

SUSTAINABLE RENOVATION PROJECT FOR SOCIAL HOUSING IN AMSTERDAM WEST

UPGRADING COMFORT AND IMPROVING PUBLIC SPACE BY A ZERO ENERGY RENOVATION FOR THE NEMAVO-AIREY DWELLINGS IN AMSTERDAM WEST

P5 PRESENTATION HERITAGE & ARCHITECTURE – 28 JUNE 2016

JASPER SEBASTIAAN MULLER - 4002024 – J.S.Muller@student.tudelft.nl



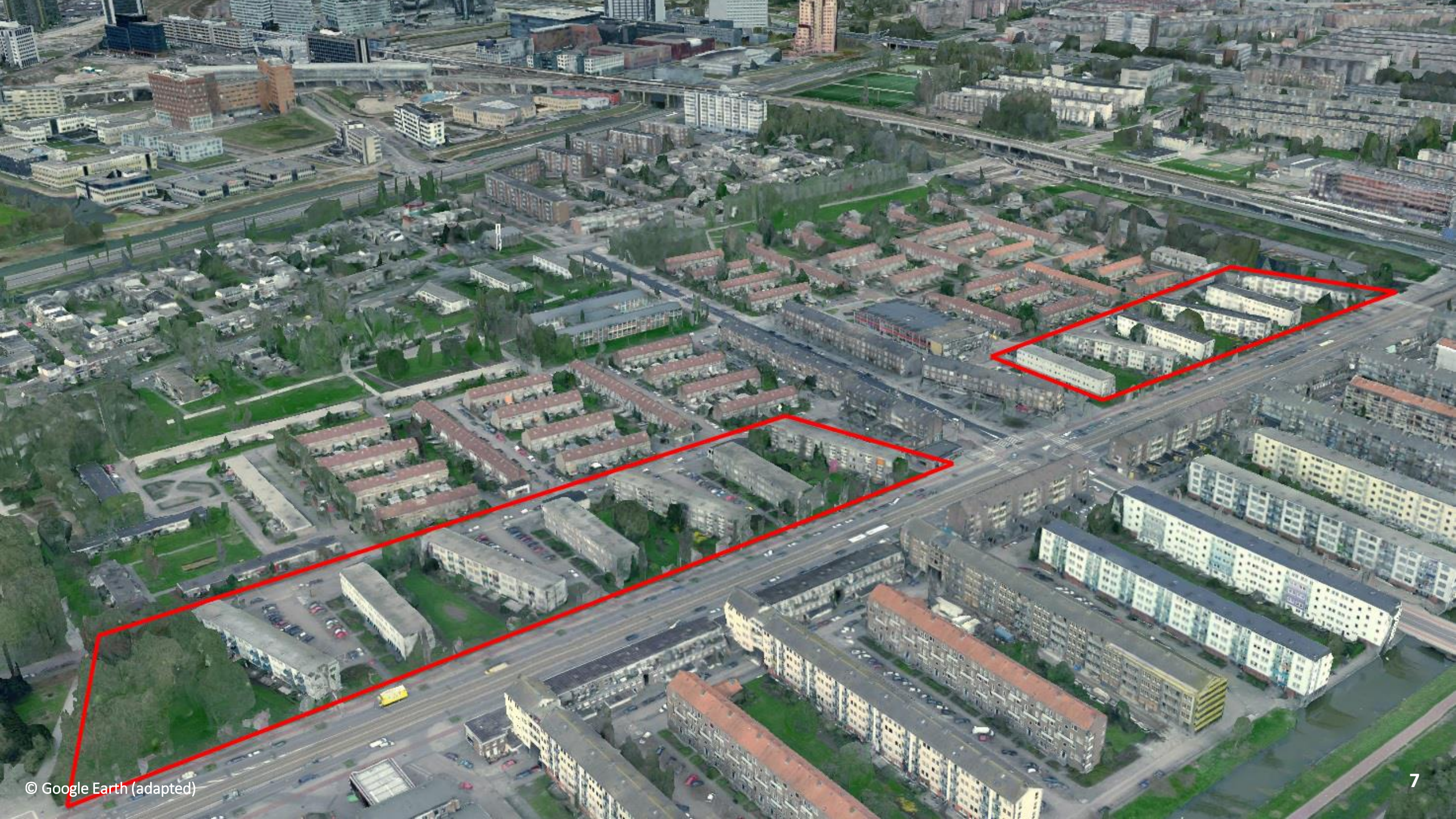
CONTENT PRESENTATION

- Introduction
- Research
- Design
- Reflection
- Conclusions

Introduction



















H.M. KONINGIN JULIANA

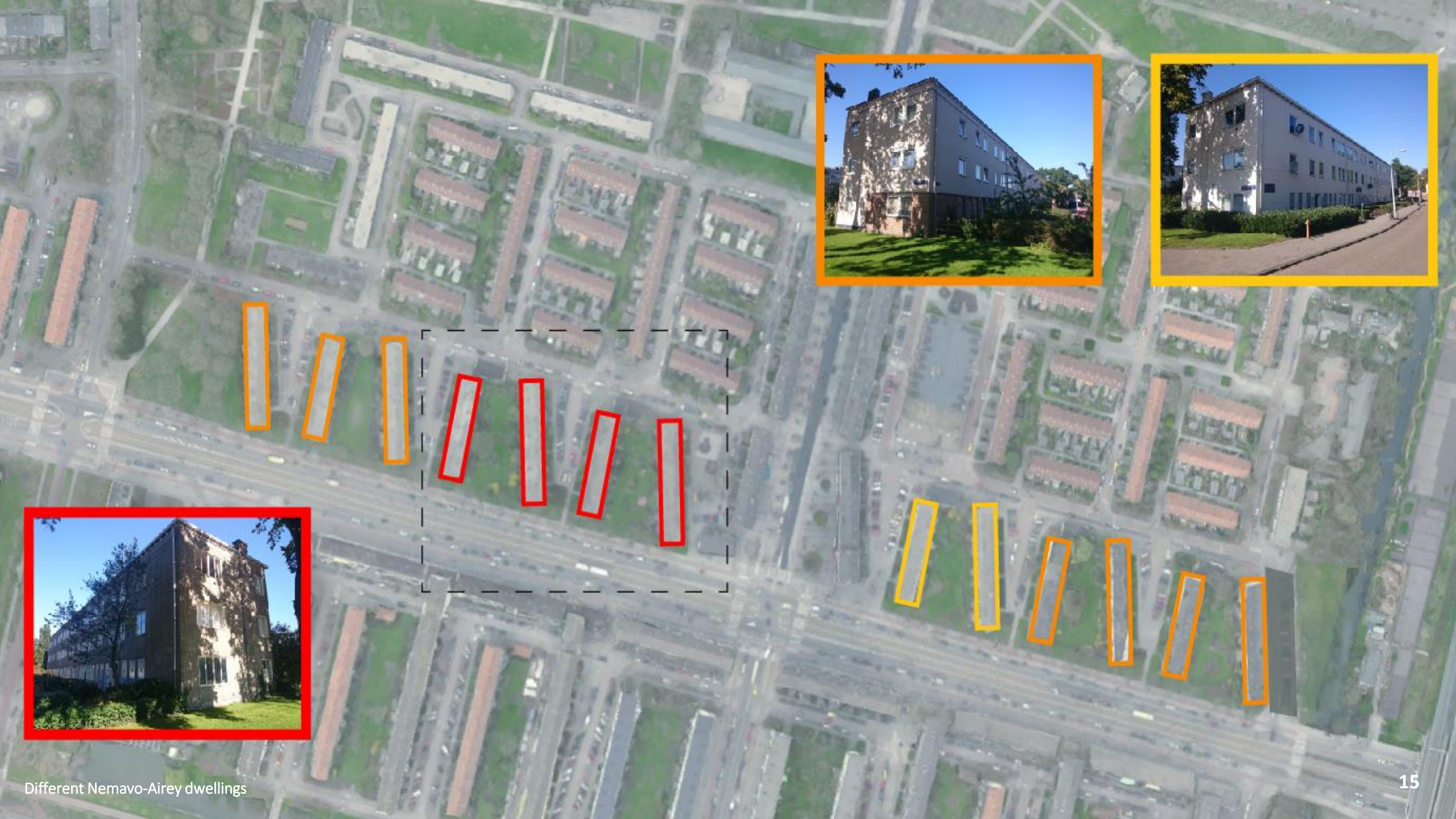
HEEFT OP 7 OCTOBER 1952

TUINSTAD-SLOTERMEER OPENGESTELD,

DE EERSTE DER TE STICHTEN TUINSTEDEN

BUITEN DE RINGSPORBAAN.





Different Nemavo-Airey dwellings



BURGEMEESTER DE VLIJCT
LAAN
ULSTEREER

JACOB FRANKHOFF
STRAAT





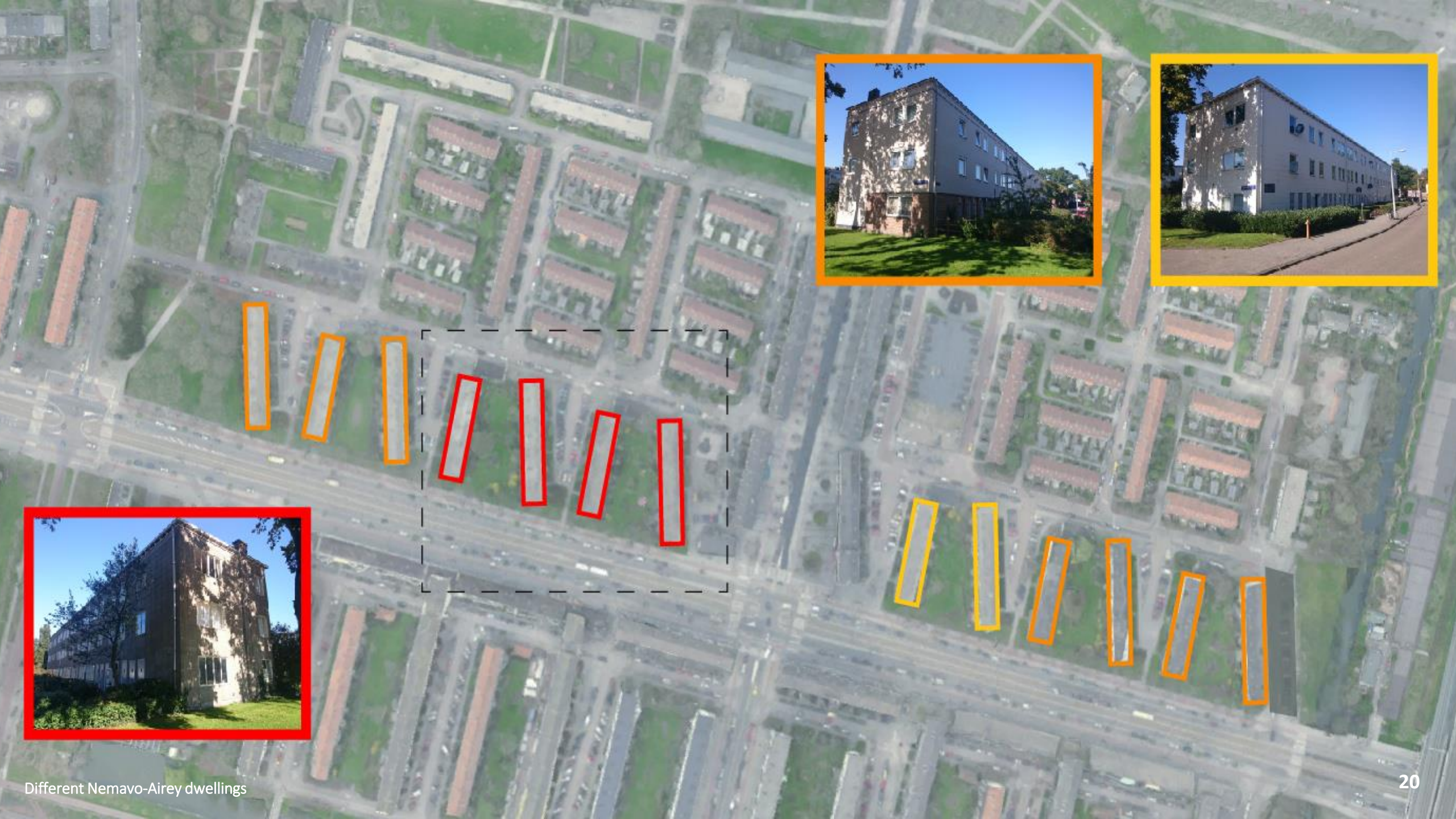
BURGEMEESTER DE VILIGT
LAAN

JOHANNES POSTSTRAAT
SLOTTENHUIS
Bouwen & Wonen is de gemeentelijke afdeling die verantwoordelijk is voor de realisatie van de woonvoorzieningen in de gemeente Slootdijk. De afdeling is onderdeel van de afdeling Wonen & Wonenplan. De afdeling is verantwoordelijk voor de realisatie van de woonvoorzieningen in de gemeente Slootdijk.



BURGEMEESTER DE VLUGT
LAAN
DIETEMEEK

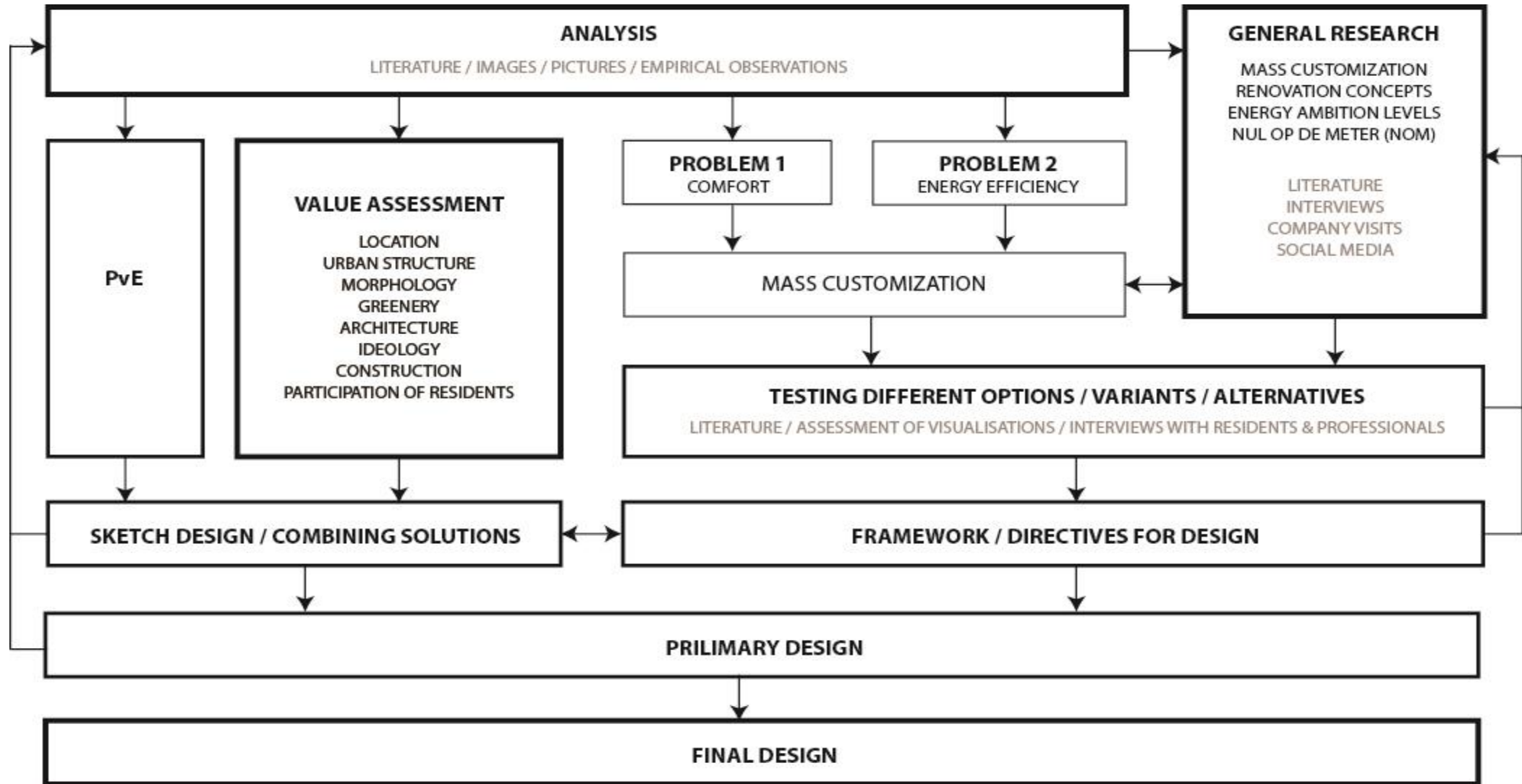
BURGEMEESTER DE VLUGT
LAAN



Different Nemavo-Airey dwellings

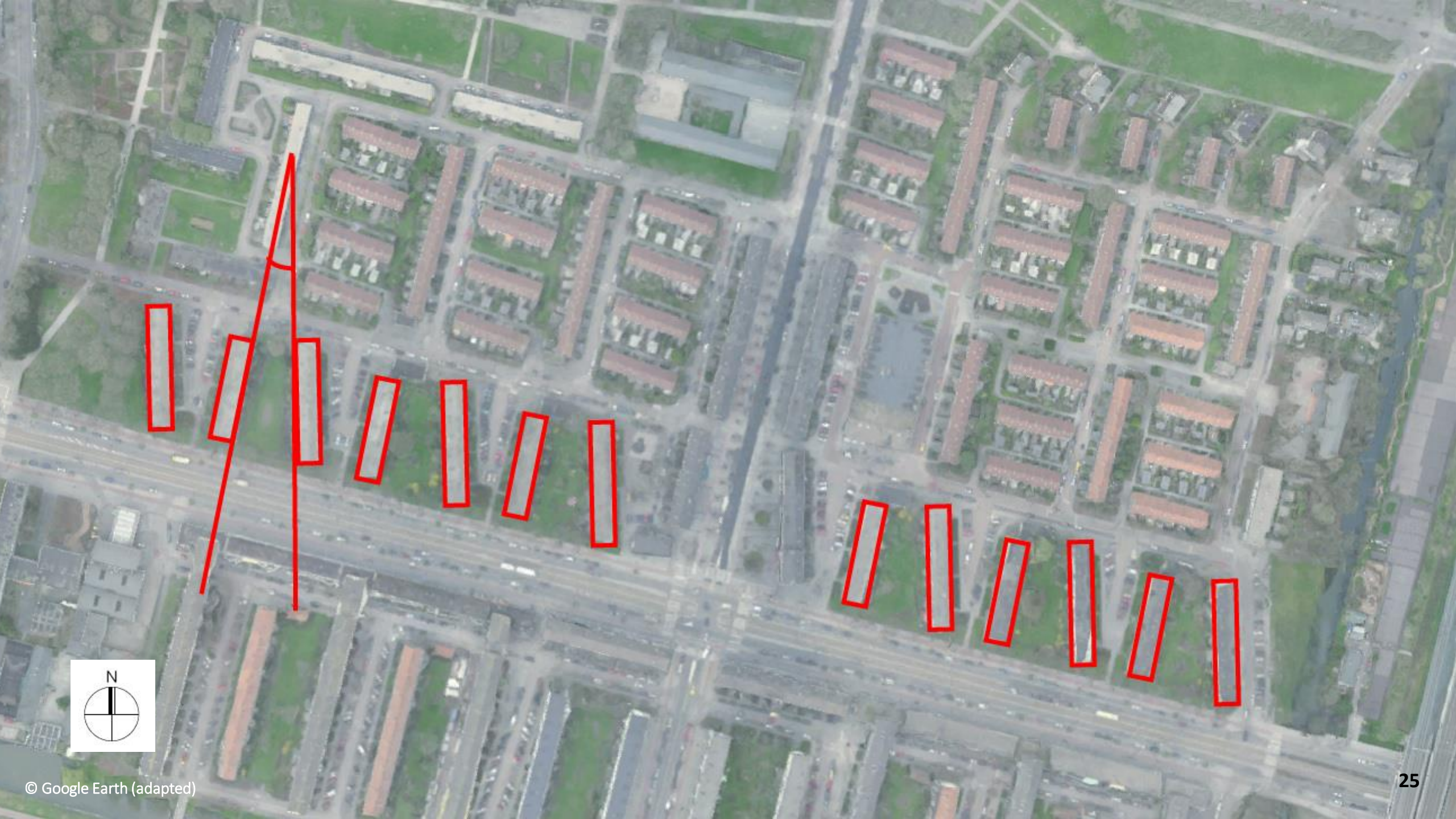
Research

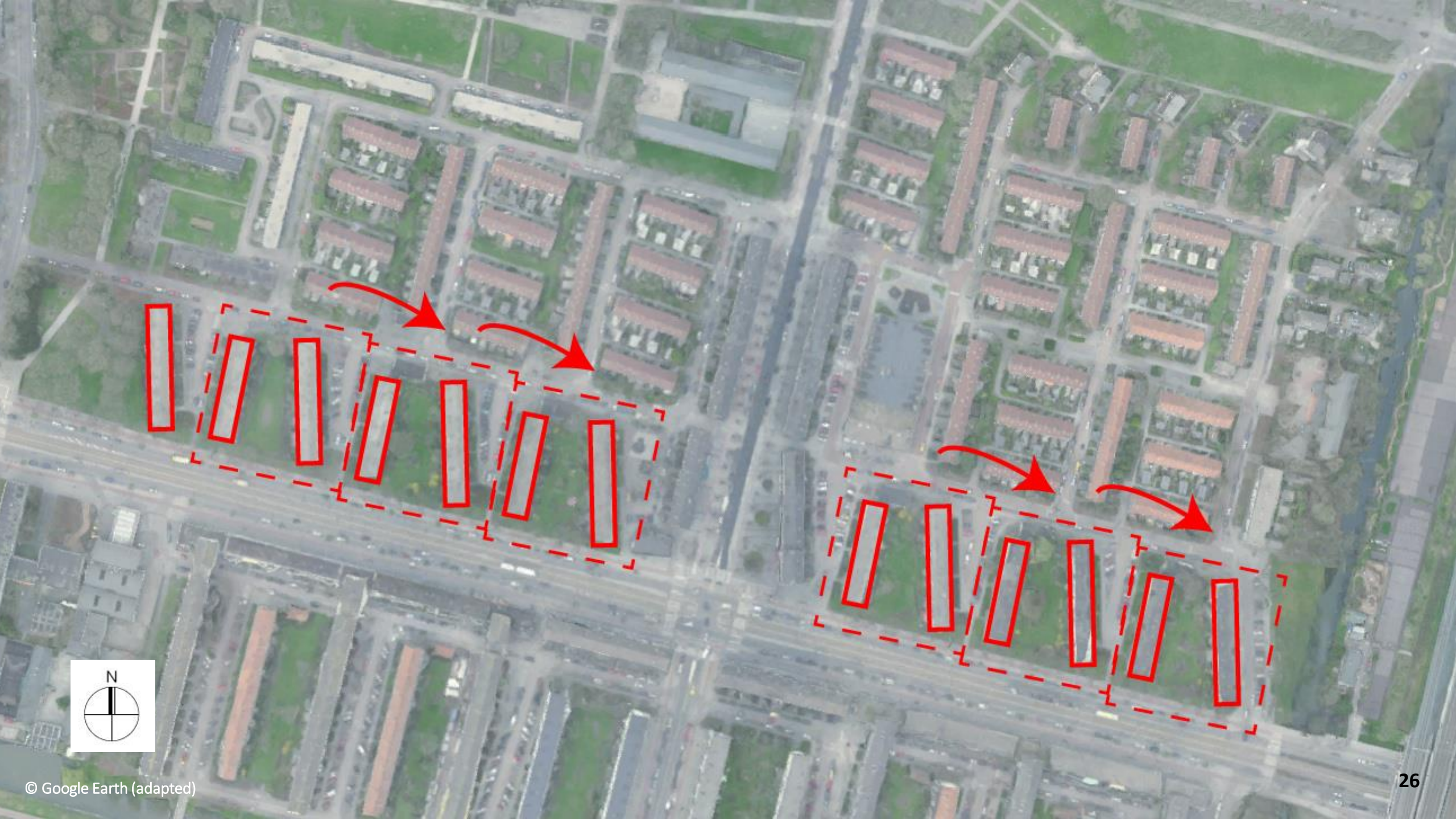
RESEARCH FRAMEWORK















DISORGANIZED PARKING SITUATION



BALCONIES: MESS & NEGLECTED 'KIJKGROEN'



DISORGANIZED PARKING SITUATION









00059550



_00059550

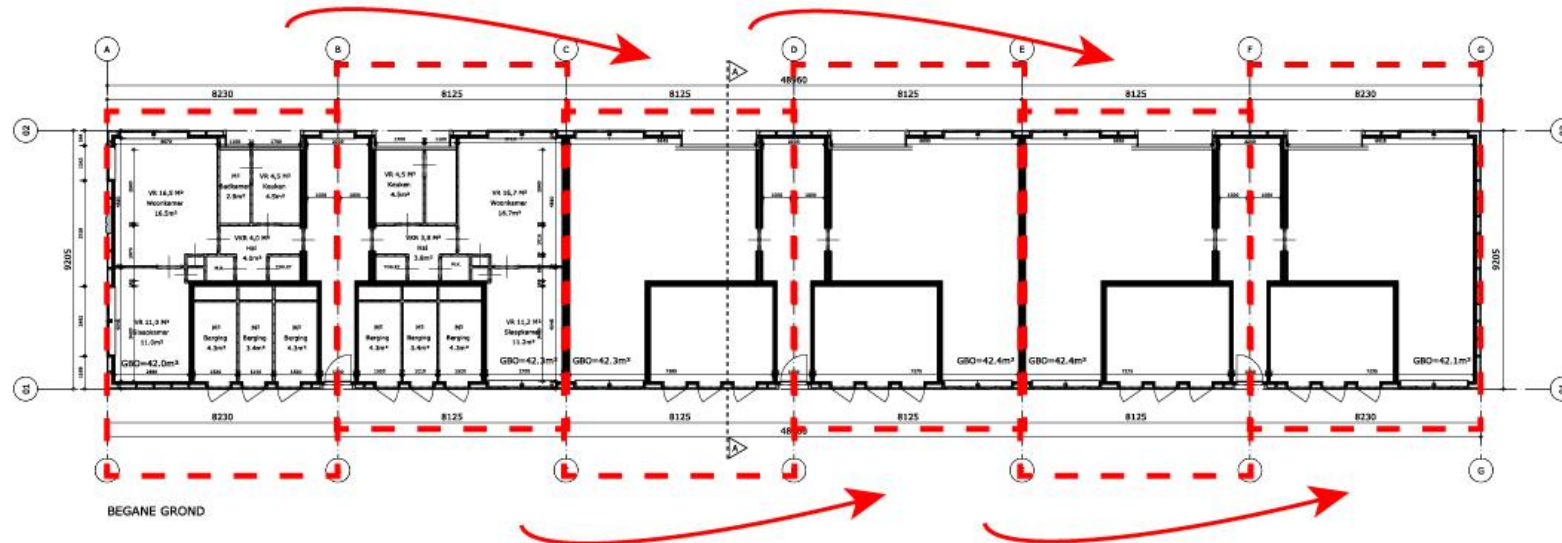
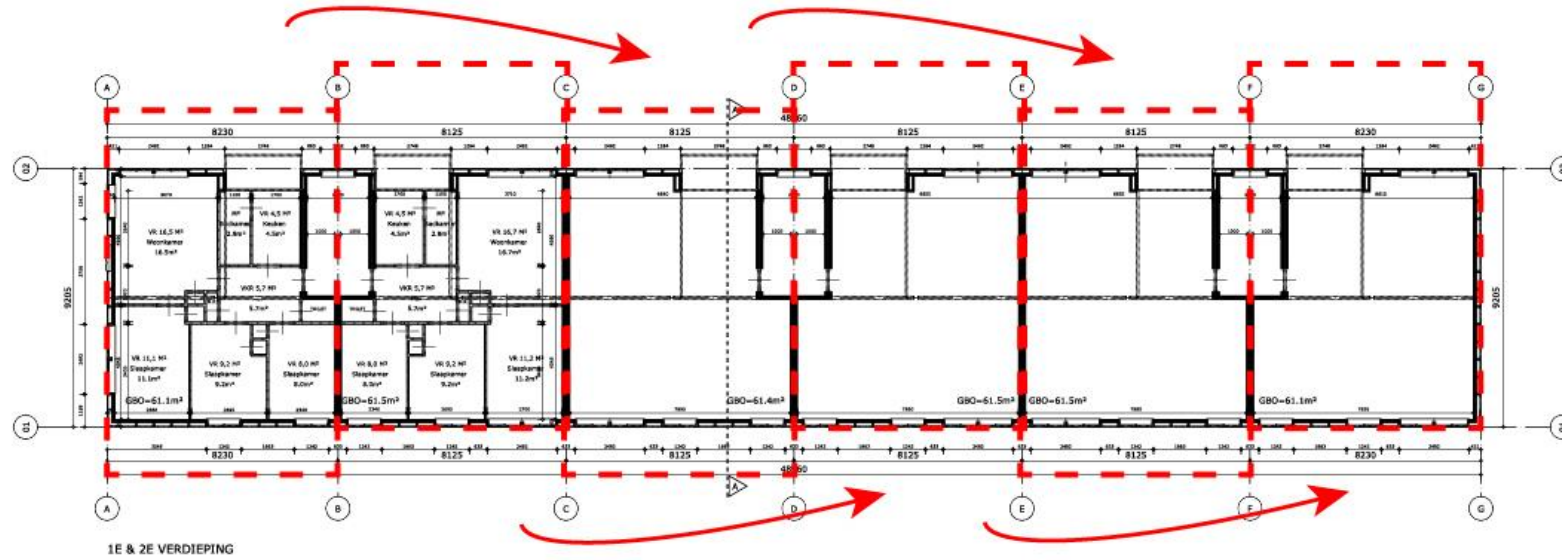
© Getty Images



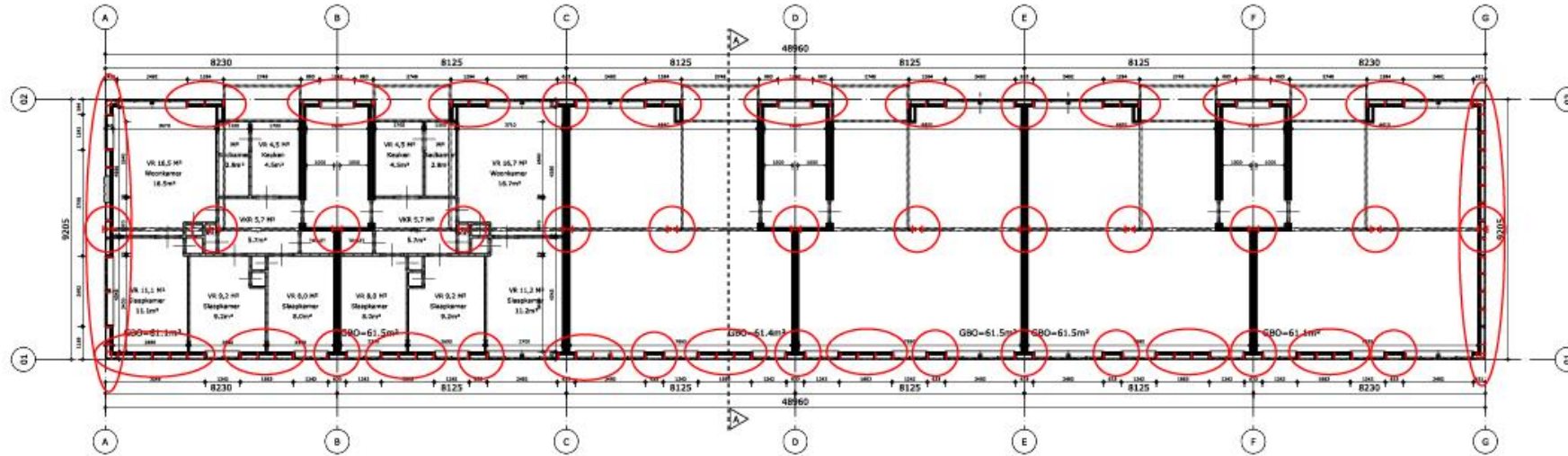
STRUCTURE / REPETITION FACADES



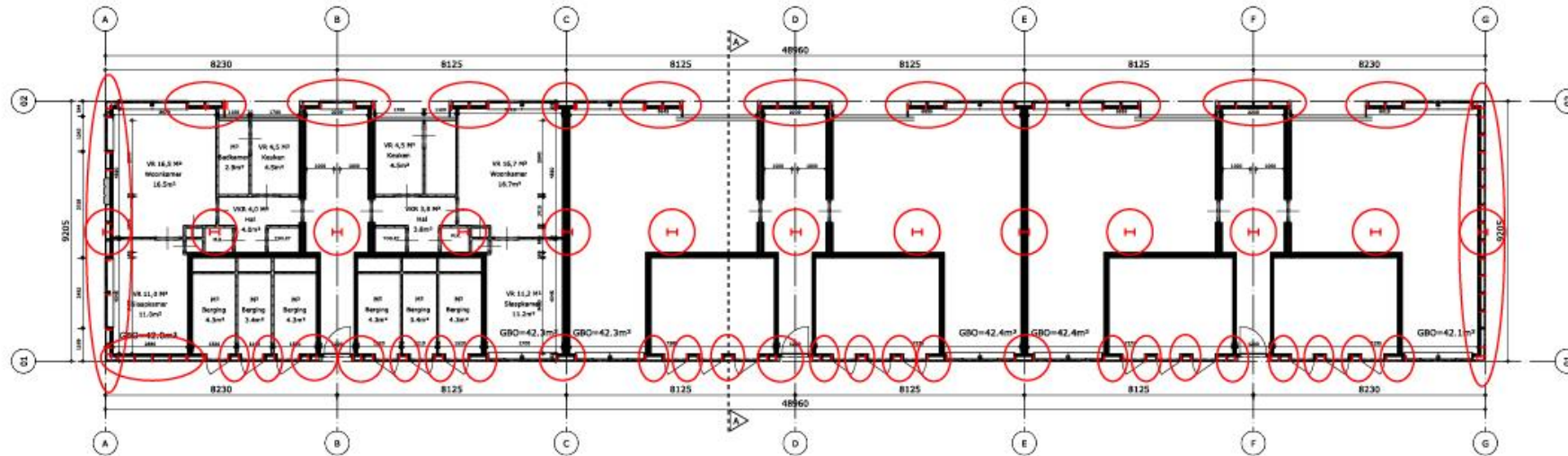
STRUCTURE / REPETITION FLOORPLANS



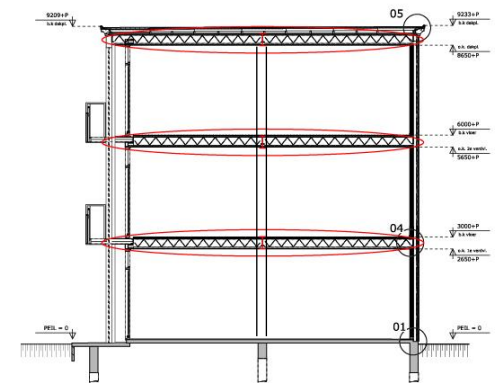
CONSTRUCTION



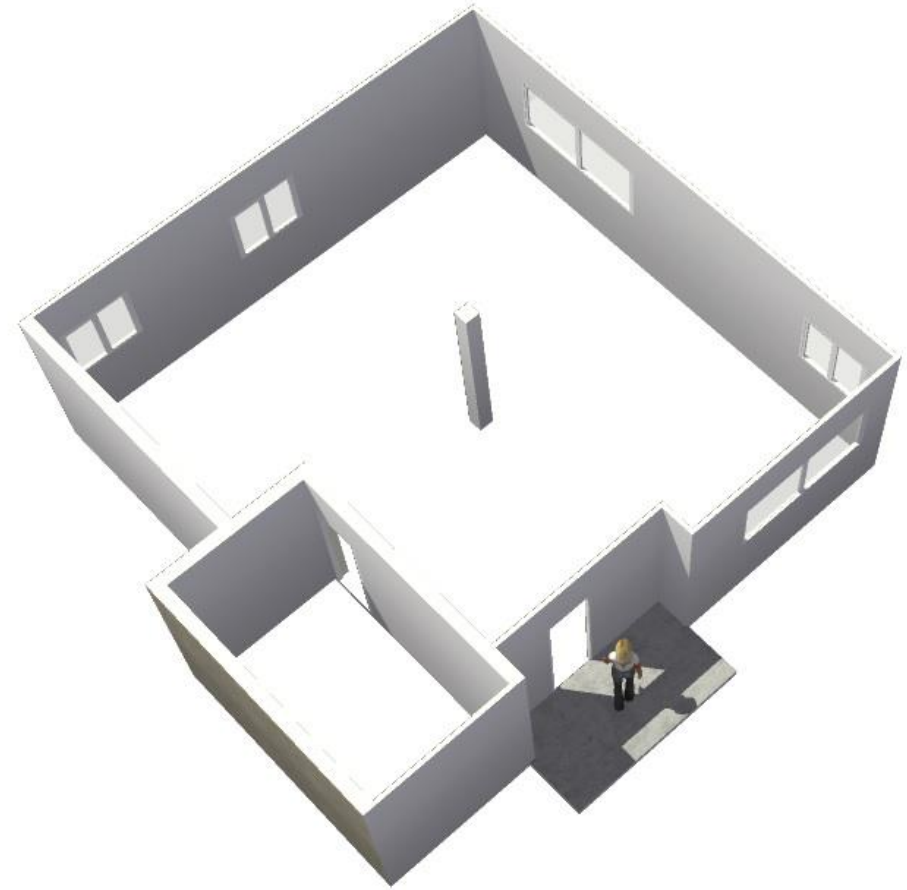
1E & 2E VERDIEPING



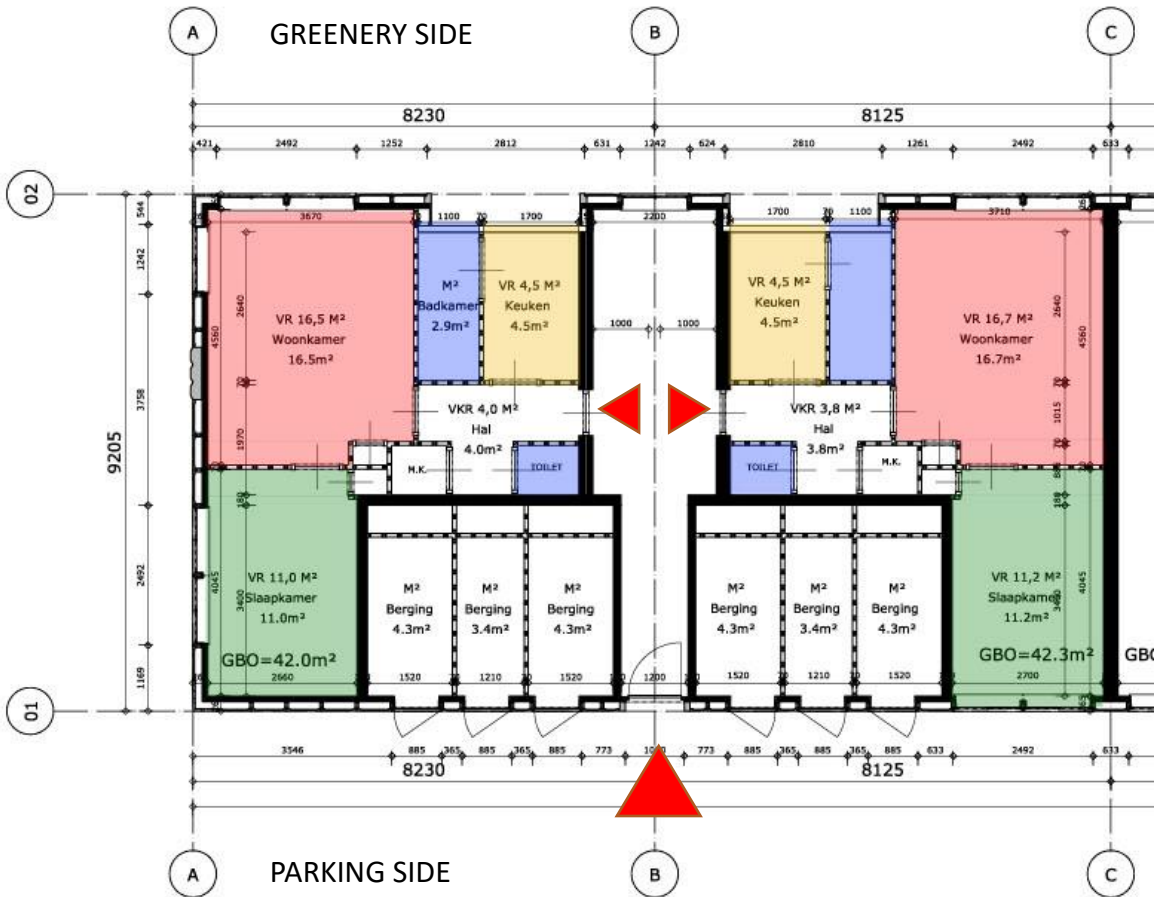
BEGANE GROND



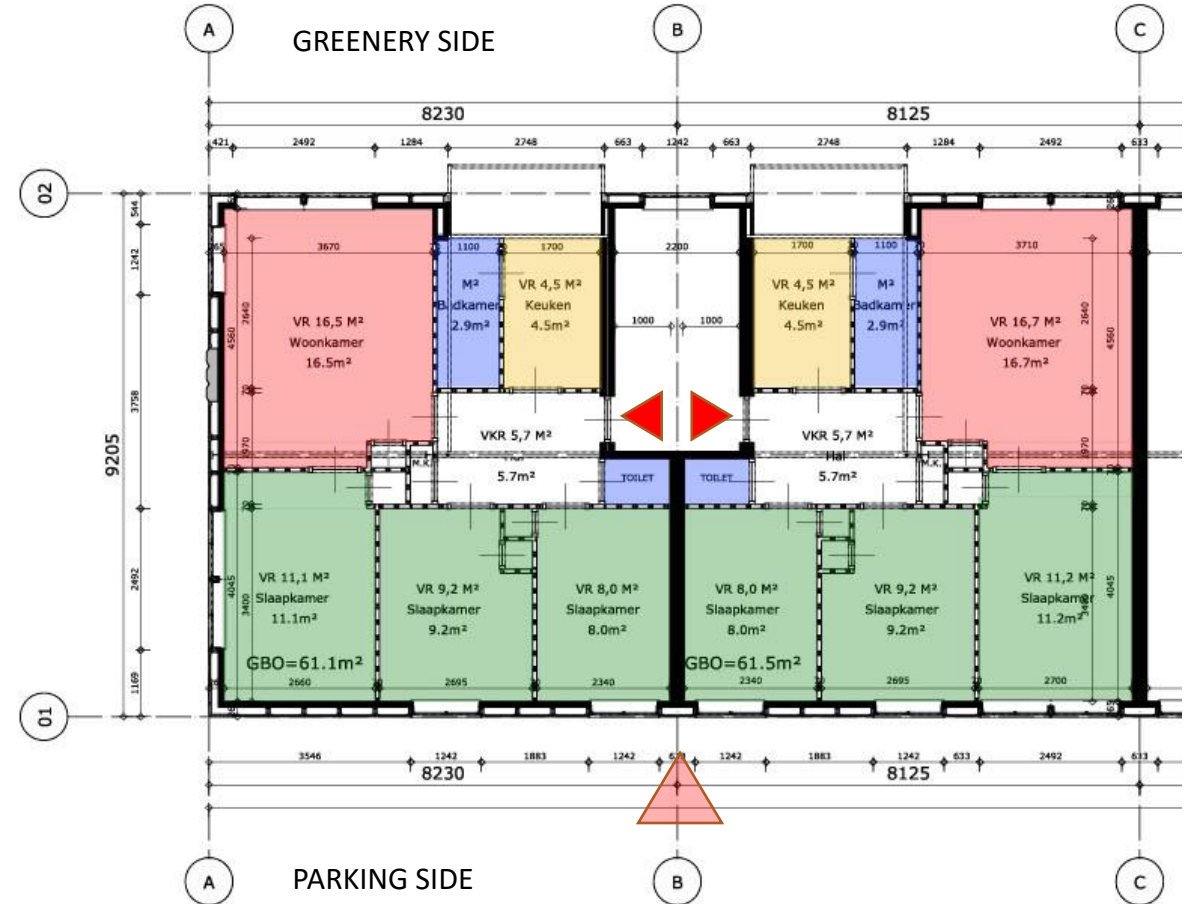
POSSIBILITIES OF FREE FLOOR PLAN



FLOORPLANS & ACCESSIBILITY



GROUND FLOOR



FIRST & SECOND LEVEL

COMFORT

- Cold
- Draught
- Noise pollution
- Moisture problems
- Square meters

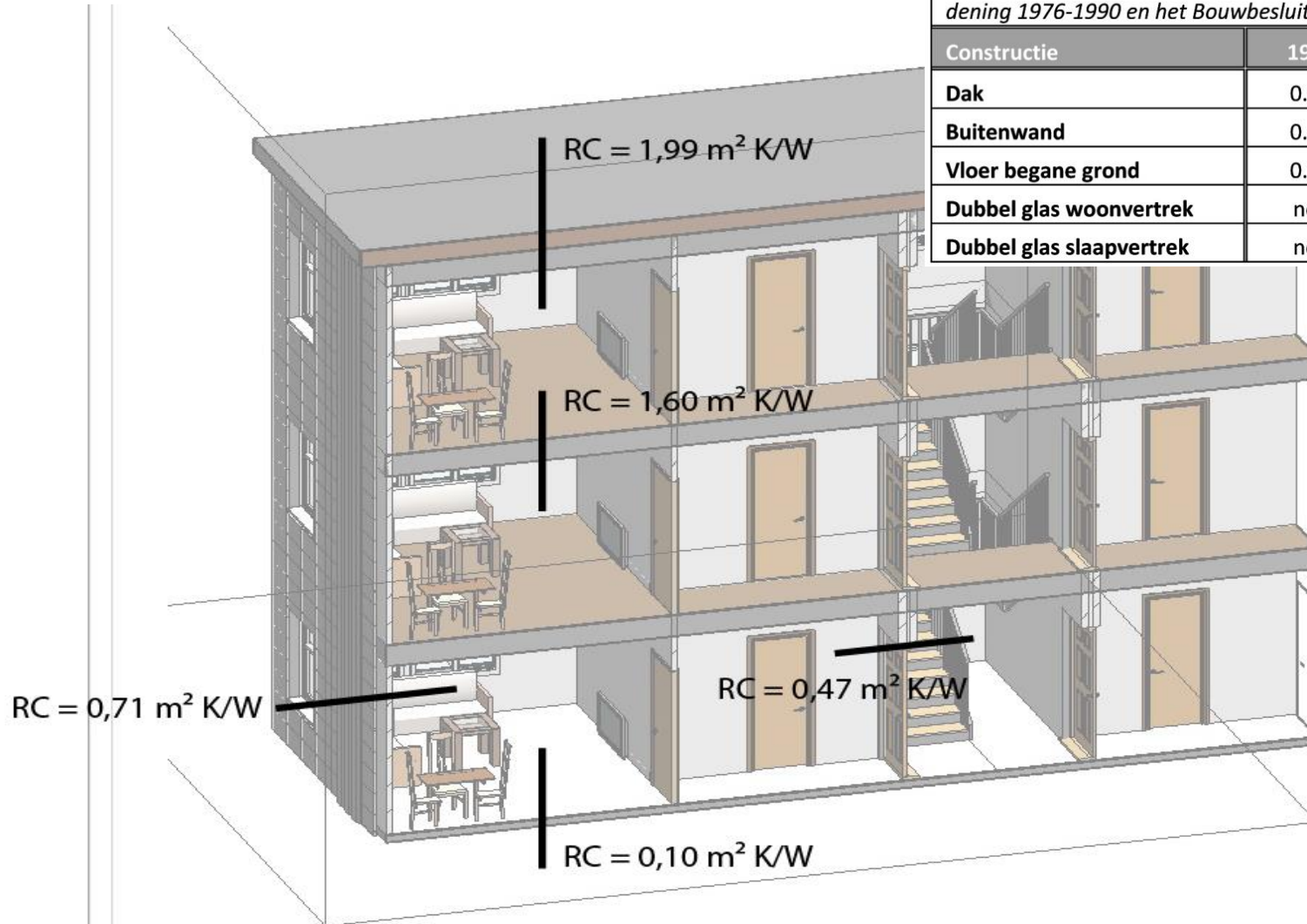
DWELLINGS FIRST AND SECOND FLOOR	Existing Situation (m ²)	Requirements 1954 (m ²)	Requirements 2015 (m ²)
Total surface	61	-	-
Living room, bedrooms & kitchen	49,2	38,5	18
Living room	16,5	16	11
Bedrooms in total	28,2	18,5	15
Bedroom 1	11	9,5	5
Bedroom 2	9,2	4,5	5
Bedroom 3	8,0	4,5	5
Bathroom	2,9	1,6	1,6
Kitchen	4,5	4	5
Storage	4,3	5	5
Balcony	2,8	2	4

DWELLINGS GROUND FLOOR	Existing Situation (m ²)	Requirements 1954 (m ²)	Requirements 2015 (m ²)
Total surface	42	-	-
Living room, bedrooms & kitchen	32	30	18
Living room	16,5	14	11
Bedroom	11	9,5	5
Bathroom	2,9	1,6	1,6
Kitchen	4,5	4	5
Storage	3,4	3	5

Minimumisolatie-eisen voor de sociale woningbouw volgens de Voorschriften en Wenken 1965, de Modelbouwverordening 1976-1990 en het Bouwbesluit 1992, uitgedrukt in de warmteweerstand van constructiedelen (Rc) in m²K/W

Constructie	1965	1975	1979	1982	1987	1990	1992
Dak	0.86	1.03	1.29	1.3	2.0	2.5	2.5
Buitenwand	0.43	0.69	1.29	1.3	2.0	2.5	2.5
Vloer begane grond	0.17	0.26	0.52	1.3	1.3	1.3	2.5
Dubbel glas woonvertrek	nee	nee	ja	ja	ja	ja	ja
Dubbel glas slaapvertrek	nee	nee	nee	nee	nee	nee	ja

Minimum requirements RC value [Liebregts, et al. 2011]



CONCLUSION:
 INNOVATIVE FOR ITS TIME,
 BUT THE BUILDINGS DO NOT MEET THE
 REQUIREMENTS OF TODAY

NATIONAL AGREEMENTS

- Energie Agreement 2013
 - 2050: Built environment must be energy neutral
 - 2020: Rented social housing: a B-label on average



 Maarten Georgius heeft getweet



Maxime Verhagen

@MaximeVerhagen

Energie neutraal bouwen belangrijker dan ooit! #COP21 #klimaatakkoord
Kijk eens wat er mogelijk is op Platform ZEN lente-akkoord.nl/zeer-energiezu...

15 dec. 15 om 10:28



ver
l
de

akkoord
aan een
in de
inister-

huidig bezit

2020



*beoogde gemiddelde
labelsprong*



2050



Energie neutraal

*benodigde energiesprong
richting 2050*







Source: Haytink, Geurts, and Valk; T.G. Haytink, B.J.H. Geurts, and H. J. J. Valk, 'Onderzoek Energiezuinige Renovatiewoningen Label B/A', (2015).

LOCATION	TPOLOGY	LEVELS	YEAR OF RENOVATION	NUMBER OF HOUSES	ENERGY INDEX BEFORE	ENERGY LABEL BEFORE	ENERGY INDEX AFTER	ENERGY LABEL AFTER	SURFACE AREA OF DWELLING	INVESTEMENT PER DWELLING	INCREASE IN COSTS PER MONTH*	ARCHITECTURAL CHANGE **
Luttebrink Enschede	Drive-in dwellings	3	2012-2013	28	2,23	E	0,48	A ++	126 m ²	unknown	unknown	+
Saterlosstraat Hengelo	Portiek	3	2014	78	2,46 - 3,78	F & G	1,16 - 1,19	B	45 - 70 m ²	€ 56.400,00	unknown	-
Jan Voermanstraat Amsterdam	Portiek	4	2013-2014	362	2,23 - 2,24	E	1,11 - 1,37	B - C	52 m ²	€ 25.000,00	€ 40,00	-
Lucellestraat Amsterdam	Portiek	4	2013-2014	179	2,42 - 3,22	F & G	0,66 - 1,22	A & B	65 - 98 m ²	€ 45.000,00	unknown	--
Beethovenlaan Doetinchem	Gallery apartments	4	2015-2015	128	1,97 - 3,80	D - G	1,04 - 1,27	A & B	31 - 66 m ²	onbekend	€ 20,00	- / +
Acacia/Magrolia Nieuwkuijk	Apartments	2	2010-2011	16	1,92 - 2,77	D - E	0,58	A++	66 m ²	€ 100.000,00	€ 100,00	+
Voermanstraat Groningen	Portiek	3	2014-2015	3 of 48	onbekend	onbekend	-0,4	A (NOM)	unknown	> € 65.000,00	€ 0,00	- / +

* calculated by: (increase of rent - savings of energy bill) / month

** architectural image changed a lot: + / architectural image did not changed a lot: -

PROGRAMME OF REQUIREMENTS

- Social houses for the existing tenants of Eigen Haard



Design

CONCEPT

TRANSFORMATION LINE – MORE LIGHT / AIR / SPACE

RENOVATION LINE – MODERN CHARACTERISTICS



CONCEPT

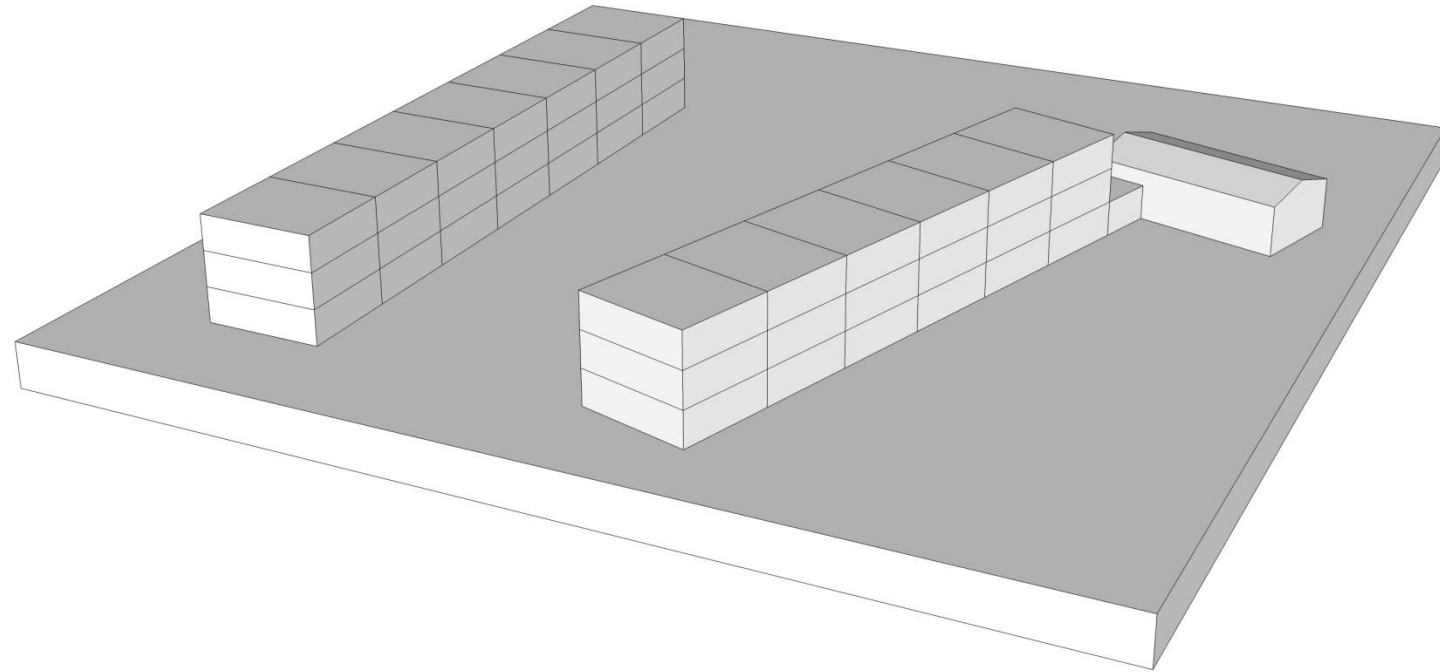
TRANSFORMATION LINE – MORE LIGHT / AIR / SPACE

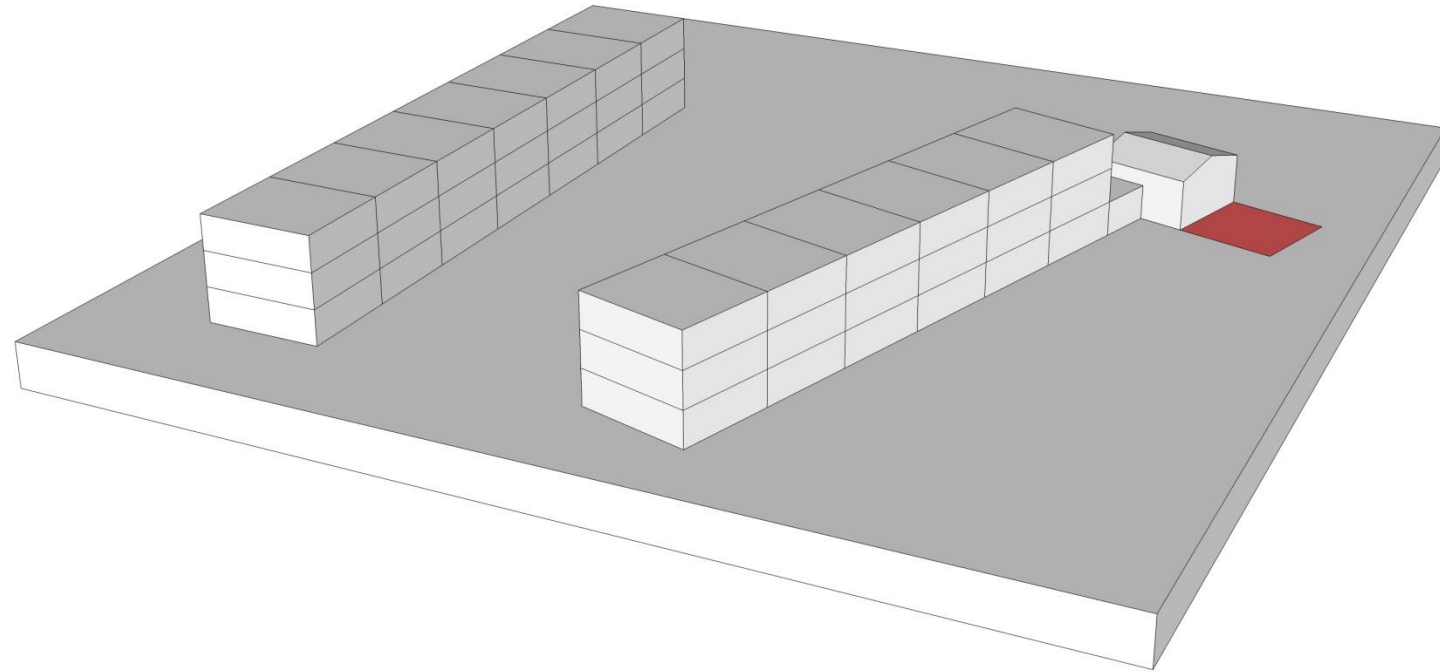
RENOVATION LINE – MODERN CHARACTERISTICS

URBAN AREA
ACCESSIBILITY & SOCIAL INTERACTION



'KIJKGROEN' QUIET ATMOSPHERE





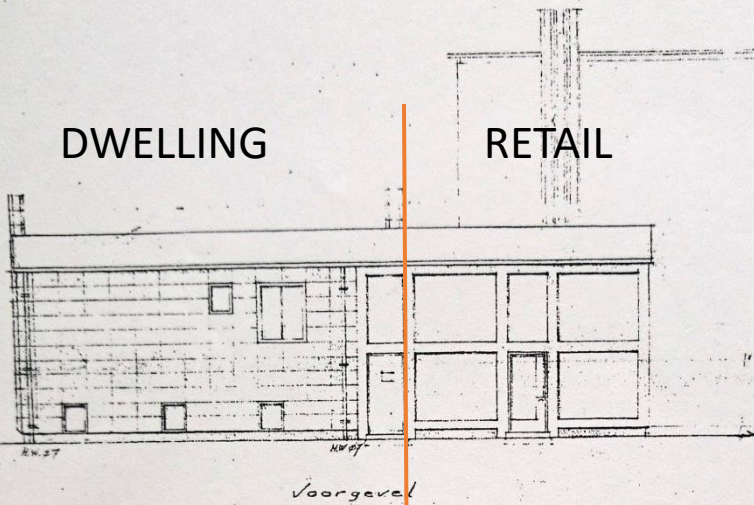




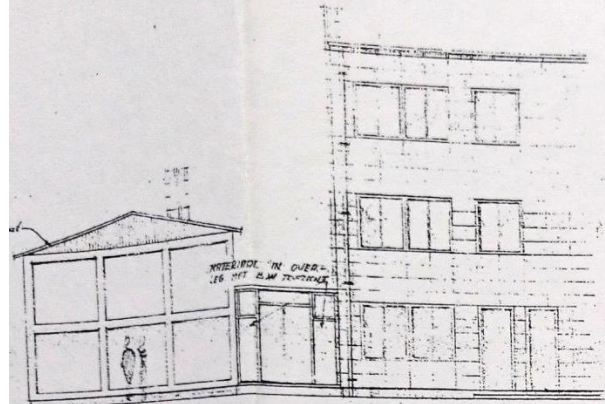


DWELLING

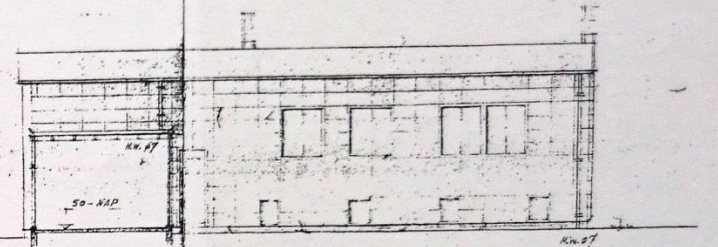
RETAIL



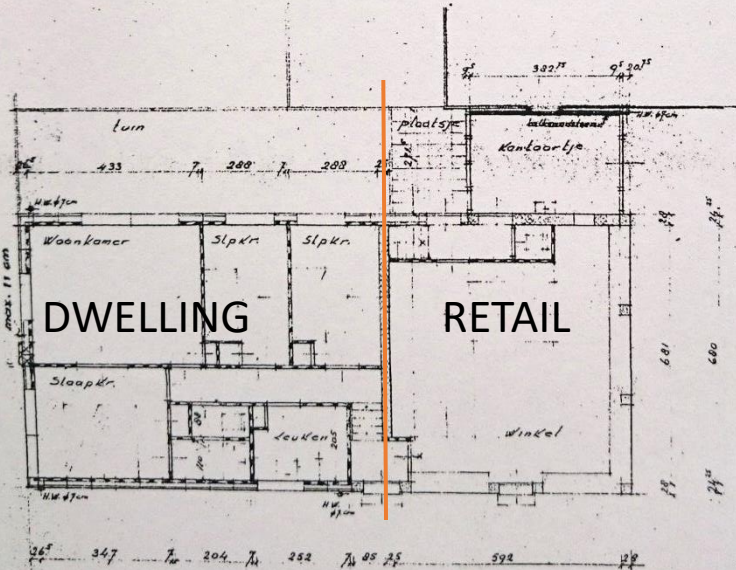
Voorgevel



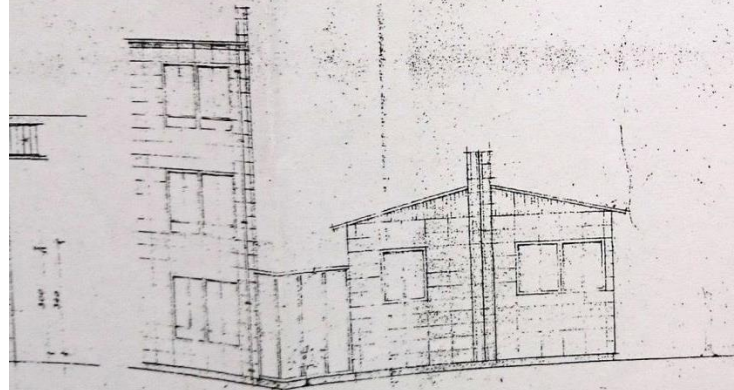
Zygevel Serie 364



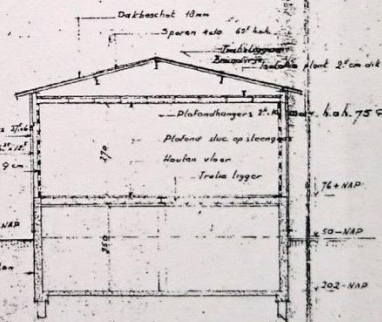
Ochtergevel



plattegrond



Zygevel



doorsnede

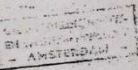
Referentie
 Gew. beton
 Metselwerk in Smalblokken
 Drijfsteen wanden dik 7cm
 Zelfbetonde deuren, met 4-10cm brandwerij bekleding
 Zie ook de opmerkingen op blad 3

NIEUWE TOESTAND
 WINKEL MET WONING
 GEVELS, PLATTEGONDEN
 BLOKKEN XV, XVI en XVII

170/52

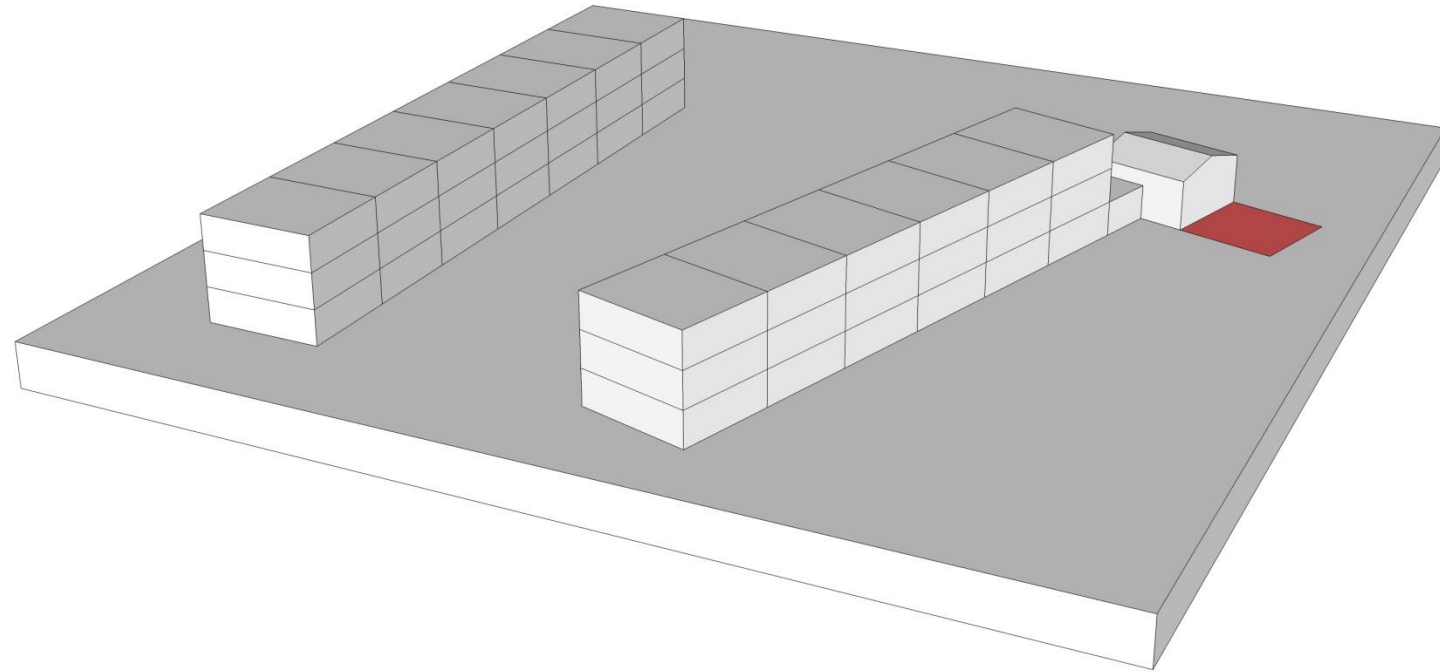
17202

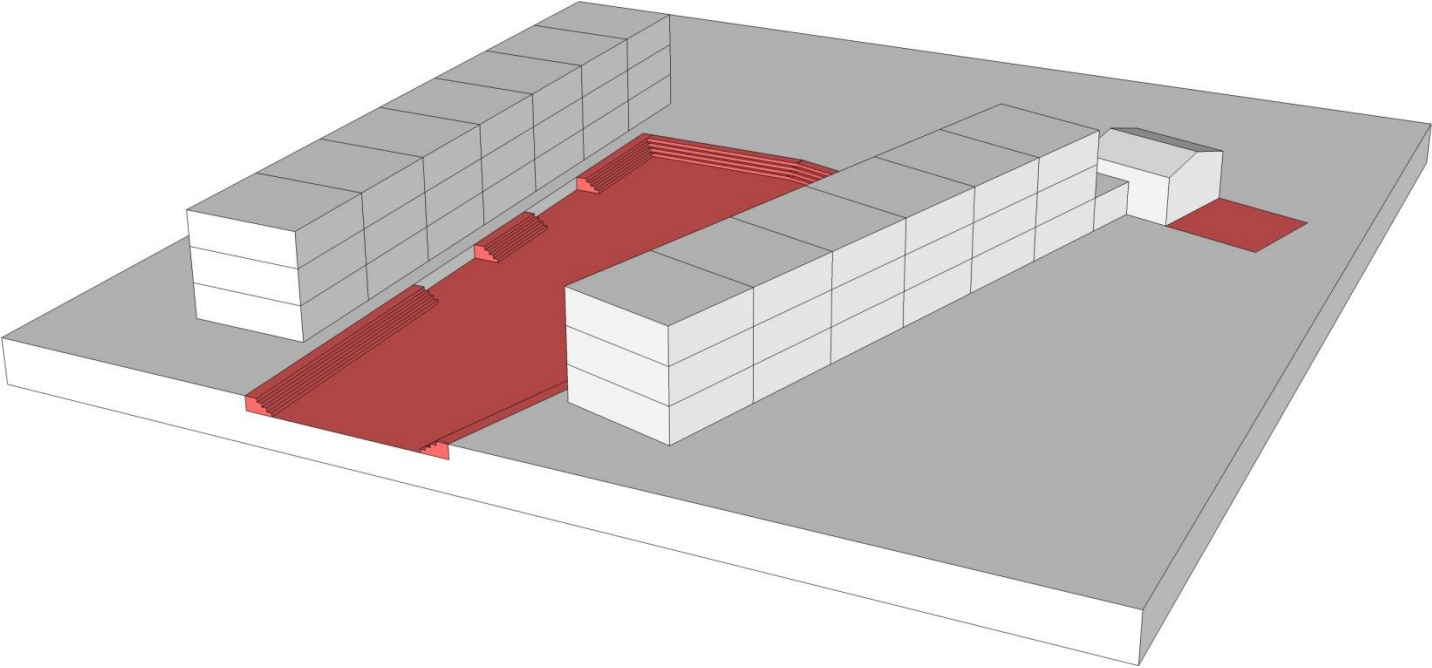
Accoord met de door de COMMISSIE
 voor de Nieuwstad
 gemaakte opmetingsplaatjes

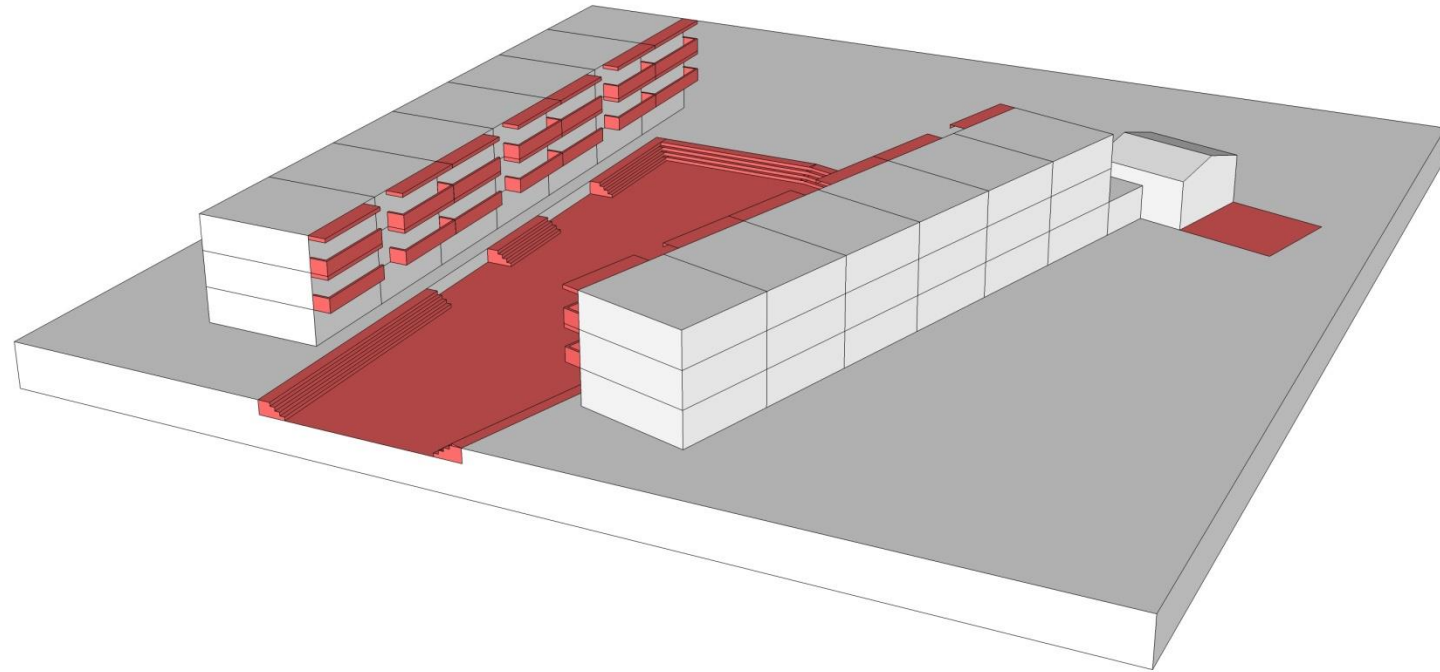


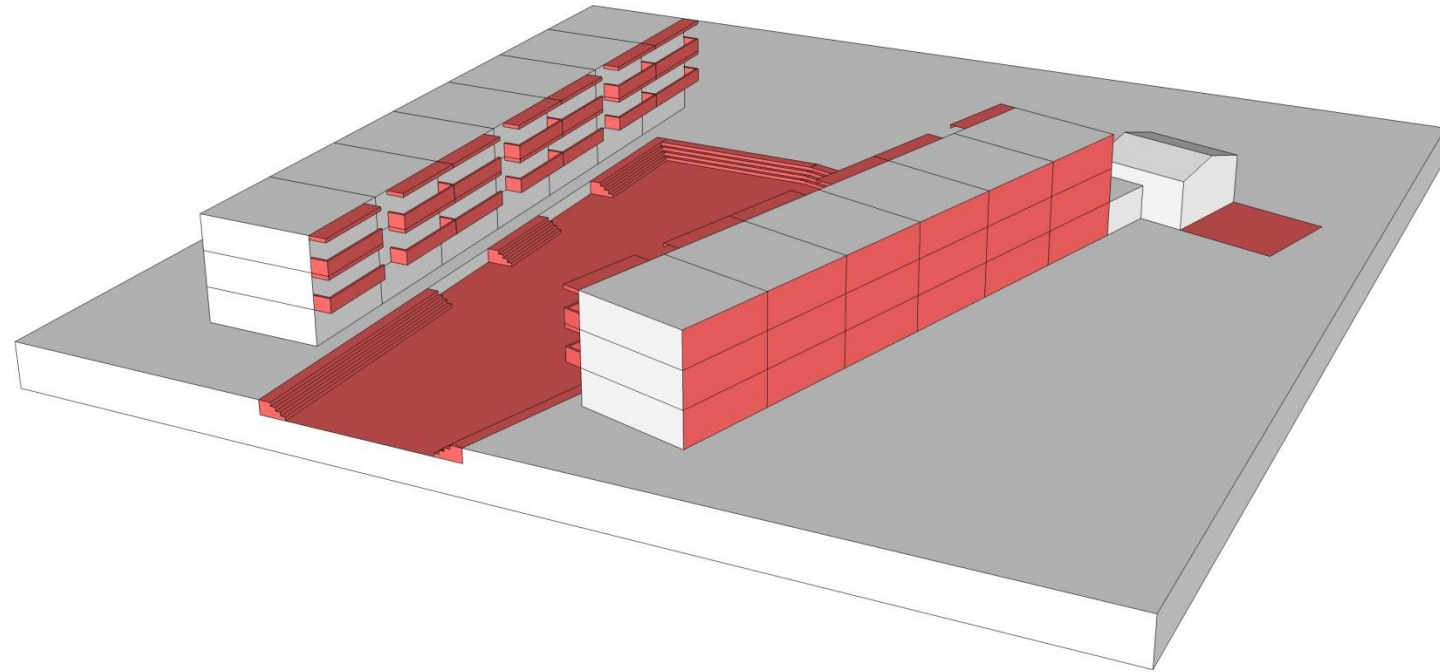
Behoort bij de beschikking van Burgemeester
 Westendorp van Amsterdam d.d. 9/11/1952
 No. 456/1952
 De Directeur van de Gemeente Amsterdam

PLAN VOOR HET BOUWEN VAN 12 PERKELEN BEVA-
 -61 WONINGEN EN 1 WINKELS.
 MELKEN AAN DE BOS EN LOMMERWEG EN CUNETT
 TUINSTAD SLOTERMEER AMSTERDAM
 NED. N.B. VOOR VOLKSHUISVESTING
 ARCHITECT: PROF. IR. J.F. BERCHOEF
 AMSTERDAM, NOV. 1951













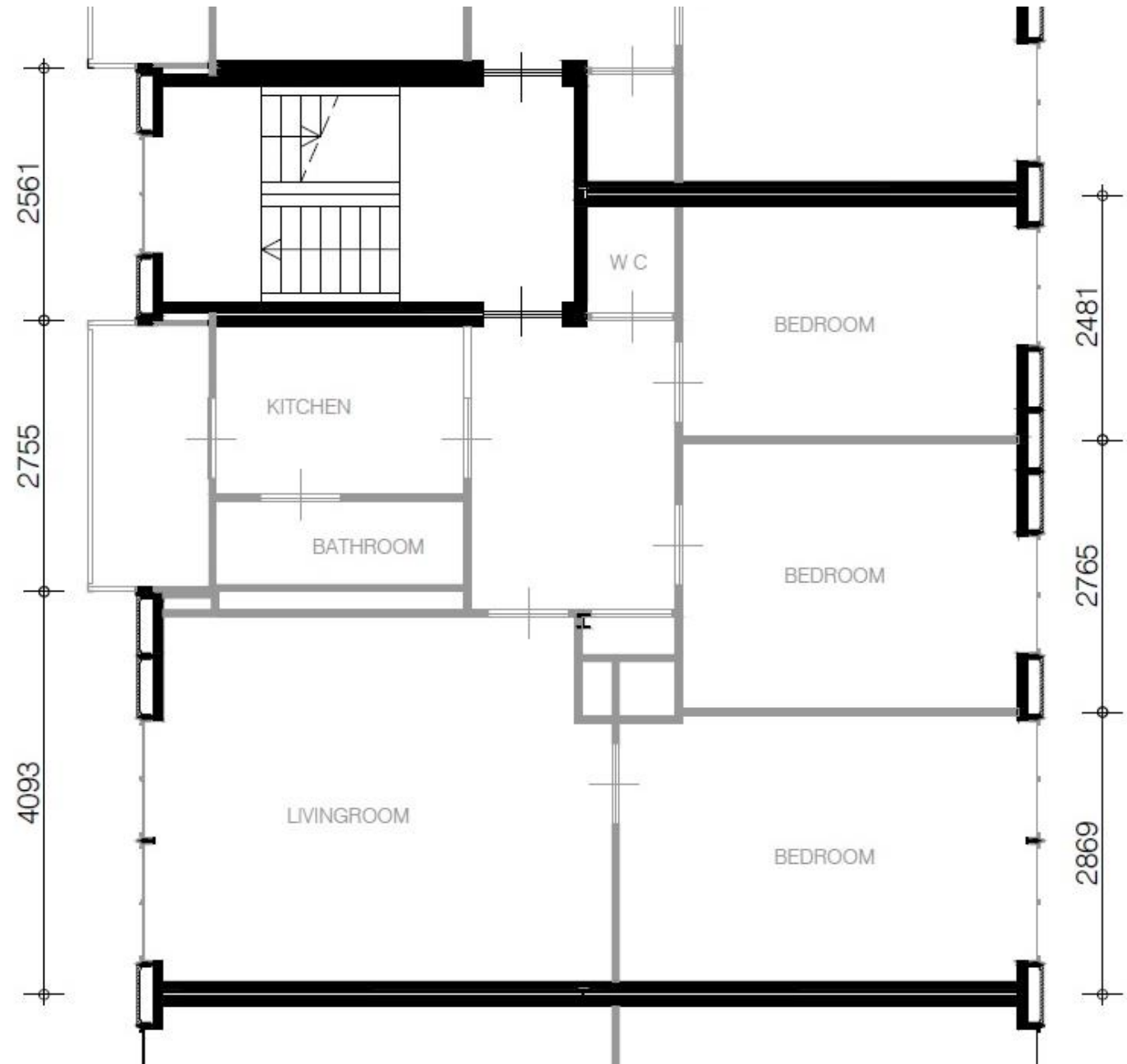


SECTION AA

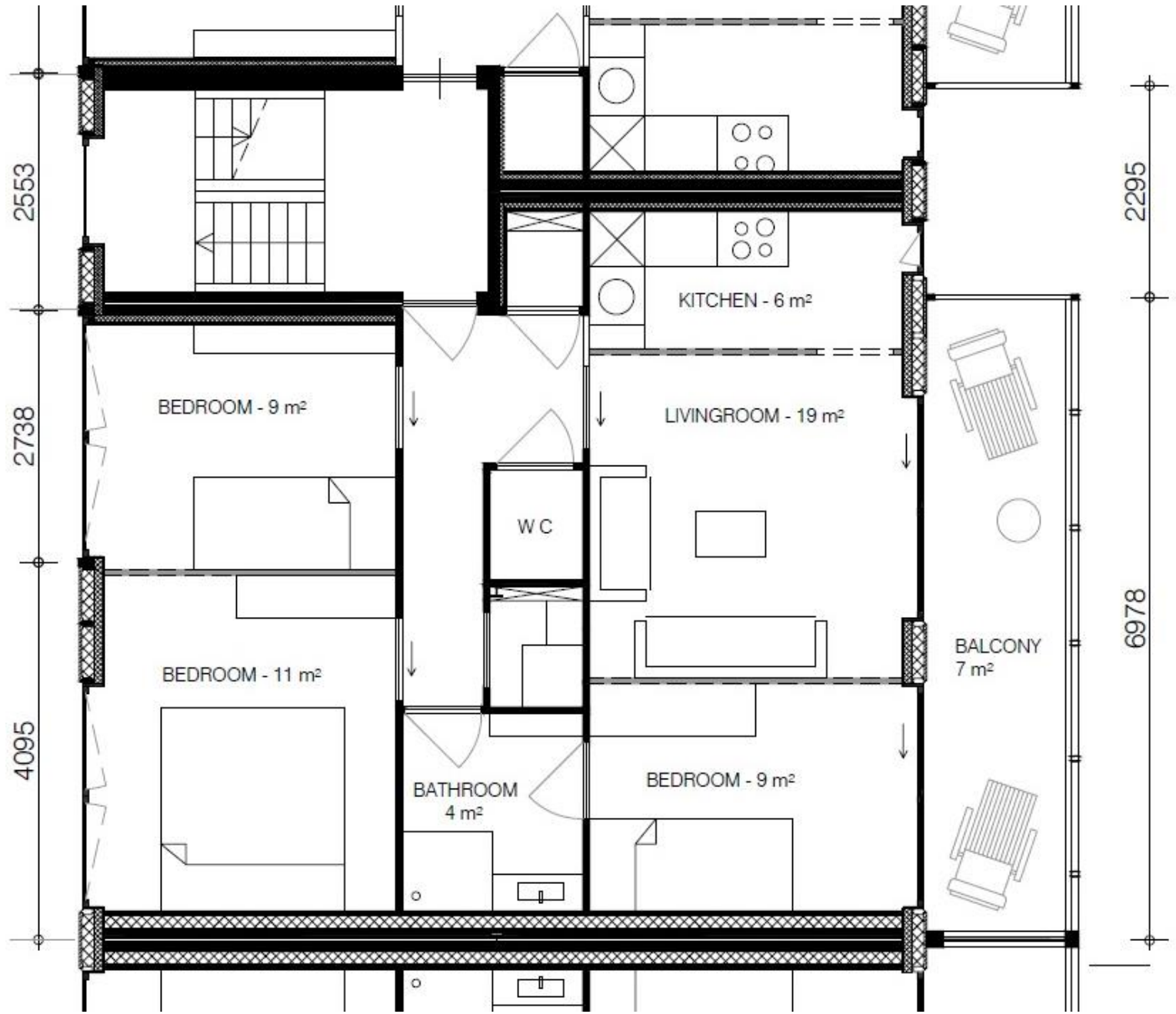


SECTION BB

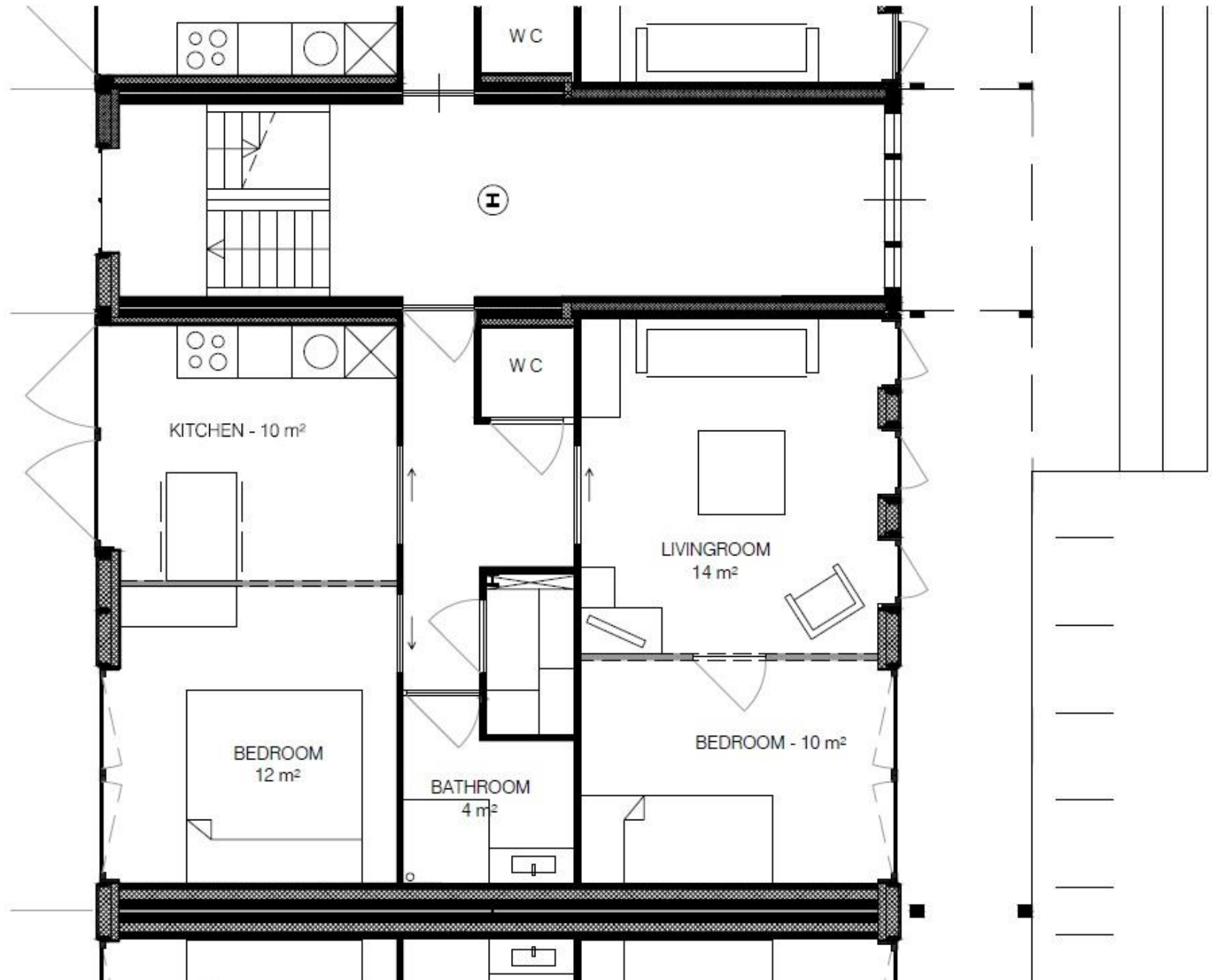
EXISTING FLOORPLAN
level 1 & 2



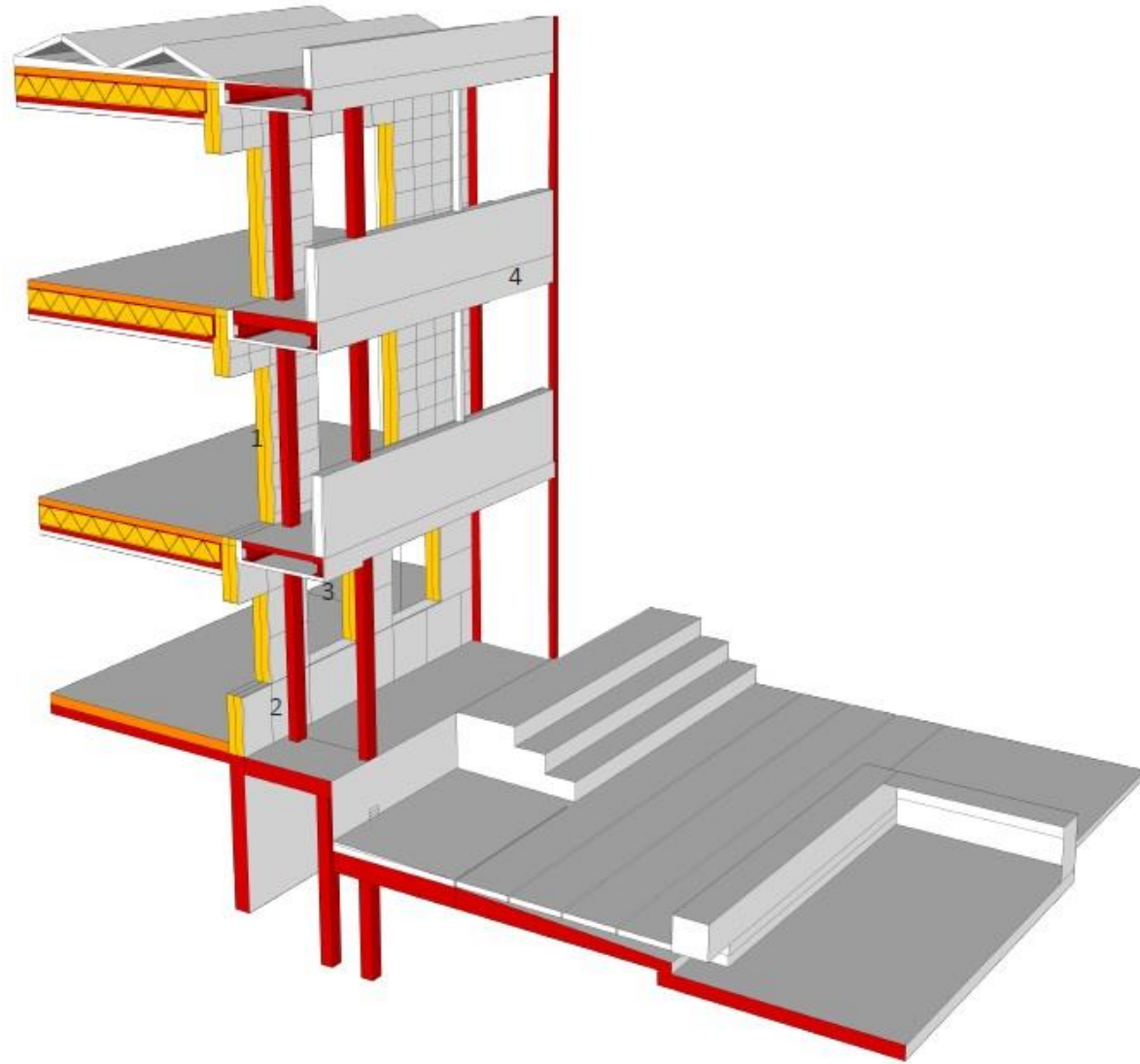
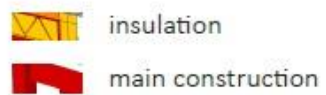
NEW FLOORPLAN
level 1 & 2



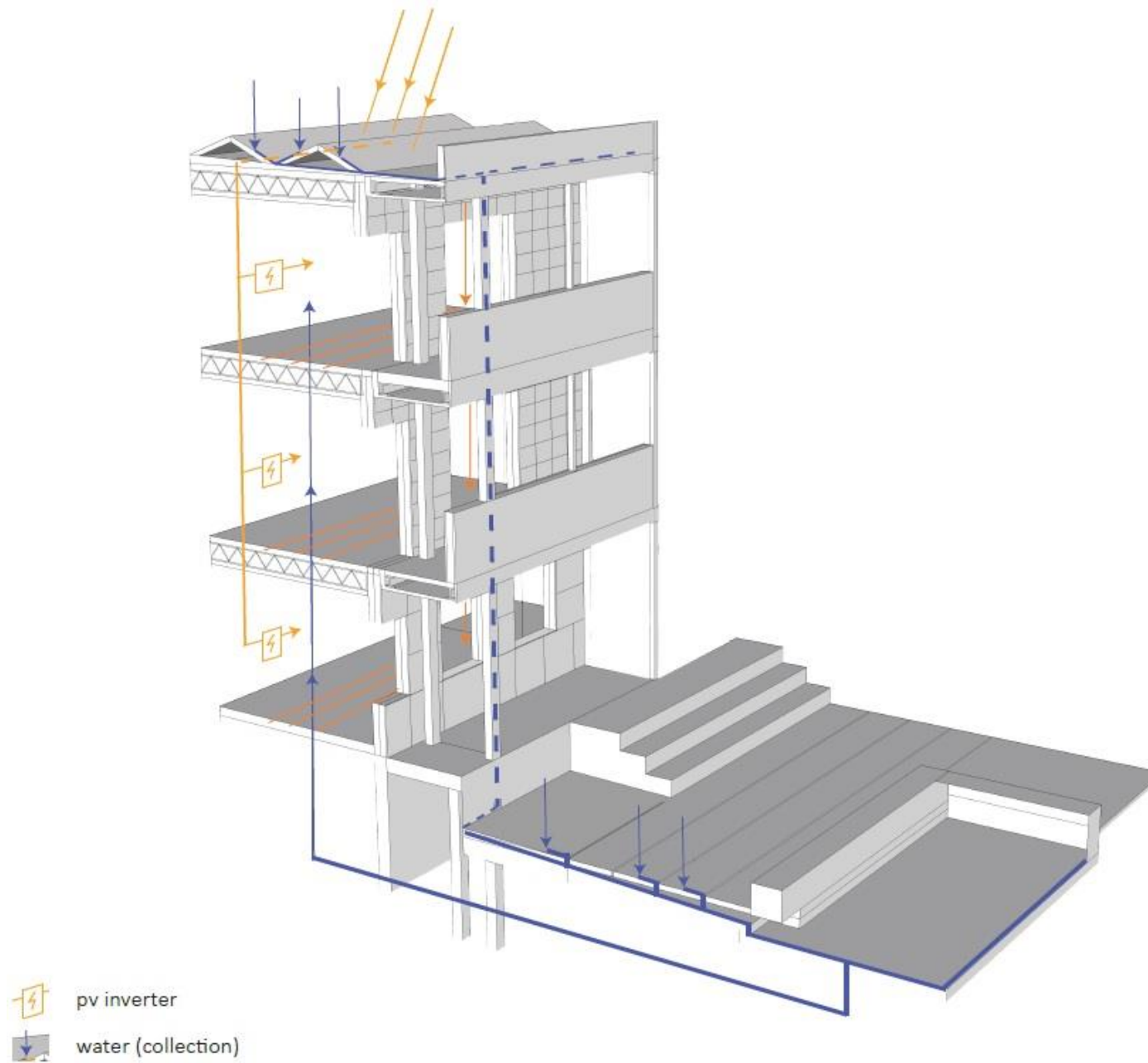
NEW FLOORPLAN
ground floor



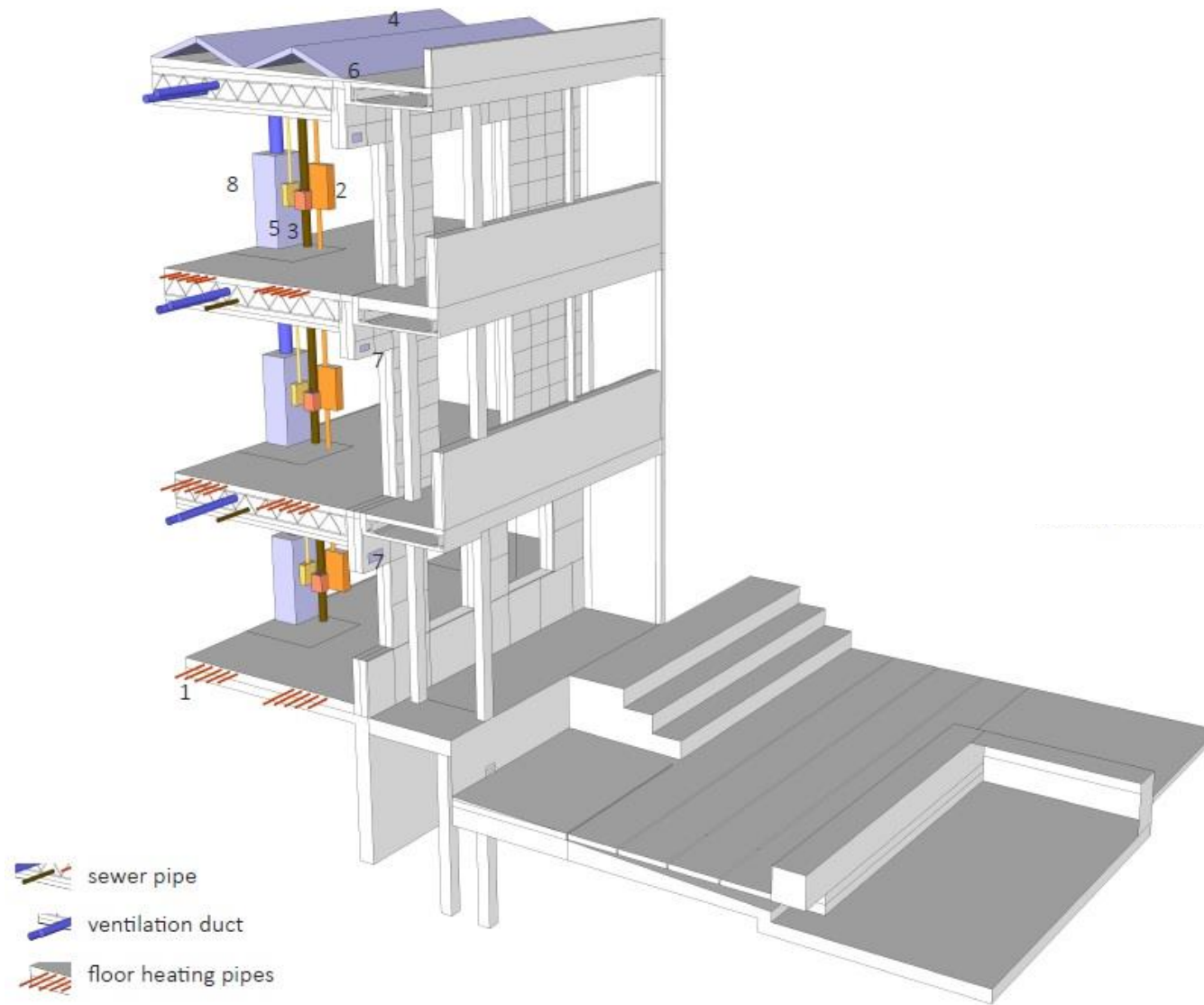
CONSTRUCTION INSULATION

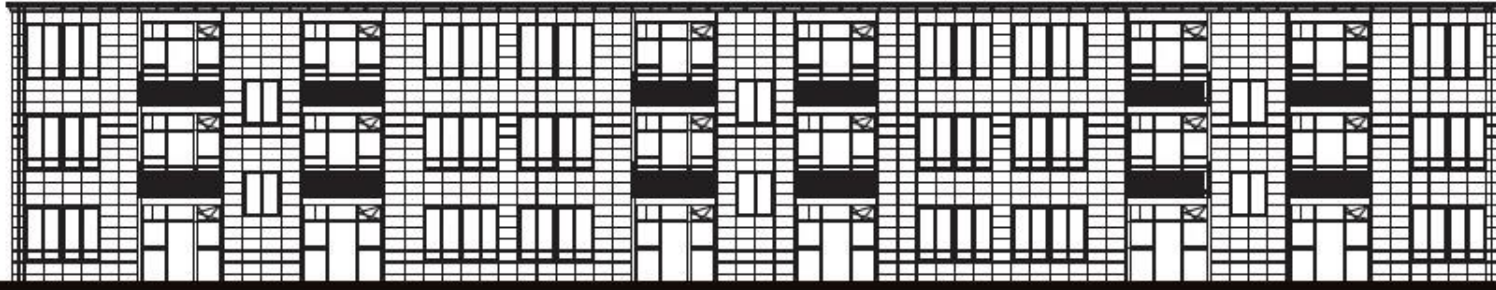


ENERGY GENERATION WATER COLLECTION

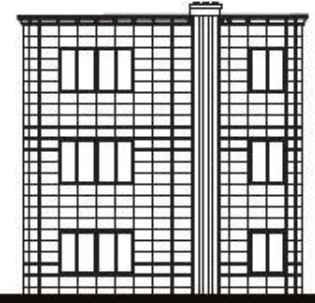


HEATING SYSTEM
VENTILATION SYSTEM
SEWERAGE





EXISTING WEST FACADE

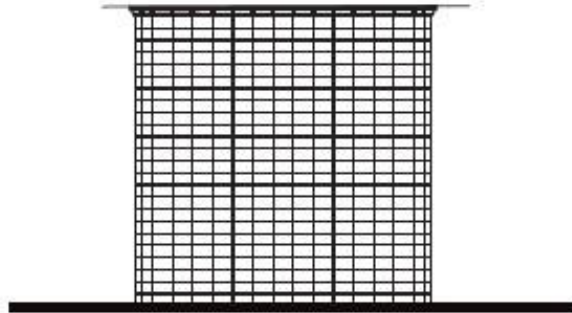


EXISTING SOUTH FACADE

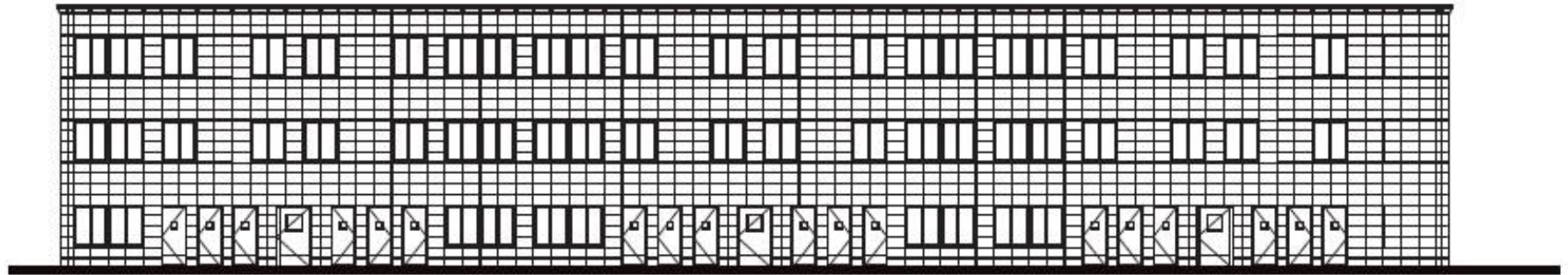


NEW WEST FACADE

NEW SOUTH FACADE



EXISTING NORTH FACADE



EXISTING EAST FACADE



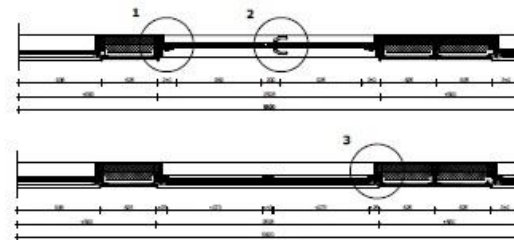
NEW NORTH FACADE



NEW EAST FACADE

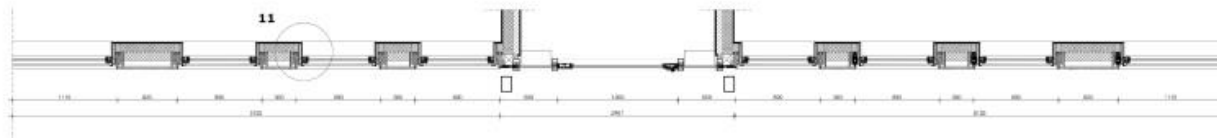


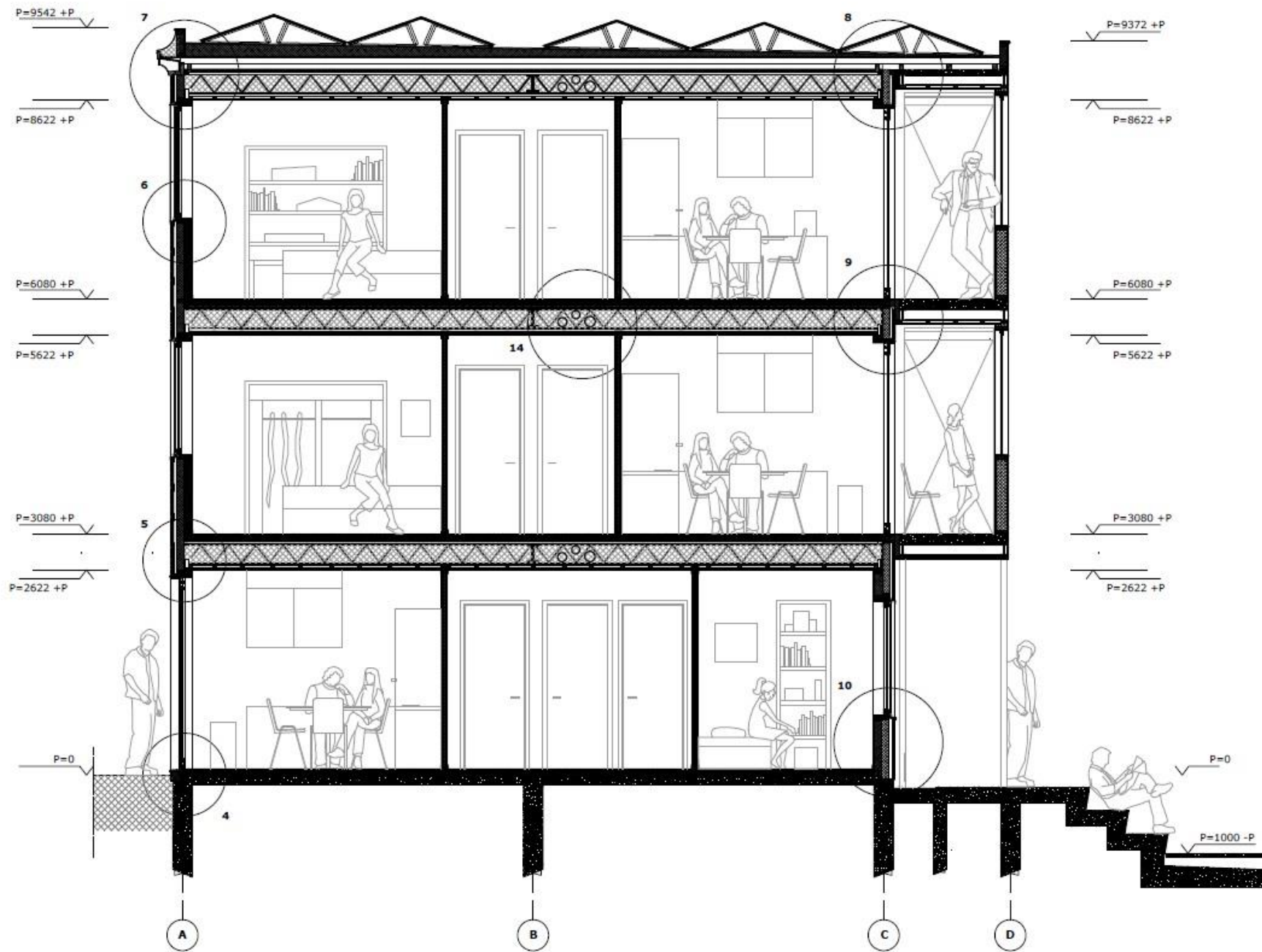
BACK FACADE & SECTION WITH
THE SELECTION OF DETAILS

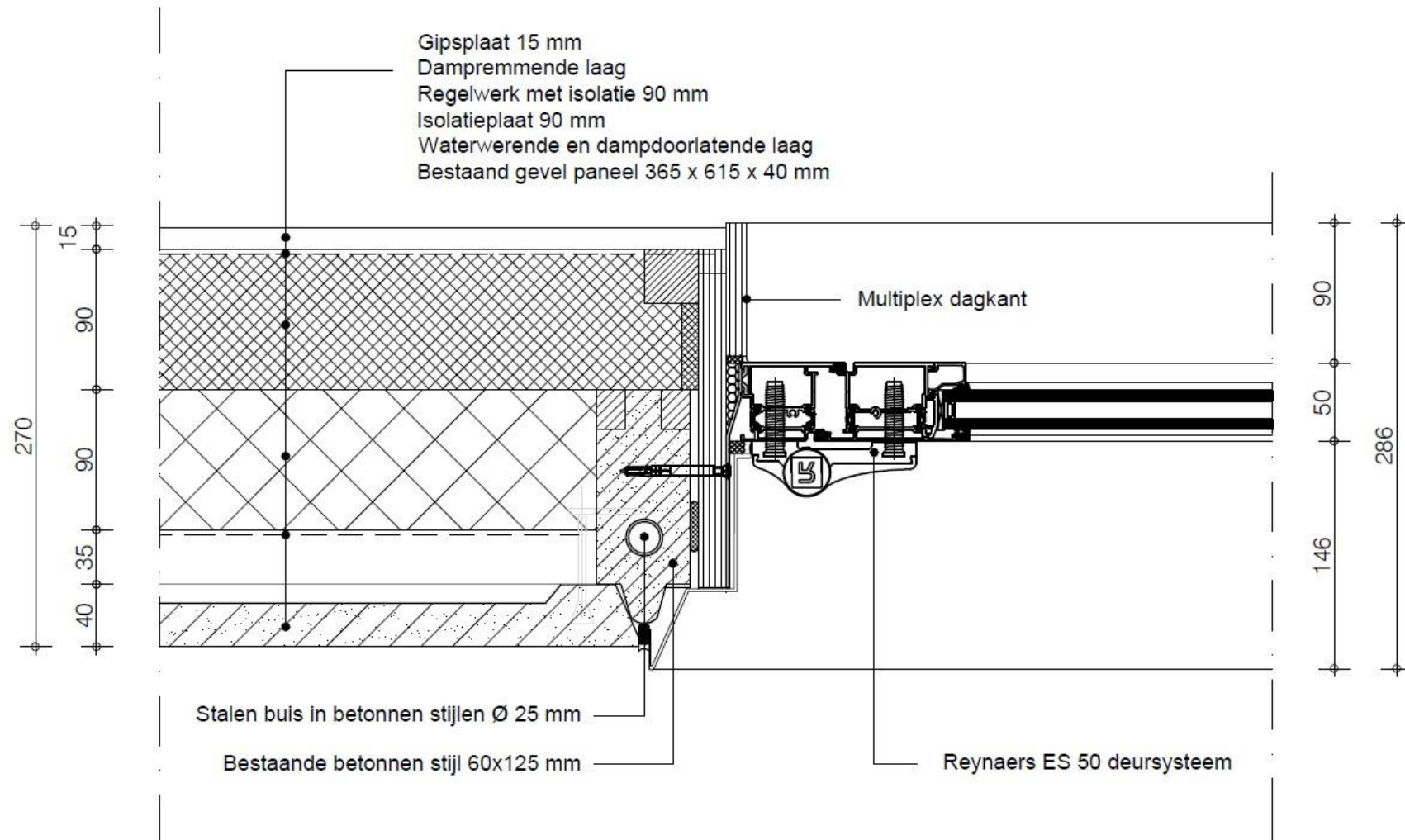




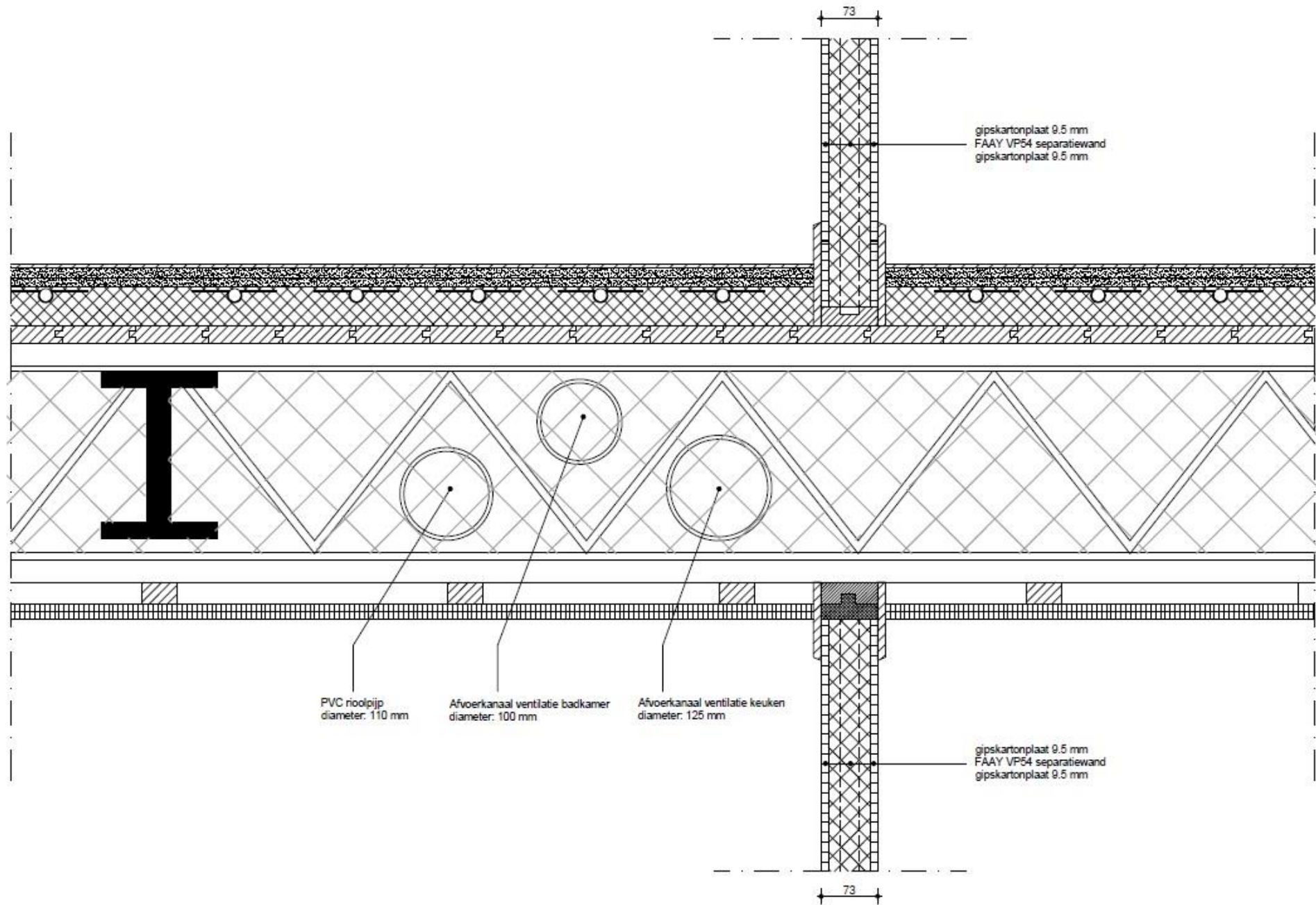
FRONT FACADE & SECTION WITH THE SELECTION OF DETAILS







DETAIL 1



DETAIL 14

Reflection

ENERGY EFFICIENCY

BEFORE RENOVATION

EPC (ENERGIE PRESTATIE COËFFICIËNT)

Uniec^{2.2}

Nemavo-Airey - Graduation Project - Nemavo-Airey dwellings
Nemavo-Airey building block with 18 dwellings

2,08

ENERGIE INDEX (EI)

G

AFTER RENOVATION

EPC (ENERGIE PRESTATIE COËFFICIËNT)

Uniec^{2.2}

Airey - Graduation Project - Heritage & Architecture - Social Housing
Renovation of Nemavo-Airey building block with 18 dwellings

-0,55

ENERGIE INDEX (EI)

A

BENG REQUIREMENTS (BIJNA ENERGIE NEUTRALE GEBOUWEN)

<i> criterium</i>	<i> Prestatie</i>	<i> Eis (2016)</i>
<i> EPC</i>	-0,55	< 0,4
<i> BENG-criteria</i>	<i> Berekend</i>	<i> Voorlopige eis (2020)</i>
<i> 1. Energiebehoefte</i>	106,7 kWh _{th} /m ²	< 25 kWh _{th} /m ²
<i> 2. Primair fossiel energiegebruik</i>	-61,6 kWh / m ²	< 25 kWh / m ²
<i> 3. Aandeel hernieuwbare energie</i>	155 %	> 50%

ENERGIE MAATREGELEN INDEX (EMI)

$$EMI = fEMI * (EP_{high} - EP) / (EP_{high} - EP_{low})$$

$fEMI = \text{dimensieloze schaalfactor } fEMI = 10;$

$EP_{high} = \text{energieprestatie of the building without energy saving measures in MJ/m}^2$

$EP = \text{energieprestatie of the building in MJ/m}^2$

$EP_{low} = \text{energieprestatie after maximum energy saving measures in MJ/m}^2$

FINAL SCORE: 5,8

³⁵ Wessel de Jonge Architecten BNA BV, 'Duurzaam Verbetered! Bepaling Duurzaamheid Herbestemming Karakteristieke Gebouwen', (2011).

INVESTMENT

NoM (Nul op de Meter) - exploitation period of 40 years

No increase in rent for the existing tenants

€ 96.845,-

STIMULERINGSREGELING ENERGIEPRESTATIE HUURSECTOR (STEP)

SUBSIDY PER DWELLING

Naar:	EI ≤0,40	EI ≤0,60	EI ≤0,80	EI ≤1,20	EI ≤1,40
Van:					
EI 1,41 ≤ 1,80	€4.800	€3.600	€2.800	€1.500	
EI 1,81 ≤ 2,10	€6.200	€4.800	€3.600	€2.800	€1.500
EI 2,11 ≤ 2,40	€7.200	€6.200	€4.800	€3.600	€2.800
EI 2,41 ≤ 2,70	€8.300	€7.200	€6.200	€4.800	€3.600
EI >2,70	€9.500	€8.300	€7.200	€6.200	€4.800

FONDS ENERGIEBESPARING HUURSECTOR (FEF)

Soort verhuurder	Van Energie-Index naar Energie-Index
Woningcorporatie woningen onder maximale huurgrens	$\geq 1,81$ naar $\leq 0,80$ $\geq 1,41$ naar $\leq 0,60$
Woningcorporatie woningen boven maximale huurgrens	$\geq 1,81$ naar $\leq 1,20$ $\geq 1,41$ naar $\leq 0,80$ $\geq 1,21$ naar $\leq 0,60$
Overige verhuurders woningen onder of boven de maximale huurgrens	$\geq 1,81$ naar $\leq 1,20$ $\geq 1,41$ naar $\leq 0,80$ $\geq 1,21$ naar $\leq 0,60$

LOAN OF 0,5% FOR 25% OF PROJECT COSTS FOR (MAX € 15.000 PER DWELLING)

Conclusion

COMFORT & PUBLIC SPACE

More square meters (+7 m² per dwelling)

Floorplans with options for the tenants

Less cold, draught & noise pollution

Reactivation of urban greenery

More social interaction at the urban square

SUSTAINABILITY & FEASEBILITY

Not meeting BENG requirements of 2020
EMI (Energie Maatregelen Index) score: 5.8
NOM (0 op de meter); EPC: - 0,55

No energy bill, but EPV (Energie Prestatie Vergoeding)
No increase in rent for the existing tenants
Investment by an ESCo (Energy Service Company)

THANK YOU

QUESTIONS?

P5 PRESENTATION HERITAGE & ARCHITECTURE – 28 JUNE 2016

JASPER SEBASTIAAN MULLER - 4002024 – J.S.Muller@student.tudelft.nl

