A Conversation with: Luai Kurdi from Besix on “3D printing in Construction”

This session will start soon.

مجلس أعمال البينيلوكس
BeNeLux Business Council

BESIX 3D

Mute your microphone when not talking

Please ask your questions at the end of the presentation

Who are we

Dedicated 3D Concrete Printing Division within BESIX

- Established in 2016 – specializing construction, facade & furnishing
- Operational since December 2018
- Dedicated team specialists
- One stop shop (design – software – printing - execution)
- International partnership with world renowned 3D companies BE & NL

BESIX

BESIX 3D

2.3Bn
EUR

15,000

100+ years

Privately Owned

66%

>>>

A CULTURE OF INNOVATION

A strong regional footprint

50+ year in the Middle East

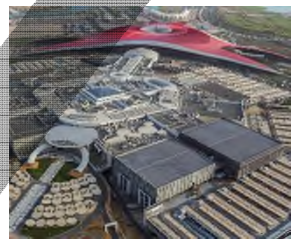
BESIX

First Contract, Corniche Abu Dhabi

Sheikh Zayed bridge

Sheikh Zayed Grand Mosque

Burj Khalifa



Ferrari World & Yas mall

King Abdullah Sports City

Four Seasons Hotel

Cleveland clinic

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3D to disrupt Construction Industry?

Technology Look Back

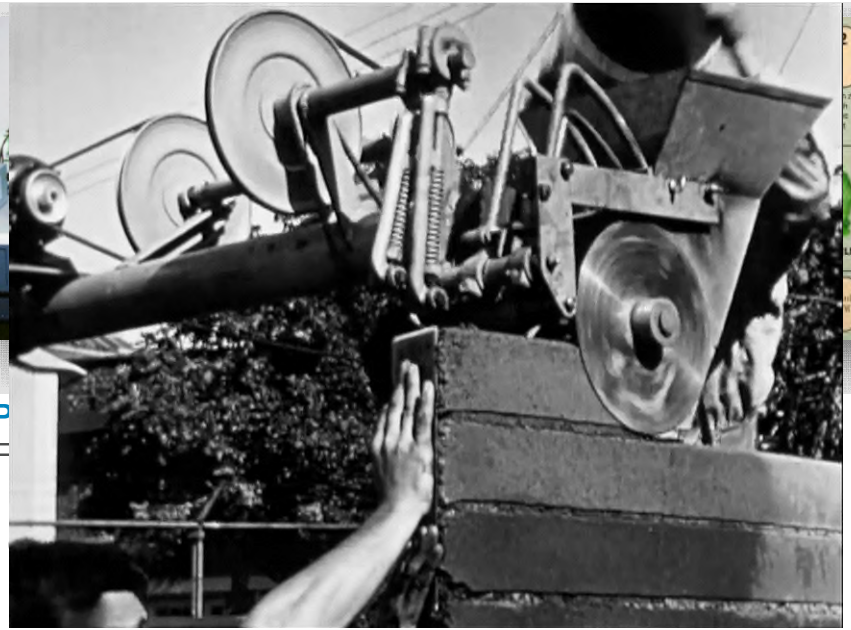
Soon to be disruptive?

Wall Building Machine

Similar Technique

YouTube

1942



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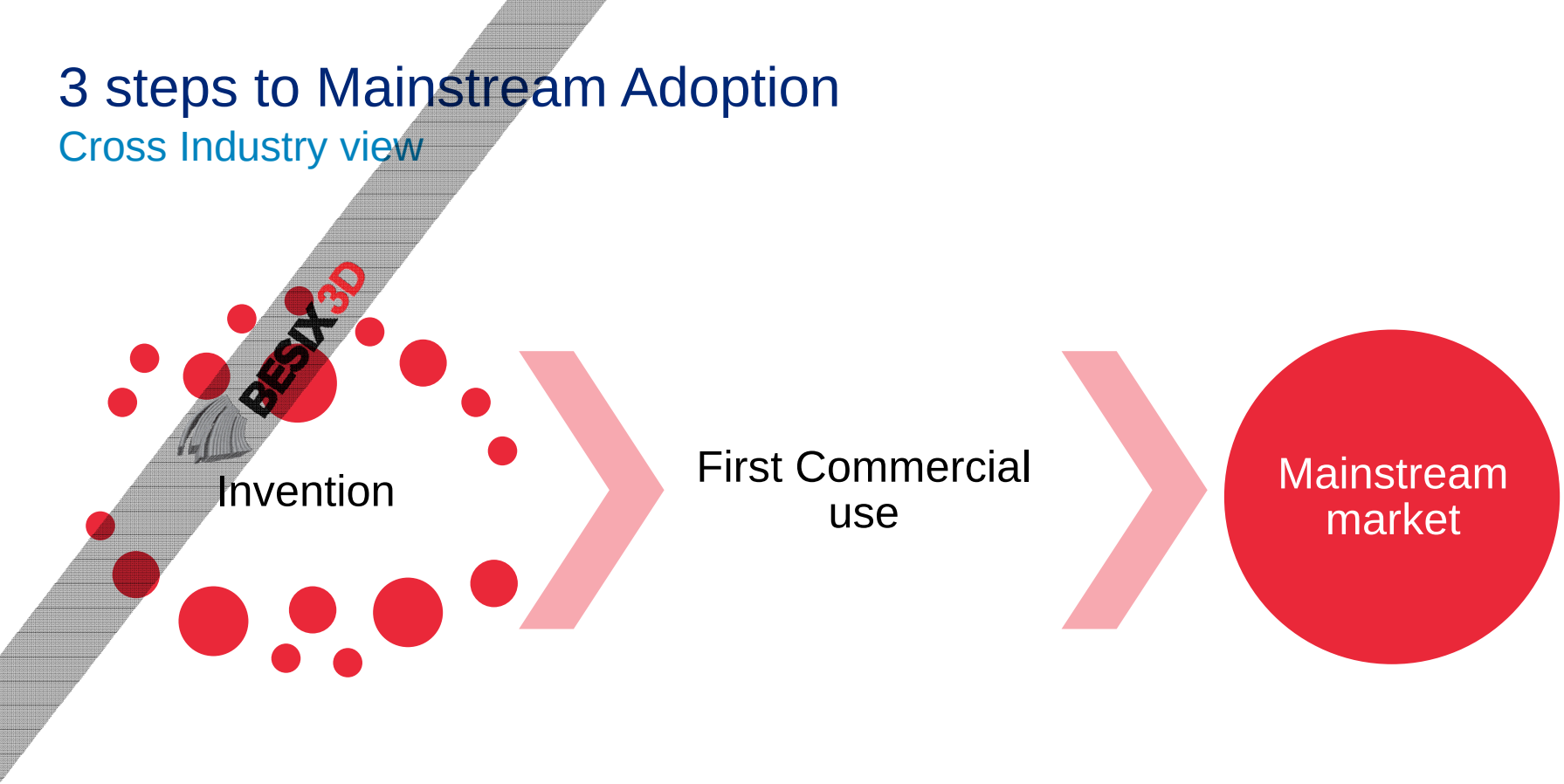
Disruption? Scale-up?

Construction sector piloting

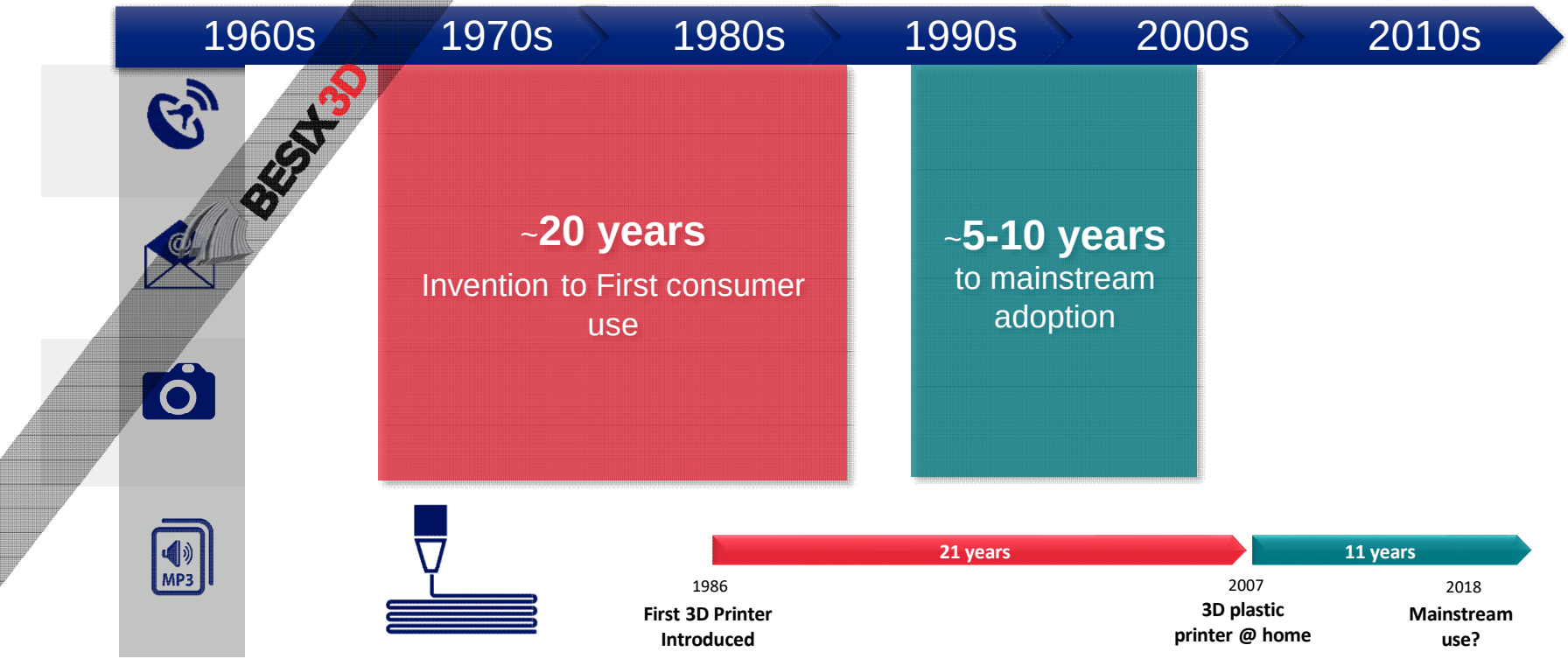
2019?

3 steps to Mainstream Adoption

Cross Industry view



Path to Mainstream Adoption



SPOTLIGHT

3D Concrete printing

Status Quo

Opportunities

- ✓ Freedom of design form
- ✓ New shapes (hollow, convex, round)
- ✓ Highly detailed & precise design
- ✓ Predictability
- ✓ Uniqueness at scale ☆
- ✓ Speed of construction
- ✓ Only concrete where needed
- ✓ Reduce material & waste (40%)
- ✓ Reduce manpower (50-80%)
- ✓ Reduced risk for workers

Challenges

- ~ Scalability current equipment
- ~ Need for controlled environment
- ~ Lack of qualified experts
- ~ Integration early stages of design
- ~ Regulations

21st century dilemma

Customization vs Standardization

UNIQUE

AT SCALE

“3DCP allows to process individual wishes per individual customer. Every iteration on existing design entails few costs.”

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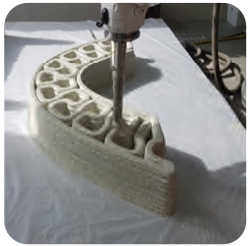
How does it work?

How does it work?

Printing process

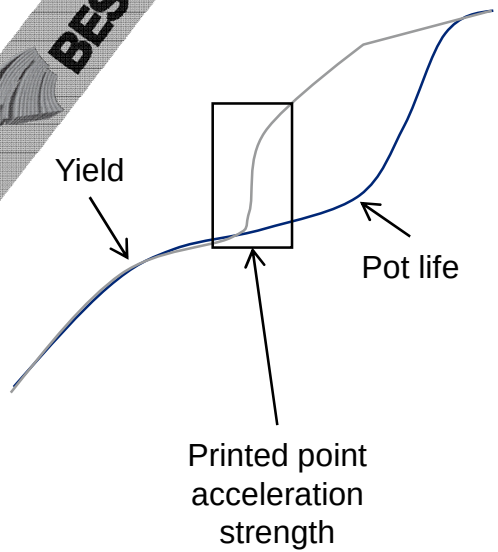


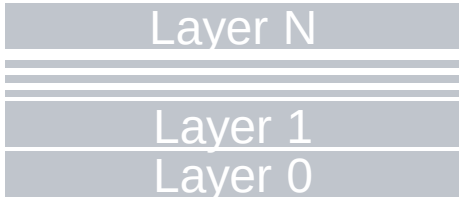
3D Mortar → Mixing pump → Extrusion → Robot → 3D Element

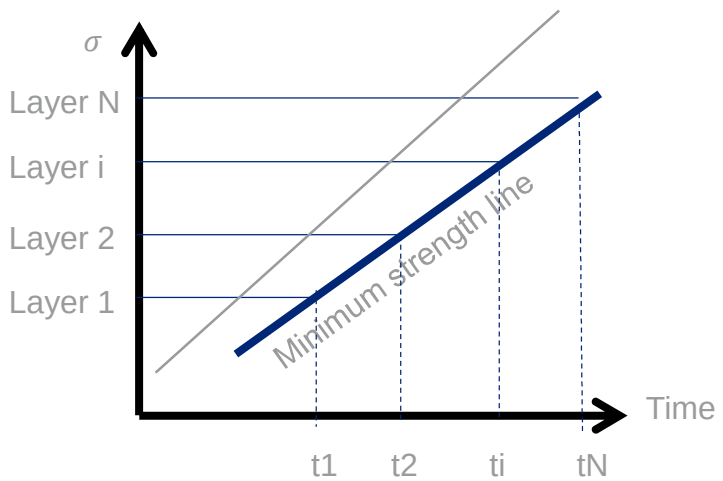
Our Technology Partners

Partner SIKA: Material expert

Challenge: Holding the weight



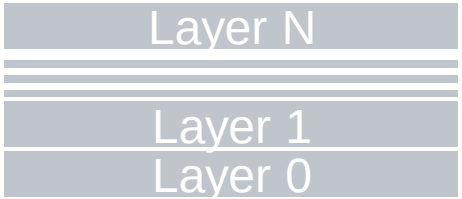




BUILDING TRUST

Partner SIKA: Material expert

Challenge: Holding the weight



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Sika
BUILDING TRUST

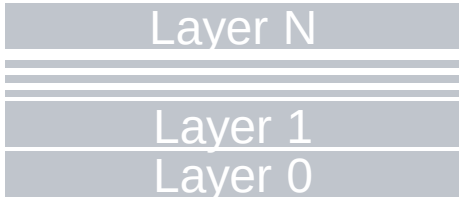
Partner SIKA: Material expert

Challenge: Interlayer (no breaks)

BUILDING TRUST

Partner SIKA: Material expert

Challenge: Interlayer (no breaks)

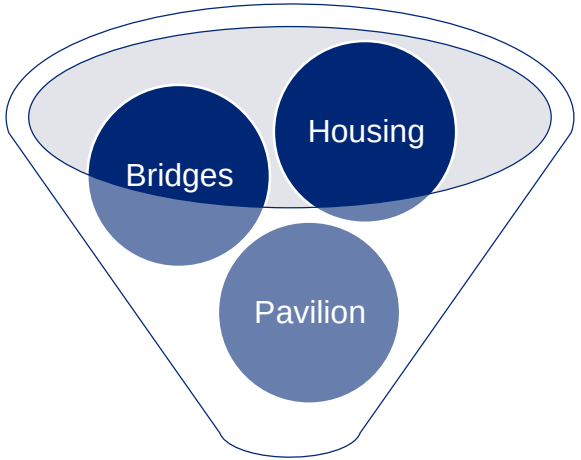


BUILDING TRUST

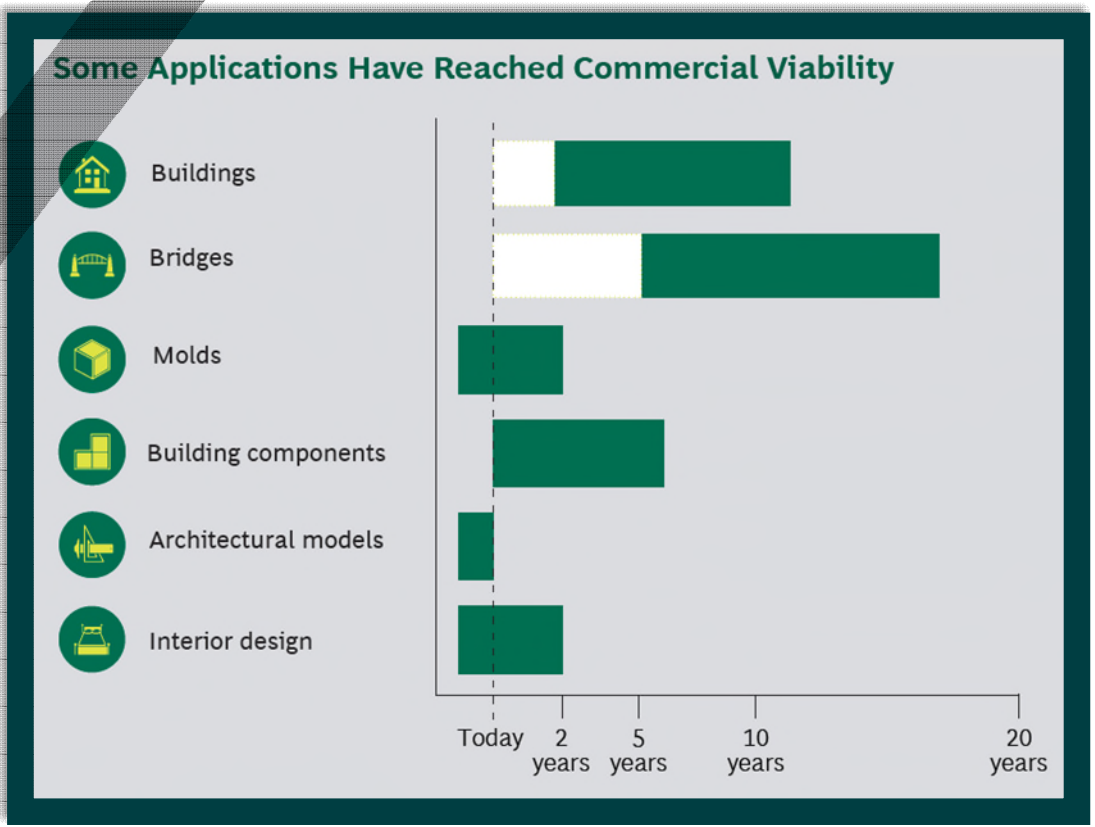
Worldwide overview

3D Concrete Printing projects

- 81 projects worldwide
  - Europe : 44 projects
  - US: 17 projects
  - Asia : 20 projects
- M-E market: 2x large projects currently ongoing



Demo-phase



Source BCG, 2014

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TRACK RECORD

Large scale 3D concrete printing

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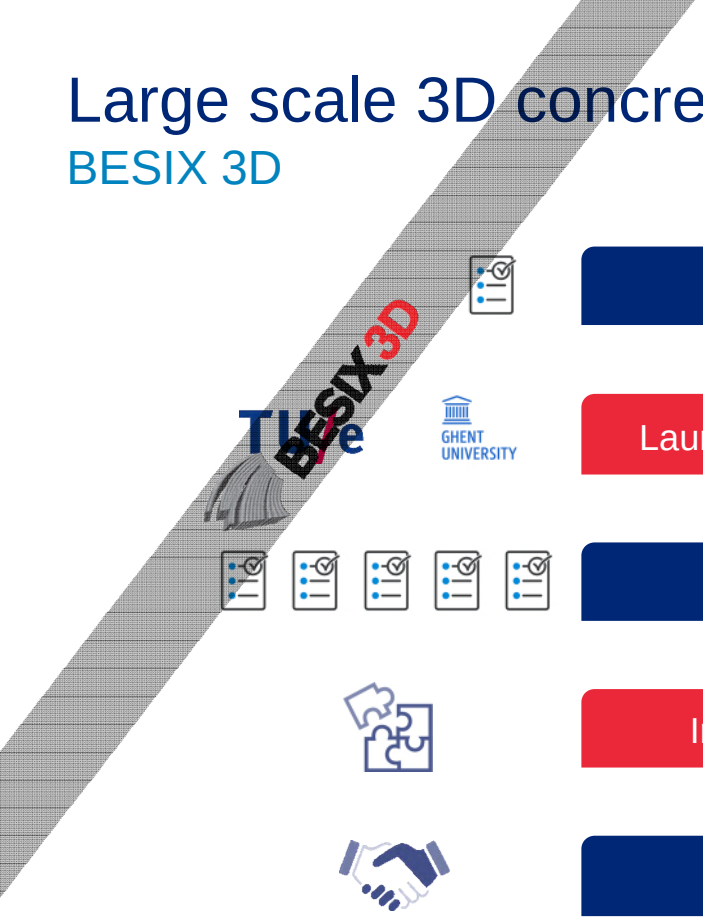

Signed contract – Project start July 2019

Launching 2x R&D programs with EU universities

Large scale 3DCP Tender Ongoing

Integrating 3DCP in current BESIX projects

Discussions with our first EU client

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In-House 3D Concrete printing Production Facility

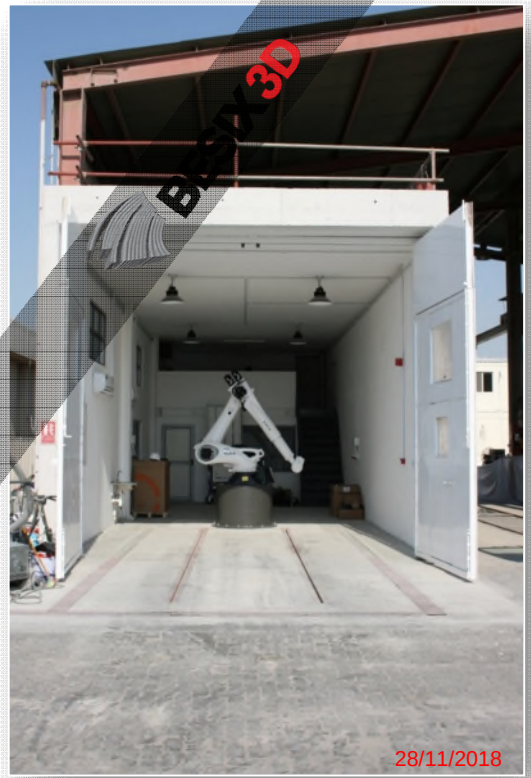
BESIX 3D STUDIO

Dubai-based 3DCP production facility

- Dubai (Al Quoz)
- 120m2 dedicated facility
- State-of-the-art technology & equipment
- Together with world-leading partners

BESIX 3D STUDIO

Dubai-based 3DCP production facility



BESIX 3D STUDIO

Dubai-based 3DCP production facility

BESIX 3D STUDIO

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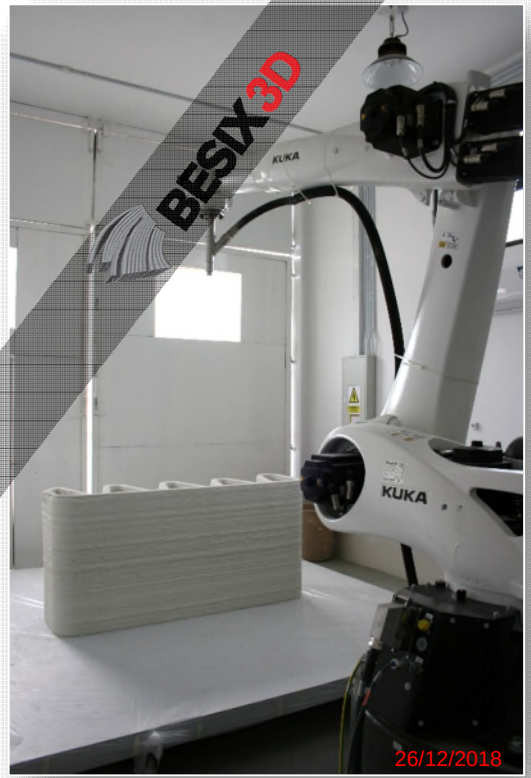
BESIX 3D STUDIO

Dubai-based 3DCP production facility



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In-house 3DCP production facility

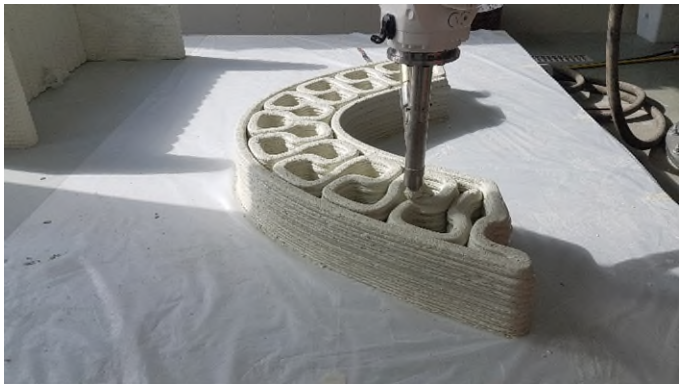
07/01/2018

BESIX 3D STUDIO

In-house 3DCP production facility

BESIX 3D STUDIO

In-house 3DCP production facility



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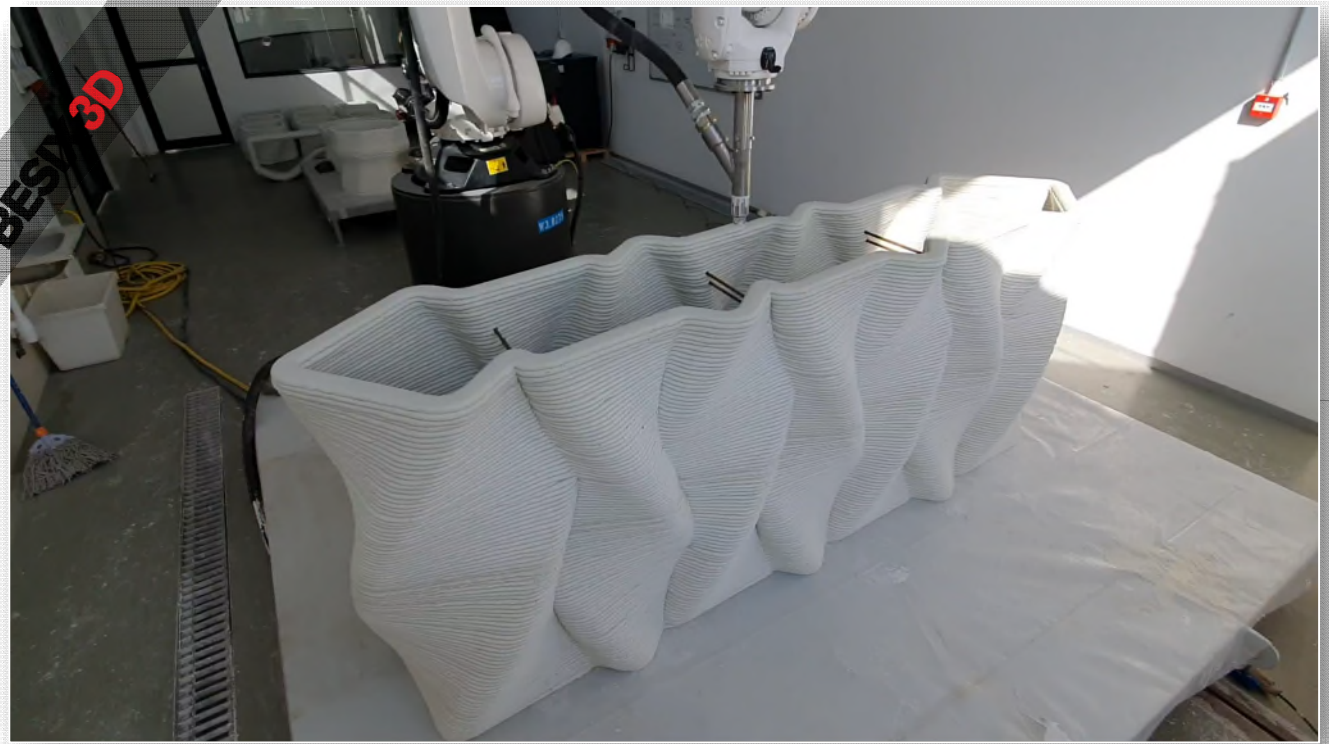
Dubai-based 3DCP production facility



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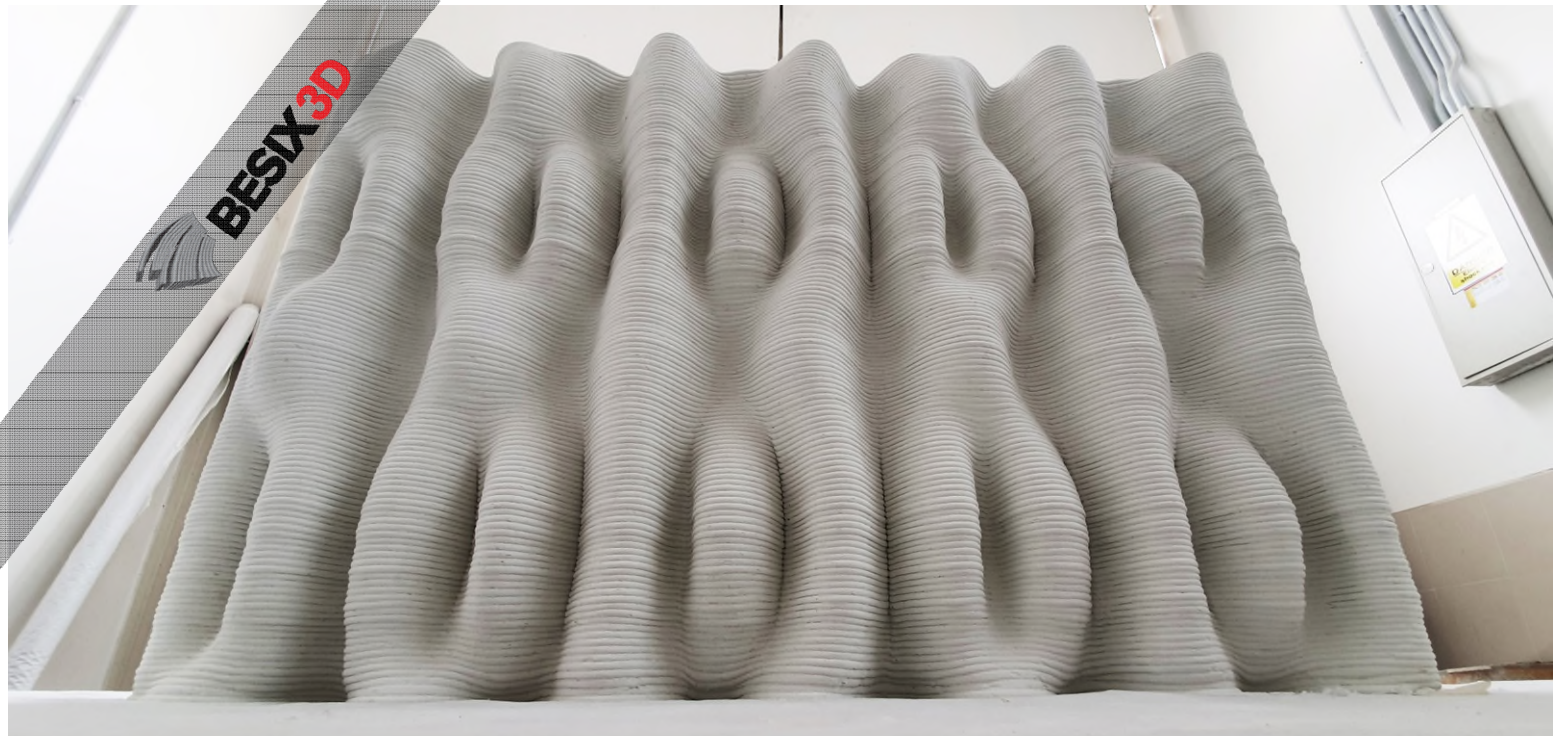
The Woven Wall

BESIX 3D STUDIO

The Stem Wall



BESIX 3D STUDIO

Outdoor Furniture

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Planters

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BEHIND THE SCENES

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Range of innovative solutions with 3DCP

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Mock-up post-tensioned bridge element

Architectural formwork

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Architectural formwork

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Architectural formwork

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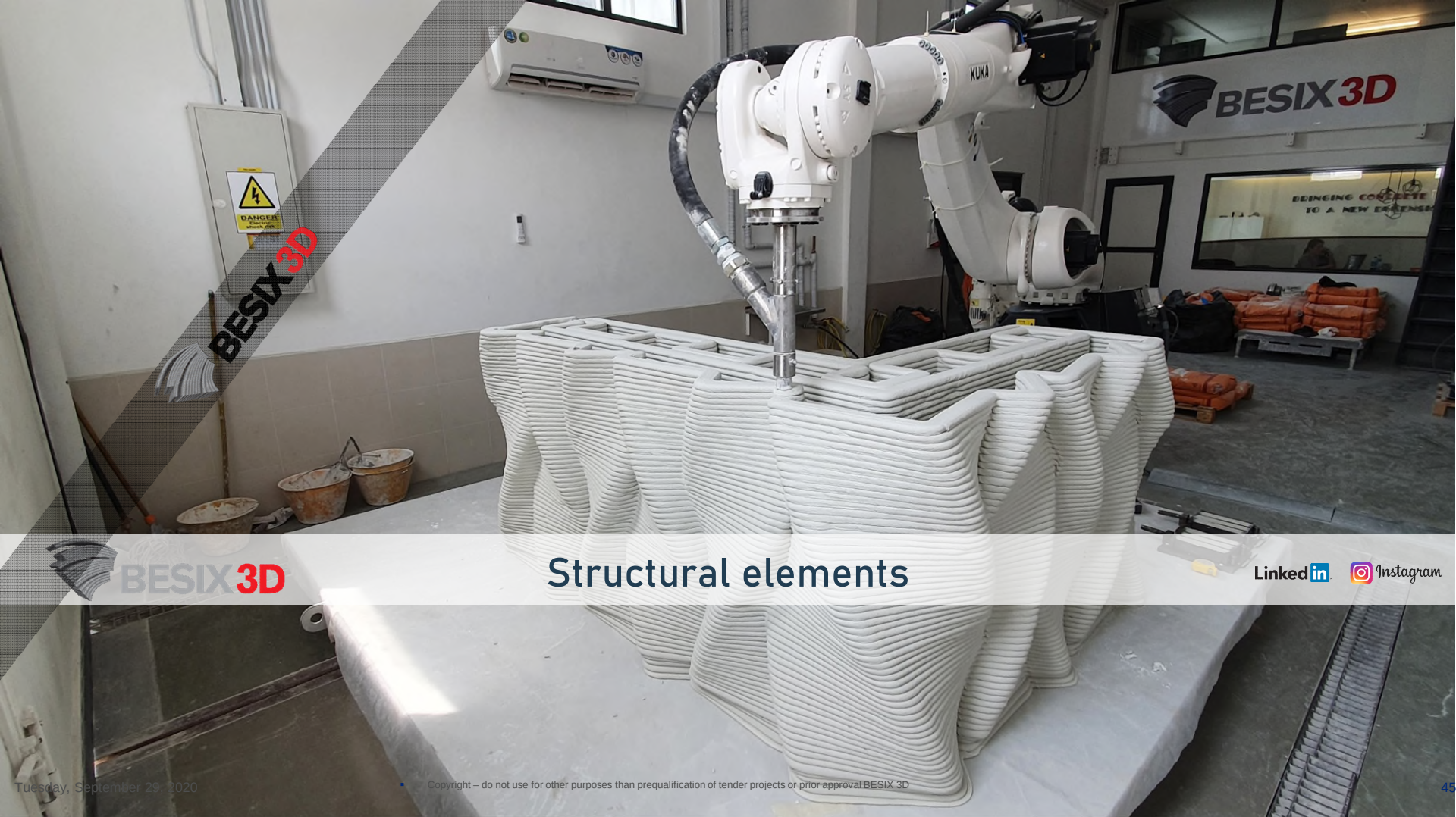

Structural elements

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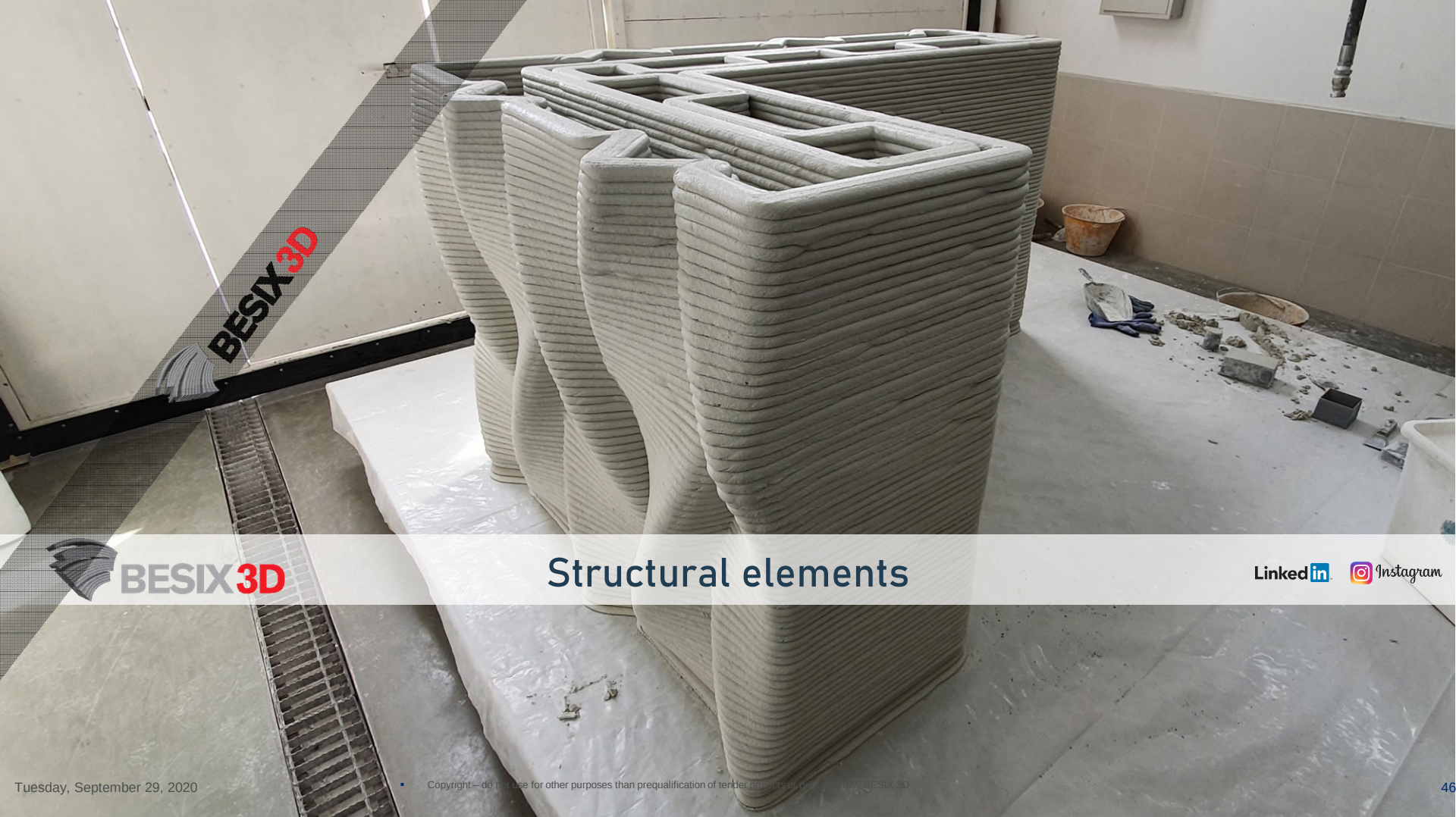

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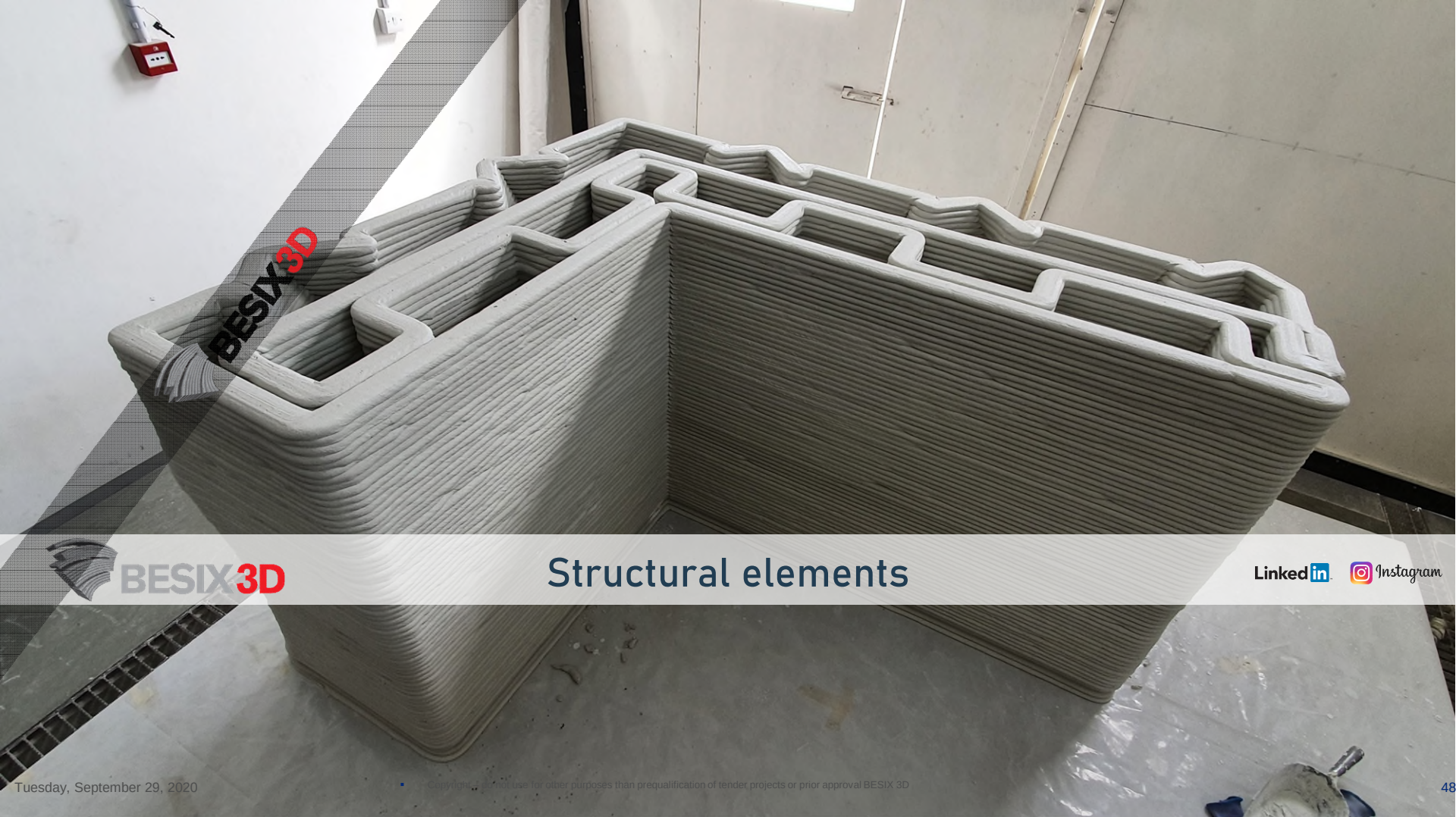

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Structural elements

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Outdoor furniture

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Textures & Colors

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Textures & Colors

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Sculptural Columns

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Outdoor furniture & Sculptures

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Outdoor furniture

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Art project for DIFC December 2019 (concrete base)

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3D Concrete Printed Art Sculptures (January 2020)

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Façade project delivered January 2020

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