

Apartment houses Unterhub, Zollikerberg

2021



In the case of the apartment buildings on the lower right bank of Lake Zurich, the advantages of TS3 technology and timber construction are both noticeable and visible: the construction method allows flexible room division and timber ceilings that run from the inside to the outside without complex cantilever connections.

The project

The above-ground building is a timber structure consisting of timber columns and cross laminated timber panels connected with TS3 technology. Timber Structures 3.0 technology, or TS3 for short, is a process that allows large areas to be made of wood - without the joists that were previously common. TS3 connects glulam panels to each other via their end faces in a flexurally rigid manner. The floor slabs rest only on the columns, which are usually positioned in the exterior walls, and the staircase core. The rooms can thus be designed very flexibly. In the model on image 3, the columns, the few load-bearing walls and the TS3 joints can be seen. A total of 520 meters of TS3 joints were created.

The construction

The TS3 connection by means of joint grouting allows the construction of joist-free skeleton building structures made of wood with slender, point-supported slabs. By activating the secondary bearing direction, the same ceilings can be built with wood. Because of the low thermal conductivity of wood, there is no need for elaborate cantilever connections. The CLT panel can easily run from the interior to the exterior. The concrete stairwell braces the building.

The challenge

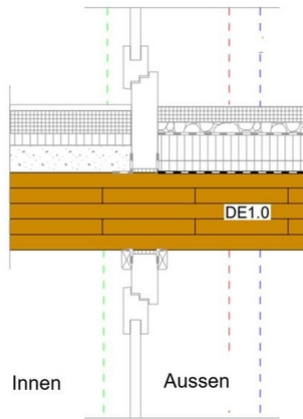
The column-free and partially cantilevered balconies were a challenge in the structural analysis.



TS3 construction during the construction phase



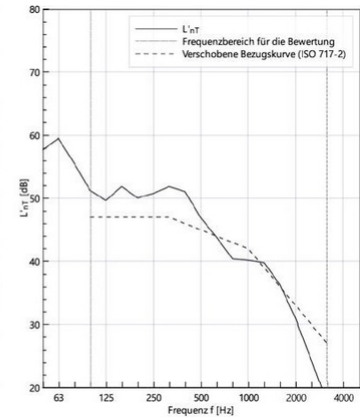
TS3 assembly in its finished state



Detail of continuous slab. Floor construction with 70 mm fill, 30 mm impact sound insulation, and 60 mm subfloor

Frequenz f Hz	L' _{tot} Terzband dB
50	57.7
63	59.5
80	55.6
100	51.3
125	49.7
160	51.9
200	50.1
250	50.8
315	51.9
400	51.1
500	46.9
630	43.8
800	40.4
1000	40.2
1250	39.8
1600	36.3
2000	30.9
2500	24.3
3150	≤ 17.3
4000	≤ 11.8
5000	≤ 11.1

≤ bei diesem Messergebnis wurde die Messgrenze erreicht



This floor construction achieves a rated impact sound level of L'_{tot}=45 dB in accordance with ISO 717-2

Construction Data

- OSB 15 mm 690 m²
- DSP 27 mm 980 m²
- C24 (Construction timber) 58 m³
- GL24h 30 m³
- TS3-CLT (200 mm) 343 m³ (1720 m²)
- CLT (various thicknesses) 33 m³
- TS3 joint 520 m¹

Construction costs

- BKP 1-9:
- BKP 2:
- BKP 214:

Services of Timbatec

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- SIA Phase 41 Tender and comparison of offers
- SIA Phase 51 Implementation project
- SIA Phase 52 Execution
- Fire protection planning
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Client

Hirs Immobilien
8702 Zollikon

Architect

Merkli Degen Architekten ETH
8053 Zürich

Timber construction engineer

Timbatec Holzbauingenieure (Schweiz) AG Zürich
8005 Zürich

Timber construction

Holzbau Oberholzer GmbH
8733 Eschenbach SG

Building physics

Timbatec Holzbauingenieure (Schweiz) AG Zürich
8005 Zürich

Photography

Elisa Florian Fotografie