

WHY
WHAT
DESIGN QUESTION
PREFABRICATION
LOCATION
URBAN DESIGN
RESEARCH BY DESIGN
ARCHITECTURAL DESIGN

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Architectural Engineering offered a chance to **tackle the struggles of our time** like the housing crises and the climate change effects, **with the strengths of our time**: technological developments, and industrial produce. All this is **done within the architectural field**, thus with the need of considering the societal and esthetical impacts of the solutions.

HOUSING CRISIS

HOUSING SHORTAGE
BUILDING LAWS
PREOCCUPIED BUILDERS
MATERIAL PRICES AND AVAILABILITY
HOUSING PRICES

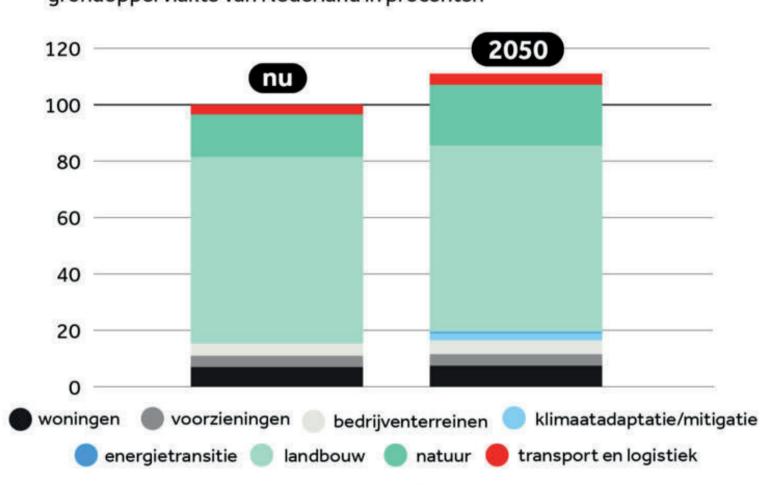


Highrise campsite, Willem de Haan 2023

SPACE SHORTAGE

HOUSING
SERVICES
INDUSTRY
CLIMATE ADAPTATION
ENERGY TRANSITION
ARGICULTURE
NATURE
TRANSPORT

Ruimteverdeling als alle plannen doorgaan grondoppervlakte van Nederland in procenten



Wageningen Universiteit, 2023

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DENSIFY THE URBAN AREAS



Studio 216, 2020

DENSIFY THE URBAN AREAS



College van Rijksadviseurs, 2010

DENSIFY THE URBAN AREAS







OLD CITY CENTRES

WORKING CLASS DISTRICTS

POST WAR NEIGHBORHOODS

Flying Holland, 2024

DENSIFY THE URBAN AREAS. WITH WHAT?





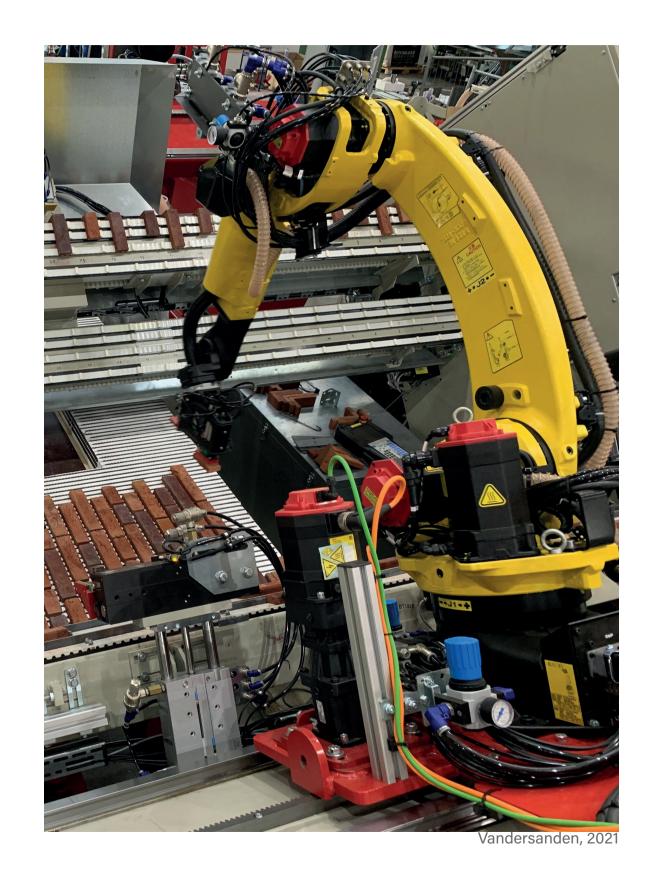


OLD CITY CENTRES

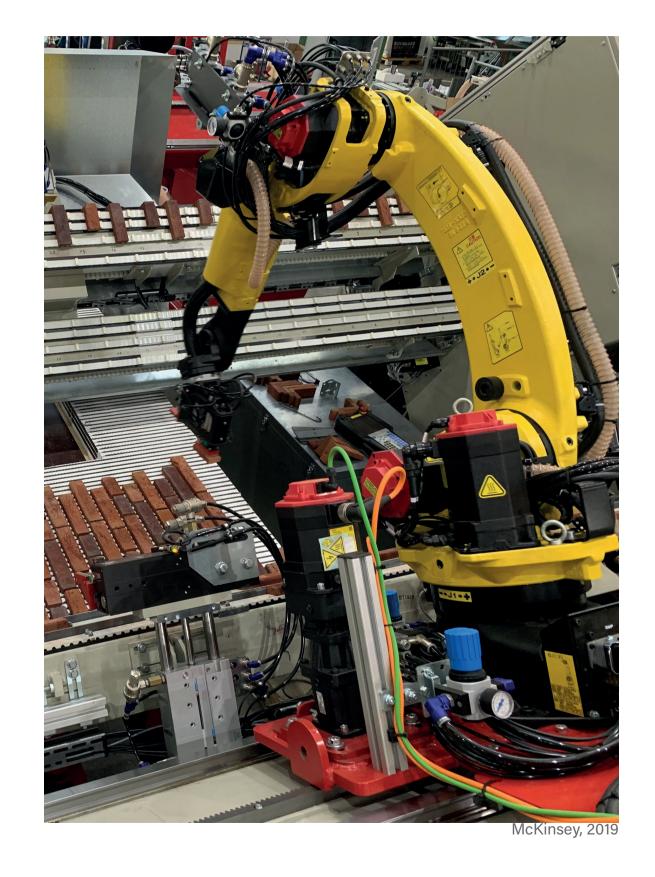
WORKING CLASS DISTRICTS

POST WAR NEIGHBORHOODS

Flying Holland, 2024

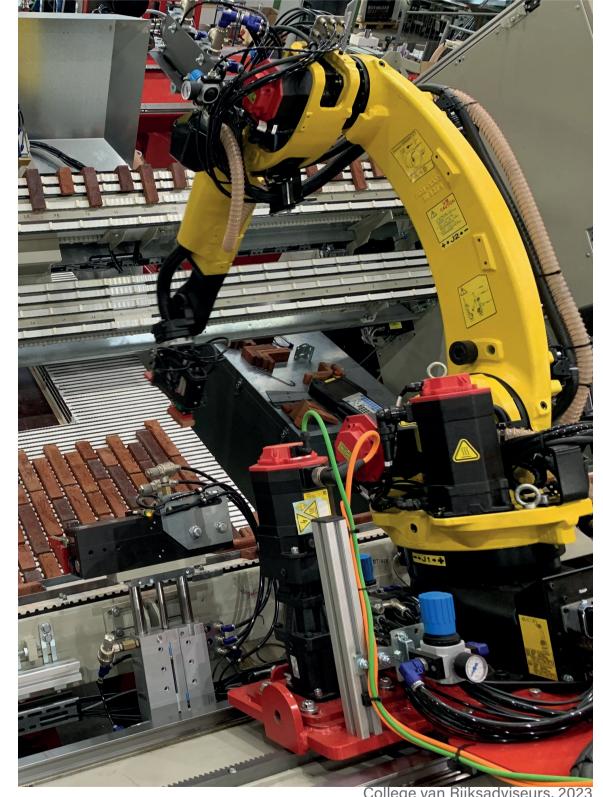


PROTECTED CIRCUMSTANCES
50% POSSIBLE TIME SAVING IN BUILDING PERIOD
20% REDUCED COSTS
MACHINE INSTEAD OF MAN
EFFICIENT IN MATERIAL USE



PROTECTED CIRCUMSTANCES
50% POSSIBLE TIME SAVING IN BUILDING PERIOD
20% REDUCED COSTS
MACHINE INSTEAD OF MAN
EFFICIENT IN MATERIAL USE

60% LESS TRAFFICMOVEMENT NEEDED 80% LESS ENERGY NEEDED ON SITE 90% WASTE REDUCTION ON SITE LESS NOISE ON THE CONSTRUCTION SITE



Jollege vari nijksauviseurs, 2023

CURRENT PREFAB







LOTS OF FACADE OPTIONS

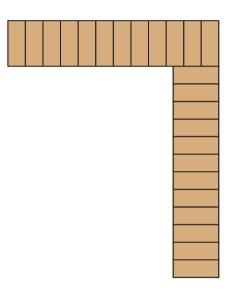
LITTLE VARIETY IN URBAN FORM

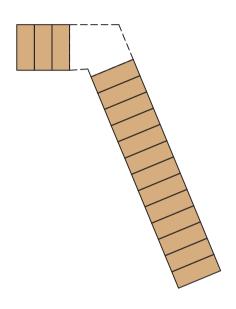
Conceptenboulevaard, 2024

THE CHALLENGE

90 DEGREES

CONNECTION POINT



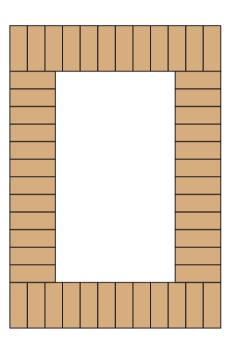


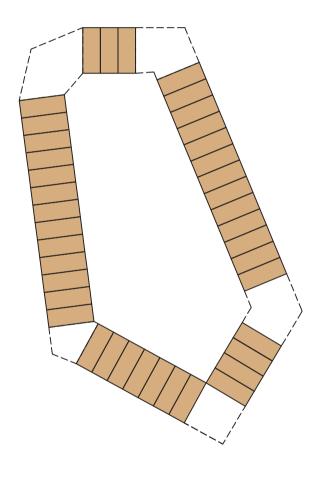
THE CHALLENGE

90 DEGREES

CONNECTION POINT

TO FIT IN YOU NEED TO BE FLEXIBLE



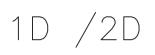


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How can we **integrate prefabricated housing** into the **existing urban fabric** in a way that the design finds **connection with** and **enhances its surroundigs**?

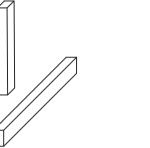
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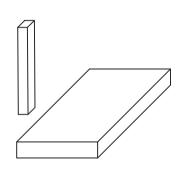
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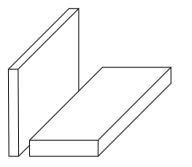


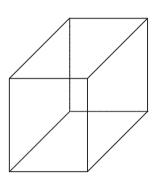


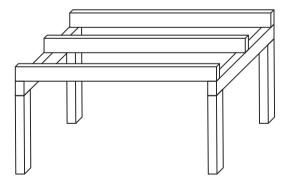


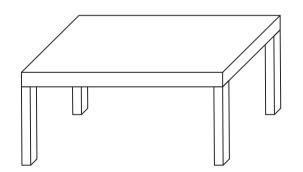


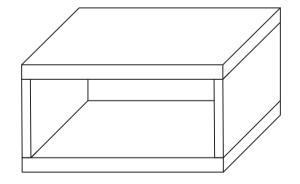


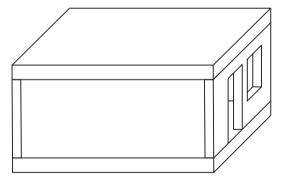














1D

2D

16mm thex

Nationalizer

Vertical section

Type C - walls

3D

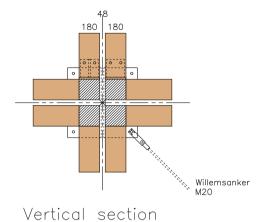
3D impression steel knots

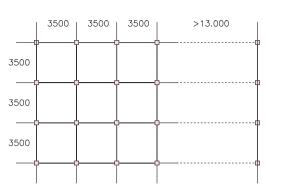
CIRCLE WOOD

STORAENSO FINCHBUILDINGS

Low Degree of prefabrication High

1D - CIRCLE WOOD





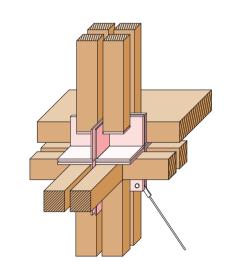
Grid

always 3500mm

Length: flexible, preferred 7000mm (3500x2)

max 13.000mm

Height: >3100mm



Possible layers:

3 - 15

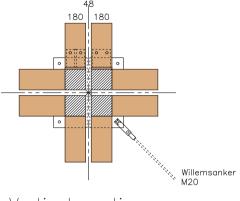
3D impression steel knots

STEEL KNOT RIGID GRID FOR 1D METHOD

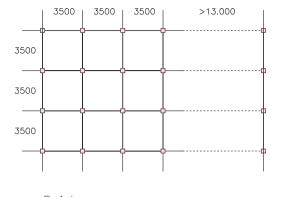
UP TO 15 LAYERS HIGH



1D - CIRCLE WOOD



Vertical section

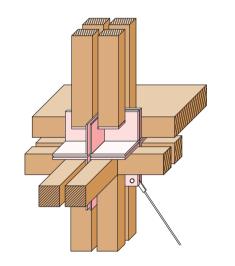


Grid

always 3500mm

Length: flexible, preferred 7000mm (3500x2) max 13.000mm

Height: >3100mm



3D impression steel knots

Possible layers:

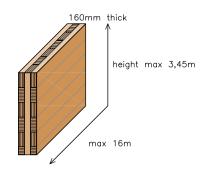
3-15



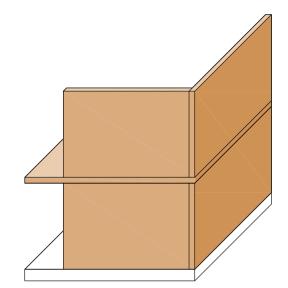
Degree of prefabrication High Low

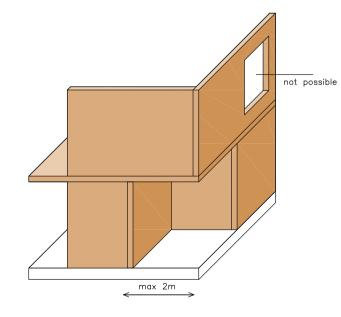
Circlewood, 2022

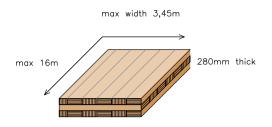
2D - STORAENSO



Type C - walls



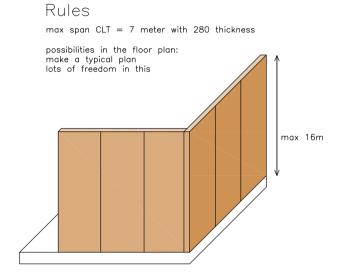




Type L - floors

Rules

place walls above eachothher
place windows above eachother



How many layers?

Low Degree of prefabrication

WALLS AND FLOORS

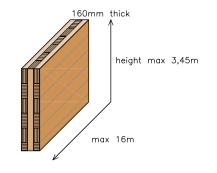
GREAT FLEXIBILITY IN DIMENSIONS

CANTILEVERS ARE POSSIBLE

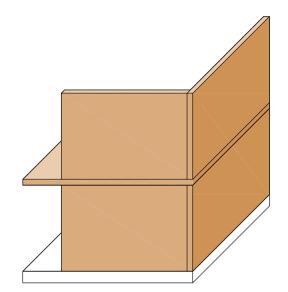
8 LAYERS HIGH

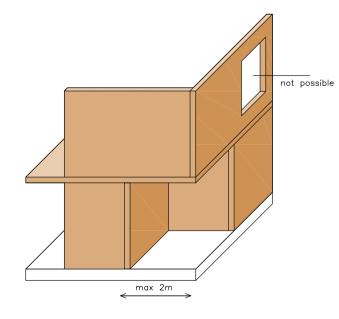
High

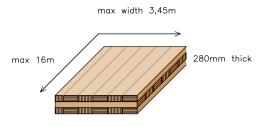
2D - STORAENSO



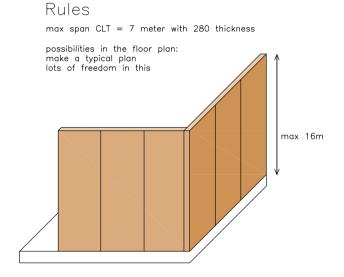
Type C - walls



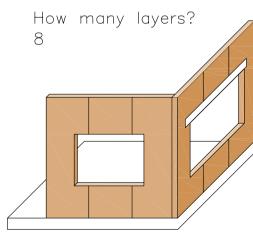




Type L - floors





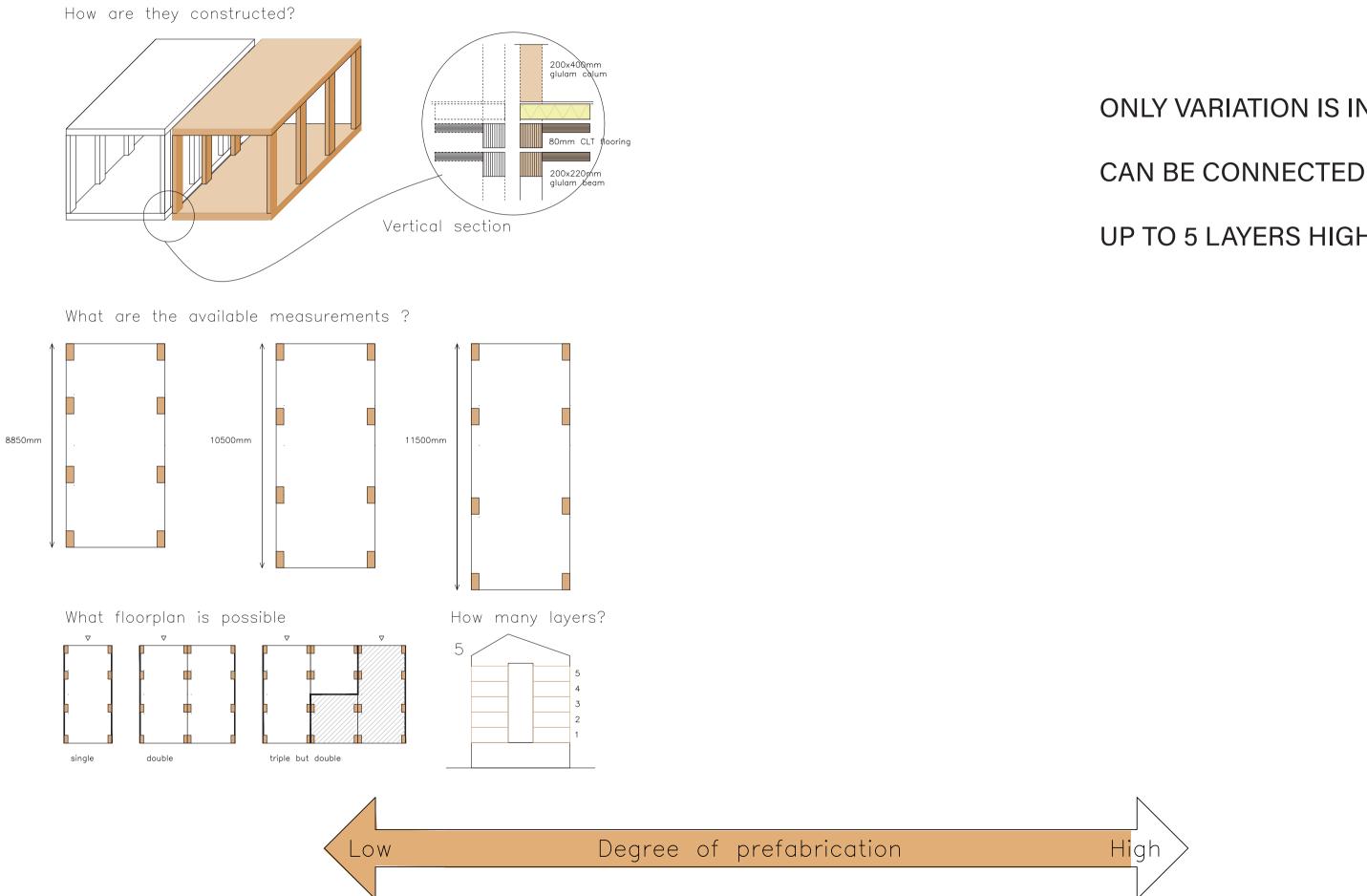




Low Degree of prefabrication High

ADmagazine, 2020

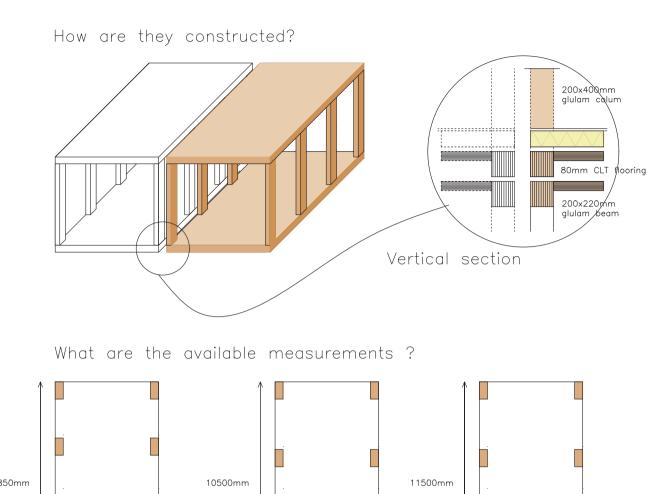
3D - FINCH BUILDING

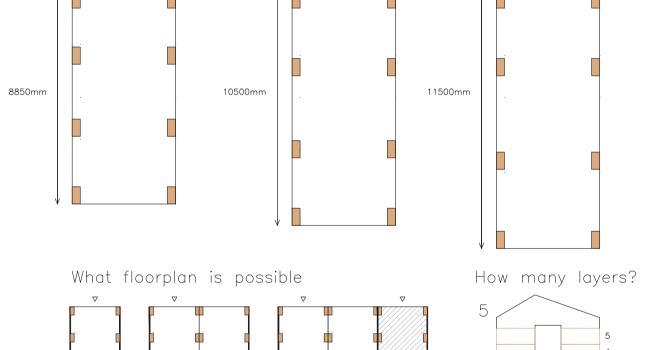


ONLY VARIATION IS IN LEGTH

UP TO 5 LAYERS HIGH

3D - FINCH BUILDING





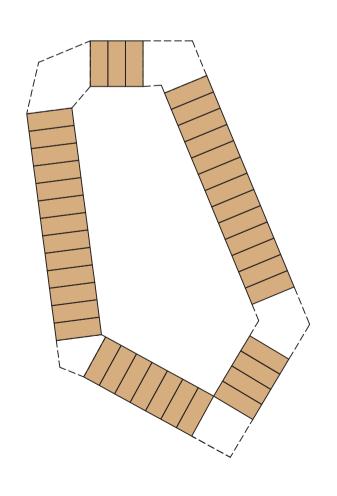


Low Degree of prefabrication High

Finchbuilding, 2023

WHICH ONE TO USE?

LOT OF REPETITION ALLREADY



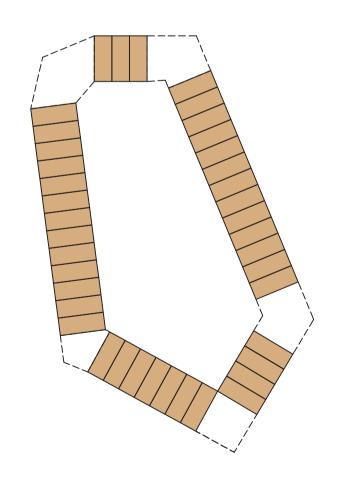
3D - FINCH BUILDING

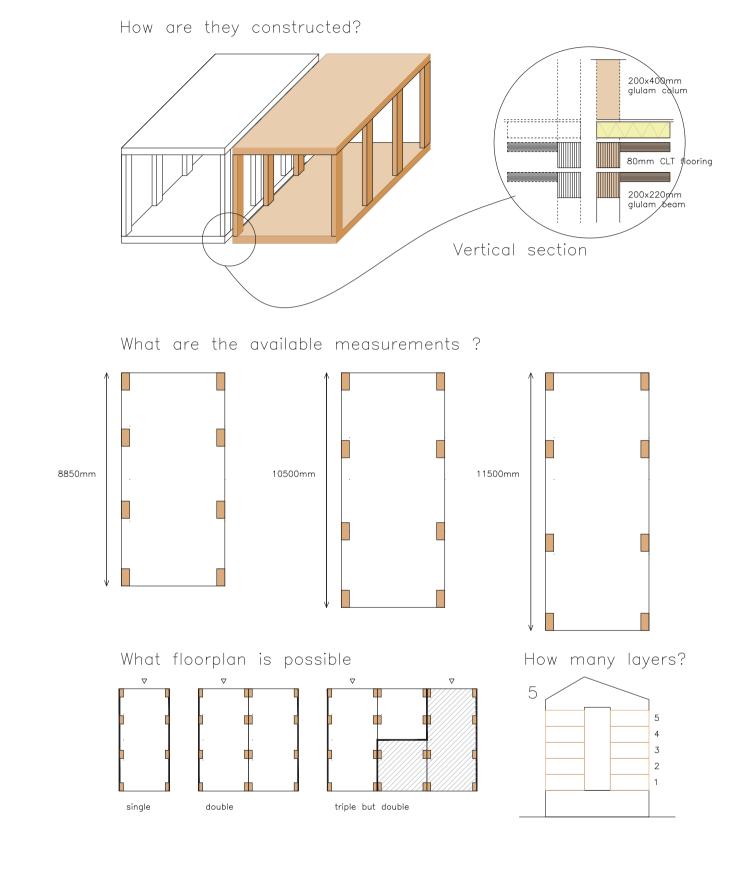
HIGHEST DEGREE OF PREFABRICATION

ENOUGH FREEDOM IN THE LAYOUT

VERY CLEAR CONSTRUCTION RULES TO ADAPT TO

CLEAR DESIGN LIMITATIONS





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SOUTH-HOLLAND

NUMBER OF HOUSES BUILD BEFORE 2030

ZUID HOLLAND 247.896

NOORD HOLLAND 183.600

NOORD BRABAND 31.000

UTRECHT 84.445



NUMBER OF HOUSES BUILD BEFORE 2030

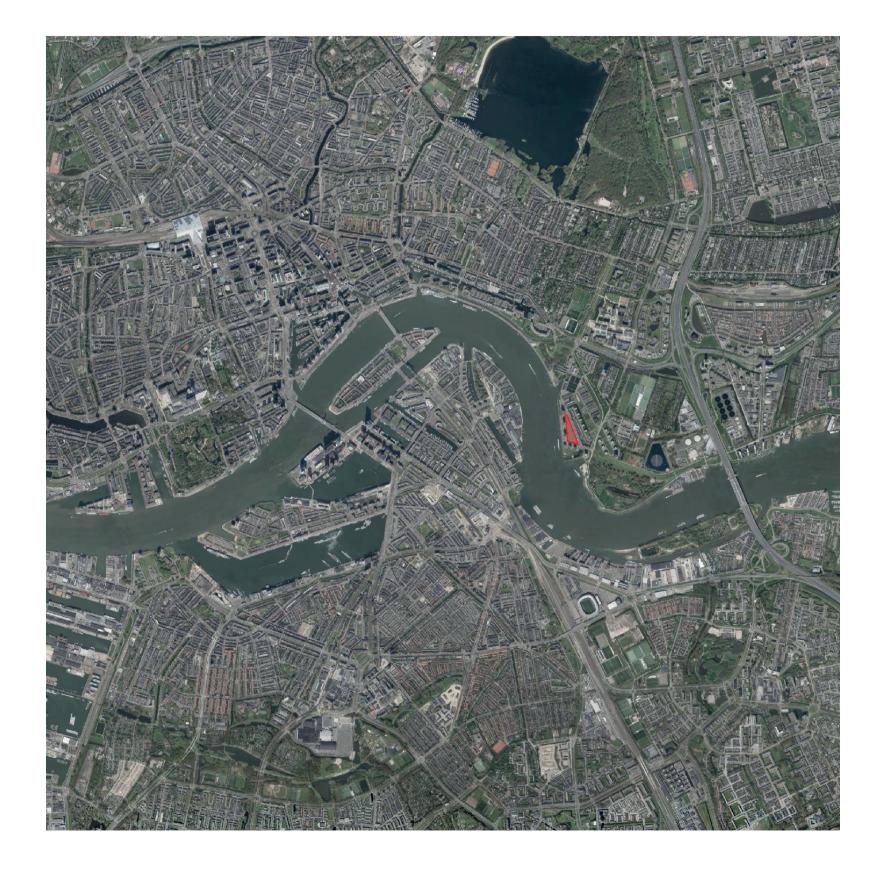
ROTTERDAM 98.641

HOOGLANDEN 74.445

HOLLAND RIJNLAND 39.005

MIDDEN HOLLAND 19.819

SAMENWERKEND 20.793



NEIGHBOURHOOD THE ESCH - municupality plans



NEIGHBOURHOOD THE ESCH - municupality plans



UPGRADE EXSITING PUBLIC TRANSPORT



CREATE NEW PUBLIC TRANSPORT



NEIGHBOURHOOD THE ESCH - municupality plans



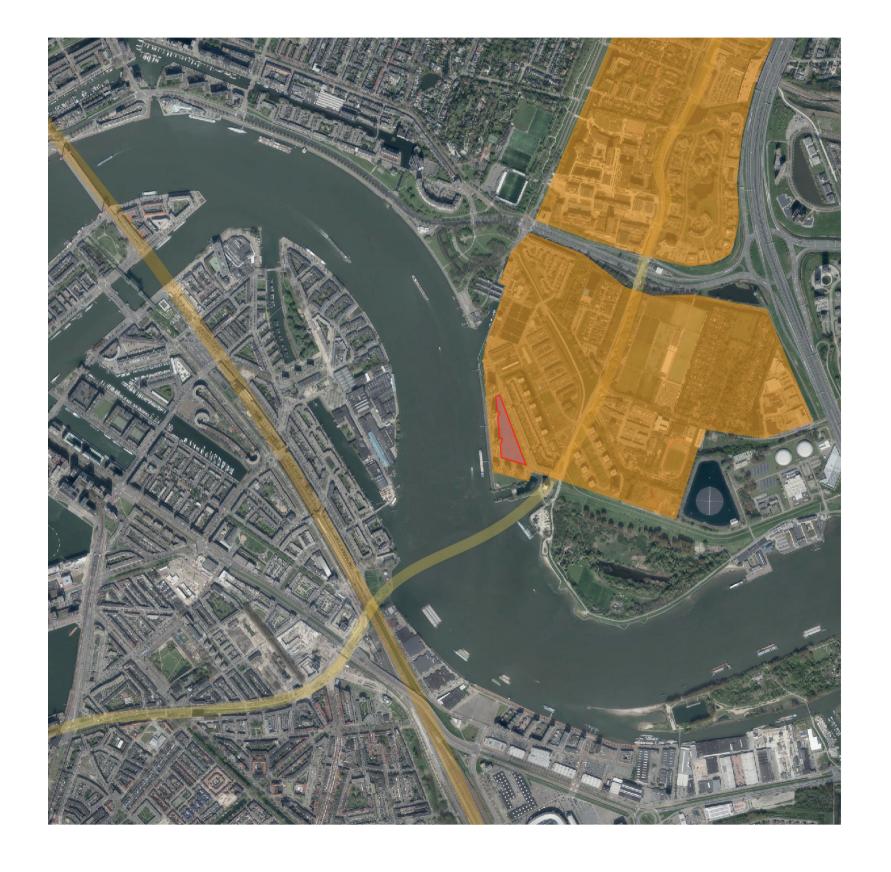
UPGRADE EXSITING PUBLIC TRANSPORT



CREATE NEW PUBLIC TRANSPORT



DENSIFY PLANS



ROTTERDAM

NEIGHBOURHOOD THE ESCH - municupality plans





DENSIFY PLANS







LOW QUALITY GREEN



















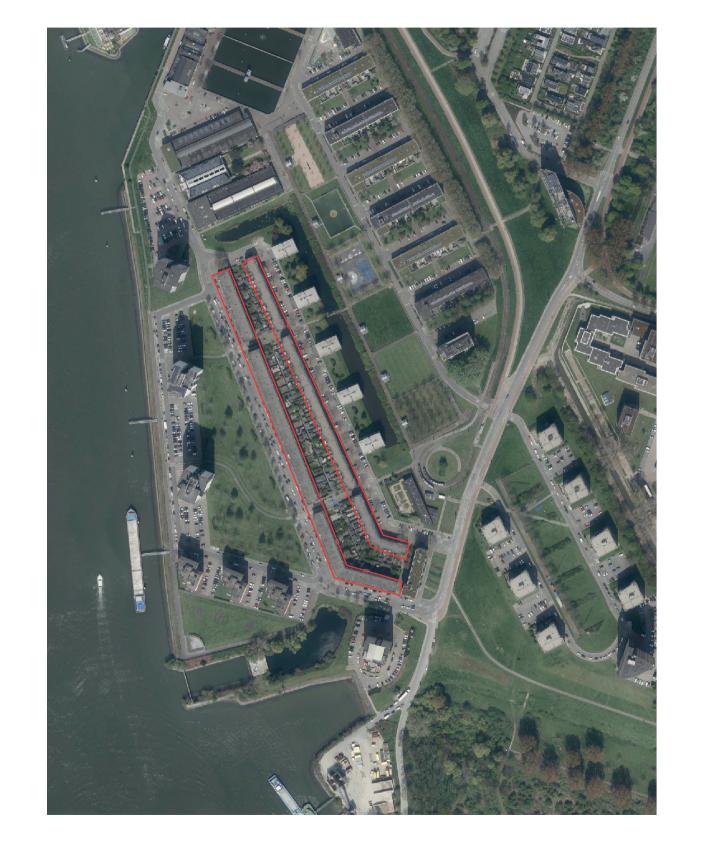












SUMMATION

HUMAN SCALE IS MISSING

CAR BASED URBAN PLAN

NO CONNECTION WITH THE MAAS



EVERY NEWBUILD PROJECT WITHIN THE CITY HAS TO CONSIDER THE FOLLOWING ASPECTS



THE COMPACT CITY

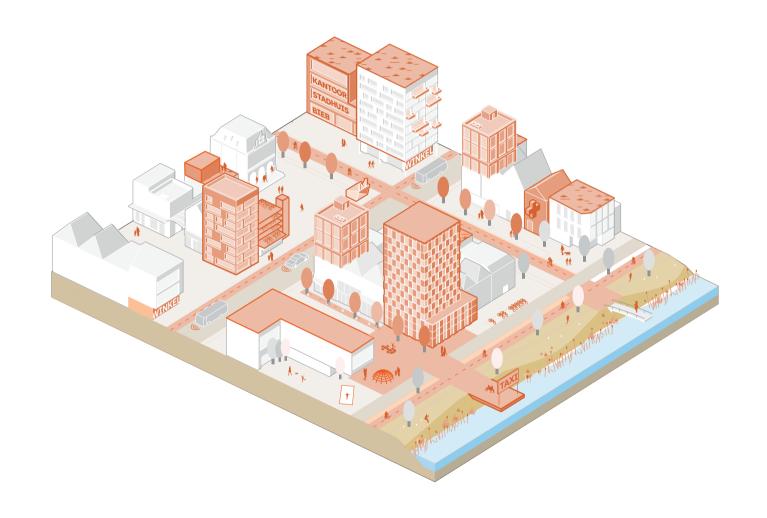
COMPACT AS MUCH AS POSSIBLE

MORE SPACE FOR BICYCLES AND PUBLIC TRANSPORT, LESS FOR THE CAR

LIVELY PLINTHS

PROXIMITY TO GREENERY

DEVELOP THE RIVER BOARDERS



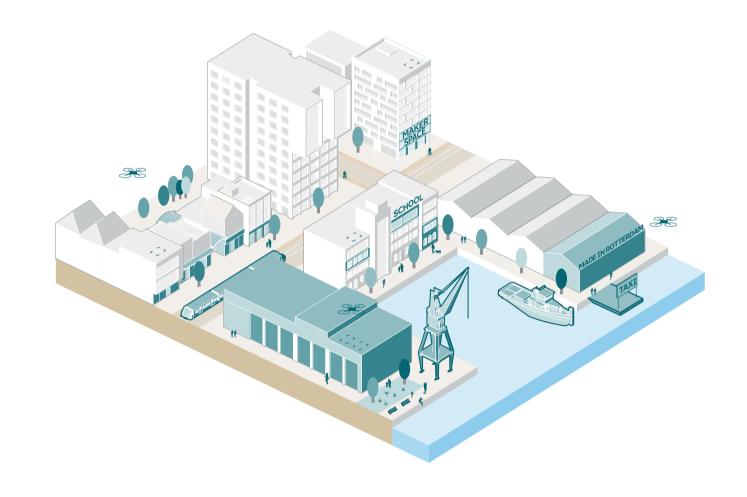
Gemeente Rotterdam, 2019

THE PRODUCTIVE CITY

AFFORDABLE WORKSPACE FOR SMALL/START-UP BUSINESSES

PROVIDING INSIGHT INTO THE CITY'S PORT IDENTITY

MEETING PLACES FOR KNOWLEDGE WORKERS



Gemeente Rotterdam, 2019

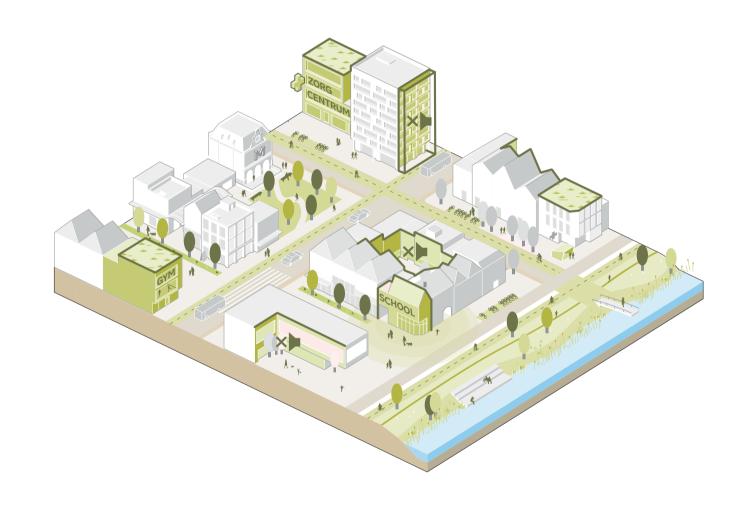
THE HEALTHY CITY

VIEW OF GREENERY

OUTDOOR SPORTS FACILITIES

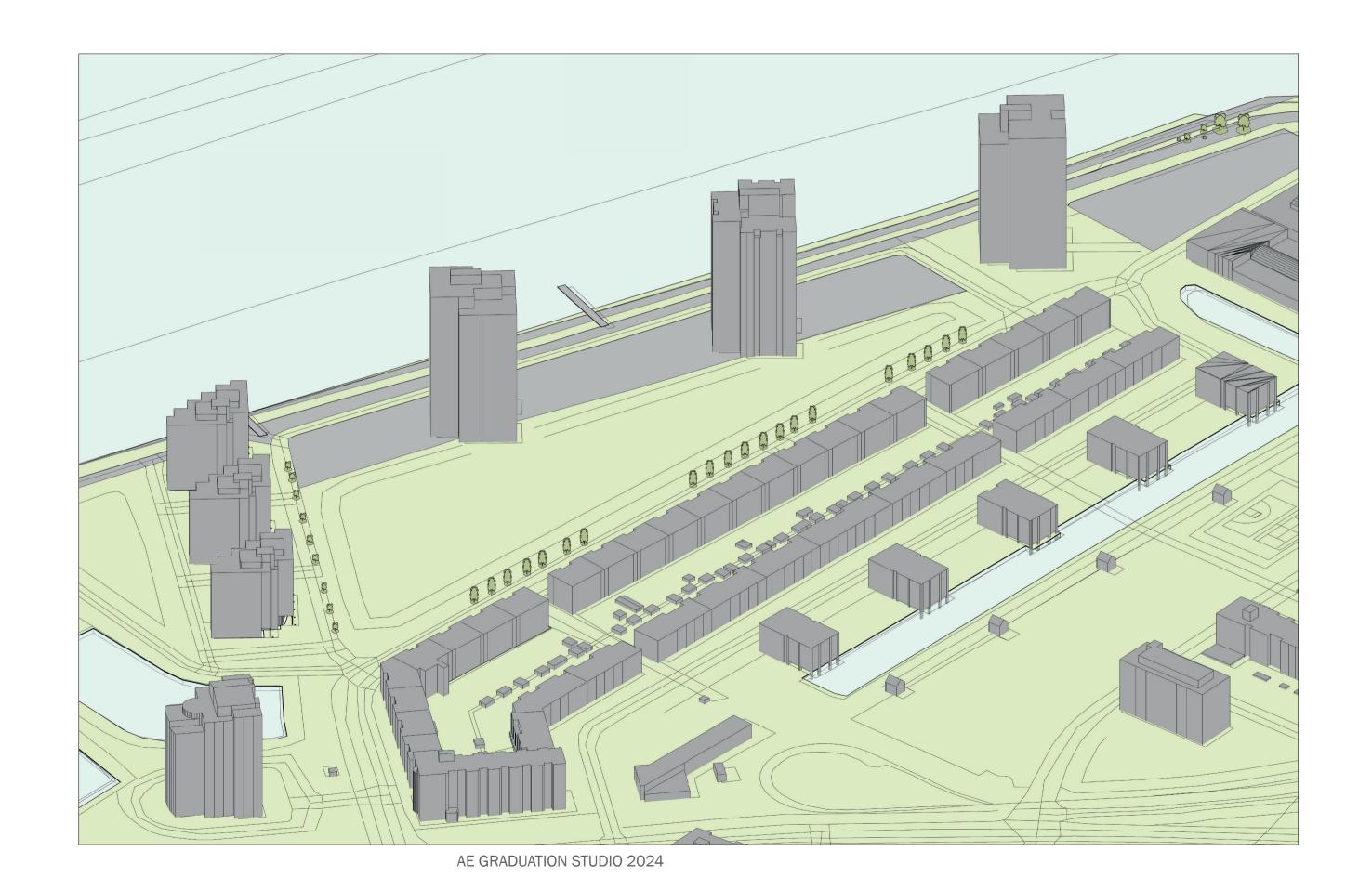
BALANCE PEACE AND HUSTLE (LOW-NOISE SIDE)

TIDAL PARK

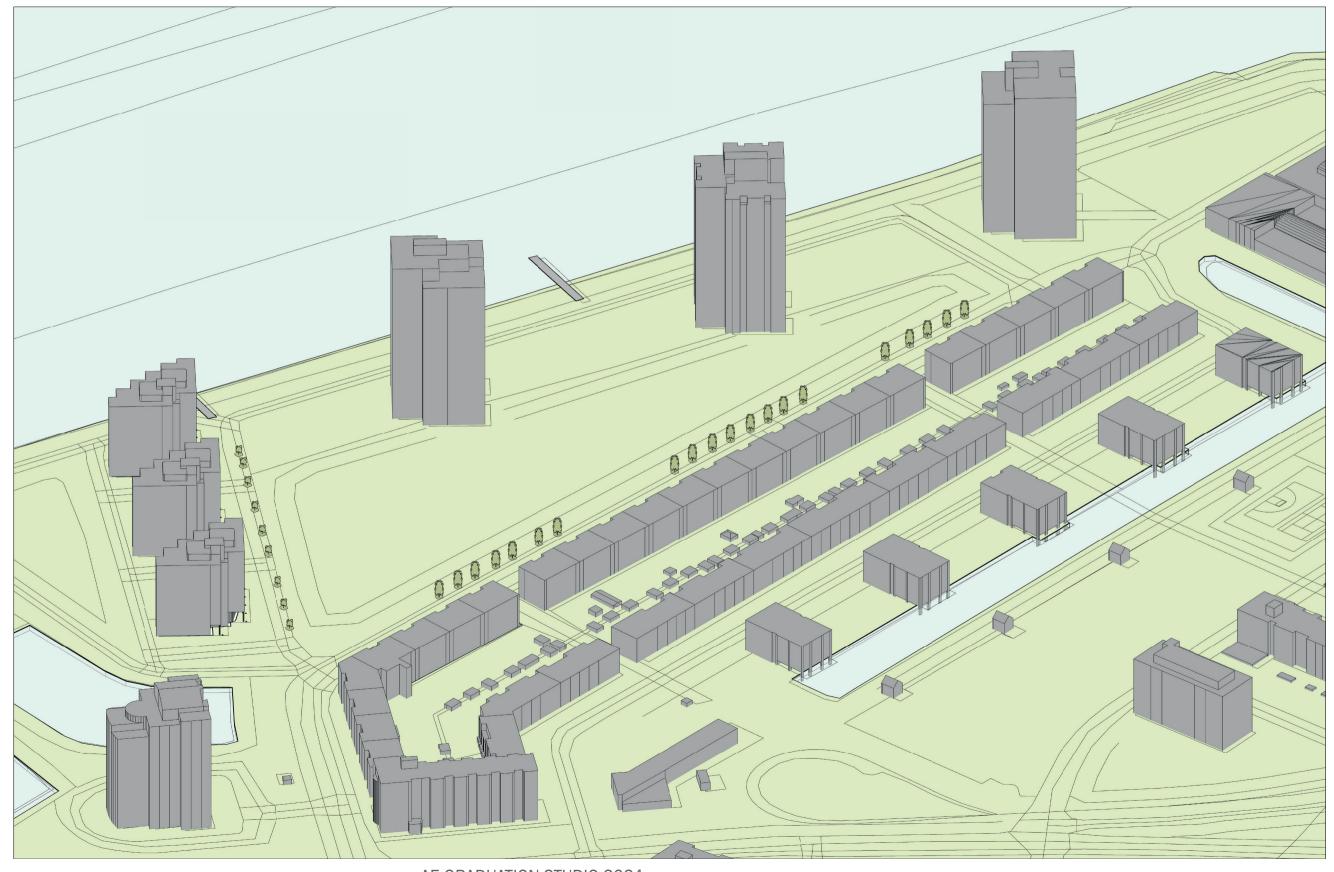


Gemeente Rotterdam, 2019

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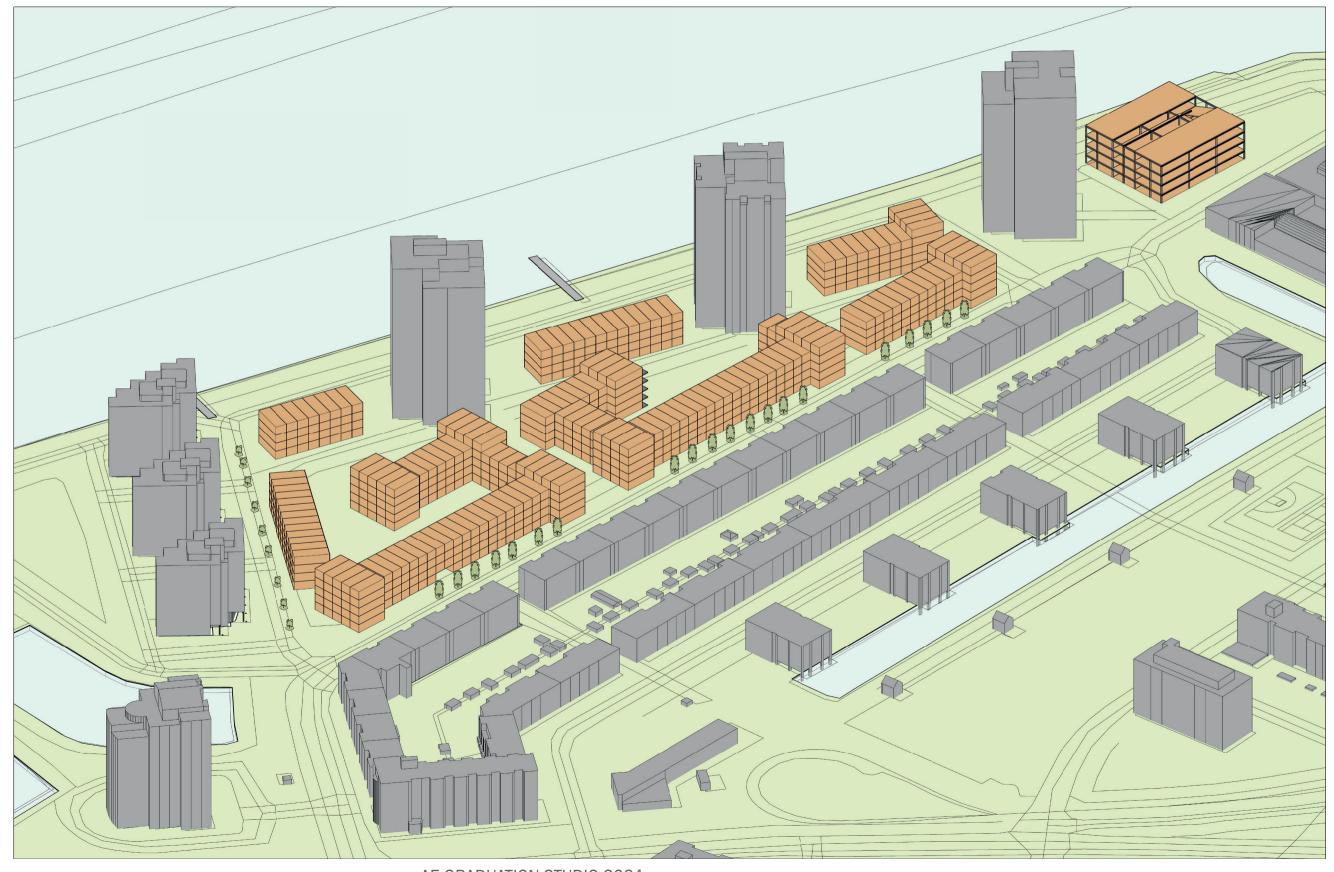


REMOVE OBSTRUCTION



REMOVE OBSTRUCTION

DENSIFY AS MUCH AS POSSIBLE



REMOVE OBSTRUCTION

DENSIFY AS MUCH AS POSSIBLE

ADD OTHER
DIVERSE
FUNCTIONS ON
UNIQUE PLACES

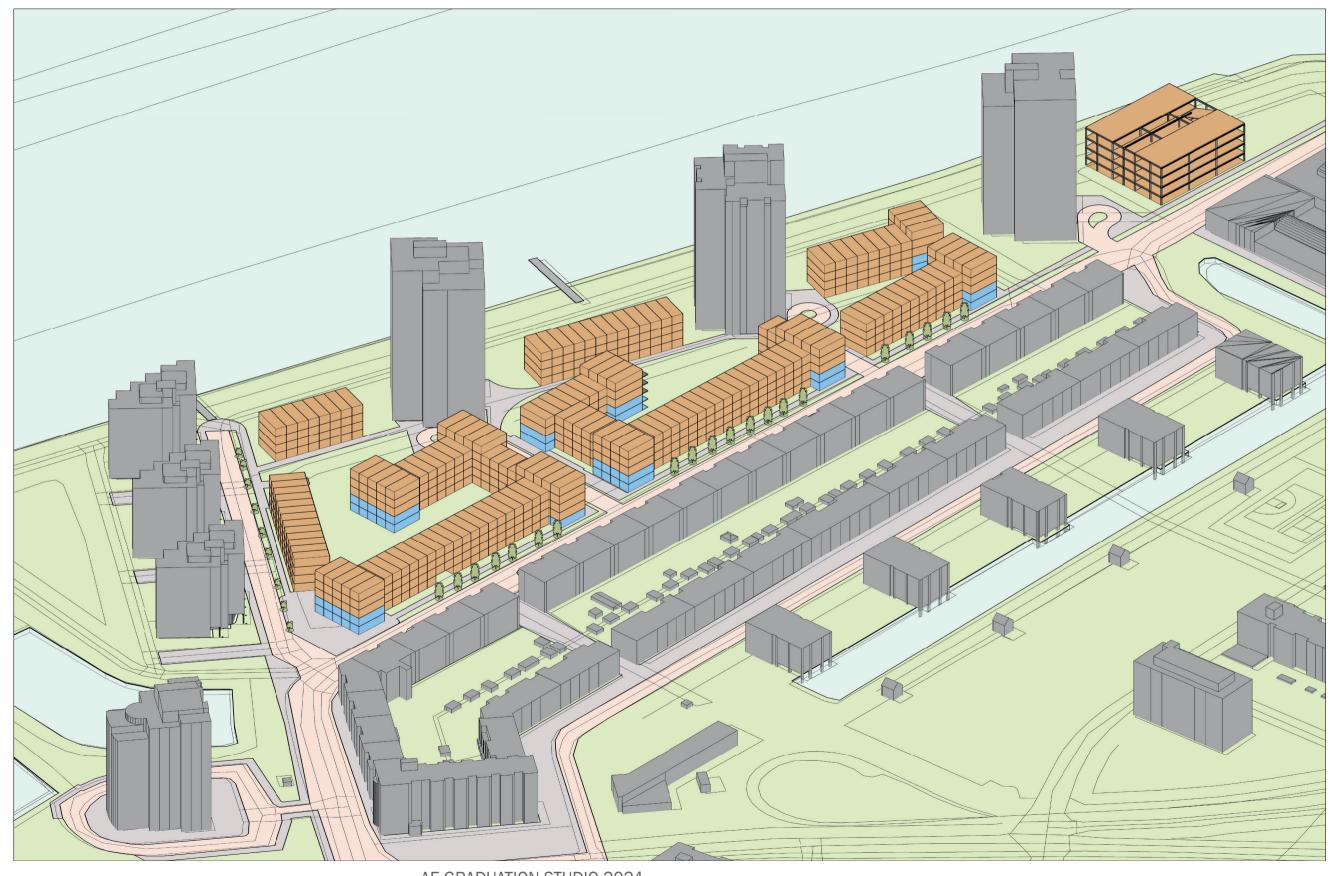


REMOVE OBSTRUCTION

DENSIFY AS MUCH AS POSSIBLE

ADD OTHER
DIVERSE
FUNCTIONS ON
UNIQUE PLACES

ADD A CAR SHY TRAFFIC PLAN



REMOVE OBSTRUCTION

DENSIFY AS MUCH AS POSSIBLE

ADD OTHER **DIVERSE FUNCTIONS ON** UNIQUE PLACES

ADD A CAR SHY TRAFFIC PLAN

ADD GREENERY, **WALKING ROUTES** AND PUBLIC/ PRIVATE SPACES



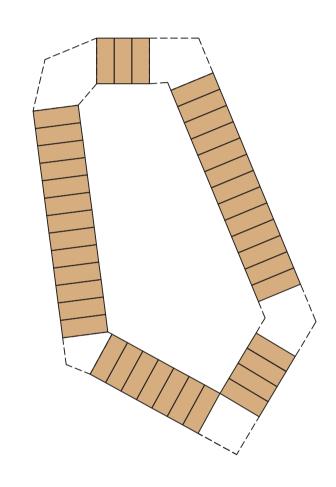
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THE MEETING POINT



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THE MEETING POINT





RESEARCH BY DESIGN

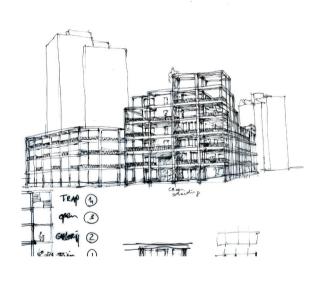
6 DIFFERENT BUILDING ADOPTATIONS

FROM OPEN TO CLOSED

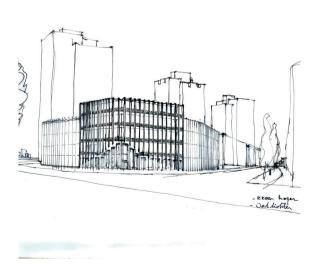
DEGREE OF PREFABRICATION













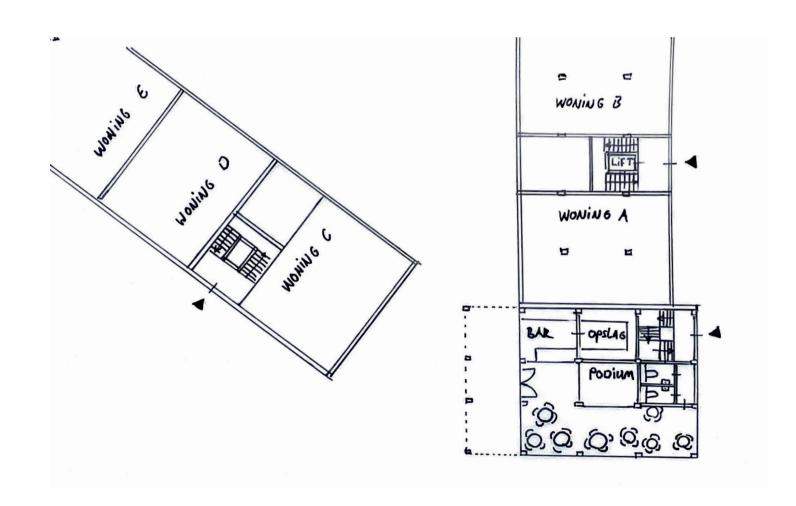
VOLUME STUDY

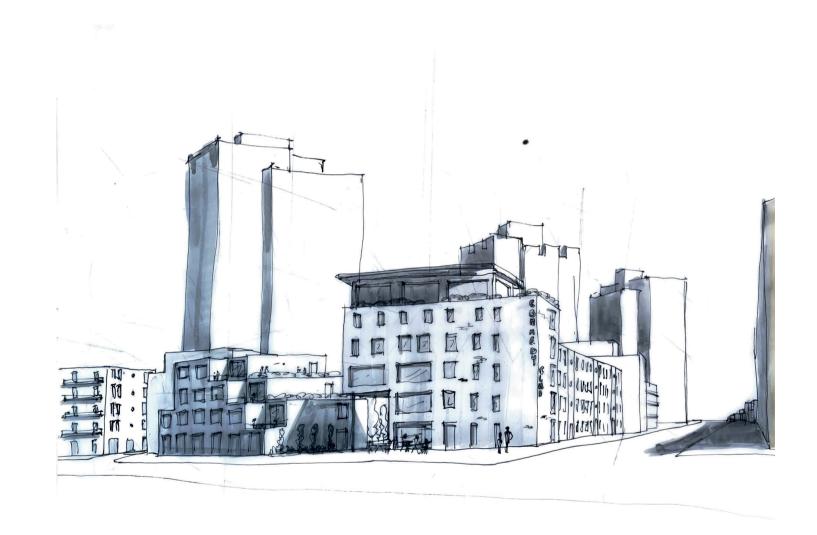
FINCH COMPOSITION

MINIMAL

ACCENTUATE

OPENESS





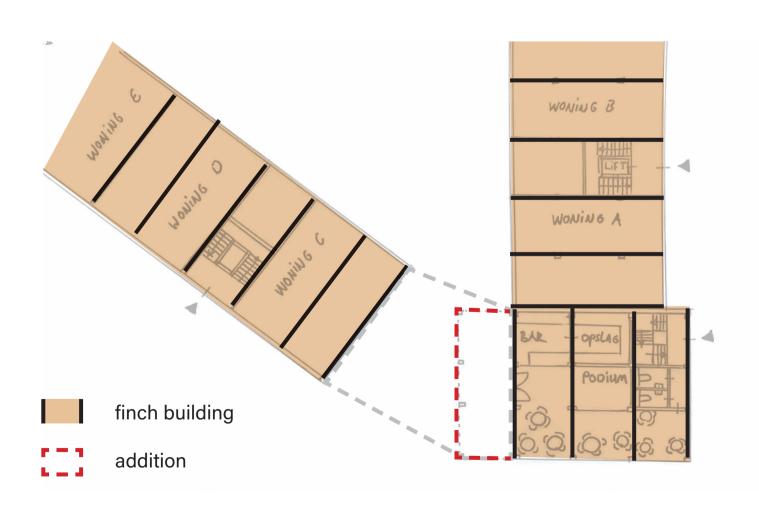
VOLUME STUDY

FINCH COMPOSITION

MINIMAL

ACCENTUATE

OPENESS





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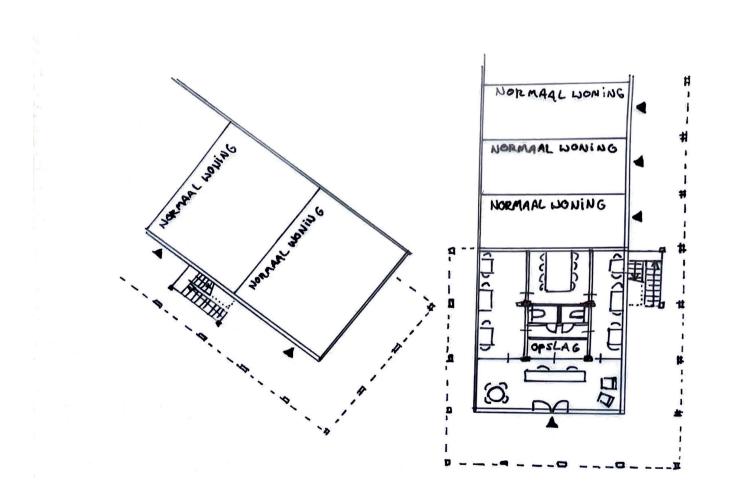
EXO I

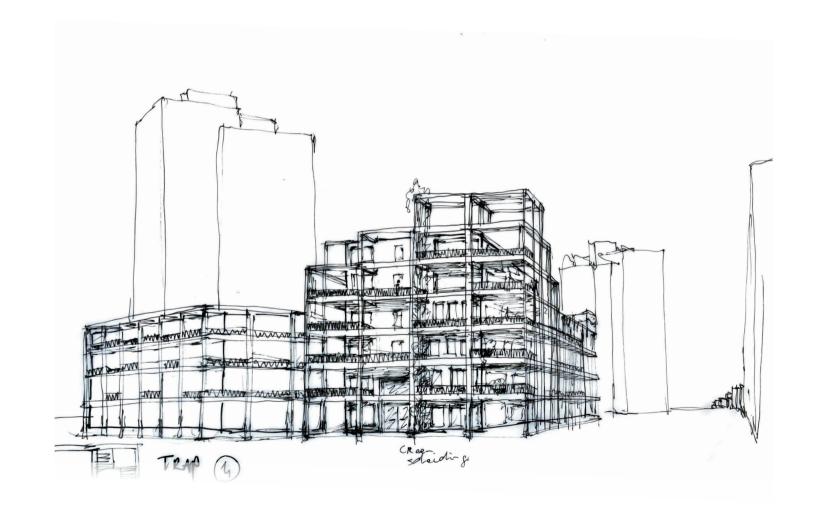
EXOSKELETON

ACCES

ACCENTUATE

BLEND / HIDE





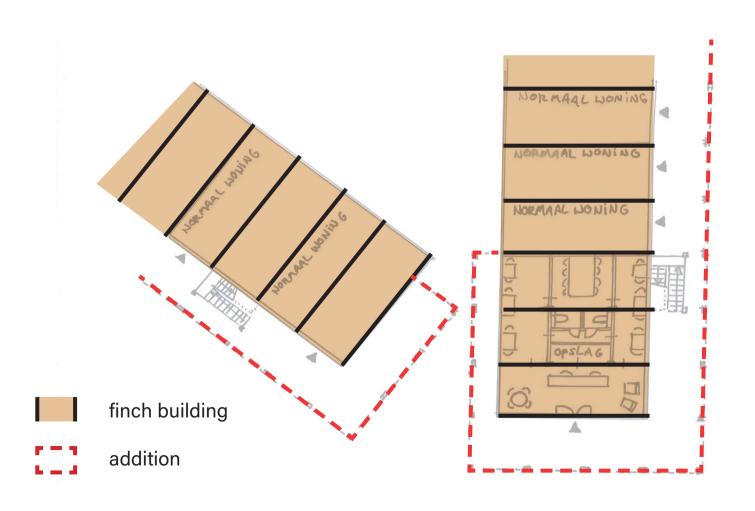
EXO I

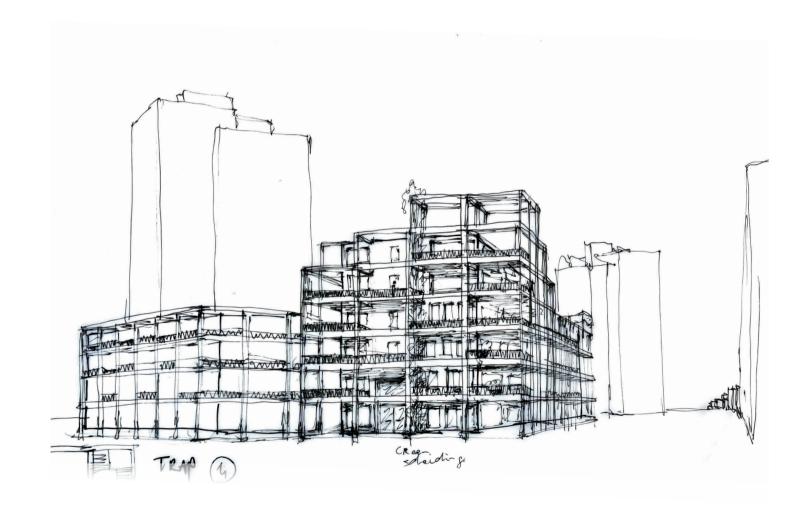
EXOSKELETON

ACCES

ACCENTUATE

BLEND / HIDE





EXO II

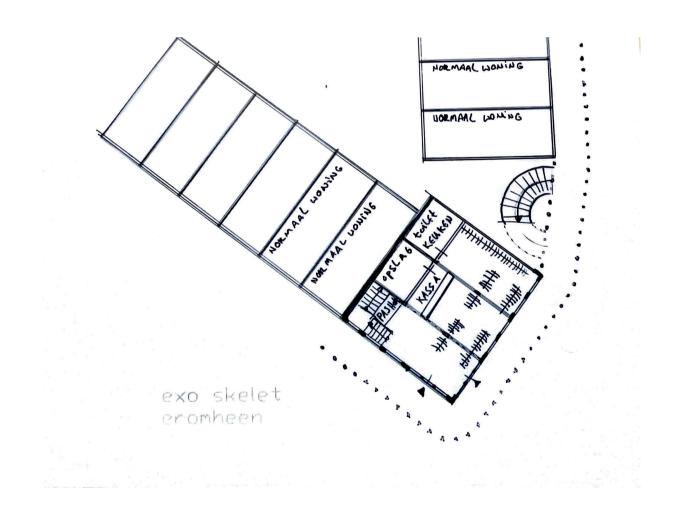
EXOSKELETON

ACCES

ACCENTUATE

UNIFY

SMALLER GRID





EXO II

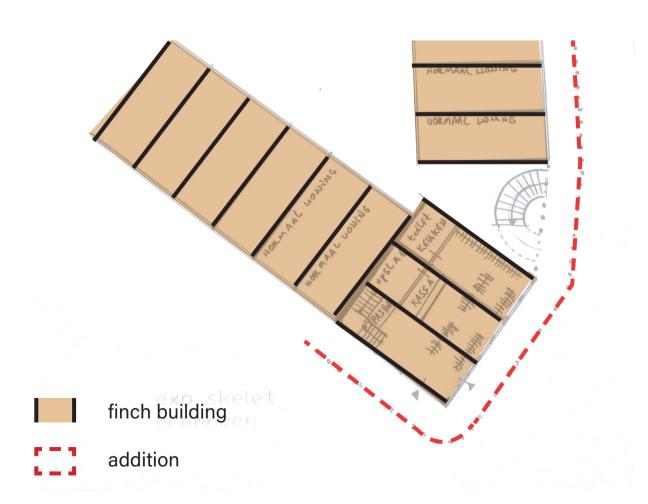
EXOSKELETON

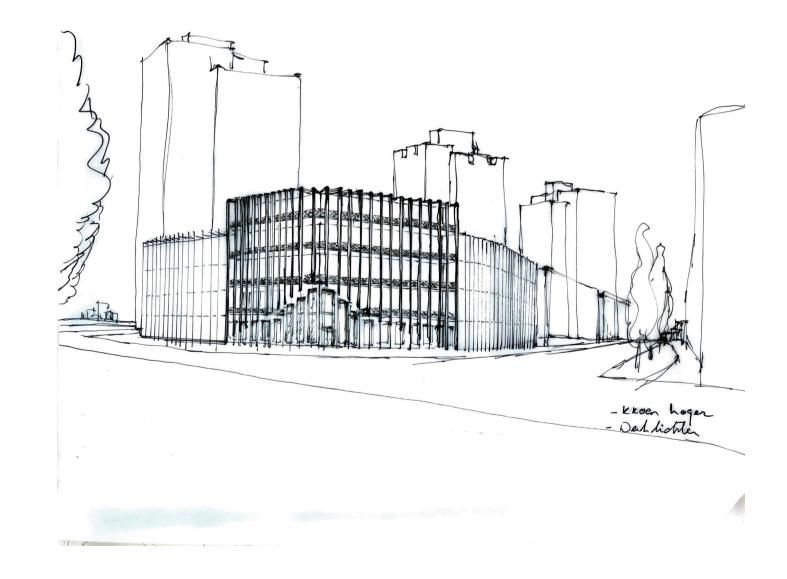
ACCES

ACCENTUATE

UNIFY

SMALLER GRID





FITTING PIECE ON THE BACK

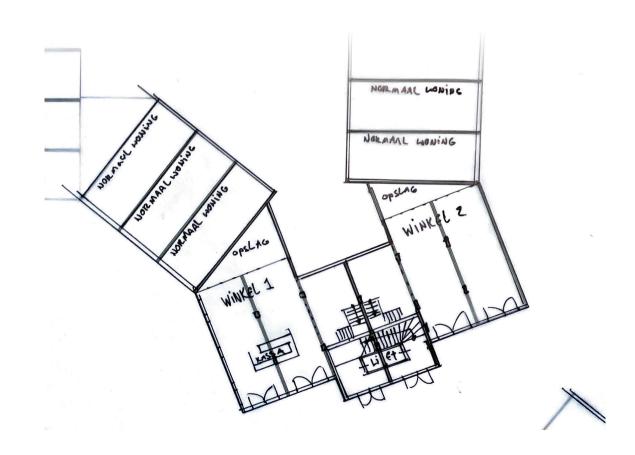
30 DEGREES FITTING PIECE

ENCLOSED BUILDING BLOCK

SYMMETRY

COMPLEX

STILL LIMTIED FREEDOM





FITTING PIECE ON THE BACK

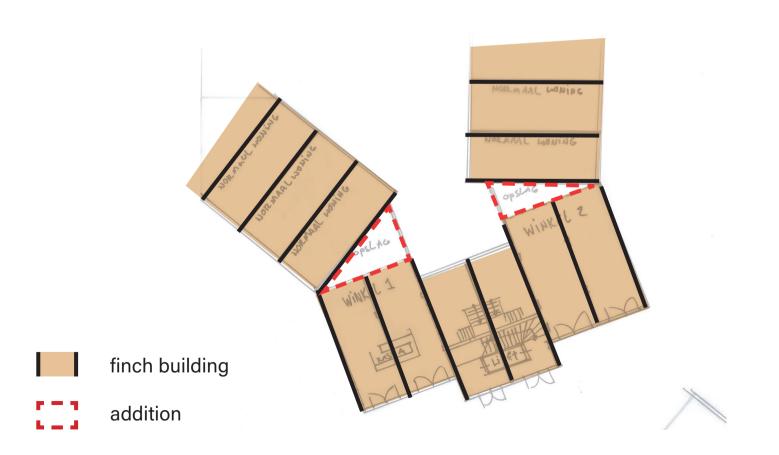
30 DEGREES FITTING PIECE

ENCLOSED BUILDING BLOCK

SYMMETRY

COMPLEX

STILL LIMTIED FREEDOM





FITTING PIECE FRONT

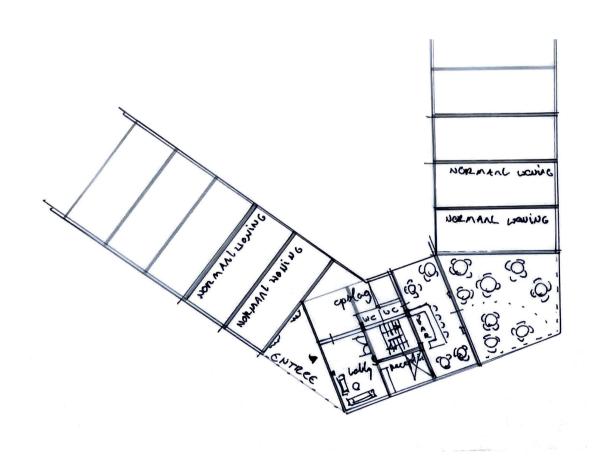
TRADITIONAL BUILD

ENCLOSED BUILDING BLOCK

COMPLEX

OUTSIDE SPACES

PREFAB FACADE SYSTEMS





FITTING PIECE FRONT

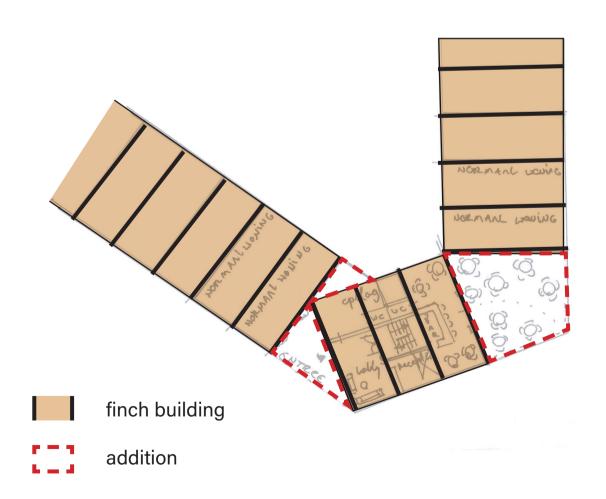
TRADITIONAL BUILD

ENCLOSED BUILDING BLOCK

COMPLEX

OUTSIDE SPACES

PREFAB FACADE SYSTEMS





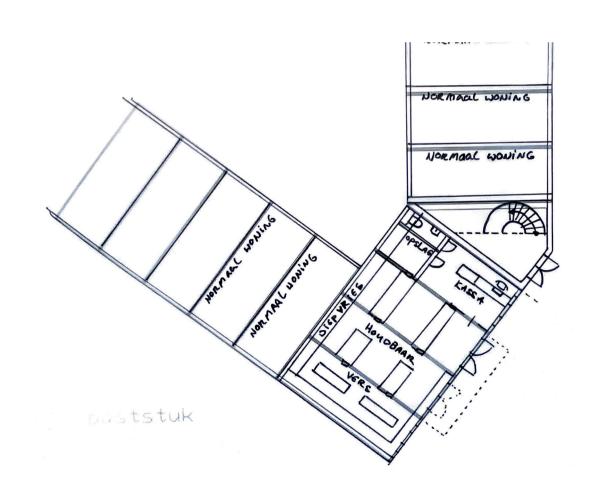
FITTING PIECE STAIRS

TRADITIONAL BUILD

ENCLOSED BUILDING BLOCK

COMPLEX

ACESS AND ACCENT





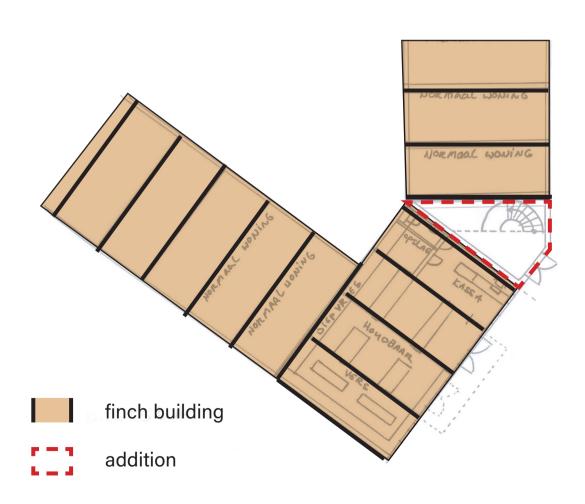
FITTING PIECE STAIRS

TRADITIONAL BUILD

ENCLOSED BUILDING BLOCK

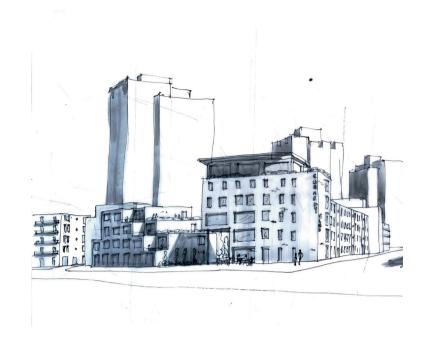
COMPLEX

ACESS AND ACCENT





CONCLUSION

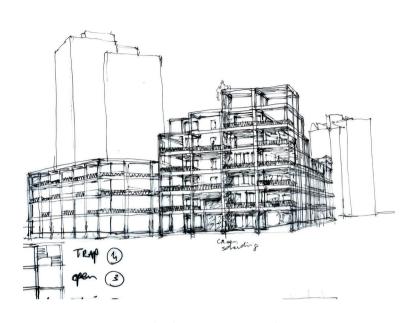


FINCH COMPOSITION

MINIMAL

ACCENTUATE

OPENESS



EXOSKELETON

ACCES

ACCENTUATE

BLEND / HIDE



TRADITIONAL BUILD

ENCLOSED BUILDING BLOCK

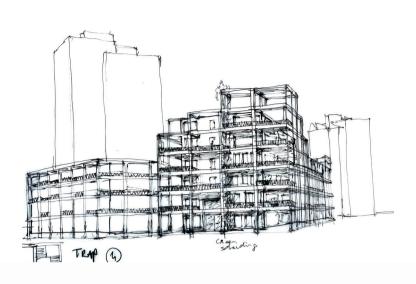
COMPLEX

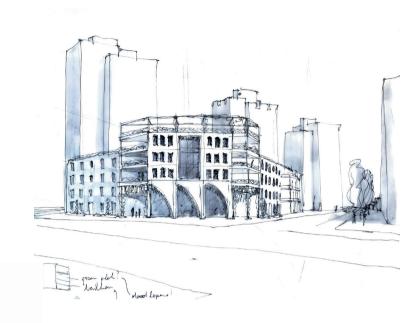
OUTSIDE SPACES

PREFAB FACADE SYSTEMS

CONCLUSION





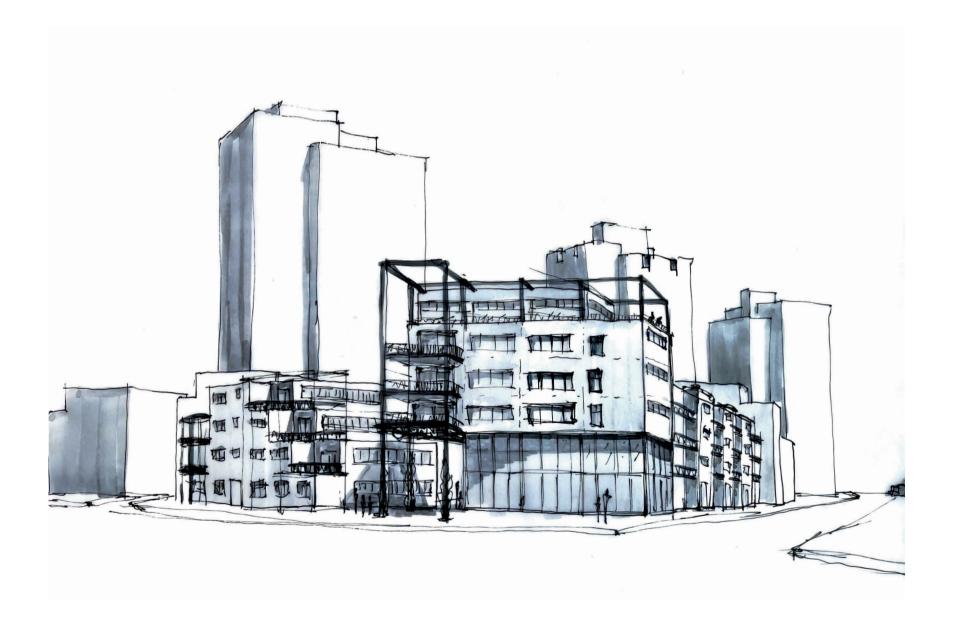




CONCLUSION

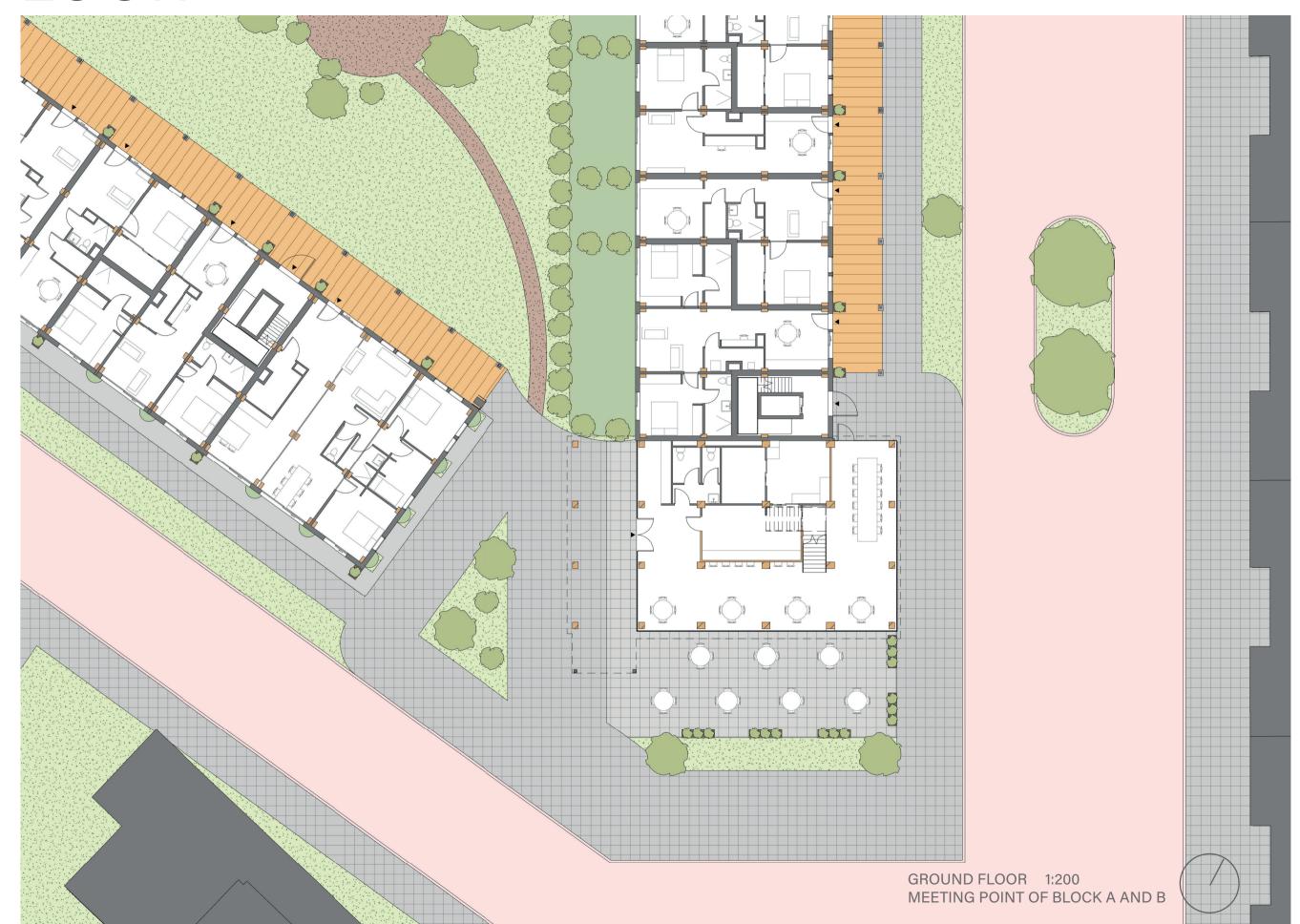
The exo skeleton and the volumeplay work together

Prefab façade system clicked on to modules



WHY
WHAT
DESIGN QUESTION
PREFABRICATION
LOCATION
URBAN DESIGN
RESEARCH BY DESIGN
ARCHITECTURAL DESIGN

CREATED AN ALLEY



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SPACIOUS PLACE

ENTRANCE OF WORK CAFE

CURTAINWALL GIVES VISUAL CONNECTION AND LIGHT

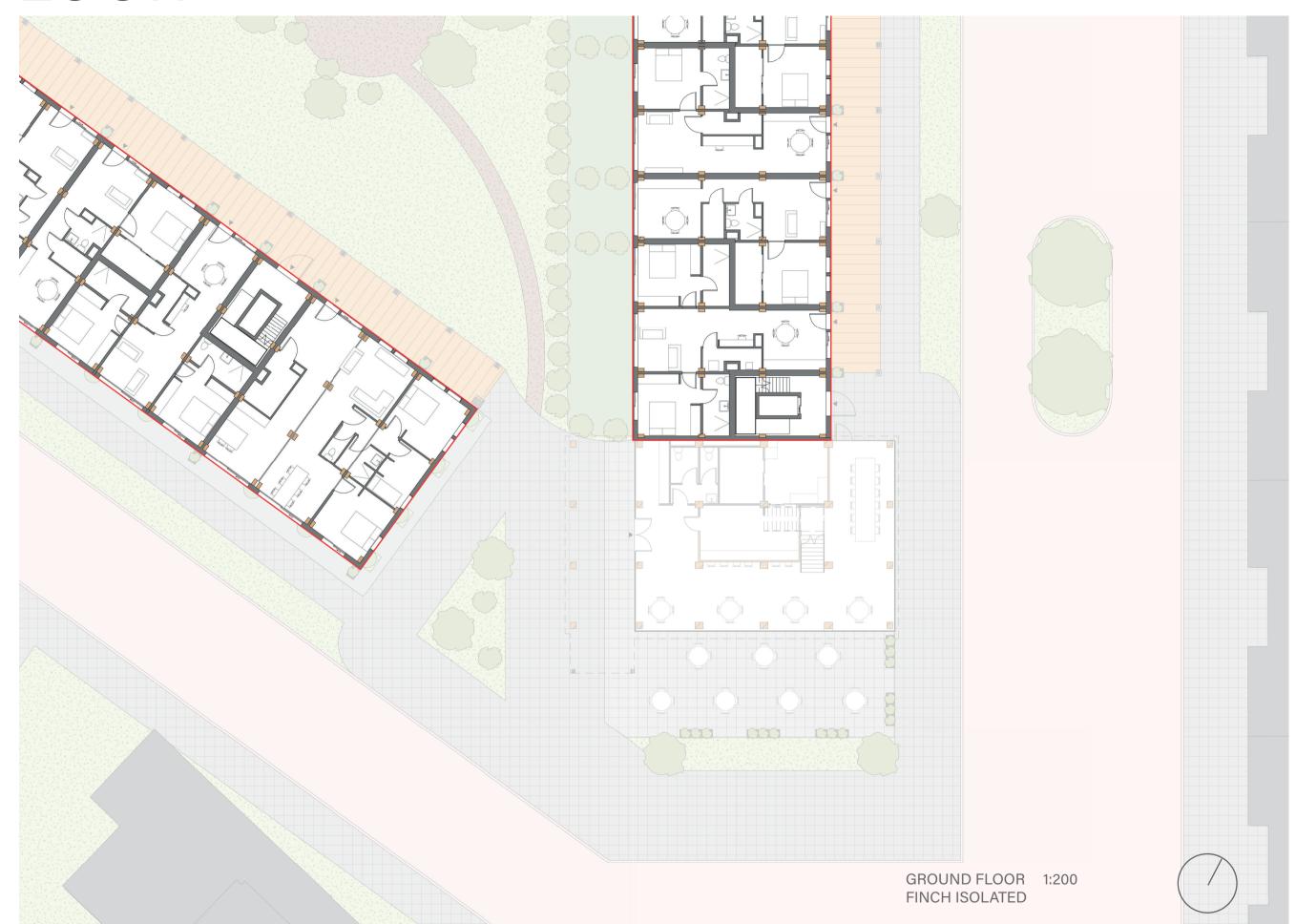
PUBLIC WALKING ROUTE

ROUTE TO HOMEOWNERS

MAKE HOMEOWNERS RESPONSIBLE FOR THE ALLY



FINCH BUILDINGS ISOLATED

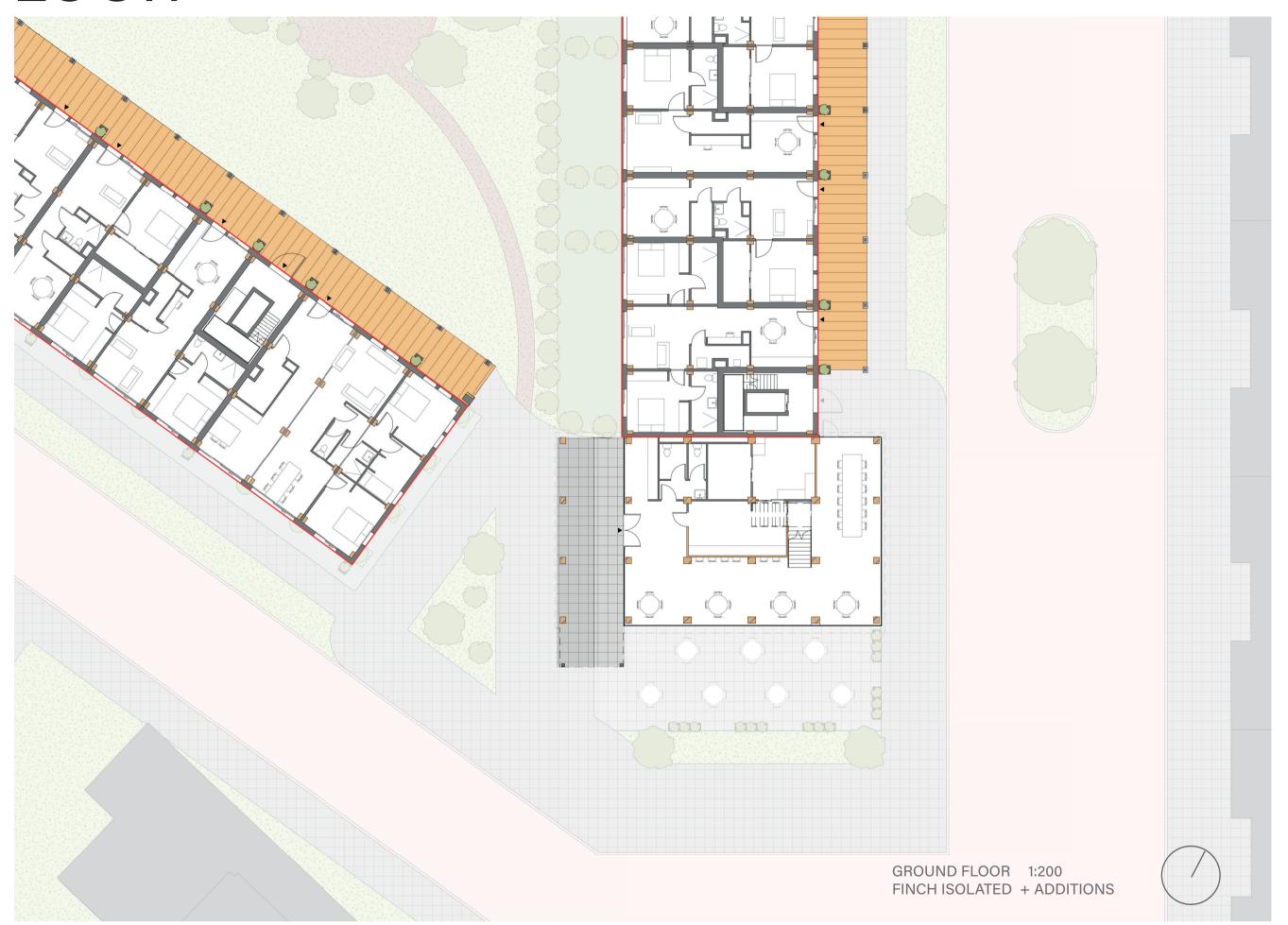


FINCH BUILDINGS ISOLATED

BUILT ADDITIONS

1. THE GALLERIES

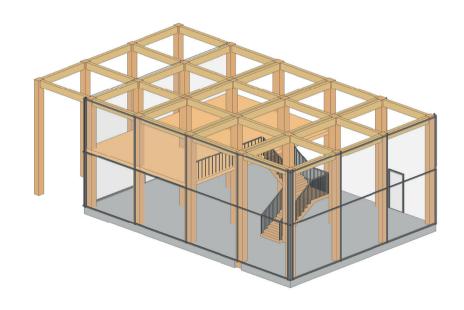
2. THE TABLE CONSTRUCTION





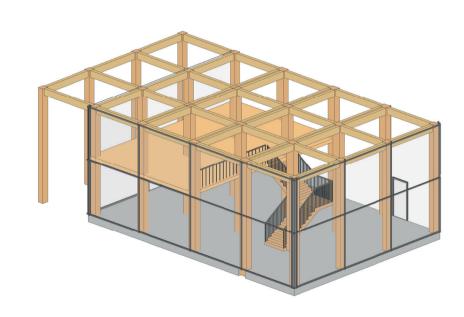
FIRST IMRESSION OF THE ALLEY

THE ADDED CONSTRUCTIONS

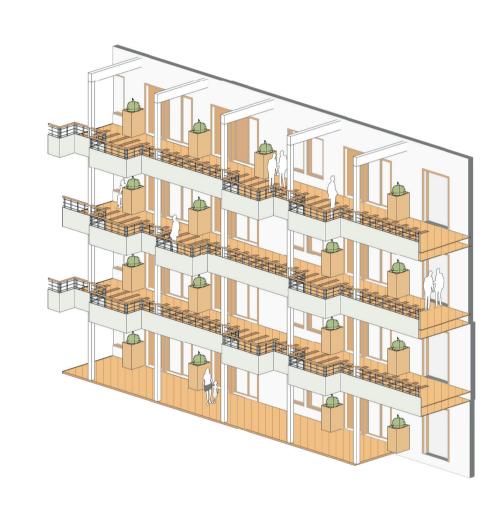


THE TABLE CONSTRUCTION

THE ADDED CONSTRUCTIONS

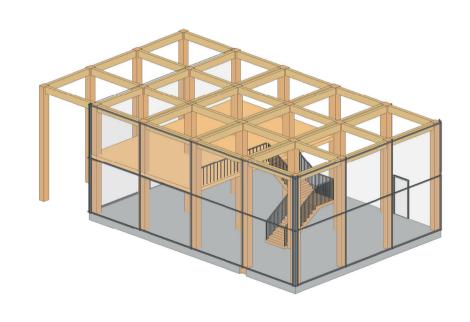




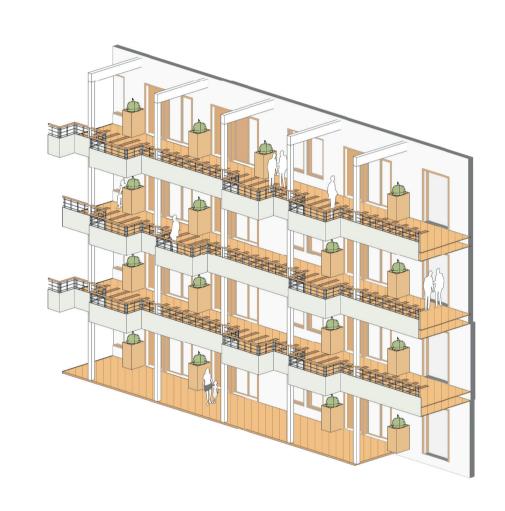


THE GALLERY

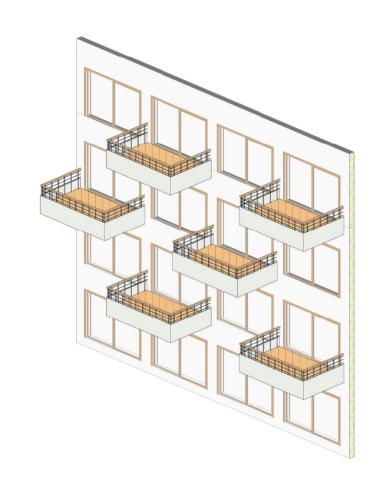
THE ADDED CONSTRUCTIONS







THE GALLERY



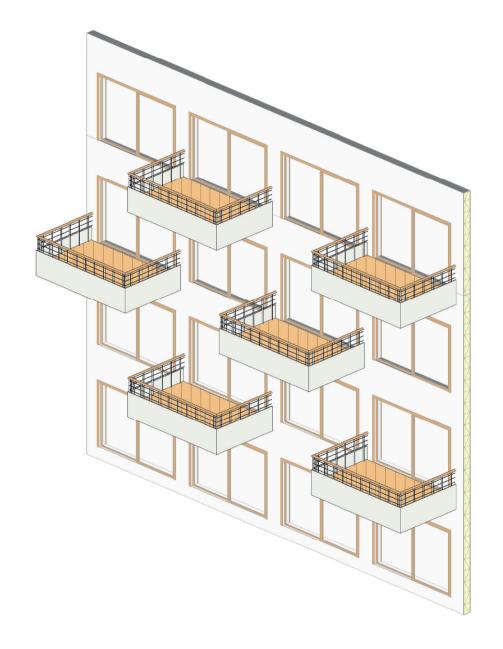
THE BALCONIES

THE BALCONIES

SITUATED ON THE SUNNY SIDE

WIDTH OF AN ENTIRE FINCH MODULE: 3.85 METERS

NEVER DIRECTLY ABOVE EACHOTHER



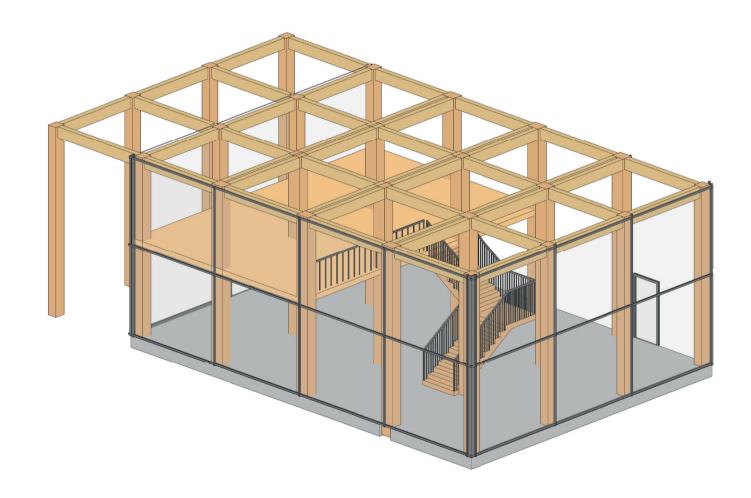
THE TABLE CONSTRUCTION

GLULAM CONSTRUCTION, FINCH INSPIRED

CREATES THE DOUBLE HIGHT

WORKS TOGETHER WITH THE FINCH COMPOSITION

ALLOWS FOR A DIFFERENT FACADE FINISH

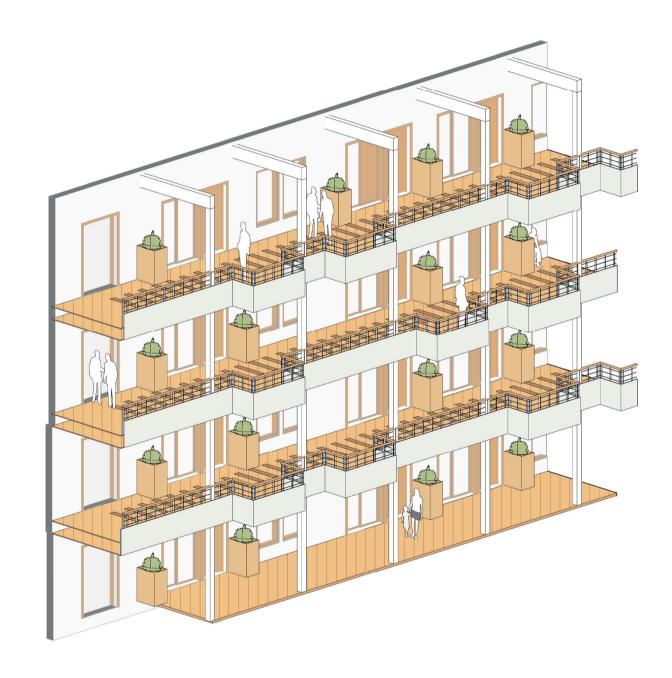


THE TABLE CONSTRUCTION



THE GALLERY

TURN A NECESSITY INTO QUALITY



THE GALLERY

TURN A NECESSITY INTO QUALITY

IRON, WOOD CONSTRUCTION

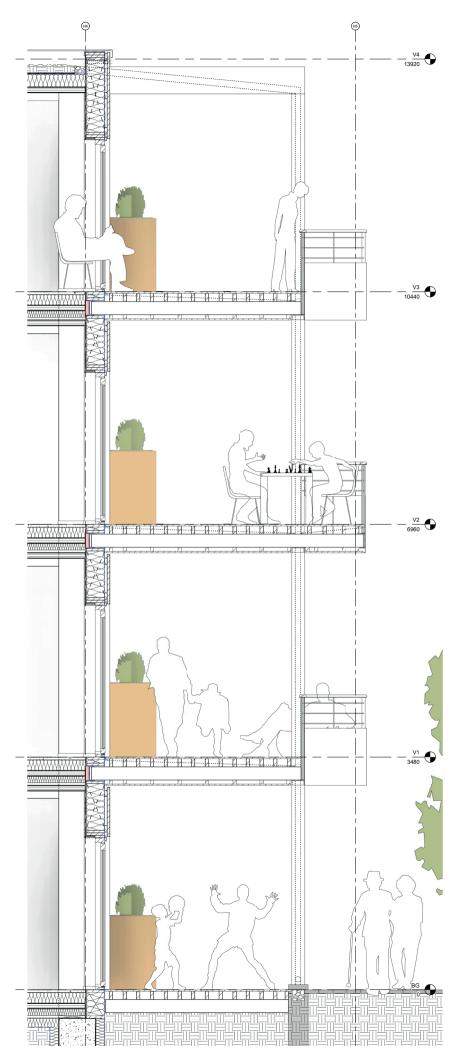
700mm PRIVATE ZONE

1100mm TRAFFIC ZONE

1500mm FRONTDECK







THE GALLERY

TURN A NECESSITY INTO QUALITY

IRON, WOOD CONSTRUCTION

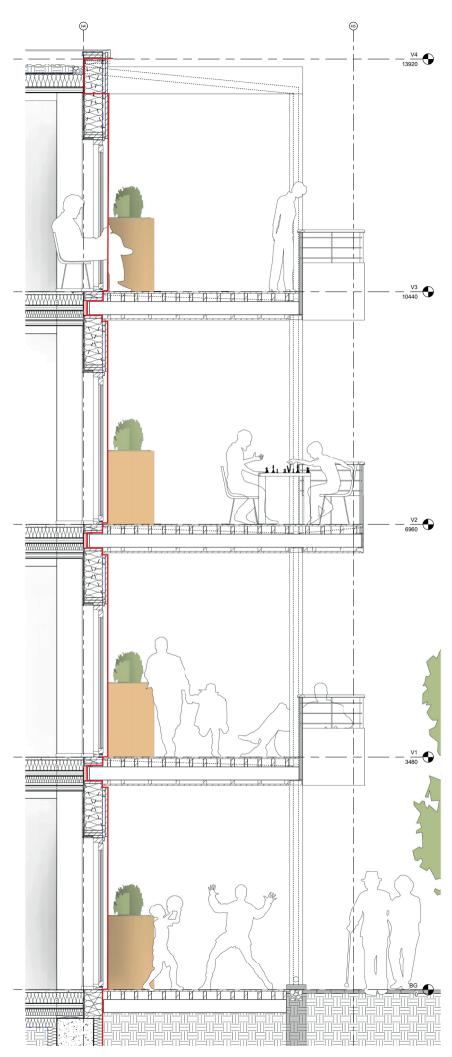
700mm PRIVATE ZONE

1100mm TRAFFIC ZONE

1500mm FRONTDECK







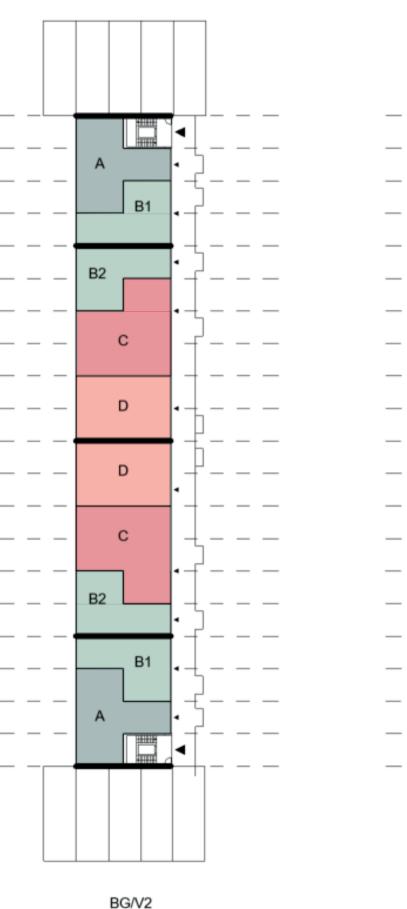
THE LAYOUT

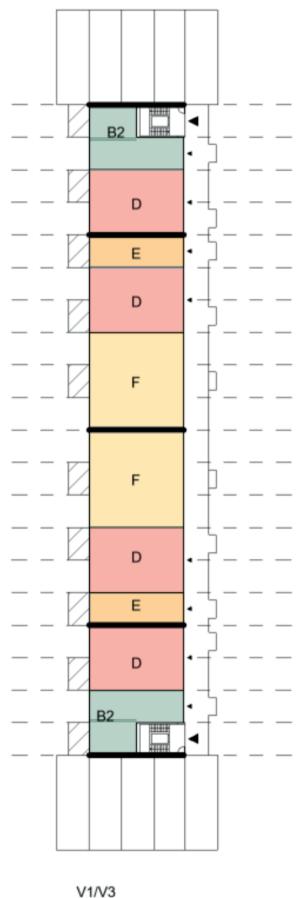
GALLERY MADE HIGH DENSITY POSSIBLE

FINCH MADE DIVERSE FLOORPLANS POSSIBLE

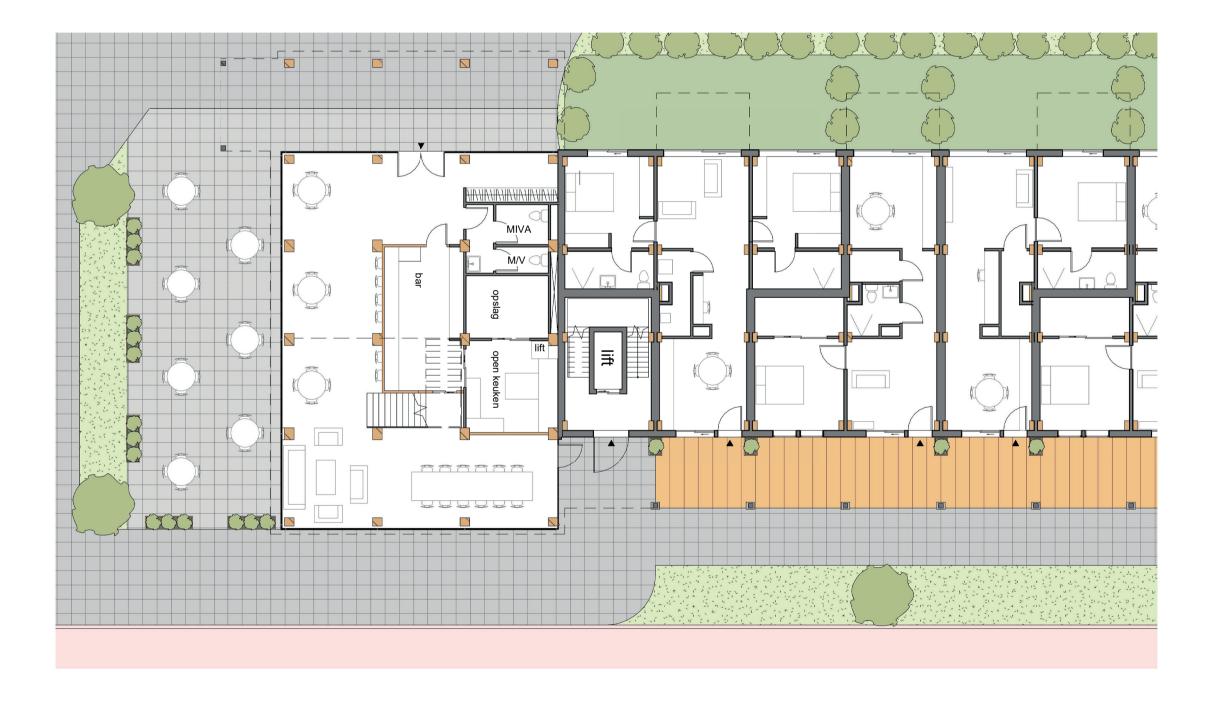
LINING THEM UP LEAVES ROOM FOR ADDITIONAL STRUCTURAL SUPPORT

A: Friends Apartment 88m2
B1/2: Couple appartment 66m2
C1/2: Triple/Four-bedroom family home 110m2
D: Double bedroom apartment 88m2
E: Studio 44m2
F: Family home 132m2





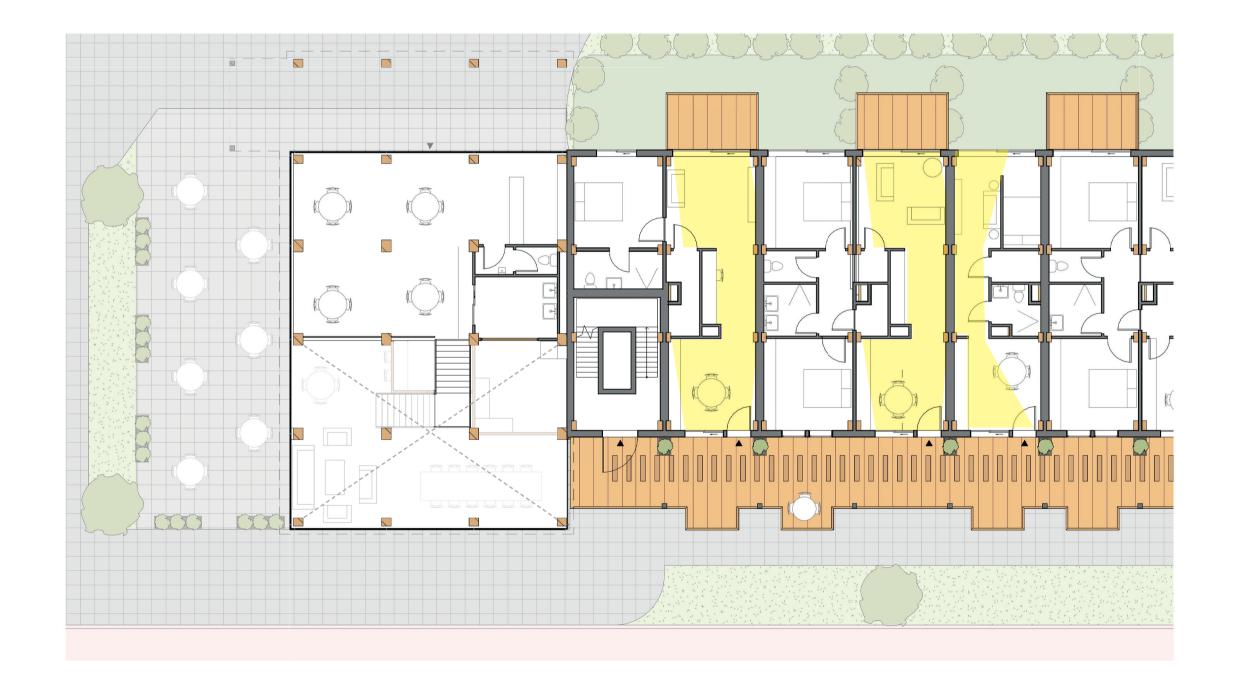
LAYOUT GROUND FLOOR



GROUND FLOOR 1:100



LAYOUT FIRST FLOOR



FIRST FLOOR

1:100



LAYOUT SECOND FLOOR



LAYOUT THIRD FLOOR



THIRD FLOOR

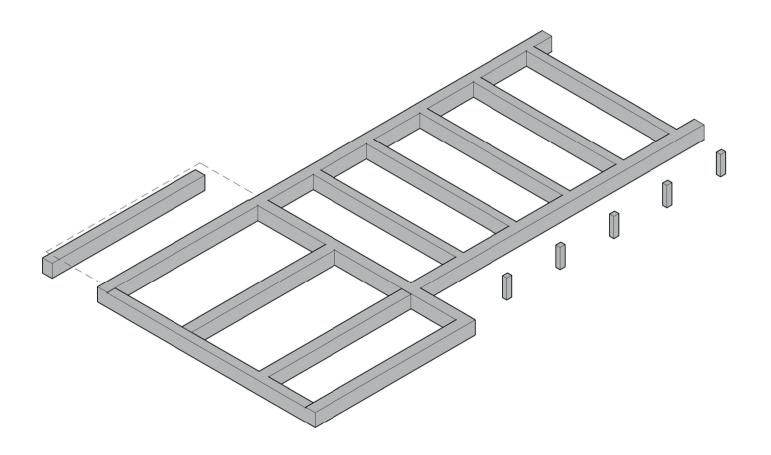
1:100



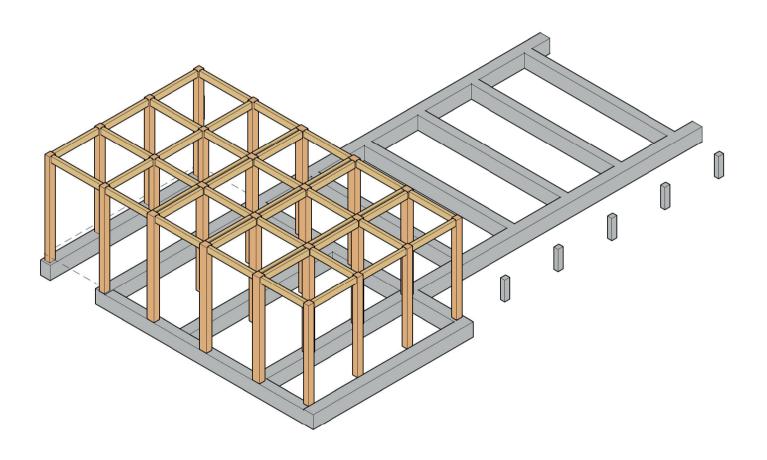
LAYOUT FOURTH FLOOR



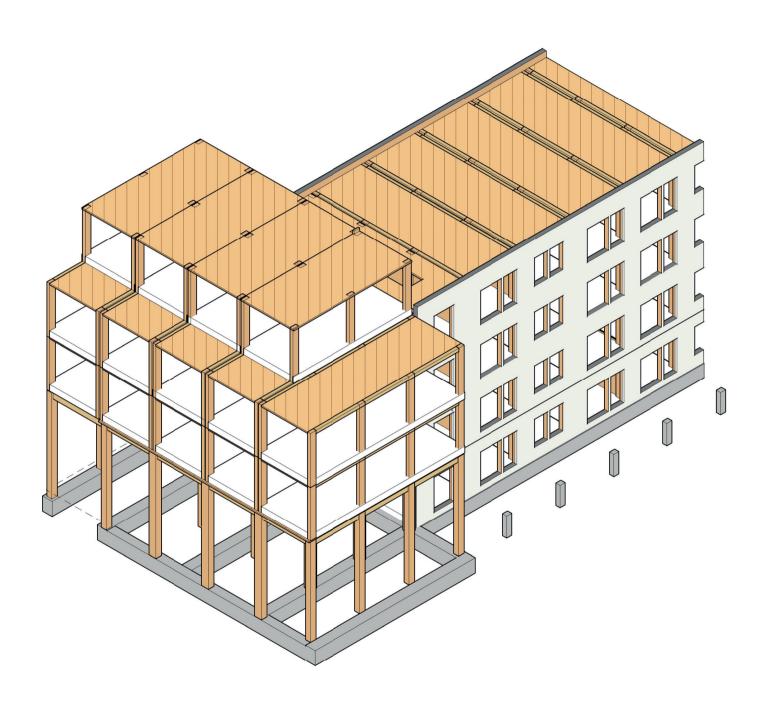
HOW CONSTRUCTED?



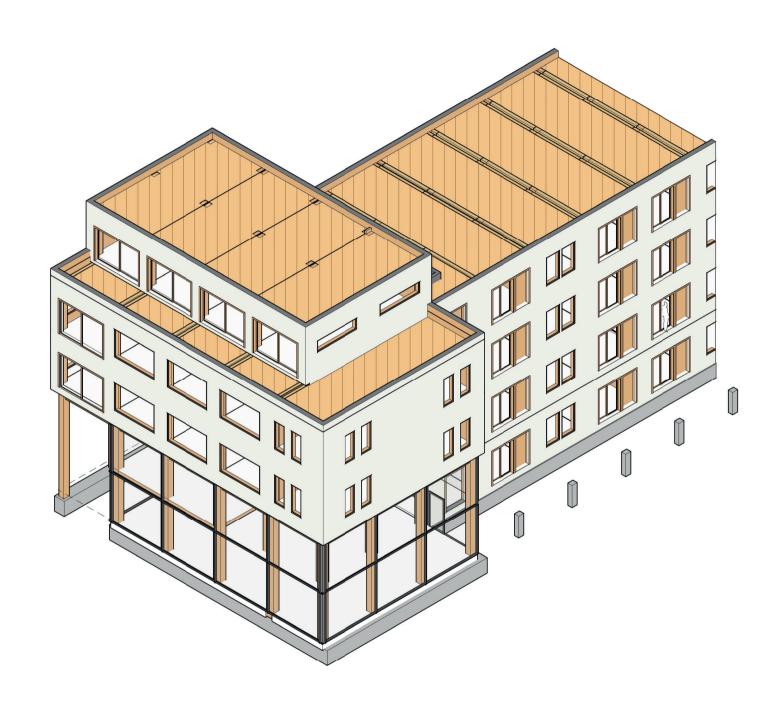
LIGHTWEIGHT FOUNDATION



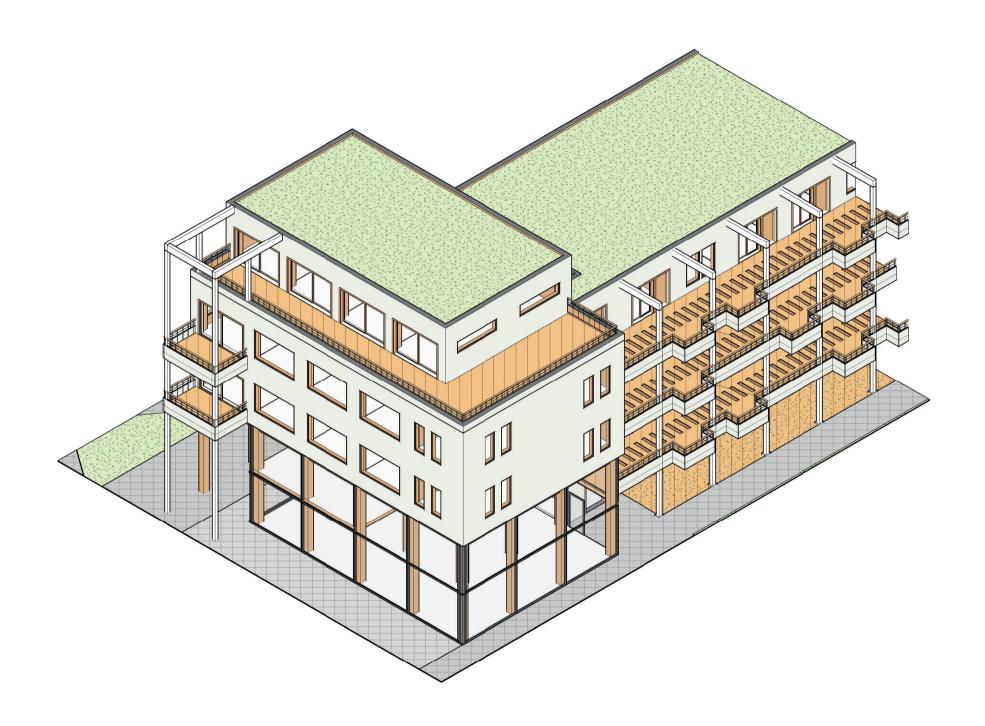
TABLECONSTRUCTION IS PLACED



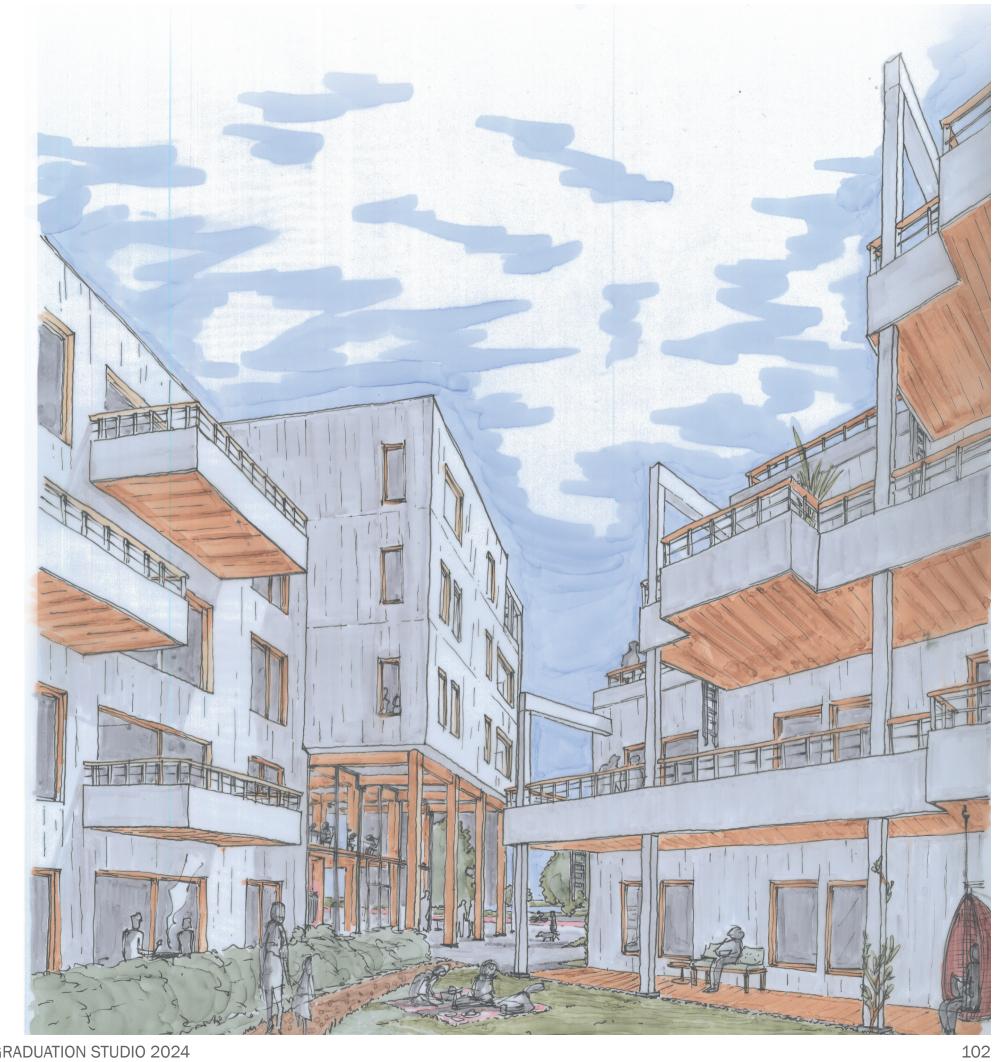
FINCH MODULES ARE PLACED



ADDITIONAL PREFAB FACADE ELEMENTS ARE PLACED



ROOFING AND GALLERIES ARE PLACED



WHY WHAT DESIGN QUESTION PREFABRICATION LOCATION URBAN DESIGN RESEARCH BY DESIGN ARCHITECTURAL DESIGN REFLECTION

REFLECTION

ALL THE MEETING POINTS THE SAME?

DIFFERENT ANGLES

DIFFERENT PLACE IN URBAN PLAN

ASK FOR DIFFERENT APPROACH

THIS ADDS QUALITY TO THE PLAN



REFLECTION

DO'S AND DON'TS PERFAB

DO STAY TRUE TO THE LAWS OF PREFAB

DO CHOSE THE PREFAB METHOD CAREFULLY

DON'T TAKE THE ADVANTAGES OF PREFAB AS

PURE PROFIT



IN THE END

INSTEAD OF CORNER I CREATED THE MEETING POINT



INSTEAD OF CORNER I CREATED THE MEETING POINT

Thank you



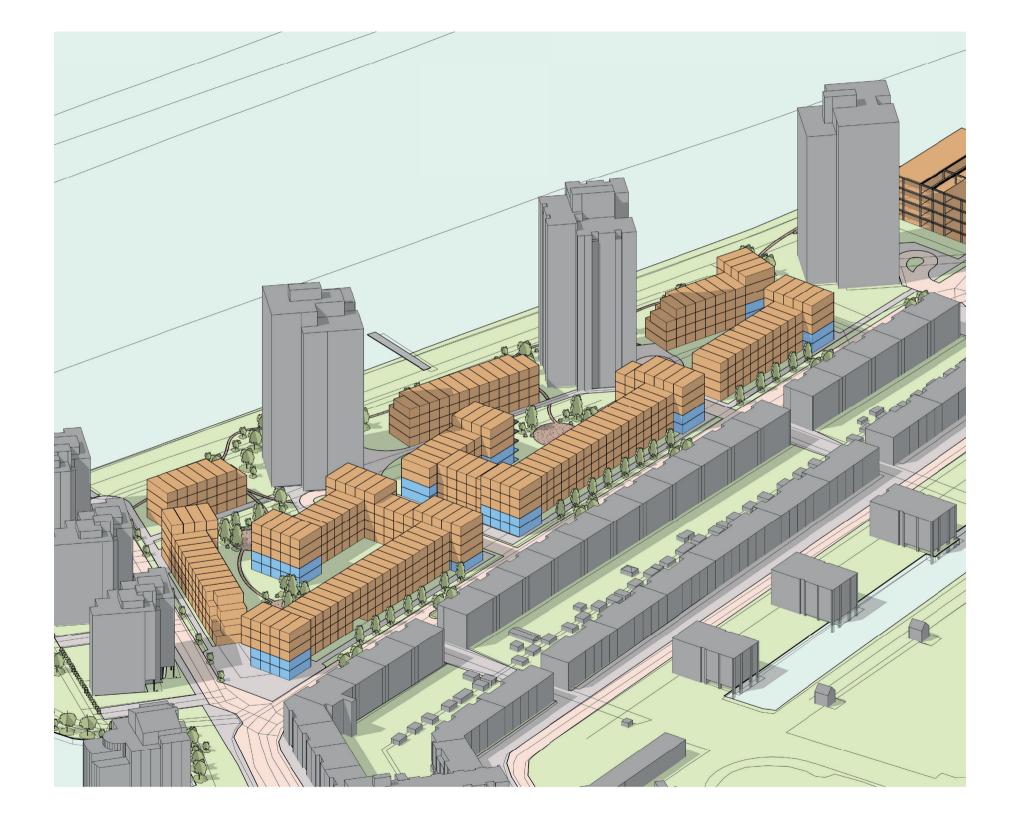
CURRENT PLAN

NUMBER OF MODULES

 11,500 MODULE:
 658
 29.149 M2

 8,850 MODULE:
 33
 1419 M2

TOTAL 691 30.568 M2



EFFICIENT I

NUMBER OF MODULES

11,500 MODULE: 622 27.555 M2 8,850 MODULE: 24 816 M2

TOTAL 698 30.656 M2

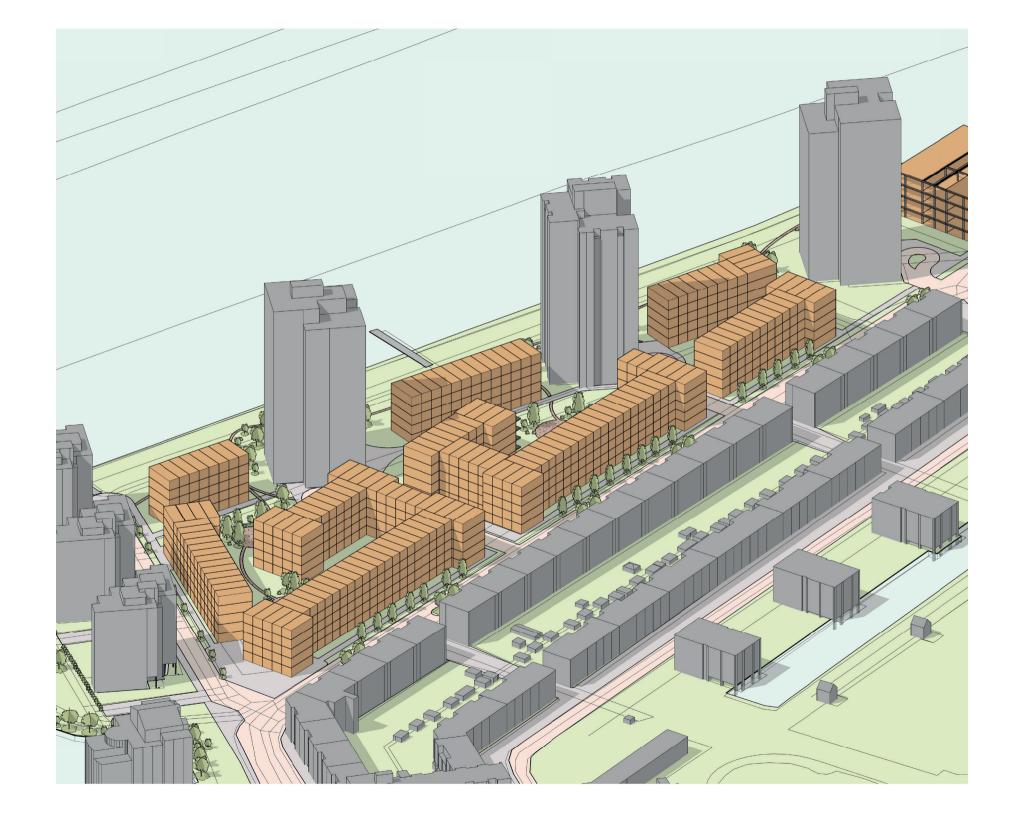


EFFICIENT II

NUMBER OF MODULES

11,500 MODULE: 685 30.345 M2 8,850 MODULE: 30 1.020 M2

TOTAL 715 31.365 M2



EFFICIENT I + CONNECTION SPACE

NUMBER OF MODULES M2

11,500 MODULE: 622 27.555 M2 8,850 MODULE: 24 816 M2

CORNER 1: - 480 M2

CORNER 2: - 560 M2

CORNER 3: - 368 M2

TOTAL 698 29.779 M2



REFLECTION

SCIENTIFIC FIELD

TRIED TO CONNECT THE VALUES OF CORNER BUILDINGS TO PREFAB CONSTRUCTION METHODS

THIS WAS TO COMPLEX BECAUSE OF THE BROAD AP-PROACH

DISCOVERING A RESEARCH GAP IN CORNER BUILDING STU-DIES

CREATED AN INITIAL PLAN FOR ORGANIZING AND ASSESSING THE DEGREE OF FREEDOM IN CONSTRUCTION WITH DUTCH PREFAB BUILDERS.

