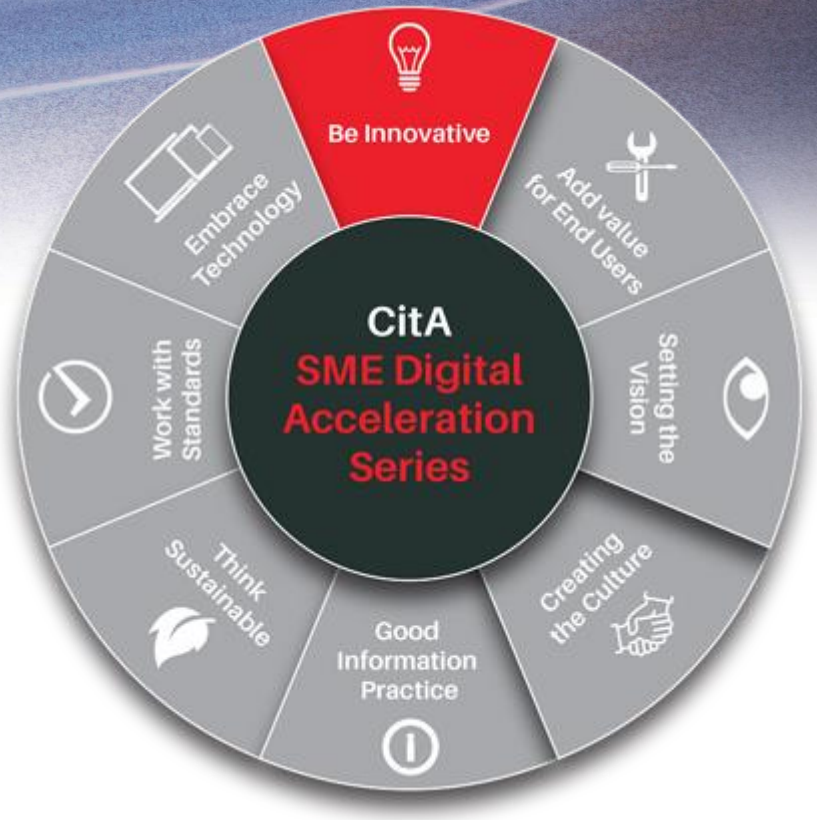
SME Digital Acceleration Series

CitA

Be Innovative:

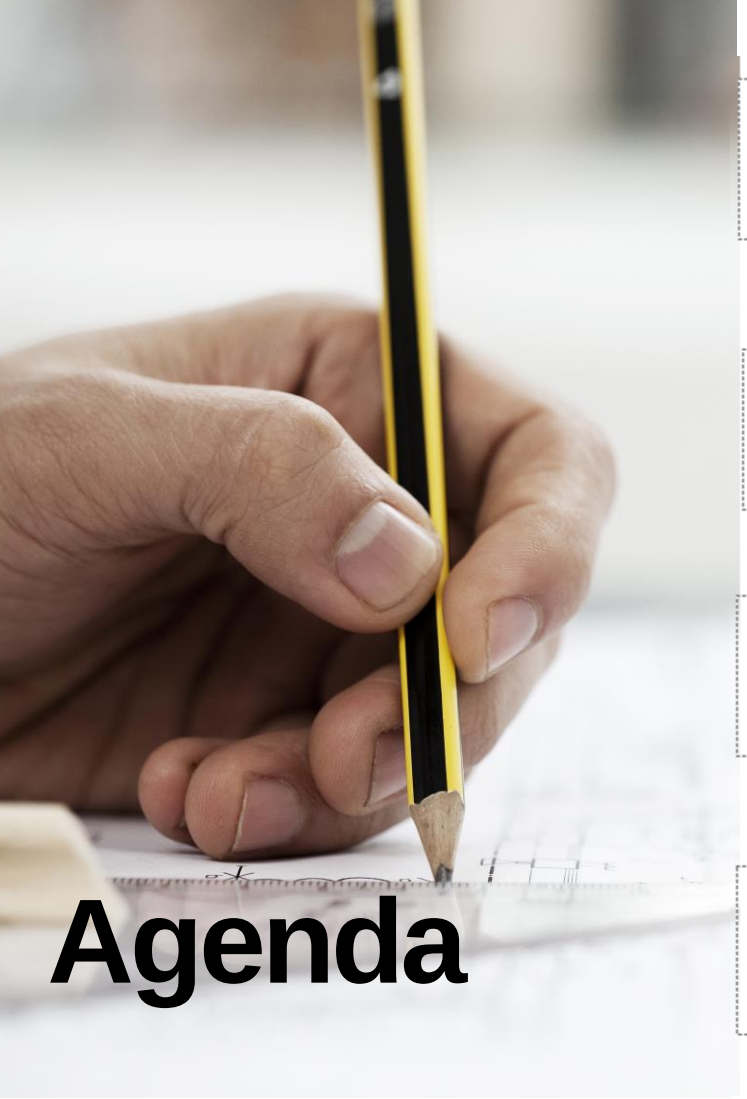
Supporting procurement reform and MMC through digital



Addressing Standards and Certification Processes to Address MMC in Housing Delivery

25:10:2023

NSAI



Agenda

1. About NSAI
2. MMC Overview
3. MMC Drivers
4. MMC Agrément
5. MMC Agrément service & Agrément Cert. Steps

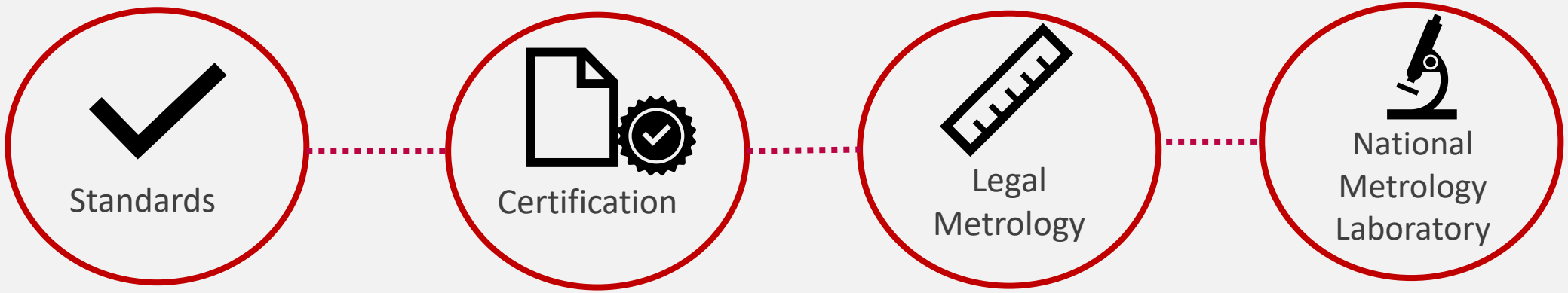
NSAI
Innovating to shape a safer, better, and sustainable future.

About NSAI

About NSAI

NSAI
Innovating to shape a safer, better, and sustainable future.

Four Main Divisions



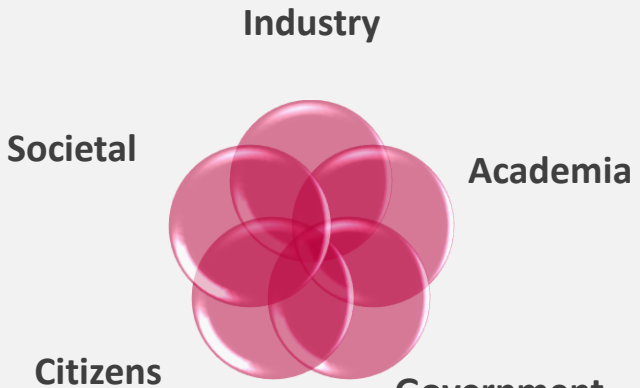
As Ireland's official **Standards body**, NSAI aims to inspire consumer confidence and create the infrastructure for products and services to be recognized and relied on, all over the world.

About NSAI

Connect & Facilitate

NSAI Role

Irish Stakeholders



Standards Committees

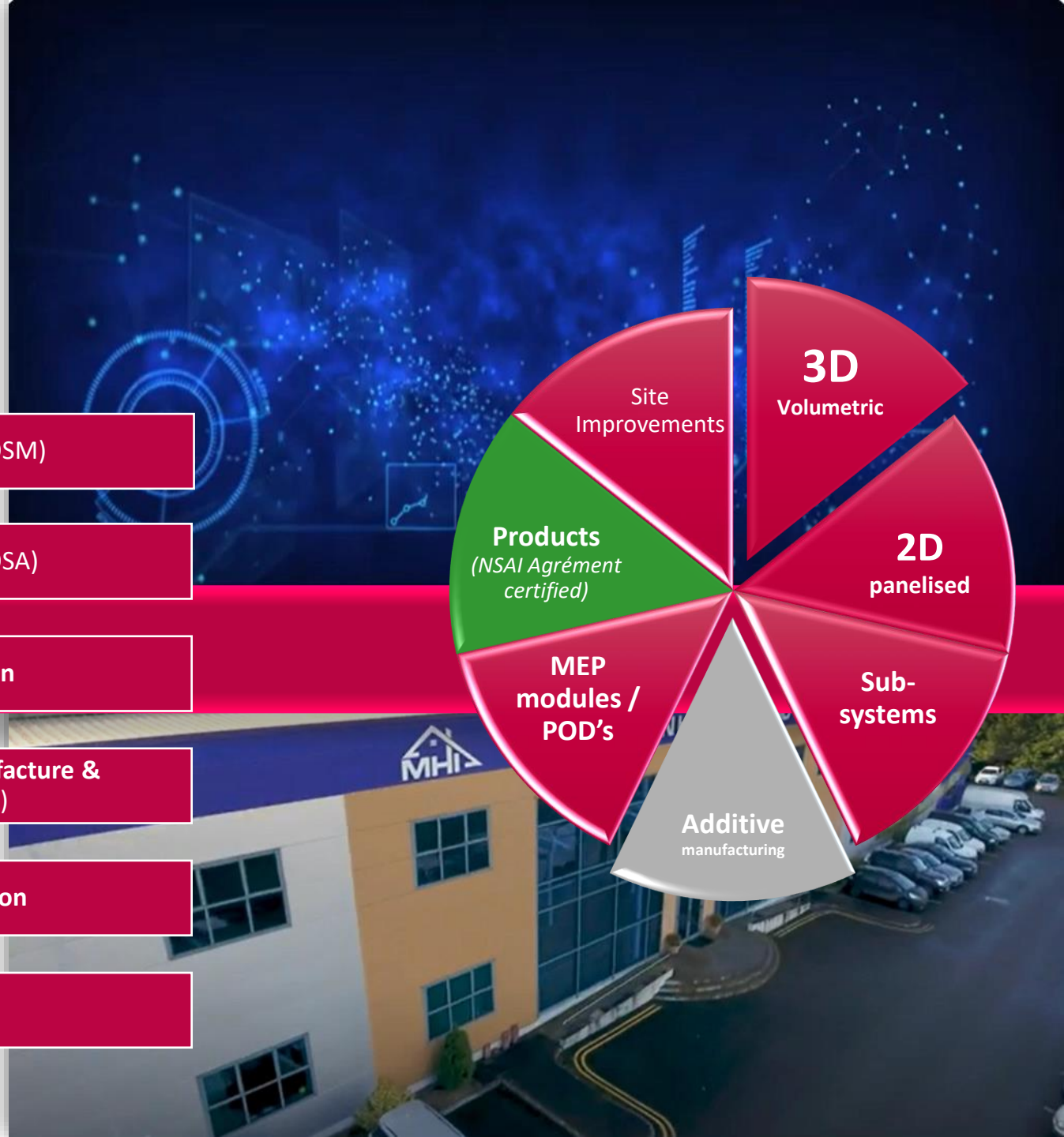
ICT
Advanced Manufacturing
Healthcare
Energy & Sustainability
Food
Construction
Services & Business Processes

NSAI improves the performance of Irish business and protects consumers through the setting of standards and issuing of certification in the quality and safety of goods and services.

MMC Overview

What is MMC?

- **Offsite Manufacturing** (OSM)
- **Offsite Assembly** (OSA)
- **Offsite Fabrication**
- **Design for Manufacture & Assembly** (DfMA)
- **Modular Construction**
- **Modularisation**



MMC Overview

MMC Categories

1 Pre-Manufacturing

(3D primary structural system)

2 Pre-Manufacturing

(2D primary structural system)

3 Pre-Manufacturing components

(Non-systemised primary structure)

4 Additive Manufacturing

(Structural and non-structural)

5 Pre manufacturing

(Non-structural assemblies & Sub-assemblies)

6 Traditional building product led site labour reduction / productivity improvements

= MMC certified

= Currently certified

= Potential to be certified

7 Site process led site labour reduction / productivity / assurance improvements

MMC Drivers

MMC Drivers

Government Policies & Actions

1
Recent Govt. policies

2
eTender requirements

3
Increased funding for Social & Affordable Housing

4
Labour shortages

5
Housing demands

6
New market entrants

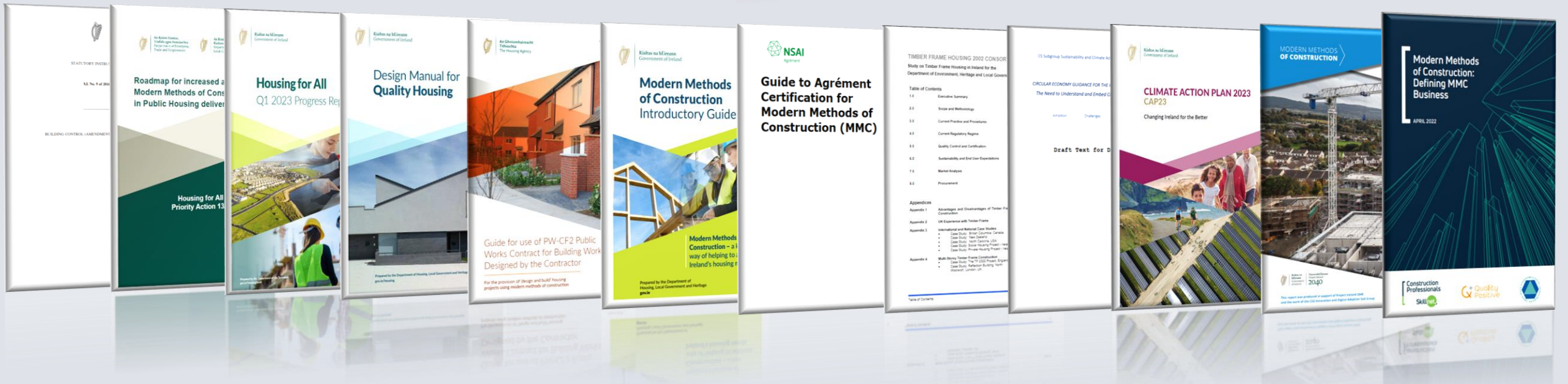
7
NDP (Project 2040)

8
- CSG outputs
- MMC LIG
- MMC Providers
- Construct Innovate research projects
- MMC Demonstration Park

MMC Drivers

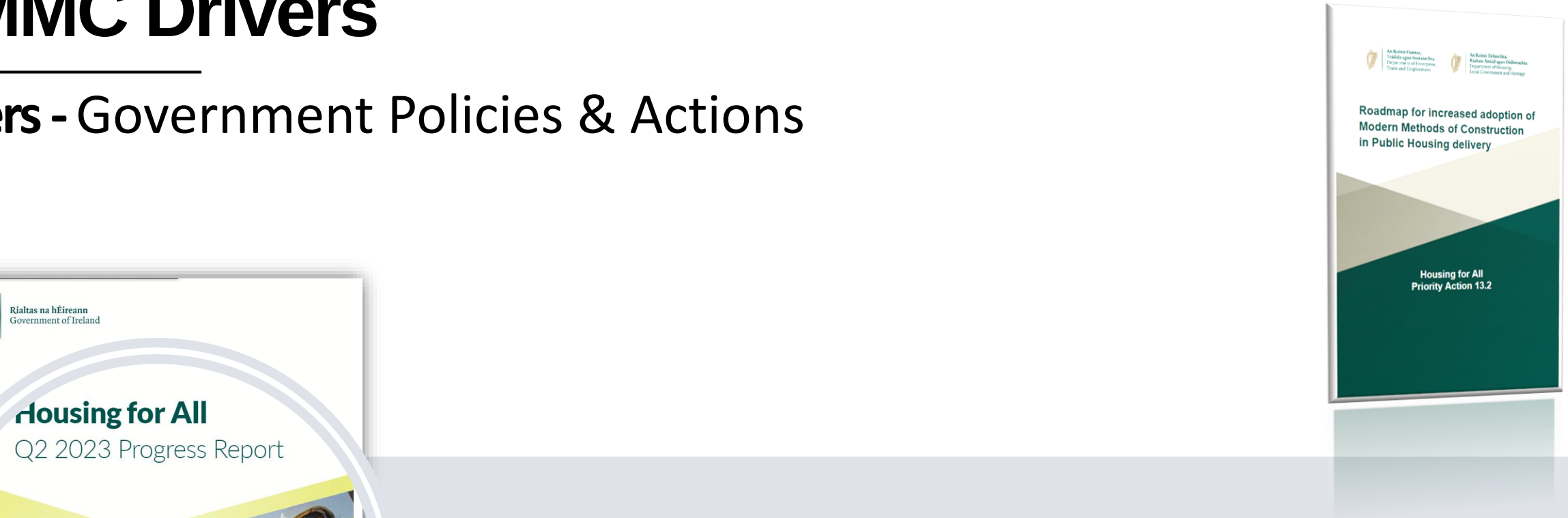
Drivers - Government Policies & Actions

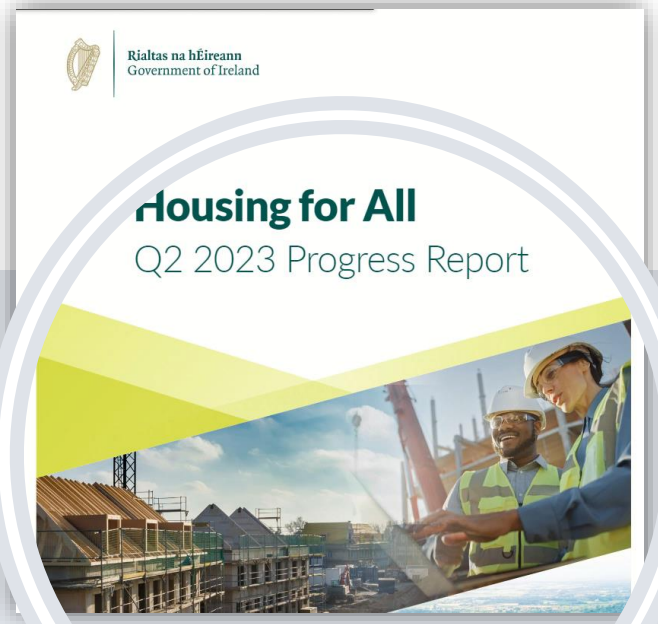
- MMC Demonstration Park
- CP Skillnet – Micro-credential training courses (coming up for this September 2023)



MMC Drivers

Drivers - Government Policies & Actions





Regulation and Standards			
11	Strengthened capacity within the NSAI to support an efficient Agrément process.	Q2 2023	NSAI
12	Assessment of the efficiency of current Agrément Certification process in an international comparative context.	Q3 2023	NSAI
13	Communication of NSAI Agrément Certification and Inspection in the context of the broader regulatory system for residential construction.	Q2 2023	NSAI
14	Stakeholder engagement and contribution to related international and European standardisation developments, and consultation on specific national needs, if any, and progress as appropriate.	Ongoing	NSAI

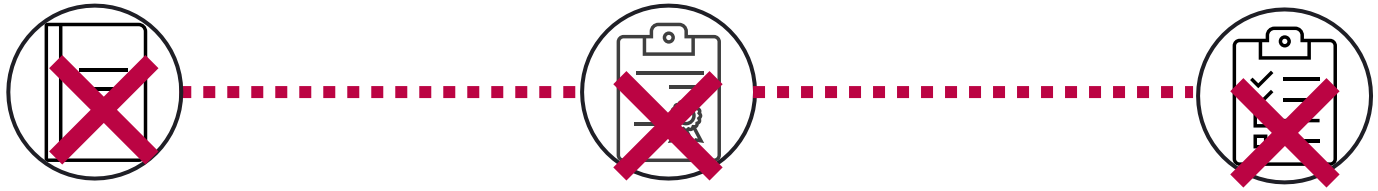
4Nr. Actions for NSAI in 2023

MMC & NSAI Agrément

MMC Agrément

Why Agrément Certificate?

Agrément Certification is designed specifically for new innovative building materials, products and systems that do not yet have a long history of use.



Products and systems for which there may be **no national standard**

Products and systems for which there may be **no harmonised European product standard (hEN)**

Products and systems for which there may be **no European Technical Assessment (ETA)**

Part D of the Second Schedule to the **Building Regulations** states: **Materials and workmanship** D1- All works to which these Regulations apply shall be carried out with **proper materials and in a workmanlike manner.** proper materials" means materials which are fit for the use for which they are intended and for the conditions in which they are to be used, and includes materials which:

(a) bear a CE Marking in accordance with the provisions of the Construction Products Regulation;

(b) **comply with an appropriate harmonised standard or European Technical Assessment** in accordance with the provisions of the Construction Products Regulation;

(c) **comply with an appropriate Irish Standard or Irish Agrément Certificate or with an alternative national technical specification** contracting party to the Agreement on the European Economic Area, which provides in use an equivalent level of safety and suitability

NSAI MMC Agrément

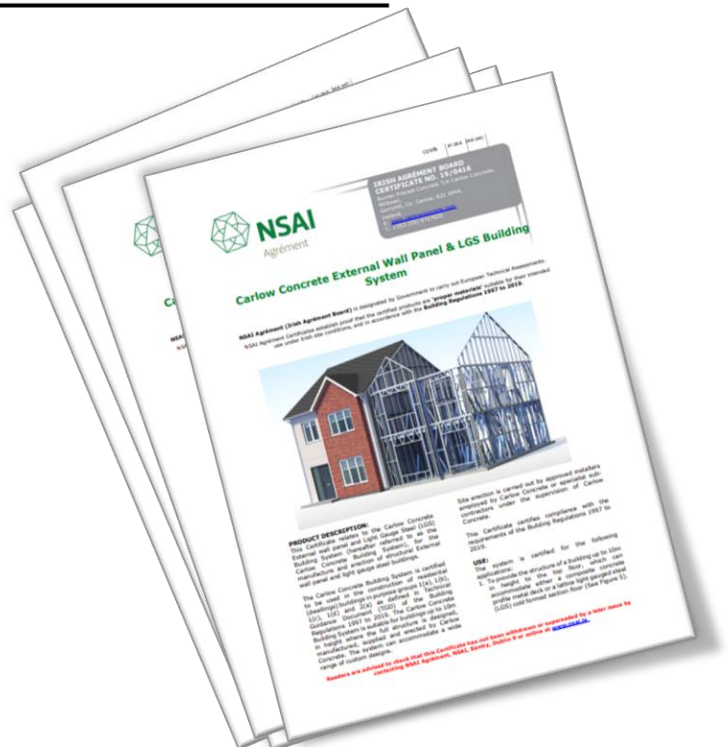
Our Mission:

To ensure that certified products and building systems use ‘**proper materials**’ suitable for their **intended use** under Irish site conditions, and per the Building Regulations 1997 to subsequent revisions.

Our emphasis on **Quality Control** ensures compliance with established standards and provides reliable and precise building materials to the construction industry here.

NSAI
Agrément

Agrément Certificate assessment



- Irish Building Regulations (TGD's A –M) and European standards compliance verification
- Laboratory test results checked
- On-site evaluations of as constructed product / building system
- Factory Production Control (FPC) inspection
- Quality Management System verification – Installation procedures and on-site inspection plan check – Post construction maintenance program

MMC Agrément

Our Clients:

New Enquires (*July to Oct*):

17 Nr.

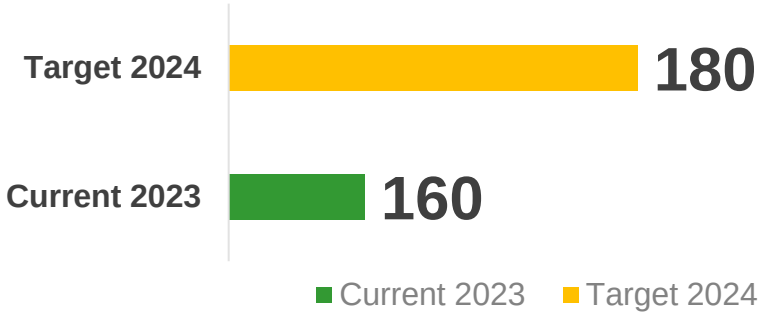
- **Unihouse Limited** (t/a/ LJ Royal)
- **Lidan Designs**
- **HTL (Harcourt Technologies Limited)**
- **Letaron Group** (SIEC Group)
- **Framespace** (3D LGS solution)
- **Tempohousing Limited**
- **Celuplast Building Solutions Limited**
- **Steeltech Modular Building Systems**
- **MurVize Limited** (Pre-cast solution)
- **Stelling Properties**
- **EcoCocon Timber frame**
- **Tim Murphy & Partners** (Steel system)
- **Glenveagh PLC**
- **Sentarmax Oü**
- **Volumetric Building Companies (VBC)**
- **CPAC Modular**
- **Buildblock ICF**

22 Nr. NSAI Agrément 'Building systems' certified *(to date)*

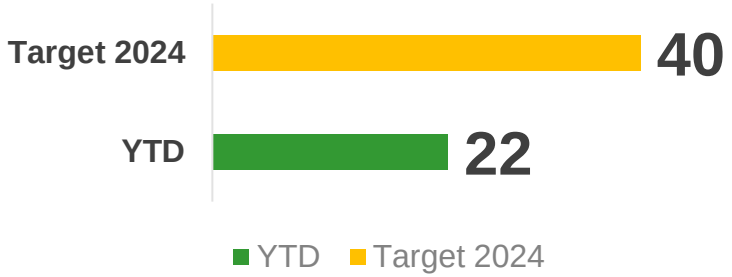
MMC Agrément metrics

Our Current Dashboard

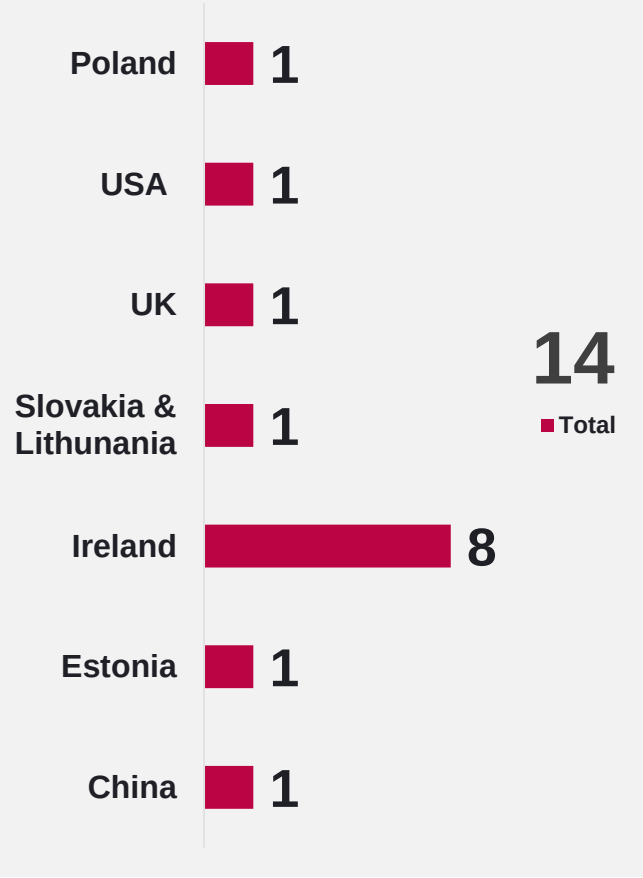
Irish MMC Providers



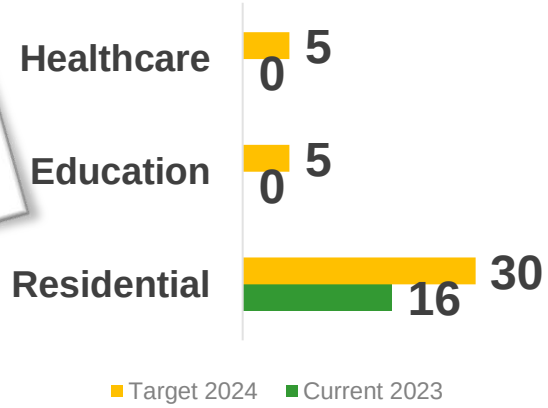
NSAI Agrément certified



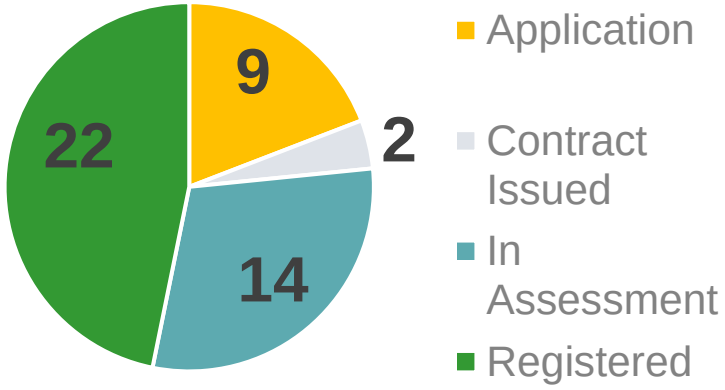
New Enquires



Sector



MMC Agrement Status Overview YTD



MMC Agrément services & Agrément Certification Steps

MMC Agrément services

Our services offerings:

Pre-Approval

- Application Analysis
- Offsite Factory **Pre-approval process**.
- As per current FPC assessment.
- Scoring mechanism applied.

1

Agrément Certification for MMC

- **Subject to Pre-Approval**
- Application/scope Analysis
- Technical Assessment: The system will be assessed **against Parts A to M to the Irish Buildings Regulations**
- Laboratory tests results checks
  Min. 4Nr. Factory audits completed in 5-year period.
- Audit report recorded.
- Audit scoring applied (to assess maturity of facility).
- Year 1 – incl. FPC assessment
- **Valid for 5 years subject to surveillance audit**

2

Ancillary certification

- Ancillary certification of Modular Construction process
- *As per current BC(A)R 2014 requirements and current Irish Building Regulations – i.e. TGD's Parts A-M.

Onsite assessment
20-10%
(12-20 weeks)

Offsite assessment
80-90%
(1-2 weeks)

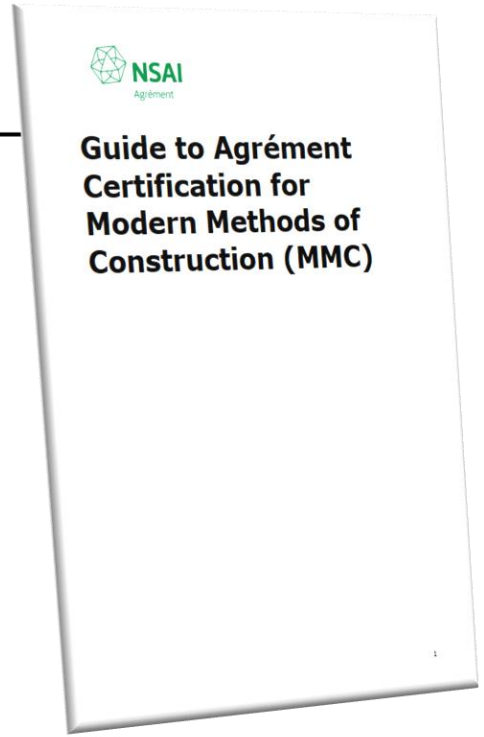
3

ISO 19650 (BIM) certification

* **Future service** *to support increased digitalisation*

0 Pre-Approval

How to apply?



Before apply verify your current GAPS. Do you have Quality Management System in place? Do you have technical data/tests of your system?Are you ready?

1

Complete the NSAI Application form – for the application process by the manufacturer.

2

Upload your Technical Documentation Pack according to the "Guide to Agrément Certification for MMC"

TGD A to M

incl. Technical data, for importation and factory certification

Tests results
Technical Calculations
evidences of compliance against ALL applicable TGDs (Structural, thermal, sound etc.)

Incomplete or poor evidences can lead to failure

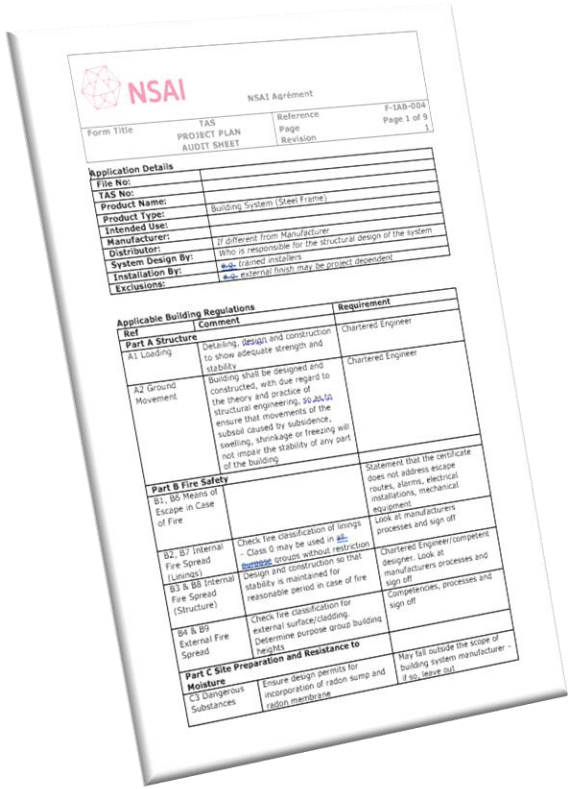
3

Pay the Fee : The application fee is **€4,400.00** plus VAT, for Building Systems certification **Note:** The Application fees are non-refundable

4

Start of Pre Assessment

1 Agrément Certification for MMC


NSAI

NSAI Agrément

Form Title	TAS PROJECT PLAN AUDIT SHEET	Reference	F-IAB-004
		Page	Page 1 of 9
		Revision	1

Application Details

File No:	
TAS No:	
Product Name:	
Product Type:	Building System (Steel Frame)
Intended Use:	
Manufacturer:	If different from Manufacturer
Distributor:	
System Design By:	Who is responsible for the structural design of the system
Installation By:	e.g. trained installers
Exclusions:	e.g. external finish may be project dependent

Applicable Building Regulations Ref	Comment	Requirement
Part A Structure		
A1 Loading	Detailing, design and construction to show adequate strength and stability	Chartered Engineer
A2 Ground Movement	Building shall be designed and constructed, with due regard to the theory and practice of structural engineering, SG.6.10 ensure that movements of the subsoil caused by subsidence, swelling, shrinkage or freezing will not impair the stability of any part of the building	Chartered Engineer
Part B Fire Safety		
B1, B6 Means of Escape in Case of Fire		Statement that the certificate does not address escape routes, alarms, electrical installations, mechanical equipment
B2, B7 Internal Fire Spread (Linings)	Check fire classification of linings - Class 0 may be used in all buildings groups without restriction	Look at manufacturers processes and sign off
B3 & B8 Internal Fire Spread (Structure)	Design and construction so that stability is maintained for reasonable period in case of fire	Chartered Engineer/competent designer. Look at manufacturers processes and sign off
B4 & B9 External Fire Spread	Check fire classification for external surface/cladding. Determine purpose group building heights	Competencies, processes and sign off
Part C Site Preparation and Resistance to Moisture		
C3 Dangerous Substances	Ensure design permits for incorporation of radon sump and radon membrane	May fall outside the scope of building system manufacturer - if so, leave out

NSAI will undertake an **initial assessment** of the information provided for the system, then agree the scope of the assessment with the MMC manufacturer and provide them with a contract

The NSAI assessment can commence when the contract is agreed and payment (either in full or partial – as agreed) has been made

An initial meeting is held with NSAI / MMC Manufacturer(s).

1

Technical Assessment Specification (TAS) Development :

- **Irish Building Regulations** (TGD Parts A - M inclusive) **and European standards compliance verification**
  Additional Regulations Compliance *– as determined by NSAI in the Technical Assessment Specification document (as drafted up)*
- **Laboratory tests results / checks / Engineering calculations**
- **On-site evaluations of the as constructed MMC product/system** i.e.
- **Factory Production Control (FPC) inspection/Manufacturing – Quality management system verification**
- **MMC Installation procedures/MMC Off-site factory inspection plan/Post-construction maintenance program**

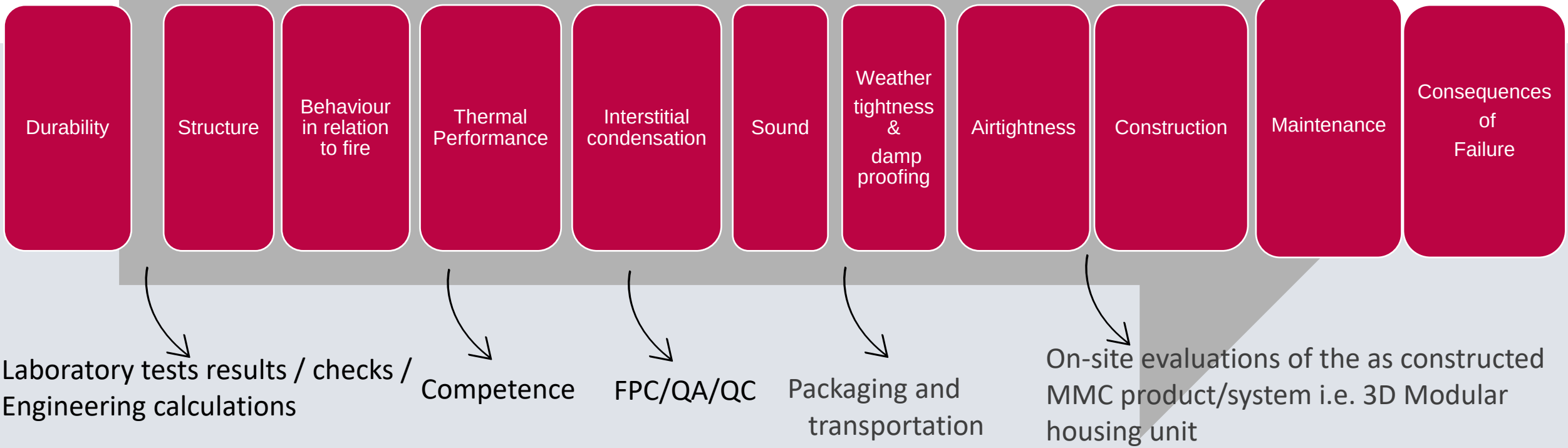
2

Subject to the results of the assessment, the NSAI Agrément Certificate is published. Valid for 5 years subject to annual surveillance audits.

MMC Agrément service

The Technical Assessment Specification (TAS) overview

The system will be assessed **against Parts A to M to the Irish Buildings Regulations and European standards compliance verification**

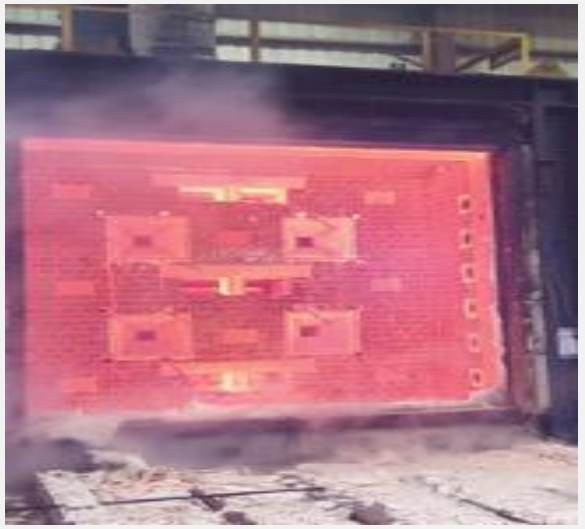


Assessment tests – Examples

Fire Testing walls & floors

Loaded walls tested to
EN 1365-1 *Fire resistance tests for loadbearing elements – Walls*

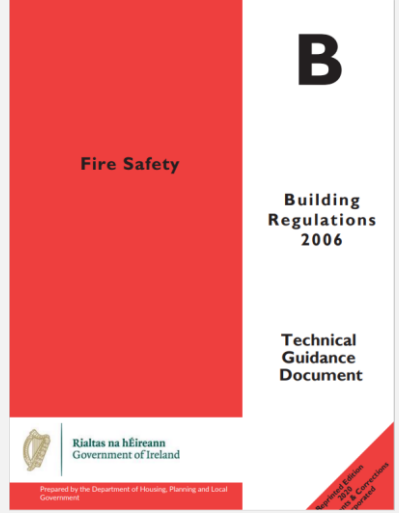
Loaded floors tested to
EN 1365-2
Fire resistance tests for loadbearing elements - Floors and Roofs



Fire Testing external cladding

External cladding systems tested to ***BS 8414*** *Fire performance of external cladding systems*

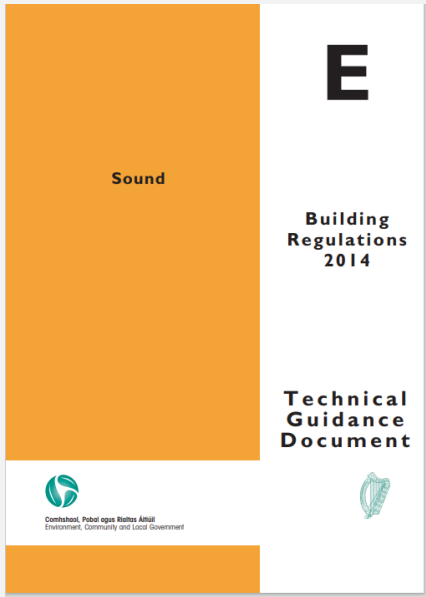
Standards cover external cladding applied to masonry substrate or structural steel frames.



Acoustic performance

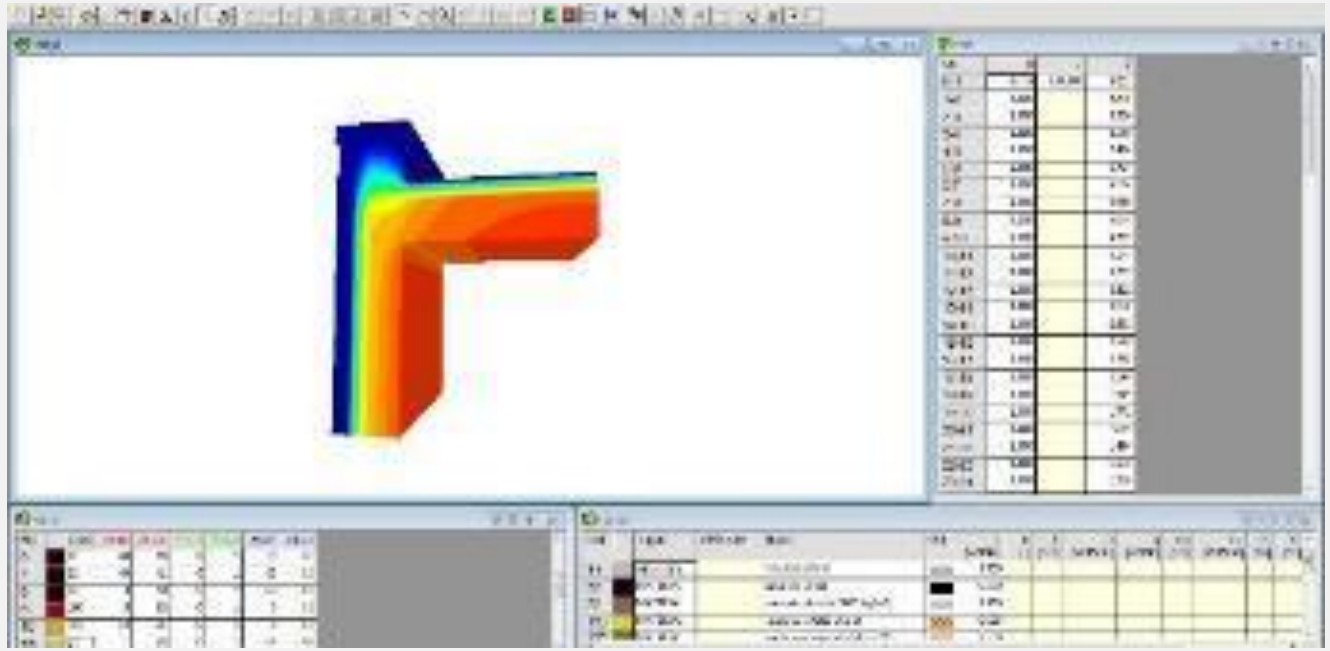
For new dwellings, where the relevant walls and floors are:
a) designed and constructed using acceptable construction as per TGD Part E,
and
b) demonstrated by testing in accordance with TGD Part E to meet performance levels as per Table 1

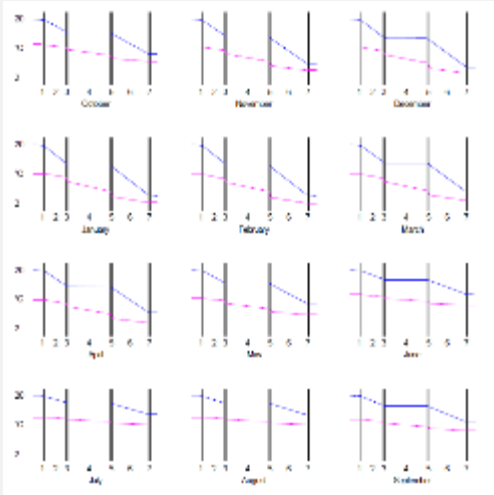
Table 1	Sound performance levels *(Par. 1.1.1)*	
Separating construction	**Airborne sound insulation $D_{nT,w}$ dB**	**Impact sound insulation $L'_{nT,w}$ dB**
Walls	53 (min)	-
Floors (including stairs with a separating function)	53 (min)	58 (max)
NOTE: For works to protected structures, refer to paragraph 1.1.3		

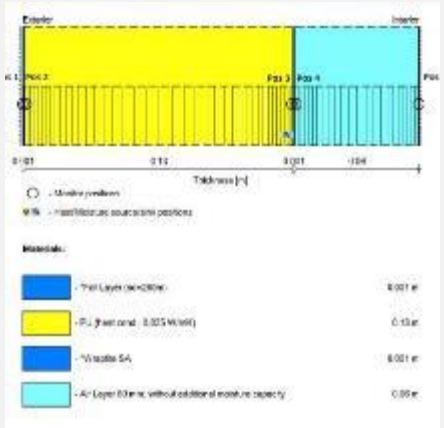


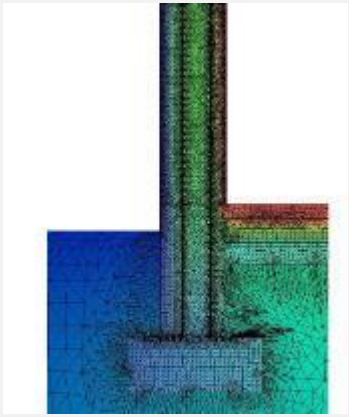
Thermal performance & interstitial condensation

- U-values
- Thermal bridging
- Interstitial condensation risk analysis (Glaser method, Hygrothermal method, WUFI method)









Weathertightness testing

Centre Window Cladding Technology (CWCT) Standard for systemised building envelopes:

- Air permeability
- Wind resistance
- Water penetration
- Water resistance
- Static test method
- Dynamic test method

Factory Production Control (FPC)

- Competencies
- Material Specifications
- Traceability
- FPC Records
- Testing and measuring equipm
- Maintenance records
- Inspection points
- Final release
- Packaging and transportation






Design/Construction

- Project specific design
- Competencies (Structure, thermal, safety, etc.)
- Method Statements
- Erection (Stability, H&S, weather…)
- Inspection plan / Check points
- Final sign off
- Maintain records
- Training

Pathway for NSAI MMC Agrément

0	1	2	3	4	5	6	7
Pre-Application (Preparation Step)	Application	Application Assessment + Contract	TAS (Technical Assessment Specification) + FPC (Factory Production Control inspection)	Draft Agrément	Final Review	Approval	Agrément Published on NSAI Website
	1-4 weeks	4-8 weeks	**6 to 18 months	2 months	1 to 2 months	1 month	1 month
Prepare a Technical Documentation Pack with supporting evidence, to demonstrated documented compliance to the current Irish Building Regulations (TGD Part A-M inclusive)	Complete the NSAI Application form + upload your evidence of compliance * Application fee €	Preliminary assessment Scope agreed Contract agreed fee Contract sign off & paid €	Kick off Meeting TAS development TAS Assessment: FPC inspection/ QMS of the production process.	Subject to the results of the assessment, we then draft an NSAI Agrément Certificate.	Internal Technical NSAI evaluation.	Internal Sign off process Publish Approval	

*The application fee is **€4,400.00** plus VAT, for Building Systems certification (non-refundable) ** The timeline will depend on the availability and results of evidences provided to demonstrate compliance

Over 5 years:

Year 1 to Year 4 – – – – – – – – – – – – – – – – – – ▶ **Year 5**

€ Annual fee + € Surveillance audit visit fee

€ Annual fee + € Surveillance audit visit fee + 5 Years reassessment

The manufacturer applying for Agrément Certification will be required to provide evidence of compliance with Part A to M of Buildings Regulations and required EU standards.

NSAI Application form link – https://www.nsai.ie/certification/agrement-certification/application-form-foragrement-certification/

NSAI MMC Agrément guide link: https://www.nsai.ie/images/uploads/certificationagrement/Guide_to_Agr%C3%A9ment_Certification_for_MMC.pdf

TAS Assessment:

- ✓ **Irish Building Regulations** (TGD Parts A - M inclusive) **and European standards compliance verification**
- ✓ Laboratory tests results checks / Engineering calculations
- ✓ MMC Installation procedures

FPC includes:

- ✓ On-site evaluations of the as constructed MMC product/system i.e. 3D Modular housing unit
- ✓ Factory / Manufacturing – Quality management system verification (ISO9001 to EN1090)
- ✓ Assessment of MMC Transportation, Storage, Handling, and Installation approaches taken

5 Years reassessment:

Evaluation of the current Agrément and verification of any changes to the product specification including manufacture, delivery and installation instructions.

In case of Changes, Steps 1 to 7 need to be followed.

Thank you for your participation

martin.searson@nsai.ie

NSAI