

**Gathering25**  
Realising vision, advancing automation

**PUNCH**  
consulting engineers

**CITA25**  
Driving Digital Construction  
for 25 years

***Digital models supporting modular housing delivery  
across Ireland***



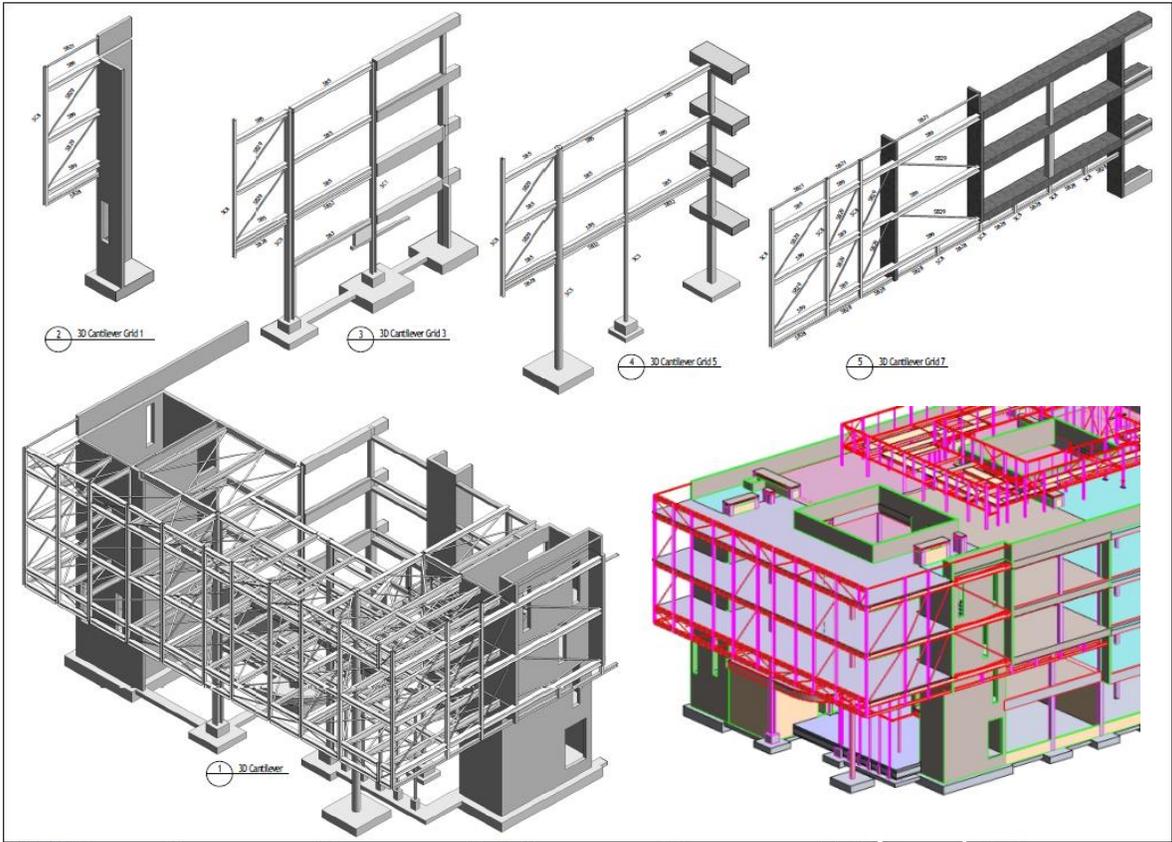
***Aidan O'Connell – Director - PUNCH Consulting Engineers***

# Gathering25

Realising vision, advancing automation



BUILDING INFORMATION MODELLING (BIM)  
 I.S. EN ISO 19650-2:2018  
 NSAI Certified



**GENERAL NOTES**

1. DIMENSIONS TO BE IN CONFORMANCE WITH ALL APPLICABLE STANDARDS AND REQUIREMENTS AND SPECIFICATIONS TO BE USED TO BE PROVIDED TO THE CONTRACTOR ONLY.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY OR OBTAIN ALL DIMENSIONS AND LIMITS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION OF FABRICATION OR ERECTION OF STRUCTURE.
3. DIMENSIONS OF STRUCTURE TO BE SHOWN ON ALL GENERAL AND SECTIONAL ARCHITECTURAL DRAWINGS.
4. FOR INSTALLATION DETAILS REFER TO ARCHITECT'S DRAWINGS.

**STEEL COLUMN SCHEDULE**

REF	MEMBER SIZE	Type	Comments
SC1	300 x 300 x 12	Column	See NC-201
SC2	300 x 300 x 12	Column	See NC-201
SC3	300 x 300 x 12	Column	See NC-201
SC4	300 x 300 x 12	Column	See NC-201
SC5	300 x 300 x 12	Column	See NC-201
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SC99	300 x 300 x 12	Column	See NC-201
SC100	300 x 300 x 12	Column	See NC-201

**STEEL BEAM SCHEDULE**

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SB2	300 x 300 x 12	Grade S275	See NC-201
SB3	300 x 300 x 12	Grade S275	See NC-201
SB4	300 x 300 x 12	Grade S275	See NC-201
SB5	300 x 300 x 12	Grade S275	See NC-201
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SB98	300 x 300 x 12	Grade S275	See NC-201
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SB100	300 x 300 x 12	Grade S275	See NC-201





IN  
blir



**RBC Modular**

170 followers · 10 following

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- **Workflow** - Design team models and contractor models
- **Communication** - Microsoft Teams, Bluebeam, Trimble Connect CDE
- **Collaborative** - If BIM is truly collaborative, will we need drawings in the future?
- **Cost** - Will the cost of digitisation impact on smaller consultancy's viability?



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**Engineering Legacies.**

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← Back

Reset model

### Models

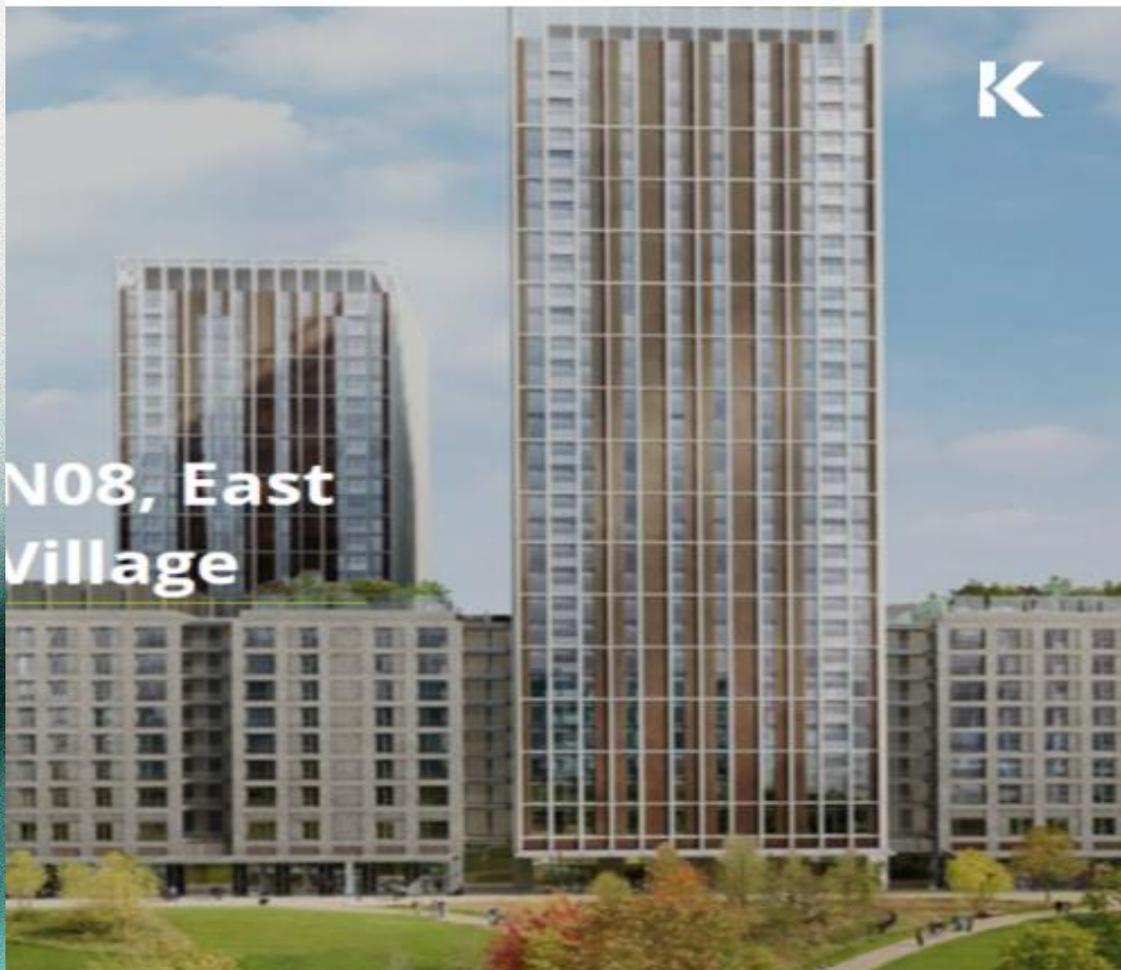
Everything in project

- ▶ Balcony
- ▶ DWG
- ▶ Incoming Arch Model
- ▶ Incoming Engineer's Model
- ▶ PUNCH TEKLA Model

No models loaded.



N08, East Village



Main Contractor – MACE

Architects – Lifschutz Davidson Sandilands | Adamson Associates

Structural Engineer – Walsh Associates

Tower 1 – 30 Storey's

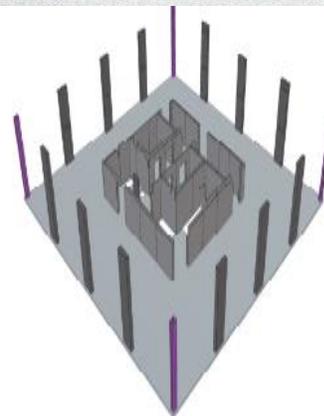
Tower 2 – 26 Storeys

480 Apartments + Leisure and Retail space

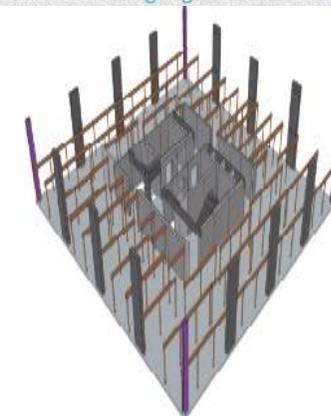
# Installation – 7 Days

- Total floor area = 700m<sup>2</sup>
- 8 Apartments per floor

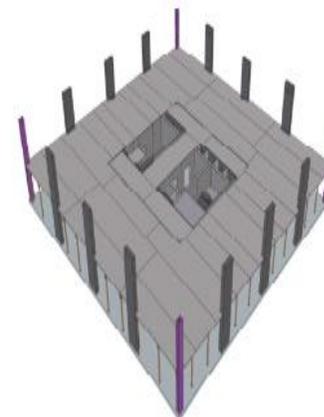
Driving Digital Construction



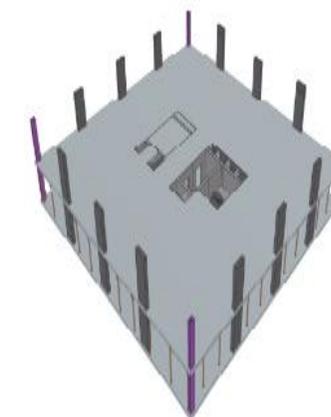
Install Vertical Elements: 15 Columns, 34 Twin Wall Panels and 9 Solid Wall Panels.



Install Propping to support Lattice Slabs



Install 34 Lattice Slabs, 2 Stair Flights and place top mat of reinforcement



Pour 185mm In situ concrete

## Digital Transformation Snapshot



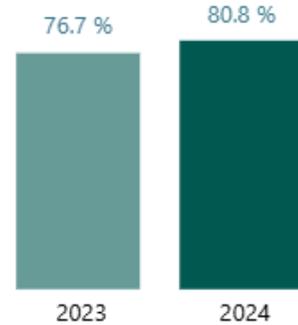
Key indicators reveal **advancements in the digital transformation of Ireland's construction industry.**

In 2024, a higher percentage of participants reported being part of organisations that had **already initiated their digital transformation process**, with improved accuracy and operational efficiency identified as the top expected benefits.

There has also been **notable growth in the use of Common Digital Deliverables.**

In 2024, over 70% of participants indicated that they had experience using digital tools and methods to produce three or more types of project deliverables. While capturing, representing and designing remain the most widely adopted areas, activities such as operation, monitoring and linking continue to lag, highlighting opportunities for further development.

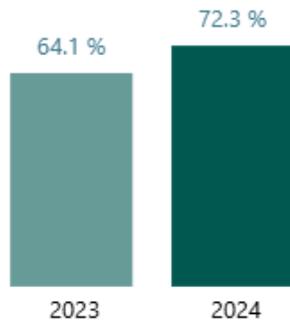
Participants in organisations that have started digital transformation process



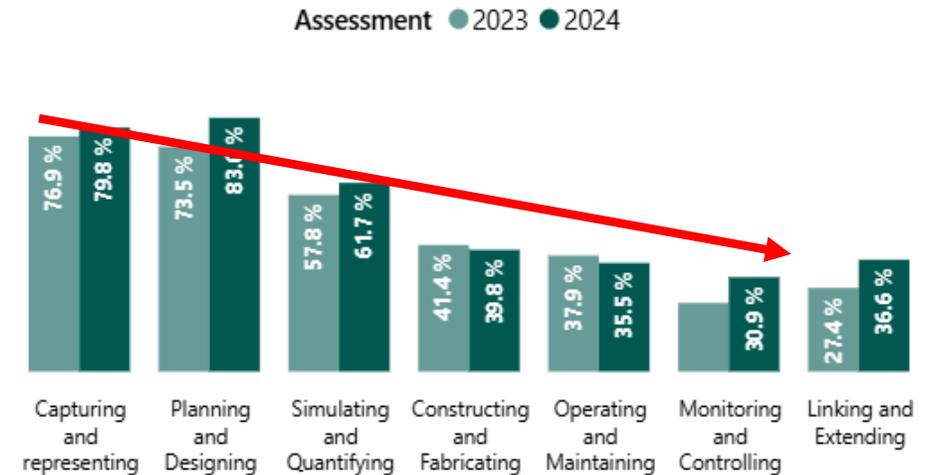
**Insight 1:** Most survey participants are personally involved in their organisation's digital transformation journey.

**Insight 2:** Improvements in accuracy and in operational efficiency are the top expected benefits in both editions.

Participants with experience using digital tools for multiple project deliverables



Participants with experience using digital tools and methods on projects



**Digital twins are virtual replicas of physical assets, kept in sync with real-time data**

## DIGITAL TWIN MATURITY LEVELS

# DIGITAL TRANSFORMATION

05

**A Platform for Continuous Improvement:** Automate existing and new processes involving asset, operations or performance data for a building or an entire portfolio. Continually optimize building performance and real estate business operations.

04

**Performance Twin:** Asset Twin integrated with Maintenance Management, Building Automation and IoT systems to join data across adjacent processes, to generate Business Intelligence and insights.

03

**Asset Twin:** Asset information management processes and system implemented to bring together building graphics, data, documents, to create a unified and living Asset Information Model.

02

**Project Twin:** Model data management processes and system implemented to get data relating to building elements to drive design optimisation and sustainability.

01

**Digital Twin Strategy:** Business outcomes clearly defined with well-structured owner information requirements for the full building lifecycle: design, construction, commissioning, and operations.



## What digital models do

- Create accurate 3D/BIM models of modular units so factories and sites know exactly what to build and install.
- Allow clash-detection, coordinating structural, services and transport logistics before modules leave the factory.
- Enable virtual planning of site layout, transport, crane lifts and foundations – reducing on-site surprises.
- Maintain a digital “kit of parts” library: reusable module types that simplify design and delivery.
- Drive sustainability metrics and life-cycle data from design onwards (energy, durability).
- Support faster permitting and tendering since visuals and data are ready early.

## How to implement in practice

- Define standard module types in digital form (BIM models) early in the programme.
- Ensure the entire supply chain (designer, factory, transport, on-site) works off the same digital model.
- Use site digital modelling (3D context) to test access, stacking, foundations, and services before modules arrive.
- Integrate manufacturing data: module internal services, connections, tolerances are all baked into the model.
- Use the digital model post-build for operations: maintenance, energy monitoring, adaptability.
- Develop training and skills so all stakeholders (including off-site manufacturers) can work with digital models.



## Recommendations for implementation

- Develop a **modular library** of digital units (BIM models) national-level: multiple types, layouts, modules.
- Ensure **interoperability**: adopt standards such as ISO 19650, ensure digital model data can move between designer, factory, site.
- Use **digital twin / city context modelling** for site selection & planning for modular housing clusters.
- Align **factory production** with digital modelling: manufacturing robots, CNC, QA linked to the BIM model.
- Train the workforce: up-skill designers, manufacturers, site installers on digital workflows.
- Use digital models for **monitoring** once modules are assembled: track performance, maintenance, future flexibility.
- Integrate with policy: The national MMC roadmap should mandate or incentivise digital modelling as part of future housing delivery.

## Key ways this can be applied in modular housing delivery in Ireland

- a) Early design → Use BIM to create modular unit prototypes, standardised modules that can slot together.
- b) Factory production → The digital model drives manufacturing: accurate dimensions, QA, integration of services (electrical/plumbing) in the modules.
- c) Site delivery & assembly → The digital model includes logistics (transport route, crane, stacking), ensures modules fit on site and align with foundation.
- d) Planning & approval → Use city-digital models (3D context) to speed up approvals, test different modular layouts visually and for impact.
- e) Data management → Maintain a module-library (digital) that local authorities or suppliers can reuse for multiple housing sites.
- f) Lifecycle/operations → Digital model carried forward to operations: maintenance schedule, energy performance, replacement modules, adaptability.

Germany is preparing to transform its **building sector** by embedding **energy efficiency** into every stage of **construction**. Under new EU regulations, buildings will soon be required to disclose their life cycle greenhouse gas emissions, shifting the focus from operational energy use to a full environmental accounting. This approach recognises that emissions from materials, construction, and end-of-life processes are just as critical as those from heating and cooling. The study highlights that **life cycle assessments (LCAs)** are becoming essential tools for achieving climate targets. By evaluating both embodied and operational emissions, LCAs help identify the most carbon-intensive phases of a building's life and offer pathways for improvement. This enables planners and developers to make informed decisions that reduce environmental impact while enhancing long-term **energy performance**



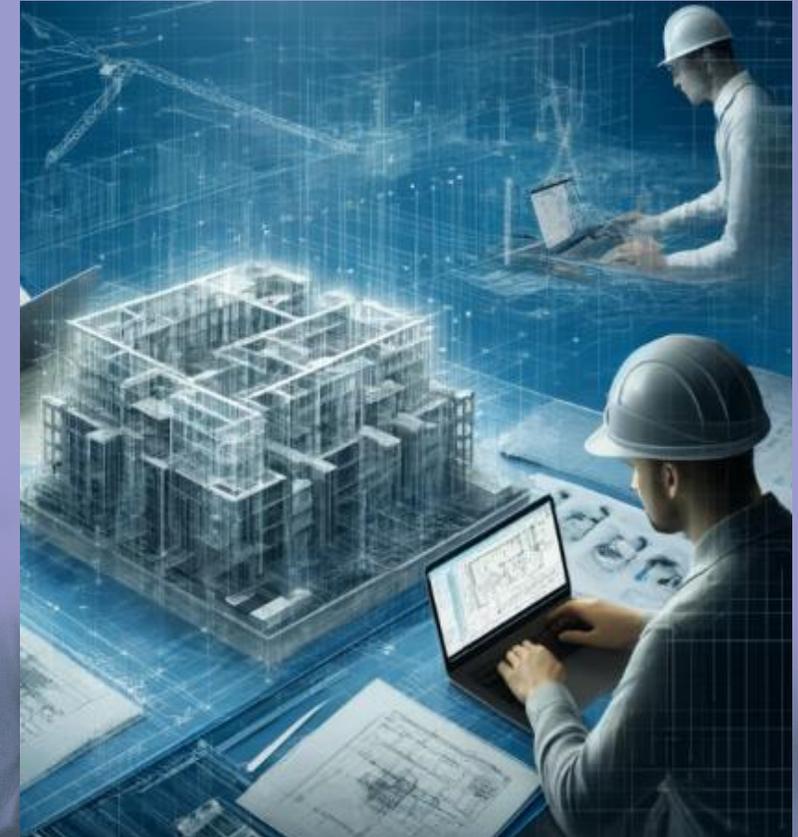
AI represents a new frontier in **construction**, offering unprecedented opportunities for **automation, efficiency, safety, and sustainability**.

By integrating AI with traditional 3D modelling, BIM, mixed reality, and other visualization technologies, the construction industry can drastically improve decision-making, streamline workflows, and deliver higher-quality projects.

The keyways in which AI is becoming the next frontier for construction visualization:

- 1. Automated Design Generation and Optimization.**
- 2. Real-Time Project Monitoring and Analysis**
- 3. AI for Enhanced Visualization**
- 4. Automated Clash Detection:**
- 5. AI-Enhanced Mixed Reality (MR) and Augmented Reality (AR)**
- 6. AI-Powered Construction Robotics and Automation**
- 7. Predictive Maintenance and Building Lifecycle Management**
- 8. AI for Sustainable and Smart Construction**
- 9. Improved Decision Making and Automated Insights**
- 10. AI for Safety and Risk Management**

**Future Today Strategy Trends - 2025 TECH TRENDS REPORT 18<sup>th</sup> Edition**  
**Futurist Amy Webb**



Tekla Structures - C:\TeklaStructuresModels\2024\249108-KP1630-Ford Marina Quarter-BA03 - [G [123]]

Alastair Brelsford

Quick Launch

**DRAWING** **ANNOTATIONS** **DIMENSIONING** **VIEWS**

Document manager Previous Next Copy Move Remove Properties DWG/DXF Image Link Hide/show Line Clone selected Part mark Weld mark Section mark Revision mark Update Arrange marks Align marks Symbol Note Text Rich text Arrange objects Window

Properties

Modify



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Thank you



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consulting engineers

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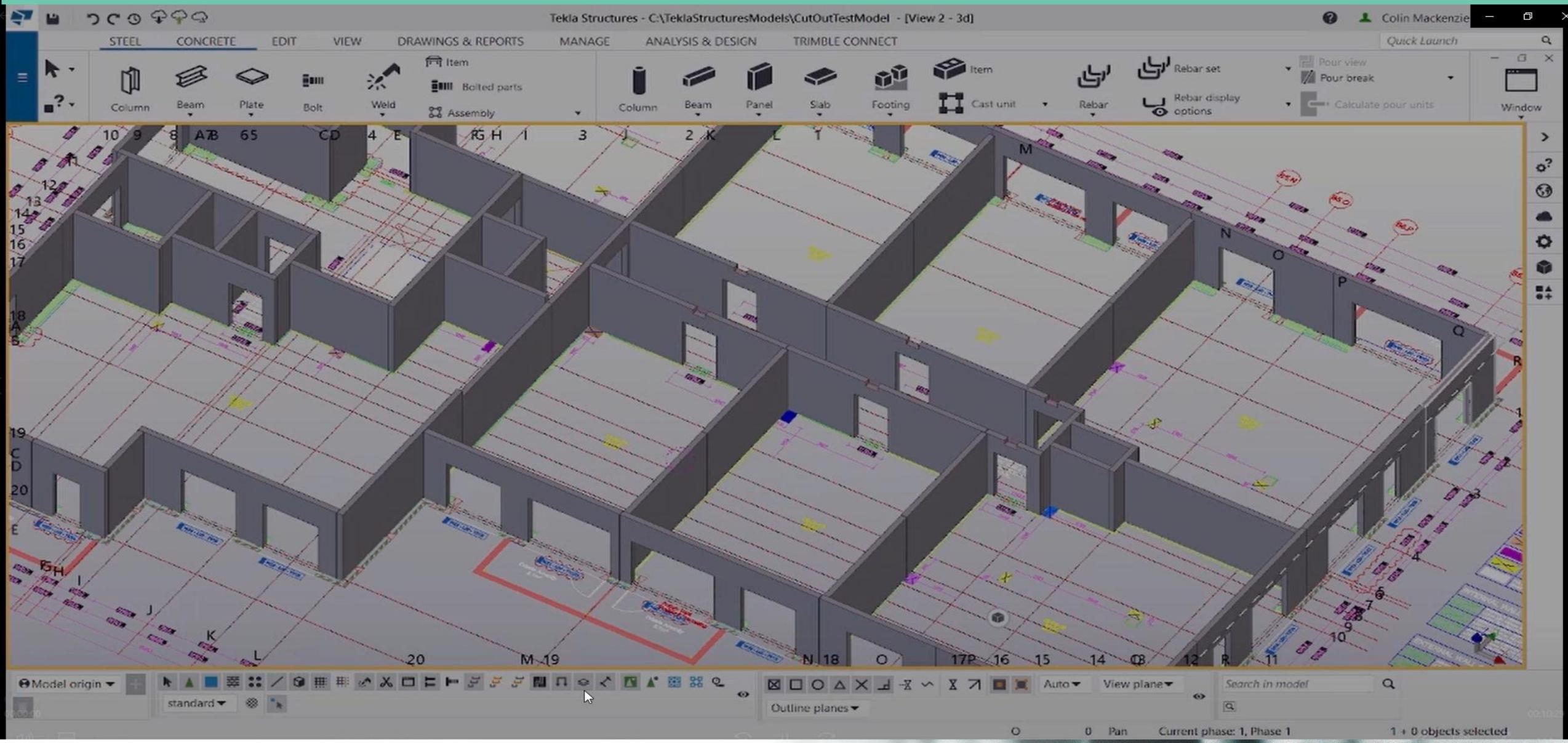
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**Welcome to the CitA BIM Gathering**  
The Clayton Hotel, Ballbridge, Dublin, 6<sup>th</sup> November 2025.

In response to this conundrum, McKinsey posits a two-pronged strategy to address the longstanding issue of stagnant and declining construction productivity. **The first part of the strategy includes initiatives to “reshape regulation, rewire contracts, rethink design, improve procurement and supply chain, improve onsite execution, infuse technology and innovation and reskill workers,”** hypothesizing that these changes could “boost sector productivity by 50%-60%.” The second part of the strategy includes a shift to “**manufacturing style production systems,” or industrialized offsite construction,** that could yield as much as five-to-ten times increase in productivity.<sup>6</sup> Although the McKinsey report offered a more nuanced series of alternatives, many of the new players entering the offsite construction market have leaped to digitalization and robotics without adopting the other changes to process and manufacturing principles advocated in the research. This kind of technocratic 5  
Barbarosa, et al., Reinventing Construction, 23. 6 Ibid., 8-9. 3 approach has contributed to widely publicized offsite construction failures that have reverberated throughout the US industry, further reinforcing an ingrained cultural hesitancy to evolve towards a manufacturing-oriented production process.





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Thank you

# Precast Cross Wall



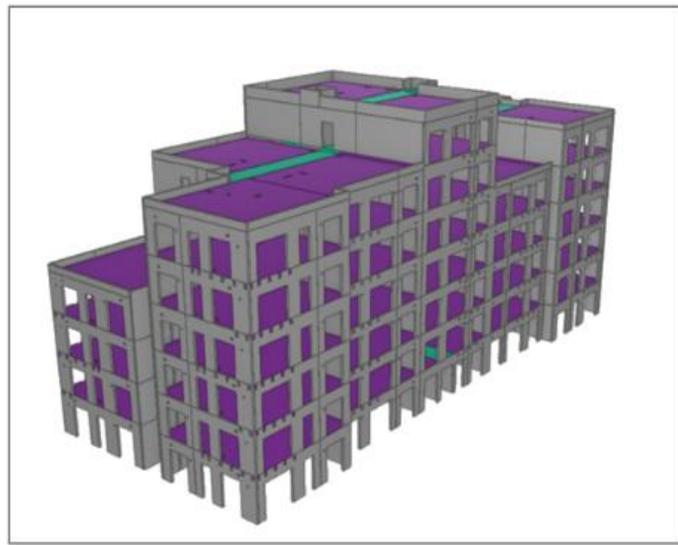
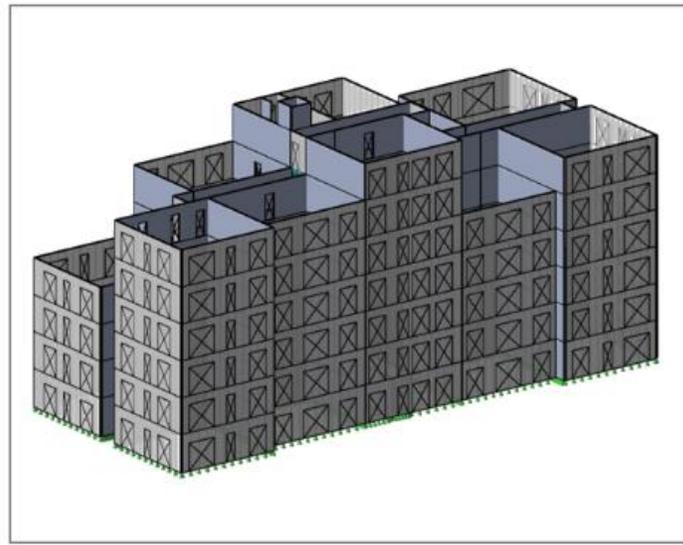
MORE VIDEOS

cepres ium  
niant ibeatur?  
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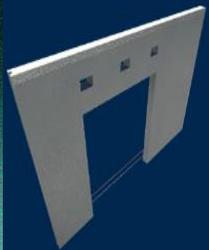
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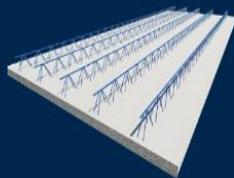
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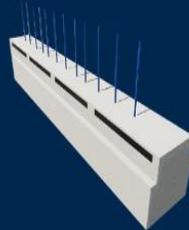
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SOLID WALLS



**43**  
TWIN WALLS



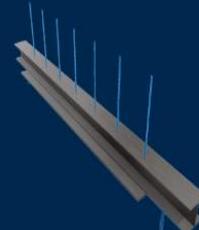
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FLOOR PLATES



**129**  
BEAMS & COLUMNS



**58**  
STAIRS



**41**  
STEEL BEAMS



# Gathering25

Realising vision, advancing automation

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for 25 years



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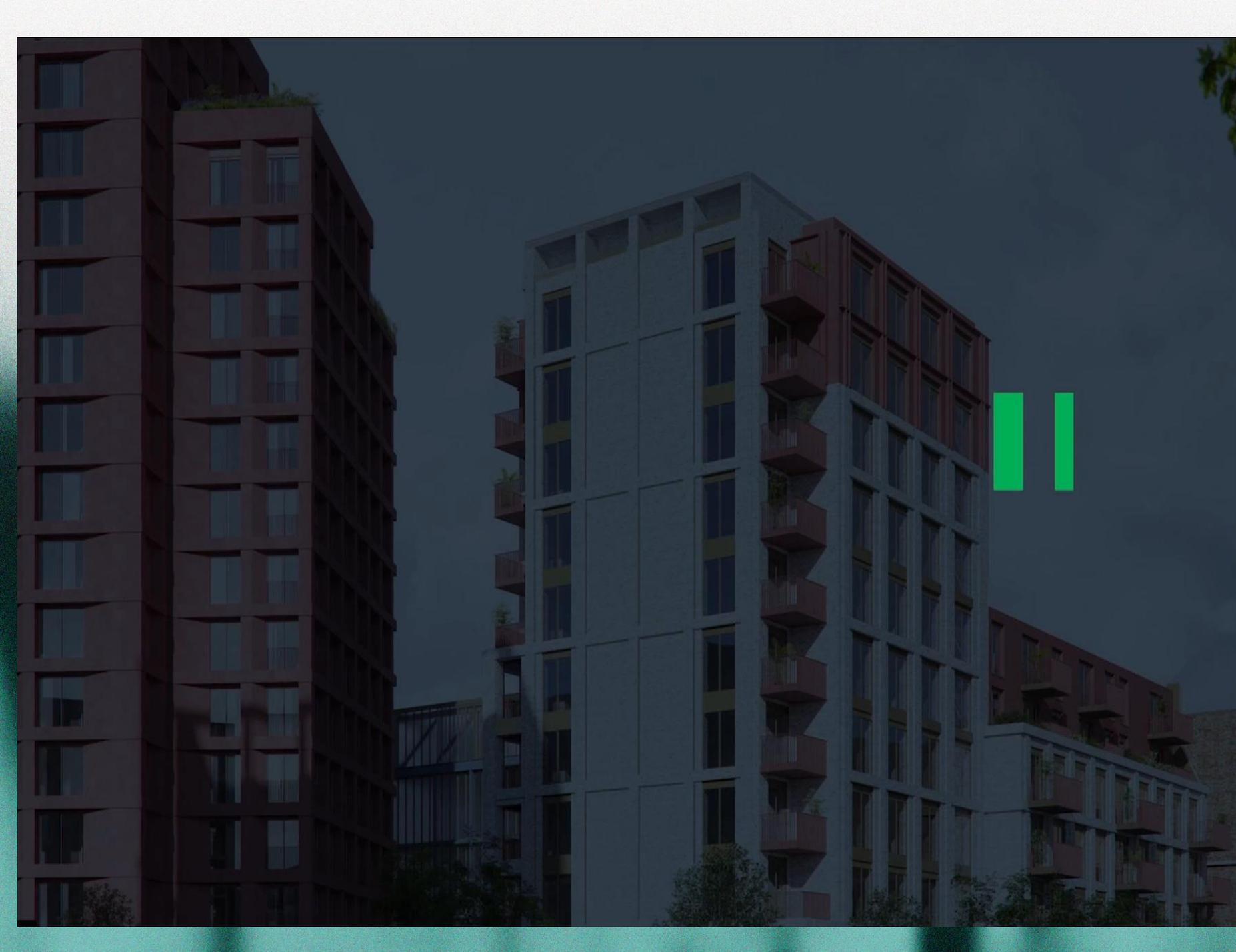
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