NAA

PHASE 2 BUILDINGS SURVEY AND WATCHING BRIEF

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FORMER MINISTRY OF DEFENCE DEPOT

KILLINGWORTH NORTH TYNESIDE

prepared for

Bellway Homes Ltd

Project No.: 1182

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KILLINGWORTH ANTI-AIRCRAFT ORDNANCE DEPOT (AAOD), KILLINGWORTH, TYNE AND WEAR

ARCHAEOLOGICAL BUILDING SURVEY (PHASE 2)

Summary

Northern Archaeological Associates Ltd (NAA) were commissioned by Bellway Homes Ltd to undertake the preparation of an archaeological building survey report for Killingworth Anti-Aircraft Ordnance Depot (AAOD), Killingworth, Tyne and Wear (NGR NZ 2800 7075 centred, Figure 1). This work forms a second phase of building recording (Phase 2); an earlier phase of building recording (Phase 1) was undertaken in 2014 (NAA 2014a), but due to the presence of asbestos and other on-site constraints, access to the buildings was not possible. This phase of building recording completes the earlier recording, and provides some further discussion of the function and history of the buildings within the complex. A watching brief was also maintained during the demolition works, which provided additional information on some of the buildings which had been long demolished before the survey commenced.

Bellway Homes is proposing to redevelop the depot for residential housing. The building recording was required by the Tyne and Wear Archaeological Officer at Newcastle City Council (NCC) as the development will completely remove all physical remains of the depot. The destruction of this heritage asset is being mitigated through its archaeological recording, in accordance the National Planning Policy Framework (paragraph 141) and local planning policies. The building recording was conducted in accordance with a Specification produced by the Tyne and Wear Archaeology Officer (Morrison 2014).

The former MoD complex at Killingworth was originally built as a facility for servicing anti-aircraft batteries defending the conurbations, industry and airfields north of the River Tyne. It was built in c. 1938 and is one of a relatively small number of known Equipment Ammunition Magazines (EAM) constructed throughout the UK in anticipation of war with Germany. It originally had a dual function; to act as the primary local supply depot for ammunition used by anti-aircraft facilities in the area and to act as a centre for the storage and maintenance of the vehicles and armaments required by the batteries. Subsequent to the war the complex served as a depot for the maintenance of vehicles until 1976, and from 1979 until the mid-1990s the complex was used as a central store for the Area Health Authority. Many of the buildings of the complex were demolished or underwent alteration and modification during this period and as the site has remained unused since the Area Health Authority vacated the premises, the buildings have gradually fallen into disrepair.

The building survey and watching brief provided further information on the use and function of the depot from 1938 until its closure in the mid 1990s, though available documentary evidence was scant. Nevertheless sufficient observational information gained through examination of the layout of the site, and comparison with other examples, has permitted some conclusions regarding the use of the buildings.

The current report is considered to be a comprehensive record of the armaments depot and its immediate curtilage. No further work on the site is recommended, though the site report is to be published in a suitable journal, and costs have been submitted and accepted by the client for the production of a journal article.

Acknowledgements

Northern Archaeological Associates would like to thank the following for their help during the inspection and assistance throughout the project: Stephen Litherland, Mark Gabriele, Paul Hebden, Emma Henderson, Ross Laurie, Simon Conroy, Andi Ruggles, Bellway Homes Ltd; Ross Spensley and all the staff at O'Brien Demolition; Nick McCamley, Folly Books; and Brian Baxter, Archivist, REME Museum, and Dr Anthony Morton, Archivist, Royal Logistics Corps Museum. NAA would also like to cordially thank Roger Thomas, Historic England, for providing additional information and his expertise on this and other AAOD sites. Jenny Morrison, Tyne and Wear Archaeology Officer, Newcastle City Council, is also cordially thanked for all her assistance.

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CONTENTS

LIST OF PLATES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Northern Archaeological Associates Ltd (NAA) were commissioned by Bellway Homes Ltd to undertake the preparation of an archaeological building survey report for Killingworth Anti-Aircraft Ordnance Depot (AAOD), Killingworth, Tyne and Wear (NGR NZ 2800 7075 centred, Figure 1). This work formed a second phase of building recording (Phase 2); an earlier phase of building recording (Phase 1) and assessment of significance was undertaken in 2014 (NAA 2014a; Figure 2), but due to the presence of asbestos and other on-site constraints, access to the buildings was not possible. This phase of building recording completes the earlier recording, and provides some further discussion as the function and history of the buildings within the complex.

Project Background

1.2 Bellway Homes acquired the site in 2014 and submitted a planning application for the demolition of the depot, and the construction of 125 houses, in the same year. The site was not designated through either scheduling or listing and was not included in North Tyneside Council's Register of Buildings and Parks of Local Architectural and Historic Interest Supplementary Planning Document (SPD) (adopted November 2008). The site was identified as an area for potential development within the North Tyneside Local Plan Consultation Draft (November 2013).

Plate 1: aerial photograph of Killingworth Anti-Aircraft Ordnance Depot (AAOD), from the east

1.3 In 2014, NAA was commissioned by the client to undertake an initial assessment of the depot, and building recording of the exteriors of the buildings and the ammunition bunkers. At the time of the survey, access to most of the buildings was not possible due to on-site constraints,

principally the presence of asbestos within the buildings (the basement of Building 10 was also flooded up to ground level). A desk-based assessment of the history of the depot was also carried out (NAA 2014a).

1.4 The former MoD complex at Killingworth was originally built as a facility for servicing anti-aircraft batteries defending the conurbations, industry and airfields north of the River Tyne. It was built in c. 1938 and is one of a relatively small number of known Equipment Ammunition Magazines (EAM) constructed throughout the UK in anticipation of war with Germany. It originally had a dual function; to act as the primary local supply depot for ammunition used by ant-aircraft facilities in the area and to act as a centre for the storage and maintenance of the vehicles and armaments required by the batteries. Subsequent to the war the complex served as a depot for the maintenance of vehicles until 1976, and from 1979 until the mid-1990s, the complex was used as a central store for the Area Health Authority (Figure 3). Many of the buildings of the complex were demolished or underwent alteration and modification during this period and as the site has remained unused since the Area Health Authority vacated the premises the buildings have gradually fallen into disrepair.

Plate 2: vertical aerial photograph of Killingworth Anti-Aircraft Ordnance Depot (AAOD), 16th May 1948 (RAF_58_b_32_v_5696).

1.5 The depot was classified as a non-designated heritage asset, and in accordance with Paragraph 141 of NPPF (DCLG 2012) and saved Unitary Development Plan Policy E19/6, a further phase of archaeological recording (building survey, research and archaeological monitoring) was requested as a condition of planning consent for demolition of the depot (Conditions 31-33, Planning Application 14/00730/FUL), to be undertaken in accordance with a specification

produced by the Tyne and Wear Specialist Conservation Team (Morrison 2014).

1.6 The building survey was carried out, under optimum conditions between the 25th and 27th February 2015. Full access to the property was provided by the client. The survey was conducted in accordance with the specification, and followed all relevant standards and guidance published by English Heritage (2006, 2007) and the Chartered Institute for Archaeologists (2014a and b). A watching brief was carried on the 3rd and 4th March 2015, during removal of the bund from one of the bunkers, and between the 2nd and 21st July 2015, during the removal of the concrete sub-base after demolition of the buildings. A final visit to the site was undertaken on the 23rd September 2015. The watching brief was undertaken in accordance with standards and guidance published by the Chartered Institute for Archaeologists (2014c).

1.7 The following report details the results of all aspects of the survey, research and watching brief.

Project Aims and Objectives

1.8 The principal aim of the project was to provide a descriptive record of the armaments depot to be developed, to act as a permanent record of the heritage asset and mitigate against its subsequent loss.

Building Survey and Additional Research

1.9 The objectives of the building survey were:

- to complete the 2014 building survey, providing plans and photographs of the interiors, depicting the form and location of any structural features;
- to complete a written and photographic record of the armaments depot and its structural features, providing details of their form, function, date and significance;
- to undertake a metric survey of the roof trusses; and
- to undertake further research into the armaments depot, consulting a number of additional archives including (but not limited to) The Imperial War Museum and the National Archives.

Watching Brief

1.10 The objectives of the watching brief were:

- to record evidence for any buried structures on the site, whether in positions of former buildings, demolished prior to the survey commencing, or sub-surface structural elements of buildings demolished as part of the clearance works;
- to record one of the bunkers after removal of the earth bund.

2.0 METHODOLOGY

Research

2.1 The following information sources were consulted:

- The Imperial War Museum;
- MOD Archaeologist (Phil Abramson);
- The National Archives;
- The REME Museum;
- The Royal Air Force Museum; and
- The Royal Logistics Corps Museum

2.2 No records specific to the Killingworth depot were identified from any of the sources consulted, though both the REME and RLC Museums provided general background information on the Royal Electrical and Mechanical Engineers, and the Royal Army Ordnance Corps, which has been incorporated into the background history for the site. The authors have attempted to find parallels for the depot through both online searches and documentary references, with some limited success (there are no definitive lists of armaments depots available). East Boldon AAOD was visited on the 29th June 2015, for this purpose.

Building Survey

2.3 In order to complete the building survey, a measured floor plan of all the accessible buildings within the armaments depot was produced as requested. A basic summary written description was made of the structures, noting the form and location of significant features, such as blocked doors, windows, internal arrangements and any evidence for fixtures or fittings of any significance.

2.4 An internal photographic record was made of the building using a digital SLR camera at a resolution of 10 megapixels, to complement the external photographs taken in 2014; additional exterior photographs were taken as required. The photographic record includes general views of the interior - looking from all directions - as well as detailed shots of representative examples of fixtures and fittings (windows, doors etc.). A catalogue of all unedited and edited images will be submitted with this report as part of the archive. Each photograph contains a graduated photographic scale of appropriate dimensions.

Watching Brief

2.5 The watching brief was undertaken during the removal of the concrete slab roadway, and the earthen bund surrounding one of the ammunition bunkers. The slab roadway incorporated the area between Buildings 5 and 17, from north to south, and Buildings 11 to 18, from east to west. A smaller area of concrete was removed to the northwest of the site beneath the

accommodation block (Building 1). Attendance on site was not continuous, but was rather contingent on the demolition contractors work programme, which required the removal of sections of concrete which were then crushed on-site and removed. Monitoring of concrete removal around Buildings 14-19 did not take place as the attending archaeologist was not informed in time for monitoring to occur. During a site visit on September 21st 2015, the exposed area was examined for the remains of buildings but the area had been driven across during a period of sustained rainfall which made identifying underlying archaeological remains impossible.

2.6 Where structures, finds, soil features or layers of archaeological interest were exposed, these were cleaned, assessed, excavated by hand and recorded as appropriate. Excavation was undertaken in order to characterise the archaeological remains and ensure recovery of artefactual evidence.

2.7 A drawn record of all archaeological features was made at an appropriate scale. Written descriptions of archaeological features/deposits were recorded on pro forma context sheets, which employ standard archaeological recording conventions. A photographic record of the site was undertaken using 35mm format black and white prints. Digital images were also taken using a digital camera at a resolution of 10 megapixels.

3.0 BACKGROUND INFORMATION

Location

3.1 The site is located on the eastern outskirts of the village of Killingworth and lies on the south side of the B1317 (Fig. 1). It is a relatively level brownfield site, at c. 75m AOD and is surrounded by the agricultural land of Killingworth Moor. The site contained a number of standing buildings relating to the former military depot complex. The buildings lay within an area of landscaped grassland and were connected by a series of concrete roads. These roads are constructed of shuttered concrete slabs, cast in situ, and were contemporary with the construction of the depot. The last recorded use of the site was as an Area Health Authority storage depot, but it is now unoccupied and the complex is falling into disrepair. A number of the buildings had been demolished prior to the survey.

Geology

3.2 The solid geology of the area site comprises Westphalian Coal Measures of the Carboniferous period (Institute of Geological Sciences 1979) overlain by Boulder Clay and Morainic Drift deposits (Institute of Geological Sciences 1977) The soils in the area consist of the stagnogleys and greyish brown drift soils of the Dunkeswick Association (SSEW 1983). The site is located within the Natural England National Character Area 14: Tyne & Wear Lowlands, described as an area of undulating landform of gently rolling hills incised by the broad river valleys of the Tyne and Wear and their tributaries (www.naturalengland.org.uk).

4.0 HISTORICAL BACKGROUND

4.1 The depot at Killingworth was recorded as Anti-Aircraft Ordnance Depot (AAOD) No 75[1], and was also known as an Equipment Ammunition Magazine – EAM. The depot was constructed c. 1938 in anticipation of hostilities with Germany, and was built to supply the anti-aircraft batteries (Light Anti-Aircraft – LAA; and Heavy Anti-Aircraft – HAA), principally north of the River Tyne, which defended the conurbations, industry and airfields from enemy attack. Killingworth has a sister site south of the Tyne at East Boldon, which serviced the anti-aircraft batteries of South Tyneside and Wearside, and this will be referred to frequently in the following passages. The air defence of Great Britain was one of the few defence activities which the Government had made provision for prior to the war commencing, and AAODs were well-designed installations built in suitable locations for supplying the relevant Brigades (Fernyhough 1965, 369).

4.2 Until late 1940, virtually all anti-aircraft sites were temporary, consisting of mobile guns in earthwork gun-pits, with tented accommodation. However, by the middle of the war, static HAA batteries were constructed on an industrial scale, with extensive supporting infrastructure. Twenty-nine HAA sites were constructed across North and South Tyneside, in the Tyne 'Gun Defended Area' (GDA). The area was one of many designated throughout the country, protecting 'Vulnerable Points' likely to attract enemy attack; in the case of Tyneside, the shipyards and ports were the principal targets. The gun batteries were generally sited away from heavily built-up areas to give a good field of view, and to be clear of urban smog. They operated in close collaboration with the searchlight units, which were spread across the countryside.

4.3 A standard war-time HAA battery operated two four-gun sites, each divided into two sections; one of the gun-sites also housed the battery headquarters (BHQ). Each gun-pit comprised an octagonal concrete pad, with a concrete gun holdfast sunk into the centre, surrounded by an outer wall with opposing pairs of steel gates and six internal ready-use ammunition lockers. Each also had an external shelter for gun maintenance, the Limber Gunner's Shelter. The ammunition lockers for each gun-pit were served by a magazine as rounds from the lockers were used up. All HAA batteries used large calibre ordnance, suitable for targeting high-flying aircraft, and the holdfast was constructed to take a range of different models and calibres. In 2014, NAA uncovered the concrete holdfast for an HAA gun during works in Howdon, North Tyneside. Documentary references showed that the site used 4.5-inch QF (quick-fire) ex-naval guns with GL Mark IA radar in 1942, and 3.7-inch Mark IIC guns with GL Mark II and Mark IIIB radar in 1945. The later guns had remote power control, automatic ammunition loading and fuse setting equipment and could send ten rounds per minute to targets at a height of 41,000 feet[2], compared with 34,500 feet using the 4.5-inch gun (NAA 2014b, 3-4).

[1] http://www.rlcarchive.org/SrchRan3?b=R01620101
[2] http://www.ra39-45.pwp.blueyonder.co.uk/gunsidx/index.html

4.4 The magazines of the batteries north of the Tyne were replenished by the EAM at Killingworth, though interestingly, a war diary for the regiment at Howdon recorded ammunition being supplied by both Killingworth and East Boldon ammunition depots, which suggests both depots may have supplied the whole Tyne-Wear area as required. During the war years, the consumption of ammunition, and flow of replacements through the EAM would have been prodigious. Although indicative figures for this period are difficult to estimate, a Hansard Report, dated to 1947, and relating to the EAM at East Boldon, records that around 23,000 rounds were received by, and about 15,400 rounds were dispatched from, this facility each week just during peacetime. The ration of stocks held equated to two days worth at the gun sites, and two and a half days worth at the EAM (Fernyhough 1965, 369).

4.5 The EAM at Killingworth acted as a dual purpose facility; firstly it acted as a local distribution centre for anti-aircraft ammunition, supplied by Intermediate Ammunition Depots (IAD) (Fernyhough 1965, 370), and secondly it acted as a depot for the storage, repair and/or maintenance of those anti-aircraft guns in the area that did not comprise elements of fixed (immobile) batteries. The depots also supplied all other kit, including clothing and general stores, but in 1941 this was reduced to just technical and war-like stores, the clothing being administered by the CODs (Central Ordnance Depots) directly (*ibid*). The IAD were supplied by the CADs (Central Ammunition Depots) [3]; these included the massive complex at Longtown, near Carlisle (which was probably the nearest source of ammunition for Killingworth). These were in turn supplied with arms and ammunition from Royal Ordnance Factories (ROFs), via the CODs, which produced explosives and propellants; filled ammunition; and constructed guns and rifles. The factories were administered by the Ministry of Supply (MoS), a Government department formed in 1939 to co-ordinate the supply of equipment to all three British armed forces, not just the Army (Hornby 1958). Both the MoS and the Ministry of Aircraft Production (MAP) financed a huge expansion in Britain's capacity for armament production during the Second World War, the MoS through complex agency and capital assistance schemes (Edgerton 2006, 79).

4.6 Ammunition of every type required by any of the anti-aircraft batteries in the area would have been brought probably by road from one of a number of IADs. There was no obvious rail link to the site, although it is likely that ammunition was sent to a relatively local rail-head for transhipment. The nearest main-line station in this period would have been Killingworth Station, adjacent to West Moor Colliery and it would seem plausible that this station could have been used for transferring ammunition. The absence of a connection to a railway line was probably deliberate; the presence of railway lines would have alerted Luftwaffe reconnaissance flights to a military use for the buildings, and it is likely the building would have been targeted. Most of the AAODs examined did not have rail network links, though a number of war-time ammunition storage sites did include narrow and wide gauge railway network connections (for

[3] http://british-army-units1945on.co.uk/royal-army-ordnance-corps/depots.html

example: RNAD Broughton Moor – NAA 2014c, Brasside ammunition depot, Durham; ROF Bulk Storage Depot, Dunham-on-the-Hill, Cheshire).

4.7 During the war, ordnance depots adopted standardised storehouse methods. These included the use of modern machinery such as fork-lift trucks, removable storage such as use of tubular scaffolding, and flow packaging. The ammunition required by the depot would have consisted of everything from the .303 rounds used by Lewis/Bren Guns, the 20mm and 40mm shells used in medium-weight Oerlikon/Polsten and Bofors Guns respectively, up to the 3.7", 25lb shells used by the QF anti-aircraft guns which were the primary, heavy defensive guns used during the conflict. It is unclear whether the Z-gun batteries, which were rocket batteries, were also supplied through this mechanism.

4.8 The depot was a pre-war building, and as such, the materials used in its construction, and the standard of its construction, were superior to military and ancillary facilities constructed during the war years. EAM sites like Killingworth were relatively rare throughout the country and tended to be situated within the vicinity of major centres of industry or other conurbations where anti-aircraft artillery batteries were a major consideration; for example London had four such establishments (NAA 2014a). Dobinson (2001, 127) states that there were 34 EAM sites, served by 9 IADs, but this almost certainly increased as the war got under way. As part of the research for this report, an attempt has been made to find comparable surviving sites across the UK, and examples are discussed in the text below.

4.9 The 2014 survey identified three separate zones within the depot – administration/welfare (offices, barrack blocks, canteens etc.), vehicle/arms storage and maintenance (large brick built shed, smaller sheds and garages, used for the storage and servicing of vehicles and weaponry), and ammunition storage (substantial, above ground, concrete bunkers surrounded by concrete blast walls and earthen bunds). Comparison with Killingworth and other sites seems to indicate that these zones were common and comparable across a number of sites, though sometimes only one or two zones were present – sometimes ammunition storage only, or vehicle and arms storage only, sometimes without substantial administration facilities.

4.10 The EAM was administered by the Royal Army Ordnance Corps (RAOC), who came under the operational command of Catterick and York (referred to as the Northern Command); the RAOC did not, however, operate the anti-aircraft guns, which came under auspices of the Anti-Aircraft Command, whose districts superimposed those of the Northern Command and others (Fernyhough 1965, 366). The RAOC had operated under this name since the Great War. However, a military grouping with responsibility for ordnance has been in existence since the mid-17th Century. Throughout its history, the sector undertaking the work of the RAOC has operated under various different labels and forms, originating as the Board of Ordnance (1683-1855), and then becoming the Military Store Department, and then the Military Store Staff Corps (1865).

4.11 The primary role of the RAOC was to equip the army, providing camps and fortresses where necessary. In addition to its role in combat, the RAOC also had responsibility for the everyday needs of the military, such as clothing and general supplies. Until 1942, the RAOC were also responsible for weapons and armoured vehicles. That year, as the flaws in this system were revealed in the Second World War, the REME (the Royal Electrical and Mechanical Engineers) were formed to take over their maintenance and supply. This organisational shift is reflected in the Killingworth site, which was occupied by REME from this date. A detachment from No. 31 Command of the newly formed REME took over the site at Killingworth, and continued to maintain vehicles and weaponry on the site until 1956. Thereafter, the REME used the Killingworth depot as a centre for the maintenance of vehicles up until its closure in 1976.

4.12 The closure of the REME depot at Killingworth was discussed in the House of Commons (Hansard 1976) and at this date, Hansard records that 45 individuals attached to the 31 Command were employed at the depot. The stores and equipment held by this depot had in fact already been offered for auction by the Ministry of Defence in August 1975 (Flight International, July 1975).

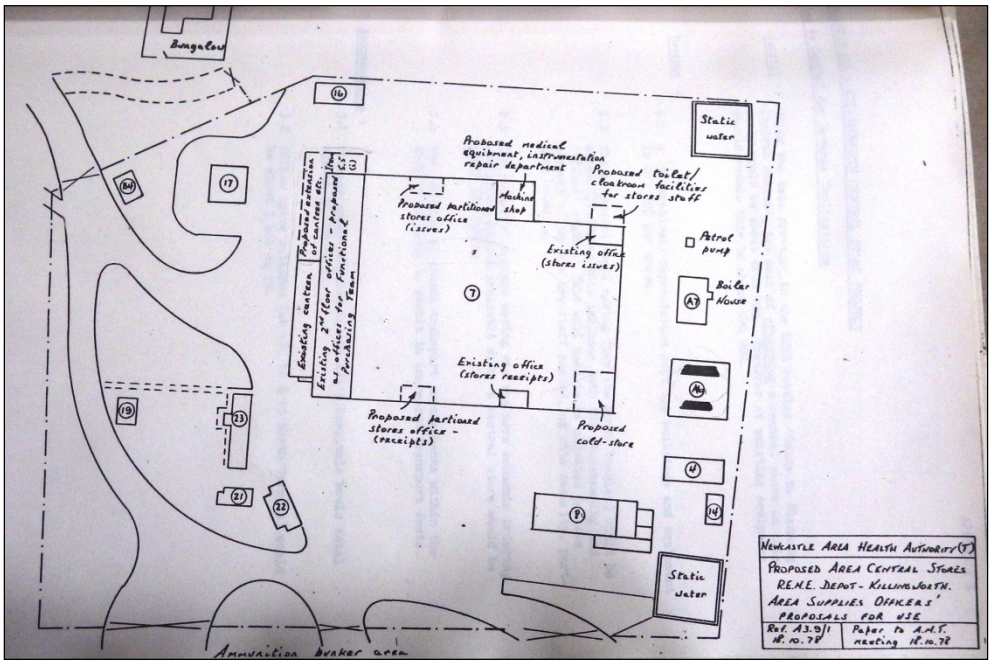

Plate 3: Area Health Authority survey of the depot prior to conversion, September 1978 (KILL/REME/DEP/QS)

4.13 Within the Tyne and Wear Archives, a document from the Local Area Health Authority dated to the end of 1978 provided costs for the conversion of the depot to storage for medical equipment and bulk pharmaceuticals (KILL/REME/DEP/QS), after the Ministry of Defence having declared it '*surplus to requirements*' (*ibid*, 4); at the time, the conversions were estimated to cost between £100,000 and £120,000 (excluding fees and furniture). Further reference to the REME depot occurs in a planning application of 1979 (70/00395/GOVDEP) in which the site was granted a

change in use to a Local Area Health Authority central store, a function which appears to have continued until the mid 1990s when the complex was finally closed; it has remained vacant since.

5.0 ARCHAEOLOGICAL RECORDING

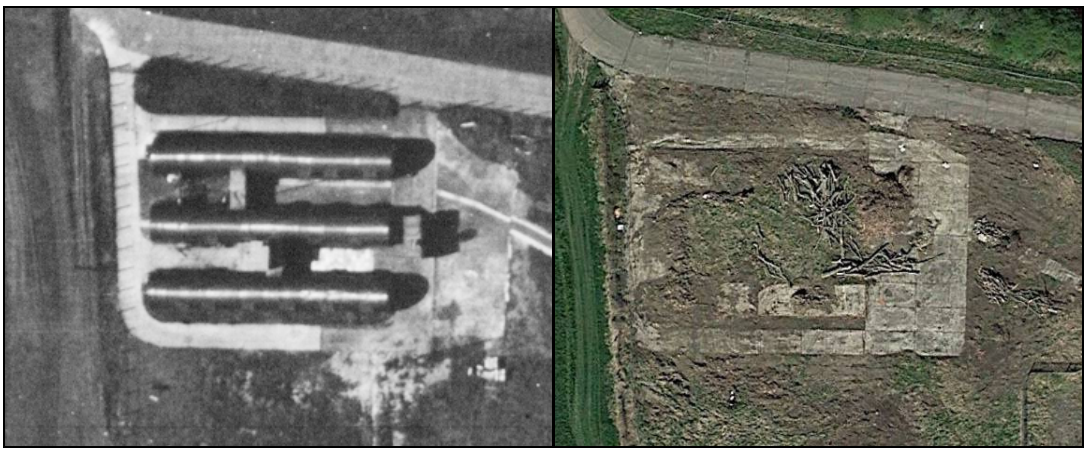

Plate 4: Building 1 (detail of 1948 aerial photograph), and remains of hard standing in 2015 (Google Earth)

Building 1

Function

5.1 At the time of the survey, Building 1 had been demolished for some time (from at least 2001), and therefore only limited assessment could be made of its function. The building, which was of modular design, and partially prefabricated, was a form of accommodation block known as a 'Spider Block', as a result of its ground plan resembling that of a stylised insect. This form of block developed in 1939, as a timber version of the 'Sandhurst Block', a U-shaped block with dining rooms and cookhouse projecting from the bottom member, which had been introduced in 1936 (Evans 2006, 11). The layout of the blocks was described in an article in the Daily Telegraph, on August 18th 1939, which gives a good understanding of their function.

'Though outwardly resembling the old war-time wooden Army hut, they differ inside more greatly than a modern luxury cinema from a pre-war music-hall. They are built in blocks of six huts – in Aldershot they have been christened "spider blocks", as they do somewhat resemble spiders, with three huts branching out on each side of a central corridor. Each block contains drying-rooms: the enormous benefit of these may well be appreciated…In addition, each block contains a bathroom, lavatories, washrooms and shower with hot and cold water…All quarters have central heating. Not only is this generally more satisfactory from the heating point of view…but it spares the troops many fatigues in keeping a fire at each end of a barrack room, blacking grates, fetching coal and so on. One great improvement in the "spider" hutments, as in the "Sandhurst Block" is the fact that all facilities are gathered under one roof. There are no walks in the rain to get washed. The men need only go out in order to eat – and train. Inside

barracks there are some shocks for old soldiers. Each group of living huts contains 6 NCOs and 120 men. Beside every bed is a radiator and an electric light. There are plugs for switching in a wireless set. A barrack room today without a radio, generally paid for communally on the hire system, is as rare as a dance band without a saxophone' (cited in Evans 2006, 14).

Plate 5: Building 1 – (top) stone foundations, and (bottom) brick foundations, both facing east

5.2 The building was located immediately adjacent to the access to the main entrance in the northwestern corner of the site, and appears to have been built either at the end of the war, or just after. The 'legs' of the building would have consisted of a number of individual bays, normally six on each side of the 'body', which would have acted as dormitories. The roofs of all of these blocks were normally ridged and gabled, unless of corrugated iron construction when the whole building would have been of a continuous arch form, with the exception of connecting corridors (if present) which were generally flat roofed. This seems to be the case at Killingworth. A standalone building to the east of the structure, with a chimney, may have been a boiler house.

5.3 Archaeological recording works undertaken at Saighton Camp near Chester (NAA 2008) suggested that the sites of such buildings would have been cleared of all top and subsoils by mechanical means until the underlying clay surface was exposed. This surface appears to have been roughly levelled and foundation trenches, reflecting the plan form of the buildings, cut into the natural clay. Examination of the 1948 aerial photograph would seem to indicate that the building was quite new when it was taken; the concrete surrounding the buildings is much fresher than the concrete elsewhere on the site, and the ground disturbed by the construction works had not had a chance to bed down when the photograph was taken. It seems likely that the construction of the accommodation block marked an evolution in the life of the depot, with the complex being staffed by residential REME staff, rather than local residents, which was the case during the war.

Watching Brief

5.4 Concrete slab paving surrounding Building 1 was removed under archaeological supervision, as part of the demolition phase of works. The watching brief observed the removal of a 33m by 15m area of paving to the east of Building 1, and two narrow strips of concrete to the north and south of the building (Figure 4).

Foundations

5.5 Beneath the eastern and northern areas of concrete beneath Building 1 lay stone foundations for the block, which consisted of large roughly squared and faced sandstone blocks laid on edge to form a solid surface. The area of stone foundations was bordered by thick concrete kerbs which seem to form the boundary of the building area. On the south side, brick foundations were used, with the bricks laid randomly. The bricks used within the southern foundations were all unstamped and slop moulded suggesting they were early in date and possibly reused from elsewhere. The foundations had been cut into a brown sandy silt plough soil containing highly abraded fragments of medieval pottery, and were an attempt the level off the ground to facilitate the construction of the accommodation block. A small trench was excavated across the northern limit of stone foundations identified numerous furrows, aligned broadly north south. These furrows are clearly visible on the 1948 aerial photograph (Plate 2) and form part of the

medieval agrarian landscape surrounding Killingworth.

Southern Accommodation Block

5.6 The exposed concrete paving within the footprint of the southern accommodation block was stripped, but no interior walls were identified. This suggested the building was one large open-plan area, or that the building was sub-divided with timber partition walls only. The brick foundations supporting the timber structure were uncovered bordering the entire structure. The full depth of these brick foundation walls was not investigated, but the walls survived to over four courses in depth.

5.7 Against the northern face of the southern accommodation block, the remains of the corridor connecting to the central block were identified. This comprised a large rectangular structure, defined by walls formed of brick setts with a stone base, which would have presumably held the timber superstructure in position (Plate 6). The structure measured 4.45m by 5.15m, with two flues evident within its northern and southern faces, and an entrance into the structure visible within its western face. The flues were probably used for stoves, and deposits of soot were identified overlying the brick foundations. On the west side of the structure a large section of concrete slab paving was uncovered, abutting the structure. The interior of the structure was infilled by general building rubble in excess of 0.75m deep.

Plate 6: structure facing east with concrete paving in foreground and two flues visible at either side

Northern Accommodation Block

5.8 As for the southern block, the northern block was not fully exposed, but was stripped as far as was practicably possible under watching brief conditions. A series of single skin interior walls were uncovered within the western end of the northern block. These most likely form a partition or corridor. A small section of the corridor connecting the northern and central accommodation blocks was also uncovered. The walls of this corridor comprised a single skin of brick. The concrete slab paving was also identified abutting its western side.

Staircases

5.9 Two staircases leading into the northern and southern accommodation blocks were recorded during the concrete removal. Both staircases were located on the western side of each block and appear to have been concreted over at some later stage. Interestingly there does not seem to have been a staircase to enter the central accommodation block and it is likely that this block was accessed through the southern and northern accommodation blocks only.

Plate 7: southern building in the cluster forming Building 2 – a probable Nissen hut (© Cannybevvy[4])

Buildings 2, 5, 6, 7, 15, 18, 20, 21 and 22 – Prefabricated Buildings

5.10 These buildings had all been removed by the time of the archaeological surveys of the depot, and little further can be added to the summary descriptions provided in the earlier report (NAA 2014a). None of the removed buildings look to have been substantial structures, and it seems

[4] http://www.cannybevvy.co.uk/pillboxes/Tyne%20and%20Wear/Killingworth%20AA%20Ammunition%20Depot/index.html

likely that most of these were built after the construction of the main depot. Whether this construction occurred during the war, or immediately after, is not clear, but may relate to a change of usage for the depot, perhaps relating to the REME occupation. All of the buildings are visible on the 1948 aerial photograph of the depot (Plate 2, Figure 2). Buildings 5 and 18 were still standing when the Area Health Authority took over the depot in 1979 (KILL/REME/DEP/QS), though only the concrete bases of these huts were seen during the original surveys.

5.11 In 1943, the definitive handbook for Anti-Aircraft battery site fabric – *The Barrack Synopsis (War)* – stated that only four types of building were to be used – Nissen Huts, Romney Huts, Curved Asbestos Huts, and the MOWP (Ministry of Works and Planning) Standard Hut (Dobinson 2001, 322). Whilst the RAOC and REME were not subject to AA Command, it seems likely that the depots were using the same building types as those used in the gun batteries. The southern building in the cluster recorded as Building 2 survived until 2008 (Plate 7), and appears to have been a Nissen Hut (prefabricated buildings developed in the First World War with timber frames). The dimensions of the huts (taken from aerial photographs) fit broadly with the 36′ by 16′ Nissen Huts, which were standard and quite common; the 16′ span building is sometimes referred to as a 'Bow' hut – Stuart 2005, 56. The building was clad with corrugated steel or iron sheets, fitted to a semi-circular steel frame, with a broad rectangular entrance on its northern side. The building probably served a storage function, as it had no windows and one large entrance.

Plate 8: storage building at Burnett, Shropshire (© Folly Books)[5]; note steel security door common for bunkers

[5] https://www.facebook.com/FollyBooks/photos/a.463758926981378.108928.175336742490266/463759183648019/?type=1&theater

5.12 Buildings 20-22 were similar in form to this building, and also clearly had a storage function, as they lay immediately south and east of the bunkers. In examining aerial photographs of other depots, it was clear that such buildings were commonly directly associated with bunkers (for example, at East Boldon; Upton, the Wirral; Hadleigh, Sussex; Burnett, Somerset – Plate 8), with access roads to the buildings from the network which also served the bunkers; they were also invariably well spread out, which would imply they were used for storing explosives. The buildings may have been used for ordnance for smaller calibre weapons. The example at Burnett had off-centre steel doors on the shorter axes of the buildings, which imply a corridor running down one side of the building, with storage adjacent; the building has brick sills, which suggests it may have been a Curved Asbestos hut originally (Dobinson 2001, 322). The position of these buildings may imply they were original c. 1938 structures, or they may have been added to the depot to increase storage capacity.

5.13 Buildings 6-7 were also small pre-fabricated buildings with similar semi-circular profiles, but in contrast to the others had windows on the longer axes of the buildings, and were located closer to the 'main store' (Building 12), which suggest they were not used to store explosives. These probably served an office/administrative, rather than a storage, function, and also appear to be Nissen Huts. The buildings were haphazardly placed, which suggests they were probably later (REME) additions.

5.14 The remaining buildings which form the cluster at Building 2, and Buildings 5, 15 and 18, appear from aerial photographs to have been simple timber buildings with ridged roofs, and were probably also of modular construction. These appear to conform to the MOWP Standard Hut Type, and came in 30' and 60' length variants (Dobinson 2001, 324). Examination of similar buildings at Saighton Camp, Chester (NAA 2008, 7) identified that these buildings usually had prefabricated frames and roof trusses with wall panels, nominally 12'00" in length, fixed to the frames. This would have allowed for buildings of different lengths to have been constructed relatively easily, simply by adding more bays. The gable walls of the buildings would also have been prefabricated in two halves, either nominally 9'00" wide or 12'00" wide, these again allowing for flexibility in the dimensions of the huts. The buildings would probably have been originally roofed in corrugated iron sheet and provided with timber floors.

5.15 The watching brief failed to identify much of a physical footprint for these buildings, and it seems unlikely that these buildings had much in the way of foundations.

Building 3 – Cottage

Function

5.16 Building 3, originally referred to as the Caretaker's Cottage (NAA 2014a), lies outside the proposed development boundary, but was once part of the AAOD complex and still survives, albeit in modified and extended form (Figure 2). The building is a single storey L shaped bungalow, with a hipped roof and brick-built walls, and appears to have been extended towards

the west. It would have originally sat at the entrance to the depot, and similar cottages were seen in a number of other AAOD sites, in the same position. The buildings must have been constructed when the depots were non-residential, and it is probable that these buildings served as the residence of the Duty Officers for the complex, who would have controlled the sentries in the guardhouses. Identical cottages were evident at: Tern Hill, Shropshire; Banstead, Surrey; Bishopbriggs, East Dunbarton (derelict); Burnett, Somerset; Scorton, North Yorkshire; East Boldon, Tyne and Wear (demolished); and Inchinnan, Renfrewshire. All of these were positioned to view and control access to the roadway leading into the depots.

Plate 9: Building 4, facing north (left) and the equivalent building at East Boldon (right) now ruined

Building 4 – 'A2'

Function

5.17 Building 4 was an original (c. 1938) building in the northwest corner of the ammunition depot complex (Figures 5 and 6). The building was a small brick-built store, with opposing doorways; the arrangement of the doorways implied a 'walk-through' whereby staff would enter, collect items and leave by the opposing doorway. The store was very small, and as such cannot have been used for the supply of substantial items; indeed the absence of goods doors probably supports this. Entering from the south, the building contained within it office space and secure cage to the right, and an open space to the left, which probably originally contained shelving. This building was likely to have functioned as a supply room, issuing small items of kit to depot staff, and possibly also operating as a post-room for the adjacent administrative offices. The building had a concrete loading bay to the immediate west of the building.

5.18 Buildings such as this typically fell under the aegis of the Quartermaster Sergeant, who would have been in charge of kitting out the Anti-Aircraft Command staff operating the guns. With the development of the site towards the end of the War, and the cessation of supply of kit and other non-technical/weapons-related items, the function of the building may have altered, perhaps switching primarily to dealing with postal items only. The depot at East Boldon contains a building which is identical in size and layout (Plate 9); the similarities probably support a

similar use. The building at East Boldon also lies in close proximity to the main administrative offices, as this building does.

Exterior

Form

5.19 Building 4 was a simple, square, brick-built structure, with an area measuring 8.18m by 8.18m (27′ square) and a height of 6.22m (20′ 6″) to the ridge. Eight brick columns, square in plan, positioned at the four corners and in the centre of each wall, supported the roof directly (at the west and east) and via a metal roof truss (to the centre). Variations on this basic structure were used in construction throughout the site. In Building 4, this formation effectively divided the structure into two bays (running north-south) and two aisles (east-west). Between these structural columns, the walls were brick infill of single brick width, set back from the outer edge of the columns. There were two opposing doors, positioned directly east of the central brick column of the north and south elevations (Plate 10). The building featured eight brick vents, one on each brick infill section.

Plate 10: Building 4, facing south-west

5.20 The roof was ridged, with gable ends on the west and east elevations. It featured two long, narrow roof lights (running east-west), positioned approximately half way between the ridge and fascia of the roof, on its north and south faces (Plate 10). There were no further windows on the walls of the building. The building rested on a concrete slab foundation, which mirrored the footprint of the building, with an extension of 2-3 inches beyond the brickwork on each side.

5.21 A corrugated iron lean-to shed had been built against the western gable, possibly for use as a bike shed. This was not original, and probably dated from the late 20th century, relating to the site's occupation by the Area Health Authority.

Features

Brickwork

5.22 The building had been executed in red brick, constructed in stretcher bond, with a surface finish of small, closely-spaced, vertical zigzag combing. The bricks were (and continue to be) produced by the London Brick Company and are known as 'rustic' bricks[6]. These bricks were used site-wide, and many loose examples of these deeply-frogged bricks were observed in demolition debris at the site. However, examples of the undecorated, unfrogged, products of the Hartley Main Colliery[7], a more local building supplier, were also found.

Brick Pillars

5.23 The brick pillars positioned at each corner of the building, and centrally in each wall were a structural feature supporting the roof load. These were square in plan, each measuring 0.6m by 0.6m (1'11"). All but two of these reached the height of the wall plate. The exceptions were those positioned in the centre of the gable ends, which reach the height of the roof apex, directly supporting the roof. Externally, the brick infill sections between each column were set back from the outer edges of the brick columns by 0.19m.

5.24 There was a downpipe on the north face of the brick column at the northeast corner of the building (Plate 10). Evidence existed of a further downpipe on the southern face of the southeast column. The central column of the east elevation features a fixing point for an overhead line, likely to have been an internal communications/telephone line, rather than a power line (considering the single connector and line which were observed). The central column of the western elevation held ceramic couplers and a junction box for a crude power cable which would have run from the ground.

Roof

5.25 The roof featured two pitched faces (with a pitch of approximately 9/12 or 36°), to the north and south, with gable ends to the east and west. The roof was covered with corrugated asbestos-cement sheets. The ridge tiles, rainwater goods and fascias were of the same material.

5.26 Each pitched face featured a continuous row of roof light windows, spanning the majority of the building's length (east-west). These were positioned approximately half way between the roof ridge and fascia and would have been the only source of natural light for the building, in the absence of further fenestration.

[6] http://www.penmorfa.com/bricks/england14a.html
[7] http://www.penmorfa.com/bricks/england10.html

5.27 There was a flue, at some point installed connecting to a stove, positioned close to the ridge on the western end of the south roof slope. There was evidence of another outlet for a flue, in the form of a hole in the roof, in the southeast corner of the same roof slope.

Doors

5.28 There were two opposing doors, located directly east of the central brick column on the north and south walls of the building (Plates 9 and 11). Their positioning suggests the building's function required efficient passage through the building. Both doors were surmounted by substantial concrete lintels. The doors appear to have been original, and were timber planked doors, painted blue. This style of door was visible in most of the buildings on the site.

Vents

5.29 Each brick infill panel featured a single clay vent (or air brick), in the lower third of the wall (Plate 10). The height of the vents was equal to three brick courses, and their length was approximately that of one and a half bricks. These were positioned centrally, with the exception of the infill sections featuring the doors, in which vents were positioned at the same height, but east of centre. The eight vents observed on the exterior were blocked internally with plasterboard.

Evidence of Other Fittings and Fixtures

5.30 Some signage, and a number of marks representing historic fittings, remained. Each brick column featured, on its lower quarter, painted chevrons in yellow - a safety feature common to a number of buildings at the site. Midway up the western infill section of the southern wall, a yellow painted circle exhibited the emboldened building name '**A2**' (Plate 9). Above this painted sign were four small holes, at the four corners of a rectangle of brick which had clearly been covered for some time. The central brick column of this southern elevation featured a number of holes, presumably from further signage. There were a number of brackets remaining on some of the columns, just below roof level, presumably these previously held fittings for exterior lighting or similar.

Foundations and Services

5.31 The watching brief during the demolition of Building 4 identified four foundation trenches, mirroring the footprint of the original building, beneath the concrete paving slabs. The lines of numerous services were traced going into the building at the eastern end, most of which appeared to relate to drainage runs connected to the downpipes.

Interior

Form

5.32 The interior of building 4 was bordered by a concrete plinth, which runs around the base of its walls (Plate 11). This decreased the internal floor area of the room by 0.28m. The floor was also concrete.

5.33 The interior was divided into two main areas; a partition ran north-south, forming a separate easternmost quarter (directly east of the opposing doors). This eastern section was then itself divided into equal sections, by a division running east-west (Plate 11). Both partitions were of timber and plaster board. The smaller areas appear to have been an office (the southern section), featuring a hatch window and stable door, while the northern area, which was only accessed from the office, was a secure cage with mesh on the upper side walls and ceiling. A variation in floor level appears to demarcate a walkway running between the two opposing doors (see above).

5.34 A metal roof truss supported the roof in the centre of the building, spanning north-south (Plate 11). There were a number of electric strip lights, a later addition, hanging from the truss. The interior featured two stove flues; the concrete hearth of one of the original stoves remained, at the foot of the western wall. A later electric heater existed on the eastern wall of the office. Some shelving survived in the southwest corner.

Plate 11: the office space inside Building 4, looking south-east (left), and the western wall of Building 4, showing the former position of a stove and blocked vents (right)

Features

Roof Truss

5.35 The central portion of the roof was supported by a metal roof truss, spanning the building north-south, supported by the central brick columns of the north and south walls. The truss was an example of the very common Fink roof truss which transmits its loads entirely onto the wall plates, in this case the brick columns, and used throughout the buildings on the Killingworth site. This form of roof structure is reliable and cost-effective, and is likely to have been chosen for these factors. Identical roof trusses were seen at East Boldon (see Plate 9), as well as other military sites (NAA 2008, NAA 2009, NAA 2014c), and appear to be common to military buildings.

Partition

5.36 The partition which ran north-south, forming an office and storage area in the eastern quarter of the interior, was of timber and plaster board. The height of the partition was just over the door height, leaving the entire interior open at the roof space level (Plate 11). The partition delimiting the storage room (the northern area) comprises timber, plaster board as well as mesh which would have prevented access over the top of the partition. The dividing wall between the main room and office room featured a stable door and a large hatch window with a counter on the office side. There was a door in the partition between the two smaller rooms, limiting access into the 'secure' storage area.

5.37 This partitioning appears to have been original as its layout conforms to a number of designed building features; for instance, the placement of vents on the north and south walls, the positioning of the opposing doors and the walkway between these doors.

Stove Flues

5.38 There was evidence of two stoves used to heat the interior (Plate 11). The first was located in the southeastern corner of the office room; of this, only the flue remains. The second was on the western wall, evidenced by a surviving flue and concrete hearth. These are thought not to have been original, possibly added c. 1950s, to improve working conditions; the flues were crudely inserted through holes in the asbestos roofing. Electric heating appears to have replaced these when electricity was installed c. 1980s (considering the style of electrical fittings).

Shelving

5.39 Some metal and timber '*Dexion*' racking remained, resting on the concrete plinth, in the southwest corner of the interior. Given the brand, the earliest this could have been installed is c. 1950. Otherwise, this may date to the building's later use as a Area Health Authority store room as an earlier concrete base - seemingly unconnected to the shelving - remains beneath. The concrete base was similar to that later seemingly re-used as a hearth at the foot of the west wall.

These may have originally been used for holding some form of barrel.

Electric Lighting

5.40 Although the interior would have originally been lit solely by the large roof lights, some electric lighting hung, somewhat haphazardly, from the roof truss. This is likely to be a later addition from c. 1980. There were a number of electric plug sockets, which don't appear to have been positioned relating to any specific purpose.

Evidence of Other Fittings and Fixtures

5.41 As on the external walls, there were a number of areas exhibiting evidence of signage. For instance, there were holes from signage on the column to the west of the southern door. There was little, if any, evidence - on either floor or walls - of fixed shelving, which might be expected in a post room/storage facility.

Plate 12: Burnett AAOD, Shropshire; main store and boiler house, with bunker in the foreground and double garage/tender shed to the right (© Folly Books)[8]

Buildings 8 and 9 – Fire Pools

Function

5.42 Buildings 8 and 9, as identified in the original survey, were static water storage tanks (also known as Emergency Water Supplies – EWS), positioned at the northeast and southeast corners of the depot (Figure 2). The risk of fire within an ammunition depot was a major concern, and as such tanks of this nature were common. These tanks were open, and may have been rainwater-fed, though it is probable that supplementary pipework was also in place to top them up if needed. The tanks in this case may have been brick-built or made of steel, and, if they were solely for use in an emergency, may not have been covered. In the event of a fire, trailer pumps or a fire tender would have been used to pump water out the tanks (see Building 14). Both of

[8] https://www.facebook.com/FollyBooks/photos/a.463758926981378.108928.175336742490266/463759183648019/?type=1&theater

the tanks were still extant in 1979 (KILL/REME/DEP/QS – Plate 3) and appear to only have been filled in the late 1990s/early 2000s.

Plate 13: examples of boiler house (yellow)/coal store (green)/main store (red) arrangements: Burnett (top left – coal store reroofed as a building); East Boldon (top right – boiler house demolished); Norwich (bottom left – coal store demolished); Tern Hill (bottom right)

Building 10 – Boiler House

Function

5.43 Building 10 operated as the original (c. 1938) boiler house for the depot, and was located towards the eastern side of the site (Figure 7 and 8). The boilers would have originally been coal-powered, with the fuel stored in Building 11 (Section 5.81) and brought into the building via the double doors in its west wall. The coal-powered boilers were replaced by oil-powered boilers, perhaps by the late 1940s (see Building 14). Before World War II, most heating systems could not rely on electric pumping, and instead operated through thermo-cycling or convection.

This refers to utilising the natural rise of heated water or steam, which could then be circulated through above-ground buildings and in return the fall of cold water which could then be heated to repeat the cycle. There would commonly be drainage and heating channels just below floor level to deliver heated water, which justifies the positioning of the boiler house adjacent to Building 12, the main building on the site benefitting from heating (see below). The positioning of the boilers below ground level would also have assisted in the convection process.

5.44 It seems likely that the boilers were used predominantly for heating only. The use of electric light on the site was limited, in view of the war-time black-outs, with most of the buildings only lit by roof-light windows, and the installation of the lamp posts around the site appears to have occurred at the very end of the War (see below). Blackout regulations were imposed across the country on the 1st September 1939, and were not lifted until April 1945. The boiler house was later upgraded to allow some power generation, perhaps at the time of the conversion of the boilers from coal to oil; boiler houses in other AAODs also show this conversion - for example, plans of Solihull AAOD from 1950 show it to have powered generators. At Killingworth, the generators were fairly small, and the electricity generated may only have been used in the boiler house itself for electric pumps and convectors, or in the immediate buildings.

5.45 It is not entirely clear why a boiler room would have required a full height building constructed above ground level, given that the majority of plant was below ground. It is likely that the over-ground structure was, predominantly, functional, relating to both insulation and ventilation of the boilers below. The above ground structure may also have offered some protection to the below-ground plant in the event of bombing. It is possible that the domestic appearance of the structure could have disguised the building's purpose during aerial bombardments, although this seems unlikely given that its position relative to coal stores.

5.46 The architecture of Building 10 resembles many boiler rooms dating to the Victorian period, when ornate designs reflected pride in heating technology, and concealed the less aesthetic pipes and boilers. Building 10 was certainly the most ornate building, externally, of all of those on site. At Killingworth, a military site with relatively high secrecy, the decorative design elements of this building - particularly the arched windows (see below) - seems somewhat out of place. It can only be assumed that this design was a stock military boiler house plan, inspired by earlier industrial architecture but with no particular pertinence to the purpose of this site.

5.47 The arrangement of boiler house/coal store/main store was common for a lot of AAOD sites examined, where they survive – parallel arrangements can be seen on aerial photographs at: East Boldon, Tyne and Wear; Upton, Wirral; Norwich, Norfolk; Burnett, Somerset; and Tern Hill, Shropshire (Plate 13). A number of examples seen have roof light windows, in the same style as those in Building 4, and it is probable that Building 10 had this also, and that it had been reroofed. At Burnett and Upton, the coal store has been roofed over and turned into a building.

Exterior

Form

5.48 Building 10 was situated close to the eastern perimeter of the site. It comprised a rectangular structure, 9.27m by 6.39m (30'6" by 21') externally, excluding entrance and chimney, and was 6.93m (22'9") high.

5.49 On the south side, a single-storey entrance block extended 1.17m (3'10") from the south wall (Plate 14); its width was slightly narrower than the main body of the building, measuring 6.16m (20'2"). This contained a stairwell for access to the interior (see below). There was a substantial chimney stack extending from the eastern wall, 2.89m (9'5") from the northeast corner of the building (Plate 15), and measured 1.26m (4'1") (east-west) by 1.62m (5'3") (north-south). The whole of the structure was constructed on a concrete plinth or pad.

Plate 14: the south-west corner of Building 10, showing the three doors to the building (compare with Burnett – Plate 12)

5.50 Building 10 featured three doors and five windows. These varied in style, size and positioning (see below), although concrete lintels and sills were common to most of the openings.

5.51 The building was brick-built. As with other buildings on site, this building featured brick infill sections, divided by structural brick columns. There were three columns on each gable end, effectively forming two aisles, and four on each of the longer elevations (east and west), forming

three bays (Plate 14). Again, these were structural features representing the positions of roof trusses and the ridge of the building. There was no evidence that the interior of the building was subdivided according to these divisions.

5.52 The roof (with the exception of the entrance portico) was ridged and gabled, and covered with asbestos cement sheeting. In contrast, the entrance block was flat roofed (Plate 14).

5.53 To the east of the building were two further associated brick structures. These were bunded fuel tank mounts, built when the use of coal was replaced by oil as a fuel source for the site (Plate 16, Figure 9). East Boldon may also have had a similar structure to the rear (Plate 13).

Plate 15: the north-east corner of Building 10, illustrating the later addition to the chimney, the original windows, and its relative position to the former bunded fuel tank. Building 12 can be seen in the background

Features

Brickwork

5.54 This building was constructed in English bond, and featured the same surface finish of small vertical zigzag combing seen on most of the other standing buildings on the site. However, it was unique within this complex in having a lower chamfered brick plinth at the base of each panel of brickwork formed by a double thickness wall for the first four courses, and two

chamfered courses of brickwork to reduce its thickness (Plate 14). This is unlikely to have been merely decorative, but was rather a structural reinforcement necessary given the absence of a floor internally at ground level. A floor would usually provide valuable bracing at the foot of the walls in order to better transmit the roof load into the ground.

5.55 Additionally, at the top of the infill sections of the west and east walls, there was a single soldier course, comprising vertically placed bricks (Plates 14 and 15). The brick infill bays along the of the west elevation were not uniform. The southernmost bay, which held the large double door opening, was a double thickness wall for its whole height. This is probably to reinforce the wall given the structural vulnerability caused by the large opening in this bay. In addition, the northern bay was slightly longer than the other two. Within the north and south elevations, a pair of vents had been blocked using brickwork, which was nearly indistinguishable from the coursing of the wall.

Plate 16: the bunded fuel tank which was situated to the north-east of Building 10

Roof

5.56 The roof was ridged and gabled, supported by two metal Fink trusses in the centre and by the brick wall directly, at both gable ends. The ends of the roof purlins were clearly visible at the gable ends, revealing this structure (Plate 15). The flat roof of the entrance block probably consisted of a concrete slab, which was sealed with a thick coat of bituminous sealant. Roof lights observed on other buildings within the complex were not present on Building 10, but may

have been originally. Both the northern and southern bays have cast-iron down-pipes affixed to the brick pillars, these being fed from gutters situated on the eaves (Plate 17).

Entrance Block

5.57 The southern elevation comprised three 'bays', of unequal size, which roughly echoed the design of the western elevation of the building (Plate 14). The chamfer courses seen on the main elevations are repeated throughout the portico. The brickwork of the easternmost bay of the portico projected beyond the other two and this panel contained a single doorway (see below). The central bay was blind and the westernmost was perforated by a window aperture.

5.58 The brickwork of the portico was constructed in stretcher bond (with the exception of the central column, which was in English bond), and therefore differed from the remainder of the building which was constructed entirely in English bond. This might imply that the entranceway was a later addition to the structure, perhaps providing shelter for the pre-existing steps into the interior. The block is, however, visible on the aerial photographs of 1948, so if it is an addition to the original structure, it appears to have been constructed soon after the main building. Other examples of boiler house do not appear to have the same entrance block however, though further study of existing examples would be needed to confirm this.

Plate 17: one of the ornate original windows of Building 10, in its east wall

Windows

5.59 Building 10 featured five windows in total. There were two windows on the east elevation, positioned centrally in the northern and southern bays (Plate 15). These were semicircular arch-headed windows, the arches formed by soldier bricks, with a concrete sill. The windows contained metal frames, the uppermost portion of which reflected the curve of the arch and was decorative, particularly relative to the functional design of the remainder of the site. These windows are reminiscent of the arched windows frequently seen in engine-houses of earlier periods, albeit of a smaller size.

5.60 Two further windows were located on the west wall, in the northern and central bays. These windows were rectangular with concrete lintels, and concrete sills approximately half the depth of the lintels (Plate 14), reflecting fenestration elsewhere on the site. These windows were not positioned centrally in the bays, but both offset to the south.

5.61 The remaining window was located on the eastern bay, in the southern wall of the entrance block (Plate 14). This window differs from the others - possibly supporting the contention that this was a later extension - as the sill is of bull-nosed header bricks. Equally, the windows on the west and east elevations, presumed to be original, differ considerably from this in their design. There is, as of yet, no explanation for this variation. The concrete lintel resembles those seen elsewhere on the site.

Doors

5.62 Building 10 featured three entranceways (Plate 14). These comprised: a large double doorway forming the southern half of the western wall; the main entrance to the east of the south wall; and a small '*fire escape*' opening located at the northern end of the west wall.

5.63 The large double doorway had a surmounting lintel made of buff-coloured, sandy, concrete. This lintel is built into the columns either side of the bay, providing structural reinforcement. This type of lintel is almost ubiquitous throughout the brick-built structures of the site. Their composition and colour suggest an intention to resemble sandstone, and their inclusion within this complex supports the notion that these buildings were architect designed, and were not built with any particular considerations towards austerity or economy. This doorway was sealed by a pair of substantial planked doors, suspended from equally substantial steel strap-hinges. It is likely that coal to fire the boilers was delivered through these doors, probably into a chute or hopper.

5.64 The doorway positioned in the eastern bay of the south wall provided access to the stairway entrance into the boiler house. The door was surmounted by a concrete lintel, but no step or sill was observed. The single-panel door in place at the time of the survey was a modern replacement, and the original planked door had been thrown down into the stairwell.

5.65 The smaller door in the northern bay of the east elevation appears to have been an emergency

exit, given the steps leading to it on the interior (see below), and its position away from any other possible exit route. The door had both sill and lintel, in concrete, conforming to other openings thought to be original. At the time of survey, the door was closed by a planked door suspended from strap hinges.

Chimney

5.66 The central bay of the eastern wall contained the chimney, which was not centrally disposed and extended slightly into the northern bay (Plate 15). The chimney was square in plan and extended beyond ridge height. The chimney brickwork was stepped inwards in two places in order to effect a reduction in its dimensions, the steps being just below and just above the eaves. There was clear evidence that the chimney had been rebuilt and subsequently extended. A single course of the same brick type as the rest of the structure was visible at ground level, keyed into the building. Above this, the lower two-thirds of the chimney were constructed of undecorated brick, in English bond. The upper 27 courses were of a different, but again undecorated, brick and built in English bond. The top of the chimney was finished in bull-nosed bricks. Internally, the chimney had been modified to accommodate a flue for the oil fired boilers, but had originally been a chimney venting the coal fires; an ash door is evident at the base of the chimney internally.

Evidence of Other Fittings and Fixtures

5.67 The north elevation featured the remains of a cable conduit, a wall-mounted box with two associated cables running into the ground, and a period light fitting attached to the northeastern corner of the building (Plate 15).

5.68 On the northern bay of the east elevation was a 2″ diameter steel pipe protruding from the wall. This was equipped with a lever operated valve and was probably associated with the fuel bunded tanks situated to the east (see below).

5.69 The building featured two non-period 6″ electric bells (Plates 14 and 15). One was affixed to the wall to the north of the northern window, on the east elevation. The second was located to the south of the double door on the west elevation. These may have been extension bells for a telephone, possibly mains operated through a relay.

5.70 Like many other buildings on the site, the columns on the western elevation of Building 10 featured yellow and black painted chevrons as a safety feature. Various other safety signage warning of fragile roof covering, as well as more recent signage warning of deep water and asbestos risk, was identified.

Bunded Fuel/Oil Tank Mounts

5.71 To the east of Building 10 were two bunded fuel tank mounts (Plate 16, Figure 9). Each comprised a rectangular brick-walled enclosure, ten courses high, containing a pair of brick-

built plinths originally supporting a cylindrical fuel tank. In order to accommodate, and lend lateral support to the cylinder, the plinths have been built with an inverted semi circular arch in their upper surface, although the tanks had been removed at the time of survey. The brickwork was undecorated and of English bond, the top of the bund wall being finished in a single course of edge-laid headers. The tank mounts are thought to have been later additions, constructed when the source of fuel was changed from coal to oil in the 1950s.

Interior

Form

5.72 Internally, Building 10 was an open, two storey space comprising a cellar (below ground level) and a ground floor room, undivided by a floor at ground level. The space above ground level was the interior of the building described above. Below ground level was an open cellar containing two boilers, and the associated piping and plant (Plate 18).

Plate 18: south-facing photomontage of the interior of Building 10, taken from below ground floor level (left), and fire escape ladder in the north-west corner, facing west (right)

5.73 The interior of the building above ground level was brick, whereas the cellar area below this level had concrete walls. The doors and windows listed on the exterior description were all visible internally above ground level. In addition, some elements of the cellar had not been visible from the outside; a ladder leading up to the emergency exit in the northwest corner was observed, along with steps up to ground level accessed through a large iron gate in the southwest corner of the cellar area; at the time of the survey the gate was off its hinges. The

floor of the cellar was not visible due to previous flooding, but was likely to be concrete. Within the enclosure for the fire escape (see below), the wall was bordered at the base with red tiles (visible in Plate 18). The same tile border is visible at the foot of the east wall, and probably extended around the entire building, but was obscured at the time of survey by flooding and debris. This feature is further evidence to the quality of building, and attention to detail, above that which might normally be anticipated for a boiler room on a military base, and above other buildings on site. In the north and south interior elevations were pairs of vents, set high up on the wall, which had been blocked externally using brickwork.

Plate 19: 'Boiler No. 1' (left) and 'Boiler No. 2' (right), facing east

Features

Roof Interior

5.74 A survey of the interior confirmed that the roof was supported by two metal Fink trusses in the central two bays (spanning east-west), supported directly by the four central brick columns of the east and west elevations (Plate 18). The roof load was also transmitted through two metal purlins braced against one another, evenly spaced on each roof slope. There is a further, narrower braced purlin at the bottom of the roof slope, seemingly supporting the overhang of the roof. At the gable ends, the roof was supported directly by the brick walls, buttressed by the columns at the corners of the building.

Fire Escape Ladder

5.75 The small doorway observed externally at the northern end of the west elevation was accessible

from the cellar floor internally via a metal ladder (Plate 18). The ladder was enclosed inside a metal casing, with a double door of the same material to the west (presumably offering some protection in the event of fire).

RSJ in SW corner

5.76 There was a rolled steel joist (RSJ) spanning the southwest corner, from above the double door on the western wall to the central column of the southern wall at the same height (Plate 18). The RSJ is built into the brickwork, and therefore is likely to have been original. The RSJ is likely to have held a pulley system for the lowering of equipment through the double doors into the cellar.

Boilers and Dynamos

5.77 The cellar included two large boilers – labelled 'Boiler No. 1' and 'Boiler No. 2' – which appear to have been installed around the early 1950s (Plate 19). 'Boiler No. 1' has no identifying maker's plate, and is difficult to date. The boiler was made of iron and originally painted blue. The boiler was broadly cylindrical, with a cylindrical access door at the front, into which would have been fitted a forced draft burner through a circular hole. This burner had been removed by the time of the survey. The boiler was enclosed by three straps, which presumably minimised lateral movement during the running of the boiler.

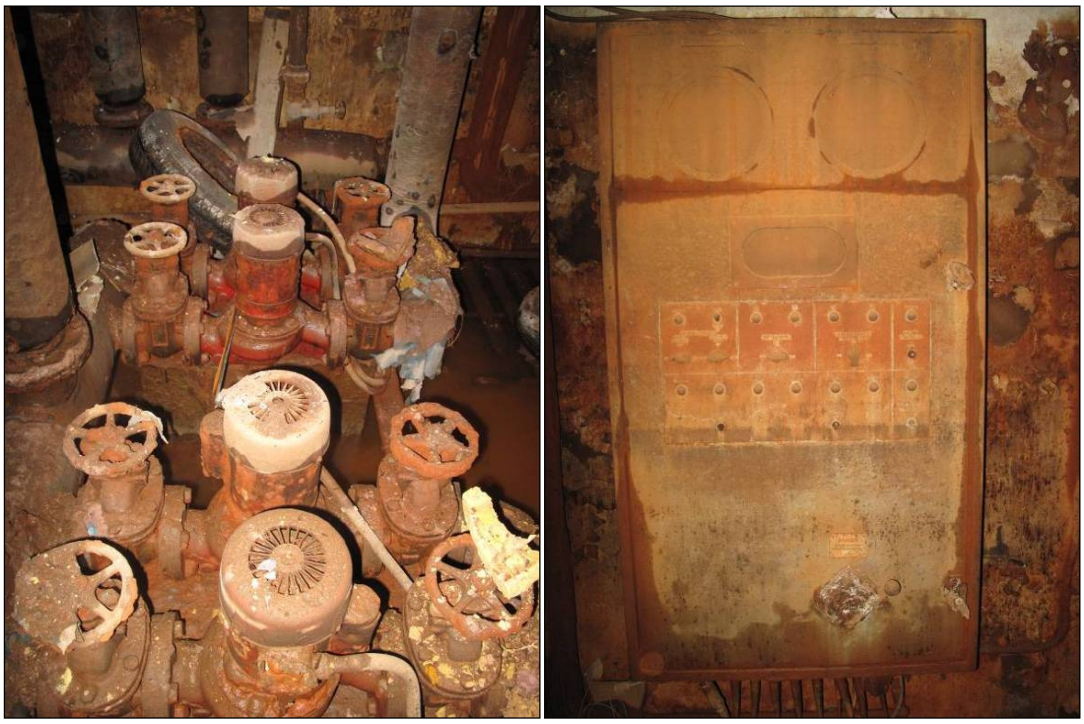

Plate 20: hydro-electric dynamo generators (left) and switchgear (right)

5.78 'Boiler No 2' was a '*White Rose*' oil fired boiler, also iron, manufactured by Hartley and Sugden, based at the Atlas Works, in Halifax, West Yorkshire. The firm was established in 1867,

and began making boilers by 1894. The '*White Rose*' was the firm's signature boiler; the initial design was a coal-fired cast iron sectional boiler, but this developed to an oil-fired version by the later 1940s, with the expansion of the use of oil for central heating systems in the post-war period. Hartley and Sugden were taken over by Francis Industries in 1959, which in turn were taken over by Midland Aluminium in 1973[9]. It is unclear whether the firm continued to produce their trademark boilers after 1959; a late 1940s date for their installation seems reasonable, and is supported by evidence from Building 14 (see below).

5.79 The oil supply entered the basement by means of a narrow pipe in the northeast corner, which was connected to the exterior bunded oil tanks. The exhaust gases from the oil-fired boilers exited from the rear of the boiler into a large 14" (0.35m) bore iron flue pipe, which ran along the back wall and exhausted to the chimney by means of a T-shaped junction. Heated water was transmitted through a network of 4" asbestos-insulated water pipes exiting from the top of the boilers, to a sub-floor conduit under the double-doors, which led the pipes across the yard to Building 12 (see below). Smaller bore (2") pipes also junction off the larger pipes, and may have been used to pipe off hot water for hand washing (etc.). The return for the heating system followed the same route, but connected back to the rear of the boiler. Most of the valves for the pipework were manufactured by Honeywell.

5.80 The pipework also incorporated four hydro-electric dynamo generators, which used the returning water to generate electricity. These generators seemed to have been only used to supply electricity for use within the boiler house itself. Electrical switch-gear on the southern wall controlled the burners, heat-pumps, convector units and oil tank alarms (labelled 'No. 1 Oil Tank and 'No. 2 Oil Tank'). The switches were made of Bakelite. The wall also included a fuse box and light-switches, and a network of metal cable channels extended around the walls. All the electrical switchgear looked to be of mid-20th century date, and probably contemporary with the installation of the oil-fired boilers. A hydro-electric substation was also identified at East Boldon, which was clearly later than the original complex, and probably served a similar function.

Building 11 – Coal Store

Function

5.81 Building 11 represented the coal store for the boiler house, and was originally constructed In c. 1938 on the eastern edge of the depot (Figure 10); the 1948 aerial photograph clearly shows the coal within the structure, banked up against the outer walls. Exact parallels for this building were visible in a number of depots (see Plate 13), and always associated with the boiler house, as would be expected.

[9] http://www.gracesguide.co.uk/Hartley_and_Sugden

Form

5.82 The structure was situated to the south of Building 10 and comprised a simple sub-square brick-built enclosure, measuring 13.43m by 12.25m (44' by 40') externally, and 3.23m (10'6") high. All four walls comprised simple brick panels, standing 36 courses high, constructed of zig-zag decorated brick, in English Bond. The corners of the enclosure were defined by further brick-built pillars which only extended to three-quarters of the height of the wall. The wall heads and pillars were finished with concrete coping stones and caps and, with the exception of the western wall, the walls were blind.

5.83 The western wall had a large double gateway placed at its centre, defined by a pair of mildly decorative gate piers at either side. The gate piers each incorporated two sandstone blocks and the gate hinges attach to these blocks on their external (west) face. The internal faces of each block also featured blocked holes denoting the positions of an earlier set of hinges. The southern of the two gate piers, together with part of the adjacent wall, had been rebuilt using a different brick type which is decorated with horizontal lines.

5.84 Externally, the west end of the southern wall preserved a switched fuse box marked '*Sandamax*' with an associated cable running into the ground, and a gas or water pipe. '*Sandamax*' were made by William Sanders and Co, of Wednesbury, and date to the 1950s[10]. A hole in the wall near these features had been infilled and the features all lay above a raised concrete slab perhaps suggesting that these features were originally enclosed by a wooden structure. Internally, there was a scar in the brickwork of the southern wall, indicating a former internal division in the southwest corner. These features are presumed to all represent later modifications to the structures.

Building 12 – Main Store ('A1')

Function

5.85 Building 12 is classed as the '*main store*' within the ordnance depot, and dates to the original construction in c. 1938 (Figures 11 and 12). The store was the largest building in the complex, and the majority of standing buildings on the site (4-19 at the time of survey) were seemingly arranged around it.

5.86 The purpose of the building was to provide a very large covered and secured area for the storage and maintenance of the vehicle fleet, used for the delivery of ammunition to the gun batteries, and the mobile anti-aircraft guns themselves. The building was sufficiently neutral in appearance to not identify its purpose, in particular from the air. The Luftwaffe reconnaissance flights would have been able to identify the building, but the building would have appeared exactly as any other large factory unit, with no clear indication of its use or function.

5.87 The floor-space in the building is vast and, combined with the large vehicle doors, most, if not

[10] http://www.historywebsite.co.uk/articles/Wednesbury/Sanders.htm

all, types of vehicle could have accessed the space. The building forms a principal component of most of the identified AAODs examined as part of this study (see Plate 12, for example), though some (e.g. Banstead AAOD in Surrey) did not include this form of store, which indicates differing requirements for different AAODs across the country. Internal variations to the design were introduced at Killingworth, probably with the occupation by the REME in the post-war period. The raised offices on the western side appear to have been later additions – the main store at East Boldon did not have these – though in the absence of the survey information for other stores it is not possible to state this conclusively. The stores were furthered modified during the Area Health Authority occupancy of the site; plans for conversion indicated that this building has been used for vehicle maintenance (KILL/REME/DEP/QS, 4).

Plate 21: the south and east elevations of Building 12, showing the three large vehicular access doors, the roof structure and considerable alteration to the window positioning (above). A comparable view of the main store at East Boldon (below)

Exterior

Form

5.88 The building was a large rectangular shape, in plan, with a protruding section to the west of the north elevation and a newer extension on the west wall. Externally, the building measured

64.5m (211'6") east to west, excluding the single-storey extension to the west and 46.13m (151'4") north to south at its widest; the east end is narrower at 38.51m (126'4"). It was divided into 18 bays and 6 aisles defined by a series of brick columns, and the valley gutters between each roof section. The brick panels between these columns were of plain brickwork. The northernmost aisle (which formed the protruding block) was shorter, relative to the others, at 12 bays long.

5.89 The north and south elevations each incorporated three steel 'up and over' vehicle access doors, and a row of steel-framed windows, showing evidence of significant alteration (Plates 21 and 22). The short elevations of Building 12 (west and east) featured only windows (Plate 20).

5.90 The building was similar in construction to many of the other buildings on site, featuring the zigzag combed brick in stretcher bond. The roof was steel-framed, comprising fan-trusses supported on vertical steel beams set into the concrete of the floor of the building, with wall-plates set on the wall-heads of the north and south elevations. The roof was composed of six parallel sections each being ridged and hipped at both ends. Each section was covered with asbestos cement sheeting, and incorporated two rows of roof-lights along almost its entire length (Plate 1). Valley guttering ran between each ridge, leading to down-pipes at the east and west ends of the structure (with some additional internal drainage, see below). There were four ventilation stacks situated towards the eastern end of the roof.

Plate 22: the west elevation of Building 12, with the non-original extension in the foreground, and the altered window second from the right

5.91 A later, single storey rectangular extension had been built against the west wall, obscuring the lower portions of the three central aisles (Plate 22). This measured 23.64m by 4.58m (77'6" by 15') and 3.18m (10'6") in height. The extension was constructed of grey-cream undecorated brick, in stretcher bond, and had a flat roof with concrete copings at the wall-heads. This later building had two doorways in its western side and a third in its southern side, all sealed at the time of survey. A structure of identical dimensions but with a ridged roof is visible in this position in the aerial photograph of 1948, indicating that there was a structure in this position by this date, though the present structure appears more modern. The modern extension appears to have been a discrete space, internally, with no access from the main building. The 1978

survey of the building identified this as a canteen (KILL/REME/DEP/QS).

Plate 23: the north elevation of Building 12, showing two of the large vehicular doors, considerable window alteration and some markings on the concrete paving slabs (above). A comparable view of the main store at East Boldon (below)

Doors

5.92 The six steel vehicle access doors in the building were near identical, varying only in the positioning of a small access door in each.

5.93 The doors measured 7.62m wide by 4.57m high (25' by 15') and extended to the full height of the walls. The lintel and each of the stanchions were made of a single I-profile steel girder (RSJ), marked with 'DORMAN LONG & Co Ltd No 6', 'MIDDLESBROUGH' and 'BRITISH STEEL' on a number of examples. The logo (which is not to be confused with the British Steel logo of post-1967 nationalisation date) indicates that these RSJs post-dated 1931 (NAA 2009, 34).

5.94 Each door was made up of eight vertical steel-framed subdivisions onto which galvanised sheets

were riveted (Plate 24). The lockable pedestrian access door was located within either the third or fourth vertical panel from the left. Pedestrian access on the northern elevation was in the third panel from the east (in the easternmost door) and in the fourth on the remaining two doors. In the south elevation, pedestrian access was in the fourth panel from the west (in the west and central doors) and in the third panel in the eastern door.

Plate 24: the south-eastern vehicular access door (left), and a detailed view of the pedestrian access (right). The brick panels surrounding the door had been significantly altered

Features

5.95 Signage - much of this non-original - featured on both the interior and exterior of the building indicate that the opposing doors allowed goods to enter through either the north or south side, and leave through the other. This may not accurately reflect their original usage, although it seems logical that opposing doors would have enabled a flow through the building.

5.96 Internally, the doors were connected by pulleys to cantilevered weights, which assisted in the manual raising and lowering of the doors by means of a winding mechanism. These were positioned in opposing pairs, on the north and south wall, affixed to brick columns. The westernmost pair was located in line with the raised platform, to operate the westernmost doors. A second pair was located between the eastern and central vehicular access doors, which would have operated the central doors, in line with the truss to the east of the row of RSJs. The third pair was situated to the west of, and would have operated, the easternmost vehicular access doors.

Windows

5.97 The bays and aisles each incorporated a rectangular window, 2.51m by 0.94m (8'3" by 3') in size, seven courses of brick below the roof line. Some had been blocked with brick, while others had metal covers over them (Plate 25). A number of the windows were visible at the time of survey, and appeared to be of uniform construction and metal framed. Each had a precast lintel, the majority in a buff coloured sandy concrete, although some were of a grey pebbly concrete. All incorporated a brick sill. The windows themselves were divided into three

sections. The central section, which comprised half the window, had 16 small glass panes, and the upper half of the section could be opened (casement). The smaller side sections each comprised eight panes and were fixed. The windows were barred with security bars internally, a later security feature.

5.98 On the west elevation, each aisle incorporated two windows which were arranged symmetrically about the central pillars (Plate 22). There were twelve windows in total. Each was surmounted by a simple concrete lintel and featured edge-laid brick sills. At the time of survey, these windows were covered by steel-mesh security grills, which obscured the details of the window frames. The second window from the south had been partly blocked and lowered. The blocking brickwork had horizontal line decoration, and the replacement lintel was slightly thicker than the original, constructed in precast grey concrete. The original sill appeared to have been reused.

5.99 The bays of the north elevation each featured windows originally positioned at a high level (Plate 23). There were twelve windows in total, and two further windows in the east elevation of the protruding block. The western two windows (on the protruding element) had modern metal covers, and the eastern window of this element had its original window blocked, with plain brick in stretcher bond. A replacement window, of the same size (and possibly using the original frame and glass) was positioned below it at ground-floor level, with a lintel and sill both of cream concrete. The easternmost window of the elevation had also been blocked (again with undecorated brick). This bay, and that immediately west, had two later windows at ground level, both featuring grey concrete lintels and sills. The easternmost window was of the same dimensions as the original; the westernmost being nearly square, 1.44m by 1.22m (4'9" by 4') in size. It had been covered, but projecting metal hinges were visible and the window appears to be metal-framed. It also had a wooden 'GOODS OUTWARD' sign fixed to the wall above it.

5.100 On the east elevation, there were originally ten upper level windows, positioned in each aisle (Plate 21). However, six of the original upper windows had been blocked: five of these towards the northern end of the elevation, and another at the southern end. The remaining original windows were uncovered at the time of survey. The blocking brickwork was again of undecorated brick in stretcher bond. The three northern aisles also featured ground floor windows, which were seemingly later additions, three of which were also blocked when this survey was undertaken. All of the lower windows had grey pebbly concrete lintels, and the northernmost two had a concrete sill. The blocking brickwork of the lower windows is in stretcher bond with horizontal line-decoration.

5.101 The south elevation featured twelve upper level windows (Plate 21). The six windows to the western half remained unaltered at the time of survey, although the two westernmost windows were covered. The six upper level windows to the east had been blocked, with plain brick, and replacement windows of the same size had been installed at ground floor level (many of which exhibited signs of further alteration). Four of the lower windows had yellow, pebbled lintels and

precast grey sills. Lintels were surviving on the two easternmost lower windows, and were of thick, precast concrete. The three eastern lower-level windows had been blocked, and the window to the west of these had been narrowed. The blocking was with brick featuring horizontal decoration. The lintel of the original upper-level window of the easternmost bay had also been replaced with a thicker yellow precast concrete. The brickwork surrounding this had also been replaced using a plain brick. The thicker materials and blocking presumably reflect structural instability at this end of the structure.

Plate 25: an original window with a pebbled concrete lintel and brick sill. Some brick patching can be seen below it

Structural Failures

5.102 The east elevation exhibited considerable alteration to the brickwork, indicative of structural instability and reactionary reinforcement (Plate 25). Several of the brick pillars defining the aisles had cracks extending their full height, indicating subsidence at this end of the building. Four of these had been entirely rebuilt, along with partial replacement of the northeast corner pillar (of the fifth aisle from the south). The brick used for these repairs is the same decorated brick used in the blocking of the lower windows, suggesting that these alterations may have been contemporary. The watching brief confirmed these had been rebuilt several times; the exterior eastern wall clearly cut across the some of the original concrete pillar foundations, with two later pillars then cutting through this wall.

5.103 The likelihood of structural flaws was also indicated by the blocking of both original and

replacement windows, where those on other elevations remained open. Additionally, the east elevation exhibited a total of eight blocked patches of varying shapes and sizes in the aisles of this wall. The easternmost bay of the southern elevation also showed signs of structural reinforcement (see below).

Plate 26: pillar rebuild in eastern elevation, identified during the watching brief

Roof

5.104 Each roof section, individually 7.62m (25') wide, was supported at either end by vertical brick pillars, with a further central pillar beneath the ridge-line. Similarly to other buildings on site, Building 12 featured long roof lights, positioned about mid-height up each roof slope (Plate 1). These appear to have been common for the '*main stores*' in other depots – e.g. Burnett, Norwich – and clearly the need to maximise natural light was important in these buildings. Valley gutters sub-divided each ridge.

5.105 There were a number of asbestos ventilation stacks situated at intervals on the roof slopes, above the roof lights (Plate 27). Their connection to the interior had been boarded off (see below) but the external feature remained. These did not appear to be original, and don't appear on the 1945 aerial photograph of the depot (Plate 2); the stacks appear to be positioned to form a roughly rectangular arrangement within the centre of the eastern section of the building, and were probably installed during the REME occupation of the depot in the post-war period. Building 14 includes later ventilators (albeit of a different style), seemingly installed in the same period. Similar ventilation stacks were recorded at the McCormick Tractor Factory near

Doncaster (NAA 2009, 17), and were common in both wartime and post-war military buildings.

Plate 27: (left) one of the ventilation stacks on the roof of Building 12, with interior access blocked. (Right) decorative trough on down-pipe, connecting valley gutters and eaves guttering

Evidence of Fixtures and Fittings

5.106 There were cast iron down-pipes located at each valley gutter, and fixed to the brick pillars, on the west and east elevations (Plate 21, 22). The head of each down-pipe had a decorated rectangular trough (Plate 27). On the west elevation, two of the down-pipes had been damaged by construction of the later extension. The northern elevation featured two down-pipes (one now plastic) fixed to the pillars, one close to the ventilation pipe, the other at the eastern end of the aisle forming this part of the elevation. The southern elevation similarly featured four regularly spaced down-pipes fixed to the brick pillars.

5.107 In addition, two later cast iron drains and an oil or water pipe projected from the wall on the east elevation. The northern elevation featured a cast iron ventilation pipe, reaching to roof height, projecting from one of the central bays.

5.108 The west and south elevations each featured an identification mark, comprising a black 'A1' in a yellow circle, painted onto the building close to its southwest corner on both elevations (see Plate 22). Above this, on the south elevation, was a wooden 'WAY OUT' sign fixed directly onto the brickwork. Further wooden signs were fixed above two of the lower windows, one reading 'GOODS INWARD', and the other being too faded to decipher at the time of survey. The building featured yellow and black chevrons, a safety feature observed on most other buildings on site, on its southwest corner. There were also faint line markings on the ground

externally, particularly around the vehicular access doors, demarcating vehicular routes around the building, and 'keep clear' zones.

5.109 Building 12 featured a number of power fittings on its exterior. Two modern halogen spot lamps were fixed to the walls just above the window line on the northern elevation, and connected to metal cable ducts (possibly original). A further two halogen lamps were fitted to two of the brick pillars on the eastern elevation, as well as a fuse box at the south east corner of this wall. The south elevation similarly featured three halogen lights, as well as a period bell and a later alarm box, fitted at various points above the upper windows. On the north elevation, there was a metal bracket for a telephone line on the northeast corner pillar, and a wall-mounted box related to this purpose.

Plate 28: Area 12A, looking south-east toward the central vehicular access door and partition wall. Note down-pipes from valley gutters connected to RSJs, and integrated radiator panels in the roof space

Interior

Form

5.110 Internally, Building 12 was divided into two large areas (A and B) by a partition wall running north-south, positioned directly to the east of the central opposing large access doors on the north and south elevations. The building featured a concrete slab floor throughout.

5.111 The internal space to the west of the partition wall (Area 12A) measured 35.84m (117'7") (west-east) in total, slightly larger than the eastern area (12B). It was predominantly an open,

rectangular space (Plate 28). The area to the east of the partition (Area 12B) was generally open plan, measuring 27.6m (90'6") (west-east) in total.

Plate 29: concrete RSJ foundations with remains of down-pipe on south side

5.112 The roof above 12A was supported by nine trusses, with the fourth truss from the east further supported along its length by six I-section RSJs, with down-pipes from the valley gutters affixed to all but the northernmost beam (the valley gutters lie at the mid-point between the RSJs, and the down pipes connect horizontally to the southern RSJ, before descending vertically to the floor - Plate 29). In 12B, seven trusses supported the roof, with the sixth truss from the eastern wall supported along its length by five evenly spaced I-section RSJs, in a mirror arrangement to that in Area 12A (Plate 31, Figure 13).

5.113 During the watching brief, the removal of the concrete slabs identified that the down-pipes connected to sub-floor drains which exited to drains running around the outside of the building (visible as brick man-holes). The concrete base of each RSJ was connected by a brick wall foundation, which provided lateral support and prevented movement of the pillar. The brick walls and manholes included Hotspur Rustic bricks, which were manufactured near Backworth (north Tyneside) in the 1930s; production of these ceased immediately after World War 2[11].

5.114 Along the western wall was a raised platform, supporting a series of offices. The platform was supported on eleven brick columns, with timber joists running perpendicular to them, and accessed by timber steps at either end. The brick columns extended 5.33m (17'5") out from the west wall. The area beneath the platform was seemingly used for storage; areas of this storage

[11] http://www.penmorfa.com/bricks/england10b.html; Davison 1986, 52

space were accessed through mesh gates. The recording of foundations for these brick divisions during the watching brief indicated their originality in the structure, though it is possible they were installed at a later date with a new floor surface. The foundations measured 5.45m long by 0.30m wide and survived in excess of 0.75m in height. Identical foundations were also noted along the east side of the building (12B), and it seems likely that a similar structure originally existed along the east side of the building also. East Boldon, in contrast, did not contain any evidence for platforms; it is unclear, therefore, whether these were common in 'main stores' during WW2 generally or a later post-war addition during the REME occupation.

Plate 30: the western end of Building 12, showing the raised platform supported on brick columns, with wood and plasterboard office walls above

5.115 Area 12B also featured three smaller ground floor level offices, in the northwest, northeast and southwest corners of this internal area (Plates 30 and 31). The offices were constructed with timber frames, plasterboard and simple, single pane windows, and did not reach ceiling height (having their own panelled ceilings). The offices were not of uniform size; the northwest sub-division ('Medical Repair Office Store') measured 11.16m (36'7") by 6.37m (20'10"), the northeast 'Goods Outward Office' measured 3.06m by 6.12m and the southwest division ('Goods Inward Office') was 8.98m (29'5") by 3.56m (11'8"). There was evidence of a further internal feature, discernible by the surviving concrete plinth and differing wall surface treatment in this area. It may have incorporated machinery, as it lay adjacent to a control panel on the wall adjacent to it. The base measured 17.89m (58'8") (north-south) by 5.83m (19'1"), and would appear to have been a later addition, installed after the blocking of ground-floor replacement windows. The 1978 survey indicated this as the position of a 'proposed cold store'

and it is possible this was built after the Area Health Authority took over the building (KILL/REME/DEP/QS).

Plate 31: the internal feature in the south-east corner of area 12B (above), and 'Goods Outward Office' in the north-east corner (below). Note hot water pipes entering building to right of plate

5.116 All the buildings were built prior to the Area Health Authority tenure of the site. However, the

positioning of windows observed externally, and their alteration, seemingly respected the internal divisions described above (for instance, Plate 21). This indicated that the ground floor internal office divisions were not original, and windows were subsequently lowered or blocked in response to the new lighting requirements of these internal spaces.

5.117 On the Area Health Authority plan, the *'Goods Outward Office'* in the northeast corner of 12B, featuring two radiators connected to the general heating system, and the *'Goods Inward Office'* on the southern side of the building, were recorded as '*existing offices'*. The '*Medical Repair Office'* was recorded as machine shop (KILL/REME/DEP/QS). The construction of these offices must therefore have originally had a military function.

Plate 32: the office in the north-eastern corner of area 12B, showing the ground floor windows in the external wall, radiators within and the modern Area Health Authority signage

Features

Partition Wall

5.118 The main partition wall dividing areas 12A and 12B reached the height of the roof truss, but would have offered negligible structural support, and comprised brick columns and panels, similar in construction to the external walls (Plate 28). It is likely that this partition wall was not original, but was added to the building, perhaps during the post-war period; the overhead radiators pass through the wall in a way which suggests they predate the wall, and no foundations were observed for it in the watching brief, discounting it as an important structural feature. The comparable building at the East Boldon depot shows no evidence of this partition.

Furthermore, later electrical fittings were incorporated into this wall, suggesting a later date for its construction. Two large doorways enabled passage between the two resulting large, open spaces – see below.

Doors

5.119 There were two doorways in the main partition wall, enabling access between the two large internal areas (Plate 28). These openings measured 2.42m (7'11") wide (the northernmost door) and 3.26m (10'8") (the opening to the south). At the time of the survey, the southernmost door had a metal frame inserted, and a rubber screen. The door to the north was left as an open archway. Additional brick columns reinforced the brick panels either side of each doorway. Above each opening was a timber/plasterboard screen, rather than brickwork, suggesting that previously the spaces in between the brick columns may have been entirely open.

Windows

5.120 The interior of the building was lit by 12 long roof lights above (Plate 1), as well as numerous windows in the walls. The alterations to the original upper level windows, which were observed externally, are largely explained by the internal layout and the changes to this over time.

5.121 Where later partitions have been added, such as the *'Goods Outward Office'* in the northeast corner of 12B, upper level windows have been replaced by those at ground floor level to deliver light directly into these spaces. On the west elevation, many of the original, upper level windows remained, as these were suitable for providing light to the raised offices internally. Upper level windows also remained in situ to light the larger, open spaces.

Roof

5.122 Viewed internally, the roof was supported by 17 metal trusses spanning the space between the north and south walls (Plate 28). Each truss was formed by six joined tri-bearing trusses (or five, for the eastern portion of the building), creating the multiple roof ridges and valleys observed externally on the east and west elevations. These trusses were further anchored by metal beams running west-east.

5.123 Presumably, this roof design was deemed the most appropriate for such a large building span; it also used simple constitutive elements present in other buildings throughout the site. Furthermore, this roof design supported the use of roof lights in each roof slope (as seen on a number of other buildings on the site, see above). The provision of such a number of windows, in addition to the original high level windows on each elevation, indicates that Building 12 was originally dependant on natural lighting.

Evidence of Fittings and Fixtures

5.124 Some signage remained at the time of survey. The office in the northeast corner of the area east

of the main partition held a sign which read *'Goods Outward Office'*, whereas that in the southwest corner read *'Goods Inward Office'*. The larger subdivided area in the northeast corner of this space had a wider door, above which a sign read *'Medical Repair Office - Store'*. These signs date to the use of the site by the Area Health Authority (Plate 33). However, a further sign had been revealed (seemingly by fire, where the paint overlying it had been burnt away), above a doorway on the raised platform at the western end of the building. This was different in style to those described above (printed directly onto the wall), and read *'Production Control'* (Plate 33). It is possible that this sign - and the raised offices - were original features. There were also faint markings on the concrete floor of Building 12 (similar to those observed externally), presumably demarcating safe pedestrian/vehicular routes through the building.

Plate 33: an earlier sign, possibly original, above one of the doorways on the raised platform to the west (left), and a sign which dates from Area Health Authority occupation

5.125 The building featured a number of electrical and mechanical fittings internally, relating to its previous uses. Seemingly, the building was extensively heated for its original function. The heating system would have been fed directly from Building 10 (see above), to the east; pipes connecting these two buildings survived at the time of survey (Plate 34). Large overhead radiators, with metal insulation above, spanned the length of the building east-west. These were positioned beneath each roof light, and secured to the top chord of the roof trusses. More modern heating had also been installed, in the form of convection heaters at various locations suspended from the roof. These were connected both to the original water heating system, as well as to electrical power. There were, in addition, two iron radiators in the *'Goods Outward Office'* (in the northeast corner of 12B), situated below the ground-level windows. It is not entirely clear why this building was so extensively heated, but presumably dry conditions were needed for the maintenance of the vehicles and guns.

5.126 In addition to more modern overhead heating, there were also a number of other non-original electrical fittings. The main switch board (a 'DENNIS' mains switch) was located centrally on the partition wall (Plate 35). There were plug sockets situated on some of the I-section RSJs; these were not modern in style, but it is unlikely that they were original to its war-time usage. Electric strip lights had also been installed in the roof space probably during the Area Health Authority tenure.

5.127 In addition to this, the room in the northwest corner of area 12B (*Medical Repair Office - Store*) featured a winch in its northeast corner. This was a modern addition, seemingly dating to Area

Health Authority site occupation, though may have been installed during its military occupation when this section of the building was recorded as a machine shop.

5.128 Iron railings were present, at the time of survey, in two locations in Area 12B. First, there were railings parallel to the wall east of the southeastern lift mechanism. Second, railings positioned perpendicular to the eastern wall separated the heating pipes from the former machine base (Plate 31).

Plate 34: the ends of the overhead radiators, connecting to the heating system (left) and the main heating pipes entering the building to the east, from Building 10 (right)

Plate 35: one of the door lift mechanisms (left), the main switchboard (centre) and some electrical sockets installed on an I-section beam

Plate 36: the north-west corner of Building 14, showing the blocked pedestrian doorways on the northern elevation, and the vehicular access door to the west

Building 14 – Fire Station

Function

5.129 Building 14 was a large vehicle garage, and dates to the original construction of the depot c. 1938 (Figures 14 and 15). The building evidently altered in use during its lifetime. The original construction appears to have housed a fire engine or tender. This is evidenced by the large vehicular access door in the west wall, and a series of side entrances, which appear to have been designed to allow the movement of a significant number of people into, or out of, the building with some haste. Given the layout of the building, and the original use of the complex as an ammunition depot, its use seems logical. In 1939, there was no Army Fire Service, with only six separate garrison fire brigades, and smaller individual units under the control of the RAOC and RASC in their depots. The larger depots would have had a dedicated fire engine, but smaller depots may only have had a trailer pump, which would have had a unit vehicle to pull it. At the start of the war, there would not have been a full-time fireman, though it is possible that the Territorial Army may have employed a civilian in the role. After mobilisation, with more military on site, there would have been a fire piquet, as part of the soldiers' duties, which involved training and practicing fire drills (Baxter *pers. comm.*). Some of the other ammunition depots examined clearly had similar provision for emergency vehicles, though an exact comparison to this building was not found. A plan of Solihull AAOD has a building marked '*garage*' on a plan from 1950 of comparable dimensions, but this now no longer exists. Both Hadleigh AAOD (Suffolk) and East Boldon AAOD had double garages for emergency vehicles,

seemingly to house two appliances side by side; of these, only the East Boldon example still survives.

5.130 The post-war REME occupation saw a change in use to the building, perhaps reflecting a shift from the supply of ammunition and guns to vehicle maintenance only. The side entrances were bricked up, and a dividing wall separated the rear of the building forming a new room. The shortened garage space was provided with ventilators at roof height, and fans just above floor level. A new extension was built along the southeast and east sides, which appeared to have provided changing facilities for civilian staff, and housed an oil-fired boiler and generator for power provision, associated with a small bunded fuel tank (Building 13).

Plate 37: the southern elevation of Building 14, showing the later extension to the east

Exterior

Form

5.131 The building structure was aligned east to west and lay to the southeast of Building 12. It was originally constructed as a single-storey, rectangular building, approximately 23m by 8m (75′ by 26′) in size, and 6.1m high (20′), to the ridge. This original building stood on a concrete slab foundation.

5.132 Externally, the original building was divided into six bays on its north and south sides, again defined by brick pillars (Plate 36). The easternmost five bays were nominally 12′ wide, each with a pair of opposed pedestrian doorways set into the north and south elevations. In both elevations, the slightly larger western bay was 15′ wide and contained no doorways. There was one much larger doorway, presumably for vehicular access, in the west gable end (Plate 36).

5.133 The roof of the original building was ridged with gables at the east and west ends. The east gable end of the original building had an external projecting chimney offset to the north of the

central brick pillar. The upper part of the gable wall, including pillar and chimney, was cement-rendered. Much of this elevation was obscured by the later extension.

5.134 At some stage after 1948 (but pre-1950 – see below), a flat-roofed L-shaped extension was added to its southeast corner (Plate 37). This measured 11.01m (36′) (east-west) by 10.23m (33′6″) (north-south) and extended out from the original building by 3.71m (12′2″) to the south and 3.29m (10′9″) east. The extension stood 3.05m (10′) high. It had one door on its west elevation, and a further two providing access to separate rooms on the east wall. This extension appears to have been added when the building was converted for use as a garage, when the site was occupied by REME. These extra rooms housed a boiler and a workshop.

Features

Brickwork

5.135 The brickwork, in stretcher bond, was of the zigzag decorated type used in most of the other buildings in the depot. In contrast, the extension was built in English bond of textured-surface brick, with two apparent phases of construction.

Plate 38: the western elevation of Building 14, showing the reinforced door surround

Concrete Foundation

5.136 The original structure had been built on a concrete slab foundation which mirrored the footprint of the building. The top of this foundation was chamfered out 3 inches beyond the brickwork on

all sides, excepting the pillars where it was flush (Plate 38). This detail did not extend to the more recent part of the building.

Doors

5.137 The original building seems to have featured one large opening for vehicular access, and five pairs of opposing doors on the north and south elevations. Many of these pedestrian doors were blocked when the survey was undertaken (Plate 36). There were an additional three doors on the west and east elevations of the later extension.

5.138 The west elevation of the original building was dominated by a pair of blue-painted wooden doors, 3.96m (13′) high and 3.35m (11′) wide, positioned centrally in the wall (Plate 38). The doors reached to the height of the wall heads and were presumably this size to allow vehicle access. The central brick pillar beneath the ridge terminated at the top of the door jamb, which consisted of a precast lintel flush with the wall, and two I-profile steel girders projecting forward of the wall-line. These were supported on brick pillars either side of the door aperture. The pillars, in plain brick, seemed to have been later additions, suggesting that the steel girders were also secondary, presumably to strengthen the doorway.

Plate 39: the door plate from the sliding vehicular access doors

5.139 The doors were timber built sliding doors, fitted with rollers and designed to slide along the inner face of the gable wall on tracks fitted above and below the doors themselves. Each door had an external steel fitting screwed or riveted to the wood at the corners, which were the mounting plates for the roller mechanism (Plate 39). The lower outer plates were the largest and were marked 'HENDERSON' '102 PATENT'; Henderson refers to P.C. Henderson of Barking,

Essex, who manufactured sliding doors from 1921[12]. The former position of a small pedestrian access door (now sealed with unpainted wooden planks) was visible in the southern door.

5.140 It seems that this large opening was almost certainly original. The concrete footing that surrounds the rest of the building was missing from this doorway, and the concrete lintel above the door is common to others thought to be original on site.

Plate 40: (left) brick patching on one of the southern pedestrian doors. (Right) interior view of same door

5.141 The pedestrian doorways, five on each side, were mostly bricked up. With the exception of the westernmost example, each of the six bays of the north and south elevations originally had an entranceway located against its west column. Of the five original pairs of opposing doors, seven doors were blocked with brickwork (with textured surface, in stretcher bond) at the time of the survey. The two eastern-most entrances of the north elevation remained in use, and the eastern-most door of the south elevation provided access to the later extension. The brick blocking had accommodated later fans above the top step, which in some cases had necessitated the cutting away of a section of the exterior top step to accommodate these. These had subsequently been removed, and the voids filled in, though some fans still survived internally.

5.142 These opposing doorways appear to be original, due to the placement of vents which appears to have been determined by the doors, and their concrete lintels which are uniform with others on site thought to have been preserved in situ. It seems likely that these openings originally held sliding doors; inward or outward opening doors would obstruct passage close to the building, particularly as the doorways are raised. The width of each bay is also approximately double the

[12] http://www.pchenderson.co.uk/company_history.php

width of the doorways.

5.143 Each of these entrances was raised above ground level, with access via a set of three concrete steps. The lintels were of grey precast concrete with large aggregate visible on the exposed surfaces. The most easterly entrance on the north elevation had a sliding door, made of riveted iron plate, moving along an external metal track attached to the wall at lintel height, and another level with the top step of the entranceway (Plate 42). The other doorway on this elevation contained, at the time of survey, a reused metal door within a wooden frame, which in turn has been inserted into the original door-frame in order to reduce its size. Three bricks at the east side of the frame have been replaced and may indicate the positions of hinges for the earlier door. The southern elevation contained a metal door, which may have been original.

Plate 41: the later extension on the south-eastern corner of Building 14

Windows

5.144 There were no windows on the walls of the original building block, only two extended roof-lights, one on each roof slope (see below). The extension had four evenly sized square windows along its south elevation (Plate 41). There were a further two windows, of unequal size, on the east elevation and one very small rectangular window on its north. All of the windows featured pre-cast grey concrete lintels and projecting sills of edge-laid header bricks. A sheet metal ventilation cowl had been fitted to the wall above the southern window on the east elevation. All openings had been covered with sheet metal or plywood.

Roof

5.145 Externally, the roof was covered with corrugated asbestos-cement sheets and each roof slope contained a continuous row of roof-lights, running for nearly the full length of the building and situated mid-way up the slopes (Plate 41). The ridge tiles and fascias of the roof were similarly made of asbestos cement. Four galvanised ventilation stacks were located near the ridge line of the roof, positioned in pairs. They were square-sectioned, with pyramid-shaped cowls. The roof of the L-shaped extension was flat and appears to have been similar in construction to that of Building 10.

Vents on Original Building

5.146 There were air bricks, or vents, on the north and south elevations located in each of the bays of the building positioned approximately mid way between the doorway and the eastern column (Plate 37). These were at a low level, four brick courses above the chamfered concrete footing (approximately 1m above ground level). There were no vents on the west elevation, but there were two air bricks positioned centrally within the bays on the east gable end (obscured at the time of survey, externally, by the extension). The vents on the original building corresponded in style with those observed on Building 4.

5.147 On the north wall, the position of the airbrick in the eastern-most bay was hidden by the sliding door and the adjacent one has been removed and patched with brick. Three other patches of later brickwork were visible at the same height as the airbricks, including one within the central entranceway of this elevation (blocked).

Vents on Extension

5.148 There were ten air bricks on the southern wall of the extension. Five of the vents were positioned just below the flat roof and the other five in line with these, but just above the foot of the wall. They were located evenly between the four windows. There were two further vents, again vertically aligned to one another, positioned in line with the southern edge of the southern-most window on the east elevation (see Plate 41).

5.149 All of the extension vents were uniform in design. These varied from those on the original building, being equal to only two brick courses in height and one brick in length.

Evidence of Other Fixtures and Fittings

5.150 The western four bays of both the north and south elevations each featured a pair of flat steel brackets fixed to the wall at approximately lintel height (Plate 37). Two of these on each elevation overlie the blocking brickwork, demonstrating that they were a later addition. A number of small patches of cement on the wall may indicate the former positions of other brackets but these do not form a regular pattern. The brackets may indicate the positions of internal fixtures added when the original function of the building changed. In the western bay,

on the south elevation, there was an additional vertical steel bracket above a lead water pipe which projects from near the base of the wall into the ground.

5.151 On the north elevation, an electric cable exited from lintel height in the second bay from the east, running into the ground. Two down-pipes from the roof gutters were also attached to brick pillars close to either end of the building. The western example was original; the eastern had been replaced in plastic.

Plate 42: (left) inside Building 14, looking west towards the sliding doors. (Right) surviving sliding door on the easternmost opening in the south wall, with later blocking wall to right of photo

Interior

Form

5.152 Internally, the original building was a simple rectangular room with a concrete floor and a ridged ceiling supported by four metal trusses centrally (Figure 13), and the brick walls with central columns at either gable end. There was evidence for all of the openings observed externally. The five pairs of opposing doorways, although blocked, were each accessed via two concrete steps from internal floor level. A pipe ran around the north, east and south walls of the building (missing only from the western wall due to its large doorway) positioned just above these doorsteps, with a corresponding pipe just above the tops of the walls; these appear to have served radiators, which had been removed at the time of the survey. The radiators post-dated the blocking walls, and also extended into the new extension. Various other fittings, and evidence thereof, represent the development of the building following its original function.

5.153 At the time of the survey, the eastern bay had been divided off with a breeze block partition (Plate 42), and access was no longer possible from the main building interior. This appears to have occurred sometime in the late 1940s, as evidenced by the internal fittings.

Plate 43: inside the later extension, looking east. Note radiator fittings on wall (left)

5.154 The later extension was divided into three rooms. The first comprised the southern rectangular section of the newer building, its northern boundary following the southern wall of the original block. The northern area of the extension was divided into two further rooms, partitioned east-west, of approximately equal size. Both smaller rooms seemed to have housed machinery; a boiler was observed in the northern space during internal survey, as well as two concrete machine bases in the other, probably for generators. These two smaller rooms were accessible only through their respective doors on the east elevation. The larger room was accessible both through the door on the west elevation of the extension, and through the easternmost pedestrian doorway in the south wall of the original building. The floor and ceiling were concrete throughout the extension.

5.155 The larger room of the extension appears to have been used as a changing facility (Plate 43). There were sink brackets close to the double doors, and further brackets for radiators, with a drain adjacent. There was also a low bench, one section against the room's north wall, and another extending around the walls of the eastern half of the room. This simply comprised wooden boards on brick supports. It is possible that the adjoining room (originally the sixth bay of the main building) contained lockers. Coat pegs and possible further sink brackets survived in this room. The door between the extension and the main building was a secure metal door (Plate 42) which would seem unnecessary for this purpose. Therefore, this door may be one dating from the building's designed function.

Features

Roof

5.156 Internally, the roof exhibited the same structural elements encountered in the other buildings on site. Brick columns supported the roof load at each gable end, with four metal Fink trusses (spanning north-south) absorbing this load along the building's length, each built into a brick column at either end. Two roof lights, one on each slope, extended the majority of the buildings length. The metal framing securing the roof lights effectively formed two purlins on each roof slope; this framing, along with the trusses, appears to have been a stock structure used throughout the site. At the time of the survey, these roof lights were covered with wire meshing. There were two further roof lights on the southern slope, one to the east of the westernmost truss, and the second directly east of the truss second from the eastern gable. These appeared to have been later additions, and the one to the west had been re-covered externally with corrugated roofing.

Plate 44: (left) the northernmost room of the later extension, the boiler room, looking south-east. (Right) a flameproof switch plug in Building 14

Evidence of Other Fixtures and Fittings

Boiler and Machine Bases

5.157 Within the northernmost of the two small rooms was a further '*White Rose*' oil fired boiler,

which was contemporary with the boilers in Building 10 (see Section 5.77). The oil was supplied from exterior bunded fuel tanks, the brick mounts for which were visible immediately to the east of the building. The oil was supplied to the forced draught burner at the front of the boiler. Heated water exited from pipes at the top, which connected to the pipework feeding the radiators in the building (see above). The boiler vented to a brick chimney, which appears to have been added at the same time as the extension to the building itself (it lies off-centre to the gable, against one of the brick pillars). The boiler was also connected by pipework to a hydro-electric dynamo, which clearly provided some electricity to the building. In the room to the south, two machine bases were identified, perhaps for generators, which may have been powered by this boiler, or may have been additional (perhaps diesel-powered) backup plant. The bases comprised large rectangular concrete blocks, with timber mounts attached. Any evidence for generators had been removed by the time of the survey.

Electric Heating and Lighting

5.158 As for the other buildings studied on site, it was clear that Building 14 did not have either heating or electricity when constructed; its sole lighting provision consisted of roof-lights. Evidence for both heating and lighting was identified at the time of the survey, but this was clearly a later addition due to the positioning of radiators and electric light fittings over blocked pedestrian doorways, and on the later partition wall, or positioned respecting this division. Electrical fittings were similar to those found in other buildings. It is likely that these fittings were installed when the extension, which housed a generator and boiler providing power and heat to the building, was constructed. This clearly occurred in the post-war period – the extension does not appear on the aerial photographs of the complex (Plate 2).

5.159 The survey identified a number of switches and sockets, cable conduits and fuse-boxes during the survey. The earliest fittings appeared to be a series of '*flameproof switchplugs*' and '*flameproof switches*' manufactured by the Walsall Electrical Company Ltd (stamped '*Walsall*'); these were mostly located in the northeast corner of the main room, and were positioned on the later breeze-block wall sub-dividing the eastern end of the building. The Walsall Electric Company Ltd was an electrical engineering company founded in 1884 in Walsall, West Midlands. The company went into liquidation in 1933, but managed to revive its fortunes, and on the 30th September 1949 registered the '*Waltric*' trademark[13], which was used on its products[14]. The absence of this trademark on the switches and plugs implies a pre-1949 date for their installation, and suggests the modifications to the building occurred between May 1948 (the date of the aerial photograph – Plate 2) and September 1949. The electrical circuits were evidently expanded and replaced throughout much of the 20th century.

[13] http://blackcountryhistory.org/collections/search/?q=waltric&cb_submit=Search
[14] http://www.historywebsite.co.uk/articles/Walsall/industry1.htm

Other fittings and signage

5.160 Various signage remained on the interior of Building 14, the majority of which was safety signage. There was an 'Emergency Exit' sign to the west of the remaining pedestrian entrance to the original building space on the northern wall. In the smaller rooms of the extension, there was a sign below a fire alarm, reading *'In case of fire strike knob'*.

5.161 A simple wooden cupboard, containing five shelves, had been installed over the blocked doorway second from the west on the south wall. Its height was approximately half that of the original doorway.

Plate 45: (top) the eastern elevation of Building 16, featuring two entrances. (Bottom) equivalent building at East Boldon, facing north-east

Plate 46: the north-east corner of Building 16

Plate 47: the rear extension, and the chimney, on the western elevation

Building 16 – 'A3'

Function

5.162 Building 16 was an original (c. 1938) building in the western side of the depot (Figures 16 and 17). In contrast to the other buildings in the depot, the building did not have an evident storage or utilitarian use, and the building must have served as the main administration block for the

depot, staffed by junior officers, along with Building 17 (the commanding officers' block), which lies directly adjacent to it. The interior included parquet flooring, and was provided with fireplaces, in contrast to the more functional buildings elsewhere. An identical building was seen at East Boldon (see Plate 45).

Exterior

Form

5.163 Building 16 was orientated north-south, and was a single-storey brick structure. It was essentially rectangular in shape, but had a small brick projection on the west wall and a wooden porch protruding from the east wall. The brick-built block on the rear of the building (Plate 47) measured 2.65m by 1.75m (8'9" by 5'9") in size, and 2.1m (6'9") in height. This was not present on the 1948 aerial photograph, and was therefore a more recent addition, although it was built in the same brick as the remainder of the building.

5.164 The east elevation formed the front of the building, featuring two doorways, both of which were flanked by windows (Plate 45). There were four windows in total on this elevation. One of the doorways was located within a wooden porch, which projected from the eastern wall by 1.29m (4'2") and measured 2.44m (8'0") in width; this appeared to be contemporary with the structure. Further windows were located on the north and south gable ends.

5.165 The roof was ridged and gabled, and featured a square brick-built chimney approximately half way along the western side of the roof; this appeared to have been reduced in height and capped with cement.

Features

Brickwork

5.166 The walls of Building 16 did not feature the external brick pillars seen on many of the other buildings, but were again built of the zigzag decorated brick, in stretcher bond. There was a strip of cement rendering over the lowest course of exposed brick. A line of header bricks was visible in alternate courses of brick, running up the wall approximately half way along the structure (Plate 45). Internal inspection confirmed that, as with other buildings on site exhibiting this feature, this was the location of an internal wall keyed into the brickwork in the east wall.

5.167 The western elevation exhibited four small repaired holes in the brickwork (Plate 47); the reason for these repairs was not clear, but may just have been patching of failed bricks.

Roof

5.168 The roof was covered with corrugated asbestos-cement sheets, and the ridge tiles and fascias of the roof were made of the same material. It had wooden weather-boards along its eaves and gables. A stout, square chimney was positioned approximately midway along the western roof

slope, at a low level close to the fascia; the chimney was not visible from the front of the building, and looked to have been reduced in height and capped with cement (Plates 45 and 47).

5.169 The rear extension on the west featured a flat concrete slab roof, covered with bituminous waterproof sheet.

Windows

5.170 Building 16 had seven windows in total, all with metal frames. Four of these were located on the east elevation, with a pair flanking each door. None of the windows were of the same size. Those flanking the main entrance measured 1.03m (3'4") (north) and 1.14m (3'8") (south), and those either side of the southern entrance measured 1.05m (3'5") (north) and 0.59m (1'11") (south). The northern gable end featured a single window, with a width of 1.09m (3'6"). Two windows of unequal size were located on the southern gable, the largest measuring 0.97m (3'2") on the west, and the eastern window a width of 0.69m (2'3"). All the windows have precast concrete lintels and sills of flat ceramic tiles.

Doors

5.171 The main door, to the north of the east elevation, was enclosed within the projecting wooden porch (Plate 46). The door for the porch was on its southern side, and its eastern wall was dominated by a large window. This was a similar design to the screen on Building 17. The southern door on the east elevation shared a common concrete lintel with the windows either side of it. The doorway had an external concrete threshold step. In terms of function, the northern door appeared to be 'main' door to the building, and led into a reception area (see below); the southern door, which led into a vestibule, appeared to be the 'back' door.

5.172 The rear projection had a wooden door on its western wall, the brick door-surround of which projected slightly from the surrounding porch wall (Plate 47).

Evidence of Other Fittings and Fixtures

5.173 On the east elevation, down-pipes for the guttering were located at the corners of the building (Plate 47). The south elevation also featured a plastic overflow pipe just below the ridge line and a metal pipe projecting from the cement rendered strip, emptying into a drain. To the south of the southern door on the eastern elevation, there were a number of pipes exiting through the brickwork (seen in Plate 45).

5.174 Building 16 featured a number of airbricks, an element common to nearly all buildings on site. The east elevation featured five air vents of single-brick size (Plate 45). Three were at ground level, one at either end of the elevation and one between the two doors. A further two were located at the top of the wall at either end, vertically aligned with their ground-level counterparts. The west elevation similarly featured two airbricks at near-ground level. Both

gable ends featured two airbricks of the same size, close to ground level.

5.175 There were two identification marks, as seen on other buildings on site, each featuring a black 'A3' in a yellow circle (Plate 46). These were located one on the northeast end of the east elevation and the other to the east of the north elevation, both at the same height, approximately 1m (3'3") from the ground. Alternating yellow and black chevrons were painted on the brickwork at the bottom of the northeastern corner, a safety feature common across the whole site.

5.176 On the west side of the building, there was a concrete slab c. 3.5m (12' 6") by c. 1.6m (5' 3"), located south of the rear projection (Plate 47). This corresponded with a black wavy line at the height of the porch roof showing the position of the corrugated roof of a lean-to structure, visible in the 1948 aerial photograph (from which the later extension is absent).

5.177 A section of the east elevation, to the south of the vertical line of header bricks, exhibited a brick colour distinct from the rest of the building (Plate 45). It is likely that this section of the wall has been covered for a prolonged period. This was supported by the existence of a horizontal plank affixed to the wall across the width of this area, to which a larger cover may have been attached.

5.178 An electric light was located just below the eaves near the building's north end and a metal light switch inside the porch. The addition of the rear extension, probably c. 1950, may coincide with the modernisation of the electrical network on the site (see below).

Plate 48: the main reception area; angled fireplace (now blocked) in the corner; doorway leads to southern half of building (compare with Plate 49)

Interior

Form

5.179 Internally, Building 16 was divided along its length (north-south) into three main rooms. In addition to this, the porch (to the east) and projecting block (to the west) were additional discrete interior spaces.

5.180 The northern and middle rooms were of a similar size, and were joined by a door in their

partitioning wall. Both had parquet floors and panelled ceilings, identical to the interior of Building 17, which was also served an office function. The northern room was lit by two windows, one in the north wall and one in the east. There was a safe in the northwest corner (Plate 50), which suggests this room was occupied by a senior clerical officer in control of the depot's finances and administration. The central room was accessed through the main entrance porch and lit by a window to the south of this; this room appears to have served as the main reception to the depot. It had a fire place in its southwest corner, the chimney breast cutting the corner of the room diagonally. This placement of fireplace was identical to the arrangement seen in the equivalent building at East Boldon (Plate 49).

Plate 49: the main reception area in the admin block at East Boldon

5.181 The southern room was much larger, and lit by a window in its east wall, and the larger window in the south gable. The southeast corner of the room was subdivided into a vestibule - accessed through the southern door in the east wall - and a toilet. The two smaller windows of the southeastern corner of the building provided light to this smaller room. There was a loft hatch in its ceiling, above the sink area. The other side of the chimney breast cut diagonally across the northwest corner of the main room. This room featured the same panelled ceiling as the others, but timber and linoleum flooring. The windows were all metal casements, in the same style as those in Building 17.

5.182 The rear extension housed a number of switch boards, electrical equipment and wiring, and had

a concrete floor and ceiling (Plate 52). This room was accessible only through the door on the western elevation, not from the interior of the main building.

Features

Doors

5.183 The main entrance into the porch on the eastern elevation was a timber planked door, in the same style as the door into the rear extension (Plate 47). The doors into the office itself, and the southern door on the east elevation, were both panel doors. A modern door was in place in the dividing wall between the two northern offices.

Fire Places

5.184 In plan, the chimney breast formed a triangle, divided in half between the two southern rooms of Building 16. The fireplaces had clearly undergone considerable alteration; both were blocked at the time of survey, with a few surviving features. In the smaller, central office, a concrete hearth remained (Plate 48). The walls containing the blocked fireplaces were occupied by shelving and a modern heater affixed onto the wall. The fireplace in the larger, southern room had a surviving timber mantle, but no hearth was observed. Again, an electric heater had been installed. The skirting board bordering the entire interior included the blocked fire places, evidencing refurbishment in at least one phase.

Plate 50: the northern room, looking north towards the safe

Safe

5.185 The northern office featured a large safe, located in its northwestern corner, built into a concrete boxing about half the height of the room (Plate 50). The safe was accessed through a small, square door on its southern face, hinged on its right, with two separate brass locks. A small sign above the door reads *'Birmingham Safe Co. Ltd., Birmingham, Supplied 1938'*. This dates the safe as a likely original feature, and substantiates the use of these rooms as offices/administrative quarters.

Cable Box

5.186 The central office featured a plasterboard box approximately midway along its western wall (Plate 48). It measured 0.67m (2'2") out from the wall, and the same distance in width. The skirting board running around the room (including over the former fireplaces) continues around this feature. The top lifted off this box and inside were insulated cables travelling from the foot of the west wall into the floor. The floor of the small box was concrete, suggesting the parquet was either later, or had to be cut away when these wires were installed. The later skirting was absent from the wall behind the box, and an earlier tile border was visible, confirming the refurbishment of the office. The tile border was similar to the example seen in the basement of Building 10 (Plate 18).

Wall Scar

5.187 A vertical relief feature was observed in the surface of the wall, just south of the cable box (see above) in the central office (Plate 48); a further possible scar lies adjacent to the fireplace as well, though this was much fainter. It is likely that this represents the position of a former internal wall or partition. Due to the small size of this room, this was probably built-in storage rather than a partition wall. At East Boldon, there was an opening in the wall adjacent to the fireplace (Plate 49), in a similar position; it is unlikely, however, that there was opening in the wall here, as there was no evidence at all for this in the exterior wall.

Evidence of Other Fixtures and Fittings

5.188 There was evidence of fitted shelving, in the form of wall markings and holes, in a number of areas of the interior. Modern shelves remained, at the time of survey, on the chimney breast in the central office (Plate 49).

5.189 Electric heating had been installed, over both former fireplaces, and below the window, on the east wall of the northern office. The wiring for this was affixed to the surface of the walls just above the skirting. Other electrical fittings were ostensibly modern, presumed to be replacements.

5.190 A sink, toilet, toilet roll dispenser and hand towel dispenser were installed in the room in the southeast corner of the building. A fire-prevention poster on the wall adjacent to the sink

appears to date to the 1940s (Plate 51). It would appear that most of the fittings were original, though the toilet may have been a later replacement.

Plate 51: fire-prevention poster, probably of war-time date

Plate 52: fire extinguisher bracket (left) and circuitry (right), extension, Building 16

5.191 The eastern extension to the building housed the electrical switchgear for the depot, the supply for which appeared to enter from west. Circuit diagrams in the extension from the Area Health

Authority tenure show how the network was arranged, and it would appear that the depot was electrified sometime after the mid 20th century. A number of the circuit boards and breakers looked to be 1950s in date, though most of the electrical switch gear was clearly a modern replacement. There was a military fire extinguisher bracket affixed to the door frame just inside the rear extension entrance (Plate 52). There was no sign of a fire extinguisher in the building. Similar fittings have been dated to the 1970s, and this style of extinguisher may originally have been vehicle-mounted.

Plate 53: east-facing elevation of Building 17, showing the main entrance, and blocked windows of the rooms either end of the corridor

Building 17 – 'A4'

Function

5.192 Building 17 was an original (c. 1938) building in the western side of the depot (Figures 18 and 19). The building was clearly designed as the commanding officers' block, and its position adjacent to Building 16 would seem to confirm this – the building included two private offices, fitted out in much the same style as Building 16. The larger office was likely to have been for the highest ranked officer and the smaller office a secretary, or an officer of lower rank. The enclosed porch or corridor offered sheltered space for these officers to observe activity in the yard around Building 12, but possibly also provided sheltered space for other officers to wait to be called into the offices. The depot at East Boldon included a similar two-roomed office building, in a location corresponding to its junior officers' accommodation; however, it is a

much simpler structure, and is stylistically closer to Building 16 than this building.

Exterior

Form

5.193 This building was situated immediately to the south of Building 16. It consisted of a brick, single-storey ridged structure orientated on a diagonal line (relative to cardinal points), northwest to southeast. The northeast (front) portion of the building was longer and wider, 9.79m (32') than the southwest (rear) part, 7.57m (25''). This longer section effectively formed a reversed, angular C-shape border around the front half of the building.

5.194 Roof slopes of different lengths at the front and back had produced gable ends (facing northwest and southeast) with asymmetric halves (Plate 54). The ridge, which is 4.0m (13') high, was positioned off-centre towards the southwest side and the northeastern roof-slope was longer than its counterpart. The roof was ridged and gabled, with a tall two pot chimney rising from approximately halfway along the ridge line.

Plate 54: the north-western elevation, showing the asymmetrical roof slopes. Building 19 can be seen to the right

5.195 The main entrance to the building was on the northeast elevation, demonstrating this as the front of the building (Plate 53). The central portion of this elevation comprised a wooden board and glass screen, forming an enclosed porch within. A further doorway in the southwest facing elevation, of the northwestern out-stepped section of the building, gave access to a small

storage area. There were two windows on the northeast elevation, on the brick walling at either end of the timber and glass screen. Two further windows, of unequal size, were positioned on the southwest elevation.

Features

Bricks

5.196 Building 17 was built in stretcher bond using the zigzag decorated brick common across the site. Exceptions to this were the southeast and northwest elevations. In each, there was a vertical line of header bricks, corresponding with internal partition walls. The same structural element was observed in the front (east) wall of Building 16. The same elevation featured two small cement repairs. Similarly, the northwest wall showed evidence of five brick repairs (Plate 54).

Roof

5.197 The roof was covered with corrugated asbestos cement sheets, and the ridge tiles were of the same material. The roof had wooden weatherboards under the eaves and gables, with the remains of guttering visible on the former during the survey. A number of asbestos sheets had been replaced with plastic.

Plate 55: The south-west facing door in the north-west projection of Building 17, giving access to storage

Doors

5.198 The main entrance was on the northeast elevation, within a screen which measured 6.58m (21'7") in length (Plate 53). This comprised a timber frame reaching the full height of the building, containing wooden panelling in the lower section and windows in the upper. The opening had a concrete base, the central quarter of which projected out forming a threshold. A central doorway, which originally contained a half-glazed door (removed at the time of survey), led into the porch.

5.199 There was a further doorway, which was southwest facing, located on building's northwest projection (Plate 55). This gives access to a 'walk-in' cupboard with a timber planked door, containing three shelves. The cupboard had a grey precast concrete lintel and a projecting concrete step.

Plate 56: the south-west elevation, showing the two rear windows, low level vents and chimney. Building 19 is to the left

Windows

5.200 Externally, four windows were observed on Building 17. There were two windows of equal size either side of the timber and glass screen on the northeast elevation (Plate 53). Both had a small concrete lintel and a wooden sill, differing to the windows of other buildings on site.

5.201 Another two windows were located on the southwest elevation (Plate 56). These were of differing widths, but both had pre-cast buff-yellow concrete lintels and, again, wooden sills.

Vents

5.202 The building featured a number of airbrick vents, in keeping with most other buildings on site. Each gable end had, on the projecting section, a larger airbrick about 2m from ground level, offset from centre away from the ridge. The other section of the northwest gable end also featured an airbrick the size of a single brick, two brick courses from the concrete foundation.

5.203 Three further examples of these smaller vents were observed on the southwest elevation at the same level and evenly spaced, however the two outer vents had been cemented over (Plate 56).

Evidence of Other Fixtures and Fittings

5.204 The southwest elevation featured a partly-ducted electric cable with a metal connecter. Fixings for a downpipe were observed on this elevation and also on the southeast elevation, but the downpipes were no longer in situ.

5.205 An identification mark, comprising a black 'A4' in a yellow circle, was painted on the building near its north corner while alternating yellow and black chevrons were painted on the brickwork at the bottom of this corner, a safety feature common throughout the site (Plate 54).

Plate 57: the enclosed porch, looking towards the L-shaped step and toilet room

Interior

Form

5.206 The main entrance on the northeast wall provided side access to a narrow corridor stretching northwest to southeast (Plate 57). This corridor formed an enclosed porch, with the external wall (northeast) consisting of wooden boarding and windows. At either end of the narrow corridor were two small rooms, the northwestern one was used as a toilet and the southeastern one as storage.

Plate 58: inside Building 17, looking south towards the central wall, and through the smaller of the rear windows

5.207 The internal wall at the other side of the corridor featured two further doors, one at either end, each providing access to an office. The offices were also joined by a door in their partitioning wall (which ran southwest to northeast). To the southwest of this door, either side of the partition wall, a chimney breast protruded into both offices providing a fireplace to each (Plate 58). To the front of each fireplace was a quarry tile hearth. The southwestern office was considerably larger than the other; this larger office also featured a storage cupboard accessed through a door in its southeast wall (Plate 59). A loft hatch in the northern corner of the panelled ceiling in this room provided access to the roof space. Each office was lit by a window to the in its southwestern wall delivering natural light directly. Both offices also had a window in their northeastern wall, which looked through to the corridor, indirectly lit by the windows in the northeastern screen. The floors of the corridor, storage space and toilet were concrete. In

contrast, the offices featured parquet flooring in a herring bone pattern (Plates 58 and 59). This alludes to the building's design for administrative use, rather than production or storage areas elsewhere on the site which consistently featured concrete flooring.

Plate 59: the southern office, looking south-east, towards doors to storage (left), the corridor (centre) and the office storage (right)

Features

Fireplaces

5.208 The chimney was located in the partitioning wall between the two offices, provided heating to both through a fireplace at each side. At the time of survey, the fireplaces were simple timber surrounds (Plate 58). The boarding on both fireplaces exhibited a break in the centre from where, in the smaller office, a metal flue pipe protruded. This suggests that the fireplaces were not open fires but more likely housed a small stove for each office. The sizes of the hearths in both offices support this possibility, these measured 0.7m (2'3") out from the chimney breast and 0.84m (2'9") across, with quarry tile borders. Given that the two offices shared this relatively small chimney (measuring 0.86m in depth between the two offices), it is likely that there would not have been space for an open fire on each side receding into the chimney

breast. The stoves are therefore likely to be original.

Doors

5.209 The door from the main entrance was missing from the screen wall at the time of survey, but hinge marks indicate that this opening was secured by a door. While the doors into the storage areas were uniform plank doors, the doors into the offices were plain timber doors with a square window occupying the top third, door knobs and two different locks (Plate 59). The office doors appear to have been later replacements.

5.210 To account for a raised floor level inside the offices and storage areas, there was a concrete step in an L-shape at each end of the corridor (Plate 57) which provided access to both the office doorways, and the storage/toilet doorways.

Windows

5.211 The windows delivering light to the office rooms were of uniform style, each with a number of rectangular glass panes set into a metal frame, a portion of which opened to allow ventilation. However, the windows were of unequal sizes. Those on the southwest wall measured 1m (3'3") and 1.52m (4'11") the former being the northwestern window, where those on the northeast wall measured 0.97m (3'2") and 1.45m (4'9").

5.212 The windows in the northeast screen wall delivering light to the corridor and, indirectly, the offices were in timber casing and of a slightly different style (Plate 57). There was one larger window directly either side of the door, and a narrow light above. Two further mullioned windows were positioned at either side of this. Looking towards the building from the front (southwest), the windows of the screen and internal wall were oddly misaligned, seemingly due to the unequal sizes of the offices. This could suggest that the screen was a later addition, but there was no evidence in the building fabric to support this contention.

Evidence of other Fixtures and Fittings

5.213 The small toilet facility in the room in the northern corner of the building featured a toilet and basin, hand towel dispenser and toilet roll holder. The latter was not of modern design; however the toilet may have been a more recent replacement. Pipes running close to the floor on the southeast wall of this room seem to be original, suggesting the toilet was a designed feature of this building.

5.214 The storage spaces noted above each featured shelving. The cupboard to the southeast end of the corridor had three rows of timber shelving, and the cupboard accessed from the exterior of the building featured similar. The storage room off the main office instead featured metal racking, presumably a later addition. The wall space inside the offices exhibited evidence of further fitted storage, for instance in the northwest corner of the larger office. A row of coat pegs also remained in the northern corner of the larger office.

5.215 There were a number of electric plug sockets located within the offices; one on either side of the chimney breast close to the door between the offices, as well as a number of light switches. It is unclear whether this building was originally connected to electric power. The placement of windows was intended to maximise and capitalise on light coming through the front screen, and it seems likely therefore that as much as possible electric lighting was not used. However, within this building the wiring for the lighting was enclosed within the wall in this building, compared to others on site where electricity has been added later, affixed to the wall's surface. Either way, the fittings were modern. There were, in addition, modern electric strip lights on the panelled ceiling.

Plate 60: the west elevation of Building 19, showing the unroofed extension sheltering the main entrance. Building 17 can be seen in the background to the left

Building 19

Function

5.216 Building 19 was designed as an ablutions block, containing four toilet cubicles, three urinals, two basins and a stove (Figures 20 and 21). The building was a simple, functional structure with very few features of note. It appears to have survived with little alteration since its original construction. The building is present on the 1948 aerial photograph, and is probably an original c1938 building, though it does differ stylistically to the known original buildings within the depot, in terms of the bond of the brickwork, and other minor features. Nevertheless, the provision of a large roof-light in the building would seem to indicate it was built during World

War 2.

Exterior

Form

5.217 This structure was located between Buildings 16 and 17 and consisted of a flat-roofed, single-storey brick building, 7.07m by 3.54m (23' by 11'6") in size and 2.82m (9'3") high. The main entrance, on the west side, was sheltered by an unroofed extension of the south wall out to the west and then north, forming an L-shape (Plate 60). This rested on a raised concrete slab base. The doorway itself had a grey pre-cast concrete lintel.

5.218 The roof, which was presumably constructed of precast concrete slabs, was covered by bituminous waterproof sheet and wooden weather boards around its edges. Internal natural light was provided by a large (now plastic) roof light.

Plate 61: the southern elevation of the toilet block; note blocked hole (centre left) for flue pipe

Features

<u>Bricks</u>

5.219 The walls of the building were constructed in English bond, of the zigzag combed brick (see above). The only exception to this was the shelter walling around the entrance, which was finished with a course of on-edge header bricks. The north and south elevations both had minor

cement patch repair; the south elevation included the (now blocked) exit hole for a flue pipe for a stove (Plate 61).

Drains

5.220 The north elevation of the building had two drains projecting from the wall near ground level. A non-period plastic gutter was affixed to the east elevation.

Evidence of Other Fittings and Fixtures

5.221 Additional features included a non-period electricity supply into the building via a wooden pole. On the northern elevation, there was a non-period external light and switch, and several minor repairs to the brickwork using cement.

Plate 62: interior of Building 19, looking west, with the toilet cubicles to the right, basins and dividing wall to the left

Internal

Form

5.222 Internally, the building comprised a simple rectangular room. On the northern wall, starting from the western corner, were four toilet cubicles of equal size, built in timber with partitioning boards and thin plank doors (Plate 62). A roof light was positioned over the two eastern-most cubicles, providing light to the entire interior. There were three urinals on the eastern wall. The southern wall featured basins, opposite the eastern-most cubicles. West of this, behind a brick

partition wall perpendicular to the south wall, was a stove. The small partition wall protruded from the southern wall by 0.7m (2'3"), as was finished on its northern end with a carved timber post matching those of the cubicles. The foot of the wall around the building's interior was tiled with a single row of square red quarry tiles (Plate 62).

5.223 The interior was originally lit through a large roof light positioned above the eastern-most cubicles, but electric lighting was added at a later date (probably in the early 1950s).

Plate 63: the stove on the southern wall, showing the small dividing wall to the east (left), and a covered switch inside Building 19 (right)

Features

Stove

5.224 A small stove was positioned in a corner formed at the apex of the southern wall and a perpendicular partition wall (Plate 63). The squat metal stove was built into a stepped brick surround, comprising alternating plain and horizontally scored bricks. This was asymmetrical, stepped only on its western side, and built into the small partitioning wall to the east. The stove surround measured 0.76m (2'5") in width (excluding the partition wall), and 0.4m (1'3") out from the south wall.

5.225 The flue for this stove appears to have originally exited through the southern wall, evidenced externally by a recent brick repair (Plate 61). This might indicate that the stove was not an original feature. Supporting this possibility further, the brick of the stove surround is different to

the brick of the rest of the building including the dividing wall into which the stove was built. In addition, the tiling which runs around the foot of the wall for the rest of the interior does not pass around the foot of the stove surround. It is possible that this feature was added to prevent the freezing of water pipes in the toilet block.

Fixtures

5.226 Most of the toilet facility fixtures appear to have been relatively modern replacements. An exception to this appears to have been the toilet roll dispensers, which could be original, and certainly predate the other fittings. The sink basins were '*Twyfords*' brand, but this does not narrow down possible dates of instalment, as the company was established in 1855 and continues to operate today. However, the style of the basins appears to be relatively modern (Plate 62).

5.227 The building featured a number of electric light switches and some electric strip lighting. As with the other buildings on site, it seems that Building 19 did not initially have electricity and this was a later addition, probably in the 1950s.

Plate 64: Bunkers E and D, facing west

Ammunition Bunkers - A, B, C, D and E.

Function

5.228 The southern part of the complex contained the five bunkers, which stored ammunition for distribution to the anti-aircraft batteries (Figures 22-25). The bunkers date to the original construction of the depot (c. 1938), and formed an integral part of most anti-aircraft ordnance depots, though were not present in every case (most depots included either a combination of 'main store' and bunkers together, or solely one or the other). The number of bunkers in each depot varied significantly, presumably according to need (for example, 64 AAOD at Upton on the Wirral only had three bunkers, whereas Burnett, Shropshire, had nine). East Boldon, the nearest comparable site, also had five bunkers. The bunkers appear largely identical, and were clearly designed to a plan. The bunkers were broadly rectangular in form, with substantial concrete revetments along each side, against which earthen bunds were heaped. The ammunition was stored in cells separated by concrete walling, and accessed by means of two parallel straight-through corridors, exiting to pairs of entrances on the shorter sides of the

bunkers. The corridors held conveyors, rollers set on concrete blocks, on which boxes of ammunition could be rapidly transferred out to waiting lorries, with large concrete blocks forming the loading bays at the entrances. The bunkers were secured by means of large blast-proof doors, and lighting was primarily by means of windows within the corridors, situated above the conveyors – later, electric lighting was added.

Plate 65: (above) the bunkers at East Boldon – with L-shaped blast walls. (Below) Bunker B, showing the slumped earth bunding, and entrances at the gable end

5.229 Variations were evident in some of the designs; East Boldon included significant L-shaped blast-walls between the pairs of entrances of two of its bunkers, and from aerial photographs, parallels to this are evident at Hadleigh, Suffolk, and on some of the bunkers at Burnett and

Upton. It would appear that these may have been added to the bunkers at a later date, perhaps as a response to the storage of different ammunition. All the bunkers appear to have been accessed by roadway, rather than railways, and this was presumably to allow the rapid deployment of ammunition to a large number of HAA gun sites, which would only have been accessed by means of the road network. The RNAD sites, in comparison, seem to have predominantly used rail, as the ammunition was being taken to one fixed point (a port) rather than multiple locations. Brasside ammunition depot is perhaps a hybrid – the bunkers are of a comparable form to those within the AAODs, but it was also connected by rail.

5.230 The bunkers were identified in the text using their original identification markings A to E, which were still visible on the structures

Exterior

Form

5.231 The southern part of the complex contained the five ammunition storage bunkers. These lay in an area of landscaped grassland and were connected to the rest of the site by a series of concrete roads. The roads were constructed of shuttered concrete slabs, cast in situ. Each of the bunkers was constructed to the same basic plan, with minor differences seen in Bunkers A and B. Bunker A varied from the rest in terms of external plan, while Bunker B incorporated windows in a different position to others.

5.232 With the exception of the internal and external fittings, the bunkers were constructed with shuttered, reinforced concrete. Each comprised what was essentially a large shed with a door in the corner of each gable wall (Plate 65). They measured 20.72m by 9.75m (68′ by 32′) externally, with vertical walls and a shallow-pitch roof which was approximately 4.10m (13′6″) high. The structures were surrounded by shuttered concrete blast-walls, with concrete buttresses. The blast-walls were then earth-bunded. By the time this survey was undertaken, the bunds had slumped through time and no longer extended to the tops of the blast-walls (Plate 65).

5.233 The bunker roofs were composed of shuttered concrete slabs which overhung the wall heads of the building's long elevations. In contrast, at the gables, there was a slight lip. The eaves featured a cast-iron gutter which was vented through three cast-iron downpipes.

Features

<u>Loading Platforms</u>

5.234 Each row of concrete plinths, which spanned each aisle (see interior description) terminated with a rectangular concrete loading platform (Plate 66), which measured 3.36m by 1.68m (11′ by 5′6″) and which were of the same height as the row of plinths. The platforms around Bunkers B, C, D and E were all of the same size and were arranged asymmetrically, presumably allowing

the loading of lorries from all four platforms simultaneously. The platforms at the southern side of Bunker A matched the arrangement of the other bunkers. However, at the northern end of Bunker A were two square platforms 3.06m (10') in size, arranged symmetrically. Damage to one platform (on Bunker B, Plate 66) reveals that these structures were hollow, with shuttered sides and a precast top. All of the loading platforms had an adjacent small, concrete pillar supporting a cast iron lamp post (see below); these were installed later than the original bunkers. Black and yellow chevrons, a safety feature used throughout the site, were observed on the corners of the loading platforms.

Plate 66: a loading platform outside Bunker A (left). (Right) the damaged loading platform outside Bunker B, revealing the internal reinforcement. Note base in background supporting lamp post

Entrances through Earthen Bunds

5.235 Simple, concrete-lined tunnels provided access to the bunkers through the earthen bunds (Plate 67). They had two sloping cheek walls, supporting a precast slab running through the bund and blast wall. The cheek wall slabs also appeared to have been precast. The entranceways originally had a gate in the entranceway through the blast wall, and a blast-proof doorway into the bunker. At the time of the survey, the gates survived in several of the outer (bund) entranceways. It was unclear whether these gates were original or later replacements. The presence of a gate in this position is confirmed by the integrated cast iron hinges and a corresponding rebate with an integrated vertical iron bar, forming a lock box to secure the gate using a padlock (painted signs above the lock box would have provided the key number).

5.236 The blast-proof doors for the bunkers had long been removed, but their position was evident from the exterior hinges and hasp for a padlock, again with a painted sign above indicating the key number. Photographs of in situ doors from other AAODs seem to indicate that the doors

were folding doors made of riveted iron plates (Plate 67). These appear similar in form to the sliding doors in Building 14.

Plate 67: (left) lock box for padlock, and gate, Bunker A; (centre) blast door fittings, Bunker B; (right) cantilevered blast doors, Banstead, Surrey, in 2003 (courtesy Roger Thomas)

5.237 The uncertainty as to whether the gates were original stems from the fact that the gates would have cut through the position of the conveyor, and indeed this was also the case for the blast proof doors (though few photographs of either in situ gates or doors were seen). It is possible that the conveyor had removable sections, and that these were dismantled to allow the closure of the doors and gates. Plate 71 (below) appears to show closed doors with an in situ conveyor.

Earthen bunds and revetment wall

5.238 The enclosing earthen bunds would originally have reached the full height of the blast wall, though at the time of the survey, slumping had occurred (Plate 65). There was no evidence of an earth cover to the bunker roofs. Bunker B had opposed flights of steps midway along each side of the bund. These were made of precast concrete, with handrails composed of scaffolding-like tubes, and may not have been be original.

5.239 A watching brief was carried out on the removal of one bund (surrounding Bunker E, the southwestern most bunker – Plate 68) to record information relating to the bunker's construction. The watching brief was carried out over two days (3rd and 4th March 2015). Removal of the bund revealed five concrete buttresses on each of the long sides, with a single central buttress on the shorter sides, between the entrances. The buttresses, broadly triangular in profile, tapered out from the top of the retaining wall to a concrete base 1.2m (4') in width, which extended around the edge of the structure, and formed the main foundation (the bunker effectively sits on a concrete raft). The foundation measured 0.70m thick, and this in turn lay directly on a thick layer of natural clay.

Plate 68: (top) Bunker E after the removal of bund, revealing the underlying concrete structure. (Below) denuded bunker at Banstead, Surrey, 2003 (courtesy Roger Thomas)

5.240 In between each buttress a single skin of loose brick was observed (Plate 69). Each skin of brickwork was poorly constructed with very little bonding and collapsed shortly after machining. These extra skins of brick appear to have been stacked up against the sides of the retaining walls, and were presumably put in position to minimise damp soil lying directly on the concrete walls, so as to aid drainage. The bricks themselves were all frogged with either a central Seghill stamp (Seghill Colliery Brickworks) or an HMC stamp (Hartley Main Colliery – NAA 2014, 19).

5.241 On the northern side of the bunker a small drain was identified cut into the concrete footing for the bunker to take water away from the interior of the structure, presumably connected to a network of drains and downpipes from the roof. Within the northern face of the bunker a series of holes had been drilled into the wall, approximately 1m above the base. The holes were probably 'weep-holes' to allow water to flow through from the bund, and then be carried out by

the drainage system.

Plate 69: south facing elevation of retaining wall after removal of bund (left) and stacked bricks against retaining wall (right)

5.242 At the northeastern corner of the bunker, two timbers were identified, embedded into the concrete foundations, measuring 0.25m long by 0.10m wide. The timbers were probably remnants of the shuttering which was used for the construction of the bunker; a few large timber planks were noted in the make-up of the bund around the north east corner which could have formed part of this same structure, now *ex-situ*.

Plate 70: the light fitting (left), and -preserved fuse box (right), Bunker A

Evidence of Fixtures and Fittings

5.243 The remains of steel cable conduits were observed on the entranceways through the earth bunds, on the interior long walls of the bunker, and on the exterior gable walls. A light fitting, light switches, and associated wiring conduits were positioned in each of the entranceways

through the bunds and on the interior of one cheek wall. The example at the northwest corner of Bunker A was the most complete example of a light fitting (Plate 70). This was circular, with a hinged, domed pendant, mounted vertically on the wall. A rubber seal was visible around the edge of the metal frame, making the light waterproof. The light contained a ceramic insulator fitting. Below this, there was a double light switch, comprising waterproof push switches. The switch was connected to the lamp by a vertical metal electrical conduit.

5.244 The exterior gable walls exhibited the remains of conduits linking the external lighting in the entranceways (and the lamp posts, Plate 70) with the interior lights. An external fuse box and a circuit breaker were observed on the north gable of Bunker A. The fuse box was marked with the manufacturers brand-name - 'REVO' – see below.

5.245 Some signage survived on the exterior of the bunkers. This included black and yellow chevrons on the loading platforms, and the building identifiers. The signs comprised a yellow circle painted onto the building, containing the appropriate capitalised letter in white.

Plate 71: Bunker B, facing south (left); Banstead, Surrey in 2003 (centre - courtesy Roger Thomas); Burnett, Shropshire, in the 1990s, rollers and blast doors in situ *(© Folly Books)*[15]

Interior

Form

5.246 The four bunker entrances, positioned at the corner of each of the gable walls, connected to two parallel straight-through corridors. The bunkers were divided longitudinally by a shuttered concrete wall (hereafter, 'central wall'), approximately 3.04m (10') high and 1.52m (5') thick, which did not extend to the full height of the roof structure.

5.247 Each aisle was divided into a series of nine numbered bays. These were formed by narrow

15 https://www.facebook.com/FollyBooks/photos/a.463758926981378.108928.175336742490266/463759183648019/?type=1&theater

concrete walls extending outward from the central wall, of equal height to it. Many of these dividing walls had a protruding lower section on their outer wall edge, which was equal in height to the concrete plinths in line with them (Plate 71).

5.248 Each dividing wall supported vertical precast concrete posts which in turn provided support for the roof beams. The roof beams extended from the wall heads across the tops of the posts to the centre-line of the roof. The innermost posts of each bay supported further concrete beams running the length of the building. The roof slabs were cast in situ on this framework. The centreline of the roof was perforated by three ventilation apertures, between Bays 2 and 17, 5 and 14 and 8 and 11. These are likely to have been capped externally, although the cowls were missing at the time of survey. Each bay had four rectangular post settings in its floor. Most had an in situ wooden lining, and these must have been for racking to support the boxes of ammunition.

Plate 72: windows, Bunker C (left), and walled up windows, East Boldon bunker

5.249 The long external walls of each bunker contained a series of six window apertures, 3.03m by 0.92m (10′ by 3′), holding steel-framed casement windows. Each window was divided into three identical subsections, each containing 18 small glass panes (Plate 72). The upper half of each subsection was an opening section. The windows in Bunkers A, C, D and E were at mid-height 1.24m (4′) above floor level. Those in Bunker B were in the upper section of the wall 2m (6′6″) above the floor. There was a flaring in the casting on the external walls over the windows, and they had precast concrete sills.

5.250 A row of low concrete plinths were positioned against the exterior walls, opposite each bay

division (Plate 71). These measured 0.64m by 0.16m (2′ by 6″) and stood 0.77m (2′6″) high. These plinths continued out through the doorways of the bunker and the entranceways, then on through the blast wall, to the loading platforms which were situated outside. A pair of steel brackets was fixed to the top of each plinth, which originally supported a conveyor or rollers (which had been removed at the time of survey).

Features

Evidence of Fixtures and Fittings

5.251 On the interior walls of the bunkers, reflector lights and conduits were fitted above the windows, although few lights survive. Originally there was one light for each bay of the structure, positioned over the conveyor, angled to illuminate the bay as well as the conveyor. There was no evidence for lighting within the bays themselves. Most of the lighting appeared to have been added to the structures, probably in the post-war period.

5.252 Some signage remained inside the bunkers (Plate 73). Every bunker retained its bay numberings, which comprised a black painted square on the dividing wall, with a white number within it; these appeared fairly standardised across the country (compare the lettering in Plate 71 at Killingworth and Burnett). Fire safety signs also survived in a number of locations, painted as a red rectangle, with white text reading 'Fire Point No [2]'; these probably indicated the position of stirrup pumps for fighting small fires.

5.253 Other surviving painted signs comprised black rectangles with white writing. Some were no longer legible, but appeared to give identify a specific code, perhaps relating to the stored ammunition. Other signs related to the relevant key number for a particular padlock to access the bunkers.

Plate 73: remains of signs: a surviving fire point sign in Bunker B (left); an illegible sign, Bunker D (centre); 'Key' sign in Bunker D

Plate 74: lamp posts on roadway (left) and on loading bays of Bunker B (centre and right)

Lamp Posts

5.254 The depot at Killingworth included a number of very ornate cast-iron lamp posts, either lighting the main roadway through the site, or affixed to the loading-bays at the ends of the conveyors leading out of the ammunition bunkers. All the lamp posts appeared to be contemporary, and were produced by the company Revo, based in Tipton, Staffordshire; the bases all carry the distinctive raised logo of the company (Plate 75). The company appears to have been formed c. 1907 as Cable Accessories Co, but was certainly known as Revo by 1932, when it was appearing at trade fairs under the name. The name appears to have originated through a partnership between Frederick Reeves, the founder of the company, and Ernest Vaughn of Vono, also of Tipton[16]. Revo was extremely successful, and was at the forefront for the production of domestic equipment and the manufacture of high-class engineering accessories for the motor, aircraft, electrical, gas and refrigeration trades[17]. In 1936 it became a public company. Revo was also at the forefront of electrical innovation, and company manufactured control gear, lamps, and lanterns, brackets and columns for street lighting, for which it is now most widely known. The company had strong links with the military; in the Second World War, Revo designed three different types of hand grenade[18] and in 1955/6 it would secure a contract

[16] http://www.simoncornwell.com/lighting/manufact/revo/history/index.htm
[17] http://www.gracesguide.co.uk/Revo_Electric_Co
[18] http://blackcountryhistory.org/collections/getrecord/GB146_BS-REV/

to design and build aluminium pontoons for the Ministry of Defence[19].

5.255 The form of the lamp posts appeared to vary. The lamp posts affixed to the bunker loading bays comprised a cylindrical base with a rectangular inspection panel leading to the internal switch gear, c. 0.5m in height. The post fitted into a torus moulding which supported a slim simple tubular post. The lamp fitting was attached to the post by an indented collar, and comprises a swan-neck with a spiked finial with cross motifs securing the lantern itself. The shades comprised simple semi-spherical pendants with a single bulb fitting. In contrast, the lamp posts along the roadside were more ornate, and look to be variant of the 'Crown' post (see Plate 76), with short side-arms being the sole difference. The lamp fittings appear the same as those for the bunker lamp posts.

Plate 75: stamped base of lighting column, Bunker B (left) and full lamp-post (right); comparative lamp post from Banstead, Surrey, in 2003 (courtesy Roger Thomas)

5.256 Most of the lamp posts were in a bad state or had been removed entirely; where they survived, they were heavily corroded but had clearly been painted a dark 'military' green, though most of the paint had long faded. The lamps are difficult to date, but examination of parallels online suggests an early to mid-1940s date, and it would seem sensible that these were installed following the end of the Second World War and the blackout restrictions. The lamps certainly seem to post-date the loading bays of the bunkers, with a number of the lamps fitted to purpose-built concrete bases abutting the bays, or free-standing adjacent to the entrances. This arrangement was seen at other depots also – in particular East Boldon. It was notable that there were no lamp posts around the remainder of the complex, or fittings attached to the buildings, which implies the complex was originally meant to be kept dark. Lamp posts were evident in photographs from a number of other AAODs, and it appears likely that these were installed at the same time, and probably immediately after the war ended.

[19] http://www.blackcountrybugle.co.uk/Revo-company-played-important-role-Tipton-s/story-24559510-detail/story.html

Plate 76: 'Crown' post from contemporary catalogue (left) and adjacent to road (right)

6.0 DISCUSSION

6.1 Killingworth Anti-Aircraft Ordnance Depot (AAOD) comprised one of probably 34 EAM (Equipment Ammunition Magazines) built in c1938, in anticipation of the war with Germany, to service the Anti-Aircraft batteries (both HAA and LAA) of the Tyne Gun-Defended Area (GDA). The depot appears to have been built to a fairly standardised plan; though local variations are evident, the depots mostly included three separate zones – administration/welfare (offices, barrack blocks, canteens etc.), vehicle/arms storage and maintenance (large brick built shed, smaller sheds and garages, used for the storage and servicing of vehicles and weaponry), and ammunition storage (substantial, above ground, concrete bunkers surrounded by concrete blast walls and earthen bunds). Comparison between Killingworth and other sites seems to indicate that these zones were common and comparable across a number of sites, though sometimes only one or two zones were present – sometimes ammunition storage only, or vehicle and arms storage only, sometimes without substantial administration facilities. The depot was managed and maintained by the Royal Army Ordnance Corps (RAOC).

6.2 The buildings at Killingworth which had a predominantly functional use comprised brick-built structures, with concrete floors and corrugated asbestos-clad rooves. The brick walls of these structures comprised brick pillars, supporting the metal Fink trusses for the roof, with thin brick panels inbetween. Light was exclusively provided by roof-lights and metal casement windows, with no obvious indications of period lighting within any of the structures. This was also the

case for heating, with most of the buildings having no heating whatsoever. A notable exception to this was the 'main store' (Building 12), which had substantial metal radiator panels within the roof-space, running the length of the building. Buildings 4 and 12 functioned as stores; Building 4 was probably for the supply of clothing and small items, whilst Building 12 almost certainly was used wholly for maintenance and storage of mobile guns, trucks for the movement of ammunition, and possibly other items such as searchlights. Building 10 was a boiler house, which supplied the heating for the main stores by means of coal fired boilers, the coal for which was stored in an open storage area (Building 11). Building 14 appears to have been a fire station, for the storage of fire engines or tenders, and water for these would have been drawn from two open fire pools (Buildings 8 and 9). In contrast to the more functional buildings, the administrative buildings (Buildings 16 and 17), were simple brick office buildings with metal casement windows and wooden roof trusses, and heated by means of stoves or fireplaces. The buildings had wooden parquet flooring, and interior ablutions (in contrast to the exterior toilets for the lower ranking soldiers, housed in Building 19). Building 16 appears to have represented lower ranking officer and administrative quarters, whilst Building 17 was the commanding officer's quarters.

6.3 Ammunition was stored in five substantial concrete bunkers, with earthen bunds against their blast walls. The bunkers were distinctive in having two parallel corridors with individual compartments for ammunition storage, and a conveyor system which comprised rollers set on concrete pedestals, along which boxes could be transmitted to waiting trucks outside; concrete loading bays were located at each end of the corridors, with concrete slab roadways leading to each bay. Each bunker could, therefore, load four trucks at a time. Additional storage was represented by further roadways leading to concrete bases which formerly held Nissen huts or similar.

6.4 Around 1942, the depot was transferred to the Royal Electrical and Mechanical Engineers (REME) and from this point onwards took on a role primarily more focussed towards vehicle and weapons maintenance, rather than its former role as a distributor of ammunition for anti-aircraft ordnance. By 1943 bombings in the Tyneside area had decreased significantly, and a purely maintenance role became more permanent after the cessation of hostilities. With the ending of the War, the boiler-house was refurbished with oil-fired boilers, and an extension to the fire station incorporated a further boiler, which meant that the depot now had heating (with radiators installed in the buildings) and lighting, powered by hydro-electric dynamos. The depot was also connected to the national grid, via a small substation at the rear of Building 16. The fire station was converted to a vehicle workshop, and ventilators were installed in the main stores and fire station, to help disperse vehicle emissions. Buildings 12 and 14 were altered, with windows and doors bricked up and moved, reflecting their new roles.

6.5 Further buildings were also added to the complex, but these appear to have been primarily prefabricated temporary structures, most likely Nissen Huts and MOWP Standard Huts, which

were added to supplement the available accommodation. Around 1948, a 'spider block' – a form of accommodation block – was added in the northwest corner of the site, which reflected that the depot had become a residential base, rather than having been staffed from the local population.

6.6 The depot continued in military use, with seemingly little further adaptation, until 1979, when the depot, now '*surplus to requirements'* was taken over by the Area Health Authority, who used the depot for storage of medical equipment and supplies until the early 1990s.

7.0 CONCLUSIONS

7.1 The current report is considered to be a comprehensive record of the armaments depot and its immediate curtilage. No further work on the site is recommended, although a synthesised report on the site is to be published in a suitable journal, and costs have been submitted and accepted by the client for the production of a journal article.

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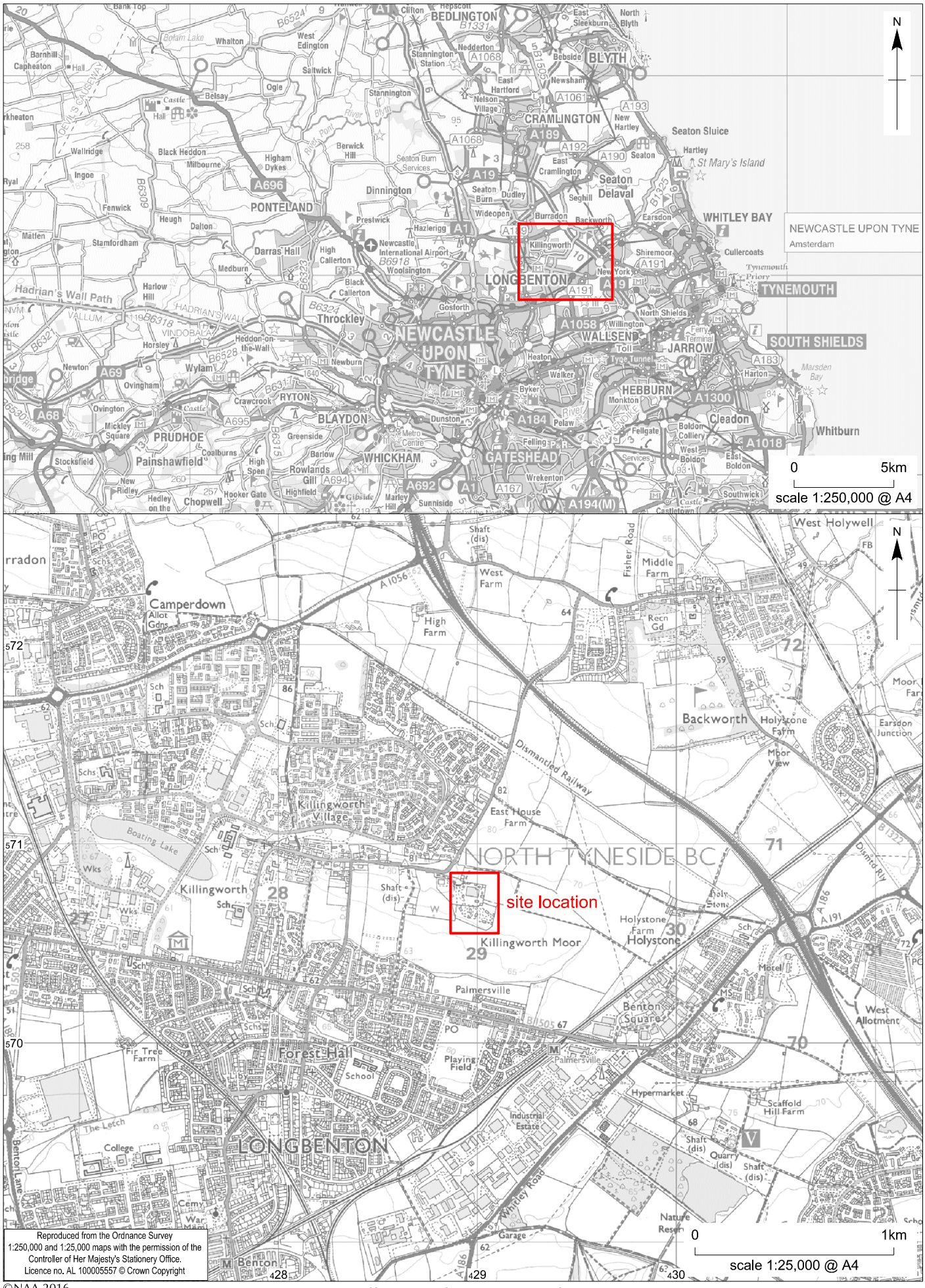

Former Killingworth Stores: site location *Figure 1*

Based on survey data supplied by:
Paul Evans Surveying Ltd
ref: KS1 survey date: November 2013
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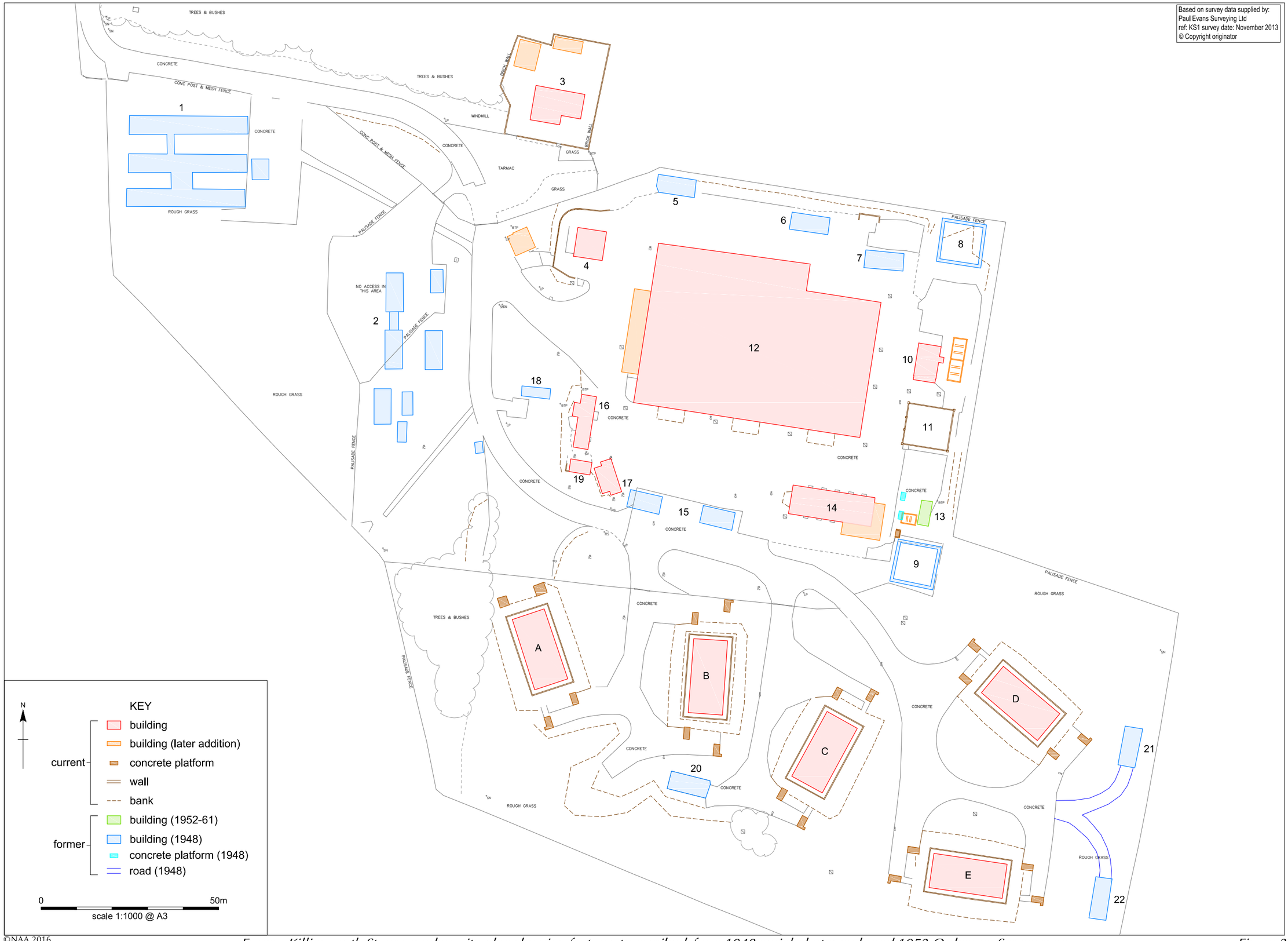
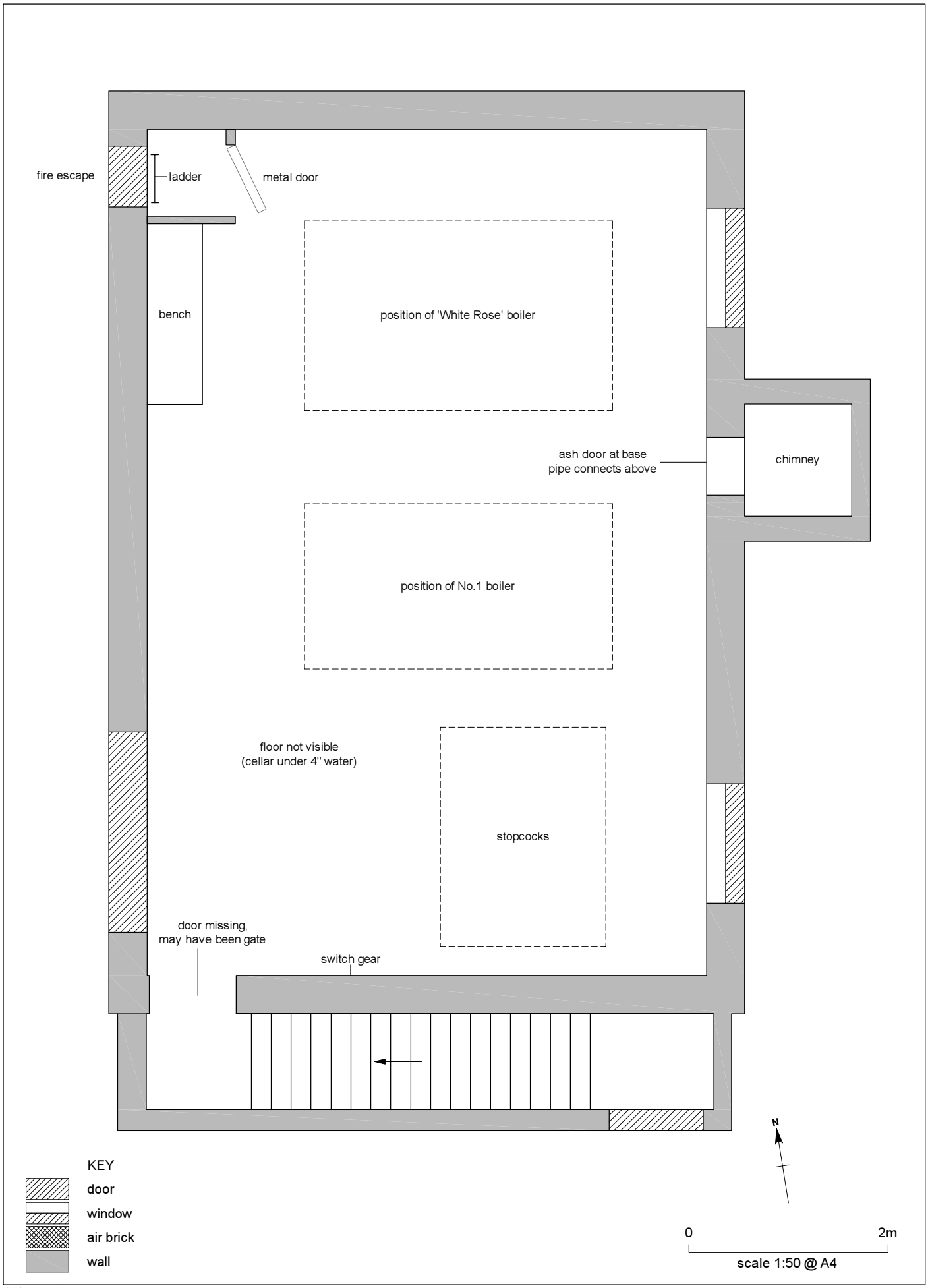


Former Killingworth Stores: modern site plan showing features transcribed from 1948 aerial photograph and 1952 Ordnance Survey map

Figure 2

Former Killingworth Stores: 1952 Ordnance Survey map

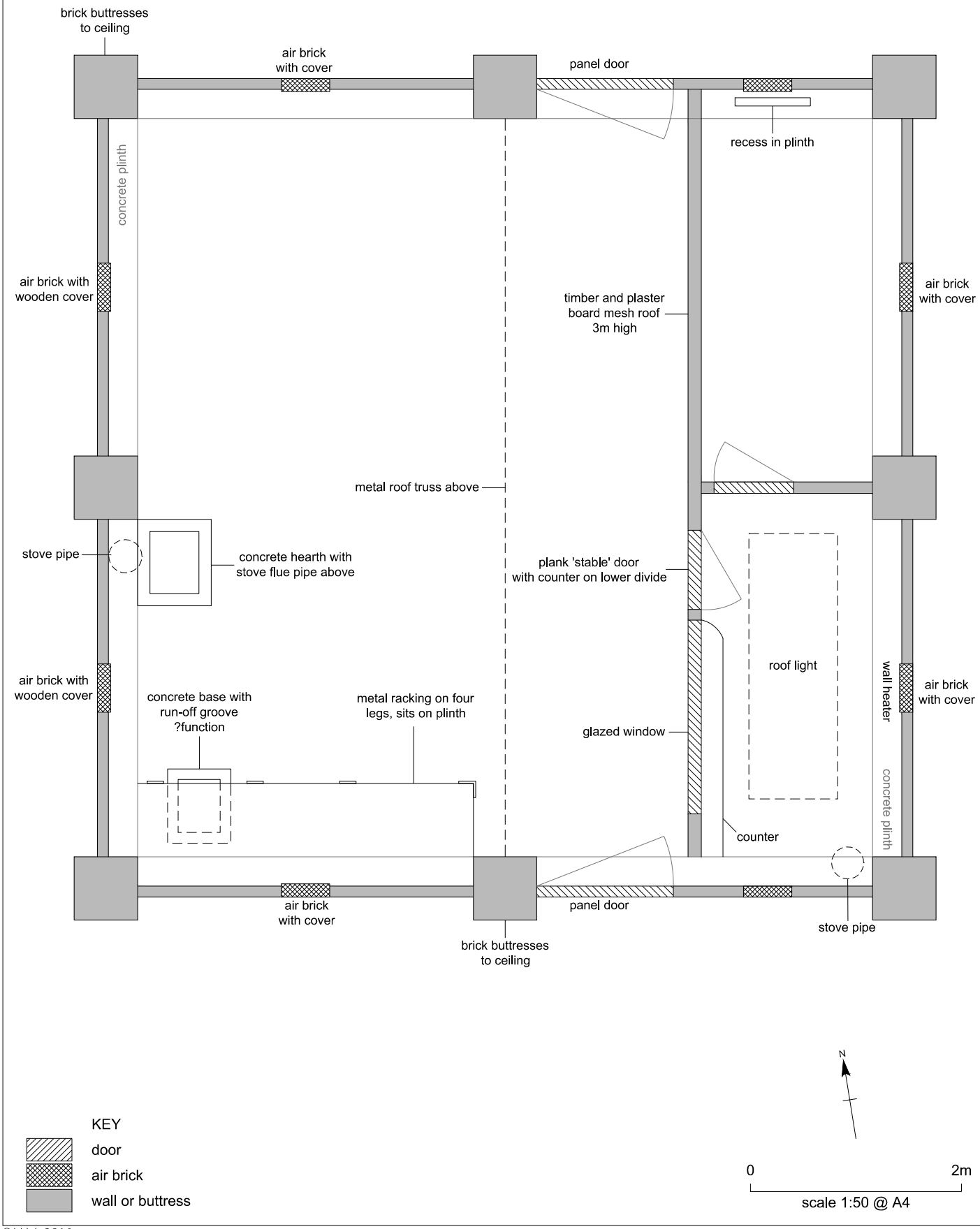
Figure 3



Killingworth Stores: plan of Building 10 *Figure 4*

Former Killingworth Stores: Building 4 elevations

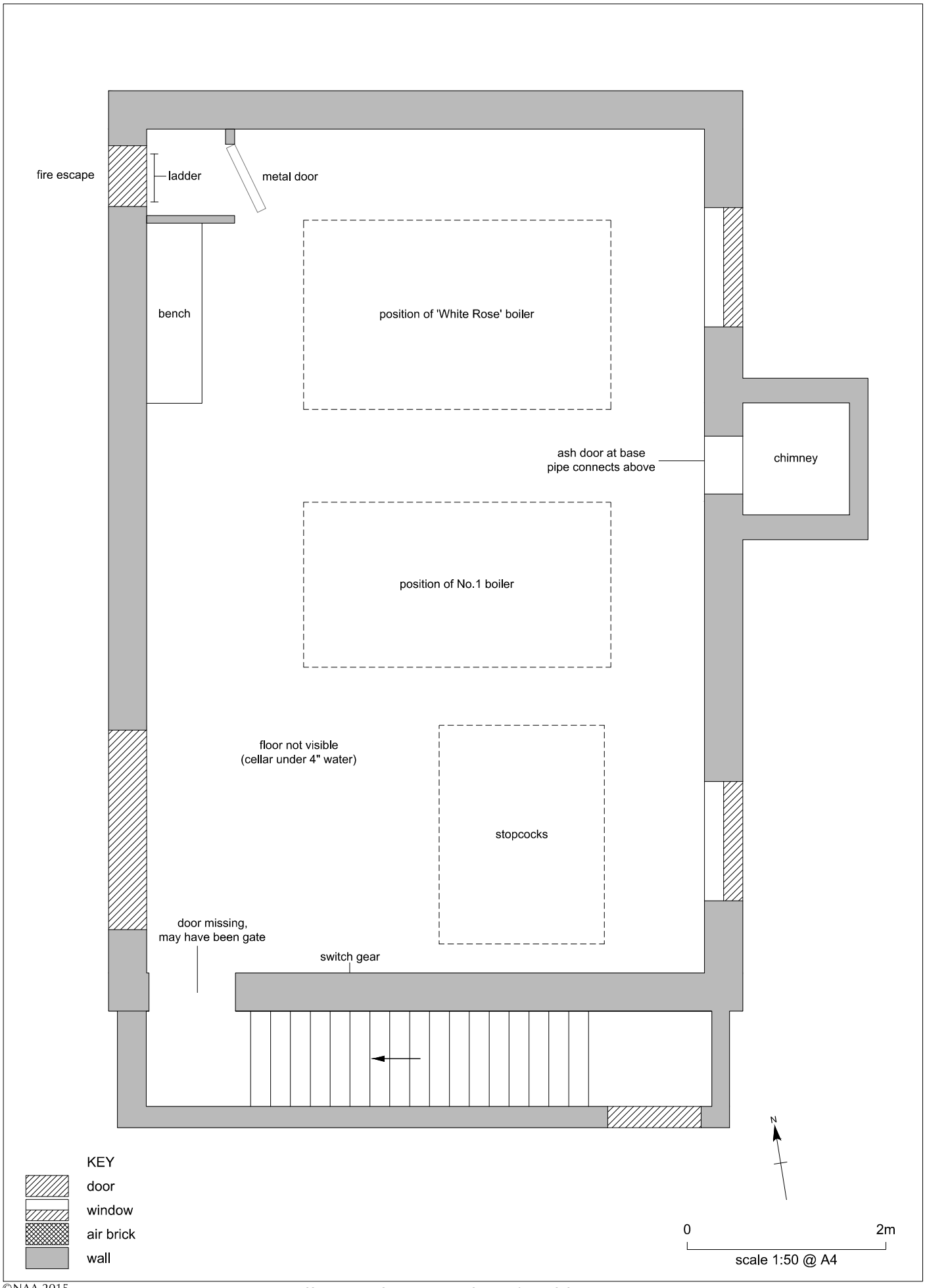
Figure 5



Killingworth Stores: plan of Building 4 *Figure 6*

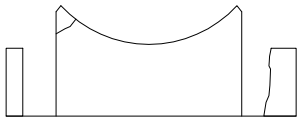
Former Killingworth Stores: Building 10 elevations

Figure 7

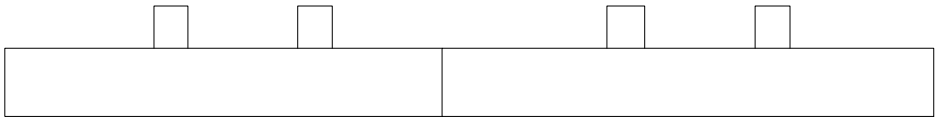


Killingworth Stores: plan of Building 10 *Figure 8*

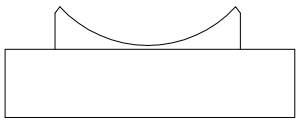
North



West



South



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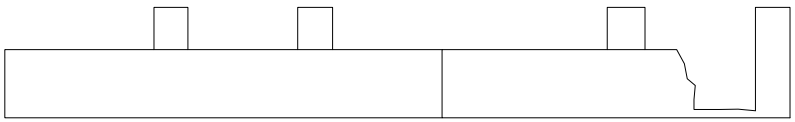

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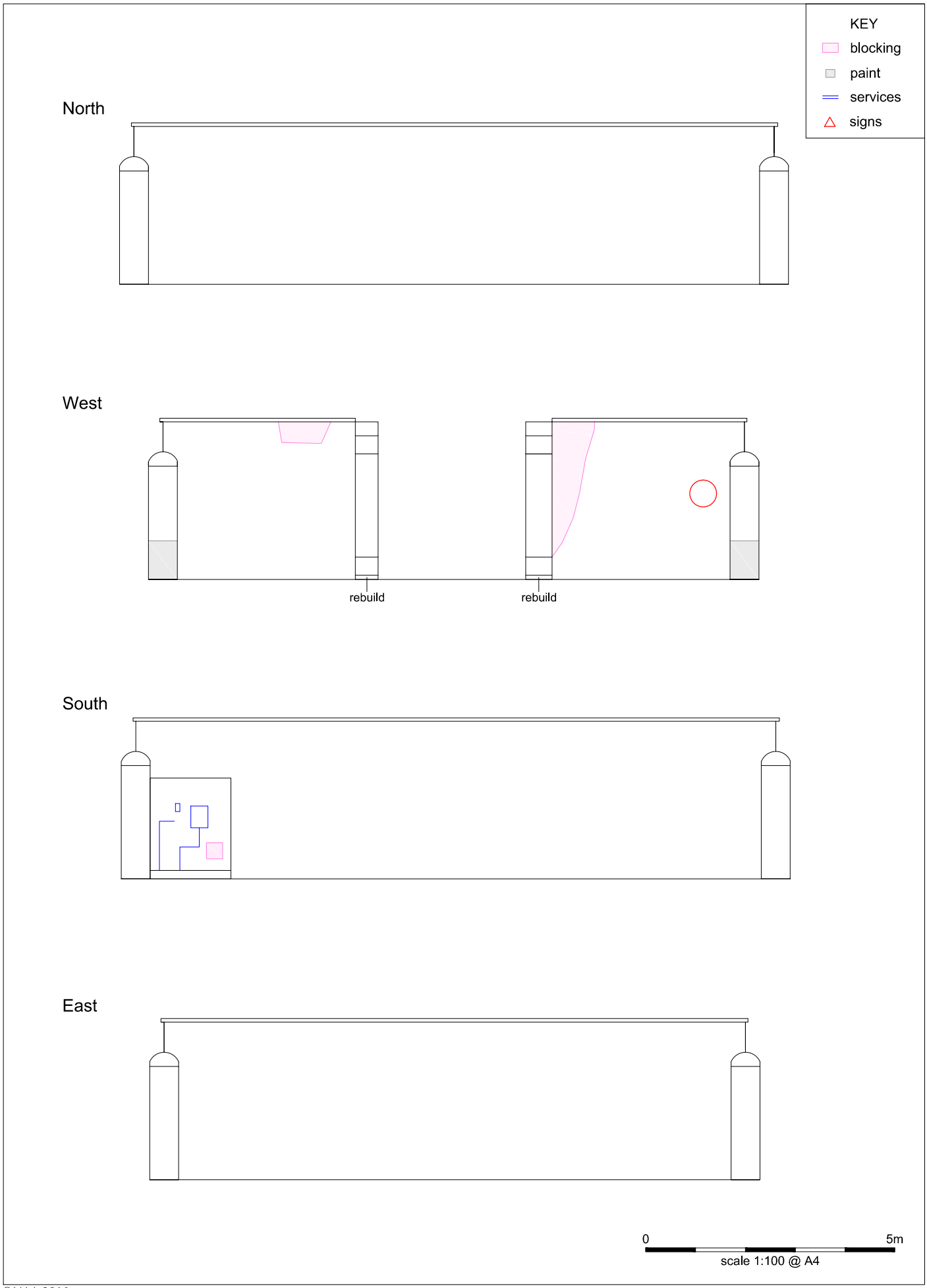
scale 1:100 @ A4

Former Killingworth Stores: Building 10 fuel tank bund elevations

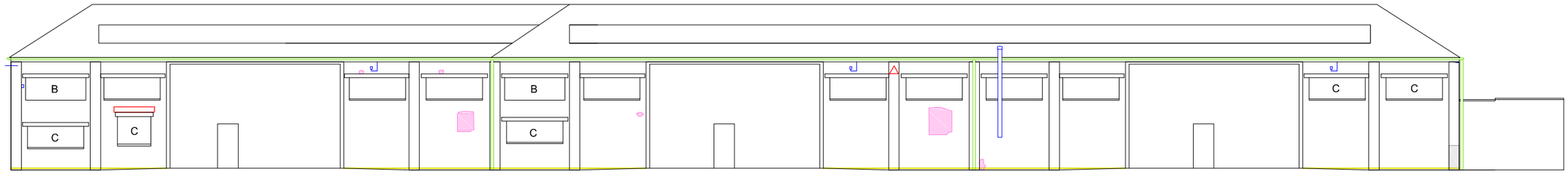
Figure 9



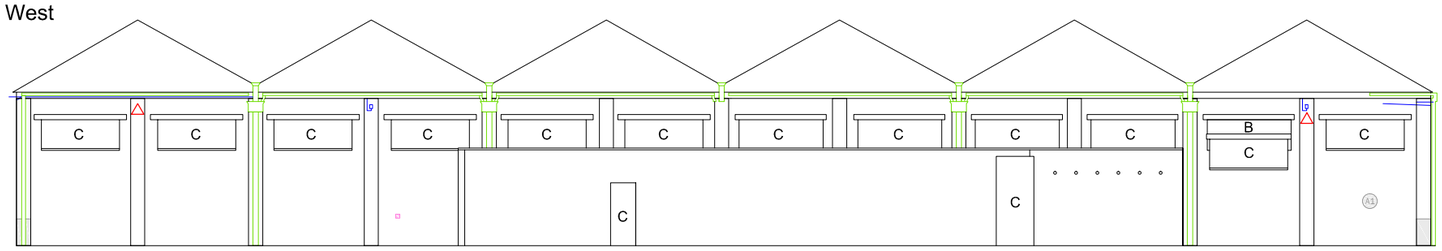
Former Killingworth Stores: Building 11 elevations *Figure 10*

North

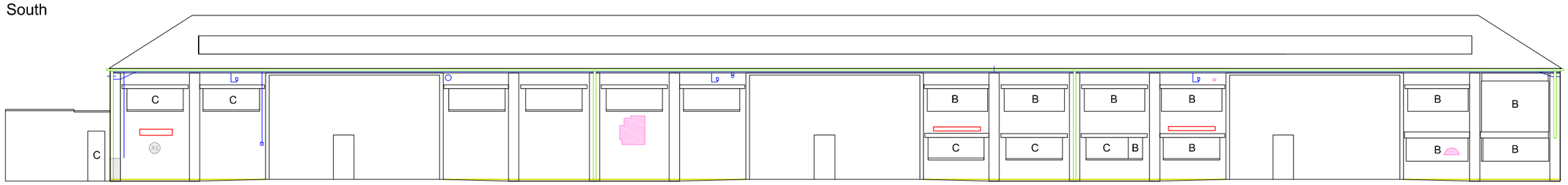
step back in building at this point



West

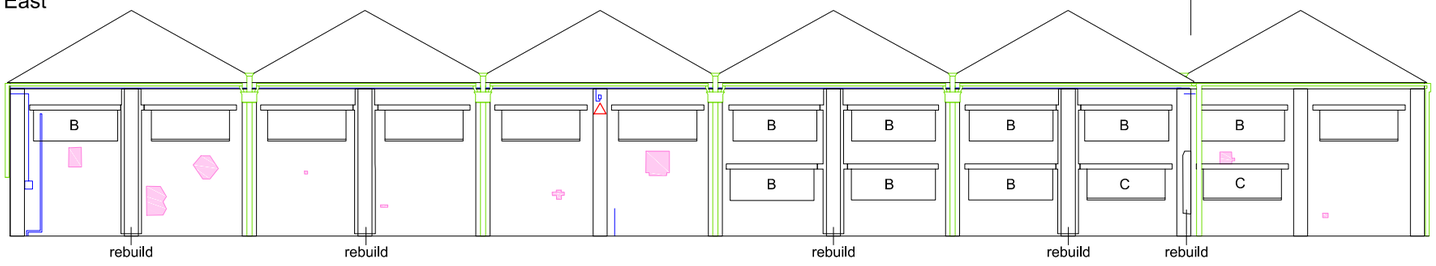


South



East

step back in building at this point



KEY

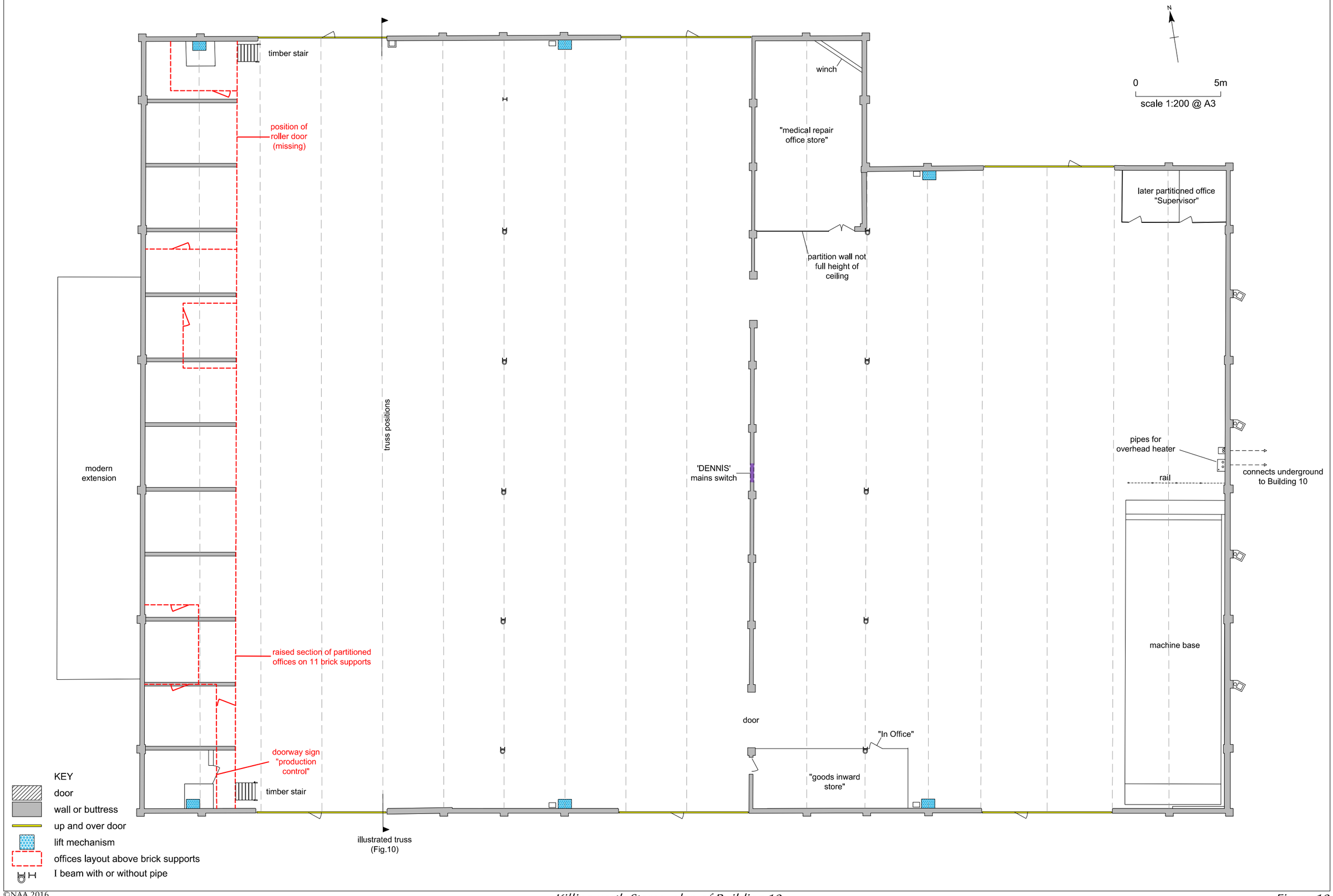
B	blocked window
	other blocking
C	covered
	damp course
	gutter
	paint
	services
△	signs

0 10m

scale 1:200 @ A3

Former Killingworth Stores: Building 12 elevations

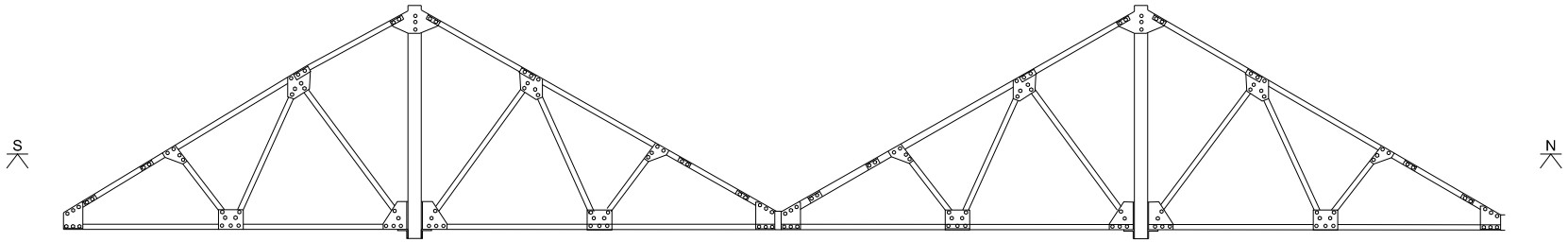
Figure 11



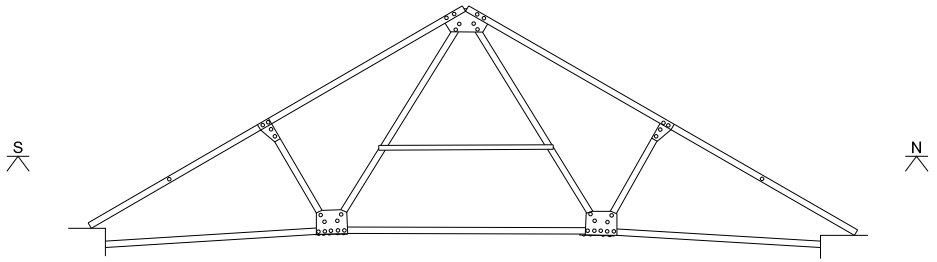
Killingworth Stores: plan of Building 12

Figure 12

Building 12



Building 14



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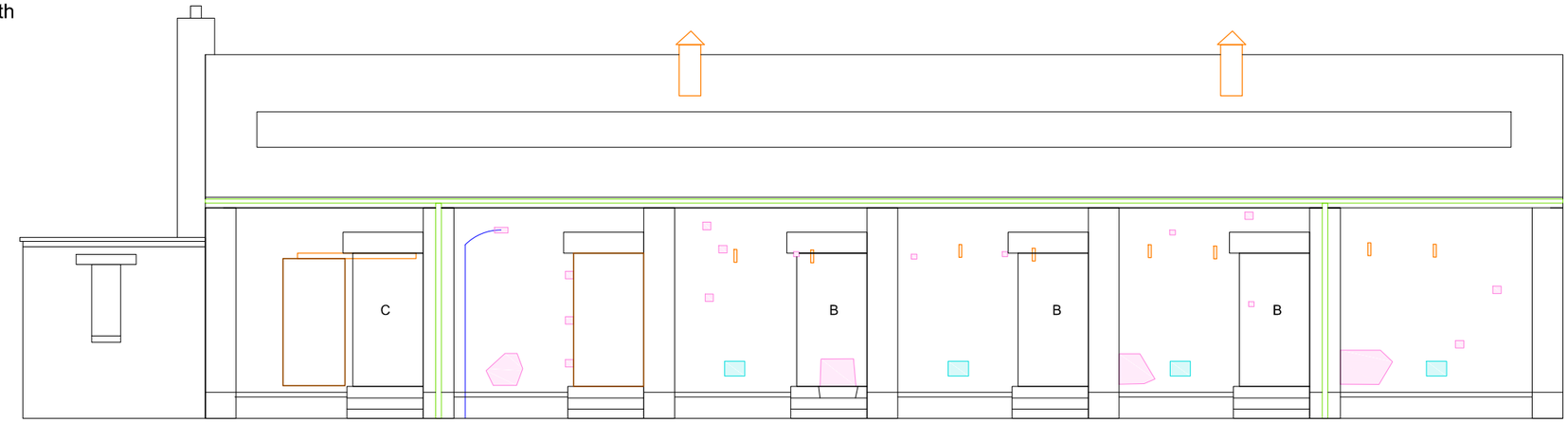
Killingworth Stores: examples of roof truss types, Buildings 12 and 14 *Figure 13*

North



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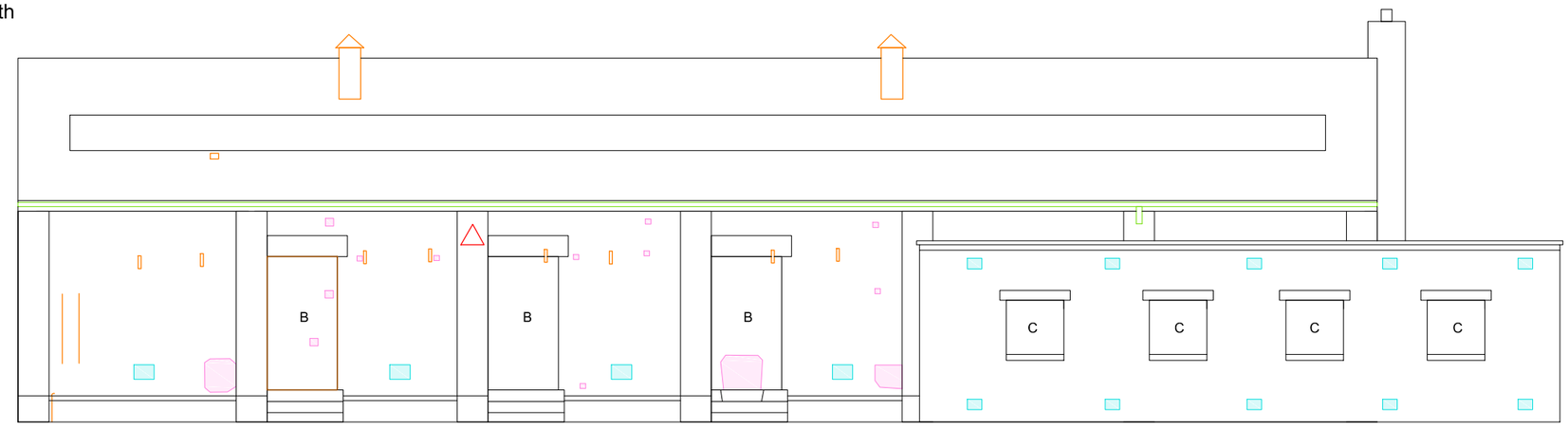

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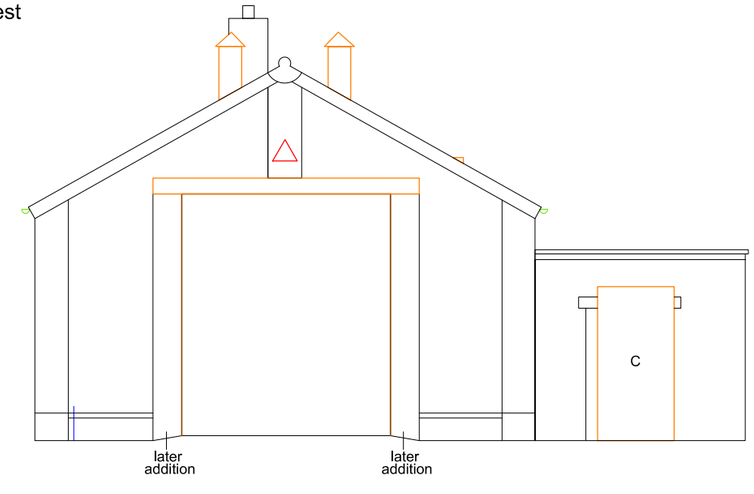

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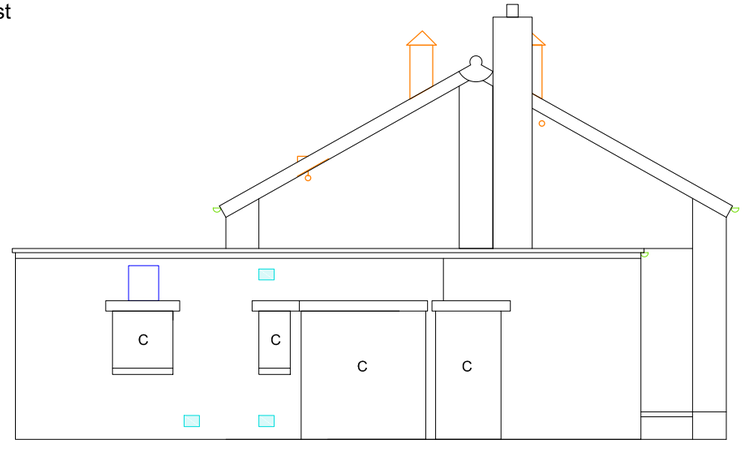


KEY

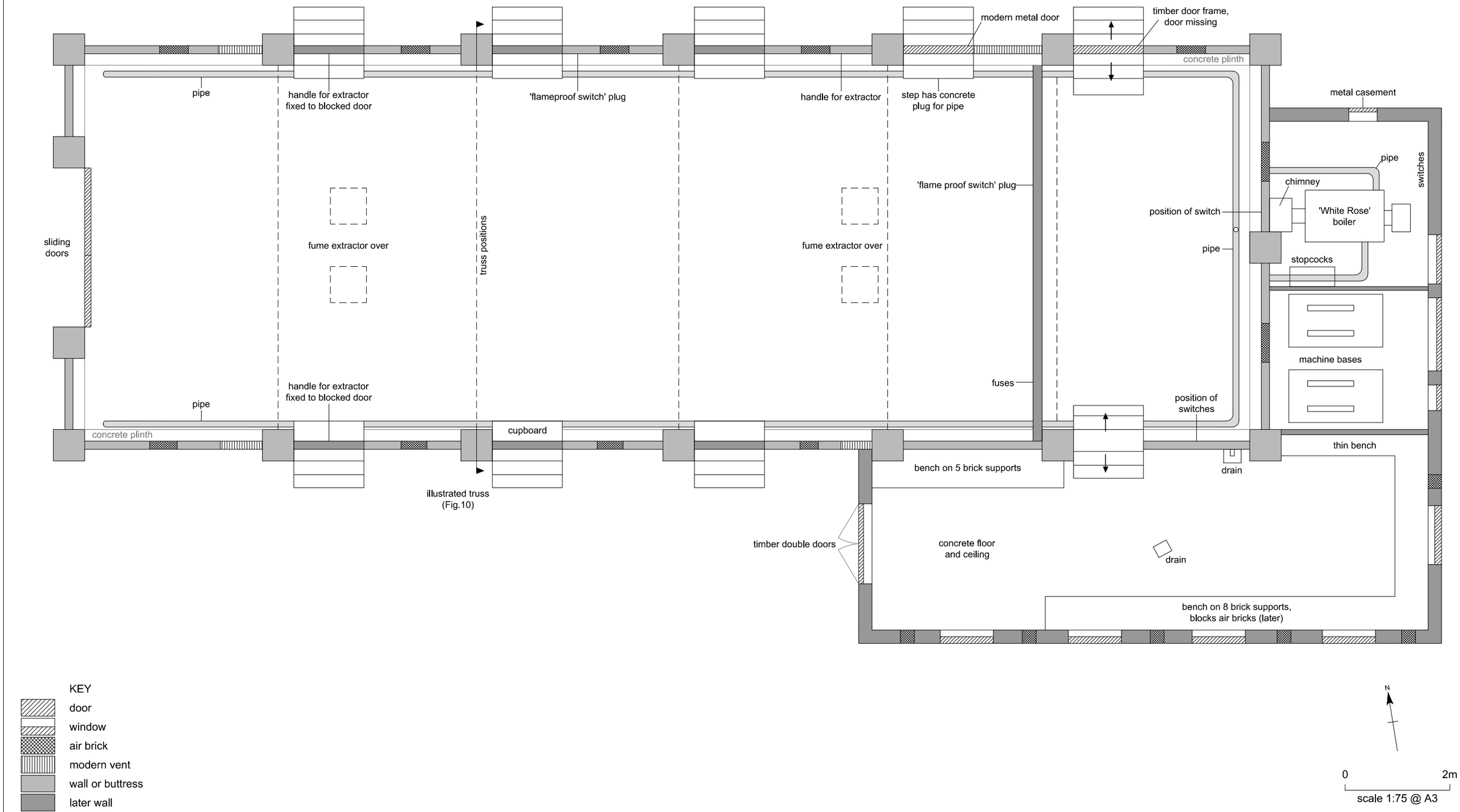
- airbrick
- B blocked door
- blocking
- gutter
- metal
- services
- signs
- wood
- C covered

0 5m

scale 1:100 @ A3

Former Killingworth Stores: Building 14 elevations

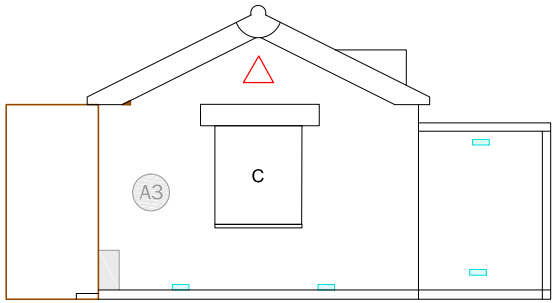
Figure 14



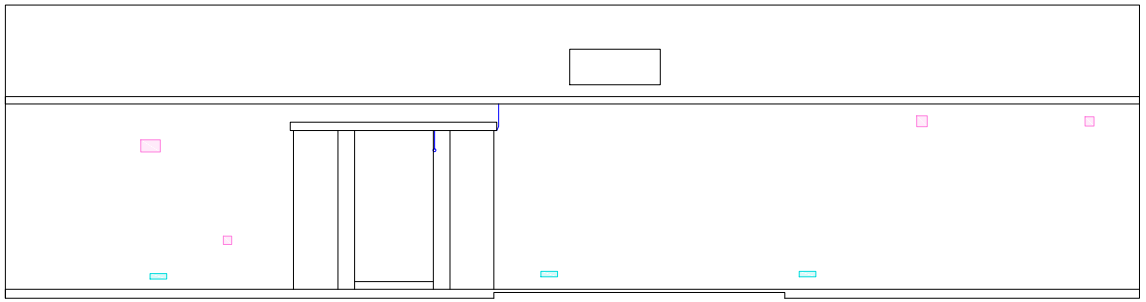
Killingworth Stores: plan of Building 14

Figure 15

North

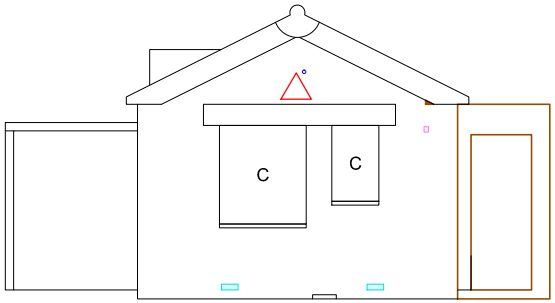


West

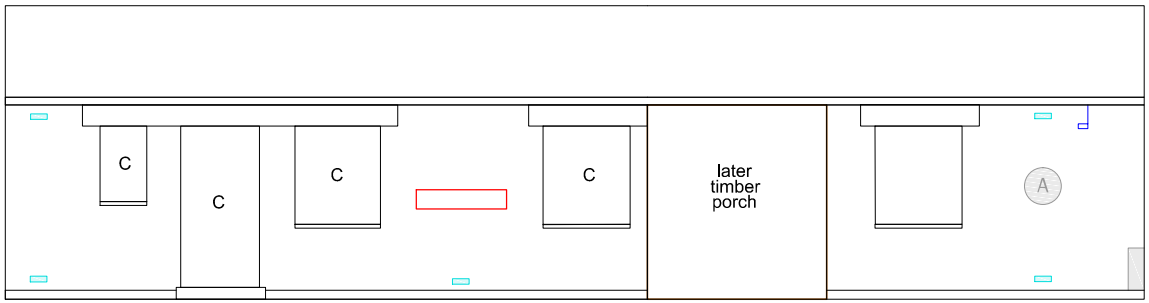


KEY
airbrick
blocking
C covered
paint
services
signs
wood

South



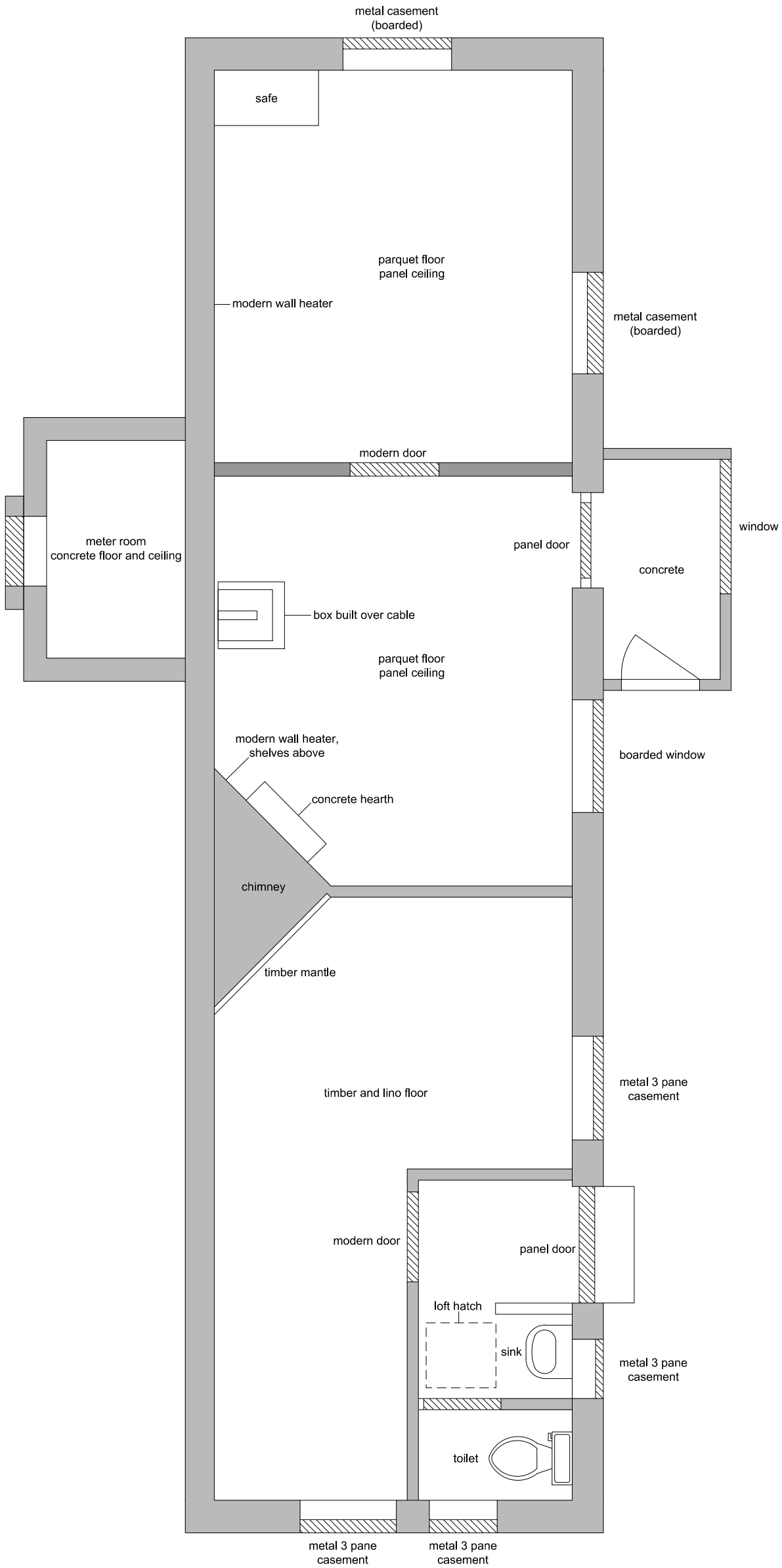
East



0 5m
scale 1:100 @ A4

Former Killingworth Stores: Building 16 elevations

Figure 16



KEY
door
window
wall or buttress
later wall

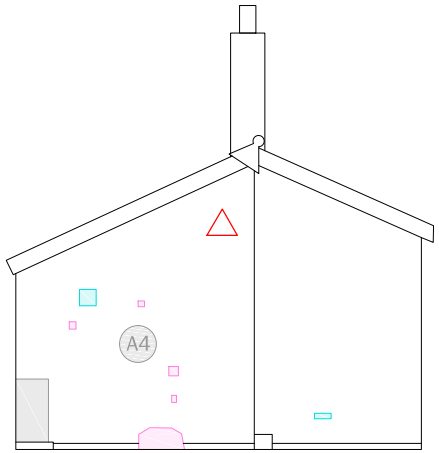
N

0 2m
scale 1:50 @ A3

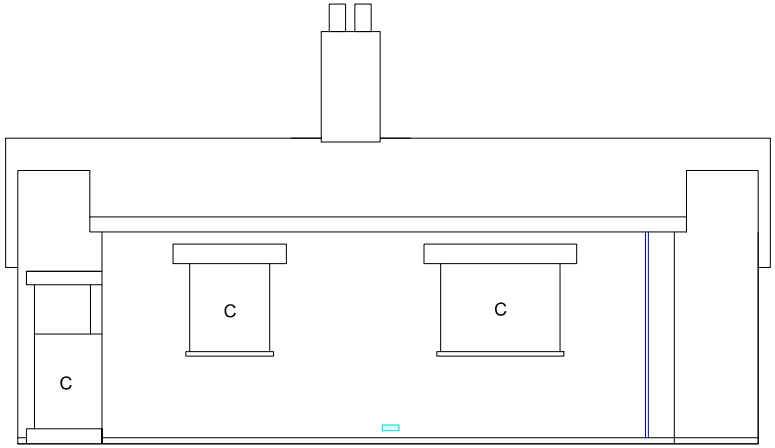
Killingworth Stores: plan of Building 16

Figure 17

North west

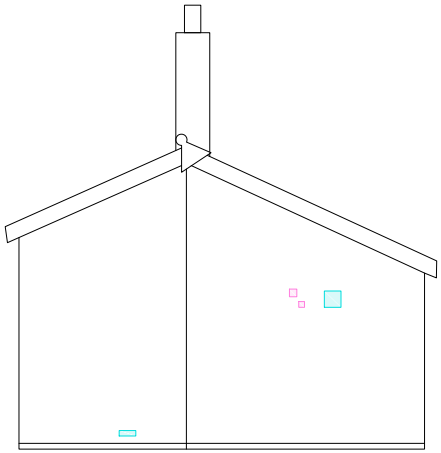


South west

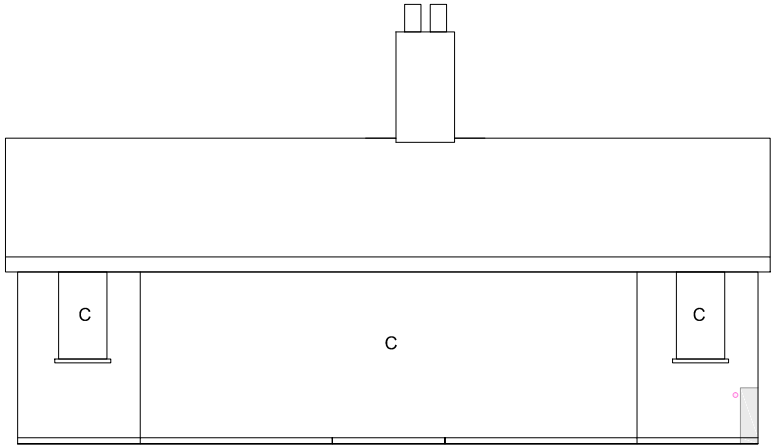


KEY
airbrick
blocking
C covered
paint
services
signs

South east



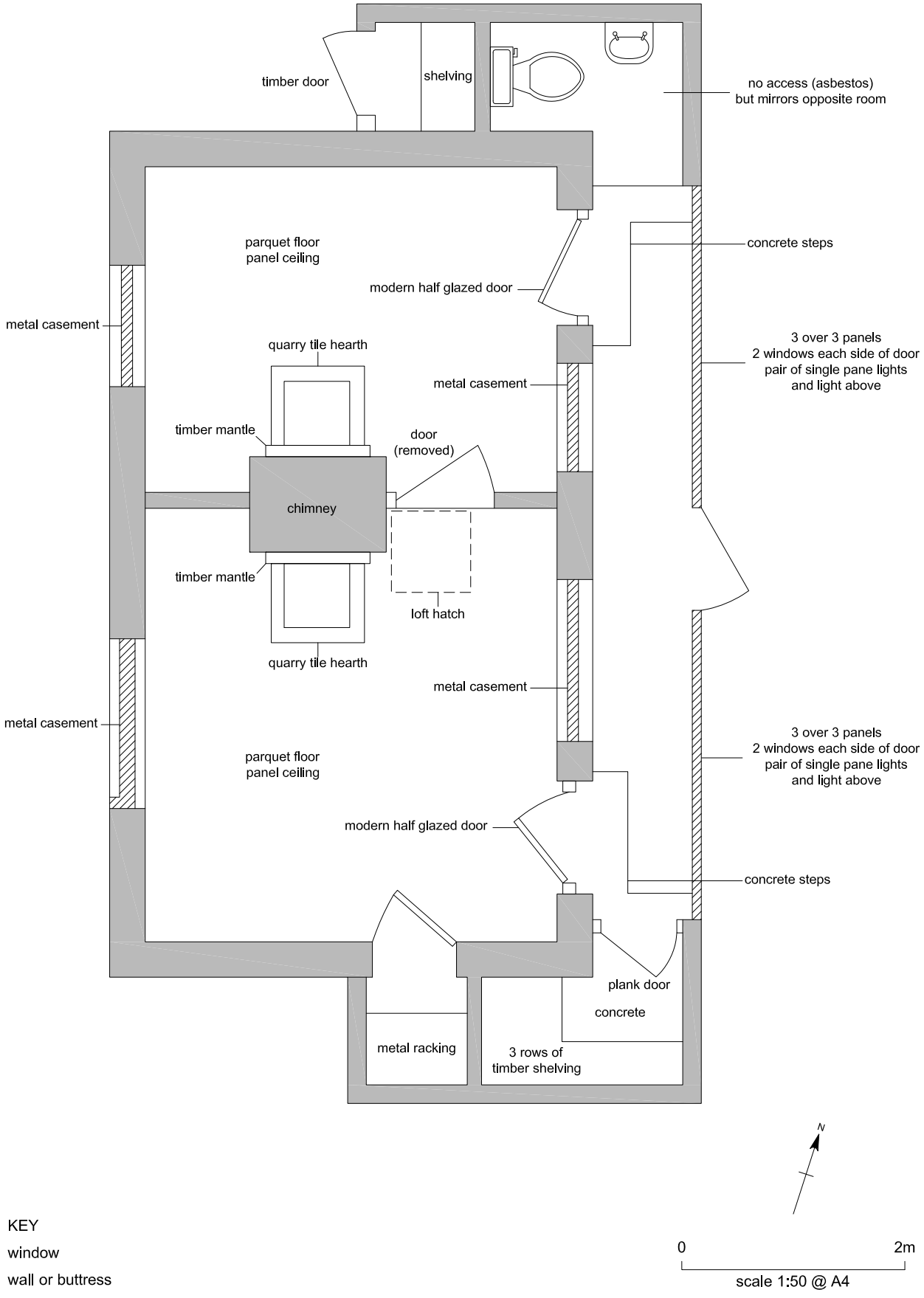
North east



0 5m
scale 1:100 @ A4

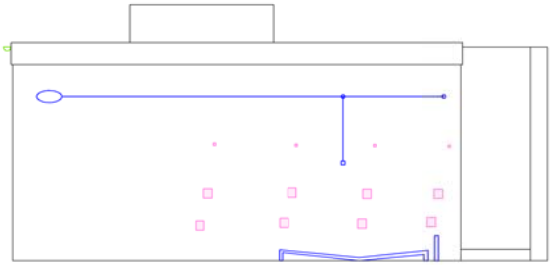
Former Killingworth Stores: Building 17 elevations

Figure 18

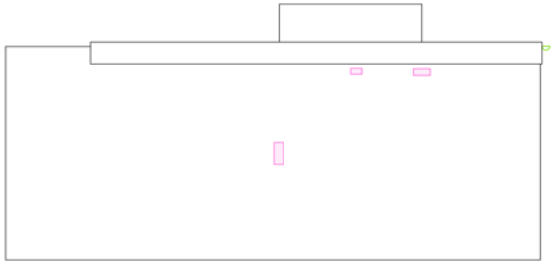


Killingworth Stores: plan of Building 17 *Figure 19*

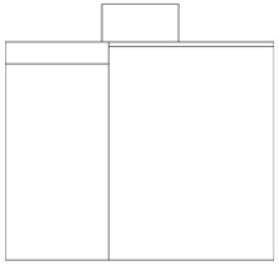
North



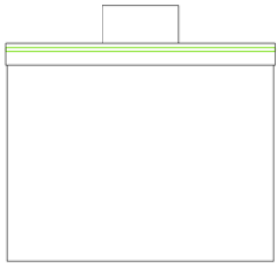
South



West



East

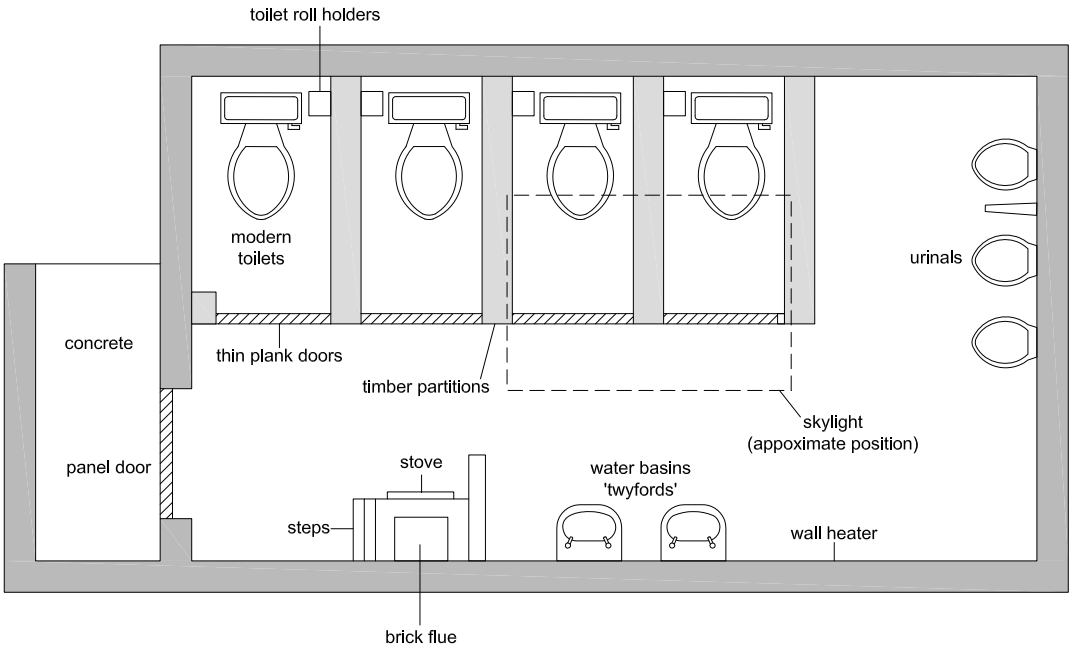


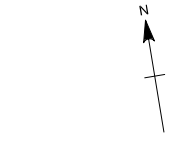
KEY
blocking
gutter
services

0 5m
scale 1:100 @ A4

Former Killingworth Stores: Building 19 elevations

Figure 20

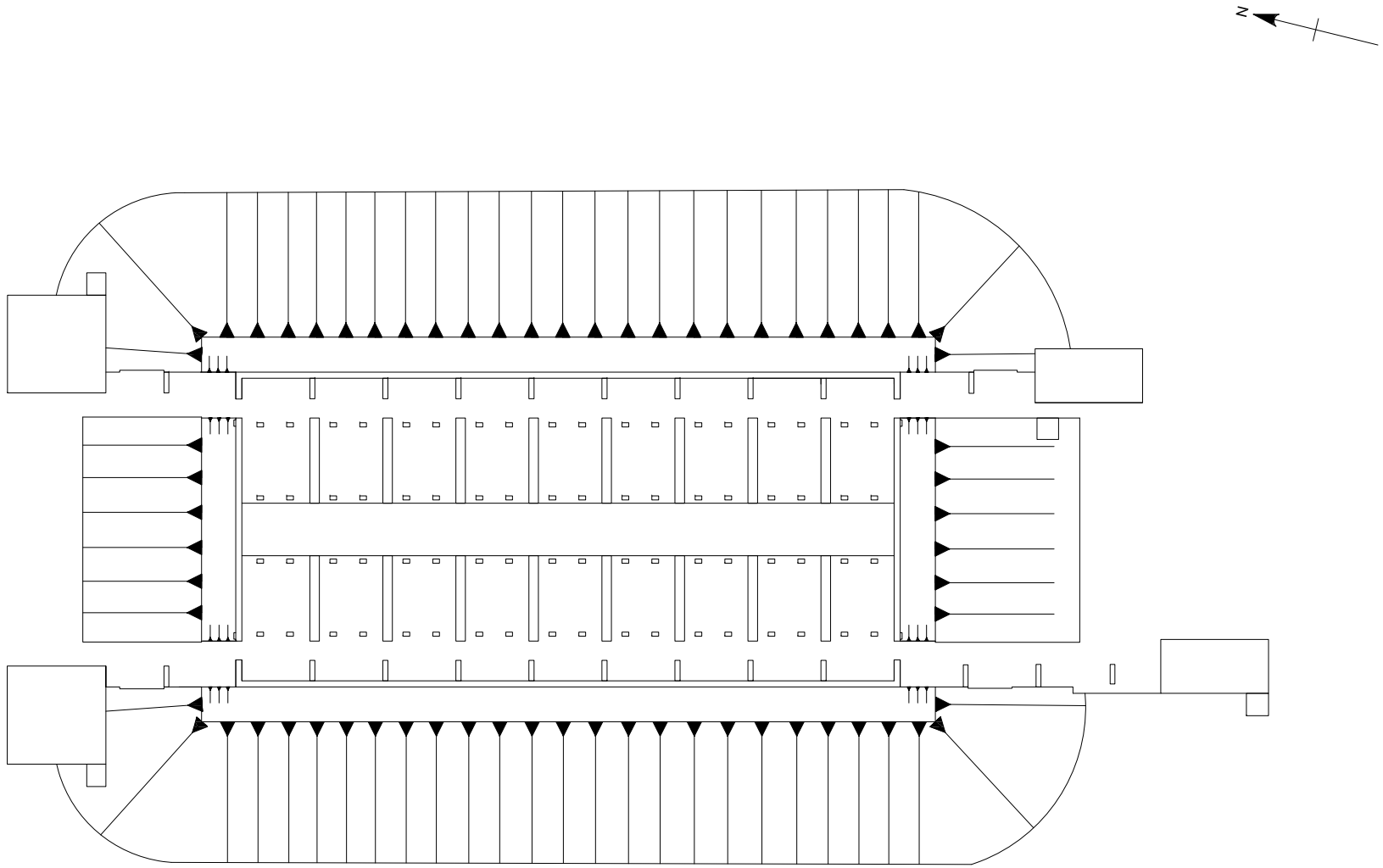




0 2m

scale 1:50 @ A4

Killingworth Stores: plan of Building 19 *Figure 21*

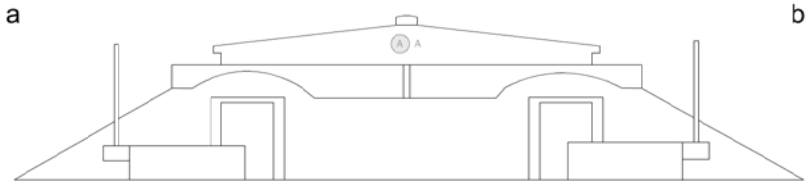


Former Killingworth Stores: Bunker A plan

Figure 22

External

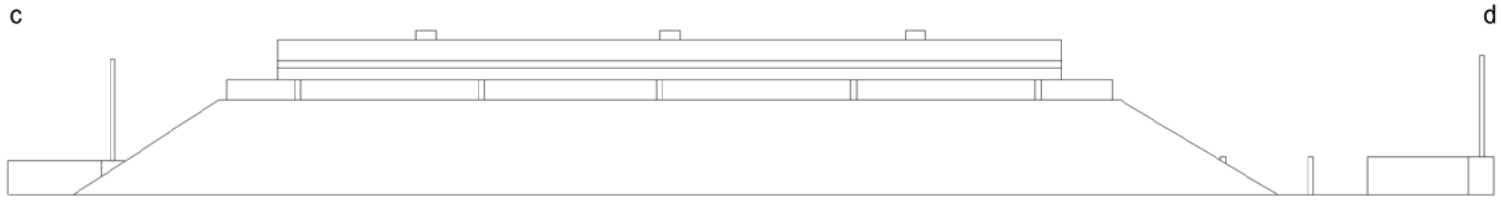
North
a



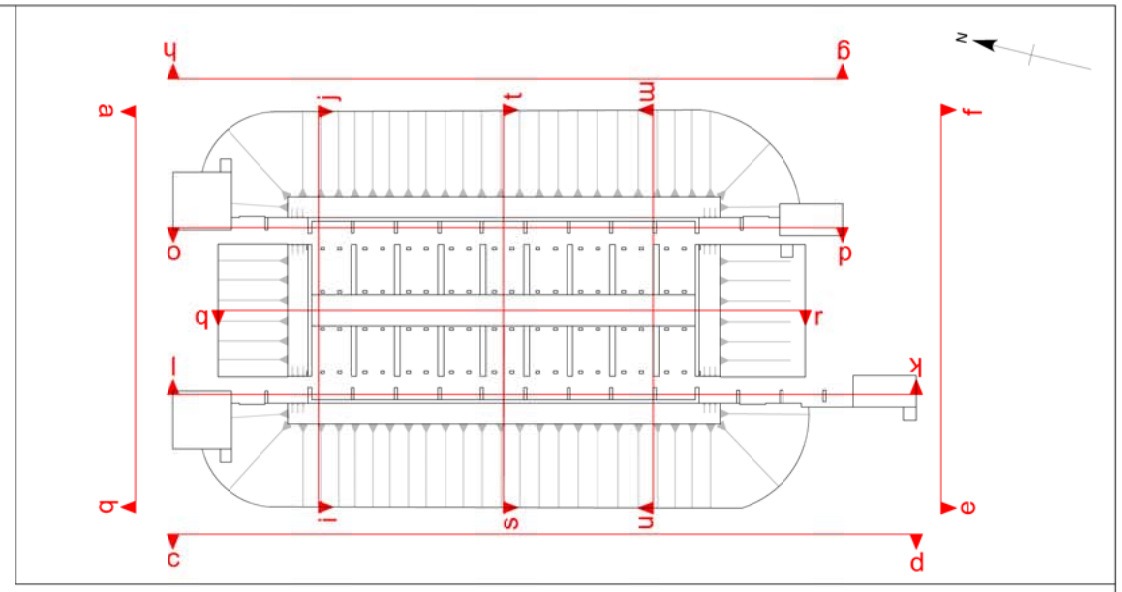
b

0 10m
scale 1:200 @ A3

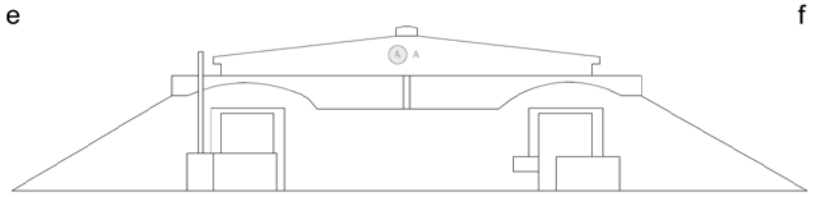
West
c



d

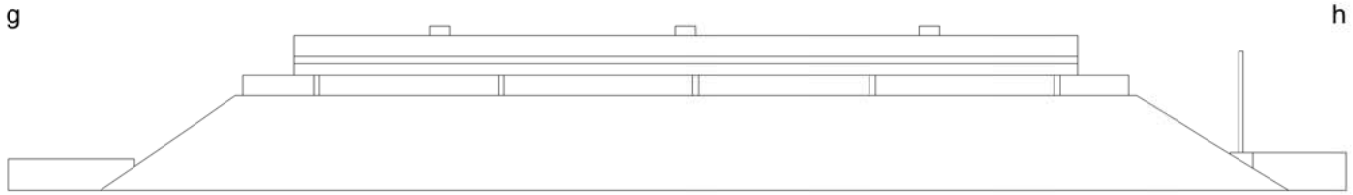


South
e



f

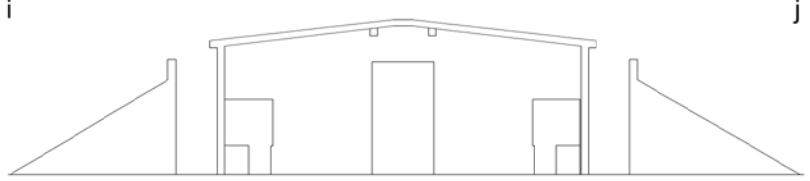
East
g



h

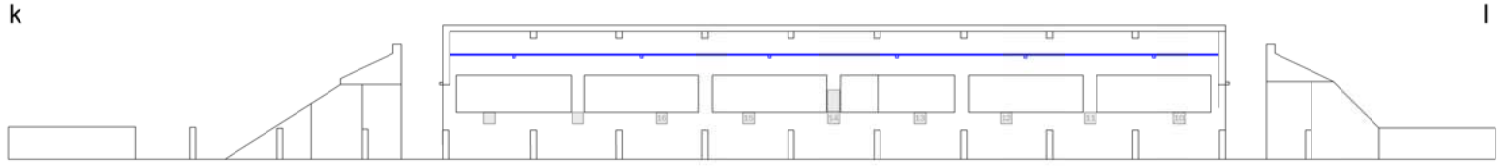
Internal

North
i



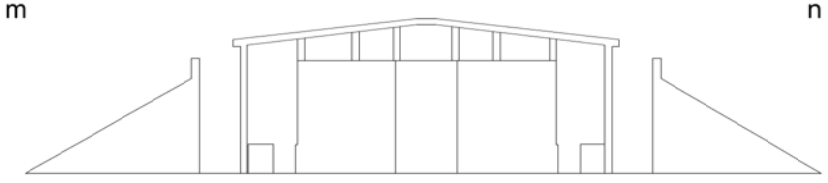
j

West
k



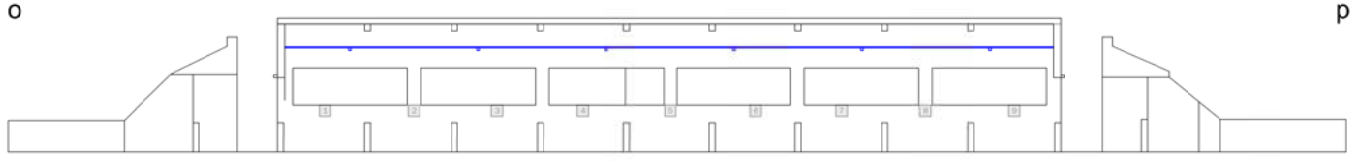
l

South
m



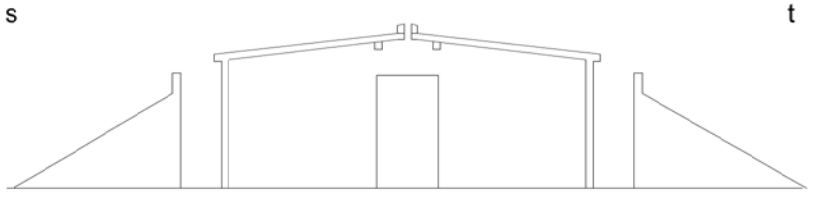
n

South
o



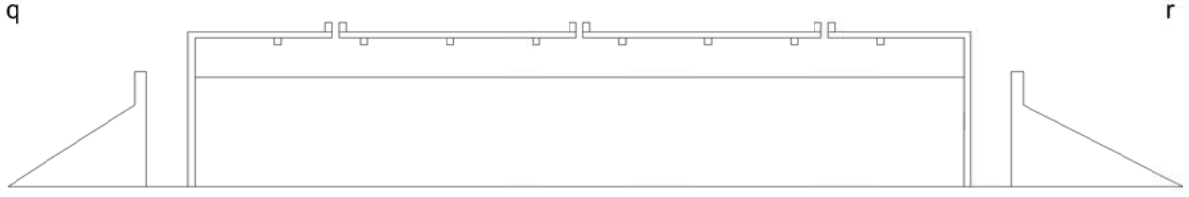
p

Central cross section (short axis)
s



t

Central cross section (long axis)
q

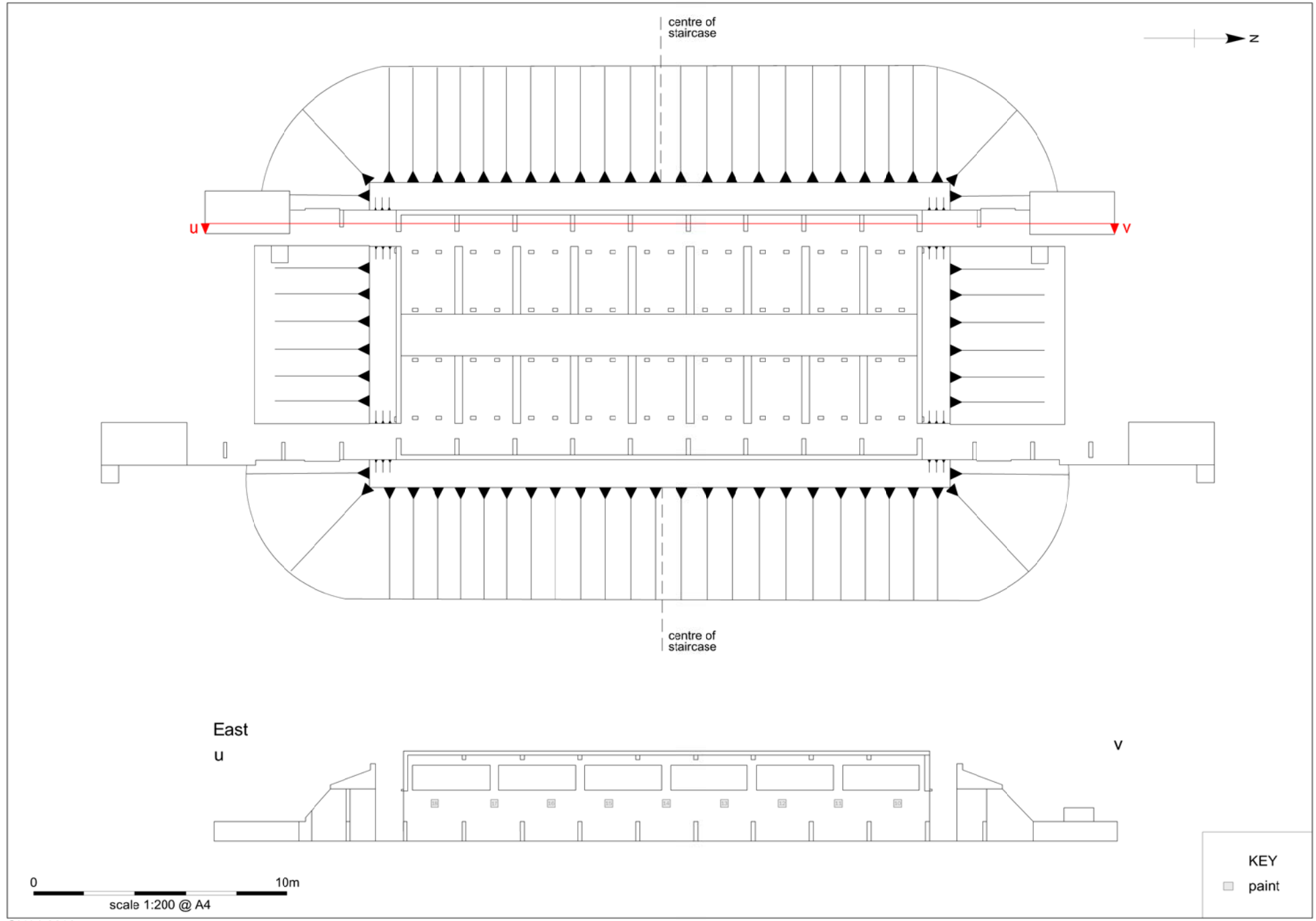


r

KEY
paint
services

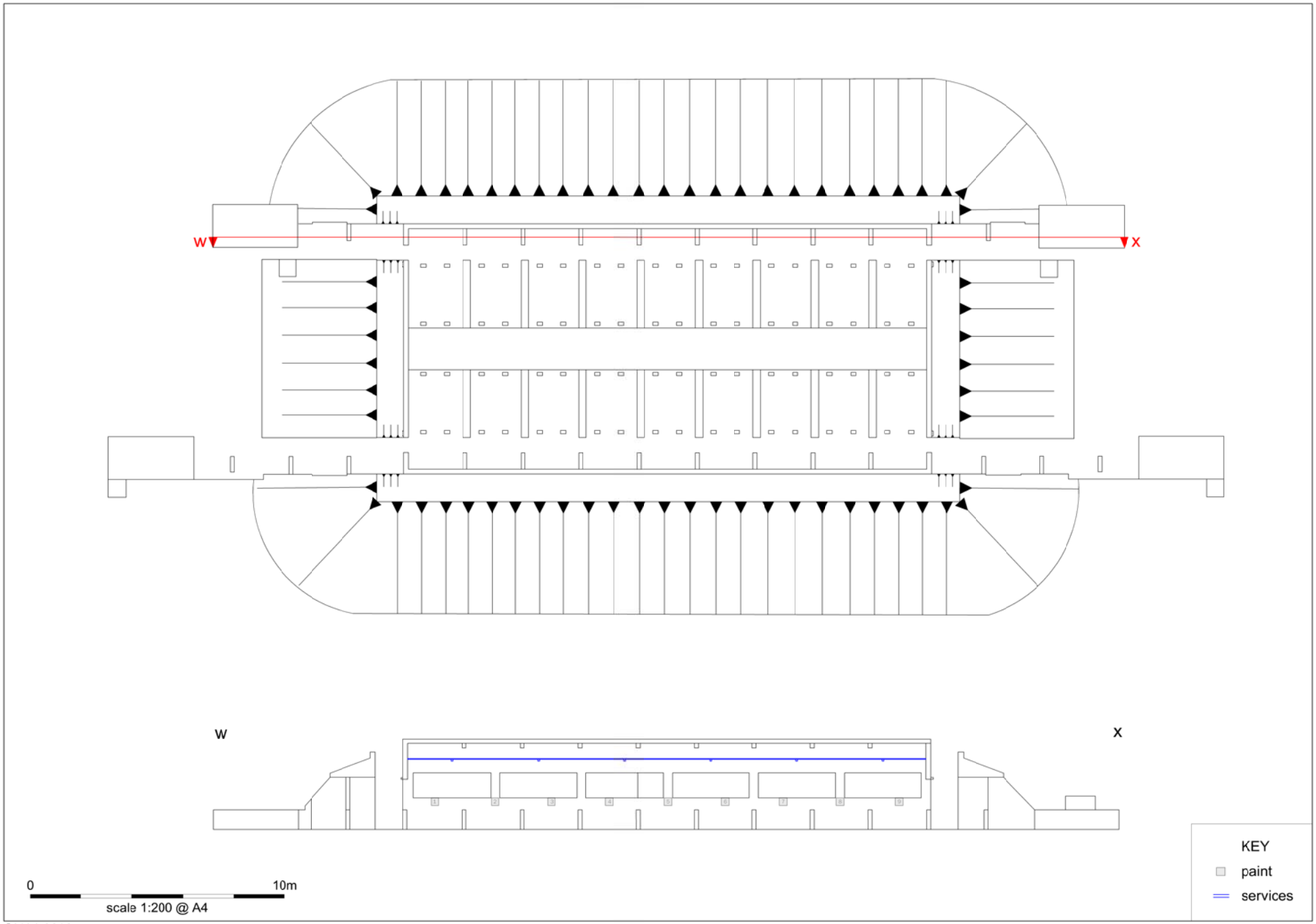
Former Killingworth Stores: Bunker A elevations and sections

Figure 23



Former Killingworth Stores: Bunker B plan and elevation

Figure 24



Former Killingworth Stores: Bunker C, D and E plan and elevation

Figure 25