

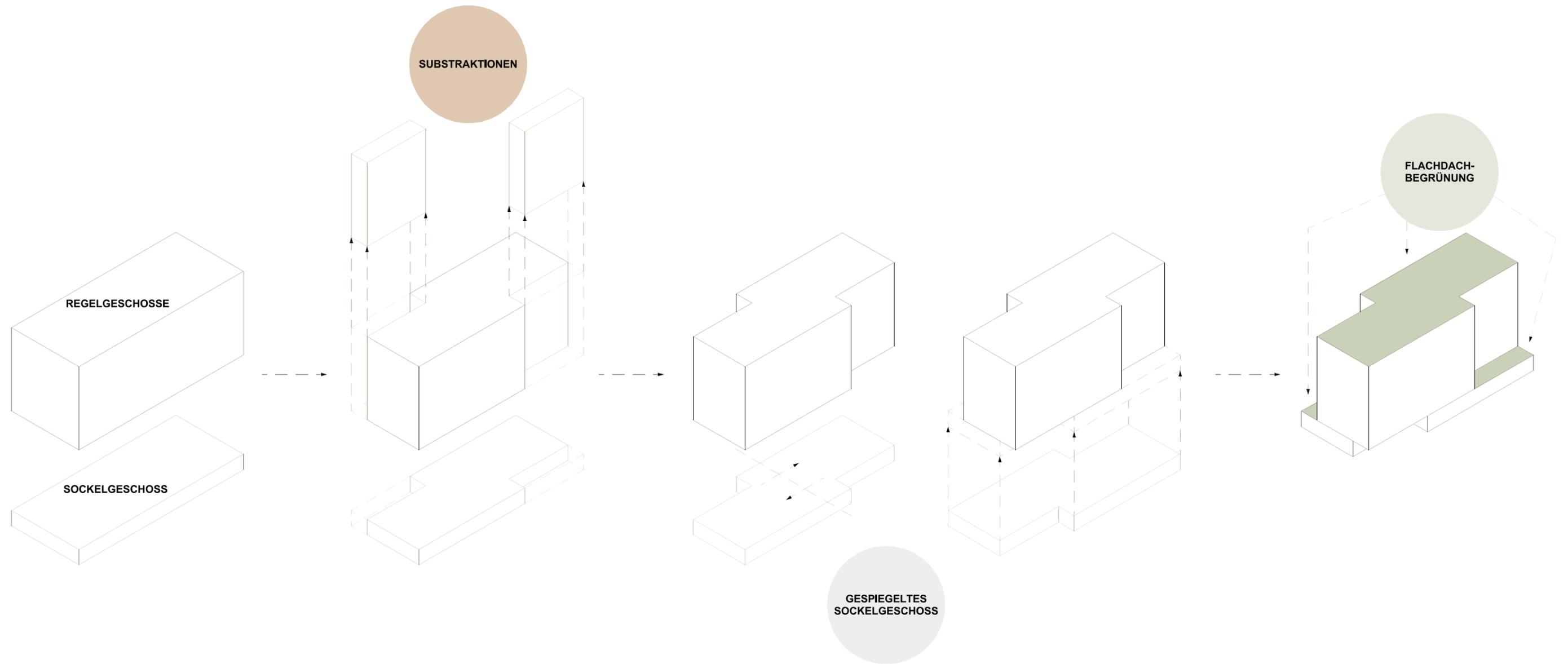
T6 VERGLEICH EINES BÜROGEBÄUDES IN GEMÄßIGTEM KLIMA ZU TROCKENEM SUBTROPISCHEN KLIMA, MIT SCHWERPUNKT DER FASSADE



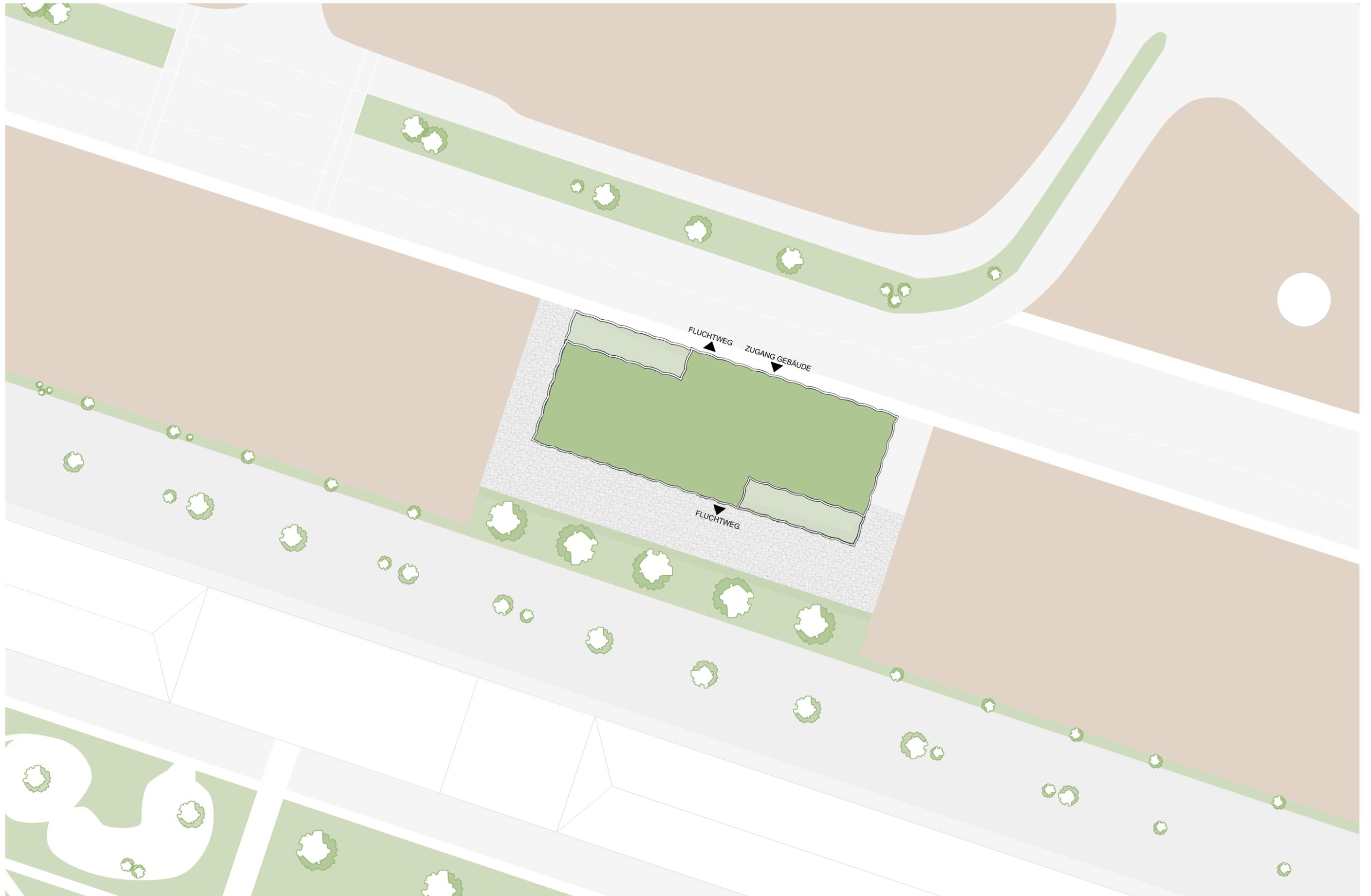
INHALT

- KONZEPT | ENTWURF
- AUSFÜHRUNGSPLANUNG
- VERORTUNG
- DOPPELFASSADE
- TEXTIELFASSADE
- ENERGIEKONZEPT
- VERGLEICHENDE BETRACHTUNG
- FAZIT
- QUELLEN

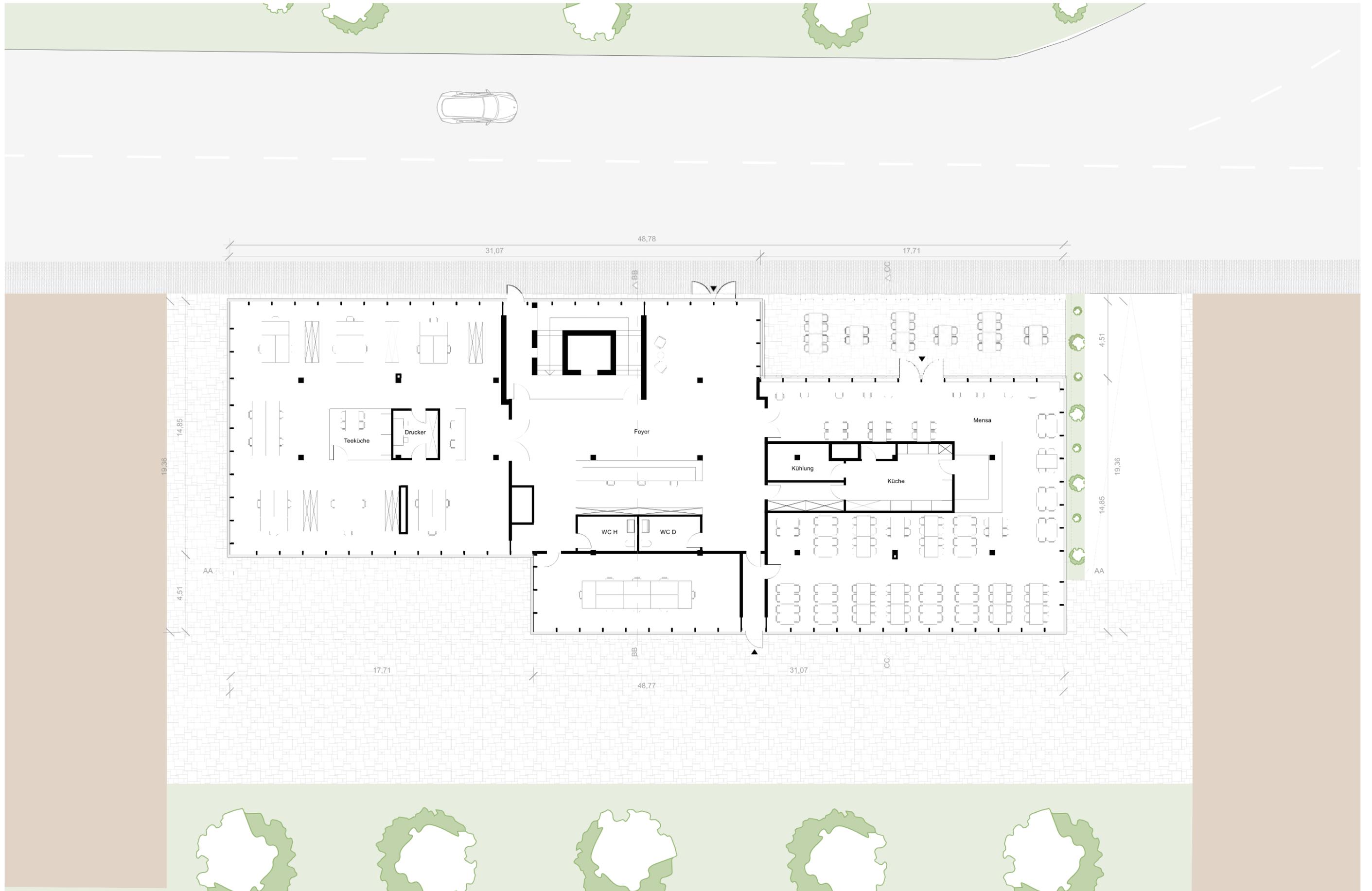
FORMFINDUNG



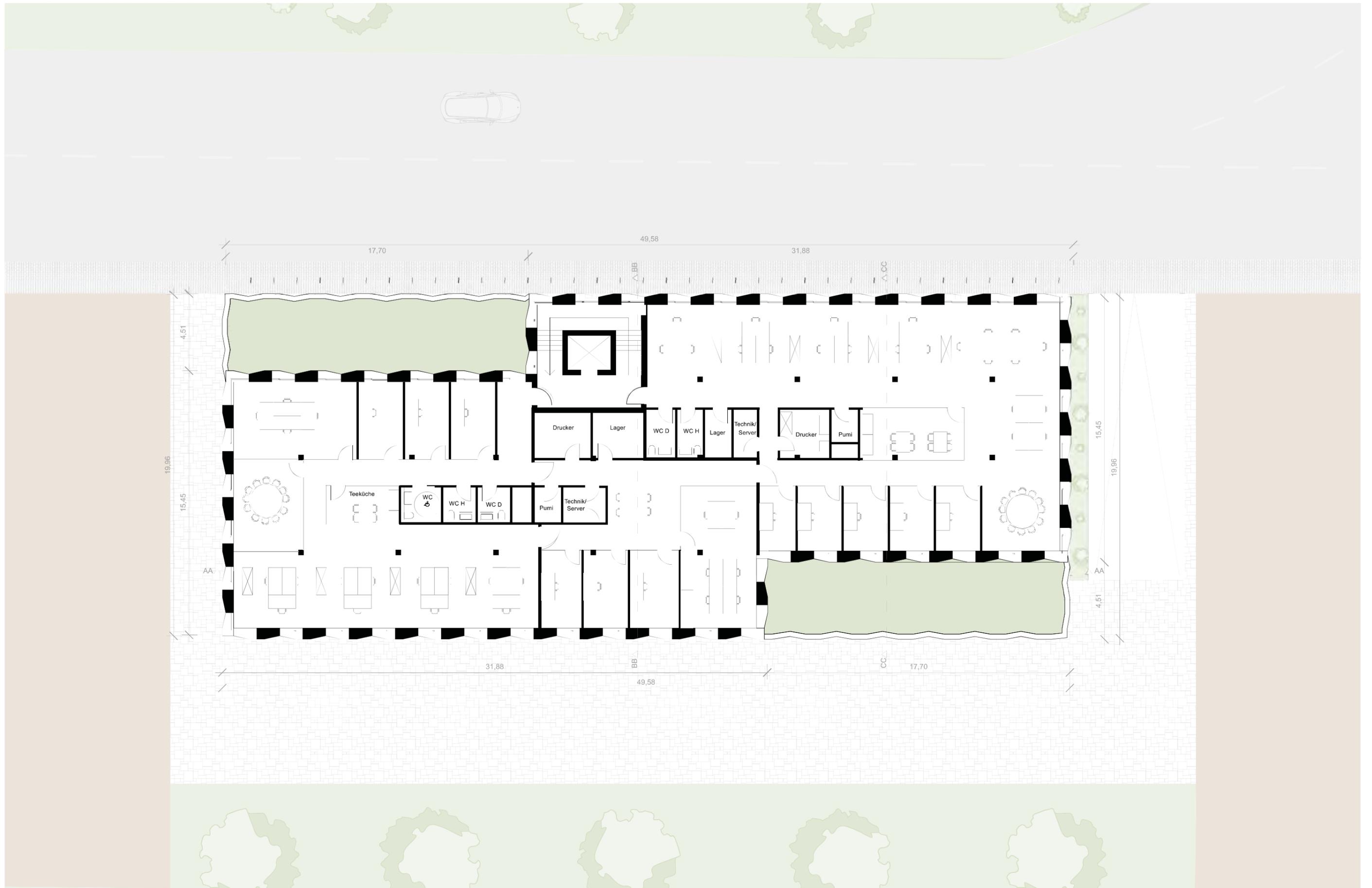
LAGEPLAN



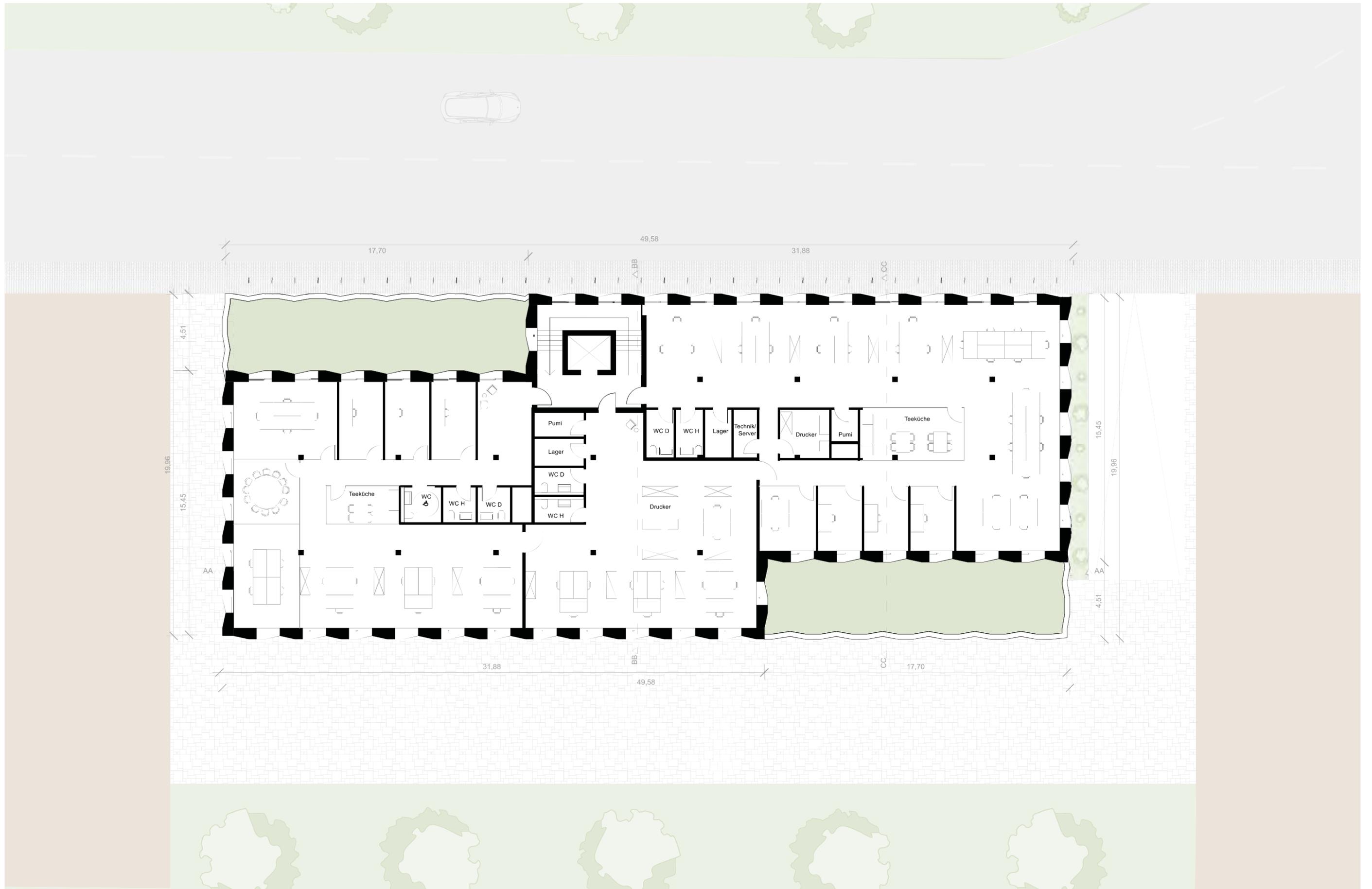
GRUNDRISS | ERDGESCHOSS



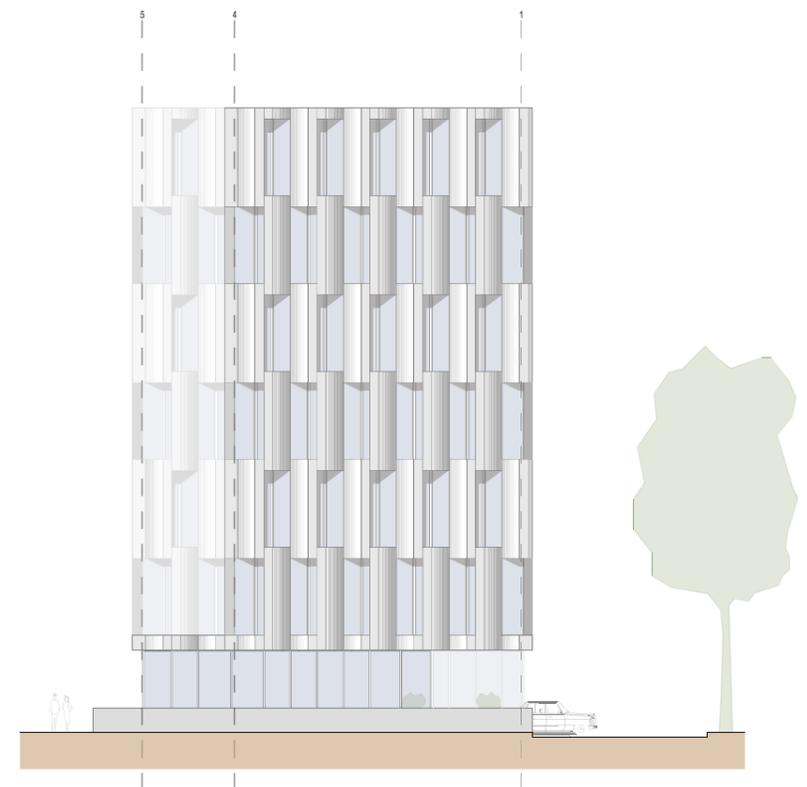
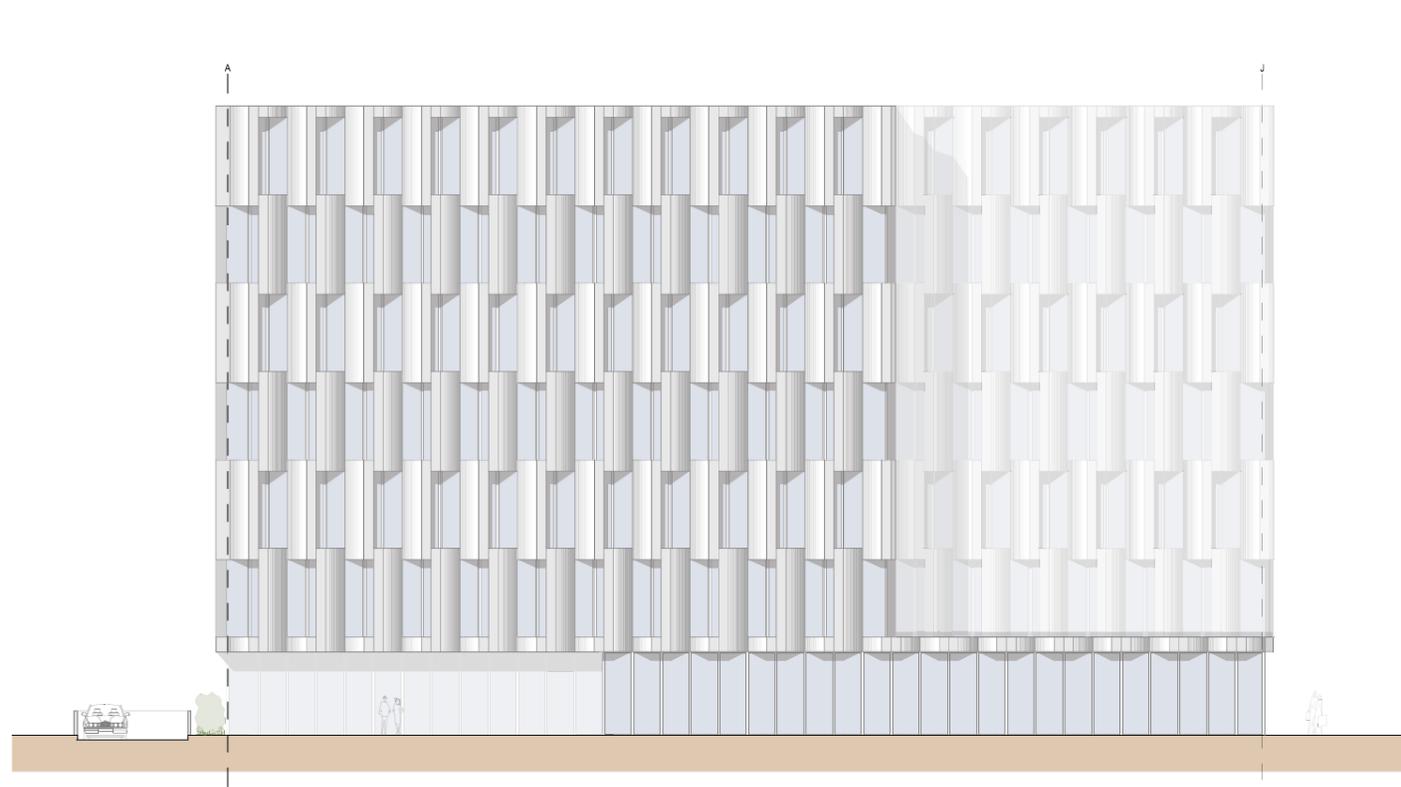
GRUNDRISS | 1. OBERGSCHOSS



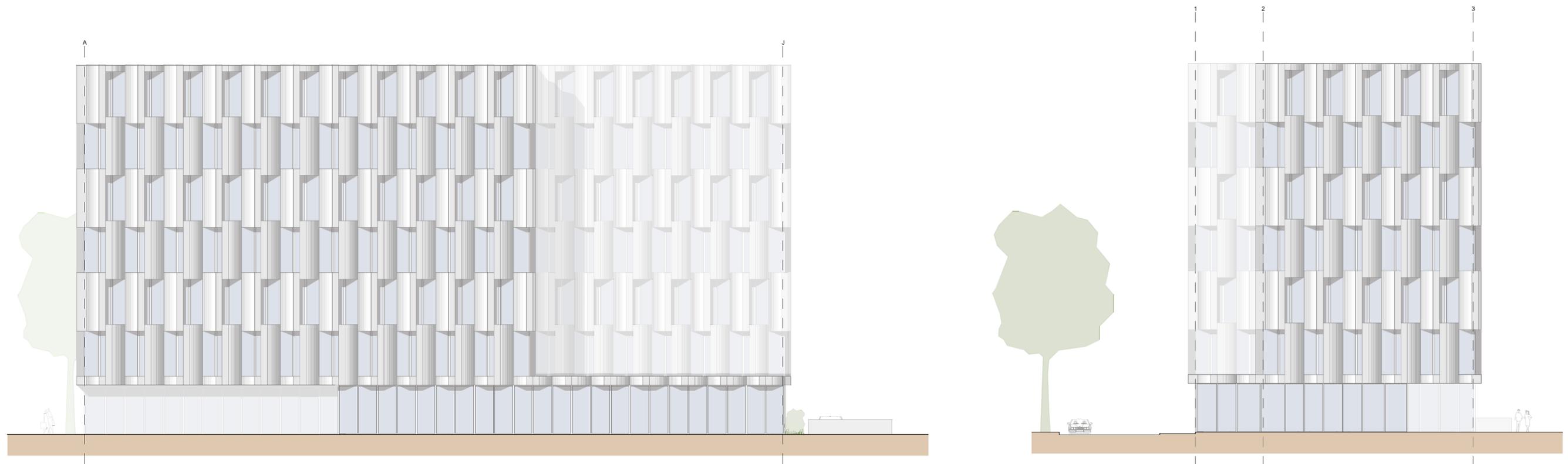
GRUNDRISS | 2. OBERGSCHOSS



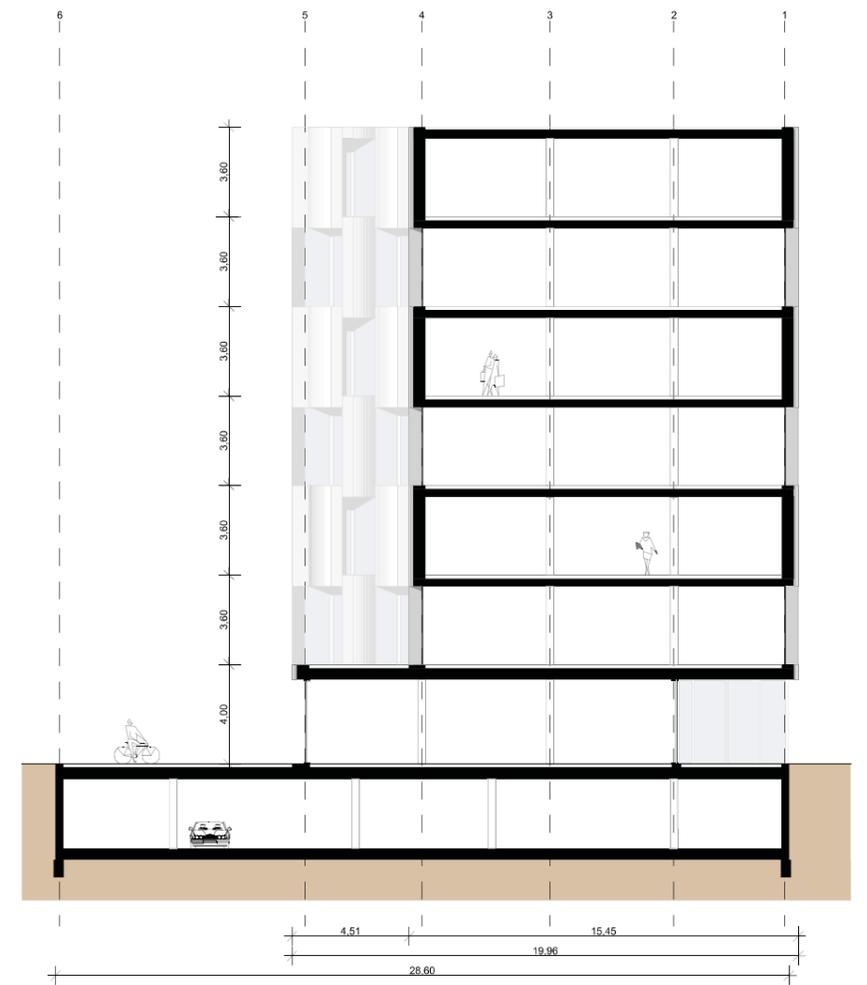
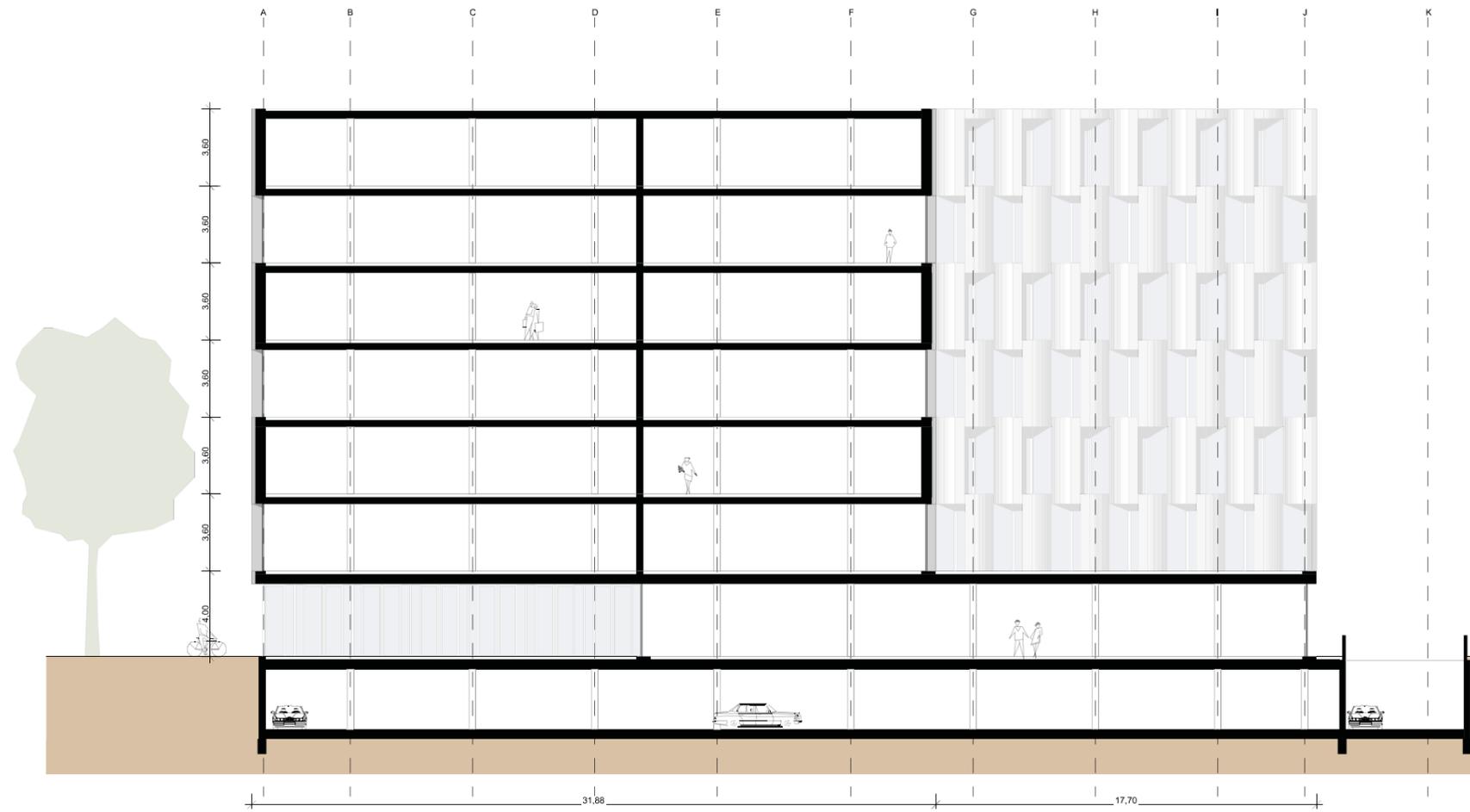
ANSICHT NORD | ANSICHT OST



ANSICHT SÜD | ANSICHT WEST

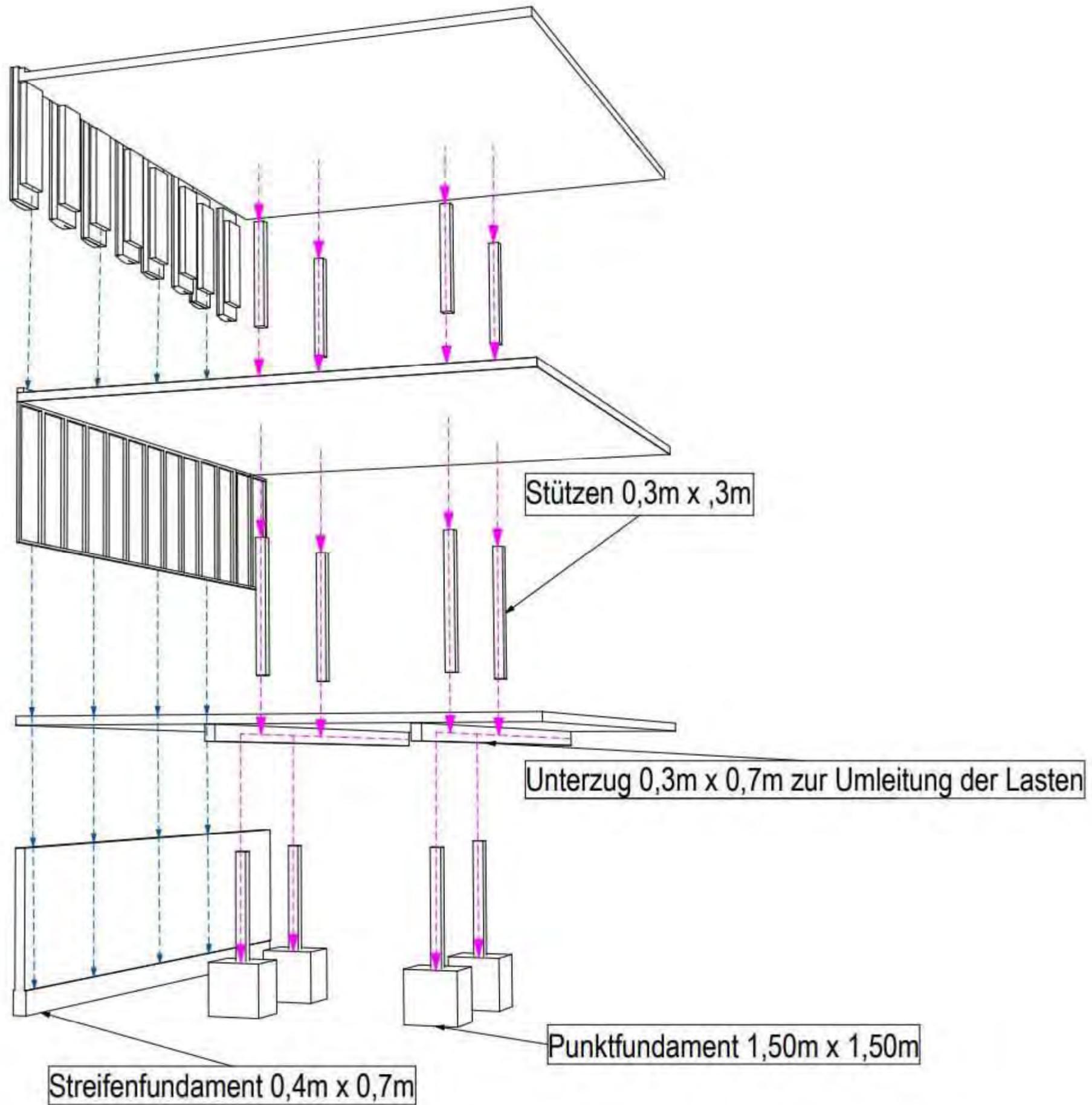


SCHNITT A-A | SCHNITT B-B



VISUALISIERUNG





HEIDELBERG (DIE ROTE STADT)



Abb.1



Abb.2

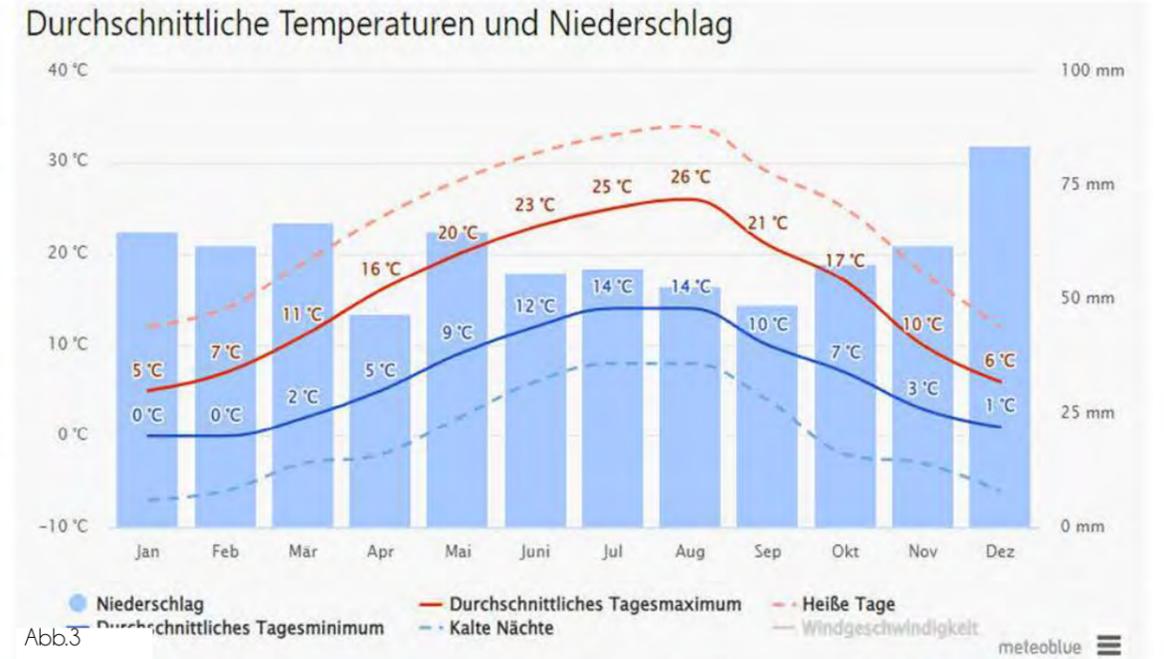


Abb.3

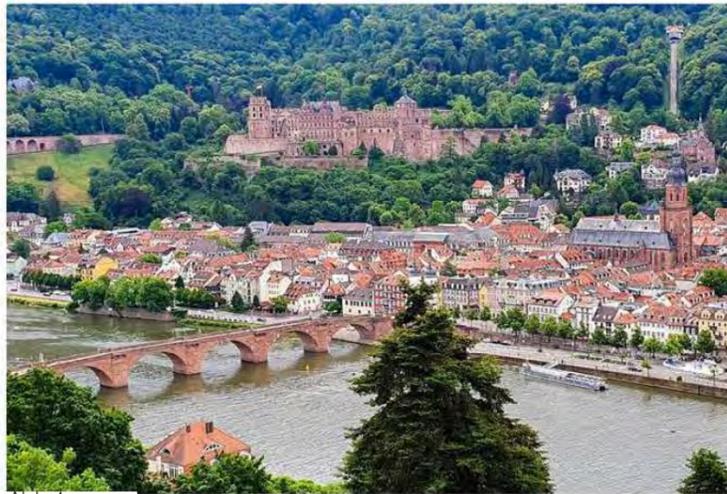


Abb.4



Abb.5



Abb.7



Abb.8



Abb.9



Abb.10

MARRAKESH (DIE ROTE STADT)



Abb.10



Abb.11

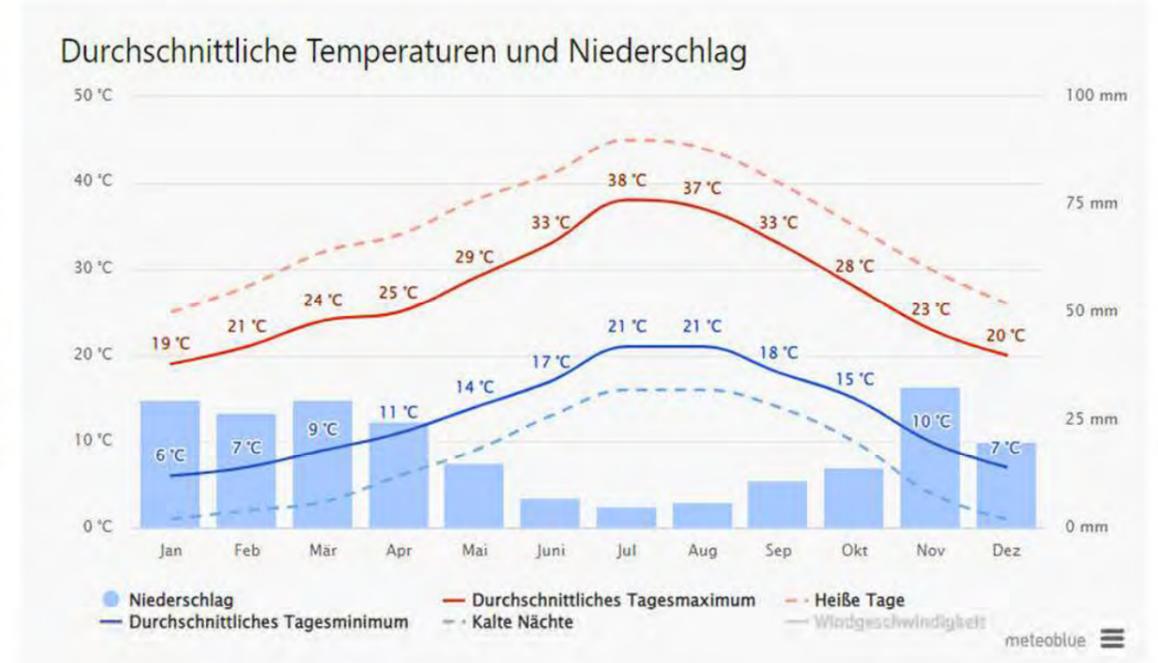


Abb.12

MEDINA (ALTSTADT)



Abb.13



Abb.14



Abb.15



Abb.16

NEUSTADT



Abb.17



Abb.18



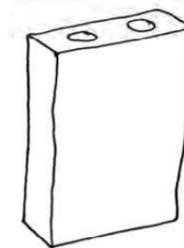
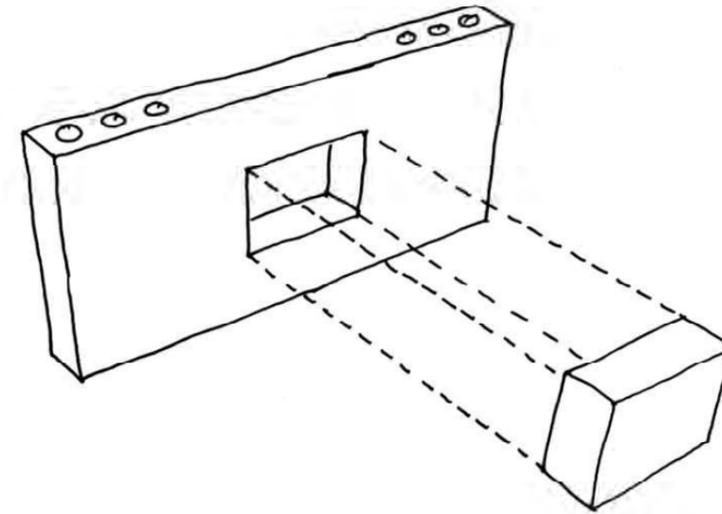
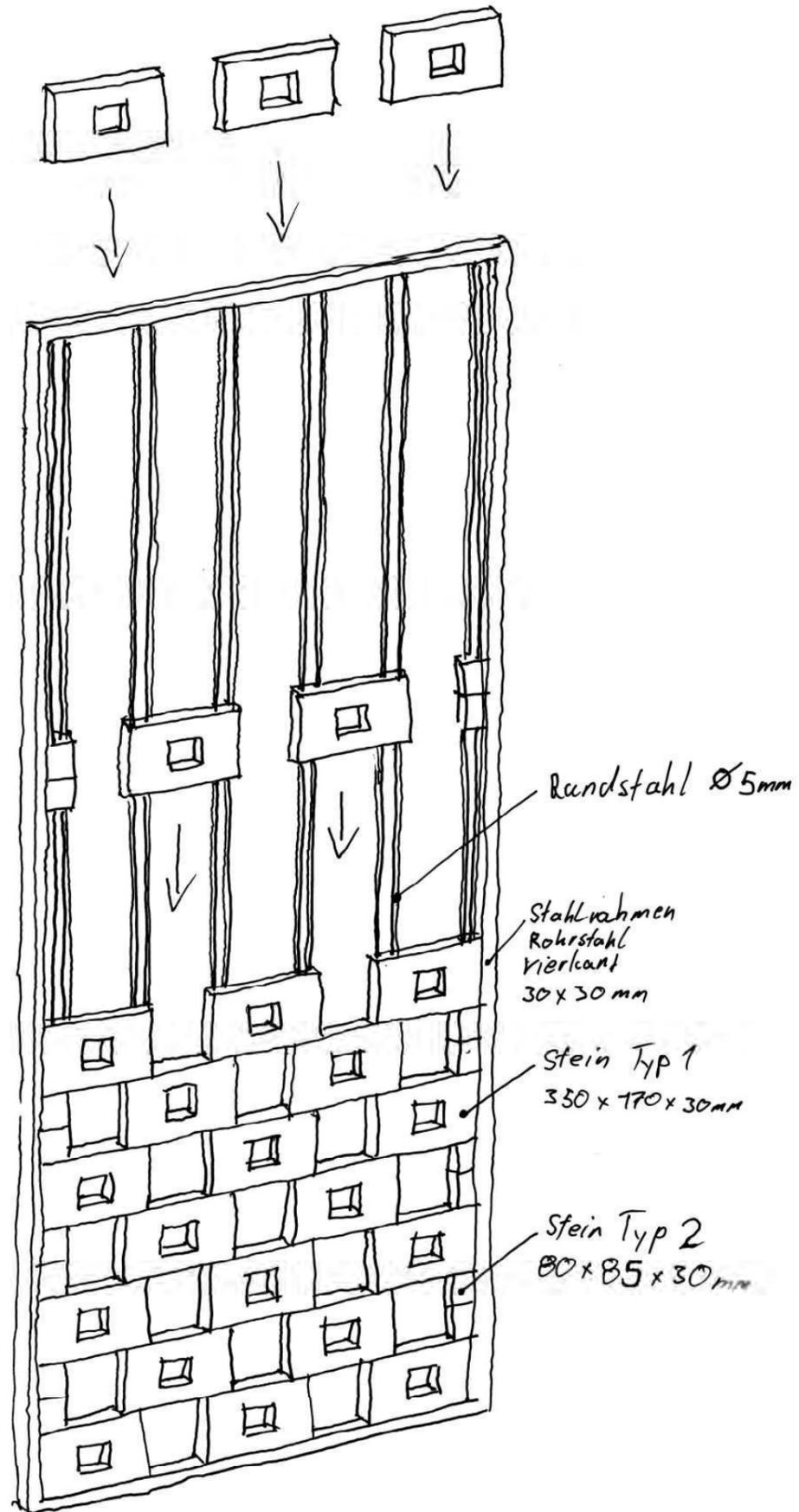
Abb.19



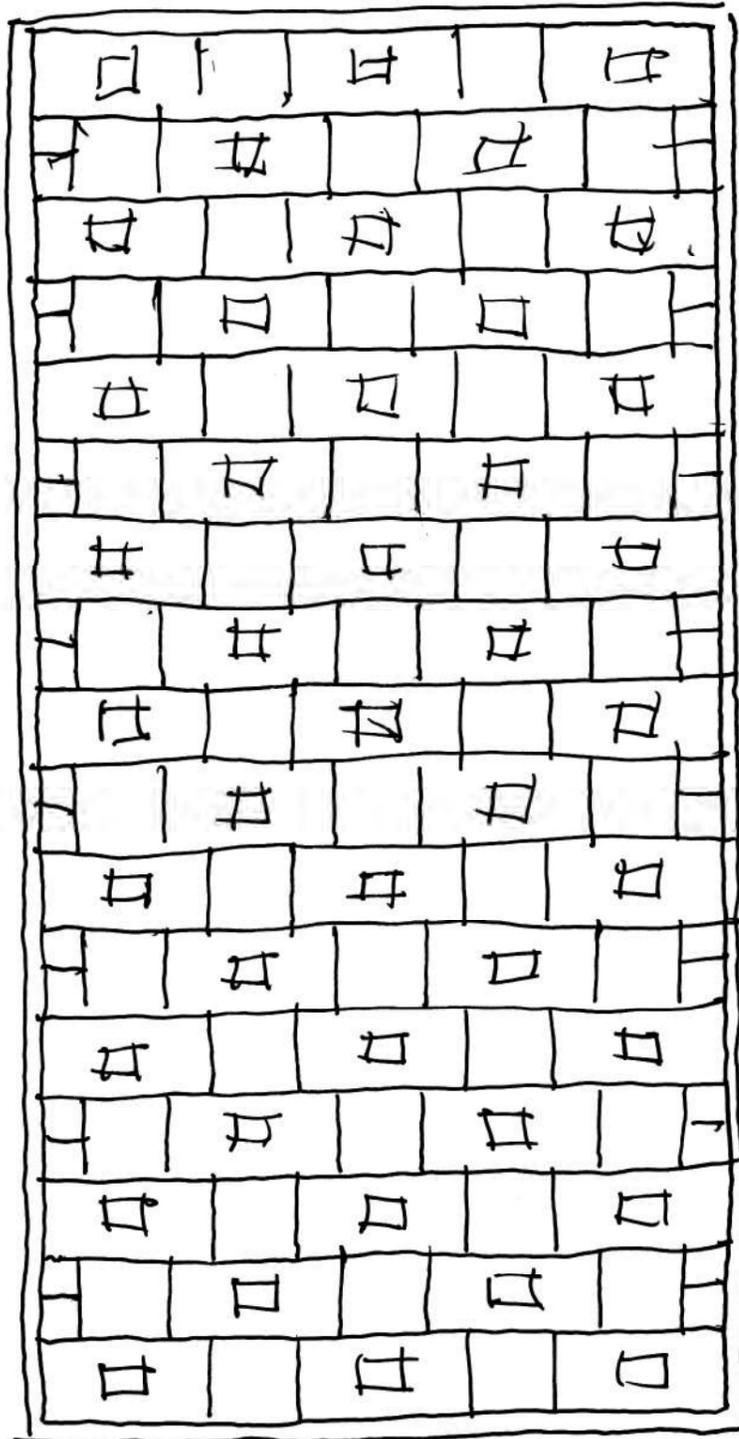
Abb.20

VERORTUNG

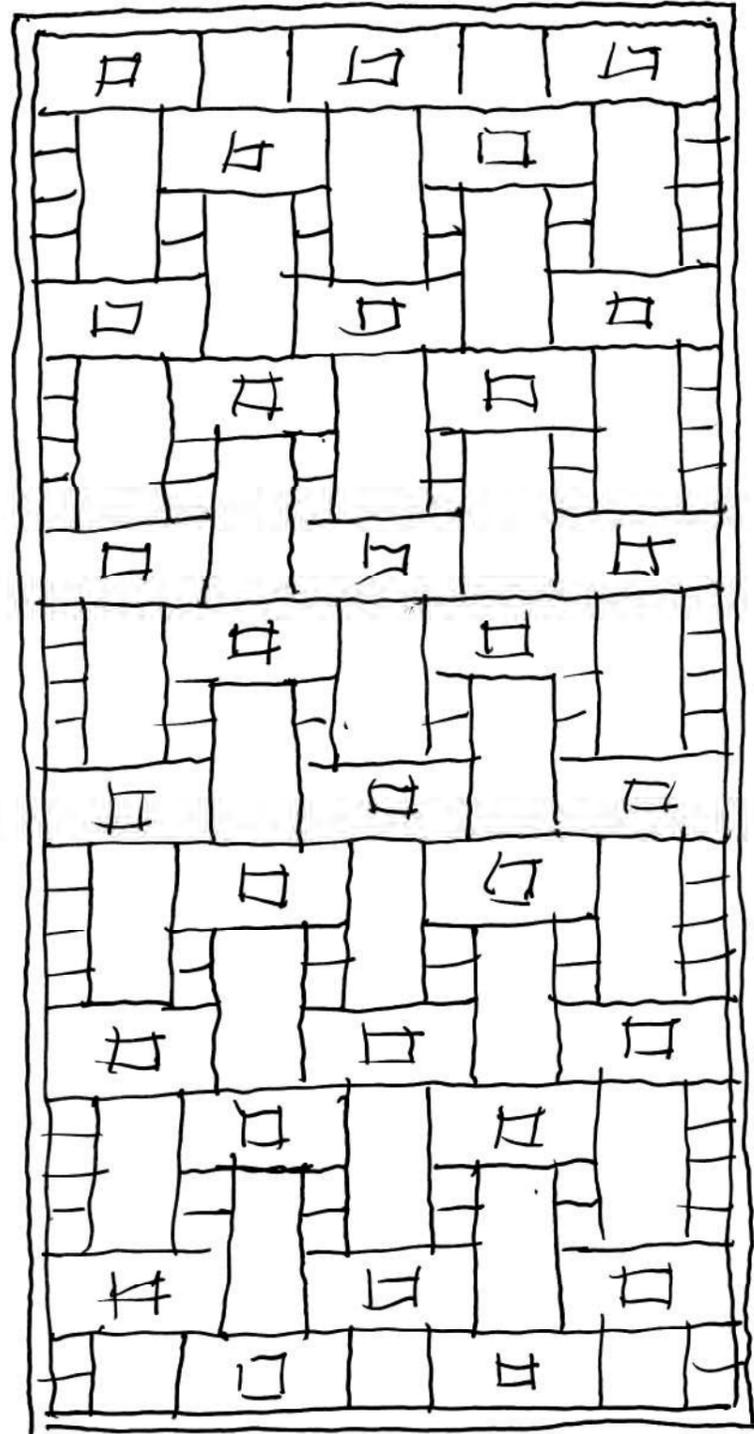
KONZEPT I FASSADE



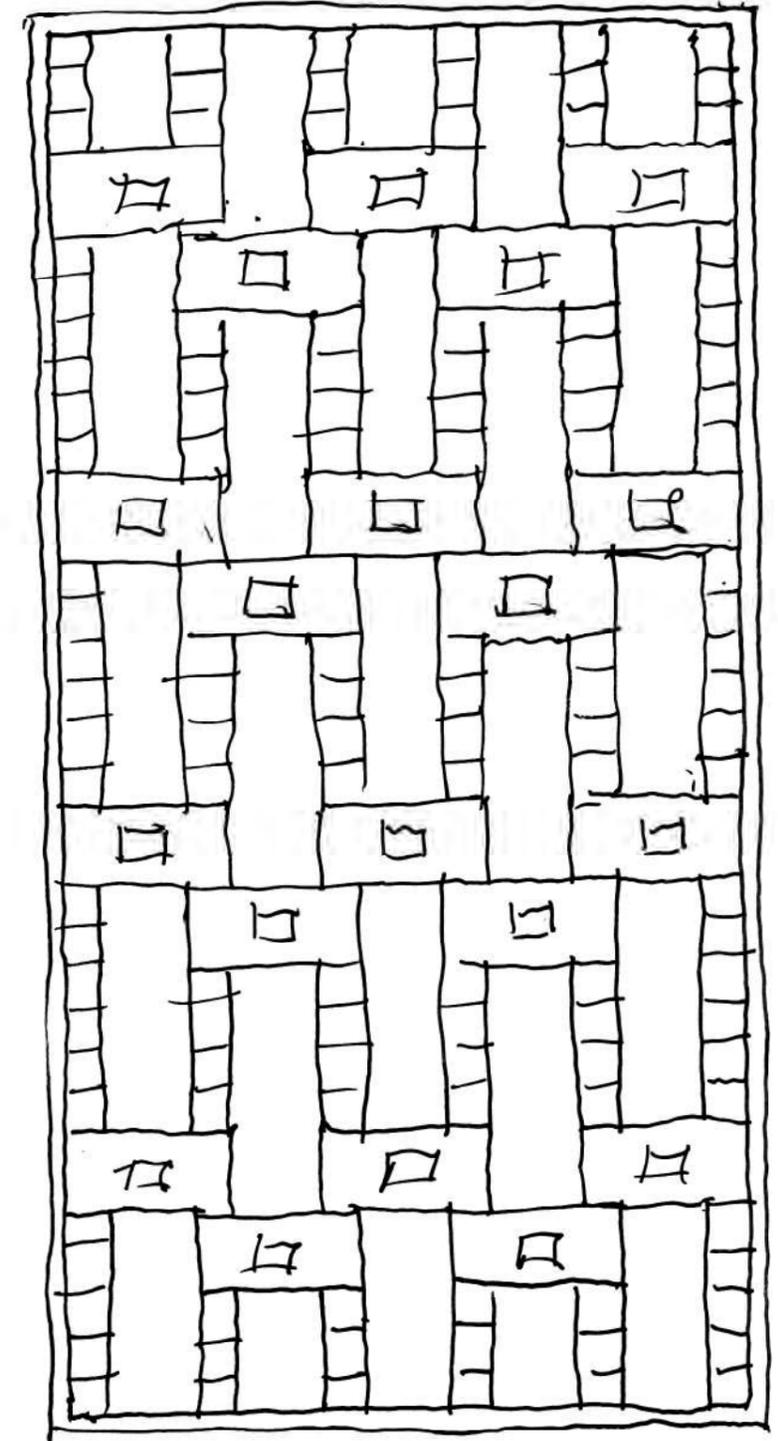
KONTEZPT I FASSADE



ANSICHT SÜD 36% LICHTDURCHLÄSSIG

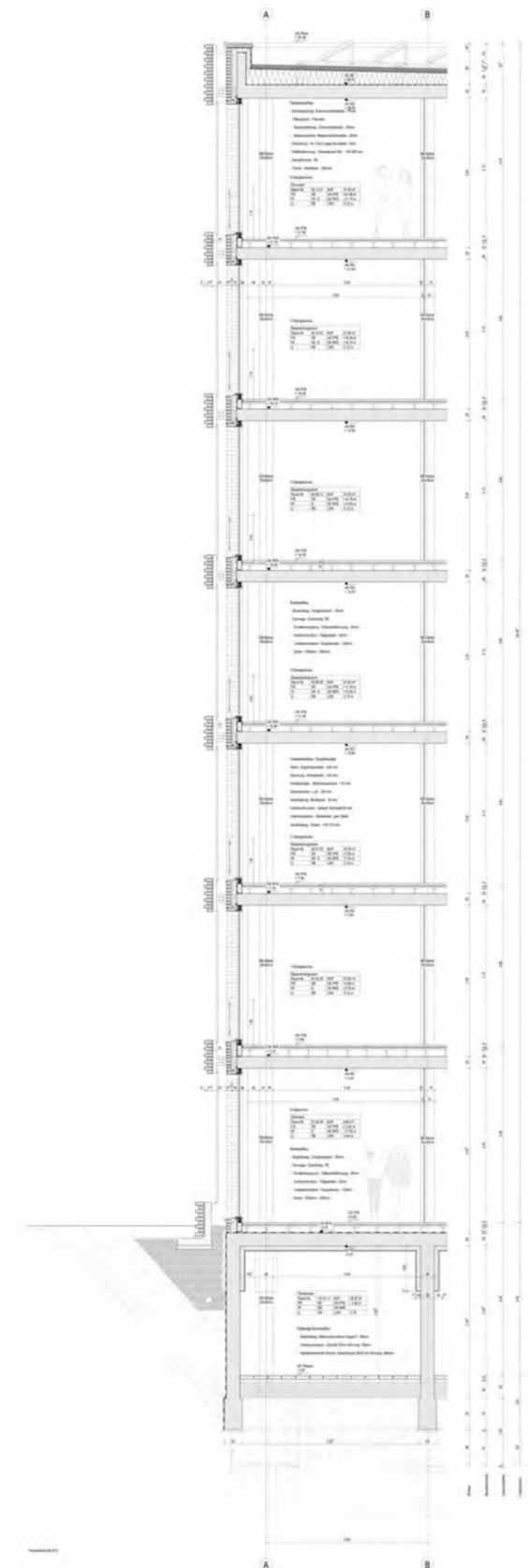
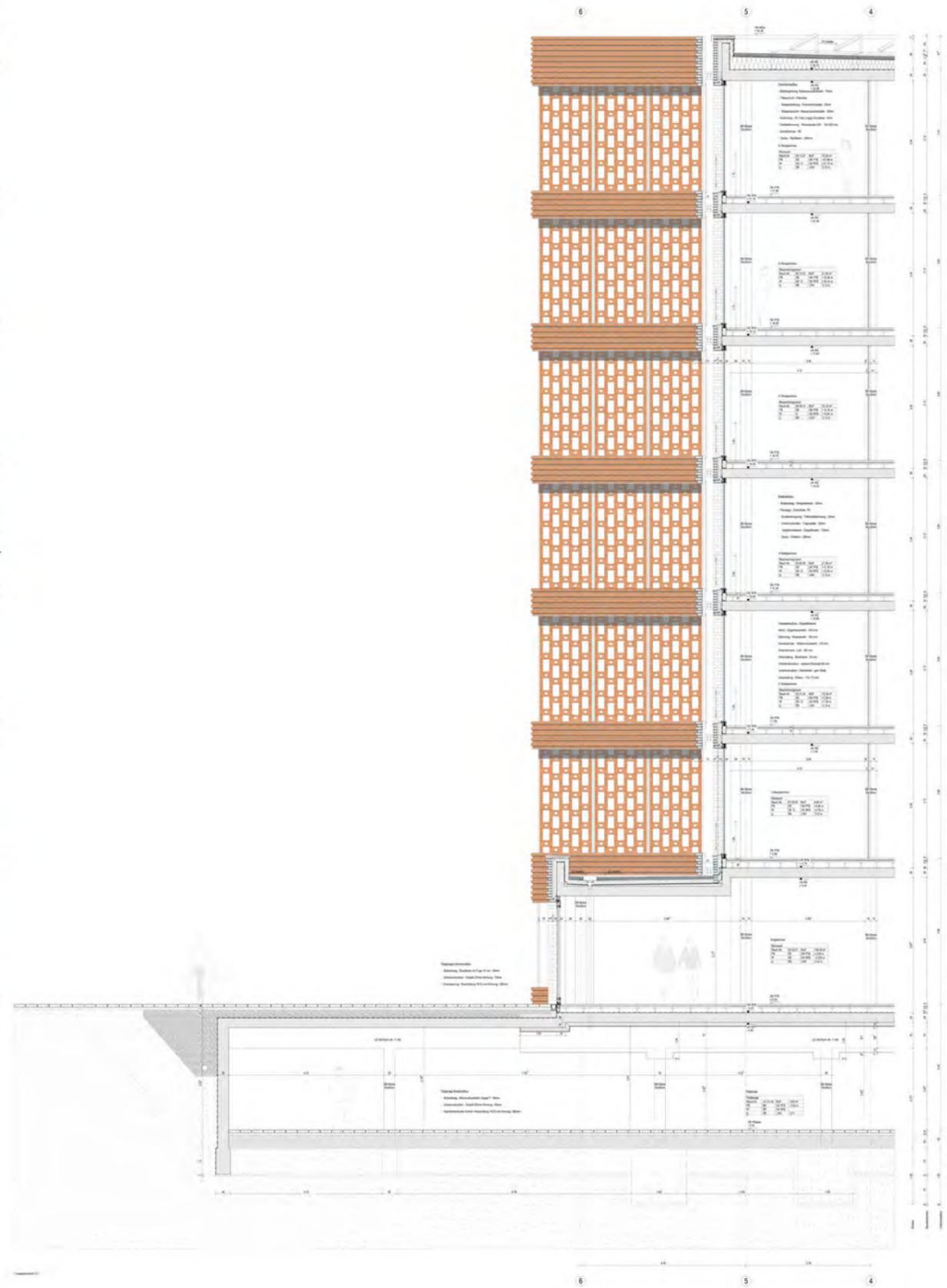
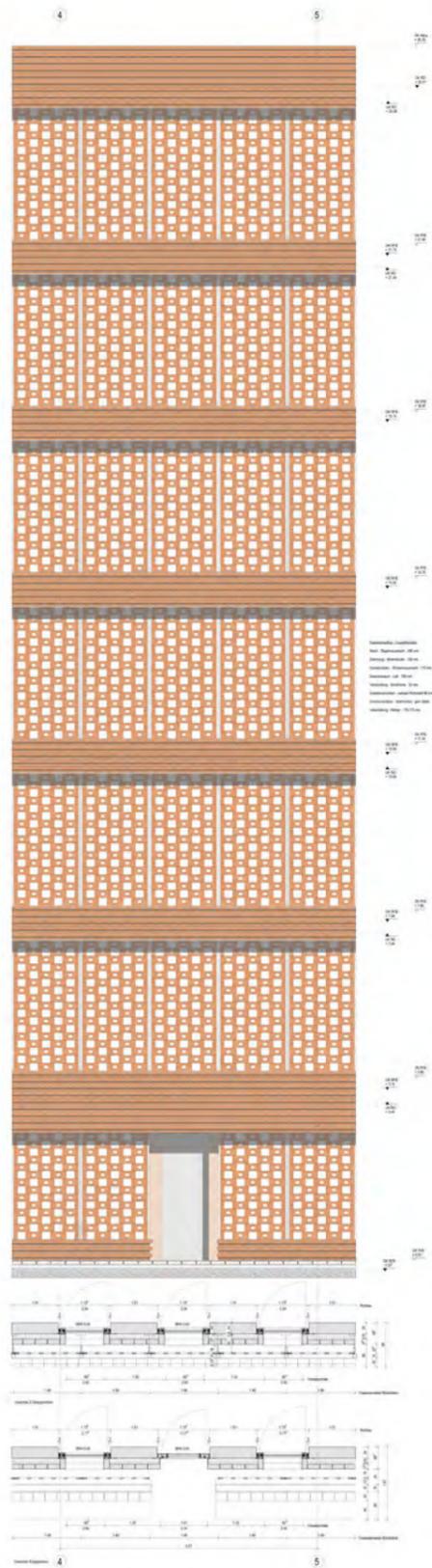


ANSICHT OST | WEST 44% LICHTDURCHLÄSSIG

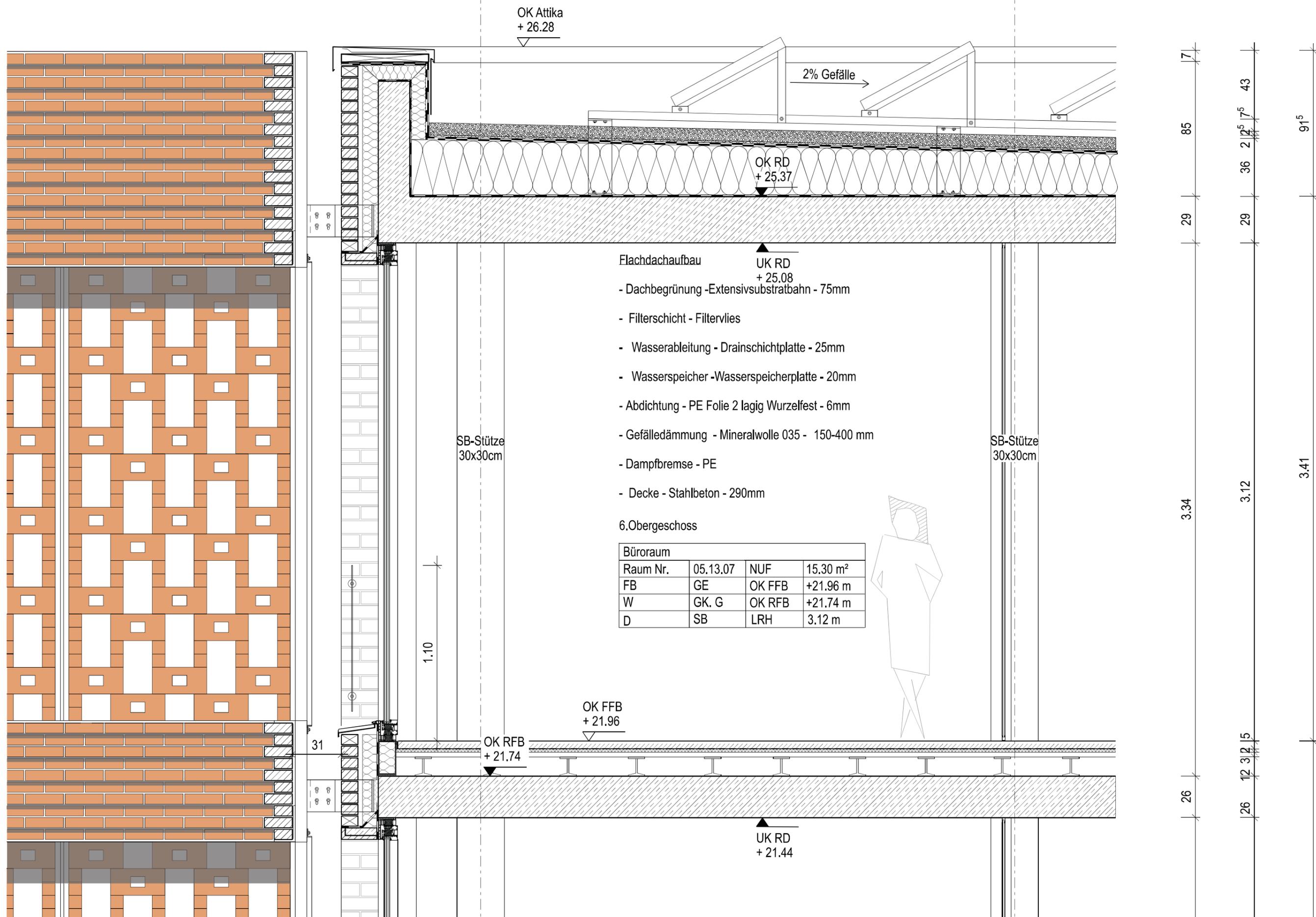


ANSICHT NORD 50% LICHTDURCHLÄSSIG

FASSADENSCHNITT

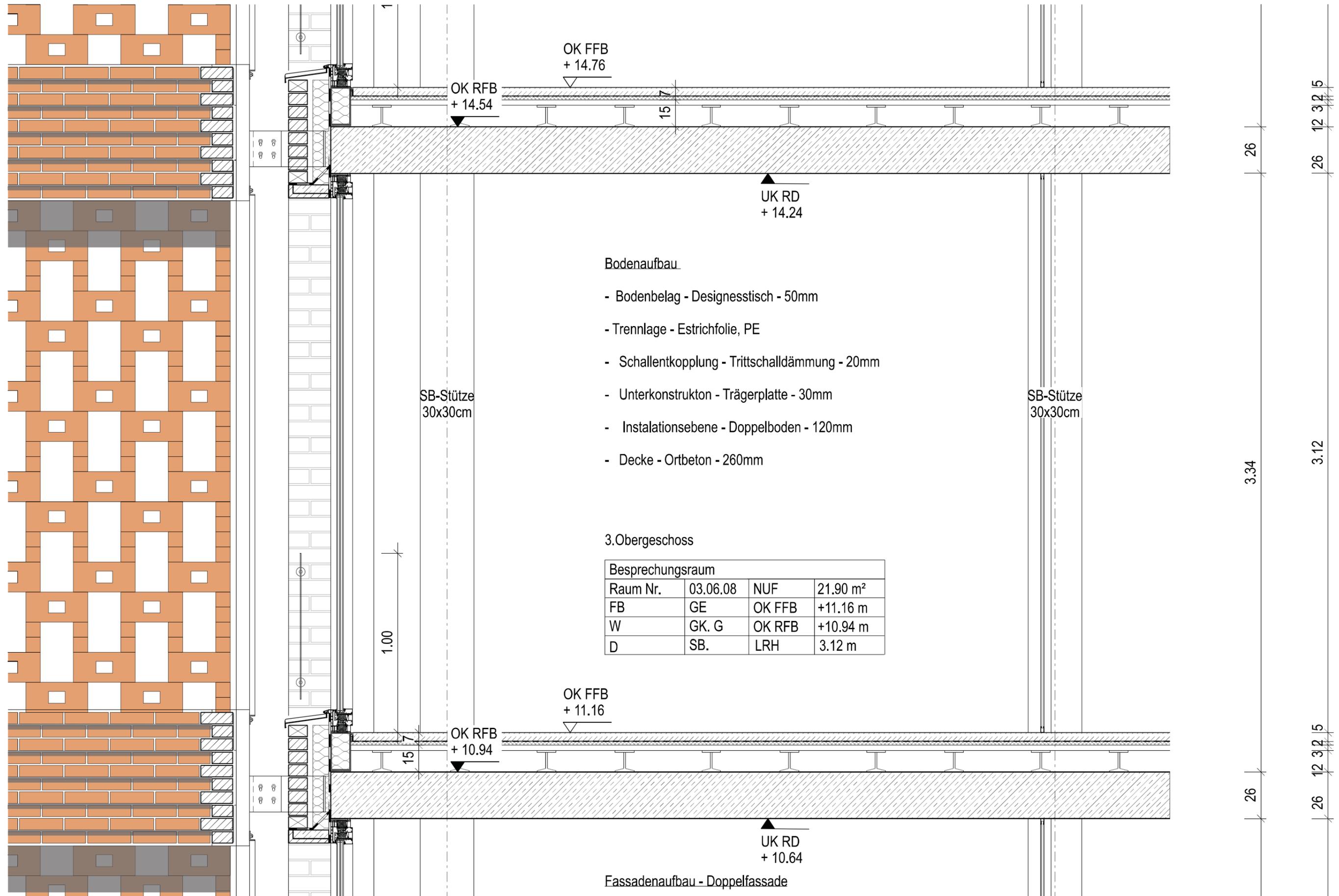


FASSADENSCHNITT C-C | AUSSCHNITT ATTIKA



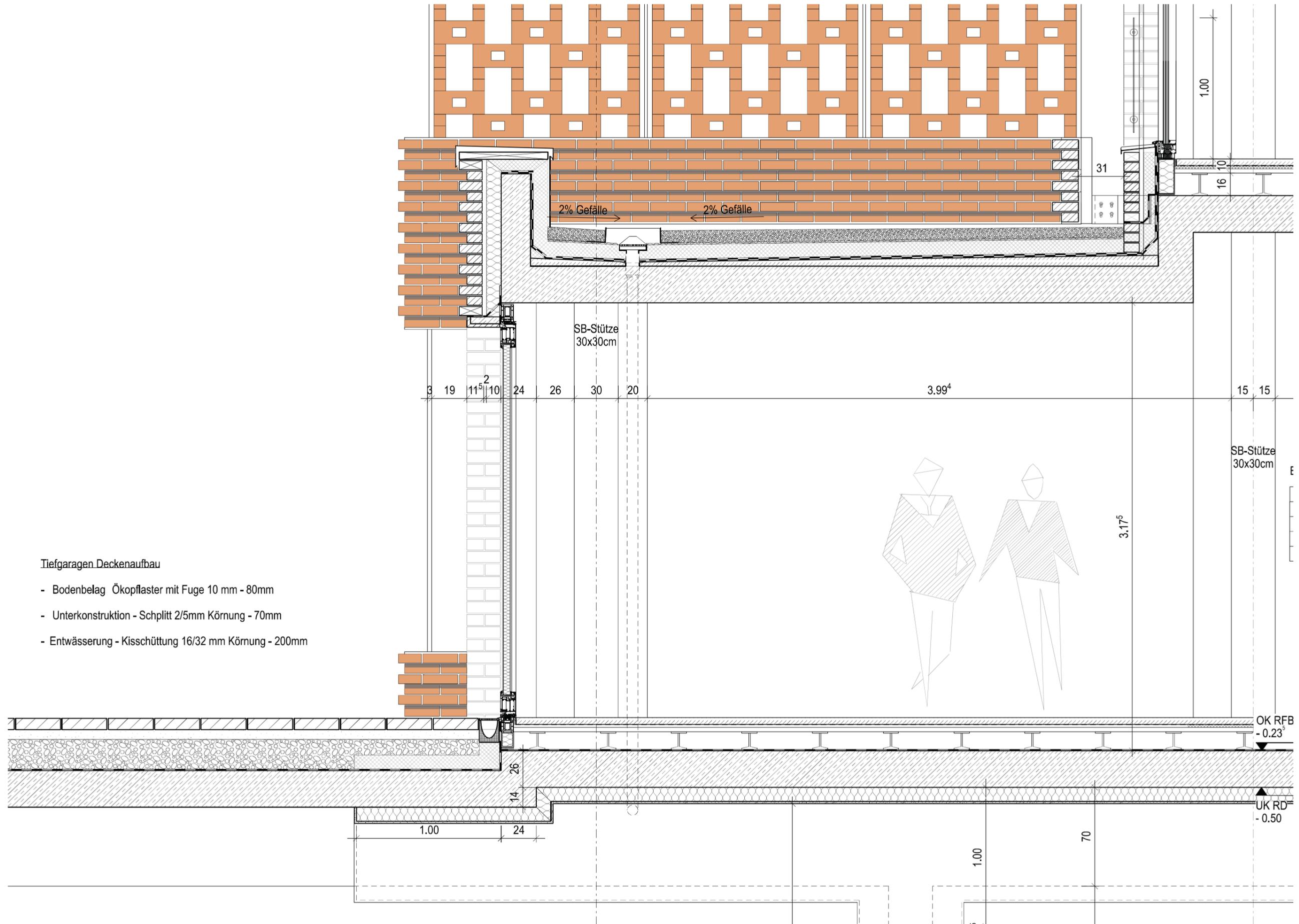
DOPPELFASSADE

FASSADENSCHNITT C-C | AUSSCHNITT MITTE



DOPPELFASSADE

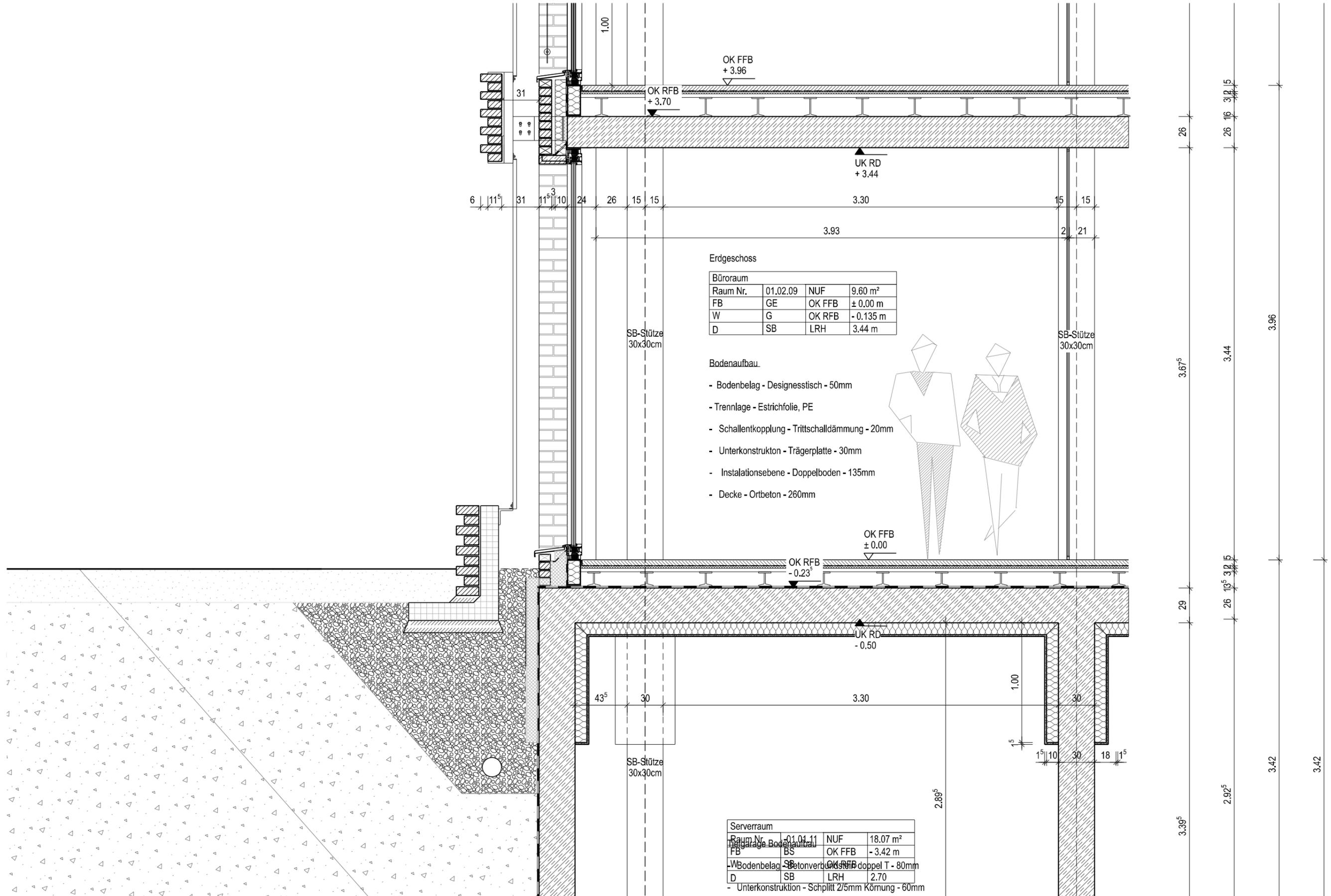
FASSADENSCHNITT C-C | AUSSCHNITT SOCKEL



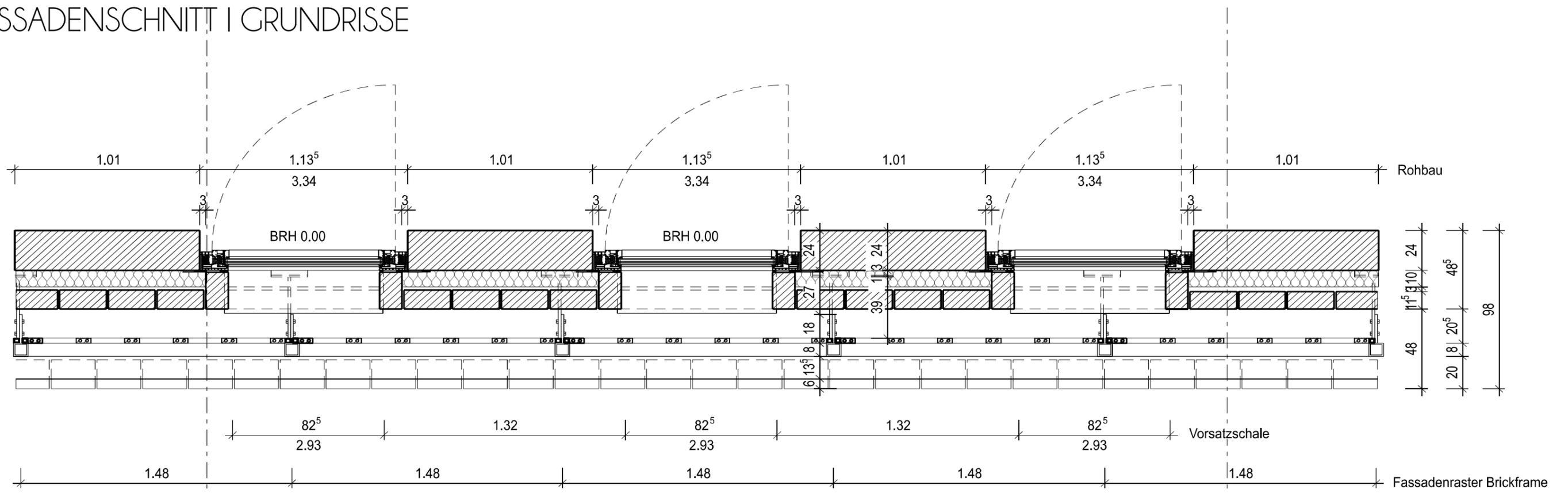
Tiefgaragen Deckenaufbau

- Bodenbelag Ökopflaster mit Fuge 10 mm - 80mm
- Unterkonstruktion - Splitt 2/5mm Körnung - 70mm
- Entwässerung - Kirschüttung 16/32 mm Körnung - 200mm

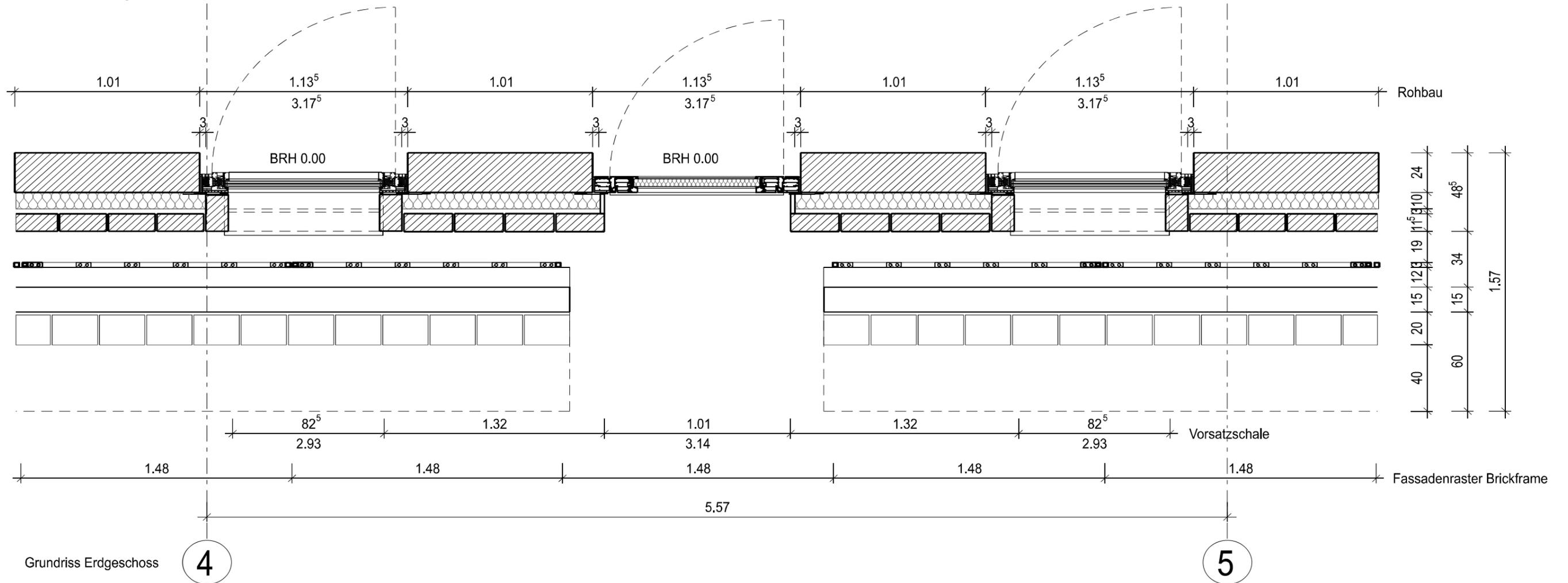
FASSADENSCHNITT D-DI AUSSCHNITT SOCKEL



FASSADENSCHNITT I GRUNDRISS

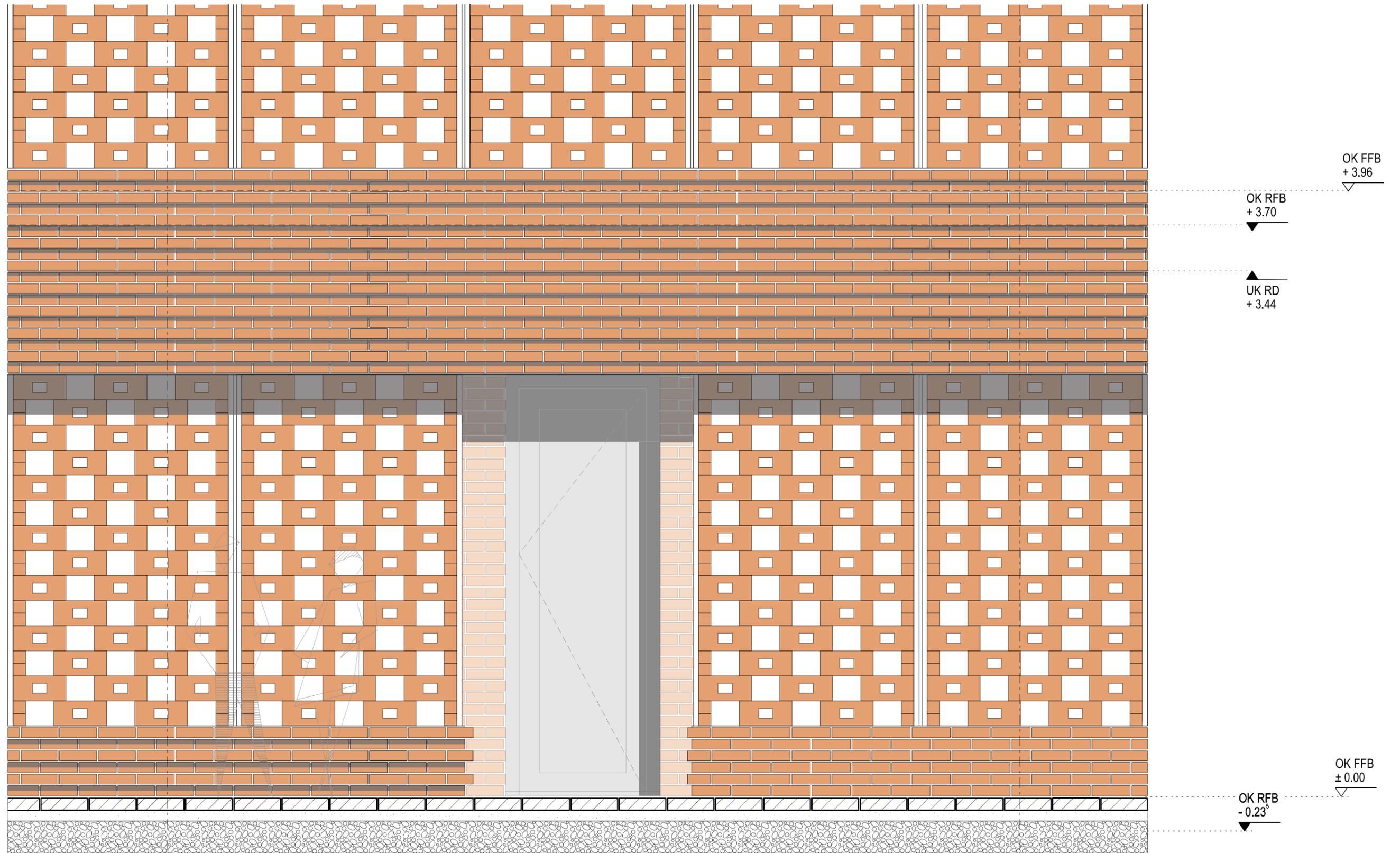


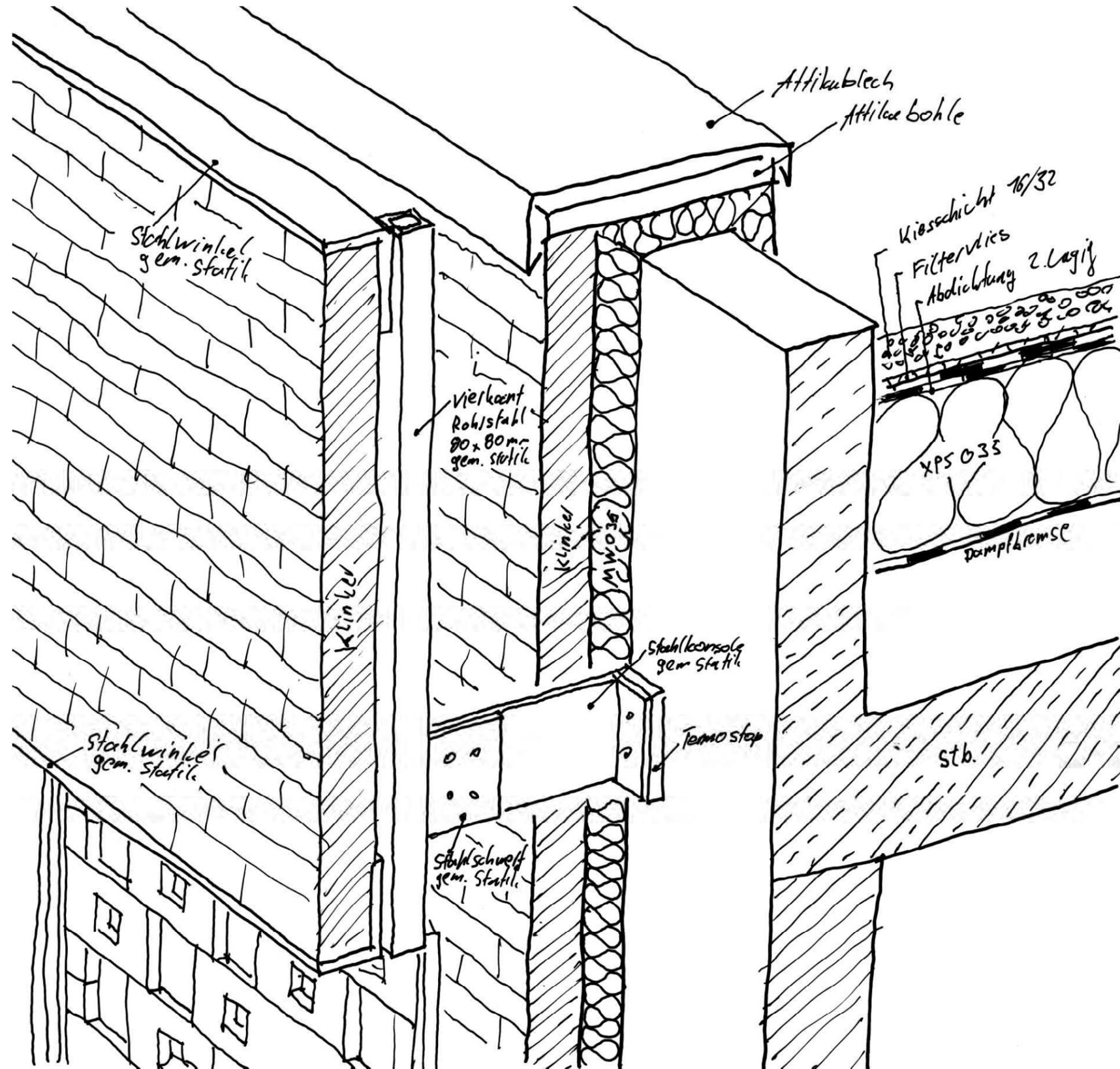
Grundriss 2. Obergeschoss



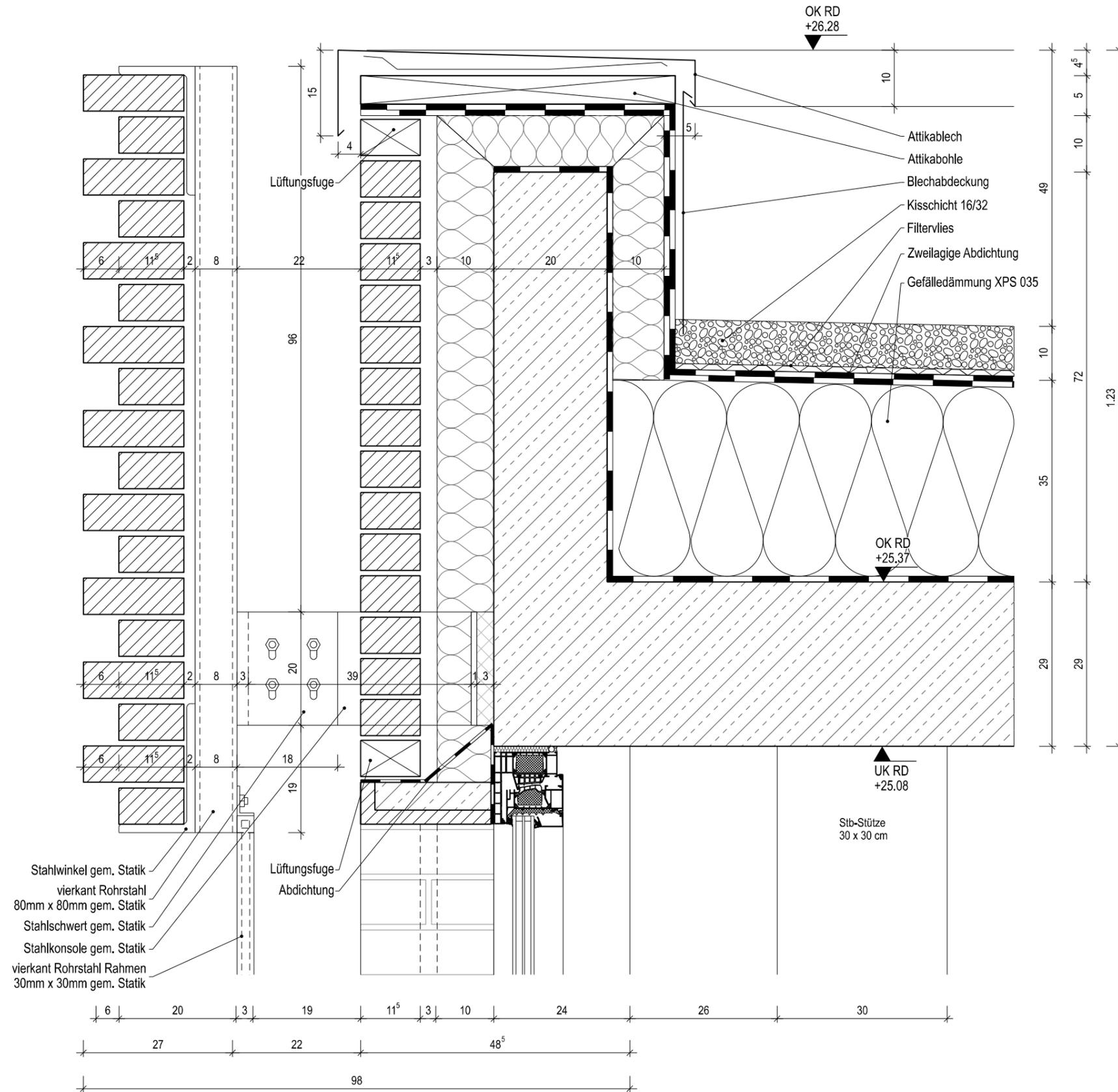
Grundriss Erdgeschoss

FASSADENSCHNITT I ANSICHT

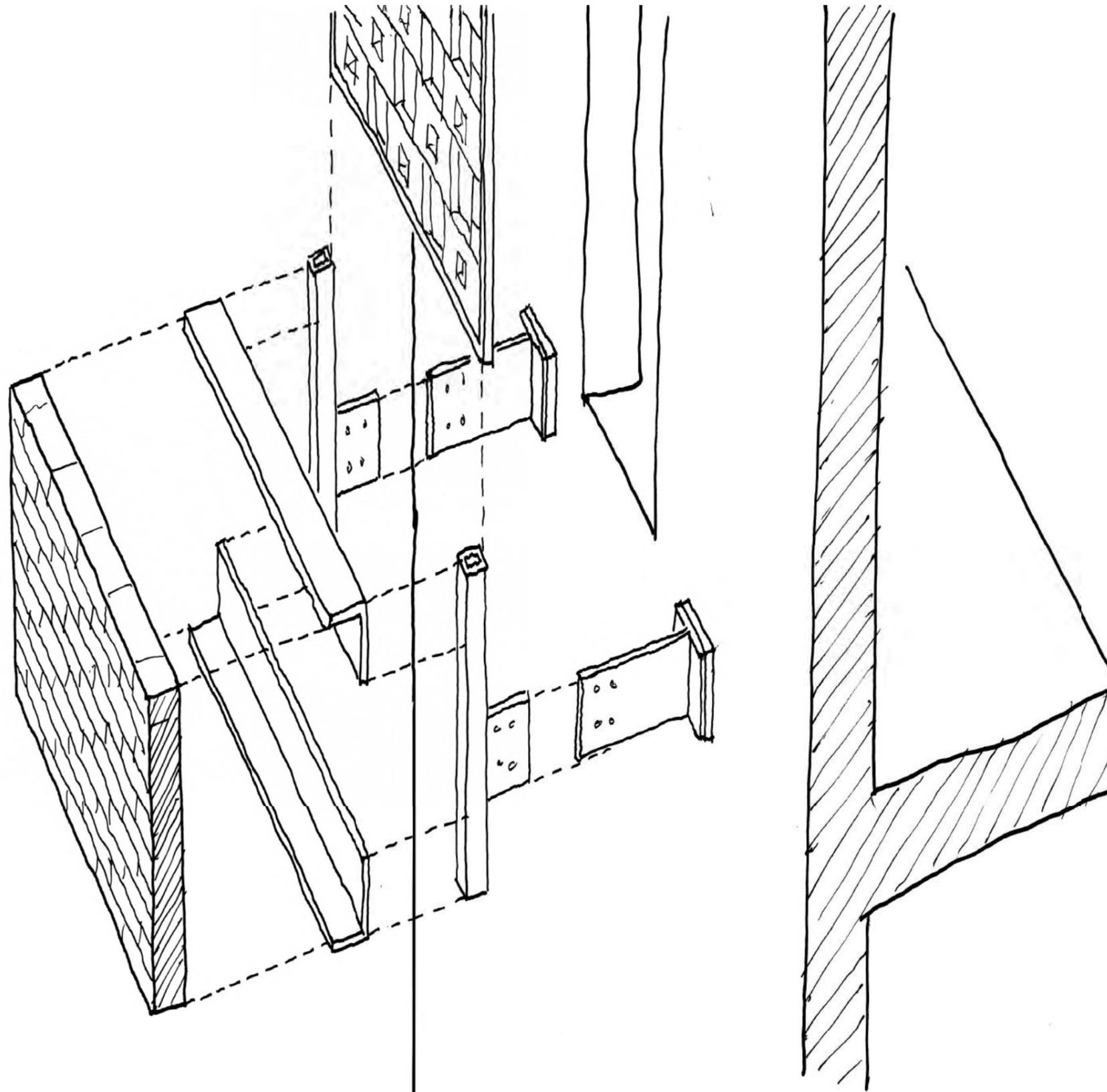




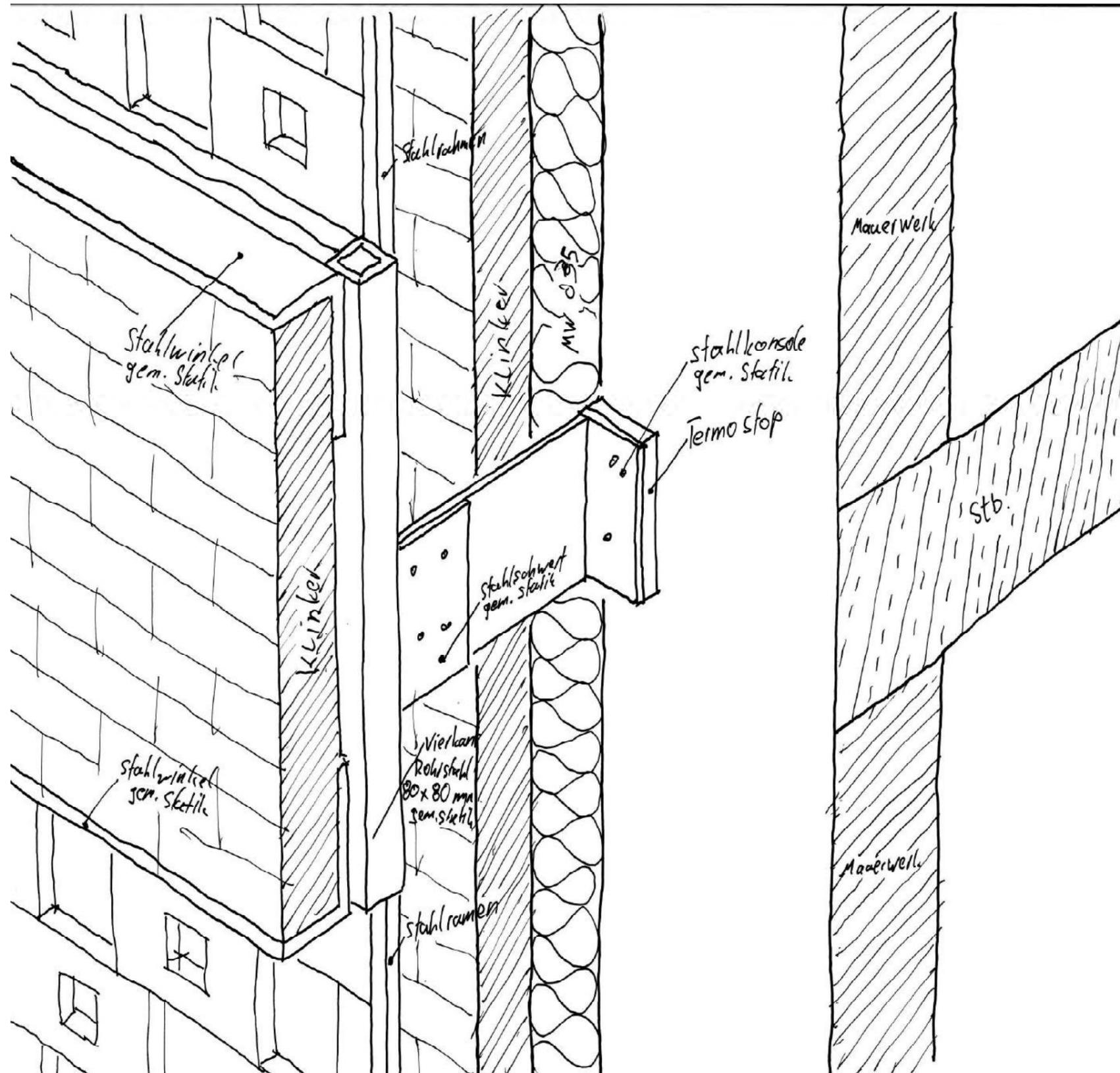
DETAIL I ATTIKA



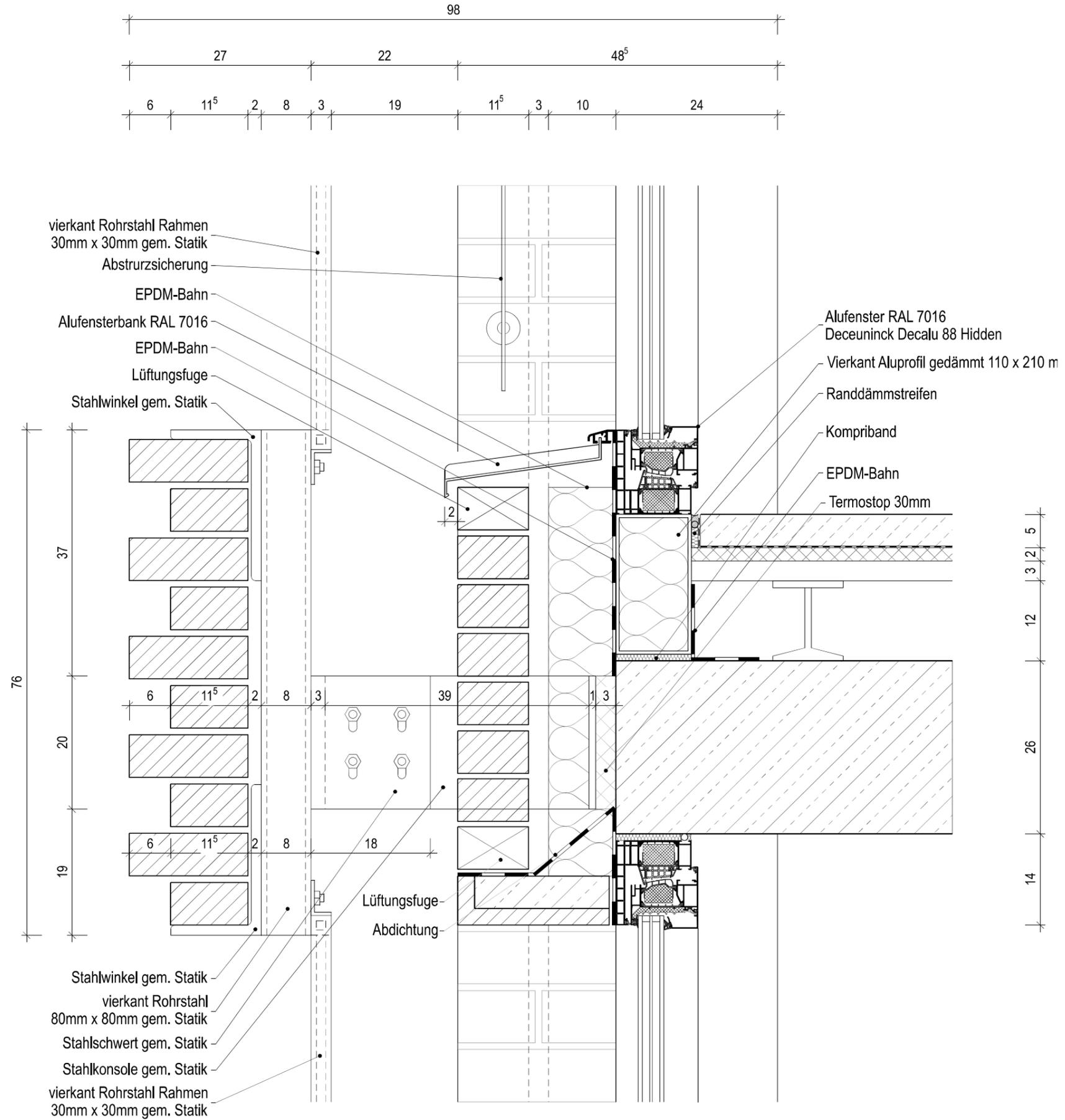
SKIZZE I KNOTENPUNKT STAHLKONSOLE



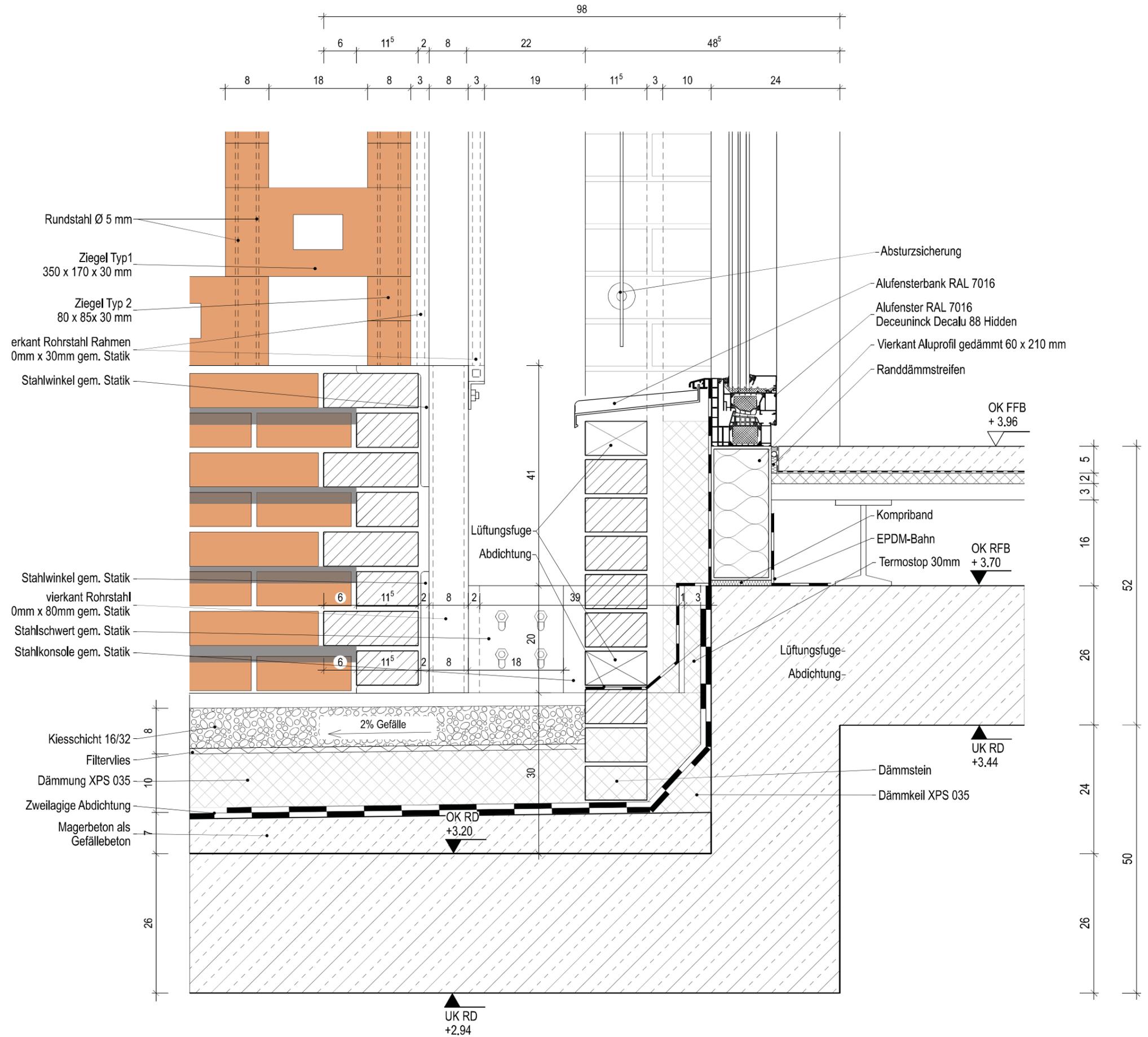
SKIZZE | STAHLKONSOLE



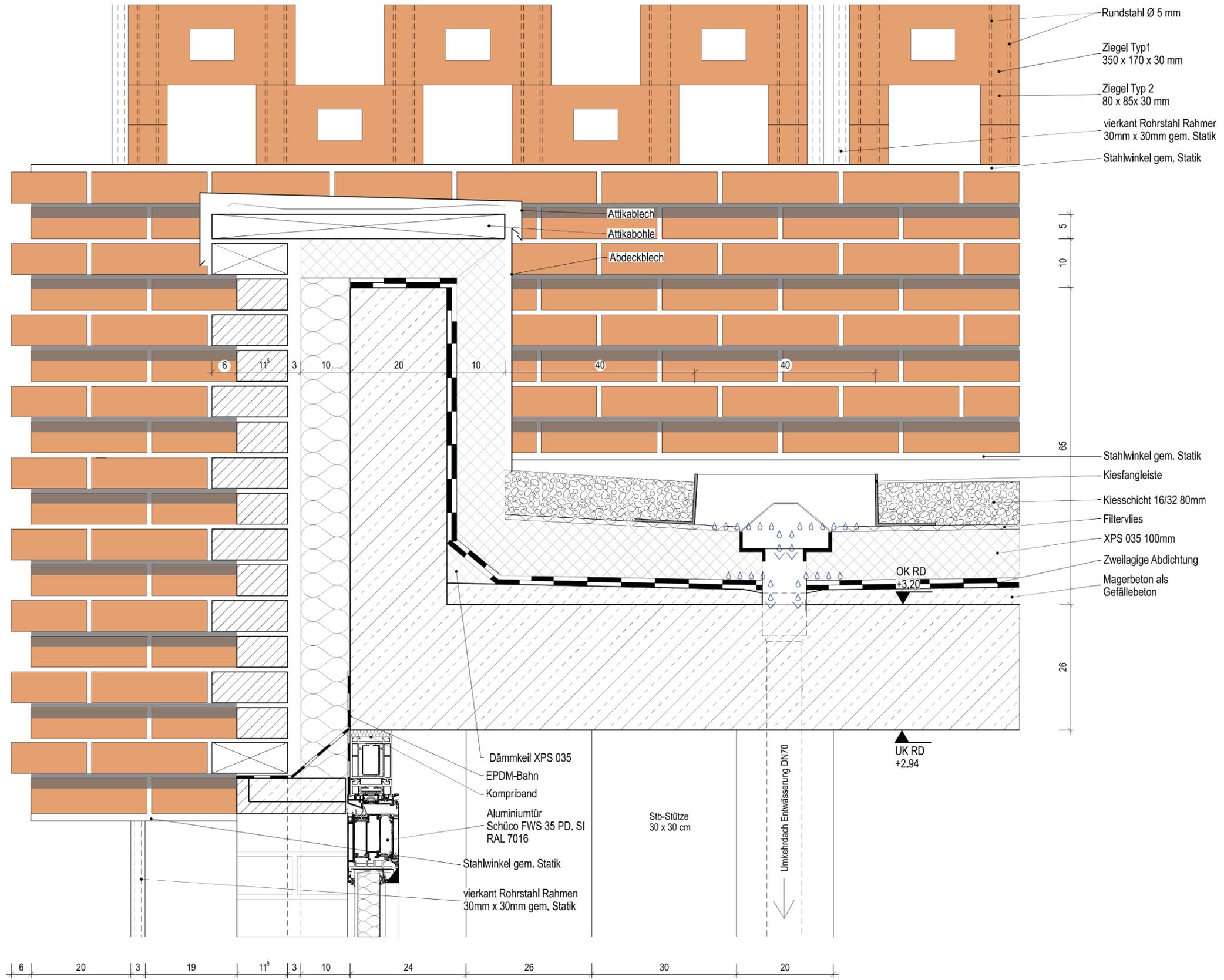
DETAIL I STAHLKONSOLE



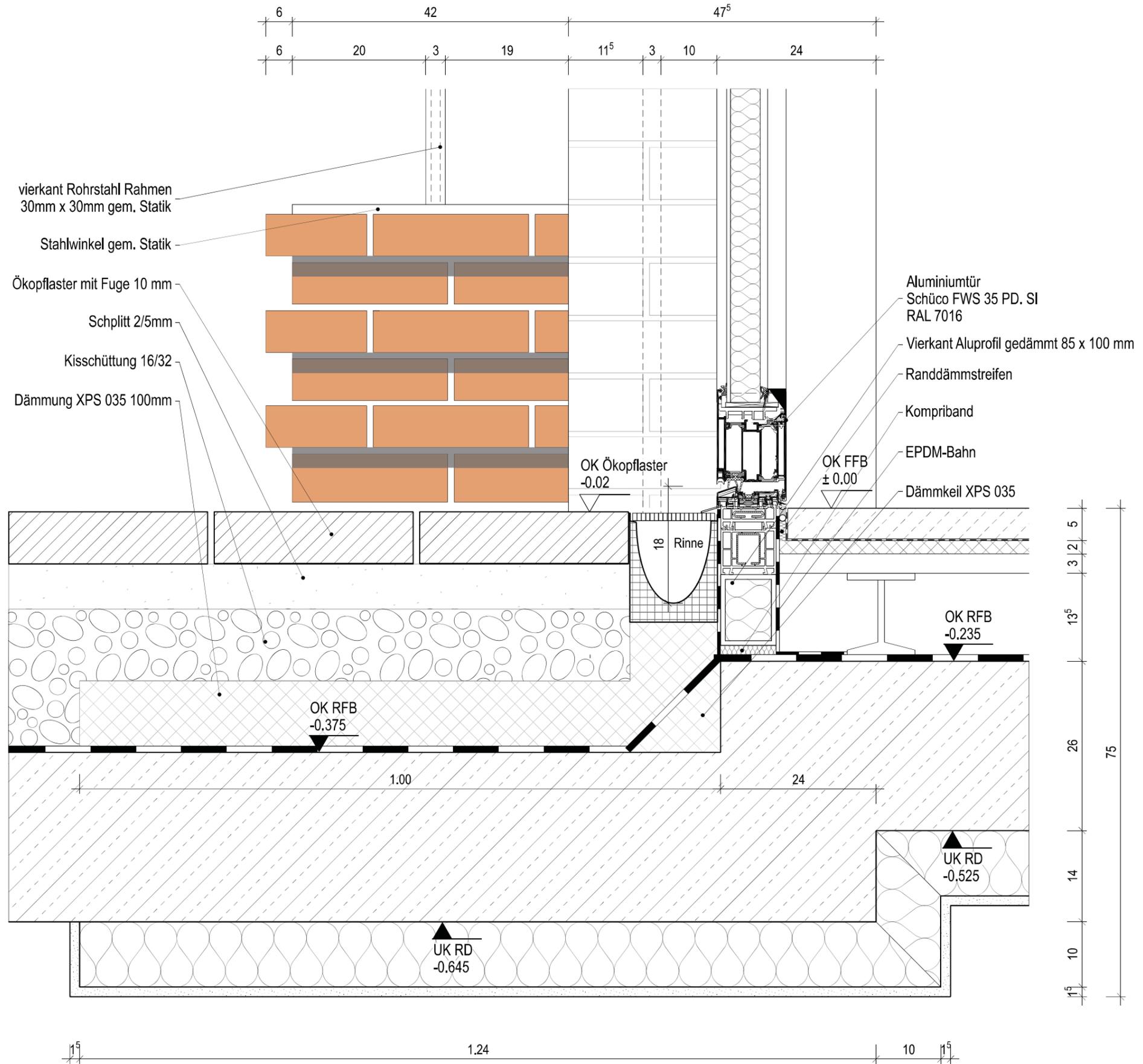
DETAIL I ANSCHLUSS VORDACH



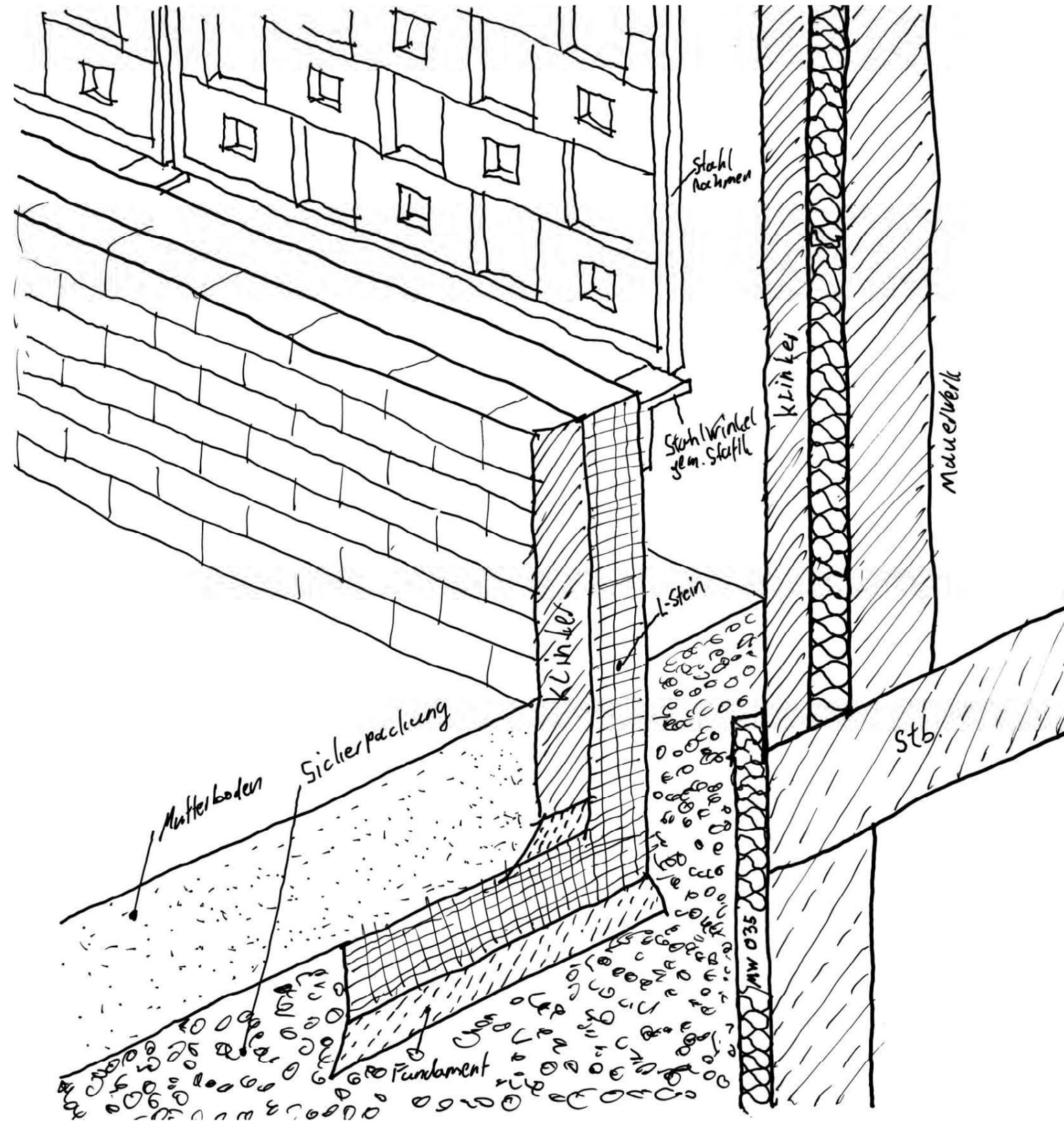
DETAIL I EINGANGSTÜR OBEN



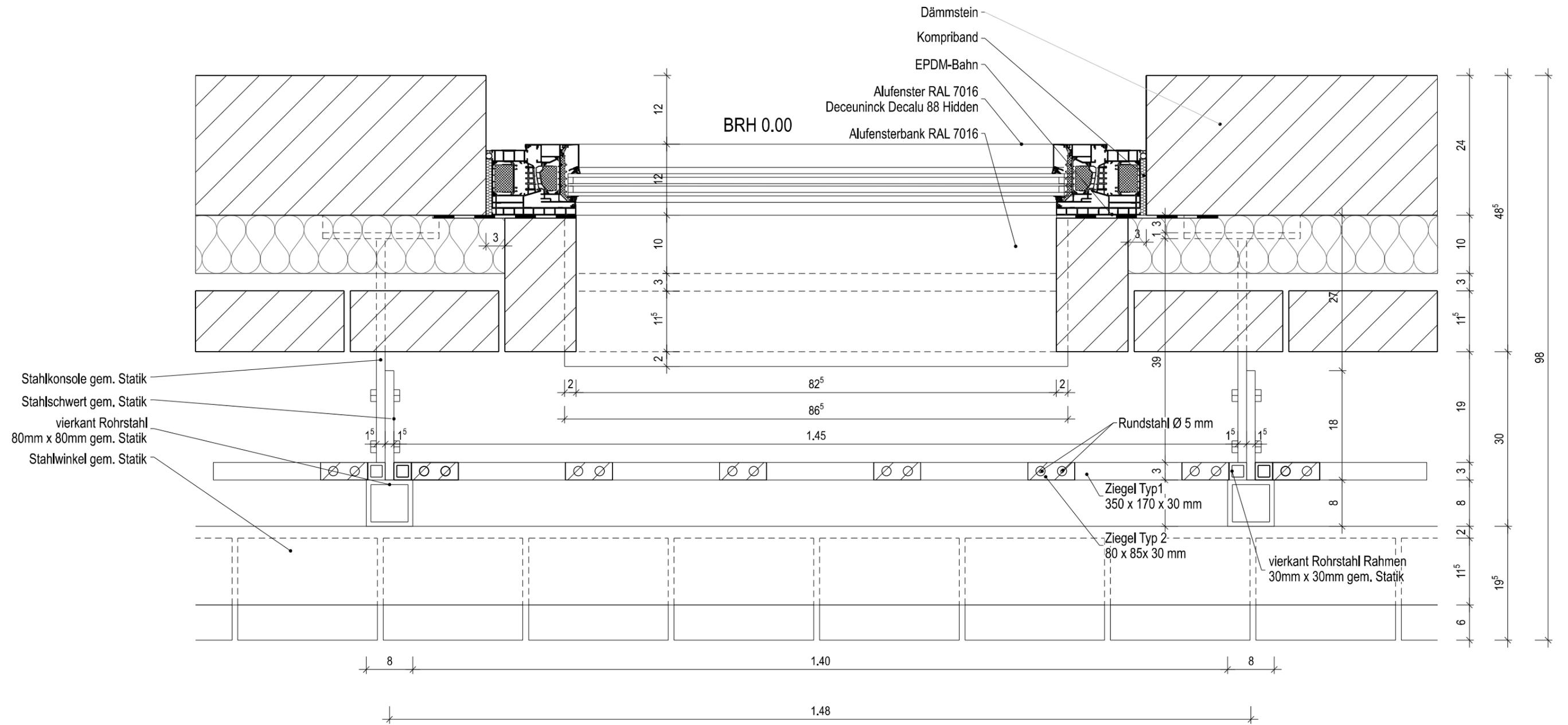
DETAIL I EINGANGSTÜR UNTEN



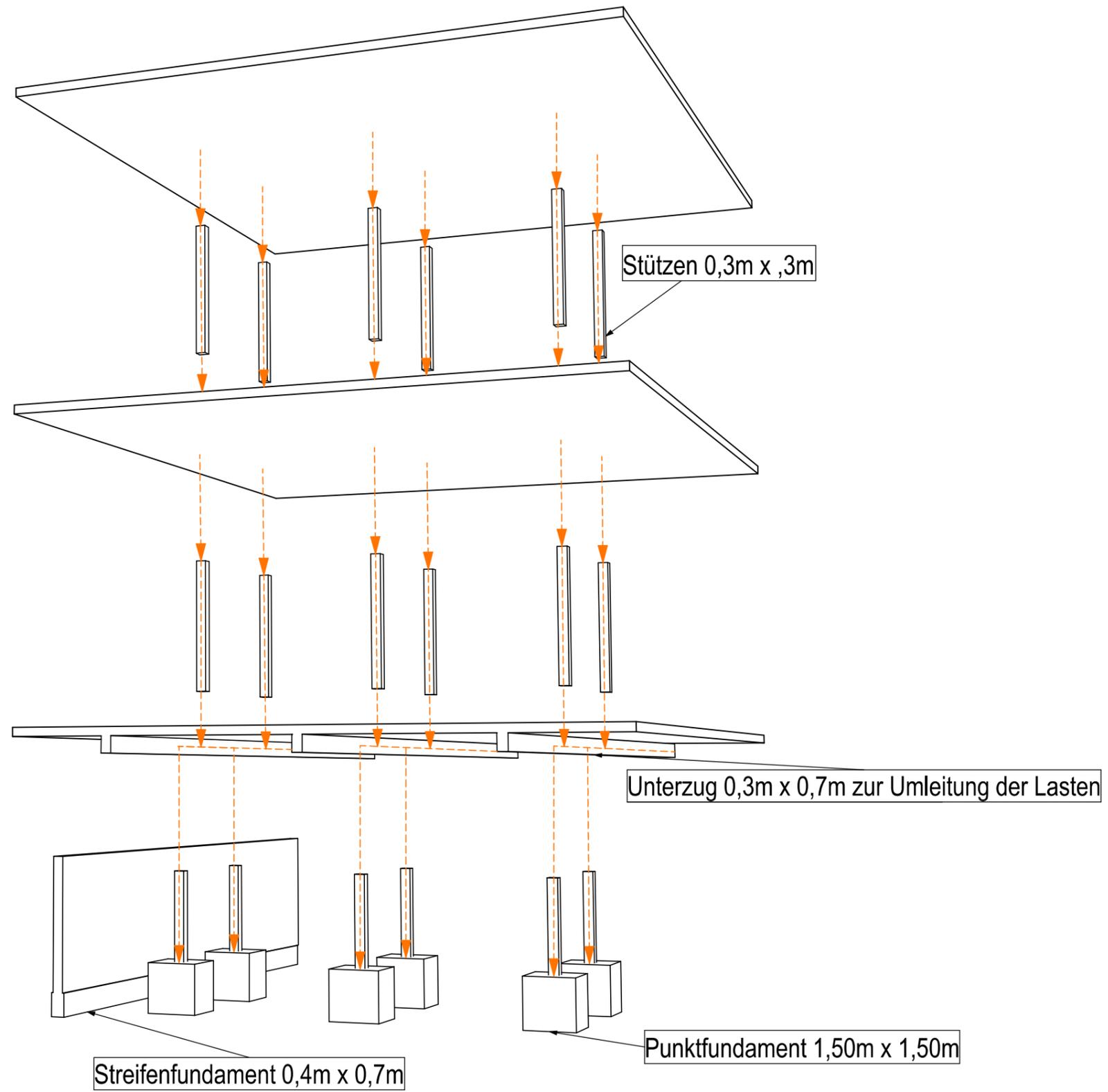
SKIZZE | SOCKEL



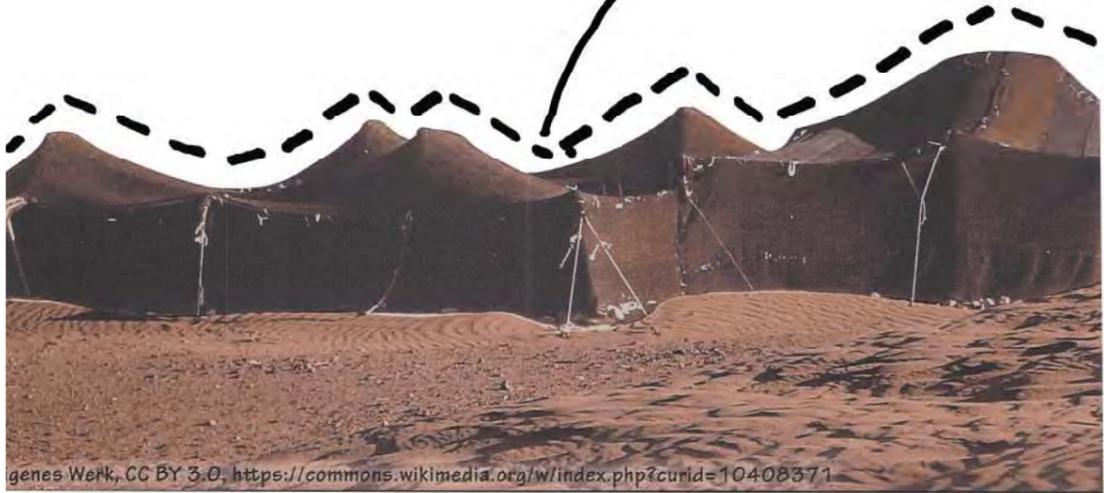
DETAIL I GRUNDRISS



TRAGWERK

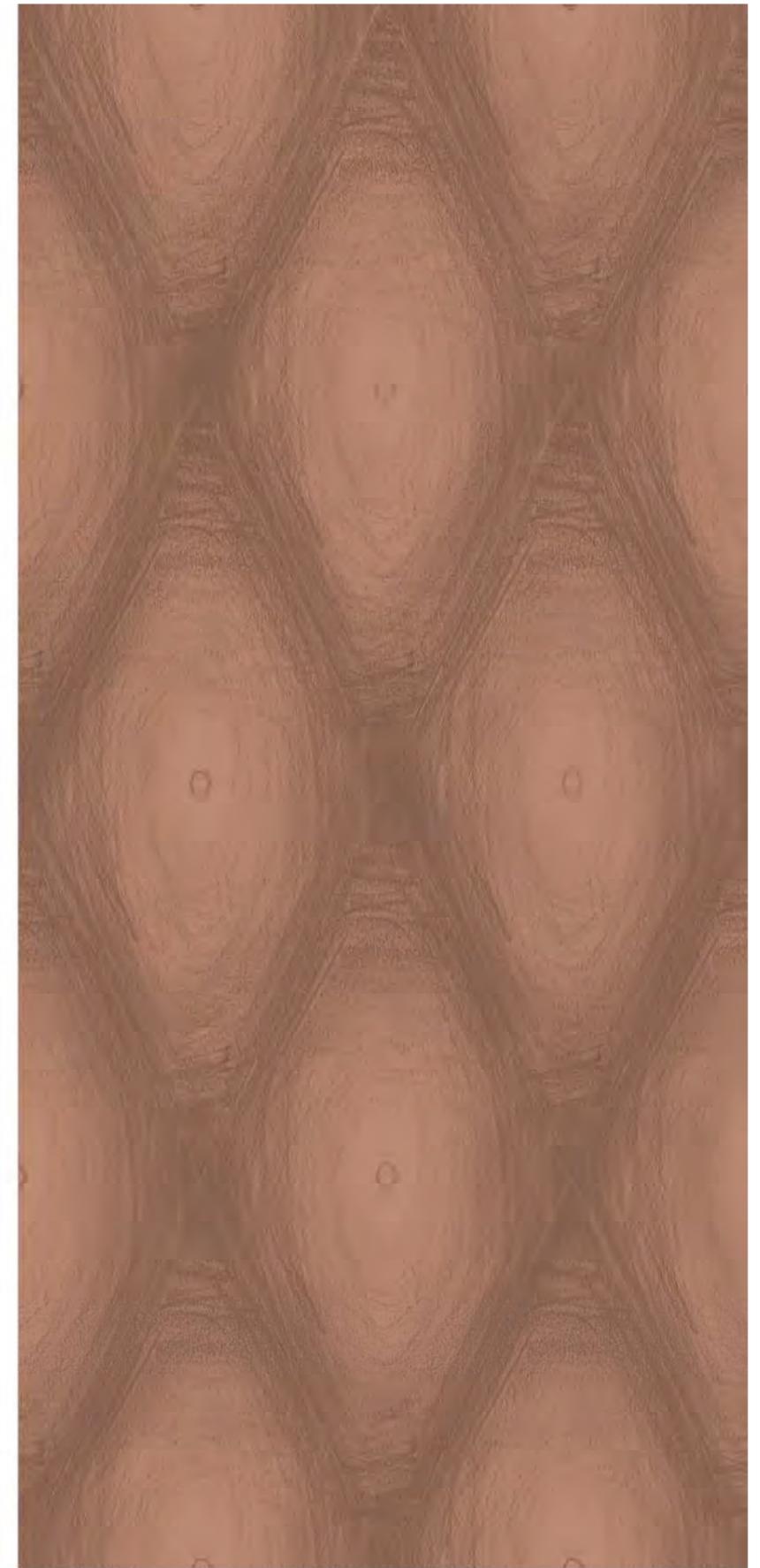
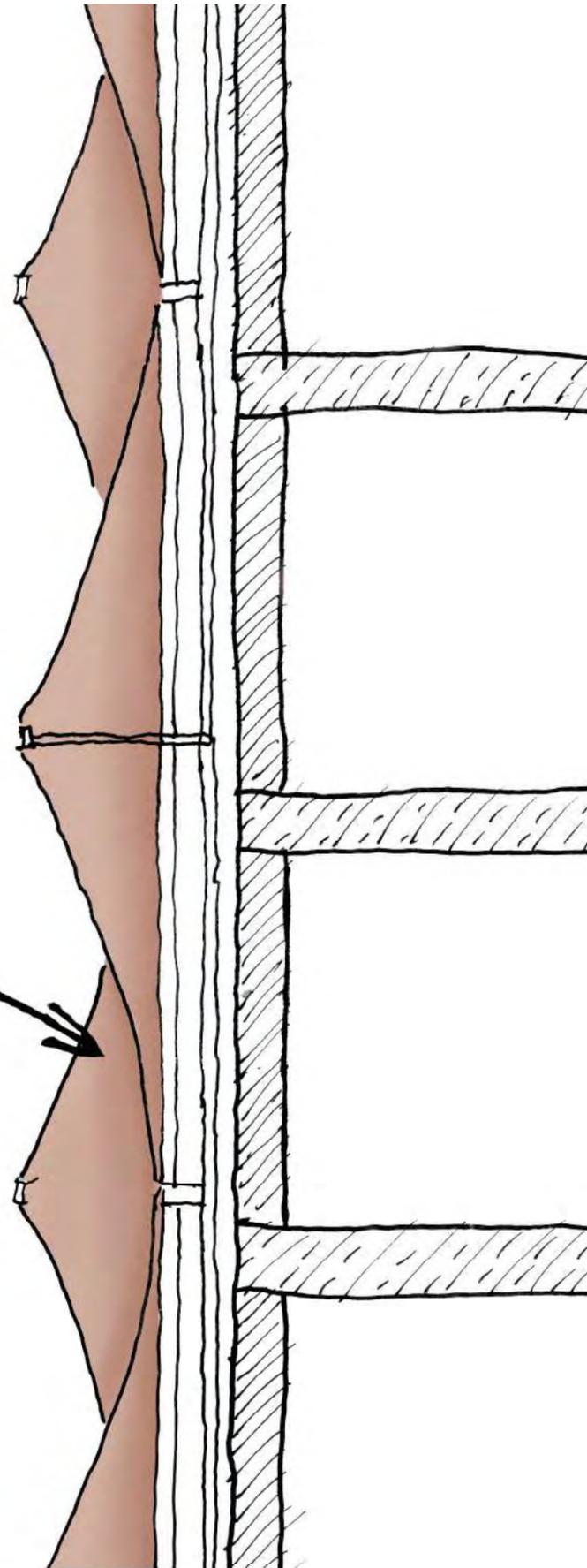


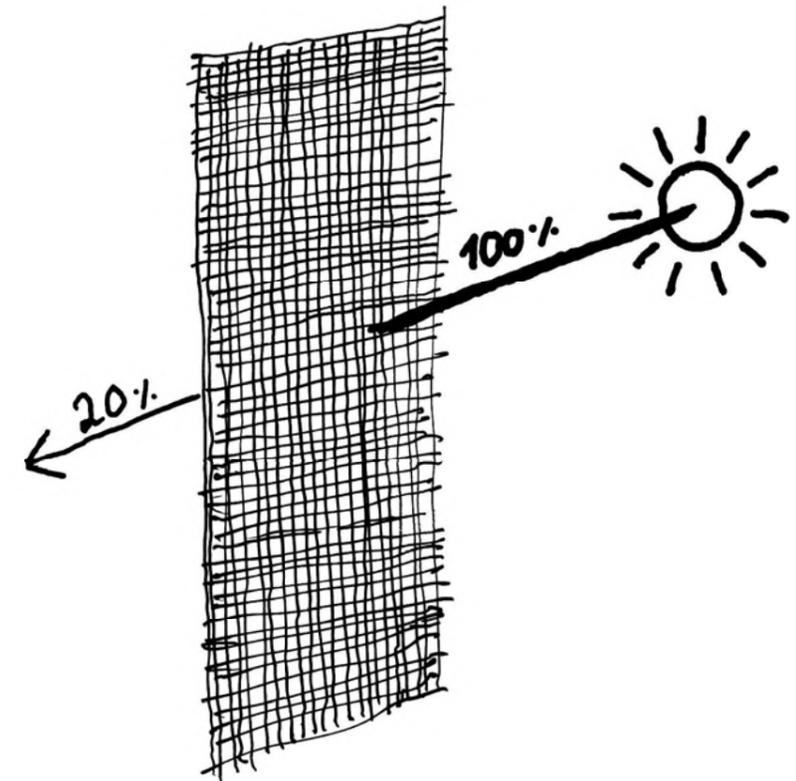
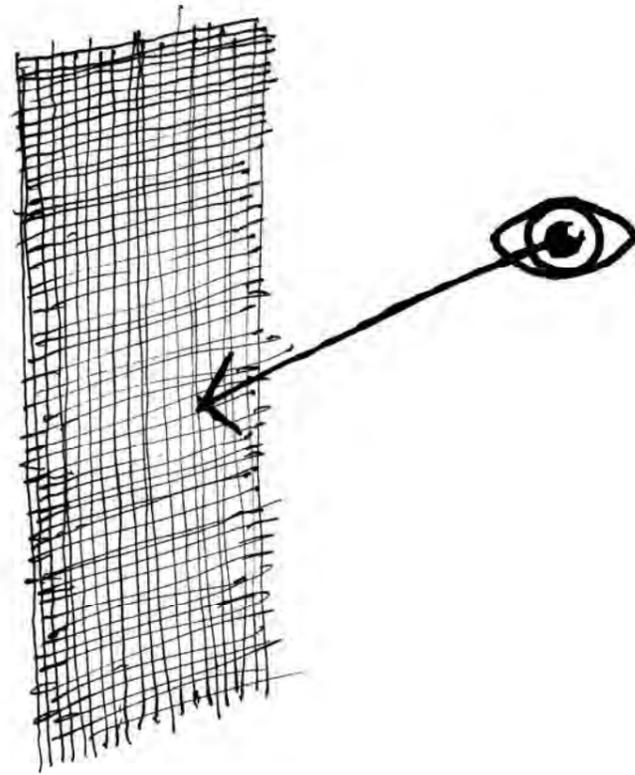
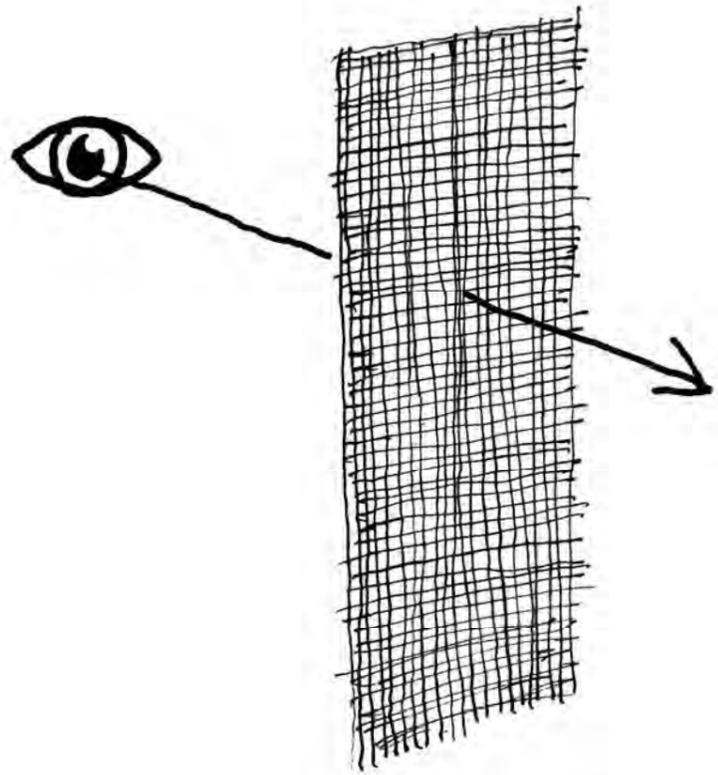
KONZEPT I FASSADENGESTALTUNG



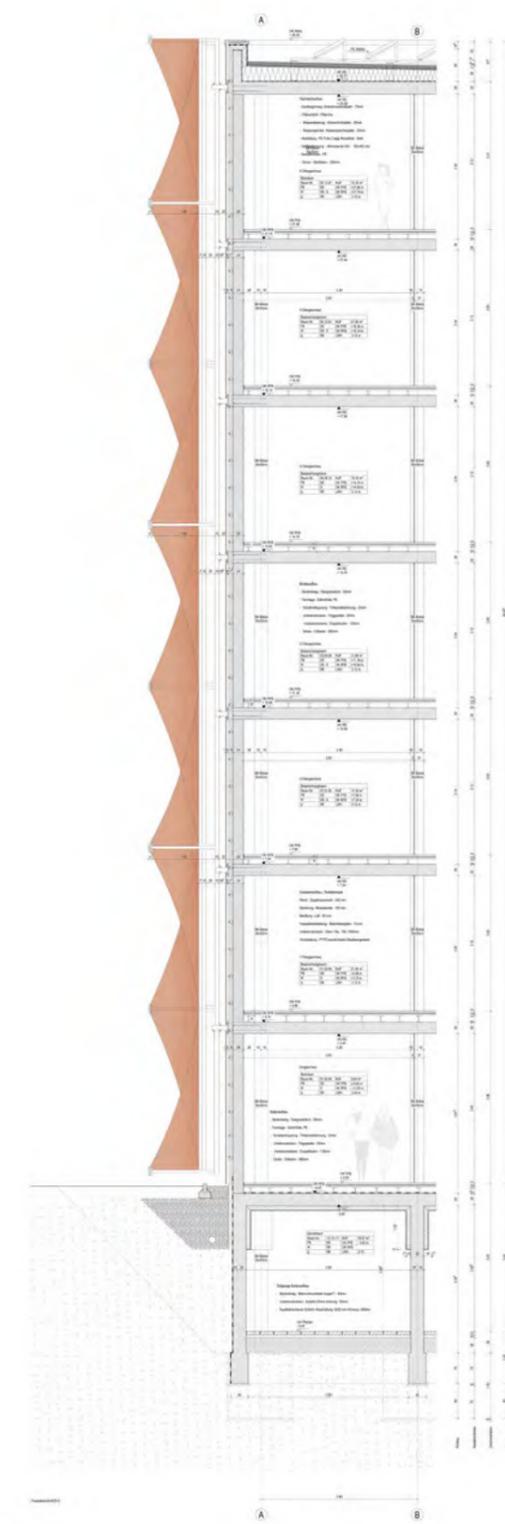
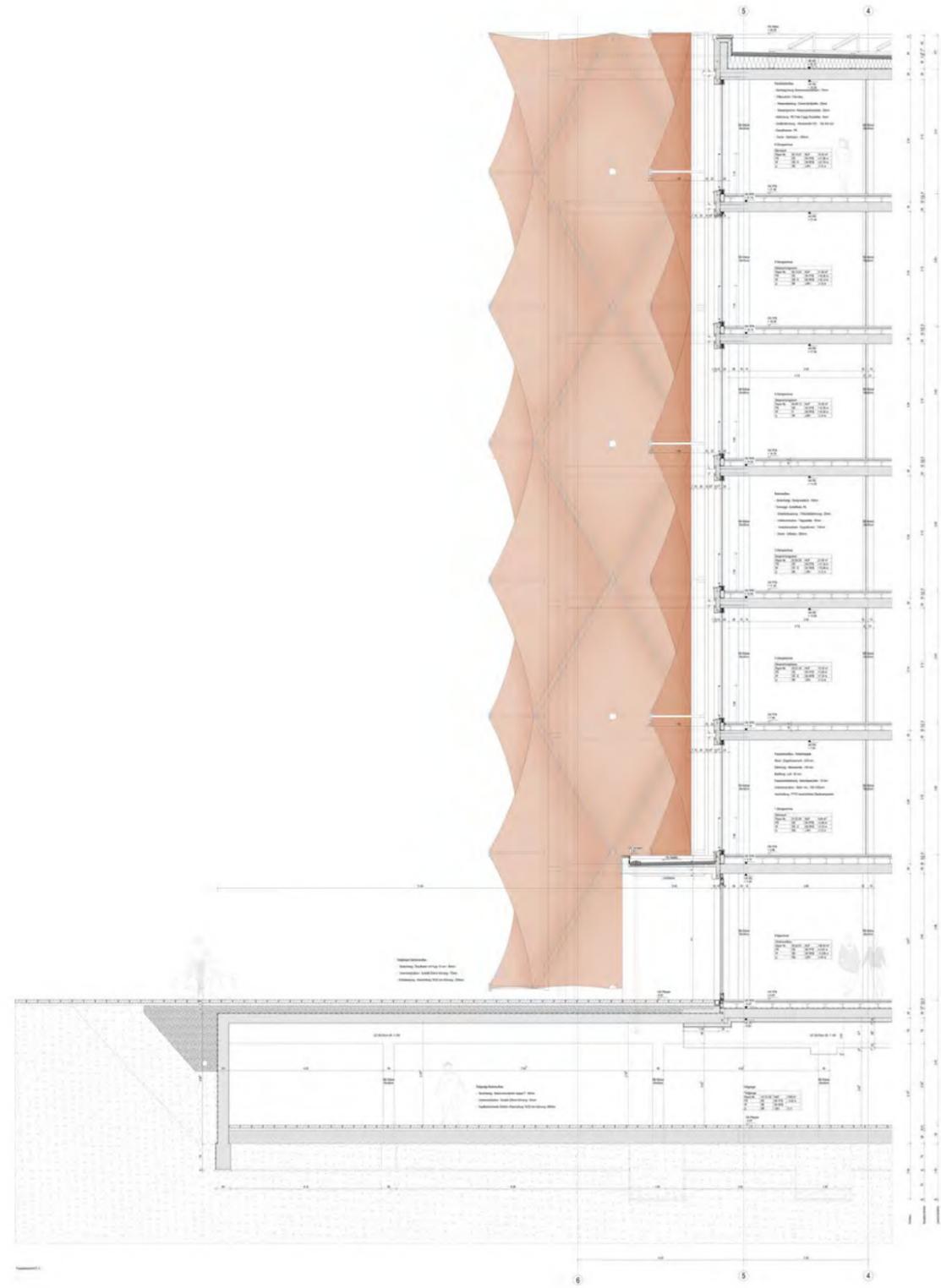
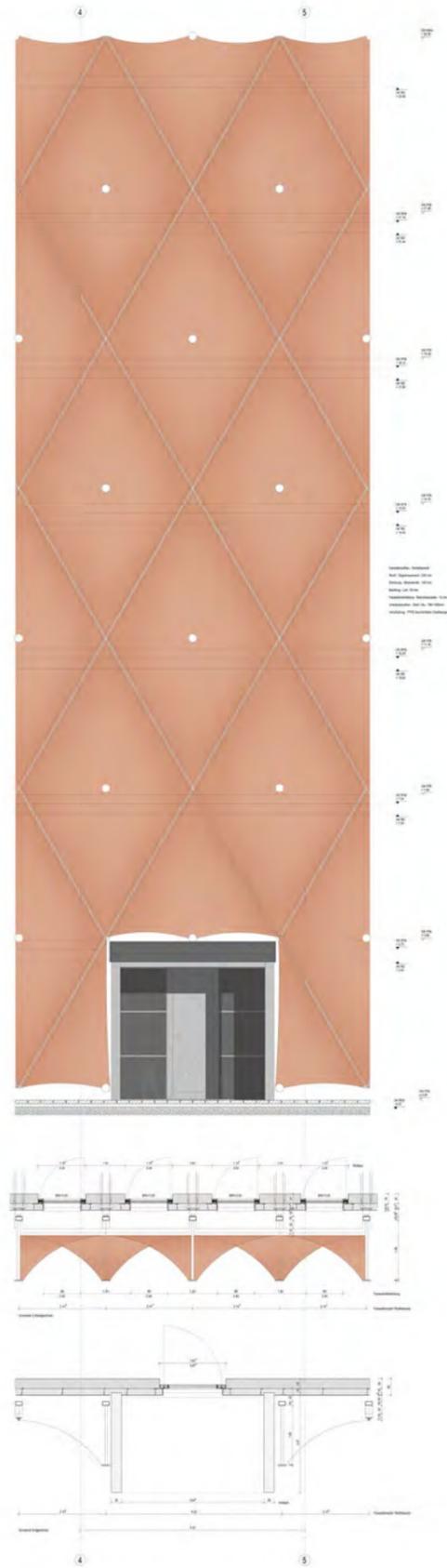
genes Werk, CC BY 3.0, <https://commons.wikimedia.org/w/index.php?curid=10408371>

Abb. 21

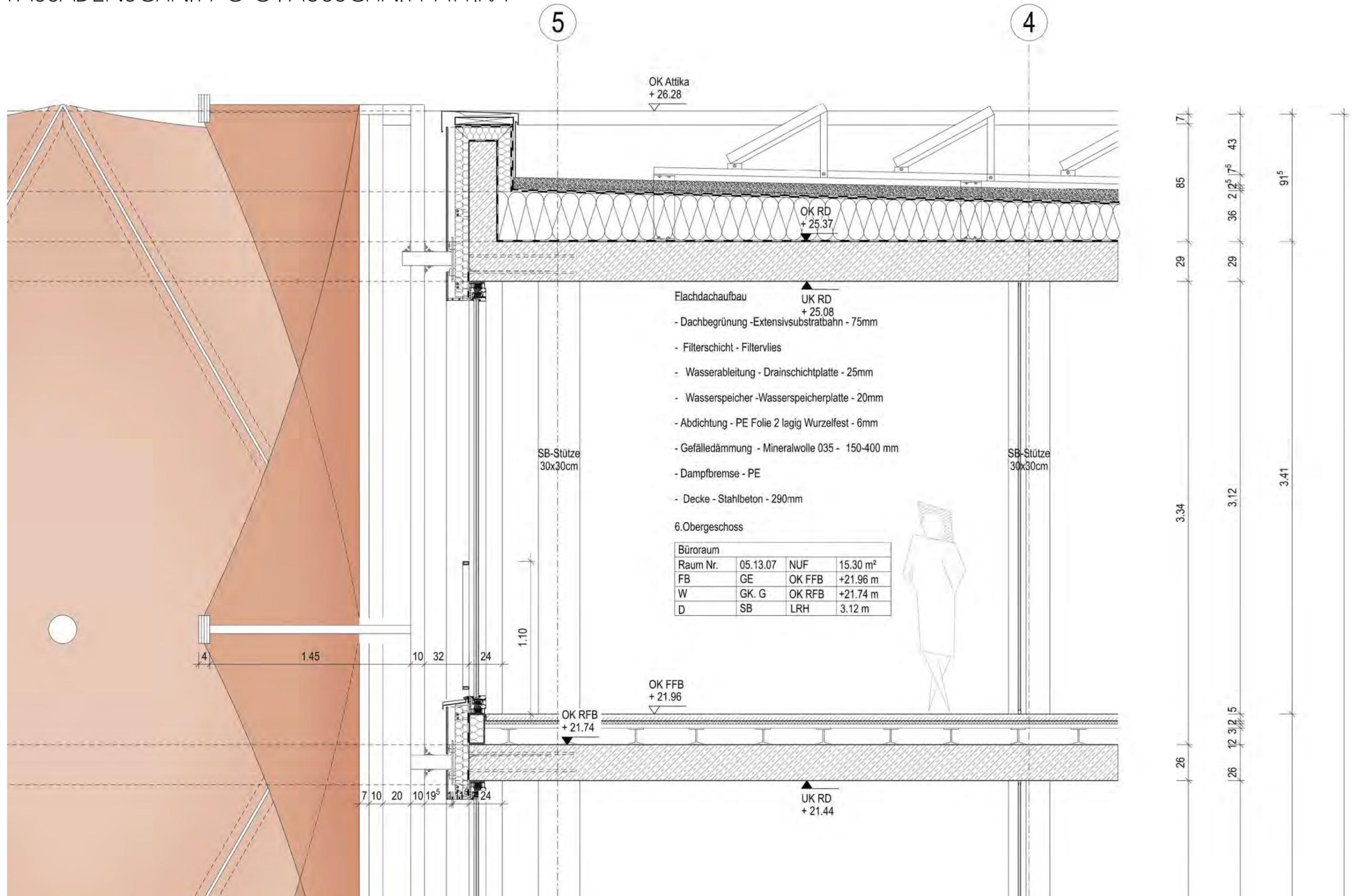




FASSADENSCHNITT

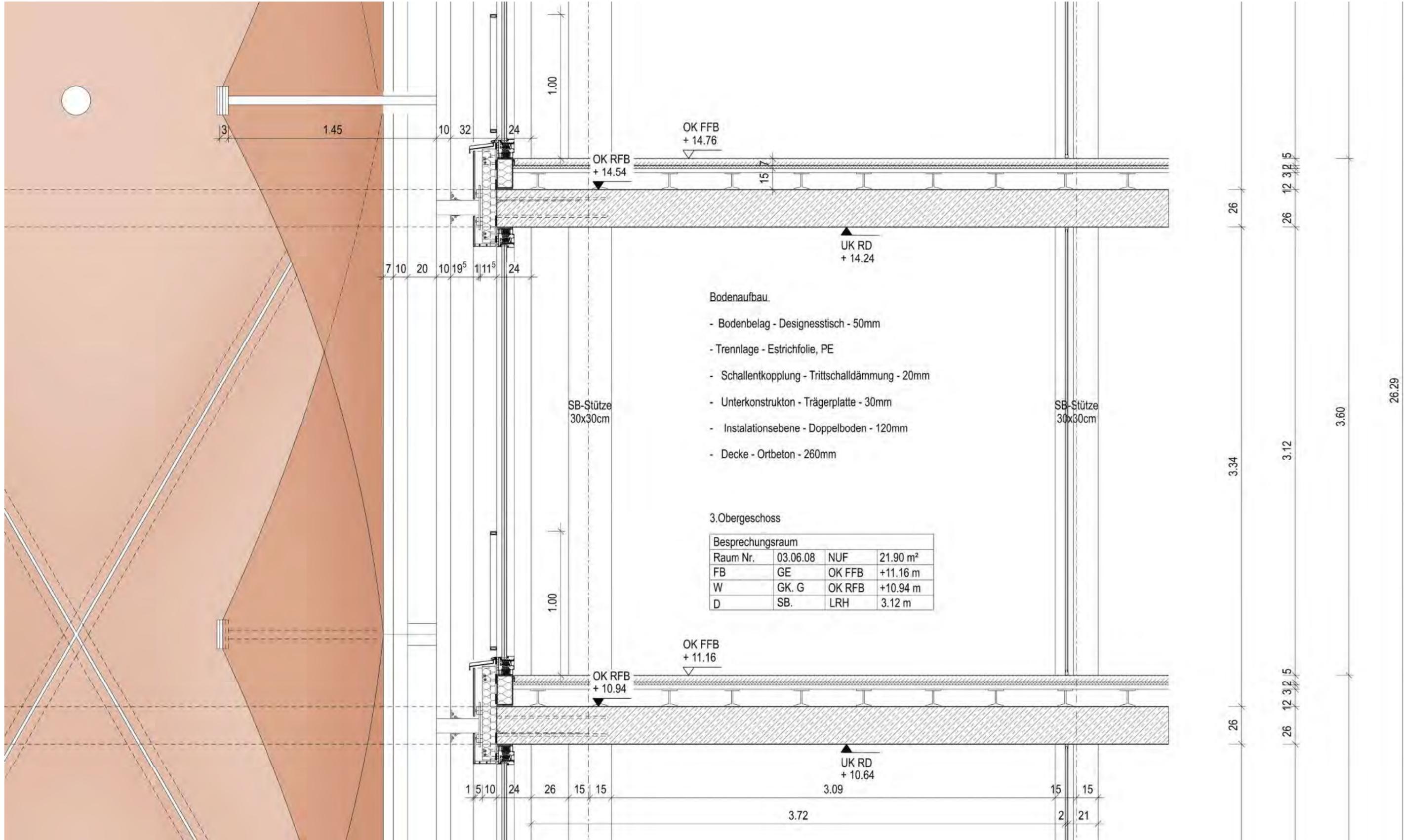


FASSADENSCHNITT C-C | AUSSCHNITT ATTIKA

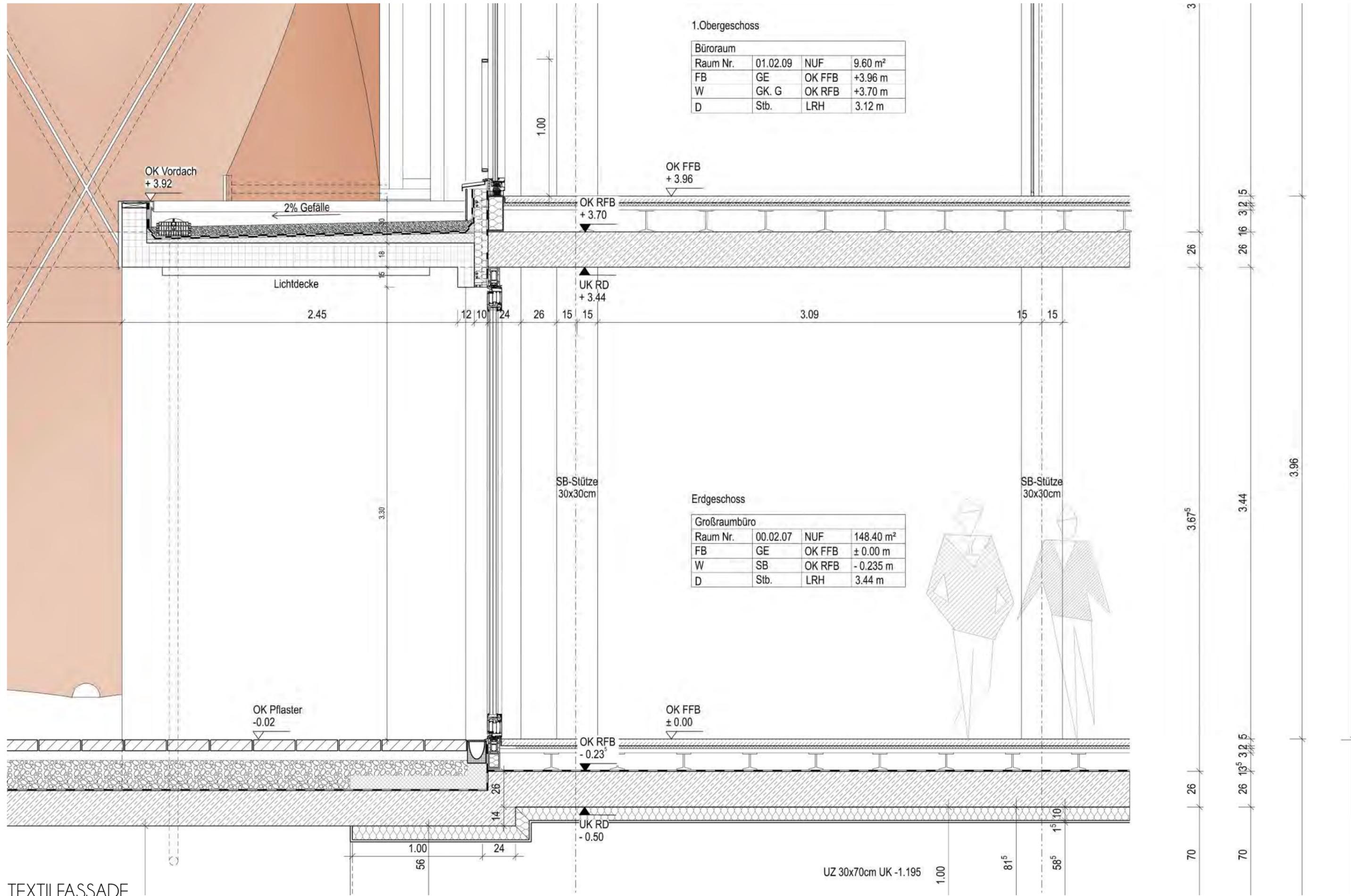


TEXTILFASSADE

FASSADENSCHNITT C-C I AUSSCHNITT MITTE



FASSADENSCHNITT C-C | AUSSCHNITT SOCKEL



1. Obergeschoss

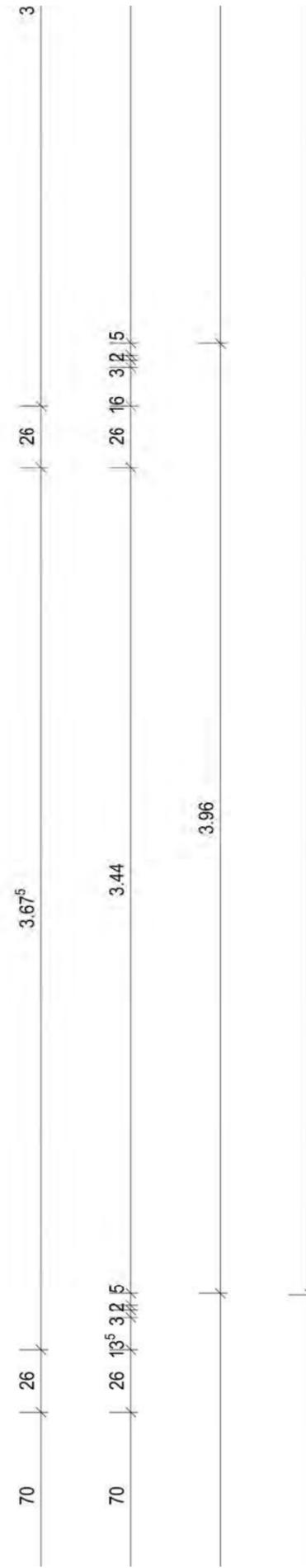
Büroraum			
Raum Nr.	01.02.09	NUF	9.60 m ²
FB	GE	OK FFB	+3.96 m
W	GK. G	OK RFB	+3.70 m
D	Stb.	LRH	3.12 m

Erdgeschoss

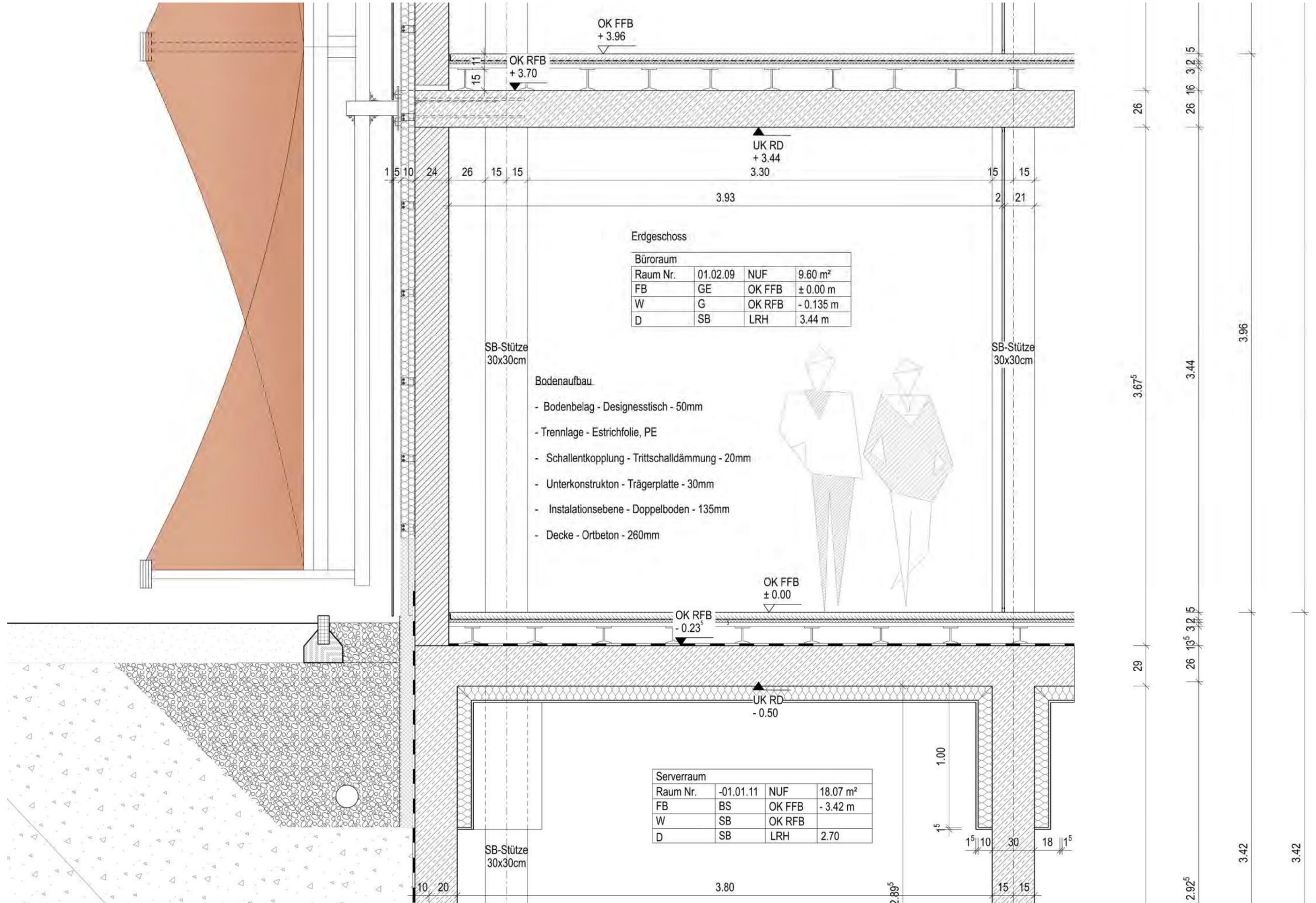
Großraumbüro			
Raum Nr.	00.02.07	NUF	148.40 m ²
FB	GE	OK FFB	± 0.00 m
W	SB	OK RFB	- 0.235 m
D	Stb.	LRH	3.44 m

TEXTILFASSADE

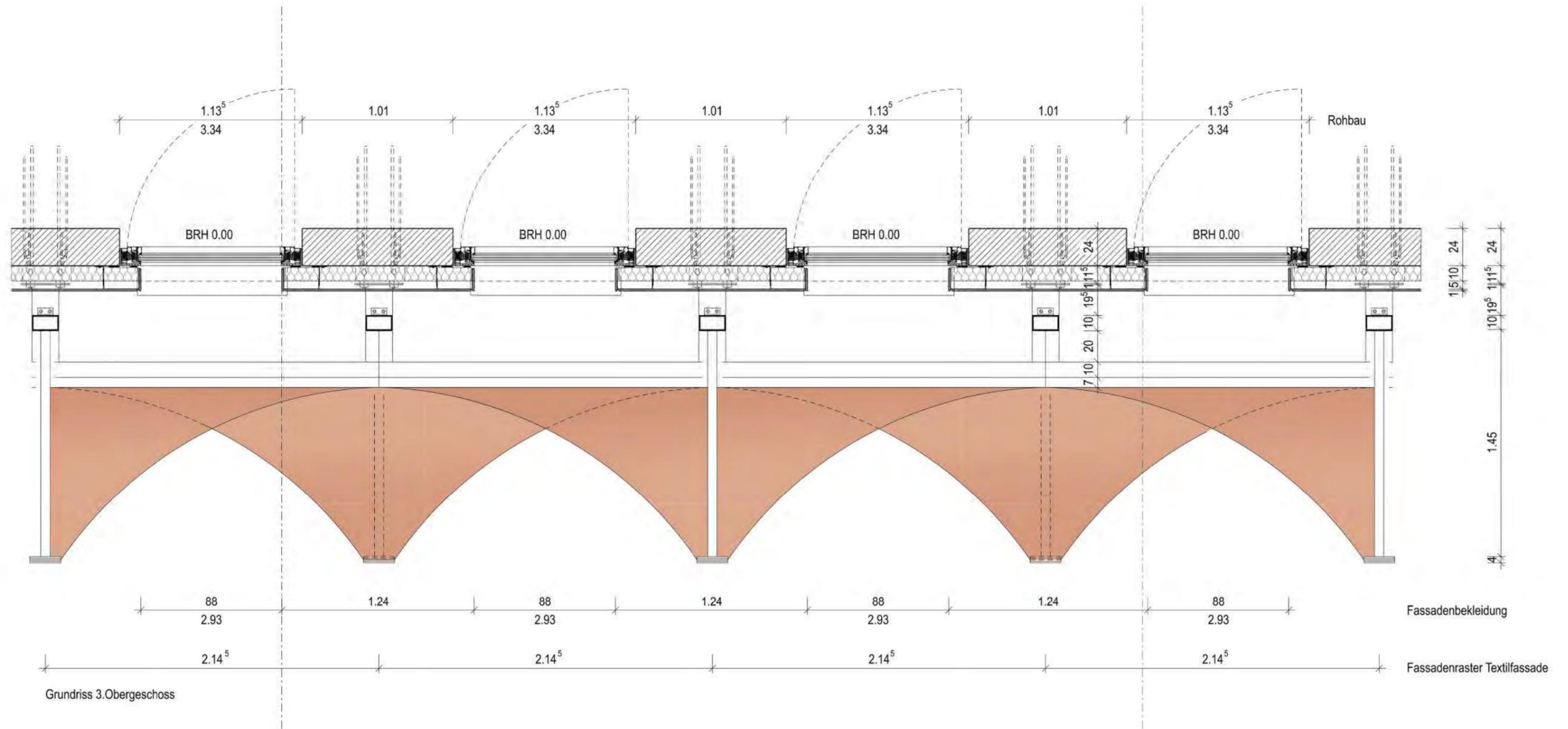
UZ 30x70cm UK -1.195



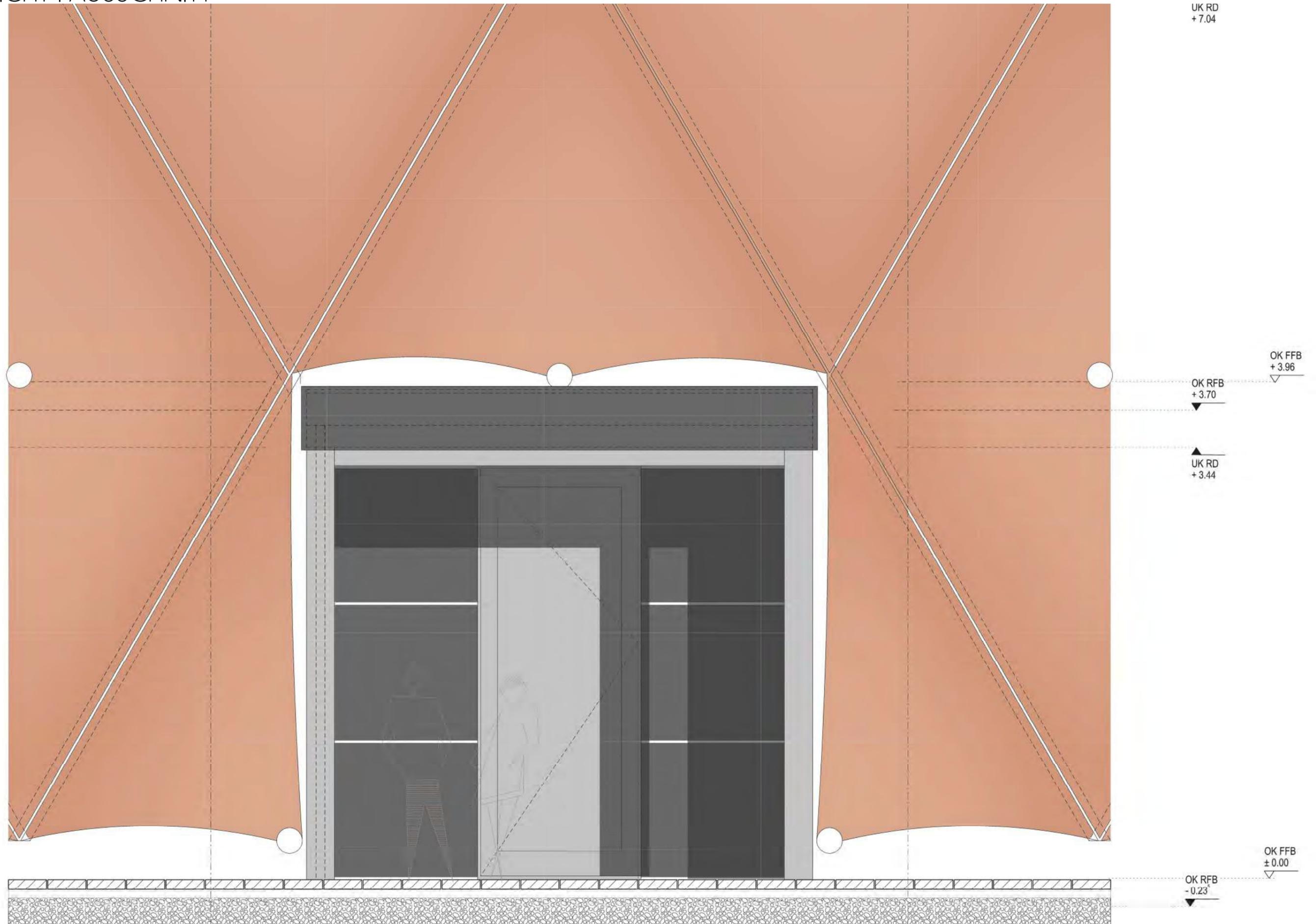
FASSADENSCHNITT D-D | AUSSCHNITT SOCKEL



GRUNDRISS I 3. OBERGESCHOSS

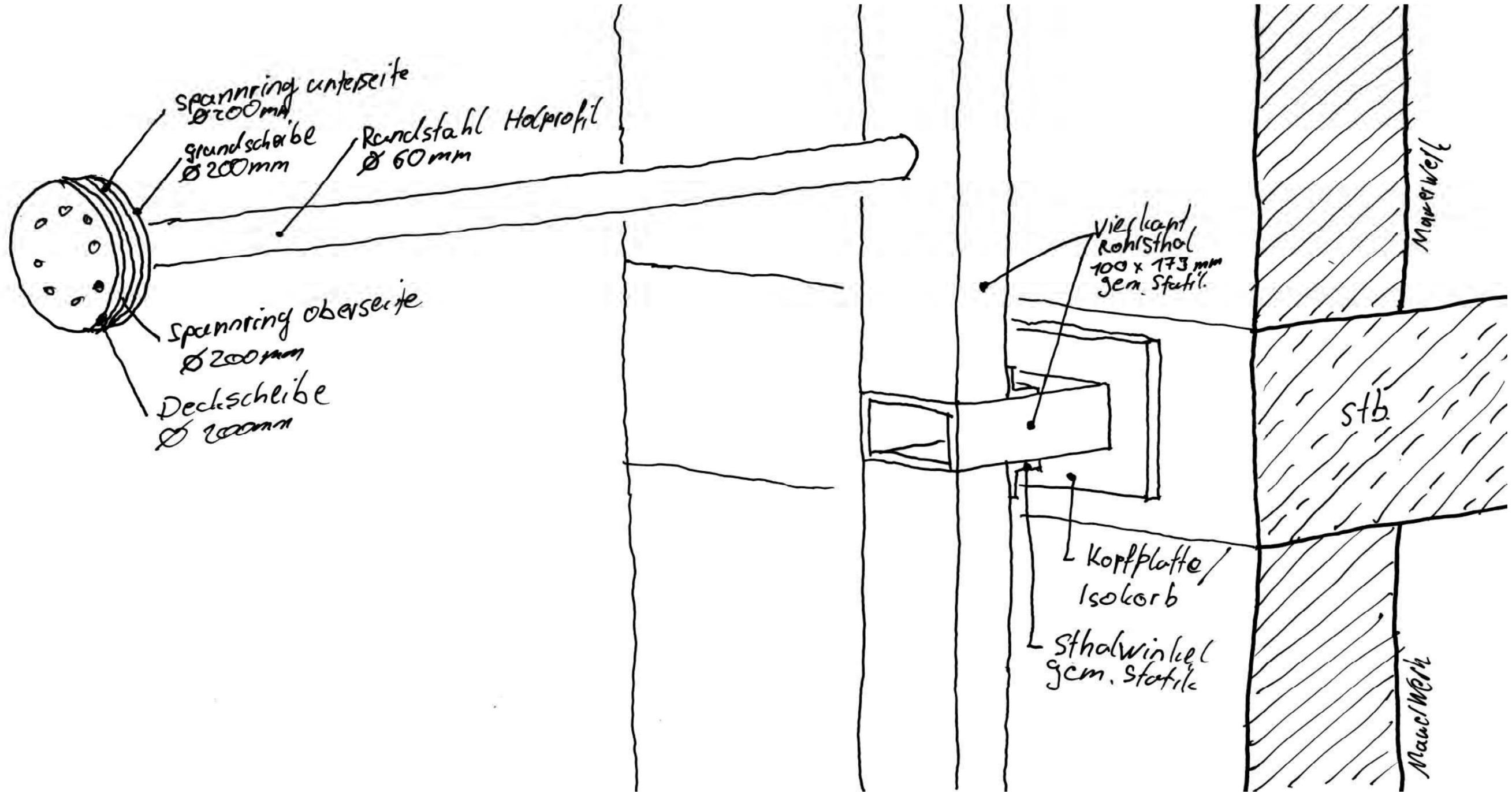


ANSICHT I AUSSCHNITT

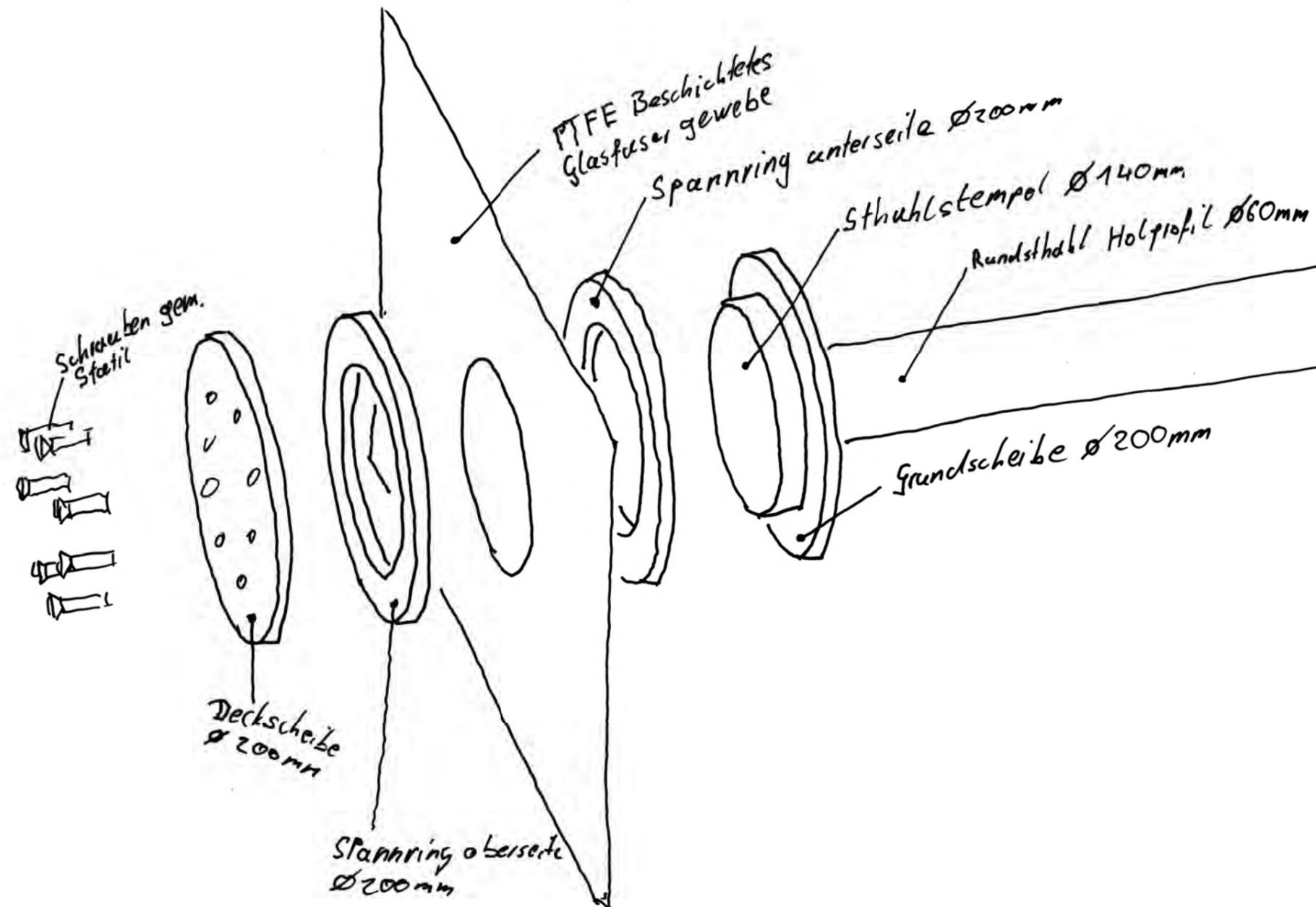


TEXTILFASSADE

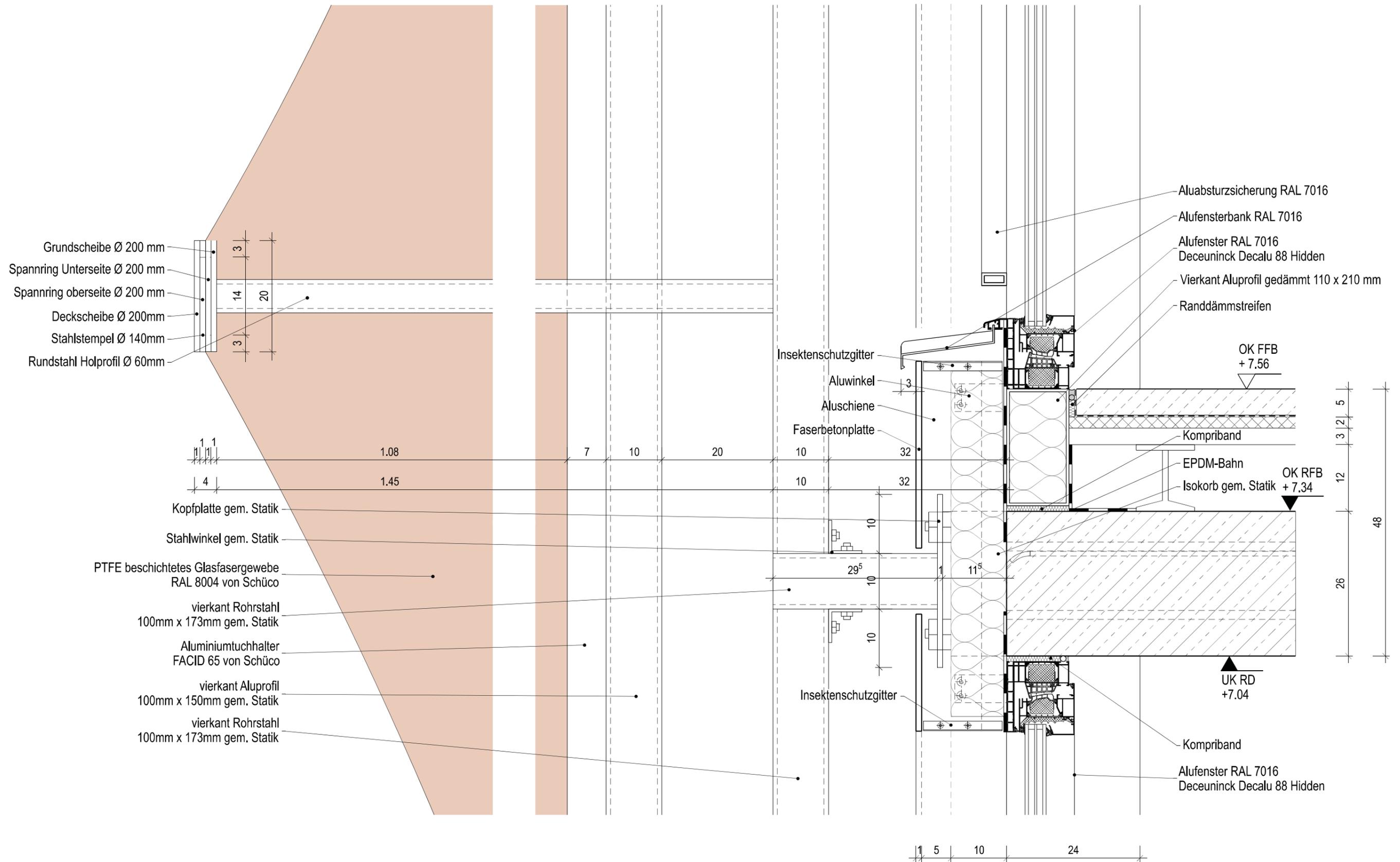
SKIZZE | KNOTENPUNKT DRUCKSTAB



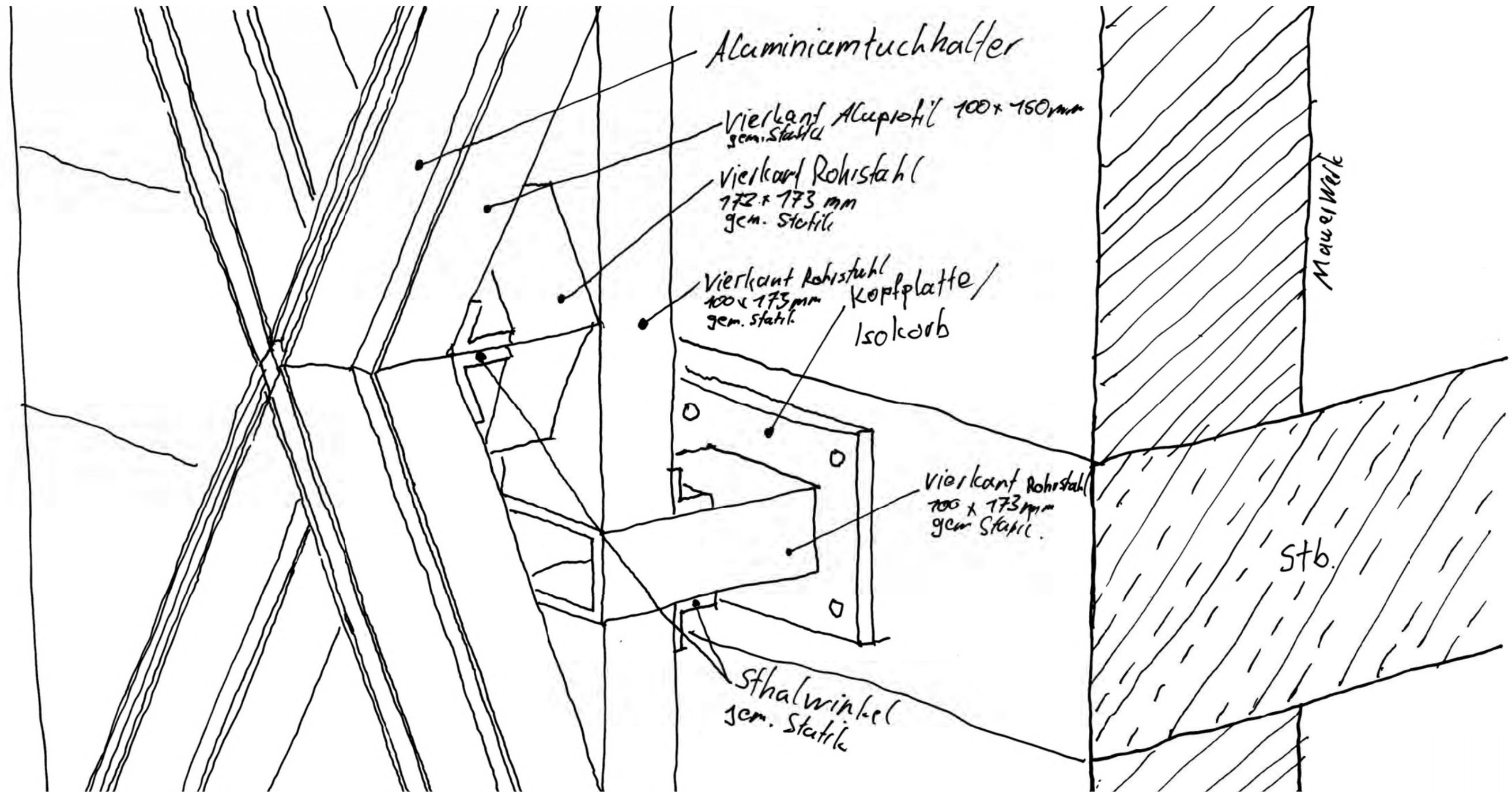
SKIZZE | SPANNRING



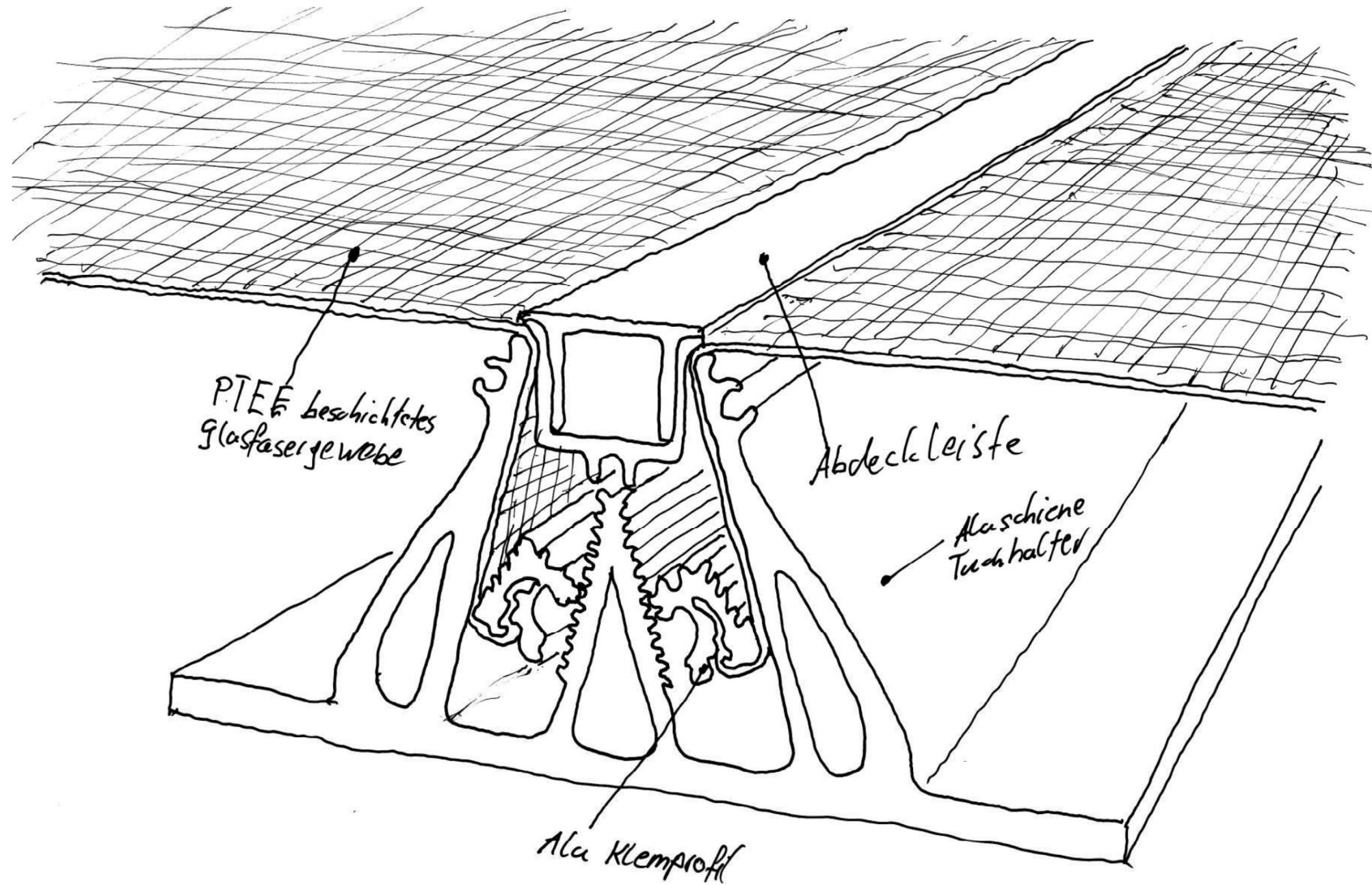
DETAIL I KNOTENPUNKT DRUCKSTAB



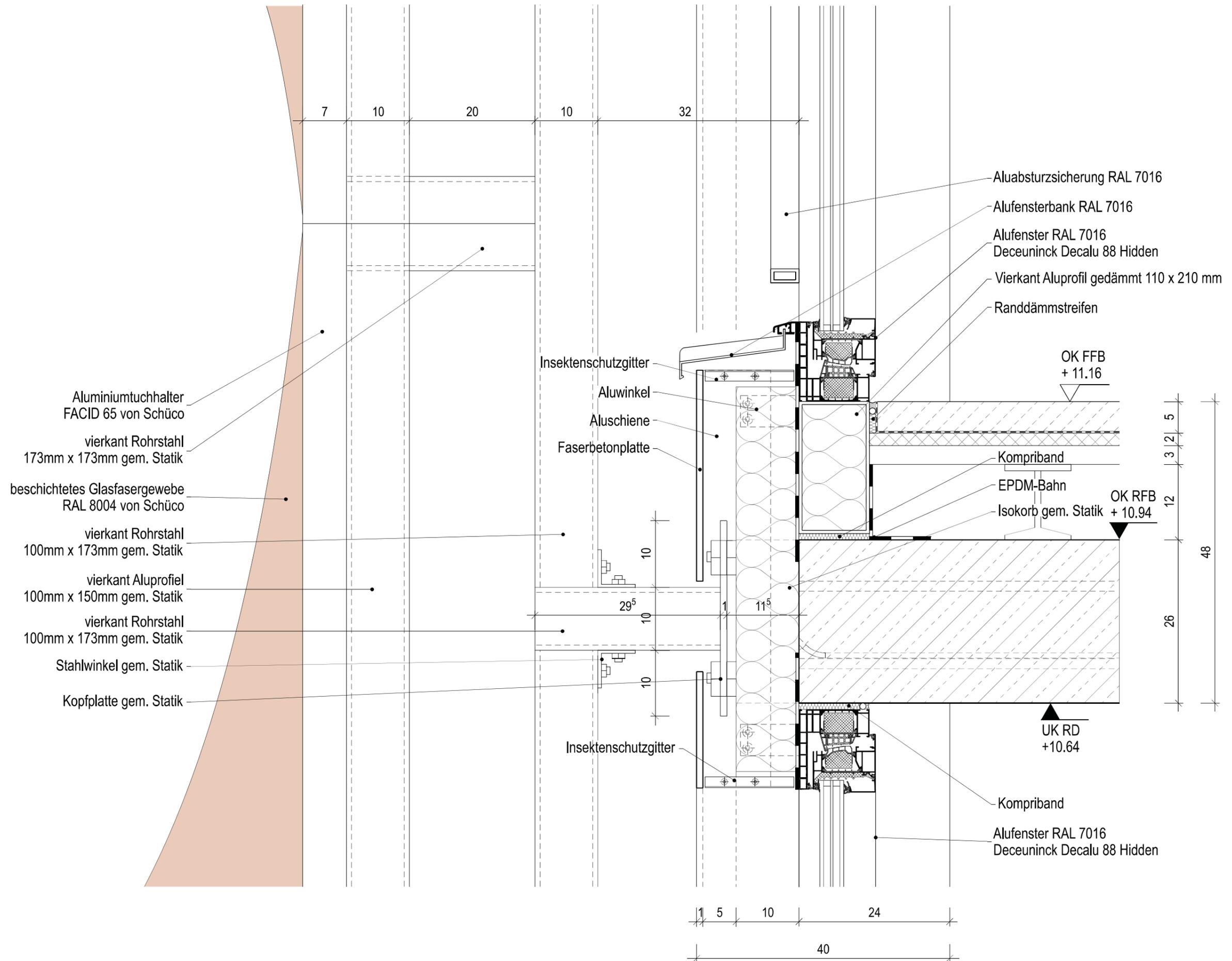
SKIZZE | KNOTENPUNKT TUCHHALTER



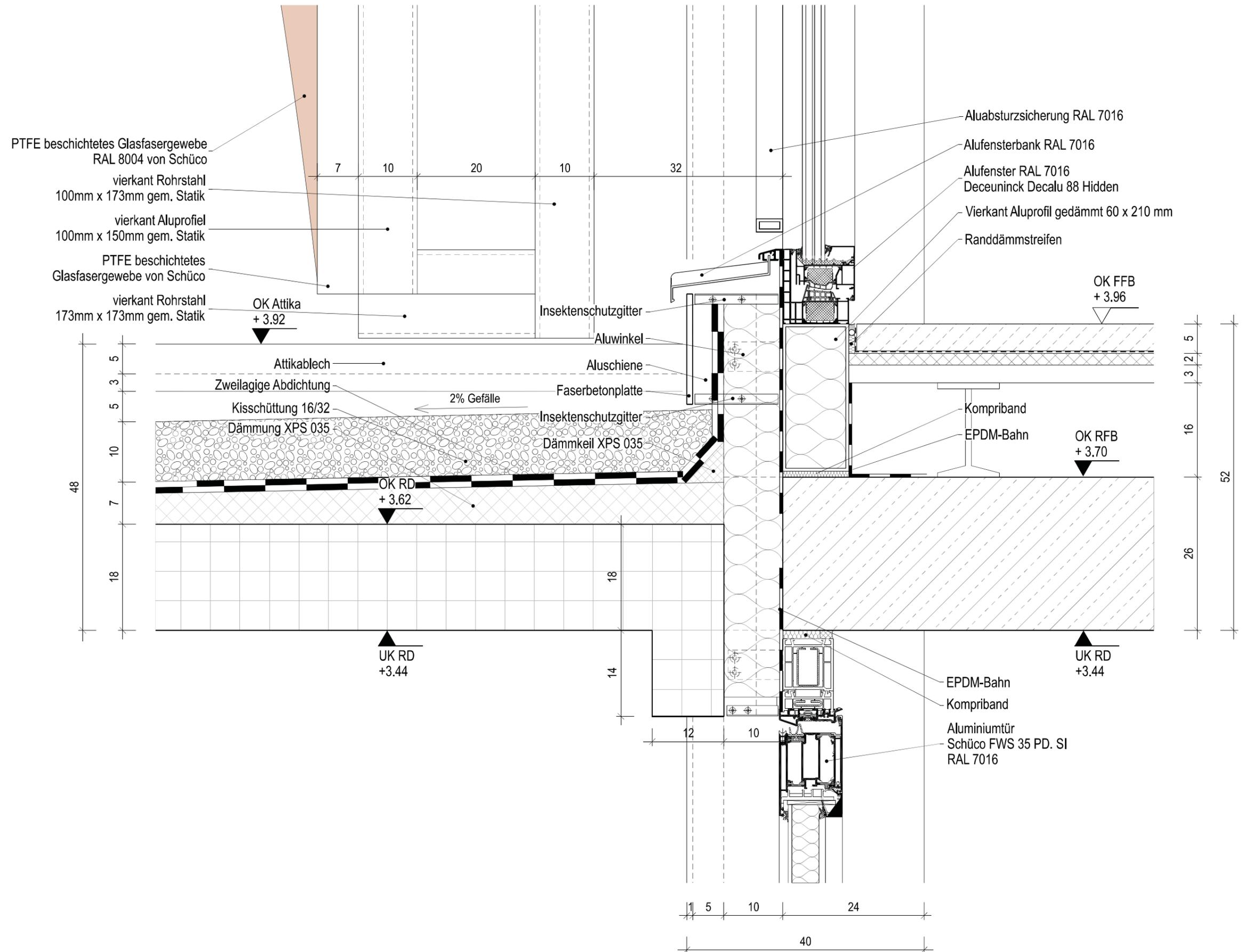
SKIZZE | TUCHHALTER



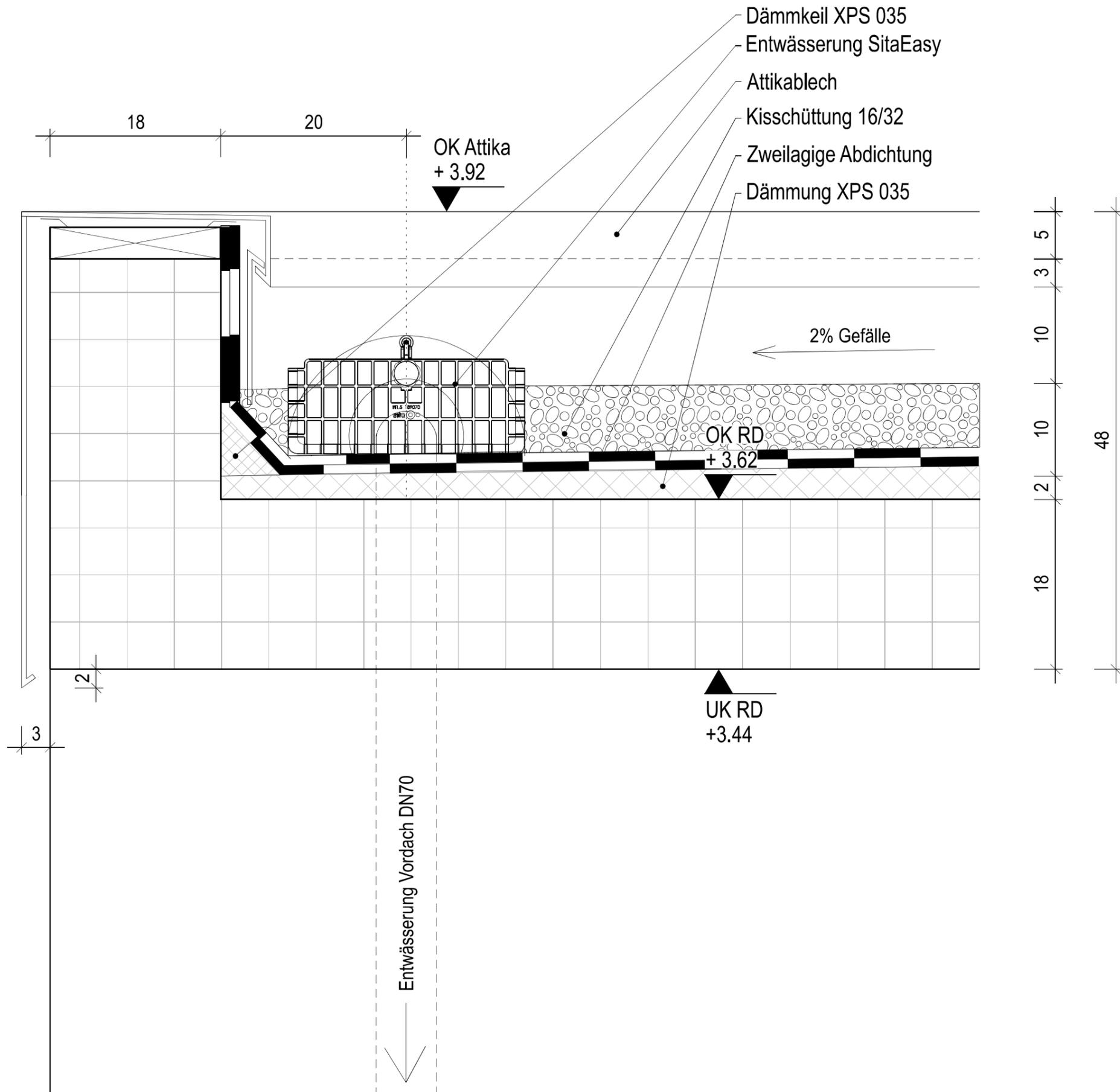
DETAIL I TUCHHALTER



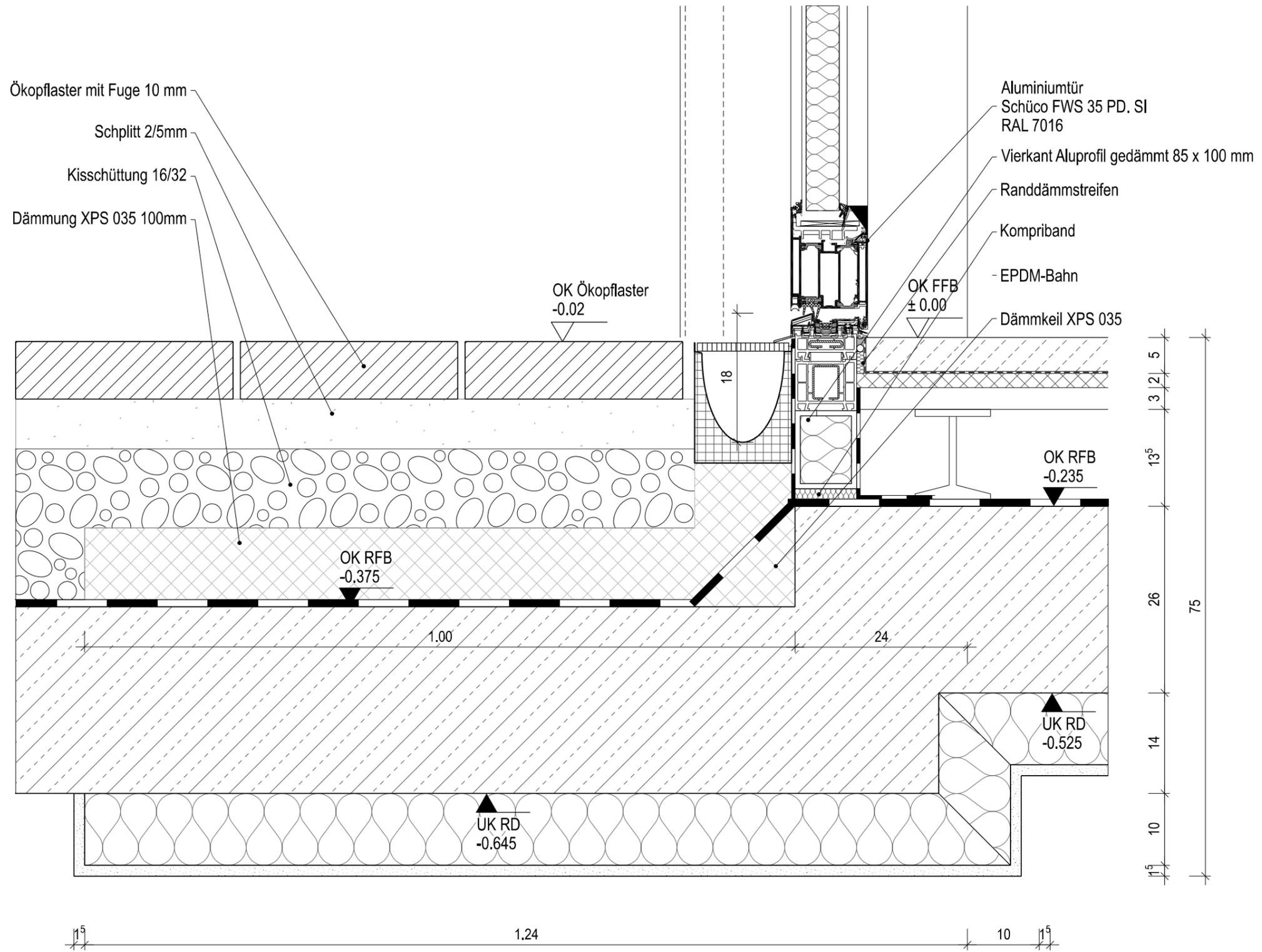
DETAIL I VORDACH ANSCHLUSS AN GEBÄUDE



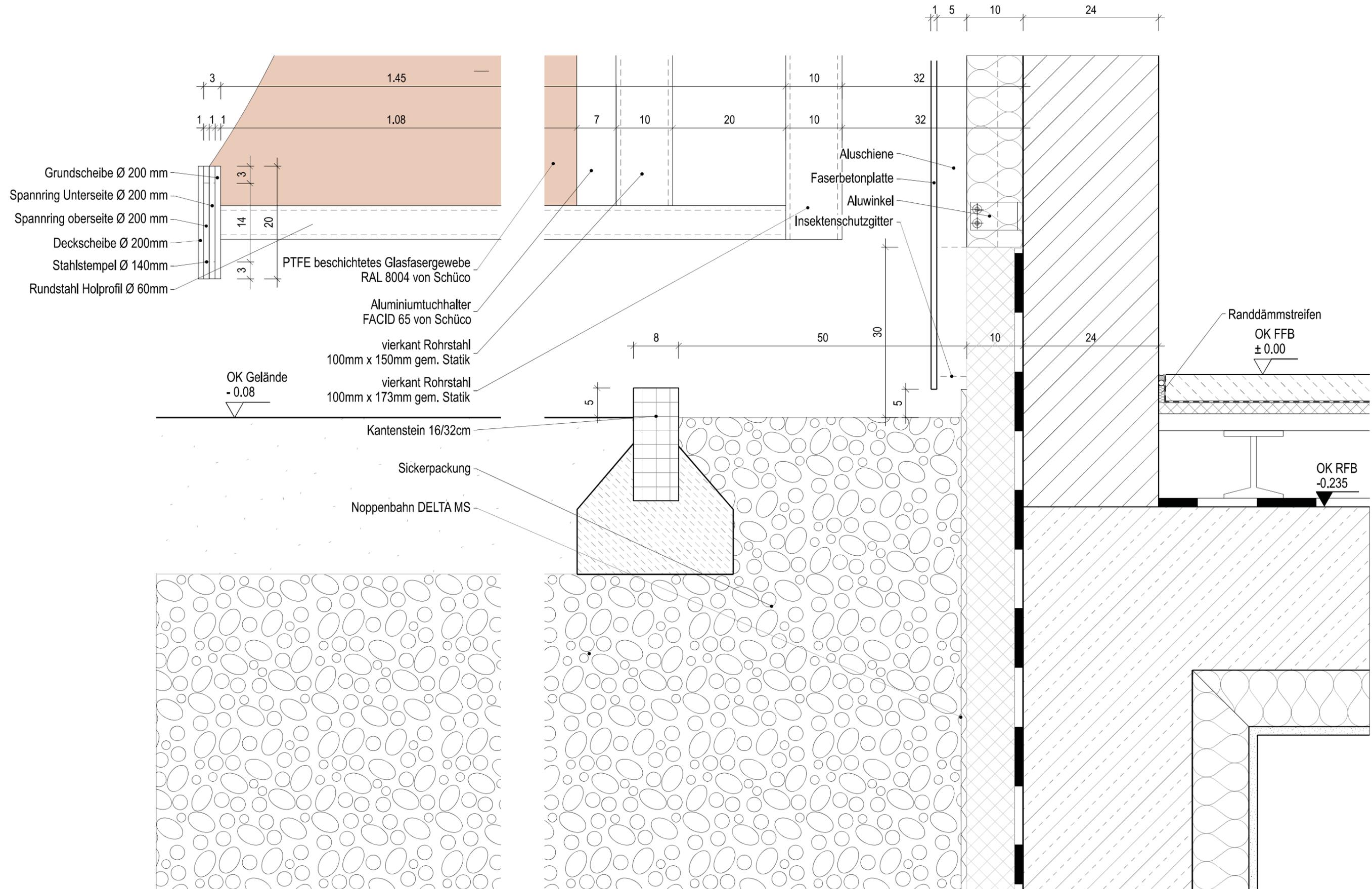
DETAIL I VORDACH ENTWÄSSERUNG



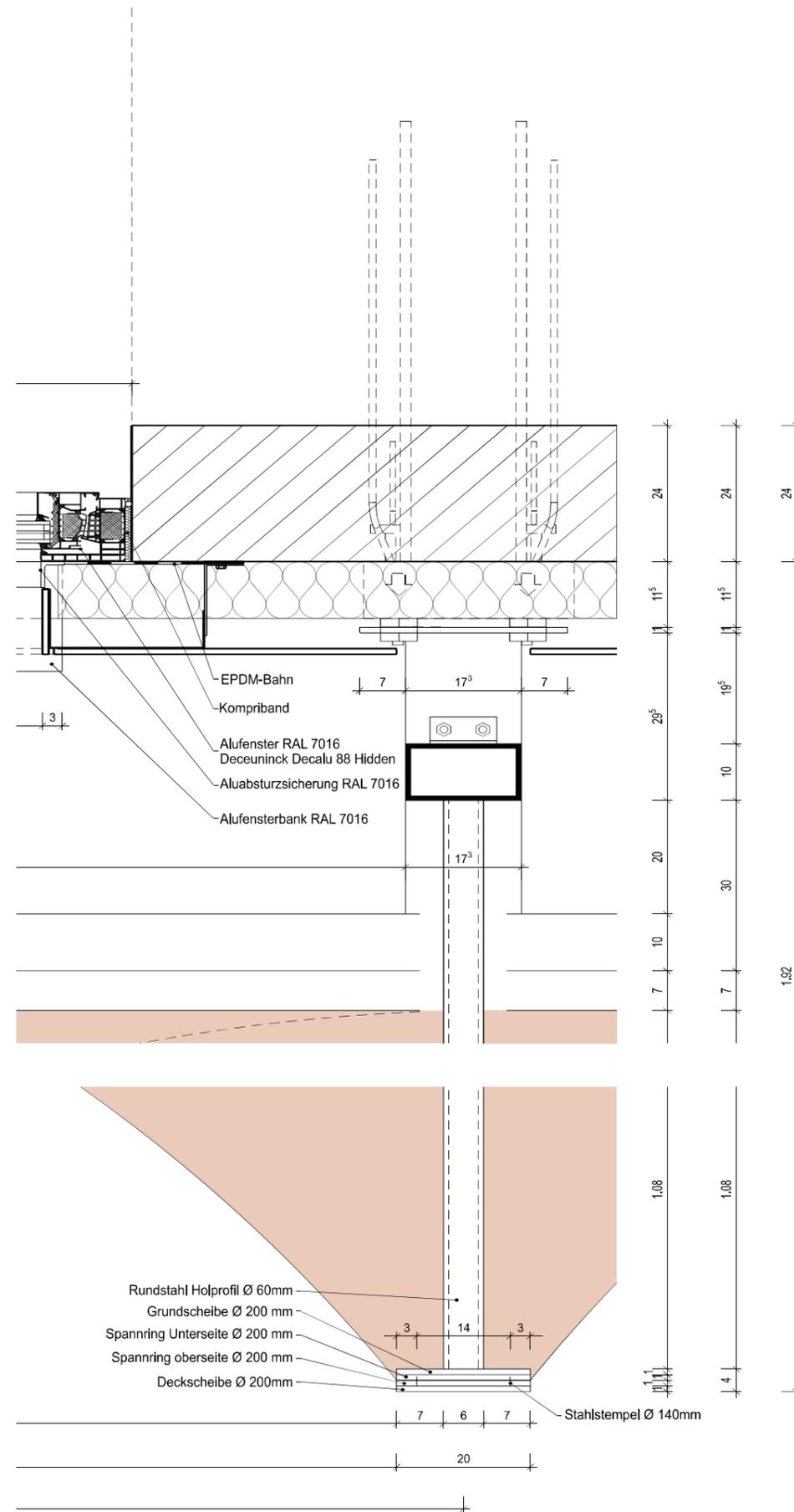
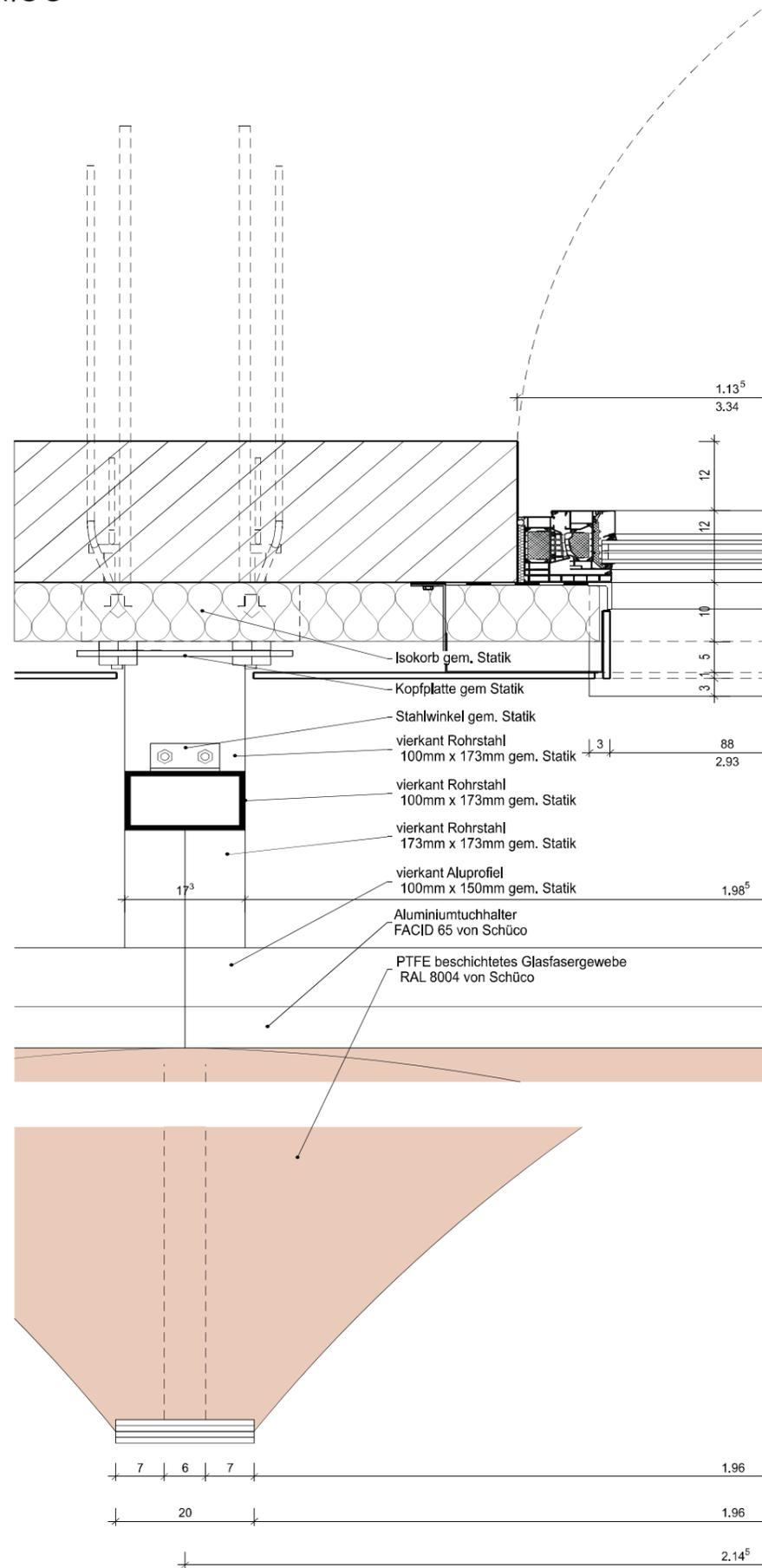
DETAIL I EINGANGSTÜR UNTEN

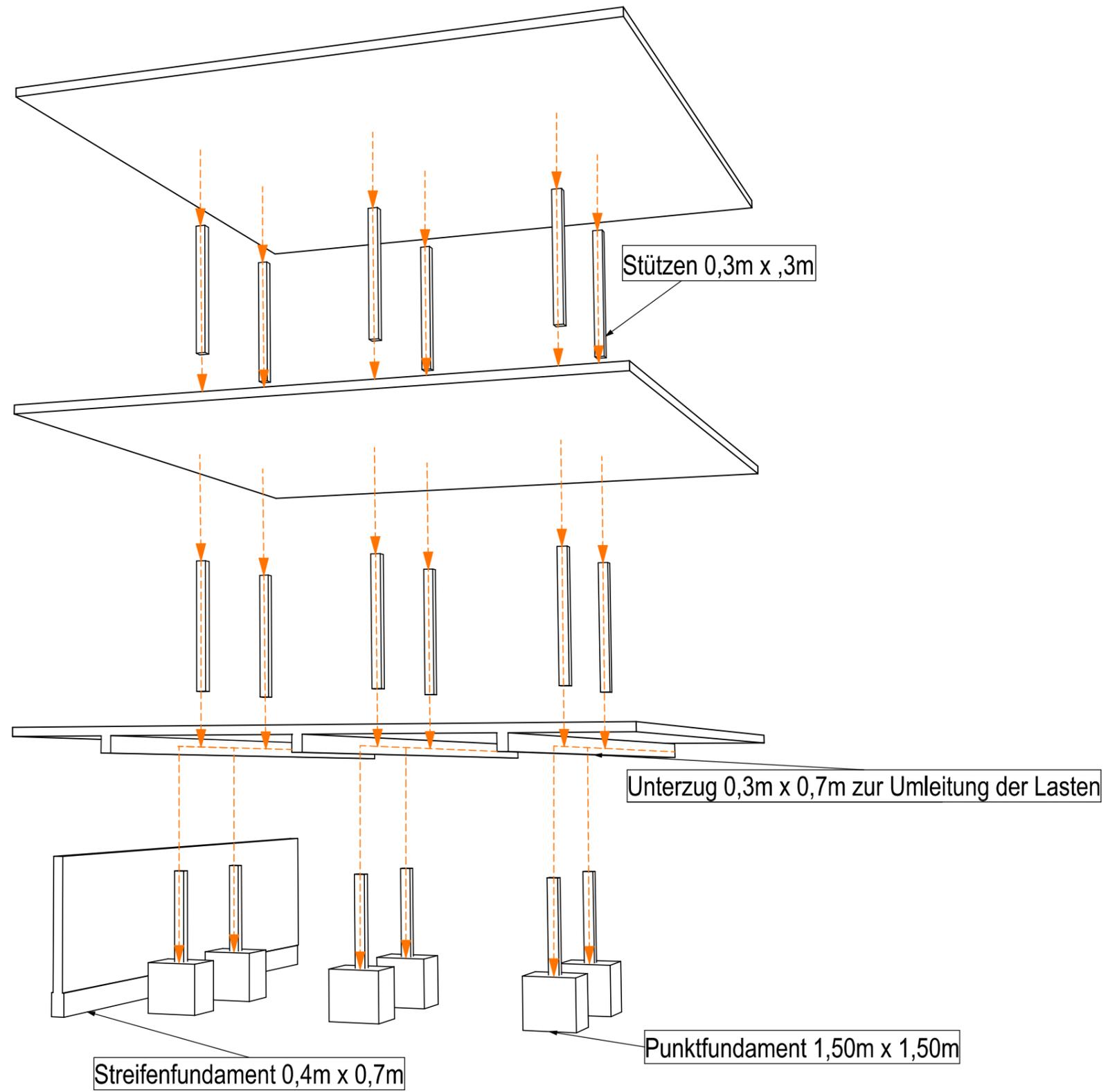


DETAIL I SOCKEL



DETAIL I GRUNDRISS

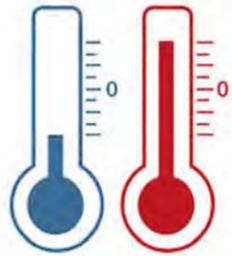






MAßNAHMEN DER GEBÄUDHÜLLE

1. ERHÖTER DÄMMSTANDARD DURCH 24CM DÄMMSTEIN + 10CM WÄRMEDÄMMUNG
2. FENSTER DREIFACHVERGLASUNG + SONNENSCHUTZFOLIERUNG
3. LUFTDICHEIT
4. VERSCHATTUNG DURCH BRICKFRAME ODER TEXTIL



LUFTTEMPERATUR

LÜFTUNGSANLAGE MIT WÄRMERÜCKGEWINNUNG

KÄLTESCHUTZ: BEI LÜFTUNGSANLAGEN MIT WÄRMERÜCKGEWINNUNG WIRD AUßENLUFT DURCH EINEN WÄRMETAUSCHER GEFÜHRT, WO SICH DURCH WÄRME ABLUFT AUS DEN INNENRÄUMENVORGEWÄRMT WIRD, BEVOR SIE INS GEBÄUDE GELANGT.

WÄRMESCHUTZ: IM SOMMER KANN DER WÄRMETAUSCHER UMGEKEHRT WERDEN, UM DIE INNENRÄUME DURCH KÜHLE NACHTLUFT ZU TEMPERIEREN



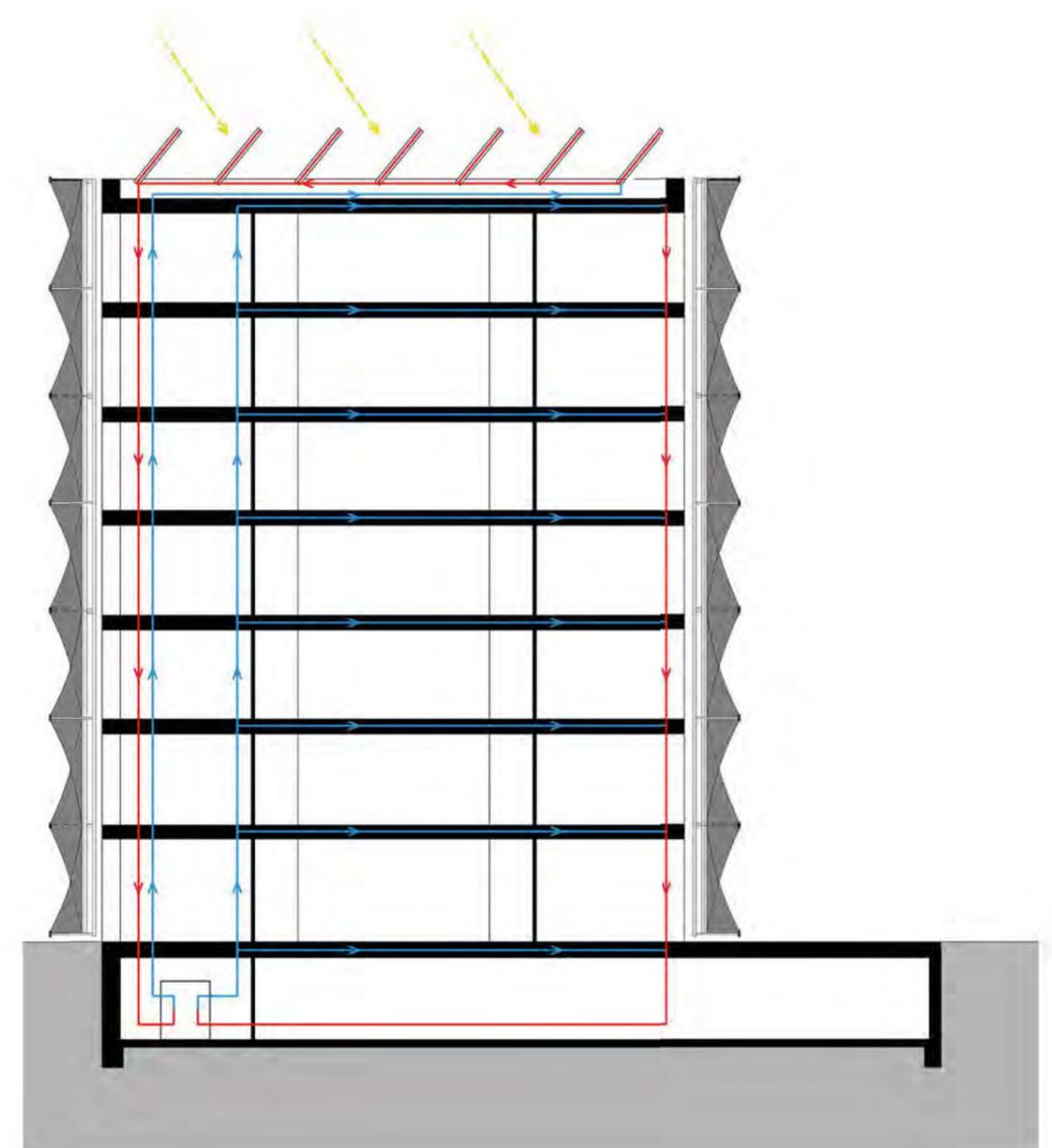
LUFTFEUCHTIGKEIT

DIE LUFTFEUCHTIGKEIT WIRD VON DER LÜFTUNGSANLAGE MIT INTEGRIERTEM ENTHALPIETAUSCHER GESTEUERT. ZUSÄTZLICH WIRD DIE LUFTFEUCHTIGKEIT DURCH PFLANZEN IM INNENRAUM AUF NATÜRLICHE WEISE ERHÖHT

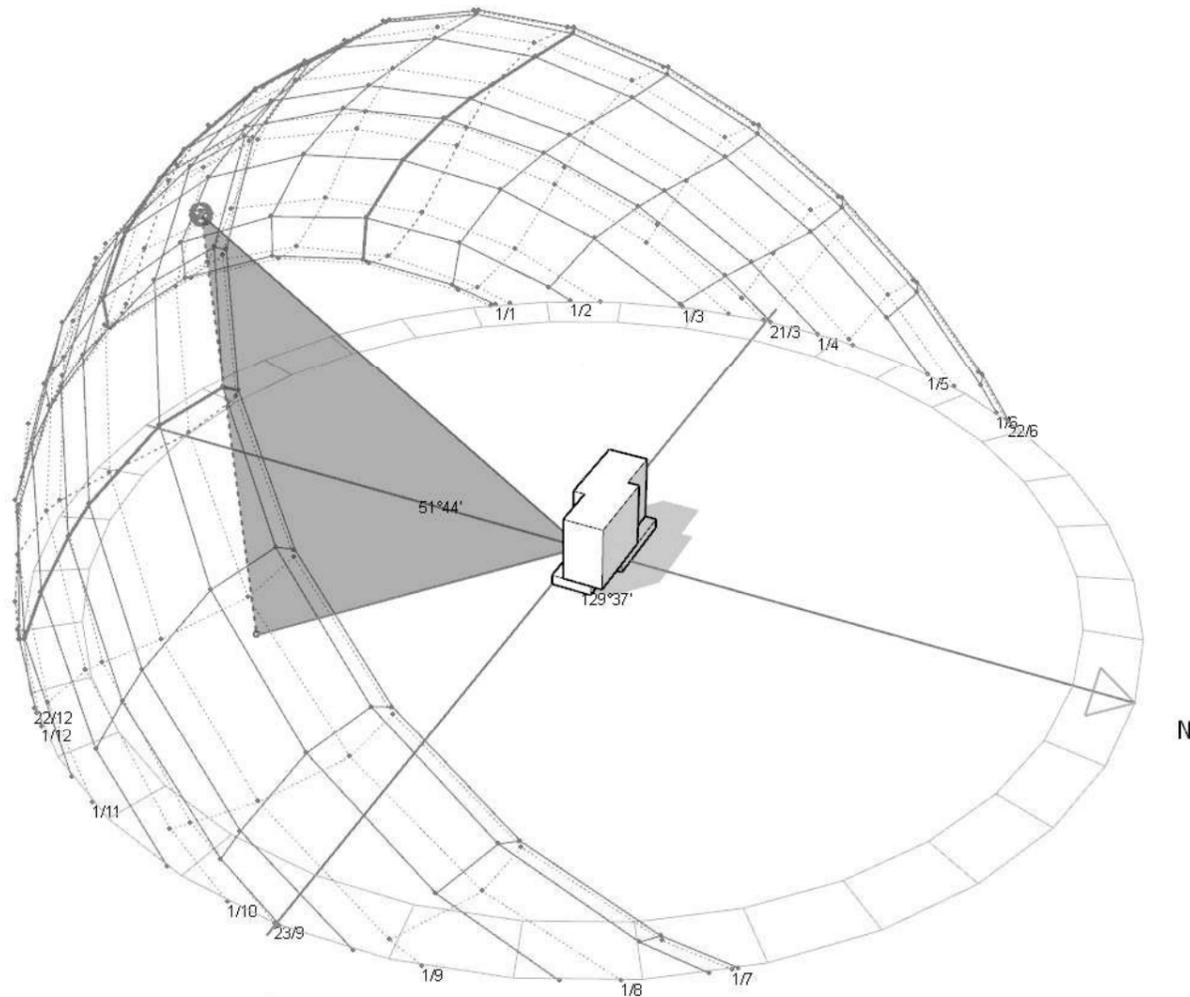
STRAHLUNGSTEMPERATUR

THERMISCHE AKTIVIERUNG DER BAUTEILE (BETONKERNTEMPERIERUNG) IN VERBINDUNG MIT EINER SOLARTHERMIE

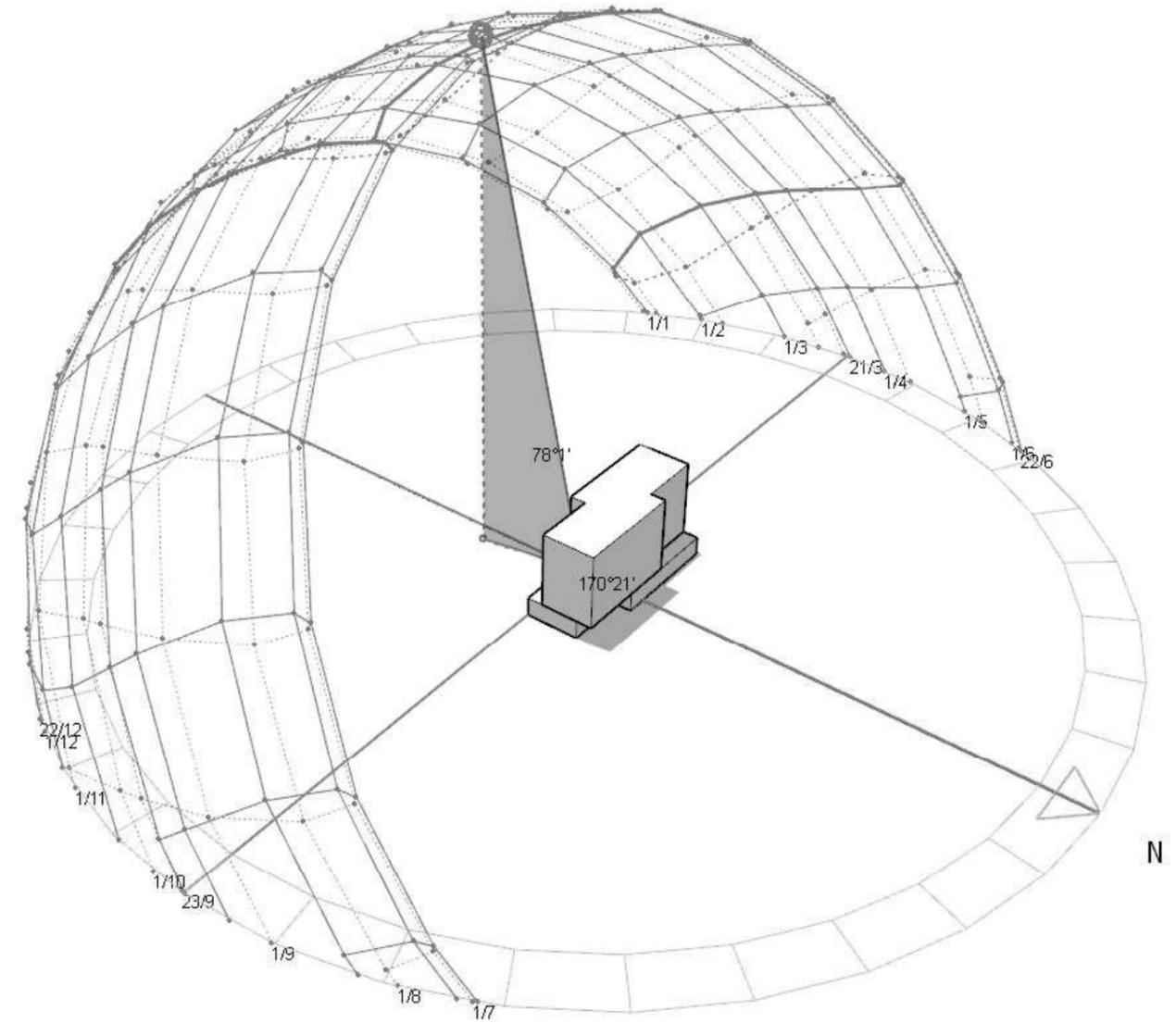
DIE SOLARTHERMIE NUTZT MASSIVABSORBER DA SICH HERKÖMMLICHE KOLLEKTOREN FÜR DEN EINSATZ IN WÜSTEN NICHT EIGNEN



SONNENSIMULATION | 23.07.2021 10:30 UHR

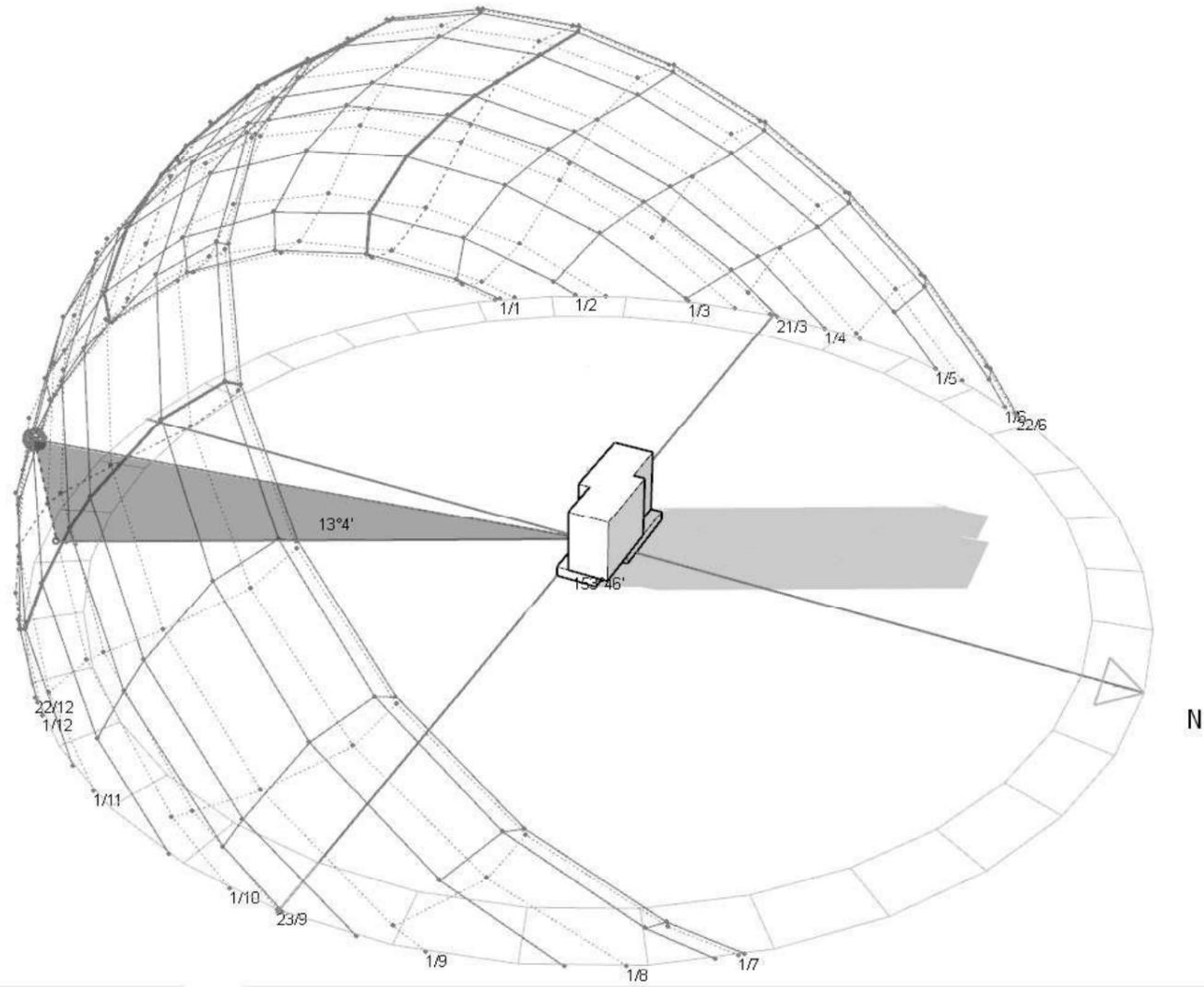


HEIDELBERG

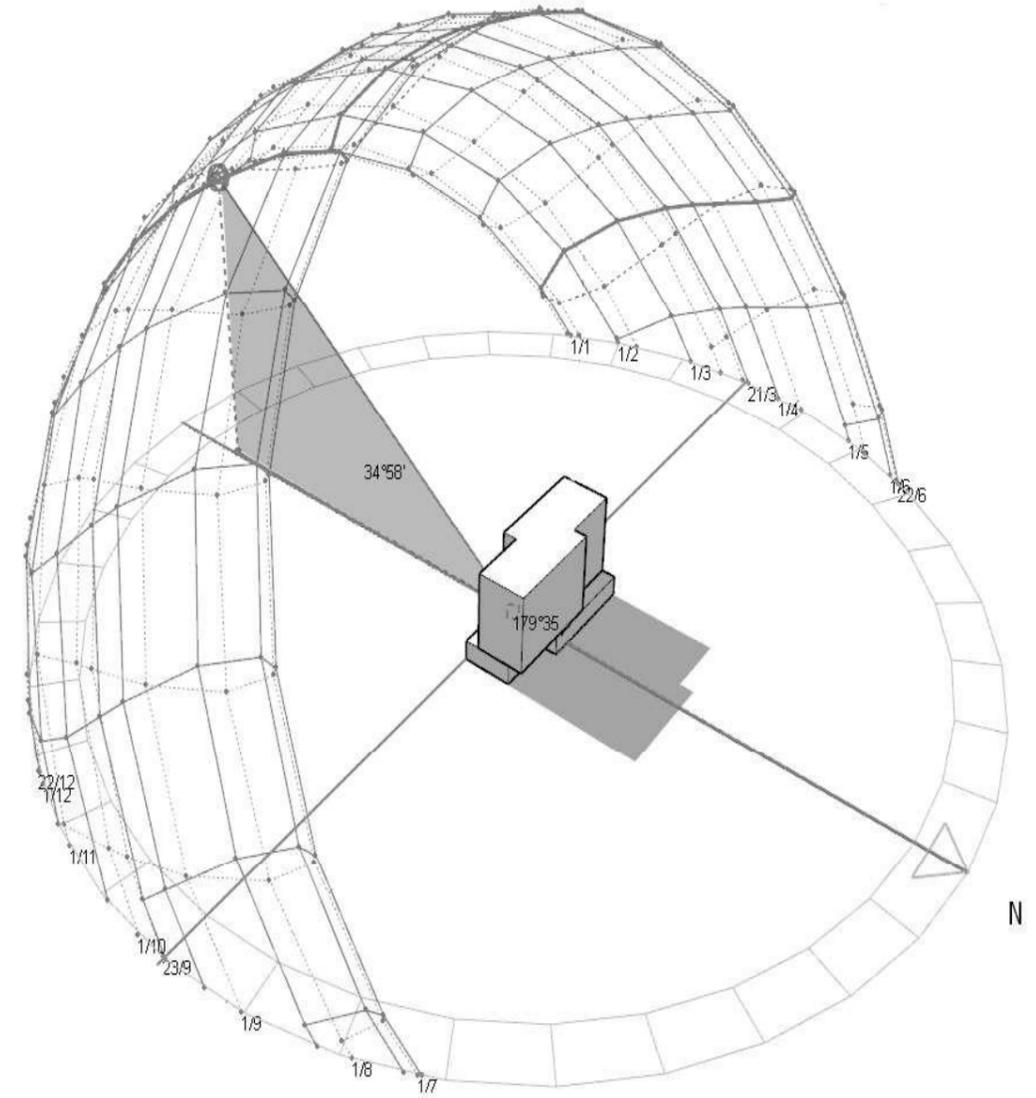


MARRAKESH

SONNENSIMULATION | 18.12.2021 10:30 UHR

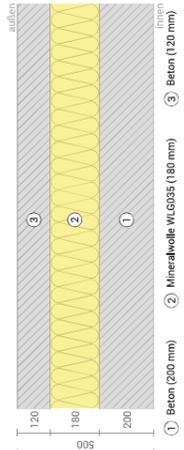


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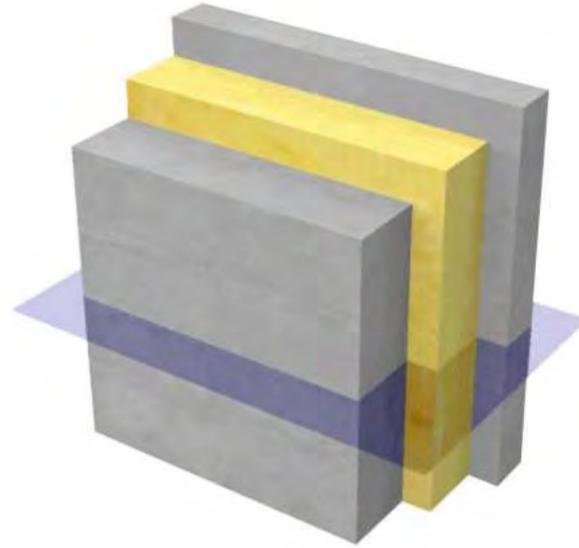


MARRAKESH

EIGENSCHAFTEN



BETON-SANDWICHFASSADE

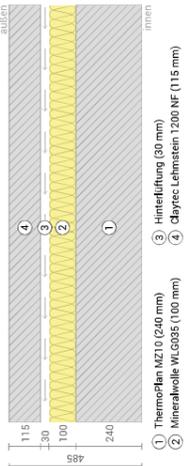


DICKE 50,0 cm

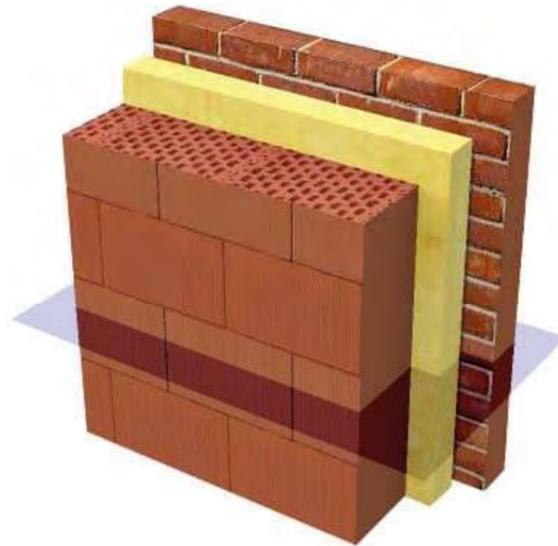
GEWICHT 772 kg/m²

WÄRMEKAPAZITÄT 733 kJ/m²K

sd-WERT 32,0 m



DOPPELFASSADE

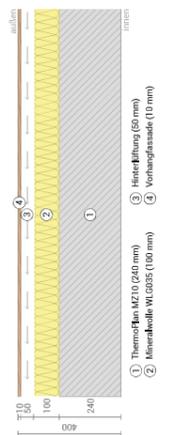


DICKE 48,5 cm

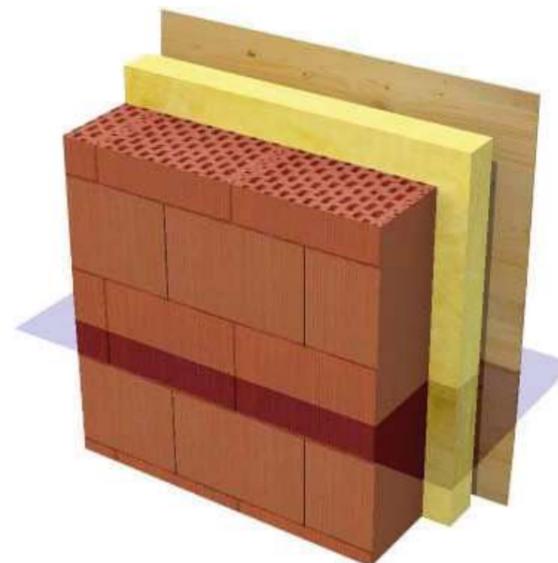
GEWICHT 320 kg/m²

WÄRMEKAPAZITÄT 182 kJ/m²K

sd-WERT 1,4 m



TEXTILFASSADE



DICKE 40,0 cm

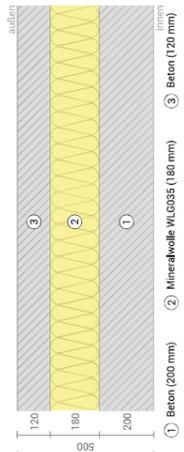
GEWICHT 187 kg/m²

WÄRMEKAPAZITÄT 182 kJ/m²K

sd-WERT 1,4 m

VERGLEICHENDE BETRACHTUNG

WÄRMESCHUTZ | FEUCHTESCHUTZ | HITZESCHUTZ



BETON-SANDWICHFASSADE

Wärmeschutz

$$U = 0,18 \text{ W}/(\text{m}^2\text{K})$$

GEG 2020 Bestand*: $U < 0,24 \text{ W}/(\text{m}^2\text{K})$



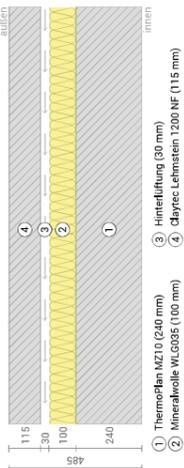
Feuchteschutz

Kein Tauwasser



Hitzeschutz

Temperaturamplitudendämpfung: >100
Phasenverschiebung: nicht relevant
Wärmekapazität innen: 437 kJ/m²K



DOPPELFASSADE

Wärmeschutz

$$U = 0,18 \text{ W}/(\text{m}^2\text{K})$$

GEG 2020 Bestand*: $U < 0,24 \text{ W}/(\text{m}^2\text{K})$



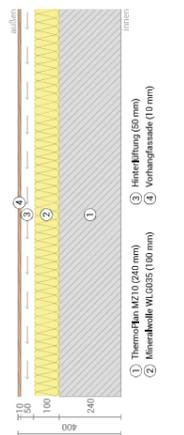
Feuchteschutz

Kein Tauwasser



Hitzeschutz

Temperaturamplitudendämpfung: >100
Phasenverschiebung: nicht relevant
Wärmekapazität innen: 136 kJ/m²K

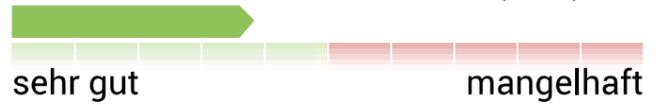


TEXTILFASSADE

Wärmeschutz

$$U = 0,18 \text{ W}/(\text{m}^2\text{K})$$

GEG 2020 Bestand*: $U < 0,24 \text{ W}/(\text{m}^2\text{K})$



Feuchteschutz

Kein Tauwasser

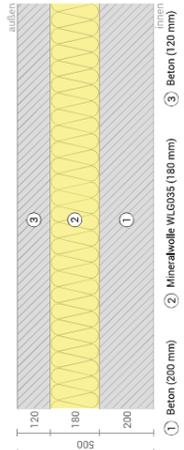


Hitzeschutz

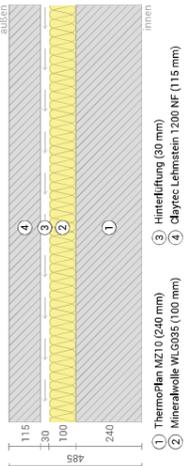
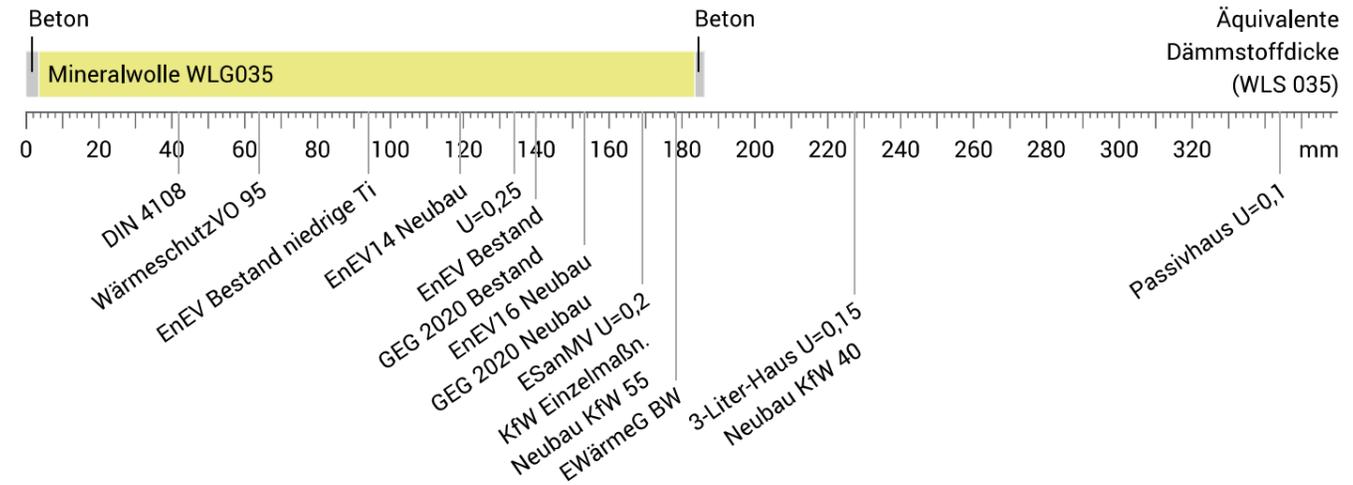
Temperaturamplitudendämpfung: >100
Phasenverschiebung: nicht relevant
Wärmekapazität innen: 136 kJ/m²K



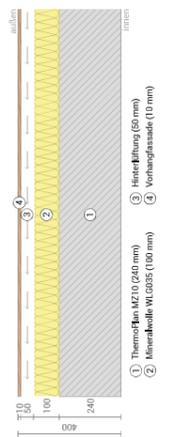
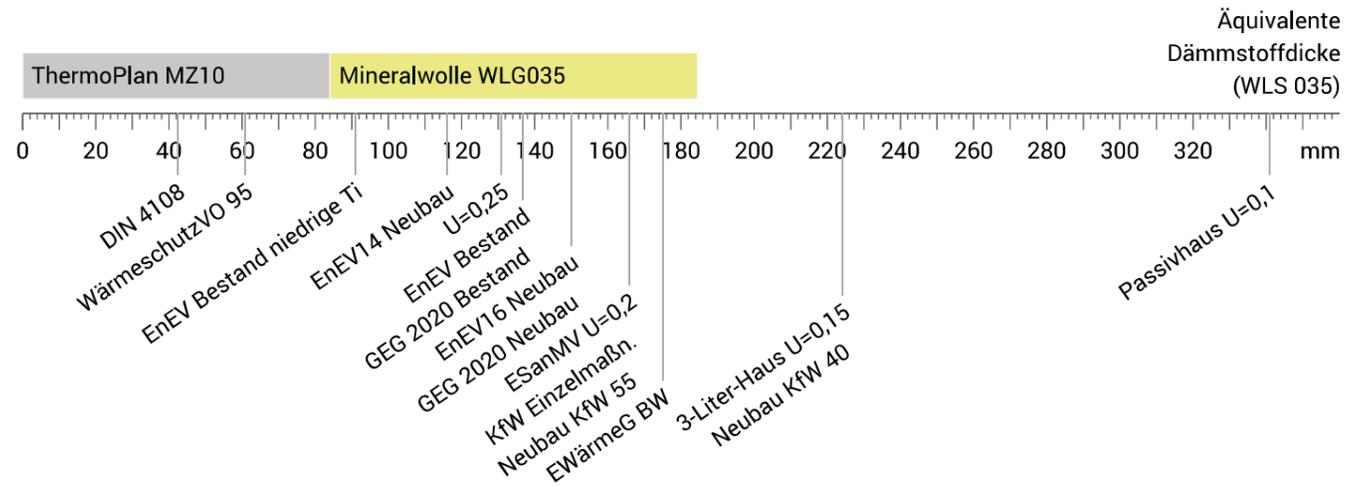
DÄMMWIRKUNG



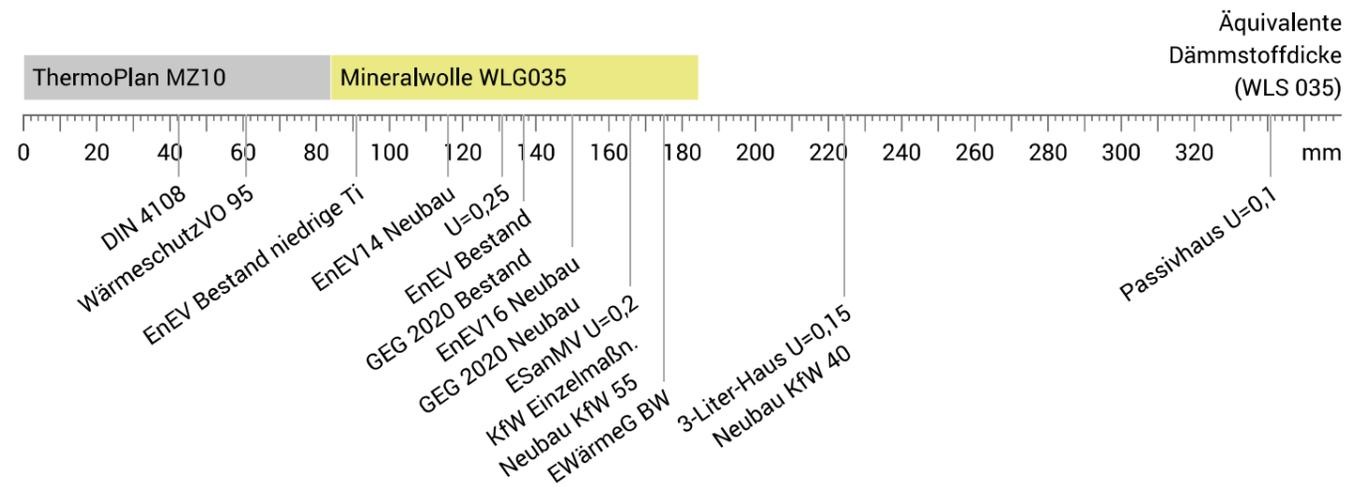
BETON-SANDWICHFASSADE



DOPPELFASSADE

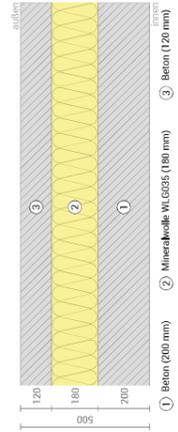


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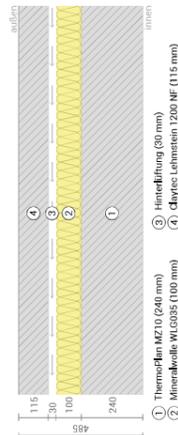
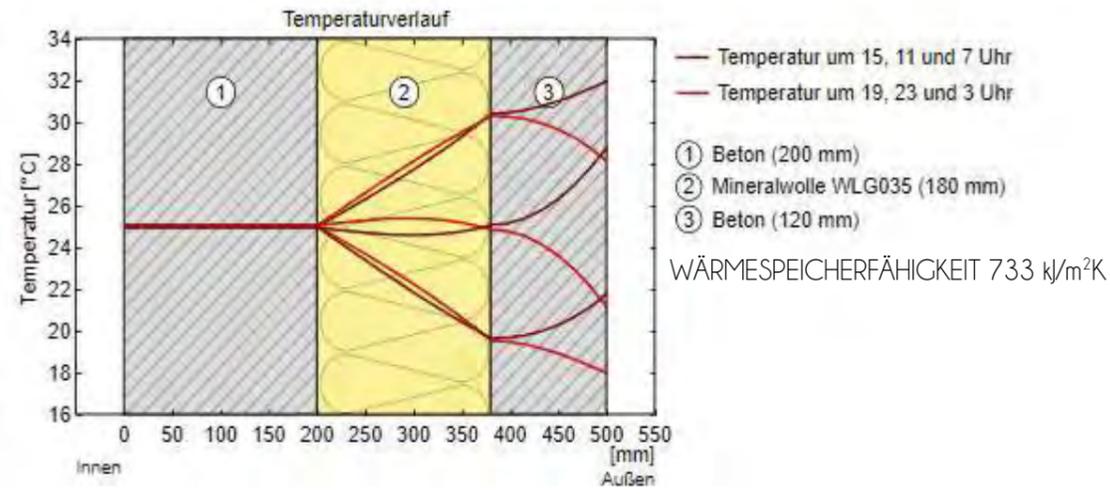


VERGLEICHENDE BETRACHTUNG

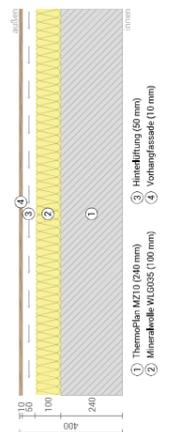
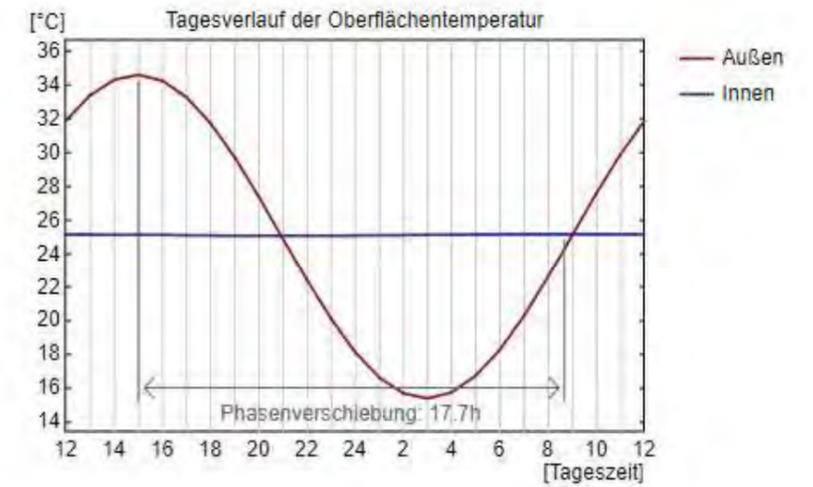
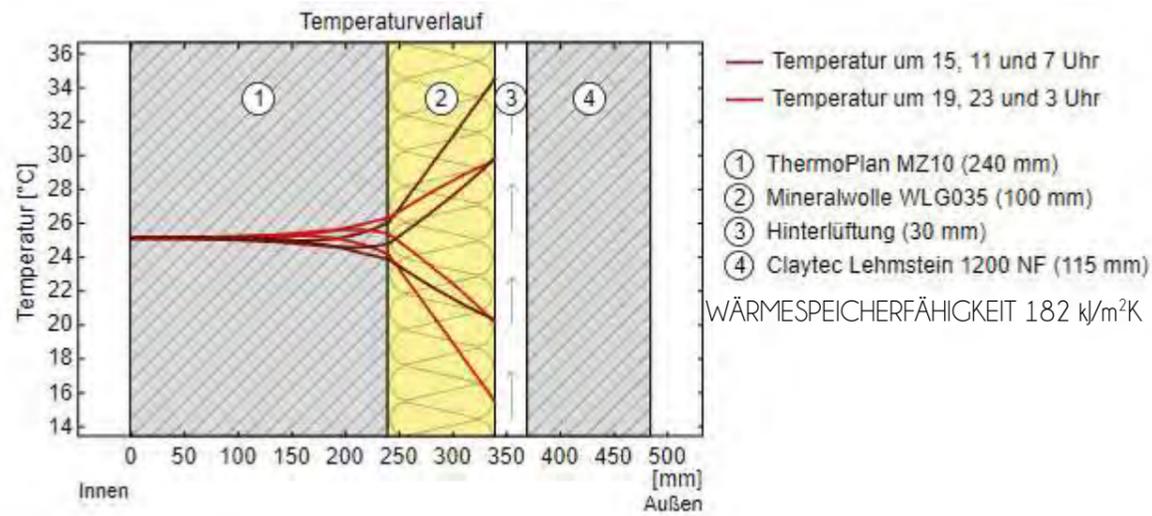
HITZESCHUTZ



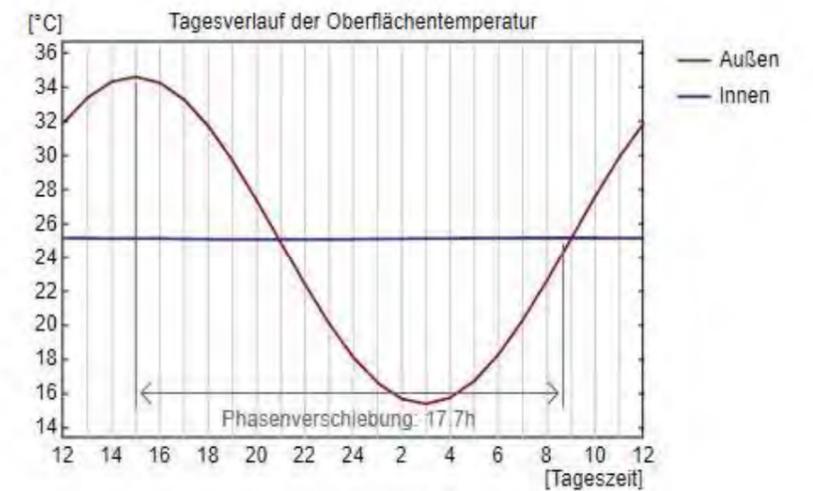
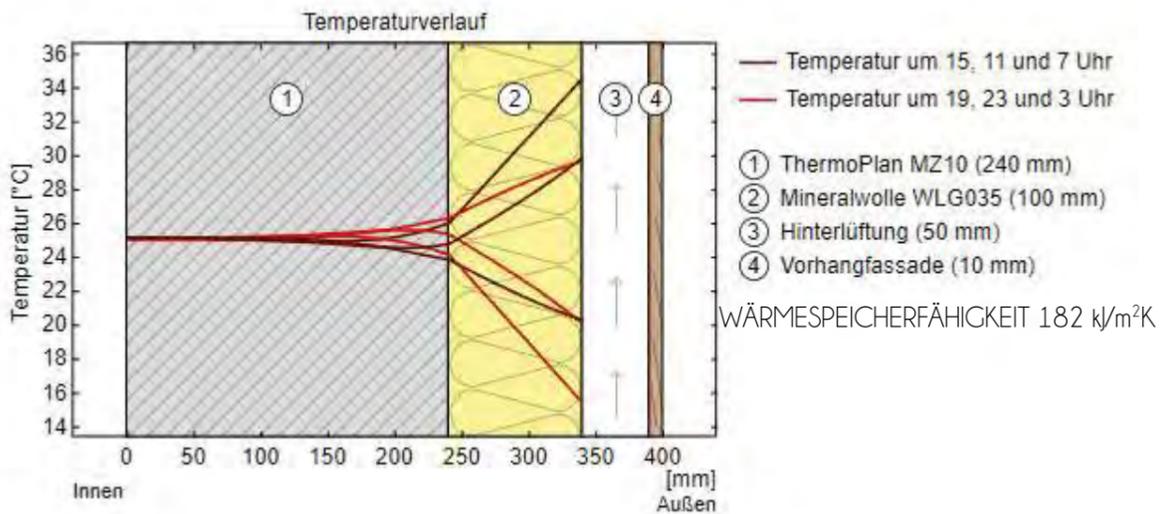
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DOPPELFASSADE

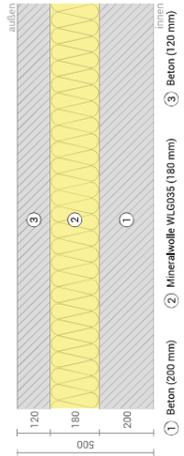


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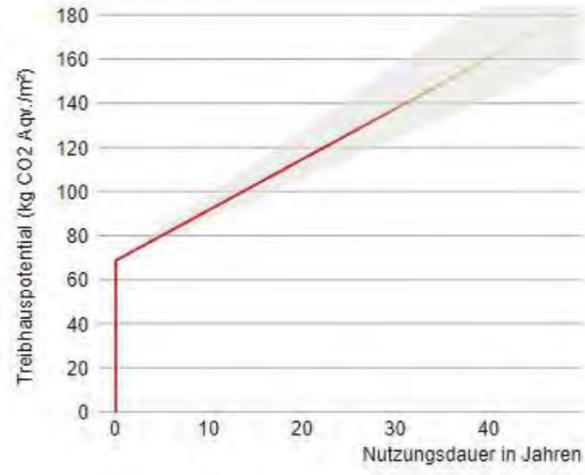
VERGLEICHENDE BETRACHTUNG

TREIBHAUSPOTENZIAL I PRIMMÄRENERGIE

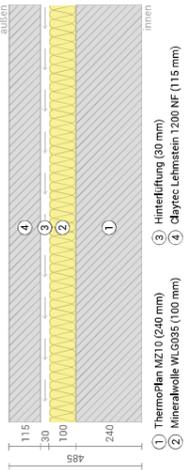
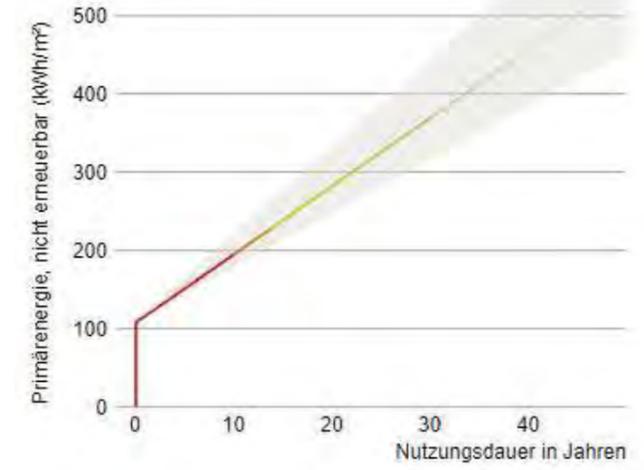


BETON-SANDWICHFASSADE

Treibhauspotential

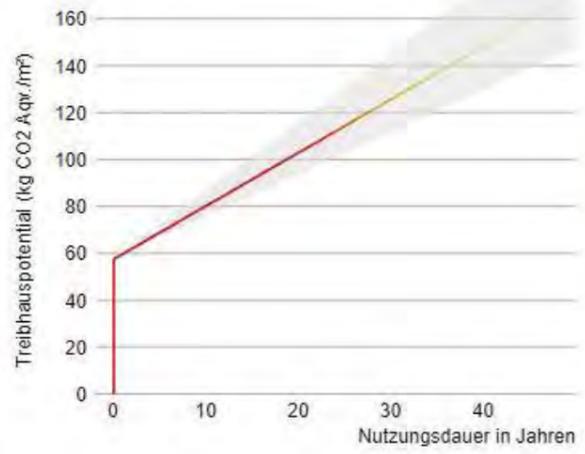


Primärenergieaufwand

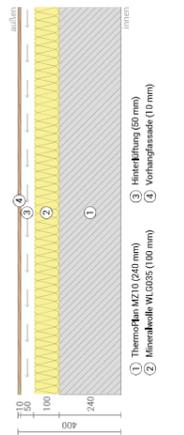
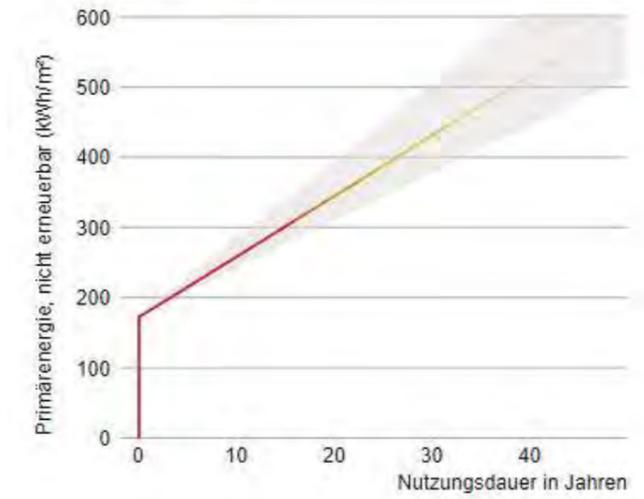


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Treibhauspotential

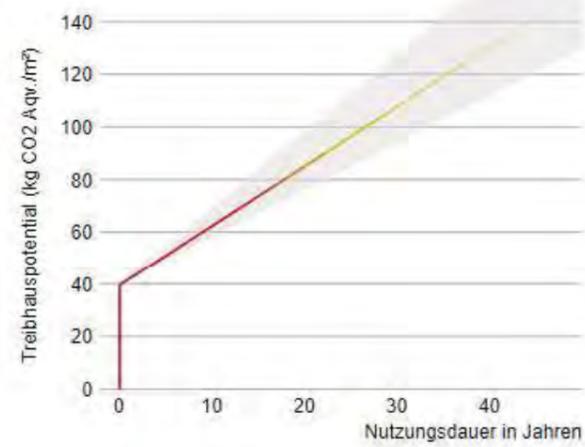


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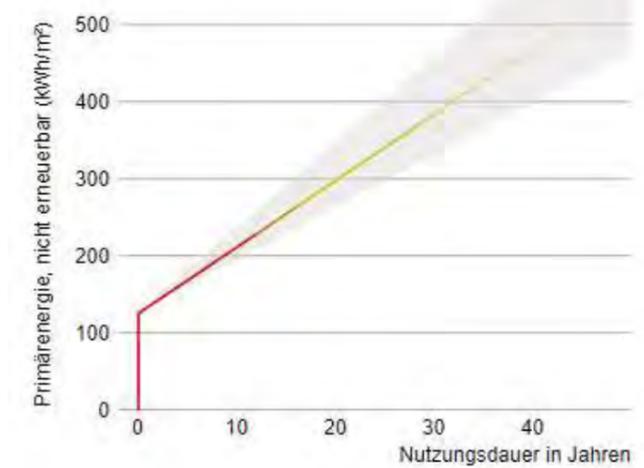


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Treibhauspotential

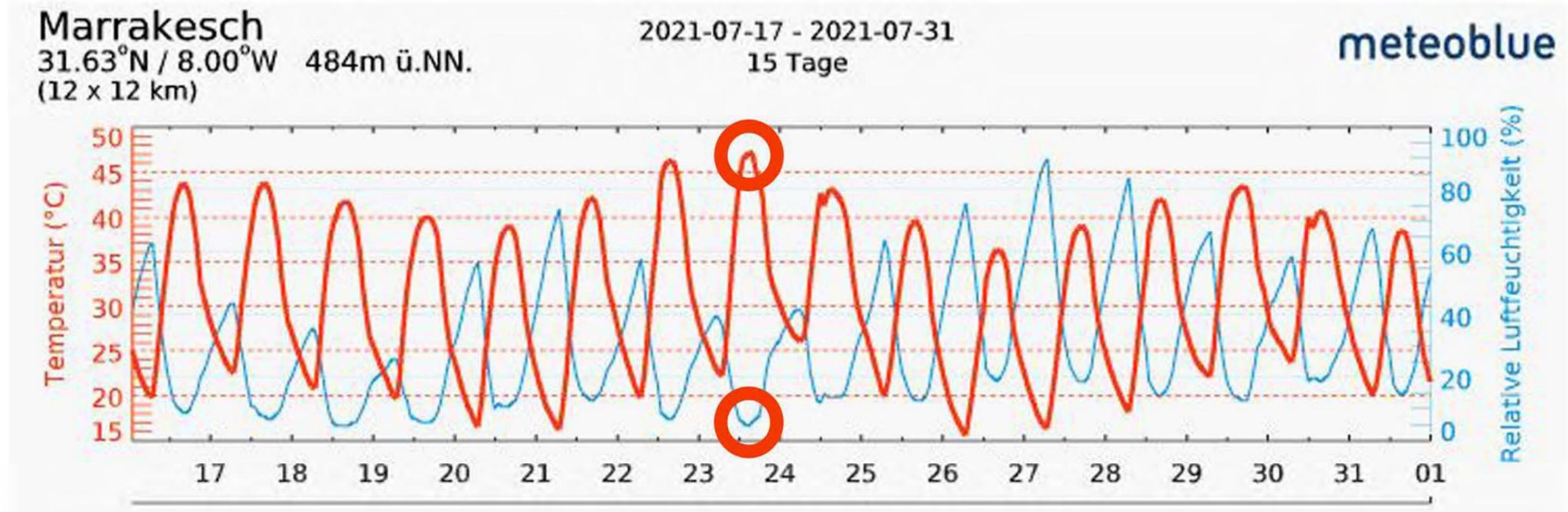


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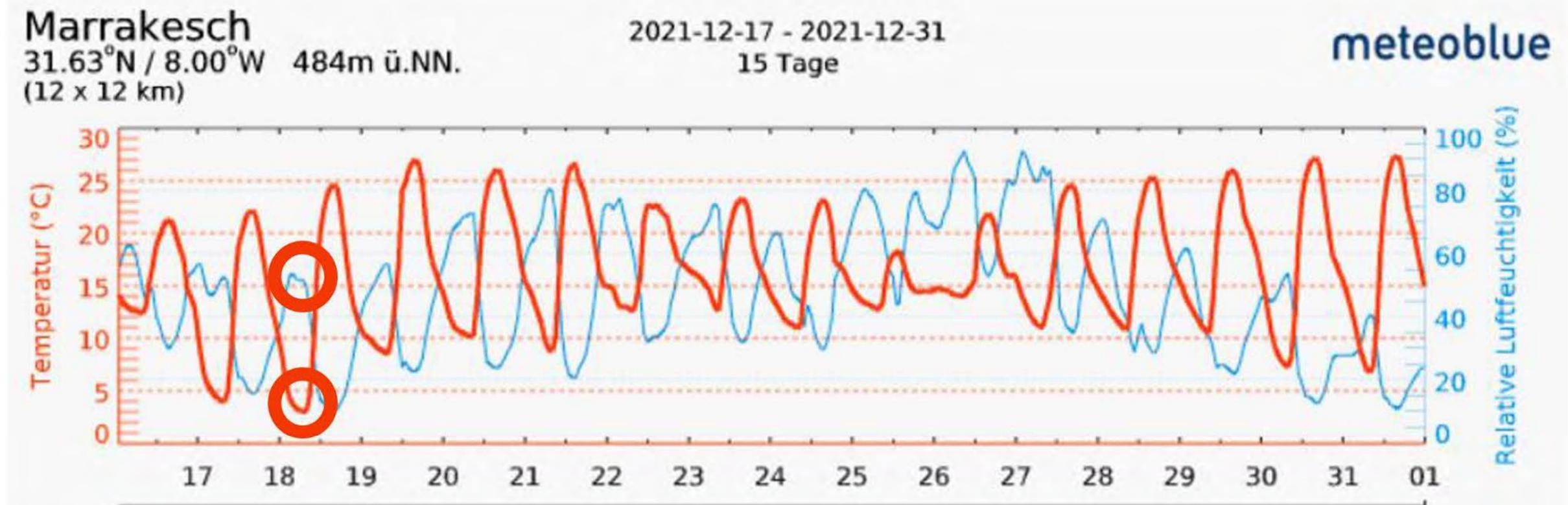


VERGLEICHENDE BETRACHTUNG

TAGE DER BETRACHTUNG



MARRAKESCH 23.07.2021 48c° 5% Luftfeuchtigkeit

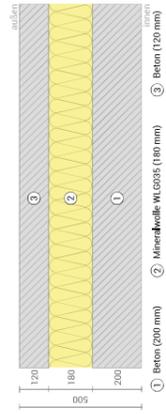


MARRAKESCH 18.12.2021 3c° 58% Luftfeuchtigkeit

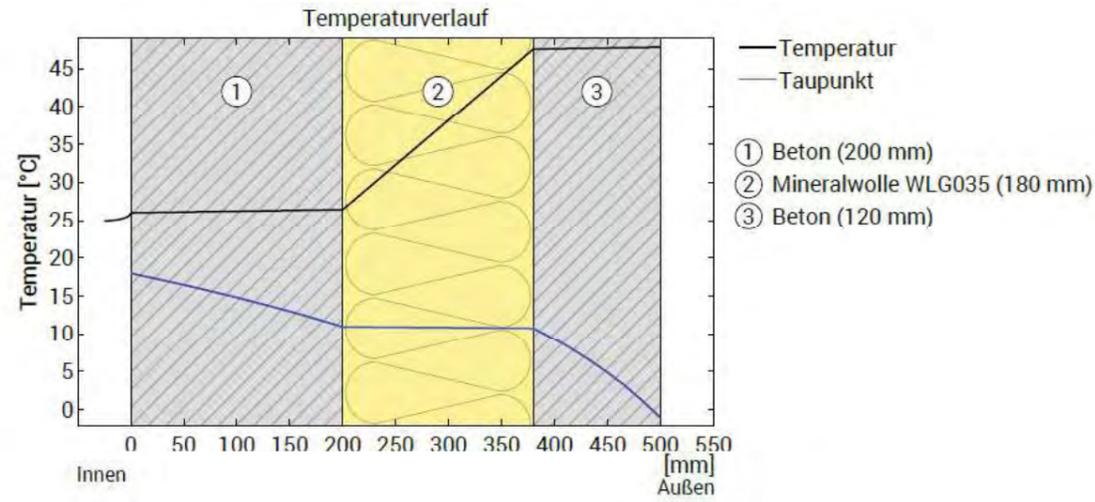
VERGLEICHENDE BETRACHTUNG

TEMPERATUR | FEUCHTIGKEITSVERLAUF

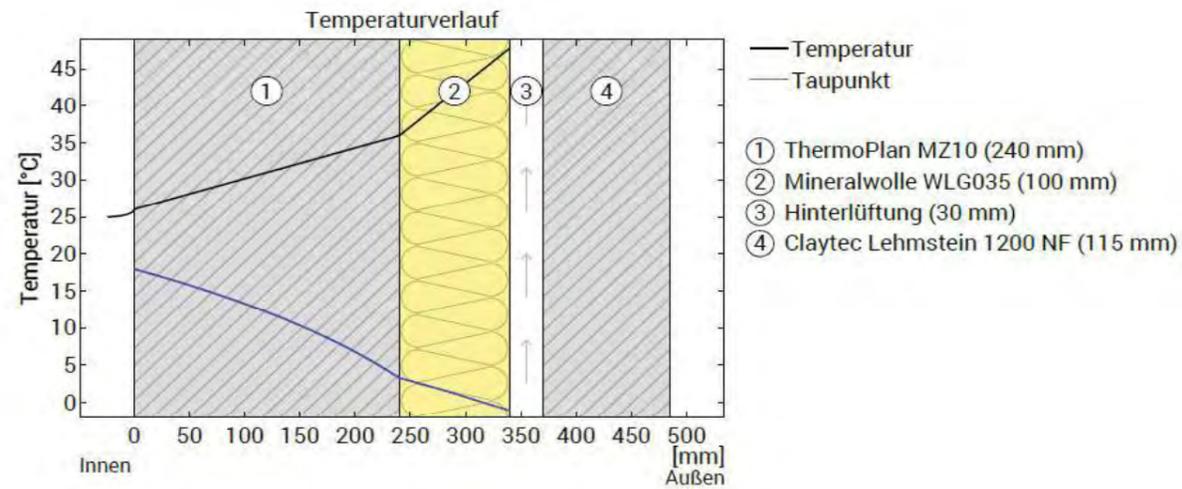
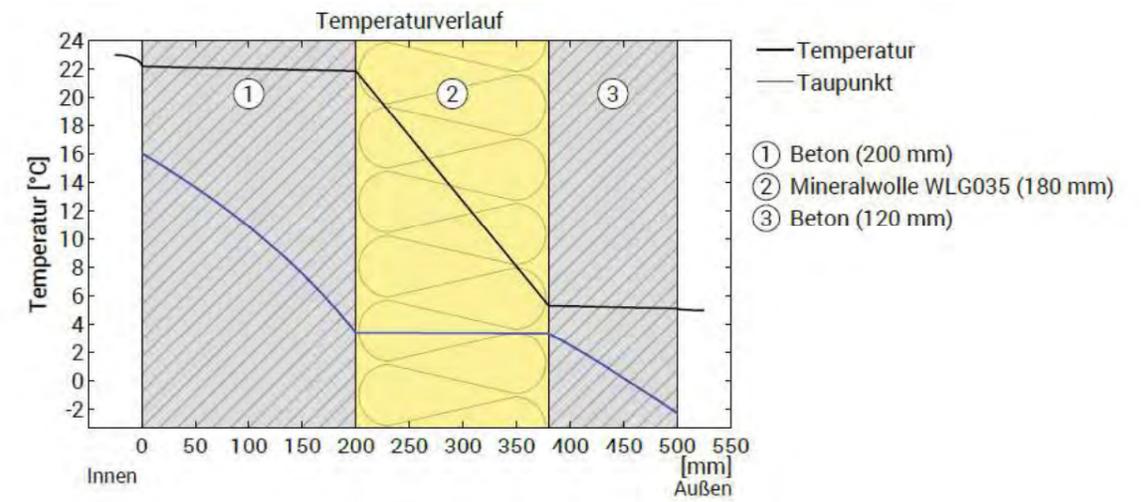
23.07.2021



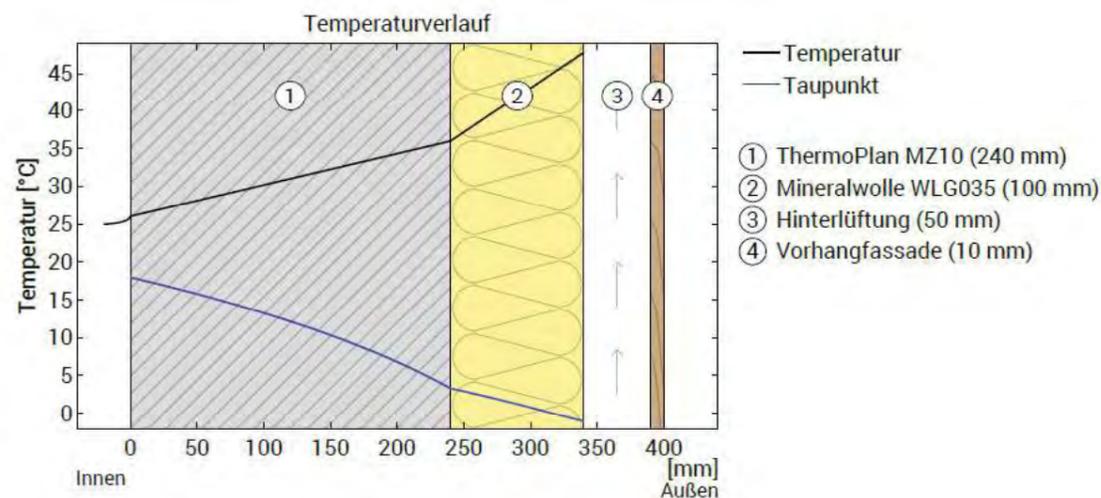
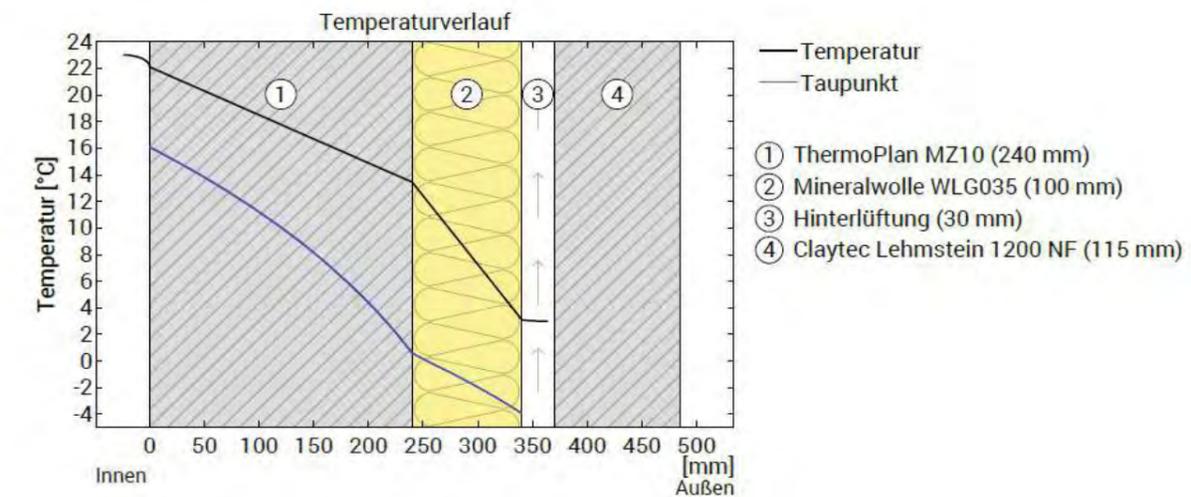
BETON-SANDWICHFASSADE



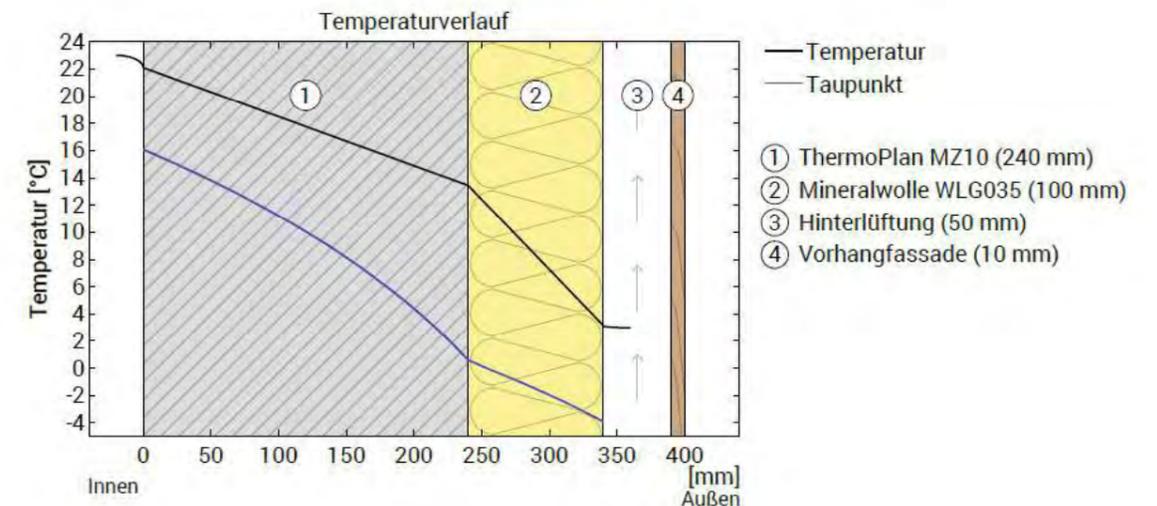
18.12.2021



DOPPELFASSADE



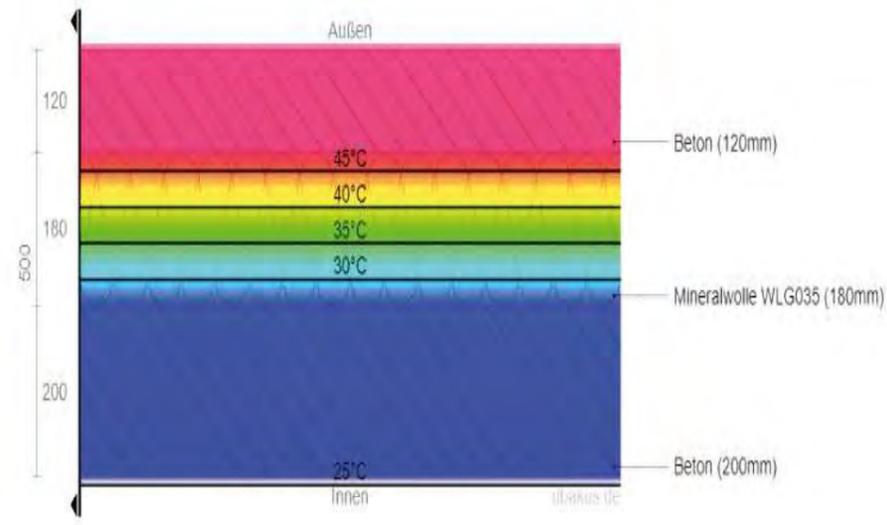
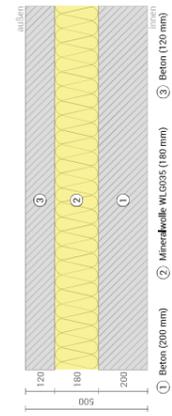
TEXTILFASSADE



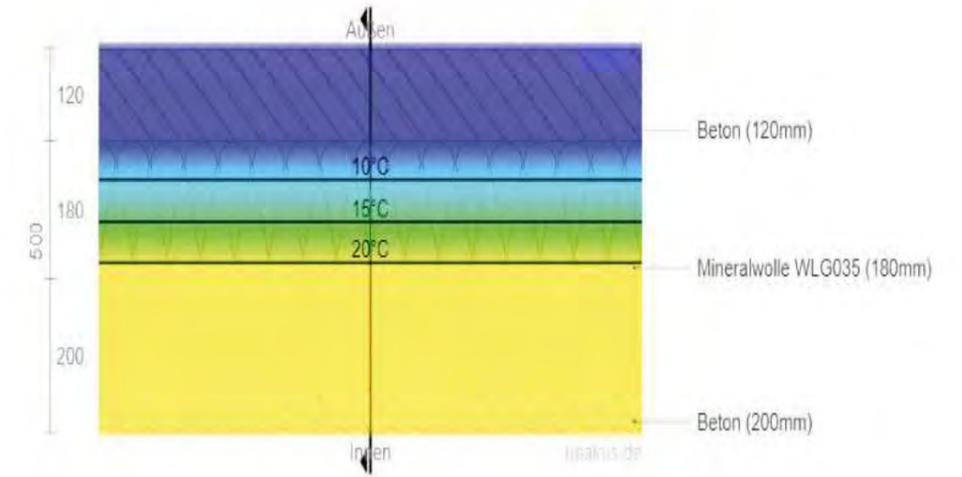
VERGLEICHENDE BETRACHTUNG

TEMPERATURVERLAUF

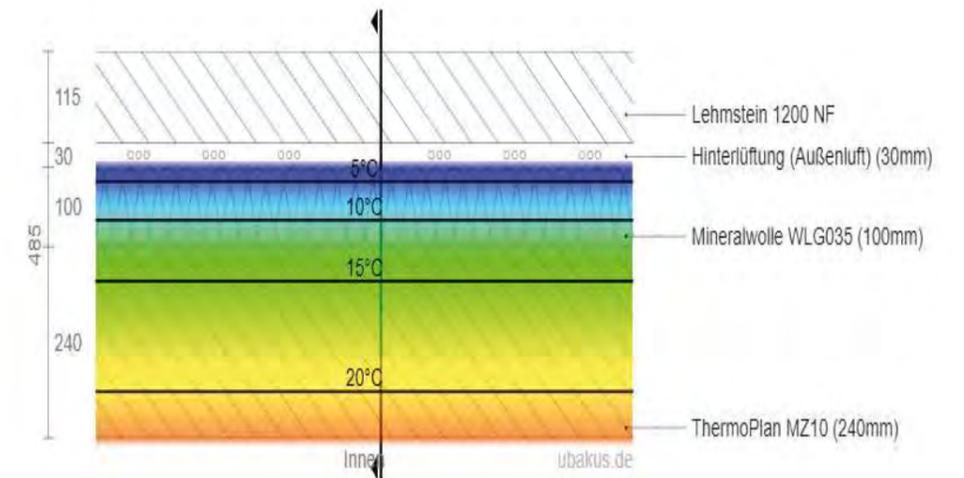
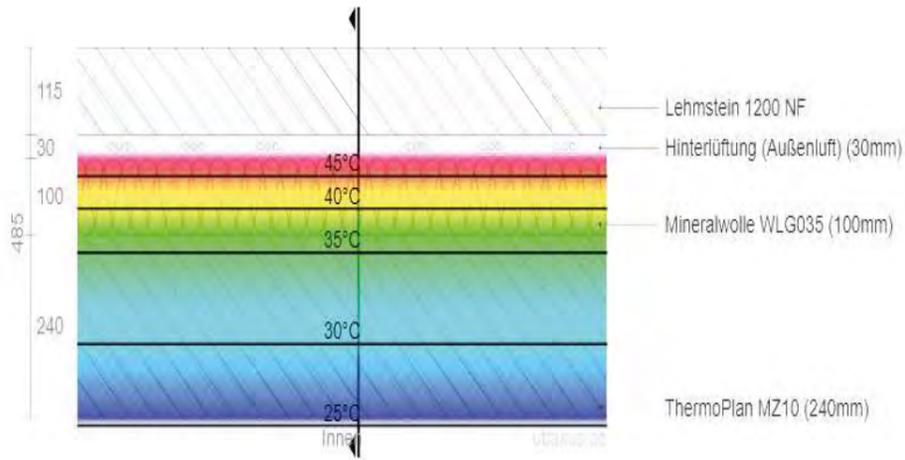
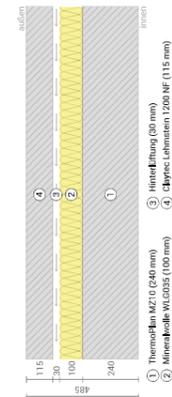
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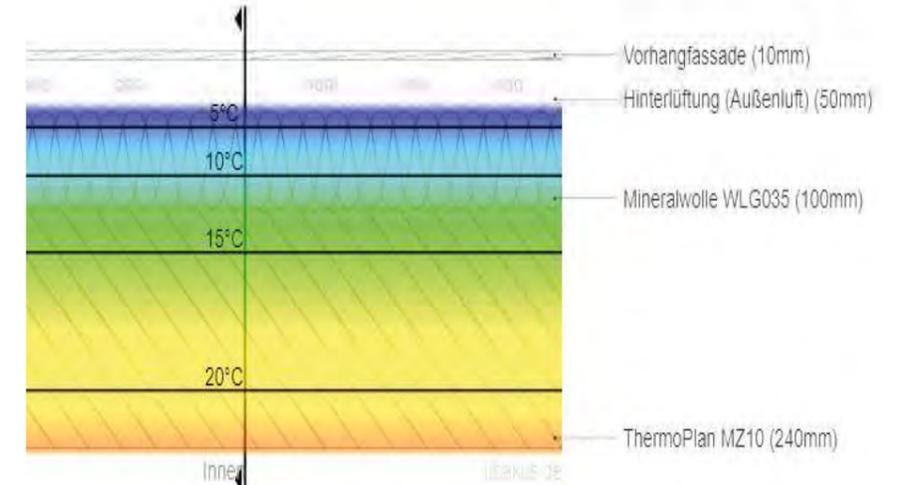
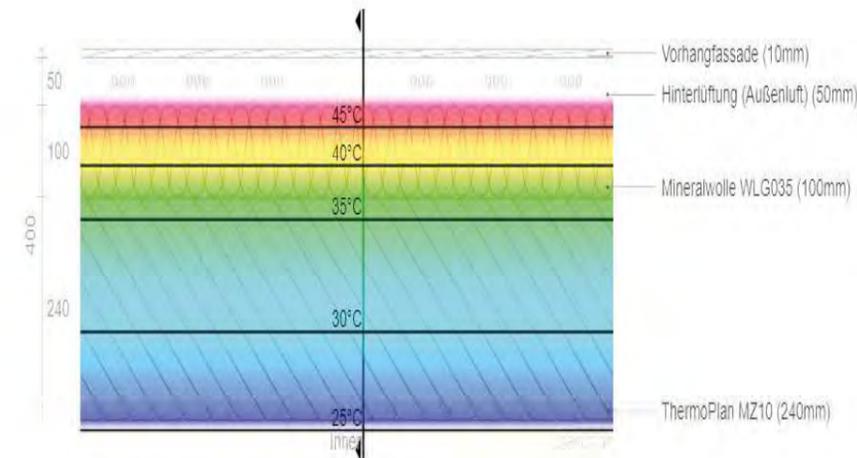
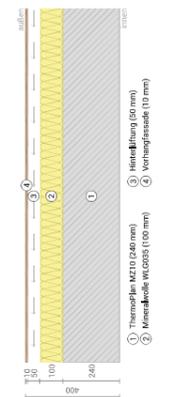
18.12.2021



BETON-SANDWICHFASSADE



DOPPELFASSADE

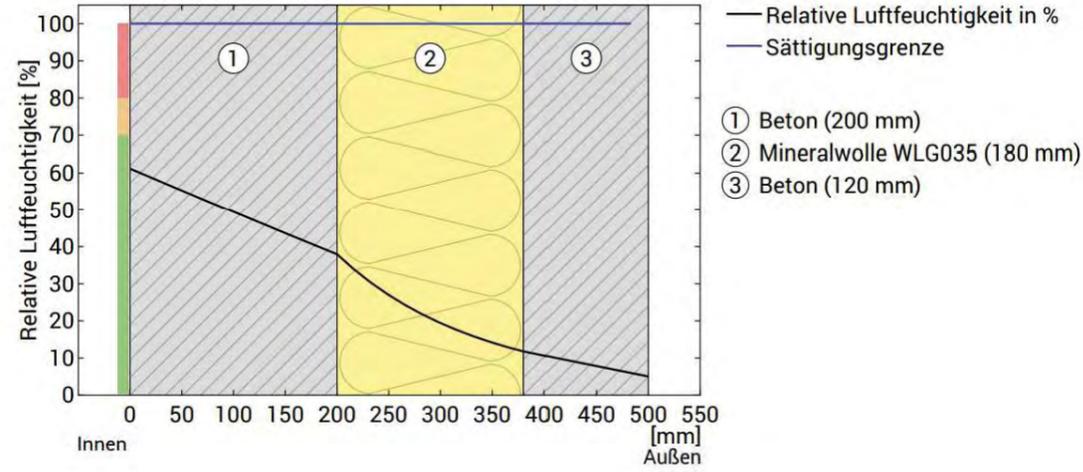
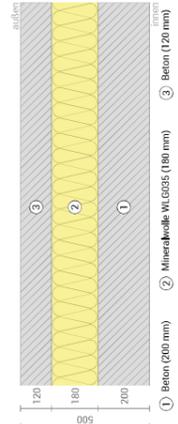


TEXTILFASSADE

VERGLEICHENDE BETRACHTUNG

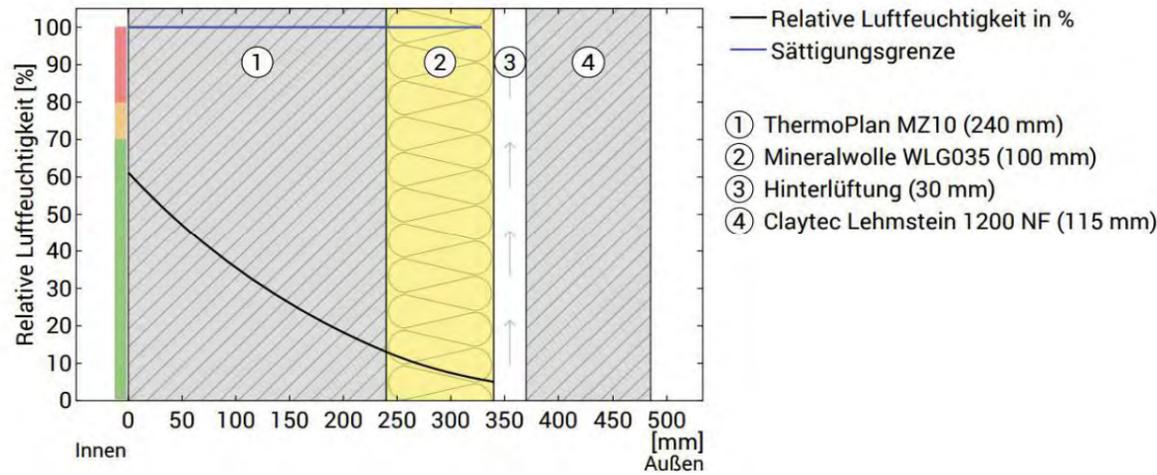
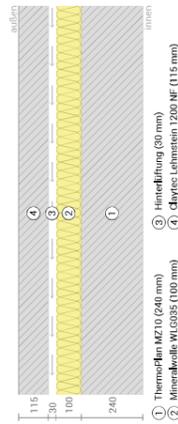
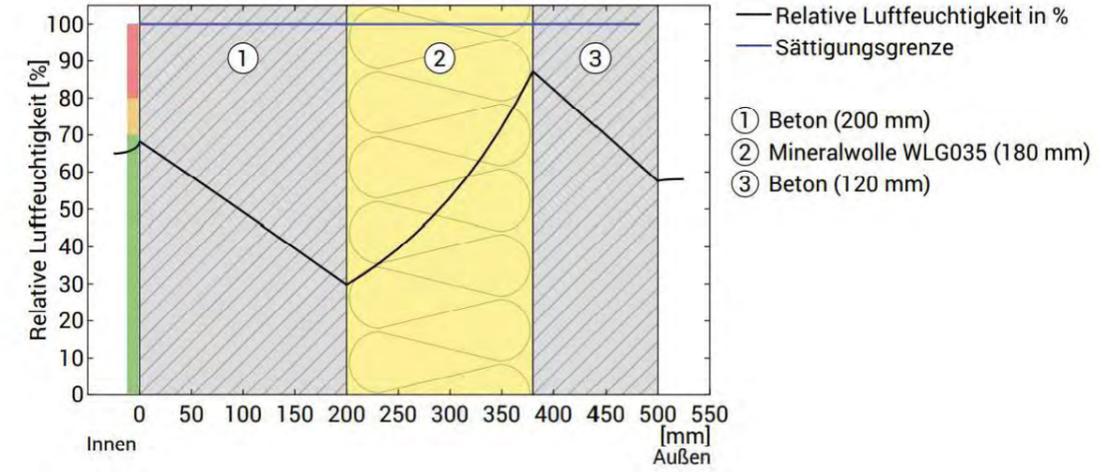
LUFTFEUCHTIGKEIT

23.07.2021

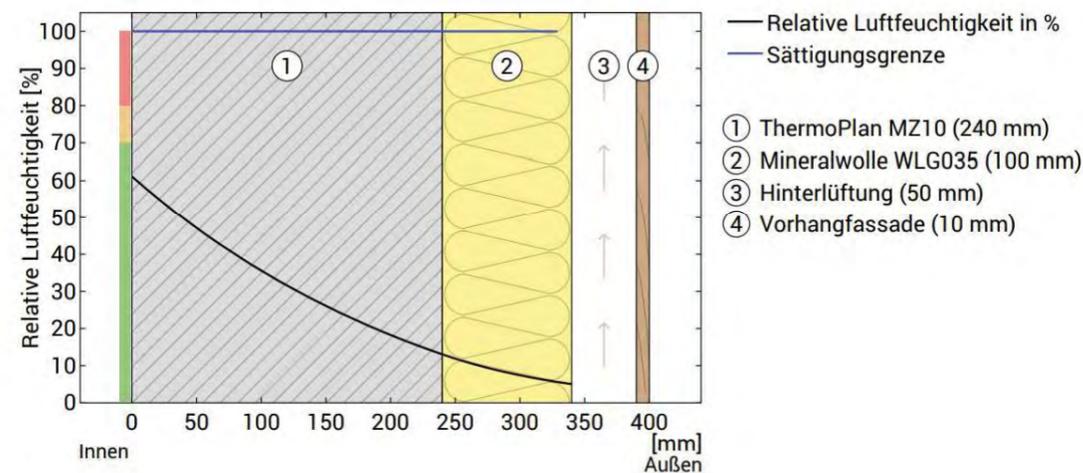
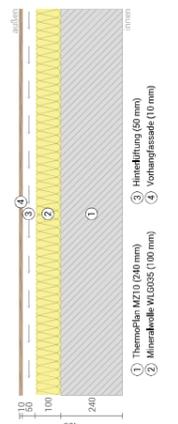
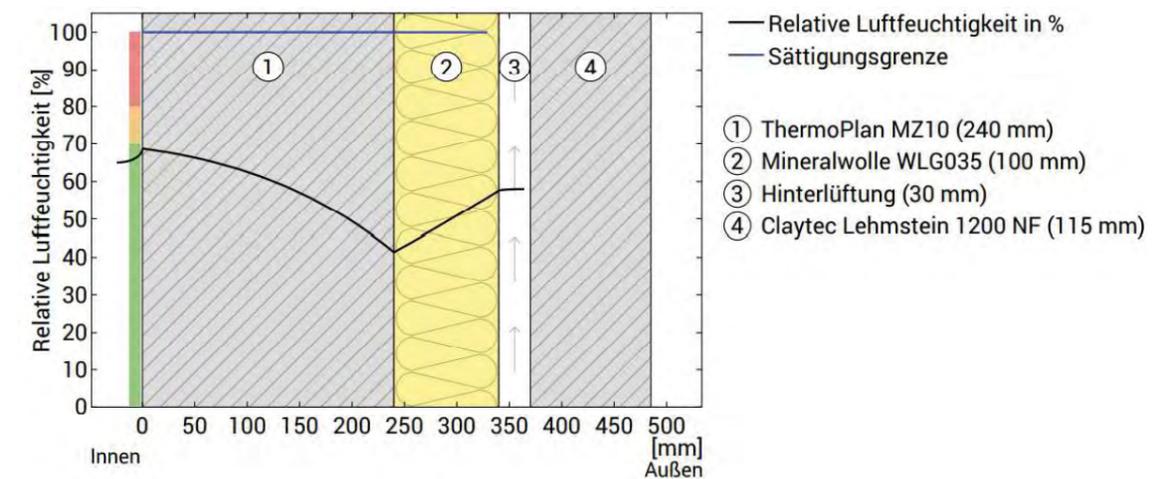


BETON-SANDWICHFASSADE

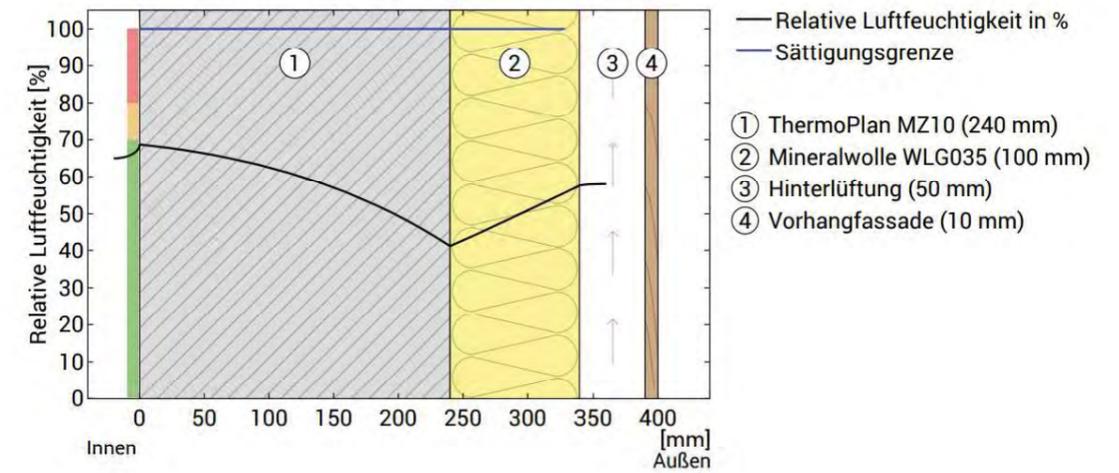
18.12.2021



DOPPELFASSADE



TEXTILFASSADE



VERGLEICHENDE BETRACHTUNG

FAZIT

DOPPELFASSADE

TEXTILFASSADE

BETONSANDWICH FASSADE

GEWICHT FASSADE



WÄRMEDÄMMUNG



REGIONALE RESSOURCEN



VERSCHATTUNG



FENSTERANTEIL



WÄRMESPEICHERFÄHIGKEI





