A Preliminary Investigation of the Archaeology and History of Philipshill Mill, Wester Kittochside, Scotland

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Introduction

The Philipshill Mill is a ruined corn mill located at Kittochside near East Kilbride. It was built some time in the mid to late 18th century and fell out of use early in the 20th century. The property is currently administered by the Scottish National Trust and the building fabric is in a state of fairly rapid deterioration.

This document is the result of research carried out in 2006 and 2007 on behalf of the National Trust. This research had the following aims:

1. To gather together all of the information already known about the mill, that is, historical, archaeological, and other data, to develop a picture of what we already know, and to provide baseline data in order to;
2. Undertake preliminary archaeological investigation based on questions raised by the data collection exercise and;
3. To determine the level of structural deterioration of the mill building and to develop some ideas about what to do with the mill (eg, conservation, restoration etc).

The course of this research has shown that historical records relating to the mill are patchy and that very little previous archaeological investigation of the site has been carried out. This, combined with the clear and rapid deterioration meant that simply recording the remaining elements of the site was considered a priority.

This report is arranged in three broad sections. The first section covers a collation of what is already known about the mill; the second section covers preliminary archaeological work carried out in May 2007; and the third section contains a collation and discussion of all known data, as well as recommendations for the future of the mill. There is also an appendix which contains copies of maps, plans, photographs etc alluded to in the text.

Section One: Historical and Archaeological Background to the Philipshill Mill

This section attempts to cover what we already know about the Philipshill Mill site. It collates knowledge from historical sources and previous archaeological research to provide baseline data in order to develop a programme of archaeological work. It begins with a discussion of the historical context under which the mill was founded, then looks at documentary sources, maps, and then finally, previous archaeological research.

Historical Context

Any archaeological site obviously does not exist in a vacuum. While we may study the site itself we need to realise that it and the people who used it, operated as part of wider social and economic networks. Thus, it is important to realise that a corn mill exists as an integral part of a larger agricultural economic and social system. Without milling facilities grain cannot be processed into a form in which it can be consumed by people. In relation to the Philipshill Mill the historical context is especially important, because the mill was first built and was subsequently used during a period of major upheaval and change in agricultural practice in Scotland.

During the 18th century a number of major changes occurred in Scottish agricultural practice relating directly to corn milling. Described as the "Agricultural Improvement" these included changes to field drainage, soil tillage, fertilisation methods, crop types, land-use and other methods designed to increase land yields (as outlined for example by McGuire 1988). The results of the Improvement were to increase crop yields in certain areas, and to drop them in others, where it was considered more advantageous to use land for pasture (McGuire 1988: 86). This impacted directly on corn milling, causing the establishment of new mills and the closure or change of others. The establishment of Philipshill Mill seems to coincide with the introduction of the Improvement in the Kittochside area. Ure (1981) discusses changes to agricultural method occurring in the parish of East Kilbride. He bemoans the lack of foresight of local farmers in not taking up these new and more efficient methods, with the exception to this being the lands around Kittochside where, "About 20 years ago, John Reid of Castlehill, Esq; began to drain his lands" and make other forms of Improvement (Ure, 1981:181-82). Reid (1943: 33) describes how his ancestor John Reid introduced elements of the Improvement, in the form of new drainage in 1773, making poor land productive. This was clearly a success, as it resulted in a Lay, dating to c.1800, called *John the Drain-Maker*, suggesting the drainage has resulted in "…twa blades whaur ane had been" (Reid, 1943: 43), implying a doubling of agricultural yield. Clearly John Reid of Castlehill was not only famous for adopting improving methods, he was also successful. The dating of these Improving actions are important because they coincide with the first mentions of the Philipshill Mill in historical sources. While there is no direct historical link between the new mill and this Improvement, given

the proximity of the mill to Kittochside, a possible link could be suggested between improved agricultural yields and the need for and situating of a new mill. Regardless, it is important to recognise that the Improvement would result in new facilities to deal with increased grain yields, including corn mills.

Improvement in general agricultural practice was accompanied by other forms of change. One of these was changes to the legislation which regulated the way farmers patronised their local corn mill. Prior to the 18th century, under a system called thirlage, farmers were required to have any grain grown by them ground at their landlord's mill, to give a third of this grain to the millkeeper as payment, and to contribute to the upkeep of the mill (McGuire 1988: 7). However, this system was breaking down at the end of the 18th century and was repealed by the Thirlage Act of 1799, meaning that farmers then had a choice about where and how to process their grain and how much to pay for this milling (Handley 1953: 281-2). This had an effect on many mills, making them either more or less profitable than before. The most obvious change however was that mill owners and tenants could no longer rely on the contribution from farmers for the upkeep of their mills. Under thirlage farmers were obligated to contribute to the upkeep of the mill both financially and in the form of labour. After thirlage mill owners and keepers would have needed to find other ways to maintain and improve their mills. This is important because, as with agricultural Improvement, there were numerous technological changes and innovations in milling developed from the 18th century onwards. These needed to be incorporated into existing mills to allow them to stay competitive. The owners and millkeepers at Philipshill would have needed to deal with this, which would have required them to change the way they operated and maintained the mill.

These technological changes occurred in a number of ways. There were numerous innovations incorporated over time, either imported from outside Scotland or the result of indigenous invention. These include changes in the type and provenance of millstones, the replacement of wood with iron, and improvements to waterwheel technology (Watts, 2002: 117-150). Local millstones were replaced by ones sourced from France in the early 19th century (McGuire, 1988: 86). There was a widespread adoption of cast and wrought iron parts for mill machinery, replacing wood (Watts, 2002: 117). And there was major change to waterwheel technology. McGuire suggests that "Most early modern corn mills in Lowland Scotland were horizontal shaft, vertical-wheel water mills" (1988; 86). However, it was not until the 19th century that changes in bucket technology made it feasible to deliver water to these wheels in an overshot or breast-shot fashion, which improved the efficiency and power delivered by the wheel (McGuire, 1988: 87). Additionally there were major changes occurring in wheel gearing, resulting in increased power available for milling (Watts, 2002: 133-137). These improvements all needed to be incorporated into mills. Additionally, while drying and threshing of grain was previously carried out by farmers at their farms before milling, these functions increasingly began to be carried out at mills (McGuire, 1988: 86). Thus, corn drying kilns and grain

threshing machines also become an integral part of the mill structure. McGuire suggests that mills "…of dressed stone are likely to have had kilns either joined to them or close by" (1988: 86).

Some of these changes, such as those caused by the Thirlage Act, are invisible archaeologically, but some, such as the technological changes, may be able to be seen. It would be reasonable to expect that some of these changes had occurred at Philipshill. Any prospective archaeological work should be prepared to encounter this kind of evidence and changes seen over time should be interpreted with these major upheavals in mind.

Documentary Evidence

There are numerous documentary sources that provide evidence of the development of the Philipshill Mill. While I have made every effort to locate and investigate as many historical sources as possible there are certainly sources which I have been unable to access or have missed due to time constraints. I would expect that the Reid Archive, held at the Museum of Country Life, Kittochside, would contain some information about the mill, but it was missed due to time constraints.

No document has been sourced which relates to the establishment of the mill. However, there are a number of documents from the 18th century which mention the mill in operation. The earliest references to the mill that I have been able to uncover date to the 1770s. The Lanarkshire Sasine of February 1774 mentions the Corn Mill of Nether Philipshill, while the Catgill Title Deeds dated 16th November 1775, required that "…the whole grindable victual that should be grown upon the said land be carried to Philippshill miln, to be grinded thereat" (original not seen, quoted in Reid, 1943: 51). These two sources firmly place the mill as a going concern by the mid 1770s, suggesting it had been established some time earlier than this.

The 1793 work *The History of Rutherglen and East Kilbride* which is the major parish history of East Kilbride names no mills individually but claims that "The parish is well furnished with mills, there being no fewer than seven. Some of them are constructed for lint, as well as for oats and barley; but none of them for wheat." (Ure, 1981:199). Unfortunately Ure makes no further mention of Philipshill Mill, or of milling in general. Niven (1988) provides further limited information about the various mills of the East Kilbride Parish. Taking Ure (1981) as his lead he further elucidates on the seven mills. He suggests that in the 1790s "The Parish Mills were at Rutherend, Philipshill, Kittochside, Dripps, Bridgemill and Craigmill" (1988: 33). The discrepancy here is that he only names six mills but the missing seventh is probably Blackburn Mill as mentioned within the valuation rolls for the parish.

Census records and valuation rolls can be used to track the ownership and tenancy of the mill over time. Table One shows the change of ownership and tenancy over time.

Year	Owner	Tenant	Source
1841		Mr Andrew Wilson	1841 Census
1851		Mr Andrew Wilson	1851 Census
1861		Mr Scouller (aged 55)	1861 Census
1871		Mr William Scouller (aged 28, son of the Mr Scouller above)	1871 Census
1881		Mrs Agnes Scouller (aged 37, widow of William)	1881 Census
1891	George Hamilton, farmer, Easterseat, Carluke	Mrs Agnes Scouller	1891 Valuation Roll; 1891 Census
1895	Mrs Martha Hamilton, Widow, and William Hamilton, bank clerk, Easterseat, Carluke	Mrs Agnes Scouller, widow	1895 Valuation Roll

Table One: Philipshill Mill tenancy and ownership

To date I have not been able to locate records earlier than 1841 which show ownership and tenancy of the mill. However, as Table One shows, for the majority of the 19th century at least, mill ownership and tenancy was fairly settled, with limited change. For nearly sixty years between 1841 and 1895 there were only four different mill-keepers, from two different families running the mill.

Maps

Historical maps can be used to situate the mill geographically and temporally, as well as providing evidence about the development of the mill over time. There are a number of maps which depict the mill and which can be used to gain information about its antiquity and development. All of these maps can be seen in Appendix One of this report.

Based on early historical records it would appear that Philipshill Mill has been in existence since at least the 1770s and possibly earlier. However surviving maps from this period do not show the mill, with neither Roy's 1750's *Military Surveys*, nor Charles Ross' 1773 *A Map of the Shire of Lanark* containing evidence of any mill at the current Philipshill site. Roy's survey shows no red dots (the symbols he uses for buildings) anywhere along the Kittoch. Likewise, Ross' map does not show any mill in the vicinity of Kittochside, nor indeed anywhere along Kittoch water. Roy's survey does however describe the area as "Philipshill", while Ross has seemingly left that entire area off of his map, showing no detail of a settlement anywhere in that vicinity.

The earliest map showing a mill in the vicinity of Kittochside is Richardson's 1795 *Map of the town of Glasgow and country seven miles around* which shows for the first time a discrimination between "Philipshill" and "Philipsmill", the latter appearing to refer to two structures depicted on the bank of the Kittoch. The first is in the approximate vicinity of the extant Mill Cottage, the second on the east side of the Kittoch, opposite the location of the current mill (see Figure 2, Appendix Two). There is no structure shown in the position of the current mill site. Interestingly, no other map of the area, either preceding or postdating this map, shows a structure existing at this location on the east side of the Kittoch. The key to Richardson's map has no separate symbol for mills, showing them as block structures in common with farm houses and other buildings. Thus, it is not possible to determine which of these two structures, if either, represents the actual mill.

The first map to clearly locate the mill in its present location is Forrest's 1816 *The county of Lanark from actual survey*. Forrest uses the word mill, and luckily, uses the spider like symbol on his maps to depict wind and water mills. The spider symbol places the Philipshill Mill in its current position from at least 1816 (see Figure 3, Appendix Two). This is thus the earliest map to confirm the geographical location of the current mill structure.

The contrast between the information shown on the four maps raises the question of whether the mill has always existed in its current location. Early maps of this form are notoriously inaccurate in certain areas and obviously, should not necessarily be taken on face value. However, they do provide a modicum of very useful information, which can often be confirmed by archaeological investigation. In this case, the question raised by the maps is as to the location of the mill prior to 1816, whether it was always situated in its current position or whether it has been moved from another location. We have historical sources that confirm the existence of a mill in the Philipshill area from at least 1775, but has there only ever been the one mill? Nisbet (2003A: 1) postulates that the extant mill cottage may have been the original mill, with the current structure being built later. But the structure shown on Richardson's map on the north side of the Kittoch would imply otherwise. Given that no other contemporary map shows a structure in this location, the possibility exists that Richardson has simply placed the mill on the wrong side of the Kittoch. It is not unusual for older maps to misplace structures, to locate them in the wrong place, or to ignore them completely, as indicated by the discrepancy between the information shown on the four maps under discussion here. As a result of this question, an investigation was made of the north side of the Kittoch during the current period of archaeological research (see page 10 for more details).

The Ordnance Survey maps are the first maps which provide very reliable data. There are five ordnance survey maps which show the mill in some detail, beginning in 1857 and providing evidence of the changing layout of the mill over time. Despite primarily providing cadastral information, these maps provide an

excellent level of detail as to building design and layout. The OS maps from 1857, 1896, 1913, 1935 and 1978 all depict the mill in sufficient detail to show the shape of the building, additions to the structure, outbuildings, and the position of the mill in relation to the Kittoch. Additionally, the lade, weir, mill pond, and mill cottage are all shown with the same level of detail. While fine detail cannot be implied, and a comparison shows some discrepancies over time, general information about the layout and structural sequence of the mill can be determined. Appendix Two (Maps) Figures 4 through 8 show the progression seen in the OS maps. As these show, while the basic structure of the mill has stayed relatively the same, there have been significant additions to the west side of the mill, as well as a number of associated outbuildings to the south. Additionally, the general floor plan of the mill that exists to the present day can be shown to be mostly in place by 1857.

Probably the most significant change that can be seen over time is demonstrated between the 1857 and 1897 maps. The 1857 map depicts the mill as a modular structure with a number of modular additions. By 1897 the map shows these different parts of the building incorporated into one structure and an implied greater structural integrity. This general floor plan of the main mill building then shows no major change on any of the further OS maps, with changes from this time onwards only involving outbuildings, and some small additions to the west side of the main building. The 1913 and 1935 OS maps depict what are probably temporary buildings or sheds to the south of the main mill structure. The 1913 map shows two distinct outbuildings, but by the 1935 map the most westerly of these outbuildings has disappeared and the eastern one has doubled in size. By 1978 this one has disappeared as well, although obviously the mill had been derelict for a number of years at this stage. The 1913 map also shows the first small addition to the south west corner of the main mill structure. This is only small, but by 1935 two larger additions have been made to the west, one attached to the main mill, the second appearing separately. By 1978 however this unattached addition has been connected to the main mill, while the other larger addition has disappeared. The small south-westerly addition survives throughout this period.

What these maps imply is the use of temporary structures to supplement mill functions. The relatively short period of time they survive would imply they are made of temporary materials and are erected and dismantled as required. It would imply that the mill structure is constantly updated and reorganised as required dependent upon the needs of the mill itself. The maps are unable to indicate what these structural additions and changes involved, but they do imply a dynamic use of the structure. While it seems probable that the changes were driven by an economic imperative, other reasons could have driven this regular structural updating.

Summary of Historical Information

While the historical data is limited we are able to divine a number of facts that are pertinent to archaeological investigation. These are as follows:

1. The earliest date we have for the mill is 1774 (Lanarkshire Sasine, February 1774), but it is clear the mill was in use before this.
2. The earliest map (Forrest 1816) showing the mill in its current location dates to 1816. Before this there is some question as to the location of the mill and if it has changed.
3. The earliest dates for the mill coincide with the adoption of major agricultural change and thus crop yields, at local farms (McGuire 1988; Ure 1981; Reid 1943).
4. There was major change in mill technology dating from the mid 1700s (McGuire 1988; Watts 2002) including:
    - Wheel technology
    - Change in the use of materials from wood to iron
    - Incorporation of threshing machines into mill structures
    - Incorporation of corn drying kilns into mill structures
    - Importation of millstones from Europe
5. The Ordnance Survey Maps show regular structural change to the mill between 1857 and 1935.
6. However, the major structural elements of the mill were in place by 1857.
7. Philipshill Mill was one of seven operating in the parish of East Kilbride (Niven 1988).
8. In the 1790s these mills were only involved in processing oats and barley, but not wheat (Ure 1981).
9. The tenancy of the mill was stable from at least 1841.

Previous Archaeological Research

There has been limited previous research or recording of the archaeological features of Philipshill Mill with seemingly only four different records of investigation. Those by Hume (1965) and Welsh (1973) provide only very limited information, and the work by John Renshaw Architects (1998) was mainly a feasibility study relating to the possibility of conserving the structure. Only Nisbet (2003a; 2003b) has gone significantly beyond this in attempting to put together a more cogent record of the site.

Hume (1965) conducted some limited research into the mill. He took five photographs of the mill site which are now held by the Royal Commission on the Ancient and Historical Monuments of Scotland. These black and white photographs, while not of the best quality, do show the mill in a ruined state. These photos allow us to see significant deterioration of the fabric of the mill between 1965 and the present day. These photographs can be seen in Appendix Three, Figures 9 through 13.

The majority of other work has involved planning the site. Recording of the floor plan of the building was carried out by Welsh (1973: 14), who provides a rough plan of the building which shows the major physical features still surviving. This work is emulated by John Renshaw Architects (1998) who provide a rough plan of the structural remains of the mill. Additionally they provide an aerial plan of the site at 1:1250 scale. Finally, Nisbet (2003a) also provides a plan of the structural remains. The three plans are fairly simple, and there are some minor discrepancies between them, but generally they suggest that remains exist of the main mill building, the wheel housing, and the lade. All three plans can be seen in Appendix 4, as Figures 14 to 16.

Nisbet (2003A; 2003B) provides the most comprehensive description of the mill to date. As well as a floor plan he also provides sketch elevations of the west and east gables, basic dimensions of the central mill structure, and some description of the technological aspects of the mill. He records the basic dimensions of the central mill structure, suggesting that it measured 13.3m x 6.3m running on an east-west axis (2003b: 124). Nisbet also recorded some of the technological aspects of the mill including the cog wheel, iron shaft, water wheel hub and mill stones still existing at the site (Nisbet 2003a: 4). Figure 17 shows Nisbet's sketch elevations of the east and west gable ends of the mill, while Figure 18 shows his sketch of the water wheel hub. Both these figures can be seen in Appendix Four. Nisbet's work is also the only previous study to attempt to tie in historical information about the site.

Questions raised by historical and archaeological sources

The information as discussed above raised a number of immediate questions which the preliminary period of research attempted to answer. These are as follows:

1. Is the current structure the original mill building, or was the mill originally situated in a different place?
2. How has the mill developed over time and what was the nature of the various additions to the structure?
3. Is there any physical evidence that could be used to date the site to a year earlier than 1774?

In addition to this, it was clear that there was a limited amount of information about the basic structure of the mill and that simply recording the nature of the site itself was required. This was also thought to be very important based on the rapid deterioration of the fabric of the mill structure.

Section Two: Archaeological work carried out in May 2007

A short programme of archaeological work was carried out in May 2007. The intention of the work was twofold; firstly to record the salient features of the site as a record in the face of rapid deterioration of the building fabric; and secondly to attempt to answer the questions raised by investigation of historical and archaeological sources. The recording of the site was carried out using an EDM survey, and digital photographic record. In addition, salient features of the structural development of the site were recorded. This phase of investigation concentrated on the mill structure itself, and paid little attention to the weir or lade.

It should be noted that this work was preliminary and the findings from it could be considerably added to by further work in the form of site clearing and excavation. No excavation was carried out in this phase of investigation due to time and labour constraints, and all investigation was based on survey and recording of surface remains. The heavily vegetated nature of the site hindered visibility and movement, and thus made interpretation of parts of the site difficult. Building collapse has also obscured a large part of the structural evidence and this could only be further investigated by clearing away some of the tumble. Finally a large amount of the archaeological evidence is underground and a programme of targeted excavation could help answer archaeological questions about the site, particularly internally and to the south of the main mill building.

The work was carried out by National Trust Archaeologist Derek Alexander, and Volunteer Archaeologists Sean Winter and Rachael Cochrane.

Determining the Original Mill Location

The area on the east side of the Kittoch indicated by Richardson's Map (1795) was investigated for structural remains in order to determine whether the mill had been moved from this location. This investigation consisted of a preliminary field-walking survey, initially to determine whether Richardson may have situated the structure wrongly on his map. A series of large cuts into the side of the hill were located in the area indicated by the map, but no other structural remains of any kind. It is unknown whether these cuts were the result of the siting of a structure, or related to the building of the track which runs through this area, or indeed, related to something else. The picture is further confused by the fact that a significant amount of material has spread down the hill into this area from the building of the Museum of Country Life. This question remains unresolved and excavation would probably be required to answer it.

EDM Survey

The survey of the site was carried out using a Total Station Electronic Distance Measuring device and was carried out over two days. An accurate picture of the mill building and the lower sections of the lade (leading into the mill) were recorded, as well as topographic information about the site such as contours.

This data was then combined with other archaeological data to develop a very detailed plan of the site (see Figure 1, in Appendix One). Extensive vegetation coverage limited some aspects of the EDM survey and data collection in some parts of the site was extremely difficult.

Photographic Record

An extensive digital photographic record of the site was developed during the two days of fieldwork. Forty four digital images were taken of various aspects of the site. It is clear from a comparison between Hume's (1965) images and the site today that the building fabric is rapidly deteriorating and the intention of recording these images was in order to provide a record of the site in the face of this deterioration. These images are provided with this report on a CD in Appendix Five.

Structural Sequence

The 1857 OS map provides the first historical evidence of the shape and nature of the building. From this map it seems clear that the main structural elements of the mill were in place. However, the archaeology would suggest that the mill as shown on the 1857 OS map had actually been built up over time, based on a single central structure, with later additions of extra rooms. The initial archaeological survey suggests five separate main phases of construction, with other additional repairs, changes and smaller additions occurring at other times. This report will refer to each subsequent addition as a new "area". The development of the mill seems to be built on a central original structure (area 1) with later additions to the north (area 2), south-west (area 3), south-east (area 4) and externally to the west (area 5). A floor plan of the mill detailing the various additions can be seen in Figure 1, Appendix One. The location of the outbuildings shown to the south of the mill on the 1913 and 1935 OS maps was not investigated at this time due to heavy vegetation cover.

The basic unit of construction throughout the mill is a combination of roughly hewn and dressed sandstone blocks. However, wall thickness, mortar type, coursing, stylistic innovations, and the use of materials such as brick and timber make the additions obvious. There are also no clear structural joins between area 1 and subsequent additions, with these simply built to abut existing walls rather than tying into them.

Area 1, the original mill structure, which contains the millstones and wheelpit, appears to be the earliest part of the building to which all other additions were made. This structure is oriented east-west with gable ends still surviving. Area 1 comprised a two or possibly three story structure of heavy sandstone construction (Nisbet 2003: 1), of both dressed stone blocks and roughly hewn and natural stones. Wall thickness in Area 1 is uniformly approximately 65cm. The external walls are finished differently on each side. The external side of these walls is constructed almost entirely of dressed stone, while the inside of the walls is generally a much rougher hewn variety. There is evidence of the exterior

having been rendered but this cannot be seen internally. It can be presumed that the interior of this structure would have been compartmentalised into rooms and floors. There were clearly two floors, with a possibility that the attic space was also used as a third floor. Unlike in the later additions there was no timber used as a basic unit of construction in the external existing walls, with window and doors using stone arches (Image A0010 in Appendix Five for example). Sockets in the stone at window and doorways indicate the use of shutters.

The water wheel and gear pits were situated inside Area 1. The lade brought water from the weir upstream entering at the south-east corner of the building, feeding the wheel then exiting at the north-east corner of the building. The delivery of water to the wheel was altered at some time during its use, changing from an undershot or breast-shot delivery, to overshot delivery (see section on technology for further details).

Area 2 to the north, is of a lesser standard of construction and as a result, with the exception of a section of the west wall, mostly deteriorated and characterised by foundations. The extant sections of wall are considerably thinner than that of the central section being approximately 55cm thick. There has been no real attempt to join this section into the original structure, with it simply abutting Area 1, rather than being tied into it. Timber is used for internal lintels for door and windows, with horizontal stone blocks used externally. The use of glass in the window space in this part of the mill appears likely.

The south addition (areas 3 and 4) may actually be either one, two or possibly three separate additions. The 1857 OS map makes it appear as three, with a single square structure to the south-west, then two smaller additions each side of the Lade which runs into the south side of, and then through the building. These two smaller additions either side of the lade appear to be involved with the control of water from the lade. Based on this, the south-westerly addition is defined as Area 3, while the two structures at the south-east are defined as Area 4.

The fabric of Area 3 is heavily deteriorated and covered in tumble, making investigation difficult. There is little that remains above ground, with the exception of a few courses of stone walling. Wall thickness in this area is approximately 60cm, indicating it is of a different phase of construction to Areas 1 and 2. However, no other salient structural features were able to be recorded and the function of this structure is unknown.

Area 4 consists of additions on each side of the lade. The structural remains to the west of the lade consist of no more than a tumble, the nature of which it is very difficult to determine without excavation. The addition to the east of the lade is a heavy stone buttress, which is well preserved on its interior side, but heavily deteriorated externally, making an accurate width measurement difficult. However, it is at least 1.2m thick. It appears that this buttress was built to assist

in water movement, as there is a slot through the base of the buttress to the outside of the building, which appears to function to divert water away from the lade and external to the building. It is not clear why this should be so, but presumably it is to allow the wheel to be stopped.

Area 5 consists of a brick structure unconnected to and to the west of Area 1. Investigation of this was hindered by heavy vegetation cover but extant remains consist of a brick wall of single brick thickness. Coursing is unknown due to whitewashing of the wall, but it is probably four to five courses high. This structure was clearly constructed late in the working life of the mill, as it does not appear on the OS Maps until 1935 and is constructed of a different material from the rest of the mill. As the wall is uniformly the same height throughout a preliminary interpretation would suggest it is a loading bay or something similar.

There was only a precursory investigation of the area to the south of the mill where the outbuildings are shown on the OS Maps, due to heavy vegetation. However, it is clear from a precursory examination that there are no structural remains above ground in this location. This would tend to reinforce the idea of these structures being of a temporary nature.

Technology

Investigation of mill technology was driven by two factors; the deteriorated nature of the site, which meant that many of the technological aspects were obscured or covered by tumble; and the previous work completed by Nisbet (2003). Thus, this phase of archaeological investigation was designed to cover those aspects which could be easily approached and to build on what Nisbet had already carried out.

Nisbet recorded the remains of the wheel (see Figure 18, Appendix Four) concluding that it's dimensions "…exceeded 6m diameter by 0.8m wide, giving efficient use of large fall on relatively minor watercourse" (2003: 1). Nisbet also suggested that the wheel may have originally been smaller and sited outside the building, before being moved inside. This current investigation did not disprove the theory that there was a wheel situated outside the building. However any external wheel would probably have been in addition to the internal wheel, as the structural remains relating to the wheel are of the same character as those in the extant section of Area 1, suggesting it was sited and built internally as an original design feature of the mill. Investigation of the structural nature of the wheel pit showed the wall between the gear and wheel pits to be structurally very similar to the external walls of area, with the same monolithic masonry, mortar and importantly, wall thickness. As each new addition to the mill displayed differences in these areas it is not unrealistic to thus interpret the wheel as having always been located internally.

There is evidence for some form of powered apparatus external to the building. The Area 4 addition has been designed to divert water from the lade to the outside of the east side of the building. It is not clear why, but a heavy steel axle

protrudes from the east of the building, measured by Nisbet as being "…3m south of water wheel, suggesting another powered operation carried on outwith east gable, in small building of which only foundations remain" (2003: 1). The 1857 OS map shows this structure, although it has disappeared from the later OS maps. Whether this means that the operation was also discontinued prior to 1897 is unknown. Certainly the nature of this operation was different from that of the internal wheel and the axle may represent a way of taking power from the internal wheel to the outside of the building (through the use of appropriate gearing) rather than a second external wheel. The axle is significantly smaller than that of the internal wheel and there is no other evidence suggesting that it was used to generate power from a stream of water external to the building. Further investigation will be required to resolve this question.

Delivery of water to the wheel was altered at some stage during the mill's use. The archaeology suggests that water was originally delivered to the wheel from the lade through the use of a steep sluice cut through the south external wall of Area 1. This sluice would have delivered water to the wheel in either an undershot or low breast-shot fashion. This sluice would have accelerated the water right before it contacted the wheel. However, this is a reasonably inefficient way to power a water wheel (Watts, 2002: 55). Thus at some later stage the wheel was altered to make it overshot or as Nisbet suggests "…more probably high pitchback" (2003: 1). This would have increased the efficiency of the wheel, because "Putting the water onto a wheel at a greater height improves its efficiency, by making use of the weight of the water as well as its velocity" (Watts, 2002: 55). This change to an overshot delivery involved bricking up the original sluice and making significant alterations to the south wall of Area 1, including demolishing and rebuilding part of it, to accommodate a much higher sluice which delivered water to the top of the wheel (see Figure A0020 in Appendix Four). This change may be contemporaneous with the addition of Area 4 to the building, as Area 4 seems to have been built solely to allow water diversion. This would date the change of water delivery to the wheel as prior to 1857. However, some brick has been used in the new sluice, as opposed to the usual stone, which would suggest a later date for this change. It would need to be determined whether this is a later addition (in the form of repairs) or was an integral part of the original change. In the case of the latter it would suggest a much later date for the change to an overshot wheel. A date for the brick addition could be derived by either dating the bricks themselves, or the number of milk bottles which have been used as inclusions in the mortar (see Figure A0023 in Appendix Four).

The vast majority of milling implements, including broken millstones, millstone gearing, and other assorted ironwork, are located in Area 1 to the west of the wheelpit. Most of this milling equipment is in a state of advanced deterioration and during present investigation any recreation of the mill gearing or apparatus was not possible. However, it indicates that Area 1, the original section of the

mill, retained its original use; that of milling. There was no indication of primary milling equipment being located in any of the subsequent structural additions.

Dating

It was hoped that some form of evidence could be recovered from the structural elements of the mill that could allow dating of the structure. In particular it was hoped that the question of the mill position could be answered in this way. A number of datable artefacts were recovered, including bricks and bottles, but these dated only to the second half of the 19th century. Removal of the tumble and excavation in Area 1 may be able to provide earlier datable artefactual material. However, at this stage the earliest current date for the mill in its current location is Forrest's 1816 map.

Section Three: Discussion and Recommendations

Discussion

This investigation of the Philipshill Mill has been preliminary in nature and has raised many more questions than it has answered. However, the process of information gathering and archaeological investigation of the site have provided us with a number of insights into the development and use of the mill.

The archaeology of the mill site shows that there was regular and constant change and development of the structure from early on in its history. This change had numerous forms, from structural additions to technological improvement. These structural changes and additions occurred fairly regularly throughout the working life of the mill. However, they appear to have been of a lesser and lesser quality and durability as time went on, with Area 1 (the original mill) and what is probably the first addition (Area 2) being of the best quality. Subsequent additions are of a lesser quality and are of an increasingly temporary nature. Tellingly the latest additions are the ones which have suffered the worst deterioration. This lack of quality may have an economic basis, implying that the mill tenants had less money to spend on capital improvements. Additionally it could imply that the number of improvements required during a period of rapid technological change, meant that the mill tenants had to make money available for capital improvements stretch further, and they did this by skimping on quality. Also questionable is whether this decline in quality was linked to the change in economic support predicated by the Thirlage Act of 1799, after which mill keepers could no longer rely on farmers to contribute to the economic upkeep of the mill. At the moment the archaeology cannot shed light on this; however, further investigation may be able to show the reason for the increasing lack of quality in mill additions.

What the regular changes does imply is that the nature of the agricultural Improvement did have an impact on the mill and the way it operated. The archaeology implies the extremely regular implementation of change and improvement. Currently the archaeology only provides evidence for the use of Area 1 (primary milling) and Area 4 (water diversion). There is no clear indication for the use of Area 2, Area 3, Area 5 or any of the other additions that have not yet been investigated. However, the fact that they had been added to the mill over time suggests they were both needed and used for various milling functions. Additionally, the archaeology shows the implementation of new technologies during the lifetime of the mill, with major alterations to the delivery of water to the wheel. This has obvious implications for the whole mill as the change from undershot water delivery, to overshot water delivery potentially doubles the amount of power available, and thus significantly increases the utility of the mill. The presence of the axle external to the east wall of the mill would suggest that this increase in power was utilised to drive another engine (possibly a threshing machine?).

Questions raised by this period of investigation are fairly obvious and relate to further identifying the process of change and technological improvement. At the moment this can be seen in a number of places, but it is my belief that further investigation would highlight numerous other changes. Additionally, it is fairly crucial that the question of the mill's original location is determined. It would not be surprising to find that the mill location had been changed as that would fit within the pattern of constant change and adaptation.

Finally, further historical investigation may unearth other information about the mill. In particular a social investigation of the mill tenancy and ownership could be particularly enlightening. Furthermore an investigation of financial records related to the mill (if they exist) could show how the Improvement affected the economic status of mill owners and tenants. A simple investigation of rental value of the mill, available in Valuation Rolls could shed some light on this.

Significance and Recommendations

The significance of Philipshill Mill lies in both its importance as an archaeological site and in its location. In historical and architectural terms the mill is unremarkable as there are numerous other examples of contemporary working mills which can be referred to. However, in archaeological terms Philipshill Mill is significant, in that it represents a site where the effects of the agricultural improvement can be seen and investigated. The fact that the mill has been built up and developed over time, and that these changes can be seen in the archaeology, makes it a prime target for archaeological investigation. In this regard the archaeology of the mill could tell us a lot about how the Improvement was enacted in East Kilbride Parish and thus, this makes the site significant. Additionally, the mill is in a prime location adjacent to the Museum of Country Life meaning that it could be incorporated as part of the museum display.

Based on the significance and location of the site, I would make the following three recommendations:

1. A targeted process of archaeological investigation should be carried out at the mill, aimed at identifying and interpreting the nature of change at the mill over time. The intent of this would be to show how the agricultural Improvement of the 18th and 19th centuries was incorporated into the mill and the impact it had on the people of East Kilbride.
2. That the mill site should be cleaned up and the current remains stabilised to prevent further decay of the building fabric. This should occur immediately to prevent further fabric deterioration. This stabilisation should be of the level that the general public are able to visit the site.
3. That the mill, left as a stabilised ruin, should then be incorporated into the Museum of Country Life, and used to educate the public as to the impacts of the Improvement in East Kilbride Parish.

At the current time, it is not recommended that the mill be fully restored, as it has more significance as a ruin and as an archaeological site, than it does as a working mill.

Conclusion

The Philipshill Mill is an archaeologically significant site which can potentially tell us a lot about the nature of the Agricultural Improvement in the 18th and 19th centuries. Historical and archaeological investigation suggests that the mill was established some time in the mid 1700s and since that time has undergone a constant process of development and adaptation to new technologies and milling methods. The nature of this change appears to be linked to the Improvement, and is characterised by an increasing lack of quality and durability in the materials and techniques used. The mill subsequently fell out of use in the early 20th century and has since suffered a period of sustained deterioration, leaving it in its current ruined state.

References

Academic Sources

Handley, James E. 1953. *Scottish Farming in the Eighteenth Century*. Faber and Faber Ltd: London.

Hume, John R. 1965. Photographs of Philipshill Mill. Held by the Royal Commission on the Ancient and Historical Monuments of Scotland, Edinburgh.

Hume, John R. 1976. *The Industrial Archaeology of Scotland: 1 The Lowlands and Borders*. B.T. Batsford Ltd: London.

John Renshaw Architects. 1998. *Feasibility Study for the Conservation of Philipshill Mill by Kittochside East Kilbride*. Unpublished report for the National Trust for Scotland.

McGuire, Dorothy E. 1988. *Agricultural Improvement in Strathkelvin 1700-1850*. Strathkelvin District Libraries and Museums: Bishopbriggs.

Nisbet, Stuart. 2003A. *Philipshill Meal Mill*. Unpublished report.

Nisbet, Stuart. 2003B. "Philipshill Mill (East Kilbride Parish)" in *Discovery and Excavation in Scotland* New Series, Vol 4: 124-25.

Watts, Martin. 2002. *The Archaeology of Mills and Milling*. Tempus: Stroud, Gloucestershire.

Welsh, T.C. 1973. "Philipshill Mill", in *Society for Scottish Industrial Archaeology Newsletter* Vol. Part 2: 14.

Primary and Secondary Historical Sources

1857 *Ordnance Survey Lanarkshire Sheet XVI.3*

1896 *Ordnance Survey Lanarkshire Sheet XVI.3*

1913 *Ordnance Survey Lanarkshire Sheet XVI.3*

1935 *Ordnance Survey Lanarkshire Sheet XVI.3*

1978 *Ordnance Survey Lanarkshire Sheet XVI.3*

1841 Census, Lanarkshire County. East Kilbride Public Library.

1851 Census, Lanarkshire County. East Kilbride Public Library.

1861 Census, Lanarkshire County. East Kilbride Public Library.

1871 Census, Lanarkshire County. East Kilbride Public Library.

1881 Census, Lanarkshire County. East Kilbride Public Library.

1891 Census, Lanarkshire County. East Kilbride Public Library.

Lanarkshire Sasine, Febrary 1774. East Kilbride Public Library.

Valuation Roll for the County of Lanark for the Year 1891-92. Held in East Kilbride Public Library.

Valuation Roll for the County of Lanark for the Year 1895-96. Held in East Kilbride Public Library.

Forrest, William. 1816. *The County of Lanarkshire from Actual Survey*. Map held by the National Library of Scotland.

Niven, Thomas Eric. 1988. *East Kilbride: the History of Parish and Village*. William Guthrie and Lang Limited: Glasgow.

Reid, Herbert. 1943. *The Reids of Kittochside* Vol. 1. Aird and Coghill Ltd: Glasgow.

Richardson, Thomas. 1795. *Map of the town of Glasgow and country seven miles around*. Map held by the National Library of Scotland.

Ross, Charles. 1773. *A Map of the Shire of Lanark*. Map held by the National Library of Scotland.

Roy, William. 1755. *Military Survey of Scotland 1747-55*. Map held by the National Library of Scotland.

Ure, David. 1981. *The History of Rutherglen and East Kilbride: 1981 Collectors Edition, reissue of original publication of 1793*. Scholar Press: Ilkley, Yorkshire.

Appendices

Appendix One – Current Work

Figure 1 - Plan of Philipshill Mill from archaeological work carried out in May 2007

Appendix Two – Historical Maps

Figure 2 – *Richardson* 1795
Figure 3 – *Forrest* 1816
Figure 4 – OS 1857
Figure 5 – OS 1896
Figure 6 – OS 1913
Figure 7 – OS 1935
Figure 8 – OS 1978

Appendix Three – Hume's Photographs, 1965

Figure 9 – Mill Cottage
Figure 10 – Mill Engine
Figure 11 – Mill Ruins
Figure 12 – Mill Truck
Figure 13 – Mill Weir

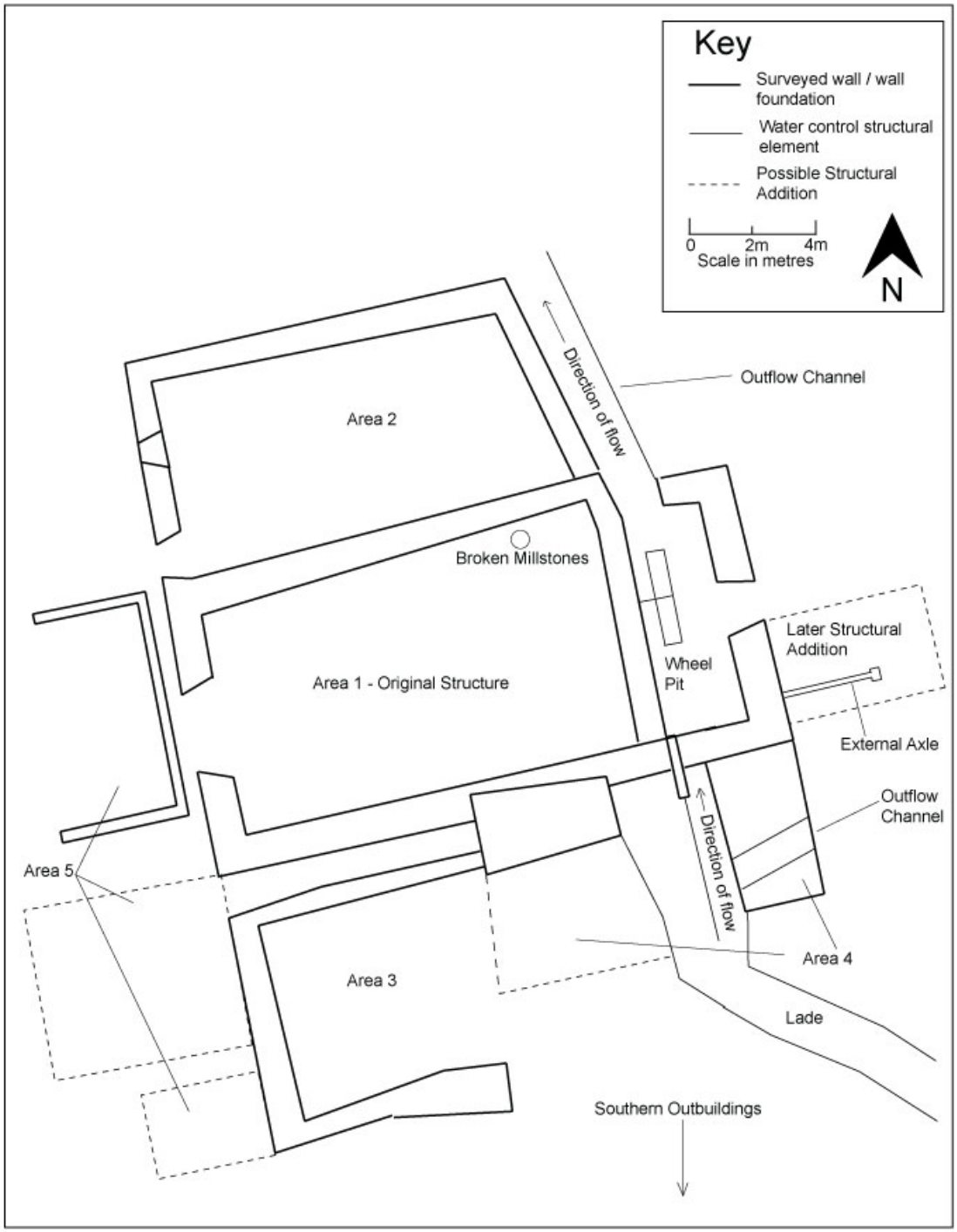
Appendix Four – Archaeological Plans

Figure 14 – Plan of Mill, Welsh 1973
Figure 15 – Plan of Mill, John Renshaw Architects 1998
Figure 16 – Plan of Mill, Nisbet 2003A
Figure 17 – Sketch Elevation of Mill Gable Ends, Nisbet 2003A
Figure 18 – Sketch of Wheel Hub, Nisbet 2003A

Appendix Five – Digital Images

Image Register
CD containing all digital images

Appendix One - Plan of Philipshill Mill from archaeological work carried out in May 2007



Appendix Two – Historical Maps

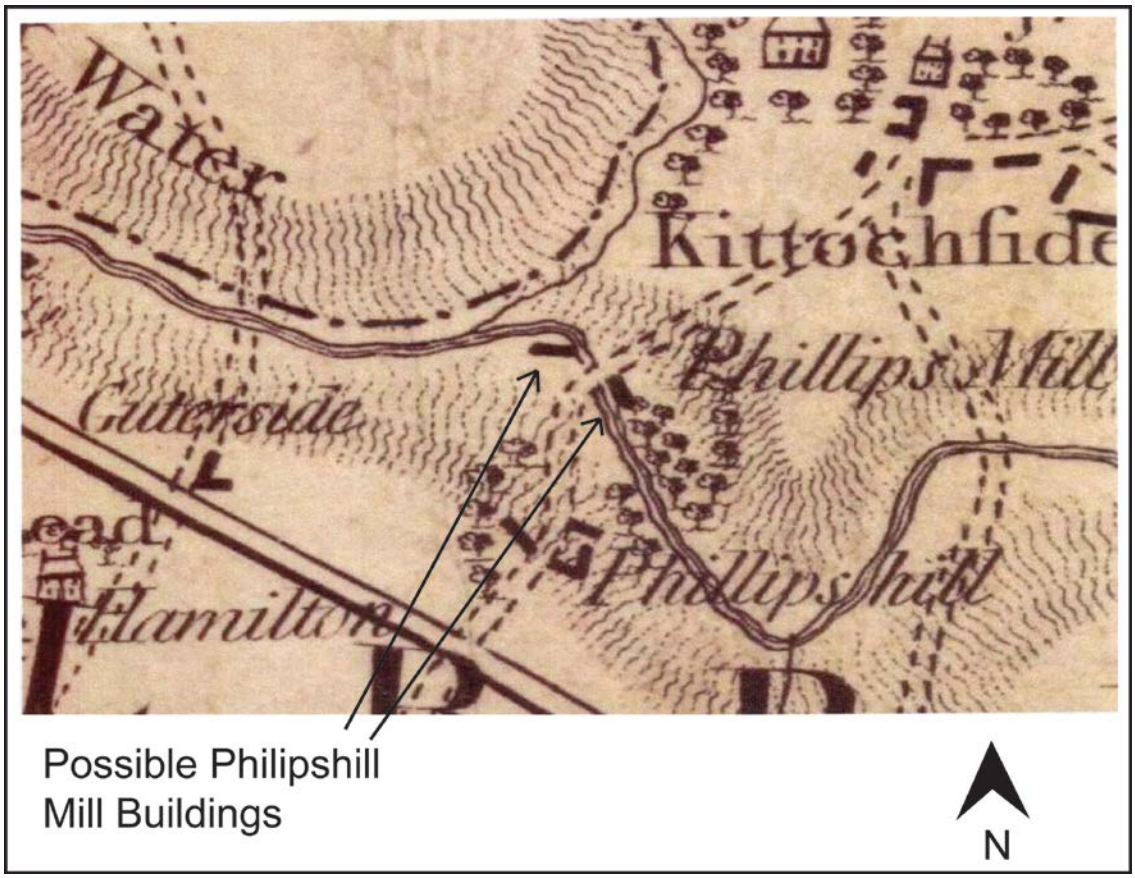


Figure Two: Detail from *Richardson* 1795

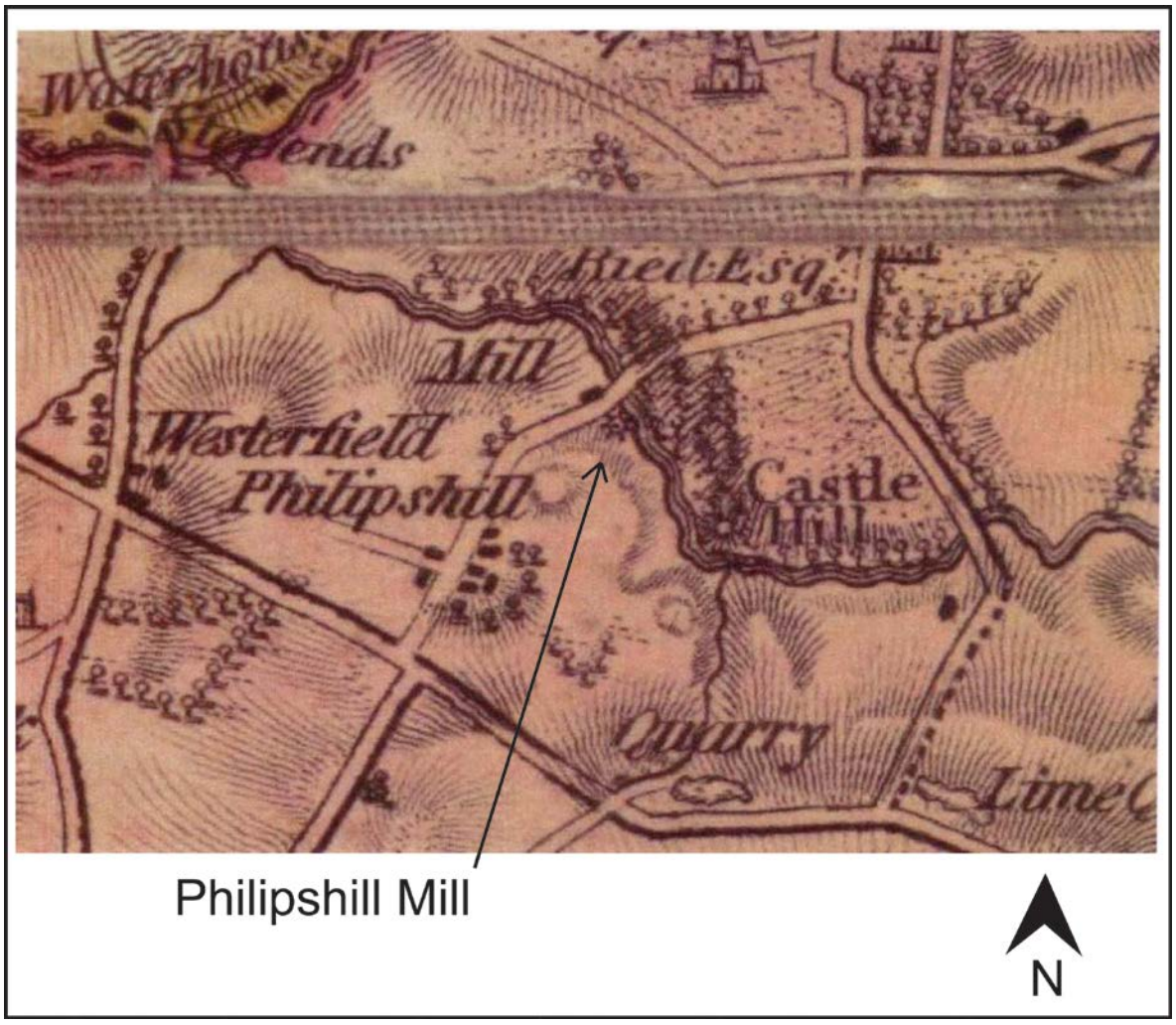
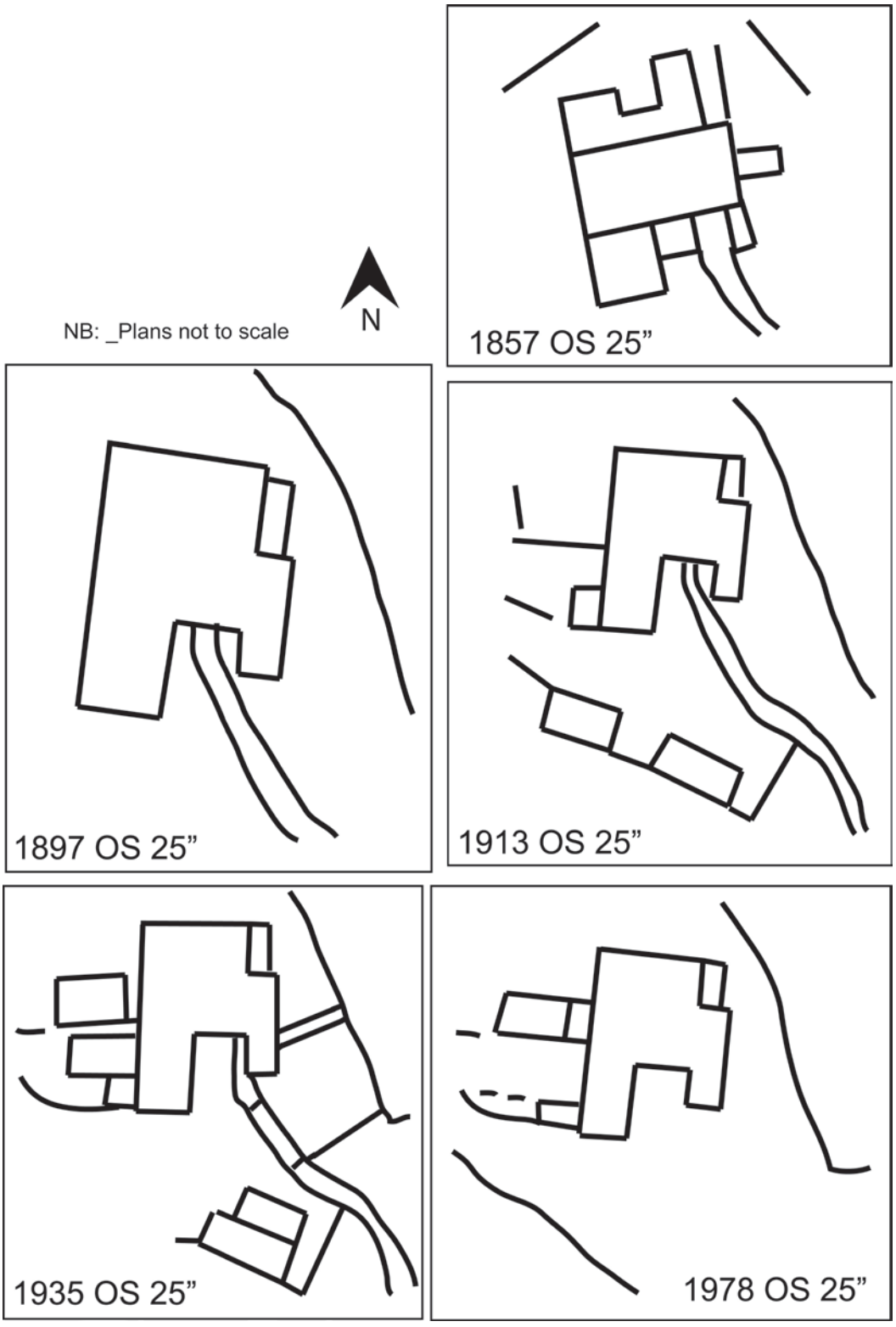


Figure Three – Detail from *Forrest* 1816



Figures Four – Eight: Detail from OS Maps

Appendix Three – Hume's Photographs, 1965

Figure Nine: Photo of the mill cottage c.1965 (after Hume 1965)

Figure Ten: Photo of the mill engine c. 1965 (after Hume 1965)

Figure Eleven: Photo of the ruins of the mill c. 1965 (after Hume 1965)

Figure Twelve: Photo of the mill truck, c.1965 (after Hume 1965)

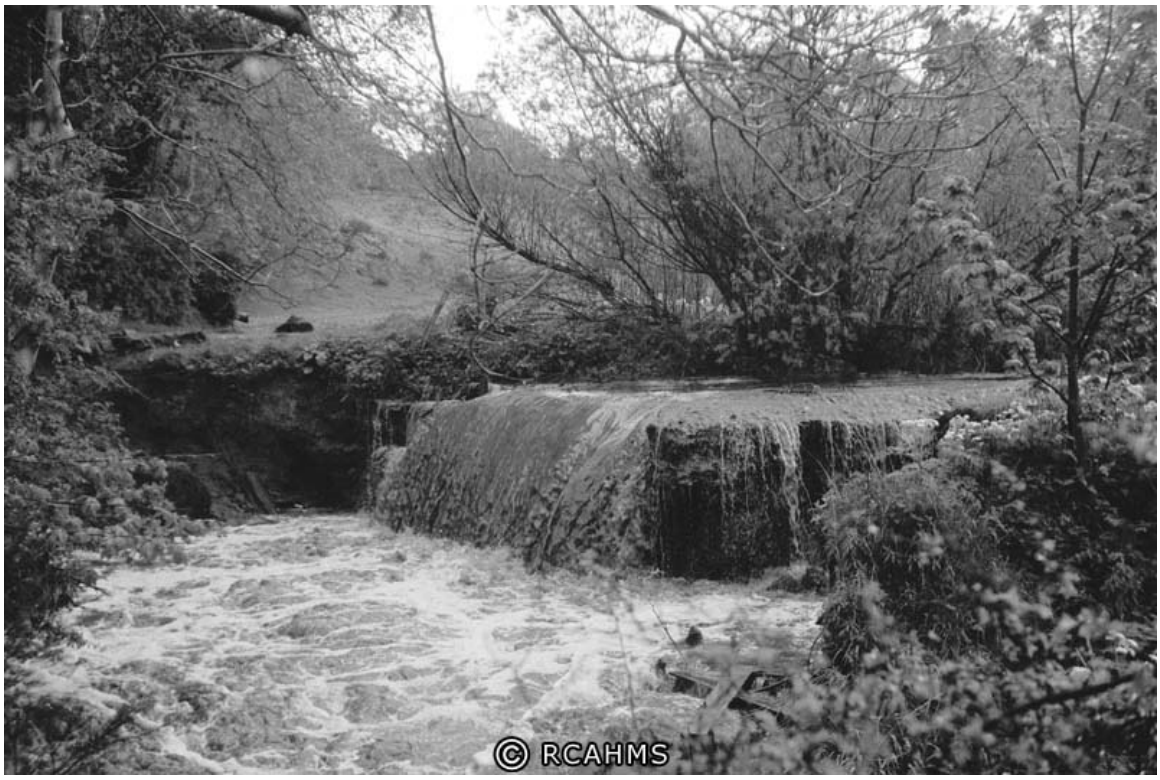


Figure Thirteen: Photo of the mill weir c.1965 (after Hume 1965)

Appendix Four - Archaeological Plans

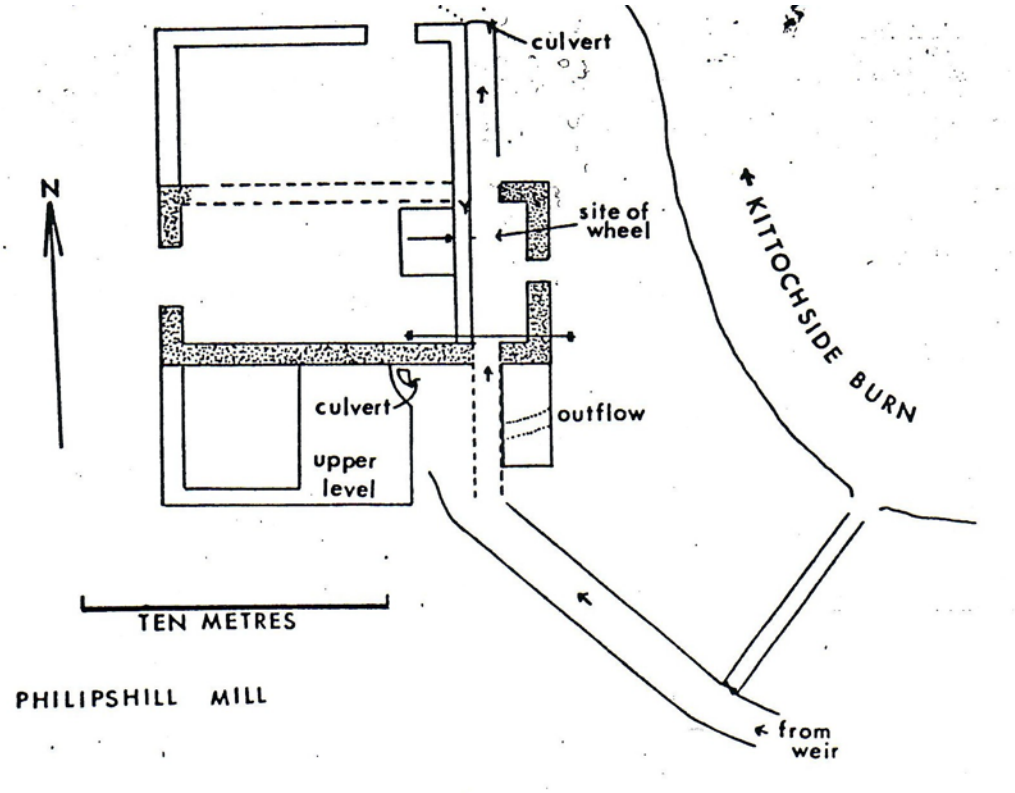


Figure Fourteen: Plan of Philipshill Mill (after Welsh 1973)

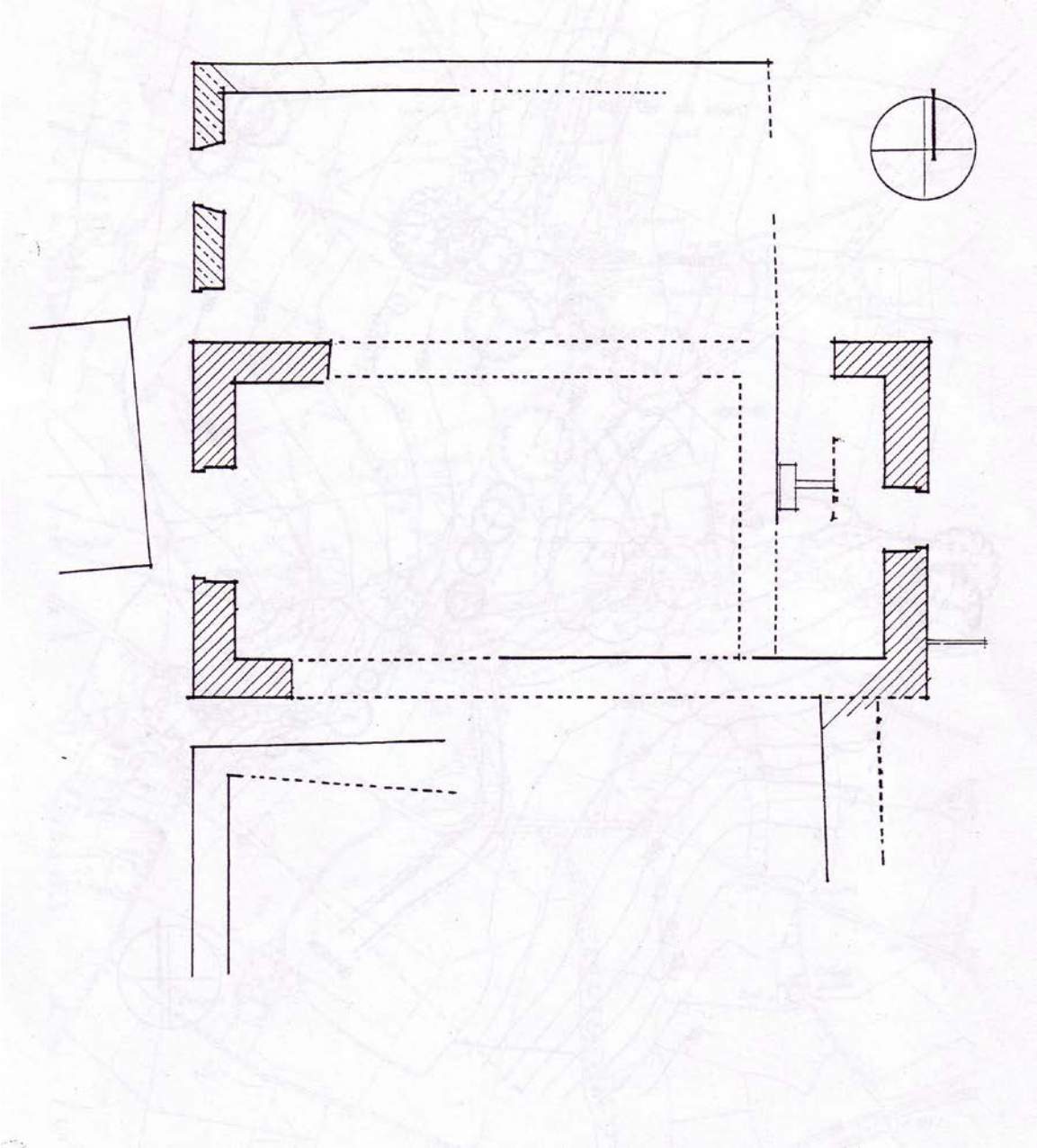


Figure Fifteen: Plan of Philipshill Mill (afterJohn Renshaw Architects 1998)

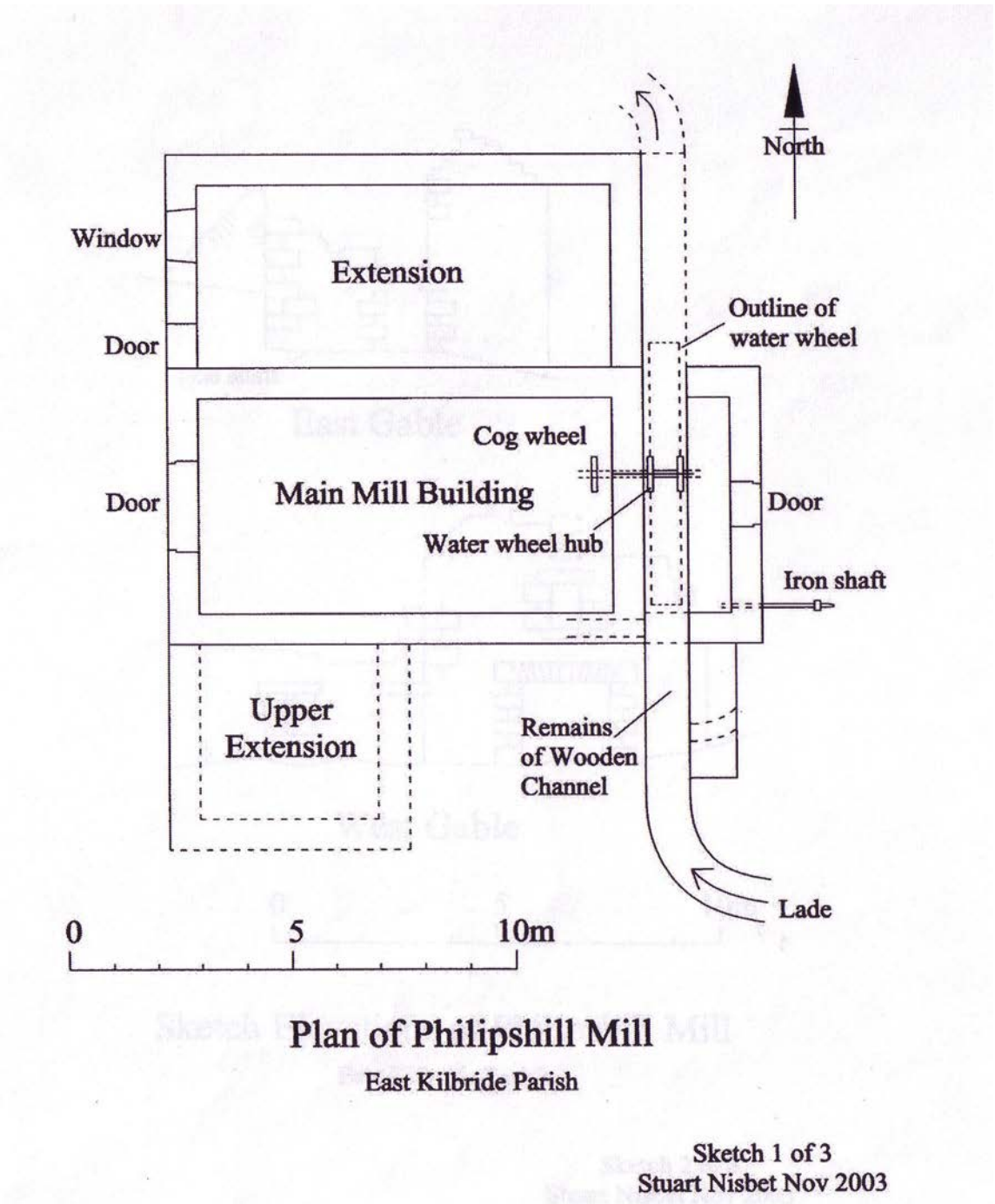


Figure Sixteen: Plan of Philipshill Mill (after Nisbet 2003A)

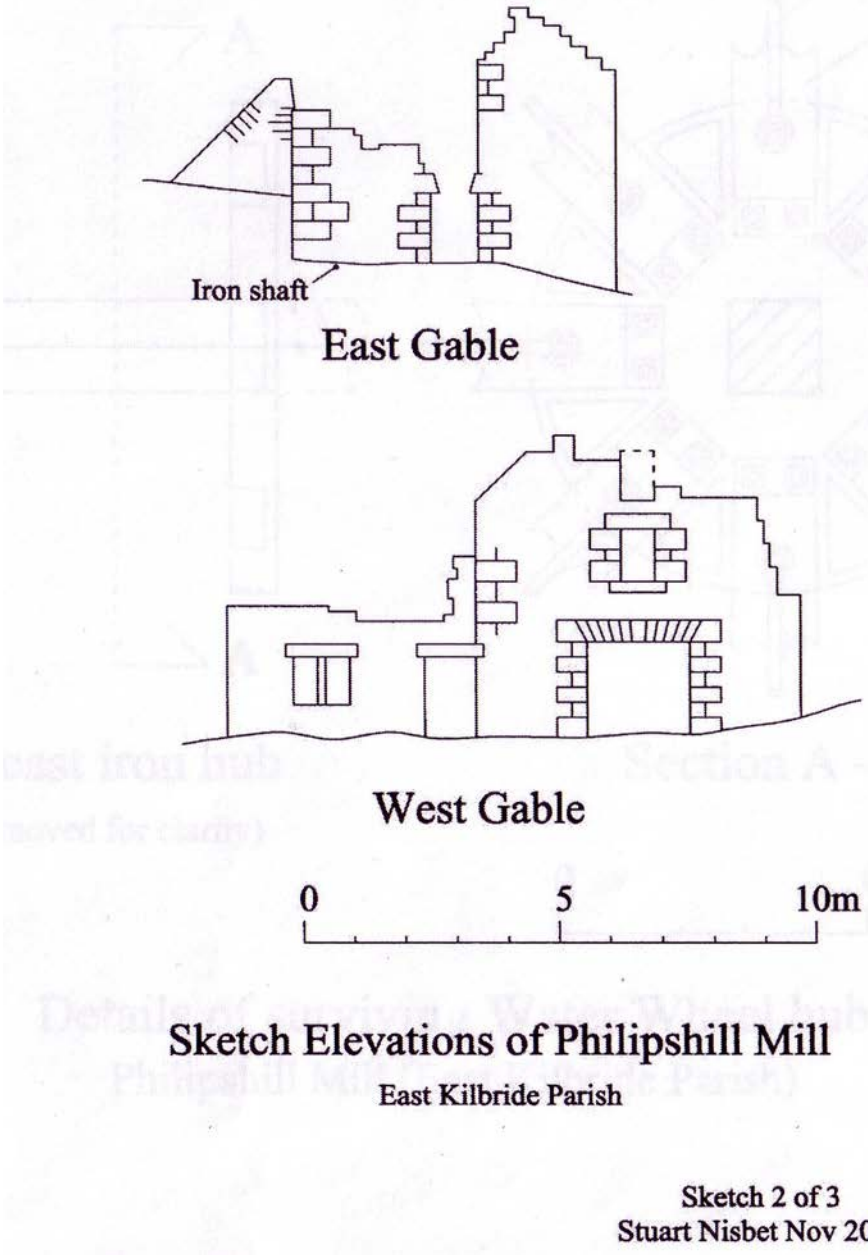


Figure Seventeen: Sketch Elevations of East and West Gables, Philipshill Mill (after Nisbet 2003A)

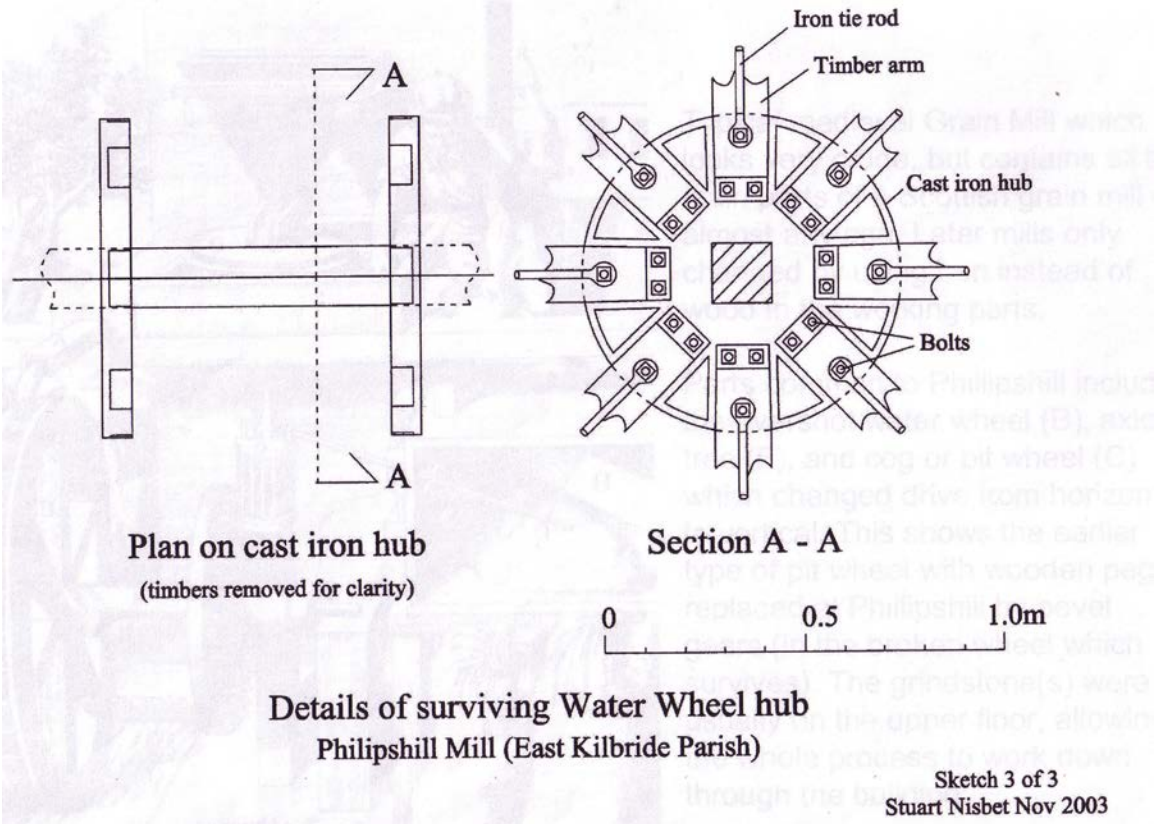


Figure Eighteen: Sketch of Water Wheel Hub, Philipshill Mill, (after Nisbet 2003A)