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1. Introduction

Many structural timber-based buildings have stood for centuries all over the world. The STA has spent time reviewing what differentiates a good durable building from one that can become defective from moisture ingress. The findings are not surprising in that good practice can be found when projects are planned, designed, built, and maintained by those who understood the building materials used. Historically there would have been more time-served skilled designers and builders. It is now known that skills and material types in construction process are changing with a drive towards more prefabrication being involved, combined with quality-controlled repeatability and engaging with upskilling new entrants to the industry.

Durability is a key component of sustainability which reduces waste and must be considered before making a large investment in a building. Although structural timber systems are capable of meeting service-life objectives, as with any material there are potential threats to longevity to be considered. There’s a need for more systematic procedures to engage professionals to review durability as a topic throughout the building process. Moisture management strategy for building projects provides appropriate attention to design and installation which is required to ensure long lasting buildings.

The guidance objective is for a systematic process based on the 7 steps of the RIBA Plan of Work stages, where time and effort is given to consider and mitigate the risk of defects that may come from moisture entrapment during the construction process and in-service.

This guidance provides the industry with additional knowledge and the benefit of experience that is needed to connect the ideas of the design team with the outcomes of site installation. To embed into the construction the process the opportunity to stop, look and act on designs - and also to be aware of warning signs during construction or in-service that indicate if moisture may be causing distress to the structure.

STA steering group members

The guidance is written by Martin Milner with support from the steering group. The STA would like to thank the members of the steering group who have provided direction and peer reviewed the document.

Dominic Lion, Gallagher (chair)

Sam Dawe, Innovare
Giulia Faffionato, KLH UK
Robin Lancashire, BM TRADA
Scott McAndrew, ITW
Martin Milner, Milner Associates
Andrew Orriss, STA
Paul Philbin, B&K Structures
Wendy Thomason, Clancy
Greg Watson, Scot Frame
Frank Werling, Metsa Group
Nathan Wheatley, Engenuity
2. This guidance

What is the purpose of this guidance?
To provide all stakeholders in the planning, design, procurement, construction and management of a structural timber buildings with examples of good practice to avoid moisture defects.

What is the objective of the guidance?
To outline a process to establish a moisture management strategy relevant to the stage of works. The guidance is based on the Stages 0 to 7 in RIBA Plan of Work 2020 and provides strategic steps to allow relevant parties to put in place plans, designs, materials and construction processes that, executed properly, will avoid moisture defects in new structural timber buildings. The RIBA driven steps address each stage in the building from concept, design, build and in use.

Why is this strategy needed?
The STA has recognised that the industry does not establish roles and responsibility for durability, leading to confusion and ignorance of moisture management in the process of commissioning a new building, with the accountability for it always being thought as “by others”.

The STA steering group on durability recognised the gap in the construction process and requested a change in the approach to include a moisture management strategy. Whilst good practitioners have years of experience of how to manage the avoidance of moisture induced defects, there are new entrants to the market for structural timber buildings.

This strategy is intended to support the industry to achieve long-lasting, durable and sustainable buildings. Using a set of key steps, the relevant parties can adopt a strategy at the appropriate stage in the process to avoid defects in the design, construction and service caused by excessive moisture.

Who is this for?
The users of this document are clients and owners of buildings, design professionals, structural building system supply chain designers, constructors, cladding/roofing design and assemblers, and building maintenance advisors. The advice is written with new developments or the refurbishment and reuse of buildings in mind, but some of the information will be of use for existing buildings and maintenance.

There are many examples of good durable structural timber buildings, some of which are hundreds of years old. As with all material types there are some projects that have clearly not been planned, designed, constructed and well-managed, leading to defects caused by moisture ingress. As growth in the use of structural timber buildings takes place the STA has recognised that leading companies demonstrate good practice in the approach to managing moisture in their projects. Taking lessons from this good practice, the STA presents a more formal and effective process, to be adopted across the industry to ensure that durability of structural timber buildings fulfils the sustainable objectives.
Moisture management strategy

Buildings are complex assemblies of different materials and conditions where defects and issues can lead to deterioration before the design life is achieved. No building or material is designed to last forever, so design life is an important point to understand and establish. Potential defects can be from how it was designed, constructed and how or if it has been maintained. Of course, there can be a change in circumstances that alter the movement of moisture, which may cause deterioration in the building and the question of “what if?” should be part of the design process and included in the operations manual, so all stakeholders are aware of their responsibility. Through the design process, construction period and in use a moisture management strategy is recommended. The process is as presented in Part 4.

What is the problem with moisture?

Damage to buildings from moisture occurs in all material types. Where structural timber is involved, excessive moisture can lead to structural deterioration and defects relatively rapidly. Whilst some materials can harmlessly absorb moisture, timber is susceptible to the natural process of decay which can reduce strength, leading to a loss of structural integrity in a building. Moisture defects in timber structures can be a costly problem to remediate. Water ingress or accumulation of high humidity, leading to moisture absorption by the wood, is a cause of distress which should be avoided.

Once timber products absorb water above the intended in-service moisture content, then loss of strength, dimensional changes and a higher likelihood of decay will occur. Different structural timber products and species behave differently.

Why is this strategy guidance?

There are many guidance books, papers and sources of good practice to avoid moisture defects. A list of these resources is provided in the appendix.
3. Application of this guidance

**Scope of document**
This guidance is for structural timber elements in a building. This does not address cladding or finishes except where they are structural.

Readers of this guidance shall be aware of the characteristics of structural timber. This document is not intended to provide education in timber decay, defects and deterioration as this is covered in many textbooks and advice documents (see the appendix for further reading).

The guidance is about wood based products including:
*Solid timber, glue laminated timbers, cross laminated panels, laminated veneer lumber, plywood, orientated strand board (OSB) and medium density fibreboard.*

Defects and deterioration in other materials such as concrete and steel are outside the scope of this document; readers should seek other guidance for these materials, noting that all materials are vulnerable to design and construction errors that allow moisture ingress.

**Terminology and explanation of key terms**

**STA**
The Structural Timber Association (www.structuraltimber.co.uk)

**RIBA Plan of Works 2020**
An up-to-date version can be found through an internet search, which will direct to the correct page on architecture.com (RIBA’s website)

**Design life**
Period of a timber structure, component or assembly to perform for a specified period of time the function to which it was intended with specified maintenance where relevant.

Note it is the duty of the designer to consider the level of maintenance, repair or replacement that may be required within the design life of the structure for the elements that they are responsible for.

**Change control procedures**
Procedures for controlling changes to the design and construction following the sign-off of the RIBA Stages.

**Basis of structural design**
Provides a technical description of the structural principles and criteria to be used in the design. It provides a confirmation (and technical interpretation) of the final project brief as well as providing the basis for the detailed development of the structural design and a record of the design criteria to be used.

**Client requirements**
A statement or document that defines the project outcomes and sets out what the client is seeking to achieve. It is used to develop the business case, which examines any viable options that meet the client requirements.
**Designer/Principal Designer**
The design team is led by the principal designer who controls and manages the design process with direct liaison for decisions with the building client. Under the management of the Principal Designer are designers from other disciplines that will contribute to the project design and may be responsible for durability, in which moisture shall be managed.

**Movement and tolerances report**
A report describing the anticipated movements of the structure over its design life and how these movements are to be accommodated within the design (including any contractor designed items). It also provides the structural tolerances assumed within the design and those to be achieved within the manufacturing and construction stage.

**Performance specification**
A detailed specification providing the performance (descriptive) requirements to enable others, typically specialist sub-contractors, to complete their design in accordance with the project brief.

**Project strategies**
A number of project strategies will occur in the life of a project. These may be anything from a single sentence to a multi-page document depending on the scale and complexity of the project. These strategies have an important role in good project management and, where relevant, include the following:

- Project planning strategy
- Sustainability/design impact on material conservation and regeneration strategy
- Cost strategy
- Design strategy - including moisture management strategy, fire safety strategy (FSS), CDM strategy
- Plan for use strategy - including moisture management strategy, fire safety strategy (FSS)
- Procurement strategy
- Installation/inspection strategy

**How to use steps to durability**
The guidance is relevant to many project stakeholders including the client and building user.

For the design and build team the full process is required. For the client and end user, the key point checks in Part 4 are required.

**Scale of a project**
All projects require a moisture management strategy. For small projects the process may be straightforward with a single page document. For large or complex buildings, a more detailed strategy will be required.
4. The basics

What is excessive moisture?

A level of moisture in a product that causes loss of shape, reduction of strength and stiffness and the onset or likely onset of wood destroying fungi.

Surface wetting is not to be confused as excessive moisture. Timber products can withstand wetting of their surfaces when there is a ventilated space above the product to avoid accumulation of moisture over time.

Where water is allowed to lie on timber product for periods beyond a few days and ventilation is not present to dry out the timber, then moisture will be absorbed by the wood and if not dried this often leads to moisture induced problems.

Expertise to understand avoiding excessive moisture

This guidance does not provide details or solutions to avoid moisture problems but rather puts the topic as part of the agenda for designers, contractors and end users to create and follow a moisture management strategy. It is the responsibility of a client appointing professional teams to advise them that these teams have an expertise or access to expertise to ensure the project has the right details, correct compliant construction and appropriate maintenance of the conditions to which the building is designed for.

Durability and moisture management

The strategy of any project starts with defining the design life and expectations of the building structure, including when maintenance and replacements are likely. Moisture management is part of design and build for durability.

Durability is defined as the performance of a product, component, or system to achieve its function for a specified period of time for which it was intended, whether it be structural safety, serviceability, amenity, or aesthetic.

Duties

Each party in the process, including the client, has a responsibility to ensure that the design life of the structural timber building is not reduced on account of their actions.

The 7 steps in the moisture management strategy presented in Part 6 sets out the principles of the process but it is the duties of the participants that can stop or progress the strategy.
## Key causes of excessive moisture

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>CAUSE OF EXCESSIVE MOISTURE</th>
<th>RISK MITIGATION</th>
</tr>
</thead>
</table>
| FROM FABRICATION TO DELIVERY  | Inadequate protection from heavy rainfall/snow during pre-delivery storage and transport  
Trapped rainwater following heavy rain or snow into closed panels from pre-delivery storage                                                                 | Allowance for ventilation and drying period during the storage and build process  
Checks on products at delivery                                                                                                                  |
| DURING CONSTRUCTION           | Inadequate protection during site storage  
Heavy rainfall or snow during the build process leaving pre-assembled elements to absorb moisture continuously over days without drying out periods  
Materials left in standing water  
Trapped moisture in the products that are encased before drying                                                                                   | Allowance for ventilation and drying period during the build process  
Checks on products before encapsulation, particularly closed panel elements  
Pre-insulated panels protected during the build process  
Vulnerable assemblies with weather protection temporary works  
Design allowing structural elements to breath and dry out  
Quality control checks on as built                                                                                                                 |
| IN THE USE OF THE BUILDING    | Long-term condensation  
Long-term and repeat humid conditions  
Leaks in water membranes designed to protect the structure Ineffective water protection or no protection  
In-service pipe leaks  
Flood damage                                                                                                                                       | Design allowing structural elements to breathe and dry out  
Designed where appropriate for flood resilience  
Service pipes accessible pipe zones and structural design to avoid movement leading to stress on pipes, structural opening of joints in the weather facade  
Design to avoid water ledges  
Consider failure of protection and allow the surfaces to fail safe with passive measures such as ensuring water can shed off all roof surfaces without becoming trapped at valleys, parapets, or low points  
Provide weep holes where necessary  
Design timber structures with adequate up-stands above ground or terrace levels  
Design floors to consider drainage in the event of flooding or leaks. In addition to considering heavy rain during the construction process  
In the design of mass timber buildings avoid flat roofs, excessively shallow falls, flat valleys and flat gutters |
Design and build for durability rules to follow

### In design

**RULES**
- Prevention is better than a cure
- Design structures for the appropriate service class (exposed, unheated, heated)
- Design matched to the project build supervision, product warranties, location and use of the building/history of use.
- Avoid encasement, ledges and pockets where moisture can be trapped
- Design assembly to allow timber to breathe

**TO THINK**
- Where water can go during the construction process or during the in-service conditions should a leak occur
- What is the weakness in the design? e.g. movement of the structure and weather seals to windows
- Are services designed to be accessible? Protection systems are likely to have a design life less than the life of the building. How will they be replaced? How can you tell if they have failed?

### During the build

**RULES**
- Prevention against consistent wetting is better than a cure
- Remedial works undertaken before closing in defects
- Inform the design team where timbers have become wetted from standing water
- Consider the weathertightness process as a critical path, where not possible consider temporary weather cover
- Have a sign off process that checks the moisture content is within acceptable limits and that the enclosure of all structural timber elements does not occur before this check has been undertaken

**TO THINK**
- Is there standing water on timber products?
- Are there processes that create pockets with timber and water?
- Do the design details address how water is managed?
- Are services built to be durable and accessible?

### In use

**RULES**
- Prevention is better than a cure
- Maintenance schedule to be followed or else accept reduced design life consequences
- Leaks to be dealt with as soon as recognised and engage with specialist to check impact of leak to the timber structure
- Classic water management red flags are standing water on flat roofs, prolonged water leaks (waste or pipes), damp spots not investigated and blocked gutters or downpipes not attended to
- Inform the design team if adverse change of building use is proposed that may increase the moisture levels

**TO THINK**
- Is it time for maintenance?
- What is the lifespan of elements and should repairs be programmed before it is a problem?
- The designer should consider increasing the slope of minimum flat roof falls where the structure is sensitivity to moisture build up - such as where mass timber and wood boarded decks are present. Section 4.4 of BS6229 (Flat roofs with continuously supported flexible waterproof coverings) is considered not suitable and too little for timber flat roofs.

Above all understand and clarify the design and build responsibilities on a project
5. Responsibility for durability

Each project will have a different make up of professional designers, managers, quantity surveyors, buyers, constructors, material supply chain, specialists and building facilities management.

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>CLIENT</th>
<th>DESIGNER</th>
<th>MATERIAL/PRODUCT SUPPLY CHAIN</th>
<th>FABRICATION SUPPLY CHAIN</th>
<th>CONSTRUCTION</th>
<th>BUILDING FACILITY MANAGERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPOINTING A COMPETENT PROFESSIONAL DESIGN TEAM</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In use</td>
</tr>
<tr>
<td>APPOINTING A COMPETENT TEAM FOR FABRICATION AND CONSTRUCTION</td>
<td>✓</td>
<td></td>
<td>Duty to warn</td>
<td>Duty to warn</td>
<td></td>
<td>In use</td>
</tr>
<tr>
<td>DESIGNING FOR DURABILITY</td>
<td>✓</td>
<td></td>
<td>Duty to warn</td>
<td>Duty to warn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPECIFICATION OF MATERIALS FOR DURABILITY</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECHNICAL SUPPORT ON DURABILITY</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DUTY TO WARN OF VULNERABILITY AND LIMITATIONS</td>
<td>✓</td>
<td>✓</td>
<td>Duty to warn</td>
<td>Duty to warn</td>
<td></td>
<td>Duty to warn</td>
</tr>
<tr>
<td>QUALITY OF BUILD SPECIFICATION/DETAIL</td>
<td></td>
<td></td>
<td>Check</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HANDBOVER OF ELEMENT TO WHICH YOU'RE RESPONSIBLE</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<td></td>
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<tr>
<td>MAINTENANCE SCHEDULE</td>
<td></td>
<td></td>
<td>Specify</td>
<td></td>
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<tr>
<td>UNDERTAKE MAINTENANCE</td>
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</tr>
</tbody>
</table>
Durability starts with the building client

Ensure the right appointment of a Principal Designer who will manage and monitor the design, including moisture management.

This also applies to the right appointment of a Principal Contractor who will have the structure and management process to ensure designs are carried out correctly in the build.

Check that the works are completed to project specification and that all possible impacts from moisture are removed prior to handover.

To understand that decisions may be needed to agree to comply with recommendations in the moisture strategy outcomes or accept in writing where a compromise may cause a moisture driven defect.
6. The moisture management strategy

The steps and key parties to the strategy

<table>
<thead>
<tr>
<th>KEY PROJECT OUTPUTS; THE 7 STEPS</th>
<th>LEAD PARTY TO PLAN AND MANAGE</th>
<th>REVIEW AND AGREEMENT</th>
<th>DUTY TO WARN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 1</strong> Outline responsibility matrix</td>
<td>Principal Designer¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEP 2</strong> Outline moisture management strategy</td>
<td>Principal Designer¹</td>
<td></td>
<td>Engineers/ designers</td>
</tr>
<tr>
<td><strong>STEP 3</strong> Updated stage 3 moisture strategy document including ‘what if’ list of issues and risk mitigation</td>
<td>Principal Designer¹</td>
<td>Principal Designer¹ pre-engagement</td>
<td>Contractor pre-engagement Supply chain Engineers/designers</td>
</tr>
<tr>
<td><strong>STEP 4</strong> Updated stage 4 moisture strategy document and risk mitigation check list</td>
<td>Principal Designer¹</td>
<td>Principal Contractor²</td>
<td>Supply chain fabricators Engineers/designers</td>
</tr>
<tr>
<td><strong>STEP 5</strong> Manual for moisture management; audit trail and remedial action recorded</td>
<td>Principal Contractor²</td>
<td>Principal Designer¹</td>
<td>Supply chain fabricators Engineers/designers</td>
</tr>
<tr>
<td><strong>STEP 6</strong> Carepoint document to handover to in use customer plus maintenance schedule hand over</td>
<td>Principal Designer¹</td>
<td>Principal Contractor²</td>
<td>Engineers/designers</td>
</tr>
<tr>
<td><strong>STEP 7</strong> Care points on condition maintained</td>
<td>Facilities Management</td>
<td></td>
<td>Specialists engaged by the facilities management</td>
</tr>
</tbody>
</table>

Table 1: Seven steps of the STA moisture management strategy

1. The term Principal Designer is used in line with CDM regulation (2015) terminology and in the context of the moisture management strategy the term includes other design management roles, for example lead designer, lead architect and design and build manager.

2. The term Principal Contractor is used in line with CDM regulation (2015) terminology role for the management of the construction phase, from which input from contractors working on the project under the Principal Contractor will be provided.
RIBA stages - inputs to the process

<table>
<thead>
<tr>
<th>RIBA PLAN OF WORK</th>
<th>RIBA STAGES DESCRIPTION</th>
<th>REVIEW AND AGREEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE 1</td>
<td>Preparation and briefing</td>
<td>Detailed requirements for the project brief</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Durability objectives declared</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Design life target noted for building</td>
</tr>
<tr>
<td>STAGE 2</td>
<td>Concept design</td>
<td>Development of the design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Design life objective declared divided into key elements with sensitive items noted in the outline moisture strategy document</td>
</tr>
<tr>
<td>STAGE 3</td>
<td>Spatial co-ordination</td>
<td>Integrate with the other design disciplines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“What if?” Project team question durability impacts of design?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engage with feedback from Structural Timber Building supply chain</td>
</tr>
<tr>
<td>STAGE 4</td>
<td>Technical design</td>
<td>Final design period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific specifications and details for moisture management and durability</td>
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<tr>
<td></td>
<td></td>
<td>Engage with feedback from structural timber building supply chain</td>
</tr>
<tr>
<td>STAGE 5</td>
<td>Manufacturing and</td>
<td>Production and construction period</td>
</tr>
<tr>
<td></td>
<td>construction</td>
<td>Submission of statement of compliance or review/changes design and specification on moisture management</td>
</tr>
<tr>
<td>STAGE 6</td>
<td>Handover</td>
<td>Practical completion until the end of the defects period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Checklist and quality works sign off sheets, matched to moisture management details</td>
</tr>
<tr>
<td>STAGE 7</td>
<td>In Use</td>
<td>Operation of the building for the design life</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintenance schedule programmed and updated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building alterations processed with new design team as appropriate</td>
</tr>
</tbody>
</table>

Table 2: Durability objectives
## RIBA PLAN OF WORK

<table>
<thead>
<tr>
<th>STAGE 1</th>
<th>Preparation and briefing</th>
<th>KEY MOISTURE MANAGEMENT</th>
<th>STAGE 2</th>
<th>Concept design</th>
<th>KEY MOISTURE MANAGEMENT OUTPUT (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Design life statement</td>
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<td></td>
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<tr>
<td>STAGE 2</td>
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<tr>
<td>Concept design</td>
<td></td>
<td>Outline moisture strategy document</td>
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<td></td>
<td></td>
<td>Scope of maintenance needed for an in-service responsibility matrix</td>
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<tr>
<td>STAGE 3</td>
<td></td>
<td>Risk weighting output depending on consequence of the risk with consequent resolution of risks noted</td>
<td></td>
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</tr>
<tr>
<td>Spatial co-ordination</td>
<td></td>
<td>Design changes to protect as appropriate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAGE 4</td>
<td></td>
<td>Methodology statements to achieve design life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical design</td>
<td></td>
<td>Timber specification items</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Responsibility matrix updated with sub-contractor expectations</td>
<td></td>
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<tr>
<td>STAGE 5</td>
<td></td>
<td>Onsite technical manual for moisture management for audit and management</td>
<td></td>
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<tr>
<td>Manufacturing and construction</td>
<td></td>
<td>Feedback from structural timber building supply chain</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Likely defects in timber products, elements and assemblies that would occur if unacceptable levels of moisture are present</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Plan for moisture control and monitoring during construction</td>
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<tr>
<td></td>
<td></td>
<td>Update risk mitigation checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAGE 6</td>
<td></td>
<td>Key points signed off; check against “what if?” conditions</td>
<td></td>
<td></td>
<td>Maintenance schedule handed over</td>
</tr>
<tr>
<td>Handover</td>
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<tr>
<td>STAGE 7</td>
<td></td>
<td>Moisture monitoring</td>
<td></td>
<td></td>
<td>Maintenance schedule</td>
</tr>
<tr>
<td>In Use</td>
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</table>

### Table 3: Outputs of the process
## RIBA stages - inputs to the process cont...

<table>
<thead>
<tr>
<th>RIBA PLAN OF WORK</th>
<th>RIBA STAGES DESCRIPTION</th>
</tr>
</thead>
</table>
| **STAGE 1**  
Preparation and briefing | Client, Principal Designer |
| **STAGE 2**  
Concept design | Project design team to RIBA Stage 2 lead by Principal Designer  
Each discipline presents their key moisture management points assumed in the moisture strategy document as relevant to the concept  
Architect and project structural engineer inputs at a minimum |
| **STAGE 3**  
Spatial co-ordination | Key team members  
Architect and project structural engineer inputs at a minimum  
Where appropriate for the scale and complexity of the project structural timber building supply chain |
| **STAGE 4**  
Technical design | Project design team to RIBA Stage 4 lead by Principal Designer  
Where appropriate for the scale and complexity of the project structural timber building supply chain |
| **STAGE 5**  
Manufacturing and construction | Project design team to RIBA Stage 5 lead by Principal Designer  
Structural timber building supply chain  
Appointed persons for checks on compliance |
| **STAGE 6**  
Handover | Key persons all confirm sign-off allocated to of their areas of durability work  
Structural timber building supply chain |
| **STAGE 7**  
In Use | Facilities management |

**Table 4: Parties to the process**
7. Appendix

Moisture management guidance

There are many guidance books, papers and sources of design and construction good practice to avoid moisture defects which will provide useful information to those responsible for the moisture management strategy.

Documents available from the Structural Timber Association

Advice Note 2 - Design life
Advice Note 3 - Introduction the construction of commercial timber frame
Advice Note 4.2 - Sole plate tolerances
Advice Note 4.3 - Timber frame wall tolerances
Advice Note 5.1 - Podium support structures
Advice Note 10 - Separating walls
Advice Note 12.1 - Specifying metal fasteners
Advice Note 14 - CLT key principles
Technical Note 19 - STA Assure engineering procedures
Technical Note 23 - Durability by design
Technical Note 24 - Moisture protection during construction
Technical Note 31 - Vocabulary of roles
Differential movement in platform timber frame
Living in a timber frame house
Pocket guides (timber frame and SIPs)

Documents available from BM TRADA

Wood information sheet WIS 4-14, Moisture in timber
Wood information sheet WIS 4-28, Durability by design
Timber Frame Construction 5th edition

British Standards documents

BS6229:2018 Flat roofs with continuously supported flexible waterproof coverings