















it's all about innovation

BRIGHTWALL - DAGSLYS IGENNEM BETONVÆGGE

Dansk Betondag 10. september 2015, Sørup Herregaard, Ringsted
Johannes Portielje Rauff Greisen, Arkitekt MAA, PhD, Konsulent, Teknologisk Institut

BrightWall

BrightWall Team
Breakfast Meeting 19th of April 2013

Proposal full title: **Development of an innovative translucent concrete sandwich panel with dynamic control of light transmission**

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Indlejret teknologi




















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Arkitektur

Peek&Cloppenburg Store/Renzo Piano Building Workshop/Cologne, Germany
photo: Michel Denance


Emporia/Wingardhs/Malmo, Sweden
photo: Tord-Rikard Soderstrom

Selfridges/Future Systems/Birmingham, UK
photo: G-Man, Wikipedia 2006

'Report for the end uses of BrightWall' - på stand og www.brightwallproject.eu


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Arkitektur

UNStudio






Leiner Furniture Store/Zechner & Zechner/Grabenweg, Innsbruck
photo: Thilo Hardlein



Printemps Store/Biecher Architectes/Strasbourg, France
photo: Luc Boegly




Kalverstraat/Amsterdam, The Netherlands
photo: Pink Paislee Blog

3.1.2 DESCRIPTION OF BUILDING TYPOLOGIES - COMMERCIAL


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Arkitektur

UNStudio






Serpentine Gallery Pavilion 2002/Toyo Ito+Cecil Balmond+Arup/London, UK
photo: Sylvain Deleu



Tbilisi Public Service Hall/Fuksas/Tbilisi, Georgia
photo: Studio Fuksas




City of Arts and Sciences/Santiago Calatrava/Valencia, Spain
photo: Jacobo Gordon

3.1.2 DESCRIPTION OF BUILDING TYPOLOGIES - CULTURE/PUBLIC


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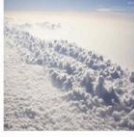
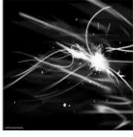


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Motiv


UNStudio




Pixel Subtraction				
Pixel Bundling				
Original Image				

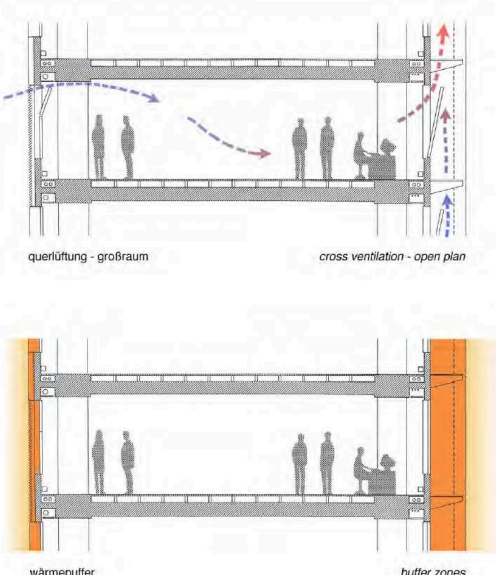
Patterns Light Guides / Resolution

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Motiv

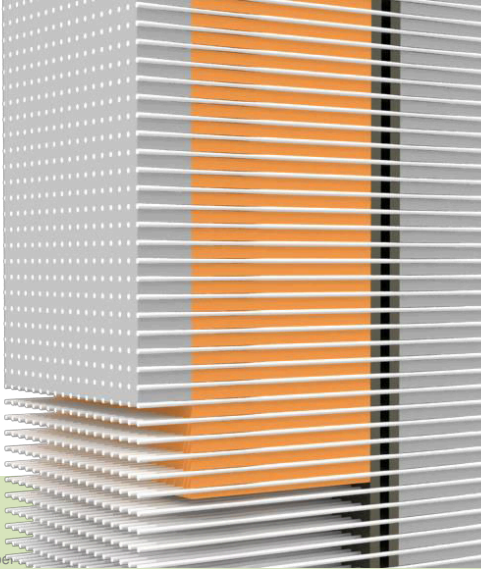




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Design koncept



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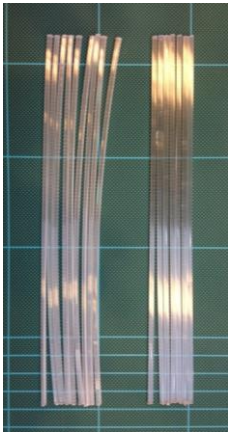


Dansk Betondag, 10. september



Lysledere

DTU Fotonik
Department of Photonics &

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Isolering

THINK ENERGY
ECOCHOICE ^e

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Beton – Lab.

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Beton – Fab.

CONFAC
funktionel og funky beton

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Prototyper


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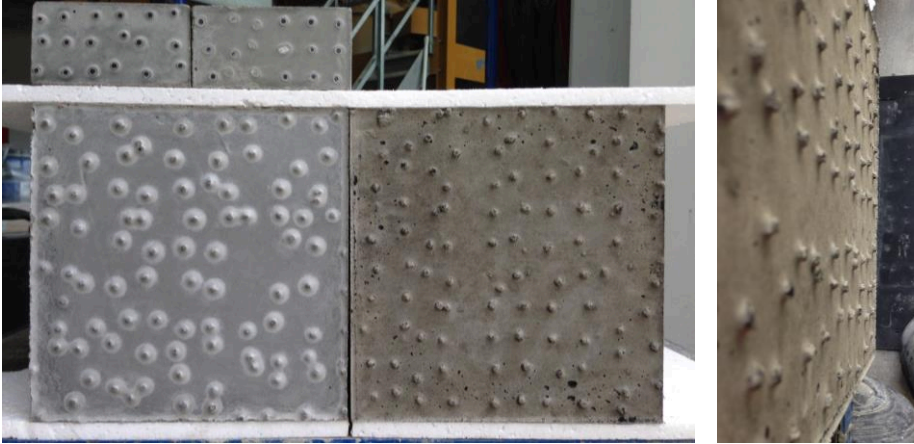
BrightWall, dagslys igennem betonvægge



Prototyper



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Samples max 20cm x 20cm

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Fuldskala



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Brand-emne, 70cm x 100cm

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Fuldskala

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Brand-emne, 70cm x 100cm

17



Fabrik

CONFAC
funktionel og funky beton

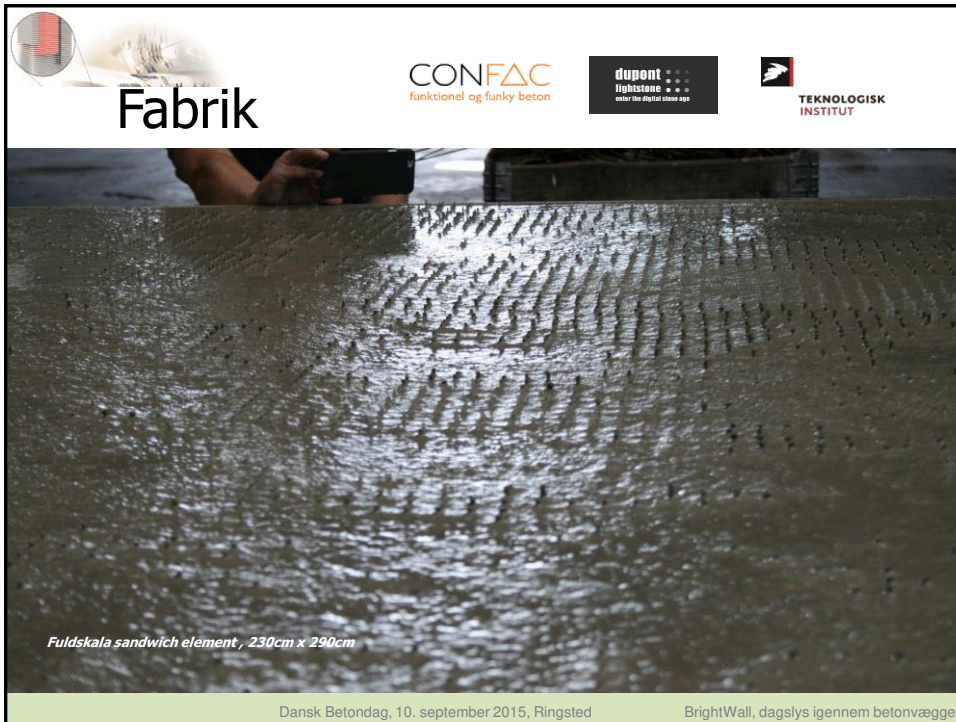
dupont
lightsone
order the digital concrete app

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Fuldskala sandwich element, 230cm x 290cm

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BrightWall, dagslys igennem betonvægge



Fabrik

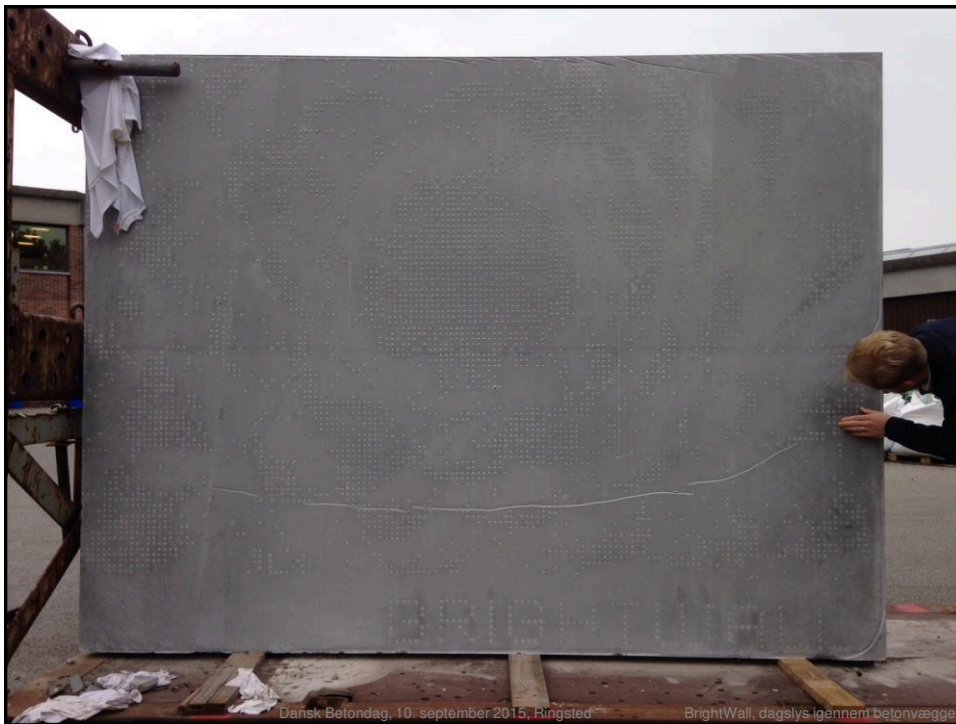
CONFAC
funktionel og funky beton

dupont
lightstone
enter the digital stone age

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Fuldskala sandwich element, 230cm x 290cm

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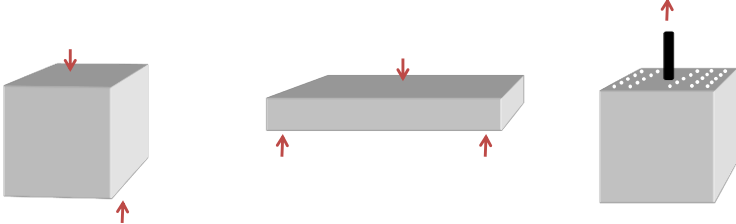




Test - Mekanisk

Hvad betyder lyslederne for betonens mekaniske egenskaber?

- Compressive strength: EN 12390-3
- Elastic modulus: EN 12390-13
- Flexural strength: EN 12390-5
- Bond between concrete and reinforcement: EN 10080



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Test - Mekanisk





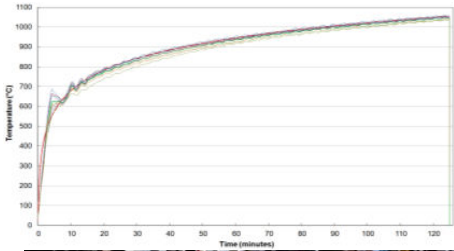
Ved 28 modenhedsdøgn – Pixel Pitch 10mm

- Trykstyrke: reduktion 10-15%
- Bøjningsstyrke: reduktion 30-35%



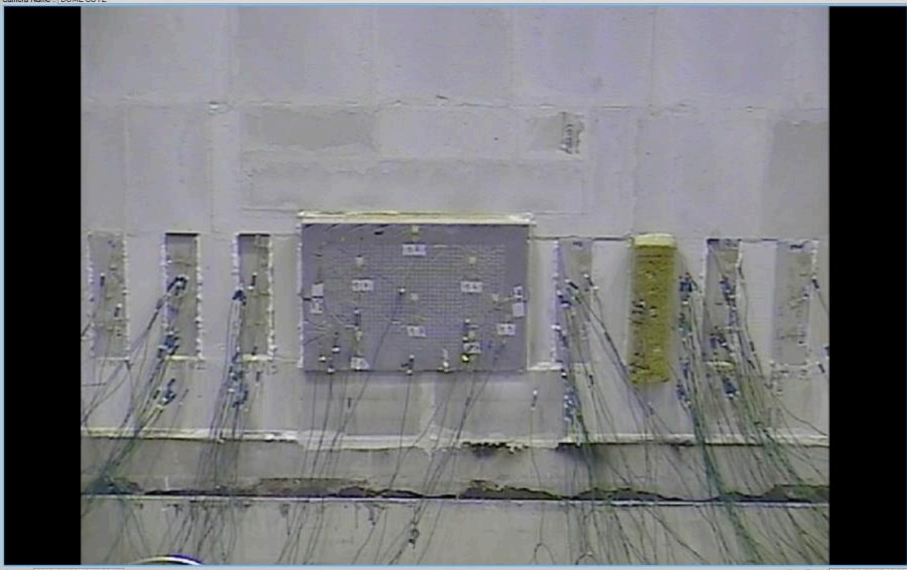
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Test - Brand



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Rotate 180 degrees

Camera Name : DOME COTE

Image : 2015-08-26 17:13:00.00

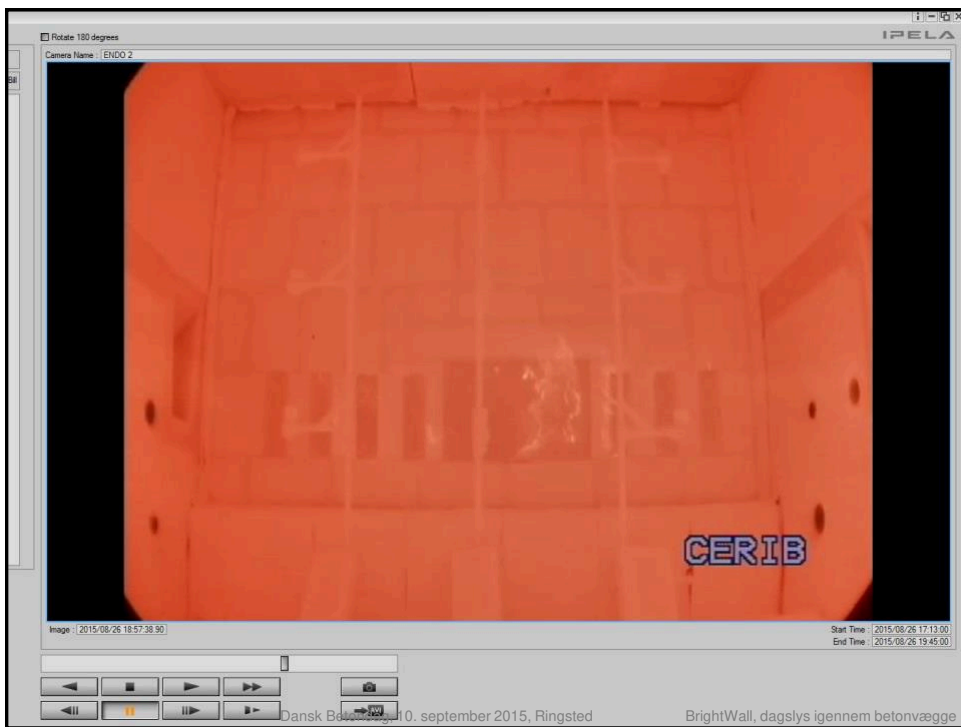
Start Time : 2015-08-26 17:13:00

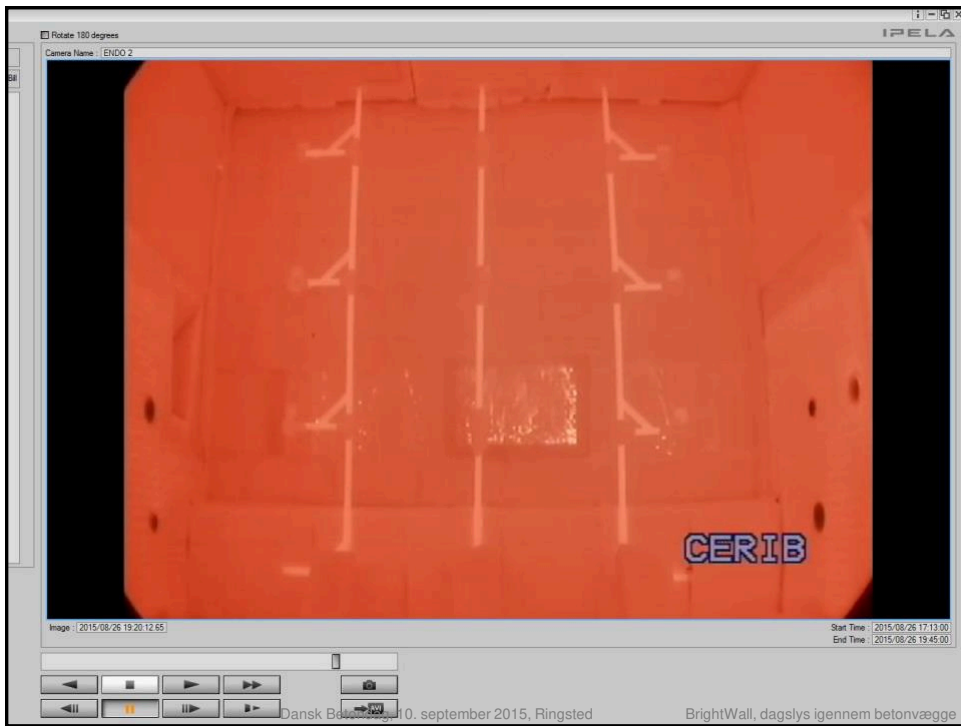
End Time : 2015-08-26 19:45:00

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Test - Robusthed


Frost-tø cyklusser er ved at blive testet.
Chlorid-migration er testet og viser migration i interface langs de optiske fibre.





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BrightWall, dagslys igennem betonvægge



Test - Isoleringsevne

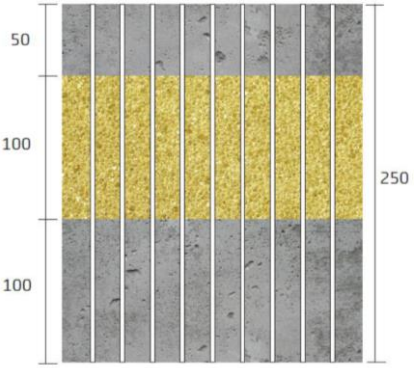
Lambdaværdier for Brightwalls tre hovedbestanddele er:

- Beton $\lambda = 2,000 \text{ W/mK}$
- Polycarbonat $\lambda = 0,200 \text{ W/mK}$
- PIR-isolering $\lambda = 0,025 \text{ W/mK}$

Teoretisk fastsættelse ved forskellige metoder og programmer, blandt andet HEAT2R

U-værdien for Brightwall

- $U = 0,240 \text{ W/m}^2\text{K}$ (blank)
- $U = 0,265 \text{ W/m}^2\text{K}$ (PP20)



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BrightWall, dagslys igennem betonvægge






Test - Isoleringsevne

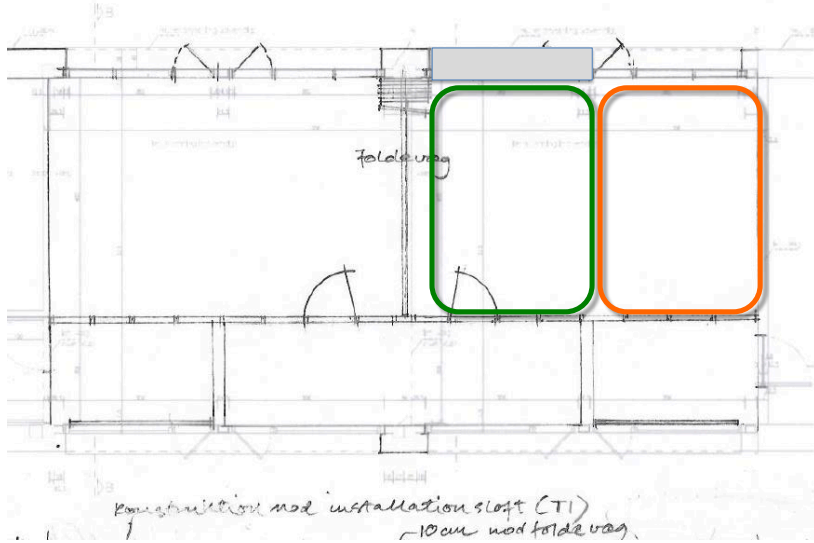
Lambda-målinger i gang. Resultater og analyse afventes.



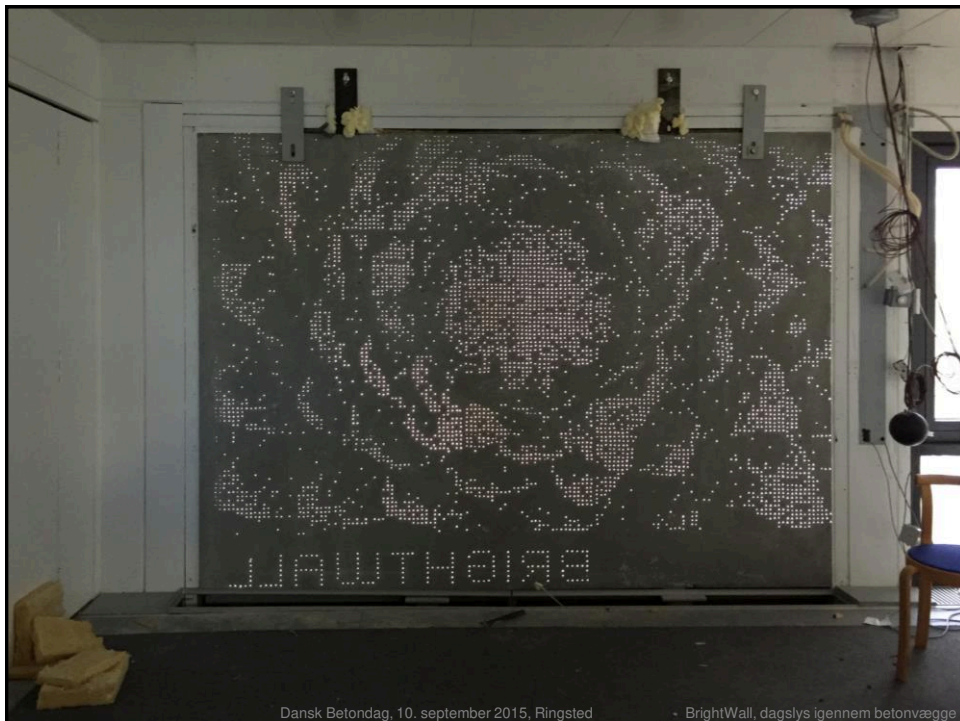
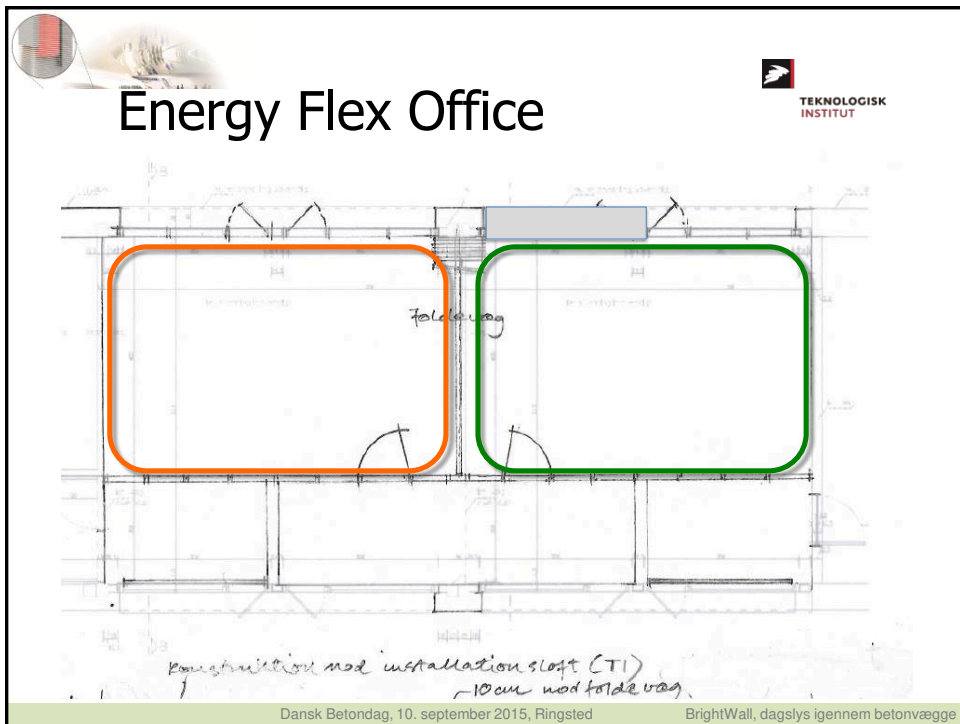

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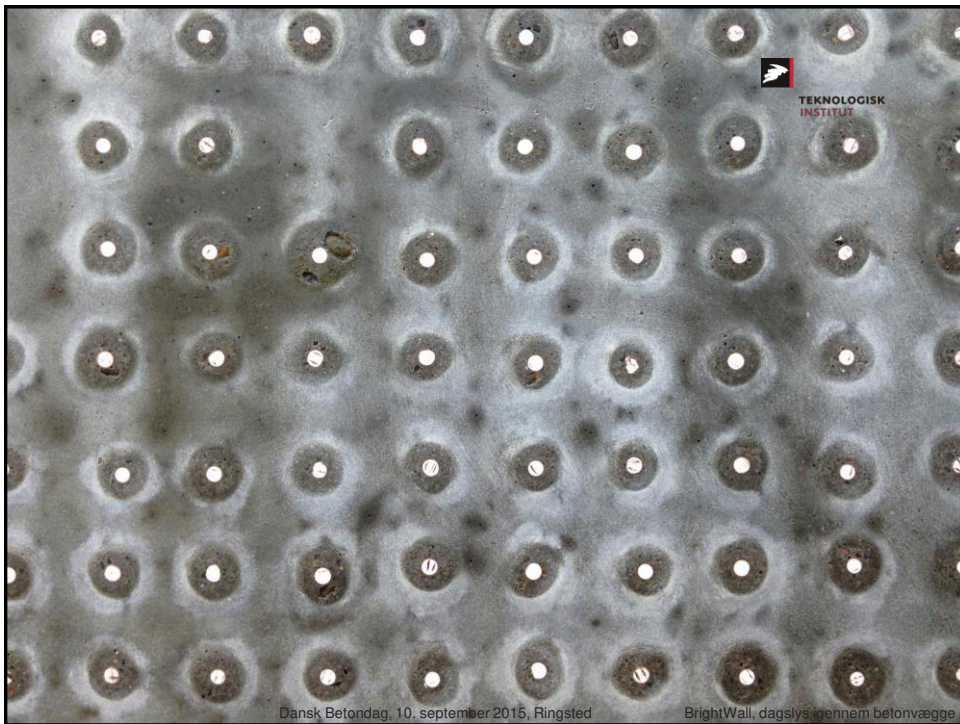
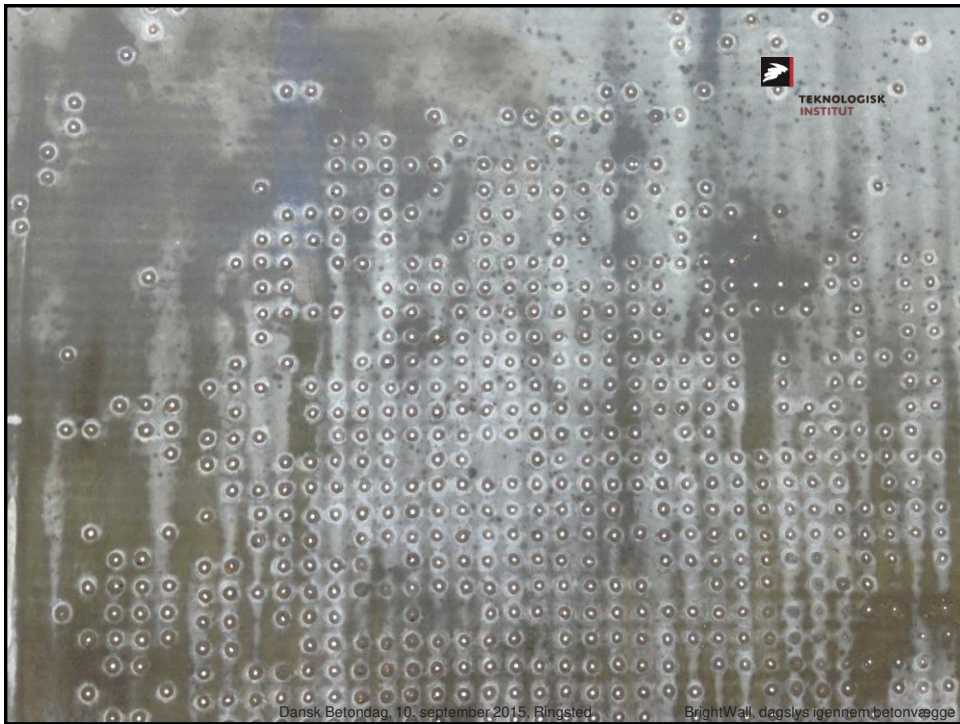
Energy Flex Office

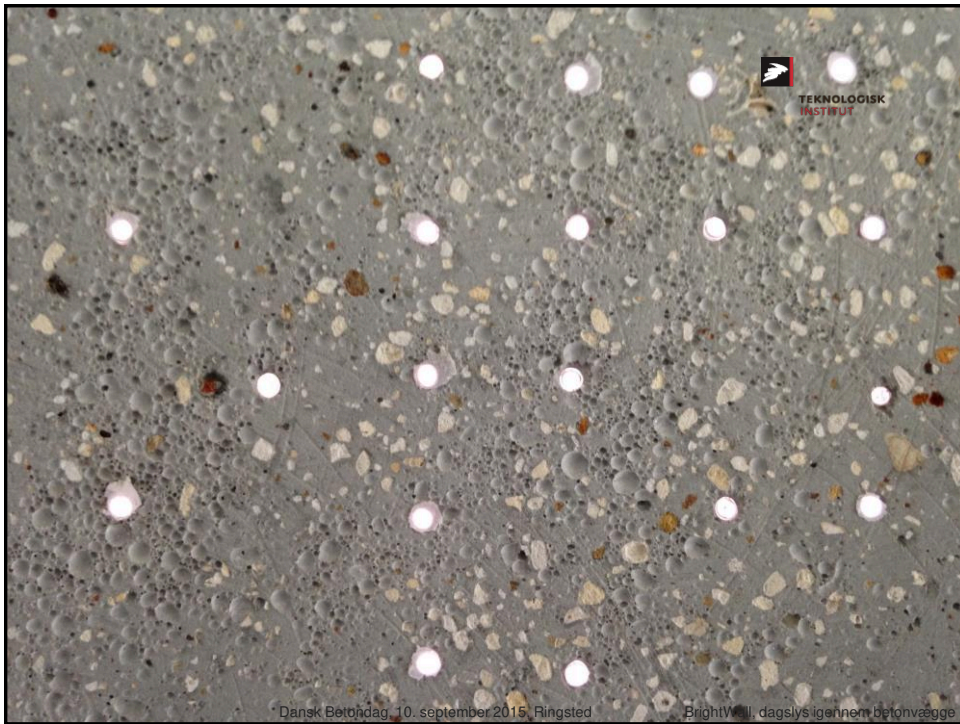


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Lysspil

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This slide features a microscopic view of concrete aggregate. The background is a greyish matrix with various colored and shaped aggregate particles. Overlaid on this are several bright, circular spots of light, some appearing as white and others as purple. The title 'Lysspil' is prominently displayed in the upper left. The logo for 'TEKNOLOGISK INSTITUT' is in the upper right. A light green bar at the bottom contains the event information and the project name 'BrightWall, dagslys igennem betonvægge'.



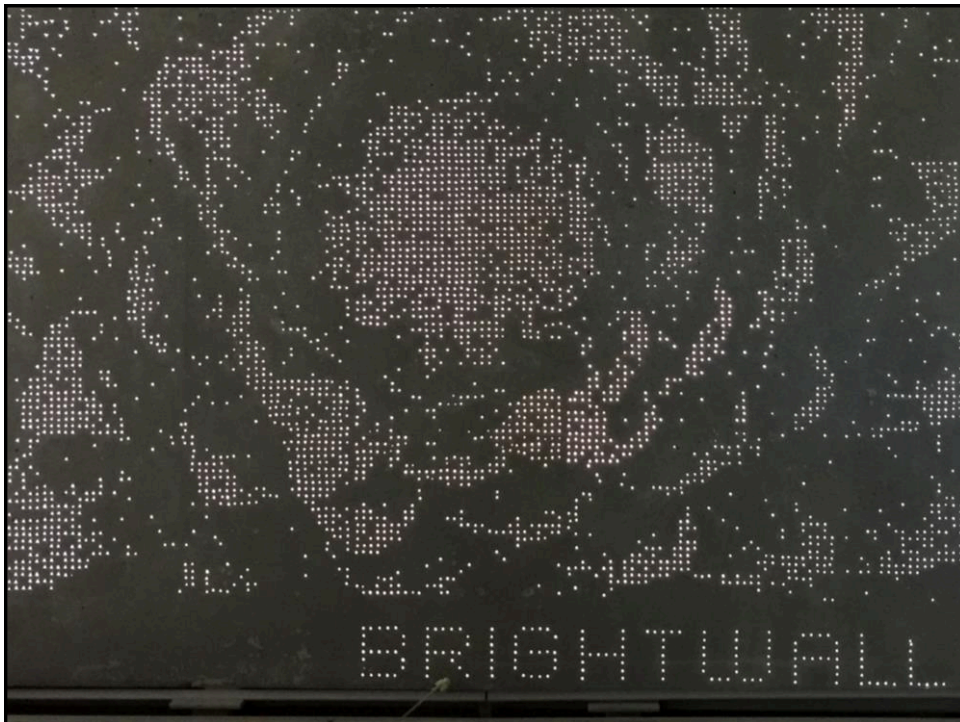
Variation

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This slide is similar to the one above, showing a microscopic view of concrete with light spots. However, the title is 'Variation'. The layout, including the logo and the bottom bar with event information, is identical to the first slide.



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www.brightwallproject.eu

TAK FOR OPMÆRKSOMHEDEN

Johannes Portielje Rauff Greisen, Arkitekt MAA, PhD jrg@teknologisk.dk +45 72202271

Dokumentation af et nyt lyskoncept til brug i offentlige rum. Projektet er støttet af Teknologisk Institut og Danmarks Tekniske Universitet. Løsningen er baseret på et samarbejde mellem arkitekt og teknolog. Læs mere om projektet på www.brightwallproject.eu. Billedet er et billede af en lysvæg, der er lavet af beton og har små lyskilder i hver celle. Lysvæggen er lavet af beton og har små lyskilder i hver celle. Lysvæggen er lavet af beton og har små lyskilder i hver celle.