## 1.0 INTRODUCTION

### 1.1 Background

In an assessment of England's historic environment – *Power of Place: The Future of the Historic Environment* – it was found that nearly 4% (1,625) of grade I and II* listed buildings and structural scheduled monuments were at risk through neglect and decay. Many are capable of economic use and could be saved through reinvestment. A similar proportion of grade II buildings are also at risk, perhaps as many as 14,000 across the country, but again most will be viable once repaired.

Statistics presented in the *State of the Environment Report 2002* show only a slight improvement, with 3.7% (1,398) of grade I and II* entries being classified at risk.

It is widely accepted that the single biggest challenge facing conservation is the lack of adequate maintenance. This is recognised in *Power of Place*, and implicit in the responding Government report – *The Historic Environment: A Force for Our Future*.

The same message – that regular maintenance and repair are the key to the preservation of historic buildings – is also found in international charters and guidance documents, *Planning Policy Guidance 15: Planning and the Historic Environment*, British Standard 7913, and guidelines from the Council of Europe.

The planned programme of research – *Maintaining Value* – will test the hypothesis that systematic maintenance offers the most sustainable and cost-effective maintenance regime for historic buildings, with associated opportunities for new products and services. This initiative is both timely and deserving of support.

### 1.2 Nature and extent of research module

Having submitted an expression of interest to Maintain our Heritage on 19th February 2003, De Montfort University was invited to tender for 'Research Module 6: Training and Education' by a deadline of 17th March 2003. A tender document was prepared and submitted on 14th March 2003. Following a successful interview held in Bath on 25th March 2003, De Montfort University was appointed by Maintain our Heritage to undertake Research Module 6 alongside Arup Research+Development as appointed consultant for 'Research Module 4: Technology' and 'Research Module 5: New Businesses'.[1]

Commencement of the research programme for Research Module 6 was set for 6th May 2003, with completion on 30th September 2003 (i.e. five months). A revised programme was submitted to Maintain our Heritage on 16th May 2003, which extended the research period to 14th November 2003 in order to coincide with that previously agreed for Research Modules 4 and 5 (i.e. six months).

This report presents the findings of research undertaken by De Montfort University on behalf of Maintain our Heritage in relation to 'Research Module 6: Training and Education'. It is therefore limited to providing an understanding of the key issues contained in the brief issued by Maintain our Heritage and summarised in the tender document.

The results, discussion, and recommendations put forward in this report are based on specific research relating to the 'Research Module 6: Training and Education', and should not be used for purposes other than for the *Maintaining Value* programme.[2]

---

[1] Although the tender for this research module was submitted to and accepted by Maintain our Heritage, the actual research was undertaken with De Montfort University acting as sub-contractor to Arup Research+Development.

[2] For information of other *Maintaining Value* research modules, see http://www.maintainourheritage.co.uk/findings.htm

### 1.3 Aims and objectives

The watchword of Maintain our Heritage (MoH) is 'Prevention is better than cure'. The aim of the *Maintaining Value* programme is thus to demonstrate and champion the provision of systematic preventive maintenance for historic buildings as an alternative to the current reliance on repair and corrective works.

Within this overall *Maintaining Value* programme, 'Research Module 6: Training and Education' is intended to identify the necessary skills and experience required to perform the inspection services and practical maintenance tasks; existing skills gaps; the means by which such skills gaps can be corrected; and methods of monitoring needs, standards, and skills gaps over time.

The specific objectives allocated to this module are:

1. to identify the necessary skills and experience required to perform the inspection services and practical maintenance tasks in relation to both heritage and non-heritage properties and in the context of the supplier market;
2. to identify the existing skills supply and gaps for performing inspection services and practical maintenance tasks in relation to both heritage and non-heritage properties and in the context of the supplier market;
3. to identify the means of correcting the skills gaps; and
4. to identify methods of monitoring needs, standards, and skills gaps over time.

Implicit within these tasks is the need to identify, assess, and provide evidence to challenge and change existing training and educational provision in order to meet the overall aim of the *Maintaining Value* programme.

### 1.4 Methodology

Although this tender relates to 'Research Module 6: Training and Education', *Maintaining Value* will draw on a range of skills and disciplines to fulfil the overall aim of the programme.

It is therefore seen that 'Research Module 6: Training and Education' will draw on the shared knowledge and experience of researchers engaged with other *Maintaining Value* research modules to ensure commonality of method and output. Co-operation and communication are seen as vital to the success of the programme.

The specific tasks to be undertaken in order to achieve the stated objectives are as follows:

1. Literature search and review;
2. Structured interviews with key persons and organisations involved with the planning, commissioning, implementation, and monitoring of maintenance tasks. This will include owners, occupiers, professional advisers, professional and craft institutions, training organisations, advisory bodies, and maintenance service providers concerned with the maintenance of heritage and non-heritage properties (linked with task 3 below);
3. Structured questionnaires sent to three key groups (client, professional adviser, and service providers) to obtain qualitative and, where practicable, quantitative data on the skills, experience, and training required to maintain heritage and non-heritage properties (linked with task 2 above);
4. Visits to selected heritage and non-heritage properties (linked to tasks 2 and 3 above);
5. Analysis and synthesis of primary and secondary data;
6. Evaluation of primary and secondary information;
7. Preparation and submission of draft report (before 30th September 2003);
8. Revision of draft report; and
9. Preparation and submission of final report (before 14th November 2003).

In addition, the following administrative tasks will be performed during the contract period:

1. Attendance at two meetings with MoH (dates and locations to be agreed);
2. Attendance at meeting with Steering Group (London on 20th May 2003); and
3. Attendance at meeting of Task Group (London on 24th June 2003).

### *1.4.1 Questionnaire design*

The design of the research module questionnaire was intended to obtain data in six key fields:

Section 1: Maintenance function
Section 2: Inspection services
Section 3: Practical maintenance services
Section 4: Causes of defects
Section 5: Skills supply
Section 6: Additional comments

Each section contained tick-box (closed) questions, based on the required rating of pre-determined responses, blank-box (open) generative questions requiring answers to specific questions, or a mix of both types. This complementary design was chosen to ensure the return of a minimum amount of data, whilst allowing those wishing to expand their responses with observations and comments to do so.

### *1.4.2 Questionnaire distribution*

A total of 101 principal questionnaires were sent to representatives of the three key groups – clients (12: 11.9%), professional advisers (67: 66.3%), and service providers (18: 17.8%), together with specific training establishments (4: 4.0%) (Appendix A) – in order to obtain qualitative and, where practicable, quantitative data on the skills, experience, and training required to maintain heritage and non-heritage properties (Appendix B). Such selective sampling, based upon a preconceived but reasonable initial set of factors (e.g. previous conservation practice, known maintenance activities), reflects the maintenance skills and/or experience of individuals engaged in, or responsible for, work to heritage and non-heritage properties.[3]

Each recipient was contacted in advance so as to brief the individual on the aims of the research module and ensure his/her willingness to complete and return the questionnaire. A total of 50 questionnaires were returned (49.5% response rate). The principal reason for non-returns is considered to be work pressures associated with spring/summer holiday periods.[4]

In addition to the main questionnaire, a supplementary questionnaire was sent specifically to those recipients who considered themselves as training providers (Appendix C); this included service providers offering in-houses apprenticeships or practical training. A total of 43 such questionnaires were sent out, with 16 returns (37.2% response rate).

Two further supplementary questionnaires – one for clients and one for service providers – were sent out on behalf of Arup Research+Development to 32 and 23 recipients respectively (Appendix D and E).

[3] The selected sample was made up of clients (owner, occupier, professional client), professional advisers (architects, building surveyors, conservation officers, conservators, estate managers, maintenance staff, planners, quantity surveyors, specifiers, structural engineers), service providers (builders, contractors, material suppliers), and specific conservation training establishments.

[4] In addition, it is evident that at least one returned questionnaire was lost by the postal service.

Selection of questionnaire recipients was based predominantly on personal contacts across the three key groups, with an emphasis placed on professional and service providers as principal sources of relevant data.

### *1.4.3 Questionnaire data analysis*

Analysis of data obtained from closed questions has been performed using simple statistical methods to both rate data and to correlate one set of data with another. Qualitative data obtained from open questions have been analysed through the identification of themes and relationships leading to the development of a set of generalisations.

It should, however, be noted that questionnaire respondents have not always given answers relevant to open questions. The difference between skill (i.e. competence, expertise) and experience is, for instance, often confused. There is also a misconception that accreditation forms part of education and training, rather than relating to experience gained after the training process. At a general level, the terms 'conservation' and 'maintenance' (as relating to heritage properties) are often loosely used by respondents without distinguishing between specific educational and training requirements.

## 1.5 Structure of report

This report is structured to provide the reader with a summary of current guidance on maintenance as it affects and influences the historic built environment (Section 2.0) before presenting the results of the research module. A profile of the questionnaire respondents is given in Section 3.0, based on maintenance function, building type, and workload. Section 4.0 considers the skills and experience required to undertake inspection services, whilst Section 5.0 considers those necessary to undertake practical maintenance tasks. Both sections consider heritage and non-heritage properties, and the problems commonly associated with these separate activities. Section 6.0 provides a summary of the causes of building defects, classified according to the affected building element/component and the nature of the defect, and draws comparison with the results of previous research, albeit largely in relation to modern forms of construction. Section 7.0 presents findings on current skills gaps as they affect education and training for inspection and practical maintenance services, and considers standards and monitoring procedures for achieving best practice. Information on current training opportunities, together with examples of current training initiatives, is given in Section 8.0. The report is concluded in Section 9.0 with recommendations for future action.

All tables show the source of the presented information in relation to the section and question of the main questionnaire from which data have been drawn.

This final report is based largely on the draft module report submitted to Arup Research+Development on behalf of Maintain our Heritage in September 2003, and has been revised to take account of the following communications:

| Ref | Date | Source |
|---|---|---|
| 1 | 15.10.03 | E-mail from Timothy Cantell via Deborah Lazarus: 'General comments on Research Modules 4, 5 and 6 draft reports' following MoH meeting |
| 2 | 20.10.03 | E-mail from Timothy Cantell via Deborah Lazarus with tracked comments and revisions to 'Summary' of draft report |
| 3 | 26.10.03 | E-mail from Timothy Cantell: 'English Heritage's Comments on Research Module 6: Training and Education' prepared by Joy Russell of English Heritage |
| 4 | 27.10.03 | E-mail from Timothy Cantell with summarised comments from Lee Bryer of CITB |
| 5 | 28.10.03 | E-mail from Timothy Cantell: 'Minutes of the Task Group Meeting' held on 22 October 2003 |
| 6 | 03.11.03 | E-mail from Timothy Cantell with clarification of queries raised by author (DW) |
| 7 | 07.11.03 | E-mail from Timothy Cantell with copy comments from Lee Bryer of CITB |
| 8 | 11.11.03 | E-mail from Lee Bryer of CITB with additional information |

## 1.6 Acknowledgements

The authors of this report would like to thank Maintain our Heritage and Arup Research+Development for their support and co-ordination of 'Research Module 6: Training and Education', the recipients and respondents of the questionnaires, ICOMOS-UK Education and Training Committee for permission to use the conservation course information presented in Appendix F, and various individuals and organisations for supplying information and commenting on aspects of the research programme.

## 2.0 THE MAINTENANCE AGENDA

### 2.1 Section introduction

Maintenance of the historic built environment has been a key statement of intent in all contemporary conservation information and guidance. Whilst laudable, it is only recently that concern has become openly expressed for the diminishing supply of craft skills and the actions needed to regenerate craft training. The following statements and action points draw attention to the concerns of key conservation agencies and provide a contextual framework for this report.

### 2.2 *Planning Policy Guidance 15: Planning and the Historic Environment* [5]

Planning Policy Guidance 15 (PPG 15) provides a statement of Government policy for the identification and protection of historic buildings, conservation areas, and other elements of the historic environment. In this, it offers guidance on the upkeep and repair of historic buildings:

> *Regular maintenance and repair are the key to the preservation of historic buildings. Modest expenditure on repairs keeps a building weathertight, and routine maintenance... can prevent much more expensive work becoming necessary at a later date. It is a common misunderstanding that historic buildings have a fixed lifespan, and that gradual decay of their fabric is inevitable. On the contrary, unless there are intrinsic defects of design or materials, the lifespan of a historic building may be indefinite provided that timely maintenance, and occasional major repairs...are regularly undertaken.... Regular inspection is invaluable.* (Section 7.1)

### 2.3 *British Standard 7913*[6]

British Standard 7913 provides information, advice, and guidance on the principles of the conservation of historic buildings, including consideration of the objectives of conservation and conservation in practice:

> *Maintenance: Routine work necessary to keep the fabric of a building, the moving parts of machinery, grounds, gardens or any other artefact, in good order.* (Section 4.9)
>
> *The value of good environment: Fine architecture and good buildings in sound condition can be of great importance to the establishment and maintenance of good environment, both as an indicator of economic health and a stimulus to economic activity.* (Section 6.3.4)
>
> *Employment and training: The general care, maintenance and repair of buildings depend mainly on labour and skill. Older buildings in particular are almost infinitely maintainable and repairable, using simple materials and tools, and require a minimum of energy and other non-renewable resources. Such work requires dedication, skill, care and craftsmanship to various degrees. The results will often be visible and can give pleasure and satisfaction.* (Section 6.3.5)
>
> *Knowledge, experience and skill: The responsibility placed on the owners and occupiers of historic buildings is made clear in the legislation governing their protection. All buildings should be systematically maintained and it is desirable for such maintenance, including every day husbandry, to be planned as a regular routine, usually on a five-year cycle. Some understanding of the nature of the buildings and its actual or potential problems will be of great advantage to the owner and occupiers in devising such routines, coupled with good specialist advice.*

---

[5] Department of the Environment / Department of National Heritage (1994). *Planning Policy Guidance 15: Planning and the Historic Environment*. PPG 15. HMSO, London.

[6] British Standards Institution (1998). *Guide to the Principles of the Conservation of Historic Buildings*. BS 7913. BSI, London.

*Routine maintenance and housekeeping: Systematic care based on good maintenance and housekeeping is both cost-effective and fundamental to good conservation. Early action can often prevent decay and avoid the need for major intervention later. Any building is best and most economically maintained by establishing a consistent level of good repair by a carefully thought out, and intelligently applied routine of maintenance and housekeeping. It is essential that there should be easy and safe access to all parts of a building for maintenance purposes.* (Section 7.1.3)

*Essential information about each building, including materials, construction, services, maintenance and housekeeping procedures, should be maintained and regularly updated in a conservation manual.* (Section 7.2.1)[7]

### 2.4 *Power of Place: The Future of the Historic Environment* [8]

The English Heritage *Power of Place* report provides a review to Government of policies relating to England's historic environment. Attention is given to the current lack of maintenance and the need to invest in traditional building skills:

*Regular, systematic condition surveys and planned routine maintenance are essential if the money spent on major repairs is not to be wasted. The Church of England's system of five-yearly inspections by qualified architects or surveyors provides a model of responsible long-term stewardship. Secular owners need to be encouraged to adopt a similar approach, tailored to the needs of smaller historic buildings.* (Section 2.3; Paragraph 53)

*Private owners of listed buildings have an implied duty of care, since failure to maintain them can lead, in time, to compulsory acquisition.... Consideration should be given to making this implicit duty explicit, provided it can be balanced by appropriate fiscal incentives and grants.* (Paragraph. 54)

*Public bodies too should have a more explicit duty of care towards the historic environment, and should be made accountable for their stewardship through annual monitoring of their performance.* (Paragraph 55)

Recommendation 6 – 'Encourage better maintenance' – states that for the Government there should be a new 'statutory duty of care on owners of listed buildings, scheduled monuments and registered parks and gardens, provided there is support through fiscal incentives and a wider availability of grants', and that public bodies should be accountable 'for their performance in maintaining their historic estates'. For the heritage sector, there must be a 'shift from cure to prevention, by encouraging regular condition surveys and planned maintenance and piloting self-help initiatives and low-cost insurance schemes'. For the owner, the recommendation is to 'carry out routine maintenance and regular condition surveys'.

In addressing maintenance skills, it is made clear that there is a shortage of traditional building skills in many parts of the country. 'Opportunities for training, particularly craft apprenticeships, are needed to meet future demand, and employers...need to be given an incentive to provide training'. Reference is made to the Urban White Paper, *Our Towns and Cities: the Future*, in which regional centres of excellence are proposed as a means of bringing together regional and local bodies to improve skills and training relevant to regeneration.

The current complexity of professional and craft training is highlighted as causing confusion amongst owners, practitioners, and the construction industry. A national conservation-training forum is seen as a means of providing training and validation.[9]

---

[7] See also sections 7.2.4 for 'Conservation manuals', 7.2.5 for 'Log books', and 7.2.6 for 'The five-yearly cycle'. Also Annex D for 'Conservation manuals, log books and five-yearly inspections'.

[8] English Heritage (2000). *Power of Place: The Future of the Historic Environment*. December. English Heritage, London.

Recommendation 7 – 'Promote conservation training and craft skills' – states that public bodies should be required by the Government to take training policies into account when awarding contracts and should support regional centres of excellence for skills training and development. For the heritage sector, a national conservation training forum should be established to bring together all training and qualifications initiatives and promote equal opportunities, broaden the training of conservation officers, and provide help and advice for private owners in seeking experienced consultants and skilled craftsmen.

### 2.5 *Informed Conservation*[10]

This English Heritage publication sets out guidelines on the techniques available for understanding historic buildings and their landscapes, and particularly how to apply such an understanding to conservation projects. The author explains why this is central to the care of the historic environment and looks particularly at how understanding is relevant to making decisions about the maintenance, repair, and management of historic buildings and their landscapes:

> *Conservation used to be synonymous with preservation. Yet conservation today is something much more dynamic, which ranges from maintenance and repair, through to finding appropriate new uses when necessary...Conservation is becoming increasingly positive and proactive, rather than negative and re-active.*
>
> *...work involved in reaching an understanding might be regarded as a luxury, as diverting resources away from the practicalities of maintenance and repair (and indeed there is no question that routine maintenance should always be a first priority.* (Pages 12–13)
>
> *Regular maintenance of an historic building and its landscape should always be the first priority of any owner or manager. Maintenance will prevent deterioration now and major expenditure later on. Minor works to buildings...are a far better use of scarce resources than undertaking major structural repairs once significance has been damaged through lack of care.* (Page 56)
>
> *In the case of a complex site, that understanding may be set out as a conservation/management plan or statement...which can include, amongst other things, guidelines for maintenance staff. Minor works that can benefit from the CoBRA process are cited as replacement of door furniture, fixtures, and fittings; cleaning of floors; and painting and repairing glazing or roofs. Long-standing maintenance staff will often have knowledge that is worth recording for the future, based on their memories of previous work done by themselves or by their predecessors.* (Page 56)

### 2.6 *The Historic Environment: A Force for Our Future*[11]

Publication of this Government statement, in response to the English Heritage review *Power of Place: The Future of the Historic Environment*, offered the following action points under the heading 'Realising Educational Potential':

- English Heritage will co-ordinate the work of the Buildings Skills Action Group and the Construction Industry Training Board and other interests to 'ensure a coherent approach to meeting skills requirements'. (Paragraph 2.17);

---

[9] The National Heritage Training Group has since been formed by the CITB and other conservation organisations to '...bring together all training and qualifications initiatives and promote equal opportunities'. See: Richardson, N. (2003). 'National Heritage Training Group', *APT News*, No 13, Spring, p. 4.

[10] Clark, K. (2001). *Informed Conservation: Understanding Historic Buildings and their Landscapes for Conservation*. English Heritage, London.

[11] Department of Culture, Media and Sport (2001). *The Historic Environment: A Force for Our Future*. December. DCMS (Architecture and Historic Environment Division), London.

- The Government is 'exploring with the Learning and Skills Council how some planned Centres of Vocational Excellence could specialise in skills relevant to the historic environment'. (Paragraph 2.18);
- The Government will encourage other grant-givers to give a degree of priority to training in conservation craft skills. (Paragraph 2.19); and
- The Government has asked English Heritage to 'work with one or two major education providers to develop courses that will match the skills required within the [historic environment] sector'. (Paragraph 2.21).

### 2.7 *Sustaining Our Living Heritage: Skills and Training for the Heritage Sector*[12]

Based on research undertaken by the HOST Consultancy into the skills and training needs of the heritage sector, this report provides a useful summary of the structures and attitudes that influence vocational education and training, together with examples of how certain organisations have responded to the challenges of skills shortages.

In its conclusions, the report highlights the need to 'redress the imbalance between the demand and supply of skills needed by the heritage sector'. On the one hand, there needs to be a 'radical shift in attitudes to training and development in the heritage sector', whilst, on the other hand, education and training providers need to re-orientate their services to respond to 'too wide a gap between the skills that heritage organisations and specialist firms need and what the education and training establishment is offering'.

In order to make progress, it is stressed that a 'closer working relationship and greater mutual respect [are needed] between education and training providers, employers and sub-contractors'.

### 2.8 *Making the Most of our Civic Heritage*[13]

This English Heritage consultation document outlines the steps to be taken to fulfil the Government commitment given in *A Force for Our Future* report for advice to local authorities on the care of their historic assets. This includes consideration of cyclical inspection and planned maintenance, the importance of maintenance records, and the need for specialist expertise:

> *Property maintenance is frequently the first casualty of short-term revenue budget pressures, even where this runs counter to prudent asset management.... Successful asset management requires a long-term view and leadership.*[14]
>
> *Cyclical inspection and planned maintenance. Planned maintenance and repair programmes are needed, based on cyclical, detailed inspection reports.* (Section 2.2)
>
> *The importance of maintaining records. Reliable information, easily accessed, is a prerequisite of good property management. Specific arrangements to ensure continuity of archives relating to historic assets are essential.* (Section 2.3)
>
> *The need for specialist expertise. Professionals and contractors working on historic assets need specialist skills to ensure that proposals and works are not detrimental. This is true of all stages in the process, from conservation statements, condition surveys and feasibility studies to specifying and executing alterations, repairs or routine maintenance.* (Section2.4)

---

[12] Heritage Lottery Fund (2002). *Sustaining Our Living Heritage: Skills and Training for the Heritage Sector*. February. Heritage Lottery Fund, London.

[13] English Heritage (2002). *Making the Most of our Civic Heritage: Some Guiding Principles for Decision-Makers*. Consultation draft (June). English Heritage, London.

[14] Quoted from National Audit Office (2000). *Hot Property*. National Audit Office, London.

### 2.9 *State of the Historic Environment Report* [15]

This report, along with associated summary document and regional factsheets, builds on the previous English Tourism Council publication *The Heritage Monitor* and offers a response to the request *in A Force for Our Future* for a pilot historic environment report. In this, it considers the link between tourism and the historic environment

> *The HHA [Historic Houses Association] calculates that the average annual maintenance costs for historic houses is £40,000 per house. This equates to some £45m per year for all historic houses in the Association. In addition average capital repairs over a five-year period totalled £215,000 per property or around £43m per year for all houses in the Association.* (Section 2.3)

Possible headline indicators for future years under the theme *Employment in the historic environment*, are 'Estimated employment in the private sector including crafts people, builders, consultants etc' and 'People employed in the public sector managing the historic environment, excluding the direct tourism jobs'. (Section 2.5)

In the summary accompanying the *State of the Historic Environment Report*, the section entitled 'Threats and Challenges' included the following statements:

- *Maintaining and improving our historic buildings is not just a question of money. There is a serious skills shortage in the construction industry. This is a real threat.*
- *Many buildings...were built before 1919 using traditional building techniques. Traditional building skills need to be retained if these buildings are to be kept in good repair.*
- *Research by the Heritage Lottery Fund has identified shortages of bricklayers, stone masons, joiners and scaffolders as well as the more specialist craft skills of thatchers, metalworkers and stained glass conservators. There is also a shortage of conservation architects, engineers, quantity surveyors and builders with specialist skills and experience*.[16]

### 2.10 *Protecting our Historic Environment: Making the System Work Better* [17]

This Government consultation paper sets out a package of suggestions for change with the aim of engaging wider public interest in the systems used for deciding what is valued in the historic environment.

Under the heading of 'Training', the Government seeks to 'animate a debate about the skills, knowledge and experience needed across the whole sector to achieve the improvements anticipated in this paper'. The question posed is 'What are the important skill gaps and what action would be most effective to bring about swift change?'. (Question 17)

### 2.11 Section summary

It is evident from the statements and action points of key conservation agencies that planned preventive maintenance is considered the key to a long-term, sustainable future for the historic built environment. The diminishing supply of craft skills and the actions needed to regenerate craft training are highlighted, as too is the shortage of professional advisers with the requisite specialist skills and experience to advise on works to heritage properties.

---

[15] English Heritage (2002). *State of the Historic Environment Report 2002*. November. English Heritage, London.

[16] Gates, C. (2002). 'Worthy Inheritance', *Building Design*, 29 November, p. 9. This article draws attention to the skills shortage in conservation architecture and highlights both the different approach and different set of priorities required for working in the heritage market.

[17] Department of Culture, Media and Sport (2002). *Protecting our Historic Environment: Making the System Work Better*. July. DCMS (Architecture and Historic Environment Division), London.

The following section provides background information on the questionnaire respondents who provided data for this module.

## 3.0 PROFILE OF QUESTIONNAIRE RESPONDENTS

### 3.1 Section introduction

This section provides background information on respondents, drawn from principal questionnaire returns (Appendix B).

### 3.2 Maintenance function

In considering the maintenance function of the questionnaire respondents, 13% categorised themselves as clients (i.e. owner, occupier, professional client), 55% as professional advisers (i.e. architect, surveyor, specifier), and 26% as service providers (i.e. builder, contractor, material supplier), with the remainder engaged specifically in training. In a small number of cases these separate roles were combined (i.e. client/professional adviser).

### 3.3 Building type

The breakdown of building types with which the questionnaire respondents are engaged was as follows:

- Commercial: 10%
- Domestic: 21%
- Educational: 12%
- Estate: 10%
- Industrial: 7%
- Institutional: 13%
- Religious: 20%
- Other: 7%

Building types referred to as 'Other' included military, museum exhibits (i.e. open-air museum), public buildings, scheduled ancient monuments, and standing ruins.

In relating 'building type' with 'maintenance function' (Figure 1), the greatest involvement for the three key groups (clients, professional advisers, service providers) is with domestic and religious buildings. The client group has a significantly greater input into work on estate buildings than does the professional adviser group. This is presumably because clients often possess professional skills (e.g. clients managing their own estate) and deal directly with service providers. Clients also have a greater input into 'Other' building types, due possibly to the specialised nature of the subject buildings, but no involvement with industrial buildings.

### 3.4 Maintenance workload

The proportion of total workload for the questionnaire respondents concerned with maintenance of heritage properties is:

- 0–25%: 33%
- 26–50%: 17%
- 51–75%: 17%
- 76–100%: 33%

In relating 'maintenance workload' with 'maintenance function' (Figure 2), it appears that the client group is not typically involved with maintenance (0–25%), whereas service providers are, understandably, involved to a much higher degree (51–100%). The professional adviser group appears either to be significantly involved or not, presumably depending on the nature of their workload.

### 3.5 Section summary

Given the pattern of maintenance activities, especially in relation to the range of building types, there is a clear emphasis on work to domestic and religious properties. This would seem to follow the traditional procurement route of client–professional adviser–service provider, and highlight the success of the quinquennial (and other similar) inspection system and the particular demands and expectations of the homeowner.

The following section considers inspection services in relation to heritage and non-heritage properties.

**Figure 1: Relationship between building type and maintenance function**

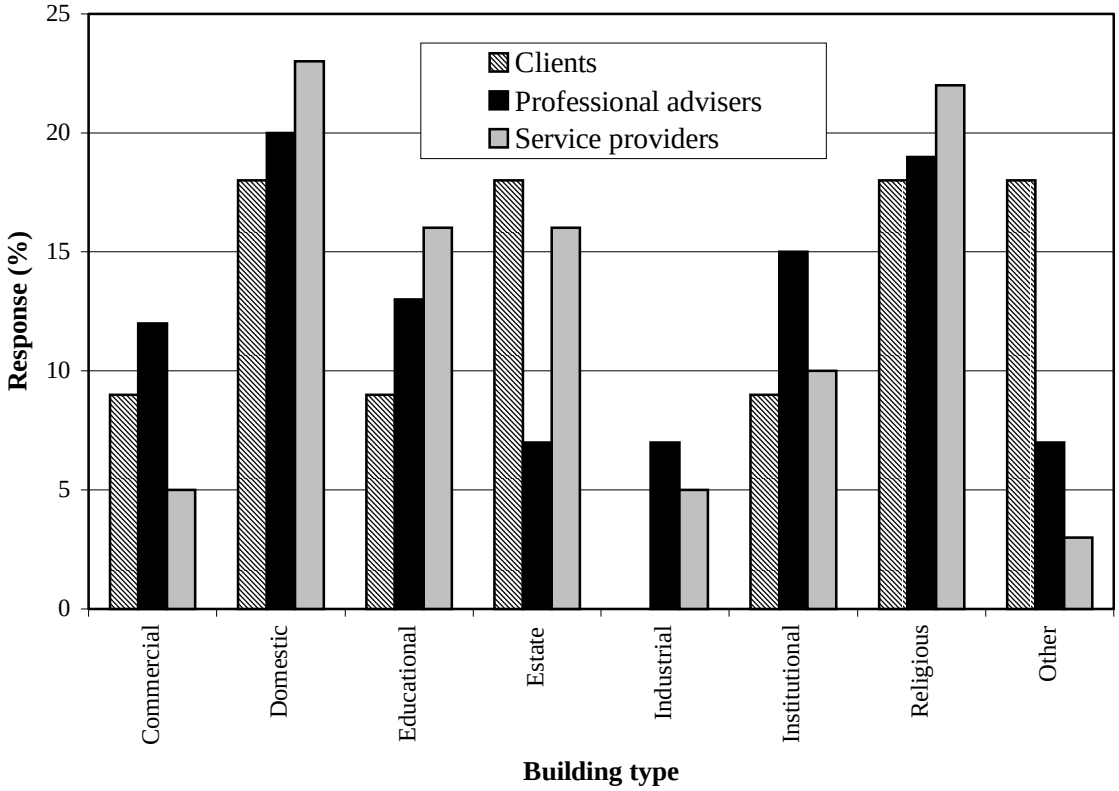
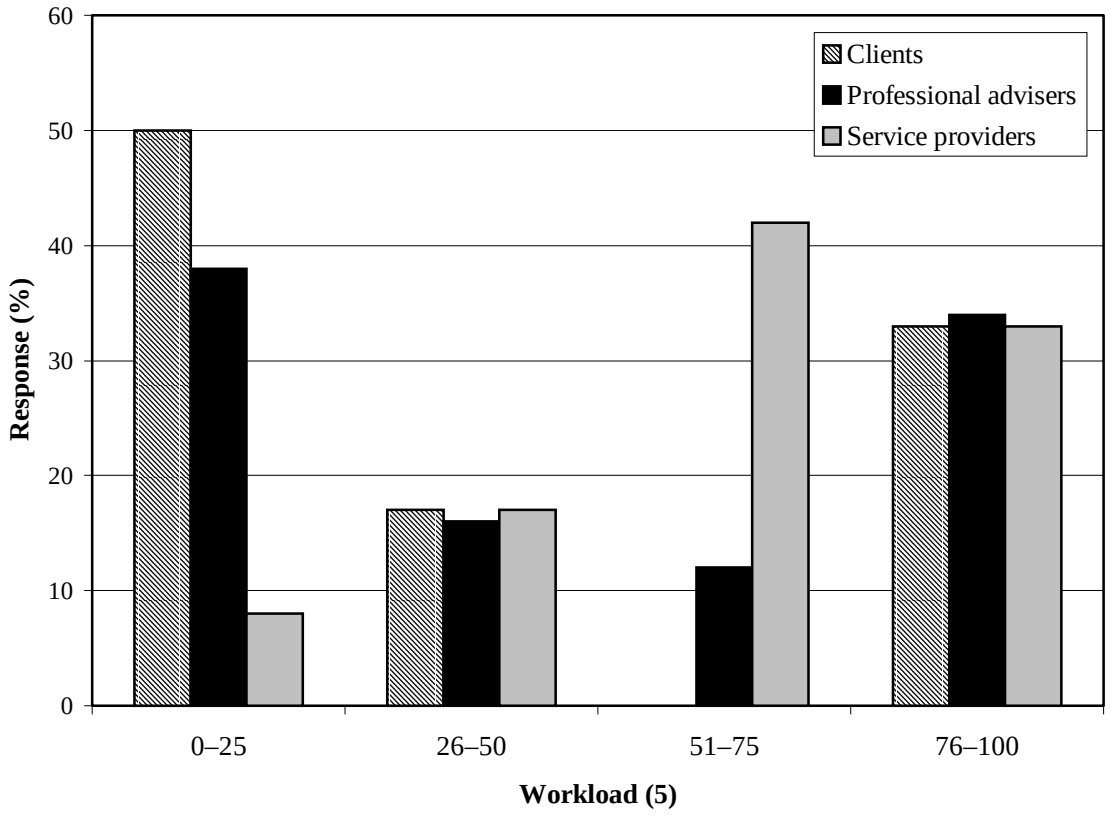



**Figure 2: Relationship between maintenance workload and maintenance function**



## 4.0 INSPECTION SERVICES

### 4.1 Section introduction

It is estimated that about 400,000 people work in some capacity in property services within the United Kingdom.[18] The number involved, whether wholly or intermittently, in the heritage sector – and particularly in relation to maintenance services – is not known. There is, however, a recognised shortage of conservation advisers with the necessary specialist skills and experience to work on heritage properties.

This section considers the skills and experience necessary to provide inspection services in relation to heritage and non-heritage properties, perceived differences between the two groups, the distinction between corrective and preventive maintenance, and common inspection problems.

### 4.2 Inspection skills and/or experience

The skills and/or experience considered to be required for the inspection of heritage properties (i.e. carried out in advance of maintenance activities) may be summarised as follows, where 'skill' is defined as competence or expertise and 'experience' as knowledge, practice, or training.

The inspection skills and/or experience have been divided into primary skills (i.e. those considered essential to performing the inspection of heritage properties) (Table 1) and secondary skills (i.e. those considered desirable, but not essential) (Table 2).

Furthermore, the single most important skill for inspecting both heritage properties (Table 3) and non-heritage properties (Table 4) is identified, and hence information gained on the perceived difference between the skill requirement for inspecting heritage and non-heritage properties (Table 5).

**Table 1: Primary inspection skills and/or experience (Source: s. 2, q. 5)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Client (12)*** | |
| Understanding traditional materials and forms of construction | 33.4 |
| Identification and analysis of defects | 16.7 |
| A mix of practical and academic skills (e.g. observation skills) | 16.7 |
| Recommending appropriate remedial action | 8.3 |
| Practical experience of dealing with heritage properties | 8.3 |
| Communication skills (i.e. helping those managing the property to understand its significance and problems) | 8.3 |
| General built environment skills/qualification | 8.3 |
| ***Professional advisers (45)*** | |
| Understanding traditional materials and forms of construction | 29.0 |
| Postgraduate conservation skills/qualification | 15.6 |
| Practical experience of dealing with heritage properties (e.g. repairs) | 13.3 |
| General built environment skills/qualification | 11.1 |
| Skills of survey and analysis (e.g. open eyes, observe, understand, problem solving) | 8.9 |
| Knowledge of architectural history | 6.7 |
| Understanding defects and defect diagnosis | 4.4 |
| Knowledge of/empathy with/understanding of heritage properties | 4.4 |
| Membership of recognised professional institution/organisation (e.g. IHBC) | 2.2 |
| Knowledge of principles of conservation | 2.2 |
| Understanding differences between old and new (i.e. significance) | 2.2 |

[18] PSNTO (2003). *The Property Services Sector and its Diversity*. PSNTO, London.

| | |
|---|---|
| ***Service providers (16)*** | |
| Appreciation of/knowledge of/empathy with/understanding of heritage properties | 25.0 |
| Practical experience of dealing with heritage properties | 18.7 |
| Understanding traditional materials and forms of construction | 12.4 |
| Academic qualification | 12.4 |
| Craft background/training | 6.3 |
| Experience as a conservation builder | 6.3 |
| Advanced management training | 6.3 |
| Technical qualification | 6.3 |
| Specific training in maintenance/repair | 6.3 |

Although dominated by the professional adviser group (62% of total responses), the key primary skills identified are the same for all three groups:

- Understanding traditional materials and forms of construction (26%);
- Understanding and practical experience of heritage properties (22%);
- General built environment skills/qualifications (22%); and
- Knowledge/skills in building conservation (12%).

General built environment skills (i.e. surveying knowledge/experience) are seen as both an important primary skill and the main secondary skill identified by all three groups (24%) (Table 2). However, it must be noted that the professional advisers again dominate the responses, and influence the statistics.

Practical experience is seen to be the most important skill by the service providers, with 18.7% of the group believing this to be a primary requirement and 33.4% believing it to be of secondary importance. Across the three groups, practical experience is still highlighted as an important skill requirement, and is given as the second most important secondary skill (12%).

Both clients and professional advisers place importance on acquiring a postgraduate qualification in conservation, making this the third most important secondary skill overall (10%).

**Table 2: Secondary inspection skills and/or experience (Source: s. 2, q. 6)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (6)*** | |
| Postgraduate conservation qualification | 16.7 |
| Knowledge of building/material performance | 16.7 |
| Practical experience (i.e. working alongside experienced practitioner) | 16.7 |
| Technical understanding to enable accurate defect diagnosis and remediation | 16.7 |
| Personal abilities (e.g. head for heights) | 16.6 |
| Methodology and approach | 16.6 |
| ***Professional advisers (32)*** | |
| Surveying knowledge/experience (e.g. defect diagnosis, structural performance, report writing) | 18.8 |
| Postgraduate conservation qualification | 12.4 |
| Understanding of broader issues (e.g. health and safety, disability, fire, Building Regulations, ecclesiastical exemption) | 9.3 |
| Practical experience (e.g. letting and administering contracts, cost/contract management, issuing instructions) | 6.3 |
| Personal abilities (e.g. head for heights, getting dirty) | 6.3 |
| Contacts with third-party advisers | 6.3 |
| Understanding personal limitations | 6.3 |
| Knowledge of architectural history | 6.3 |

| | |
|---|---|
| Communication skills (incl. report writing) | 6.3 |
| Keen interest in heritage properties | 3.1 |
| Experience of 'shadowing' experienced practitioners | 3.1 |
| Relationship with contractors and operatives | 3.1 |
| Understanding client objectives | 3.1 |
| Skills of interpretation/recording | 3.1 |
| Ability of adopt a multidisciplinary approach | 3.1 |
| Knowledge of appropriate repairs (i.e. minimum intervention, significance) | 3.1 |
| ***Service providers (12)*** | |
| Practical experience | 33.4 |
| Appreciation of faults that may cause deterioration (i.e. defects) | 25.0 |
| Specialisation in one craft skill | 16.7 |
| Knowledge of architectural history | 8.3 |
| Knowledge of conservation philosophy | 8.3 |
| Surveying experience | 8.3 |

When asked for the single most important inspection skill in relation to both heritage and non-heritage properties, the three groups are in better agreement. All three groups identify an understanding of traditional materials and forms of construction as a key skill in relation to heritage properties (29%), with inspection experience (i.e. defect diagnosis and prognosis) of almost equal importance (23%) (Table 3). The same skills have been identified for non-heritage properties (Table 4), but far more importance has been placed on inspection experience (42%) than on knowledge of different materials and forms of construction (25%).

In terms of the principal skill difference between the inspection of heritage and non-heritage properties (Table 5), two main differences have been identified:

- Knowledge of traditional materials and forms of construction (35%); and
- Ability to identify historical character/significance and understand heritage properties (29%).

These two identified differences can, perhaps, be seen as a single difference in that knowledge of traditional materials and forms of construction is inherent in the identification of significance and understanding of heritage properties.

**Table 3: Principal inspection skill (heritage properties) (Source: s. 2, q. 8)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (9)*** | |
| Understanding traditional forms of construction and inherent limitations | 55.6 |
| Recommending appropriate remedial action (i.e. translating knowledge into practical, affordable, step-by-step programme of work | 22.2 |
| Understanding the history of the building | 11.1 |
| Recognising defects | 11.1 |
| ***Professional advisers (27)*** | |
| Understanding of defects and defect diagnosis (incl. building physics) | 22.2 |
| Understanding traditional materials and forms of construction (incl. structural performance, material sciences, inherent limitations) | 22.2 |
| Ability to identify historic significance | 22.2 |
| Ability to 'read' a building and understand its actual and potential problems within conservation context | 18.6 |
| Communications skills | 3.7 |
| Avoiding preconceptions | 3.7 |
| Experience/skills in non-destructive investigations | 3.7 |

| | |
|---|---|
| Ability not to confuse old method of construction (and ageing) with defect requiring rectification | 3.7 |
| ***Service providers (12)*** | |
| Inspection experience | 33.4 |
| Understanding of traditional materials and forms of construction | 25.0 |
| Sympathetic understanding of the property | 16.7 |
| Qualifications | 8.3 |
| Knowledge of the subject | 8.3 |
| Broad range of skills | 8.3 |

| **Table 4: Principal inspection skill (non-heritage properties) (Source: s. 2, q. 9)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (3)*** | |
| Knowledge of contemporary materials and forms of construction | 66.7 |
| Ability to follow a structured inspection schedule | 33.3 |
| ***Professional advisers (26)*** | |
| Ability to diagnose and evaluate significance of defects | 42.4 |
| Knowledge of different forms of construction (incl. structural and material performance, material science) | 27.0 |
| Ability to 'read'/understand a building | 11.5 |
| Inspection experience and competence | 7.7 |
| Appreciation of health and safety | 3.8 |
| Common sense | 3.8 |
| Structural evaluation | 3.8 |
| ***Service providers (12)*** | |
| Inspection experience | 33.4 |
| Knowledge of construction | 16.7 |
| Defect diagnosis and prognosis | 16.7 |
| Understanding of structural and material performance | 8.3 |
| Application of preventive maintenance | 8.3 |
| Qualification | 8.3 |
| Common sense | 8.3 |

| **Table 5: Principal inspection skill difference (Source: s. 2, q. 10)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (5)*** | |
| Knowledge of traditional materials and forms of construction | 60.0 |
| Appreciation and understanding of heritage properties | 20.0 |
| Understanding of how different material perform and might be used | 20.0 |
| ***Professional advisers (29)*** | |
| Ability to identify historical character/significance | 31.0 |
| Understanding differences between modern and traditional materials and forms of construction (i.e. performance, defects, breathability) | 31.0 |
| No difference | 10.4 |
| Understanding conservation principles/philosophies/legislation | 7.0 |
| Ability to ensure work does not detrimentally affect significance | 7.0 |
| Ability to understand how heritage properties 'work' | 3.4 |
| Knowing how to apply knowledge | 3.4 |
| Knowledge of mechanical services | 3.4 |
| Use of non-destructive investigative techniques to retain historic fabric | 3.4 |

| | |
|---|---|
| ***Service providers (12)*** | |
| Understanding heritage properties (i.e. how/why materials and methods have changed) | 33.3 |
| Care and attention to detail | 16.7 |
| Difference in attitude (rather than difference in skills) | 16.7 |
| No difference | 16.7 |
| Specific specialism | 8.3 |
| Lateral thought | 8.3 |

In considering the single most important experience required to undertake the inspection of both heritage (Table 6) and non-heritage properties (Table 7), all three groups were concordant in their opinions: previous practical experience with the type of building being inspected was seen to be by far the most important issue (42% and 29%, respectively). For heritage properties, the importance of recognising significance and understanding how heritage properties 'work' was also highlighted (29%). This led to the main experience difference between the inspection of heritage and non-heritage properties (Table 8) being identified as experience of traditional materials and forms of construction (40%). On the other hand, a fairly high proportion of all three groups perceived there to be no experience difference at all (20%).

**Table 6: Principal inspection experience (heritage properties) (Source: s. 2, q. 12)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (5)*** | |
| Practical knowledge/experience of heritage properties | 40.0 |
| Making and learning from mistakes | 20.0 |
| Receiving peer-based acknowledgement/encouragement | 20.0 |
| Recognising significance | 20.0 |
| ***Professional advisers (27)*** | |
| Practical experience of inspecting heritage properties (e.g. defect diagnosis, shadowing experienced practitioner) | 29.7 |
| Familiarity with traditional materials and forms of construction (e.g. experience of repairs) | 25.9 |
| Surveying skills (e.g. methodical approach) | 14.8 |
| Understanding how heritage buildings 'work' | 11.1 |
| Understanding relationship between conservation and preventive maintenance requirements | 3.7 |
| Ability to assimilate information from previous reports | 3.7 |
| Contract administration | 3.7 |
| Hearing other people's problems/errors | 3.7 |
| Multidisciplinary approach | 3.7 |
| ***Service providers (13)*** | |
| Practical experience (e.g. construction, defects, familiarity with heritage properties) | 38.4 |
| Inspecting/surveying heritage properties | 15.4 |
| Understanding of/familiarity with heritage properties | 15.4 |
| Qualifications to carry out inspections | 7.7 |
| Training | 7.7 |
| Experience of specification writing | 7.7 |
| Knowing when to call in others for advice | 7.7 |

**Table 7: Principal inspection experience (non-heritage properties) (Source: s. 2, q. 13)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (3)*** | |
| Practical experience of property inspection | 66.7 |
| Ability to follow a structured inspection schedule | 33.3 |

| | |
|---|---|
| ***Professional advisers (25)*** | |
| Experience of inspecting non-heritage properties (e.g. defect diagnosis, shadowing experienced practitioner) | 32.0 |
| Experience of modern construction methods/technology (e.g. experience of repairs) | 24.0 |
| Ability to analyse building and diagnose defects | 12.0 |
| Management/cost control | 4.0 |
| Economics | 4.0 |
| Understanding modern construction standards/legislation (i.e. impact on value) | 4.0 |
| Hearing other people's problems/errors | 4.0 |
| Training | 4.0 |
| Contract administration | 4.0 |
| Surveying skills | 4.0 |
| Decision making (i.e. preventive versus corrective maintenance) | 4.0 |
| ***Service providers (7)*** | |
| Training with less emphasis on traditional/historic building experience | 28.5 |
| Experience of specific craft/trade | 14.3 |
| Historical knowledge | 14.3 |
| Experience of specification writing | 14.3 |
| Understanding construction services | 14.3 |
| Where to look for guidance | 14.3 |

| **Table 8: Principal inspection experience difference (Source: s. 2, q. 14)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (4)*** | |
| Understanding different forms of construction and their performance | 75.0 |
| No difference | 25.0 |
| ***Professional advisers (27)*** | |
| Understanding traditional materials and forms of construction | 33.4 |
| Ability to analyse/understand heritage properties (incl. significance) | 18.5 |
| No difference | 14.8 |
| Experience of undertaking repairs (e.g. conservation versus modern techniques) | 11.1 |
| Understanding conservation conventions/philosophies | 7.4 |
| Ability to correctly diagnose defects and offer appropriate prognosis | 7.4 |
| Difficulty in predicting maintenance/repair costs | 3.7 |
| Specifying works based on thorough knowledge of conservation practice and material properties | 3.7 |
| ***Service providers (11)*** | |
| Experience of traditional materials and forms of construction | 45.4 |
| Care and attention to detail | 18.2 |
| No difference | 18.2 |
| Training with less emphasis on traditional/historic building experience | 9.1 |
| Lateral thought | 9.1 |

### 4.3 Classification of inspection skills

In considering the skills required to undertake the inspection of heritage properties, questionnaire respondents rated the pre-determined responses as follows:

Essential
1. Understanding of historic/traditional materials;
2. Understanding of defects, deterioration, and decay (i.e. 'problems');
3. Understanding of historic/traditional forms of construction;

4. Ability to accurately diagnose identified ‘problems’;
5. Understanding of appropriate remedial methods;
6. Understanding of principles of preventive maintenance;
7. Ability to form an accurate forecast/prognosis of identified ‘problems’ (i.e. how will the ‘problem’ develop over time);
8. Understanding of basic structural performance; and
9. Understanding of personal limitations (i.e. necessity for third-party advice).

Essential/desirable
1. Understanding of health and safety legislation/guidance;
2. Understanding of specific conservation legislation (e.g. listed buildings, conservation areas, ancient monuments, Article 4 directions);
3. Understanding of basic conservation framework (e.g. conservation ethics, legislation, history); and
4. Understanding of insurance issues (e.g. professional indemnity, public liability).

Desirable
1. Understanding of energy efficiency issues;
2. Understanding of relevant property improvements (e.g. fire/smoke detection);
3. Understanding of financial issues (e.g. grants);
4. Understanding of disability issues (e.g. access requirements); and
5. Understanding of general property legislation (e.g. landlord and tenant, boundaries, party walls, advertising).

Where respondents signalled ‘Other’ inspection skills, these included communication skills, ability to get other professionals involved at an early stage, ability to treat each property on its own merits within an overall conservation framework, and understanding of related technologies.

The key skills required for the inspection of heritage properties are divided between those that might reasonably be expected of a qualified built environment professional (i.e. defect diagnosis and prognosis, repair and maintenance techniques) and those that relate specifically to the historic built environment (i.e. historic materials and forms of construction, conservation framework). The balance tends to favours the former, which, in terms of education and training, would suggest the need for general inspection skills with the addition of core elements relating to the heritage sector. The inclusion of specific heritage issues into current built environment and construction curricula, such as NVQ/SVQ Building Maintenance and Estate Service (Levels 3 and 4), might therefore offer a means of increasing the number of future maintenance inspectors.

### 4.4 Classification of inspection experience

In considering the experience required to undertake the inspection of heritage properties, questionnaire respondents rated the pre-determined responses as follows:

Essential
1. Inspecting and surveying historic buildings;
2. Scheduling of repair and maintenance works;
3. Report writing; and
4. Specification writing.

Essential/desirable
1. Inspecting and surveying buildings (i.e. general surveying experience).

Desirable
1. Contract administration.

Where respondents signalled 'Other' inspection experience, this included analysis/recording of heritage properties, knowledge and practical understanding of traditional craft skills, architectural/construction history, causes of decay, and open views on research programmes.

Experience is the key to the successful inspection of heritage (and non-heritage) properties. Based on the views of respondents, such experience should be that reasonably expected of a practising built environment professional (i.e. scheduling, report writing, specification writing), but with particular emphasis on working with heritage properties.

### 4.5 Inspection in relation to corrective and preventive maintenance

Of the time spent providing inspection services, 57.3% related to corrective maintenance (i.e. putting things right after failure) and 35.0% related to preventive maintenance (i.e. putting things right before failure).

In relating 'maintenance timing' with 'maintenance function' (Figures 3 and 4), it appears that all three groups allocate more time to inspections relating to corrective maintenance than preventive maintenance (Table 9).

**Table 9: Comparison of time allocated to inspections relating to corrective and preventive maintenance (Source: s. 2, q. 15)**

| | Corrective maintenance (%) | Preventive maintenance (%) |
|---|---|---|
| **Clients** | 51 | 46 |
| **Professional advisers** | 54 | 37 |
| **Service providers** | 67 | 22 |

Forty per cent of clients allocate 20–29% of their time to corrective maintenance, whereas 60% allocate more than 50% of their time. The reverse is true for preventive maintenance, with 60% of clients allocating less than half of their time. Eighty per cent of professional advisers allocate more than half their time to corrective maintenance, but only 50% spend more than half their time on preventive maintenance. In fact, almost all of the professional advisers (95%) spend less than 60% of their time on preventive maintenance. With service providers, 82% spend more than 60% of their time on corrective maintenance, with 55% spending less than 20% of their time on preventive maintenance.

**Figure 3: Proportion of time spent providing inspection services for corrective maintenance**

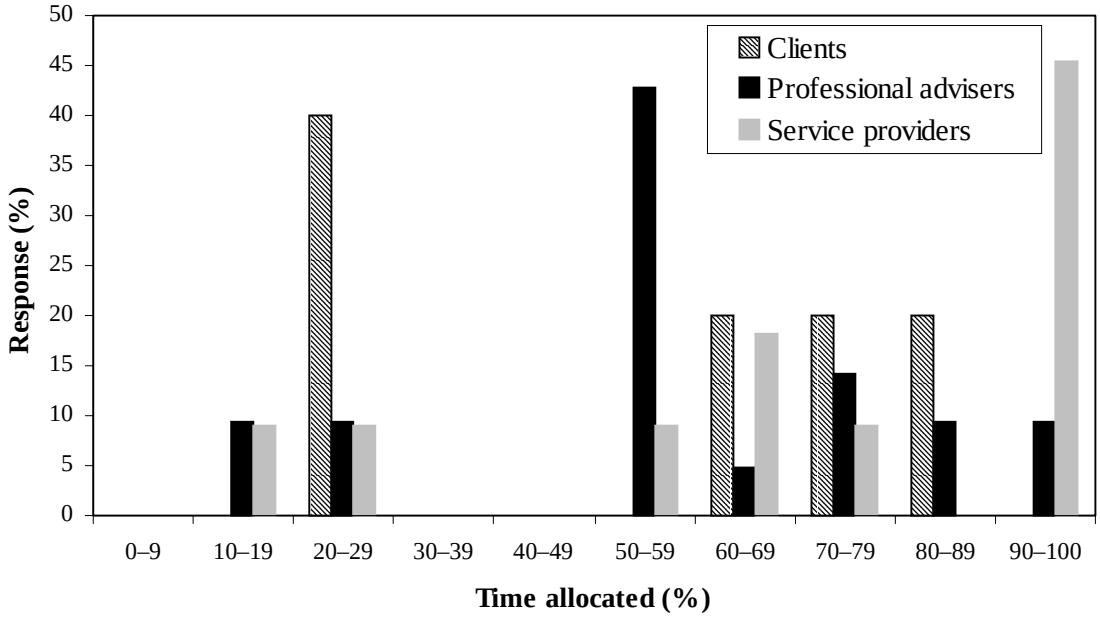
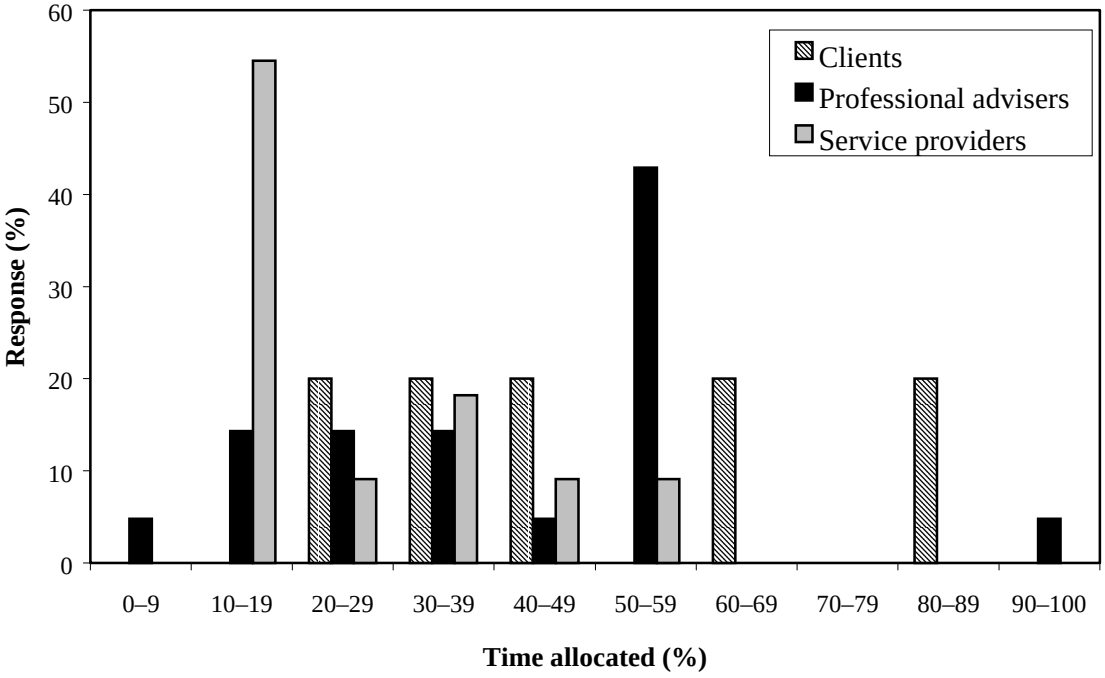



**Figure 4: Proportion of time spent providing inspection services for preventive maintenance**



### 4.6 Common inspection problems

All three groups identified two main problems associated with inspections (Table 10):

- Access/health and safety (24%); and
- Cost implications (predicting costs accurately) (20%).

A further problem was identified by both the professional advisers and the service providers:

- Client brief (12%).

This was perhaps balanced by the clients commenting on poor reports from the professional advisers, with inadequate summaries and lack of prioritised recommendations.

**Table 10: Common inspection problems (Source: s. 2, q. 16)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (8)*** | |
| Access/health and safety | 37.5 |
| Difficulty in obtaining accurate costings | 12.5 |
| Access to historic building data | 12.5 |
| Ease of adaptability to modern needs | 12.5 |
| Poor-quality reports (e.g. inadequate summary, no prioritised recommendations, lapse between inspection and report, lack of attention to health and safety issues) | 12.5 |
| Insurance for derelict buildings | 12.5 |
| ***Professional advisers (41)*** | |
| Cost implications (e.g. predicting accurate costs, high costs, lack of funds especially in public sector) | 22.0 |
| Access/health and safety | 22.0 |
| Clients (e.g. lack of understanding, lack of understanding by institutional clients that heritage properties do not come with guarantees just lots of promises, absence of/changes to client brief) | 12.1 |
| Inappropriate works (e.g. leading to loss of historical integrity) | 9.8 |
| Lack of information at early stage (e.g. dimensioned survey drawings, previous reports) | 9.8 |
| Specific defects (e.g. dampness, timber defects) | 4.9 |
| Lack of maintenance | 4.9 |
| Lack of understanding for why a heritage property might need a different/more detailed form of appraisal (i.e. significance) | 4.9 |
| Unauthorised works | 2.4 |
| Use of unskilled and inexperienced operatives | 2.4 |
| Poor professional advice | 2.4 |
| Compliance with Building Regulations | 2.4 |
| ***Service providers (10)*** | |
| Reporting on cost implications | 20.0 |
| Access/health and safety | 20.0 |
| Client brief | 20.0 |
| Funds for investigative work | 10.0 |
| Inexperienced people further up the chain | 10.0 |
| Balancing legislation (e.g. Building Regulations, health and safety) with conservation issues | 10.0 |
| Expectation of carrying out extensive survey for little or no fee | 10.0 |

### 4.7 Section summary

The inspection of heritage properties requires a specific understanding of issues relating to the actual building(s) (i.e. traditional materials and forms of construction) and to the overall conservation

framework within which one is operating (i.e. historical character/significance). With regard to non-heritage properties, previous inspection experience (i.e. defect diagnosis and prognosis) is considered essential. Corrective maintenance is more common than preventive maintenance. Significant inspection problems are associated with access/health and safety and cost forecasting.

The following section considers practical maintenance services in relation to heritage and non-heritage properties.

## 5.0 PRACTICAL MAINTENANCE SERVICES

### 5.1 Section introduction

With predicted employment growth in the construction industry over the next few years (40,000 in the period 1999–2010, as compared with the loss of 184,000 in the period 1991–2001 and growth of 316,000 in the period 1981–1991),[19,20] demand for skilled labour is set to rise. This, however, comes at a time when there is a significant decline in young people entering the industry and reluctance within the sector to invest in training. Severe skills shortages are reported across most construction sub-sectors, with training and recruitment targeted at carpenters and joiners, managers, electricians, clerical workers, bricklayers, and plumbers.

Whilst little information is available in relation to the heritage sector, estimated to employ 36,5000 individuals, output accounts for up to £2b per annum or approximately 6% of total repair and maintenance output.[21] The heritage sector is, like the construction industry as a whole, suffering from a skills crisis.

This section considers the skills and experience necessary to provide practical maintenance services in relation to heritage and non-heritage properties, perceived differences between the two groups, the distinction between corrective and preventive maintenance, and common maintenance problems.

### 5.2 Practical maintenance skills and/or experience

The skills and/or experience required to undertake practical maintenance services of heritage properties (i.e. works undertaken to keep or restore a building to an acceptable standard) may be summarised as follows, where 'skill' is defined as competence or expertise and 'experience' as knowledge, practice, or training.

The maintenance skills and/or experience have been divided into primary skills (i.e. those considered essential to performing the inspection of heritage properties) (Table 11) and secondary skills (i.e. those considered desirable, but not essential) (Table 12).

Furthermore, the single most important skill for maintaining both heritage properties (Table 13) and non-heritage properties (Table 14) is identified, and hence information gained on the perceived difference between the skill requirement for maintaining heritage and non-heritage properties (Table 15).

**Table 11: Primary maintenance skills and/or experience (Source: s. 3, q. 17)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (8)*** | |
| Recognising and understanding the importance of heritage properties | 25.0 |
| Knowledge of traditional materials and forms of construction (incl. usage) | 25.0 |
| Care and attention to detail | 25.0 |
| Sourcing appropriate materials | 12.5 |

[19] Learning and Skills Council (2003). *Skills in England 2002 – Key Messages Summary Report, Volume 1, and Volume 2*. LSC, Coventry. The construction sector provided 7.6% of employment in England in 1991, as compared to 6.3% in 2001.

[20] Department of Trade and Industry (2002). *Construction Statistics Annual: 2002 Edition*. August. DTI/ Stationery Office, Norwich. Employment (not seasonally adjusted) in the construction industry accounted for 1,265,000 employees and 918,000 self-employed individuals in 1990, compared with 1,366,000 and 663,000 respectively in 2001.

[21] Robert Bilbrough Associates (RBA) (2003). *Heritage Building Skills Report*. March. RBA, Elton (Shropshire). Repair and maintenance output accounts, on average, for 48% of the total output of the construction industry, representing £28b in 2001.

| | |
|---|---|
| Mix of practical and theoretical understanding | 12.5 |
| ***Professional advisers (38)*** | |
| Knowledge/experience of traditional/local materials and forms of construction (e.g. porosity) | 31.7 |
| Traditional craft techniques (e.g. carpentry/joinery, bricklaying, pointing, masonry, lime plastering, plumbing, glazing) | 23.7 |
| Understanding and application traditional repair techniques | 15.8 |
| Analysis/survey of heritage properties | 5.3 |
| Sensitivity (e.g. care, minimum intervention) | 5.3 |
| Prioritising maintenance tasks | 2.6 |
| Understanding how historic buildings 'work' | 2.6 |
| Keeping up to date | 2.6 |
| Finding experienced/reliable craftsmen | 2.6 |
| Good conservation/DIY skills | 2.6 |
| Common sense | 2.6 |
| Advanced craft qualification | 2.6 |
| ***Service providers (11)*** | |
| Knowledge of traditional materials and methods of construction (e.g. lime) | 27.3 |
| Experience (10–15 years, trade or supervisory) | 27.3 |
| Training | 18.1 |
| Experience of failure patterns | 9.1 |
| Ability to work in a sympathetic manner | 9.1 |
| Relevant craft training/skills | 9.1 |

There are two main primary skills that have been identified by the groups (Table 11). All three groups have identified the importance of knowledge of traditional materials and forms of construction (30%). In addition, the professional advisers and service providers have highlighted the importance of traditional craft skills and training (18%). The latter was also seen to be a secondary skill requirement by some (7%). The main secondary skill identified, however, was the ability to undertake work in a sensitive manner, implementing correct methods of maintenance and repair (12%) (Table 12). Experience and training were identified by the service providers as being of most importance (12%), whilst the professional advisers felt that understanding the difference between modern and traditional materials and forms of construction was their highest priority (9%). The clients and professional advisers, on the other hand, thought that surveying skills were also important (9%).

In summary, the primary skills identified by the whole population were:

- Knowledge of traditional materials and forms of construction (30%); and
- Traditional craft skills and training (18%).

The secondary skills identified were:

- Ability to undertake work in a sensitive manner, implementing correct methods of maintenance and repair (12%);
- Experience and training (12%);
- Understanding the difference between modern and traditional materials and forms of construction (9%);
- Surveying skills (9%); and
- Traditional craft skills and training (7%).

| **Table 12: Secondary maintenance skills and/or experience (Source: s. 3, q. 18)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (4)*** | |
| Ability to undertake work in a sensitive manner (incl. patience, intelligence, attention to detail, pride in work) | 75.0 |
| Surveying methods and techniques | 25.0 |
| ***Professional advisers (29)*** | |
| Understanding differences between modern and traditional materials and forms of construction | 13.8 |
| Physical fitness (e.g. ability to leap off short ladders, endurance) | 10.3 |
| Defect diagnosis and remediation | 10.3 |
| Contacts with specialist consultants and other technical advisers | 7.0 |
| Personal limitations (i.e. know when to seek advice) | 7.0 |
| Ability to implement correct methods of conservation | 7.0 |
| Project management (incl. ability to run an effective business) | 7.0 |
| Traditional craft techniques (e.g. roof tiling, leadwork, drainage) | 7.0 |
| Knowledge of conservation framework (e.g. policy, advice, and regulations) | 3.4 |
| Value | 3.4 |
| Decision making (e.g. opening up) | 3.4 |
| How to direct operatives | 3.4 |
| Questioning attitude | 3.4 |
| Ability to avoid collateral damage (e.g. access, material storage) | 3.4 |
| Conservation experience | 3.4 |
| Conservation qualification | 3.4 |
| Common sense | 3.4 |
| ***Service providers (10)*** | |
| Experience (10 years) | 30.0 |
| Training (e.g. craft apprenticeship) | 20.0 |
| Ability to use traditional materials and methods (incl. traditional tools) | 10.0 |
| Ability to seek advice from those who have experience | 10.0 |
| Interest | 10.0 |
| Patience | 10.0 |
| Secondary craft skills | 10.0 |

When asked to define the single most important practical maintenance skill in relation to heritage properties (Table 13), respondents felt that traditional craft skills and training, with the appropriate use of traditional materials and forms of construction, were by far the most important skill (42%) for maintaining heritage properties.

| **Table 13: Principal maintenance skill (heritage properties) (Source: s. 3, q. 20)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (5)*** | |
| Correct use of appropriate materials and methods of repair (incl. ensuring a match with what is already there) | 80.0 |
| Traditional craft training | 20.0 |
| ***Professional advisers (28)*** | |
| Traditional craft skills | 17.9 |
| Identifying least damaging method of maintenance | 10.7 |
| Knowledge of traditional materials and forms of construction | 10.7 |
| Taking care and ensuring a match with what is already there | 10.7 |
| Conservation understanding (e.g. understanding significance) | 10.7 |

| | |
|---|---|
| All-round understanding (i.e. not approaching work from single-skill angle) | 10.7 |
| Carpentry/joinery (because operative understands other trades) | 7.1 |
| Ability to undertake routine inspections and identify problems before they occur | 7.1 |
| Pointing | 3.6 |
| Thoroughness | 3.6 |
| Knowledge and ability to deal with modern systems | 3.6 |
| Record keeping | 3.6 |
| ***Service providers (12)*** | |
| Understanding/experience of traditional materials and forms of construction | 33.4 |
| Training | 16.8 |
| Skill and experience in multiple trades | 8.3 |
| Ability to work in a sympathetic manner | 8.3 |
| Clearing/repairing rainwater goods | 8.3 |
| Replacing displaced slates/tiles | 8.3 |
| Knowing when to seek advice/help | 8.3 |
| Personal specialist skills | 8.3 |

The single most important practical maintenance skill for non-heritage properties (Table 14) was identified by all three groups as being good knowledge and understanding of contemporary materials and forms of construction (22%).

Consequently, the main skills difference between maintaining heritage and non-heritage properties (Table 15) was highlighted as being the ability to work with traditional materials (30%). However, a significant group of professional advisers and service providers felt that there was no skills difference at all (14%).

**Table 14: Principal maintenance skill (non-heritage properties) (Source: s. 3, q. 21)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (4)*** | |
| Understanding of contemporary materials and forms of construction | 50.0 |
| Good-quality workmanship | 25.0 |
| Being able to put components together | 25.0 |
| ***Professional advisers (24)*** | |
| Good knowledge of building construction/techniques | 20.8 |
| All-round expertise | 16.6 |
| Good workmanship/contemporary trade skill | 12.5 |
| Ability to undertake routine inspections and identify problems before they occur | 8.3 |
| Carpentry/joinery (because operative understands other trades) | 8.3 |
| Project management (e.g. efficiency, record keeping) | 8.3 |
| Identifying cheap and functional means of maintenance | 4.2 |
| Construction repairs | 4.2 |
| Knowledge and ability to deal with modern systems | 4.2 |
| Knowledge of current regulations | 4.2 |
| Painting | 4.2 |
| Competence | 4.2 |
| ***Service providers (13)*** | |
| Experience (e.g. appropriate materials and tools) | 23.0 |
| Appreciation/knowledge of modern forms of construction | 15.4 |
| Training (e.g. trade apprenticeship) | 15.4 |
| Qualification | 7.7 |
| Clearing/repairing rainwater goods | 7.7 |
| Replacing displaced slates/tiles | 7.7 |

| | |
|---|---|
| Knowing when to seek advice/help | 7.7 |
| Attention to detail | 7.7 |
| Personal specialist skill | 7.7 |

| **Table 15: Principal maintenance skill difference (Source: s. 3, q. 22)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (4)*** | |
| Care to avoid damage when undertaking repairs | 25.0 |
| Requirement for specific (i.e. non-standard) solutions | 25.0 |
| Ability to work with traditional materials (e.g. sand-cast lead) | 25.0 |
| Wider range of traditional materials and methods of construction | 25.0 |
| ***Professional advisers (28)*** | |
| Knowledge of/skills with traditional materials and forms of construction | 32.1 |
| No difference | 10.7 |
| Approach (e.g. attitude, care versus business, sensitivity) | 10.7 |
| Conservation skill level | 7.1 |
| Defects (e.g. structural problems) | 7.1 |
| Care to avoid damage when undertaking repair and retain original fabric | 7.1 |
| Conservation techniques | 3.6 |
| Overall heritage knowledge | 3.6 |
| Ability to prioritise essential repair works/protection | 3.6 |
| Requiring both trade and conservation skills | 3.6 |
| Significance | 3.6 |
| Separate fields | 3.6 |
| Understanding of mechanical services for non-heritage properties | 3.6 |
| ***Service providers (11)*** | |
| No difference | 27.2 |
| Experience and understanding of traditional materials (e.g. why use them) | 18.2 |
| Care and attention to detail | 18.2 |
| Patience | 18.2 |
| Training | 9.1 |
| Interest/knowledge | 9.1 |

In considering the single most important experience required to undertake the practical maintenance of heritage properties (Table 16), the respondents were unanimous: practical experience of working on heritage properties, and hence with traditional materials and forms of construction (54%).

Not surprisingly, the single most important experience required to undertake the practical maintenance of non-heritage properties (Table 17) was identified by all three groups as being previous experience of working on a range of non-heritage properties and a knowledge of contemporary materials and forms of construction (47%).

Consequently, the principal difference between maintaining heritage and non-heritage properties (Table 18) was identified by all three groups as a wider practical experience of traditional materials, forms of construction, and heritage properties in general (42%).

| **Table 16: Principal maintenance experience (heritage properties) (Source: s. 3, q. 23)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (6)*** | |
| Practical experience of traditional materials and forms of construction | 33.2 |
| Practical experience of working on various heritage properties | 16.7 |

| | |
|---|---|
| Understanding importance and value of heritage properties | 16.7 |
| Decision making (e.g. when to call in expert, such as archaeologist) | 16.7 |
| Attention to detail | 16.7 |
| ***Professional advisers (24)*** | |
| Previous experience with heritage properties (e.g. repair experience) | 37.4 |
| Craft experience (e.g. holistic approach) | 16.6 |
| Knowledge of traditional materials and methods of construction | 12.4 |
| Multi-skilled operatives | 4.2 |
| Lateral thinking | 4.2 |
| Ability to produce non-standard solutions | 4.2 |
| Good workmanship | 4.2 |
| Regular maintenance contracts under experienced guidance | 4.2 |
| Regular and thorough checking | 4.2 |
| Decision making (e.g. specialist access equipment, when to call in experts) | 4.2 |
| Historical significance | 4.2 |
| ***Service providers (11)*** | |
| Practical experience (e.g. working alongside experienced craftsmen and professionals) | 54.5 |
| Training/supervision | 18.2 |
| Knowledge/understanding (e.g. specific craft/trade) | 18.2 |
| Knowing how to save the unsaveable! | 9.1 |

| **Table 17: Principal maintenance experience (non-heritage properties) (Source: s. 3, q. 24)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (4)*** | |
| Good-quality workmanship | 25.0 |
| Practical experience of contemporary materials and forms of construction | 25.0 |
| Practical experience of working on various non-heritage properties | 25.0 |
| Skills as an 'installer' (i.e. have lost ability to repair) | 25.0 |
| ***Professional advisers (21)*** | |
| Trade experience (e.g. repair experience) | 38.0 |
| General construction knowledge | 23.7 |
| Ability to identify, diagnose, and remedy defects | 9.5 |
| Good-quality workmanship | 4.8 |
| Regular maintenance contracts under relevant guidance | 4.8 |
| Experience in achieving cost-effective methods | 4.8 |
| Multi-skilled operatives | 4.8 |
| Decision making | 4.8 |
| Training | 4.8 |
| ***Service providers (9)*** | |
| Practical experience (e.g. variety of tasks) | 33.4 |
| Knowledge of modern materials and forms of construction | 33.3 |
| Training | 11.1 |
| Problem solving | 11.1 |
| Knowledge/understanding | 11.1 |

| **Table 18: Principal maintenance experience difference (Source: s. 3, q. 25)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (5)*** | |
| Taking additional care and pride in working on heritage properties | 20.0 |
| Understanding traditional materials and forms of construction | 20.0 |
| Wider practical experience of working on heritage properties | 20.0 |

| | |
|---|---|
| Ability to select the appropriate solution | 20.0 |
| Craft skills (e.g. use of lime) | 20.0 |
| ***Professional advisers (22)*** | |
| Skill/experience on different buildings (e.g. repair rather than replace) | 31.9 |
| Empathy/understanding/experience/significance/specific versus general | 27.3 |
| Traditional and contemporary trade skills (e.g. mortar mixes) | 13.6 |
| Ability to obtain best results from traditional materials and forms of construction | 9.1 |
| No difference | 9.1 |
| Cost effective and practical means of work | 4.5 |
| Knowledge | 4.5 |
| ***Service providers (9)*** | |
| Use of traditional/sympathetic materials (e.g. lime mortars) | 33.4 |
| Knowledge/understanding (e.g. importance of property) | 22.2 |
| No difference | 22.2 |
| Training | 11.1 |
| Having no preconception | 11.1 |

### 5.3 Classification of practical maintenance skills and/or experience

In considering the skills and/or experience required to undertake practical maintenance services of heritage properties, questionnaire respondents classified the pre-determined responses as follows:

#### *5.3.1 General*

Essential

1. Understanding of appropriate remedial methods;
2. Understanding historic forms of construction;
3. Understanding of defects, deterioration, and decay (i.e. 'problems'); and
4. Ability to accurately diagnose identified 'problems'.

Essential/desirable

1. Understanding of health and safety legislation/guidance; and
2. Understanding conservation legislation (e.g. need for listed building or conservation area consent).

#### *5.3.2 External*

Essential

1. Re-pointing open and/or defective mortar joints;
2. Repair and/or replacement of defective rainwater goods;
3. Replacing slipped or missing roof slates and tiles;
4. External render repairs;
5. Joinery repairs;
6. Plumbing (e.g. sheet roofing, flashings);
7. Localised stonework repairs (e.g. indenting, plastic repair);
8. Clearing rainwater goods (e.g. gutters, gulleys);
9. Painting and decorating; and
10. Cutting out and replacing defective bricks (incl. cracks).

#### *5.3.3 Internal*

Essential

1. Joinery repairs; and
2. Plaster repairs.

Essential/desirable

1. Plumbing service (e.g. central heating, hot and cold water);
2. Electrical service (e.g. heating, lighting, power supply); and

3. Painting and decorating.

Where respondents signalled 'other' practical maintenance skills and/or experience, these included understanding traditional craft skills, understanding structural concepts, temporary works (i.e. protection), arches (incl. causes of failure), glazing, leadwork, stone flags, attention to drainage systems, removal of surface water, dealing with dampness (e.g. condensation), and working with lightning protection systems.

The key skills required for the practical maintenance of heritage properties are, by and large, those that might reasonably be expected of a competent building operative. Such skills must, however, relate to the traditional materials and forms of construction associated with heritage properties and to the overall conservation framework within which the work is undertaken. The addition of core heritage skills into current vocational training would potentially increase the number of future heritage maintenance operatives without the need for specific heritage programmes.

### 5.4 Practical services in relation to corrective and preventive maintenance

Of the time spent providing practical maintenance services, 63.7% related to corrective maintenance (i.e. putting things right after failure) and 32.7% related to preventive maintenance (i.e. putting things right before failure).

In relating 'maintenance timing' with 'maintenance function' (Figures 5 and 6), it appears, in general, that all three groups allocate more than half of their time to corrective maintenance and less than half of their time to preventive maintenance (Table 19).

**Table 19: Comparison of time allocated to undertaking corrective and preventive maintenance (Source: s. 3, q. 26)**

| | Corrective maintenance (%) | Preventive maintenance (%) |
|---|---|---|
| **Clients** | 65 | 45 |
| **Professional advisers** | 61 | 33 |
| **Service providers** | 65 | 20 |

The service providers show the greatest predisposition toward corrective maintenance, with 55% allocating 95–100% of their time and only 8% allocating less than half of their time. This is not surprising, as much of this work will come directly from orders placed by clients and professional advisers in the event of failure.

**Figure 5: Proportion of time spent undergoing corrective maintenance**

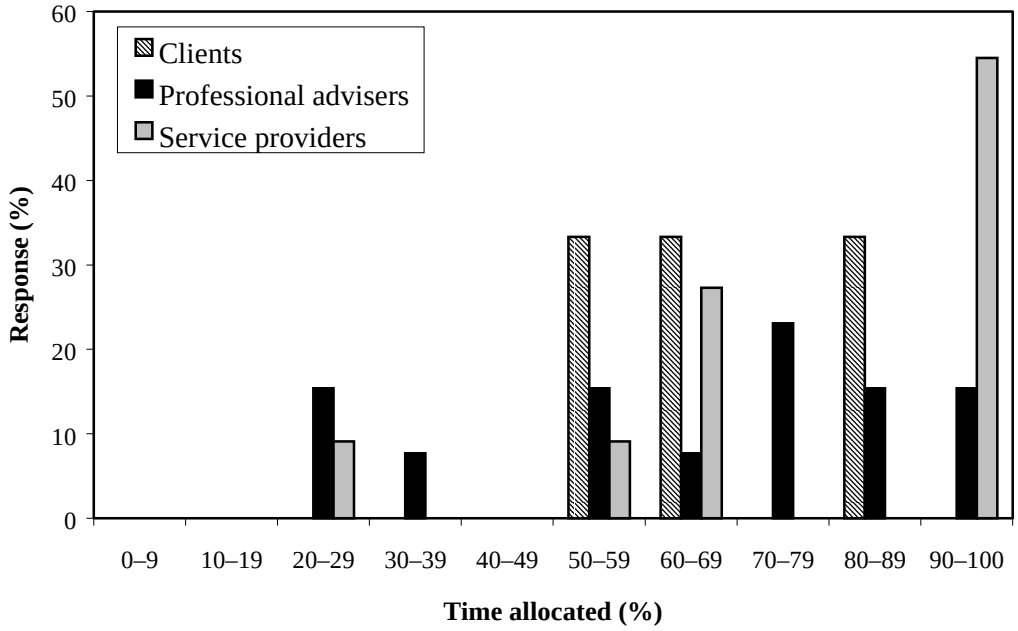
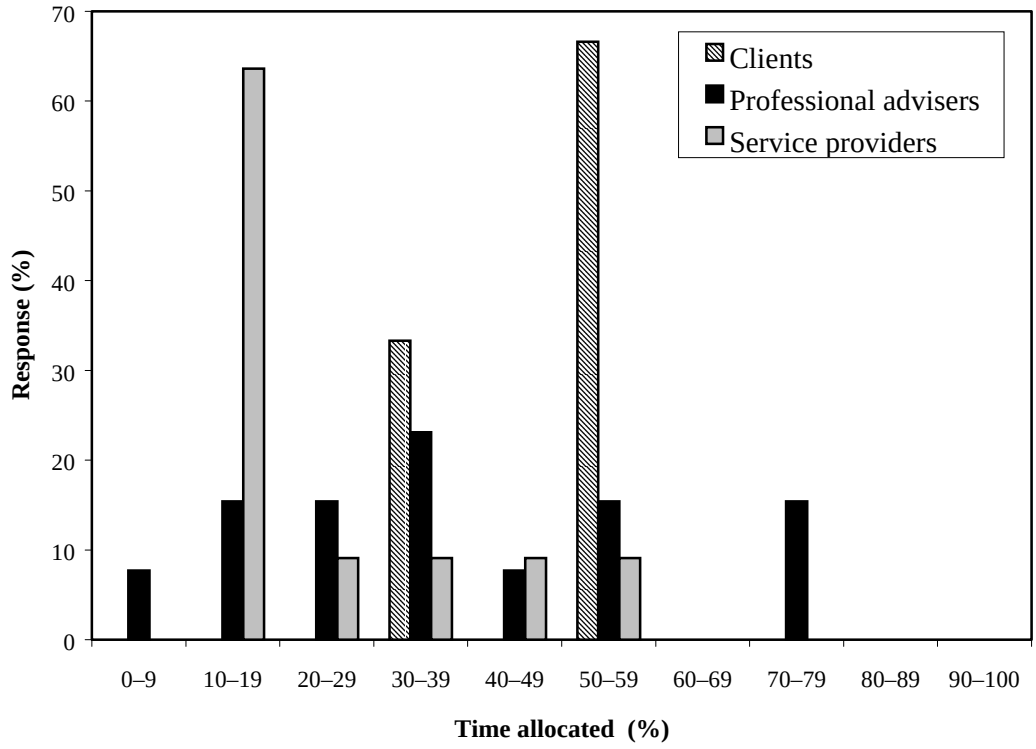



**Figure 6: Proportion of time spent undergoing preventive maintenance**



## 5.5 Common practical maintenance problems

The most common problems relating to the practical maintenance of heritage properties (Table 20) were identified by all three groups:

- Access/health and safety (18%);
- Lack of skilled/experienced labour (13%);
- Sourcing appropriate materials (13%); and
- Poor specification (11%).

**Table 20: Common maintenance problems (Source: s. 3, q. 27)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (8)*** | |
| Access | 25.0 |
| Finding skilled contractors capable of working to acceptable standards | 25.0 |
| Sourcing appropriate materials | 12.5 |
| Funding 'stitch in time' maintenance work | 12.5 |
| Lack of clear and practical specification/schedule of works | 12.5 |
| Causing minimal damage to other parts of building | 12.5 |
| ***Professional advisers (22)*** | |
| Lack of skilled/experienced labour | 18.1 |
| Access/health and safety | 13.6 |
| Sourcing appropriate materials | 9.2 |
| Importance of vigilance (i.e. regular maintenance, stitch in time) | 9.2 |
| Lack of clear reports, specifications, and/or schedule of works (e.g. lack of depth, inaccuracies, misconceptions about traditional materials) | 9.2 |
| Inappropriate repair techniques (e.g. use of modern rather than traditional materials) | 9.2 |
| Previous incorrect repairs | 4.5 |
| Unauthorised works | 4.5 |
| Working at high level | 4.5 |
| Lack of appropriate standards of workmanship | 4.5 |
| Emphasis on accessible parts of building rather than most weathered | 4.5 |
| Clients (e.g. lack of understanding) | 4.5 |
| Getting general agreement to overall approach (from minimal work to major repairs) | 4.5 |
| ***Service providers (15)*** | |
| Sourcing appropriate materials | 20.0 |
| Access/health and safety | 20.0 |
| Poor specification/schedule of works from professional advisers | 13.3 |
| Unrealistic client expectations | 6.7 |
| Timing of contracts (e.g. work priced in spring, but instructed in winter) | 6.7 |
| Lack of funding | 6.7 |
| Value added tax (VAT) | 6.7 |
| Restrictions imposed by conservation authorities | 6.7 |
| Delays in payments from grant-giving bodies | 6.6 |
| Inexperienced people further up the chain | 6.6 |

## 5.6 Section summary

The practical maintenance of heritage properties requires knowledge of traditional materials and forms of construction, backed up by experience and an ability to work in an appropriately sensitive manner. With regard to non-heritage properties, previous maintenance experience and an understanding of contemporary constructional methods are deemed essential. Corrective maintenance is again more common than preventive maintenance. Significant maintenance problems are associated with

access/health and safety, the availability of skilled labour, sourcing suitable materials, and the quality of inspection/procurement documentation.

The following section considers the causes of defects in relation to the nature of the particular defect and its effect on specific building elements/components.

## 6.0 CAUSES OF DEFECTS

### 6.1 Section introduction

The successful identification and correction/prevention of defects depends on the skills of those providing inspection and practical maintenance services. By understanding common or specific patterns of defects, deterioration, or decay, resources can be targeted to achieve long-term and sustainable results.

This section highlights the range of problems affecting both heritage and non-heritage properties, and classifies these defects according to their frequency of occurrence.

### 6.2 Classification of building elements/components

In considering the building elements/components of heritage properties to be affected by defects, as determined by the frequency of required maintenance and repair, questionnaire respondents rated the pre-determined responses as follows:

**Table 21: Building elements/components affected by defects (Source: s. 4, q. 28)**

| | **Building elements/components** | **%** |
|---|---|---|
| 1. | Rainwater goods | 15.4 |
| 2. | Flat roofs | 11.8 |
| 3. | Windows (incl. glazing) | 11.0 |
| 4. | External decorations | 9.2 |
| 5. | Chimney stacks | 7.5 |
| 6. | Render finishes | 7.0 |
| 7. | External walls (incl. structural frames) | 5.7 |
| 8. | Pitched roofs | 5.7 |
| 9. | Building services (e.g. heating, water supply) | 4.4 |
| 10. | Plaster finishes | 3.9 |
| 11. | Internal decorations | 3.5 |
| 12. | External works (e.g. paths, steps, boundary walls) | 3.1 |
| 13. | Balconies | 3.1 |
| 14. | Flooring | 2.6 |
| 15. | Stairs | 2.2 |
| 16. | Doors | 1.3 |
| 17. | Internal separating walls and partitions | 1.3 |
| 18. | Other (e.g. basements/cellars, underground drainage, lightning protection systems, weathervanes) | 0.9 |
| 19. | Foundations | 0.4 |

Earlier research into the technical quality of the design and construction of new housing revealed 955 different kinds of faults in low-rise, mainly two-storey, housing.[22] Just under half of these were judged to have originated on site, slightly fewer in design, and with a small remainder related to materials and components. Other significant factors included inadequate design information and poor site practices. The detailed results of this research provide an attribution of fault type to particular building elements and the effects on building performance,[23] as follows:

[22] Bonshor, R. and Harrison, H. (1982). *Quality in Traditional Housing – Volume 1: An Investigation into Faults and their Avoidance*. BRE/HMSO, London.

[23] The results of this earlier research are summarised in: Building Research Establishment (1988). *Common Defects in Low-Rise Traditional Housing*. Digest 268. BRE, Garston.

*Attribution of fault type to building elements*

1. External walls (20%);
2. Roofs (19%);
3. Windows and doors (13%);
4. Floors (11%);
5. Services (9%);
6. Sub-structure (7%);
7. Internal partitions (4%);
8. Separating walls (4%);
9. Stairs (4%);
10. Planning and layout (4%); and
11. General and external works (4%).

*Effects on building performance*

1. Durability (20%);
2. Stability (18%);
3. Weathertightness (13%);
4. Maintenance (12%);
5. Thermal insulation (4%);
6. Fire (4%);
7. Buildability (4%);
8. Sound (4%);
9. Surface condensation (3%);
10. Rising damp (3%);
11. Ventilation (2%);
12. Interstitial condensation (1%);
13. Heating (1%); and
14. Other (11%).

The Construction Quality Forum (CQF), which operates a defects database based on member responses, has also analysed the elements or locations where defects occur and how defects contribute to poor building performance:[24]

*Attribution of defects to building elements*

1. External cavity walls (16%);
2. Pitched roofs (11%);
3. Windows and glazing (10%);
4. Flooring (10%);
5. Building services (7%);
6. External solid walls (5%);
7. Flat roofs (5%);
8. Cladding (5%);
9. Separating walls (4%);
10. Structural framing (4%); and
11. Other (23%).

*Corresponding lack of performance*

1. Weathertightness (21%);
2. Durability (18%);
3. Maintainability (13%);
4. Strength and stability (10%);
5. Health and safety (10%);
6. Condensation (8%);

[24] Construction Quality Forum (1997). *CQF Database Analysis – Report 4*. April. CQF, Garston. This research is based on 862 database entries, 303 of which relate to residential and 559 to non-residential construction.

7. Habitability (5%);
8. Ventilation (3%);
9. Rising damp (3%);
10. Thermal insulation (3%);
11. Buildability (3%);
12. Heating/lighting/sound (2%); and
13. Fire (1%).

Housing Association Property Mutual (HAPM) has similarly analysed data from audits of 2,120 schemes (about 31,000 dwellings) and identified common potential defects for six particular elements of construction – foundations, ground floors, external masonry walls, pitched roofs, separating walls, and intermediate floors.[25] A general overview of this work indicates particular issues relating to non-compliance with Buildings Regulations, lack of technical guidance, conflicting requirements, and utilisation of marginal sites. The work also confirms that the majority of defects occur through failure to achieve adequate standards with traditional forms of construction, rather than with novel or innovative construction.

In considering heritage properties, analysis of technical enquiries made by telephone to the SPAB during the period June 1997 to May 1998 highlighted the main issues (positive caller identification 80.6%), specific building elements (positive caller identification 51.8%), the specific building materials (positive caller identification 81.5%):[26]

*Main issues identified by caller*
1. Breathability (~22%);
2. Damp (~19%);
3. Decay/attack (~12%);
4. Paint removal (~9%);
5. Conservation repairs (~9%);
6. Alterations (~6%);
7. Structure (~6%);
8. Cleaning (~6%);
9. Ventilation (~5%);
10. Other (e.g. insulation, fire, non-destructive testing, dendrochronology, services) (~4%); and
11. Heating (~2%).

*Elements of the building identified*
1. Damp-proof courses/damp-proof membranes (~25%);
2. Floors/ceilings (~16%);
3. Windows/doors (~11%);
4. Walls (~10%);
5. Roofs (~9%);
6. Frames/panels (~8%);
7. Other (e.g. cellars, weatherboarding, spire, cobbled yard, garden wall) (~8%);
8. Chimneys (~6%);
9. Ironmongery (~3%);
10. Foundations (~2%); and
11. Fixtures/fittings (~2%).

*Materials asked about/identified*
1. Mortars/plasters/renders (~31%);
2. Paints/finishes (~21%);

---

[25] HAPM (1997). *Feedback from Data 1991–1994*. Technical Note No. 7. HAPM, London.

[26] Gardner, A. (1999). 'Some Statistics on the SPAB Telephone Technical Enquiry Service', *SPAB News*, Vol 20, No 3, pp. 16–18. It is presumed that the majority of calls made to the SPAB were from both property owners and professional advisers, and related to heritage properties.

3. Lime/limewash (~21%);
4. Timber (~9%);
5. Stone (~5%);
6. Brick (~4%);
7. Earth (~3%);
8. Other (e.g. flint, roofing felt/membranes, grouting, fire protection products) (~2%);
9. Thatch (~2%);
10. Glass/glazing (~1%); and
11. Metalwork (~1%).

Although the above data sets relate largely to non-heritage properties, there are common problems affecting specific building elements/components across the heritage/non-heritage divide. These, in particular, relate to the external building envelope and, by implication, its ability to shed and dispose of rainwater. Linked with the specific heritage issues raised by the SPAB research, there is a clear concern for the problems of excess moisture (i.e. dampness) and their effect on the health of the building and its occupants.

### 6.3 Classification of building defects

In considering the range of defects to affect heritage properties, as determined by the frequency of occurrence, questionnaire respondents rated the pre-determined responses as follows:

**Table 22: Frequency of building defects (Source: s. 4, q. 29)**

| | **Building defects** | **%** |
|---|---|---|
| 1. | Rain penetration | 17.6 |
| 2. | Rising damp | 10.8 |
| 3. | Cracking | 10.2 |
| 4. | Fungal attack (dry and wet rots) | 9.7 |
| 5. | Failure of mortars | 9.7 |
| 6. | Weathering/staining of external surfaces (e.g. frost damage, salt crystallisation, lichen) | 9.0 |
| 7. | Failure of external paint finishes | 8.0 |
| 8. | Wood-boring beetle | 5.7 |
| 9. | Detachment (e.g. masonry, roof covering) | 5.1 |
| 10. | Condensation (surface and interstitial) | 5.1 |
| 11. | Leakage | 4.0 |
| 12. | Structural movement (e.g. settlement, subsidence) | 3.4 |
| 13. | Other (e.g. defects caused by lack of/inappropriate maintenance and repair, damage to enrichments/mouldings, changes in equilibrium with new heating system or traffic vibration) | 1.7 |

Earlier research conducted by the BRE Advisory Service and based on its database of building defects identified defect types, as follows:[27]

*Attribution of defect types*
1. Rain penetration (22%);
2. Condensation (17%);
3. Cracking (16%);
4. Detachment (13%);
5. Entrapped water (6%);
6. Sound transmission (5%);

[27] Trotman, P. (1994). 'An Examination of the BRE Advisory Service Database Compiled from Property Inspections'. Paper presented at the *Dealing with Defects in Buildings* symposium, CIB/ICITE-CNR/DISET, 27–30 September, Varenna, Italy.

7. Rising damp (5%);
8. Flooring (not involving moisture) (3%);
9. Indoor air quality/ventilation (3%);
10. Appearance/discolouration/surface defects (2%); and
11. Other (8%).

It is again evident that dampness, in whatever form, is the principal defect to affect both heritage and non-heritage properties, although condensation is less problematic with traditional forms of construction. Fungal infection, associated with excess moisture, is of more concern than beetle infestation. Cracking and failure of mortars may, in part, be associated with the use of inappropriate methods of repair (e.g. cementitious mortar).

### 6.4 Section summary

Based upon previous research and the feedback of respondents to this module, a pattern of defects has been established in relation to heritage and non-heritage properties, together with an indication of the frequency of occurrence.

The following section moves on to look at the provision of skills required to undertake the inspection and practical maintenance of heritage and non-heritage properties, together with skills gaps and means of determining maintenance needs and standards.

## 7.0 SKILLS SUPPLY

### 7.1 Section introduction

Having identified the skills and experience required to undertake the inspection and practical maintenance of heritage and non-heritage properties, this section considers the availability of relevant expertise, associated skills gaps, means of addressing these gaps, and the monitoring of maintenance needs and standards.

### 7.2 Classification of inspection skills

In considering the current supply of skills relating to the maintenance of heritage properties, questionnaire respondents classified pre-determined responses as follows:

#### *7.2.1 Respondents classified these statements as true*

- The best way to obtain inspection skills/experience is through relevant professional training (e.g. CIOB, RIBA, RICS) (56% majority); and
- The best way to obtain practical maintenance skills/experience is through relevant craft training (e.g. apprenticeships, NVQ/SVQs) (70% majority).

It is important to note, however, that practical experience is considered more important than training.

#### *7.2.2 Respondents classified these statements as false*

- There is an adequate supply of skilled 'operatives' currently available to undertake the practical maintenance of heritage properties (76% majority);
- There are no additional skills/experience required to inspect heritage properties over and above those required for non-heritage properties (92% majority); and
- There are no additional skills/experience required to undertake the practical maintenance of heritage properties over and above those required for non-heritage properties (89% majority).

There was no statistically significant response with regard to the following statements:

- There is an adequate supply of skilled 'surveyors' or equivalent currently available to inspect heritage properties; and
- The most appropriate person to carry out the inspection of a property is the person who will provide the practical maintenance services.

### 7.3 Inspection skills gaps

When asked about any current gap(s) in the supply of skills education and training for the inspection of heritage properties (Table 23), questionnaire respondents identified two main deficiencies:

- Lack of experienced practitioners (38%); and
- Insufficient training and knowledge about heritage properties (33%).

All three groups emphasised the lack of practical experience within current training programmes.

The lack of skilled craftsmen was identified as a shortfall when considering skills education and training for the inspection of non-heritage properties (21%) (Table 24). Interestingly, an equal number of respondents considered there to be no skills gap at all.

In general, the overall opinion would seem to indicate more of a gap in supplying relevant education and training for the inspection of heritage properties than non-heritage properties. This is borne out when determining the single most important difference between the supply of inspection skills education and training for heritage and non-heritage properties (Table 25). The general opinion is that

there is a lack of specialist professional training, highlighting the need to understand the differences between traditional and contemporary materials and forms of construction (29%). The point is also made that there is a lack of relevant training programmes (9%) and, equally, a lack of interest in the training opportunities that are available (12%).

| **Table 23: Inspection skills gaps (heritage properties) (Source: s. 5, q. 31–34)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (6)*** | |
| Insufficient training and knowledge about heritage properties (i.e. in general built environment courses) | 33.2 |
| Qualifications lacking practical experience | 16.7 |
| Lack of experienced practitioners | 16.7 |
| Attitude of service provider (i.e. large firms not interested and lose information during changes in personnel; small firms take a long time to carry out work, but do it well and with a personal touch | 16.7 |
| Too few individuals entering construction industry | 16.7 |
| ***Professional advisers (26)*** | |
| Lack of training and knowledge about heritage properties (e.g. traditional repair techniques, multidisciplinary awareness, practical versus theoretical, inappropriate/unsympathetic work, lack of education for engineers regarding existing structures) | 42.3 |
| Lack of experienced practitioners (e.g. incorrect defect diagnosis and remedial works, delegation to less experienced office staff) | 38.5 |
| No gap | 11.5 |
| High cost of conservation training courses (e.g. English Heritage) | 7.7 |
| ***Service providers (10)*** | |
| Lack of experienced/qualified individuals (e.g. use of traditional materials) | 50.0 |
| Lack of on-site training and experience | 10.0 |
| Lack of practical knowledge of professional advisers (e.g. impracticable work items ) | 10.0 |
| No gap | 10.0 |
| Lack of training opportunities | 10.0 |
| Lack of basic maintenance procedures | 10.0 |

| **Table 24: Inspection skills gaps (non-heritage properties) (Source: s. 5, q. 31–34)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (2)*** | |
| Shortage of skilled craftsmen (i.e. ‘a dying breed’) | 50.0 |
| No gap | 50.0 |
| ***Professional advisers (18)*** | |
| No gap | 16.6 |
| Need for additional, ‘top-up’ training | 16.6 |
| Lack of understanding about traditional forms of construction | 16.6 |
| Lack of skills | 11.0 |
| Poor ability to diagnose defects and justify actions | 5.6 |
| Generalised defect diagnoses without adequate evidence (esp. architects’ reports) | 5.6 |
| Insufficient disability inspections | 5.6 |
| Lack of training for engineers | 5.6 |
| Lack of understanding of mechanical services (i.e. difficult to inspect) | 5.6 |
| Lack of professional experience | 5.6 |
| Poor ‘experts’ | 5.6 |
| ***Service providers (8)*** | |
| Lack of skilled/qualified individuals (e.g. due to poor wage rates) | 37.5 |
| No gap | 25.0 |

| | |
|---|---|
| Inadequate clients funds spent on detailed inspections (i.e. could save time and money) | 12.5 |
| Gap caused by government pushing more teenagers into university education | 12.5 |
| Lack of basic maintenance procedures | 12.5 |

**Table 25: Principal inspection education/training difference (Source: s. 5, q. 31–34)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (5)*** | |
| Understanding differences between traditional and contemporary materials and forms of construction | 40.0 |
| More interest with current generation in fast-track construction rather than understanding heritage properties | 20.0 |
| Lack of professional training on traditional buildings | 20.0 |
| Need to understand history of building, together with craft skills and repair philosophies | 20.0 |
| ***Professional advisers (20)*** | |
| Specialist training/skills (e.g. practical, on-site) | 25.0 |
| Limited targeted education for heritage properties | 15.0 |
| Lack of interest/take-up of training opportunities | 15.0 |
| Wider level of knowledge of constriction, materials, and repairs | 15.0 |
| No difference | 10.0 |
| Need to understand and be able to practice appropriate craft repair skills (together with modern construction skills) | 5.0 |
| Conservation-orientated skills training is a relatively new area and needs to catch up | 5.0 |
| Need for more mechanical services engineers for non-heritage properties | 5.0 |
| Use of conservators/specialists for heritage properties | 5.0 |
| ***Service providers (9)*** | |
| No difference | 33.4 |
| Professional advisers must have greater appreciation of architectural history | 22.2 |
| Knowledge/understanding (e.g. traditional materials and methods of construction) | 22.2 |
| Experience (e.g. gained on site over number of years) | 22.2 |

There were four main recommendations for addressing perceived skills gaps in education and training for the inspection of heritage and non-heritage properties (Table 26) that were common to all three groups:

- Improve specialist training provision (36%);
- Attract more people into the inspection sector (28%);
- Raise employer awareness of the need for specialist skills (6%); and
- Apprenticeships with skilled practitioner (6%).

**Table 26: Recommendations for addressing inspection education/training skills gaps (Source: s. 5, q. 31–34)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (8)*** | |
| Improve built environment education (e.g. coverage of traditional materials and forms of construction) | 37.5 |
| Secondment for surveyors to observe craft skills on heritage sites | 12.5 |
| 'Apprenticeship' period with experienced practitioner | 12.5 |
| Encourage craft skills | 12.5 |
| Increase awareness of significance of heritage properties and corresponding need for a different approach to repair | 12.5 |
| Encourage individuals into inspection sector | 12.5 |

| | |
|---|---|
| ***Professional advisers (32)*** | |
| Need for specialist/practical education and training | 37.5 |
| Greater awareness, promotion, and recruitment | 28.2 |
| Attracting more professionals into inspection sector | 9.5 |
| Improve employer awareness of need for specialist skills | 3.1 |
| 'Apprenticeship' period with experienced practitioner | 3.1 |
| Accreditation | 3.1 |
| Recognise different levels of training | 3.1 |
| Improve awareness/education for heritage property owners | 3.1 |
| Improve client briefing | 3.1 |
| Acknowledge importance of quality over cost | 3.1 |
| Improved levels of salary | 3.1 |
| ***Service providers (10)*** | |
| Improve training provision | 30.0 |
| Mentoring of newly-qualified individuals | 10.0 |
| Encourage employers and professionals to train apprentices whilst skilled craftsmen exist | 10.0 |
| Link/collaboration between professional advisers and service providers | 10.0 |
| Attract more people into inspection sector | 10.0 |
| Persuade clients to have more detailed inspections to assist future works | 10.0 |
| Raise employer awareness | 10.0 |
| Use of tender lists of qualified firms only | 10.0 |

### 7.4 Practical maintenance skills gaps

When asked about any current gap(s) in the supply of practical maintenance education and training in relation to heritage properties (Table 27), questionnaire respondents identified two main deficiencies:

- Lack of relevant training (37%); and
- Shortage of experienced/skilled operatives (20%).

There was also a perceived shortage of skilled operatives in the supply of practical maintenance education and training for the inspection of non-heritage properties (Table 28) (30%). As with heritage properties, a lack of training opportunities was highlighted (28%), although a significant proportion of respondents felt that there was no skills gap at all (17%).

**Table 27: Maintenance skills gaps (heritage properties) (Source: s. 5, q. 35–38)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (9)*** | |
| Lack of skilled operatives (i.e. multi-skilled, reliance on few skilled operatives within firm) | 33.3 |
| Lack of awareness for importance of heritage properties (e.g. greater care when working on heritage properties) | 22.3 |
| Confusion/gaps in certification | 11.1 |
| Lack of employer support for training | 11.1 |
| Inadequate take-up of existing NVQ/SVQs in conservation and restoration | 11.1 |
| Lack of training opportunities for working on heritage properties | 11.1 |
| ***Professional advisers (20)*** | |
| Lack of training (e.g. awareness of significance, accurate defect diagnosis, damage limitation, understand how heritage properties 'work') | 55.0 |
| Lack of multi-skilled operatives specialising in maintenance and repair work | 10.0 |
| Lack of motivation on part of potential operatives | 5.0 |
| Large gap with too few places and opportunities available | 5.0 |
| Lack of co-ordination between professional bodies (e.g. RIBA and AABC) | 5.0 |

| | |
|---|---|
| Insufficient public awareness for specialist input | 5.0 |
| Inconsistency in conservation courses | 5.0 |
| Lack of marketing | 5.0 |
| Too few young individuals working alongside experienced craftsmen | 5.0 |
| ***Service providers (12)*** | |
| Shortage of experienced/skilled operatives (e.g. plumbers) | 25.0 |
| Lack of practical conservation skills training (e.g. college courses, fluctuations in workload caused by grant timing so limiting on-site training opportunities) | 25.0 |
| Need to encourage employers and professionals to train apprentices whilst skilled craftsmen exist | 16.8 |
| Need for regulation of unskilled staff and operatives | 8.3 |
| Use of tender lists of qualified firms only | 8.3 |
| Too much indemnity | 8.3 |
| Too little action | 8.3 |

**Table 28: Maintenance skills gaps (non-heritage properties) (Source: s. 5, q. 35–38)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (2)*** | |
| Lack of apprenticeships | 50.0 |
| No gap | 50.0 |
| ***Professional advisers (13)*** | |
| Shortage of experienced operatives | 38.5 |
| Lack of training opportunities (e.g. traditional and modern craft skills) | 30.7 |
| No gap | 7.7 |
| Poor image of maintenance (i.e. 'Cinderella of conservation industry') | 7.7 |
| Lack of qualification/accreditation | 7.7 |
| Lack of awareness/promotion | 7.7 |
| ***Service providers (8)*** | |
| Shortage of experienced operatives | 25.0 |
| No gap | 25.0 |
| Little encouragement for individuals to enter trade apprenticeships rather than further education | 12.5 |
| No provision for maintenance in NVQ/SVQ system | 12.5 |
| Need for clients to have more detailed inspections to assist future works | 12.5 |
| Lack of training | 12.5 |

The single most important difference between the supply of skills education and training for undertaking the practical maintenance of heritage and non-heritage properties is given in Table 29.

All three groups identified the lack of knowledge and understanding of traditional materials (33%) as the main difference in the supply of skills education and training in practical maintenance.

Recommendations for addressing the shortfalls (Table 30) are strongly supported by all three groups:

- Increase relevant practical training (38%);
- Attract more people into building conservation and related crafts (23%); and
- Greater support for employers to allow relevant training of staff (18%).

| **Table 29: Principal maintenance education/training difference (Source: s. 5, q. 35–38)** | |
|---|---|
| **Questionnaire respondent*(number of respondents)*** | **%** |
| ***Clients (5)*** | |
| Lack of knowledge of traditional materials and forms of construction | 40.0 |
| Pride and care in working on heritage properties | 20.0 |
| Traditional skills not being passed on (i.e. lost in future) | 20.0 |
| Lack of standards, regulations, and codes of practice for conservation work | 20.0 |
| ***Professional advisers (19)*** | |
| Specific knowledge (e.g. traditional materials, undertaking conservation repair techniques, how historic buildings 'work' (e.g. breathability), familiarity with building types) | 36.8 |
| Size of skills gap (e.g. traditional versus modern repairs) | 15.8 |
| Availability of expert professional assistance | 10.5 |
| No difference | 10.5 |
| Lack of training (incl. experienced tutors to provide holistic education and skills training) | 10.5 |
| Regional differences | 5.3 |
| Experience of construction and services of non-heritage properties | 5.3 |
| Lower standard once move away from grade I listed buildings | 5.3 |
| ***Service providers (9)*** | |
| No difference | 22.2 |
| Appreciating and understanding traditional materials | 22.2 |
| Shortage of skilled operatives (e.g. care and patience to work on heritage properties) | 22.2 |
| Loss of skilled tradesmen to pass on experience | 11.1 |
| Lack of training (c.f. non-heritage properties) | 11.1 |
| Appreciation of significance | 11.1 |

| **Table 30: Recommendations for addressing maintenance education/training skills gaps (Source: s. 5, q. 35–38)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (8)*** | |
| Increased practical training provision | 37.5 |
| Attracting people into conservation (e.g. not selling the product, poor pay and conditions, satisfying work) | 37.5 |
| Greater publicity for existing NVQ/SVQs | 12.5 |
| Greater support for employers to allow training | 12.5 |
| ***Professional advisers (20)*** | |
| Increased practical conservation training (e.g. using experienced tutors to provide holistic education and skills training) | 35.0 |
| Craft-based apprenticeships with larger concentration in heritage sector | 20.0 |
| Ensuring employers are aware of training needs and setting budget | 20.0 |
| Awareness/promotion of service within construction industry | 20.0 |
| Recognised levels of qualification for heritage and non-heritage properties | 5.0 |
| ***Service providers (12)*** | |
| Improve practical, on-site training (incl. recognised qualification) | 41.7 |
| Attract people into practical work | 16.7 |
| Financial support for employers to take on individuals and support them through training and practical apprenticeships | 16.7 |
| Support from client and professional adviser groups | 8.3 |
| Use of tender lists of qualified firms only (i.e. not making up numbers) | 8.3 |
| Having no preconceptions | 8.3 |

### 7.5 Setting inspection standards

The recommendations of questionnaire respondents for establishing and assessing standards for training in the inspection of heritage properties are given in Table 31.

All three groups are in extremely good agreement, recommending three main action points:

- Professional conservation accreditation (43%);
- Continuing professional development (26%); and
- Better professional training (9%).

**Table 31: Recommendations for establishing and assessing inspection training standards (Source: s. 5, q. 39)**

| **Questionnaire respondent *(number of respondents)*** | **%** |
|---|---|
| ***Clients (8)*** | |
| Professional conservation accreditation | 62.5 |
| Continuing professional development | 12.5 |
| Benchmark (e.g. best practice scheme for quinquennial inspection report and specifications) | 12.5 |
| Practical training | 12.5 |
| ***Professional advisers (32)*** | |
| Professional conservation accreditation | 40.6 |
| Continuing professional development (i.e. structured and collaborative) | 31.3 |
| Better professional training (e.g. architects) | 6.4 |
| Reputation based on local assessment by heritage organisations (e.g. EH, local authorities, DACs) | 3.1 |
| Inspection experience | 3.1 |
| Less fragmentation of accreditation | 3.1 |
| Supervised experience/'shadowing' experienced practitioner | 3.1 |
| Getting narrow-minded engineering academics to open their minds | 3.1 |
| Client education/training (e.g. building societies) | 3.1 |
| Training that caters for full-time working fee earners | 3.1 |
| ***Service providers (13)*** | |
| Professional conservation accreditation (incl. hands-on experience) | 38.5 |
| Continuing professional development | 23.0 |
| Professional training/qualification | 15.4 |
| Inspection experience | 7.7 |
| Mentoring of newly-qualified individuals | 7.7 |
| Employer involvement | 7.7 |

### 7.6 Setting practical maintenance standards

The recommendations of questionnaire respondents for establishing and assessing standards for training in the practical maintenance of heritage properties are given in Table 32.

Again, good agreement between the three groups is apparent, leading to three main recommendations:

- Conservation craft training (38%);
- Support for more apprenticeships (27%); and
- Qualifications (21%).

| **Table 32: Recommendations for establishing and assessing maintenance training standards (Source: s. 5, q. 40)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (9)*** | |
| Conservation craft training | 33.4 |
| Apprenticeships | 22.2 |
| Qualifications (e.g. NVQ/SVQ) | 22.2 |
| Better promotion/recruitment | 1.1 |
| Greater funding for scholarships and bursaries | 1.1 |
| ***Professional advisers (33)*** | |
| Conservation craft training | 36.3 |
| Apprenticeships (incl. working alongside experienced operative) | 27.3 |
| Qualifications (e.g. NVQ/SVQ in conservation/restoration) | 21.2 |
| Innovative collaboration (e.g. Norfolk County Council and R.G. Carter Group) | 6.1 |
| Government funding for contractors (e.g. apprenticeships) | 6.1 |
| Local craft training centres | 3.0 |
| ***Service providers (14)*** | |
| Support for more apprenticeships/scholarships for specialised crafts | 28.6 |
| Practical training (incl. supervised experience) | 28.6 |
| Qualifications (e.g. NVQ/SVQ) | 21.4 |
| Standard apprenticeships and NVQ/SVQ training should include conservation craft training with emphasis on traditional materials | 14.3 |
| Employer involvement | 7.1 |

### 7.7 Monitoring maintenance needs

Recommendations for how to monitor the maintenance needs of heritage properties over time are given in Table 33.

Eighty-nine per cent of all respondents put forward the same three recommendations:

- Regular inspections (44%);
- Maintenance logbooks (35%); and
- Long-term maintenance term contracts (10%).

| **Table 33: Recommendations for monitoring maintenance needs (Source: s. 5, q. 41)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (9)*** | |
| Regular inspections | 55.6 |
| Maintenance logbooks (e.g. floor plans, service installations, passed to new owners as with CDM Health and Safety File) | 44.4 |
| ***Professional advisers (51)*** | |
| Regular inspections (e.g. quinquennial system) | 41.1 |
| Maintenance logbooks (e.g. 'service history' to form part of seller's pack, electronical version for ease of use) | 31.3 |
| Long-term maintenance term contracts | 11.7 |
| Spot tests by accreditation bodies/insurance companies | 3.9 |
| Regular maintenance | 2.0 |
| Costed schedules of work | 2.0 |
| Maintenance budgets that reflect inspection recommendations | 2.0 |

| | |
|---|---|
| Reduction in insurance premiums for those able to demonstrate regular inspections and condition | 2.0 |
| Condition of mortgage/loan | 2.0 |
| Continued use of proven craftsmen | 2.0 |
| ***Service providers (18)*** | |
| Regular inspections | 44.4 |
| Maintenance logbooks (i.e. recording maintenance needs and actions) | 38.9 |
| Maintenance term contracts | 11.1 |
| Reporting serious maintenance lapses to local authority conservation officer for enforcement action | 5.6 |

### 7.8 Monitoring practical maintenance standards

Recommendations for how to monitor practical maintenance standards in relation to heritage properties over time are given in Table 34.

The main recommendation highlighted by all three groups was follow-up inspections (58%).

| **Table 34: Recommendations for monitoring maintenance standards (Source: s. 5, q. 42)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **%** |
| ***Clients (6)*** | |
| Follow-up inspections (incl. feedback reports and recommendations) | 66.6 |
| Regular inspections during work on site | 16.7 |
| Incentive to undertake practical maintenance of property (e.g. reduction in stamp duty) | 16.7 |
| ***Professional advisers (35)*** | |
| Follow-up inspections and reports (e.g. using agreed checklist kept with logbook, avoid being overly bureaucratic) | 57.0 |
| Benchmarking | 11.4 |
| Regular maintenance cycle | 11.4 |
| Maintenance manual/logbooks (incl. quality assessment) | 8.6 |
| Publicity/education | 2.9 |
| Financial incentives | 2.9 |
| Appointment of term consultant (i.e. Surveyor to the Fabric) | 2.9 |
| National audit to quantify/highlight extent of disrepair | 2.9 |
| ***Service providers (14)*** | |
| Follow-up inspections (i.e. after annual maintenance is complete) | 57.2 |
| Reporting procedures | 14.4 |
| Approved list/register (incl. random inspections to monitor standards) | 7.1 |
| Use of experienced tradesmen (or vigilant supervision) | 7.1 |
| Benchmarking | 7.1 |
| Review recommendations from previous inspections | 7.1 |

### 7.9 Monitoring maintenance skills gap(s)

Recommendations for how to monitor maintenance skills gap(s) over time are given in Table 35.

The two main recommendations given by all three groups are:

- Approved lists (55%); and
- Accreditation (24%).

| **Table 35: Recommendations for monitoring maintenance skills gap(s) (Source: s. 5, q. 43)** | |
|---|---|
| **Questionnaire respondent *(number of respondents)*** | **No.** |
| ***Clients (5)*** | |
| Approved lists (esp. local recognition) | 60.0 |
| Accreditation | 20.0 |
| Awards and publicity for examples of good craftsmanship | 20.0 |
| ***Professional advisers (25)*** | |
| Approved lists (incl. particular experience, graded entries, local monitoring, kept up-to-date, entry in relation to approved criteria) | 56.0 |
| Accreditation | 24.0 |
| Monitoring (i.e. by local authorities and English Heritage) | 12.0 |
| Benchmarking | 4.0 |
| Local initiatives | 4.0 |
| ***Service providers (8)*** | |
| Approved lists/register | 50.0 |
| Accreditation | 25.0 |
| Financial support (e.g. reduction in rate of VAT, grant aid) to encourage owners to use approved/accredited service providers rather than non-registered individuals | 12.5 |
| Communication(i.e. between service providers and clients/professional advisers) | 12.5 |

### 7.10 Section summary

Relevant professional and craft training is seen as essential to the provision of inspection and practical maintenance services within the heritage sector, with an emphasis on understanding the differences between traditional and contemporary materials and forms of construction. Increased provision of practical training for both professional adviser and service provider groups is considered key to meeting standards for inspection and practical maintenance. Monitoring of skills gaps might be achieved through the use and evaluation of approved lists/registers and accreditation.

The following section highlights a selection of current training opportunities for those inspecting and maintaining heritage properties and draws particular attention to current initiatives and occupational standards.

## 8.0 TRAINING PROVISION

### 8.1 Section introduction

Based on the findings of the *Employers' Skill Needs Survey* and *CITB Skills Foresight Report*,[28,29] it is clear that the construction industry is experiencing recruitment difficulties, with craft trades presenting a particular problem (especially bricklaying, and carpentry and joinery), and that the skill base of new recruits is of concern. With the gap between required and qualified intake, wide-sweeping action must be taken if the industry is to move towards a fully-qualified workforce.

Given that nearly half of construction output relates to repair and maintenance, with heritage work accounting for up to £2b per annum or approximately 6% of total repair and maintenance output, the need for specific training and qualification for employment in this sub-sector is self-evident.

In addition to the stated objectives of this module, it has been possible during the research period to draw together information about current training opportunities with particular reference to the maintenance and repair of heritage properties. This section provides a summary of information submitted by questionnaire respondents, together with additional evidence of training provision.

It should be noted that the training opportunities referred to in this section cover a range of different forms and methods of delivery, ranging from formal academic courses to on-site work experience, and demonstrate the often bewildering array of opportunities that face those seeking training.

For further information on heritage building skills, see *Heritage Building Skills Report* commissioned by the CITB and published in March 2003.[30]

### 8.2 Training function

In considering the training function of the supplementary questionnaire respondents, 43% categorised themselves as craft trainers (i.e. college, training establishment, builder, contractor), 50% as professional trainers (i.e. college, university, training establishment, CPD provider), and 7% as training assessors (i.e. assessor, examiner).

### 8.3 Training type

The breakdown of training types with which the questionnaire respondents are engaged is as follows:

- General building crafts 13%
- Specialist heritage material supply/usage 17%
- Survey/inspection 7%
- Specialist heritage maintenance 20%
- Other 7%
- General property care 10%
- Repair and maintenance 13%
- Health and safety 3%
- Specialist survey/inspection (e.g. non-destructive survey, access, monitoring) 10%

Training types referred to as 'Other' included traditional paints (Holkham Linseed Paints), and building re-use and regeneration (Oxford Brookes University).

[28] CITB (2002). *Employers' Skill Needs Survey: Autumn 2002*. CIB, London.
[29] CITB (2002). *CITB Skills Forecast Report: February 2002*. CITB, London.
[30] Robert Bilbrough Associates (RBA) (2003). *Heritage Building Skills Report*. March. RBA, Elton (Shropshire).

### 8.4 Inspection training

Training in the inspection of heritage properties is typically provided as part of a broader package of skills:

- Postgraduate or undergraduate conservation courses (details of current conservation courses/programmes offered at Higher Education and Further Education levels are given in Appendix F);[31]
- Undergraduate built environment courses;
- Industry-supported training initiatives (e.g. Upkeep/City & Guilds Certificate for Repairs Staff);
- Maintenance and repair courses offered by specific training providers (e.g. SPAB, West Dean College);
- General interest conservation/heritage courses/events; and
- CPD/LLL training events.

### 8.5 Practical maintenance training

Practical maintenance training typically forms part of the coverage given to general heritage building conservation/management:

#### *8.5.1 General training*

- Church Maintenance Trust educational events;
- Essex County Council 'Traditional Building Skills Courses for Primary Schoolchildren';[32]
- Prince's Foundation training scholarships;[33]
- SPAB 'An Introduction to the Repair of Old Houses' weekend course for homeowners;
- SPAB regional group events (e.g. Fenland/Wash Regional Group 'An Introduction to Lime');
- SPAB 'Churchwarden Training'; and
- Zibby Garnett Travelling Fellowship for students/apprentices working with historic buildings, gardens and landscapes; traditional building trades; sculpture and chattels; and historic and decorative crafts.

More detailed practical maintenance training is often associated with courses concerned with a particular material or form of construction:

#### *8.5.2 Specific training*

- British Waterways Heritage Skills Training Centre courses;
- Building Crafts & Conservation Trust training events;
- Essex County Council 'Traditional Building Skills Courses';
- Faenol Estate training project (with Linford-Bridgman Limited);
- Gerard Lynch brickwork training on individual basis (e.g. gauged work, tuck pointing);
- Holkham Linseed Paints 'Window Craft Information Course';
- Orton Trust courses (e.g. 'Basic Masonry Skills', 'Restoration Carving', 'Setting Out', 'Tool Sharpening');
- SPAB 'Spring Repair Course' week course for professionals and contractors;
- SPAB practical courses (e.g. 'Introduction to Lime for Building Contractors' day course;
- SPAB Lethaby Scholarships[34] and William Morris Craft Fellowships;
- Teach Project (Norfolk County Council with R.G. Carter Group);
- Upkeep repair and maintenance courses (e.g. 'Inspecting a property', 'Managing a Maintenance Budget', 'Effective Planned Maintenance and Stock Re-Investment');

---

[31] Based on information provided by the ICOMOS-UK Education and Training Committee.

[32] Holden, A. (2003). 'Building Skills for Primary Schoolchildren', *Context*, No 79, May, pp. 16–17.

[33] Russell, H. (2003). 'Craft Training', *The Journal*, RICS Building Surveying Faculty publication, Issue 6, March/April, p. 5.

[34] Innerdale, J. (2003). 'Preserving the Know-How', *SPAB News*, Vol 24, No 2, pp. 53–55.

- Upkeep/City & Guilds Certificate for Repairs Staff (based on 'Basic Building Construction', 'Condensation, Damp and Decay', 'Domestic Electrical and Heating Installations', 'Plumbing, Wastes and Drains', 'Repairs Reporting Skills' modules, and assessment);
- Weald & Downland Open Air Museum 'Historic Building Conservation' courses;
- West Dean College 'Building Conservation Masterclasses' courses;
- West Dean College 'Professional Conservators in Practice' courses; and
- Woodchester Mansion Trust training courses and practical summer schools.

Such training initiatives target all three key groups (clients, professional advisers, service providers), and typically include coverage of the theory and practice of maintenance. There are, however, few training opportunities available for operatives wishing to learn about the maintenance of heritage buildings and, at the same time, obtain the necessary site evidence to meet the requirements for NVQ/SVQ Level 3 qualification and CSCS conservation endorsement.

## 8.6 Current practical training opportunities

### *8.6.1 Teach Project*

One example of how such training might be gained is the Teach Project, run as a collaborative venture between Norfolk County Council and the R.G. Carter Group, which is providing on-site training during contract works at Waxham Barn in Norfolk.[35] The objective of this project is to provide operatives with a range of otherwise limited practical craft training in order to satisfy performance criteria. Operatives with a NVQ/SVQ Level 3 qualification or apprenticeship training are eligible for a CSCS Gold Card and, with additional conservation units, can progress towards attaining a CSCS card with conservation endorsement.[36] The R.G. Carter Group is an accredited NVQ centre offering training in a range of traditional crafts and, through the Teach project, can offer site experience/evidence that is considered missing from college courses.

### *8.6.2 Faenol Estate training programme*

Another example is the training project established at the Faenol Estate in Wales, where Linford-Bridgman Limited are providing training opportunities as part of on-going works to the 70 listed buildings on the estate.[37]

### *8.6.3 Historic Scotland schemes*

A further example of practical instruction are the internship and fellowship schemes operating through Historic Scotland's Technical Conservation Research and Education Division (TCRE), which provide a potential model for practical conservation training.[38]

The intern scheme, which began in 1987, finds placements for newly-trained conservators in order to meet the shortfall of experienced practitioners working with the moveable heritage. The emphasis is on retaining the interns in Scotland and, to date (with five or six interns per years), the success rate has been about 75%.

The Historic Scotland Building Conservation Fellowship scheme was established in order to provide experience in traditional building repairs, with an emphasis on a wide range of skills and knowledge across many different materials and building types (the emphasis has since moved to single trades/crafts). This 'jack-of-all-trades' is of particular relevance in Scotland owing to the nature of the

---

[35] Creasey, A. (2003). Personal telephone communication (22 September). The Teach Project and others can only operate where there is a 'philanthropic client' allowing training on site during a building contract.

[36] The CSCS is currently administered by the CITB and aims to register every competent construction operative with the United Kingdom not currently on a skills registration scheme. The first CSCS cards with conservation endorsement were achieved in November 2002.

[37] Anon. (2003). 'Conservation: The Future', *Natural Stone Specialist*, May, pp. 17–18.

[38] Brown, C.E. (2003). 'Beyond the Divide – Experiences from Scottish Conservation', in: Watt, D. and Colston, B. (Eds.), *Conservation of Historic Buildings and their Contents: Addressing the Conflicts*, Donhead Publishing, Shaftesbury, pp. 28–40.

building stock and remote location. The fellows receive initial training at the Scottish Lime Centre, attend lectures at the Scottish Centre for Conservation Studies, and are sent on placements throughout Scotland. Those that have received this training typically remain in Scotland and provide a valuable service for owners and conservation agencies.

#### *8.6.4 Monumentenwacht programme*

In considering the system of Monumentenwacht operating in the Flanders region of Belgium,[39,40] different inspection systems operate for buildings, mills, and interiors. The inspectors typically make recommendations for maintenance and repair work, but will undertake minor or urgent works using traditional materials and methods of construction. A standard procedure is used for site inspections and recording, with reports prepared for the property owner/member giving a detailed description of the property, a ranked assessment of the condition of the building elements/components (i.e. good, reasonable, moderate, bad, and not inspected), recommendations, and a roof plan/illustrations. On-site advice and a help desk are also available. Training is provided for the inspectors on a continual basis, and the reports of the various inspection teams are reviewed every year in order to provide a level of assessment. A particular difficulty in performing this service is providing safe working access to historic buildings. A strict system of risk assessment and protection is in operation, with industrial rope-access techniques used to ensure safety during inspections.

### 8.7 Recent training initiatives and occupational standards

#### *8.7.1 National Heritage Training Group*

The NHTG was launched in February 2003 with the aims of attracting more people into the sector and encouraging accreditation of the workforce. Its objective of recruiting 30,000 more people into conservation over the next five years is ambitious, but, based on its recently published business plan,[41] the Group has identified three areas for immediate action:

- to develop and implement a formal structure to ensure a financially viable support mechanism to integrate the work of the NHTG with key groups and stakeholders;
- to fill current gaps in information necessary to develop a traditional building craft skills training plan; and
- to develop and implement a traditional building craft skills training plan.

#### *8.7.2 National Construction Forum*

The National Construction Forum, launched in July 2003, is intended to prepare a 'sector skills agreement' by December 2003 to meet the needs of the construction industry.[42] Inherent in this is the desire of the Government to get contractors more closely involved in training, to attract more skilled workers to the sector, and to strengthen and increase the number of apprenticeships.

#### *8.7.3 CITB recruitment campaign*

With 380,000 people having to be recruited into the construction industry over the next three years in order to meet government targets for new housing, hospitals, roads, and schools, the recently-launched CITB recruitment campaign is aiming to attract 14–19 years olds using a range of advertising

---

[39] Stulens, A. (2003). Personal e-mail communication to Deborah Lazarus (13 June). The Monument Watch system operating in Flanders currently has a membership of 3,700 building owners, with an annual subscription fee of Euro 40 per building. A separate inspection fee is charged at Euro 19 per person per hour of inspection time.

[40] Stulens, A. (2003). 'MONUMENT WATCH: An Effective Monitoring and Maintenance System for the Cultural Heritage? An Overview of the Flanders Experience'. Unpublished notes from *Conservatione Programmate: Nuovi Processi per Valorizzare il Patrimonio Storico-Architettonico* conference, 11–12 April, Milan, Italy.

[41] National Heritage Training Group (2003). *Building on the Past: Training for the Future*. Business plan covering period 2003–2005. NHTG, London.

[42] Hay, G. (2003). 'National Forum to Oversee £400m Training Budget', *Building*, 11 July.

techniques.[43] Of the 380,000 people needed, 65,000 will be required simply to replace existing manpower lost mainly through retirement. As part of its campaign, the CITB aims to promote construction as an exciting and varied career option, increase awareness among employers and stakeholders about the work is undertaking to meet the skills shortages, and encourage employers to meet the demand for apprenticeships and work placements.[44]

Recent research commissioned by the CITB and Department for Education and Skills (DfES) looking at the effect of employment status on investment in training has highlighted the differences in training provision between directly-employed staff and labour-only sub-contractors.[45] Given the current situation and general growth in the use of sub-contractors, on-site familiarisation and supervised training when working on heritage properties are becoming of greater significance.

### *8.7.4 CITB building conservation and restoration careers campaign*

With its recently published brochure *Building Conservation and Restoration*,[46] the CITB set the scene for a career in 'working to preserve and restore a vast range of old and historic buildings, from cottages and country houses to churches and cathedrals, military, industrial buildings and bridges'.[47] This can be done through one of eight specialist skills:

- bricklaying and craft masonry;
- carpentry and joinery (site work or bench work);
- lead working;
- painting and decorating;
- plastering (solid and fibrous);
- roof slating and tiling;
- steeplejacking; and
- stonemasonry (banker and fixer).

In mapping a career path, it is made clear that individuals starting out will 'probably need to join a specialist restoration company', with the possibility of day- or block-release college attendance. Qualifications include City & Guild certificate and NVQ/SVQ (Levels 2 and 3). Three building conservation management NVQs are available in 'building site management (conservation)' (Level 4), 'conservation control' (Level 4), and 'conservation consultancy' (Level 5).[48] For those seeking graduate opportunities, it is recommended that a general degree (such as building, quantity surveying, or project management) be obtained before seeking employment opportunities in industry.

### *8.7.5 National Occupational Standards for Home Inspectors*

With the planned requirement for Home Condition Reports to form part of a property 'seller's pack', it is estimated that 7,500 inspectors will be needed to meet demand when the scheme commences in 2006. Whilst this will, in part, be met by existing property professionals (such as surveyors, estate agents, facilities managers), training and some level of qualification will be required for new Home Inspectors. National Occupational Standards are being developed by PSNTO, with the intention that Home Inspectors will require NVQ/SVQ level 4 or equivalent qualification in order to apply for a

---

[43] BBC News (UK Edition) (2003). *Builders Launch Recruitment Drive*, 12 August, http://news.bbc.co.uk/1/hi/uk/3143005.stm.

[44] This long-term CITB initiative includes the 'Positive Image Campaign', which seeks to integrate marketing and media relations to promote construction, 'Building London', and the regional 'Construction Series', which launched *Constructive Cornwall* in November 2002 and *Constructive Somerset* in September 2003.

[45] IFF Research Ltd (2003). *The Effect of Employment Status on Investment in Training*. April. IFF Research Ltd, London.

[46] CITB (2003). *Building Conservation and Restoration*. Ref. CAR 02/18. CITB, London.

[47] Cantell, T. (2003). Personal e-mail communication (18 July). The view of the MoH Board to the CITB building conservation and restoration careers brochure is that it is '...an opportunity missed to consider a set of skills for maintenance...it pushed the specialised compartments too hard and gave little credence to a generalist or jack of all trades'.

[48] Rolfe, R. (2003). 'Proving Competence', *Natural Stone Specialist*, February, pp. 30–31.

licence from the Home Inspectors Certification Board (HICB).[49,50,51,52] The main role of a Home Inspector will be to 'inspect residential properties and to report on their condition', requiring the following skills:

| | |
|---|---|
| ***Unit 1*** | ***Work in an effective and professional manner*** |
| Element 1.1 | Develop and maintain effective working relationships |
| Element 1.2 | Manage own time and resources |
| Element 1.3 | Develop yourself to improve your performance |
| Element 1.4 | Conduct work in a professional and ethical manner |
| ***Unit 2*** | ***Contribute to the safety and security of people and property*** |
| Element 2.1 | Contribute to the maintenance of health and safety at work |
| Element 2.2 | Contribute to the security of self, colleagues and clients |
| Element 2.3 | Contribute to the security of property |
| Element 2.4 | Contribute to the security of information |
| ***Unit 3*** | ***Prepare for Home Condition Inspections*** |
| Element 3.1 | Identify and agree client requirements |
| Element 3.2 | Make enquiries on matters relating to the property |
| ***Unit 4*** | ***Undertake Home Condition Inspections*** |
| Element 4.1 | Inspect property for condition |
| Element 4.2 | Make complete and comprehensive records of findings |
| Element 4.3 | Determine condition ratings |
| Element 4.4 | Collate information for the assessment of energy efficiency |
| ***Unit 5*** | ***Prepare and disseminate Home Condition Reports*** |
| Element 5.1 | Produce complete and comprehensive Home Conditions Reports |
| Element 5.2 | Make completed Home Condition Reports available and maintain own records |

As the majority of inspected properties will fall within the non-heritage category, the National Occupational Standards necessarily relate to modern forms of construction. For those buyers considering the purchase of a heritage property, it is probable that building surveys will continue to be commissioned from suitably experienced and possibly accredited professional advisers.[53]

Given the current format of the National Occupational Standards, and with its emphasis on non-heritage properties, it is considered doubtful whether the skill standards would be applicable for use with heritage properties. This was clearly never intended and it is felt that to expand or otherwise adapt their format to take account of the variables encountered when inspecting heritage properties would be counter-productive. The traditional form of building survey is, in the hands of an experienced practitioner, capable of providing an informative and useful product that only requires better marketing for it to be more widely adopted.

### 8.8 Section summary

Whilst there is clearly a range of exciting and stimulating training opportunities available to individuals from the three key groups considered in this report, much is achieved in an *ad hoc* manner without overall co-ordination. Successful projects share skills and experience, and provide a practical framework for dialogue and collaboration. Future training initiatives, such as highlighted in the NHTG business plan, should seek to build on these individual successes and provide the means to integrate conservation training – including inspection and practical maintenance services – into the wider built environment and construction agendas.

---

49 Collard, R. (2003). Personal e-mail communication (17 June).

50 PSNTO (2003). *National Occupational Standards for Home Inspectors.* Draft consultation document (edition 7 - July). PSNTO, London.

51 PSNTO (2003). *Home Inspectors: Where Will They Come From?* PSNTO, London.

52 PSNTO (2003). *Outline Job Description for Home Condition Inspectors.* PSNTO, London.

53 Spilsbury, M. (2003). Personal telephone communication (17 June).

The following section draws together the overall findings of this report, and offers recommendations on training and education as they relate to the maintenance of heritage and non-heritage properties.

## 9.0 DISCUSSION AND RECOMMENDATIONS

### 9.1 Discussion

#### *9.1.1 General*

Whilst it is a clearly stated aim of guidance concerning conservation of the built heritage that maintenance should be practised with forethought, control, and the use of records (i.e. planned maintenance) and that this should be carried out at predetermined intervals with the intention of reducing the probability of failure (i.e. preventive maintenance), it is considered that such a system is not served by current forms of education and training. Deficiencies are present for those undertaking the inspection and the practical maintenance of heritage properties. In addition, it is evident that the education and training of those engaged in the maintenance of non-heritage properties is not sufficient to meet the needs of the national maintenance backlog.

Such concerns have been voiced by others in recent years, yet without a significant change in the attitudes of owners, occupiers, and those responsible for the performance and use of heritage and non-heritage properties, the message of preventive maintenance – with or without improvements in maintenance education and training – will continue to fall on deaf ears.

For this change to take place, attitudes such as 'it'll do' and 'don't do today what you can put off until tomorrow' must be met with a response that, ideally, would combine both carrot (i.e. financial incentives, tax breaks) and stick (i.e. maintenance-equivalent of Urgent Works Notice or Repairs Notice, re-payment of grants, fines). This is the business of government and the remit of other Research Modules. Were such a change to occur, however, it is the conclusion of Research Module 6 that current forms of education and training would not be adequate to meet this (hypothetical) demand.

Where research has shown that modern buildings are preferred over older buildings when building maintenance is not controlled, but that older buildings are better liked when maintenance is controlled,[54] it is clear that building maintenance has a significance beyond simply keeping or restoring 'every facility to an acceptable standard'. If greater use is to be made of heritage (and non-heritage) properties, management of the historic environment must be seen as part of, not separate from, the everyday lives of rural and urban communities.[55]

#### *9.1.2 Inspection services*

In considering the skills and experience required by those undertaking inspections of heritage properties, there is a consensus between the three key groups (clients, professional advisers, service providers) that such persons must have a good understanding of traditional materials and forms of construction backed up by a general empathy towards the historic built environment. Training in a built environment discipline, with a postgraduate qualification in architectural conservation, offers the preferred route, although the responses of the service provider group suggest a preference for more practical training and experience. A problem for service providers wishing to undertake inspections is the high cost of indemnity insurance.

With regard to non-heritage properties, it is clear that a general ability to analyse a building and diagnose its actual and potential defects, is of primary concern.

The principal skill difference between the inspection of heritage and non-heritage properties was seen as the ability to identify the historical character and significance of the building.[56] Not unimportant,

---

[54] Herzog, T.R. and Shier, R.L. (2000). 'Complexity, Age, and Building Preference', *Environment & Behavior*, Vol 32, No 4, July, pp. 557–75.

[55] Hankey, D. (2003). 'Management of the Historic Environment – The Broad Nature of the Process' in: Watt, D. and Colston, B. (Eds.), *Conservation of Historic Buildings and their Contents: Addressing the Conflicts*, Donhead Publishing, Shaftesbury, pp. 97–113.

[56] Previous research suggests that the identification of cultural significance embodied in the fabric of historic buildings and considerations of its vulnerability should be a prerequisite for determining approaches to

however, is the view of respondents from both professional adviser and service provider groups that there is no actual significant skill difference.

In considering the problems associated with the inspection of heritage properties, the three key groups identified cost and access provision as key determinants, together with inappropriate work and a lack of client understanding for the requirements of heritage properties.

### *9.1.3 Practical maintenance services*

The skills and experience required by those undertaking the practical maintenance of heritage properties were again those of understanding traditional materials and forms of construction, but matched with traditional trade skills and the ability to carry out appropriate repair techniques. Of particular importance was the ability to select and undertake the least damaging form of repair (i.e. avoiding collateral damage) and matching this to the original construction/material. Above all, in effecting maintenance services on heritage properties, experience counts.

In performing the practical maintenance of non-heritage properties, it was considered essential to have an overall knowledge and experience of building techniques, and a good level of workmanship. Given the growing enthusiasm for do-it-yourself (DIY) repair and maintenance undertaken to non-heritage and, to a lesser extent, heritage properties, the potential for increased levels of information and education for homeowners should not be disregarded.[57]

The principal skill differences lay with appreciating the significance of heritage properties, understanding traditional materials and forms of construction, and having an appropriate level of skill to work on heritage properties, but equally there was a view, albeit limited, that no significant skill difference exists.

The problems inherent in maintaining heritage properties were identified as access provision, sourcing appropriate materials, a lack of craft skills, and a lack of regular maintenance. Of particular consequence are the views of the service providers (i.e. those who actually carry out the work) in drawing attention to the inexperience of professional advisers, the poor quality of specifications/schedules of work, and unrealistic client expectations. Greater use of partnership deals with service providers would provide opportunities for forward planning, cost reduction, and training initiatives.

Whilst, anecdotally, the Construction (Design and Management) Regulations might be viewed as a cause of consternation for service providers, on the basis of Research Module 6 this appears not to be the case. Difficulties of ensuring safe working access to heritage properties have been raised by both professional advisers and service providers, but ambiguities surrounding health and safety responsibilities, whilst noted in relation to small building works,[58] have not been raised in the context of practical maintenance services.

Although much useful maintenance can be undertaken through the relatively simple acts of replacement or repair, it is considered advantageous for both the building and property owner/stakeholder if additional works could be undertaken at the same time, thus making best use of relatively high-cost resources (e.g. access equipment, skilled labour).

---

maintenance management. See: Dann, N., Worthing, D. and Bond, S. (1999). 'Conservation Maintenance Management – Establishing a Research Agenda', *Structural Survey*, Vol 17, No 3, pp. 14–15.

[57] Davidson, M. and Leather, P. (2000). 'Choice or Necessity? A Review of the Role of DIY in Tackling Housing Repair and Maintenance', *Construction Management and Economics*, Vol 18, No 7, 1 October, pp. 747–56.

[58] Griffith, A. and Phillips, N. (2001). 'The Influence of the Construction (Design and Management) Regulations 1994 upon the Procurement and Management of Small Building Works', *Construction Management and Economics*, Vol 19, No 5, 1 September, pp. 533–40.

### *9.1.4 Causes of defects*

Identifying the skills and experience required to inspect and maintain heritage and non-heritage properties provides only half the picture. Knowing the causes of defects, both in terms of the element/component of the building to be affected and the frequency of occurrence, offers scope for targeting resources to maximum effect.

In considering the element/component of heritage properties to be affected by defects, rainwater goods, flat roofs, windows, and external decorations were identified as raising the most frequent concerns. Whilst there is no direct correlation with previous studies of building defects (although most published data relate to modern forms of construction), this finding nevertheless points to the vulnerability of the external building envelope and the requirement for access to high-level fabric. This has implications in terms of access provision, health and safety, and cost.

In considering the range of defects, it was evident that excess moisture (i.e. dampness), cracking, timber decay, and mortar failure are the most frequent to affect heritage properties. Such a preoccupation with problems of dampness compares with the findings of other studies and anecdotal evidence of all engaged with the historic built environment. It is, however, a concern for 'breathability' (and comparable data on condensation) that signifies perhaps the most important difference between traditional and modern forms of construction. This, to a large degree, is in direct response to the efforts of the SPAB in educating homeowners and professional advisers.[59] Understanding how old buildings 'work' and what is needed to keep them in good working order were issues identified by clients, professionals advisers, and service providers alike.

In linking the causes of defects to the provision of education and training, it is considered that greater emphasis needs to be placed on understanding the causes and effects of common defects (e.g. dampness, fungal infection, beetle infestation) in a holistic manner so that an appropriate solution may be found without recourse to third-party advisers (i.e. remedial treatment companies). This applies to both professional advisers and service providers, and would require specific training to address the problems at a practical level. Such action would arguably have greater impact on the maintenance and aftercare of heritage properties than the numerous 'lime' events currently available in the heritage market.

### *9.1.5 Skills supply*

In considering the current supply of skills for the maintenance of heritage properties, is was clear (but not surprising) that professional and relevant craft training offer the most appropriate routes for education.

Whilst there appears to be an inadequate supply of skilled operatives currently available to provide practical maintenance services, the picture is less clear when it comes to carrying out the inspection of heritage properties. This, no doubt in part, comes from the view that much maintenance could be left in the hands of the operative without the need for a separate inspection and reporting service. Whether the most appropriate person to carry out the inspection of a heritage property is the individual who will provide the practical maintenance services appears a moot point.

What is clear, however, is that the inspection and, to a slightly lesser degree, the practical maintenance of heritage properties requires additional skills and experience over and above those needed for the maintenance of non-heritage properties. This is in contradiction to the views of a limited number of respondents referred to above.

[59] See, for instance, Hughes, P. (1987). *The Need for Old Buildings to 'Breathe'*, SPAB Information Sheet 4, SPAB, London.

In the view of one experienced individual,[60] today's professional advisers have to look increasingly to craftsmen and women for guidance in implementing works to heritage properties. This is seen as undermining and de-valuing the importance of the craft group. The adviser should have a proven track record in understanding architectural significance and repair philosophy in order to value the quality of the building and assess the most appropriate method of repair. This is especially important where there can be more than one approach.

Ideally, there should be a mix or team of skills to cover all aspects of procurement, from the initial identification of problems – and including preparation of schedules/specifications, cost planning and financial control, contract administration, health and safety, material selection, and skills selection – through to implementation of the work on site. This mix of skills highlights the potential role of a conservation project manager, who could come from a professional or craft background. The NVQ Level 4 in Building Site Management (Conservation) offers a potential training route, with reference to the CIOB *Project Management Code of Practice for Construction and Development* and proposed ABCM *Code of Practice in Conservation Project Management*.

In terms of training, it is considered that:

> *Clearly we face a major problem, as we have not created the right environment for training in works to historic buildings except, that is, for the small works departments within the National Trust and some cathedral works departments, who have recognised that they have to home-grow their skills to continue. There are some exceptions, such as the Heritage Building Contractors Group, although small in number they are trying to create and maintain a skills base. The move away from direct labour to sub-contracting has been one of the major contributing factors towards the loss of skills.*

If skills gaps are to be met, the cost of training will ultimately have to be passed on to the client. Will this be accepted?

#### *9.1.6 Skills gaps – inspection services*

Concerns were expressed about the current lack of experienced practitioners (especially those with a multidisciplinary understanding of heritage properties), the poor levels of relevant knowledge and experience within the built environment professions, and the general need for greater emphasis on the skills required to inspect heritage properties. This criticism was levelled in particular at the architectural profession, where current training largely ignores the potential heritage market.[61] Particular concern was drawn by service providers to the usefulness of many inspection reports and associated schedules of work, which have often become little more than tick-box checklists that cannot be relied upon for pricing and planning works on site. Clients might usefully be made aware that commissioning a more detailed inspection and schedule would save time and money in the longer term.

The loss of experienced practitioners from the marketplace (such as through retirement and ill health) is of marked concern, especially when linked to the need for such skills to be passed on to younger members of the professions. This might point to an opportunity for older, experienced practitioners to be used in training or individual 'parenting' roles.

It should not, however, be ignored that there was a view that no inspection skills gaps exist in dealing with heritage properties.

---

[60] Burbidge, G. (2003). Personal e-mail communication (18 July). Gerald Burbidge is Works Bursar at Wellington College and Chairman of the CIOB Association for Building Conservation Management (ABCM), and was formerly Clerk of Works at Lincoln Cathedral

[61] This statement holds true for many British architectural programmes, where the emphasis lies (as is perhaps right) with design rather than repair/restoration. Given the current market, however, a significant number of graduates will find employment on projects involving existing and historic buildings, and be inadequately prepared for the specific contractual, ethical, and technical challenges.

In terms of any skills gap affecting the inspection of non-heritage properties, there was an equal view that no gap exists and there is a definite lack of appropriate skills. This dichotomy seems to point to the individual experiences of the respondents. From the service provider perspective, it is clear that there is a need for more qualified operatives – respondents indicated that the skills gap is caused by poor wage rates and the government pushing more teenagers into university education.

The single most important difference between the supply of skills education and training for undertaking the inspection of heritage and non-heritage properties was reported as the need for specialist conservation knowledge and skills when dealing with heritage properties. This is needed to provide the context within which maintenance is planned and undertaken. From the service provider perspective, there appears to be a view that there is no skills difference.

Recommendations for addressing the perceived skills gaps included greater awareness, promotion, and recruitment for working within the heritage sector and the need for more specialist education and training in relation to maintenance inspection. The inclusion of core heritage competencies within current and planned built environment programmes also offered a means of increasing the number of potential heritage maintenance inspectors. Improved training provision, including mentoring of newly qualified individuals, was seen by the service provider group as essential for improved inspection services. Broadening the remit of general property schemes, such as the training of Home Inspectors and provision of Home Condition Reports, to take account of specific heritage property issues was considered to be of little benefit. Demand is not for semi-skilled heritage inspectors, but for competent individuals with the skills and experience necessary to understand and respond to the challenges of the historic built environment.

### *9.1.7 Skills gaps – practical maintenance services*

In considering the skills gap in the supply of practical maintenance education and training, there was a general theme of needing more practical training combined with a greater awareness and sensitivity for working on heritage properties. This training should come from experienced craftsmen, rather than enthusiasts and material suppliers, and be targeted towards the existing workforce through specific re-training initiatives.

Despite the current drive by construction industry stakeholders to encourage the recruitment of more adult entrants (including the re-employment of experienced individuals), together with the increase in young people entering the sector,[62] the shortage of skilled operatives, lack of practical maintenance training, and use of unskilled services (i.e. accepting lowest tender) were particular issues raised by the service provider group. Of particular concern was the view that most new trainees are joining the construction industry for the wrong reasons (i.e. without an interest in buildings and the built environment).

There is also concern that, as the demands of working on heritage properties become more onerous, there will be less scope for the multi-skilled operative capable of responding to a variety of maintenance needs.

The point was made that apprentices receive little college training in traditional craft skills and learn by spending time with craftsmen on site.[63] Whilst NVQ/SVCs provide the qualification benchmark for manual trades within the construction industry and require a level of college attendance, such training would appear not to prepare the student for working on heritage properties. Learning ‘on the job’ can only continue whilst such companies take on apprentices and remain in business.

---

[62] Bryer, L. (2003). MoH e-mail and personal telephone communications (7 November). The CITB New Entrant Trainee Survey has shown that, on average, there has been a 10.8% year-on-year growth in registered trainees since 1998, with approximately 60% of trainees gaining employment.

[63] Bryer, L. (2003). MoH e-mail and personal telephone communications (7 November). This statement is at odds with the view expressed by some firms within the construction industry that trainees spend too much time at college and not enough on the job.

In considering the practical maintenance of non-heritage properties, the skills gap is less evident, although still with a shortage of skilled operatives and need for more practical maintenance training. The skills of preparing accurate schedules of work upon which to plan and implement site works are again lacking.

The single most important difference between the supply of skills education and training for undertaking the practical maintenance of heritage and non-heritage properties was reported as the need for understanding and appreciating traditional materials and forms of construction, and having the knowledge and ability to undertake appropriate repairs to heritage properties. From the client perspective, the key difference lay in the care and pride needed when working on heritage properties.

Interestingly, a view was expressed that the standard of practical maintenance dropped when dealing with the lower grades of listed building. Is this a reflection of the standards set by the client or professional adviser or both (i.e. economics)? There was again a limited view that no difference existed in the need for specific education and training when dealing with heritage properties.

Recommendations for addressing the perceived skills gaps included the use of craft-based apprenticeships (with a larger concentration in the heritage sector), greater awareness and promotion of conservation within the construction industry, support from clients and professional advisers for companies that are committed to delivering high-quality work (i.e. not accepting the cheapest tender from an inexperienced contractor), and increased maintenance training provision. Although much is now being done to promote conservation within the construction industry (such as through the formation of the NHTG and drive to recruit into this sector), such recent initiatives will take time to build up the depleted skills base in heritage work.

### *9.1.8 Setting standards – inspection services*

In establishing and assessing standards for training in the inspection of heritage properties, professional conservation accreditation was a clear consideration of the three key groups. Current accreditation schemes include:

- Accreditation for Chartered Surveyors in Building Conservation (RICS);
- Conservation Accreditation Register for Engineers (CARE) (ICE and IStructE);
- Professional Accreditation of Conservator-Restorers (PACR) (NCCR sponsored by UKIC, IPC, and SoA); and
- Register of Architects Accredited in Building Conservation (AABC) (ACCON Limited).

Accreditation has raised many issues about standards of professional education, professional competence in conservation, and the increasing specialisation of the subject. Although not strictly an issue of education and training, accreditation has become a focus for all engaged with heritage properties.[64,65]

The current fragmentation of accreditation across the built environment professions was highlighted as a concern, as too was the view that accreditation was not necessary for the advancement of architectural conservation, but simply as a requirement of English Heritage. In terms of education and training, continuing professional development was seen as a vital means of keeping up-to-date with conservation issues. To be of greatest benefit, it should be structured and bring together the experiences of the three key groups.

---

[64] Shaw, R. (2003). 'Letters: The Harm in Architect Accreditation', *SPAB News*, Vol 24, No 3, pp.10–11. In this correspondence, it is stated that 'If an architect in not competent to work on "old" buildings, he or she should not be in practice at all'. This sentiment, whilst often proclaimed by practising architects, is at odds with the views of service providers, clients, and other professional advisers.

[65] Hume, I. (2003). 'Briefing: Accreditation for Engineers', *Context*, No 81, September, pp. 2–3.

### *9.1.9 Setting standards – practical maintenance services*

Recommendations for establishing and assessing standards for training in the practical maintenance of heritage properties included a clear need for more conservation craft training and use of apprenticeships. There was a view, especially with the smaller service providers, that greater financial incentive was required to take on apprentices given the level of regulation and paperwork attached to this form of practical training. Specialist training for operatives was also seen as potentially beneficial, but, in the current competitive market, no advantage would be gained at tender stage. Some form of qualification (e.g. NVQ/SVQ) was seen as important, but so too were more collaborative initiatives that brought the different groups and stakeholders together. The need for local craft training centres that reflected the particular materials and forms of construction of the locality was highlighted.

Linked to this is the view that there are no standards, regulations, or codes of practice that provide a benchmark for practical training.[66] Although it is acknowledged that works to heritage properties are typically non-standard and often with various solutions to a particular problem, the point remains that, without a clear point of reference, how can standards be assessed.

Promoting craft excellence, such as through local and national competitions, awards, and events, was seen as benefiting both the industry and training initiatives.

### *9.1.10 Monitoring maintenance needs*

Monitoring the maintenance needs of heritage properties was seen universally as coming from regular inspections together with some form of maintenance manual or logbook that passed to new owners in the same manner as the Health and Safety Files prepared under the Construction (Design and Management) Regulations. Examples of (past and present) property logbooks include *The Property Log Book*,[67] *The Building Centre Maintenance Manual + Health and Safety File*,[68] and *King's Lynn & West Norfolk Borough Council Listed Building Property Logbook*.[69]

Monitoring through regular inspection and reporting is seen as forming part of the overall service provided by a competent professional adviser. Such core skills are learnt through a combination of initial and mid-career training, backed up by the accumulation of personal experience, and should be embraced by those planning and delivering inspection training.

The use of maintenance term contracts also provides the opportunity for better monitoring and response to maintenance needs, but required appropriate levels of administration.

### *9.1.11 Monitoring maintenance standards*

Seen as difficult to achieve in practice, the preferred method of monitoring maintenance standards was for follow-up inspections carried out as part of a regular maintenance cycle, together with some form of maintenance benchmarking. This might be through a quality assessment process recorded in the property logbook. The appointment of a maintenance term consultant (such as a Surveyor to the Fabric) was also seen as a means of ensuring consistency and continuity in the provision of appropriate maintenance alongside the use of long-term maintenance contracts.

---

66 Bryer, L. (2003). MoH e-mail and personal telephone communications (7 November). A number of clients, particularly members of the Major Contractors Group, require workers on their sites to have a CSCS card, which will have obvious implications for the training and/or assessment of the entire workforce, specialist or not.

67 Davenport, Kingdom & Company Limited (1985). *The Property Log Book*. 3rd ed. Davenport, Kingdom & Company Limited, Bristol.

68 Blacker, J. (n.d.). *The Building Centre Maintenance Manual + Health and Safety File*. 5th ed. The Building Centre, London.

69 King's Lynn & West Norfolk Borough Council (Planning Policy) (2003). *Listed Building Property Logbook*. King's Lynn & West Norfolk Borough Council, King's Lynn. These logbooks are prepared for individual listed properties as part of the Listed Buildings Protection Project.

### *9.1.12 Monitoring maintenance skills gap(s)*

Again seen as difficult to achieve, the use of up-to-date skills lists and registers linked to accreditation were highlighted as possible means of monitoring maintenance skills gaps (both inspection and practical maintenance services) over time. Concern was expressed over the criteria used for registration in order to attain an appropriate standard; practical experience of working with heritage properties was seen as being more relevant than qualifications. It was also considered that craftsmen often rely on their local reputation, whereas 'cowboy' builders are better at getting on to lists or advertising in *Yellow Pages*. Monitoring by local authorities and English Heritage, perhaps linked to local and/or national registers, seemed the preferred option over third-party involvement. It must, however, be noted that local authority registers (such as those listing specialist advisers, craft firms, and material suppliers) are not approved lists, take time and resources to administer, and usually carry broad disclaimers.[70] Local initiatives, such as bringing the three key groups together at awareness-raising or practical events, was highlighted, but requires adequate resourcing. Skills surveys, such as that proposed in the NHTG business plan to establish regional and country variations in skills shortages and training provision, require significant resources if they are to be sensitive to actual supply and demand issues.

## 9.2 Recommendations

Based on the findings of Research Module 6, it is clear that there is no single initiative or change that will address the education and training needs of the three key groups (clients, professional advisers, service providers). Instead, it is considered that practical and long-term solutions will only be achieved through a combination of actions.

### *9.2.1 Education and training*

Inspection services

With the evident lack of practical inspection experience, it is clear that primary and supplementary training must be made available. This should be targeted at the three key groups (clients, professional advisers, service providers), but draw on the practical experiences of each in formulating curricula.

- ***Recommendation 1****: Develop primary maintenance-related training for the inspection of heritage and non-heritage properties (the latter to include coverage of heritage properties) for delivery to the three key groups (incl. homeowners, stakeholders, Home Inspectors, churchwardens). The potential involvement of universities and colleges in the provision of theory-based training should be examined.*
- ***Recommendation 2****: Develop supplementary maintenance-related training for the inspection of heritage and non-heritage properties (the latter to include coverage of heritage properties) for professional advisers and service providers, with an emphasis on practical, on-site inspection procedures and reporting standards (e.g. induction training to new conservation employees, CPD).*
- ***Recommendation 3****: Support and promote existing training initiatives within overall structured framework (e.g. IHBC, CITB, NHTG).*
- ***Recommendation 4****: Support for collaborative ventures that offer practical, hands-on experience to professional advisers as part of academic courses (e.g. Weald & Downland Open Air Museum / Bournemouth University, West Dean College / University of Surrey).*

Practical maintenance services

Although considered the 'Cinderella' of the construction industry, it is evident that greater support must be given to establishing a recognised training and qualification in property maintenance. This is

[70] Morrison, A. (2003). Personal telephone communication (29 September). Derbyshire County Council has operated a paper-based craft skills register for 30 years, and this has recently been added to the Derbyshire Historic Buildings Trust website for free public access. There has been a limited response from those asked to be added to the register and, with the reduction in grant-aided schemes, there is less day-to-day contact with service providers.

needed for both heritage and non-heritage properties, with an emphasis on attaining a level of proficiency across a range of skills (i.e. working with traditional and contemporary materials and methods of construction). In addition, training is required for those working at high level. Encouragement and training must also be provided for the many individuals looking after heritage properties who are not service providers.

- ***Recommendation 5****: Support for regional training centres with experienced tutors and opportunities for site placements with experienced operatives.*
- ***Recommendation 6****: Greater financial support/incentives for offering trade and craft apprenticeships (e.g. focus on recruitment of school leavers).*
- ***Recommendation 7****: Support for local training initiatives that bring together the three key groups. This might take the form of local maintenance services, following the Monumentenwacht model operating in Belgium.*
- ***Recommendation 8****: Practical maintenance training for individuals with high-access skills (e.g. abseiling, steeplejacking) to work on high-level fabric.*
- ***Recommendation 9****: Support for basic maintenance training offered to lay individuals (e.g. property owners, churchwardens) at a local level.*

Practical craft training

With the lack of practical craft training opportunities, support must be given to promoting the opportunities of a career in construction (and conservation), establishing a network of regional training centres, and offering practical training opportunities. Emphasis should be placed on increasing the skills of the existing workforce through re-training initiatives. This should take advantage of the work of the Learning and Skills Council (LSC), the Sector Skills Councils (SSC),[71] and the NHTG.

- ***Recommendation 10****: Support for regional craft training centres with experienced tutors and opportunities for placements on site with experienced craftsmen.*
- ***Recommendation 11****: Greater financial support/incentives to service providers for offering trade and craft apprenticeships and re-training of existing operatives.*
- ***Recommendation 12****: Support for local training initiatives that bring together the three key groups (client, professional advisers, service providers). The potential involvement of universities and colleges in the provision of theory-based training should be examined.*
- ***Recommendation 13****: 'Training plans' to be prepared as a condition of HLF grant, demonstrating how training might be provided during a particular project.*
- ***Recommendations 14****: Promotion for training opportunities, especially targeting school leavers (e.g. Construction Industry Trust for Youth, Prince's Trust, UK Skills SkillCity).*

Homeowner information

The provision of easy-to-follow advice and information for owners and occupiers of heritage properties offers the long-term opportunity to influence patterns of maintenance and repair. Published information is already readily available through conservation organisations,[72] but much is taken up only by informed owners and professional advisers. Other sources of information include general conservation publications, websites, and organised events.[73] More specific information dealing with

[71] The SSC network is underpinned by the Sector Skills Development Agency (SSDA).

[72] Examples of published information include: Council for the Care of Churches (e.g. *A Guide to Church Inspection and Repair*, *Church Log Book*, *The Churchwarden's Year*, *The Churchyards Handbook*, *Church Property Register*); CPD Study Pack Club (e.g. *Structural Failures in Traditionally Built Domestic Buildings*); Ecclesiastical Insurance Office plc (e.g. *Guidance Notes on the Use of Ladders*), SPAB technical pamphlets, guides, and information sheets; and Wrightson, A. (2002). *A Stitch in Time: Maintaining Your Property Makes Good Sense and Saves Money*, IHBC/SPAB, London.

[73] Examples of events include: SPAB National Maintenance Week (22–29 November 2002, 21–28 November 2003), SPAB National Gutters Day (29 November 2002, 28 November 2003), English Heritage *Maintenance Matters: A Coordinated Approach to Fostering Better Care of Historic Buildings* conference (22 November 2002), National Trust maintenance conference (21 November 2003), and local authority craft skills registers.

practical maintenance is also available through organisations such as Maintain our Heritage.[74] The need remains, however, for straightforward guidance on inspection and maintenance aimed at owners and occupiers of heritage and non-heritage properties.

- ***Recommendation 15****: Preparation and dissemination of general and heritage property maintenance guidance (possible link with maintenance logbook) to new property owners via solicitors, estate agents, public libraries, Citizens' Advice Bureaux, and DIY outlets.*
- ***Recommendation 16****: Support for local training initiatives, drawing on the skills of experienced professional advisers and service providers. Such events work well when organised by local authority conservation teams, bringing together individuals from the three key groups and breaking down class or knowledge barriers.*[75]

### *9.2.2 Setting standards*

Inspection services

With the current move towards conservation accreditation across the built environment professions, there is scope for increased confusion within the client group regarding whom to appoint and for what service(s).

- ***Recommendation 17****: Support for a unified accreditation scheme that reflects the inter-disciplinary nature of conservation whilst giving support for individual practitioners in their chosen areas of expertise.*
- ***Recommendation 18****: Support for 'experience exchange', using retired or part-time practitioners to act as mentors for newly qualified conservation professionals. This could be linked to accreditation schemes, whereby an individual could pass from 'probationer' to 'experienced' category by logging time spent with approved practitioner. Employer support would be essential.*

Practical maintenance services

With the reduction in trade/craft apprenticeships and practical training opportunities, emphasis has been placed on attaining a level of qualification through a demonstration of individual competencies. The NVQ/SVQ system offers a qualification route that is gaining recognition within the industry and beyond, yet is seen by many as a 'dumbing-down' of traditional craft training with an undue emphasis on record-keeping and portfolio preparation. Overall, there is support within the service provider group for greater support for 'traditional' apprenticeships.

- ***Recommendation 19****: Support for increased apprenticeships, combining college education with practical site experience, and offering the opportunity to exchange apprentices and existing operatives (i.e. secondment) between local service providers in order to provide a greater range of practical experience and make best use of the remaining traditional tradesmen.*
- ***Recommendation 20****: Support for system of qualification (e.g. NVQ/SVQ, City & Guilds Certificate) linked to practical craft competencies and with appropriate levels of assessment.*
- ***Recommendation 21****: Support for recognised qualification in property maintenance, covering a range of trade skills (e.g. Upkeep/City & Guilds Certificate for Repairs Staff), and with specific qualification for heritage property maintenance.*
- ***Recommendation 22****: Support for accreditation scheme based upon qualification and practical experience, with national and/or regional registers for individuals (not companies) with specific trade/craft skills. Such a scheme would require monitoring and re-assessment at intervals.*

---

[74] See: http://www.maintainourheritage.co.uk/further_reading.htm for previously-published papers on maintenance, including Dann, N., Worthing, D. and Bond, S. (1999). 'Conservation Maintenance Management – Establishing a Research Agenda', *Structural Survey*, Vol 17, No 3; Dann. N. (2000). 'The Logic of Maintenance', *Context*, No 67; and Allan, G. (1999). 'Preventive Maintenance: The Way Forward?, *Context*.

[75] The author (DW) was involved with various training events when employed as Conservation Officer with Norfolk County Council (e.g. clay-lump days, lime day, wattle-and-daub weekend), with positive feedback for bringing homeowners and service providers together.

### *9.2.3 Future developments*

Inspection technology

With the growing impact of health and safety legislation on those undertaking maintenance tasks, it will become increasingly necessary for property owners, together with their professional advisers and service providers, to consider providing safe (temporary or permanent) means of access and working conditions. Any form of technology that ensures greater safety, whether for inspection or recording, is to be welcomed.

- ***Recommendation 23****: Make greater use of remote means of inspection and recording. Aerial photographic services using ground-based still or video cameras, with CCTV preview at ground level, are available for inspections and recording of high-level fabric.*[76]

Information technology

By taking account of developments in modern information technology and its use in forecasting predictive building maintenance and modelling running costs,[77,78,79] the traditional inspection or survey of heritage properties might usefully be developed to take greater account of risk and management factors. Although requiring greater knowledge of the life-cycle costs of traditional materials and forms of construction, the potential gains in objectivity and accuracy of data would allow for improved assessments of condition and division of resources.[80,81] In the context of Research Module 6, such changes would have implications for the education and training of new and mid-career professionals.

- ***Recommendation 24****: Provide specific training associated with the use of maintenance-related information technology.*

Maintenance cost information

The requirement from clients and professional advisers for accurate cost information (such as needed for fund raising, setting budgets, and seeking grants/loans) and the difficulty for the service provider in providing this information (including a lack of/open-ended brief, and paucity of reliable maintenance cost information) points to a need for cost information relating to the maintenance and repair of heritage properties. Whilst, for instance, the *BMI Building Maintenance Price Book*[82] provides a valuable annual guide to estimating and pricing, it does not provide cost information that is specific to heritage properties.

- ***Recommendation 25****: Develop specific heritage property maintenance (and repair) cost database for use by professional advisers and service providers.*

Maintenance procurement

For many service providers, additional training would not lead to greater success at tender stage where they are competing against often unskilled operatives. Continuity of employment, based upon mutual trust, would engender benefits for all concerned.

---

[76] Such services are provided by various companies, including Aerial Close-Up Limited, 70 Northampton Road, Denton, Northampton, NN7 1DL (tel: 01604-899499; website: http://www.aerialcloseup.com).

[77] Pitt, T.J. (1997). 'Data Requirements for the Prioritization of Predictive Building Maintenance', *Facilities*, Vol 15, No 3/4, 18 April, pp. 97–104.

[78] Al-Hajj, A. and Horner, M.W. (1998). 'Modelling the Running Costs of Buildings', *Construction Management and Economics*, Vol 16, No 4, 1 July, pp. 459–70.

[79] Alani, A.M., Tattersall, R.P. and Okoroh, M.I. (2002). 'Quantitative Models for Building Repair and Maintenance: A Comparative Case-Study', *Facilities*, Vol 20. No 5/6, pp. 176–89.

[80] Kempton, J., Nichol, S., Anumba, C. and Dickens, J. (2001). 'Surveyor Variability in Large-Scale House Condition Surveys', *Structural Survey*, Vol 19, No 4, 12 September, pp. 156–62.

[81] El-Haram, M.A. and Horner, M.W. (2002). 'Factors Affecting Housing Maintenance Cost', *Journal of Quality in Maintenance Engineering*, Vol 8, No 2, pp. 115–23.

[82] BCIS (2003). *BMI Building Maintenance Price Book 2003*. RICS Building Cost Information Service Limited, London.

- ***Recommendation 26****: Linked to accreditation and the operation of skills registers, support for competitive tendering between matched service providers.*
- ***Recommendation 27****: Where possible, support for open negotiation rather than competitive tendering, and use of double-envelope tendering to balance quality with cost.*
- ***Recommendation 28****: Establishment of partnership deals between clients/grant-giving organisations (e.g. English Heritage) and service providers providing regular employment with continuity and enhanced training opportunities.*
- ***Recommendation 29****: Financial support for owners, such as reduction in rate of VAT and grant aid, to encourage greater use of skilled accredited/approved service providers.*

Quality assurance

Although formal quality assurance standards, such as ISO 9000, are present within the mainstream construction industry and their impact on defect reduction considered,[83] the case for quality assurance in relation to the general property market has so far gone unmade. Coupled with public concern for 'cowboy builders', it is evident that some form of quality assessment and assurance in relation to general property repair and maintenance services would be beneficial.

- ***Recommendation 30****: Formation of publicised quality-assurance scheme, based upon proven skill and experience (rather than simply paying a subscription), for general property repair and maintenance services. The same or similar scheme might operate for heritage properties. Such a scheme could be combined with an accreditation scheme or operate on a separate basis.*
- ***Recommendation 31****: Linked to Recommendation 30, support for service providers offering an inspection service alongside existing planned maintenance services. This would require co-operation across various groups to satisfy issues of competence, liability, and indemnity insurance.*

Promoting excellence

Recognition for excellence, in whatever walk of life, is essential for inspiring and maintaining interest. Maintenance is considered the 'Cinderella' of the construction industry, yet (together with repair activities) provides a significant income stream for service providers. Greater support within the construction industry, together with national initiatives (e.g. insurance premium reduction, VAT reduction), would do much to highlight quality workmanship and career opportunities.

- ***Recommendation 32****: Promoting craft excellence through local and national competitions, awards, and events to highlight training and the construction/conservation industry. This includes entries for the UK Skills National Training Awards.*

[83] Pheng, L.S. and Wee, D. (2001). 'Improving Maintenance and Reducing Building Defects through ISO 9000', *Journal of Quality in Maintenance Engineering*, Vol 7, No 1, 11 April, pp. 6–24.