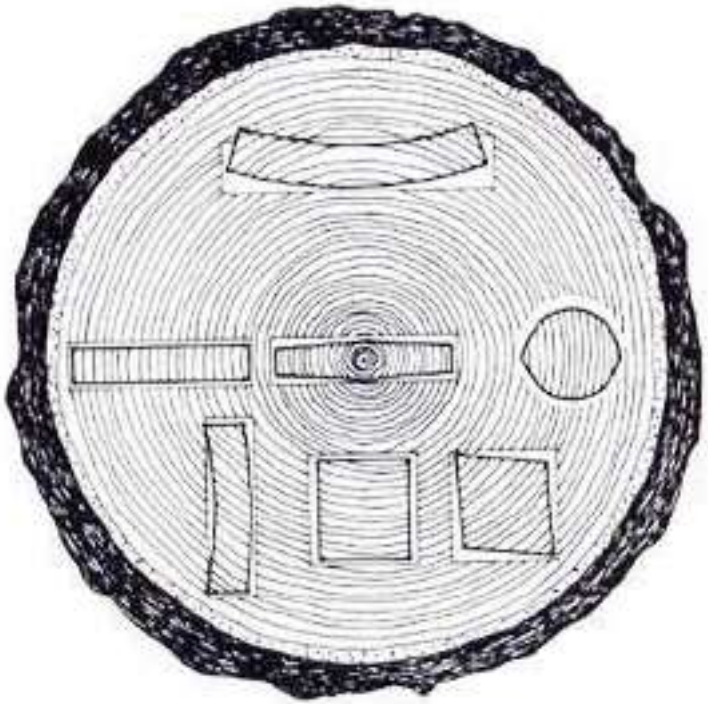


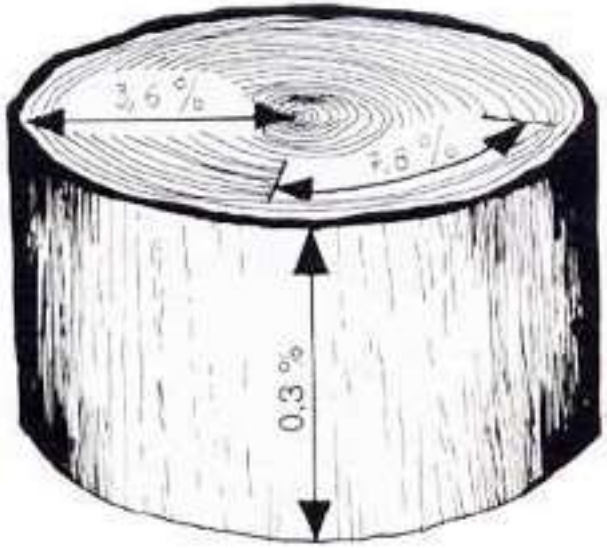


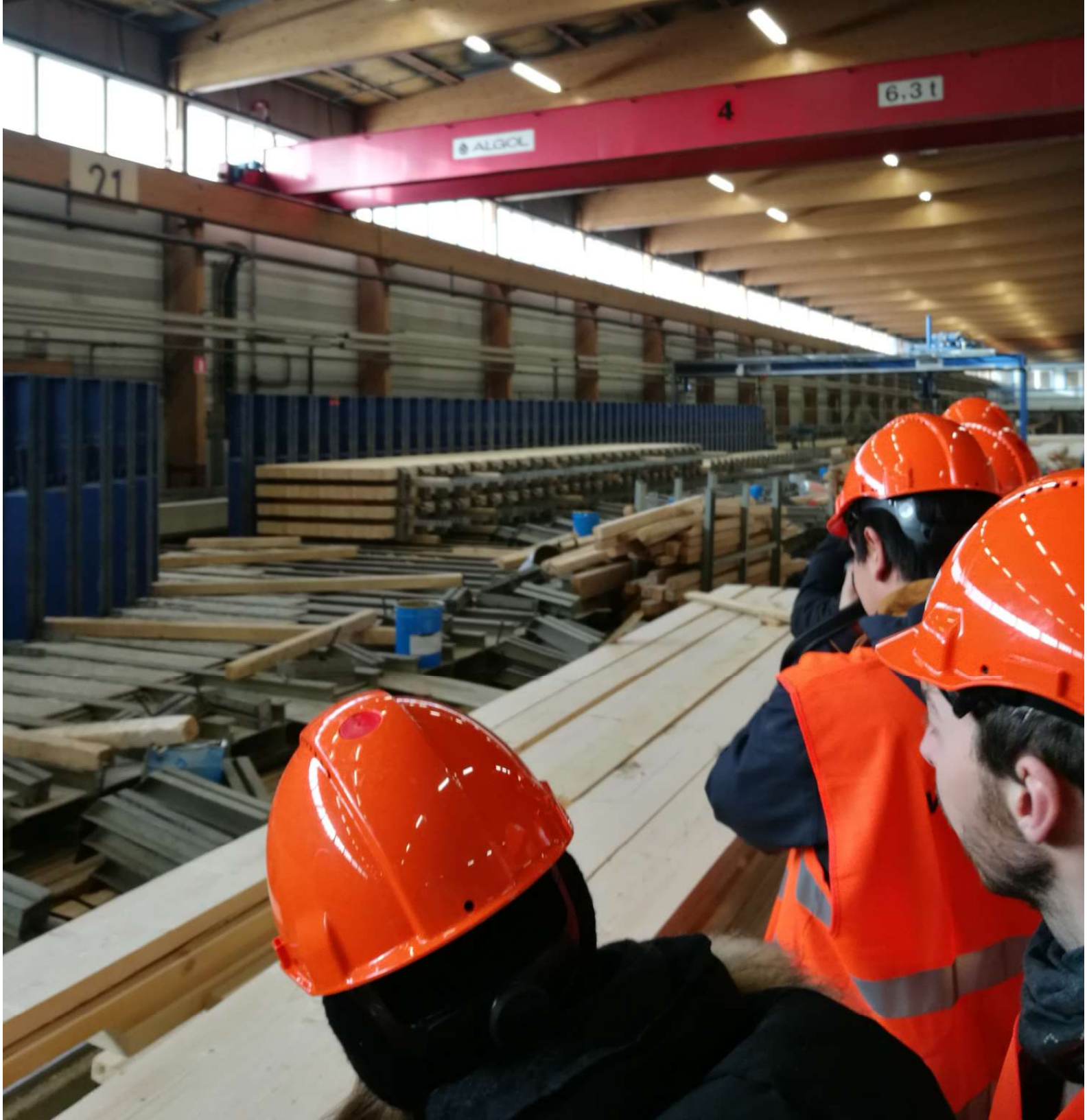



24 Years - 36 Projects

Finnish forest

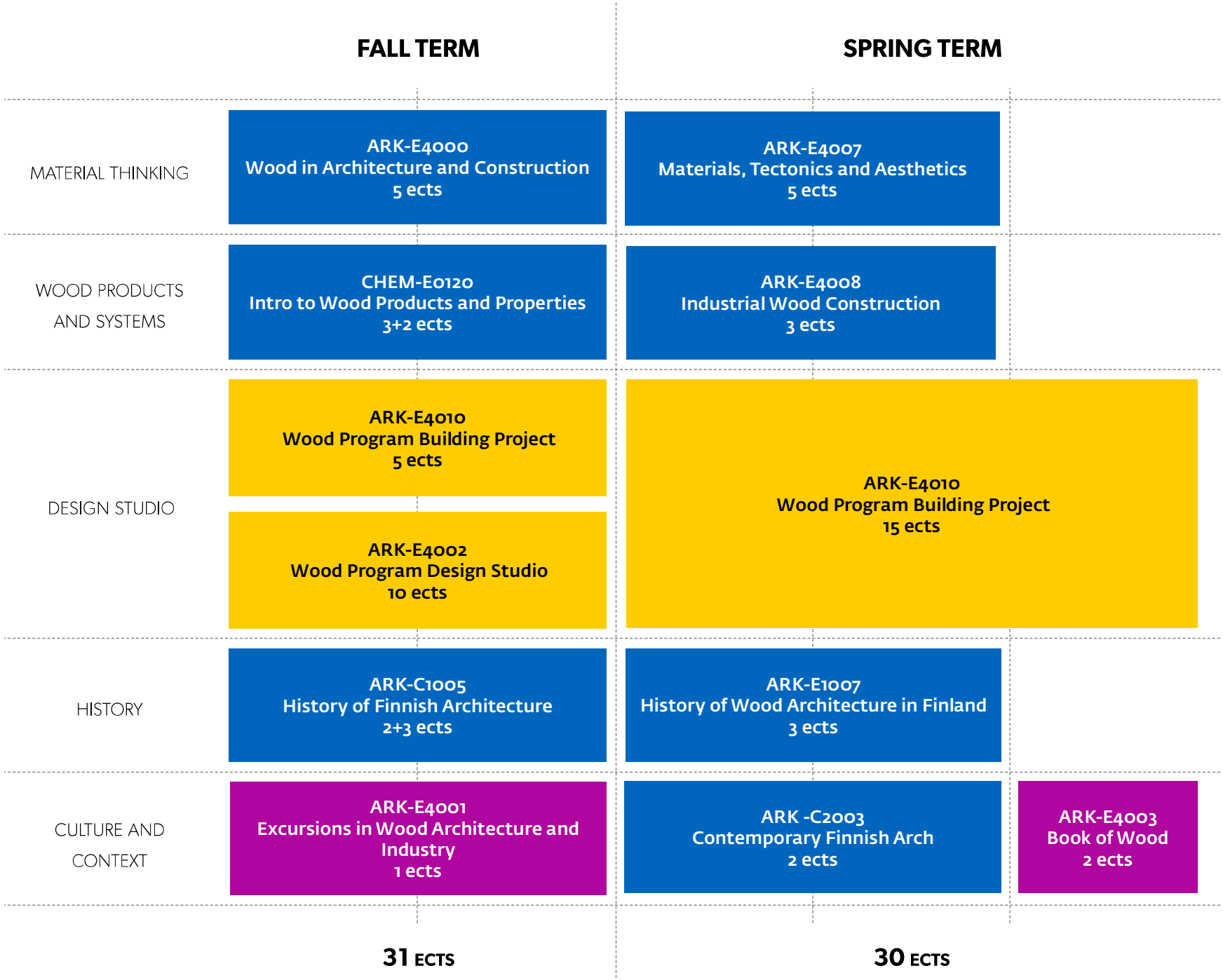



3,6 %
7,0 %
0,3 %



Excursiones


1
6,3 t
2
6,3 t
B B B B B

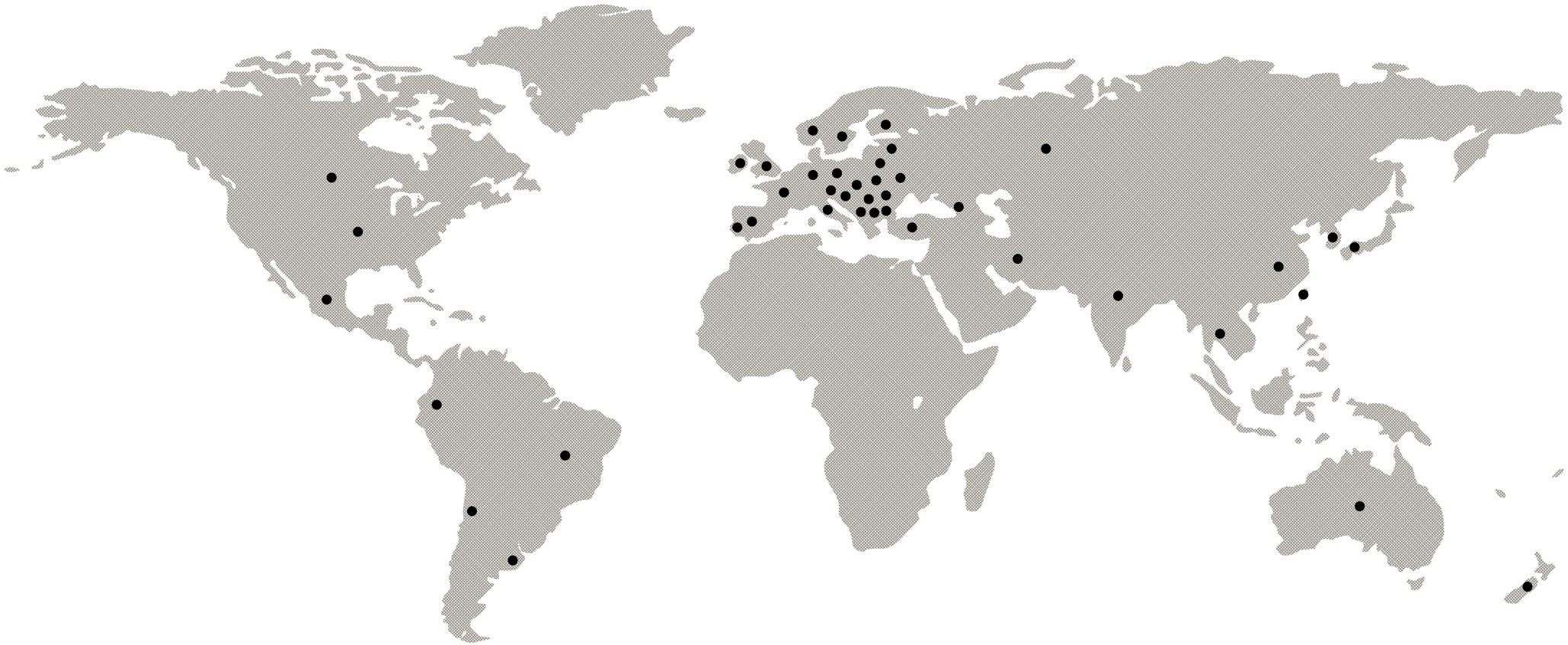


Aalto University
School of Arts, Design and Architecture
Wood Program

Lectures / Seminars

Studios

Project Based Courses (meeting times vary)



More than 400 students from 48 countries

Working together in the classroom

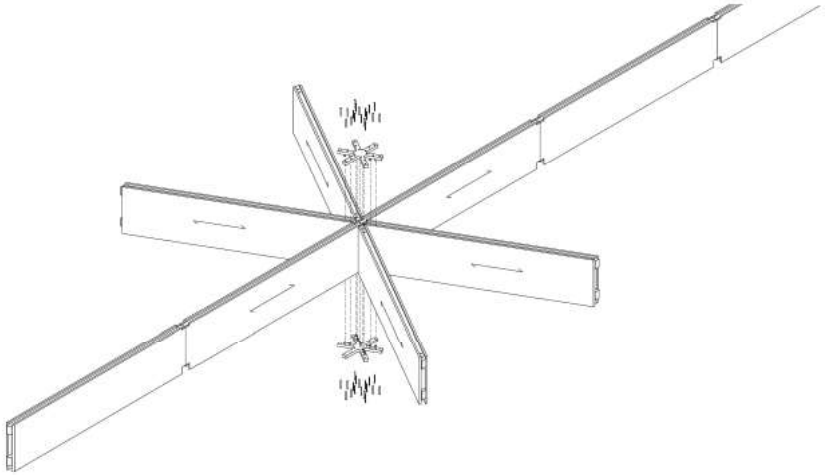
Trabajo en estudios

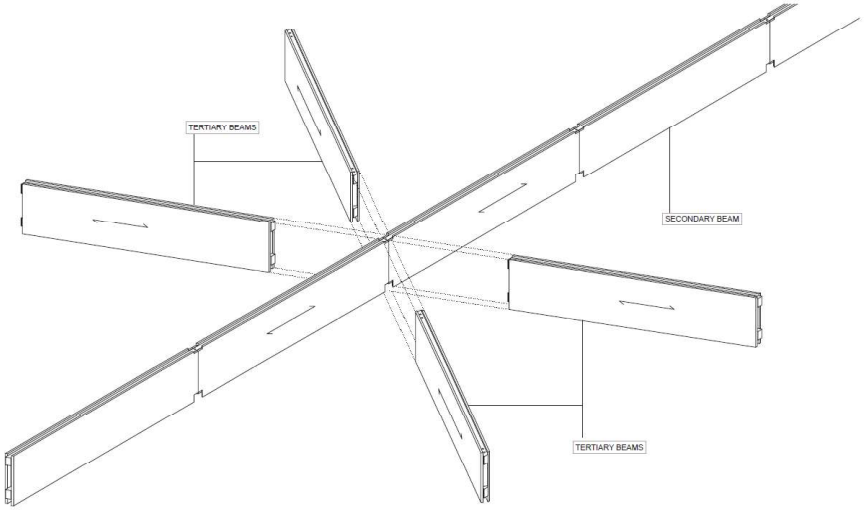
Trabajo en taller

Mock-up 1:1

Mock-up ו.ו

Pabellón "World Design Capital"





Testing

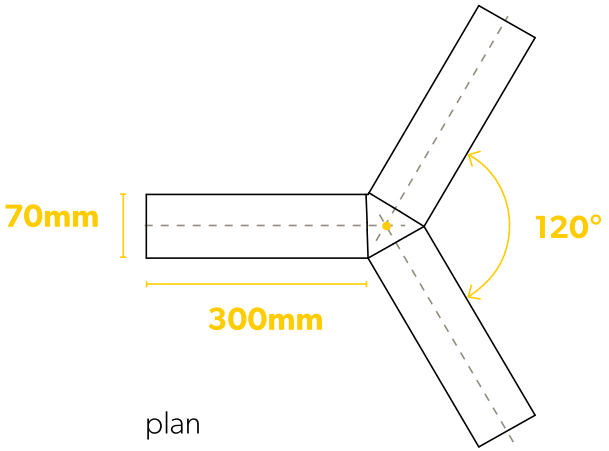
Testeo 1:5

Testeo 1:5

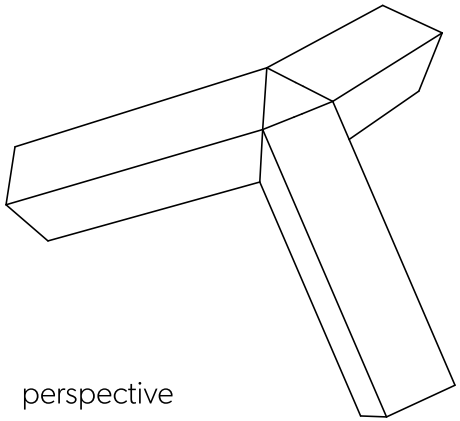
”The cube”

Especies finlandesas

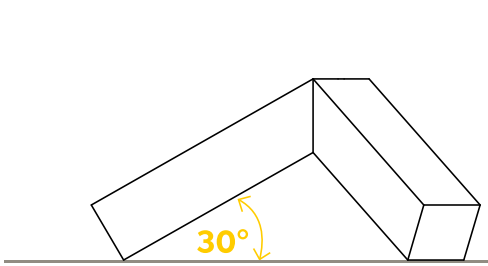
"The cube"



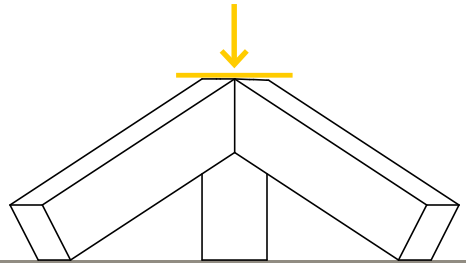
plan



perspective

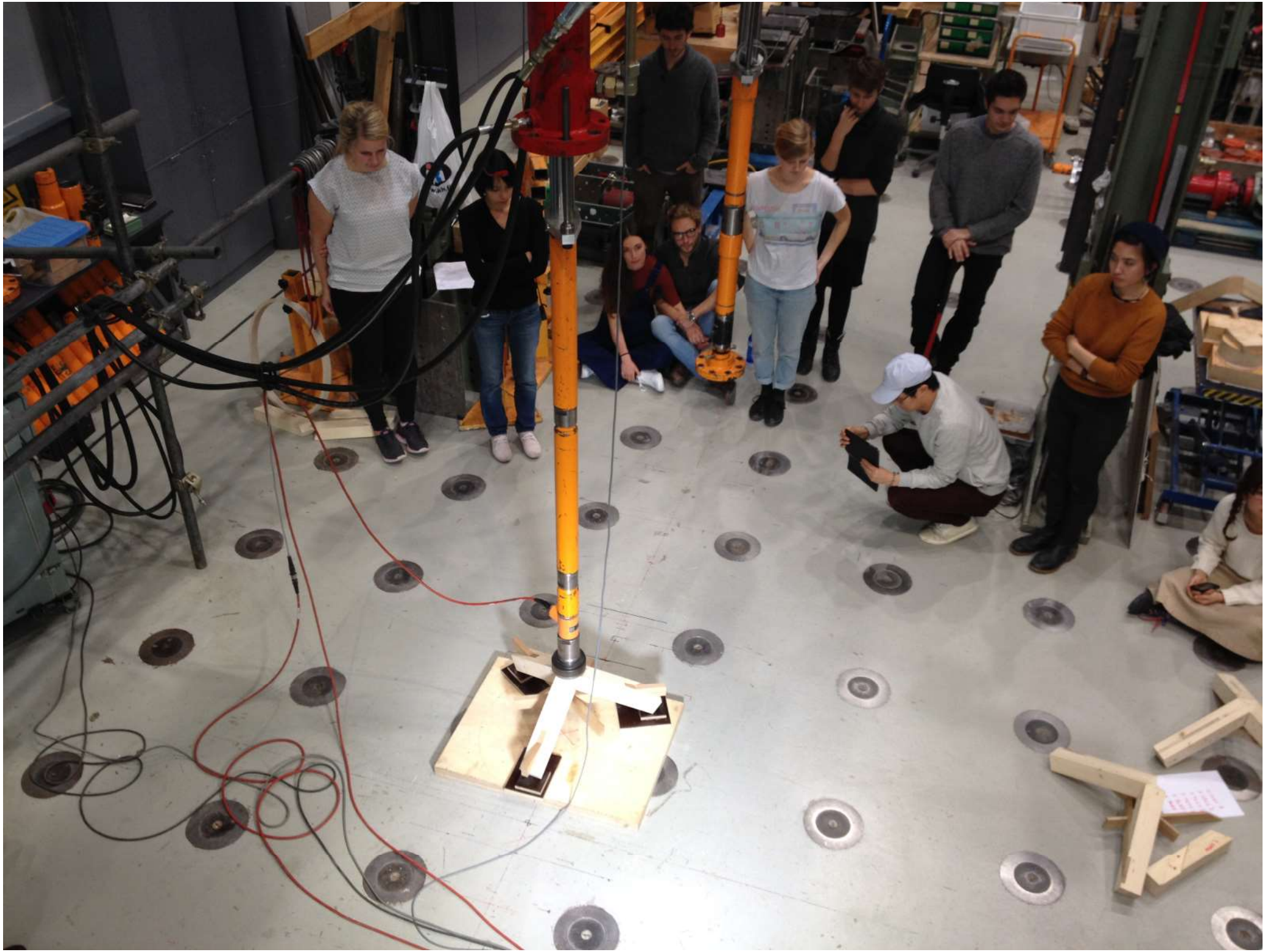


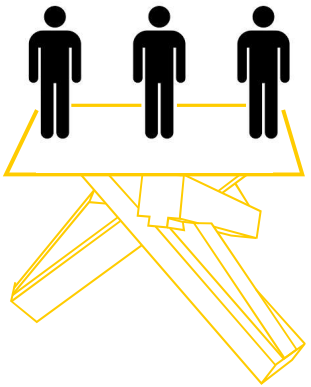
side elevation



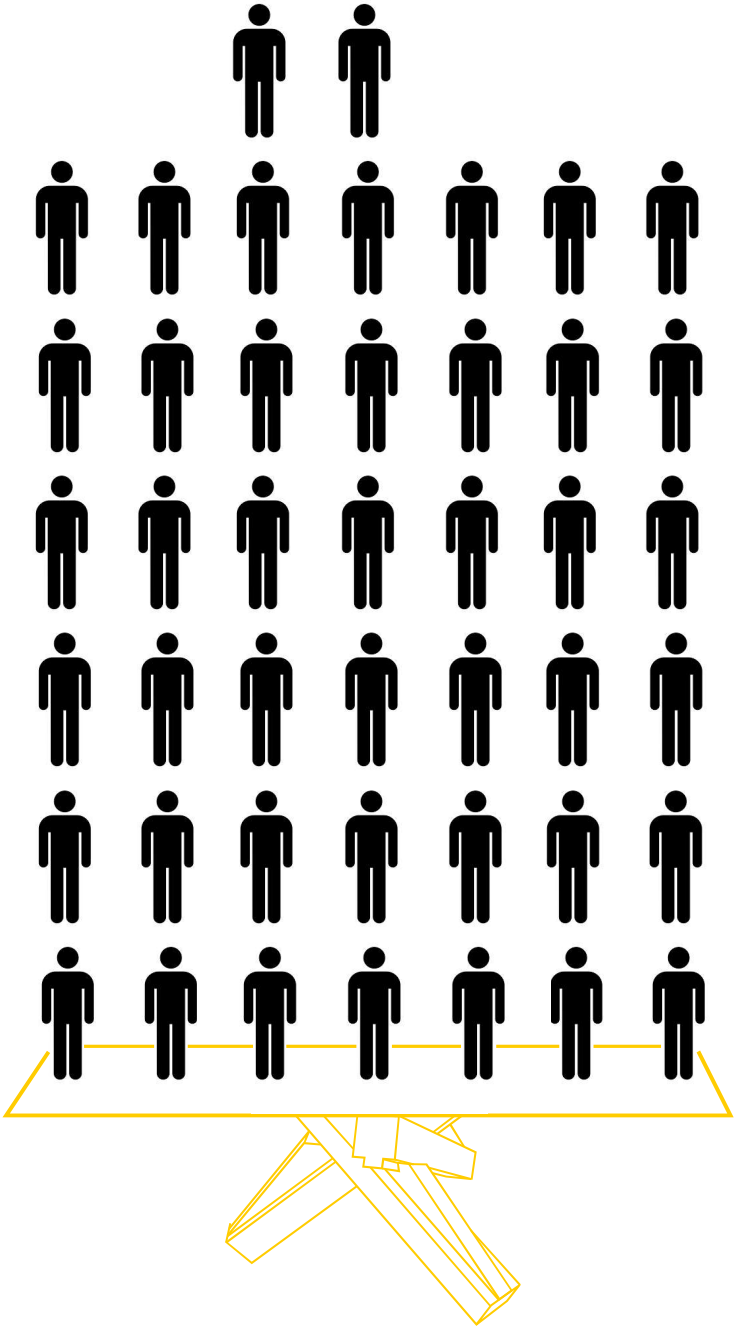
front elevation

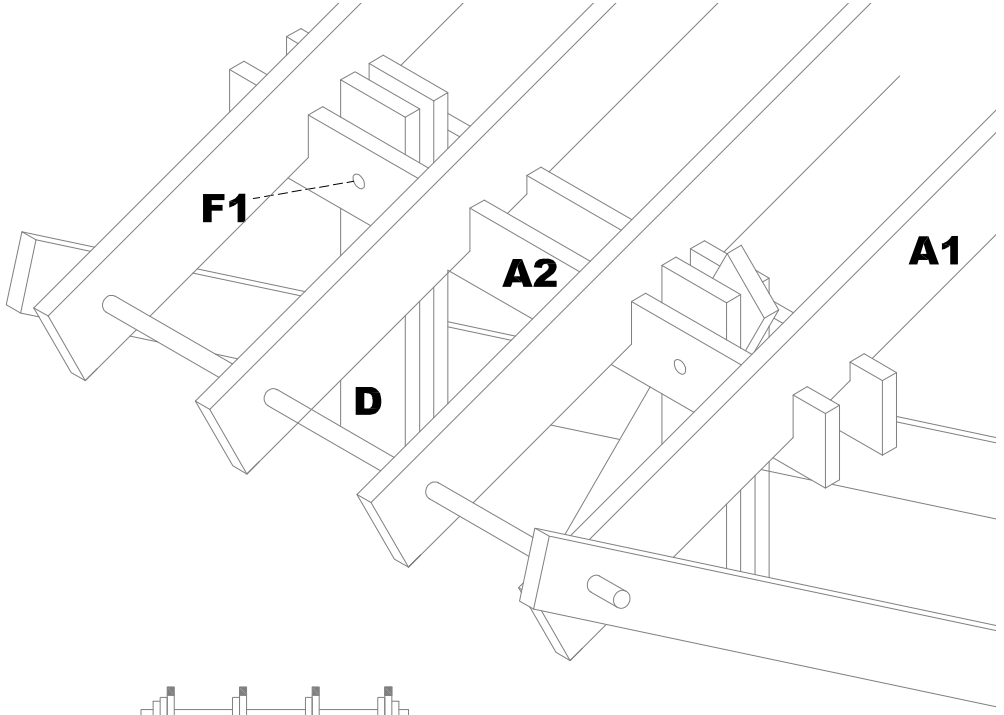
Joint design

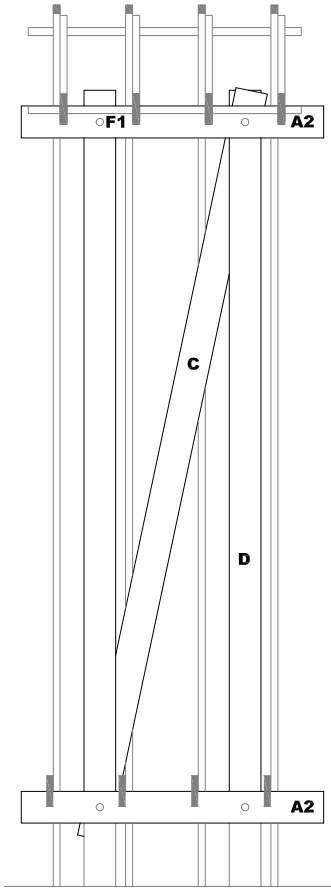


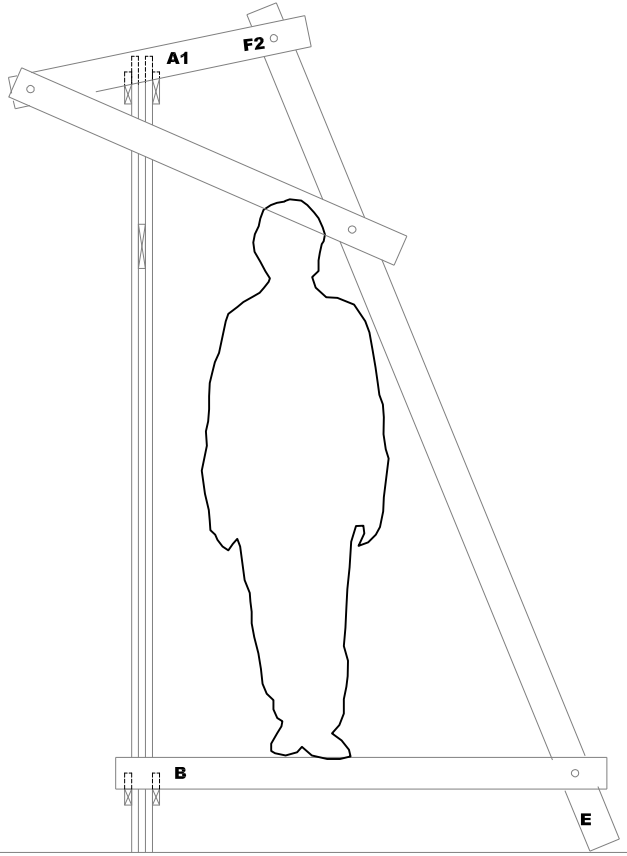


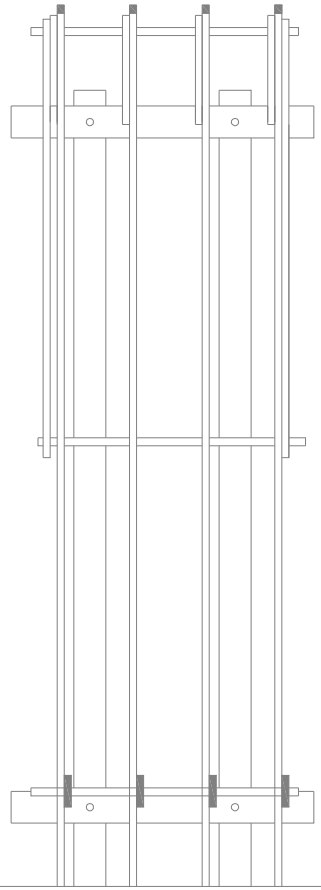
44 kN ~




F1
A2
A1
D


F1
A2
C
D
A2

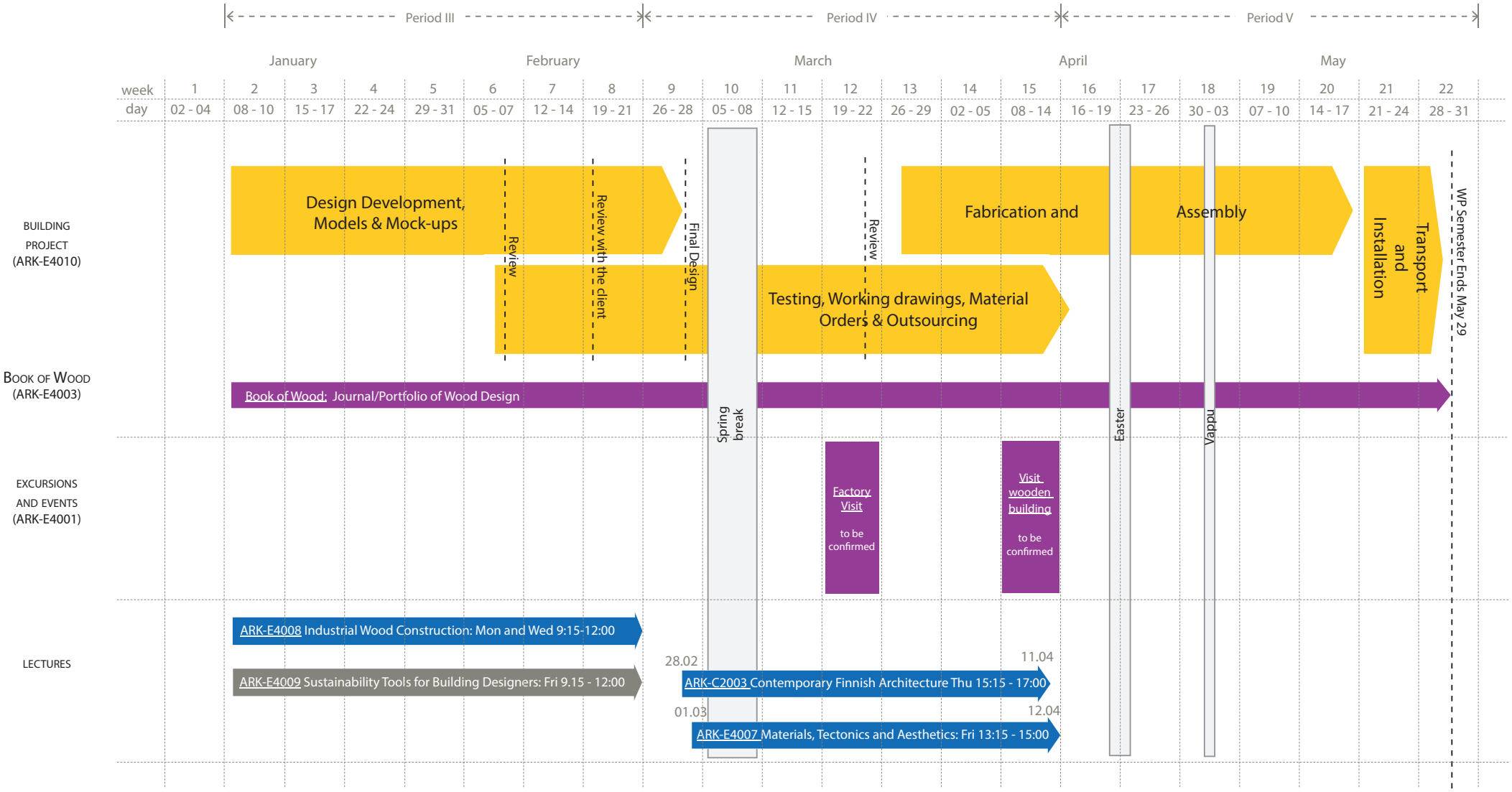

A1
F2
B
E

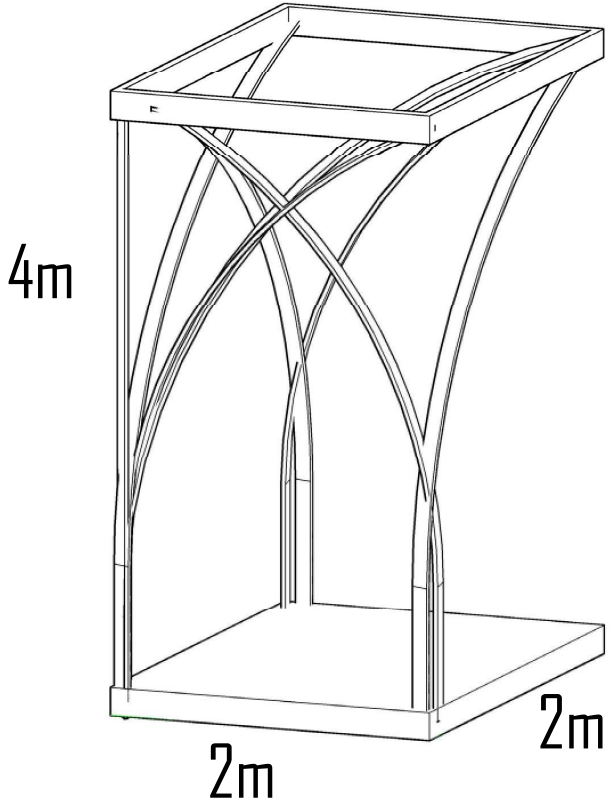


Building project

Schedule of Studies
SPRING 2019

Aalto University
Department of Architecture
Wood Program





Structural concept

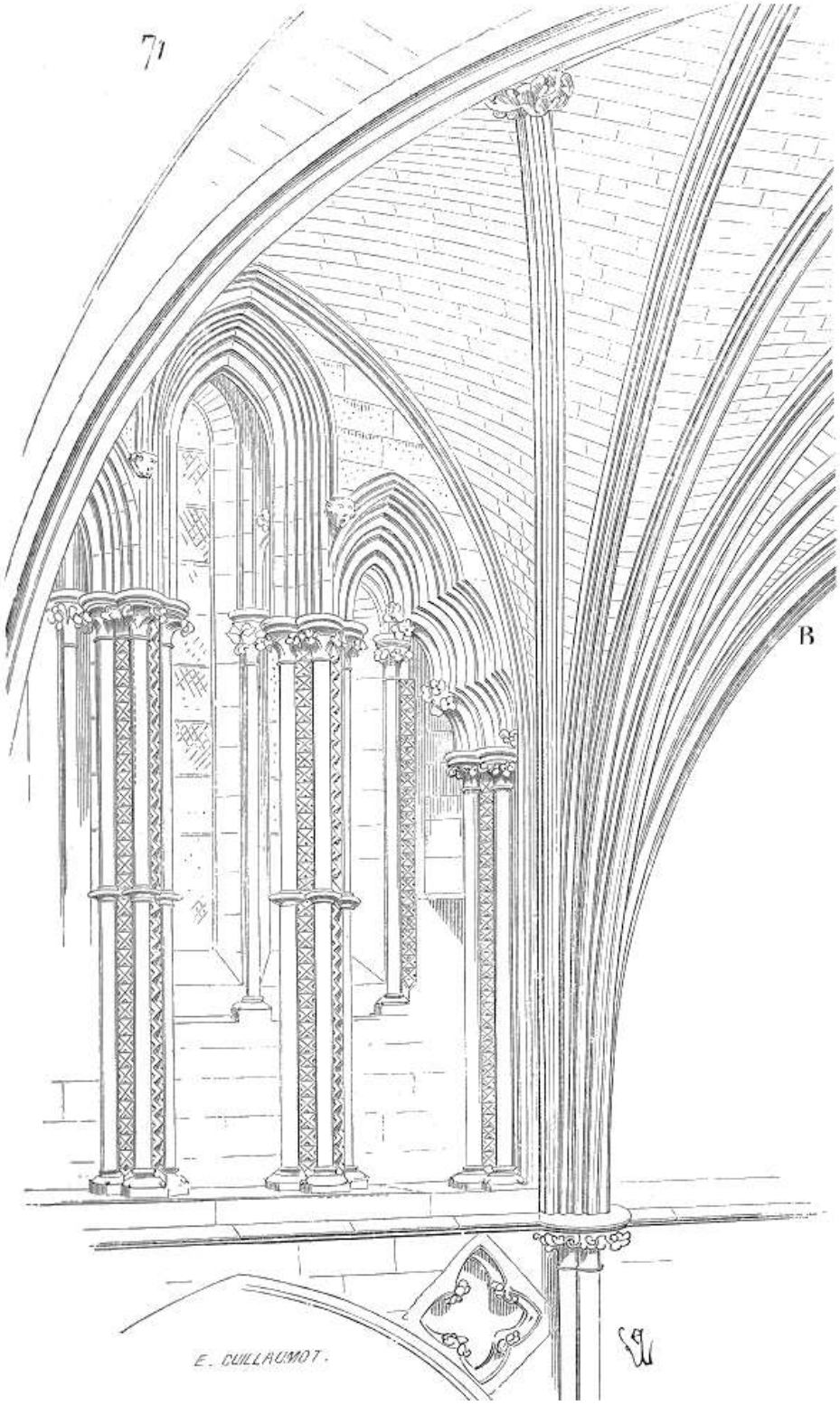
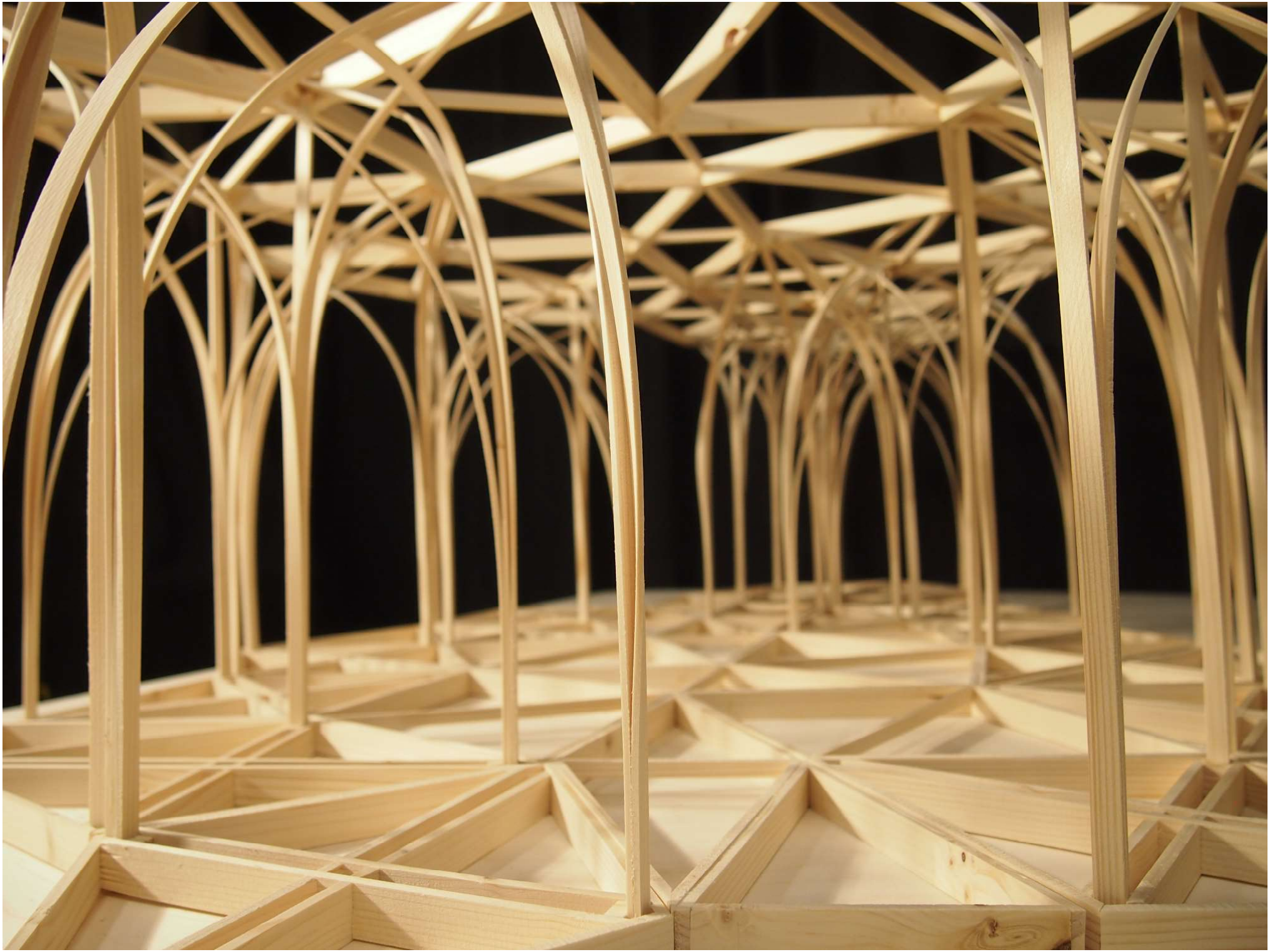
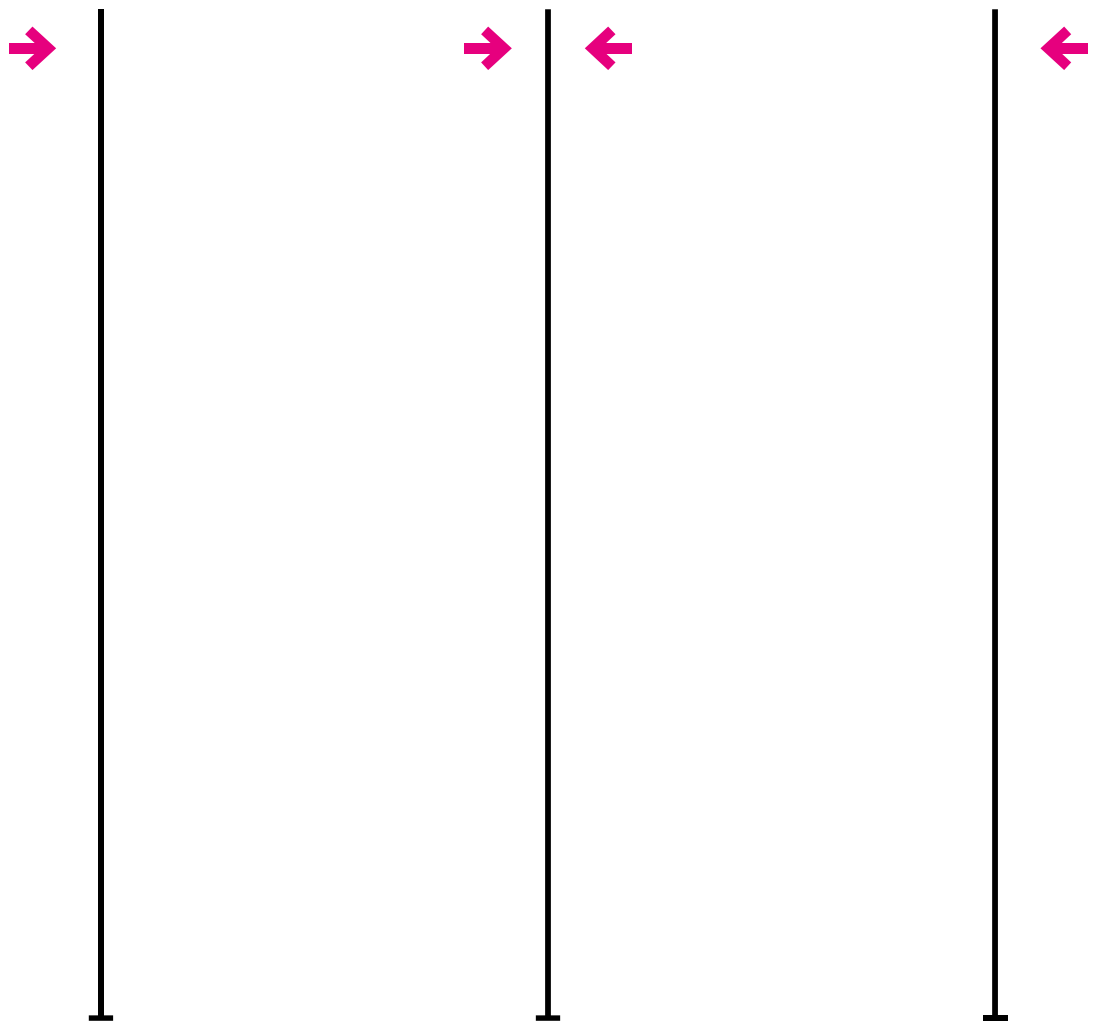
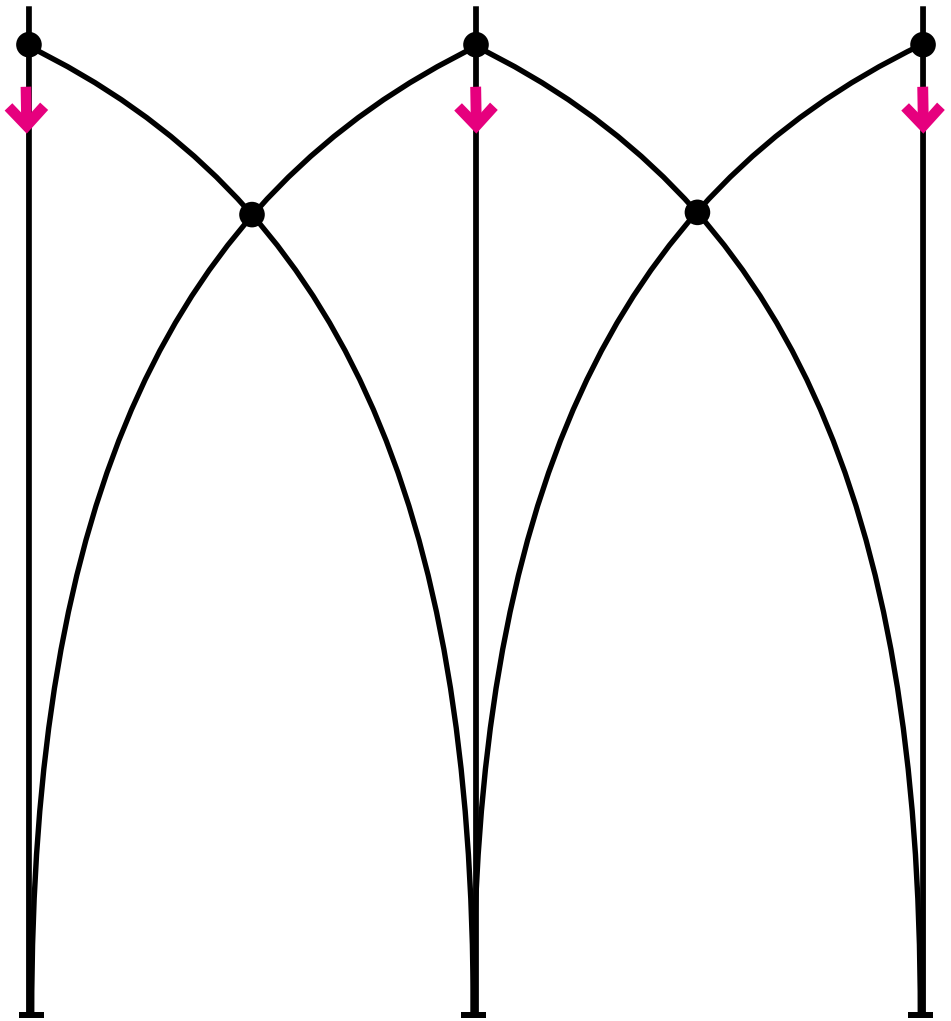


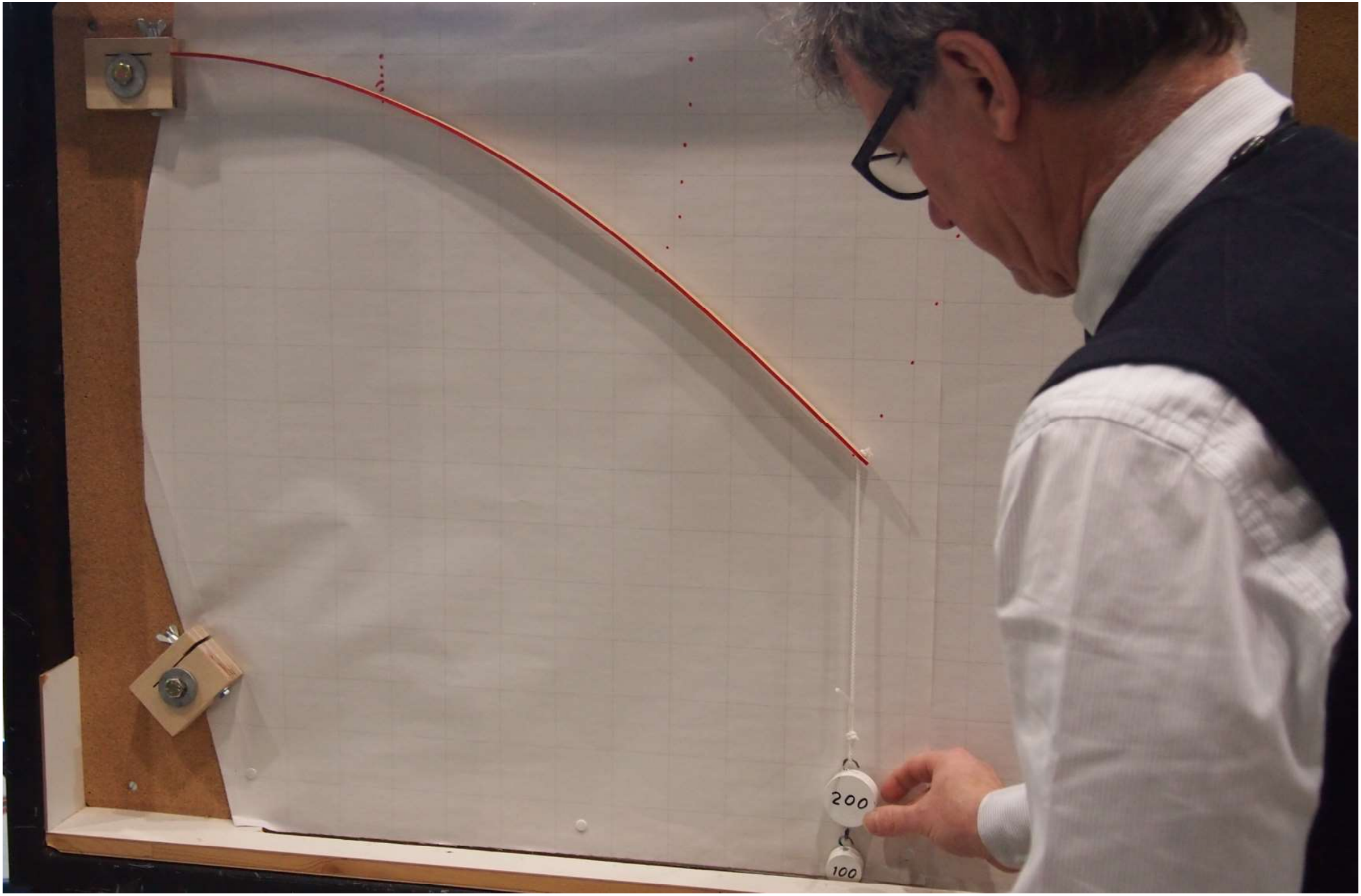
Illustration of Saint-Leu d'Esserent from Entretiens sur l'architecture
by Eugène Viollet-le-Duc. Paris, 1858-72
Drawings by E. Cuillaumot

Mock-up 1:1

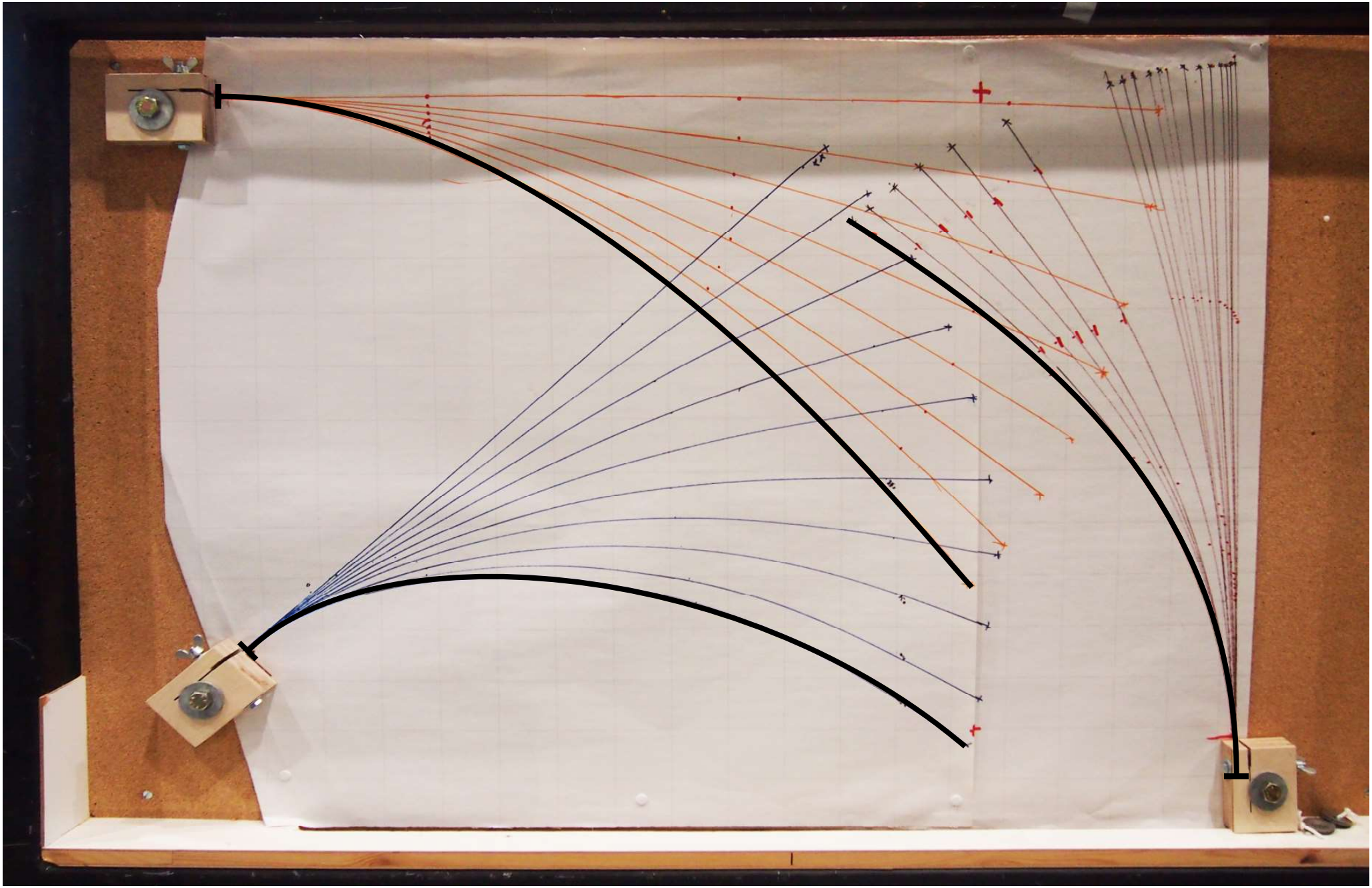








Bending test - 1:5

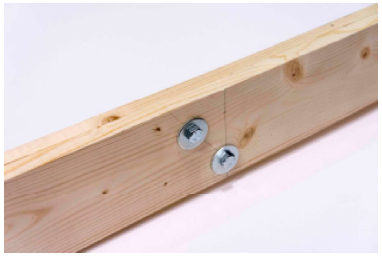


Bending test - 1:5

Column tests 1:1

A B C D E

A:



Bolted
15 mm two lamellas

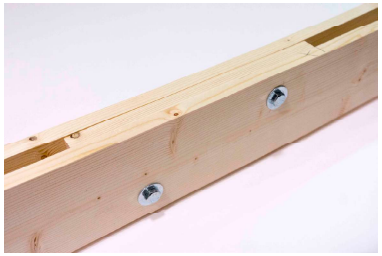
Springback: 55 cm
Upwards force: 9.5 kg
Joint material: 45mm bolts, 20pcs + 20 nuts and 40 washers. In total: 1160 bolts and nuts, 2320 washers.

B:

Wood peg no glue
12.5 mm three lamellas

Springback: 35 cm
Upwards force: 5.5 kg
Joint material: 80mm wood sticks, 8pcs.
In total: 464 sticks.

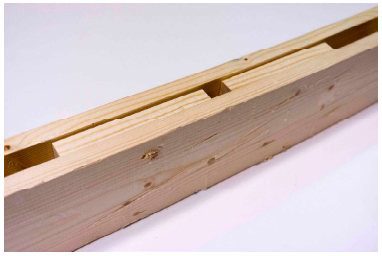
C:



Bolted
15mm three lamellas

Springback: 30 cm
Upwards force: 13 kg
Joint material: 45mm bolts, 20pcs + 20 nuts and 40 washers. In total: 1160 bolts and nuts, 2320 washers.

D:



Wood peg with glue
15 mm three lamellas

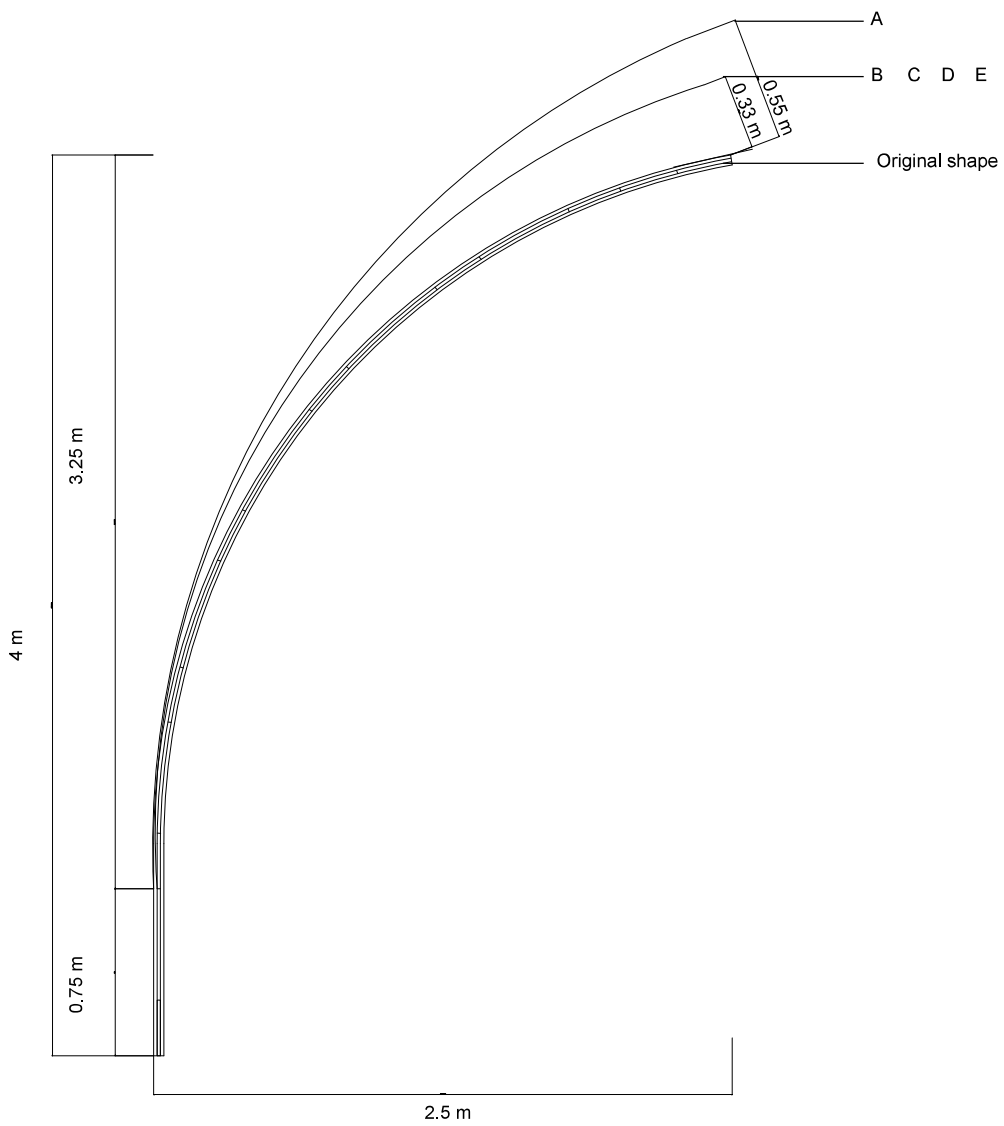
Springback: 33 cm
Upwards force: xx kg
Joint material: 80mm wood sticks, 8pcs + glue.
In total: 464 sticks and three (?) bottles of glue.

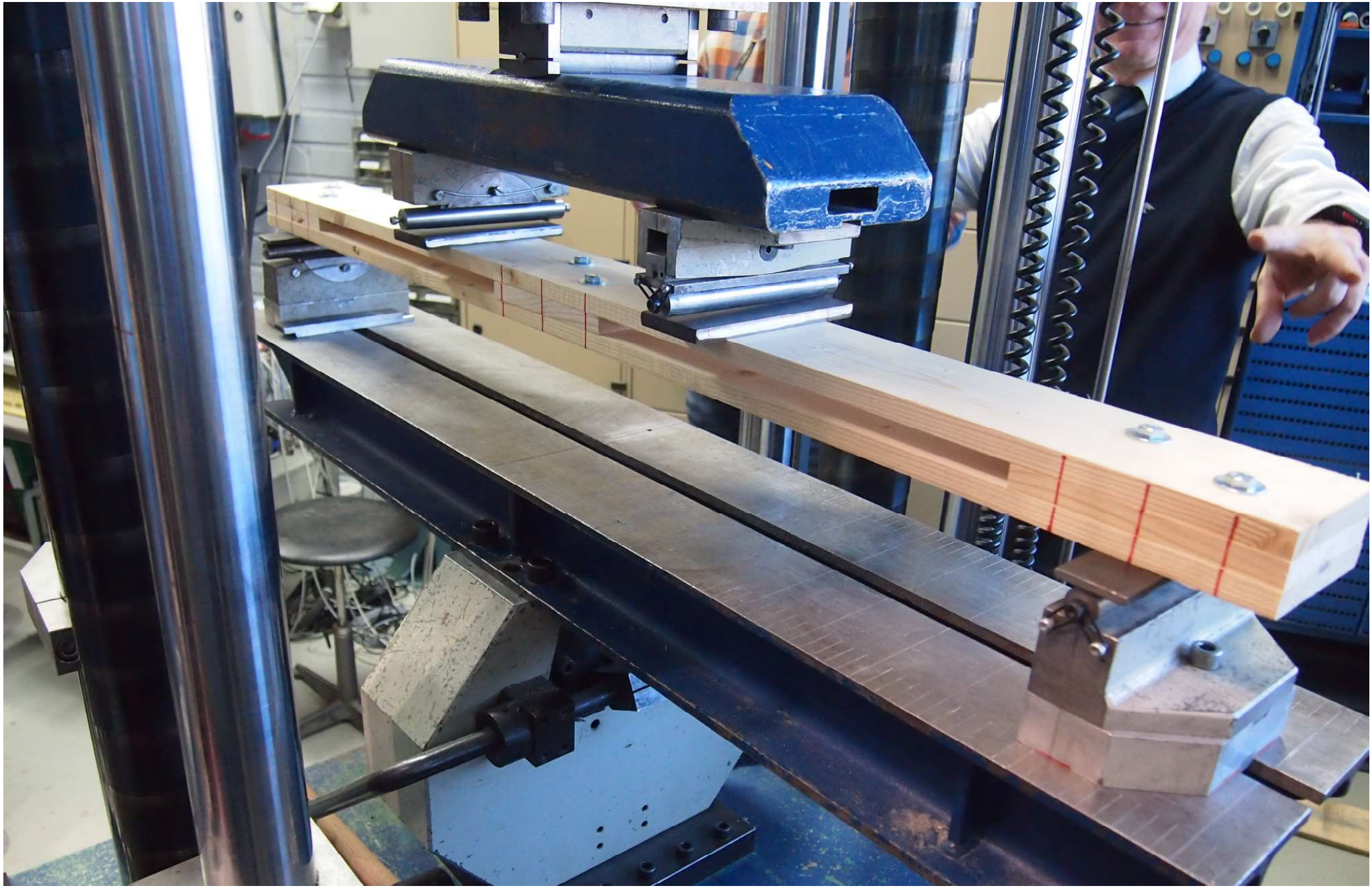
E:

Rivets
10 mm three lamellas

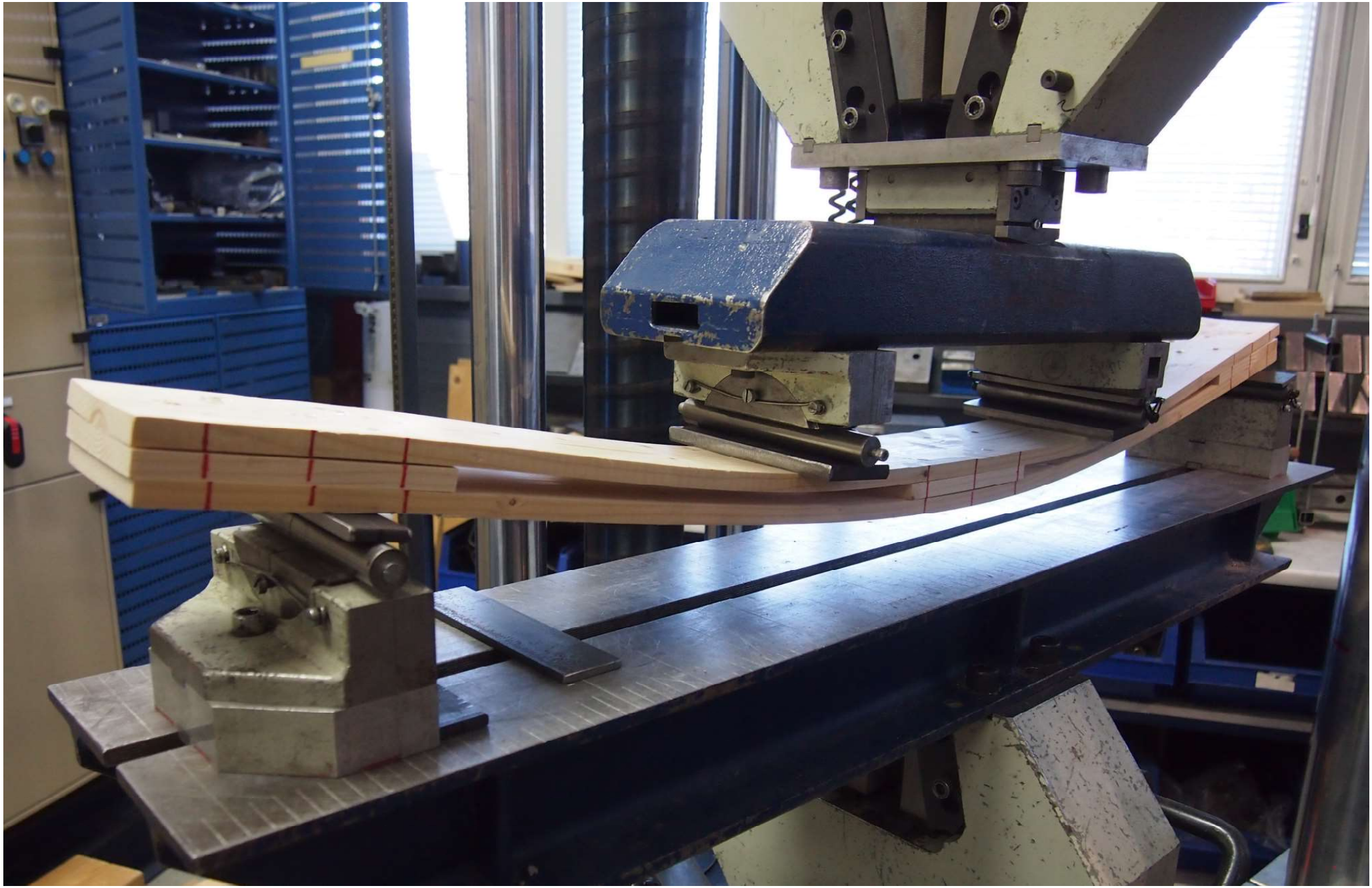
Springback: 28 cm
Upwards force: 5 kg
Joint material: 35mm rivets, 20 pcs + 40 washers.
In total: 1160 rivets and 2320 washers.

Column tests: Springback



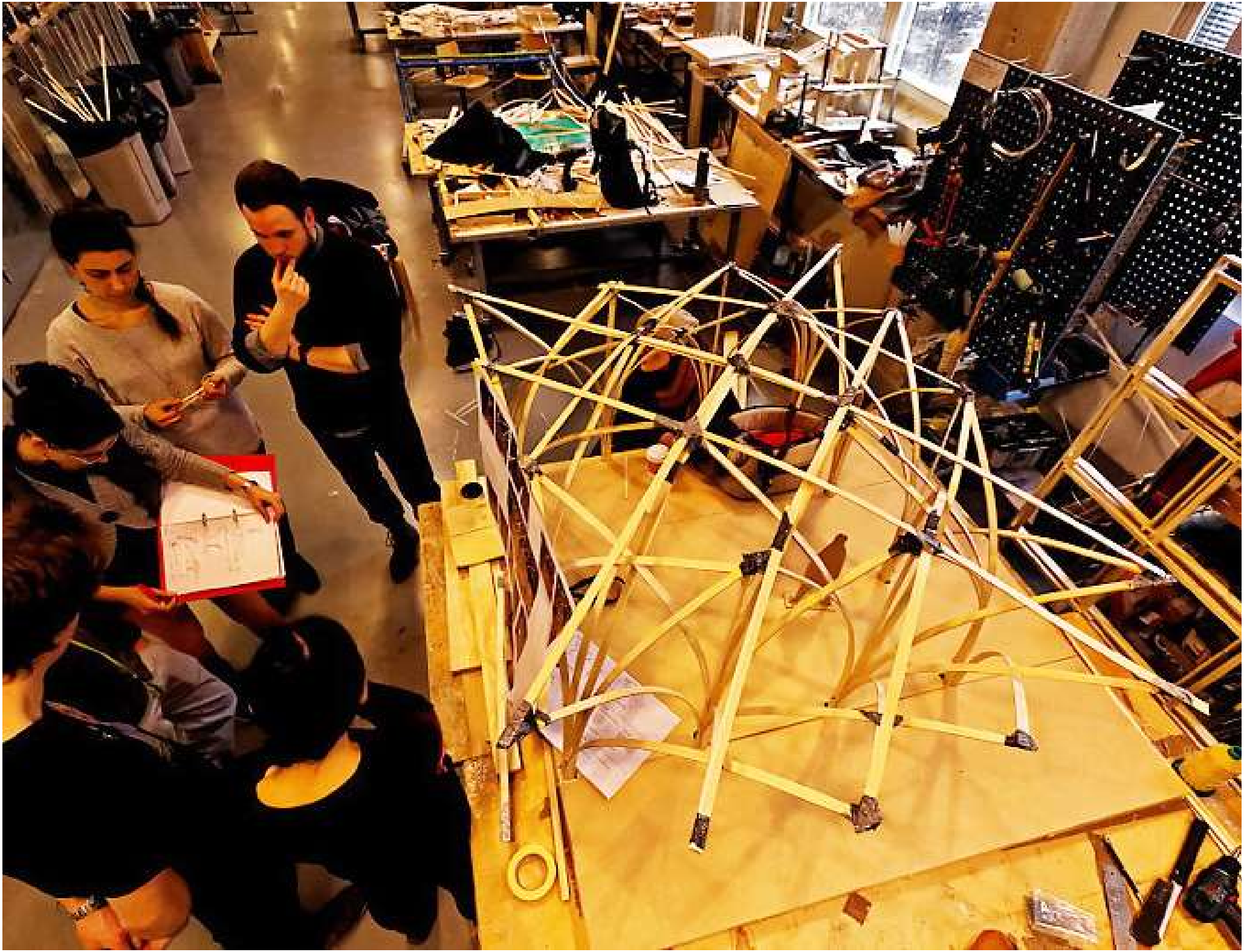


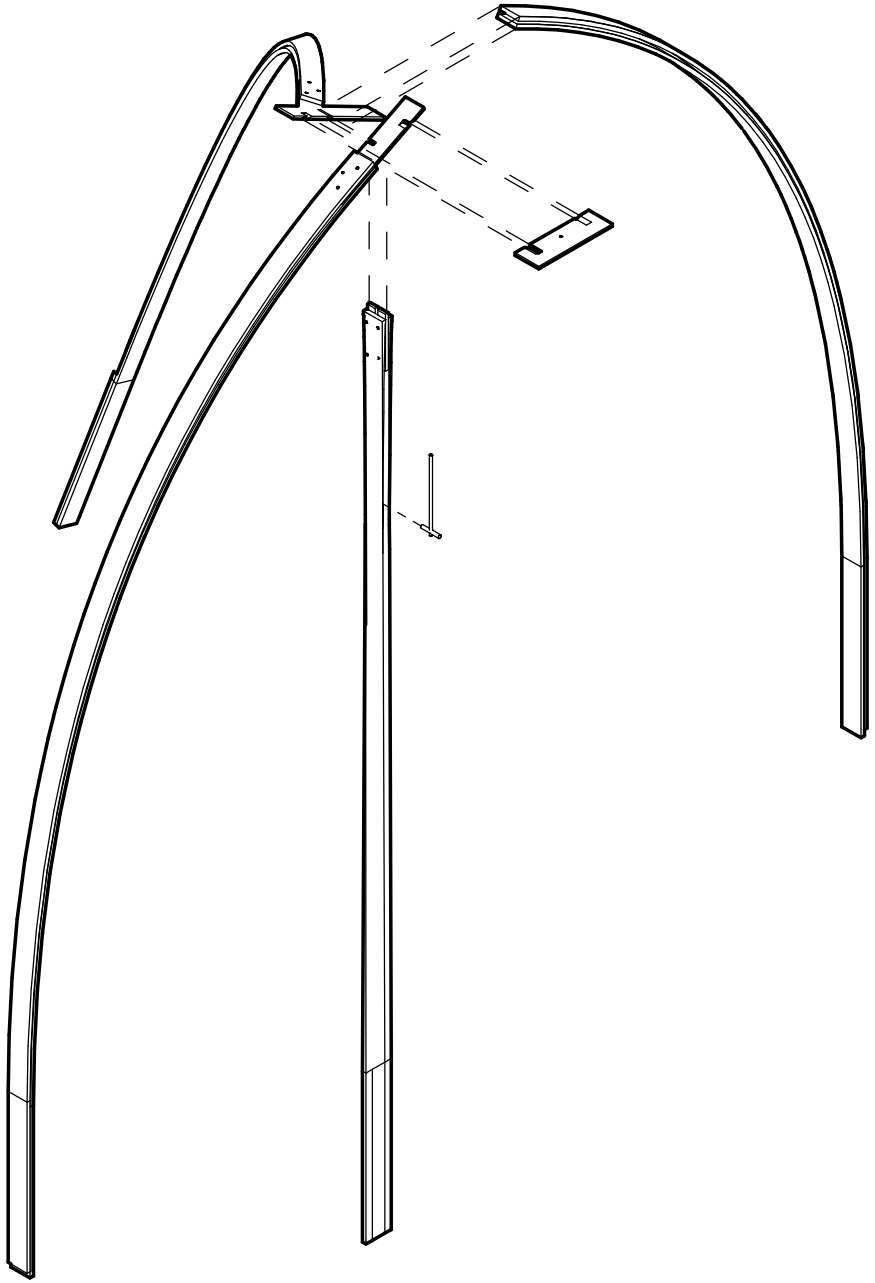
Testing 1:1



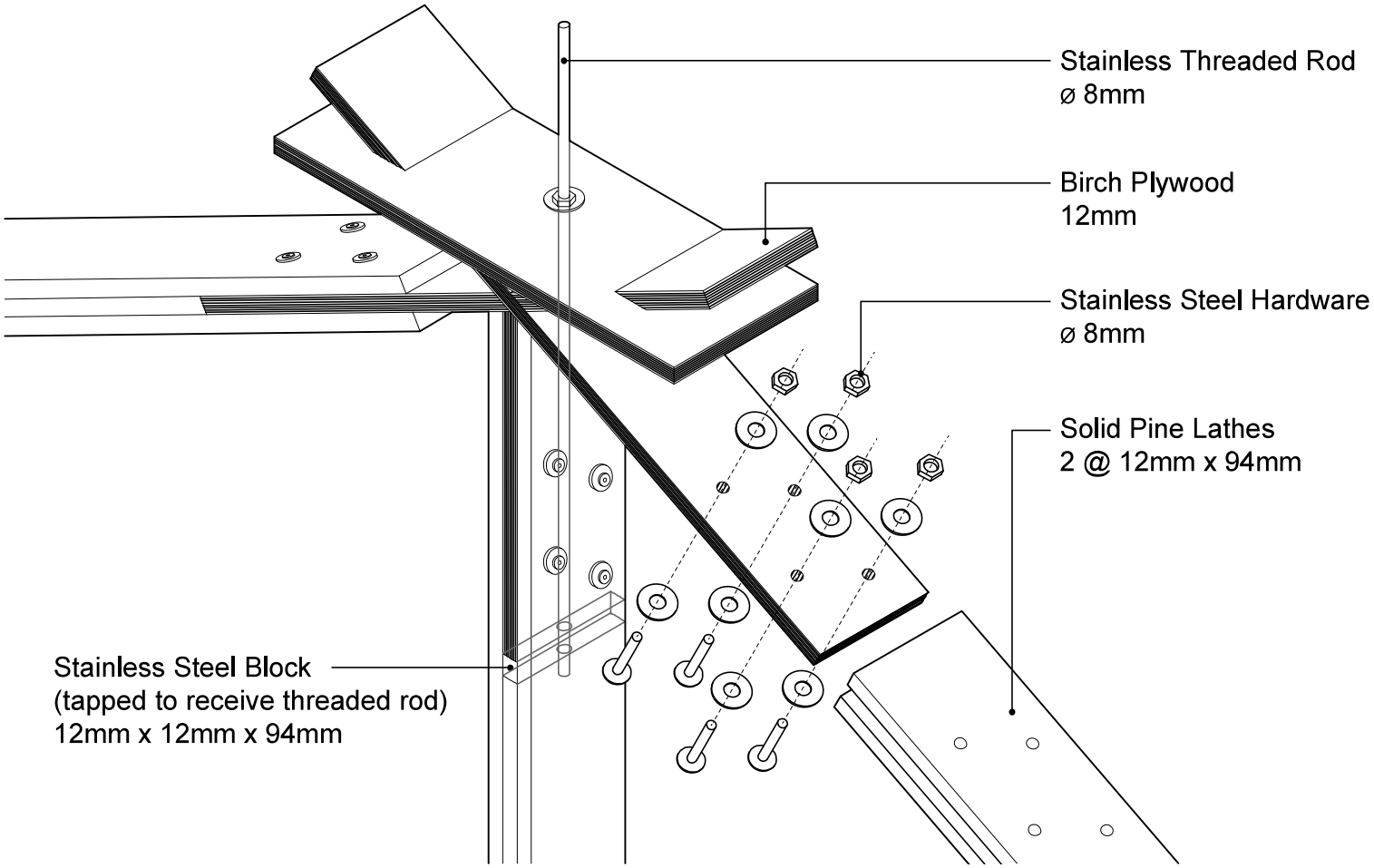
Testing 1:1

Twisting test

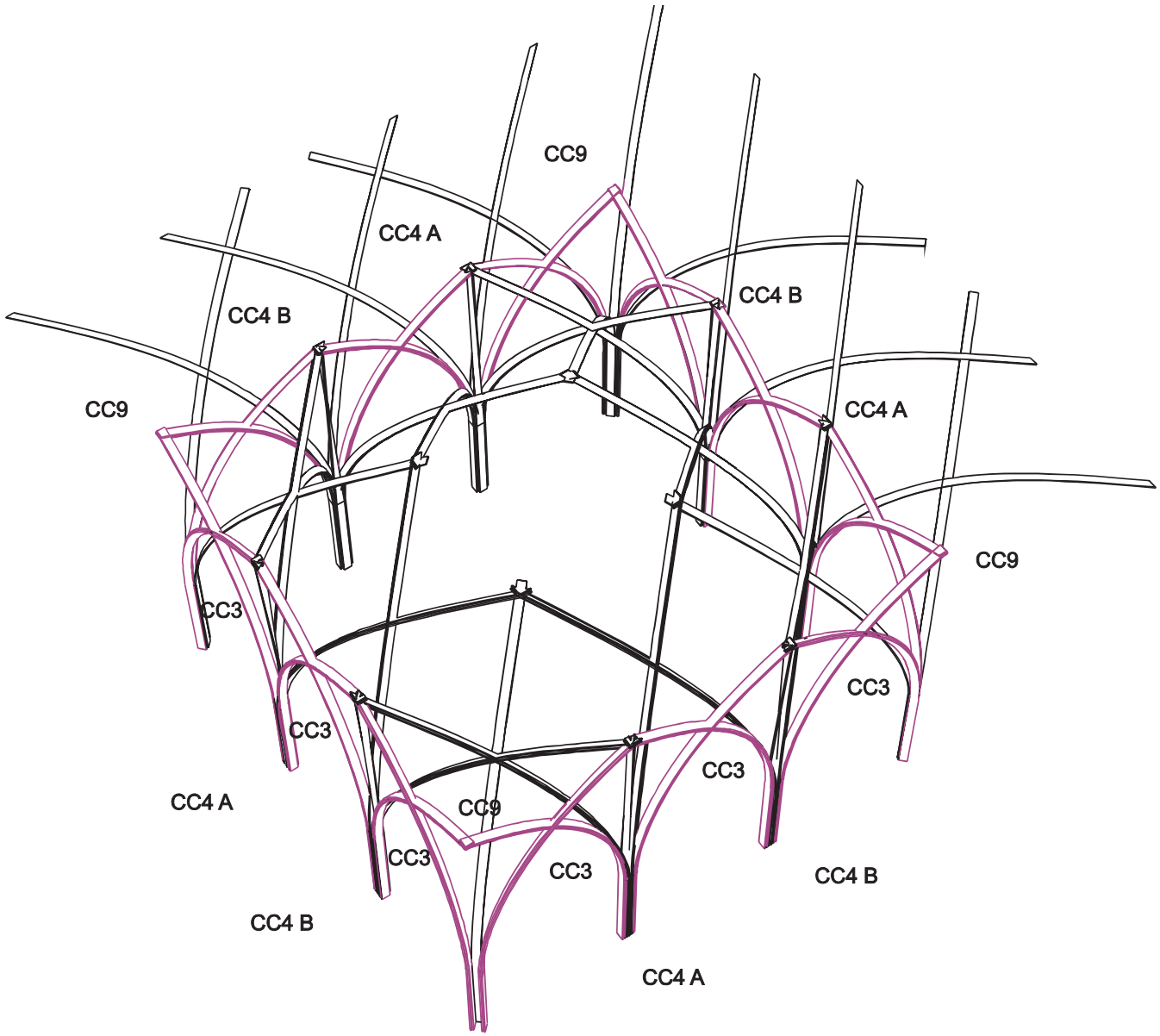




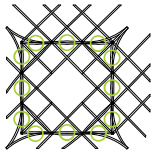
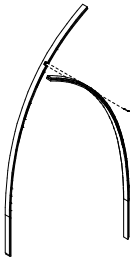
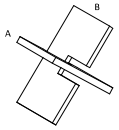
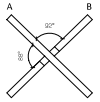
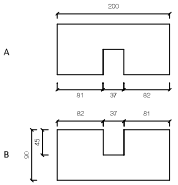
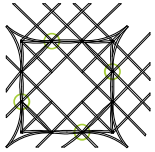
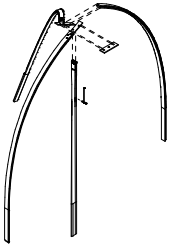
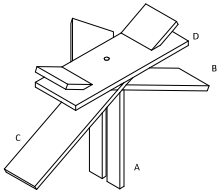
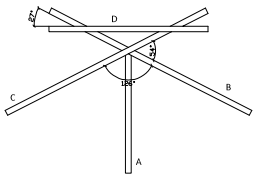
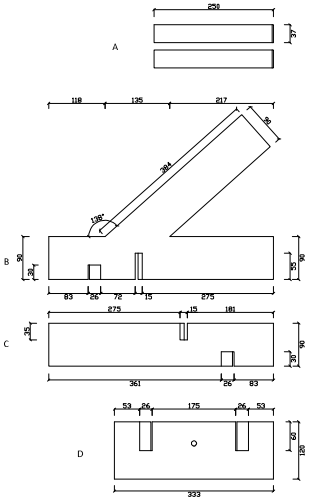
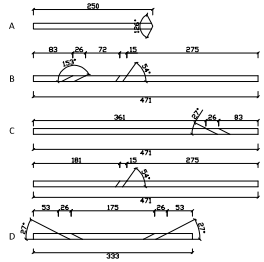
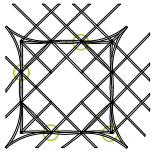
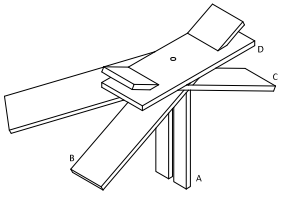
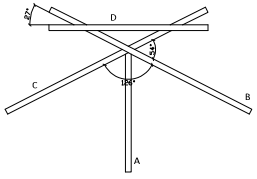
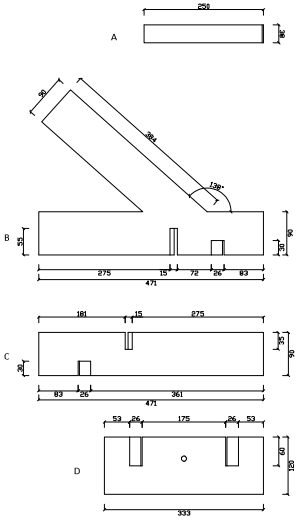
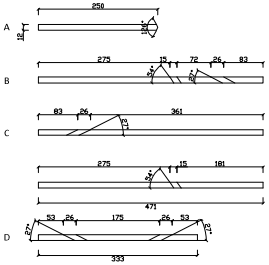
Joints development

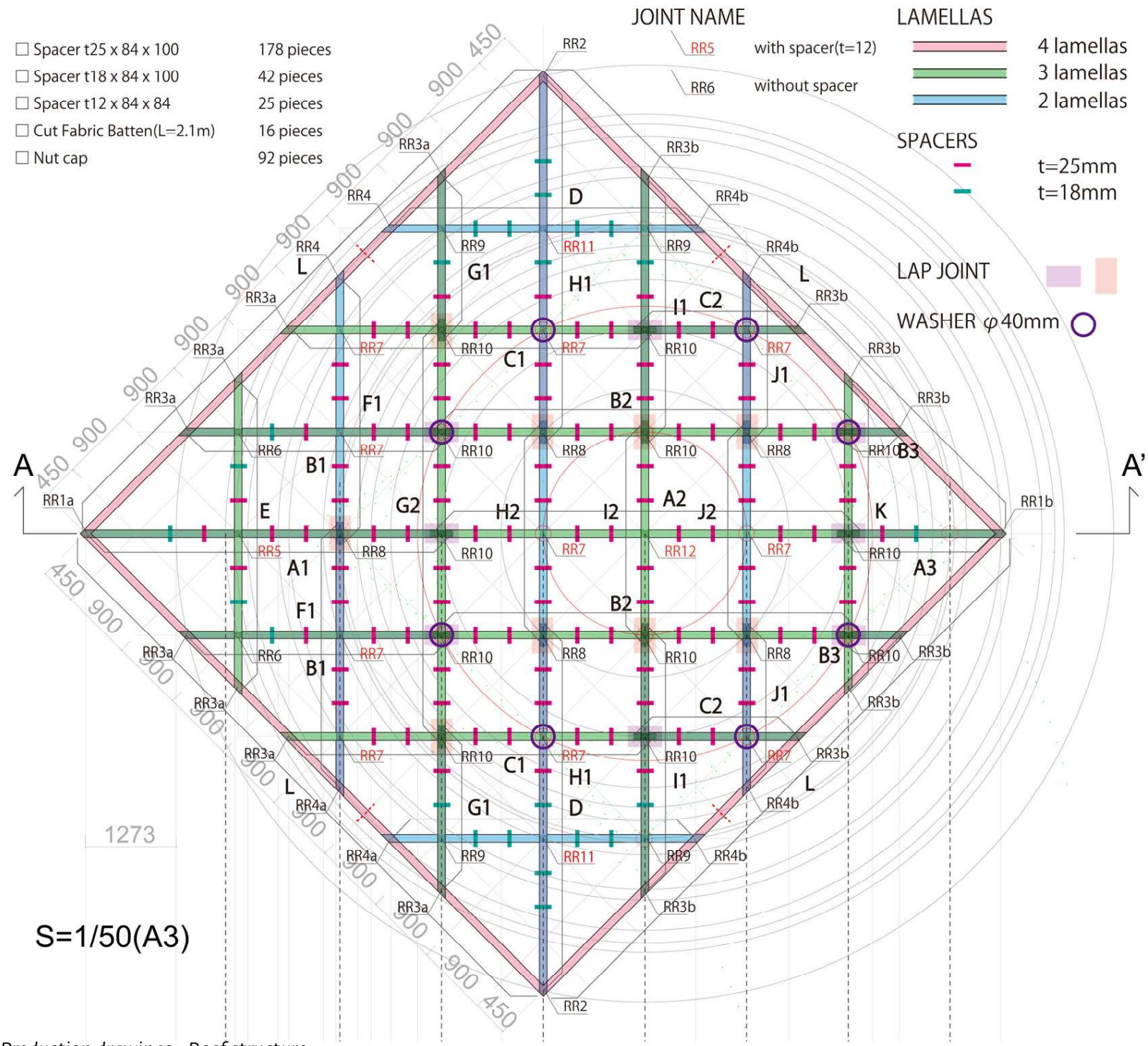


Joints development

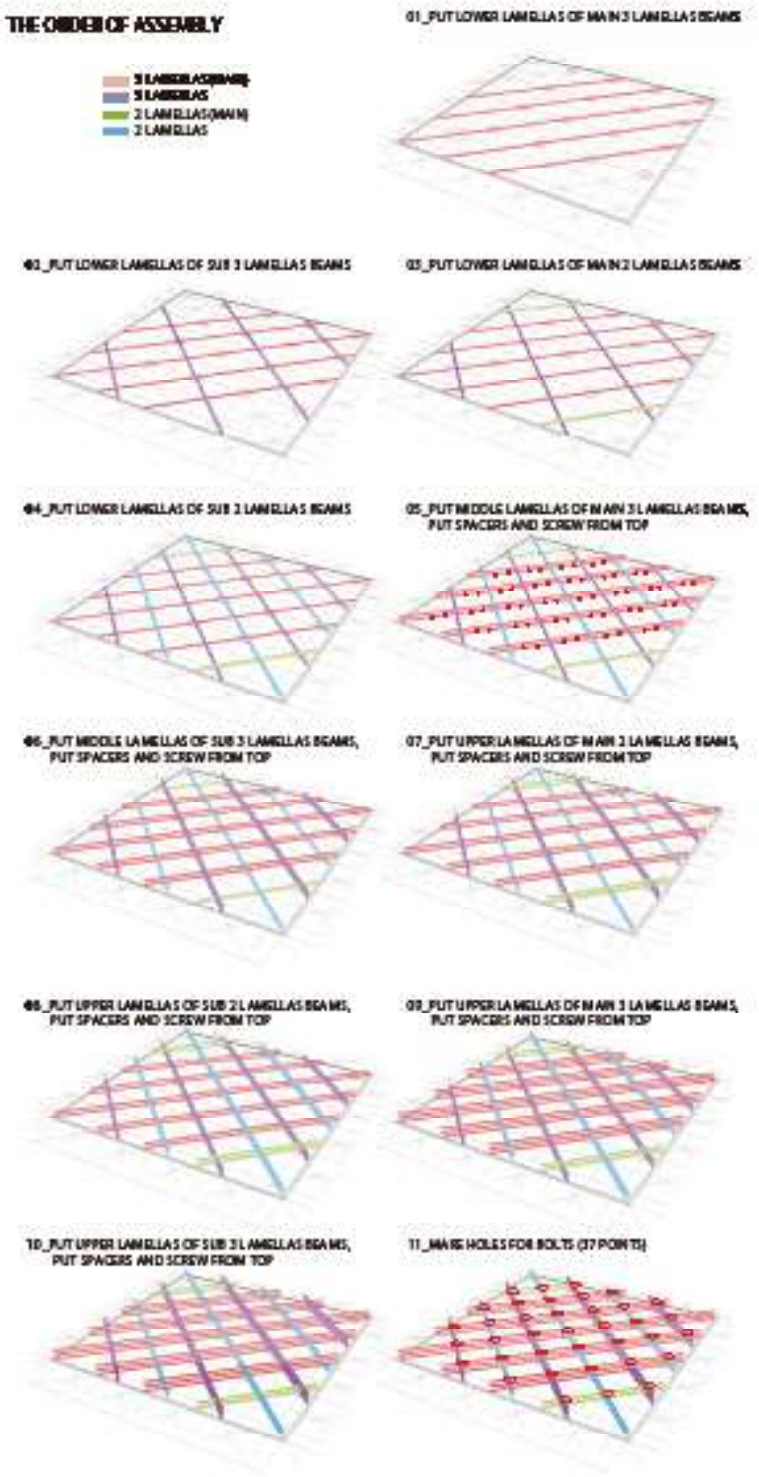


Lateral stability

CODE	Q.	LOCATION	EXPLODED AXONOMETRIC	JOINT AXONOMETRIC	JOINT ELEVATION	COMPONENT PLAN	COMPONENT ELEVATION
CC3 Cross bent arches of straight wall	12						
CC4a Arches of straight wall-straight column-inner arch	4						
CC4b Arches of straight wall-straight column-inner arch	4						

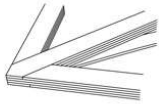


Production drawings - Roof structure



Production drawings - Roof structure

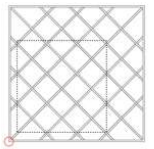
RR1-1: 1



BOLT A L=85 2 x 1=2
BOLT B L=?? 1

Screw T/P 5*35 10 x 1=10
Screw T/S 5*45 10 x 1=10
Screw B/S 5*35 5 x 1=5

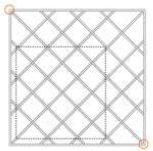
RR1-2: 1

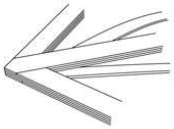


BOLT A L=85 2 x 1=2

Screw T/P 5*35 10 x 2=20
Screw T/S 5*45 10 x 2=20
Screw B/S 5*35 5 x 2=10

RR2: 2

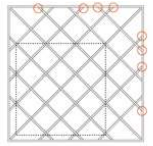




BOLT A L=75 2 x 2=4
BOLT B L=?? 1

Screw T/P 5*35 10 x 2=20
Screw T/S 5*45 10 x 2=20
Screw B/S 5*35 5 x 2=10

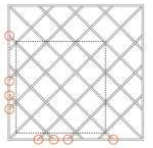
RR3-1: 8



BOLT A L=85 2 x 8=16
BOLT B L=?? 1

Screw T/P 5*35 10 x 8=160
Screw T/S 5*45 10 x 8=160
Screw B/S 5*35 5 x 8=40

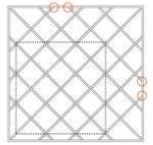
RR3-2: 8

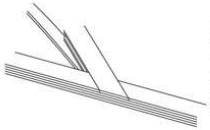


BOLT A L=85 2 x 8=16

Screw T/P 5*35 10 x 8=160
Screw T/S 5*45 10 x 8=160
Screw B/S 5*35 5 x 8=40

RR4-1: 4

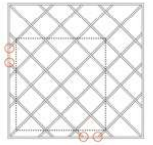


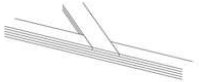


BOLT A L=75 2 x 4=8
BOLT B L=?? 1

Screw T/P 5*35 10 x 4=40
Screw T/S 5*45 10 x 4=40
Screw B/S 5*35 5 x 4=20

RR4-2: 4

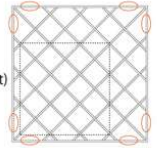




BOLT A L=75 2 x 4=8

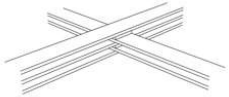
Screw T/P 5*35 10 x 4=40
Screw T/S 5*45 10 x 4=40
Screw B/S 5*35 5 x 4=20

RR-: 8
(straight part)



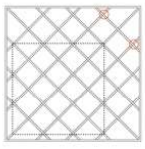
Screw T/P 5*35 8 x 8=64
Screw T/S 5*45 8 x 8=64
Screw B/S 5*35 4 x 8=32

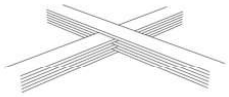
RR5: 1



BOLT L=100 1
Screw 4.5*25 4

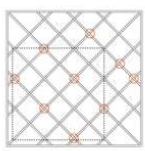
RR6: 2

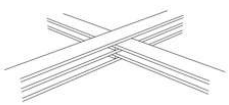




BOLT L=90 2

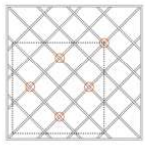
RR7: 10

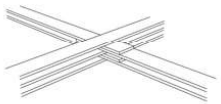




BOLT L=100 10
Screw 4.5*25 40

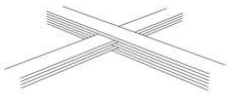
RR8: 5





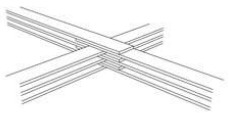
BOLT L=100 5

RR9: 4



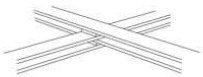
BOLT L=80 4

RR10: 12



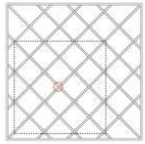
BOLT L=130 12

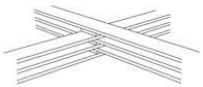
RR11: 2



BOLT L=90 2
Screw 4.5*25 8

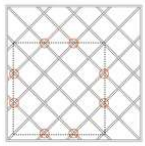
RR12: 1





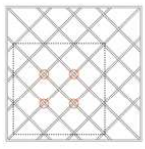
BOLT L=130 1
Screw 4.5*25 6

CR1: 8



with CC4&RR7/10

CR2: 4



with CC7&RR8

CR3: 1

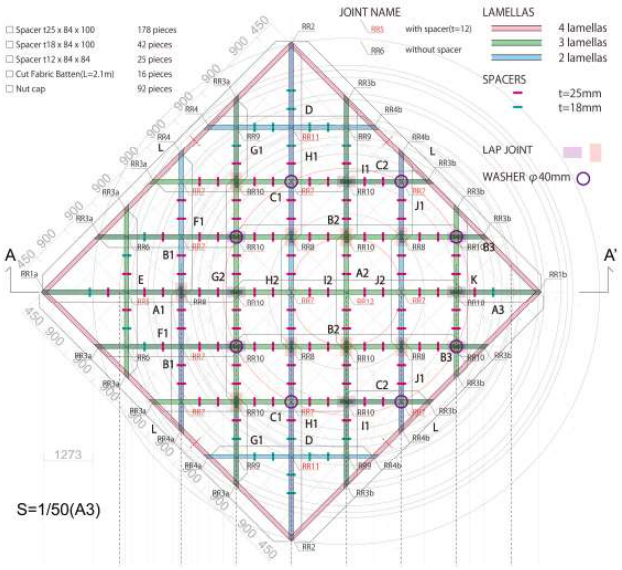
with CC9&RR8

CR4: 2

with CC9&RR9

CR5: 1

with CC9&RR4



S=1/50(A3)

Production drawings - Roof structure

On Site Assembly

On Site Assembly

On Site Assembly

KERTO – LAMINATED VENEER LUMBER + 3000 meters of PINE LATHES *(Tent Sauna 2004-2005)*

(with Metsä Wood)

BIRCH PLYWOOD + LAMINATED GLASS + DIGITAL PROCESS *(HDW Pavilion 2004-2005)*

(with UPM Kymmene)

LOG and GLUE-LAMINATED TIMBER *(VIIRUN TUPA 1997-1998, PIKKUKOSKI 2003-2004)*

(with Honka and Metsä Wood)

GLUE LAMINATED and CROSS LAMINATED TIMBER (*Oksa 1996-1997, Info Bar 2005-2006*)

(with Verso Wood)

THE PAVILION – *World Design Capital Helsinki, 2011-2012*

(with UPM Kymmene)

THE PAVILION – *World Design Capital Helsinki, 2011-2012*

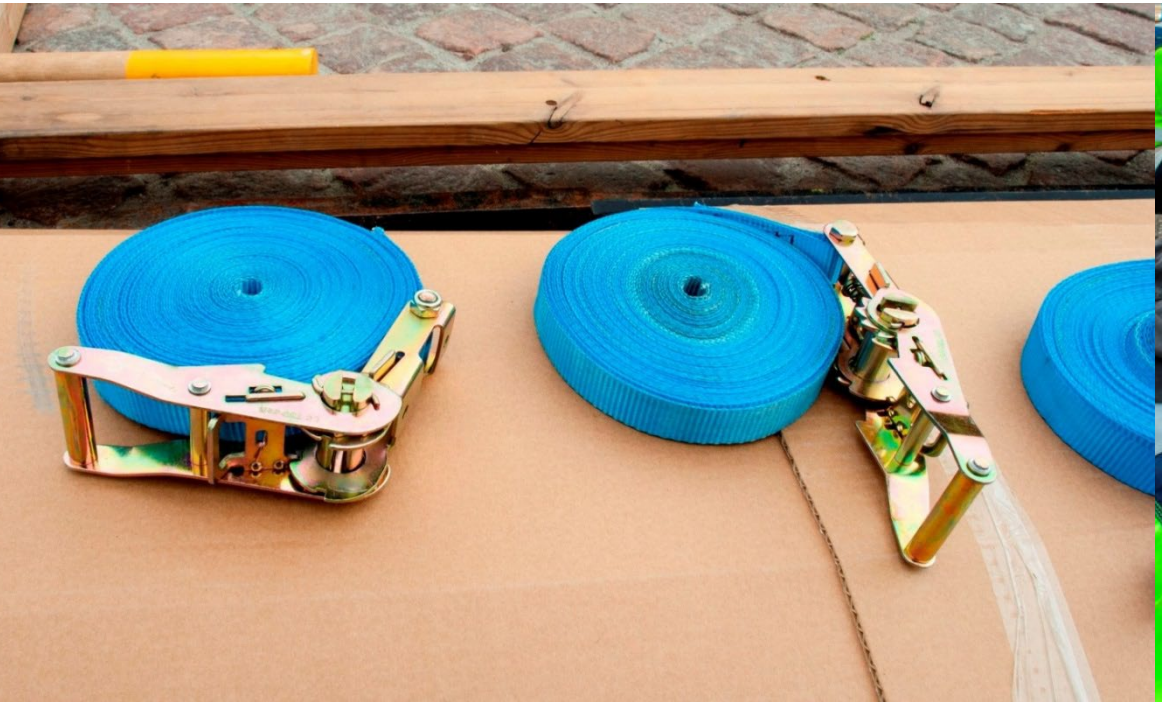
(City of Helsinki, Rose for Building -award 2012)

LIINA HOUSE – transitional shelter, *2010-2011*

(with UPM Kymmene, Metsä Wood)

LIINA HOUSE – transitional shelter, *2010-2011…assembled in 4 hours*

(with UPM Kymmene, Metsä Wood)



LIINA = STRAP



KOKOON HOUSE, Helsinki, three-story modular unit, *2015-2016*

(with Metsä Wood)

KOKOON HOUSE, Helsinki, three-story modular unit, *2015-2016…assembled in 5 hours*

(with Metsä Wood)

SÄIE PAVILION, *standard profile 12 x 94 mm, 2014-2015*

(with Lauta and Wurth Finland)

- WAN WOOD IN ARCHITECTURE AWARD 2016: Wood Program / Säie Pavilion
  https://www.worldarchitecturenews.com/project/2017/27638/wan-awards/wan-wood-in-architecture-award-2016-winner-announced.html

SÄIE PAVILION, *standard profile 12 x 94 mm, 2014-2015*

(with Lauta and Wurth Finland)

LUUKKU, Zero-energy house, *2008-2010, Solar Decathlon Europe 2010*

(with Metsä Wood, Woodpolis and others)

LUUKKU, Zero-energy house, *2008-2010, Solar Decathlon Europe 2010*

(Finnish Wood Award 2010)