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Introduction

1. Location - Indonesia, Bandung, Cigondewah
2. Situation - Cigondewah, kampungs RW2 and RW12
3. Climate data for Cigondewah - rainfall, sun path and wind speed and direction

4. Wind analysis - courtyard typology and row house typology
5. Vernacular urban layout and ventilation
6. Design progress - transformation of row house typology for good ventilation and social communication on 1x1 grid with possibility of additional spaces

7. Climatic principles - step 1 - lifting the house for better ventilation and flood protection
8. Climatic principles - step 2 - tilting the facades to the front to achieve shade all year round
9. Climatic principles - step 3 - adding butterfly roof for better ventilation and rainwater collection

10. Solid rammed earth walls and its advantages

11. Zoning of the building - public inside space, private inside spaces, public outside space and inner courtyard

12. Incrementality

stage 1
stage 2
stage 3

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Sustainable approach

- Sustainable approach
- Water and energy management on off-the-grid plot
- Sun protection and gaining the energy form it
- Ventilation through permeable structure
- Rain water harvesting and stormwater management
- River water purification through constructed wetland system
- Gray and black water management

Water flow diagram
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Urban plan

1. Creating roads with new connections near the river / creating constructed wetlands

2. Renaturalizing landscape with variety of levels / managing stormwater in the canals

3. Creating public spaces near and in canals and creating edible gardens

meeting terraces

the heart - main meeting point of whole neighbourhood

banana plantation

biogas station

second water collector
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Different ways of developing typology  1:100
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Facades 1:100

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Plans of a unit    1:50

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Ground floor

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First floor

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Second floor

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Prefabricated frames 1:20

- Air-tightening wooden beams
- Leveling up side beam
- Tracked independently rotating walls
- Reed sound insulation
- Additional bamboo poles
- Tracked independently rotating shutters with insulation infill

Horizontal cut through wall panels and connection with construction 1:10

1. Adding side, leveling up, L shape hardwood profile to the construction
2. Adding top and bottom, leveling up, L shape hardwood profile to the construction
3. Inserting prefabricated panels to the hardwood frame securing them from the back with hardwood planks
4. Securing the panels to the frame at the top and bottom by the hardwood pins

Use of natural materials

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Prefabricated frames 1:20

- Wooden frame of prefabricated panel 60x100mm
- Upper leveling up wooden beam 60x100mm
- Leveling up side wooden beam 30x200mm
- Prefabricated wattle and daub panels
- Bathing panel method
- Horizontal cut through wall panels and connection with construction 1:10

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removable frame with jute filter and decorative bamboo
upper ventilation opening
upper leveling up wooden beam 40x100mm
woven bamboo mat 10 mm
insulation from reed board 80mm
woven bamboo mat 10mm
leveling up side wooden beam 30x200mm
lower ventilation opening
wooden frame of prefabricated door panel 60x100mm
lower leveling up wooden beam 60x100mm
Wooden frame of prefabricated wall panel 60x100mm
removable frame with jute filter and decorative bamboo
upper ventilation opening
upper leveling up wooden beam 40x100mm
woven bamboo mat 10 mm
insulation from reed board 80mm
woven bamboo mat 10mm
leveling up side wooden beam 30x200mm
lower ventilation opening
wooden frame of prefabricated door panel 60x100mm
lower leveling up wooden beam 60x100mm
bamboo support transferring the vertical forces to the beams

double horizontal construction of bamboo beams Ø 100mm

fastening ropes

double horizontal construction of bamboo beams Ø 100mm

hardwood pins

bamboo support transferring the vertical forces to the beams

quadruple vertical construction of bamboo poles Ø 100mm

fastening ropes

double horizontal construction of bamboo beams Ø 100mm

hardwood pins

exchangeable lower end of column connected to the foundations

steel pins

steel plates anchored as deep in concrete as possible

foundation from concrete and stones
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Connection details 1:5

double construction at an angle of bamboo poles Ø 100mm

bamboo support transferring the vertical forces from the roof to the primary horizontal beams

fastening ropes
double horizontal construction of bamboo beams Ø 100mm

hardwood pins

bamboo support transferring the vertical forces to the beams

quadruple vertical construction of bamboo poles Ø 100mm

construction bamboo pole Ø 100mm

fastening ropes

side plates made from quarter-round culms of a larger diameter

hardwood pin

construction bamboo poles Ø 100mm

fastening ropes

secondary construction bamboo pole Ø 100mm transferring forces between connecting poles

hardwood pin
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Prefabricated frames - inside facade  1:20
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Prefabricated frames - outside facade  1:20