Canal Plus

moving to the bank

WHY RMIT ?

Assignment

MSc 4: Post-war areas, Utrecht
transformation of the southwestern areas (AR3Ar111)

Problem statement

The soutwestern areas of Utrecht was known for its industrial activities next to the channel. By the growth of the city the industrial areas become enclosed. Because of this expansion the industrial activity's can not function anaymore.

Therefore, most industry moved to adjacent industrial areas and the industrial site became vacant. These areas are often closed and a barrier for many residents.

Goal

Transformation of the whole industrial strip to a new urban fabric. Making the bank accessible for public en connected to the neighborhood. The ultimate goal is to zoom in on part of the canal project and redesign this chosen part until detail level.

Peiling 4
Technische Universiteit Delft
Architecture, Urbanism and Building Sciences
Studio RMIT, post-war areas Utrecht 2011/2012
Rob Heukshorst - 4063368

country

province

region

city

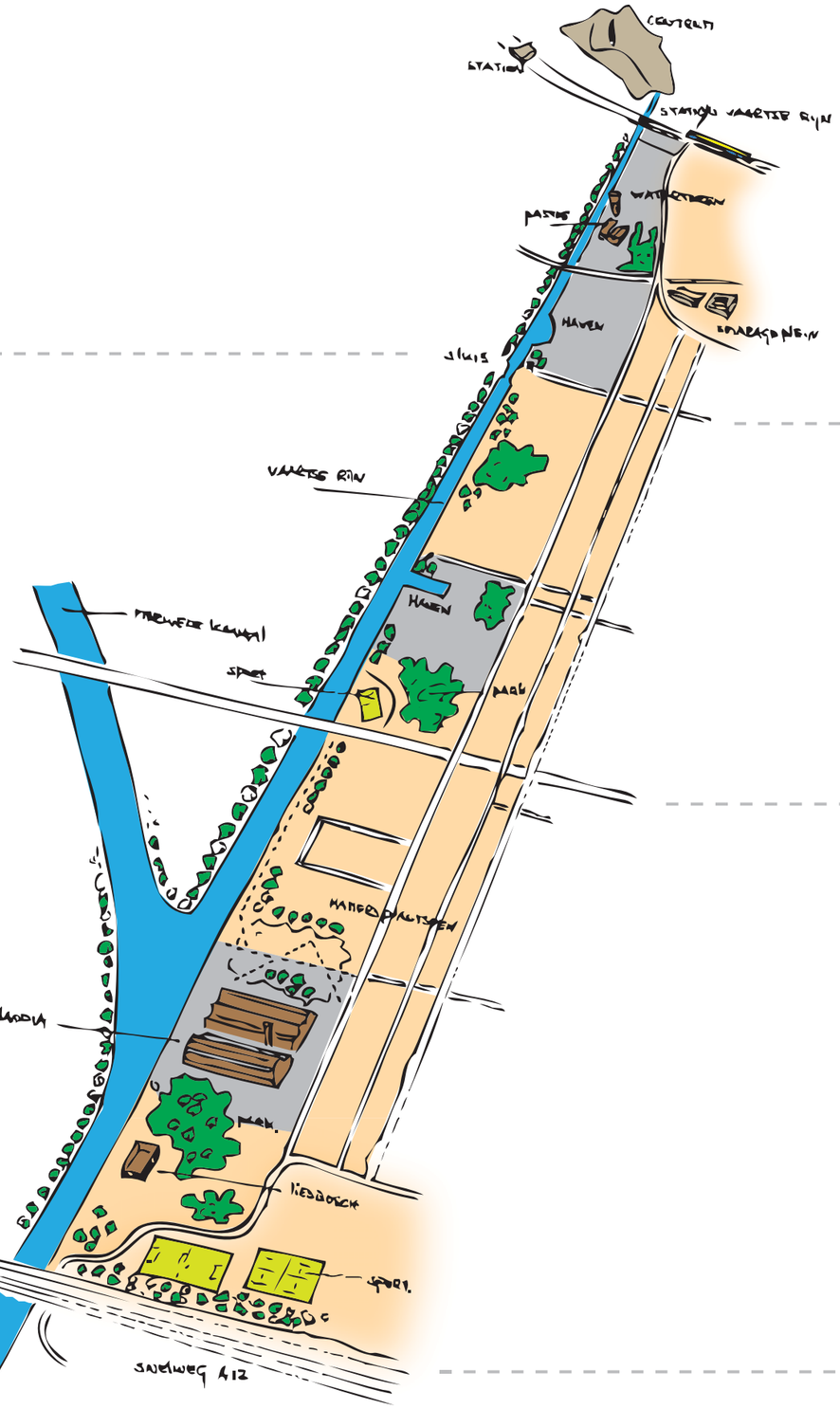
area

site

ROTSOORD

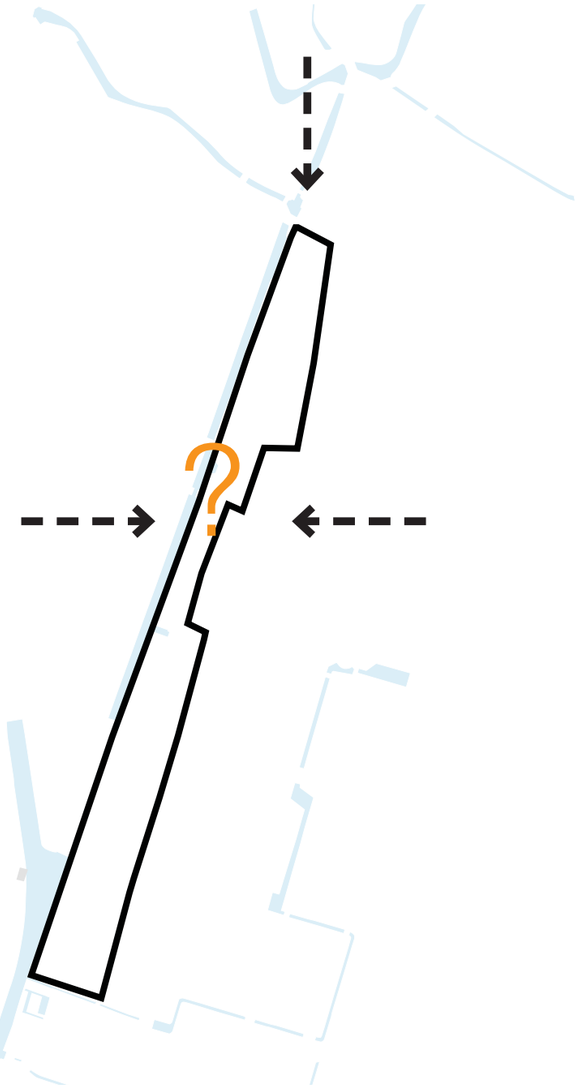
HARBOR ZONE

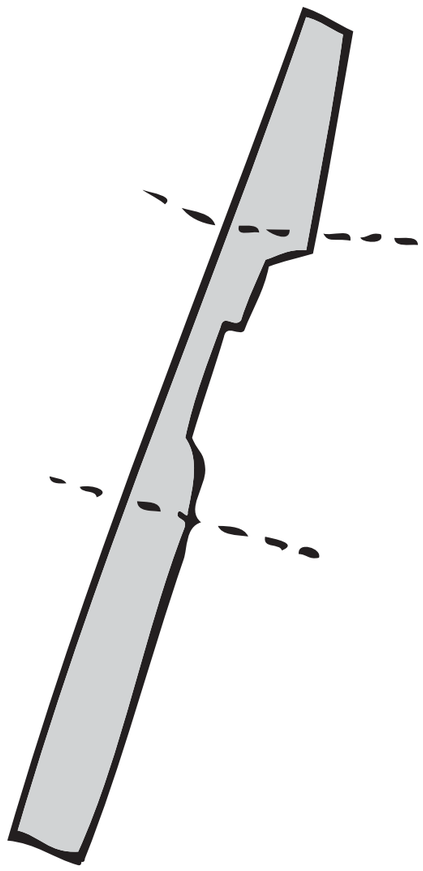
NEERLANDIA



Vaartse Rijn Zone

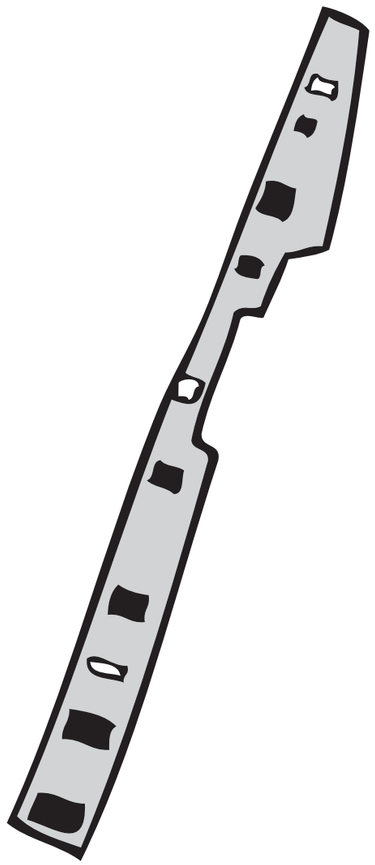
How to revitalize the disconnected and fragmented canal bank of the Vaartse Rijn and strengthen the historical layerd strucure of the area ?





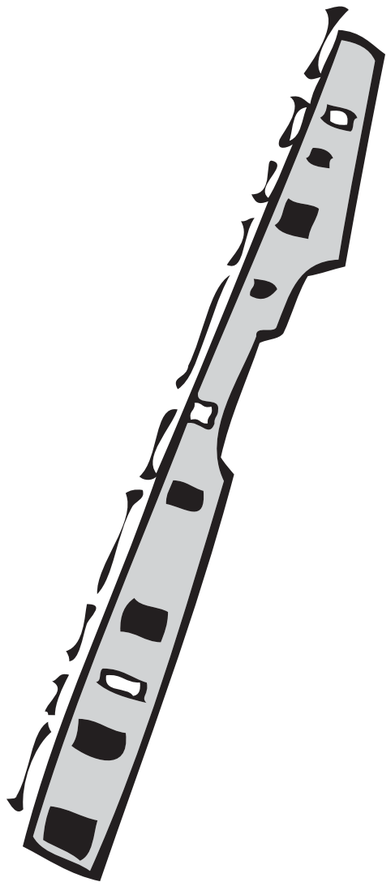
Vaartse Rijn Zone

Rotsoord
Harbor zone
Neerlandia



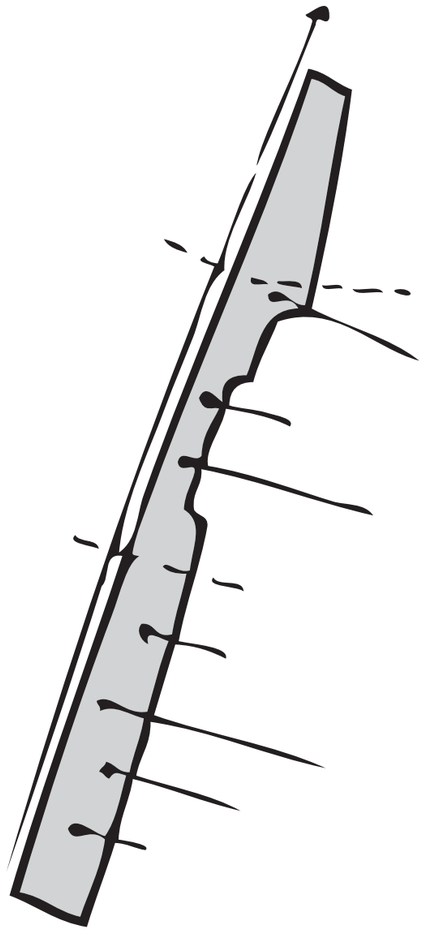
Public Zones

Existing and New
Public spaces and facilities



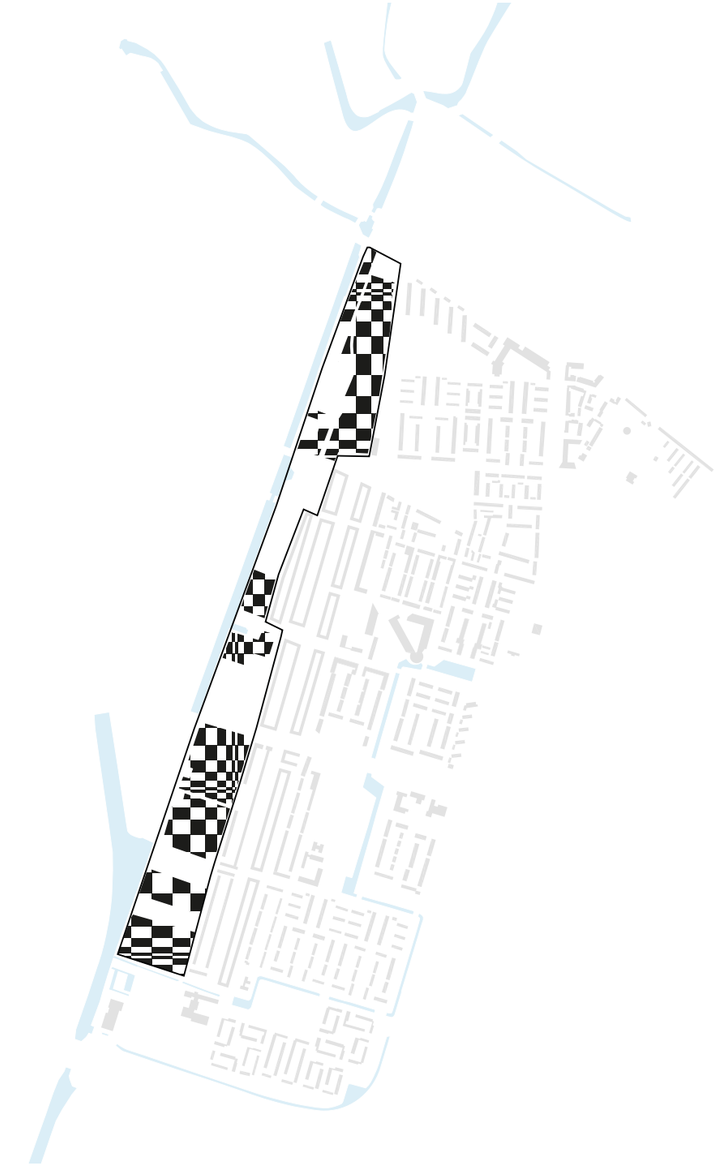
Connection Public

Chain of public spaces
One public area



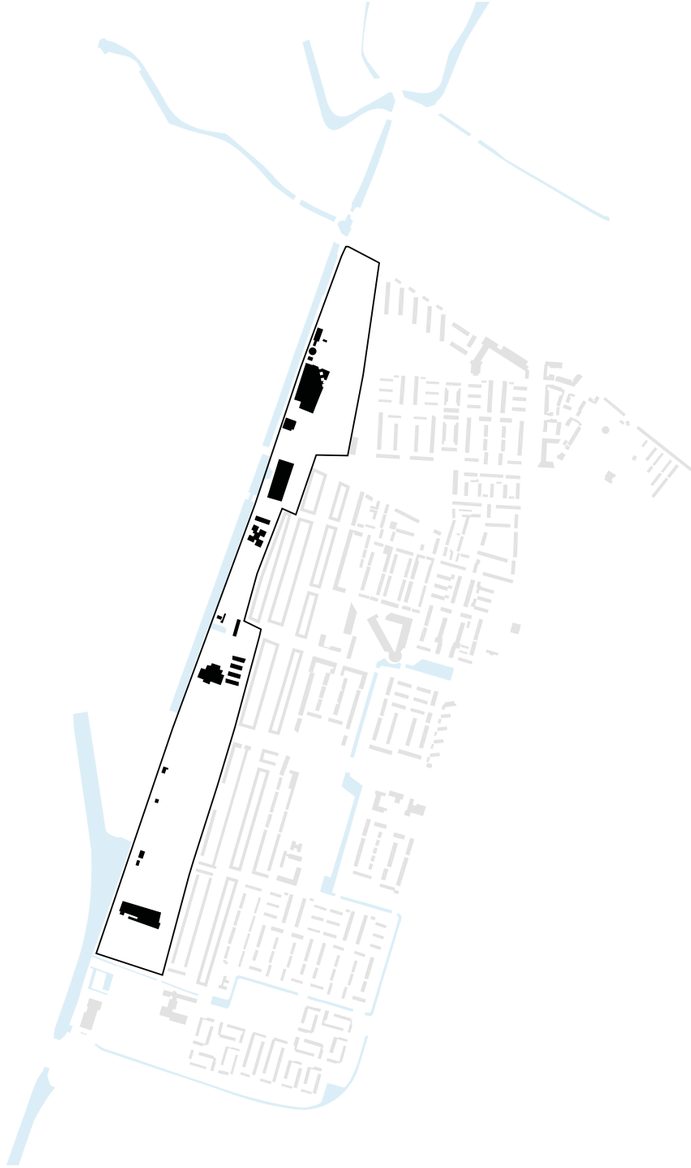
Connection Neighborhood

New connection
Intergration with neigborhood



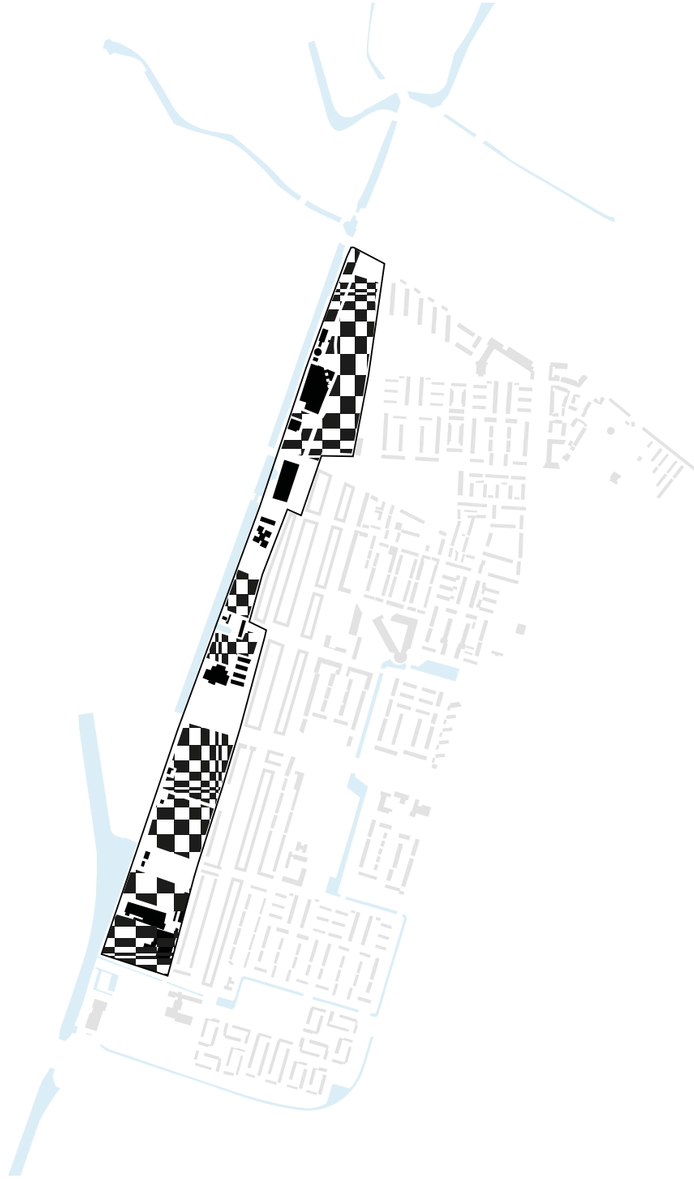
Creating new urban fabric

Acces to experience the bank
Public spaces and functions
Continious zone of public spaces



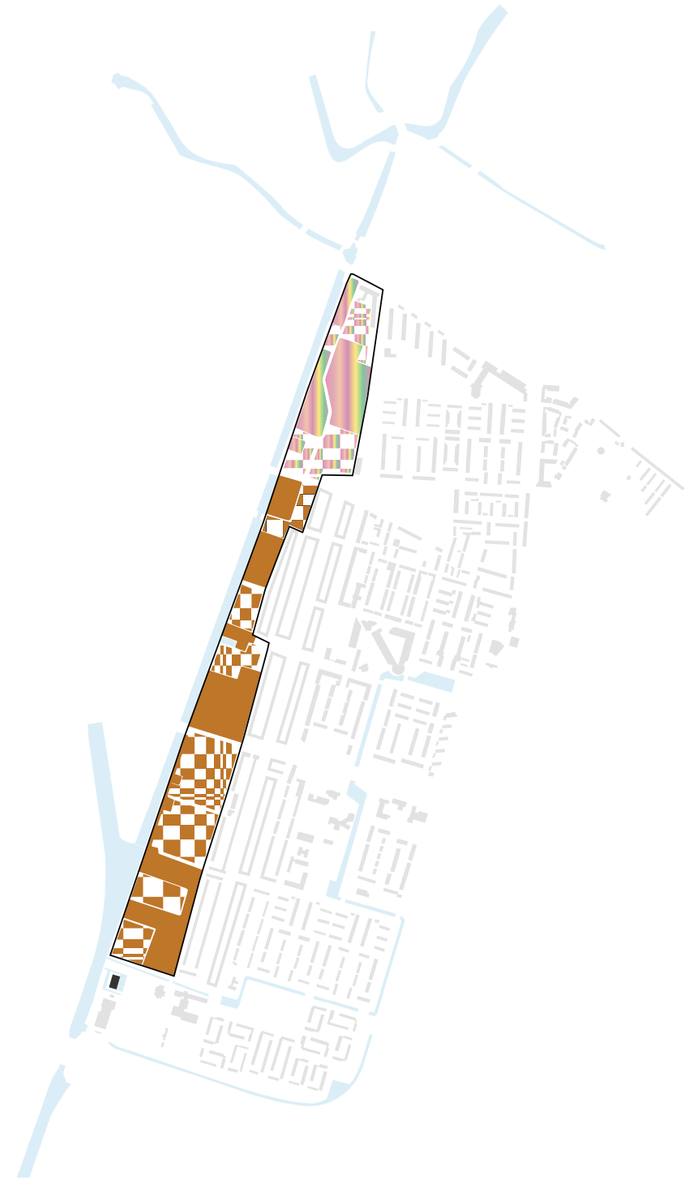
Preserving

Historical landscapes
Industrial buildings
Potential value



Assemble

Old program meets the new
changing function of the old

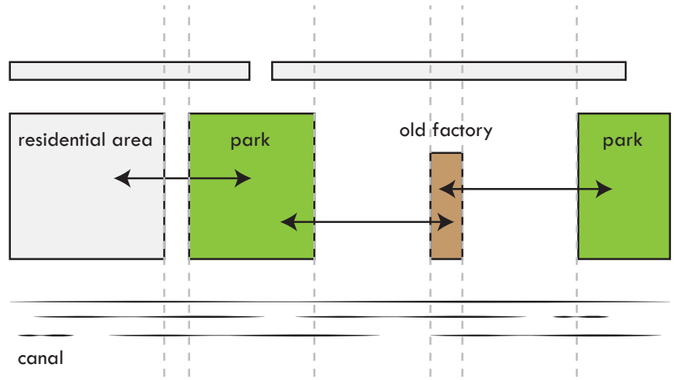


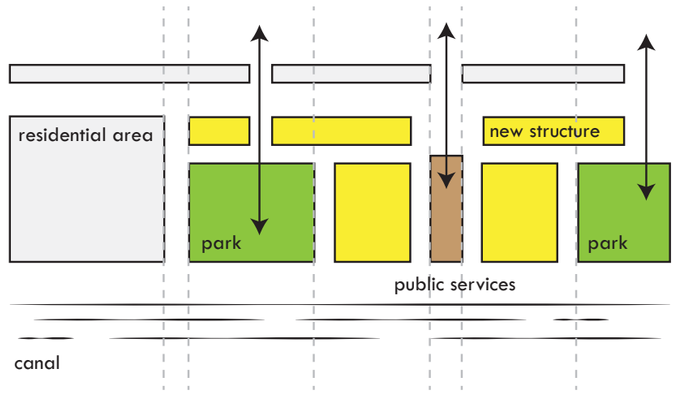
Identity

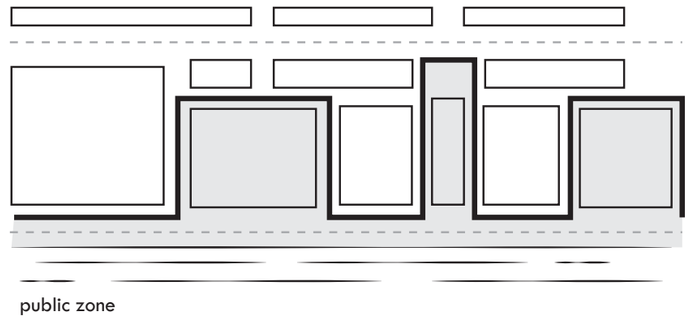
Creative mixt use area
Living area
Continious public space

Connections

Public space and neighborhood
Hotspots
Public space and city center







Connecting public spaces

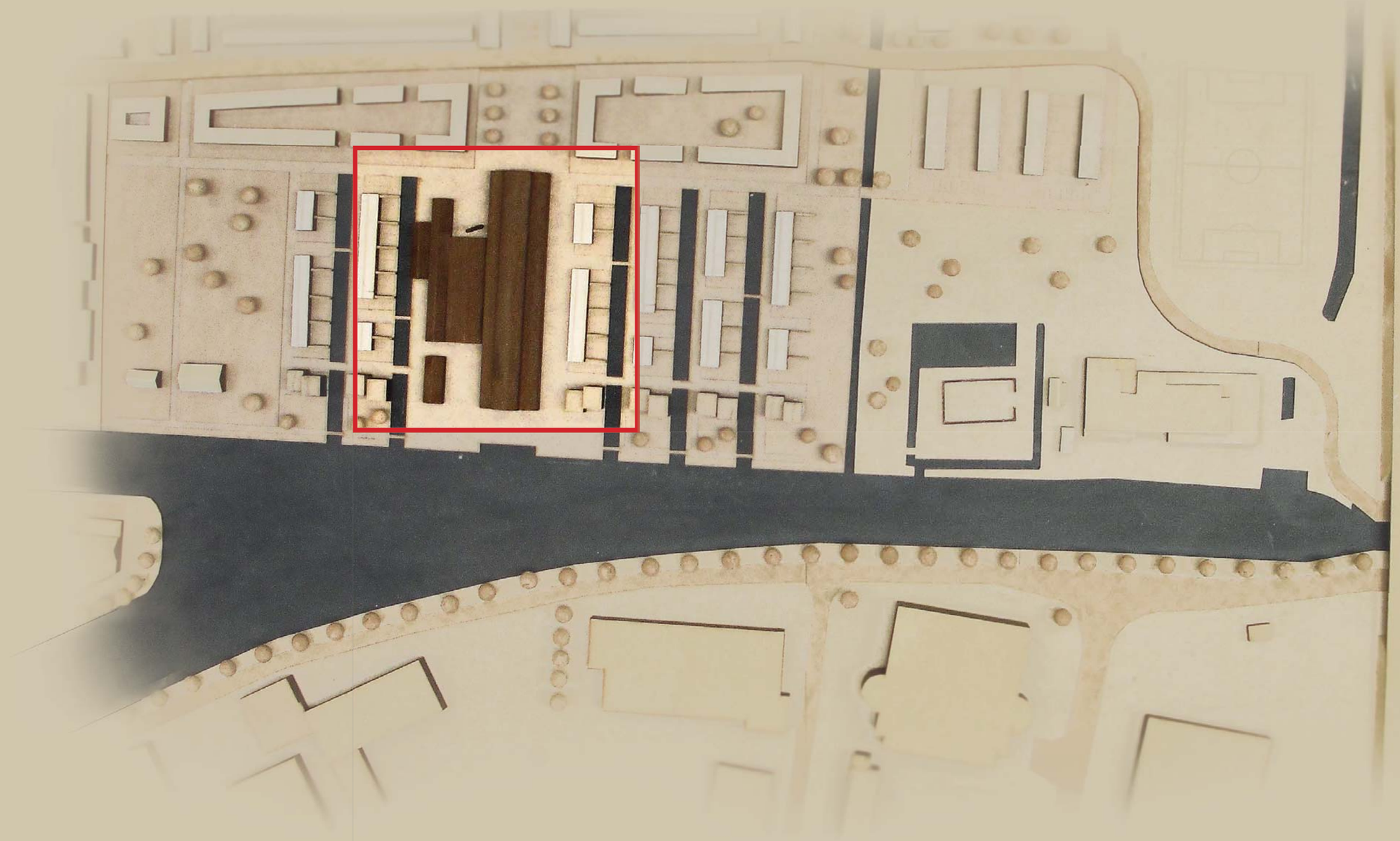
Isolated public spaces connect to each other
Continious public spaces

Structuring of the open spaces

Connection public spaces with neigborhood
Structure open area
Relation neighborhood and public spaces
Entrance public spaces
Keep the front facade visual

Public zone

Continious public spaces
Differentiation in dimensions



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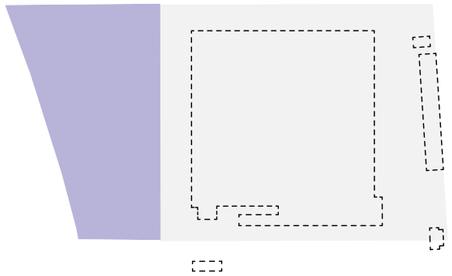

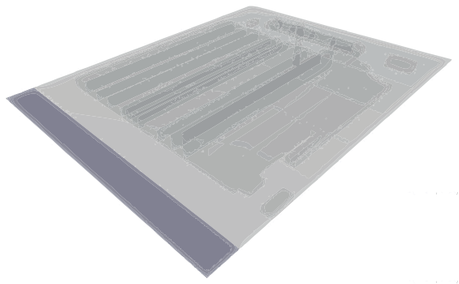

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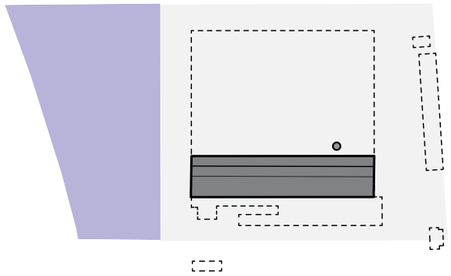

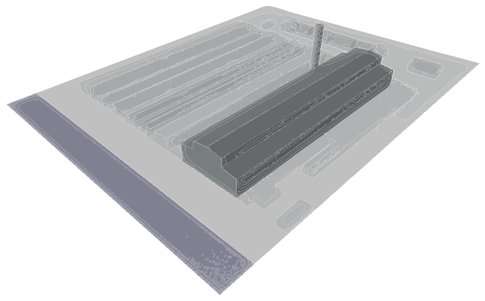

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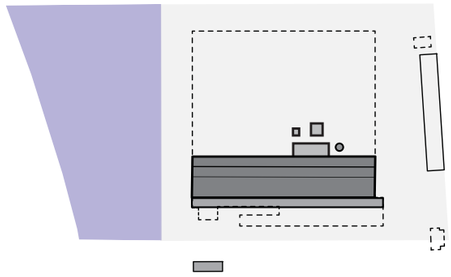

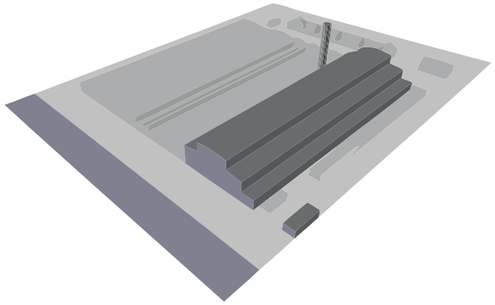

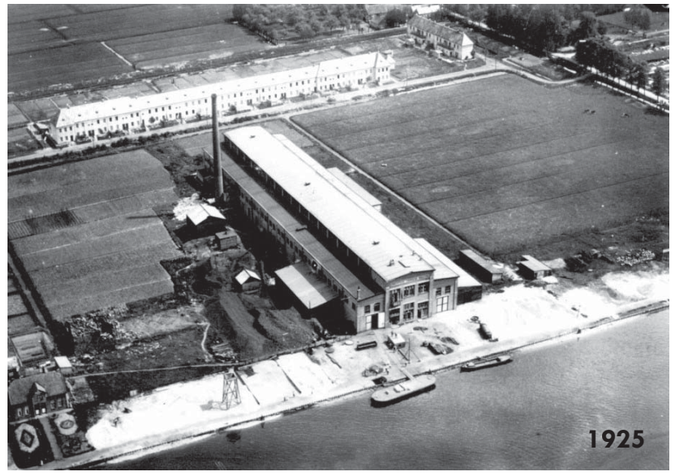

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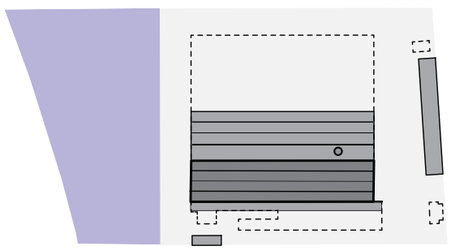

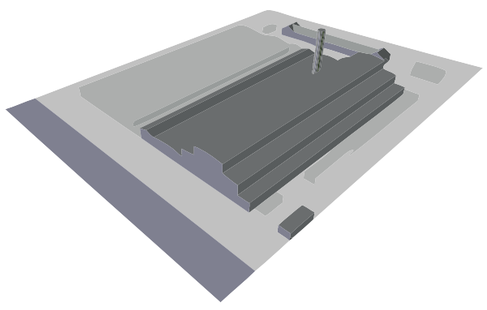

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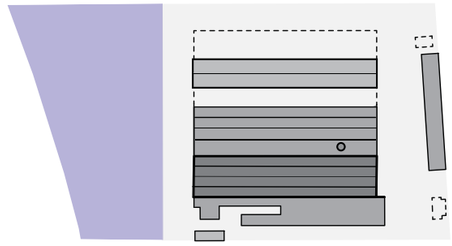

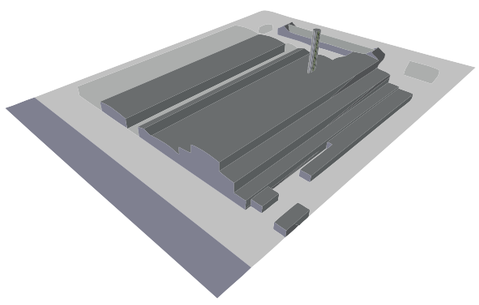

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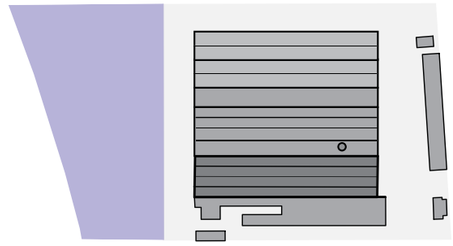

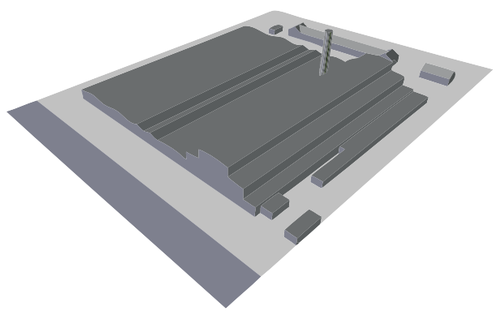

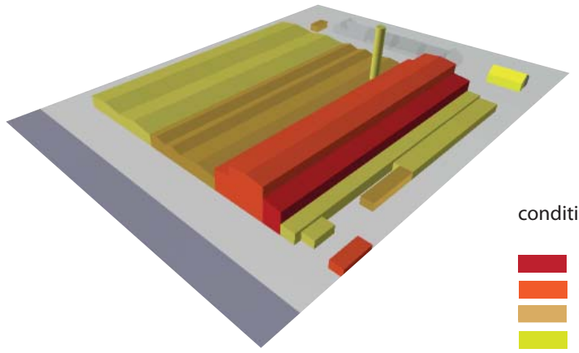

condition

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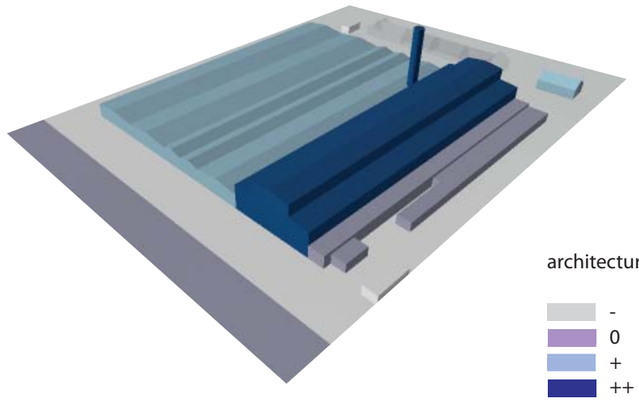

architectural value

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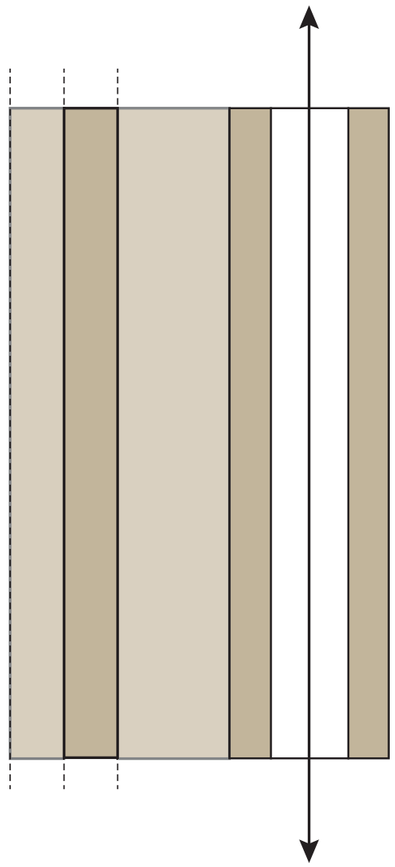
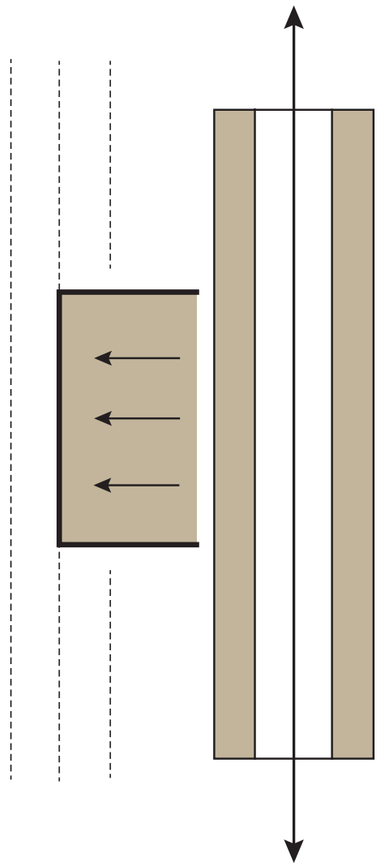
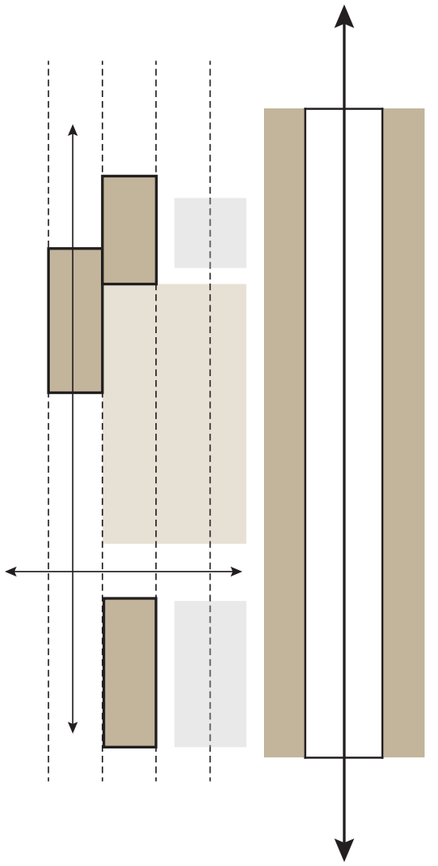


existing compostion



preserve main building



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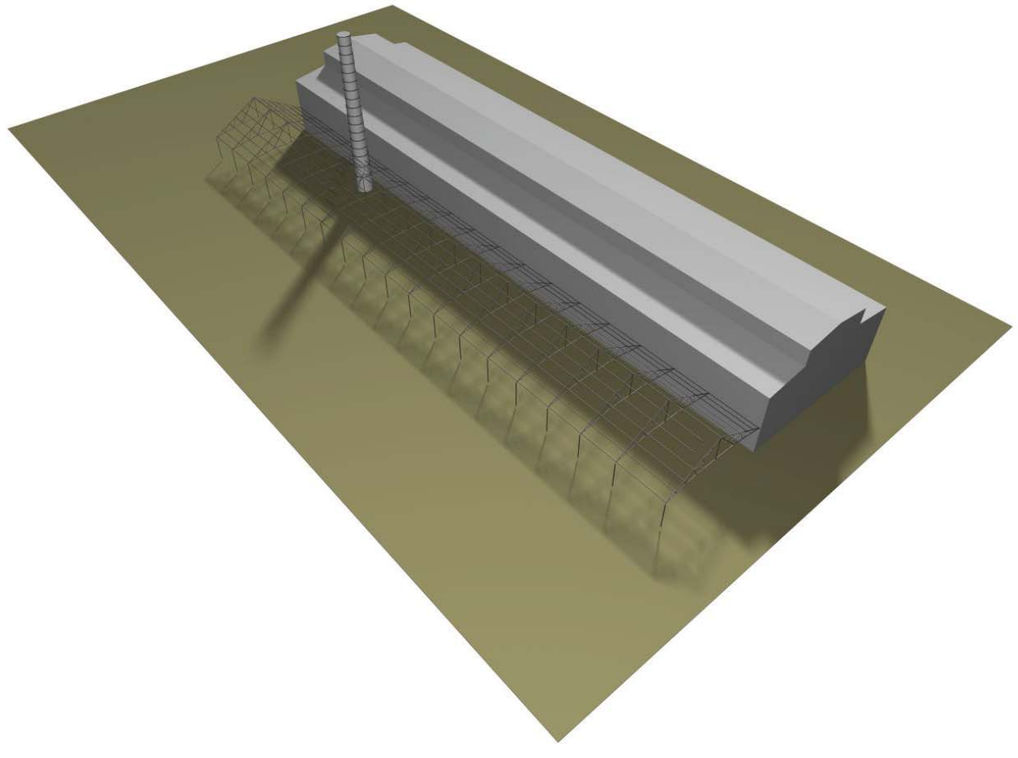
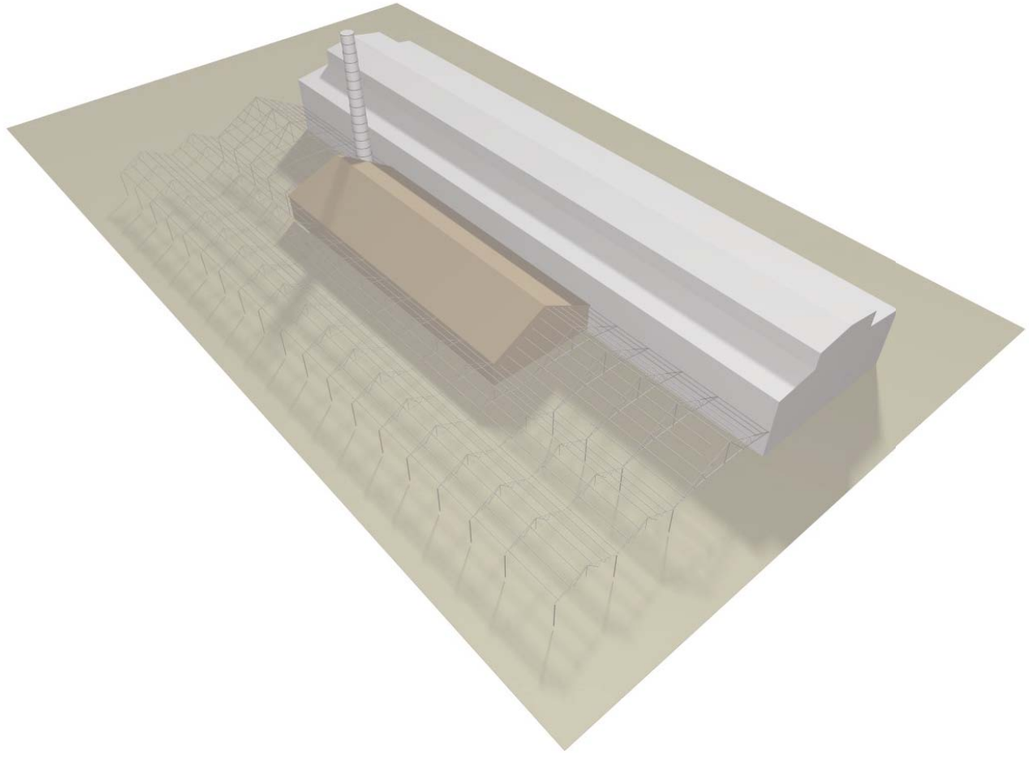
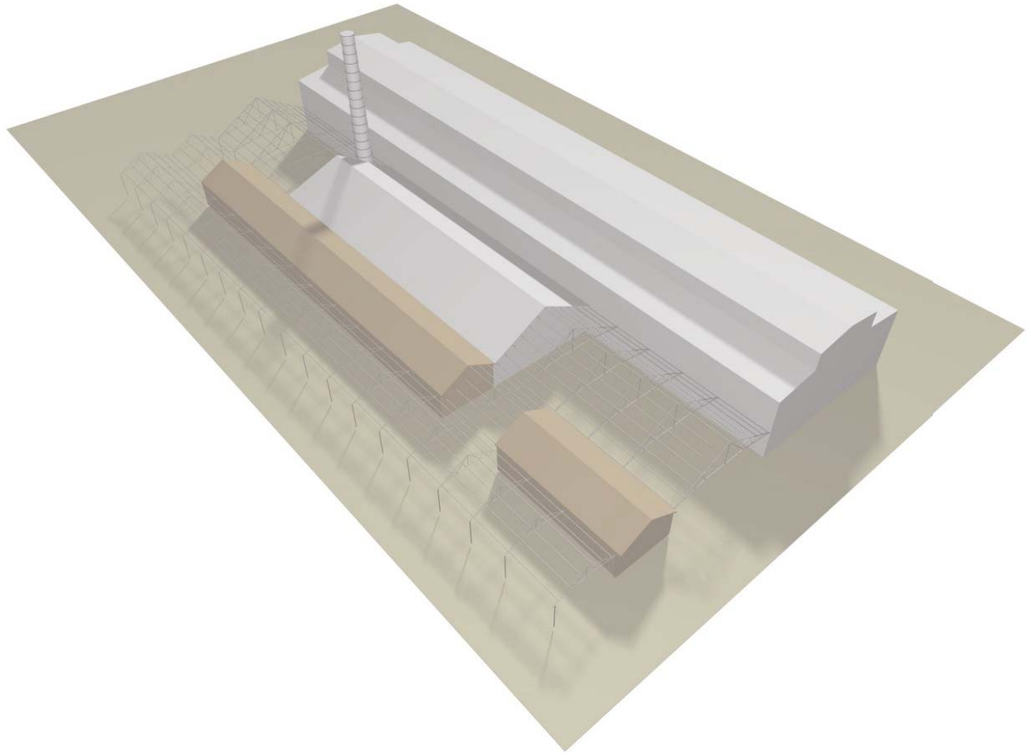
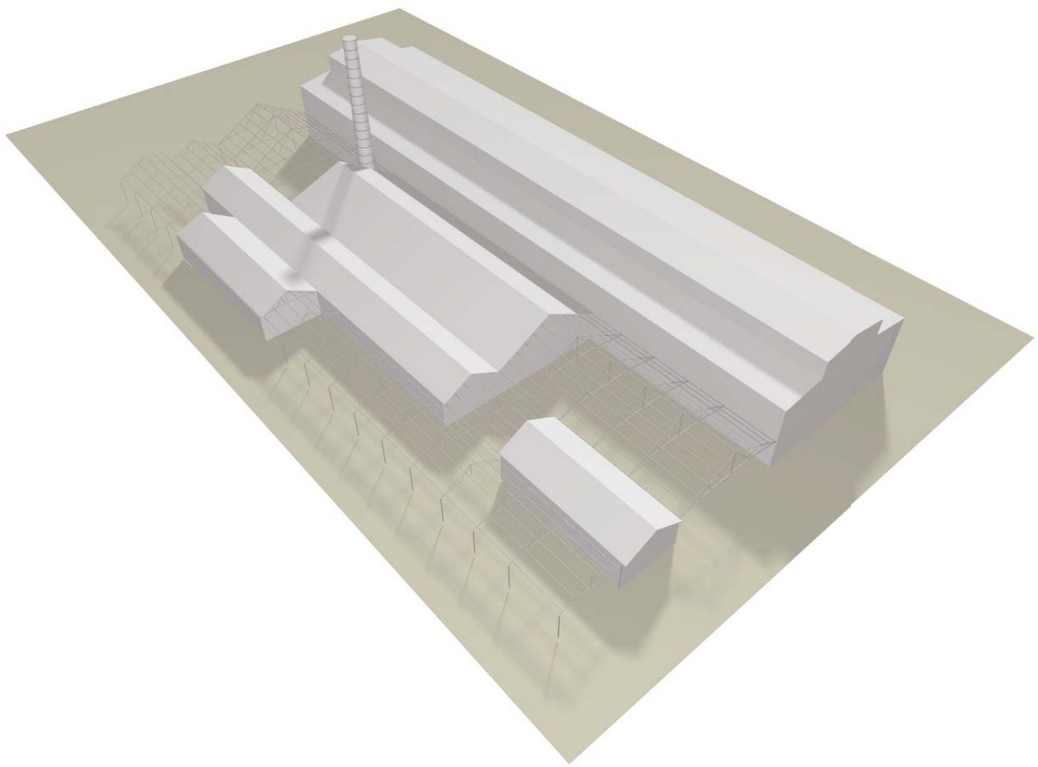
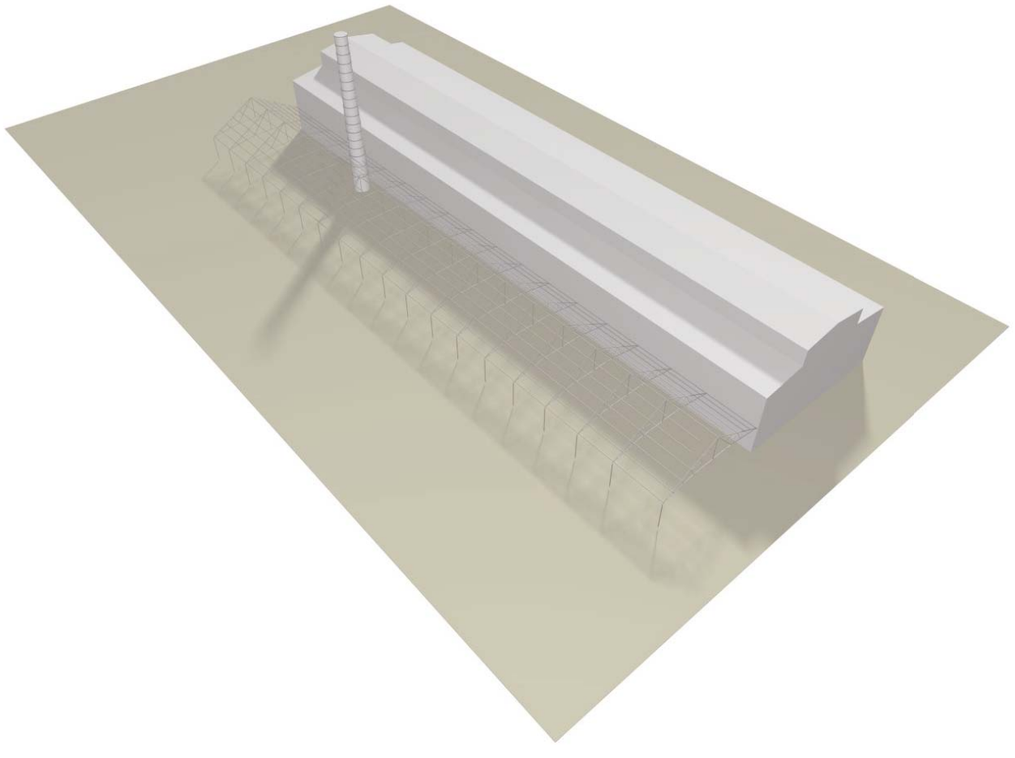
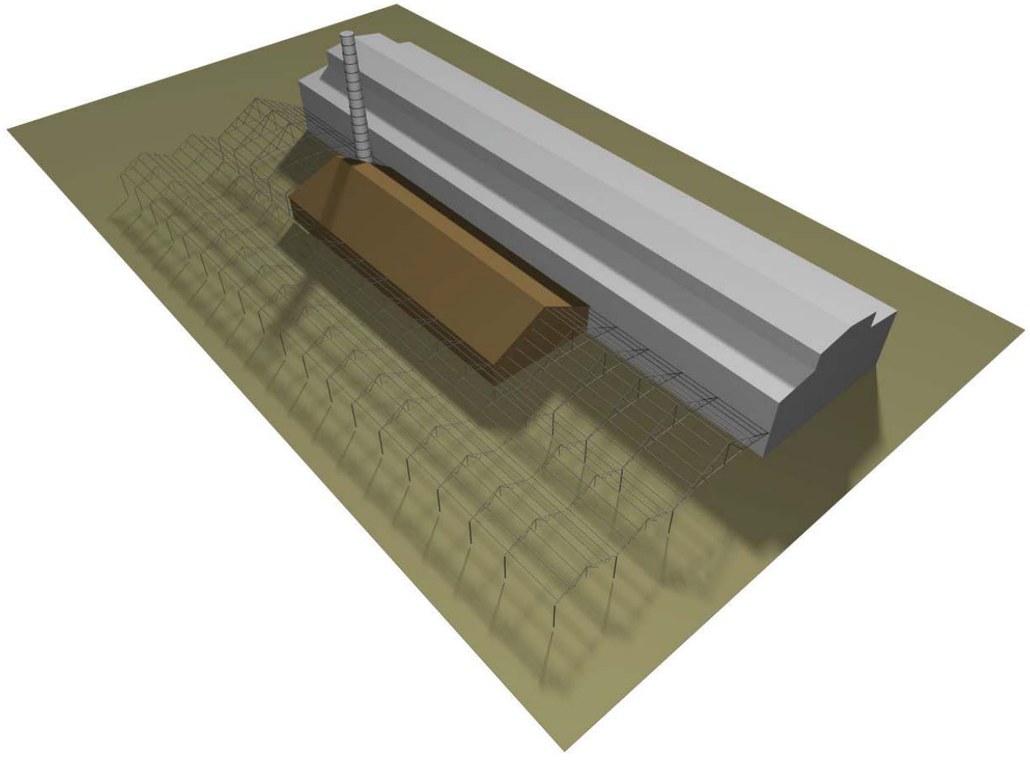


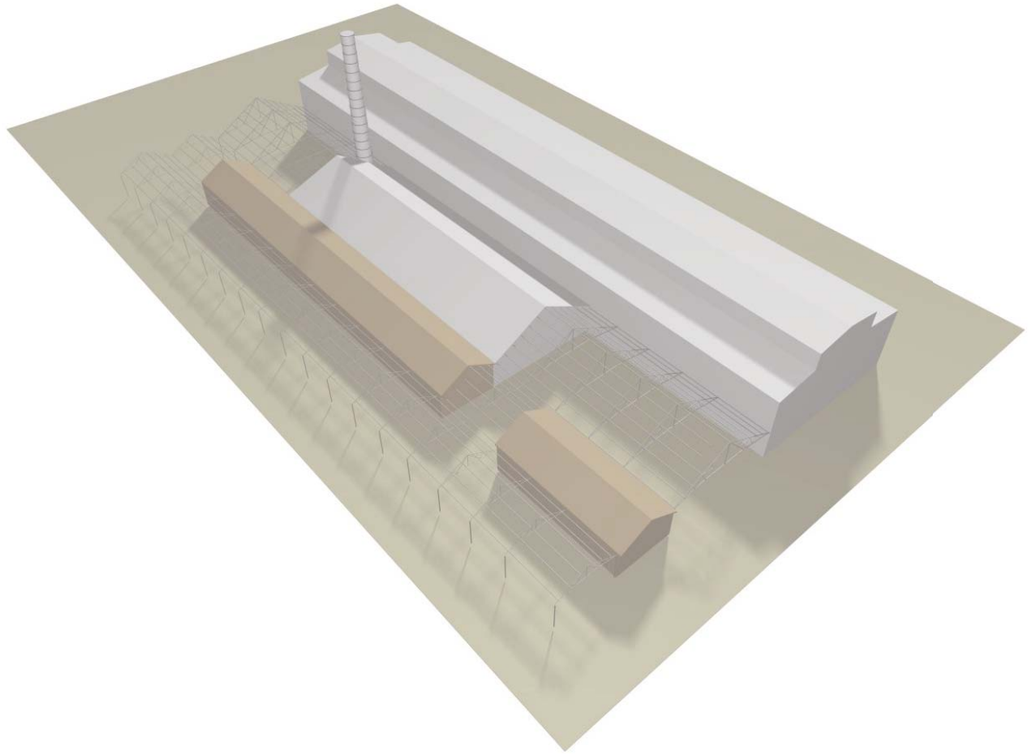


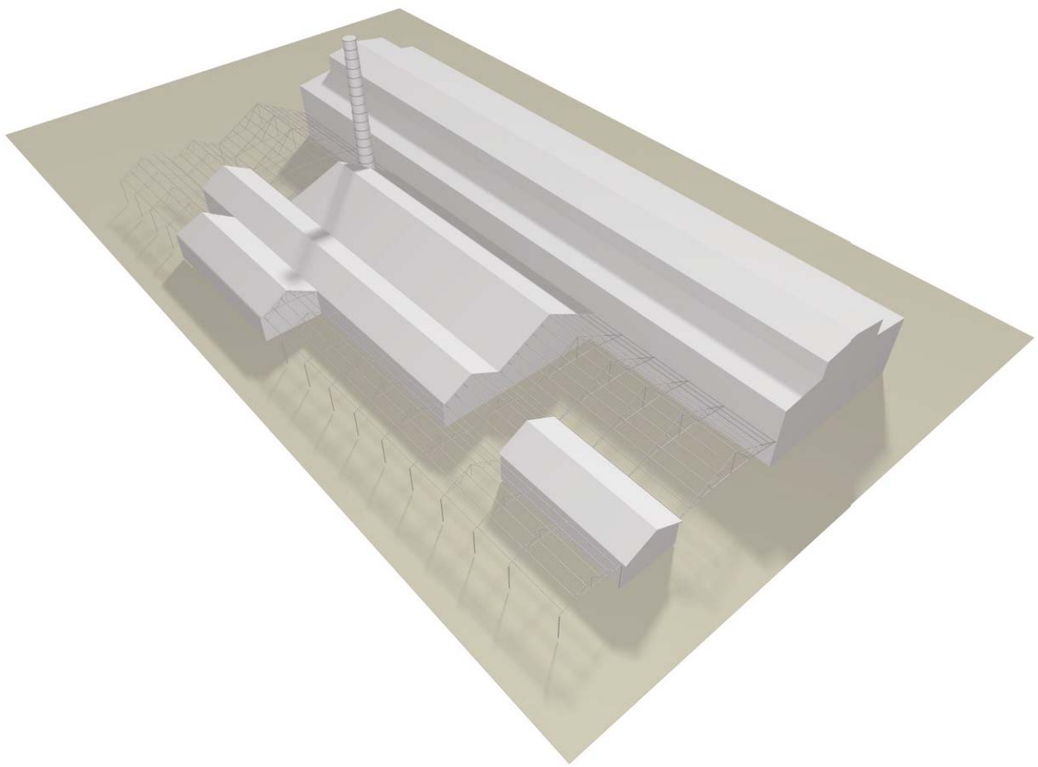


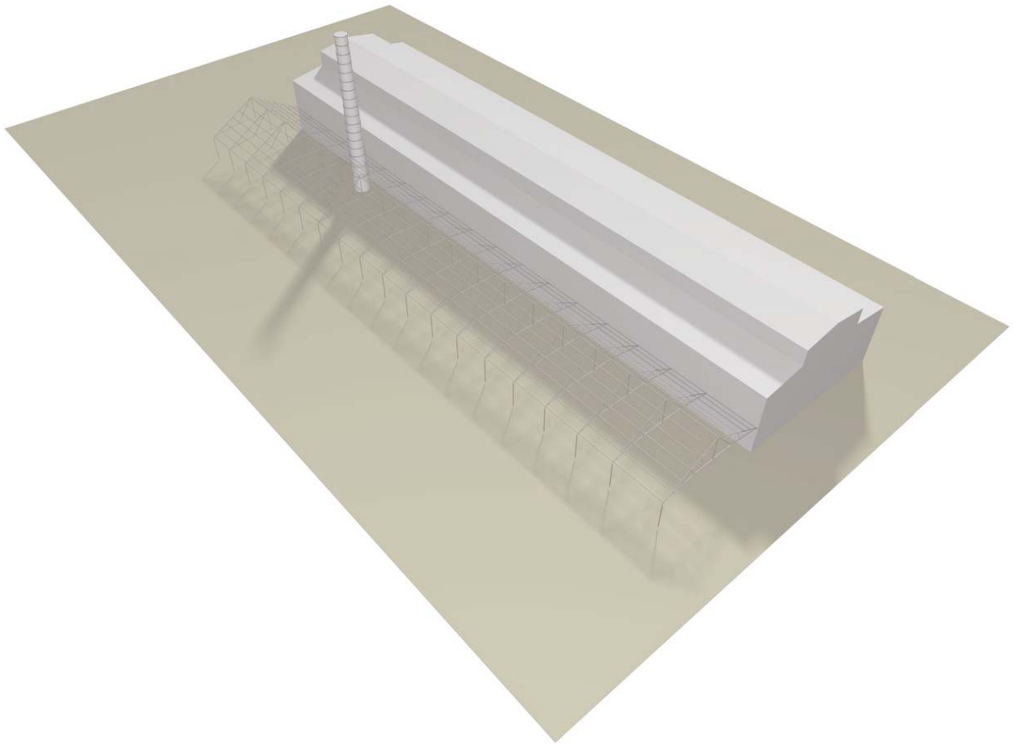


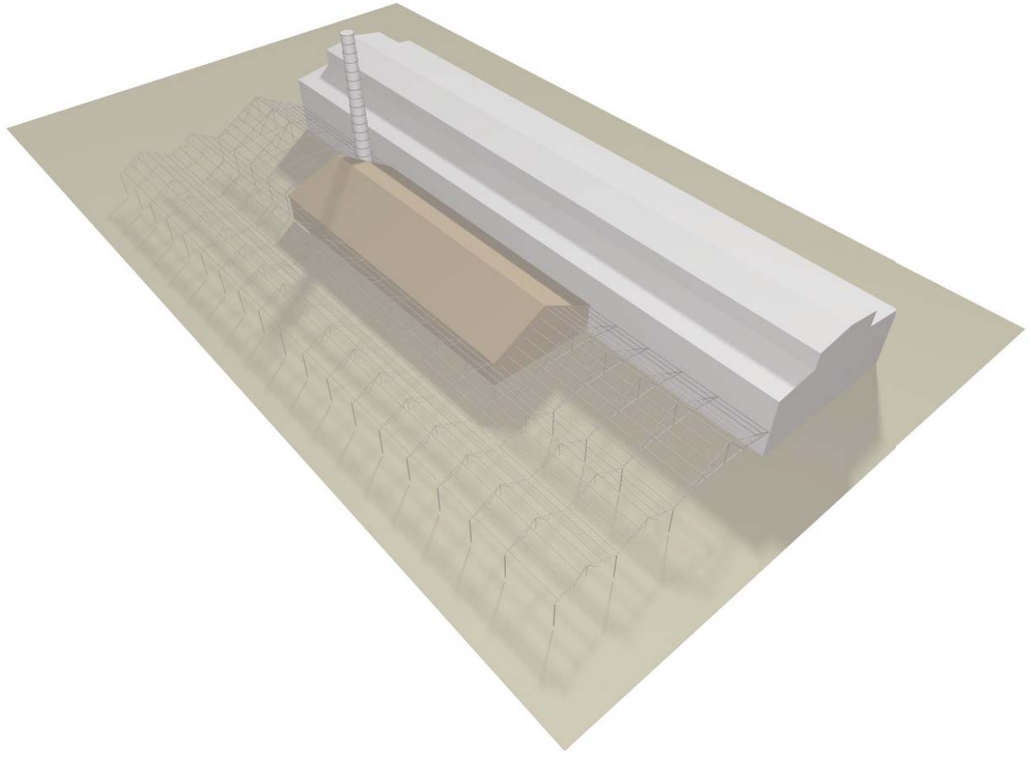


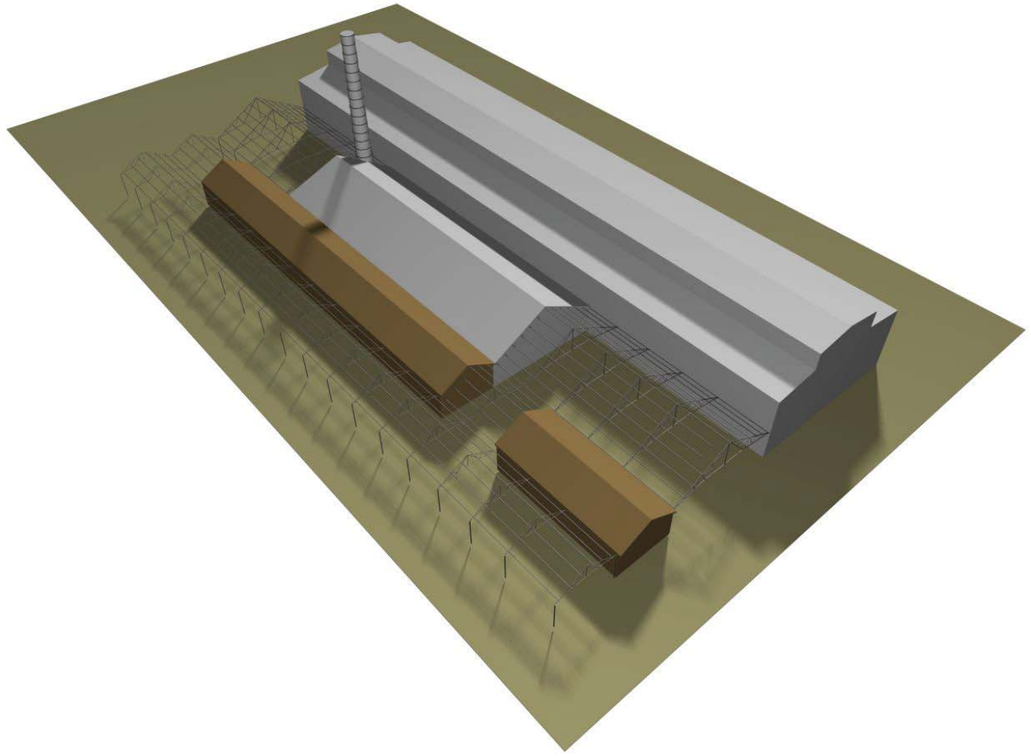


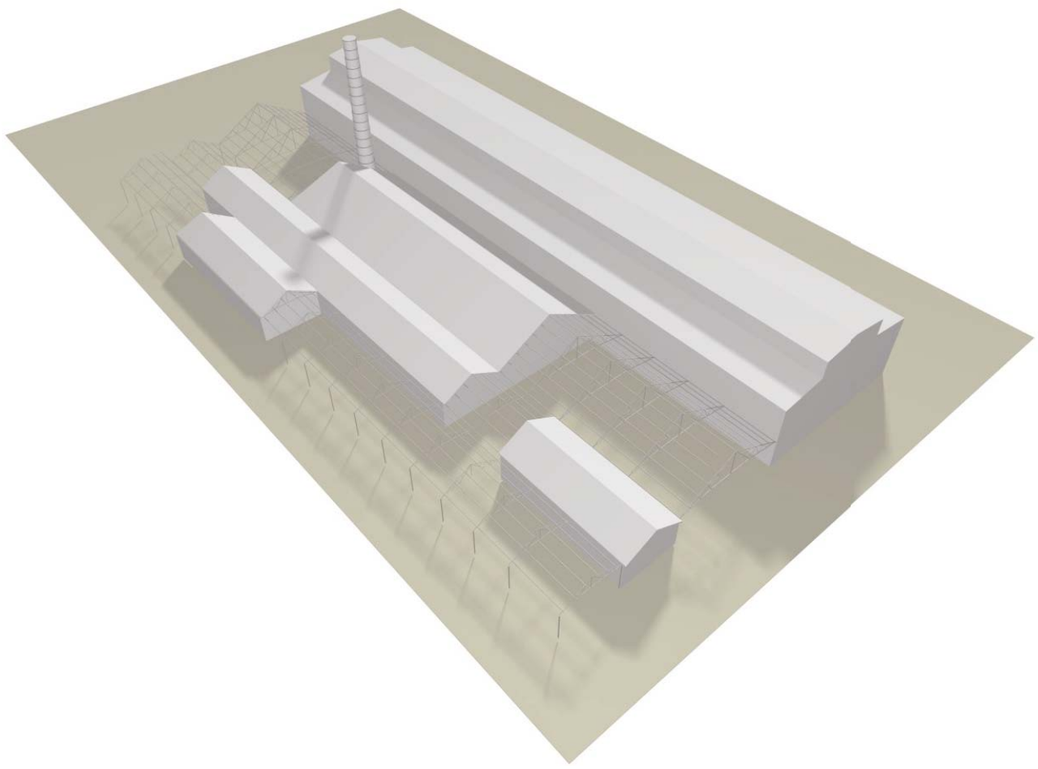


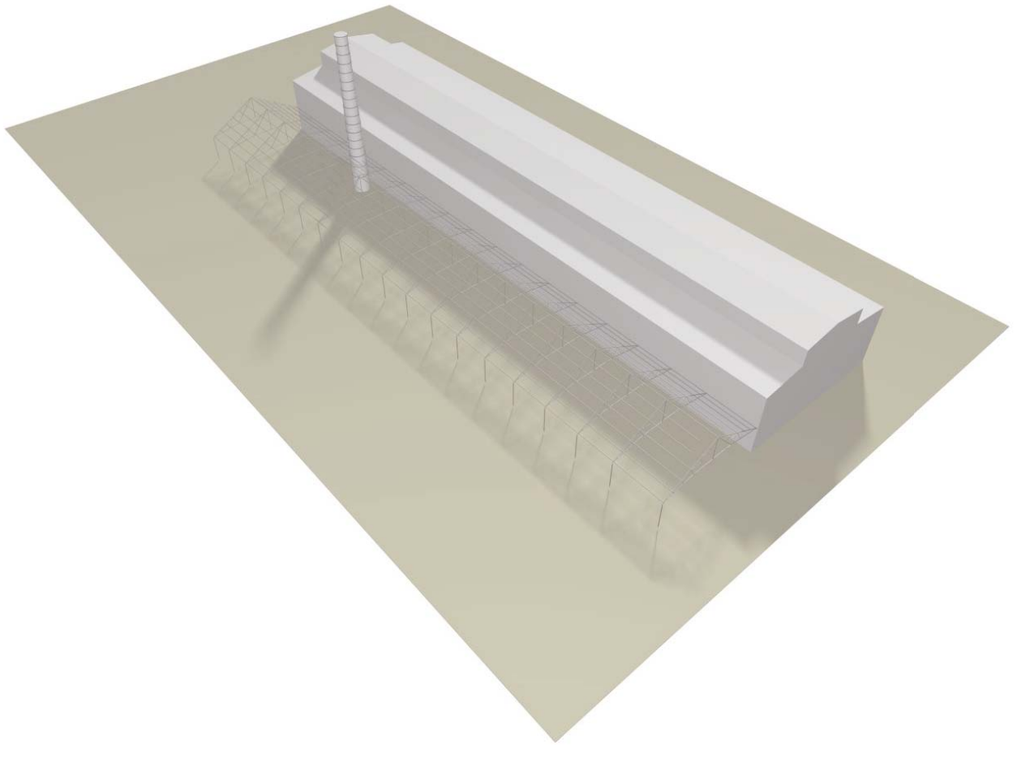


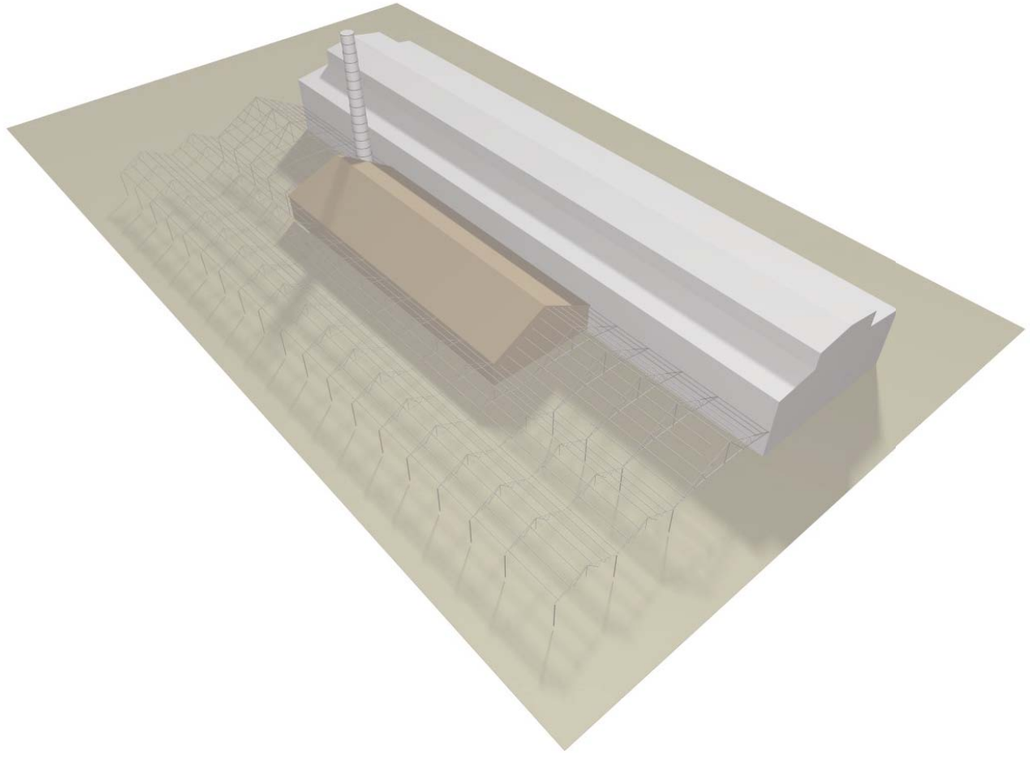


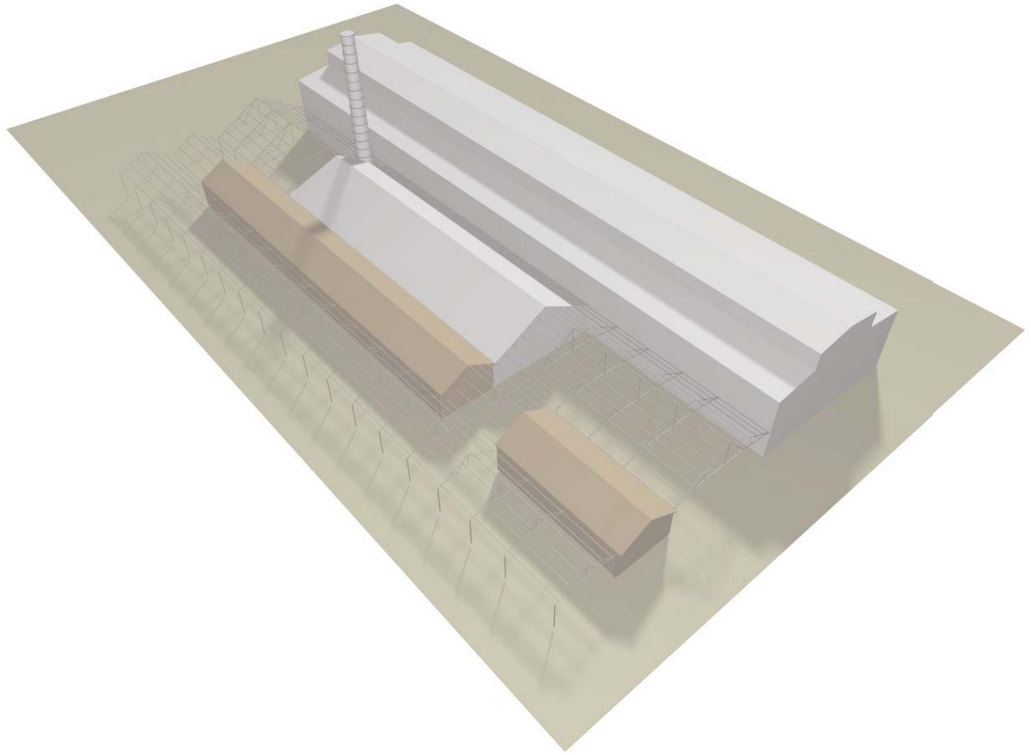


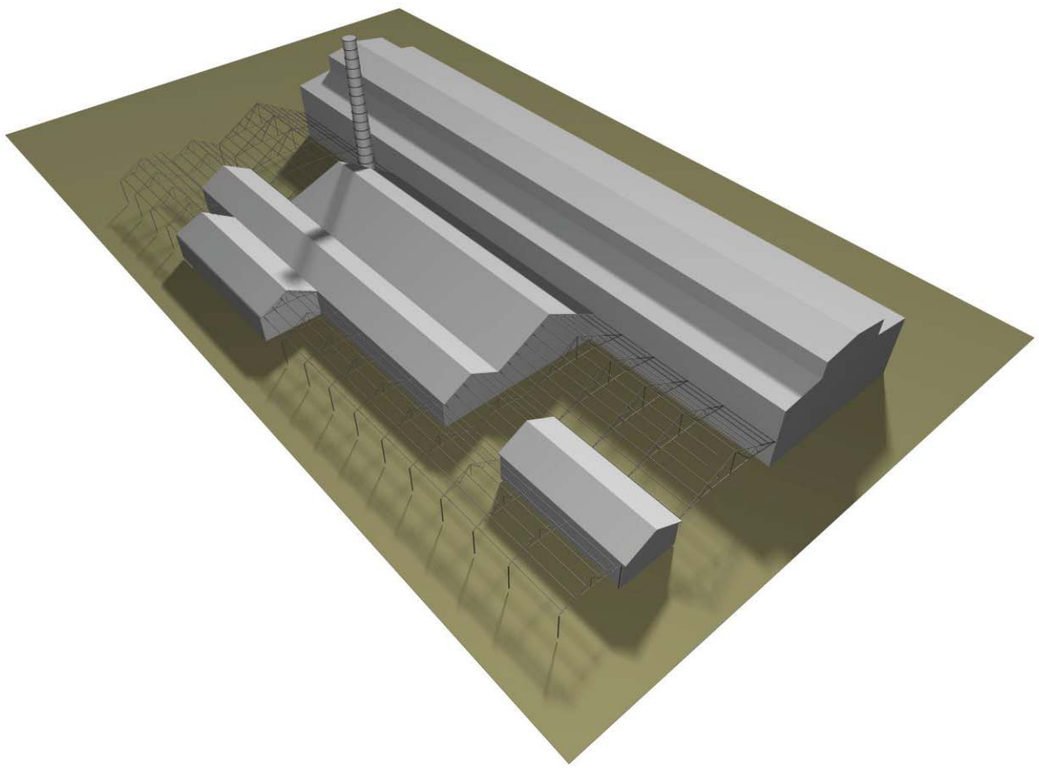


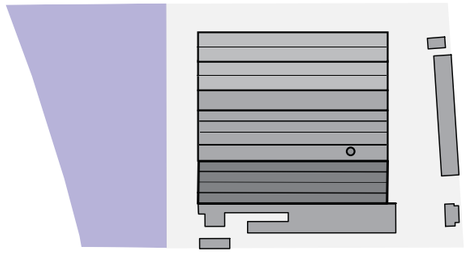


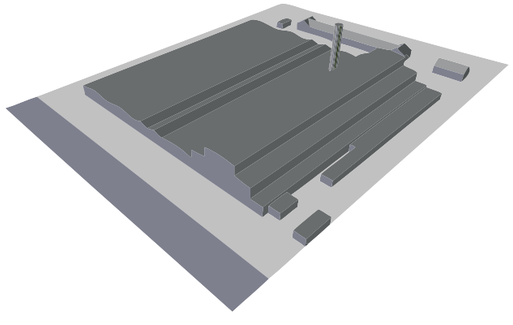


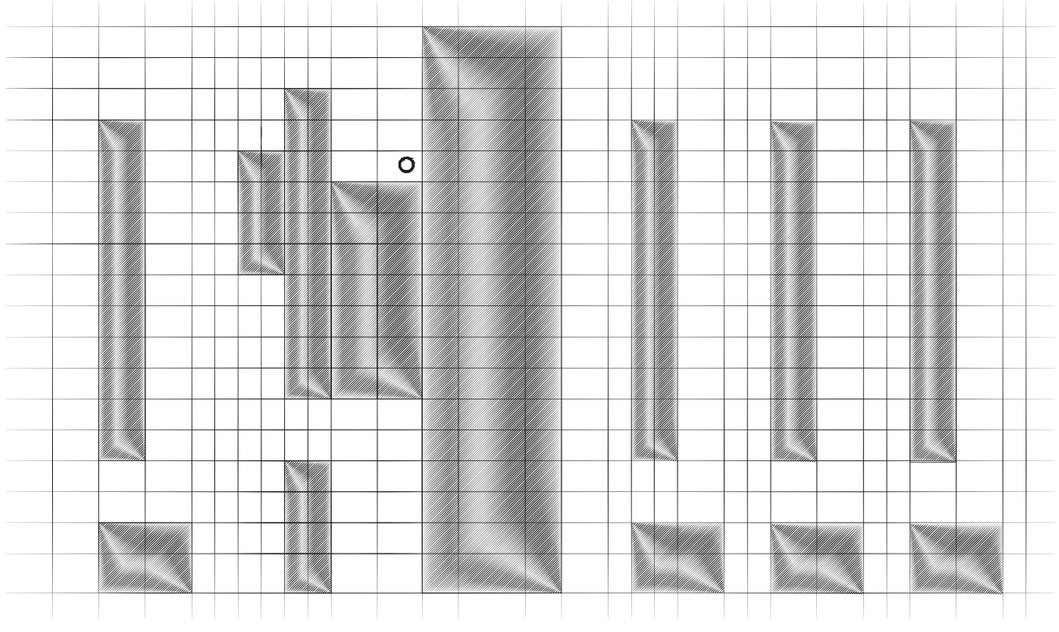


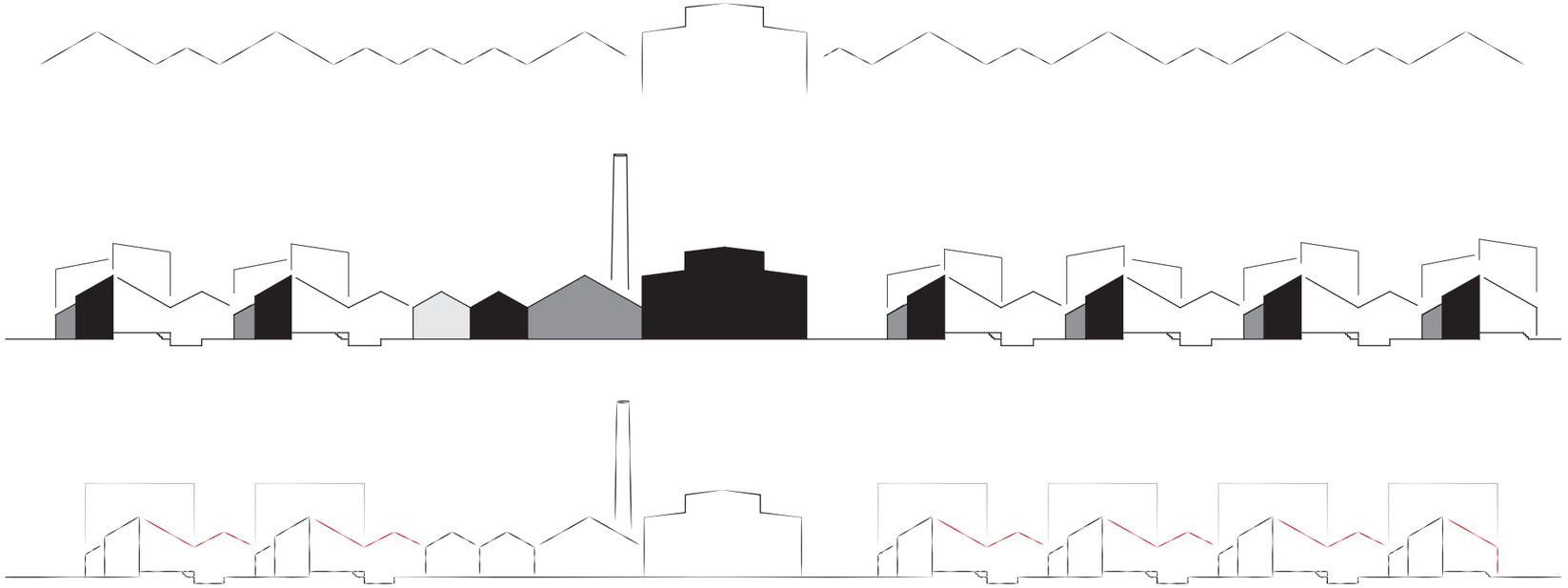












Program

New structures

> Residential

Supporting diverse mix of people

* diversity is important to support the living area
* attracting people by creating different kind of living
* different group have different needs and bring different things
* the Neerlandia as public function needs residential

> Public function

The Neerlandia as a public building that facilitates the neigborhood

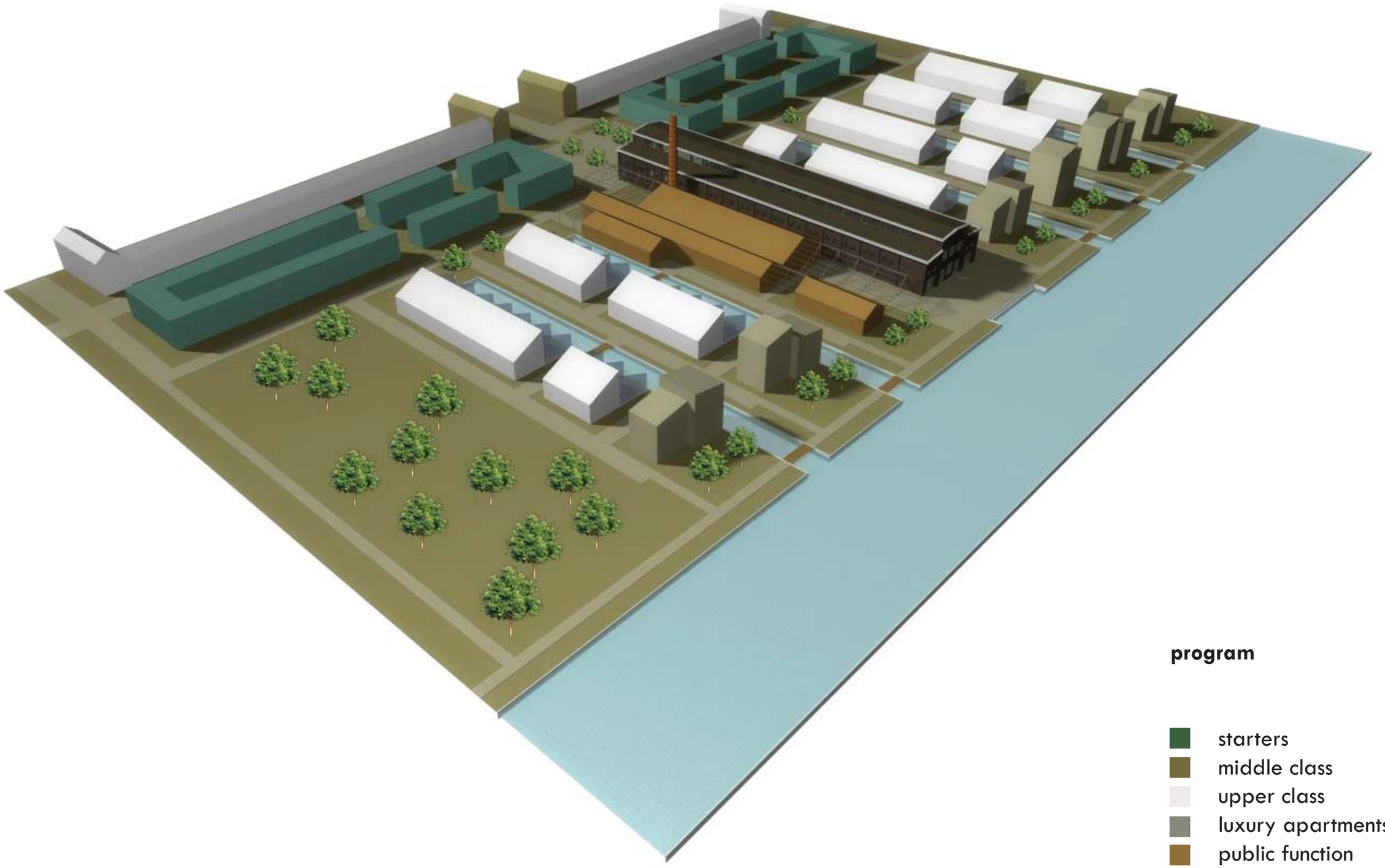
* functions based on the neighborhood
* services : daily living needs, health care, leisure, employment and community

> Parking : for new residential, existing residential & visitors

Preconditions, Principles & Values

toolbox as masterplan instrument
Neerlandia as a **attractor**
translation of the past
quality of the **water**

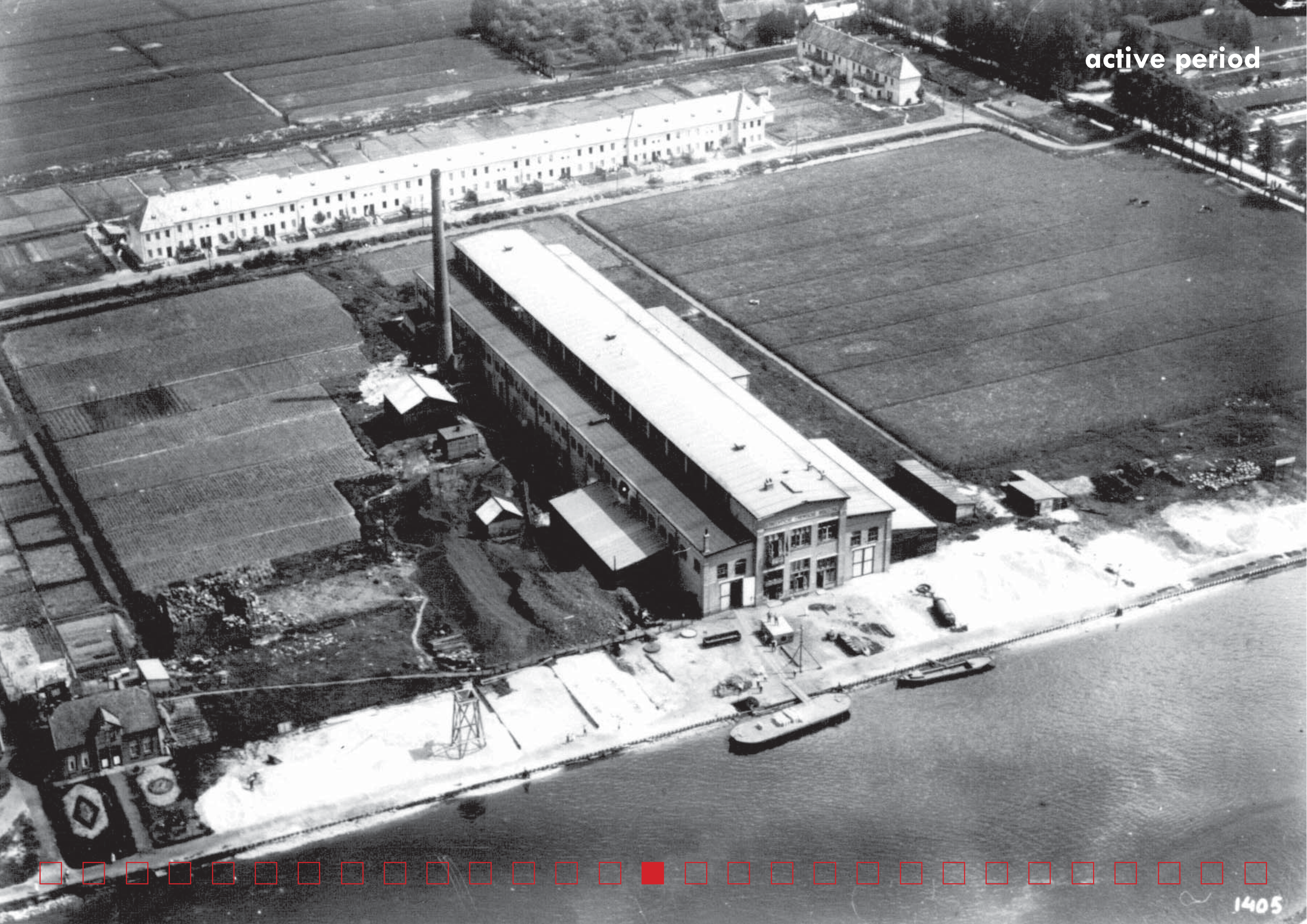
use of old **construction elements**
transport by water
focal point, **chimney**

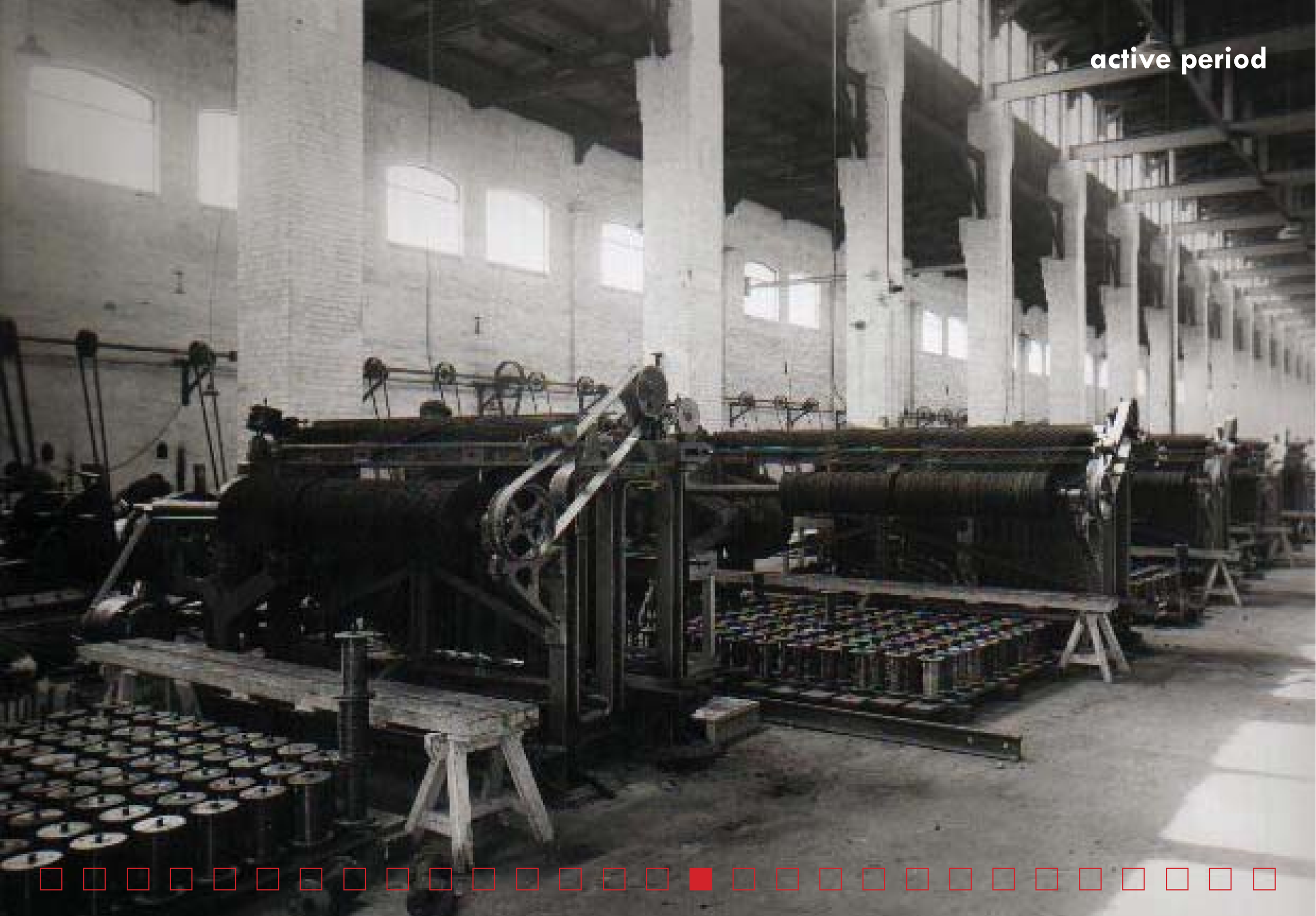


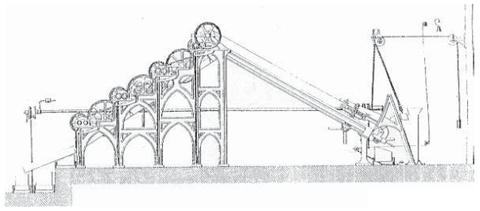
program

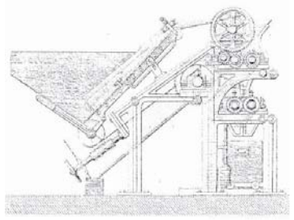
- starters
- middle class
- upper class
- luxury apartments
- public function

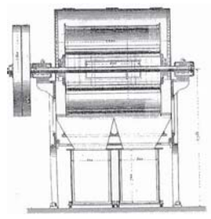
active period

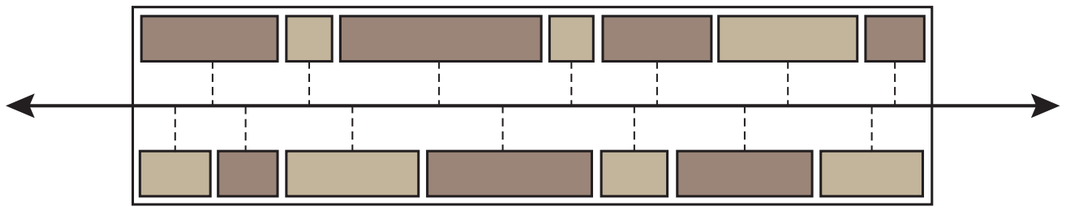








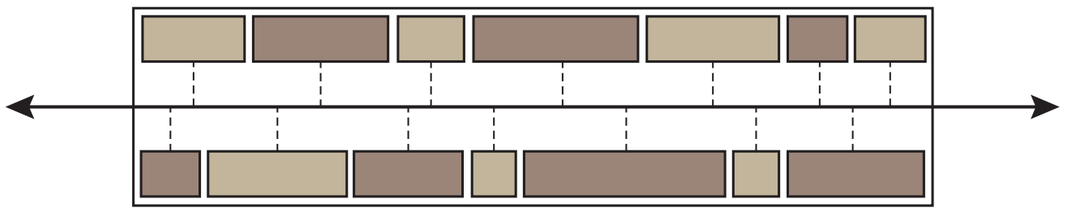




Building concept

Movement in the central nave by **production** is taking over by the **movement** of **people**

Side aisle - **storage** for production **products** becomes **storage** of products & **services**



Building program

The Neerlandia as a public building that facilitates the neighborhood

Functions based on the neighborhood

Services : daily living needs, health care, personal services, leisure, employment & community

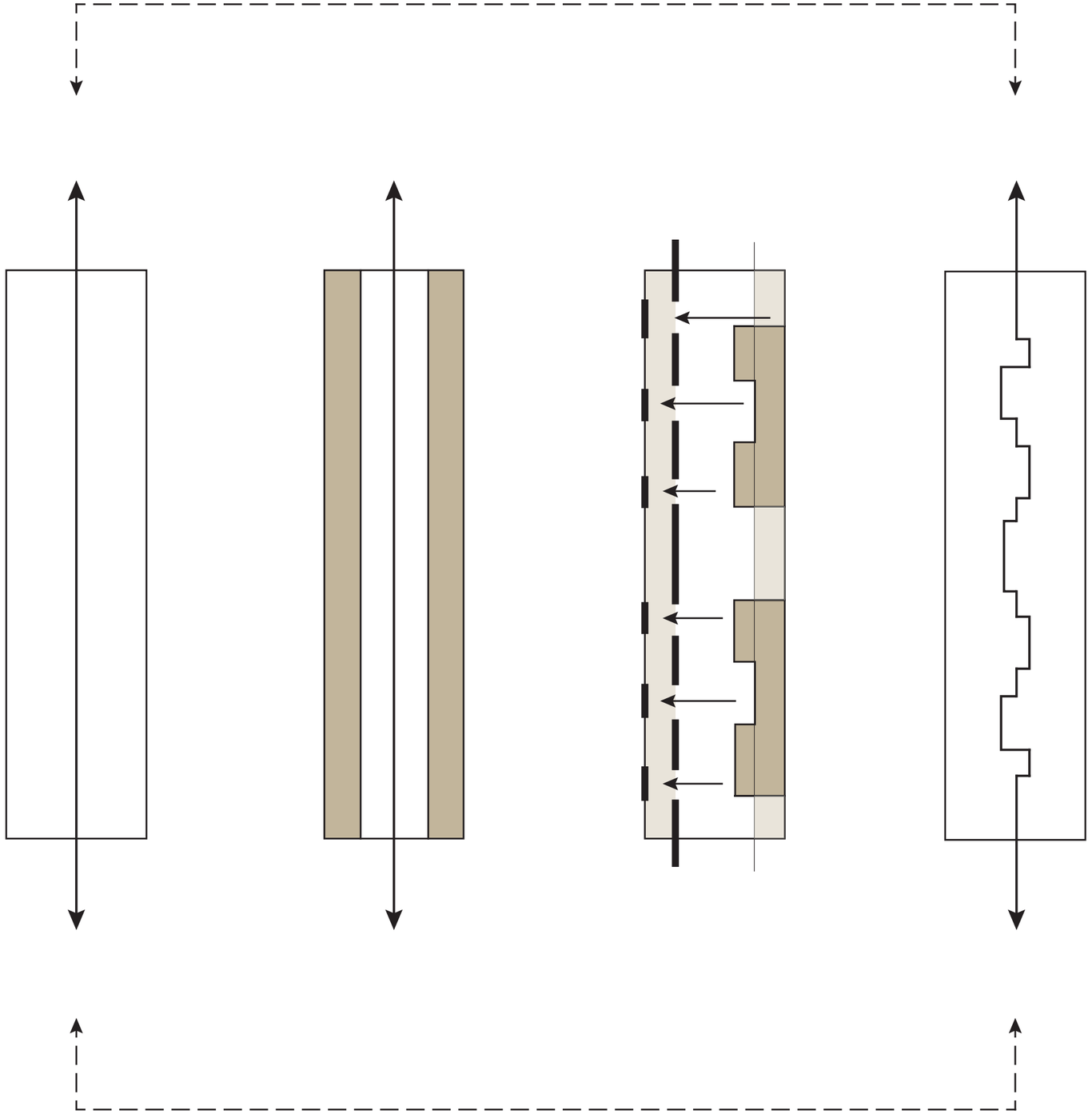
Daily living needs	> supermarket, bakery, butcher, florist, fish
Health care center	> doctor, fysio, dentist, dental care, GGD, obstetrician
Personal services	> hairdresser, manicure, beautysalon
Leisure	> grand cafe, lunchroom
Employment	> the new functions creates employments
Community	> community center

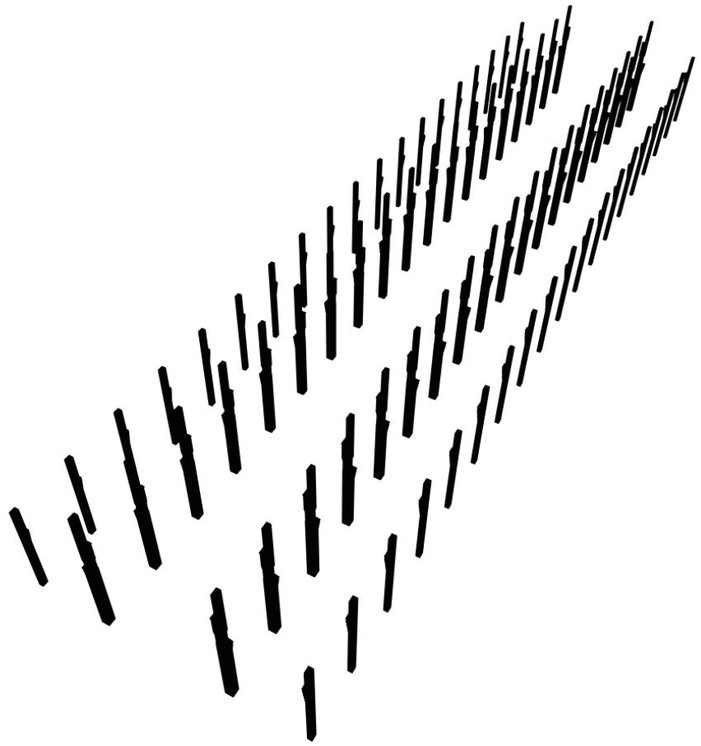
Preconditions, Principles & Values

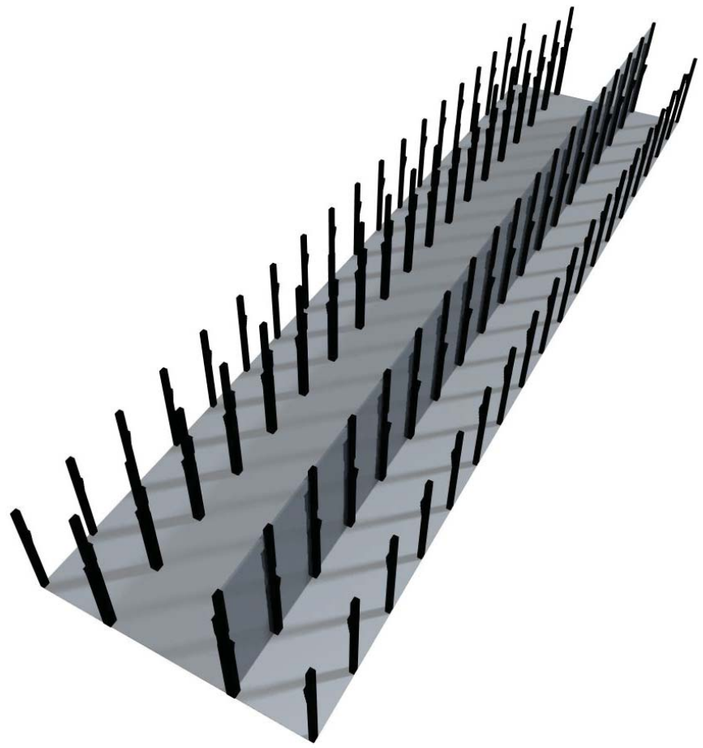
spatial quality, central hall
structural elements, **columns structure**
separating **wall**, remans of productionproces

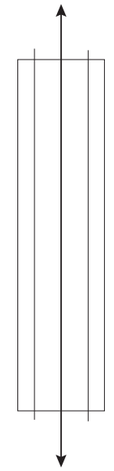
functions (visual) connected with central nave
movement in the central nave
translation of the past

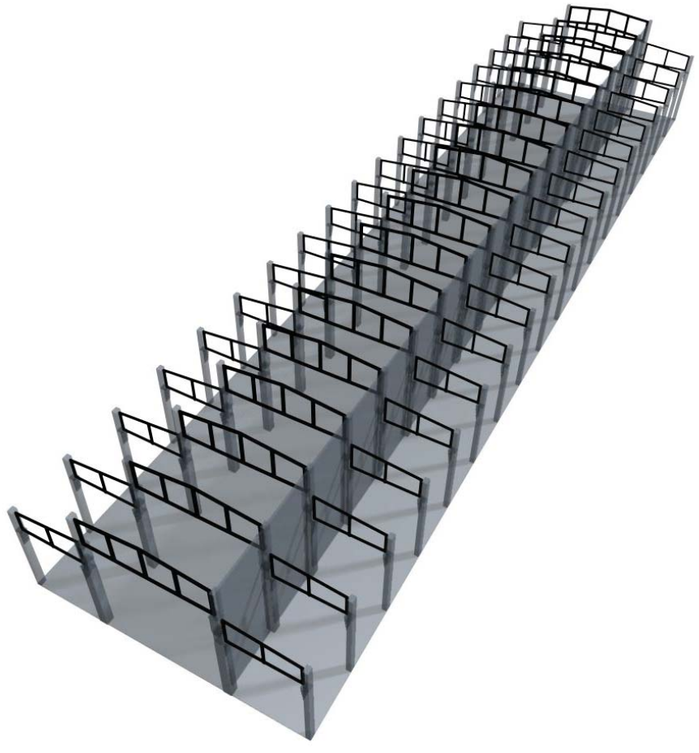
the daily living facilities, entrance H.C.C. > ground floor
leisure > located at the waterfront, terrace and view direct visual connected to canal.

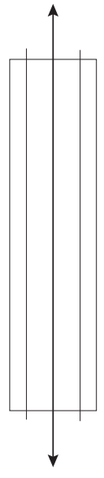


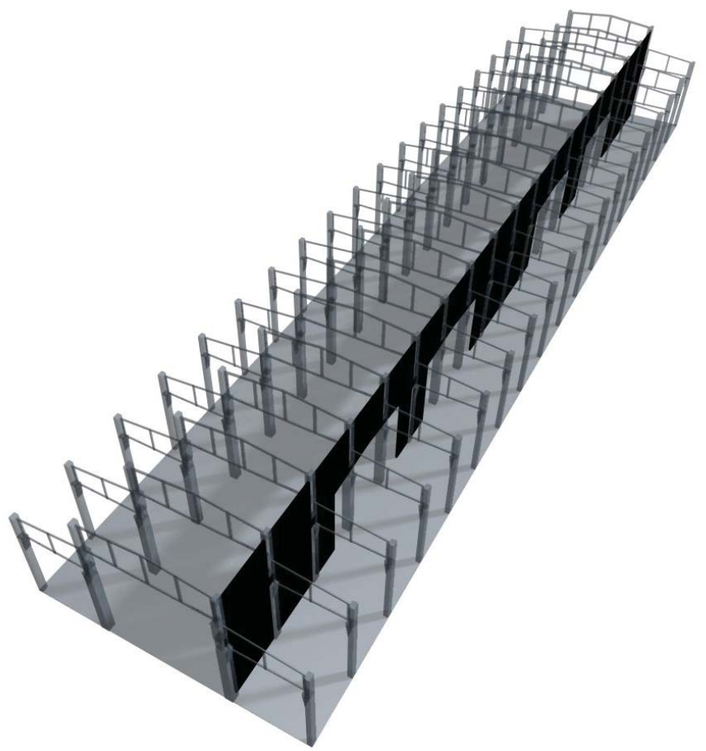


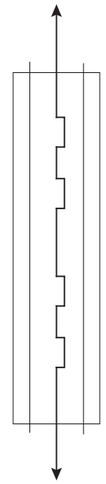


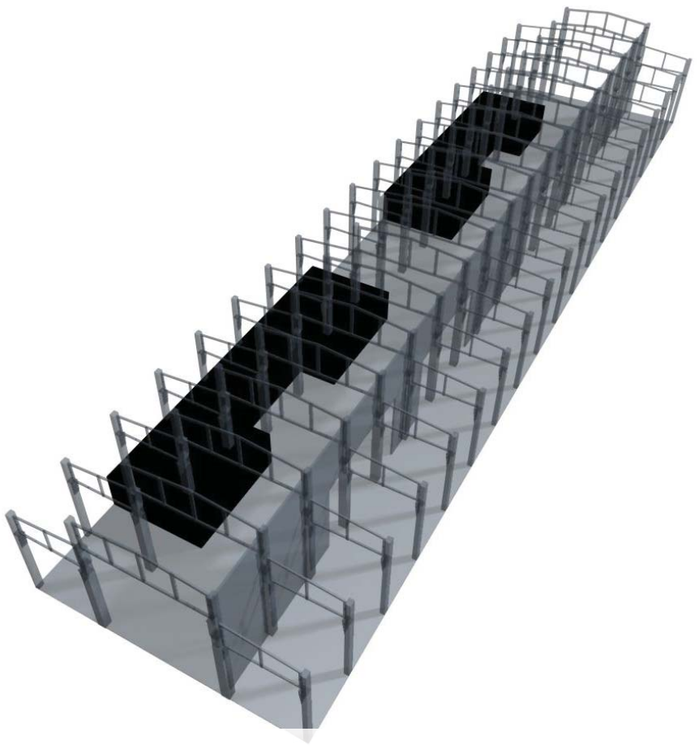


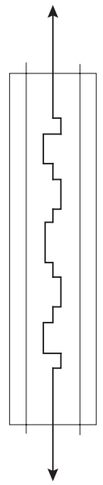


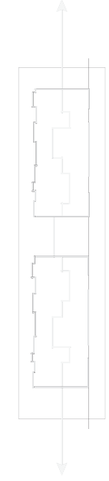


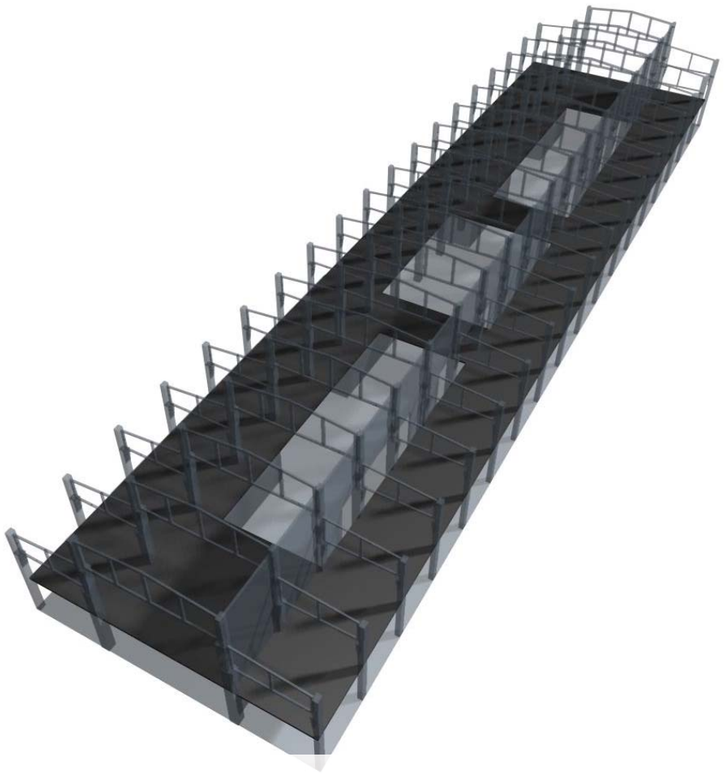


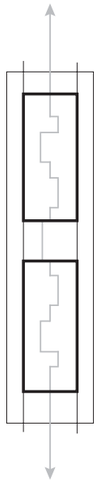


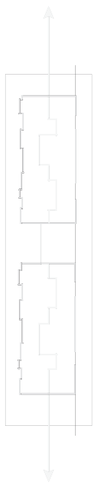


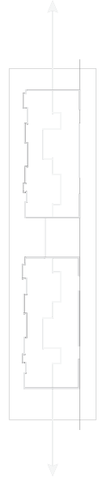


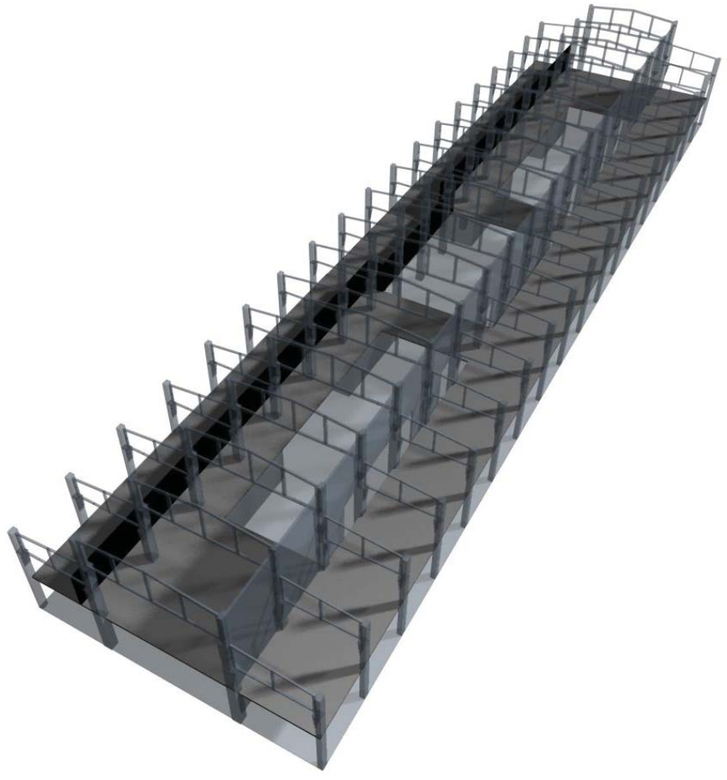


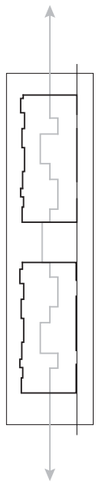


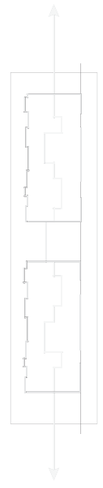


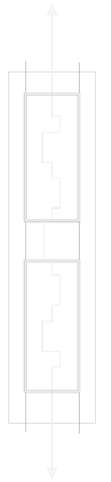


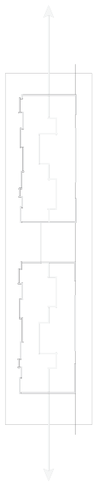


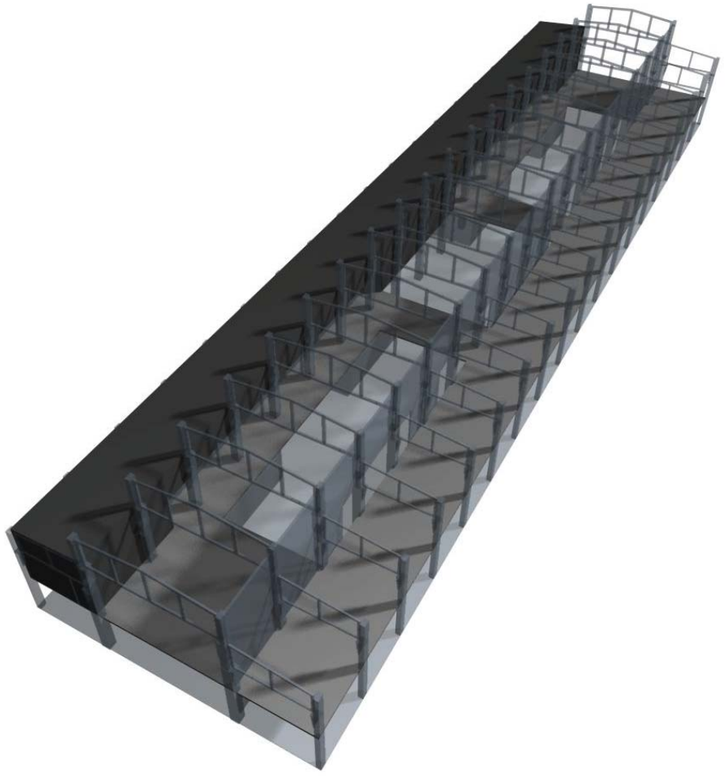


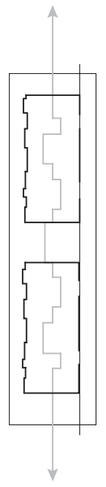


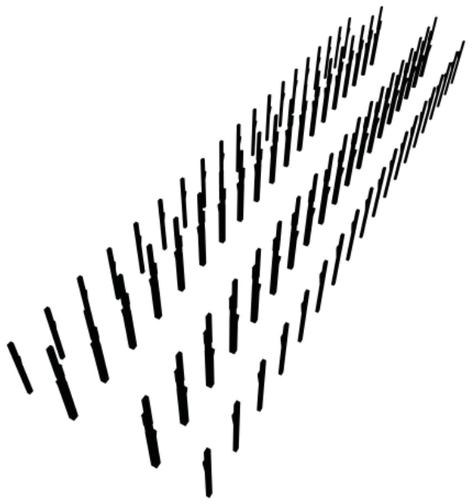


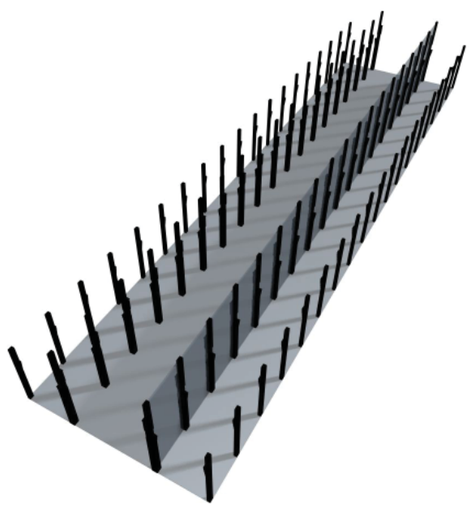


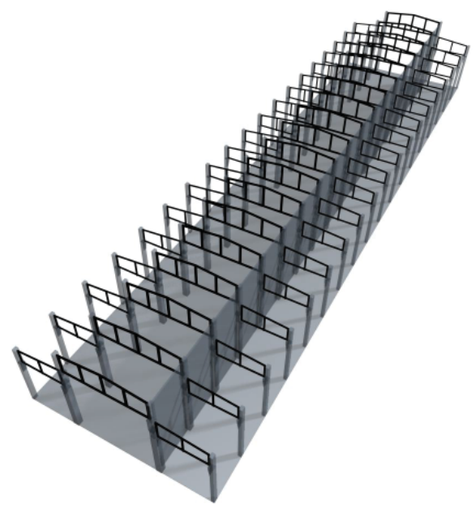


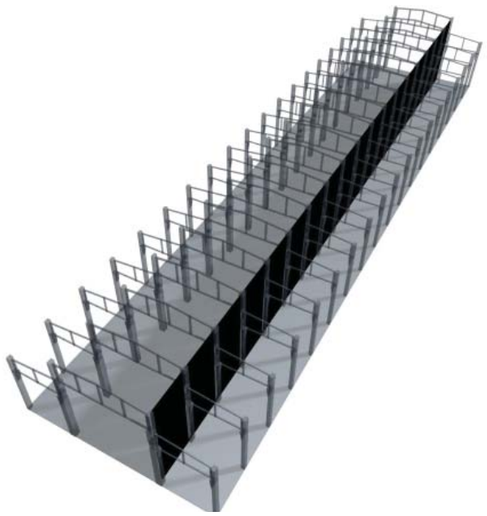


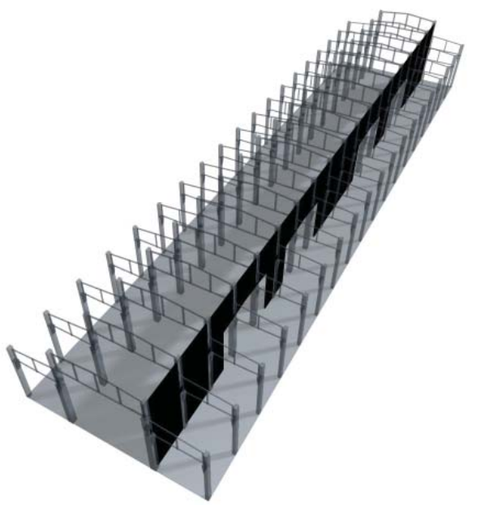


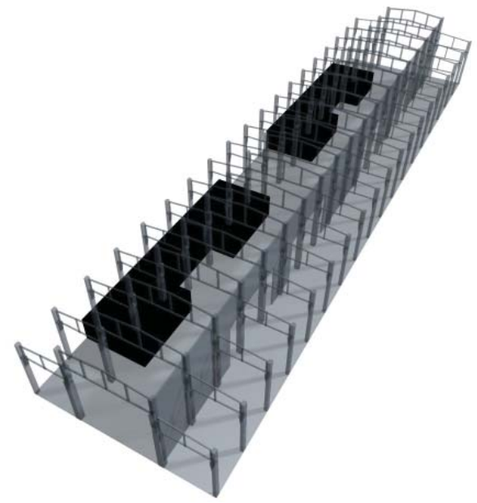


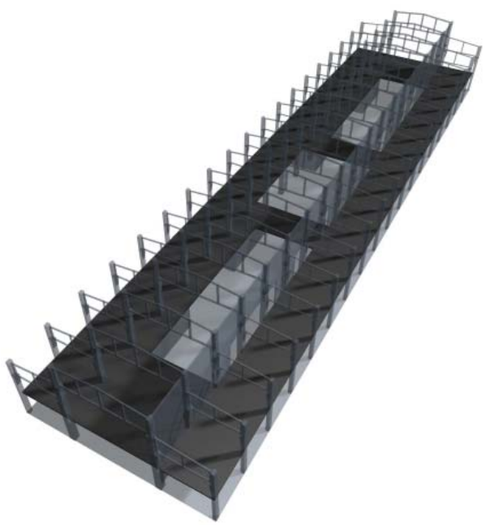


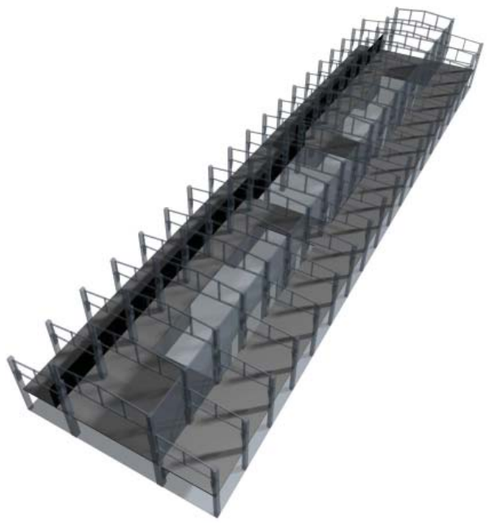












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supermarket & fresh products

traffic space

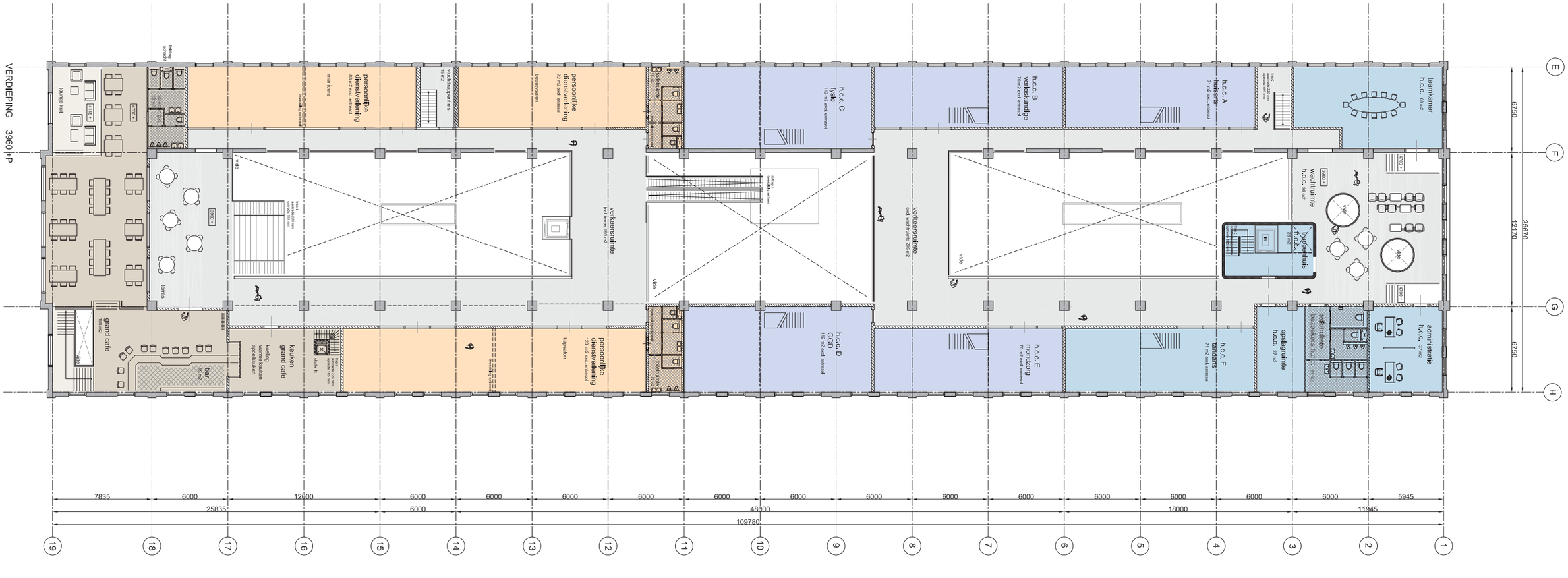
health care center

grand cafe

personal services

community

BEGANE GROND PEIL = 0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leiding schacht
toiletruimte
persoonlijke dienstverlening
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manicure
vluchttrappenhuis
15 m2
persoonlijke dienstverlening
72 m2 excl. entreeuit
beautysalon
verkeersruimte
excl. terras 196 m2
vide
terras
grand cafe
186 m2
bar
16 m2
keuken grand cafe
koeling
warme keuken
spoelkeuken
persoonlijke dienstverlening
123 m2 excl. entreeuit
kapsalon
h.c.c. C
fysio
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h.c.c. B
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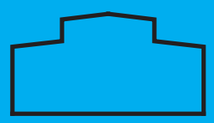
Research by Design



facade

columns

truss structure

floor levels

constr. elements

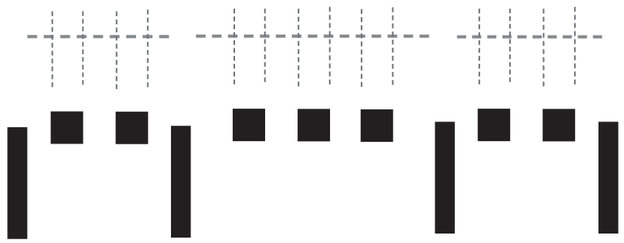
climate

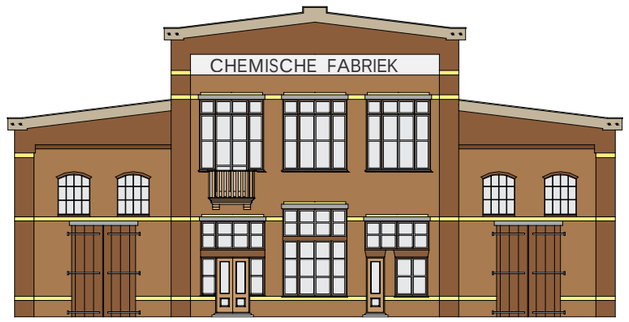
fire safety

construction

materialization


N. V. DRAADINDUSTRIE NEERLANDIA

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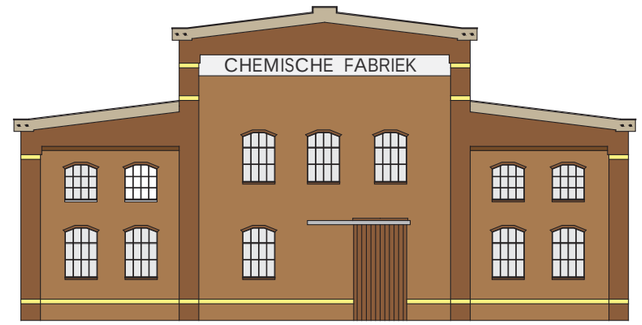
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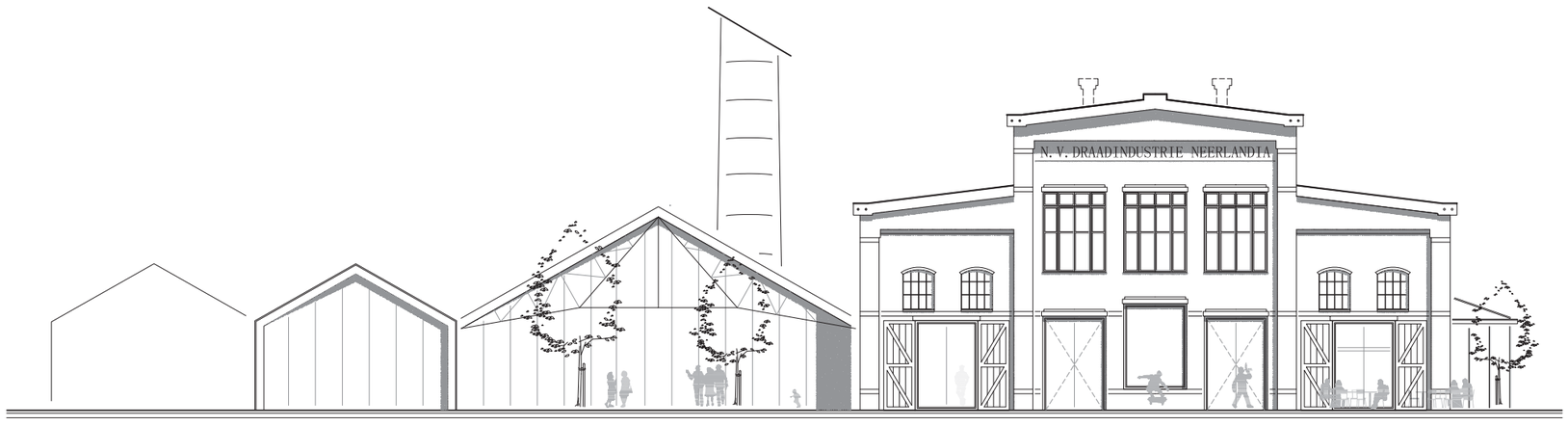
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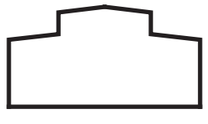
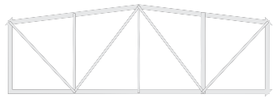
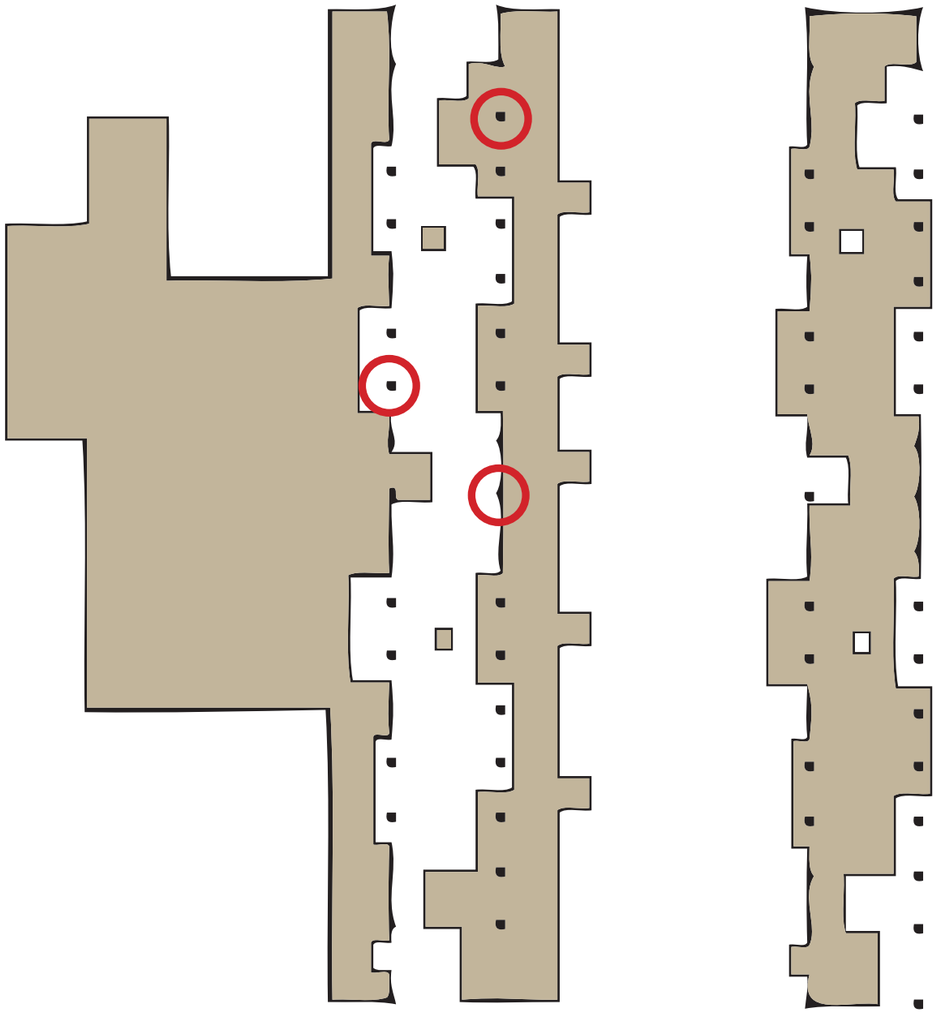
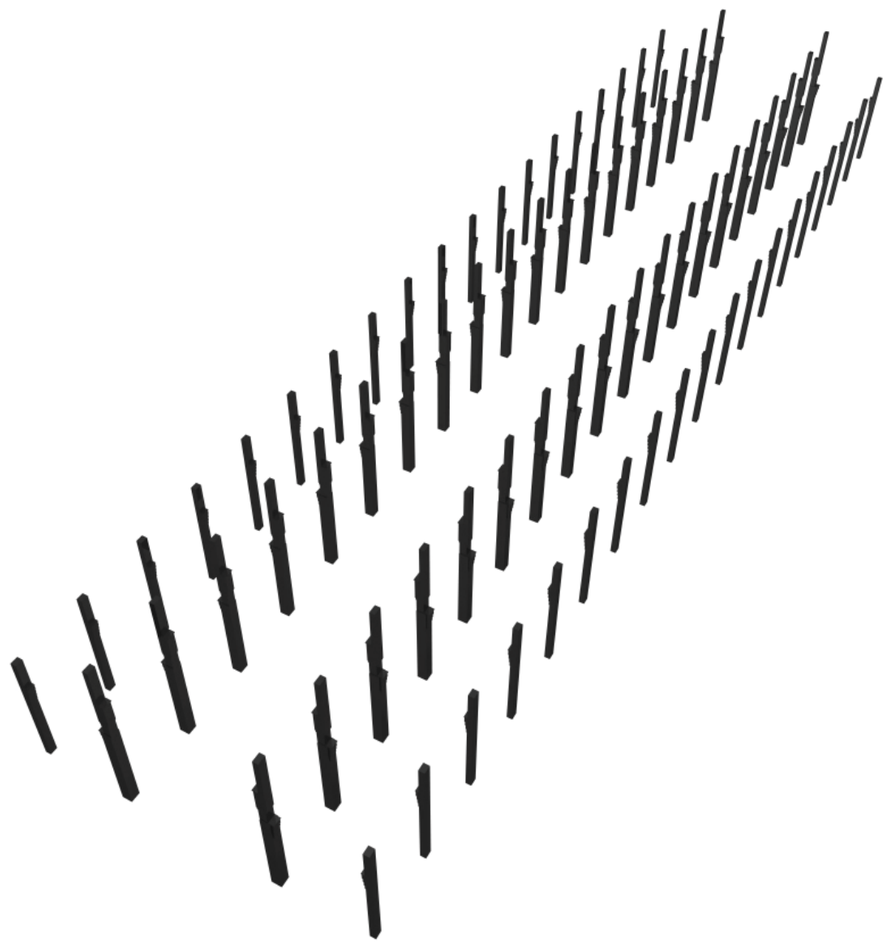
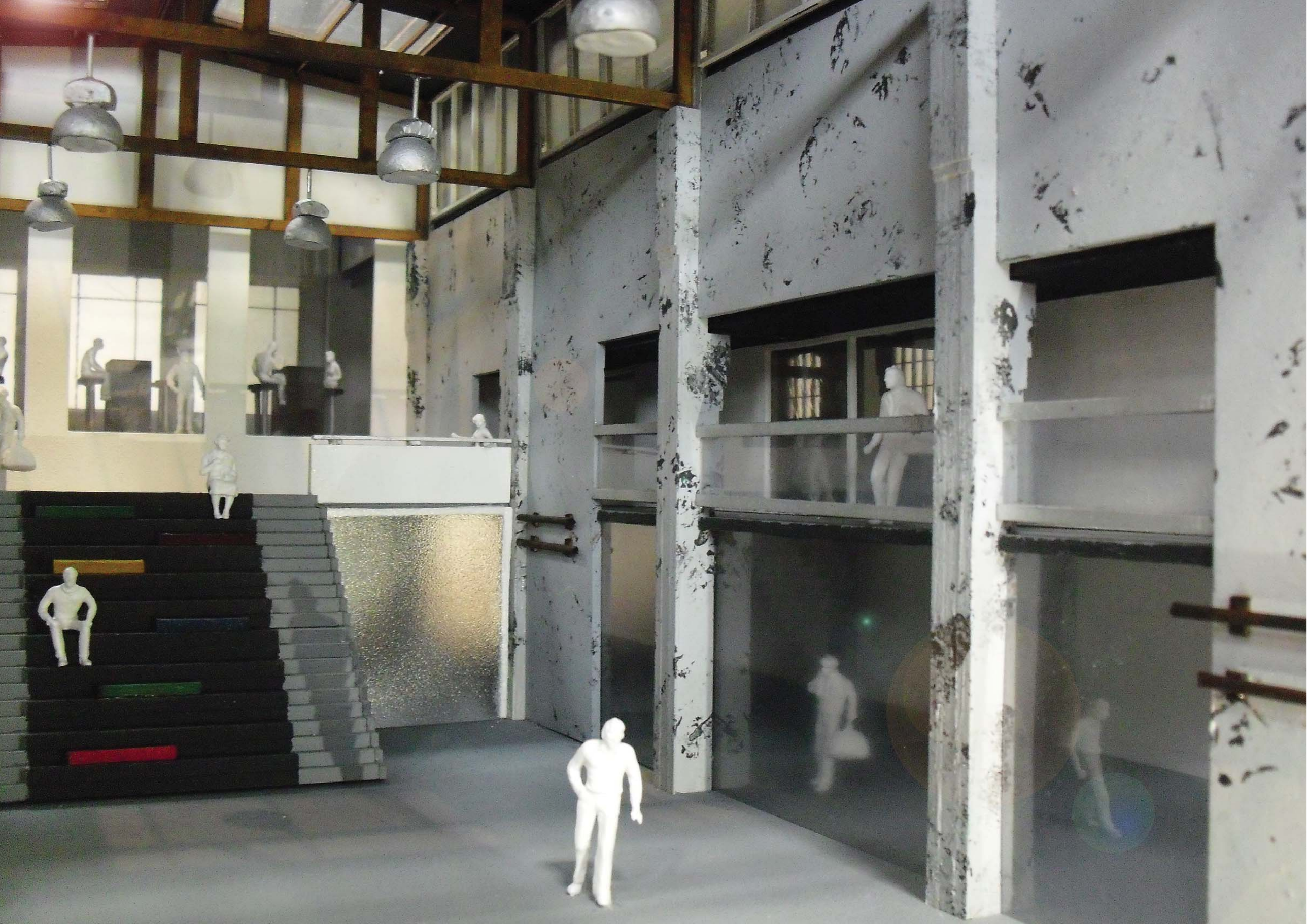





"DRAADINDUSTRIE NEERLANDIA"







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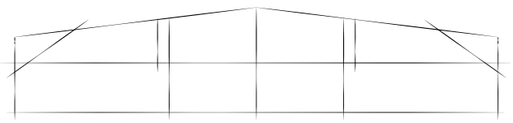
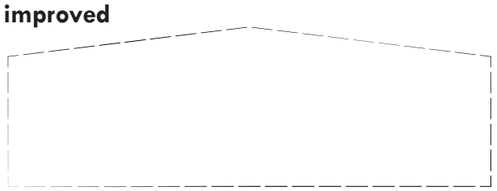
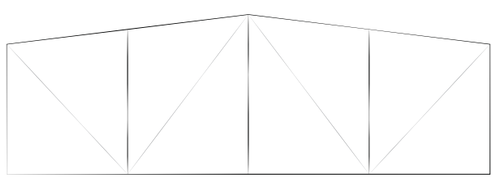


improved



contour



derivative

value

derivative of the original, use of the same **materilialization**

model

as existing, not as original because of **instability**

cost

relatively **light** and simple **construction**, using existing buttresses.

functional

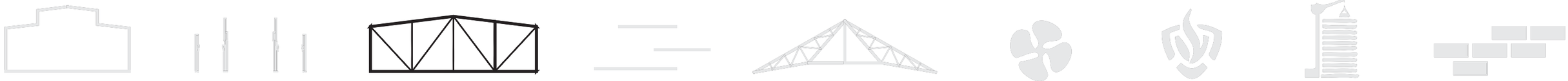
easy to place, by the lower beam a visual **ceiling** created like the former steel beam

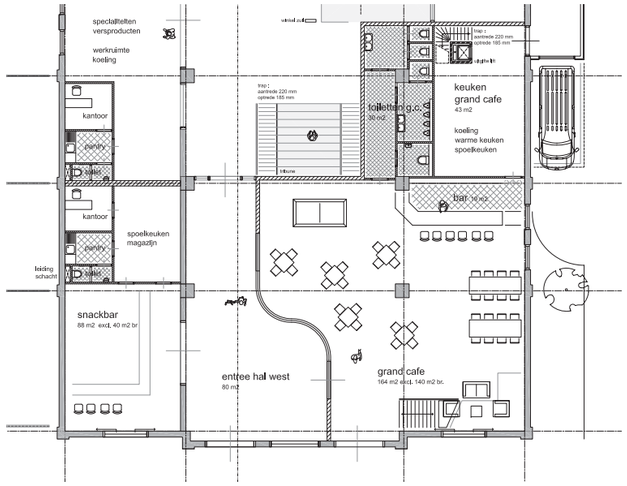
consideration

existing structure is in very poor condition, **restoration** is not possible.

HEA profile ? adds **no value** to the new spans, history not readable & constructive more complex

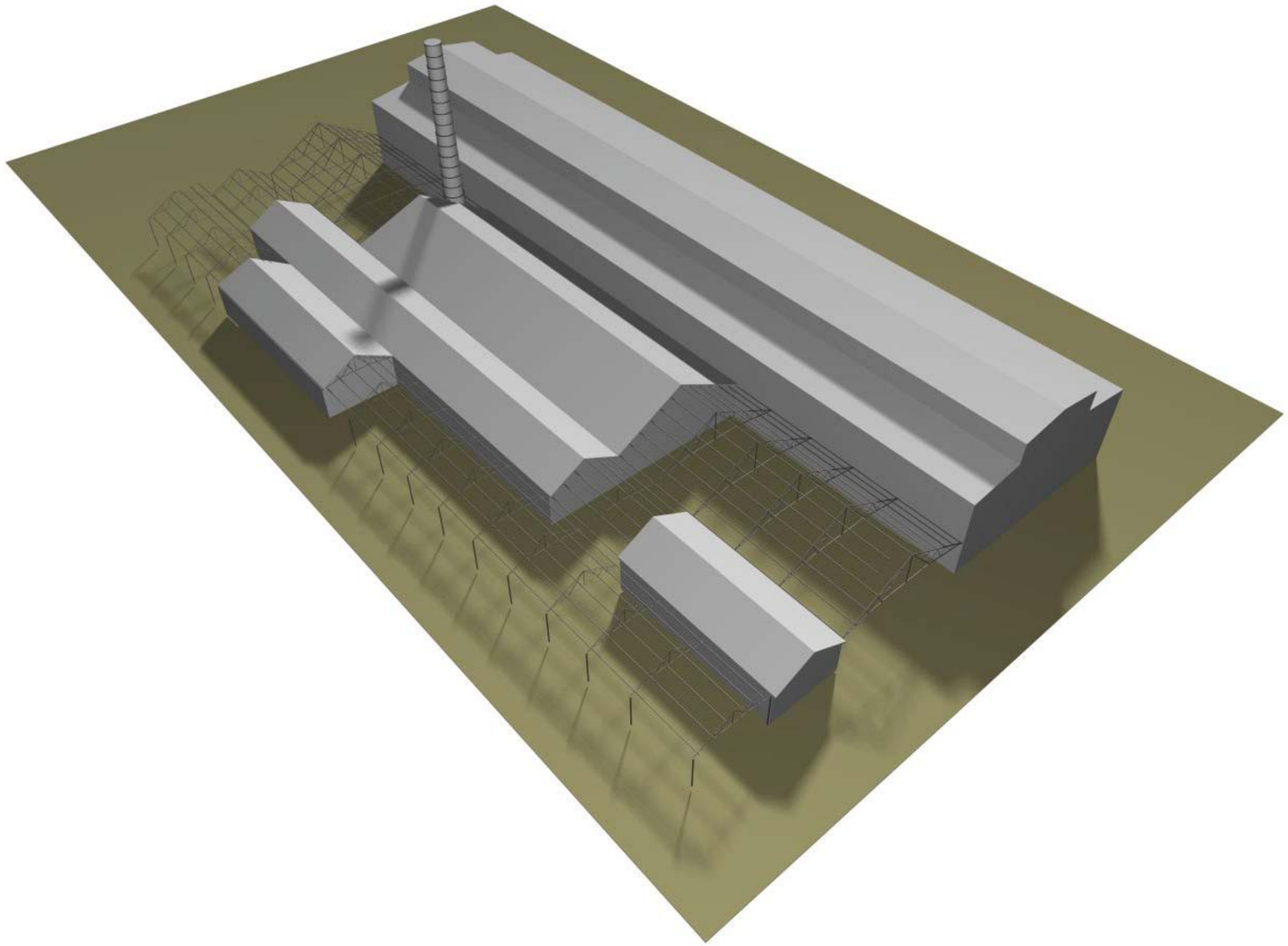
not a replica, renewal may be visible but will need to blend into the existing, **symbiose**

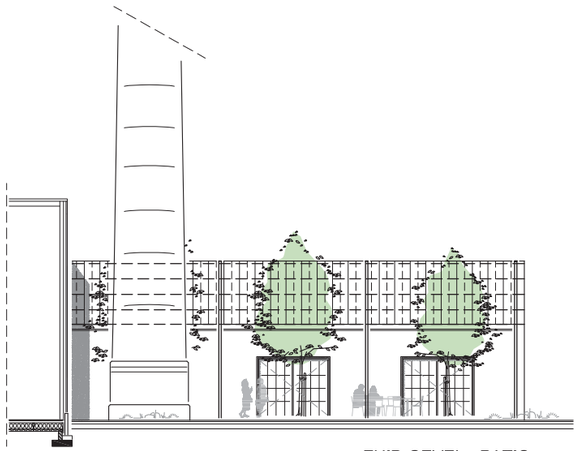




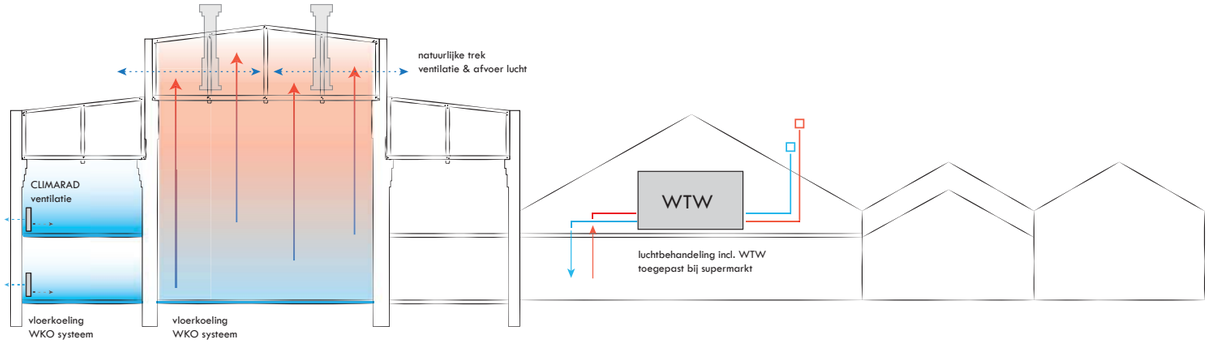
WEST GEVEL 1:200


Toilet

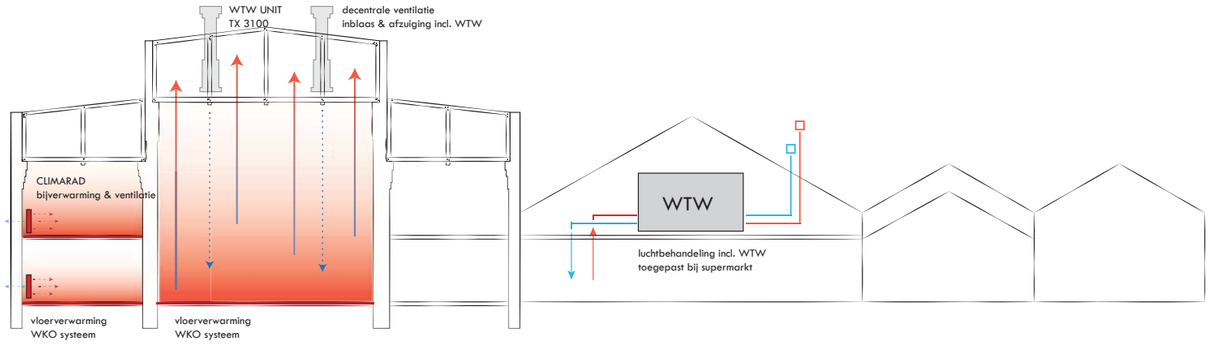




ZUID GEVEL - PATIO



SUMMER



WINTER

Ventilatie unit met warmte terugwinning dakmodel type TX 3100

Deze industriële warmteterugwinunit is speciaal ontworpen voor decentrale ventilatie in combinatie met een hoog rendement.

Toepassing

grote ruimte, magazijnen of werkplaatsen

Samenstelling

- Warmte wisselaar
- Afvoer ventilator
- Toevoer ventilator
- Toevoer filter
- Afvoer filter

Fan

- Ziehl Abbeg - EC ventilator
- qv = 3000 m^3/h

Warmtewisselaar

- Heatex warmte wiel
- Aluminium lamellen
- 1 module

Filter

- F5 afzuig
- F5 toevoer

Opties

- PIR sensor
- Hygrostaat
- C02 sensor

BINNENWANDOPBOUW RC 3,52 M2K/W (br.w. 60 min.) 63 dB
dubbele gipsvezelplaat 2x12,5 mm
metalen C profielen 50 mm h.o.h. 600mm
isolatie 50 mm tussen metalen stijlen
luchtspouw 20 mm
isolatie 50 mm tussen metalen stijlen
metalen C profielen 50 mm h.o.h. 600mm
dubbele gipsvezelplaten 2x12,5 mm

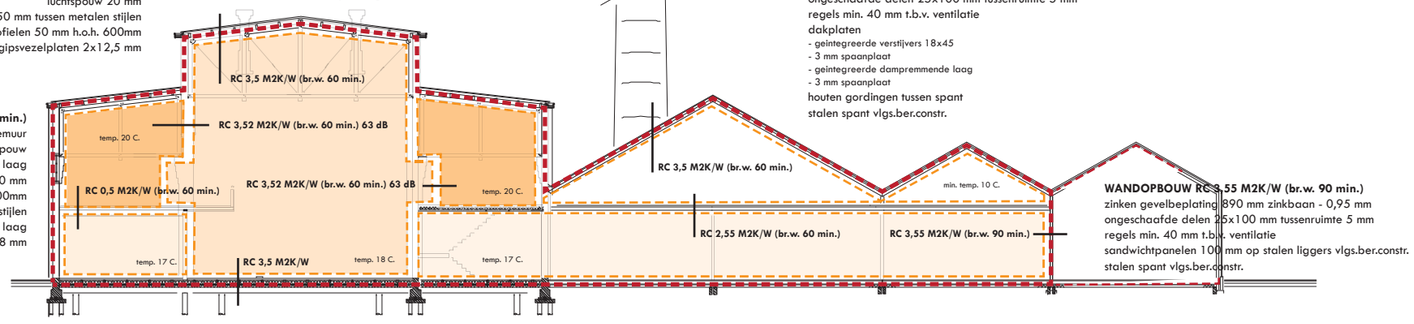
WANDOPBOUW RC 3,0 M2K/W (br.w. 60 min.)
bestaande constructiemuur
ventilatie spouw
dampdoorlatende laag
comfortpanel 50 mm
metalen C profielen 50 mm h.o.h. 600mm
isolatie 50 mm tussen metalen stijlen
dampremmende laag
dubbele gipsvezelplaten 18 mm

DAKOPBOUW RC 3,5 M2K/W (br.w. 60 min.)
baanvormige dakbedekking
dakplaten
- geintegreerde verstijvers 18x45
- 3 mm spaanplaat
- geintegreerde dampremmende laag
- 3 mm spaanplaat

biezenplaat 12 mm
gordingen vlgs.ber.constr. tussen spant h.o.h. 610
spant vlgs.ber.constr.

DAKOPBOUW RC 3,5 M2K/W (br.w. 60 min.)
zinken roevendak 890 mm zinkbaan - 0,95 mm
ongeschaafde delen 25x100 mm tussenruimte 5 mm
regels min. 40 mm t.b.v. ventilatie
dakplaten
- geintegreerde verstijvers 18x45
- 3 mm spaanplaat
- geintegreerde dampremmende laag
- 3 mm spaanplaat

houten gordingen tussen spant
stalen spant vlgs.ber.constr.



WANDOPBOUW RC 3,55 M2K/W (br.w. 90 min.)
zinken gevelbeplating 890 mm zinkbaan - 0,95 mm
ongeschaafde delen 25x100 mm tussenruimte 5 mm
regels min. 40 mm t.b.v. ventilatie
sandwichtpanelen 100 mm op stalen liggers vlgs.ber.constr.
stalen spant vlgs.ber.constr.

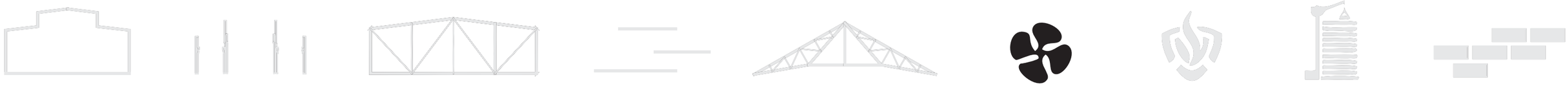
VERD.VLOEROPBOUW RC 0,5 M2K/W (br.w. 60 min.)
cementdekvloer 60 mm
bovenwapening vlgs.ber.constr.

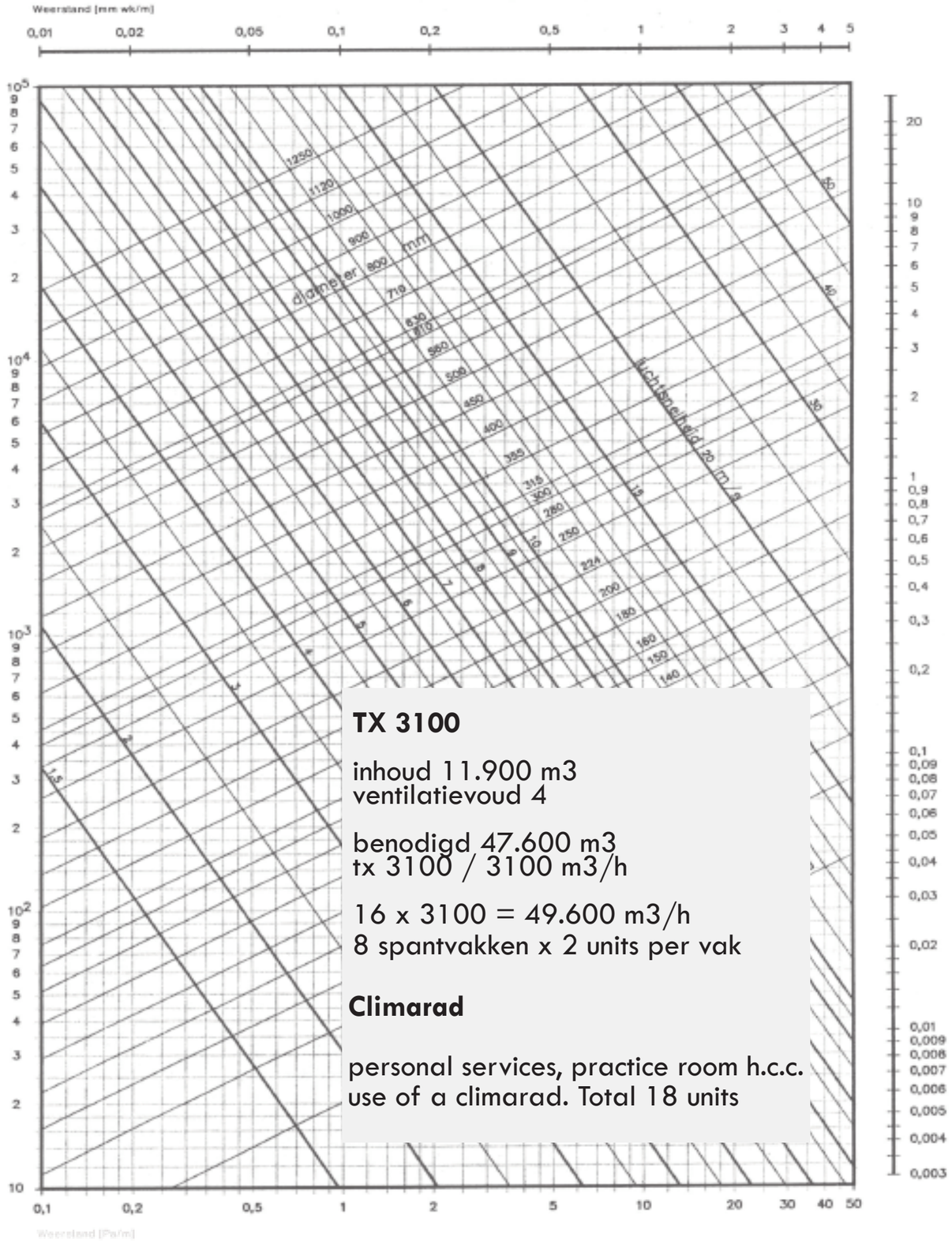
koel/verwarmingsleiding 12 mm
drukvaste isolatie 20 mm
egalisatieshape 40 mm
kanaalplaatvloer 200 mm
leidingruimte / ophangsysteem plafond
systeemplafond

BEG.GROND.VLOEROPBOUW RC 3,5 M2K/W
cementdekvloer 60 mm
bovenwapening vlgs.ber.constr.
koel/verwarmingsleiding 12 mm
drukvaste isolatie 20 mm
egalisatieshape 40 mm
isolatieplaatvloer 260 mm Rc 3,0 m2 K/W
betonnen ringbalk vlgs.ber.constr.
op palen gefunderd vlgs. funderingsplan

VERD.VLOEROPBOUW RC 2,55 M2K/W
underlaymentplaat 19 mm
balklaag vlgs.ber.constr. tussen stalen balk

stalen HEA profiel vlgs berekening constr.
minerale wol 80 mm
regelwerk 22 mm
leidingruimte / ophangsysteem plafond
systeemplafond





TX 3100

inhoud 11.900 m3
ventilatievoud 4

benodigd 47.600 m3
tx 3100 / 3100 m3/h

16 x 3100 = 49.600 m3/h
8 spantvakken x 2 units per vak

Climarad

personal services, practice room h.c.c.
use of a climarad. Total 18 units

• Capaciteit

Te verplaatsen luchthoeveelheid in een ruimte gedurende een bepaalde periode wordt uitgedrukt in m^3/u of m^3/s.
Er worden verschillende methodes gebruikt om de capaciteit te bepalen.

1) Afhankelijk van het ruimte-gebruik wordt het aantal lucht-wisselingen per uur (VV/U) bepaald.

SOORT RUIMTE	VENTILATIEVOUD PER UUR
Openbare toiletten	5 - 15
Toiletten in woningen	3 - 4
Bad- en doucheruimten	5 - 8
Kantoren	4 - 8
Lakkerijen	15 - 20
Lakspuiterijen	30 - 80
Garages	4 - 6
Ontvangstruimten in hotels	4 - 8
Gieterijen	8 - 15
Bioscopen / theaters	5 - 8
Keukens in woningen	10 - 20
Middelgrote bedrijfskeukens	15 - 25
Grote bedrijfskeukens	20 - 30
Laboratoria	8 - 15
Magazijnen	4 - 6
Machineruimten	15 - 30
Montagehallen	4 - 8
Scholen	4 - 6
Zwembaden	5 - 7
Showrooms	4 - 8
Restaurants	5 - 8
Vergaderruimten	5 - 10
Wasserijen	12 - 15
Warenhuizen	4 - 6
Werkplaatsen	3 - 6

Bovenstaande ventilatievouden zijn slechts richtlijnen en niet nauwkeurig genoeg.
Verder kunnen voor het bepalen van de ventilatievouden een aantal normen gebruikt worden zoals die wettelijk zijn bepaald.

2) Ventilatievoud-berekening afhankelijk van het aantal personen en hun activiteiten in de ruimte.

niet rokende personen met normale arbeid:
20-25 m³/u per persoon

rokende personen met normale arbeid:
30-35 m³/u per persoon

personen met lichte lichamelijke arbeid:
45 m³/u per persoon

personen met zware lichamelijke arbeid:
60 m³/u per persoon

Dit zijn echter minimum waarden welke naar omstandigheden geïnterpreteerd dienen te worden.

3) Afhankelijk van de luchtsnelheid, noodzakelijk voor de opvang van stofdeeltjes of voor hun transport door kanalen:

AANZUIGSNELHEID	
Wasemkap	
huishoudelijke toepassing	0,15 - 0,20 m/s
industriele toepassing	0,20 - 0,25 m/s
verbrandingsgassen	0,25 - 0,50 m/s
ontvetting	0,25 - 0,50 m/s
lasdampen	0,50 - 1,00 m/s
galvanisatie	0,50 - 1,00 m/s
spuitcabine	0,70 - 1,00 m/s
slijpsel	2,50 - 10,00 m/s

TRANSPORT SNELHEID	
stof	9 m/s
bloem	13 m/s
zaagstof	15 m/s
fijn metaal stof	15 m/s
houtkrullen	18 m/s
metaalkrullen	20 - 25 m/s

Het volstaat om deze snelheid te vermenigvuldigen met het kanaaloppervlak om aan de juiste capaciteit te komen.

• Keuze van ventilatoren

De selectie van een ventilator dient te geschieden volgens de volgende criteria:

1) Type ruimte:
- industrieel
- commercieel
- huishoudelijk

2) De aard van de te transporteren lucht en zijn eigenschappen:
- zuivere lucht
- lucht met stof en/of vet
- transport van materialen
- vluchtige stoffen

3) Vorm en aard van de installatie
- lokaal, in onder- of overdruk
- ventilator in de wand, op het dak of in kanalen
- plaatsing van de luchtinlaat en -uitlaat
- speciale voorwaarden, temperatuur, hoogte enz.

4) De benodigde luchthoeveelheid en druk

5) Het toegestane geluidsniveau:
- in ruimten
- buiten

6) Het type elektrische voeding:
- enkel- of driefasig
- spanning

Andere belangrijke factoren waarmee rekening gehouden dient te worden voor de selectie van een ventilator zijn:

- afmetingen van de ventilator
- regelbaarheid in toerental
- verkrijgbare accessoires

• Ventilatie wetten

Deze leren ons de veranderende eigenschappen van de lucht te bepalen betreffende:
- de capaciteit (Q)
- de weerstand (Δp)
- de luchtsnelheid (P)
- het geluidsniveau (Lp)

De veranderende eigenschappen ontstaan ten gevolge van wijziging:
- toerental (RPM) (N)
- diameter van de waaier (D)

1) Bij gelijkblijvende diameter;

-varieert de capaciteit Q proportioneel ten opzichte van het toerental:

$$Q_2 = Q_1 \times \left(\frac{N_2}{N_1}\right)$$

-varieert de druk P kwadratisch ten opzichte van het toerental:

$$\Delta p_2 = \Delta p_1 \times \left(\frac{N_2}{N_1}\right)^2$$

-varieert het opgenomen vermogen P tot de derde macht ten opzichte van het toerental:

$$P_2 = P_1 \times \left(\frac{N_2}{N_1}\right)^3$$

2) Bij een vast toerental:

-varieert de capaciteit Q tot de derde macht ten opzichte van de waaierdiameter:

$$Q_2 = Q_1 \times \left(\frac{D_2}{D_1}\right)^3$$

-varieert de druk p kwadratisch ten opzichte van de waaierdiameter:

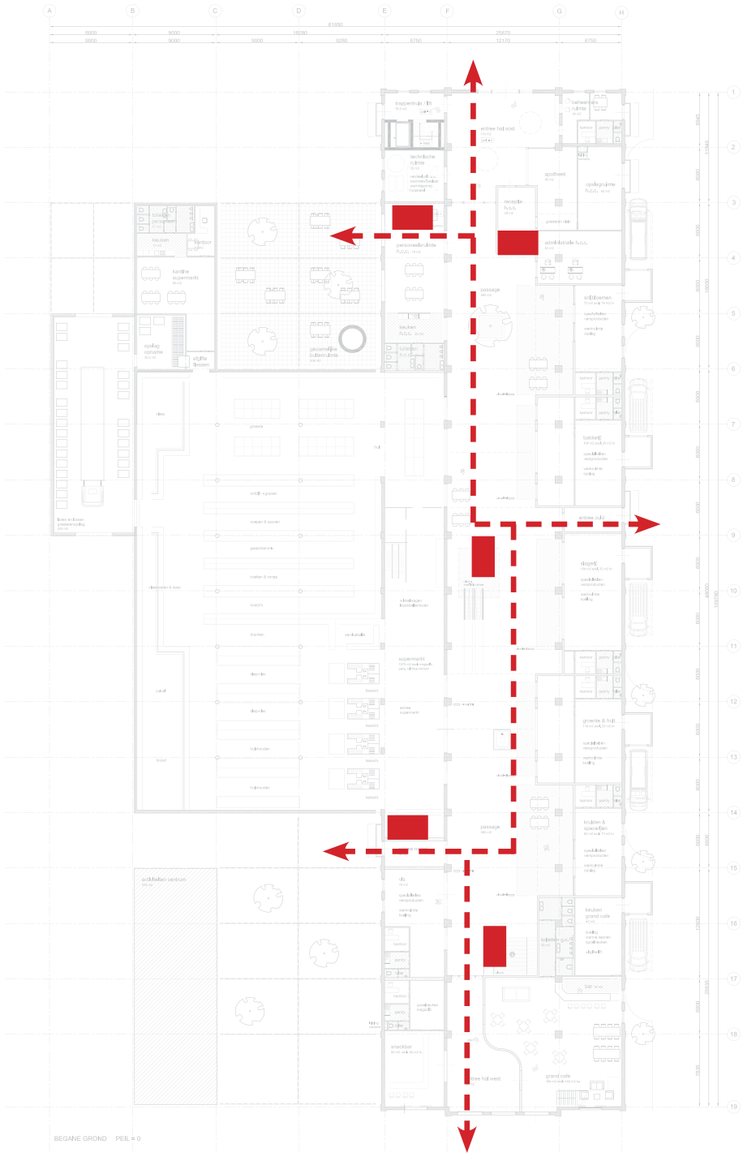
$$\Delta p_2 = \Delta p_1 \times \left(\frac{D_2}{D_1}\right)^2$$

-varieert het opgenomen vermogen P tot de vijfde macht ten opzichte van de waaierdiameter:

$$P_2 = P_1 \times \left(\frac{D_2}{D_1}\right)^5$$

• Omrekeningstabel

Volumestroom:		
1 CFM	=	1,699 m³/u
	=	0,472 l/s
1 m³/u	=	0,589 CFM
	=	0,278 l/s
1 l/s	=	2,119 CFM
	=	3,6 m³/u
Snelheid:		
1 ft/min	=	0,0051 m/s
1 ms	=	196 ft/min
Volume:		
ft³	=	0,00283 m³
m³	=	35,31 ft³
Druk:		
1 inWG	=	249 Pa
	=	25,4 mmWk
1 Pa	=	0,004 inWG
1 mmWk	=	0,0393 inWG



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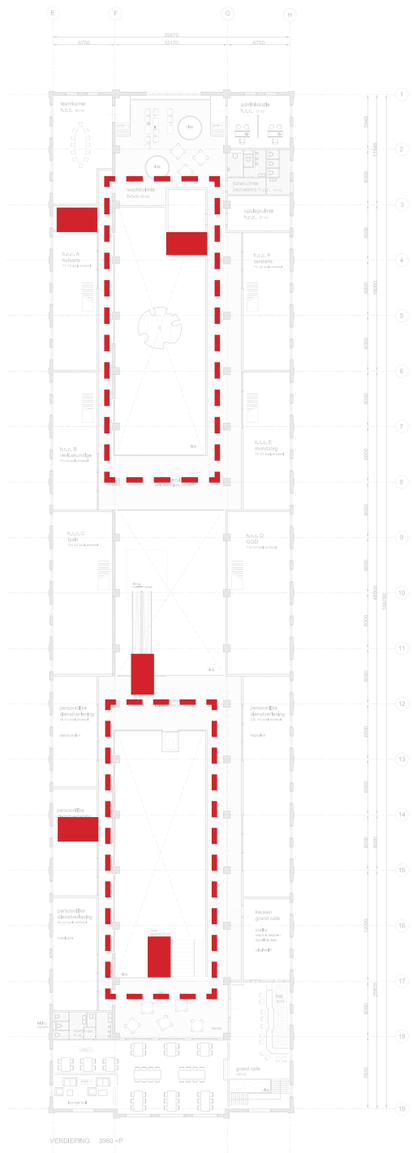

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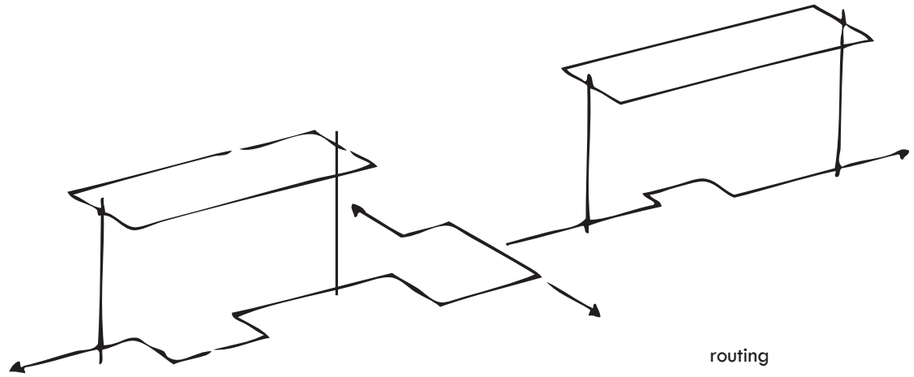
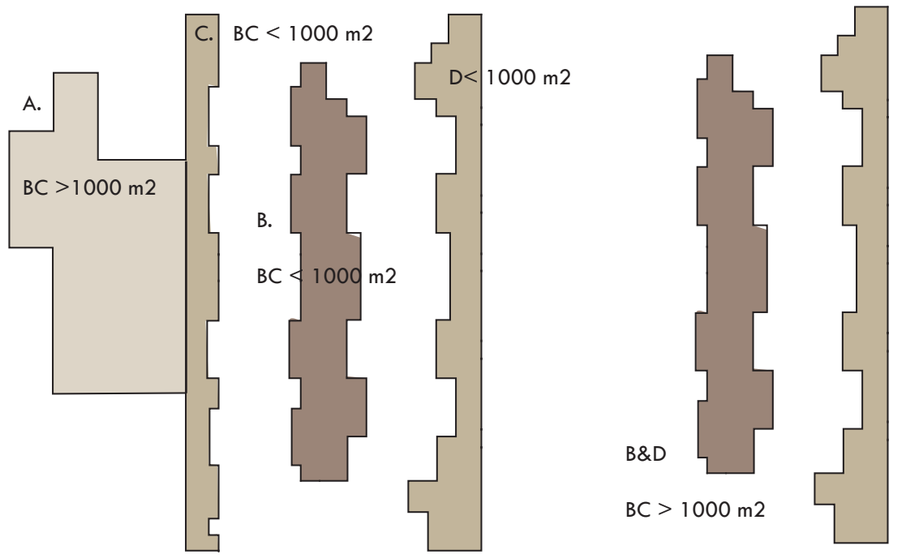
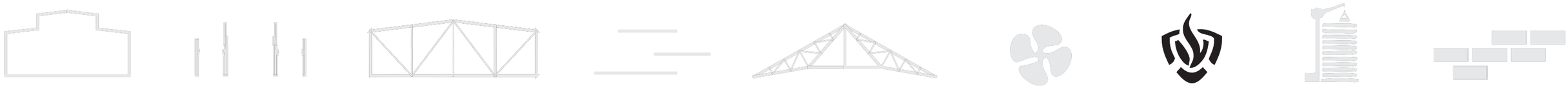
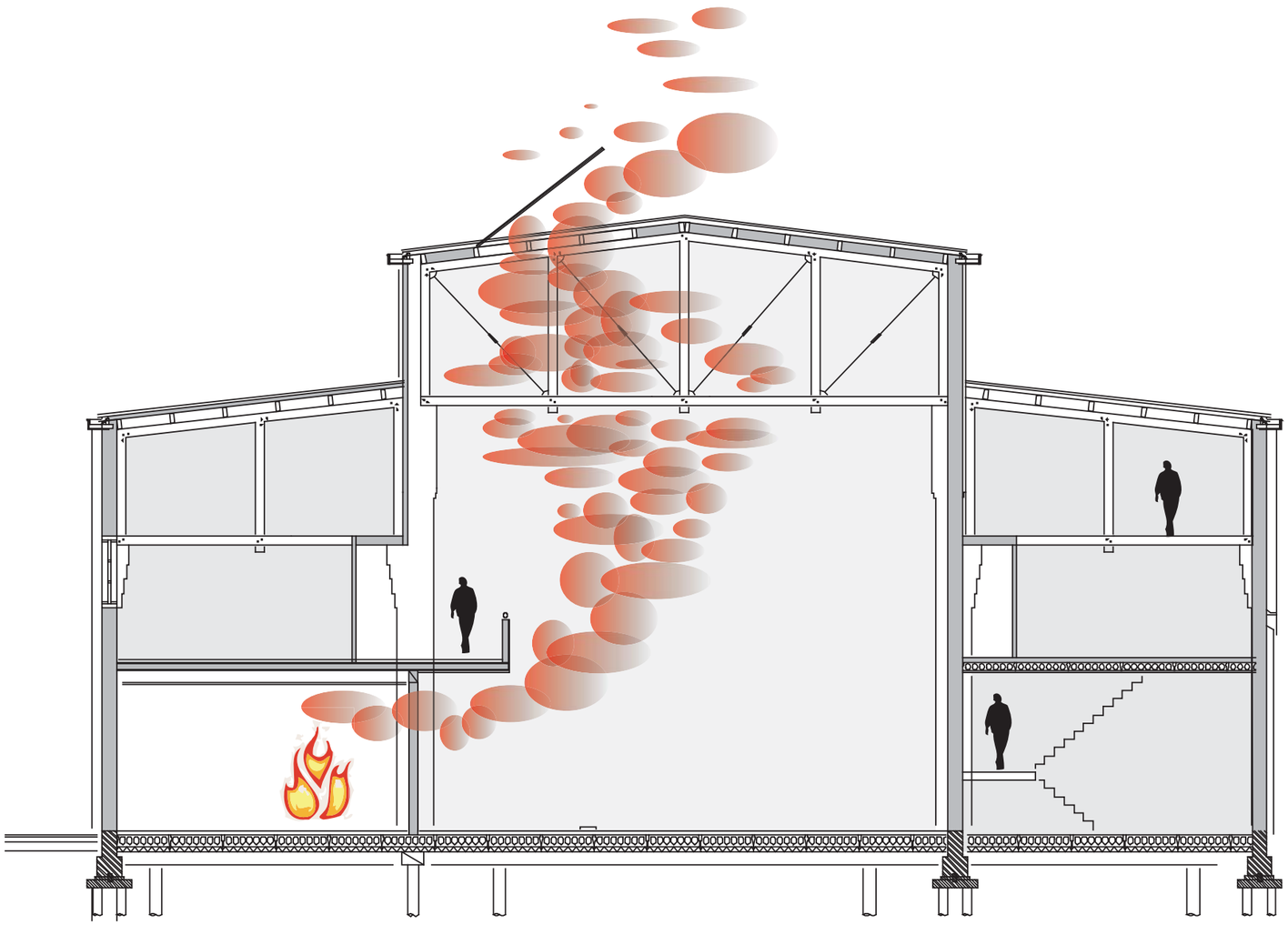


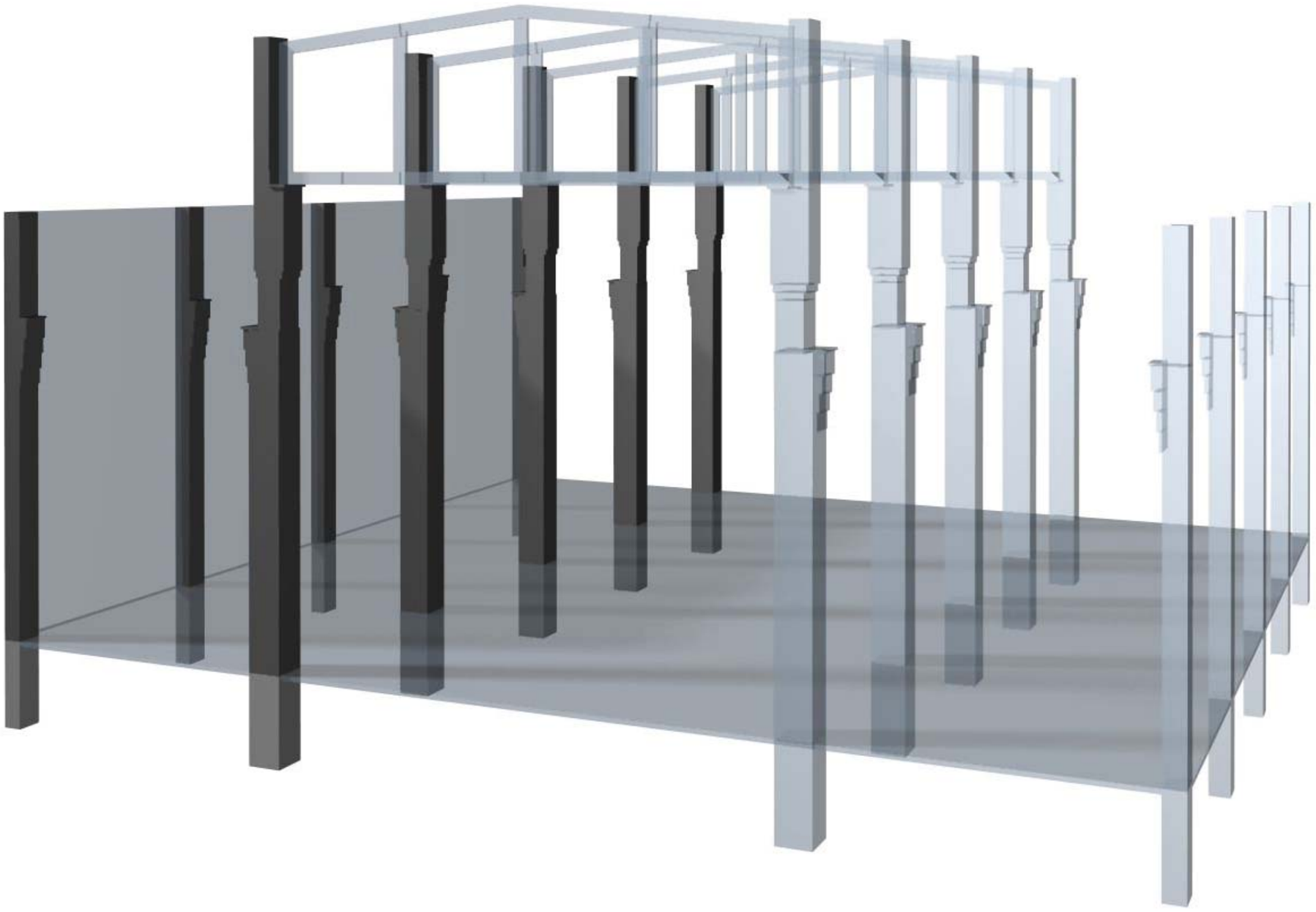
routing

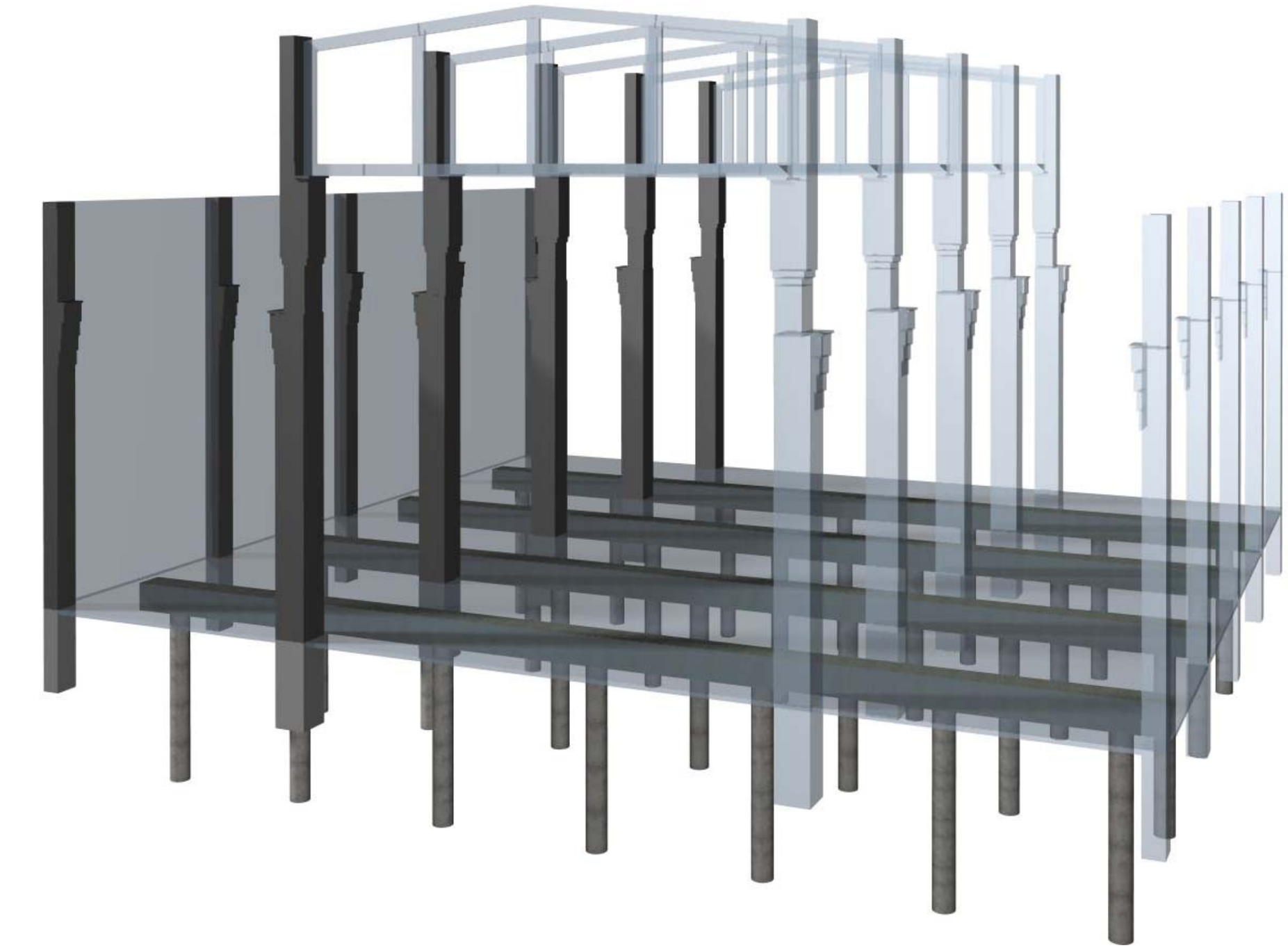


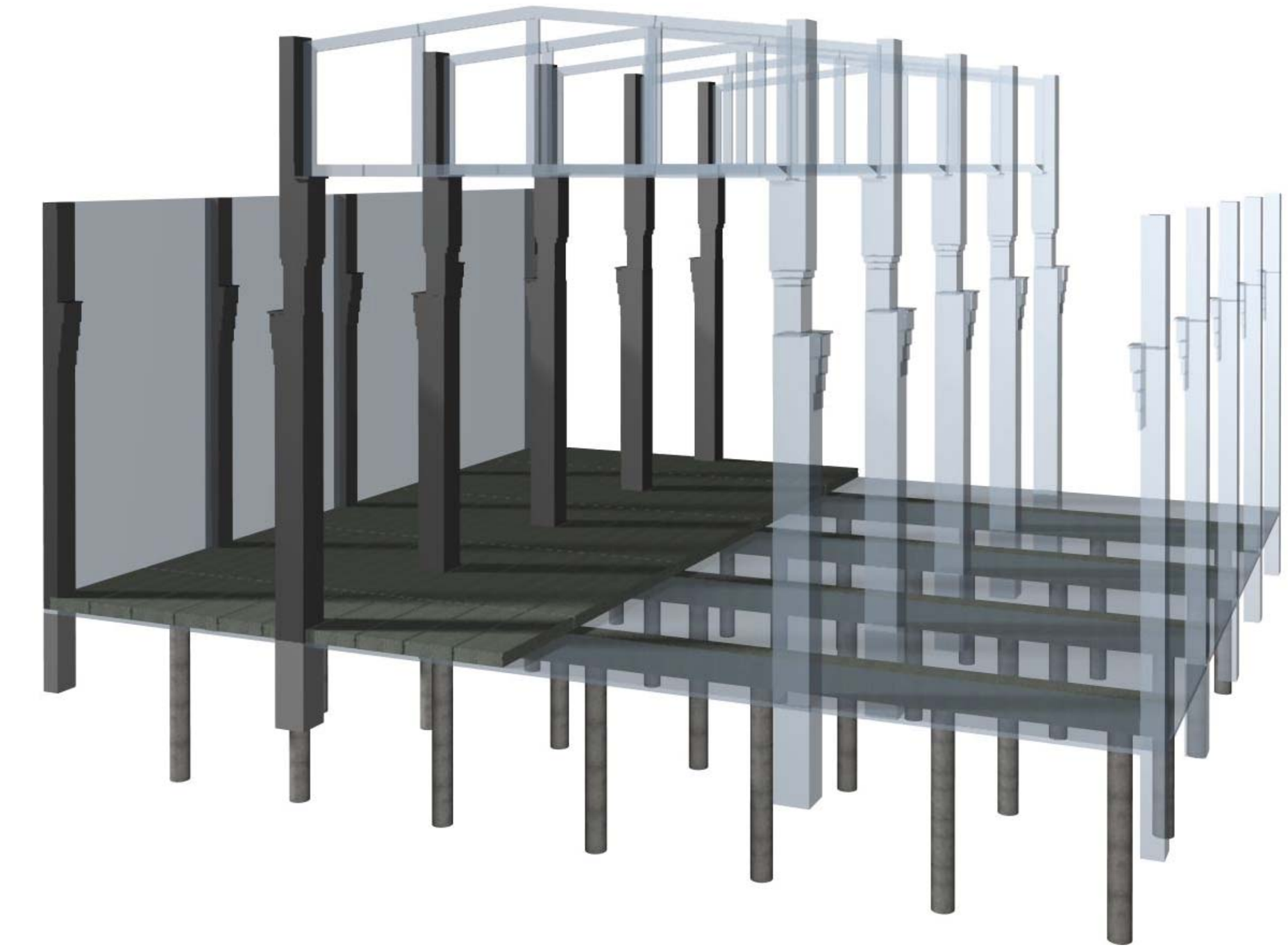


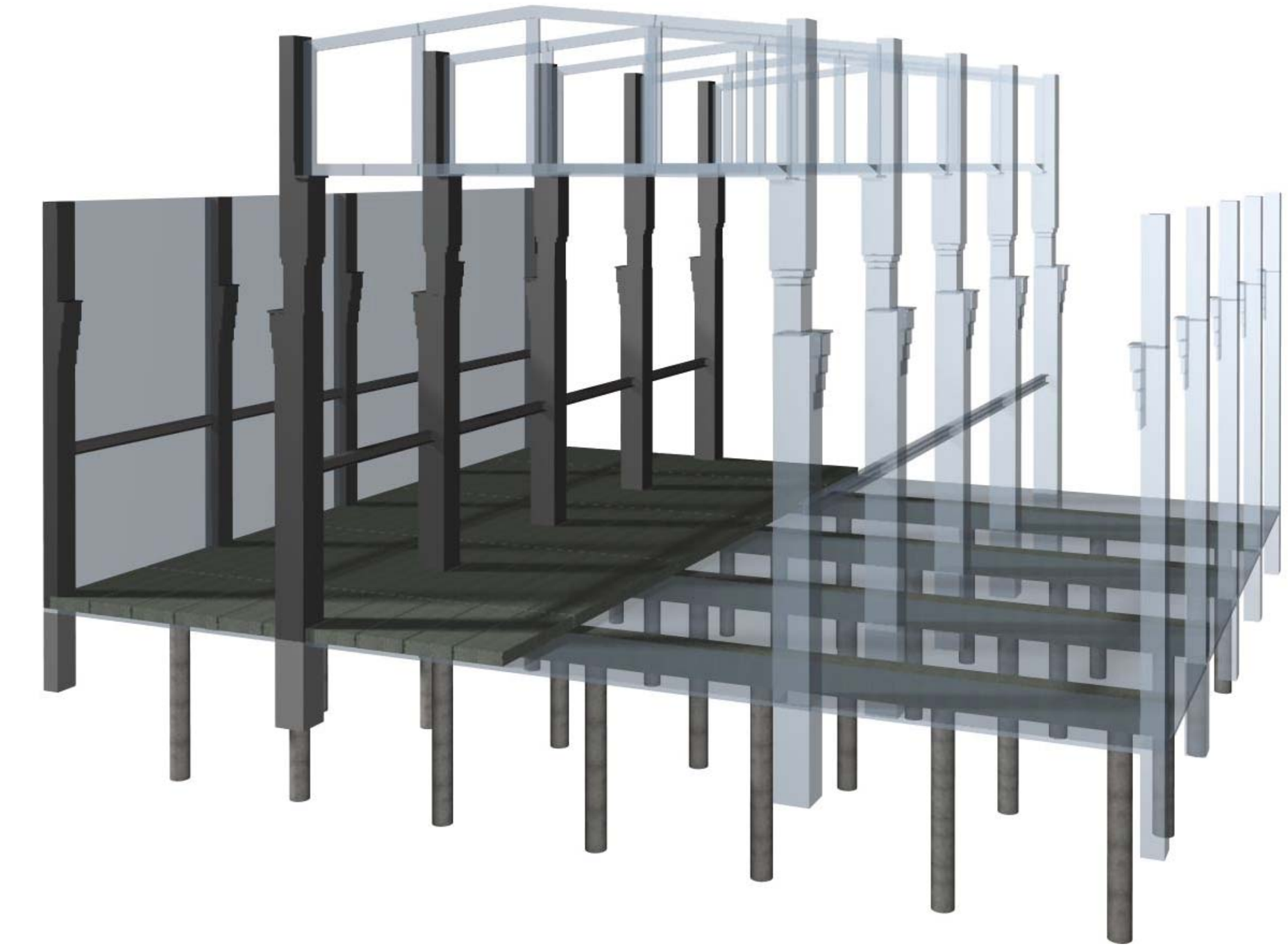


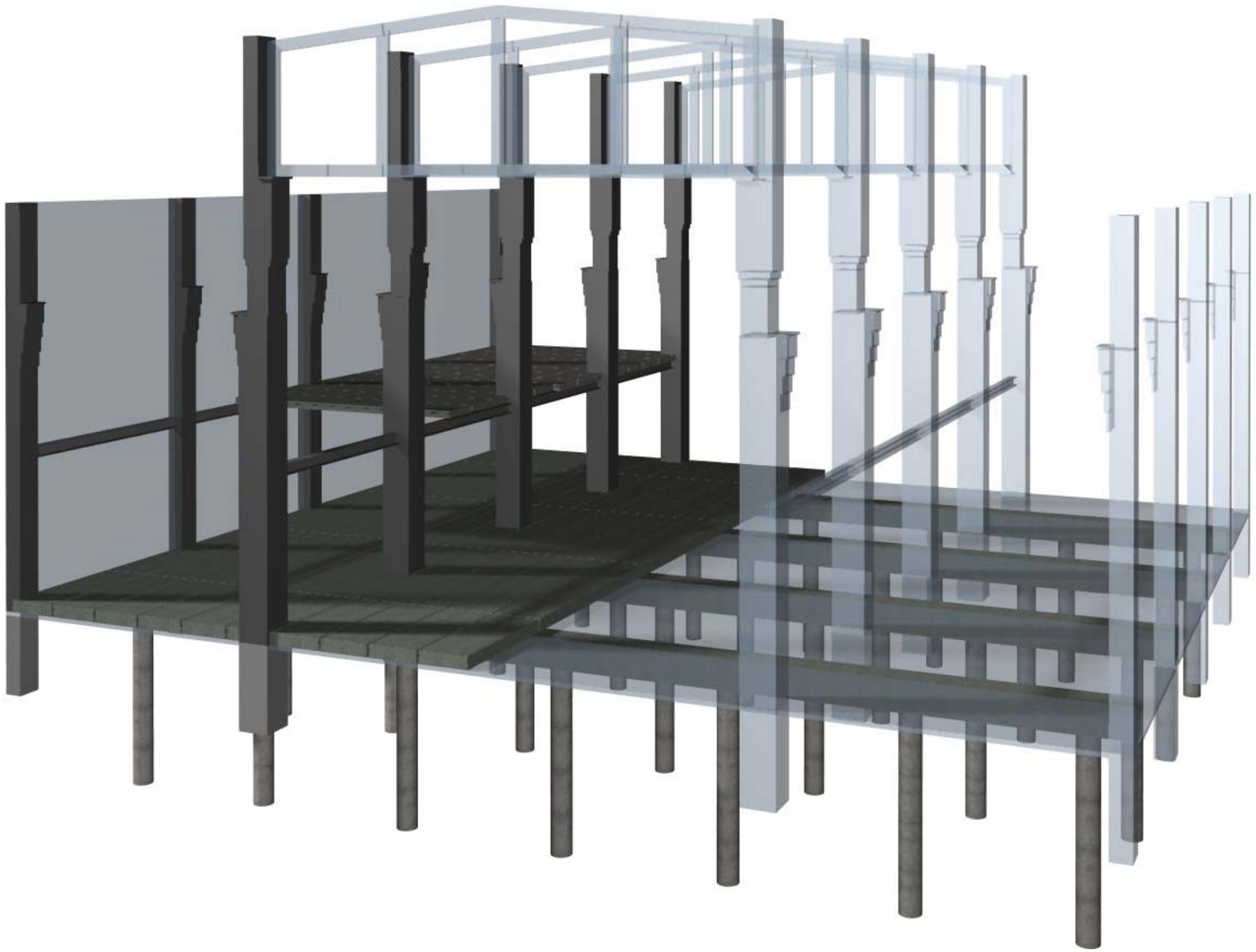

Intelligente
Brandmeldcentrale

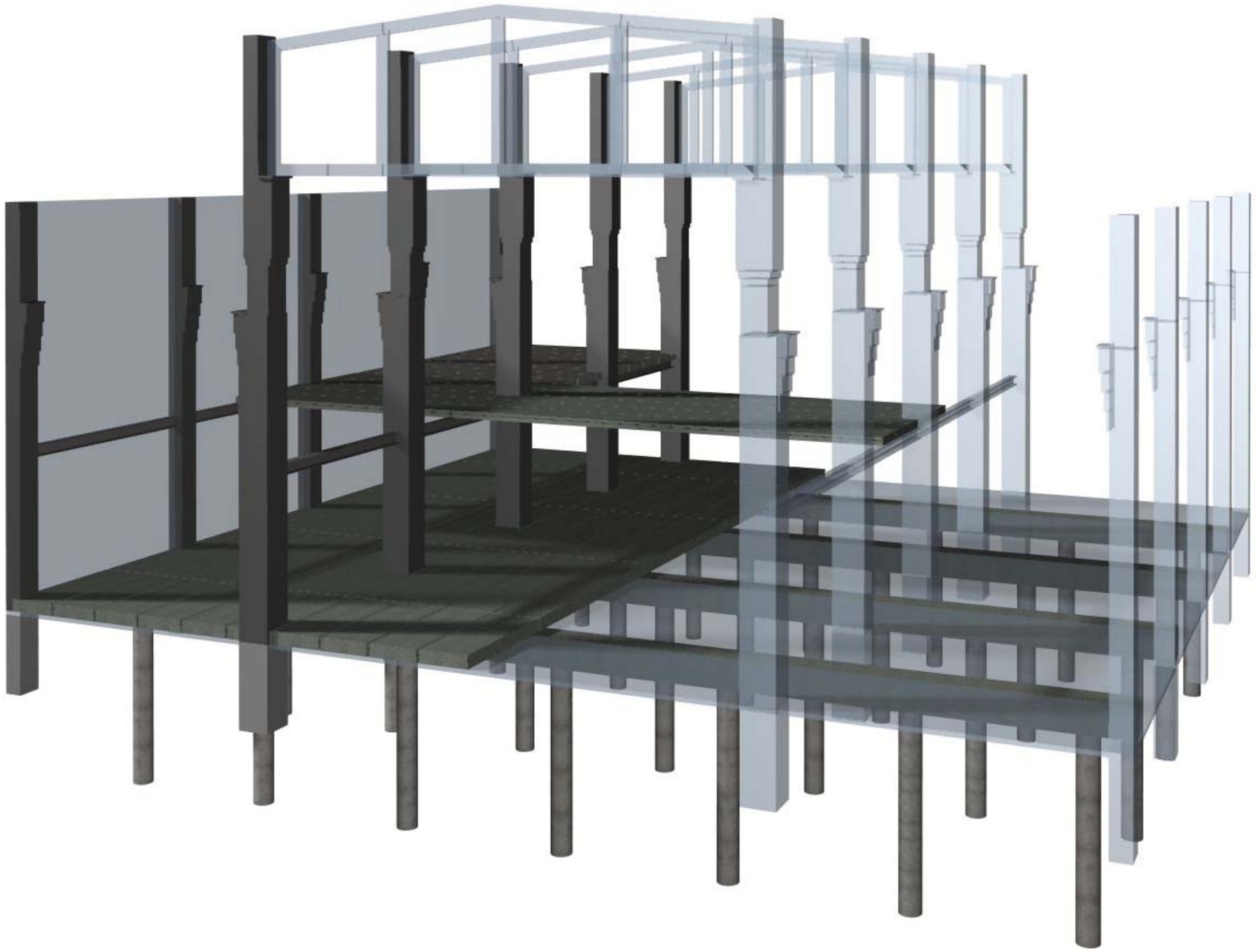


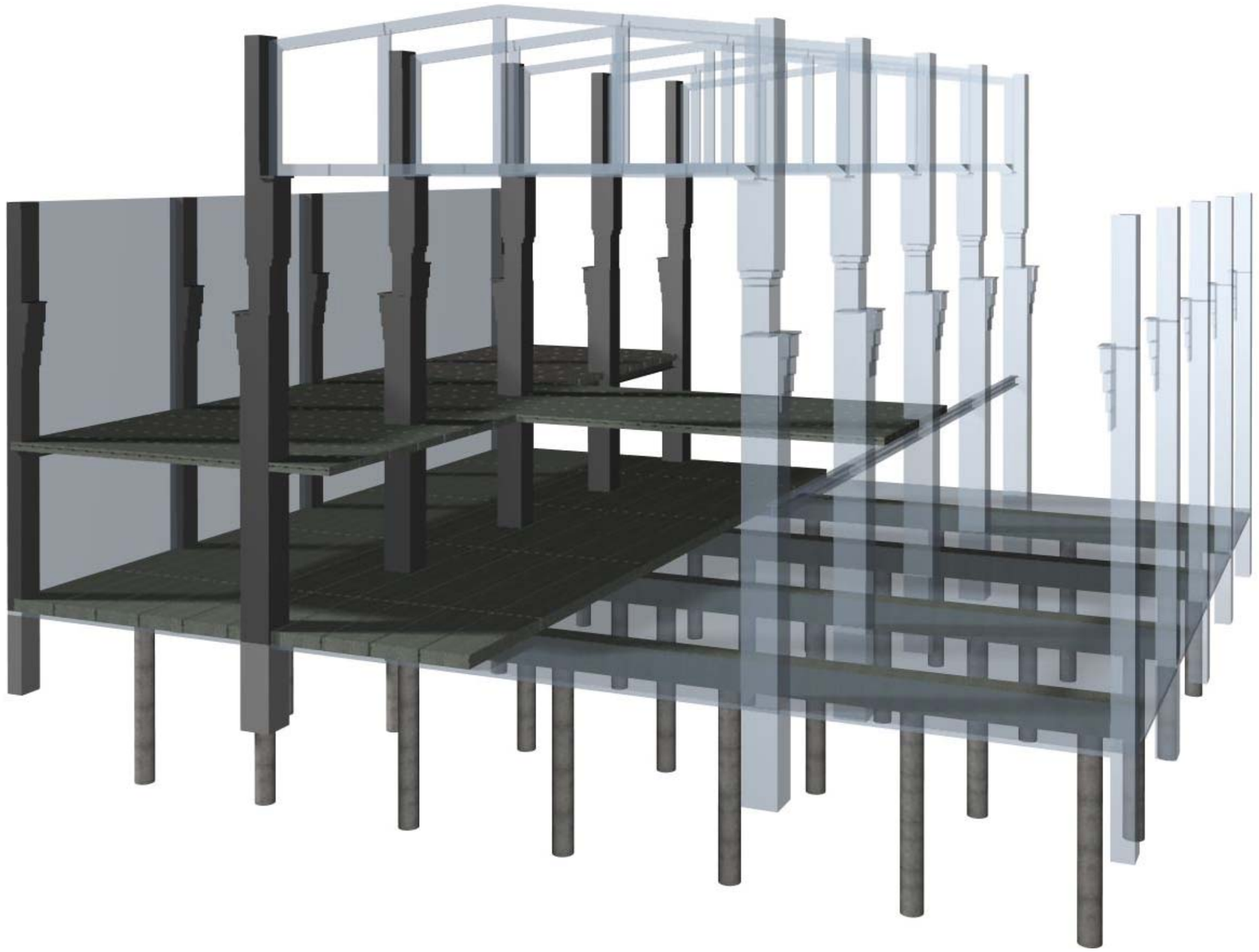


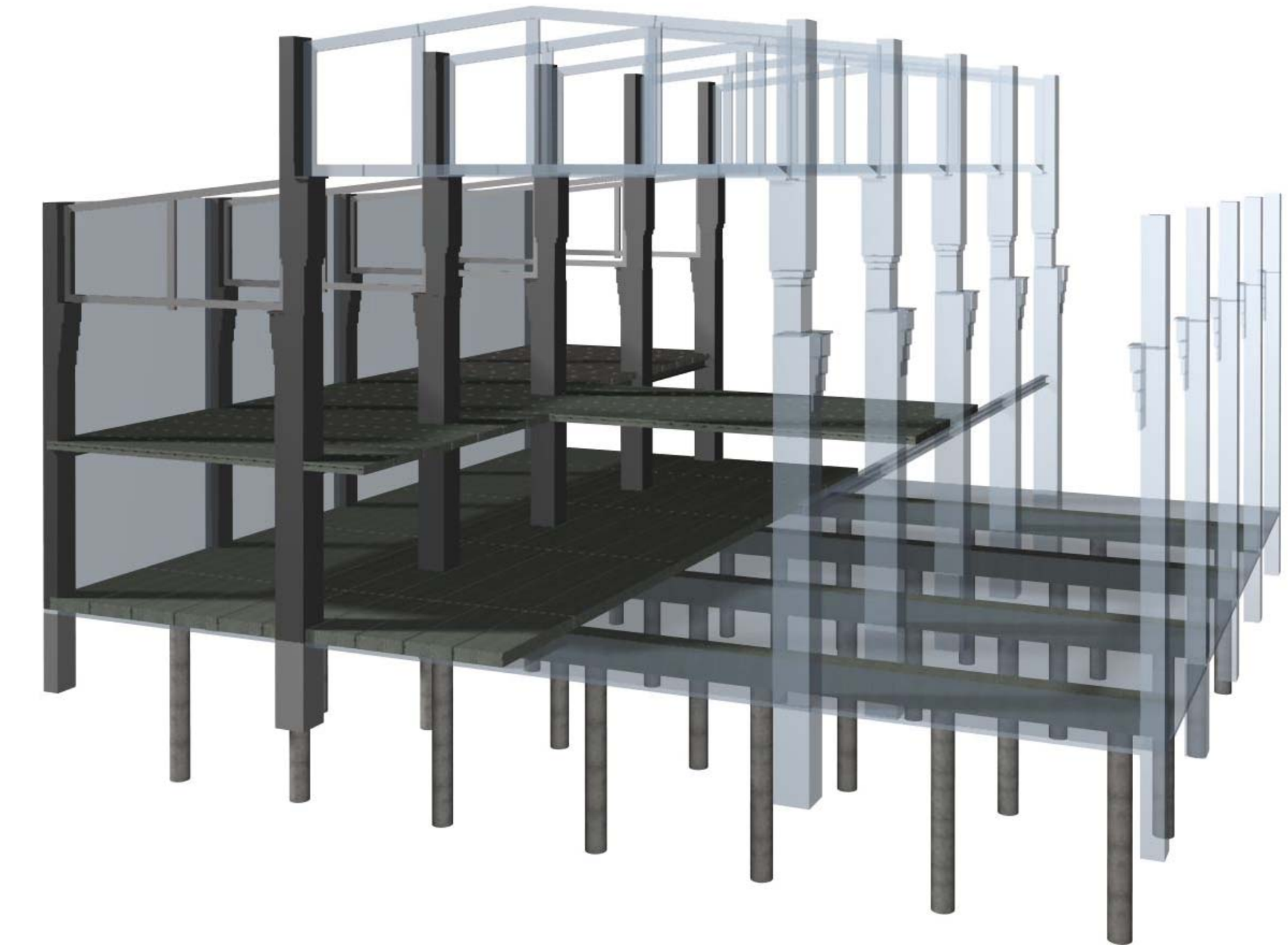


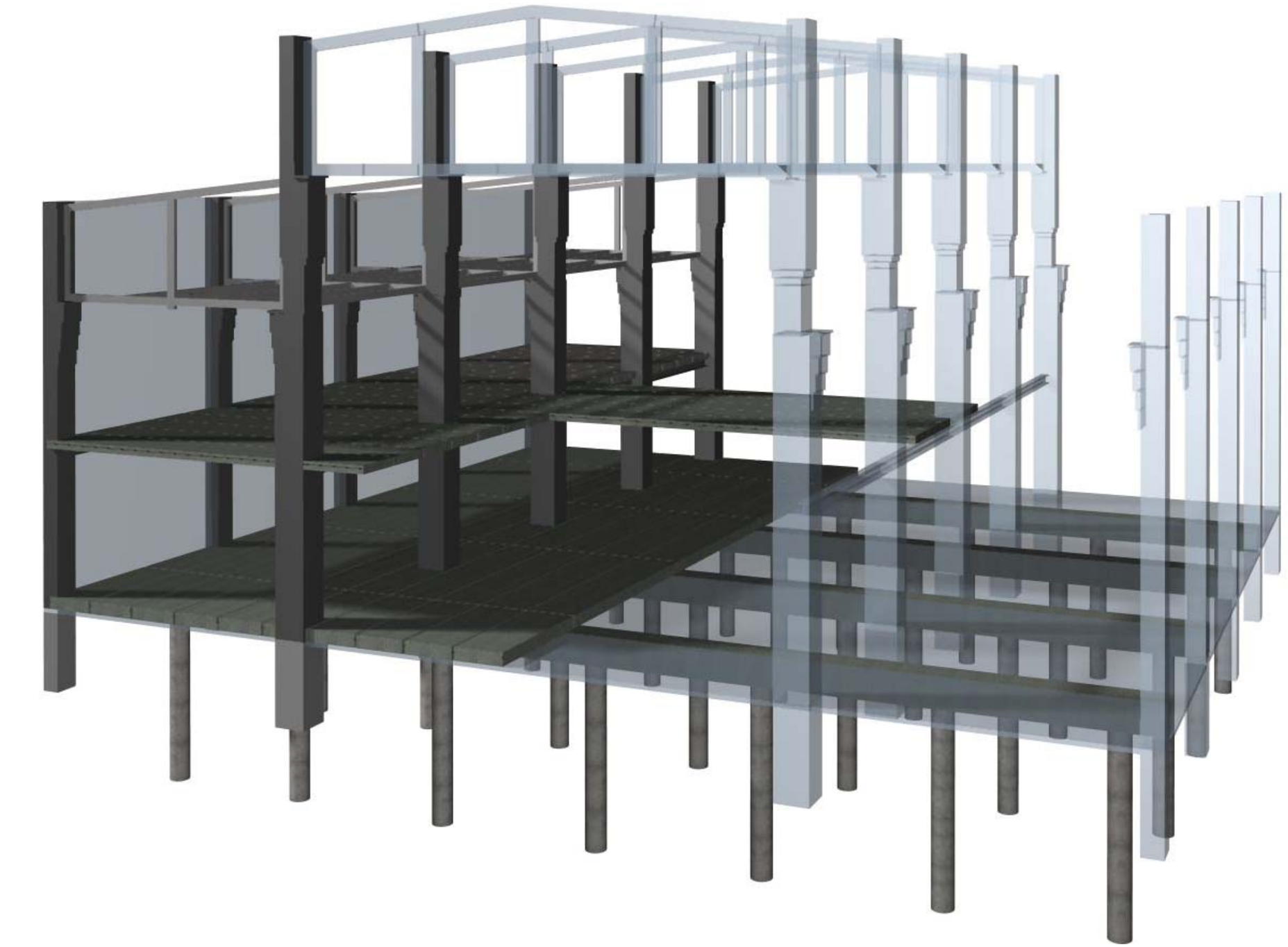


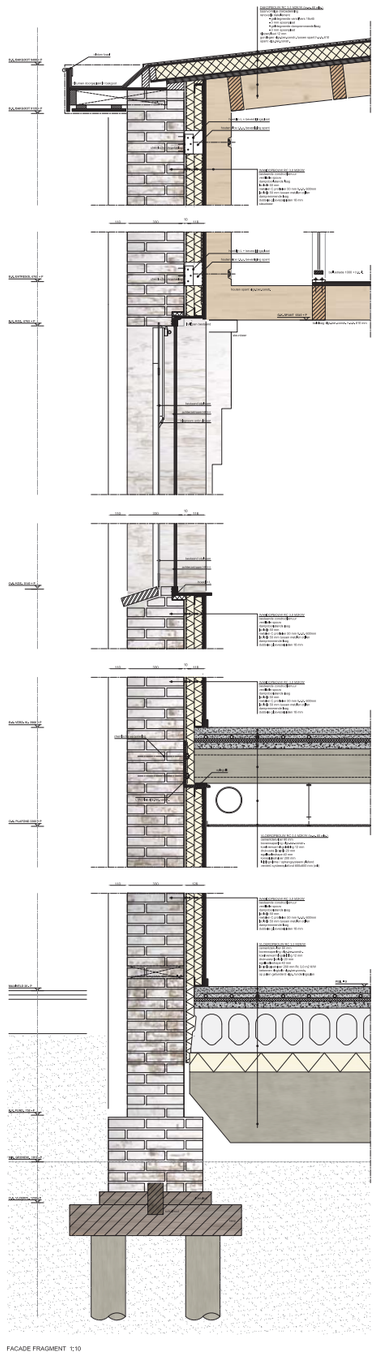




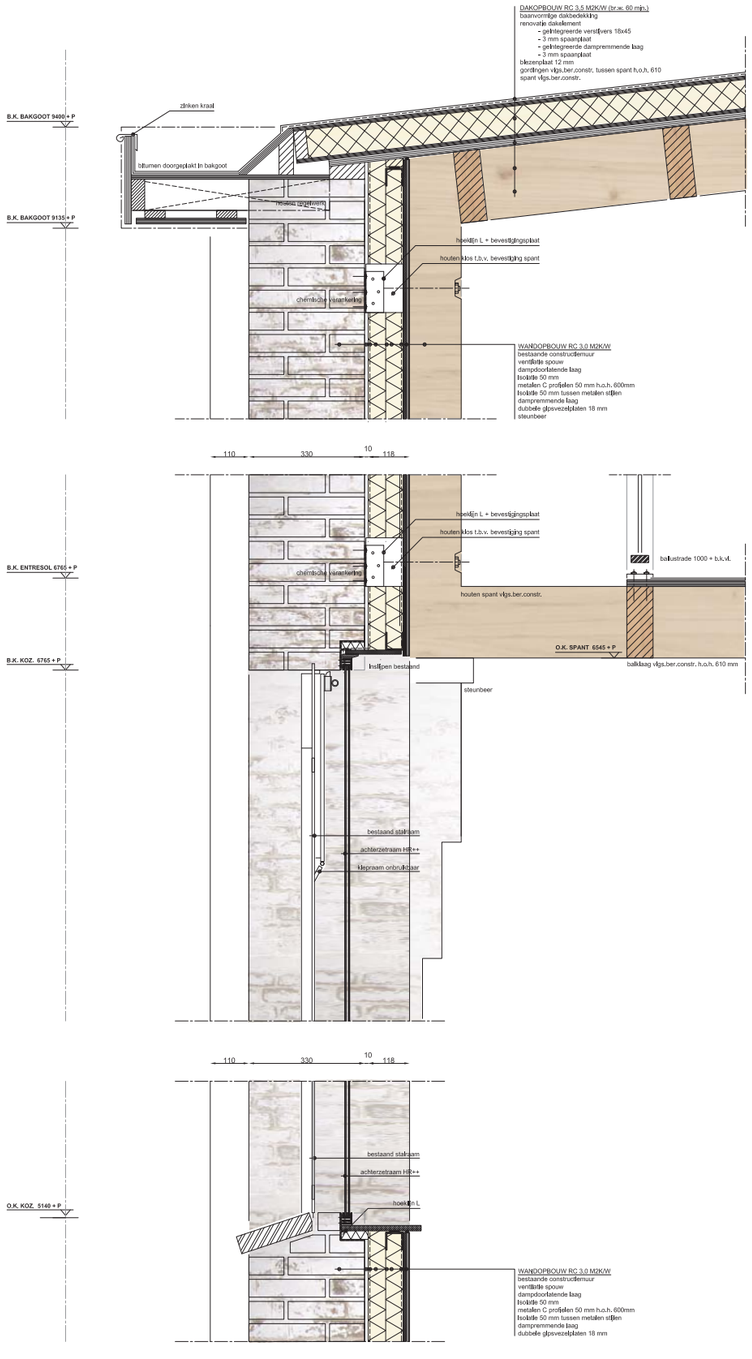


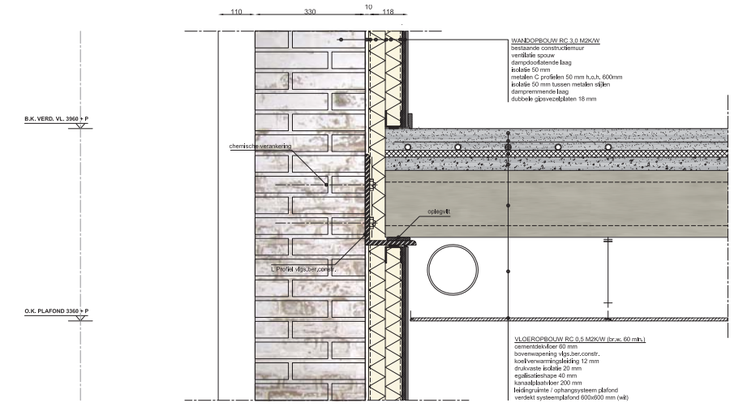


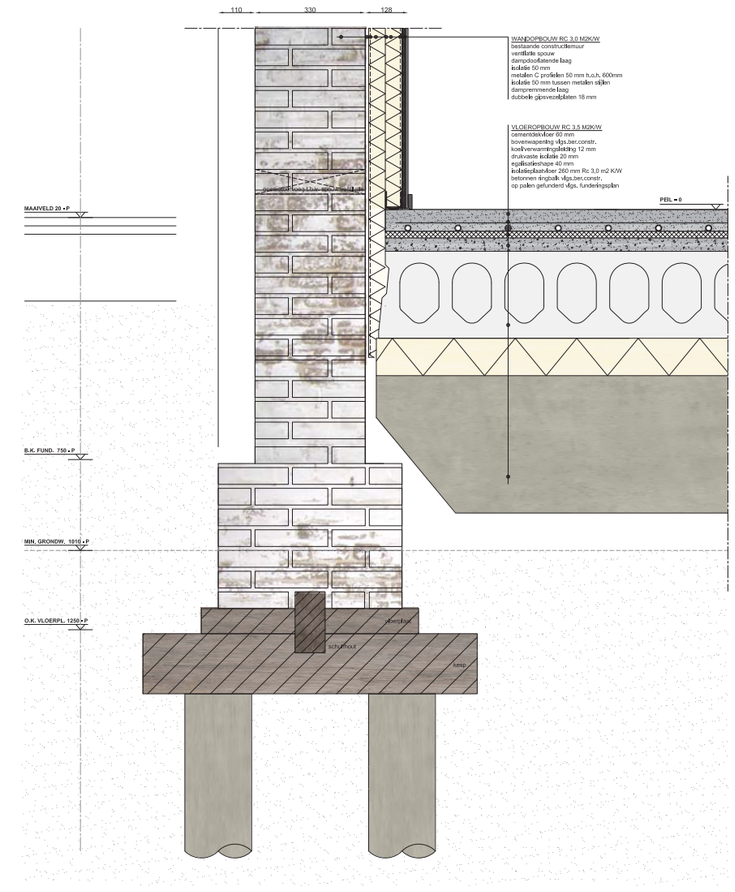




FACADE FRAGMENT 1:10







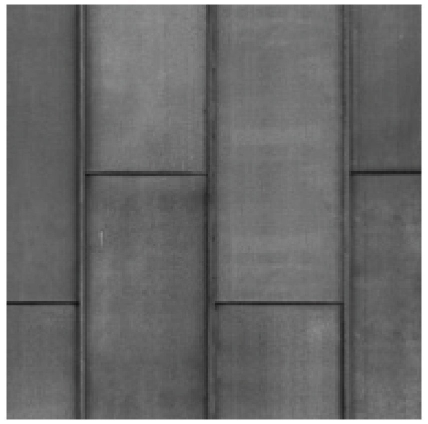
FACADE FRAGMENT 1:10

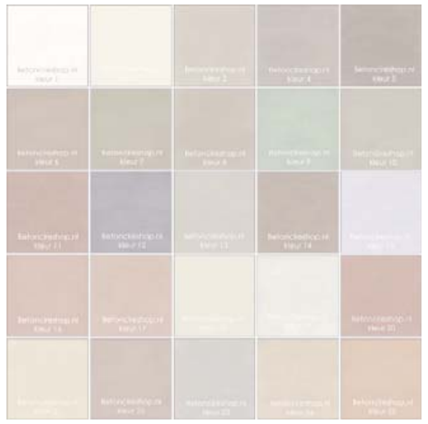










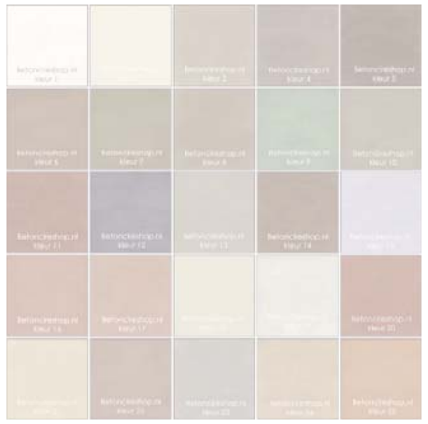
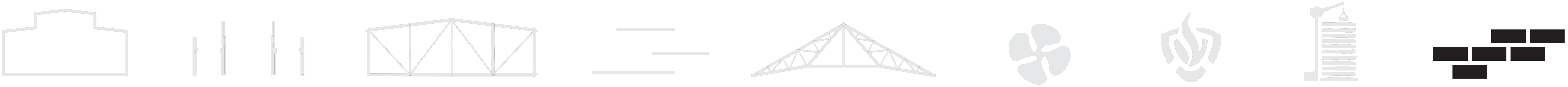











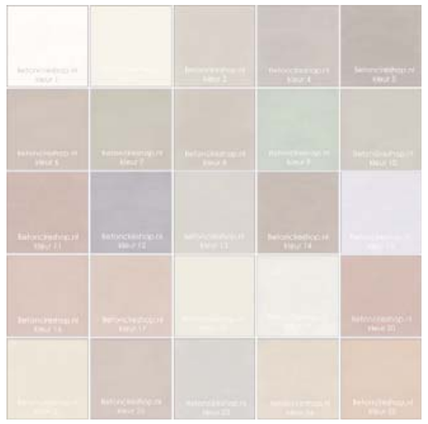
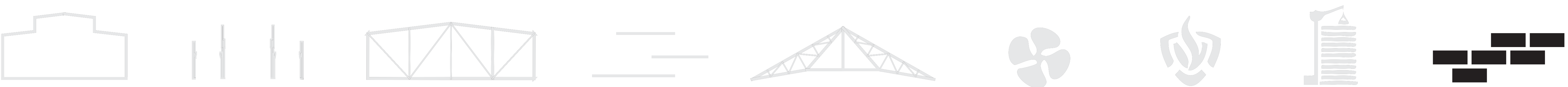




















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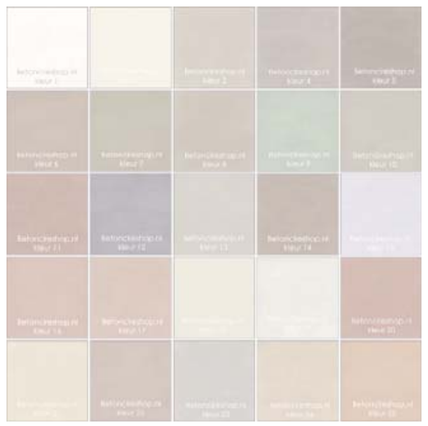
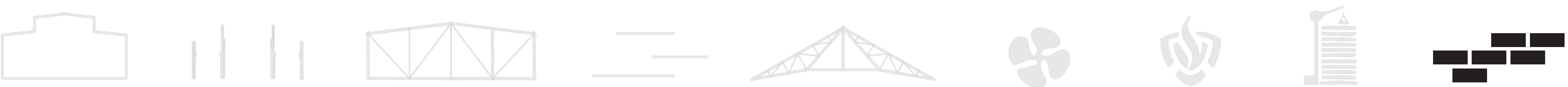
kleur 25









Thank you for your attention