Substantiate Structuralism
Give reason for preservation or transformation
Content
Testing to formulate a position

A. Theoretical background

B. Urban context in relation to site

C. Building clusters in relation to units

D. Choosing a position

E. Technical details connecting old and new

F. Conclusion: position
“For all their differences, the team 10 members originally shared an aversion to CIAM’s analytical functionalism and a desire to conceive the built environment in terms of human interrelations and associations”.

Quote. Francis Strauven: (Mellon Lecture 24 May 2007)

*Shaping the new reality from the in-between to the aesthetics of number*

Fig. Unite d’habitation - Le Corbusier, Burgweeshuis - Adlo van Eyck, Centraal Beheer - Herman Hertzberger
Studio excursion
Units. Flexibility. Building/City. collective interactions

Fig. Exursion photos: t’Karregat, Burgweeshuis

Fig. Exursion photos: Raadhuis Ter Aar, Cubus houses
Getting started
Archive visits, building analysis, concept sculpture.
Personal understanding of the themes

Units

Flexibility

Building/City

Collective interactions

“Dialectics is not a method for generating predetermined outcomes but it is a method of study of social process: interrelations, development, transformation” (Herman Hertzberger).
Fig. Photo: Joop van Stigt in Amsterdam; dual timeline of J. van Stigt buildings (x) vs architectural movements (y)
Common themes: Humanities
Faculty Leiden University

Units. Flexibility. Building/City. Collectivity.

The units Joop van Stigt designed are still dominant and define the building. If one or more of these units are removed or changed, the character of the building is altered.

Joop van Stigt created several indications for expanding his plan. For instance, the columns in the park and space for power outlets on the roof. In reality, changes are made not in extending the building in horizontal or vertical direction. Rather, the floor plans are changed due to the easy removal of interior walls.

Although in floor plan the city is moving into the building in reality these transitions of spaces are a bit separated from each other, creating disconnected ‘islands’.

Joop van Stigt had a vibrant environment in mind where people would meet each other outside the buildings but the buildings functions on their own and people rarely move out.

Fig. Group heritage and building analysis
State of situation today?
Fig. Public square, courtyard, entrance hall, first floor stair case, interior experience of existing roof
Problem/research question:
Testing to formate a position

What is the range of possible transformation to a structuralism building in relation to heritage value and future use?

Preserve/reveal?  Transform/cover?
What is structure?
What is fixed and what can change?

Fig. Steward Brand - Layers of a building and the lifespan of each layer
Design question:
How to test the two opposite positions within the limits for possible transformation for future use while preserving the original concept.

Fig. Dual opposite design approach
Fig. Diversity of learning spaces today vs forty years ago
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Site plan
Design proposal South and North Cluster
“Dialectics is not a method for generating predetermined outcomes but it is a method of study of social process: interrelations, development, transformation” (Herman Hertzberger).
Demolition

South cluster ground floor plan

- Remove interior finishes
- Cover the structure with a new surface
  (thermal bridges)

North cluster ground floor plan

- Remove existing facade
- Cover the structure with new skin
  (thermal bridges)
East elevation old
South cluster, Wittesingel
West elevation old
South cluster, Trekvliet
East elevation old
North cluster, Wittesingel
West elevation old
North cluster, Trekvliet
Timber Structure
South Cluster
Curtian Wall
South Cluster
Roof
South Cluster
Reprogram
North Cluster

- Seminar Centre
- Collaborative Courtyard (Living Room)
- Student Admin
- Collective Courtyard (Living Room)
Platforms
North Cluster
Skin
North Cluster
Additional Level
North Cluster
Reuse
North Cluster
Content
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F. Conclusion: position
South cluster
Ground floor unit plan
South cluster
First floor unit plan
South cluster
Second floor unit plan
South cluster

Section C - C, Scale 1:250

Section D - D, Scale 1:250
Fig. Sequence of perspective views South Cluster: Alleyway along park, entrance under platform, living room between classrooms, collective platform introduced into atrium
Fig. Sequence of perspective views South Cluster: Transformed lecture office interior, second floor open work desks below new atrium roof with view to greenery on outdoor terrace, preserved exterior appearance from Wittesingel square.
North cluster
Ground floor unit plan
North cluster
First floor unit plan
North cluster
Second floor unit plan
North cluster
Third floor unit plan

Atrium roof
North cluster
Cross section

Section A - A, Scale 1:250

Section B - B, Scale 1:250
Fig. Sequence of perspective views North Cluster: Entrance approach under pergola, new foyer with doors towards courtyard atrium, covered atrium with preserved walls from courtyard, canteen with experience of ceiling and columns
Fig. Sequence of perspective views North Cluster: View towards other atrium, preserved original furniture in PHD centre, view of collaborative platforms in the courtyard. Reading corner on old concrete slab and below new added floor level.
Content
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Original structural diagram across entire site
Dialectics design method evaluation

Floor area = 15745 sqm
8% new
92% old

Floor area = 13730 sqm
25% new
75% old

Material preserved:
Red brick skin exterior

Material preserved:
Exposed aggregate concrete (gewassen beton) surface interior
Fig. Spatial result of office interior due to surface transformation approach in comparison to skin transformation approach
(Final conclusion: transform the skin and preserve surface materials and experience of Structuralism for future users.)
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Deconstruction process of timber roof structure

Fig. Cartoon of the deconstruction process of the existing timber roof structure to be reassembled one floor level up. Embodied energy in material preserved and cultural value of roof structure reused.
1 - New 420x180 steel I beam cladded in redwood timber box with opening latch to access service cables.
2 - New IJC composite timber floor joist beams spanning between 90x 140mm redwood laminated timber beams. Plywood floorboard. 70mm suspended screed with integrated water piping system. Polished screed floor finish
3 - Base thickening of beam with timber blocks to support existing column above.
4 - Extension floor:
   250mm L-profile steel edge beam.
   Steel I-beam floor joist, 600mm spacing.
   Steel floor plate (30min fireproof rating)
   Acoustic floor insulation
   Redwood floor boarding
5 - Reused roof structure
Facade investigation

Reveal structure

Cover structure
Light glass curtain wall

Heavy concrete wall
Operable window: double glazing, aluminium frame. Colour: Ral 7009 Krensheimer Muschelkalk natural stone tile fixed to Halfen stainless steel support system. New timber floor structure: 450x140mm laminated redwood timber beams. I Joist compatible beams at 600mm spacing. New steel structure and timber floorboard attached to original concrete structure. Deconstruct existing roof and reassemble on Level 4. Additional insulation to be added above old roof structure. New 150mm parapet upstand. New roof trim cladded in zinc sheeting. Demolish old facade and replace with new timber frame construction wall or glazed curtain wall. To be supported on new prefabricated concrete foundation.
Fig. Perspective view illustrating new building installations and material finishes
Ventilation section

- **01 First floor**
  - Open desk

- **02 Second floor**
  - Open desk
  - Meeting room

- **03 Third floor**
  - Lecture room

- **04 Fourth floor**
  - Library collection

- **Basement**
  - Car and bicycle parking
Ventilation plan
Heating and cooling aquifers
Materials old
Materials new
Content
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Position

As heritage architect

Key:
- Intervention exterior skin (NORTH CLUSTER)
- Intervention interior surface (SOUTH CLUSTER)
Concluding remark: By sacrificing a layer (skin/surface) the thermal bridges may be resolved. Through the analysis, old building materials may be recovered and reused by creating simple detailing solutions. The university learning environment may continue to enjoy the spirit of structuralism which is revealed to its future users.
Thank you for listening!

Questions?
Substantiate Structuralism

Technical Booklet
Michelle Bettman
Detail F
Green roof and facade cladding

1 - New 420x180 steel I beam cladded in redwood timber box with opening latch to access service cables.
2 - New IJC composite timber floor joist beams spanning between 90x 140mm redwood laminated timber beams. Plywood floorboard. 70mm suspended screed with integrated water piping system. Polished screed floor finish
3 - Base thickening of beam with timber blocks to support existing column above.
4 - Extension floor:
   - 250mm L-profile steel edge beam.
   - Steel I-beam floor joist, 600mm spacing.
   - Steel floor plate (30min fireproof rating)
   - Acoustic floor insulation
   - Redwood floor boarding
5 - Reused roof structure
Ventilation compartments

South cluster

North cluster
Ventilation section
Ventilation plan
Heating and cooling aquifers

South cluster houses

North cluster houses

South cluster plein /square

North cluster plein /square
Operable window: double glazing aluminium frame.

Krensheimer Muschelkalk natural stone tile fixed to Halfen stainless steel support system.

New timber floor structure: 450x140mm laminated redwood timber beams.

I Joist compatible beams at 600mm spacing

New steel structure and timber floorboard attached to original concrete structure

Deconstruct existing roof and reassemble on Level 4.

Additional insulation to be added above old roof structure.

New 150mm parapet upstand.

New roof trim cladded in zinc sheeting.

Demolish old facade and replace with new timber frame construction wall or glazed curtain wall.

To be supported on new prefabricated concrete foundation
Detail A
Reused and externally insulated roof edge

1 - Kingspan 60mm OPTIM-R roof insulation
2 - 47x100mm Existing timber upstand beam
3 - 214mm reused roof timber panels
4 - Zinc coping profile
5 - 22mm plywood timber cornice
6 - Steel L-profile connecting cornice to sandwich panel
Detail B
Green roof and facade cladding

3 - Added floor system:
   - 65x250mm C channel beam
   - 240mm I-profile steel beam
   - Steel floor plate (30min fire proof rating)
   - Acoustic insulation layer
   - 22x100mm redwood wooden floor

4 - Prefabricated timber wall sandwich panels (3600mmx1800mm)

5 - 450x300x47mm Muschkalk natural stone fastened to Halfon Aluminum frame

6 - Wall bracket to attach aluminum frame though closed aluminum wall panel to the C-channel beam
Detail C
Operable window

1 - Stabalux ZL-S double glazed curtain wall facade system, midway small t profile mullion
2 - Operable double glazed sliding window
3 - Terracotta ceramic tile solar shading.
Detail D
Floor extension and facade cladding

1 - Floor extension structure:
   65x250mm C channel beam
   240mm I-profile steel beam
   Steel floor plate (30min fire proof rating)
   Acoustic insulation layer
   22x100mm redwood wooden floor

2 - Suspended ceiling

3 - Wall bracket to attach aluminum frame though closed aluminum wall panel to the C-channel beam

4 - Prefabricated timber wall sandwich panels (3600mmx1800mm)

5 - 450x300x47mm Muschkalk natural stone fastened to Halfon Aluminum frame
Detail E
Steel floor fastened to concrete slab
(reference: Reimagine the facade - TuDelft)

1 - New 70mm floating screed. Heating and cooling waterpipes integrated into floor. Polished screed floor finish.
2 - 225mm existing post tensioned concrete floor slab
3 - Existing redwood timber ceiling
4 - Extension floor:
   - 250mm L-profile steel edge beam.
   - Steel I-beam floor joist, 600mm spacing.
   - Steel floor plate (30min fireproof rating)
   - Acoustic floor insulation
   - Redwood floor boarding
5 - New ceiling
1 - Double glazed operable window
2 - 450x300x47mm Muschkalk natural stone fastened to Halfon Aluminum frame
3 - Concrete foundation prefabricated
4 - New 70mm floating screed. Heating and cooling waterpipes integrated into floor.
Linoleum floor finish. 100mm Insulation layer on top of new concrete floor slab
Detail G
Green roof and facade cladding

1 - New 420x180 steel I beam cladded in red-wood timber box with opening latch to access service cables.
2 - New IJC composite timber floor joist beams spanning between 90x 140mm red-wood laminated timber beams. Plywood floorboard. 70mm suspended screed with intergrated water piping system. Polished screed floor finish
3 - Base thickening of beam with timber blocks to support existing column above.
4 - Extension floor:
   250mm L-profile steel edge beam.
   Steel I-beam floor joist, 600mm spacing.
   Steel floor plate (30min fireproof rating)
   Acoustic floor insulation
   Redwood floor boarding
5 - Reused roof structure
South cluster
First floor plan
South cluster
Second floor plan
South cluster

Section C - C, Scale 1:250

Section D - D, Scale 1:250
North cluster
Ground floor plan
North cluster
First floor plan
North cluster
Second floor plan
North cluster
Third floor plan
North cluster
Cross section

Section A - A, Scale 1:250

Section B - B, Scale 1:250
Substantiate Structuralism

Sketch Booklet - North Cluster
Michelle Bettman
Substantiate Structuralism

Sketch Booklet - South Cluster
Michelle Bettman