

Timber-Concrete Composite floor system (TCC)

Konrad Merz

**merz
kley
partner**











- When and Why?
- Composite action
- Classification
- Projects



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Residential floor system

About 5 m span length

$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)

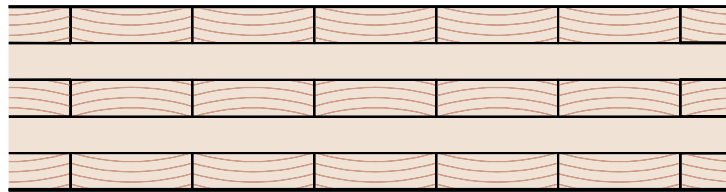
Residential floor system

About 5 m span length

$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)

Timber floor

100 kg/m²



200 mm

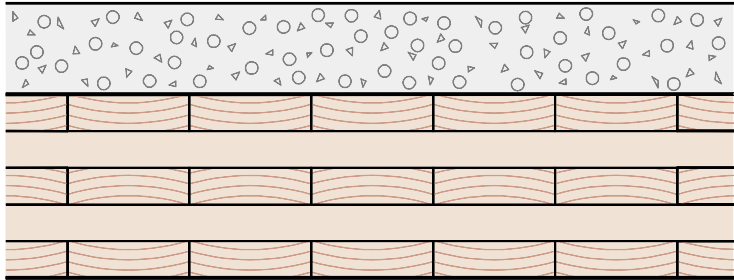
Residential floor system

About 5 m span length

$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)

Timber floor

150 kg/m²



100 mm

100 kg/m²

200 mm

Residential floor system

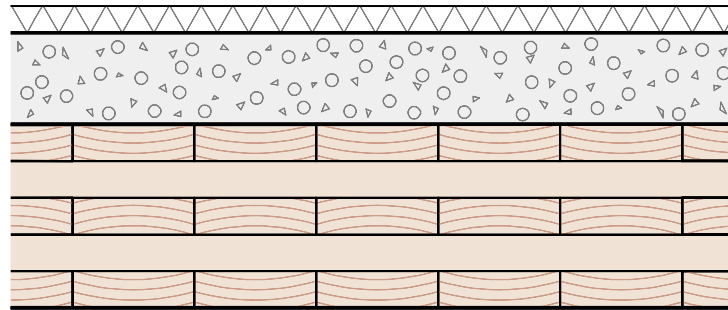
About 5 m span length

$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)

Timber floor

150 kg/m²

100 kg/m²



30 mm

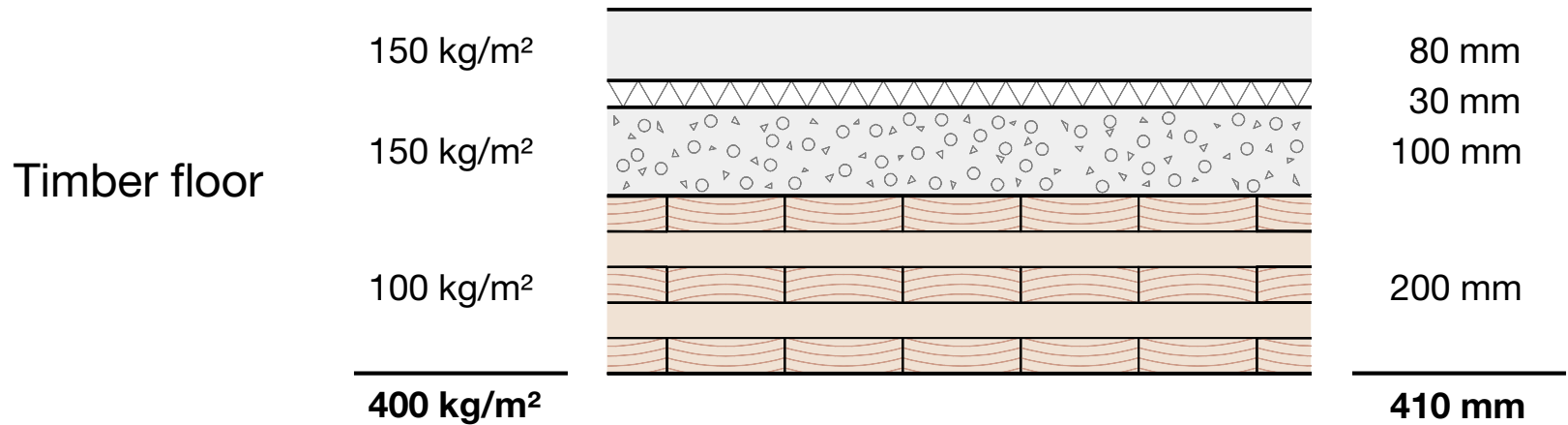
100 mm

200 mm

Residential floor system

About 5 m span length

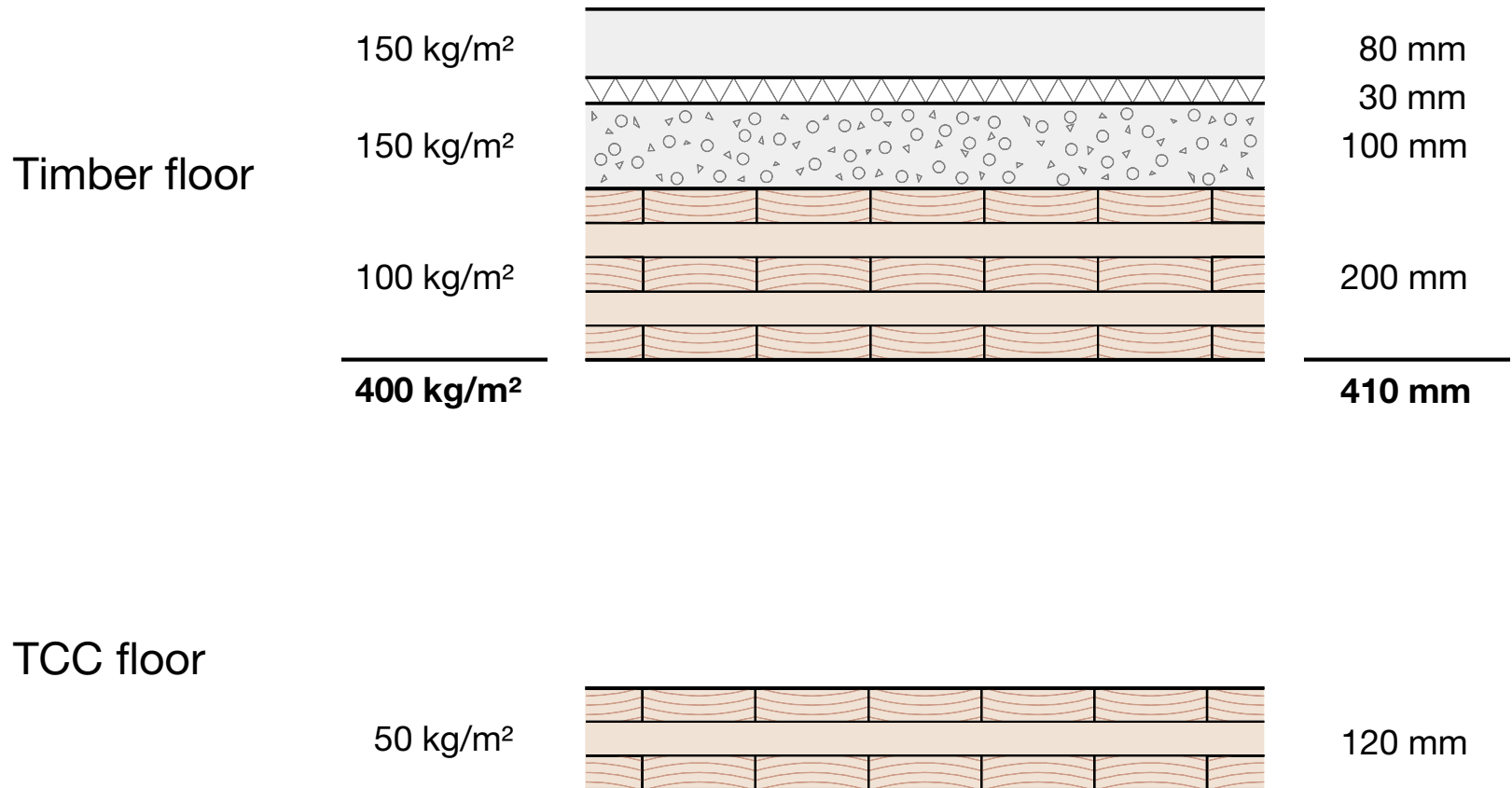
$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)



Residential floor system

About 5 m span length

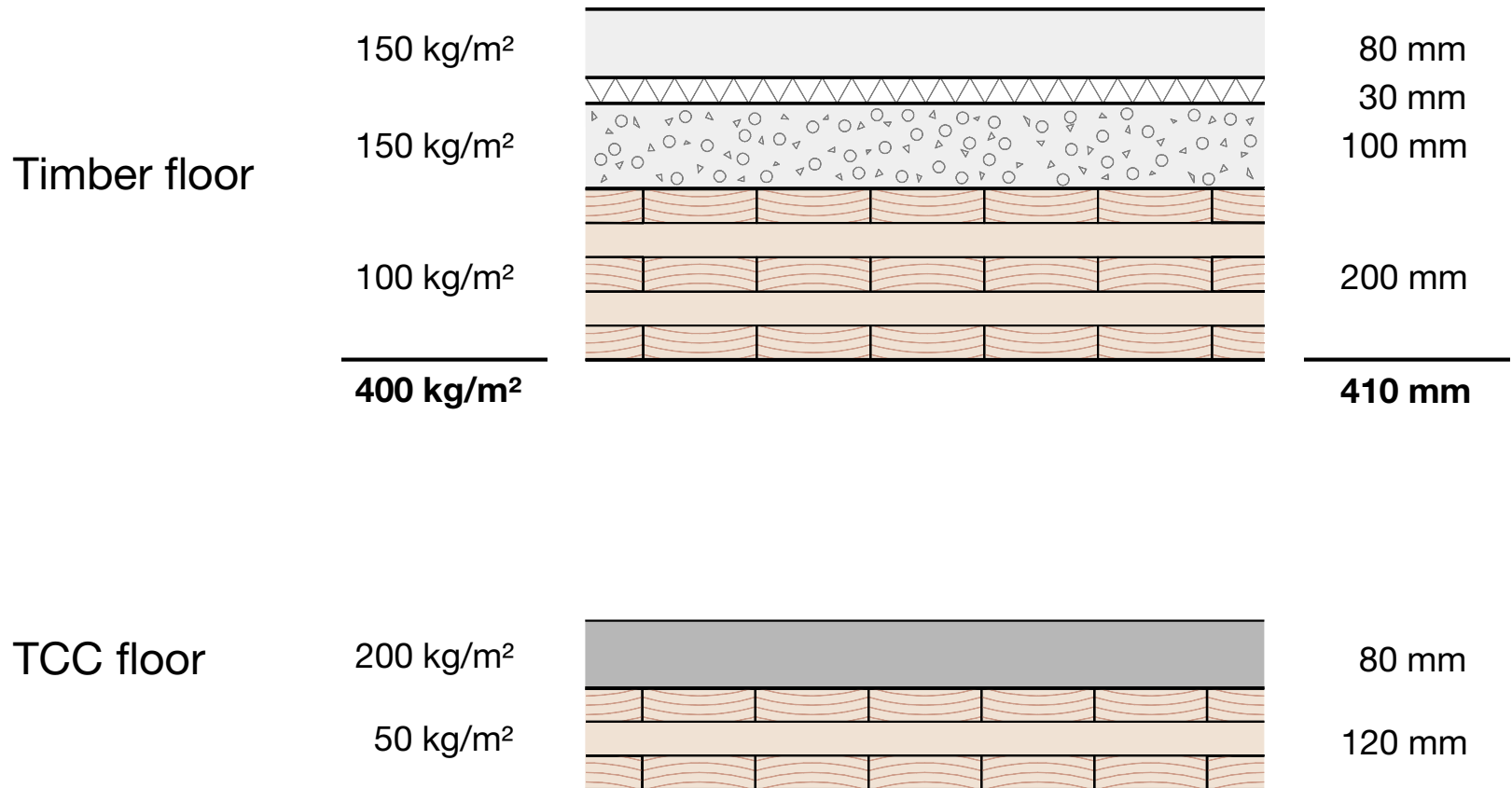
$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)



Residential floor system

About 5 m span length

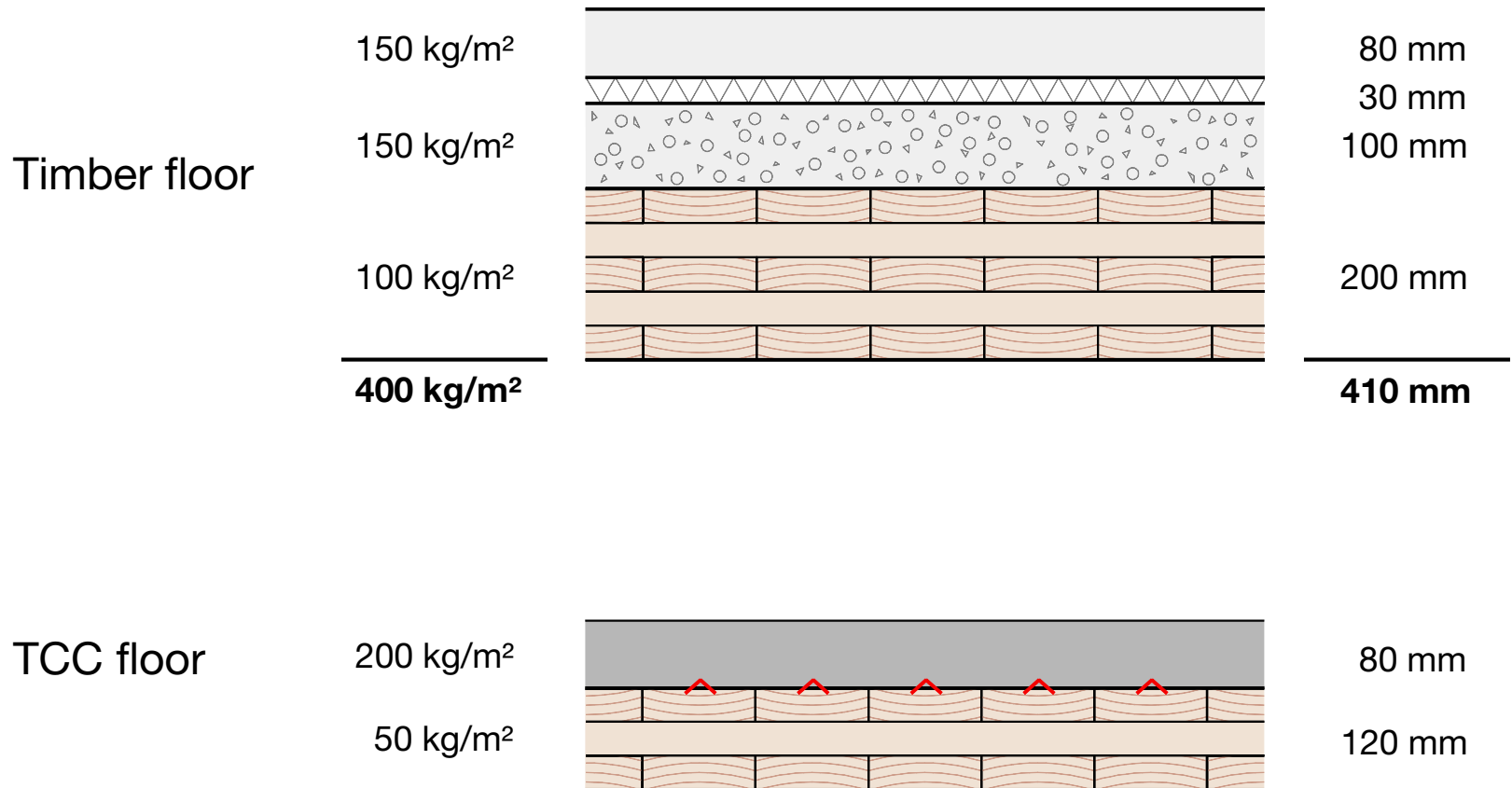
$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)



Residential floor system

About 5 m span length

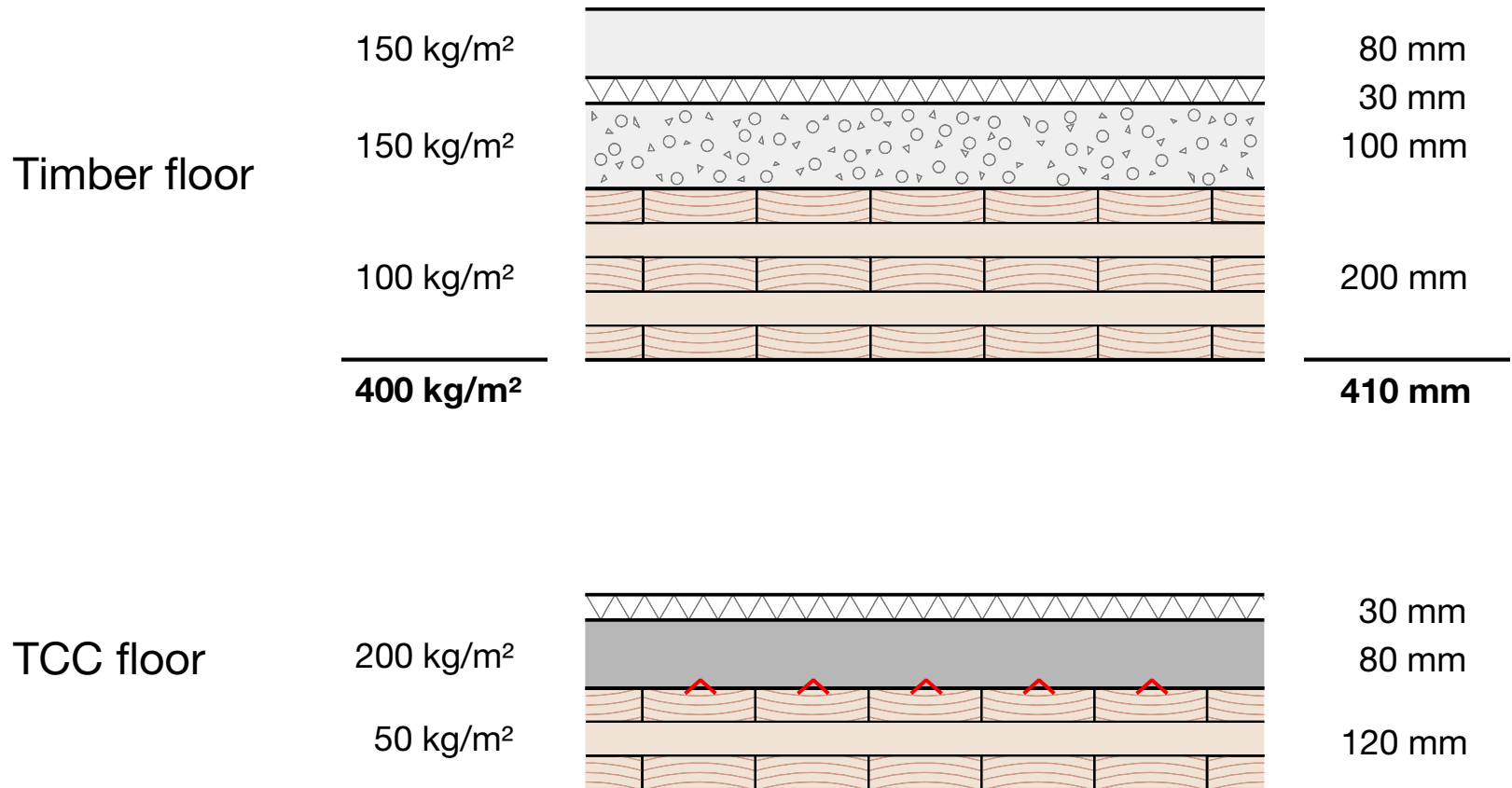
$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)



Residential floor system

About 5 m span length

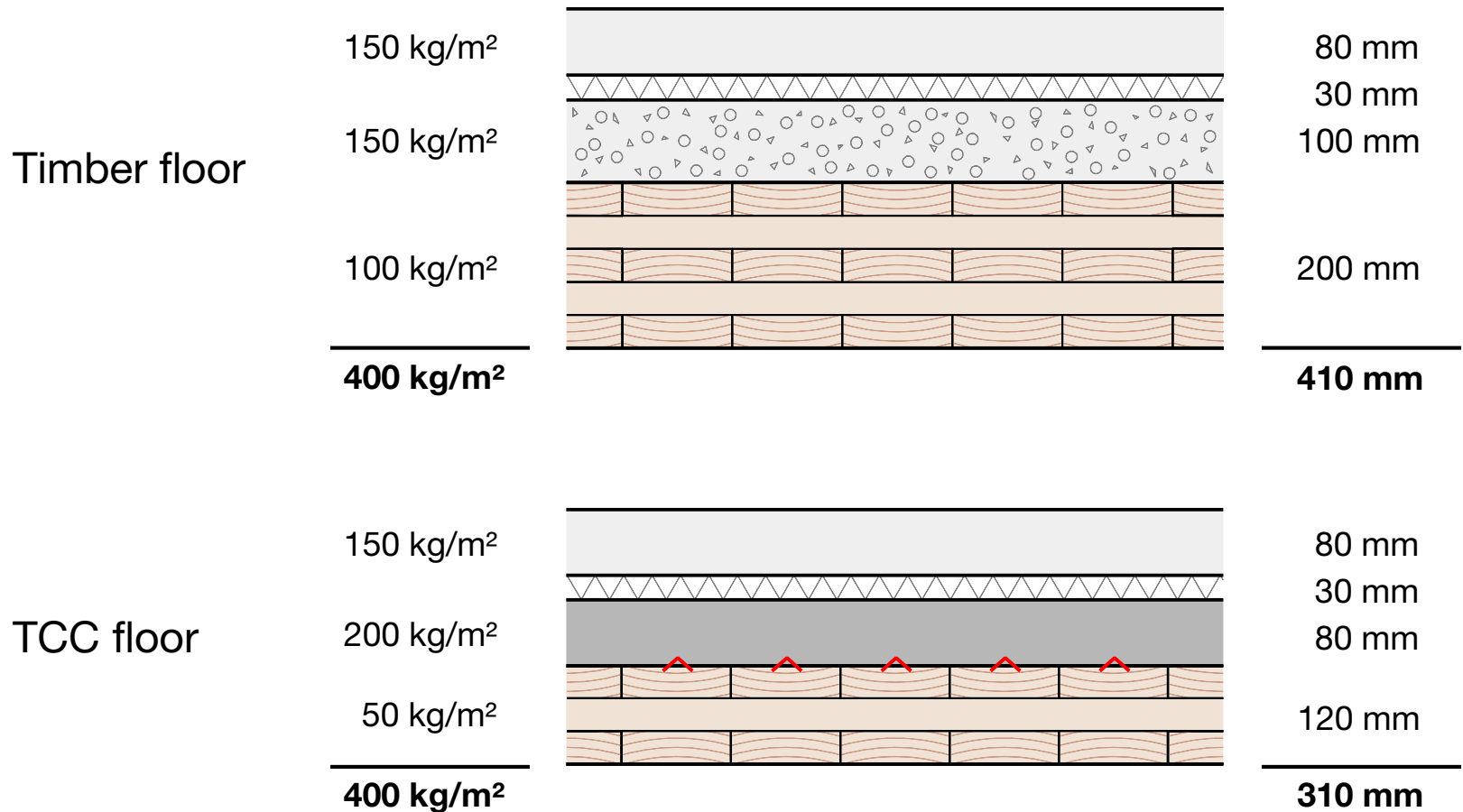
$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)



Residential floor system

About 5 m span length

$L'_{nT,W} \approx 43$ dB (Weighted Standardized Impact Sound Pressure Level)

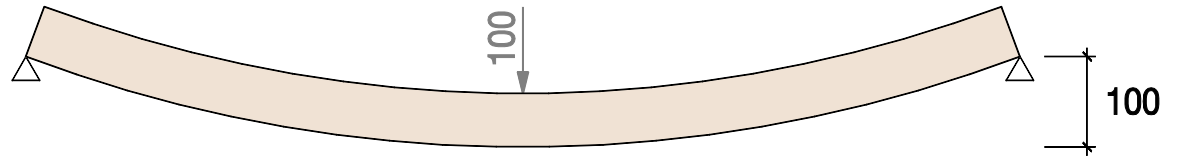




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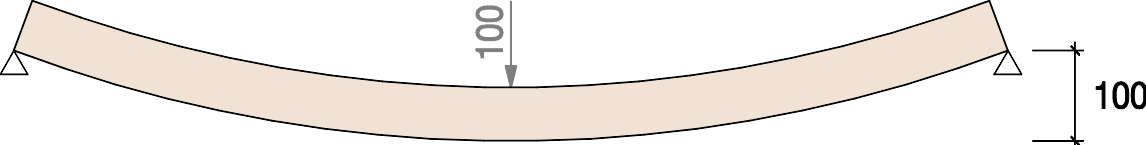
Composite action

1 beam

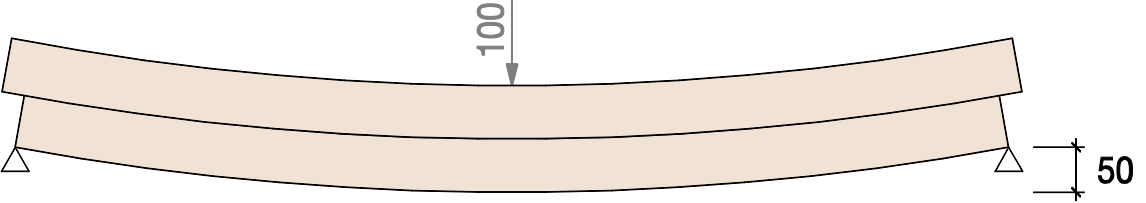


Composite action

1 beam

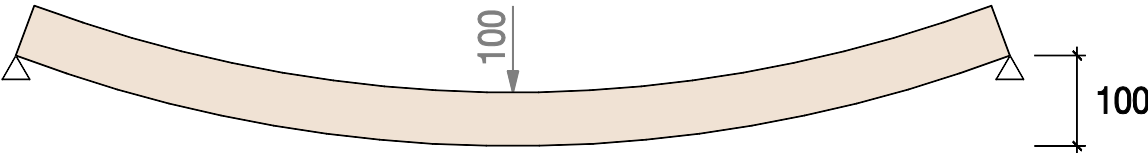


2 beams

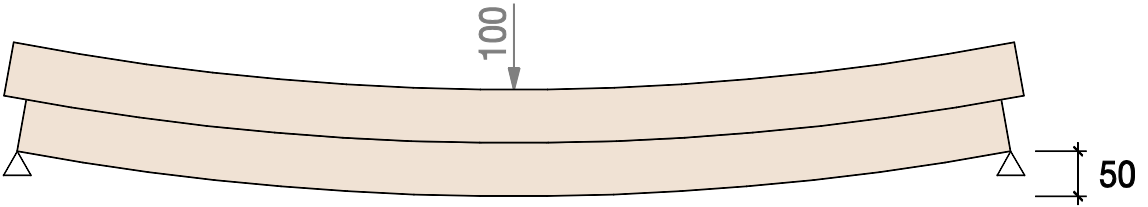


Composite action

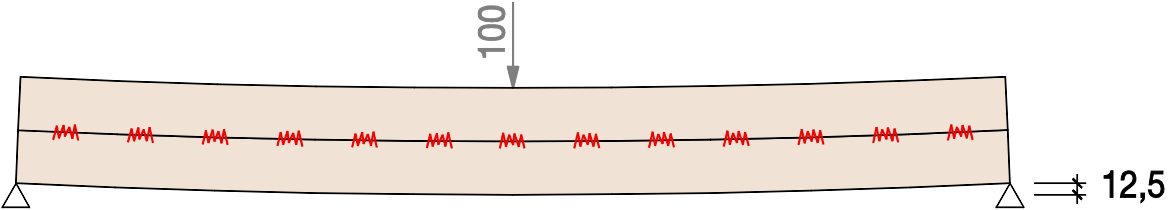
1 beam



2 beams

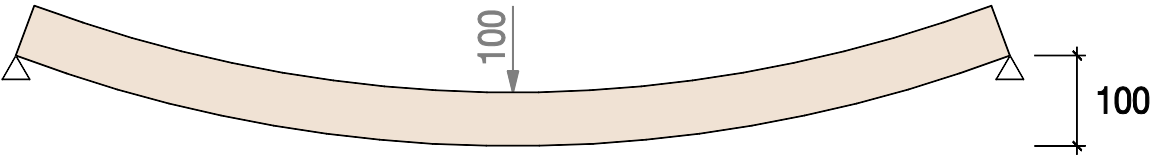


Glued connection

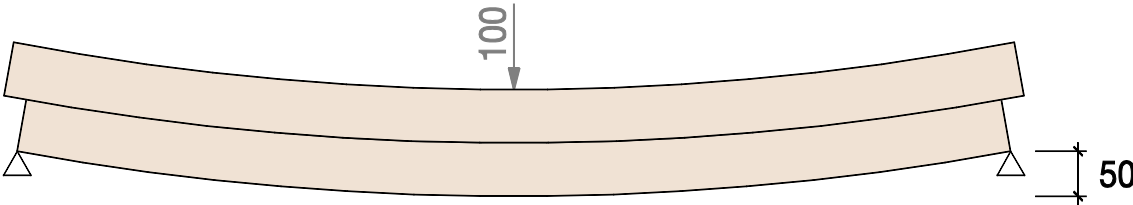


Composite action

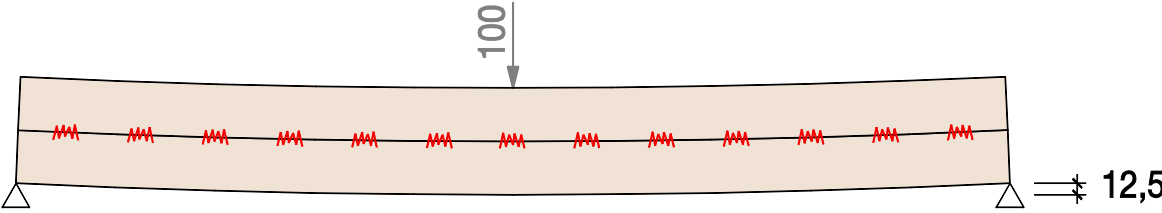
1 beam



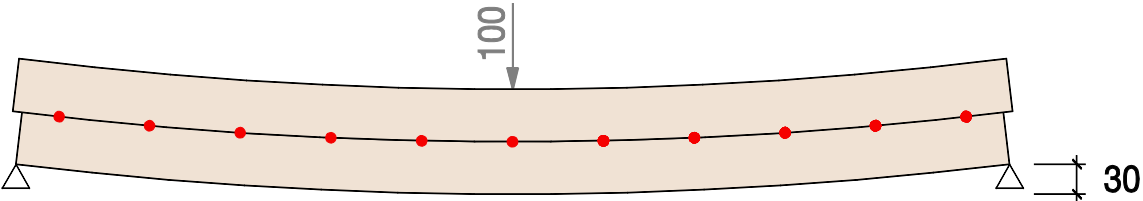
2 beams



Glued connection



Composite action





- When and Why?
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- **Classification**
- Projects

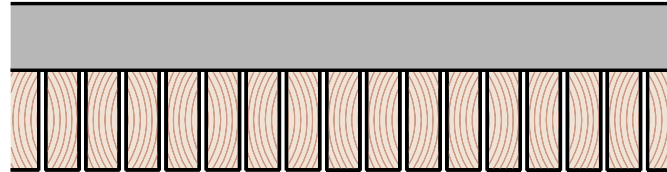


- Classification
 - Cross-section
 - Type of connection
 - Process



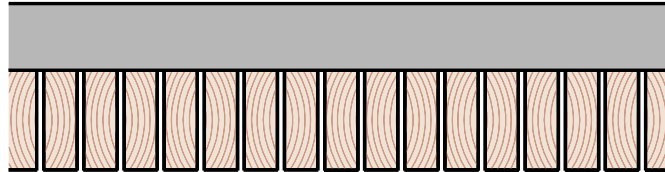
Cross-sections

Nail laminated timber (NLT)

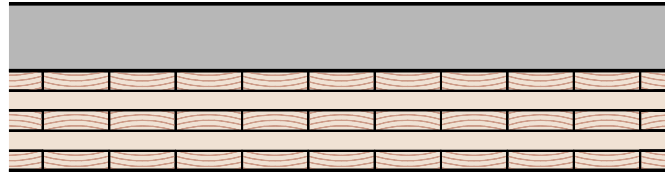


Cross-sections

Nail laminated timber (NLT)

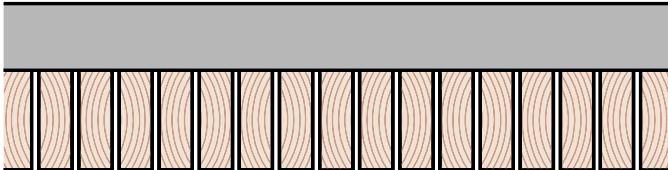


Cross-laminated timber (CLT)

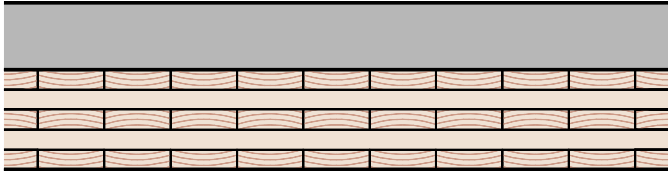


Cross-sections

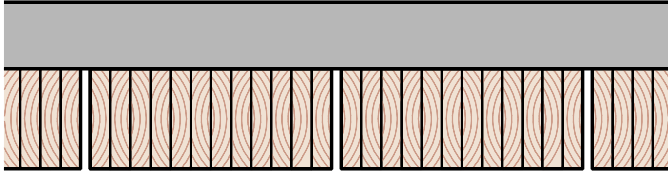
Nail laminated timber (NLT)



Cross-laminated timber (CLT)

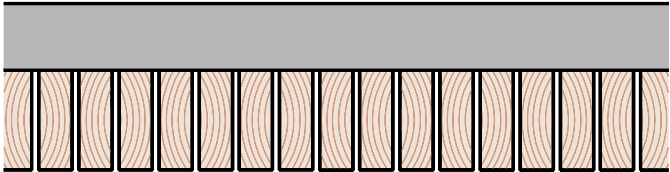


Tilted glulam beams

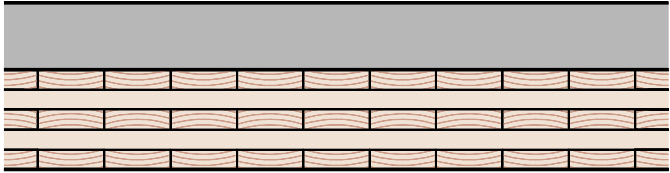


Cross-sections

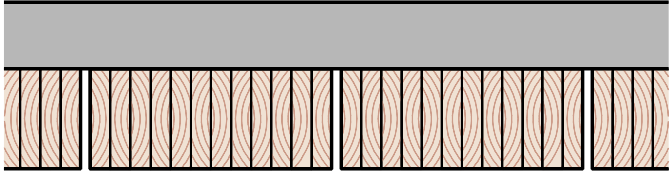
Nail laminated timber (NLT)



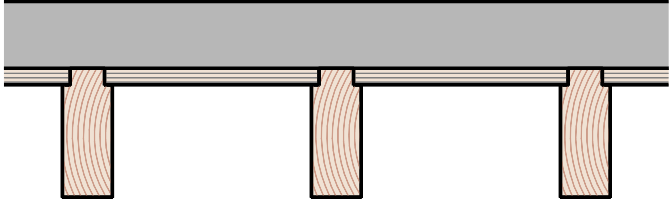
Cross-laminated timber (CLT)



Tilted glulam beams



Joists

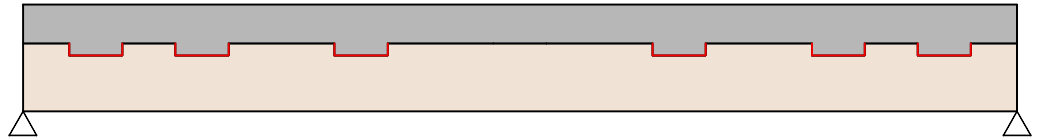




- Classification
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 - Type of connection
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Types of joints

Grooved connections



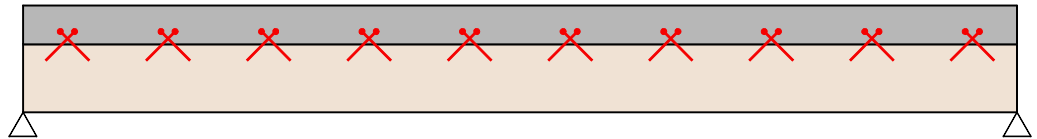


Types of joints

Grooved connections



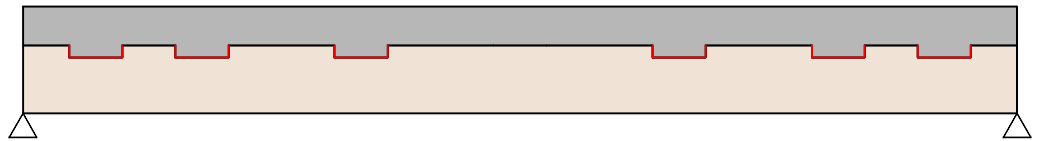
Threaded steel fasteners



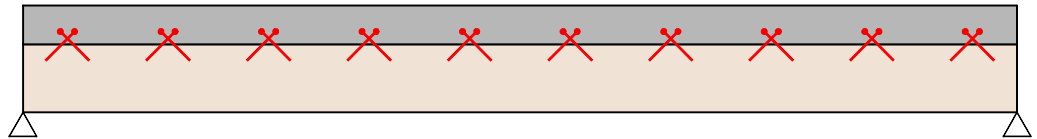


Types of joints

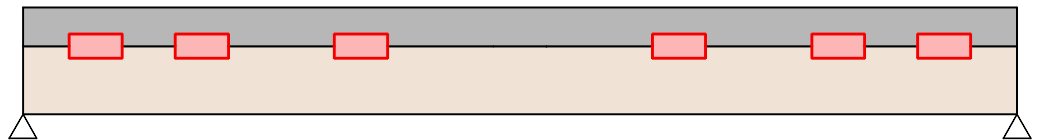
Grooved connections



Threaded steel fasteners



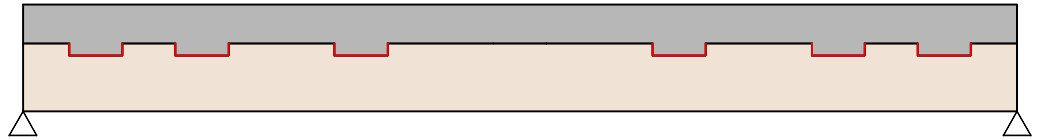
Glued-in steel connectors



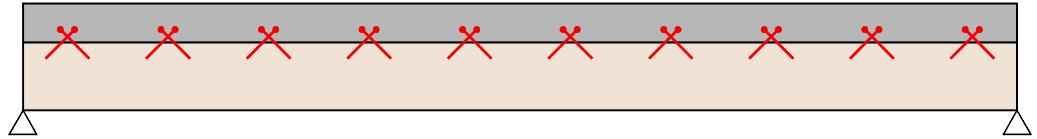


Types of joints

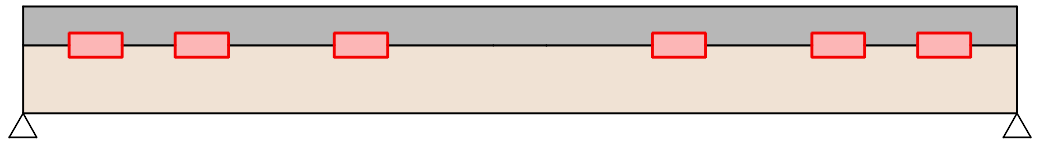
Grooved connections



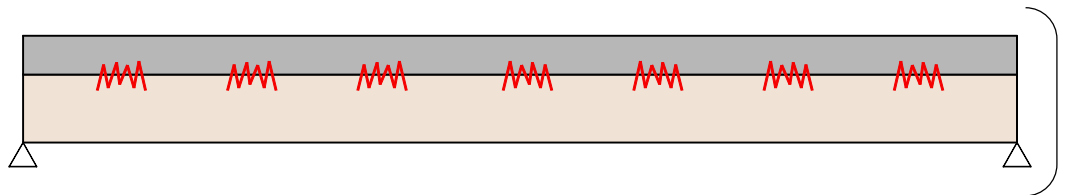
Threaded steel fasteners



Glued-in steel connectors



Epoxy adhesive

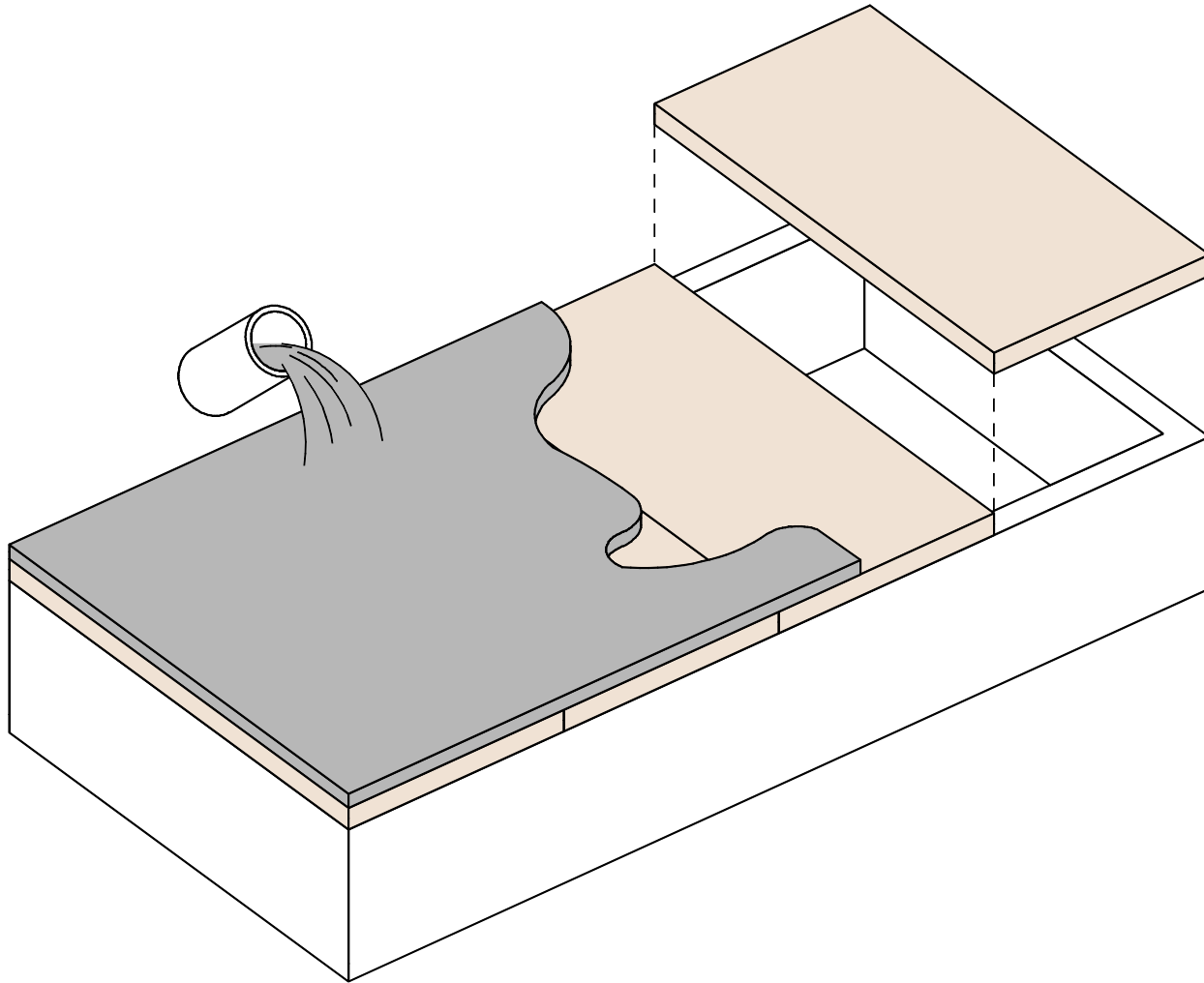






- Classification
 - Cross-section
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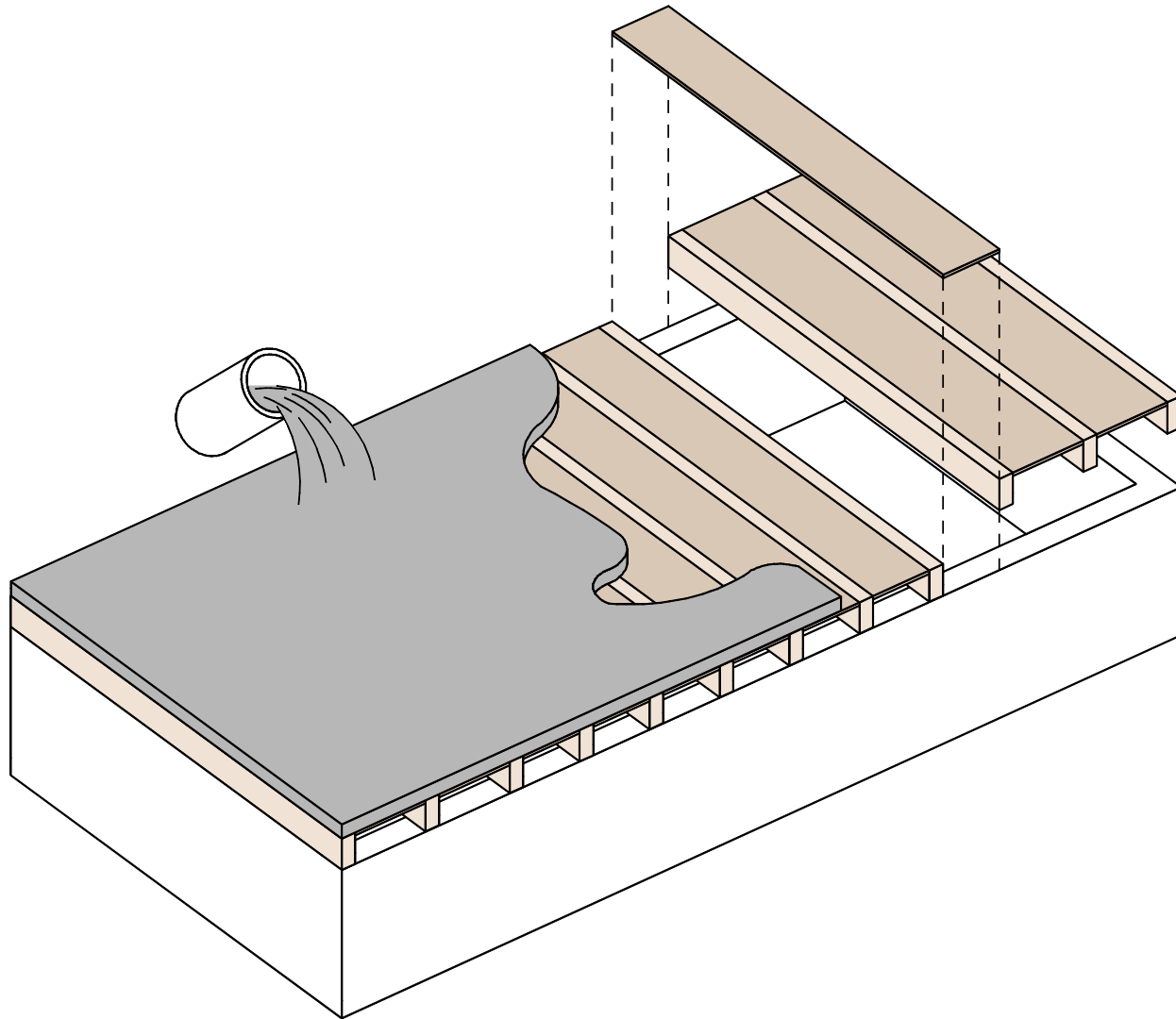
Wet method : concrete poured on site





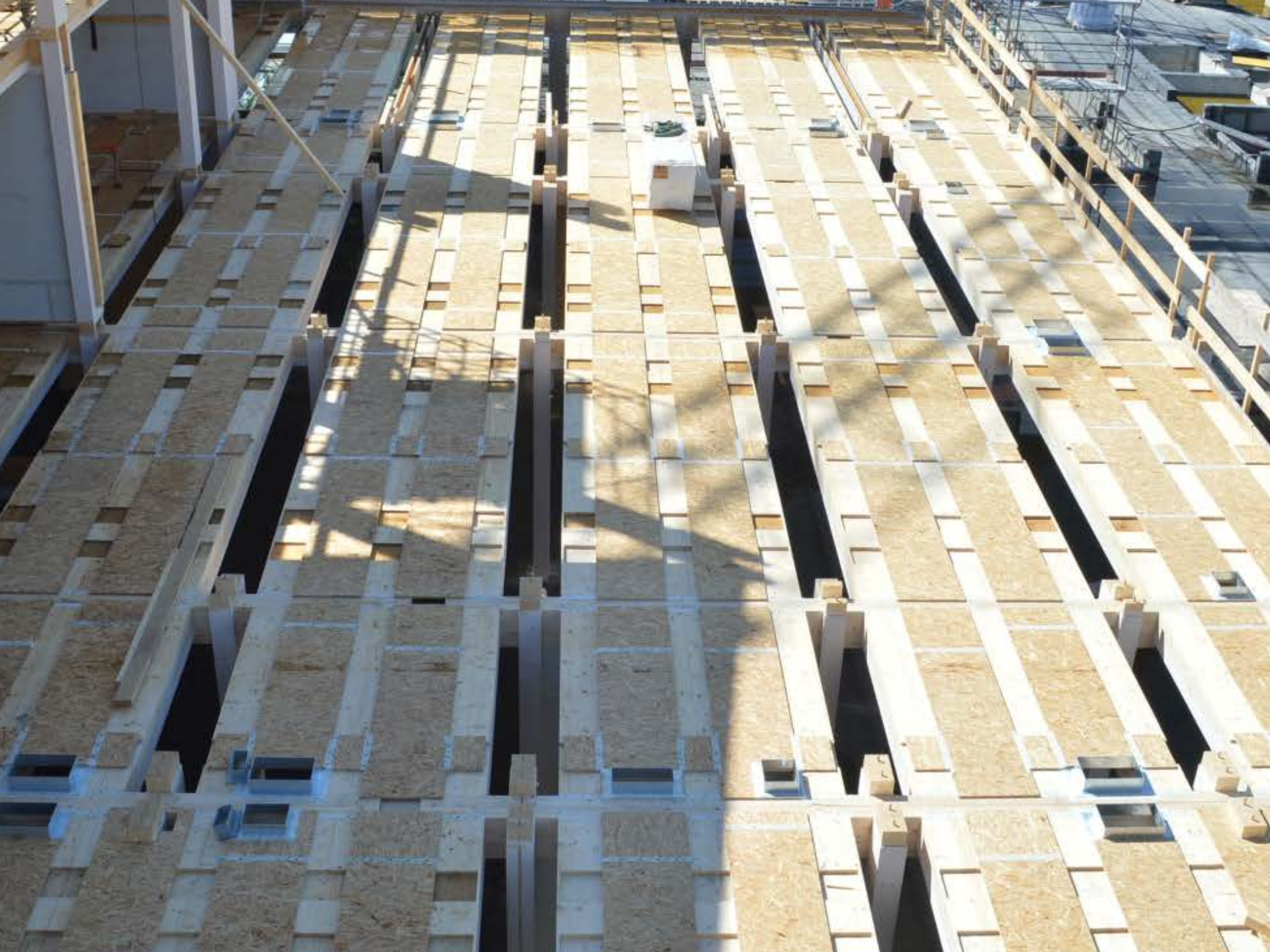


HBV-Plattenbalkendecke mit Ortbeton





056













149g

ON
TARE

OFF

Max 2200g
0.1g

NET

0.250g

SOENNE

PROFESSIONAL

8241











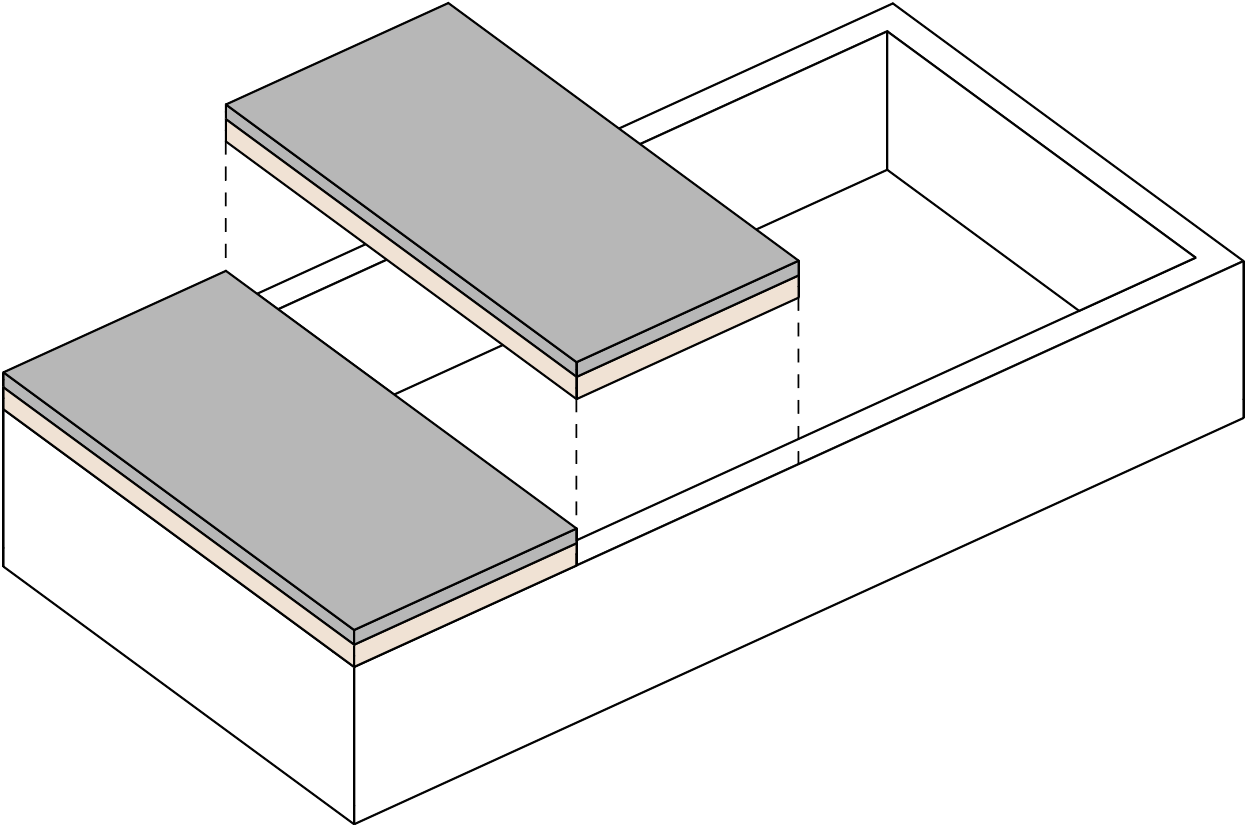


Gymnasium Diedorf, D

Architekten: Florian Nagler / Hermann Kaufmann



Prefabrication method: TCC panels manufactured off site



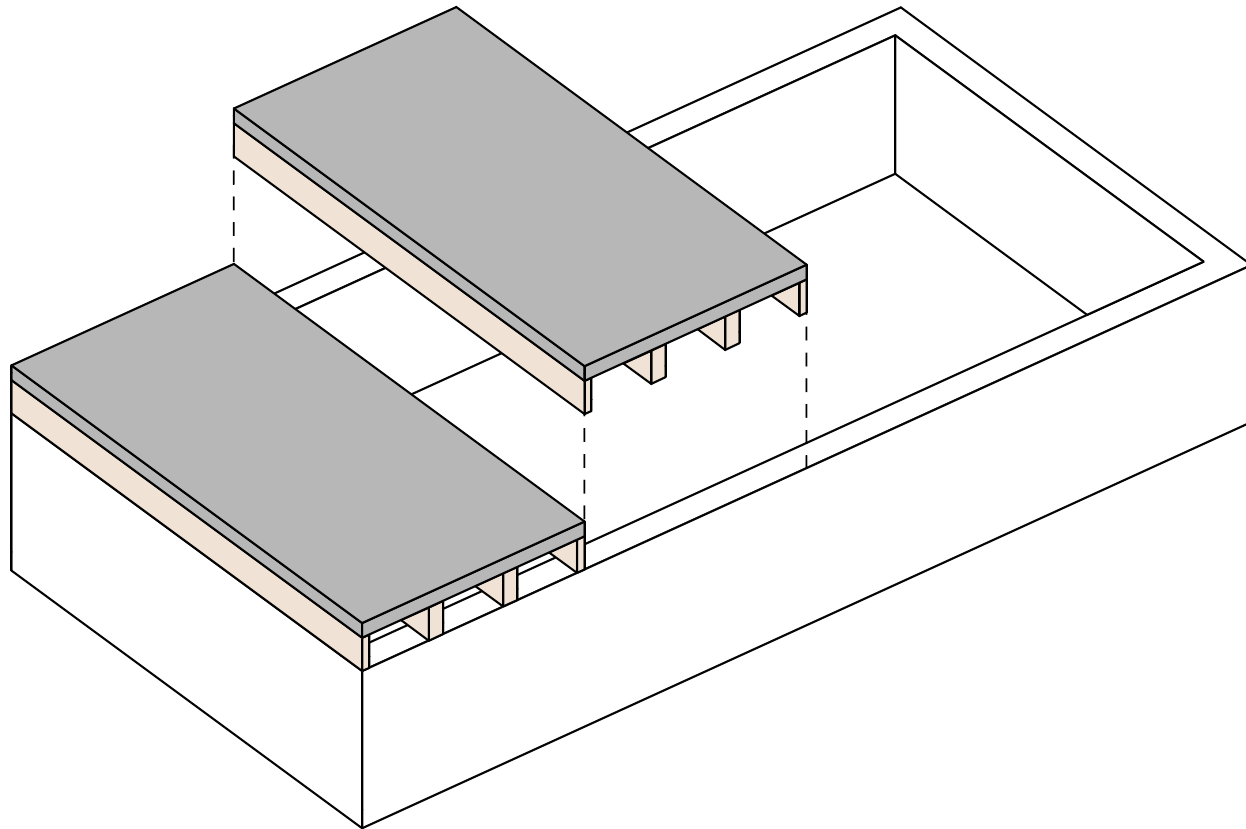








Im Werk vorgefertigte HBV-Plattenbalkendecken













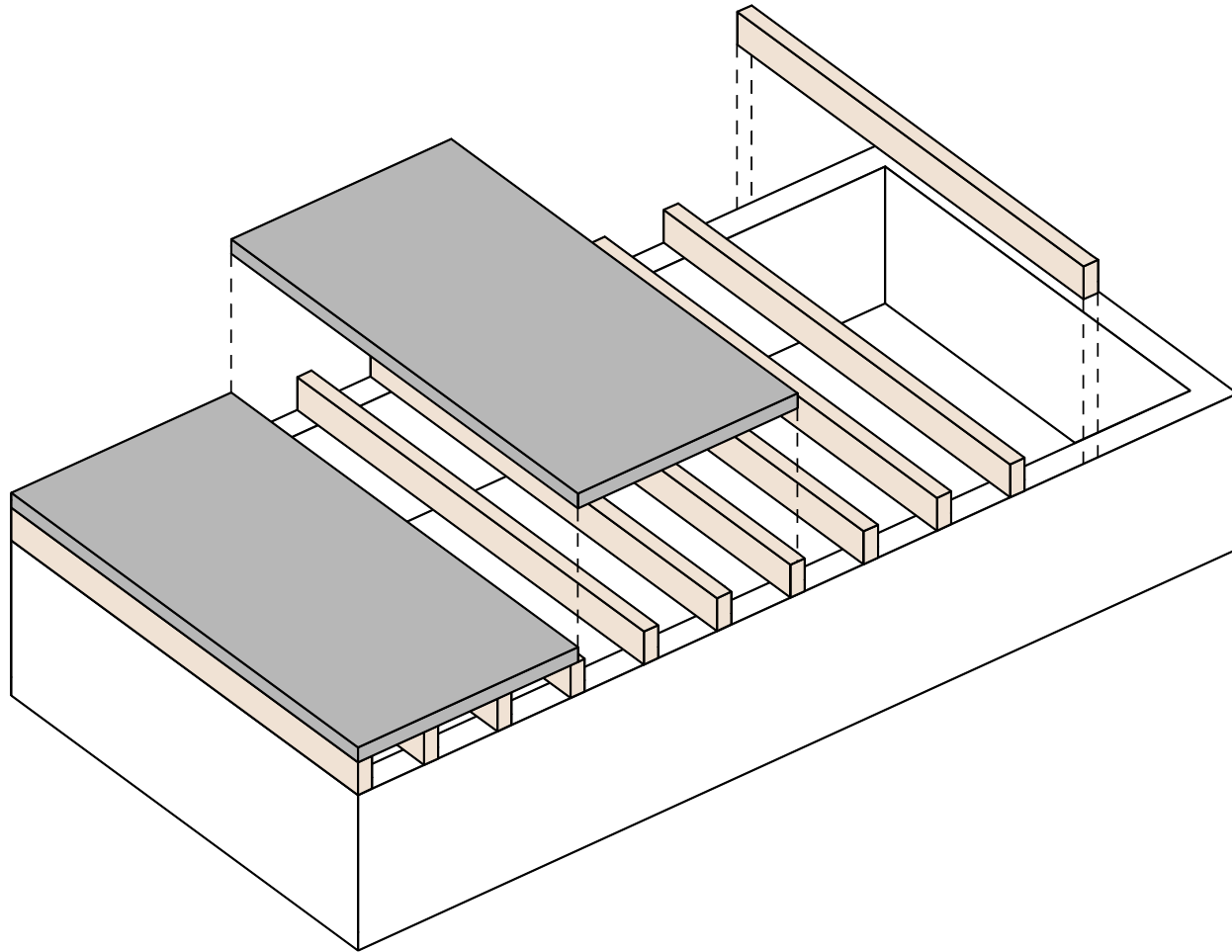


SONN





Semi-prefabrication method: concrete panel prefabricated off site









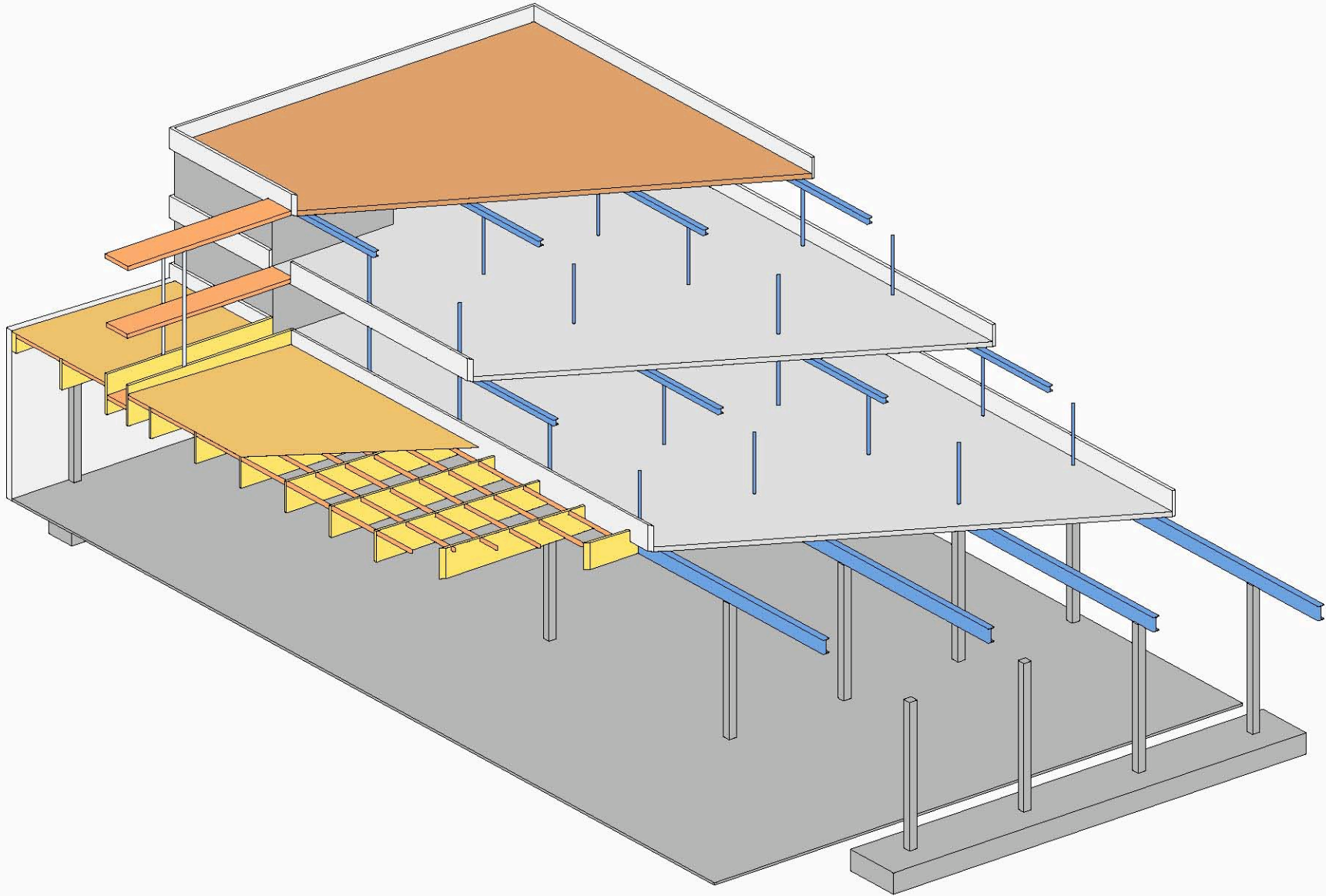
Würth System

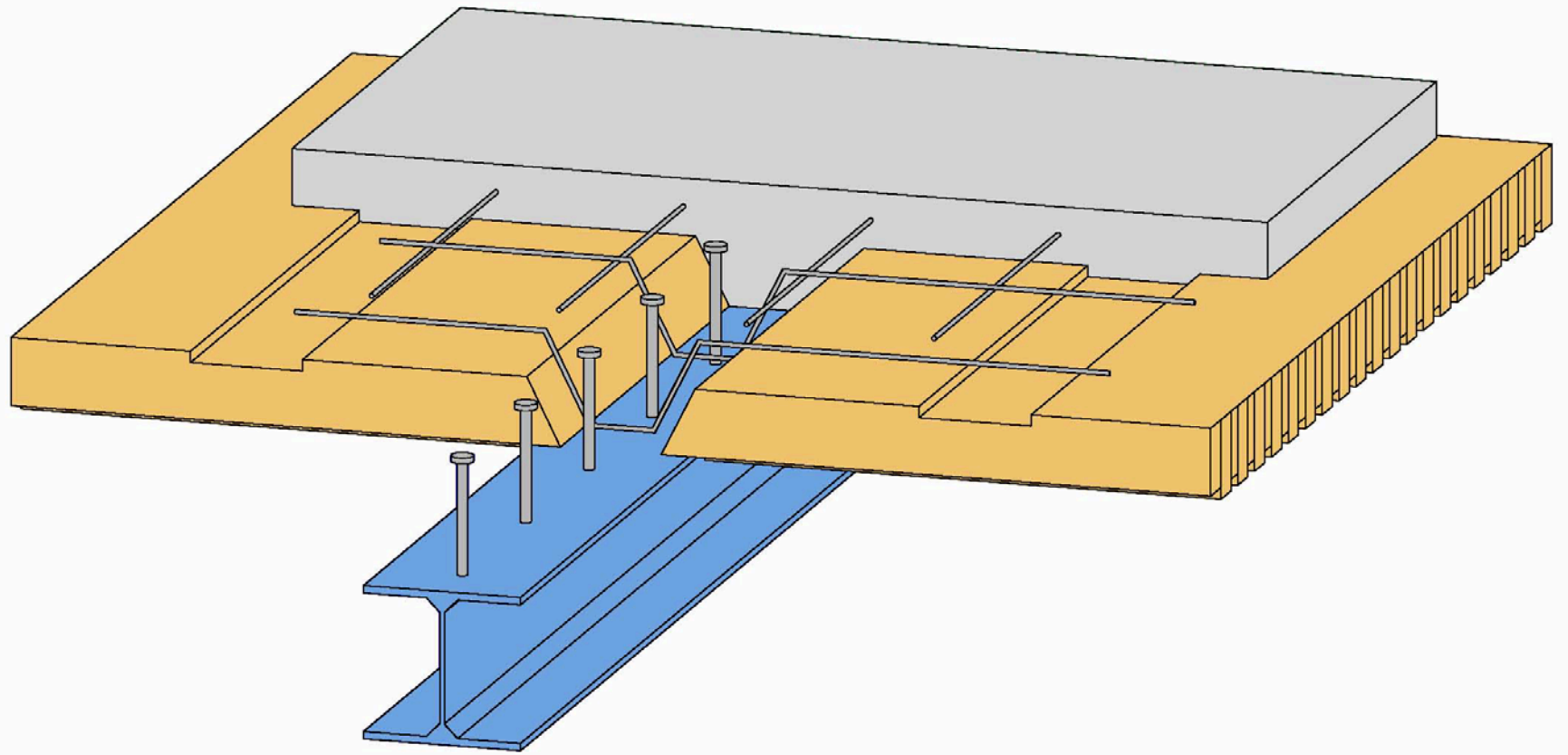


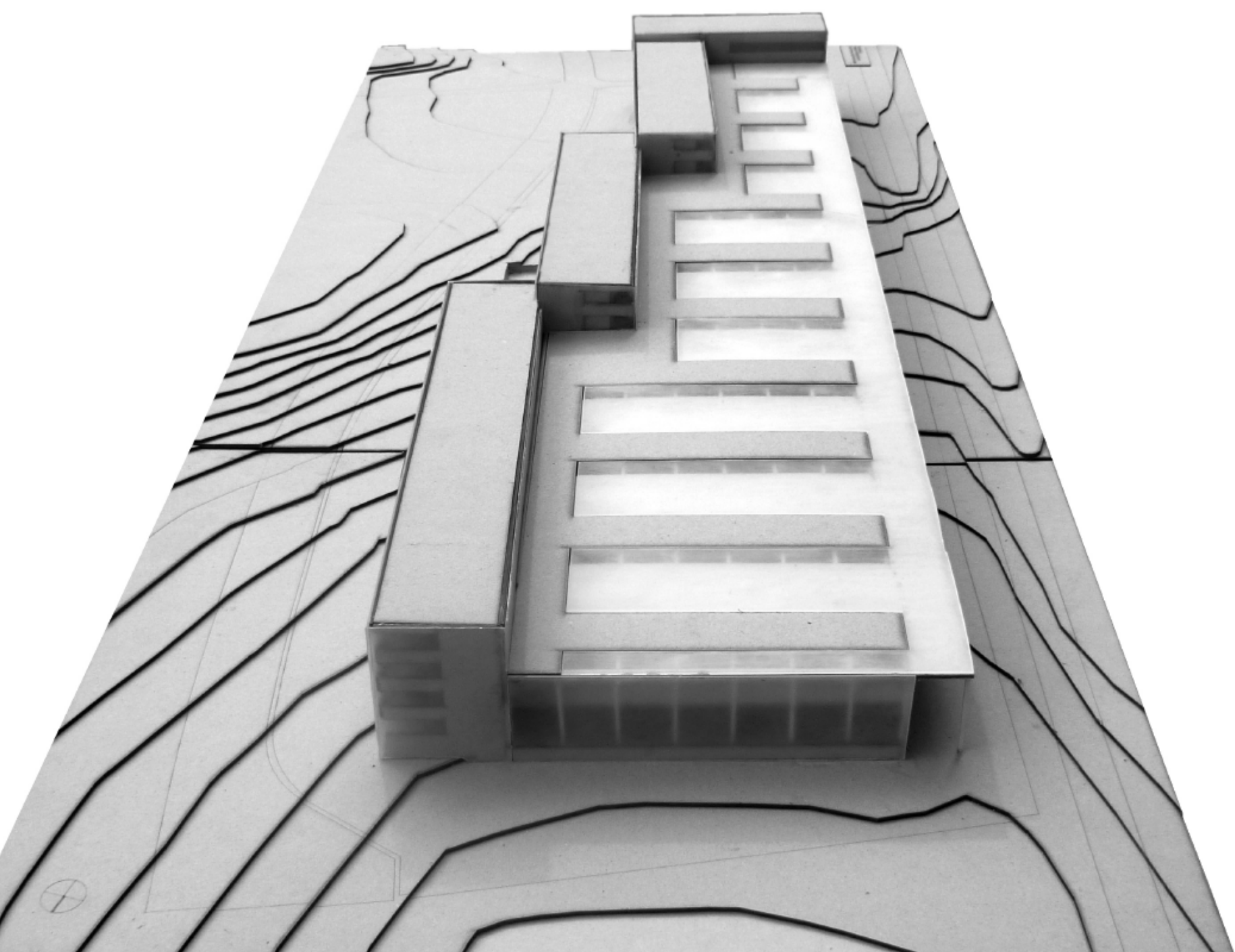
Produktions- und Verwaltungsgebäude, Biel

Architekt: Burckardt Partner, Bern

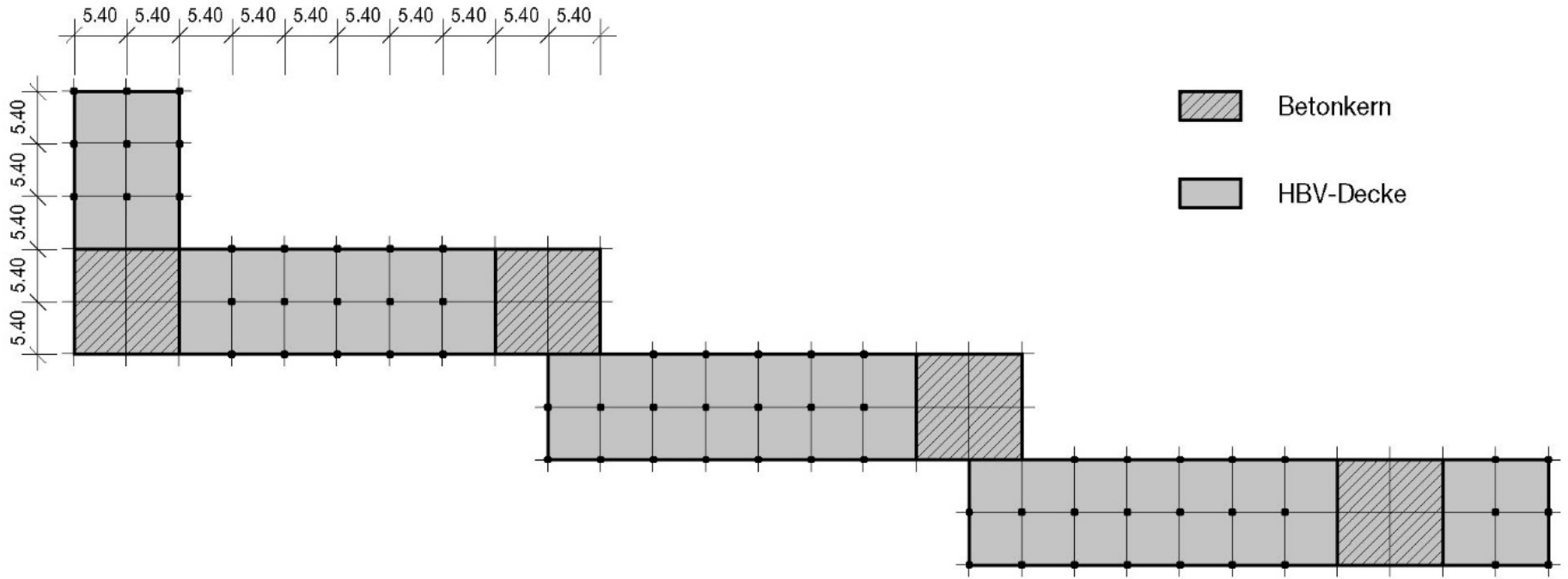






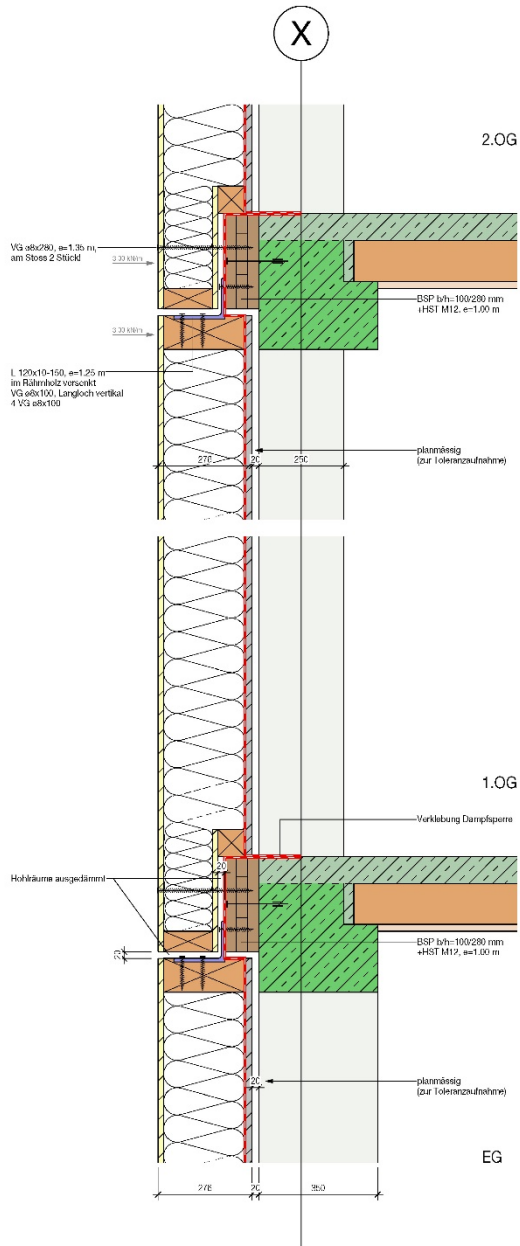


Grundriss M 1:1000



Wandelement Typ 1 Vertikalschnitt

M 1:10

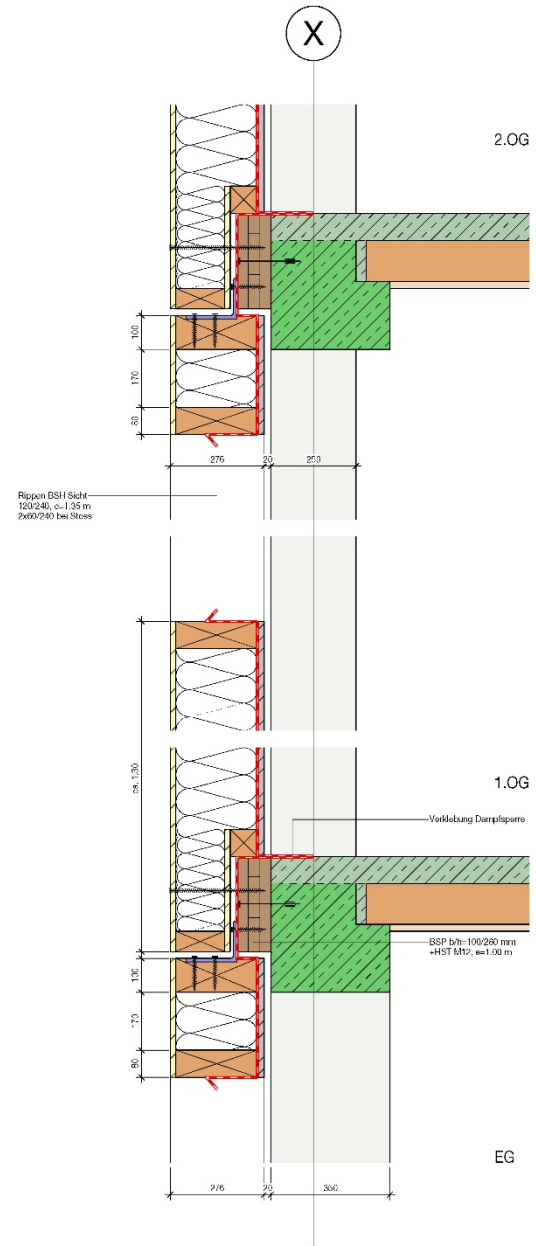


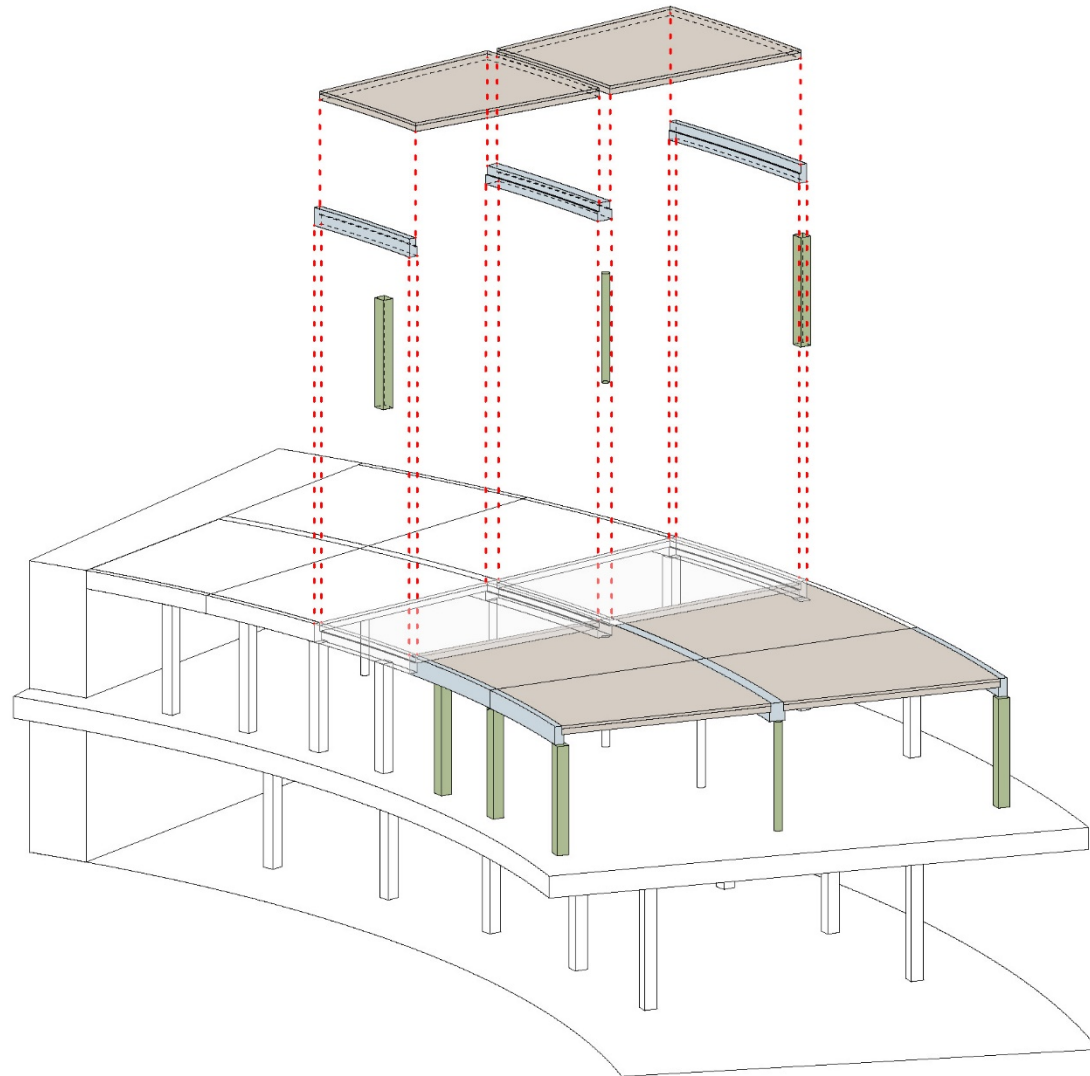
Wandelement Typ 2 Vertikalschnitt

M 1:10



Anschlüsse und Verbindungsmittel wie Typ 1



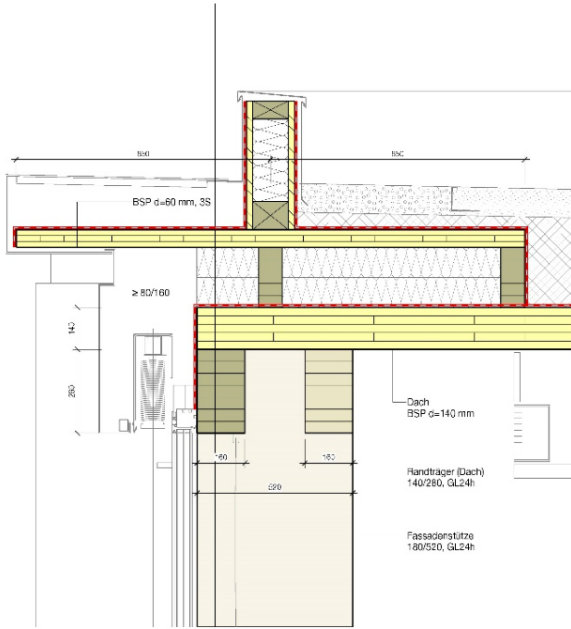


Modulares, vorgefertigtes Tragsystem

Detail Randträger

M 1:10

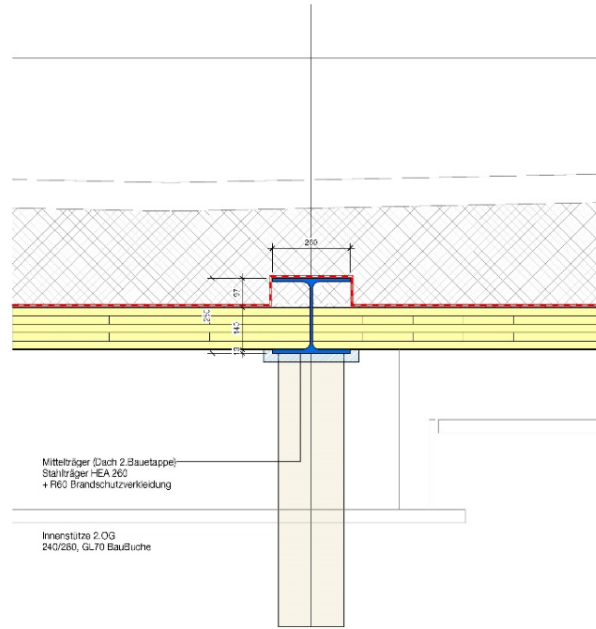
Warmdach 2. Bauetappe



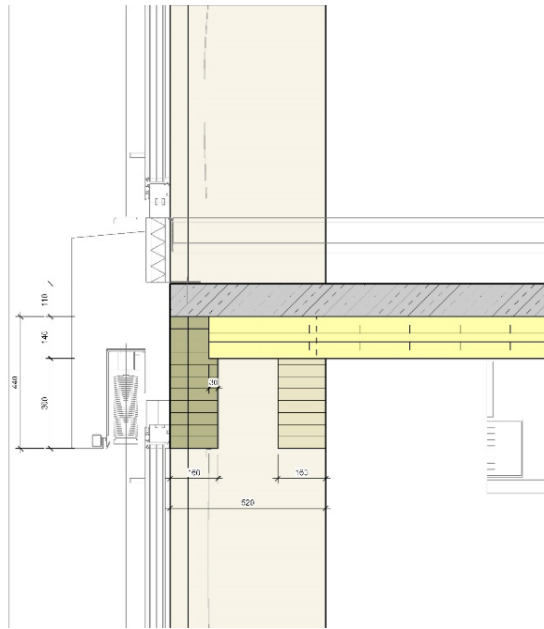
Detail Mittelträger

M 1:10

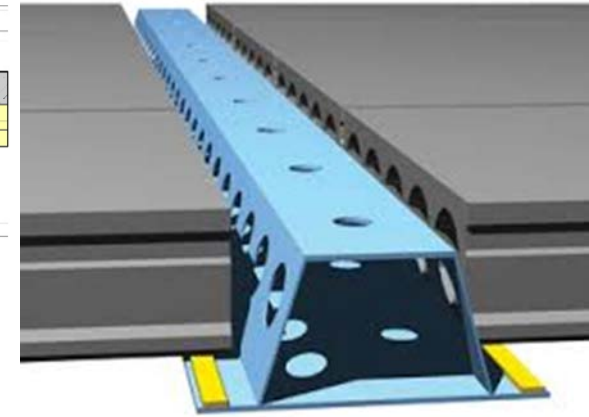
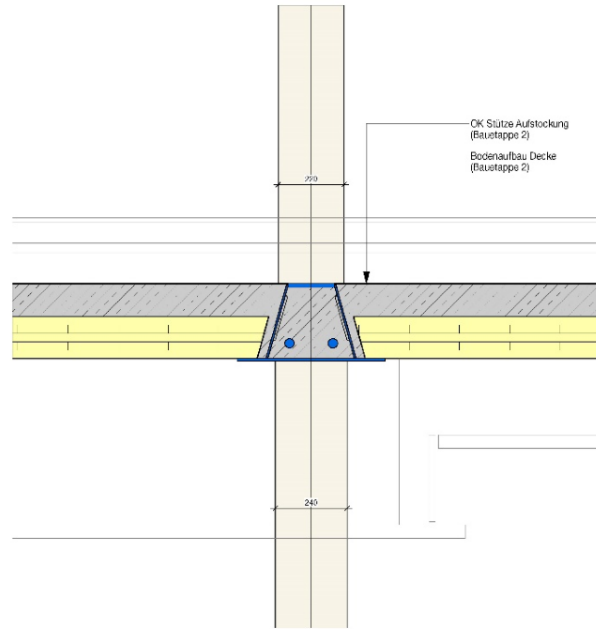
Warmdach 2. Bauetappe



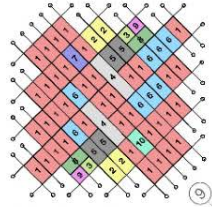
Decke 2. Bauetappe



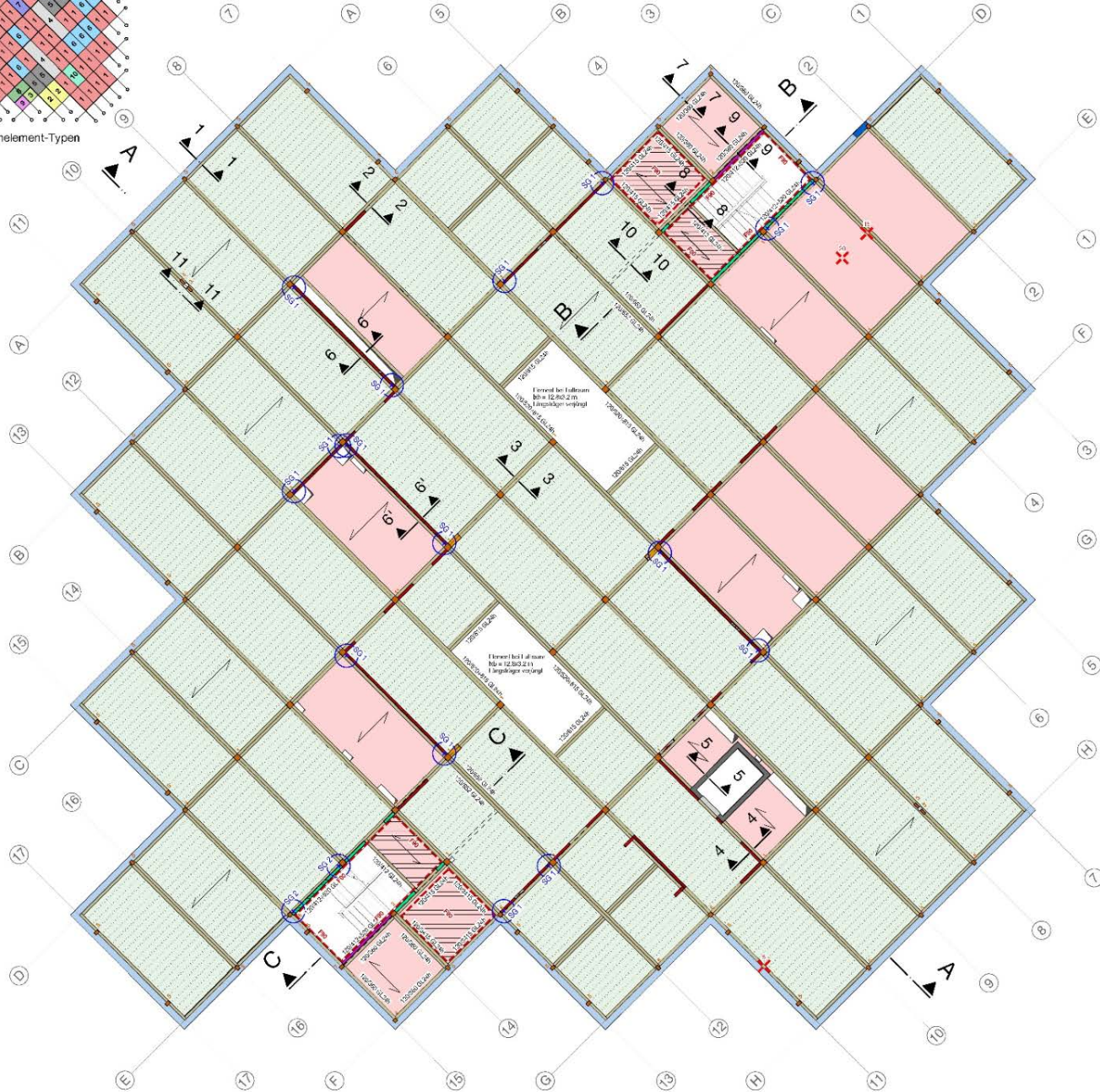
Decke 2. Bauetappe



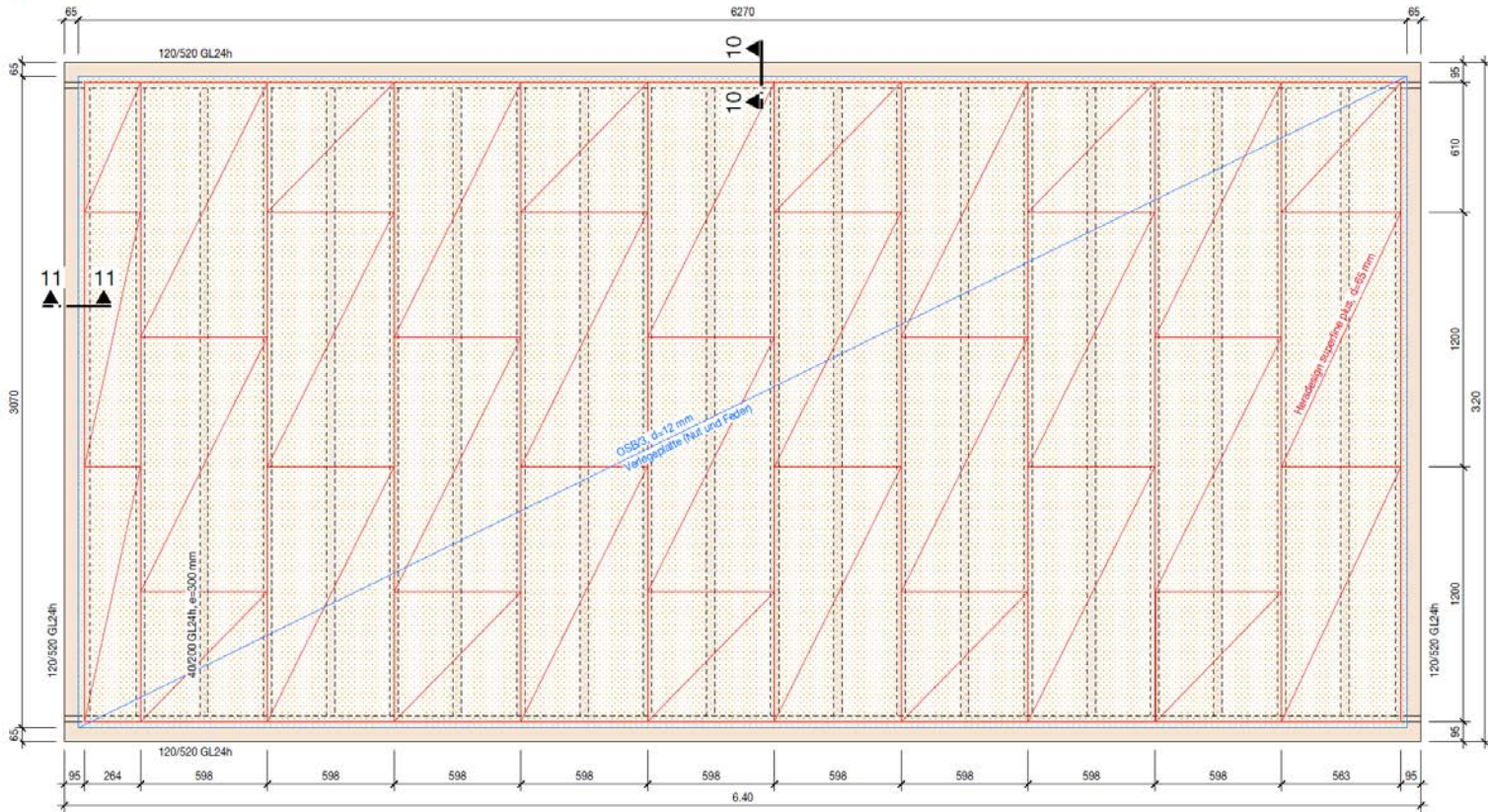
Deckenkonstruktion M 1:100



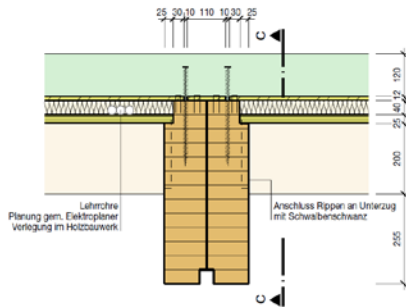
- 1 38x horizontal
- 2 4x horizontal
- 3 2x horizontal
- 4 2x horizontal
- 5 4x horizontal
- 6 6x horizontal
- 7 1x horizontal
- 8 2x horizontal
- 9 2x horizontal
- 10 1x horizontal



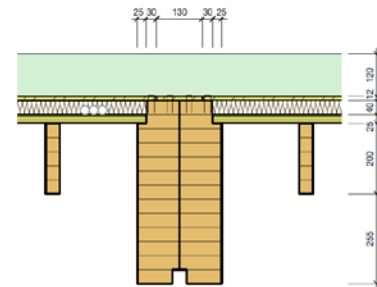
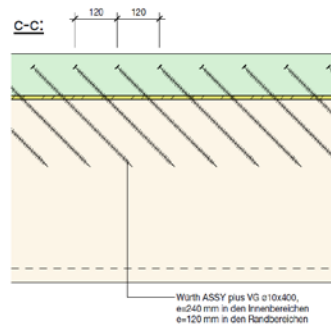
Decke



Schnitt 10-10 M 1:10



Schnitt 11-11 M 1:10

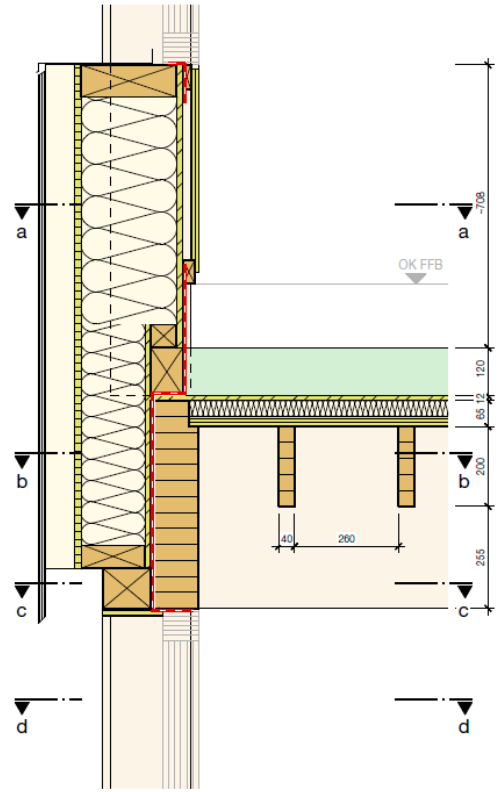
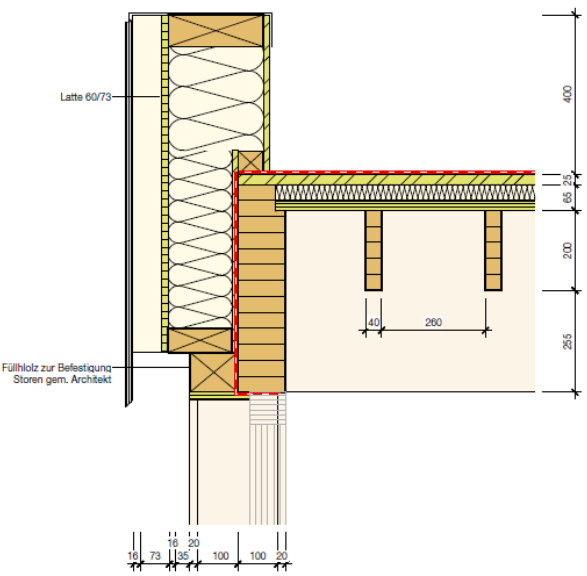












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