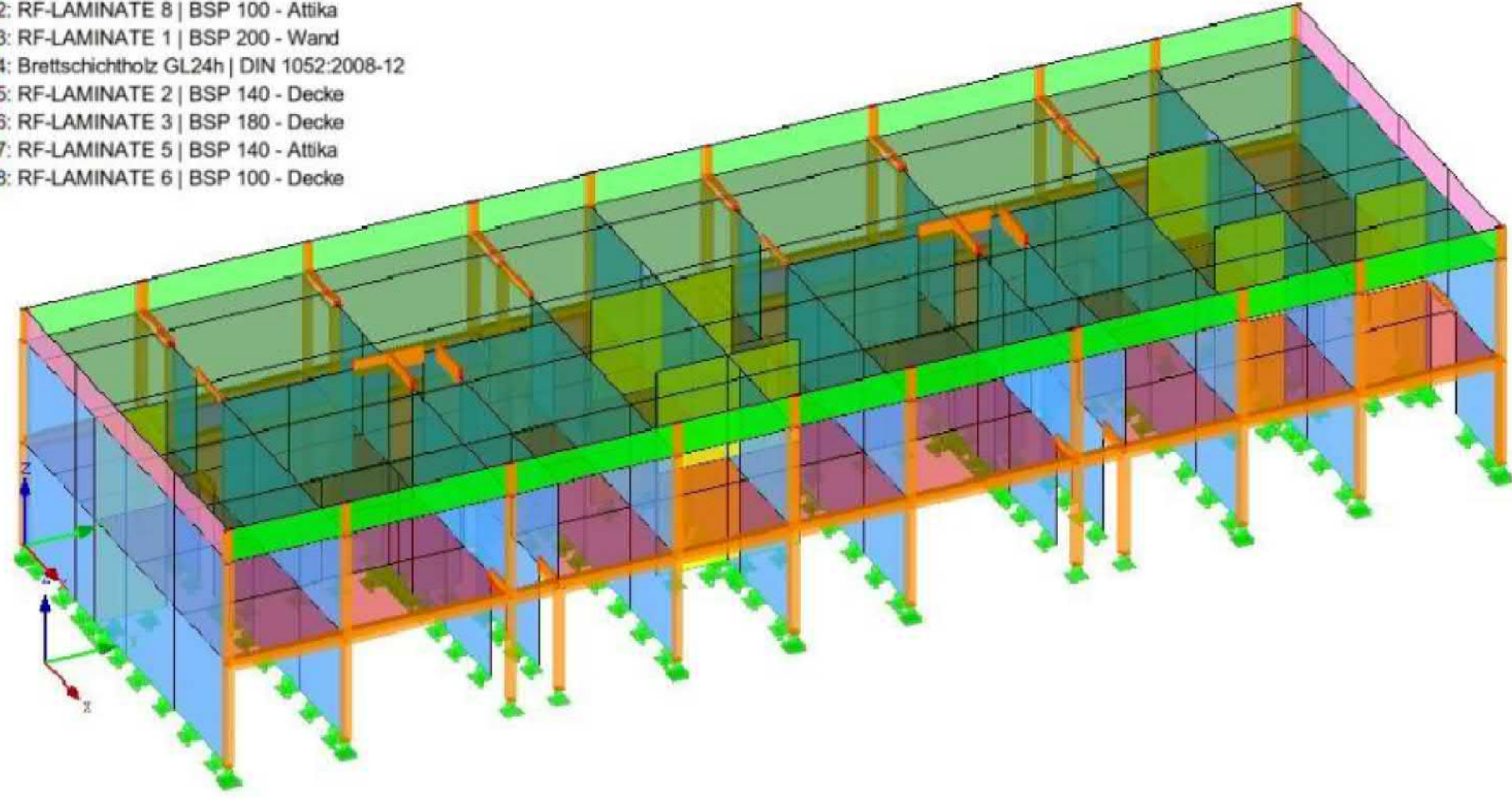


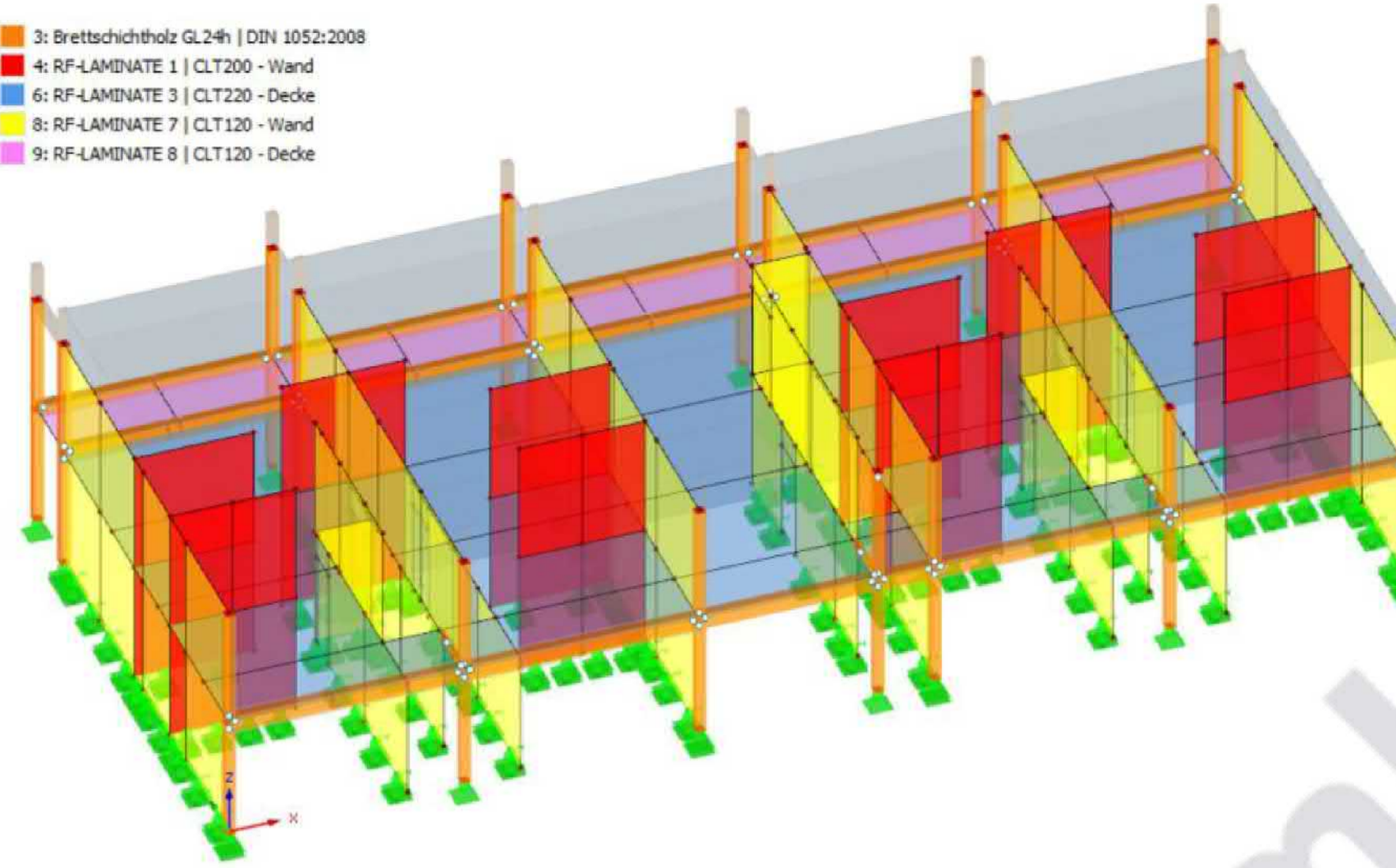
### Haus B,D

- 1: RF-LAMINATE 7 | BSP 120 - Wand
- 2: RF-LAMINATE 8 | BSP 100 - Attika
- 3: RF-LAMINATE 1 | BSP 200 - Wand
- 4: Bretttschichtholz GL24h | DIN 1052:2008-12
- 5: RF-LAMINATE 2 | BSP 140 - Decke
- 6: RF-LAMINATE 3 | BSP 180 - Decke
- 7: RF-LAMINATE 5 | BSP 140 - Attika
- 8: RF-LAMINATE 6 | BSP 100 - Decke



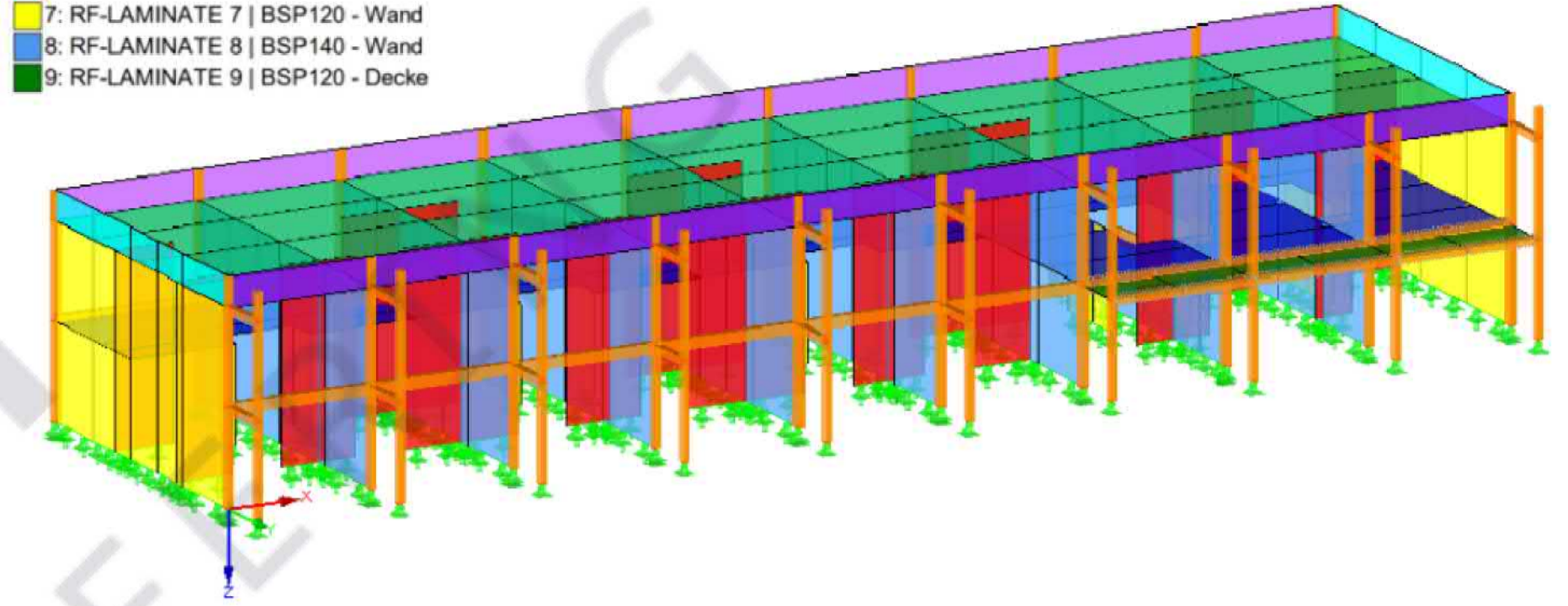
### Haus C

- 3: Bretttschichtholz GL24h | DIN 1052:2008
- 4: RF-LAMINATE 1 | CLT200 - Wand
- 5: RF-LAMINATE 3 | CLT200 - Decke
- 6: RF-LAMINATE 7 | CLT120 - Wand
- 9: RF-LAMINATE 8 | CLT120 - Decke



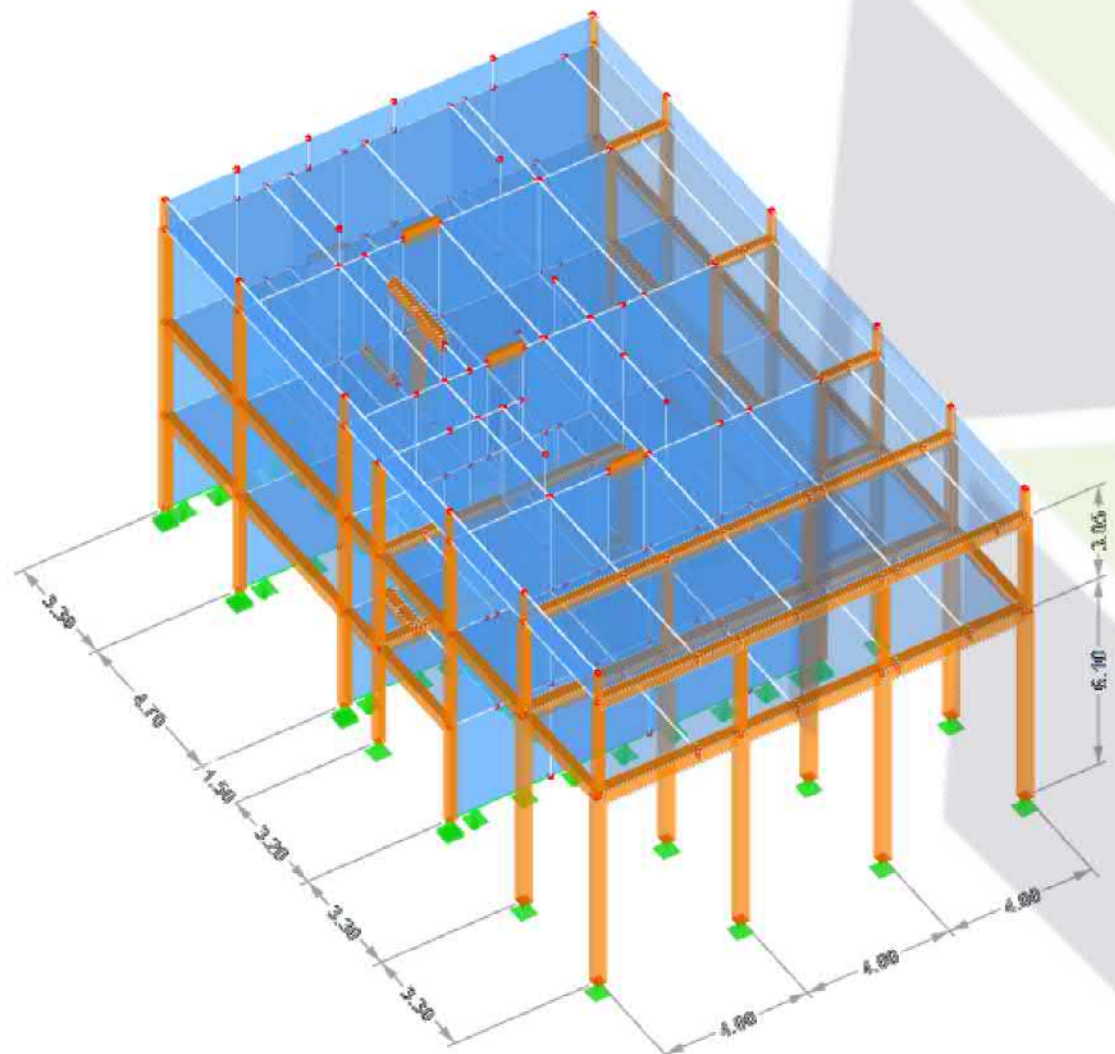
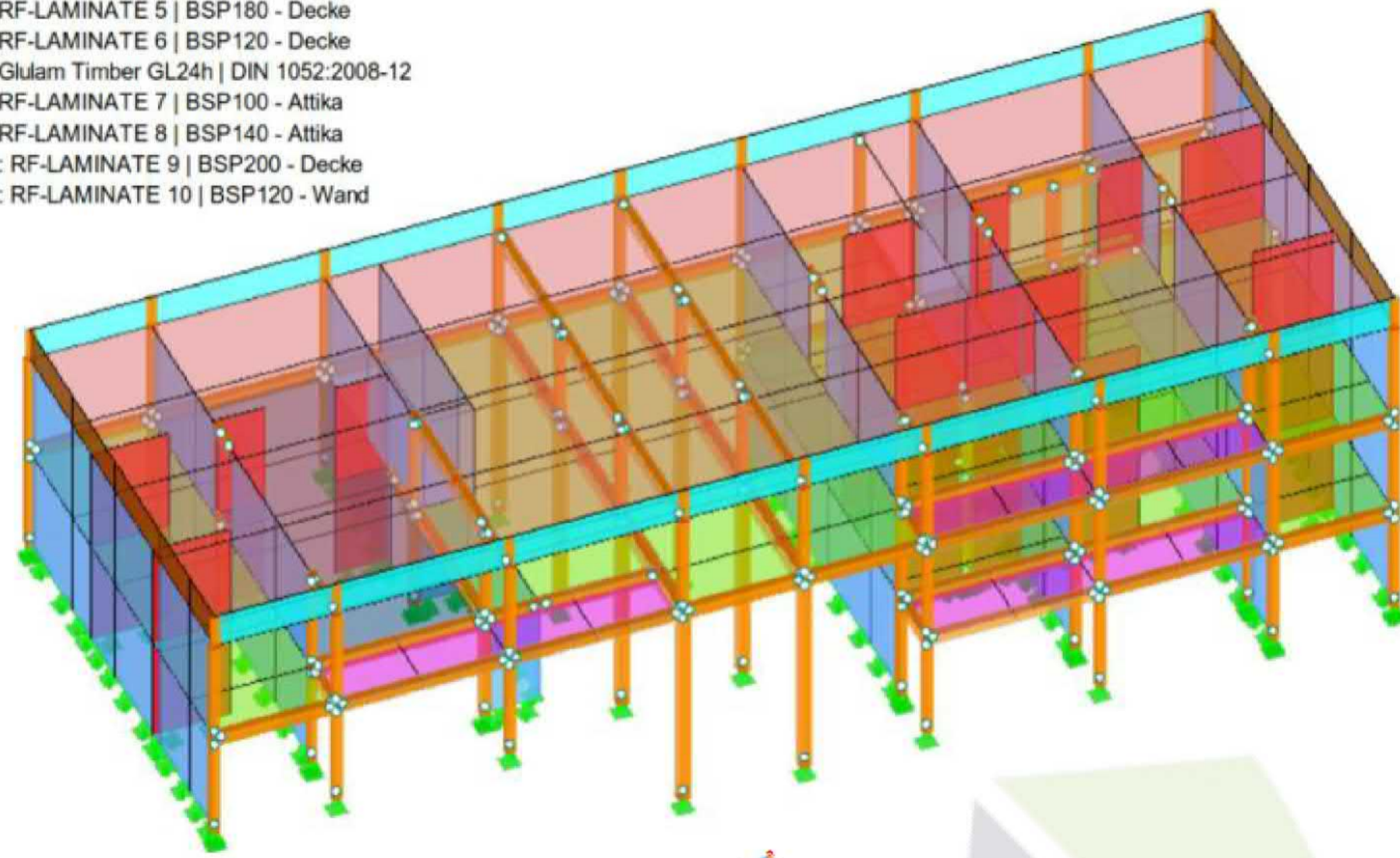
### Haus E

- 1: Bretttschichtholz GL24h | DIN 1052:2008-12
- 2: RF-LAMINATE 1 | BSP180 - Decke
- 3: RF-LAMINATE 2 | BSP200 - Wand
- 4: RF-LAMINATE 4 | BSP140 - Decke
- 5: RF-LAMINATE 5 | BSP140 - Attika
- 6: RF-LAMINATE 6 | BSP100 - Attika
- 7: RF-LAMINATE 7 | BSP120 - Wand
- 8: RF-LAMINATE 8 | BSP140 - Wand
- 9: RF-LAMINATE 9 | BSP120 - Decke



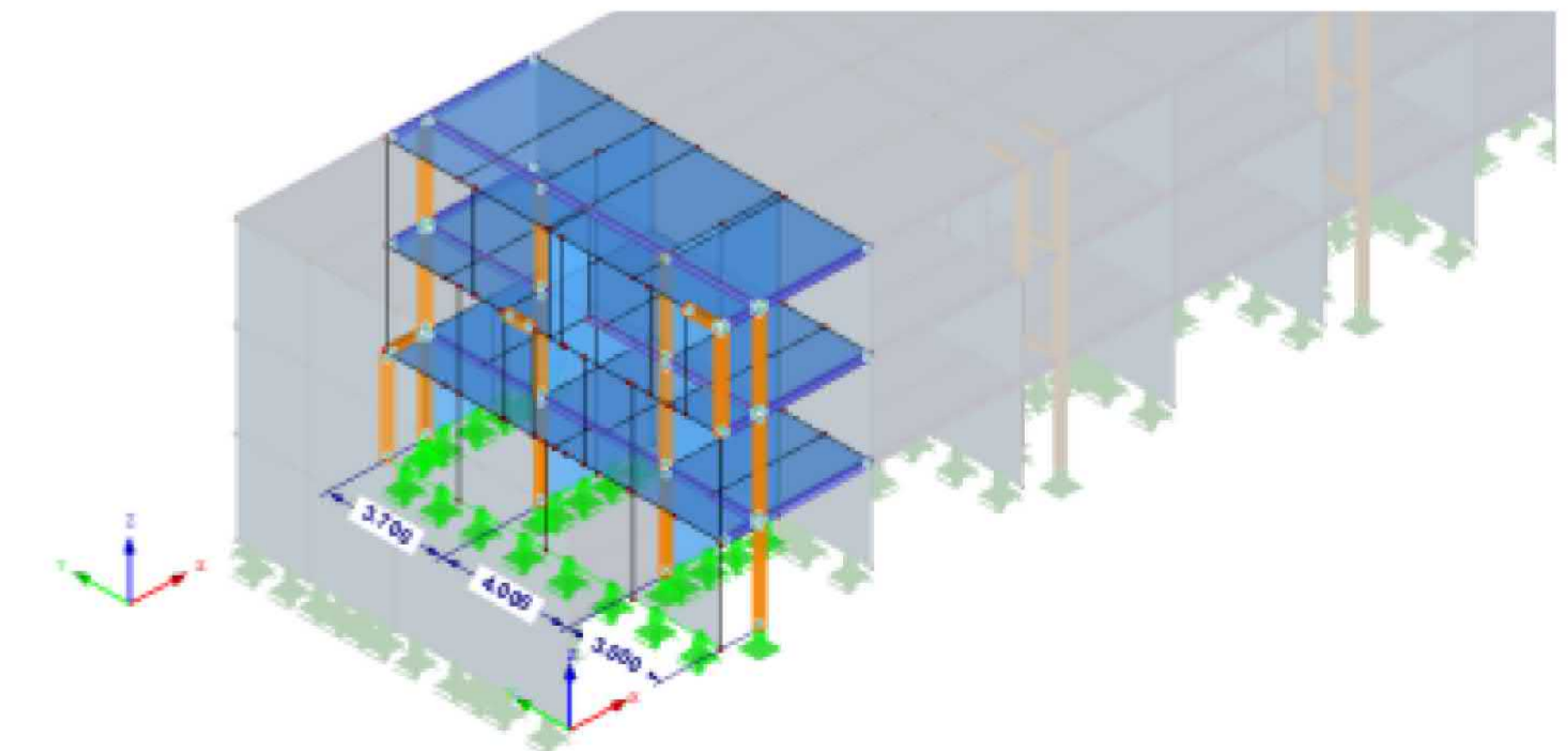
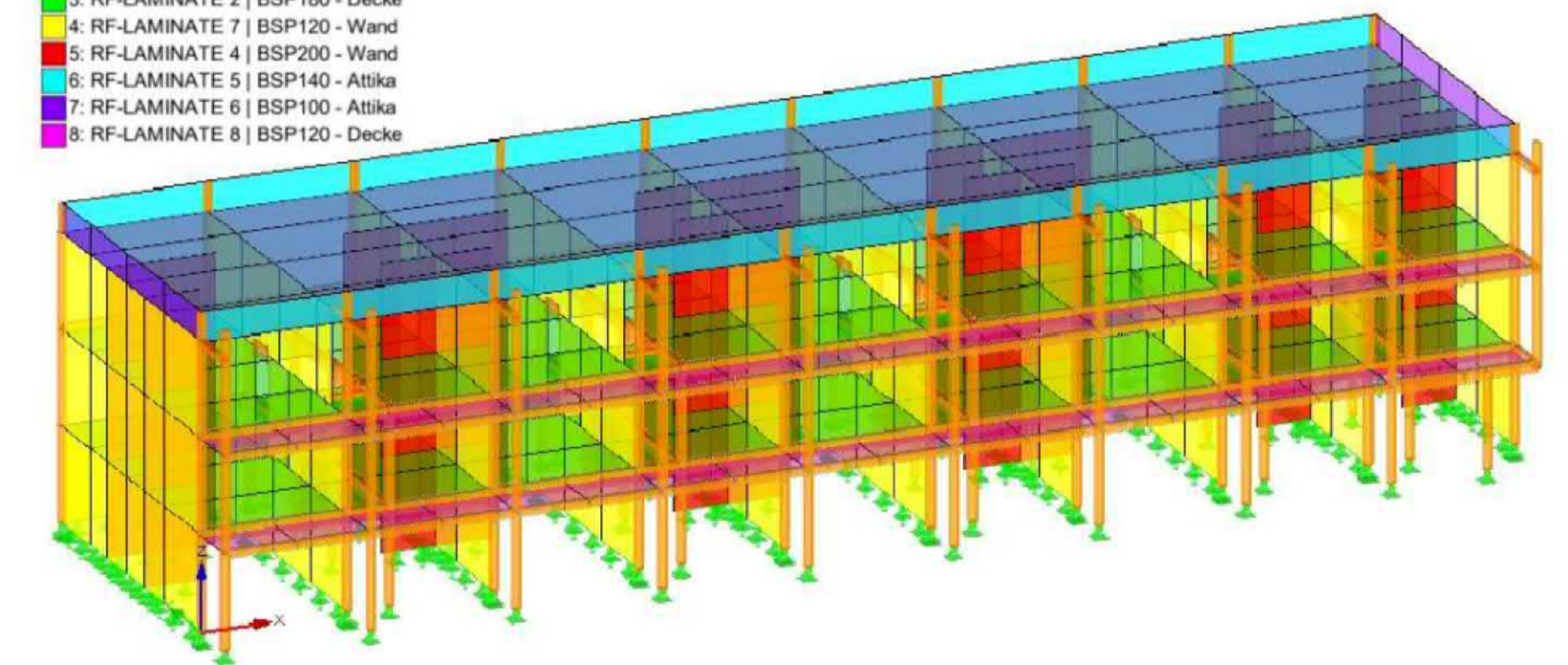
### Haus A

- Materials
- 1: RF-LAMINATE 1 | BSP140 - Decke
  - 3: RF-LAMINATE 3 | BSP200 - Wand
  - 5: RF-LAMINATE 5 | BSP180 - Decke
  - 6: RF-LAMINATE 6 | BSP120 - Decke
  - 7: Glulam Timber GL24h | DIN 1052:2008-12
  - 8: RF-LAMINATE 7 | BSP100 - Attika
  - 9: RF-LAMINATE 8 | BSP140 - Attika
  - 10: RF-LAMINATE 9 | BSP200 - Decke
  - 11: RF-LAMINATE 10 | BSP120 - Wand



### Haus F

- 1: Bretttschichtholz GL24h | DIN 1052:2008-12
- 2: RF-LAMINATE 1 | BSP140 - Decke
- 3: RF-LAMINATE 2 | BSP180 - Decke
- 4: RF-LAMINATE 7 | BSP120 - Wand
- 5: RF-LAMINATE 4 | BSP200 - Wand
- 6: RF-LAMINATE 5 | BSP140 - Attika
- 7: RF-LAMINATE 6 | BSP100 - Attika
- 8: RF-LAMINATE 8 | BSP120 - Decke



**HAUS C**  
 $g_{DL} = 113700 \text{ kg}$   
 $q_{DL} = 0$   
 $s_{DL} = 30500 \text{ kg}$   
 $g_{4.0G} = 170200 \text{ kg}$   
 $q_{4.0G} = 86800 \text{ kg}$   
 $g_{3.0G} = 106800 \text{ kg}$   
 $q_{3.0G} = 69000 \text{ kg}$   
 $k_x = 81081 \text{ kN/m}$   
 $k_y = 152542 \text{ kN/m}$

**HAUS B**  
 $g_{DL} = 152100 \text{ kg}$   
 $q_{DL} = 0$   
 $s_{DL} = 42900 \text{ kg}$   
 $g_{4.0G} = 211800 \text{ kg}$   
 $q_{4.0G} = 104300 \text{ kg}$   
 $g_{3.0G} = 150500 \text{ kg}$   
 $q_{3.0G} = 102600 \text{ kg}$   
 $k_x = 215323 \text{ kN/m}$   
 $k_y = 75852 \text{ kN/m}$

**HAUS D**  
 $g_{DL} = 152100 \text{ kg}$   
 $q_{DL} = 0$   
 $s_{DL} = 42900 \text{ kg}$   
 $g_{4.0G} = 211800 \text{ kg}$   
 $q_{4.0G} = 104300 \text{ kg}$   
 $g_{3.0G} = 150500 \text{ kg}$   
 $q_{3.0G} = 102600 \text{ kg}$   
 $k_x = 215323 \text{ kN/m}$   
 $k_y = 75852 \text{ kN/m}$

**HAUS E**  
 $g_{DL} = 158400 \text{ kg}$   
 $q_{DL} = 0$   
 $s_{DL} = 44600 \text{ kg}$   
 $g_{4.0G} = 180000 \text{ kg}$   
 $q_{4.0G} = 76600 \text{ kg}$   
 $g_{3.0G} = 158100 \text{ kg}$   
 $q_{3.0G} = 104200 \text{ kg}$   
 $k_x = 84938 \text{ kN/m}$   
 $k_y = 234310 \text{ kN/m}$

**HAUS A**  
 $g_{DL} = 127700 \text{ kg}$   
 $q_{DL} = 0$   
 $s_{DL} = 38500 \text{ kg}$   
 $g_{4.0G} = 196500 \text{ kg}$   
 $q_{4.0G} = 82000 \text{ kg}$   
 $g_{3.0G} = 84000 \text{ kg}$   
 $q_{3.0G} = 41500 \text{ kg}$   
 $g_{2.0G} = 62500 \text{ kg}$   
 $q_{2.0G} = 34700 \text{ kg}$   
 $k_x = 147273 \text{ kN/m}$   
 $k_y = 43615 \text{ kN/m}$

**HAUS F**  
 $g_{DL} = 156300 \text{ kg}$   
 $q_{DL} = 0$   
 $s_{DL} = 54900 \text{ kg}$   
 $g_{4.0G} = 258000 \text{ kg}$   
 $q_{4.0G} = 132000 \text{ kg}$   
 $g_{3.0G} = 275900 \text{ kg}$   
 $q_{3.0G} = 135300 \text{ kg}$   
 $g_{2.0G} = 165300 \text{ kg}$   
 $q_{2.0G} = 104200 \text{ kg}$   
 $k_x = 65971 \text{ kN/m}$   
 $k_y = 130673 \text{ kN/m}$

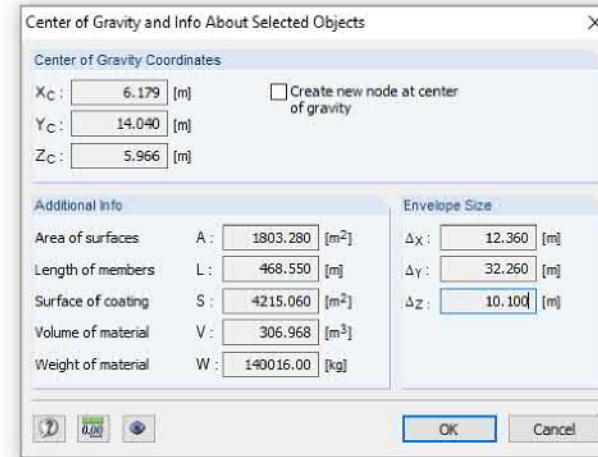
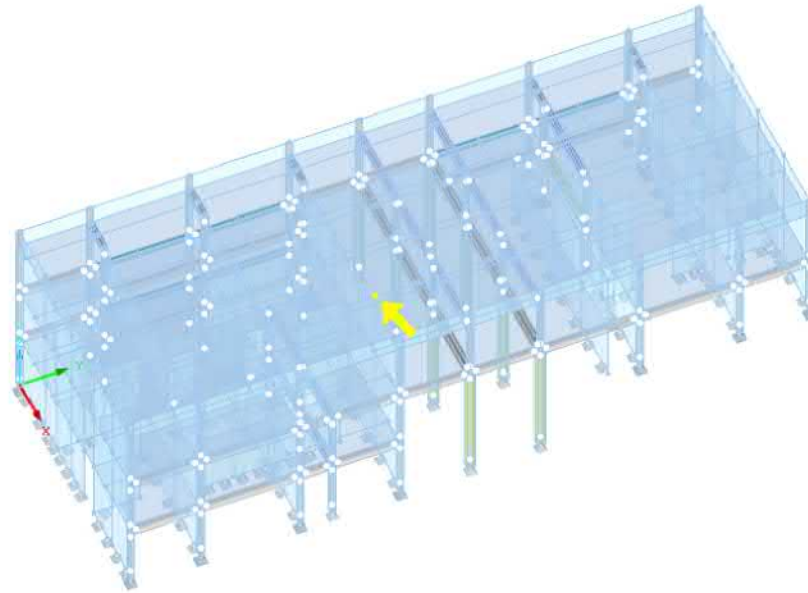
Bereich, in dem Lasten nicht in die Massenberechnung einbezogen wurden. Sie sollten im 3D-FEM-Modell auf der Ebene 3.OG angewendet werden:  
 $g=2.5\text{kN/m}^2$   
 $q=2.3\text{kN/m}^2$

Bereich, in dem Lasten nicht in die Massenberechnung einbezogen wurden. Sie sollten im 3D-FEM-Modell auf der Ebene 2.OG angewendet werden:  
 $g=2.5\text{kN/m}^2$   
 $q=?? \text{ kN/m}^2$

INDEX	DATUM + NAME	ÄNDERUNG
c	13.01.2025 DM	Geänderte Wandstärken, Verbindungen der CLT-Paneele, Lasten, zusätzlich angepasste Modelle an die neueste Architektur
b	06.12.2024 DM	Geänderte Wandstärken, längsseitige Verbindungen der CLT-Paneele, zusätzlich angepasste Modelle an die neueste Architektur
a	16.07.2024 DM	Änderungen in Haus A; Schneelast hinzugefügt

## HAUS A

### 1. Schwerpunkt.

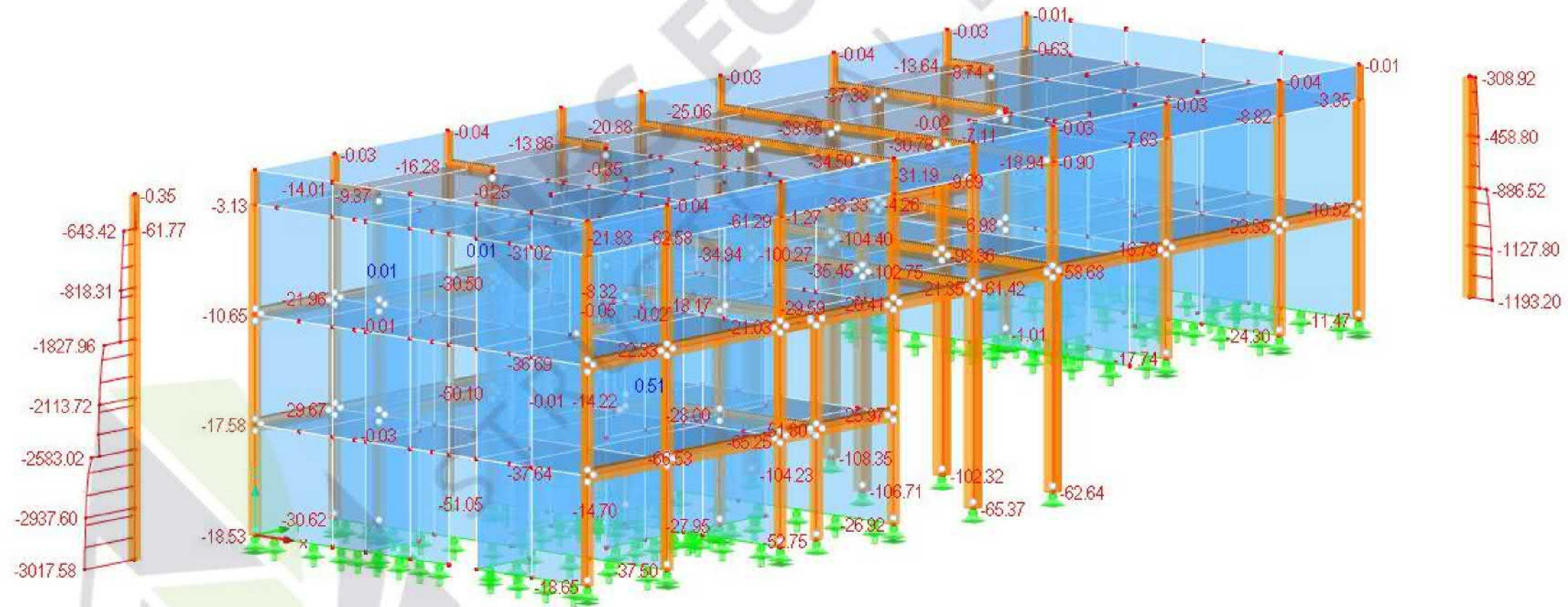


**Schwerpunkt:**  
 X = 6.18m  
 Y = 14.04m

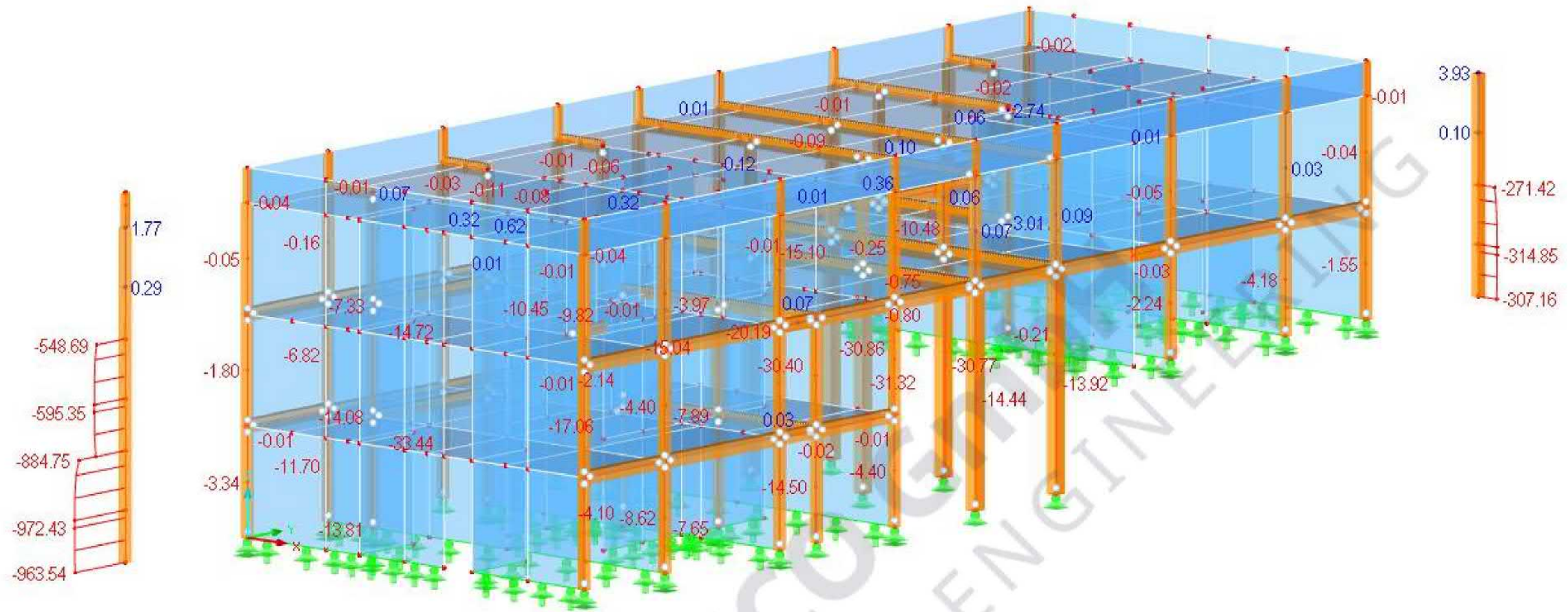
### 2. Massen/Lasten für jede Ebene.

Ermittelt mit dem Ergebnisbalken.

G – Ständige Last:



Q – Nutzlast:



Lasten für die Dachebene:

$$g_{DL} = 818 \text{ kN} + 459 \text{ kN} = 1277 \text{ kN} = 127700 \text{ kg}$$

$$q_{DL} = 0$$

$$s_{DL} = 397 \text{ m}^2 * 0.68 \text{ kN/m}^2 + (12.4\text{m} + 32\text{m}) * 2 * 5\text{m} * 0.52 \text{ kN/m}^2 * 1/2 = 385 \text{ kN} = 38500 \text{ kg}$$

Lasten für 4.OG:

$$g_{4.OG} = 2114 - 818 + 1128 - 459 = 1965 \text{ kN} = 196500 \text{ kg}$$

$$q_{4.OG} = 549 + 271 = 820 \text{ kN} = 82000 \text{ kg}$$

Lasten für 3.OG:

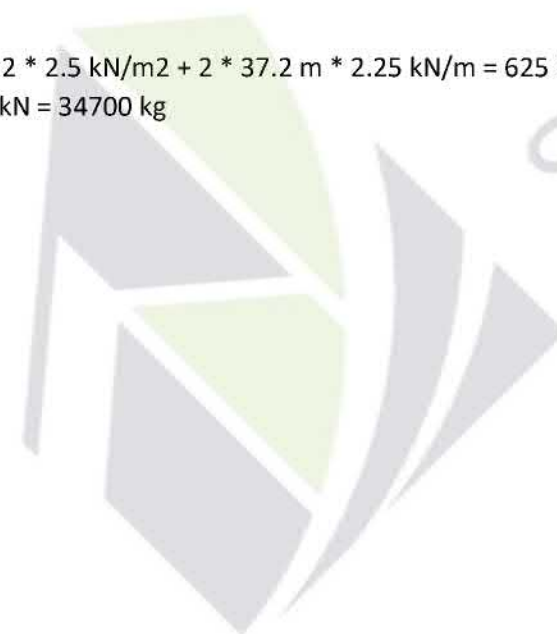
$$g_{3.OG} = 2938 - 2114 = 824 \text{ kN} = 82400 \text{ kg}$$

$$q_{3.OG} = 964 - 549 = 415 \text{ kN} = 41500 \text{ kg}$$

Lasten für 2.OG (Betonplatte):

$$g_{2.OG} = 3018 \text{ kN} - 2938 \text{ kN} + 151 \text{ m}^2 * 2.5 \text{ kN/m}^2 + 2 * 37.2 \text{ m} * 2.25 \text{ kN/m} = 625 \text{ kN} = 62500 \text{ kg}$$

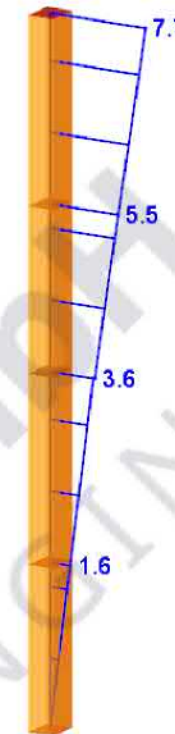
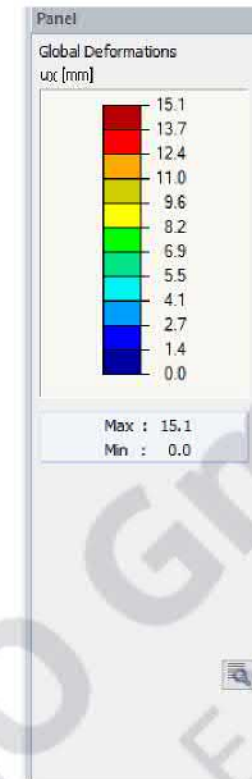
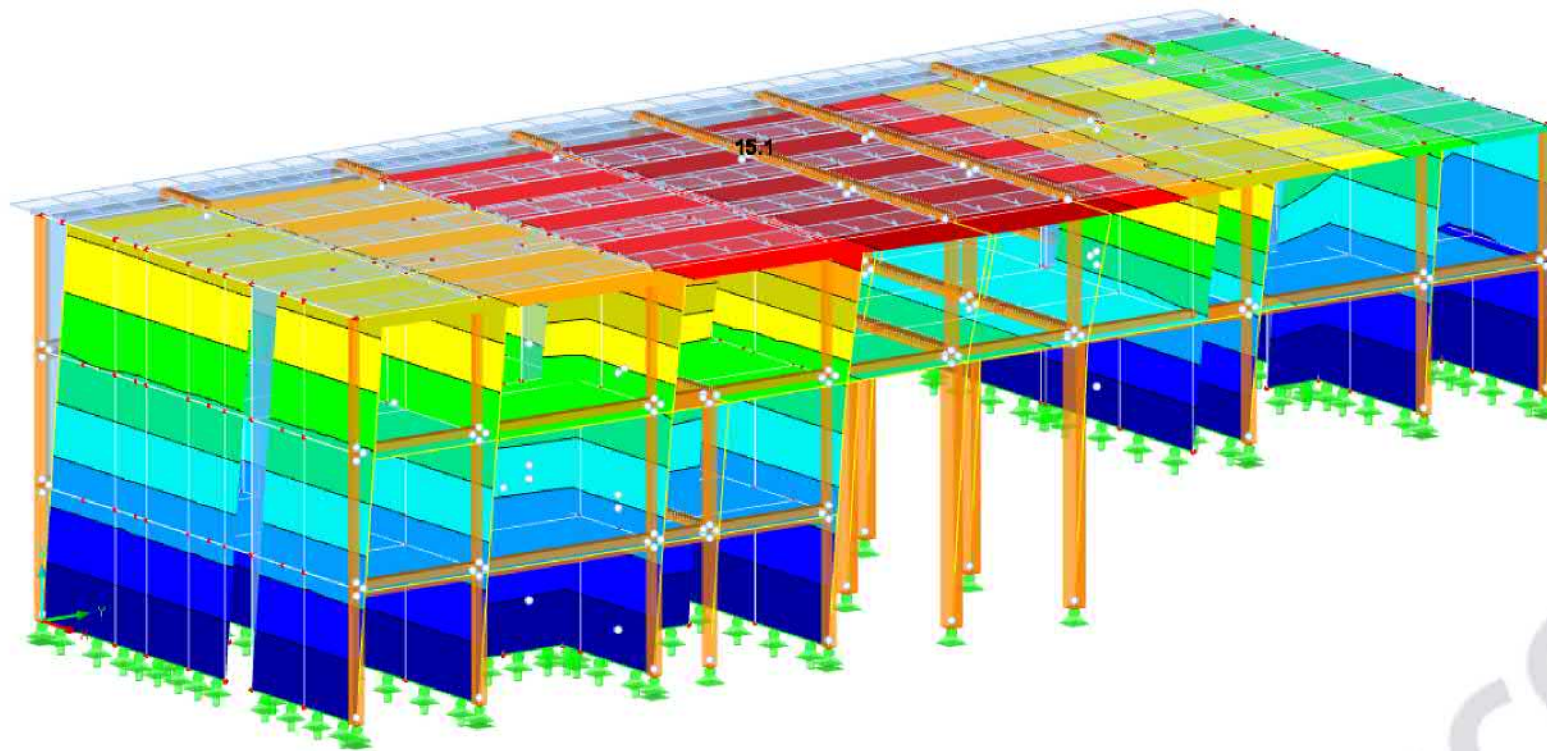
$$q_{2.OG} = 151 \text{ m}^2 * 2.3 \text{ kN/m}^2 = 347 \text{ kN} = 34700 \text{ kg}$$



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### 3. Haus A - Bauwerkssteifigkeit

X Richtung



$$f_{,x} = 3 \text{ kN/m}^2 * 378 \text{ m}^2 = 1134 \text{ kN}$$

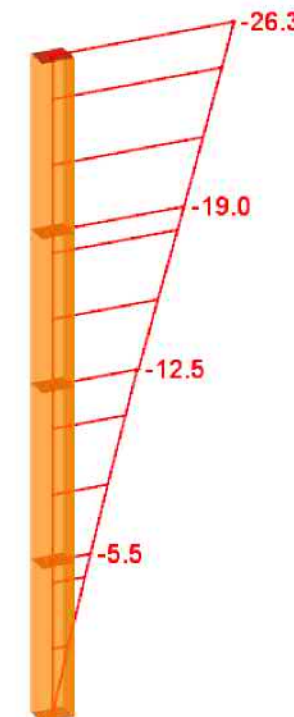
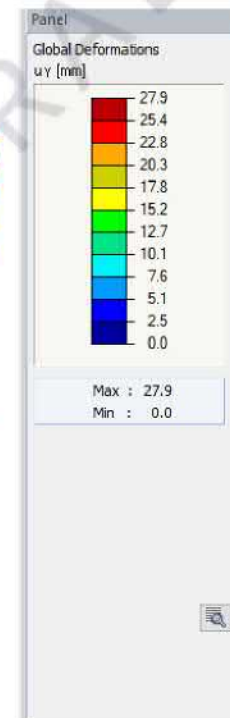
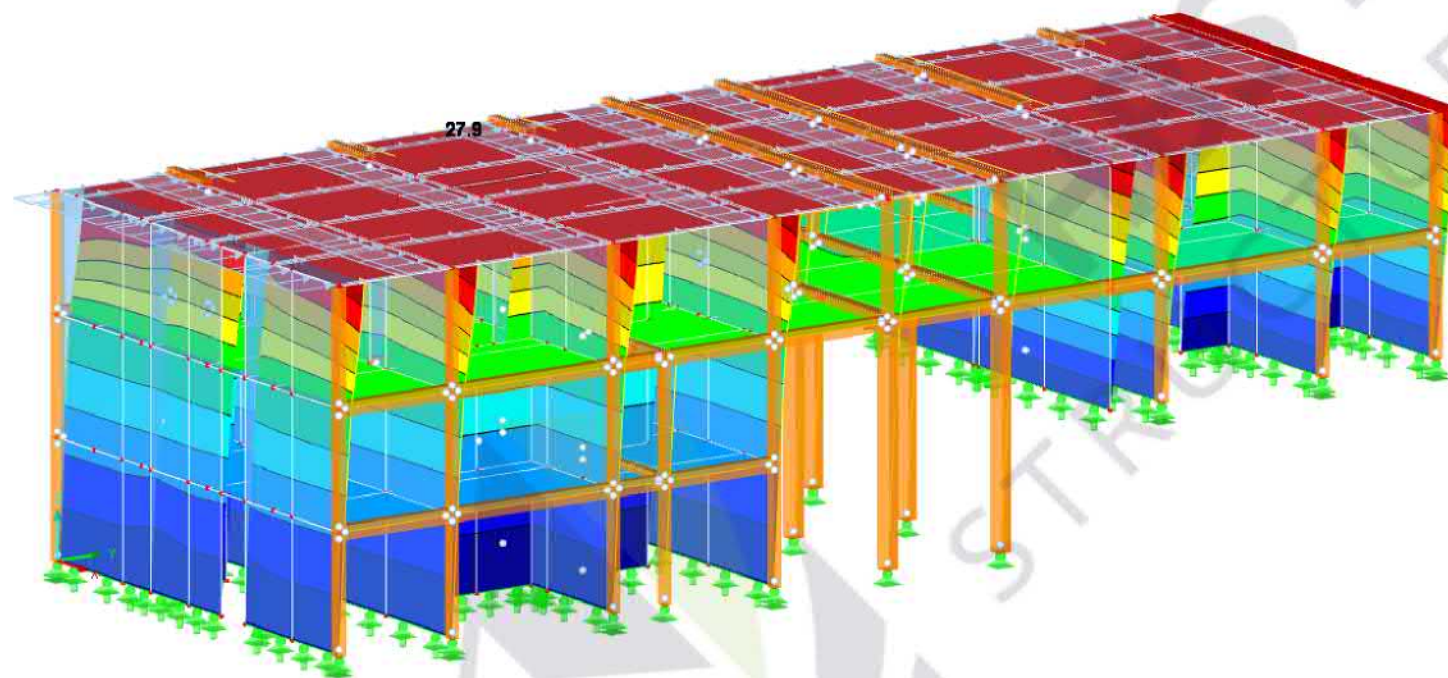
$$F_{,x} = 1134 \text{ kN}$$

$$U_x = 7.70 \text{ mm} = 0.0077 \text{ m}$$

$$k_x = F_x / u_x = 1134 / 0.0077 = 147273 \text{ kN/m}$$

**$k_x = 147273 \text{ kN/m}$**

Y Richtung



$$f_{,y} = 3 \text{ kN/m}^2 * 378 \text{ m}^2 = 1134 \text{ kN}$$

$$F_{,y} = 1134 \text{ kN}$$

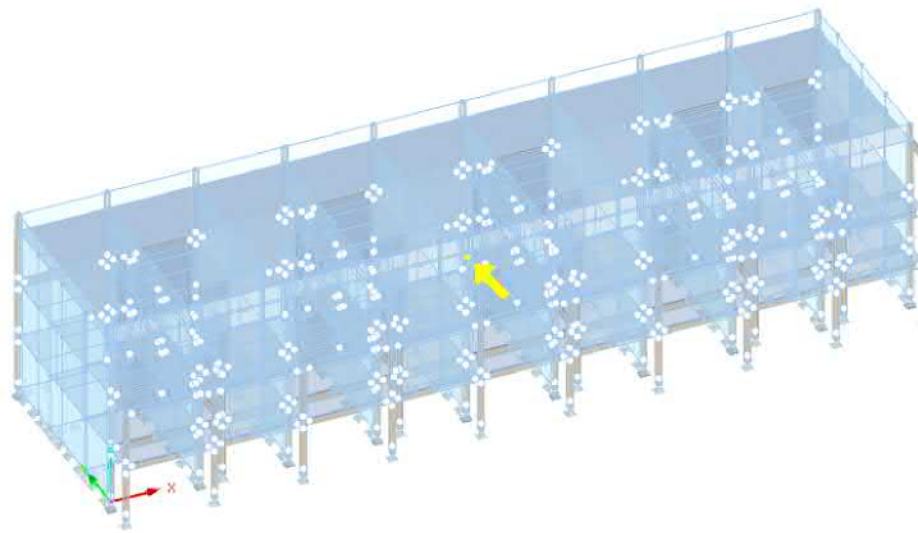
$$U_y = 26.30 \text{ mm} = 0.026 \text{ m}$$

$$k_y = F_y / u_y = 1134 / 0.026 = 43615 \text{ kN/m}$$

**$k_y = 43615 \text{ kN/m}$**

# HAUS F

## 1. Schwerpunkt.



Center of Gravity and Info About Selected Objects

Center of Gravity Coordinates

X<sub>C</sub>: 21.184 [m]  Create new node at center of gravity

Y<sub>C</sub>: 5.109 [m]

Z<sub>C</sub>: 5.163 [m]

Additional Info

Area of surfaces	A:	3015.690 [m <sup>2</sup> ]
Length of members	L:	776.200 [m]
Surface of coating	S:	6982.540 [m <sup>2</sup> ]
Volume of material	V:	505.911 [m <sup>3</sup> ]
Weight of material	W:	234348.00 [kg]

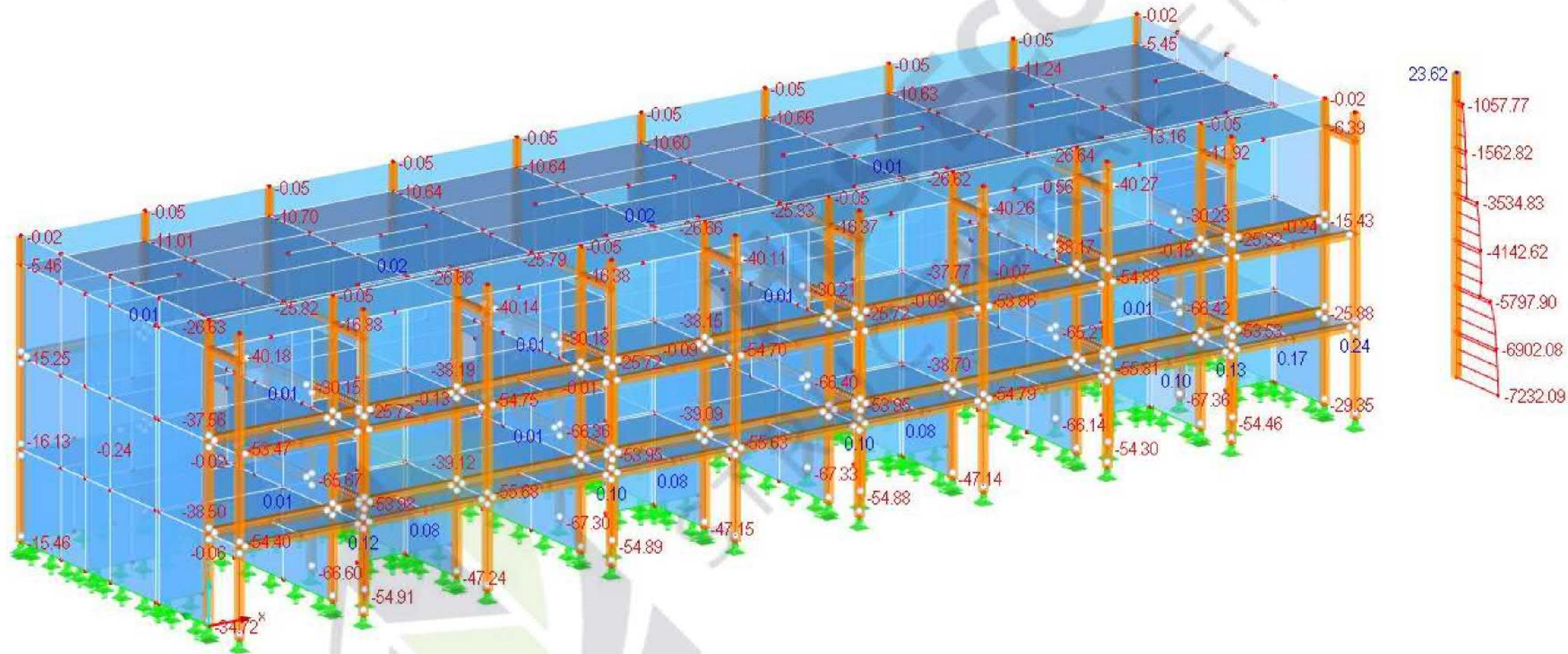
Envelope Size

Δx:	42.560 [m]
Δy:	12.710 [m]
Δz:	10.100 [m]

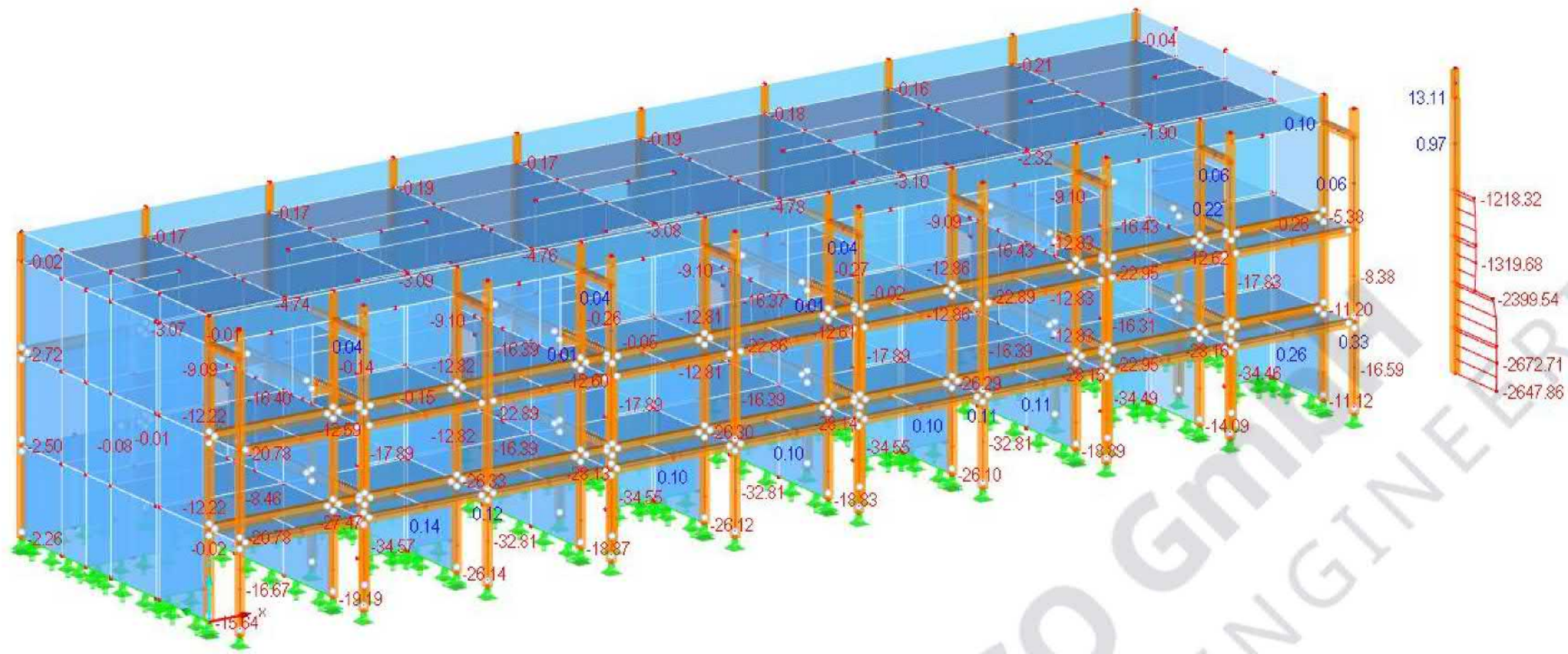
OK Cancel

**Schwerpunkt:**  
X = 21.18 m  
Y = 5.11 m

## 2. Massen/Lasten für jede Ebene. Ermittelt mit dem Ergebnisbalken. G – Ständige Last:



## Q – Nutzlast:



Lasten für die Dachebene:

$$g_{DL} = 1563 \text{ kN} = 156300 \text{ kg}$$

$$q_{DL} = 0$$

$$s_{DL} = \text{Dach} + \text{Balkone} = 453 \text{ m}^2 * 0.68 \text{ kN/m}^2 + (10.7\text{m} + 42.3\text{m}) * 2 * 5\text{m} * 0.52 \text{ kN/m}^2 * 1/2 + (43.2\text{m} * 1.75\text{m}) * 2 * 0.68 \text{ kN/m}^2 = 446 \text{ kN} + 103 \text{ kN} = 54900 \text{ kg}$$

Lasten für 4.OG:

$$g_{4.OG} = 4143 - 1563 = 2580 \text{ kN} = 258000 \text{ kg}$$

$$q_{4.OG} = 1320 \text{ kN} = 132000 \text{ kg}$$

Lasten für 3.OG:

$$g_{3.OG} = 6902 - 4143 = 2759 \text{ kN} = 275900 \text{ kg}$$

$$q_{3.OG} = 2673 - 1320 = 1353 \text{ kN} = 135300 \text{ kg}$$

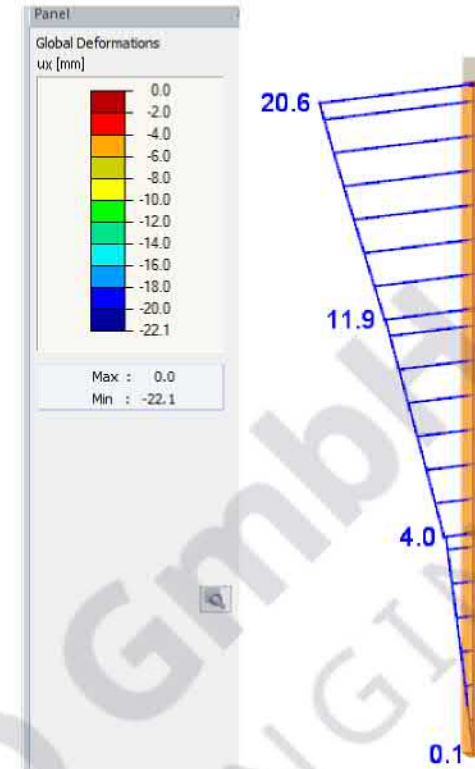
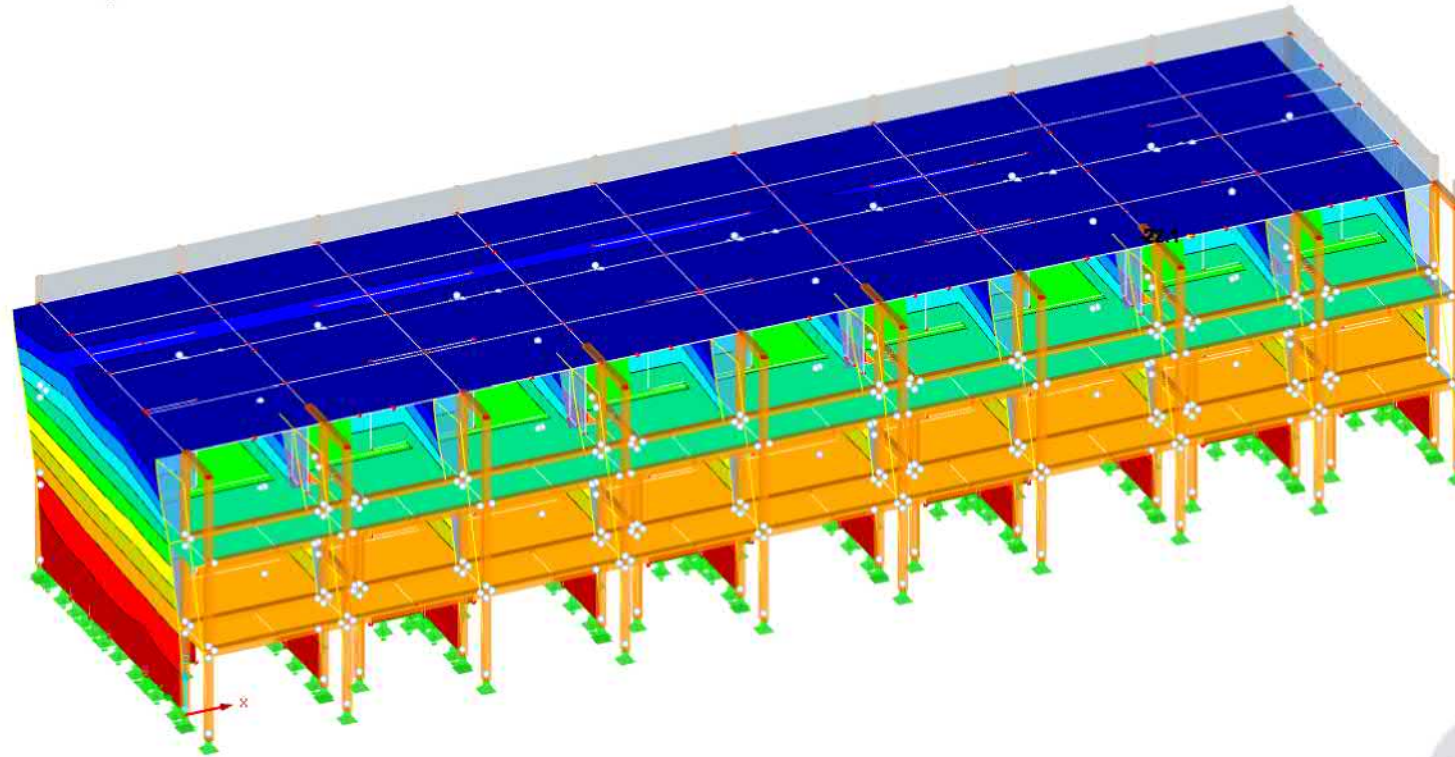
Lasten für 2.OG (Betonplatte):

$$g_{2.OG} = 7232 \text{ kN} - 6902 \text{ kN} + 453 \text{ m}^2 * 2.5 \text{ kN/m}^2 + 2 * 42.3 \text{ m} * 2.25 \text{ kN/m} = 1653 \text{ kN} = 165300 \text{ kg}$$

$$q_{2.OG} = 453 \text{ m}^2 * 2.3 \text{ kN/m}^2 = 1042 \text{ kN} = 104200 \text{ kg}$$

### 3. Haus F - Bauwerkssteifigkeit

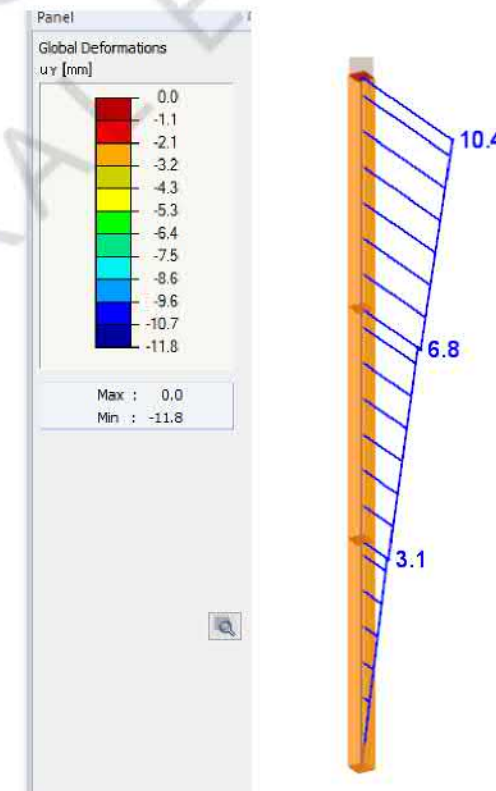
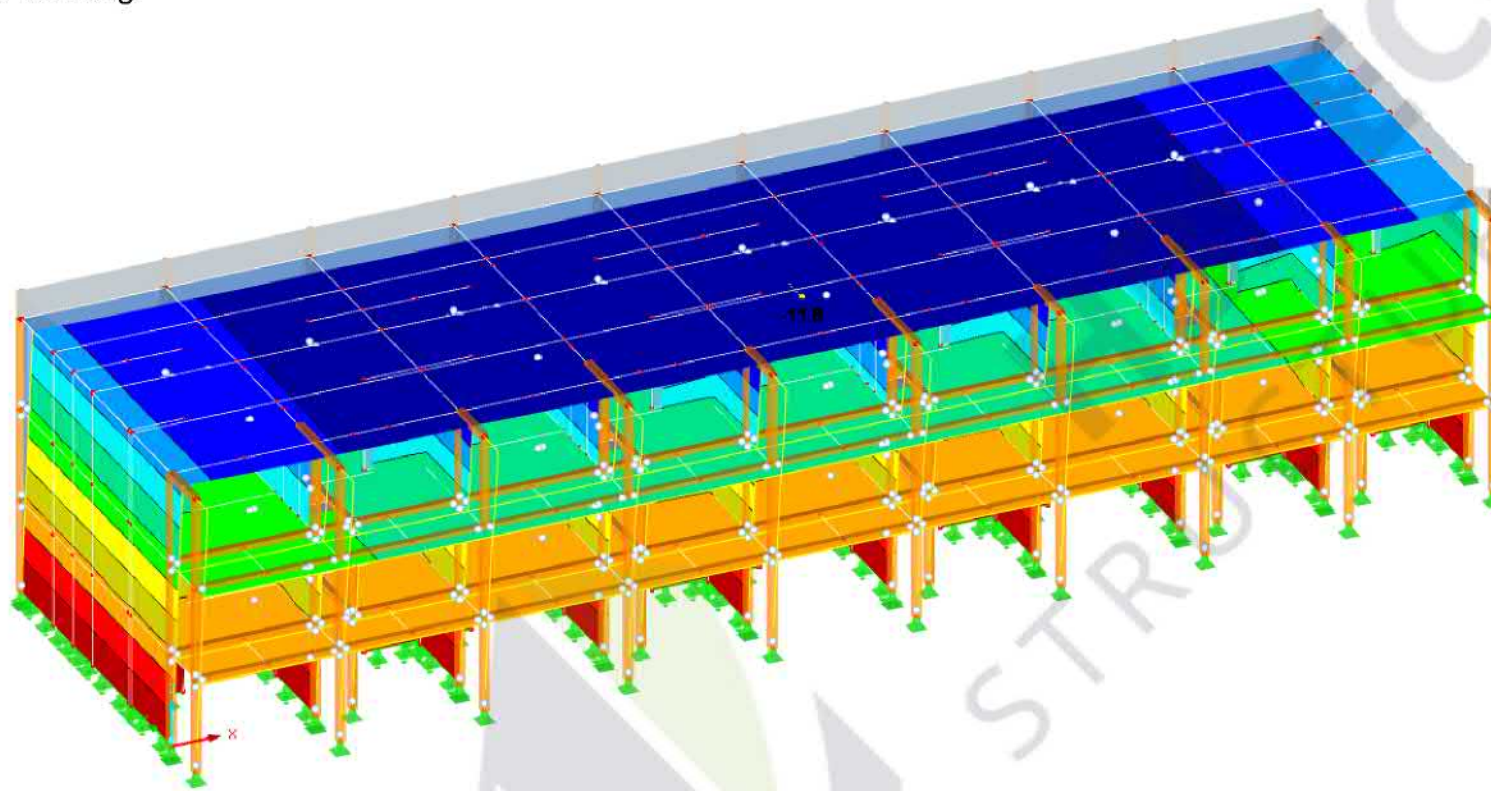
X Richtung



$$f_{x} = 3 \text{ kN/m}^2 \cdot 453 \text{ m}^2 = 1359 \text{ kN}$$
$$F_{x} = 1359 \text{ kN}$$
$$U_x = 20.6 \text{ mm} = 0.0206 \text{ m}$$
$$k_x = F_x / u_x = 1359 / 0.0206 = 65971 \text{ kN/m}$$

**$k_x = 65971 \text{ kN/m}$**

Y Richtung



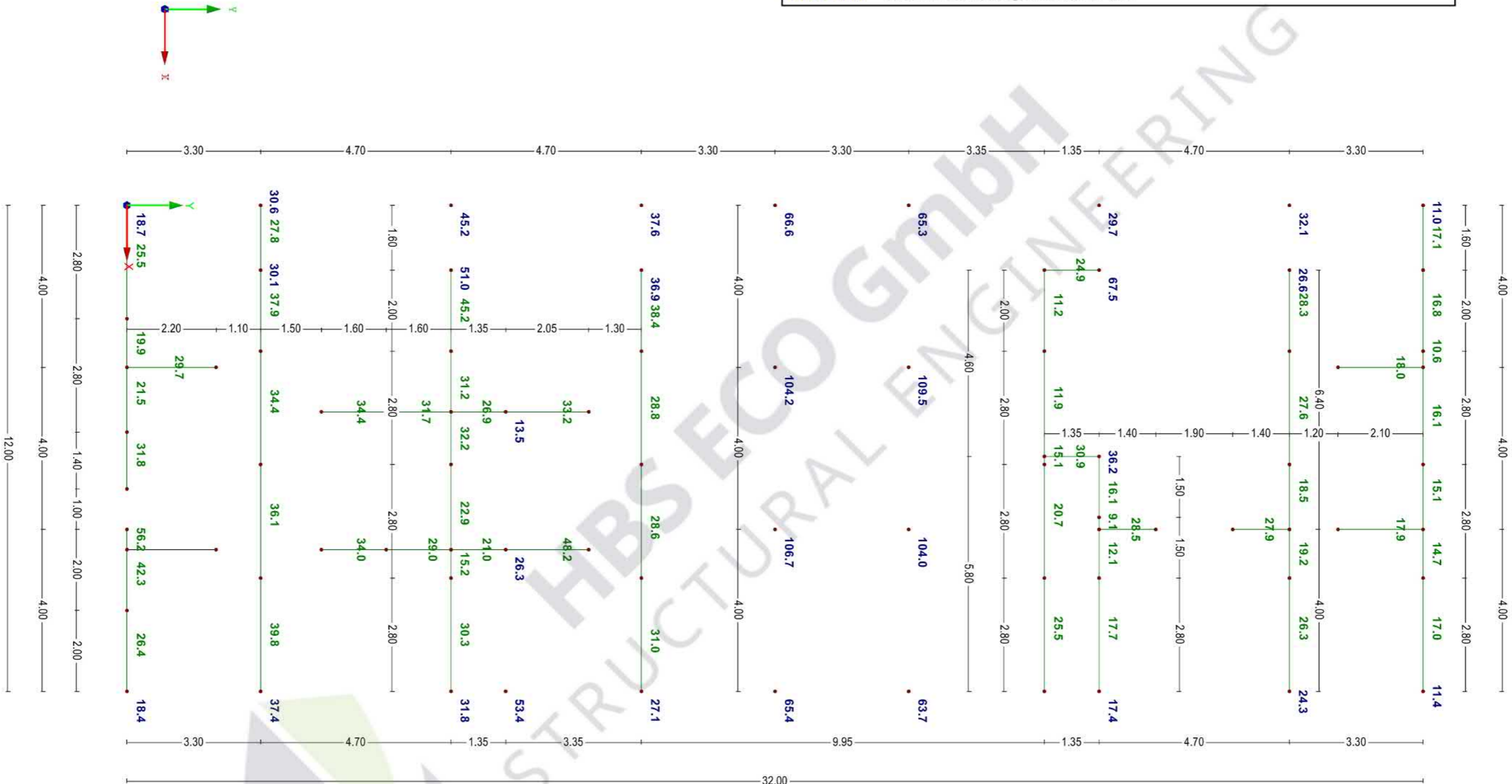
$$f_{y} = 3 \text{ kN/m}^2 \cdot 453 \text{ m}^2 = 1359 \text{ kN}$$
$$F_{y} = 1359 \text{ kN}$$
$$U_y = 10.40 \text{ mm} = 0.01040 \text{ m}$$
$$k_y = F_y / u_y = 1359 / 0.0104 = 130673 \text{ kN/m}$$

**$k_y = 130673 \text{ kN/m}$**

LAGERREAKTIONEN

LF1 : G  
Lagerreaktionen[kN], [kN/m]

Grüne Werte – stellen angenäherte, konstant verteilte Werte aus den Linienauflagerreaktionen dar.  
Blaue Werte – stellen Knotenaullagerreaktionen dar.



Max P-Z: -11.0, Min P-Z: -109.5 kN  
Max p-z: -9.1, Min p-z: -56.2 kN/m

2.102 m

Entgegen der Z-Richtung



