Understanding Building Pathology and the role of BS7913

*Professor John Edwards* MA, DipBldgCons, CEnv, FRICS, FCIOB, IHBC

Certified Historic Building Professional

*Director: Edwards Hart Consultants and CIOB Policy Board member*
At the very beginning...

These buildings are the different

Modern         Traditional

They perform differently
What is an historic building?

DOES IT MATTER?

• Similar design
• Similar Construction
• Similar performance
• Requires Similar Repairs
• Same understanding!
• Significance....
Authoritative Guidance

BS 7913: 2013

based on managing significance

Embracing international standards and charters
(3) ...”decisions justified on social, cultural, economic and/or environmental grounds, and usually a combination of these”.

(4) ...”conflicting pressures need to be balanced”.

(5) ...”sound research evidence base and the use of competent advisors and contractors...”
1 Scope

(1) .... “best practice in the management and treatment of historic buildings. It is applicable to historic buildings with and without statutory protection. It is not applicable to below ground archaeology or any other type of heritage asset such as movable objects or vehicles”.
BS 7913: 2013 – what it covers...

1. Description of buildings/Architecture & conservation history.
2. Significance, conservation principles and values.
3. Heritage management – pro-active & re-active – reconciling values
4. Historic areas as well as structures / buildings.
5. Condition surveys, inspections, investigations and pathology.
8. New development & adaptation.
10. Sustainability and energy efficiency.
11. Project Management.
12. Project Supervision.

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BS 7913: 2013 – what it covers…

THE CHARTED INSTITUTE OF BUILDING
BS 7913: 2013

Wide ranging authoritative guidance for all old buildings…

The most authoritative UK wide….guidance according to the IHBC – a ‘must have’.
BS 7913: 2013

Contents

0. Introduction

1. Scope

2. Normative References

3. Terms and definitions

4. Heritage Values and Significance
Use of significance, Values contributing to significance, Assessment of significance.

5. Using Significance as a framework for managing the historic environment
6. Significance as part of operational care and other interventions
Asset Management, Condition surveys and inspections, Assessment of performance and pathology, Investigation techniques and equipment, common defects and approaches to assessment, Fire strategy, Repair, Lost features, Damp and fungi, Intervention and judgment, Environmental values and sustainability, New development, Design, Context and setting, Adaptation, conversion and extension, Alterations.

7. Maintenance

8. Heritage and Project Management – with Project Supervision

Annexe A – Conservation Accreditation Schemes

Annexe B – Conservation Manuals, Logbooks and periodic inspections
It is based on...

**SIGNIFICANCE**
- Significance analysis
- Conservation Plans (and Conservation Management Plans)
- Heritage Impact Assessments

**TECHNICAL**
- Surveys (Condition, Quinquennial, etc.)
- Inspections
- Targeted Specialist Investigations

**PROCESS**
- Project management, Heritage Management & Supervision
- Maintenance management & FM
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**PROCESS**
- Project management, Heritage Management & Supervision
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Numerous references to ‘competence’

“Carried out by competent persons with knowledge of traditional materials, construction techniques and decay processes”

6.2 Condition surveys and inspections
Numerous references to ‘competence’

“Unbiased advice from competent persons based on best practice should be sought…” Understand significance.

7.1 Maintenance guidance
Numerous references to ‘competence’

“There are a number of conservation accreditation schemes that identify individuals who have achieved a recognized level of competence in building conservation”
demonstrating...

Competence

Assessment Criteria

ICOMOS

international council on monuments and sites

+ Energy Efficiency

CIOB Building Conservation Certification Scheme

Launching 22nd June 2017
Cardiff
BS 7913: 2013

and where it makes a difference..

- Significance
- Competence
- Building Pathology
- Quality Management
- Referenced by Building Regulations
The Retrofit Process

1. Condition Survey
2. Work to existing fabric – *making it more energy efficient*
3. Energy Efficiency Assessment
4. Consider use of Building Pathology
5. Consider / evaluate mix of possible ‘works’ to existing fabric and retrofit ‘measures’ – *use the STBA Guidance Wheel*
6. Test proposals with Heritage Impact Assessments
7. TEST NEW / AMENDED PROPOSALS?
8. The Heritage Impact Assessment process considers all types of issues and will exhaust their consideration
9. LIST OF RECOMMENDED MEASURES
10. Advise > Design ‘works’ and ‘measures’
11. Determine proposals that may work and *cost benefit analysis* – *may result in reconsideration*

Following BS 7913: 2013 up to the advice and design stage
Part of the retrofit process

6.2 Condition surveys and inspections

(6) Carried out by competent persons with knowledge of traditional materials, construction techniques and decay processes.

NOTE Conservation Accreditation schemes.
Part of the retrofit process

6.2 Condition surveys and inspections

(10) There should be a consistent and logical process for the inspection, recording and reporting (see Annex B for further information).
Part of the retrofit process

BS 7913: 2013: Sect 6.2 Condition surveys and inspections

(11) Surveys and inspections can conclude with the need for more detailed analysis, often termed “targeted specialist investigations” (TSI). Examples include, timber decay assessment, structural movement monitoring and environmental monitoring for dampness and humidity.

NOTE TSI’s usually go beyond a visual inspection - involve destructive and non-destructive equipment and processes, involving data collection and assessment over a period in time. Can lead to a reconsideration of the ongoing use...
Part of the retrofit process

BS 7913: 2013: Sect 6.3 Assessments of performance and pathology: 6.3.1 General

Cause of problems and not just the symptoms.

“Knowledge of the pathology of materials and the agents of decay should be sought so that corrective, preventative and remedial measures can be taken that allow the retention of original historic fabric and ensure its longevity”.

Part of the retrofit process

BS 7913: 2013: Sect 6.3 Assessments of performance and pathology: 6.3.2 Core principles and dynamics

“Pathology is broader than the decay of materials. It also encompasses the way the components interact and, how the spaces are used”.

Ventilation is important - chimney flues, sub floor vents and cupolas. Disruptions and consequences identified.

“Some decorative features are also functional, for example over sailing eaves, string courses and hood mouldings. Reinstatement of such features can fulfil a repair need”.
Part of the retrofit process

Need to properly assess dampness – methods and processes that would comply with BS 7913: 2013

Experienced (COMPETENT) building pathologist – using appropriate methods and equipment

- Thermography
- Electric capacitance meter
- Electric resistance meter
- Gravimetric method
- Carbide meter
- Hygrometer
BS 7913: 2013 - Condition Surveys

National Trust: Castle Ward, Northern Ireland
Foundry Terrace, Llanidloes
“Elements such as walls can be over a third less energy efficient if damp. Some energy efficient measures can have an adverse effect on sustainability. The actual energy efficiency of historic buildings and their potential energy efficiency with the addition of energy efficient measures should be taken in account at the outset (see 6.3). The need for energy efficiency and low carbon might also influence the selection of materials and work methods as they can impact on thermal performance and weather resistance. Building materials and products should be sourced and procured in a sustainable manner”...
……“The most effective way of ensuring energy efficiency and sustainability is to keep historic buildings in good repair so that they last as long as possible, do not need replacement and do not suffer from avoidable decay that would require energy and carbon to rectify. They should provide occupancy in an efficient manner, involving minimal production of carbon and use of energy without harming significance or the physical performance of the historic fabric. Using natural ventilation and light, and proper temperature and humidity control for individual rooms are ways of minimizing energy usage that respect the building’s material characteristics”……
Elements such as walls can be over a third less energy efficient if damp. Some energy efficient measures can have an adverse effect on sustainability. The actual energy efficiency of historic buildings and their potential energy efficiency with the addition of energy efficient measures should be taken in account at the outset (see 6.3). The need for energy efficiency and low carbon might also influence the selection of materials and work methods as they can impact on thermal performance and weather resistance. Building materials and products should be sourced and procured in a sustainable manner.
The Retrofit Process (BS 7913)

The holistic retrofit process following BS 7913: 2013 up to the advice and design stage: Dealing with existing fabric first. © Edwards Hart Ltd. For further information go to: environmentstudycentre.org
Part of the retrofit process

BS 7913: 2013: Section 5.9 Heritage impact assessments (HIA’s)

• Measure impact of proposals on significance and determine mitigation.
• Must understand and articulate the ‘significance’ value.
• “HIAs can be carried out at various levels of scale and complexity, from the effects of building works on a small structure to the effects of major development in a world heritage site”.

This requires an understanding of significance...
Part of the retrofit process

BS 7913: 2013: Section 4.3 The assessment of significance

A wide range of factors contribute to significance and their relative importance varies:

- Physical components,
- Immediate and wider setting,
- Use and associations (e.g. with a particular event, family, community, or artist and those involved in design and construction).
Part of the retrofit process

BS 7913: 2013: Section 4: Heritage values and significance

4.1 Use of significance in the management of the historic Environment

“Significance represents a public interest...”

“Research and appraisal into the heritage values and significance of the historic building should be carried out to ensure that decisions resulting in change are informed by a thorough understanding of them”. This is proportionate.

“Understanding the significance of a historic building enables effective decision...”
Part of the retrofit process

BS 7913: 2013: Individual heritage values:
1) architectural, technological or built fabric value;
2) townscape characteristics;
3) spatial characteristics;
4) archaeological value;
5) artistic value;
6) economic value;
7) educational value;
8) recreational value;
9) social or communal value;
10) cultural value;
11) religious value;
12) spiritual value;
13) ecological value;
14) environmental value;
15) commemorative value;
16) inspirational value;
17) identity or belonging;
18) national pride;
19) symbolic or iconic value;
20) associational value;
21) panoramic value;
22) scenic value;
23) aesthetic value;
24) material value; and
25) technological value
Part of the retrofit process

So what would stop this?
Part of the retrofit process

Test Proposal with a Heritage Impact Assessment

EWI

1. Why?
2. Necessary?
3. Alternatives?
4. Impact on significance?
5. Mitigate impact – if its possible – how?
Part of the retrofit process

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Part of the retrofit process

What makes it SIGNIFICANT and what could be effected:

1. Architectural – is it special?
2. Townscape characteristics – is the homogenous appearance important? Is it the only street left without EWI in the locality
3. Economic value – will it effect property values?
4. Commemorative value – why were they built?
5. A sense of identity or belonging for community
6. Material value – are they special?
IWI – Is it undertaken properly..
Quality Management

Consider using Competency Schemes...

RISK ASSESSMENT – specification non compliance measuring likelihood and impact

HIGH / MEDIUM RISK

1. ‘CERTIFICATION’ /’ACCREDITATION’ SCHEMES

ASSESS ROBUSTNESS OF SCHEMES – YES/NO

INSPECTIONS/ TESTS PERIODICALLY AND ON COMPLETION AS APPROPRIATE

DETERMINE HOW RISK IS TO BE MANAGED – 2 OPTIONS

2. TAKE THE PRO-ACTIVE APPROACH PROCESS

LOW RISK

YES

NO
1. Breaking down the specified work into activities.

2. Work out the critical stages when it can go wrong.

3. Determine what can be done to mitigate risk of specification non compliance.
Quality Management

BS 7913: 2013: Proactive Approach

PROJECT SUPERVISOR
Outline test/inspect methodology & process in accordance with specification

OUTLINE REQUIREMENTS

PROJECT SUPERVISOR
Sign Off – Work Approved

EVIDENSING / LIAISING

WORKS SUPERVISOR
Propose test/inspect methodology & process in accordance with specification

PROPOSALS APPROVED

WORKS SUPERVISOR
Implement test/inspect methodology & process - evidencing to PS

PROJECT SUPERVISOR
Monitor the WS and undertake tests/inspections as and when appropriate

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Quality Management

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Quality Management

No competence – No standard - No process – No quality
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