



Implenia

SWISS RE INSTITUTE

**TOMORROW'S TIMBER
– A BUILDING MATERIAL
REVOLUTION**

**LESSONS LEARNED &
FUTURE TRENDS IN
TIMBER CONSTRUCTION**

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AGENDA

- ❑ Introduction to Implenía Holzbau
- ❑ Lessons learned on the example of Project «Lokstadt Krokodil Winterthur»
- ❑ Future trends in timber construction



INTRODUCTION TO IMPLENIA HOLZBAU

Implenia Holzbau in brief

- ~30 Mio CHF turnover
- 90 employees from 18 nations
- Business: Timber construction & interior work

Specialist in residential and non-residential **large-scale projects** mainly in **Switzerland & Germany**



PROJECT LOKSTADT «KROKODIL» (1/2)

The project in brief

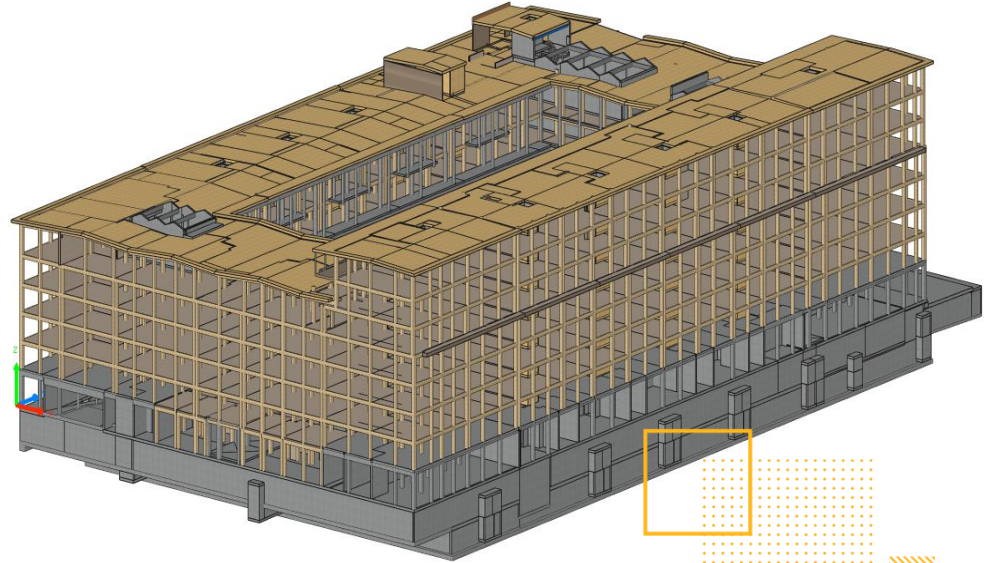
- **Customer:** Implenia Immobilien; GESEWO; GAIWO; Adimora
- **Architect:** ARGE Baumberger & Stegmeier Architekten
- **Total volume:** 98.5 mn CHF
- **Total volume timber constr.:** 17.5 mn CHF
- **Key facts:**
 - 248 apartments
 - Minergie P standard



PROJECT LOKSTADT «KROKODIL» (2/2)

Details on timber construction

- One of the largest residential buildings made of wood in Switzerland
- Assembly period for timber constr.: 11 months
- 7,700 m³ of wood
- 11'000 t CO₂ emissions stored in construction



→ **Total used wood regrown in Swiss forests within 8 hours!**

LESSONS LEARNED – AN ENGINEER'S PERSPECTIVE



Main precondition for a successful realized timber construction project is involving timber construction engineers and specialists as early as possible and latest in the draft planning.



And why?

LESSONS LEARNED – AN ENGINEER'S PERSPECTIVE

LESSON LEARNED

Possible level of standardisation in timber construction not yet achieved, many of the realized projects are still **prototypes based on individual project solutions** in terms of...

1

Construction methods

2

Used construction elements

3

Execution details

RESULTING CONSEQUENCES

- **High level of experience needed** in all involved disciplines
- **Difficult to achieve a customer understanding** for the quality of the developed solution
- **Still not possible to use the full potential** of timber construction because - even if the timber solution provides "best technical and economical performance" - interfaces to other crafts are not standardized

LESSONS LEARNED - STANDARDIZATION AS MAIN FUTURE TASK?

Scaling up the level of standardization in timber construction would result in...



Increasing customers preference of timber construction



Continuous high quality in execution & construction



Lower cost benefiting from economies of scale of prefabrication



Improved economy in project development & significantly higher efficiency in project execution

Standardization as basis for sustainable growth enabling to benefit from **economies of scale**, ensuring a **consistent high level of quality** while at the same time opening the possibility to use a larger pool of **construction resources**.

MARKET DEVELOPMENT - TIMBER CONSTRUCTION SWITZERLAND

LIVING FROM UP TO 3 UNITS: SHARES OF MATERIAL (MAIN STRUCTURE / in %)

		Neu buildings 			Reconstructions / extensions 		
		2011	2020		2011	2020	
Holz		4,3	6,2	↗	22,8	28,1	↗
Beton		51,3	51,4	↗	40,6	39,9	↘
Backstein		43,9	39,9	↘	30,6	23,4	↘
Stahl		0,3	2,2	↗	5,7	8,4	↗
Andere		0,2	0,3	↗	0,2	0,2	→

Quelle: Gebäudedatenbank BFH-AHB

- **Market share of timber construction** compared to other building methods has **increased significantly** over the last 10 years
- This popularity increase holds **true for both new buildings and reconstructions / extensions**
- Especially in the segment **new building of apartment houses** the market share increased **by 44 %**

FUTURE TRENDS – PREFABRICATION

WHY PREFABRICATION

- **Providing cost-effectiveness** because it enables to save significant cost of labor
- **Providing time efficiency and the acceleration of the construction process on site**
- **Securing a higher consistency & quality**
- **Reduces safety risks**

WHY TIMBER

- Timber can outperform other materials in prefabrication settings due to its **easy machinability** and possible **accuracy of processing**



FUTURE TRENDS – HYBRID CONSTRUCTION METHODS

WHY HYBRID-ELEMENTS AND CONSTRUCTIONS

- Combinations of timber with steel or concrete guarantee **efficient material use** by **simultaneously excellent performance**
- **To fulfil sound insulation requirements** quite often timber is used in combination with concrete for ceiling constructions

WHY TIMBER

- Timber can outperform other materials in terms of its **weight-strength relation**
- Prefabricated elements can have **integrated visible surfaces**



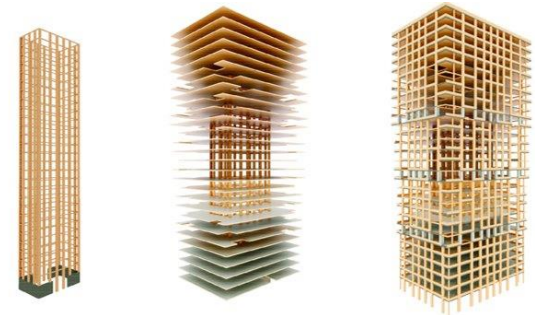
FUTURE TRENDS - HIGH-RISE BUILDINGS

WHY HIGH-RISE BUILDINGS

- Increasing **urbanization**
- **Shortage of building land** and increasing property prices

WHY TIMBER

- **Renewable raw material** (CO2-reduction/greenhouse gas emission)
- Providing **excellent performance** due to its weight-strength-relation and possible high grade of prefabrication



FUTURE TRENDS – MAIN REASONS FOR FURTHER GROWTH

MAIN DRIVERS

- ▶ **Aesthetic of wood / timber construction** – high appreciation and acceptance
- ▶ Increasing social and individual **need for sustainable living**
- ▶ Wood as **renewable primary product** (reduction of greenhouse gas emissions)
- ▶ **Sustainability** and their increasing meaning **in public procurement law**
- ▶ **Increasing harmonization of building regulations** regarding timber construction
- ▶ **Increasing level of standardization and digitalization** in timber construction



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THANK YOU!



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