

# EBUKI

## Development of Earth Occupation Standards within the UK

## Die Entwicklung von Beruflichen Standards im Lehmbau im Vereinigten Königreich

Dr Daniel Maskell,  
Rowland Keable

D.Maskell@bath.ac.uk  
rowland@ebuki.co

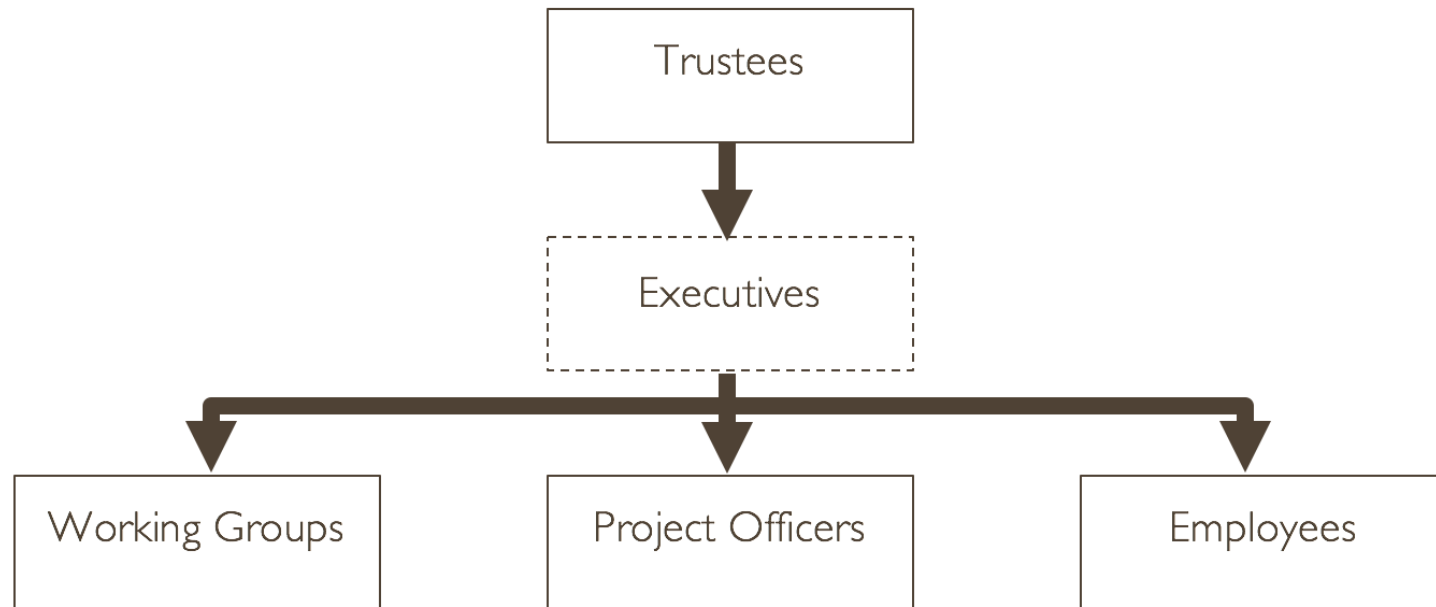
# EBUKI

## Introduction



# EBUKI

## Introduction



# EBUKI

## Introduction

EBUK was formed in October 2007

*Mission Statement:*

- to inspire (alt. foster) the conservation, understanding and development of building with earth in the United Kingdom.

EBUK expanded to include Ireland in 2015 forming EBUKI

Registered UK charity in 2015



## Introduction

### *Aims:*

- **Conservation:** to promote the recognition, understanding and cultural significance of existing earth buildings in the UK and Ireland To promote the appropriate repair and maintenance of earth buildings.
- **New Build:** to promote earth building in contemporary construction. To work towards the development of appropriate standards and testing methods.
- **Knowledge:** to promote research and the development of understanding of earthen materials and their applications.
- **Skills & Education:** to foster the traditional skills base and promote the development of new skills and techniques. To promote earth building during the education and training of construction professionals.
- **Networking:** to represent earth building interests as an authoritative national body, fostering links to other relevant organisations, both within the UK. and internationally. To promote the development and dissemination of guidance on earth building. To foster networking between members.

# EBUKI

## Training





# EBUKI

## Training





# EBUKI

## Training



# EBUKI

## Training





# EBUKI

## Training





# EBUKI

## Training





# EBUKI

## Standards



ASTM E2392 / E2392M - 10(2016)  
Standard Guide for Design of Earthen Wall Building Systems



DIN 18945 (2013-08)  
Earth Blocks - Terms And Definitions, Requirements, Test Methods  
DIN 18946 (2013-08)  
Earth masonry mortar - Terms and definitions, requirements, test methods  
DIN 18947 (2013-08)  
Earth plasters - Terms and definitions, requirements, test methods



NZS 4297 (1998): Engineering design of earth buildings

# EBUKI

## Standards



British standards institute



National Occupation Standards



National Vocational Qualifications



Construction Industry Training Board

## Qualifications



The EQF aims to relate different countries' national qualifications systems to a common European reference framework.

Individuals and employers will be able to use the EQF to better understand and compare the qualifications levels of different countries and different education and training systems.

## Qualifications



European  
Qualifications  
Framework

### Level

### Example

1

2

UK - GCSE (16 yrs)

3

UK - GCSE (16 yrs)

4

UK - A-level (18 yrs)

5

6

Bachelor degree

7

Master's degree

8

PhD

## Qualifications



Make it easier for people to get validation and recognition of work-related skills and knowledge acquired in different systems and countries – so that they can count towards vocational qualifications

Make it more attractive to move between different countries and learning environments

Increase the compatibility between the different vocational education and training (VET) systems in place across Europe, and the qualifications they offer

Increase the employability of VET graduates and the confidence of employers that each VET qualification requires specific skills and knowledge.

## Earth building training standards



### **A framework for learning and teaching earth building in Europe**

Empower professionals, offer modular qualification, encourage employment opportunities and mobility, further skills training to help job search.

Guide teachers when defining new content and assessment procedures, judging learners performance.

Be a tool for certifying bodies when reviewing or creating qualifications, looking for transnational compatibility.

## Earth building training standards



**European co-operation in developing earth building training standards: results of the Pirate project**

**Europäische Kooperation zur Entwicklung von Standards in der Lehmbauausbildung**

Keable, R.; Brown, M.; Faria, P.; Costi de Castrillo, M.; Didier, L.  
Pirate Project, EU



## Earth building training standards

Unit	Description	Subunit	EQF Level					
			L1	L2	L3	L4	L5	
M	From raw material to earth mix							
P	Production of prefabricated elements							
B	Building with earth	B1 Earth Masonry						
		B2 Cob						
		B3 Rammed Earth						
C	Application of clay plaster							
F	Formwork for earth building							
R	Repair and conservation in earth building	R1 Building						
		R2 Clay Plaster						
D	Interior design							
O	Decorative techniques							
E	Earth building market							

# EBUKI

## Earth building training standards



Provide Instructions and Resources for Assessment and Training in Earthbuilding

ECVET Earth Building		From Raw Material to Mix	Unit M
Learning outcomes		Levels 3+4	
KNOWLEDGE		SKILLS	
<ul style="list-style-type: none"><li>Sources of information about local raw materials: using a soil map, existing buildings, site investigation, reports, landscape observation, local knowledge</li><li>Legal and environmental controls of earth extraction</li><li>Constituents and properties of earth: cohesion, grain size distribution, plasticity, Optimum Moisture Content OMC, colour</li><li>Different clay minerals and their properties</li><li>Field and/or Laboratory identification tests for earth</li><li>Relation between mix composition (particle size distribution, cohesion) and finished wall or plaster (technique, strength, durability, surface)</li><li>Principles of stabilisation: physical and chemical</li><li>Role of the fibres in earth structure</li><li>Use of manufactured products</li><li>Extraction process to ensure homogenous uncontaminated mix</li><li>Methods for ensuring mix proportions: samples, test wall</li><li>Effect of order and timing on extraction, storage, mixing</li><li>Effect of storage conditions on raw materials and mix: weather, moisture content, workability, fibre degradation</li><li>Tools, machinery and equipment</li><li>Mixing techniques, manual and mechanical</li><li>Relevant codes of practice and current standards for quality of work and materials</li><li>Current legislative workplace requirements</li><li>Health and safety regulations</li></ul>		<ul style="list-style-type: none"><li>Raw material sourcing, testing and processing, recipe<ul style="list-style-type: none"><li>Take representative soil samples</li><li>Ensure a continuous control of extraction</li><li>Make field tests</li><li>Make samples: mortars samples, test walls or cubes</li><li>determine appropriate mix</li><li>Assess the strength of the samples</li><li>Calculate the materials (quantities, volumes, proportions)</li><li>Prepare raw materials (dry, grind, sieve, soften in store, transport...)</li></ul></li><li>Mix production<ul style="list-style-type: none"><li>Assess and choose the mixing techniques</li><li>Mix to achieve even distribution of all materials</li><li>Monitor and control moisture content of the mix</li><li>Avoid disaggregation during transport and mixing</li><li>Modify the composition of the mix, according to requirements</li><li>required task, weather conditions and equipment</li></ul></li><li>Organisation<ul style="list-style-type: none"><li>Order the tasks involved in preparing the mix</li><li>Organise the earth extraction, preparation, storage, production site (protection, storage, access)</li><li>Select and use the correct tools and machinery</li><li>extraction, transport, preparation and storage mixer and</li><li>Clean, maintain and store mixer and</li></ul></li></ul>	

The image shows several overlapping documents related to earth building training standards. The most prominent document is a table with columns for 'ECVET Earth Building', 'From Raw Material to Mix', and 'Unit M'. It details learning outcomes for levels 3 and 4, divided into 'KNOWLEDGE' and 'SKILLS'. The 'KNOWLEDGE' section covers topics like soil information sources, earth properties, identification tests, stabilisation principles, extraction processes, and safety regulations. The 'SKILLS' section is divided into 'Raw material sourcing, testing and processing, recipe', 'Mix production', and 'Organisation'. Other documents in the background show similar structures for 'Level 3' and 'Level 4' competencies, and 'Indicators' for skill assessment.

# EBUKI

## Earth building training standards

Within construction

Levels 3 and 4 apply to workers taking responsibility for completion of tasks and exercising self-management respectively.

Levels 5 and 6 apply to supervisors managing technical activities, responsible for decision-making in unpredictable contexts.

Level 7 is suitable for the design team including architects and engineers

Level 8 reserved for academics.

# EBUKI

Expertise

**Pirate** 

Provide Instructions and Resources for Assessment  
and Training in Earthbuilding

EBUKI



**NOS**  
NATIONAL OCCUPATIONAL STANDARDS

**citb**

# EBUKI

Expertise

**Pirate** 

Provide Instructions and Resources for Assessment  
and Training in Earthbuilding



EBUKI



**NOS**  
NATIONAL OCCUPATIONAL STANDARDS

**citb**



# EBUKI

Expertise

**Pirate** 

Provide Instructions and Resources for Assessment and Training in Earthbuilding

EBUKI

**NOS**  
NATIONAL OCCUPATIONAL STANDARDS

**citb**



# EBUKI

Expertise

**Pirate** 

Provide Instructions and Resources for Assessment and Training in Earthbuilding

EBUKI

**NOS**  
NATIONAL OCCUPATIONAL STANDARDS

**citb**





# EBUKI

## Standards



**Qualification Title: Level 3 NVQ Diploma in Heritage Skills (Construction) v7**

- Pathway 1: Level 3 NVQ Diploma in Heritage Skills (Mason)
- Pathway 2: Level 3 NVQ Diploma in Heritage Skills (Brick Worker)
- Pathway 3: Level 3 NVQ Diploma in Heritage Skills (Earth Builder)
- Pathway 4: Level 3 NVQ Diploma in Heritage Skills (Finisher)
- Pathway 5: Level 3 NVQ Diploma in Heritage Skills (Dry Stone)
- Pathway 6: Level 3 NVQ Diploma in Heritage Skills (Decorative Occupations)
- Pathway 7: Level 3 NVQ Diploma in Heritage Skills (Wood Occupations)
- Pathway 8: Level 3 NVQ Diploma in Heritage Skills (Wall and Floor Tiling Occupations)
- Pathway 9: Level 3 NVQ Diploma in Heritage Skills (Plastering Occupations – Solid plastering)
- Pathway 10: Level 3 NVQ Diploma in Heritage Skills (Plastering Occupations – Fibrous plastering)
- Pathway 11: Level 3 NVQ Diploma in Heritage Skills (Roof Slating and Tiling Occupations)
- Pathway 12: Level 3 NVQ Diploma in Heritage Skills (Blacksmith)
- Pathway 13: Level 3 NVQ Diploma in Heritage Skills (Fully Supported Lead and Hard Metal Roofing and Cladding)
- Pathway 14: Level 3 NVQ Diploma in Heritage Skills (Thatching)

# EBUKI

## Standards



Natio

**Qualification Title:** Level 3 NVQ Dip  
(Construction) v

- Pathway 1: Level 3 NVQ Diploma in Heritage
- Pathway 2: Level 3 NVQ Diploma in Heritage
- Pathway 3: Level 3 NVQ Diploma in Heritage
- Pathway 4: Level 3 NVQ Diploma in Heritage
- Pathway 5: Level 3 NVQ Diploma in Heritage
- Pathway 6: Level 3 NVQ Diploma in Heritage
- Pathway 7: Level 3 NVQ Diploma in Heritage
- Pathway 8: Level 3 NVQ Diploma in Heritage Occupations)
- Pathway 9: Level 3 NVQ Diploma in Heritage (plastering)
- Pathway 10: Level 3 NVQ Diploma in Heritage (Fibrous plastering)
- Pathway 11: Level 3 NVQ Diploma in Heritage Skills (Roof Slating Occupations)
- Pathway 12: Level 3 NVQ Diploma in Heritage Skills (Blacksmith)
- Pathway 13: Level 3 NVQ Diploma in Heritage Skills (Fully Supported Lead and Hard Metal Roofing and Cladding)
- Pathway 14: Level 3 NVQ Diploma in Heritage Skills (Thatching)

549

Conserving and restoring earthen structures in the workplace

# EBUKI

## Heritage skills

COSVR767

Prepare and mix earth plasters and earth renders

---

### Performance criteria

You must be able to:

- P1 interpret the given information relating to the work and resources to confirm its relevance
- P2 comply with the given, relevant legislation and official guidance to carry out your work and maintain safe and healthy work practices
- P3 select the required quantity and quality of resources for the methods of work
- P4 comply with organisational procedures to minimise the risk of damage to the work and surrounding area
- P5 comply with the given contract information to carry out the work efficiently to the required specification
- P6 complete the work within the allocated time, in accordance with the programme of work

# EBUKI

## Heritage skills

COSVR767

Prepare and mix earth plasters and earth renders

### Performance criteria

You must be able to:

- P1 interpret the given information relating to the work and confirm its relevance
- P2 comply with the given, relevant legislation and official out your work and maintain safe and healthy work
- P3 select the required quantity and quality of resources work
- P4 comply with organisational procedures to minimise the work and surrounding area
- P5 comply with the given contract information to complete efficiently to the required specification
- P6 complete the work within the allocated time, in programme of work

*... render finishes on conservation or  
... structures*



*... information, advice, safe, healthy and  
... and using materials  
... and  
... and*

*COSVR767*

*Produce plaster and  
... render in a*

### Overview

*This standard is about interpreting  
environmentally responsible work practices,  
components, tools and equipment, preparing and  
producing internal plaster and/or external render finishes  
... render in a variety of situations*

*This standard is for people working in the occupational level of heritage skills  
and can be used by practitioners, supervisors and managers*

# EBUKI

## Heritage skills- Prepare and Erect

COSVR767

Prepar

Perform

You must



### Overview

This standard is for people working in the occupational areas of heritage skills and can be used by operatives, supervisors and managers

structures

structures

components, tools and equipment and erecting in support in order to prepare and erect or conserve and/or

This standard is about independently environmentally responsible work practices

Prepare and erect in respect of structures

Prepare and erect in respect of structures

This standard is about independently environmentally responsible work practices

components, tools and equipment and erecting in support in order to prepare and erect or conserve and/or

This standard is for people working in the occupational areas of heritage skills and can be used by operatives, supervisors and managers

This standard is for people working in the occupational areas of heritage skills and can be used by operatives, supervisors and managers



# EBUKI

## Heritage skills



# EBUKI

## Timeline

Project commenced	November 2014
Out for consultation	20/01/14
Passed to submissions team	15/06/15
Final submitted to regulators	24/06/15
Final approved by regulators	August 2015



# EBUKI

## Expertise

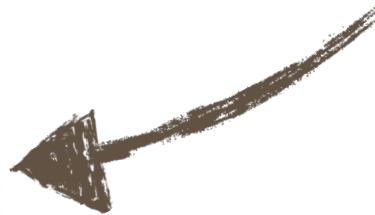
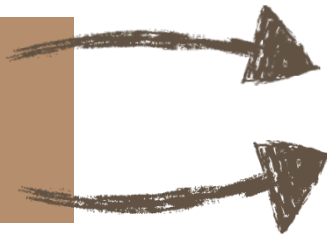
**Pirate** 

Provide Instructions and Resources for Assessment and Training in Earthbuilding

EBUKI

**NOS**  
NATIONAL OCCUPATIONAL STANDARDS

**citb**



# EBUKI

## Expertise



EBUKI



**NOS**  
NATIONAL OCCUPATIONAL STANDARDS

# EBUKI

June 2016



<b>Title:</b>	Preparing and erecting or conserving and restoring earthen structures in the workplace
<b>Additional information about this unit</b>	
<b>Assessment Guidance</b>	<p>This unit must be assessed in a work environment and in accordance with:</p> <ul style="list-style-type: none"><li>-the Additional Requirements for Qualifications using the title NVQ in QCF</li><li>-the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment.</li></ul> <p>Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy.</p> <p>Workplace evidence of skills cannot be simulated.</p> <p>This unit must be assessed against the endorsements detailed within the relevant Rule of Combination (RoC). Please refer to the RoC applicable to the qualification/occupational area in which the candidate is being assessed.</p>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>Learning outcomes</b>	<b>Assessment criteria</b>
<i>The learner will be able to:</i>	<i>The learner can:</i>
1.1 Interpret the prior information leading to the work and resources when preparing and erecting or conserving and restoring earthen structures.	1.1 Interpret and extract information from specializations, schedules, methods, safety assessments and manufacturers' information.
1.2 Comply with information and/or instructions derived from risk assessments and/or method statements.	
1.3 Describe the organizational procedures developed to report and rectify inappropriate information and available resources and how they are implemented.	
1.4 Identify the sources and	
	2 Building and Construction
	Prepared unit
	04/2020

# EBUKI

## Expertise



# EBUKI

## Expertise



# EBUKI

## Expertise



# EBUKI

## Expertise



# EBUKI

## Summary

EBUKI have successfully developed a National Vocational Qualification for new build and conservation of earthen structures

Achieved through the recognition of earthen construction as a heritage skill,

The NVQ is aligned to the European Qualification Framework.

Allows lifelong learning and mobility of Earth builders around Europe,

Resulting from the ECVET funded Pirate project.



# EBUKI

## Expertise



# EBUKI

Expertise



European  
Qualifications  
Framework

**Pirate** 

Provide Instructions and Resources for Assessment and Training in Earthbuilding

EBUKI



Historic England



HISTORIC SCOTLAND  
ALBA AOSMHOR



EBUKI

