

VOLUME 1 : MAIN TEXT

Research on the Irish labour market in construction conservation

for

THE HERITAGE COUNCIL

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## CONTENTS

1.0	INTRODUCTION.....	4
1.1	Preamble.....	4
1.2	Scope of findings informing research .....	5
1.3	Presentation of findings.....	7
2.0	IDENTIFICATION OF COMPONENT TRADES AND JOBS IN THE BUILT HERITAGE SECTOR .....	9
2.1	Introduction .....	9
2.2	Findings.....	9
2.3	Comment.....	11
3.0	RELEVANT LABOUR MARKET STATISTICS RELATING TO CONSTRUCTION CONSERVATION TRADES .....	13
3.1	Introduction .....	13
3.2	Labour market facts relating to construction.....	14
3.3	Information relating to contractors and trades .....	14
3.4	Category 1: Management contractor comments .....	14
3.5	Category 2: Main contractor comments.....	16
3.6	Category 3: Specialist sub-contractor comments .....	16
4.0	IDENTIFICATION OF SKILL COMPETENCIES AND STANDARDS FOR ACCREDITATION FOR CONSERVATION WORKERS.....	18
4.1	Introduction .....	18
4.2	Competencies expected of general contracting trades .....	18
4.3	Standards for accreditation for general contracting trades .....	18
5.0	IRISH TRAINING COURSES AND THEIR RESPONSE TO CRAFT NEEDS	20
5.1	Introduction .....	20
5.1.1	Apprenticeships and guilds .....	20
5.2	Training courses available.....	22
5.2.1	Management / main contractor .....	23
5.2.3	Carpentry and joinery.....	23
5.2.4	Stone and brick .....	23
5.2.5	Roofer .....	23
5.2.6	Plasterer.....	24
5.2.7	Mechanical and electrical services.....	24
5.2.8	Floor and wall tiling .....	24

5.2.9	Painter and Decorator .....	24
5.2.10	Glazing (through painter and decorator craft) .....	24
5.2.11	Facade restoration .....	24
5.2.13	Ironwork and blacksmithing.....	26
5.3	Comment.....	26
5.4	Apprenticeship curricula.....	27
5.5	Curricula for apprenticeships.....	29
5.5.1	Carpentry and joinery apprenticeship.....	29
5.5.2	Brick- and stone-laying apprenticeship .....	29
5.5.3	Stonecutting and stonemasonry apprenticeship .....	30
5.5.4	Plastering apprenticeship.....	30
5.5.5	Electrical apprenticeship .....	30
5.5.6	Plumbing apprenticeship.....	30
5.5.7	Floor and wall tiling apprenticeship .....	30
5.5.8	Painting and decorating apprenticeship .....	30
5.6	Training – discussion and conclusions.....	31
6.0	ANTICIPATED FUTURE NEEDS FOR CONSERVATION CRAFT SKILLS...	33
6.1	Introduction .....	33
6.2	Contractor opinion on future needs .....	33
6.3	Comment.....	35
7.0	RECOMMENDATIONS .....	36
7.1	Recommendations .....	36
7.1.1	Competencies .....	36
7.1.2	Engagement of management contractors with craft skills .....	36
7.1.3	Training.....	36
7.1.4	Investment in indigenous crafts and skills.....	37
7.1.5	Employer and client awareness .....	37
7.1.6	Procurement and the ‘conservation card’ .....	38
7.1.7	Addressing skill deficiencies and mentoring programmes.....	39
8.0	SUMMMARY .....	40

## 1.0 INTRODUCTION

This research serves as an overview of the building industry to determine if it meets the needs of built heritage conservation and its workers. It further seeks to establish true numbers of contractors employed in the heritage contracting industry, together with an evaluation of how that skill base is composed. Volume 1 contains the text of the report, while Volume 2 contains the appendices.

The project team consists of Maol Íosa Molloy, architect, Rob Goodbody, conservation consultant and Pat McAfee, stonemason.

### 1.1 Preamble

The Heritage Council commissioned this report to carry out research into the labour market in Ireland in construction conservation, to provide a clearer understanding of the built heritage craft skills sector and its significance and to inform the basis for its future management.

To this end, the Heritage Council submitted a brief which would;

- 1) Identify the component trades and jobs in the Built Heritage sector, by reviewing the draft list of trades and jobs and assess its completeness,
- 2) Collate and present any relevant labour market statistics related to these construction conservation trades,
- 3) Identify, for each trade on the list the skill competencies and standards for accreditation for conservation workers.
- 4) Compile a list of training courses available in Ireland which respond to the craft skills needs of the building conservation sector
- 5) Establish the anticipated future needs for conservation craft skills, and at what level or standard (e.g. apprenticeships, traineeship, and master craftsperson).

As the research progressed, it was evident that the Heritage Council's research expectations to a large extent could be met in the carrying out of detailed interviews with relevant parties. Initiating research with the contracting industry required qualitative and quantitative research methods in the issuing of questionnaires to all known heritage contracting firms, as a basis for singular interviews with each firm.

Questionnaires were thus designed for three distinct categories: Category 1 comprising private sector management contractors, Category 2 comprising private sector main contractors and Category 3 private sector specialist sub-contractors.

As participants in each group were interviewed on a one-to-one basis, it allowed the authors to extract pertinent and often starkly honest responses to specific questions.

With agreement from the Heritage Council, a colloquium of key management and main contractors operating in the field of heritage took place on the 26<sup>th</sup> June 2014, where the core issues of the research were discussed in an open forum further informing opinion in the following texts.

The brief also required conclusive investigations into the area of conservation education and training opportunities, research that presented questionable challenges for the desirable standardisation of heritage skills across all trades.

## 1.2 Scope of findings informing research

The Heritage Council's intention that the scope of the research would identify component trades and jobs in the built heritage sector has been achieved in Section 2.0 below. The research found that the draft list of trades, did not describe trades as viewed by contractors in the industry. In response, a list of trades and jobs was collated and is listed in Table 2.2 under the titles with which they are colloquially known in the industry, on the premise that terminologies form the basis of specialist contractor organisation and supply to the sector. This table also incorporates trades that are not included in the draft list.

Section 3.0 seeks to collate and present relevant labour market statistics relating to construction conservation trades. A total of 354 private sector contractors were identified as working within the industry, ranging from larger management through to smaller main and specialist contractors. All were contacted for the purpose of interviews. A total of seventy-six of the contractors gave in-depth and honest interviews, representing approximately a quarter of known heritage contractors. Interviews were also held with public sector foremen, which offered an alternative view of the maintenance and repair sector operated by the OPW.

The brief also required that the team identify skill competencies and standards for accreditation for conservation workers, outlined in Section 4.0 of the report. In analysing contractor opinion on this matter, it was found that the majority were in favour of developing their knowledge and engaging with recognised educational programmes, as they perceive that enhanced skills and competencies will immeasurably benefit quality conservation work, meeting the expectations of their clients and the wider heritage protection community. They acknowledge at present that deficiencies in education and

training place the future of the indigenous craft industry at a disadvantage to competition from elsewhere.

The team reviewed apprenticeships in mainstream skills and parallel opportunities for primary training in craft skills for established operatives as a basis for competent coordination and supervision of skilled trades on heritage sites. In discussion with contractors, critically few apprenticeships are being offered to a younger generation, with all known participants serving carpentry apprenticeships<sup>1</sup>. The scarcity of such opportunities has been acknowledged in previous studies such as the 2006 inter-departmental '*Strengthening the Protection of the Architectural Heritage*', the contemporaneous Department of Arts, Culture and the Gaeltacht publication; '*Developing a Government Policy on Architecture; a proposed framework and discussion of issues*', the subsequent skills needs analysis of the built heritage sector in Ireland of 2009, '*Traditional Building Craft Skills: Assessing the Need, Meeting the Challenge*', by the (British) National Heritage Training Group (NHTG); and an ICOMOS review of the same period, '*Sustaining our Built Environment- Review of the state of conservation education and training in Ireland.*' Despite the existence of these published reports with their excellent analysis and recommendations, the present research found that little has changed in the learning and development opportunities within the realm of the industry since their publication.

Section 5 observes the relevance of apprenticeship programmes in the construction trades to the heritage craft industry, and examines how other course providers respond to the deficiencies in the same programme in their offering of alternative opportunities to interested operatives to upskill as heritage craft workers post-apprenticeship. It was found that the present apprenticeship programmes incorporate little in the way of training for traditional building methods. The carpentry apprenticeship includes fifteen hours of conservation training in the four-year programme, while some others have no heritage training at all. Some courses have been identified that would allow craft workers to progress further in their training, but these are limited in their number and scope. In interviewing contractors, interesting opinions on the provision of enhanced training opportunities were revealed. Most cited their disappointment that heritage training is usually restricted to one-day courses provided, often by highly competent, skilled and experienced, but unregulated providers. Acquired knowledge through such educational routes was not recognised as necessary by consumers and was certainly not rewarded in procurement processes. It was found that contractors would have a distinct preference for courses that arise in the awarding of a qualification or certificate of competence in a given skill. They were of the opinion that if awards followed educational investment, greater demand for attendance would arise as more employers would see the long-term benefit of up-skilling its direct labour force and consequential recognition of awards.

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<sup>1</sup> In reality a small number of apprentices have commenced their training in other crafts not identified by the contractors interviewed for this study and this is noted in section 5 below.

Contractor interviews wholly informed Section 6.0 'Anticipated future needs for conservation craft skills', where almost all contractors interviewed held similar concerns for the survival of an indigenous heritage workforce in Ireland. Almost all interviewed were of the opinion that attracting genuinely interested apprentices to the field was key to formal, steady progression of skills through to master craft level. Conversely, support for the apprenticeship programme within the industry was critically absent, largely due to inconsistent supply of work for heritage contractors compounded to a lesser degree by a genuine financial inability to invest time in mentoring and supervising an inexperienced operative. Most contractors were in the fortunate position of retaining long-term staff, skilled to their specific requirements. The greater portion of others however, due to work limitations, employed perhaps one skilled operative long-term, acquiring nomadic skills to supplement workloads when required.

Whilst casual labour could be sourced locally, the majority of contractors admitted to sourcing labour elsewhere, largely in eastern Europe where apprenticeship training favouring traditional crafts was found to be more suited to heritage works than the training of our indigenous workforce. All contractors interviewed stated that the reason for such recruitment practices was not to acquire cheaper labour, but more competent, skilled labour.

As implied by this finding, the study recorded that most contractors interviewed saw a greater future need for skills at master craft level than any lower level. However due to inconsistencies in formal training opportunities beyond mainstream apprenticeships, skills at master craft level cannot be achieved at present. This very oversight by national training bodies is seen as one of the greatest challenges to a consolidated heritage contracting industry.

Most main contractors interviewed held the belief that a specific heritage main contractor group was not viable. They felt that all main contractors should have the ability to engage with all building types, on the basis that neither exclusive new-build nor pure heritage projects exist, and most works arise in the repair and maintenance of older buildings of all eras, more often without the contemporary additions forming the primary focus of training programmes. They felt that conservation skills should be brought into mainstream contracting, and that training bodies should reflect the industry demand for wider embracing of all building types and eras in the tailoring of corresponding courses offered.

### 1.3 Presentation of findings

The research is aimed at informing the indigenous conservation construction sector of present deficiencies threatening its future within the wider Irish construction sector. The research team's presentation of findings corresponds directly with the sentiment of contractors interviewed as part of the research process. The team saw their role more as recorders of opinions and the reality of the challenges faced by contractors, than analysers of the same opinion. As a consequence, Section 7.0, Recommendations, offers in brief, solutions that could, if adopted, resolve some of the more



significant concerns of heritage contractors in turn affecting a sustainable, viable heritage contracting sector.



## 2.0 IDENTIFICATION OF COMPONENT TRADES AND JOBS IN THE BUILT HERITAGE SECTOR

### 2.1 Introduction

The project brief included a draft list of component trades and jobs, ranging from main contractor and heritage contract management to mainstream crafts, highly specialised trades and semi-skills. The team added to that list in early submissions to the Heritage Council as part of this research project, as is evident in the Appendix 2.2 in Volume 2.

However, since then, extensive discussions with private sector management, main and specialised contractors<sup>2</sup> have shown that colloquial referencing to trades within the industry differs significantly from the terminology that had been used in compiling the original list. This led to the preparation of a new list, based on trades as perceived by the industry, with various sub-skill sets assumed by each trade described. This list is set down in Appendix 2.3 in Volume 2.

### 2.2 Findings

#### Management contractors

Private sector management contractors have a pivotal role in the shaping of trades and skills in the built heritage sector. Often employing extensive office based professional staff but skeletal site staff; they comprise the greatest employers within the industry in their temporary appointment of subcontractors for all aspects of work. All works incur the appointment of a main contractor who carries out the majority of works across a spectrum of trades. Specific primary works are often grouped into trade sub-categories such as roofing, plastering, painting, services, carpentry and joinery and sub-contractors deemed as specialists in their respective fields are engaged. In all cases traditionally described specialist heritage works such as stuccowork, glazing, metalworking etc. are carried out by smaller specialist sub-contractors.

#### Main contractors

Private sector main contractors for the purposes of this study are defined as independent general contractors directly employing a range of trades and skills. Most interviewed have the benefit of an in-house quantity surveyor (QS) who often acts as a contracts manager, with others outsourcing QS services. It would appear that this group has the greatest commitment to enhancement of staff heritage skills, as a basis for continued best practice in their works. Typically, these small-medium sized companies have less than twenty employees, but largely concentrate on general contracting with specialist works carried out by smaller specialist sub-contractors.

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<sup>2</sup> Referred to as Category 1 (management contractors), Category 2 (main contractors) and Category 3 (specialised sub-contractors)

A significant finding from the research was that none of the main contractors interviewed has been sub-contracted by management contractors. Every effort was made to try and identify this main contracting group, which makes up such a significant workforce, but without success. It is clear that they do not feature in the heritage community, as all such contractors were contacted, if not interviewed.

### Specialist subcontractors

Specialist subcontractors are defined in this report as comprising all skills and trades falling outside main contracting. Whereas some main contractors employ specialists in-house, the majority engage smaller sub-contractors for these works. Considerable works such as first fix/structural carpentry are typically carried out domestically, with joinery often assigned to others. Very often, large components such as roof works, services and finishes are assigned to others.

In the review of the range of skills and trades known as 'specialists' by the industry, it was found that there is little to distinguish those who have acquired their skills from formal craft apprenticeship (carpentry, masonry, plastering, painting etc.) than those who acquired them otherwise. Non-craft skills such as damp-proofing, scaffolding, landscaping and demolitions/enabling works are considered integral specialists within the industry, often having more prominence on heritage site than traditional craft workers, but having least training.

### Designation of skills

As no formal title beyond 'apprentice' exists in the industry, for the purposes of clarity, this study has identified the designation of skill levels as follows:

- *General operative*  
Often a semi-skilled to skilled operative specialising in concrete work, attendance to trades etc.
- *Licensed operative*  
A person who has an occupational craft such as a scaffolder, mobile access tower operator, other heavy machinery operator, steeplejack
- *Apprentice*  
A person who is following the SOLAS craft route
- *Skilled craft worker*  
A former apprentice who has undergone formal training and passed his/her exams/tests and now works as a skilled craft worker.

Other operatives with on-the-job experience and within certain craft categories doing variable quality of work are often equally recognised within the industry.

To complicate the designation further, the study has identified many skilled workers who have not followed the registered apprenticeship system but have drawn their skills from alternative learning methods, formal and informal. In discussion with some individuals who have acquired unofficial competencies, concerns were expressed that no system exists at present recognising their important contribution to the industry.

Most tellingly, whilst the title 'master' craftworker is colloquially used in the industry, there is no formal route to recognition of the award, as there is in some other jurisdictions.

Furthermore, there does not appear to be any system for regulating those holding courses purporting to impart advanced skills.

### 2.3 Comment

In this study caution has been exercised in recording informal terminology within the contracting industry. The industry is unregulated, with consequential variances in how contractors manage their workforce and sites, particularly where some sites are closely monitored by unions, contrasting with others with little union influence.

A significant number of main contractors interviewed referred to 'blocklayers' as the second most desirable operative on a site after carpenters, however blocklayers are considered to be a low cost form of labour as they do not follow a formal apprentice and are not known to have the range of skills they are expected to possess on building sites. Good employers usually shun this practice and know that it is a better investment to employ bricklayers that have served a formal apprenticeship and have a rounded training as a result. Whilst all contractors referred to blocklaying as if it is a recognised trade, for the purposes of clarity the term *bricklayers* is used in the texts below.

Some employers have complained about inadequate training for apprentices in heritage skills, but unfortunately the research has found that heritage contractor support for apprentice training is sporadic, with a consequential shortage of trained crafts people progressing through the industry.

General operatives, where given the opportunity, carry out craft work and sometimes to a reasonable standard. This however is where they have developed an enhanced skill in part of the overall craft, a unit/module as in block work in bricklaying or shuttering or basic roofing in carpentry. It is often the practical side only that has developed, with no access to the theoretical component of training central to the judgement required for a skilled craft worker. Problems occur when the general operatives then operates outside their limited area of competency, as is the reality in smaller main contracting firms

where operatives are expected to work across a spectrum of trades. What was found in casual discussions with employees, was that this practice is embraced as it allows the employee to continue working whereas if he was to strictly execute work within his formally recognised ability he would be otherwise idle at critical stages of work.

If 'master craft' is to develop it has to have its roots in a formal certified apprenticeship with follow on educational opportunities.

Furthermore, regulation and standardisation of skill sets is critical to consolidate the heritage workforce, but equally regulation must be imposed on the trainers central to further learning initiatives.

### 3.0 RELEVANT LABOUR MARKET STATISTICS RELATING TO CONSTRUCTION CONSERVATION TRADES

#### 3.1 Introduction

The team reviewed various methods to source information from the contracting industry. Meeting with contractors directly and discussing a range of specific topics was found to be the most effective and accurate method. The first contact was with all management, main and specialised contractors from the Register of Heritage Contractors and the Irish Georgian Society Traditional Building Skills Register by email appending a questionnaire and requesting a meeting to discuss responses, a network that was expanded as the project progressed, as outlined below.

While not all identified contractors responded, those interviewed were enthusiastic and most forthcoming in their responses. Each contractor listed below represents those with whom detailed interviews were held. Part-interviews were held with a number of others, but as the interviews are incomplete they are excluded from the research.

The greatest concern arising from the interviews is accuracy of sub-contractor numbers. Management contractors typically see their role as the management of heritage sites, with their workforce almost wholly comprising sub-contractors. As this category of contractors will not release the names of their networks, the team could not identify their sub-contractors and verify if they are working for a number of main contractors, so the figures obtained sub-contracting numbers not definitive. Whilst the results include the accumulated number of subcontractors under each trade, duplication as a consequence of verification challenges is inevitable.

In attempts to overcome this challenge, RIAI Grade 1 and 2 conservation architects were contacted, requesting that they issue their lists of contractors and subcontractors. A poor response led to the same request being made to mainstream architectural firms known to engage with heritage work. This also received very few responses, but from those received it was notable that many contractors engaged with heritage works were not on any formal national registers, yet featured prominently by reputation for good quality heritage work.

The study team also collated names of firms from some local authority skills registers, which demonstrated interesting demographics for contracting skills, particularly in the fields of thatching and masonry.

### 3.2 Labour market facts relating to construction

The information set down in Appendix 3.2 in Volume 2, represents a summary from the interviews with contractor firms up to Friday 5<sup>th</sup> September 2014. The target of completing interviews with all known contractors was not achieved, despite exhaustive efforts to do so.

The first column 'Total number of firms known to team' comprises all known contractors from the following registers/ contacts:

- Register of Heritage Contractors
- Irish Georgian Society register
- Louth County Council skills register
- Cork City Council skills register
- Clare County Council Traditional Building Crafts Directory
- Offaly County Council skills register
- Architects and conservation architects contacts
- Contacts known to team members

### 3.3 Information relating to contractors and trades

Appendices 3.3.1, 3.3.2 and 3.3.3.1 to 3.3.3.12, in Volume 2, record information yielded from discussions with the three categories of contractors working in the heritage industry<sup>3</sup> across as many trades as possible. Detailed interviews were held, sometimes spanning more than one meeting. Trust was built up during the sessions, resulting in the opportunity to ask wider reaching questions of contractors exceeding brief demands, but allowing a more detailed perspective of the composition of the heritage contracting industry. Information gathered includes age profiles of employees, participation in training and general sentiment.

### 3.4 Category 1: Management contractor comments

Management contractors engage with smaller main contracting firms to carry out much of their heritage works. However, none of the main contractors interviewed work in this capacity. All stated that they would not do so, even if approached by management contractors. As previously stated, a consequence is that the study was not able to determine the identity of these contractors who comprise a great number of heritage workers, nor to obtain knowledge of the level or type of skilled workers engaged by these firms and if they participate in heritage training.

Interviews with management contractors in particular revealed that where they had concern with supply of skilled workers insofar as it affected fulfilling their contractual work requirements with regard

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<sup>3</sup> Category 1 comprising management contractors; Category 2: main contractors and Category 3: sub-(specialist)contractors

to appointment of sub-contracting firms; they had no reason for concern with the supply of skilled individuals, as this was ultimately the responsibility of the appointed sub-contracting firm.

Similarly, the sourcing, training and skill management of individual personnel was the responsibility of each sub-contractor, whether a main or specialist sub-contractor. The management contractor retains records of numbers of personnel for each sub-contractor for Health and Safety purposes, but has no requirement to record the individual names and qualification details of each individual employed by sub-contractors on the site. Accurate data gathering is thus further complicated. Firstly, in summarising the numbers of sub-contractor personnel on site, as there is often no record of identity, further possible recording duplications are likely as whilst site presence may not vary in terms of numbers, workers may often be changed during a job. Secondly, it is impossible to know from the same records what craft skills sub-contractor operatives possess, if any.

Most management contractors admitted that even if a conservation architect is engaged to oversee the work, (most stated that the majority of their sites have no conservation architect) inspections are sporadic. As they agreed that an independent conservation architect is more likely to have concern over quality than a foreman, it would appear that Ireland's largest heritage projects employing greatest numbers of heritage workers have poor control over quality and workmanship.

The brief for this research specifically sought a review of contractor opinion on labour supply, recruitment of skilled labour, supply procedures and training opportunities. Previously referred to appended tables indicate the extent to which contractors participate in education and training, which is not repeated here. In seeking responses to specific queries, pertinent quotes have also been included to enrich responses.

Satisfied with	Yes	No	Difficult	Quotes
supply of specialist skilled workers in Ireland?	6	3	1	'Generally a struggle'
				'Calibre of young people has dropped'
				'Shortage envisaged in next 12 months with emigration'
				'Scarcity of copper/ lead/ roofers'
How does interviewee source skilled workers?	Own register from own network / Pre-qualification systems	IGS/ RHC	Recommendations by design team/ conservation officer	Quote
	9	0	1	'Always looking for new contractors but emerging skill base does not exist'
Satisfied with educational/ training opportunities?	Yes	No	No requirement	Quote
	2	3	5	'More variety of apprentices required'

### 3.5 Category 2: Main contractor comments

Main contractors had considerably more interest in quality of work and as a consequence the supply of skilled individuals. Similarly, participation in training and the employment of qualified personnel was considered important, whether employed fulltime or contracted for specific periods, as workmanship and accountability for individual competence was deemed to have a bearing on the overall performance and reputation of the firm.

Whilst skilled workers were sought from the UK, these were confined in one instance to a lead worker, and in another to a stuccodore. The study found that all other personnel were sourced from eastern Europe. Of all contractors interviewed, the rest of Europe and all other jurisdictions as resources for skilled labour were not mentioned.

Satisfied with supply of specialist skilled workers in Ireland?	Yes	No	Difficult	Quote
	11	7	3	'Must enquire abroad for some skills ' ' huge difference in quality of sub contractors'
How does interviewee source skilled workers?	Own register / networks/ Pre qualification systems	IGS/ RHC	Recommendations by design team / agency	Comment
	18	0	2	0
Satisfied with educational/ training opportunities?	Yes	No	No requirement	Quotes
	9	10	1	'Training is usually restricted to 1-day courses. We would like to see the opportunity for courses that can earn a qualification or certificate of competence in a given skill. Our firm would be willing to up-skill its direct labour force via such courses.'
				'More workshops required '
				'Have to search for training – too difficult to get a speciality in Ireland'
				'Not enough work so no need for more training'
				'Flexibility key to conservation – master craftsperson should be happy to work at all levels '
				'Steady progression at all levels key to sustainable workforce '

### 3.6 Category 3: Specialist sub-contractor comments



Of the specialist sub-contractors interviewed, all had grave issue with the absence of formal training in their respective fields. They were of the opinion that consumer and peer recognition for skills acquired by way of experience was an inadequate alternative to recognised qualifications in the present climate. Almost all those interviewed faced continuous challenges with supply of skilled personnel, and rely on informal means to recruit new personnel, usually through contacts of existing employees from abroad.

All sub-contractor specialists referred to eastern Europe as the best resource for skilled labour. One blacksmithing firm employed two highly skilled workers from the UK. As with main contractors, the contractors interviewed did not use mainland Europe or any other jurisdiction as a resource for skilled labour.

<b>Satisfied with supply of specialist skilled workers in Ireland?</b>	<b>Yes</b>	<b>No</b>	<b>Difficult</b>	<b>Comment</b>
	0	32	0	'Have to source regularly outside Ireland '
<b>How does interviewee source skilled workers?</b>	<b>Own register / Pre qualification systems/ network</b>	<b>IGS/ RHC</b>	<b>Recommendations by design team / agency</b>	<b>Comment</b>
	32	0	0	-
<b>Satisfied with educational/ training opportunities?</b>	<b>Yes</b>	<b>No</b>	<b>No requirement</b>	<b>Comment</b>
	0	32	0	'Need courses at early entry to teach aspiring operatives basic skills'
				'Can't see attitude changing.'
				'Knowledge base not there to do properly.'

## 4.0 IDENTIFICATION OF SKILL COMPETENCIES AND STANDARDS FOR ACCREDITATION FOR CONSERVATION WORKERS

### 4.1 Introduction

In interviewing many main and specialist contractors working in the heritage industry, anomalies were found between existing competencies and those competencies that would be ideally required of all involved in heritage works.

Existing skill ranges quoted by contractors working at present in the industry were identified for each craft and are set down in Appendix 4.1 of Volume 2.

### 4.2 Competencies expected of general contracting trades

From all available resources and from interviewing the contracting, professional and consumer communities alike, the range of skill competencies and standards expected of conservation workers across all sectors was identified. What was found as emerging in each craft is a deep and interesting range of skills and knowledge necessary to work competently in the heritage sector. It also highlights why problems occur when skilled workers transfer from the modern construction industry without adequate training in heritage skills: the craft titles are identical but the competencies demanded are very different.

Within the breakdown of the heritage skills that are set down in Appendices 4.2 and 4.3 of Volume 2, are potential future common training modules that if developed would appeal to an even wider audience and lead on to shared educational prospects and opportunities within the heritage sector.

### 4.3 Standards for accreditation for general contracting trades

Whilst there is no skill accreditation in Ireland at present, the present review of the industry, skilled workers who have voluntarily invested in the development of their craft all state that they require acknowledgment of their efforts to distinguish them from peers who may purport to possess comparable skills, but have no academic or acquired competence to demonstrate as such.

Many interviewees recommended that a conservation card system be introduced. The card would be awarded to an individual with proven competency, skill and knowledge in their particular craft. Those interviewed were opposed to the current heritage registration system where one individual, usually at management level, can acquire registration for a whole company. Typically, it was found from the interviews with the skilled craftspeople that such companies engaged foremen and workers involved in significant building components with little or no appreciation of heritage skills, contrary to spirit of their inclusion in the heritage register.

Other countries however have developed excellent models for accreditation. In Germany, the Master craftworker is the highest professional qualification in crafts and is a state-approved grade. The education includes theoretical and practical training in the craft together with business and legal training, including a qualification to train apprentices. The status of Master craftworker is regulated in the German Gesetz zur Ordnung des Handwerks, HandwO<sup>4</sup>.

#### Objectives for a defined accreditation policy

1. Standardising the skill base of each trade or skill by way of acknowledgment of prior learning through informal apprenticeship and advancement together with completion of recognised apprenticeships
2. Enhancing an established skill base to master craftworker level
3. Creation and delivery of appropriate learning and development opportunities at each level for each skill, realistically available for participants from all demographics to include practical and theoretical training
4. Introduction of standardised examination procedures
5. Introduction of competency assessments
6. Annual accreditation to be maintained by way of recorded participation with CPD

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<sup>4</sup> Crafts and Trades Regulation Code

## 5.0 IRISH TRAINING COURSES AND THEIR RESPONSE TO CRAFT NEEDS

### 5.1 Introduction

The training courses available in the Republic cover some of the craft skills involved with building conservation, but there are significant gaps in the provision, particularly in some trades. The findings of this study are that conservation does not take up a significant element of most training for construction crafts and the skills are often learned through experience. Some short courses are available, particularly relating to specific trades, but these generally are more geared towards Continuous Professional Development rather than being qualification-based or having some kind of verifiable measure of skills achieved through the course.

The lack of courses is not always due to any failure to meet demand, but in verifiable cases it is clear that courses have been made available, but have failed to run due to inadequate numbers of potential students taking up the opportunity. There may be a number of reasons for this, and this will be discussed elsewhere.

A number of courses are available in Northern Ireland, accredited under the UK system of validation. These are run through the regional colleges at Derry/Londonderry, Dungannon and Armagh. Further courses are available in Great Britain through a range of regional colleges and other centres and also through English Heritage and Historic Scotland, with some courses also run by Cadw in Wales. The courses in Great Britain are not considered in this section, which concentrates on the training opportunities available in the Republic of Ireland and in Northern Ireland.

#### 5.1.1 Apprenticeships and guilds

##### Historical systems

From medieval times, if not before, the training of craftworkers was carried out through apprenticeship. Within urban areas this system was formalised into trade guilds, with each guild being responsible for one of the trades, though often trades were grouped. This was not a nationwide system and it was set down in the charters of individual towns and cities; in some cases the guilds were established by royal charter, but mostly the charters gave the corporations of the towns and cities the right to incorporate guilds. In a few cases these guilds had an input into the administration of the town or city, most notably in Dublin where the twenty-five guilds were represented on the Corporation. In Drogheda the guilds had an input into the election of aldermen to the town council, while in many other instances, including Cork and Limerick, the guilds had no input into the city administration.

In Dublin, only two of the guilds that represented the construction trades – the smiths and the carpenters – were established in the medieval period, the older and more powerful guilds being the merchants and the tailors. The guild of carpenters included millers, masons and tilers. In the latter half

of the seventeenth century three new guilds were established in the city, representing the cutlers, bricklayers and joiners. The full titles of these guilds shows the broader range of representation, as the cutlers also included painters and paper-stainers, plasterers were represented with the bricklayers, while joiners also included wainscoters. In many other towns the merchants were the only trade to have a guild, though Galway had joiners, masons, slaters, sawyers, plasterers and painters, amongst others. Limerick's guilds included smiths, carpenters and masons in the eighteenth century and painters, slaters, smiths, nailers, stonecutters, founders, masons and carpenters in the early nineteenth century. Carrickfergus had just one guild representing the construction trades; known as the guild of hammermen, this looked after smiths, carpenters, joiners, coppers, glaziers, saddlers, pewterers and bricklayers.

In reality, however, the guilds began to lose touch with the trades that they nominally represented. By the early nineteenth century they exercised little control over their members and the standards of craftsmanship and in some cases had little connection with the trades that they were supposed to represent. The guild system was abolished by the Municipal Corporations Act of 1840 and this probably made little difference to the regulation of the various trades as the apprenticeship system continued without change. Probably of more relevance than the guilds were local societies of craftworkers, including the Regular Carpenters of Dublin, which dated from around the 1760s. After the repeal of the law banning combinations or trade unions in the 1820s the first of the unions began to emerge, taking the place of the guilds and local societies to some extent. This included the Union of Bricklayers and Plasterers, established in 1833 and often emerged as branches of British unions, such as the Friendly Operative Carpenters' and Joiners' General Union and the Amalgamated Society of Carpenters and Joiners, which both opened branches in Ireland in the 1860s. In addition to the unions, some local societies, such as the Stonecutters' Society of Stepside, looked after the interests of their members in a particular trade.

### Early twentieth-century systems

In 1899 the Department of Agriculture and Technical Instruction was established, but its role was restricted to the principles of science and art applicable to industries and did not include the teaching of any skills in relation to industry or employment. In 1931 the Apprenticeship Act was introduced to regulate training in the crafts, but it applied only to trades that were designated by Ministerial order, and the only trade in the construction industry that was designated at that period was that of the house painters and decorators. The 1931 act was replaced in 1959 by the Apprenticeship Act, which set up AnCO to take responsibility for training, including apprenticeships. It was not until six years later, in 1965, that "the trade of building and construction" became a designated trade under the act, with apprenticeships brought under the responsibility of AnCO.

### Twenty-first-century systems

In 1987 the Labour Services Act replaced AnCO with a new FÁS, which was replaced in turn by SOLAS in 2013. The introduction of this revised system of apprenticeship in the construction trades coincided with the final stages in the changeover to newer building materials, with the abandonment of many traditional skills that were based on the old materials and technologies. As a result, the new system took no account of heritage craft skills and many of the old techniques were no longer included in the apprenticeship programmes.

Under the present system the responsibility for a great deal of training rests with sixteen regionally-based Education Training Boards. This includes the provision of apprenticeship training, though SOLAS has the overall responsibility for the nationally-based oversight and coordination of apprenticeships. This system was set up on an interim basis for the implementation of the new system, but it may become permanent. The *Review of Apprenticeship Training in Ireland*, published in July 2014, recommends that SOLAS retain this role, though with the addition of an Apprenticeship Council to provide a significant input.

A comment made during consultations for the preparation of this report was that Solas does not include any representative of the construction industry on its board and this was remarked as a failing in the system.

The development of the curricula for apprenticeships is carried out by the National Apprenticeship Advisory Committee (NAAC). The process for the introduction or revision of a curriculum is complex and is based on an extensive programme involving stakeholders. Typically, this would include subcommittees to examine standards, projects and reviewing and developing the programme followed by the preparation of a draft curriculum. This phase would include stakeholder input from the relevant industry, SOLAS, unions, the Construction Industry Federation and employers. The draft is sent out for comment to a wide list of bodies and in the case of the curriculum for carpentry and joinery this list included about three hundred reviewing bodies such as employers, institutes, the Office of Public Works and the city councils. Following this stage a revised draft is prepared and is sent out again to the reviewing bodies before being finalised, approved and implemented. In those cases where the draft curriculum includes a conservation content this part of the curriculum would be sent to conservation bodies for comment.

## 5.2 Training courses available

In this section the various headings for contractors, foremen and crafts listed in section 4 are taken individually and the nature of the training available is summarised, noting the FETAC levels at which they are aimed. Those courses that are outside the formal training system are also discussed.

The college-based elements of apprenticeship training are to be found at a number of colleges throughout the country, but all are based on courses designed and agreed by SOLAS. The curricula

for these apprenticeships are reviewed from time to time and this is carried out in conjunction with the various stakeholders and agreed with QQI – Quality & Qualifications Ireland.

Each of the trades identified within the heritage contracting industry is listed below, with a summary of the training issues pertaining in each case. Appendix 5.2 in Volume 2, lists the training that is available in each case, with a summary of the average training participation. In the cases of contractors, foremen and roofers an additional summary is given, setting down the requirement for training.

### **5.2.1 Management / main contractor**

There are no requirements for training in conservation for contractors. Where a contractor chooses to avail of training in conservation, some is available, aimed specifically at the contractor or those in supervisory roles, while other training is more generally orientated, aimed at a broader range of skills backgrounds.

### **5.2.2 Foremen**

As with contractors, there is no requirement for conservation training for foremen. They would generally come from a craft background – usually carpentry – and would learn the conservation aspects of the foreman's role on the job. Discussion with heritage contractors has suggested that it was common for carpenters to be on site during the entire length of a contract and that this was a reason why so many foremen had previously been carpenters. However, to a large extent the work is now done by subcontractors and as a result there is no-one who is on-site from start to finish. In the absence of this broad experience on sites there is now a much greater need for training aimed specifically at site foremen.

### **5.2.3 Carpentry and joinery**

No distinction tends to be made in Ireland between the carpentry and joinery trades. However, for the purpose of this study the requirements for each are noted separately in Volume 2, Appendix 5.2.3. Carpentry and joinery has become increasingly mechanised on the site though formal modern apprentice training still has correctly a strong emphasis on using hand tools.

### **5.2.4 Stone and brick – including bricklayer, stone layer, stonecutter, stonemason and stone carver**

Formal training in masonry skills is overwhelmingly orientated towards brick and blocklaying, with very little emphasis on stone and lime mortars. There is presently no stonecutting apprenticeship, but there are plans to start one soon. There is no specific course for stonemasonry and no apprenticeship as yet. Stone carving is carried out by stonecutters and sculptors/artists. Individual courses are available that concentrate on specific aspects of the craft.

### **5.2.5 Roofer**

As noted in section 4 above, there is no formal 'roofing' trade, though the term is used extensively. Many of those working on roofs come from the carpentry trade, though they also need skills in stone and brick masonry, slating and plumbing.

### **5.2.6 Plasterer**

A plasterer should be trained in and capable of working at plain solid internal plasterwork, external renders and as a decorative specialist / stuccodore; however both skills are distinguished in reality. The traditional plastering apprenticeship covered all aspects of the craft. Operatives working at plasterwork that have served no formal apprenticeship mostly confine themselves to plain work.

### **5.2.7 Mechanical and electrical services**

The services in historic buildings tend to be retrofitted and the nature of these services is becoming more complex. To the original requirement for plumbing services, gas services were added early in the nineteenth century and electrical services later in the same century. These services became more widespread and in greater quantities in buildings over time and have more recently been expanded to include air handling, communications, alarms, entertainment and other services, many of the more recent types being bracketed with the electrical trades.

### **5.2.8 Floor and wall tiling**

Floor and wall tiling are common in a conservation context, involving both the maintenance and repair of traditional tiling and retrofitting new tiling into existing premises.

### **5.2.9 Painter and Decorator**

Painters and decorators have a major role to play in heritage buildings, given that they would have an involvement in each room in a building and on the exterior at intervals during the life of a building. As a result there is scope for incorrect techniques and materials to be used if the craftworker does not have adequate conservation training.

### **5.2.10 Glazing (through painter and decorator craft)**

Glazing is part of the painter and decorators craft but in practice often involves operatives with no formal training

### **5.2.11 Facade restoration**

Facade restoration is a complex topic that is site-specific and that can involve a wide range of craft skills, including brick and stonelaying, stonecutters and plasterers, along with professionally-trained conservation specialists in stone cleaning and repairs. These are distinguished below:

### **5.2.12 Thatcher**



As noted above, thatching is not a trade that is formalised through apprenticeship. The traditional craft of thatching tends to be passed down through the vernacular tradition, with each new crafts person learning from the previous generation.

### 5.2.13 Ironwork and blacksmithing

There is no formalised apprenticeship in iron working or blacksmithing, though the trade through its association organises training.

## 5.3 Comment

From the above and from the lists set down in Volume 2, it will be seen that the range of courses available for training in conservation skills is extremely limited. Where courses are run for the various trades involved in construction they tend to give little or no training in conservation skills or, indeed, conservation ethos and theory. This is a critical issue. The result is that those who work in the various building trades only become conversant with conservation issues and the need for different skills when working with traditional buildings through compliance with specifications and required methodologies that run counter to their training and experience to date. The plasterer wrongly straightens out and plumbs walls, disregards split lath partitions and ceilings, adds a waterproof compound to sand and cement mixes; the brick and stonelayer points with sand and cement and builds non-structural brick and stone wall types; the metal worker uses oxyacetylene rather than fire welding techniques or hot riveting, the painter applies impervious paints to pervious substrates. Lack of education and training results in destruction of historic fabric and increased costs.

A further issue to arise out of the study is that where courses are offered in relation to conservation skills they are often not taken up by potential students and hence do not run. This has the knock-on effect of discouraging course providers from developing any further courses with a conservation emphasis. One possible reason for this situation is that potential students do not see the financial benefit in gaining the qualification, particularly if the course fees are not paid by an employer and if work time is lost through attendance on the course.

Compulsory criteria for enrolment on some courses was that the participant was registered unemployed with sometimes the longest unemployed getting preference. Matters were made worse by instructors not being part of the selection process.

#### 5.4 Apprenticeship curricula

Previous to the Apprenticeship Act of 1959 apprentices in some crafts were indentured to their fathers or other members of their extended families who were in the craft, to serve a seven-year apprenticeship. In other cases apprentices were taken on by contractors. Apprenticeship at that time included attendance at college for one day per week for theoretical knowledge and the finer points of necessary practical skills. The practical and theoretical exams were set by the Department of Education at junior and senior levels and the City and Guilds of London at craft and senior craft level. A one year post-apprenticeship Full Technological Certificate under City and Guilds was available to apprentices who successfully passed their craft exams.

Up to 1966 an excellent full time course covering the first two years of a seven-year apprenticeship was provided at Bolton Street, College, Dublin for both brick- and stonelayers and also for plumbers under the Day Apprentice Scholarship System. Apprentices were paid a small allowance and provided with tools and work clothes. The course covered both the practical and theoretical parts of each trade along with drawing, general education, weight training and swimming.

Most apprenticeships up to that period were very much based on traditional skills training, the curricula for some of which may have gone back to the late nineteenth or early twentieth centuries. It is interesting to note that it is many of these skills that we now need for the conservation and repair of our built heritage.

In 1959 the Apprenticeship Act led to the development of AnCO which provided for the training of apprentices which was then reduced to five years in duration. In 1987 under the Labour Services Act apprenticeship training became the responsibility of FÁS with a four-year apprentice duration which in turn became the responsibility of SOLAS in 2013.

The building industry began to change rapidly from the 1960s onwards and apprenticeship training followed suit. Although some trades like brick and stonelaying use the same tools and masonry materials that were used in previous centuries and even millennia, the nature of building has changed, no longer involving solid, thick structural, vapour-permeable and flexible walls but thin, non-structural walls with impermeable and non-flexible cementitious materials. Serious and costly problems that can't be undone occur when crafts that are solely based on modern building methodologies, materials and approach transfer what they know and can do to the building heritage sector.

This report lists what is covered in the curricula for modern apprenticeships in the construction sector, followed by the skills that would be required in the building heritage sector and the details are set down in Appendix 5.5 of Volume 2. The gap between the two, which is wide, is where the potential for future training and education lies. Ideally this will be introduced at both apprentice and post-

apprenticeship levels. Post-apprenticeship should provide the opportunity for advancement to the title: 'Master Craftworker' and also on to further education if so desired.

Ideally all education and training will be divided into modules, each being tested and listed on a card system with a unique number that a crafts person can add to as appropriate throughout their working life. Some modules could be shared amongst crafts, professionals and semi-skills in order to create a common approach and to improve communication and develop strategies and teamwork related to conservation and repair. Modules should also be linked to European initiatives in master craft and conservation training so that a crafts person can travel, learn and add to his/her qualifications elsewhere.

There is a danger that a select but limited number of modules could be seen as adequate training in a craft but this depends on which modules are chosen as common. Appendix 5.5 Curricula for apprenticeships lists conservation and also history as common and necessary to all crafts. The Wet Trades could share education and training in lime mortars.

To increase the up-take of apprentices by employers those tendering for heritage contracts should gain points if they provide training, and provide on-site training facilities which is what is presently happening on the Canadian parliament buildings in Ottawa, Canada with a workforce of over two hundred stonemasons, sixty of whom are apprentices, including both men and women.

It should be compulsory on all public contracts to provide training and to take on apprentices otherwise the state is not showing example and not making provision for a skilled, educated and indigenous workforce in the future.

Training and assessment could take place on site or in an educational establishment, depending on individual modules. Anyone at master craft level should have pedagogic skills in order to educate and train others at lower levels.

Many jobs are carried out by semi-skilled and skilled workers in the modern and heritage building sectors. Education and training is a necessary component of their overall competency and should be provided for in a similar fashion to that suggested for craft training.

The future needs an established and respected system of training that is seen as valuable to the participant and employer and results in first class and appropriate work on heritage buildings. Curriculum, certification, trainers and various supports need to be established and developed in order to make this a reality.

## 5.5 Curricula for apprenticeships

From an analysis of the curricula and from talking to those in the construction industry and in the educational institutes it is clear that the conservation content of these apprenticeship courses is low. Some of the feedback from the educational institutes suggested that the tutors on the courses are skilled and experienced craftworkers and would share some of their conservation knowledge during the courses. In one instance the course tutors add further material that is not on the curriculum to build the conservation awareness and knowledge of the apprentices. While these various inputs can be valuable, they cannot be consistent and they are dependent on an informal approach by individual tutors. In essence, any conservation content must be part of the formal curriculum if it is to be taught effectively.

Each of the eight apprenticeships in the construction industry is listed below. The present curriculum for phases 2, 4 and 6 of each of these apprenticeships, which are the off-the-job phases, is listed in part A of Appendix 5.5 in Volume 2. In each case, this is followed in part B by an additional curriculum that would take the student up to master craftworker level in conservation techniques of the craft. It is critical that some of the proposed training in conservation is incorporated in the present apprenticeship training, though it is obvious that this would be limited rather than comprehensive. In order to accomplish the overall education of each craft work in the heritage sector further education and training would be necessary at post-apprenticeship level and the curricula in part B relating to each craft would form the basis for this additional training.

Traditionally craft skills evolved through apprenticeship to journeyman to master craftworker. The journeyman stage involved travel, working with others, learning new skills, honing existing ones and picking up foreign language and cultures. When the journeyman returned he was assessed by master craftworkers, this involved the making of a masterpiece. After successfully passing the journeyman stage the candidate passed to master craftworker where some of his responsibility was to train and bring on others. This system still continues in some other European countries and should be considered an exemplar for us to follow.

### 5.5.1 Carpentry and joinery apprenticeship

The curriculum for this apprenticeship is undergoing a substantial review at present. The crafts of carpenter and joiner are not separated for the purpose of this apprenticeship and is treated in practice as a single occupation. The present curriculum includes fifteen hours for conservation training, though this is a small input within a four-year programme and its adequacy is uncertain.

### 5.5.2 Brick- and stone-laying apprenticeship

The present curriculum does not contain much in the way of conservation training. There are only three apprentices currently in their first year of training nationwide.

### **5.5.3 Stonecutting and stonemasonry apprenticeship**

This is a new craft and replaces the previous proposed training in Environmental Stone Cutting. The title of the course, Stonecutting and Stonemasonry is confusing and the skill competencies in the present curriculum, as listed in part A, suggest that the course should be simply titled: 'Stonecutting'. Stonemasonry was traditionally more concerned with the building of stone. The present curriculum for this apprenticeship has a broad educational and training approach which includes much of what is needed in the heritage sector and therefore not much was added to the need for additional skill competencies in Part B, though additional education and training will be required at post apprenticeship level.

### **5.5.4 Plastering apprenticeship**

The training of plastering apprentices includes some lime plastering, though the overall content of conservation training is low. In 2013 only eight new students registered for the apprenticeship in plastering throughout the Republic, while only four registered in 2012.

### **5.5.5 Electrical apprenticeship**

The electrical apprenticeship has been reviewed and a draft curriculum is being agreed with QQI. The training for this apprenticeship includes both domestic and industrial work in new build sectors only.

### **5.5.6 Plumbing apprenticeship**

The curriculum for the apprenticeship in plumbing does not include conservation training. The curriculum has been reviewed and a draft curriculum is being agreed with QQI. Plumbing apprentices are trained in both domestic and industrial work in new build sectors only. It is noticeable that lead roofing and flashing, which was once part of the plumbers craft, is no longer listed in the modern apprentice plumber's curriculum; it is included here in the proposed curriculum as an essential skill area for work on the conservation and repair of old buildings. This telling omission suggests that lead work, a critical component of historic buildings, is not included in any apprenticeship programme and is a site-acquired skill.

### **5.5.7 Floor and wall tiling apprenticeship**

There is no specific conservation element in the apprenticeship in floor and wall tiling.

### **5.5.8 Painting and decorating apprenticeship**

The apprenticeship in painting and decorating includes some element of conservation. There are only three painting and decorating apprentices in their first year of training at present.

## 5.6 Training – discussion and conclusions

It has been noted above that the take-up of courses has been disappointing in many cases in recent times. This is largely driven by the downturn in the construction sector and the resulting perception amongst school-leavers that there is no future in the sector in the short-term. In many of the courses it would be expected that the student or trainee would be in employment, which is a further hindrance to take-up of courses and in some cases, most notably apprenticeship, employment in the trade is obligatory. In the case of apprenticeships the low numbers of new entrants has been noted, with four candidates taking up carpentry throughout the Republic in 2012 and eight in 2013, while only three new apprentices are in their first year in both the bricklaying and painting & decorating apprenticeships.

A number of other factors have been mentioned by those interviewed for this study, including the reluctance of contractors to take on apprentices. This can result from fragmentation in the industry, where large-scale contracting companies previously had their own divisions to handle individual trades. With the fall-off in available work some of these divisions have been disbanded, reforming as separate and independent contracting companies who are subcontracted by their previous employers. The resulting change in the economies of scale and the economics of their companies makes it less favourable to take on apprentices. One source stated that newly-formed contracting companies are not familiar with the processes of engaging apprentices and hence do not avail of the opportunities; if this is true, then this could be addressed by a campaign of information aimed at employers. A further factor stated by contractors was that the new government form of contract is a strong disincentive to take on apprentices; heritage contracting makes up such a small proportion of the total amount of work in the construction sector, and has such high levels of uncertainty over the level of work that would be required on site, that heritage work should be exempted from the form of contract.

A frequent issue mentioned was that large numbers of building workers came to Ireland during the boom years and while many or all of these may be fully trained in their respective crafts, this cannot be verified as there is no means of checking qualifications in an industry that, in this respect, is not regulated. One contractor stated that the capabilities of potential employees are tried out in the yard to assess their competencies, admitting that checking systems for mechanical and electrical trades work well, while those for plastering and carpentry do not.

Another comment that was made frequently by those interviewed was that contractors are engaging workers on very low rates of pay. The availability of people to do the work ensures that this level of pay can be imposed and this will only change when there is a return to fuller employment in the business. The knock-on effect of this is to discourage new entrants to apprenticeships. Potential candidates would be faced with a four-year period of work at the apprenticeship rate, which is below the minimum wage, followed by the prospect of a career in which they would earn a low rate of pay

that does not greatly exceed the minimum wage. If recognition for progression through the industry by way of enhanced qualifications were to be introduced, this alone would justify incremental wage increases as individuals progress through the grades.

The largest employer of heritage craftworkers in the state is the Office of Public Works (OPW), and this body would take on apprentices in various crafts. At the end of their apprenticeship the apprentice is generally let go, but can apply for a job with the OPW if one comes up. It is seen as beneficial if they work in the private sector for a time and during the boom years the OPW sometimes sent apprentices out to work for a time in the private sector. There are drawbacks in the system that are seen in the OPW. There is a requirement for the apprentice to experience certain tasks and the OPW does not always have the range of work necessary to accomplish this, such as elements of work that are specific to modern buildings.

The question of introducing a requirement to have a recognised training qualification or conservation card before being allowed to work produced a variety of responses from a broad spectrum of those interviewed for this study. In general, heritage contractors were strongly in favour of such a move, as it would ensure that those contractors that engaged only suitably skilled workers would not be undercut by contractors with no proper qualifications. It was recognised that this could be addressed in public contracts through a prequalification requirement for suitable skills, but the opinion remained that this form of regulation is needed. A further advantage of such regulation would be that it would provide the incentive for individual craft workers to further upskill so that they could become qualified to carry out heritage work, thereby improving the availability of craftworkers. A counter-argument to this opinion was that mandatory training would introduce a rigidity to the market that would act against the interest of the employers at times when the available work expanded.

The training system introduced in Germany would fit in with the notion of craftworkers taking responsibility to further their own careers. This would include the gaining of heritage skills through successive modules, thereby encouraging the craft worker to achieve additional skills, while making it easier to achieve through incremental steps. This approach would be compatible with the introduction of a system of master craftworker and the curricula for this level of craft skill attainment have been set down above. The *Review of Apprenticeship Training in Ireland*, published in July 2014, supports this concept, recommending that:

Opportunities for progression should be strengthened, made more transparent and well published. The green economy, heritage protection, retro-fitting, sustainable energy ... are all areas where progression options could be developed. A master craftworker qualification should also be considered.



## 6.0 ANTICIPATED FUTURE NEEDS FOR CONSERVATION CRAFT SKILLS

### 6.1 Introduction

A significant finding from the research is the divergence of views as to what level of craft skills specialised sub-contractors and management/ main contractors believe is most required into the future. Some main contractors were more in favour of recruiting apprentices and training them up within their own firms. Other main contractors did not have the resources to spend mentoring and supervising apprentices and had greater requirement for skilled operatives. Most specialist sub-contractors shared the latter view, as having fewer employees, smaller premises and inconsistent work they felt they could not afford the investment in apprenticeships.

Most agreed that whilst master craft skills are most required, master craft level can only be achieved through steady progression and formalised training from apprentice level - which is simply not provided for at present. The only nationally recognised formal training offered is at mainstream apprentice level, with intermittent opportunities for interested parties to up skill thereafter.

All contractors had grave concerns at the dearth of quality apprentices (i.e. operative unwilling to truly embrace their craft), the poor prospects for employment of apprentices on account of inconsistency of work and the limited opportunity for quality training into the future as older generations of skilled craftspeople retire. This is evidenced by the fact that across the full spectrum of contractors interviewed to date, there are only forty-one apprentices.<sup>5</sup>

All trades other than carpentry and services have an ageing workforce, some of who although experienced, do not have formal acknowledgement of their craft and are not therefore in a position to pass on their knowledge to a younger generation in a formal capacity.

### 6.2 Contractor opinion on future needs

#### Category 1 Management contractor

Opinion varied across management contractors interviewed but ultimately all contractors stated that as they are in the business of sub-contracting skills acquired by others, they would have a preference for the highest level of skill in that field.

Apprentice	Trainee	Master craftworker	Not core of business
-	-	9	1

<sup>5</sup> 28 in carpentry and joinery with management or main contractors; 3 in carpentry and joinery with specialist sub-contractors; 1 unofficial apprentice serving under a Facade Restorer; 1 Painter & Decorator; 1 Plasterer; 4 Electricians; 3 Plumbers

### Category 2 Main contractor

One contractor who supports the apprentice programme stated a preference for training up a young apprentice to his firm's particular requirements. Another contractor did not have the resources to train an apprentice, but had a preference to engage a freshly qualified apprentice and train him to their practices. All other contractors were more in favour of acquiring established workers who did not need to be guided or supervised, but could work independently. All, when asked about a possible future add-on heritage module to traditional apprenticeships were greatly in favour of the proposal, as they were all of the opinion that existing apprenticeships over-emphasise new-build technologies and ignored the more prominent repair and maintenance sector arising in retrospective works to established and heritage building stock.

Another contractor made the point that a degree of exclusivity shrouded an over-qualified operative, who he felt may not embrace the requirement of smaller main contractors for a skilled person to work at all levels of skill. This same contractor did not encourage up-skilling of staff in heritage skills.

Apprentice	Trainee	Master craftsperson	Quotes
1	1	18	'Apprentices should be trained in heritage and become accredited as specialist trainees'
			'Apprenticeships too streamlined – young need to earn a living'
			'Flexibility key to conservation – master craftworker should be happy to work at all levels'
			'Steady progression at all levels key to sustainable workforce'

### Category 3 Specialist sub-contractor

All contractors expressed a concern at the lack of formal progression through their respective trades. Primarily requirements for apprentices are thwarted by inconsistent work and limited resources to adequately supervise and mentor apprentices. On this basis, this category of contractors all had a greater need for fully skilled craftspeople.

Apprentice	Trainee	Master craftworker	Quotes
-	-	39	'Not enough skilled workers. No apprentice suitable- too mainstream. No proper heritage training'
			'Level of experience and quality of that experience a big worry'

### 6.3 Comment

Whilst the question posed to contractors was notional, their responses presented a critically poor future for the industry. The interviews revealed a surprising reality that the future of apprenticeships lies predominately with main contractors. Management and specialist contractors typically do not support the apprenticeship system. As main contractors work across new-build and heritage sites, more rounded training will arise if their patronage of the scheme is encouraged.

However, of the main contractors interviewed, very few actually had an apprentice working with them and of those who did, all were in carpentry. In the research there was no evidence of support for other apprentices from the remainder of craft skills critical to the survival of the heritage crafts.

Another significant finding was the over emphasis by management and specialist sub-contractors on a future need based on the appointment of master craftworkers over lower level skills which if manifested in reality could limit opportunities for skill progression in younger generations.

It would appear from interviews that apprenticeships are not in the main encouraged at present, but the demand for a higher skilled worker has inevitably driven contractors of all categories to source workers from abroad, mainly eastern Europe, where comprehensive and lengthy traditional apprenticeships inherently focusing on traditional skills produces a skilled worker better suited to the Irish heritage craft industry than our indigenous apprenticeship programmes. This aspect coupled with poor work prospects for graduates of those schemes drives highly skilled operatives to seek work in Ireland, and in turn to be embraced by our craft employers.

This growing trend of filling gaps in our own skill bases with skilled craftspeople from elsewhere has the potential to reduce the perceived need for craft training here in Ireland. Both immigration and emigration are to be expected in a global economy but at the same time it is important to maintain our own traditional skill base that reflects styles, materials and methodologies indigenous to our own country when it comes to the specific repair and maintenance requirements of our older buildings.

## 7.0 RECOMMENDATIONS

### 7.1 Recommendations

The following recommendations arise from the findings of this study:

#### 7.1.1 Competencies

Research has evidenced significant disparities in the competencies of contractors and services offered by trade categories working within the heritage contracting industry. This anomaly has the potential to undermine consumer protection within the industry where diverse skill bases are permitted.

Best practice in the heritage contracting industry can only be achieved in the standardisation of the skill base serving that industry. In discussion with contractors, all were in favour of the introduction of a conservation card system, but tellingly on the basis that it applies only to an individual and not a contracting firm, as evidence of singular achievements on the part of interested operatives.

#### 7.1.2 Engagement of management contractors with craft skills

A worrying finding from the research was the largely unpoliced control of quality in heritage work carried out by the largest employers of heritage craft skills; management contractors. Whilst some management contractors were informed and committed to quality work, the greater proportion of their peers were not.

Some specialist sub-contractors interviewed were adopting a policy of refusing work opportunities as sub-contractors in this sector on the basis that there was a dominant practice of appointing specialist skills as domestic rather than nominated sub-contractors. Appointment as a nominated contractor afforded greater protection for the contractor, and offered an opportunity to achieve quality work using quality materials. Appointment as a domestic contractor offered a starkly opposing opportunity, where materials were often purchased directly by the employer, sourced for their value rather than quality, and workmanship was often comprised as a consequence of this coupled with often unrealistic programmes.

Specialist contractors comprise a small, but critically important sector within the heritage work force. It is essential that support is offered to them to ensure continued quality of work in larger conservation projects by way of policing this significant work sector.

#### 7.1.3 Training

Clear training paths for skill progression for all trades and skilled workers engaged in heritage works is a core recommendation of this study, as a means to standardise heritage awareness across all

sectors. Consistency in scope and quality of learning programmes is central to a standardised skill base.

In this regard, introduction of a national competence standard common to all participants in the heritage industry should be reviewed, accompanied by universal accreditation across all crafts to raise standards nationwide and improve Ireland's reputation internationally for achievement of good conservation practice standards.

The research has shown that a review of educational prospects for contactors engaged in the industry can be achieved, if present systems are enhanced and formalised. Such intervention will have immeasurably positive consequences for the actual realisation of best practice in heritage works.

#### **7.1.4 Investment in indigenous crafts and skills**

If the indigenous heritage workforce can formally progress their craft, the requirement for resources from abroad will be reduced, amplifying career opportunities in the construction heritage sector. It corresponds that an enhanced skill base will expand employment opportunities for Irish skilled workers internationally, further consolidating the long-term prospects for younger generations who may have an interest in joining the industry but are nervous of potential future unemployment as they have witnessed with the present down-turn.

#### **7.1.5 Employer and client awareness**

Greater efforts could be made by statutory guardians of the industry to raise awareness among consumers of the importance of engaging competent operatives for heritage works. Although outside the remit of this study, there is widely held perception that heritage crafts are niche skills patroned by the public sector that are beyond the needs or do not apply to heritage works in the private sector.

General awareness of statutory responsibilities in respect of custodianship of heritage properties and ensuring good practice, such as when carrying out essential maintenance and repairs, is not ordinarily present in private sector employers. There is no vehicle for clear, unambiguous information at employer level, nor, in their transfer of responsibility for compliance to an agent, can they reasonably be expected to have this responsibility. In engaging a third party to define the scope of works required to a heritage project, employers are relying on the skill, knowledge and competence of that individual to define a scope of works that achieves good conservation practice, but the study has found that, conversely, the same competencies are often diverse, inconsistent and sometimes at odds with the ideals of good practice.

More often, singular work programmes posing the greatest risk for building fabric if carried out incorrectly, comprising for example the replacement of a roof or rainwater goods, are specified and carried out by small contractors operating outside the heritage craft community. It is important that

consumer awareness focuses on the sustainability of quality crafts and materials for the repair of historic fabric, offering a greater long-term investment for the consumer. If an employer is made aware of the importance of engaging reputable contractors known for the expertise in their field of work, their investment in the work is more likely to yield a sustainable intervention.

Studies<sup>6</sup> based on interviews with consumers of heritage contractors found that a national register recognising the particular competence of contractors for mainstream and elemental heritage works was required to ensure consumer protection both as a resource for contractors and as a form of recourse in the event of complaints.

Whilst quality is a factor, employer interest in procurement of qualified heritage contractors is predominantly weighted in favour of value for money. In tendering, if a heritage contractor proves more expensive than his mainstream counterpart, the lowest tenderer will be appointed unless the price difference is negligible. However, if proof of competency was offered by way of a conservation card, register or other regularised system, it is likely that greater demand within the private sector will arise for skilled operatives offering a quality service.

#### **7.1.6 Procurement and the 'conservation card'**

Of those contractors interviewed, many stated that inclusion on a heritage contractor register was pointless as the assessment process did not fairly assess the competence, skill and knowledge of the individual. Registration was deemed excessively expensive and without critical mass on national registers, was more likely to be ignored as a useful procurement tool for consumers.

The market was deemed uncompetitive at present on account of the critical deficiencies in an inadequate skill base nationally, an unregulated sector and a lack of value placed on quality. The challenge faced by contractors generally means that they typically must compete against less competent contractors for work. Genuine conservators who know how to price heritage jobs are often at risk of being underpriced by others who anticipate variations as a means to improve profit margins. To obtain work competitively, they often have to cut their costs considerably which inevitably leads to reduced quality of work and materials. If they attempt to maintain their position in respect of the actual cost of achieving quality, they may not succeed in getting appointed for contracts.

Consumers and architects alike must be educated to ensure that value for money does not incentivise appointment at the risk of quality - a tradition that cannot be addressed whilst contractor inequalities exist. Value for money is difficult to determine in heritage jobs due to persistent competence

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<sup>6</sup> Unpublished 'Research project on behalf of The Register of Heritage Contractors, 2012

inequalities between tendering contractors, but it is achievable if comparably qualified contractors are invited to tender.

In this respect skill base inconsistencies must be addressed - a standardised skill base will ensure an equal standing in procurement and eradication of the dilemma of competent heritage contractors/master craftworkers competing with less skilled contractors, often at their loss.

The study has found that most contractors, specifically main and specialised, may not belong to a register and would appear to be included on tender lists on repute alone. As cited previously however, the specialised contracting category all stated that the introduction of a conservation card system would secure their continuance in the industry as a procurement advantage, at very little cost to the contractor. The primary purpose of the card is to possess physical evidence of their efforts to upskill and acquire qualifications and to preclude unqualified operatives from presenting themselves as qualified. Most contractors agreed that a two-year duration for the card was appropriate, with re-issue awarded on the basis of consistent work and evidence of competence in the field.

It is essential that the voice of the industry is heard and changes implemented to standardise craft skills in the form of a conservation card for genuinely qualified heritage workers.

#### **7.1.7 Addressing skill deficiencies and mentoring programmes**

Contractors find it difficult to recruit specialists. The scarcity of skilled indigenous workers will be addressed if present training and development deficiencies are improved. In this regard, there is a requirement to positively engage with older craftworkers who have acquired invaluable skills native often to their localities. A mentoring programme could be introduced, the status of which could be incentivised formally with a Mentor title, as a means to ensure traditional skills and material provision are not lost.

## 8.0 SUMMARY

A significant finding of the study is that a three-tier system in the crafts is required, returning to the ancient system of apprentice, journeymen and master craftworker. This arises because a great deal of the work that is required on heritage buildings is too specialised to be covered by the standard systems of training offered through apprenticeships. It thus follows that not only are qualifications beyond apprenticeship level central to the training of skilled operatives in the heritage sector, but that they must fit in to a recognised system of accreditation, usually carried out through a progression of modules leading to attainment of sufficient credits to reach master craftworker level.

At the same time it is important that at least a basic understanding of conservation issues is taught on all apprenticeship programmes. It is the experience of anyone involved with work on heritage buildings, particularly the more modest buildings rather than the nationally important or high-profile structures, that inappropriate methods of repair, alteration or refurbishment are frequently used, to the detriment of the conservation of the building. This frequently occurs because the craftworker and/or the contractors have no knowledge or understanding of the need for conservation-based practices and materials, nor of the adverse effects that inappropriate work can have.

Furthermore, it is a reality that a significant proportion of the owners of heritage properties have no understanding of the structure of their buildings or of the need for a traditional craft approach and the onus lies with the contractor or craftworkers to identify conservation issues, particularly in those cases where there is no conservation architect or other conservation professional involved. The most effective way to overcome this problem is for craftworkers in all of the crafts to have at the very minimum an understanding of conservation so that they can identify when building fabric requires a heritage approach rather than the methods used with more modern materials. Even if the craftworkers are not sufficiently trained to implement all of the heritage methods, the ability to recognise the need for those methods and a good understanding of the implications of not doing so would go a long way to improving the care of heritage buildings. If the crafts were trained in basic conservation methods so as to enable them to carry out the more common tasks this would increase the probability that work would be done in accordance with conservation principles.

One suggestion for broadening the understanding of conservation issues amongst apprenticeships would be to include visits to conservation projects as part of the curriculum. However, it is not believed that this alone would suffice as an information tool to a young apprentice, as practicable, hands-on experience on construction sites is limited to the type of work expected of the apprentice during the on-site phases of the apprenticeship, which specifically excludes enhanced skills. The preceding research demonstrates that specific heritage training, allocating time for on- and off-site experience together with theoretical education will better serve enhanced heritage training requirements.



Another comment made during consultations for this study was that conservation contracting is focussed on refurbishment rather than new-build and that it is generally one-off work; for this reason, it would not be advisable to set apprentices to practice on the original material on significant conservation jobs. However, this should not be a problem in a properly-organised training model as workshop-based training can give a firm grounding in techniques and this can be followed with on-site work on simpler tasks before the apprentice works up the skill level to tackle major and important projects. This has always been the case in refurbishment jobs and is not an insurmountable issue.

### Summation of key recommendations

1. That apprenticeship training is maintained even during down-turns in the construction industry
2. That the requirement that an apprenticeship be initiated by an employer needs to be examined as this results in few or no apprentices being trained during a down-turn which then leads to the importation of skills when there is an up-turn
3. That heritage skills are introduced to apprenticeship training
4. That heritage skills are continued at post-apprenticeship level leading to master craft level
5. That existing craft workers with no formal training are given the opportunity for training and certification
6. That a modular approach to training is adopted with common core modules shared amongst different craft skills, professionals and others
7. That all courses in heritage skills are offered to the employed and unemployed alike
8. That training modules are linked and acceptable to European initiatives in conservation and master craft training
9. That on-site assessment is made available for some modules
10. That employers gain points when tendering if they employ apprentices and provide training
11. That public contracts of a certain size must employ a set minimum number of apprentices
12. That access is opened to third-level education post apprenticeship
13. That specific programmes are developed for trainers and assessors, both on- and off-site, utilising already skilled craftworkers with proven competency in the field to train the trainers
14. That a fiscally incentivised public archival system for recording and documenting interventions, methodologies and site-specific specifications is introduced
15. That a conservation skills card with a unique individual number is developed, recording all certified training undergone by an operative during their work life.

16. That improved policing of heritage projects is introduced to ensure quality of work by domestically appointed craftworkers
17. That further research be carried out to compile comprehensive data on the numbers and skill levels of those working in the field of building conservation

VOLUME 2 : APPENDICES

Research on the Irish labour market in construction conservation

for

THE HERITAGE COUNCIL

September 2014

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## CONTENTS

Appendix 2.2	Trades and jobs included in the draft list .....	4
Appendix 2.3	Trades and jobs as referred to within the construction industry.....	6
Appendix 3.2	Summary of contractor information .....	17
Appendix 3.3	Information relating to contractors and trades .....	19
3.3.1	Category 1 Management contractors.....	19
3.3.2	Category 2 Main contractors.....	27
3.3.3	Category 3 Sub- (Specialist) Contractors.....	36
3.3.3.1	Joiners/ cabinet makers.....	36
3.3.3.2	Roofing.....	37
3.3.3.3	Stone worker .....	38
3.3.3.4	Facade restoration.....	38
3.3.3.5	Mechanical services .....	39
3.3.3.6	Electrical services.....	40
3.3.3.7	Painting and Decorating .....	40
3.3.3.8	Thatching.....	40
3.3.3.9	Glazier .....	41
3.3.3.10	Blacksmithing .....	41
3.3.3.11	Damp proofing.....	42
3.3.3.12	Scaffolders.....	42
Appendix 4.1	Skill ranges of crafts working in the heritage industry .....	43
Appendix 4.2	Competencies expected of general contracting trades.....	47
4.2.1	Competencies expected of a main contractor or foreman working within the heritage sector .....	47
	Recognised craft skills: .....	48
4.2.2	Competencies expected of a carpenter and joiner working within the heritage sector at master craft level .....	48
4.2.3	Competencies expected of a brick and stonelayer working within the heritage sector at master craft level .....	48
4.2.4	Competencies expected of plasterer working within the heritage sector at master craft level .....	49
4.2.5	Competencies expected of a painter and decorator working within the heritage sector at master craft level .....	50
4.2.6	Competencies expected of a floor and wall tiler working within the heritage sector at master craft level .....	51
4.2.7	Competencies expected of mechanical and electrical craftspeople working within the heritage sector at master craft level .....	52

Non- designated craft skills.....	52
4.2.8 Competencies expected of skilled a roofer working within the heritage sector .....	52
4.2.9 Competencies expected of a skilled thatcher working within the heritage sector .....	53
4.2.10 Competencies expected of a skilled ironworker and blacksmith working within the heritage sector .....	54
4.2.11 Competencies expected of a skilled glazier working within the heritage sector .....	54
4.2.12 Competencies expected of a skilled facade restorer working within the heritage sector .....	55
Appendix 5.2 Training courses available.....	56
5.2.1 Management / main contractor.....	56
5.2.2 Foremen.....	58
5.2.3 Carpentry and joinery .....	59
5.2.4 Stone and brick – including bricklayer, stone layer, stonecutter, stonemason and stone carver .....	60
5.2.5 Roofer .....	61
5.2.6 Plaster .....	63
5.2.7 Mechanical and electrical services.....	63
5.2.8 Floor and wall tiling .....	64
5.2.9 Painter and Decorator .....	64
5.2.10 Glazing (through painter and decorator craft).....	64
5.2.11 Facade restoration .....	65
5.2.12 Thatcher.....	65
5.2.13 Ironwork and blacksmithing.....	65
Appendix 5.5 Curricula for apprenticeships.....	67
5.5.1 Carpentry and joinery apprenticeship.....	67
5.5.2 Brick- and stone-laying apprenticeship .....	72
5.5.3 Stonecutting and stonemasonry apprenticeship.....	76
5.5.4 Plastering apprenticeship .....	78
5.5.5 Electrical apprenticeship .....	83
5.5.6 Plumbing apprenticeship .....	86
5.5.7 Floor and wall tiling apprenticeship .....	90
5.5.8 Painting and decorating apprenticeship .....	94

## Appendix 2.2 Trades and jobs included in the draft list

Skill Area	Comment
<b>Brick and Stonelaying</b>	See brick and stonelaying apprenticeship description in section 5 for recommendations for additional training requirements for the heritage sector.  In practice stonelaying and also blockwork is sometimes carried out by semi-skilled operatives
<b>Roofing - slating and tiling</b>	See carpentry and joinery (timber roof structures), plastering (slating) and plumbing (lead sheet roofing and flashing) in section 5  Specific skills required in sheet metal work  Slating, roof tiling and sheet metal roofing is often carried out by semi-skilled operatives specialising in these areas. There is no formal apprenticeship
<b>Thatching</b>	Thatching is carried out by skilled operatives with materials and techniques that reflect local and regional tradition. There is no formal apprenticeship
<b>Carpentry</b>	Carried out by a carpenter and joiner. See carpentry and joinery apprenticeship in section 5 for recommendations for further training requirements for the heritage sector
<b>Joinery</b>	As above
<b>Cabinet making</b>	As above
<b>External renders in lime</b>	See plastering apprentice description in section 5.  In practice some plain/flat renders including wet dash/harling are carried out by semi-skilled operatives
<b>Plasterwork -internal</b>	See plastering apprenticeship in section 5.  In practice some plain/flat/solid plastering is carried out by semi-skilled operatives
<b>Decorative plasterwork</b>	See plastering apprenticeship in section 5.  In practice decorative plasterwork in lime mortar is carried out by skilled decorative plasterer's who specialise solely in this area of work
<b>Ironwork and blacksmithing</b>	Blacksmithing is not a formal registered apprenticeship but an informal apprenticeship system is often incorporated in the training of blacksmithing by more experienced blacksmiths
<b>Lead working</b>	Traditionally plumber's work. See apprentice plumber in section 5.  In practice flashings, valleys and other areas of leadwork is carried out by semi-skilled operatives
<b>Glazier</b>	Traditionally part of a painter and decorator's trade. See apprentice painter and decorator in section 5.  In practice often carried out by semi-skilled operatives

Skill Area	Comment
<b>Stained glass repair and glass painting</b>	In practice carried out by specialist firms with skilled and semi-skilled operatives, artists and others
<b>Painting and decoration</b>	See apprentice painter and decorator In section 5. In practice often carried out by semi-skilled operatives
<b>Tiling</b>	See apprentice floor and wall tiler in section 5. In practice often carried out by semi-skilled operatives
<b>Gilding</b>	See apprentice painter and decorator in section 5. Gilding is often carried out by artists and others specialising in this area
<b>Stone carving and cutting</b>	See apprentice stone cutter in section 5. Machine operators vary from being stonecutters to semi-skilled operatives. Professional hand cutting and dressing is carried out by stonecutters. Carving of stone is often done by artists and others
<b>Stone conservation</b>	See apprentice stonecutter, brick and stonelayer and plasterer in section 5. In practice operatives working in this area vary from the crafts to artists and others, often semi skilled workers working for specialist firms
<b>Wood carving</b>	Wood carving is carried out directly with copying machines and/or by hand by cabinet makers, some carpenters, artists sculptors and others specialising in this area
<b>Wood machinist</b>	Apprenticeship
<b>Timber preserver</b>	Semi skilled operatives, with no formal apprenticeship
<b>Dry-stone walling</b>	Dry-stone walling is carried out by farmers and other agricultural workers. Work related to landscaping is carried out by trained, un-trained and brick and stonelayers
<b>Site management</b>	Site managers operating heritage projects have either undergone training through the CIF heritage site management programme or have had on the job experience
<b>Retrofit insulation</b>	Carried out by a number of different trades and semi-skilled operatives
<b>Retrofit services</b>	Carried out by plumbers and electricians
<b>Services maintenance</b>	Carried out by plumbers, electricians and others working for specialist firms
<b>General operatives</b>	Carry out a large range of work from assisting trades to doing semi-skilled work
<b>Handyman/ caretaker</b>	Mostly semi-skilled
<b>Steeplejack</b>	Carried out by specialist firms. Steeplejacks are often involved with pointing and other work related to stone and brick

Appendix 2.3 Trades and jobs as referred colloquially to within the construction industry, evidenced in interviews with contractors including skills not included in the draft list

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
0.0	<b>Main Contractor / Foreman</b>	No  As the supervisor of all works on site, including skills unique to heritage works, this job title is considered a significant omission from the list	<p>Many main contractors interviewed to date have a background in carpentry. All others have a background in engineering. No main contractors or their foremen interviewed to date have a background in any of the other trades described previously.</p> <p>All main contractors interviewed, with the exception of one mid-sized firm, work predominantly on mainstream work, with heritage work considered a niche area. Whilst they would have workers employed full time who are considered heritage craftworkers in their respective fields, these workers work more regularly on mainstream work.</p> <p>All contractors interviewed had most interest in employing workers who had basic training in a specific field, but who were flexible to work in other areas. The general heritage contracting industry in Ireland is deemed by most main contractors to be too small to support specialists in a particular skill in general contracting.</p>	Manager of heritage sites	Either a 3rd level degree or skilled craft worker with experience of management
1.0	<b>Carpentry</b>	Carpentry AND Joinery AND Cabinet making AND	<p>Sub-contracting firms specialising in carpentry also considered themselves competent in joinery, cabinetmaking and machining. Whilst some firms specialised in specific building elements such as repair, draught proofing or replication of heritage windows, most had a wider works scope and also included internal joinery, wood turning and carving, including flooring.</p> <p>Half of the firms interviewed were often engaged as</p>	<p>Knowledge of all trades; most likely skill to evolve to overall site management</p> <p>All skills relating to timber; carpentry; joinery, repairs</p> <p>Retrofit insulation</p> <p>Masonry</p>	Any skill level from apprentice to skilled craft worker



Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
		<p>Wood carving AND Wood machinist</p> <p>In discussion with carpentry firms, all four skills were often described as one.</p>	<p>sub-contractors under a management contractor to carry out all joinery works in a conservation project with a joinery workshop set up on site. Others did not function in this manner and having a greater emphasis on their own workshops, worked solely as specialists on specific items.</p> <p>Whilst we found that 26 apprentices are engaged in the industry, they are all working under main or management contractors. No specialist sub-contractor interviewed was found to be in a position to support the apprenticeship scheme.</p> <p>We found that joinery repairs are carried out by firms who declare their speciality in the field, scheduled in item 11.0 below.</p>	<p>Roofing – all skill sets described above</p> <p>Glazing</p> <p>Insertion of precast materials</p> <p>Timber flooring- boards; sheets</p>	
2.0	Roofing	<p>Slating and tiling only</p> <p>The wider term 'roofer' engaged by the industry is based on a variety of skills. Either each skill should be included in the list, or an all embracing term 'roofer'.</p>	<p>Roofers are described under the one heading, although expected skills cover an extensive range of crafts. In most main contracting firms, roof works are carried out in-house using predominantly carpenters, who are expected to have knowledge of all aspects of roofing. None of the main contracting firms interviewed had engaged in specialist training in slating, lead work, copper work. Specialist roofing firms however, were more open to specialist training and participated sporadically. Only three of the main contracting firms interviewed had operatives with particular skills in sheet metal work.</p> <p>There are only two Irish members of the UK's Lead Contractor Association in our research to date.</p>	<p>Roof carpentry</p> <p>Tiling</p> <p>Slating</p> <p>Sheet metalwork; lead; copper</p> <p>Masonry</p> <p>Knowledge of lime mortars</p> <p>Steeplejacks</p>	Any skill level from general operative to master craftworker

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
3.0	<b>Bricklayer</b>	Brick masonry building and repair; combined with below	No bricklayers were interviewed as part of this survey, as none would appear to have entered either into management of main contracting firms, or set up their own specialist firms. From our interviews however, we were surprised to find that an experienced bricklayer is considered one of the greatest assets for a heritage contracting firm. In most cases, the firm's full time bricklayer would also be required to have knowledge of stonemasonry as part of his range of skills. In fewer cases where stonemasons were employed full time, they would also carry out brickwork.	Laying of all masonry materials; underpinning; foundations; brick, stone, concrete block and precast materials.	Any skill level from apprentice to skilled craft worker
				Retrofit insulation	
				Landscaping	
4.0	<b>Brick and stonelayer / stonecutter</b>  <b>Also known in the trade as stonemason</b>	Stone building and repair; combined with above	Stonemasons are required to have an understanding of all related stone skills by main contractors; from a knowledge of lime through to all types of stone building, stone cleaning, conservation and repair. Few main contractors were aware of the various crafts skills sub-sets as set down in the draft list. Some facade restoration specialists interviewed had a background in stonemasonry, which they found naturally led to a career in all aspects of external works.	Basic stone cutting	Any skill level from apprentice to skilled craft worker
				building	
				knowledge of lime mortars and pointing	
				Stone conservation-identification of defects and repair	
				Dry-stone walling	
				All of the above, as per brick work	
				All of the above, as per blockwork	
				Cleaning methodologies and techniques	
Landscaping					
5.0	<b>Plastering</b>	Plasterwork -internal	Plasterers employed full time by a main contractor are most likely to have started their careers as plastering	Internal flat lime plasterwork	Any skill level from apprentice to skilled craft

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
			<p>apprentices, but also may have a background in <b>basic</b> carpentry where stud partitioning and plasterboard is used. Lime based flat plastering is considered by many main contractor interviewed as an in-house trade. Most main contractors would have sent their plasterers on heritage training courses, to overcome the lack of training with lime at apprentice level.</p> <p>A limited number of internal stucco firms exist in Ireland, but it would appear that most internal flat plasterwork in lime is carried out by either full time plasterers within a main contracting firm, or sub-contracting mainstream plastering firms who claim to have specific lime knowledge. No mainstream plastering firms have been interviewed to date to verify if this is indeed the case.</p>	<p>Paper removal</p> <p>Plaster repair</p> <p>Retrofit insulation</p>	worker
<b>6.0</b>	<b>Tiling</b>	Yes	Tiling works within main contracting firms are inevitably carried out in-house by plasterers, but on occasions sub-contractors are engaged to carry out tiling. None of the main contractors interviewed had ever engaged the services or even know of a specialist heritage tiler.	Internal and external finishes; stone slabs; ceramic and porcelain tiles	Any skill level from apprentice to skilled craft worker
<b>7.0</b>	<b>Services</b>	Retrofit services	Neither apprenticeship plumbing or electrician courses include any reference to the care required when working in context with historic fabric. However,	<p>Stripping out</p> <p>Services maintenance</p>	Any skill level from apprentice to skilled craft

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
		<p>AND</p> <p>Services maintenance</p> <p>All such works are carried out by formally skilled plumbers and electricians. The trades should perhaps be separated as both have differing impacts on historic fabric</p>	<p>almost every heritage project requires services intervention. No services contractors are included in the Register of Heritage Contractors, the Irish Georgian Society Skills Register or Local Authority Skills Registers. We interviewed five firms who we know carry out sensitive work when engaging with heritage buildings, and found that none have any heritage training or view themselves as having a specialist craft skill.</p>	<p>Installation of all mechanical and electrical services and routing of same</p>	<p>worker</p>
8.0	<b>Painting and decoration</b>	<p>Yes</p> <p>No distinction however is made for the conservation of historic finishes</p>	<p>Painters and decorators are typically engaged as sub-contractors, with few main contracting firms employing full time decorators. Of the two painting contracting firms interviewed, both considered themselves as having specialist craft skills, but acquired through knowledge and experience. Decorative experts are more likely to work as single entities and be employed on public sector works, as no main contractors interviewed had ever engaged the services of a heritage painter decorator.</p>	<p>General painting preparation and decorative completions, all surfaces</p>	<p>Any skill level from apprentice to skilled craft worker</p>
<b>SPECIALIST SUBCONTRACTORS</b>					
9.0	<b>Facade restoration</b>	<p>Lime mortars and plasters external</p> <p>The expansion of external works into newly termed 'facade restoration works' should be acknowledged</p>	<p>All main contractors interviewed sub-contract facade cleaning works to specialised companies. Most contractors will have in-house skills in repairs to stone. Few contractors have in-house skills in standard flush lime pointing and lime render, engaging a speciality for heritage pointing. Most contractors however sub-contract all facade works to specialist firms.</p> <p>In interviewing specialised facade restoration firms,</p>	Lime render (plasterer)	Any skill level from general operative to skilled craft worker
				Harling (plasterer)	
				Pointing types and techniques (brick and stonelayer)	
				Render repairs and plastic stone repairs (plasterer)	

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
			the scope of their works is extensive. It ranges from all aspects of masonry (all stones, brick, terracotta, concrete, tile) repair, cleaning, pointing/ rendering and repair, leadwork to steeplejack and abseiling. However, aside from lime training, their skills are largely acquired through experience on the job.	Masonry (stone and brick) repair, indenting, reinstatement (brick and stonelayer and stonecutter) Masonry and applied finishes cleaning methodologies and techniques (part of brick and stonelaying apprenticeship) Concrete conservation, repair and maintenance (various) Steeplejack (Specialist)	
10.0	Thatching	Yes	Thatch work is rarely required as a skill by main contractors. In interviewing a thatcher, his work is predominately obtained through direct contact from clients.	This is not a designated trade	skilled craft worker
11.0	Joinery Encompassing joinery and carpentry/ cabinet making/ machinist	as per 1.0	Joinery workshops are typically engaged for sash window and traditional joinery works. Two main contracting companies interviewed carry out this work in-house, but all others engage sub-contractors for this work.	Parquet flooring repair and replacement Cabinet making Wood carving (Cabinet maker or machinist) machinist	skilled craft worker
12.0	Plastering encompassing	Decorative plasterwork	Whilst flat plasterwork in lime would appear to be within most skill ranges offered by main contractors,	Stucco conservation and consolidation	skilled craft worker

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
	<b>Decorative plasterwork</b>		all main contractors interviewed to date sub-contract decorative work to a limited number of specialist companies. These companies generally offer skills in stucco, gesso work in addition to paint removals and replications.	Stucco repair and replication gesso repair and replication papier mâché repair and replication Scagliola	
<b>13.0</b>	<b>Ironwork and blacksmithing</b>	Yes	All blacksmithing works are sub-contracted to specialists. Specialist workshops engage a range of skilled operatives from blacksmiths to coppersmiths to fabricators.	Leadsmith (traditionally from plumbing apprenticeship) Blacksmith (not a designated trade) Coppersmith (not a designated trade) Fabricator Sheet metal worker Farriery	skilled craft worker
<b>14.0</b>	<b>Glazier</b>	Yes	Most glazing for new sash windows is supplied by mainstream glazing suppliers. Plate, crown and stained glass works are carried out by a small number of specialist glaziers, who also specialise in metal and leaded framing repair.	Stained glass repair glass painting	Any skill level from apprentice to skilled craft worker
<b>15.0</b>	<b>Painting and</b>	Gilding	Painting and decoration is predominately viewed as a	Marbling	Any skill level from

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
	<b>decoration</b>	As per item 8.0 above, painting and decoration in a strictly heritage context should be acknowledged as an additional skill to standard training	mainstream skill. Clearly if gilding, marbling or fresco repair is required specialists are engaged, but all general paintwork would appear to be carried out by apprentices/ skilled painter and decorator.	Gilding graining Sign writing Paper hanging	apprentice to skilled craft worker
<b>16.0</b>	<b>Floor and wall Tiling</b>	Yes- but expected of general trade 'Tiling'  The repair of historic tiling as cited in columns adjacent requires knowledge and competence beyond standard training	Tiling is generally considered a mainstream skill by most main contractors. When asked about mosaic, encaustic, polychromatic tile repair and reinstatements, few contractors were aware that specialists exist in these areas. Tile cleaning is typically carried out by facade restoration specialists.	Knowledge of historic tiling styles and materials, ceramic/clay/ decorative stone, terracotta repair and maintenance  Terrazzo and mosaic conservation, repair and maintenance  Cleaning and repair  Reinstatement and replication	Any skill level from apprentice to skilled craft worker
<b>17.0</b>	<b>Stone carving</b>	Stone carving and cutting	Stone carving is a skilled area of work carried out by stone cutters, artists and others.	Stone cutting Stone lettering	skilled craft worker
<b>18.0</b>	<b>Damp and fungal treatment</b>	No  This trade has emerged as one of the more prominent	Almost all design teams/ main contractors engage specialist firms to take responsibility for the identification of damp and fungal decay, however minor the impact of deteriorated fabric. Treatment is carried out typically by the same firms, hence its	gauging of damp Identification of rot type Identification of extent of removals required	skilled craft worker

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
		trades on heritage sites. It is essential that it is recognised as a craft skill working in heritage buildings and its operatives brought within the folds of the conservation community. No training is required at present and the impact of the trade presents considerable risk to historic fabric	inclusion as a craft skill in this research.	Treatment	
19.0	<b>Scaffolding</b>	No  As above, most heritage sites require scaffolding.  It is essential that the trade is recognised as one that works with heritage buildings and its operatives brought within the folds of the conservation community. No specific conservation training is required and the impact of the trade presents considerable risk to historic fabric	All scaffolding would appear to be erected by specialist firms, with some having a better reputation than others for careful installations. Specialist training is required to become a licensed scaffolder.	-	Licensed operative rather than designated 'craft worker'
20.0	<b>Enabling works</b>	No  As with the previous skills not included in the draft list, most heritage sites require	Specialist demolition firms now incorporate other skill sets such as those described here. All would appear	Demolitions  excavations	



Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
		<p>demolition works, often carried out by specialist.</p> <p>It is essential that the trade is recognised as one that works on heritage buildings and its operatives brought within the folds of the conservation community. No training is required and the impact of the trade presents considerable risk to standing remains of historic fabric, by way of vibrations/ separation of extant from demolished fabric, shoring and propping, careful removals and protection from vibrations,</p>		<p>shoring/propping</p> <p>scaffolds</p> <p>ground works</p>	
21.0	<b>Landscaping</b>	<p>No</p> <p>Landscaping in heritage contexts requires careful digging, planting to ensure containment of root growth and appropriateness. This widely engaged heritage skill should be included in the list and the skill of informed trades' people acknowledged.</p>	Traditional landscape design, planting etc.		

Ref.	TRADE	INCLUSION IN DRAFT LIST	DESCRIPTION	SKILL SETS EXPECTED BY CONSUMER OF TITLE - COLLOQUIAL TITLE	LEVEL OF SKILL GENERALLY EXPECTED BY EMPLOYER OF TITLE
22.0	<b>Environmental control</b>	No As an emerging trade, particularly in the context of museum and very early buildings, it is important that this skill is acknowledged	Objets d'art; laboratories		

## Appendix 3.2 Summary of contractor information

Trade	Total number of firms known to researchers	Complete interviews and responses	Skilled workers employed full time by management and main contractors	Skilled subcontractor numbers	Apprentices
Management contractor	13	10	62	Unknown as numbers could transfer across a number of firms	24 carpenters
Main Contractor	43	27	271	Unknown as numbers could transfer across a number of firms	4 carpenters
Carpentry and joinery	64	6	107	29	
Roofing	41	5	4	27	
Stone worker	39	1	58	2	
Bricklayer	(combined with stone)	-	17	1	
Facade restoration	16	5	-	36	
Internal Plastering	13	1	22	-	
Decorative plasterwork	12	3	1	1	



<b>Tiling</b>	6	-	-	-	
<b>Mechanical Services</b>	9	2	1	16	
<b>Electrical Services</b>	12	3	1	43	
<b>Painting and decoration</b>	19	2	14	16	
<b>Thatching</b>	37	1	-	1	
<b>Glazier</b>	6	2	-	4	
<b>Stone carving</b>	4	-	-	-	
<b>Ironwork and blacksmithing</b>	9	4	-	26	
<b>Damp and fungal treatment</b>	4	2	-	8	
<b>Scaffolding</b>	7	2	-	19	

**Appendix 3.3 Information relating to contractors and trades**

Tables 3.3.1, 3.3.2 and 3.3.3.1 to 3.3.3.10 record information yielded from discussions with the three categories of contractors working in the heritage industry: management, main and sub-contractors, across as many trades as possible.

**3.3.1 Category 1 Management contractors**

**Summary - totals of responses from all management contractors:**

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)	
10	2,886	62	874	General contracting	505	24- all in carpentry	CIF	17 people
				Specialist c & j	85		BLF	Varies
				Roofers	77		RHC	Varies
				Stone worker	1		Others	Varies
				Plasterers (internal)	24			
				Decorative plasterwork	24			
				Painting and decorating	104			
				Tiling	13			
				Facade restoration	36			
				Scaffold	39			
				Ironwork	9			
				Stone carving	1			
				Mechanical	85			
				Electrical	87			
				Damp and fungal	18			
Stained glass (glazier)	5							

Individual responses from management contractors

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
<b>Firm 1</b>	1335	18 foremen  All Carpentry	53  11 firms	General contracting	ca.20	0	None
				Specialist c & j	ca. 3		
				Roofers	ca. 4		
				Plasterers	ca. 4		
				Painters	ca. 4		
				Facade restoration	ca. 4		
				Scaffolding	ca. 2		
				Ironwork	ca. 2		
				Mechanical	ca. 4		
				Electrical	ca. 4		
Damp and fungal	ca. 2						
<b>Firm 2</b>	715	10  Foremen (4) Carpentry (2) Roofers (2) Plasterers (2)	101  12 firms	General contracting	ca. 54	12 carpenters	1 person x CIF Conservation Theory for Heritage Contracting
				Specialist c & j	ca. 5		
				Roofers	ca. 6		Singular attendance at ALL Building Limes Forum courses, seminars and conferences
				Plasterers	ca. 4		
				Painters	ca. 12		
				Facade restoration	ca. 3		Singular attendance at ALL courses advertised by the Register of Heritage Contractors
				Scaffolding	ca. 4		
				Ironwork	ca. 1		in-house training in lime, stone, decay, timber, painting carried out in UK/ Holland and thru web
				Mechanical	ca. 4		
				Electrical	ca. 6		
				Damp and fungal	ca. 1		
				Stained glass (glazier)	ca. 1		

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
<b>Firm 3</b>	255	4 foremen  All Carpentry	165 Approx  10 firms	General contracting	ca. 107	None	1 person x CIF Conservation Theory for Heritage Contracting
				Specialist c & j	ca. 5		
				Roofers	ca. 10		
				Specialist stuccodores	ca. 4		
				Painters	ca. 15		
				Facade restoration	ca. 3		
				Scaffolding	ca. 4		
				Mechanical	ca. 5		
				Electrical	ca. 10		
				Damp and fungal	ca. 2		
<b>Firm 4</b>	120	6 foremen  All Carpentry	144  10 firms	General contracting	ca. 110	4 carpenters	1 person x CIF Conservation Theory for Heritage Contracting
				Specialist c & j	ca. 2		Singular attendance at Building Limes Forum courses, seminars and conferences
				Roofers	ca. 8		
				Stuccodores	ca. 2		
				Painters	ca. 4		
				Facade restoration	ca. 4		
				Scaffolding	ca. 2		
				Mechanical	ca. 4		
				Electrical	ca. 6		
				Damp and fungal	ca. 2		



## Research on the Irish labour market in construction conservation

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
Firm 5	240	10 foremen  All Carpentry	136  10 firms	General contracting	94	None	2 people x CIF Conservation Theory for Heritage Contracting
				Specialist c & j	2		
				Roofers	7		
				Stuccodores	1		
				Facade restoration	4		
				Mechanical	6		
				Electrical	9		
				Painters	10		
				Stained glass (glazier)	1		
				Scaffold	2		





## Research on the Irish labour market in construction conservation

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
Firm 6	96	4 foremen  All Carpentry	185  12 firms	General contracting	Ca. 101	None	2 people x CIF Conservation Theory for Heritage Contracting
				Specialist c & j	Ca. 10		
				Roofers	Ca.12		
				stuccodores	Ca. 4		
				Painters	Ca.18		
				Facade restoration	Ca.4		
				Mechanical	Ca.14		
				Electrical	Ca.14		
				Ironwork	2		
				Stained glass (glazier)	1		
				Scaffold	3		
				Damp and fungal	2		

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
<b>Firm 7</b>	78	6 foremen  All Carpentry	76  9 firms	General contracting	Ca.39	<i>None</i>	3 people x CIF Conservation Theory for Heritage Contracting
				Carpentry and joinery	Ca. 7		
				Facade restoration	Ca.4		
				Decorative plasterwork	Ca.4		
				Mechanical Services	Ca.8		
				Electrical Services	Ca.5		
				Painting and decoration	Ca.5		
				Ironwork and blacksmithing	Ca.1		
				Scaffolding	3		
<b>Firm 8</b>	47	3 foremen  All Carpentry	14  3 firms	General contracting	11	<i>None</i>	None
				Decorative plasterwork	1		
				Scaffolding	2		



## Research on the Irish labour market in construction conservation

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
<b>Firm 9</b>	87	7 foremen  All Carpentry	131  16 firms	General Contracting	51	2 carpenters	1 person x CIF Conservation Theory for Heritage Contracting
				Carpentry and joinery	14		
				Roofing	9		
				Stone worker	1		
				Facade restoration	Ca.4		
				Internal Plastering	Ca.4		
				Decorative plasterwork	1		
				Tiling	Ca.2		
				Mechanical Services	Ca.11		
				Electrical Services	Ca.10		
				Painting and decoration	Ca.9		
				Glazier	1 or 2		
				Stone carving	1		
				Ironwork & blacksmithing	1		
				Damp and fungal treatment	Ca.4		
Scaffolding	Ca.8						



## Research on the Irish labour market in construction conservation

Numbers interviewed	Total employed	Skilled craft workers employed directly	Sub-contractors engaged at time of interview- approx figures from Health and Safety Records	Subcontractor skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of staff (ranging from in-house professionals to skilled craft workers)
Firm 10	112	9 foremen  All Carpentry	212  14 firms	General Contracting	67	6 carpenters	3 people x CIF Conservation Theory for Heritage Contracting
				Carpentry and joinery	Ca.8		
				Roofing	Ca.21		
				Facade restoration	Ca.6		
				Internal Plastering	Ca.12		
				Decorative plasterwork	Ca.8		
				Tiling	Ca.11		
				Mechanical Services	Ca.19		
				Electrical Services	Ca.23		
				Painting and decoration	Ca.17		
				Glazier	1		
				Ironwork and blacksmithing	Ca.2		
				Damp and fungal treatment	Ca.5		
Scaffolding	Ca.12						

## 3.3.2 Category 2 Main contractors

## Summary - totals of responses from all main contractors

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Average age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers	
20	381	271	Carpentry	91	Average age is 50	Specialist c & j	2	4 carpentry	CIF	16
			Joinery	16		Roofers	60		BLF	Varies
			Plastering -internal and external	22		Specialist stucco	13		RHC	Varies
			Stuccodore	1		Painters	11		Others	Varies
			Stone cutters/ layers / brick	58		Facade restoration	23			
			Roofers	4		Scaffold	29			
			Painters	14		Ironwork	3			
			Plumber	1		Mechanical	54			
			Electrician	1		Electrical	61			
			Lead	3		Damp and fungal	9			
			Foremen, general operatives and labourers excluded	Stained glass (glazier)		3				
				Stone		1				
				Brick		1				
				Tiling		1				
			Decorative paint	1						
			Plaster internal	22						

Individual responses from main contractors

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
Firm 1	24	20	Foremen	3	50-55	Roofers	6	0	Firm seeks to regularly attend courses on any conservation skills available. These include courses on stone work, lime, roofwork, iron, brick, window restoration, etc.  No specifics given
			Carpentry	6	50-55	Specialist stucco	2		
			Joinery	1	50-55	Painters	4		
			Plastering	2	50-55	Facade restoration	2		
			Stone cutters/ layers	2	50-55	Scaffold	3		
						Ironwork	1		
			Bricklayers	2	45-50	Mechanical	13		
			Roofers	2	45-55	Electrical	14		
General operatives	2	20-25	Stained glass (glazier)	1					
Firm 2	29	22	Foremen	3	50-55	Roofers	6	1 carpenter	Regular CPD in house
			Carpentry	6	50-55	Plasterers	4		
			Joinery	2	50-55	Painters	4		
			Stone cutters/ layers	4	55-65	Stucco	2		
						Facade restoration	3		
			Bricklayers	3	55-60	Scaffold	3		
			Lead	1	55-60	Ironwork	1		
			Painters	2	30-40	Mechanical	6		
						Electrical	9		
Damp and fungal	3								
Firm 3	29	25	Foremen	6	50-55	Roofers	10	Have QS trainees but no trade apprentices	1 person x CIF Conservation Theory for Heritage Contracting
			Carpentry	7	30-55	Plasterers	5		
			Stone cutters/ layers	4	55-65	Decorative paint	2		
			Bricklayers	3	30-55	Stucco	3		
			Painting	5	30-40	Facade restoration	2		
Scaffold	3								
Singular attendance at ALL Building Limes Forum courses, seminars and conferences									

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
						Mechanical	7		Singular attendance at ALL courses advertised by the Register of Heritage Contractors
						Electrical	9		
						Damp and fungal	3		
<b>Firm 4</b>	22	17	Foremen	3	55-70	Facade restoration	2	None as work flow too sporadic	1 person x CIF Conservation Theory for Heritage Contracting
			Carpentry	3	55-65	Scaffold	3		
			Joiner	1	55-60	Damp and fungal	2		
			Stone cutters/ layers	2	50-60				
			Bricklayers	1	50-60				
			Lead / slater	1	55-65				
			Plaster for internal and external lime work	1	35-40				
			Stuccodore	1	35-40				
			Plumber	1	35-40				
			Electrician	1	35-40				
Painting	2	35-40							
<b>Firm 5</b>	13	11	Foremen	3	60-65	Stucco	2	None	None
			Carpentry	4	60-65	Plasterers	2		
			Stone cutters/ layers	1	50-55	Facade restoration	2		
			Bricklayers	1	50-55	Scaffold	1		
			Painting	1	35-40	Mechanical	3		

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
			Plasterer	1	35-40	Electrical	2		
<b>Firm 6</b>	15	12	Foremen	3	50-65	Damp and fungal	1	Have QS trainees but no trade apprentices	1 person x CIF Conservation Theory for Heritage Contracting
			Carpentry	2	50-65	Roofers	4		
			Joiner	1	60-65	Glazier	1		
			Stone cutters/ layers	2	55-65	Stucco	1		
			Bricklayers	1	55-65	Ironwork	1		
			Plaster	1	35-40	Scaffold	3		
			External lime render/ pointing	1	35-40	Mechanical	3		
			Painting	1	30-35	Electrical	4		
						Damp and fungal	1	Singular attendance at most Building Limes Forum courses, seminars and conferences	
<b>Firm 7</b>	6	4	Foremen / all trades	4	50-65	Roofers	2	None	1 person x CIF Conservation Theory for Heritage Contracting
						Carpenters	2		
						Stone cutters/ layers	1		
						Bricklayers	1		
						Plaster	1		
						Scaffold	3		
						External lime render/ pointing	1		
						Painting	1		
						Mechanical	3		
Electrical	4								
								Singular attendance at some Building Limes Forum courses, seminars and conferences	
								Singular attendance at most courses advertised by the Register of Heritage Contractors and the Irish Georgian Society	
<b>Firm 8</b>	60	15	Foremen	2	45-65	Roofers	13	2 carpentry	3 people x CIF Conservation Theory for Heritage Contracting
			Carpentry	7	40-45	Plasterers	2		
			Stone cutters/	1	55	Stucco	1		



Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
			layers						
			Bricklayers	1	60	Scaffold	3		
			Plaster- external	1	50	Mechanical	6		
			Plaster- internal	1	50	Electrical	6		
			Painting	2	25-30				
<b>Firm 9</b>	15	13	Foremen	2	45-55	Roofers	2	None	1 person x CIF Conservation Theory for Heritage Contracting
			Carpentry	4	35-65	Plasterers	2		Regular attendance at courses advertised by the Register of Heritage Contractors
			Stone cutters/ layers	2	40-70	Stucco	1		
			Bricklayers	1	55-60	Facade restoration	2		
			Plasterer	1	55-60	Scaffold	2		
			General Operative	2	25-30	Mechanical	2		
			Labourer	1	30	Electrical	2		
<b>Firm 10</b>	5	5	Foremen / carpentry/ lead work	1	65	Painters	1	Have QS trainees but no trade apprentices	None as already highly experienced
			Carpentry and specialist joinery	1	65	Mechanical	1		
			Stone cutters/ layers	1	70	Electrical	1		
			Bricklayers	1	65				
			Lime Plaster- internal and external	1	60				
<b>Firm 11</b>	22	19	Foremen	2	45-60	Plasterers	5	1 carpenter	Singular attendance at most Building Limes Forum courses, seminars and conferences

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
			Carpentry	6	30-65	Stucco	1		Regular attendance at courses advertised by the Heritage Council and IGS
			Joinery	1	60	Facade restoration	2		
			Stone cutters/ layers / lead work	3	55-65	Scaffold	3		
			Bricklayers	1	-	Mechanical	4		
			Internal plaster	1	-	Electrical	4		
			External plaster	1	-	Glazier	1		
			General operative	2	-				
			Labourer	1	-				
			Painting	1	-				
<b>Firm 12</b>	11	10	Foremen	1	55	Roofers	10	None	1 person x CIF Conservation Theory for Heritage Contracting
			Carpentry	4	35-65	Tiler	1		
			Stone cutters/ layers	2	45-65	Scaffold	2		
			Bricklayers	1	60	Mechanical	1		
			Plasterers	1	55	Electrical	1		
			General operative	1	30				
<b>Firm 13</b>	8	6	Foremen	1	-	Roofers	4	None	Regular attendance at courses advertised by the IGS
			Carpentry	2	-	Mechanical	2		
			Stone cutters/ layers / lead work	1	65	Electrical	2		
			Bricklayers	1	50	Internal lime plasterers	1		
			Plasterers	1	40	External lime plasterers	2		
<b>Firm 14</b>	11	10	Foremen	2	-	Roofers	3	None	Regular attendance at courses advertised by the IGS/ Heritage Council
			Carpentry	4	-	Mechanical	2		
			Stone cutters/	2	-	Electrical	2		

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
			layers / lead work						
			Bricklayers	1	-	External lime plasterers/ pointing	2		
			Plasterers	1	-	Facade restoration	3		
<b>Firm 15</b>	36  (14 only dedicated to heritage work- others on mainstream work)	14	Foremen	2	-	Carpentry	5	None	Regular attendance at courses advertised by the Heritage Register/ IGS/ Heritage Council
			Carpentry	8		Facade restoration	2		
			Stone cutting/ laying	2		Scaffold	3		
			Plasterer (internal)	1					
			Roofer (slater/ lead)	1					
							1 person x CIF Conservation Theory for Heritage Contracting		
<b>Firm 16</b>	17	16	Foremen	3	40-50	Damp and fungal	2	None	3 people x CIF Conservation Theory for Heritage Contracting
			Carpentry	5	55-70	Mechanical	2		
			Joiner	1	50	Electrical	2		
			Stone cutters/ layers	1	60	Facade restoration	2		
			Bricklayers	2	50-60	Scaffold	3		
			Lead / slater	1	55				
			Plaster for internal and external lime work	2	35-40				
			Painting	1	30				
<b>Firm 17</b>	21	18	Foremen	3	40-60	Stucco	1	None	2 people x CIF Conservation Theory for Heritage Contracting
			Carpentry	6	30-65	Facade restoration	2		
			Joinery	1	60	Roofers	4		Singular attendance at most Building Limes

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
			Stone cutters/ layers / lead work	1	55-65	Mechanical	4		Forum courses, seminars and conferences
			Bricklayers	1	-	Electrical	4		
			Internal / external plaster	2	-	Ironwork/ blacksmithing	2		
			General operative	3	-	Glazier	1		
			Labourer	1	-	Painting	1		
						Scaffold	3		
						Decorative painter	1		
<b>Firm 18</b>	12	12	Foremen	2	45-55	Roofers	4	None	Regular attendance at courses advertised by the IGS
						Specialist c&j	2		
						Painters	2		
			Carpentry / leadwork	7	35-55	Mechanical	2		
						Stone cutters/ layers / Bricklayers	2		
			Plasterer- internal and external	1	40	Internal lime plasterers	1		
						External lime plasterers	2		
<b>Firm 19</b>	7	7	Foremen	1	53	Roofers	3	None	Attendance at most Building Limes Forum courses, seminars and conferences
			Stone/ brick work/ blockwork	2	35-55	Facade restoration	2		Regular attendance at courses advertised by the Heritage Register/ IGS/ Heritage Council
			Carpenters	3	30-55	Damp proofing	2		
			General operative	1	25	Mechanical	2		
						Plumbing	1		
Thatcher	1								
<b>Firm 20</b>	16	15	Foremen	2	55-60	Roofers	10	None	1 person x CIF Conservation Theory for Heritage Contracting



## Research on the Irish labour market in construction conservation

Numbers interviewed	Total employed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Subcontractor numbers and skill breakdown - approx figures taken from Health and Safety Records		Apprentices employed directly	Educational/ training participation of skilled craft workers
			Carpentry	5	25-65	Tiler	1		Regular attendance at courses advertised by the Register of Heritage Contractors
			Stone cutters/ layers	2	45-65	Scaffold	2		
			Plasterers	1	55	Mechanical	1		
			General operatives	4		Electrical	1		
			Painter	1	55	Damp proofing	2		

3.3.3 Category 3 Sub- (Specialist) Contractors

3.3.3.1 Joiners/ cabinet makers						
Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
4	29	Carpentry and joinery /cabinet makers	24	23-70	3	varies
		Machinist	4			
Firm 1	5	Joiner/ cabinet makers	4	50-70	0	Completion of heritage craft training course
		Machinist /carver	1			
Firm 2	11	Carpentry and joinery	6	28-50	1	Director attends courses on management only
		cabinet makers	2			
		Machinist	2		1	
		General operative	1			
Firm 3	7	Carpentry and joinery	5	23-50	1	None
		cabinet makers	1	42		
		Machinist	1	35		
Firm 4	6	Carpentry ,joinery, cabinet makers	5	23-50	None	1 person x CIF Conservation Theory for Heritage Contracting
		Machinist	1	41		

3.3.3.2 Roofing						
Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
5	27	Carpenters	3	Average age 50	None	Varies
		Mixed skills	14			
		Stone cutters/ layers	4			
		Slaters/ leadworks / copper/ joinery	6			
Firm 1	4	Stone cutters/ layers	1	55	None	Attendance at most Building Limes Forum courses, seminars and conferences
		Slaters/ leadworks / copper/ joinery	3	35-65		
Firm 2	6	Stone cutters/ layers / abseiler	3	45-70	None	None of the workers formally qualified- all have learnt on the job Attendance at one Building Limes Forum course
		Slaters/ leadworks / copper/ joinery	3	45-55		
Firm 3	5	Carpenter	1	55	None	1 person x CIF Conservation Theory for Heritage Contracting
		Stone cutters/ layers	2	35-55		Attendance at some Building Limes Forum courses, seminars and conferences
		Slaters/ leadworks / copper/ joinery	2	35-65		
Firm 4	4	Carpenter / slater/ leadworker	2	45-60	None	1 person x CIF Conservation Theory for Heritage Contracting
		Stone cutters/ layers/ steeplejack	2	40-55		
Firm 5	8	Carpenter s	3	50-65	None	1 person x CIF Conservation Theory for Heritage Contracting
		Stone cutters/ layers/ Slaters/ leadworks / copper/ joinery	5	35-55		Attendance at some Building Limes Forum courses, seminars and conferences

**3.3.3.3 Stone worker**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
Firm 1	2	Stonecutters/ layers	2	60s	None	None

**3.3.3.4 Facade restoration**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
5	36	Stone cutters/ layers	23	60	1	Varies
		Plasterers (including all pointing types)	9			
		Brick	1			
Firm 1	10	Stone cutters/ layers	8	40-70	Applied through SOLAS but no interest	Refresher courses annually for all operatives; private attendance with The Traditional Lime Company
		Plasterers (including all pointing types)	2	35-50		
Firm 2	8	Stone cutters/ layers	3	40-70	1 casual apprentice	In-house trainer
		Brick	1	55		
		Plasterers (including all pointing types)	2	50-60		
		Carpenter and general worker hoping to retrain in stone	1	30		



<b>Firm 3</b>	8	Stone cutters/ layers who can also carry out cleaning/ render / all pointing types	8	30-65	None	West Dean, Hereford  No training in Ireland considered relevant
<b>Firm 4</b>	5	Stone cutters/ layers	3	40-65	None	Attendance at some Building Limes Forum courses, seminars and conferences
		Plasterers	2	50-55		
<b>Firm 5</b>	5	Stone cutters/ layers	1	40-60	None	1 person x CIF Conservation Theory for Heritage Contracting
		Plasterers	3	45-65		Attendance at all Building Limes Forum courses, seminars and conferences
		General operative	1	28		

<b>3.3.3.5 Mechanical services</b>						
<b>Numbers interviewed</b>	<b>Skilled craft workers employed directly</b>	<b>Skill types employed directly</b>		<b>Age of skilled workers</b>	<b>Apprentices employed directly</b>	<b>Educational/ training participation of skilled craft workers</b>
<b>2</b>	<b>16</b>	Plumbers	16	<b>18-57</b>	<b>3</b>	<b>Varies</b>
<b>Firm 1</b>	11	Plumbers	11	18- 57	2	None
<b>Firm 2</b>	5	Plumbers	5	19-53	1	Management take part in general management courses
						Management take part in new technology courses

**3.3.3.6 Electrical services**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
3	43	Electricians	43	17-65	4	Varies
Firm 1	24	Electricians	24	18- 65	3	Management take part in general management courses
Firm 2	17	Electricians	17	17-60	1	Management take part in general management courses
Firm 3	2	Electricians	2	30-40	None	General courses

**3.3.3.7 Painting and Decorating**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
2	16	Painter decorators	16	18-60	1	None
Firm 1	4	Painter decorators	4	30-60	None	None
Firm 2	12	Painter decorators	12	18-55	1	None

**3.3.3.8 Thatching**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
1	-	-	-	-	-	-
Firm 1	1 Another skilled labourer available on occasions	Thatcher	1	61	None	None

**3.3.3.9 Glazier**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
2	4	-		42-60	None	Varies
Firm 1	2	Qualified glazier	1	42	None	University of Sunderland, regular courses in Germany
		Competent assistant	1	45		
Firm 2	2	Competent glaziers	2	50-60	None	None

**3.3.3.10 Blacksmithing**

Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
3	26	Smiths	12	40-55	1	Varies
		Fabricators	8	30-55		
		Welders	5	45-55		
Firm 1	15	Smiths	4	40-55	One, general operative hoping to train as blacksmith	All courses sporadic. One persons 3 weeks attendance at Hereford course, past attendance at Leitrim sculpture factory; Belmullet courses, BABA courses attendance annually- 1 day up skilling
		Fabricators	5	30-45		
		Welders	3	45-50		
		General operatives	2	-		
Firm 2	4	Smiths	2	50-55	None	Belmullet courses, BABA courses attendance annually
		Fabricators	1	35-65		
		Welders	1	45-55		
Firm 3	12	Smiths	6	50-55	None	Leitrim sculpture factory; Belmullet courses, BABA courses attendance annually
		Fabricators	2	35-60		
		Welders	1	45-50		
		General operatives	3	-		

3.3.3.11 Damp proofing						
Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
2	8	-		35-60	None	Varies
Firm 1	5	MUBC	1	50	None	MUBC, various courses in the UK , attendance at courses advertised by the IGS/ Heritage Council/ Dublin Civic Trust
		Skilled assistant	4	-		
Firm 2	3	Skilled labourers	3	35-60	None	Doctorate in Surveying , degree in surveying

3.3.3.12 Scaffolders						
Numbers interviewed	Skilled craft workers employed directly	Skill types employed directly		Age of skilled workers	Apprentices employed directly	Educational/ training participation of skilled craft workers
2	19	-		25-60	None	Varies
Firm 1	7	General operatives	7	25-55	None	Fetac-approved scaffolding course
Firm 2	12	General operatives	12	30-60	None	Fetac-approved scaffolding course

## Appendix 4.1 Skill ranges of crafts working in the heritage industry at present

### Skill sets of management contractor

- Managing contractor has predominantly a professional background
- Appointment and approval of skilled sub-contractors with heritage experience (ranging from main to specialised contractors) considered an important skill set
- Select site managers having a predominantly professional background
- Select foremen with predominantly carpentry background
- Experience on traditional sites not necessarily considered key to competence
- Quality of foreman supervising works central to success of project

### Skill sets of main contractor and foreman

- Managing contractor has predominantly a background in either carpentry or engineering
- Foreman has predominantly a background in carpentry
- Experience on traditional sites key to competence
- Quality of foreman supervising works central to success of project

### Skill sets of carpenter

- Master craft worker level is not a requirement on most heritage sites
- Specific knowledge of heritage work not a requirement for employers
- Most carpenters on sites ranged from apprentices to skilled persons
- Where employed by a main contractor, a carpenter is most likely to develop his career as an overall site manager, and must have a knowledge of all trades
- In addition to demonstrating competence in his own craft, he is often expected to carry out other trades such as masonry, insertion of steel or precast materials, roofing, glazing, retrofit insulation
- Highly skilled craft workers are typically self employed

### Skill sets of bricklayer/ stone mason

- Master craft worker level is not a requirement on most heritage sites
- Specific knowledge of heritage work not a requirement for employers
- Most masons on sites ranged from general operative to craftworkers
- Craft workers at master level are typically self employed
- The mason is expected to have knowledge of the following, but generally does not:
  - Lime mortars and pointing
  - Brick making, types and origins found in historic Irish buildings and sourcing of matching brick
  - Cutting, building, Grouting, Dry stone walling
  - Traditional bonds, including decorative bonds.
  - Masonry decay, weathering and its conservation, repair and maintenance

Building and pointing techniques  
Bedding materials and techniques  
Chimney repairs and reconstruction  
Consolidation of surfaces  
Cleaning methodologies and techniques  
Landscaping

#### Skill sets of metalworker

- Master craft worker level is not a requirement on most heritage sites
- Most metalworkers work off site and are expected to have knowledge of heritage work
- He/she is expected to have the following skills in his workshop:
  - Lead work
  - Blacksmithing
  - Coppersmithing
  - Fabrication
  - Welding

#### Skill sets of roofer

- Master craft worker level is not a requirement on most heritage sites
- Specific knowledge of heritage work not a requirement for employers
- The general term 'roofer' is not clearly defined. Sometimes it refers to a carpenter specialising in roofing, it is commonly used for those who carry out slating and flashing, sheet materials such as copper and lead etc.
- Most roofers employed by general contractors range from general carpentry operatives to skilled masons, lead workers, steeplejacks
- Skilled craft workers are typically self employed

#### Skill sets of plasterer

- Master craft worker level is not a requirement on most heritage sites
- A disparity exists between internal and external plasterers and decorative plasterers; with three distinct areas of work emerging from the one craft
- Specific knowledge of heritage work not a requirement for employers
- Most plasterers employed by general contractors range from apprentices through to skilled persons
- Skilled craft workers are typically self employed
- The internal plasterer is expected to have knowledge of the following:
  - Paper removal
  - Lime plasters (uncommon knowledge)
  - Plaster repair

#### Retrofit insulation

- The external plasterer is expected to have knowledge of the following:
  - Lime renders (uncommon knowledge)
  - Harling (very uncommon knowledge)
  - Pointing types and techniques (uncommon knowledge)
  - Render repairs (uncommon knowledge)
- The stuccodore is expected to have knowledge of the following:
  - Stucco conservation and consolidation
  - Stucco repair and replication
  - Gesso repair and replication
  - papier mâché repair and replication

#### Skill sets of services installer

- Master craft worker level is not a requirement on most heritage sites
- Specific knowledge of heritage work not a requirement for employers
- Some service contractors are employed in-house by general contractors, but most general contractors engage sub-contracting firms to carry out service installations
- Stripping out, installation of all mechanical and electrical services and routing of same and services maintenance are expected of a services installer

#### Skill sets of heritage tiler

- Master craft worker level is not a requirement on most heritage sites
- Specific knowledge of heritage work not a requirement for employers
- Few tilers are employed directly by main contractors, and more often operative as sub-contractors
- The following skill sets are expected of a ceramic conservator, but this is deemed a specialist skill and does not come under mainstream tiling;
  - Historic tiling styles and materials, ceramic/clay/ decorative stone, terracotta; repair, replication and maintenance
  - Terrazzo and mosaic conservation, repair and maintenance
  - Cleaning

#### Skill sets of painter and decorator

- Master craft worker level is not a requirement on most heritage sites
- Specific knowledge of heritage work not a requirement for employers
- Few painter decorators are employed directly by main contractors, and more often operative as sub-contractors

- The following skill sets are expected of a specialised painter decorator, but this skill is not mainstream;
  - General painting preparation and completions of joinery, plaster and masonry
  - Marbling
  - Gilding
  - Graining
  - Sign writing
  - Paper hanging

#### Skill sets of glazier

- Master craft worker level is not a requirement
- No glaziers are employed directly by main contractors
- The following skill sets are expected of a skilled heritage glazier;
  - clear glass repair
  - stained glass repair
  - Knowledge of traditional framing techniques and repair
  - Lead work
  - Glass painting

#### Skill sets of facade worker

- As per stone/brick and plastering above but typically specialising in heritage buildings only
- Expertise includes concrete conservation, repair and maintenance; applied finishes, cleaning methodologies and techniques



## Appendix 4.2 Competencies expected of general contracting trades

Rob, same as before, do we need to say where the following information originates here?

### 4.2.1 Competencies expected of a main contractor or foreman working within the heritage sector

1. He/she must have the ability to manage building contracts in respect of the day to day complexities of heritage works
2. He/she must have knowledge of all statutory parameters governing heritage sites
3. He/she must have the ability to source and maintain skilled labour
4. He/she must ensure that he has full time employees of all skills and invest in developing the skills of his workforce
5. Able to write risk assessments and method statements
6. He/she must have the knowledge, experience, competence and ethical approach required to manage heritage works, co-ordinate tasks, supervise his staff and control quality workmanship
7. He/she must recognise the particular significance of the building in architectural; historical; archaeological; artistic; cultural; scientific; technical; social and geographical/vernacular terms
8. Create and maintain a safe working environment for everyone on-site ensuring everyone complies to safe working practice
9. Provide protection, storage, maintenance and security for materials, artefacts, documentation and elements of the building
10. Ability to programme, sequence, co-ordinate, organise and protect the work to avoid damage to the fabric of the building and its curtilage
11. Aware of and carry out in practice well established philosophies of approach such as minimum intervention and repair like with like when dealing with the fabric of the structure and its curtilage.
12. He/she must have confidence in his own skill to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of historic fabric. Similarly, he must have the knowledge, experience, competence and ethical approach required to offer those same skills to the benefit of the heritage works in conjunction with the professional team.
13. He/she must have the ability to programme heritage works efficiently, particularly in respect of unforeseen works, lengthy works and undefined works, typical of heritage sites
14. He/she must have the ability to source appropriate materials and specialist skills where required
15. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists
16. Record and document all interventions

### Recognised craft skills:

#### 4.2.2 Competencies expected of a carpenter and joiner working within the heritage sector at master craft level

1. The carpenter works closest with the main contractor and must have an understanding of all structural and decorative components of a building
2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must recognise the particular significance of the building and its components in architectural; historical; archaeological; artistic; cultural; scientific; technical; social and geographical/vernacular terms
4. He/she must have sufficient confidence in his craft to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of historic fabric. Similarly, he must have the knowledge, experience, competence and ethical approach required to offer those same skills to the benefit of the heritage works in conjunction with the professional team.
5. He/she must have the management skills to co-ordinate trades relevant to structural carpentry and also joinery works according to a programme
6. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
7. He/she must understand and be able to diagnose causes of decay in timber, adopt methods of monitoring and repairing same
8. He/she must have the ability to source and use appropriate materials
9. He/she must have the ability to develop craft technologies
10. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### 4.2.3 Competencies expected of a brick and stonemason working within the heritage sector at master craft level

1. He/she must have an understanding of all components of a building related to his craft

2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must recognise the particular significance of the buildings masonry components and style in architectural; historical; archaeological; artistic; cultural; scientific; technical; social and geographical/vernacular terms
4. He/she must have the confidence in his craft to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of historic fabric. Similarly, he must have the knowledge, experience, competence and ethical approach required to offer the benefit of his craft in liaison with the professional team.
5. He/she must have the management skills to co-ordinate trades where interfacing with his craft according to a programme
6. He/she must have specific knowledge of indigenous, diverse Irish masonry traditions, materials and pointing craft, conservation and repair
7. He/she must understand the chemistry of treatments and materials and methods of investigation, research and analysis.
8. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
9. He/she must understand and be able to diagnose causes of masonry decay, adopt methods of monitoring and addressing same
10. He/she must have the ability to source and use appropriate materials
11. He/she must have the ability to develop craft technologies
12. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.4 Competencies expected of plasterer working within the heritage sector at master craft level**

1. The plasterer must have an understanding of all components of a building related to his craft
2. He/she must have the ability to advise and work in accordance with the contractual programme
3. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
4. He/she must recognise the particular significance of the plaster's composition and style in architectural; historical; artistic; cultural; scientific; technical; social and geographical/vernacular terms
5. He/she must have the confidence in his craft to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of

- historic fabric. similarly, he must have the knowledge, experience, competence and ethical approach required to offer the benefit of his craft in liaison with the professional team
6. He/she must have the management skills to co-ordinate trades where interfacing with his craft
  7. He/she must have specific knowledge of indigenous, diverse Irish plastering traditions, materials, conservation and repair
  8. He/she must understand the chemistry of treatments and materials and methods of investigation, research and analysis.
  9. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
  10. He/she must understand and be able to diagnose causes of deterioration of historic plaster, adopt methods of monitoring and addressing same
  11. He/she must have the ability to source and use appropriate materials
  12. He/she must have the ability to develop craft technologies
  13. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.5 Competencies expected of a painter and decorator working within the heritage sector at master craft level**

1. The skilled painter and decorator must have an understanding of all components of a building related to his craft
2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must have the management skills to co-ordinate trades where interfacing with his craft
4. He/she must have the ability to advise and work in accordance with the contractual programme
5. He/she must have specific knowledge of indigenous Irish painting and decorating traditions, materials, methodologies, conservation and repair
6. He/she must understand the chemistry of treatments and materials and methods of investigation, research and analysis.
7. He/she must have the confidence in his craft to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of historic fabric. Similarly, he must have the knowledge, experience, competence and ethical approach required to offer the benefit of his craft in liaison with the professional team.
8. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
9. He/she must understand and be able to diagnose causes of deterioration of historic paintwork, adopt methods of monitoring and repairing same

10. He/she must have the ability to source and use appropriate materials
11. He/she must have the ability to develop craft technologies
12. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.6 Competencies expected of a floor and wall tiler working within the heritage sector at master craft level**

1. The floor and wall tiler must have an understanding of all components of a building related to his craft
2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must have the management skills to co-ordinate trades where interfacing with his craft
4. He must have specific knowledge of indigenous, diverse Irish tiling traditions, materials, conservation and repair
5. He/she must understand the chemistry of treatments and materials and methods of investigation, research and analysis.
6. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
7. He/she must understand and be able to diagnose causes of deterioration of historic tiling, adopt methods of monitoring and repairing same
8. He/she must have the ability to source and use appropriate materials
9. He/she must have the ability to develop craft technologies
10. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### 4.2.7 Competencies expected of mechanical and electrical craftspeople working within the heritage sector at master craft level

1. The skilled services craftspeople has an essential role in the conservation, repair and sustainability of heritage works and must have the ability to carefully analyse the composition of a building, identifying least invasive services routes and methodologies
2. He/she must have an understanding of all extant contextual components of a building where accommodating his craft
3. He/she must have the management skills to co-ordinate trades where interfacing with his craft
4. He/she must have specific knowledge of indigenous, diverse Irish services traditions, materials, re-use, conservation and repair
5. He/she must have the ability to source and use materials appropriate to heritage contexts
6. He/she must have specific knowledge of the performance of new technologies in the context of heritage fabric
7. A clear understanding and compliance with all regulatory health and safety issues related to the specific work and the building industry in general
8. Knowledge and awareness of hazardous materials in old buildings such as asbestos, lead based paint, mercury. Biological hazards such as bird and rat droppings.
9. Toxic chemicals in chemically treated wood. Radioactive materials, old lightning conductors, biological moulds, PCB's
10. Knowledge of traditional building structures of stone and brick in lime and clay/lime mortars. Understanding lime and clay mortars, matching, permeability etc. Traditional solid plasterwork, timber, joinery, roof and floor tiles, windows, glass, metalwork and furnishings.
11. Consideration and avoidance of damage to historic and structural fabric such as walls, plasters, renders, floors, roofs, ceilings, windows, tiles, finishes, fabrics and decoration.

#### Non- designated craft skills

##### 4.2.8 Competencies expected of skilled a roofer working within the heritage sector

Please note that whilst there is no formal 'roofing' trade, the term is widespread in the Irish building tradition, and must be recognised as a gathering of a number of recognised trades such as carpentry, stone/brick masonry and plumbing combining to produce a worker skilled in the construction and repair of all roofing components. Reference should therefore be made to those trades mentioned and covered in this section of the report.

1. The roofer must have an understanding of all components of a building related to his craft
2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation

3. He must recognise the particular significance of the building's roofing components and style in architectural; historical; artistic; cultural; scientific; technical; social and geographical/vernacular terms
4. He/she must have the confidence in his craft to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of historic fabric. Similarly, he must have the knowledge, experience, competence and ethical approach required to offer the benefit of his craft in liaison with the professional team.
5. He/she must have the management skills to co-ordinate trades where interfacing with his craft according to a programme
6. He/she must have specific knowledge of indigenous, diverse Irish roofing traditions, materials, conservation and repair
7. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
8. He/she must understand and be able to diagnose causes of decay in roofing components, adopt methods of monitoring and repairing same
9. He/she must have the ability to source and use appropriate materials
10. He/she must have the ability to develop craft technologies
11. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.9 Competencies expected of a skilled thatcher working within the heritage sector**

Please note that there is no formal 'thatching' trade, but the skill is widely acknowledged within the Irish vernacular building tradition.

1. The skilled thatcher must have an understanding of all components of a building related to his craft
2. He/she must have sufficient theoretical knowledge to identify the significance of extant fabric, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must have the management skills to co-ordinate trades where interfacing with his craft
4. He/she must have specific knowledge of indigenous Irish tradition of thatching; materials, methodologies, conservation and repair.
5. He/she must have the recording skills to observe and reproduce historic elements
6. He/she must have the ability to source and use appropriate materials
7. He/she must have the ability to develop craft technologies

8. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.10 Competencies expected of a skilled ironworker and blacksmith working within the heritage sector**

Ironwork and blacksmithing are not specific trades. However, the tradition does exist and the skill is required to conserve the Irish architectural heritage, hence its inclusion.

1. The skilled ironworker and blacksmith must have sufficient theoretical knowledge to identify the significance of extant fabric, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
2. He/she must have the management skills to co-ordinate trades where interfacing with his craft
3. He/she must have specific knowledge of indigenous metalwork traditions, materials, methodologies, conservation and repair.
4. He/she must have the recording skills to observe and reproduce historic elements
5. He/she must have the ability to source and use appropriate materials
6. He/she must have the ability to develop craft technologies
7. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.11 Competencies expected of a skilled glazier working within the heritage sector**

Please note that the Irish glazier derives his skill from the painter and decorator trade, however it is becoming an emerging craft in its own right due to the demand for conservation of historic glazing.

1. The skilled glazier must have an understanding of all components of a building related to his craft
2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must recognise the particular significance of the glazing composition and style in architectural; historical; archaeological; artistic; cultural; scientific; technical; social and geographical/vernacular terms
4. He/she must have the management skills to co-ordinate trades where interfacing with his craft
5. He/she must have specific knowledge of indigenous Irish tradition of heritage glazing, materials, methodologies, conservation and repair.
6. He/she must have the recording skills to observe and reproduce historic elements, allowing for tolerances, shrinkage and movements
7. He/she must have the ability to source and use appropriate materials



8. He/she must have the ability to develop craft technologies
9. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

#### **4.2.12 Competencies expected of a skilled facade restorer working within the heritage sector**

Please note that whilst there is no formal 'facade restoration' trade, the term is used in the Irish building tradition. A skilled facade conservator must possess a range of skills; stone, brick, plastering; individual competencies that are cited above. All facade conservation firms interviewed to date employ the full range of skilled craftspeople, each complementing the skill of the other to provide a unified skill in the repair and re-application of all elevational components.

1. The skilled facade restorer must have an understanding of all components of a building related to his craft
2. He/she must have sufficient theoretical knowledge to identify the significance of a feature, authenticate its provenance, identify environmental risks to its safeguarding, implement preservation, restoration and protection measures and ensure appropriate presentation
3. He/she must have the management skills to co-ordinate trades where interfacing with his craft
4. He/she must have the ability to advise and work in accordance with the contractual programme
5. He/she must have specific knowledge of indigenous, diverse Irish plastering and masonry traditions, materials, conservation and repair
6. He/she must have the confidence in his craft to challenge the specifications and methodologies proposed by others, if they are deemed to adversely affect the integrity of historic fabric. Similarly, he must have the knowledge, experience, competence and ethical approach required to offer the benefit of his craft in liaison with the professional team.
7. He/she must understand the chemistry of treatments and materials and methods of investigation, research and analysis.
8. He/she must have the recording skills to observe and reproduce historic elements, allowing for environmental constraints, tolerances, shrinkage and movements
9. He/she must understand and be able to diagnose causes of deterioration of historic elevational fabric, adopt methods of monitoring and addressing same
10. He/she must have the ability to source and use appropriate materials
11. He/she must have the ability to develop craft technologies
12. He/she must be able to recognise when supplementary expertise is required to ensure the appropriate conservation of fabric in his care, and know where to seek such advice from relevant specialists

## Appendix 5.2 Training courses available

### 5.2.1 Management / main contractor

#### Training requirement for managing / main contractor

- Duties and responsibilities of a construction manager
- Contract administration, and management of sub-contracts
- Legal studies for construction managers
- Planning and heritage protection controls governing excavations and building works; *archaeology and built heritage*
- Other statutory controls governing building works - *building control regulations; fire safety, health and safety, energy performance, inclusive access*
- Construction finance - *measurement estimating and tendering*
- Profile of construction trades - *managing quality on site*
- Introduction to project management - *effective planning, trade co-ordination and sequencing of work, especially lengthy heritage crafts*
- Building performance technology - *building systems, structures, materials and sustainable construction technologies*
- Services technologies
- Building defects and pathology
- Maintenance and conservation technologies
- Building and site surveying and dimensional control
- Fire, safety and security on site

#### Available training for managing / main contractor

**Conservation Theory for Heritage Contracting** – 1 day programme in CIF HQ Dublin.

Availability: intermittent

**Conserving your Period House** – Irish Georgian Society Lecture Series

Availability: intermittent

**Building Limes Forum Ireland** courses, seminars and conferences

Availability: intermittent

**BSc in Applied Conservation Skills**, Level 7, Waterford Institute of Technology

**Dublin Civic Trust** courses

Availability: intermittent

**Irish Georgian Society** runs an annual Traditional Skills Weekend

### Average training participation

The finding of the survey was that contractors had generally attended the one-day programme in Conservation Theory for Heritage Contracting, run by the CIF in Dublin and had also attended courses, seminars and conferences run by the Building Limes Forum.

## 5.2.2 Foremen

### Training requirement for heritage site foreman

- Duties and responsibilities of a construction manager of a heritage site
- Construction and building conservation policy and legislation - *all aspects of statutory heritage protection context. Building control regulations updates, health and safety, fire safety, access, energy efficiency, wildlife and environmental*
- The science and economics of historic buildings
- Architectural conservation and restoration philosophy, its relevance and significance
- Vernacular buildings in Ireland
- Surveying, measuring and recording processes for heritage structures - *research on and off site*
- Heritage building performance technologies - *construction and conservation materials; maintenance of historic buildings, emerging technologies etc.*
- Energy efficiency in heritage buildings
- Temporary works design and site investigations - *introduction to sensitive techniques applicable to appropriate investigating and access (health and safety to be covered by other CPD avenues):*
  - *appropriate protection techniques*
  - *appropriate erection of scaffolds*
  - *appropriate shoring/ propping techniques*
  - *Appropriate removal techniques (i.e. floorboard types, patch removal of lime work etc.)*
  - *appropriate inspection of voids; floor, attic and flues*
  - *appropriate management of protected species, other environmental constraints*
  - *appropriate hazardous substance removal*
  - *reinstatement*
- Heritage site fire safety, general safety and security
- Managing heritage construction projects - *effective planning, supervision and trade co-ordination*
- The business of heritage contracting - *measurement, estimating and tendering for procurement of heritage projects*
- After-care and protection of materials and part completed and completed works
- Profile of heritage sub-contractor craft skills and trades and quality assessment

### Available training for foreman

**Conservation Theory for Heritage Contracting** – 1 day programme in CIF HQ Dublin. This is a CPD-level course and offers a number of topics of use to foremen working on heritage sites.

Availability: intermittent

**Building Limes Forum Ireland** courses, seminars and conferences

Availability: intermittent

**Dublin Civic Trust** courses

Availability: intermittent

**Irish Georgian Society** runs annual Traditional Skills Weekend

**Site skills:**

A course is available in Northern Ireland at NVQ level 3, entitled Understanding Repair and Maintenance of Traditional Buildings.

A ten-week, part-time course entitled **Introduction to the Conservation of the Built Environment** is run at the Limerick Institute of Technology. This is not accredited and is not examined.

**BSc in Applied Conservation Skills**, Level 7, Waterford Institute of Technology

**Average training participation**

**Conservation Theory for Heritage Contracting** – 1 day programme in CIF HQ Dublin.

Availability: intermittent

The study found that in general foremen had undertaken the CIF course in Conservation Theory for Heritage Contracting and had also attended some courses, seminars and conferences run by the Building Limes Forum.

**5.2.3 Carpentry and joinery****Available training for carpenters**

- A FETAC-accredited course in Construction Technology is offered at Rossa College, Central Technical Institute Clonmel and Limerick College of Further Education and can be carried out with a Carpentry option. This is a level 5 qualification and includes elements such as wood fabrication and building construction.
- Apprenticeships are available at various centres, to level 6.
- Little formal training offered post-apprenticeship

**Available training for joiners**

- Carpentry & Joiner / cabinet making apprentice level
- Letterfrack

**Average training participation**

The study found that the average carpenter and joiner was trained up to apprentice level

#### 5.2.4 Stone and brick – including bricklayer, stone layer, stonemason and stone carver

##### Available training for bricklayers and stonemasons

A FETAC course in **Traditional Stone Wall Construction Skills** is offered at various centres, including Waterford Institute of Technology and in Gaeltacht areas. This is a six-month stand-alone course accredited at FETAC level 5, covering dry stone and mortared (not lime).

A FETAC course in dry-stone walling (double wall) entitled *Stonescaping* and of six weeks duration was on offer through SOLAS, but has now ceased.

A course on **Conservation of Masonry / Traditional Stone Wall Skills** was managed by Sweeney Architects through the EDI Centre at Longford, but this course has now closed and there are no plans to reopen it. The conservation of masonry course had practical tests and a final theory test. It was monitored by the Scottish Vocational Authority, part of their National Progression Award system there and assessed at Scottish Vocational Qualification level 6.

Various **short courses and CPD courses** are run by agencies such as the Building Limes Forum Ireland and Dublin Civic Trust and are run on an ad hoc basis.

A course is available in Northern Ireland on **Heritage Skill – Construction**, one of the options being Brick worker and Mason. This is part of the broader course entitled Understanding Repair and Maintenance of Traditional pre-1919 Buildings.

**Apprenticeships:** The finding of this study is that in the normal Brick and Stonelaying apprenticeship of four years only about two to three weeks is spent on stone-laying skills. The syllabus for the apprenticeships does not include much that would relate to building conservation, but many of the basic hand skills of spreading mortar, laying, plumbing, levelling, bonding, chimneys, arches etc are there. This is a level 6 qualification.

A new apprenticeship in Stone Cutting and Stone Masonry is now on offer, replacing the previously-proposed **Environmental Stone Cutting** course. This apprenticeship has been set up by the Office of Public Works in conjunction with SOLAS and will be based at the six OPW district centres around the country, with the college-based elements at the SOLAS training centre at Tralee and at institutes of technology and colleges of further education.

##### Average training participation

The study found that the average level of training in the masonry trades was apprenticeship, with some Informal, intermittent training offered post-apprenticeship by way of 1 day courses.

### 5.2.5 Roofer

#### Training requirement for roofer

- Introduction to traditional methodologies
- Slates and Slating- Conservation, repair, maintenance, replacement, including non-standard coursing, curved roofs
- Tiles and tiling - Conservation, repair, maintenance
- Rainwater goods- Conservation, repair, maintenance and replication
- Sheet metals; Lead and lead work (copper and copper work) (flashings, soakers- correct installation techniques) - coverings; hot/ folded cold work, decorative
- Structural joinery; internal and external- conservation, repair, maintenance
- Traditional parapet and chimney types, treatments, weathering -conservation, repair, maintenance
- Lime bedding materials and techniques
- Thatch and thatching – general conservation, repair, maintenance

#### Available training for roofers

**Carpentry and Joinery** apprenticeship as well as the brick and stonelaying apprenticeship cover some of the requirements.

**Dublin Civic Trust and Building Limes Forum Ireland** courses, seminars and conferences, intermittently available.

**Irish Georgian Society**, runs an annual Traditional Skills Weekend

There are no courses available in **slating**; the course in **Conservation of Masonry / Traditional Stone Wall Skills** run by the EDI Centre at Longford included uncertified courses in slating, and also in lead, in conjunction with the Lead Sheet Association, which is based in Britain, but this course has now closed and there are no plans to reopen it.

A course in **Advanced Roofing Skills** is offered at the Dundalk Training Centre. This is offered only to redundant carpentry and joinery professionals who have successfully passed stage 6 of their apprenticeship programme. The course syllabus covers only the carpentry element of roofing, but in practice a flexible approach is adopted and slating and leadwork are taught where those attending the course wish to learn these skills.



### Average training participation

The study found that in general roofers have apprenticeships in carpentry.



### 5.2.6 Plasterer

#### Available training for plasterers

A course available in Northern Ireland on *Heritage Skills – Construction (Plastering Solid)* is equivalent to FETAC level 5.

The **Apprentice Craft Certificate in Plastering** is offered at various centres, leading to a level 6 qualification. This appears to lack the lime only mortar skills necessary for conservation work. It is noted that only eight applicants presented for this apprenticeship last year and four the year before.

A level 7 course in craft studies, on the *Restoration and Conservation of Plasterwork* was devised by DIT in conjunction with SOLAS. Entry to the course requires a craft certificate. Unfortunately this course is not going to run at present due to a lack of take-up by potential students.

#### Average training participation

The study found that the only training available at plasterwork was through the formal apprenticeship system, with some attendance at courses, seminars and conferences run intermittently by the Building Limes Forum Ireland, Dublin Civic Trust and the Irish Georgian Society.

### 5.2.7 Mechanical and electrical services

#### Available training for electricians

Electricians are trained to apprenticeship, level 6.

There is no specific heritage training available for electricians

#### Available training for plumbers

Plumbers are trained to apprenticeship, level 6.

There is no specific heritage training available for plumbers

#### Average training participation

The study found that the average level of training attained by those involved with services in a conservation context was apprenticeship.

### 5.2.8 Floor and wall tiling

#### Available training for tiler

Tilers are trained by apprenticeship to level 6.

#### Average training participation

The study found that the average tiler working in a conservation context is trained to apprenticeship level

### 5.2.9 Painter and Decorator

#### Available training for painting and decorating

The study found that the only training available at painting and decorating was through the formal apprenticeship system, with some attendance at courses, seminars and conferences run intermittently by the Building Limes Forum Ireland, Dublin Civic Trust and the Irish Georgian Society.

In Northern Ireland the course in ***Heritage Skills – Construction*** is available with an option in ***Decorative Occupations***.

#### Average training participation

The study found that the average painter and decorator working in a conservation context is trained to apprenticeship level

### 5.2.10 Glazing (through painter and decorator craft)

#### Available training for glaziers

Apprenticeships in ***Painting and Decorating*** are available, though there is no apprenticeship in glazing

There are various courses around the country in ***stained glass***, but these tend to be at hobby level and concentrate on the making of small-scale domestic items.

Specialist courses in the ***conservation of glass***, including stained and painted glass, are available in the United Kingdom.

#### Average training participation

The study found that the average painter and decorator working in a conservation context is trained to apprenticeship level

### 5.2.11 Facade restoration

#### Available training

Training in stone, brick and plastering is available at **apprentice** level

**Building Limes Forum** Ireland, Dublin Civic Trust and the Irish Georgian Society run courses, seminars and conferences, available intermittently

#### Average training participation

The study found that the average craftworker on facade restoration is trained to apprenticeship level

### 5.2.12 Thatcher

#### Available training

A SOLAS traineeship in **thatching** has been devised and offered, but is not going to run due to lack of take-up.

The course in Northern Ireland on **Heritage Skills – Construction** includes an option in thatching.

#### Average training participation

The study found that the average craftworker working on thatching has trained on the job with skilled thatchers with long periods of experience.

### 5.2.13 Ironwork and blacksmithing

#### Available training

**Metal fabrication** is trained through the craft certificate at various centres. There is no conservation element in this apprenticeship.

Various courses are available in **art metalwork**, but these courses do not cover conservation issues.

Some blacksmiths run courses in **Blacksmithing** and most are at a relatively basic level. These include:

- Eric O'Neill, Killuragh Kraftworks - Offers 8-week courses with Limerick VEC at novice to intermediate level.
- Michael Budd training courses - Courses in Co. Sligo for one-to-one or groups of up to four at novice to intermediate level..

- Calnan & Anhøi Blacksmith Short Courses - Beginner level, Russborough, Co. Wicklow at novice to intermediate level..
- Ray Munnely - Killala, Co. Mayo. The beginners course content in Killala includes traditional tool-making, traditional hardware production, setting up your own forge, at novice to intermediate level.
- Ray Munnely - Killala, Co. Mayo runs a course at advanced level; the course content includes traditional tool-making, traditional hardware production, advanced techniques.

#### Average training participation

The study found that the average blacksmith and metal craft worker gained their skills through intermittent courses organised by the blacksmiths through the British Artist Blacksmiths Association.

## Appendix 5.5 Curricula for apprenticeships

Both conservation and history of architecture and building are common to most crafts and with some minor variation they would lend themselves as common core modules of education. They are listed here to reduce repetition:

- **Conservation**
  - Heritage conservation awareness. An understanding of what is meant by historic fabric and the principles of conservation. Minimum intervention, repair rather than replace, match like with like and reversibility.
  - Legislation, policy and acts, international charters and conventions. NIAH, RPS, RMP, ACAs, etc. Ministerial consent, definitions of heritage, preservation, conservation, repair, maintenance, restoration, refurbishment and renovation.
  - Environmental benefit of existing buildings.
  - Irreplaceable buildings, materials and craft skills
  - The science of materials analysis and testing, determining decay mechanisms, matching and performance based repair and replacement materials.
  - Ecology, flora and fauna, species, habitats and their protection, legislation.
  - Environmental care and waste management. CO2
  
- **History**
  - Greek and Roman classical architecture
  - The influence of Pompeii and Herculaneum and the Renaissance.
  - Palladianism, Baroque, Rococo, Greek Revival. Irish Regency, Neo Classicism, Gothic Revival, French revival, industrial revolution, Arts and Crafts etc.
  - Terminology of Classical architecture
  - Greek and Roman mouldings
  - History and identification of Irish examples of both structural and decorative materials like stone, brick, wood, lime, slate iron, paint etc., their indigenous provenance including import, extraction, production, manufacture and use
  - Identification of architectural styles and periods -Early Christian, Romanesque, Gothic, church and cathedral, abbey and monastery, castle and tower house, defensive and big house, industrial buildings and domestic including vernacular houses, barns and other out- buildings.
  - Palladianism, Baroque, Rococo, Greek Revival. Irish Regency, Neo Classicism, Gothic Revival, French revival etc.
  - Vernacular styles, the Rundale System and the Clachan
  - History of craft, the guilds, unions, labour movements, written sources, diaries and books of individual crafts people, tools, methodologies, written, photographic records, drawings and extant examples of work and buildings.

### 5.5.1 Carpentry and joinery apprenticeship

The apprenticeship carpentry and joinery incorporates both carpentry and joinery within the one craft. This is not necessarily the case in other countries where they are seen as separate skill areas. This

combination of both skill areas has served both the building industry and the craft itself well, producing well rounded and highly skilled individuals.

Part A of the lists below shows the present curriculum for the apprenticeship in carpentry and joinery, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

## B. Existing course content for off-the-job Phases 2, 4 and 6

### • Core Skills

- Construction of upper floors
- Construction of flat roofs
- Construction of pitched roofs
- Construction of hip roofs
- Construction of pitching roofs (trussed)
- Construction of load and non- load bearing partitions
- Fabrication and erection of formwork for walls, columns, floors, stairs
- Construction and hanging of the following:
  - Framed and sheeted doors
  - Panelled doors
  - Flush doors
  - Construction and installation of internal and external door frames
  - Construction and installation of windows
  - Carrying out 1<sup>st</sup> and 2<sup>nd</sup> fixing on buildings
  - Operation of the following powered hand tools:
    - Saw, planer, drill, router, screwdriver, ballistic gun, router, sander, jig saw

### • Specialist Skills

- Construction of moulds
- Construction of centres for arches
- Construction of specialist type joinery
- Construction of fitments
- Setting out buildings
- Site levelling

### • Common Skills

- Use and care of hand tools
- Interpreting drawings
- Measurement

- Setting out
  - Marking out
  - Planning (production)
  - Calculations
  - Tools/equipment
  - Work practice
  - Use of manufactured boards
  - Fixings
  - Ironmongery
  - Basic wood joints
  - K/D fittings
  - Setting up and operation of machines for specific operations
- **Personal Skills**
    - Communications
    - Customer relations
    - Adaptability
    - Ability to work as a team member
    - Ability to work independently
    - Initiative
    - Problem solving
    - Planning
    - Information gathering
    - Quality systems
    - Safety

NOTE: Integrated curriculum includes maths, science and theory, drawing and computer applications

## B. Proposed additional course content for Carpentry and Joinery work in the heritage sector

- Heritage and conservation components generic to most crafts listed earlier
- **Knowledge and skills**
  - An understanding of forestry and sustainability issues
  - Traditional skills of working timber with the use of the felling axe, adze, broad axe, mortising axe, carpenters axe, froe, wedges, crook, spud and draw knife, Converting a log to a four sided timber beam
  - Ability to use a shaving horse, spring pole lathe, modern lathe
  - Understanding of traditional saw milling, saw pits, modern and traditional methods of drying timbers including the use of quicklime

- Ability to set out various roofs types and styles working with both sawn and rough timbers from various vernacular roof types to early timber cruck, Irish medieval roof in oak, heavy timbers, using mortise and tenon joints, dowelled /tree nailed and scarfed, principal trussed roofs, purlins, wind bracing, rafters, oak boarding, slating laths, slating. Steep pitched roofs, hipped, half hipped, gabled, conical, domed, scissor and hammer beam roofs.
- Medieval timber framing –
- Timber bridges, piers/jetties, canal lock gates,
- Scribing methods for joining heavy curved and rounded timbers
- Understand various structural/defensive/protective components associated with roofs such as allure stones, spouts and gargoyles, parapets, crenellations, merlons, machicolations, bartizan, cap tower and turret.
- Understanding of various roof coverings such as thatch, shingles, clay tiles, slate (Irish and imported), stone, corrugated iron
- Work with wrought and cast iron structural components in roofs.
- Set out and construct decorative barge boards.
- Understanding of eaves and barge stones.
- Installation of thermal and sound insulation including ventilation in roofs, floors and walls
- Research the loss of Irish oak forests, imported timbers and the regeneration of Irish forests
- Pedimented gable fronts and dormers.
- Ability to set out and construct early dormer windows, lanterns and fumaroles.
- Understanding of chimneys, lead valleys, flashings and ridges, lead and cast iron rainwater goods
- Select and use timbers for structural repair work.
- Date timbers by tool and carpenters marks and dendrochronology.
- Set out and construct various floors including notched oak beam medieval floors, joists and boarding.
- Understand structural stability provided by floors.
- Strengthening floors and roofs to carry additional loading.
- Cutting out, splicing, scarfing and repair of decayed joist, rafter and beam ends and other components.
- Calculate loading on roofs, floors and other structural timber elements in a building
- Produce and fix various skirting, door and window architraves, dado and picture rails, ceiling and wall boards with various classical mould details
- Set out and construct various window types from different periods with local variation including vertical sliding, horizontal sliding and casement windows, with pulleys, cords and weights, glazing bars, horns. Construct and fix window shutters
- Fit various heritage ironmongery
- Construct doors, ledged, panelled and lugged,
- Fix door and window furniture
- Knowledge of appropriate paint stripping methods and safety re lead paints
- Fix wooden chimney pieces



- Construct timber staircases including spiral, balustrades, handrails and decorative stair brackets,
- Detect, recognise and treat dry and wet rot, fungi, insect attack and fungal decay
- Carve designs in relief
- Turn various decorative elements
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

### 5.5.2 Brick- and stone-laying apprenticeship

Part A of the lists below shows the present curriculum for the apprenticeship in brick and stonelaying, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

#### A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**
  - **Building**
    - Brick walls
    - Solid concrete block walls
    - Cavity walls in brick and block
    - Cellular block walls
    - Door and window openings
    - Piers
    - Soldier courses
    - Chimney breasts and stacks
    - Timber frame construction
  - **Setting**
    - Capping and copings
    - Lintels and sills
    - Laying damp proof courses
    - Producing joint finishes
    - Identifying various types of scaffolding
    - Maintaining safe scaffolding practices
- **Specialist Skills**
  - Arch construction
  - Stonelaying
  - Installing and building drainage and sewerage layouts
  - Setting kerbstones
  - Laying paving slabs
  - Floor and wall tiling
  - Decorative brickwork
  - Prefabricated brick/concrete panelling construction
  - System built chimneys

- **Common Skills**
  - Reading and producing drawings
  - Calculations: costing projects and estimating materials
  - Measuring and setting-out
  - Transferring levels
  - Plumbing, ranging and levelling using spirit level
  - Use and care of tools
  - Knowledge of building materials
  - Safety
  
- **Personal Skills**
  - Planning and organising work
  - Problem solving
  - Using initiative
  - Good verbal communications
  - Adaptability to changing work practices and conditions
  - Working as part of a team

NOTE: Integrated curriculum includes maths, science and theory

## B. Proposed additional course content for Brick and Stonelaying work in the heritage sector

Many brick and stonelayers concentrate on the stonelaying element of their craft. They receive very little education and training as part of their apprenticeship in this part of their craft. Significant additional input is necessary to the stonelaying element of this course, shown as follows.

- Heritage and conservation components generic to most crafts listed earlier
  
- **Knowledge and skills**
  - Knowledge of geology and identification of different stone types, clays and aggregates, their provenance, formation, composition, characteristics, workability, suitability for purpose, weight, size availability, natural shape
  - Knowledge of lime mortars, advantages, lime kilns, building and firing a small kiln, quicklime, hot lime mortars, non-hydraulic lime, lime putty, natural hydraulic lime, hydraulic and formulated limes, pozzolans, natural cement, additives
  - Determine mix ratios, mixing methodologies. Preparation, application, after-care and protection.
  - Take examples of existing earth based mortars and analyse for material type and mix ratios
  - Select and test various clays determining suitability as mortars.
  - Produce and work with earth based mortars, sand and lime
  - Take lime based mortar samples without damage to the fabric

- Do analysis of brick, stone and mortar for type, absorption, capillarity and crystallisation of salts on both extant and new materials to match or produce performance based solutions.
- Carry out sand/ aggregate testing for void %, clay and silt content, bulking and grading.
- Check mix design ratio for mortars, brick and stone for durability, resistance to freeze/thaw cycles, resistance to sulphates exposure, resistance to freeze/thaw in sulphate conditions
- Carry out proprietary plastic mortar repairs for brick and stone surfaces
- Produce non-proprietary mortar repairs for brick and stone surfaces
- Set out and build, thick, solid, structural walls in both brick and in stone to traditional principles and bonding patterns.
- Build rubble stone, un-coursed, coursed, brought to courses, snecked, formal and informal and ashlar stone.
- Safely manoeuvre large blocks of stone using machinery, lewis and nippers, slings and chains including use of levers, fulcrum etc
- Build battered and curved walls vertically and horizontally in stone.
- Build various gables types and barges in brick/stone
- Set kerbs, flags, cills, barges, lintels, steps, cantilevered staircases, spiral stone steps, string courses, eaves stones, plinths, balustrades, door and window surrounds, cappings and copings, hearthstones and fireplace surrounds.
- Build and repair arches, vaults, bridge arch barrels, skew arch barrels on timber, solid and wickerwork centres/forms
- Build a small bridge to include foundations, abutments, pier, arch barrel, cutwaters, spandrels and parapet.
- Build/repair a selection of retaining walls as in basements, earth retaining, sea defence, estuaries and canal locks, and weirs.
- Build/fix fireplaces, chimney construction in stone and in brick with multiple parged flues, chimney pots and decorative detailing.
- Build square and circular piers in brick and in stone. Fix hanging eyes, spud stones and hang wrought iron gates.
- Build rebated door and window openings
- Build brick noggins in timber stud partitions.
- Carry out brick pointing styles including tuck and wiggling using lime mortars and colour washes.
- Point rubble using lime mortar with the insertion of pinnings and gallets if appropriate.
- Point ashlar stone with lime mortar
- Cut and carve brick
- Record, dismantle and re-build brick and stone structures.
- Understand mechanisms of decay in mortar, brick and stone, bio-destructive vegetation, freeze/thaw, scour, salts, exposure, location, environment, natural accelerated decay mechanisms in stone, brick and sands. Problems with cementitious mortars.
- Consolidate and repair exposed wall tops.

- Understand structural stability, settlement of structures and foundations, buckling-compression, Euler's slenderness ratios, bulging, rotation, turning points, eccentric forces, wall face separation, eccentric loading, re-direction of forces, Do basic structural calculations, monitor cracking etc and make visual judgements.
- Understand damp, condensation, dew point, interstitial condensation, vaporisation, vapour diffusion, osmosis, hygroscopicity, absorption, adsorption, capillary rise
- Carry out cleaning and consolidation methodologies for masonry surfaces.
- Grout wall cores.
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

### 5.5.3 Stonecutting and stonemasonry apprenticeship

Part A of the lists below shows the proposed curriculum for the new apprenticeship 'stonecutting and stonemasonry', phases 2, 4 and 6, which are the off-the-job stages. The apprenticeship concentrates on stonecutting rather than the building of stone. Using the double title 'Stonecutting and Stonemasonry' is confusing and does not represent the actuality. The course shown here should simply have the title: 'Stonecutting'. The proposed course is very suitable for those working in the heritage sector.

Part A is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

#### A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**
  - Characteristics and qualities of stone
  - Sources and suppliers of stone
  - Selecting and matching of stone
  - Lifting stone
  - Handling, packing and storing stone
  - Presentation of stone
  
- **Specialist Skills**
  - Extracting and Processing
  - Stone blocks (extraction)
  - Primary cutting (block to slab)
  - Secondary cutting (cut to specification)
  - Splitting stone
  - Finishing
  
- **Engraving and Carving**
  - Funerary products
  - Letter-cutting techniques
  - Modelling
  - Carving
  - Inlaying
  - Moulding
  
- **Architectural Work**
  - Principles and procedures of conservation and restoration
  - Surveying and recording stonework

- Interventions
- Cleaning methodologies
- Walling
- Lime mortars
- Restoring stonework
  
- **Fixing**
  - Fixing cladding, interior and exterior stone
  - Laying stone tiles and granite flagstones
  - Stone faced pre-cast products
  
- **Common Skills**
  - Site safety
  - Personal protective equipment (PPE)
  - Workplace safety (dust and blades)
  - Care of tools
  - Interpreting drawings
  - Maths/calculations (weights, areas, volume, etc.)
  - Costing/estimating
  - Scheduling/planning work
  - Environmental care
  - Waste management
  - Terminology and styles of architecture
  - IT skills/basic CAD
  
- **Personal Skills**
  - Customer relations
  - Communication skills
  - Ability to work as a team member
  - Information gathering skills
  - Problems solving skills

NOTE: Integrated curriculum includes maths, science and theory

#### **B. Proposed additional course content for Stonecutting and Stonemasonry work in the heritage sector**

- Heritage and conservation components generic to most crafts listed earlier

- **Knowledge and skills**

- Taking stone samples.
- Proprietary plastic mortar repair mortars for stone surfaces
- Using silicon rubber to take moulds from original cut stone artefacts, casting in plaster and using model to cut/carve from
- Architectural stonecarving based on the classical orders
- Do analysis of stone and mortar for type, absorption, capillarity and crystallisation of salts on both extant and new materials to match or produce performance based solutions.
- Check mix design ratio and stone types for durability, resistance to freeze/thaw cycles, resistance to sulphates exposure, resistance to freeze/thaw in sulphate conditions
- Carry out proprietary plastic mortar repairs for stone surfaces
- Produce non-proprietary mortar repairs for brick and stone surfaces
- Safely manoeuvre large blocks of stone using machinery, lewis and nippers, slings and chains including use of levers, fulcrum etc
- Fix marble and other fireplace surrounds.
- Record and dismantle cut stone structures.
- Understand mechanisms of decay in mortar and stone, bio-destructive vegetation, freeze/thaw, scour, salts, exposure, location, environment, natural accelerated decay mechanisms in stone, brick and sands. Problems with cementitious mortars.
- Understand structural stability, settlement of structures and foundations, buckling-compression, Euler's slenderness ratios, bulging, rotation, turning points, eccentric forces, wall face separation, eccentric loading, re-direction of forces, Do basic structural calculations, monitor cracking etc and make visual judgements.
- Understand damp, condensation, dew point, interstitial condensation, vaporisation, vapour diffusion, osmosis, hygroscopicity, absorption, adsorption, capillary rise
- Carry out cleaning and consolidation methodologies for masonry surfaces.
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

#### 5.5.4 Plastering apprenticeship

Part A of the lists below shows the present curriculum for the apprenticeship in plastering, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.



## A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**

- Preparation of backgrounds
- Scudding
- Rendering and floating sand/cement
- Floating lightweight/plasters
- Cutting and fixing plasterboards
- Fixing metal beads using expanded metal
- Skimming walls and ceilings
- Dotting and screeding
- Floating with soft screeds
- Fixing rules for reveals/plinths and quoin stones
- Plastering piers, beams and curved surfaces
- Dry lining, taping joints
- Cutting and fixing fibrous plaster
- Plaster moulding
- Squaring and margining of reveals
- Floating and skimming
- Erecting scaffolding
- Safety
- Use of metal systems

- **Specialist Skills**

- Decorative plasterwork
- Metal systems
- Suspended ceilings
- Roofing
- Floor screeds
- Tiling

- **Common Skills**

- Measuring/setting out
- Use of tools
- Care of tools
- Ordering materials
- Safety

- Costing/estimating
  - Reading and producing drawings
  - Plumbing, ranging and use of level
  - Knowledge of materials
- **Personal Skills**
    - Planning work
    - Organising work
    - Ability to work independently and as part of a team
    - Using own initiative in problem solving
    - Ability to gather information
    - Ability to adapt to changing work practices and conditions
    - Interview technique

Note: Integrated curriculum includes maths, science and theory.

## B. Proposed additional course content for Plastering work in the heritage sector

- Heritage and conservation components generic to most crafts listed earlier
- **Knowledge and skills**
  - Knowledge of lime mortars, advantages, lime kilns, building and firing a small kiln, quicklime, hot lime mortars, non-hydraulic lime, lime putty, natural hydraulic lime, hydraulic and formulated limes, pozzolans, natural cement, additives, plaster of Paris, animal hair, pigments, split laths.
  - Prepare stone wall surface, pin joints in stonework, daub out, scratch and float coats on internal walls and split lath ceilings and partitions using lime putty, sand and animal hair. Finish coats in lime putty and fine sand/marble dust with or without gypsum.
  - After care and protection from sun, wind, rain and frost
  - Produce and work with earth based plasters and renders with or without sand and lime
  - Apply external renders, plain, ruled ashlar and wet dashes/harling using natural hydraulic lime, hybrid mixes, non-hydraulic lime and pozzolans and hot lime mortars.
  - Set out and apply various classical architectural features such as plinths, rustication etc
  - Apply external lime and clay based renders and plasters to different substrates such as stone, brick, earth, split lath, brick noggin, wattle, turf and straw bail.
  - Run in-situ work internally and externally for cornices, architraves, door and window surrounds, arches etc. with lime putty/gypsum, NHL's, natural cement mixes etc
  - Plaster vaulted ceilings and curved work in split lath, lime putty, sand and animal hair

- Select, sort, gauge and fix natural slating and lime torch/parge undersides of slated roofs
- Hang vertical slates on lime renders
- Plan, draw and set out ruled ashlar renders
- Plan, draw and set out decorative ceilings
- Understand mix ratios, mixing methodologies.
- Apply plasters and renders. Carry out after-care and protection
- Apply, model and tool plastic repair mortars to stone and brick
- Produce non-proprietary mortar repairs for brick and stone surfaces
- Select, mix, apply and protect clay/sand/lime mortars for vernacular and green build
- Take mortar samples without damage to the fabric
- Carry out analysis of renders, plasters and mortar for type, absorption, capillarity and crystallisation of salts on both extant and new materials to match or produce performance based solutions
- Test sand/ aggregate for void %, clay and silt content, bulking and grading.
- Check mix design ratio for durability, resistance to freeze/thaw cycles, resistance to sulphates exposure, resistance to freeze/thaw in sulphate conditions
- Apply scagliola decoration to columns, fireplaces etc
- Carry out fibrous plasterwork
- Conduct freehand modelling of organic shapes on walls and ceilings.
- Conduct geometric designs on walls and ceilings
- Model with clay
- Build armatures
- Create moulds from plaster, vinamould and silicon rubber.
- Apply enrichments
- Carve undercuts
- Understand mechanisms of decay in renders, plasters and mortars, structures, ceilings and walls.
- Research how water, insects, bio-destructive vegetation, freeze/thaw, salts, ferrous inserts, fungi, exposure, location, environment affect plasterwork. Understand how cementitious mortars can be destructive
- Understand damp, condensation, dew point, interstitial condensation, vaporisation, vapour diffusion, osmosis, hygroscopicity, absorption, adsorption, capillary rise
- Remove paint without damage and with regard to personal safety
- Record, dismantle and re-fix
- Stabilise and support dropped ceilings.
- Provide structural supports
- Determine causes of failure in plasterwork
- Take profiles from existing cornices and other decorative details in order to replicate
- Understand structural stability, settlement of structures and foundations, buckling-compression, Euler's slenderness ratios, bulging, rotation, turning points, eccentric

forces, wall face separation, eccentric loading, re-direction of forces, Do basic structural calculations, monitor cracking etc and make visual judgements.

- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

### 5.5.5 Electrical apprenticeship

Part A of the lists below shows the present curriculum for the electrical apprenticeship, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

#### A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**

- Selection, procurement, safe use of, and storage of craft-related tools, equipment and materials
- Selection and utilisation of fixing devices
- Assessment, interpretation and implementation of ETCI wiring regulations, installation inspection and testing procedures
- Utilisation of electrical test instruments
- Installation of steel conduit wiring systems
- Installation of plastic conduit wiring systems
- Installation of steel trunking cable systems
- Installation of plastic trunking cable systems
- Installation of cable tray and ladder systems
- Installation of industrial cable systems
- Installation of subdistribution boards and protective devices
- Installation and maintenance of lighting, heating and motive power systems and controls
- Installation and testing of overcurrent and earth leakage protection systems
- Installation of earthing and bonding systems
- Interpretation of circuit schematics and architectural drawings which incorporate IEC symbols
- Interpretation of technical data and manufacturing standards
- Interpretation of equipment assembly, disassembly and adjustment procedures
- Completion and updating of job-related documentation

- **Specialist Skills**

- Installation of wiring systems and equipment in hazardous environments
- Assembly and wiring of main distribution boards
- Assembly and wiring of motor control panels

- Installation and maintenance of emergency lighting systems
  - Installation and maintenance of fire alarm systems
  - Installation and maintenance of intruder alarm systems
  - Installation and maintenance of standby power and battery systems
  - Installation of lightning protection systems
  - Installation and maintenance of HT transformers and switchgear
  - Installation of metering systems
  - Installation of power factor correction systems
- **Common Skills**
    - System fault analysis skills
    - Interpretation of electrical/electronic schematic diagrams
    - Interpretation of flow, function and ladder charts
    - Soldering and desoldering skills
    - Testing, removal and replacement of electronic components/PCBs
    - Installation and programming of PLC systems
    - Installation and calibration of sensors and transducers
    - Installation of electro-pneumatic systems
    - Installation of data communication cable systems
- **Personal Skills**
    - Communications
    - Customer relations
    - Adaptability
    - Ability to work as part of a team
    - Ability to work independently
    - Initiative
    - Problem solving
    - Planning
    - Information gathering
    - Quality
    - Language
    - Report Writing

Note: Integrated Curriculum includes Maths, Science, Theory, Drawing and Computer Applications

## B. Proposed additional course content for Electrical work in the heritage sector

- Heritage and conservation components generic to most crafts listed earlier
  
- **Knowledge and skills**
  - Knowledge and awareness of hazardous materials in old buildings such as asbestos, lead based paint, mercury. Biological hazards such as bird and rat droppings.
  - Toxic chemicals in chemically treated wood. Radioactive materials, old lightening conductors, biological moulds, PCB's
  - Knowledge of traditional building structures of stone and brick in lime and clay/lime mortars. Understanding lime and clay mortars, matching, permeability etc. Traditional solid plasterwork, timber, joinery, roof and floor tiles, windows, glass, metalwork and furnishings.
  - Consideration and avoidance of damage to historic and structural fabric such as walls, plasters, renders, floors, roofs, ceilings, windows, tiles, finishes, fabrics and decoration.
  - Aesthetic considerations in the placement and siting of various fittings, panels, machinery etc
  - Re-use of historic fittings and fixture
  - External lighting considerations
  - Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
  - Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

### 5.5.6 Plumbing apprenticeship

Part A of the lists below shows the present curriculum for the apprenticeship in plumbing, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

#### A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**

- Use of plumbing tools and materials
- Pipe fitting
- Pipe jointing
- Pipe bending
- Inspection and testing of pipework
- Fault diagnosis
- Design/installation of central heating systems including:
  - Solid fuel
  - Gas and
  - Oil fired boilers
  - Flues and ventilation
  - Fuel storage and distribution
- Design/installation of plumbing systems including:
  - Mains water supply
  - Water treatment
  - Domestic and multi-storey hot and cold water supply
  - Storage tanks, cylinders, calorifiers
  - Sanitary appliances and discharge pipework and systems
- Installation of:
  - Gas appliances
  - Fire fighting systems

- **Specialist Skills**

- Installation of:
  - Underfloor heating
  - Solar heating
  - Steam heating
  - Compressed air systems
  - Vacuum systems



- Commissioning and servicing:
  - Boosted cold water systems
  - Unvented hot water systems
  - Boilers
  - Burners
  - Gas appliances
  - Pumps
- Knowledge of:
  - Heating controls
  - Air handling units and air conditioning systems
  - Industrial and process gases and liquids
  - Medical gases
  - Water and gas regulations
- **Common Skills**
  - Safety awareness
  - Planning
  - Interpreting drawings and specifications
  - Mensuration
  - Basic metalwork
  - Basic electricity
  - Pipe development
  - Oxy-acetylene welding
  - Bronze welding
  - Manual metal arc welding
  - Tungsten inert gas welding
  - Computer aided design
  - Building management systems
  - Knowledge of building regulations
- **Personal Skills**
  - Planning and organisation
  - Verbal and written communication
  - Problem solving
  - Working independently
  - Ability to work as part of a team
  - Customer relations
  - Information gathering

- Good working practice, including:
  - Time keeping
  - Tidiness
  - Responsibility
  - Quality
  - Initiative
  - Safety awareness

NOTE: Integrated curriculum includes maths, science and theory

## B. Proposed additional course content for Plumbing work in the heritage sector

- Heritage and conservation components generic to most crafts listed earlier
  
- **Knowledge and skills**
  - Knowledge of hazardous materials in old buildings such as asbestos, lead, lead based paint, mercury, Biological hazards such as bird and rat droppings.
  - Knowledge of toxic chemicals in chemically treated wood. Radioactive materials, old lightening conductors, biological moulds, PCB's etc.
  - Knowledge of damage to lead from fresh lime and cement mortars
  - Knowledge of traditional building structures of stone and brick in lime and clay/lime mortars. Understanding lime and clay mortars, matching, permeability etc. Traditional solid plasterwork, timber, joinery, roof and floor tiles, windows, glass, metalwork and furnishings.
  - Proficiency at the Installation of sprinkler systems and pipework in older buildings with regard to the structure, fabric and decoration of the building. Consideration and avoidance of damage to historic and structural fabric such as walls, plasters, renders, floors, roofs, ceilings, windows, tiles, finishes, fabrics and decoration with the installation of pipework, sprinkler systems and other fire protection measures, water tanks, boilers, stoves, cisterns and radiators. Aesthetic, practical and appropriate siting of fixings, fittings and equipment
  - Working with and fixing cast iron rainwater goods: gutters, down pipes and hopper heads.
  - Awareness of the historic value and the re-use of old cast iron radiators and other plumbing fittings and fixtures from the past.
  - Planning, preparation and use of lead in roofing, domes, lanterns spires, ridges, finials flashings and valleys. Underlay materials.
  - Manufacture of rainwater goods and other components in lead. Decorative lead work, pattern making casting, heraldic arms, lettering, numbers etc.
  - Sheet lead roofing
  - Working wiped soldered joints, Lead burning, lead pipe bending.
  - Application of anti-theft forensic marking

- Knowledge of decay, thermal stress, biological damage. Effects of tannin from oak roofs and boarding.
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

### 5.5.7 Floor and wall tiling apprenticeship

Part A of the lists below shows the present curriculum for the apprenticeship in tiling, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

#### A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**
  - Select components and materials
  - Select and use of hand and power tools
  - Clean floor and wall surfaces
  - Select and prepare materials and components
  - Prepare backgrounds
  - Cut and fix wall tiles to substrates
  - Lay floor screeds
  - Cut and bed/bond floor tiles
  - Position and fix movement joints
  - Apply grouts
  - Prepare and clean work area
  - Safe erection, movement and dismantling of access platforms
  
- **Specialist Skills**
  - Preparing, fixing and bedding
  - Mosaic sheets
  - Chemical resistant tile applications
  - Laying/Fixing marble tiles
  - Consultation and design of wall and flooring layouts
  - Forming and arranging patterns and designed shapes
  - Water resistant applications
  - Laying floor tiles to large areas and cross-falls
  - Laying natural stone and terracotta tiles
  - Tanking
  - Forming access panels
  - Tiling into movement joints
  
- **Common Skills**
  - For Construction Trade
  - Measuring, setting out and pattern arranging
  - Use and care of tools

- Selecting and ordering materials and components
  - Costing/estimating and planning work operations
  - Safety procedures
  - Reading and interpreting drawings/designs/patterns
  - Plumbing, alignment and squaring application of datums/levels /falls
  - Knowledge of materials, components, backgrounds and
  - Environments
  - Ability to erect and work from access platforms, trestles and scaffolds safely
- **Personal Skills**
    - Written, verbal communication
    - Conceptualisation and detailing techniques
    - Basic calculation application
    - Planning work
    - Organising and controlling work operations
    - Ability to work independently and with self motivation
    - Work within teams
    - Decisive and able to problem solve
    - Ability to gather and apply information
    - Ability to adapt to changing work practices
    - Interview techniques
    - Customer relations
    - Punctuality
    - Reliability
    - Good personal hygiene

NOTE: Integrated curriculum includes maths, science and theory

## B. Proposed additional course content for Floor and Wall Tiling work in the heritage sector

- Heritage and conservation components generic to most crafts listed earlier

- **Knowledge and skills**

- Understand the materials involved - clay, sand, silt, grog, slip, ball clay, kaolin, feldspar, oxides, dyes, pigments, glazes, mortars, grouts, cleaners, polishes, substrate materials.
- Identify different clay types, sources, aggregates, additives and glazes. Historic tile manufacture
- Understand methods of manufacture: kilns, fuels, wood mould process, cut sheet, extrusion, dust pressing
- Select clays, analyse, test and determine adjustments if necessary to make tiles.
- Using mould boxes produce plain, encaustic/decorative tiles using different coloured clays.
- Fire a small kiln to produce un-glazed low-fired ceramic quarry floor tiles.
- Identify different historic tile types and patterns
- Work with glazed ceramic floor tiles, encaustic, geometric, mosaic, vitreous and semi vitreous floor tiles
- Produce lime mortars, understand the advantages, lime kilns, quicklime, hot lime mortars, non-hydraulic lime, lime putty, natural hydraulic lime, hydraulic and formulated limes, pozzolans, natural cement.
- Mix and lay limecrete floors and use hydraulic/pozzolanic lime bedding mortars and grouts
- Understand solid wall stone and brick structures, lime plasters, timber floors
- Mix mortars to given mix ratios, mixing methodologies, preparation, application, after-care, cleaning and protection
- Take mortar and tile samples without damage to the fabric
- Conduct analysis of floor and wall tiles, bedding/mortar for type, absorption, capillarity and crystallisation of salts.
- Test and/ aggregate for void %, clay and silt content, bulking and grading.
- Prepare mix design ratios for bedding/grouting
- Plan and conduct layout and design of decorative tiles including mosaic floors and wall murals
- Record, remove and re-lay floor and wall tiles.
- Match damaged tile replacements, methodology of individual tile replacement. In-situ repairs to floor and wall tile
- Understand mechanisms of decay in tile and mortar, bio-destructive growth, mould and mildews, freeze/thaw, salts, humidity, exposure, location, environment, natural accelerated decay mechanisms in clay tile. Cementitious mortars.
- Understand decay of substrates, structural movement, settlement of structures.
- Understand damp, condensation, dew point, interstitial condensation, vaporisation, vapour diffusion, osmosis, hygroscopicity, absorption, adsorption and capillary rise
- Understand destructive cleaning methods, materials and protective coatings
- Understand failure in glazes, grouting and bedding.
- Understand thermal movement in floor and wall tiling and substrates including long term expansion and contraction of materials through natural processes
- Cleaning, sealing and polishing methodologies for tile surfaces.

- Lay decorative shell and pebble patterns on walls in lime mortar as found in Irish shell houses, follies etc
- Lay decorative vernacular cobble patterns as found in 18<sup>th</sup> and 19<sup>th</sup> century courtyards, farmyards etc.
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.

### 5.5.8 Painting and decorating apprenticeship

Part A of the lists below shows the present curriculum for the apprenticeship in painting and decorating, phases 2, 4 and 6, which are the off-the-job stages. This is followed by Part B, which lists the additional items that are recommended for a curriculum that would bring the apprentice up to a level as a master craftworker in building conservation.

#### A. Existing course content for off-the-job Phases 2, 4 and 6

- **Core Skills**
  - Surface preparation
  - Priming and sealing
  - Mixing and applying undercoating and finishes
  - Mixing and applying ground colours
  - Applying clear finishes, dyes, stains and glazes
  - Wall covering
  - Glazing and reglazing
  - Elementary sign writing and stencilling
  - Stripping
  - Reading drawings and specifications
  - Brush graining
  - Rag rolling
  - Texture work
  - Storage and use of tools and materials
  - Housekeeping and appearance
  - Basic power tools
  - Ladders, planks and scaffolding
  - Measurements
  - Application of emulsions
  - Specific safety
  
- **Specialist Skills**
  - Mixing and applying water scumbles
  - Graining
  - Marbling
  - Texture work
  - Signwriting and automated lettering systems
  - Stencilling
  - Broken colour
  - Spray painting
  - Silk screen
  - Gilding



- **Common Skills**
  - Reading drawings and specifications
  - Measuring and estimating
  - Plumbing and levelling
  - Using ladders, planks and scaffolding
  - Safety regulations
  - Costing materials
  
- **Personal Skills**
  - Using initiative
  - Co-operating with others on the job
  - Problem solving
  - Planning and organising
  - Working alone
  - Customer relations
  - Verbal communications
  - Team work

NOTE: Integrated curriculum includes maths, science and theory

## B. Proposed additional course content for Painting and Decorating work in the heritage sector

- Heritage and conservation components generic to most crafts listed earlier

### 1. Knowledge and skills

- Prepare surfaces, mix and apply external and internal limewashes to lime renders, stone, brick and earth surfaces with or without earth pigments/copperas
- Mix and apply lime plaster substrate, apply fresco to wet lime plaster surface following design with earth pigments and water.
- Research early paints and designs on medieval roof timbers and ceilings
- Select materials, mix and apply soft distempers to prepared substrate
- Select materials, mix and apply oil bound distemper to prepared substrate
- Preparation and application of oil paints
- Prepare and apply gilding, marbling, graining, Trompe l'oeil and stencilling
- Production of hand blocked wallpaper
- Repairs to existing wall papers
- Recording and removal of existing wall paper. Preparation and hanging of replacement paper
- Drawing of letterforms and application of traditional signwriting
- Painting wrought and cast iron

- Application of silicate based paints
- Taking necessary precautions to protect work
- Understanding mechanisms of decay in buildings, bio-destructive vegetation, freeze/thaw, salts-wet/dry cycles, sulphates from flues/fireplaces, fungal decay, exposure, sunlight, location, environment.
- Understanding damp, condensation, dew point, interstitial condensation, vaporisation, vapour diffusion, osmosis, hygroscopicity, absorption, adsorption, capillary rise
- Understanding of damage by non-breathable paints on vapour permeable surfaces. Problems associated with cementitious materials
- Determining critical repairs-roofs, gutters, down pipes, ground levels, dry and wet rot, and problems associated with accelerated heating of older buildings and de-humidifiers
- Carrying out material analysis and taking samples
- Preserving original paint and paper evidence in situ
- Determining compatible paint systems
- Taking necessary safety precautions when working with lead based paints
- Cleaning/removal of material by hand and by specialist methods
- Conduct research, survey, measure, draw and sketch, record and document interventions, write reports, placing in an archival system, development of leadership, pedagogic and IT skills, take off quantities and estimate, write risk assessments and method statements
- Awareness of how climate change may adversely affect materials, buildings and performance in the near future.