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BUILDING SOLID FOUNDATIONS: CAREER PATHWAYS IN TRADITIONAL TRADES IN AUSTRALIA.

Observations on Vocational Qualifications in the United Kingdom Heritage Sector

An International Specialised Skills Institute Fellowship.

TIM HAVILAH

Sponsored by Carlo Valmorbida International Fellowship for Innovation in Specialised Trades. © Copyright July 2019 (Image Credit : Gloucester Cathedral Trust)

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1. Acknowledgements

The Fellow would like to thank the following individuals and organisations who generously gave their time and their expertise to assist, advise and guide him throughout his Carlo Valmorbida International Fellowship for Innovation in Specialised Trades Fellowship.

Awarding Body – International Specialised Skills Institute (ISS Institute)

The ISS Institute plays a pivotal role in creating value and opportunity, encouraging new thinking and early adoption of ideas and practice by investing in individuals.

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This Fellowship, generously offered by Elsie Valmorbida in honour of her late husband Carlo Valmorbida, provides an opportunity for an Australian, with a proven high level of vocational skill and learning in their specific field to focus on innovative practices and skill development in specialised trades or bespoke crafts. The Fellowship is offered to candidates who are interested in exploring new and leading practice, innovation and leadership opportunities in Skill Enhancement areas that will benefit Australia.

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The Fellowship provides the recipient the invaluable opportunity to travel overseas and enhance their skills for the benefit of organisations, communities and industries in Australia.

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Fellowship Supporters

Cameron Logan: Dr. Cameron Logan urban and architectural historian and director of the postgraduate program in Heritage Conservation in the Sydney School of Architecture for his ongoing mentoring and support during the Masters of Heritage Conservation studies.

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Graham Lee: National Project Manager, at National Heritage Training Group, part-time tutor with the Building Crafts College in Stratford West London. Active member of the Council on Training in Architectural Conservation. Former Project Manager for the NHTG Lottery Funded Bursary scheme. Member of the Institute of Historic Building Conservation (IHBC).

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2. Executive Summary

There has been a growing concern from within the Australian Heritage sector regarding the availability of tradespersons with the requisite skills to deliver appropriate practical fabric conservation outcomes. For over a decade traditional tradespeople, such as fibrous plasterers, bricklayers and stonemasons, have been regularly listed on the Australian Skills Shortage List.¹

The Australian 2011 State of the Environment Report succinctly outlined the inevitable result of the current skills shortages.

“The continuing decline in availability of specialist heritage tradespeople and a looming skills shortage will place major pressures on historic heritage conservation in the immediate future”²

Numerous reports have indicated that tradespersons with the skills and experience to successfully undertake sensitive building conservation and repair are aging or leaving the workforce. To guarantee a viable workforce for Australia’s built heritage assets, it is therefore imperative to utilise these skills and provide further training opportunities for the next generation of tradespeople. Currently, there are few such heritage trades training programs in Australia.

Over a decade ago, 2008 ISSI Fellow Simon Brown identified two basic requirements of Australian Vocational Training (VET) to address the current and future heritage trades skills shortages in stonemasonry.³

- a. provide career advice for those seeking to enter working with stone in the built heritage; and
- b. provide high level skills and knowledge for those working in the built environment in heritage contexts

Regrettably, in the ensuing decade there has been little progress in either of these points. For the few apprentices entering the trade annually, the Certificate III in Stonemasonry syllabus has little space for discussion of heritage conservation.⁴ For qualified masons seeking further training in heritage specialisation and career development, there is no post-trade training provider or qualification in Built Fabric Conservation currently available through the mainstream construction industry or tertiary studies in Australia.

Taking conservation stonemasonry as a case study, this Report will argue that the currently limited range of post trade training opportunities is a contributing factor

1 Department of Employment, Historical List of Skill Shortages in Australia (online resource) <https://docs.employment.gov.au/documents/historical-list-skill-shortages-australia>

2 State of the Environment (2011 Committee). Australia State of the Environment 2011

3 Brown, Simon. Traditional and Contemporary Practices in the UK Stone Industry, National ISS Institute Overseas Fellowship (International Specialised Skills Institute, Melbourne. March 2008) <http://issinstitute.org.au/wp-content/media/2011/04/ISS-FEL-REPORT-S-BROWN-lo-res.pdf>

4 Construction and Property Services Industry Skills Council ‘CIMS 198 Certificate III in Stonemasonry (Monumental/Installation)’ –Performance Growth [SM] posted 29/7/2016, <http://www.cpsisc.com.au/resources/CPSISC/CIMS/Final%20-%20CIMS%20198%20Certificate%20III%20in%20Stonemasonry.pdf>

to Australia's heritage trades shortages. With no formal qualification to define 'heritage specialist', there is no clearly defined career pathway or motivator for the tradesperson to up-skill.

To maintain a viable workforce skilled with the competencies and sensitivity to maintain our heritage assets, clearly, there exists a need to develop a dedicated and distinct heritage trade specialist qualifications framework.

This paper will draw upon and develop the observations and findings of the Fellow, Tim Havilah's recent dissertation on the Training of Traditional Trades, undertaken in the conclusion of his studies toward completion of Masters of Heritage Conservation, USYD.

The thematic line of investigation was further explored in Tim's Fellowship study tour of Italy and the United Kingdom. While providing him the invaluable opportunity to attend short courses in skills development, the primary objective of the Fellowship Study tour was to document the response of the United Kingdom heritage sector to their traditional trades skills shortages, and to identify aspects that may have application in Australia.

The Fellow will demonstrate that United Kingdom heritage sector has developed and implemented a distinct and incremental range of heritage practitioner qualifications, that recognize both the specialised manual skills and conservation philosophy that underpin their valuable work.

The catalyst for the United Kingdoms enhanced training programs has been the development of a coalition of allied heritage sector industry stakeholders and organisations to raise the issue of specialised skills shortages, and to build cross-agency partnerships to address current and future workforce needs.

Of particular interest in regard to the United Kingdom model, has been the establishment of dedicated centers of excellence to deliver vocational education

to traditional trade apprentices, and also to post-trade practitioners wishing to further their chosen careers in built fabric conservation .

The principal focus of the Fellowship study tour was the training of stonemasons to successfully undertake the physical conservation of historic buildings. Whilst provision of trade level training was examined as a starting point, the principal aim was to examine post-trade training and qualifications in specialist heritage conservation roles.

Linking trade training to opportunities for specialised built fabric conservation graduate and post graduate studies has thus, provided clear and rewarding career pathways for new entrants, raised the standards of proficiency ,and retained and developed experienced practitioners as future leaders and mentors in their fields of specialisation.

The Fellow aimed to:

- » Attain greater personal insight into best practice heritage conservation principles and methods, apply and communicate them in the workplace
- » Develop local and international professional networks of experienced heritage trades practitioners, educators and heritage sector stakeholders
- » Demonstrate the benefits of a unified Heritage Trades Training strategy in regard to bringing new entrants and developing the skills of experienced tradespersons.
- » Provide the Australian Heritage Sector a model of specialised traditional trades training and qualifications framework as observed in the United Kingdom.
- » Investigate the impact of specialised heritage qualifications on training opportunities and career pathways arising from the UK Construction Skills Card System.

- » Establish specialised training workshops to introduce and develop the skills of all aspiring trade craft practitioners.

Specific areas of study and skills development focused on the examination of training institutions delivering high quality skill sets to stonemasons engaged in conservation stonemasonry.

Locations included:

- » The Building Crafts College, Stratford , London
- » Cathedral Workshop Fellowship participating sites:
 - » Gloucester Cathedral
 - » Canterbury Cathedral
- » Slate Letter cutting workshop, Cirencester
- » Dry Stone Walling Workshop, Gloucester
- » Marble Workshops, Pietrasanta, Italy

3. Fellowship Background

Fellowship Context

In undertaking the overseas study tour, and in the correspondence and research leading ultimately to the final ISSI Fellowship Report, Tim aims to promote the development of quality training resources and career pathways in traditional trades. In dissemination of the ISSI Fellowship to relevant Australian Heritage Bodies, influential stakeholders and educators, he ultimately seeks to develop a specialised heritage practitioner qualification framework.

The Fellow aimed to:

- » Develop local and international professional network of experienced heritage trades practitioners.
- » Further develop my existing stonemasonry skills, and to consolidate my role as supervisor and mentor to junior masons.
- » Attend specialised training workshops in statuary carving, letter cutting and dry-stone walling, and examine operational models for application in Australia.
- » Provide greater personal insight into best practice heritage conservation principles and methods as observed in the United Kingdom.
- » Observe overseas models of post qualification specialised training in traditional trades.

- » Investigate the impact of specialised heritage qualifications on training opportunities and career pathways arising from the UK Construction Skills Card System.
- » Demonstrate the benefits of a unified heritage trades training strategy in regard to bringing new entrants and developing the skills of experienced tradespersons.
- » Advocate for the implementation of a modified version of the UK heritage trades training and qualification framework to fill a recognised gap in Australia.

Identifying the Skills Gaps

ICOMOS

Over 53 years have passed since the signing of the Venice Charter and the establishment of ICOMOS (International Council on Sites and Monuments) in 1965.⁵ In its function as an advisory body to UNESCO, in the ensuing decades ICOMOS has been instrumental in the listing of 878 places of 'outstanding universal value', the World Heritage sites.

Another key ICOMOS achievement has been the adoption of a suite of international doctrines and charters proscribing the protection, conservation, and management of cultural built heritage.

5 The Venice Charter for the Conservation and Restoration of Monuments and Sites "ICOMOS. (2004). The History of the Venice Charter" (PDF).

The ICOMOS Guidelines, Education and Training in the Conservation of Monuments, Ensembles and Sites, were adopted in 1993.⁶ The Guidelines state:

“Traditional crafts are a valuable cultural resource. Craftspersons, already with high-level manual skills, should be further trained for conservation work with instruction in the history of their craft, historic details and practices, and the theory of conservation with the need for documentation. Many historic skills will have to be recorded and revived.”

The transfer of knowledge necessary to retain these historic skills, bespoke crafts and traditional is the Intangible Cultural Heritage of the Building Arts (As per the 2003 UNESCO Convention for the Safeguarding of Intangible Cultural Heritage). The Convention urges that parties:

“endeavour to ensure the widest possible participation of communities, groups, and, where appropriate, individuals that create, maintain and transmit such heritage, and to involve them actively in its management

The ICOMOS Education and Training guidelines are widely used in the international conservation field both as a basis for the content of conservation courses and also as a benchmark for the accreditation of industry professionals.⁷

Section 5 of the ICOMOS guidelines outlines fourteen specific abilities in which trained conservation professionals should be competent .

The main occupational skill sets of the Architectural Conservators group comprise:

- » Understanding the character, integrity, context, evolution and significance of the fabric of a site, ruin, building, architectural element or monument.

- » The knowledge and ability to identify materials used in construction and their expected performances and deterioration mechanisms.
- » Diagnosis, documentation and interpretation of information obtained from assessments of the existing condition, pathology, past treatments, current influences and future impacts of conservation interventions.
- » The skill and knowledge to advise, commission specific analyses, undertake trials and on-site testing and carry out appropriate treatments.
- » The knowledge and application of established conservation principles for recommended treatment and maintenance procedures.
- » The ability to interpret and document research, investigation and conservation interventions in a clear, comprehensive format.

The essence of conservation principles is to make ‘balanced judgment’, understand all potential implications and clearly justify the decision-making process in all built fabric intervention activities .

Clearly these cognitive abilities underpin the work of the experienced traditional tradespersons engaged in heritage building projects

The architectural conservation community is characterized by its overlap of highly specialised sub- groups. Architectural Conservators care for a wide variety of materials gilding, glass, metals, monuments, plaster, sculpture, stone, timber, wall and floor tiles, terracotta, and wall paintings. In many respects there is blurring in distinction between the specialist work of conservators and other aspects more readily associated with traditional building craft skills.

Specialisation in any traditional trade or craft infers a deep understanding of the particular material, its capacities for structural applications and decorative

⁶ International Council of Monuments and Sites (ICOMOS) Guidelines on Education and Training in the Conservation of Monuments, Ensembles and Sites (1993) <http://www.icomos.org/en/charters-and-texts/179-articles-en-francais/ressources/charters-and-standards/187-guidelines-for-education-and-training-in-the-conservation-of-monuments-ensembles-and-sites>

⁷ Aylin Orbas & Philip Whitbourn (2002) Professional Training and Specialization in Conservation: An ICOMOS Viewpoint, *Journal of Architectural Conservation*, 8:3, 61-72, DOI: 10.1080/13556207.2002.10785327

elements. Each trade has its own vernacular, covering the tools and methods of fashioning and assembling, and the historical forms that serve as studies for new work.

In 2005, the UK National Heritage Training Group observed:

*“What separates the traditional building sector from the main construction industry is that it generally requires more refined practical skills and judgements than those used in much of the new-build sector...the approach to historic buildings requires a different mental attitude”*⁸

Blades (1998) elaborates:

*“Existing trade schools have developed sound approaches to the teaching of practical skills and knowledge for modern construction. The approach to historic buildings should be different. Conservation must be introduced not simply as a topic or module but as a framework for the entire program, providing a structured approach to learning and thinking. There should be a clear understanding among all parties, from manager to site operative. Conservation in this context must embrace not just materials and techniques but the philosophical framework that drives the decision making on site.”*⁹

By the above stated definition, Specialist Trades engaging in built fabric conservation should thus be acknowledged a discipline deserving of academic recognition.

Currently in Australia, there is no heritage industry or professional qualification, or indeed any qualifiable set of skills that defines a specialist heritage trade. This

raises questions about the nature and provision of appropriate training, and the specialists’ parity of professional accreditation in the field.

It is the author’s firm belief that this combination of specialised knowledge and conservation principle awareness is desirable in the professional development of all tradespersons participating in conservation and restoration work and would go further to deem it an essential requirement for site foreman and managers of sensitive heritage-built fabric.

Background - The United Kingdom

The National Heritage Training Group (NHTG) was established in October 2002 as an independent specialist sector skills development group, through an agreement between the Construction Industry Training Board (CITB) and English Heritage. The NHTG was chaired by contractors, trade federations, trade unions, heritage bodies and training providers and was charged with a UK-wide remit to develop and implement a coherent strategy for traditional building craft skills training and provision.

In 2005 the CITB and English Heritage entered into a Skills Sector Agreement, committing the stakeholders to a number of strategic and deliverable objectives, to be implemented by the NHTG.¹⁰

These included:

- » Quantifying and validating the scope and size of the specialist labour and skills needs for the next 3-5 years;

⁸ National Heritage Training Group (NHTG). Traditional Building Craft Skills: Reassessing the Need, Addressing the Issues: Skills Needs Analysis of the Built Heritage Sector, England, 2008, Review. Construction Industry Training Board (UK). https://www.citb.co.uk/documents/research/nhtg_skillsresearch_england_2008_fullreport_tcm17-6855.pdf

⁹ Keith Blades “Training the Trades for Masonry Conservation: Integrating Conservation Ideals and Traditional Skills.” APT Bulletin 29, no.3/4 (1998): %1-54. Doi: 10.2307/1504613

¹⁰ Heritage training | Structural Survey | Vol 23, No 1, International Journal of Building Pathology and Adaptation ,2005

- » Assembling a tailored strategic national and regional strategy to support training, knowledge and skills provision specific to the traditional trades and built heritage sector;
- » Coordinating the provision of specialist conservation training
- » Attract career changers into the sector
- » Lobbying for the establishment of targeted national specialist Centres of Vocational Excellence
- » Establishing pre-tender training and qualification requirements for grant-aided work, including a 100 per cent qualified workforce

Heritage Skills Needs Studies from the United Kingdom

In the UK between 2003 and 2009, the NHTG released a series of interrelated regional reports, The Skills Needs Analysis of the Built Heritage Sector

The reports quantified local supply and demand for heritage services in terms of the economic activity of the sector, and anticipated future skills needs of the UK built heritage industry.¹¹

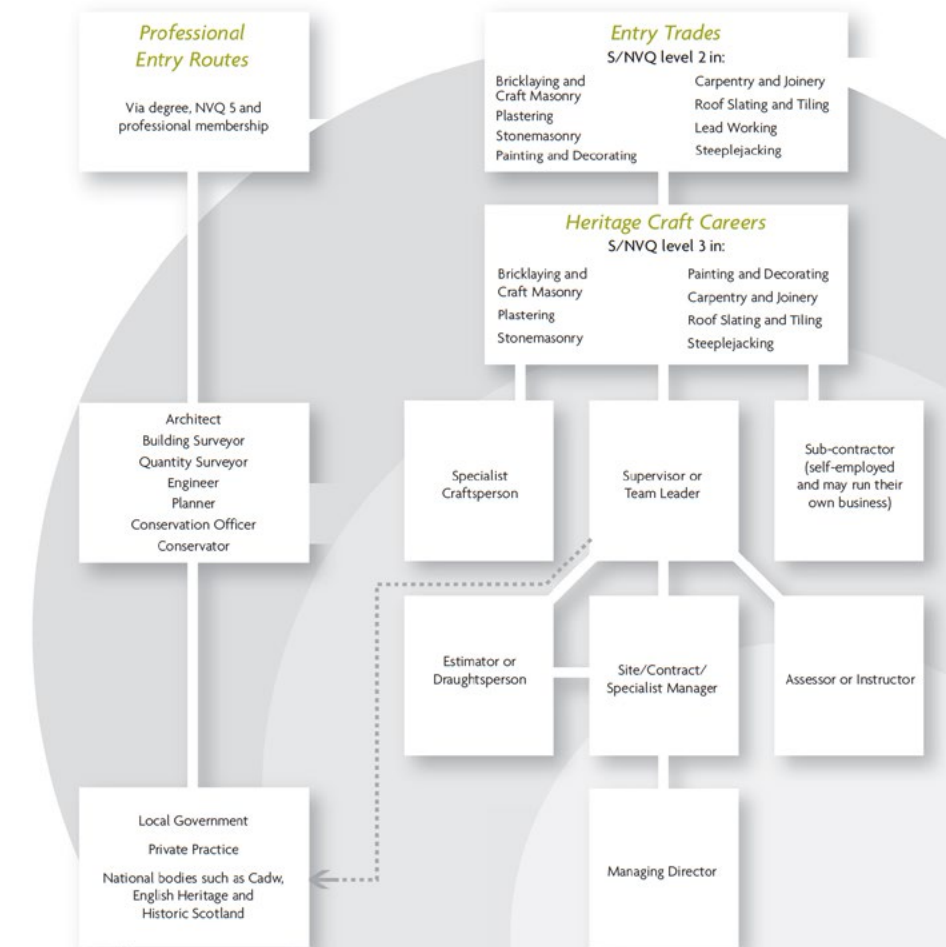
The Report regarded contemporary trade skills as providing a sufficient foundation of practical competence, however identified “heritage awareness” as a knowledge gap, observing the majority of practitioners would benefit from up-skilling before undertaking work on traditional buildings.

The NHTG reports also confirmed the anecdotal concerns that the typical mastery of the heritage trade specialist was in mid or late career. Encouragingly the

NHTG report found that the (then recent) implementation of construction industry qualification cards had been instrumental in stimulating demand for newly created heritage training streams, thus creating a defined career pathway for heritage specialization.

CAREER PATHS →

Craftspeople & Graduates



Career pathways in Historic Building Conservation and Restoration (National Heritage Training Group, 2012)

11 The National Heritage Training Group (NHTG). Traditional Building Craft Skills: Reassessing the Need, Addressing the Issues: Skills Needs Analysis of the Built Heritage Sector, England, 2008, Review. Construction Industry Training Board (UK). https://www.citb.co.uk/documents/research/nhtg_skillsresearch_england_2008_fullreport_tcm17-6855.pdf

The UK report concluded that the key to the continued viability and expansion of the heritage services sector hinged on the coordinated promotion of awareness, to both public and industry, of the benefits of heritage specialisation in achieving quality conservation outcomes.

Heritage Skills Needs Studies in Australia

The research methodologies and subsequent findings of the UK skills needs reports provided the thematic and contextual background for a series of similar studies undertaken in Australia.

The impetus for local research stemmed from a 2007 workshop presentation held at the NSW Heritage Office, which was convened as the regional UK reports were being collated.¹² Keynote speaker John Fidler examined overseas conservation skills shortages and compared standards of heritage professional and trades training delivery in overseas and local models.

The findings of the subsequent Heritage Trades and Professional Training Report, 2010 reiterated many of the findings and recommendations arising from the previous UK reports.¹³

Practitioners were typically older, having received their formal training more than twenty years ago. Worryingly, less than half of respondents were currently training apprentices, yet practical conservation was identified as a current and future training priority for many Professionals in the sector.

The report found that access to quality training in Australia was unevenly distributed and expensive, education outcomes were not standardized, and targeted initiatives had faltered due to lack of consistent funding and perceived lack of demand.

The specification of “specialised contractors” was perceived to be difficult, due to ill-defined skillsets, in part attributable to the absence of a formal accreditation scheme

The report observed:

*“There is a limited ‘demand’ for true specialists, arising from a combination of the quantum of available heritage trades work, value perceptions on the part of clients and builders and absence of any contractual or legal requirement for practitioners to have such skills. These factors appear to have combined to cause a substantial drop off in the number of younger specialist heritage trades practitioners”.*¹⁴

Comparatively, measures to address the Australian skills shortage had been impeded by the fragmented education framework in this country, compounded by the relatively uncoordinated response of the local heritage sector. Meanwhile, the UK had a significant advantage in having a Heritage Training Strategy and administrative body (NHTG).

To address these key issues, the authors recommended that the report’s sponsor, the Heritage Chairs and Officials of Australia and New Zealand (HCOANZ), take the lead in coordinating and promoting heritage training. The recommendations went further, advocating for the increased targeting of government policy to stimulate demand for, and raise the quality of, specialised trades and heritage professionals, and also urging for a major review of both secondary and tertiary level competencies.

Somewhat disappointingly considering the scope of the report, no attempt was made to quantify the size or economic contribution of the Australian built heritage sector.

12 Précis. The Retention and Development of Traditional Craft Skills in England, Workshop held at the Heritage Office, Parramatta, Sept 12, 2007. <http://www.environment.nsw.gov.au/resources/heritagebranch/heritage/RetentionDevelopmentTraditionalCraftSkillsEngl andprecis.pdf>

13 HCOANZ Heritage Trades and Professional Training Project, September 2010. www.environment.gov.au/resource/heritage-trades-and-professional-training-project

14 HCOANZ Heritage Trades and Professional Training Project section 3. 29.

This omission was repeated in the Heritage Trades Skills Report (2012).¹⁵ Commissioned by the Construction & Property Services Industry Skills Council (CPSISC) and Heritage Victoria on behalf of HCOANZ, the study directly canvassed construction industry contractors. The CPSISC report found that the majority of respondents were small businesses “dabbling” in heritage projects, a characteristic similar to the UK experience.

Interestingly, less than ten percent of respondents declared heritage work to be their core business activity, yet almost one quarter identified themselves as “heritage trade specialists”. The authors, it is felt, did not adequately pursue the possible explanations of this anomaly.

It may be possible that the “heritage specialist” branding is being misapplied, or that proponents overstate their skillsets, an issue identified in Irish studies.¹⁶

Reiterating the findings of the Heritage Trades and Professional Training Report (2010), demand for heritage works is not regularly sufficient to maintain small businesses—almost half described heritage activity as “quiet”. Again, the lack of current and meaningful data in terms of heritage related economic activity remains problematic.

Only half of respondents intended to train apprentices. Confidence in the generic trade competencies acquired at TAFE was generally high, however many felt that the inclusion of restoration and repair modules would be beneficial.

What was clear from the CPSISC study (and consistent with UK findings) was a firm belief that post-trade “top-up” training was required to work successfully in heritage repair, restoration and renovation. Three quarters of respondents expressed intent to provide existing staff heritage skills training in the future;

however, the availability, cost and perceived quality of courses were identified as barriers to off-site training.

The report recommended the increased use of units from the “heritage restoration stream” of Certificate IV in Building and Construction (Specialist Trades) offered as electives at Holmesglen College, Victoria.

Summary of the Literature Review

In contrast to the United Kingdom, the relatively smaller Australian built heritage sector remains fragmented, and cohesive representation of specific education agendas has been delayed.

- » Accurate data on the economic contribution of the Australian heritage sector, and the workforce required to maintain it, is deficient.
- » An ageing cohort of heritage practitioners is consistent with post-trade specialisation pathways yet limits opportunities for knowledge transfer.
- » Employers in general support training but find access to suitable courses limited, while educators have been slow to respond due to limited demand.
- » Reform of educational funding and qualification structures may assist in reversing the general decline in trade participation.
- » Opportunities exist for promoting and extending traditional trade heritage specialisation in the secondary educational system.

¹⁵ Construction and Property Services Industry Skills Council (CPSISC), Heritage Trade Skills Report, August 2012, prepared by Georgie Cane of Performance Growth Pty. Ltd., CPSISC, Belconnen ACT, 2012. www.cpsisc.com.au/.../Report%20Heritage%20Trade%20Skills%20%20to%20CPSISC.

¹⁶ National Heritage Training Group., Skills Needs Analysis of the Built Heritage Sector in Ireland 2009, 45. <https://www.citb.co.uk/documents/research/traditional-building-craft-skills-ireland-2009.pdf>

The Australian Context

The following summary of the Australian stonemasonry work force has been presented to illustrate similar challenges to the various building occupations with ongoing shortages in specialised trade skills.

Under the Australian and New Zealand Standard Classification of Occupations (ANZSCO). Stonemasonry has been assigned the occupation code Unit Group 3311 Bricklayers and Stonemasons, which in 2017 was estimated to provide employment to 24000 persons, however only 16% of census respondents identified as Stonemason, or around 4000 individuals. 2011 census data indicates only 39% of respondents who identified their main occupation as Stonemason had attained a formal qualification. Over 12 % of stonemasons are overseas trained.¹⁷

Certificate III in Monumental Stonemasonry is offered through TAFE in Brisbane, Sydney Melbourne and Perth. South Australia has contracted a Registered Training Organisation (RTO) Apprentices from Tasmania must travel to Holmesglen, Victoria. Nationally, an average around seventy new tradespersons enter the combined stone industries workforce annually following attainment of the trade qualification.¹⁸

The Department of Employment estimates that 70% of stonemasons work in the manufacturing sector, predominantly the kitchen and bathroom suppliers¹⁹. The remainder collectively represent the stonemasons with skillsets suited to landscape and new construction, and heritage restoration specialist.

Around 2000 firms advertise stone and related services.²⁰ Employers across the industry consistently report recruitment difficulties, with only 40 % of advertised

positions filled. Employers in the Restoration and Funeral Monument sectors face critical shortages, with only 13% of advertised vacancies being filled.²¹ As a result, the industry relies heavily on non-qualified trades assistants.

“Shortages of stonemasons persist. Employers have difficulty hiring stonemasons who have specialist skill sets and, in most states and territories, there are also shortages of those with more generalist stonemasonry skills. Employers in Queensland and Western Australia, though, recruit without marked difficulty.”

The stonemasonry trade consistently sits on the national Skills Shortage List.

Conservation stonemasonry

Specialised conservation stonemasonry activities are distinct from the skillsets of “new build” stone construction. The primary objective is to stabilize and maintain original fabric. Interventions that introduce new material need to be carefully considered and endeavor to be faithful to the original.

Interventions to built fabric range from undertaking routine maintenance and repair, to the adaption of structures to accommodate a new use or function. Any of these activities has the potential to negatively impact the site. The sensitivities in handling original building fabric, and inserting new material, require many or most of the skill sets previously outlined.

Specialised skillsets include:

» Drystone and rubble wall construction

17 <https://industry.gov.au/Office-of-the-Chief-Economist/SkilledOccupationList/Documents/2014SOLOccupationalSummarySheets/3311BricklayersandStonemasons.pdf>

18 Labour Market Research and Analysis Branch, ANZCO 3311-12 Stonemason, released September 2016 Department of Employment', https://docs.employment.gov.au/system/files/doc/other/331112stonemasonaus_2.pdf

19 Labour Market Research and Analysis Branch, ANZCO 3311-12 Stonemason, released September 2016 Department of Employment', https://docs.employment.gov.au/system/files/doc/other/331112stonemasonaus_2.pdf

20 Yellow Pages: "Stonemason" search conducted 11/10/2017. <https://www.yellowpages.com.au/search/listings?clue=Stone+mason&locationClue=Australia&lat=&lon=&selectedView Mode=list>

21 Labour Market Research and Analysis Branch. Department of Employment ANZSCO 3311-12 Stonemason released September 2016

- » Restoration of stone elements with mortar repair
- » Indenting new stone elements
- » Correct application of hydraulic lime products
- » Use of appropriate stone cleaning technology
- » Correct set out and bonding of stonework to openings and arches
- » Banker masonry skills to accurately reproduce intricate architectural moldings shapes
- » Drawing techniques

Fellow's Biography

Tim Havilah is a conservation stonemason with over twenty years' experience undertaking façade repairs to many of Sydney's fine sandstone churches and civic buildings. Tim was introduced to stonemasonry through landscape construction, which led to a position with a leading stone company whilst on a working holiday in the United Kingdom. During these extended travels, his interests in archeology, history and architecture led him to visit numerous World Heritage Sites in Central America, Asia, India, Turkey and Europe. As a member of the International Council of Monuments and Sites (ICOMOS) he has maintained a professional interest in historic building conservation and aspires to one day work on an iconic world heritage site.

Tim has recently completed the Masters of Heritage Conservation program at the University of Sydney Faculty of Architecture. Taking the recurrent listing of stonemasons on the National Skills Shortages List as a starting point, his final thesis investigated the current training of stonemasons in Australia at a trade and post trade level. His research led him to examine the heritage sector in the United Kingdom, and their concerted and innovative response to addressing the similar challenges in regard to current and future training of traditional tradespersons to undertake the sensitive repair of historic building fabric.

In 2018 Tim Havilah was selected to act as Youth subcommittee member for the upcoming ICOMOS General Assembly 2020, to be held in Sydney. Tim aims to utilize this platform to raise awareness, promote heritage stakeholder dialogue, and make tangible progress in addressing the issues of skills shortages in the heritage trades, as outlined in this Fellowship Report.

Contact Details

Tim Havilah

12 Allans Avenue Petersham, NSW 2049 | Tim.havilah @hbsgroup.com.au

Qualifications

- » Certificate 3 in Green Keeping
- » Associate Diploma in Applied Science: Landscape
- » Certificate 3 in Stonemasonry
- » Masters of Heritage Conservation, USYD Completed 2017

Academic Awards

- » Deans List of Excellence in Academic Performance
- » Morton Herman Prize in Building Conservation
- » Rodney Connors Prize for Conservation Studies
- » Australian Institute of Building NSW Chapter President's Award

Memberships

- » Aus ICOMOS
- » ICOMOS General Assembly 2020 – Youth Forum Subcommittee member

Abbreviations and Acronyms

ABS	Australian Bureau of Statistics	DET	Department of Education and Training
ANZSCO	Australian and New Zealand Standard Classification of Occupations	DSWA	Dry Stone Walling Association
APT	Association for Preservation Technology International	HCOANZ	Heritage Chairs and Officials of Australia and New Zealand
AQF	Australian Qualifications Framework	HES	Historic Environment Scotland
BCA	The Business Council of Australia	ICOMOS	International Council on Sites and Monuments
BCC	Building Crafts College	IHBC	Institute of Historic Building Conservation
CCB	The Cotswolds Conservation Board	ISSI	International Specialised Skills Institute
CITB	Construction Industry Training Board (UK)	NHTG	National Heritage Training Group (UK)
CSCS	Construction Skills Card System.	NVQ	National Vocational Qualification
COTAC	Council on Training in Architectural Conservation	SPAB	Society for the Protection of Ancient Buildings
CPSISC	The Construction and Property Services Industry Skills Council	TAFE	Technical and Further Education
CWF	The Cathedrals' Workshop Fellowship (UK)	UNESCO	United Nations Education, Scientific and Cultural Organisation
DEEWR	Department of Education, Employment and Workplace Relations	VET	Vocational Education and Training

4. Fellowship Learnings

In June 2017 the Fellow, Tim Havilah, commenced his Fellowship tour in the United Kingdom and later in Italy. The objectives of his study tour were three-fold. The Fellow sought to develop his practical skills and stoneworking knowledge in techniques ancillary to his vocational experience. Secondly, he realised the opportunity to observe fine architectural stonework and the best practice techniques in contemporary conservation. And lastly, his itinerary took him to various stonemasonry training centres.

This primary aim of this fellowship paper is to detail aspects of the United Kingdom traditional trades training with potential for application in Australia. The ISSI Fellowship Study Tour also permitted the Fellow to attend practical workshops in stoneworking techniques. A summary of his international Fellowship component follows.

Pietrasanta, Italy

The historic city of Pietrasanta, near Lucca in Tuscany is a mecca for both artists and art aficionados. Over the years many artists have found their way to Pietrasanta and have stayed there for varying periods of time. Artists can work there in one of several marble studios. The whole town breathes art and it is to be found (mostly as modern art) on every square and in almost every street. A large number of monumental contemporary sculptures located in public spaces both in the town centre and surroundings, a clear sign of the strong connection between Pietrasanta and the masters of sculpture who worked here or are still regular frequenters of local workshops.

At one corner of the central piazza, in a former convent, is the Museo dei Bozzetti, (Maquettes' Museum), which houses a collection of hundreds of models donated by artists who have worked in the area, dating from the beginning of the century and still growing. The models are a fascinating educational display for sculptors, guided tours explaining the many “meanings” of the museum—that is, the history of local sculpture, what a model is, the techniques used to accurately copy the details of model to the block of stone.



Collection of plastercasts for reproduction (Museo dei Bozzetti)

On high recommendation from a friend and fellow mason and only minutes' walk from the town centre, TIM attended La Cooperativa Barsanti'. The grounds are home to a collection of marble carving workshops, a Bronze foundry and mosaic studio, who's proprietors collectively acquired the factory of a former marble magnate, the Barsanti family.

On entering the gates, the Fellow was immediately met by a profusion of statuary pieces, of both classical and modern design. The Fellow carefully parked his little car in a small space among a vast pile of stone slabs, of a bewildering range of colours and varieties. The place hummed with the sound of pneumatic and electric tools, and the smoky forklifts moving pieces around the site.

The Fellow was met by German sculptor and artisan Christian Lange. Having undertaken his training in Germany at Freiburg Christian came to Pietrasanta to further develop his carving skills and landed a job working for the Barsantis. When the Barsanti empire closed its operations, Christian was instrumental in saving the premises as part of the town's marble working heritage. For over 20 years he had called the town home and ran a small team specialized in the execution of commissioned sculptures and custom artwork and pieces for design and architecture.

In practice, sculptors will experiment with spatial and compositional arrangement in preliminary modelling in clay or wax. Once finalised this form will then be cast in plaster, which provides reference points for reproduction of the sculpture. Many 'artisan' sculptors do not personally undertake the carving work in stone preferring to outsource to experienced studio crafts persons such as Christian.

To supplement the fluctuating demand for artworks fluent in Italian, English and German and French, for the last decade he had offered tuition in sculptural techniques to mostly international students.

Tim observed the fellow sculptors as they undertook the replication of artists models in stone, the mainstay of the commercial operations of the studio. Daily,

artists would drop off their maquettes, or collect the finished piece. Two of these were German masons, on extended stays to master the art thanks to a remarkable grant system offered by the European Union for newly qualified tradespersons to travel and further their studies called the Erasmus program.

On the walls of the workshop, with a thick coating of marble dust, were countless plaster-casts of religious motifs and saints. The faithful reproduction of these models entails a Renaissance technique that remains largely unchanged to this day in the making of one-to-one copies, known as the "indirect" method of carving, the artisan employs the "macchinetta di punta" or pointing machine.

To commence, the model is attached at three reference points directly corresponding to the dimensions of the raw stone block from which it will be carved. To these datum points is attached a T shaped wooden arm, or 'the cross', to which the pointing device is then attached - a set of three movable, sliding and rotatable arms which the sculptor sets to critical correspondents on the model.

The sculptor then proceeds to "waste" the excess stone to permit the transfer of the machine to their sculpture. As the roughing out process becomes closer to the desired contour, the sculptor then proceeds to carefully drill the required three-point co-ordinates, and carefully trim down the remaining stone in between by chisel.

The reference points, on both the model and stone are marked with pencil. The process is then repeated up to hundreds of times, in effect a three dimensional 'join the dots' exercise.

The technique has advantages in that the specific procedural process provided by the method is very controllable, and that the chance of making irreparable mistakes in the end result is reduced drastically.



La macchineta di punta, employed to make accurate reproductions (photo credit Wikipedia)

Due to the Fellow's limited stay at the studio, it was decided that it was best to "free-carve" his piece. In order to get an impression of my intended sculpture, a photographic study was made of a mason's arms holding a mallet and chisel freeing themselves from the stone from which they emerge.



Photographic study of Mason's hand and tool posture (credit TH)

Christian provided modelling clay for which to make the model. Once the basic form had been modelled, grid references were made in the clay, from which we scaled up the coordinates and transferred to a block of fine white Carrara marble. For ease of measurement and comparison, the sculpture was scaled at 1:1. Once the preliminary marks were made on the top and sides of the block, the Fellow then proceeded to "waste" or remove large portions of stone in order to get closer to the forms with

a grinder. The first detail to be fixed was the location of the mallet head and the general form of the arms.



Preliminary 'wasting' of stone to reveal desired forms (TH)

Changing to a pneumatic gun and tungsten chisels, the next stage was to begin to define the right hand thumb, and to locate the chisel held in the left hand, and below it begin to define the left hand. ,The Fellow made repeated studies of his own hands in natural positions, periodically using calipers to accurately measure the components, and drew lines in pencil indicating what stone should be removed, and where to refine the remaining stone. Christian stressed the importance of leaving material to make adjustments.

Slowly, having identified where the knuckles sit, the fingers took shape. As he gained confidence, Tim 'located' the mallet handle, and looked for how the fingers in the right hand would emerge from the concealed side. Once the two hands had been roughed out, the Fellow then proceeded to 'break through' the space between the two hands, liberating the forms and bringing a sense of life to the sculpture.



The piece at the end of the week spent in Pietrasanta carving workshop(TH)

During the course of my week, Christian offered the Fellow quite a few good tips.

- » The eye is adept at registering inaccuracies in anatomical forms: - the human body contains no straight lines, work in gentle curves, with tool marks parallel to the desired contour.
- » Natural positioning and proportions are essential; use the finger knuckles and joints as a reference.
- » Retain a portion of original block surface as a record of the size of the block upon commencement.
- » It is quite acceptable to leave some background "in finito' or unfinished, a revolutionary technique attributed to Michelangelo.
- » Heavy tool marks in the background give the impression of a work in progress, giving a sense of drama as if the forms are 'emerging' from the block.

Among the work benches were scattered sculptures, finished and incomplete. In Pietrasanta it seemed, art in stone adorned every street corner. Indeed throughout his Italian Grand Tour The Fellow was reminded of Stonemasonry's long tradition

Workshops

Dry Stone Walling Workshop

With over 4,000 miles of dry stone walls in the e Cotswolds region, the quintessential rural landscape is deserving of its designation as an Area of Outstanding Natural Beauty from 1966. The maintenance of the heritage listed landscape features is an important part of retaining the visual unity and landscape character.

For the past nine years The Cotswolds Conservation Board (CCB) has run an annual programme of training courses aimed at teaching people the methods and techniques involved in traditional Cotswold skills and crafts.

In addition to hosting introductory short courses in traditional rural skills such as thatching, woodland management and blacksmithing The CCB has partnered with the Dry Stone Walling Association (DSWA) to provide accredited training courses in the traditional skill of dry-stone walling. Instructors are DSWA members, trained to construct new work and repair works in conservation in the local vernacular styles.²²

The courses begin with the two introductory workshops, or by attending a Level 2 intermediate weeklong workshop with final assessment attendees entitled to become a professional member of the Dry Stone Walling Association. A twelve day, level 3 advanced certificate provides instruction on more complex structures and landscape features, a higher level of craftsmanship.

Due to time constraints, The Fellow attended the two day beginners' course, instructed by a locally trained dry stone wall specialist. She proudly told us that she regularly competes in drystone walling competitions and was a former world champion. She stressed the importance of studying the predominant local style, determined in general more by the characteristics of the local stone as that of the creativity of the waller. Stone selection is critical in the repair of aged fabric, as many of the traditional quarries have closed, and modern harvesting equipment can leave visible marks or cause unseen damage to the stone.

The salvaged stone selection was graded, keeping the larger pieces for the wall ends, known as 'cheekends'. The participants then erected temporary profiles to carry the string lines used to keep the wall straight and to the desired camber, around one to six.

The individual stones were then placed upon the wall, with attention paid to bridging the joints of the stones below. A well laid stone has a small fall towards the wall face, to shed water that may damage the wall as the water expands on freezing. It is also desirable to have tight joints, that may allow plants to take hold.

Depending on the concealed stone shape, it may be necessary to wedge the piece with small shards to prevent rocking.

At intervals of one metre, stones were placed with their short face showing, acting as bonding stones between the two wall faces. If longer stones are available, they can be cut to be visible on both faces, termed 'through' stones they also provide strength to the wall. With a few firm blows from her mason's hammer, Cathy quickly dressed a few stones, however, working individual stones is discouraged.

Stones without flat bedding planes are reserved to be used in a vertical orientation finishing the copings, with various styles known as "cock and hen" or "hen and butt" (refer photo). An experienced Waller can complete around four square metres of wall per day.

Work shop participants were mostly local amateurs wishing to undertake works at home including one young landscaper attending the course to learn the art in advance of an upcoming work project. Despite the unseasonably hot weather, the comradery among the team was high.

Cathy also gave some maintenance and care advice:

- » Regularly Remove vegetation from the side of walls once a year, to allow inspection and prevent the growth of woody weeds
- » Cut vegetation from the side of walls once a year. This will allow the wall's condition to be checked and will prevent the growth of woody vegetation. It will also 'air' the wall and help prevent frost damage.
- » Do not allow trees to grow beside walls. Their roots can make foundations unstable and the tree trunk could eventually push the wall over.
- » Remove ivy from walls as soon as it emerges, as this will weaken the whole structure. Walls already overgrown with ivy may need complete reconstruction.

- » Replace coping stones or their equivalent as soon as they fall off. They give the wall additional strength.
- » Repair any damage to walls as soon as it happens. If left untreated, the damage will get worse and the cost of repair will increase.



In unseasonably hot conditions workshop participants rebuilding both faces of the wall



Careful selection of infill material to prevent rocking.(TH)



© Countryside Agency - Photographer Nick Turner 03-7332

Installing Cock and Hen Coping Stones (Nick Turner Drystone Walling Association)

Slate Letter Cutting Workshop , New Brewery Arts , Cirencester



The adapted industrial building complex housing the New Brewery Arts centre, Cirencester

Whilst in Gloucester, The Fellow travelled to Cirencester to attend a three day stone letter cutting workshop at the New Brewery Arts Centre.

The premises had lain dormant since the closure of the Cirencester brewery in 1937 and were earmarked for demolition. However, in the late 1970's a local group successfully lobbied for two of the remaining buildings to be repaired and converted into craft workshops.

The aims of the charitable entity managing Cirencester Workshops was to support craftspeople with a fair rent, encourage them to produce creative work of a high standard, and a place to display and sell their crafts. Among other crafts represented the centre houses studios for glass blowing, ceramics, fine joinery and silver Smithing. The centre regularly runs short courses in numerous art and craft traditions.

The model has proven to be financially viable, in 2006 the public spaces were redesigned and refurbished, and a popular café opened. In 2016 New Brewery Arts opened The Barrel Store, providing affordable and comfortable hostel accommodation for visitors to Cirencester and New Brewery Arts.

Decorative Glass Blowing worksop at the New Brewery Arts Centre (credit TH)

The Fellow was most fortunate to be tutored in Stone letter cutting by the well-known Tom Perkins, who's commissions include a large opening plaque for the Queen's Gallery at Buckingham Palace.

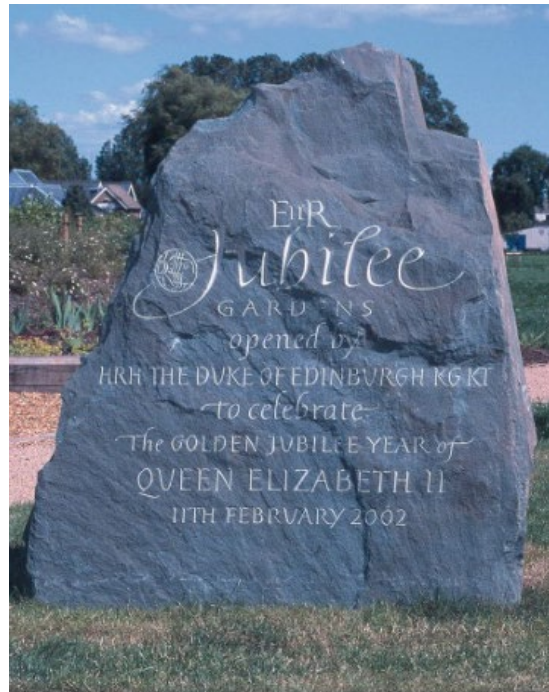
Trained in calligraphy at the Reigate School of Art and Design during the



1970's, his enthusiasm and experience in the medium has seen him acknowledged as a Fellow of the Calligraphy and Lettering Arts Society, Temenus Academy, and The Royal Society of Arts and the Society of Designer Craftsmen. He is also a member of Letter Exchange and the Art Workers Guild.

His authoritative book, *The Art of Letter Carving in Stone* was published in 2007. His work is displayed internationally, and he also conducts regular courses in teaches Letter carving in stone all levels at the local West Dean College, and the Princes School of Traditional Arts in London.

Tom Perkins (assisted by Helmet Hochrein), V-incised riven Cumbrian green slate boulder. Commissioned by East Cambridgeshire District Council for the Jubilee Gardens, Ely (reproduced from Art of Letter Carving in Stone, by Tom Perkins.)



Tom commenced the workshop outlining the early twentieth century renaissance of modern letter carving, with the rediscovery of edged-pen calligraphy stemming from the Arts and Crafts movement initiated by William Morris in the late 19th Century, combined with a renewed interest in classical Roman capitals.

He then introduced us to the two main hand tools, the dummy mallet and the short tungsten tipped chisel, and the various grips for holding them with comfort. Placing a piece of honed slate almost vertically on an adjustable letter carving

easel, he then demonstrated the basic techniques for V-incising the key strokes of letters.

Commencing by entering the cut at the 'serif', the desired form of the letter is defined by carefully working along the central line of the individual component shapes of the letter, either round or straight, in a controlled series of operations.

Thinner 'strokes' are cut to a reduced depth: wider elements, such as the vertical leg of a capital R are cut deeper, the optimum V cut being a square 90 degrees, the two planes equating to the width of the chisel.



Working Stone on Easel (Reproduced from Art of Letter Carving in Stone, by Tom Perkins)

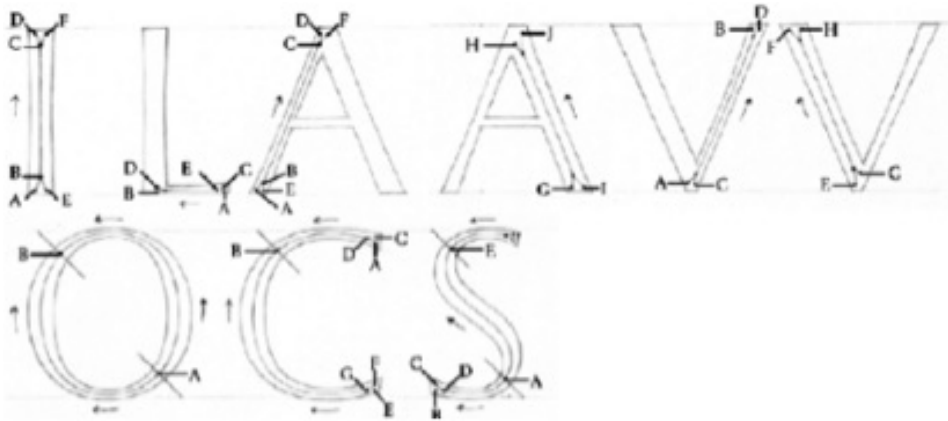


Diagram showing procedure for carving the component stems, horizontals, curves and diagonals, (reproduced from *Art of Letter Carving in Stone*, by Tom Perkins)

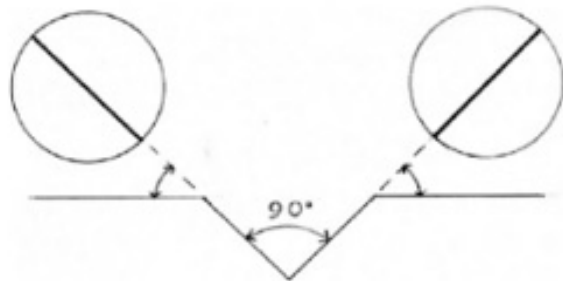


Diagram showing correct angle of chisel when letter cutting (reproduced from *Art of Letter Carving in Stone*, by Tom Perkins)

Beginners to the art were then encouraged to draw up single letter forms and attempt the cutting action. It was suggested that larger letters were easier on which to commence.

I spent the majority of the first day drafting the letter forms of my inscription on paper. Tom explained the proportions of the three typical sizes, the largest being a

basic square in which the largest letters, such as the O and Q are contained. The second largest set-out is two thirds of the square, in which sit E, L, S and Y. The smallest letters, such as I and J occupy a space equal to half the height of the letter. For visual reasons, circular strokes such as C and O are extended slightly beyond the horizontal tram lines, while some strokes thin out when coming out of the rounded form. Individual letters are then carefully positioned to give a balanced and harmonious “space” between the forms.

When the paper drafting exercise has been finalised, a piece of carbon paper is first taped to the polished piece of stone, with the paper draft then overlayed. With a hard, sharp pencil, the draft is retraced and thereby transferred to the piece. Once the paper has been removed, any details without clarity are re-done in a white pencil, with the central line of the V cut also defined.



Detail showing V-incised alphabet in Portland limestone (Tom Perkins)

Now ready to commence the letter-cutting exercise, Tim placed his piece vertically on the artist's easel, lent against the wall and began to introduce the cut from the serif. Being accustomed to working stone from above on a bench, at first I found the vertical arrangement slightly un-natural. Tom explained how the easel has advantages when larger pieces are undertaken, where reaching across a bench becomes hindered by the width of the stone. Tom also finds the easel more ergonomic, reducing fatigue after many hours at work. The arrangement also permits you to view the developing piece as it will be ultimately read.

Tom distributed some print outs that explained the preferred sequence of operations to cut the individual letters. By firstly defining the central line of the cut it effectively forms a guide for the chisel as repeated passes are made until the V cut reaches the desired edge of the letter. It is critical to hold the chisel at the correct angle to the plane of the piece, risking putting a concave wall to the cut, or worse cutting too deeply. Slate has a much finer grain than my more familiar sandstone, but if the mallet stroke is consistent, a very flat and clean cut can be achieved.

Being right handed, certain actions, such as the right hemisphere of the O, and the right up stroke of the A were relatively more comfortable. Replicating the opposing stroke of the letter proved more difficult, particularly when required to cut from the top down.

Tim's inscription had a number of S forms, replicating the arcs with precision on subsequent letters proved particularly challenging. Periodically, Tom would inspect the progressing work, offering to clean up certain elements with his experienced hand.



The Fellow nearing completion of the piece (TH)

Tim completed his piece, with the intention of cleaning up a few features upon his return home. Whilst his familiarity with the tools and techniques were an advantage, the length of my inscription was challenging in the limited two days spent cutting the letters. Good letter cutting takes time, and attention to detail.

The Fellow came away with an understanding of how careful planning and drafting is critical to the visual unity of the finished piece.

The Building Crafts College



Coat of Arms, entry to Building Crafts College, student work in Portland limestone (credit TH)

Founded in 1893 by the Worshipful Company of Carpenters, The Building Crafts College was established to train young people in a range of construction crafts including roof plumbing, lead work and solid plastering. Formerly occupying a site in central London, the college relocated to the current, purpose-built facility in Stratford, East London in 2001. The catchment of students is mostly from greater London.

The Carpenters arm of the college currently offers practical training and workshops dedicated to timber construction, site carpentry, wood machining, bench joinery and furniture making. Additionally, the BCC offers trades training in bricklaying, concrete formwork and stonework.

Tim was kindly provided a tour of the facilities by National Project Manager Graham Lee. Graham was instrumental in administering the Traditional Building Skills Bursary Scheme. He explained a typical training project required the students to firstly design a piece and prepare a set of detailed shop drawings, produce the required templates, and then execute the works, often in a reduced scale for economy of materials. While The College benefits from the donation of salvaged materials and offcuts made by commercial firms for student use, the cost of timber and stone remains a significant operational overhead.



Carpentry work stations (TH)



Carpentry and Joinery student completing his major work (TH)



The stonemason's work station, the banker



Completed major works, Building Crafts College Stonemasonry Department

The Fellow met with head stonemasonry tutor Nigel Gilkison, himself a former student of the BCC, who first worked with stone from the age of thirteen. In 2016 Nigel was awarded the prestigious Mason's Company Master Crafts Certificate.

Nigel outlined the emphasis given to the use of manual techniques of working stone with mallet and chisels. These techniques are preferred as they most faithfully replicate the original production processes and surface finishes found in historic building fabric. Nigel observed that in acquiring proficiency in manual skills in the classroom environment, and in doing so gaining an appreciation of the fine tolerances that may be thus achieved, the student has a solid grounding for application of their skills in the work environment.

They discussed the reality of the contemporary commercial workplace, where much of the stonecutting process is mechanized, Due to cost constraints and competitiveness the modern workshop relies heavily on specialised plant, electric and pneumatic power tools, greatly reducing the time spent on the laborious preliminary operations in stone cutting, and repetitive secondary and finishing operations.

While the college does have designated equipment in isolated booths to minimize exposure to air born dust, due to the college's OHS obligations, mechanized techniques are unacceptable in the class room environment. In addition, the use of pneumatic tools must be controlled, due to the risks of causing permanent nerve damage, known as "vibration white finger". As a result, students "air time" must be regularly recorded in log books.

Nigel displayed examples of student's major works, that replicate architectural features commonly encountered in historic buildings. The student's individual pieces are then brought together and built, as tracery windows, arches, pinnacles etc. (see photos)

Students at all levels are encouraged to publicly display their finished works in trade expositions, and to participate in skills competitions. In June 2017 a BCC

stonemasonry apprentice came first in the UK Masonry Skills Challenge.

The BCC also regularly conducts overseas study trips for the stonemasonry and conservation students. As the students returned from their extended summer break, Nigel had scheduled a visit to Florence Duomo and the mason's workshops, Pisa and the Carrara marble quarries.

Courses and Qualifications

The BCC offers six courses targeted to differing levels of proficiency on the National Vocational Qualification (NVQ) framework. Pre apprenticeship courses (NVQ 1) are aimed at school leavers, offering an introduction to typical construction trades, and OHS awareness and elementary site calculations. Students undertaking the apprenticeship level courses typically attend in two-week blocks, however evening classes are offered in specialist modules of wood and stone carving techniques. Stonemason apprentices must complete the Level 2 entry level Diploma as a pre-requisite for undertaking the (Level 3) qualifications of Advanced Diploma, specializing in banker work techniques, or the Heritage stonemasonry stream, tailored for on-site conservation specialisation.

Following attainment of trade proficiency qualifications, the next progression for those wishing to pursue an occupation in Building Fabric Conservation is the Level 4 Diploma in Conservation Construction Site Supervision.

In this syllabus, the learner will attain key practical skills and knowledge in generic construction core subjects of programming and trades co-ordination, costing, observance of OHS mandatory requirements and Standards compliance . Elective modules allow for the specialised tasks of recording, activity planning and works supervision required on works to historic or aged building fabric. The BCC website provides links to relevant trade placement opportunities.

Council on Training in Architectural Conservation (COTAC)

The Building Crafts College premises is also home to the Council on Training in Architectural Conservation (COTAC). Formed in 1959, the Council's primary objective is to provide knowledge in support of training and education in the arts and skills required to protect and preserve the historic environment.

COTAC has adopted an integrated approach, consulting with craft specialist occupations. Since 2003, one of COTAC's key projects has been the drafting of proficiency standards, and the consistent provision and review of accredited training for conservation professionals across all disciplines.²³

COTAC has developed an online CPD program, called "Understanding Conservation", syllabus targeted to heritage sector professionals seeking institute accreditation.

The two key features of COTAC's CPD program are Awareness of historic environment conservation matters and an appreciation of inter-related disciplines "Skill sets". The program is not intended to provide answers but merely stimulus and routes to comprehension and broader understanding of the philosophical knowledge base and skills necessary to act as a conservation practitioner.

The modules cover:

1. Cultural Significance, and the fundamentals of current conservation philosophy and ethics, aesthetic qualities and values
2. Investigation, materials and technology
3. Social & financial issues
4. Implementation and management of conservation works:

The Understanding Conservation online CPD is also very useful for crafts workers who wish to expand their skills and knowledge in building conservation. The online delivery is self-paced, accessible and teaches common skill sets.

M Graham Lee notes that COTAC is also developing the site further with an on-line school, which will give those interested the opportunity to work through a series of training modules and obtain a certificate of achievement.

The Cathedrals' Workshop Fellowship (CWF)

Founded in 2006, The Cathedrals' Workshop Fellowship (CWF) is a group of nine Anglican cathedrals which have joined together to create a new generation of crafts men and women capable of undertaking the restoration and conservation of cathedrals and heritage buildings.²⁴

The participating cathedral sites are Durham, Exeter, , Lincoln, Salisbury, Winchester, Worcester and York Minster. The Fellow was most honoured to be invited to visit the cathedral workshops of Gloucester and Canterbury Gloucester

The CWF has two purposes:

1. To standardise and promote the training of stonemason apprentices in English Cathedrals.
2. To provide an accredited training development for stonemasons to Foundation Degree Level, working in partnership with the University of Gloucestershire

Stakeholders

A key partner and sponsor of the CWF program is the Worshipful Company of Masons. Participating cathedrals are eligible to apply for financial assistance

²³ <http://cotac.global/resources/1-Edinburgh-Group-Terms-of-Reference-2016.pdf>

²⁴ <https://cwfcathedrals.co.uk/about/>

for the apprentices training period, the Masons' Company Apprentice Support Scheme.²⁵

The support scheme is also available to appropriate public institutions and other charitable bodies which train masons, including the Canal and River Trust, English Heritage.

The Masons Livery Co also works with and supports Building Crafts College in Stratford, East London, and the City & Guilds of London Art School.

GLOUCESTER CATHEDRAL

The first recorded use of Gloucester as a religious place of worship dates to 678 AD, with Benedictine rule introduced in the early 11th Century. Under the direction of the Normans, building works began to enlarge the abbey church, the monastery rapidly grew to be a powerful institution, with extensive landholdings and income from the wool trade.

In 1216, the nine-year-old Henry 111 was crowned here. Major building works continued in the 13th century with the construction of the first Lady Chapel and new Tower and refectory. The place became an important pilgrimage site, when the murdered King Edward II was buried here in 1327, a shrine –like monument was erected over his tomb.

With Royal patronage, and a continued stream of income from devotees, the Norman fabric was substantially and progressively remodelled in the very latest “Perpendicular” style. By the 15th Century, the abbey church had attained its current configuration, with a new west end crossing tower and re-built Lady Chapel.

With some resistance, in 1541 the monastery was dissolved, and its lands

confiscated by Henry V111. Due to its magnificence and Royal links Gloucester was spared the widespread destruction of the dissolution, the building became a cathedral with Henry appointing the first bishop of his newly formed Anglican Church.

Gloucester Cathedral was a central player to the ideological and doctrinal struggles of the 16th and 17th centuries, and narrowly escaped demolition under the orders of Oliver Cromwell; much of the intricate stained glass was senselessly destroyed. There is evidence that the gargoyles were used for target practice by the Puritan soldiers and the stonework on the south aisle shows impact holes from musket balls.

Between 1735 -52, major repairs were undertaken to halt the neglect of previous centuries, continued over later by the Victorian Architect and noted gothic revivalist Sir George Gilbert Scott.

In 2014 , a campaign was launched to have Gloucester Cathedral inscribed as a World Heritage Site, and a 5 million pound program of works secured to maintain the fabric and improve visitor experiences.

Arriving at the Cathedral Grounds early in the morning, while studying the stonework, Tim met the Verger as he opened up the cathedral prior to the arrival of the days visitors. As they discussed his intentions to meet with the stonemasonry team, Verger kindly allowed Tim to enter with him, and then left the Fellow to contemplate the vast interiors on his own, in complete silence.

Principally a place of religious worship and contemplation, the interior provides the stonemason a feast of architectural details for inspiration. Built over a period of five centuries, the fabric of the building clearly articulates the ongoing development of the stonemason’s art, and the corresponding changes in architectural styling.

Nevertheless, the interior possesses an imposing and uncluttered grandeur. The eye was drawn to the soaring vaulting, with distinct changes in configuration corresponding to the progression in the bays.

The scale of the interior was truly inspiring, the smallest details slowly discernible as the morning sun streamed in through the Great East Window.

The Fellow then proceeded under the remains of a ruined medieval arcade and down a small lane to the unassuming gates of the nearby Stonemasonry Workshop.

There he was met by Pascal Mychalysin, Master Mason overseeing the restoration team since 1996. In his rich and thick accent, he explained how he had been trained in his craft under the French “Compagnion” apprenticeship system, after which he embarked on a working tour of his native country, emulating the medieval “journeyman” tradition.

Having introduced the Fellow to his permanent staff of seven masons, Pascal gave him an introductory history on the development of the structure.

“Gloucester is an extraordinary building, made from very different constituents. It may not be the biggest cathedral, but it is certainly one of the most interesting – historically, architecturally and ascetically it is fascinating in its complexity,” he said.



Morning light through the Great East Window (Credit TH)

Admiring the looming 15th Century crossing tower from vantage point of the workshop, he proudly detailed the first of his works at the cathedral, the restoration works, completed over 20 years ago.

They discussed the restoration philosophies that guided the program of façade restoration works. Of highest priority was the identification and stabilization or replacement of elements at risk of falling; aesthetics were, in general, a second tier consideration. Whilst the secure funding had seen an expanded program of remedial works, it was not open ended. Pascal was still required to justify all remedial actions and endeavor to keep to budget and program. As a result, some difficult decisions were made to leave behind some of the more deteriorated but sound material, ‘piecing in’ missing details with small stones or other actions such as mortar repair and lime shelter coating.

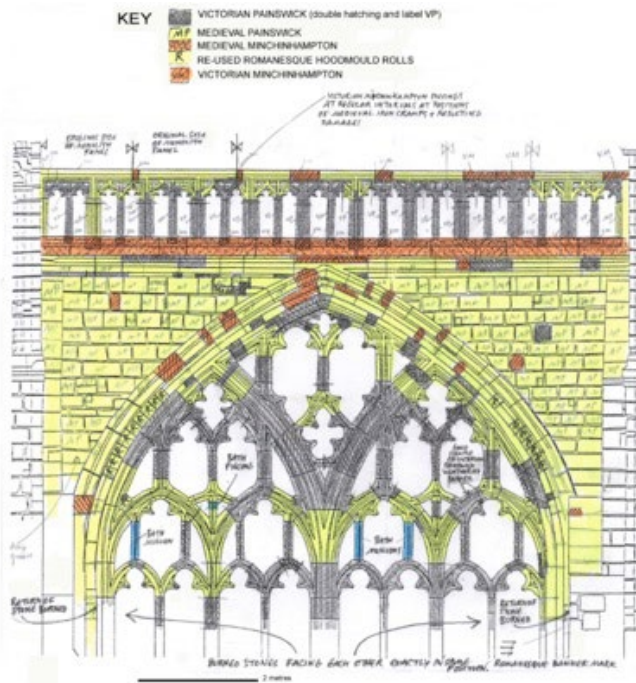
Like many medieval buildings, the cathedral has been constructed and subsequently repaired in a variety of stone types. These are now mostly unavailable due to the closure of the quarry; those that do remain open cannot deliver stone block in the required sizes, or are otherwise compromised by modern mechanical harvesting techniques.

Following an extensive period of research and ongoing evaluation, two main varieties of stone are now used, according to their application. For detailed banker work and carvings the finely grained limestone “Lepine” is used; where durability and structural capacity is required, the density of the calcite crystalline “Beaunautte” stone is preferred. Both being imported from the west of France, Tim inquired how the decision fitted with the conservation principles of replacing with “like for like”?

Pascal had some interesting observations on the matter, questioning the seemingly inflexible “puritan” stance taken by the Society for the Protection of Ancient Buildings (SPAB) and influential conservationist and architect John Ruskin, stating without reservation ‘Authenticity, it’s a myth’.

Being an ancient geological material, for Pascal, the geographical source is not important, the material should be selected for performance and appearance, but cost is also a major consideration. In other words, some degree of pragmatism must be incorporated into decision making.

On the walls of his office were hung the detailed recordings of the stone types identified as being original fabric, or from previous repair works.



Surveyed Stone –types and other details of the 11th Century North Window(Canterbury Cathedral Trust)



Survey of Gloucester Cathedral North Transept, (Phase 2 , north Gable Archaeological report 2007)

Pascal explained how the previous repairs in the Victorian period were generally well executed, however, they had suffered accelerated deterioration due to widespread use of the then newly ‘discovered’ cement in the pointing. A considerable proportion of the current works was the removal of the cement material, and replacement with the traditional lime mortar.

For its preferred workability, pointing work done in the early building season used slaked lime in the mortar. However, due to its slow curing properties, slaked lime mortars were problematic as the weather cooled, with frosts having a major impact on the strength of the final product. For this reason, the quicker curing Hydraulic Lime St Astier 3.5 was also used.

Another problem resulting from the Victorian era repairs was the stone selection, sourced from nearby Painswick quarry, as all the good stone had been depleted. A subsequent round of repairs in the 1960’s had used a more durable stone

type; however, the works were marred by poorly executed replication of original geometry.

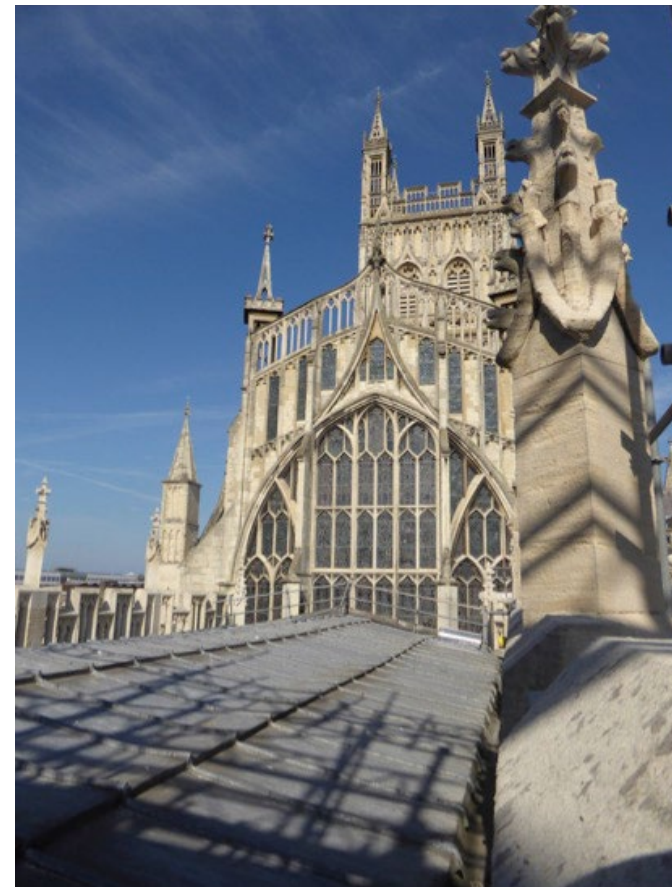


Preliminary Sketches and Model for Carving (TH)

As they spoke, the team was loading some finished stones, to be carried by forklift to the current work site restoration of the 14th Lady Chapel.

Pascal most kindly invited Tim to escort the three men onto the scaffold, and to view the restoration works in progress. Having mentioned the Fellow's recent visit to London's BCC, he chatted freely about conservation stonemasonry and training with local workers James Bayliss and Paul Synan. Whilst undertaking their apprenticeships as part of the Cathedral Workshops Fellowship, both James

and Paul had attended the college, during which time they undertook a study tour of the marble capital of Italy, Carrara. They then subsequently completed the Foundation Degree in Applied Historic Building Conservation and Repair at Gloucester University. Tim was later to learn that James had only recently been the recipient of the 2017 Duke of Gloucester Award for Excellence in Stonemasonry.



View from Lady Chapel Parapet to West Window (front) and Crossing Tower (Credit TH)

Joining the team on the scaffold was senior mason, Weislaw Szot, who had trained in stone masonry and sculptural carving in his native Poland. He too showed great interest in the Fellow's forthcoming carving workshop in Italy. The day's tasks were the installation of a number of richly ornamented finials, finishing off the newly rebuilt pinnacles of the chapel. Being short on hands, they invited Tim to assist in the installation of a number of stones, a great honour.



Raising the last stone to be fixed on the Lady Chapel Pinnacles (TH)



The Fellow assisted in the installation of the Finial, a great honour (Credit TH)



Images of the Lady Chapel Finial Reconstruction (Gloucester Cathedral Trust)



Partially installed open tracery merlots, Lady Chapel Parapet Balustrade (TH)

Once the work was done, James escorted Tim down to the level of the parapet wall. Much of the new work had been installed, awaiting the completion of a number of stones in the workshop. Upon leaving Pascal, after a long and varied discussion, the Fellow again took a lengthy tour of the inside of the cathedral.



Interior, Gloucester Cathedral (source: <https://www.gloucestercathedral.org.uk/>)

The interior of the Lady Chapel was exquisitely conceived and executed, of particular note was the remnants of the coloured lime-wash that formerly was applied to features.



Visible remnants of original lime wash -
Carving by Pascal Mychalysin



The exquisitely executed fan vaulting the cloister walk, arguably a high point in English masonry (TH)



James Bayliss applying templates for an open tracery parapet merlot, using French Lepine limestone due to the tall bed height requirements over 600mm.

Upon his return to the Gloucester Cathedral the fixing works on the Lady Chapel scaffold witnessed on his first visit were on hold. Pascal and his team in were in the workshop, banking merlots and parapet stones for the Lady Chapel.



James commencing work on the merlot: the soft nature of the freshly quarried stone permitted James to cut a chamfer with a hand saw with 10mm wide teeth. (photo TH)

Having cut his chamfer James then evened out the plane using a “French drag” similar in appearance and use to a hand plane, with multiple sets of replaceable serrated teeth set in opposing angles.

Pascal explained that these techniques only became widely available after developments in sheet steel fabrication around 1850, and was widely used in Bath during the later era of ashlar stone construction, giving a very precise accuracy to the facades built in the period.



Master mason Pascal working a stone by hand as we talk

Pascal further discussed the funding arrangements with the National Heritage Lottery Fund. Initially the NHL had reservations in funding a non-competitive tenderer, Pascal had to argue the case that as the resident team, offered ongoing training, the investment served to both conserve and restore the existing fabric, and foster the skillsets of younger tradespersons to continue the works.

Pascal was adamant that even though his team did not go to tender, his ‘not for profit’ team delivered the works at a figure measurably lower than the commercial firms, due to lower running overheads of office staff, advertising and tax exemptions. The regular team also delivered a higher standard of works due to their level of training and supervision, and their “rapport” with the building. He felt

that commercial imperatives had the potential to lead to compromises in quality and method. Pascal quoted the works to be done using minimal electric tools, the mainstay of commercial operations, allowing his workers to develop their hand skills.

Pascal had a strong opinion that there was an ecologically sustainability imperative to promote the ongoing practice of stonemasonry construction, among the other traditional trades, due to their low carbon footprint, the longevity of the resulting works and the enduring aesthetic merits of the materials. He stated his hope that the future economy would eventually return to a crafts ethos, producing products of longevity, functionality and beauty.

It was clear that Pascal was passionate about his craft. On the subject of training he said

“Since 1089, generations of stonemasons have worked tirelessly to build, conserve and restore various parts of the Cathedral. This important heritage skill has been a constant throughout the Cathedral’s history, which continues today and will remain in the future. We are incredibly fortunate to be one of only a handful of English cathedrals to have our own in-house team of talented masons to support the maintenance of the building which is why it remains in such wonderful condition”.

Over the course of his 25 years at the cathedral, Pascal had imparted his enthusiasm, skills and knowledge to over 40 masons. In addition, he regularly opens the doors to his workshop to the public as part of Meet the Masons demonstrations. In 2014 he was among a select group of masons to receive a Master Craftsman Certificates as part of a scheme organized by the Livery Companies. His contribution to stonemasonry was again acknowledged in 2105, when he was awarded a prize by the Radcliff Trust for Exceptional Achievement in Crafts.

Canterbury Cathedral



Canterbury Cathedral, source: <https://www.canterbury-cathedral.org>

With a continued use since the arrival of St Augustine, the First Archbishop of Canterbury in 579 AD, the site is arguably the oldest institution of its kind in the English speaking world. The former Saxon Cathedral, was completely rebuilt by the recently arrived Normans in 1070 , using creamy white Caen stone imported from France. The cathedral became a major pilgrimage site following the murder of its most famous Archbishop, Thomas Becket in 1170. Several years later, following a major fire in 1174 , the church was again remodelled and reported to be the first major building constructed in the Gothic style in England. In addition, Canterbury held an original copy of the King John’s charter of liberties Magna Carta (1215).

The site was almost continuously a building site until 1540, when upon the orders of King Henry VIII, Canterbury's program of new building work and function as an Augustine Monastery came to an abrupt end. Much of its famous stained glass was smashed by the Puritans during the Civil war of the 1640's. Some 400 years later, due to the bravery of the team of fire watchers, it narrowly escaped damage from incendiary bombs that destroyed the cathedral's library and much of the surrounding precincts. The Cathedral was inscribed as a World Heritage Site in 1988.

Conservation of the Cathedral

In addition to the resident stonemason team, the cathedral also employs eight stained glass conservators, specialist carpenters, plumbers and other conservators to maintain the cathedral's extensive collection of historic manuscripts and objects.

The Fellow was met by the current head mason Tony Long, who had been superintendent for the past four years, having previously undertaken his apprenticeship and continuously worked on the site for the whole of his career. Tony now oversees an onsite team of nine stonemasons including two apprentices. The fabrication of replacement stones is done at a dedicated industrial workshop located on the edge of the city where the raw blocks (some of them 1m³ and weighing over two tons) are cut to more manageable sizes with specialist equipment. The factory houses a further twelve stonemasons, including four apprentices who undertake their three year training at the Building Crafts College, London.

Apprentices nearing the end of their indentureship are encouraged to undertake the Foundation degree (Arts) in Applied Historic Building Conservation and Repair at Gloucester University.



Decayed local Dalton stone showing considerable surface deterioration, accelerated due to the action of atmospheric pollutants (TH)

Tony showed the Fellow his previous and extensive work concentrated on the lower nave buttresses. The medieval builders had used the local Dalton stone, with the quarry being long since closed.

The Dalton stone had not performed well. In the initial stages of the 1980's works program a decision was made to use local Clipsham stone. Tony's initial observations to the Fabric Committee suggest that it is performing well, however it will continue to be closely monitored and assessed before it is used again.

From a philosophical perspective, the renewed use of Caen stone, imported from France for replacement pieces, poses no conservation dilemma, as it was brought from William the Conquerors quarries in Normandy at the time of the original construction. From a practical perspective, more problematic is the limited bed height of slabs obtained from Caen, seldom yielding quality stone greater than 300mm high. For this reason, another French stone, Lepine, has been approved as it is available in heights of up to 900mm and widely employed on pinnacle and parapet stones.

Ascending to the works by a temporary lift attached to the side of the tower scaffold. The Fellow was first taken to the level of the nave roof, which had recently been re-clad in heavy lead. Approximately 56 metric tonnes of lead had been taken off the roof, recycled and re-laid.

To increase the capacity to discharge rain water from the box gutters, it was decided to double the number of gargoyles.



Left: Master carver prepares new guttering overflow gargoyle. Right: Recently installed piece (Canterbury Cathedral Trust)

From the level of the roof parapet box gutters, the Fellow was escorted through a roof hatch, entering onto a vast high-level temporary floor spanning between the clerestory walls. High above the floor level of the nave below the glass conservators had carefully documented, locally repaired, and cleaned the stained-glass windows. A separate team had spent four months delicately scrubbing the elegant and ornate stone vaulting, blackened from centuries of candle smoke. Where present, remnant traces of coloured medieval lime wash were preserved and photographed, however, it was decided not to re-apply the coloured wash over the vaults.

The current five year works program is the restoration of the west towers. In the early 1830s, the original North West tower was found to be dangerous and

demolished. It was replaced by a copy of the South West tower, with its unusual use of knapped flint on the lower sections, thus giving a symmetrical appearance to the west end of the Cathedral.

At that time, when “restoration” often meant “correcting” architectural features, the Victorian architects modified details of the original medieval molding profiles to bring them into line with the contemporary neo-gothic tastes of the time. Today, the work is regarded as being poorly executed and as the stone has not performed well, and deteriorated rapidly, much of the current remedial work involves the removal and replacement of the Victorian era parapet wall and tracery elements.



View from western tower scaffold to the 235-foot-high Bell Harry Tower. Approximately 56 metric tonnes of lead had been taken off the roof, recycled and re-laid. (Credit TH) .

The Oolitic limestone is extremely porous and draws moisture out of mortar too rapidly, affecting its strength and performance. For this reason, the stones are completely immersed in trays of water for several days prior to installation.

One remedial action that the Fellow had no first-hand experience with was the use of lime shelter coats. The coats are used to provide protection to surfaces that suffer unduly from the effects of erosion from wind, rain and pollutants.

Since the stone from which the pinnacles was constructed was structurally sound, and sufficient detail remained to distinguish features from ground level, the decision was made not to replace some of the pinnacles. Instead, following the removal of surface salts, a mixture of lime and sand was applied to the badly weathered but historically significant fabric in order to extend the life of the stone. Being a reversible process, shelter coating is widely used as an appropriate conservation technique for extending the life of medieval stonework.



Pinnacle conserved with sacrificial lime render (TH)

In the drafting workshop, the men were working on templates to repair the underside of the flying buttresses, a crucial structural component.



Master Mason Tony Long working a carved capital stone (Canterbury Cathedral Trust)

Competencies and Qualifications in the United Kingdom

The Construction Skills Certification Scheme (CSCS)

Construction Skills Certification Scheme (CSCS) is a not-for-profit limited company with its directors representing employer organisations and unions from across the UK construction industry sector. Since its inception in the early 1990's as a means to prove construction industry OHS awareness, the CSCS has grown to be the leading competence card scheme for the United Kingdom construction industry across all sectors requiring vocational training and licensing.²⁶

The scheme's application processing and contact centre is delivered under contract by CITB.

The scheme confirms that individuals working in the built environment have the necessary qualifications, training and experience for the job that they do on site. All card holders are recorded on an on-line data base that covers 370 different trade occupations and construction professions. A standard application requirement is the attainment of a Construction Industry Occupational Health and Safety Test.

Although a CSCS card is not a legal requirement, almost all contractors and clients require workers to possess a valid and up-to-date CSCS card to prove their level of training. It is entirely up to the principal contractor or client whether workers are required to hold a card before they are allowed on site. However, an estimated 80% of principal contractors and major house builders require construction workers on their sites to hold a valid CSCS card. The smart technology cards now contain a microchip which stores information on the cardholder's identity, qualifications and training. This information can be read using a smartphone, tablet or PC allowing them to instantly record the cardholder's information and be secure in the knowledge that the cardholder is qualified for the job they do on site.

The scheme has grown to include over 30 different types of card that cover a wide range of occupations including site operatives, trainees, skilled workers and professionally qualified personnel.

Regardless of type, all CSCS cards have the following information:

- » Photographic ID
- » Name of Holder
- » Unique Registration number
- » Expiry date
- » Qualification Title and level



Sample Construction Skills Certification Scheme

Heritage Practitioner Classifications

Since 2007, there have been 20 distinct trade (NVQ3 level) occupations commanding heritage status, of which nine are specialist stonemasonry classifications.

The Gold Advanced Craft card in heritage skills is recognition of an individual's training and qualification to NVQ Level 3 in one of the specialist traditional building skills such as carpentry and joinery, stonemasonry, plastering or leadwork. It is a reliable and portable means of providing proof that the worker possesses the correct skills for the work they will be undertaking.

Additionally, various career pathways into site management roles are available via the attainment of skillset qualifications up to NVQ6 (Masters), with Doctorate and Mastercraft qualifications currently under development.²⁷

Card Qualification	Pre-requisites	Heritage Pathways	Stonemasonry Pathways
Red: TRAINEE CARD Working to attain Level 1:	Registered on a Specialist Apprentice Programme	Specialist Apprenticeship in Heritage Crafts	Specialist Apprenticeship in Heritage Crafts
Red: EXPERIENCED WORKER CARD Level 2	Registered Apprentice and /or Industry Experience	Façade Preservation Façade cleaning	Diploma in Stonemasonry (L1) Stone fixer
Blue: SKILLED WORKER CARD: Level 2	Completed apprenticeship/Skills recognition	Award in Building Heritage Award in Heritage Construction Diploma in Heritage Skills (Construction)	Diploma in Stonemasonry (L2) <ul style="list-style-type: none"> • Façade Preservation (Cleaning and/or Restoration) • Banker Mason • Stone Fixer • Stone Floor Fixer
Gold HERITAGE CARD: Level 3	Trade Qualified in Heritage Stream	Award in Understanding Repair and Maintenance of Traditional (pre-1919) Buildings Award in Preservation of Heritage Buildings and Sites Diploma in Heritage Skills (Construction) (QCF)	National Progression Award in Conservation of Masonry Specialist Apprenticeship in Heritage Stonemasonry (Specialist Upskilling Program) Diploma in Stonemasonry (L3) <ul style="list-style-type: none"> • Heritage Mason • Stone Fixer • Banker mason
Gold SUPERVISORS CARD Level 4-5	Supervisors with relevant Trade Qualification (NVQ Level 3)	Diploma in Construction Site Supervision-Conservation	Level 4 NVQ Diploma in Senior Crafts (Construction) (QCF)
Black MANAGERS CARD Level 6	Managers with NVQ level 4 or 5	Level 6 NVQ Diploma in Construction Site Management – Conservation	Master of Craft (currently under development)

The CSCS card system provides a reputable and portable means of recording specialist qualifications and has many potential benefits if adopted in Australia.

Opportunities for developing an accredited training package for Heritage Specialists in Australia

Continuing Professional Development (CPD) could be a potential solution to top up gaps in skills in the short term. The focus of such programmes could centre on heritage awareness acquisition, in particular developing an understanding of the conservation process as proscribed in the principles of the Burra Charter, and a wider appreciation of the materials, roles and skills of the related trades and industry professionals.

The sole training package available for the professional development of specialized heritage tradespersons in the current TAFE system is the CPC40611 Certificate IV in Building and Construction (Specialist Trades) developed and offered at Holmesglen College, Victoria. The Heritage Stream elective units within the syllabus have been specifically tailored to support and develop builders and site supervisors working within the heritage sector.

The course description reiterates the supervisory and managerial focus of the syllabus:

“These units do not attempt to replicate the technical processes associated with the specific trade skills necessary to complete the work, with the main focus being the effective management of the process of sequencing the application of existing high-level trade skills in the specialist heritage restoration environment to arrive at a quality outcome”.

Building on the accepted best practice heritage management principles as outlined in the Burra Charter, students undertake a range of competency units, ultimately forming a framework for trade supervision, coordination and decision

making appropriate to the heritage conservation setting and context.²⁸ Developing upon the student's post-trade experience, the Heritage Stream of elective units provides a foundational understanding of traditional building construction and period characteristics. Additionally, the student gains an appreciation of the varied trade-specific materials, associated repair techniques and processes of ancillary trades commonly engaged in restoration work.

At the core of the syllabus is heritage awareness, which provides a framework of questioning and justifying all decision making and subsequent conservation actions.

These include examination of:

- » Why is the place and material significant?
- » What are the consequences of change?
- » Why is the fabric failing?
- » What actions are critical and what may be deferred?
- » What conservation techniques are available?
- » What are the most suitable and sympathetic actions?
- » How subtly will the interventions blend into the original fabric?
- » What aftercare is required?

Australian Heritage Sector Endorsement

The Certificate IV' in Building and Construction (Specialist Trades) has been widely cited as a significant measure to address the issue of heritage specific training for trade level occupations. The package has been endorsed by The Construction and

Property Services Industry Skills Council (CPSISC) who note that the format offers economies in training delivery, offering a competency-based training model that is relevant and applicable to the common workplace needs of potential candidates from a range of niche heritage trades.²⁹

The CPSISC have gone further in their endorsement , expressing support for a modified unit of heritage principles and practices are included as an elective among all existing Certificate III trade level training packages.

The CPSISC has recommended the syllabus be further developed and expanded, acknowledging:

“there is a need for the development of a relatively small number of new units of technical competency that would build on competent tradespeople’s skills and enhance their capacity to work in the heritage sector. These units would ‘sit’ most appropriately within the CPC40611 Certificate IV in Building and Construction (Specialist Trades) and provide a pathway for post-trade upskilling’

Continuing Professional Development via E-learning

As previously mentioned, the Specialist Trades syllabus is currently offered as ‘face to face’ elective units within the CPC40611 Certificate IV in Building and Construction offered by Holmesglen College Victoria. As such, the potential benefit to the wider Australian heritage sector is somewhat restricted. How then may the benefits of the existing heritage stream units be realised through effective delivery?

E-Learning presents an opportunity for future development of the Heritage Stream training package.

28 CPSISC: Heritage Trade Skills Report August 2012, 31.

29 CPSISC: Heritage Trade Skills Report August 2012. 23.

At a recent summit of the Organisation for Economic Co-operation and Development it was observed that an expanded range of pedagogical approaches have been made available with the advent of the “information age”.

OPEC stated: ‘innovation is not about using a single new teaching method or one kind of technology, it is about employing a combination of approaches , including direct teaching and tools.’³⁰

Training organisations and employer groups in Australia are increasingly recognizing that innovative web-based educational platforms have the potential to provide responsive and flexible modes of training delivery, particularly suited to addressing areas of skills shortage in the trade industries.³¹

The construction industry is more likely to be able to take advantage of CPD that can be delivered flexibly (for example via webinars outside of core working hours), and that is not cost prohibitive.

Blended E-learning, as described by Callan et al (2015) is regarded to offer customized and cost-effective training; the requirement to release employees is significantly reduced or negated, a significant advantage to addressing the challenges faced by small business, particularly those in regional areas. Many of the mandatory occupational workplace health and safety units that currently occupy ‘space’ in traditional training formats may be delivered up-front, and relevant to the specific work environment.

Employers have a greater involvement in the learning process, the trainee collects and reports evidence of work activities on mobile phones , with built in checks whereby the employer must validate the student’s achievements as their own. Trainees build upon their work place experiences by undertaking smaller tasks

in a self-paced assessment model, incorporating links to web-based learning materials, online tutorials and chat room sessions.

The flexible, inclusive and collaborative structure of E-learning presents as a viable model for future development of the heritage stream units. The theoretic framework of conservation principles and best practice enables standardisation within the marking rubric; the student’s unique and varied work environments provide the content and context of case study assignments. The format does not exclude participants from most contemporary building trades; ‘significant’ values and fabric may be identified in many buildings and settings. Conditional reporting and failure analysis techniques are common skill sets and an application of repair interventions builds on the tradesperson’s existing knowledge and skill set. Additionally, the e-learning format has distinct advantages in economy and equity, in delivering quality training across all Australian regions.

30 Business Council of Australia Future-Proof: 2017. 46.

31 Victor James Callan, Margaret Alison Johnston & Alison Louise Poulsen “How organisations are using blended e-learning to deliver more flexible approaches to trade training” Journal of Vocational Education & Training, 67:3, 2015. 295., DOI: 10.1080/13636820.2015.1050445

5. Considerations and Recommendations

Considerations

This Fellowship paper has examined the UK heritage sector strategy implemented over the past decade, with the objective of reversing skills shortages in the heritage trades. A key strength of the UK heritage sector is the degree of co-operation and co-ordination between stakeholder bodies, each with clear remits and areas of responsibility, across the key sectors of higher and further education, construction, heritage and tourism.

In contrast, the governance and funding of Australian heritage and training needs remains fragmented and poorly represented.

This paper has endeavoured to investigate where lessons can be learnt and explore new approaches for recruiting, and identified post trade training and distinct qualifications as being several crucial components in this endeavor. To achieve this objective will require greater collaboration between industry and academia, notably in relation to influencing the design of training and qualifications, a model used successfully in the UK and other countries.

At a macro level the United Kingdom has made significant advances in their labour market assessment via the implementation of the Construction Skills Certification System that registers an individual's vocational qualification levels. The UK heritage sector has capitalized on the initiative, in the development of a distinct and parallel suite of specific conservation training packages and qualification levels, with tertiary academic studies providing a defined career pathway that expands trade level skills and experience. The initiative benefits the individual tradesperson, raises the proficiency standards of the conservation sector, and the historic buildings they maintain.

In contrast, commentators on vocational training within the Australian Heritage Industry have identified challenges to meaningful progress

- » a general disconnect between industry and training providers, and academia.
- » the bespoke nature of many craft and traditional trade practices perceived to present challenges to the development of consistent training outcomes.
- » a range of cultural issues faced by employers, such as lack of time and money to invest in training, coupled with a limited understanding of where skills and knowledge gaps in built heritage conservation lie.

Historic education governance and funding disparities which have resulted in an increasing preference for tertiary attained qualifications; correspondingly the once valued trade papers are perceived to be of diminished prestige

This paper posits that training and education providers in Australia should consider approaches to heritage trades training provision in the UK and identify actions which can be transferred to local conditions. These actions include the following.

Recommendations

1. Establishing a Heritage Industry Stakeholder Advisory Council, bringing together academia, research institutes and industry with the purpose of advocating for future training needs of the Australian Heritage Industry.
2. Consideration should also be given to expanding a Traditional Craft Skills Network, currently being developed by the ISSI under the Heritage Skill Initiative

3. Build key stakeholder partnerships and securing a permanent funding streams.
4. Conduct meaningful research in regard to the economic contribution of Heritage activities, and forecast both supply and demand sides of the skills arena.
5. Establish a Vocational Education Taskforce tasked with the development of a program of built fabric conservation studies that bridge the current divide between trade and academic learning.
6. Define a set of core skills and competencies common across the suite of traditional and bespoke trades and heritage professionals.
7. Develop relevant training packages that position qualifications at a level appropriate to an individual's stage of career progression.
8. Equip students at all stages of the careers pathway with training opportunities to broaden their skills and knowledge base in the field of built fabric conservation, enabling application of these core skills and knowledge to different settings, materials and systems.
9. Develop a syllabus expanding on the Holmesglen College Special Trades package .
10. Foster career development by delivering educational packages offering a cumulative , multi-disciplinary curriculum of skills, theory, and related technology, underpinned by a context of historical significance and authenticity.
11. Recognize the attainment Heritage Specialist skill sets and status by naming the field distinction within the qualification title.
12. Facilitate entry to the educational system via improved new information technologies in the attainment of Recognition of Prior Learning.
13. Provide on-line Career Professional Development modules, suited to self paced learners and regionally remote candidates
14. Develop a database of individual's training and qualifications, and specific project experience
15. Mandate the attainment of qualifications as a contractual requirement prior to engagement on State or Australian Heritage Listed assets
16. Explore with relevant stakeholders and owners of heritage assets opportunities to establish meaningful on site training opportunities, and utilising experienced peer- respected, , and highly skilled senior tradespersons as instructors.
17. Provide concessions and funding incentives to entities actively engaged in training.
18. Identify, secure and develop heritage assets as centres of excellence in Built Fabric Conservation.
19. Curate and digitise archival materials pertaining to fields of specialisation. Provide links to relevant international research associations

Conclusion

This paper has detailed a number of new approaches to the recruitment and professional development of trades practitioners seeking to develop a specialised career in Australian built heritage. Clearly, in order to develop the future mentors and leaders in specialist trades it is imperative that an investment be made in quality craft education and training.

It is envisioned that the Australian heritage sector implement a multi-faceted strategy to attract more people to a career in the built heritage sector. Careers information, advice and guidance to those seeking opportunities in the construction sector that includes consideration of traditional construction trades and management roles could help offer clear pathways to higher level occupations as well as promoting offsite to a greater diversity of people, including young people.

As has been demonstrated, it is estimated that the national pool of tradespersons with skill sets suited to maintaining Australian historic buildings remains consistently in shortage. Currently, opportunities for an individual's career development within their chosen occupation are often limited at best. Regrettably and for various reasons, many tradespersons do not pursue further training. This paper has argued the key to resolving the persistent trades shortages is a holistic re-evaluation of the vocational training and tertiary education and qualification framework.

For Australia to maintain a viable Heritage workforce, tradespersons, like their professionally trained counterparts, should be encouraged to further develop their post-trade qualification skills, and be provided with the incentives and opportunities to do so. To achieve this objective it is imperative that key stakeholders implement a 'multi-pronged' strategy. Three key components of the strategy entail a re-assessment of the qualifications framework, innovation in the provision of training tailored to the needs of tradespersons, and a coordinated strategy from the Australian construction industry to encourage its members to pursue further training.

The conservation of Australia's historic buildings maintains a tangible link to Australia's history, and therefore it is crucial that talented crafts persons continue to be trained to bring new life to valued historic assets.

Building conservation is both an ethically bound philosophical approach and an applied science, a discipline worthy of academic status and recognition. Regaining the former prestige of the "Master Craftsperson", requires putting value back into craft education and training, to attract and retain dedicated students who have

the potential to achieve fully respected qualifications by all professionals across the whole industry.

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7. Appendices

Appendix 1

The CPC40611 Certificate IV in Building and Construction (Specialist Trades) developed and offered at Holmesglen College, Victoria. The syllabus equips the paraprofessional with the organizational and communication, analytical and interpretive skills to inform and deliver good heritage management outcomes.

- » Initiate the heritage works process examines the inherent complexities of the heritage restoration process and emphasizes the importance of establishing an effective line of communication and common understanding between all parties.
 - » Prepare report for heritage restoration work requires the preparation of detailed dilapidation and fabric condition reports, and the identification of typical fabric conservation actions specific to the individual building trades.
 - » Prepare to undertake the heritage restoration process ensures the works proceed in accordance to Industry workplace OHS standards and protocols, supplemented by conservation best practices of research and methodical recording of historical data, architectural elements and styling.
 - » Prepare work plans for restoration work expands on understanding of the various trade activities to develop realistic work program schedules.
 - » Undertake the heritage restoration process provides a working knowledge of legislative compliance and organisational requirements, including progress monitoring and quality assurance, ncluding resolution of technical issues and reporting on contractual matters with stakeholders.
- » Prepare drawings for heritage works develops the ability to interpret specifications for drawings, accurately measure and calculate dimensions, and work to scale by hand and utilizing Computer Aided Drafting software in the preparation of Orthographic and sectional details in accordance with Architectural drawing conventions.
 - » The CPC40611 Certificate IV in Building and Construction (Specialist Trades) course outline maybe viewed at the following link: https://training.gov.au/TrainingComponentFiles/CPC08/CPC40611_R5.pdf



ISS Institute
Level 1, 189 Faraday Street
Carlton VIC 3053

T 03 9347 4583
E info@issinstitute.org.au
W www.issinstitute.org.au

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