



Cree Building System
Tevás Fagdag 2016, Bergen

Building
the Natural Change

RHOMBERG GROUP

CONSTRUCTION



RESOURCES



RAIL





RESOURCES

40%

- resource consumption
- energy demand
- CO₂ emission
- solid waste amount

Source: UNEP, Sustainable Buildings & Construction Initiative, 2009



Ecological Backpack

How heavy is a building?



The items of daily life are heavier than we think:



Jeans

0.6 kg

32 kg



Cell

0.3 kg

500 kg



Desktop

5 kg

1500 kg



Gold ring

0.005 kg

2000 kg

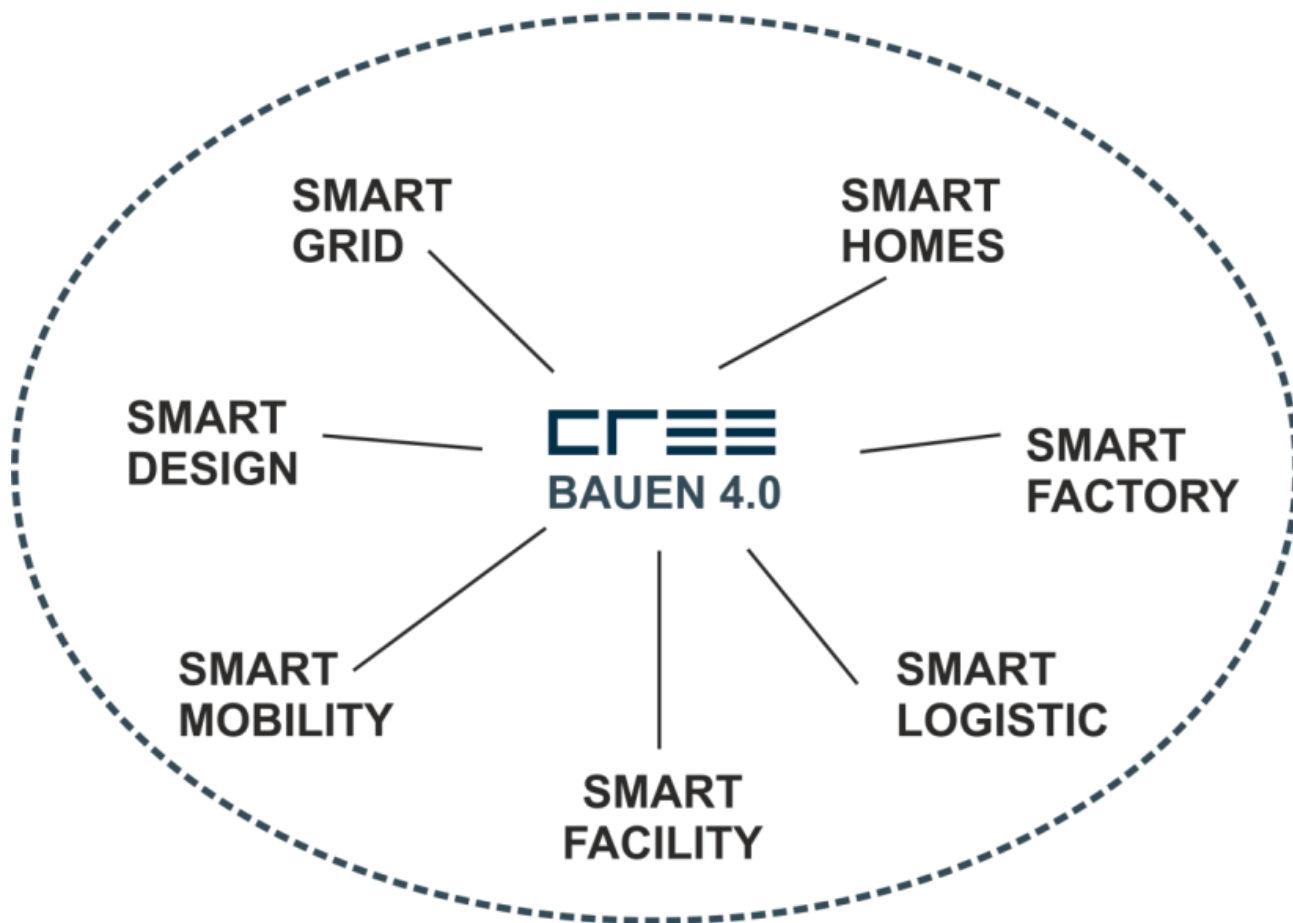
Product-weight

Ecological Backpack

Each building is a prototype!

Situation:

- chaotic process
- high consumption of resources
- inefficient execution

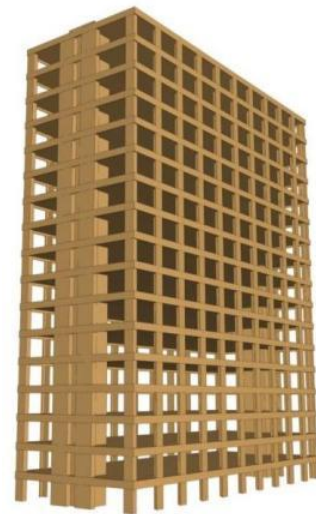
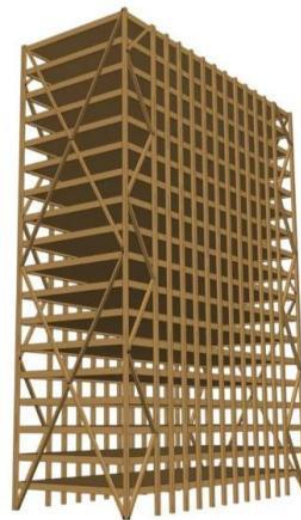
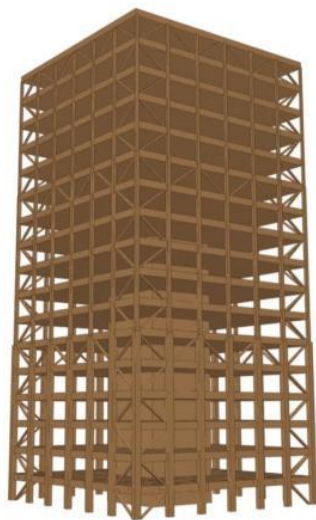
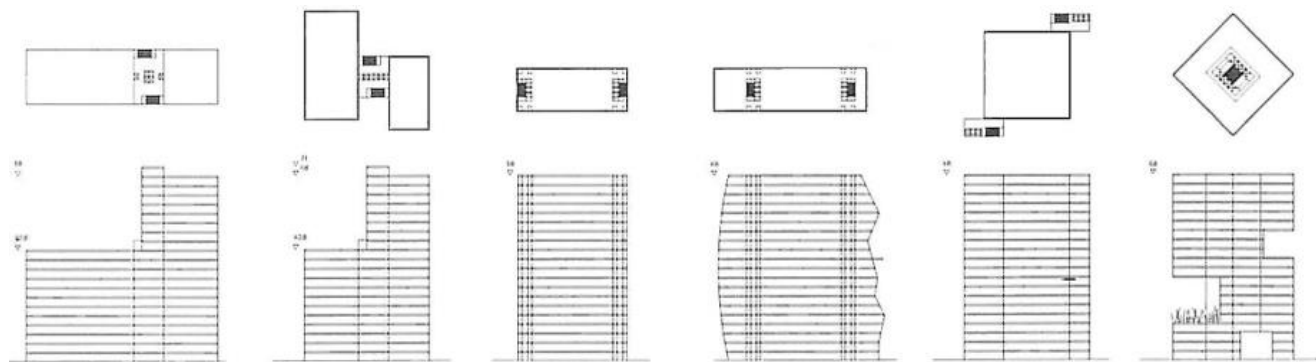


LIFECYCLE TOWER

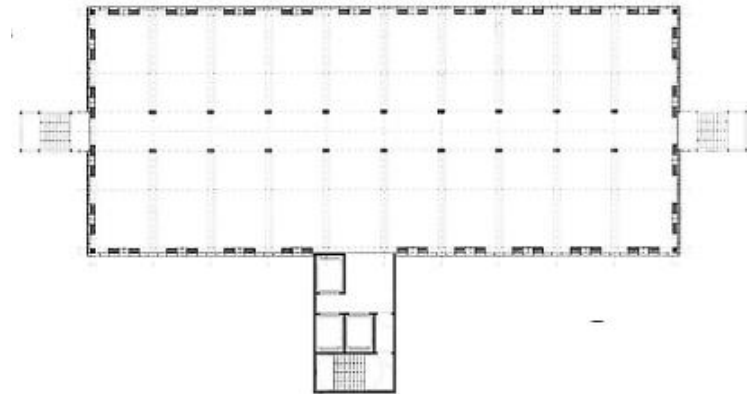
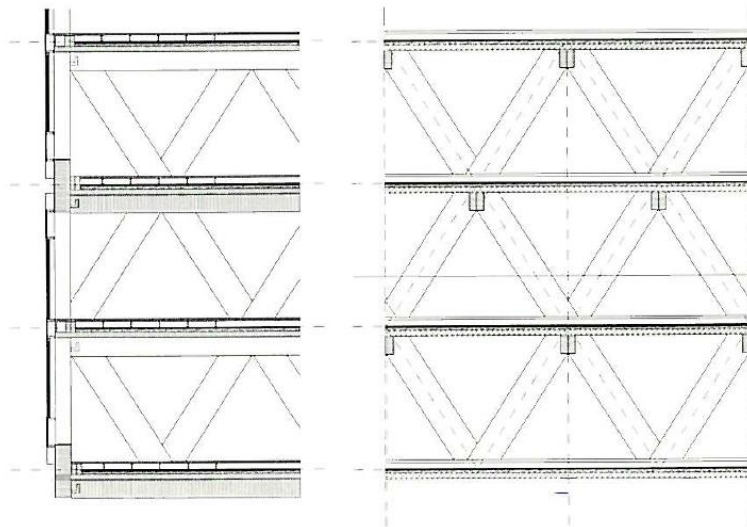
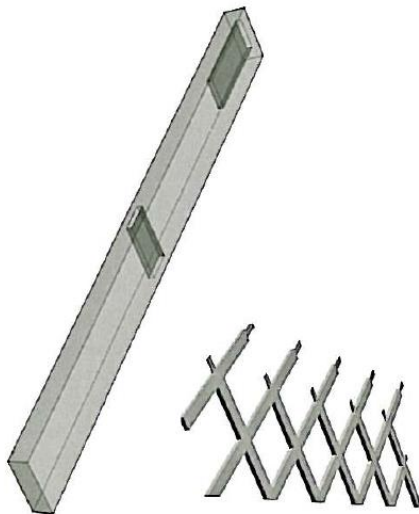
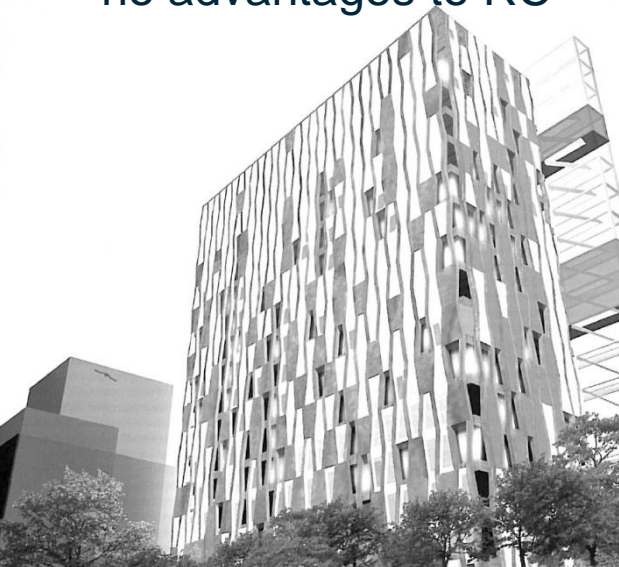
Research Project 8+

TEAM:

- Arch. Schluder
- Rhombberg Bau
- Wiehag
- TU Vienna



- very complex
- high-tech joints
- shear connectors
- many parts
- difficult assembly
- high cost
- no advantages to RC





LifeCycle Tower

- Timber based construction system for multi-story buildings
- Industrial pre-fabrication
- Energy and Resource efficient
- Power generation

Architekten **Hermann Kaufmann ZT GmbH**

ARUP

WIEHAG
TIMBER CONSTRUCTION

TU
Graz

HOLZ
FORSCHUNG
AUSTRIA

DGNB

FFG

HAUS
der Zukunft

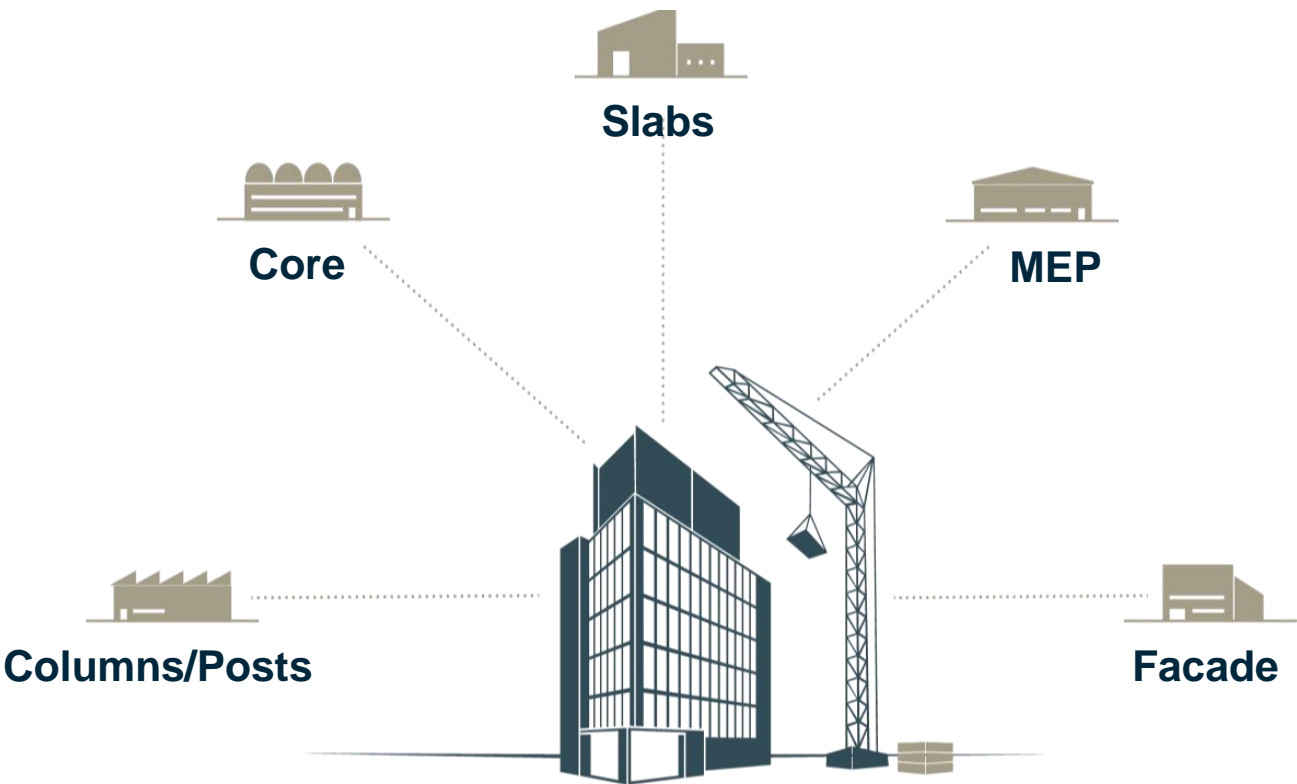
bm **vti**

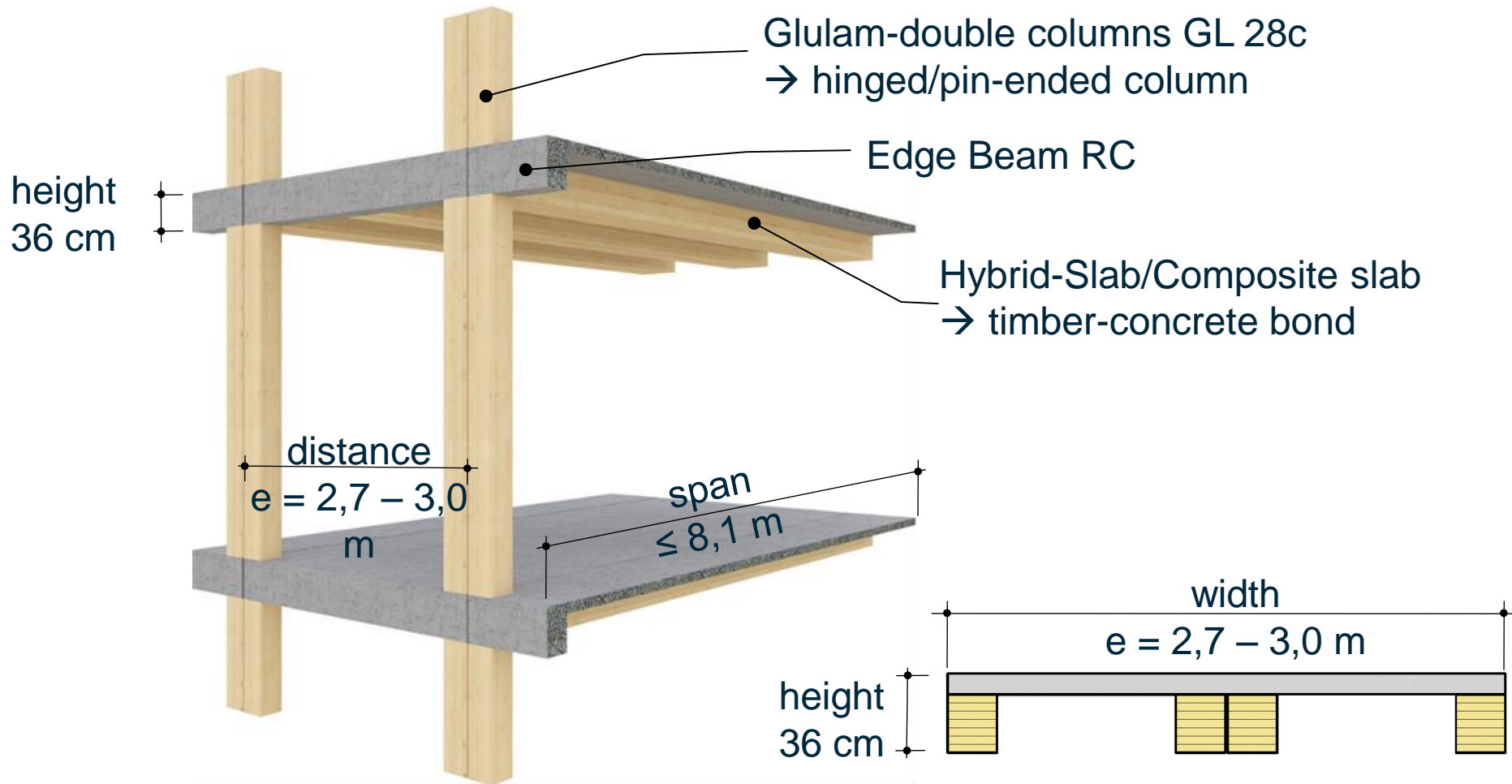
FFG: Austrian Research Promotion Agency

bmvt: Austrian Ministry for Transport, Innovation and Technology



Industrial manufacturing







RESOURCES



How much CONCRETE does your Building need?


CRE

1 $\frac{\text{m}^3}{10\text{m}^2}$



3 $\frac{\text{m}^3}{10\text{m}^2}$



What is the WEIGHT of your Building?



300 $\frac{\text{kg}}{\text{m}^2}$



700 $\frac{\text{kg}}{\text{m}^2}$



How much CO₂ will you produce?



150 $\frac{\text{kg}_{\text{CO}_2}}{\text{m}^2}$

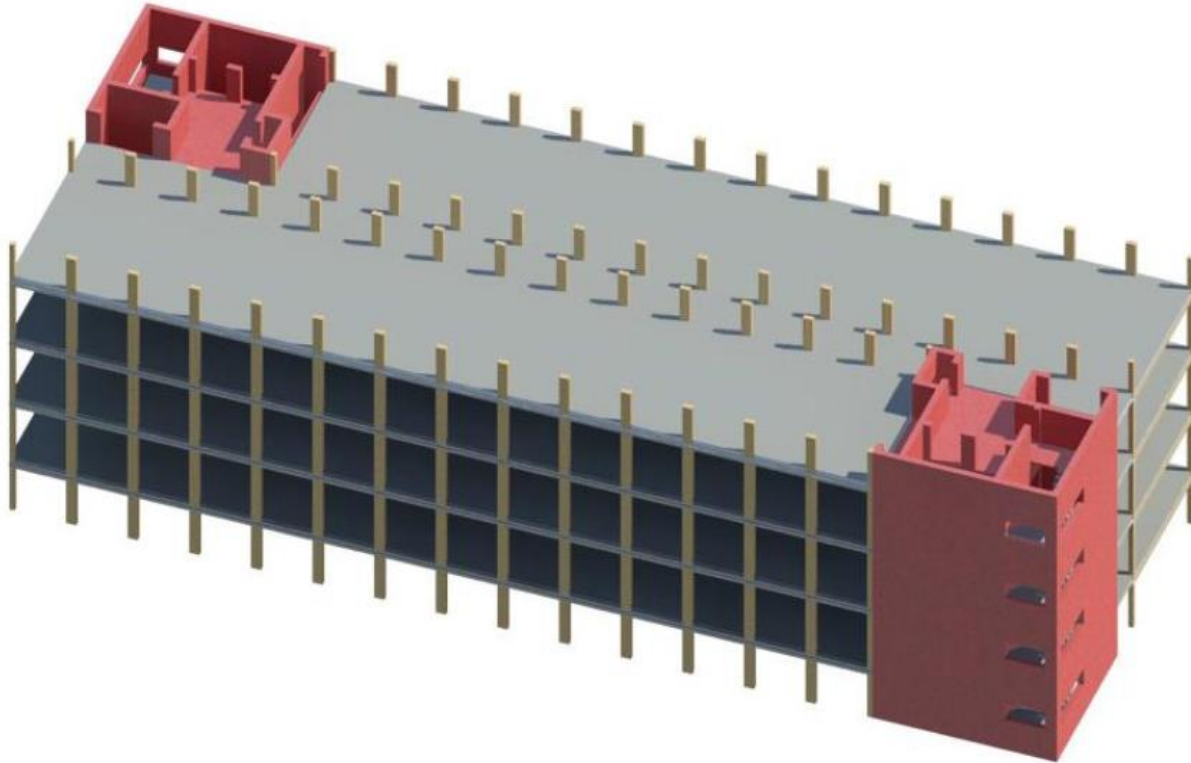


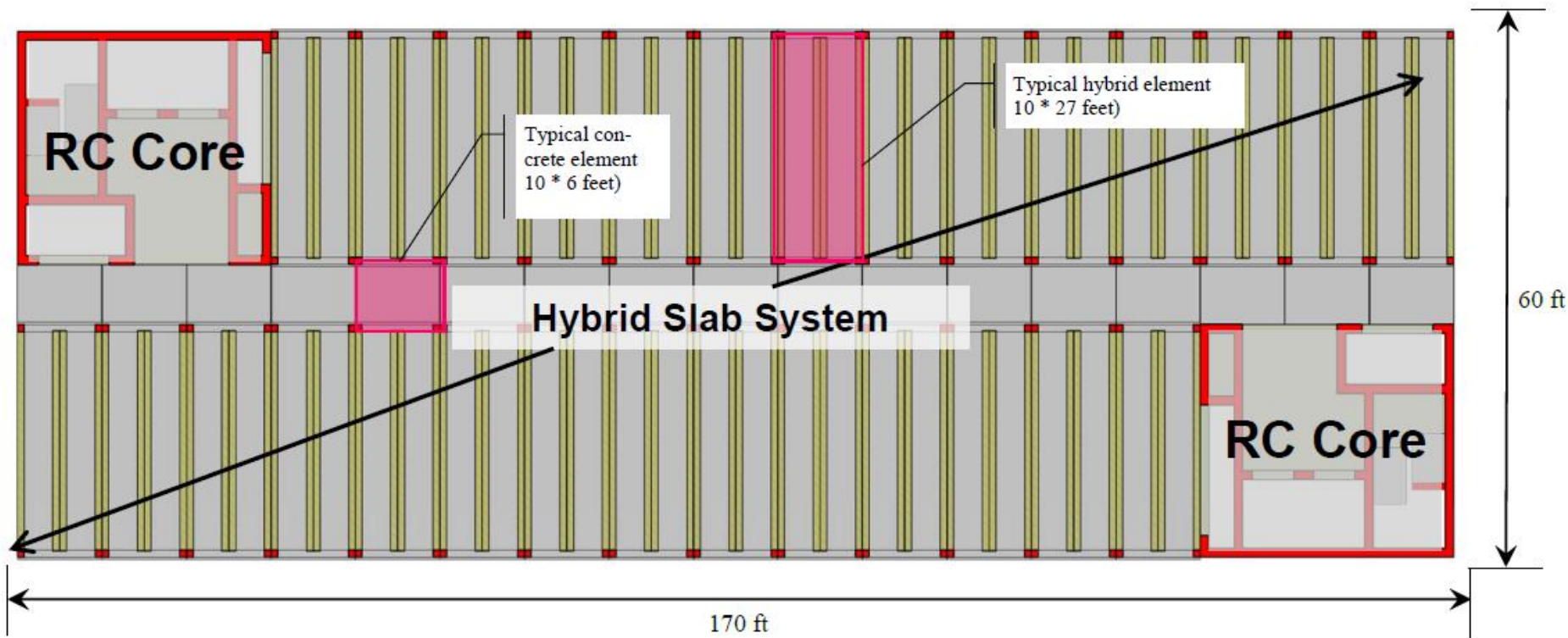
750 $\frac{\text{kg}_{\text{CO}_2}}{\text{m}^2}$

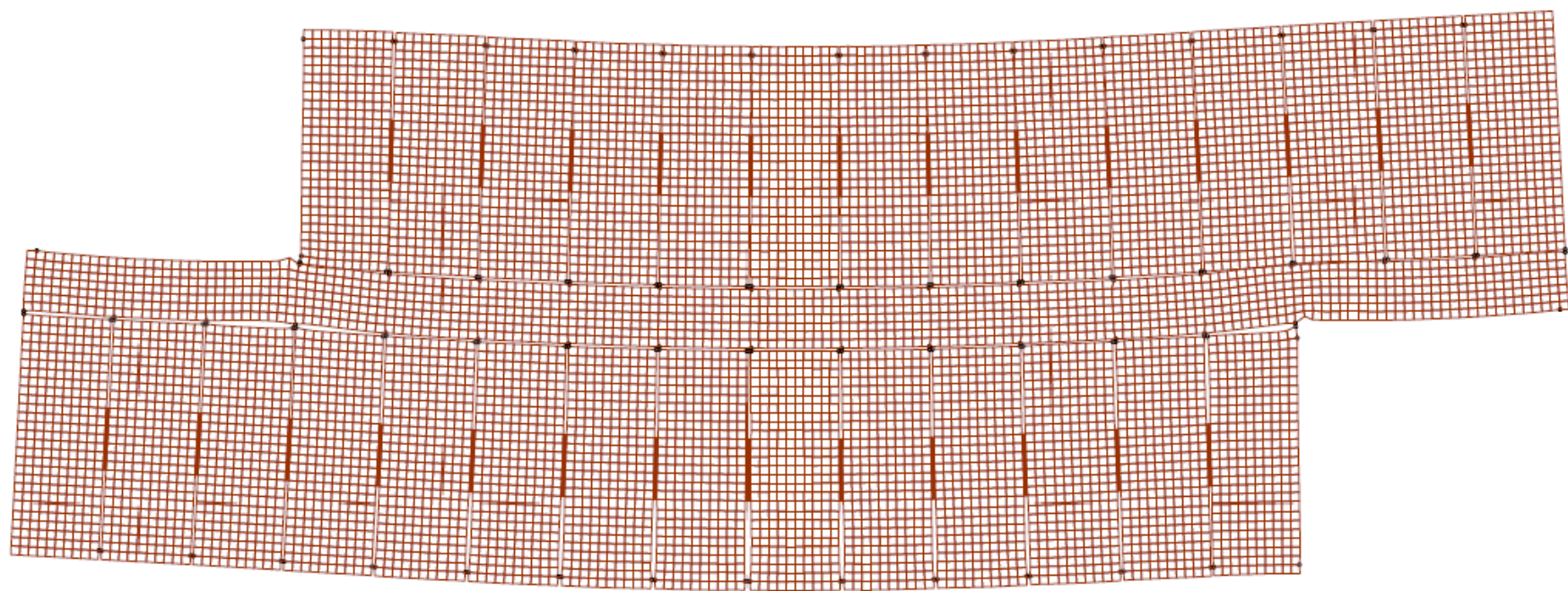
A composite image featuring a man's profile on the left, looking towards a city skyline. The skyline includes the Empire State Building and other skyscrapers. The word "SAFETY" is prominently displayed in the center. On the right, there is a transparent overlay of a hand holding a smartphone, with a grid pattern visible behind it.

SAFETY

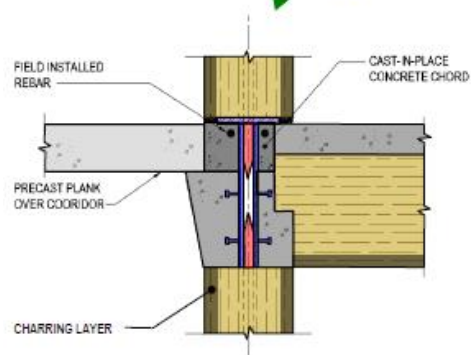
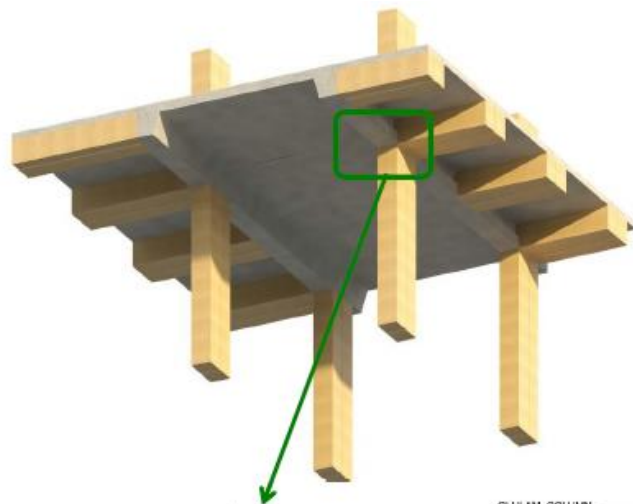
Seismic Design



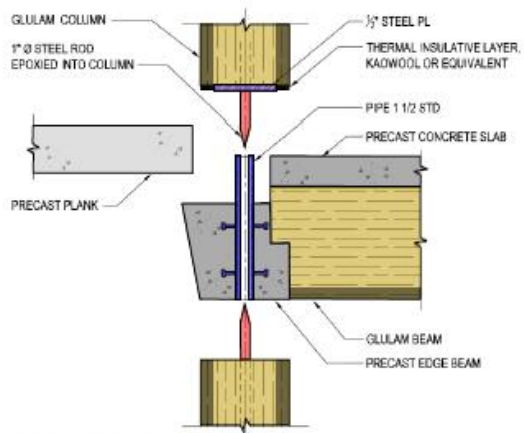




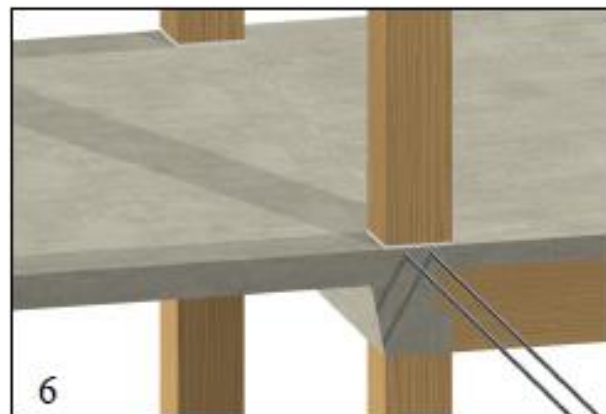
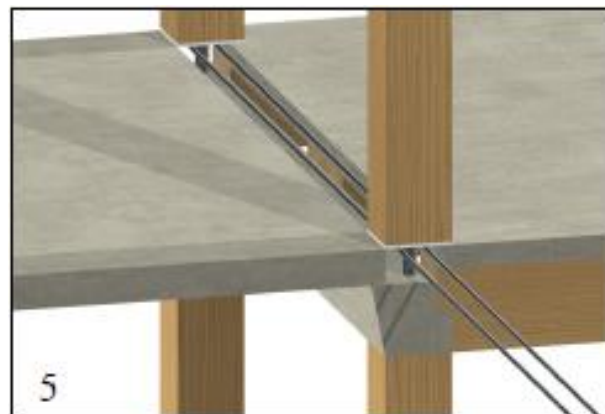
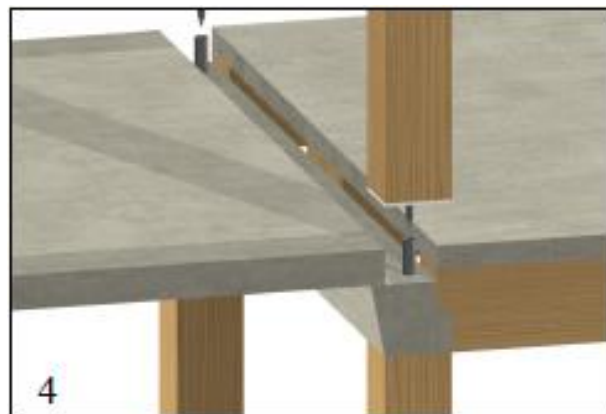
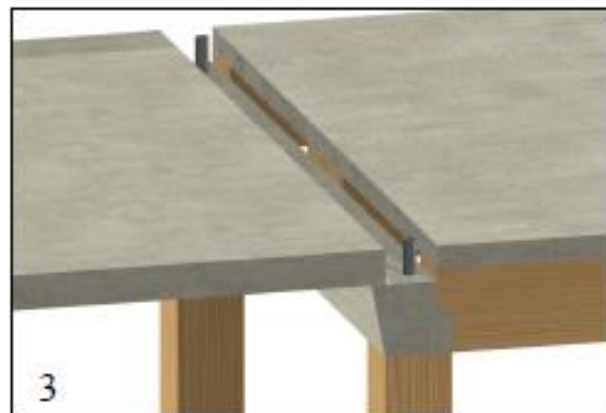
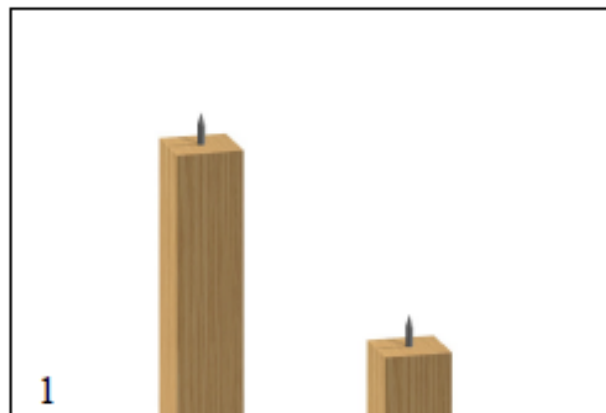
Typical level slab finite element model showing exaggerated deflections due to lateral loading. Deflected shape indicates that lateral movement is largely restrained by the core structures.



Assembled Components



Exploded Components



FIRE TEST



2:08:39



PAVUS, a.s.
POŽÁRNÍ ZKUŠEBNA

Firma:

Cree GmbH

Datum:

2011-01-31

1516Kg



EN 1363-1:1999; EN 13652; DIN EN 13501-2:2008-01 | REI 90 & REI 120



PAVUS, s.p.a.
Via S. Maria 10
20121 Milano (MI)
Tel. 02 58 54 11 11
Fax 02 58 54 11 12
Email: info@pavus.it
Web: www.pavus.it

**FIRE RESISTANCE
CLASSIFICATION REPORT**

Subject of classification: **Loadbearing Slabs and walls with the separating function according to DIN EN 13501-2:2008-01, part 1, 2.3**

Identification number: **PK2-03-11-003-A-1**

Standard and type of specimen: **EN 1363-1:1999**

Specimen: **One Sample**
Dimensions: 1000x1000x100 mm
Area: 1.00 m²

Issuing organization: **PAVUS, s.p.a.**
Authorized body (1)
Approved by the Italian Ministry of the Interior (2)
Approved by the Italian Ministry of the Interior (3)
Approved by the Italian Ministry of the Interior (4)
Approved by the Italian Ministry of the Interior (5)
Approved by the Italian Ministry of the Interior (6)
Approved by the Italian Ministry of the Interior (7)
Approved by the Italian Ministry of the Interior (8)
Approved by the Italian Ministry of the Interior (9)
Approved by the Italian Ministry of the Interior (10)

Draw No: **22-01-00000**
Joint reference to the order No. **22-01-00000**

Date of issue: **2012-06-27**

Copies in total: **4**

Copy number: **1**

Pages in total: **4**

PAVUS, s.p.a.
Via S. Maria 10
20121 Milano (MI)
Tel. 02 58 54 11 11
Fax 02 58 54 11 12
Email: info@pavus.it
Web: www.pavus.it

**FIRE RESISTANCE
CLASSIFICATION REPORT**

Subject of classification: **Loadbearing Slabs and walls with the separating function according to DIN EN 13501-2:2008-01, part 1, 2.3**

Identification number: **PK2-03-11-004-A-2**

Standard and type of specimen: **EN 1363-1:1999**

Specimen: **One Sample**
Dimensions: 1000x1000x100 mm
Area: 1.00 m²

Issuing organization: **PAVUS, s.p.a.**
Authorized body (1)
Approved by the Italian Ministry of the Interior (2)
Approved by the Italian Ministry of the Interior (3)
Approved by the Italian Ministry of the Interior (4)
Approved by the Italian Ministry of the Interior (5)
Approved by the Italian Ministry of the Interior (6)
Approved by the Italian Ministry of the Interior (7)
Approved by the Italian Ministry of the Interior (8)
Approved by the Italian Ministry of the Interior (9)
Approved by the Italian Ministry of the Interior (10)

Draw No: **22-01-00000**
Joint reference to the order No. **22-01-00000**

Date of issue: **2012-06-27**

Copies in total: **4**

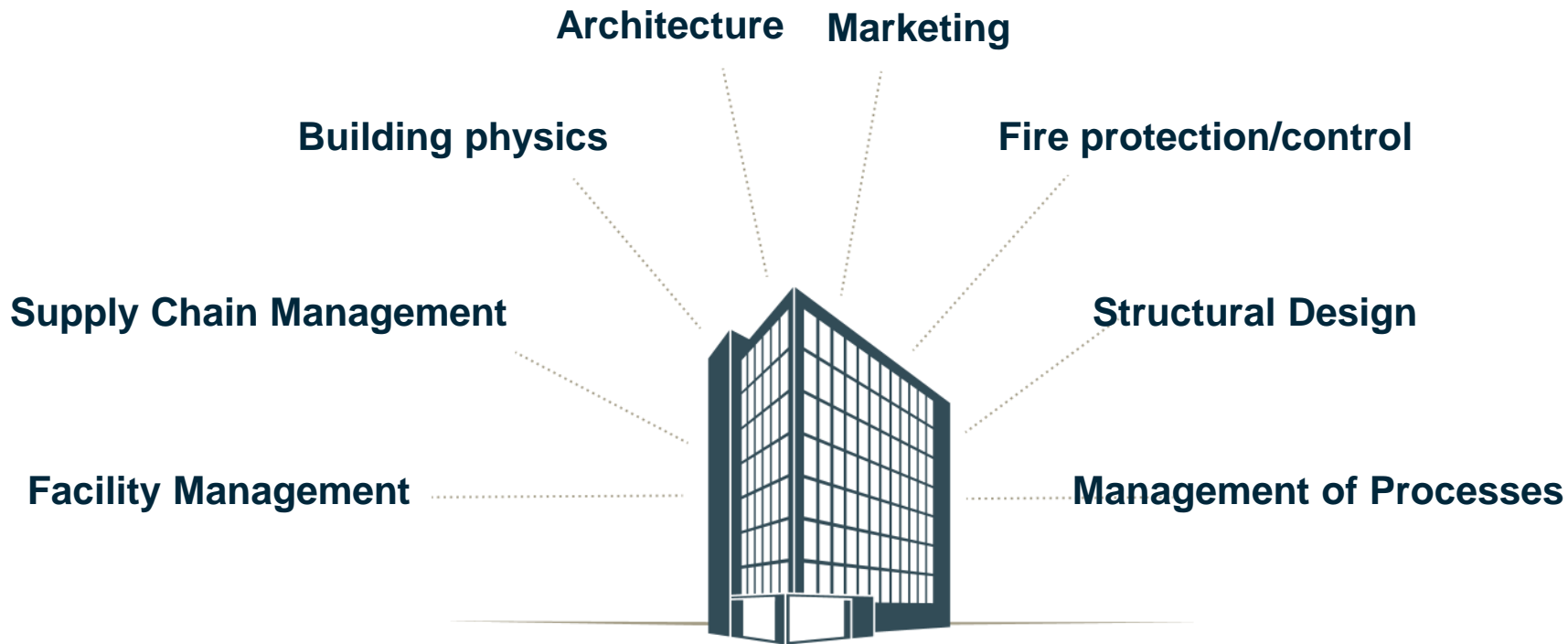
Copy number: **1**

Pages in total: **4**

DESIGN



Integrated Design



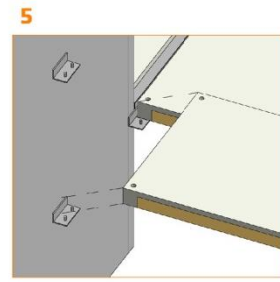
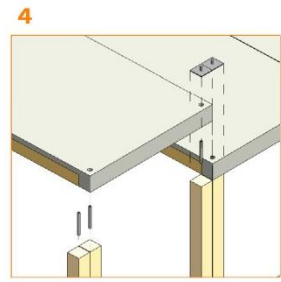
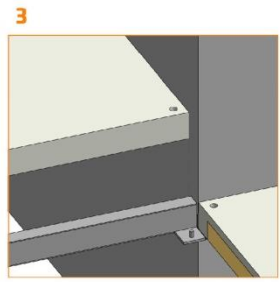
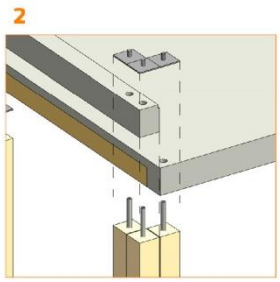
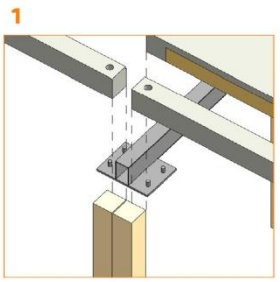
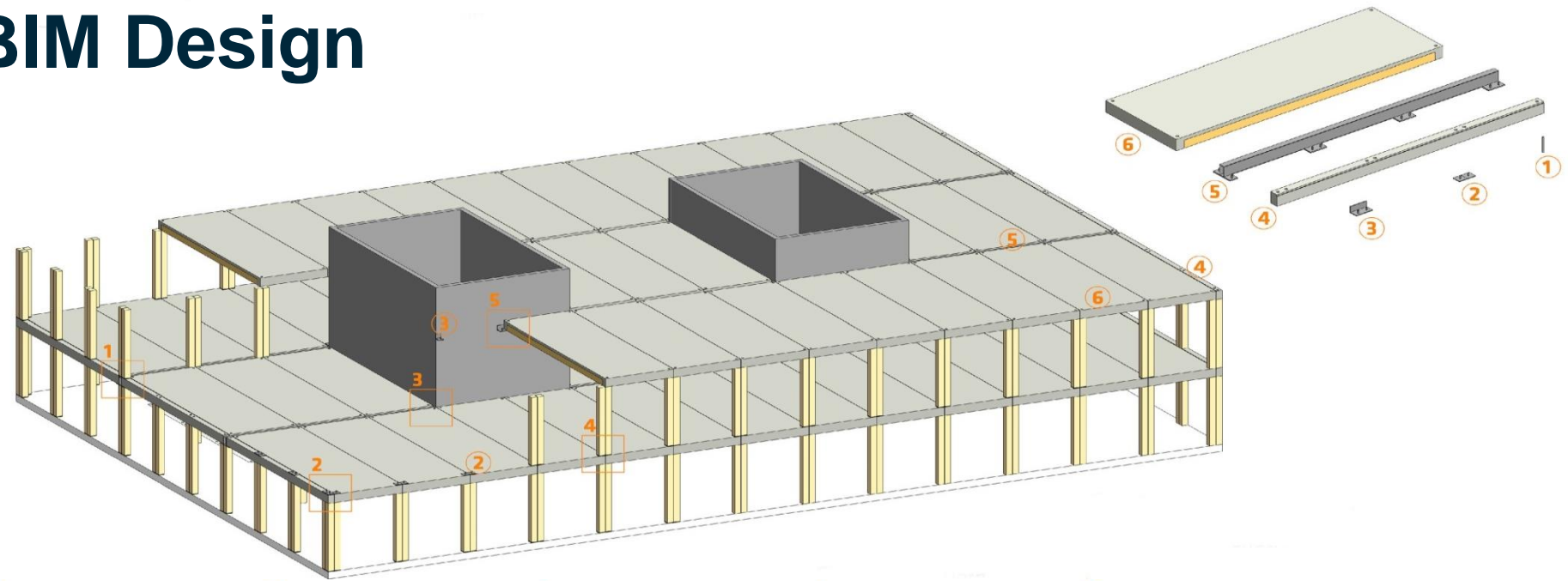
Smart Design

Reduction of:

- **prototypes** → standardization
- **complexity** → no special solutions
- **embodied energy** → renewable raw materials
- **oversized technology** → sequential adaption (upgrading)
- **interfaces** → modularization
- **operation & maintenance** cost → quality
- **errors** → BIM/collision check and simple detailing



BIM Design



Project Cloud with product pages available for Cree Master Licensees

The screenshot displays the BIMobject website interface. At the top, the BIMobject logo is visible, along with navigation links for 'For Manufacturers', 'For Investors', and a user profile for 'Michael Etterer'. Below the logo, there are search and filter options: 'Search here...', 'Brands (1)', 'BIM object categories', and 'File types'. A 'Missing a manufacturer?' button is also present. The main content area shows a filter for 'Cree Building System' with '11 product families', '488 downloads', and '1 brands'. A grid of 11 product cards is displayed, each featuring a 3D model of a Cree Building System component, its name, and an 'Add' button. The products include:

- Cree LCT 1.0 Column
- Cree LCT 1.0 Edge Beam
- Cree LCT 1.0 Edge-Beam_Span-Ch
- Cree LCT 1.0 Facade Room-high
- Cree LCT 1.0 Facade Room-high
- Cree LCT 1.0 Facade Room-high
- Cree LCT 1.0 Facade Room-high
- Cree LCT 1.0 Hybrid Slab Panel
- Cree LCT 1.0 Span Change Beam
- Cree LCT 1.0 Support Angle
- Reference Project LCTone

Project Cloud with product pages available for Cree Master Licensees



Showing **14** products

<p>Curtain Wall Façade CREE Buildings</p> <p>♥ Add</p>	<p>Wood/Concrete Floor Slabs CREE Buildings</p> <p>♥ Add</p>	<p>Reynaers Window Concept System... Reynaers</p> <p>♥ Add</p>	<p>Reynaers Window Concept System... Reynaers</p> <p>♥ Add</p>	<p>Reynaers Window Concept System... Reynaers</p> <p>♥ Add</p>	<p>Reynaers Window Concept System... Reynaers</p> <p>♥ Add</p>	<p>Reynaers Window Concept System... Reynaers</p> <p>♥ Add</p>
<p>Schüco ADS 75 SimplySmart Schüco</p>	<p>Schüco Door ADS 75... Schüco</p>	<p>Schüco Façade FWS 35 PD Schüco</p>	<p>Schüco Façade FWS 60 CV Schüco</p>	<p>Schüco Façade USC 65 Schüco</p>	<p>Schüco Parametric System Schüco</p>	<p>Schüco Skylight FW 50+ SI Schüco</p>

DASHBOARD BIManalytics® Pro

Cree Building System

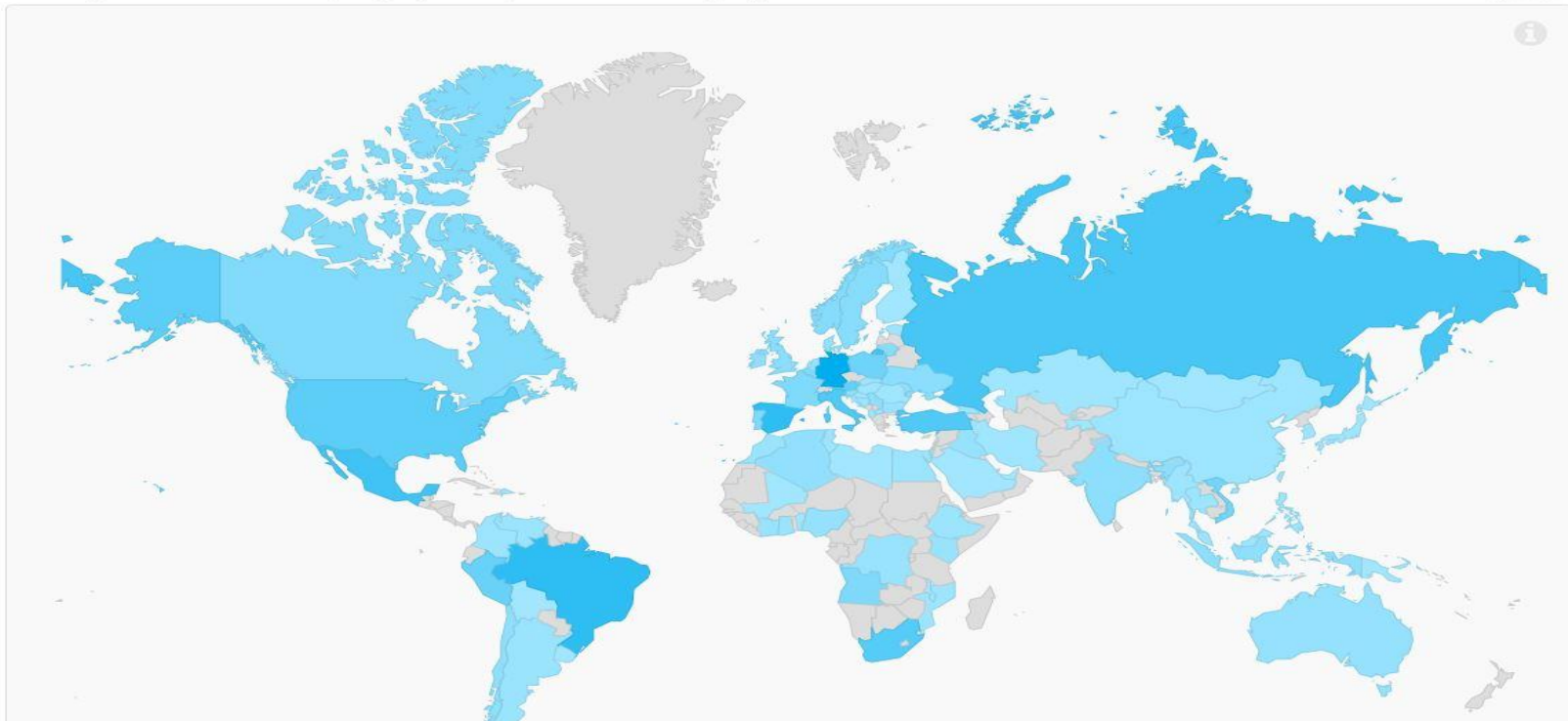
Total downloads

1 386

Total views

9 495

BIMobject® downloads geographically - Cree Building System

CREE
Building and Industrial Group

A man with a beard, wearing a red and blue plaid shirt and brown pants, is leaning over a large, detailed architectural model of a city. He is looking down at the model with a focused expression. The model features various skyscrapers and building structures. The word "PRODUCTION" is overlaid in large, bold, white capital letters across the center of the image. The background is a dark, textured wall with a grid-like pattern.

PRODUCTION











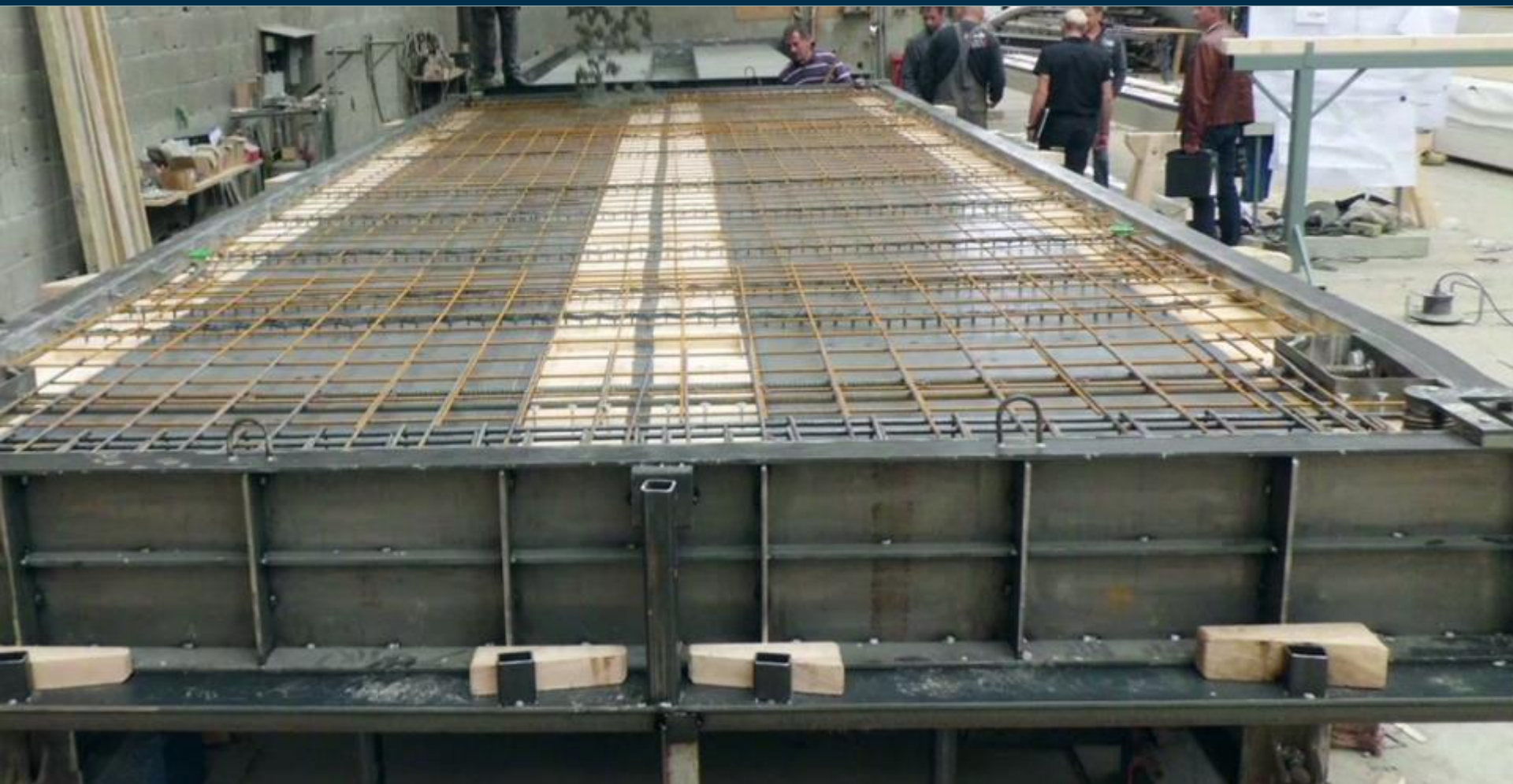










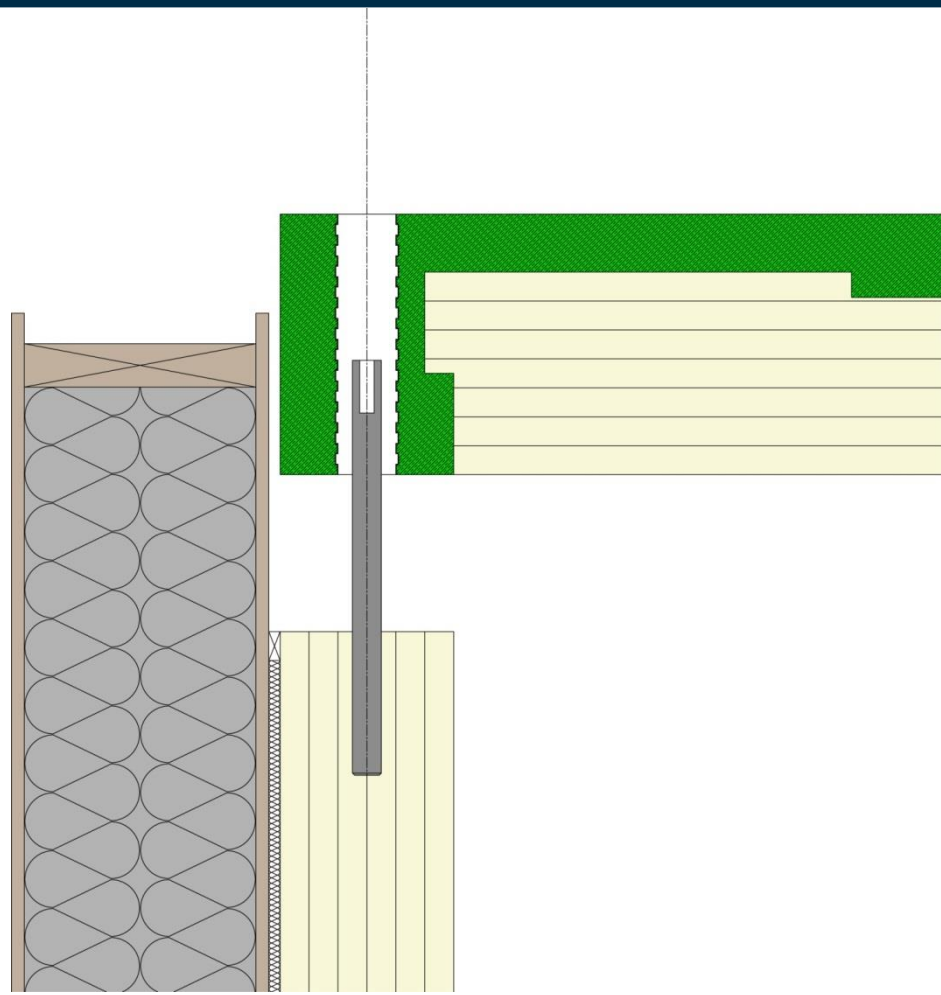


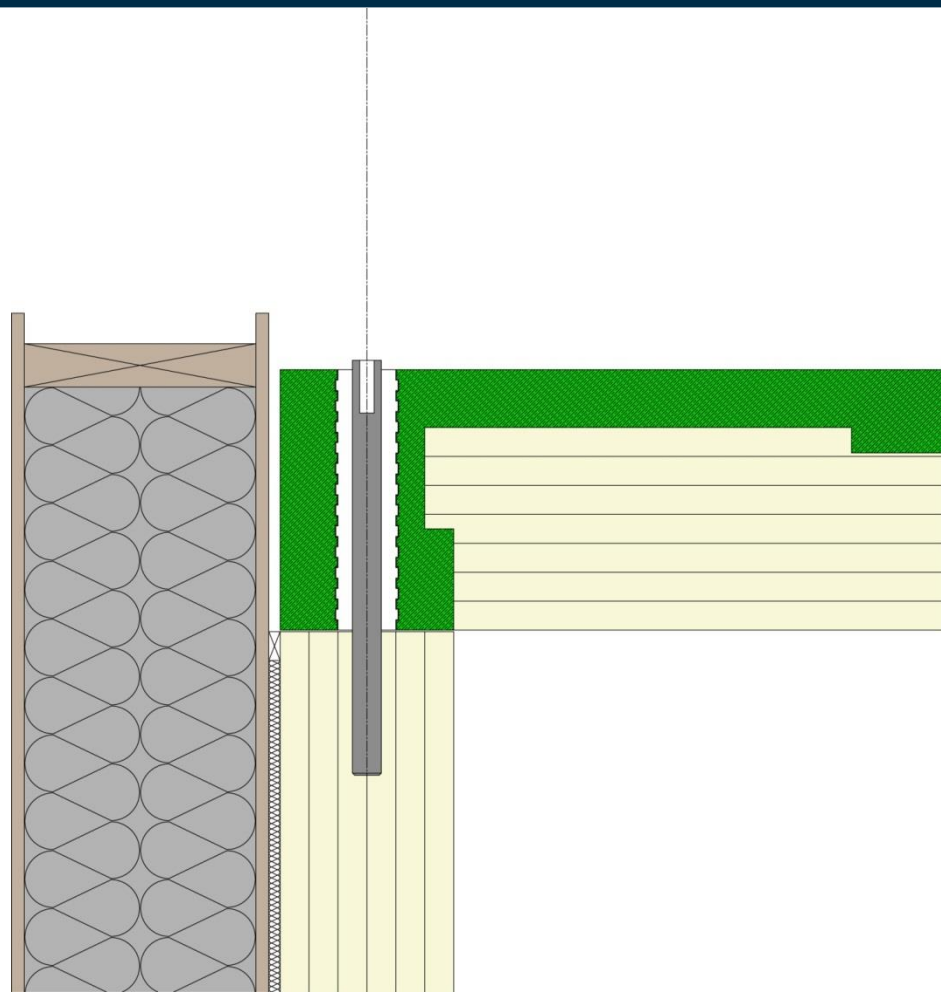


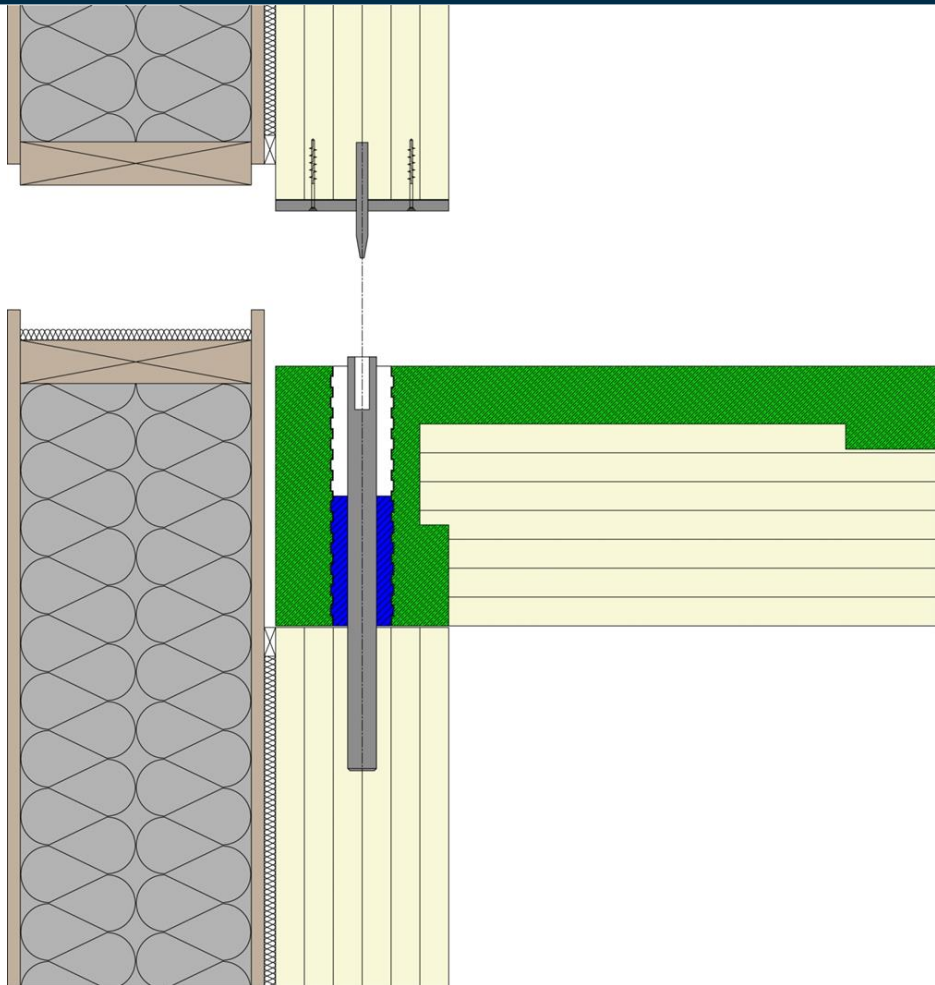


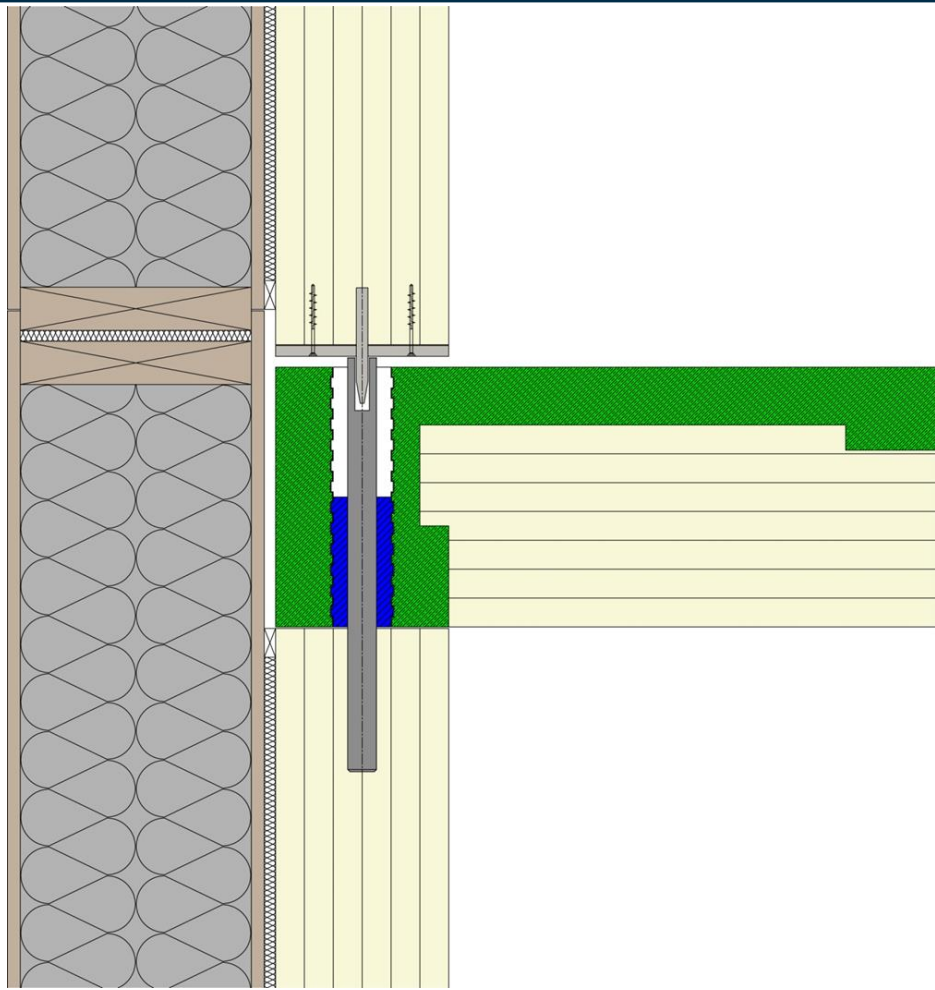


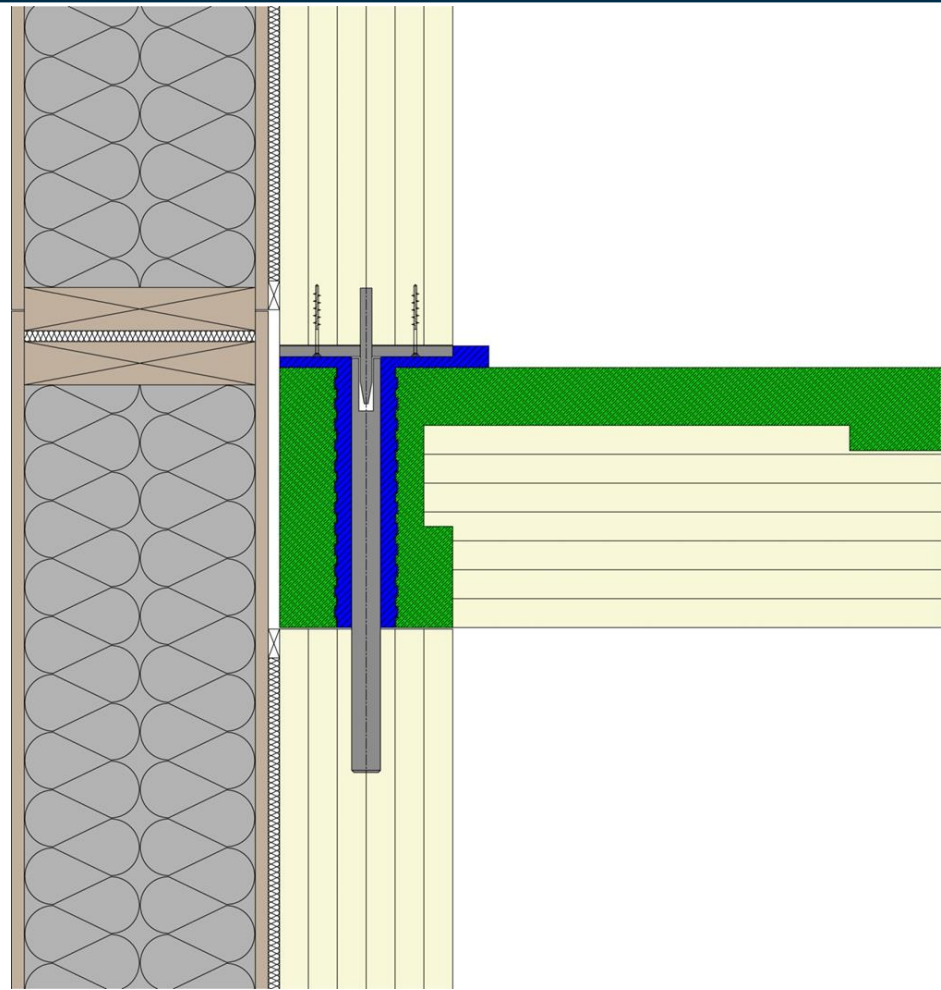
TECHNOLOGY



























PROJECTS

A low-angle photograph of a modern, white, multi-story building with a grid-like facade of windows, set against a dramatic, cloudy sky. The building's facade is composed of large, white rectangular panels that form a grid pattern around the windows. The perspective is from the ground looking up, making the building appear to rise steeply into the sky. The sky is filled with soft, wispy clouds, and the overall color palette is dominated by the white of the building and the various shades of grey and blue in the sky.



Certified Cree Architects

BEHF

Hermann Kaufmann *Tom Kaden* Schwarz

Weinhäupl Dietrich | Untertrifaller Auer - Weber

Snøhetta *Werner Sobek* Baumschlager Eberle

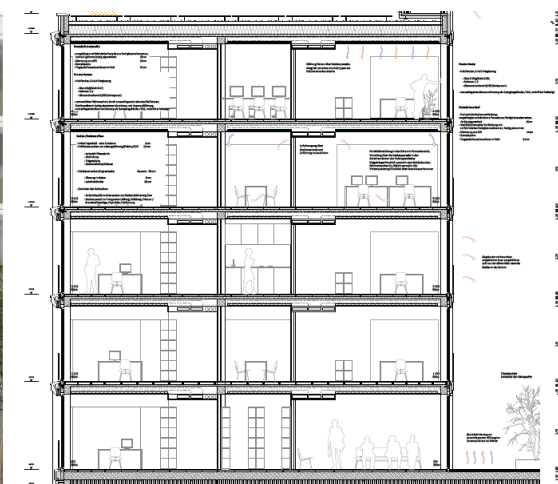
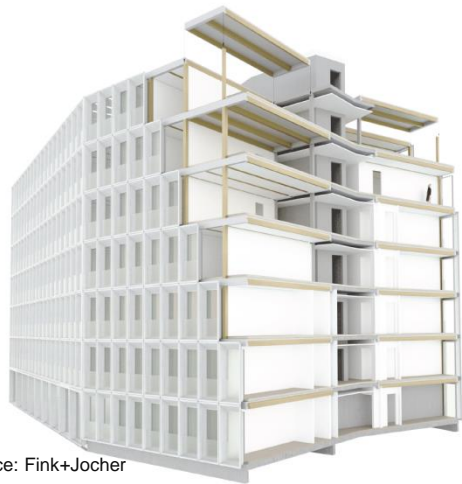
Fink + Jocher Ingenhoven Heinz Neumann **Wurm**

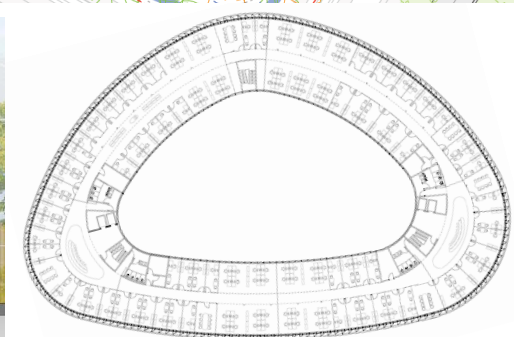
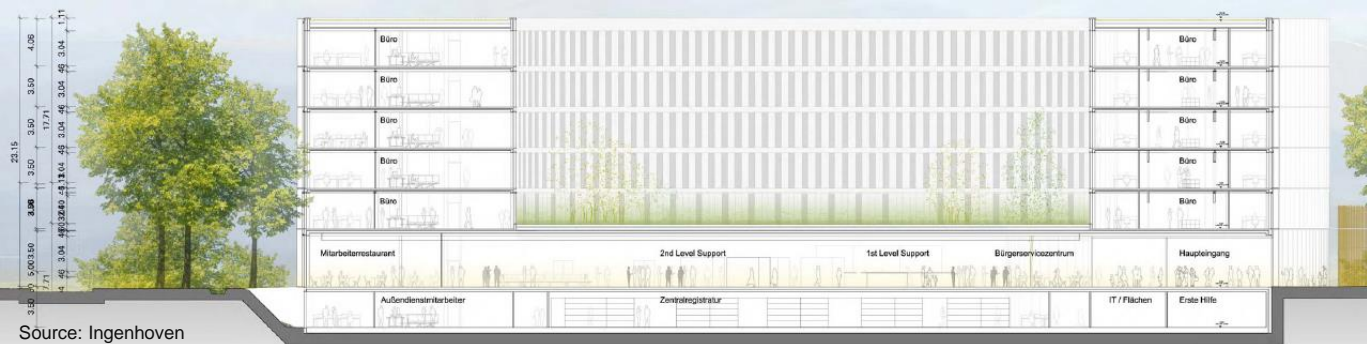
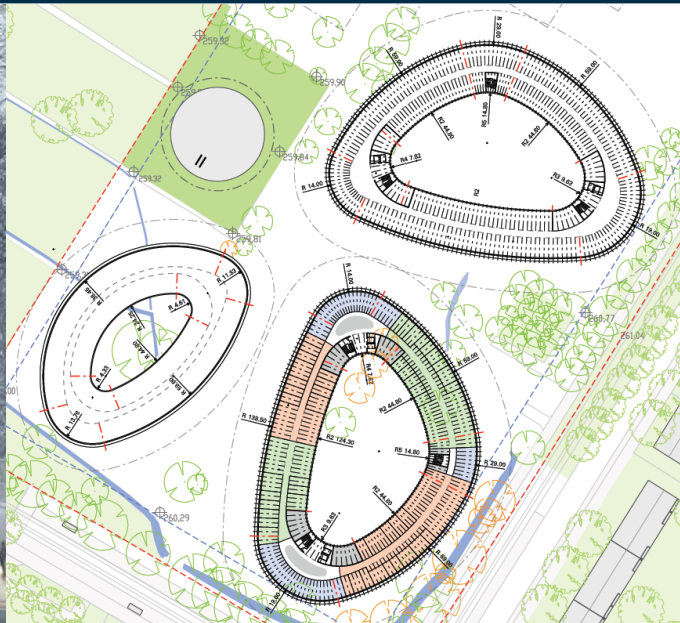
Waugh Thistleton Matteo Thun **SEHW**

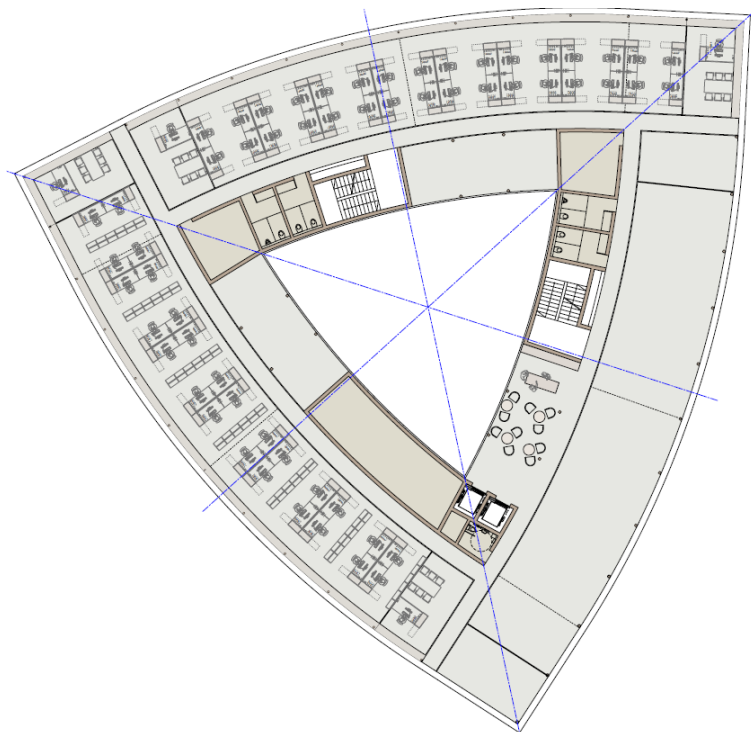
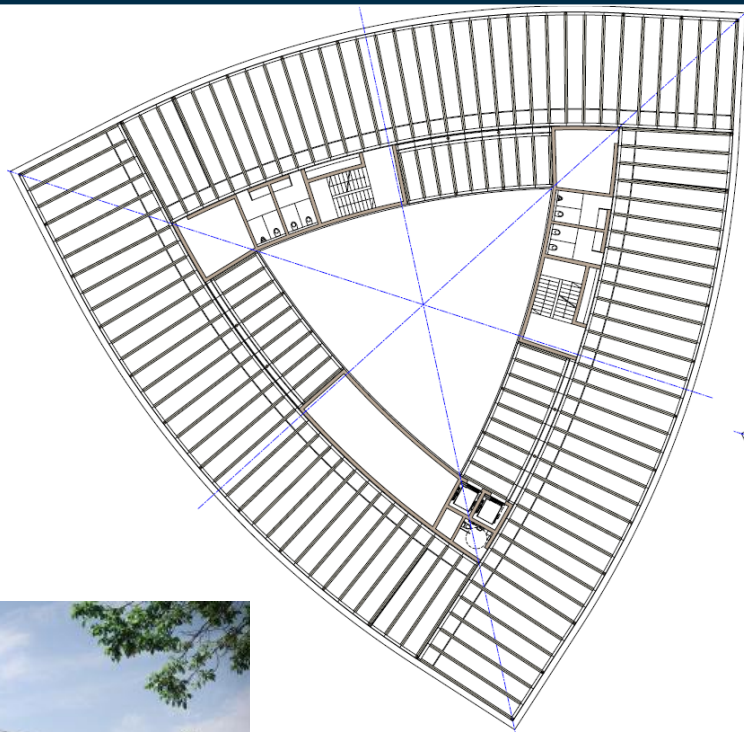
Maurer Moser **Behnisch**

CEI Bayer & Zilker *n-v-o*

Gensler

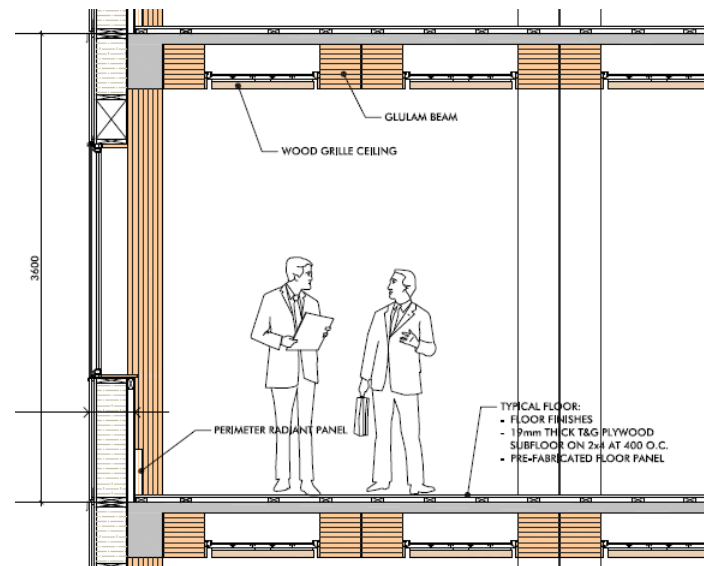






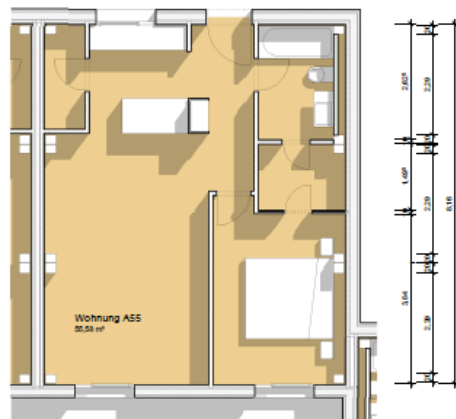
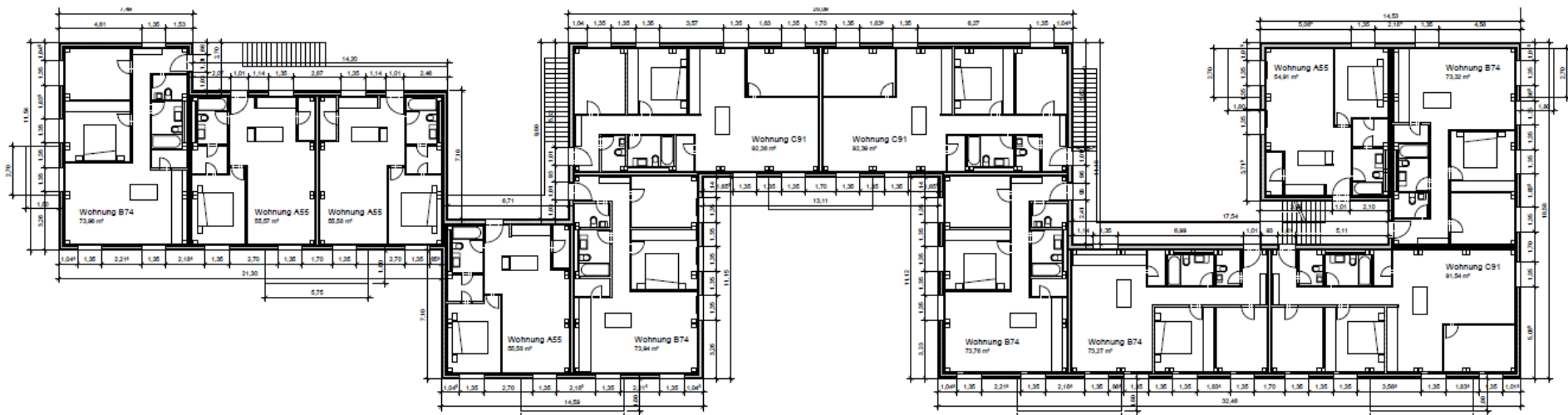


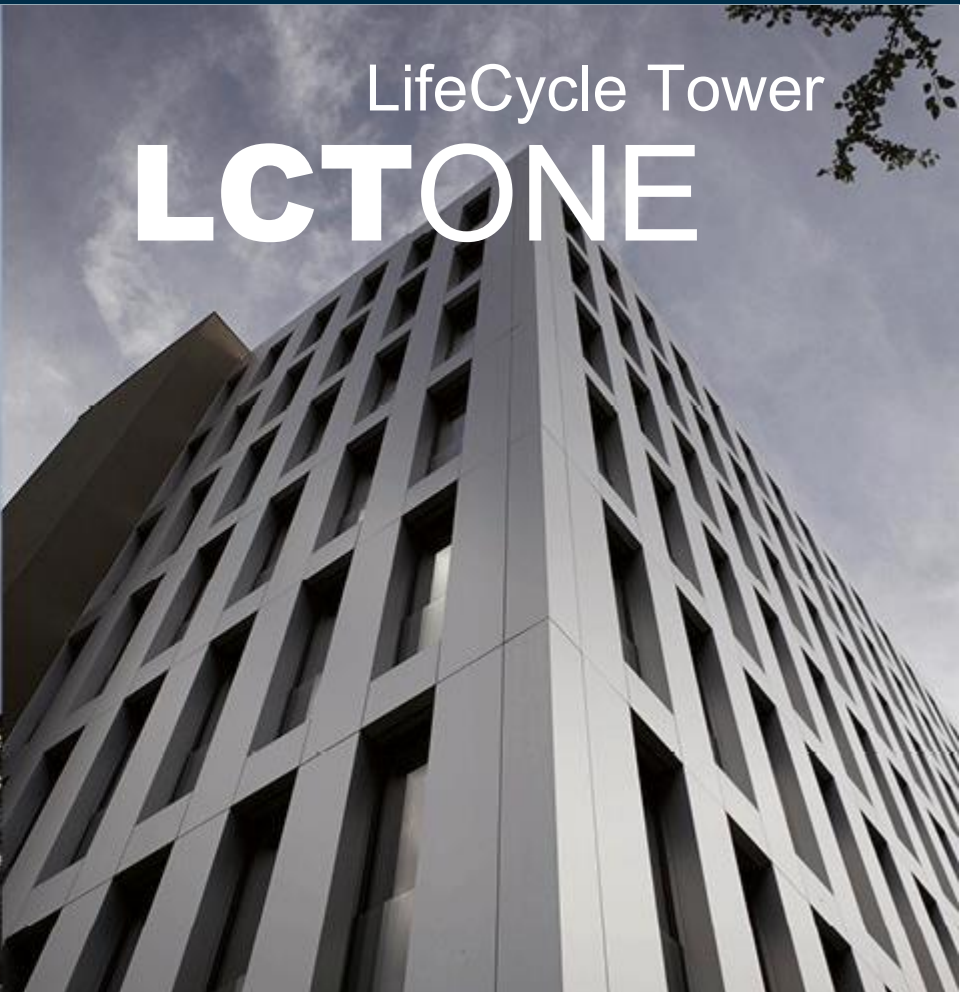












LifeCycle Tower

LCTONE

Facts

Project: LCT ONE
Location: Dornbirn /Austria
Client: Cree GmbH
Start: September 2011
Completion: July 2012

Dimensions:
Length: 24m
Width: 13m
Height: 27m
Stories: 8
Floor space: ~ 2.500m² (gross)
Cubage: ~ 7.500m³ (gross)

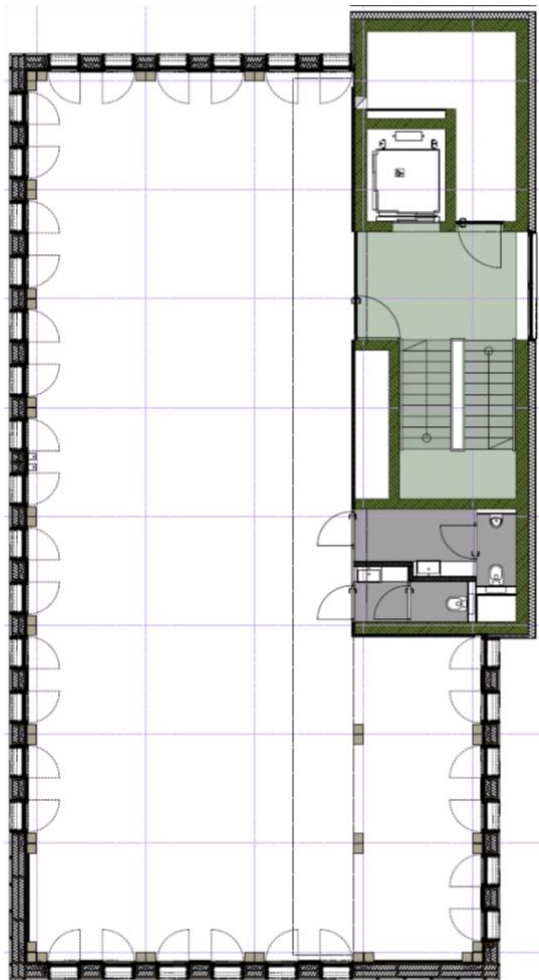
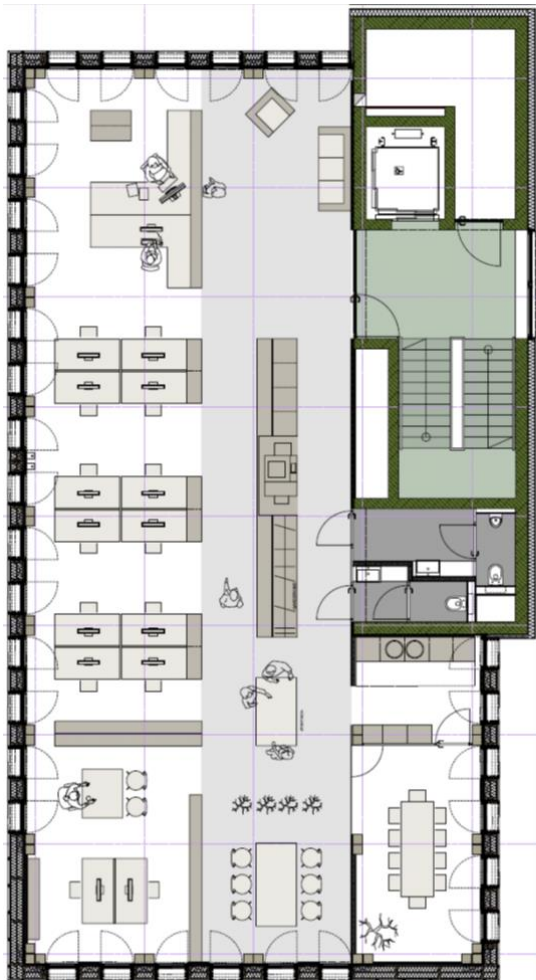


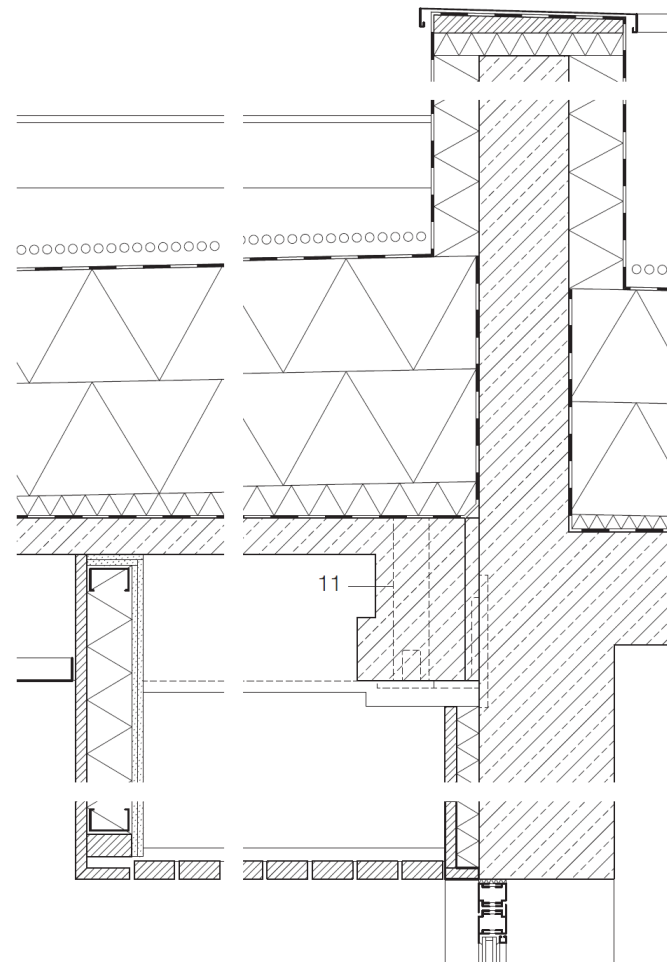
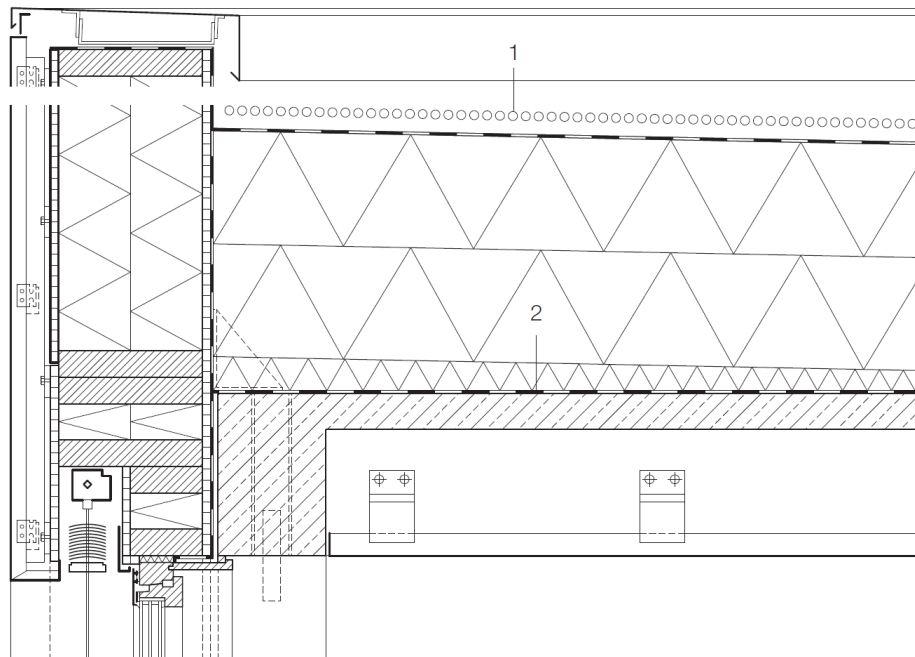
Green Building Certifications

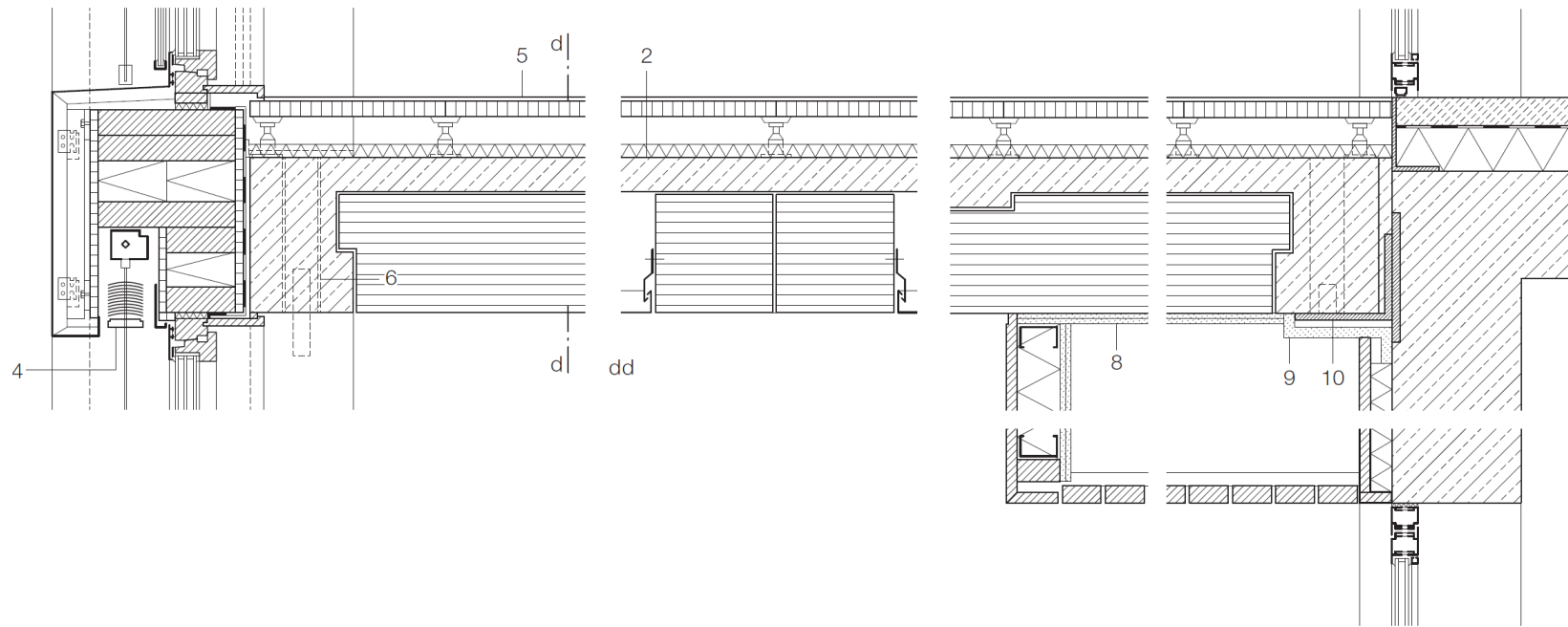
- LEED Platinum
- DGNB/ÖGNI Platinum
- ÖGNB certified
- Certified Passive House
- Open House certified

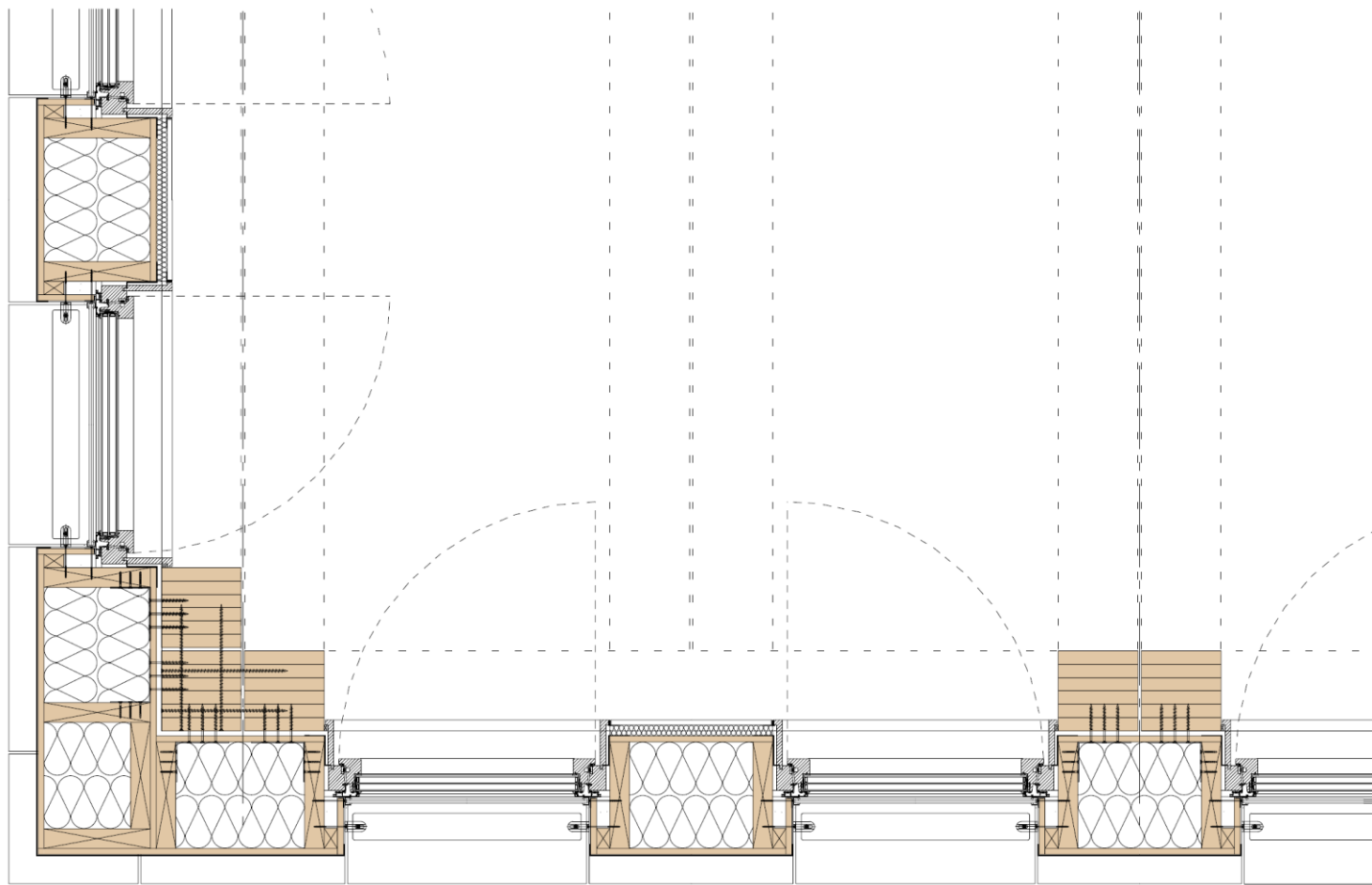


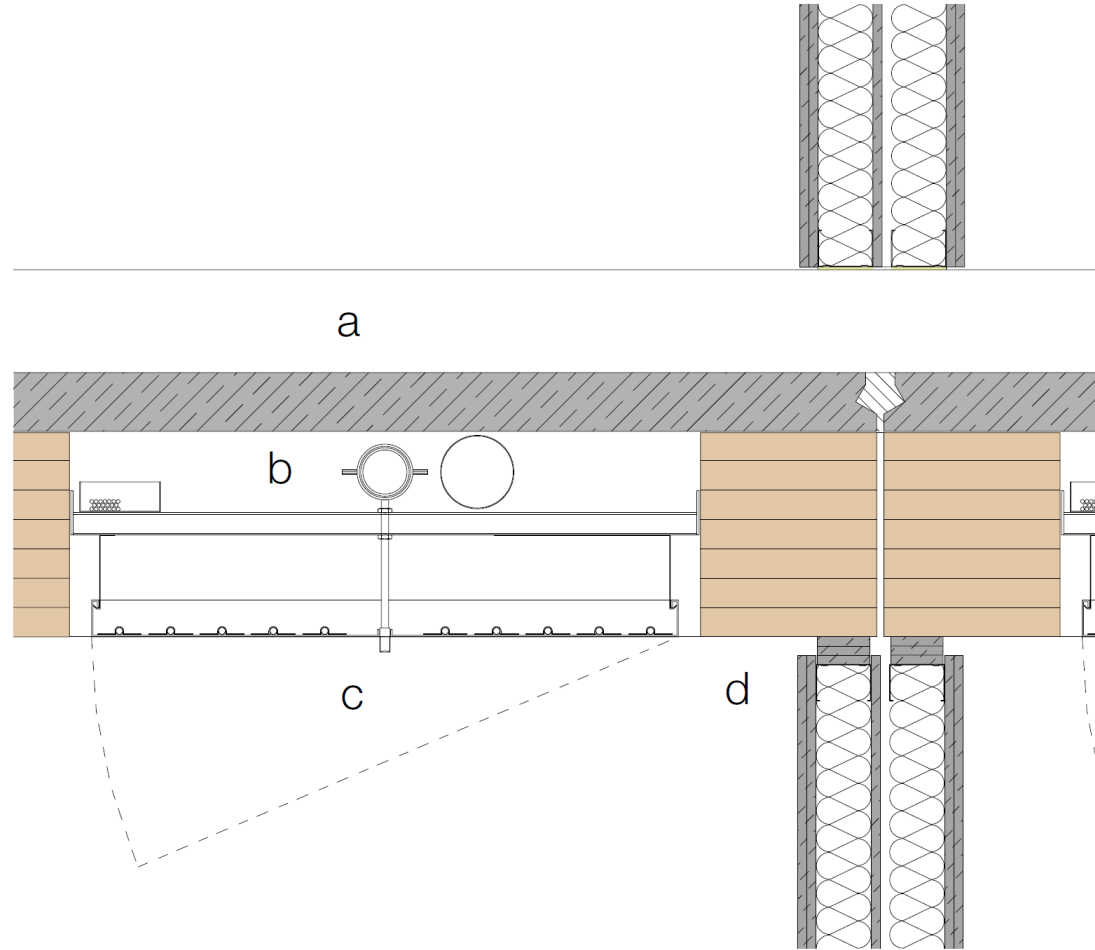


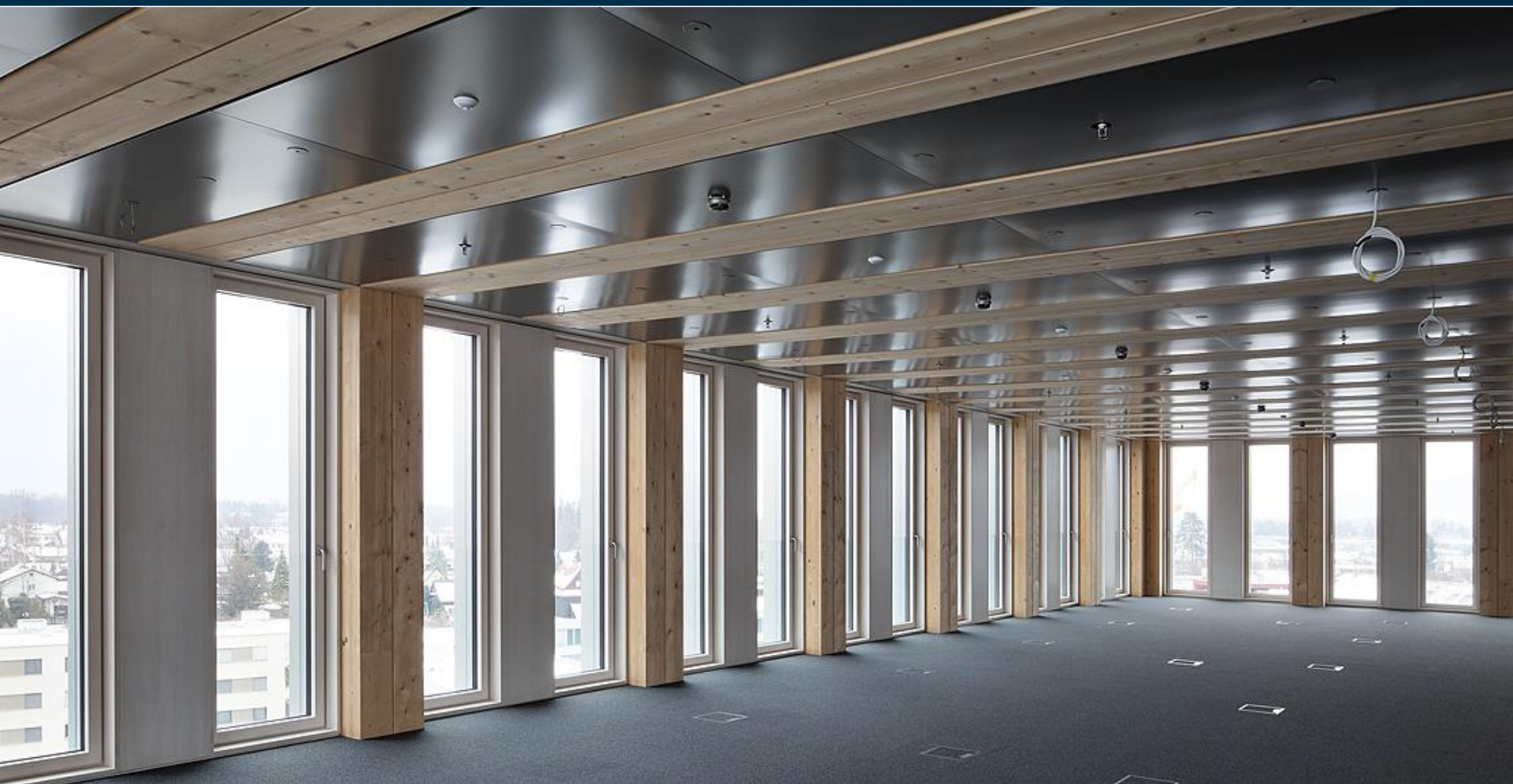
















Wagnertec

Office extension



Hybrid-slab with integrated heating/cooling mats

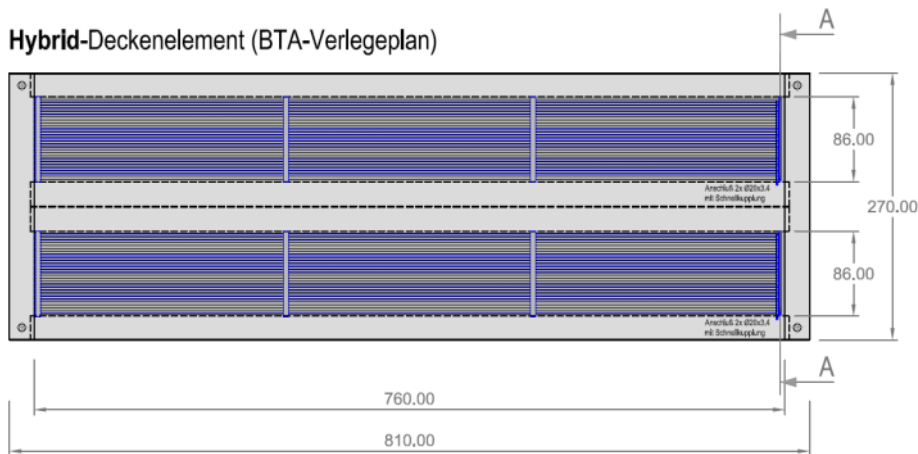
cooling: **max. 88 W/m²**

heating: **max. 80 W/m²**

time of reaction: **15 – 20 min**



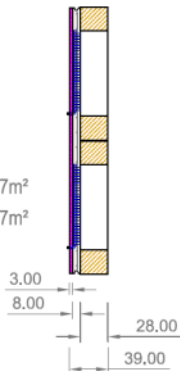
Hybrid-Deckenelement (BTA-Verlegeplan)



Schnitt A-A

$$A_{\text{element}} = 21.87\text{m}^2$$

$$A_{\text{BTA}} = 13.07\text{m}^2$$





BTV

Office- and Residential Building









IZM

Illwerke Zentrum Montafon

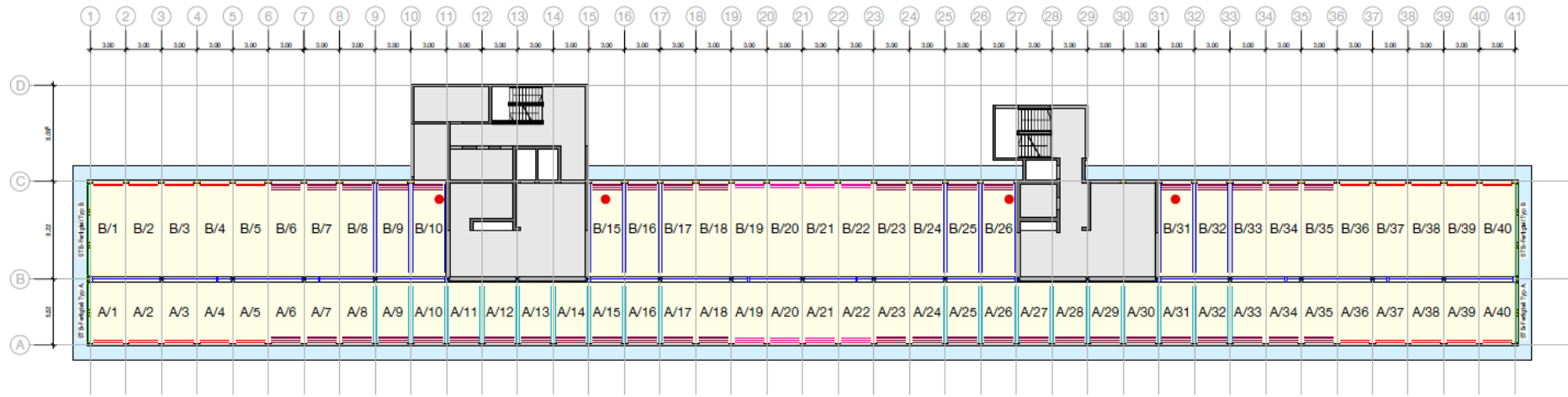


Facts

Project: IZM
 Location: Montafon /Austria
 Client: Vorarlberger Illwerke AG
 Start: March 2012
 Completion: August 2013

Dimensions:
 Length: 120m
 Width: 16m
 Height: 21m
 Stories: 6
 Floor space: ~ 11.500m² (gross)
 Cubage: ~ 45.000m³ (gross)











































SHARE OUR IDEAS

Phase I

Local Market Evaluation

- _ Building Codes
- _ Approval Procedures
- _ Suppliers
- _ Design Processes
- _ Construction Process

Phase II

Training Center Austria

- _ Inspection of Cree Buildings
- _ Insight to Cree Suppliers
- _ Approval Procedure Comparison
- _ Cree Design Process
- _ Cree Construction Process
- _ Consolidation of Findings

Phase III

Your Prototype Project

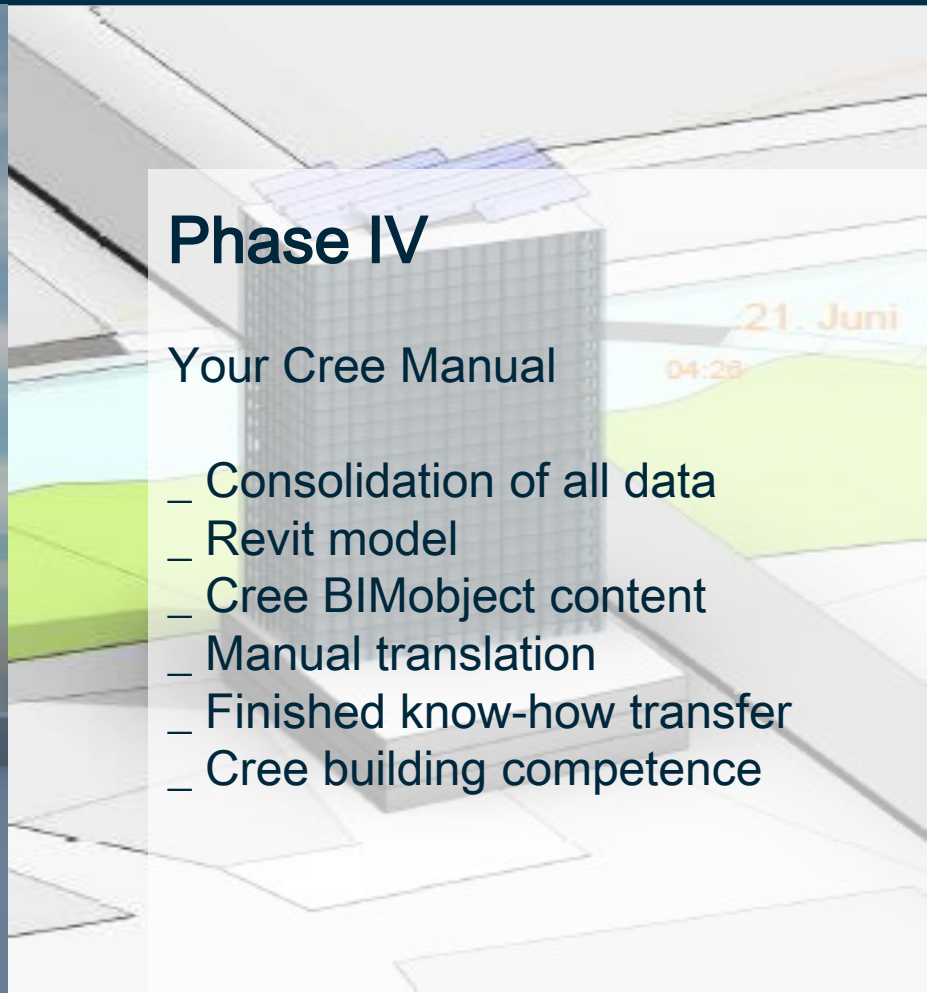
- Project defined
- Authority on board
- Team building
- Kick off
- Design Phase
- Supplier integration
- Governmental approval
- Construction phase
- Commissioning



Phase IV

Your Cree Manual

- _ Consolidation of all data
- _ Revit model
- _ Cree BIMObject content
- _ Manual translation
- _ Finished know-how transfer
- _ Cree building competence



A background image showing a woman in a light-colored shirt looking upwards, with a large, modern building under construction in the background. The building features a complex, curved facade with many windows and structural elements.

Be part of our revolution!



Cree GmbH
Mariahilfstr. 29
6900 Bregenz
Austria

T +43 (0)5574 403-190
F +43 (0)5574 403-99190
info@creebyrhomburg.com
www.creebyrhomburg.com

