HiCON

TAILOR-MADE BALCONIES

in Ultra High Performance Concrete

Aahusene, Denmark

WE TURN YOUR BALCONY DREAMS INTO REALITY

At Hi-Con, we create tailor-made balcony solutions that add value for architects, engineers, contractors, developers, and, most importantly, users. Our balconies in Ultra High Performance Concrete (UHPC) are designed for buildings where strong design, climate resilience, and functionality are in focus.

With our slim balconies, we harness the properties of UHPC, allowing us to create larger balconies with a wide range of design possibilities that stand out from other materials.

CONSULTATION IS AN INTEGRAL PART OF OUR SERVICE.

When you choose a balcony from Hi-Con, our knowledge and consultation always come as part of the package. Early in the process, we can collaborate with you on design and mounting methods to create the perfect balcony that meets your needs.

With UHPC, a wealth of possibilities arises for combining function, design, and mounting principles – and we are ready to contribute to your construction process with our expertise and experience.

This brochure presents several of our inspiring references and applied mounting principles.
We hope you will be inspired.

BENEFITS OF ULTRA HIGH PERFORMANCE CONCRETE

- Larger balconies and, consequently, increased property value
- Reduced material consumption compared to regular concrete
- 100+ years of durability and no maintenance
- Freedom in design and aesthetic appeal
- Numerous mounting options
- Fire resistant material
- Sleek and minimalistic design
- High strength
- Smaller cranes for installation

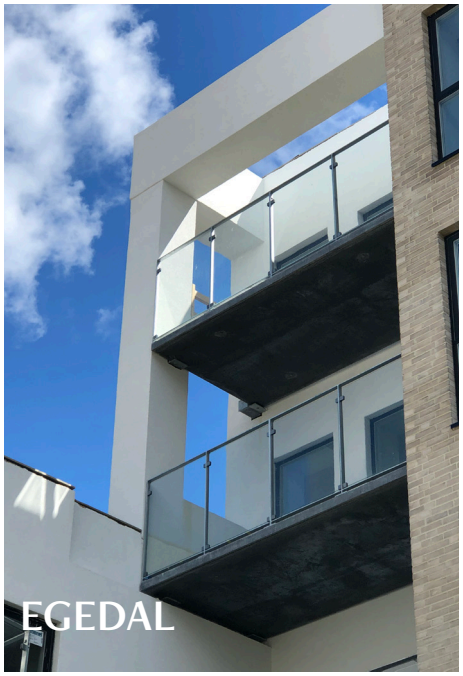
BALCONY SLABS

The architectural dream of slender and minimalistic, cantilevered balconies is possible in high performance concrete. Hi-Con has supplied both new building projects and renovation projects with thousands of balcony slabs in high performance concrete.

The minimalistic and extremely slender balcony can be made down to a thickness of 50 mm and, besides its aesthetic value, the balcony weighs less than a comparable balcony in conventional concrete. Often buildings can carry very large balconies of this type, which increases the value of the apartments and the applicability for the residents.

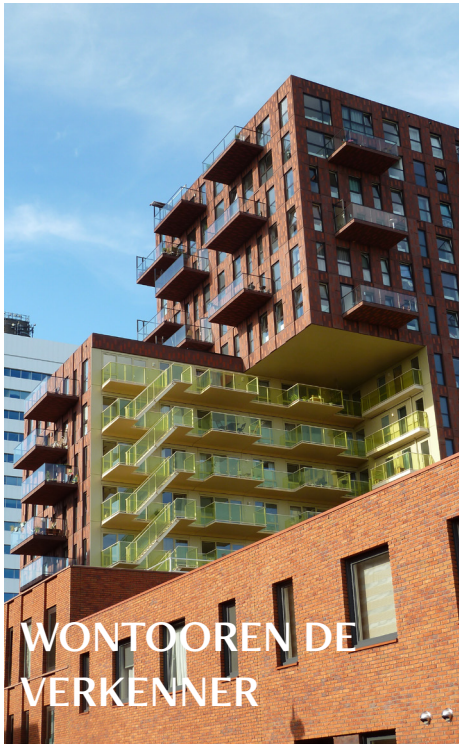
MANY INSTALLATION PRINCIPLES

Balcony slabs can be installed in various ways.
Read more on page 22.


EGEDAL


POPTAHOF


GARTNERBYEN


WONTOOREN DE VERKENNER


CERES BF8


HIGH PARK

AARHUS Ø4

AARHUS, DENMARK

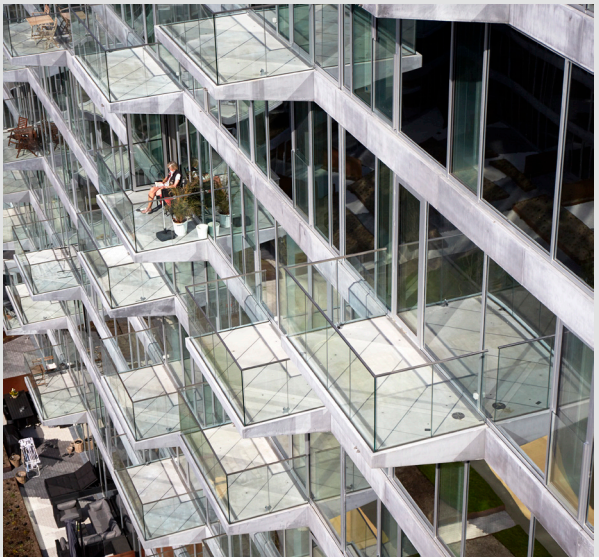
Balcony type: Balcony slabs

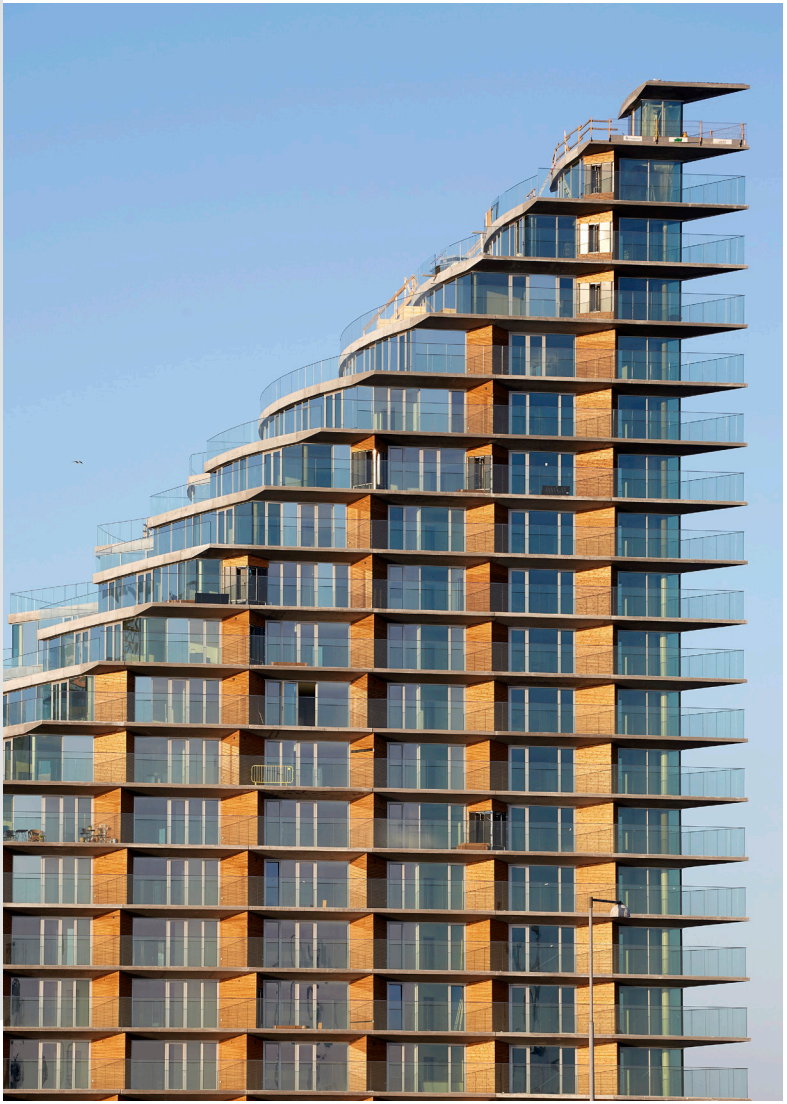
Architect: BIG & Gehl Architects

Contractor: MT Højgaard

Engineer: MOE A/S

Year of construction: 2019





THE FREE HARBOR TOWER

COPENHAGEN, DENMARK

Balcony type: Balcony slabs on c-frames

Architect: Praksis Arkitekter

Contractor: HHM A/S

Engineer: Henry Jensen Rådgivende Ingeniør A/S

Year of construction: 2016

PARAPET BALCONIES

The design options are many with balconies with one or more parapets. The parapets can be designed in various heights and may function as a privacy screen.

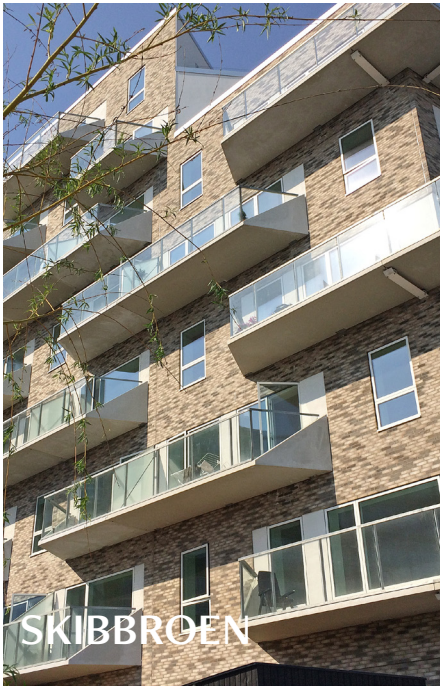
Furthermore, the parapets can be a part of the load bearing structure, making it possible to use hidden connections.

The balconies are suitable for both renovation and new buildings.

See installation principles on page 22.

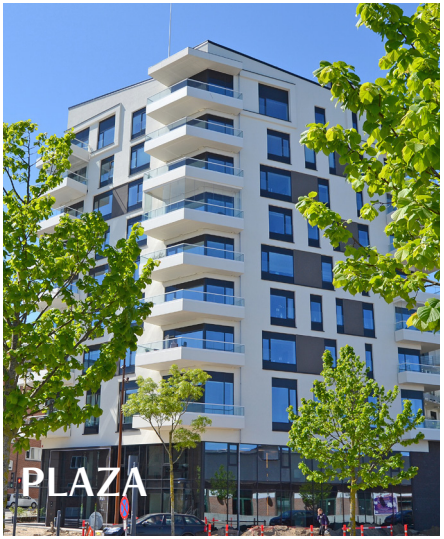

BELLA VISTA


MUSIKHUSKVARTERET


SKIBBROEN


NABOLAGET


ISLANDS BRYGGE


PLAZA

NICOLINEHUS

AARHUS, DENMARK

Balcony type: Parapet balcony

Architect: Aart Architects A/S

Contractor: NCC Danmark A/S

Engineer: Rambøll A/S

Year of construction: 2019-2022

THE NEIGHBORHOOD

AARHUS, DENMARK

Balcony type: Parapet balcony

Architect: Erik Arkitekter

Contractor: Dansk Bolig Byg A/S

Engineer: Midtconsult / Afry

Year of construction: 2016-2020

BOX BALCONIES

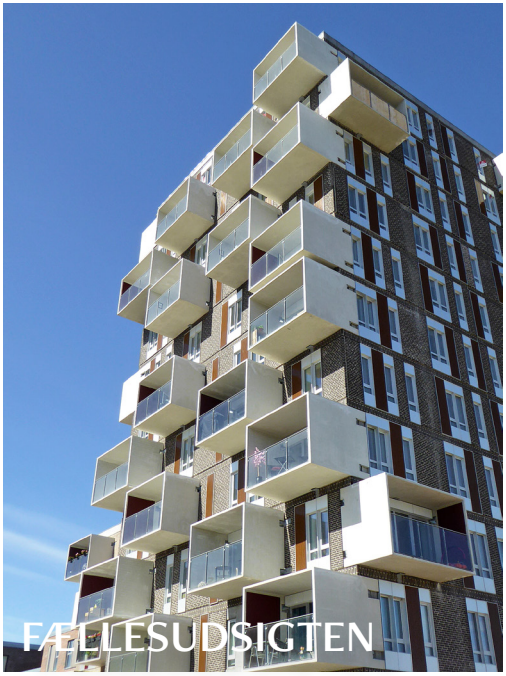
The properties of Ultra High Performance Concrete CRC i2 provide the architects with a freedom to express their creativity in both design and shape of the balconies. This is only possible because of the extreme strength and durability of the material.

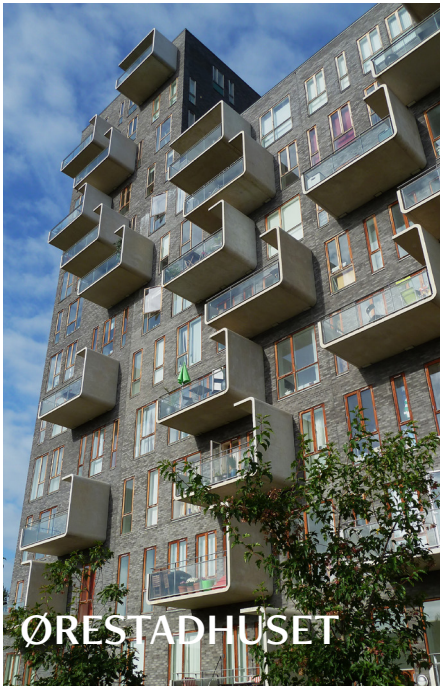
The material properties make it possible to create tailor-made balconies with the exact architectural expression that you wish for. Whether it concerns slender, minimalistic balcony slabs or balcony boxes with a playful design, only your imagination sets the limits.

MANY INSTALLATION PRINCIPLES

Box balconies can be installed in various ways.
Read more on page 22.

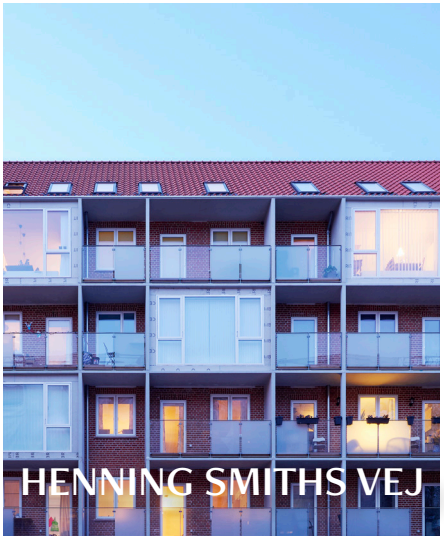

DLG-SILOEN


FÆLLESUDSIGTEN


ØRESTADHUSET


NEJLIKAN


KIRJEKYYHKY 4


HENNING SMITHS VEJ

RØDOVRE PORT

COPENHAGEN, DENMARK

Balcony type: Box balcony

Architect: Arkitema A/S

Contractor: CG Jensen A/S

Engineer: Rambøll A/S

Year of construction: 2020-2023

ØRESTAD PLEJECENTER

COPENHAGEN, DENMARK

Balcony type: Box balcony

Architect: JJW Arkitekter

Contractor: NCC Construction

Building owner: AKB Copenhagen

Year of construction: 2010

RENOVATION PROJECTS

At Hi-Con, we have extensive experience with renovation projects, where we have assisted our clients in addressing the challenges that often arise during this process.

Our specialized team are experts in managing the challenges associated with renovation projects. We understand the importance of tailoring solutions to fit the existing building structure and creating balconies that are both aesthetically appealing and functional.

With our innovative material, Ultra High Performance Concrete CRC i2, we can offer tailor-made balconies that are particularly suitable for renovation projects. Our material possesses a range of essential properties that you can benefit from in your renovation project.

MANY INSTALLATION PRINCIPLES

The balconies can be mounted in various ways depending on the type of balcony.

See mounting options on p. 22.

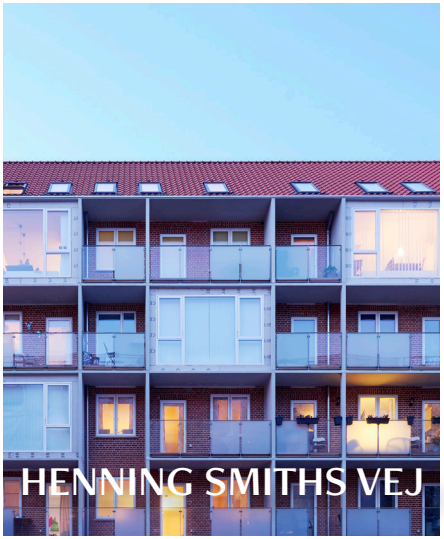

SORGENFRIVANG


FRIHAVNS TÅRNET


H.C. ØRSTEDSVEJ


VED VOLDEN


DE NOORMAN


HENNING SMITHS VEJ

FYRREPARKEN

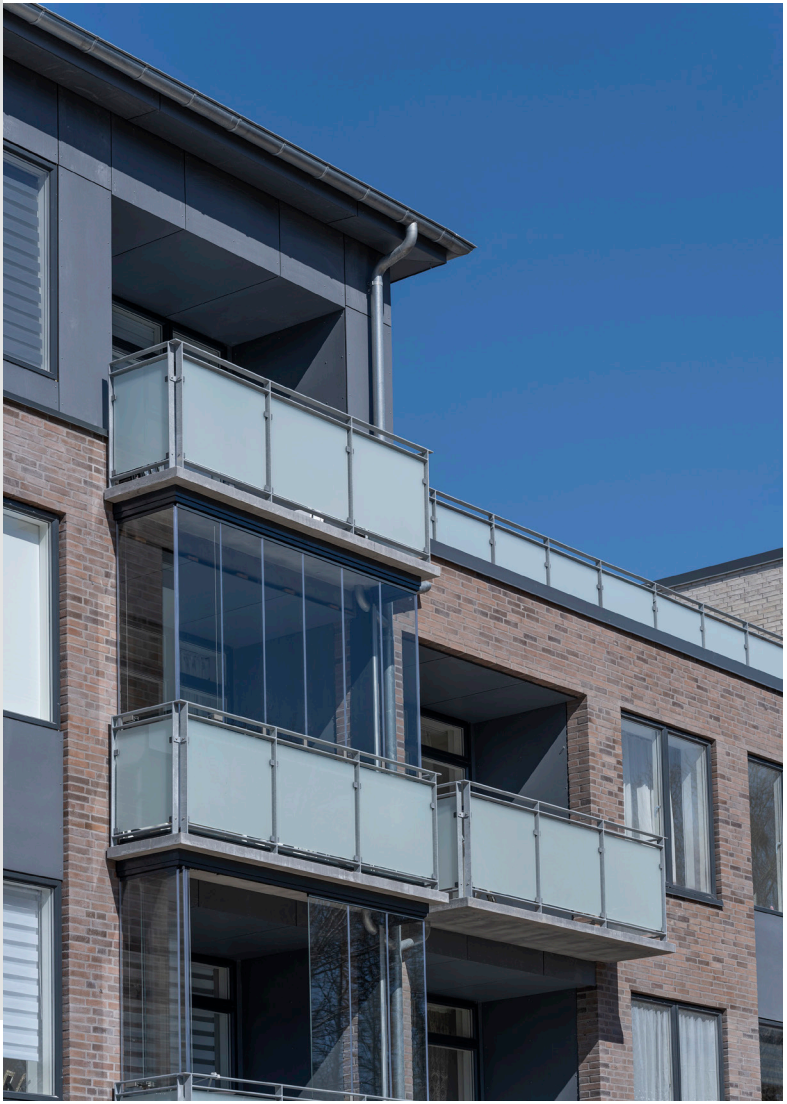
ODENSE, DENMARK

Balcony type: Balcony slab

Architect: Erik Arkitekter A/S

Contractor: Ingeniørfirmaet Viggo Madsen A/S

Building year: 2021-2023



HIGH PARK

ARNHEM, THE NETHERLANDS

Balcony type: Balcony slab

Architect: Powerhouse Company

Engineer: Pieters Bouwtechniek

Building year: 2019

INSTALLATION PRINCIPLES

We constantly develop new and innovative installation principles for our balcony projects. All solutions from Hi-Con are unique and the identification of the best installations principle is always a part of the design process. Three basic principles, which can be applied individually or together, are shown below:

Principle A: Suitable for plane balcony slabs

Principle B: Suitable for balconies with parapets

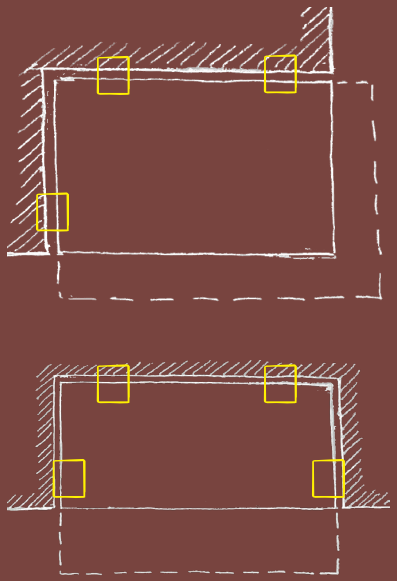
Principle C: Suitable for balconies on columns

A1 BRACKETS SUPPORTING TWO OR THREE SIDES

The balcony plate is supported on brackets fixed to the loadbearing parts of the building, either along 2 or 3 edges. The plate may be partially cantilevered. The distance between brackets along the edges depends on the plate thickness but is typically in the range of 2-3 meters.

The bracket placement can usually be adjusted to take placement of windows and doors in the facade into consideration.

Balcony type: All types

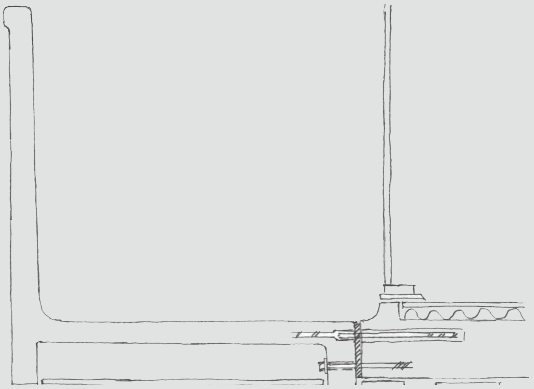


A2 CHEMICAL ANCHORS

The balcony plate is fixed to the deck via threaded rods connected to cast-in inserts in the balcony and glued into drilled holes in the deck. The method is only possible when the deck is sufficiently strong, and only for massive decks.

The number of bars needed depends on the size of the balcony and the structural capacity of the deck, but typically several bars per meter along the facade is required. This fixing method is normally only applied when other methods are not possible, primarily for renovation projects.

Balcony type: This method is normally only applied when other methods are not possible, primarily for renovation projects.

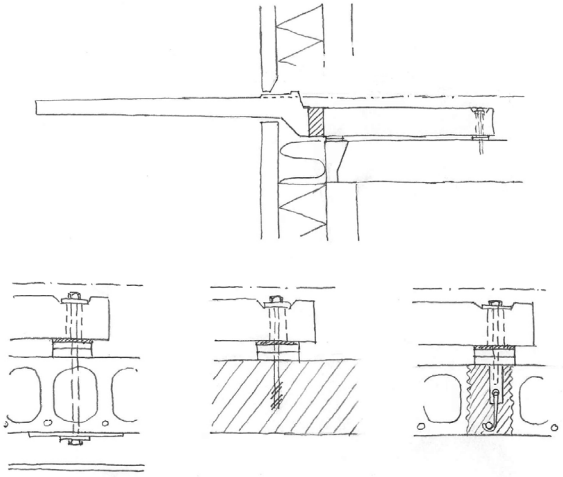


A3 ISOKORB

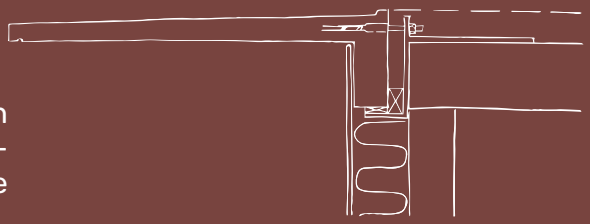
The balcony plate is supported on consoles (or plates) overlapping the deck within the floor build-up. It is only possible to use this connection when the floor build-up is 180-200 mm or more. The consoles typically need to be distributed relatively evenly along the facade, in most cases, the aim is to align them with window and door openings.

The number and size of consoles depend on the balcony size and the load situation.

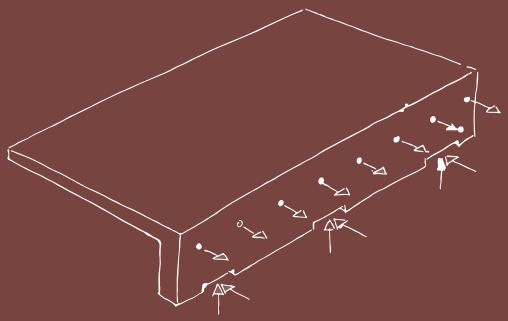
Balcony type: Most suitable for plane balcony slabs but can be used for all types.



A4 L- AND T-CONNECTION



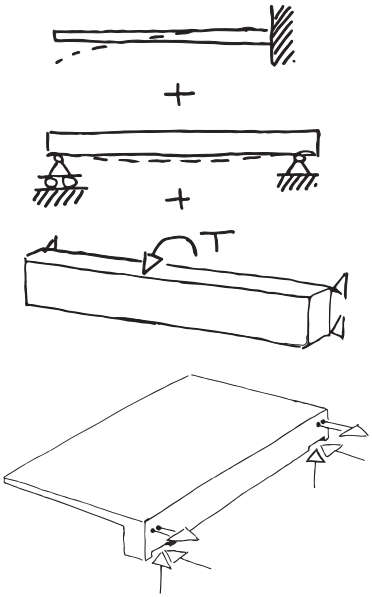
The back edge of the balcony is rotated 90 degrees up or down making an L-shape, or both ways making a T-shape. The resulting edge beam can either run the full length of the balcony or be divided into smaller consoles.



This beam is connected to the building via anchors, either chemical anchors or bolted connections via brackets. The anchors are normally distributed evenly along the beam but can be grouped to accommodate windows and doors. The required number of anchors depends on both the size of the balcony and its load situation, and the structural properties of the deck, with typical numbers being between 1 and 3 anchors per meter.

Balcony type: Most suitable for plane balcony slabs but can be used for all types.

A5 TORSION BEAM



The balcony is cast with an integrated beam along the back edge spanning between 2 or more supports. The moment from the cantilevered plate is transferred to the beam as torsion and from there to the support points where the beam must be restrained.

The principle makes it possible to have few support points, but this also means that concentrated forces must be handled at these supports. Consequently, the principle is best suited for new buildings where it is possible to plan and prepare for the reaction forces.

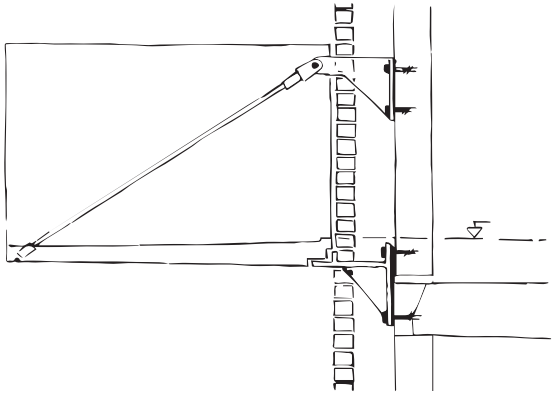
Balcony type: Most suitable for plane balcony slabs but can be used for all types.

B1 PARAPETS AND STRUTS

The vertical load of the balcony is supported on brackets at the facade, whereas the moment is transferred into horizontal push/pull forces through cast parapets, steel struts, or a combination of a parapet and a strut.

Parapets and struts can be designed in many ways, depending on the requirements for assembly at different stages of building completion, structural capacity of the building and building parts, desired geometry and aesthetics, tolerances etc., so a specific solution is designed for each individual project.

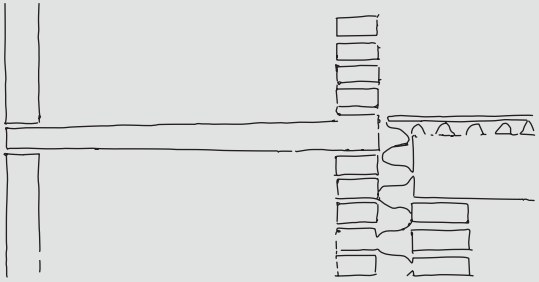
Balcony type: Most suitable for balconies with parapets but can be used for all types.



C1 COLUMNS

The balcony is supported on a load bearing wall or brackets at the facade, and a number of columns depending on required supports and desired aesthetic expression. If the vertical load at the facade is supported directly on a brick wall, the lateral stability must be ensured through brackets connected to the deck. In renovation, the back edge of the balcony is usually adjusted in thickness to match the brickwork, including tolerances.

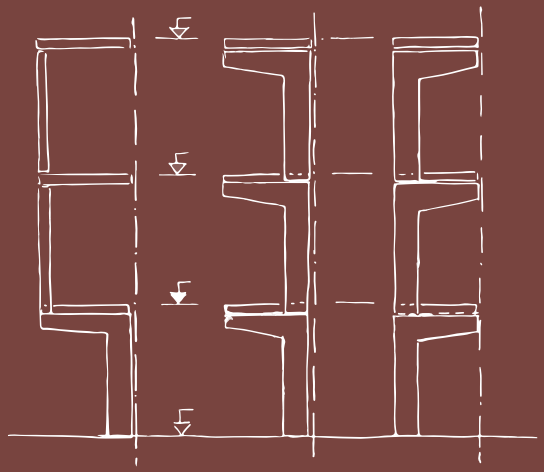
Balcony type: Most suitable for plane balcony slabs but can be used for all types.



C2 L-COLUMNS

The balcony is typically supported fully on L-columns but can also be partially supported by brackets along the facade. The L-columns are placed with the columns either at the facade, or as free-standing columns at the front edge of the balconies. In both cases most or all vertical load is transferred to the foundation under the L-columns. Because of this, the principle is often used for renovation or wooden buildings with limited structural capacity. The columns can be attached to the building in different ways, depending on the specific situation for each project.

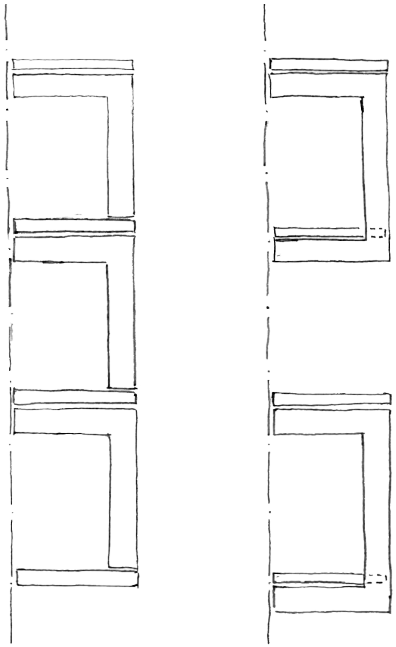
Balcony type: Most suitable for plane balcony slabs but can be used for all types.



C3 SELF-SUPPORTING L- AND C-FRAMES

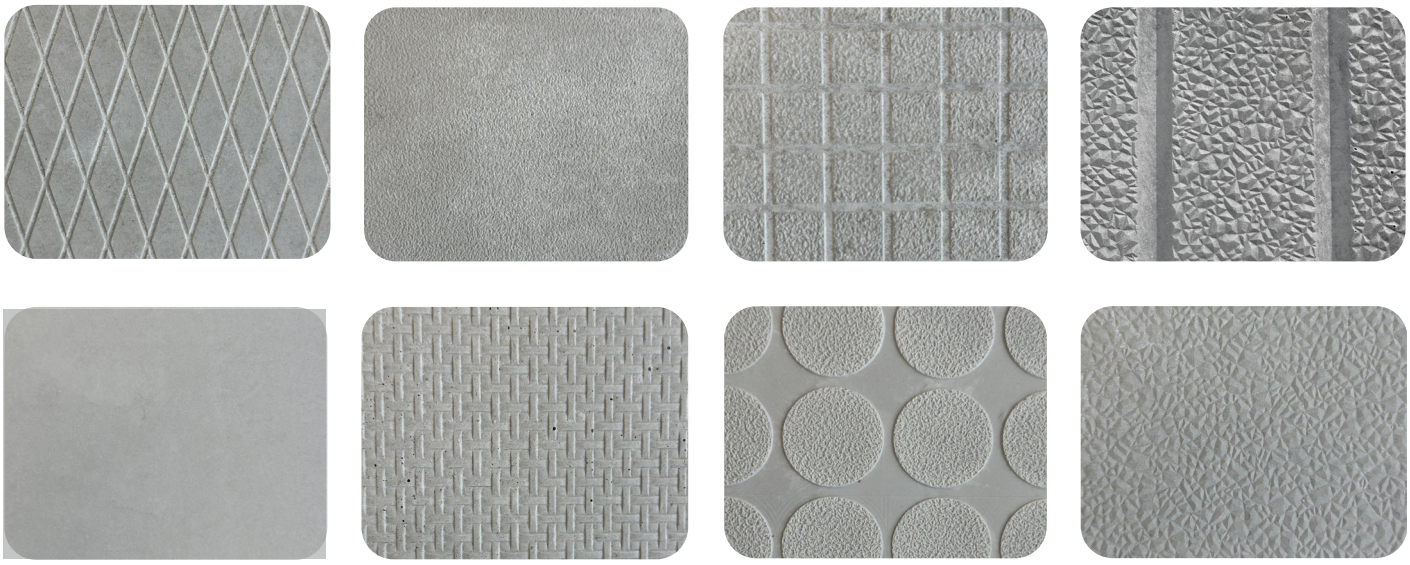
The balconies are supported by L- or C-shaped frames connected to the building. The frames are supported only by brackets at the end of the horizontal beam part of the frame.
For L-frames, the horizontal forces at the bottom of the column part are transferred to the building via the balcony plate, meaning that the L-frames must be supported by a set of temporary props until the balconies are in place. Lateral stability is ensured via the balconies acting as stabilizing disks for both L- and C-frames.

Balcony type: Most suitable for plane balcony slabs but can be used for all types.



UNLIMITED SURFACES

With UHPC, you get unparalleled opportunities to create surfaces with exactly the aesthetics and functionality you desire. We offer 8 standard surfaces as a starting point, but only your creativity sets the limits. Thousands of unique surfaces can be created to meet your project's needs and give your buildings character. We can also add reliefs and create unique imprints and patterns in the concrete, really bringing life and depth to your design.



HiCON

Ultra High Performance Concrete (UHPC) is a type of concrete characterized by a strength range of 130-200 MPa, distinguishing it from other types of concrete such as fiber concrete and high-strength concrete. When you use UHPC, you are offered a light and slender solution, and you avoid complicated joints. Furthermore, UHPC offers a maintenance-free solution and a fire-safe construction that can be shaped and designed without limitations.

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