

**PUBLIEKE EINDPRESENTATIE
HYBRID BUILDINGS**

**STADSKANTOOR – STATION
SPOORZONE DELFT**

ARCHITECTUUR EN BOUWTECHNOLOGIE

ONTWERPOPGAVE

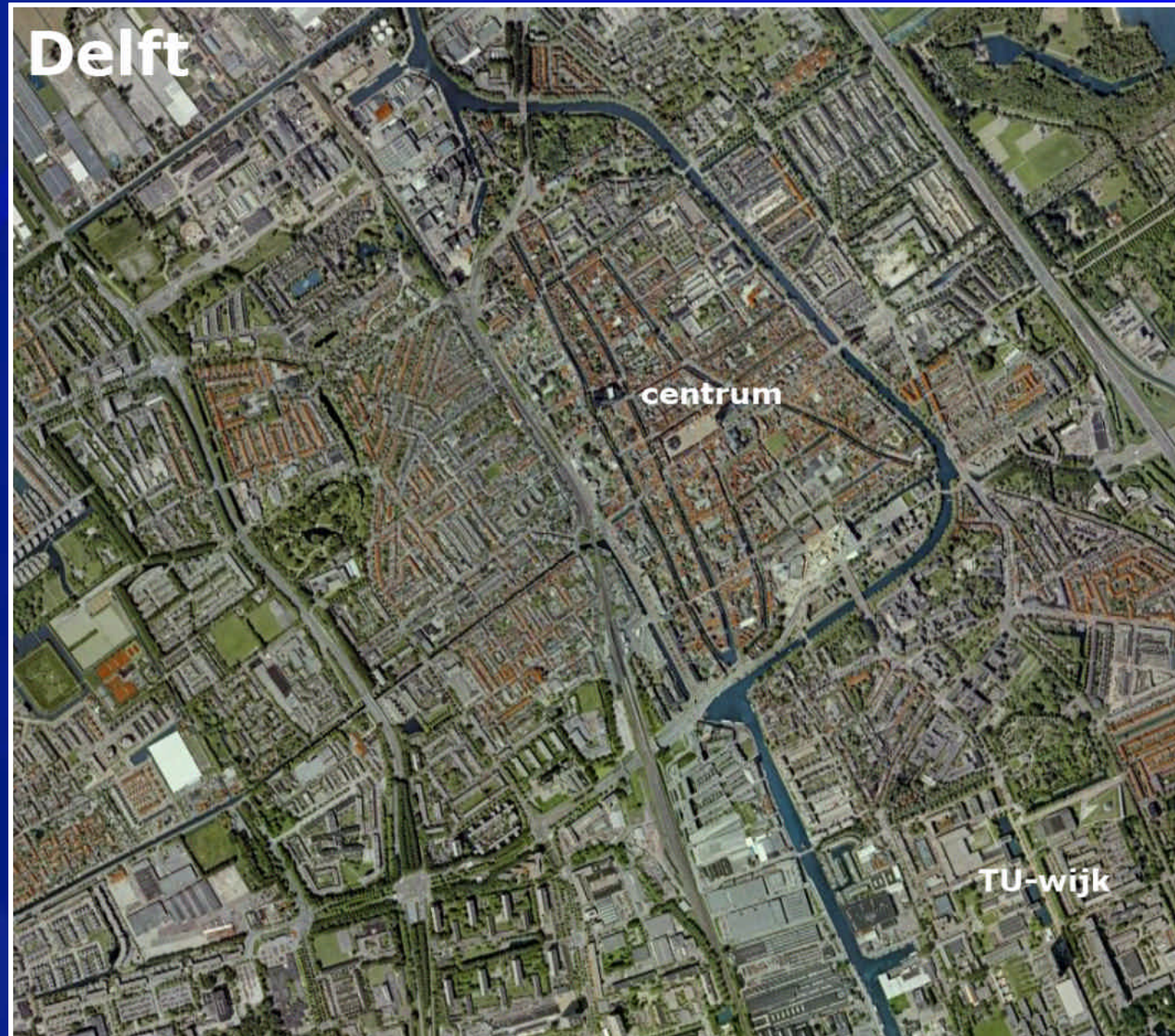
Bestaande prijsvraag stadskantoor – stationshal, Spoorzone Delft



Winner:

juli 2007

Mecanoo architecten



Masterplan Spoorzone

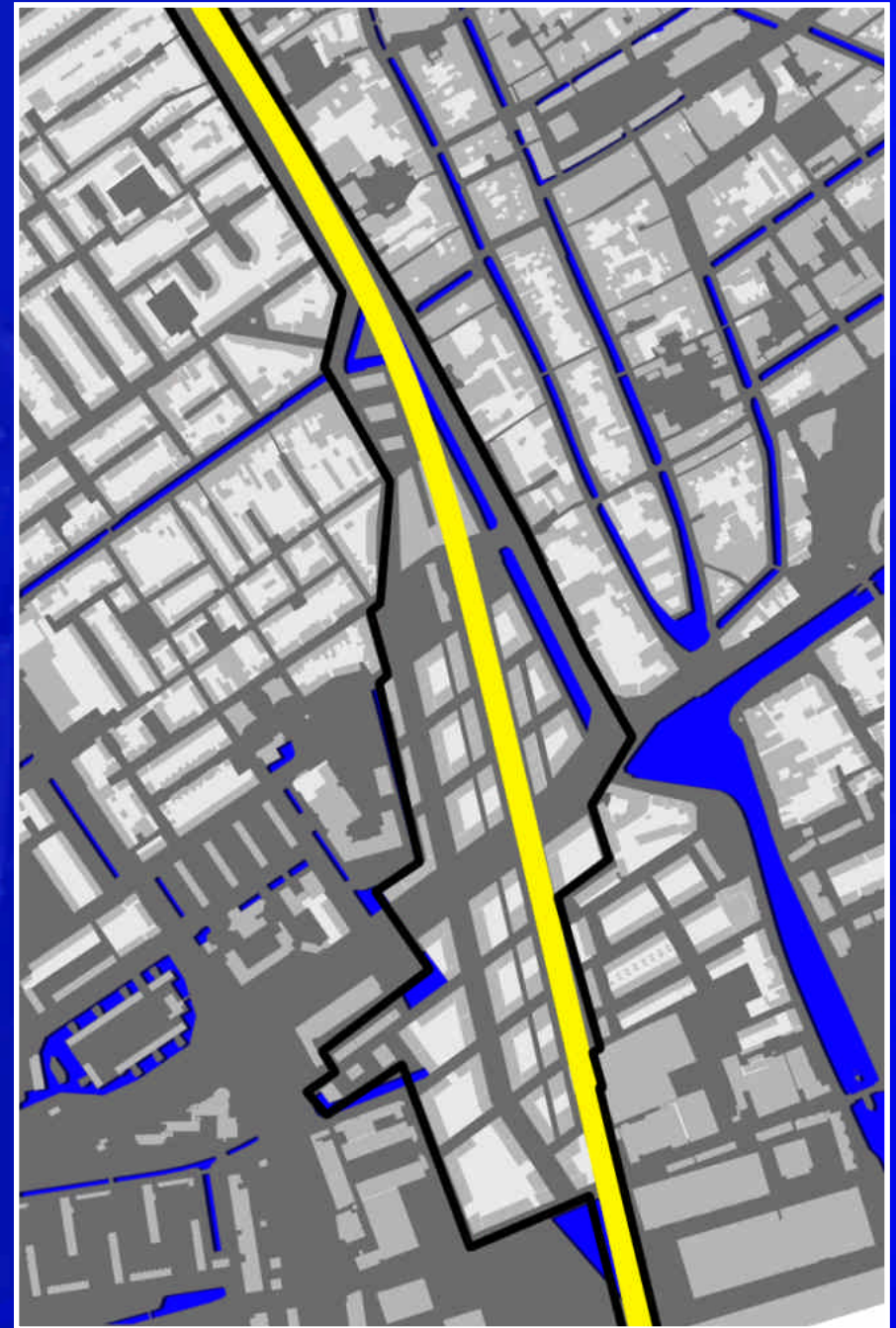
- prof. Joan Busquets
- bouw 2009-2020



SPOORZONE BUSQUETS

Masterplan Spoorzone

- prof. Joan Busquets
- bouw 2009-2020
- treinviaduct - spoortunnel



Masterplan Spoorzone

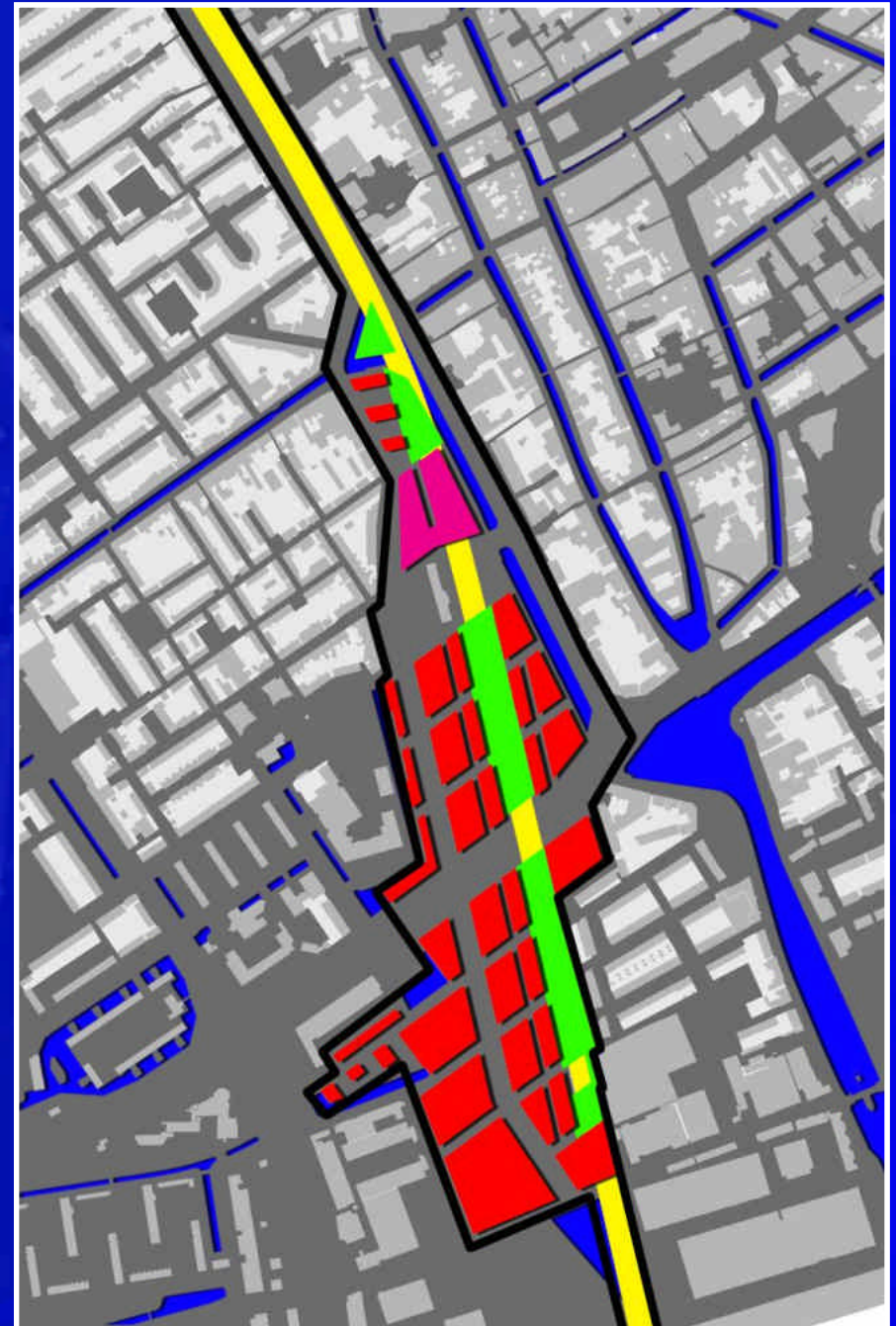
- prof. Joan Busquets
- bouw 2009-2020
- treinviaduct - spoortunnel
- stadspark



SPOORZONE BUSQUETS

Masterplan Spoorzone

- prof. Joan Busquets
- bouw 2009-2020
- treinviaduct - spoortunnel
- stadspark
- 1500 woningen
- 50.000 m² kantoor
- stadskantoor
- station



SPOORZONE BUSQUETS

Visie Spoorzone Busquets

- ruimtelijke en visuele verbinding
- zichtlijnen tussen bouwblokken

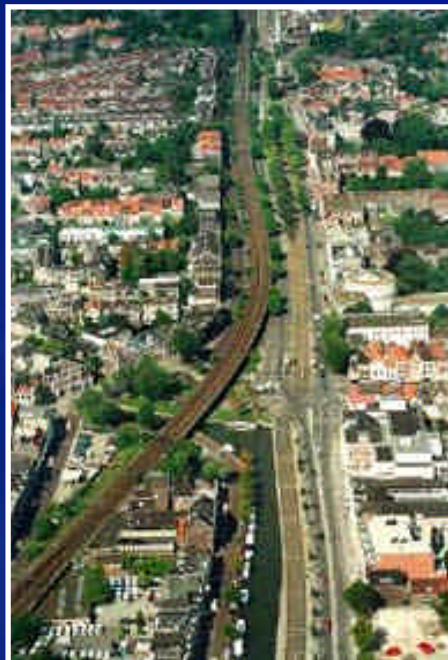


SPOORZONE BUSQUETS

Visie Spoorzone Busquets

ruimtelijke en visuele verbinding

- zichtlijnen tussen bouwblokken
- verwijderen barrière treinviaduct



SPOORZONE BUSQUETS

Visie Spoorzone Busquets

ruimtelijke en visuele verbinding

- zichtlijnen tussen bouwblokken
- verwijderen barrière treinviaduct

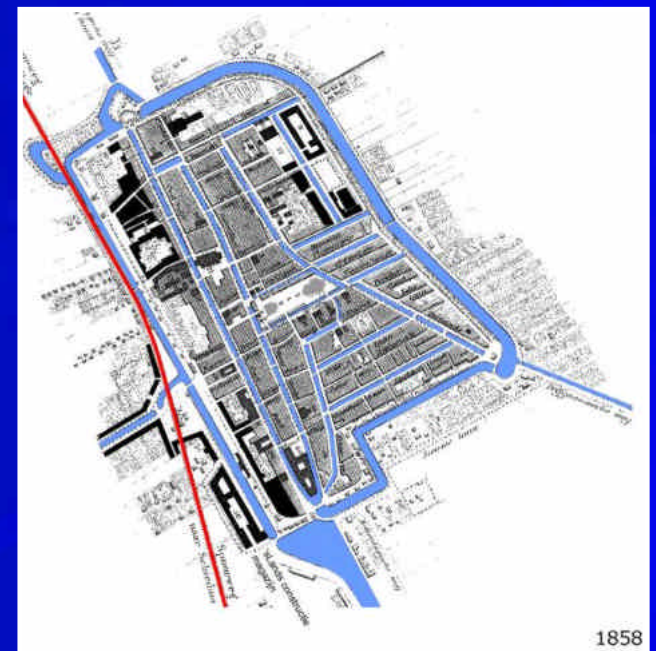
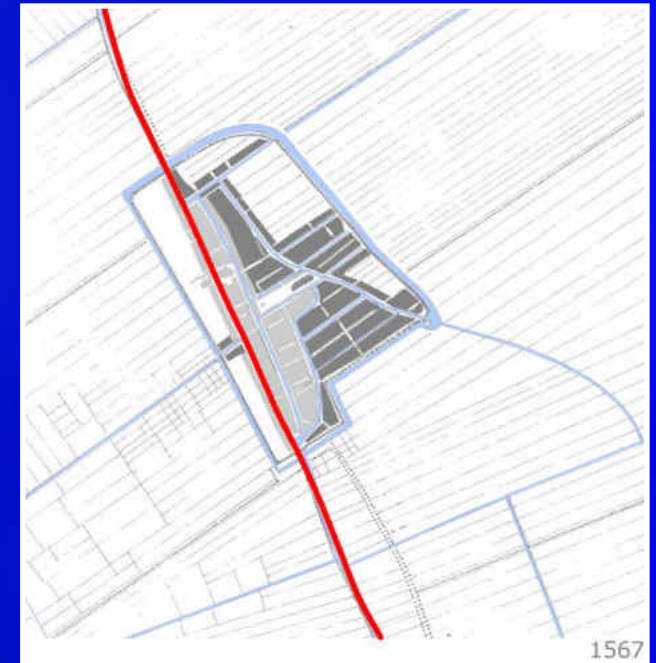
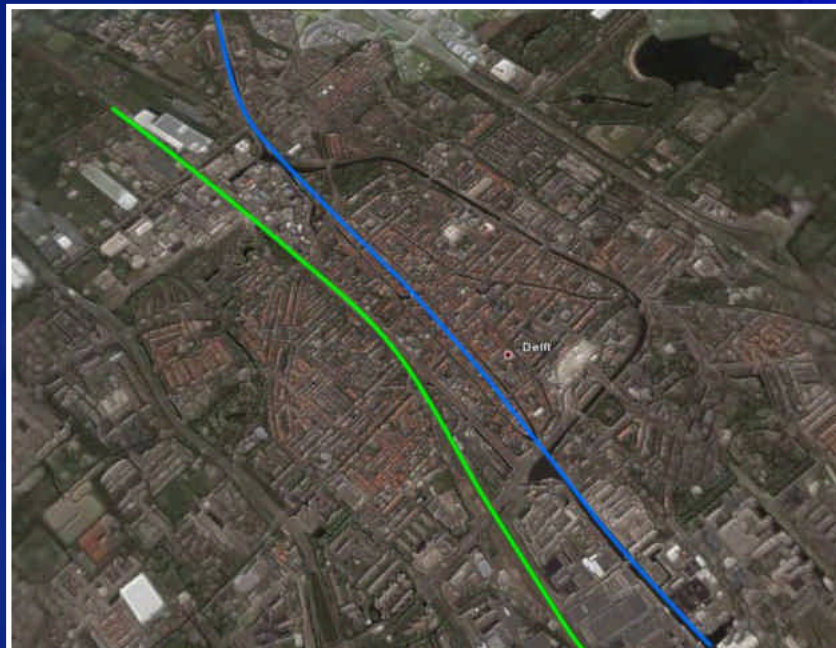
groen en water

- spoortunnel onbebouwd - park
- terugbrengen grachten en groen



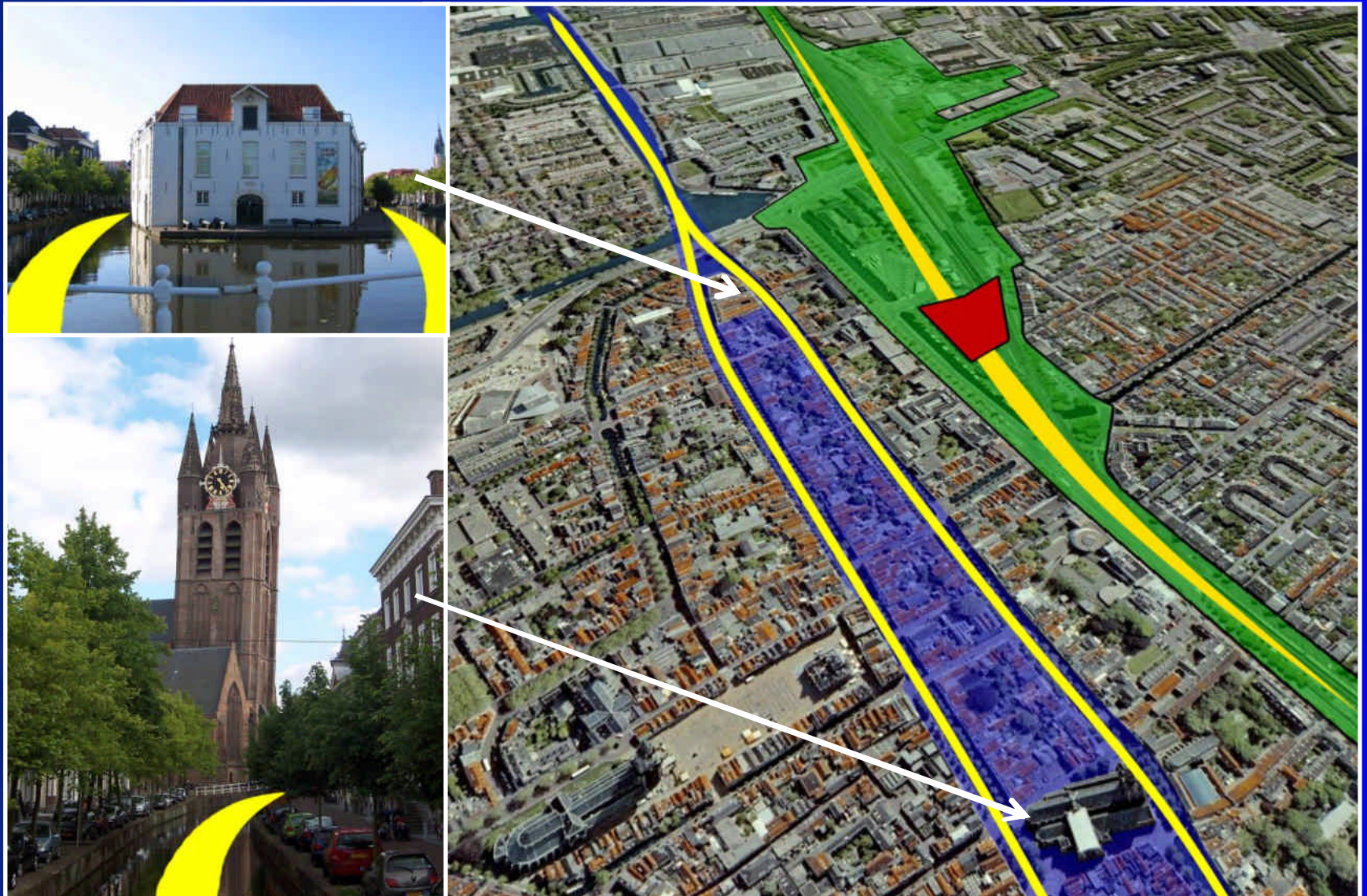
Historie

- verschuiving aanvoerroute
- schaalvergroting Delft
- verdwijning viaduct legt nieuwe as open



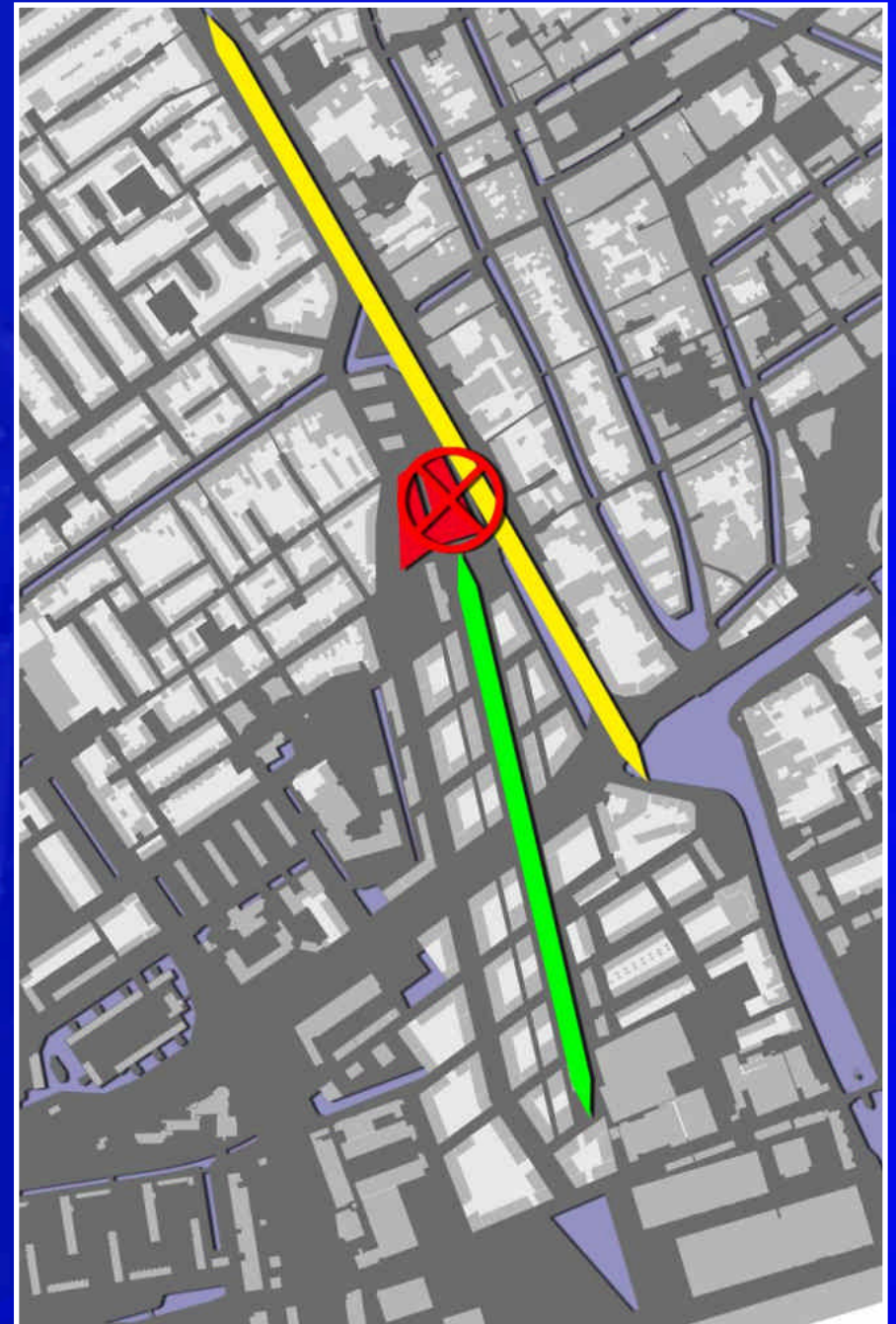
STEDENBOUWKUNDIG ONDERZOEK

- Legermuseum en Oude Kerk begeleiden Oude Delft
- stadskantoor katalysator voor stedelijke ontwikkeling nieuwe as



Nieuwe as

- ruimtelijke en visuele verbinding
- stadskantoor belemmert ontwikkeling nieuwe as



Omgeving stadskantoor

- tussenzone
- wijkdifferentiatie
- vier verschillende gevelbeelden



Drukke ov-knooppunt

- compacter ov-knooppunt
- drukte verkeersstromen
- gebrek aan groen
- gebrek aan rust



EIGEN VISIE SPOORZONE

Nieuwe as

- ruimtelijke en visuele verbinding



Nieuwe as

- ruimtelijke en visuele verbinding
- stadskantoor als katalysator



EIGEN VISIE SPOORZONE

Tussenzone

- gebied met eigen identiteit
- gebruik van stadskantoor - station



EIGEN VISIE SPOORZONE

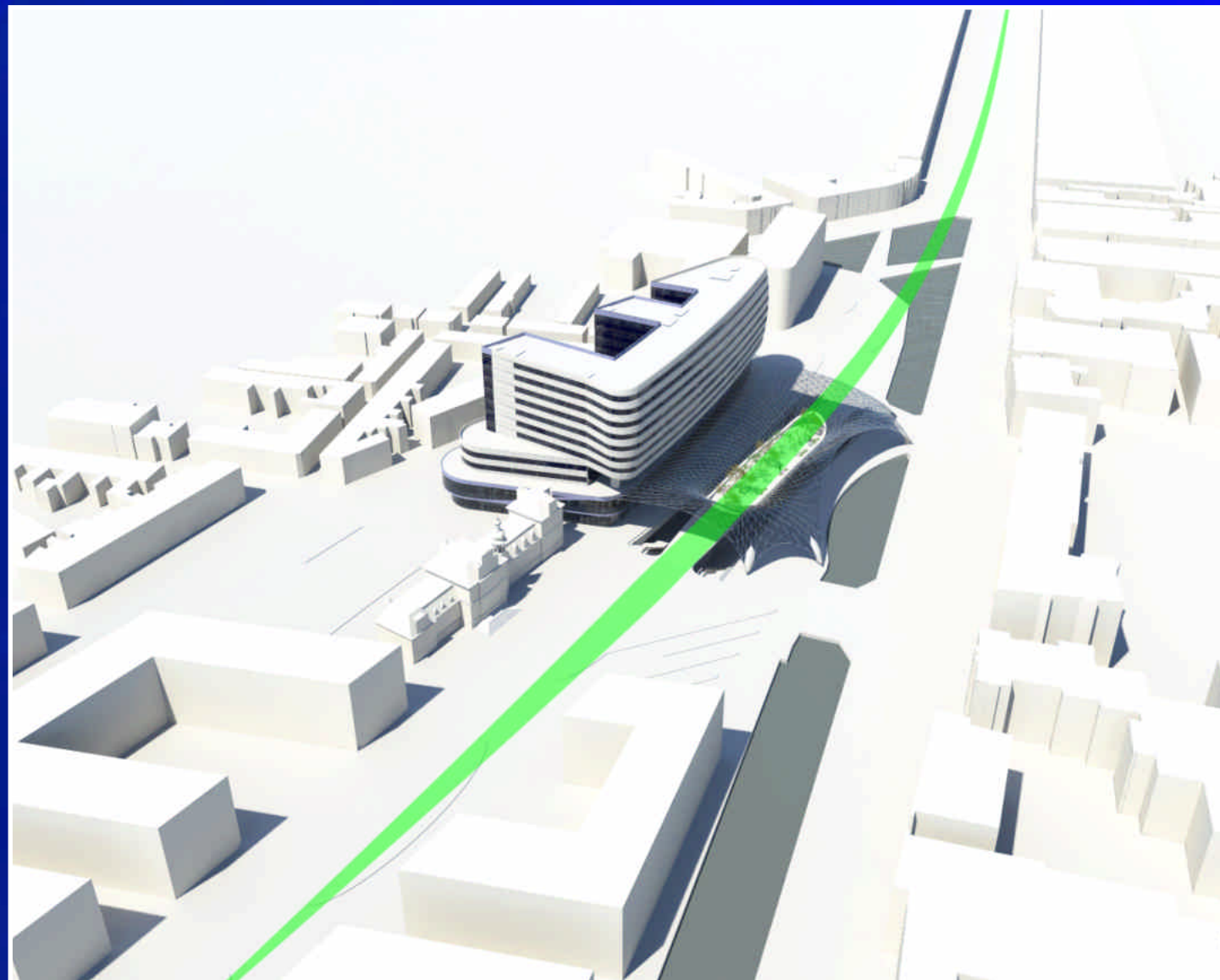
Rust

- rust terugbrengen in drukte gecomprimeerde ov-knooppunt



Nieuwe as

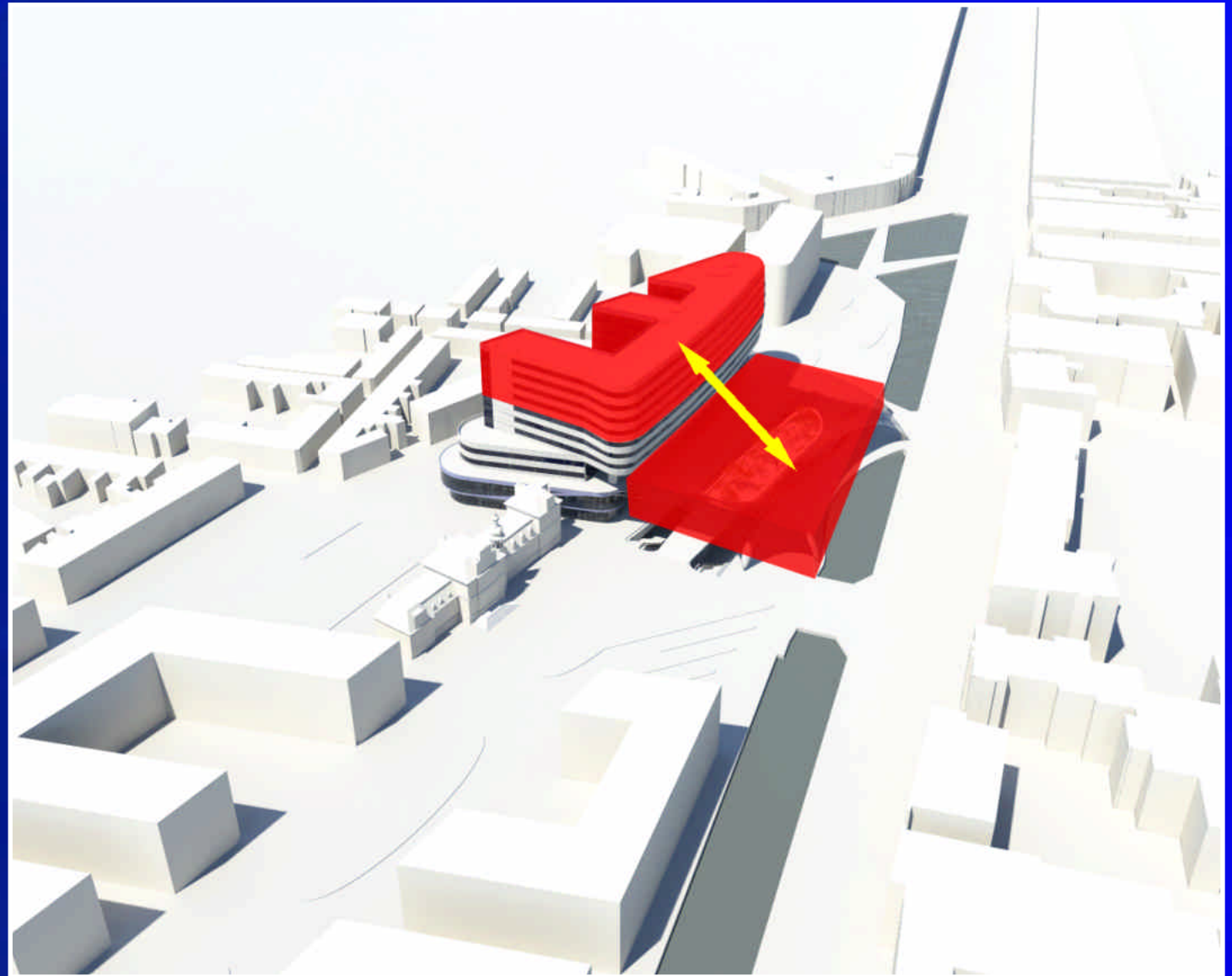
- verbinding stadspark - Phoenixstraat



VORMGEVING EIGEN VISIE

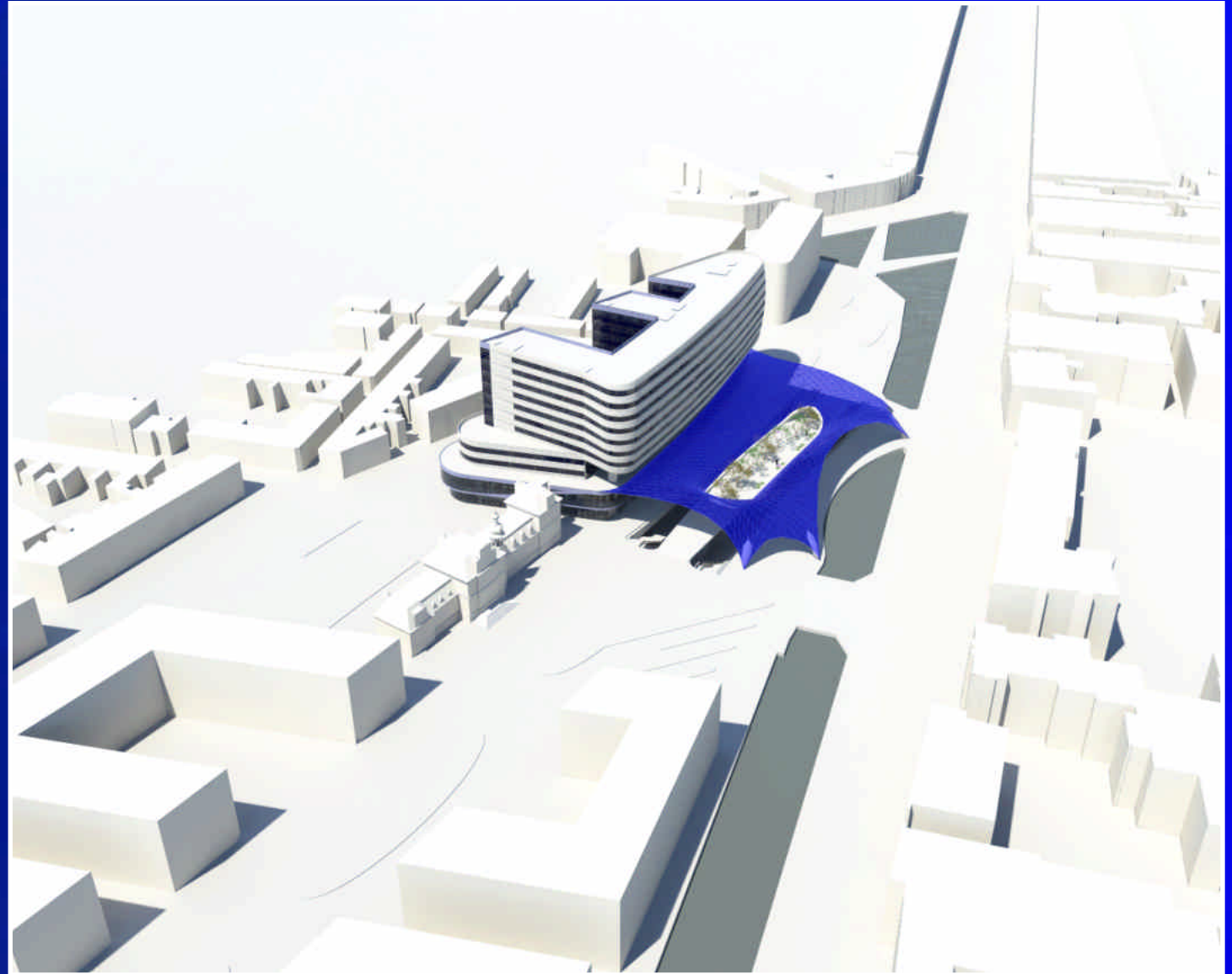
Nieuwe as

- PVE verplaatsen door stadskantoor te verhogen



Nieuwe as

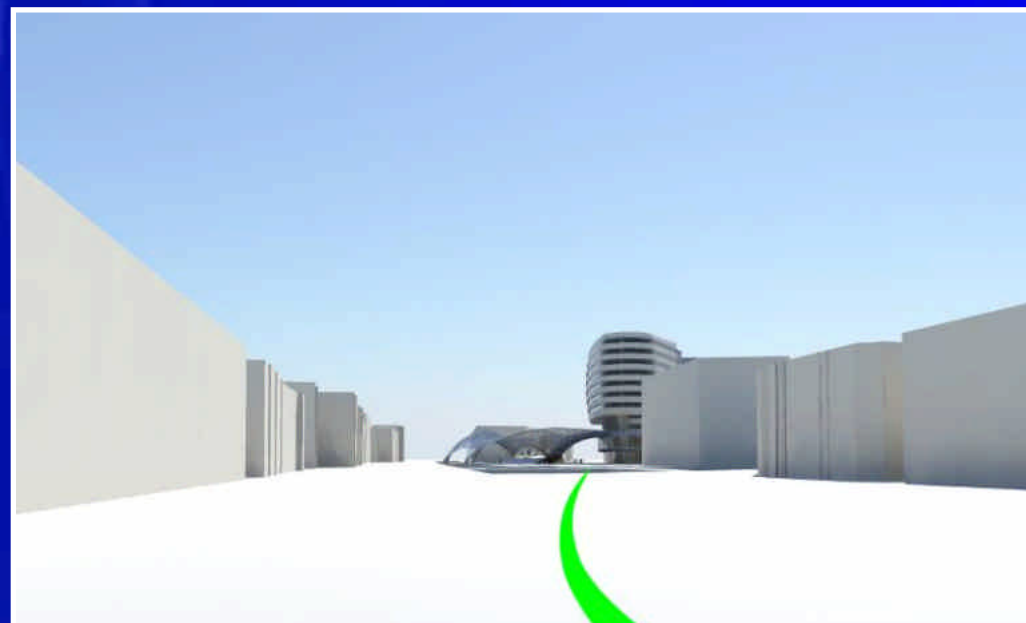
- transparant stationsgebied



VORMGEVING EIGEN VISIE

Stadskantoor nieuwe as

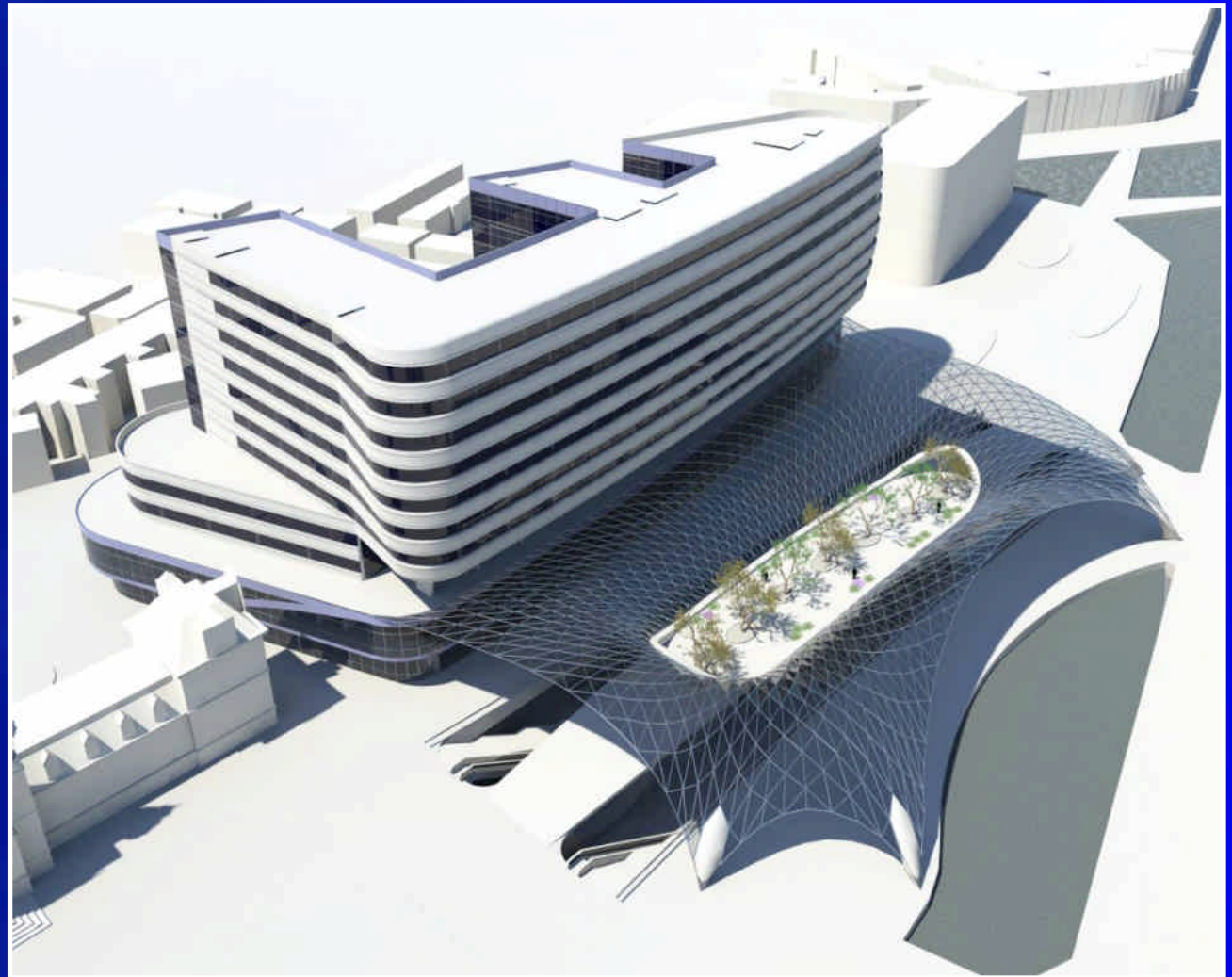
- landmark
- katalysator



VORMGEVING EIGEN VISIE

Identiteit

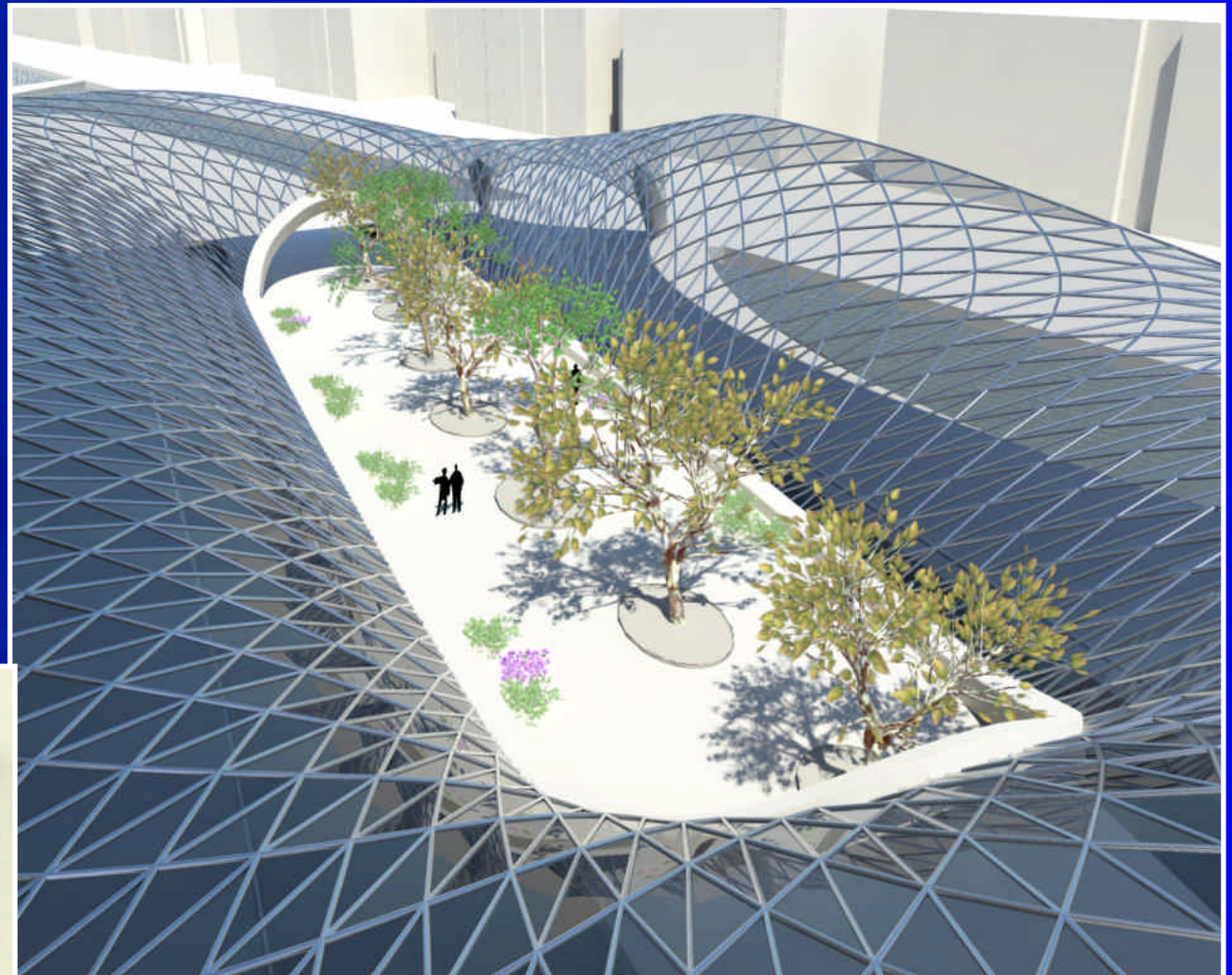
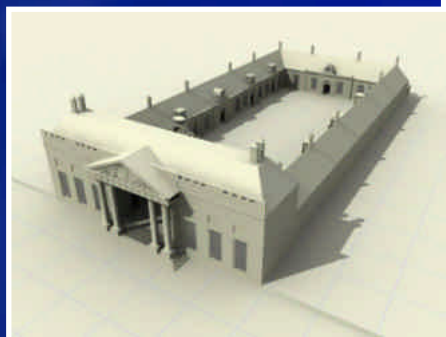
- vormgegeven als één object
- zone krijgt eigen identiteit



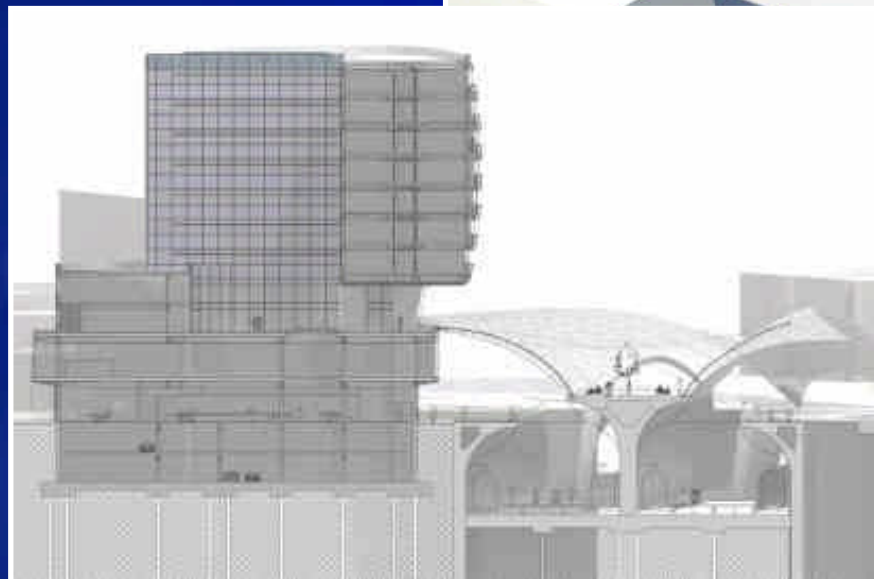
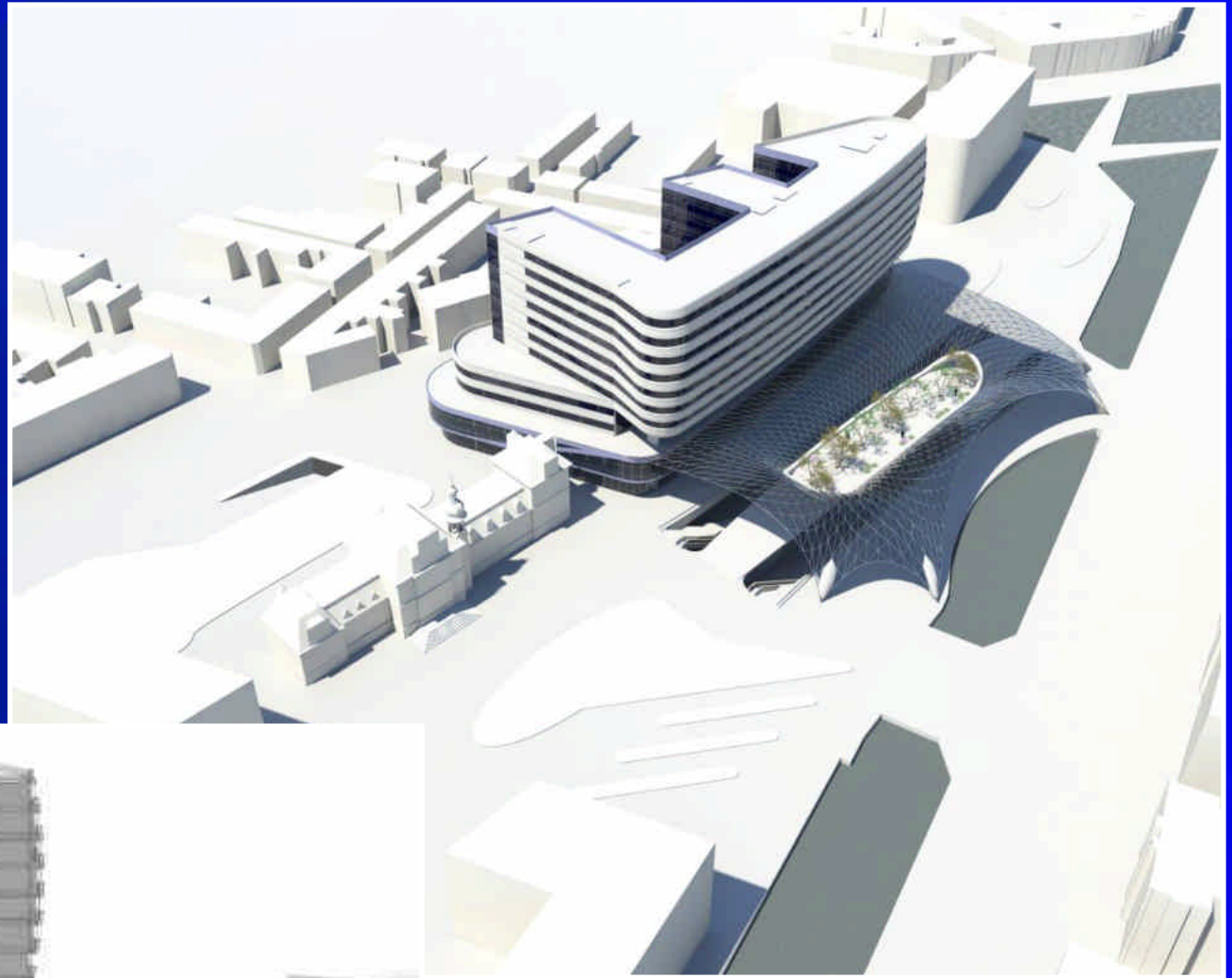
VORMGEVING EIGEN VISIE

Rust Serenity Park

- rust in compact ov-knooppunt
- parkachtig gebied
- afgesloten zone
- organische vorm

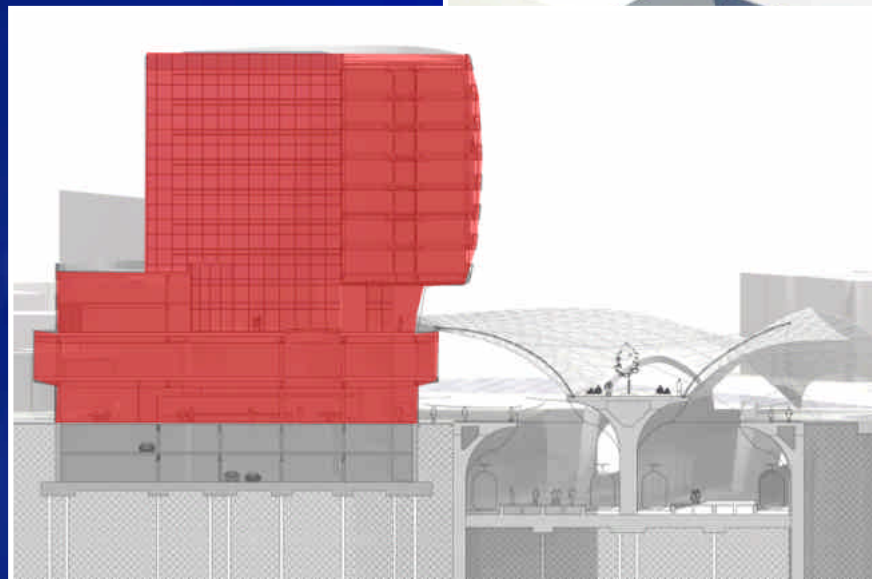
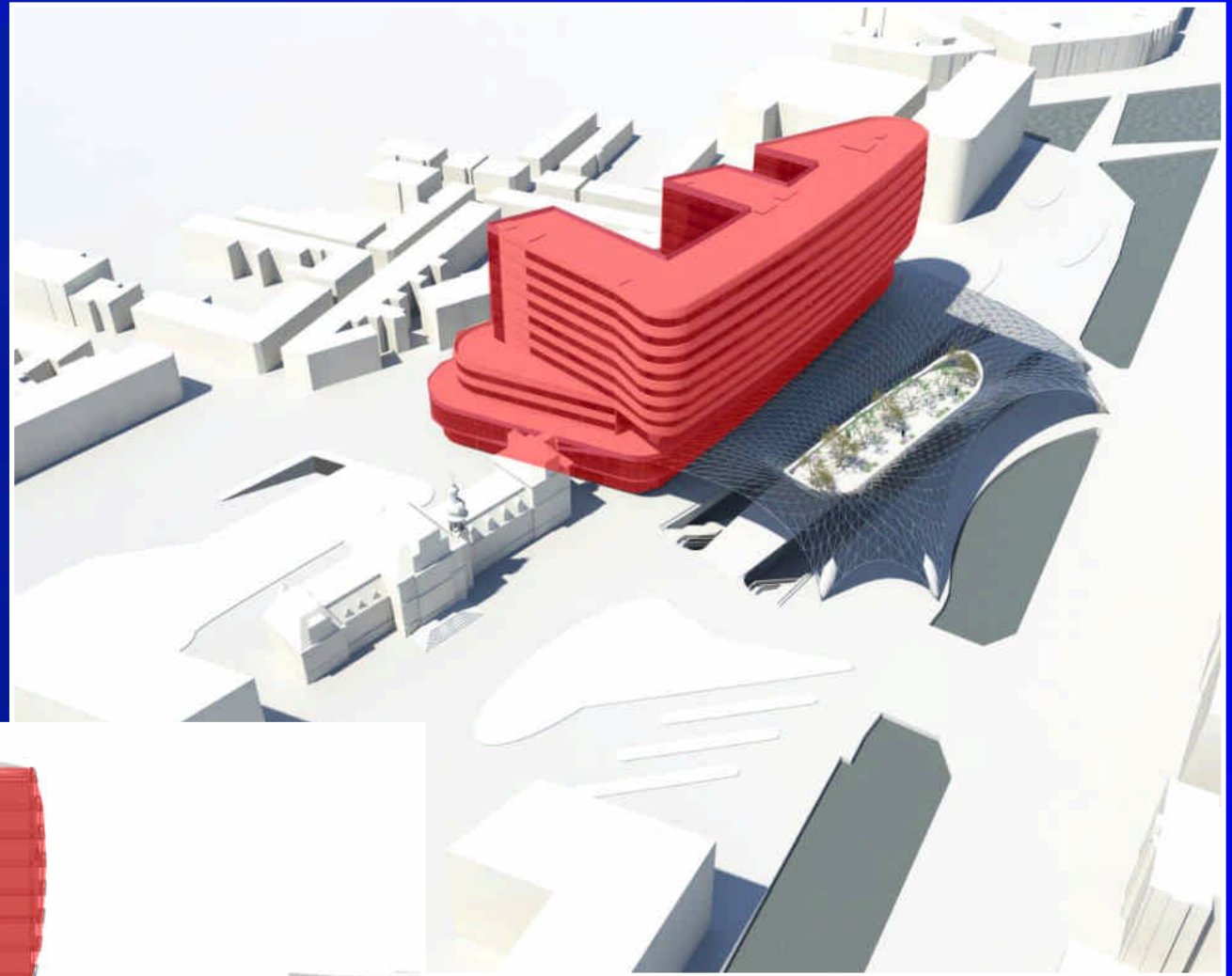


STEDENBOUWKUNDIGE FUNCTIES



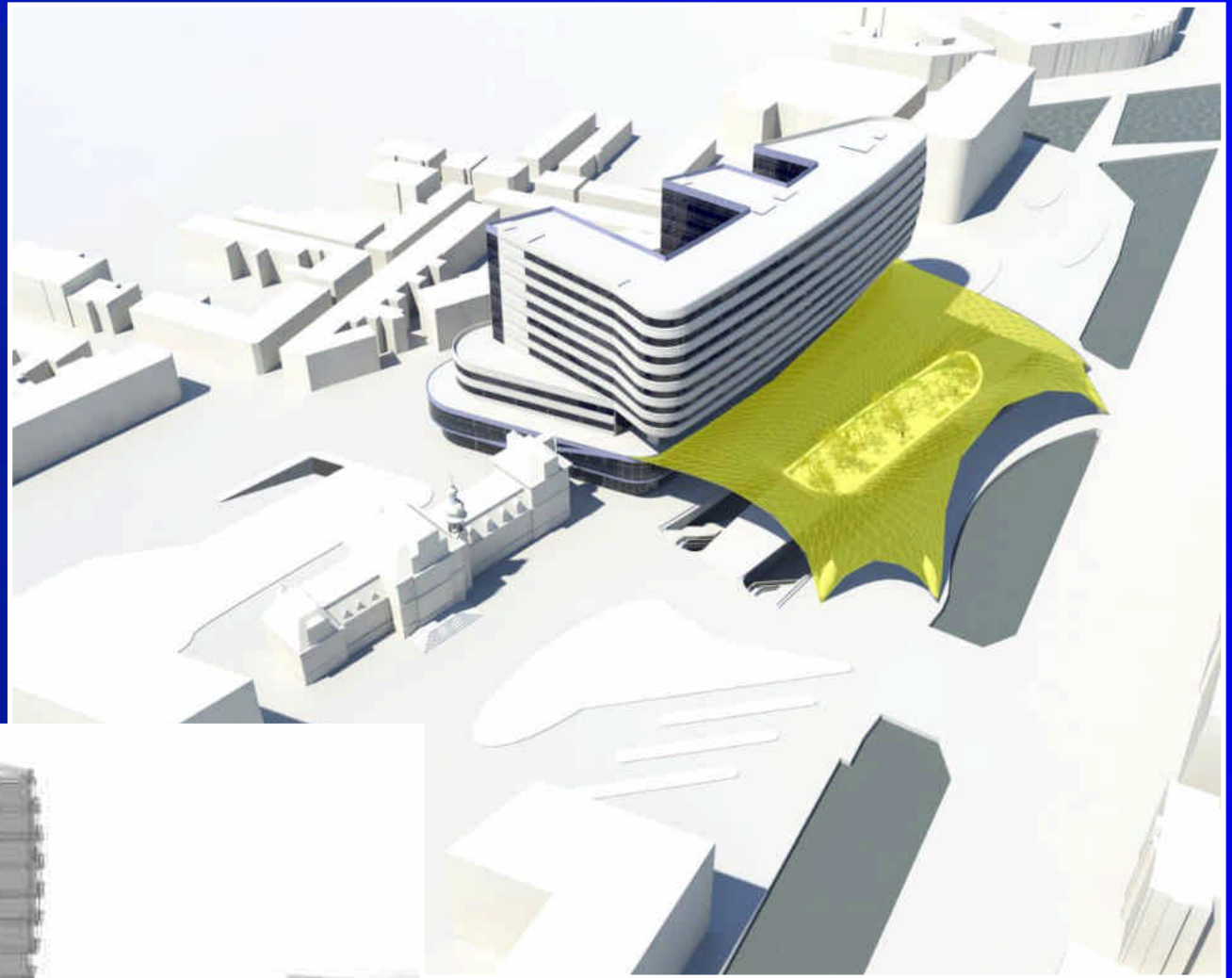
STEDENBOUWKUNDIGE FUNCTIES

Stadskantoor



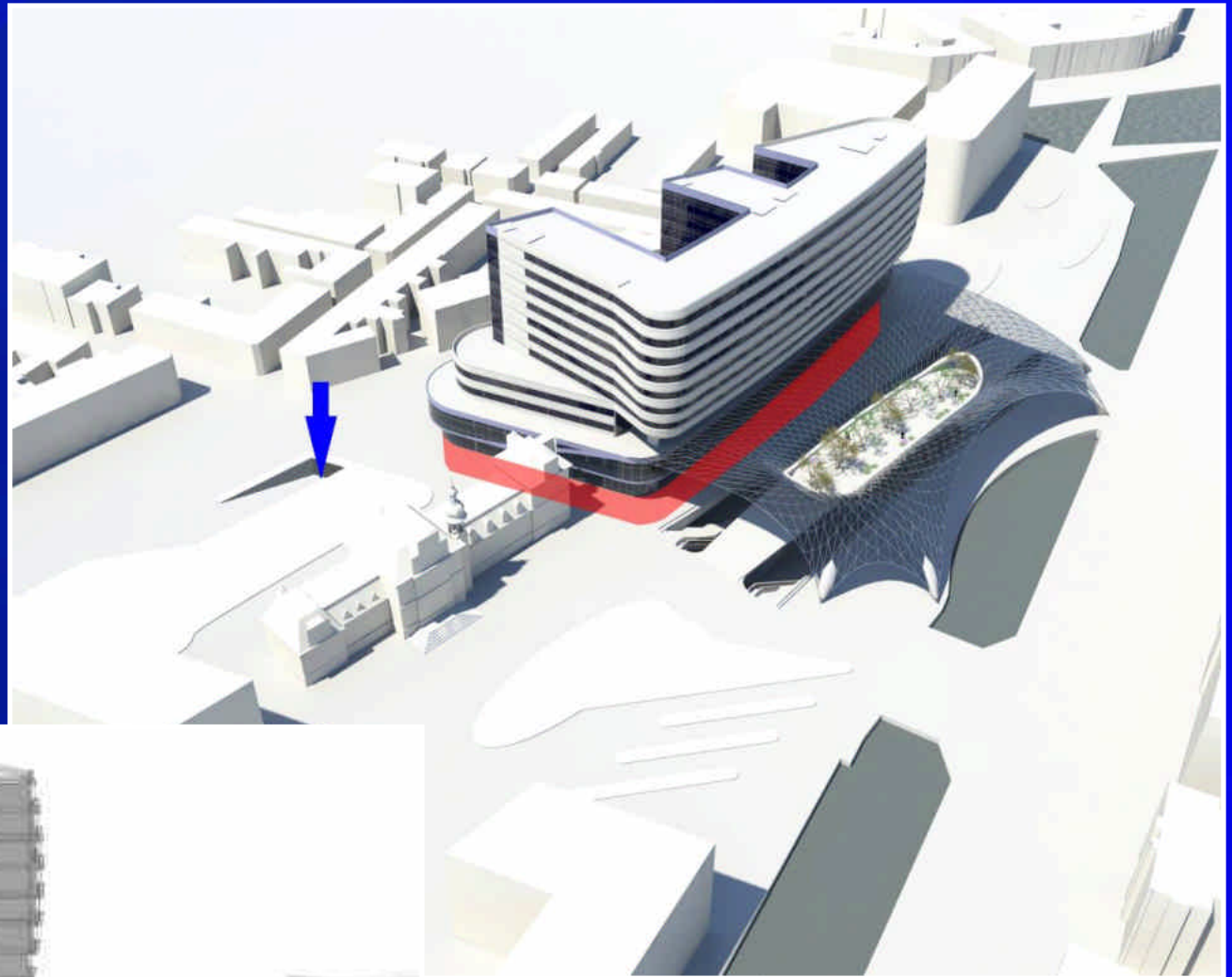
STEDENBOUWKUNDIGE FUNCTIES

Parkachtig
stationsgebied

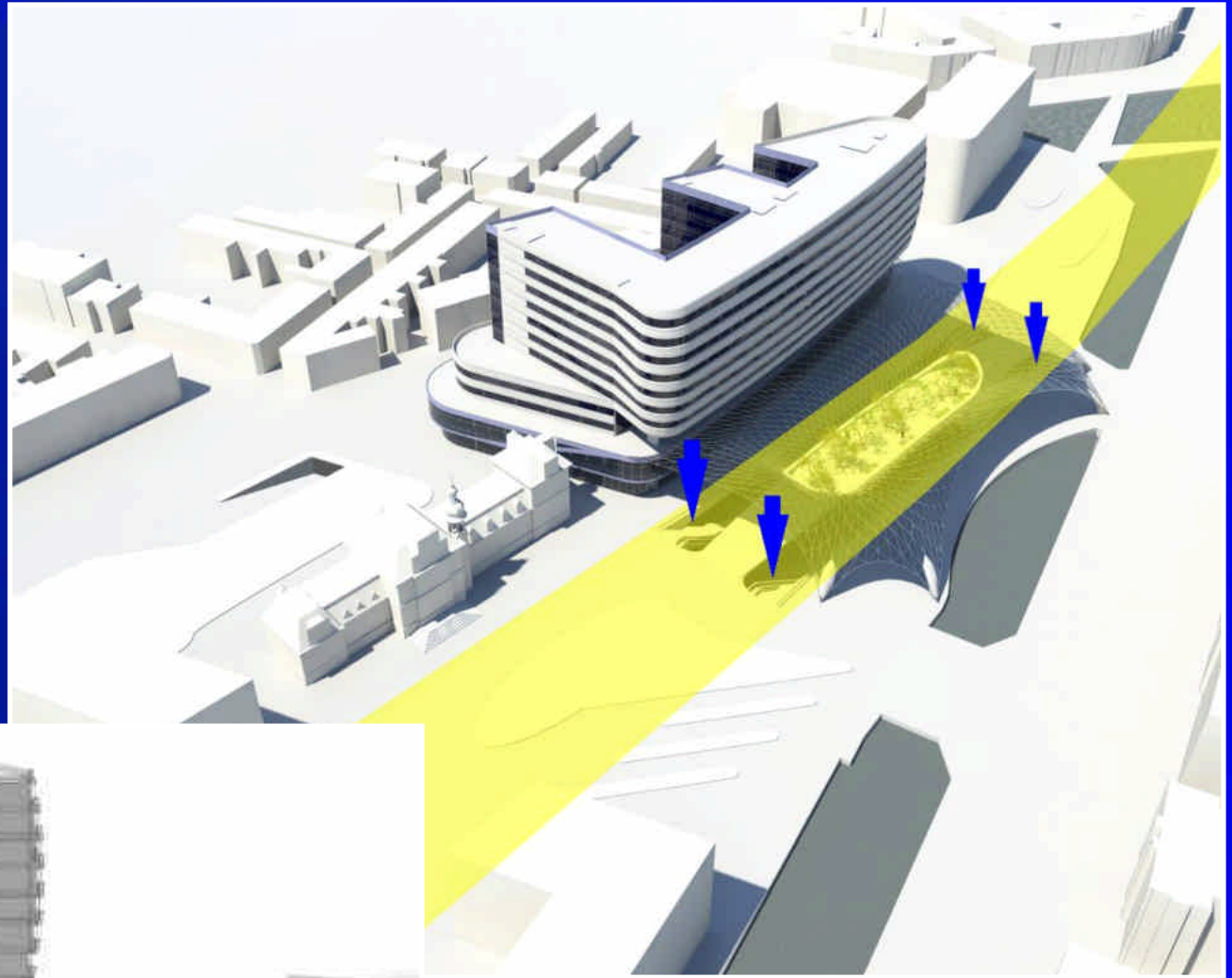


STEDENBOUWKUNDIGE FUNCTIES

Parkeergarage



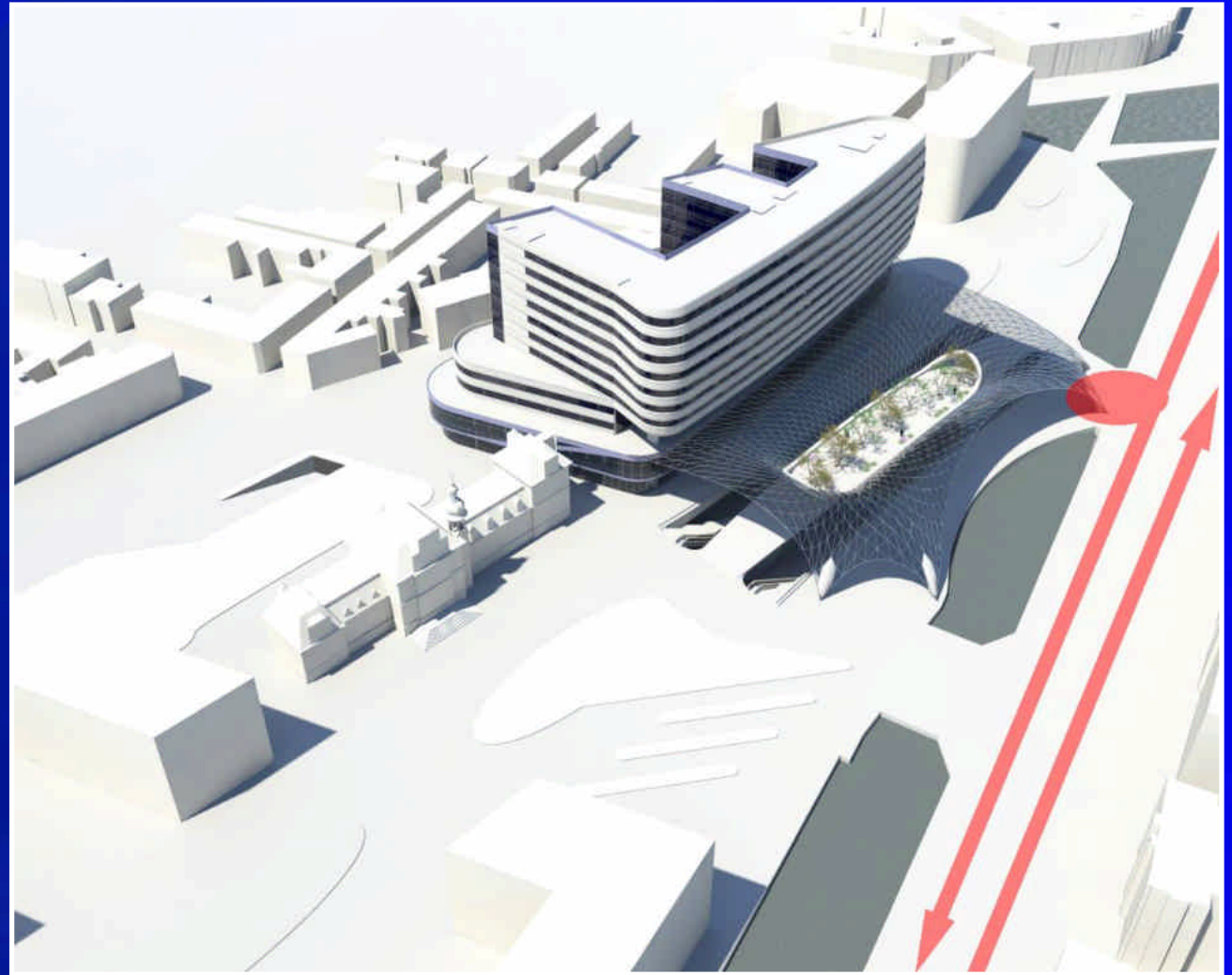
Treinstation



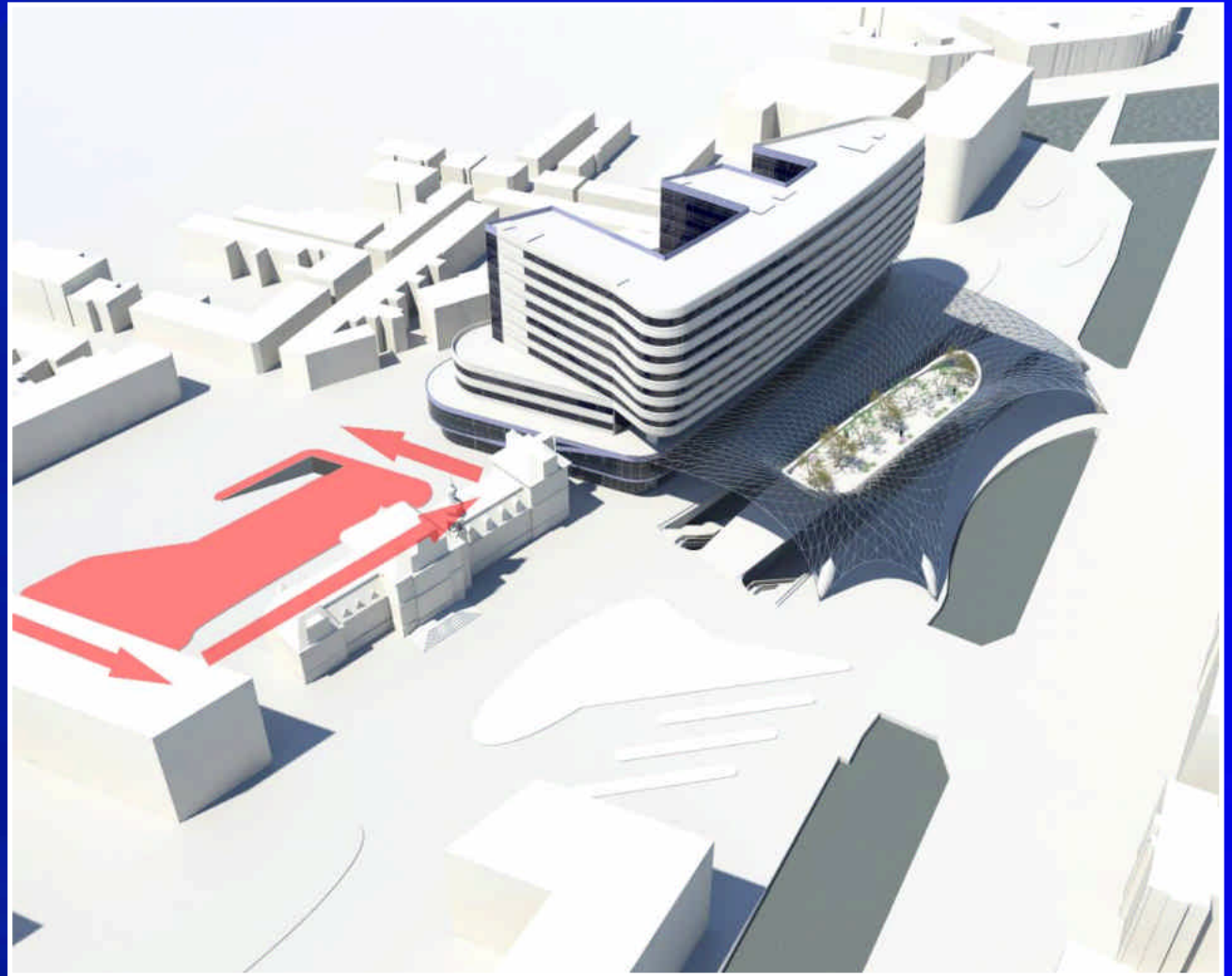
Busstation



Tramhalte



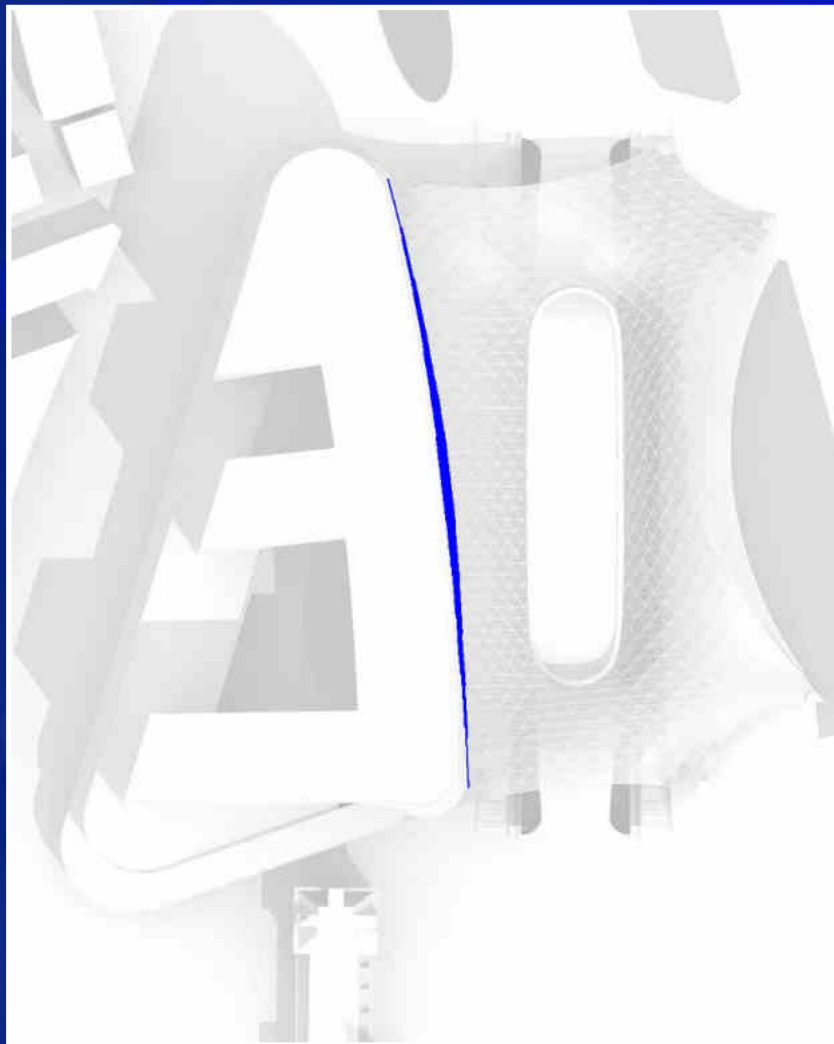
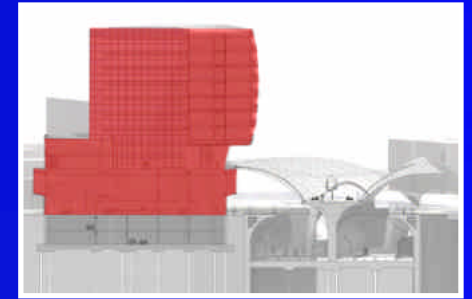
Autoverkeer



STADSKANTOOR

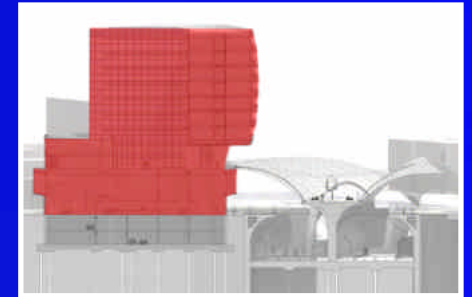
Nieuwe as

- curve stadskantoor begeleid de nieuwe as



Nieuwe as

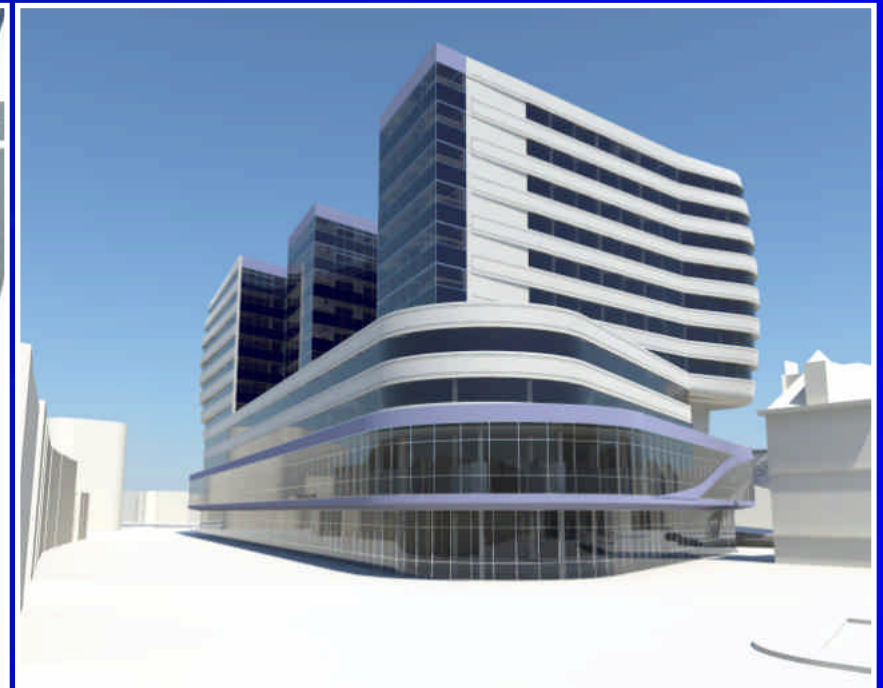
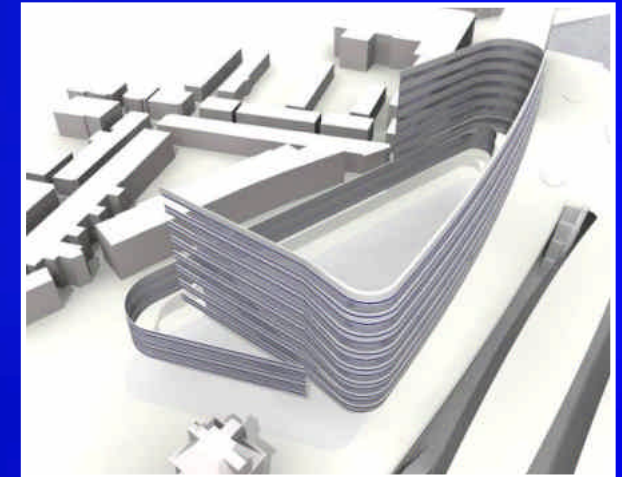
- versterking as door verticale kromming
- horizontale stroken benadrukken geleiding



STADSKANTOOR

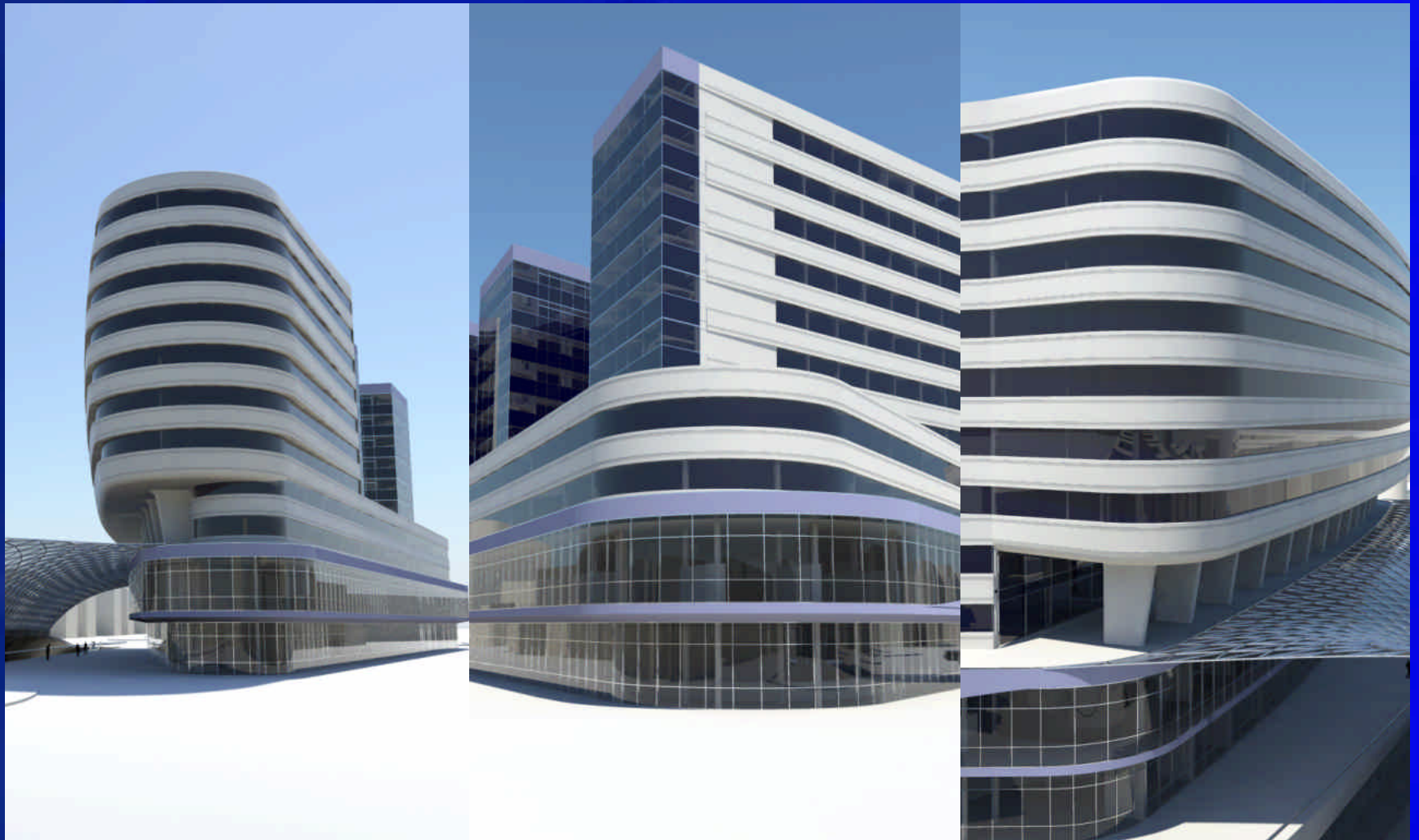
Identiteit

- landmark
- vloeiende strakke vormgeving
- horizontale gevelstroken tot één object



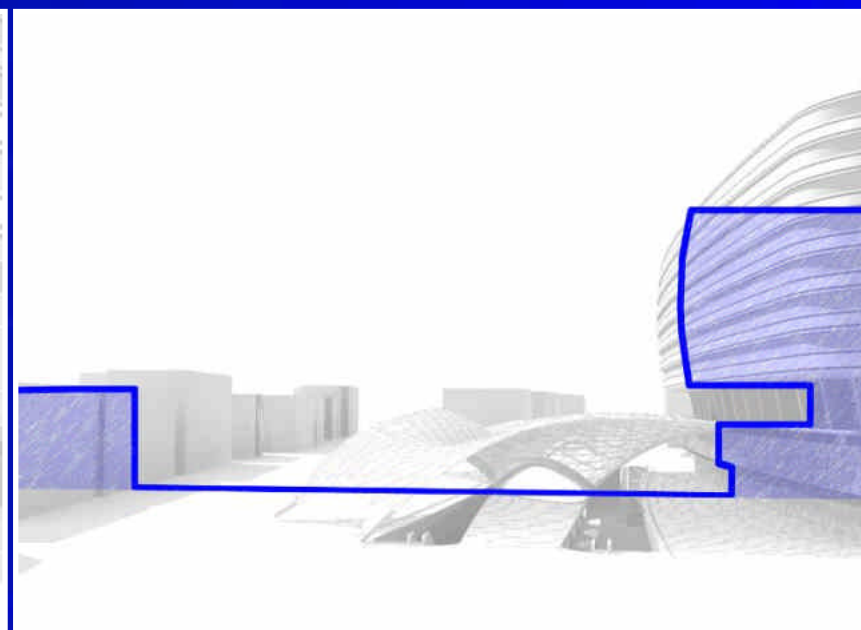
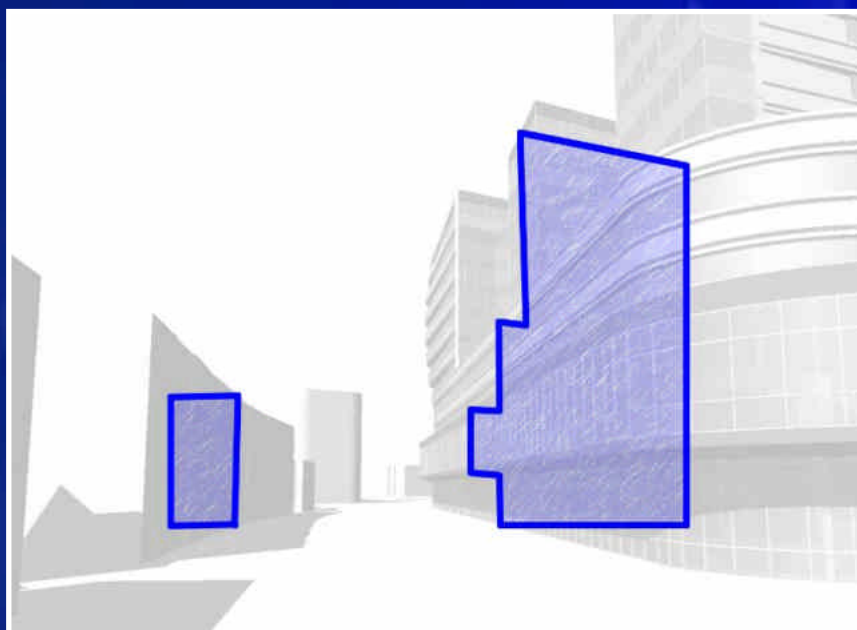
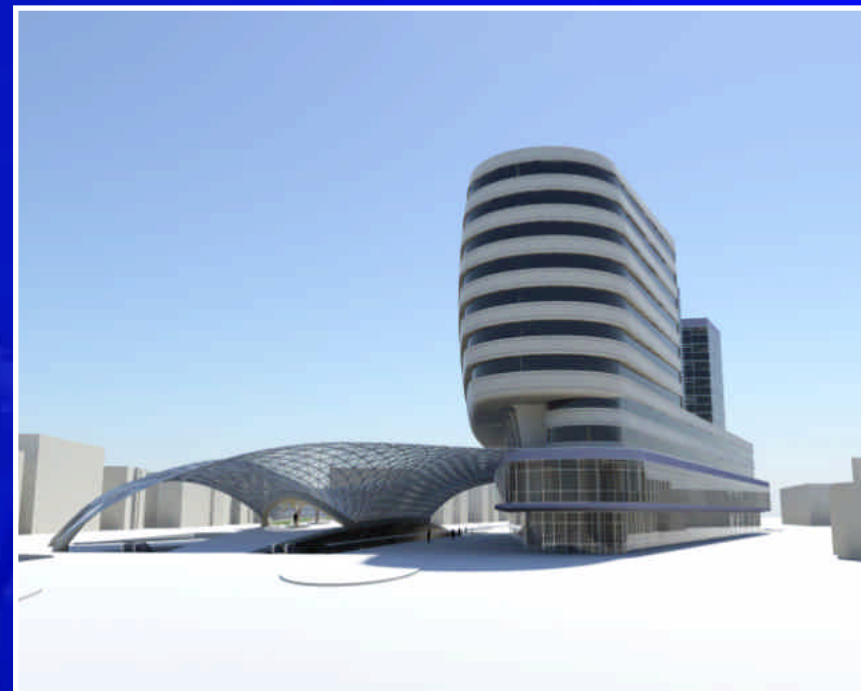
Identiteit

- rondingen smeden stadskantoor tot één object



Identiteit

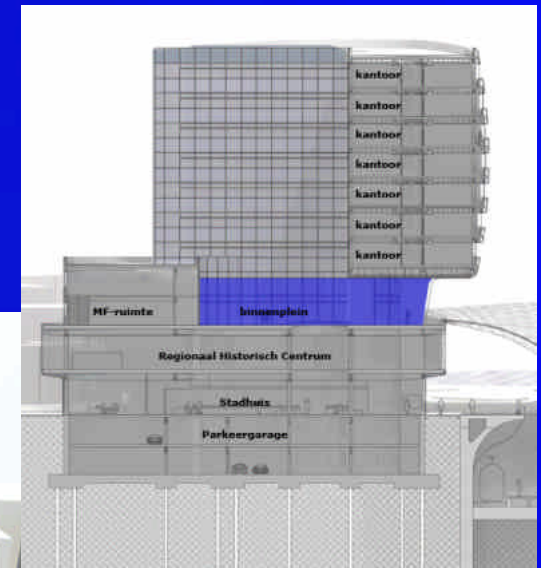
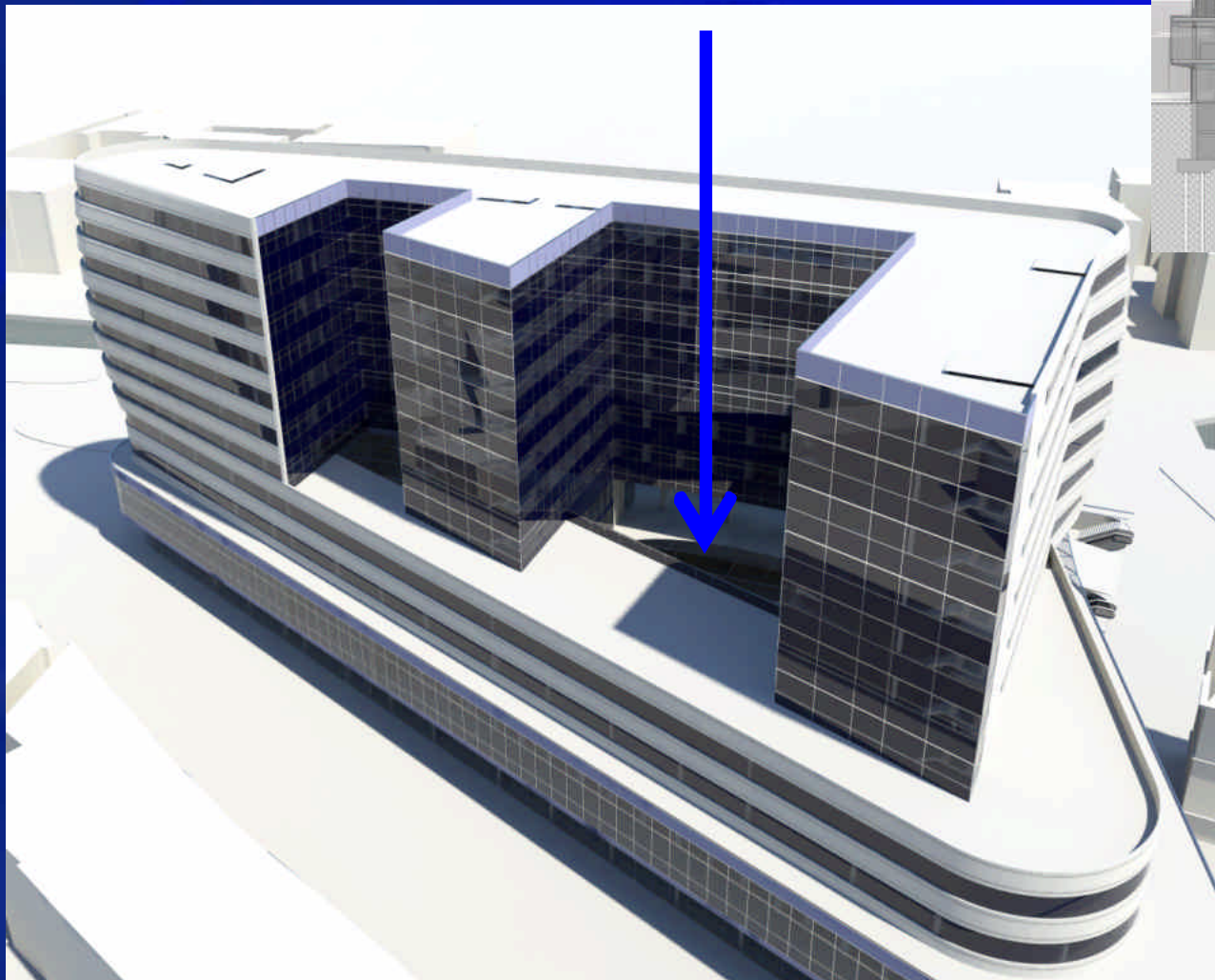
- Coenderstraat
Trapsgewijze afloop
- Westvest
Uitdagende geste



STADSKANTOOR

Rust

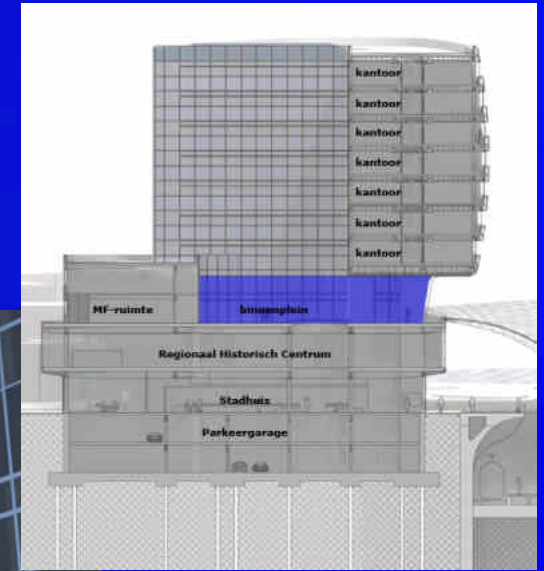
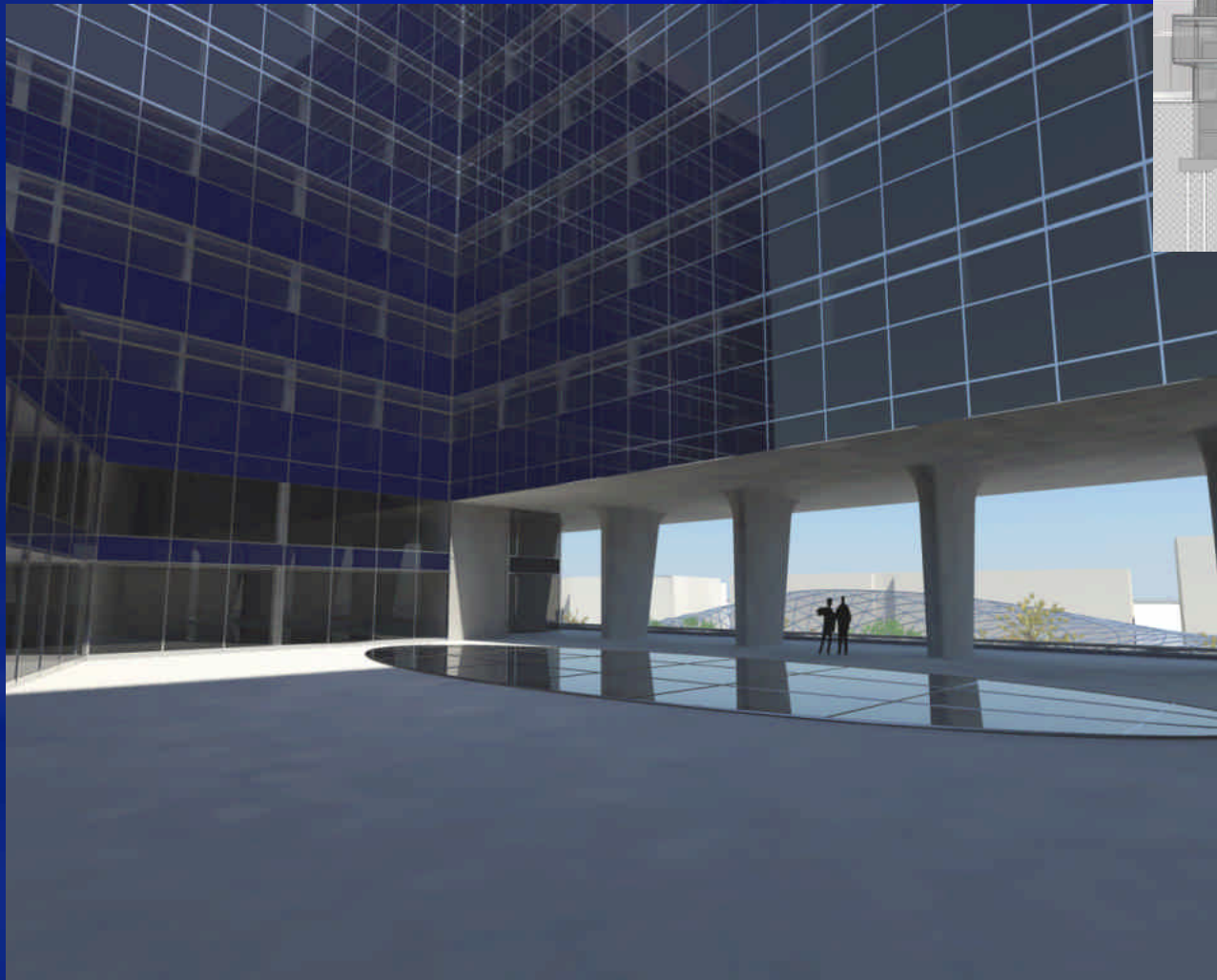
- binnenplein als rustzone medewerkers



STADSKANTOOR

Rust

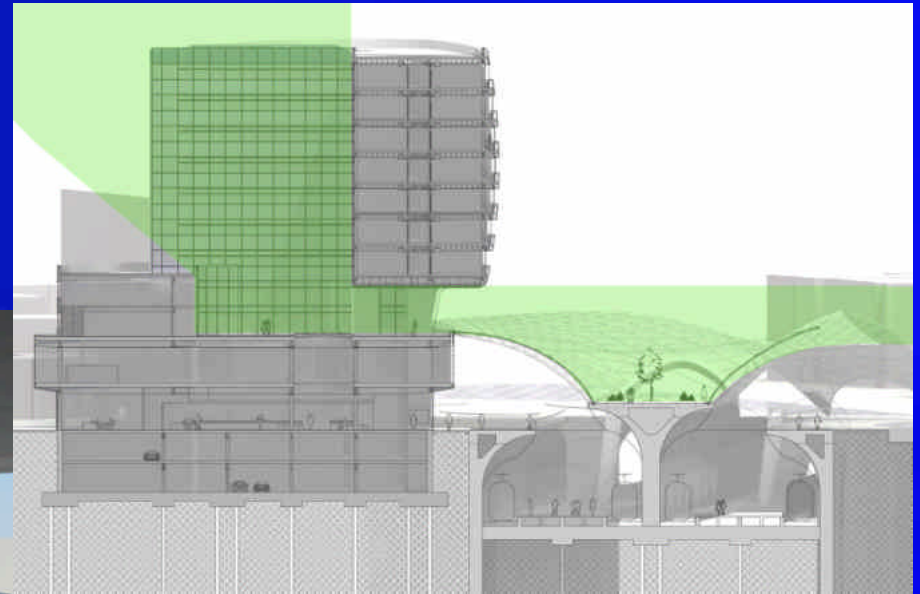
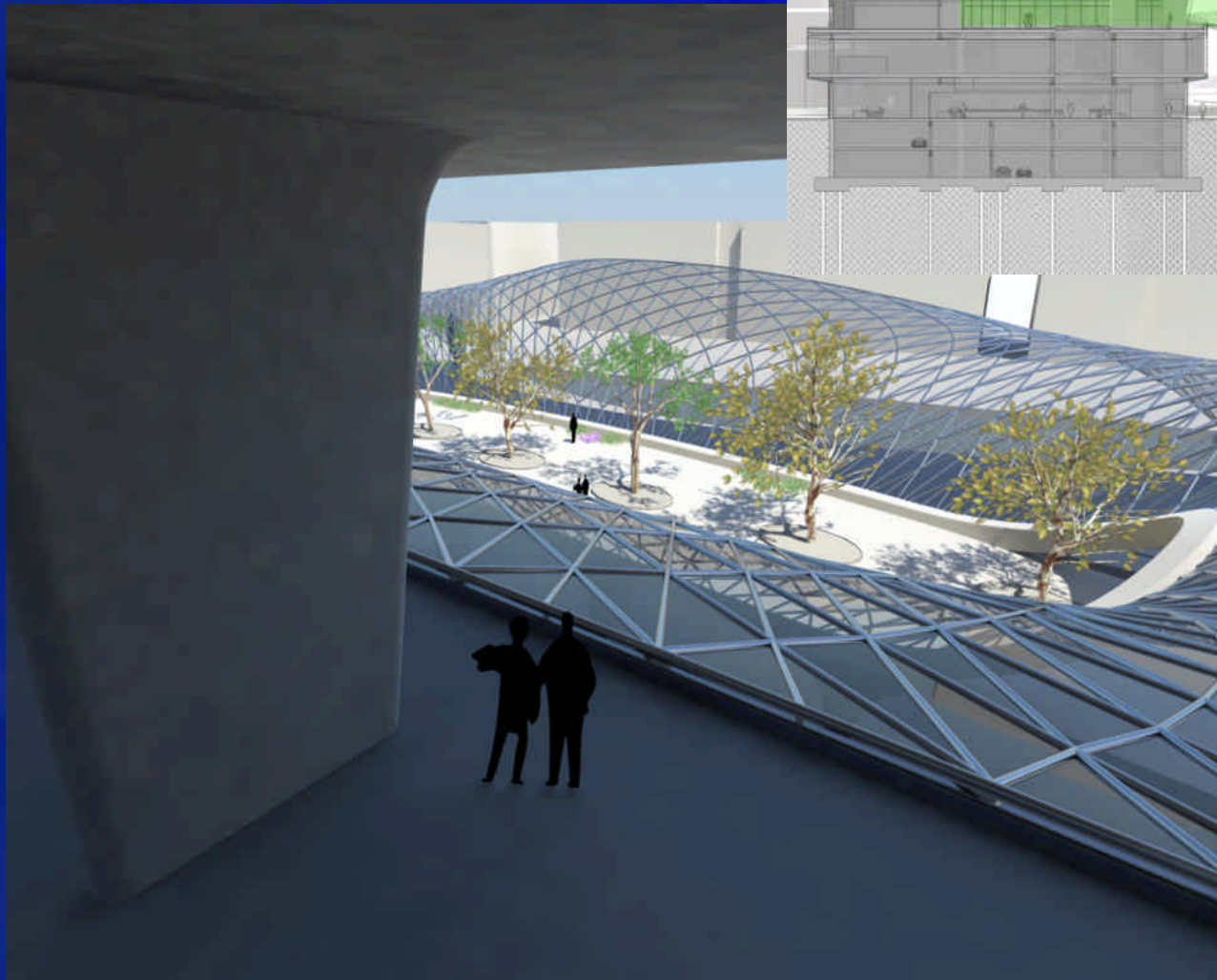
- hoog gelegen binnenplein
- optillen bovenbouw



STADSKANTOOR

Rust

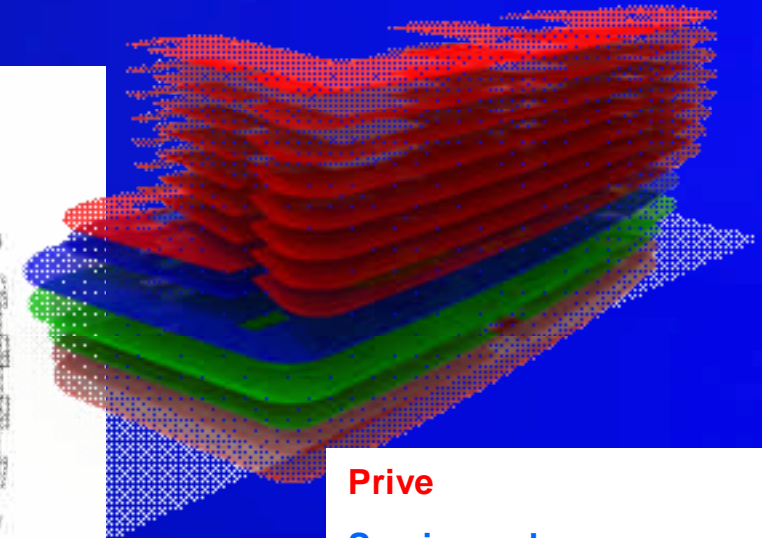
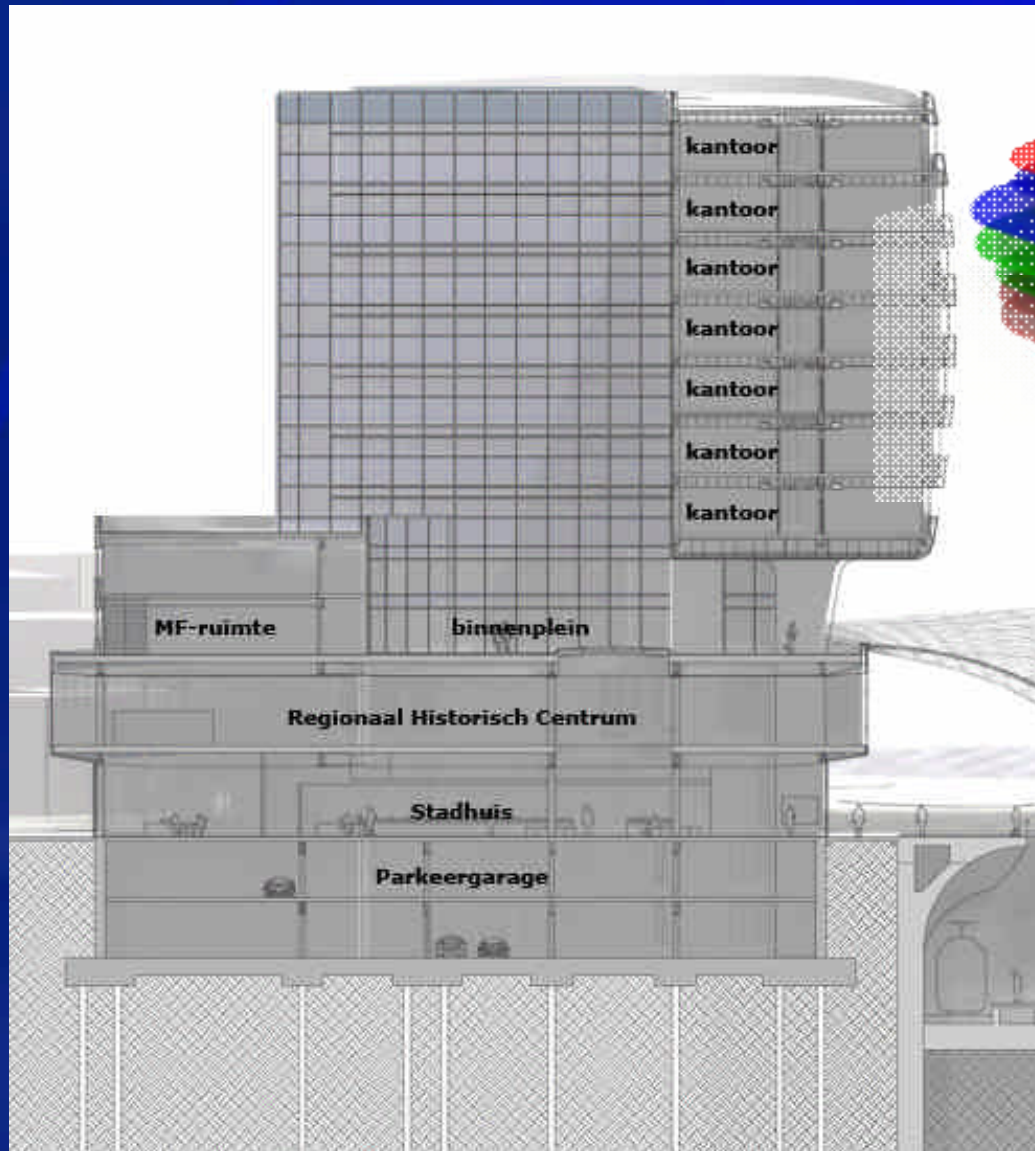
- delen rust met Serenity Park
- optillen bovenbouw



STADSKANTOOR PROGRAMMA

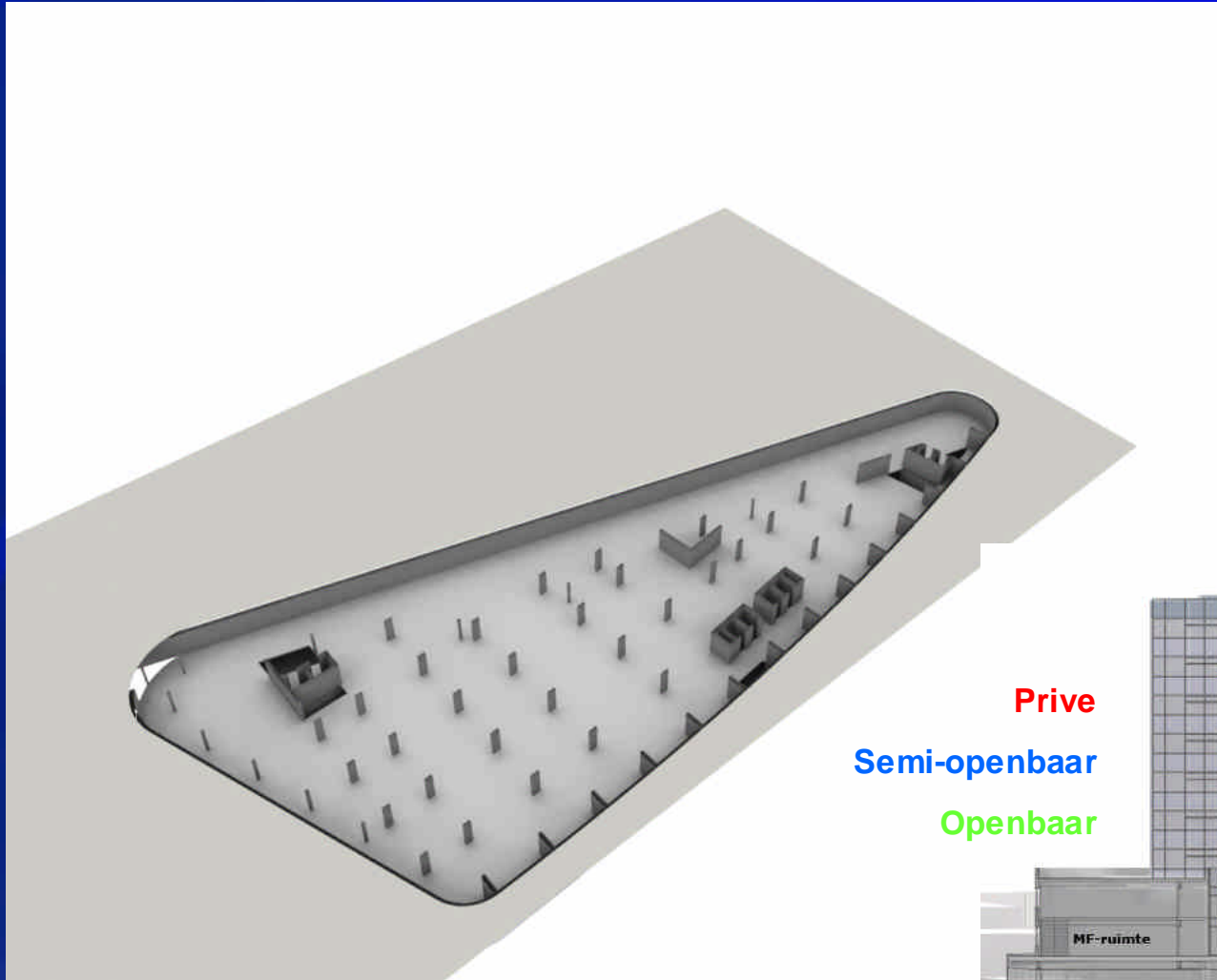
Hybride stadskantoor

- complex programma van eisen

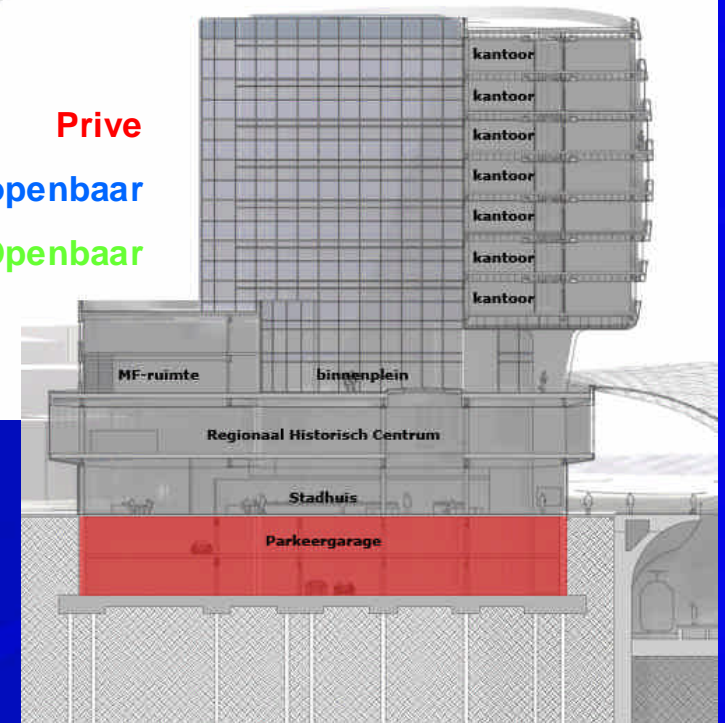


Prive
Semi-openbaar
Openbaar

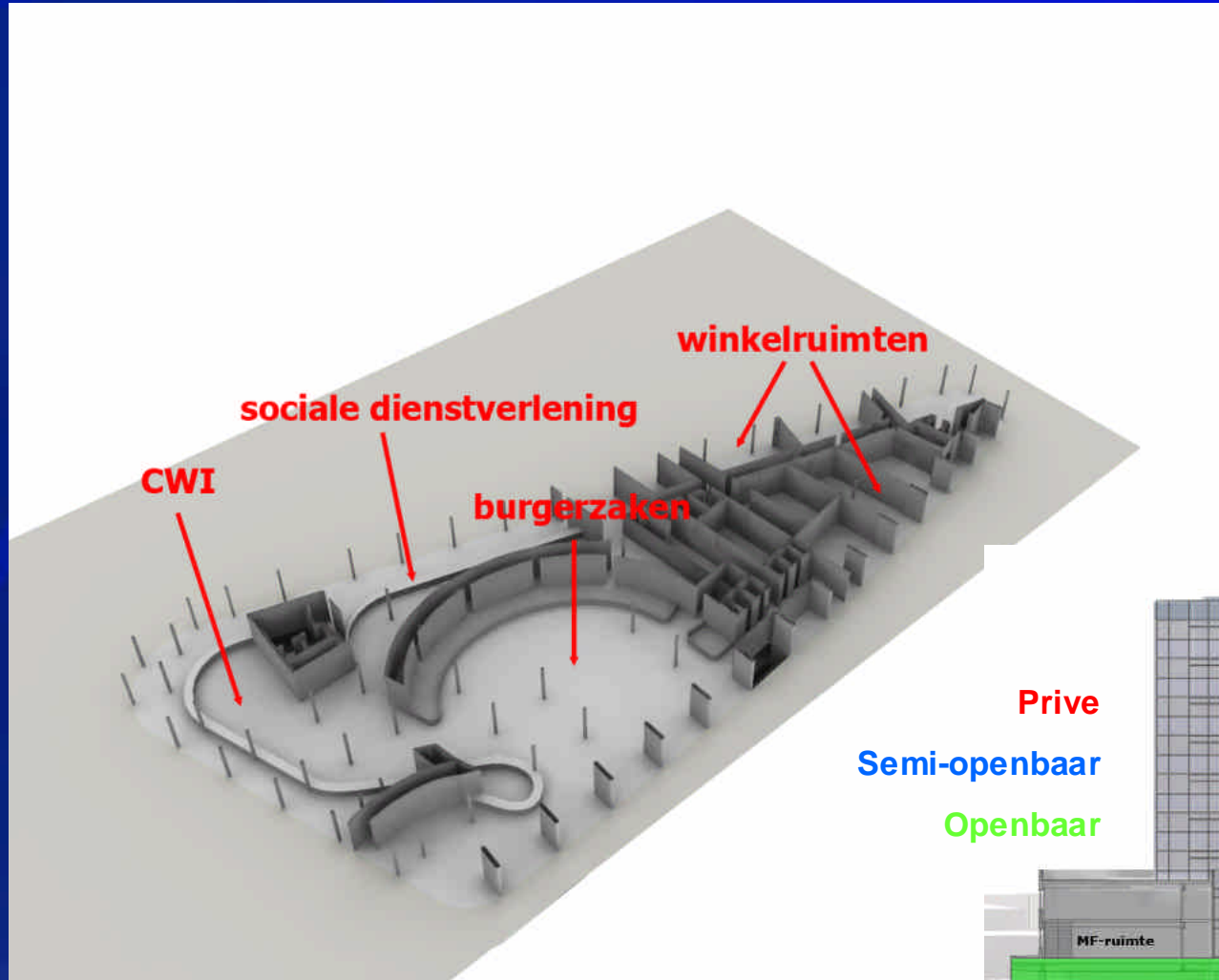
STADSKANTOOR PROGRAMMA



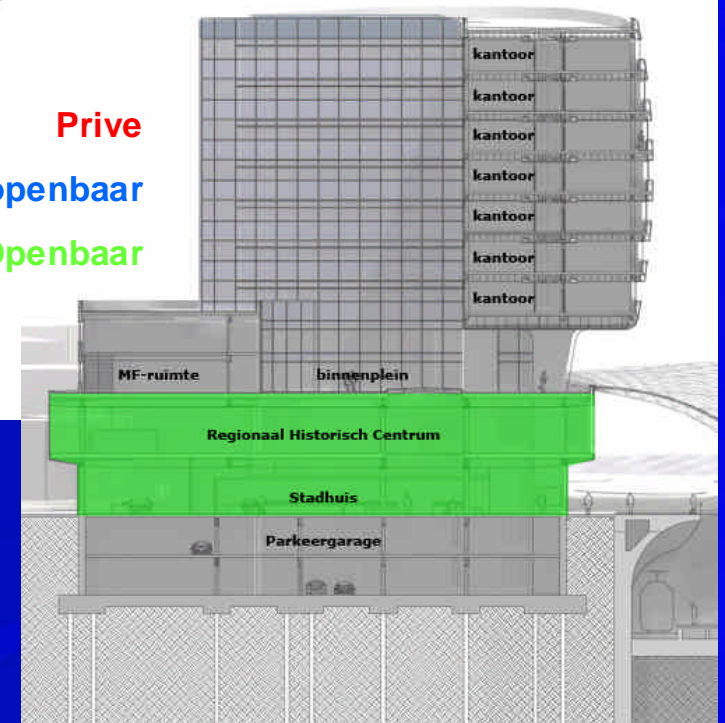
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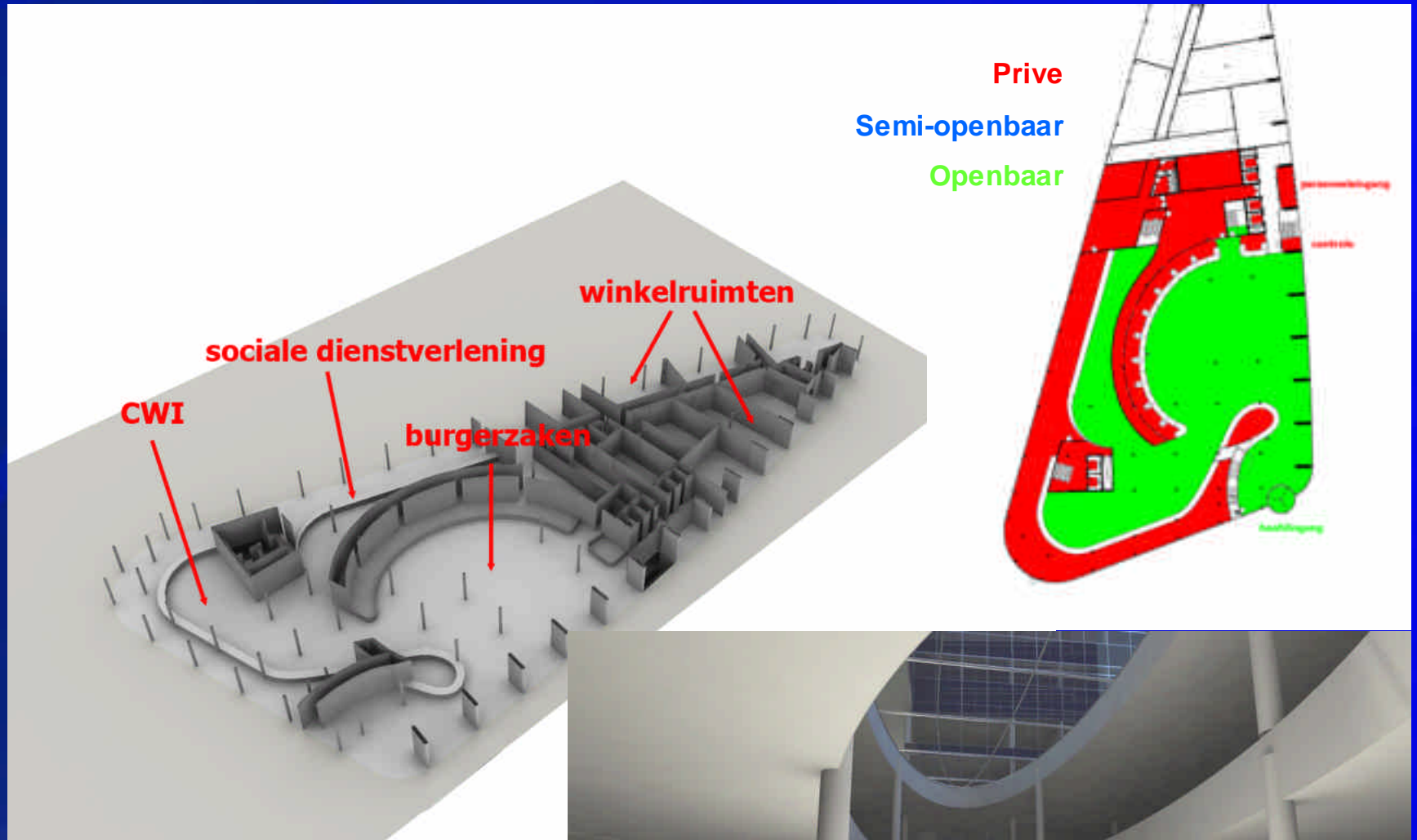
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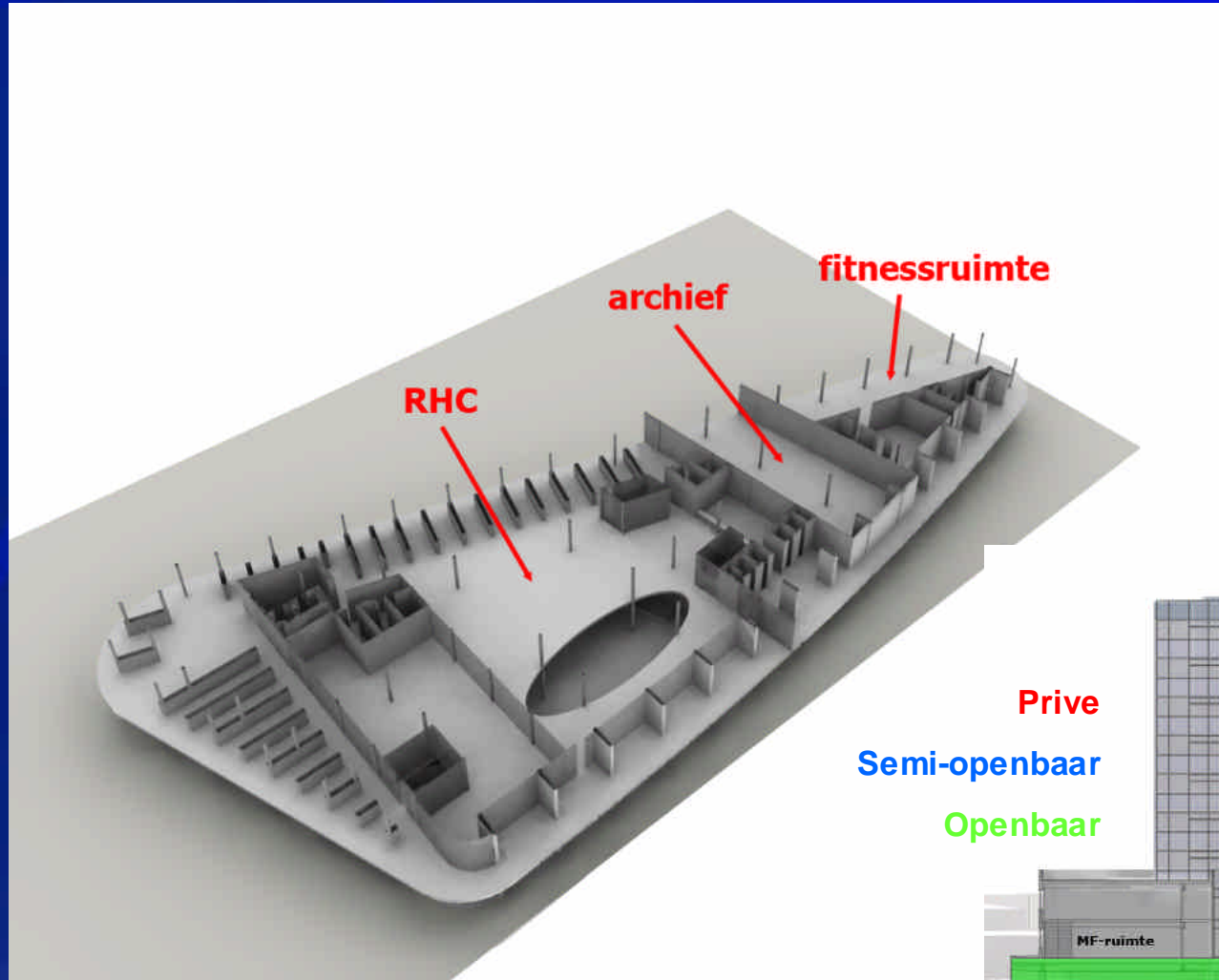
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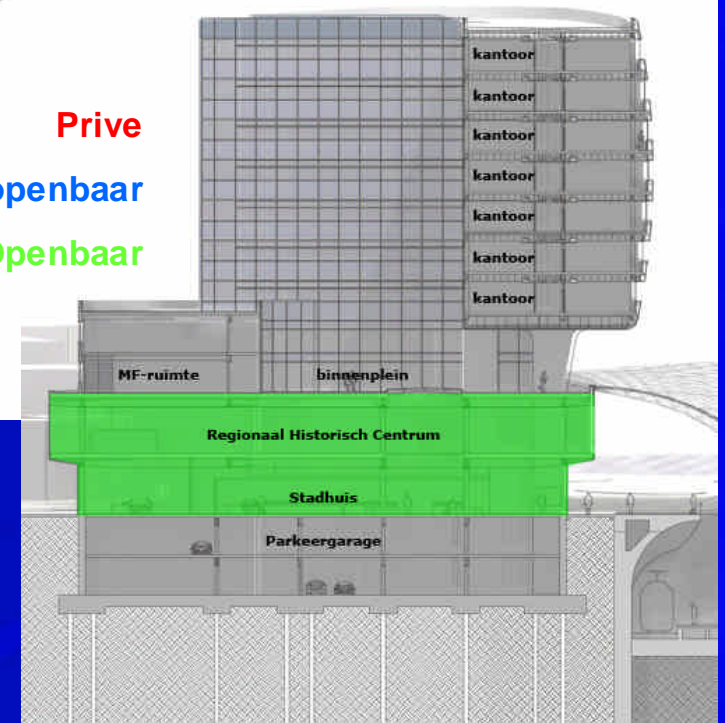
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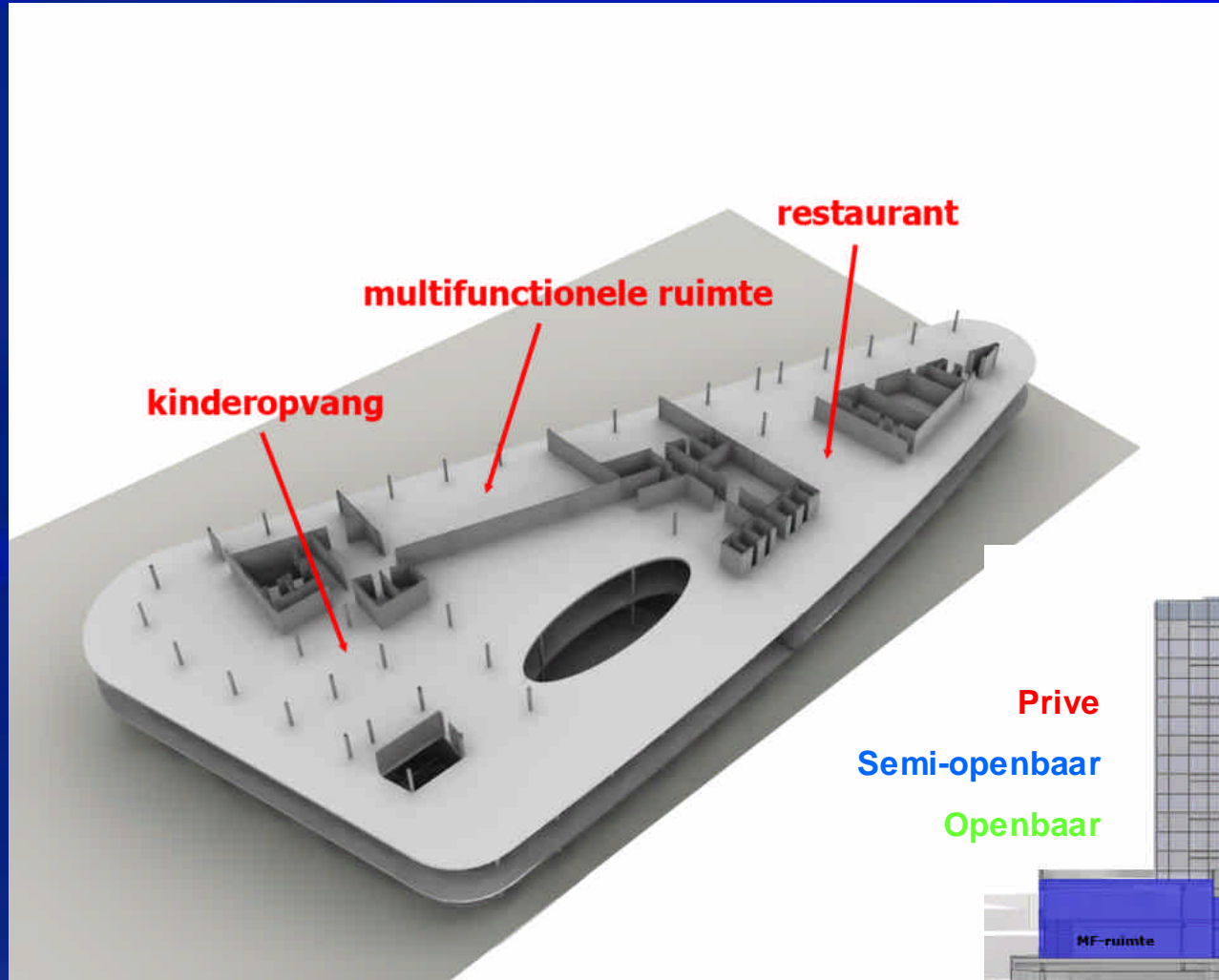
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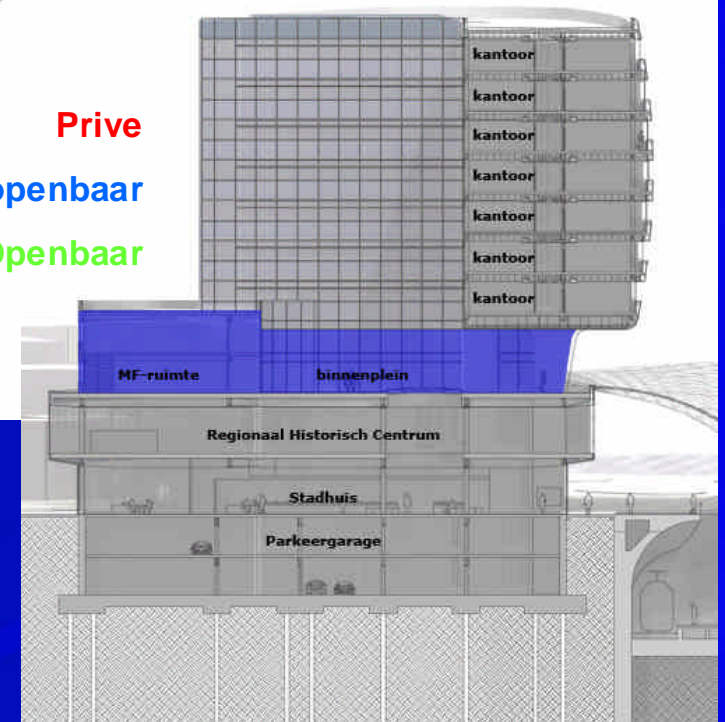
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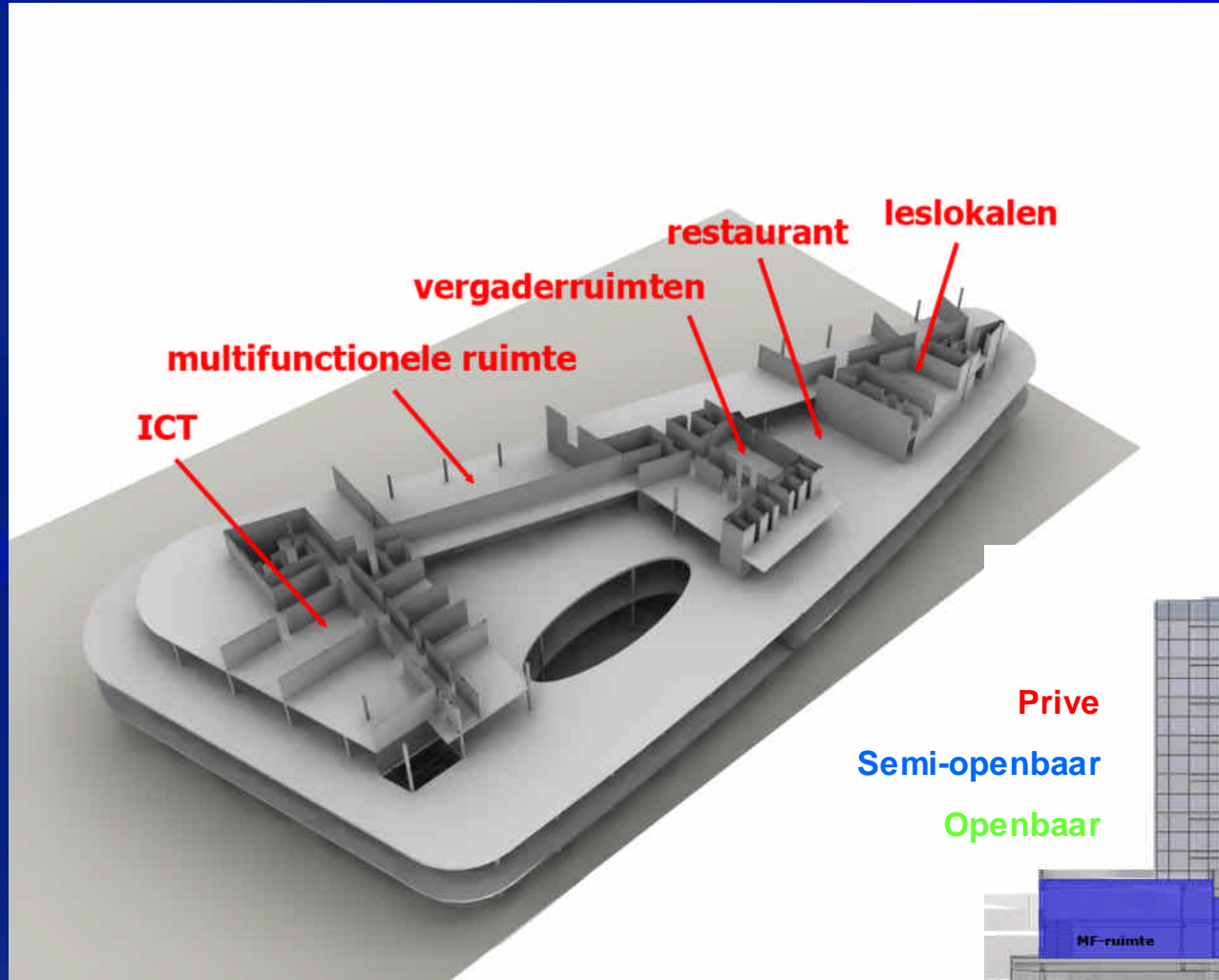
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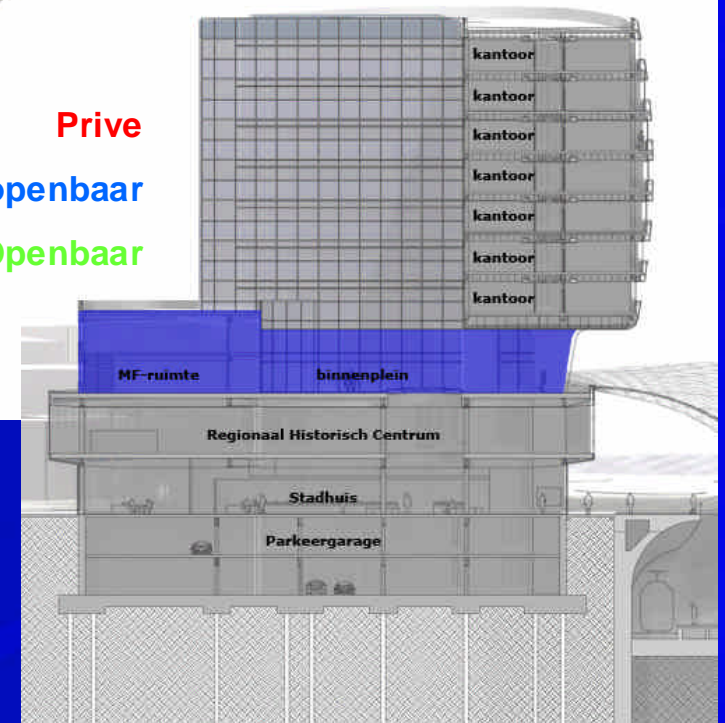
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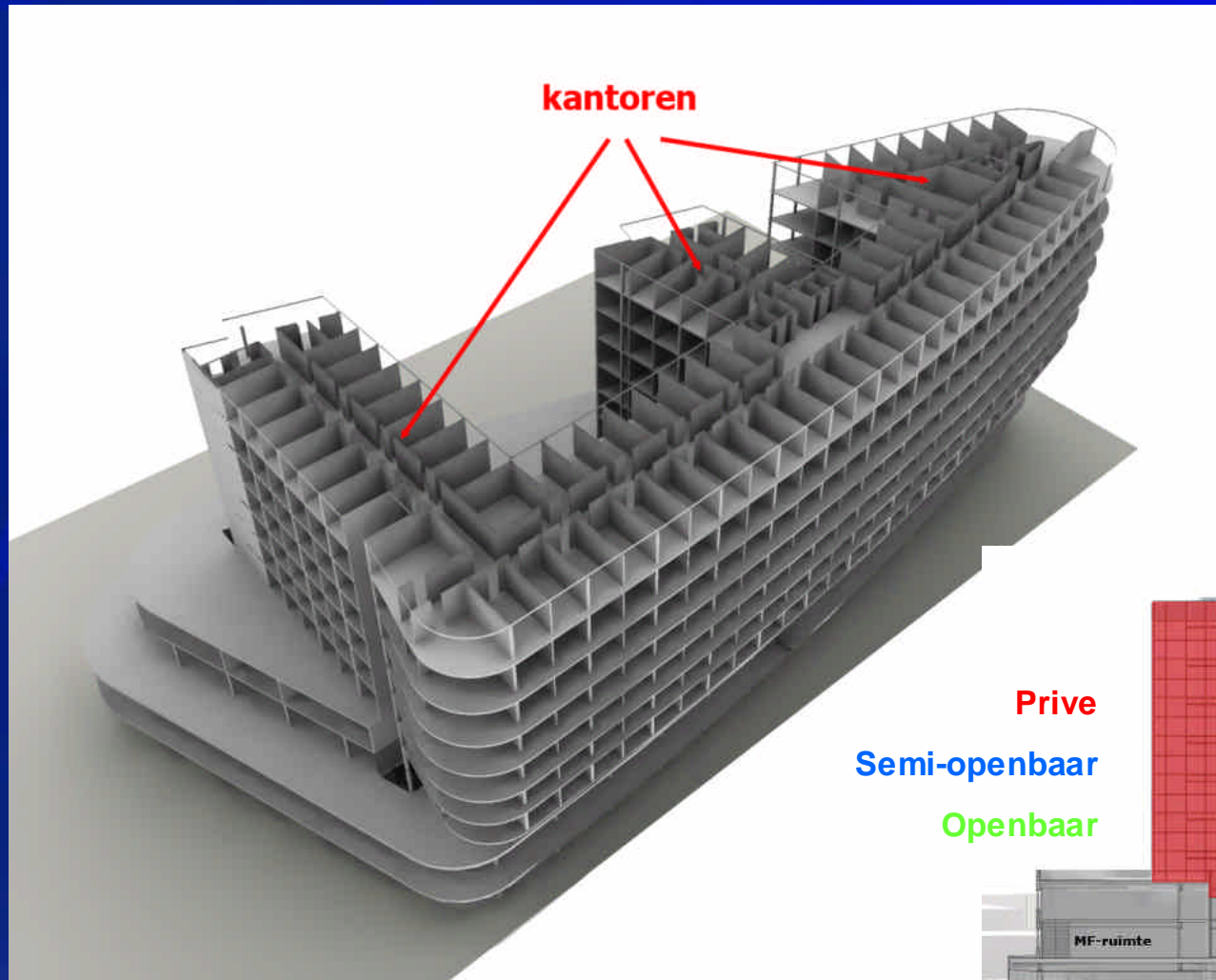
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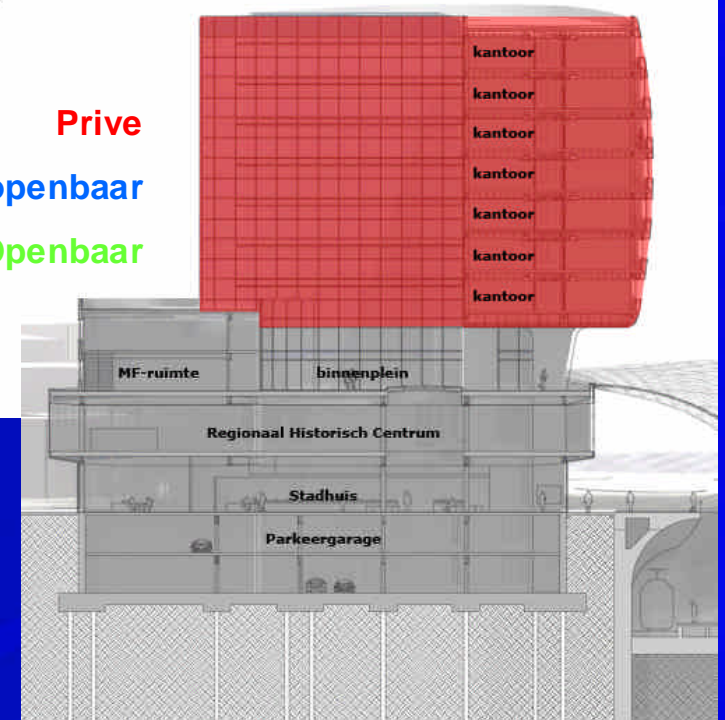
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STADSKANTOOR PROGRAMMA

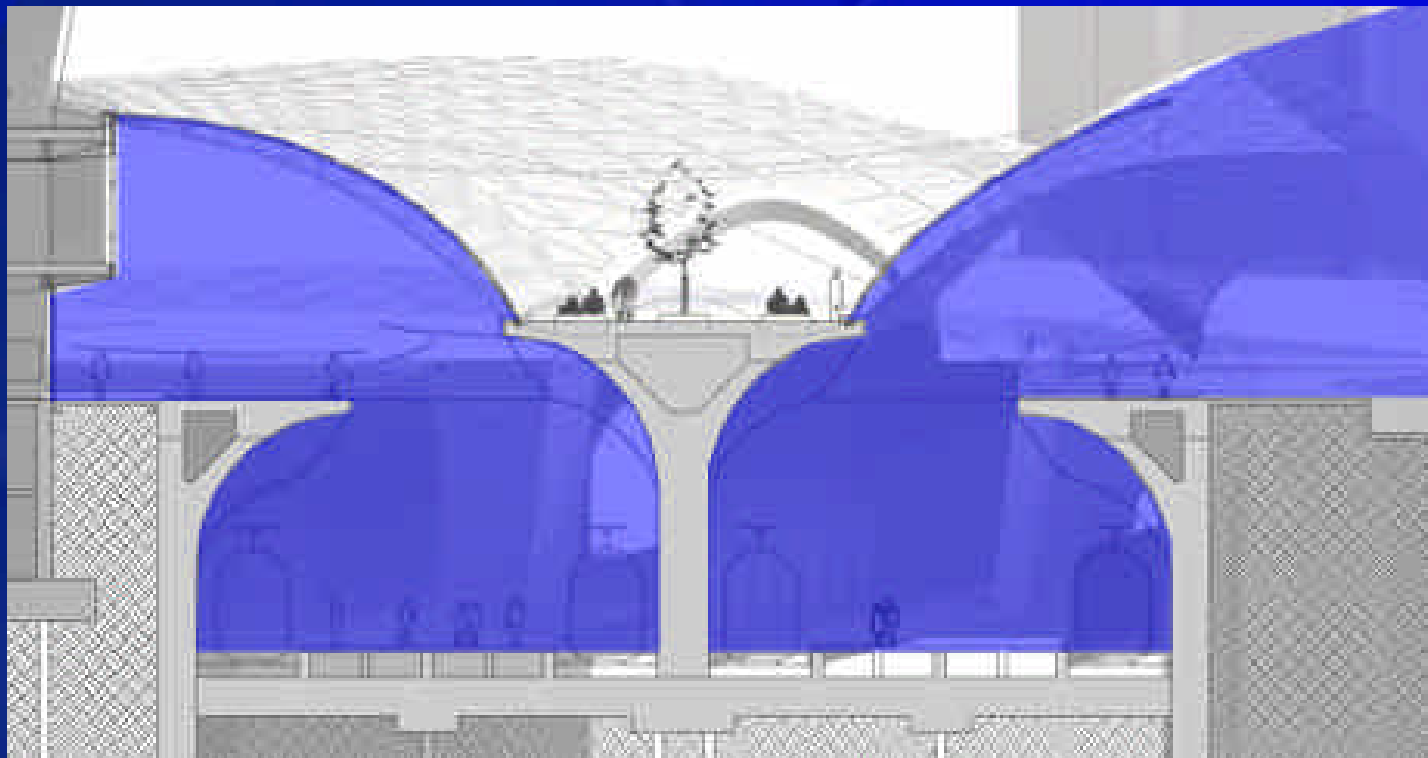
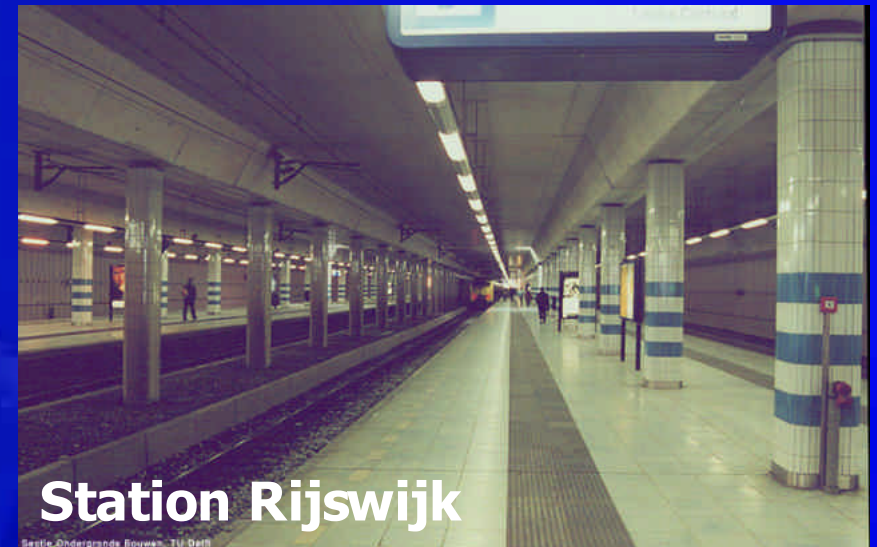


Prive
Semi-openbaar
Openbaar



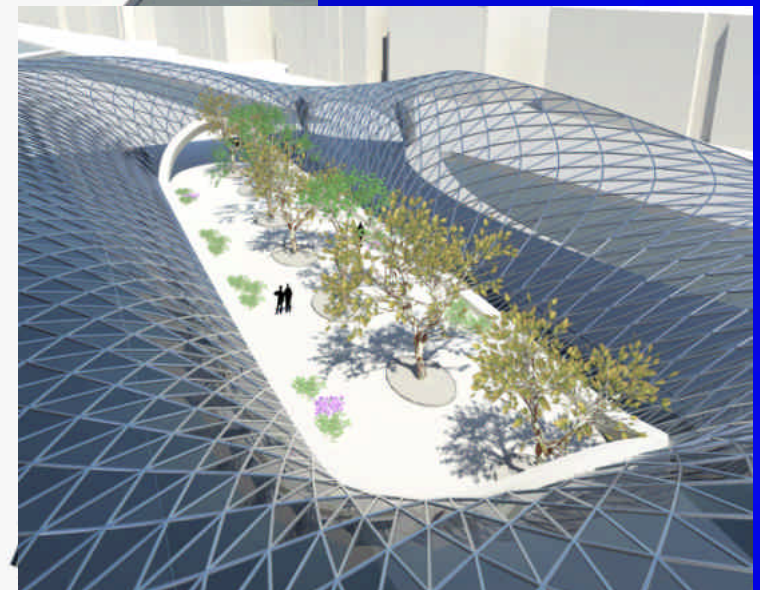
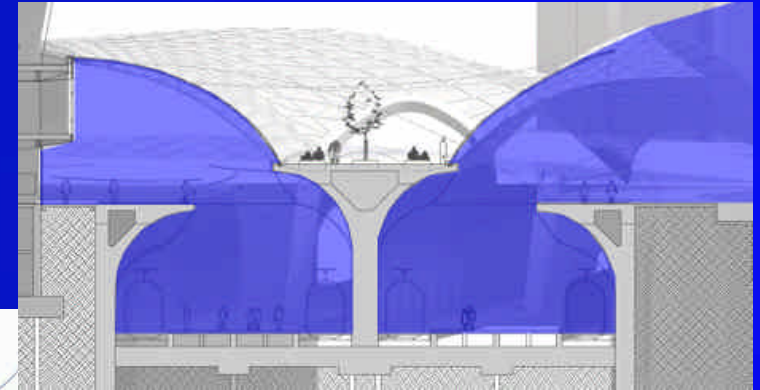
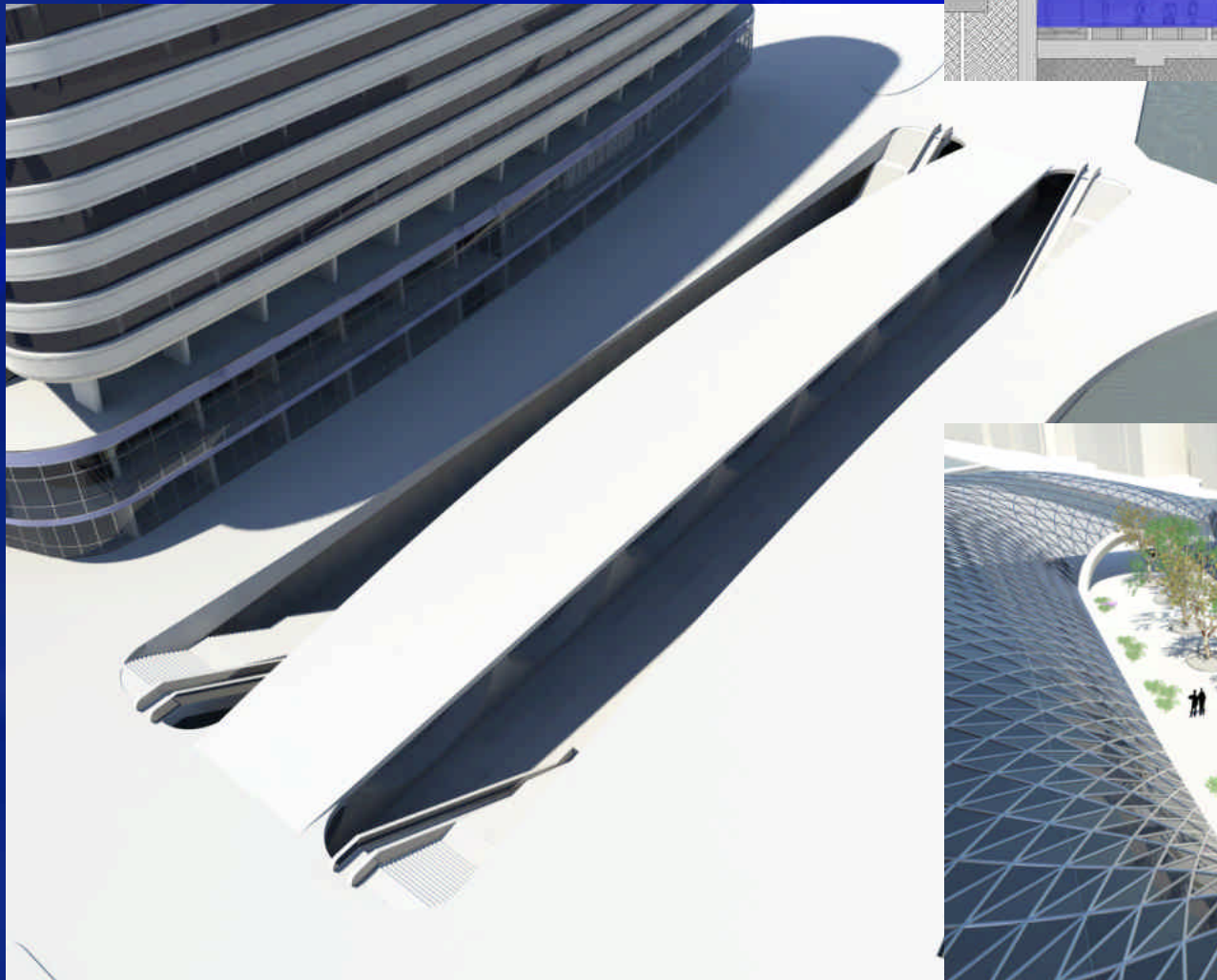
Openheid

- ondergronds station
- ruimtelijke eenheid beneden- en bovenwereld



Openheid

- vloeiend vormgegeven openingen



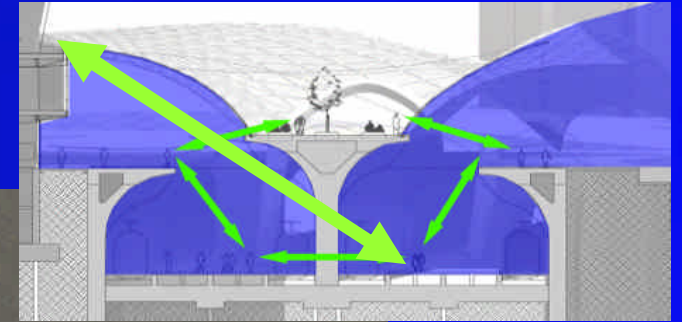
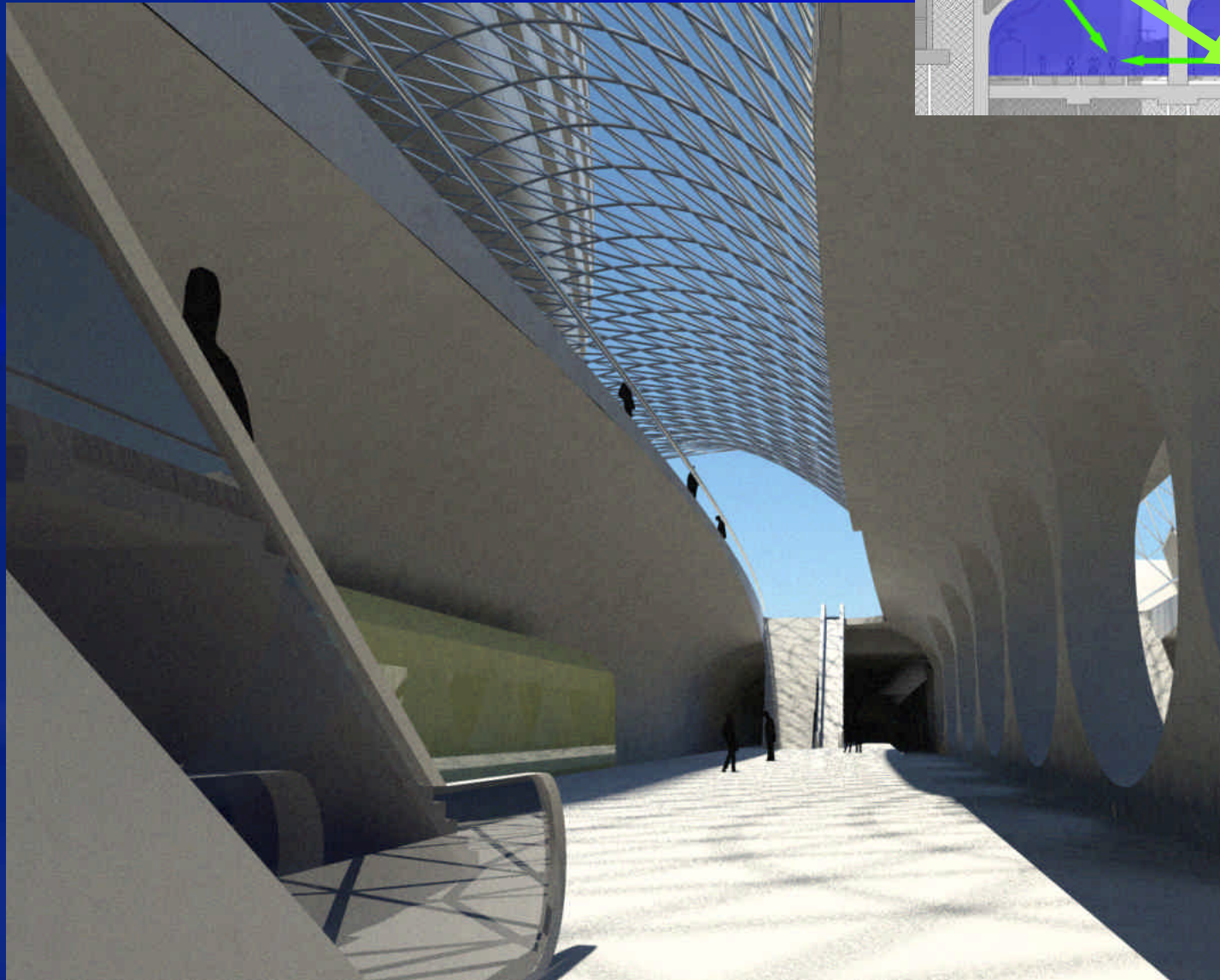
Vormgeving

- sluit aan bij stadskantoor
- interactie



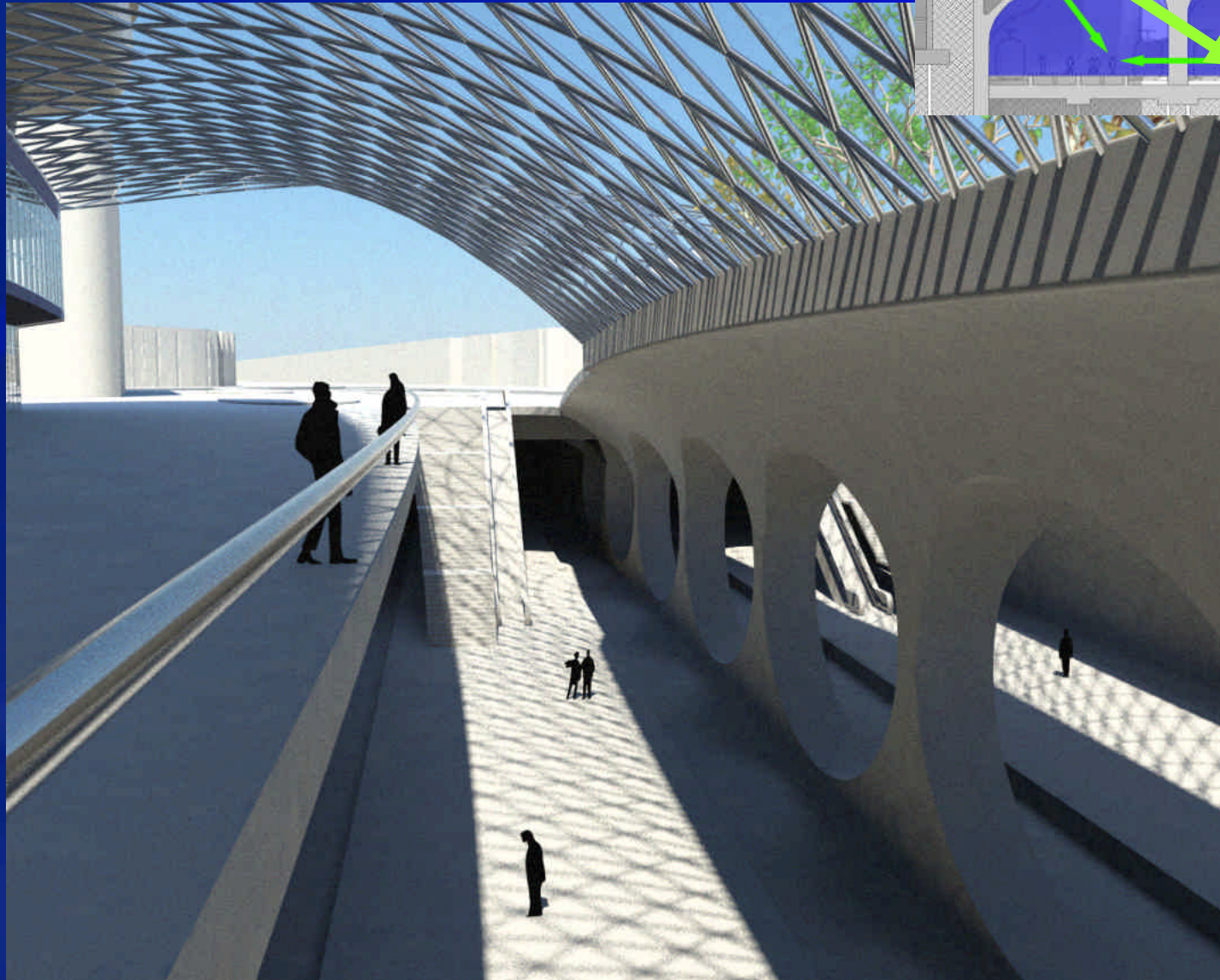
Zichtlijnen

- visuele verbindingen op alle niveaus



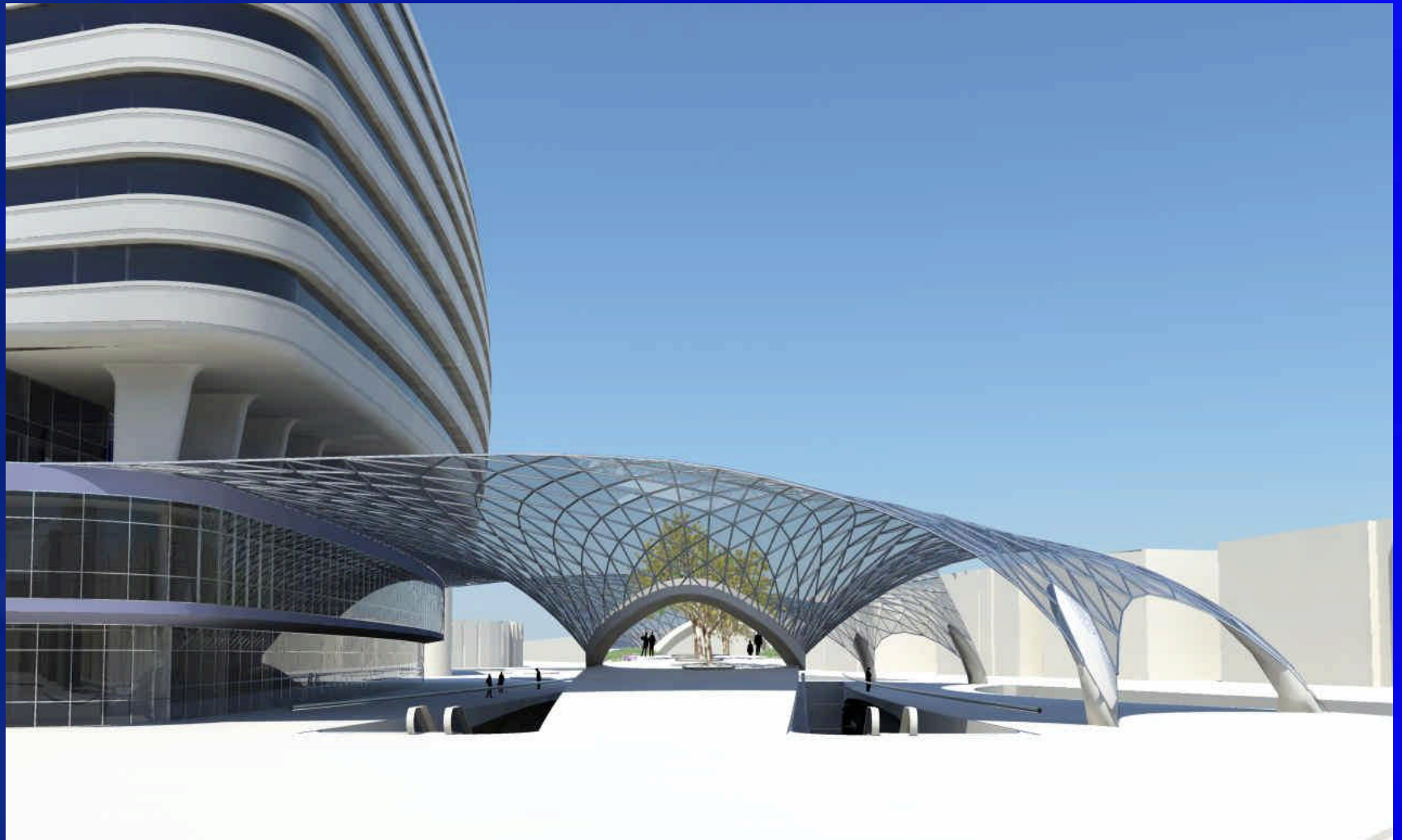
Zichtlijnen

- visuele verbindingen op alle niveaus



Visie

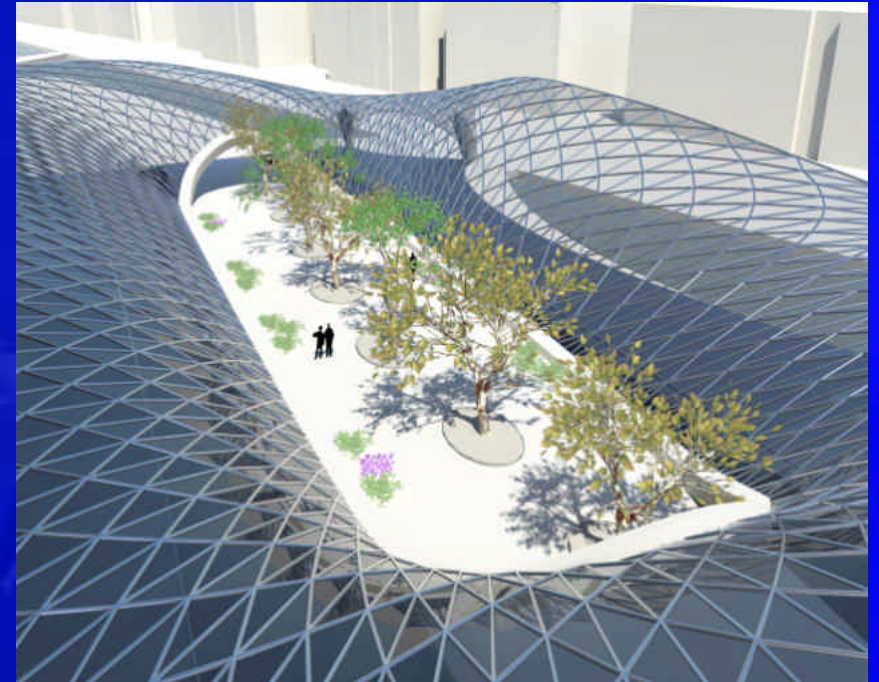
- zo transparant mogelijke overkapping van het stationsgebied
- parkachtig verbindingstuk van de nieuwe "groene" as



GRIDSCHAAL

Kasachtige overkapping

- botanische tuinen



Nieuwe as

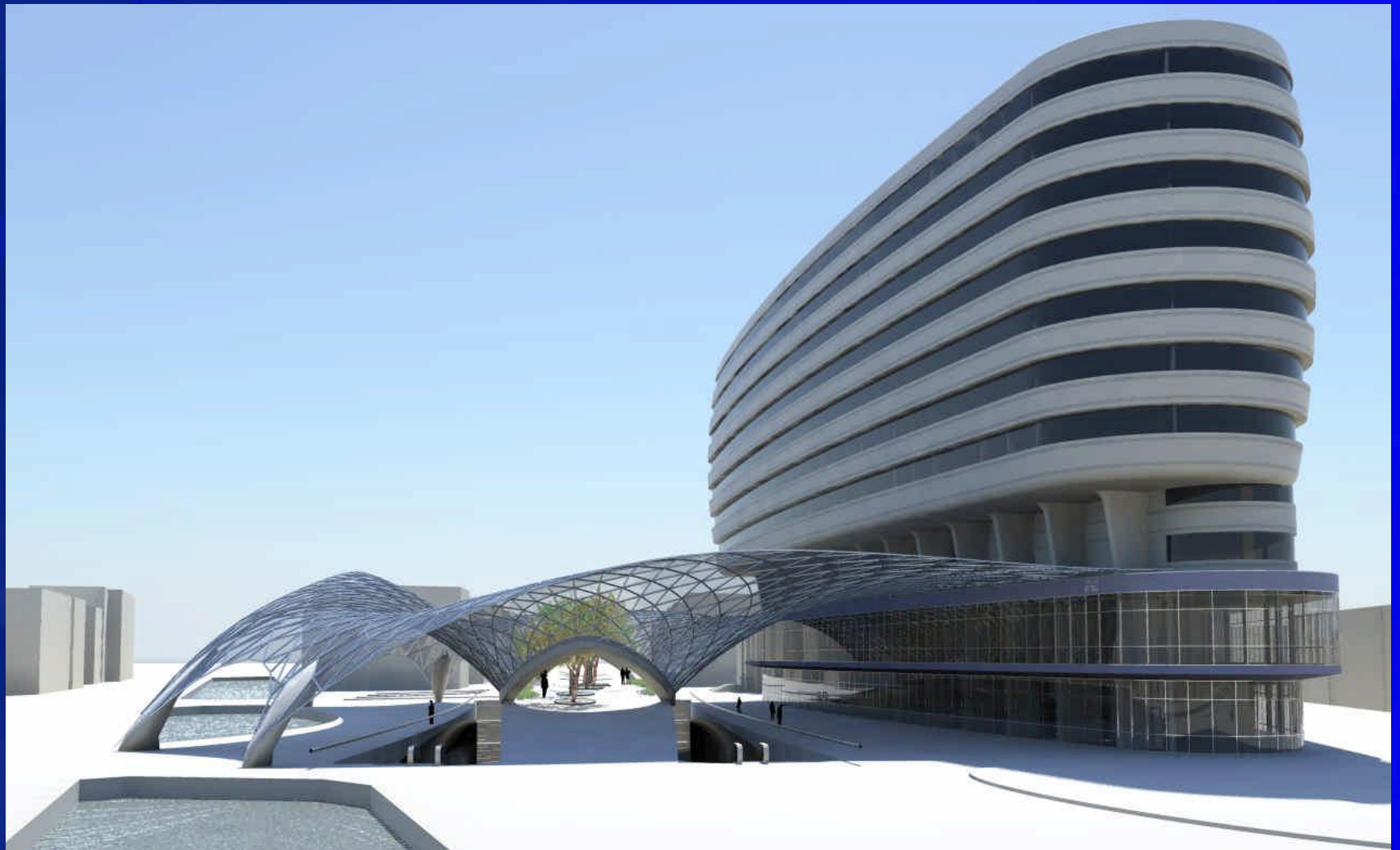
- verbinding groen stadspark-phoenixstraat



GRIDSCHAAL

Gridschaal

- zelfdragend constructienet met glazen overkapping

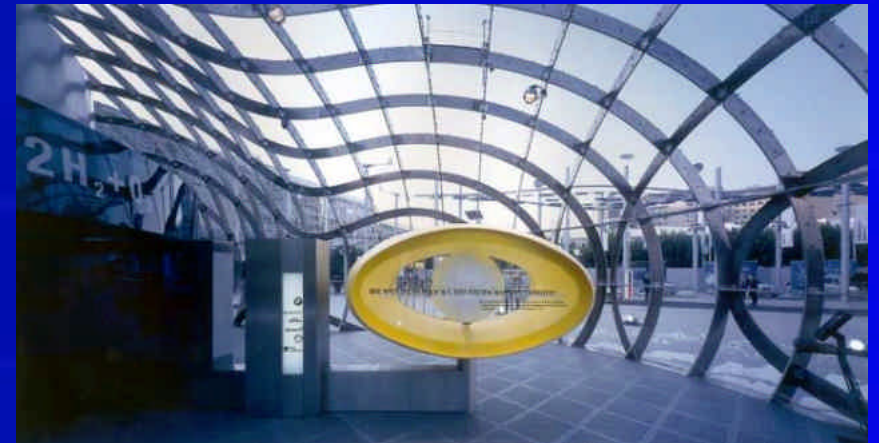


Vrije vorm

- verschillende manieren om constructie te ontwerpen



The Wave
Munich, Germany, 2003
Bernhard Franken



BMW Clean Energy Bubble
Munich, Germany, 2003
Bernhard Franken

Visie oplossing gridschaal

- homogene natuurlijke verdeling van het constructienet



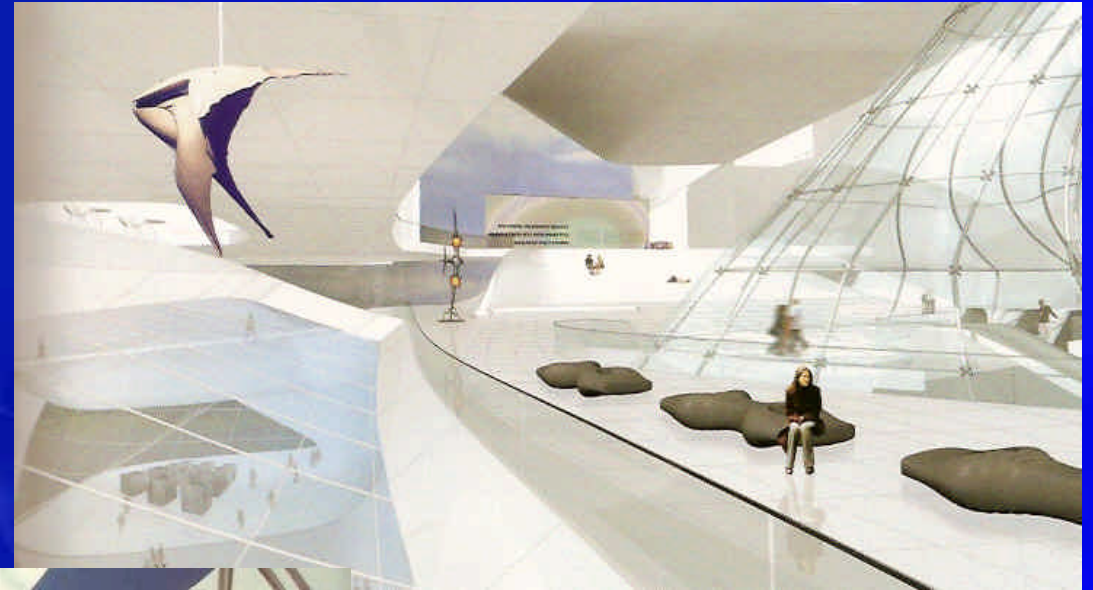
British Museum, Queen Elizabeth II Great Court
London, GB, 2000
Foster and Partners



GRIDSCHAAL

Probleem

- moeite construeren grid

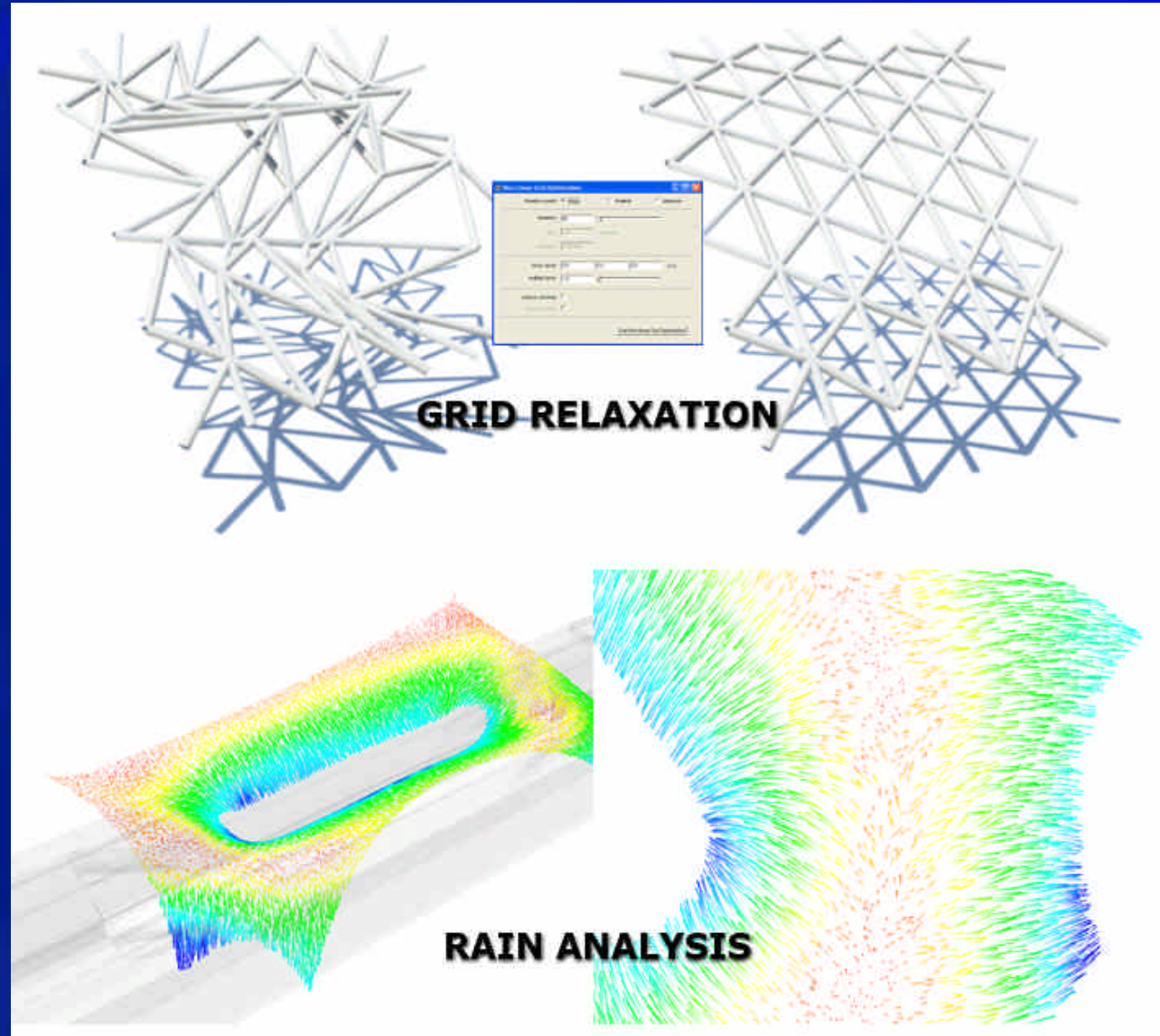


Guggenheim Guadalajara
Guadalajara, Mexico, 2005
Asymtote

Mur Island Project
Mur Island, Graz, Austria, 2003
Vito Acconci

Tools voor student, architect

- creatie homogeen verdeelde gridschaal



GRID RELAXATION

Chris Williams - British Museum

Doel grid relaxation tool

- grid relaxatie op elke willekeurige vrije vorm
- homogene verdeling van constructie grid over vrije vorm

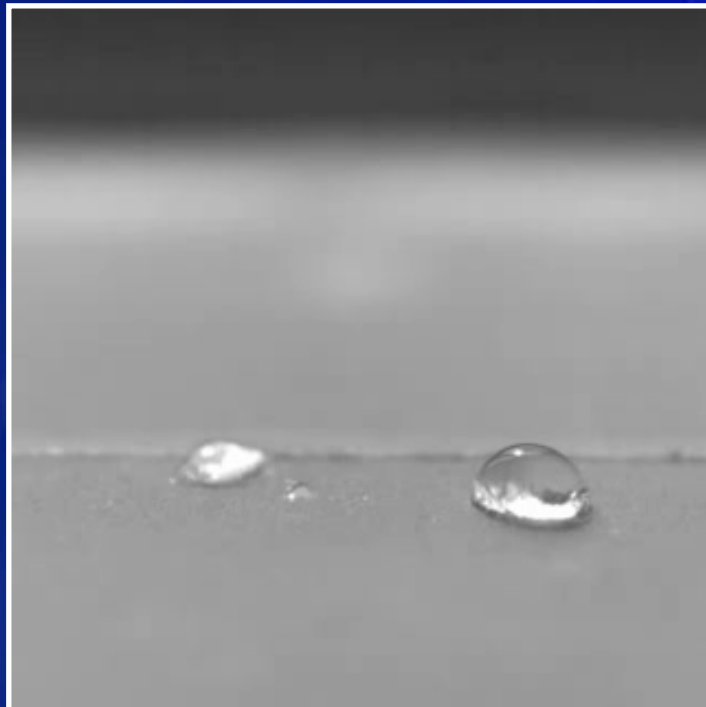
**British Museum,
Queen Elizabeth II Great Court
London, GB, 2000
Foster and Partners**



GRID RELAXATION

Inspiratie

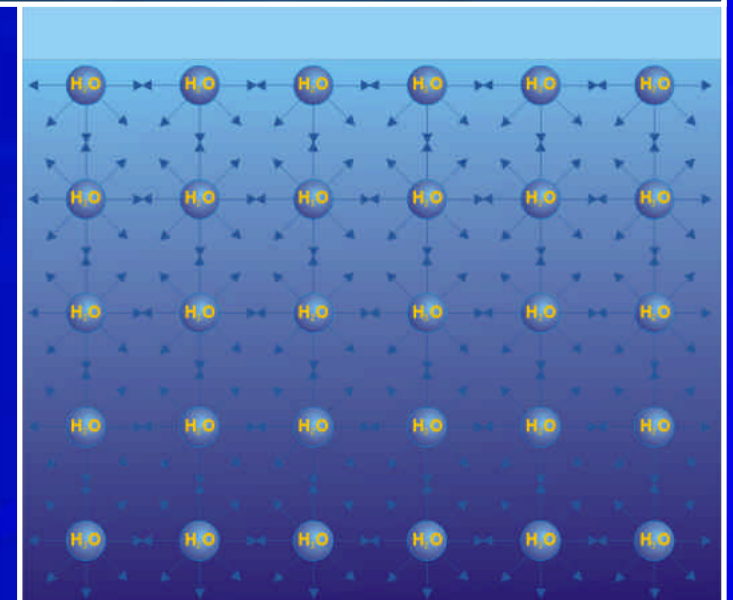
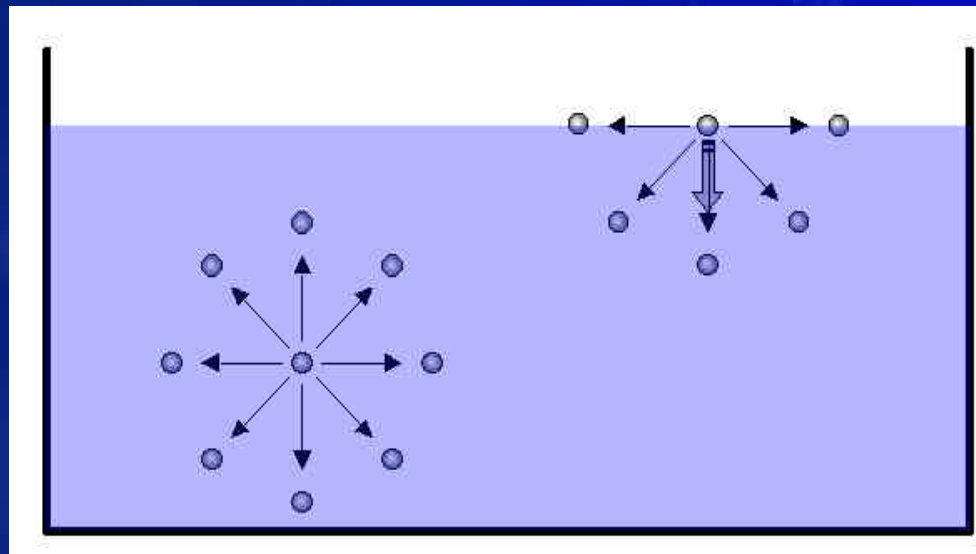
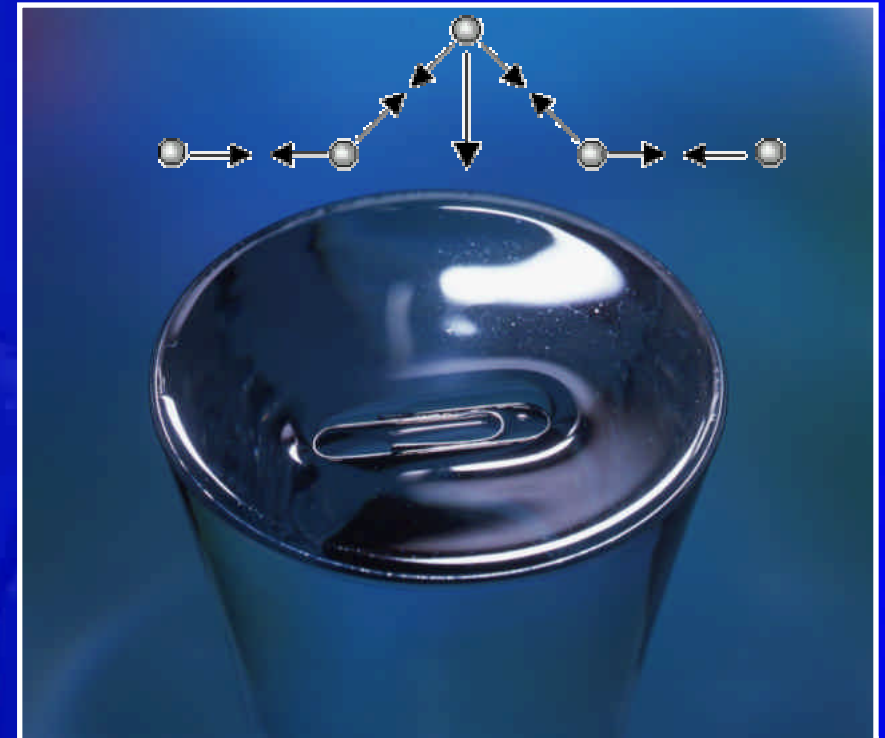
- watermolecuul
- evenwicht



GRID RELAXATION

Oppervlaktespanning

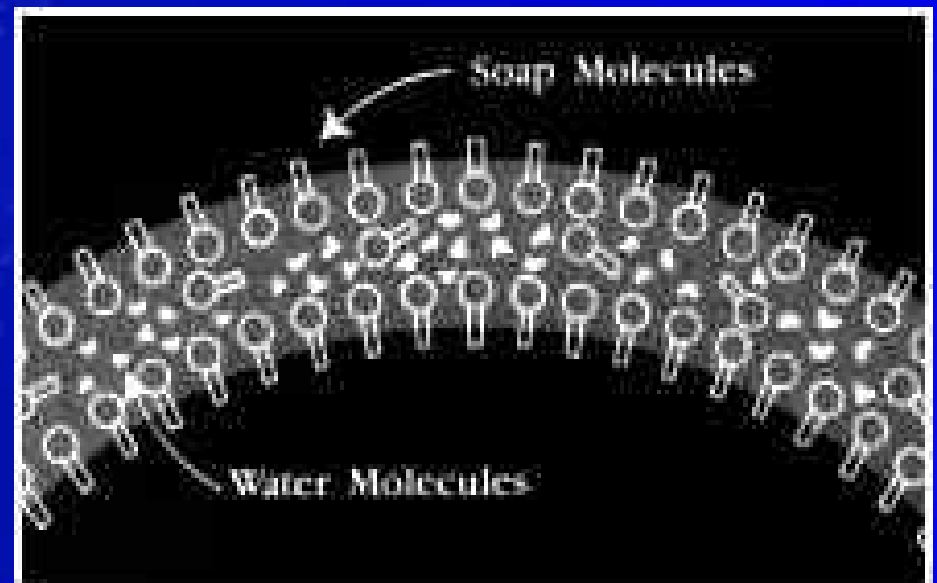
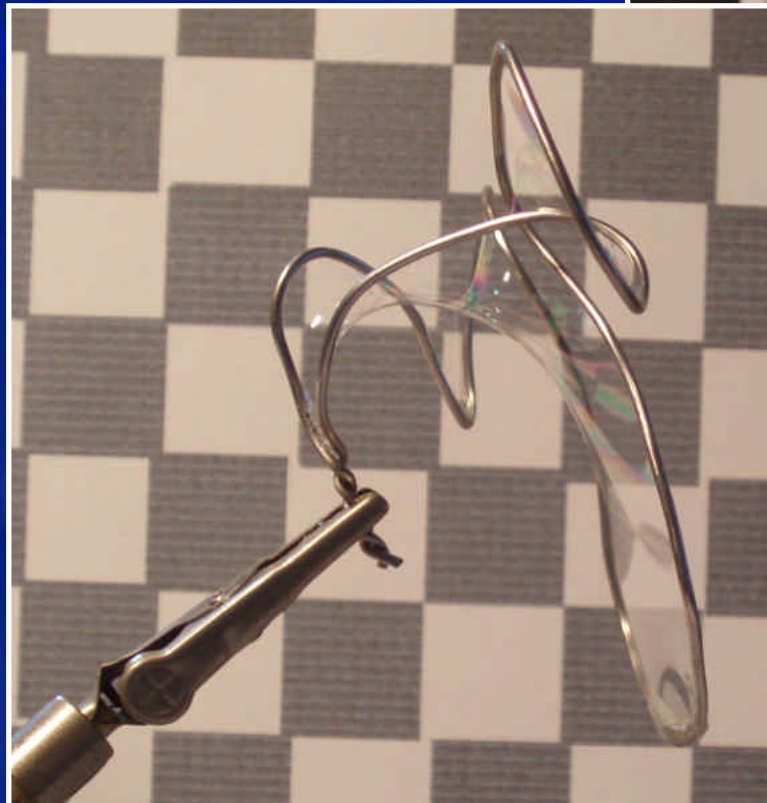
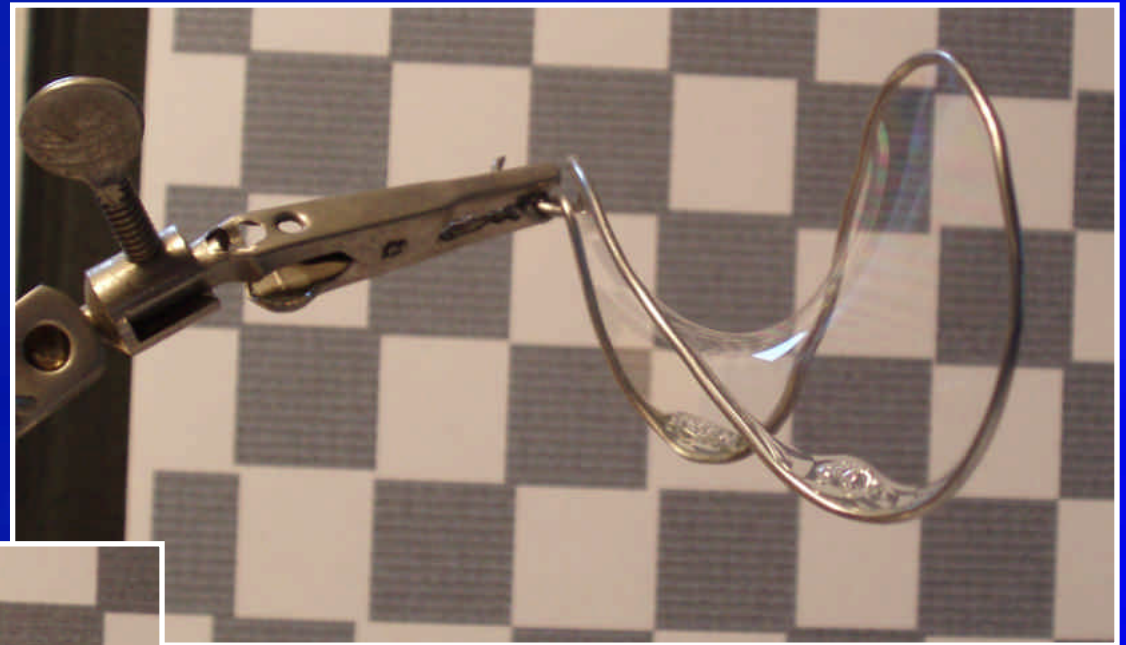
- samendrukking oppervlak
- vlies zoekt naar minimale spanning



GRID RELAXATION

Zeepvlies

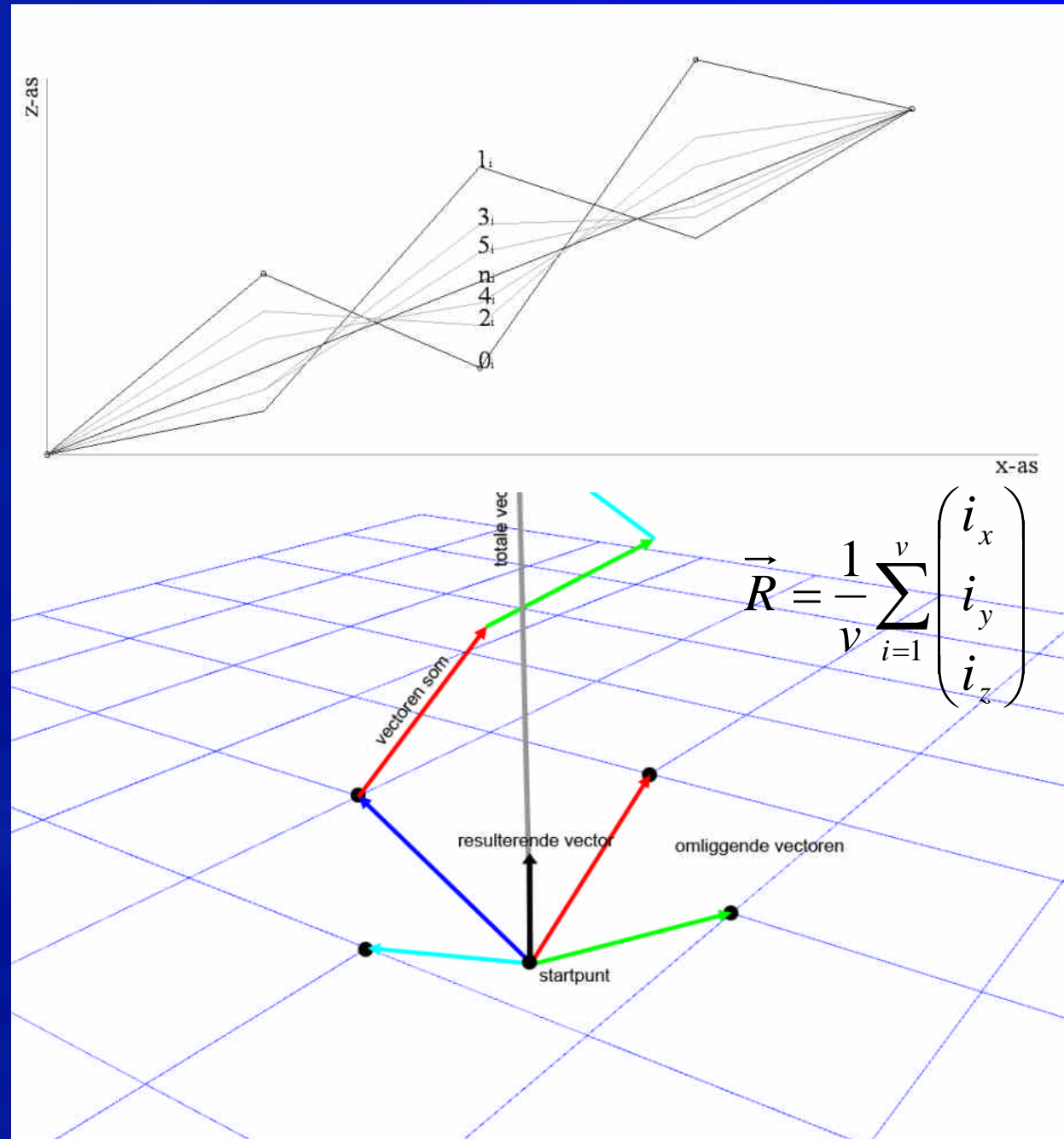
- minimal surfaces
- kleinste oppervlak
- zadelvormige vlakken



GRID RELAXATION

Theorie:

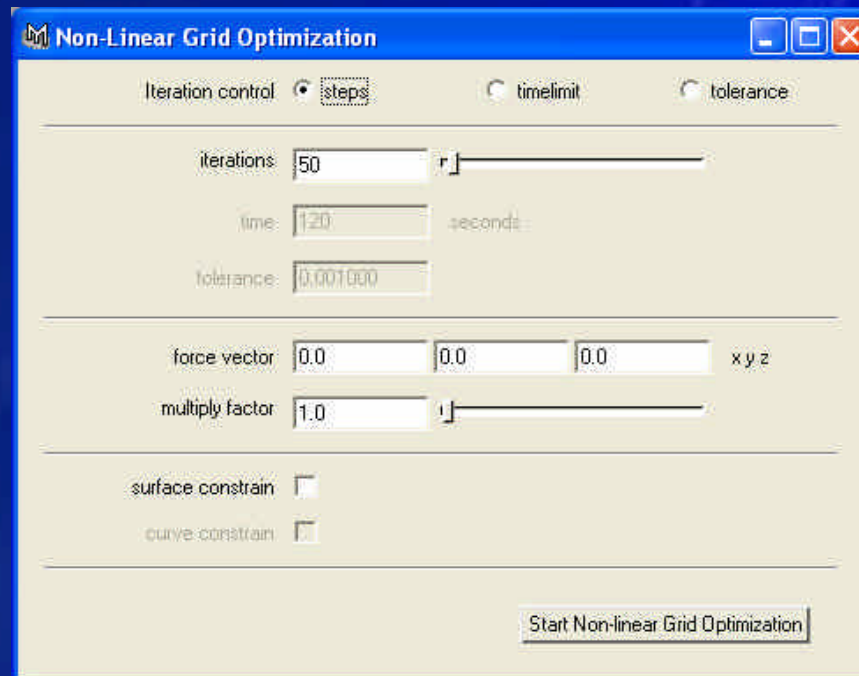
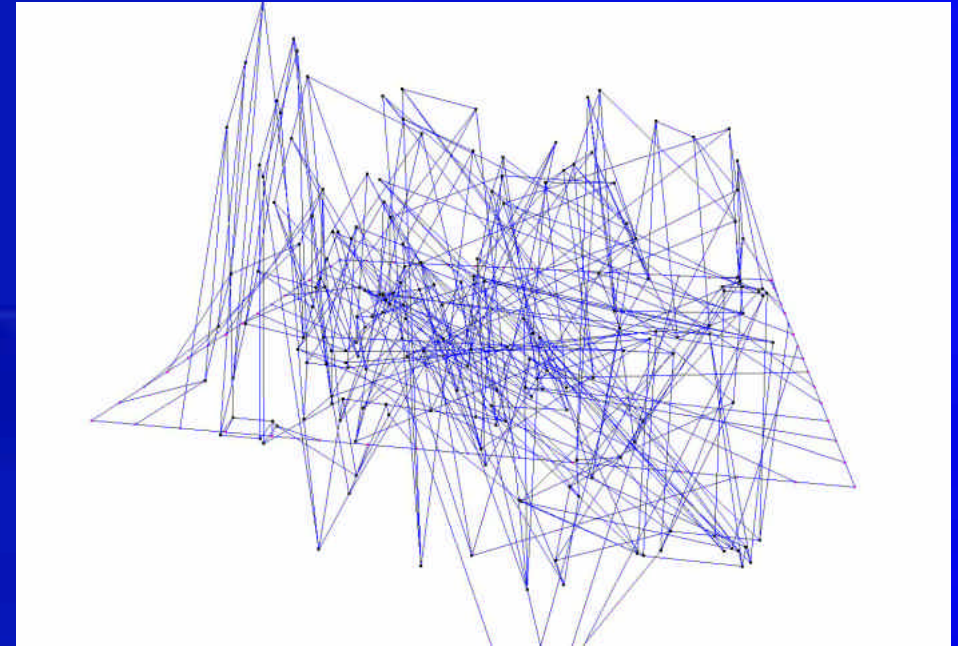
- evenwicht
- alle punten



GRID RELAXATION

Uitvoering

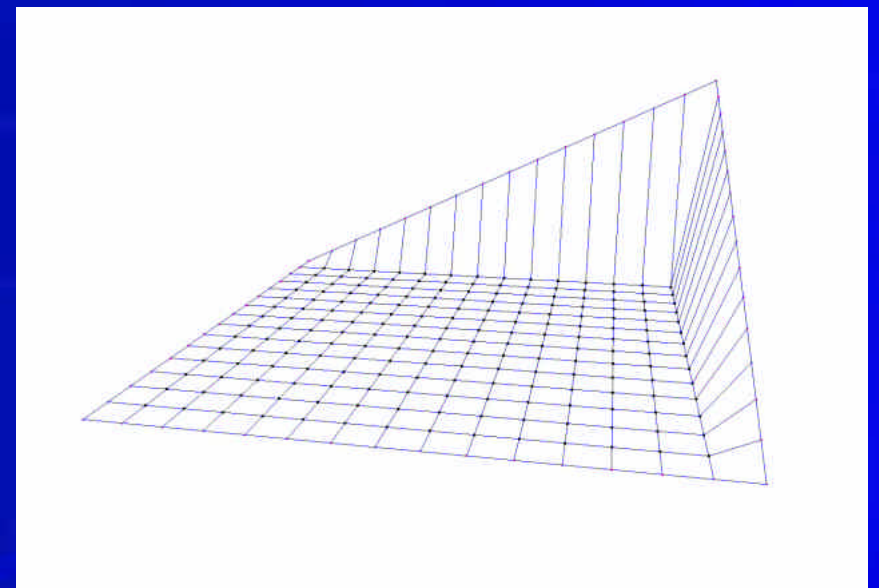
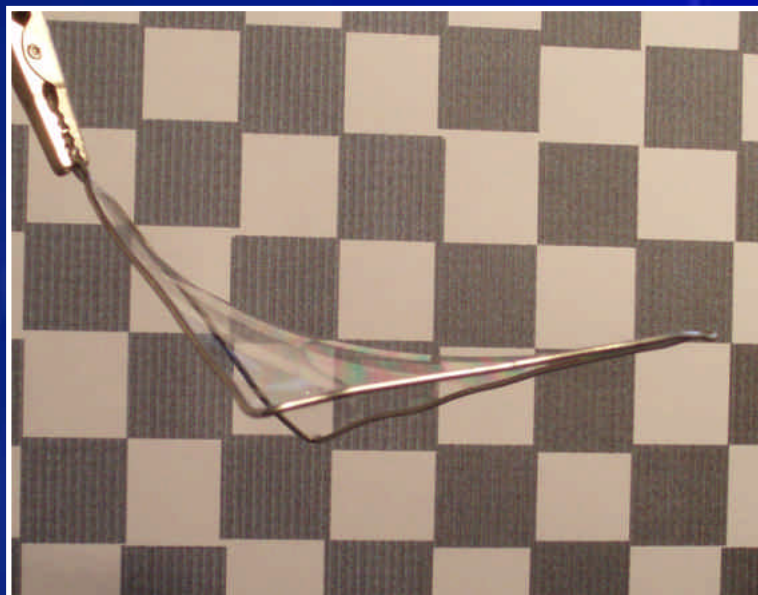
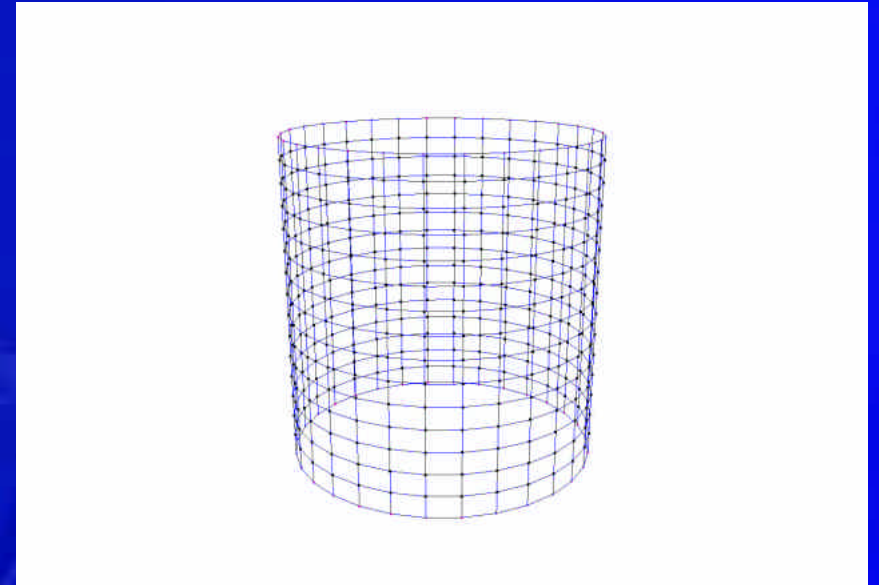
- 524 regels Melscript in Maya
- uitgebreid menu
- minimal surfaces
- grid relaxation op vrije vorm



GRID RELAXATION

Grid relaxation tool

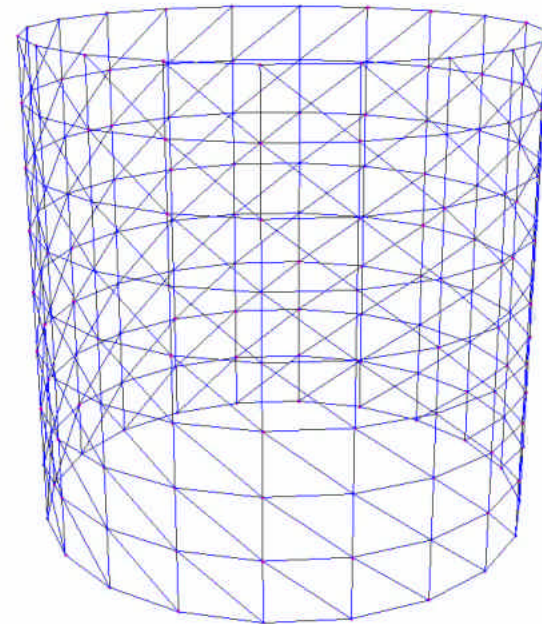
- script vergelijking met zeepvlies
- minimal surfaces
- catenoïde
- hyper vlak



GRID RELAXATION

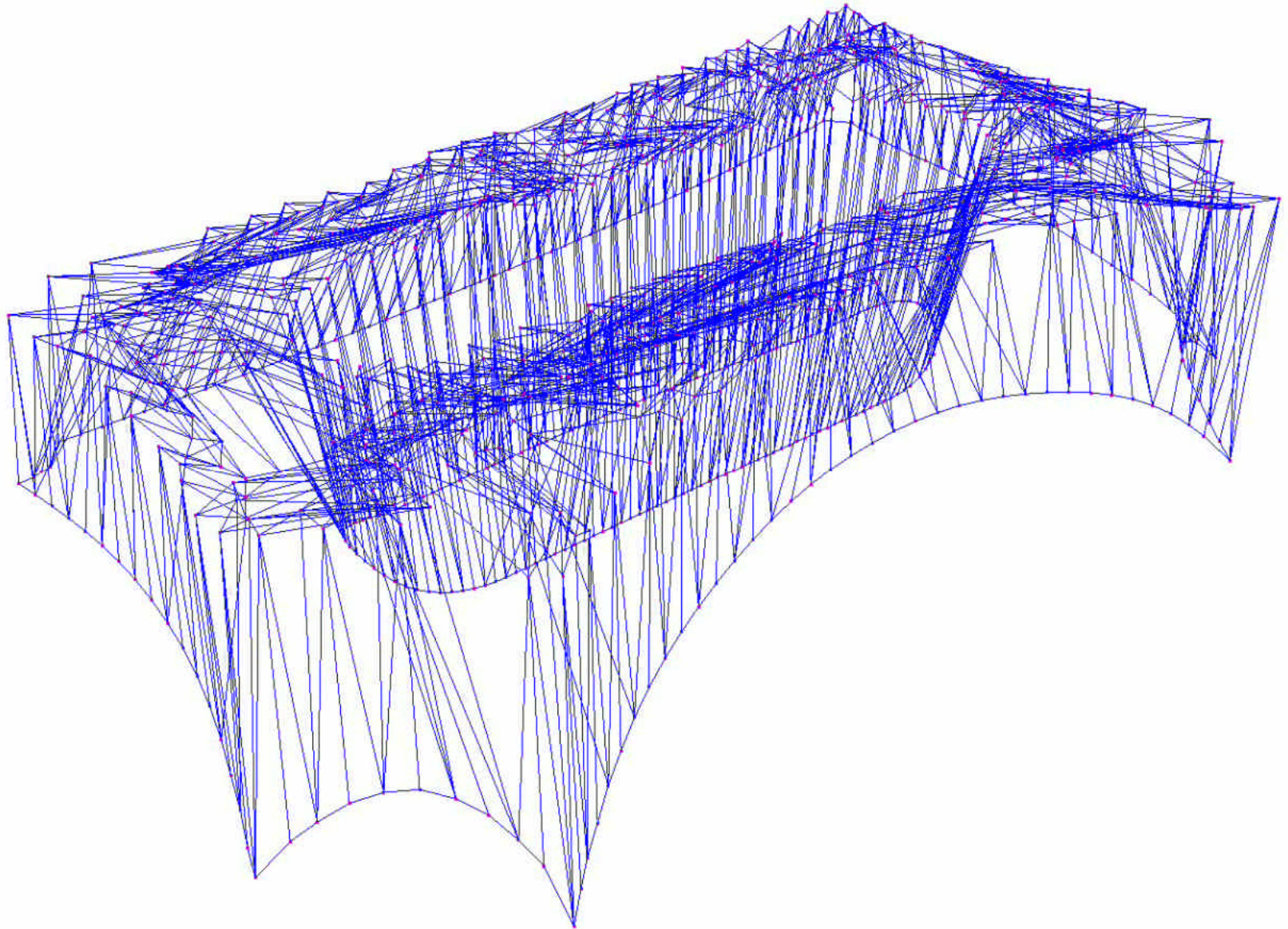
Grid relaxation

- grid blijft bestaande Bestaande vorm volgen

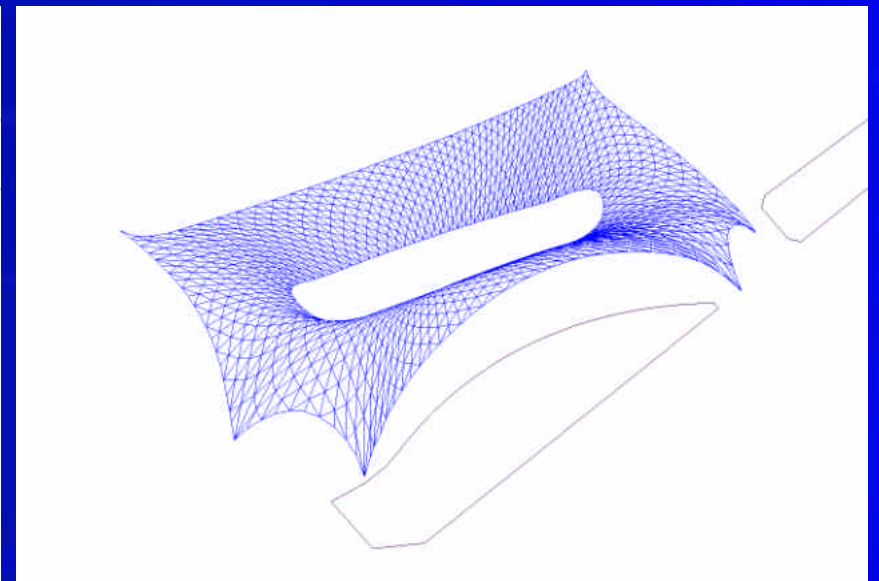
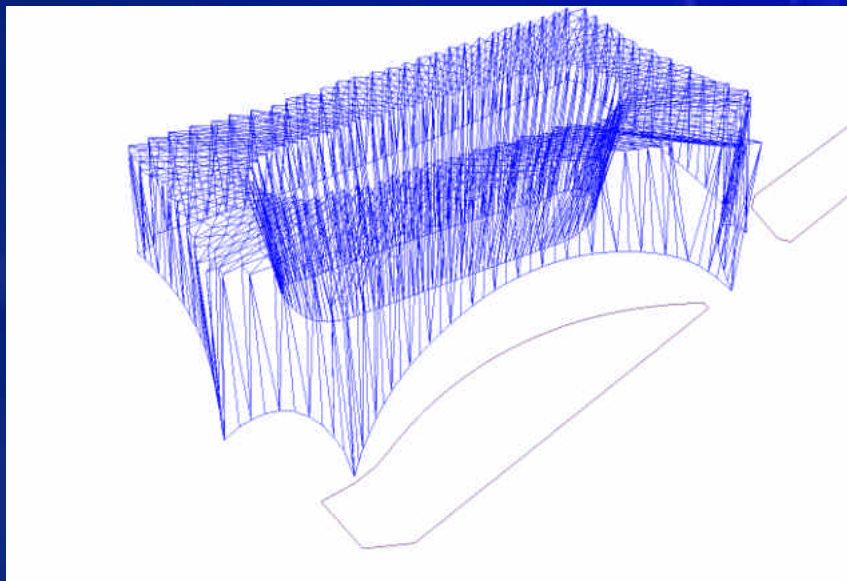
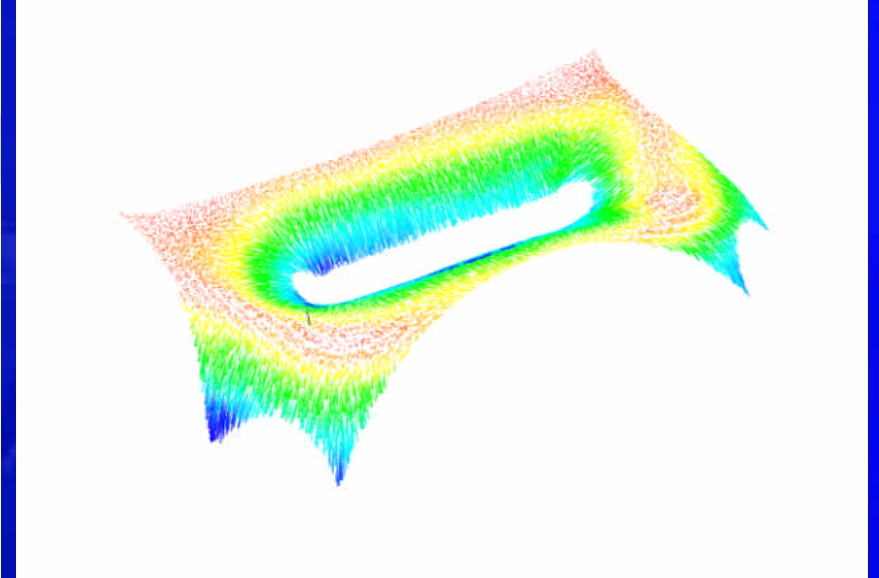
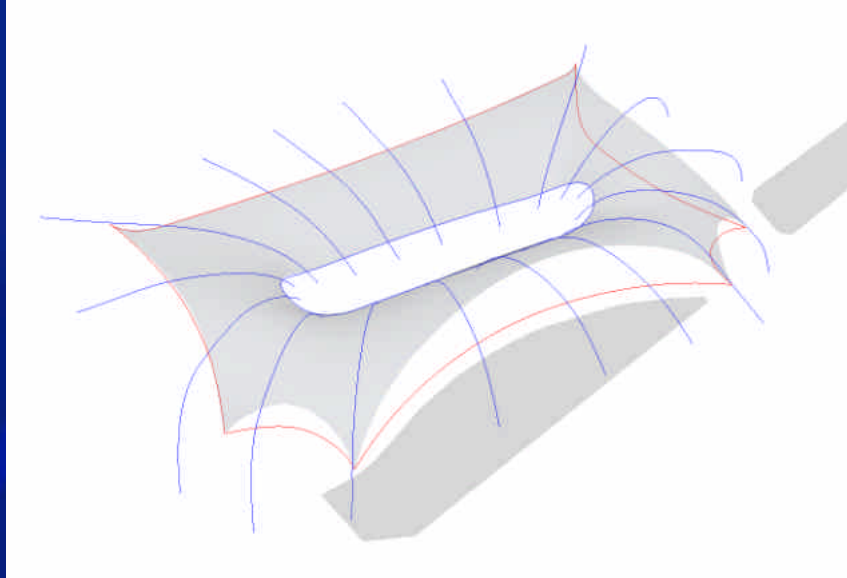


GRID RELAXATION

Grid relaxation op ontwerp



GEBRUIK TOOLS



RAIN ANALYSIS

Doel Rain Analysis:

- zoeken juiste vorm van vrij gevormde schaal voor goede krachtsafdracht

Hypothesis:

- zoals een regendruppel willen krachten afvloeien via de steilste helling van een oppervlak naar de opleggingen

Paper:

- The relationship of form and force in (irregular) curved surfaces

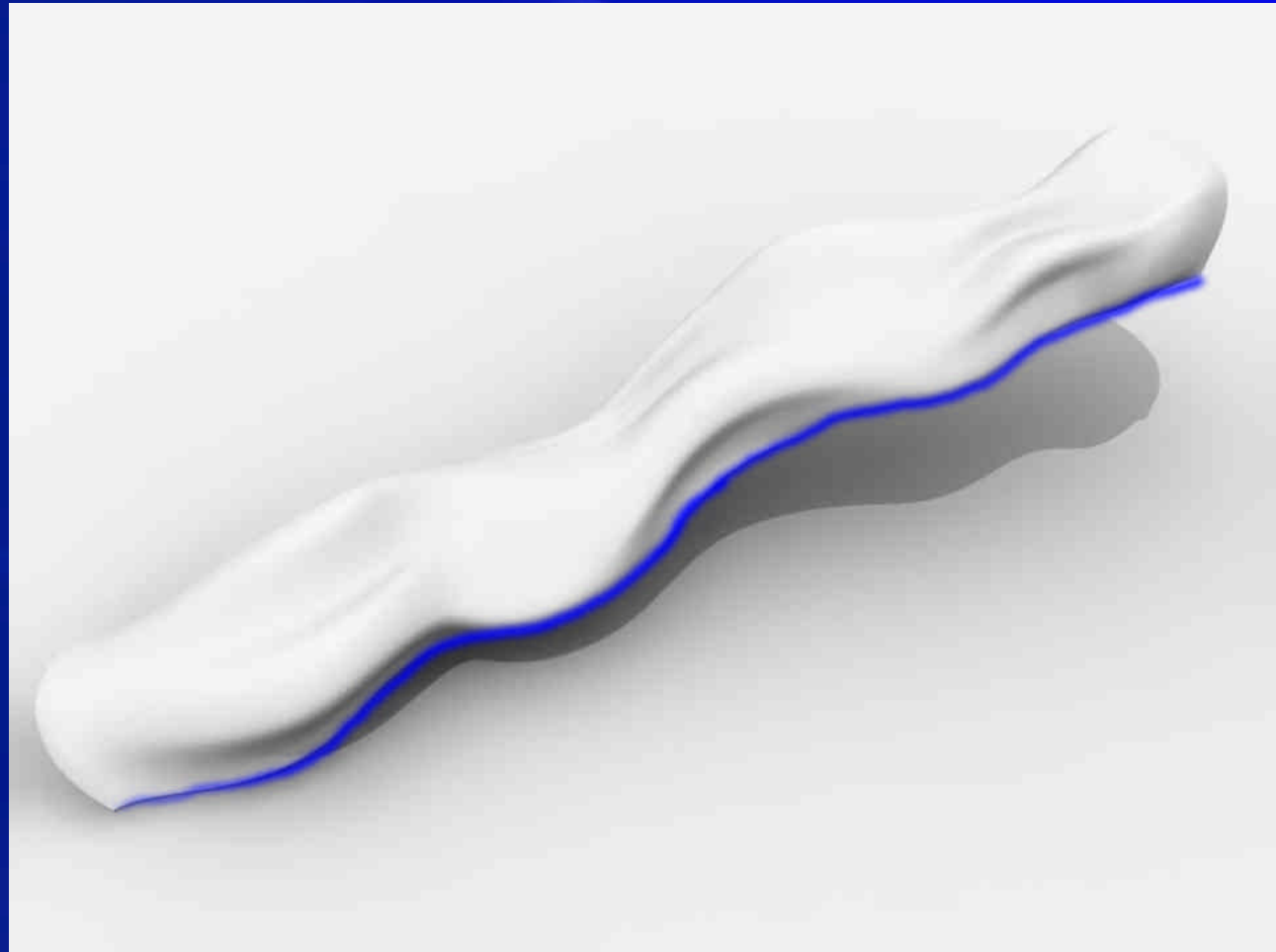
Andrew Borgart, Marck de Leuw, Pierre Hoogenboom

Tool:

- krachtige tool die ontwerper ondersteunt in de vormgeving van de schaal zonder zware EEM programma's te gebruiken

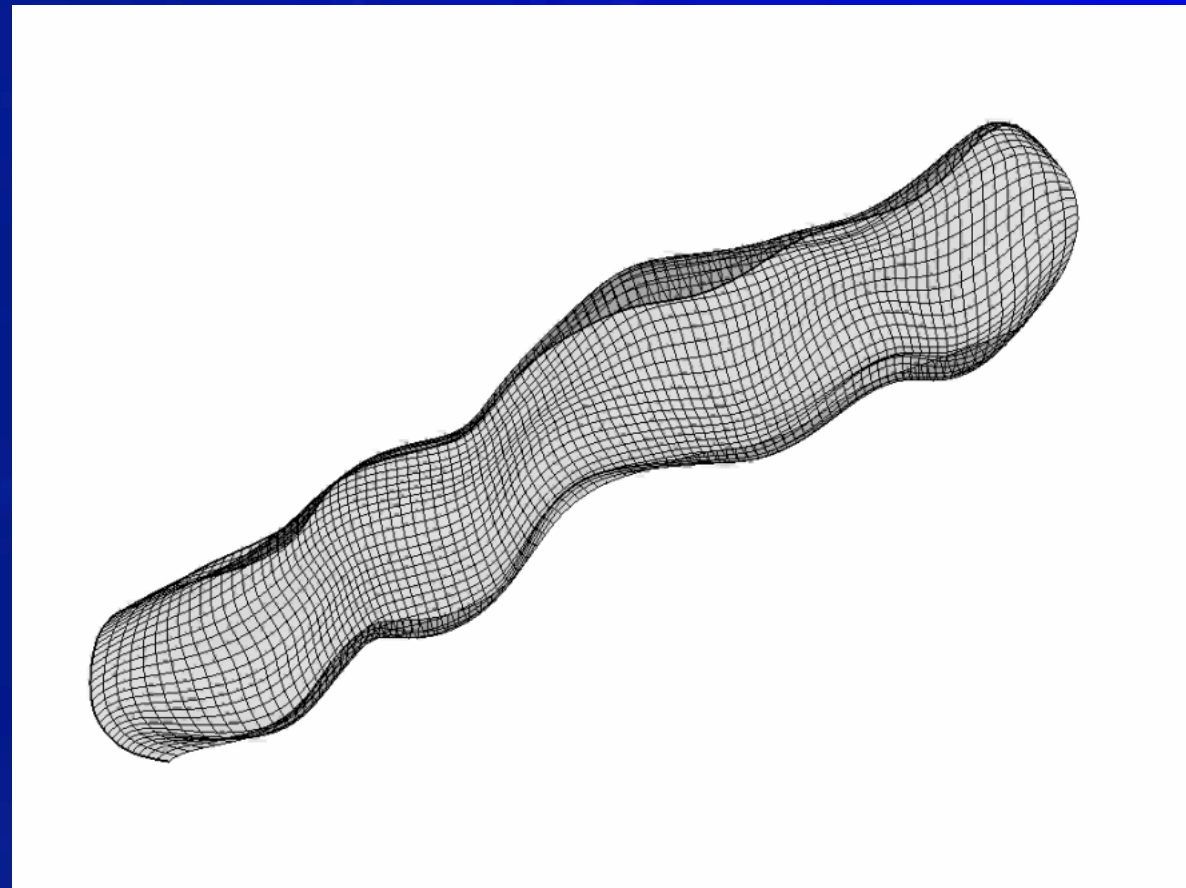
RAIN ANALYSIS

- case study: SnowPalace, H.Hanselaar
- overdekte skihal
- oplegging langs de lange zijden



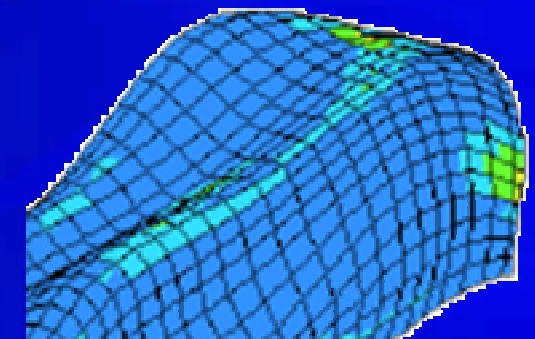
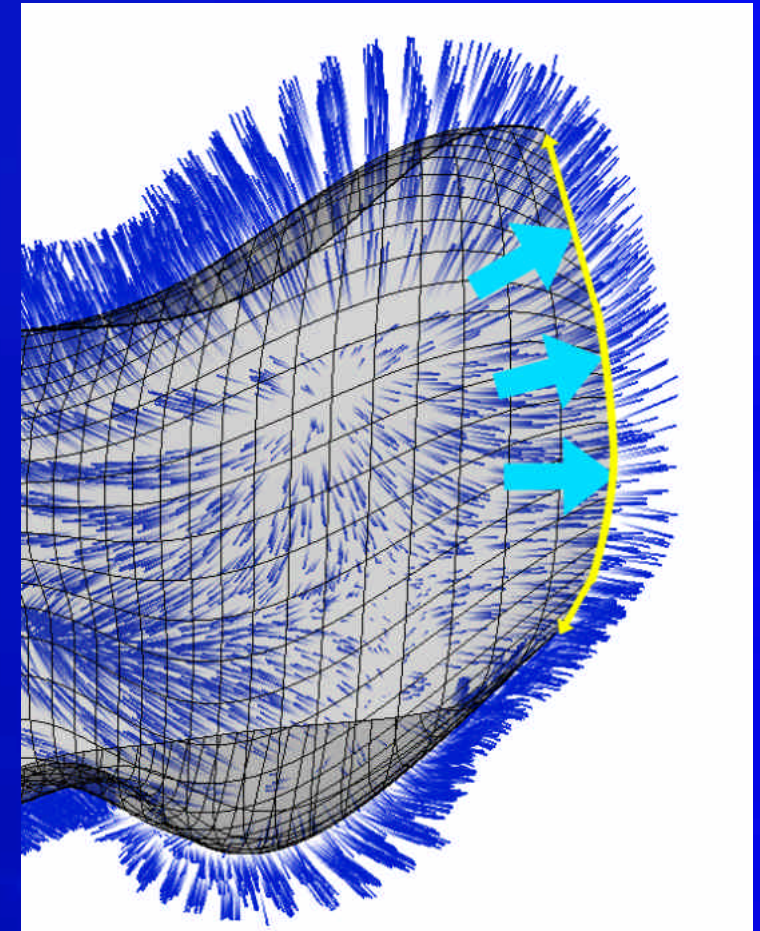
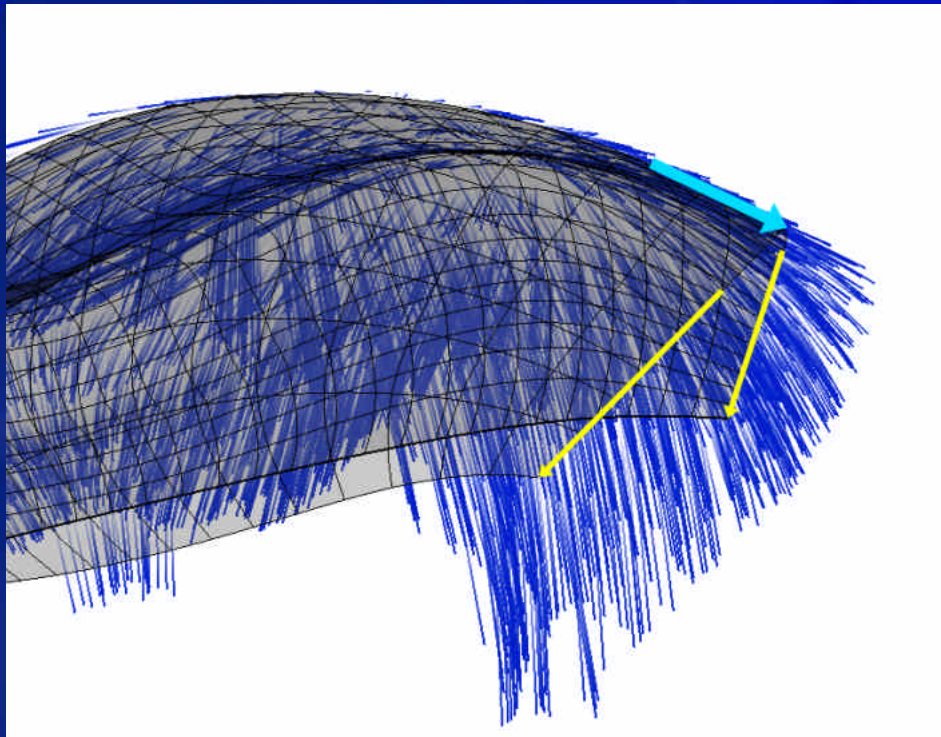
RAIN ANALYSIS

- particle routine ontworpen in maya
- eerste die theorie omzet naar computermodel
en gebruikt als ontwerper



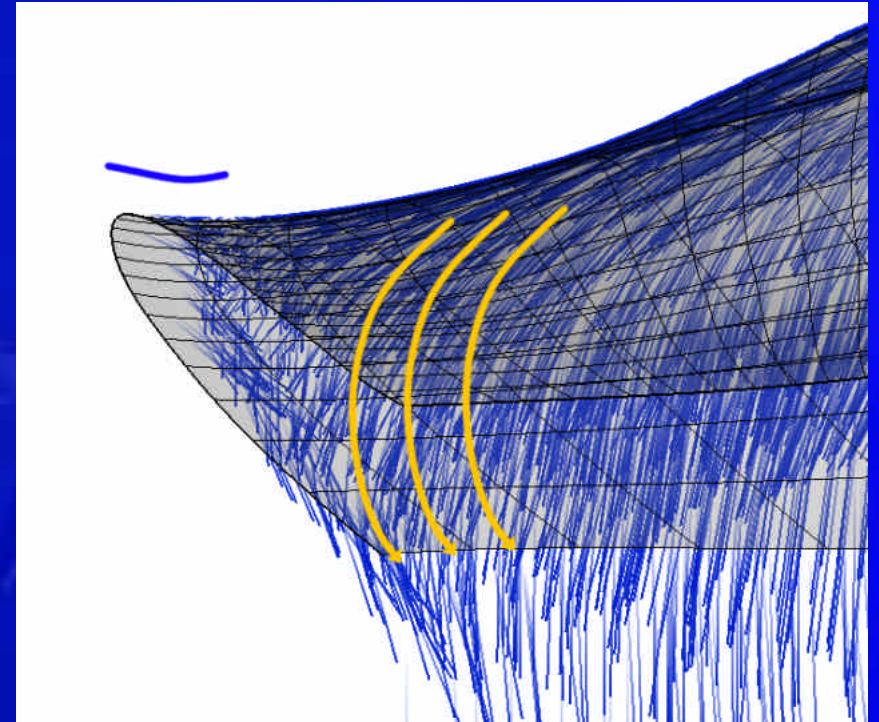
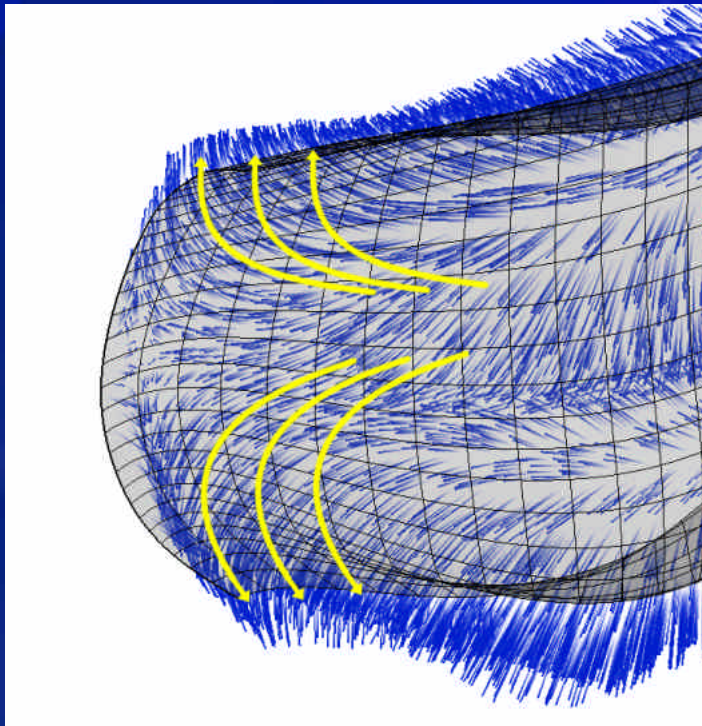
Vrije rand

- steilste helling leidt niet tot oplegging
- krachten worden afgebogen onder 90° naar de opleggingen
- storingsveld in de rand



Oplossing

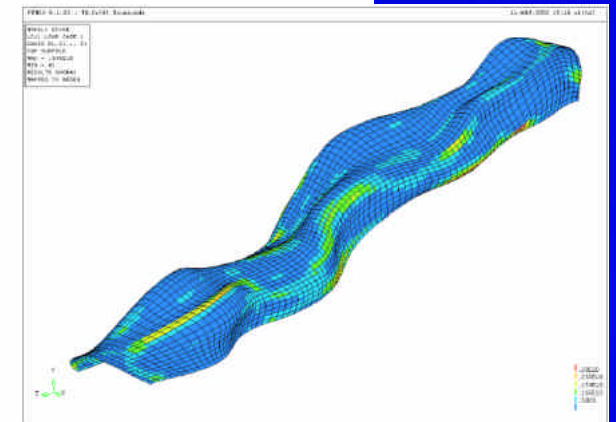
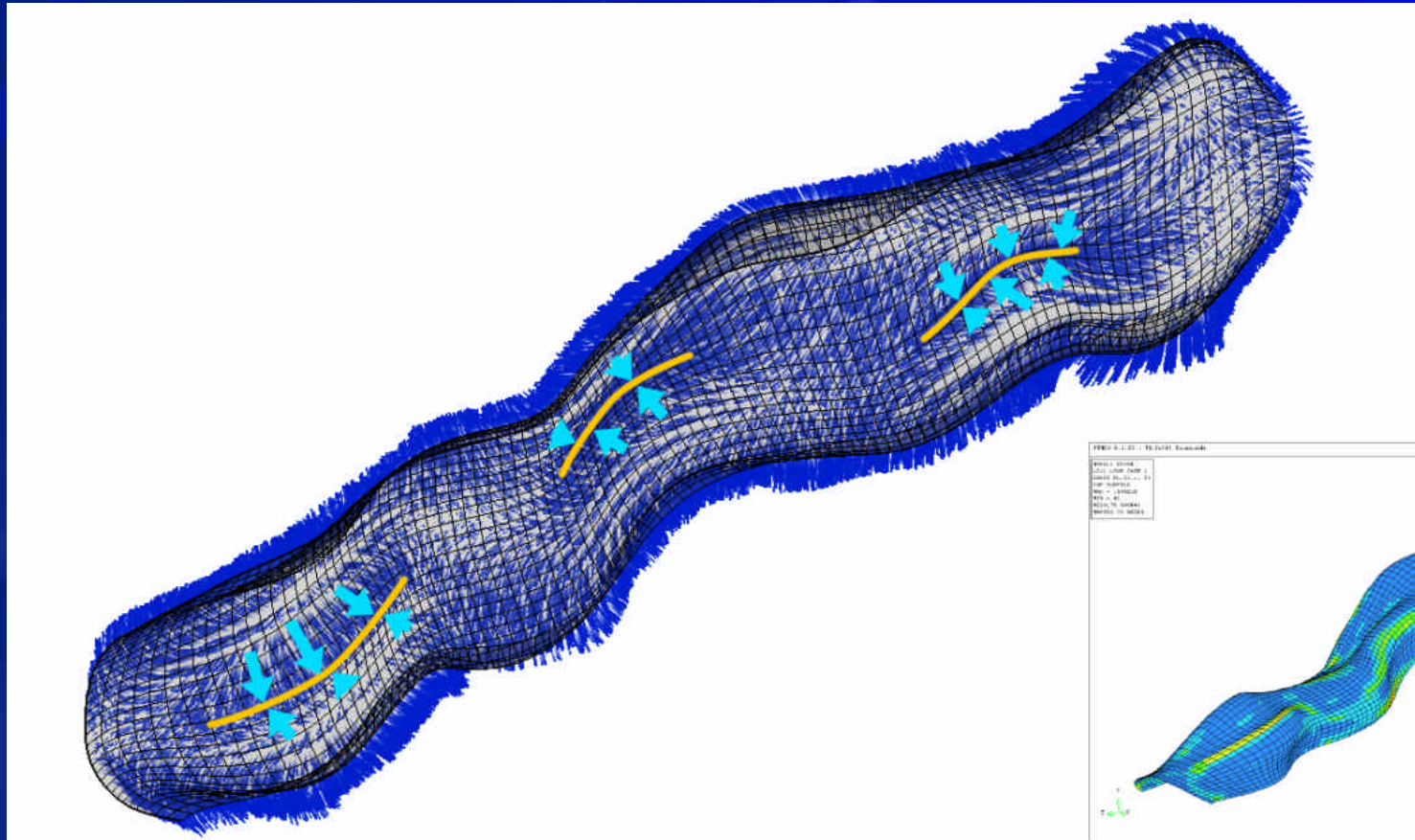
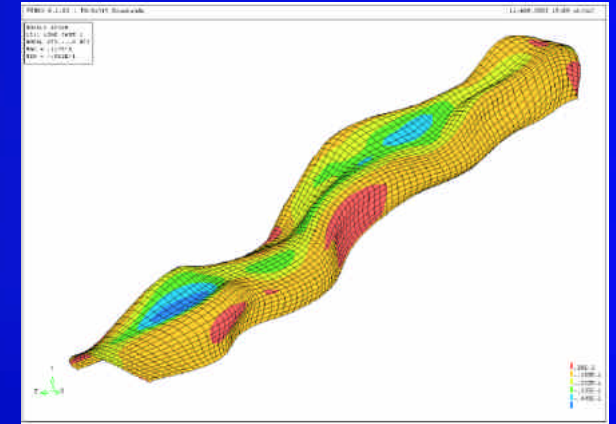
- opstaande rand
- vloeiende geleiding krachten naar opleggingen
- geen compenserende krachten



RAIN ANALYSIS

Drainlines

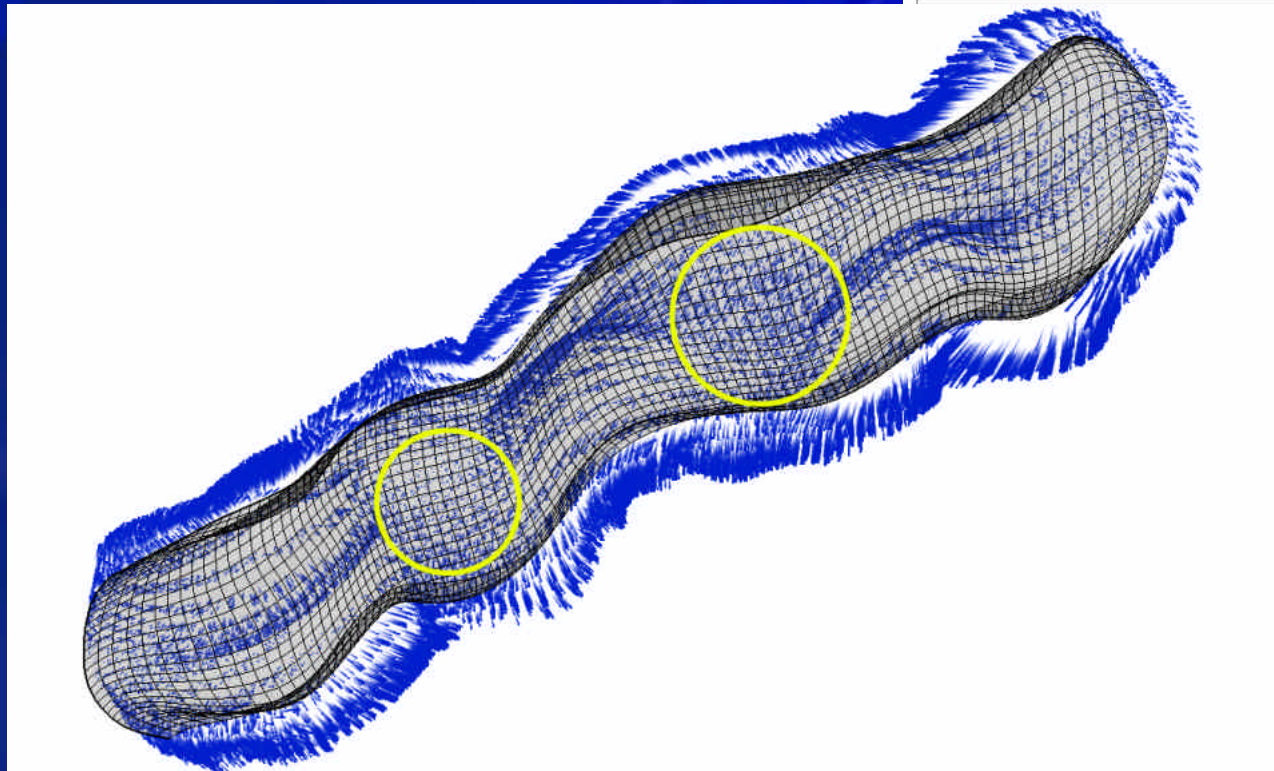
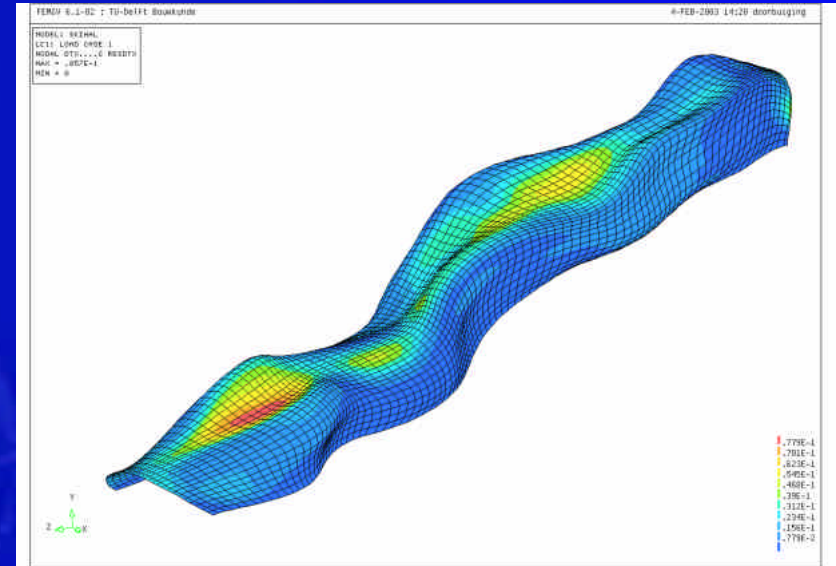
- afwateringskanalen
- krachten worden sterk afgebogen
- storingsveld krachten



RAIN ANALYSIS

Snelheid

- lengte van de partikels
- horizontaal vlak, trage partikels
- doorbuiging



Conclusie

- Vermijd sterke afbuigingen in de afvloeiende krachten
- Laat krachten afstromen richting de opleggingen
- Zorg voor een zekere afstroomsnelheid
- Vermijd overhellende gebieden

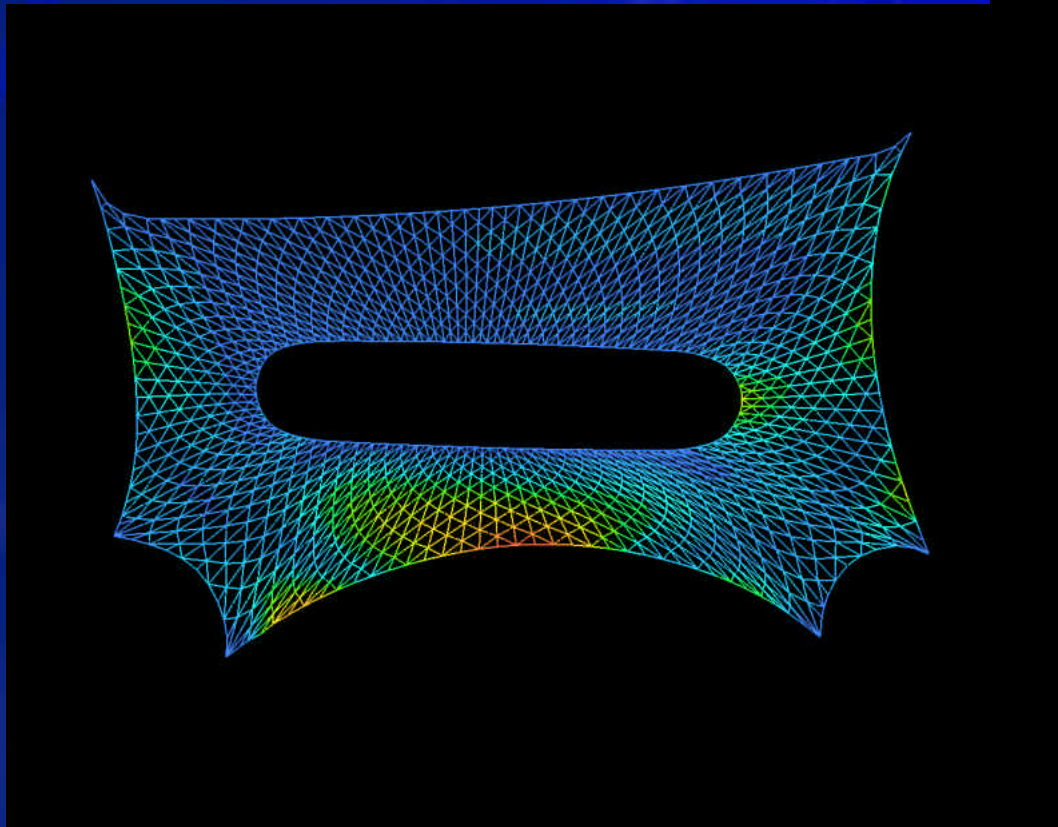
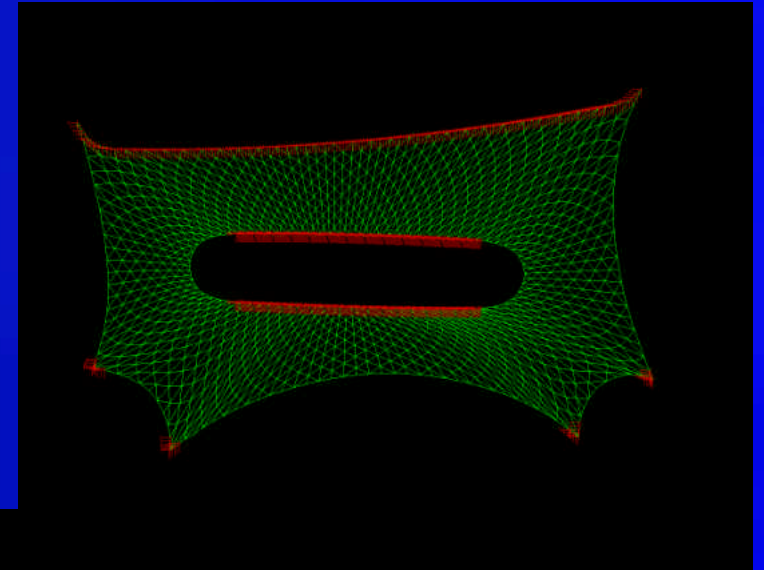
RAIN ANALYSIS

- Rain Analysis leidt tot uiteindelijke vorm
- Problemen weggewerkt



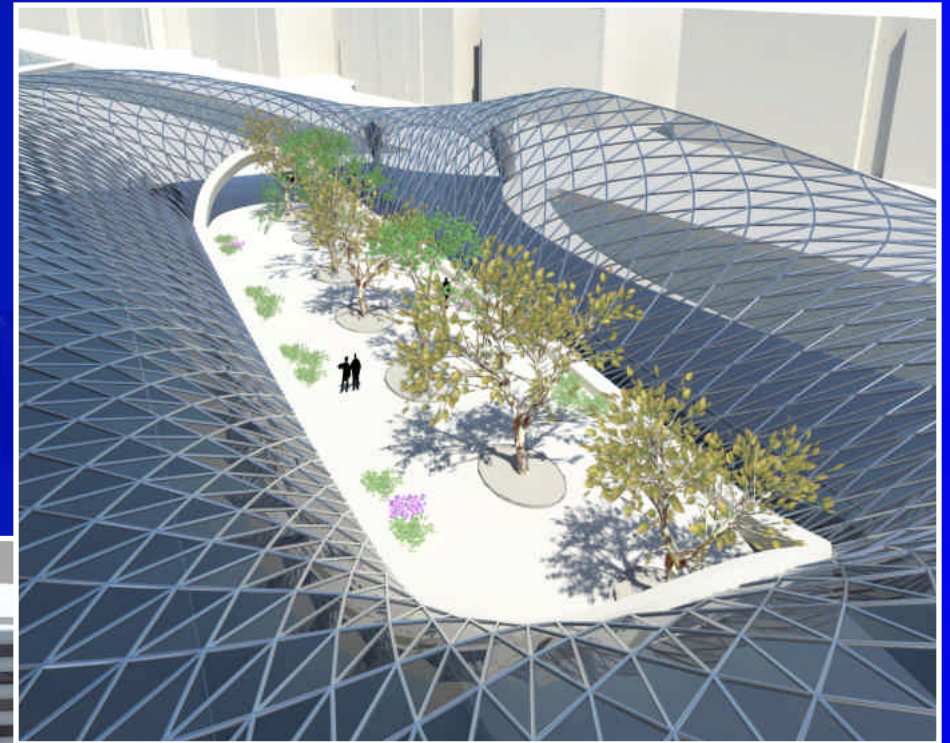
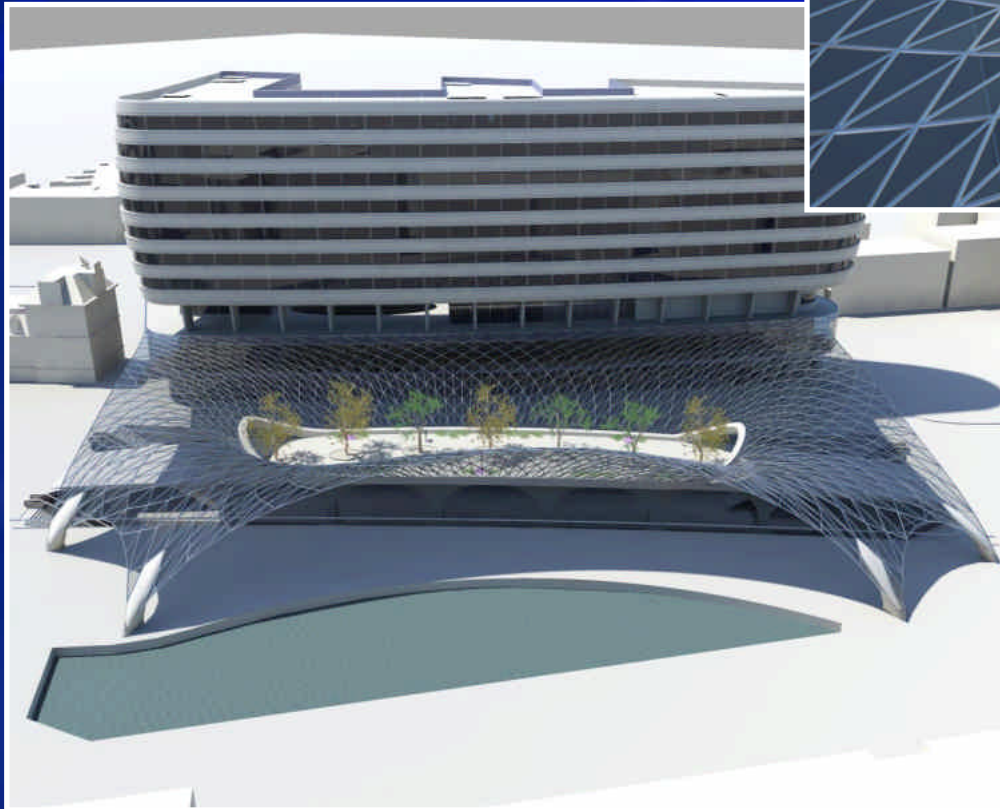
EEM

- berekening gridschaal ter controle
- uiteindelijke dimensies constructienet



GRIDSCHAAL

Eindresultaat gridschaal



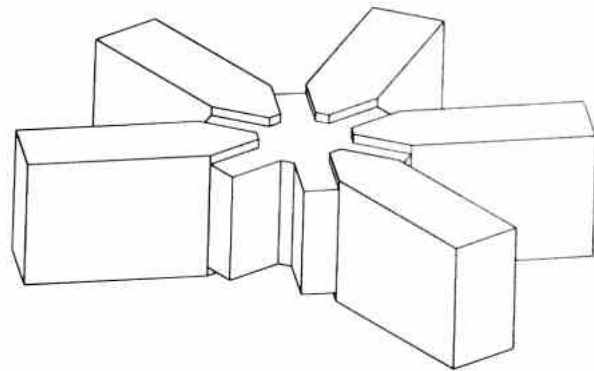
FILM STADSKANTOOR - STATION



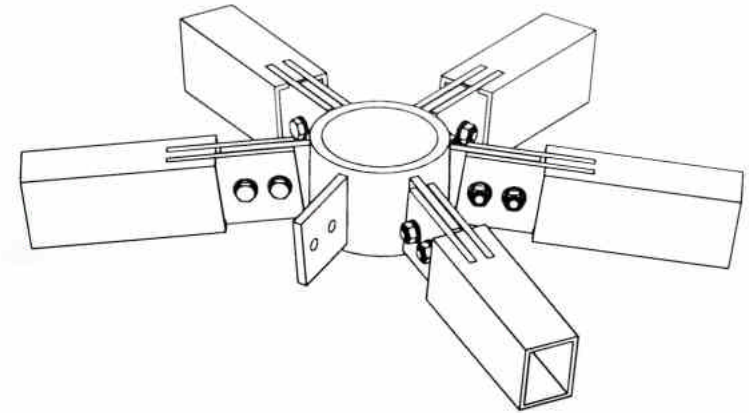
EINDE

Zijn er nog vragen?

End-face connectors



End-face connector



Splice connectors

Bucking Analysis

