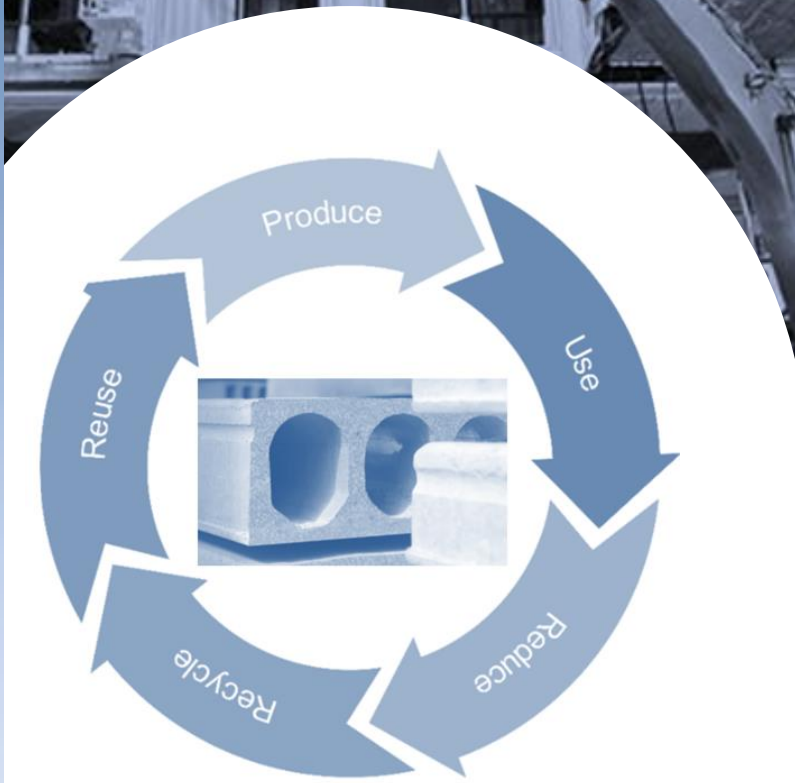


INVITATION

2023 IPHA TECHNICAL SEMINAR



12-13 October 2023

AMSTERDAM

The Netherlands

RE-USE OF HOLLOWCORE SLABS

Design for circular construction



INTERNATIONAL PRESTRESSED
HOLLOWCORE ASSOCIATION

In cooperation with

CONSOLIS

VBI

Dear Colleagues,



I am delighted to invite you to the **IPHA Technical Seminar 2023** in **Amsterdam** in The Netherlands. This is the next in a series of Technical Seminars in IPHA's history, bringing an excellent opportunity for your technical staff to discuss important issues regarding sustainable hollowcore flooring. By this Technical Seminar, IPHA promotes a dynamic and enriching **exchange of information** between its international members, **encouraging dialogue** and **knowledge sharing** to ensure they are up-to-date on technical matters related to the design of hollowcores.

Once again, IPHA in cooperation with VBI worked hard to organize what will be an event of bringing the circular future into today construction practices as an interesting experience that all involved in the hollowcore industry wants to join. Participation is free of charge for IPHA members and it is part of IPHA's endeavours to promote free exchange of information to be part of the frontrunners in the industry.

Yours sincerely,

Seamus McKeague
President IPHA











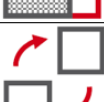







Circular construction aims to close the building material loop by reusing, sharing, leasing, repairing, refurbishing, upcycling or recycling rather than continuing the traditional take-make-use-waste process. For precast, the circle of circular construction can be closed by mining prefabricated structural element from an obsolete building and reuse them. Nowadays, first pilot projects display how to reuse precast concrete element in buildings in order to support the sustainability transition.

Precast hollowcore slabs are very well suited for reuse. Reusing hollow core slabs from obsolete structures might however be a challenge, because slabs and floors were not designed for demounting. On the other hand, when designing new structures, demountable hollowcore slabs can easily be included in the design to make reuse in the future easier. Hence, flexibility measures in design are key in improving the circularity of building components. Moreover, the carbon footprint of a building reduces significantly if concrete components are reused.

From a technical perspective, there are first good experiences in the reuse of hollowcore slabs in The Netherlands. Pilot projects cross the knowledge gap how to move from linear to circular construction, and how to design accordingly. From an economic perspective, circular construction in general and the reuse of hollowcore slabs in specific, will disrupt the market place and will change the current business practices on hollowcore.

Looking forward to meet you in Amsterdam-Schiphol.

Wim Jansze
President Technical Committee IPHA

	Name	Also known as	Meaning
	Accessibility	Accessible, physical access, reachability,	Access to the component that needs to be adapted without hindrance from other components.
	Demountability	Demountable, design for deconstruction, design for disassembly, dismantlable, disassembly, separable, simplify demolition	The capacity to deconstruct the components from the building and deconstruct components into their constituents.
	Durability	Durable	The capacity of materials and systems to continue to be useful after an extended period of time and usage.
	Independence	Clustering, flexibility, layering of components, no integration, reduced interaction, segregation, separation	The technical separation of elements of different service lives and functions.
	Integration	Clustering	The technical coupling of components that will never be adapted separately.
	Interface simplicity	Flexible interfaces, mechanical connections, pluggable connections, simplicity	The use of uncomplicated mechanical connections between elements.
	Modularity	Modularization, modular,	The consistent use of matching building blocks that can form into a larger component or system.
	Movability	Mobility, movable,	The possibility to place a building component at a new location.
	Overcapacity	Capacity, redundancy, reserve capacity, surplus (includes fire safety + insulation)	The capacity to accommodate higher technical specifications than initially required.
	Reconfigurability	Adjustability, rearrangeable, transformable, versatile	The possibility to rearrange parts or components in relation to each other.
	Remountability	Reassembly, reusable, reuse	The possibility to directly reuse a component without or with only minor repairs.
	Removability	Disposability, ejectable, rejectability,	The capacity to remove a component from a system without negative consequences to the technical functioning of the system.
	Replaceability	Exchangeable, refitable, replaceable	The possibility to replace a component with the same component.
	Scalability	Elastic, elasticity, expendable, extendable, scalable,	The capacity of the building or building component to change in size or capacity.
	Standardisation	Compatibility, interchangeable, regularity, universal	The use of the same component sizes and construction details throughout the building.
	Upgradability	Refitable	The possibility to improve the performance of a component.

(ref: Flexible Floor Systems - The effectiveness of flexibility measures in improving the circularity of building components, Lisa van Iperen, MSc thesis Delft University of Technology, 2021

Thursday 12 OCTOBER 2023

08:00-13:00 Registration at venue

08:30 Site visit close to Amsterdam (45' bus, 100' site visit, 45' bus)
See page 8

12:00-13:00 Lunch

13:00 Opening of seminar
Wim Jansze

13:15 Hollowcore flooring in circular construction
Peter Musters

14:00 Remolition of buildings including hollowcore flooring
Arend van de Beek

14:45 **Workshop 'Introduction'**
Groups and topic

15:00-15:30 Coffee break

15:30 Design for re-assembly
Thijs Lambrechts

16:15 **Workshop 'Getting started'**
Getting started on the topic, brainstorming

17:00 Closure first day

19:00 Dinner at restaurant 'Societeit'

Friday 13 OCTOBER 2023

08:00 Venue opens

08:30 Codes and the re-use of elements

Agnieszka Bigaj-Van Vliet

09:15 Protocol re-use of hollowcore slabs

Ton van Beek

09:45 Workshop 'Peel the union'

To discuss the topic more deeply, interactive discussions

10:30-11:00 Break

11:00 Designing and adapting re-used hollowcore slabs for buildings

Hans van Steen

11:30 Traceability of products

Jos Hebing

12:00–13:00 Lunch

13:00 The future role of the structural engineer in hollowcore design

Ronald Klein-Holte

13:45 Workshop 'Get it done'

Group conclusions and reporting

14:30 Closure of the seminar

Wim Jansze

15:20 Free bus to Schiphol airport (10 km, 15 minute drive)(free bus leaves every 40 minutes in front of the hotel, i.e – 13:20 - 14:00 - 14:40 - **15:20** – 16:00 – 16:40 – 17:20 – 18:00 – 18:40 – 19:20 -)

Hollowcore flooring in circular construction Peter Musters | Consolis VBI | The Netherlands



Making construction more environmentally sustainable requires the transition from the linear to the circular approach. In the linear economy the scrapped hollowcores ends up as landfill or in low-value applications, while in the circular economy the hollowcore slab is re-used in a new building. Concepts of circularity and demountability will be introduced, and examples from practice will be showcased.

Peter Musters has been working at VBI since 1998 and has been active as a building concept consultant since 2010. Based on the client's business case, Peter thinks along and offers clear solutions in the field of smart support structures or services that enable better, faster and cheaper building. He also specializes in the broad spectrum of sustainability and durability, particularly in the field of circular economy and CO2 reduction. He enjoys discussing themes such as healthy and comfortable buildings, adaptability, value retention of materials and about sustainable schools and office buildings.



Remolition of buildings including hollowcore flooring Arend van de Beek | Lagemaat | The Netherlands

Lagemaat leads the mining of structural elements from buildings for circular construction. Demolition and reconstruct, or in other words, remolition. Under the heading of Lagemaat Circularity, business models and strategies are being developed to accelerate the transition to a circular economy. The transformation of the temporary court (Amsterdam Zuidas), Prinsenhof (Arnhem) and Scheveningen Zuiderstrandtheater are well-known actual remolition projects.

Arend van de Beek is programme manager circular economy at demolition and reassembly company Lagemaat in Heerde. Lagemaat has been active in the demolition industry since 1977. Circular demolition has been central to this in recent years. He is project leader of the dismantling of the temporary Court in Amsterdam and Prinsenhof in Arnhem.

Design for re-assembly

Thijs Lambrechts | TU/e Build Environment | The Netherlands



Precast buildings have complex though standardized load-bearing structures made up of different materials, products and elements that are connected. The extent, to which these connections can be demounted and remounted, so that an object can retain its function and high-quality reuse can be achieved, determines the degree of demountability. Four technical factors influence the de- and remountability of a load-bearing structure: connection type, accessibility of the connections, shape of the structural element, and intersections of the structural elements.

Thijs Lambrechts is currently PhD student researching the viability of reusing concrete elements in the EU-funded ReCreate project. The ReCreate project will demonstrate deconstruction of intact precast structural components from condemned buildings for reuse in new buildings in real-life innovative pilots. Thijs graduated in 2021 at University of Antwerp (Belgium) as MSc in civil engineering.



Codes and the re-use of elements Agnieszka Bigaj-van Vliet | TNO | The Netherlands

For the circular buildings industry to reach its full potential and scale necessary for a sustainable future, international cooperation is paramount to ensure the alignment and harmonization of protocols, norms and standards. There is need for developing standards related to the circular economy and sustainable concrete structures with re-used structural elements including hollowcore slabs. What is currently ongoing in the international standardization committees?

Agnieszka Bigaj-van Vliet is a senior expert in the field of design, assessment and life-cycle management of concrete structures. For over 20 years she has been involved in applied research and innovation project at TNO. Agnieszka is a fib Presidium member, member of the fib Technical Council and head of the Dutch National Delegation to fib. She is co-convener of the fib TG10.1 Model Code for Structural Concrete, member of fib Commission 8 Durability and fib Commission 10 Mode Codes, and deputy chair of recently established fib Special Activity Group Sustainability. She is also a member of subcommittee 318-L, International Liaison, of the American Concrete Institute ACI Committee 318-25, Structural Concrete Building Code.

Protocol re-use of hollowcore slabs

Ton van Beek | SKB-IKOB | The Netherlands



If you get used hollowcores from the demolition of an existing precast structure, can you still guarantee its quality? The standards used nowadays, like the EN1168, were mostly not published when the slabs were designed. In order to verify the suitability of hollowcore slabs for future application, protocols with necessary steps are under development for the suitability of re-use.

For 12 years Ton van Beek is technical Manager at SKG-IKOB, the certification body for the construction and real estate sector. Ton has a PhD degree on young concrete from Delft University of Technology (2000). He started his career as advisor at Intron and manager at Rijkswaterstaat. Then he worked 3 years as Managing Director at VOBN and 3 years at Delft university of Technology as executive director Ageing Centre. In 2010 he founded 'Bouwsucces' to help organizations develop themselves in the construction industry



Designing and adapting re-used hollowcore slabs for buildings

Hans van Steen | Dycore, a CRH company | The Netherlands

There is a great benefit in re-using recovered structural precast concrete elements from buildings. Not only for environmental benefits, but as well on the structural aspects to approach the design with recovered precast structural elements. How is a structural engineer going to include them into a newly designed building? The technical design possibilities to adapt re-used hollowcore slabs for buildings will be presented.

Hans van Steen is currently technical specialist at Dycore, a CRH company. After his MBO-study he started his career in 1990 as a technical designer for hollowcore slabs. In the next years he attended various training courses at the Betonvereniging to become a structural engineer for hollowcore slabs and ribbed floors. Since 2019 his position at Dycore is technical specialist.

Traceability of products

Jos Hebing | Ketenstandaard Bouw en Techniek | The Netherlands



Traceability of products is identifying specific the objects during their lifecycle. It documents where they were built, where they are located, where they were moved, the ownership of the product and perhaps what has been done with the products during their lifecycle. Traceability of products is an important means for achieving circularity in the construction sector since they promote high-value reuse at the material, product, element, and building levels.

Jos Hebing is standardization advisor at Ketenstandaard Bouw en Techniek (supplychain standard construction and technology). He is responsible for the DICO standard, a set of agreements that provides rules for the electronic exchange of information between manufacturers, wholesalers, construction, maintenance and installation companies and housing corporations. Jos graduated in 2018 from the Avans University of Applied Sciences on Construction Management and Real Estate.



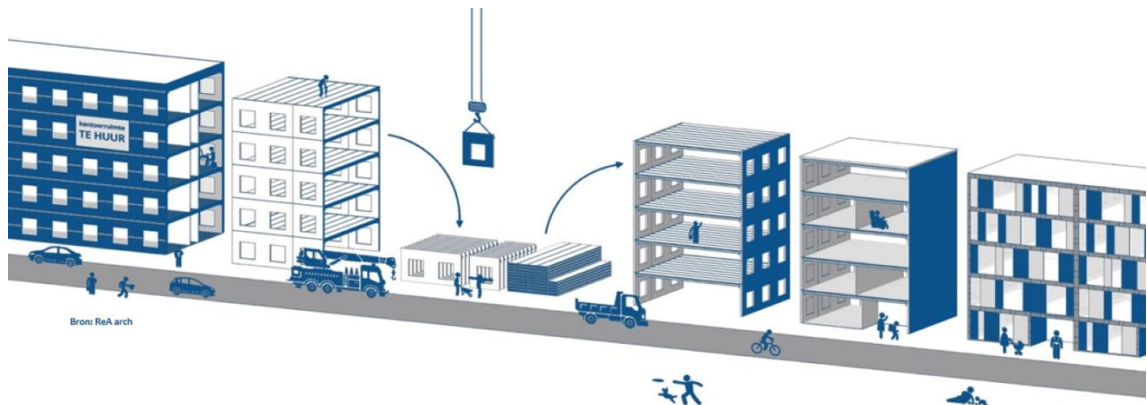
The future role of the structural engineer in hollowcore design

Ronald Klein-Holte | Consolis VBI | The Netherlands

In circular construction, elements are re-used in new buildings. What will be the role of the structural engineer in hollowcore design? Will it be the same as today, or will it change because the business changes? Although re-use is still pioneering, clients need sound technical advice about what can be achieved. Structural engineers in flooring can make a big difference in terms of circularity and sustainability.

Ronald Klein-Holte is R&D manager at VBI. Ronald finished his study Civil Engineering at HAN Technical Highschool. After 3 years working as structural consultant at IBT, he started in 1987 as a structural R&D engineer at VBI. In the last 36 years he specialized in the design and application of hollow cores floors. He is, among others, member of fib COM6 and convener of CEN TC229/WG1/TG1 in which he is responsible for the CEN product code EN1168 "Precast concrete products - Hollow core slabs".

Construction site visit This Technical Seminar on the re-use of hollowcore slabs will include a site visit to a circular building. More details will follow in autumn 2023 when the final brochure for the Technical Seminar is finalized. The site visit is planned for Thursday morning 12th October.



Your safety comes first. IPHA and Consolis VBI will bring a great experience to all delegates, and that includes taking care of every detail, especially when it comes to safety measures. Consolis VBI will provide yellow reflecting safety jackets and hard hats for all delegates to ensure their safety while they are at the construction site. Due to practical and hygienic reasons, you are kindly requested **to bring your own safety shoes** when visiting the construction site. In case you prefer to use ear plugs and safety glasses too, please note you should bring your own.



Consolis VBI. This technical seminar is organized in cooperation with Consolis VBI. As a producer of innovative precast floor systems, VBI offers industrial customization to build the future together with all parties in the value chain. This makes it possible to anticipate rapidly on changing demands in the market. This makes VBI not only a supplier but also a real partner. Together with contractors, structural engineers, architects and project developers, we work daily on safer, smarter and more sustainable solutions. Safety, quality and innovation are of paramount importance, and this is what the company strives for in everything. The further development of floors is an extensive, interesting and challenging process. In this way, VBI offers a basis on which we can literally and figuratively build together. Consolis VBI is part of Consolis, the European leader in precast concrete solutions for the building and utilities sectors.



Hotel Van der Valk A4 is selected to host the Technical Seminar. The hotel is with 10 km distance conveniently close located to Amsterdam Schiphol airport. Participants need to book the hotel through IPHA (€ 169 per night including breakfast excluding local tourist tax). When registered for the technical seminar, IPHA will send you the [Hotel Reservation Form](#) that needs to be returned to IPHA before 31.08.2023.

Hotel Schiphol
Rijksweg A 4 Nr.3
2132MA Hoofddorp–Schiphol
Tel +31 252 67 53 35
schiphol@valk.nl
www.hotelschiphol.nl



Conference room The two-day seminar is held at Hotel Van der Valk A4 near Amsterdam-Schiphol in one of the many conference rooms. The lunches are served in the restaurant. The dinner will be served in the room "Societeit" of the restaurant.

Traveling by shuttlebus Participants will preferably travel on Wednesday 11 October towards the hotel accommodation in Amsterdam A4. From Schiphol Airport it is only a 15 minute drive with the Van der Valk shuttle bus. This shuttle service drives every 40 minutes to the hotel (i.e. 14:20 - 15:00 – 15:40 – 16:20 – 17:00 – 17:40 – 18:20 – 19:00 – 19:40 – 20:20 – 21:00 – 21:40 – 22:20 – 23:00 – 23:40 (last bus). Departure from Schiphol is located at bus stop A9 - A13 in front of the arrivals hall. Alternatively, you can take a taxi.



Weather forecast. The average temperature in Amsterdam in October is around 7-15°C and relative humidity of 75%. For a visit and a walk to the centre of Amsterdam take your umbrella as it rains about 80 mm on 15 days in the whole month. Amsterdam Centraal railway station is only 14 minutes from Schiphol airport by NS train through platform 1-2.

Please return to Kjell-Ole Gjestemoen at keijo@hollowcore.no by 31 July 2023

I hereby register for the IPHA Production Seminar on 12-13 October 2023:

First name: _____

Surname: _____

Nationality: _____

Company: _____

Country: _____

- I will join the site visit on 12.10.2023 at 08:00 and will take my own PPE
- I will not join the site visit on 12.10.2023.

I hereby request IPHA to make a reservation at 'Hotel Van der Valk A4' as follows:

- 2 nights | Wednesday October 11 and Thursday October 12
- ___ nights | October ___ until October ___ (please fill in)

Dinner and lunch

- Specific dietary requirements: _____

Please note the following conditions:

- Registration is only open for Full members and Associate members of IPHA.
- Registration is mandatory and is required before July 31, 2023 by returning this undersigned registration form to Kjell-Ole Gjestemoen at keijo@hollowcore.no.
- Registration is limited to 60 participants due to venue requirements. So, IPHA advises to register asap.
- One person per registration form. If more than one person per company wants to register, each one should fill in a registration form individually.
- There is no registration fee for the participant. However, in case of no show at the Technical Seminar, € 550 no-show fee will be invoiced to your company.
- A maximum of 5 people per IPHA company member can participate for free (15 for Group members). Additional company/Group participants pay a € 250 fee to cover additional costs.
- Registration includes 2 days seminar program with site visit, 2 lunches and 1 dinner.
- Participants assume the costs of hotel plus breakfast and travelling themselves.
- Hotel's registration is coordinated by IPHA. When registration is accepted, IPHA will send the participant the Hotel Reservation Form. The special rate of € 169,00 per night including breakfast (but excluding local tax). This rate applies only when the registered person returns the hotel reservation to IPHA before 31.08.2023. Each guest have to sign in at arrival at the hotel with credit card and pay on departure.

I hereby accept the conditions given above and sign to register:

Registration date: _____ (before 31.07.2023)

Signature: _____