



# **Guide to Agrément Certification for Modern Methods of Construction (MMC)**

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## 1. Introduction

This guidance document has been prepared by the National Standards Authority of Ireland (NSAI) to provide more information on the Agrément Certification assessment process for **Modern Methods of Construction (MMC), such as off-site construction, modular construction panels and structural insulated panels**. The aim is to enhance the certification process for MMC and provide a clear pathway for system manufacturers on the assessment process for Agrément Certification.

Agrément Certification is designed specifically for new innovative building materials, products and systems that do not yet have a long history of use and for which there may be no national standard, harmonised European product standard (hEN) or European Technical Assessment (ETA). Agrément Certification confirms products/systems are fit for purpose and when installed with due regard to the limitations contained within their Agrément certificate, the MMC will satisfy all relevant Parts of the Irish Building Regulations 1997 - 2021.

This guidance document is provided mainly for MMC and is addressed to manufacturers seeking Agrément Certification recognition. The following sections of this document provide information on all stages of the application and review process for Agrément Certification.

## 2. Application Process

Initial stage of the Agrément Certification covers the application process by the manufacturer. The application form for the Agrément Certification is available on the NSAI website ([link](#)) and is sent directly to the NSAI Certification Department. The application form covers initial information on product/system and manufacturer's company such as:

- Name of the product
- Detailed description of proposed use and scope
- Manufacturer's company information
- Country/Countries of manufacture
- Product range (e.g., dimensions, volume, weight per unit and colours)
- Full details of ancillary items

Additional guidance notes on the application form for the Agrément Certification are included in [Appendix A](#). Manufacturers of MMC applying for the Agrément Certification recognition are encouraged to read the guidance notes included in Appendix A prior to filling the application. A comprehensive and fully completed application by the manufacturer will help NSAI with an initial assessment.

## 3. Application Assessment & Contract

Once the application is sent by the MMC manufacturer, NSAI will undertake an initial assessment of the information provided for the system. NSAI Agrément Department will agree the scope of the assessment with the manufacturer and provide them with a contract. The assessment can commence when the contract is agreed and payment (either in full or part) has been made. The cost of the Agrément Certification process is dependent on the assessment and is determined on a case-by-case basis.

- Technical Assessment Specification (TAS) Development

Based on an initial meeting and the completed 'Building system checklist form' (Appendix B), a Technical Assessment Specification (TAS) will be developed by NSAI and shared with the



manufacturer. Based on an initial meeting and the completed 'Building system checklist form' (Appendix B), a Technical Assessment Specification (TAS) will be developed by NSAI and shared with the manufacturer. The TAS will set out technical criteria for the assessment and testing of the system. The system will be assessed in accordance with the Irish Building Regulations and any relevant standards and codes of practice. 'Draft Technical Assessment Specification for MMC' is included in the Appendix C. It is important that manufacturers applying for Agrément Certification for MMC, familiarise themselves with the TAS as it provides essential guidance on technical assessment for Agrément Certification.

#### **4. Product/System Assessment**

Assessment of the system may include the following (depending on the product/system):

- Irish Building Regulations and European standards compliance verification
- Laboratory tests results checks
- On-site evaluations of as constructed product/system
- Factory production inspection
- Quality management system verification
- Installation procedures
- On-site inspection plan
- Post construction maintenance program.

Guidance to technical assessment for MMC has been included in the following subsections.

#### **5. Irish Building Regulations Compliance**

The system will be assessed against Parts A to M to the Irish Buildings Regulations. The aim of the Irish Building Regulations requirements is to provide for the safety and welfare of people in and about buildings. Minimum requirements are set in 12 Parts (A to M) to the Irish Building Regulations. In addition, Technical Guidance Documents are published to accompany each part of the Irish Building Regulations indicating how the requirements of that part can be achieved in practice. Adherence to the approach outlined in a Technical Guidance Document (TGD) is regarded, as evidence of compliance with requirements of the relevant part of the Irish Building Regulations. In addition to the TGD, NSAI Agrément can consider other means of compliance with Irish Building Regulations.

Following subsections provide information on Irish Building Regulations requirements and guidance for the manufacturer on how to achieve compliance with each part of the Irish Building Regulations.

### 5.1. Part A – Structure

Part A Irish Building Regulations sets structural requirements for buildings. Table 1 shows Part A Irish Building Regulations requirements.

**Table 1 Part A Irish Building Regulations requirements**

Ref	Requirement
<b>Part A Structure</b>	
A1 Loading	<p>(1) A building shall be designed and constructed, with due regard to the theory and practice of structural engineering, so as to ensure that the combined actions that are liable to act on it are sustained and transmitted to the ground:</p> <p>(a) safely, and</p> <p>(b) without causing such deflection or deformation of any part of the building, or such movement of the ground, as will impair the stability of any part of another building.</p> <p>(2) In assessing whether a building complies with subparagraph (1), regard shall be had to the variable actions to which it is likely to be subjected in the ordinary course of its use for the purpose for which it is intended.</p>
A2 Ground Movement	A building shall be designed and constructed, with due regard to the theory and practice of structural engineering, so as to ensure that movements of the subsoil caused by subsidence, swelling, shrinkage or freezing will not impair the stability of any part of the building.
A3 Disproportionate Collapse	<p>(1) A building shall be designed and constructed, with due regard to the theory and practice of structural engineering, so as to ensure that in the event of an accident the structure will not be damaged to an extent disproportionate to the cause of the damage.</p> <p>(2) For the purposes of subparagraph (1), where a building is rendered structurally discontinuous by a vertical joint, the building on each side of the joint may be treated as a separate building whether or not such joint passes through the substructure</p>

The manufacturer will be required to provide evidence of compliance with Part A Buildings Regulations. Evidence that may be examined includes:

- Structural calculations (carried out by Chartered Engineer)
- Structural drawings and details
- Structural test results (NSAI may ask to witness product/system test)

The manufacturer shall provide a structural design philosophy or acceptable procedure, possibly with supporting sample calculations. The design and structural calculations shall cover as a minimum:

- load takedown in accordance with I.S. EN 1990 and I.S. EN 1991, including permanent, variable and accidental load cases.

- structural properties and capacities in accordance with I.S. EN 1990 and other product/system specific Eurocodes and Irish Standards as appropriate.
- verification of Ultimate Limit State and Serviceability Limit State in accordance with I.S. EN 1990 and other product/system specific Eurocodes and Irish Standards as appropriate.

Calculations of structural properties of the product/system may include:

- Axial/shear/bending resistance
- Racking resistance
- Stiffness properties
- Creep
- Resistance to concentrated loads
- Response factor, natural frequency, etc.
- Robustness and disproportionate collapse

Where evaluation of structural properties and capacities is carried out by testing, the manufacturer shall provide full results of the testing for NSAI Agrément review. If structural properties cannot be obtained by calculation methods or NSAI Agrément chooses to verify calculation methods, laboratory testing will be required. Laboratory tests may include:

- Axial/shear/bending resistance
- Impact resistance
- Racking resistance
- Stiffness properties
- Creep
- Response factor or other vibration criteria testing
- Soft and hard body impact resistance

Independent, accredited laboratories are acceptable for testing the product/system. NSAI Agrément may request the manufacturer to provide information on testing laboratories and their accreditation.

Further to structural calculations, design and testing; structural drawings for the MMC system shall be provided by the manufacturer. Structural drawings shall include all structural details, for example:

- Substructure details (foundations/ground floor/rising elements)
- Superstructure details (vertical elements/floor structure/roof structure)
- Critical junctions

## 5.2. Part B – Fire Safety

Part B Irish Building Regulations provides information on requirements regarding the fire safety of buildings. Table 2 shows Part B Irish Building Regulations requirements.

**Table 2 Part B Irish Building Regulations requirements**

Ref	Requirement
<b>Part B Fire Safety</b>	
B1 Means of escape in case of fire	A building shall be so designed and constructed that there are adequate means of escape in case of fire from the building to a place of safety outside the building, capable of being safely and effectively used.
B2 Internal fire spread (linings)	For the purpose of inhibiting the spread of fire within a building, the internal linings: <ul style="list-style-type: none"> <li>(a) shall have, either a rate of heat release or a rate of fire growth and a resistance to ignition which is reasonable in the circumstances; and</li> <li>(b) shall offer adequate resistance to the spread of flame over their surfaces</li> </ul>
B3 Internal fire spread (structure)	<p>(1) A building shall be so designed and constructed that, in the event of fire, its stability will be maintained for a reasonable period.</p> <p>(2) (a) A wall common to two or more buildings shall be so designed and constructed that it offers adequate resistance to the spread of fire between those buildings.</p> <p>(b) A building shall be sub-divided with fire resisting construction where this is necessary to inhibit the spread of fire within the building.</p> <p>(3) A building shall be so designed and constructed that the unseen spread of fire and smoke within concealed spaces in its structure or fabric is inhibited where necessary.</p> <p>(4) For the purposes of sub-paragraph 2 (a), a house in a terrace and a semi-detached house are each to be treated as being a separate building.</p>
B4 External fire spread	The external walls and roof of a building shall be so designed and constructed that they afford adequate resistance to the spread of fire to and from neighbouring buildings.
B5 Access and facilities for the fire service	A building shall be so designed and constructed that there is adequate provision for access for fire appliances and such other facilities as may be reasonably required to assist the fire service in the protection of life and property.

Further guidance on Part B Irish Building Regulations can be found in TGD Part B, Volume 1 and 2. TGD Part B Volume 2 covers fire safety requirements for dwelling houses.

The manufacturer applying for Agrément Certification will be required to provide evidence of compliance with Part B Buildings Regulations. Evidence that may be examined includes:

- Fire resistance test results.
- Reaction to fire performance results.
- Compartmentation drawing details (compartmentation wall and floor) and fire stopping details.
- Evidence of compliance with Technical Guidance Document Part B – Fire Safety (Volume 1 or 2).

The minimum fire resistance shall be in accordance with TGD Part B Fire Safety Volume 1 or 2. Table A1 specifies the required fire resistance for different parts of the building. TGD Part B provides minimum requirements for structural elements, floors, roof, ceilings, cavity barriers, internal and external walls. Fire resistance shall be determined in terms of Load bearing capacity (L), Integrity (E) and Insulation (I) depending on the building element type. Minimum thickness of masonry or concrete structural elements to achieve fire resistance can be found in relevant Eurocodes (I.S. EN 1996-1-2/ I.S. EN 1992-1-2). Supplementary Guidance to TGD B (Fire Safety) Volume 2 – Dwelling Houses provides guidance on fire resistance of traditional timber frame structures.

Where the structure type differs from the traditional method of construction and their fire resistance is not clearly defined by the Eurocodes or TGD Part B, a fire resistance test will be required. Fire resistance of the building element shall be tested in accordance with I.S. EN 1364 and I.S. EN 1365. NSAI may ask to witness fire testing to verify testing procedure and results. The manufacturer may be required to provide information on test laboratories and their accreditation. In addition to wall and floor fire testing, a full-scale fire test may be required depending on the type of MMC and this will be determined on a case-by-case basis.

The product/system shall be designed to achieve the required resistance to the spread of fire (external and internal). Linings of walls and ceilings shall be designed to achieve performance class as per section 2.4 of TGD Part B, Volume 2. Class 0 performance can be used without restrictions for linings. Table A5 in TGD Part B, Volume 2 gives guidance on fire performance ratings of materials and products. Where reaction to fire of lining cannot be determined using TGD Part B, Volume 2 and its referred documents, reaction to fire testing will be required. Reaction to fire test shall be in accordance with I.S. EN 13501.

Roofing coverings and external surfaces that are part of the system shall meet the requirements of TGD Part B, Volume 1 and 2. Provisions will depend on maximum building height as well as boundary distance. For buildings more than 18m high additional fire requirements for outer cladding and insulation in cavities apply. Refer to TGD Part B for more information. Fire classification for all external surface/cladding shall be clearly stated in the application with information on the determination of the class (either by testing or classification by Commission Decision and/or TGD Part B).

Drawings showing compartmentation details and fire stopping shall be included in the technical documentation provided at the application. Drawings shall include as a minimum:

- Compartmentation walls and/or floor details
- Fire stopping at services penetration
- Critical junctions between fire barrier element meeting other building element (e.g., compartmentation wall and external wall junction detail)

Guidance on fire stopping can be found in TGD Part B.



### 5.3. Part C – Site Preparation and Resistance to Moisture

Part C Irish Building Regulations sets requirements for site preparation, avoidance of dangerous substances and resistance to weather and ground moisture. Table 3 shows Part C Irish Building Regulations requirements.

**Table 3 Part C Irish Building Regulations requirements**

Ref	Requirement
<b>Part C Site Preparation and Resistance to Moisture</b>	
C1 Preparation of site	The ground to be covered by a building shall be reasonably free from vegetable matter.
C2 Subsoil drainage	Subsoil drainage shall be provided if necessary, so as to prevent the passage of ground moisture to the interior of the building or damage to the fabric of the building.
C3 Dangerous substances	Reasonable precautions shall be taken to avoid danger to health and safety caused by substances (including contaminants) found on or in the ground to be covered by a building.
C4 Resistance to weather and ground moisture	The floors, walls and roof of a building shall be so designed and constructed as to prevent the passage of moisture to the inside of the building or damage to the fabric of the building.

The manufacturer will be required to provide evidence of compliance with Part C Buildings Regulations. Evidence that may be examined includes:

- Ground floor detail including hardcore bed
- Drawing showing typical detail of incorporating radon sump and radon membrane in the system for radon and soil gasses
- Drawing showing typical detail of incorporating DPC and DPM for ground floor
- Basement drawing details
- Construction details for external envelope demonstrating weathertightness compliance
- CWCT testing (NSAI may ask to witness product/system test)

Weathertightness compliance shall be demonstrated by providing information and details on preventing water penetration through external envelope. Where there is a risk of water penetration, correct detailing shall be adopted for water management. Drawing details of window sills, parapets, doors, joint in external wall façade etc. shall be submitted to NSAI for review. The manufacturer may be required to provide information on history of use of the external façade detailing in Ireland. TGD Part C gives recommendation on double leaf cavity masonry walls. Where the external wall deviates from TGD Part C recommendation, the manufacturer will be required to provide evidence of compliance with weathertightness criteria. This may be achieved by carrying out CWCT testing on façade element.

The CWCT (Centre for Window and Cladding Technology) testing is performed in accordance with CWCT 'Standard for systemised building envelopes'. Testing may be required if the external envelope differs from the traditional method of construction and/or NSAI deems the testing is necessary to determine Irish Building Regulations Part C compliance. CWCT test for building envelope may include airtightness, impact resistance, watertightness, and wind resistance. The

testing shall be carried out on whole wall or module with installed windows, doors and including joints within wall unit.

The supplier shall undertake the vapour permeability and moisture resistance assessment in accordance with I.S. EN 13788. Alternatively testing can be performed in accordance with I.S. EN 12086.

#### 5.4. Part D – Materials and Workmanship

Part D Irish Building Regulations verifies if the system is comprised of proper materials fit for the intended use and for the conditions in which they are to be used. Table 4 shows Part D Irish Building Regulations requirements.

**Table 4 Part D Irish Building Regulations requirements**

Ref	Requirement
<b>Part D Materials and Workmanship</b>	
D1 Materials and workmanship	All works shall be carried out with proper materials and in a workmanlike manner.
D2 Letterplates	A letter plate aperture shall be so positioned at a reasonable height above ground level so as not to endanger the health and safety of persons using such apertures.

'Proper materials' means materials which are fit for use for which they are intended and for the conditions in which they are to be used. 'Proper materials' include:

- Materials that bear a CE marking in accordance with the Construction Product Regulation
- Materials that comply with an appropriate harmonised or European Technical Assessment in accordance with the provisions of the Construction Product Regulation
- Materials that comply with an appropriate Irish Standard or Irish Agrément Certificate or with an alternative national technical specification of any State which is a contracting party to the Agreement on the European Economic Area, which provides in use and equivalent level of safety and suitability (refer to TGD Part D for more information)
- Materials assessed by other alternative methods as per TGD Part D

The manufacturer will be required to provide evidence of compliance with Part D Buildings Regulations. Evidence that may be examined includes:

- List of materials/products and their specifications used in the system
- Technical information on materials/products used in the system (e.g., CE marking, Declaration of Performance, technical brochures, ETA certification, etc.) . Consideration of dangerous substances (within or released from construction materials).
- Testing in accordance with relevant standards and European Assessment Documents (EAD) etc
- Certification/approvals of the system by others
- Ancillary items list (used to assemble and/or install system, they will not be covered by Agrément Certification by NSAI)

### 5.5. Part E – Sound

Part E Irish Building Regulations sets the requirements regarding the resistance to sound. Table 5 shows Part E Irish Building Regulations requirements.

**Table 5 Part E Irish Building Regulations requirements**

Ref	Requirement
<b>Part E Sound</b>	
E1 Sound	Each wall and floor separating a dwelling from (a) another dwelling or dwellings, (b) other parts of the same building, (c) adjoining buildings, shall be designed and constructed in such a way so as to provide reasonable resistance to sound.
E2 Reverberation	The common internal part of a building which provides direct access to a dwelling shall be designed and constructed so as to limit reverberation in the common part to a reasonable level.

The manufacturer will be required to provide evidence of compliance with Part E Buildings Regulations. Evidence that may be examined includes:

- Sound performance levels for separating wall and/or floor
- Drawings showing separating wall and/or floor
- Drawings showing junctions between separating wall and other elements (floors, roof, external and internal walls)
- Penetration details through separating element
- Acoustic testing as per TGD Part E for separating elements (NSAI may ask to witness product/system test)

The product/system shall meet the requirements of Part E Irish Building Regulations regarding resistance to sound. Table 1 in TGD Part E provides the required sound performance level for separating walls and floors. The guidance on construction details to achieve required sound performance level for wall and floor types is included also in TGD Part E. TGD Part E covers walls made of masonry, concrete or timber and floors made of concrete or timber joists. Where a type of wall and/or floor type is not covered by typical details in TGD Part E, then it shall be tested to achieve sound performance level as in accordance with Table 1 TGD Part E. Testing shall be carried out in accordance with I.S. EN ISO 10140.

Detailing of separating walls and/or floor shall be included in the application. In order for the separating element to be fully effective, the manufacturer shall provide correct detailing between the separating element and other elements, such as floors, roofs, external and internal walls. Drawings shall include information on sealants, tapes, cavity closers, etc. to show adequate flanking noise provision. Detailing of service penetrations through separating element shall be also provided.

## 5.6. Part F – Ventilation

Part E Irish Building Regulations sets requirements for providing adequate and effective means of ventilation in buildings and preventing excessive condensation in a roof. Table 6 shows Part E Irish Building Regulations requirements.

**Table 6 Part F Irish Building Regulations requirements**

Ref	Requirement
<b>Part F Ventilation</b>	
F1 Means of Ventilation	Adequate and effective means of ventilation shall be provided for people in buildings. This shall be achieved by: a) limiting the moisture content of the air within the building so that it does not contribute to condensation and mould growth, and b) limiting the concentration of harmful pollutants in the air within the building.
F2 Condensation in roofs	Adequate provision shall be made to prevent excessive condensation in a roof or in a roof void above an insulated ceiling

The manufacturer will be required to provide evidence of compliance with Part F Buildings Regulations. Evidence that may be examined includes:

- Details of the ventilation system
- Design ventilation rate to meet the level of air pollutants.
- Evidence of compliance with Technical Guidance Document Part F – Ventilation

For full requirements on Irish Building Regulations Part F refer to TGD Part F – Ventilation.

## 5.7. Part G – Hygiene

For full requirements on Irish Building Regulations Part G refer to TGD Part G – Hygiene. Irish Building Regulations Part G is outside the scope of this publication.

## 5.8. Part H – Drainage and Waste Water Disposal

For full requirements on Irish Building Regulations Part H refer to TGD Part H – Drainage and Waste Water Disposal. Irish Building Regulations Part H is outside the scope of this publication.

## 5.9. Part J – Heat Producing Appliances

For full requirements on Irish Building Regulations Part J refer to TGD Part J – Heat producing Appliances. Irish Building Regulations

## 5.10. Part K – Stairways, Ladders, Ramp and Guards

For full requirements on Irish Building Regulations Part K refer to TGD Part K – Stairways, Ladders, Ramp and Guards. If the system includes provision of stairways, ladders and/or ramps then they shall be designed to afford a safe passage for the users of a building and provide protection from falling in relation to users and vehicles. Irish Building Regulations Part K is outside the scope of this publication.

### 5.11. Part L – Conservation of Fuel and Energy

Technical Guidance Document to Part L (Conservation of Fuel and Energy – Dwellings) and European Union (Energy Performance of Buildings) (No. 2) Regulations 2019 (EPBD) sets out the requirements regarding conservation of fuel and energy for dwellings and the energy performance of dwellings.

Technical Guidance Document to Part L (Conservation of Fuel and Energy – Buildings other than Dwellings) and European Union (Energy Performance of Buildings Directive (Recast)) Regulations 2010 (EPBD) sets out the requirements regarding conservation of fuel and energy for Buildings other than Dwellings and the energy performance of Buildings other than Dwellings. Irish Building Regulations Irish Building Regulations

**Table 7 Part L Irish Building Regulations requirements**

Ref	Requirement
<b>Part L Conservation of Fuel and Energy</b>	
L1	A building shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of Carbon Dioxide (CO <sub>2</sub> ) emissions associated with this energy use insofar as is reasonably practicable.

The Regulations provide guidance on the design of the buildings to limit the amount of energy required to operate the building and the amount of CO<sub>2</sub> emissions associated with this energy use. The Building Energy Rating (BER) is calculated using Domestic and Non-Domestic Energy Assessment Procedure (DEAP & NEAP) published by Sustainable Energy Authority of Ireland (SEAI).

Guidance is provided on the air tightness performance of the building and on renewable energy sources.

The full requirements of TGD to Part L (Conservation of Fuel and Energy – Dwellings) and TGD to Part L (Conservation of Fuel and Energy - Buildings other than Dwellings) to the Irish Building Regulations can be found on the Department of Housing, Planning and Local Government ([DHPLG](#)) website.

Assessment of MMC under TGD to Part L of the Irish Building Regulations shall include verification of:

- Thermal transmittance (U-values) calculations for all relevant building elements, typically walls, roofs and ground floors.
- Detailed drawings at all key junctions which demonstrate continuity of insulation, which will limit thermal bridging, and continuity of the designed air tightness layer, which will limit heat loss associated with air leakage.
- A thermal modelling assessment of all key junctions by either an approved NSAI thermal modeller or by comparison to the Accredited Construction Details (ACD's) if applicable. The thermal modelling assessment shall demonstrate that internal surface temperatures ( $f_{Rsi}$ ) remain adequately high to mitigate the risk of internal surface condensation as described in TGD to Part L Appendix D.

- A submission to demonstrate that interstitial condensation of a construction detail shall not present a risk.
- A submission to demonstrate a calculated solar gain rate for summer period overheating calculation purposes. This may involve calculating the thermal mass within the thermal envelope.

Table 1 in TGD to Part L (Dwellings and Buildings other than Dwelling) shows maximum elemental U-values for typical building elements. Thermal transmittance (U-values) calculations shall be carried out as per Appendix A to TGD to Part L (Dwellings and Buildings other than Dwelling) and provided for NSAI review.

Appendix A to both TGD to Part L provides examples, references and guidance on elemental U-values calculation for ground floor, basements, windows, doors, curtain walling, steel frame construction, metal clad construction, walls and roofs.

Appendix D to both TGD to Part L provides guidance on the assessment of surface condensation and linear thermal transmittance (thermal bridging). Thermal modelling shall be carried out as described in I.S. EN ISO 10211 and with due regard for the guidance given in BR 497 *Conventions for calculating linear thermal transmittance and temperature factors*. Surface temperature shall be assessed as described in I.S. EN ISO 13788 and with due regard for the guidance given in BRE IP 1/06: *Assessing the effects of thermal bridging at junctions and around openings*.

$\Psi$ -values along with flanking elemental U-value must be provided for all key junctions which can be used to calculate the total linear transmission heat loss coefficient due to thermal bridging ( $H_{TB}$ ) also known as the  $\gamma$ -value. The  $\gamma$ -value is the single digit entry which is entered into Domestic and Non-Domestic Energy Assessment Procedure (DEAP & NEAP) which takes account for all thermal bridging.

Both TGD's to Part L provide guidance on the allowable air permeability index of buildings.

The manufacturer may provide airtightness and thermal transmittance test results from projects completed on site. This however does not relieve the manufacturer from providing evidence as described in this section.

### **5.12. Part M – Access and Use**

For full requirements on Irish Building Regulations Part M refer to TGD Part M – Access and Use. Irish Building Regulations.

## **6. Additional Regulations Compliance**

Additional technical requirements are listed in this section.

It is recognised that this document is for guidance only and depending on the system additional assessment scope and technical criteria may be determined by NSAI. Full scope and assessment criteria will be determined by NSAI in Technical Assessment Specification (see section 4) on case-by-case basis.

The standards, codes of practice, regulations referenced in this document may be amended or additional standards, requirements added in the future. Manufacturers shall ensure that they use the latest standards issue with all amendments. In case of new standard or regulation published, the manufacturer will need to provide evidence of compliance with that standard or regulation.

Where the manufacturer cannot satisfy the requirements in Technical Guidance Documents, NSAI may offer an alternative approach in assessing Irish Building Regulations requirements. This

however does not relieve the manufacturer from providing evidence of compliance with Irish Building Regulations.

### **6.1. Durability and Maintenance**

The system shall be designed to ensure that its components and materials have an ability to perform its intended function over a design period of time.

The durability of the building system shall be assessed to have a design life of at least 60 years for structural elements in dwellings in accordance with BS 7543. Individual components not forming part of the structure may have a lesser durability, but generally not less than 25 years.

As the durability of the system is dependent on its maintenance and repair, the manufacturer shall address it in the relevant manuals. Full information on maintenance and repair shall be provided including frequency of maintenance, repair and maintenance products (and their specification), their application, etc.

Assessment of durability and maintenance may include a verification of:

- Compliance of system with relevant Irish Standards, Eurocodes or equivalent European Technical Specification
- History of use of system and its components, including site visits in the country of manufacture or wherever the oldest buildings exist
- Repair and maintenance manual
- Practicability of repair, replacement and adaptability
- Durability testing results for components (including durability of building system overt marking)
- Resistance to accidental damage, acts of vandalism or burglary

### **6.2. External Envelope Sound Performance**

In addition to section 5.1.5 on sound performance on separating building elements, the following requirements are required when the product/system includes full external envelope elements (such as roofing and/or external façade/finishes):

- Airborne sound insulation verification for external façade and roof system
- Rain noise verification for all roof systems
- Impact sound insulation testing for accessible roof systems (such as flat roofs or roof terraces)

Airborne sound insulation of external façade and roof system can be verified by testing or calculations. Calculations shall be in accordance with I.S. EN ISO 12354-3. When testing is performed to verify airborne sound insulation the testing guidance included in I.S. EN ISO 10140-1 shall be used. Declared airborne sound characteristic shall be as per BPS 7014 section 3.5.

Impact sound insulation for accessible roof system shall be tested as per BPS 7014. The rain noise for all roof system can be verified by calculations as per I.S. EN ISO 10140-1.



### **6.3. Sustainable Use of Natural Resources**

In accordance with Construction Product Regulation, the construction works must be designed, built and demolished in such a way that the use of natural resources are sustainable. Verification of this criteria may include:

- Reuse and recyclability of the materials and parts of the system after demolition
- Durability of the system
- Use of environmentally compatible raw and secondary materials in the system

NSAI may ask the manufacturer to provide information on the sustainable use of natural resources. Evidence that may be examined includes:

- Environmental Product Declaration (EPD)
- Responsible sourcing of materials certification scheme
- Life Cycle Costing (LCC) assessment (building system only)
- Declaration of recycled content (ISO 14021)
- Durability assessment
- BREEAM, LEED, DGNB certification of project (scoring of building system only)
- Ecolabel

### **6.4. Transportation, Storage, Handling, and Installation**

The system shall be designed considering transportation, storage, handling, and installation aspects.

Transportation, handling, and storage shall not cause any damage or impair the performance of the system and/or ingress of moisture. Storage shall consider weather protection of the system components. Clear guidance on handling, transportation, storage lifting activities shall be included in the System Manual.

Installation of the system shall be communicated in the Installation Manual including installation drawing details. The manufacturer shall identify the responsibility of system installation, any relevant competency and training requirements for installers.

Risk Assessment and Inspection Plan for all works shall be provided by the manufacturer, including any checklists used by the manufacturer. The condition and workmanship shall be checked at all stages. Prior to installation, system quality check list shall be completed. After system installation Preliminary Inspection Plan shall be followed to verify the quality and condition of the system and its installation. In case of unsatisfactory system installation or condition, manufacturer shall provide clear guidance on repair and replacement methodology.

NSAI will ask the manufacturer to provide a System Manual including information on:

- Transportation of the system to site
- Storage and handling of the building hit system and its components
- Installation and lifting procedure (including installation drawing details)
- Risk Assessment for all operations
- Preliminary Inspection Plan and quality check list
- Repair/replacement methodology
- Client/end user file/manual

The information listed in this section should form part of the system specification and be clearly communicated in relevant manuals. NSAI will review manufacturer's manuals as well as their implementation in the factory and/or site.



## 7. On-site Evaluation of As-constructed Product/System

NSAI will request to inspect an as constructed MMC system. The site visit is to verify the system in terms of quality and compliance as well practicability & buildability. NSAI will arrange a site inspection with the manufacturer and agree its time and date. If the system has not been yet used on the construction site, then NSAI may ask the manufacturer to build a 'mock-up' unit to satisfy this requirement. On-site evaluation of as constructed system may include:

- Inspection of at least one live installation of the system
- Inspection to existing installations of the system to assess the history of use of the system
- Inspection of a 'mock-up' unit

## 8. Quality Management System Verification

Further to technical requirements set in previous sections of this publications, NSAI will verify the manufacturer's quality management system. Quality management system is an approach to directing, controlling and coordinating quality in manufacturer's organization.

The general requirements of quality management are included in I.S. EN ISO 9001. Further quality management systems requirements may be included in product specific Irish Standards and Eurocodes. Buildings kit system suppliers using:

- structural steel and aluminium shall meet the requirements of I.S. EN 1090
- structural concrete shall meet the requirements of I.S. EN 206-1
- structural timber shall meet the requirements of relevant Irish standards and Eurocodes depending on the product type (e.g., I.S. EN 14081, I.S. 127, I.S. 193, I.S. EN 14250)

NSAI provides timber and ready-mix concrete certification schemes ([link](#)). Participation in certification scheme is not mandatory for Agrément Certification applicants. Where MMC systems and its components is covered by harmonised European standard, Irish standard or European Technical Assessment, the manufacturer shall provide the evidence that their product complies with it.

Technical reviews shall be carried out as each stage of the production and construction stage. Critical check points shall be carried out:

- for incoming materials
- at production stage
- at release of product
- at erection stage
- during and after installation
- at completion stage

The manufacturer shall provide information on technical review procedure and evidence of adherence to it.

Non-exhaustive list of documents to show compliance with this section is shown below.

- Information and or/certification of manufacturer's quality system (e.g., ISO 9001 registered quality management system)
- Product certification (e.g., I.S. EN 1090, I.S. EN 206-1)
- Design procedure and review process (with records of compliance)
- Customer's complaints process
- Approved manufacturers process
- Inspection and testing process
- List of essential equipment for production and its calibration

- Control of non-conforming product procedure
- Product ID and traceability process
- Installation manual with full installation details
- Records of site inspections
- Document procedure detailing recruitment, selection, interview and appointment criteria for employees
- Employee competency
- Procedure for evaluating competence and how it is recorded
- Induction training manual
- Competence of subcontractors and how it is assessed
- Information on technical support to installers, supervisors, etc.
- Organisational chart
- Design risk assessment
- Factory unit checklist
- Technical review procedure
- Use of Building information modelling/management (BIM) or similar

Draft Technical Assessment Specification for MMC' is included in Appendix C provides more guidance notes on quality management system verification. NSAI will seek relevant manuals and documents as mentioned above as well as evidence of implementing them on site and in the factory.

## **9. Factory Production Inspection**

Part of the assessment of the application for Agrément Certification will include a factory production audit. The audit aim is to assess the manufacturer's quality system, workplace and capabilities in accordance with normative requirements. Product specific criteria may be included in the relevant standards (e.g. I.S. EN 1090, I.S. EN 206-1, refer also to 9).

Items to be examined include:

- Manufacturing facility, its suitability to produce the product/system, quality of management system in the factory
- Records and evidence of adherence to company's policies (quality, design process, production process, tracing, records of testing and inspections, etc.)

See Draft Technical Assessment Specification for MMC' is included in Appendix C for guidance on factory production audit and key items to consider prior to NSAI audit.

## **10. Competency**

Applicants/certificate holders must ensure that personnel responsible for key work activities are suitably qualified and experienced to carry out those duties. For example, where design is a key element of the system, there should be a documented designer approval process which should include the qualification and experience requirements for the person responsible for approving completed designs and changes to designs. As part of the initial assessment and surveillance audits, NSAI will review the applicant's/certificate holder's documented procedure for evaluating and determining competency requirements, including training plans and records, and how competency is determined for subcontract staff where relevant.

### **11. Results of Assessment and Publication of the Certificate**

Subject to the results of the assessment, NSAI will draft the Agrément Certificate for final review and share with manufacturer. All images shown in the certificate shall be provided by the manufacturer. 2D images are acceptable provided they present information better than 3D images. 3D images are in general preferable to include in the certificate. Once the Agrément Certificate is signed off by the manufacturer and approved by NSAI, the NSAI publish it on the website. All NSAI Agrément Certificates can be found on NSAI website.

### **12. Maintaining Certification**

In order to maintain the Certification and ensure continued adherence of the system to that certified, NSAI have implemented a surveillance audit programme.

In addition, Agrément certificates have a validity of five years from date of issue or date of latest revision. Before the certificate expires, it will be reviewed to ensure the product/system meets all current regulations and that the processes, specification are in accordance with NSAI requirements.

Responsibilities for both the Agrément certificate holder and NSAI to support and maintain the certification process are outlined below.

### **13. Certificate Holder Responsibilities**

Certificate holders shall:

- Maintain an effective quality management system which is able to ensure quality and consistency of products and services;
- Prompt payment of annual registration fees;
- Be pro-active in arranging surveillance audits and 5 year reassessments;
- Close out any non-conformances raised by NSAI within agreed time scales;
- Notify NSAI of the following:
  - Any changes to the product specification including manufacture, delivery and installation instructions
  - Changes to ownership and/or key personnel

### **14. NSAI Responsibilities**

NSAI shall:

- Ensure that the assessment/surveillance/5 year reassessment is undertaken by personnel who are adequately trained and experienced in the technology to enable them to assess compliance;
- Ensure that surveillance audits and 5 year reassessments are conducted within the relevant time period;
- Treat all information in respect of the certificate and certificate holder are treated in strictest confidence;
- Maintain an up-to-date list of Agrément certificates on the NSAI website [www.nsai.ie](http://www.nsai.ie).



**15. Have any questions?**

Feel free to contact NSAI Agrément at the details below:

Patricia Walsh

T: +353 1 807 3892

[patricia.walsh@nsai.ie](mailto:patricia.walsh@nsai.ie)

## Appendix A Guidance on filling Agrément Certification application form

### APPLICATION FORM FOR AGRÉMENT CERTIFICATION

Name of Product

- Name of the product that will be on the certificate

Detailed description of proposed use

- Detailed description
- Scope of use covered by the assessment (commercial, residential etc.). Refer also to Table 0.1. TGD Part B, Volume 1
- Maximum building height and/or number of storeys
- How the product/system is manufactured?
- How the product system is to be installed?
- Is the product already in use and in which countries (if applicable)?

Name

Address Line 1

Address Line 2

City

Eircode

Telephone

Fax

Email Address

- Company details

Registered Office(if different from above)

Country/countries of manufacture and number of manufacturing addresses in each

- Provide all locations at which product/system or its critical components are manufactured

Product Range e.g dimensions, volume, weight per unit and colors

- Provide information on sizes, finishes, colours, materials in which the product/system is supplied

Full details of ancillary items (if applicable) e.g. nails, special tools; including description of each component proprietary names.

- Provide details of ancillary items that are used to assemble the product/system or during its installation

VAT Code

Please upload any documentation relevant to your application, such as ETA certificates or other certification, DOPs (Declarations of Performance), test reports etc.

Choose File



**PAY NOW**

- Attach (if applicable):
- Technical details, construction drawings
- Technical marketing literature
- CE marking
- Declaration of Performance (relating to system and products used in the system)
- Factory Production Certificate
- ETA certification
- Test reports (fire, thermal, acoustic, durability, etc.)
- Other approvals (e.g. BBA Certificate)



**Appendix B MMC checklist form**

**System Owner details**

**Date:** year/month/day

<b>File No</b> (for internal use)	
<b>Manufacturer</b> (Registered company name)	
<b>System or Product Name</b>	
<b>Contact name and title</b>	
<b>Telephone</b>	
<b>Email</b>	
<b>Address where manufactured</b>	

<b>System Details</b>		<b>Proposed system</b>
MMC category (please select)	<ul style="list-style-type: none"> <li>• Volumetric (MHCLG Category 1 – 3D primary structural systems)</li> <li>• Panelised (MHCLG Category 2 – 2D primary structural systems)</li> <li>• Products (MHCLG Category 3 – non-systemised primary structure)</li> <li>• Site-based (MHCLG Category 6 – Traditional building product allowing labour reduction/productivity improvements)</li> </ul>	
Primary construction material		
Secondary / other material		
Building typology, intended use	<ul style="list-style-type: none"> <li>• Housing (Detached, terrace, semi)</li> <li>• Low-rise apartments (&lt;5 storeys)</li> <li>• Mid-rise apartments (6-9 storeys)</li> <li>• High-rise apartments (10 storeys and above)</li> <li>• Apartments only or including common areas?</li> <li>• Other (basements, garages, room-in-roof)</li> </ul>	
Is structural stability for the complete building provided by this system?		Y/N
Structural elements included as part of the system and produced offsite	Ground floor cassette	Y/N
	External wall panels	Y/N
	Internal wall panels	Y/N
	Party wall panels	Y/N
	Intermediate floor cassettes	Y/N



	Roof	Y/N
Limitations on use of system	No. of storeys / maximum height of building	
	Building Purpose Groups (TGD B)	
	Wind-driven rain exposure zone	
	Wind speed/wind pressure	
	Steps and staggers	
	Plan area / apartment configuration	
	Ground conditions	
	Other	

**Components** (indicate in the correct column, any known named materials or products which are included in each component; otherwise TBC)

<b>Component</b>	<b>Standard Components of the system</b>	<b>Non-standard components of the system<sup>1</sup></b>	<b>Ancillary components supplied but installed on site</b>	<b>Elements of the building completed on site</b>
Foundation & Substructure				
External walls structure				
External walls cladding				
Roof structure				

<sup>1</sup> those that vary for individual projects and are assembled offsite



Roof covering				
Thermal insulation				
Breather membrane				
VCL				
Sheathing board or bracing				
Internal linings				
Cavity barriers				
Acoustic insulation				
Windows/doors				
Balconies				
Dormers/porches/canopies				
Ground floor				
Intermediate floors				
Floor finishes				
Services				



**Other information**

Add any other important information e.g.

Responsibility for design and coordination of the system	
Third party certification of the system	
QMS standard for system production	
Number of standard house types (where applicable)	



**Appendix C Draft Technical Assessment Specification for MMC**

**1. General**

<b>TAS No.:</b>	
<b>File No.:</b>	
<b>IAB Cert No.:</b>	
<b>Date:</b>	
<b>Revision:</b>	
<b>Product Name:</b>	
<b>Product Type:</b>	<i>Building kit system</i>
<b>Intended Use:</b>	
<b>Manufacturer:</b>	
<b>Distributor:</b>	<i>If different from Manufacturer</i>
<b>System Designed By:</b>	<i>Who is responsible for the structural design of the system</i>
<b>Installation By:</b>	<i>e.g. trained installers</i>
<b>Exclusions:</b>	<i>e.g. external finish, windows, doors, etc. may be project dependent</i>



**2. Product range**

Product description:	
Structure:	
3D Module (modular systems only)	
Multiple modules (modular systems only)	
Foundations:	
Rising walls:	
Ground Floor:	
External walls:	
Internal walls:	
Compartment walls:	
Floors:	
Roof:	
Stairs:	
Chimneys:	
External and internal finishes:	
Windows and doors:	

Ancillary elements:	<i>e.g. nails, special tools; including description of each component proprietary names. Where manufactured and by whom. Compliance with Irish Standards/European Standards. Whether covered by an Agrément Certificate.</i>
Transportation:	<i>Who is responsible?</i>
Handling and storage:	<i>Who is responsible?</i>
Installation:	<i>Who is responsible?</i>

### 3. Compliance with Building Regulations

Ref	Requirement	Client Comment	Assessor Comment	Closed
<b>Part A Structure</b>				
A1 Loading	<p><i>Detailing, design and construction to show adequate strength and stability. Provide structural information including:</i></p> <ul style="list-style-type: none"> <li>• <i>Structural calculations</i></li> <li>• <i>Information on competency of personnel (Chartered Engineer status)</i></li> <li>• <i>Structural drawings and details</i></li> <li>• <i>Structural testing of product/system</i></li> </ul>			
A2 Ground Movement	<i>Building shall be designed and constructed, with due regard to the theory and practice of structural engineering, so as to ensure that movements of the subsoil caused by subsidence, swelling, shrinkage or</i>			

	<p><i>freezing will not impair the stability of any part of the building.</i></p> <ul style="list-style-type: none"> <li>• <i>Does the certificate cover ground movement? Who is responsible for geotechnical assessment of the ground?</i></li> </ul>			
<b>Part B Fire Safety</b>				
B1, B6 Means of Escape in Case of Fire	<ul style="list-style-type: none"> <li>• <i>Does the certificate address escape routes, alarms, electrical installations, mechanical equipment?</i></li> </ul>			
B2 & B7 Internal Fire Spread (Linings)	<p><i>Check fire classification of linings – Class 0 may be used in all-purpose groups without restriction</i></p>			
B3 & B8 Internal Fire Spread (Structure)	<p><i>Design and construction so that stability is maintained for reasonable period in case of fire.</i></p> <ul style="list-style-type: none"> <li>• <i>Provide fire stopping details (e.g. party wall and at roof junction)</i></li> <li>• <i>Provide fire testing results in accordance with EN1365</i></li> </ul>			
B4 & B9 External Fire Spread	<p><i>Check fire classification for external surface/cladding. Determine purpose group building heights</i></p> <ul style="list-style-type: none"> <li>• <i>Provide fire testing results in accordance with EN1365</i></li> </ul>			

	<ul style="list-style-type: none"> <li>• Fire barriers at party walls and compartment floors.</li> <li>• Render manufacturer identified, cert provided showing fire classification.</li> </ul>			
<b>Part C Site Preparation and Resistance to Moisture</b>				
C3 Dangerous Substances	<p>Ensure design permits for incorporation of radon sump and radon membrane</p> <ul style="list-style-type: none"> <li>• Provide typical detail at ground floor</li> <li>• Guidance on installation of radon membrane to be in Installation Manual.</li> </ul>			
C4 Resistance to Weather and Ground Moisture	<p>Check design for provision of DPCs and DPMs for ground floors, and weather resistance of roofs and external walls for different exposure zones</p> <ul style="list-style-type: none"> <li>• Provide typical detail at the windows and doors</li> <li>• Guidance on installation of DPC and DPM to be in Installation Manual</li> <li>• Provide CWCT test results</li> </ul>			
<b>Part D Materials and Workmanship</b>				
D3 Proper Materials	<p>Check system is comprised of proper materials fit for intended use (CE marking etc.)</p>			



	<ul style="list-style-type: none"> <li>• Provide certification, DOPs, technical documentation for all system components</li> </ul>			
D1 Materials and Workmanship	Works carried out using proper materials in workmanlike manner			
<b>Part E Sound</b>				
E1 Airborne Sound (Walls)	<p>Wall design and construction to meet Table 1 of TGD E</p> <ul style="list-style-type: none"> <li>• Provide acoustic test results</li> </ul>			
E2 & E3 Airborne and Impact Sound (Floors)	<p>Floor design and construction to meet Table 1 of TGD E</p> <ul style="list-style-type: none"> <li>• Provide acoustic test results</li> </ul>			
<b>Part F Ventilation</b>				
F1(a) Means of Ventilation	<p>Adequate provision for ventilation. Wall and roof design and construction to comply with BS 5250</p> <ul style="list-style-type: none"> <li>• Part of the system?</li> <li>• Provide detail of sealing at ventilation ducts</li> </ul>			
F1(b) Limiting the Concentration of Harmful	Check design ventilation rate to meet level of air pollutants (refer out to a site-specific design)			

Pollutants in the Air Within the Building				
F2 Condensation in Roofs	<i>Check ventilation design for roofs</i>			
<b>Part H Drainage and Waste Water Disposal</b>				
H1 Drainage Systems	<ul style="list-style-type: none"> <li><i>Part of the system?</i></li> </ul>			
<b>Part J Heat Producing Appliances</b>				
J3 Protection of Building	<i>Check specified separation distances from wall lining insulation</i> <ul style="list-style-type: none"> <li><i>Part of the system?</i></li> </ul>			
<b>Part L Conservation of Fuel and Energy</b>				
L1 Conservation of Fuel and Energy	<i>Check range of elemental U-values for the system. Thermal bridging to be limited at bridged junctions. Can be ACDs or NSAI approved thermal modeller.</i> <i>Safeguard against the risk of surface and interstitial condensation.</i> <i>Airtightness, demonstrate how the system can limit heat loss through undersigned ventilation (provide details</i>			

	<i>identifying blue line of airtight membrane)</i>			
<b>Part M Access for People with Disabilities</b>				
M1 Access and Use	<ul style="list-style-type: none"> <li><i>Can buildings be designed to meet these requirements?</i></li> </ul>			
M2 Sanitary Conveniences	<ul style="list-style-type: none"> <li><i>Can buildings be designed to meet these requirements?</i></li> </ul> 22.			
<b>Part K Stairways, Ladders, Ramps and Guards</b>				
K1 Stairways, ladders and ramps	<ul style="list-style-type: none"> <li><i>Can buildings be designed to meet these requirements?</i></li> </ul>	24.		
K2 Protection from falling	<ul style="list-style-type: none"> <li><i>Can buildings be designed to meet these requirements?</i></li> </ul>	26.	27.	

#### 4. Specification for Materials

Item	Designed/Manufactured to	Clients Comment	Assessor Comment	Closed
<i>List system components here</i>	<i>Check code compliance with ETAs, European standards.</i>			

**5. Assessment**

Item	Requirement	Date Received	Assessor Comment	Closed
Manufacturing Audit	Review of company quality system			
	Approved manufacturers			
	Receiving inspection and testing			
	Ensure DoP's on file for purchased construction products, where relevant			
	In-process inspection and testing			
	Final inspection and testing			
	Calibration			
	Control of non-conforming product			
	Product ID and traceability			
	Design process			
	Customer complaints process			
	Full set of installation details to include <ul style="list-style-type: none"> <li>• Typical connection details between panels</li> <li>• Typical details of interface with doors, windows, floor, chimneys</li> <li>• Accommodation of services</li> <li>• Access to future maintenance of services</li> <li>• Fire stopping and cavity closers</li> <li>• Bridged junctions</li> <li>• Acoustic performance</li> </ul>			

	<ul style="list-style-type: none"> <li>• Brick/cladding finishes</li> </ul>			
	<p>Records of site inspections</p> <ul style="list-style-type: none"> <li>• Frequency of inspections</li> <li>• What was checked</li> <li>• How were issues raised satisfactorily resolved?</li> <li>• Sign-off</li> </ul>			
Manufacture and site assembly	Full set of installation details including sections through all junctions (Sill, head, jamb, floor/wall junction, party wall, ground floor/external wall, eaves, corner interior/exterior, etc). For modular systems provide typical connection details between units.		Full set of "Installation details" must address requirements of thermal insulation and airtightness section below	
Structural Stability	Structural design EN 1090 - project review		Provide one sample design	
Structural Fire Safety	<p>Fire resistance of structure</p> <p>Provide fire test reports for External &amp; Internal Load Bearing Walls to I.S. EN 1365-1</p> <p>Separating Walls to I.S. EN 1365-1</p> <p>Non-Load Bearing Walls to I.S. EN 1364-1</p>			

	Compartment floors: Loaded Floors Joist, Truss or Composite Metal Deck to I.S. EN 1365-2:2014			
	<p>Surface spread of flame</p> <p><i>An external cladding of brick/block has a designated Class 0 National Rating surface spread of flame and a European class B-s3, d2</i></p> <p><i>Internal plasterboard before decoration has a designated Class 0 National Rating and a European class B-s3, d2</i></p> <p><i>Slates/Tile have a designated AA National Rating and a European class B<sub>roof</sub>(t4)</i></p>			
	Cavity barriers and fire stops to meet the requirements of TGD to Part B			
	Provide details of the junction of separating wall with roof for both residential and multi occupancy dwellings.			
Thermal Insulation	U-values - walls, roof, floor			
	Specification, including CE marking DoP, for insulation			

	DoP's and datasheets for thermal conductivity of all materials used in U-value calculations			
	Thermal bridging submission to demonstrate no risk of surface condensation and must relate to "Installation details"			
	Thermal project review			
	Thermal bridging submission if wishing to provide superior Psi values			
Airtightness	Identify the line of the air barrier on the "Installation details". This must include call outs on all airtight membranes, AVCL's, tapes and sealants used.			
Ventilation	Demonstrate that the system can provide adequate provision for both natural and mechanical ventilation strategies to satisfy the requirements of TGD to Part F			
Condensation	Interstitial condensation in walls			
	Interstitial condensation in floors			
	Mould growth and surface condensation		This will be assessed under the Thermal Insulation section above by the thermal modelling.	
	Ventilation		This will be covered by the Ventilation section above	
Sound	Party wall		Fire table with sound column	

	Compartment floors			
	On-site testing			
Weathertightness and damp proofing	Damp proof course (DPC)			
	DPC under sole plate			
	DPM			
	External render			
	Windows and doors			
Durability	Design life of system (60 years?)			
	Design life of render			
Maintenance	Maintenance programme			
	Level of inspection			
	Records of inspections			
	Health & Safety file to client			
Competencies	Documented procedure detailing recruitment, selection, interview and appointment criteria			
	Detailed job descriptions with responsibilities and minimum experience and qualifications			
	Documented procedure for evaluating competence			
	How are competencies assessed and reviewed on ongoing basis?			
	What evidence is recorded to demonstrate individuals are competent to perform the work?			
	Induction training			



	Training programme to close competency gaps – installers, site supervisors, design team etc.			
	Designer approval process			
	Review of completed designs by nominated person – Formal qualifications should be Chartered Engineer as minimum			
	Technical support to installers, supervisors etc.			
	Where subcontractors are used, how is their competence determined initially and assessed on an ongoing basis?			
	Names of personnel responsible for sign-off: <ul style="list-style-type: none"> <li>• Design review</li> <li>• Acceptance of incoming raw materials</li> <li>• In-process inspection</li> <li>• Final inspection</li> <li>• Erection and supervision</li> </ul>			



**6. Meetings to date**

Date	Present	Summary

**7. Document Submission Index**

	Document Name	Date Issued to NSAI	Comments
1			

2			
3			
4			
5			
6			

### Sample Audit Sheet

#### Key Personnel

Role	Name
Overall responsibility for the factory production control (FPC) system and its implementation	
Responsibility for design	
Responsibility for design review	
Responsibility for component specification	
Responsibility for release to manufacture of drawings	
Responsibility for manufacturing inspections	
Responsibility for final inspection prior to loading/transportation	
Responsibility for installation	

Questions to be considered	Comments
<b>General</b>	
Does company already have an ISO 9001 registered quality management system or certified FPC system? If YES, ensure certificate is still valid.	
Has FPC system been documented? If YES, what is latest revision?	
Evidence that the results of inspections, tests and assessments are recorded	

Evidence that the action to be taken if control values or criteria are not met is recorded?	
How long are these records retained, and is this specified in the FPC manual?	
Where have the responsibilities, authorities and relationships between personnel been defined?	
What qualifications and training are required for personnel defined and are they documented in the FPC manual?	
Have the key inspection intervals been defined, with clear responsibilities for sign-off at each stage?	
List of essential equipment used for production	
How regularly is the equipment maintained, calibrated, regularly inspected?	
What procedures are used for checking calculations, and the individuals responsible for the design?	
What resources and software calculation, design, verification packages are used as part of the design process?	
How is constituent product used in the manufacturing process reviewed and is there a written procedure for this?	
What is the procedure for checking and recording that constituent products conform to the specification and that they are correctly used in component manufacture?	
Who is responsible for the preparation of the component specification is: the manufacturer or the client, or do both contribute to its preparation?	
Written inspection and test plan for checking and recording that manufactured components conform to their component specification	
What procedures have been established to ensure that the declared values and classes of all of the characteristics are maintained?	
How are non-conforming products dealt with and is this documented in a procedure?	
How are such events recorded and are these records kept for the period defined in the written procedures?	



Is repair/rectification conducted on non-conforming products, and if so, are descriptions of appropriate procedures available at all workstations where this is performed?	
Evidence that the tasks and responsibilities related to the control of materials, structural fasteners etc. are specified and implemented in production, i.e identification, storage and handling?	
What sub-contractor(s) of services or activities are used, if any, as part of the manufacturing process?	
If YES, how is it ensured that the sub-contractor(s) can comply with the quality requirements as specified?	
Evidence of sign-offs at each of the key stages: <ul style="list-style-type: none"><li>• Design</li><li>• Design review</li><li>• Component specification</li><li>• Release of drawings to manufacture</li><li>• Inspection of incoming goods</li><li>• In-process inspections</li><li>• Final inspection of finished product</li><li>• Erection plan</li><li>• Erection supervision</li></ul>	