21/11/2019

Making a concrete impression

with graphic concrete

About GC

About US

Application

Design & Price

Benefits & Need to know

Reference

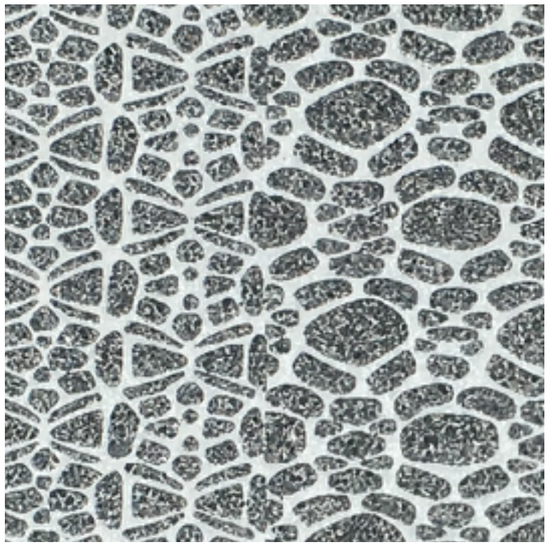
1. About Graphic Concrete

What is Graphic Concrete?

Concrete= aggregate + cement + water

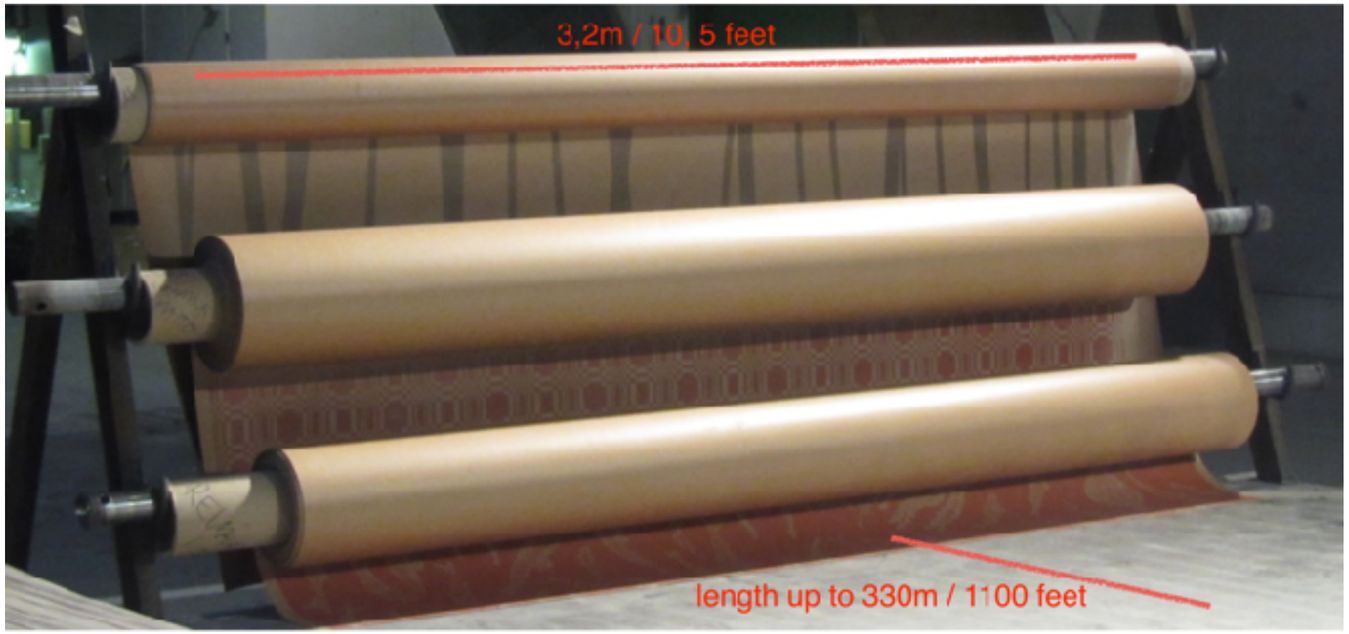
smooth cement surface
(cement glue hardens on the surface covering the aggregates)

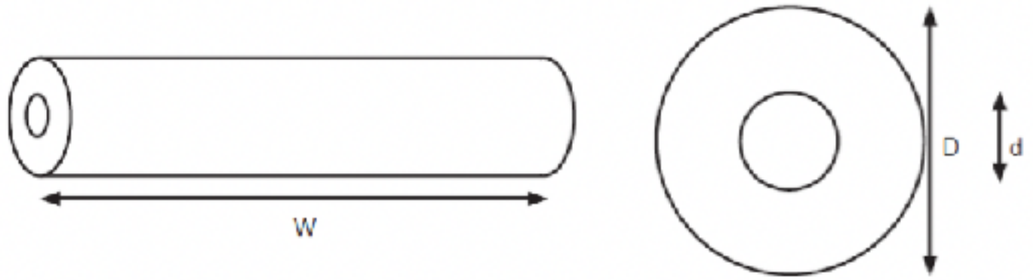
exposed surface
(the cement glue is washed off)



graphic concrete surfcace
(partly smooth, partly exposed)

How does GC work?





- Graphic concrete is made using a special membrane in the mould when casting the concrete.
- The desired patter or image is printed on the membrane with a surface retarder.
- The image results from the retarder exposing the aggregate on the concrete surface.

- Length of a full roll: approx. 330 lm
- W: 3300mm(= image width max 3200 mm + margins)
- D: 410 mm
- d: 153 mm
- Weight: 340 kg

- The membrane is delivered on a roll to the concrete precast factory.

- The membrane is spread on the bottom of the mould.

- Mouldings are built on the top of the membrane.

- The concrete is cast on the membrane.

- The element is de-moulded and the membrane is removed the following day.

- The element is high pressure washed.

- Finally, the graphic concrete pattern is exposed.

Qualifications:

- requires prefabrication (not suitable for on-site casting)
- requires horizontal casting on a casting table

Suitable for:

- any type of concrete
- sandwich elements
- any type of concrete slabs
- light concrete panels

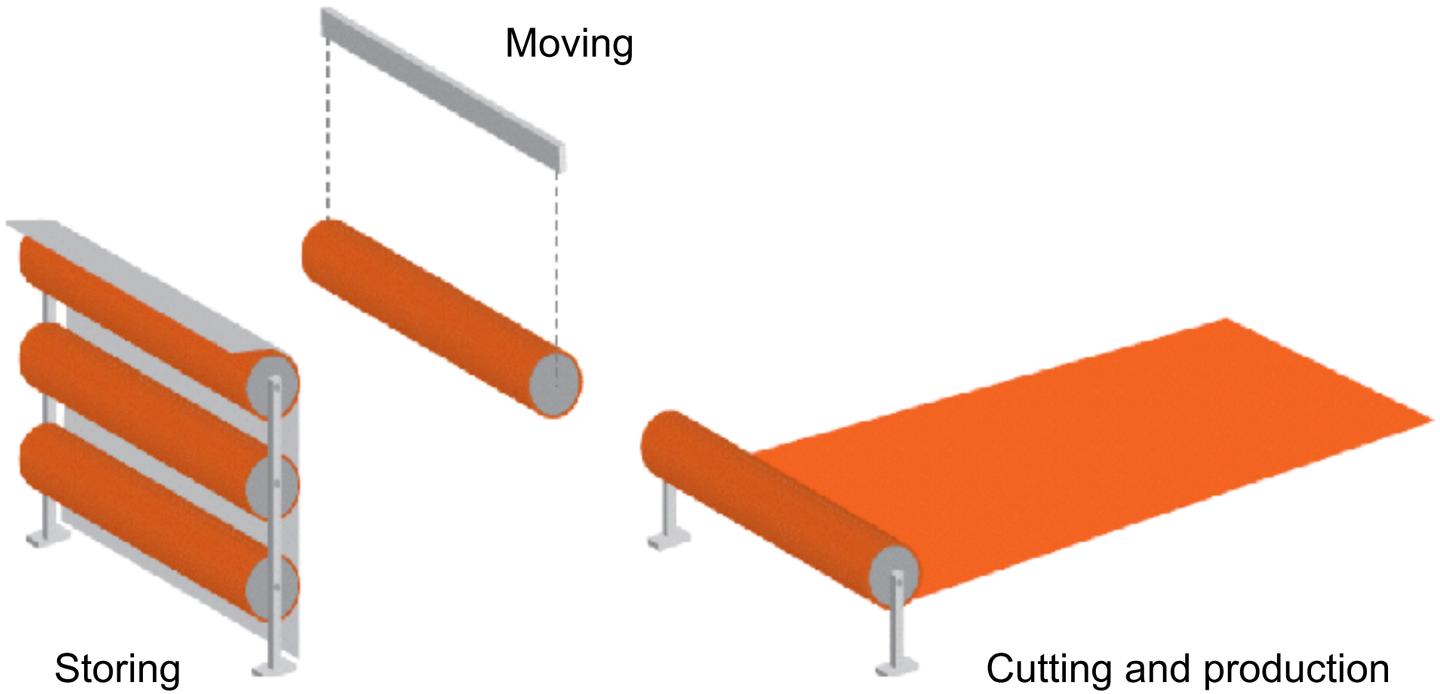
Applications:

- everything from large facades and landscaping to the finest interior design

Needs to consider

- Participation on GCTechnologyTraining
- All instructions must be carefully studied and followed
- Knowledge and facilities to produce fine exposed aggregate concrete surfaces
- Facilities and equipment to use high-pressure washing with water (approx. 200 bar / 2900 Psi)
- High-quality holds for horizontal casting (vacuum table use recommended)
- Keep the membrane in the original delivery package until using it
- Prevent all compression to the membrane roll
- Dry conditions (relative humidity under 50%)
- Warm conditions (temperature + 15-40 °C / +60 -105°F)
- No direct sunlight on the membrane
- The membrane shall be used within 12 months of delivery
- Use appropriate equipment for moving and storing
- Keep the membrane clean: do not allow the membrane to become dusty, dirty, wet or covered with oil

Membrane



For moving:
- A lifting bar
- A crane

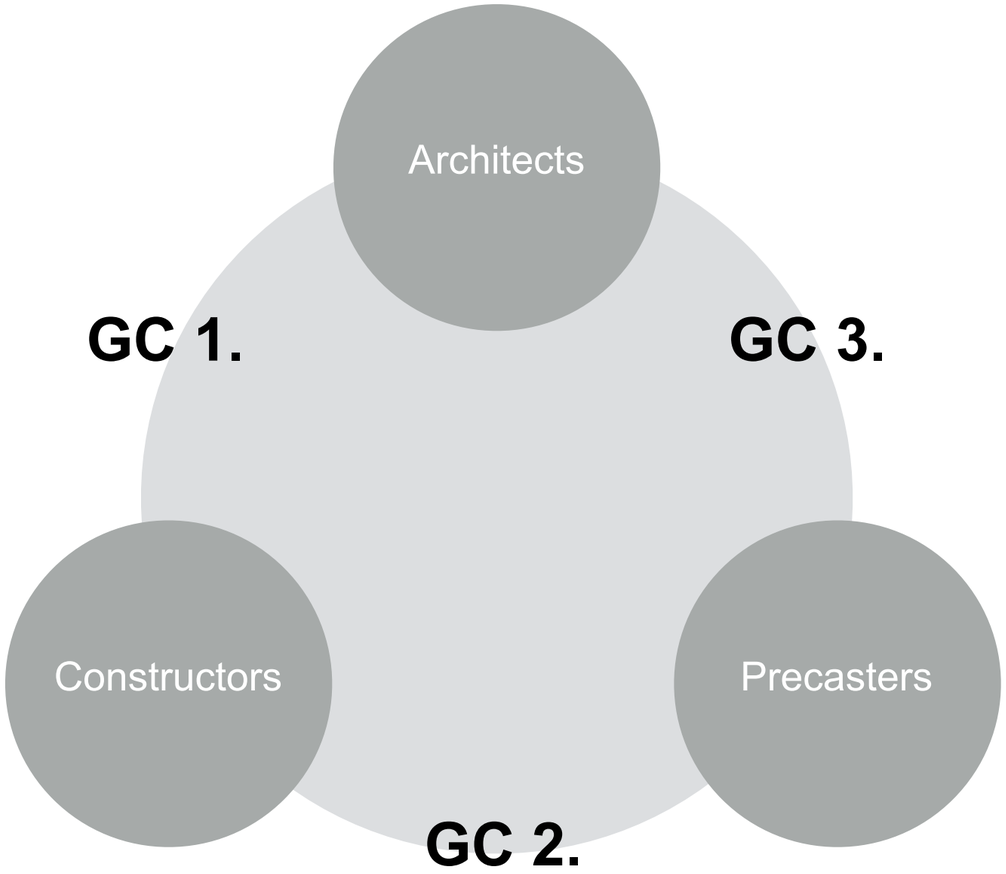
For cutting:
- A clean, even surface by the roll rack
- Re-roll after cutting if the membrane needs to be moved

For production:
- No wrinkles, creases or ruptures will appear
- The membrane will stay clean

For storing:
- A roll rack for safe storage and efficient use of the membrane
- A protection tarpaulin to protect the membrane in the factory

2. About US

What do we do?



- GC provides membrane and service for different stakeholders during the whole process.
- GC facilitates better communication among each stakeholder.
- GC inspires architects out of concrete, as well as consult and support the best application of GC at the planning stage.
- GC supports finding the local precasters and train precasters to produce the best quality
- GC supports problem-solving during the production.

Contact

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3. Applications

Where to apply?








- Exterior façades
- Parking houses
- Sound walls
- Interiors
- Paves
- Landscaping
- School

Where to apply?





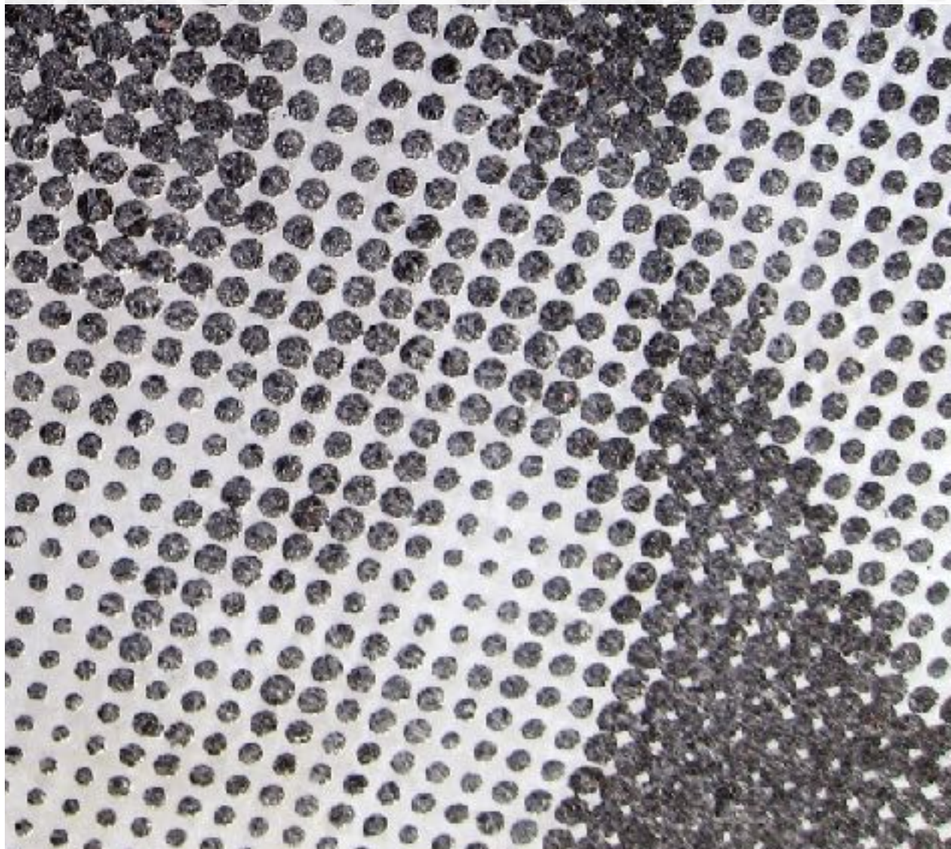




- Educational building
- Civic building
- Government building
- Parking structure
- Infrastructure and non-building structure
- Industrial building
- Religious building
- Medical building
- Residential building
- Commercial building
- Others

The image -dot raster

Albert Edelfelt Shool
Porvoo, Finland
Eduarch Oy



The image -line raster

Chiesa Beato Papa Giovanni XXIII, Chapel
Bergamo, Italy
Traversi + Traversi Architetti

Surface Design Award, London 2015
Best interior space -winner
Best of the best - winner

Color - from aggregate

White cement – red aggregate

Maxinge Shopping Center
Mariehamn, Åland
Arch. Michael Donalds

Color - from pigments

Pigmented cement – black aggregates

Joensuun Elli, student housing
Joensuu, Finland
Arcadia Oy , Design by artist Maria Mughal

Color - surface treatment

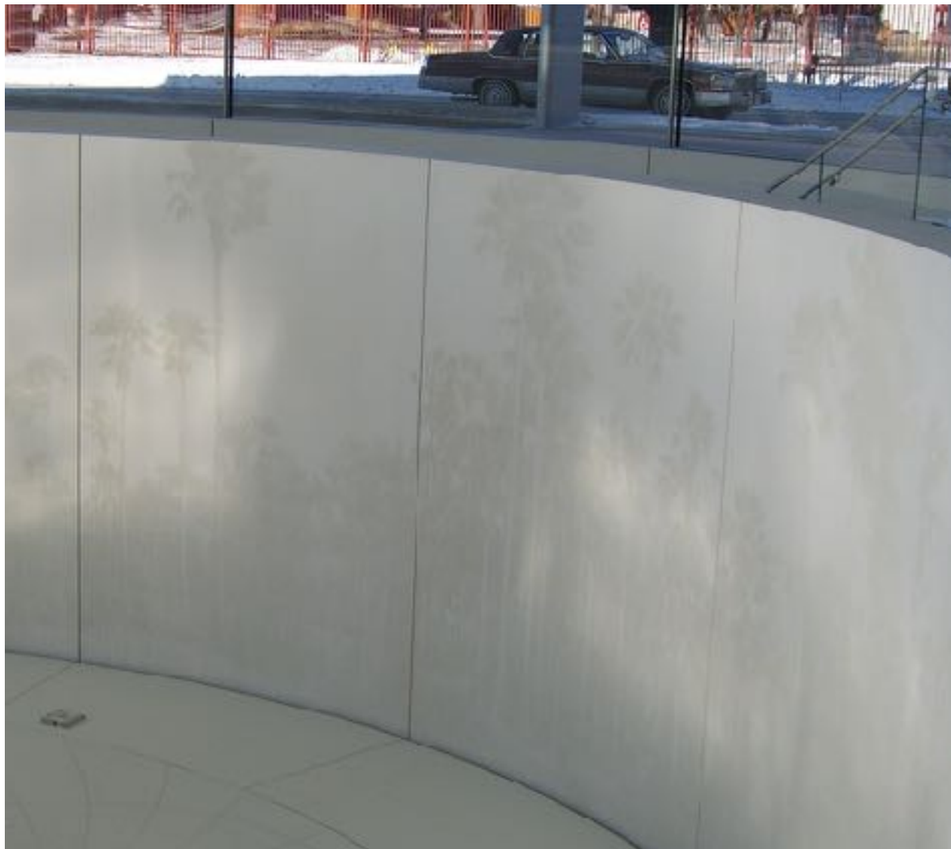
Tuusulan Tulppaani housing
Tuusula, Finland
L-arkkitehdit

Surface -texture

Attunda Tingsrätt
Stockholm, Sweden
Svante Forsström Arkitekter AB

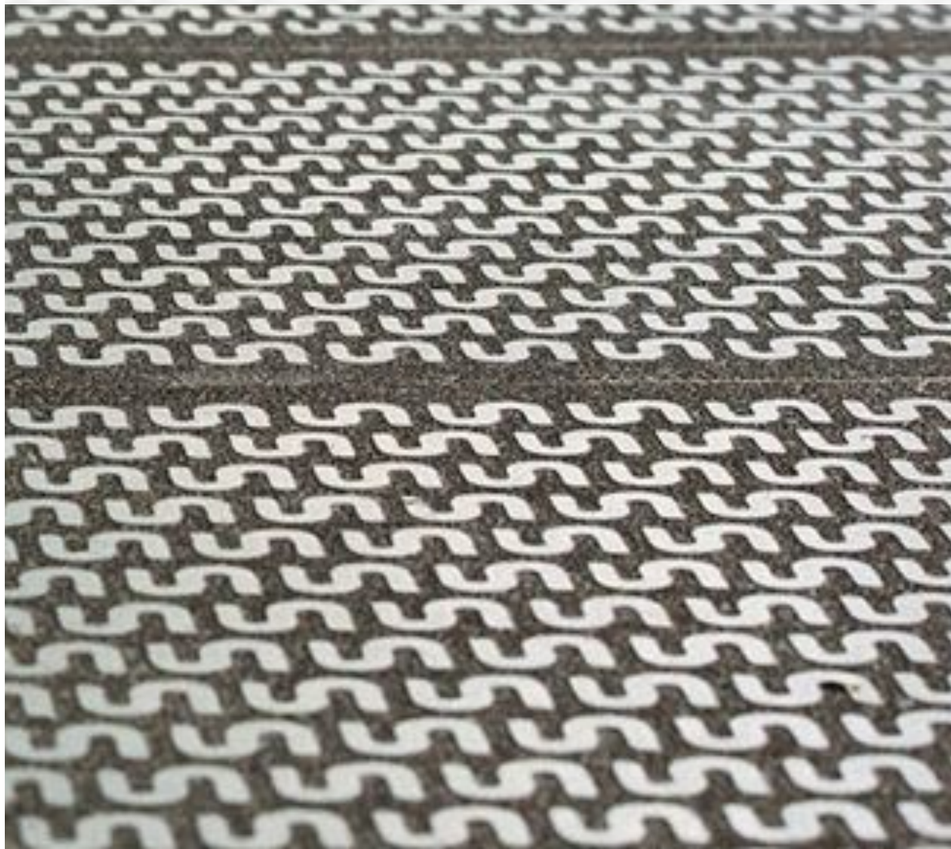
Curved forms

SC Johnson ”Project Honor”
Wisconsin, USA
Arch. Fosters + Partners



Small-scale

Skanskaplattan
Stockholm, Sweden
Strategisk Arkitektur



Large-scale

Pihlajalaakso Sound barrier
Kuopio, Finland
Ramboll Finland

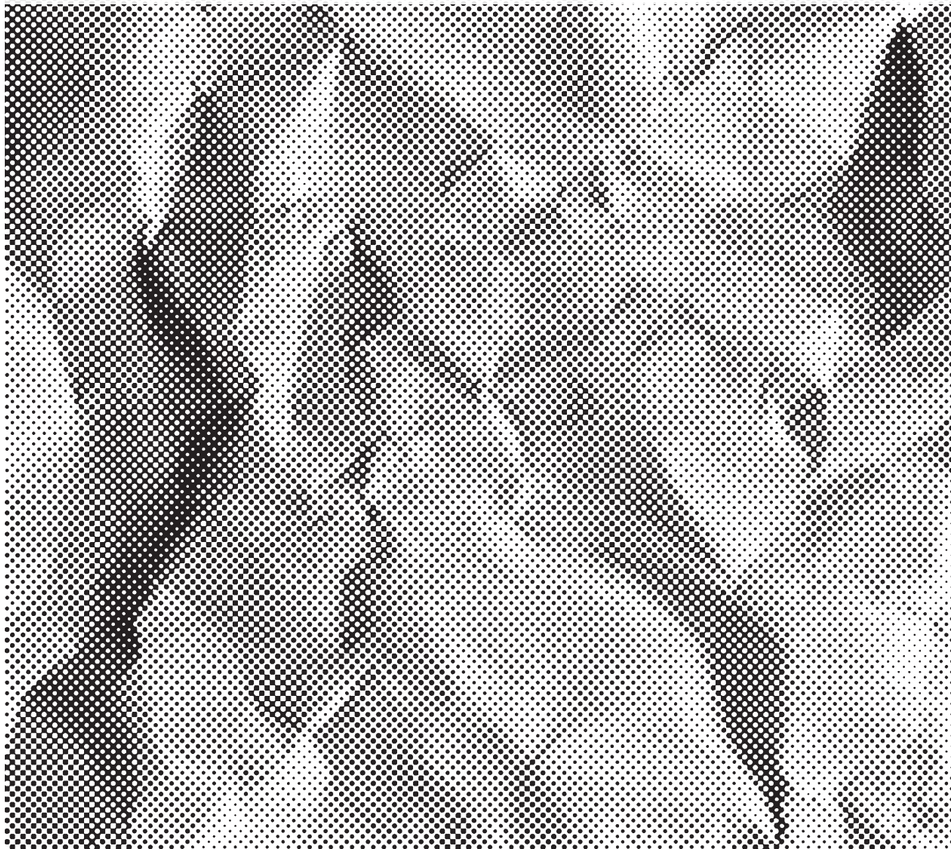
3-D effects

Viborg Landsarkiv- Archive
Viborg, Denmark
Schmidt Hammer Lassen Architects

“Utzon- prize” concrete construction nominee 2017
City of Viborg Honorable Mention for fine architecture 2016

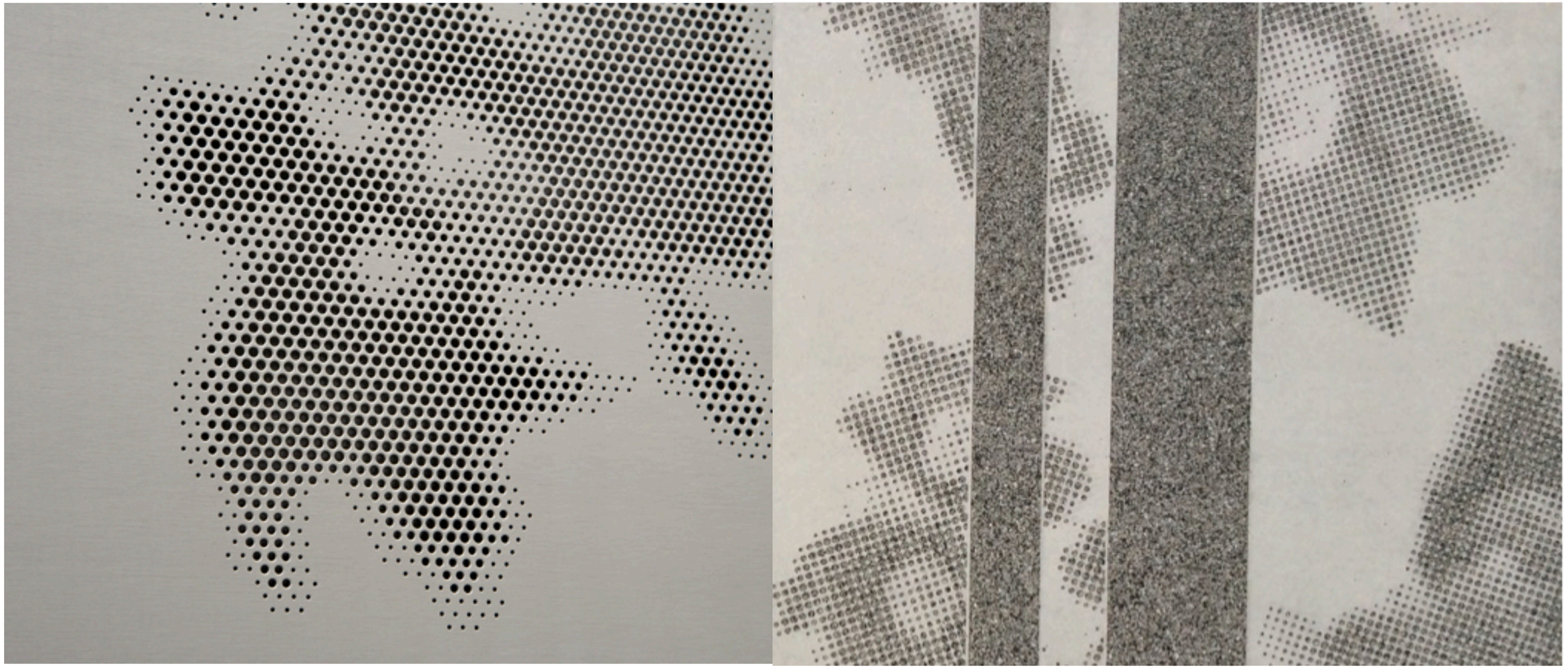
3-D effects

Timanttikujan Pysäköinti
Vantaa, Finland
Anttinen Oiva Arkkitehdit Oy



Bricks

Graphic Concrete



Perforated metal sheet

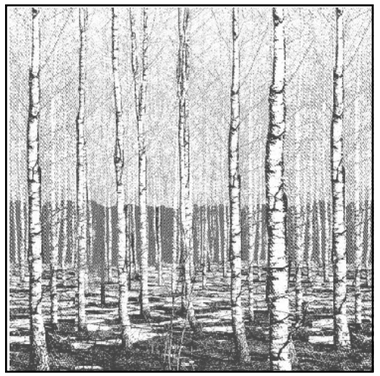
Graphic Concrete

Patterned glass

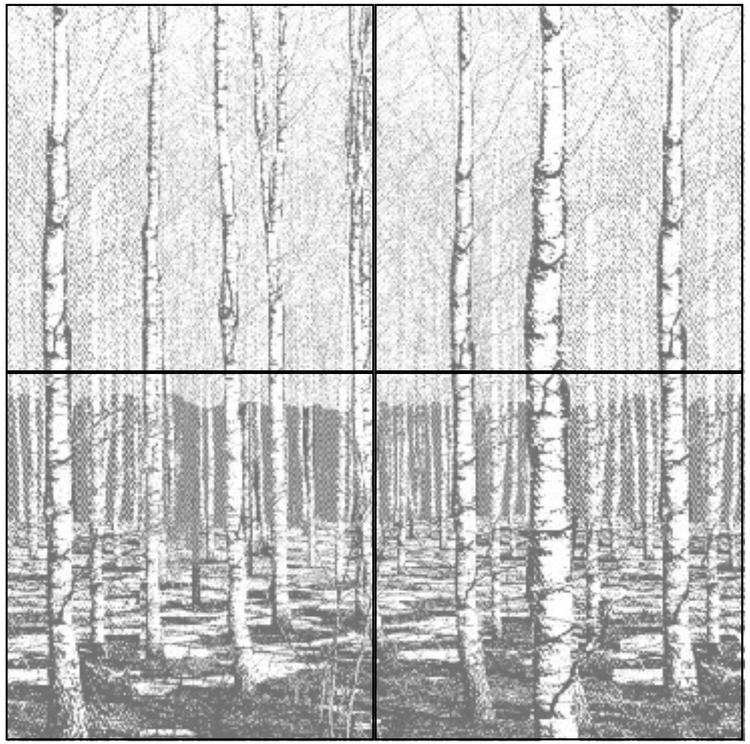
Graphic Concrete

4. Design & Price

How to design/place pattern?



One image on one panel

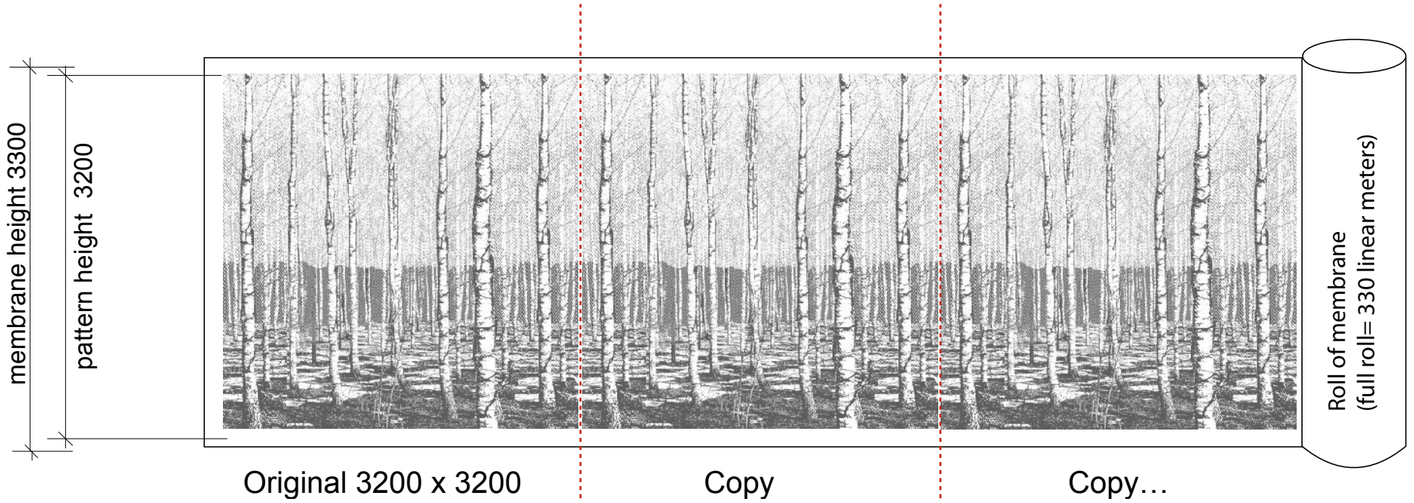


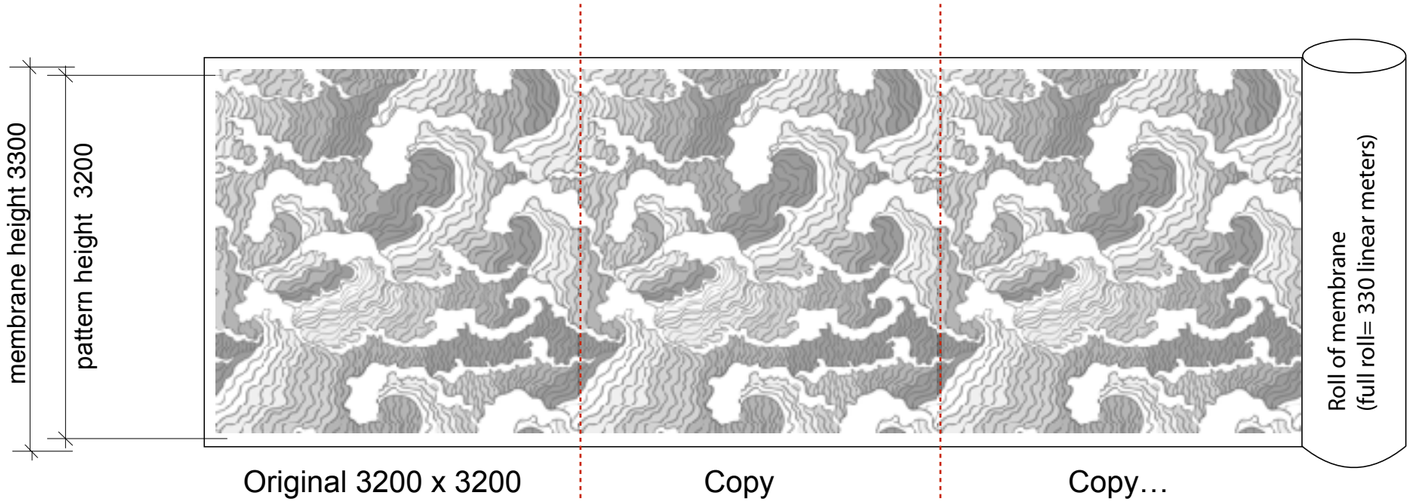
One image on four panels

- You can make on image on one panel or have a large image stretching over many panels.
- The membrane is disposable (use once) and can be cut or combined to any size.

How to design/place pattern?

- The image can be anything that can be printed on a piece of paper
- The membrane is disposable and flexible to use; it can be cut into small sheets or larger pieces can be joined together
- There is no limit to the slab size
- It can be used with very different types of concrete
- It requires no special equipment; a factory that can make exposed aggregate surfaces can also make graphic concrete
- It requires no special structural adjustments; the exposed areas are only about 1,5 mm deep, thus the image does not affect the thickness of the slab (—> minimises the amount of concrete, weight, cost for material / transportation / installation)





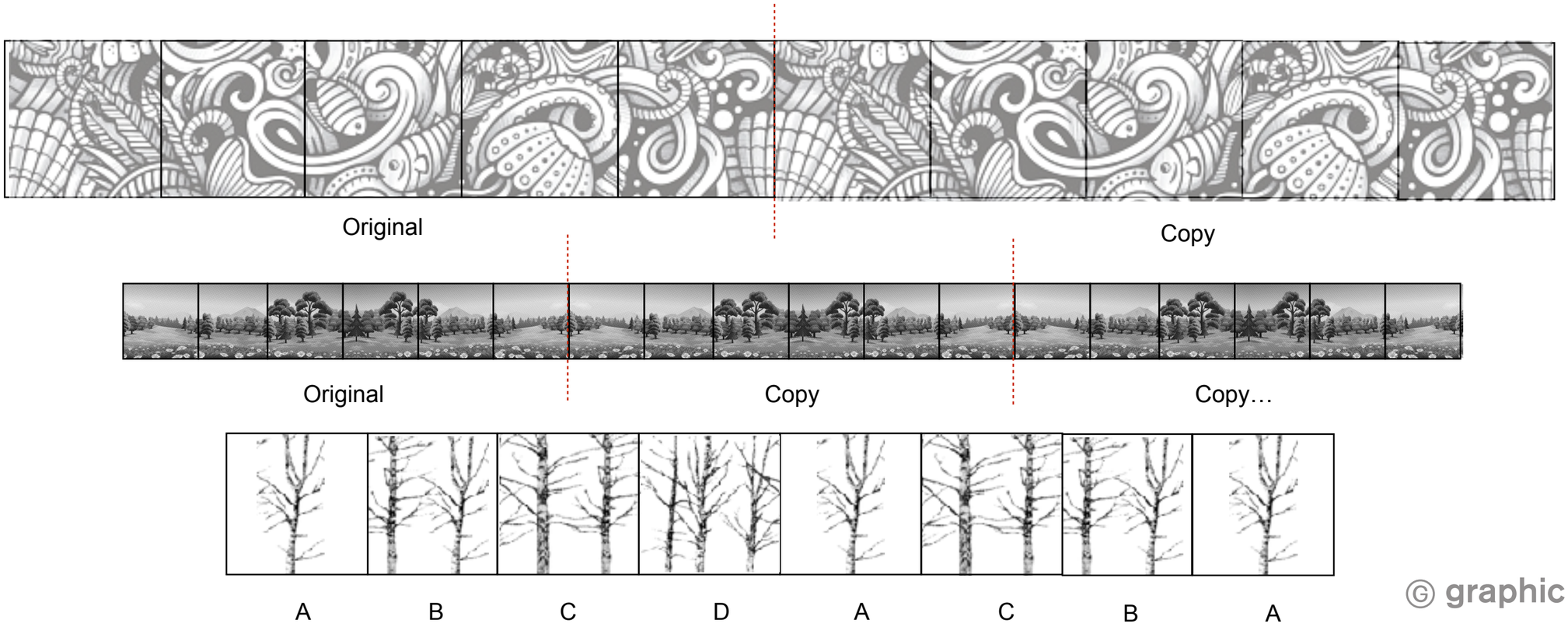
- You can also choose to make a repeating pattern (like a wallpaper).
- The image can be anything that can be printed on a piece of paper.
- The most cost effective is repeating an image of max size 3200 x 3200 mm.

- The membrane is sold per linear meter. The image is max 3200 mm high. The image is repeated for as many linear meters as needed
- The cost depend on the amount ordered: for larger amounts the price per linear meter drops

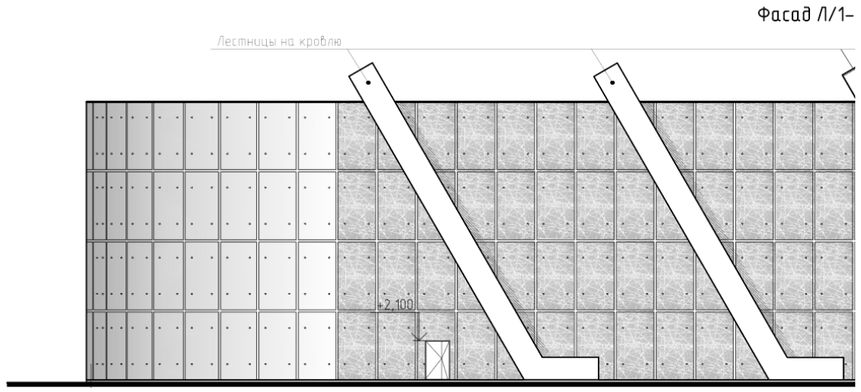
- In order to print the design, we need a black and white pdf of the design.

  Black = exposed aggregate surface
  White = smooth concrete surface

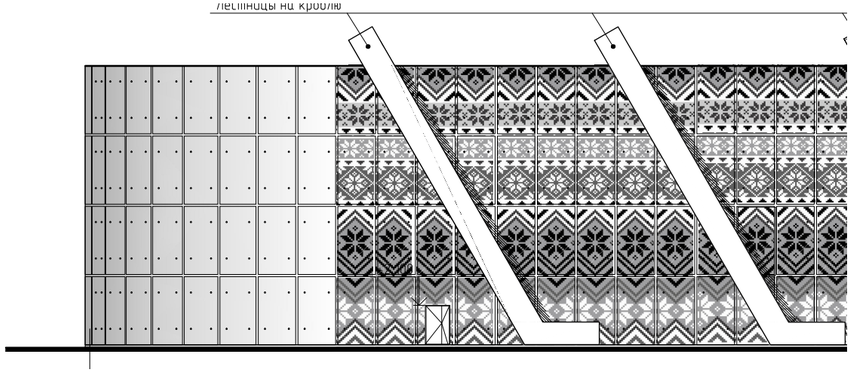
- You can repeat a larger image.
- There is no limit to the size of the image, but it can be divided into parts on the membrane. If the original to be repeated is larger than 3200 x 3200 mm, the place is set according to the size (m2) of the original.
- Instead of repeating the exact same image, you can choose to repeat different images.
- By combining the images in varying order your design will constantly change and the repetition will not be noticeable.



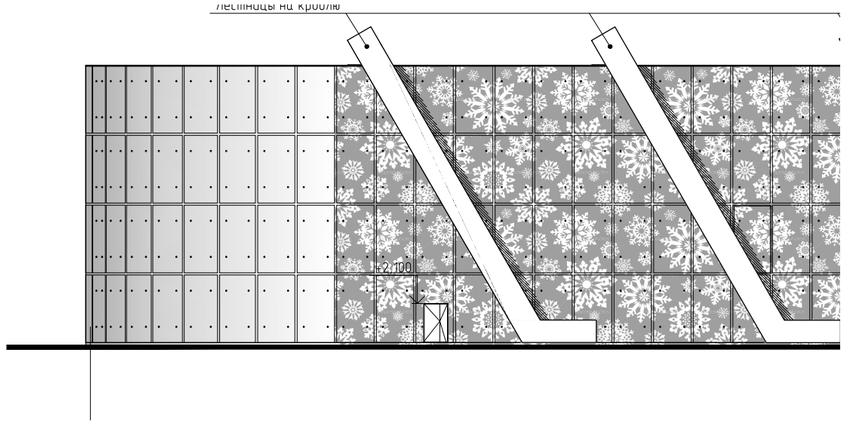
- You can achieve very different looks depending on the scale of the pattern (ex. Ice Hockey Arena, Moscow)



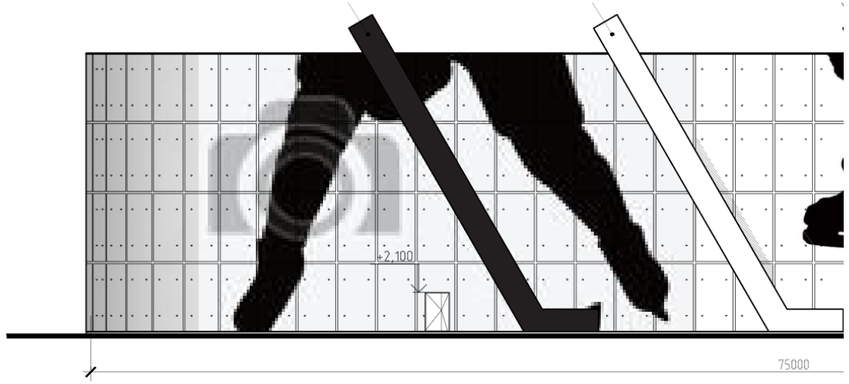
texture finish (“scratched ice”)



graphics emphasising the facade division (“Norwegian sweater”)

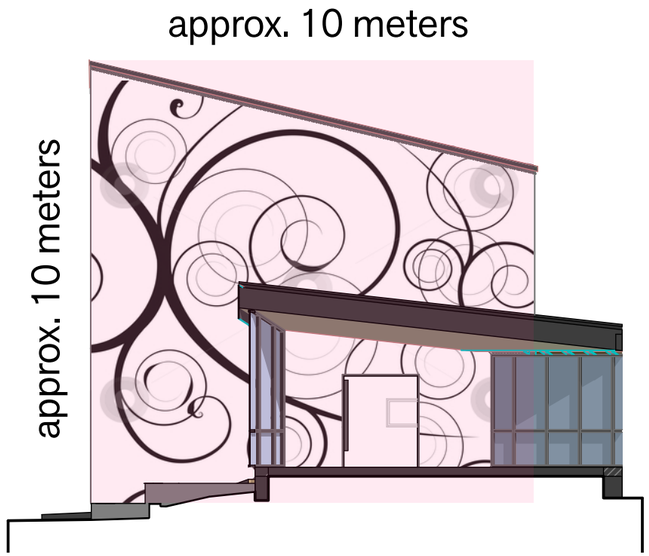


large wall-paper like finish (“snow flakes”)



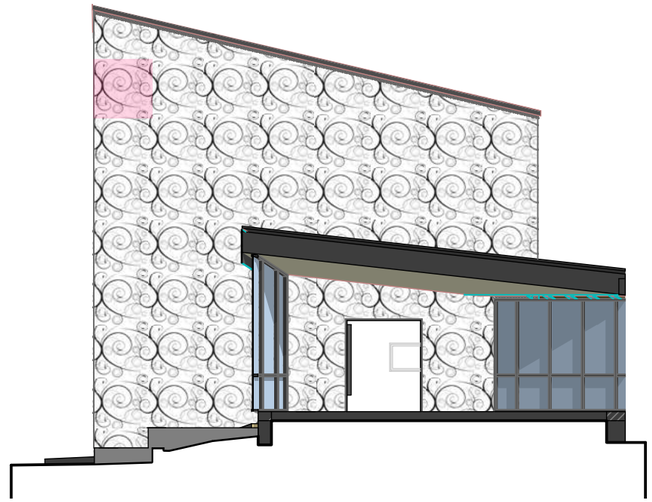
mega-graphics playing with the architecture (“hockey player”)

- The first copy is the most costly; you copy more the same design and the price/m2 of membrane decreases.



One unique piece of art:
The most costly option (100% price)

One image repeated four times:
(33 % price)



A wall-paper type continuing pattern:
(15% price)

5. Benefits & Need to know

Specification

Project membrane

- Image/pattern (file): GCCollection -pattern OR Special pattern/image (print file sent to Graphic Concrete according to GCDesignInstructions)
- Image size: There is no limitation to the size of the image
- Project Drawings: Façade drawings, element drawing or equivalent materials
  The following information needed:
  - the total area of graphic concrete
  - image/pattern, positioning and repetition
  - the element/panel measurements and positioning direction
- Concrete Recipe: Cement, aggregates, pigment %

Project Sample

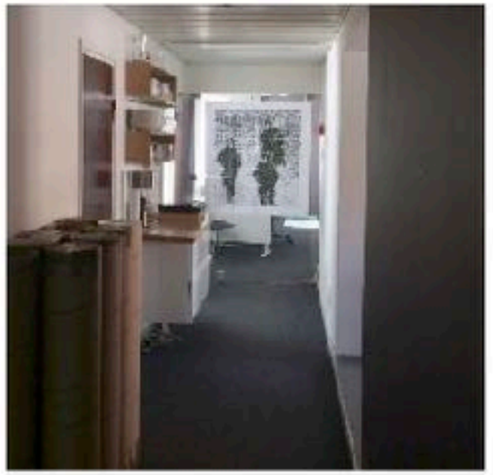
Things to consider
- same production process than in real project
- no stock products
- high starting costs
- time consuming
- usually leeds to interruption of production

not necessary for image or raster testing

Project Sample

Simple Image Testing

Original picture

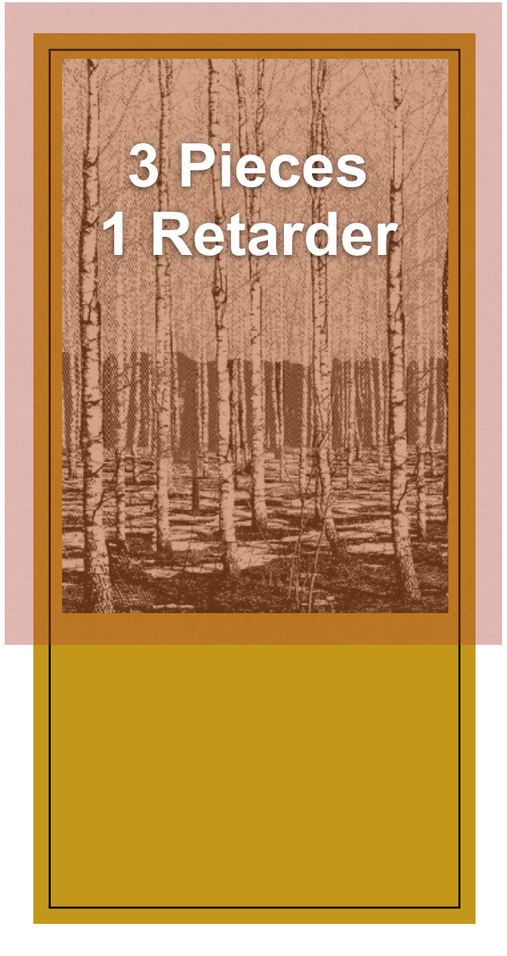


Rasterized image

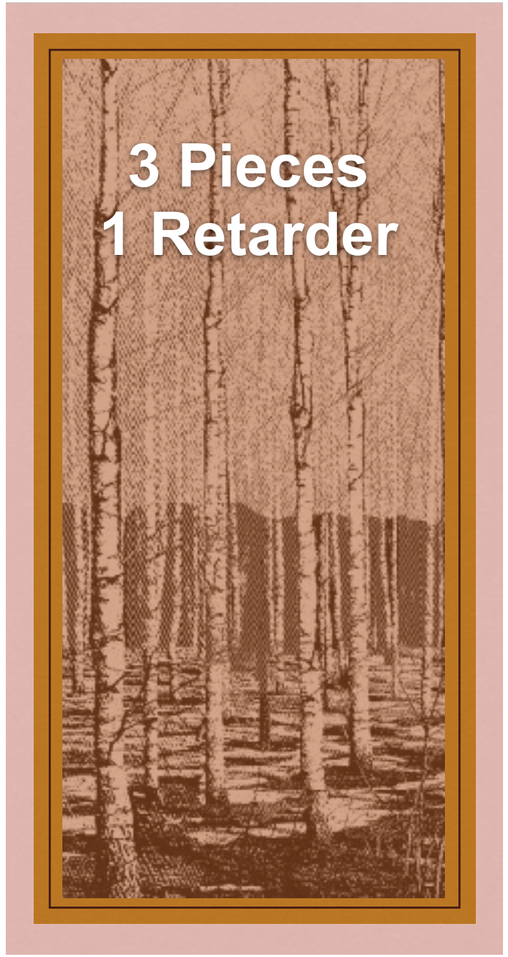
Final concrete slab

Project Sample

Sample size max.
1500x1000mm



Sample size max.
1500x2000mm



Sample size max.
1500x3200mm

Benefits

- Recyclable and safe to use
- Does not emit any harmful gas or chemicals
- Reduces the use of solvent based materials and dust inconvenience during production
- Does not have any effect in regards to the environmental loading of a building reduces the need for additional material use on the concrete surface (additional cladding, treatments or paints)
- Reduces the need for additional scaffolding at the site; minimally disrupts the construction site and saves time during construction
- The surface is straight; - stays clean, easy to maintain, no formed edges that can break
- The outcome is 100% made of concrete and the surface as durable as the concrete itself
- A graphic concrete surface is virtually maintenance free, which saves costs during the whole lifespan of the structure
- It provides great slip resistance on horizontal surfaces

6. References

Enjoy Concrete Factory Building, Veurne, Belgium
Industrial building
2012
Architecture: Archoteltiirbirp Govaet & Vanhoutte
Prefabrication: Enjoy Concrete
Designer’s own pattern

Cortex Science Park
Educational Building
2015
Architecture: Creo Arkitekter
Prefabrication: DS Elcobyh A/S
GC-collection

Läansisatamankatu 23 Residential Building, Helsinki, Finland
Residential Building
2014
Architecture:Huttunen Lipasti Rakkanene Architecty Oy
Prefabrication: Ammän Betoni Oy
GC-Collection pattern

Albert Edelfelt School, Porvoo, Finland
Educational Building
2008
Architecture:Eduarch Oy
Prefabrication: Betoniluoma Oy
Designer's own pattern

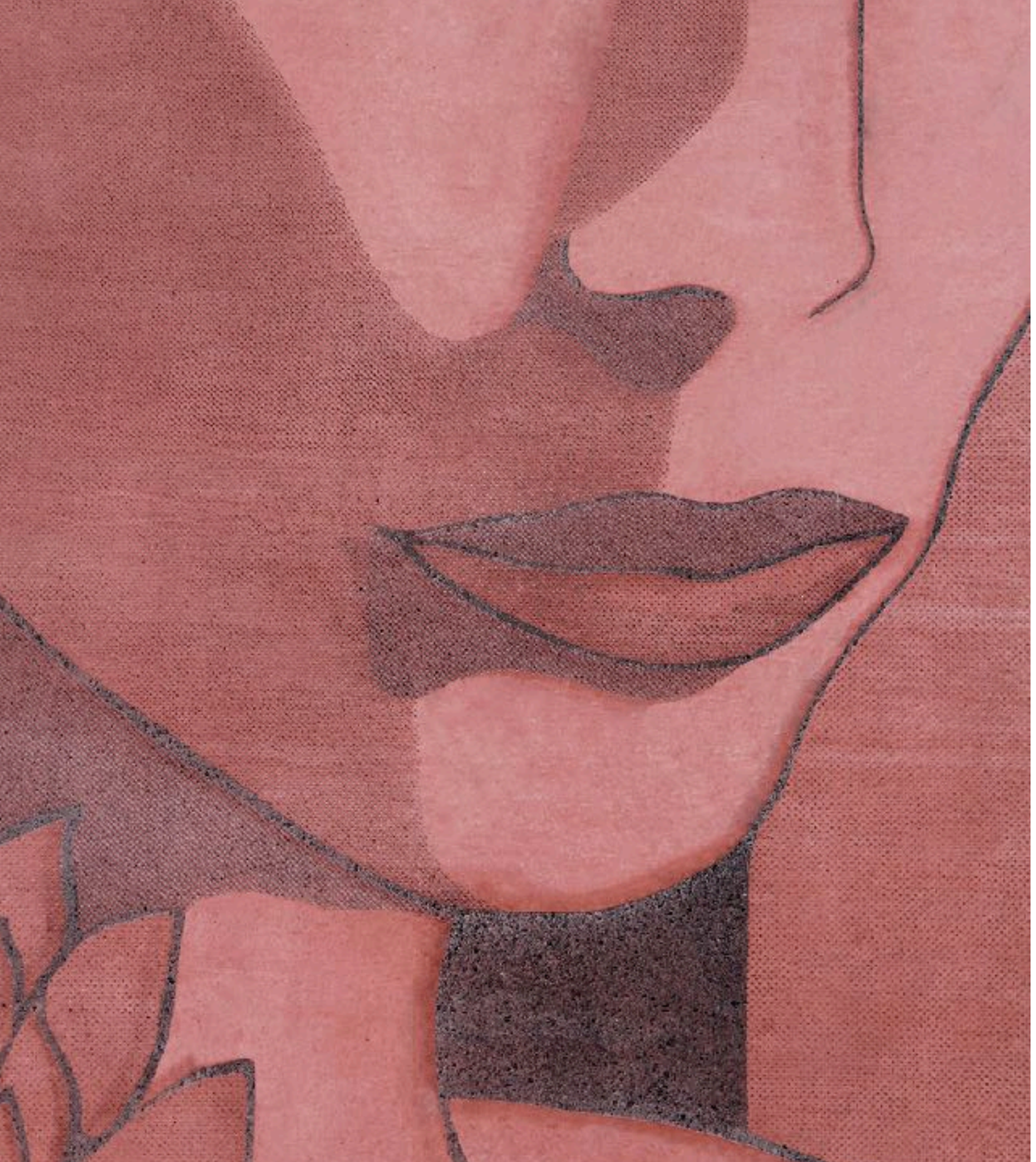
Best Concrete Facade of the Year 2009, Finland
Concrete Structure of the Year 2010, Finland
Nominee for the Mies van der Rohe Award for European Architecture 2011

Hämeenlinna Provincial Archive
Civic Building
2009
Architecture: Heikkinen-Komonen Architects
Prefabrication company: Parmy Oy
Designer's own repeating pattern

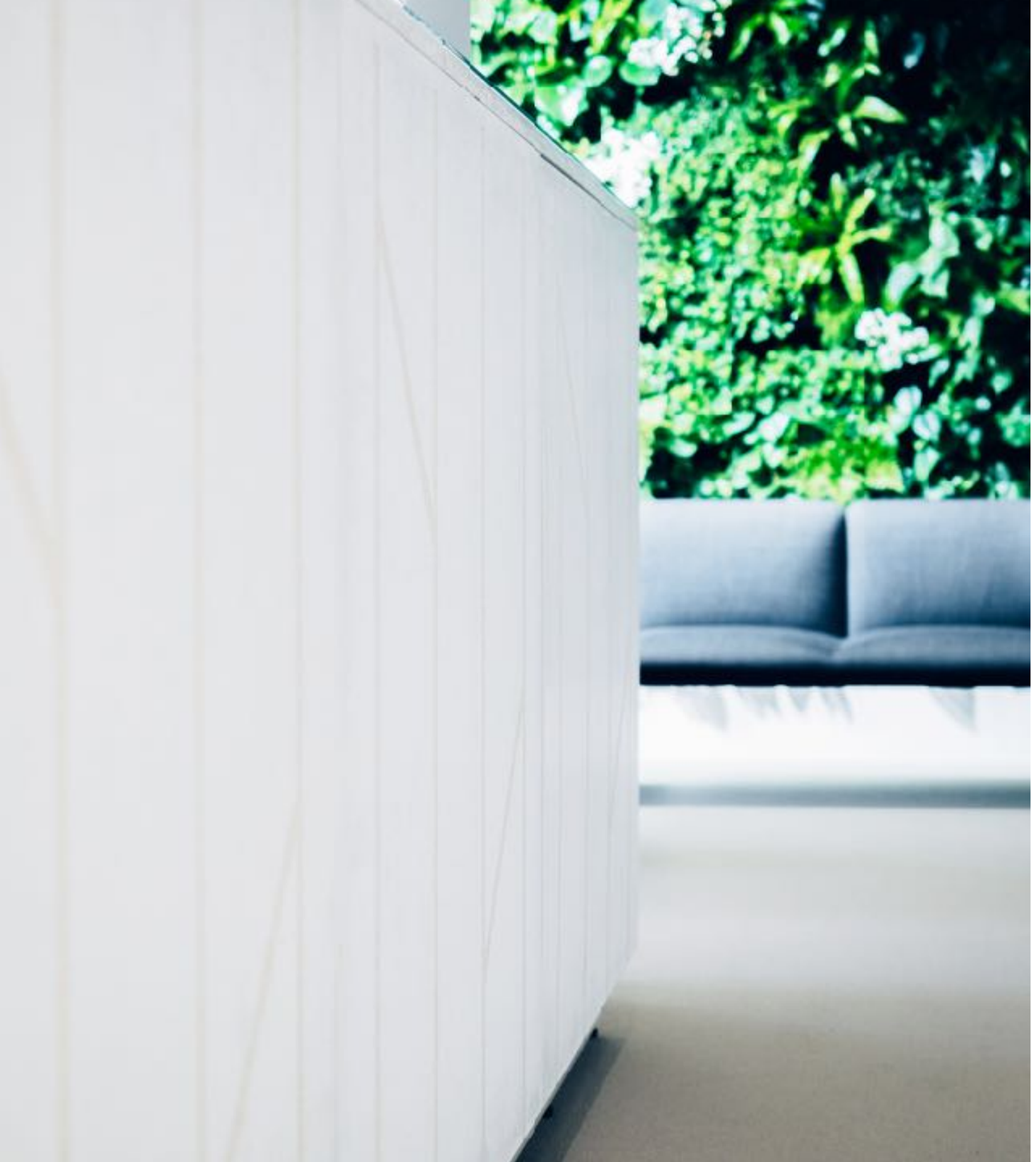
Rubiiniparkki Parking House
Parking Structure
2015
Architecture: L.a.B Arkkitehdit Oy
Prefabrication company: Betonimestarit Oy
Designer’s own repeating pattern

H.A.N.S. Industrial Building, Czech Republic
Industrial Building
2009
Architecture: Ing. arch. Jan Jarolimek
Prefabrication company: H.A.N.S. Stavby. a.s.
Designer’s own repeating pattern

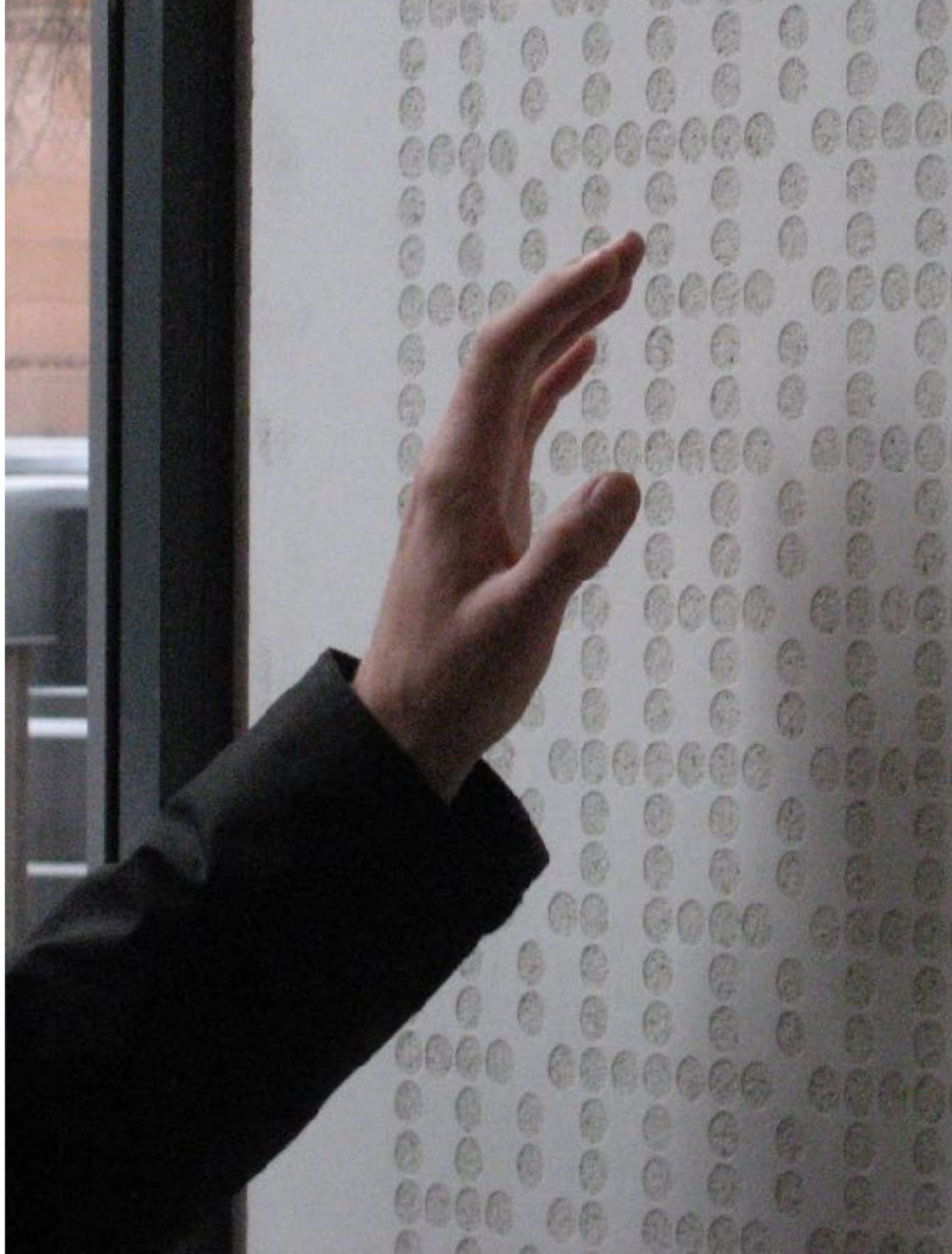
Joensuun Elli Residential Building, Joensuu, Finla
Residential Building
2011
Architecture: Arcadoa Arkkitehtitoimisto Oy
Prefabrication company: Pielisen Betoni Oy
Designer’s own pattern



Lexia Reception Desk,
Commercial Building
2016
Architecture: Katriina Kankinen
Prefabrication company: Sklocement Plus s.r.o / Polycom
Designer’s own repeating pattern



Pennfäktaren, Office Building Entrance, Stockholm, Sweden
Commercial Building
2010
Architecture: Reflex Arkitekter
Prefabrication company: Fiberbetong
Designer's own pattern
Designer: Gabor Palotai Design

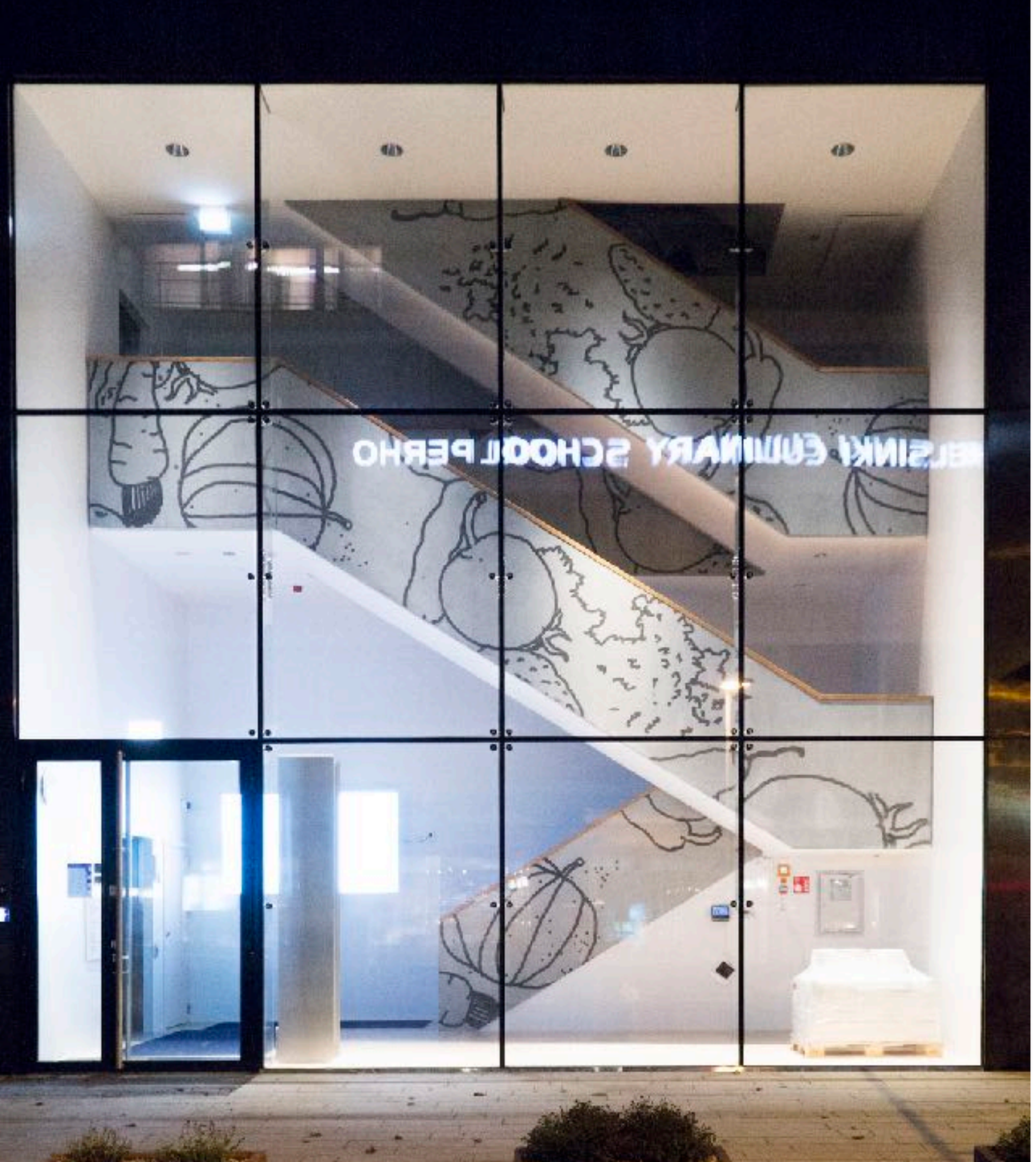


Leed Platinum building

General Electronic Building
Commercial Building
2015
Architecture: GaS Studio
Prefabrication company: Il Cantiere
Designer’s own pattern

Église Saint-Vincent-de-Paul Chapel, Rezé, France
Religious Building
2015
Architecture: Magnum Architectes & Urbanistes
Prefabrication company: Naullet
Designer's own Repeating pattern

Långbrodal School, Älvsjö, Sweden
Educational Building
2017
Architecture: Aperto
Prefabrication company: Abetong
Rebecka Bebben Andersson’s own pattern



Helsinki Culinary School Perho, Helsinki, Finland
Educational Building
2015
Architecture: SARC Architects
Prefabrication company: Parmy Oy
Oiva Toikka's own design pattern

Falun Travel Centre, Falun, Sweden
Infrastructure and Non-Building Structures
2015
Architecture: Sweco Architects, Falun
Prefabrication company: Strängbetong AB
Designer’s own pattern

Pihlajalaakso Sound Barrier, Kuopio, Finland
Infrastructure and Non-Building Structures
2014
Architecture: Ramboll Finland
Prefabrication company: Betonimestarit Oy
Rebecka Bebben Andersson's own pattern
Designer: Teemu Matilainen / Ramboll Finland Oy and Graphic Concrete

“Utzon- prize” concrete construction nominee 2017

City of Viborg Honorable Mention for fine architecture 2016

Viborg Provincial Archive, Viborg, Denmark
Civic Building
2015
Architecture: Schmidt Hammer Lassen Architects
Prefabrication company: Confac A/S
Pattern: Designer's own Repeating pattern
Designer: TGrethe Sørensen

Thank you!

www.graphicconcrete.com