

AI: The Next Frontier for
Irish Construction

CITA | **TECHLIVE**
2024 AI in Construction

Aidan O'Connell – PUNCH Consulting Engineers

New Bons Secours Hospital Limerick – Visualisation From Design to Construction



Overview of the Practice

- Michael Punch & Partners was established in Limerick in 1973
- PUNCH Consulting Engineers was registered in April 2010 as a trading name of Michael Punch & Partners Ltd
- Offices in Dublin, Limerick, Cork, Galway Macclesfield and Glasgow
- Over 130 Professional Staff



Introduction

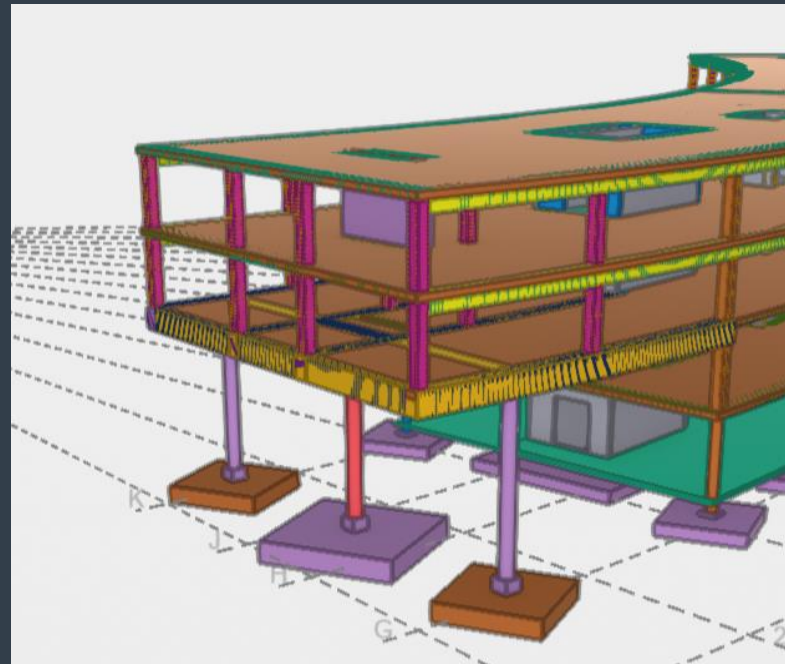
The Bon Secours Hospital in Limerick is a €190 million state-of-the-art medical facility. When completed it will provide 150 bed hospital over four storeys which is due to open in 2025. The structure consists of a consist of reinforced concrete flats slabs and superstructure. PUNCH are the Civil and Structural consultants on the project.

3D Architectural Image



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3D Model Image



3D Construction Image



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BIM – The old fashioned way?

GENERAL NOTES

- DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER SHEET DRAWINGS AND MEMBERS SHOWN ON SPECIFICATION. DO NOT SCALE UNLESS OTHERWISE NOTED.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY OR OBTAIN ALL DIMENSIONS AND CHECK INCLUDING CHECK OF FABRICATION DRAWINGS.
- ON DETAILS OR APPROVAL OF THIS SET, WITH ALL DIMENSIONS, SEE THE RELEVANT ARCHITECT DRAWINGS.
- FOR ALL DIMENSIONS REFER TO ARCHITECT'S DRAWINGS.

STEEL COLLAR SCHEDULE		
REF	MEMBER SIZE	Type
001	100x100x10	Steel Collar
002	100x100x10	Steel Collar
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STEEL BEAM SCHEDULE		
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ICT BUILDING
 CANTILEVER STEELWORK Sheet 1
 H.E.J. MAINGOOTH
 PUNCH consulting engineers
 DUBLIN
 LIMERICK
 CORK

Scale: 1:100
 Date: 18/08/2015
 112281-166 CND

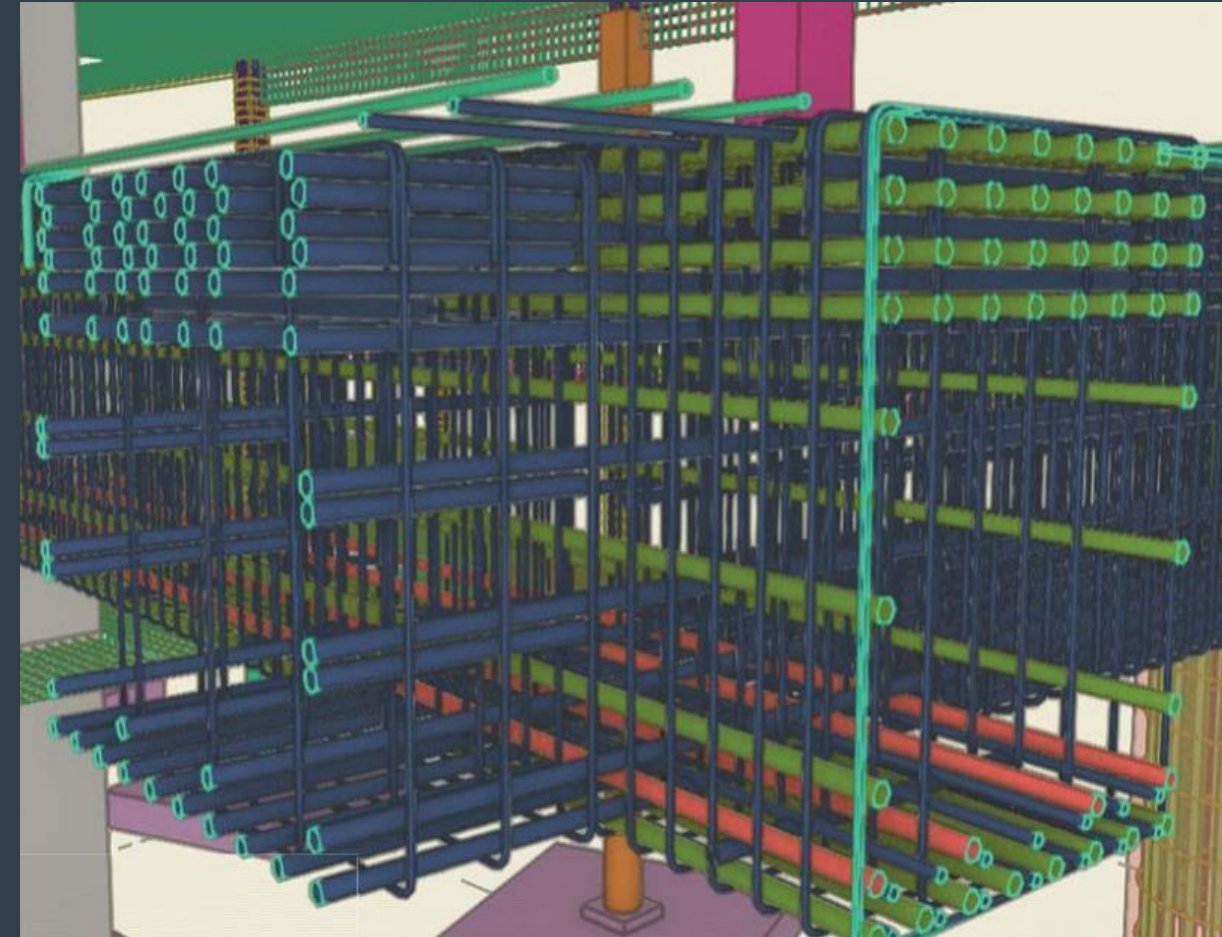
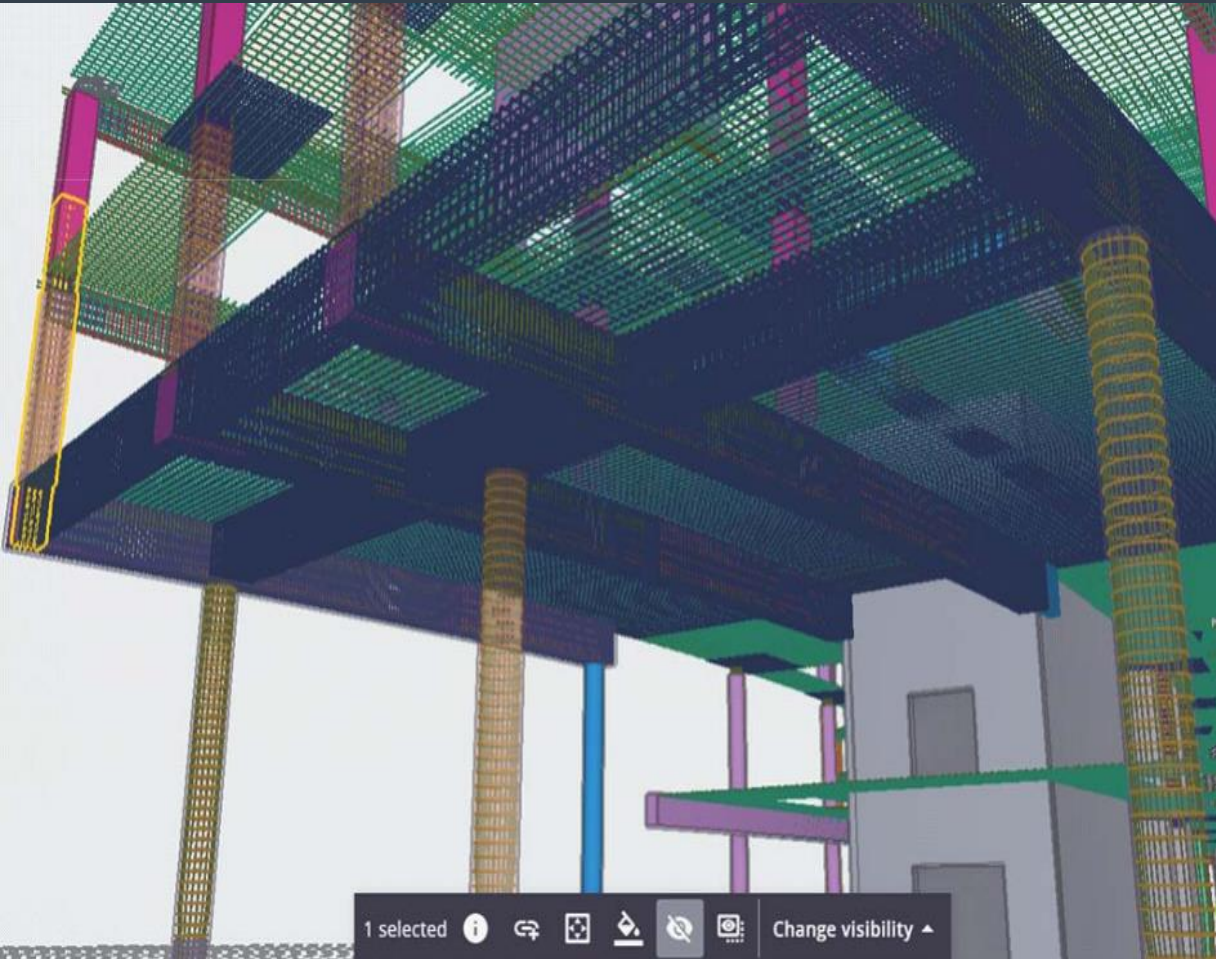




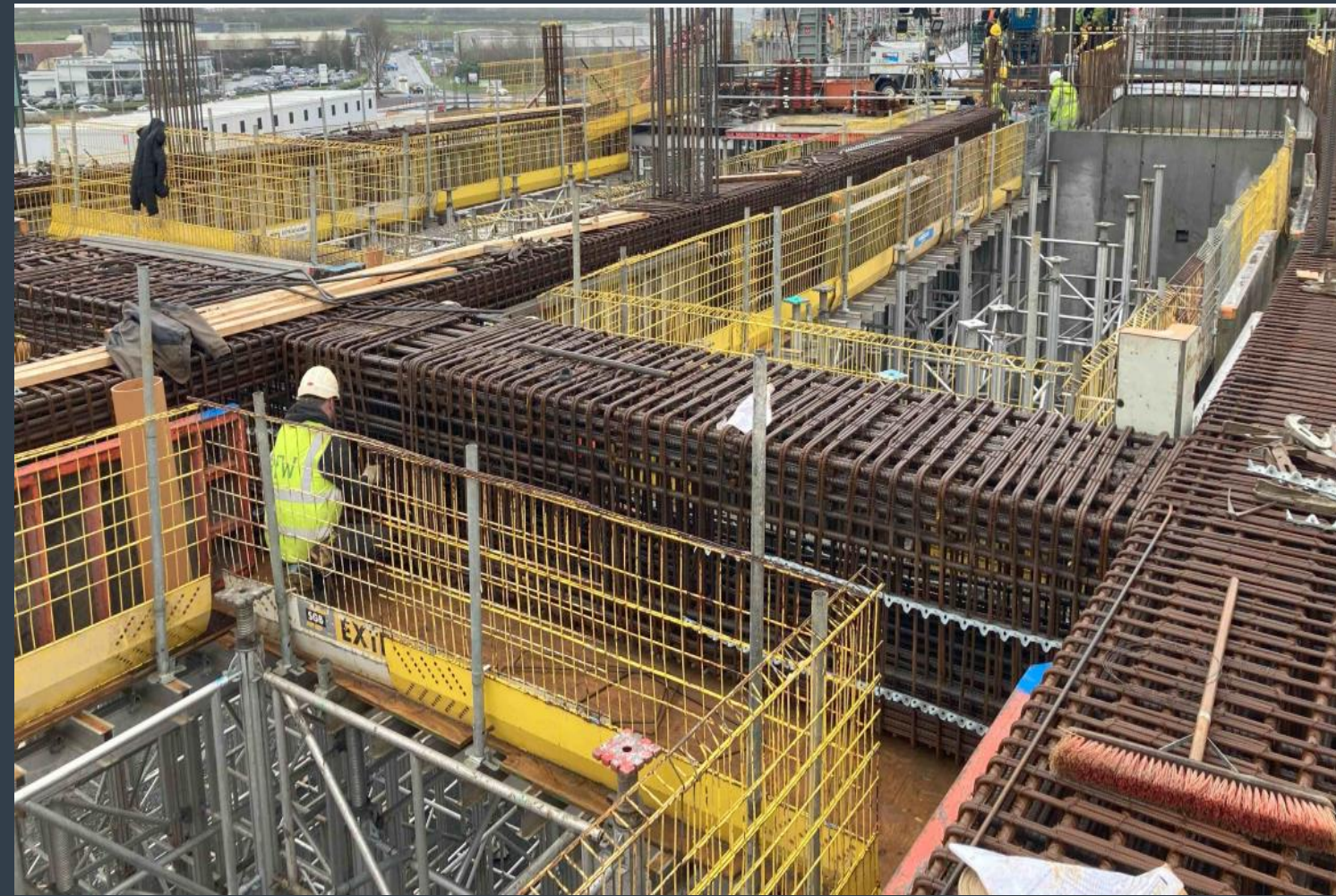
The Bon Secours Hospital

A look at the 3D reinforcement model and the buildability of the 5.5m two storey cantilever support reinforced concrete structure

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MMC – Precast

3D Structurally
Modelling to Precast
Prefabrication
modelling to
reinforcement
modelling to
construction on site



AI represents a new frontier in **construction visualization**, 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

According to industry studies, construction rework can account for 5-10% of total project costs

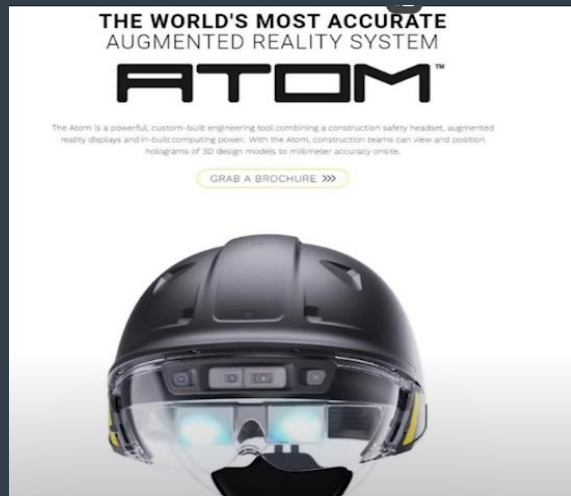


AI-Enhanced Mixed Reality (MR) and Augmented Reality (AR) Smart Object Recognition and Placement:

- AI can improve MR and AR by enabling more accurate object recognition and placement of 3D models in real-world environments. For example, AI can automatically align virtual models with real-world conditions by analysing spatial data.
- Impact: This leads to better on-site visualization, where construction workers can see more accurate overlays of structures in their real-world surroundings, improving installation precision.
- AI-Assisted Training: AI can be used in MR/AR environments to simulate complex construction scenarios for training purposes. AI-powered virtual assistants can provide real-time feedback to workers learning new equipment or construction techniques.
- Impact: AI-enhanced training environments can reduce the learning curve for new workers and improve their readiness for actual job site work



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