

The Royal Gunpowder Factory
Waltham Abbey
Essex

Archaeological Report Summary
October 1995

by Steve Chaddock MA AMA
Consultant to the Ministry of Defence

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Archaeological Report Summary

The position of resident archaeological consultant was maintained after the departure of A.D. Ford in January 1995. Essentially the duties of full time archaeological advisor, working to keep the decontamination programme on track while ensuring the appropriate protection to the scheduled areas and listed buildings, continued up to the point that groundwork ceased on site (27 September 1995).

I intend to follow the layout of A.D. Ford's 'Archaeological Report Summary' (1995) and add to it where necessary.

Scheduled Ancient Monument (SAM)

Advice continued to be sought by the decontamination contractor on the likelihood of successful applications for scheduled monument consent. Close liaison with English Heritage (HBMC) continued. Please refer to additional report on SAM for details of work carried out between January 1995 and September 1995.

Listed Buildings

English Heritage were informed of all alterations and damage to listed buildings on site.

To date, only the Grade 1 listed building, L157, has been issued with a certificate guaranteeing safety from explosives. L157 requires its roof timbers to be sprayed with a fire retarding paint.

A201/A202 continued to be occupied as Royal Ordnance's site offices and the mess room. A200, Walton's House, was subject to an outbreak of dry rot which was addressed. Treatment is detailed on the site files and correspondence.

L176 continues to be occupied by Bray Construction Plant, who also have use of the slab of L169 for heavy plant storage.

Areas Outside SAM

Areas outside the SAM were dealt with as described in Ford (1993).

Powdermill Lane Housing Development Site

Wimpey Homes purchased Powdermill Lane Housing Site and it was agreed that the resident archaeologist would provide watching brief cover, in line with Essex County Council guidelines. Further excavation below Flagstaff Road is planned during November and December 1995.

Acid Factory

The Acid Factory, in the area known historically as Edmonsby Mead, was carefully excavated to expose a complex series of concrete and brick foundations. These have been photographically recorded and located within the MKS site survey on CAD. Further archaeological recording was not possible within the time frame available.

Non Listed Buildings

These buildings continued to be treated as described in Ford (1993). Royal Ordnance have compiled an accurate architectural record of all these buildings which can be found in the site archive.

Projects

Where remains were uncovered as a result of the decontamination process, an assessment was made of their significance in close liaison with English Heritage. Consideration was also given to the need for external assistance in order to compile an adequate record.

Three archaeological projects have been carried out on site by external bodies during the decontamination process. All these have been funded by Defence Lands Service(Cambridge) through the decontamination budget.

Powdermill Lane Housing Development Site

Field Evaluation by Essex County Council Field Unit. Detailed in PLHDS Archaeological Report (Ford.1994)

Four Barges

Recording project focusing on four waterlogged barges that lay in the path of the decontamination project. Report forthcoming with figures.

211a and RCHME135

Recording project concentrating on the remains of a water powered gunpowder incorporating mill (211a) and pre 19th Century sluice remains (RCHME135). Copy on site archive.

Photographic Recording

A similar policy to that outlined in Ford (1995) was adopted.

The photographic archive (archaeology) is now complete and together with the Royal Ordnance collection documenting the decontamination programme represents a formidable photographic account of work on site.

Finds

Portable Finds

Aims to catalogue and store all excavated finds in the secure store in A203 proved to be unmanageable. Time and money necessitated an adjustment in plans.

Cataloguing

All artefacts collected on site have been given a label, or are in a box that is labelled. The information recorded is the date of excavation, method of excavation and the context. This should allow a future owner of the site to complete the full cataloguing of the collections without losing any information.

Storage

Labelled as above, the majority of excavated finds are stored in L168. Finds that have had a catalogue sheet filled out are boxed and stored in the Secure Store (A203).

Large Objects

Barges

In all there are 17 Barges on site at present. The surprising survival of so many barges has led the Nautical Archaeology Society to recommend a separate display area for the inland working craft represented at Waltham Abbey. A summary of barge types and locations is copied here.

Masonry Fragments

During excavation of the waterways on site a large number of limestone edge runner fragments and carved sandstone chimney tops were recovered. These are stored in the vicinity of A200

Drawings

Many of the remains uncovered were recorded on the MKS Site Surveys with additional, smaller scale, details added where necessary. Plans of canals excavated and filled can be found on these plans. In addition to these, a series of line drawings (to scale) and sketches (not to scale) were produced where archaeological detail was missed by MKS. These drawings are part of the site archive and have the prefix [WALD]. An index of the WALD drawings is copied here.

Monitoring

Recording of the temperature and humidity conditions in the Conference Room and in the Secure Store, both in A203, has been carried out since October 1994 using Meaco digital thermohygrometers.

Analysis of the different conditions noted should allow conservators to understand the fluctuations more accurately and make plans accordingly.

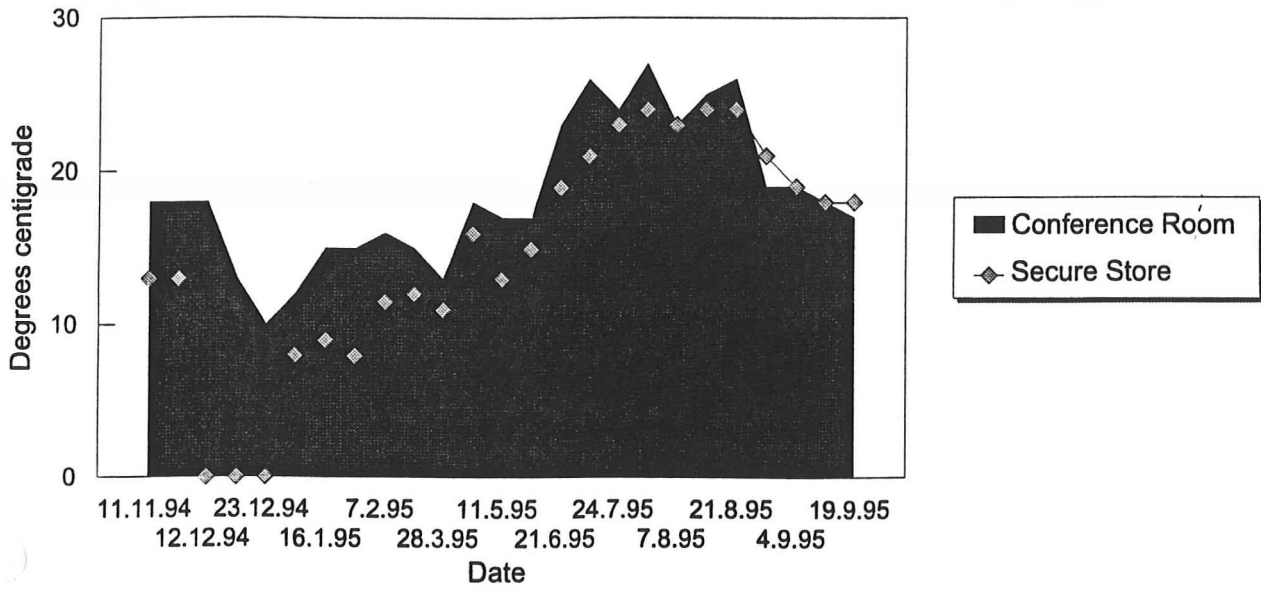
Reports

It was decided that additional reports would be completed to compliment the interim reports prepared by A.D. Ford in January 1993.

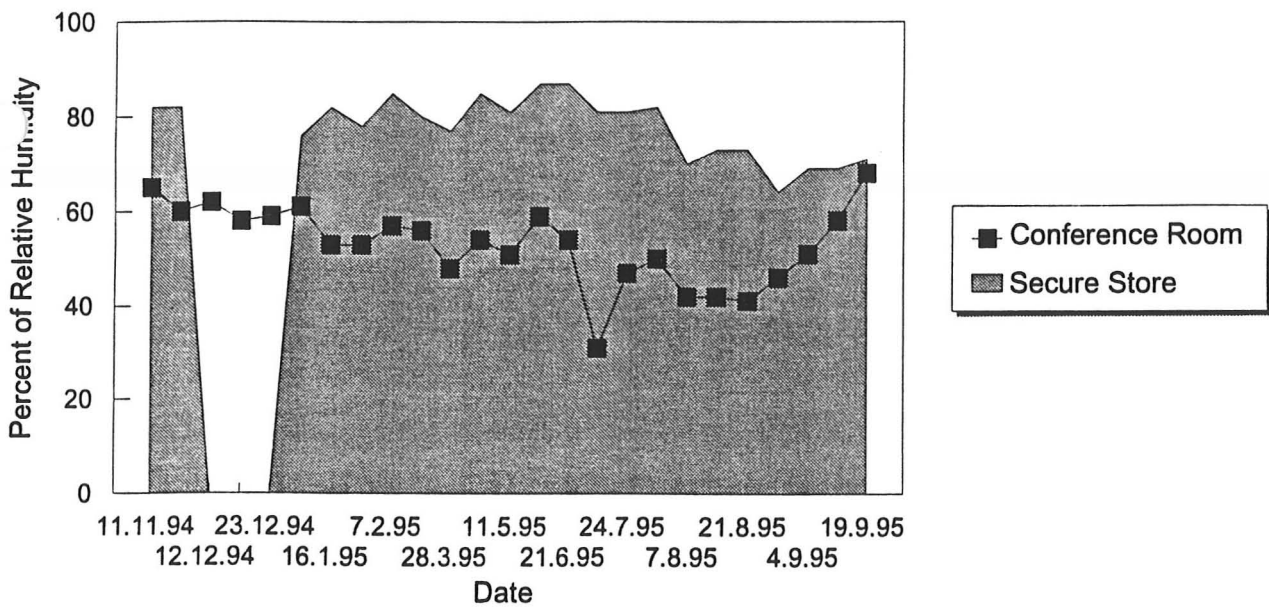
Conclusions

A pragmatic approach to a challenging new kind of site has paid off. Decontamination contractors and heritage bodies are not easy bedfellows, but through discussion and advice, the middle path has been steered.

Temperature Spot Readings, Waltham Abbey



Humidity Spot Readings, Waltham Abbey



I would like to thank the following for their help and advice:

Adam Ford
Anthony Moores
Bob Stebbings
Bob Watts
CIVIX
David Prince et al
David Stanners
Deborah Priddy
Gordon Wyatt
Kate Carver
Melissa Eyears
Royal Ordnance
Stuart Fox
Wendy Webb

The Royal Gunpowder Factory
Waltham Abbey
Essex

Powdermill Lane Housing Site
and North P Area

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Consultant to the Ministry of Defence

North P Area

During 1995 little excavation was carried out on North P Area, as most of the work had already been completed (see A.D. Ford 1993).

A bank of ground at 45 degrees to the garden wall of 221 was removed over a long period of time and replaced with clear aggregate. No structures were noted during this exercise.

Generally the ground in North P Area has been reduced by over 1 meter. The presence of the Boiler House (A210), led to some contamination from industrial activities. The ground around the Boiler House (A210) has been cleaned up but the ground on which it stands has been sealed in using semi-permeable membrane (Terram) and a capping layer of aggregate. There has been no effort to backfill this area after removal of fills.

Powdermill Lane Housing Development Site

A continuing watching brief on the PMLHDA has noted no unknown features. Two brick vaulted culverts, probably associated with the 19th Century Artificer's Yard, were seen in a trench dug through Powdermill Lane. They were running across the road to the Cornmill Stream on the other side.

Work has yet to be started on insertion of a foul and surface water sewer along Flagstaff Road.

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Area H

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AREA 'H'

Structures left standing on 'H' area are:

H7 - Cordite Reel Drying Stove
- RCHME Sheet
- Threatened Buildings Report attached

H17 - Sewer Pump House
- RCHME Sheet

H26 - Sandhurst Hospital
- RCHME Sheet
- Threatened Buildings Report attached

In the Summer of 1995 work on the Scheduled Ancient Monument at the southern end of 'H' area started. Because of the fragile nature of the remains, a light surface scrape was all that was allowed and the exposed areas were then covered with terram and ballast to seal in any potential contamination. These works were carried out in compliance with Scheduled Monument Consent HSD9/2/3130 pt.23.

Removing vegetation on HBS.SAM did not allow a better understanding of the historic structures in this area as later concrete bases have been laid over their foundations.

S. Chaddock
Consultant Archaeologist
20.09.95

H Area

The majority of work carried out in H Area was completed before 1995 (refer to A.D. Ford 1993).

The whole area, except those parts within the Scheduled Ancient Monument and under standing structures, has been remediated to a reduced level of c. 1 meter. The fence line and land between the fence and the Horsemill Stream has not been looked at.

Proposed housing development on this land may consider access for services via a trench cut through the ancient monument before it was scheduled. It is believed this trench runs in line with the line of the road through Highbridge Street Gates.

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Millhead Stream and The Island Site

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MILLHEAD - REMOVAL OF FILLS

During decontamination work at Waltham Abbey, the fill of all known canals or drainage leats was removed under the guidance of the on site archaeologist who was guided by Scheduled Ancient Monument Consent HSD9/2/3130 pt.2.

In the case of Millhead the fill of the waterways made up a significant proportion of the whole existing landmass. It seems as if fly tipping had been practised, as the hard-core in the canals would have made up more buildings than were known historically.

[RCHME 296] Millhead Stream was fully excavated along almost its full length, the only exception to this being at the northern end, where the old line of the Millhead Stream has been truncated by the flood relief channel, Horsemill Stream. At this northern point, between 155 and Intersection 10, the fill was found to be mostly gravels, presumably deriving from the Horsemill Stream widening in the 1970's, and so a central 'V' only was dug and two supporting banks left up against the canal walls. (Site Photography)

Causeways, with pipes to allow water flow, have been reinstated at the two crossing points. One on the east/west road towards the north of H7, and one from the roundabout east/west to the south of H7.

Previously water powered, the mills along the islands of Millhead Stream also had their wheel shots excavated. These were sandstone curves with some repair patching in evidence.

All steps were taken to restrict excavation on the islands of Millhead Stream and, apart from localised asbestos removal necessary for health and safety reasons, this was achieved.

The southern end of Millhead Stream, the 'Gullies' [RCHME 135], were uncovered during 1995. These interesting water management structures proved to contain phases dating back to the early part of the site's history. Cotswold Archaeological Trust won the contract to record the remains, which included the foundations of 211a, and their report and archive are held on site.

To the east and west of [RCHME 296] Millhead Stream lie the mill races [RCHME 119] and [RCHME 301] respectively. These have both been decontaminated by excavation and are crossed by piped causeways in the same fashion as Millhead Stream (see above).

Also in 1995, Hoppit Pool, which both [RCHME 296] Millhead Stream, and its westerly race [RCHME 301] flow into, was pumped down and the silts excavated. A temporary dam to the immediate south of Bridge 17 kept the water back and it was possible to examine the foundation of the Island Site as well as the 'Gullies' [RCHME 135].

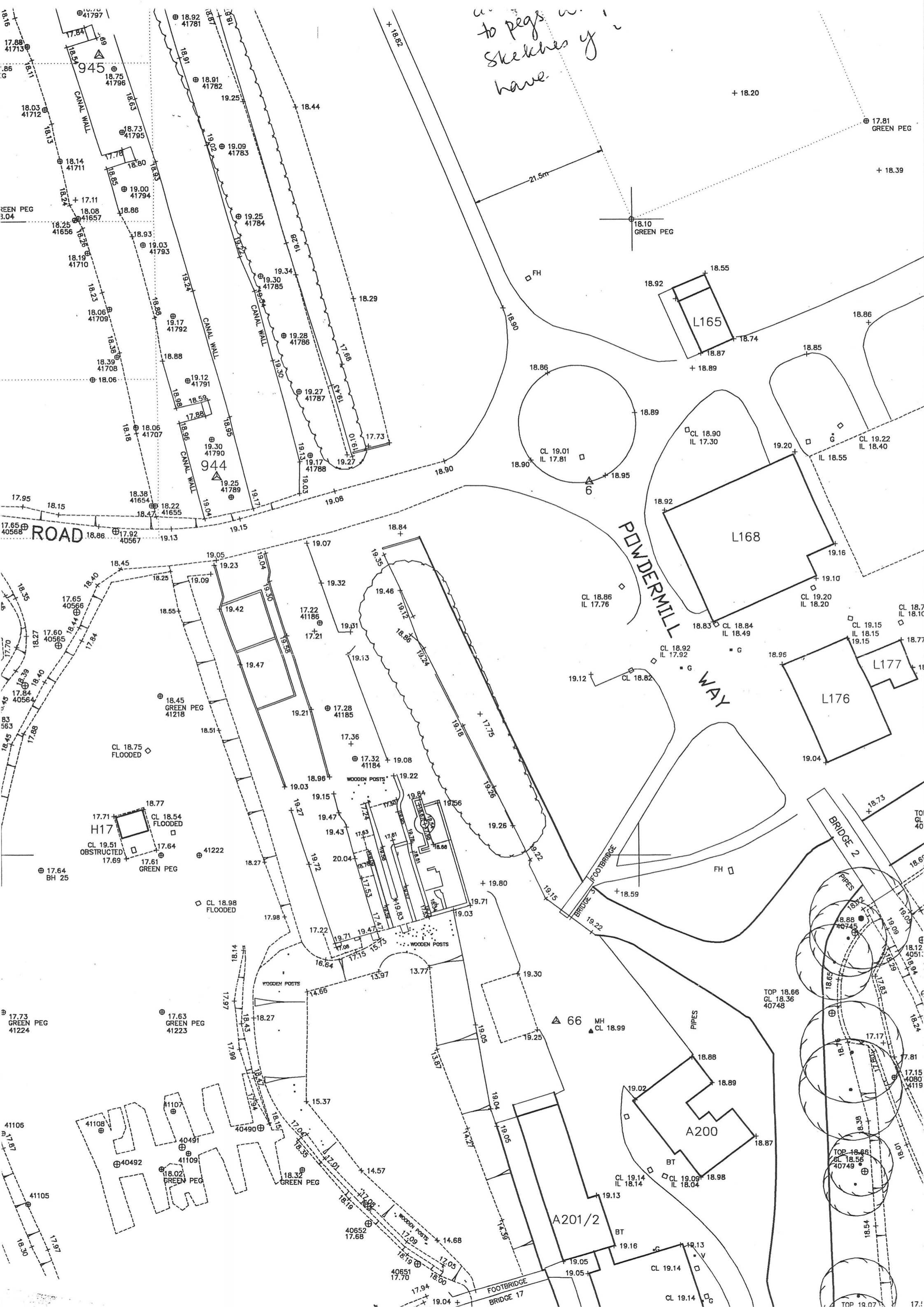
The Island Site is set on a wooden pile foundation, the waterlogged sludge below this receded without water saturation and the chance was taken to insert some concrete support to the foundation. (Site Photog).

[RCHME 135] The 'Gullies' 19th Century brick built walls are founded on wooden piles in an orderly manner, the piles following the walls in the same line as the walls. On the southern edge, the existence of a number of horizontal and vertical timbers was discovered. This construction aligned itself to the east of the centre of the 19th Century sluices. The irregular eastern timbers were packed with some chalk. (See Site Photog). To the west, the island on which 211 sits, the island was founded on more regular upright timbers standing c. 1½ metres from the walls and possibly packed with rubble. It seems reasonable to suggest that this western island is founded on 19th Century style foundations.

S. Chaddock
Consultant Archaeologist
29.08.95

SCREPO5

to pegs w.
Sketches of
have



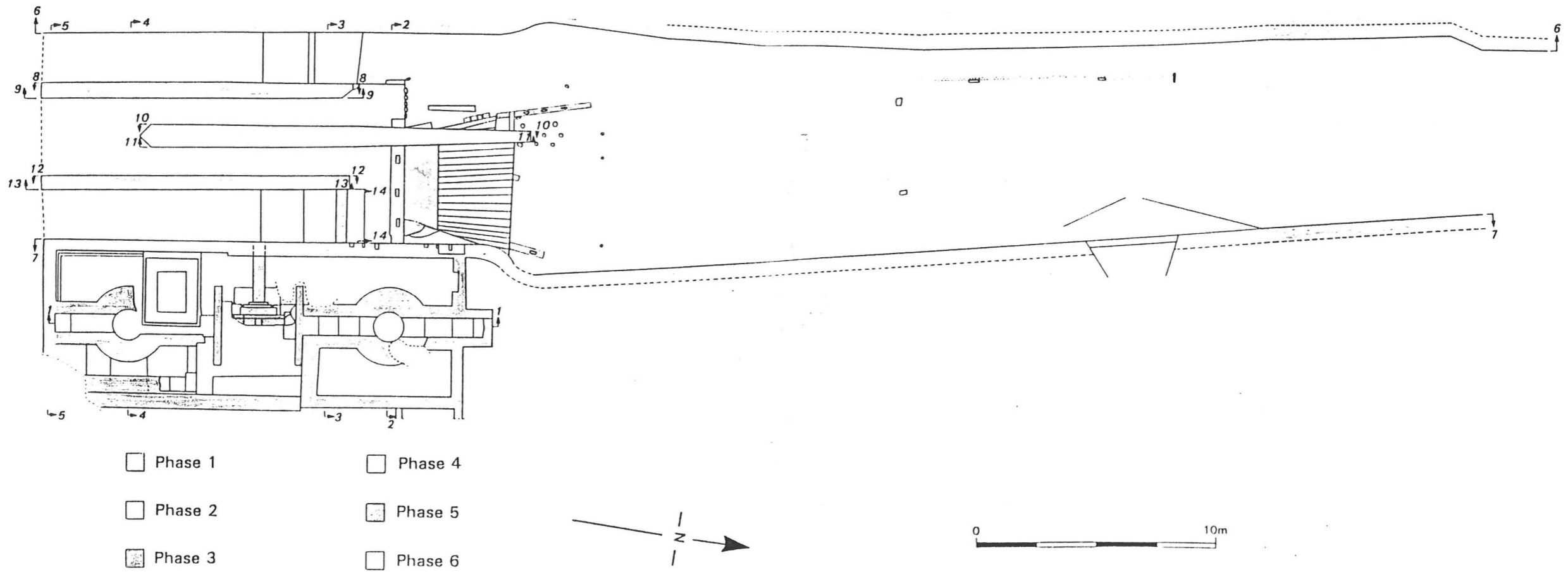


Figure 3: Phase plan of site

A200 or WALTON'S HOUSE

Malcolm Maclaren pers. comm.

A210 Boiler House provided steam heating for North Site buildings including A200.

M. Maclaren's Museum on site was housed in part of A200, (bay windowed room upstairs and south extension).

When A210 was closed, heating was no longer provided for A200 and this led to a degeneration.

The museum was opened in 1968 and lasted for 12 years up to 1980.

Malcolm remembers checking on the exhibit cases one Friday evening and then returning on the following Monday to find a fine layer of orange spores on every horizontal surface. Dry rot was diagnosed and extensive works were commissioned by Dr Hooper's immediate predecessor, on the understanding that A200 was listed. (It was not at this time.)

Most museum cases were also condemned, believing that the building was listed, the instructions given were to replace all materials with similar materials. This strict "like for like" replacement, although very commendable, led the H & S offices to designate the area 'temporary visitor space' only - presumably based on a fire risk or possibly horse hair in the plaster posed some sort of anthrax risk (B. Watts pers. comm.)

Heating was provided after the work had been completed (at a cost of c. £15,000) in the form of many 4 bar electric oil heaters set on low. This gave the effect of keeping the inside of the walls dry, although the walls suffered on the outside from rain soaking and seepage.

M. Maclaren puts this episode between 1984 and 1986, based on who signed the authorisation form for the work.

Since the site's closure in 1991, having survived 5 years being electrically heated, the unheated building fell prey to the ravages of dry rot once more. Fruiting bodies and spores were discovered in the south extension, west side, and work agreed by S. Fox was carried out in September 1995.

It is unlikely that the building will remain unaffected by dry rot in the future, especially as no heating system is in place at present, and will not be likely for the oncoming Winter as the site is to be closed from 29th September 1995.

S. Chaddock
Consultant Archaeologist
15.09.95

The Royal Gunpowder Factory
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Queen Meads

Archaeological Report
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by Steve Chaddock MA AMA
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Queen Meads

The RCHME Survey showed few structures existing on this area of land on site.

The removal of fills from canals resulted in the accumulation of large quantities of very wet, sloppy muck. Queen Meads was used to dewater this muck before it could be removed from site.

The action of excavators pulling the muck around and of lorries gaining access to the loading points, has had the effect of stirring the wet muck into the topsoil layer of the Queen Meads. A final scrape of the area therefore resulted in removal of the topsoil from the entire area. This has not been replaced.

Buried Archaeological feature discovered on Queen Meads are limited to the line of concrete and brick foundations which stretch along the western side of the stream powered incorporating buildings.

Canal RCHME 181

Excavation of canal RCHME 181, which runs south from BR8. led to the discovery of two barges and a new area of the site.

This branch was not excavated to its full length and so it is difficult to say if it was a loading cul-de-sac or a through route to the barge workshop and charcoal works in the south. Nevertheless, historical maps show a blastwall along the western bank of RCHME 181 and evidence of one end may be seen as a concrete foundation.

The position of the excavated canal can be seen on (WALD024) and also the position of a footbridge, whose concrete foundations were noted. To the east of the blast mound, in the section of the canal wall, two recessed channels were noted (site photography) (WALD011). No attempt was made to excavate these fully. Presumably excavation would allow exact placement of the conjectured blastwall to be made.

The two barges discovered were backfilled with clay and concrete. RCHME 561 was more interesting as it was a shape not seen at RGPF before (WALD001) RCHME562 is dealt with in the next section.

From these loading jetties, cordite paste would have been taken on narrow gauge trucks around from the east side of the blast wall to L130 and L137 where pressing of the cordite was carried out. No remains of these tracks were found.

RCHME 562

Found to the south of Bridge 8 in Canal RCHME 181, adjacent to the southern of two loading jetties that serviced the Cordite Press Houses L130 and L137.

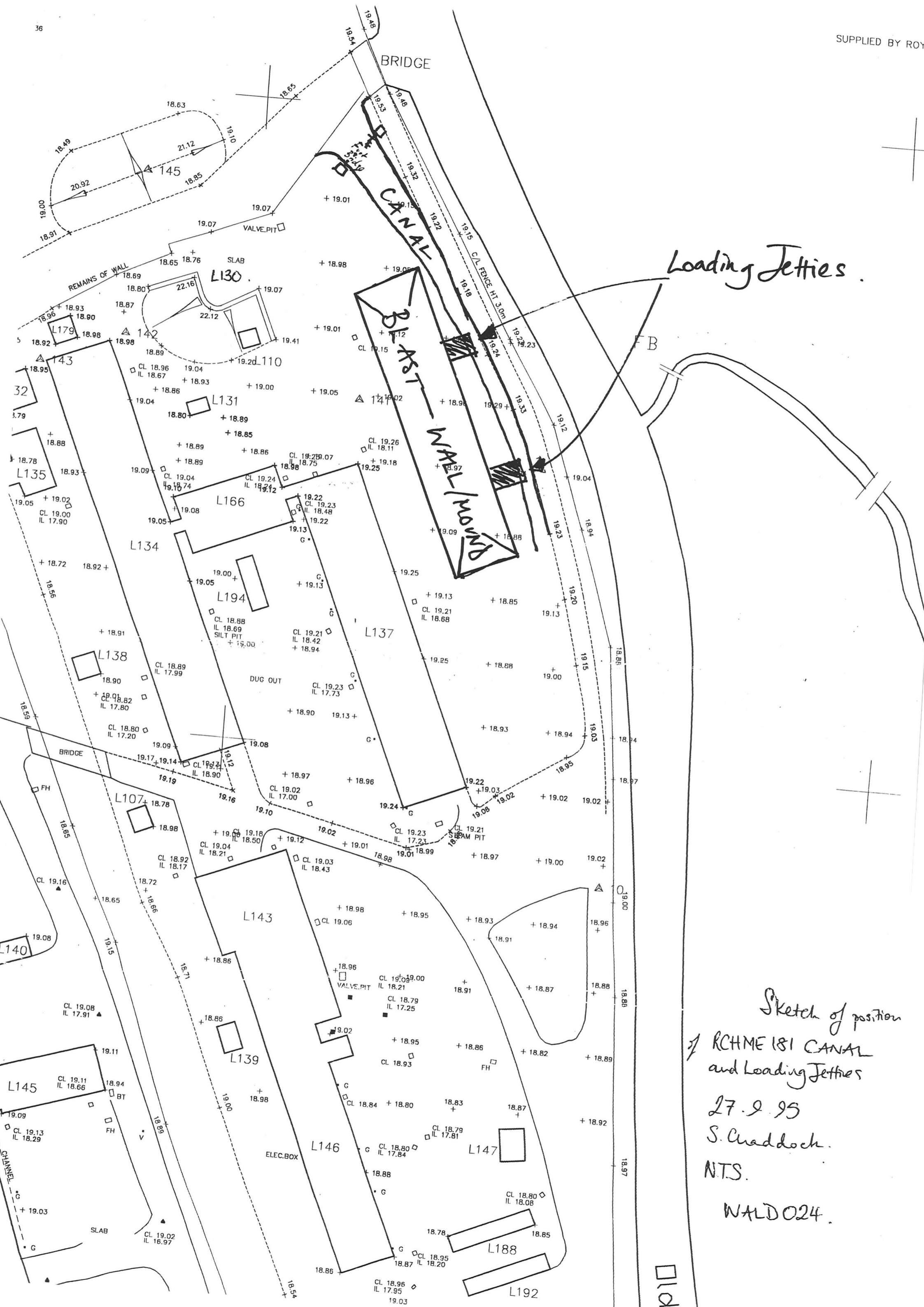
The fill of RCHME 181 was composed of hard-core and concrete fragments, which, it is possible to assume, came from the demolished blast wall immediately to the west of the canal.

The mass of rubble and concrete had damaged the barge severely at one end but the barge was seen to be sitting on a large bed of cordite - presumably having accumulated from various spills around the loading jetty area. It was necessary to remove this contaminant and this involved moving RCHME 562. A ramp was constructed and the barge removed, during this operation its waterlogged timbers proved incapable of holding together.

On initial inspection of the barge, it appeared to be similar to the other three swim-ended vessels on site. However when boards were removed it became clear that the barge was in fact lined with concrete between the cross timbers below the floor boards and above the hull. This had obviously added to the weight of the vessel and had encouraged separation of the timber planks. It was also clear that the vessel was double diagonal planked on each side and had been bitumen sealed.

The remains were replaced in the canal and backfilled in situ to preserve them in anaerobic waterlogged condition.

S. Chaddock
Consultant Archaeologist
20.09.95



Loading Jetties.

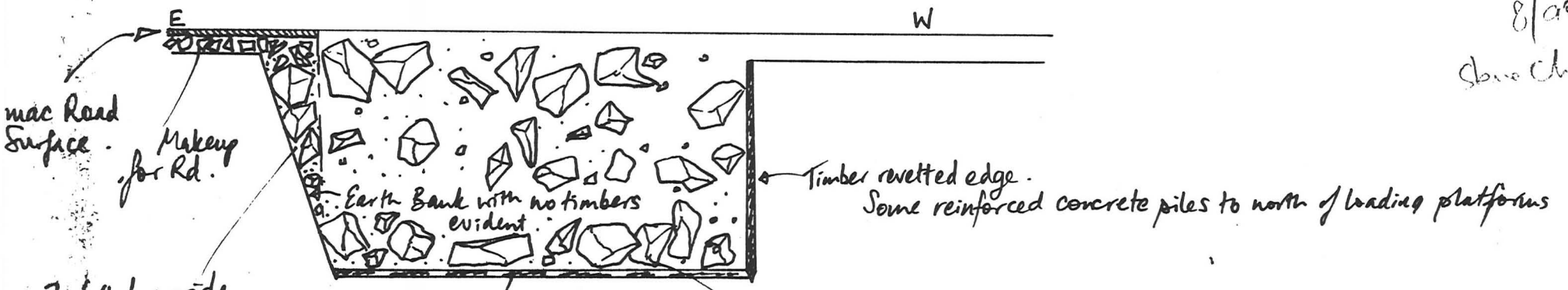
BRASS TIE WALL / FOUND

Sketch of position
 RCHME 181 CANAL
 and Loading Jetties
 27.2.95
 S. Craddock.
 NTS.
 WALD024.

KUMME 181.

Sketch to show canal fill & general arrangement of loading stages in section.

WALD 711
NTS
8/25
Steve Chaddock

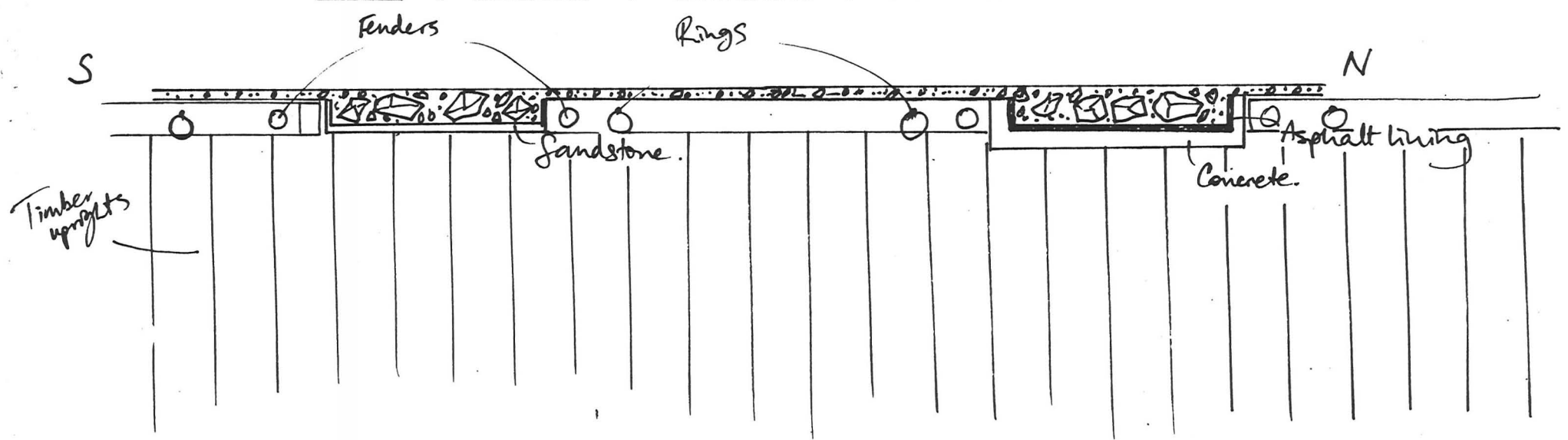


Infill to provide stability for Road.

Humic layer at base of canal
 - former bed?
 - Contained decayed vegetable materials and large quantities of Cordite propellant.

Fill of KUMME 181 described:

- Some soil
- Scrap metals - 5 and 50 gallon drums
- Concrete blocks
- Hardcore demolished brick rubble.
- Cordite layer

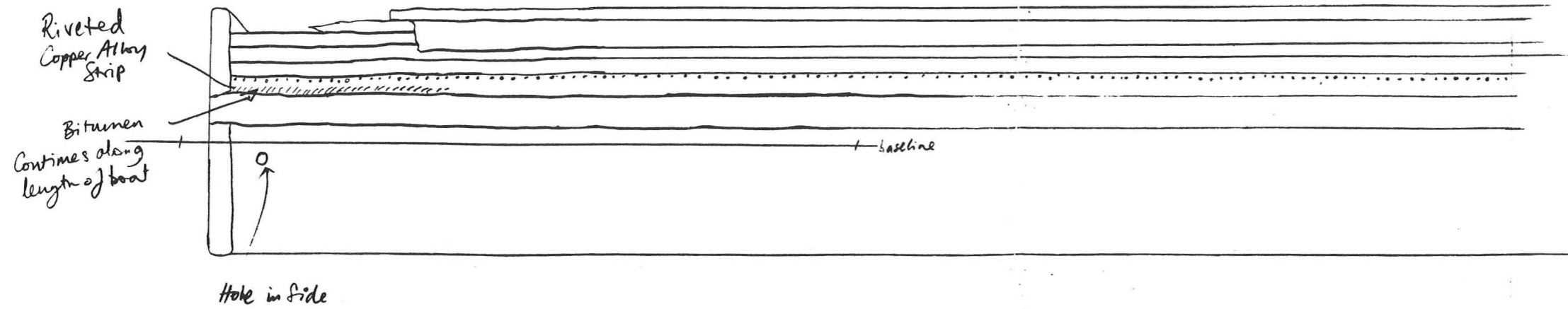
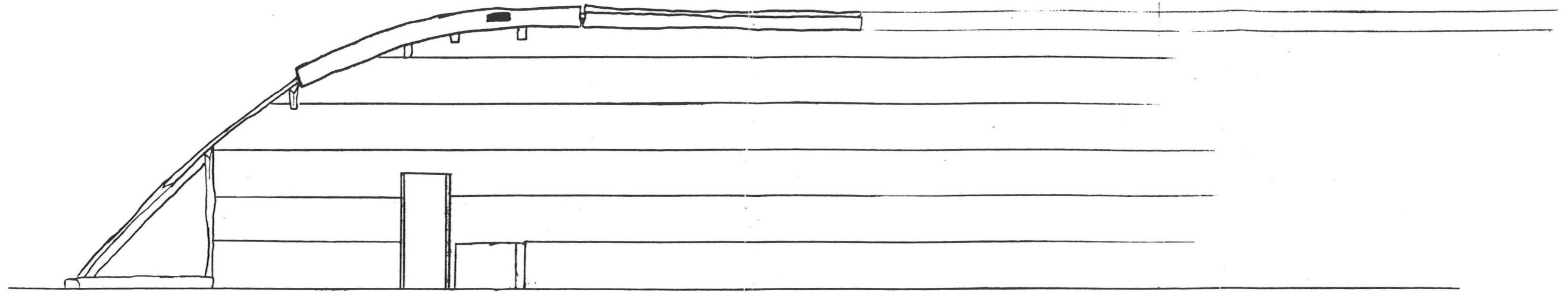


RCHME 561

DRAWN BY S. CHADDOCK

11.08.95

Scale 1:20



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Waltham Abbey
Essex

New Hill

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Consultant to the Ministry of Defence

Please refer to the interim archaeological report (January 1995) by A.D. Ford.

During 1995 the area of New Hill Nitro-glycerine factory was examined in more detail. Residual asbestos contamination was found in the structure of many buildings (at the date of the factory's founding, asbestos was used widely in gasketing and generally in explosives buildings).

No buried archaeological features were found on New Hill. Examination of the ditches and ponds to the east of the complex proved fruitless. Some building had been overgrown with thorn scrub.

S16

Clearance of filled pits in S16 revealed the original standing for the NG drowning tank, circular in plan and standing c.20cm proud of the concrete floor. This tank presumably also circular, sat within a square timber revetment pit which was positioned centrally within S16.

During the last few days of work on New Hill, a small amount of reconstituted propellant was found in the area to the north east of S16. This led to removal of some thick scrub but no archaeological features were discovered in this exercise.

S23

Clearance of S23 revealed tank standings and a peripheral walkway which had been covered by slippage of earth on the surrounding mound.

S25

S25 was seen to be suffering from slippage of the earth bank directly to its south east. No action was taken on this.

Steam Pipe routes in the New Hill area have been scrutinised and capped with an aggregate.

Conclusion

Little new has been discovered about New Hill since the RCHME Survey. Clearly some buildings have been revised as part of the proof test experiment on site but others were simply levelled and abandoned to nature.

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Scheduled Ancient Monument Area
(SAM)

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74 and 75

Originally constructed to serve as gunpowder magazines for the Dusting and Glazing Engine (RCHME 275) to the north, the southernmost magazine (75) was later converted to serve as a fan house for S28. Its concrete mounting blocks survive in the interior of the building.

Remains were carefully worked around and photographed. Detailed archaeological line drawings can be found (WALD003 and WALD004).

63

Immediately to the north west of 74, the remains of Mixing House 63 were investigated. Wholesale rearrangement of the structure was expected after reference to the 'Inquiry into the Explosion' in the Waltham Abbey Special Collection.

Some surface asbestos was cleared away but there was a large hole created by the blast and it seems likely that there was some 'clean up' work done after the inquiry. 63 has been capped with hoggin.

RCHME 275

The removal of fills from Canal RCHME 293, which fed the waterwheel of RCHME 275 uncovered a sandstone slab which may mark a previous sluice point.

The concrete slab overlying the wheel pit of was noted as cracked and recorded. No steps were taken to investigate this building further.

E4

This building was cleared of vegetation exposing the footings of the washwater settling tank. An NG gutter fastening strap was found in the building.

Steam Pipe Routes in the area have been scrutinised and capped with hoggin.

E12 North Area

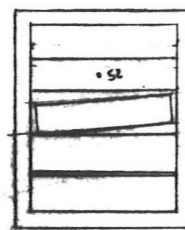
Extensive asbestos contamination discovered in the area immediately surrounding E12 led to the reduction of the ground level by c 0.5 m. most of the fill was made up ground containing rubble, slate and asbestos (fibrous).

This decontamination exercise also brought to light the foundations of five structures previously buried (WALD008).

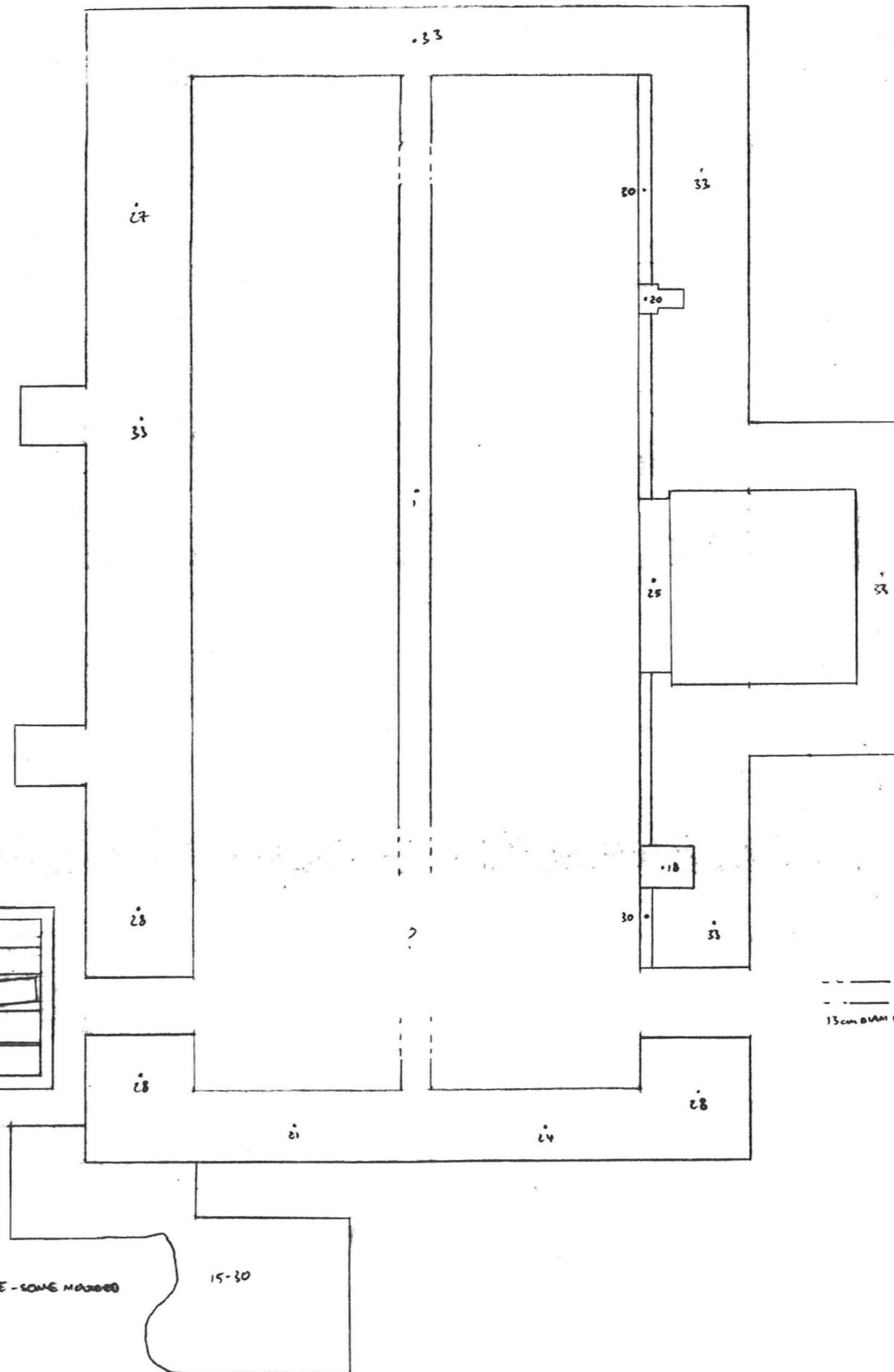
ALL WALLS ARE SOFT YELLOW STICKS
ENGLISH BOARDING

ALL ELEVATIONS IN METRE ABOVE AVERAGE
GROUND LEVEL IN CENTIMETRES

VALVE HOUSING, COVERED WITH
WOODEN PLANKS IS



ROCKY CONCRETE - SOME MISSING



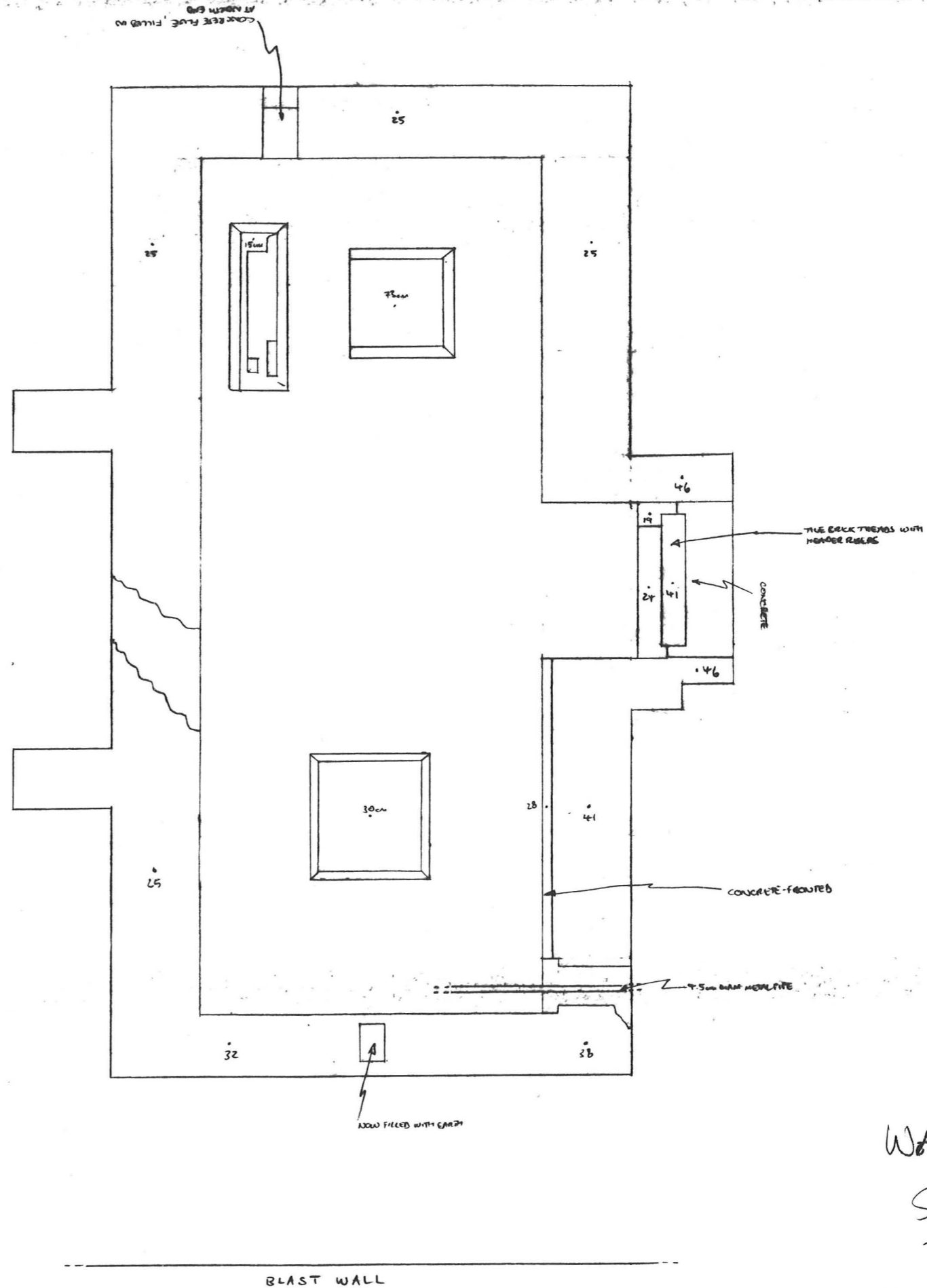
ABUTMENT
B236

→ CANAL
15cm diam pipe

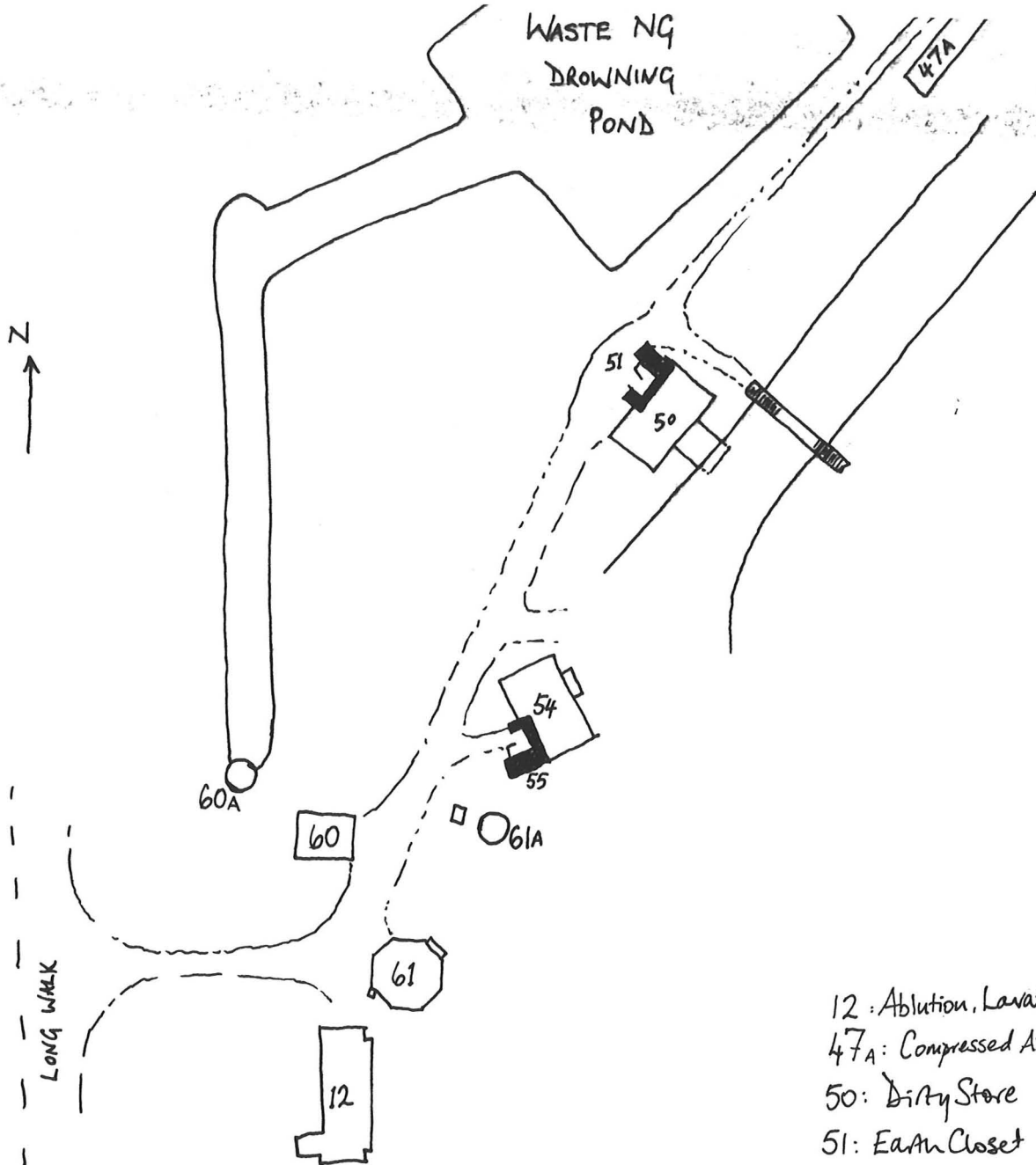
WALD 004
74
Tim Stevens
13/9/95
Scale: 1:50



ALL WALLS YELLOW STEEL ENGLISH CONCRETE.
 ALL INTERNAL STRUCTURES CONCRETE, AS IS THE
 FLOOR.
 ALL DIMENSIONS REFER TO HEIGHT ABOVE FLOOR IN CM.



WALD003
 Scale 1:50
 75.
 Tim Devans
 13.9.95



- 12: Ablution, Lavatory + Changing
- 47A: Compressed Air Reservoir
- 50: Dirty Store
- 51: Earth Closet
- 54: Dirty Store
- 55: Earth Closet
- 60: Pump House
- 60A: Well
- 61: Water Tower
- 61A: Well

E 12 NORTH AREA

Steve Chaddock 24.5.95

CONTAMINATED FILL REMOVAL (ASBESTOS) RESULTED IN LOCATION OF STRUCTURES ABOVE.

The group centred around a hexagonal water tower (61). It is supposed that the tower provided a head of water not only for the ablutions in E12 to the south, but also for the Acid Factory to the west and south west.

The tower drew its water by means of a pumping house (60) and this was supplied with water from one of two wells (60A, 61A). 60A was filled by an extended leg from the Waste NG drowning pond to the south of E2. (It seems unlikely that contaminated waters would have pumped up a storage tower.) 61A was fed by way of a pipe, whose easternmost end was fed by the high level canal RCHME 291.

The Dirty Store (54) and its Earth Closet (55) were only exposed and not excavated.

A more detailed drawing of 61 can be found at WALD007, showing pipes and construction details.

Canals in the SAM

The filled canals in the Scheduled Ancient Monument Areas have been systematically excavated using small excavators supervised by the resident archaeologist.

The excavated canals are recorded on Milton Keynes Survey 'Land Survey : Sheets 1 to 8', which is held on site. Photographic recording of the canals being excavated, and after excavation, are accessible through the site photographic index.

Agreed methodology on the excavation of canals was developed through discussion between W.S. Atkins and English Heritage at regular liaison meetings on site and can be summarised by reference to SK10/2A.

Construction

Reference to the RCHME Site Survey reveals that the system of waterways on site developed gradually over a number of years and this patchwork development is also evident in the various construction methods employed. Later repairs are usually carried out in the style of the day, but there are five recognisable styles identified on site.

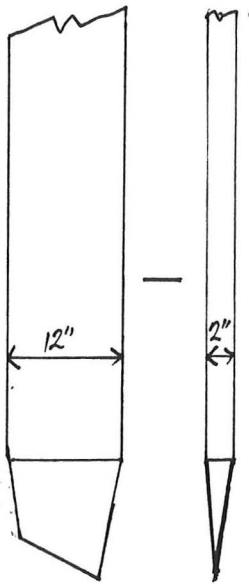
1. Canal banks at 90° and revetted in brick
2. Canal banks at 90° and revetted in corrugated iron
3. Canal banks at 90° and revetted in upright timbers
4. Canal banks at 90° revetted in reinforced concrete piles
5. Canal banks at 45° clay bank with periodic timbers

Provision of a walkway alongside the canal was important in order to allow the barges to be moved around site. In the case of styles 1-4, a tarmac path often survives alongside one bank. Style 5 had a walkway that is now represented by the periodic timbers. These upright timbers supported a boarded walkway along which persons could walk (WALDO 19B)

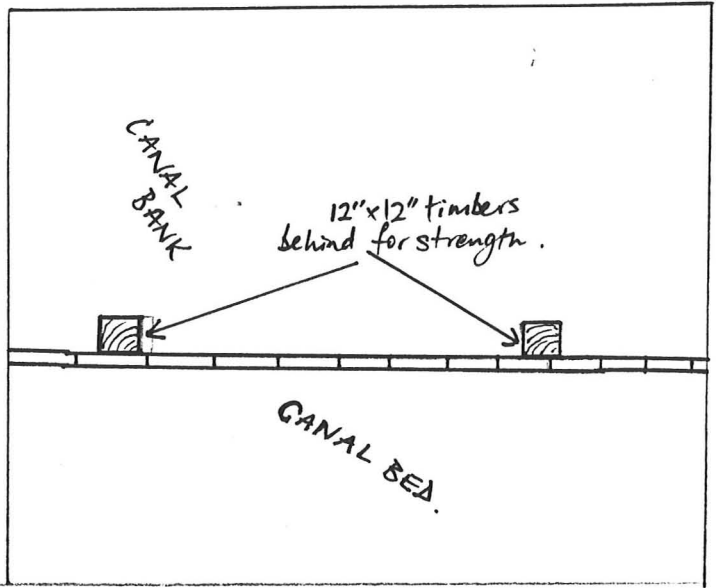
Many timber piles (Style 3), have been saved and stored in a watertight lorry body beside W68. These have also been tagged to record their context. The usual profile of the timber

Sketch of Wooden Piles in SAM.
S. Chaddock . 27.9.95 . NTS.

WALDO19.A



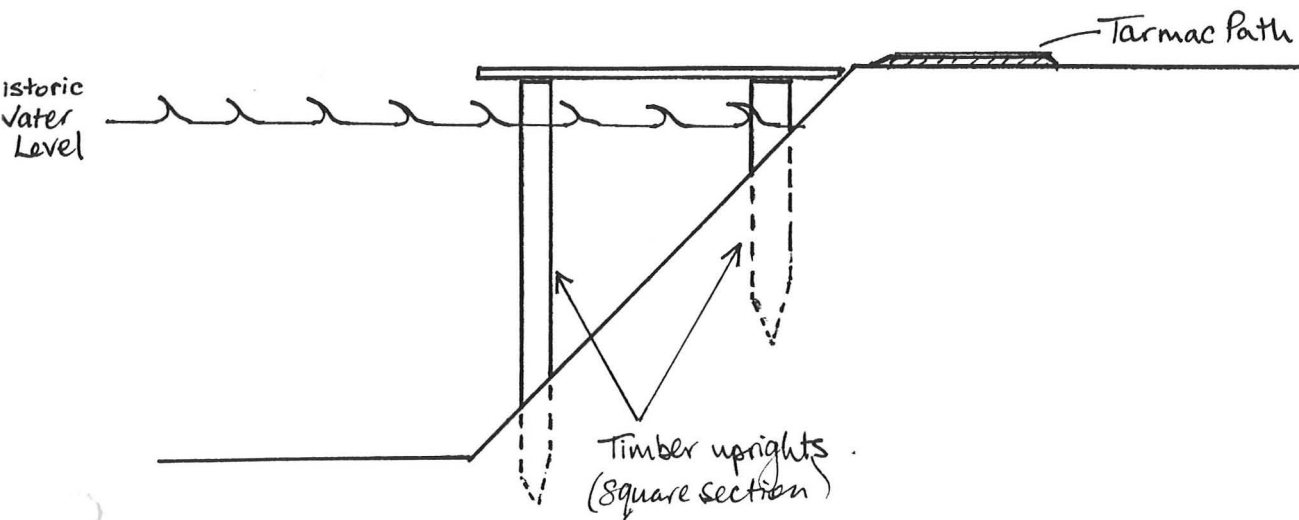
Face and Side View of timber
pile design.



WALDO19.B

NTS .
S. Chaddock 3.10.95

Profile of Canal with Arrangement of
Timber piled walkway.



piles is illustrated at WALD19A. Interestingly this design was later copied by the manufactures of the reinforced concrete piles (Style 4).

Lessons

Generally the excavation of canals in the SAM has proved successful with few unwanted results.

It has been found that the reduction of the water level on the site, as a result of the construction of the Horsemill Stream Flood relief channel in the 1970's, has had the effect of reducing the supporting qualities of the ground, notably under canal-side buildings.

Excavation of the filled canals sometimes resulted in slippage, the worst example being L108. Having identified this as a potential problem, action could be taken to support the banks with a 45° bank of clay or granite chips.

In flowing water there has been some revetment collapse in isolated areas. These tend to be located on the bend of a canal and so are attributed to natural erosion effects.

Access Points

Although the methodology followed in the excavation of the canals can be seen to have been successful, it is important to note the careful choice of access points into and out of the canals. Excavators were found to be the least damaging as their tracks spread the load more evenly than tyres and they were under close supervision. Vast quantities of spoil were removed from the canals on site. At a depth of c. 2m, a 100 metre stretch produces about 1120m³ of spoil which represents 510 dumper loads. This is 510 trips laden and 510 trips unladen : so 1020 dumpers going in and out of the access point for every 100 metres excavated.

Conclusion

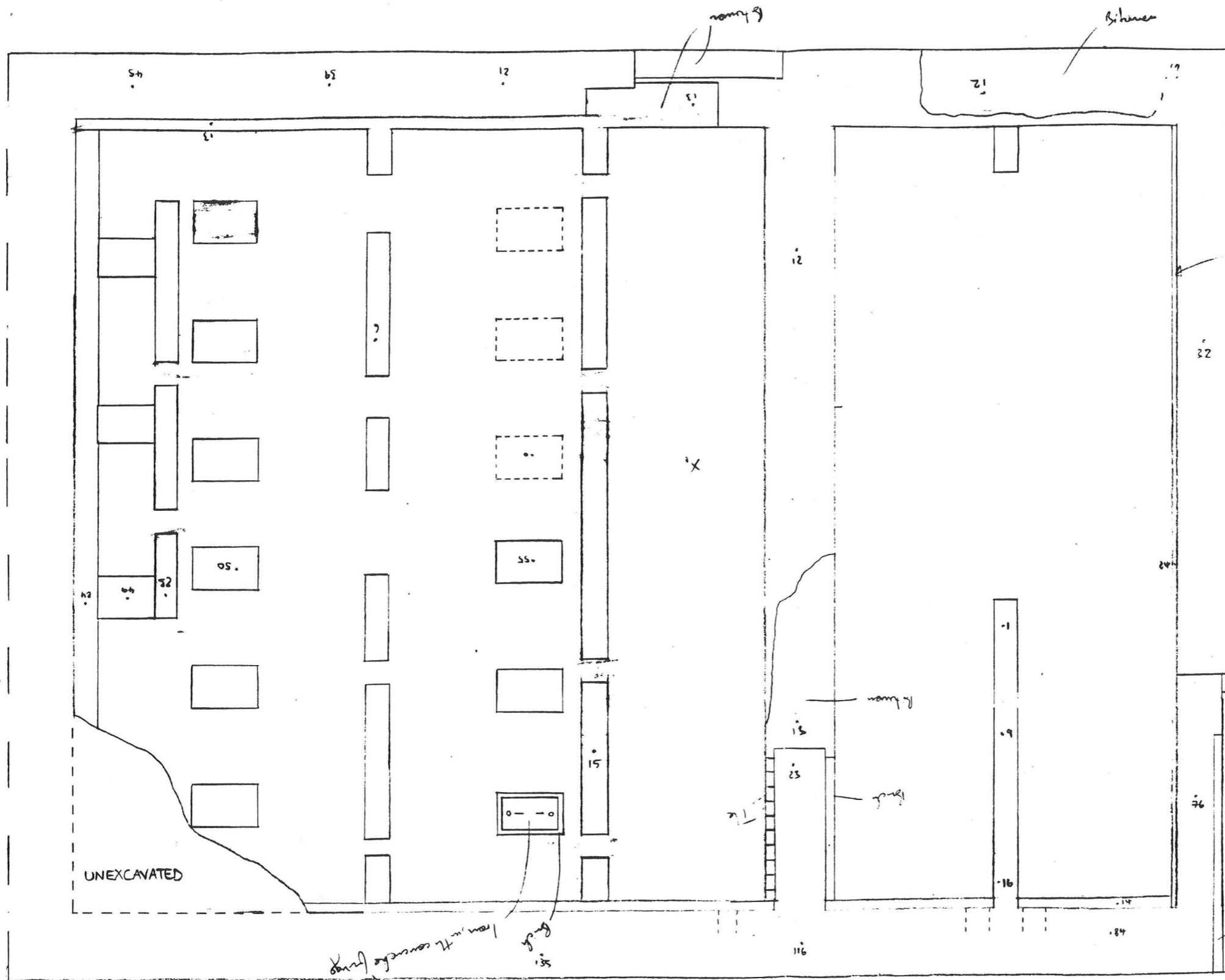
Information exists that could be added to. Construction of a comprehensive report dealing with the canal system, methods of construction, locks, loading points etc. would be a worthwhile venture in the future.

Building 25, 26, 27

While building 26 is well documented in the RCHME report, its associated drying stoves are less well understood. The two drying rooms are the best preserved on North Site and were buried underneath 50cm - 1m of river worn gravel.

Removal of gravel allowed a series of brick built supports to be revealed. In both of the buildings these brick supports were surviving in the two bays nearest to the stove (26). There was also evidence of ventilation bricks in the upstanding parts of the walls, as well as a possible entrance in the southern side of Building 25. Remains were drawn and photographed and have been left exposed.

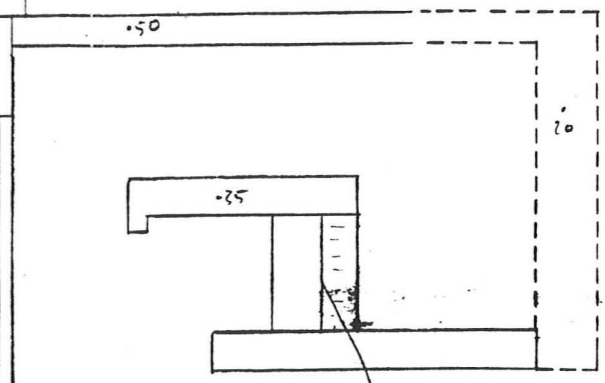
25
W. H. DODD
T. J. DODD
14/01



Riviera covered



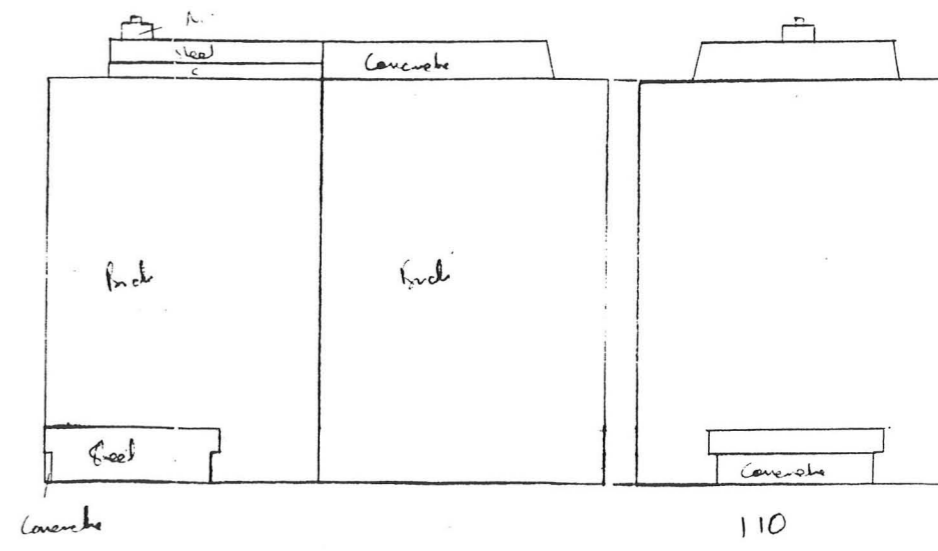
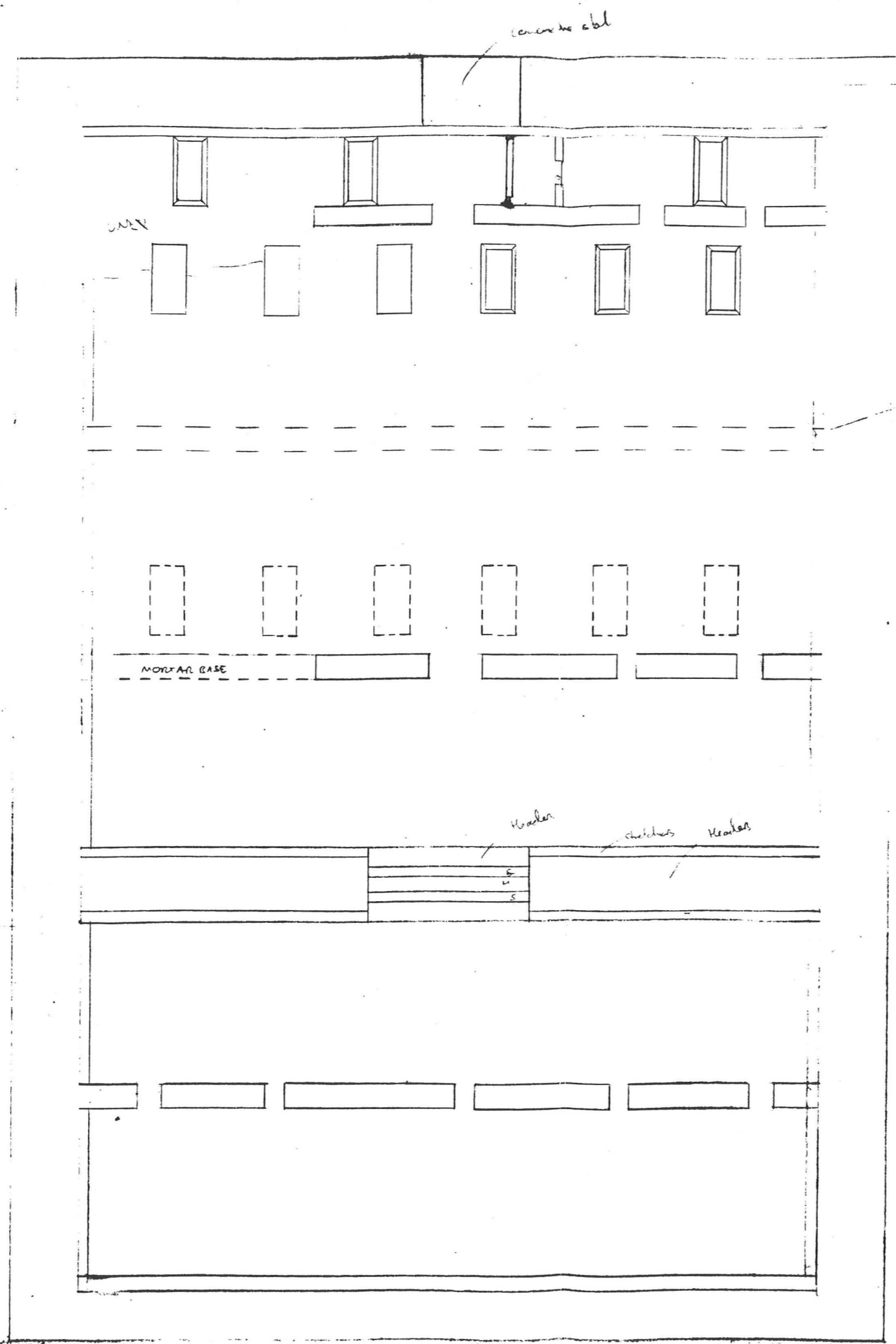
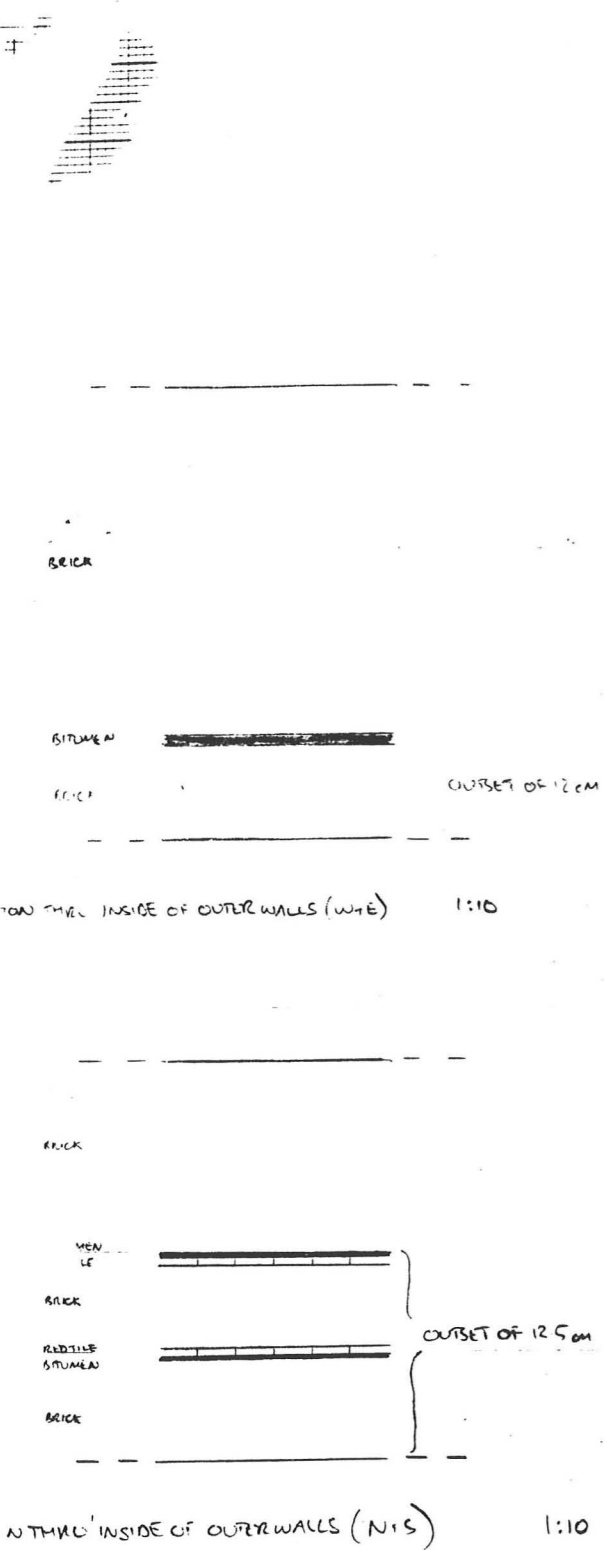
ALL BRICKWORK IS ENGLISH BOND (NO) SOFT YELLOW
STOCKS UNLESS OTHERWISE STATED
ALL ELEVATIONS ARE IN CM ABOVE POINT X, WHICH IS THE
FLOOR OF THE BUILDING.



Block angled bricks (x 11)
Concrete slab with in-laid block bricks

stable line of wall →
for my excavation
draw

low in the concrete frame
Riviera



APPLIES TO ROOM 25 & 27

27
 WAUS 006
 1.50
 Tim Stevens

It seems reasonable to assume that these buildings were fired before being backfilled with river gravel. A strange tin-like deposit may be seen on the floor of the drying rooms. There was also evidence of slate damp coursing which has been detailed on the drawings (WALD005 and WALD006).

To the north of 25 an earth closet foundations were uncovered. This seems to be in the usual RGPF style. The whole complex was surrounded by a U-shaped canal which passed underneath the present bridge 22, although no evidence for the canal profile was seen during excavation of Canal RCHME 285. As it is expected with drying stove complexes, there were two boathouses, one to service each of the drying rooms. The northern boathouse was identified as a length of wall during a vegetation scrape, no further excavation was carried out. The southern boathouse was discovered by way of excavation from Intersection 27 eastwards. In the process of removing the fill of Intersection 27, two barges were discovered. Both these were large navigation barges which were too heavy and awkward to lift, but were backfilled in situ, remaining under the water level and therefore well preserved. RCHME 560 barge sits inside the southern boathouse.

Quinan Stove (22A) Area

During summer 1995 it was planned to excavate the full extent of Canal RCHME 285, from its junction with Canal RCHME 284 in the south and Guncotton Drying Stove No. 169.

Heat transfer pipes were lying across the canal between 22A/3 and 22A; these were carefully lifted and rested on the bank beside 22A.

On excavating the canal it became clear that there was very little originally deposited silt fill and that the canal was actually buried under 3-4 metres of inert river worn gravel. Apart from a few wooden balls found in soils under BR2, nothing of significance was discovered in the base of the canal. In the light of this discovery, it was thought best to discontinue the removal of the canal fill at the northern end of 22A.

The banks of the canal were seen to have intermittent upright timbers. There was no evidence of a planked walkway, although one would be expected.

Investigation of North and North West of SAM

Due to increasing pressures, an attempt was made to limit the movement of the huge quantities of gravel which, it has been suggested before, derive from the construction of the Horsemill Stream Flood Relief Channel or dredging of the same.

With reference to the RCHME Survey and its recognition of the buried features in this area, and also in reference to the design drawings for the Flood Relief Channel Construction, which are held in the site archive, it was thought most economical to pinpoint potentially hazardous buried remains and excavate these individually. Similarly the Grand Magazine Complex, originally positioned on Payne's (or Paine's) Island and now attached by land to the rest of

North Site, was to be investigated carefully and no attempt was made to remove the fills of the old canal system.

Grand Magazine

A general light scrape around the remains of the two buildings showed Building 1 as having a low wall existing to the north east, forming a small yard in this direction. As little more than vegetation removal was completed, it is difficult to say more about Building 1.

Building 2A, known to be asbestos boarded, proved to be an asphalt floored structure with steps up to it from the western end, also covered in asphalt. To the eastern side, evidence of a narrow gauge railway entering the building from the south was noted.

Foundations for a small hut (3a, 5) were also uncovered but not excavated.

The inlet beside 3a from Cornmill Stream was also investigated as a large amount of concrete hard-core could be seen in the interface. The fill proved to be generally hard-core and, as expected, the remains of a sluice gate and foundation for a footbridge were also found on either side of the intersection. Removal of the intersection ceased after c. 4m when the Hard-core gave way to a more soil and gravel based fill.

The canals surrounding Payne's Island represent a unique archaeological resource that has yet to be tapped and this should be considered when plans are made to develop this area.

Guncotton Drying Stoves [4, 8, 10, 11, 17]

Immediately outside the Grand Magazine compound, the remains of Guncotton Drying Store No.8 were investigated. The general layout of the Guncotton Drying Stores is well understood and the recessed channel running around a concrete pedestal, on which the timber building once stood, proved to be contaminated with asbestos lagging originating from the lagged hot air pipes (site photograph). This slab has been left open.

Similarly the floor slabs of Guncotton Drying Stores Nos. 4, 10, 11 and 17 were also exposed and remediated. In the case of these stoves, the road has been reinstated over their remains but the general outline can be seen.

RCHME 328

Exploratory trenches were dug to find RCHME 328 and, although the building and its concrete revetment walls were discovered, it was decided to backfill the trenches and leave the remains undisturbed as no contamination was found.

OTHER DATA

WALTHAM ABBEY ROYAL GUNPOWDER MILLS

Inland Working Craft Survey at RGPF, WA 1994/5

RCHM N^o	POSITION	TYPE
101	By Building 76 in RCHM107	Shipshaped
104	By BR26 in RCHM289. Burnt 27.55.95	Shipshaped
121	Moved to A214, South Face.	Swim ended
125	Moved to A214, South Face.	Swim ended
157 158 159 160	In Clean Canal RCHM156. Documented by NAS (12.94). Associated Finds in L168	3 Shipshaped 1 Swim ended
169	To West of Buildings 107/108 in RCHM294	Shipshaped
279	Fort Halstead Reconditioned Barge	Shipshaped
337	Lifted From Millhead Stream and Relocated in Clean Canal RCHM300	Lrg. Navigation
556	Discovered in Canal Interface 21 RCHM288 at TL 37386 01972. Excavated and relocated in RCHM300	Lrg. Navigation
557	Lifted From RCHM179 Behind L136. Relocated in Clean Canal RCHM300. Icebreaker. TL 37644 01437	Small Shipshaped
558	Discovered in Canal Intersection 26. Excavated and relocated in Clean Canal RCHM300. TL 37406 02242	Swimended
559	Discovered in Canal Intersection 27. Excavated and backfilled. End damaged in flood channel excavation.	Lrg. Navigation
560	Discovered in Canal Intersection 27. Backfilled. Located in boathouse south of Building 26. TL 37400 02270	Lrg. Navigation
561	Discovered to the south of RCHME 228 in canal branch RCHME 181. Backfilled in situ. TL 37718 01488	Shipshaped
562	Discovered to the south of RCHME 561. Badly damaged and filled with concrete. TL 37721 01473	Swim ended

This is a summary of the inland working craft found to date on the Royal Gunpowder Factory.

There are 17 boats on the site and 1 at Fort Halstead.

Steve Chaddock. 2 October 1995

SMC LIST RGPF - MONUMENT N° 21567

NUMBER	DESCRIPTION	DATE SENT	DATE ON RET'N SMC
HSD9/2/3130 pt 1	Draining Newtons Pool. Replace culvert and road	13/08/93	06/12/93
HSD9/2/3130 pt 2	Waterways - canals, ponds and hollows. Steam pipe routes	14/10/93	22/12/93
HSD9/2/3130 pt 3	Test pits in mounds on Newtons Pool	07/12/93	20/01/94
HSD9/2/3130 pt 4	Replanting of Long Walk Alders	05/01/94	26/01/94
HSD9/2/3130 pt 5	Strimming, herbicides, hand raking. Clean up of concrete slabs. H37 hole hoggin fill etc	07/02/94	21/02/94
HSD9/2/3130 pt 6	Boot wash by Walton House (A200)	08/02/94	30/03/94
HSD9/2/3130 pt 7	Fence re-erection at Grand Magazine	21/03/94	01/04/94
HSD9/2/3130 pt 8	Chevrons on Bridge 10	17/03/94	12/04/94
HSD9/2/3130 pt 9	North site road system repairs	11/04/94	03/05/94
HSD9/2/3130 pt 10	Semi-permanent barriers and fences - <u>itemised</u>	04/05/94	27/09/94
HSD9/2/3130 pt 11	Brick lined sump 211a. Steam route	13/05/94	21/06/94
HSD9/2/3130 pt 12	Bridge repairs	13/06/94	03/08/94
HSD9/2/3130 pt 13	Removal of timber structure on bank of E2 pond	13/07/94	08/08/94
HSD9/2/3130 pt 14	Realignment of approach to BR10	01/08/94	06/10/94
HSD9/2/3130 pt 16	Removal and treatment to asphalt floors in "danger" buildings	01/11/94	21/11/94
HSD9/2/3130 pt 17	Trial pits in blast mounds	01/11/94	21/11/94
HSD9/2/3130 pt 18	Erection of Tensar windbreak	03/11/94	23/11/94
HSD9/2/3130 pt 19	Localised asbestos in E2 mound	12/12/94	31/01/95
HSD9/2/3130 pt 20	Tree planting and habitat re-creation in SSSI	11/01/95	16/02/95
HSD9/2/3130 pt 21	Safety barriers on mounded buildings	23/01/95	14/03/95
HSD9/2/3130 pt 22	Removal an relocation of TNT channel from E2	10/03/95	26/04/95
HSD9/2/3130 pt 23	Capping of SAM Areas	26/06/95	14/09/95
HSD9/2/3130 pt 24	Tensar Windbreak 250m Acid Fact.	26/07/95	08/09/95

Waltham Abbey Royal Gunpowder Factory

	Super Store		Conference Room	
Date	Deg.Cent	%RH	Deg.Cent	%RH
11.11.94	13	82	18	65
21.11.94	13	82	18	60
12.12.94	Ø	Ø	18	62
19.12.94	Ø	Ø	13	58
23.12.94	Ø	Ø	10	59
9.1.95	8	76	12	61
16.1.95	9	82	15	53
27.1.95	8	78	15	53
7.2.95	11.5	85	16	57
24.2.95	12	80	15	56
28.3.95	11	77	13	48
1.5.95	16	85	18	54
11.5.95	13	81	17	51
14.6.95	15	87	17	59
21.6.95	19	87	23	54
26.6.95	21	81	26	31
24.7.95	23	81	24	47
31.7.95	24	82	27	50
7.8.95	23	70	23	42
14.8.95	24	73	25	42
21.8.95	24	73	26	41
28.8.95	21	64	19	46
4.9.95	19	69	19	51
12.9.95	18	69	18	58
19.9.95	18	71	17	68

WALD000 DRAWINGS NUMBERS

DRAWING N ^o	NGR	DESCRIPTION AND DETAILS	SCALE	DATE	DRAWN BY
WALD 001	TL 37718 01488	RCHME561 Barge. Plan and side elevations.	1:20	11/08/95	SC
WALD 002	TL 37680 01573	RCHME303 Experimental House. Plan + notes.	1:100	13/09/95	TS
WALD 003	TL 37650 02000	75. Plan.	1:50	13/09/95	TS
WALD 004	TL 37640 02024	74. Plan.	1:50	13/09/95	TS
WALD 005	TL 37414 02308	25. Plan. + notes.	1:50	14/09/95	TS
WALD 006	TL 37415 02291	27. Plan plus 4 x 1:10 side elevation. + notes.	1:50	19/09/95	TS
WALD 007	TL 37480 02080	61. Plan and elevation. + notes.	1:50	19/09/95	TS
WALD 008	---	Area to North of E12:- E12, 47a, 50, 51, 54, 55, 60, 60a, 61, 61a.	NTS	24/05/95	SC
WALD 009	105 - TL 37557 01663 106 - TL 37537 01659	106 and 105 Gunpowder Magazines. Plans. + notes.	1:50	20/09/95	TS
WALD 010	564 - TL 37725 01785 565 - TL 37683 01555	RCHME564 and 565. Timber catchment/settlement tanks. Plans and elevations.	1:20	29/11/94	SC
WALD 011	---	RCHME181 canal. Sketch of section.	NTS	08/95	SC
WALD 012	TL 37386 01972	RCHME556 Barge. Large navigation type. Plans (x 3) (3 sheets).	1:50	19/05/95	SC
WALD 013	TL 37386 01972	RCHME556 overlay.	1:50	19/05/95	SC
WALD 014	---	South P Area - 40m S of Bridge 1. Plan.	1:100	24/11/93	ADF
WALD 015	---	South P Area - 40m S of A230. Plan.	1:100	24/11/93	ADF

DRAWING Nº	NGR	DESCRIPTION AND DETAILS	SCALE	DATE	DRAWN BY
WALD 016	---	South P Area. Plan of drainage leats and foundation trenches.	1:500	06/10/93	ADF
WALD 017	---	NW of South P Area. Plan.	1:500	06/10/93	ADF
WALD 018	TL 37667 00995	211a section looking S through E part of remains. (Ref: MKS4/01).	1:10	01/06/94	ADF
WALD 019A		Sketch of wooden piles in SAM.	NTS	03/10/95	SC
WALD 019B		Profile of canal with timber walkway.	NTS	03/10/95	SC
WALD 020	---	Permatrace map showing location of Waltham Abbey in S.E. England and of RGPF North Site in Waltham Abbey.	NTS	---	OS based
WALD 021		South P Area.	1:100	20/11/93	ADF
WALD 022		L153 Incorporating Mill. Detail of floor machine features.	1:100	29/05/94	ADF
WALD 023		Building 1, 2, 2a. Grand Magazine, sketch showing old waterways and new sheet piles.	NTS	27/09/95	SC
WALD 024		Sketch of RCHME181 canal and loading jetties.	NTS	27/09/95	SC
WALD 025	---	Sketch to show method of barge relocation at L109.	NTS	30/94	ADF
WALD 026	---	Burning Ground. Sketch showing expected features before removal of canal RCHME294.	NTS	03/10/95	SC
WALD 027		Sketch recording exact location of barge RCHM558	NTS	04/05/95	SC
WALD 028		Sketch showing relationship between chute for 197/098 and canal Millhead Stream.	NTS	08/09/95	SC
WALD 029		Series of tracings showing history of HBS SAM development	Photo-copies	06/95	SC