

RO

ARCHITECTEN

Tij & Energiehuis



COÖPERATIE
DELTAWIND

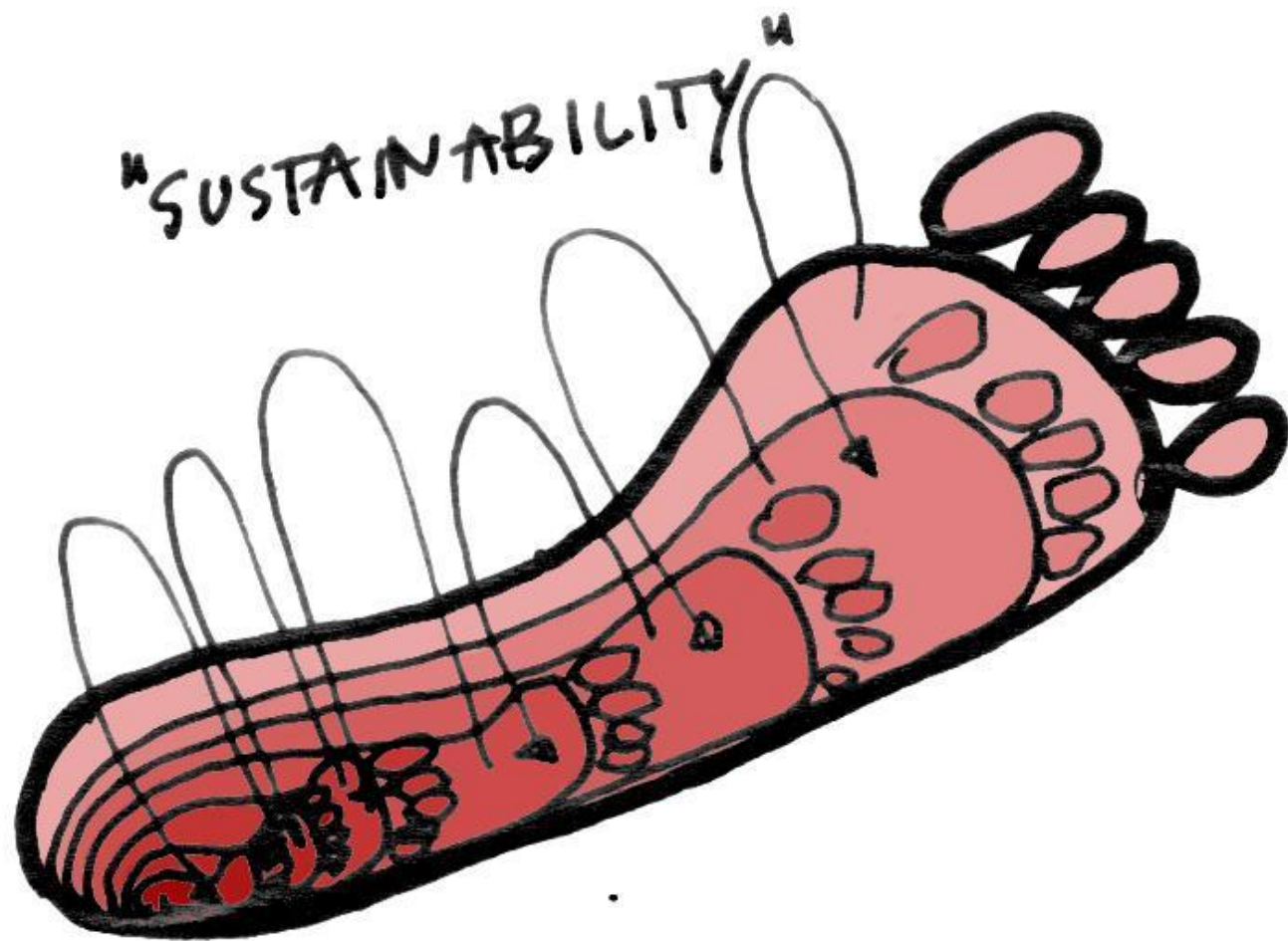
&

AD

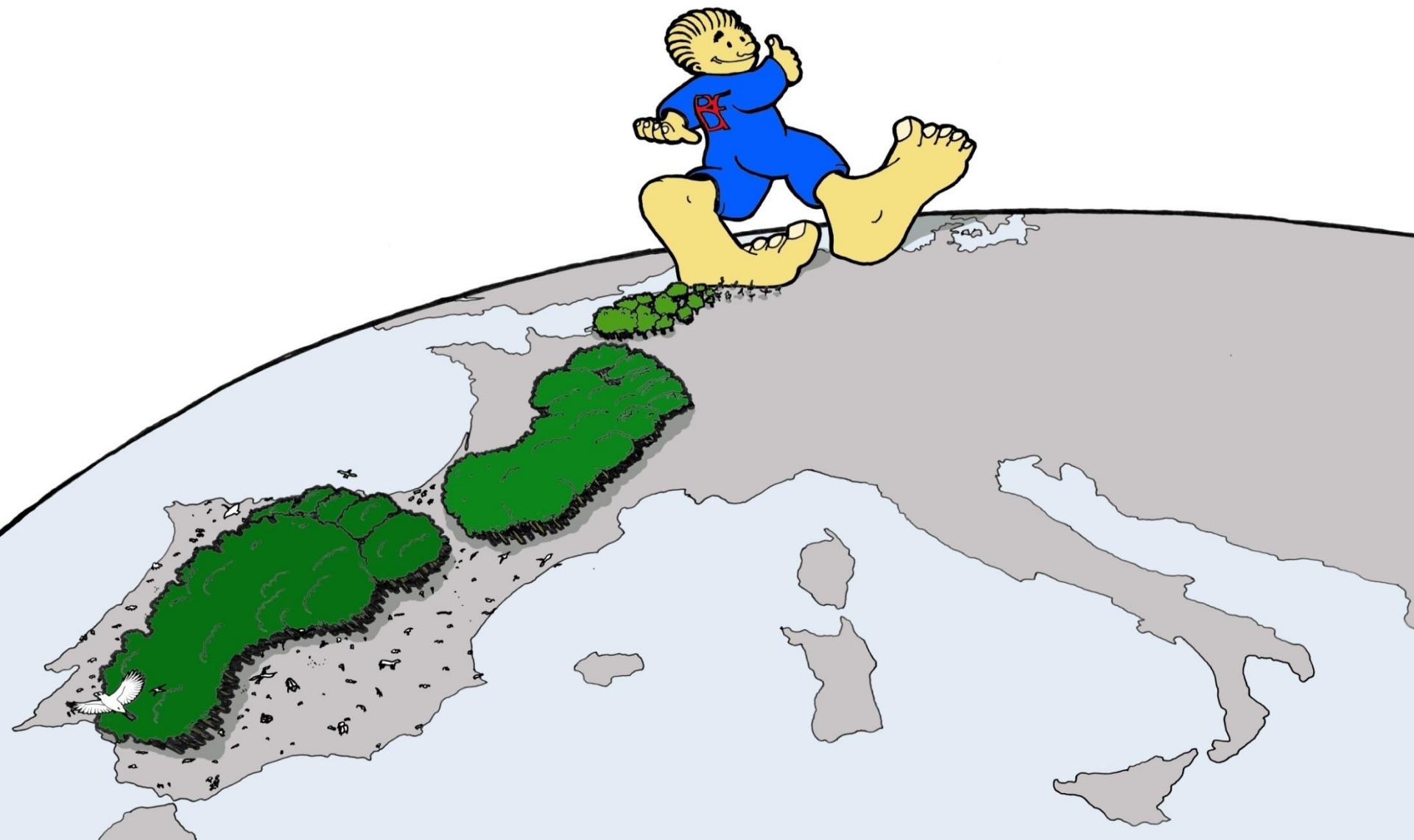
16 05 2025

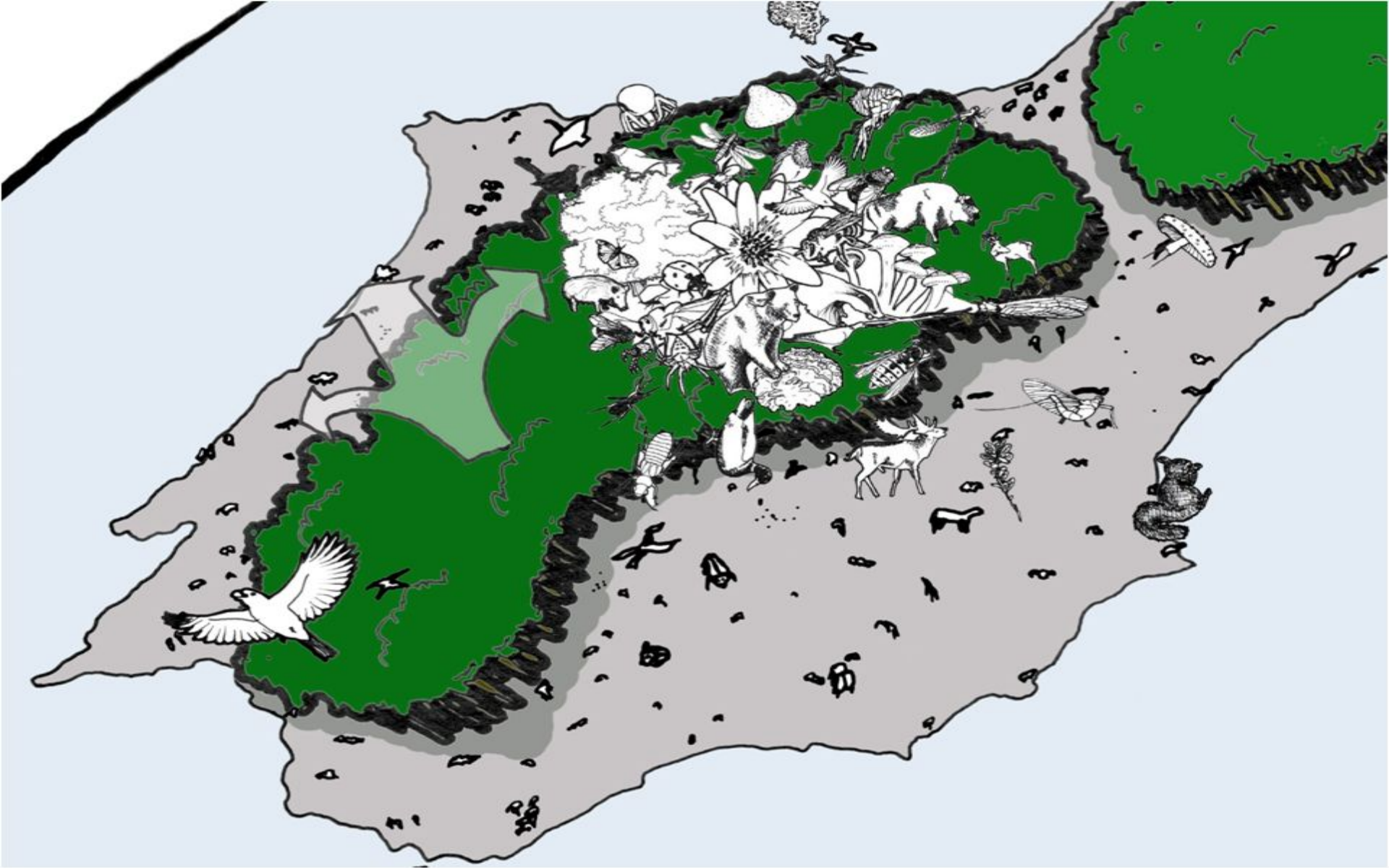


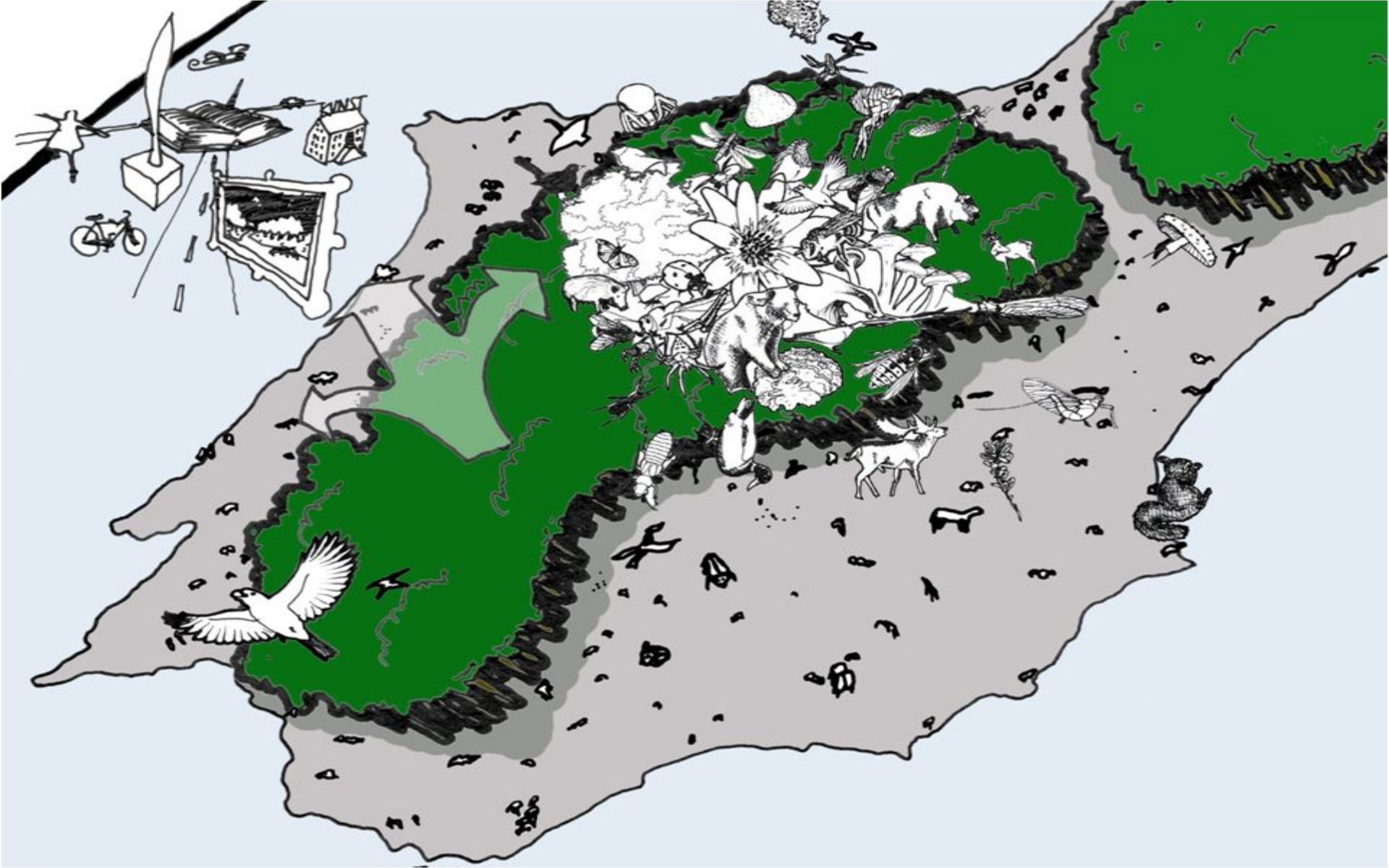
RO&AD Architecten

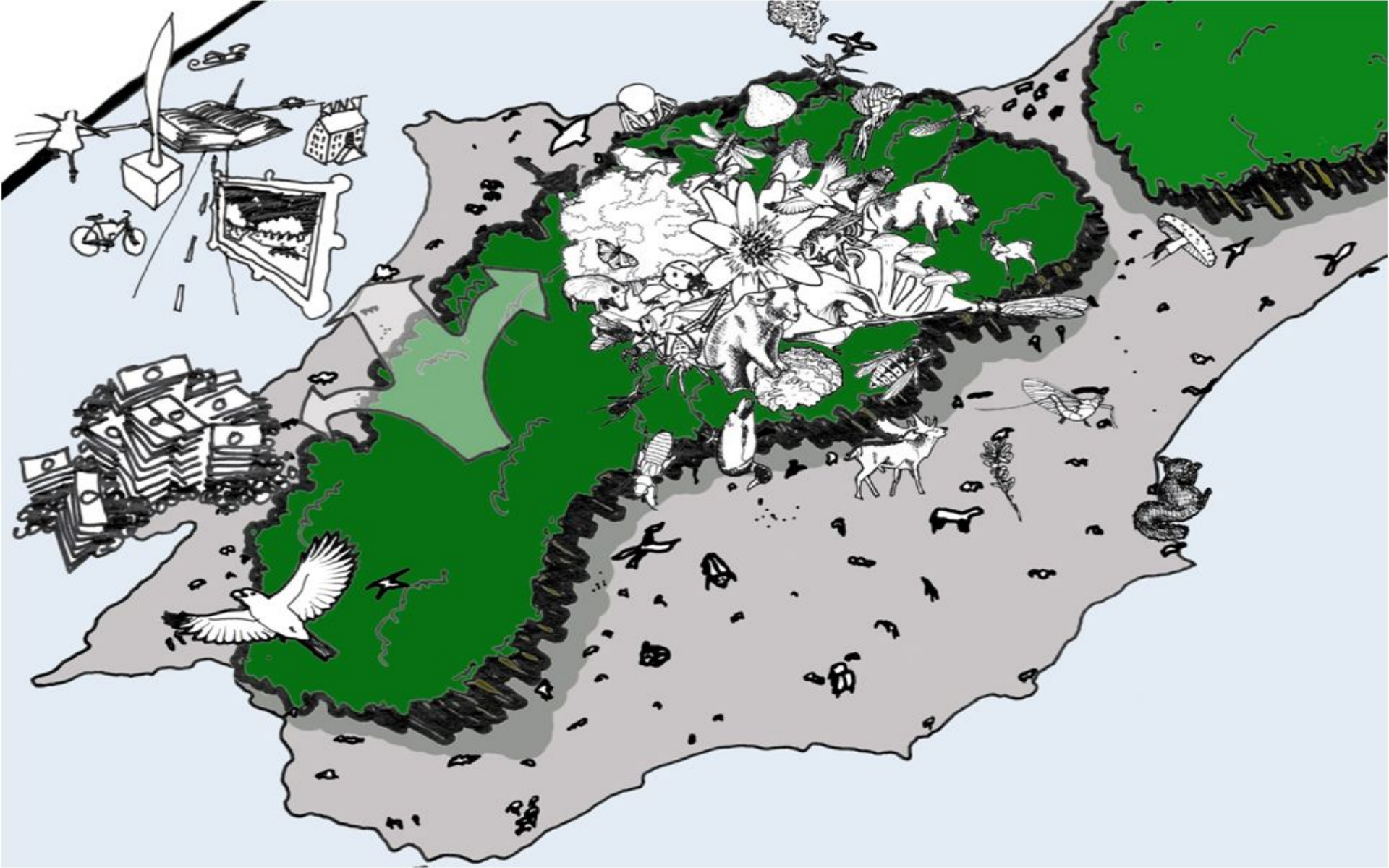




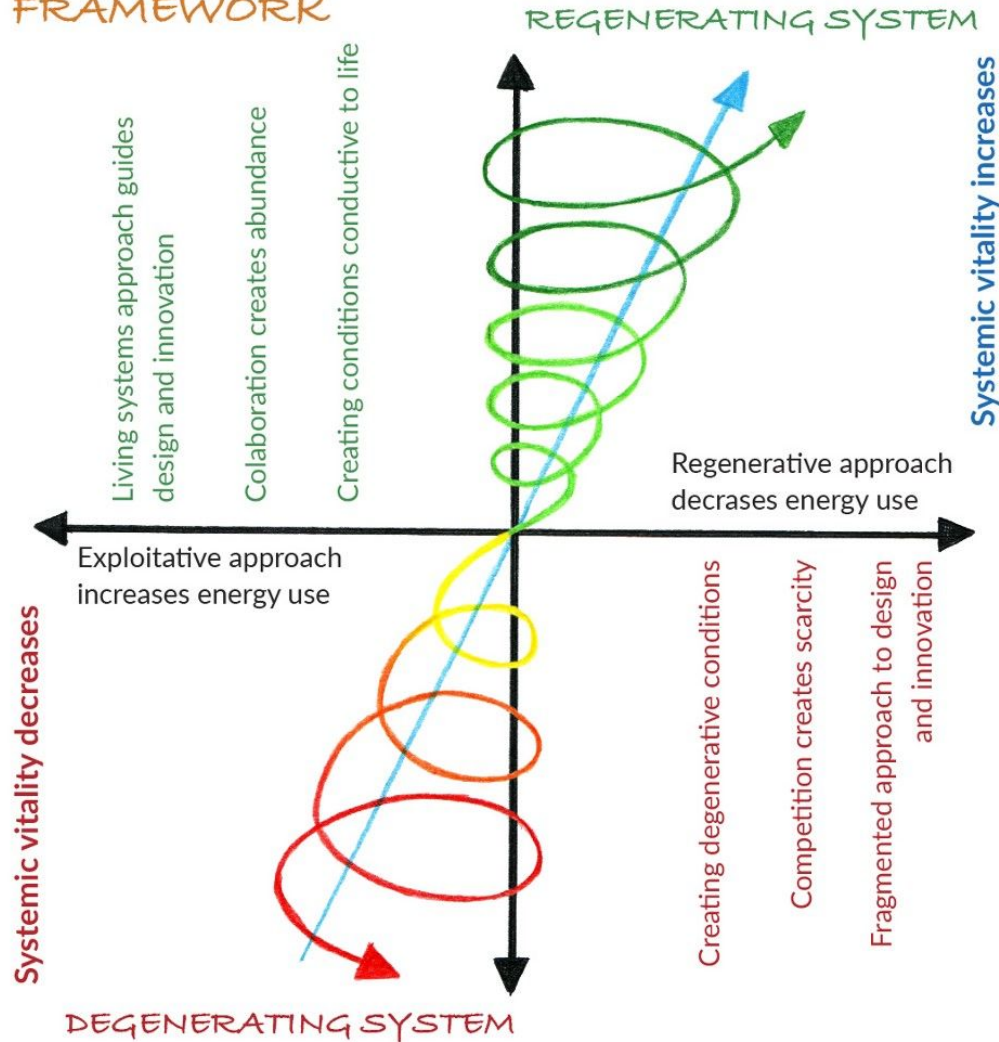








THE REGENERATIVE DESIGN FRAMEWORK



Regenerative

Appropriate participation and design as nature.

Reconciliatory

Reintegrating humans as integral parts of nature.

Restorative

Humans doing things to nature.

Sustainable

Neutral point of not doing any more damage.

Green

Relative improvements.

Conventional practice

Compliant to avoid legal actions.



An aerial photograph of the Tijk Vogelobservatorium in Stellendam. The image shows a large, circular observation tower with a yellow and blue facade, situated on a grassy hill. A winding path leads up to the tower. The surrounding landscape is a mix of green grass and some trees. The text "Tijk" is prominently displayed in a large, bold, black font, and "Vogelobservatorium, Stellendam" is written below it in a smaller, bold, black font.

Tijk

Vogelobservatorium, Stellendam



Moses Bridge



Watch-Theatre Tower Pompejus



Watch-Theatre Tower Pompejus



Bastion IX, Brielle



The Good House, Roosendaal



Schoolgarden, Roosendaal



Schoolgarden, Roosendaal



Hitsertse Kade, Oud-Beijerland









Tij



Ontdek het gebied →



Een krachtige samenwerking voor een uniek natuurgebied!

Zes natuurorganisaties werken eensgezind samen voor het Haringvliet. De bijdrage uit het Droomfonds van de Nationale Postcode Loterij in 2015 was de onmisbare impuls om belangrijke stappen te kunnen zetten op weg naar een dynamische delta. Bekijk wat de natuurorganisaties met de bijdrage uit het Droomfonds en een groeiend aantal partners in de regio hebben kunnen realiseren. Ook na de Droomfondsperiode blijven de natuurorganisaties zich onverminderd inzetten voor het Haringvliet. Lees en kijk snel verder. Op naar een dynamische delta!

Droomfondsproject

→ Vier jaar droomfondsproject Haringvliet

→ Nieuwe iconen in en om het Haringvliet

→ Hoe gaat het verder?











Google











OP DE 1^{ste} VERDIEPING
GRANDE FINALE



VOGEL- & VIS
BROED-EILAND



ENTREE

LADEN
LOSSEN

KUKEZ
BINNENKAMER
SCHEELHOEK

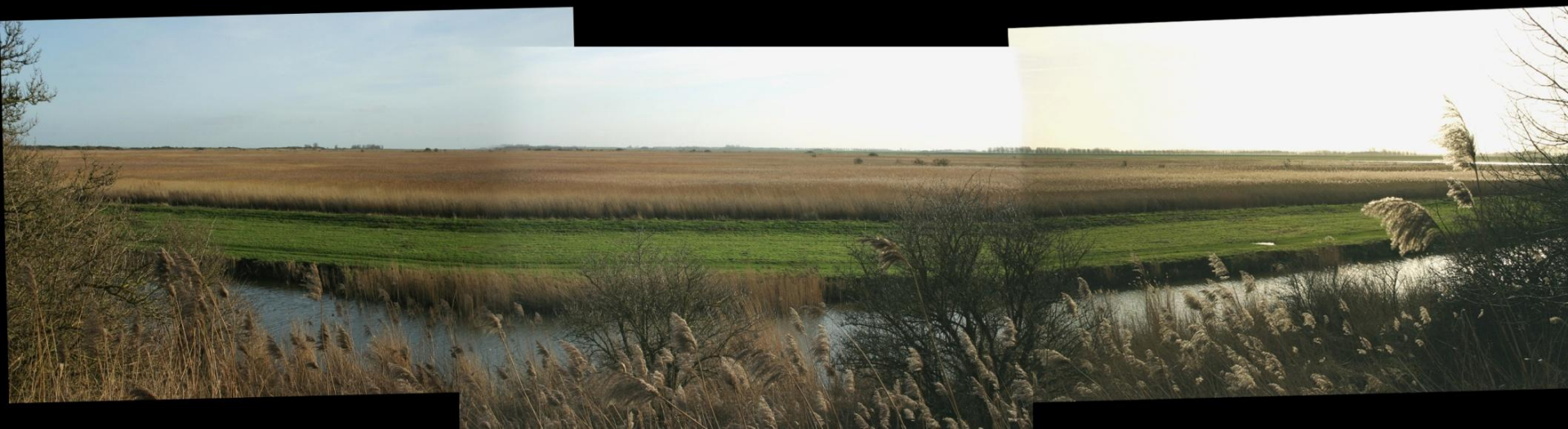
OEVERZWALUWENBROEDWAND
IN TUNNEL

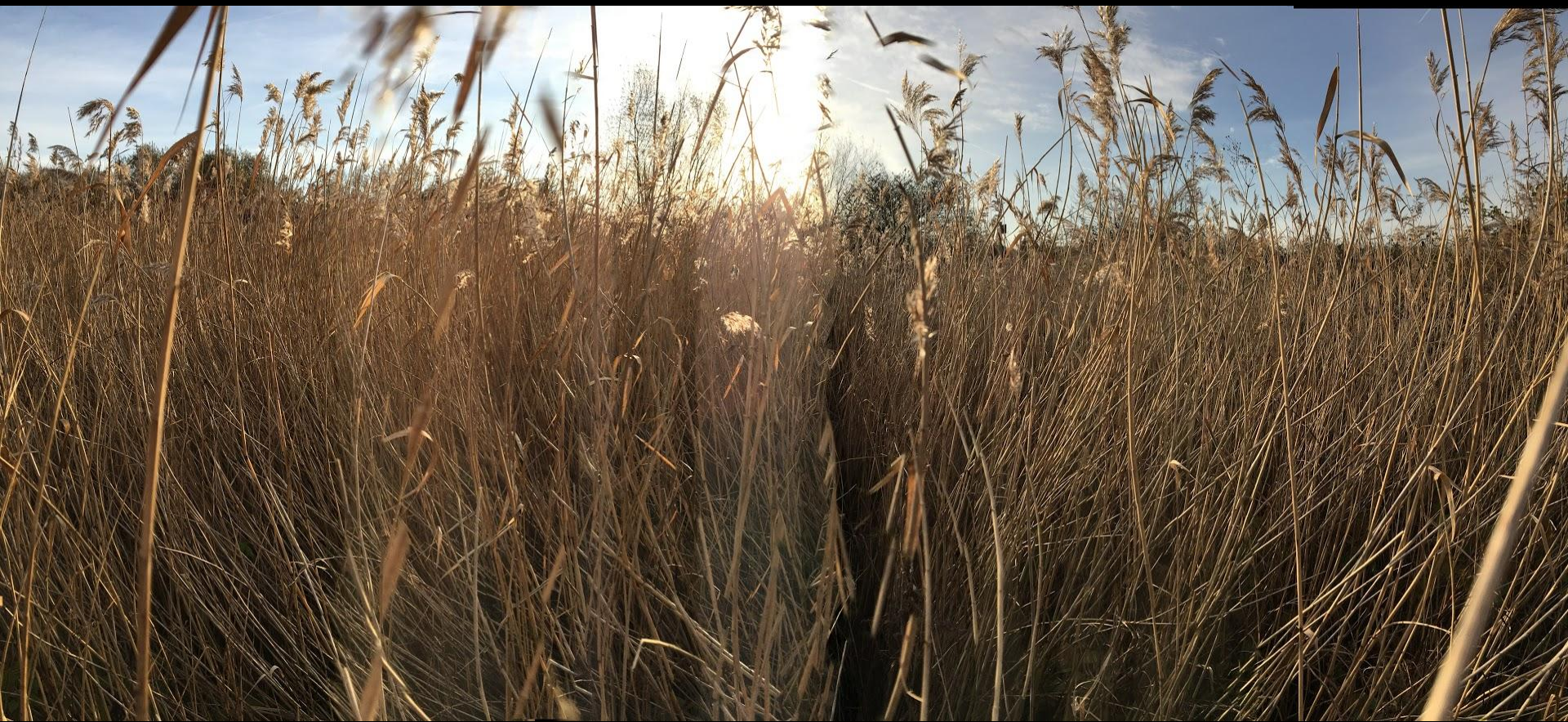
GLIMP
VAN
HARINGVLIET

OP BESANE GROND:
VIS & VOGELKUKEN

STERNENGLUREN
VIA PERISCOOP

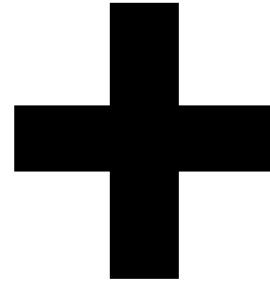
KUKEZ
OVER
DOLDER
KUKEZ
OVER
DOLDER







ecologische















Spinnenzoekkaart

Tel de spinnen in huis en tuin en geef je waarnemingen door op:
vroegevogels.vara.nl - Insturen voor 18 oktober 2013
 Noteer de volgende gegevens: Soort - Aantal



(Gewone) tandkaak

Enoplognatha ovata

Tuinspin. Verstopt in opgerold blad. Achterlijft kan helemaal geel zijn, of met één of twee rode strepen. ♀ max 6 mm ♂ max 5 mm



(Venster)sectorspin

Zygiella x-notata

Rond web waar een sector (taartpunt) aan ontbreekt. Achterlijft met zilvergrijs bladachtig patroon. ♀ max 7 mm ♂ max 5 mm



(Gewone) strekspin

Tetragnatha extensa

Tuinspin. Rond web met gat in centrum. Slank zilverwit lichaam, geelbruine lijnen, lange voorpoten. ♀ max 11 mm ♂ max 9 mm



Kruisspin

Araneus diadematus

Huis- en tuinspin. Wielvormig web. Herkenbaar aan witte kruisvormige tekening op achterlijft. ♀ max 17 mm ♂ max 10 mm



Gewone huisspin

Tegenaria atrica

Huisspin. Horizontaal trechterweb. Bruin tot bijna zwart met lichtere vlekken. Lange, harige poten. ♀ max 18 mm ♂ max 15 mm



Muurkaardespin

Amaurobius similis

Zit overdag verstopt in gaten. Vaak V-vormige tekens op fluwelig behaard achterlijft. ♀ max 12 mm ♂ max 8 mm



Grote trilspin

Pholcus phalangioides

Huisspin. Web van draden kriskras door elkaar. Eng. lange poten. Begint bij verstoring te trillen. ♀ max 10 mm ♂ max 10 mm



Wespspin

Argiope bruennichi

Tuinspin. Grote wielwebspin. Achterlijft heeft de kleuren van een wesp. Steeds vaker in NL. ♀ max 15 mm ♂ max 5 mm



Tuinwolfspin

Pardosa amentata

Tuinspin. Geen web, maar achtervolgt prooi op de grond. Donkerbruin, stevige geringde poten. ♀ max 8 mm ♂ max 6,5 mm



Koffieboonspin

Steatoda bipunctata

Huis- en tuinspin. Grofmazige spinnemat. Herkenbaar aan achterlijfs als een koffieboon. ♀ max 7 mm ♂ max 5 mm





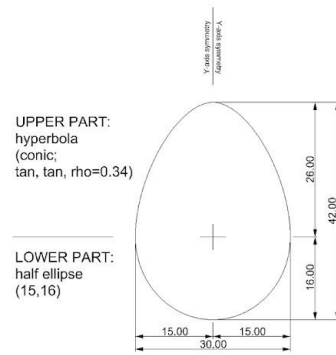




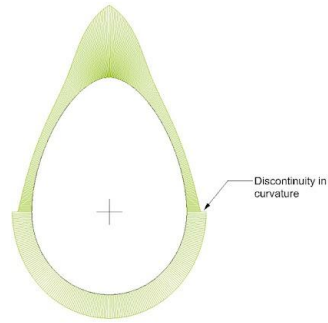




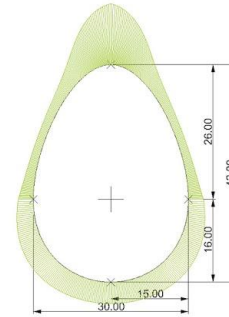
1. REFERENCE SHAPE
(STERN EGG)



2. SHAPE GENERATION



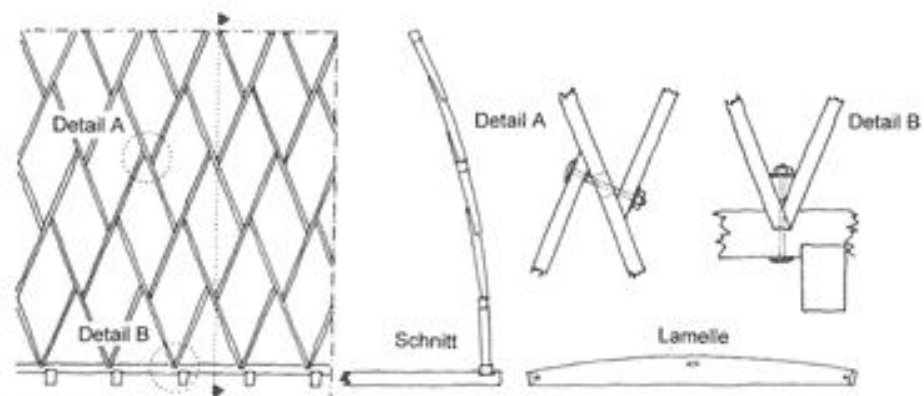
3. SECTION
CURVATURE GRAPH



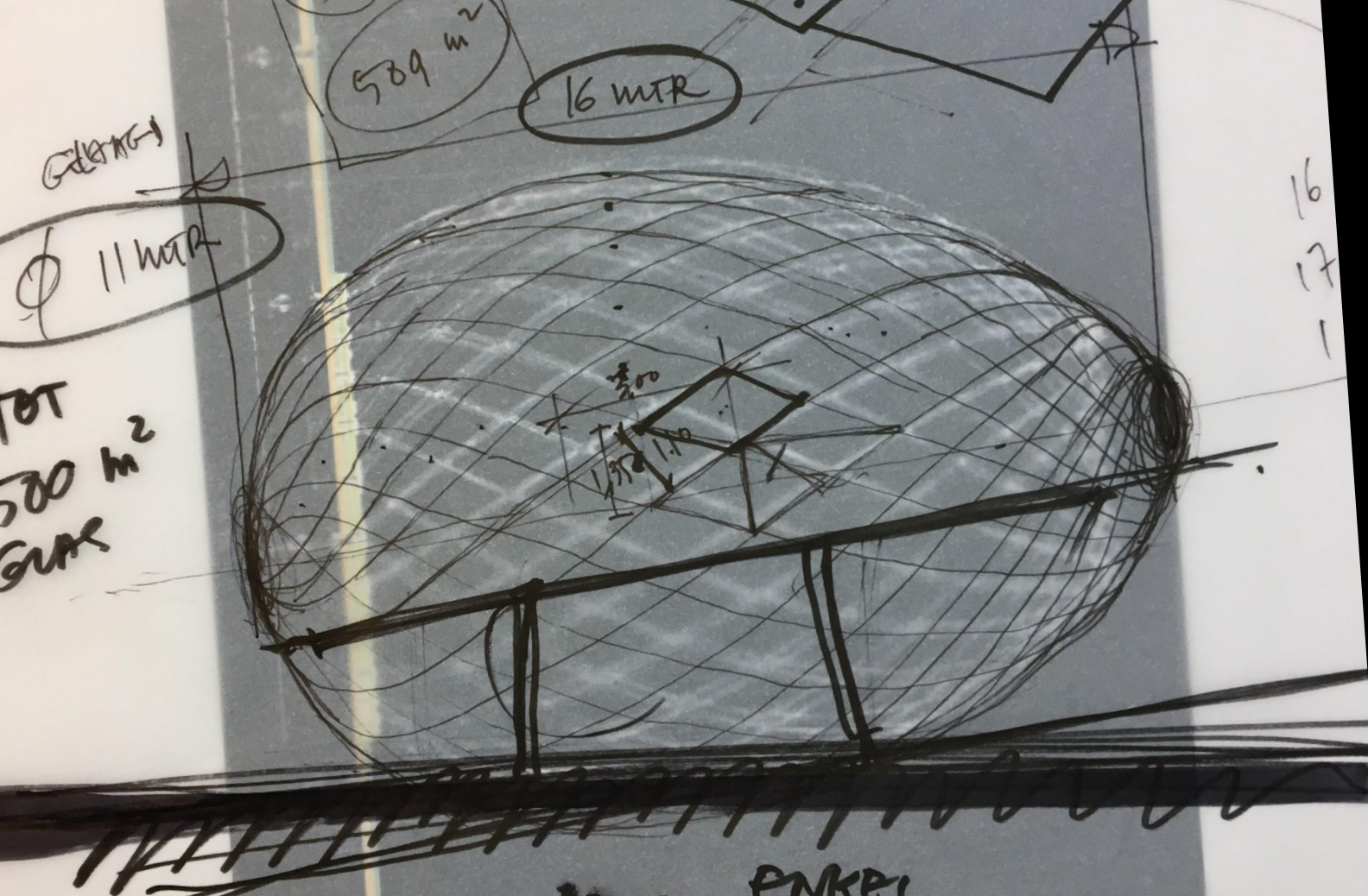
4. SECTION
CURVATURE GRAPH



5. REVOLVED 3D-SHAPE



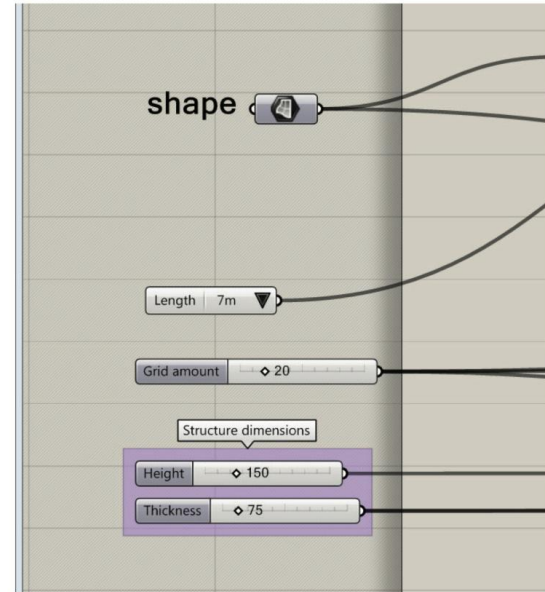
Zöllinger Bauweise



GRAB PRYS ENKEL
&
DUBBEL GUNT



Continuous and smooth shape of tern egg as basis of the building.



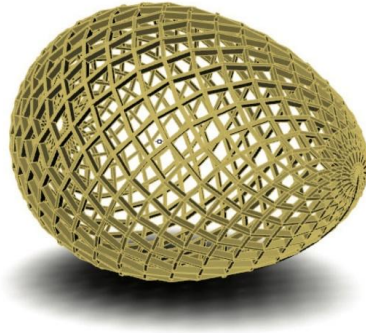
Controls for adapting the structure in real time.

Ro&Ad - Bird's Eye

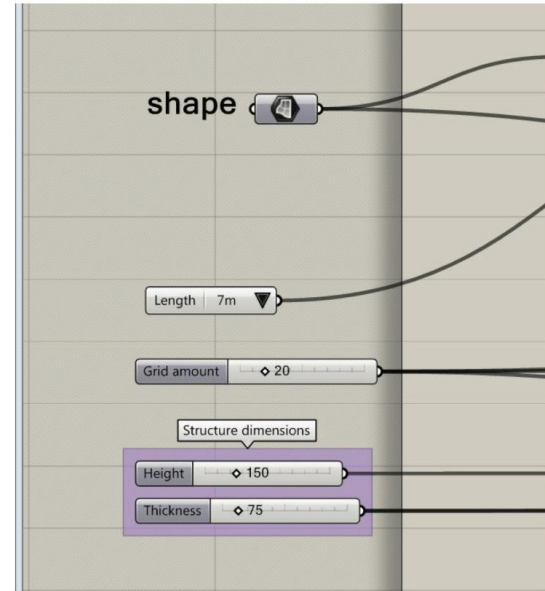
Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



3D representation of the shape and the structure.
Contains necessary information for structural analysis
and fabrication.

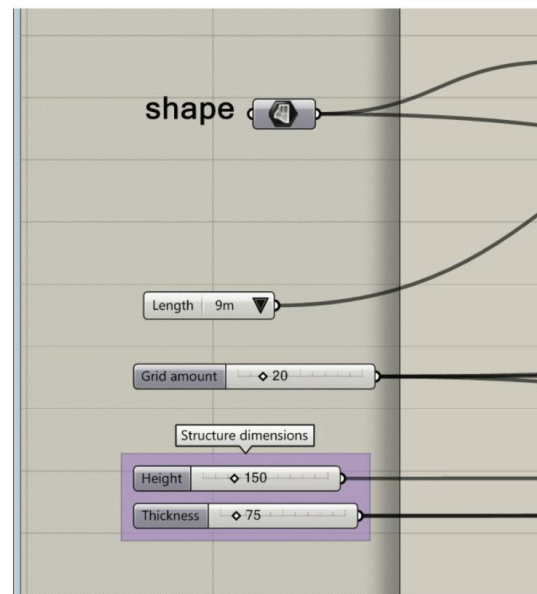
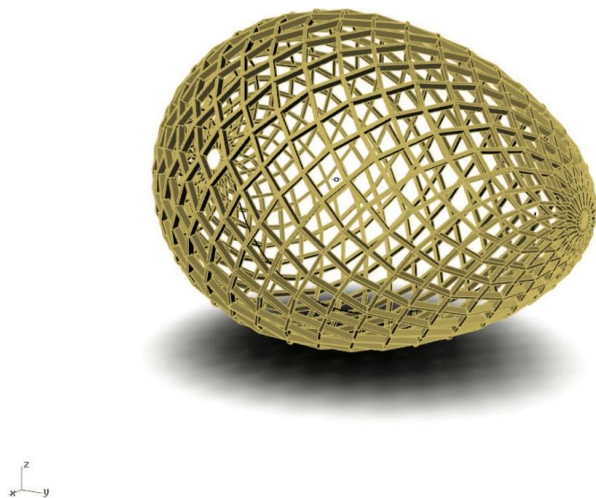


Ro&Ad - Bird's Eye

Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



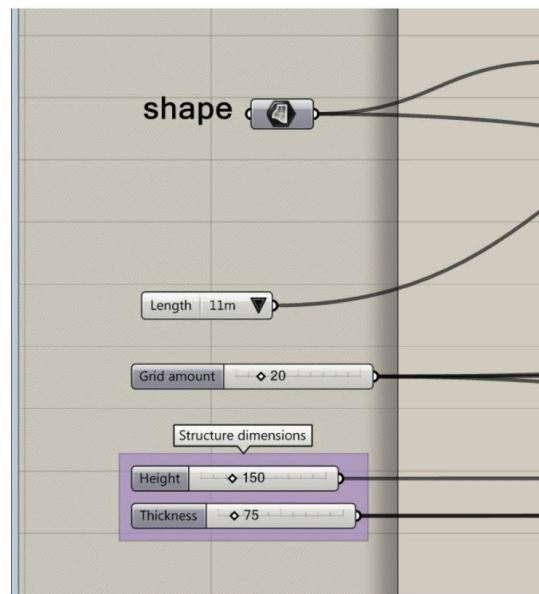
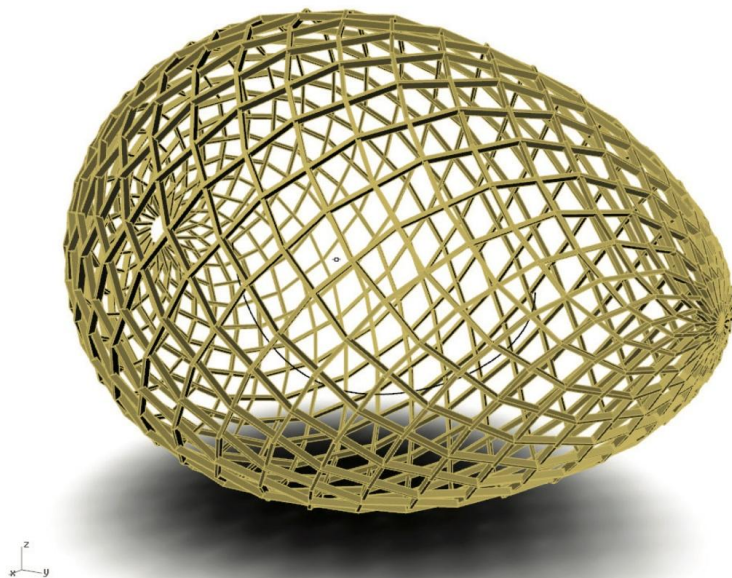
Changing the length to 9m.

Ro&Ad - Bird's Eye

Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



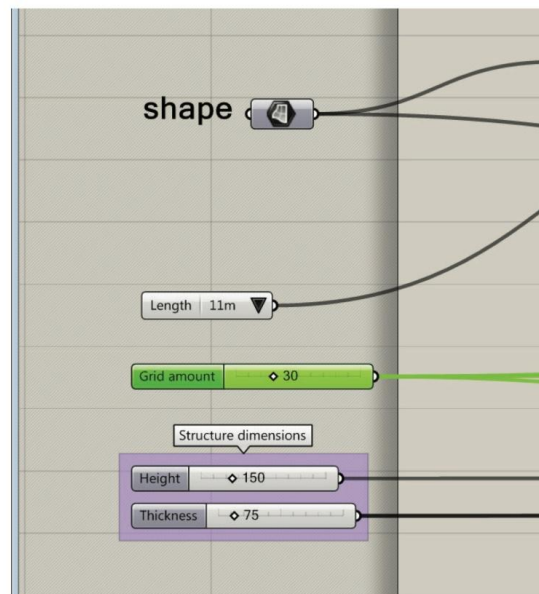
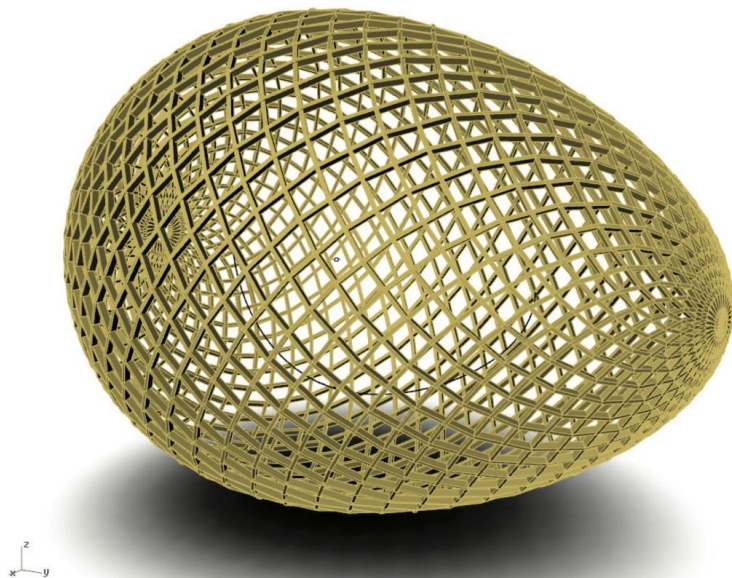
Changing the length to 11m.

Ro&Ad - Bird's Eye

Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



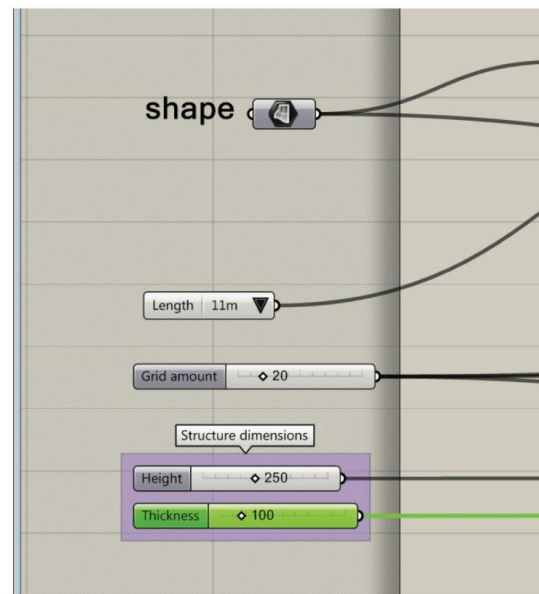
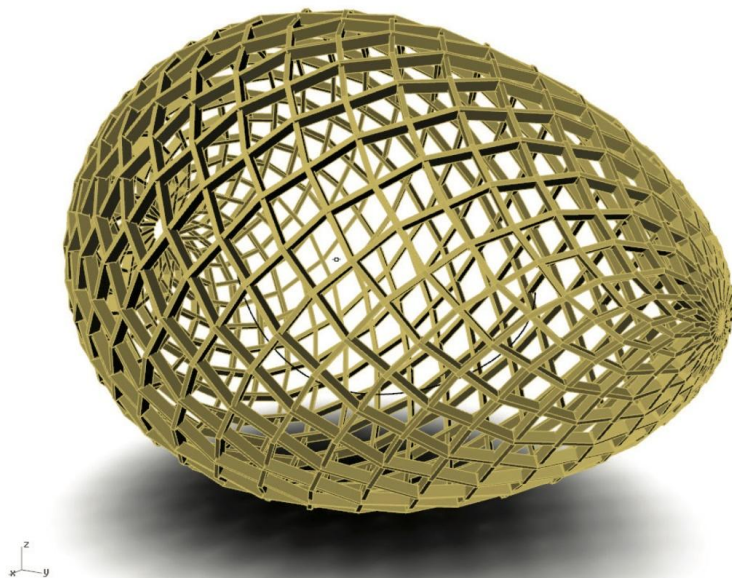
Denser Zollinger structural grid.

Ro&Ad - Bird's Eye

Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



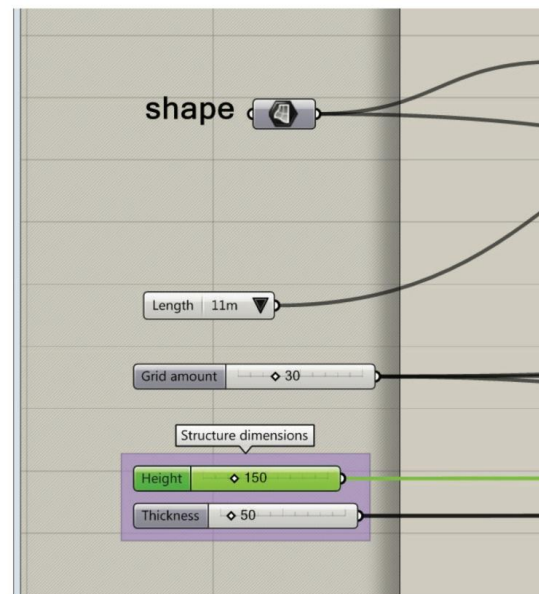
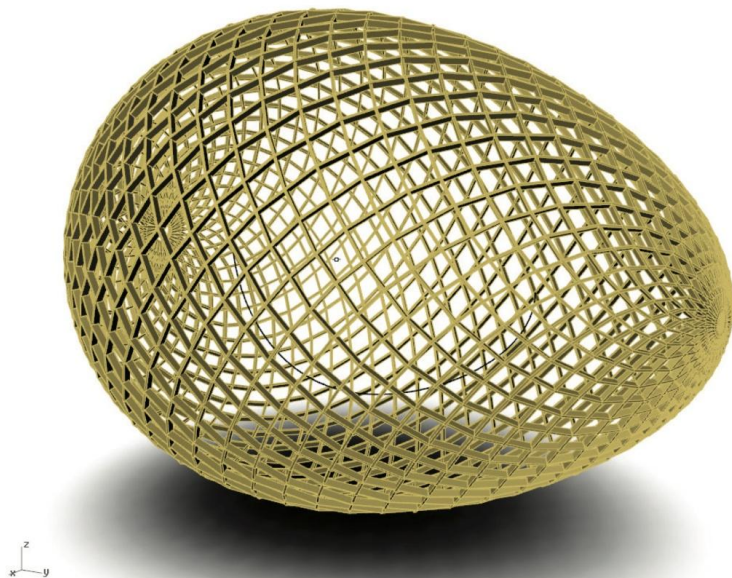
Changing structure dimensions. These can be set locally instead of globally - based on structural analysis.

Ro&Ad - Bird's Eye

Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



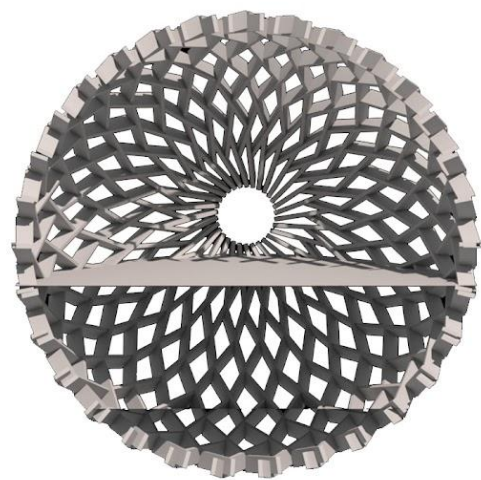
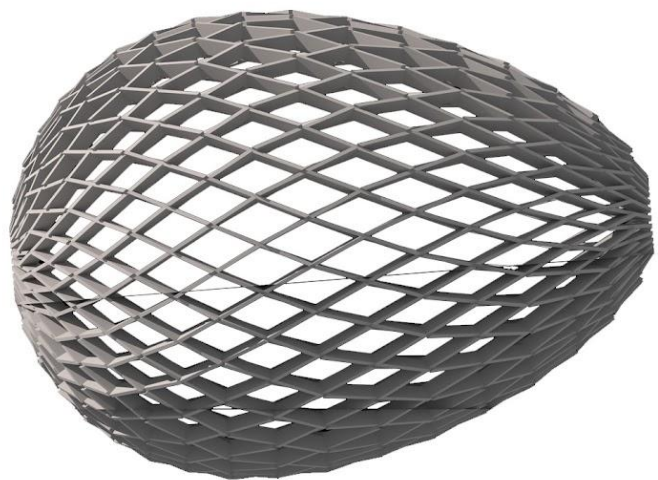
Parameters can be adjusted in order to find a perfect balance between structural efficiency, visual aesthetics and cost efficiency.

Ro&Ad - Bird's Eye

Structure generation and adaptation | 21.03.2017

Geometria Architecture Ltd
info@geometria.fi
www.geometria.fi

GEOMETRIA
architecture & geometry



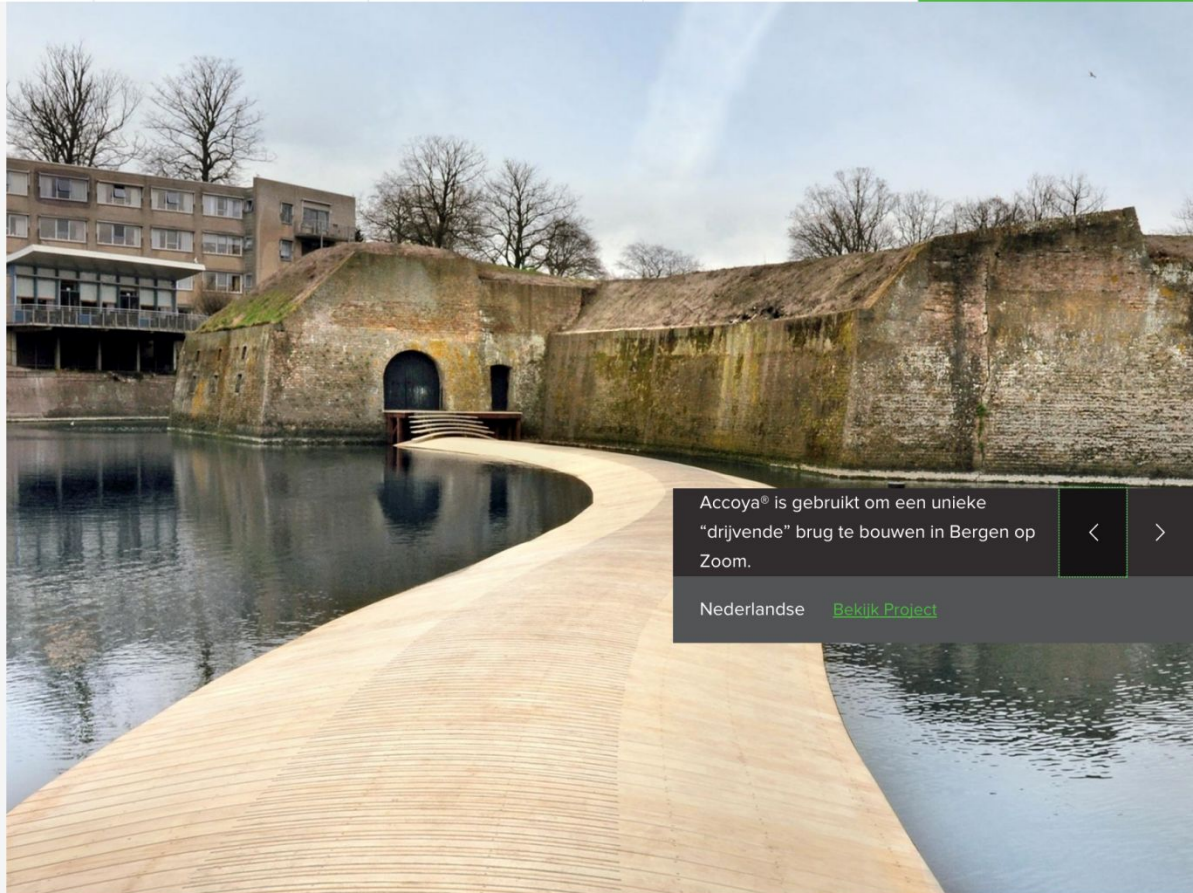
Material





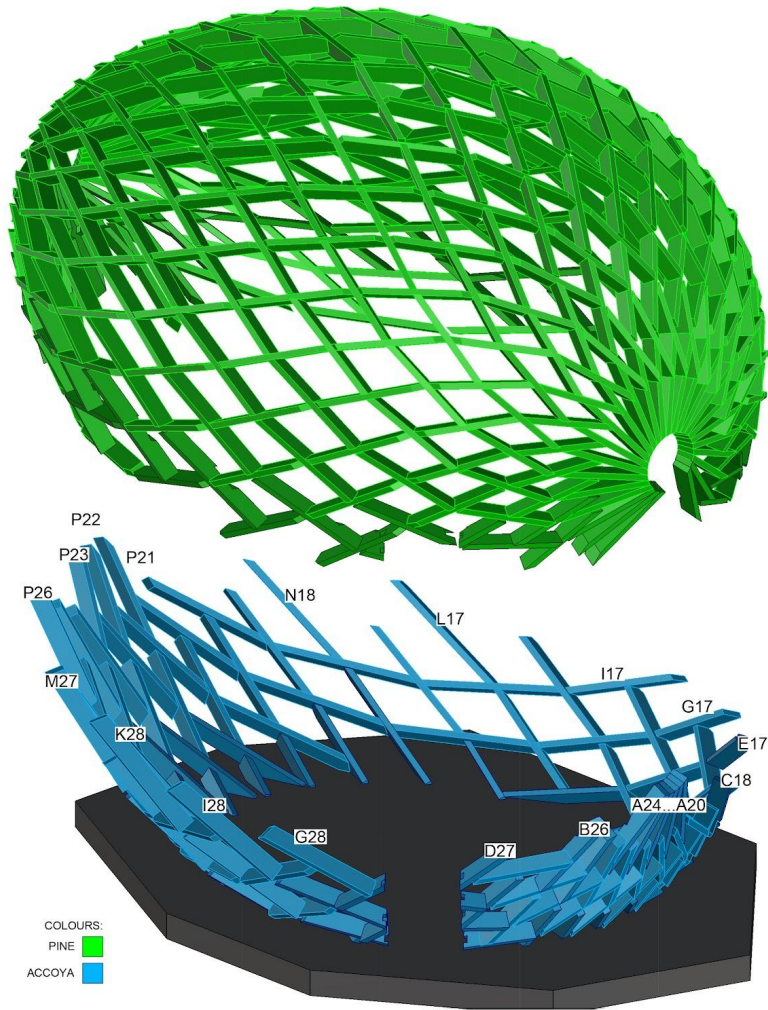
VERHOOGDE PRESTATIES ÉN BETER VOOR HET MILIEU

Accoya® is hout, maar niet zoals u hout kent. Met behulp van het acetylatisatieproces, een geavanceerde gepatenteerde technologie, gaat Accoya hout gegarandeerd mee voor 50 jaar boven de grond en 25 jaar in grond of zoetwater. De verbeterde dimensiestabiliteit verdubbelt de levensduur van coatings. De prestaties van geacetyleerd hout zijn uitzonderlijk betrouwbaar. Accoya hout is een toonaangevend materiaal dat voldoet aan elke applicatie uitdaging – [gevelbekleding](#), [houten dekdelen](#), oeverbeschoeiing en meer.



Accoya® is gebruikt om een unieke "drijvende" brug te bouwen in Bergen op Zoom.

Nederlandse [Bekijk Project](#)



ACCOYA beams:

A20	E27	L24
A21	F17	L25
A22	F18	L26
A23	F26	M19
A24	F27	M20
B19	G17	M21
B20	G18	M22
B21	G19	M23
B22	G26	M24
B23	G27	M25
B24	G28	M26
B25	H17	M27
B26	H18	N18
C18	H25	N19
C19	H26	N20
C20	H27	N21
C21	I17	N22
C22	I18	N23
C23	I19	N24
C24	I26	N25
C25	I27	O20
C26	I28	O21
C27	J17	O22
D18	J18	O23
D19	J19	O24
D20	J26	O25
D21	J27	O26
D22	K18	P21
D23	K19	P22
D24	K25	P23
D25	K26	
D26	K27	
D27	K28	
E17	L17	
E18	L18	
E19	L19	
E20	L20	
E21	L21	
E25	L22	
E26	L23	

Amount: 110



GRANDE FINALE



VOGEL- & VIS
BROED-EILAND



ENTREE

LADEN
LOSSEN

KUKKEZ
BINNENKAMER
SCHEELHOEK

GLIMP
VAN
HARINGVLIET

OEVERZWALUWEN BROEDWAND
IN TUNNEL

OF BEGANE GROND
VIS & VOGELK'JKEN

STERNENGLUREN
VIA PERISCOOP

KUKKEZ
OVERPOLDER
KUKKEZ
OVERPOLDER

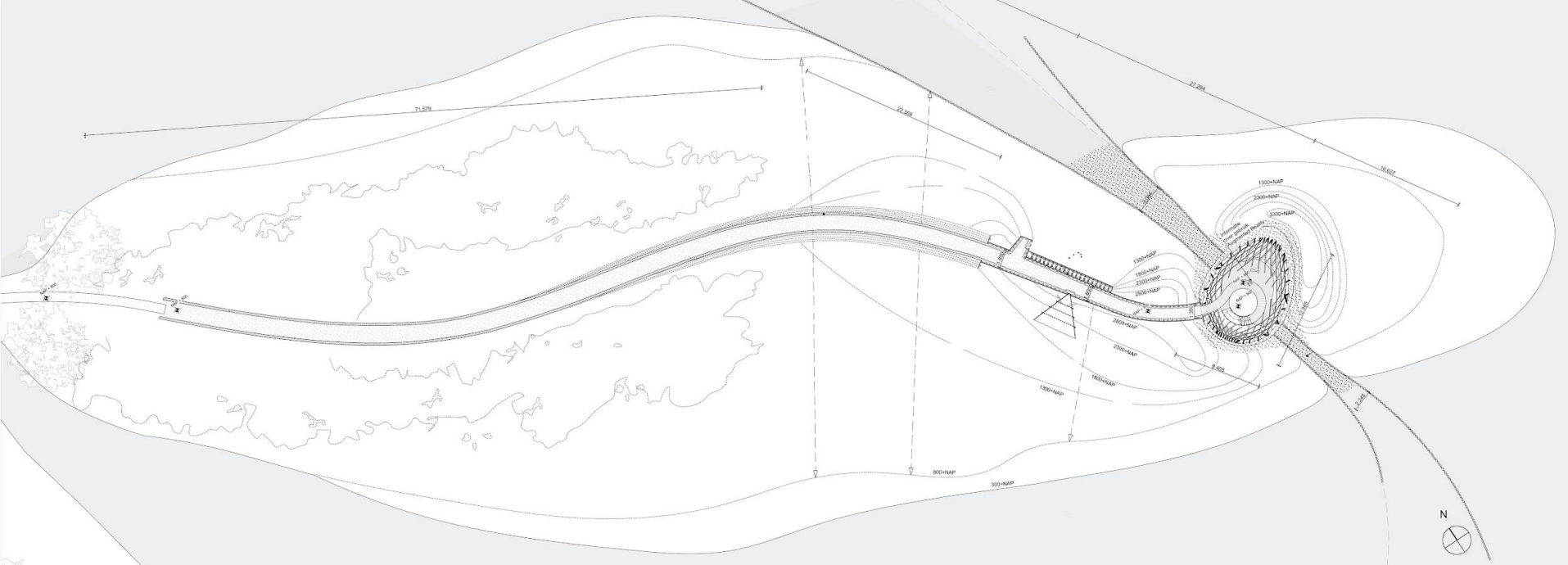




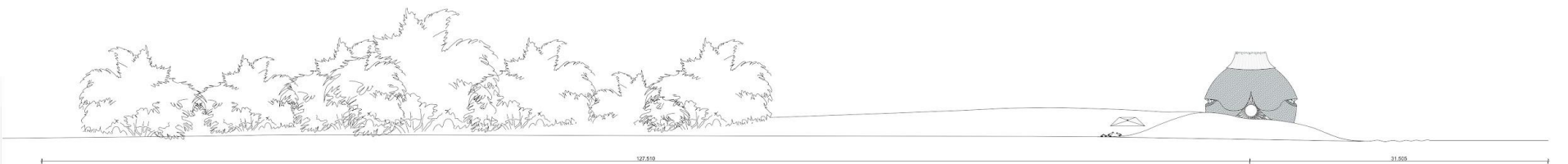








Beganegrond



Zuid aanzicht

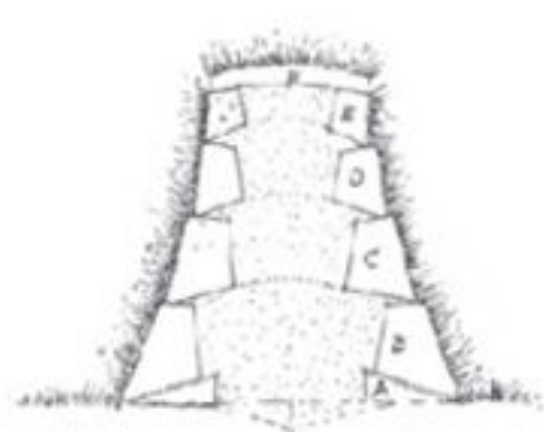


Figure 1.

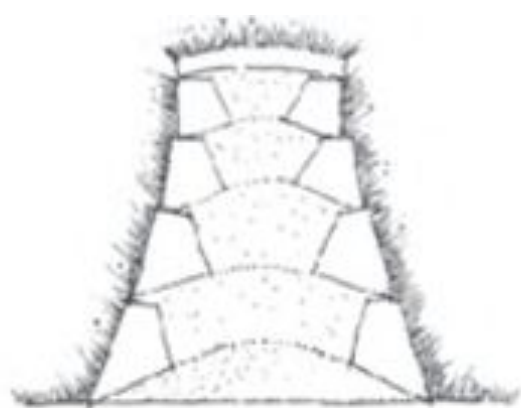
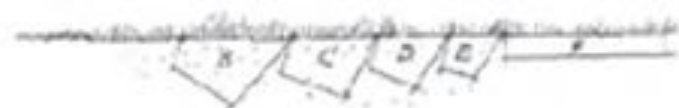


Figure 2.

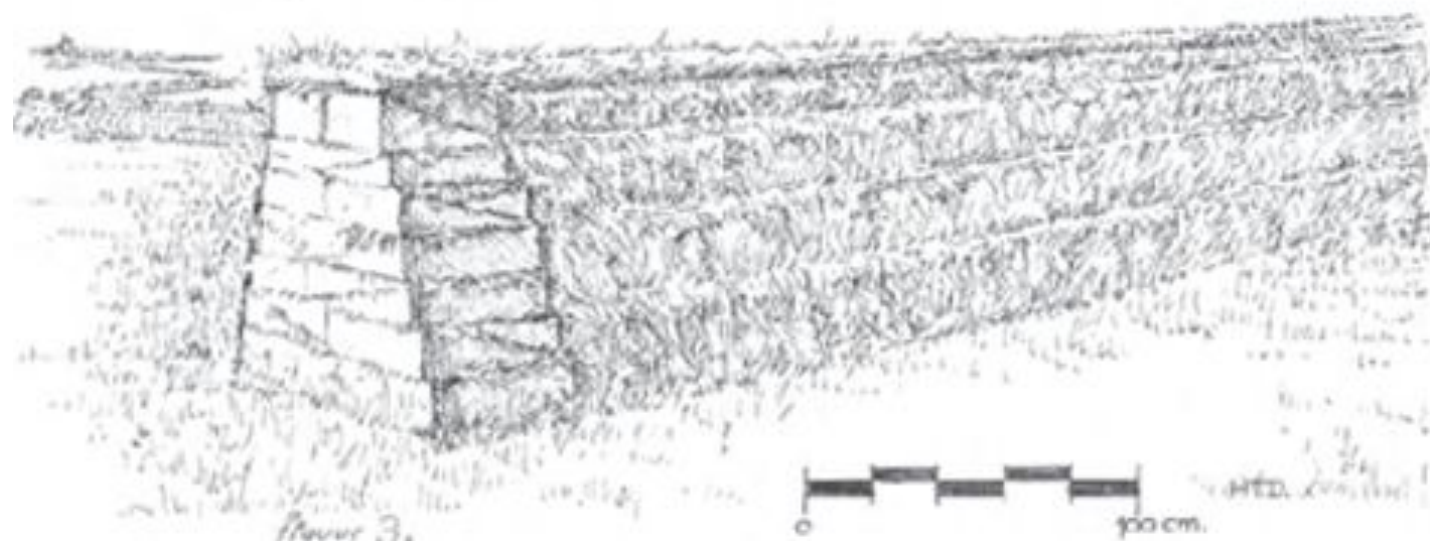
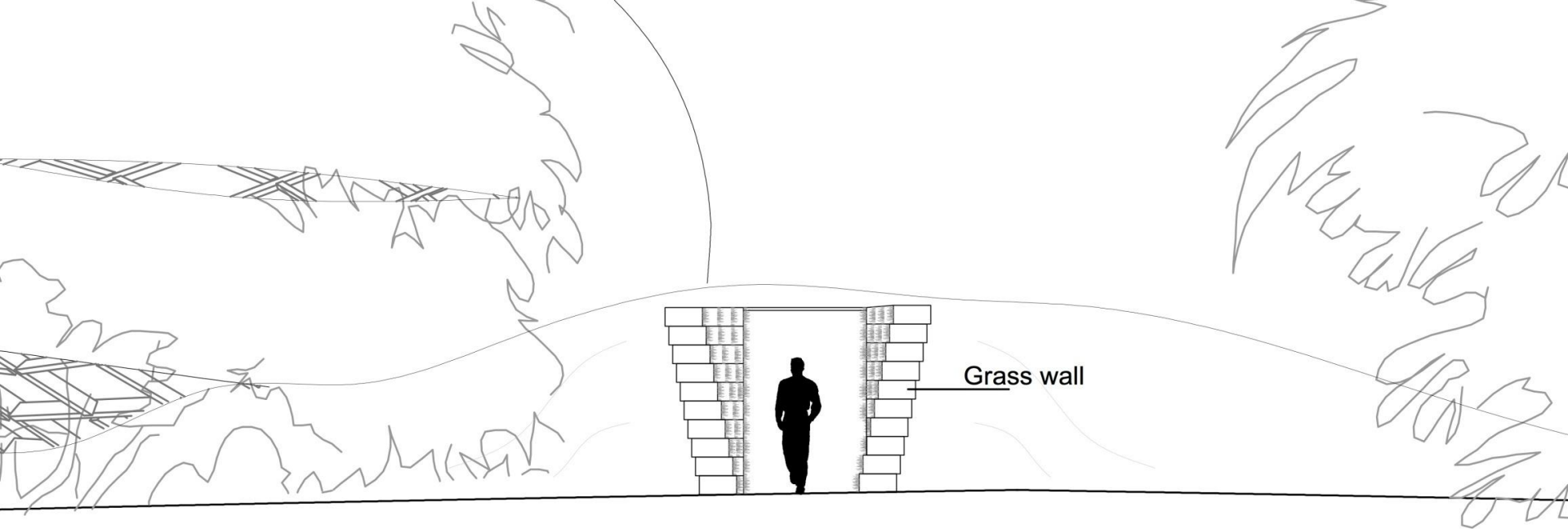


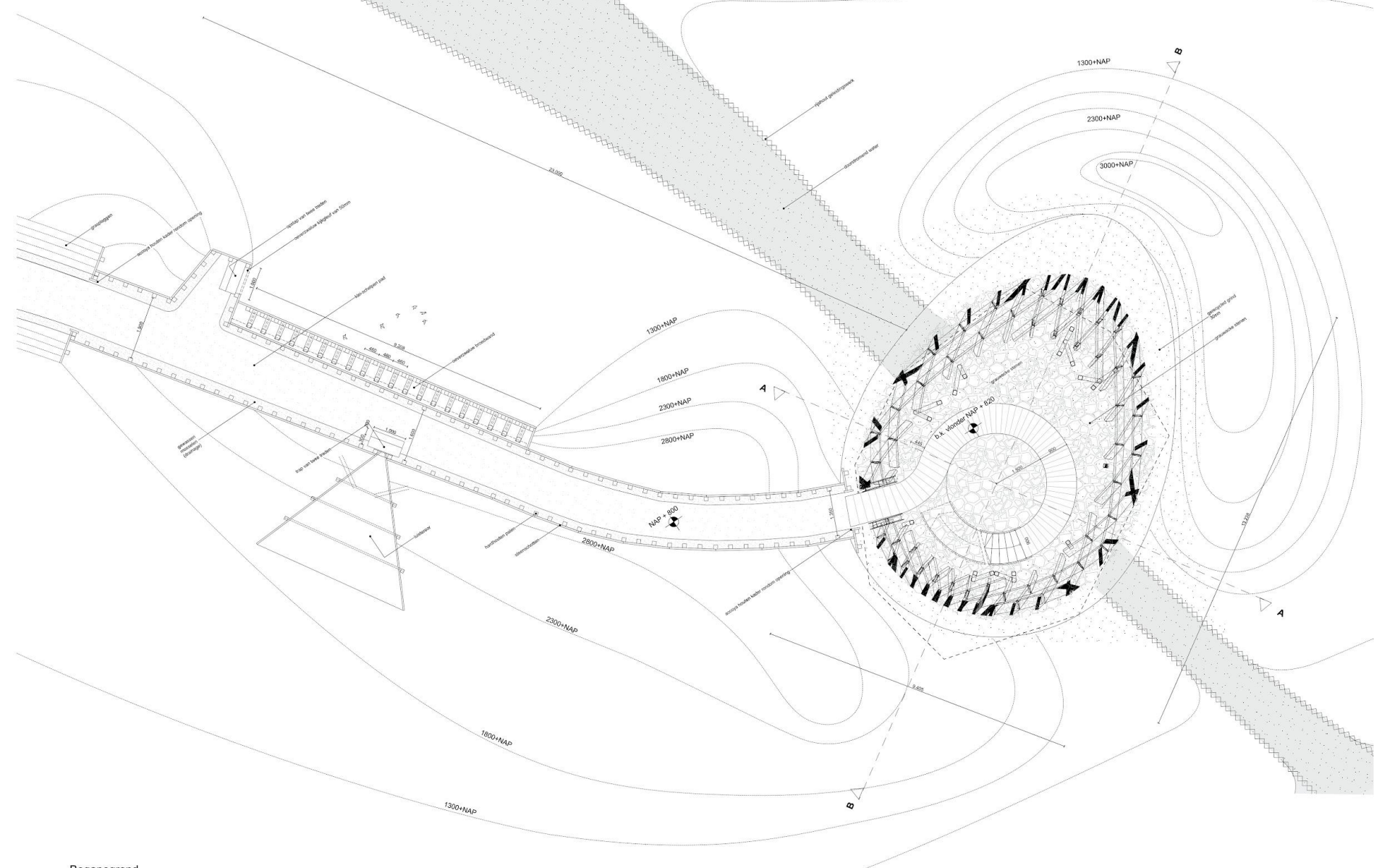
Figure 3.

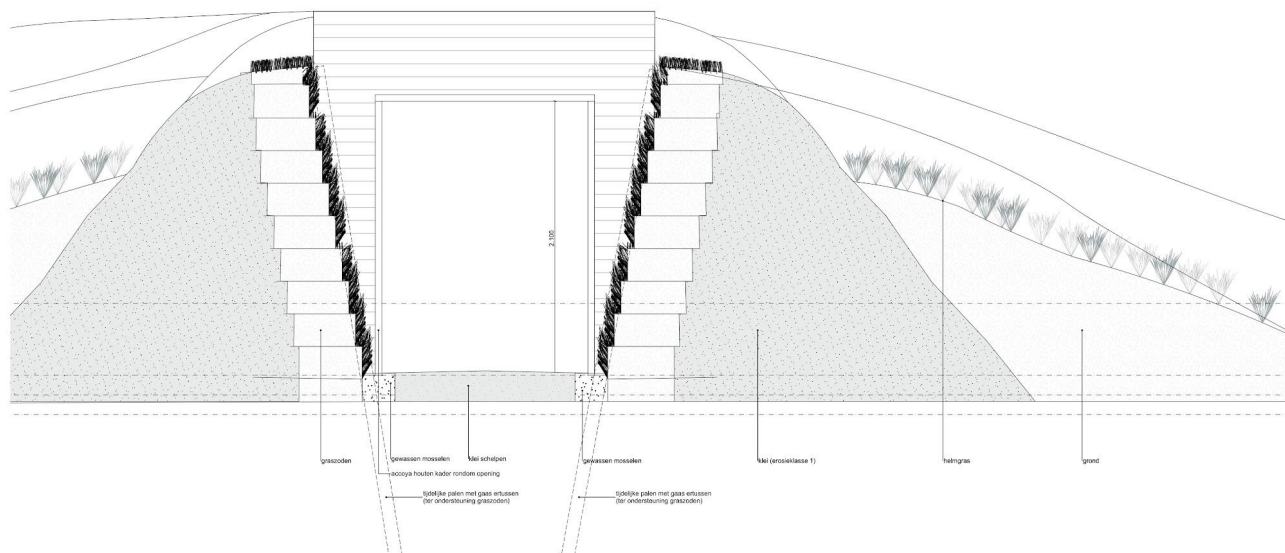


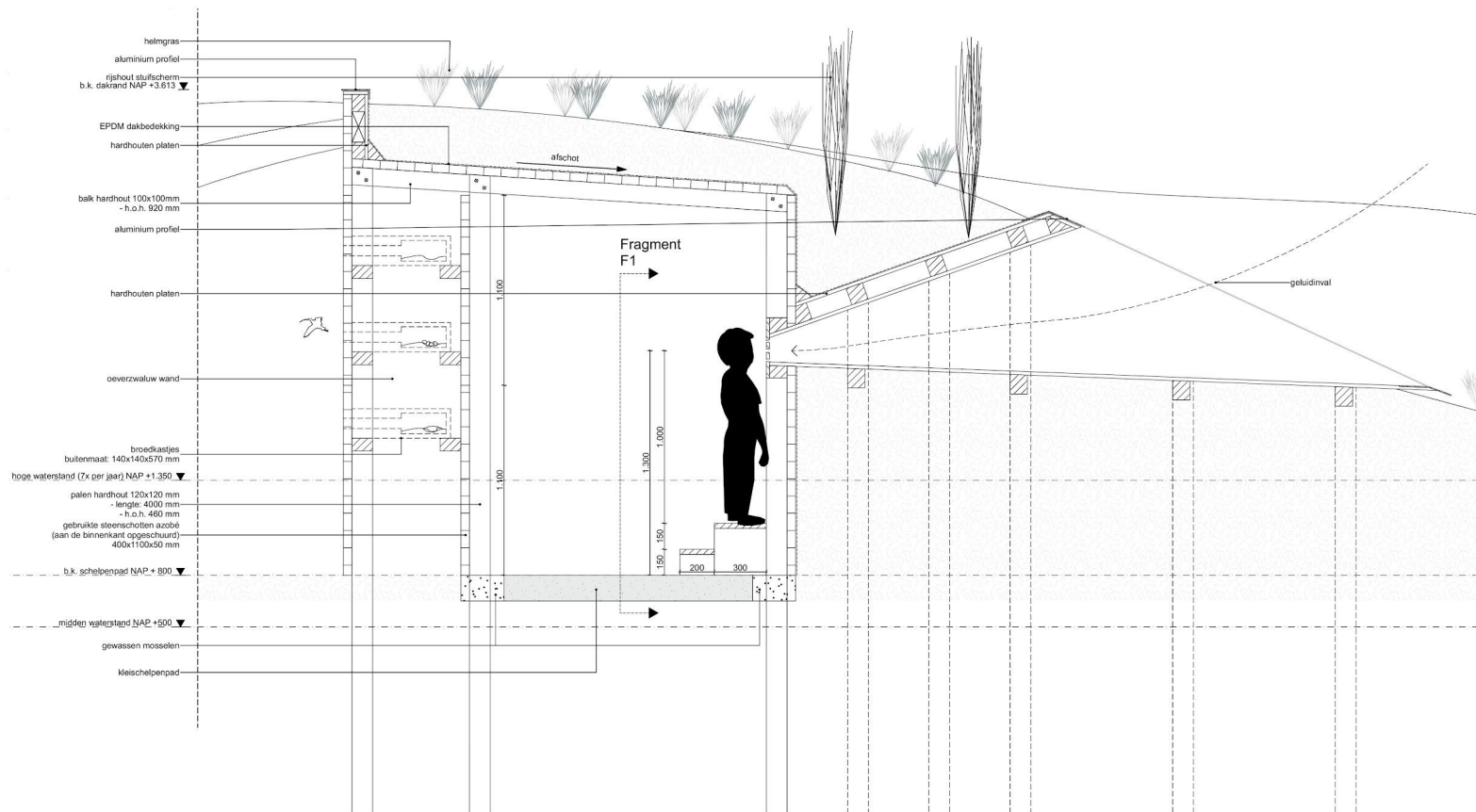


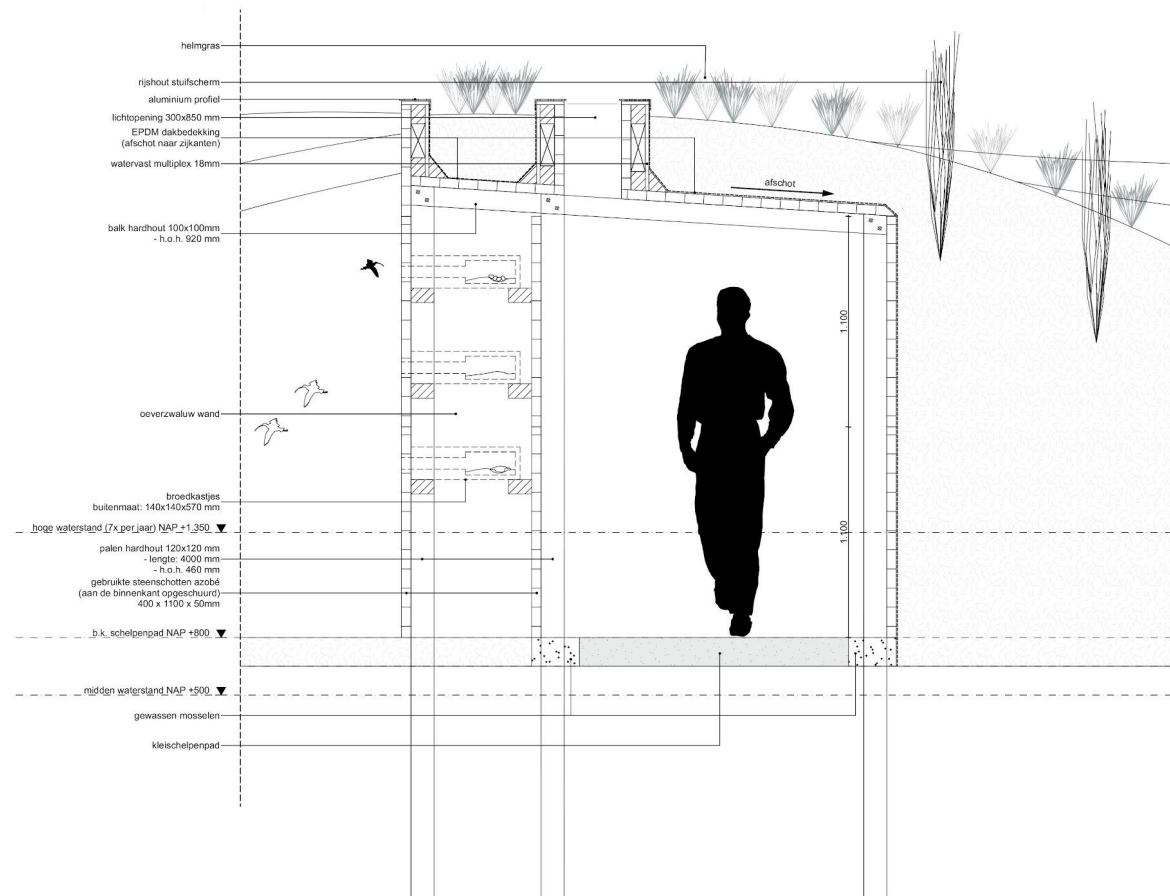


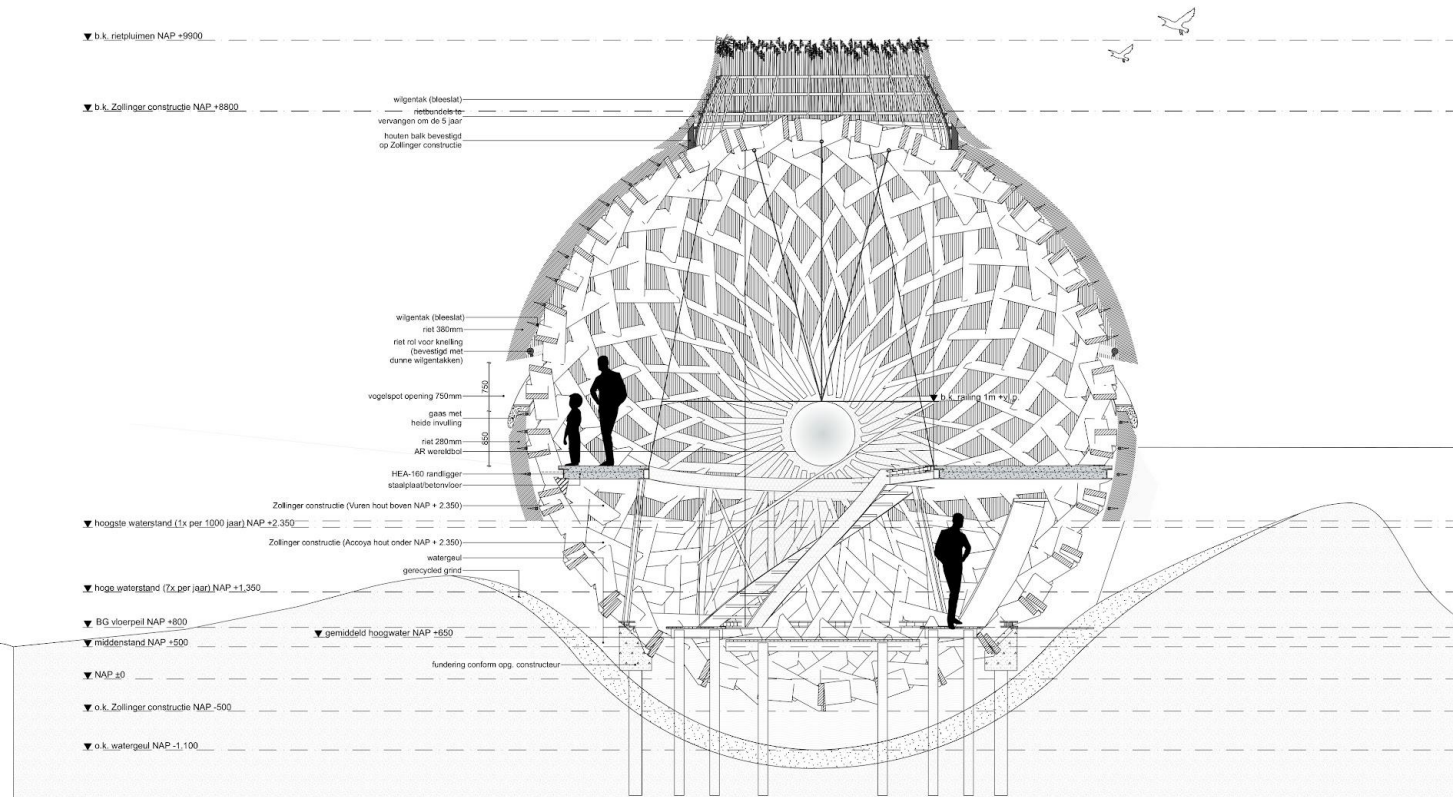
hidden route











Doorsnede A



▼ b.k. rietpluimen NAP +9.900

▼ b.k. Zollinger constructie NAP +8.800

▼ hoogste waterstand (1x per 1000 jaar) NAP +2.350

▼ hoge waterstand (7x per jaar) NAP +1.350

▼ B.G. vlierpeil NAP +800

▼ middenstand NAP +500

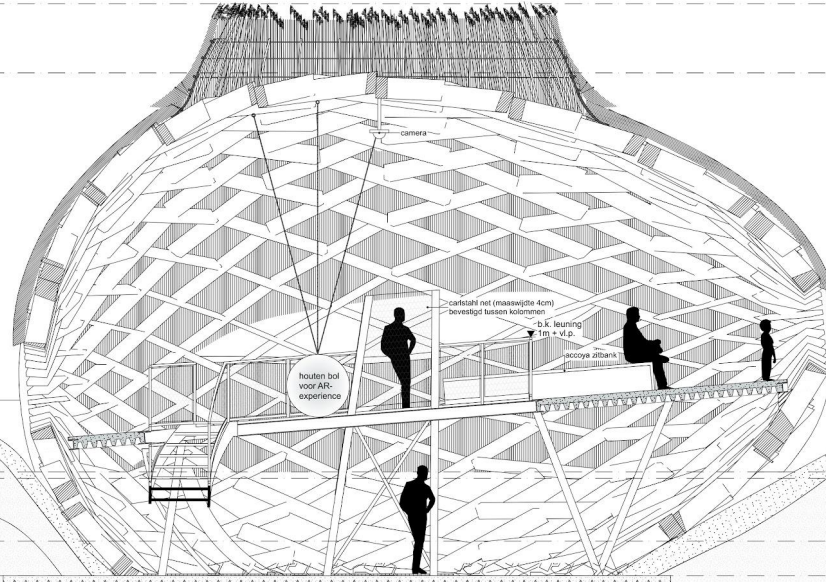
▼ NAP ±0

▼ o.k. Zollinger constructie NAP -500

▼ o.k. watergeul NAP -1.100

▼ gemiddeld hoogwater NAP +650

fundering conform opg. constructeur



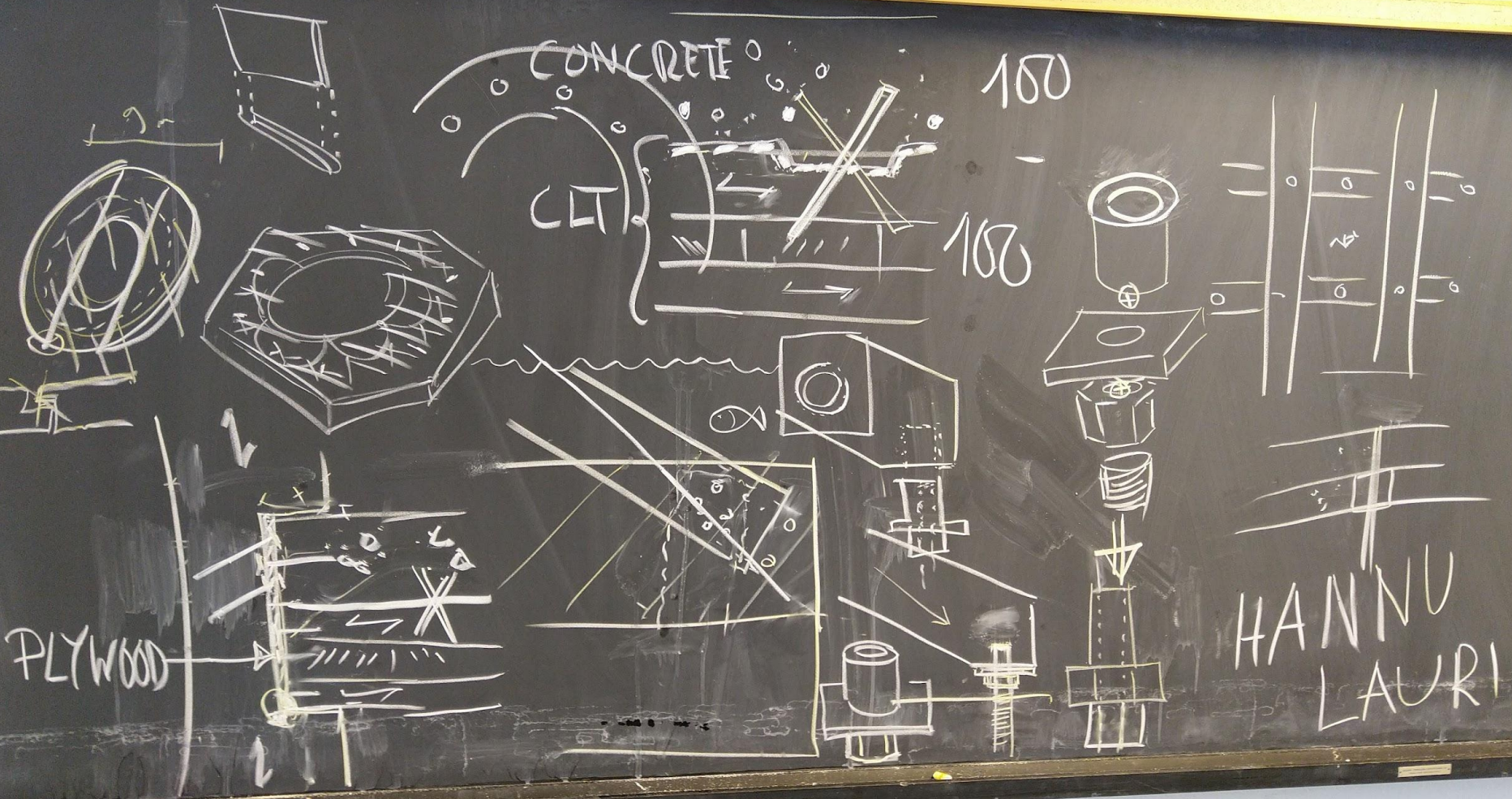






Hannu Hirsi & Lauri Salokangas

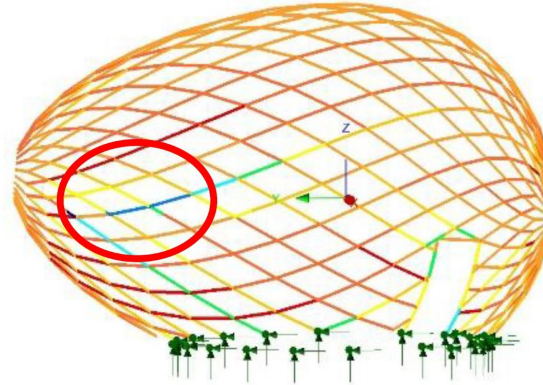
Aalto Universiteit Helsinki Finland



4.2 Verifying the strength capacity of the details

4.2.1 Wooden members at Zollinger connection (Figs 5 and 6)

Max/min normal forces:



Load Combination 3:

1	Component	Fx[N]	My[N.mm]	Mz[N.mm]
2	Maximum	42,8354E3	12,5203E6	5,95437E6
3	Node	22	697	785
4	Minimum	-68,7198E3	-10,0461E6	-5,89953E6
5	Node	661	808	168

Fig. 5. Maximum and minimum stress resultants for detail 1 from SLS- load combinations.

Compression:

$$F_{Ed} = 68,7 \text{ kN} < F_{cd} = f_{cd} * A_n = 99 \text{ kN} \quad \text{OK}$$

Tension:

$$F_{t,Ed} = 42,8 \text{ kN}$$

External design tension

Checking 2- and 4-peg connections:

$$d = 30 \text{ mm}$$

diameter of a peg

$$l = 100 \text{ mm}$$

length of a peg

$$f_{v,d} = 2,5 \text{ N/mm}^2$$

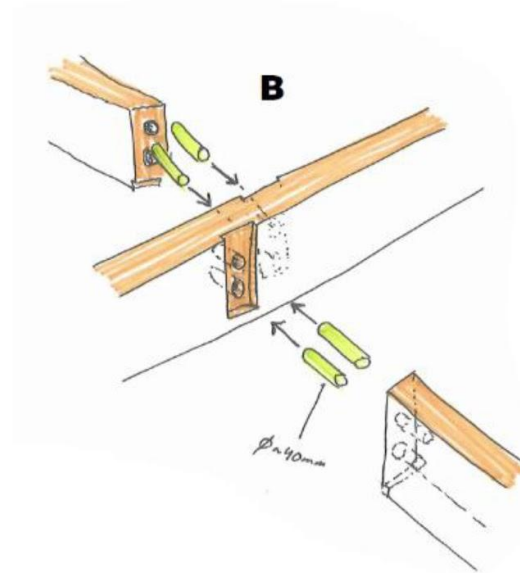
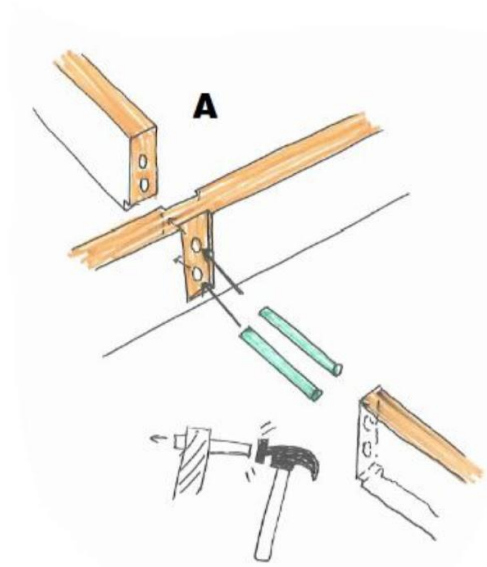
shear strength of surface

Tension capacity of 2-peg joint:

$$F_{t,Ed} = 42,8 \text{ kN} < F_{vd} = 2 \pi d l f_{v,d} = 2 * 3,14 * 30 * 100 * 2,5 = 47,1 \text{ kN} \quad \text{OK}$$

Tension capacity of 4-peg joint:

$$F_{t,Ed} = 42,8 \text{ kN} < F_{vd} = 4 \pi d l f_{v,d} = 2 * 3,14 * 30 * 100 * 2,5 = 94,2 \text{ kN} \quad \text{OK (is preferable)}$$









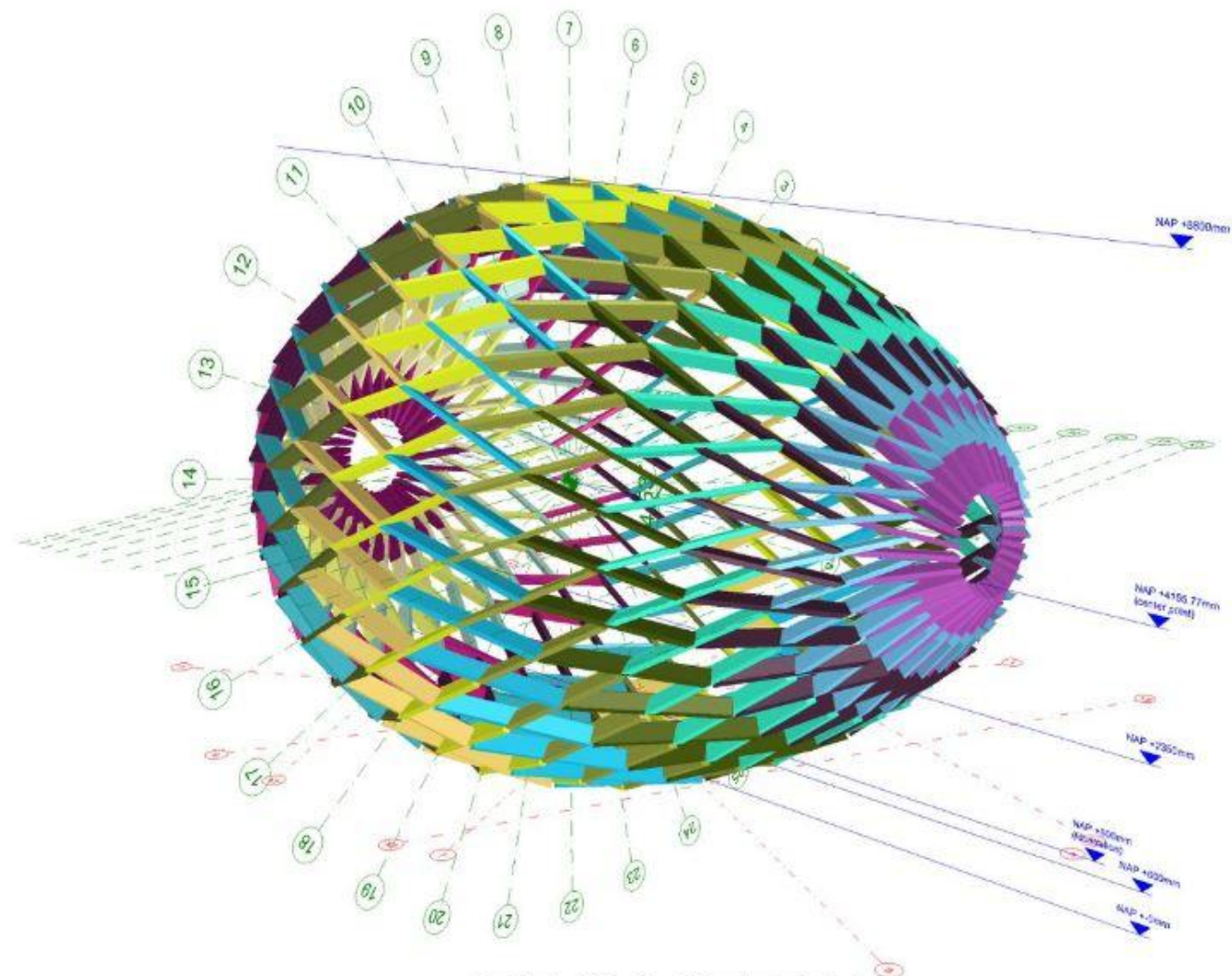




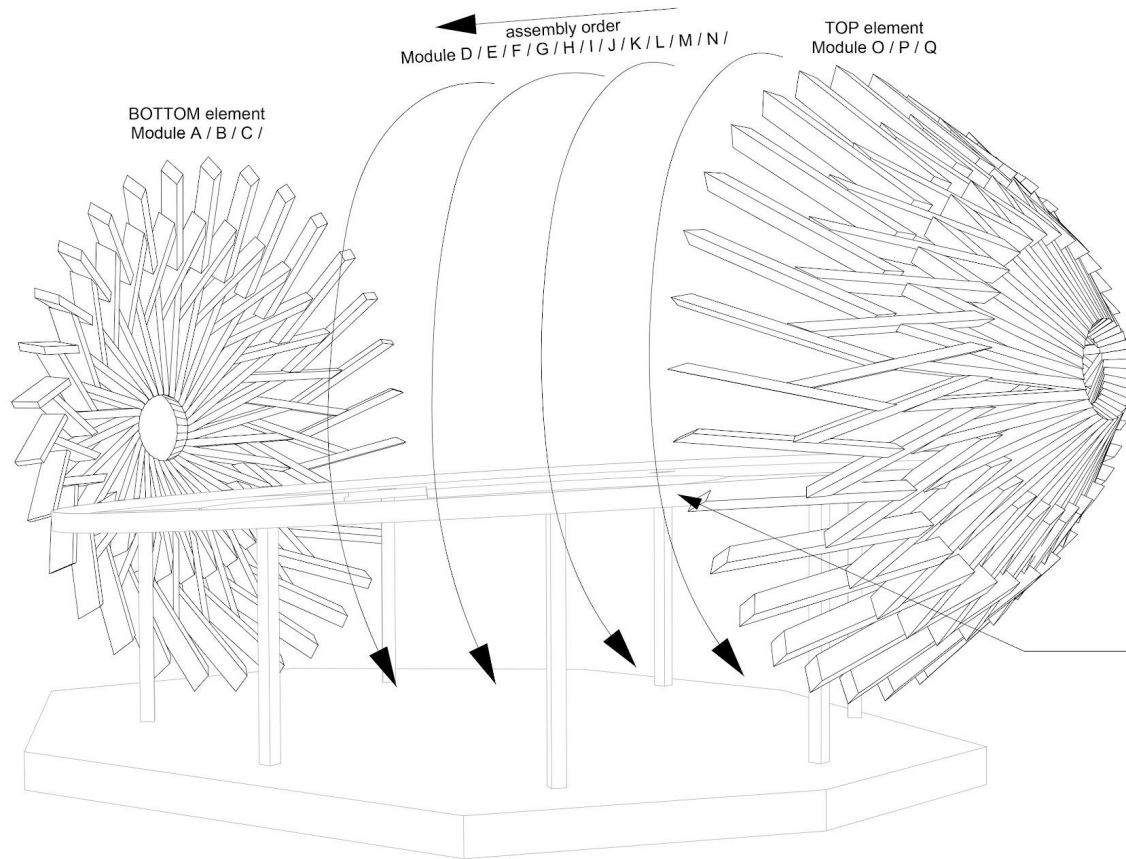








GEOMETRIA



In order to get the assembly started accurately, on both ends, first three rows are pre-assembled as elements.

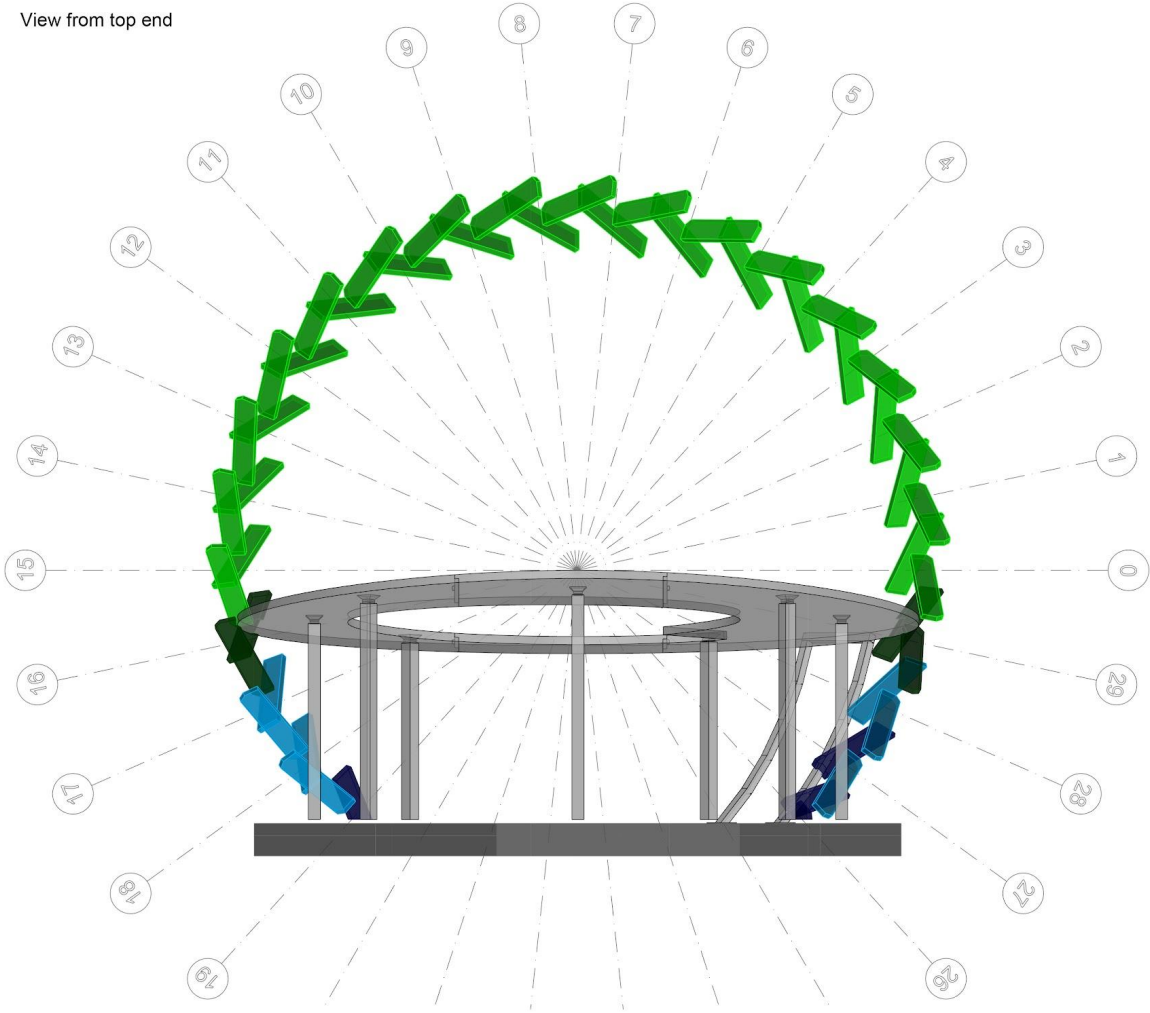
The assembly begins from the "top" side of the egg, where the top element is hoisted to its correct location and supported well.

Small drill holes in the CLT mark the correct positions of the beams.

The assembly progresses a row at a time from top to bottom. (Alphabetically downwards)

drill marks on CLT help positioning the beams

View from top end



ROW H:
24 beams

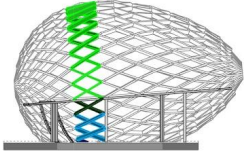
BEAMS		
type	code	length
basic	H00 PINE	1992
basic	H01 PINE	1992
basic	H02 PINE	1992
basic	H03 PINE	1992
basic	H04 PINE	1992
basic	H05 PINE	1992
basic	H06 PINE	1992
basic	H07 PINE	1992
basic	H08 PINE	1992
basic	H09 PINE	1992
basic	H10 PINE	1992
basic	H11 PINE	1992
basic	H12 PINE	1992
basic	H13 PINE	1992
basic	H14 PINE	1992
basic	H15 PINE	1992
special	H16 PINE	1992
basic	H17 ACCO	1992
basic	H18 ACCO	1991
special	H25 ACCO	751
basic	H26 ACCO	1980
basic	H27 ACCO	1992
special	H28 PINE	1992
basic	H29 PINE	1992

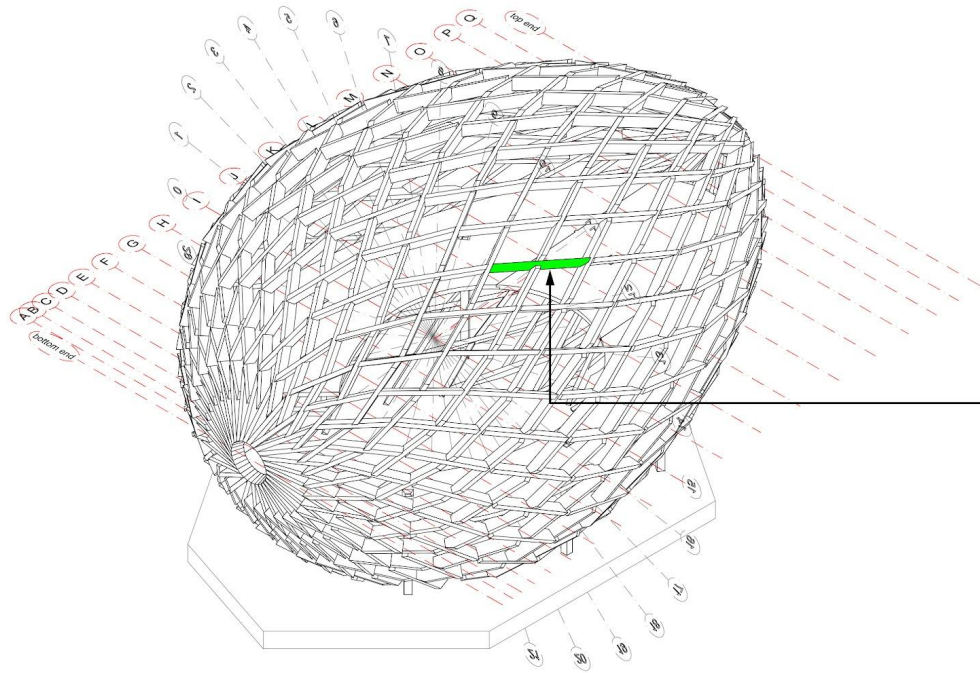
JOINTS		
module	dowel amount	dowel length
G	3	339
H	3	339
I	3	339

INFO about joint treatment (oil/ glue) in drawing no.G126-303

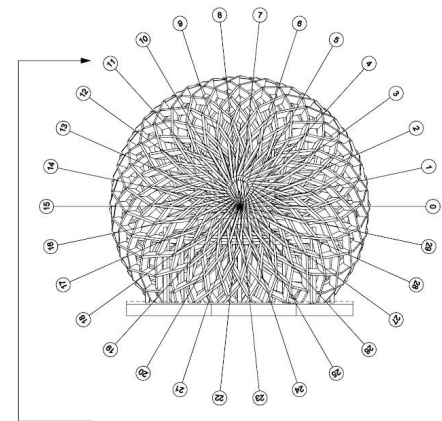
COLOURS:

- PINE basic
- PINE special
- ACCOYA basic
- ACCOYA special





axonometric view

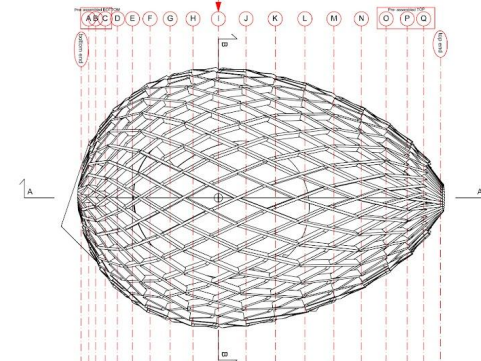


Longitudinal
module

Polar
module

Material
definition

I	11	_	PINE
---	----	---	------



















Dynamische delta



es Infra BV

0113-383745

0113-383745

SHIKE RECYCLING BV





WISSER VERHUUR





















































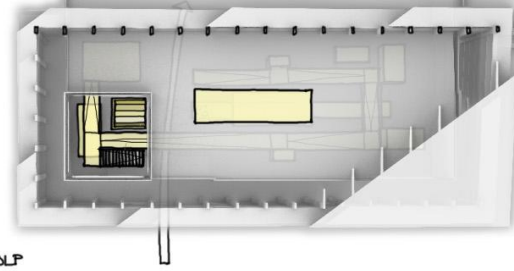
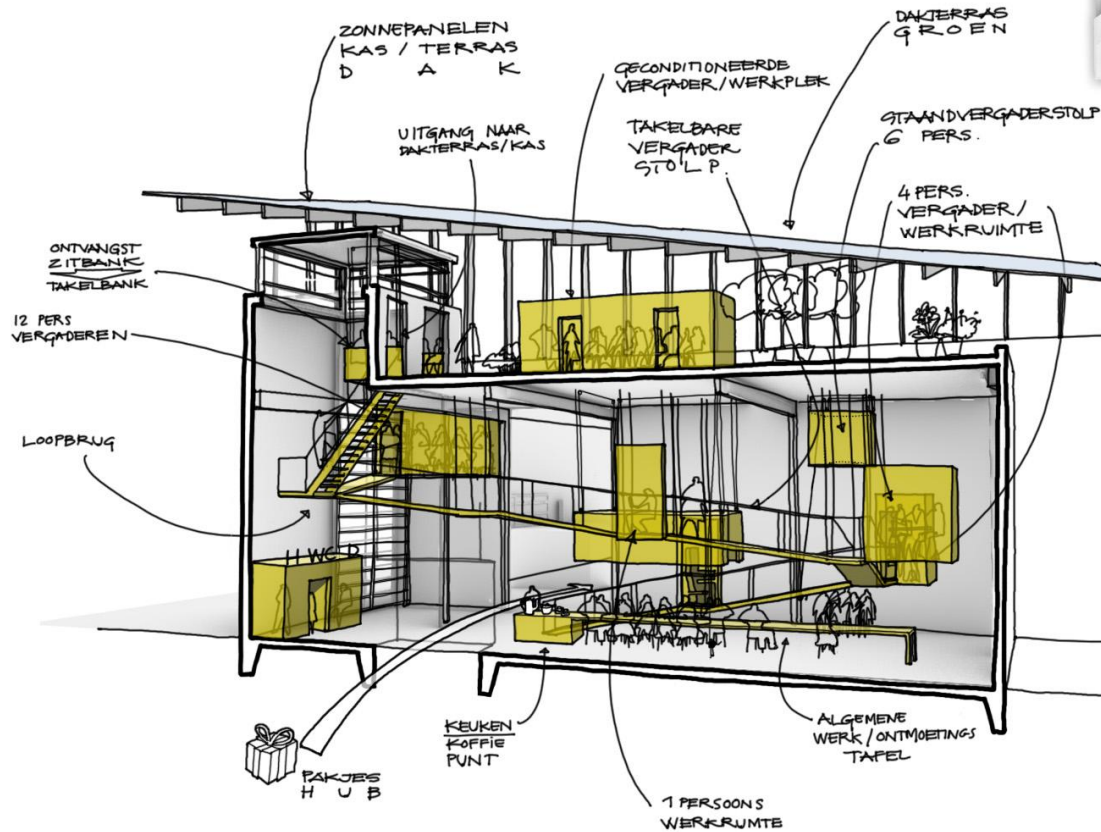




Ontwerpproces



2019



FRUITBOMEN
= FRUIT
&
SCHADUW.

ZONNEDAK & GEVEL
TBV.
ENERGIE OOGST
&
AFKOELING

UITGANG NAAR
DAKTERRAS/KAS

GECONDITIONEERDE
VERGADER / WERKPLEK

TAKE AWARE
VERGADER
STOL P.

DAKTERRAS

STAND VERGADER STOLP
6 PERS.

4 PERS.
VERGADER/
VERMIDELER

ONTVANGST
ZITBANK
TAKELBANK

VERGÄNDLICHKEIT

Loops

PIRNICK
WERKPLEK

HOPGEVEL
TBV
BIERBROUWERIJ

KEUKEN
YOFFIE
PUNT -

1 PERSONS -
WERKRUIMTE

ALGEMENE
WERK / ONTM
TAFEL

WINGERD GEVEL
&
GEDUMDAK
TBV VERKOELING &
BIODIVERSITEIT

BLOEMENWEIDE
TER VERPOZEN
&
BIODIVERSITEIT

BIJEN & BIJENKASTEN
OP NAAR HET BIJEN-
POPULATIE HERSTEL

2019

Blauwe P

555

90A

2.493 m2

0.38

20.13

5.00

4.65

5.00

27.23

5.00

61.74

5.00

Najaar 2020



Najaar 2020



Najaar 2020

ONDERNEMEN
LANGS DE N59

**VOLOP
RUIMTE
VOOR UW
BEDRIJF**

oostflakkee
bedrijvenpark

MEER WIL?
Joost Meerman
06 - 83 91 00 65

- Kavels va. 1.500 m² • Scherpe prijzen
- Actief parkmanagement
- Beveiligd terrein • Direct uitgeefbaar

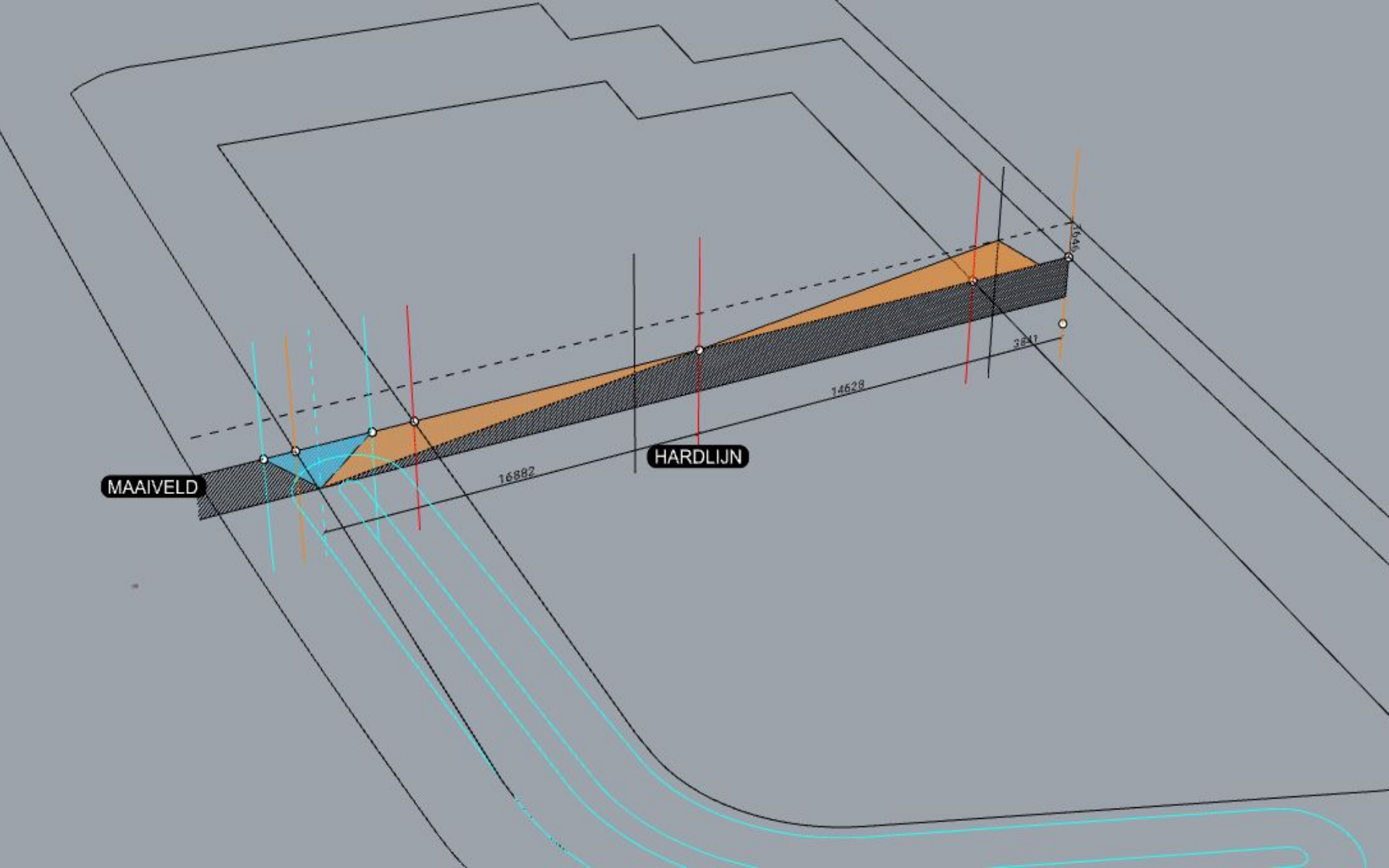
bedrijvenparkoostflakkee.nl





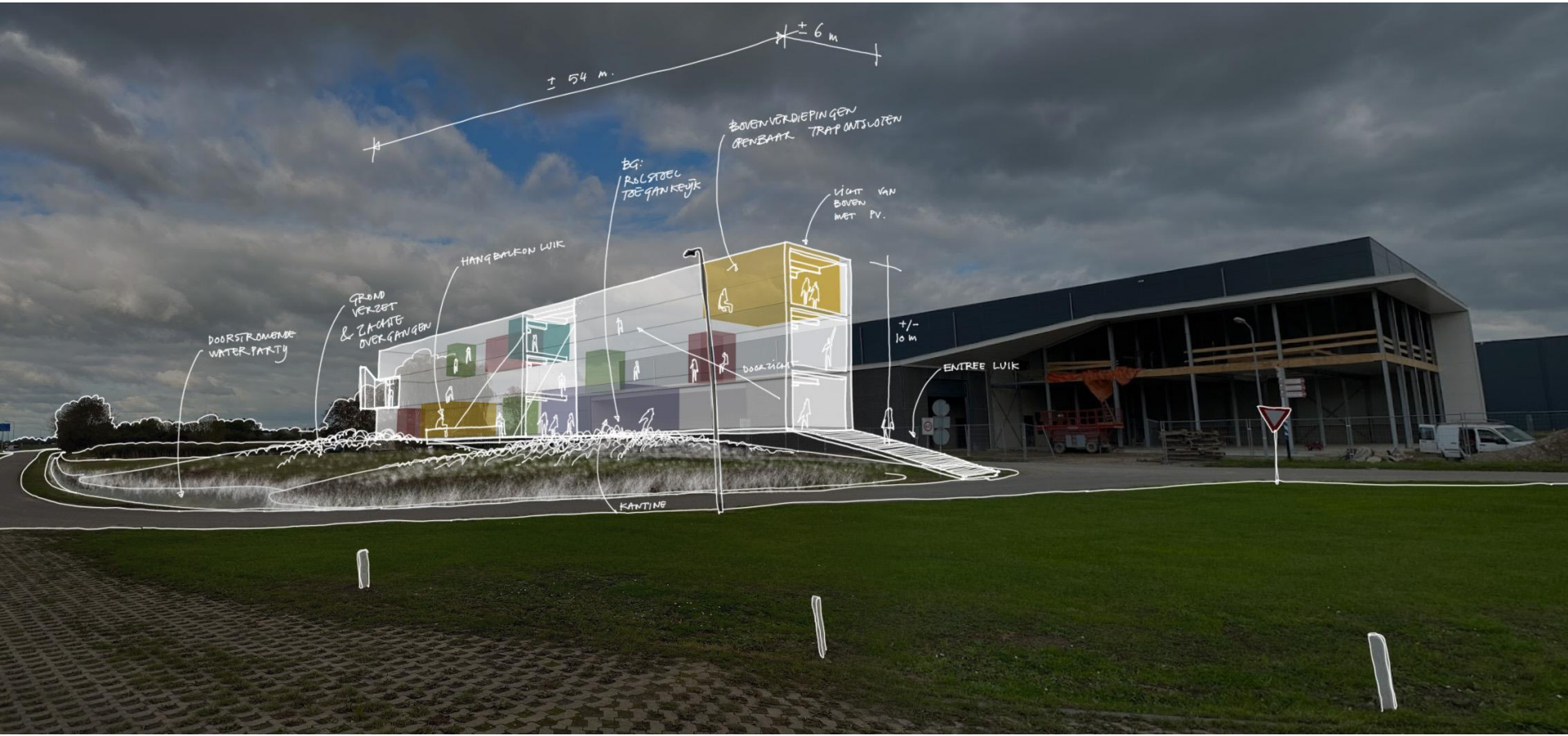
Ruimte geven aan natuur

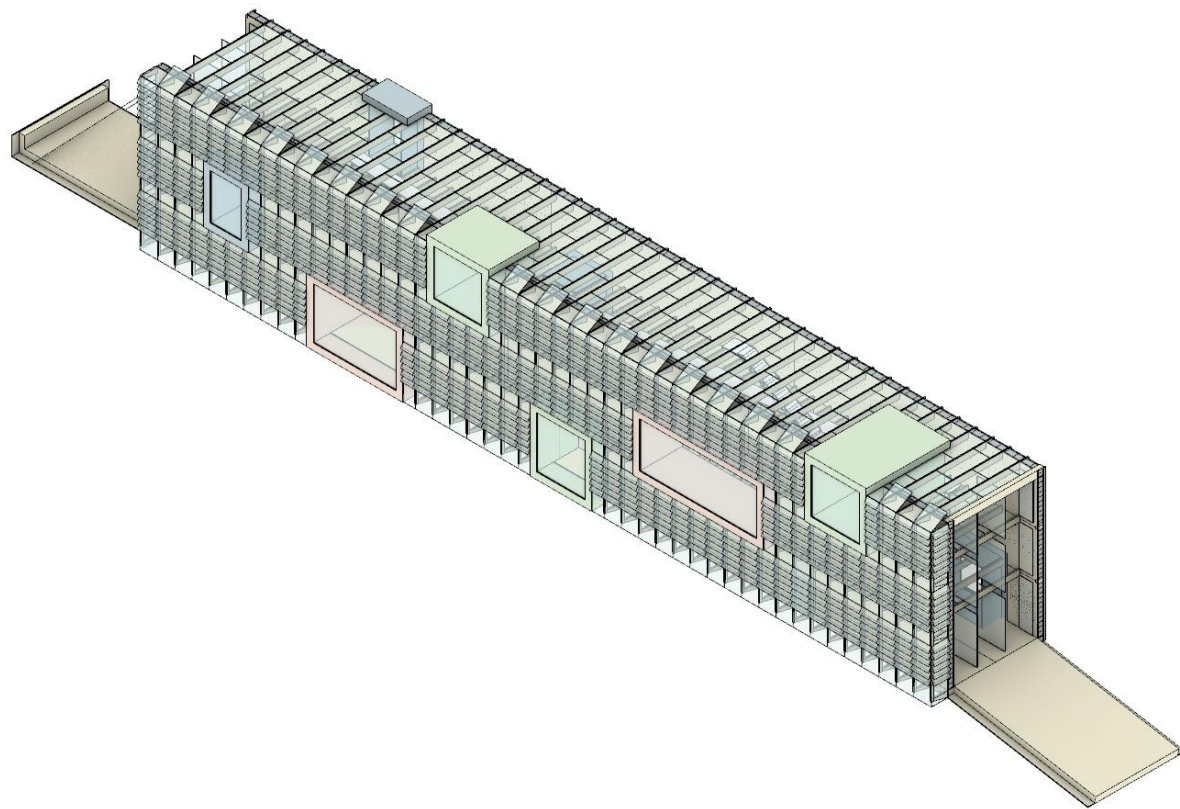












Januari 2021

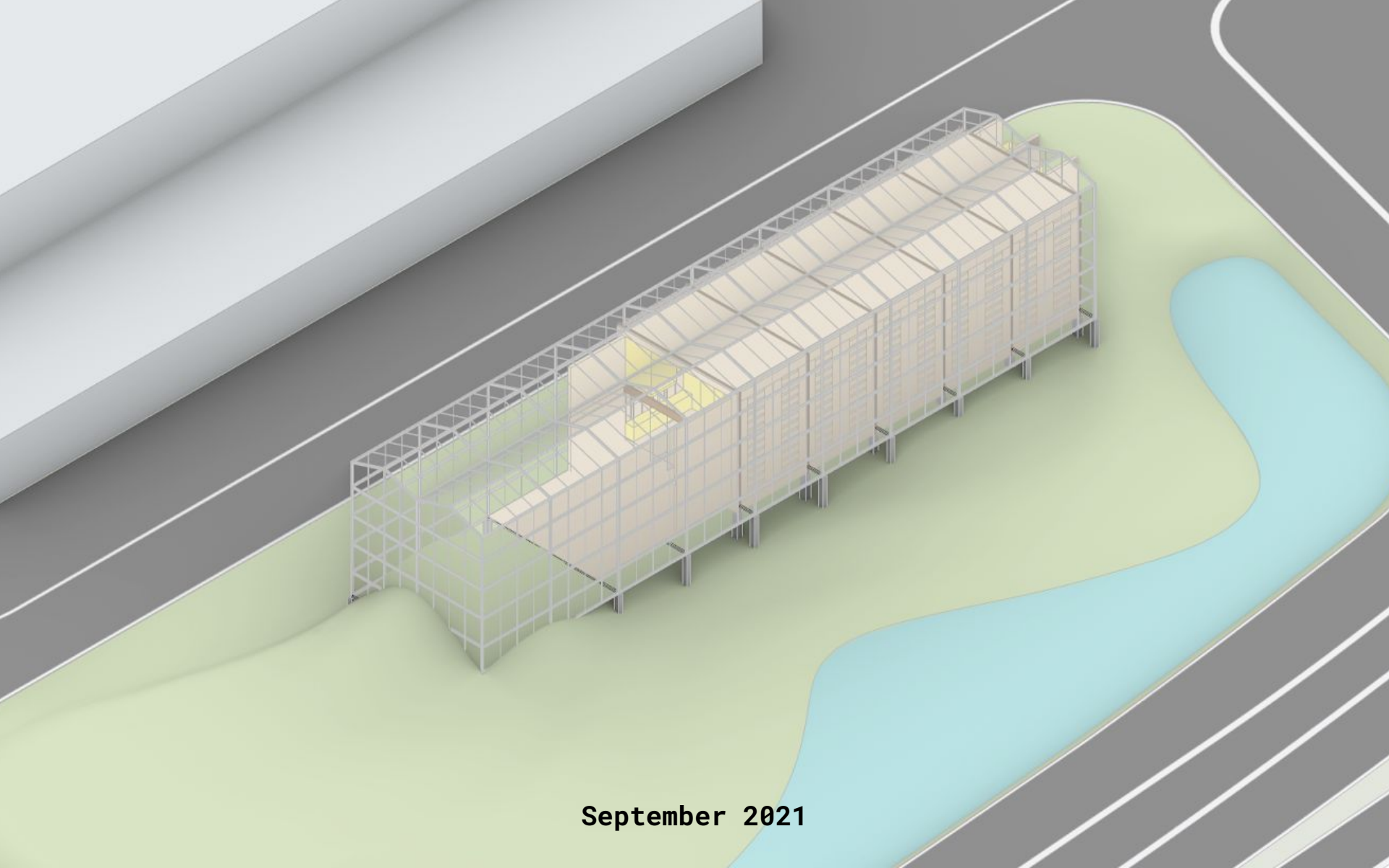




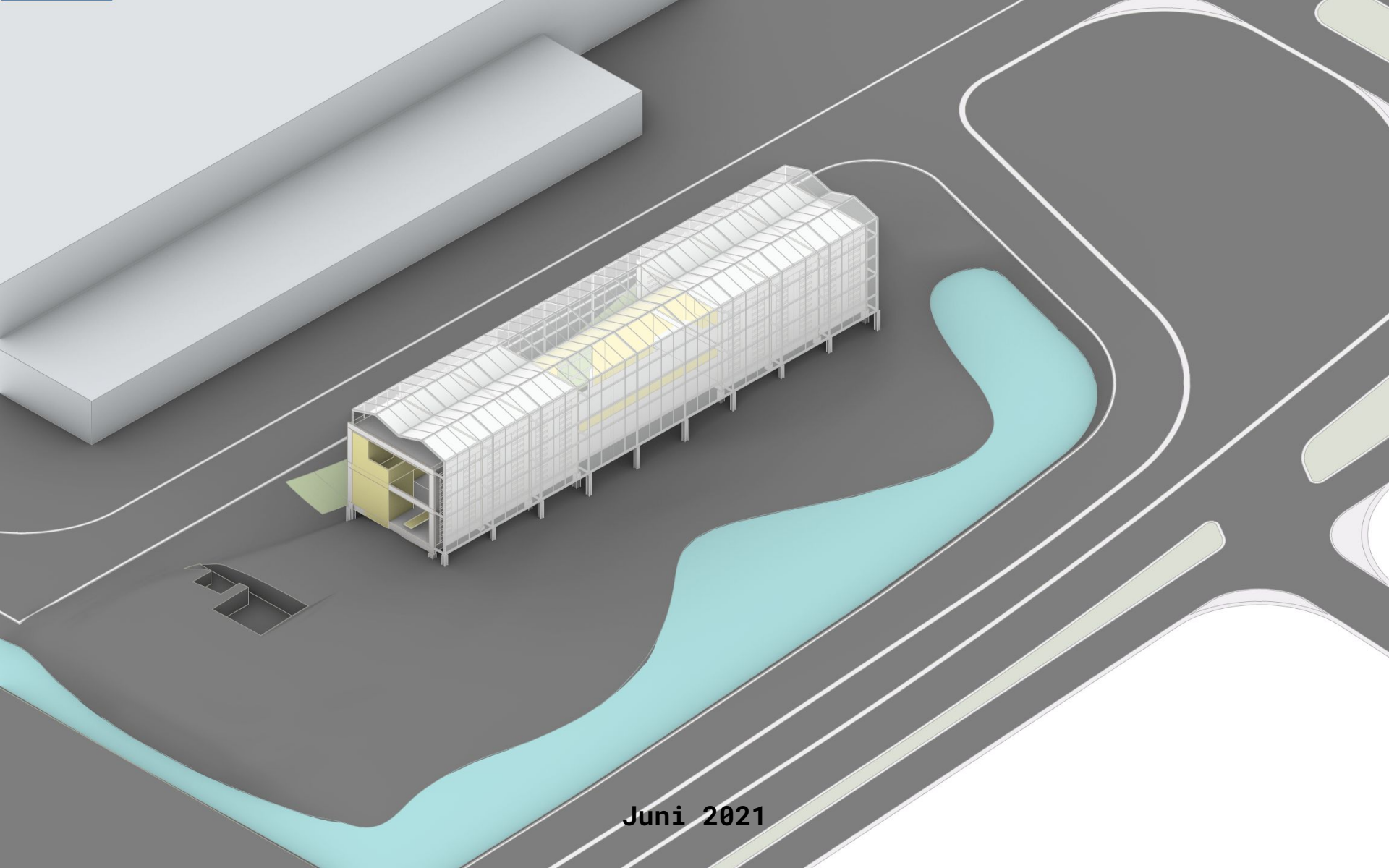
Juni 2021



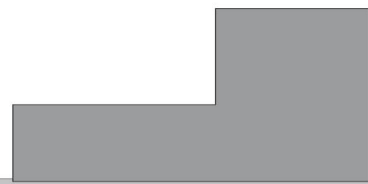
Juni 2021



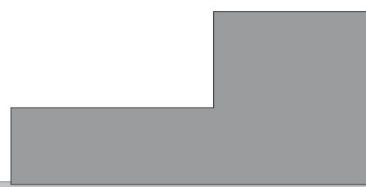
September 2021



Juni 2021

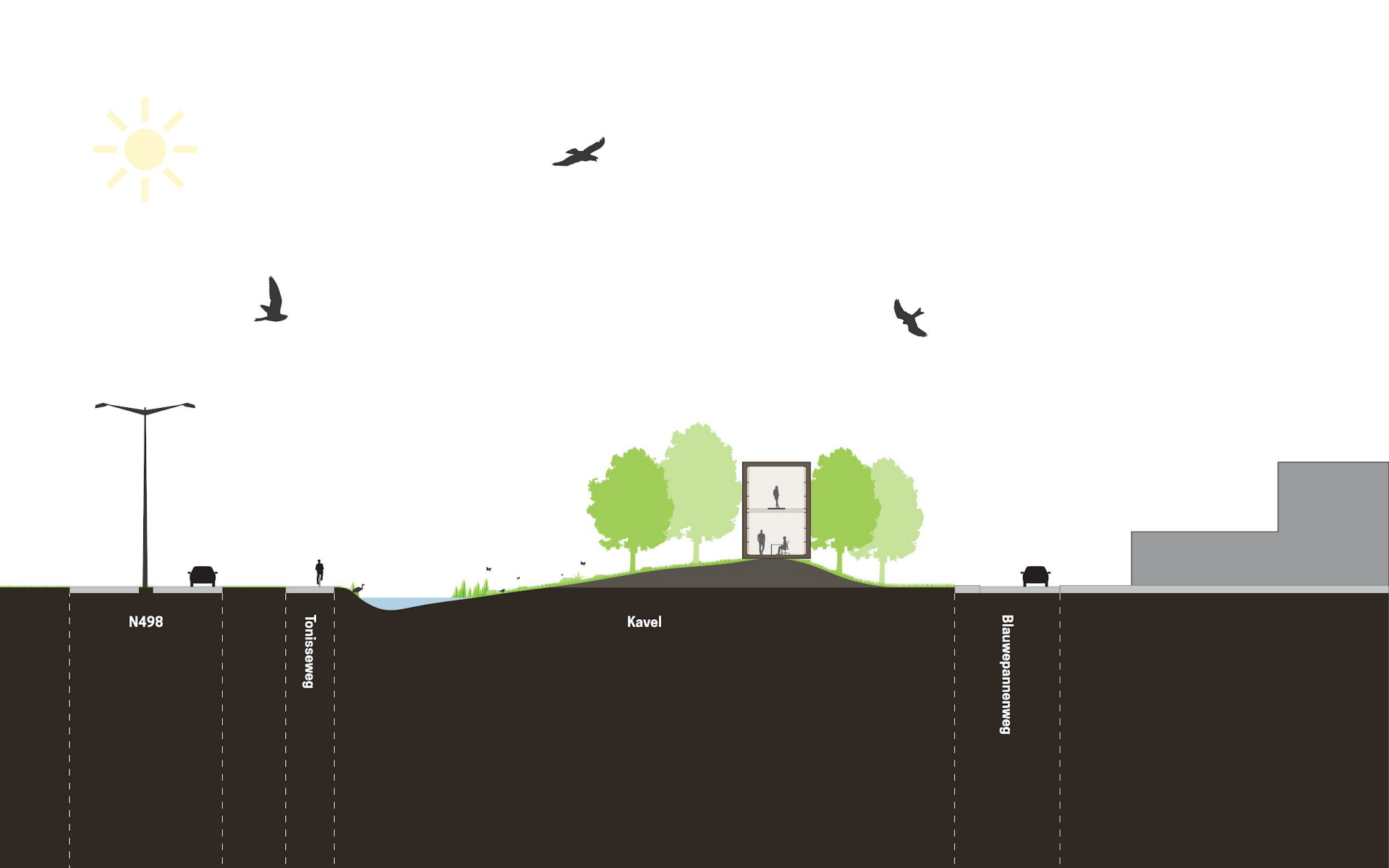


Doorsnede

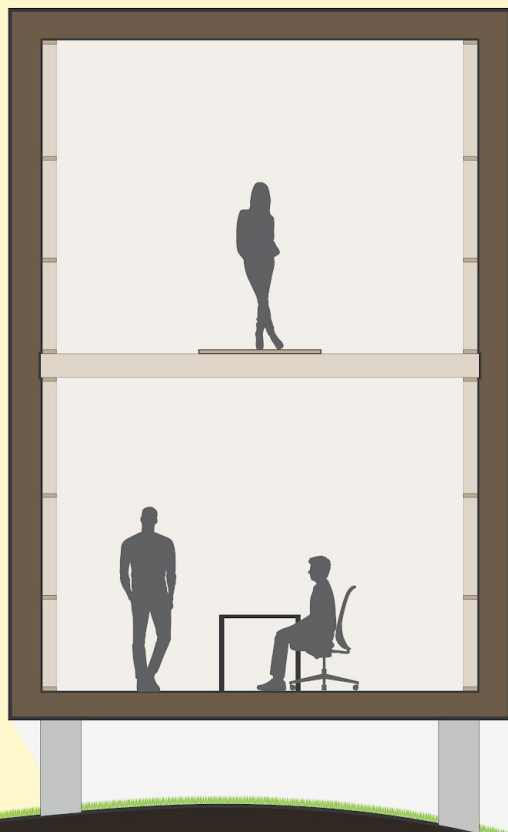


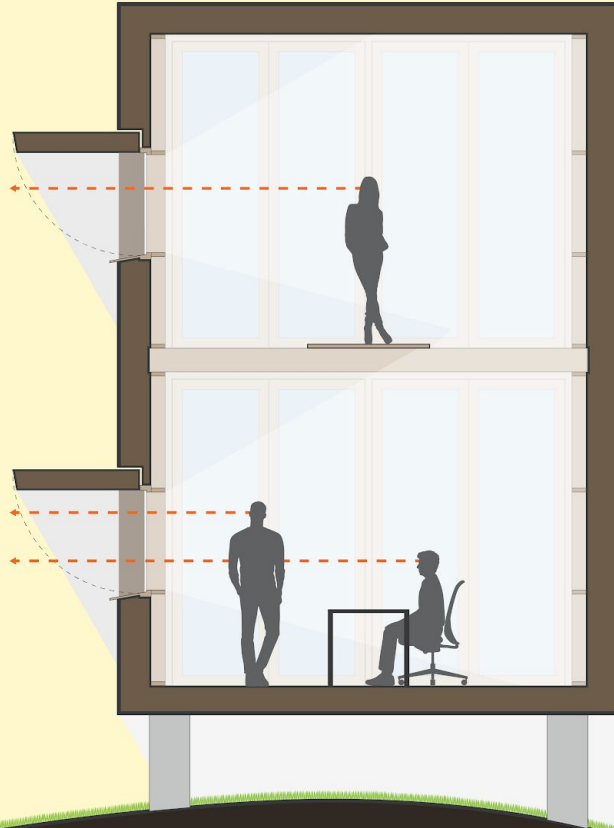


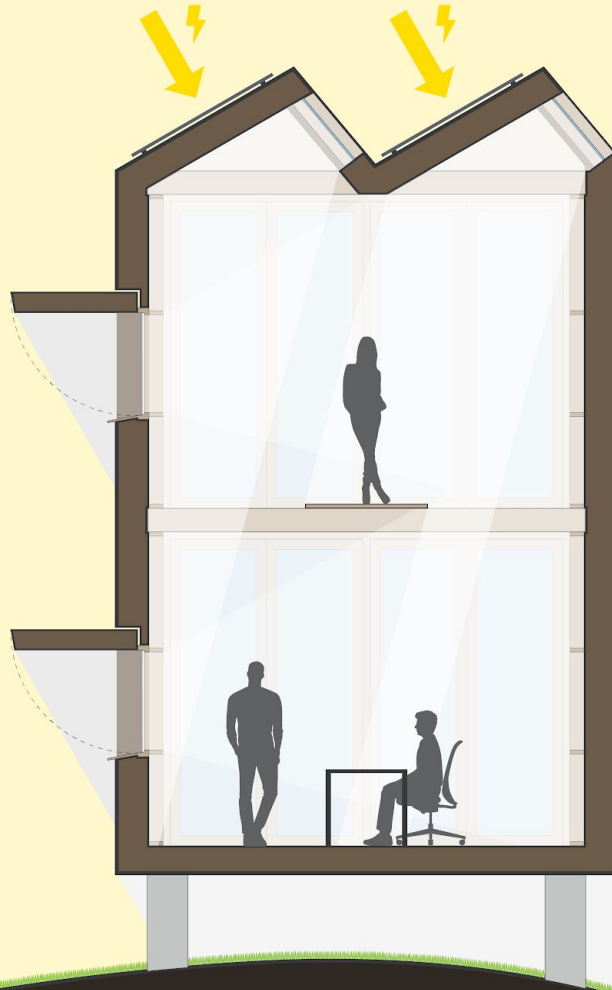


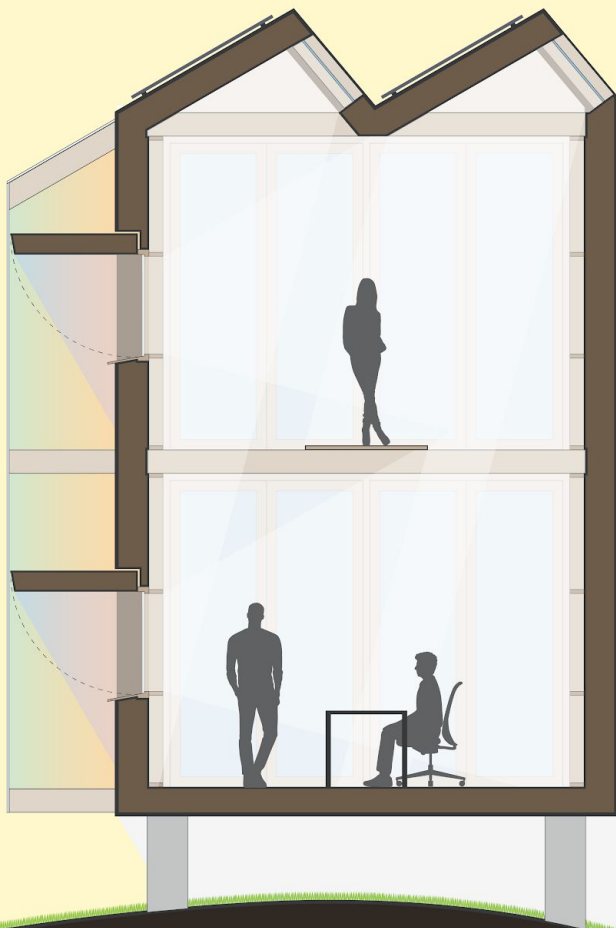


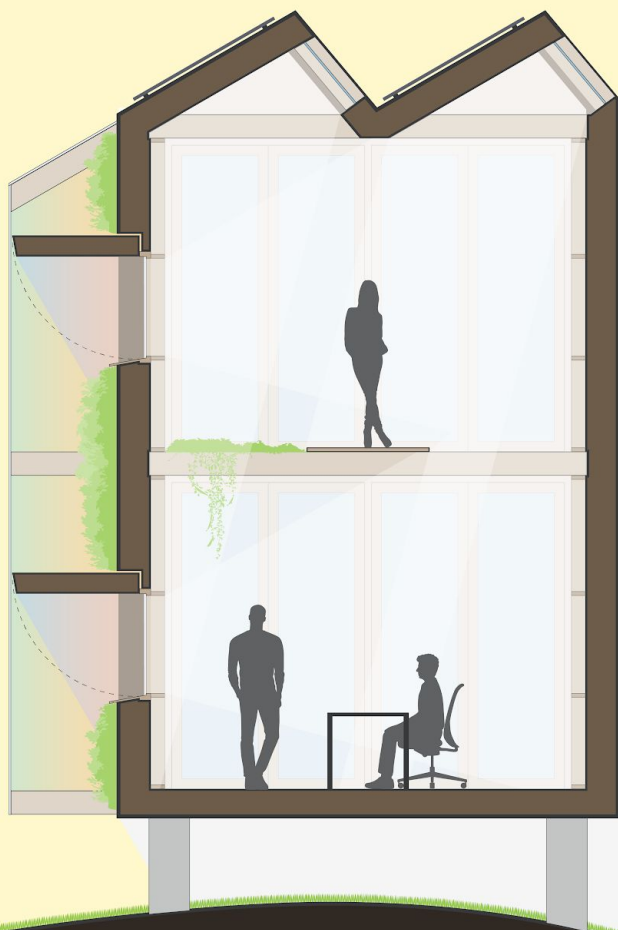


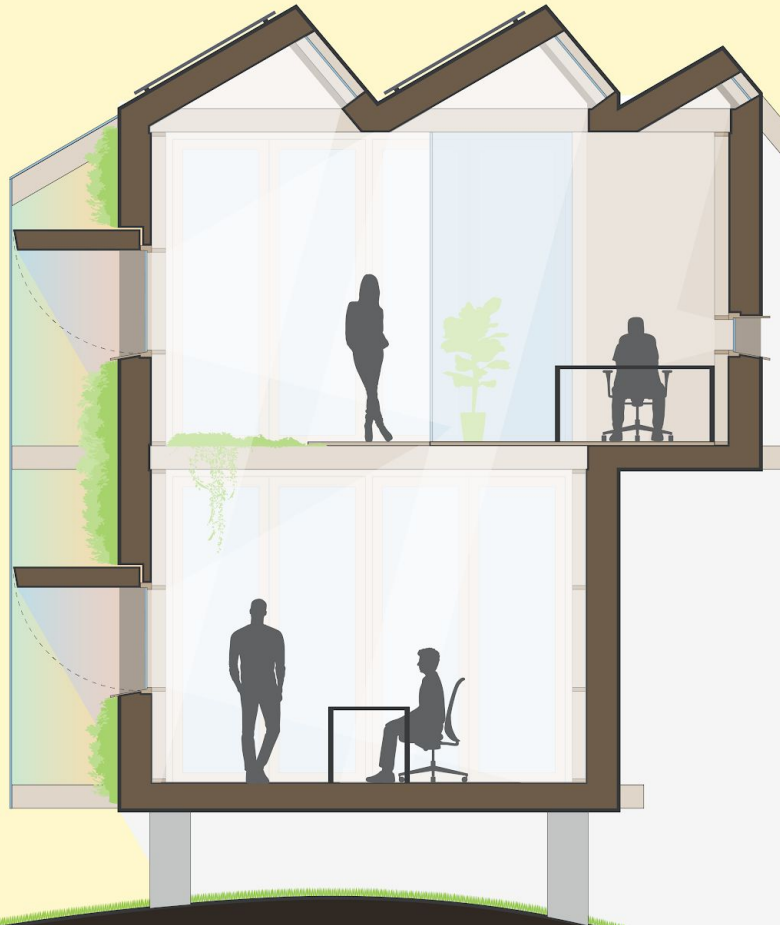


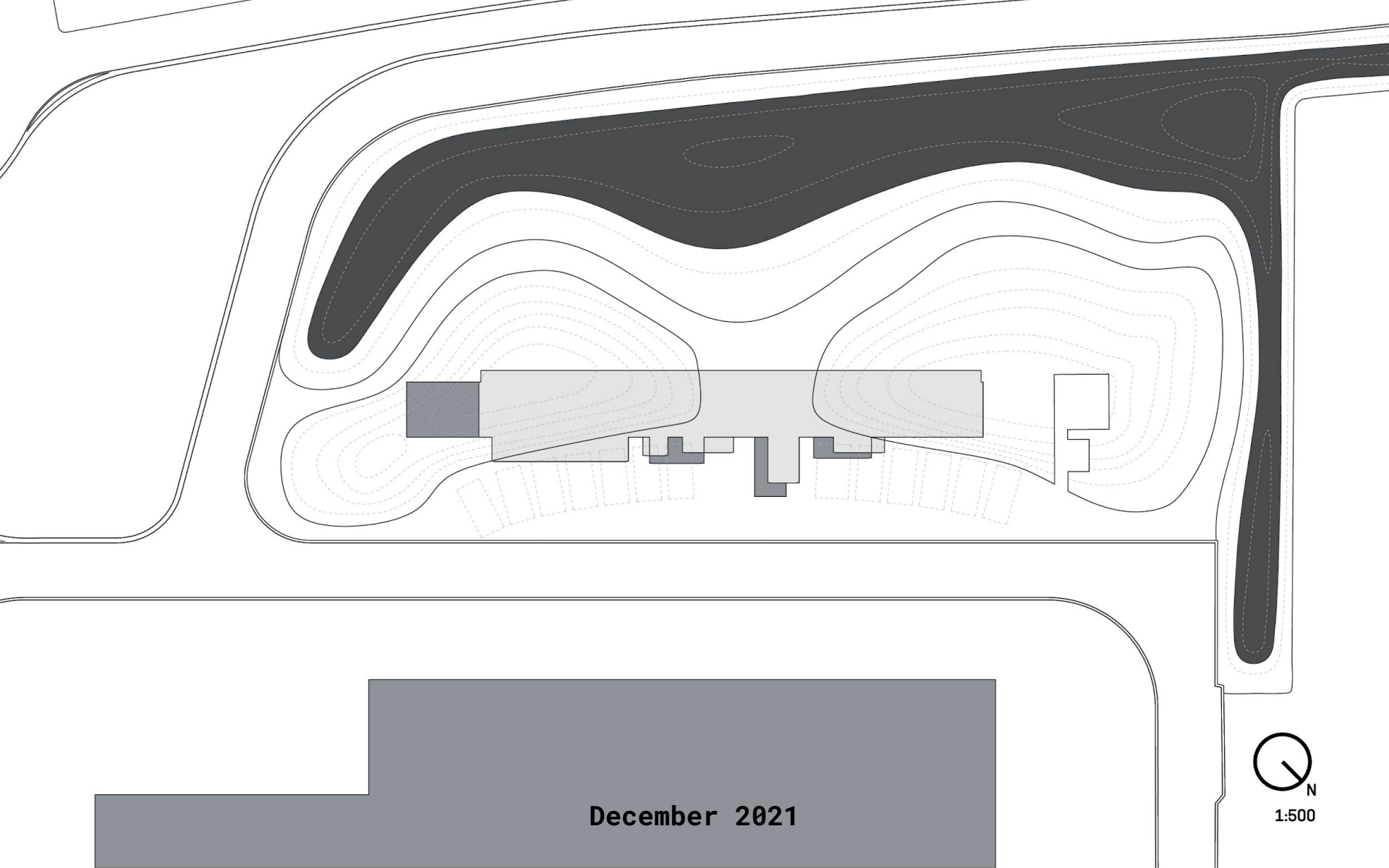








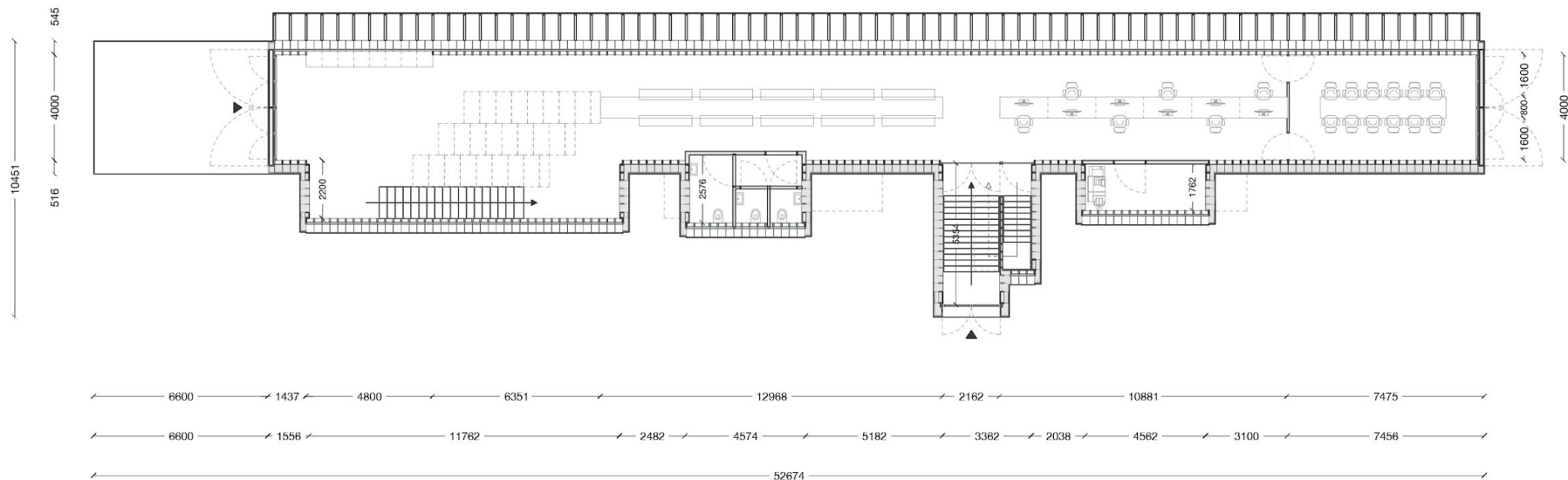




December 2021



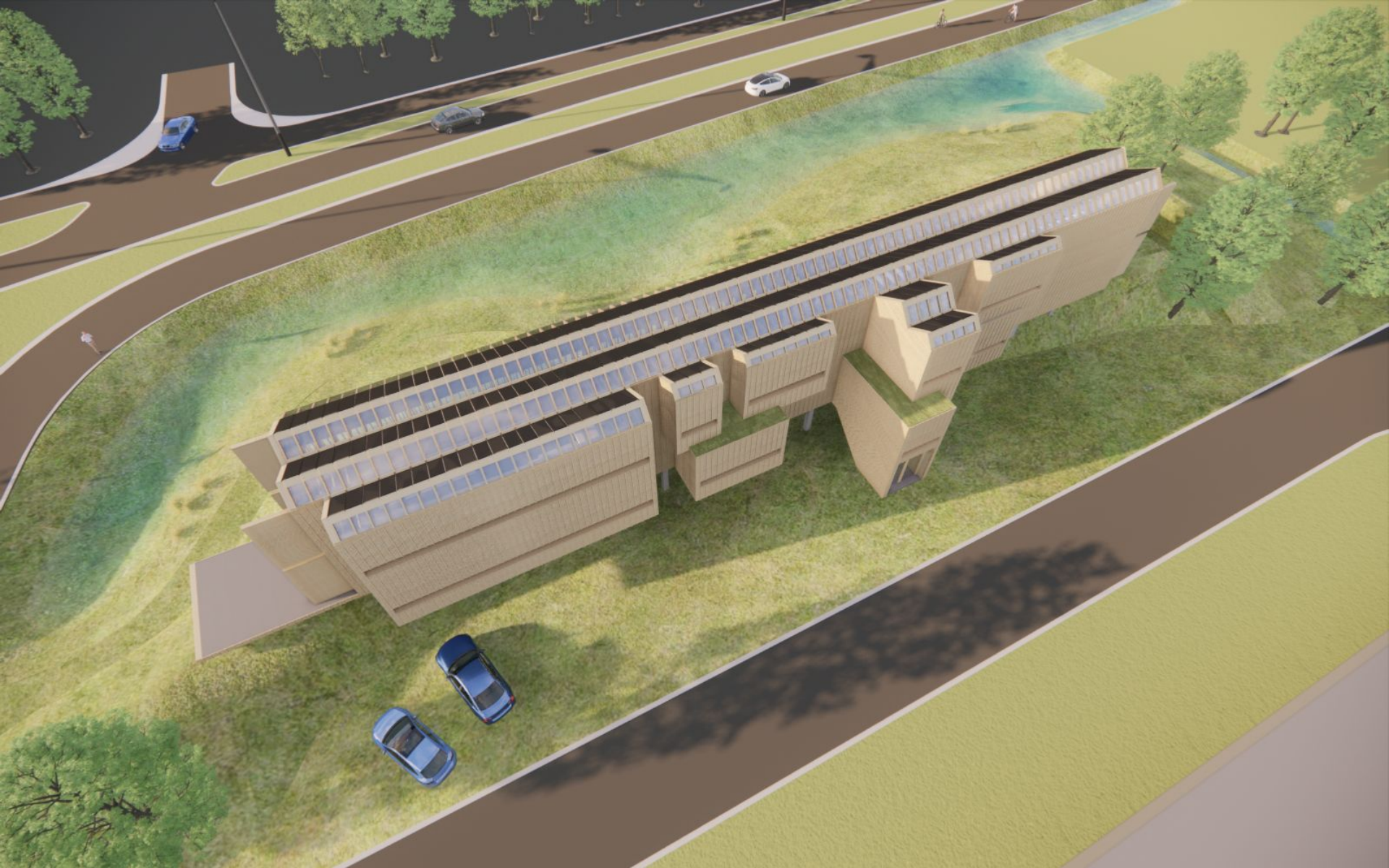
1:500



Begane grond









November 2021





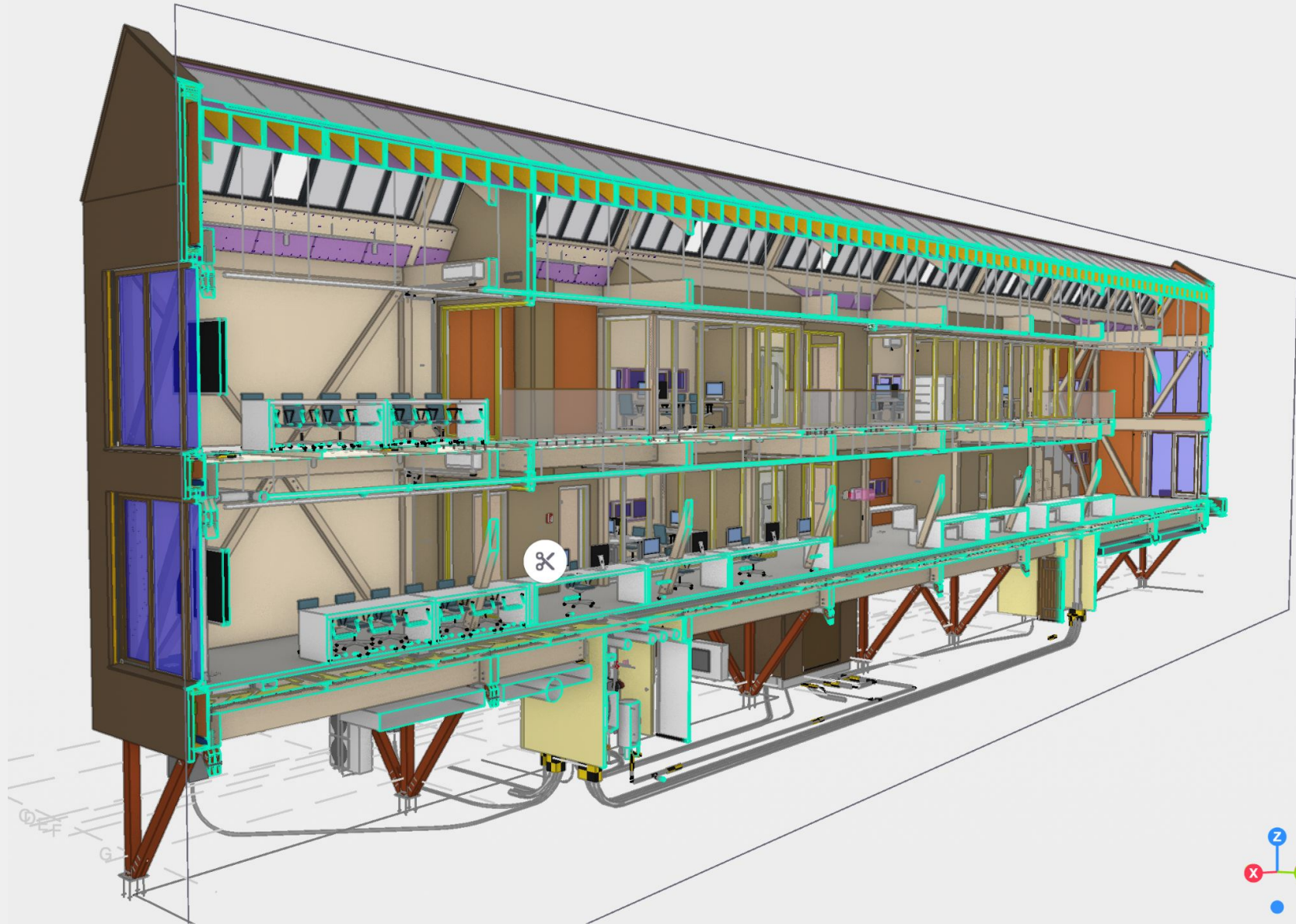
juni 2022

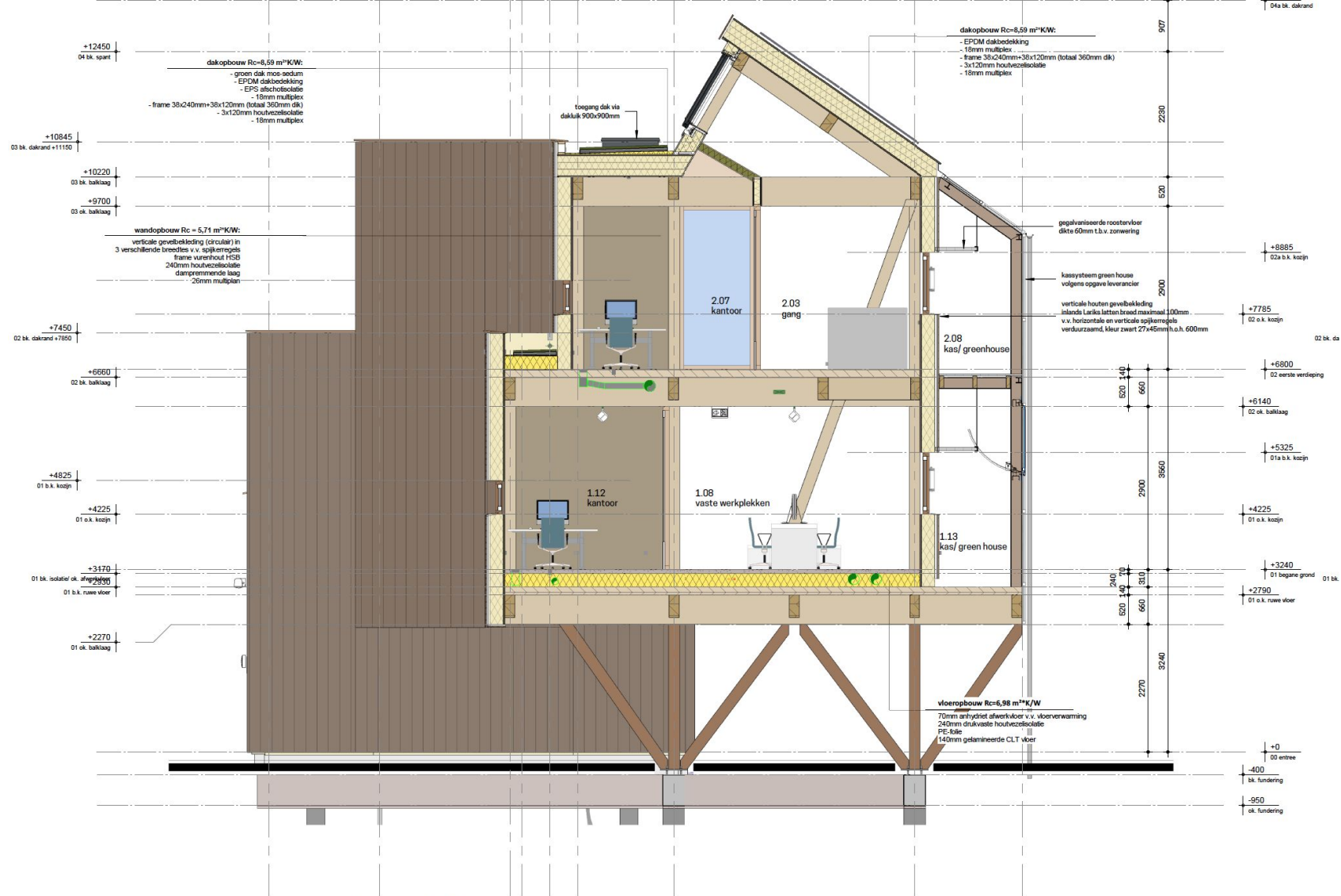


Circulair bouwen

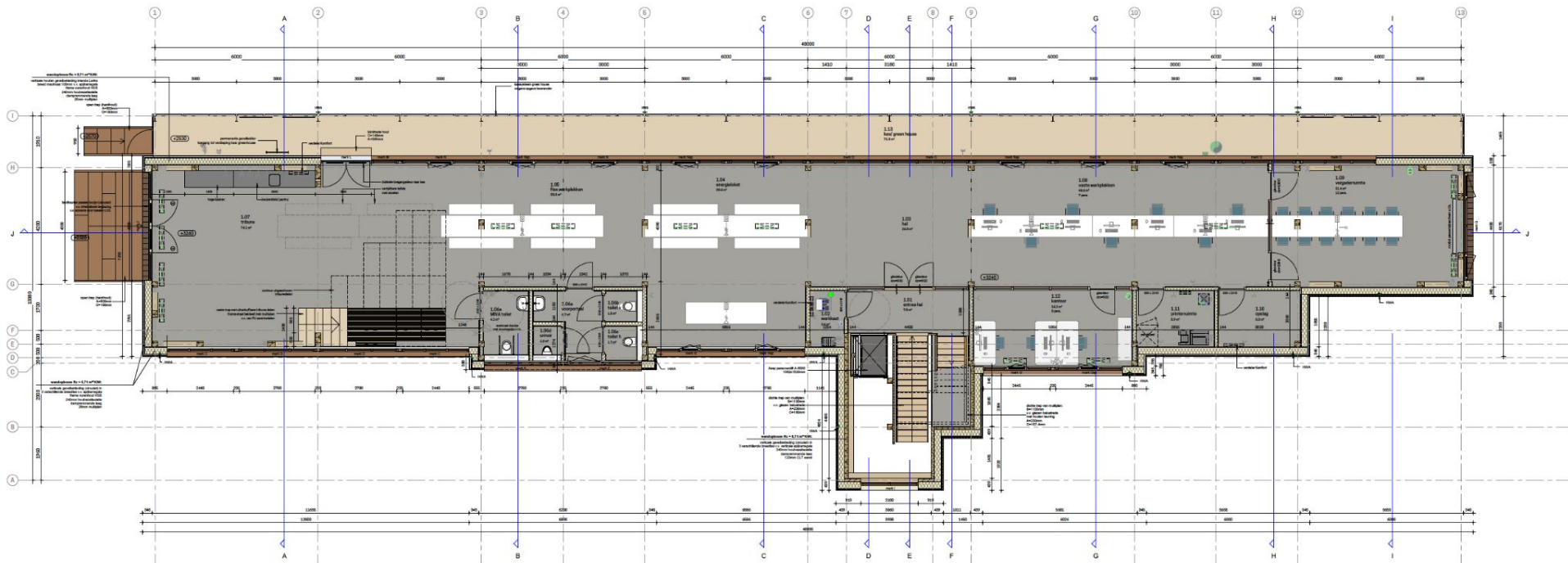


Biobased bouwen

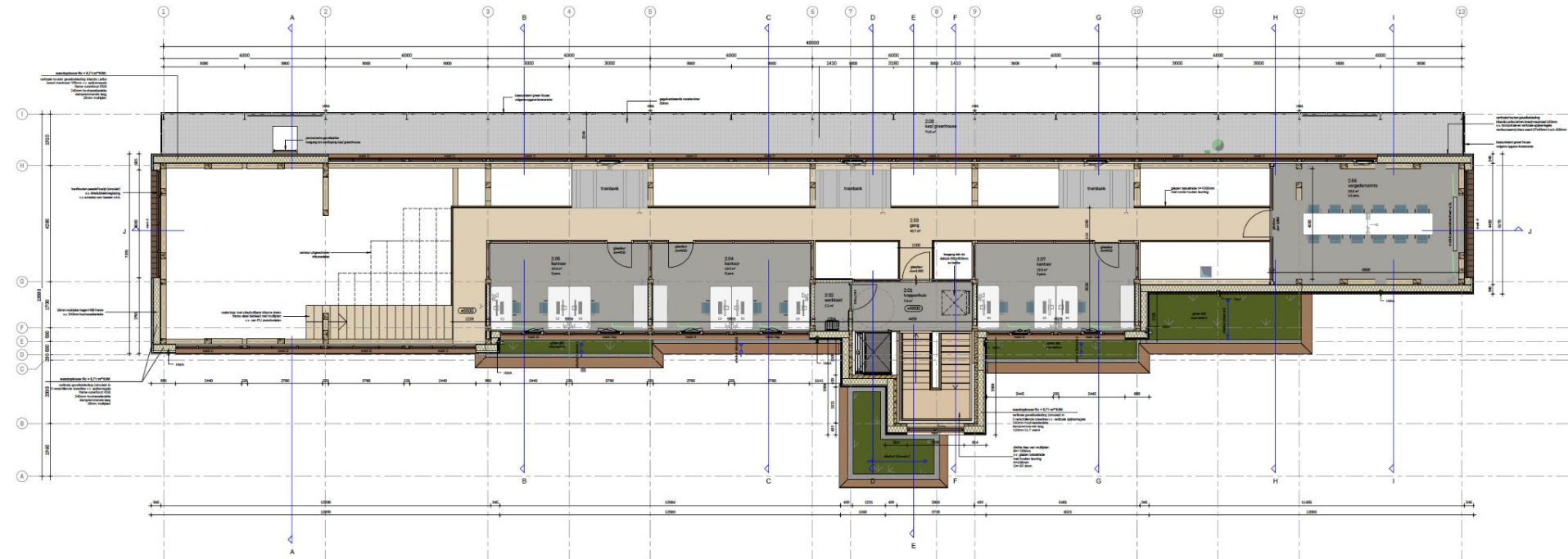




doorsnede G



begane grond (+3240)
1:50



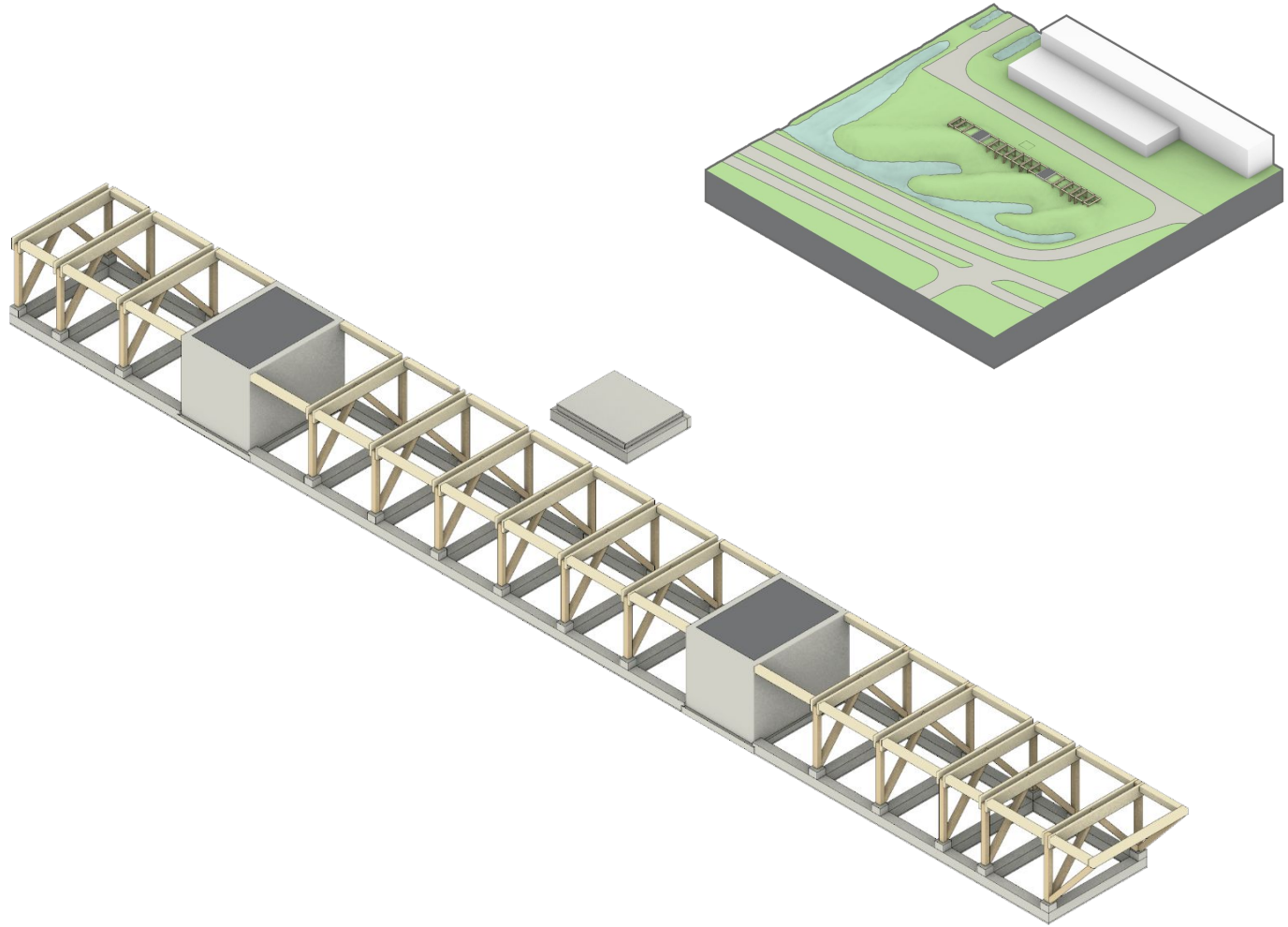
1e verdieping (+6800)

1:50





Opbouw



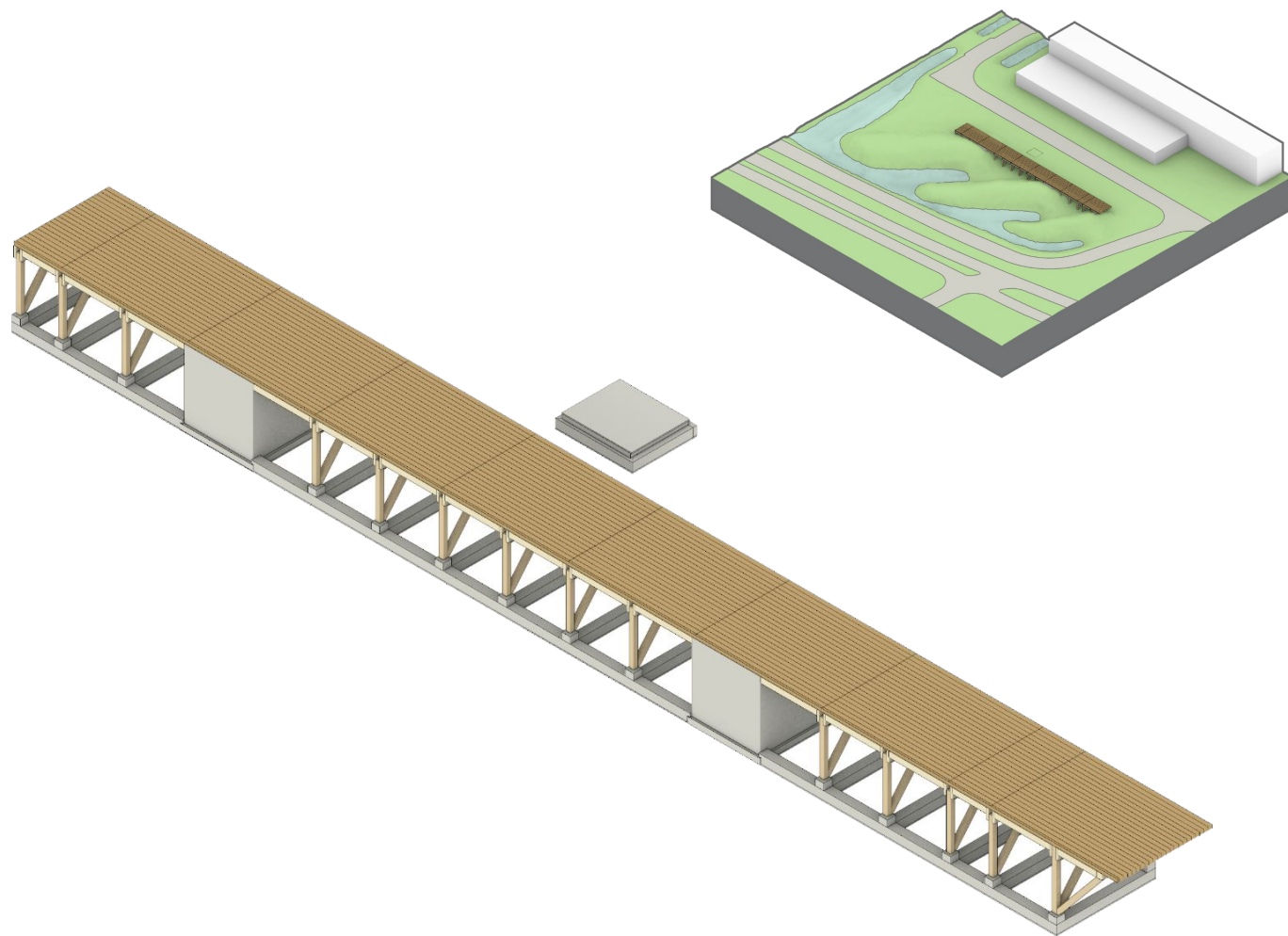
Fundering



Azobé



Azobé

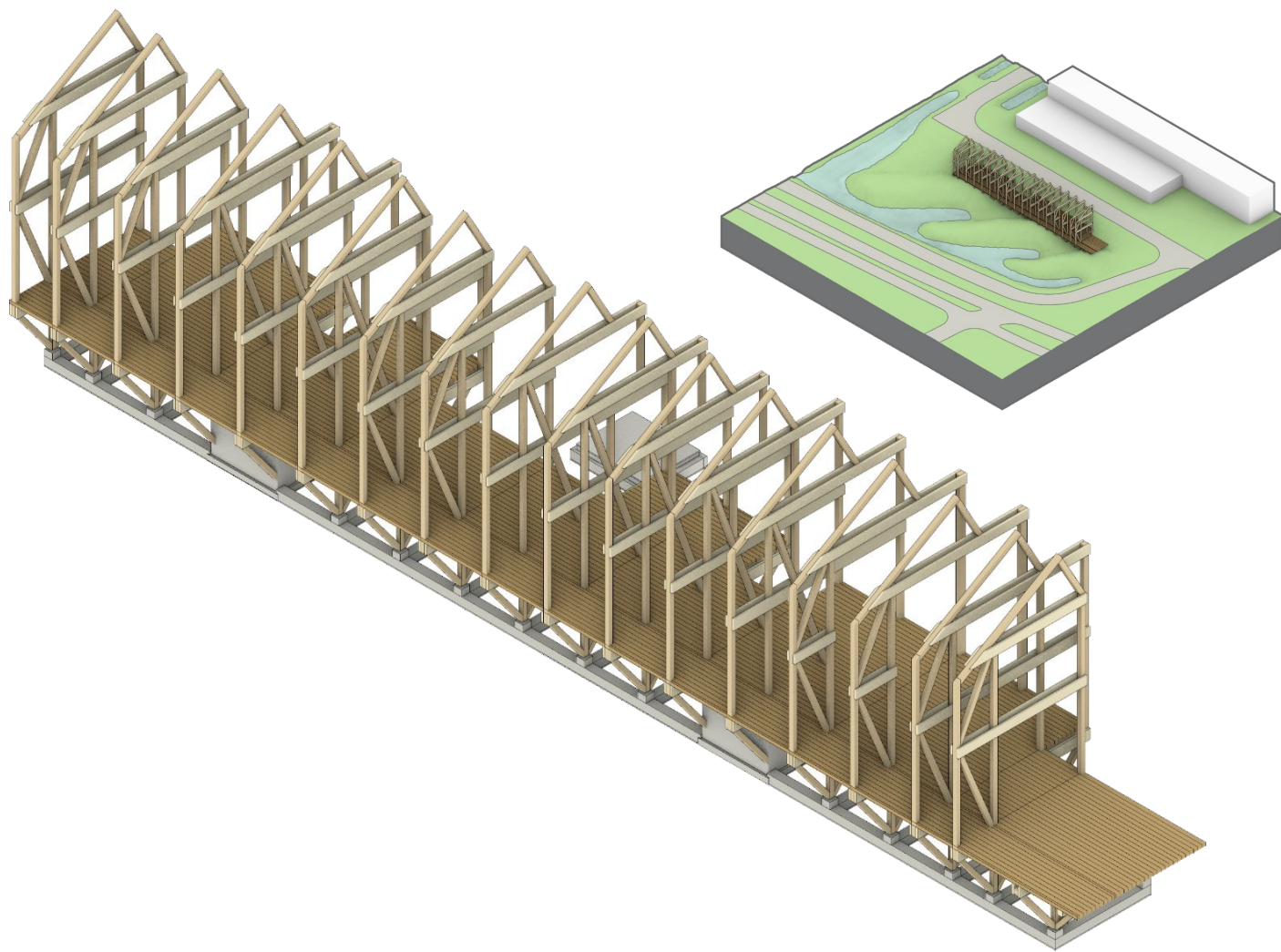


Funderingstafel



CLT





Spanten van gelamineerd hout

2331981
3574637



ARCON B.V., NL - 5674 TR N

Kommissie
1 DELTAWIND

GL 28 Standard
160 / 440 / 5799
20.07.23

Binr
39

CE

M-M

Productie van de Duitse Staat
in de fabriek van de Staat

200 L/M UBJJ

BN 14000.0013

Productie van de Duitse Staat

200 L/M

200 L/M

Gelamineerd vuren



Bezoek aan Mayr Melnhof, Oostenrijk



Bezoek aan Mayr Melnhof, Oostenrijk



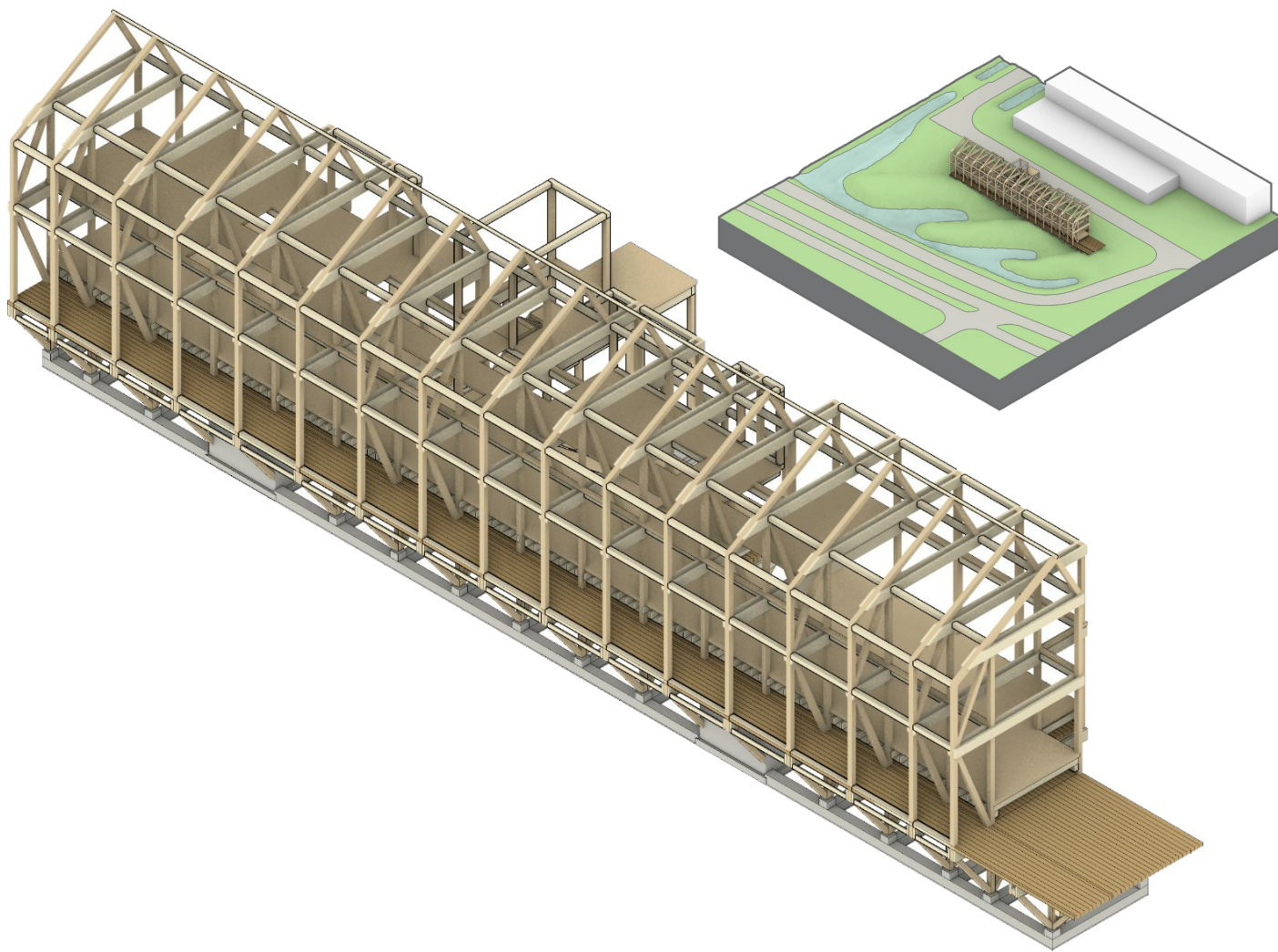
Gelamineerd vuren



Viering hoogste punt



Viering hoogste punt



Vloeren



CLT



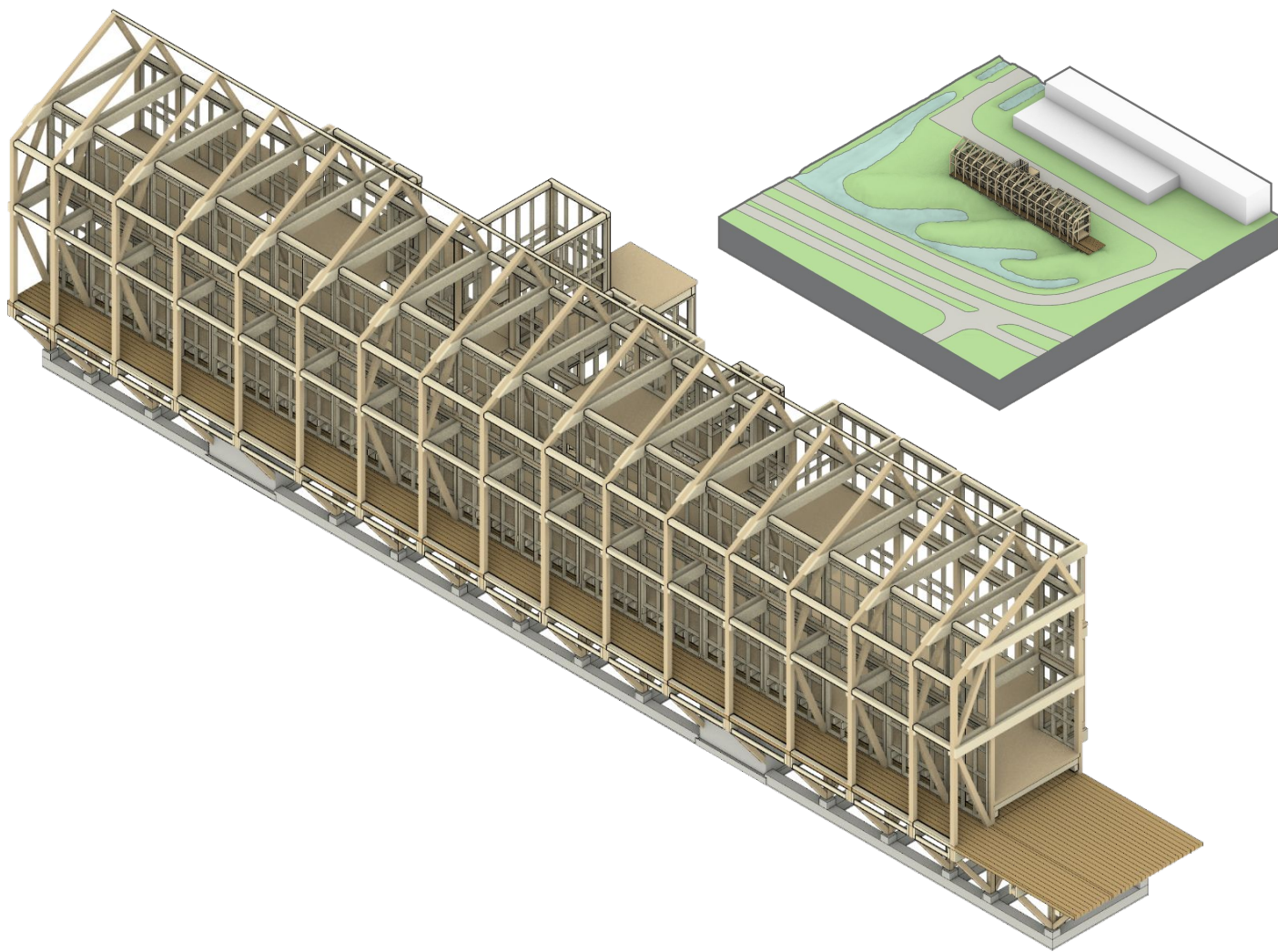
CLT



Circulair Azobé



Circulair Azobé



Gevels Houtskeletbouw



Multiplan



Multiplan



Vuren



Vuren



Schaaldelen van meerpalen

A large, stylized letter 'S' is constructed from various pieces of weathered wood, including planks and beams, arranged in a way that forms the shape of the letter. The 'S' is positioned in the center of the frame. The background consists of a dense arrangement of vertical wooden planks of different shades of brown, grey, and black, some showing signs of weathering and discoloration. The overall texture is rough and natural.

Schaaldelen van meerpalen



Inlands Lariks



Inlands Lariks



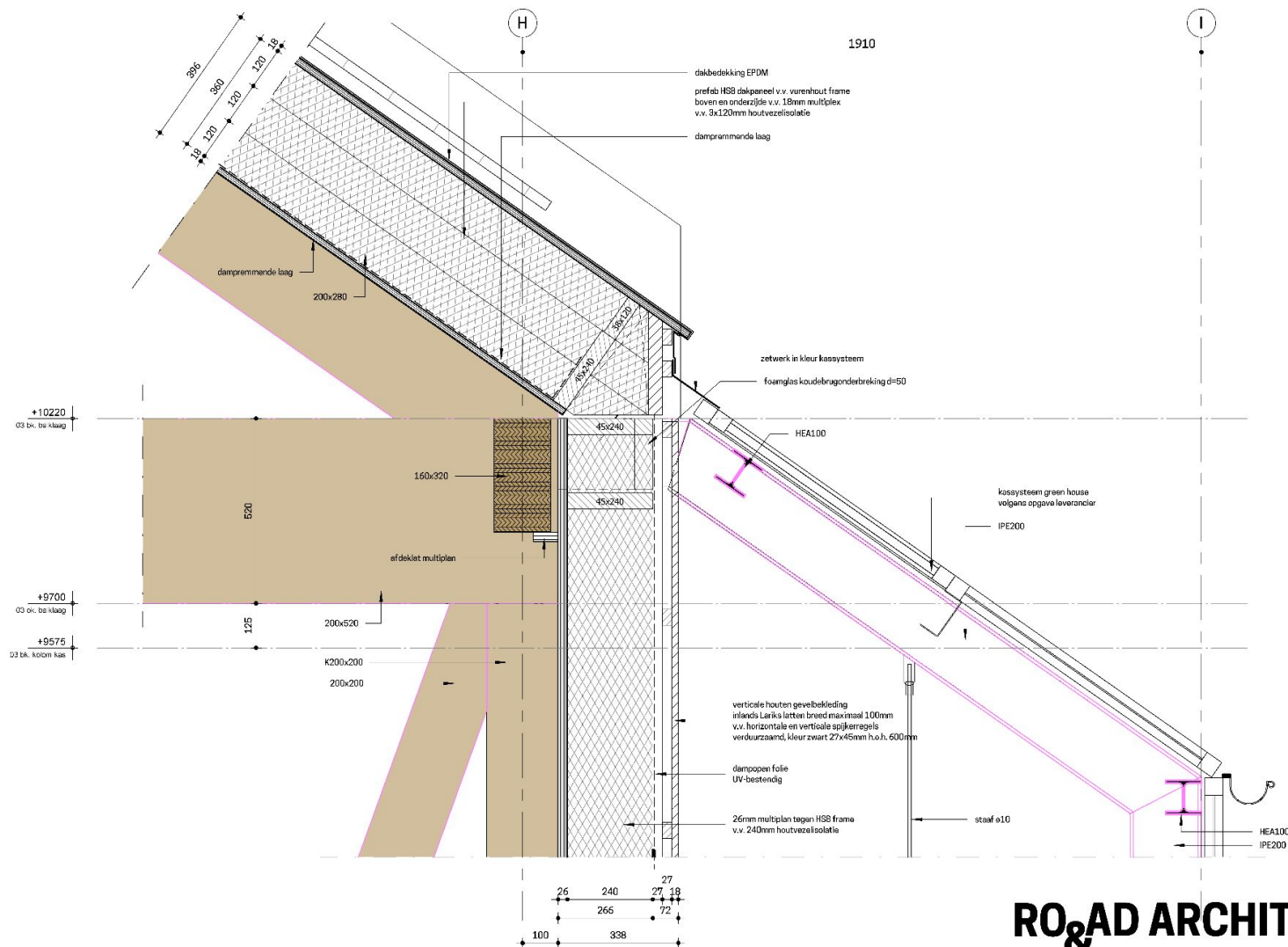
Thermisch gemodificeerd Fraké



Thermisch gemodificeerd Fraké



Houtvezel isolatie



Houtvezel isolatie

RO&AD ARCHITECTEN

Pro Kester Oosterveld 5 4332TL Middelburg Nederland t +31 118 774769 m +31 06 28967971
Ad K1 Van der Rijtstraat 40 4511PR Borgeen co Zoom Nederland t +31 0164 266329 m +31 6 65750027

detailnr
V08
datum
27-04-2023
wijziging
wijzigingsdatum

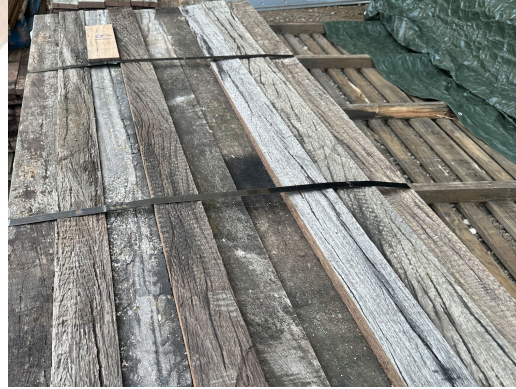
formaat
A3
schaal
1:10

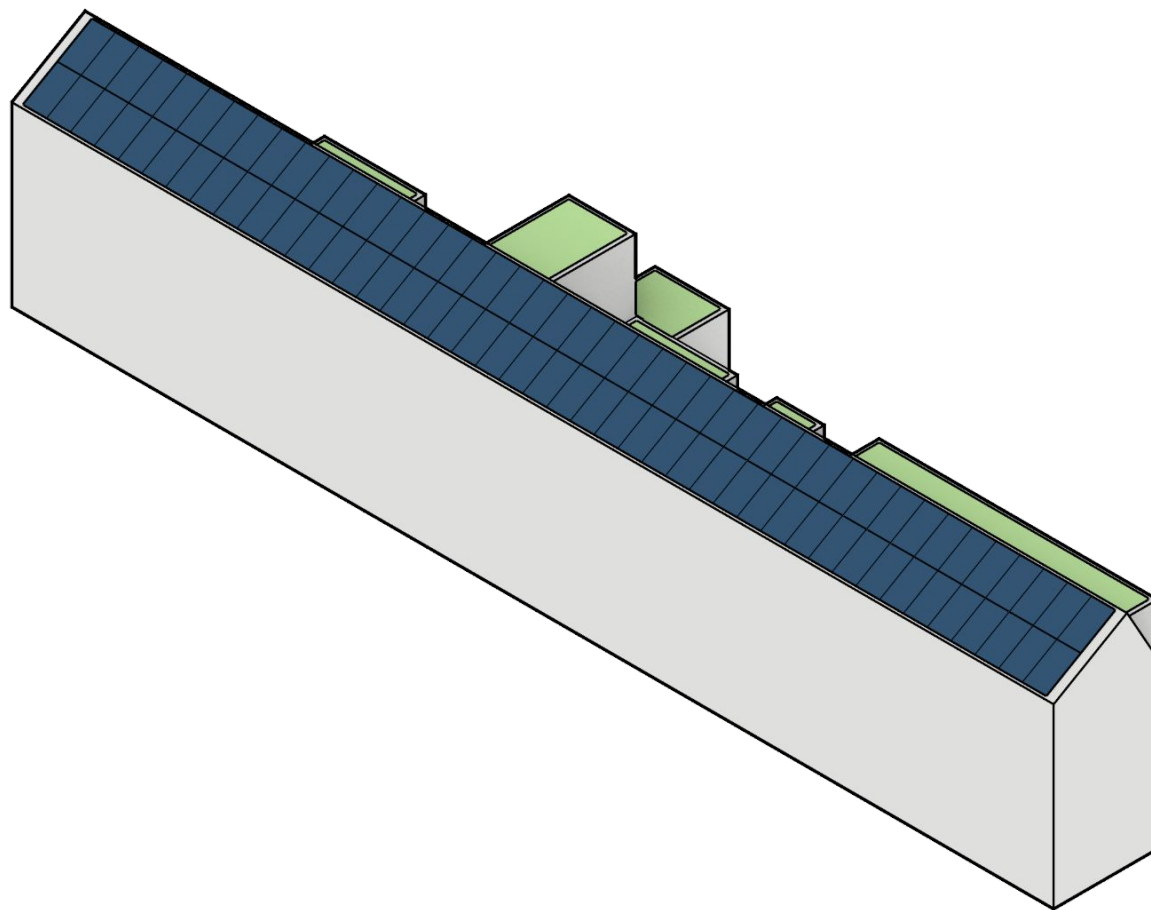


Beuken



Beuken

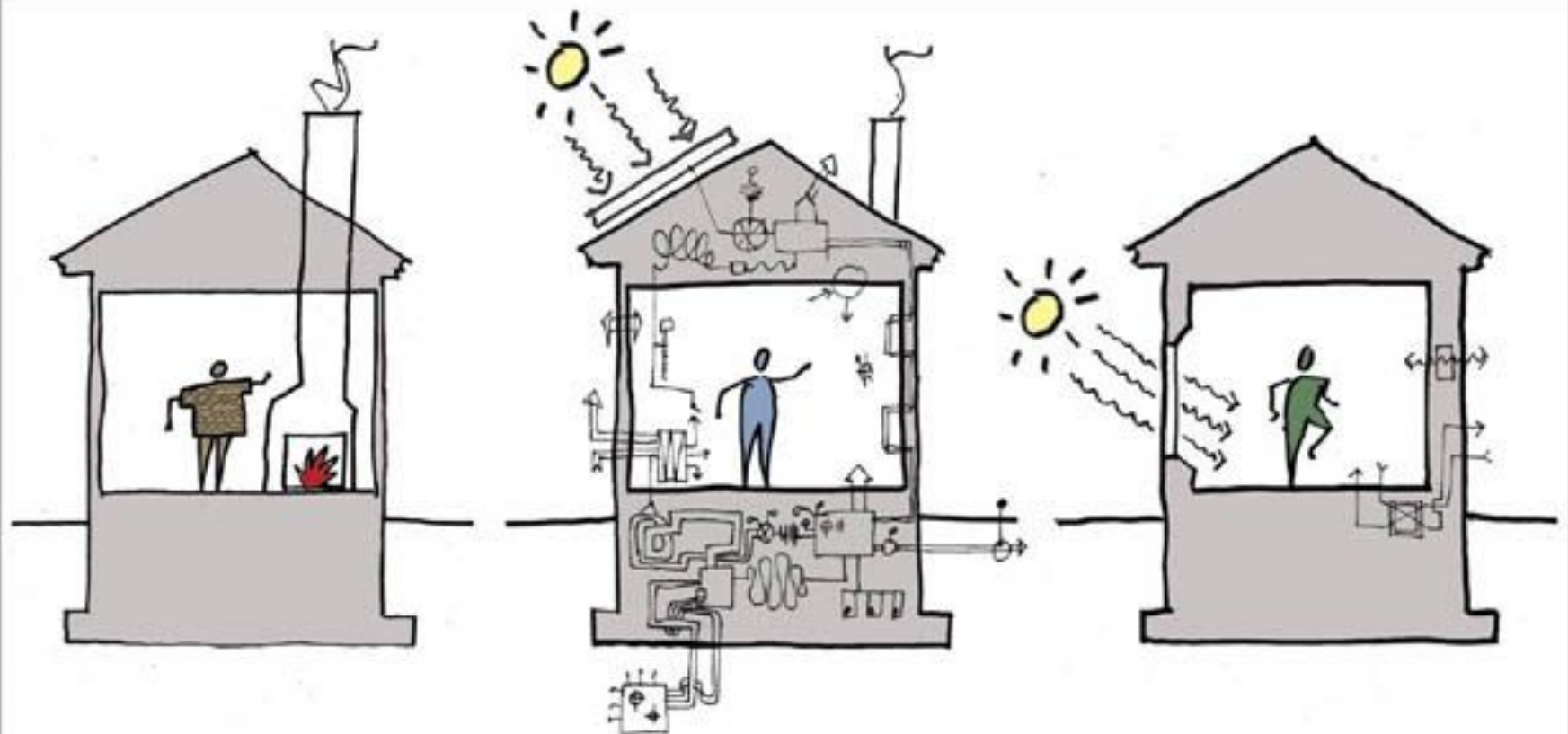




Sheddak met zonnepanelen en glas op het noorden



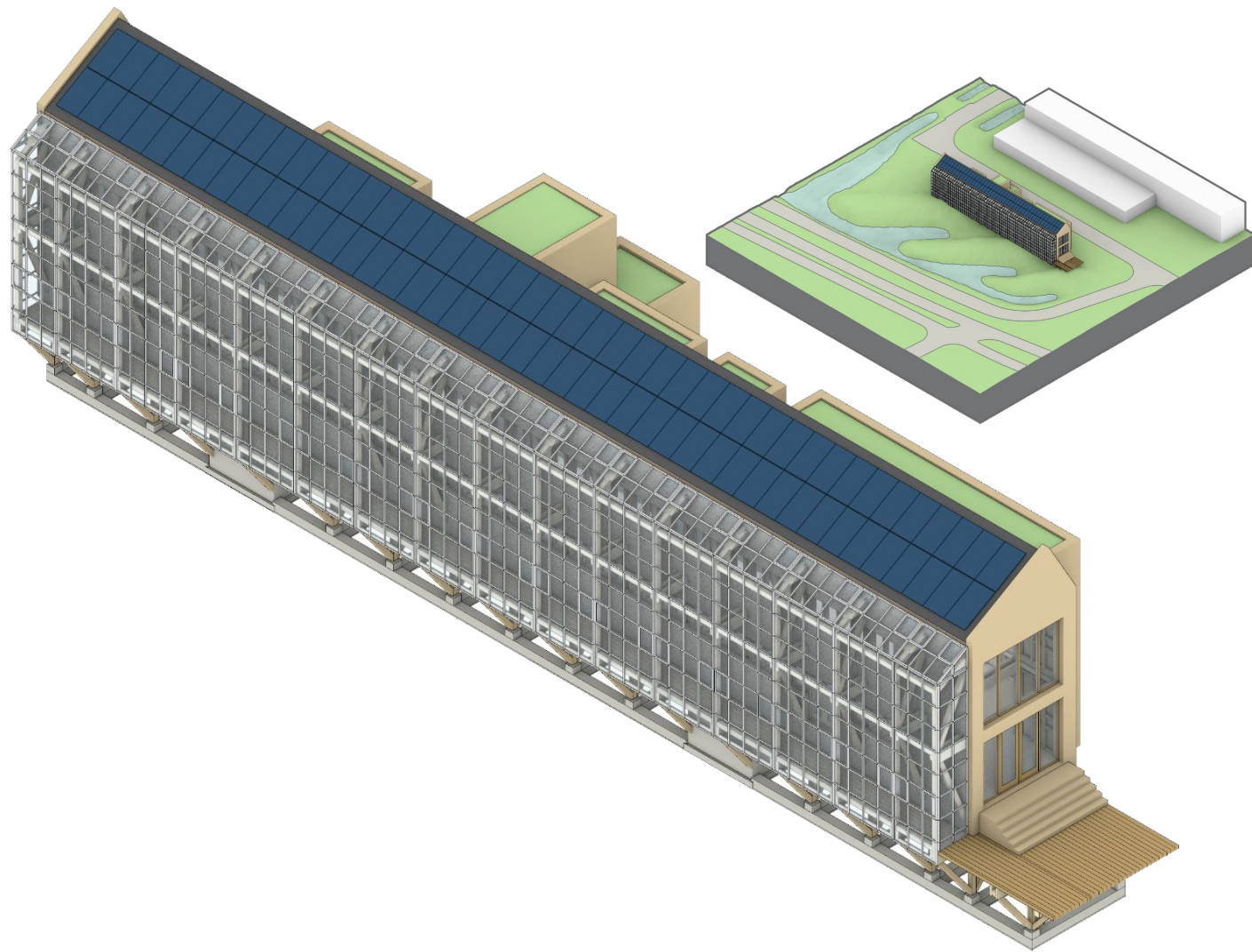
Licht



19th Century

20th Century

21st Century



Kas voor de gevel



Planten in de kas









Groendaken op de platte daken



Kasten voor vleermuizen, en vogels



Uilenkast



































RO

ARCHITECTEN

Tij & Energiehuis



COÖPERATIE
DELTAWIND

&

AD

16 05 2025