



Combe Mill Society - Risk Assessment

Activity: Use of the Blacksmiths' Forge

Risk Assessment undertaken by: RB and BK

Assessment Date	14 April 2023	Certification	The contents of and the conclusions drawn in this Assessment are the responsibility of the HTA and have been certified by the DRS as meeting the requirements of the Combe Mill Society for display on the web site.
Next review date:	1 March 2024		
Date of last review:	Not applicable: new version		
Assessment Ref:	RA01_v4		

Abbreviations used in this risk assessment

Where an action or reference applies to a specific person that person is referred to by his or her initials. These persons are:

- RB, Robin Bowl, BK ,Robert 'Bob' Kitchener (HTA)

Where an action devolves on a post holder the following abbreviations are used:

Abbreviation or Name	Meaning
Blacksmith	Proficient Persons working in the Blacksmithing Technical Area are known as Blacksmiths and are so called in this Risk Assessment. They are individuals who are qualified and experienced to allow them to take charge of work within the Technical Area in the absence of the HTA. They must be at least 18 years of age.
CMS	Combe Mill Society
CP	Competent Person: individuals who are deemed by the HTA as sufficiently qualified and experienced to allow them to carry out work within the Technical Area in the absence of direct supervision. They must be a Member or Volunteer, typically gaining experience in order to qualify as a blacksmith. They are deemed by the HTA as fit persons to work without immediate supervision but are not yet permitted to work alone.

*Residual Risk (RR) =H x P



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Abbreviation or Name	Meaning
DRS	Director Responsible for Safety or a Member authorised to carry out his/her duties.
HTA	Head of the Blacksmithing Technical Area or a Blacksmith authorised, by the HTA or the Board, to act on the HTA's behalf.
PPE	Personal Protective Equipment
Volunteer	A person working voluntarily for CMS but not yet a member.

Scope

CMS's Blacksmiths' Forge at Combe Mill is a heritage forge containing two hearths. These allow the Blacksmiths to:

1. demonstrate their traditional skills and to make goods for sale in the Gift Shop,
2. give visitors a taste of the skills and strength required of a successful blacksmith and
3. train suitable members or Volunteers with the ultimate intention of allowing them to become Blacksmiths.

The initial sections of the Assessment (Hazards 1 – 12) examine the associated Risks that arise in the pursuit of the first objective. The outcome of this may be summarised as these Hazards give rise to uncontrolled risks of up to Substantial (Risk =16). The measures taken to control the risks reduce the majority to the Tolerable range (Residual Risks between 4 and 6). There are a few at the bottom of the moderate range but they are shown to be acceptable.

The last four sections (Hazards 13 - 16) explain the ways that appropriate supervision is used to ensure that the presence of a less skilled party does not increase the level of assessed risk.

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			H	P	Risk		RR*
1 Slips, trips and falls at same level	Blacksmiths Public	Possible Moderate injuries due to striking a hard object as a result of the fall. The uncontrolled Risk is Moderate.	3	3	3 X 3 = 9	The high level of Harm involved in this assessment arises from the layout of the heritage forge. All visitors are warned of the Risks that they run by choosing to work in a Heritage environment. All Blacksmiths are volunteers and no one is under any compulsion to work in the area. All are aware of the heightened risk associated with working in a Heritage environment. The Blacksmiths on duty ensure that the floor is kept clear of materials and equipment. Any spillages are mopped-up immediately. This reduces the Probability of Occurrence of the precursor of the incident considered and hence the Residual Risk, which is Tolerable. There are no further appropriate actions available and the risk is acceptable.	3 X 2 = 6

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2 Fire spreading to the building fabric	Blacksmiths and any person present in the building.	Possible Extreme Harm Unmitigated Risk assessed as Substantial and unacceptable	5	3	5 X 3 = 15	1) Fire is contained within a steel hearth. 2) When the fires are alight, the blacksmiths on duty ensure that: a) firefighting equipment is readily available b) the working area is kept free of ignitable materials c) 30 min. fire watch is kept after finishing work. 3) When a substantial number of visitors are expected, the DRS carries out a preoccupation safety inspection 4) The Society has a system of Fire Marshals whose duties include ensuring that all members and Volunteers: - are fully briefed concerning the Society's fire arrangements. - undergo adequate training and - participate in regular fire exercises These measures reduce the Probability of this high consequence accident to Very Unlikely making the Residual Risk Tolerable.	5 X 1 = 5

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3. Sparks or hot embers from fire burning a person	Blacksmiths and public	Unlikely Minor Injuries requiring first aid lead to a Tolerable Risk	2	3	2	1) Fire is contained within the hearth (a steel trough). 2) There is a strong metal 'fence' between the work and public viewing areas. 3) The blacksmiths are trained to avoid: a) overheating of metal in the hearth (this avoids sparking) b) hammering white hot metal to avoid spark production These measures reduce the Probability of Occurrence and confirm the Residual Risk as Tolerable, which is formally Tolerable. There are no further appropriate actions available and the risk is acceptable.	2
					3		2
					=		=
					6		4

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4 Burns from touching hot metal	Blacksmiths, members and Volunteers under training and visitor under supervision	The resulting burns are assessed as Moderate and the probability of occurrence as Likely making the uncontrolled Risk Moderate	3	4	3 X 4 = 12	The Blacksmiths have been appropriately trained and are provided with correct PPE. Only Blacksmiths, CPs and supervised persons under instruction, are allowed to remove hot metal from fire. A Blacksmith or CP correctly using the supplied tools and PPE reduces the probability of Moderate burns to VeryUnlikely and the Residual Risk to Tolerable For persons undergoing instruction appropriate supervision reduces the Residual Risk to Tolerable.	3 X 1 = 3
5 Injury from misuse of the tongs	Blacksmiths Visitors working at the anvil.	The misuse of tongs can lead to burns (see Hazard 4). It also leads to pinching of the palm of the hand between the handles. This causes minor injuries at a Likely Probability. The unmitigated Risk is Moderate.	2	4	2 X 4 = 8	The proper use of tongs contributes to the mitigation of Hazard 4 The only practicable controlling factor is practice to increase manual dexterity. A skilled Blacksmith or CP reduces the Probability to Unlikely and the Residual Risk to Tolerable The risk to trainees is controlled by the supervisory arrangements.	2 X 2 = 4

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6 Injury from use of damaged or broken tools (e.g. hammer head flying off handle)	Blacksmiths and public	Injuries assessed as Major are Possible	4	3	4 X 3 = 12	All tools are inspected before use and rejected if damaged. All rejected tools must be placed in a place of safety to avoid the risk of their re-entering circulation. The HTA must ensure that once rejected tools are either repaired or disposed of in a safe manner. This reduces the Probability to Very Unlikely and the Residual Risk to Tolerable. In the absence of further appropriate measures this s acceptable.	4 X 1 = 4
7 Noise	Blacksmiths and the public	Blacksmithing is inevitably associated with the noise of hammering. The level of Harm is negligible but the Probability is inevitable. The associated risk is Tolerable	1	5	1 X 5 = 5	The bounding risk is that to the Blacksmiths. It is formally Tolerable. CMS knows of no reason to believe that the low level of the actual noise and the relatively short periods of exposure is harmful. As a consequence the risk is acceptable. The risk to the public is much lower because persons are only exposed for a very short period.	1 X 5 = 5

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			H	P	Risk		RR*
8 Manual handling	Blacksmiths Visitors working at the anvil.	Usage of incorrect lifting techniques and/or handling or attempting to handle too heavy a load can lead to Major Harm with a Possible Probability The Risk is Moderate but because it is not controlled is unacceptable.	4	3	4 X 3 = 12	All Blacksmiths are required to be familiar with and act upon the requirements in CMS Method Statement MS16. All Blacksmiths supervising a visitor ensure that no visitor attempts to lift a load heavier than a Blacksmith's hammer [2lb (approx. 900g)]. With these precautions the assessed Probability falls to Unlikely The Residual Risk remains Moderate but is controlled and, in the absence of further appropriate measures, is acceptable.	4 X 2 = 8
9 Object flying out of vice	Blacksmiths Visitors working under supervision in the forge area.	A flying object could cause Major Harm with a Possible Probability. The associated risk is Moderate	4	3	4 X 3 = 12	Blacksmiths are trained to ensure that items that are placed in the vice are securely held. Any blacksmith supervising a visitor must ensure that the visitor securely places items in the vice. With these precautions the estimated Probability falls to Unlikely. The Residual Risk remains moderate. The Risk is under control and, in the absence of any other practicable alternatives, is acceptable.	4 X 2 = 8

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10 Unauthorised entry into working area	Any unauthorised person	An unauthorised person especially a child entering the Forge when the fires are lit could face hazards posing Major Harm with a frequency at the Possible level. The Risk is Moderate but because it is not controlled is unacceptable. When the forge is cold and unoccupied there is a further range of hazards with lower (Moderate) consequences and a similar Probability.	4	3	4 X 3 = 12	A substantial metal barrier is erected between the viewing public and work area. The access gates are bolted from the working side. The arrangements are not childproof and the HTA is reviewing them. Any necessary upgrades will be actioned by the HTA no later than the June Steaming. Subject to the satisfactory replacement of the existing bolt the Probability of the risk being realised falls to Very Unlikely and the Residual Risk to Tolerable. The Risk is controlled and there are no further simple means of reducing it. The Risk is acceptable.	4 X 1 = 4

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			H	P	Risk		RR*
11 Injury from the use of the bench grinder	Members and Volunteers	Improper use of powered grinders can lead to Major injuries with a probability assessed as Likely. The associated risk is Substantial and unacceptable.	4	4	4 X 4 = 16	1) The use of the grinder must be restricted to those authorised by the HTA. Their names should be displayed adjacent to the machine. 2) An approved user may supervise a trainee 3) Grinders must be operated in accordance with the manufacturer's instructions and any regulations on display. 4) Eye protection must always to be used. 5) Damaged stones are never re used. They are removed from service and, together with fragments, retained in a place of safety until such time as the HTA determines that they are not required for any investigation. 6) The above actions reduce the Probability of Occurrence to Unlikely and the Residual Risk to Moderate. The Risk is controlled and, in the absence of any other mitigating factors, is acceptable. The use of a lockable isolating switch should be considered to prevent unauthorised use.	4 X 2 = 8

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			H	P	Risk		RR*
12. Blacksmith distracted by unsupervised member of public in the general area around the forge.	Blacksmiths, persons under training and public	The assessed Harm is Minor and the Probability is Unlikely	2	2	2 X 2 = 4	Unauthorised entry to the forge area is prevented by a metallic wall; see section 10. Blacksmiths and tour guides are aware of the distraction hazard when there are substantial numbers of visitors in the Forge area but outside of the working area. No changes are necessary. The Residual Risk is confirmed as Tolerable.	2 X 2 = 4

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			H	P	Risk		RR*
13 Supervision of fee paying visitors*	Visitor undergoing a blacksmithing experience, Supervising Blacksmith	The various hazards that can arise are set out above and the details are not repeated here			As above	Visitors 1) Visitors are supervised on a one to one, hands on basis for the entire time that they are within the fenced forge area. 2) The supervisor must be a Blacksmith who has been approved by the HTA to undertake this duty. 3) The supervisor must not undertake any other tasks when the visitor is in the forge fenced area. 4) Before starting the activity the supervisor must ensure that the visitor: a) is given a briefing about working with hot metal b) wears leather gloves, apron, & eye protection when shaping metal on the anvil (continued on next page)	As above

* CMS offers two basic courses for which visitors pay an appropriate fee: a brief introductory course during which visitors make a poker and a longer course where they have a wider choice of artefacts.

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			H	P	Risk		RR*
13) (cont'd) Supervision of visitors					As above	(continued from previous page) c) When necessary, informs the visitor that they cannot wear unprotected open toed sandals or similar and must additionally wear the leather gaiters supplied 5) The detailed risks above were confirmed as applicable when supervised visitors were present.	As above
14) Supervision of training	Person undergoing initial training Supervising Blacksmith	The various hazards that can arise are set out above and the details are not repeated here			As above	1) During the early stages of their training Trainees are supervised in the same way as visitors. 2) At the end of basic training trainees are reclassified as Competent Persons. 3) The detailed risks above were confirmed as applicable when trainees were present.	As above

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			H	P	Risk		RR*
15) Supervision of Competent Persons	The Competent Person Supervising Blacksmith	The various hazards that can arise are set out above and the details are not repeated here			As above	1) A Competent Person may work unsupervised at a hearth but, under CMS's Safety Arrangements, there must be a Blacksmith present on the site and able to go to the Competent Person if required. 2) Other tasks must be supervised. 3) The relevant detailed risks above were confirmed as applicable when a CP was present.	As above

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Topic	Comment
Appendix: Safety Related Responsibilities created by the DRS:	
This Appendix is not formally a part of the associated Risk Assessment. It has been prepared by the DRS providing a reminder of the existing safety management responsibilities that impact on the application of the Assessment.	
Note For sound historic reasons skilled persons in the Blacksmithing Technical Area are known as Blacksmiths. Within the CMS Safety Policy, they are a subset of suitably skilled and experienced members known as Proficient Persons. The Safety Policy is written in terms of Proficient Persons. Wherever such a reference occurs in the Policy and/ or its supporting documents it applies equally to Blacksmiths.	
1 Trainee development	As soon as the HTA is satisfied that a Trainee is sufficiently skilful the HTA will reclassify the Trainee as a Competent Person and enter the person's name on the list that the HTA is required to keep. (See Item 3 below) The HTA must then ask the appropriate person (at present Tony Simmons) to issue the Competent Person with a certificate of Competence

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Topic	Comment
2 CP development	<p>As soon as the HTA is satisfied that the CP is sufficiently skilful the HTA will reclassify the CP as a PP and enter the person's name on the list that the HTA is required to keep. (See Hazard 16)</p> <p>The HTA must then ask the appropriate person (at present Tony Simmons) to issue the Proficient Person with a certificate of proficiency</p>
3 Loss of control of risk due to unqualified persons carrying out duties for which they were not properly trained.	<ol style="list-style-type: none"> 1) The HTA is required to maintain up to date lists of the names of Competent and Proficient Persons These lists are the definitive list of Competent and Proficient Persons approved to work in the Forge Area. 2) The certificates of Competency and Proficiency provide reassurance to the persons concerned that they are on the HTA's list. Their possession is not obligatory. 3) Any person may ask for his/her name to be removed from a list. 4) The HTA is formally responsible for ensuring that CMS's safety requirements are met in the Blacksmithing Forge area. 5) The HTA seeks to resolve such matters by discussion. 6) If such discussion fails the HTA should consult the DRS.

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Risk Rating Matrix

		Probability of Occurrence (P)				
		Very Unlikely	Unlikely	Possible	Likely	Very likely
Consequence of Incident expressed as the resulting "Severity of Harm" (H)	Negligible	Trivial (1)	Trivial (2)	Trivial(3)	Tolerable(4)	Tolerable(5)
	Minor	Trivial(2)	Tolerable(4)	Tolerable(6)	Moderate(8)	Moderate(10)
	Moderate	Tolerable(3)	Tolerable(6)	Moderate(9)	Moderate(12)	Substantial(15)
	Major	Tolerable(4)	Moderate(8)	Moderate(12)	Substantial(16)	Very serious(20)
	Extreme	Moderate(5)	Moderate(10)	Substantial(15)	Very serious(20)	Very serious(25)

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Guidance on Interpretation

Parameter Level	HSE Descriptor	Meaning
Severity of Harm (H)		
1	Negligible	Postulated event not expected to lead to noticeable harm.
2	Minor	Level of harm that could lead to an injury that needs first aid treatment at the Mill
3	Moderate	Level of harm that could lead to an injury that requires professional help
4	Major	Serious medical injuries: for example broken limbs or a period of unconsciousness or the need to report the incident to a Regulatory Body
5	Extreme	Harm that could lead to death or life changing permanent injuries
Probability of Occurrence (P)		
1	Very Unlikely	Not more than once in 10 years
2	Unlikely	Not more than once a year
3	Possible	Over 1 but not more than twice a year
4	Likely	Over 2 but not more than 4 in a year
5	Very likely	Almost certain to appear: the occurrence often overlooked as being a 'normal everyday occurrence'.

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Further Typical Measures that may be required to make the Residual Risk Acceptable

Risk R	Trivial	Tolerable	Moderate	Substantial	Very serious
Comment	Residual Risk (RR= 1 to 3) The risk is effectively non-existent and is acceptable as it stands.	RR = 4 to 6 The risk is adequately controlled but consider any justifiable minor additional measures	RR = 5-12 Additional controls should be considered where possible. The risk may or may not be adequately controlled.	RR=15-16 The risk is not adequately controlled: set out steps that must be taken before execution of operation can be approved	RR=20-25 The risk is not adequately controlled: the operation is unacceptable. Rigorous control methods are essential. Find an alternative if practicable.

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