

Shepherd Wheel Volunteer Manual

Resource Material for Volunteers

Extended and revised 2026



Preface and Acknowledgements

Preface

This core manual contains a welcome, a guide to volunteering at the Wheel, and a short overview. This is essential reading and should take no more than 15 minutes.

There is also a longer version containing supplementary sections providing further detail available which you can peruse at your leisure. This is available to download from the FoPV website.

Acknowledgements

We acknowledge the following as sources for images and contributions in this guide. Where not mentioned, images are either FoPV or public domain.

Picture Sheffield: p. 21, p. 29, p. 32, p. 36, p. 37

South Yorkshire History Society: p. 11, p. 24

The Swimming Magazine: p. 23

Peter Bayliss (author) : *Shepherd Wheel, Overview*, published in the SPAB Mills book, 2026

Duncan Edwards: FAQ *Who Dug* p. 21 and FAQ *Square and Circular* p. 33; Appendix D: Horsepower calculations

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1. INTRODUCTION

WELCOME TO THE SHEPHERD WHEEL VOLUNTEER GUIDES TEAM!

You are now one of approximately 20 guides coordinated by the environment charity **Friends of the Porter Valley (FoPV)**. We work in partnership with **Sheffield Museums Trust (SMT)** whose Heritage Engineers operate the **Shepherd Wheel** ensuring it can be seen working at weekends. This unique partnership was founded in 2008¹ when we obtained a National Lottery grant to restore the derelict millpond (dam), buildings and machinery. One key condition was that the museum would open for free at weekends and would be managed by a tri-partite partnership (**Sheffield Council** as the landowner is the 3rd partner). That partnership has functioned successfully ever since.

I hope you will find this Handbook useful and enjoyable. You will certainly find your colleagues keen to welcome and help you.

This unique working example of a water powered workshop is very popular, not just with local residents who love the Porter Valley but with visitors from all over the world (32% of our visitors who signed the Feedback book in the first six months of 2024 came from outside Great Britain). Overseas visitors are often introduced by Sheffields wanting to show off the roots of the city's industry in this green setting. Your task as a volunteer guide is to bring that history alive.

Some background

The **Porter valley** is a rich mosaic of built and green heritage and the Shepherd Wheel site might be considered a jewel in this fascinating landscape.

- Its millpond and water form a **nature reserve** recognised by **Natural England**, and is popular with naturalists and photographers.
- The workshops are within a **grade 2 listed building** which is also a **scheduled ancient monument**.

Together they constitute one of Sheffield's finest Museums.

The **Friends of the Porter Valley** is a substantial and active Friends group which, in partnership with the Council, manages the public parks and Nature Reserves along the Porter Brook. We are committed to the conservation, protection and restoration of the ecology, landscape and cultural heritage of the Porter Valley for the enjoyment of all and the benefit of future generations.

I am sure you will enjoy presenting this unique heritage to the visiting public and thank you for joining the team!

Ann Le Sage

Chair – Friends of the Porter Valley

¹ <https://www.heritagefund.org.uk/projects/shepherd-wheel-conservation-project>

2. EXPECTATIONS

Thank you for becoming a volunteer guide at this unique piece of Sheffield history. We hope you'll find greeting people from many parts of the country and abroad, as well as local inhabitants an enjoyable and interesting way of spending a couple of hours. As a largely open-air site in the middle of a park, visitor numbers can be variable and weather dependent. You will get regular dog walkers popping in for a chat, parents with young children calling in as part of their routine walk. At other times you will meet people who are interested in history, engineering or who are just passing by. Enjoy the many different conversations you will have, there is no script. Before your first shift read the guide book and memorise some key facts - you don't need to know everything on the first day as you have this guide to hand or you can refer questions to the engineer.

When a visitor arrives, greet them warmly and offer to answer any questions. Some will be happy just to look, have a brief chat, whilst others will want to know all that you are able to tell them. Some will know a great deal already whilst others will have no idea what they are looking at. Children tend to be fascinated by the Wheel itself; many older people comment on the fire as being similar to the one in their grandmother's kitchen. Some want to know about the horse power and the revolutions per minute. Older Sheffield people will often tell you that they visited with school many years ago. You may find that children enjoy learning new words such as 'overshot', 'goit', 'pentrough' and learning the difference between cutlery and flatware. Never be afraid to admit that you do not know the answer to a question – ask the engineer on task as they may know the answer, or if that doesn't work, post it on the volunteer WhatsApp group for future reference. One of your colleagues may be able to help.

Try to remember to ask for entries in the visitor's book. Gently refer to the card reader and the bucket for donations if you feel that is appropriate and suggest that they use the QR code when they have time.

Now, read on to find out who, what and how.

2.1 Who's who?

- a. **Chair of FoPV:** Acts as our liaison with SMT and attends their quarterly meetings on our behalf as well as working on all the other projects with which FoPV is involved.
- b. **Shepherd Wheel Rota Organiser:** Creates the schedule for volunteering at Shepherd Wheel.
- c. **SMT Volunteering Manager:** Looks after all the volunteering opportunities across SMT sites other than Shepherd Wheel.
- d. **SMT Head of Historic Engineering:** Has oversight of engineering operations across SMT sites and creates the rota for SMT engineers to attend Shepherd Wheel and other industrial museum sites (Kelham Island and Abbeydale Industrial Hamlet)
- e. **The SMT Historic Engineers:** One of them will be on task with you each weekend at the Wheel. They are responsible for opening and closing the premises; for starting and stopping the Wheel; for checking the water level in the dam and operating the sluice to increase or reduce inflow; for controlling the water level in the pentrough controlled by the lever from within the Hull; for building the fire in the fireplace and a number of other tasks relating to the upkeep of the site. They are responsible for health and safety while on site and have access all areas while volunteers should remain in areas accessible to the general public.

- f. **Fellow Volunteers:** there are over 20 volunteers whom you will meet, probably only at Shepherd Wheel shift handover to start with, but through WhatsApp exchanges and the occasional face-to-face meeting you will come to know most if not all.
- g. **SMT visitor survey volunteers** who may occasionally visit the Wheel to undertake the Arts Council survey conducted at all SMT sites.

2.2 What's involved?

- a. Being available for one of the two daily shifts (in winter) and three daily shifts (in summer). Each shift is two hours long. You will be contacted by email each month and asked about your availability. You do not have to opt for a regular or frequent slot. Some volunteers can offer only one shift per month, others more.
- b. Showcasing Shepherd Wheel and the surrounding site to the public. Helping bring to life the history of water-powered grinding along the Porter Valley, the engineering of the Wheel itself, and what it might have been like to work here.
- c. Working with the SMT engineer to keep the premises safe, clean and tidy

2.3 Induction

- a. To volunteer at Shepherd Wheel you will need to read through this manual and undertake some shadowing sessions (see 2.4e. below).
- b. Because the Wheel is operated by SMT, you can also apply to become a SMT volunteer and undertake a SMT volunteer induction and safeguarding training, although this is not a pre-requisite. Sessions are usually held at Kelham Island and there are several opportunities throughout the year. You will then have access to the SMT volunteer website and wider volunteering opportunities, should you so wish.

2.4 Getting started

- a. Make sure you have suitable clothing for your volunteer session (warm layers, waterproofs and sensible boots or shoes). It is chilly inside the stone building!
- b. You will need a mobile phone. Please ensure you bring it with you each time you are at the Wheel.
- c. At home you will need access to email and WhatsApp. You will be invited to the Shepherd Wheel volunteers WhatsApp group, our handy forum for news, information and making last-minute changes.
- d. Your email address, with your permission, will be added to the rota organiser's list and you will be invited to volunteer. Please respond promptly so that the rota can be drafted and circulated in good time. Summer hours comprise three shifts (10-12; 12-2; 2-4). Winter hours comprise two shifts (11-1; 1-3).
- e. For your first two sessions at the Wheel, you will be shadowing one of our experienced volunteers to get a feel for what is involved. If you feel comfortable and confident after that, you will then be able to go solo.

2.5 Tasks

- a. **First session of the day.** If you are scheduled for the first session of the day, please arrive ahead of the scheduled opening time.
You can, if you are able, assist with the opening of the Wheel. This involves:
 - i. opening the window shutters and securing them safely via hook and eyes on the outer wall (the engineer will show you how when you start).
 - ii. storing the metal 'closing pegs' under the bench by the fire.
 - iii. putting out the banners on pre-positioned posts.
 - iv. wheeling out the park footpath sign and stand (though this is heavy and should not be attempted unless you feel confident with moving heavy objects).
 - v. assisting the engineer to light the fire.
 - vi. opening the Visitor Book so that it is ready for comments to be entered.

- vii. checking the leaflet display and ensuring there are copies of the Visitor Guide available. If not, ask the engineer for more – they are stored in the room at the back.
 - viii. wearing the FoPV ‘Volunteer’ lanyard to identify you as a volunteer and taking charge of the number clicker which records the number of visitors during your shift.
- b. Last session of the day.** Please remain to assist the on-site engineer with closing the site, which takes approximately 15 minutes. You can, if you are able, assist with the following:
- i. all the items mentioned at the start of the day, in reverse order i.e. take banners in, shut the window shutters and put the metal pegs in while the engineer slots the retaining toggles into them from the inside.
 - ii. checking the donation box and write the total for the day in the book which the engineer holds and will countersign.
 - iii. returning the clicker to the engineer so that s/he can record the number of visitors for the day and put your lanyard back.
- c. All sessions.** Whatever session you are scheduled for:
- i. on arrival, obtain and display your FoPV ‘Volunteer’ lanyard.
 - ii. take charge of the clicker and try to ensure you click in every visitor to the site, adults, children and babies. This can be tricky during busy times and when you get engrossed in conversation, but do your best.
 - iii. make visitors feel welcome. Make sure they are aware of the different parts of the site (hulls, wheel and pond) and of the presence of a volunteer, and an engineer who will try to answer any questions they may have. Just a simple ‘Welcome to Shepherd Wheel. First visit?’ is a good way to start.
 - iv. If a visitor has shown interest and asked questions, ask them to make an entry in the Visitor Book. This is extremely useful data which tells of the remarkable reach and impact of the Wheel. In addition there is the QR code supplied by the Arts Council to learn more about visitors to our sites. You might say something along the lines of...
- “It would be great if you could leave informal comments in the file here and if you have time there is also a link on this QR code which helps the Arts Council understand more about visitors to our sites in Sheffield.”*
- v. SMT and Shepherd Wheel rely on donations for much of their work. Sometimes it’s a large donation from a significant sponsor. Other times it’s a small donation on site from visitors. At the Wheel there is an electronic screen for electronic donations and a bucket for cash donations. Cash donations are exclusively for use at Shepherd Wheel and are held by FoPV in the Shepherd Wheel reserve account. All donations made on the electronic device go to Sheffield Museums Trust to use across all museums. Please mention some of the things which donations have funded to give donors a sense of their investment in the Wheel – the hoist and the new drum are two good examples.
 - vi. On departure, thank visitors for their visit. If they have made a donation, thank them for that, too, and offer them one of the Shepherd Wheel ‘Visitor’s Guide’ booklets in appreciation of their support.

d. If you are unable to attend

- i. **A week or more before your shift.** Use the WhatsApp group to seek a fellow volunteer who is able to cover for you in exchange for a swap with one of their scheduled shifts
- ii. **On the day.** Contact the rota organizer on WhatsApp. S/he will advise on best solution.

e. Expenses.

- i. If you are a registered SMT volunteer, you will receive a claim form for each month in which you volunteer by email also explaining the policy on expenses. FoPV will pay pre-authorised exceptional expenses.

2.6 Health and Safety

a. Information and equipment

- i. The notice board in the main hull has the latest health, safety and emergency information. Please familiarise yourself with this. The reverse of your lanyard contains key contact information should you need it.
- ii. There is a risk assessment for visits to the site by members of the public. It is included as Appendix G in the full volunteer manual.
- iii. The SMT engineer is the member of staff responsible for dealing with any and all incidents. The volunteer is there to assist as directed by the Engineer.
- iv. There are two First Aid kits. One is in the main hull and the other is in the Engineers' hut. The throw rope for water incidents is hung up in the WC.
- v. There is also an incident record book which is the responsibility of the Engineer.
- vi. If there are any personal limitations on your ability to assist with an accident or you have any health or mobility issues that we should bear in mind please contact the Chair.

b. Contacts, location and accessibility

- i. Please add the SMT Emergency phone number to your contacts: **07485 334728**. Phone, if you have to alert an engineer or other support staff.
- ii. The location of the Wheel is best described using 'WHAT3WORDS': **item.liked.upon**
- iii. Emergency vehicle access is only from Rustlings Rd/Oakbrook Rd junction S11 7AD
- iv. SMT have a useful [Powerpoint](#) that describes the location of the Workshop.
- v. Accessibility information is provided on [the SMT pages](#) for Shepherd Wheel.

c. Important: In the event of an accident

- i. Alert the on-site engineer who is First Aid trained and is also the responsible person. Follow their instructions.
- ii. If the on-site engineer is incapacitated, if possible enlist people to help you with the following:
 - **Assess the situation.** Call the emergency services immediately if it seems appropriate. Use WHAT3WORDS (**item.liked.upon**) for location.
 - **Close doors** to both hulls so machinery is inaccessible.
 - **Move the public** to the assembly point across the river in the clearing by the benches. It is essential that access to Shepherd Wheel is kept clear

for emergency service vehicles. **Call the off-site engineer** who will then take charge **07485 334728**.

d. **Training.**

- i. From time to time FoPV offer a one day Emergency First Aid course for volunteers plus a Safeguarding briefing.

2.7 Public access

- a. Shepherd Wheel is open to the public on weekends. In the summer, from 10 a.m. till 4 p.m., and in winter from 11 a.m. till 3 p.m.
- b. The nearest public toilets are at Endcliffe Park Café and Forge Dam. The toilet at Shepherd Wheel is for the use of engineers and volunteers only.
- c. Dogs are not allowed in the pond. During the most recent renovations the dam was desilted and a liner installed. Dogs scrambling out of the water damage the liner. They can also disturb nesting birds and waterfowl.

3. Overview: Shepherd Wheel Sheffield. SK317 854

The two major industries for which Sheffield is known throughout the world, steel and cutlery, both have histories heavily entwined in the use of water power provided by the five rivers that flow from the hills around the city. The earliest mills recorded date from the thirteenth century, being corn and fulling mills, owned by the Lords of the Manors and, until the Reformation in the 16th century, local abbeys. Some of these monastic establishments were early producers of local mined iron ore, and as the iron industry developed, so did the use of water powered machinery, with watermills soon being harnessed to drive trip hammers, bellows, slitting mills, and rolling mills, as well as grinding workshops for the growing cutlery trade, these last being known as 'Cutlers Wheels'. At the height of water power, the five rivers drove over one hundred water wheels, until in 1786 steam power arrived in Sheffield, no longer dependent on the vagaries of water levels in the rivers, and rapidly replaced many but not all the waterwheels. Of the survivors, only one cutlers' wheel remains, the Shepherd Wheel, which continued to produce blades until the early 1930's.

The Shepherd Wheel is a water powered 'Cutler's Wheel' situated on the Porter Brook, one of the five rivers in Sheffield. It stands in Whiteley Woods, part of a linear urban park, described by Patrick Abercrombie, one of the most influential British town planners of the 20th century, writing about the Porter Valley in 1924 as "the finest example... of a radial park strip... leading from a built-up part of the city direct into the country."

The Wheel today consists of two workshops or 'Hulls', the larger believed to date from around 1750, replacing an earlier building, and the smaller from around 1780/1790. The water wheel itself is overshot, 18ft in diameter and 6ft wide, with a frame of cast iron believed to date from around 1820, with steel buckets replacing the earlier wooden ones. Water is diverted into the dam via a weir and shuttle, and from the dam feeds into a pentrough and thence onto the wheel. (Fig 1) After passing over the wheel the water passes through a culvert to return to the brook 100 metres downstream. The output of the wheel when fully operational and running at 6 revolutions per minute has been calculated as approximately 13.3 horsepower. This would give the grindstones an optimum surface speed of 2,500 feet per minute, depending on the size of the grindstone, which in turn was dictated by the type of blades being produced.

The water wheel is mounted on an axle which passes into the main hull, and on which is mounted a crown wheel. This is eight feet in diameter and consists of an iron casting into which are fitted eighty individually made oak teeth set into the face. This gear wheel meshes with two metal pinions on stub axles which turn the motion through ninety degrees, thus transferring the power via two large diameter wooden drums and leather belts to the spindles and pulleys of the grindstones. At its peak the wheel could drive up to twenty stones and several 'glazing' wheels, the latter used to give the blades a last polish.

The earliest documentary evidence for a wheel on this site appears in a will of 1584, when it is called the Porter Wheel. It stood on land owned by the Earl of Shrewsbury, who was Lord of the Manor of Hallam. No record exists of the wheel's founding, but Allison in an article in the Transactions of the Newcomen Society in 1949-50 entitled "Water power as the foundation of Sheffield's industries", describes a contract for the construction of a cutler's wheel in 1549 in which the cutlers paid a lump sum to the Lord of the Manor and agreed to pay eight pence. a year for manorial services. They could take a dozen oak trees from the waste for spindles etc. The constructor agreed to construct the dam and grinding hull for seven pounds. This may or may not refer to Shepherd Wheel, but it is fairly certain that this was the first grinding wheel on the Porter, and unlike many other wheels over

the centuries which were at times used for grinding cutlery, then corn, then back to cutlery, Shepherd Wheel was only ever used for the grinding of cutlery.

The wheel changed hands a number of times, with occasional 'down' periods, in 1749 being operated by Edward Shepherd, who had the wheel from 1759 to 1794, at a rent of three pounds and three shillings. and whose name has remained to the present in the name of the wheel Throughout its operational life Shepherd Wheel specialized in the grinding of table knife, pen and pocket knife blades. There is also residual evidence of file, scissor and razor grinding in later years.

Unlike many other wheels, Shepherd Wheel did not succumb to the introduction of steam power, but remained a water-powered workshop until it finally ceased production in the early 1930's. In 1927 it was inspected by the Factory Inspectorate, found to be unsafe and issued with a closure notice. By this time however, whilst continuing production, it was already acting as an unofficial museum, with passersby stopping to watch the work, visible through the open windows and doors. A protest was organized against the closure involving local dignitaries including the Lord Mayor, local MP's and Master Cutler which eventually reached the Prime Minister and was discussed in the House of Commons, with the result the wheel was allowed to continue with some provisos regarding safety.

By the early 1930's the larger hull had been abandoned and work continued using the smaller hull. By this time, it was difficult to compete with the larger factories in town, and the remaining grinders were of an age to retire, so the hulls were locked and handed back to the owners, by this time the City Council. One of the last men to work at the wheel was called Hind, and his family had been employed there for over a century, indeed in the late 17th century the wheel was operated by a Thomas Hynde though whether this was the same family isn't known.

After its closure, demonstrations were arranged from time to time by the Sheffield Trades Historical Society until 1940. It is notable that one such demonstration at Easter 1936 attracted over 1,000 visitors, both local and from elsewhere in the UK.

After 1940 the wheel fell into dilapidation until in 1957 the Council voted a sum of £500 for its demolition. However the Council for the Conservation of Sheffield Antiquities persuaded the Council to use the money for the restoration of the building, and itself undertook the repair of the waterwheel and the machinery. An appeal was launched and many local companies contributed generously but the amount raised only covered part of the labour cost and materials. However, over the following three years craftsmen from a local company, assisted by volunteers from the Sheffield Junior Chamber of Commerce worked on the restoration in their spare time. With enough water in the dam for just twenty minutes running, the wheel turned again in May 1962.

The wheel was open to the public at weekends and Bank Holidays until the 1980's, when it closed and was effectively abandoned until in 2008 a local organization the Friends of the Porter Valley (FoPV), undertook the task of fundraising to reopen the wheel to the public. With match funding available from the Lottery Heritage Fund, a tripartite group was set up with the FoPV, the City Council (the owners), and the Sheffield Industrial Museums Trust which oversaw the restoration of the wheel and dam, and the wheel once again turned in 2012, with an official opening by the then Deputy Prime Minister and local MP Nick Clegg.

Since then, the wheel has been open to the public at weekends, staffed by an engineer from the Sheffield Museums Trust and volunteer guides from the Friends of the Porter Valley.

Further reading: C. Ball, D. Crossley and N. Flavell eds. "Water Power on the Sheffield Rivers". South Yorkshire Industrial History Society 2006

Video of the restoration of Shepherd Wheel: <https://www.youtube.com/watch?v=7g5QVXor7OA>

Fig 1 Cutaway drawing of the main hull and machinery (courtesy of Sheffield Museums Trust)

