



# Design guide to separating distances during construction

For timber frame buildings above 600m<sup>2</sup> total floor area

## Product Paper 4

Product assemblies to achieve different category levels of timber frame

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# 1 Introduction

This document is to be read in conjunction with the STA guidance Design guide to separating distances during construction, parts 1, 2 and 3.

This product paper is for the timber frame supply chain. It provides a set of wall and floor assemblies which, when combined, will provide the performance needed to achieve a specific category of timber frame e.g. Category A, B1, B2, B3 or C (C1 and C2). The definition of assembly is a product that is delivered out of the factory from the manufacturer without additional works on site or in the case of floors delivered as loose elements for assembly on site before the next wall level is erected.

The combination of floor and wall assemblies allows the timber frame supply chain to respond to client design requirements on the category of timber frame needed to fulfil the off the site risk assessment appraisal for the project.

The STA Guidance document 'Design guide to separating distances during construction - For timber buildings above 600m<sup>2</sup> total floor area, parts 1,2 and 3', provides the client and project designers with the tools to select a category of timber frame suitable for the separation distance being considered. The procurement of timber frame will involve timber frame companies providing a Category A, B1, B2, B3 or C1, C2 frame. The STA guidance provides generic advice on the timber frame assembly to achieve a specific category of timber frame (Figure 3.2 in the guidance). This product paper provides the options for walls and floors to achieve the category required.

It is recommended that the timber frame design team shall provide confirmation, as part of their CDM regulation duties, that the appropriate assembly in their design submission complies with the category of timber frame required in the procurement documents, and that this is carried through to production drawings. The appendix in this paper provides a proforma for self-certification on the assembly selection process and Figure 4.1 shows a diagrammatic flow chart on the steps in the process from concept to the project starting on site.

In using this paper the timber frame designers must be familiar with the STA guidance parts 1 to 3 and the products listed on the STA web site that have been reviewed to comply with the fire testing and performance required for products in a timber frame assembly.

## Background

The information provided in this paper is the deliverable from the research undertaken by the STA and the supply chain industry to find a flexible approach to different combinations of materials and systems to achieve categories of timber frame. The research involved an extensive test programme and review overseen by HSL, FERMI and Milner Associates. The programme and as delivered outputs have been presented to the timber frame working group that includes HSE, CFOA, FPA, FBU, ABI and the STA. Further consultation has been undertaken across the timber frame industry sectors.

Testing of timber frame build methods, (i.e. wall and floor panels) has demonstrated that radiant heat and growth of fire can be influenced by the materials which make up the structure, or elements that form part of the as delivered timber frame assembly. The STA, in conjunction with members of the timber frame working group have developed a test method that can be used to categorise different types of timber frame construction.

Supporting Technical Papers 1 to 3 provide information on the tests, methodology and frame categories (available from the STA web site).

The research undertaken has enabled each wall and floor assembly to be awarded points which when the floor and wall points are added together correspond to a category.

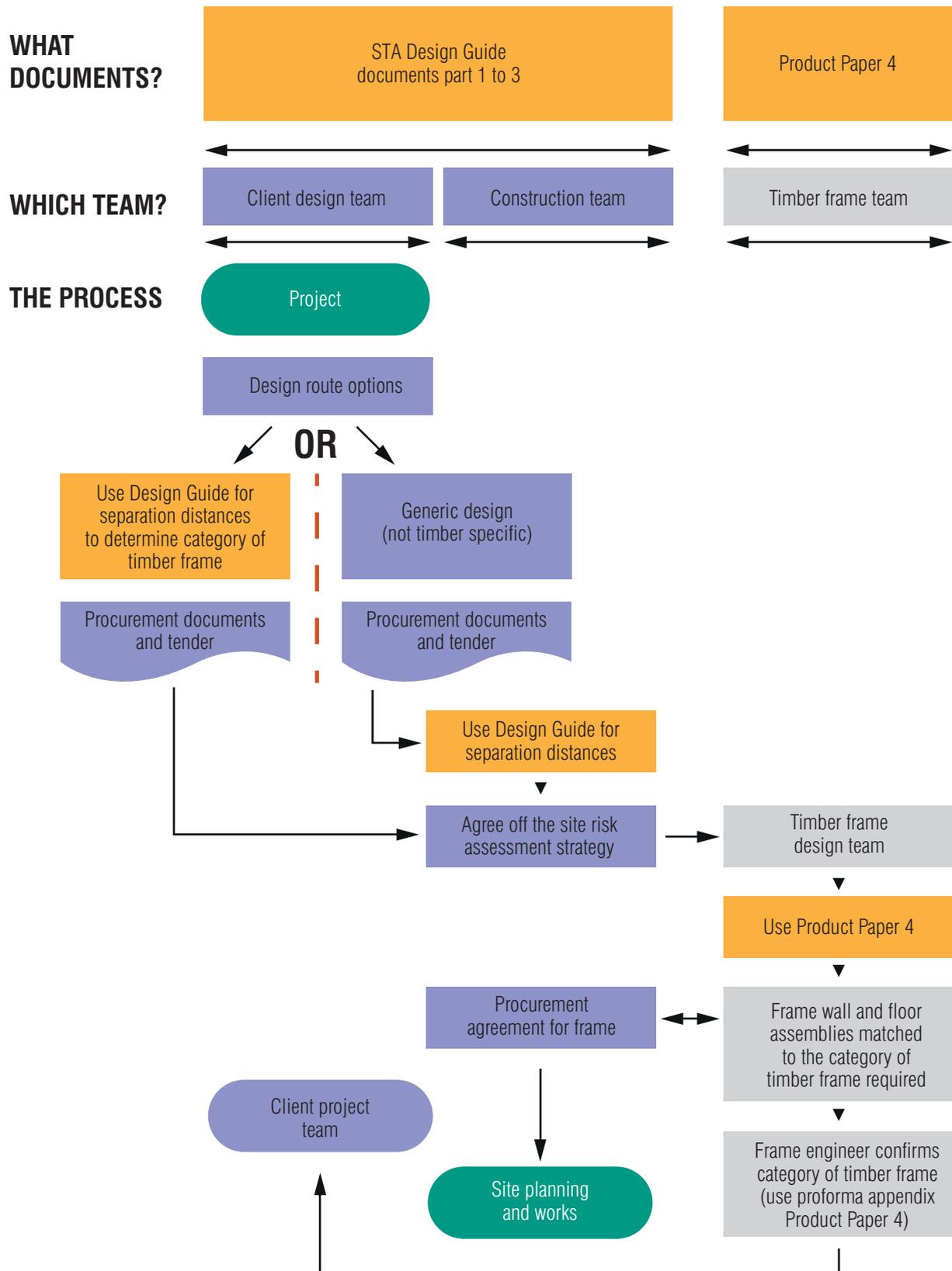
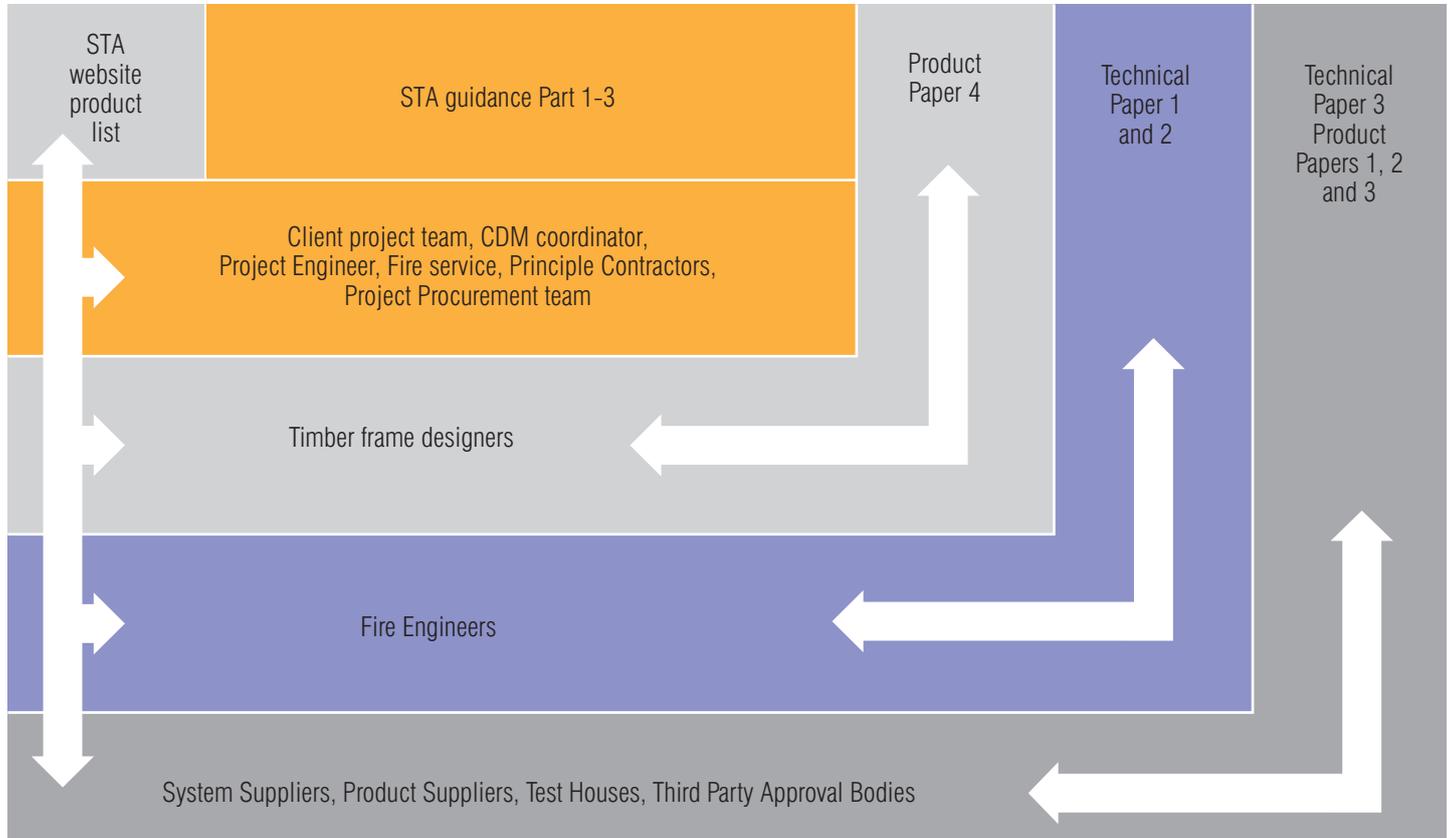


Figure 4.1 Process understanding of where the Product Paper 4 fits into selection of category of timber frame

**Level of guidance and technical papers - target users**



**Table 4.2 Diagrammatic explanation of where STA Guidance and supporting papers are used.**



## 2 Timber frame build assemblies that comply with each type of category to reduce separating distances

Once a category of timber frame has been determined, in accordance with the STA guidance document 'Design guide, parts 1, 2 and 3', then this paper can be used to provide solutions to match the required category.

Timber frame designers can select appropriate wall and floor assemblies to match the total points needed for the category of timber frame they are to comply with. Please note that the points do not hold any significance other than providing a means to differentiate performance needed to match the category of timber frame.

The timber frame designer will, through the project design quality documents and processes, confirm that the category of timber frame being proposed is at the required level for the project as requested in the procurement documents. The use of the proforma self-certification document in the appendix can be used to confirm to the project team that the correct product assembly has been selected from this paper.

The table below provides the minimum points<sup>2</sup> needed to be achieved for each category.

Category	Minimum total points for wall + floor assembly	Minimum points for the floor assembly alone <sup>1</sup>
A	<3	
B1	3	1
B2	5	1
B3	6	1
C1/2	7	2

### **Note 1**

*The floor assembly has a significant bearing on the spread of fire and minimum values are needed to ensure that a high level wall does not allow a higher level of category.*

### **Note 2**

*The points do not represent anything other than a means to differentiate the different category of timber frame compliance.*



## 3 Rules for timber frame build assemblies in Category B and C

### 3.1 Product types

#### Deck types

Minimum 15mm board (OSB, plywood) or 18mm chipboard unless noted otherwise.

#### Joist and stud types

Pictorial representation	Brief description
	Rectangular timber based product sections
	<b>I joists</b> Timber based flanges with thin timber board webs
	<b>Open Joists</b> Timber based flanges with steel plate connected webs

**Note:** Timber based products are those with a charring rate of 0.67mm/min to BS 5268-pt 4.1. For example: sawn timber, Glu-laminated, Laminated Veneer Lumber and Laminated Strand Lumber. Minimum thickness of joists 38mm. Rim board minimum thickness is 25mm. Where specific joist types are required the type of joist will be stated in the tables.

#### Sheathing types

Unless referenced alternatives in Product Paper 4 minimum thickness of boards to be:

- Non-combustible - 9mm
- Limited combustibility - 12.5 and 15mm depending on application (see tables in section 4)
- Timber based - 9mm

All non-standard timber (outside of EN standards) and non-timber sheathing to comply with FC Build. See STA Product Paper 3.

**Note:** FC Build is a name given to the quality check process for this specific application.



## Insulation types

Generic types of insulation are difficult to attain as each product manufacture has different performances. For the purposes of this paper only mineral wool insulation - stone wool or glass wool material can be treated as generic.

Other types of insulation materials such as FR EPS, PUR, PIR and Phenolic should comply with the FI Build checklist. See STA Product Paper 2.

**Note:** *FI Build is a name given to the quality check process for this specific application.*

Type references to insulation in this paper refer to the response to fire and heat from a fire.

Type FI Build 1 - Melts under heat and has combustible gases

Type FI Build 2 - Shrinks under heat and may have combustible gases

Type FI Build 3 - Maintains volume and does not combust

## References supporting papers

**FR Build** - refers to flame retardant and intumescent coatings.

See STA guidance parts 1-3 and Product Paper 1 on the STA web site.

**FI Build** - refers to the insulation standard. See STA guidance parts 1-3 and Product Paper 2 on the STA web site.

**FC Build** - refers to the sheathing and decking standard.

See STA guidance parts 1-3 and Product Paper 3 on the STA web site.

**A1 & A2** - refers to EN reaction-to-Fire classifications for contribution to fire growth in accordance with EN 13501-1. A1 utilises EN 1182 and EN 1716 tests and is typically referenced as 'Non-Combustible'. A2 utilises EN 1716 and EN 13823 testing and is referenced typically 'Limited Combustible'

**Note:** *In the Scottish 2013 Technical Handbooks, Domestic Section 2 Fire classifies this as non-combustible as well as A1.*

Products can also be classified under the currently accepted British Standards with non-combustible products proven to tests to BS 476- 4:1970 Fire tests on building materials and structures or BS 476-11:1982 Fire tests on building materials and structures - method for assessing the heat emission from building materials.

Also for limited combustibility products test compliance to BS 476-11:1982 is required as an alternative to European classification.



## 3.2 Rules for application floors in Category B or C

Location/ Element	Application
<b>Compartment floors</b>	Basic structural floor select from section 4.1.
<b>Intermediate floors and stair well openings, lift shaft openings</b>	<p>Select from section 4.1.</p> <p>Stair well openings can be left open when stairs are present providing the exposed floor zone perimeter is FR Build protected or boarded with A1/A2 boards or where temporary decks are required within the void before stairs are installed to be as the floor construction or FR treated joists and deck.</p> <p>Note for Category C structures the stair void presents a break in the pseudo horizontal compartmentation, however, stair void area to protection of walls and floors means that there is little potential for fire spread under this category and the stair void does not invalidate the assumptions made in the fire load to determine the radiant heat.</p> <p>For lift shaft openings it is assumed that the shaft walls are protected in accordance to the frame classification requirements for the walls.</p>
<b>Joists and decking in Category C</b>	<p>For Category C the floor is to provide a level of resistance to the spread of fire into the compartment floor above.</p> <p>Testing has shown that where joists are exposed it is the horizontal decking that presents the most significant risk for fire spread. Category C performance has been proven using decking comprising non-combustible boards - or boards with FR Build treatments, or where the use of appropriate Rockwool underlay has been applied to the untreated deck board.</p> <p>The use of butt jointed boards has been tested and suitable where non-combustible boards or FR fully treated boards are used. Tongue and groove boards will be required where only underside surfaces are FR treated or directly protected by boards on one side (except where Rockwool underlay has been adopted to cover the joints).</p> <p>The nominal “compartmentation” of the floor is based on the decking material providing an initial barrier to the spread of fire. The floor joists are there to provide support to the decking. For most floors failure of the joist will result in collapse of the decking which would mean failure of the Category C model being considered.</p> <p>For this reason FR Build rectangular sections have been proven to provide resistance to fire and maintain sufficient strength for the Category C fire condition. Testing of specifically designed and enhanced engineered joists i.e. I-joists and metal web joists, has proven to provide the robustness needed for the Category C criteria.</p> <p>Alternatives will be enclosed joists with a suitable fire resistance covering that, where appropriate, has been tested.</p>
<b>Service voids and holes</b>	<p>For all openings greater than 50mm by 50mm, or equivalent, temporary infill is required to stop vertical fire spread.</p> <p>Holes and gaps can be filled using stone wool insulation material of at least 50mm thickness.</p>
<b>Rim beams, header joists and perimeter blocking in fire compartmentation walls</b>	<p>A vertical barrier to each fire compartment is required to be robust and not allow fire to migrate and spread into hidden cavities from where it can grow undetected. The use of stone wool packed within any rim beam cavity or FR Build treatments, or protection with boards of limited combustibility along the fire compartment wall has been found in tests to provide robust barriers.</p>
<b>Timber beams in floors</b>	<p>The beams are to be treated as the floor joists.</p> <p>Where exposed untreated large section timber beams are required assessment by an engineer is required for accidental load bearing capacity after charring.</p>



### 3.3 Rules for application walls in Category B or C

Location/ Element	Application
<b>Sole plates</b>	No FR Build treatment required
<b>Head binders</b>	To be FR Build when used in conjunction with an FR build wall frame solution
<b>External wall panels</b>	Select from section 4.2, 4.3, 4.4, 5.2 or for full systems section 6
<b>Internal load bearing walls</b>	Select from section 4.2, 4.3, 4.4, 5.2 or for full systems section 6 Or - for unsheathed walls to be FR Build vertical and horizontal timbers
<b>Party walls when used as a fire compartmentation</b>	Select wall type from section 4.2 to 4.4 with minimum points of 5, or full wall and floor systems as given in section 6, or FR Build sheathing and timber frame with full fill mineral wool (FI Build type 2 or 3) in the party wall cavity. In all cases no combustible boarding, that is not FR Build compliant, is to be exposed during the construction process.
<b>Party walls not used as fire compartmentation</b>	As internal load bearing walls
<b>Parapet walls to roofs</b>	Select from section 4.2 to 4.4
<b>Doors in fire compartmentation walls</b>	Temporary fire doors may be constructed using weather resistant limited combustibility board, or non-combustible boards over a timber frame, or 30 min standard fire doors. Smoke seals are not required. Door to have a self-closure mechanism to frame.
<b>Window openings</b>	Only Category C2 require temporary non-combustible or limited combustibility boards over the opening and over the installed window until the room in which the windows is placed has a building regulation compliant fire protection of at least 30mins lining to the walls or an engineer's report providing an alternative strategy. Note Category C2 specification is required to continue to at least 5 m from a receiver face.

### 3.4 Rules for application roofs in Category B or C

<b>For roof pitch less than 15 degrees</b>	To be treated as the relevant category floor assembly
<b>For roof pitched roofs greater than 15 degrees</b>	Standard timber components, including sarking
<b>Room in the roof and Mansard roofs less than 55 degrees pitch</b>	For Category C can be regarded as a pitched roof except where the emitter frame external wall line is 5 m or less from the receiver building then sarking and roof boarding shall be minimum FR Build or A1 or A2 boarding (all non combustible boards referenced in this paper are acceptable).
<b>Room in the roof and Mansard roofs greater than 55 degrees pitch</b>	Risk mitigation roof taken as an additional storey with treatment as the storey levels below.

## 4 Allocation of points for assemblies

### 4.1.1 Floor assemblies (open and closed panel elements)

Ref	Construction of floor elements	Points
F1	<p>DECK DECK DECK</p> <p>JOIST</p> <p><b>DECK</b> - Not treated <b>JOIST</b> - Not treated</p>	0
F2	<p>DECK DECK DECK</p> <p>JOIST</p> <p><b>DECK</b> - FR Build treatment <b>JOIST</b> - Untreated <i>Note: Structural check on wall stability if floor diaphragm is absent under a fire condition</i></p>	1
F3	<p>F3.1 F3.2 F3.3</p> <p>F3.4 F3.5 F3.6 or F3.7</p> <p><b>DECK</b><sup>1</sup> - FR Build treatment. <b>JOIST</b> - options as: <b>F3.1</b> - FR Build solid rectangular <b>F3.2</b> - I joist Rockwool web fill min 58mm flange <b>F3.3</b> - I joist moisture resistant A1 or A2 board <b>F3.4</b> - Finger jointed Metal-Web FR Build treatment to top flange <b>F3.5</b> - MiTek Posi-Joist Fire-Safe <b>F3.6</b> and <b>F3.7</b> - MiTek Posi-Joist Fire-Safe Plus</p> <p><i>See Appendix 2 for joist technical descriptions and make up.</i></p> <p><sup>1</sup> See alternative product listing section 4.1.2</p>	2

Ref	Construction of floor elements	Points
F4	<p><b>DECK</b> - Not treated  <b>JOIST</b> - Not treated  <b>CEILING<sup>2</sup></b> - A2 board 12.5mm minimum or 9mm A1 board</p> <p><b>Construction notes:</b></p> <ol style="list-style-type: none"> <li>Board to be correctly screwed to the joists for fire resistance to manufactures instruction</li> <li>This solution can be temporary or permanent solution, but the process and installation must occur before any additional timber frame walls are installed above the floor level</li> <li>Durability and sensitivity to the weather conditions of the construction shall be considered. H&amp;S issues can arise if non weather resistant products are used, become wet and fall off the floor structure</li> </ol> <p><sup>2</sup> See alternative product listing section 4.1.2</p>	2
F5	<p><b>DECK</b> - A1/A2 structural (minimum of 15 mm)  <b>JOIST<sup>3</sup></b> - Solid untreated</p> <p><b>Note:</b> The designer shall ensure the decking is structurally appropriate and suitable to walk over during wet weather and does not become a slip hazard. See Product Paper 3 for compliance. Third party approval required for application</p> <p><sup>3</sup> See alternative product listing section 4.1.2</p>	2

Ref	Construction of floor elements	Points
F6	<p><b>DECK</b> - Not treated  <b>DECK UNDERSIDE SKIN<sup>2</sup></b> - 9mm minimum  A1 board or 12.5mm A2 board  <b>JOIST<sup>3</sup></b> - Solid, not treated  <i><b>Note:</b> A1/A2 skin structural compatibility in terms of deflection not causing cracking. Top surface shall not be sensitive to the weather conditions of the construction by moisture build up at the interface of the skin and board.</i>  <i>Third party approval required for application</i>  <sup>2,3</sup> See alternative product listing section 4.1.2</p>	2
F7	<p><b>DECK</b> - Not treated  <b>JOIST</b> - Options I joist (58mm flange) with Stone wool web fill, Metal Web with Stone wool web fill, solid joist all not FR Build treated  <b>INSULATION</b> - Type 2/3 mineral wool base full depth of floor void and secured  <b>CEILING</b> - Fire spread resistant membrane that has been tested to room test  <i><b>Note:</b> Durability and suitability for weather conditions during construction to be considered with suitable inspection criteria to ensure insulation and structure has not become wet. This construction is assumed to arrive on site pre constructed. Onsite applications will require full installation prior to the next floor level walls being erected</i></p>	2



## 4.1.2 Floor assemblies (alternative products)

<sup>1</sup> Alternatives for the FR Build decking Rockwool 40mm decking protect



Untreated decking 40mm Rockwool ProRox SL 930

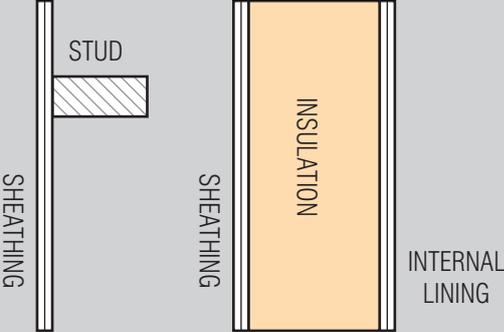
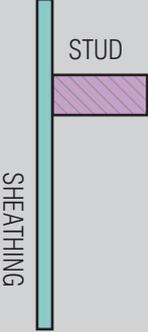
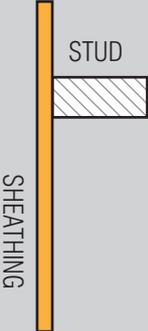
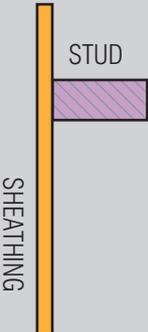
<sup>2</sup> Alternatives for the ceiling board/deck underside in F4/F6

Duncryne Econicboard 6mm board  
Fermacell 10mm board  
IWS 7mm fast board  
RCM Y wall 6mm board  
Resistant XS 6.5mm board

<sup>3</sup> Alternatives for the joists in F5/F6

F3.2 - I joist Rockwool web fill min 58mm flange  
F3.3 - I joist moisture resistant A1 or A2 board  
F3.4 - Finger jointed Metal Web FR Build Treatment to top flange  
F3.5 MiTek Posi-Joist Fire-Safe  
F3.6 and F.7 - MiTek Posi-Joist Fire-Safe Plus  
See Appendix 2 for joist descriptions

## 4.2.1 Wall assemblies (open panel elements)

Ref	Construction of open panel elements, standard structural insulated panels and massive wood elements	Points
W1	 <p>Open timber frame wall</p> <p>Structural Insulated Panel (SIP)</p> <p>Standard open timber frame panel  <b>STUD</b> - Not FR Build treated  <b>SHEATHING</b> - Timber not treated  OR  Standard Structural Insulated Panel (SIP) with untreated timber board facings  OR  Standard massive wood elements such as CLT</p>	0
W2	 <p>Open timber frame panel  <b>SHEATHING</b> - FR Build treated min 9mm  <b>STUD</b> - FR Build treated</p>	2
W3	 <p>Open timber frame panel  <b>STUD</b> - Not FR Build treated  <b>SHEATHING</b><sup>4</sup> - 9mm A1 or 12.5mm A2  <sup>4</sup> See alternative product listing</p>	5
W4	 <p>Open timber frame panel  <b>STUD</b> - FR Build treated  <b>SHEATHING</b><sup>4</sup> - 9mm A1 or 12.5mm A2  <sup>4</sup> See alternative product listing</p>	5



## 4.2.1 Wall assemblies (alternative products for open panels)

<sup>4</sup> Alternatives for the sheathing board in W3 and W4

Duncryne Econicboard min 6mm board  
IWS min 7mm fast board  
Resistant XS min 6.5mm board

## 4.3.2 Wall assemblies (pre-insulated panel elements)

Ref	Construction of pre-insulated panels	Points	
W5		<p><b>STUD</b> - Not FR Build treated  <b>INSULATION</b> - FI Build min Type 1  <b>SHEATHING</b><sup>5</sup> - FR Build treated - min 9mm  <i>Note: Insulation to be tight fitting and retention of insulation by clips or equal required</i></p> <p><sup>5</sup> See alternative product listing</p>	2
W6		<p><b>STUD</b> - FR Build treated  <b>INSULATION</b> - FI Build min Type 2  <b>SHEATHING</b><sup>5</sup> - FR Build treated - min 9mm  <i>Note: Insulation to be tight fitting and retention of insulation by clips or equal required</i></p> <p><sup>5</sup> See alternative product listing</p>	3
W7		<p><b>STUD</b> - Not FR Build treated  <b>INSULATION</b> - FI Build min Type 3  <b>SHEATHING</b><sup>5</sup> - FR Build treated min 9mm  <i>Note: Insulation to be tight fitting and retention of insulation by clips or equal required</i></p> <p><sup>5</sup> See alternative product listing</p>	4
W8		<p><b>STUD</b> - Not FR Build treated  <b>INSULATION</b> - FI Build min Type 2 &amp; 3  <b>INTERNAL LINING</b><sup>4</sup> - A1 board 9mm or A2 board 12.5mm  <b>SHEATHING</b><sup>5</sup> - External FR Build treated min 9mm or 9mm A1 or 12.5mm A2</p> <p><sup>4,5</sup> See alternative product listing</p>	5



## 4.3.2 Wall assemblies (alternative products for pre-insulated panels)

<sup>4</sup> Alternatives for the internal lining board in W8

Duncryne Econicboard min 6mm board  
IWS min 7mm fast board  
Resistant XS min 6.5mm board

<sup>5</sup> Alternatives for the sheathing board in W5, W6, W7 and external W8

Duncryne Econicboard min 6mm board  
Fermacell min 10mm board  
IWS min 7mm fast board  
RCM Y wall min 6mm board  
Resistant XS min 6.5mm board  
Norbord 9mm OSB treated with NoBurn intumescent both sides  
Norbord composite with external outer face 3mm Resistant MgO laminated to 9mm Norbord OSB/3  
SmartPly FR OSB/3 min 11mm

## 4.4.1 System wall assemblies

S1	<p>Diagram labels: EBS elk, STUD, MINERAL WOOL, EBS ELK, EXTERNAL LAYER, OUTER SHEATHING, INNER LINING.</p>	<p><b>COMPANY SYSTEM BY EBS elk</b> - Pre insulated and pre clad wall panels</p> <p><b>STUD</b> - Not FR Build treated</p> <p><b>SHEATHING</b> - Internal lining - A2 board 18mm Outer sheathing A2 board 15mm</p> <p><b>INSULATION</b> - Mineral wool</p> <p><b>EXTERNAL LAYER</b> - 5mm EBS elk Alesco render over 100mm EBS elk</p> <p>All board fixings at manufactures recommended fixings for fire resistant minimum</p>	5
S2	<p>Diagram labels: FR MEMBRANE, INNOVARE FR EPS INSULATION, INTERNAL LINING, TIMBER OUTER SHEATHING, TIMBER INNER SHEATHING.</p>	<p><b>COMPANY SYSTEM BY INNOVARE</b> - Structural Insulated Panel with pre fitted over clad lining</p> <p><b>EXTERNAL MEMBRANE<sup>6</sup></b> - As tested flame resistant breather membrane secured to the SIP timber inner SIP boarding</p> <p><b>INTERNAL LINING</b> - 15mm A2 board secured to the SIP timber boarding</p> <p>All board fixings at manufactures recommended fixings for fire resistant performance</p> <p><sup>6</sup> See alternative product listing</p>	5

S3		<p><b>COMPANY SYSTEM BY KINGSPAN TEK</b> - Structural Insulated Panel with pre fitted over clad lining</p> <p><b>EXTERNAL MEMBRANE<sup>6</sup></b> - Tested flame resistant breather membrane secured to the SIP timber boarding</p> <p><b>INTERNAL LINING<sup>4</sup></b> - 9mm A1 board secured to the SIP timber inner sheathing board</p> <p>All board fixings at manufactures recommended fixings</p> <p><sup>4,6</sup> See alternative product listing</p>	5
S4		<p><b>VAL-U-THERM</b> - Pre insulated and pre clad wall panels</p> <p><b>STUD</b> - Not FR Build treated</p> <p><b>INNER LINING<sup>4</sup></b> - Internal lining 9mm A1 board</p> <p><b>EXTERNAL SHEATHING<sup>6</sup></b> 9mm A1 board</p> <p><b>INSULATION</b> - Val-U-Therm</p> <p><b>UNTREATED BATTENS</b> - 38mm by 45mm</p> <p>All board fixings at manufactures recommended fixings for fire resistant performance</p> <p><sup>4,6</sup> See alternative product listing</p>	5
S5		<p><b>STEWART MILNE TIMBER SYSTEMS</b> - Sigma II Closed Panel Building System</p> <p><b>STUDS</b> - Not FR Build treated</p> <p><b>INNER LINING<sup>4</sup></b> - Internal 9mm mm A1 board or 12.5mm A2 board</p> <p><b>EXTERNAL SHEATHING<sup>6</sup></b> - 9mm A1 board 12.5mm A2 board</p> <p><b>INSULATION</b> - Sigma II Cavity Insulation</p> <p><b>UNTREATED BATTENS</b> - 38mm by 25mm</p> <p><sup>4,6</sup> See alternative product listing</p>	5

S6		<p><b>ENGINEERED WOOD PRODUCTS COMMITTEE</b> - I joist wall</p> <p><b>STUDS</b> - FR Build treated 220 by 45 I joist</p> <p><b>SHEATHING</b> - FR Build 9mm ply</p> <p><b>NO INSULATION</b></p> <p><b>UNTREATED BATTENS</b> - Open panel frame</p>	3
S7		<p><b>BESPOKE OPEN TIMBER FRAME PANEL</b></p> <p><b>STUD</b> - Not FR Build treated</p> <p><b>SHEATHING</b> - 10mm Fermacell board OR 6mm RCM Calcium Silicate</p>	4
S8		<p><b>NORBORD WALL SYSTEM</b></p> <p><b>SHEATHING</b> - Norbord composite. Inner face 3mm resistant® board. Outer face 9mm Norbord No Burn® OSB</p> <p><b>STUD</b> - FR Build treated</p> <p><b>INSULATION</b> - Rockwool® 40mm Rockwool ProRox SL 930 stapled to sheathing</p> <p><b>Note:</b> Combination 4 in section 6 for Category C compliance</p>	4

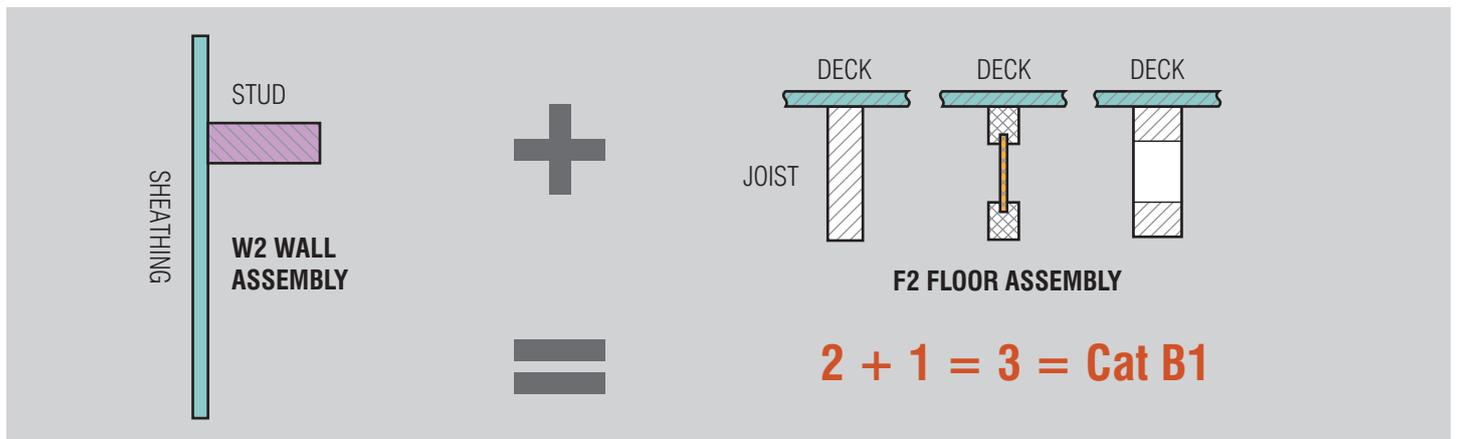
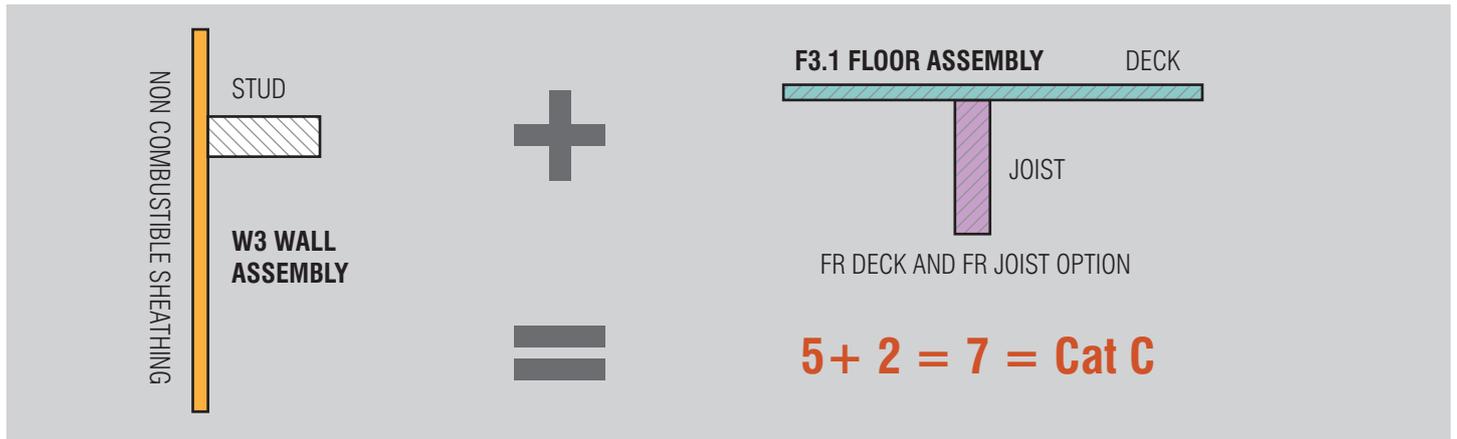


## 4.4.2 Wall assemblies (alternative products for system walls)

<p><sup>4</sup> Alternatives for the internal lining board</p>	<p>Duncryne Econicboard min 6mm IWS min 7mm fast board Resistant XS min 6.5mm board</p>
<p><sup>6</sup> Alternatives for the sheathing board</p>	<p>Duncryne Econicboard min 6mm Fermacell min 10mm board IWS min 7mm fast board RCM Y wall min 6mm Resistant XS min 6.5mm board</p>

## 5 Examples of points and assemblies

### 5.1 How the numbers work





## 5.2 Matrix of solutions

For ease of selection the following provides an easy route to product selection.

W1		FLOOR ASSEMBLIES						
		F1	F2	F3	F4 <sup>7</sup>	F5	F6	F7
WALL ASSEMBLIES	W1	A	A	A	A	A	A	A
	W2	A	B1	B1	B1	B1	B1	B1
	W5	A	B1	B1	B1	B1	B1	B1
	W6	A	B1	B2	B2	B2	B2	B2
	S6	A	B1	B2	B2	B2	B2	B2
	W7	A	B2	B3	B3	B3	B3	B3
	S7	A	B2	B3	C <sup>9</sup>	B3	B3	B3
	S8	A	B2	B3	C <sup>8</sup>	B3	B3	B3
	W3	A	B3	C	C	C	C	C
	W4	A	B3	C	C	C	C	C
	W8	B3 <sup>10</sup>	B3	C	C	C	C	C
	S1	A	B3	C	C	C	C	C
	S2	A	B3	C	C	C	C	C
	S3	A	B3	C	C	C	C	C
	S4	A	B3	C	C	C	C	C
	S5	A	B3	C	C	C	C	C

Table of floor and wall combinations for selection of category to reduce separating distances

**Note 7**

See section 6 for Category C combinations using F4 floor

**Note 8**

S8 and F4 floor tested to Category C - see section 6

**Note 9**

S7 and F4 floor tested to Category C - see section 6

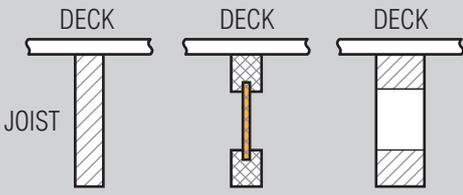
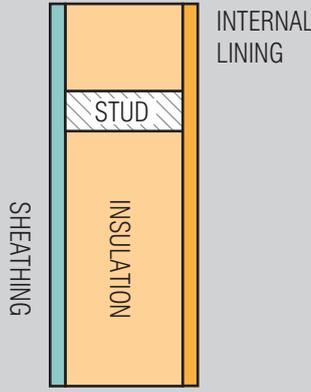
**Note 10**

W8 and F1 floor tested to Category B3 - see section 6

## 6 Wall and floor systems as tested

Tests using the STA small room test as given in Technical Paper 2 and 3 have resulted in specific combinations that are not given in the assembly combinations. The following provides the classifications of tests as submitted to the STA but not suitable for interchangeable assembly approach subject to further testing and research.

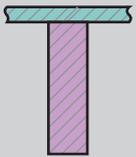
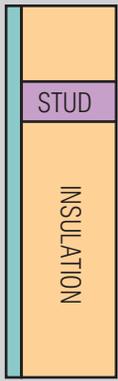
### Combination 1 - STA B<sub>3</sub> solution

Construction	Detail	Category of construction
<p><b>Floor</b></p>  <p><b>Wall</b></p> 	<p><b>Floor</b> Not FR Build treated floor structure (reference F1)</p> <p><b>Wall</b> <b>STUD</b> - Not FR Build treated <b>INSULATION</b> - FI Build Type minimum type 1 <b>INTERNAL LINING</b><sup>4</sup> - A1 board 9mm or A2 board 12.5mm <b>SHEATHING</b><sup>5</sup> - External min FR Build treated - 9mm or A1/ 12.5mm A2 boards <i><b>Note:</b> structural checks on wall stability if floor diaphragm is absent</i></p>	<p>B3</p>

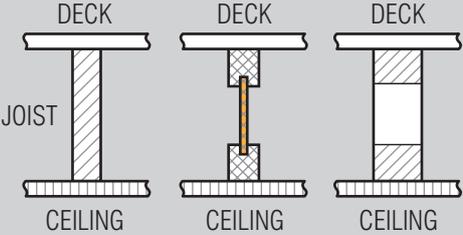
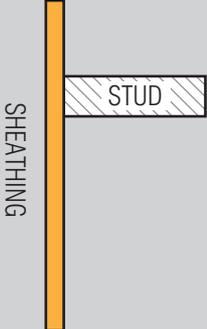
## Alternative products for Combination 1

<p><sup>4</sup> Alternatives for the interal linings</p>	<p>Duncryne Econicboard min 6mm IWS min 7mm fast board Resistant XS min 6.5mm board</p>
<p><sup>5</sup> Alternative products for Combination 1 sheathing</p>	<p>Duncryne Econicboard min 6mm board Fermacell min 10mm board IWS min 7mm fast board RCM Y wall min 6mm board Resistant XS min 6.5mm board Norbord 9mm OSB treated with NoBurn intumescent both sides Norbord composite with external outer face 3mm Resistant MgO laminated to 9mm OSB/3 SmartPly FR OSB/3 min 11mm</p>

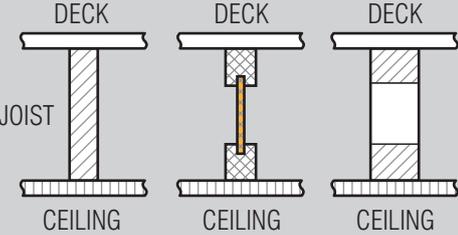
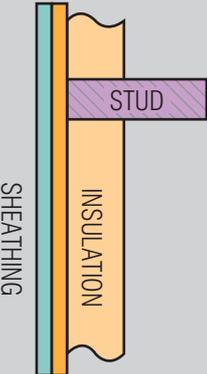
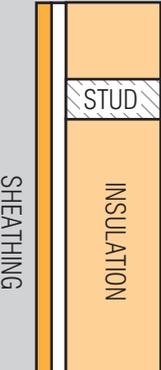
## Combination 2 - SmartPly floor wall system

Construction	Detail	Category of construction
<p><b>Floor</b></p>  <p><b>Walls</b></p> 	<p><b>Floor</b> <b>DECK</b> - SmartPly FR Build OSB/3 min 15mm <b>JOIST</b> - F3.1 FR Build solid rectangular <i>Note: all F3 joist solutions are acceptable</i></p> <p><b>Walls</b> <b>SHEATHING</b> - SmartPly FR OSB/3 min 11mm <b>STUD</b> - FR Build treated <b>INSULATION</b> - Type 3 insulation - Stone wool full fill</p>	<p>B3</p>

## Combination 3 - Fermacell open panel solution

Construction	Detail	Category of construction
<p><b>Floor</b></p>  <p><b>Walls</b></p> 	<p><b>Floor</b>  <b>DECK</b> - Not FR Build treated  <b>JOIST</b> - Not FR Build treated  <b>CEILING</b> - 10mm Fermacell board</p> <p><b>Walls</b>  Open timber frame panel  <b>STUD</b> - Not FR Build treated  <b>SHEATHING</b> - Fermacell 10mm board</p>	<p>C</p>

## Combination 4 - Norbord/Rockwool floor wall system

Construction	Detail	Category of construction
<p><b>Floor</b> Decking - Rockwool 40mm decking protect</p>  <p>Plus J 8 (see appendix)</p>  <p>or F4 floor assembly</p>  <p><b>Wall</b></p>  <p>or</p> 	<p><b>Floor</b> <b>DECK</b> - Norbord 15mm OSB/3 decking with 40mm Rockwool ProRox SL 930 to underside. <b>JOIST</b> - I joist minimum flange width of 58mm not FR Build treated but web protected by min 25mm rock wool Rockwool ProRox SL 930 fitted tight between flanges and secured by staples top and bottom</p> <p>OR</p> <p>F4 floor assembly</p> <p><b>Walls</b> <b>SHEATHING</b> - Norbord composite. Inner face 3mm resistant® board. Outer face 9mm Norbord NoBurn® OSB <b>STUD</b> - FR Build treated <b>INSULATION</b> - 40mm Rockwool ProRox SL 930 - stapled to sheathing</p> <p><b>SHEATHING</b> - Norbord composite 9mm thick Norbord OSB/3 laminated to 3mm thick resistant multi-pro MgO board on the exposed face <b>STUD</b> - untreated <b>INSULATION</b> - Rockwool® full fill</p>	<p style="text-align: center;">C</p>



# 7 Appendix 1 - STA proforma for self-certification of product assembly

## **STA member certification of product assemblies to comply with the category level of timber frame.**

This document is to be completed by the STA timber frame company and submitted to the prime contractor. A copy of the document is to be held on the construction site for inspection.

### **Project details**

Project reference

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Fabricator Member

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Project reference

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Principle contractor

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Timber Frame designer

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Project brief description

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### **Risk assessment details**

Project site radiant heat risk assessment report reference or reference to STA guidance parts 1, 2 and 3

Category of timber frame required:

- Category A - location reference drawing to be attached
- Category B - location reference drawing to be attached
- Category C - location reference drawing to be attached

### **Product assembly compliance certification**

It is recorded that the timber frame design includes for the required category of timber frame noted in the off the site radiant heat risk assessment report requirements. The product assemblies have been checked against the STA Guidance parts 1, 2 and 3 and where noted against either a third party approved system or as identified in the STA Product Paper 4.



cont....

**Summary of product assembly types adopted in the design**

External walls

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_

Internal load bearing walls

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_

Fire compartmentation walls

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_

Fire doors in fire compartmentation walls

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# cont...

Floors

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Roof

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**Specific product reference for identification**

Flame retardant / intumescent supplier

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Confirm STA website listed YES

Colour

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Non-combustible boarding description

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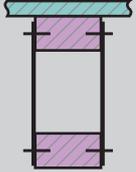
Limited combustible boarding description

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Insulation description

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## 8 Appendix 2 - Floor joist types and description

Ref	Description	Drawing Ref
J1	Not FR Build treated joist	
J2	Not FR Build treated I joist	
J3	Not FR Build treated metal web joist	
J4	FR Build treated joist rectangular section	
J5	FR Build finger jointed metal web FR Build treated top flange engineered for spans using top flange to span only under accidental load + charring rate.	
J6	MiTek Posi-Joist Fire-Safe metal web 1 47 mm thick FR treated TR26 chords 2 Posi-Strut webs 3 Enhanced fixings of the webs to the chords	

Ref	Description	Drawing Ref
J7	<p>MiTek Posi-Joist Fire-Safe Plus metal web</p> <ol style="list-style-type: none"> <li>1 47 mm thick FR treated TR26 chords</li> <li>2 Posi-Strut webs</li> <li>3 Enhanced fixings of the webs to the chords</li> <li>4 30mm Rockwool ProRox SL 920 batt fixed between the webs of the Posi-Joists or to one face of the Posi-Joist</li> </ol>	
J8	<p>Norbord/Rockwool I Joist</p> <p>Not FR Build treated I joist with 25mm Rockwool ProRox SL 930 each side of web, minimum flange size 58mm</p>	
J9	<p>Untreated I joist with 12.5mm moisture resistant plasterboard board across flanges screwed to flange at 230mm centres or nailed at 150mm centres</p> <p><b>Alternative bespoke boards:</b></p> <ul style="list-style-type: none"> <li>Duncryne Econicboard min 6mm</li> <li>Fermacell min 10mm board</li> <li>IWS min 7mm fast board</li> <li>RCM Y wall min 6mm</li> <li>Resistant XS min 6.5mm board</li> </ul>	



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