COMMONS OF CARE
CURE
CURATION
COLLECTIVITY
CONNECTIVITY

"The production of the commons, spatially, presents a new notion of sharing, negotiation, and usage; architecture seeks to create new political forces, new ways of acting, and new forms of the local."
Flavien Menu, New Commons for Europe, Leipzig: Spector, 2018.

Daycares and care centres are common goods. Care as a resilient urban marker provides a framework that concerns the marginalised multitude of the city. The design is guided by four principles (cure, curation, collectivity, connectivity) that suggest multiple interventions for realising the aspiration for a public condenser. The aim of the project is to reshape liveability, via care, providing cure, and curating activities, for new forms of collectivities that promote connectivity and diversity.

Two assumptions were decisive for the development of the Commons of Care. One was the site, the 19th-century Skydebanehaven park that punctuates the Vesterbro district, and the other was the creation of a commons, a place in which the public visits on short or long intervals. From these two premises, the entire architecture was devised. Multiple forms of care will inform multiple forms of use: an architectural ensemble, an urban ensemble, an ensemble of learning, an ensemble of recreation, an ensemble of cultures, an ensemble of goods, an ensemble of people in commonality.

CARE
Guided by the principle that welfare ties to wellbeing and excludes no one.

CURE
Providing relief for the those in need, cure offers a support network.

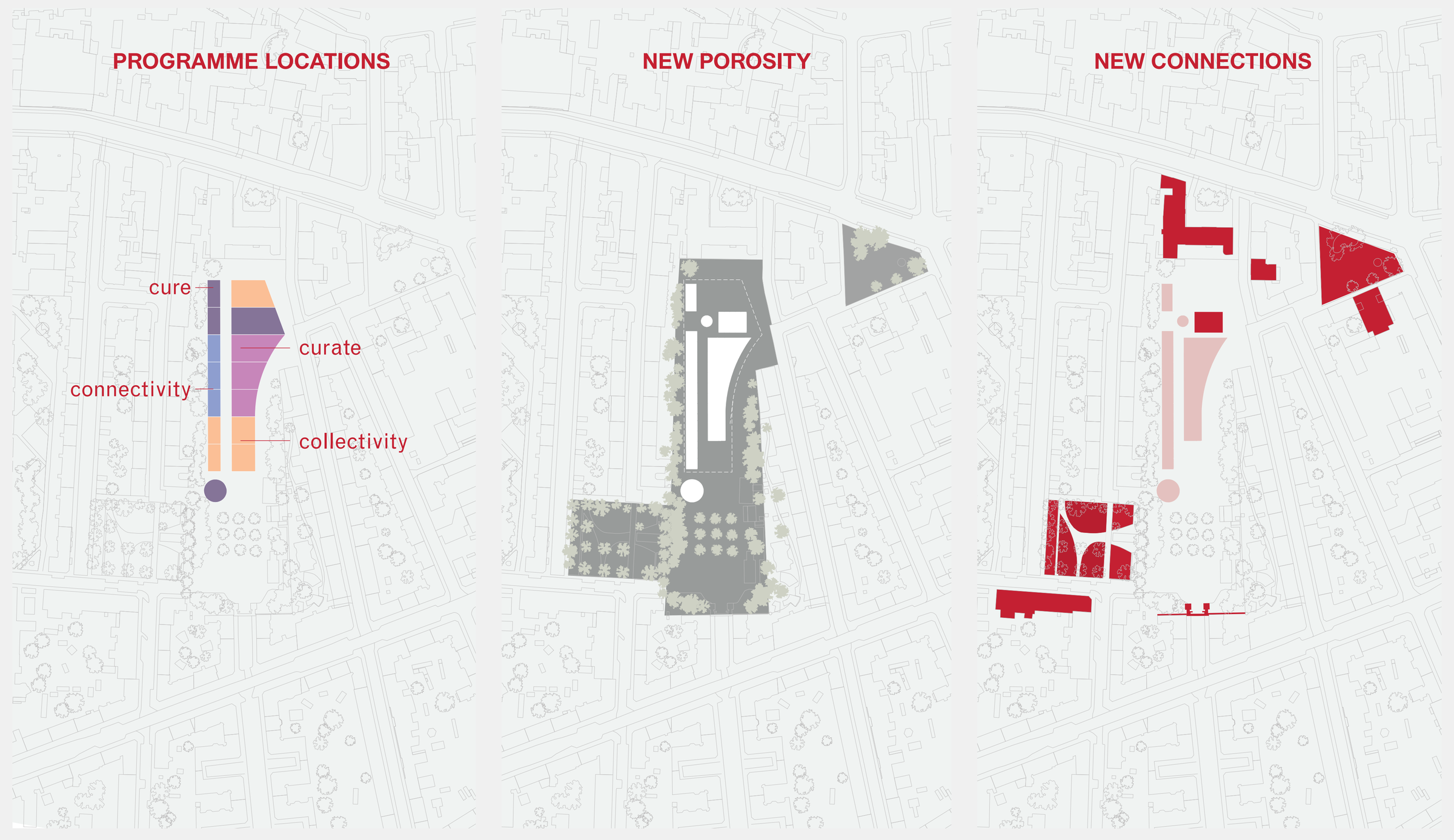
CURATION
The verb "to care" derives from the Latin 'curare' which is inscribed etymologically in the word "to curate".

COLLECTIVITY
Cure and curation come within a collaborative framework of shared identity: assemblage, togetherness, solidarity, belonging.

CONNECTIVITY
Offer new opportunities in the city that connect to people who might otherwise be excluded or marginalised.

PLAN
CITY SITUATION
COPENHAGEN

PLAN
NEIGHBOURHOOD SITUATION
VESTERBRO



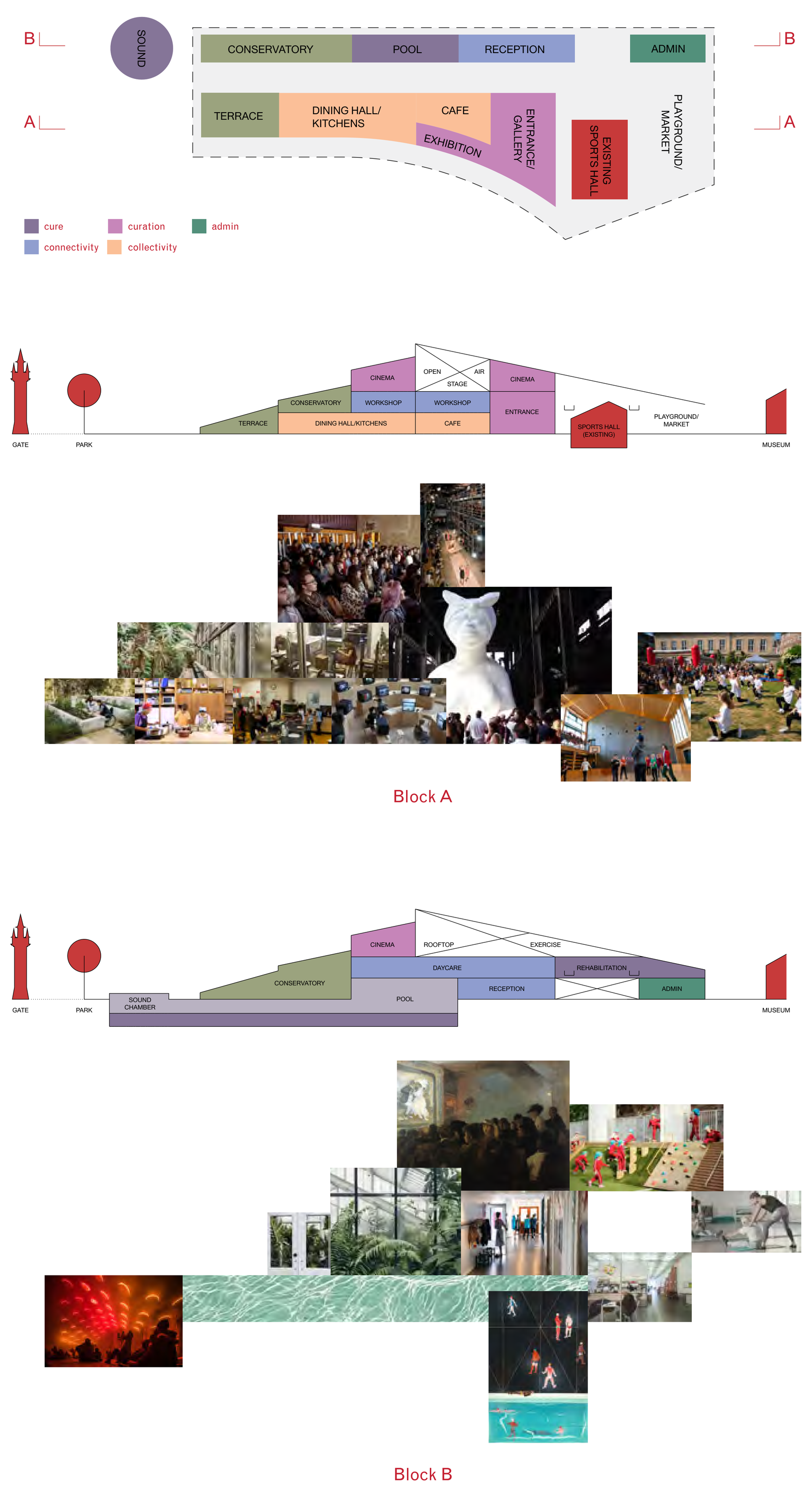
DIAGRAMS
SITE STRATEGIES
SCALE:N/A

SITE SECTION | AA CROSS
SKYDEBANEHAVEN
SCALE: 1:750

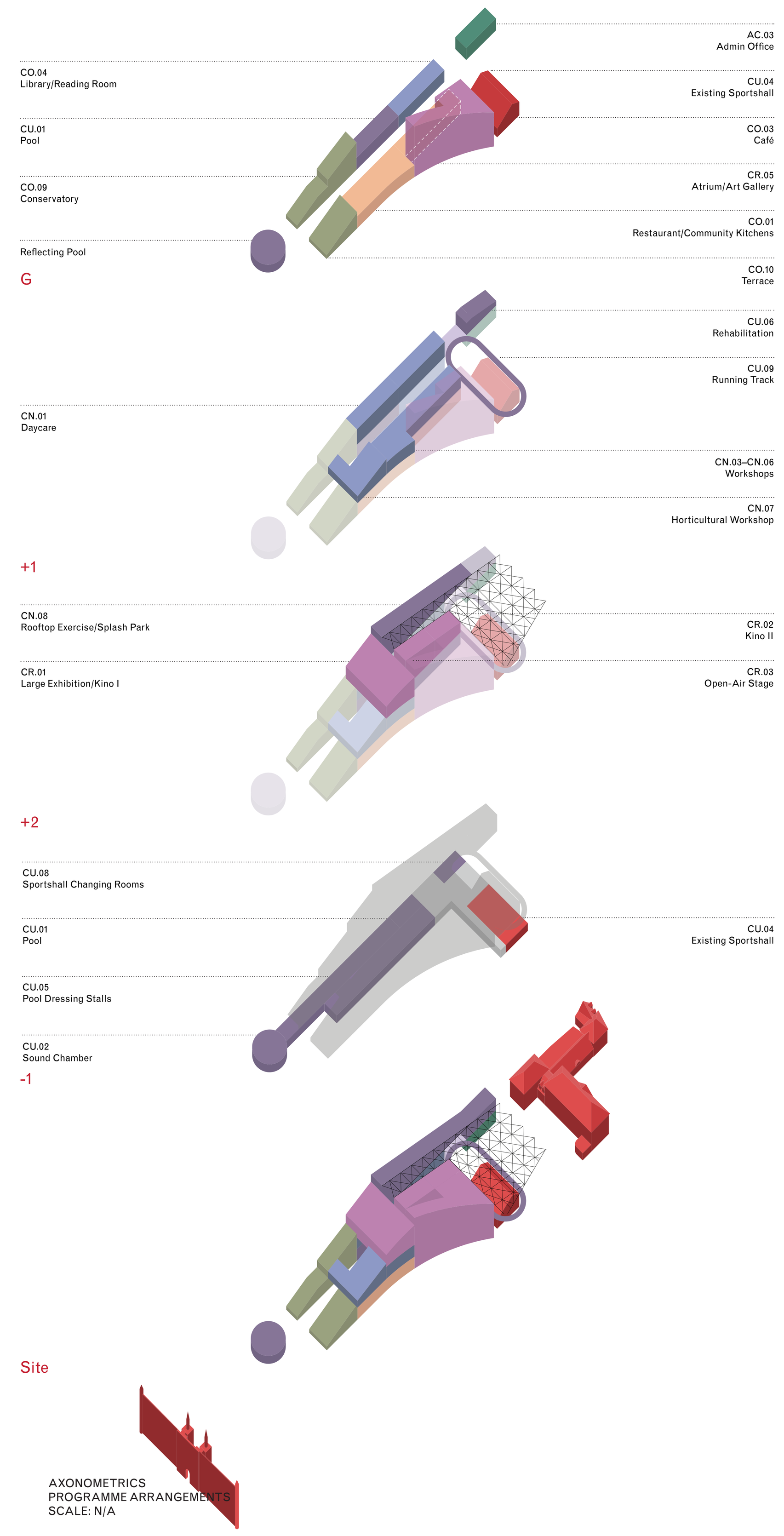
SITE SITUATION | NOLLI
SKYDEBANEHAVEN
SCALE: 1:1500

SITE SECTION | BB LONGITUDINAL
SKYDEBANEHAVEN
SCALE: 1:750

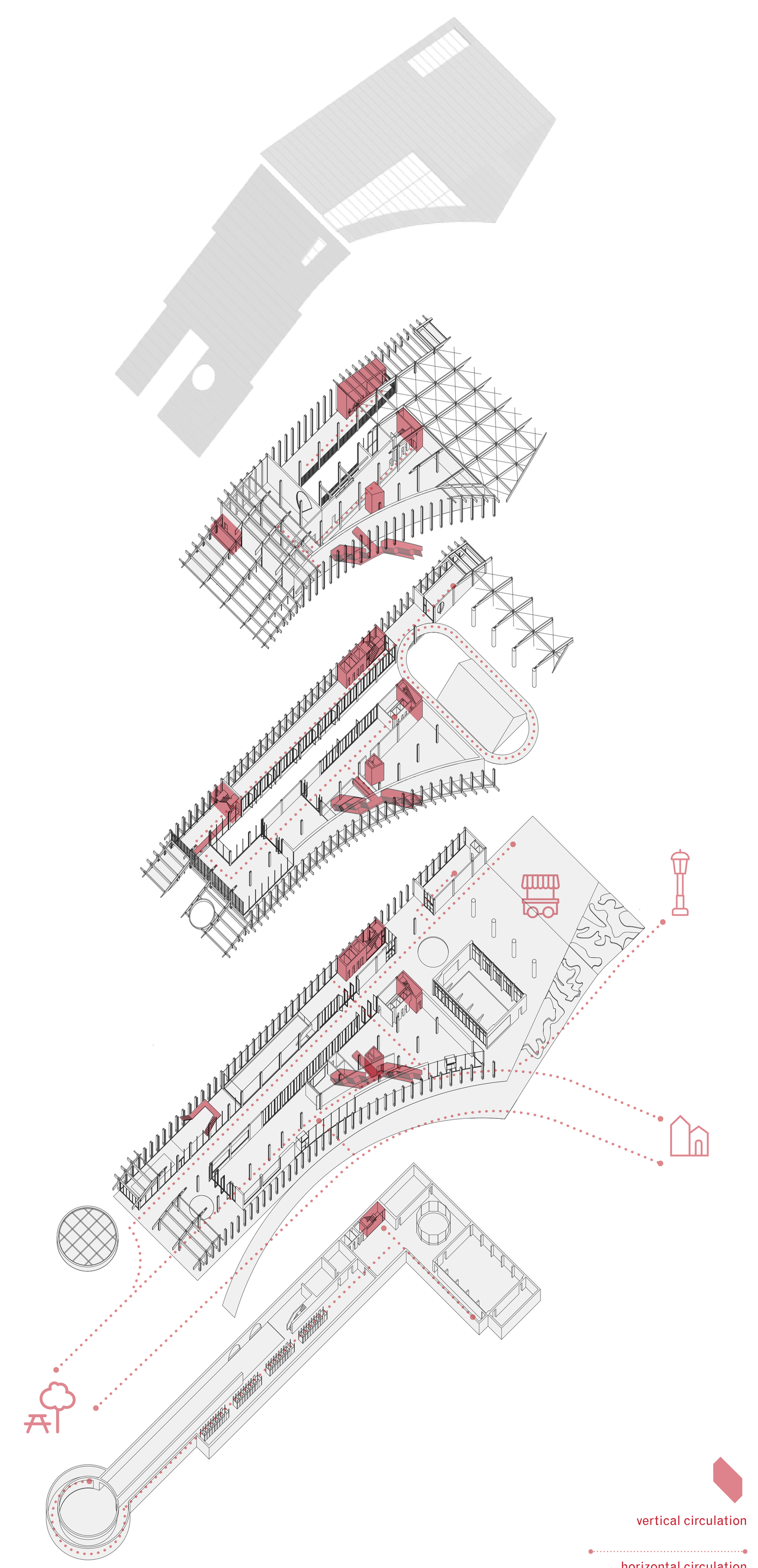
VIEW
AERIAL VIEW TOWARDS SOUTHERN GATE



SCHEMATICS
BLOCK A, B
SCALE: N/A



AXONOMETRICS
PROGRAMME ARRANGEMENTS
SCALE: N/A



AXONOMETRICS
ROUTES AND CIRCULATION
SCALE: N/A

A101 CONTEXT

Studio: AR3AP131 Public Building MSc3 2019/2020
Name: Yuncheng Deng
Student Number: 4892852

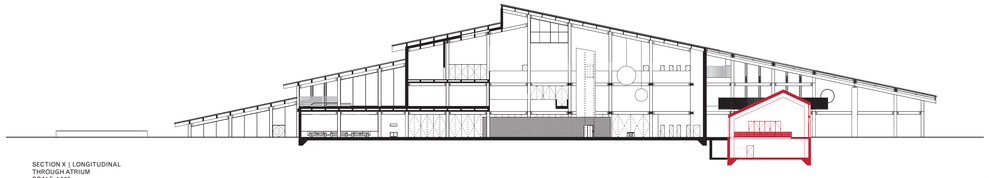
TU Delft
Tutors: Paul Kuitenbrouwer, Gilbert Koskamp
Location: Skydebanehaven, Vesterbro, Copenhagen, Denmark

Date: 09.07.20
Format: A0
Scale: As indicated

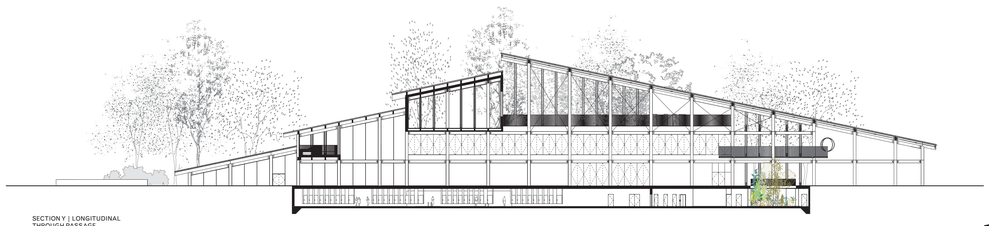
VIEW
ABSALONSGADE TOWARDS SOUTH

VIEW
EXISTING VESTERBRO UNGDOMSGÅRD SPORTSHALL LOOKING NORTH TOWARDS COPENHAGEN MUSEUM

VIEW
NEW PATH TO SKYDEBANEHAVEN PARK, EAST FAÇADE, ABSALONSGADE

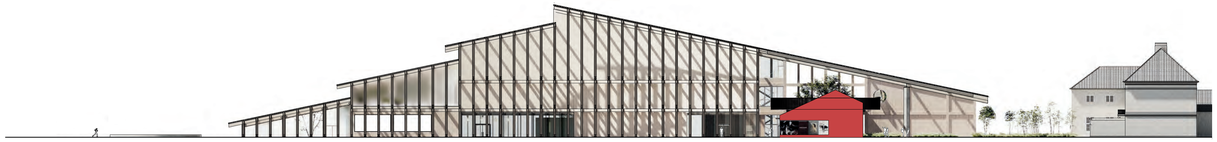


SECTION X | LONGITUDINAL
THROUGH ATRIUM
SCALE: 1:500

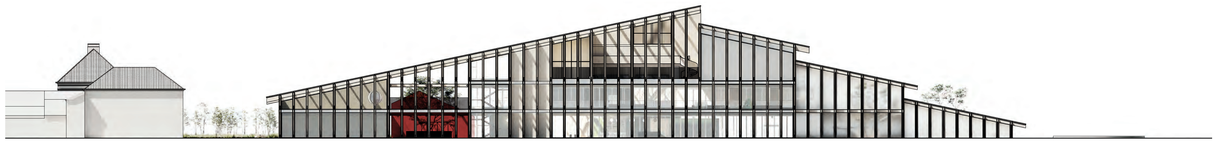


SECTION Y | LONGITUDINAL
THROUGH PASSAGE
SCALE: 1:500

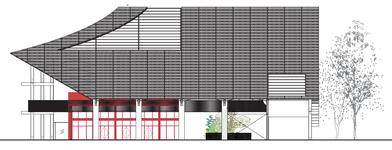
SECTION Z | LONGITUDINAL
THROUGH WEST BLOCK
SCALE: 1:500



ELEVATION
EAST
SCALE: 1:500



ELEVATION
WEST
SCALE: 1:500



ELEVATION
NORTH ELEVATION
SCALE: 1:500

ELEVATION
SOUTH ELEVATION
SCALE: 1:500

A102 SECTIONS AND ELEVATIONS

Studio: AR3AP131 Public Building MSc3 2019/2020
Name: Yuncheng Deng
Student Number: 4892852

TU Delft
Tutors: Paul Kuitenbrouwer, Gilbert Koskamp
Location: Skydebanehaven, Vesterbro, Copenhagen, Denmark

Date: 09.07.20
Format: A0
Scale: As indicated

POSITION

Facing the enormous challenges from shifting demographics, the demand to reduce dependence on commodities, a changing climate, and the need to create environment conducive to the improvement of human well-being, buildings need to address such urgent issues. Presently, buildings use 30 to 40% of global energy and contribute to approximately one-third of global greenhouse gas emissions. Facing climate change and material scarcity, two aims are essential in the multiplicity nature of timber construction:

The reduction of environmental footprint of construction.

A circular economy in which commodities are recycled, remanufactured, and returned to the marketplace.

A building's materialisation, construction, operation, and maintenance have direct and dire impact on the environment. The position of the Commons suggests possible means to reduce the emissions associated with a building's structure, climate, and building fabric.

STRUCTURE

In 2009, Copenhagen announced plans to be the first carbon-neutral city by 2025.[1] Together with the City's plan to build 6.8 million sqm of new buildings to service a predicted population increase of 110,000 of the same year.[2] In 2016, precast concrete was particularly popular in Denmark where approximately 90-95% of new constructions employed this system.[3] The heavy reliance of non-renewable concrete production reflected the complete absence of the 2025 sustainability ambitions. As an alternative, CLT (cross-laminated timber) and glulam (glue-laminated timber) can be considered a novel and sustainable approach. Timber construction would reduce the existing CO^2 deficit of 70,000 tons by 22%, a significant contribution comparable in magnitude to other CO^2 reducing initiatives.[4] In light of its environmental advantages, the Commons of Care suggests the adoption of CLT construction as the primarily structure for the public condenser in Copenhagen; timber, as a renewable substance, both carries and conveys a meaning of multiplicity of nature.

The clear organisation of the visible skeleton construction makes it possible to react flexibly to multiple public programmes now and in the future. Supports, beams, and joists or rafters made of white-glazed glued laminated timber, create a sense of unity across all of the buildings housed under one roof. Rows of exterior buttress supports 2.40 metres apart enable intimate and grand spaces with pergola to basilica-like characters.

STRUCTURAL PERFORMANCE
due to the cross-laminating of layers, CLT exhibits relatively high in-plane and out-of -plane strength. The strength and crosslamination make CLT capable of a twoway span, similar to reinforced concrete.

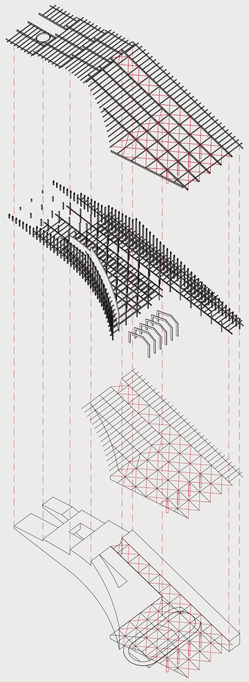
EASE OF ASSEMBLY
because CLT panels offer a high level of prefabrication, CLT as a relatively lightweight system can reduce construction time by 20% when compared to cast-in-place concrete systems.

CO^2 REDUCTION
CLT and wood construction materials in lieu of steel and concrete can result in lower CO^2 and other greenhouse gas emissions when considering the whole material life cycle.

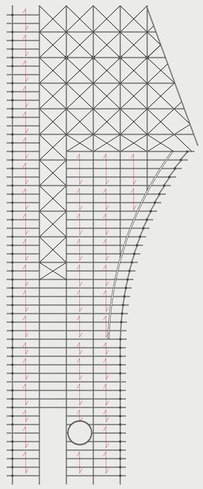
RENEWABLE/RECYCLABLE RESOURCE
as a renewable source of material, CLT also could be easily separated, reused, recycled or incinerated to produce energy.

ENERGY EFFICIENT ASSEMBLIES
when coordinated with climate and ventilation strategies, CLT systems can help provide maximum energy efficiency, reduce operational costs, and are best suited to colder climates.

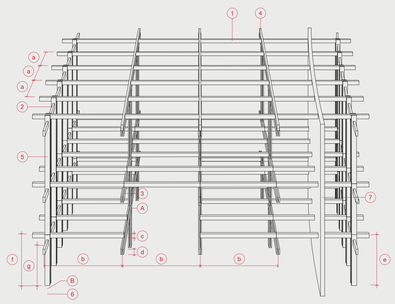
AESTHETIC
exposing the natural wood finish of CLT in an interior space showcases the natural beauty of wood and is conducive to the wellbeing of the users.



EXPLODED ISOMETRICS
STRUCTURE AND CANOPY
SCALE: N/A



STRUCTURAL PLAN
BUILDING
SCALE: 1:500



COMPONENTS AND DENOMINATIONS

1	beam
2	spandrel beam
3	girder
4	rafter
5	column, support
6	foundation, footing
7	stability wall

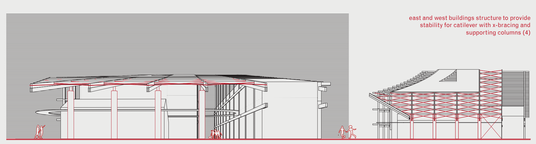
TOPOGRAPHICAL SYSTEM POINTS

A	point of support, bearing point
B	base point

BEAM SYSTEM DIMENSIONS

a	beam span	2380mm
b	girder span	7500mm
c	beam depth	400mm
d	girder depth	500mm
e	column height	5000mm
f	eaves height	5000mm
g	clear height	4000mm

SECTION-ACTIVE
CLT STRUCTURE SYSTEMS
SCALE: N/A



DIAGRAMS
CANTILEVERED ROOF CANOPY
SCALE: N/A

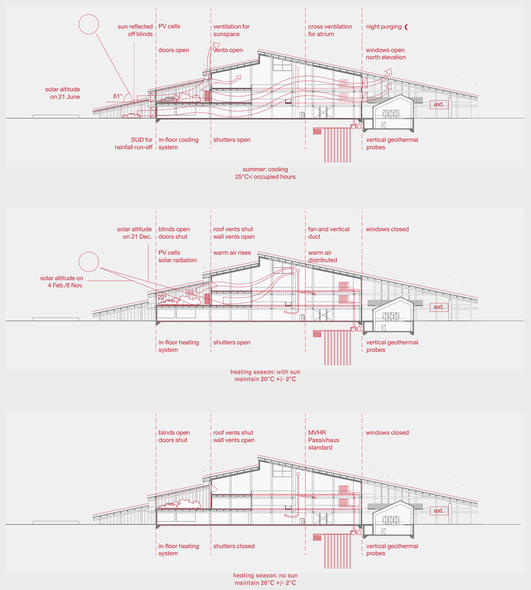
CLIMATE

Zone-division as energy and climate concept:
Divided into three thermal zones, the Commons can be used flexibly throughout the years. As an efficient solar collector, the glass house utilises the greenhouse effect of polycarbonate. Soil, plants and an elongated botanical conservatory on the south edge combine to collect the rays of the sun. Heat is released to the internal space during the night during winter time. Long wave heat rays are retained by the polycarbonate panels with PV cells, whilst raising the air temperature. This also allows growing tropical plants in an otherwise hostile climate. The Commons will manifest in physical form the diverse nature of its climate elements that follow the three principles of REDUCE-RENEW-ADAPT in order to achieve optimum comfort level while reinforcing the importance of sustainability.

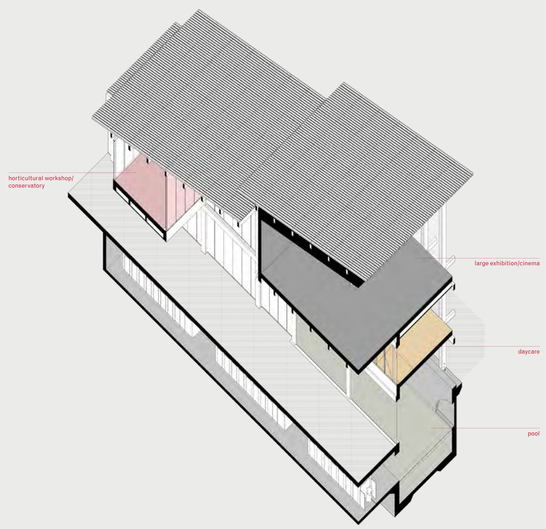
REDUCE - reduce energy consumption by:
- additional insulation
- increased quality of fenestration (low-E argon windows)
- application of low temperature heating and cooling distribution (radiant floor)
- rainwater collection
- task-based LED lighting levels

RENEW - apply renewable energy via:
- PV cells
- mechanical ventilation with heat recovery (MVHR)
- geothermal heat pump

ADAPT - allow passive systems through:
- sustainable drainage system (SUD)
- irrigation via green roof and bioswale
- night purging
- daylight presence sensors
- thermal mass



DIAGRAMS
ZONE-DIVIDED FUNCTIONS
SCALE: N/A



AXONOMETRIC NE
BLOCK B
SCALE: N/A

BUILDING FABRIC

As the building fabric (facade and roof) forms an interface between inside and outside, its construction influence many aspects its performance, experience of occupants, and energy efficiency. Underlying the zero-energy concept, which also includes user-induced energy consumption, is the passive house concept and a photovoltaic system to integrate in the large roof surfaces to ensure an adequate energy production off-grid. The configuration of the slopes of the roofs provides the opportunity for the installation of solar photovoltaic PV cells whilst natural light reduce the demand for artificial lighting use. Operable full height windows and shutters allow ventilation and shading as desired by the users.

PREFABRICATION
lightweight prefabricated glulam and CLT elements provide thermal insulation values while offset installation costs.

RAINSCREEN CONSTRUCTION
vertical cladding with rear ventilation layer ensure protection from weather while the polyfunctionality of structure, air-tightness, vapour barrier, and insulation are integrated in exterior facing walls that run the full height of the building on the east side.

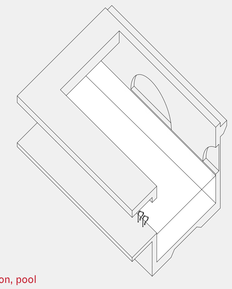
STANDARDISED WINDOWS
low-E argon-filled double glazing units (OKALUX) provide visibility and supreme thermal insulation

solar control glass to minimise excess solar gain

standardized sizing ensures recyclability and contributes to circular economy

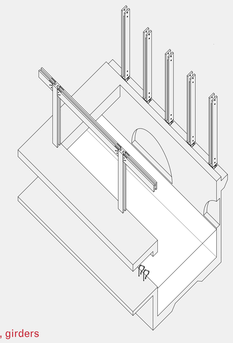
PRECEDENTS AND SYSTEMS

The creation of a solid base maximises the volume of the long basement pool that provides contrasting spatial qualities to the light weight timber construction above. Owing to its high thermal mass and the evaporative cooling effect of water, a microclimate occurs interseasonally.



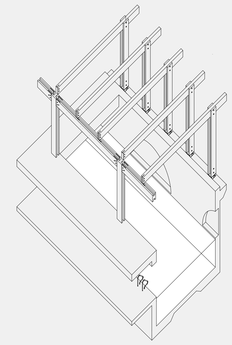
Foundation, pool -1

Standardisation improves efficiency on several levels from transportation to construction. Prefabricated glulam elements make up the complete skeleton of the Commons.



Columns, girders 0

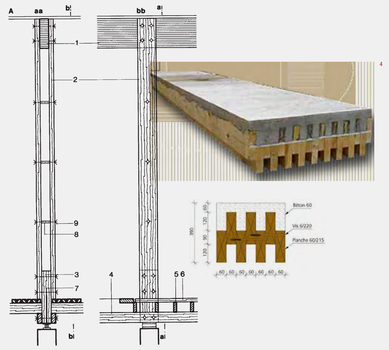
H-profiled linear members secured by metal components allow the reduction of materials and construction time. "Keys", "slots", and "knife plates" are part of the vocabulary of such components.



Beams 0

1

2



3

1 'Caravaggio', film still
Derek Jarman
1986

2 Youth Village
R. Schweitzer
Cieux, France
1985

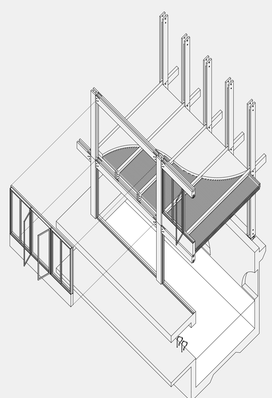
3 Youth Village
R. Schweitzer
Cieux, France
1985

4 Wood and concrete hybrid floor system

5 Junko Fukutake Hall
SANAA
Okayama, Japan
2010-2013

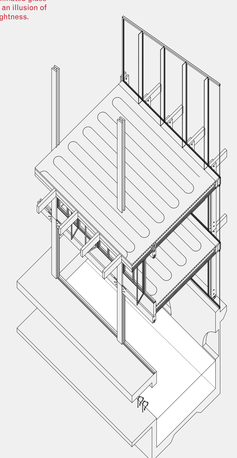
6 Viggo6
Arrhov Frick
Värmdö NV, Sweden
2016

All building components, including the floor structure, are prefabricated. The construction process is perceptible in the building's appearance, with its deliberately expressed materiality and well-proportioned façade.



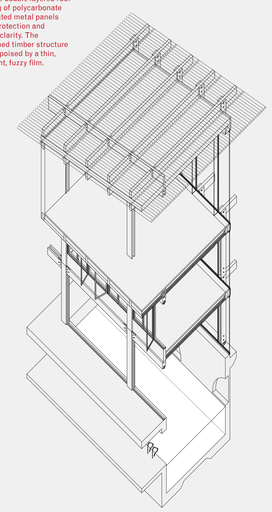
Prefabrications, hybrid floors +1

Two materials, wood and glass, enable verticality and view; the importance of western glazed façade as a lightweight construction is emphasised by the tall laminated glass fins that give an illusion of impossible lightness.



Glazed façade +2

Finally, the double layered roof consisting of polycarbonate and insulated metal panels ensures protection and aesthetic clarity. The dimensioned timber structure is counterpoised by a thin, transparent, fuzzy film.



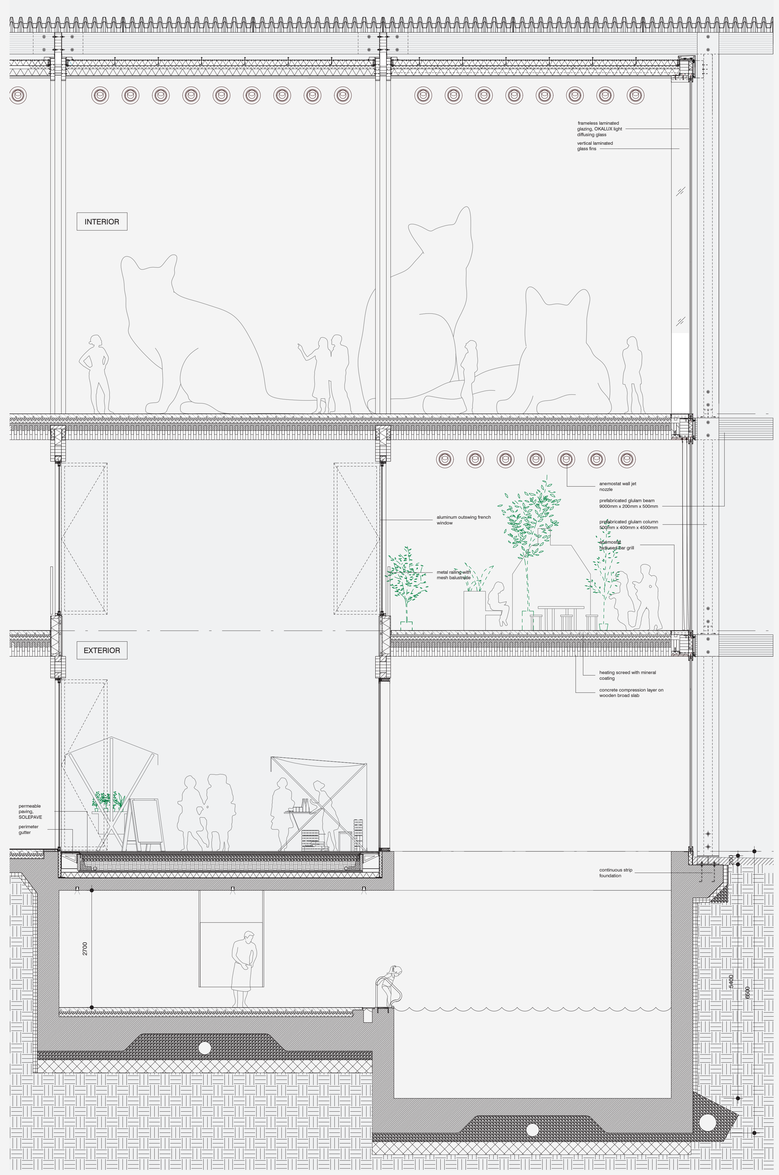
Roof +2

Studio: AR3AP131 Public Building MSc3 2019/2020
Name: Yuncheng Deng
Student Number: 4892852

TU Delft
Tutors: Paul Kuitenbrouwer, Gilbert Koskamp
Location: Skydebanehaven, Vesterbro, Copenhagen, Denmark

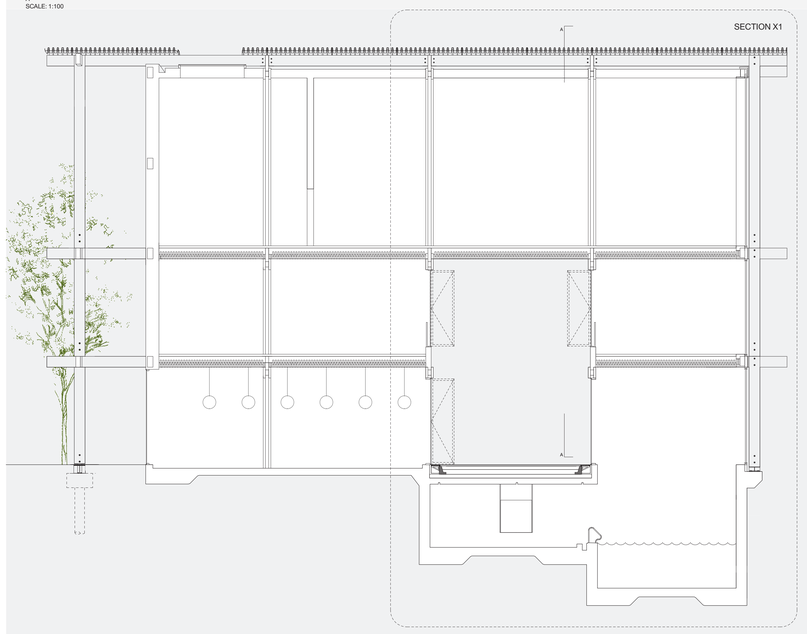
Date: 09.07.20
Format: A0
Scale: As indicated

SECTION
A
SCALE: 1:100



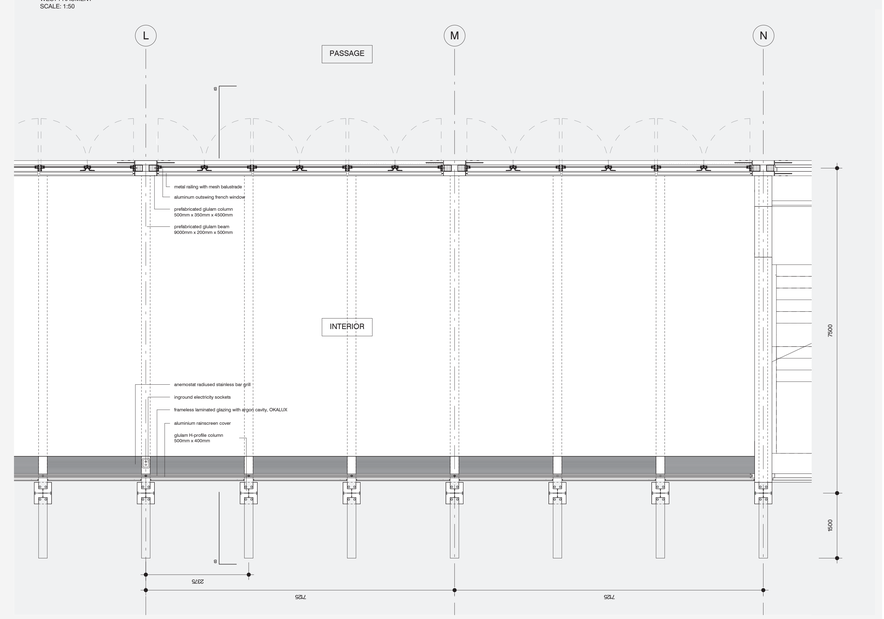
SECTION CALLOUT
X1
SCALE: 1:50

ELEVATION
WEST FRAGMENT
SCALE: 1:50



CROSS SECTION
GENERAL
SCALE: 1:100

VISUALISATION
PASSAGE TOWARDS SOUTH
SCALE: N/A



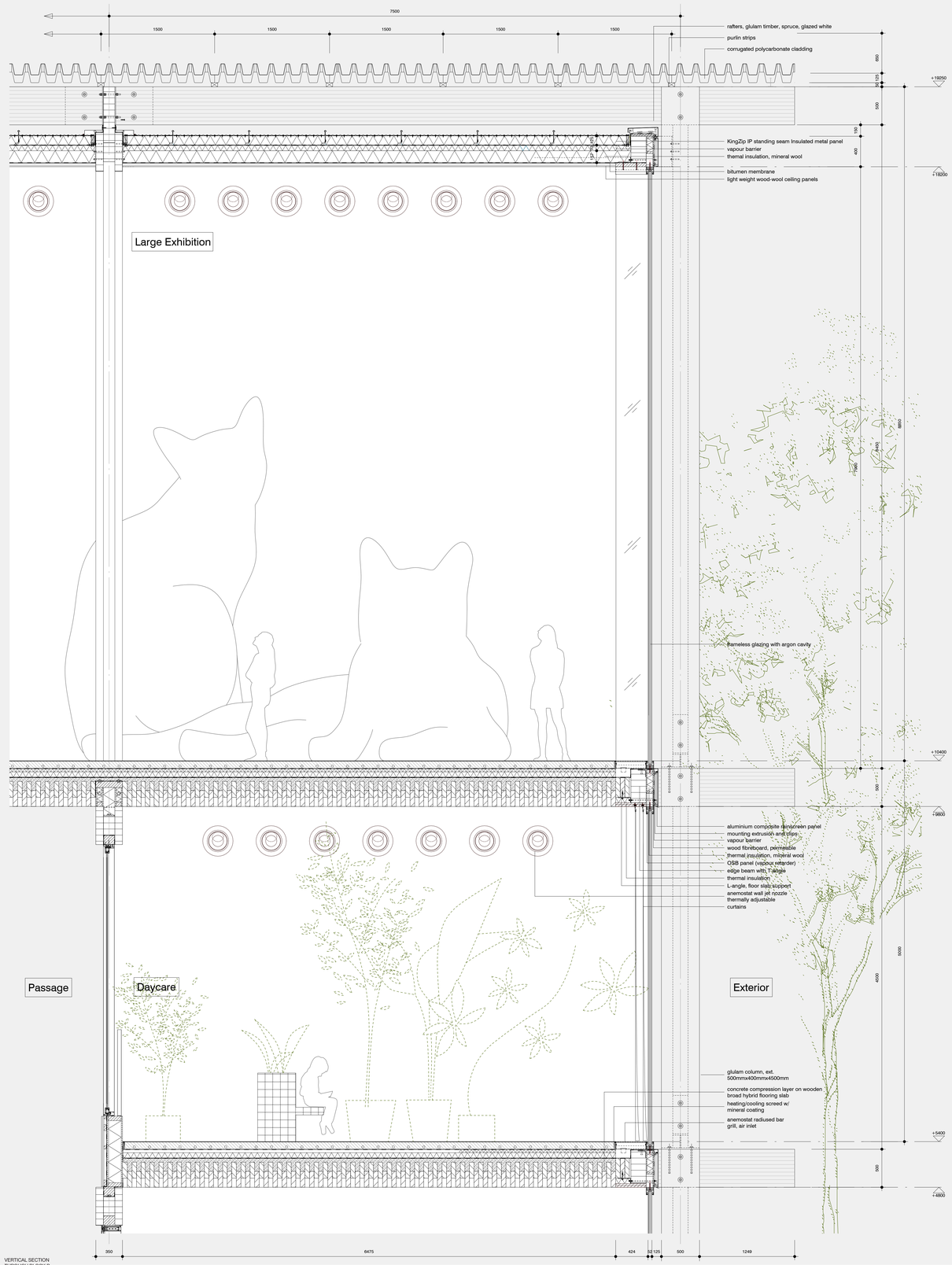
HORIZONTAL SECTION
BLOCK B, TYP.
SCALE: 1:50

A202 BUILDING FRAGMENT

Studio: AR3AP131 Public Building MSc3 2019/2020
Name: Yuncheng Deng
Student Number: 4892852

TU Delft
Tutors: Paul Kuitenbrouwer, Gilbert Koskamp
Location: Skydebanehaven, Vesterbro, Copenhagen, Denmark

Date: 09.07.20
Format: A0
Scale: As indicated



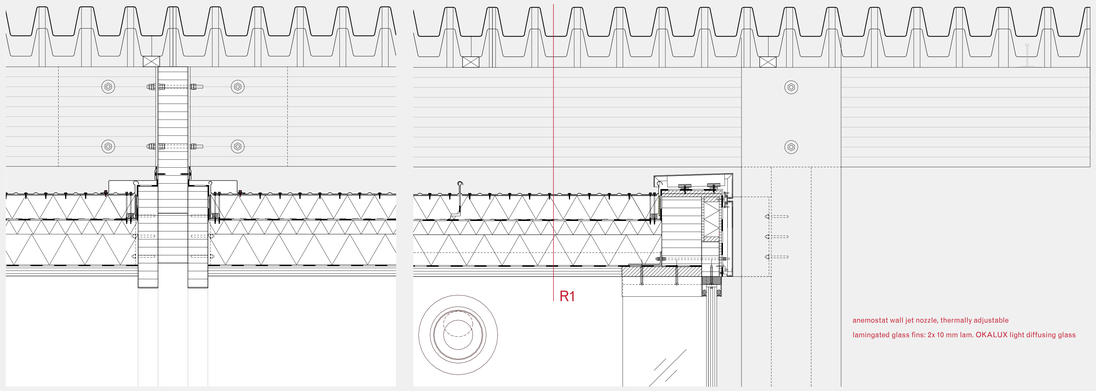
VERTICAL SECTION
THROUGH BLOCK B
SCALE: 1:20

A203 VERTICAL SECTION

Studio: AR3AP131 Public Building MSc3 2019/2020
Name: Yuncheng Deng
Student Number: 4892852

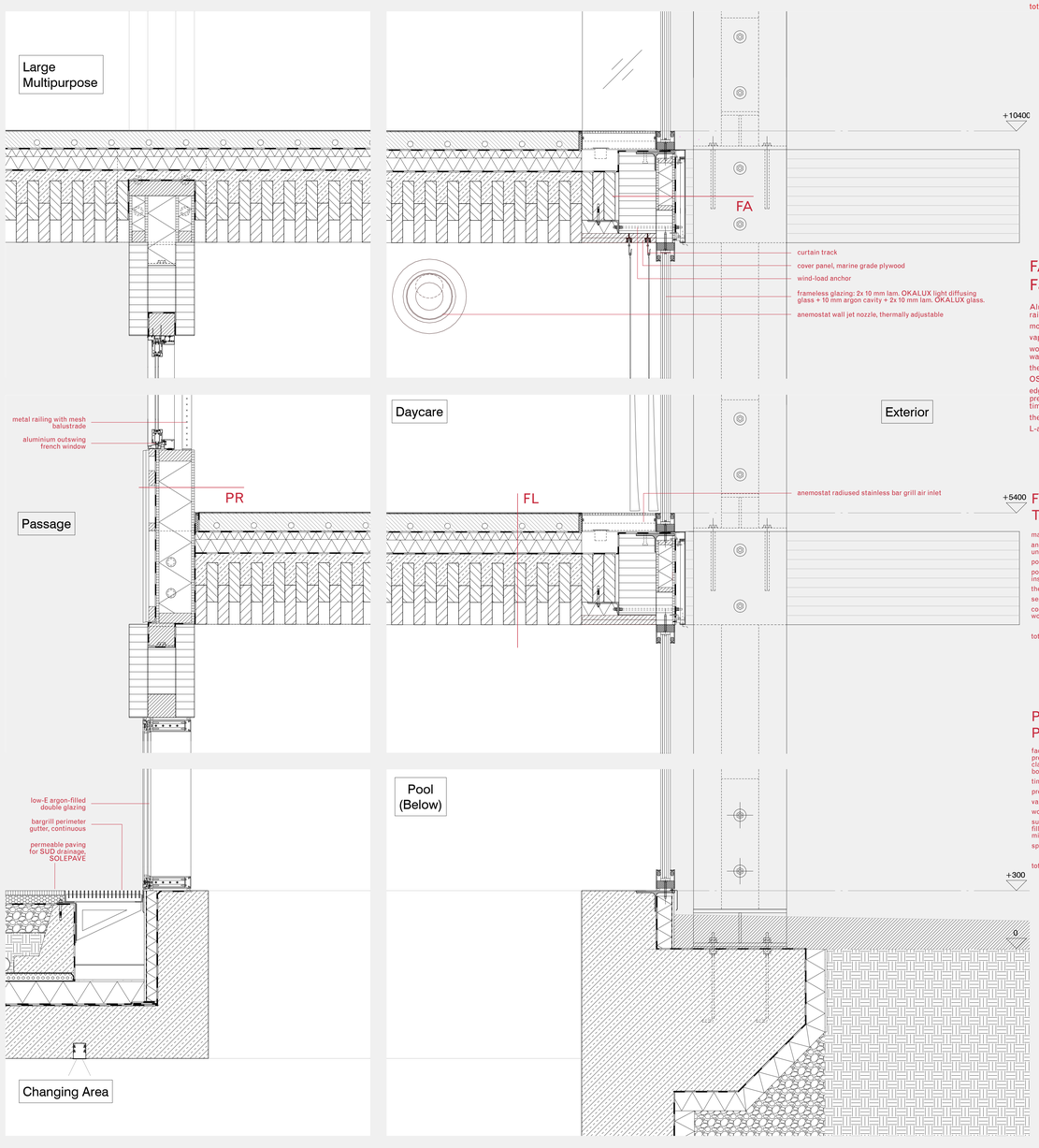
TU Delft
Tutors: Paul Kuitenbrouwer, Gilbert Koskamp
Location: Skydebanehaven, Vesterbro, Copenhagen, Denmark

Date: 09.07.20
Format: A0
Scale: As indicated



R1
Roof

corrugated polycarbonate cladding	125mm (W1500mm)
purlin strips	50mm
rafters, prefabricated glulaminated timber, spruce, glazed white	200/500mm
KingZip IP standing seam Insulated metal panel	125mm
vapour barrier	-
thermal insulation, mineral wool, pressure-resistant	70mm
thermal insulation, mineral wool, pressure-resistant	160mm
waterproofing	-
bitumen membrane	-
light weight wood-wool ceiling panels	50mm
total (net)	1080mm



FA
Facade Assembly

Alucobond aluminium composite rainscreen panel	25mm
mounting extrusion and clips	35mm
vapour barrier	-
wood fibreboard, permeable, waterproof	15mm
thermal insulation, mineral wool	75mm
OSB panel (vapour retarder)	15mm
edge beam with T angle, prefabricated glulaminated timber, spruce, glazed white	200mm/440mm
thermal insulation	70mm/200mm
L-angle, floor slab support	70mm/170mm

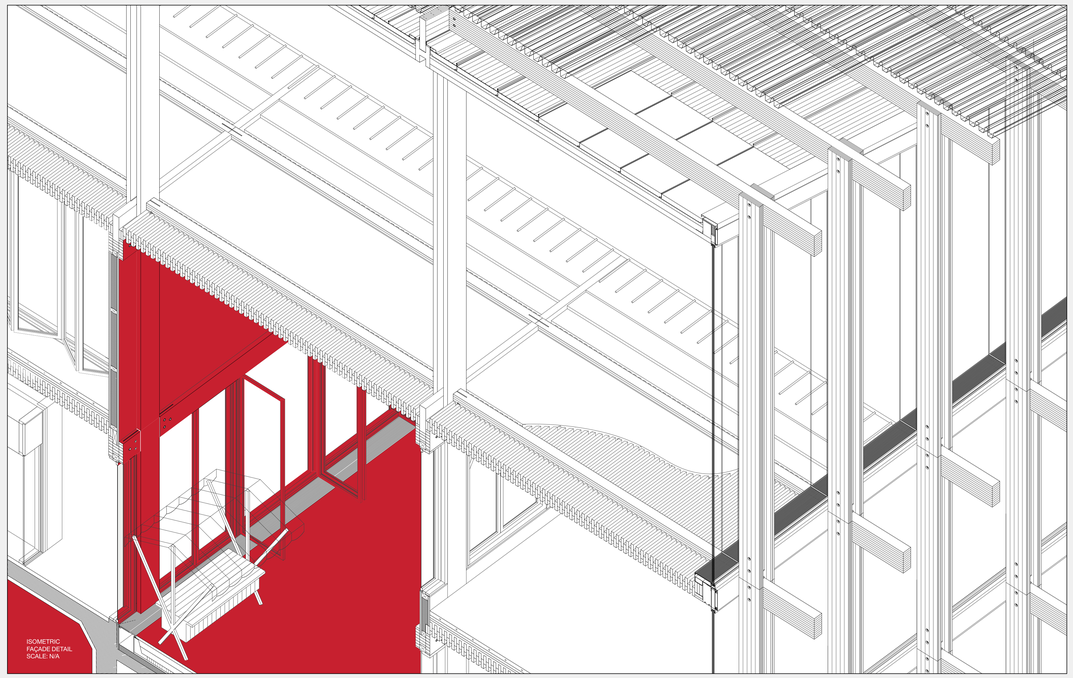
FL
Typical Floor

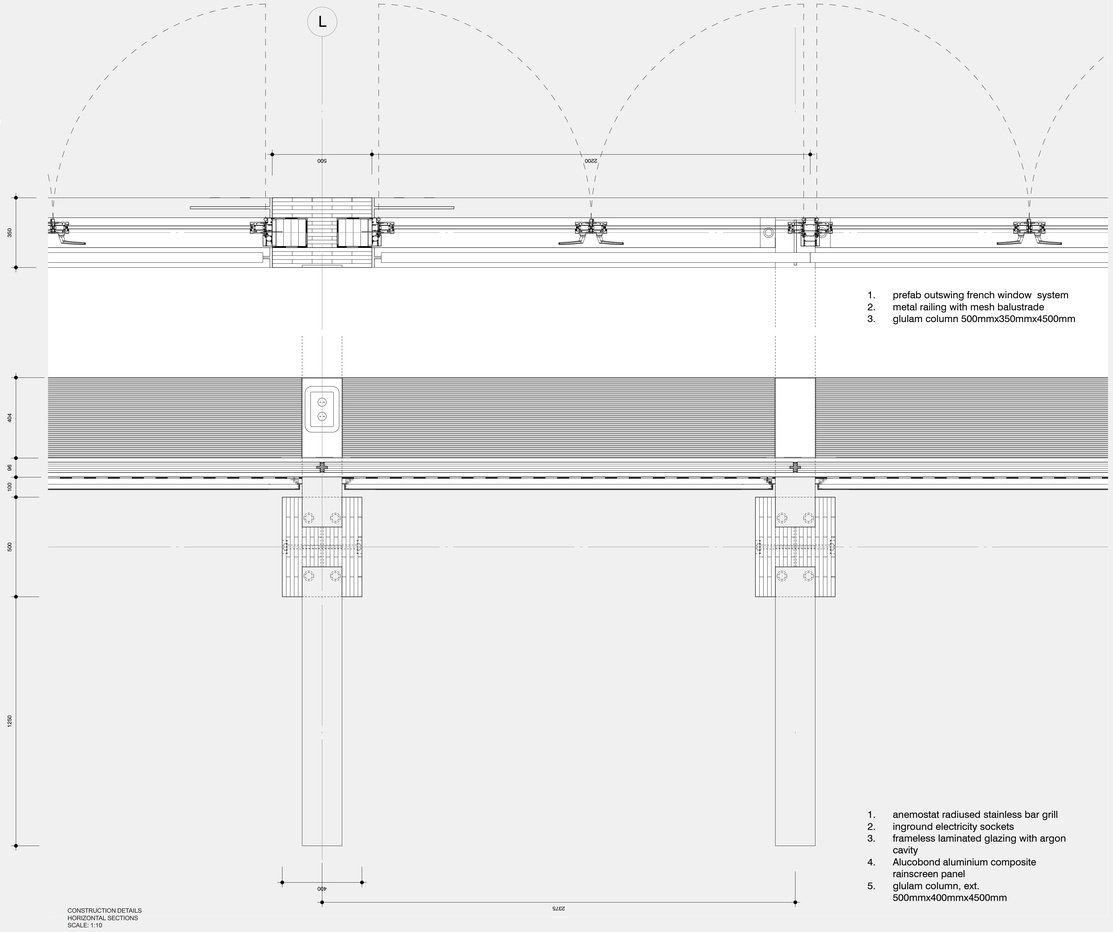
magnesite screed	15mm
anhydrite screed with underfloor heating	85mm
polythene foil	-
polystyrene impact-sound insulation	45mm
thermal insulation, leveling	70mm
separation layer PE foil, two ply	-
concrete compression layer on wooden broad hybrid flooring slab	385mm
total (net)	600mm

PR
Prefab Element

facade element hung over prefabricated panel system: cladding spruce, with different board widths	30mm
timber batten	
prefab panel system:	40mm
vapour barrier	-
wood fibreboard, permeable	15mm
supporting structure, spruce, filled with thermal insulation, mineral wool	175mm
spruce inter cladding	15mm
total (net)	275mm

CONSTRUCTION DETAILS
THROUGH BLOCK B
SCALE: 1:10





CONSTRUCTION DETAILS
HORIZONTAL SECTIONS
SCALE: 1:10

A204 DETAILS

Studio: AR3AP131 Public Building MSc3 2019/2020
Name: Yuncheng Deng
Student Number: 4892852

TU Delft
Tutors: Paul Kuitenbrouwer, Gilbert Koskamp
Location: Skydebanehaven, Vesterbro, Copenhagen, Denmark

Date: 09.07.20
Format: A0
Scale: As indicated