PENETRATIONS AND THE FIRE RESISTANCE OF UPPER FLOORS: ENGINEERED JOISTS

Introduction

This technical bulletin is issued as an important update for Developers to ensure they are meeting the Functional Requirements of Warranty in relation to the fire resistance of upper floors when constructed using engineered joists (e.g. timber I joists or metal web joists). It sets out the Warranty provider's expectations for fire test evidence, particularly where service penetrations occur through ceiling linings.

What situation does this bulletin relate to?

This bulletin applies to all new upper floors constructed using engineered joists including but not limited to I-joists and metal-web joists. The focus is on ensuring fire resistance is maintained where service penetrations are present in the plasterboard ceiling linings (e.g. downlighters, extractor fans, vents, ceiling mounted air valves).

What are the Warranty providers concerns?

The Warranty provider has concerns that engineered floor joist constructions with service penetrations may be prone to premature failure in a fire due to insufficient testing and potential vulnerabilities around these penetrations.

Where penetrations occur, many engineered floor joist constructions do not have fire tests to reflect the actual situation 'in-service', and it cannot be assumed to meet the necessary fire resistance standards without supporting evidence.

Warranty stance

Our Warranty stance is that where any upper floor is constructed using engineered floor joists it shall have appropriate fire test certification issued by a UKAS accredited testing organisation that is acceptable to the Warranty provider.

The fire test certification must demonstrate that the minimum period of fire resistance required by the relevant and applicable Building Regulations is achieved and shall be specific to the upper floor being constructed.

Where penetrations occur, the services and their associated components, and the fire protection measures employed to protect them must be part of the fire test certification issued for the specific floor construction.

A failure to provide this test evidence would be considered as not meeting with the Functional Requirements and Performance Requirements stipulated by the Technical Manual, notably those relating to fire resistance within the 'Upper Floors' section.

The above stance has been reached after consultations with our Building Control partners. It is based on the understanding that fire testing comprehensively addresses the specific design, materials, and performance requirements of an upper floor constructed using engineered floor joists. This approach goes beyond merely applying guidance from approved documents or building standards, which are typically used for more common building situations and materials. By conducting fire tests, we can ensure that the unique aspects of engineered floor joists are fully evaluated and meet the Functional Requirements of Warranty provision.

PENETRATIONS AND THE FIRE RESISTANCE OF UPPER FLOORS: ENGINEERED JOISTS

What Developers should action after reading this document?

The Warranty provider requires that the Developer provides evidence that the proposed upper floor construction, including all penetrations and the associated fittings, is tested by a UKAS accredited test house that is acceptable to the Warranty provider to either:

- BS EN 1365-2:2014 'Fire resistance tests for loadbearing elements. Floors and roofs', **or**
- BS 476-21:1987 'Fire tests on building materials and structures. Methods for determination of the fire resistance of loadbearing elements of construction'.

The test must be to a suitable standard that has not been withdrawn* and must be provided to the Warranty surveyor prior to works commencing on site.

Site teams must instruct their sub-contractors and operatives that to achieve the required fire resistance, all work must be completed on site as per the tested information.

Uncontrolled material substitution – in both the fire protection measures and the materials used to construct the upper floor – must be avoided.

Where a deviation is noted on site – be it in construction methodology, penetration sizes and distances, and/or material changes – and the Surveyor considers the changes to be outside of the scope of the test, then we will request that the Developer seeks an 'Extended Field of Application' assessment of the 'as built' situation from the organisation who has issued the test certificate.

Where this cannot be provided, the work must be remediated to align with the test certification.

*Note: Where testing to BS 476-21 exists for this situation which pre-dates our position it may be used to demonstrate performance providing it is still valid and representative of the build-up being proposed. However, Developers should be mindful that certification issued under BS 476-21 may be affected by the proposed withdrawal of the standard, with all references to it scheduled to cease on 2 September 2029. Where certification validity is considered affected by this withdrawal, the Developer will need to have the manufacturer provide a statement about their certification. Any new testing required to situations affected by any withdrawal or for entirely new situations should be conducted to BS EN 1365-2:2014 'Fire resistance tests for loadbearing elements. Floors and roofs'.