# HISTORIC BUILDING RECORDING
# FORMER FLAX FACTORY,
# METHERINGHAM HEATH LANE,
# METHERINGHAM,
# LINCOLNSHIRE
# (MHFF 15)

Work Undertaken For
**Future Biogas Ltd.**

February 2015

Report Compiled by
Neil Parker MA

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ARCHAEOLOGICAL
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SERVICES

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# 1. SUMMARY

*A programme of historic building recording was undertaken on buildings that served as a flax production factory on Metheringham Heath, Metheringham, Lincolnshire.*

*By the time the work was commissioned the buildings had been demolished. Subsequently the description and interpretation of the structures was re-constructed from sets of photographs. Images from the walkover survey from a previous desk based assessment were supplemented by images provided by the client.*

*The buildings were purpose built during World War II to produce flax, vital material needed for the war effort. The structures first appear on the 1947 edition of the Ordnance Survey 6 inch map. The main structure comprised three units and was constructed of brick and corrugated iron. Auxiliary buildings were present in the form of concrete structures and large, iron-framed and corrugated iron Dutch barns. Aside from the Dutch barns at the northeast of the site, none of the structures remain.*

*A description of the flax production process is included in the discussion in relation to the different sections of the building.*

*Following cessation of flax production, parts of the complex were used for the processing of pea vines before the factory became redundant.*

# 2. INTRODUCTION

## 2.1 Definition of Archaeological Building Recording

Building recording is defined as *'a programme of work intended to establish the character, history, dating, form and archaeological development of a specified building, structure, or complex and its setting, including its buried components on land or under water.'* (CIfA 2014).

## 2.2 Planning Background

The site is subject to a planning application (13/1426/FUL) submitted from North Kesteven District Council for the erection of a biomass anaerobic digestion renewable energy facility. Permission was granted subject to archaeological conditions including the undertaking of historic building recording. However, the buildings were demolished without the historic building recording taking place. As a result, the Senior Historic Environment Officer advised that a record be constructed from available photographs and research.

As a result, Archaeological Project Services was commissioned by Cornerstone Planning Ltd. on behalf of Future Biogas, to carry out the historic building recording. Photographs of the buildings prior to demolition were provided by the client for use in the recording.

## 2.3 Site Location

Metheringham is located 14km southeast of Lincoln and 15km north of Sleaford in the administrative district of North Kesteven, Lincolnshire (Fig. 2).

The proposed development site is located 4.7km west of the centre of Metheringham, as defined by the parish church of St Wilfrid, on the north side of Metheringham Heath Lane, at National Grid Reference TF 02202 60793 (Fig. 3).

The site lies at a height of *c*. 45m on land that slopes gently down to the east, towards the fens of the Witham valley. There are dry valleys to the north and south of the site.

## 3. AIMS

The aim of the work was to provide a record of the building and its function.

## 4. METHODS

Recording of the building was undertaken in accordance with English Heritage guidelines 2006 and ALGAO guidelines 1997.

Subject to accessibility and safety considerations, the recording of the building included:

- A photographic survey showing the building in its context, general and detailed views of the exterior, interior views of the principal rooms and circulation areas and structural or decorative details.

- A written record providing an account of the building's location, type, materials and possible dates, supplemented by a brief history of the building from readily available sources.

Photographic recording was undertaken with a digital camera. An index of the photographs was compiled on Archaeological Project Services pro forma recording sheets. APS photographs from previous work comprised external views, supplemented by internal views provided by the client.

Enquiries regarding any past research on the plant were made to the SLHA Industrial Archaeology Committee but they had no information. The report was re-constructed from the photographic evidence alone as the buildings had already been demolished.

**Plate 1.** General view of the south and west elevations of the processing area of the flax factory.

## 5. HISTORICAL EVIDENCE

Historical research involved examination of historic Ordnance Survey maps of Metheringham. This was supplemented by an article published in the Metheringham Area News.

The first map on which the flax factory appears is the 1947 revision of the 1904 Ordnance Survey 6 inch map (Figure 1). On previous maps the farm buildings to the north of the factory were present and they appear to remain mostly unchanged. The flax factory buildings flax factory on the 1947 map are mostly the same as those viewed on the most recent aerial views of the site before it was cleared. There were, however, some structures marked on the map that have been removed sometime in the past, prior to the recent demolition.

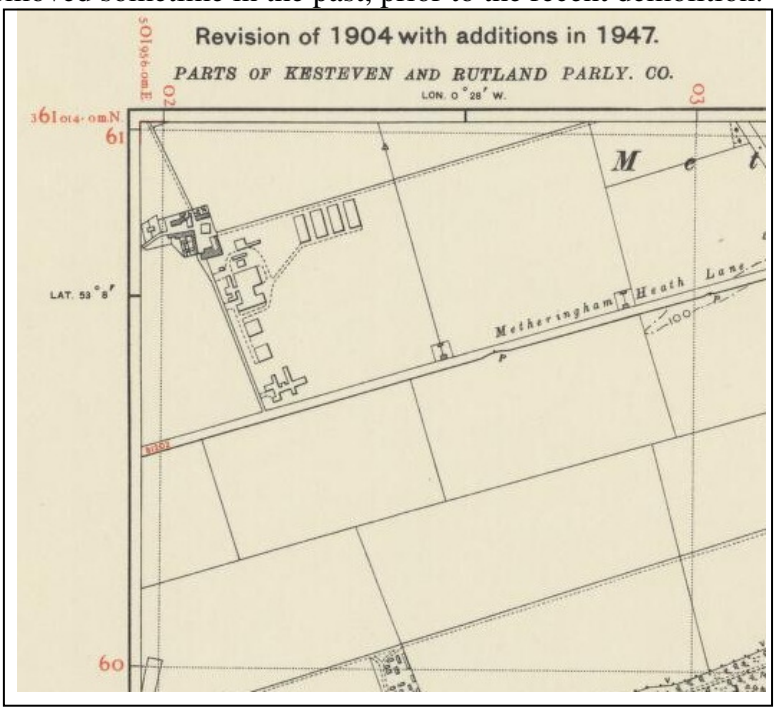


**Figure 1.** Extract from the 1947 Ordnance Survey 6" map.

## 6. FABRIC EVIDENCE

**The Dutch Barns** (Plates 2 – 5, Fig. 4)

To the northeast of the brick built processing plant of the flax factory are eight Dutch barns. They are arranged in four sets of two. The most easterly and westerly are plain double barns whereas the central two barns have a mono-pitched roof on their east side.

**Plate 2.** General view of the Dutch barns at the northeast of the site with the processing plant in the distance. Looking west

Originally, these steel framed structures had corrugated iron walls and roofs cladding the frames and were open at the northern end. The frames remain unchanged, however the corrugated iron walls have undergone alteration as is common with structures of this type.

**Plate 3.** The second barn from the east, entirely enclosed and accessed from the southwest corner. Looking northeast

The second barn from the east was closed off at the north end, half way along the structure and accessed at the southwest corner by means of a set of double doors with vents. This indicates continued agricultural use after the closure of the factory. The manufacturer's nameplate in the southern elevation reads "Main" indicating that these barns were fabricated by A.J. Main and Co. of Glasgow and London (Thompson, nd).

**Plate 4.** The frame of the second barn from the west showing the additional struts for the mono-pitched roof (removed). Looking northwest

The mono-pitched roof structure on the east side of the two central barns provided extra storage space and was bolted onto the side of the main frame. Within the main structures there are concrete floors but underneath the eastern roof space the ground is simply grass indicating these were later additions to the overall structure.

Attached to the southern elevation via a lean-to structure are three smaller Dutch barns that also appear to be original to the complex. These barns were manufactured by Boulton & Paul Ltd of Norwich, better known for their subsidiary company's manufacture of aircraft.

**Plate 5.** Two of the smaller Dutch barns at the south of the complex. The northernmost is set back and not visible in this plate. Looking ENE

**Factory Complex** (Plates 6 – 16)

The main factory complex comprised three main units. A large central brick structure 35m long x 17m wide housed the main boiler and engines at the north end. There were smaller units on the east (30m x 13m) and the west, 35m x 7m. The western and central unit were subdivided with three storeys at the south end and two at the north. The eastern unit had a larger tower structure at the north end, slightly offset from the central pitch of the roof on its

east side. Corrugated iron, lean-to structures were present on the east and south elevations. The southern of the two connected the main building complex to the Dutch barns described above.

**Plate 6.** Arial view of the factory as it stood circa 2014.

## South Elevation

The south elevation of the main factory complex is covered by a steel frame and corrugated iron lean-to structure and would have served as the main unloading area for the unprocessed flax. A pitched roof structure at the south with seven steel upright girders and associated cross beams joined, on its northern edge, to a mono-pitched roof attached to the main brick building.

**Plate 7.** The lean-to steel framed corrugated iron sheds at the southern elevation of the main factory complex. Looking east

The brickwork on the southern elevation extends in a square fashion rather than following the apex roof line. The lean-to steel and iron structure butts directly to the top of this brickwork.

**Plate 8.** Southern elevation from within the lean-to structure. Looking northeast

Within the lean-to structure there was a covered area where it abuts the south wall. This also provided an additional floor space above and may have served as an upper level. The circular apertures show no evidence of ever having contained glass and may be for ventilation as much as for providing additional light.

## West Elevation

The southern subdivision of the west elevation comprises the three storey part of the flax factory. Each storey is of roughly equal height. The bricks are laid in Flemish bond, except for where they have been used to partially block a window, (at the north end of the elevation) where they are laid in stretcher bond. All of the apertures for both windows and doors have concrete lintels. Where the apertures are on the same level a single concrete lintel covers several windows. The cills are constructed from blue engineering bricks laid on their side. On the ground floor, there were three, small windows at the south next to a longer aperture. The windows above these on the first and second floor are directly aligned with those on the ground floor. The remaining steel frames of the Crittal windows were present on the first and second floor.

**Plate 9.** The southern subdivision of the west elevation showing the change in building levels at the left of the picture. Looking east

Three of the apertures on the southern subdivision of the west elevation served as doors. A large aperture was boarded over at the north end of the ground floor. Above and to the south of this on the first floor was another opening. Although the same size as the window apertures it differed in that the cill was of plain concrete and there was no metal frame evident. Internal brick partitions were visible through this opening.

On the second floor a large aperture with wooden double doors and a wooden railing offered direct access to the upper part of the building. Above and central to this was a short wooden boom/gibbet for winching material to and from the door.

The northern subdivision of the west elevation is a two storey structure. The height of the bottom storey corresponded to the southern subdivision while the upper storey was larger, extending approximately two thirds of the way up the southern subdivision.

The windows and door on the ground floor were boarded up. All were spanned by a single concrete lintel. On the upper floor, two sets of three Crittal windows were placed either side of an upper loading door. A smaller window was situated at the north end.

**Plate 10.** The northern subdivision of the west elevation. Looking east

## North Elevation

The north elevation showed the gable ends of the three units. At the level between the ground and first floor a single concrete lintel spanned the apertures of all windows and doors in the western and central units. Each of the ground floor windows had been bricked up.

**Plate 11.** The north elevation showing the boiler chimney. Looking southeast

Aside from the three small windows at the west end of the elevation, the larger windows on the upper floor were all on the same level. This suggests a uniform floor level between the west and central unit. The roof space of the central unit is larger than the western unit. Each gable end is clad in corrugated iron. The apex of the central roof is approximately 2m higher than that of the east and west units. This may be to accommodate larger machinery associated with the main boiler. The chimney in the central unit suggests that this is where the boiler was situated. The large loading door on the ground floor was probably where the "retted" and dried flax would have been taken in for "scutching".

**Plate 12.** The north elevation showing the eastern unit and tower structure. Looking southwest

The eastern unit on the northern elevation differed from the others in its external structure. Along the north elevation was a single story structure with a mono-pitched roof. Two sets of double doors in the north face of this structure gave access along with another in the eastern elevation. The gable end of the eastern unit was truncated by a tower. This was probably a water tower associated with the retting tanks.

**East Elevation**

**Plate 13.** The northern end of the east elevation showing the corrugated iron lean-to structure. Looking northwest

Attached to the east elevation was a lean-to structure. Fashioned from a steel frame, this was a corrugated iron walled area, possibly used to stack the flax straw prior to being taken in to be de-seeded as the first part of the process. In the roof of the east unit was a large ventilation stack. The circular apertures in the water tower probably served the same purpose.

The low brick walls extended beyond the lean-to structure and they may pre-date it. These low walls were constructed in English bond.

**Plate 14.** The eastern unit and the south end of the central unit. Looking northwest

To the south of the water tower, the remaining section of the eastern unit was a steel-framed, corrugated iron structure built on a low, brick foundation. This appears to be where the de-seeding of the flax straw took place. To the east of this was an electric sub-station that may post-date the rest of the complex.

The southeast corner of the central unit had external access by means of an external brick staircase with doors on the first and second floors.

## The Retting Tanks

**Plate 15.** General view of the retting tanks where the second phase of the processing of the flax straw would have taken place. Looking northwest

The largest portion of these structures comprised concrete tanks into which the flax straw was placed before water was poured over them. The tanks had to be concrete as the process was corrosive to brickwork and metal (Decktowel nd).

The brick structures with mono-pitched roof would have been the pump rooms where the machinery that regulated and heated the water was contained.

**Plate 16.** Detail of the retting tanks showing the main tank at the east of the structure. Looking southeast

The two doors at the base provided access for loading and unloading of the flax straw. The

top could be accessed via the external iron ladder at the side of the structure. All around the structure was the remains of pipe-work that would have controlled the flow of water. On the north elevation there was a stop-tap where the central and upper portions of the structure met. The doors on the large tank on the east side were not present but the sealable doors on the smaller tanks to the west survived. Internal examination of any of the different sections was not possible when these photographs were taken.

**Some internal details** (Plates 17 – 20)

As the buildings had been demolished the internal details discussed are based on previous photographs made available.

**Plate 17.** Internal view of one of the structures. The light fittings would have overhung a conveyor or long table.

Although it is not entirely certain where this image was taken from, the trees and overgrowth visible in the apertures and the mono-pitched roof suggest that this was at the northern end of the east elevation. The light fittings would have overhung a conveyor belt or long table, associated with the initial process of de-seeding the flax.

The opening visible in the rear wall in the picture was possibly where the de-seeded flax was unloaded for the next process.

**Plate 18.** Detail of what appears to be a seed hopper.

The seeds from the de-seeding of the flax straw would have been held in hoppers, probably adjacent to, or very near where this process took place. The piece of equipment in Plate 18 appears to be for seed collection. The exact location of this is unclear.

**Plate 19.** Part of a centrifugal fan used for dust extraction during the de-seeding process.

Probably located in the eastern unit, there were the remains of a centrifugal fan that would have been attached to a hood over the de-seeding machine in order to extract the dust that this process created (Plate 19). This type of fan was specifically used in the de-seeding process (see discussion).

**Plate 20.** Detail of a boiler, probably located adjacent to the "retting tanks". The heated water would have been pumped from here to the tanks.

Following de-seeding, the flax straw was "retted". This involved stacking the sheaves in retting tanks and immersing them in water. The water was heated to speed up the process (see discussion). The boiler in Plate 20 is likely to have been used for this and was probably located in the mono-pitched brick structure butting the concrete retting tank.

## 7. DISCUSSION

Interpretation of the buildings of the flax factory and their uses has been aided by viewing a short film from the East Anglian Film Archive showing the flax production process at a factory in Sandringham, Norfolk. From this it was possible to compare similarities in building structures and extrapolate which parts of the Metheringham flax factory were used for which process.

When World War II broke out, supplies from Europe were cut off and home-grown flax was rapidly in demand. In 1931 only three acres in Great Britain was given to flax growing. This expanded rapidly and by 1944 the acreage had increased to 74,000. It was urgently needed for equipment such as parachute harness, ships canvass and hose pipes (Goodall and Hardwick 1951).

Once the flax had been harvested, the entire plant being pulled rather than cut, the straw was kept in stacks in the stack-yard until further processing was required. The area between the storage barns and the processing plant appears to have served this purpose at Metheringham.

The first part of the process was to de-seed the flax straw. The smaller Dutch barns at the southern end of the factory complex may have been where the flax straw was initially unloaded prior to the beginning of the process. The eastern unit of the main structure seems to be the most likely area for de-seeding. The flax was loaded onto conveyors and de-seeded by machine. The best seed was kept for the next crop and the lower quality seed used for linseed oil. The de-seeding was a dusty process and hazardous to health unless suitable dust extraction was in place. Hoods over the machines were attached to centrifugal fans that drew the dust upwards. The remains of one of these centrifugal fans, illustrated in Plate 19 would have discharged the dust through bag filters outside the room (*ibid*). From the north end of the east unit, the de-seeded flax straw would have been taken to the retting tanks for the next stage in the process.

The process of "retting" consists of steeping the straw in water in order to rot (or ret) the woody material so that it can be more readily separated from the fibre. This can sometimes be done by leaving the straw in the fields and expose it to the action of dew or rain. Another method was to soak the straw in ponds or streams. There was no local over-ground water source and so here the method used was tank retting. The straw was stacked in the concrete retting tanks situated to the north of the main complex. Warm water was pumped into the tanks and the straw was left to soak from four to seven days before being taken out to the fields to be "gaited" (put into small upright sheaves) and dried prior to the next process, "scutching" (EAFA Cat. 934 nd).

The "scutching" process is the separation of the wood from the fibre and is done mechanically in a machine called a turbine scutcher. The straw is passed between two rollers to break the woody constituents of the straw into short pieces. Rotating "beater blades" then flay the wood or "shive" from the fibre. During World War II, un-retted straw was often processed to save time. This was known as "green scutching" (Goodall and Hardwick 1951).

The process described above would probably have taken place in the central unit of the factory complex. This is the largest unit, and the turbine scutcher one of the most bulky pieces of equipment in the process. The purpose of the small, west unit is unclear. It may be associated with the dust collection through bag filters. The dust from "scutching" was drawn up by means of an axial flow fan and discharged outside of the Scutching Room (*ibid*).

The machinery used for all the mechanical processes would have been powered by a large

central engine or boiler. This is in evidence on the east side of the central unit where a single chimney rises from the roof.

At the north end of the east unit, the tower structure is most likely to have been a water tower. There is no nearby local supply of water other than ground-water and storage would have been preferable. The structure is similar to that recorded in a World War I flax factory in Bury St. Edmunds, Suffolk (Goldsmith & Henry, 2006).

Finally, the processed flax would have been taken for storage prior to shipment. The storage area was the eight Dutch barns to the east of the factory complex (Metheringham Area News, 2007).

## 8. CONCLUSION

The historic building recording undertaken at the former flax factory at Metheringham Heath, Metheringham, Lincolnshire, was re-constructed from several sets of photographs previously taken at the site prior to its demolition. The Flax Factory was constructed to supply flax for linen and linseed during World War II. At some stage after the war, flax production at the site ceased and part of it was given over to processing pea vines. All mechanised processing was abandoned at some point in the past and the factory lay disused for many years prior to its demolition.

Through photographic analysis and historical research it was possible to ascertain a rudimentary sense of the function of different elements of the factory. The factory was a short-lived entity, designed and built to meet an urgent requirement for materials vital to the war effort.

## 9. ACKNOWLEDGEMENTS

Archaeological Project Services would like to acknowledge the assistance of Mr A Presslee of Conerstone Planning Limited for commissioning this work on behalf of Future Biogas Limited. The work was coordinated by Gary Taylor who edited this report along with Denise Drury.

## 10. PERSONNEL

Project Coordinator: Gary Taylor
Building Recording: Neil Parker
Historical research: Neil Parker
Photographic reproduction: Neil Parker
CAD Illustration: Neil Parker
Analysis: Neil Parker

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## 12. ABBREVIATIONS

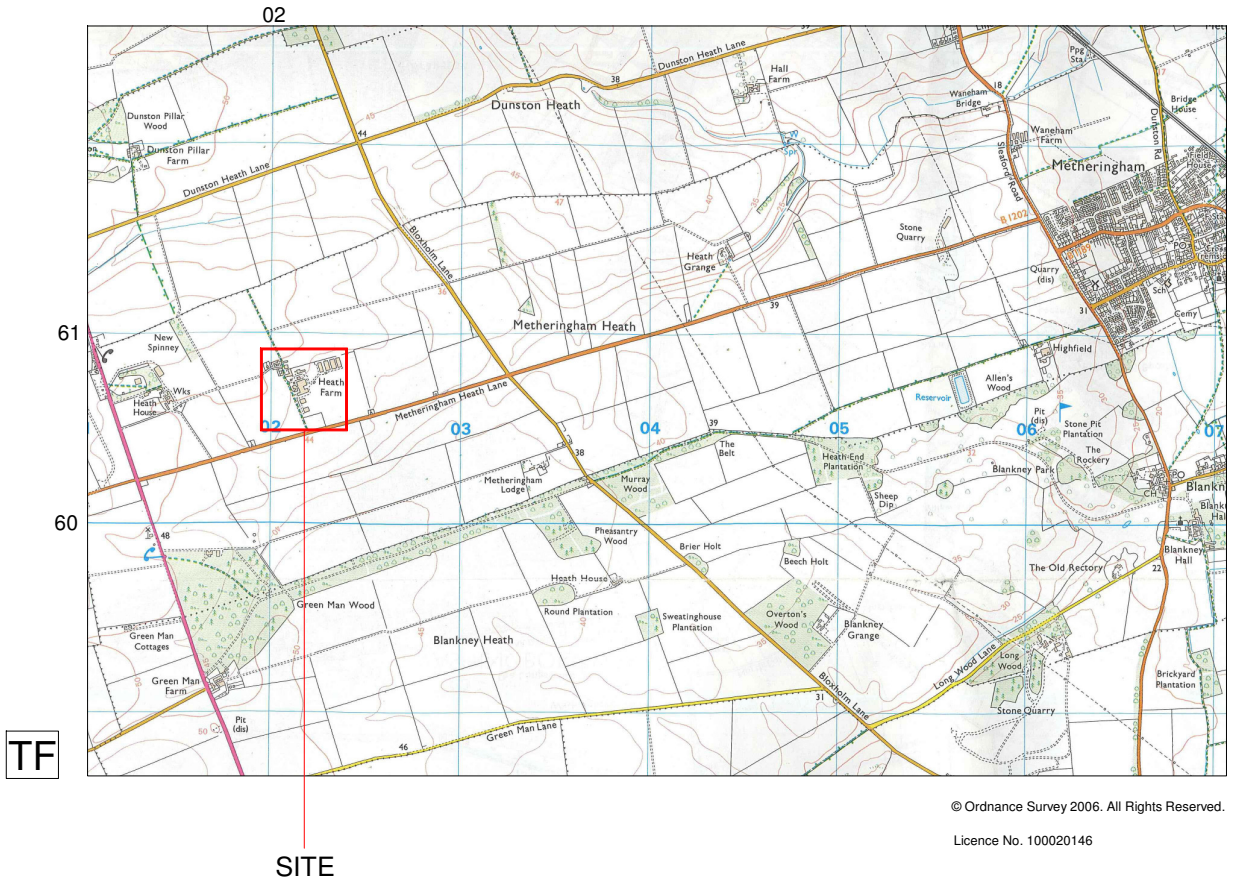
APS Archaeological Project Services

EAFA East Anglian Film Archive

CIfA Chartered Institute for Archaeologists

OS Ordnance Survey


Figure 2 - General location plan




| Archaeological Project Services | | |
|---|---|---|
| Project Name: Metheringham Heath Flax Factory | | |
| Scale 1:40,000 | Drawn by: NP | Report No: 20/15 |

Figure 3 Site location

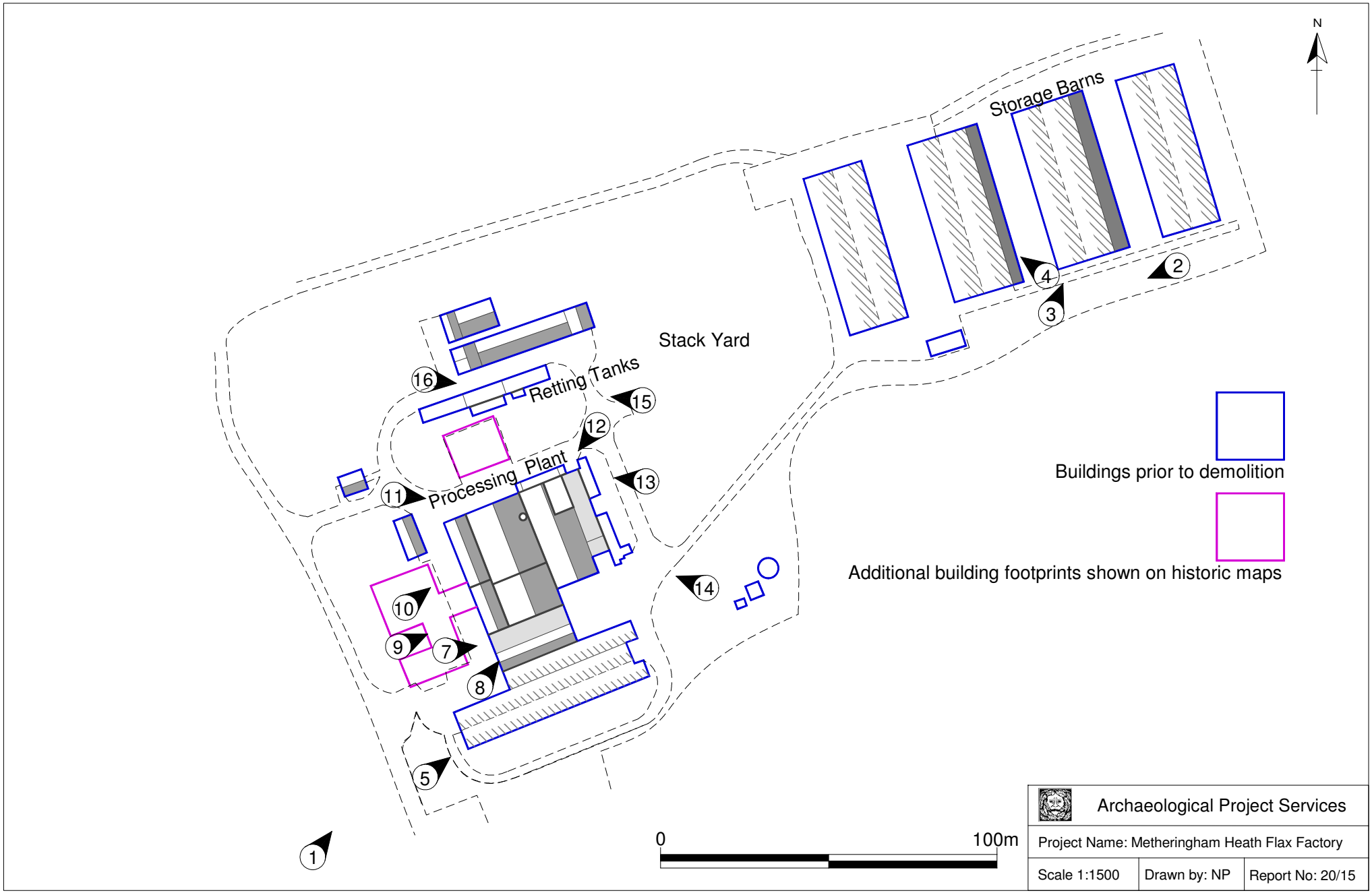



Figure 4 Site plan showing positions of the plates

# Appendix 1

## GLOSSARY

| | |
|---|---|
| **Crittall window** | Steel casement window, particularly popular in the 1930s and given the generic name after the main firm that manufactured them. |
| **English bond** | Brickwork arranged with alternate layers of stretchers (bricks laid lengthwise) and headers (bricks laid so their ends are visible). |
| **Mono-pitched** | Roof having only one side sloping. |

# Appendix 2

## THE ARCHIVE

The archive consists of:

| | |
|---|---|
| 1 | Photographic Record Sheet |
| 1 | Daily record sheet |

All primary records and finds are currently kept at:

Archaeological Project Services
The Old School
Cameron Street
Heckington
Sleaford
Lincolnshire
NG34 9RW

The ultimate destination of the project archive is:

The Collection
Art and Archaeology in Lincolnshire
Danes Terrace
Lincoln
LN2 1LP

| | |
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| Accession Number: | LCNCC: 2015.35 |
| Archaeological Project Services Site Code: | MHFF 15 |

The discussion and comments provided in this report are based on the archaeology revealed during the site investigations. Other archaeological finds and features may exist on the development site but away from the areas exposed during the course of this fieldwork. *Archaeological Project Services* cannot confirm that those areas unexposed are free from archaeology nor that any archaeology present there is of a similar character to that revealed during the current investigation.