P5

The Cycle Pavilion in Brettenzone

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Brettenzone-unban recreational area
Brettenzone-exist cycle track
Strategy-Cycle network-cycle pavilion

Urban scale
Cycle track and 6 cycle facilities- strengthen the inner connection of Brettenzone, give Brettenzone a clear image

Building scale
cycle in building(cycle pavilion)- provide space and service to cyclists, at the same time, be attractors like landscape architecture
Design requirement - complex curved form

Fascination - materialization of complex geometry architecture

Context - Brettenzone, an urban natural area

Materialization of complex timber structure by digital fabrication

Digital fabrication
Technique research
Complex timber structure by 2.5D Digital Fabrication

Timber Structure

Digital Fabrication

Balance

Timber lattice construction system
Timber lattice construction system

Space grid(truss)

Reciprocal structure

Benefit of Reciprocal structure
a. easily fabricated wood-wood connection
b. side by side not end by end
c. mutually supported elements
d. feeling for nature
Free form for reciprocal structure

With standard profile, the reciprocal structure can achieve free form by three ways:

a. variation of the angle between different elements
b. variation of the length of each element
c. depth of each notch
Connection for reciprocal structure — Benefit of digital fabrication

Indoor-self stand by wood-wood connection only

outdoor-self stand by wood-wood connection with metal joint

The benefit of digital fabrication here is:
By precut the wooden elements, simple standard metal joint can be employed to achieve complex geometry architecture.
Architectural Concept
Form of cycling building

- curved route
- two way track
- "spice up"
- shelter
- function
Program study

- cycle club
- sightseeing
- cafe
- storage
- toilet
- restaurant
- bike repair
- tourist
- info
- sit+rest
- commuter
- local user
- bike for rent
Program-section

- sit+rest
- Bike for rent
- Bike repair
- storage
- restaurant cafe
- toilet
- cycle club
Conceptual Model
Architectural Design on Site D-The Cycle Bridge
Program
Cycle Park: info, bike repair, storage: 10
Facility: cafe:20p, toilet: 1
outdoor gathering place
outdoor bike park: 30
Materialization Concept

- wood
- asphalt
- concrete
WOOD SHELL-Reciprocal Timber Frame Design
64mm
80mm

×2 each
Plane-surface - planar curve

curve division- points

lines-based on the logic of the reciprocal structure

Lines-beams
Concrete  Base-Fluid form concrete
Form Optimization
Structure concept

40m
Construction
Materialization Whole Bridge
Drawings
Double layer ETFE Cushion

Adjustable Steel Connection bolt fixed 200*60*300mm

Steel Plate bolt fixed 80*150mm

Thermowood Post 60*50mm

Asphalt deck surface layer 60mm

waterproof layer 10mm

Mineral-fiber insulation 300mm

Prestressed Concrete box with 2 steel wires (d=30mm)
Climate Design
Architectural Ornament Drawing
Thank you for your attention!