

A DECADE OF MMC BCAR COMPLIANCE – A PRACTITIONERS EXPERIENCE

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MMC Ireland





James Young BEng (Hons) CEng Director of Engineering Services

- 18 Years Experience in MMC Industry
- Chartered Engineer
- Pioneered solutions as specialist consultants in the MMC industry
- Worked with over 100 MMC manufacturers globally
- Experienced in the BCAR certification of MMC systems in Ireland
- Recognised NHBC Stage 2 Certifier (UK)

OUR MISSION

“To be recognised as the world’s largest and best MMC/Offsite consultancy”





Engineering a Sustainable Future. Today.

Evolution Innovation is the world's most significant team of MMC consultants, working on some of the largest MMC projects internationally.



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Experts In

- Structural Engineering + BIM
- Building Product & System Certification
- Dynamic and Thermal Modelling
- Life Cycle Analysis (LCA)
- Environmental Product Declaration (EPD)
- Whole Life Carbon Assessments and Benchmarking
- Project Management of Fire, Acoustic and Structural Testing



WHAT IS BCAR (FOR THOSE NOT FAMILIAR WITH IT)

- Building Control (Amendment) (No. 2) Regulations 2015 (S.I. No. 365 of 2015) or otherwise known as **BC(A)R**
- Introduced in 2014 with associated Code of Practice
- Many reasons for its introduction
- Development of statutory roles in the design process responsible for building regulations with the key role with the **Assigned Certifier**



Code of Practice

for

Inspecting and Certifying
Buildings and Works

**Building Control
Regulations 2014**

February, 2014



Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government



BRIEF MMC HISTORY PRE BCAR IN IRELAND

- In Ireland, interest in alternative Offsite/MMC systems has always been very high
- The application of MMC systems was developed and becoming more common in the 2000's
- Many manufacturers were in operation and developing systems including a very strong export to the UK
- In the mid to late 2000's, MMC was starting to become more established across Ireland
- The economic crash resulted in most of these companies disappearing
- Between 2008 – 2014, little or no activity in the MMC in particular, hence little or no development or knowledge of the systems.

INTRODUCTION OF BCAR IN 2014

- MMC, in particular timber frame and light gauge steel were starting to build up their factory and pipeline once again at the stage when BCAR is introduced.
- Modular factories were starting to spring up at this time also.
- Businesses were able to fund more and more R&D projects to develop their products
- Introduction of BCAR brought the element of factory as well as site-based inspections, especially for the modular projects.
- The industry including clients, contractors, and especially Assigned Certifiers needed guidance and education in these systems to give comfort.

COMPLIANCE

- Timber frame industry has IS 440 as a standard. This allowed the Assigned Certifier to have a clear understanding of what to expect and how timber frame complied with Building Regulations.
- LGS and Modular do not have a similar standard currently.
- In line with TGD D, they have produced individual NSAI Agreement Certs for their systems.
- Early stages of BCAR, we assisted the 2D and 3D manufacturers in guiding the market in relation to the systems.



NSAI
Standards

Irish Standard
I.S. 440:2009+A1:2014

Timber frame construction, dwellings and other buildings (including amendment 1, consolidated)

APPLICATION

- Practice Notes
- Inspection Notification Framework (INF)
- Design Responsibility Matrix (DRM)
- Guidance and Education of Assigned Certifiers, design teams, contractors and developers

PRACTICE NOTES

PRACTICE NOTE 1



S_D <small>RIAI ACCD 02</small>	<p>ANCILLARY CERTIFICATE OF COMPLIANCE: DESIGN (COMMENCEMENT NOTICE / 7 DAY NOTICE)</p> <p><i>TO BE COMPLETED BY A SPECIALIST OR UNREGISTERED CONSULTANT</i></p>
S_C <small>RIAI ACCD 02</small>	<p>ANCILLARY CERTIFICATE OF COMPLIANCE: DESIGN (COMPLETION)</p> <p><i>TO BE COMPLETED BY A SPECIALIST OR UNREGISTERED CONSULTANT</i></p>
S_I <small>RIAI ACI 02</small>	<p>ANCILLARY CERTIFICATE OF COMPLIANCE ON COMPLETION (ANCILLARY COMPLETION CERTIFICATE -INSPECTION-)</p> <p><i>TO BE COMPLETED BY A SPECIALIST OR UNREGISTERED CONSULTANT</i></p>

E_D <small>ACCI / EI - BCR 1401</small>	<p>Ancillary Design Certificate</p> <p>ANCILLARY CERTIFICATE OF COMPLIANCE: DESIGN (Commencement Notice / 7 Day Notice)</p>
E_C <small>ACCI / EI - BCR 1402</small>	<p>ANCILLARY CERTIFICATE OF COMPLIANCE ON COMPLETION (ANCILLARY COMPLETION CERTIFICATE)</p> <p><i>DESIGN OF THE WORKS</i></p>
E_I <small>ACCI / EI - BCR 1403</small>	<p>ANCILLARY CERTIFICATE OF COMPLIANCE ON COMPLETION (ANCILLARY COMPLETION CERTIFICATE)</p> <p><i>INSPECTION PLAN</i></p>

PRACTICE NOTES

PRACTICE NOTE 1



ANCILLARY CERTIFICATE OF COMPLIANCE ON COMPLETION

*CERTIFICATE SIGNED BY SUB-CONTRACTOR / SPECIALIST CONTRACTOR
ASSIGNED BY THE BUILDER / MAIN CONTRACTOR ON COMPLETION*



ANCILLARY CERTIFICATE OF COMPLIANCE ON COMPLETION

*CERTIFICATE FOR SUB-SUB CONTRACTOR TO
SUB-CONTRACTOR / SPECIALIST SUB-CONTRACTOR & BUILDER / MAIN CONTRACTOR*

PRACTICE NOTES

PRACTICE NOTE 2



ACEI ASSOCIATION OF
CONSULTING ENGINEERS
OF IRELAND



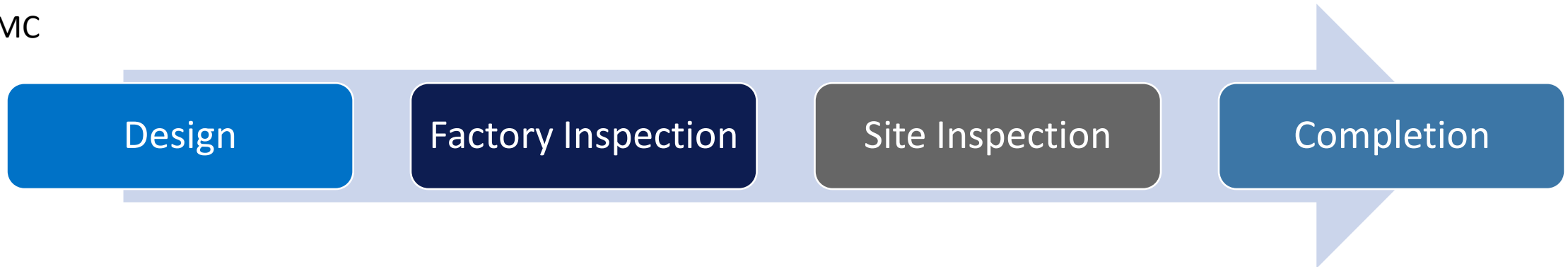
3. The primary purpose of this Practice Note 2 is to provide further guidance on the application of these Ancillary Certificates in respect of elements designed and/or constructed by Sub-contractors.

INSPECTION NOTIFICATION FRAMEWORK

Traditional Construction



MMC



DESIGN RESPONSIBILITY MATRIX

- Clear communication who is responsible for issuing what Ancillary Cert for which aspect of the project.

	Manufacturer	Evolution	Project C&S Engineers	Architect	M&E	Fire	Acoustics	Part L Designer	Sub C	BCAR Certification
Element Detail										
Foundation										
Line and Point Loads of Superstructure	Input	Lead	Input	Input						Sd. Si & Sc
Element Detail										
External Wall										
Frozen GAs, elevations and sections and sign off of Manufacturers precon model prior to production	Input	Input	Input	Lead	Input	Input	Input	Input		
Cold Formed Steel Structural Design	Input	Lead	Input							Sd. Si & Sc
Specification of insulation outside cold formed steel frame, confirmed by Part L Designer	Input			Input	Input			Lead		
Installation of the insulation and masonry wall tie channel outside cold formed steel frame	Lead	Input	Input							Cs
Specification and inspection of Insulation inside Cold Formed Steel (Fire Test Data)	Lead	Input		Input	Input	Input	Input	Input		Cs

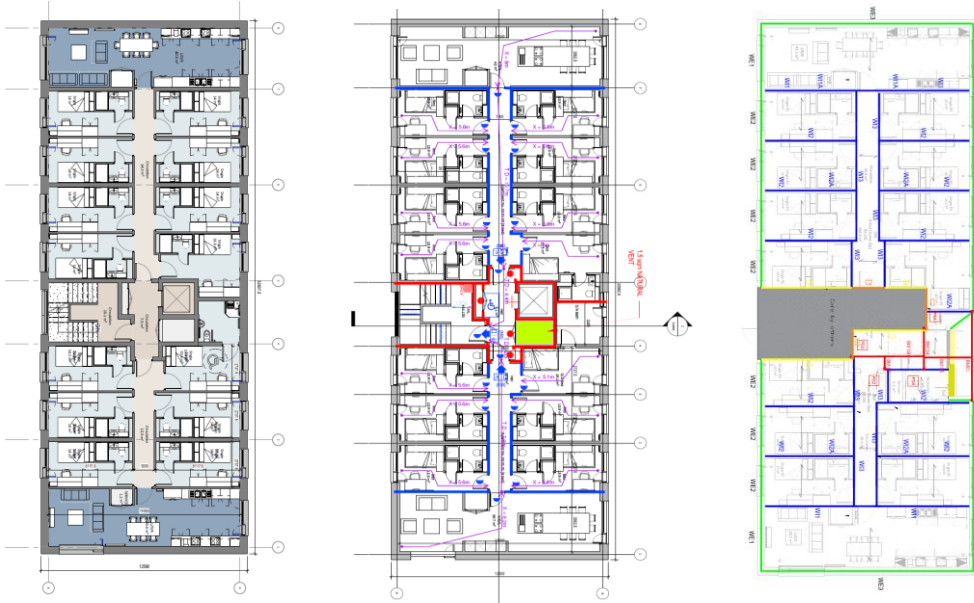
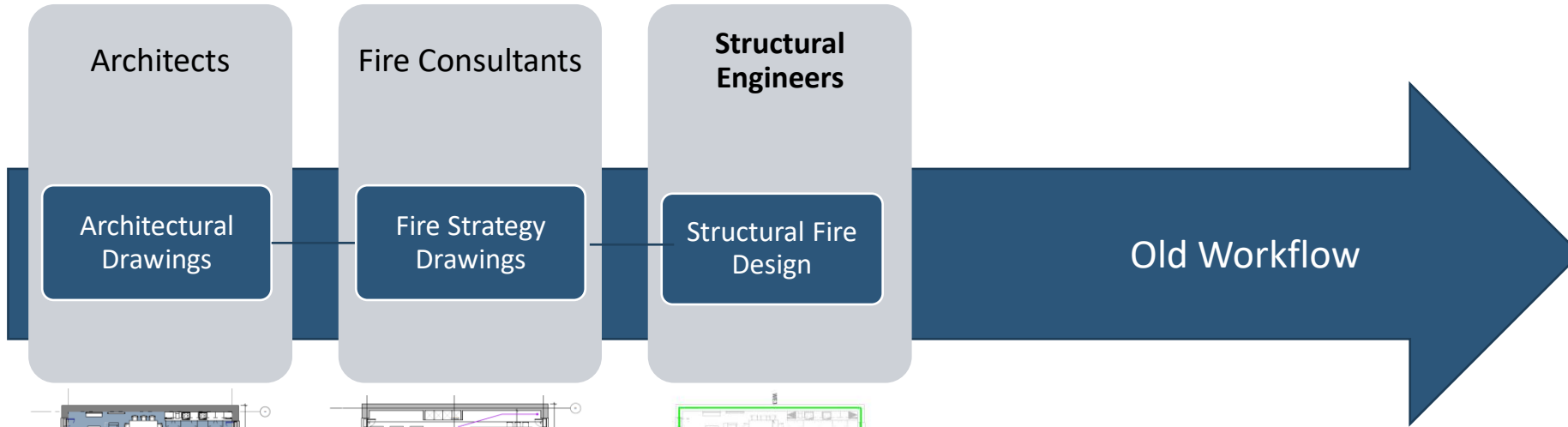
GUIDANCE AND EDUCATION

- NSAI Certified system – more than just a structure
- Roles and responsibilities in relation to MMC project application for BCAR.
- Guiding the manufacturers in the delivery of compliant solutions as well as enhanced solutions
- Working with Assigned Certifiers in relation to technical queries or understanding of the application of various systems
- Structural Fire Protection – a particular area of focus

AN EXAMPLE OF UPDATING THE PROCESS

Current Design Workflow

Fire Consultants and Structural Engineers do not collaborate



Fire consultants are not provided with structural drawings

Structural engineers are not provided with minimum periods of fire resistance for elements of structure

Proposed Design Workflow

Load bearing walls exposed to fire

Architects

Structural Engineers

Fire Consultants

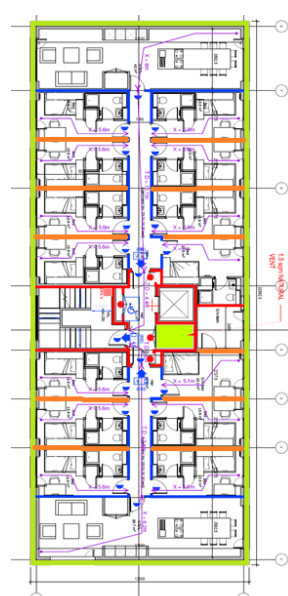
Structural Engineers

Architectural Drawings

Identification of Elements of Structure

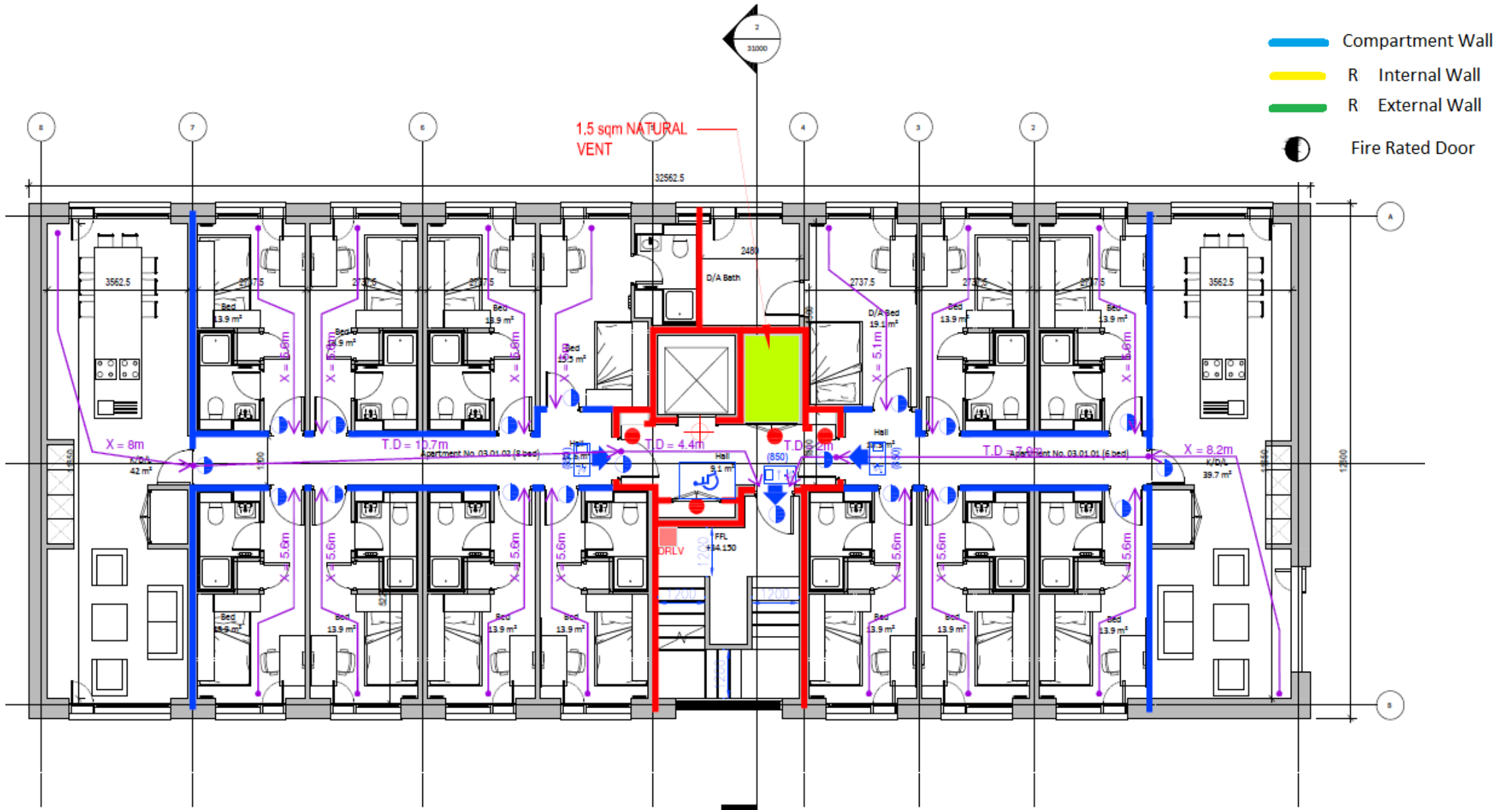
Fire Strategy Drawings

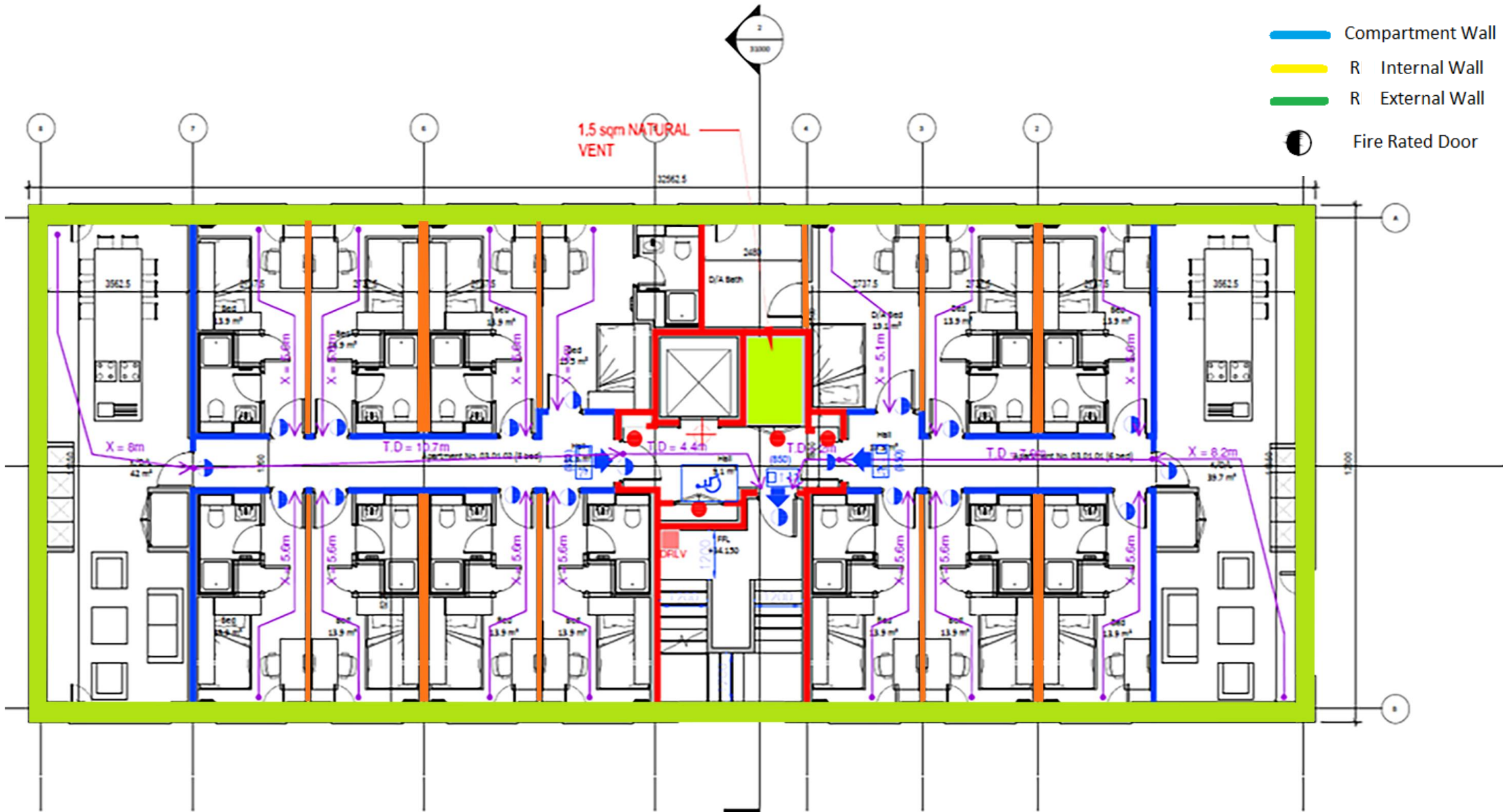
Structural Fire Review



Fire consultants are provided with structural drawings

Structural engineers are provided with minimum periods of fire resistance for elements of structure







ABM for Fingal County Council

40 No houses

2D Panelised System



ABM for Fingal County Council

67No Units with a mix of houses and apartments

2D Panelised System



Clancy for Roundhill Capital – Bandon Road, Cork

5No. 6 Storey Student Accommodation Blocks

2D Panelised System

Noted as one of the only key projects to still meet programme during early stages of Covid restrictions



Sisk for OPW

Residential Accommodation Structures for Ukrainian refugees

Working with 4 of the 5 modular suppliers across 8 sites

First phase complete

CONCLUSIONS

- BCAR has increased the quality control and quality of construction in general
- MMC manufacturers have significantly improved in terms of quality and compliance.
- MMC manufacturers have invested a significant amount in testing of their systems, especially in relation to fire.
- Suppliers and manufacturers need to ensure quality on site as well as in the factory.
- In relation to structural fire compliance, this is an area of expertise that Evolusion can support clients.
- Design team committed to the application of the MMC technology being applied



THANK YOU!



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