



# Precast in Central Europe

Tomas Plauska, Sustainability Manager at Consolis

*fib*/CNI International Seminar on Precast Concrete in Seismic Regions and International Perspectives

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# Briefly about Consolis

Countries

17



Factories

47



Employees

>9.000



Customers

>1.000



Sales

>1.000

MEUR



# Agenda

- **Big picture** including **key environmental-sustainability challenges**
- **Precast** including **hollowcore floor as a part of the solution** for low carbon and circular buildings
- **Circular precast** project cases

**Precast concrete is the  
building material of the  
future**

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- › **Flexible**
- › **Versatile**
- › **Robust and resilient**
- › **Material efficient**
- › **Long durability**
- › **Can be reused or at least recycled**
- › **Locally available**
- › **No waste at construction site**
- › **Inherent thermal mass**
- › **...**



# Linear Economy one of key environmental-sustainability challenges



take



make



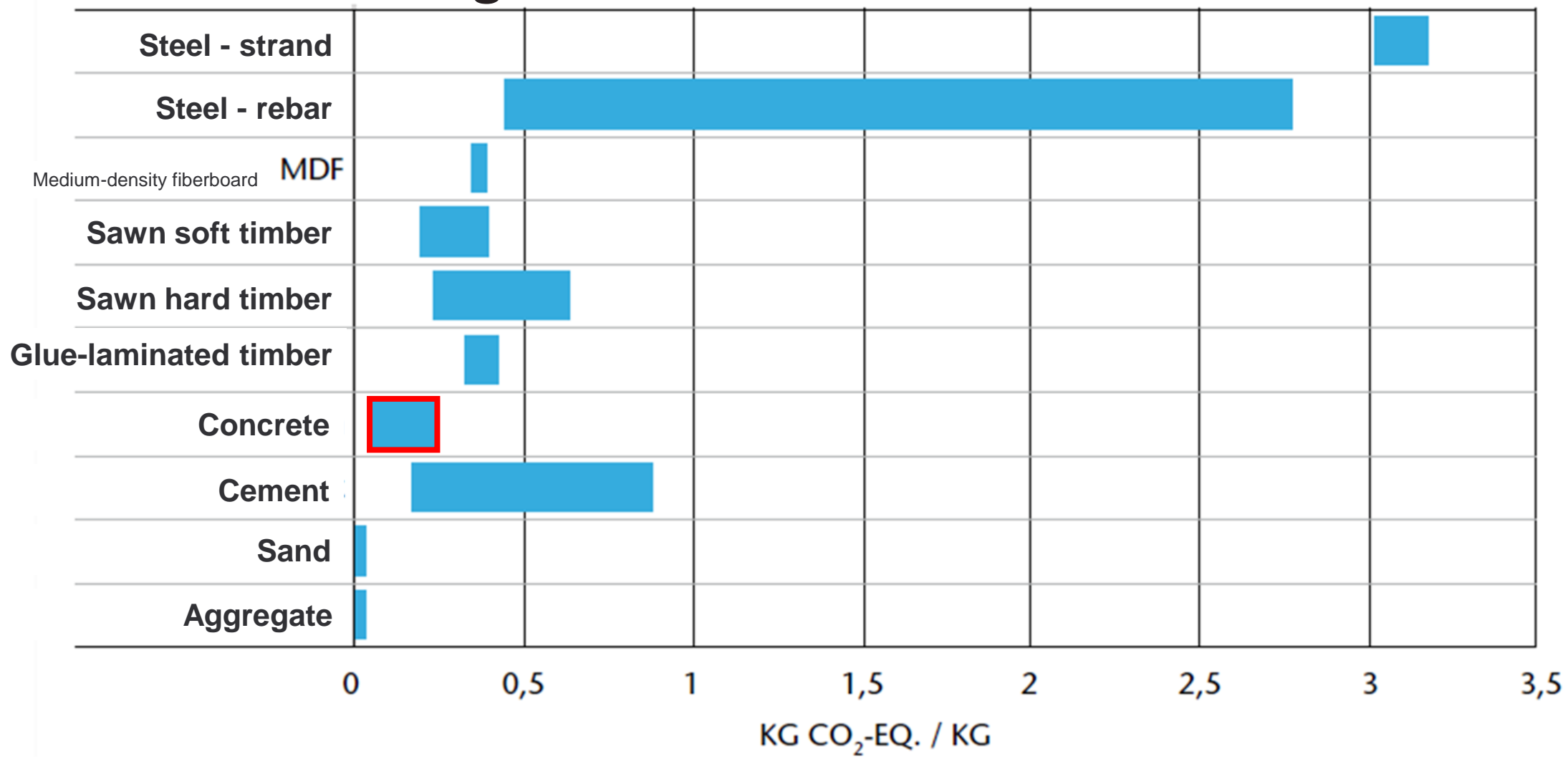
waste

# Climate Change one of key environmental-sustainability challenges





# Embodied carbon of concrete is relatively low when comparing to some other building materials





# Carbon impact on a building level is what finally matters



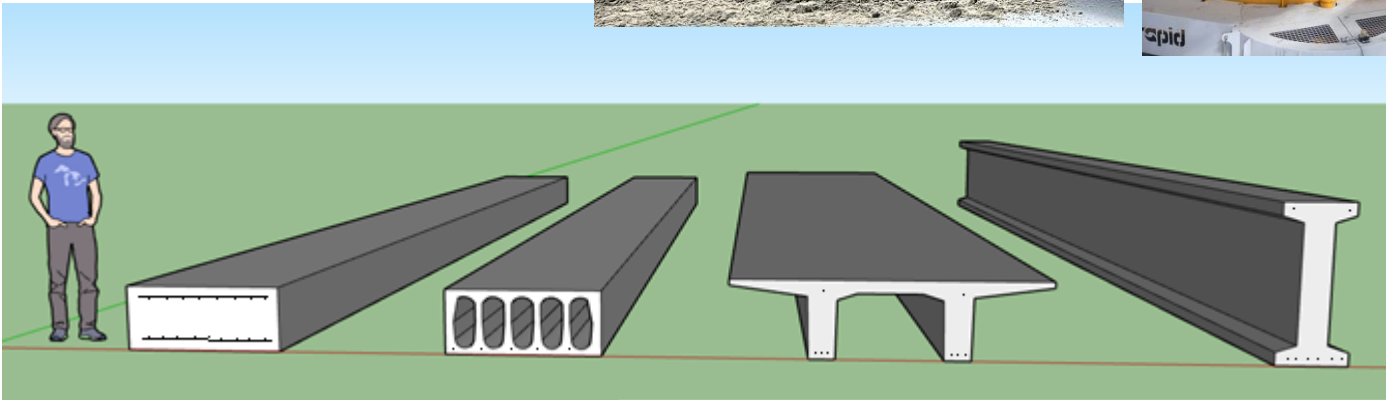
kg-CO2-eq/tn of concrete



kg-CO2-eq/tn of element



kg-CO2-eq/m2 of building floor area!



# Upcoming/ proposed regulatory limits for carbon emissions on building level

- › **Denmark** 12 kg-CO<sub>2</sub>-eq/m<sup>2</sup>/a (2023)
- › **Finland** 10-14 kg-CO<sub>2</sub>-eq/m<sup>2</sup>/a (2025)
- › **France** 12,8-14,8 kg-CO<sub>2</sub>-eq/m<sup>2</sup>/a
- › **UK** 13,3 kg-CO<sub>2</sub>-eq/m<sup>2</sup>/a (2020) and 10,8 kg-CO<sub>2</sub>-eq/m<sup>2</sup>/a (2025)
- › Other limit values including those in **Netherlands** (MPG), **Austria** (OI3) and **Switzerland** (SIA). These are however set using a different LCA indicator.



# Linear Economy and Climate Change are only few of many Global Challenges that construction industry needs addressing



**Precast including  
hollowcore floor as a  
part of the solution**

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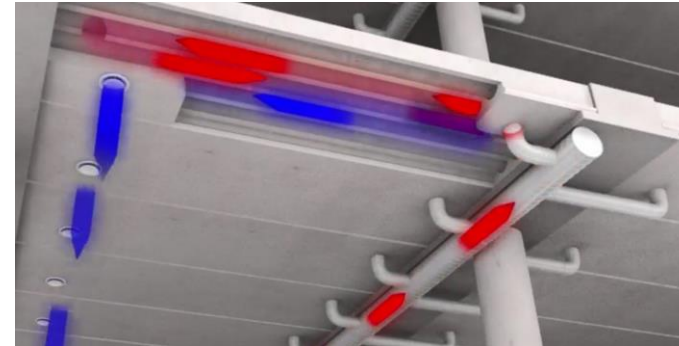


# Hollowcore floor as structural floor

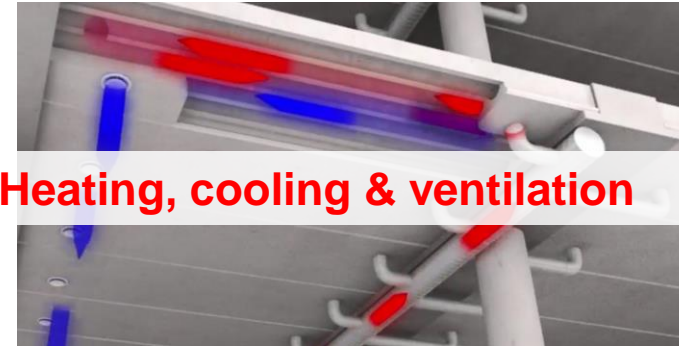
- › Floors in buildings contain a **major of mass** of total building structure, therefore have a **high material optimization potential**
- › Precast concrete **hollowcore** floor produced in highly **controlled & safe** factory environment use about **40% less concrete** and about **50% less reinforcement** comparing to solid cast-in-situ concrete floors
- › As **hollowcore** floor is **light**, it can have **long spans**, up to **50% less embodied-carbon** and are **cost efficient**, thus is not only sustainable but also very competitive product



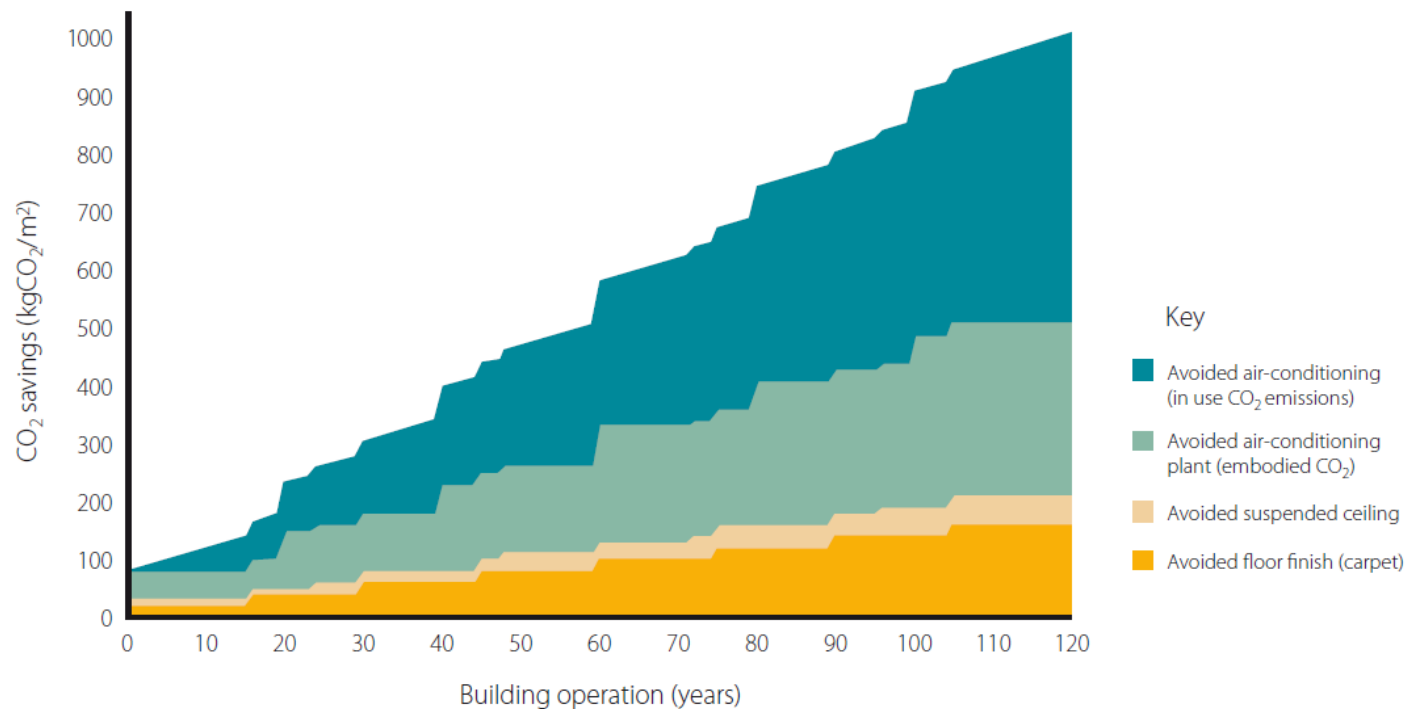
# Hollowcore floor with more functions can reduce embodied carbon even further



# Hollowcore floor with more functions can reduce embodied carbon even further

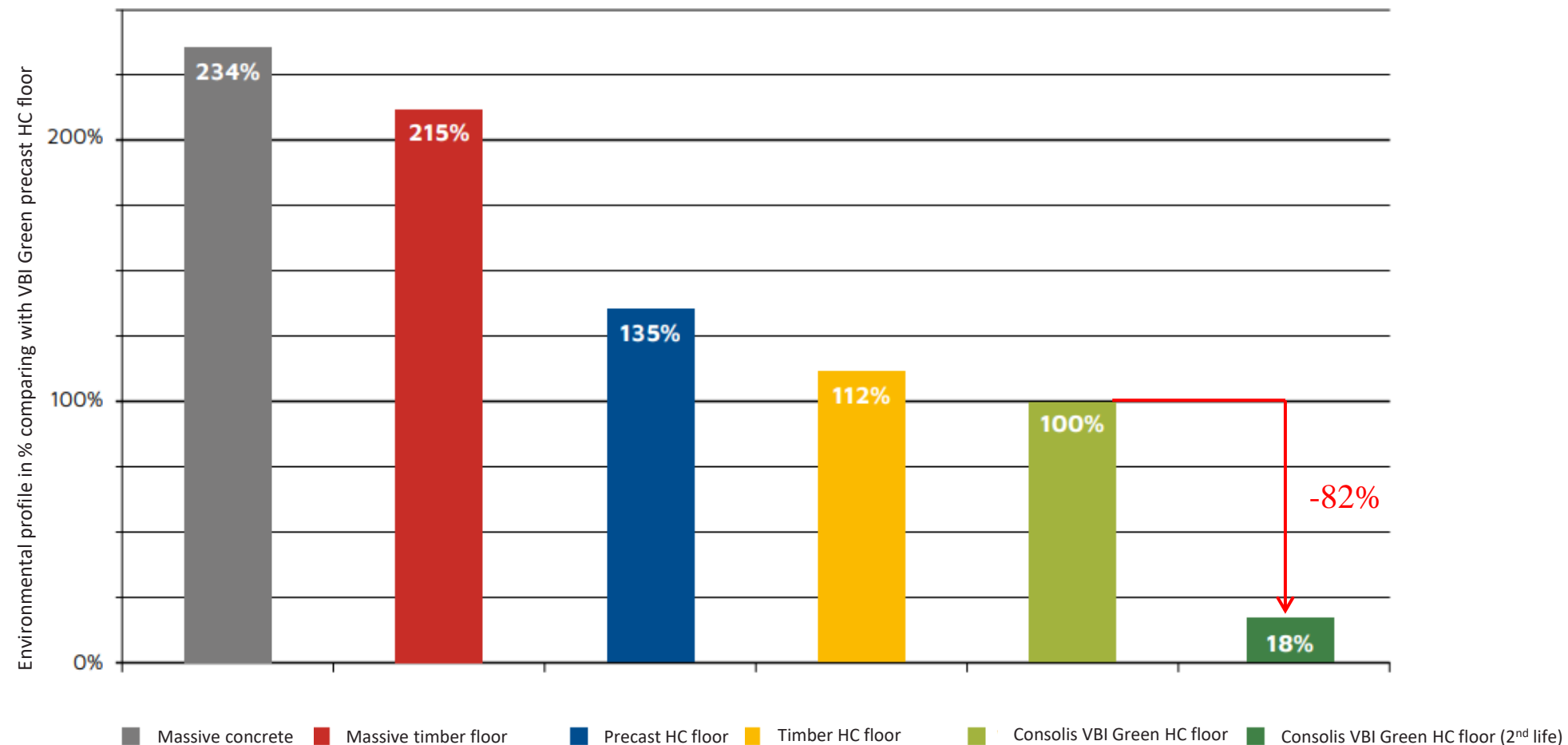


# Thermal mass of concrete can deliver cooling and comfort with less Mechanical & Electrical (M&E) systems and reduce carbon emissions significantly





# Climate impact of reused precast elements is just a fraction when comparing to newly produced ones



# Consolis participating in EU funded international ReCreate project

- › International ReCreate project aims to discover how used concrete elements can be deconstructed without damaging them to be reused in new buildings – and turn the process into a profitable business



## 99% Reuse

The pilot is made of 99% reuse material (by weight).



## 92% less CO2 emissions

The carbon footprint of the pilot is 92% lower in the production phase when compared with new construction



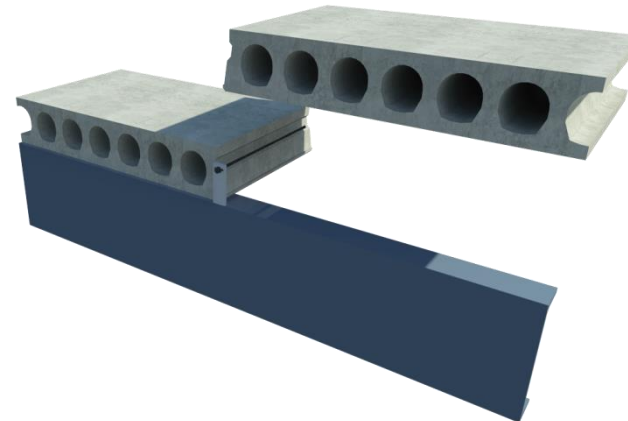
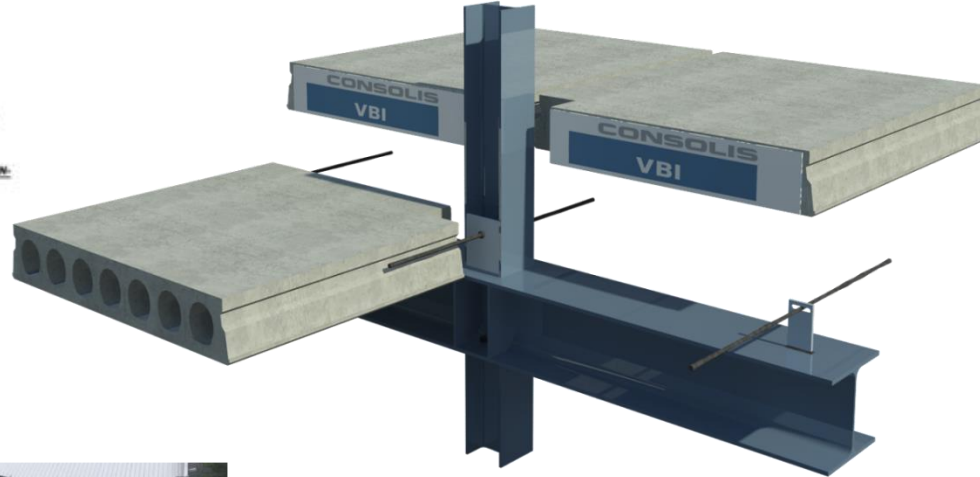
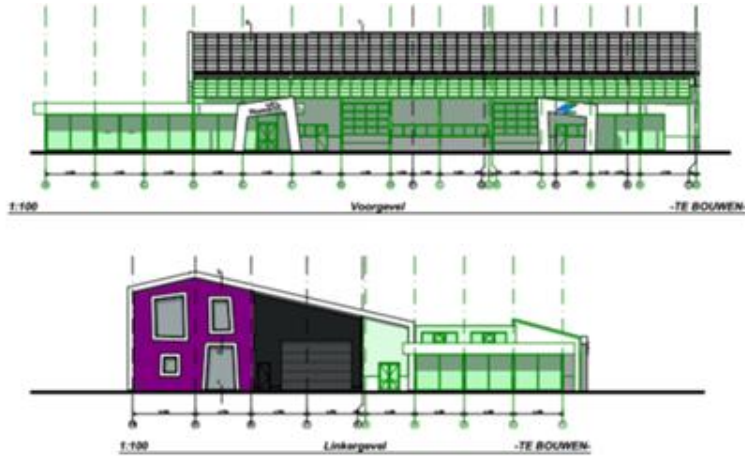
## Made for disassembly

The pilot is designed to be dismantled and the elements can be reused again in future projects.



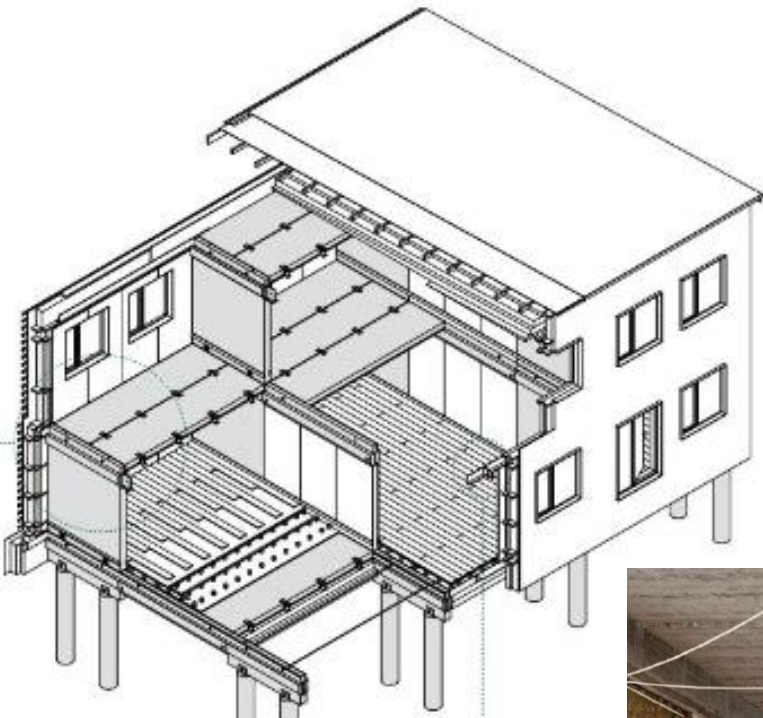
# Circular precast project cases

# Circular AGRO NRG commercial office & storage project in Ootmarsum, The Netherlands - designed and built for reassembly

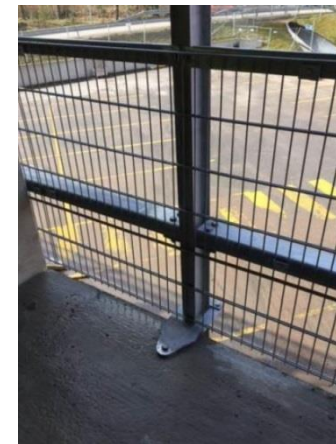




# Circular Circle House residential apartment project in Lisbjerg, Denmark - designed and built for reassembly



# Circular TempoDeck™ carpark project in Arlanda (P53, Terminal 5), Sweden - designed and built for reassembly

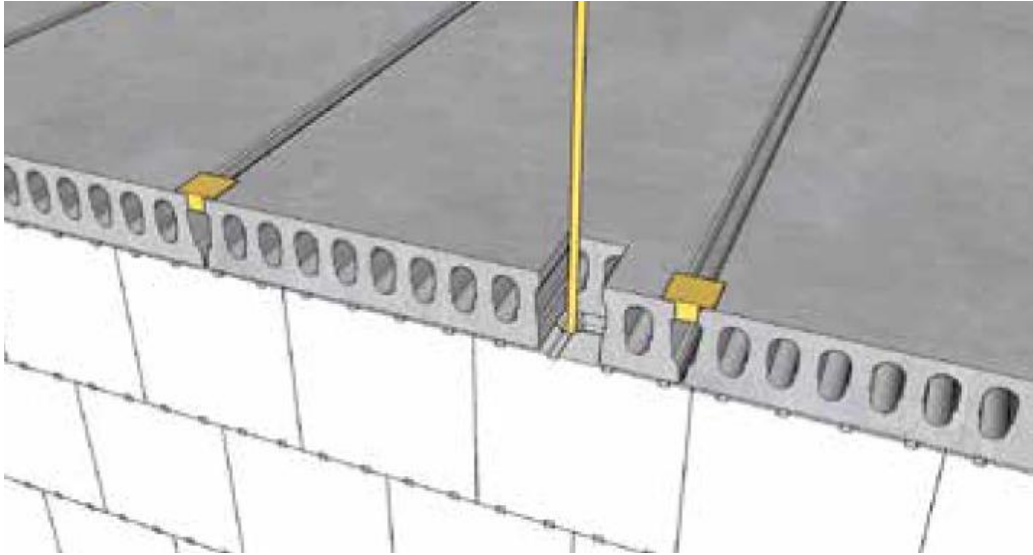




# Circular viaduct project in The Netherlands - designed and built for reassembly

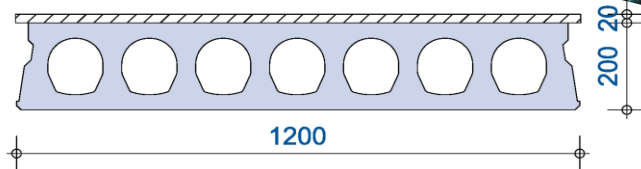
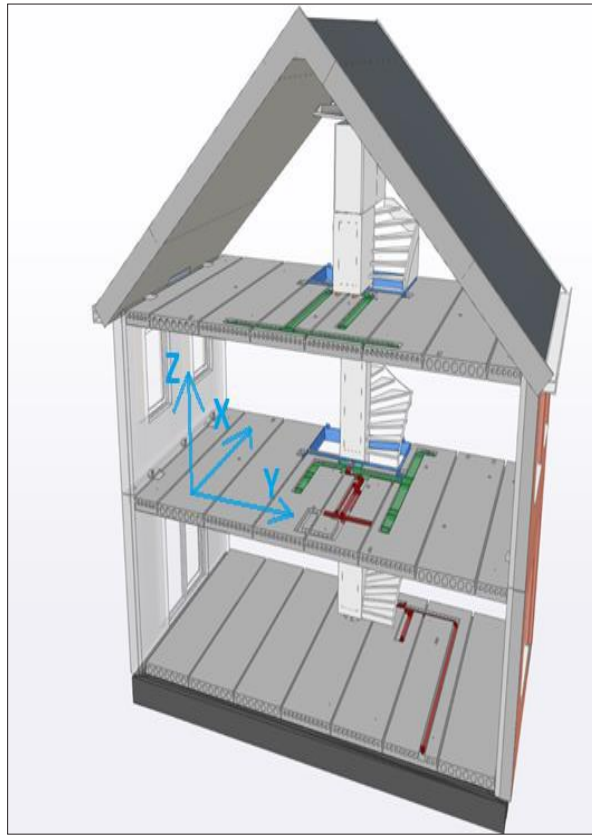


# Circular residential single-family house project first built in Dresden and then rebuilt in Meißen, Germany





# Circular residential dwelling project in Nijmegen, The Netherlands

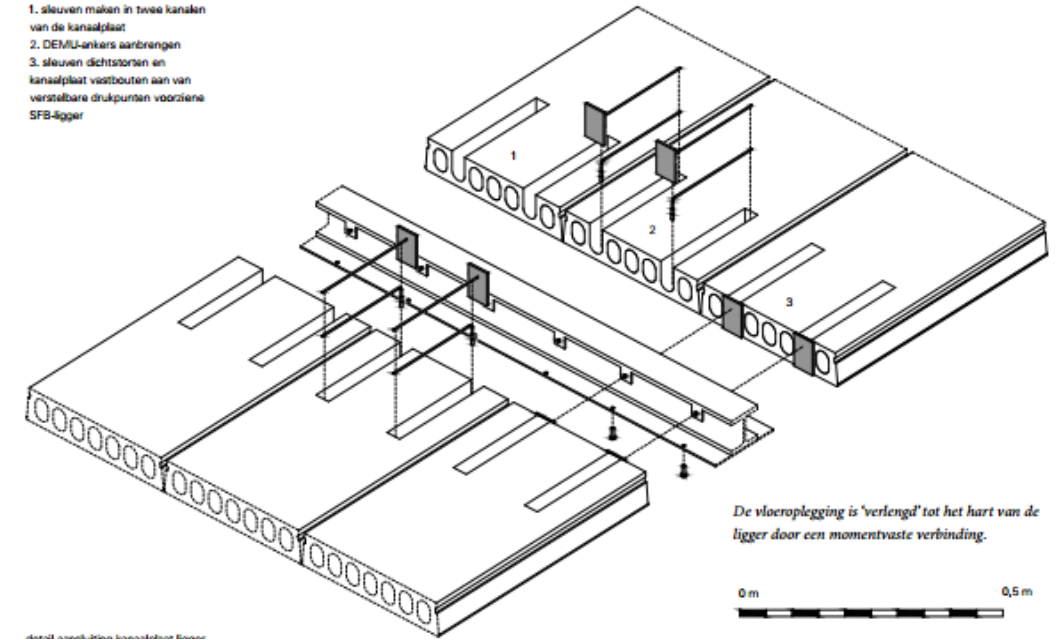




# Circular courthouse project in The Netherlands - designed and built for reassembly (not Consolis project)

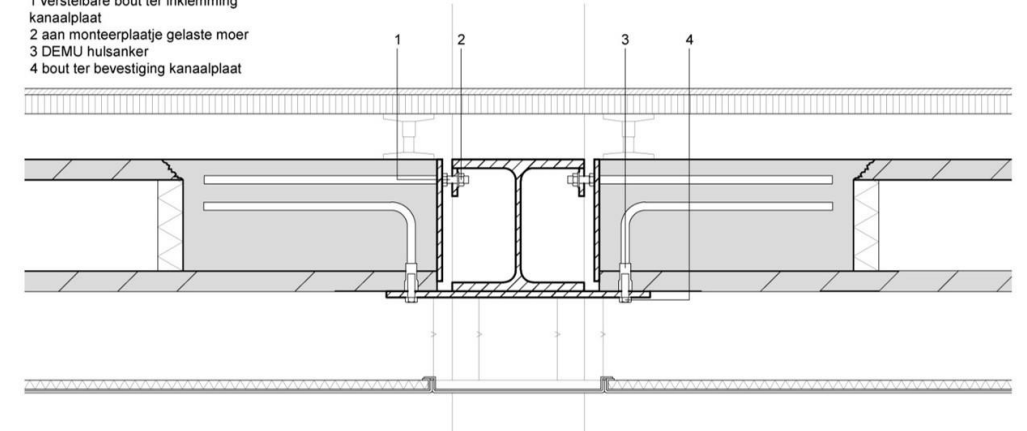


1. sleuven maken in twee kanalen van de kanaalplaat
2. DEMU-ankers aanbrengen
3. sleuven dichtstorten en kanaalplaat vastbouten aan verstelbare drukpunten voorziene SFB-4gger

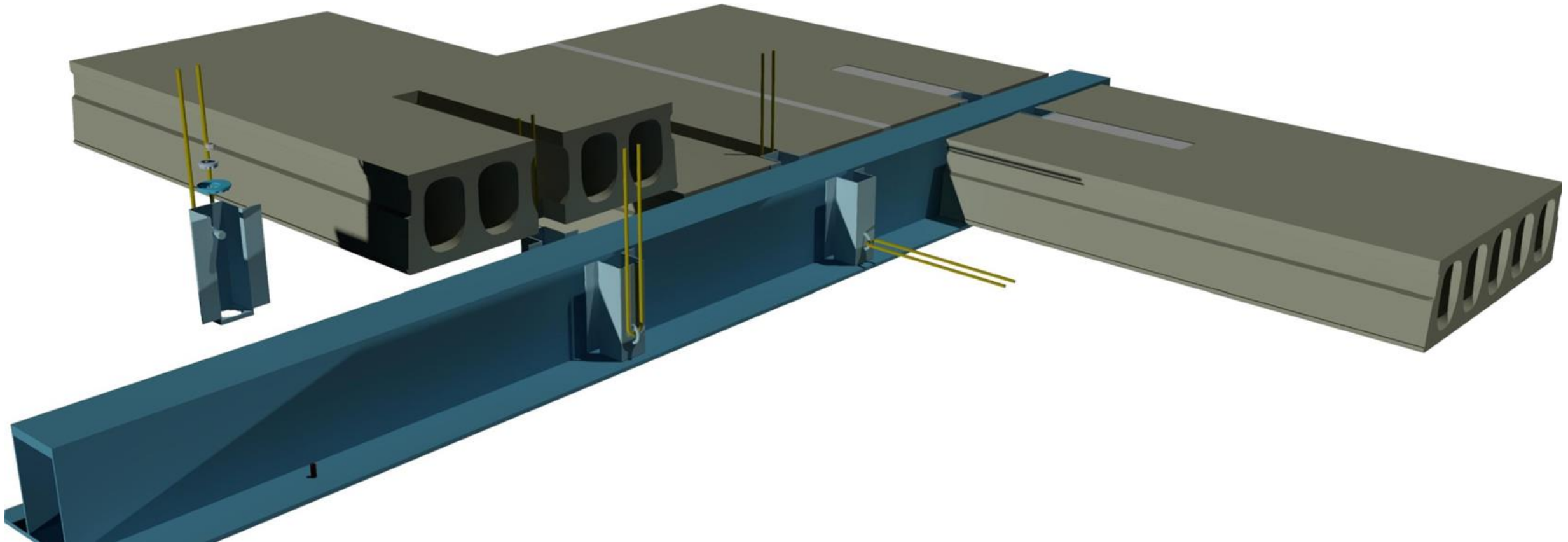


detail aansluiting kanaalplaat-ligger  
1:10

- 1 verstelbare bout ter inklemming kanaalplaat
- 2 aan monterplaatje gelaste moer
- 3 DEMU hulsanker
- 4 bout ter bevestiging kanaalplaat

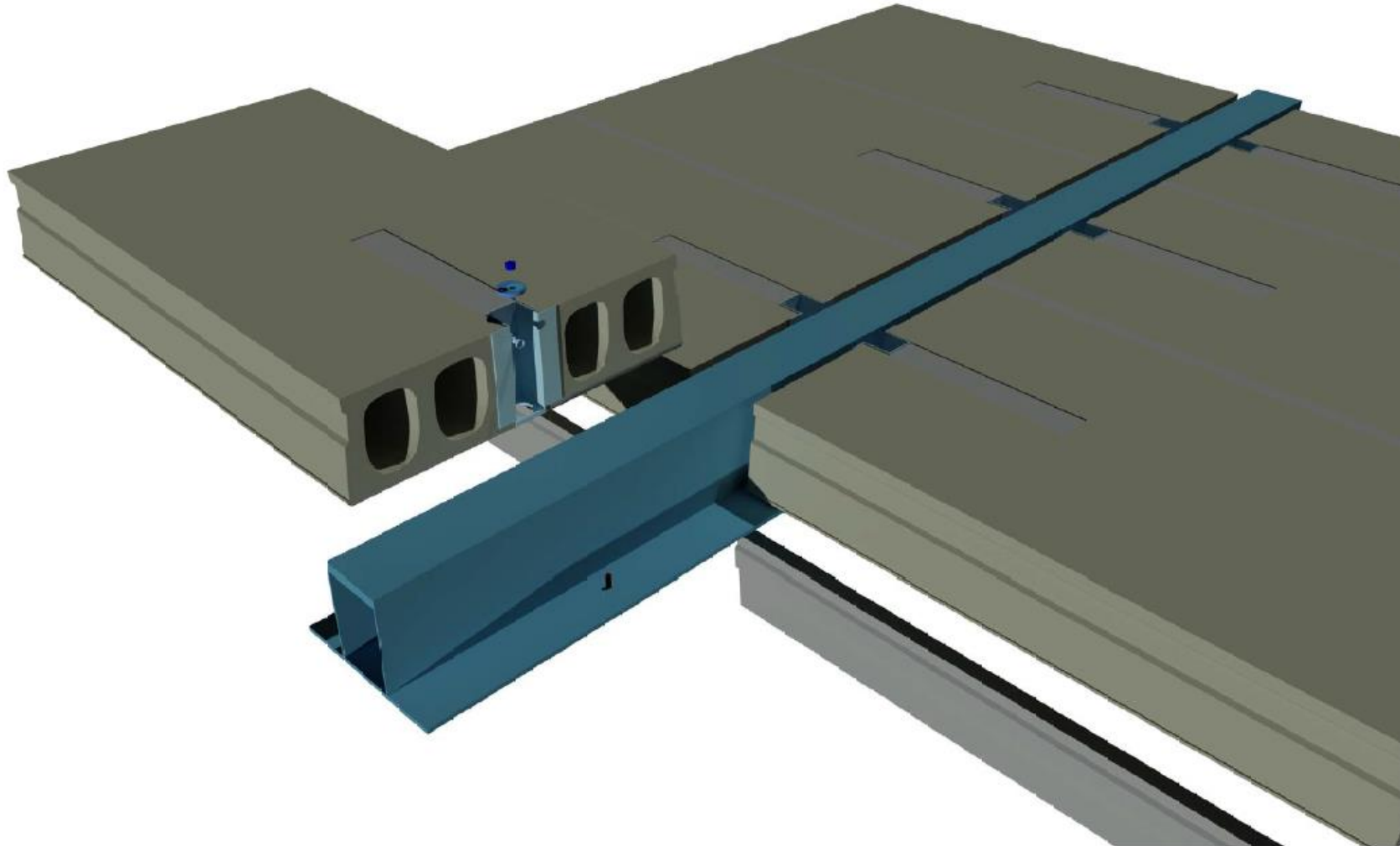


# Continue the development of the connections of a courthouse project





# Continue the development of the connections of a courthouse project..





# ..and testing the developed connections in a pilot project in Finland



# Sustainability of precast structures

- › This state-of-the-art report addresses the sustainability of precast structures
- › It includes
  - the most recent work that has been developed regarding sustainability
  - a review of the existing sustainability assessment systems
  - a chapter regarding the life cycle of precast structures
  - case studies and examples of sustainability applications of precast structures and more.



## Sustainability of precast structures

State-of-the-art report

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Well-built for well-being