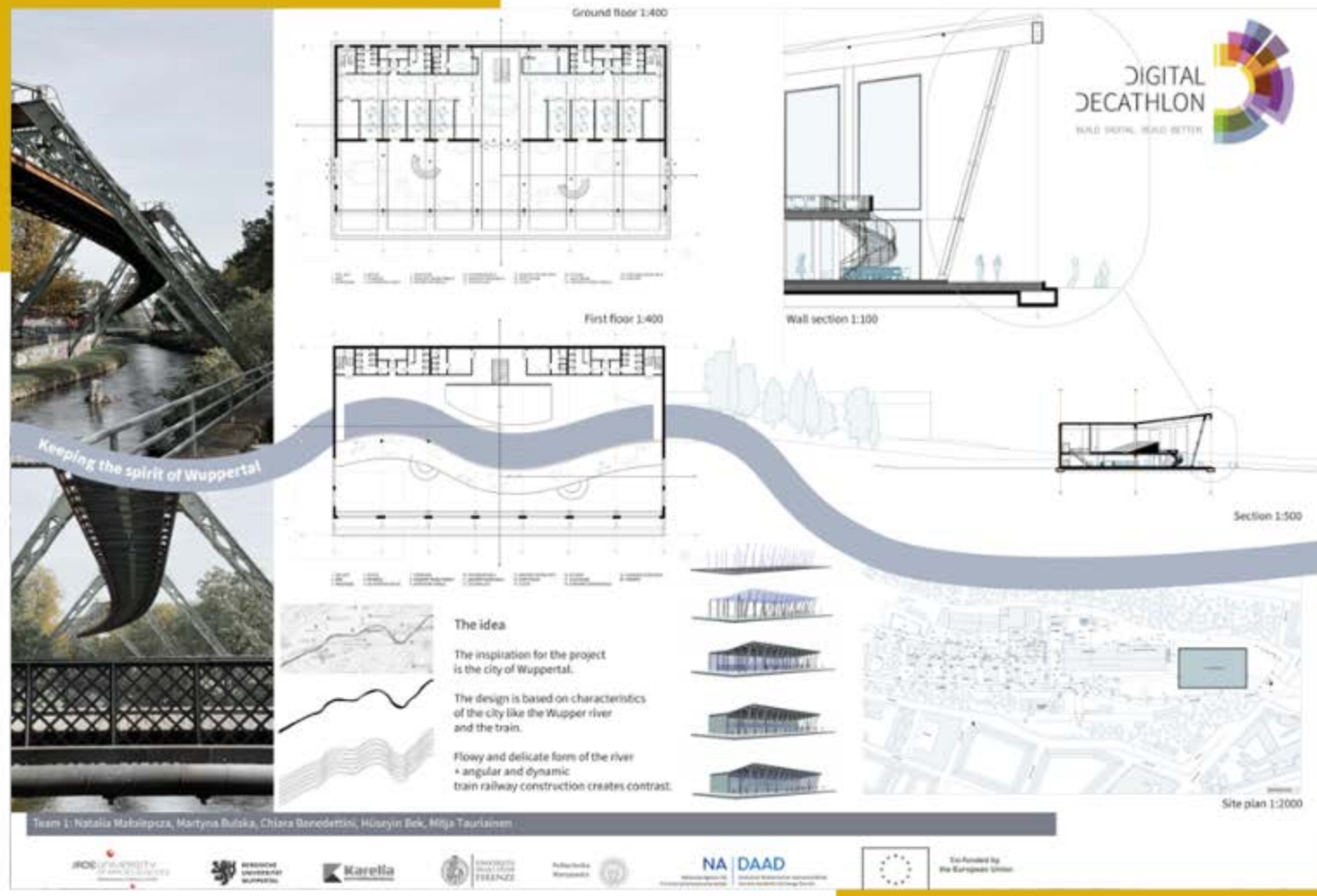
TEAM 01

KEEPING THE SPIRIT OF WUPPERTAL

DIGITAL
DECATHLON

TEAM 01

KEEPING THE SPIRIT OF WUPPERTAL



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TEAM 02

URBAN GARDEN RELOADED

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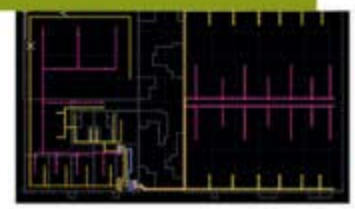
TEAM 02

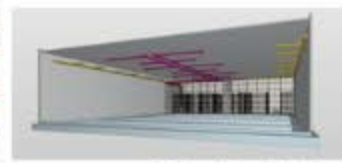
URBAN GARDEN RELOADED

Air handling unit



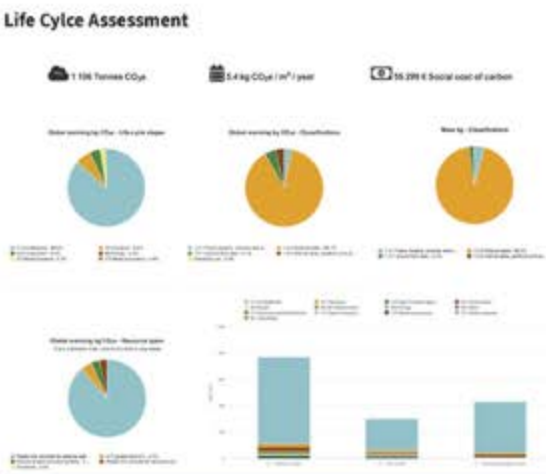
Ventilation plan

Visualisation of the multifunctional hall



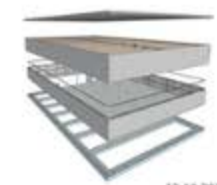
3D view of the ventilation pipes

Life Cylce Assessment



Model Checking

10.10.2023

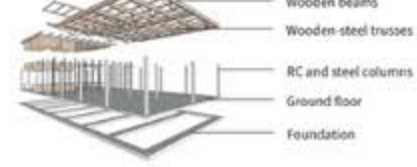


13.10.2023

08.12.2023

12.02.2024

Construction Scheduling



Order	Task	Start	End	Task Type
1	Foundation	11.01.2024	13.03.2024	Construct
2	Ground floor	15.03.2024	12.04.2024	Construct
3	RC columns	15.04.2024	13.05.2024	Construct
4	First order beams	15.05.2024	18.06.2024	Construct
5	Roof trusses	18.06.2024	02.08.2024	Construct
6	Second order beams	02.08.2024	09.08.2024	Construct
7	Interior columns and walls	09.08.2024	16.08.2024	Construct
8	Roof truss in urban garden part	16.08.2024	18.08.2024	Construct
9	Steel columns	18.08.2024	25.08.2024	Construct
10	Second order beams in urban garden part	25.08.2024	01.07.2024	Construct

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Product Traceability

Local companies

Bricofloor

Innovative products

Snøhetta

One Click LCA

Datasheets from One Click LCA

Siniat

Datasheet linked in the model

Team 02: Finn Braun, Maciej Kołodziejczak, Annika Porschen, Akusti Toivonen

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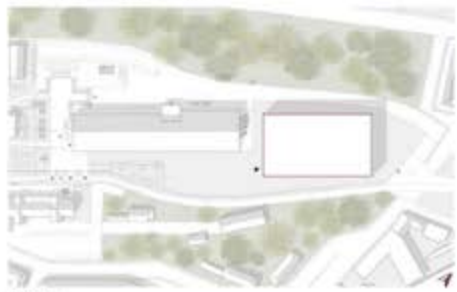
TEAM 03

CREATIVE KNOT

Creative Knot

cultural center in Wuppertal



site plan

rendering

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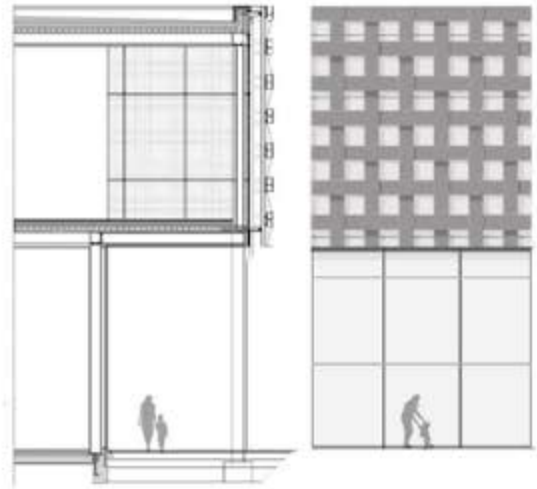
elevation

section

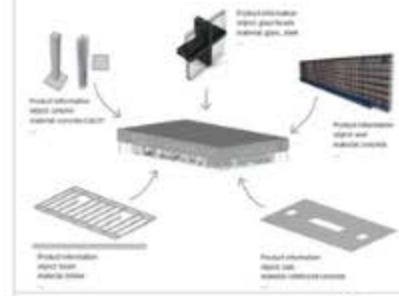
Ground Floor

First Floor



facade detail

Building Product Traceability



Team 03: Pawel Arendt, Lorenzo Baroni, Niko Nordback, Setrayesh Rostami, Teresa Stenguß

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TEAM 03

CREATIVE KNOT

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TEAM 04

TEXTIL ROUTE

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TEXTILE ROUTE

Main entrance view

Ramp view

Team 04: Anastasia Antoniadou, Anna Stuenkel, Christine Girod, Maria Francesca Perri, Piotr Wojnar

JADE UNIVERSITY OF APPLIED SCIENCES
BERGISCHE UNIVERSITÄT WUPPERTAL
Karelia
UNIVERSITÀ DEGLI STUDI DI FIRENZE
Politechnika Warszawska
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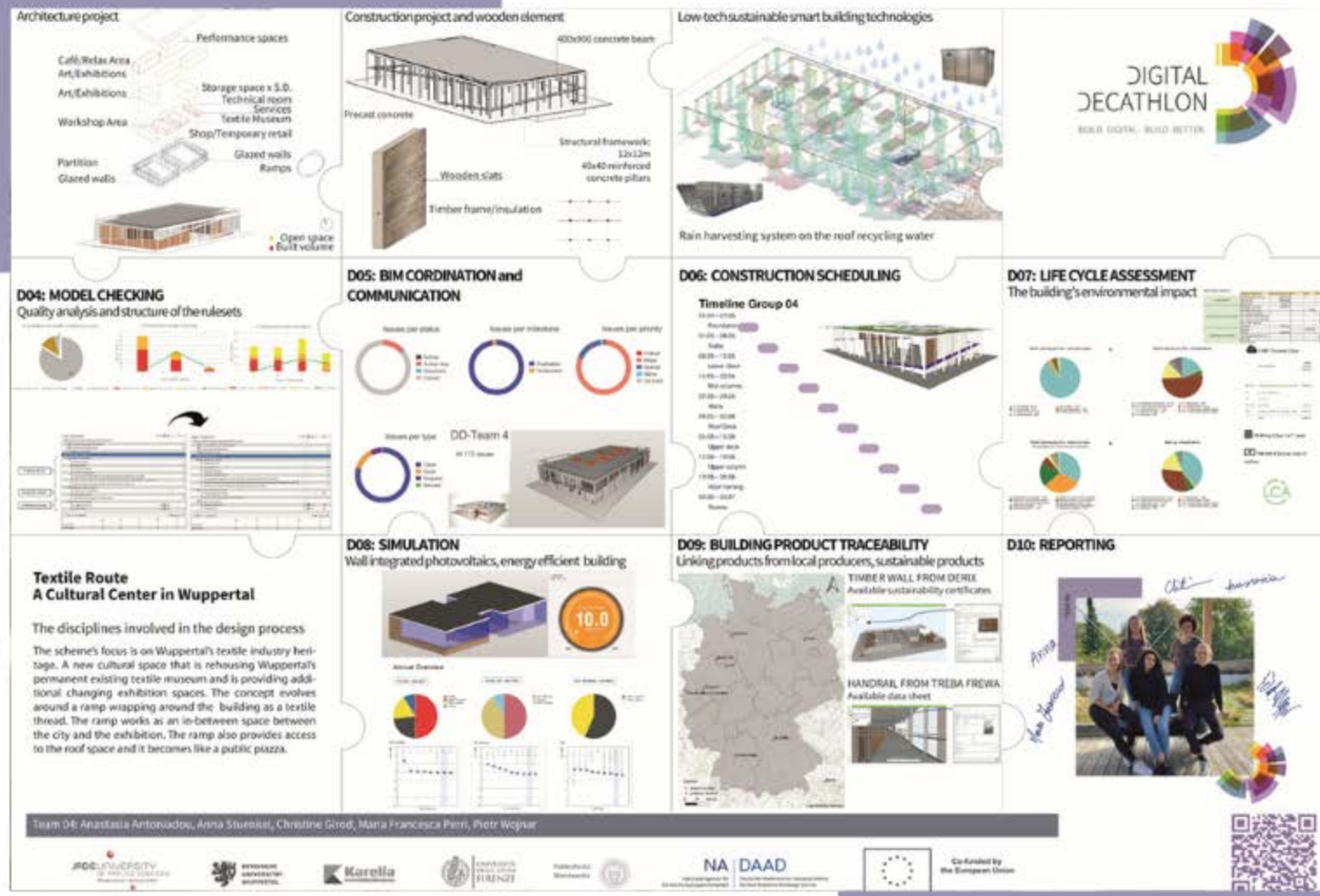
TEAM 04

TEXTIL ROUTE



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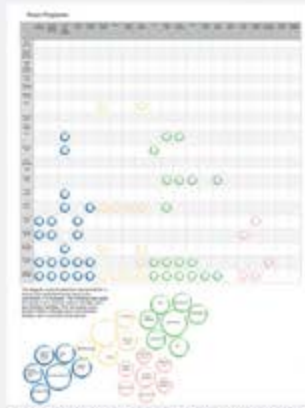
TEAM 05

CUBE SYSTEM

D1: ARCHITECTURE



The Culture project involves the transformation of an empty warehouse in Wuppertal into a cultural center. The 4,000 square meter hall, close to the A46 freeway, is part of the structural transformation of an industrial area. The aim is to create an identity-forming, appealing place for people of all ages and social age groups and social classes.
The cultural center is intended to be a place of encounter, transparency and openness. It is planning flexible, multifunctional rooms for events, work or meetings, as well as a mixed program of rooms program that integrates outdoor and indoor spaces.

D10: REPORTING

D2: CONSTRUCTION

Construction of the Cultural Hall is a combination of steel, reinforced concrete and of course added timber constructural elements including walls, floors, roofs and tops, stairs and beams combined with floor slabs as parts of the new construction. Rather than inner construction which is made maily of tinber, there are two raws of walls added in the northern side of the construction as reinforced concrete walls, serving as bracing walls against side forces to the whole structure such as wind, earthquake or big side impacts during the constructions lifetime.

Cubes Structure

Cross Laminated Timber (CLT):
is a subcategory of engineered wood with panel product made from gluing together at least three layers of solid-sawn lumber

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is a subcategory of engineered wood with panel product made from gluing together at least three layers of solid-sawn lumber

Intermediate Floor 1.04

160 mm CLT, PVC flooring , suspended ceiling
Acronym in BIM model: D02-SL-EC-1.04

External Wall 1.06

100 mm CLT, Plaster facade
Acronym in BIM model: D02-WA-CLT-1.03

Intermediate Floor 3.1.12

Sylva LVL Rib - type Open
Dry screed with gypsum fibre with gravel
Acronym in BIM model: D02-SL-EC-3.1.12

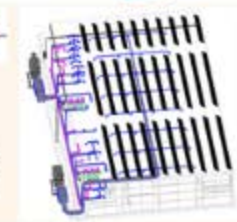
D3: MEP

Heating system

The central heating system is an air system. The heat source is a heat pump that recovers heat from the sewage system and exhaust ventilation. In addition, convection heaters are provided in the bathrooms

Ventilation system

The ventilation instlation system is the main system in the building. Its task is to provide fresh air, heat the rooms in winter and cool them in summer. Air preparation takes place in the technical area through a heat pump and a chiller. With this solution, materials can be saved on other installations.



Control systems

A control system based on temperature, C02 level and humidity was envisioned.

Plumbing and sewage systems

The sewage system will be an underfloor installation. The system will be the bottom source of the heat pump.

Building Management Systems

A BMS system is provided for the building, allowing monitoring of system performance and automatic fault detection

Electrical & lighting systems

The source of electricity will be a PV installation located on the roof of the building. In addition, space has been provided for energy batteries.

Air conditioning system

The source of cooling is a chiller that prepares chilled water for cooling ventilation air. The heat discharged from the chiller can be used for the purpose of hot water preparation.

Water systems

The source of cold water is the municipal network, hot water will be prepared in a heat pump. The water system feeds the bathrooms, changing rooms and the catering area. In addition, a rainwater accumulation system is planned for watering greenery.

Team 05 Masoud Abdi-Ghomshe, Pia Schnittker, Angelina Stavila, Eyal Ohayon, Bogdewicz Przemyslaw

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TEAM 05

CUBE SYSTEM

D4: MODEL CHECKING

The first thing we did was to place the model in the BIM modeling software so that we could see if the elements in general appeared, we realized that we had a problem with the definitions of the elements and from there we switched to Solibri so that we could issue a detailed report. After we defined our preferences in the software for receiving the report, we marked and divided responsibility for the various problems that appeared in the model.

Software used to test the model are:
REVIT
SOLIBRI
BIMCOLLAB
DRIVE PLATFORM

After that, we published the problems and the report in two places, one is in the drive so that everyone has access to the file and a copy of the report, the second form was through BIMcollab where we marked for each the things that he needs to fix and we conducted the chat about each problem separately and followed the progress.

D5: BIM COORDINATION and COMMUNICATION

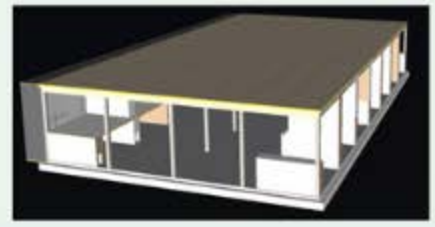
BIM Execution Plan

Time schedule

Level Of Detail

Codding file

D6: CONSTRUCTION SCHEDULING



D7: LIFE CYCLE ASSESSMENT

using OneClickLCA

With help of LCA databases of OneClick application, we could measure a roughly calculated CO2e amount of the structure during it's life time.

Rather than CO2 produced during the life time, the application also measures a yearly amount of carbon dioxide produced with the given usage of the structure, which is here a cultural gathering hall.

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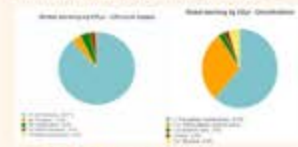

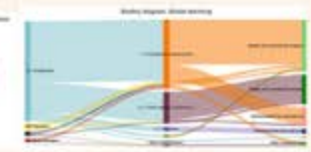

D9: BUILDING PRODUCT TRACEABILITY

D8: SIMULATION

For the initial solar and light analysis we used a model based on the architectural concept, when the model was simplified to basic forms.
We received the data of the model in the form of graphs, diagrams, and tables.

After the first result, another model was made which describes another option for the division of the rooms and the locations, including the distance of the closed spaces from the direct area of the sun's rays, and the use of a wall which is exposed to the sun's rays during most of the day as a surface on which the installation of PV would be possible. Thus the surface area of PV increases by at least 200 square meters.

Team 05 Masoud Abdi-Ghomshe, Pia Schnittker, Angelina Stavila, Eyal Ohayon, Bogdewicz Przemyslaw

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