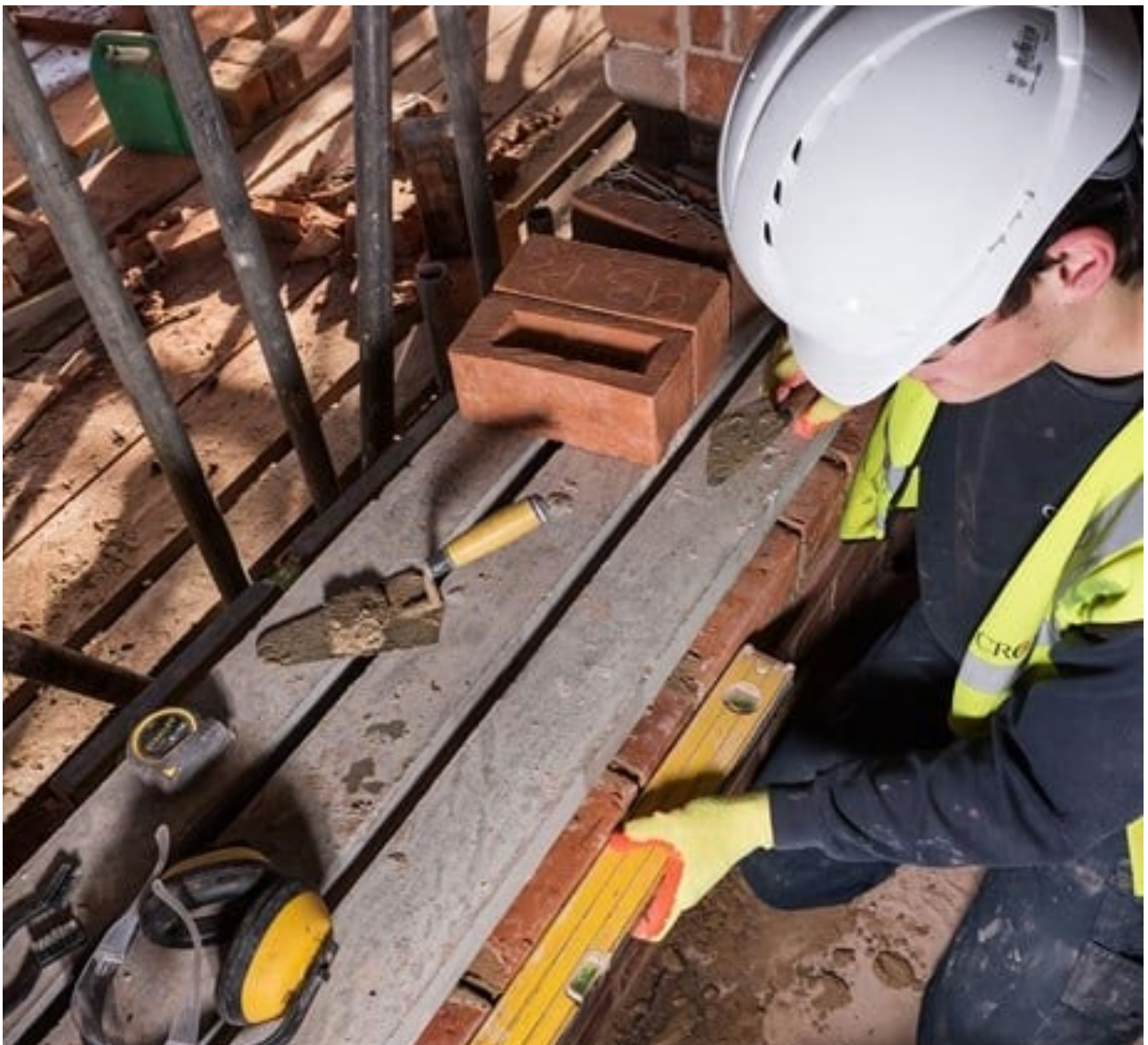


# Shrewsbury Flaxmill Maltings case study

Construction skills training in heritage projects



# Summary

This case study illustrates how to deliver skills and training activities in construction projects.

It describes how this was done within the [construction training programme](#) on the repair and refurbishment of the Grade I Listed Main Mill and the Grade II Kiln at [Shrewsbury Flaxmill Maltings](#).

It focusses on how processes were used to build these activities into the main contractor's works via the tender process and contract documents.

It explains the planning of the activities, the tendering process and gives practical examples.

It then describes the delivery of the activities including the outputs, costs and an analysis of what worked well.

It gives an end project review including feedback and giving practical lessons learned. And finally, it signposts to further information and case studies.

It is intended for those commissioning, planning and delivering construction works particularly in the built heritage sector, such as potential funding applicants and clients, and those delivering construction projects, project teams including architects, building surveyors, quantity surveyors and contractors.

## Contributors

This case study has been written by Kate Gunthorpe and published by Historic England 2025

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# Introduction

Historic England worked with partners, Shropshire Council and the Friends of the Flaxmill Maltings, to bring Shrewsbury Flaxmill Maltings, home of the world's first iron framed building, back in to use. A grant of £20.7 million from The National Lottery Heritage Fund (NLHF), as well as funding from the Marches Local Enterprise Partnership via its Growth Deal with Government, enabled the project to progress.

## Construction Training Programme

A range of skills and training activities were delivered as part of the project to repair the Main Mill and Kiln. This ran between May 2017 and March 2020. The planned outputs were:

- 20 Work based placements
- 175 Training opportunities aimed at students and learners
- 200 Continuing Professional Development opportunities
- 20 Contractor led hard hat tours of the construction work in progress

The construction training programme was part of the activity plan for the National Lottery Heritage Fund (NLHF) grant and also attracted funding of £95,447 from the Andrew Lloyd Webber Foundation.

## Integrating the skills and training activities into the construction works

This case study examines how the delivery of the skills and training activities linked to the construction works on site were included from the beginning of the tender process and as clauses in the contract. The tendering contractors could then estimate the workload, costs and resources required, as well as consider health & safety and logistics alongside the wider scope of the construction work. This approach had been used by the author in previous projects for English Heritage and the National Trust.

# Shrewsbury Flaxmill Maltings

The site comprises eight listed buildings, including the Grade I listed Main Mill, which when built in 1797, was the world's first iron-framed building, paving the way for the modern skyscraper.

The site fell into disrepair and was on the [Heritage at Risk](#) register before being acquired by Historic England as owners of last resort in 2005. Working with partners [Shropshire Council](#) and the [Friends of the Flaxmill Maltings](#) on the NHLF funded project to repair and refurbish the Grade I Main Mill and Grade II listed Kiln was split into three construction phases, and undertaken between June 2017 and Summer 2023.

The scope of the works included:

- Complex structural repairs using over 30,000 new handmade 'Giant' bricks to repair the brick walls and open up historic window openings
- Installing tie rods to support the cast iron frame
- Repairs to the timber roof structure, rainwater goods and recovering the roof with around 15,000 new Welsh slates
- Fitting new triple glazed windows and repair existing timber windows
- Creating interpretation, an exhibition, learning space, café and four floors of office space

The value of construction works was around £28million under JCT Standard Contracts. The main contractor was Croft Building and Conservation Limited, from Cannock, Staffordshire.

# Planning the Activities

To plan the construction training activities on the Shrewsbury Flaxmill Maltings project, a consultation was undertaken with a range of stakeholders, locally and nationally, including organisations across heritage, training providers and construction industry organisations. Consultees included advocacy or training bodies, such as the Natural Stone Industry Training Group (NSITG), the National Federation of Roofing Contractors (NFRC), Lead Sheet Association (LSA) and the Tywi Centre. Local educational institutions, including Shrewsbury College, Telford College and Birmingham City University, were also involved at this early planning stage to identify how the training opportunities linked to the construction works could be used to support their learners' needs and fit with their existing courses.

Factors which shaped the choice of activities were:

- The scope of the construction work which offered training opportunities around roofing, carpentry, brick work, ironwork and lime mortars
- The scale of activities needed to be proportional, reasonable and realistic to deliver within the construction phase by the contractor, a full-time co-ordinator and the Friends who assisted on some of the hard hat tours
- Activities were selected to appeal to the potential target audiences of those working in construction, both heritage specialists and those in the wider construction industry, and from entry level to upskilling and CPD
- The facilities available on site, including toilets, equipped education room and larger space in the Dyehouse, plus parking for visitors, good public transport
- Budget of £100,000 over three years, with activities offered free of charge and paid bursaries for placements
- Funders requirements, in this case, contributing to the NLHF application 'outcomes for people', 'outcomes for heritage' and 'outcomes for communities', and Andrew Lloyd Webber Foundation (ALW) priorities that enable people to develop their abilities and careers

During the planning stage some activities were considered but rejected including a requirement for the contractor to employ apprentices. Construction apprenticeships are typically 2 - 3 years. But at the time of designing the plan, the construction phase was only expected to be one year on site and would not provide the range of experience required to complete the construction apprenticeships. Instead, placements were planned, which offered the benefits of:

- Offering placements across a range of roles, not only craftspeople but also professional roles, such as with the project architect, quantity surveyor and Shropshire Council's Historic Environment Department
- Offering flexible and variable opportunities with paid bursaries can attract a wide range of applicants. For example, applicants were able complete placements around studies, other work, caring responsibilities and flexible hours better suited applicants with disabilities or additional needs.
- Offering upskilling opportunities to those already working in the sector and to those with experience in mainstream construction looking to get into heritage work.



Figure 1: Women in Roofing on rooftop tour to view the work in progress on the Mill's unusual roof. [Photo courtesy of Livia Williams].

# Integrated processes to incorporate skills and training activities

While the primary focus of the tender process to select the main contractor was on the budget and technical aspects of the project, the requirement for the contractor to support Historic England to deliver the skills and training activities in the project was incorporated. This ensured that the tenders were aware of and capable of delivering these activities and planned for the resources and costs required in their tenders.

Due to the value of the construction contracts and as Historic England is a public body, the tender process had to meet the requirements of the Public Contracts Regulations 2015 and follow the Official Journal of the European Union (OJEU) process to achieve best value.

But the processes which were incorporated here are applicable to smaller projects and other types of clients.

An integrated process was followed at each stage of the tender process to take the training activities into the main contract works, including:

- Pre-qualification questionnaire (PQQ) – This was used to carry out an initial sift of potential bidders. Marks were allocated to supplementary/additional project specific questions included in PAS 91 – 2013 to assess capability to support the training activities. These drew out potential bidders' understanding of the risks and benefits of undertaking training activities on a building site, their previous experience, and the numbers of apprentices in their organisation as an indicator of their experience of training.
- Tender – Outline descriptions for the activities and numbers of each type to be delivered, where included in clauses in the preliminaries, to highlight the resources and access to construction works in progress required. It also set out what was required from the Contractor including, health and safety management, risk assessments, evidence of insurances, gaining co-operation of sub-contractors and steps for monitoring progress.
- Contract documents – The clauses and costs were carried through to into the main contract, the JCT Standard Contract.
- Delivery – Once completed, payments for the Contractors' involvement in the training activities were made via the monthly contract interim payments. The JCT contract also includes for the possibility to vary the scope or number of the activities if required, by written variation instruction, so allowing for some flexibility as the project progressed.

# Delivery

The programme was delivered on time and within budget and exceeded its targets for outputs.

Table 1: Summary of targets and delivery for training activities.

	Target	Delivered	Approx % of budget
Work based placements	20	20	22%
Training opportunities focussed on students and learners	175	209	34%
Continuing Professional Development opportunities	200	220	38%
20 Contractor-led hard hat tours of the construction work in progress (places for 240 people)	20	24 (243 places)	6%
TOTAL	635	692	Total final spend £95,592 (within the £100,000 budget)

## Additional resources

In addition to the budget, this project benefited from an equipped training room and WC being provided free of charge. The Dyehouse, a large, unheated space was also used for some events.

A full-time co-ordinator was employed by Historic England so the range of tasks to support the delivery, such as advertising events, bookings, organising resources required, feedback etc, could be allocated to that role. However, in other projects these tasks could be allocated to the contractor or others in the project such as the professional team or volunteers.

Also, the Friends of Flaxmill Maltings supported the hard hat tours by booking some events and supplying member of the team on the day.

The Historic England Construction Project Manager gave presentations on many of the tours and events.

## Work-based placements

The work-based placements were the most costly element per head.

- Each placement was paid at least the National Minimum wage as a bursary, to ensure the opportunities were open to all.
- If applying the National Minimum wage as a rate for the bursary payment, it can be difficult to forecast costs as it will vary by age and increase each year.
- A minimum of 5 days, but then length of placement was flexible so could be longer.

For the construction placements, the contractor's time to provide training and supervision and support the learning plan was included in the tender price. Other organisations, such as the professional team including architects and quantity surveyors, and Shropshire Council, provided this support free of charge.

## Training and Continuing Professional Development events

The costs of the training and CPD events could vary, for example, approximately:

- £300 - £350 per candidate for a 2-day accredited course leading to a qualification delivered by an external training provider
- £150 per head for an event with site tours and a coach trip to Ironbridge for a site tour with three external speakers, and buffet lunch included
- £3 per head for low cost events where in-house staff delivered a talks or tours and only limited refreshments such as tea/ coffee was provided

Key factors influencing the costs of the events were whether outside speakers were used, the level of catering supplied, and the equipment required particularly for hands on events, e.g. example gazebo, PPE, materials and tools for practical events.

Previous projects have shown that hosting events on the construction site to take place over weekends cost more, so it was made clear in the tender that all events would be on weekdays.

## Hard hat tours

The contractor-led hard hat tours of the construction work in progress were the lowest cost activities at a cost of approx. £18 per person including tea / coffee refreshments, supply hard hats and hi vis vests, and two members of contractor's staff to talk about the works in progress and escort the groups around the building site.

## Additional benefits

There were also additional benefits including:

- Attracting publicity for the project including press, articles, social media.
- Members of the contractor's workforce were able to benefit by attending training on traditional sash windows, hot-mix lime mortars, and traditional brick making.
- The Professional Team were also involved in delivering the events, notably hosting the SPAB Scholars and Fellows site visits, the project Architects and QS firms hosted placements, hot mix lime training event, and presentations on their work and lessons learned at a one day conference to share lessons from the project.
- The programme offered opportunities for closer partnership working. Shropshire Council hosted two placements in Historic Environment Team. The Friends volunteers hosted hard hat tours for local stakeholder groups and the public. This gave the Friends additional insights and information on the construction works which they were then able to share with other visitors.



Figure 2: Prince's Foundation trainees learn new skills on the roof of the Main Mill [© Historic England Archive, Steven Baker]

# End of project review

The aims of the processes which were used to plan and procure the skills and training activities into the main contractor's works via the tender process and contract documents was that they should be consistent, deliverable, clear and proportionate.

## Feedback

As part the end of project review and evaluation, feedback was gained from the Historic England Project Manager, main contractor and professional team and key stakeholders. This indicated that the approach taken to planning and incorporating the activities into the tender process and contract documents was successful.

The approach raised the profile of the training activities within the overall project, ensuring that they became central to the programme of work by attaching a monetary value to them. This prevented them from being a bolt-on, reliant on the goodwill of the contractor for delivery, instead embedding the delivery of the training activities into the contractor's thinking from the beginning. Feedback included:

'Making the training and skills requirements central to the tender process for the contract really makes them a part of it and gives them a different level of focus.'

'There is a huge amount of paperwork included in a tender of this scale. It's important to ensure that things like this are pulled out so that they don't get lost.'

'Working in this way grows awareness that Historic England cares about skills, so any contractor who works with them needs to as well. It is important to embed this in contractor thinking.'

The contractor felt that the level of detail provided at tender stage was appropriate and gave them the basic information they needed to estimate the workload and attach costs to it. Feedback from the Consultant Quantity Surveyor was that the clauses were clear and straightforward to apply. No queries were raised by tenderers, again suggesting they were understood by the tenderers. This process allowed for clarity around what was required from the contractor, enabling them to allocate time and resources.

All those who tendered took notice of the skills elements and responded to them. In this case, as the training activities were only a small proportion of the overall construction costs, these clauses were not priced separately as items in the tender but included in the

overall costs within the preliminaries. Some stakeholders felt that perhaps the cost of the training activities may have been underestimated by tendering contractors at tender stage.

The level of detail provided in the tender documents also allowed some flexibility, which was highlighted positively. It was felt that the nature, scale and number of activities required had been specified in enough detail in the tender. But the process still allowed Historic England and the main contractor to work together planning the activities during the construction phase. For example, planning the timing of placements to ensure a good fit with their needs and the type of works being carried out on site.

It was felt by stakeholders that clauses covering training activities could also work for smaller projects, although it was acknowledged that the scope of the work included would need to be considered carefully to ensure that it was both deliverable within the bounds of the project itself (e.g. timescale and working environment) and did not place an undue burden on the contractor.

## Lessons Learned

Developing heritage skills and knowledge among contractors and professionals has been identified as a key action from skills research. Incorporating training activities into construction projects on site is an effective means to do this.

‘Hands on experience and learning from skilled professionals. Seeing ‘theory’ applied in a practical way. Nothing can beat seeing things live. – Participant feedback’

Building on the experience and lessons learned from this project, their wider application for other projects would be:

### Skills activities are attractive to grant funders

Skills was a theme that was attractive to grant funders. These activities supported the National Heritage Lottery Fund (NLHF) essential outcomes, that people will have developed skills and that a wider range of people will be involved. [The Andrew Lloyd Webber Foundation](#) also provided funding. Feedback from the fundraising team was that the skills activities were attractive to both grant funders and individuals, so the skills programme was showcased at fundraising events.

### Early planning and consultation to shape the activities

It is important early in the project to plan the type of activities, number of events and number of participants and audience, thinking about:

- What activities will be offered?

- Who will benefit?
- Who will deliver the activities and when?
- What will this cost and what resources will be required?

It is important to be clear what outcomes are expected from the project in order that sufficient resources can be allocated, and outcomes can be measured. You need to think about what would best suit your project and what is realistic to deliver, considering the risks, costs, staff resources and funds available, time, what skills are required on the project, the range of work offered by the project and finally what is special / different about the project.

In this case early consultation was very useful to shape the activities and helped to get buy-in by sounding out potential partners and training providers, a number of which went on to be involved with the project.

‘The training was well researched; Historic England knew that it fitted the competency and skills required. ‘

‘[The consultation] allowed them to plan training that tapped into people’s needs. ‘

‘They knew it would add value so people would come and do it. ‘

## **Integrated Processes to incorporate skills and training activities**

It is important to plan and embed the skills and training activities from the beginning as this allows the requirements to be incorporated consistently throughout the tender process: from advert, Pre-Qualification Questionnaire, Invitation to Tender and then through into the tender and contract documents.

The level of description in the tender clauses was designed to give the bidders a clear view of the number of each of the activities, the tasks which were expected to be completed by the contract and the resources required in terms of labour and materials e.g. personnel, supply of hard hats and hi vis vests for the hard hat tours.

There is a benefit from including the requirements at tender stage to get best value, as there is a competitive element in pricing at tender stage.

The benefit of having the activities as priced items in the tender, was that these rates could then be used to aid cost control during the delivery phase as reference points if additional activities were required.

There is still flexibility to add or omit via variations to the contract e.g. as the tours were included in the contract, variations to numbers can be made if required, for example, to increase or decrease the numbers. But this must be done via the Contract Administrator

on the project, as any variations to the terms of the contract may increase costs or add extra time to the contract completion date.

The activities were designed to be reasonable in relation to the scale of the project and realistically deliverable. But this approach is scalable, for example, on smaller project some hard hat tours could be offered at relatively low cost and appeal to a range of audiences from CPD for professionals, students, local stakeholders, potential funders or the public.

## Scalable

The Shrewsbury Flaxmill Maltings project was somewhat exceptional, in size and scope and in that it ran over 3 years, all of which shaped the scale of the construction training. Most heritage projects have shorter timescales, smaller sites, fewer resources, and more limited access to expertise than that available to Historic England.

The scope of the activities included should be considered carefully to ensure that it is deliverable within the bounds of the project itself (e.g. timescale and working environment), proportional to the scale of the construction works, and does not place an undue burden on the Contractor.

Elements of this programme, the behind-the-scenes tours, could be replicated on smaller scale projects with shorter timescales and can be readily adapted for different audiences.

## Access to works in progress very popular

Feedback around behind the scenes tours was overwhelmingly positive. Multiple stakeholders highlighted how beneficial the tours had been, both for opening such a unique construction site to visitors and allowing them to learn, and for allowing those involved in the project to share their knowledge and expertise. In addition, the Friends volunteers brought into the project gained knowledge and information to share with other visitors.

‘The tour helped volunteers to understand more about the history and conservation of the Flaxmill so they will be able to use this information when interacting with visitors in future. ‘

‘I really enjoyed leading the hard-hat tours. They could be carried out in the same way, but with content tailored to the people coming round. We should do more in future. ‘

It is important to understand that on a construction site the Principal Contractor is responsible for Health and Safety so permission for access must be sought from and

agreed with the contractor. Therefore, using this integrated process throughout the procurement is useful as this is clear from the outset and can be planned for.



Figure 3: A trainee on the Kiln roof during their carpentry placement. [Photo courtesy of Juliet Baillie]

## Further Information

Find out more about the range of options for your project and explore more case studies:

<https://historicengland.org.uk/services-skills/training-skills/heritageskills-cpd/building-skills-and-training-into-conservation-projects/>

<https://www.heritagefund.org.uk/good-practice-guidance/skills-and-training-guidance>

Construction Industry Training Board (CITB) have developed a toolkit for planning, procuring and delivering proportional and achievable skill and training activities on construction projects. Including benchmarks for Apprenticeships, work placements, job creation and upskilling opportunities that are relevant and proportionate to the construction works being procured. Shrewsbury Flaxmill Maltings was used to test these benchmarks for heritage projects. This experience showed the benchmarks in practice on a large-scale project but that could be adapted for smaller projects.

<https://www.citb.co.uk/standards-and-delivering-training/national-skills-academy-for-construction/how-to-do-it-nsafc-toolkit/#>

Find out more about Shrewsbury Flaxmill Maltings:

<https://historicengland.org.uk/get-involved/visit/shrewsbury-flax-mill/>

<https://www.shrewsburyflaxmillmaltings.org.uk/>