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SWECO

Modern Methods of Construction

Building Standards Guidance Note 6

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Guidance

Introduction

With the industry striving to reach net zero carbon targets, we have seen the emergence of many innovative Modern Methods of Construction (MMC) over recent years. Many of the drivers are based around embodied carbon targets but there are also many practical advantages such as speed of construction, reduced health and safety risk and reduced substructure works.

Sweco are committed to playing our part and are currently regulating many of the most challenging sustainable office developments in the UK. However, establishing compliance for MMC is problematic as they do not necessarily behave in a similar fashion to traditional construction both structurally and in a fire situation.

Guidance

The Manual to the Building Regulations and the introduction in Approved Document B makes it clear that the suitability of guidance given should be considered to ensure that any design meets the Statutory requirements. It is our policy that Approved Document B is not an appropriate document to use to base compliance for Cross Laminated Timber (CLT) and Load Bearing Modular Construction in terms of B3 (Internal Fire Spread) and in some circumstances B4 (External Fire Spread).

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There are numerous challenges in establishing a route to compliance for projects using MMC. Where there is no defined standards Sweco will often require a performance-based design that is validated by a large-scale fire test of the system in the exact configuration proposed.

Another challenge can be that test data is not readily transferable from system to system which means “systems” need to be individually tested. There is also a general absence of verified testing methodology for the various methods of construction, to overcome this issue Sweco have established a network of industry experts with the necessary experience to assess compliance.

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NFCC Policy Position Statement on MMC broadly aligns itself with this position and calls for the government to provide specific guidance on compliance for:

- 3D Modular (Volumetric) construction - Category 1 of the MMC Definitions Framework (3D primary structural systems); and
- The use of engineered mass timber products e.g., CLT; Glue-Laminate Timber (Glulam).

Currently the design approach Sweco accept is one that follows the principles laid down in BS 7974 (Application of fire safety engineering principles to the design of buildings), by a fire engineer who can show competence in the MMC concerned.

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Aims of Qualitive Design Review (QDR)

The aim of the QDR is to establish the appropriateness of the guidance in the first instance. The applicability of standard guidance-based solutions (such as BS 9999:2017 ADB and BS9991) is considered. Where this guidance is deemed to be adopted outside of the intended scope, a need for an alternative compliance pathway is highlighted. Where a performance-based route to compliance is noted, this will generally follow the principles set out in BS 7974:2019 and the associated published documents referenced. The QDR will set out the challenges noted and will usually seek further stakeholder input.

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Structure of the QDR

In accordance with BS7974 the QDR we would expect the contents to be structured:

- Review of Competence of the designers and other stakeholders
- Architectural design, selection of materials including their suitability and fire properties, occupant characteristics and client requirements.
- Identify hazards and possible consequences (what if study)
- Establish functional objectives
- Establish trial fire safety designs
- Set acceptable criteria for designs
- Identify the method of analysis.
- Establish fire scenarios for analysis
- Document output from the QDR including any performance testing.

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The other considerations to make during the design stage:

- What is the manufactures QA sign off procedures / testing of the factory constructed elements
- Are the processes/products third party accredited, by who to what standard?
- What inspections will be needed both on site and at the factory of production?

Below is the Sweco BC route to compliances for CLT projects and Modular construction.

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Sweco BC will designate that any building using these techniques should be classed complex (level 3) and a suitable performance-based assessment will be required in most cases. We will designate a competent Project Manager and we will allocate one of our Surveyors who has specialist knowledge of managing compliance in the MMC proposed.

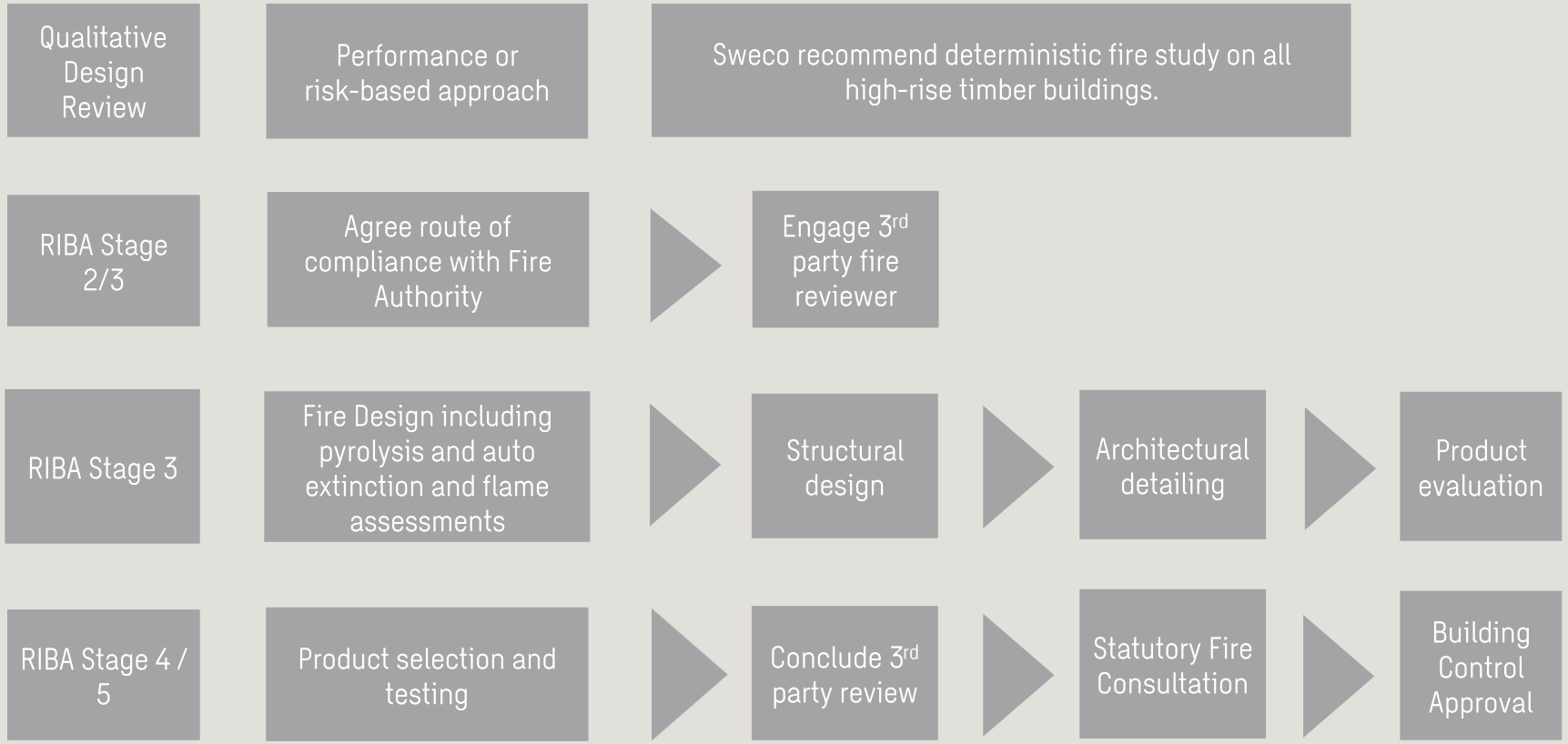
Modular Specialists

- Richard Price

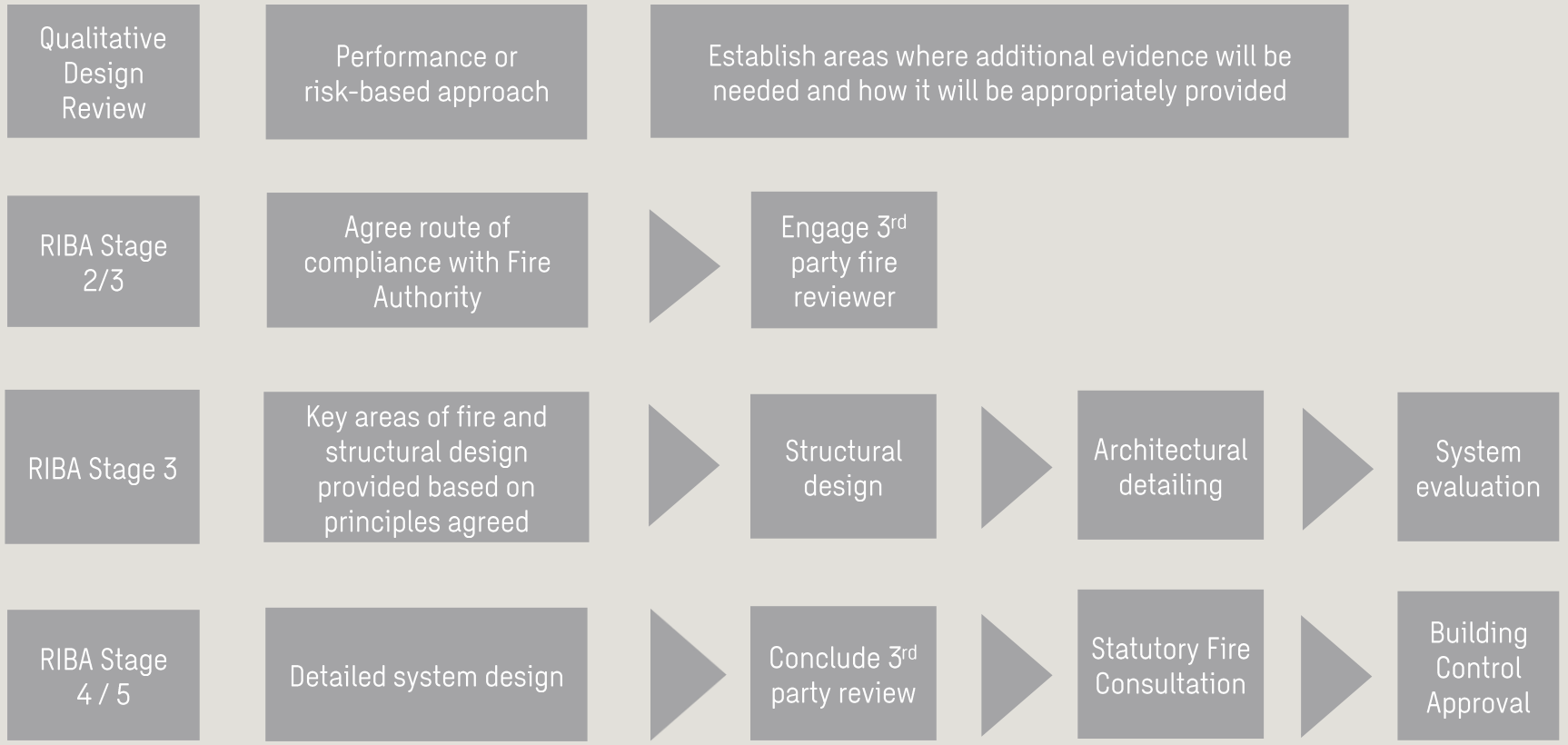
CLT/hybrid and Mass Timber Specialists

- Conor Stevens

Sweco BC CLT Route to compliance with Building Regulations



Sweco BC Modular Construction Route to compliance with Building Regulations



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