

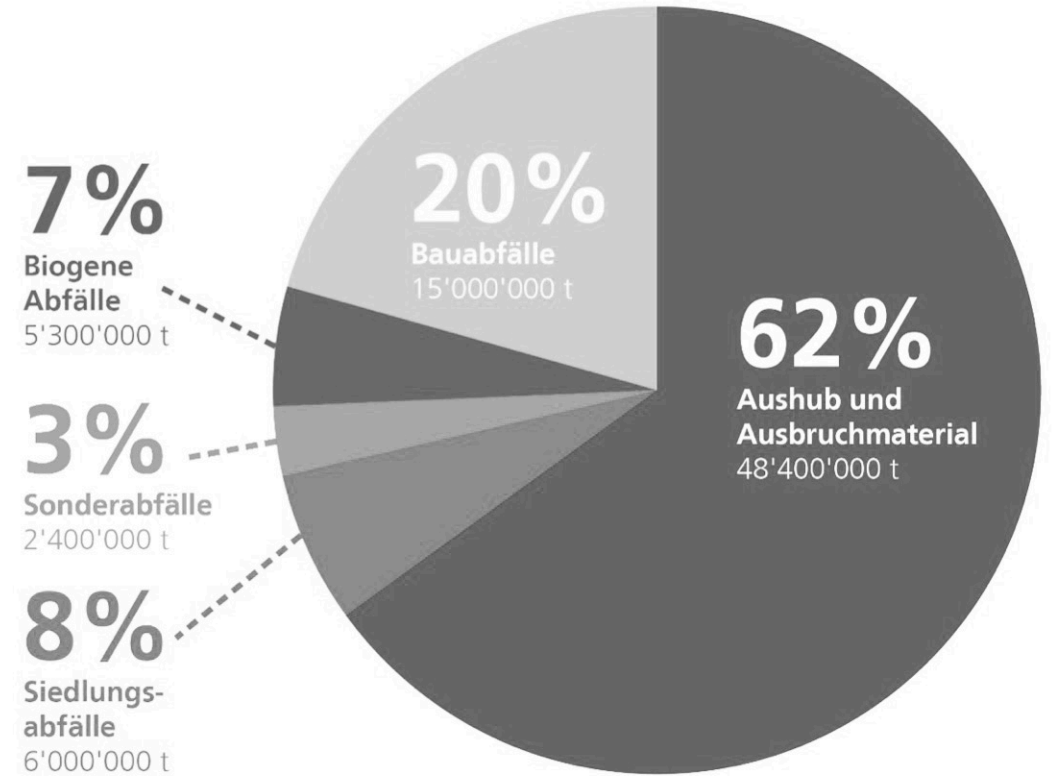
20  
BETON  
30

## Re-Use Concrete!

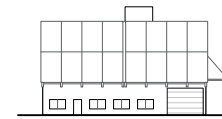
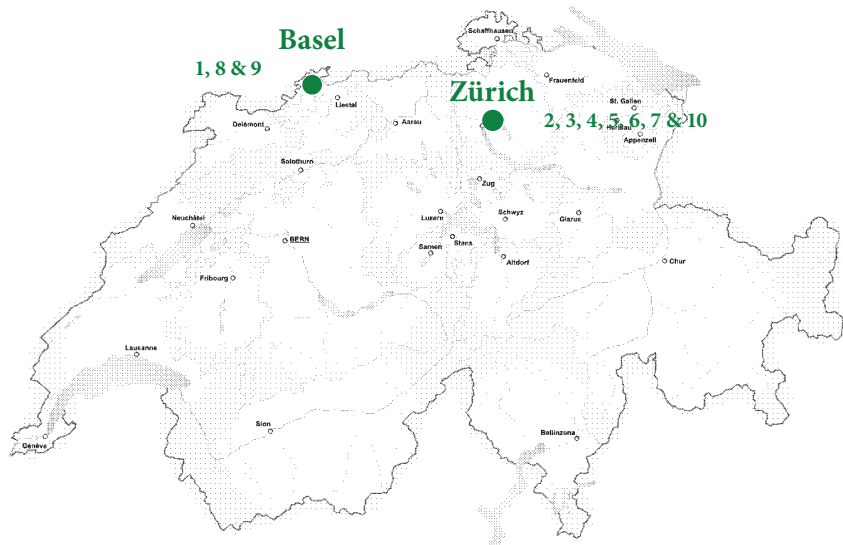
Neue Kreisläufe für bestehende Betonstrukturen

*New circular strategies for reusing in-situ cast concrete structures*

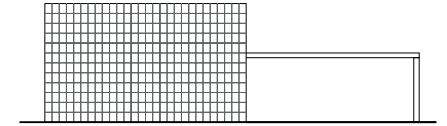
Adrian Kiesel



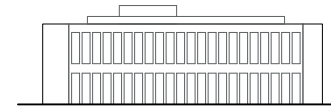
Stand: Januar 2017  
Quelle: BAFU 2017



Gewerbegebäude Erlenmatt Ost  
Basel 1



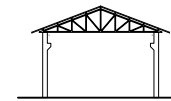
Maag Hallen  
Zürich 2



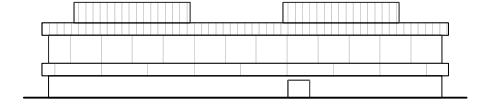
Zürich Versicherung Binz  
Zürich 3



Gewerbehalle Manegg  
Zürich 4



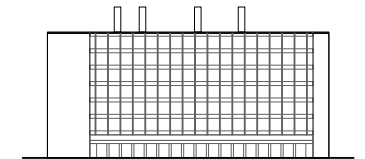
Lagerhalle Kochareal,  
Zürich 5



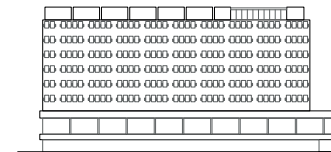
Schwimmbad Oerlikon,  
Zürich 6



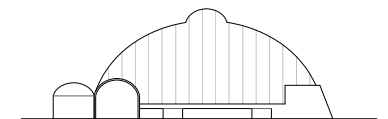
Gewerbehallen Wallisellen,  
Zürich 7



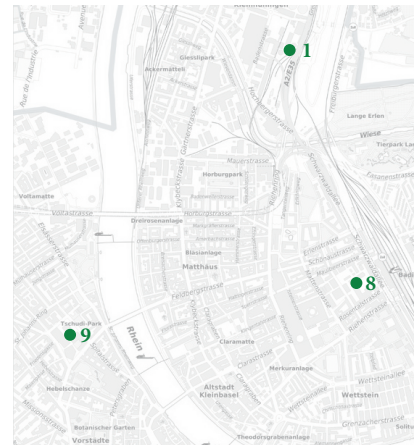
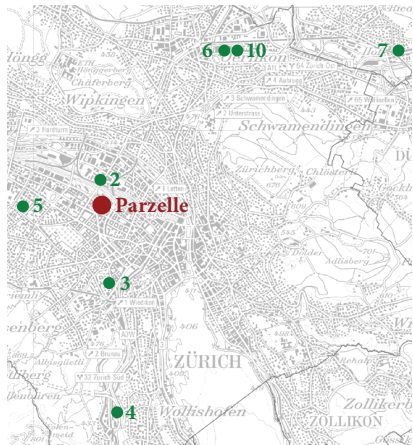
Laborgebäude Haus 6 Rosental  
Basel 8

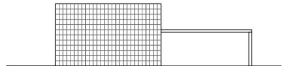
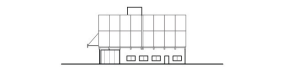





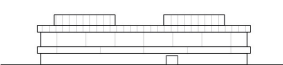

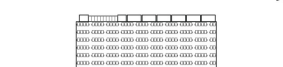


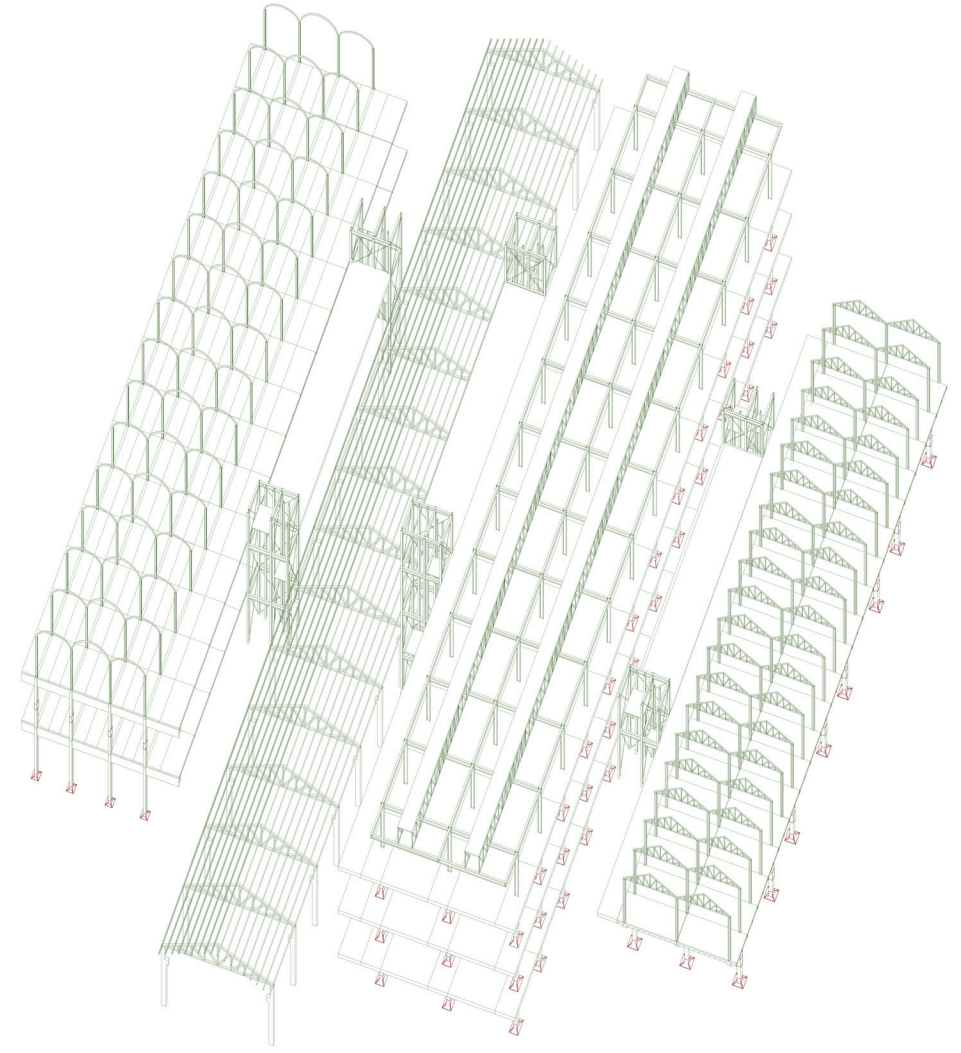
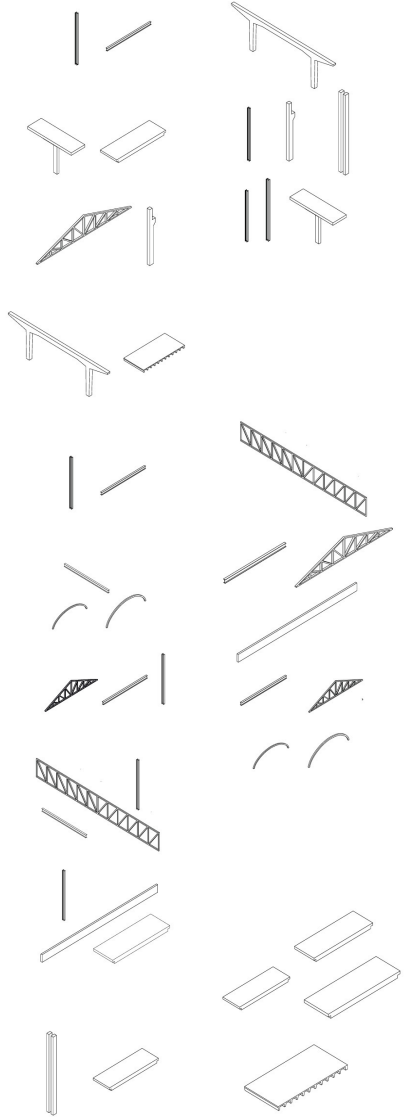
Laborgebäude Universität Basel,  
Basel 9



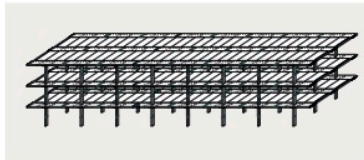
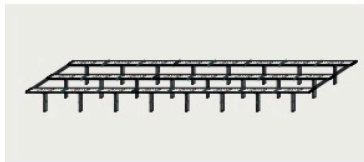
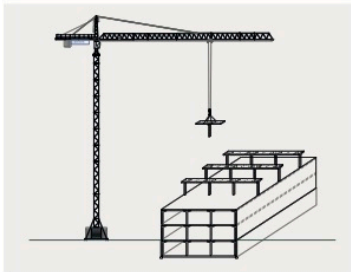
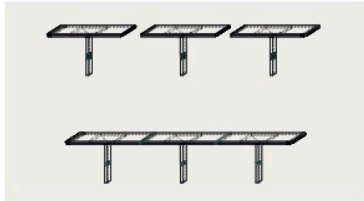
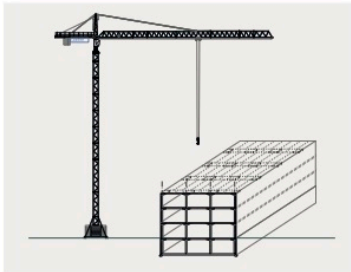
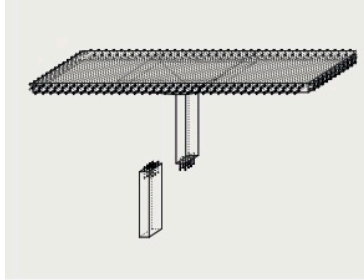
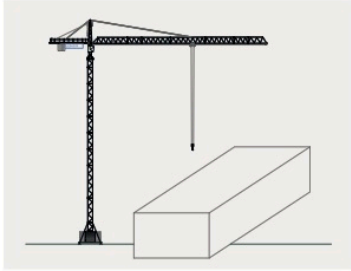
Kunstseilbahn Oerlikon  
Zürich 10



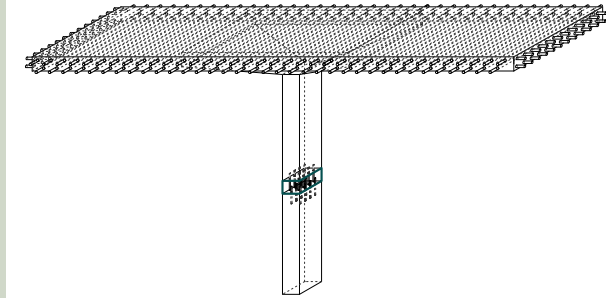
- 1  Maag Hallen, Zürich
- 2  Gewerbegebäude Erlenmatt Ost, Basel
- 3  Lagerhalle Kochareal, Zürich
- 4  Gewerbehalle Manegg, Zürich
- 5  Zürich Versicherung Binz, Zürich
- 6  Kunstseilbahn Oerlikon, Zürich
- 7  Gewerbehallen Wallisellen, Zürich
- 8  Schwimmbad Oerlikon, Zürich
- 9  Laborgebäude Haus 6 Rosental Mitte, Basel
- 10  Laborgebäude Universität, Basel







### Betontragwerk Erlenmatt Ost, Basel

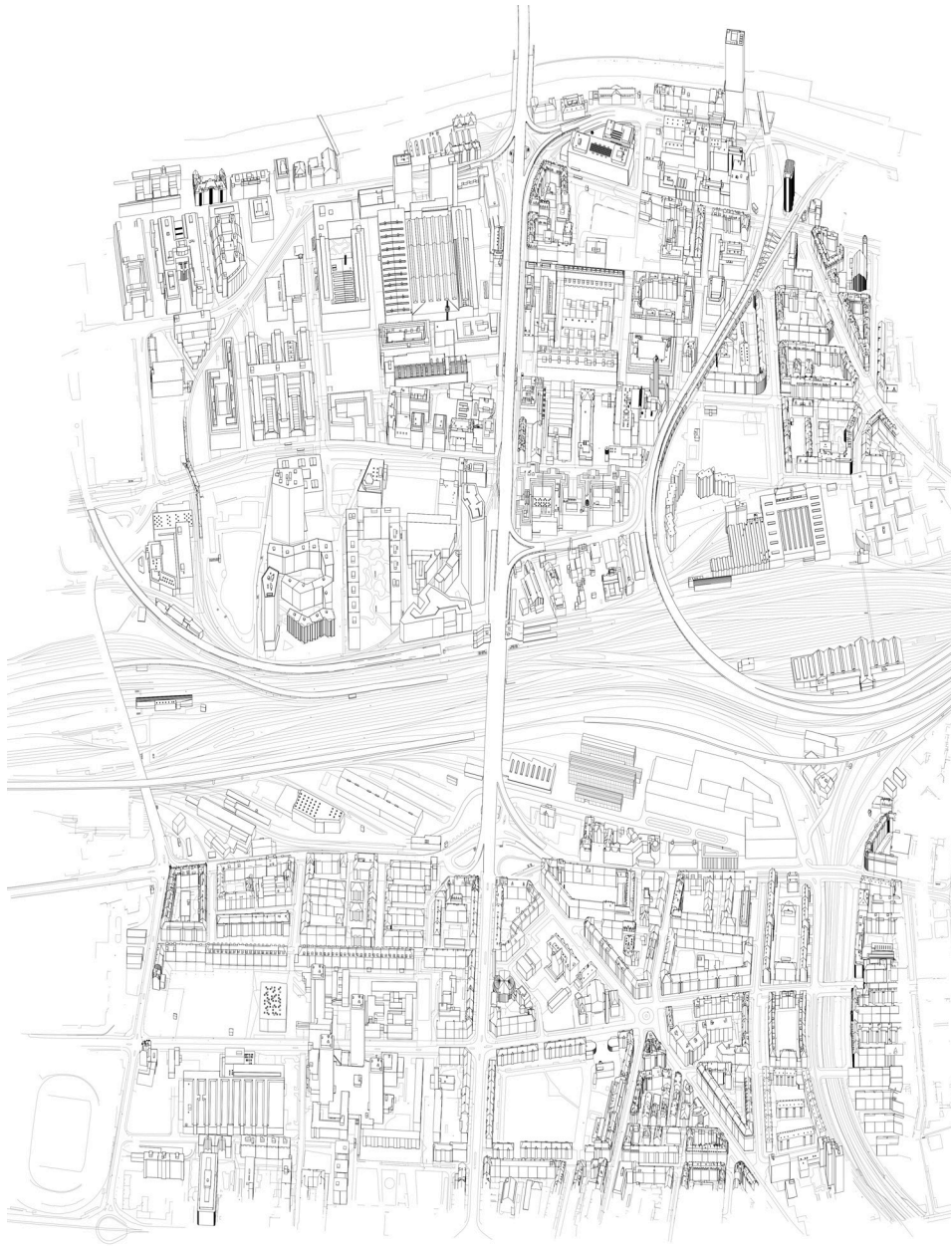


Stahlbetondecke: 9,86 m<sup>2</sup>    Stahlbetonstütze: 2,1 m<sup>3</sup>    Volumen ges.: 11,96 m<sup>3</sup>    Stahlbeton: 350 kgCO<sub>2</sub>eq./m<sup>3</sup>  
Bauteil\_Neu: 4186 kgCO<sub>2</sub>eq./Stk.    Bauteil\_ReUse: 204,71 kgCO<sub>2</sub>eq./Stk.    Ersparnis: 3981,29 kgCO<sub>2</sub>eq./Stk.

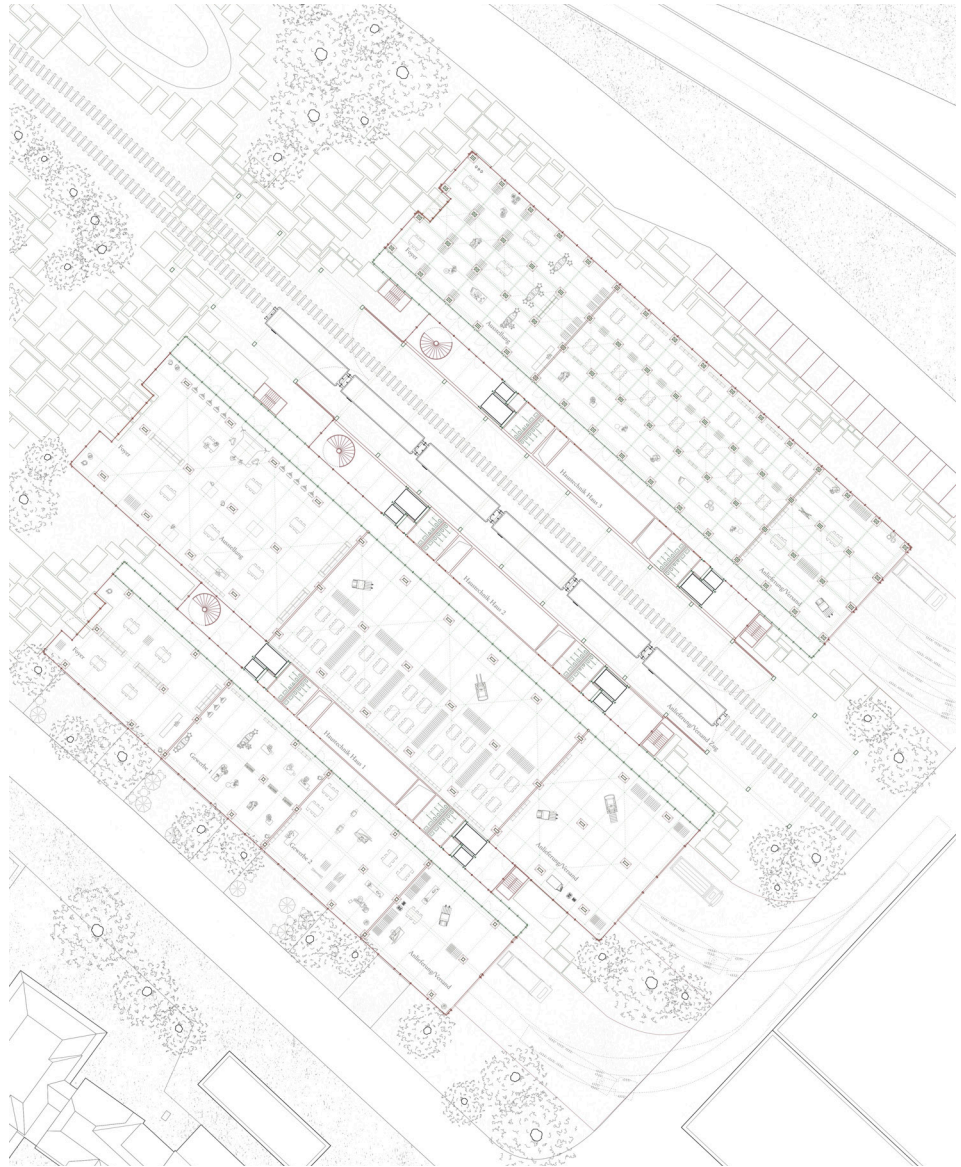
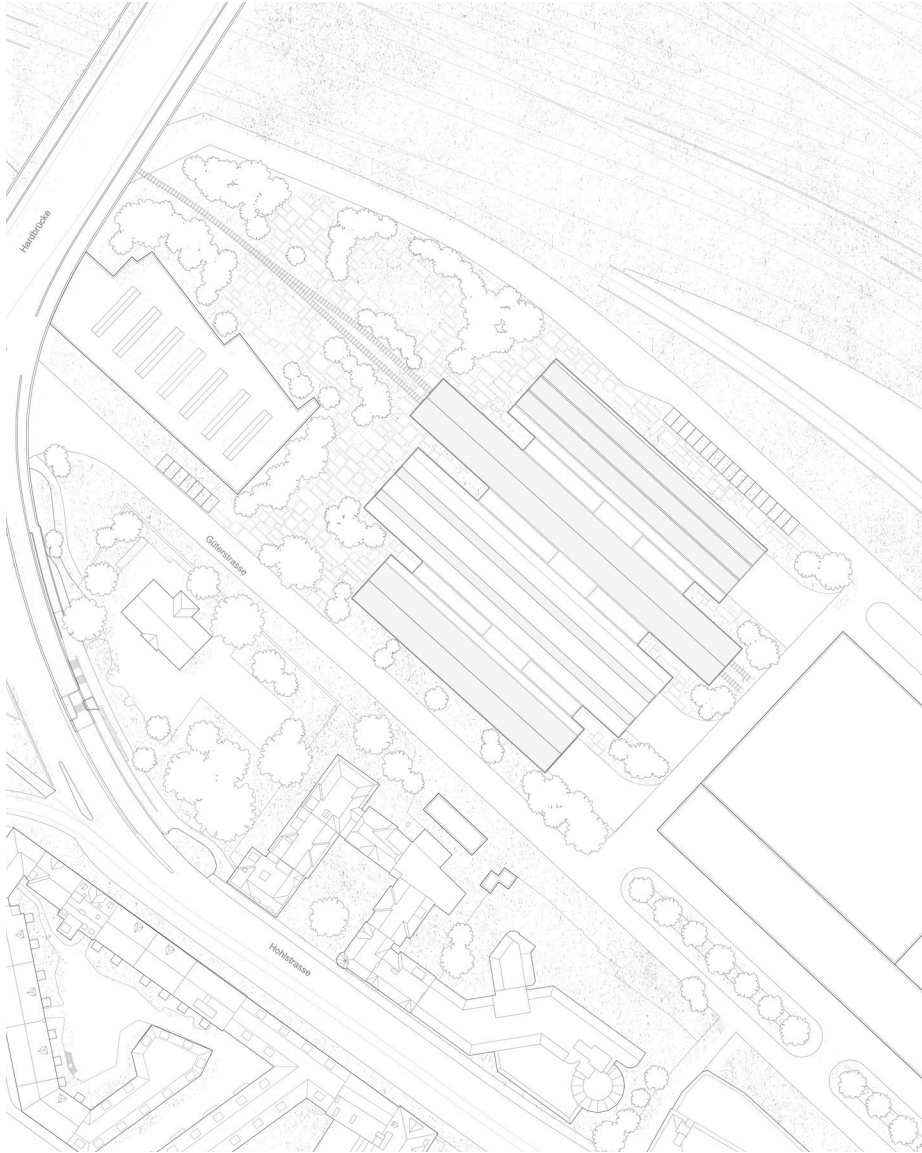
### Treibhausgasemissionen

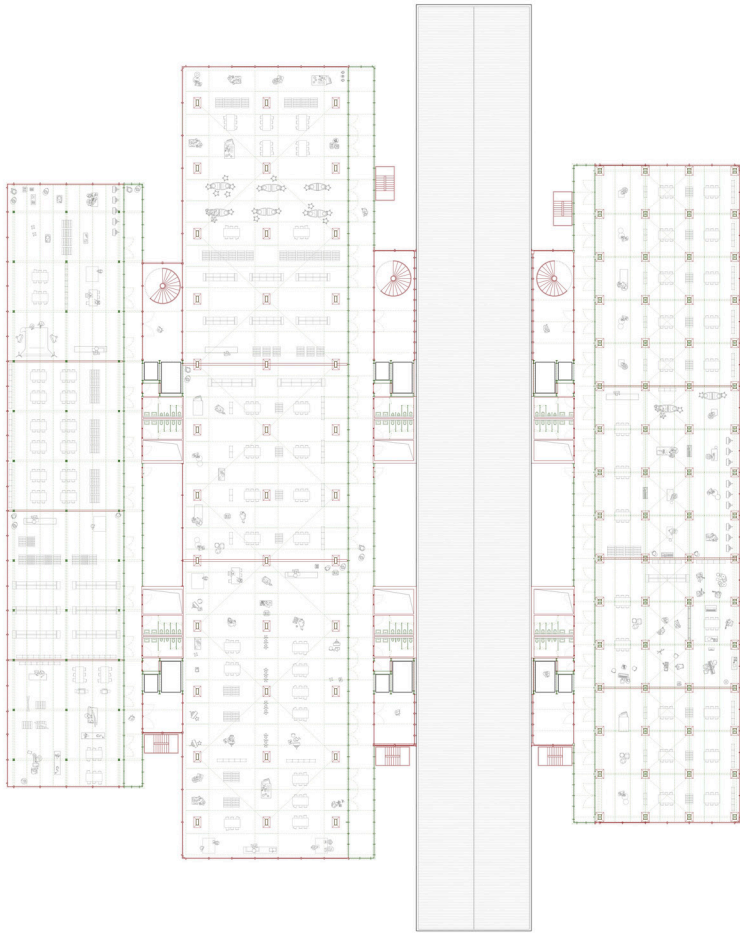
Hydroschneider	Transport	Wasser
Fläche: 10 m <sup>2</sup>	Strecke: 120 km	Verbrauch: 8-22 l/min
Tiefe: 0,05 m	Kraftstoff: Diesel	1 l Wasser: 0,35g CO <sub>2</sub> eq/dStk.
Dauer: 1 h	Verbrauch: 25 l/100 km	
Verbrauch: 160 kWh	1 kWh Diesel: 0,31 kgCO <sub>2</sub> -eq	Dauer: 28,56 h
1 m <sup>3</sup> - 20h Laufzeit	1 Liter Diesel: 6,50 kWh	Verbrauch ges: 25704 l Wasser
Betonplatte: 1,27 m <sup>3</sup>		
Betonstütze: 0,06 m <sup>3</sup> 1,43 m <sup>3</sup>		
1 kWh: 0,0296 kgCO <sub>2</sub> eq.		
Schneiden: 28,56 h	30l * 6,50kWh * 0,31kgCO <sub>2</sub> eq.	25704l * 0,00035kgCO <sub>2</sub> eq.
	135,26 kg CO <sub>2</sub> eq./Stk.	60,45 kg CO <sub>2</sub> eq/dStk.
		9,00 kg CO <sub>2</sub> eq/dStk.

204,71 kg CO<sub>2</sub>eq./Stk.

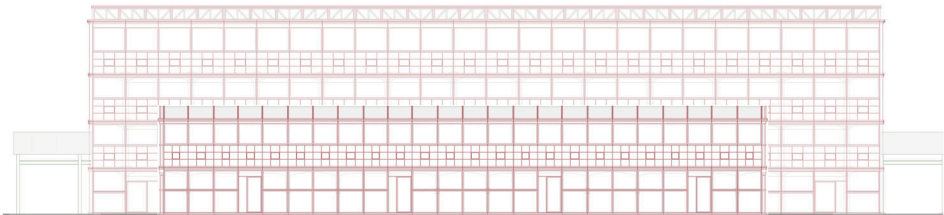
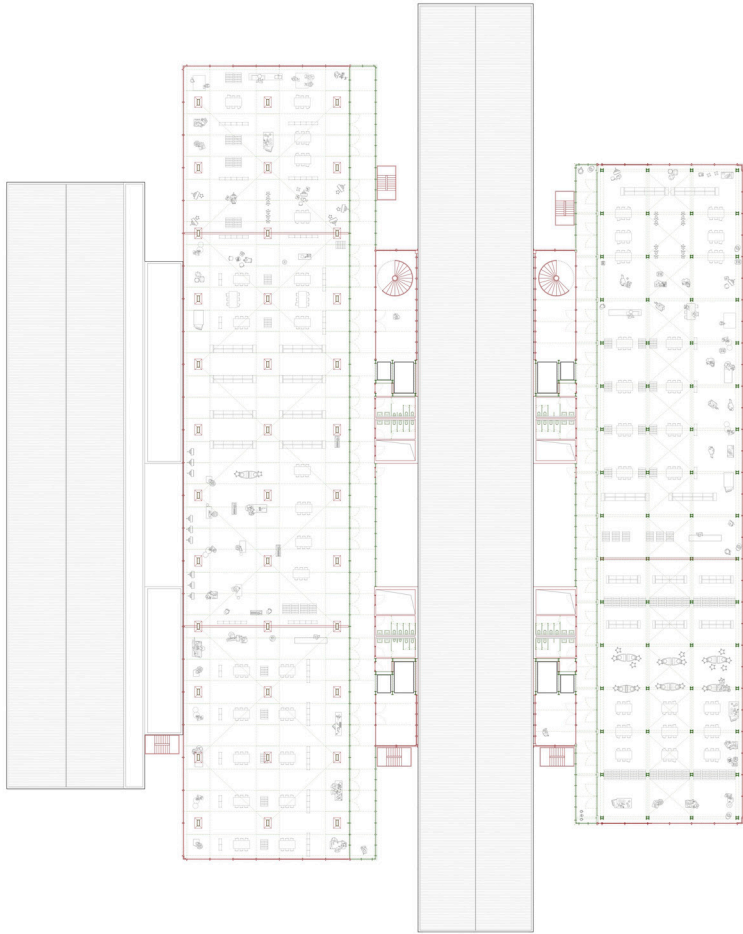


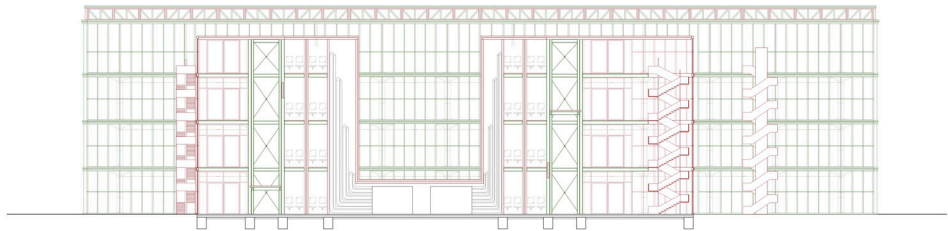




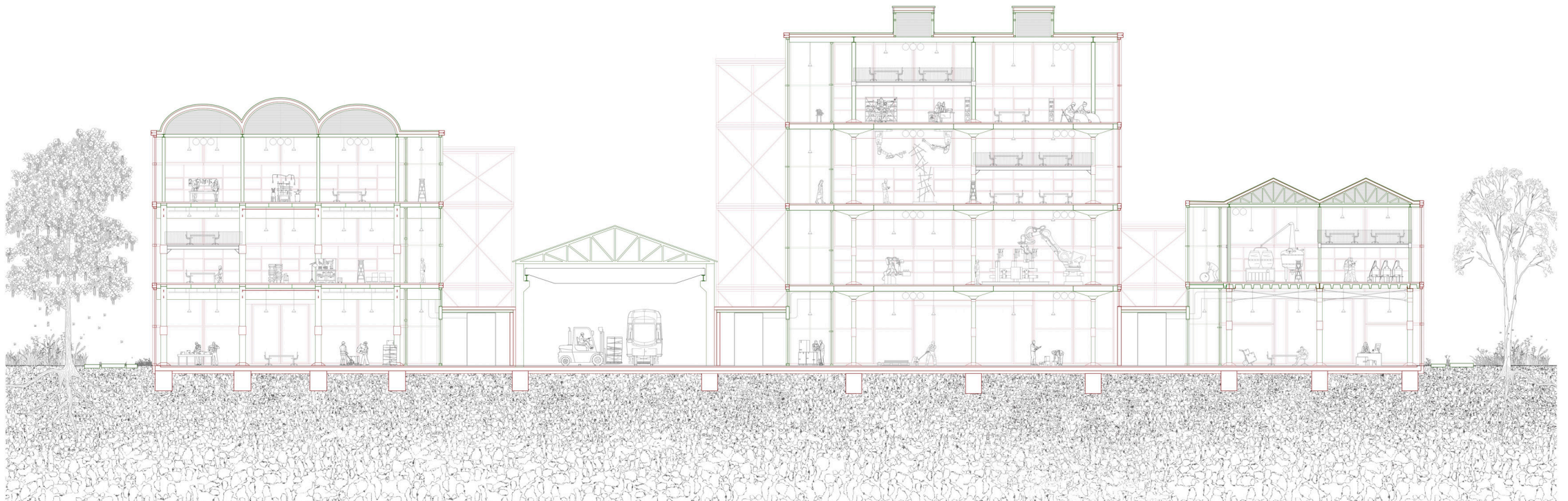


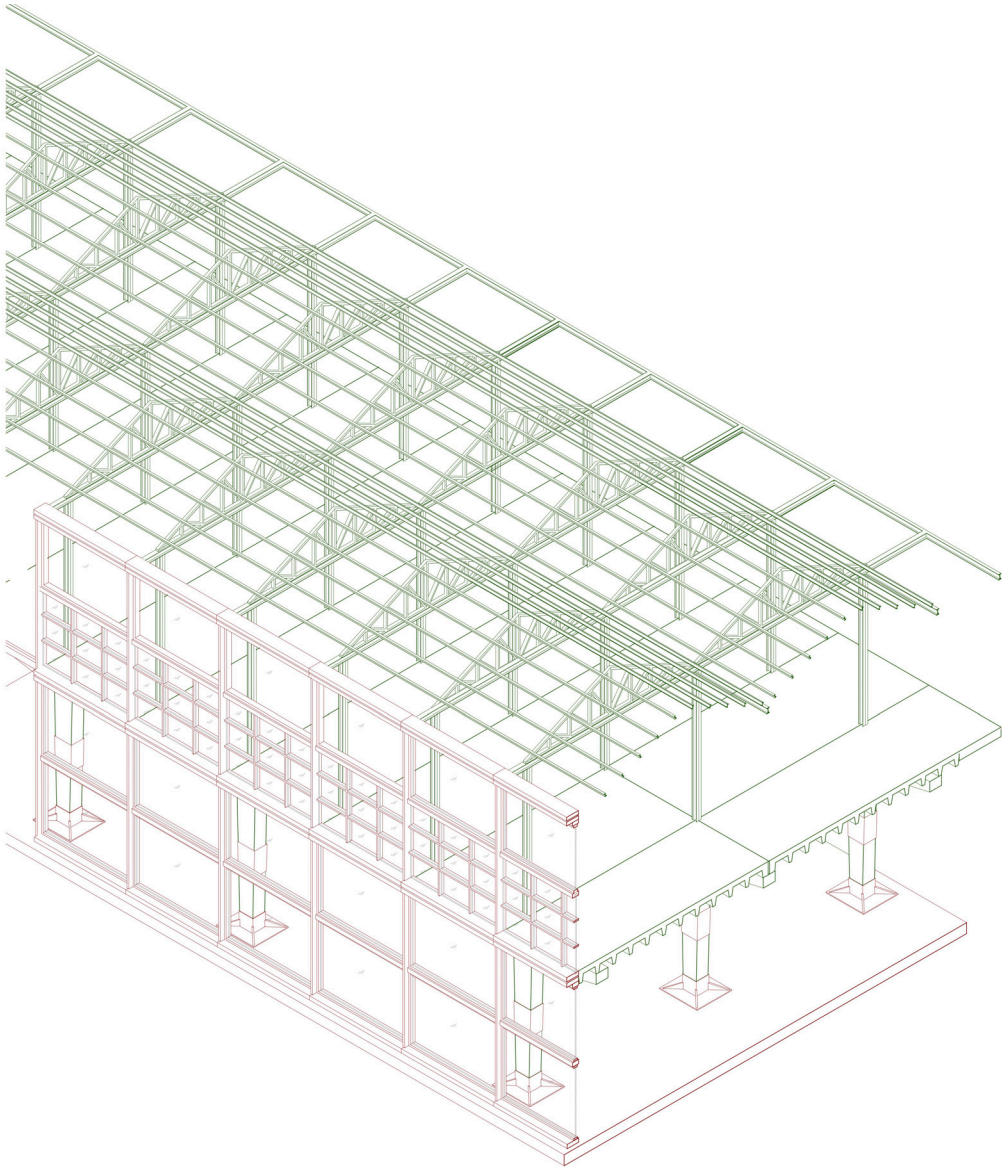




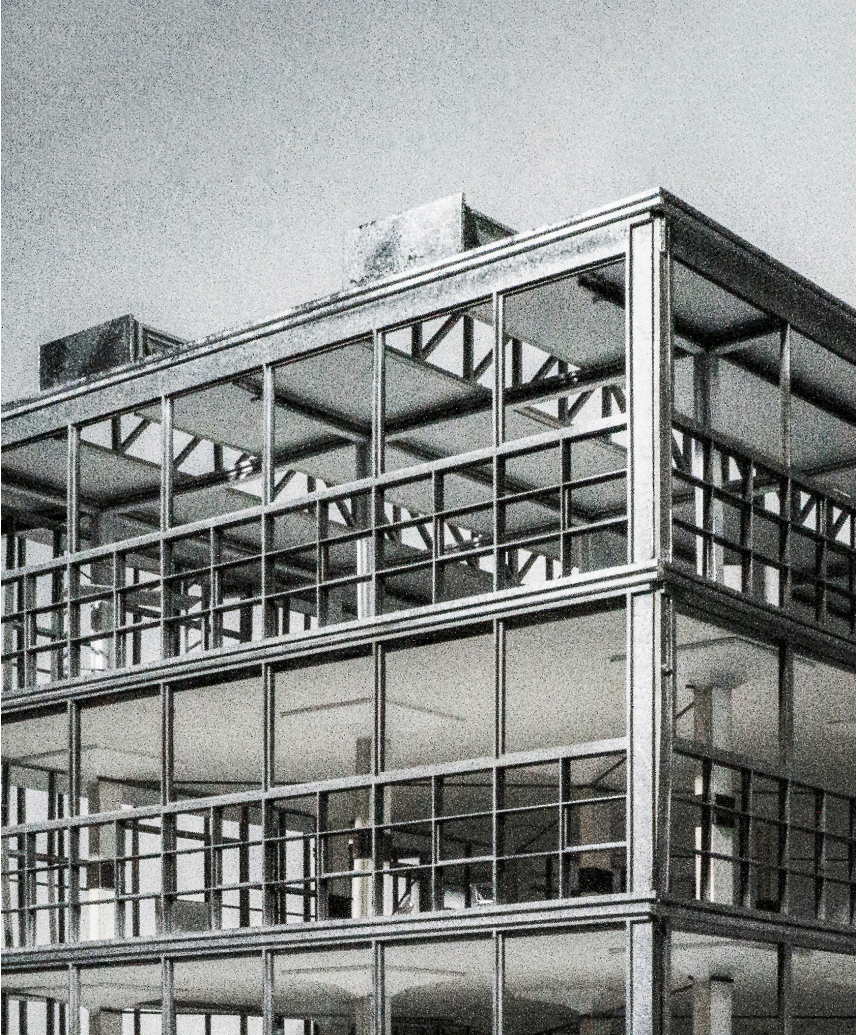
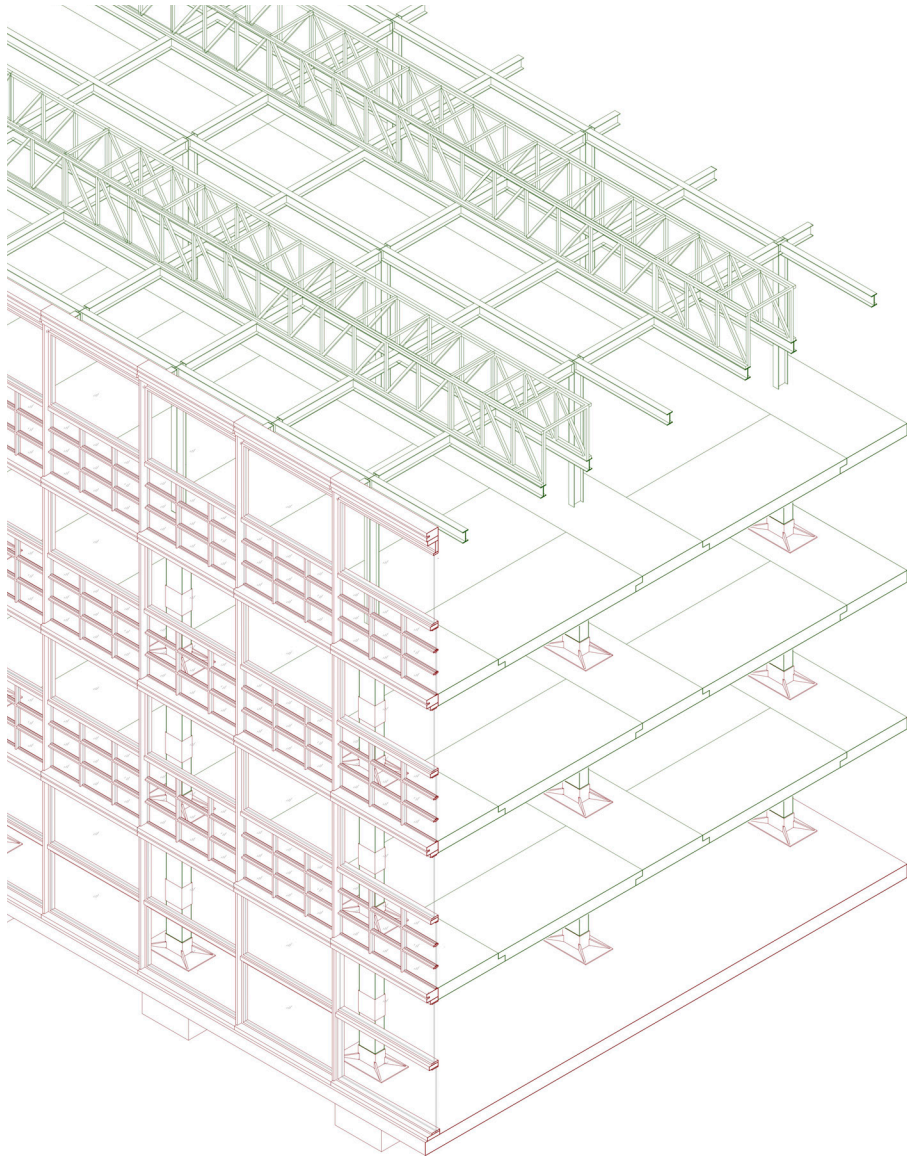




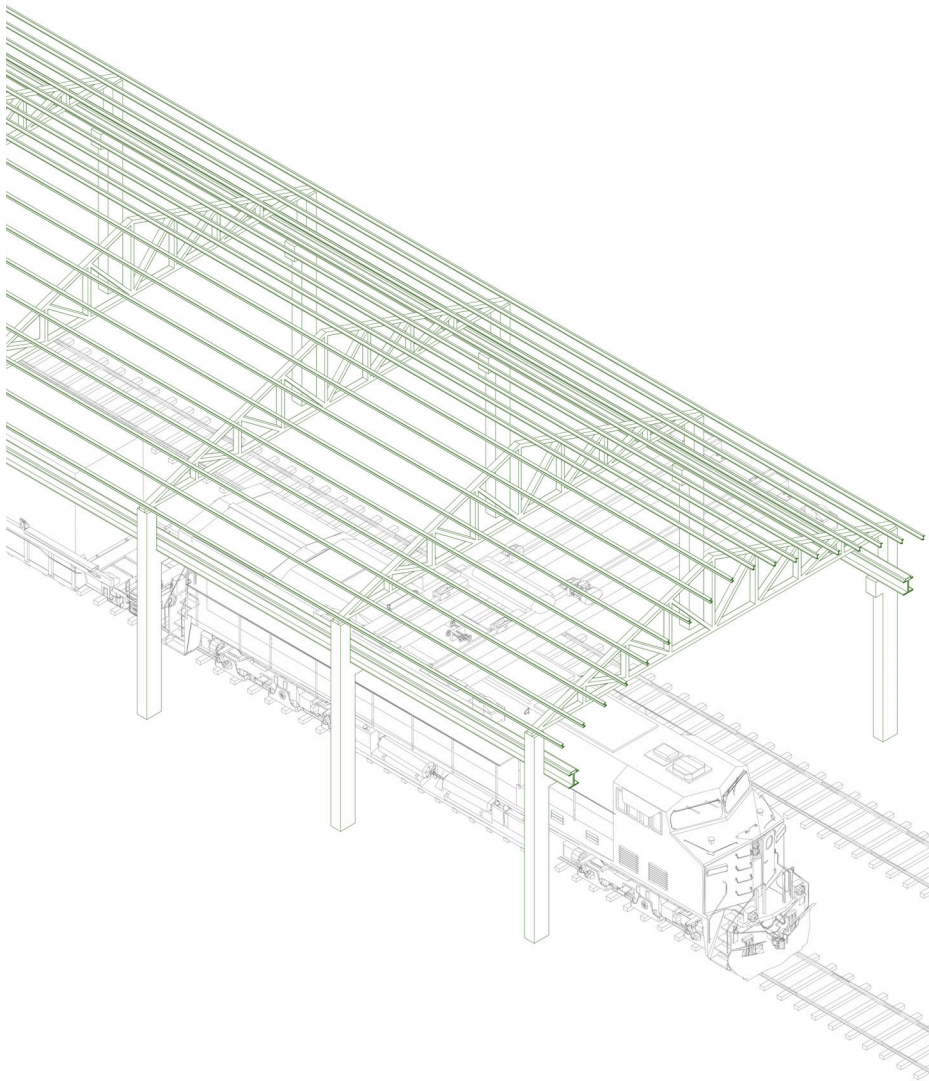




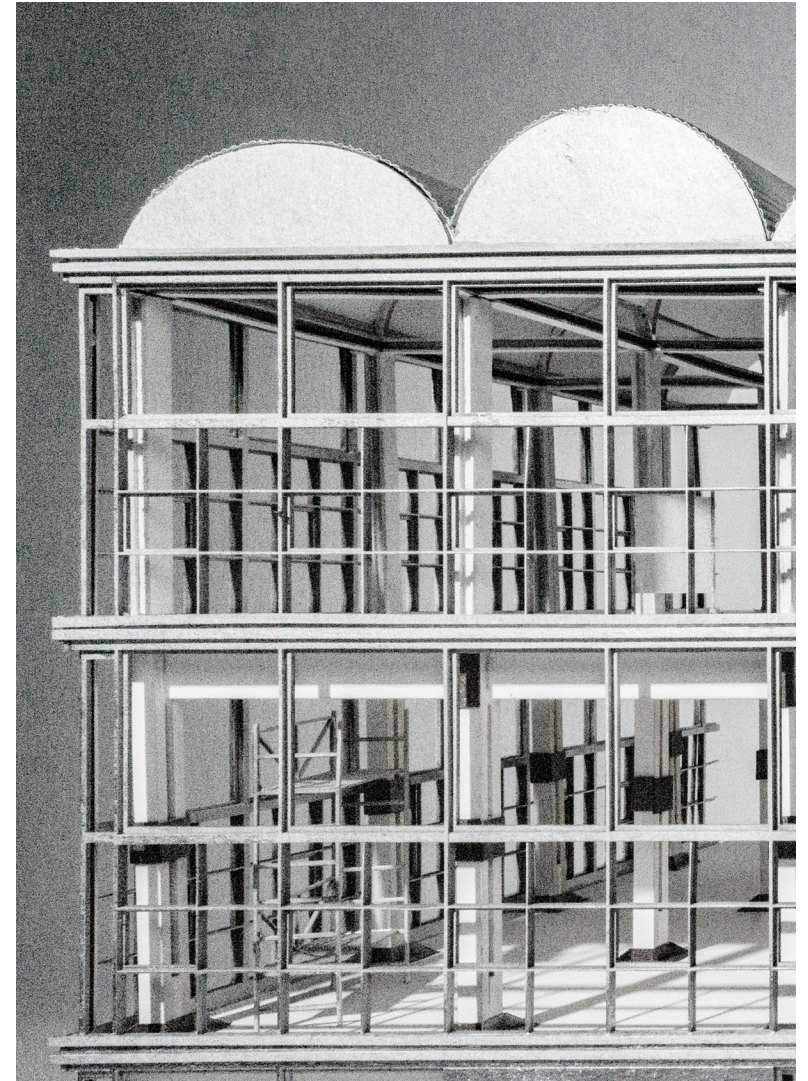
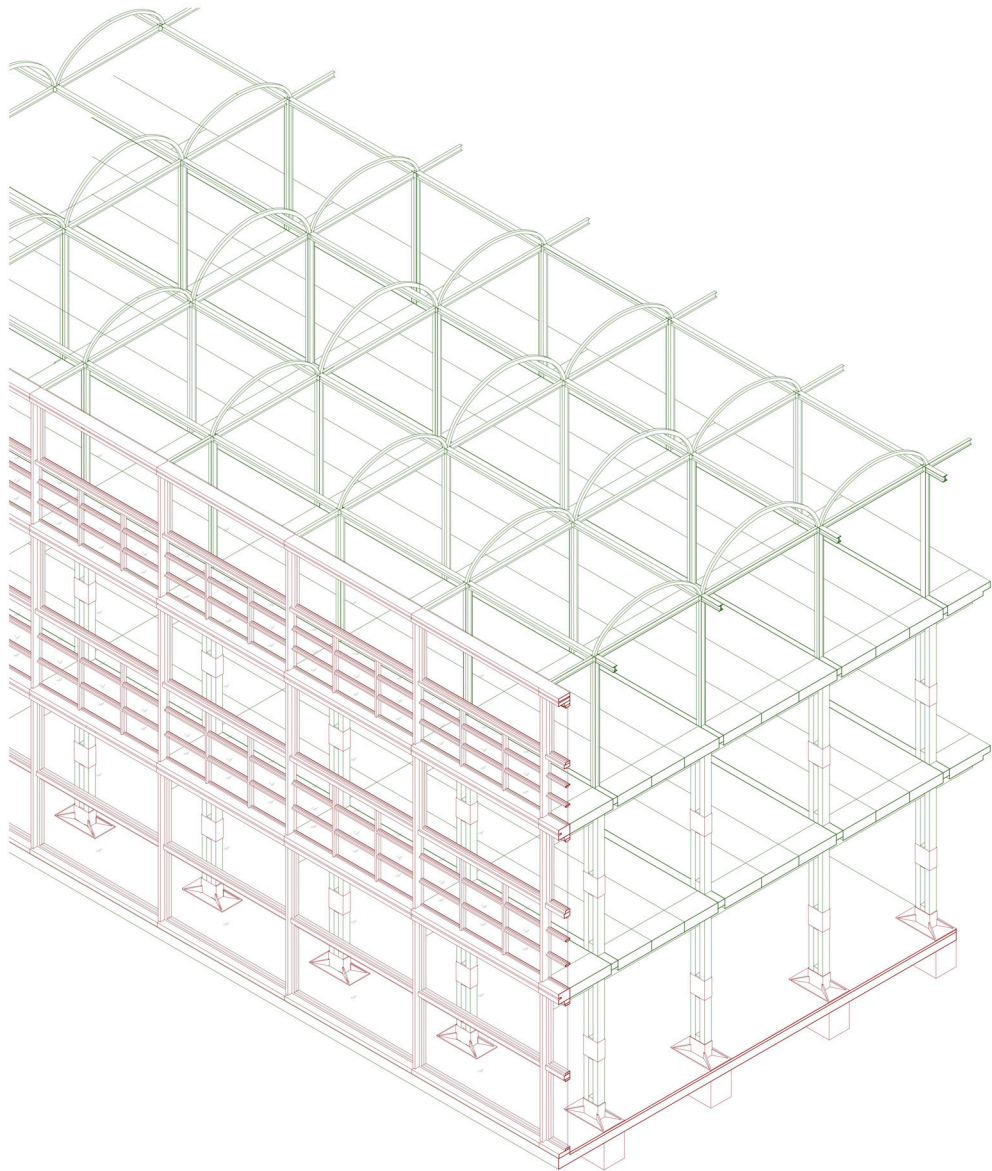




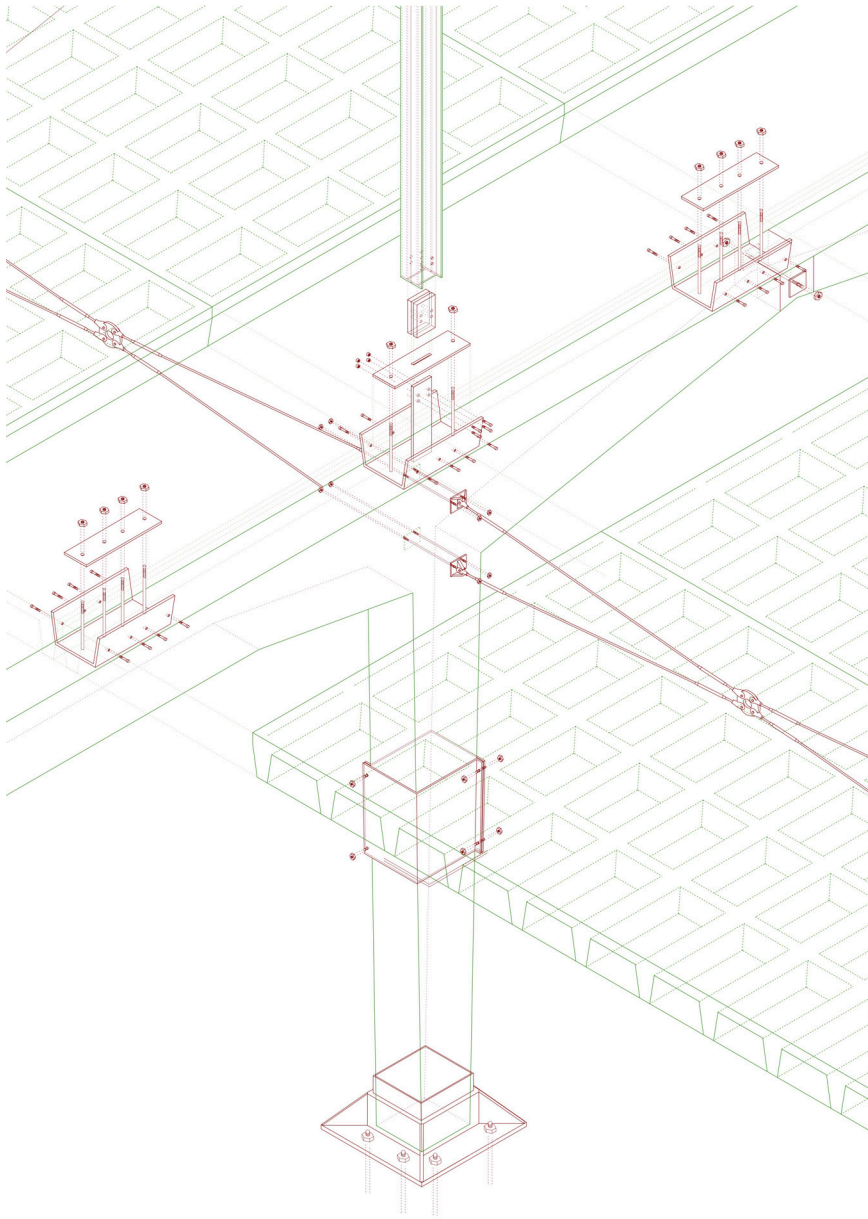




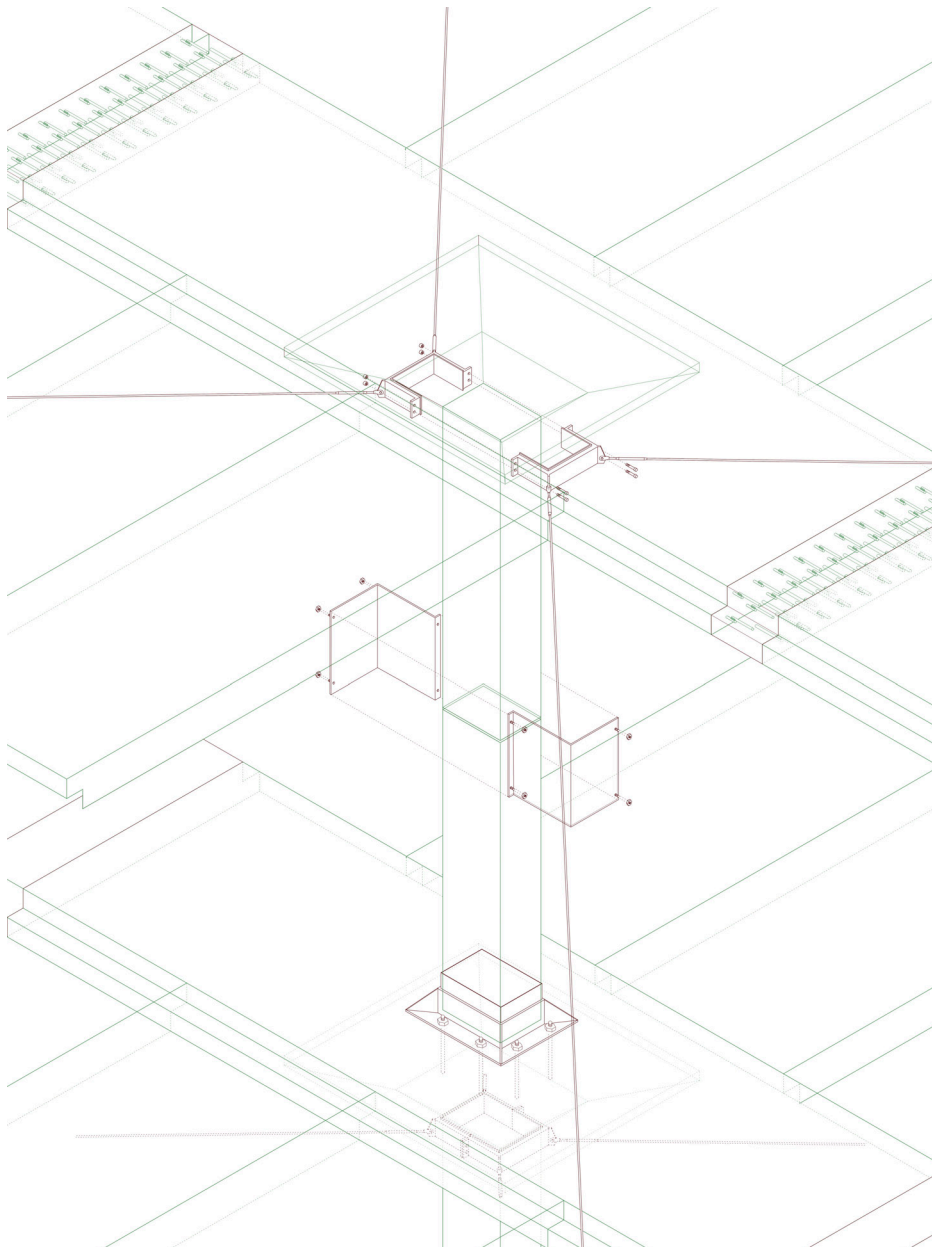


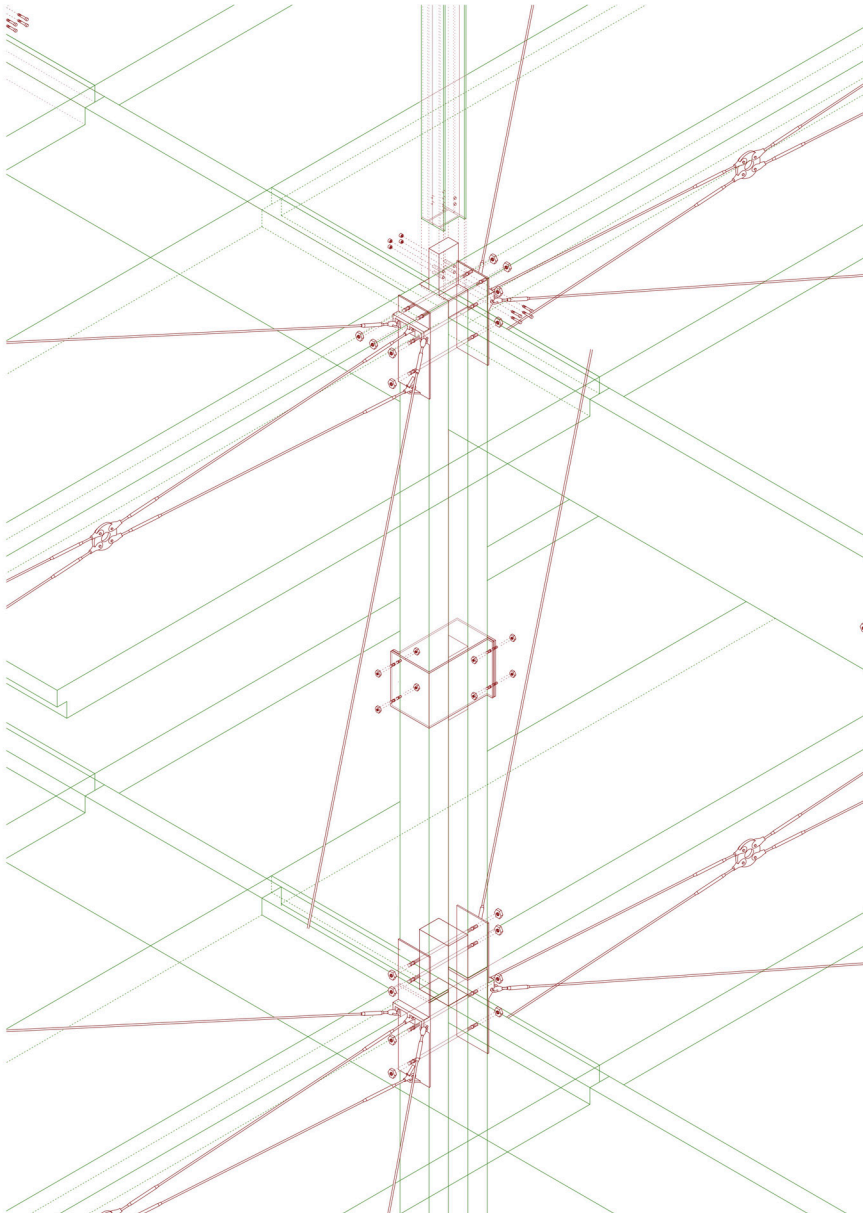




























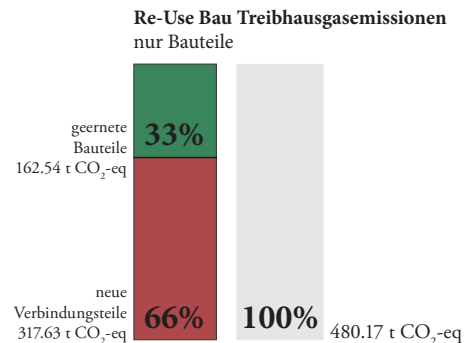
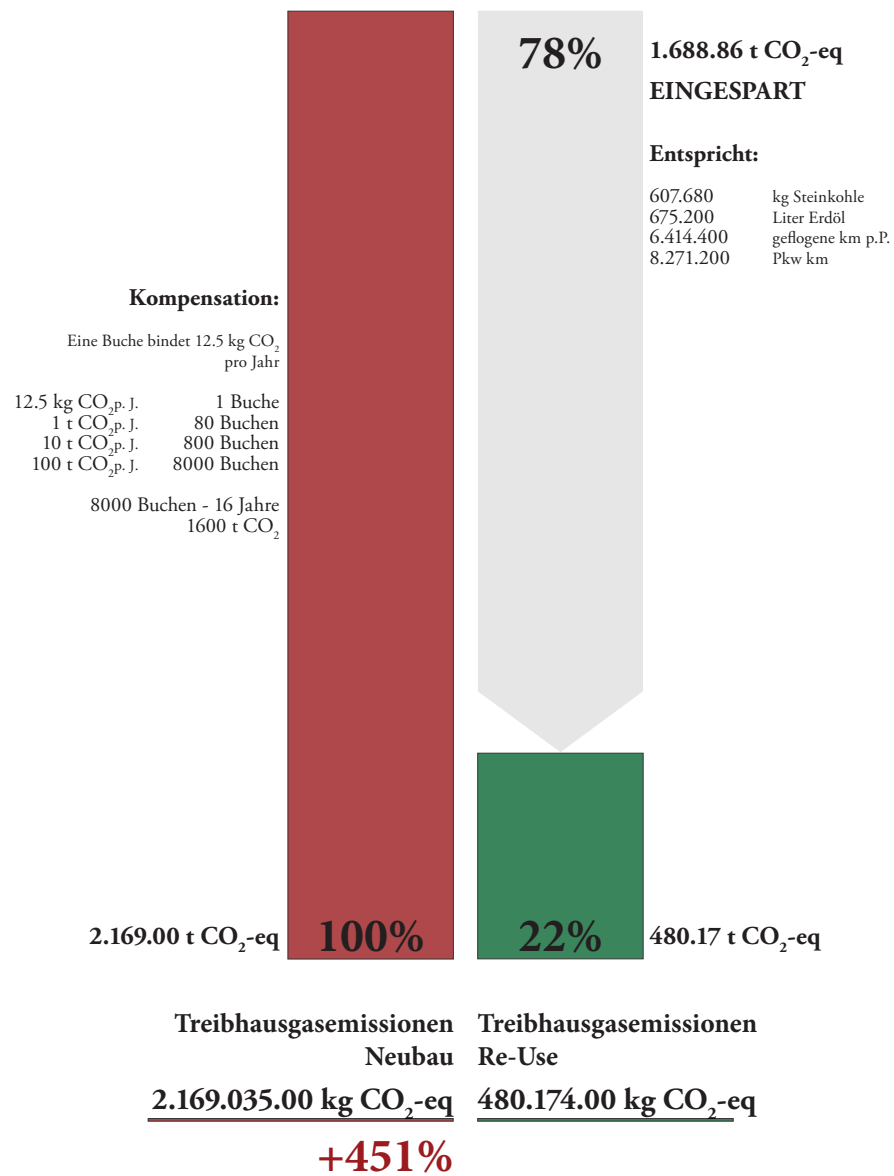




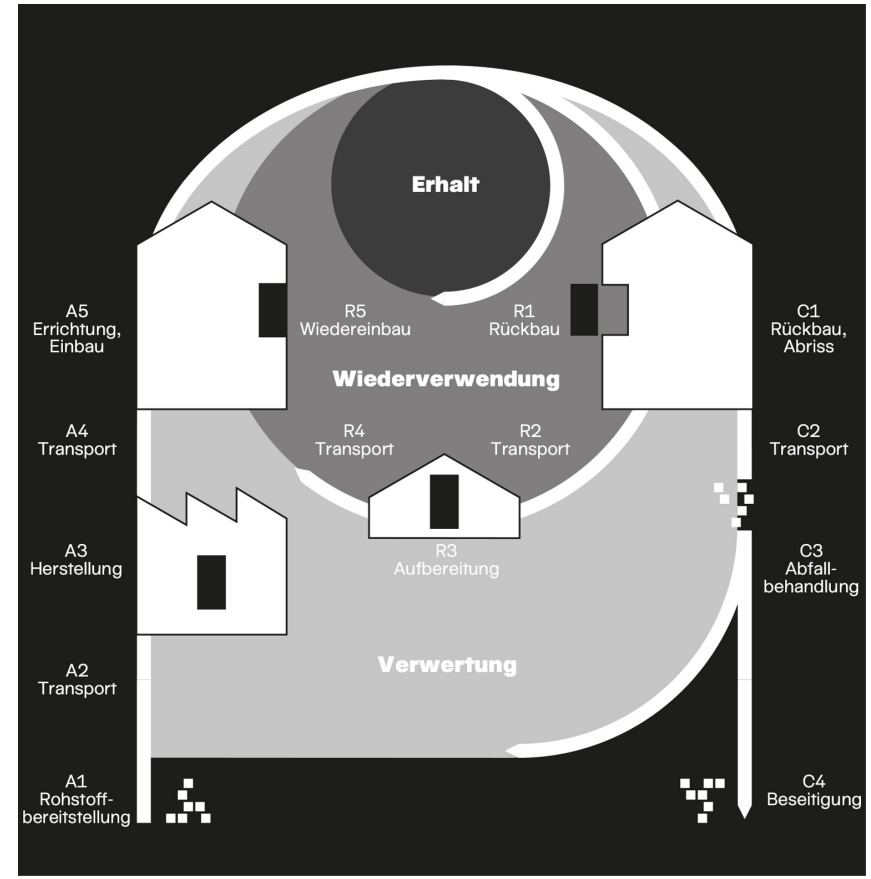
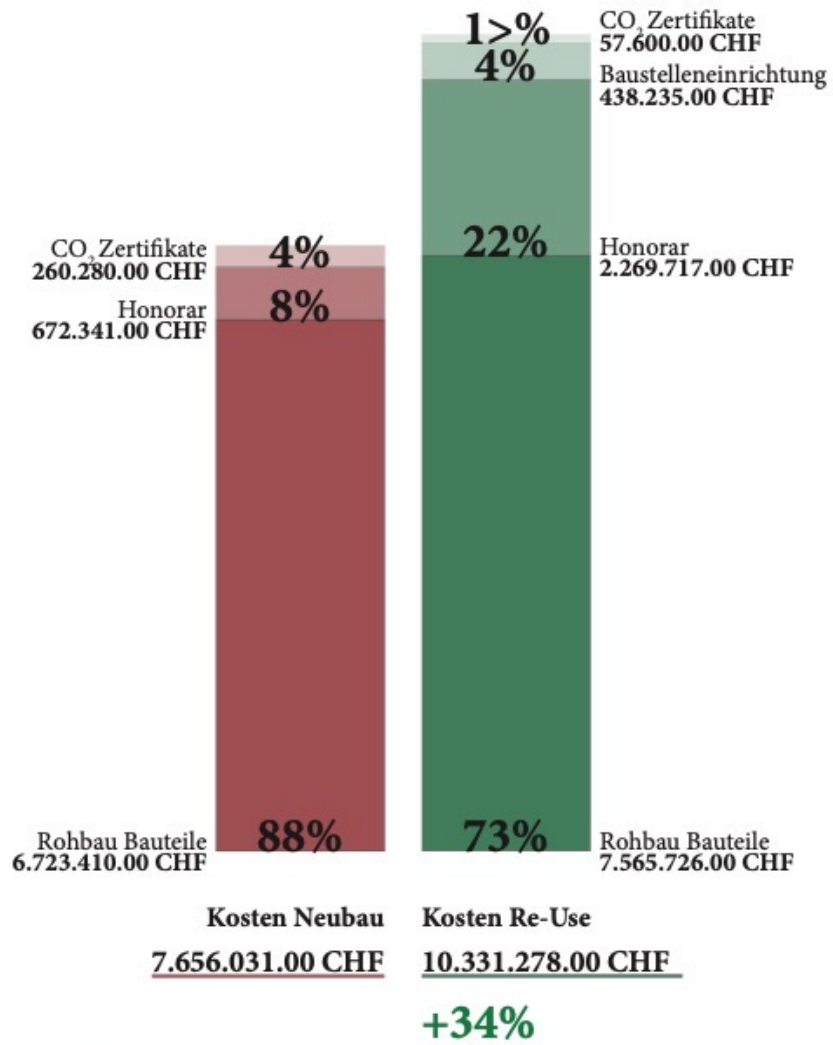
	Pilzstütze	Deckenelement	Deckenelement	Stahlstütze	Stahlstütze
					
Emissionen <small>in kg CO<sub>2</sub>-eq</small>	37 T CO <sub>2</sub> - eq	19 T CO <sub>2</sub> - eq	37 T CO <sub>2</sub> - eq	1.2 T CO <sub>2</sub> - eq	1.3 T CO <sub>2</sub> - eq
Kosten <small>in CHF</small>	852.720.00 CHF	831.600.00 CHF	1.566.000.00 CHF	49.900.00 CHF	52.250.00 CHF
Gebäude					
Herkunft	Gewerbegebäude Erlenmatt Ost Basel	Gewerbegebäude Erlenmatt Ost Basel	Gewerbegebäude Erlenmatt Ost Basel	Zürich Versicherung Binz Zürich	Zürich Versicherung Binz Zürich
Transport <small>in km</small>	82	82	82	87	87
Material	Stahlbeton	Stahlbeton	Stahlbeton	Stahl	Stahl
Menge	108 Stk.	108 Stk.	216 Stk.	72 Stk.	72 Stk.
Abmessungen <small>in m</small>	8.5 x 2.9 x 0.4	6.0 x 3.0 x 0.4	6.0 x 2.75 x 0.4	0.2 x 0.1 x 5.5	0.25 x 0.15 x 5.5
Volumen <small>in m<sup>3</sup></small>	11.51	7.20	6.60	126 kg	135 kg
Reuse Emissionen <small>in kg CO<sub>2</sub>-eq</small>	336	176	175	17	18
Neubauanteil Emissionen <small>in kg CO<sub>2</sub>-eq</small>	4025	2520	2310	189	198
Reuse Kosten <small>in CHF</small>	9.895.00	7.700.00	7.250.00	693.00	726
Neubauanteil Kosten <small>in CHF</small>	10.835.50	4.500.00	4.125.00	630.00	660

	Stahlträger	Stahlträger	Fachwerkträger	Betonstütze	Betonrahmen
					
Emissionen <small>in kg CO<sub>2</sub>-eq</small>	0.7 T CO <sub>2</sub> - eq	3.0 T CO <sub>2</sub> - eq	5.9 T CO <sub>2</sub> - eq	0.2 T CO <sub>2</sub> - eq	0.2 T CO <sub>2</sub> - eq
Kosten <small>in CHF</small>	30.250.00 CHF	123.550.00 CHF	240.127.50 CHF	13.500.00 CHF	26.400.00 CHF
Gebäude					
Herkunft	Zürich Versicherung Binz Zürich	Maag Hallen Industriequartier Zürich	Lagerhalle Koch Areal Altstetten Zürich	Lagerhalle Koch Areal Altstetten Zürich	Gewerbehalle Manegg Zürich
Transport <small>in km</small>	2	2	3	3	6
Material	Stahl	Stahl	Stahl	Stahlbeton	Stahlbeton
Menge	24 Stk.	96 Stk.	17 Stk.	34 Stk.	12 Stk.
Abmessungen <small>in m</small>	5.4 x 0.15 x 0.3	5.4 x 0.09 x 0.18	13 x 0.1 x 2.8	0.6 x 0.4 x 7.5	25 x 0.4 x 6.0
Volumen <small>in m<sup>3</sup></small>	234 kg	234 kg	2575 kg	1.8	9.90
Reuse Emissionen <small>in kg CO<sub>2</sub>-eq</small>	32	32	350	7.2	35
Neubauanteil Emissionen <small>in kg CO<sub>2</sub>-eq</small>	351	351	3861	630	3465
Reuse Kosten <small>in CHF</small>	1287	1287	14157	397	2200
Neubauanteil Kosten <small>in CHF</small>	1170	1170	12870	6375	4675









Die Zuordnung der Phasen der zum Lebenszyklusmodell nach SN EN 15804+A1 / SIA 490. Wiederverwendung052+A1

