



Knowsley Business Park, Draw Well Road, Knowsley, Merseyside Historic Building Survey Report

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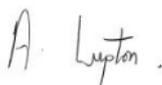
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Knowsley Business Park, Draw Well Road, Knowsley, Merseyside

Historic Building Survey Report

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Summary

In May 2020 Oxford Archaeology (OA) North was commissioned by Knowsley Council to complete a Level 3 Historic Building Survey of four former magazine bunkers at Knowsley Business Park, Merseyside (NGR SJ 43647 98810) ahead of their planned demolition and redevelopment (20/00114/DEMCON). The work was undertaken as a requirement of the demolition consent and was completed over two days, with an initial visit on the 6th of May and a subsequent visit on the 12th of that month, 2020.

The survey concluded that the four buildings form part of a larger group of ten surviving bunkers that once constituted the Group Nine Magazines of Royal Ordnance Factory (ROF) Kirkby No. 7. The magazines were erected sometime between 1939 and 1941, prior to the opening of the factory in September of that year in order to supply ordnance to the British during the Second World War. Their design, form and construction reflect their purpose as storage facilities but also the circumstances of their erection. Their construction, using inexpensive, durable materials and techniques that were suited to rapid assembly, ensured a low visibility structure capable of withstanding aerial attack whilst simultaneously protecting against accidental explosions.

Since the closure of ROF Kirkby in 1946 the bunkers have been used for various industrial storage functions, with alterations largely limited to the removal of surrounding banks from some elevations and the insertion of loading doors and fire escapes. Despite their austere character, they remain an interesting example of mid-twentieth century military architectural history and echo the social and political context of the period in which they were erected.

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The project was managed for OA North by Paul Dunn. The fieldwork was undertaken by Jamie Quartermaine, whilst the report was written by Andy Phelps. Survey and digitizing was carried out by Jamie Quartermaine and Debbie Lewis.

1 INTRODUCTION

1.1 Scope of work

1.1.1 In May 2020 Oxford Archaeology (OA) North was commissioned by Knowsley Council to complete a Level 3 Historic Building Survey of four former magazine bunkers at Knowsley Business Park, Merseyside (SJ 43647 98810). The work, which was undertaken as a requirement of the demolition consent (20/00114/DEMCON) was completed ahead of the planned demolition of the structures and the redevelopment of the land for employment use. The survey was carried out over two days by Jamie Quartermaine, with an initial visit on the 6th of May and a subsequent visit on the 12th of that month, 2020. The works were completed in accordance with the relevant Chartered Institute for Archaeologists (CIfA) and Historic England guidelines (CIfA 2017; 2019a; 2019b; 2020; Historic England 2015; 2016).

1.2 Location, topography and geology

1.2.1 The site is located within Knowsley Business Park, to the north of Knowsley and to the east of Kirkby (Fig 1). The four bunkers proposed for demolition are situated on the east side of the Business Park, bound by Draw Well Road to the west and Acornfield Road to the east (NGR: SJ 43647 98810).

1.2.2 They sit at an elevation of 40m AOD, on the edge of the Merseyside Conurbation, with the intensively-drained and highly-productive farmlands of the Lancashire Plain immediately to the north and east.

1.2.3 The underlying geology is comprised of sandstone of the Chester Sandstone Formation, deposited approximately 247 to 250 million years ago in the Triassic Period. The bedrock is overlain by wind-blown sands of the Shirdley Hill Sand Formation, a superficial deposit formed up to 2 million years ago in the Quaternary Period (BGS 2020). The area is characterized by naturally wet very acid sandy and loamy soils, of naturally very low fertility (Farewell *et al* 2011) but has since extensive improvements through drainage.

2 AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The following programme of works was designed to best meet the work required as defined in the project brief. The building was subject to Historic England Level 3 measured survey (Historic England 2016). Following completion of the fieldwork, the data has been collated, processed and interpreted to produce a written and illustrated report outlining a narrative history of the buildings, their development, and how they fitted into the wider landscape. The following report will also form an archive for submission to the appropriate Record Office.

2.2 Methodology

2.2.1 **Descriptive Record:** written records using OA North *pro-forma* record sheets were made of all principal building elements, both internal and external, as well as any features of historical or architectural significance. Particular attention was paid to the relationship between those areas of the building where its development, and any alterations, could be observed.

2.2.2 **Site Drawings:** plans, elevations and cross-sections were produced from the point cloud data generated during handheld laser scan survey of the buildings and annotated with pertinent detail. The final plans, elevations and cross-sectional drawings were created within an industry-standard CAD package (Autocad 2016), enhanced and annotated to show the form and location of all architecturally and historically significant features.

2.2.3 **Photographic Record:** a Canon EOS 2000D digital SLR (24 megapixel) camera, with a selection of lenses, was used for the photographic record. The record comprises landscape and detailed photography; the detailed photographs of archaeological features incorporated a scale bar where appropriate. Archival images comprise jpgs and Canon RAW format files (cr2) saved as 8-bit TIFFs. The data is stored on two separate servers on different sites, with appropriate back-up and disaster plans in place.

2.2.4 **Archive:** a full professional archive has been compiled in accordance with current ClfA (2020) and Historic England guidelines (2015). The paper and digital archive will be deposited with the Merseyside Historic Environment Record on completion of the project.

3 ARCHAEOLOGICAL AND HISTORIC BACKGROUND

3.1 Introduction

3.1.1 The historical background of the buildings has already been examined in some detail and the following section therefore offers only a brief overview of their history. For a fuller account, the reader is directed towards the Statement of Heritage Significance as prepared by SLR (2020) and Wardell Armstrong's previously completed survey (2019).

3.2 Historical Background

3.2.1 At the turn of the twentieth century Kirkby was a small village located to the west of the proposed development site in an agricultural landscape characterized by scattered farmsteads, large fields and mixed woodland, mid-way between the expanding urban centres of Liverpool to the south-west and St Helens to the east. The railway had reached Kirkby in 1848 but, with the opening of the East Lancashire Road in 1934, the area became more attractive for prospective development. By the late 1930s Kirkby was being considered as a potential site for the development of a new industrial centre but with the approach of war in Europe these plans were shelved (SLR 2020,8). Kirkby's position, outside of the major urban centres but within a commutable distance for a local workforce made it a suitable location for the construction of one of the Royal Ordnance Factories (ROF) being built to supply the war effort (Roberts 1976, 8).

3.2.2 The factory was commissioned in 1939 and construction began soon after, with over 1000 buildings erected, 26km of road and 33km of railway being laid (SLR 2020,8). Royal Ordnance Filling Factory Kirkby No 7. commenced production in 1941, specialising in the packing and filling of shells and the production of fuses for anti-tank mines. At its height it reportedly manufactured 10% of the ordnance produced for the British during the Second World War and employed over 23,500 people (SLR 2020,9), the majority of which were women.

3.2.3 Production was scaled back towards the end of the war as the demand for munitions slowed and ROF Kirkby was officially closed in March 1946. Following its closure, the site was acquired by the City of Liverpool and redeveloped as Knowsley Industrial Estate repurposing many of the existing building. The Group Nine ammunition bunkers were still ideally suited to provide storage facilities and have continued as such with minor modifications into the twenty first century. The site now forms one of the largest business parks in Europe (Plant 1988, 44).

3.3 Map Regression

3.3.1 **1:10,560 OS map of Lancashire, 1850:** At this date the area is depicted as being divided into a series of small but regular rectangular fields, indicative of post-medieval enclosure. Many of the fields are hachured to indicate areas of poor drainage and it is probable the area formed part of Kirkby Moss prior to improvement. To the south runs Kirby Rank Lane, with Moss Lane passing parallel to the north.



Plate 1: Excerpt from the 1:10,560 OS map of Lancashire, 1850

- 3.3.2 **1:2,500 OS map of Lancashire, 1893:** Forty years later the basic arrangement remains, although several fields have been amalgamated to form larger enclosures. To the north Moss Lane is now called Boundary Lane, with Stockpit Farm to its north and to the north-west Draw Well Farm occupies the site of what was formerly Parrs Moss House on the earlier map.



Plate 2: Excerpt from the 1:2,500 OS map of Lancashire, 1893

3.3.3 **Lancashire County Council Plan c.1945:** The change between the previous map and that completed in 1945 is substantial. The previous layout of fields and settlements and farmsteads has been swept away with the construction of Kirby ROF, which is shown as a series of well-ordered structures of varying sizes laid out upon its own grid. The ten square structures that comprise the Group Nine magazines can be seen at the eastern edge of the factory, divided at the centre by a north/south aligned road. One of the few surviving landscape features still visible on the map is the truncated western end of Boundary Lane, which lies to the north-east of the magazines but is preserved to the west as a district and constituency boundary.



Plate 3: Lancashire County Council Plan c 1945 (Reproduced from WA 2019)

- 3.3.4 **1:10,000 OS map of Lancashire, 1966:** This map, completed twenty years after the closure of ROF Kirby demonstrates the extensive rail network that served the factory during the Second World War. In particular, it shows the distribution of sidings to each of the group nine bunkers and demonstrates the survival at this date of the surrounding banks on all four sides of each structure. The roads have also been renamed, referencing the earlier farms in the area, with Stockpit Road to the west and Draw Well Road providing access to the Bunkers themselves.



Plate 4: Excerpt from the 1:10,000 OS map of Lancashire, 1966

3.3.5 **Aerial view 2019:** A recent aerial view demonstrates the development of the industrial estate in the intervening years. The bunker to the west of Draw Well Road have been extended and are more difficult to identify but those to the east can be seen as overgrown grass-covered mounds. A carpark has been laid out on the land immediately to the east of the latter, resulting in the partial removal of the eastern bank from each of the bunkers. Only an isolated fragment of the railway can still be identified to the east of Draw Well Road, but the widely-splayed corners at the junctions testify to its former presence.



Plate 5: Aerial view of the Group Nine Bunkers, September 2019 (Google Earth 2020)

4 BUILDING DESCRIPTIONS

4.1 Introduction

- 4.1.1 The basic layout, form and construction was repeated on each of the buildings and for the purposes of description an initial overview has been provided below. This is followed by an account of the exterior and interior of each building, focusing on alterations and modifications that may provide additional detail upon their function, use and construction.
- 4.1.2 In the following sections, the external elevations of each bunker is described first, followed by the interior elements. The descriptions should be read in conjunction with the accompanying drawings (Figs 3-10).

4.2 Overview

- 4.2.1 Despite small-scale modifications in the years since the closure of the ordnance factory, the magazine bunkers all essentially preserved the same footprint. They appeared as single storey, part subterranean structures, built to a rectangular plan and with an entrance projecting from the western end of the northern elevation. Constructed in a utilitarian manner using reinforced concrete, the regular horizontal marks identifiable on the face of each wall denoted the use of the cast-in-place technique, with the corners of all structural elements chamfered to reduce the risk of damage. Originally, the walls appear to have been covered in a waterproof coating, before banks of grass-covered soil were mounded against them but many of the banks have been removed and the exterior walls coated in white paint. In all four examples the soil-covered rooves remained intact and were covered in grass.
- 4.2.2 Internally, each building was divided into two distinct areas, with a large square storage room to the east divided from an elongated loading bay and platform to the west by a concrete cross-wall. The cross-wall was punctuated at regular intervals by a series of six full-height doorways, providing access between the platform and one of the bays that divided the storage room into six by six bays. The roof of the storage room was supported upon six rows of five square concrete columns, the head of each column splayed where it adjoined the ceiling.

4.3 Bunker 9/3

Exterior

- 4.3.1 At the western end of the northern elevation the main entrance was flanked by a pair of tapering blast walls, the western example splayed slightly to the west to accommodate access for the railway (Plate 6). The ground level to the east of the entrance was approximately 2m higher and was retained by the blast wall on this side, which had here been extended to the north in brick up to mid-height. The entrance was fitted with a pair of large timber loading doors, hinged to open externally and incorporating a low access hatch at the base of the western door.



Plate 6: Main entrance to Bunker 9/3

4.3.2 Despite the removal of the bank from the Bunker's northern side there were no openings in this wall, although a detached rectangular single-storey structure had been built at the western end (Plate 7). This building had been erected in red brick and had a large entrance on its northern side fitted with a roller shutter, a pedestrian entrance at the southern end of the eastern wall with a window to its north and another window on the opposing elevation. The garage-type structure housed a large diesel generator inside, powering what appeared to be an extractor fan, perhaps associated with the ventilation of the building (Plate 8).



Plate 7: Single-storey structure to the north of Bunker 9/3



Plate 8: Diesel Engine housed within single-storey structure

4.3.3 The bank had also been removed from the Bunker's eastern elevation and a set of double doors had been inserted at the southern end, with a steel handrail to its south (Plate 9). The faded remnants of a fire exit sign had been erected above the door and the opening was surmounted by a single course of red brick.



Plate 9: Fire exit at the southern end of the eastern elevation

- 4.3.4 To the south, the soil bank remained as a gentle gradient leading up to the Bunker's grass-covered roof, which was surrounded on the remaining three sides by a timber post and rail fence. The bank had been removed from the western elevation, but no openings or further features were identified on this wall (Plate 10).



Plate 10: Western elevation, note the horizontal lines denoting the use of the cast in place technique

Interior

- 4.3.5 The loading bay was an elongated rectangular space with an overhanging concrete platform running along the eastern side (Plate 11), accessed via a set of five steps at its northern end enclosed within a small stairwell (Plate 12). The floor was laid in concrete with a switch-back ramp at the southern end (Plate 13), rising to a docking station for the unloading of goods from a reversing vehicle, but the tops of a pair of parallel steel rails, approximately 1.4m apart, had been preserved within the present floor surface, denoting the standard gauge of the original railway line (Plate 11). The walls were painted yellow and white, with the ceiling coated in white.



Plate 11: Loading bay, facing south. Note the original rails preserved in the concrete floor



Plate 12: Stairwell at the northern end of the platform, facing west



Plate 13: Loading bay facing north, with ramp to centre, full height openings to right of frame and truncated brackets on the opposing wall

- 4.3.6 Along the eastern side of the platform, the dividing cross-wall was punctuated at regular intervals by six full height openings, each of equal width and leading into its own east/west bay within the large storage room (Plate 13). On the western wall of the loading bay, a series of truncated brackets projected from the wall approximately 2m above the present ground surface, perhaps once providing supporting for interior lighting or cable runs (Plate 13).
- 4.3.7 Within the storage room historic detail was sparse, reflecting the room's basic function to provide secure storage while eliminating any potential source of ignition. The walls and ceiling were coated in white paint and modern fluorescent strip lighting had been installed down the centre of each bay (Plate 14). To the north and south of each column an L-shaped metal bracket had been attached to the ceiling, possibly the remains of attachment points for racking or some other form of shelving.



Plate 14: Typical bay in the storage room, facing east with 1m scale

- 4.3.8 Much of the concrete floor had been painted, but this had evidently been undertaken without emptying the building and against the eastern wall a series of small repeating square markings and elongated patches which had not been painted, presumably indicated the position of racking (Plate 15). In addition, and more widely observed across the entire floor, were the circular imprints of what may have been barrels or drums. The relationship of these circular markings to the location of the shelving indicated the former to be the earlier of the two.

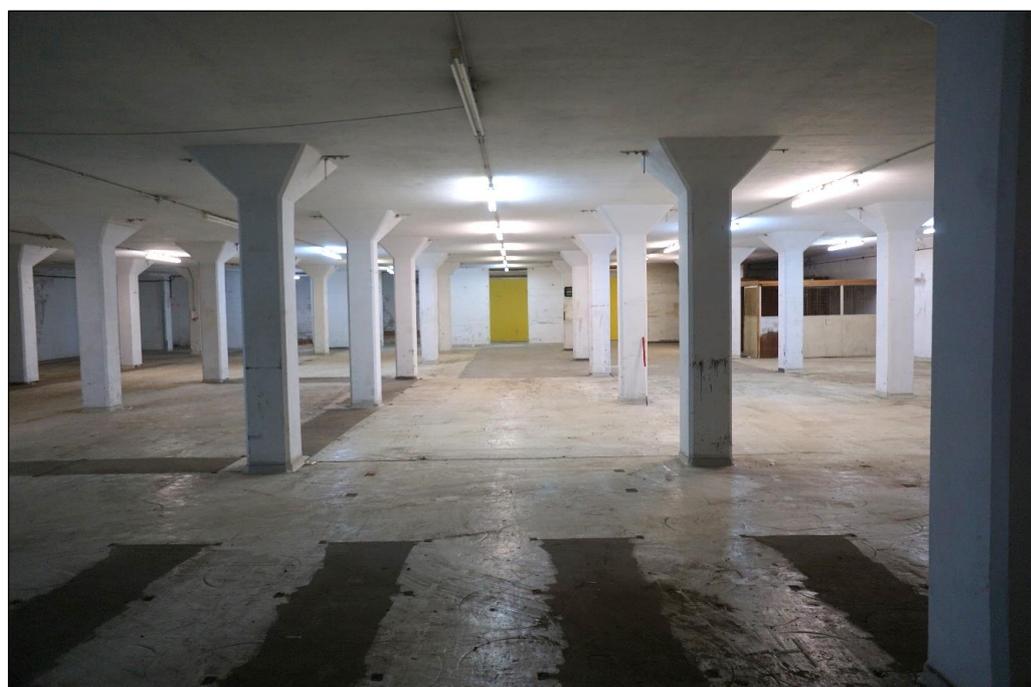


Plate 15: Looking west along the storage bay towards the platform opening, with markings on the floor visible in the foreground

- 4.3.9 Modern timber partitions installed within the north-western corner of the room had created two small rectangular cells, one of which was heated, probably an administration space, and the other as a storage room. Similar timber partitions had been erected across two bays in the south-eastern corner, providing another large room in this location and, to its north, a timber ramp led up to the fire escape described on the eastern external elevation (Plate 16).

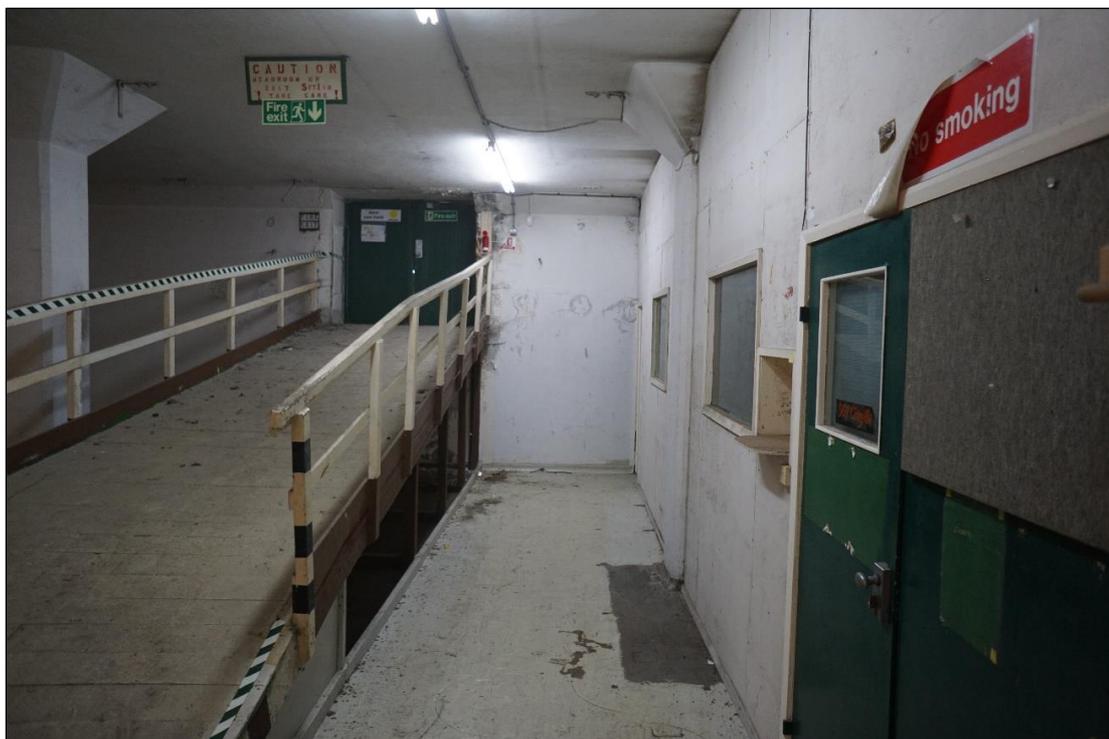


Plate 16: Ramp leading up to the fire escape on the eastern wall with partitioned room to the right

4.4 Bunker 9/5

Exterior

- 4.4.1 As with the previous Bunker, the north-western entrance was flanked by tapering blast walls and had been fitted with two large externally-opening timber doors, each set upon a pair of pintel hinges (Plate 17). Pedestrian access was provided by a low hatch cut through the lower portion of the western door.



Plate 17: Main entrance on northern elevation, facing south, with 1m scale

4.4.2 The ground surface to the east of the entrance was also slightly raised, with the change in soil level being retained by the lower portions of the eastern blast wall. The bank that had once abutted the remainder of the northern elevation had been removed and a fire escape door had been inserted at the eastern end (Plates 18 and 19). At the western end of this elevation there were a series of small concrete plinths, arranged in three rows of four across the ground, which presumably represented the foundation pads of a now demolished small square structure (Plate 20).



Plate 18: Northern elevation, facing south-east



Plate 19: Entrance at the eastern end of the northern elevation, with 1m scale



Plate 20: Foundation pads at the western end of the northern elevation, with 1m scale

- 4.4.3 The bank had also been removed from the eastern side of the building, exposing the base of a pair of brick-built ventilation towers located at thirds across its length (Plate 21). Each tower extended to a height of approximately 3.75m, and at the top of each elevation there was a small square aperture fitted with a honey-combed mesh. The towers were topped by an oversailing concrete cap and the base was coated in a waterproof sealant. On the northern example, a metal bracket had been fitted to the centre of the concrete cap, the remnants of a fixture since lost.



Plate 21: Brick ventilation towers on the eastern elevation, facing south

- 4.4.4 The bank had also been lost from the western side of the structure, but no alterations had been made to this elevation (Plate 22), while the slope of the southern bank remained *in situ*, providing access to the grass- and scrub-covered roof.



Plate 22: Eastern elevation, facing south-east

Interior

- 4.4.5 The interior was similarly arranged to Bunker 9/3, with a stairwell at the northern end accessing a concrete platform running along the eastern side of the elongated loading bay and a switch back ramp at the southern end fitted with a modern docking station (Plates 23 and 24). Here, however, a modern steel safety rail and chain link had been installed along the side of the platform and a series of modern bolts projected at regular intervals from half height along the western wall. Again, the concrete floor had been raised slightly but the rails had been left *in situ* and were just visible in plan.



Plate 23: Loading bay, facing south



Plate 24: Modern docking station at the southern end of the loading bay

4.4.6 The walls and ceiling of the storage room were coated in white paint and the same arrangement of lighting was used as in the previous bunker (Plate 25). The L-shaped ceiling brackets were also common to both buildings but here despite the pattern of small square impressions on the floor surface there was no evidence of the circular marks seen in Bunker 9/3.



Plate 25: Southern bay of the storage room, facing west

4.4.7 A single room had been partitioned off in modern timber at the western end of the penultimate northern bay, which had occasioned the blocking of the opening of the dividing cross-wall in this location (Plate 26). This room was accessible via a doorway from the south but was of no historic interest.



Plate 26: Modern partitioned room in the north-western corner

4.4.8 The only other features of note were a timber staircase located in the north-eastern corner of the storage area, which led in three stages up to the fire escape located at the eastern end of the northern external elevation, and a pair of square apertures located at either end of the eastern wall just below ceiling height (Plate 27). The latter coincided with the ventilation towers noted externally.



Plate 27: Penultimate northern bay, facing east. Note the square aperture in the eastern wall, one of two on this wall which coincides with the external ventilation towers

4.5 Bunker 9/7

- 4.5.1 The main entrance at the western end of the northern elevation had been fitted with a steel roller shutter but was otherwise identical to those previously described (Plate 28). In this instance, the ground to the east of the main entrance was broadly level with that to the west and may perhaps have been reduced to make it so. The bank had again been removed to expose the remainder of the northern elevation and a pedestrian doorway fitted with a steel roller shutter having been inserted into the western end (Plate 29). A concrete path had been lain as an approach to this doorway.



Plate 28: Main entrance on the northern elevation, facing south with 1m scale



Plate 29: Entrance inserted into the western end of the northern elevation, facing south with 1m scale

- 4.5.2 At the centre and eastern end two more entrances had been cut through the wall, slightly wider in dimension than the last for the purposes of loading but both again fitted with steel roller shutters (Plates 30 and 31).



Plate 30: Northern elevation facing south-east



Plate 31: Inserted entrance at the eastern end of the northern elevation, 1m scale

- 4.5.3 The bank on the eastern elevation had only been partially removed, exposing the top of the concrete wall behind and revealing the upper three-quarters of two brick

ventilation chimneys, identical to those described in the same position as on Bunker 9/5 (Plate 32).



Plate 32: Brick ventilation towers on eastern elevation, facing south-west

4.5.4 The bank had been completely removed from both the southern and western elevations, but neither revealed any features of historic interest (Plates 33 and 34).



Plate 33: Southern elevation, facing north



Plate 34: Western elevation, facing south-east, with 1m scale

Internal

- 4.5.5 Although dimensionally identical to those previously described, the loading bay in Bunker 9/7 had been modified, with the removal of the overhanging portion of the platform to leave a vertical step accessible only from the stairwell at the northern end (Plate 35). In addition, there was no evidence to suggest it had ever had a switchback ramp at the southern end and a deep channel had been cut through the centre of the floor at the northern end, perhaps to form a vehicle inspection pit (Plate 36).

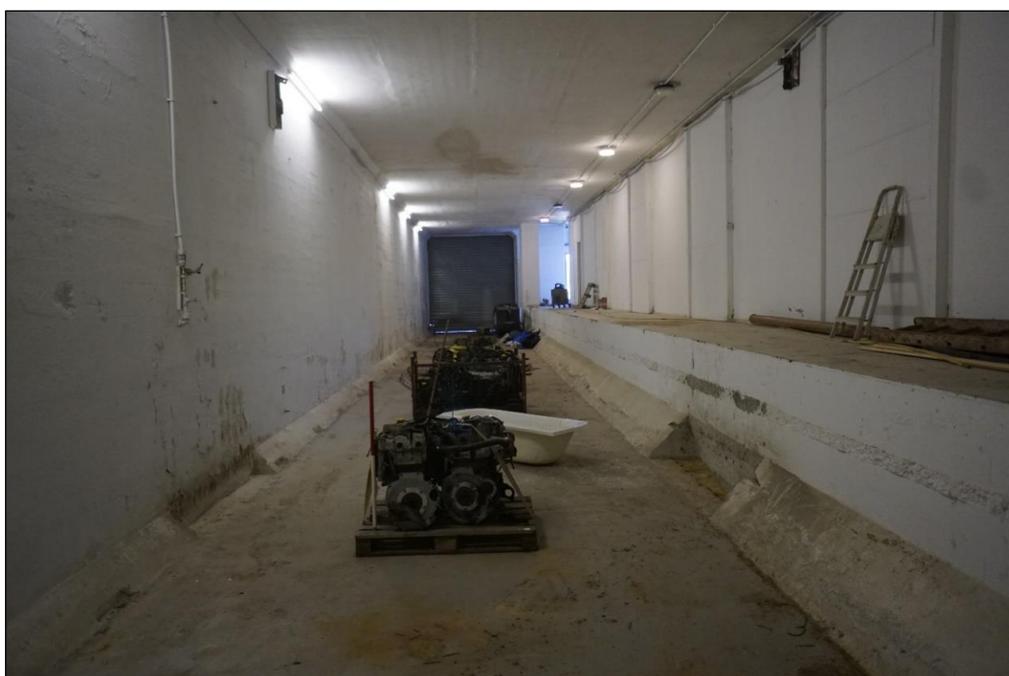


Plate 35: Loading bay facing north, showing the removal of the platform and blocked doorways on the cross-wall



Plate 36: Loading bay facing south, showing channel cut into the floor

- 4.5.6 Several of the openings on the cross-wall had been boarded over (Plate 35), leaving just the southern entrance and the northern entrance intact, although the latter had been reduced in width and height to facilitate pedestrian use (Plate 37). Few details remained on the opposing western wall, but towards the southern end a vertical metal channel had been attached to the wall just below ceiling height (Plate 38). The features purpose was unclear, but an identical channel had also been bolted to the opposing wall in the corresponding position.



Plate 37: Modified northern opening in the cross-wall, facing east

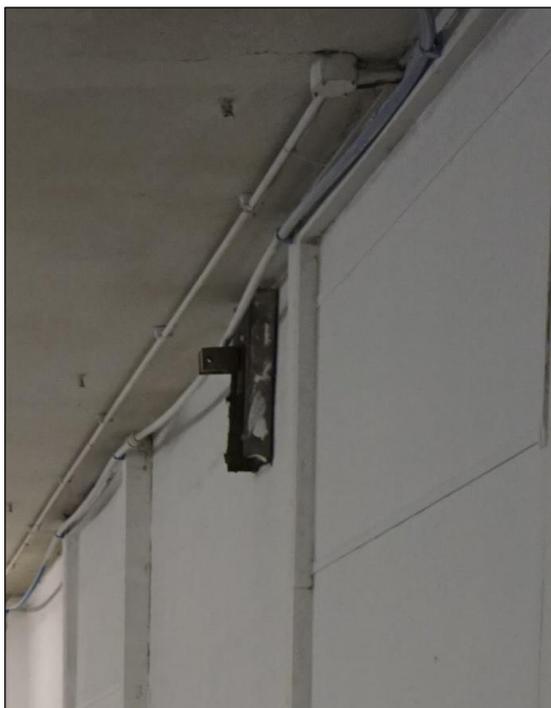


Plate 38: U-shaped channel on the western face of the cross-wall, facing north

4.5.7 The first of the three inserted doorways identified on the northern elevation provided a direct entry to the stairwell via a single step down (Plate 39). It was topped by a modern fire-escape sign and was otherwise unremarkable in its form. The second opening lay within the fourth bay from the west in the storage room and was served by a short flight of steps formed out of timber pallets (Plate 40), while the third opening in the penultimate eastern bay, had a lower threshold and required no step.



Plate 39: Entrance into stairwell, facing north



Plate 40: Inserted entrance in the fourth bay from the west, facing north-west

- 4.5.8 The storage room itself was decorated in the same manner as the previous two bunkers, although the L-shaped ceiling mounted brackets had all been removed, in each case leaving just the two projecting bolts upon which they had been set. The floor again showed evidence for heavy goods storage in the preservation of indentations of both circular and square form. On the eastern wall a pair of square apertures, set just below ceiling height, were presumably associated with the ventilation towers observed externally (Plate 41).

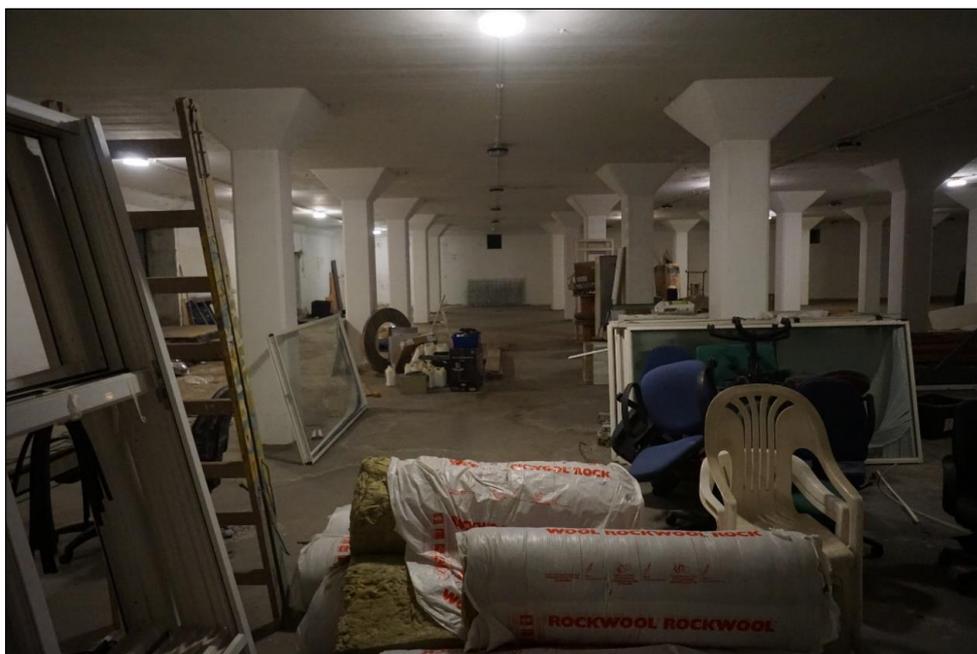


Plate 41: Storage room facing east, with 1m scale. Note the square ventilation aperture on the eastern wall

4.5.9 The only partitions within the storage room were located in the north-western corner, where a pair of modern toilet cubicles had been installed side by side against the northern wall, with washing facilities to their east.

4.6 Bunker 9/9

Exterior

4.6.1 The entrance at the western end of the northern elevation was fitted with the same timber doors as those on Bunker 9/5, although the building's disuse meant the approach was more vegetated than any of the previous examples (Plate 42). The bank had been removed from the remainder of the northern elevation and this too was partially obscured by vegetation, but there did not appear to be any additional openings (Plate 43). The bank had been removed from the eastern (Plate 44) and southern (Plate 45) elevations too, once again exposing the two ventilation chimneys on the eastern side, but no further openings were observed on either wall.



Plate 42: Northern entrance facing south, with 1m scale



Plate 43: Northern elevation, facing south-west



Plate 44: Eastern elevation, facing south-west and showing ventilation towers with 1m scale



Plate 45: Western end of the southern elevation, facing north-east

4.6.2 On the western elevation, the removal of the bank had been followed by the introduction of loading doors through the southern end and centre of the wall (Plate 46). In both instances, the sills were raised above ground level, reflecting the difference in the external and internal floor heights (Plates 47 and 48). Both openings were fitted with internally-opening double timber doors, had single piece reinforced concrete lintels and their surrounds had been patched with concrete render. At the northern end of the elevation an abutting small brick structure with a flat concrete roof and an entrance to the west enclosed what appeared to be the building's electrical isolation switch (Plate 46).



Plate 46: Western elevation facing south-east, with 1m scale



Plate 47: Northernmost inserted loading door on the western elevation, 1m scale



Plate 48: Southern inserted loading door on the western elevation, 1m scale

Interior

4.6.3 The loading bay of Bunker 9/9 had also been modified, with the floor level raised to the height of the platform to produce a single level surface with a pedestrian ramp at

the northern end to negotiate the change in height from the exterior of the building (Plate 49). A line in the concrete denoted the original position of the platform edge and, following the alterations, a pair of double timber doors had been inserted into the northern and southern ends of the western wall. The doors of both openings were hinged to open internally and their surrounds had been patched in concrete, but the work appeared to have resulted in the spooling of concrete from above the lintels, revealing the original reinforced steel lattice work behind (Plates 50 and 51).



Plate 49: Loading bay, facing south. Note the substantially raised floor level



Plate 50: Inserted loading door at the southern end of the loading bay, facing south-west



Plate 51: Inserted loading door at the northern end of the western wall, facing west, with 1m scale

4.6.4 The remainder of the building was in largely original condition, with no additional openings added to any of the walls. It preserved its original and undivided six by seven bay storage room and each bay's associated entrance from the platform was intact (Plate 52). Unlike the previously described bunkers, however, it also retained what appeared to be its original lighting system, which consisted of a series of ceiling-mounted bulbs, arranged to illuminate the centre of each east/west-aligned bay (Plate 53).



Plate 52: Cross-wall entrance from platform, facing west, with 1m scale



Plate 53: Southern bay, facing east. Note the original light fittings running along the centre of the ceiling

- 4.6.5 The L-shaped ceiling mounted brackets had been removed, leaving just traces of the truncated bolt heads protruding slightly from the surface, while the floor appeared to preserve traces of the circular indentations identified in Bunker 9/3.

4.7 Railway

- 4.7.1 In addition to the portions identified within the loading bays, substantial elements of the railway tracks were observed to the west of Bunker's 9/3 and 9/5, with the latter preserving a siding, that branched away from the main track in a north-easterly direction (Plate 54). The rails were of standard gauge and attached to timber sleepers via chairs using square-headed bolts bearing the letter S on their tops. The rails were affixed to each other using fish plates and the stone chippings forming the track ballast remained. A tall steel lever survived to operate the points where the siding divided from the main line to the west of Bunker 9/5 (Plate 55).

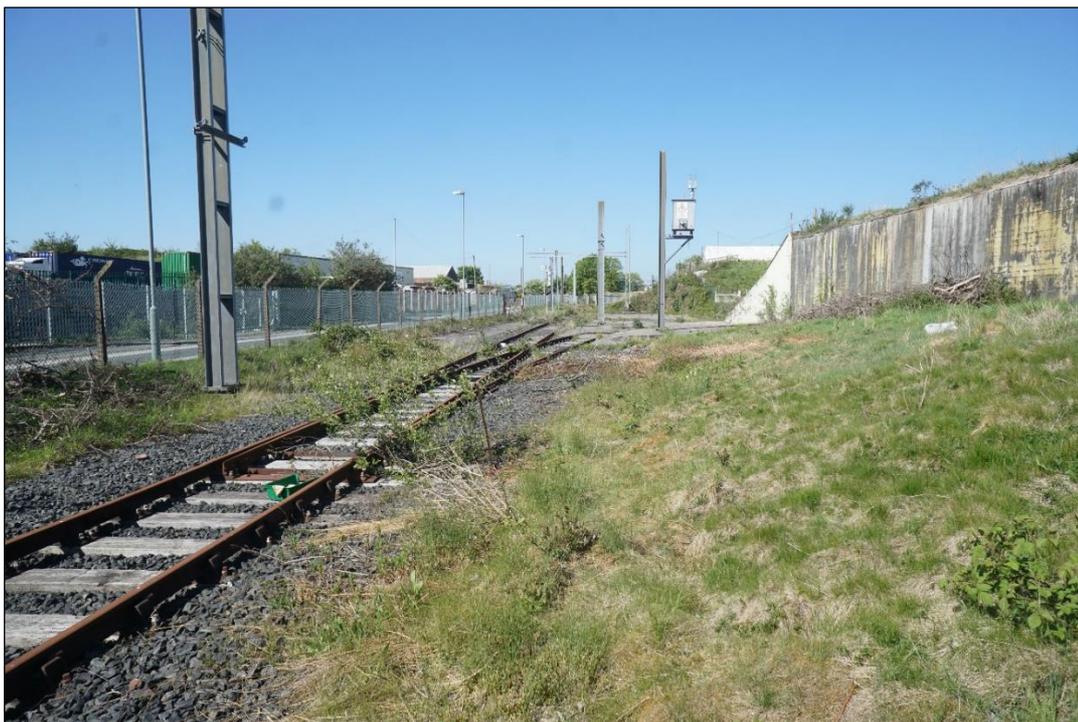


Plate 54: Railway line to the west of Bunker 9/5, showing the main transit line and siding to the north-east



Plate 55: Looking north along the track, with the lever operating the points to the right of the frame

5 DISCUSSION

5.1 Origin

- 5.1.1 The four bunkers presently under study form part of a set of ten that once constituted the Group Nine Magazines and comprised just one section of the ROF Kirkby No.7. The construction of the factory, one of forty across the country as a whole, can be directly associated with the geopolitical events of the first half of the twentieth century that plunged Europe and many other parts of the world into the First and Second World Wars. The factory began production in 1941 and reportedly manufactured 10% of the ordnance produced for the British during the Second World War. It specialized in the packing and filling of shells for six pounder guns, and fuses for anti-tank mines (Stratton & Trinder, 2000, 213).
- 5.1.2 Its location was carefully considered, the existing railway and newly-built East Lancashire Road, providing good access to the major urban centres of Liverpool and St Helens for the purposes of providing a large workforce, while lying outside the area considered most at risk of aerial attack.
- 5.1.3 Its buildings too reflect the circumstances in which it was erected, with a range of structures built using inexpensive, durable materials and techniques that were suited to rapid assembly. Reinforced concrete was extensively employed, providing buildings, such as the Group Nine Bunkers, that were capable of withstanding potential aerial assault. The Bunkers were constructed to a common design that is seen across almost all of the ROF facilities, providing a simple storage space, while omitting any extraneous architectural embellishment.

5.2 Function

- 5.2.1 The bunkers were built to a simple design using what at the time were modern and efficient methods that facilitated the rapid construction required. The use of reinforced cast concrete ensured the strength to defend against aerial assault, with the grass-covered banks providing a measure of camouflage. The banks were also designed to absorb any explosion, whether accidental or through enemy fire, thus safeguarding against triggering further explosions. Similarly, the construction of the bunkers as small, detached structures, arranged in groups, spread the ordnance out and defended against the threat of a catastrophic direct hit upon a larger warehouse.
- 5.2.2 Internally, their uncomplicated layout was designed to facilitate the smooth transport and storage of goods, with the assembled ordnance entering the loading bay from the north either by rail or truck and being unloaded onto the platform from where they could be deposited directly in to one of the six storage bays with the minimum of handling.
- 5.2.3 For obvious reasons, security was tightly controlled, with the provision of a single entrance making it easier to monitor access, but adequate ventilation was also evidently an important consideration, with each bunker built with a pair of ventilation towers on its eastern side.

5.2.4 The bunkers were connected to a standard gauge railway that permitted direct unloading and reloading of munitions under cover and transit via the national rail network, but provision was also made for road access.

5.3 Development

5.3.1 As demand for munitions reduced towards the end of the war it was recognized that a new purpose would need to be found for the site, and as originally intended, it was redeveloped as an industrial estate, reusing many of the existing buildings where possible. The form of the bunkers meant that with only very minor alterations they were well suited to the storage of other less hazardous materials and they appear to have undergone only limited modifications in the years since.

5.3.2 The most significant alterations are the removal of the banks from some of the elevations, the cartographic evidence suggesting that the bank abutting the northern elevation of Bunker 9/3 had been removed by 1971, with the rest following before the end of the century. The partial removal of the eastern banks was undertaken between 1971 and 1990 to provide sufficient car parking facilities for the Kodak Factory that occupied the site on the eastern side of Acornfield Road, but the removal of the banks also allowed the insertion of new entrances both for loading and as fire escapes.

5.3.3 Across the site of the former Factory as a whole the general layout of the railway survived until the latter half of the twentieth century, although it was no longer being used to transport goods. New developments in the intervening years, however, have seen its gradual removal, with the section to the west of Bunker 9/5 being one of the last sections visible.

5.3.4 Aerial photographs show the northern three bunkers in regular use throughout the present century, with Bunker 9/9 in more limited use since at least 2000. Since 2011 alterations have been made to Bunker 9/7, with the installation of a steel shutter and insertion of openings on the northern elevation.

5.4 Conclusion

5.4.1 The four buildings presently under investigation form part of a larger group of ten surviving bunkers, arranged in two rows of five to the east and west of Draw Well Road that once constituted the Group Nine Magazines of ROF Kirkby No. 7. The magazines were erected sometime between 1939 and 1941, prior to the opening of the factory in September of that year in order to supply ordnance to the British during the Second World War. Their design, form and construction reflect their purpose as storage facilities, but also the circumstances of their erection. The use of inexpensive, durable materials and techniques that were suited to rapid assembly, while ensuring a low visibility structure capable of withstanding aerial attack, while simultaneously protecting against accidental explosions.

5.4.2 The factory was decommissioned in 1946 following the conclusion of the War and since this time the bunkers have been used for various industrial storage functions. During this time, alterations have been largely limited to the removal of surrounding banks from some elevations and the insertion of loading doors and fire escapes. Despite their austere character, they remain an interesting example of mid-twentieth

century military architectural history and echo the social and political context of the period in which they were erected.

APPENDIX A BIBLIOGRAPHY

Cartographic Sources

Ordnance Survey, 1850 1:10,560 Lancashire (surveyed 1845 to 1847)

Ordnance Survey, 1893 1:2,500 Lancashire (surveyed 1893)

Ordnance Survey, 1966 1:10,000 Lancashire

Lancashire County Council Plan c 1945

Google Earth, 2020 *Aerial view of the Group Nine Bunkers* September [Online] available at: <https://www.google.co.uk/maps> (accessed 24th June 2020)

Secondary Sources

British Geological Survey (BGS) *Geology of Britain Viewer* [Online], Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (accessed 24th June 2020)

Chartered Institute for Archaeologists (CIfA), 2017 *Standard and guidance for historic environment desk-based assessment*, Reading

CIfA, 2019a *Standard and guidance for the archaeological investigation and recording of standing structures*, Reading

CIfA, 2019b *Code of conduct*, Reading

CIfA, 2020 *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*, Reading

Historic England (HE), 2015 *Management of Research Projects in the Historic Environment (MoRPHE)*, London

HE, 2016 *Understanding Historic Buildings, a guide to good practice*, Swindon

Farewell TS, Truckell, IG, Keat, CA, Hallett, SH, 2011 *The derivation and application of Soilscales: soil and environmental datasets from the National Soil Resources Institute*, Cranfield University

Plant, A 1988 *The History of Kirkby*

Roberts J, 1976 *Kirkby a Short History*

SLR, 2020 *Knowsley Industrial Park, Statement of Heritage Significance*, Unpub Report

Stratton M and Trinder B, 2000 *Twentieth Century Industrial Archaeology*, Routledge

Wardell Armstrong, 2019 *Draw Well Road, Knowsley Industrial Park, Archaeological Building Recording*, Unpub Report

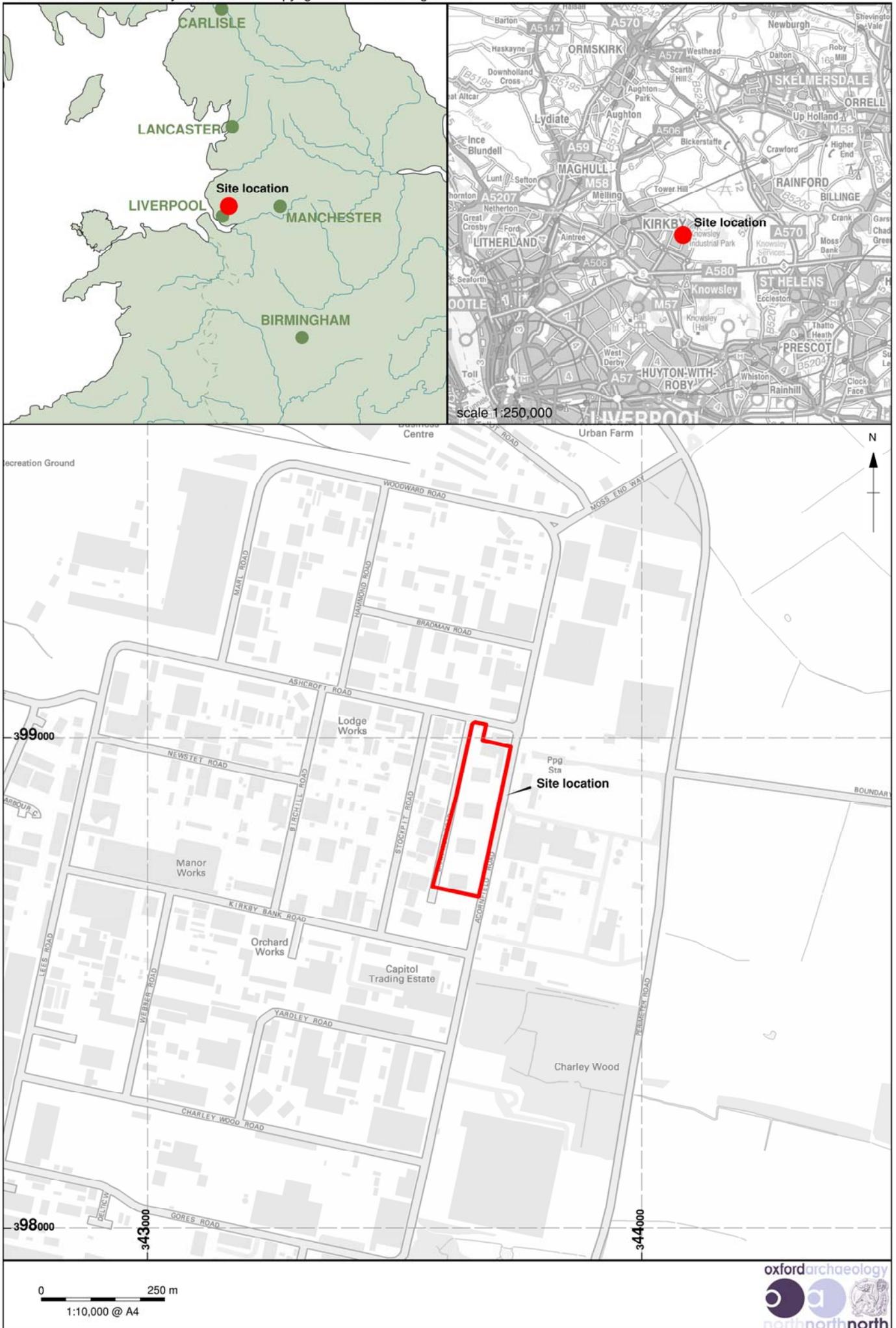


Figure 1: Site location

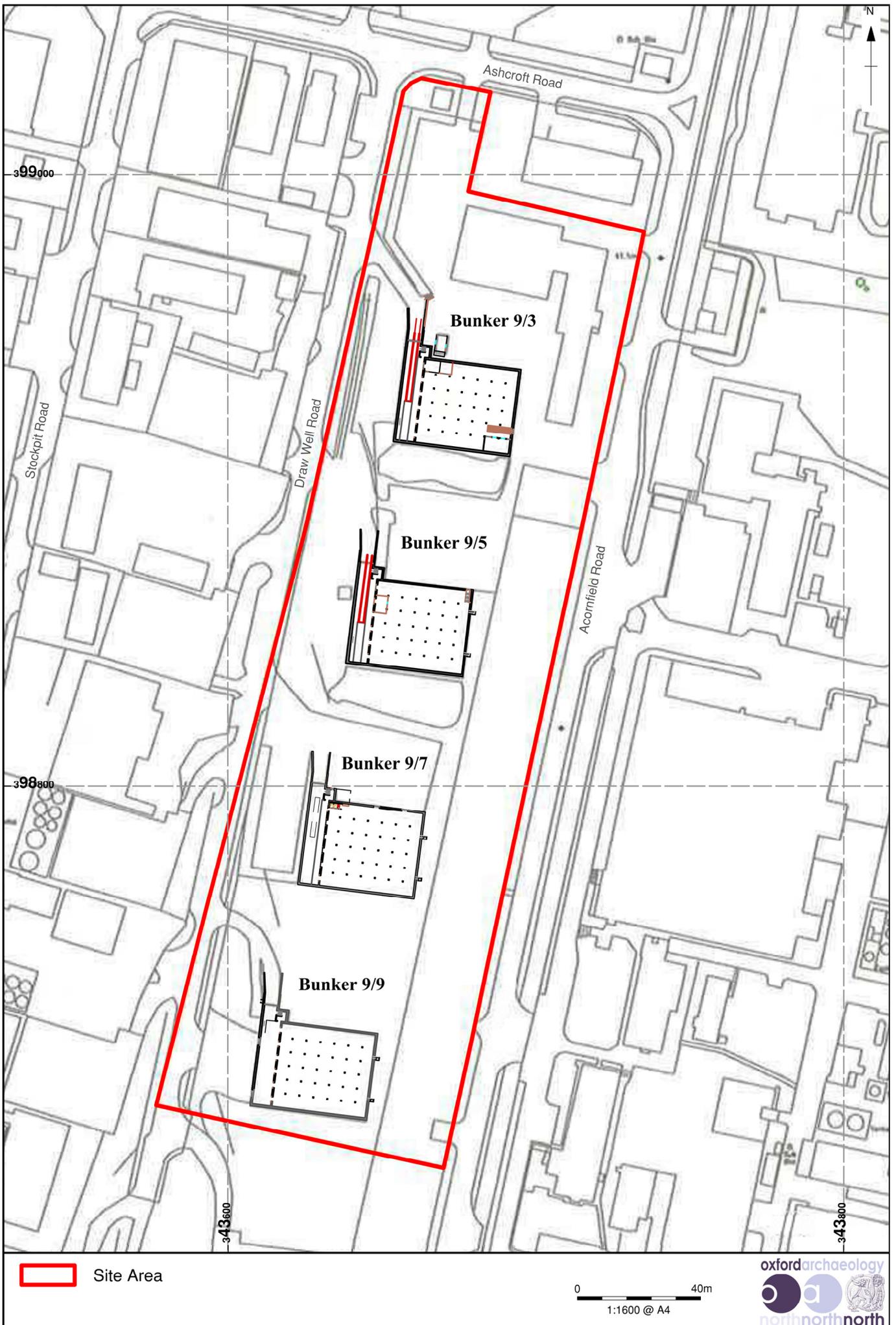
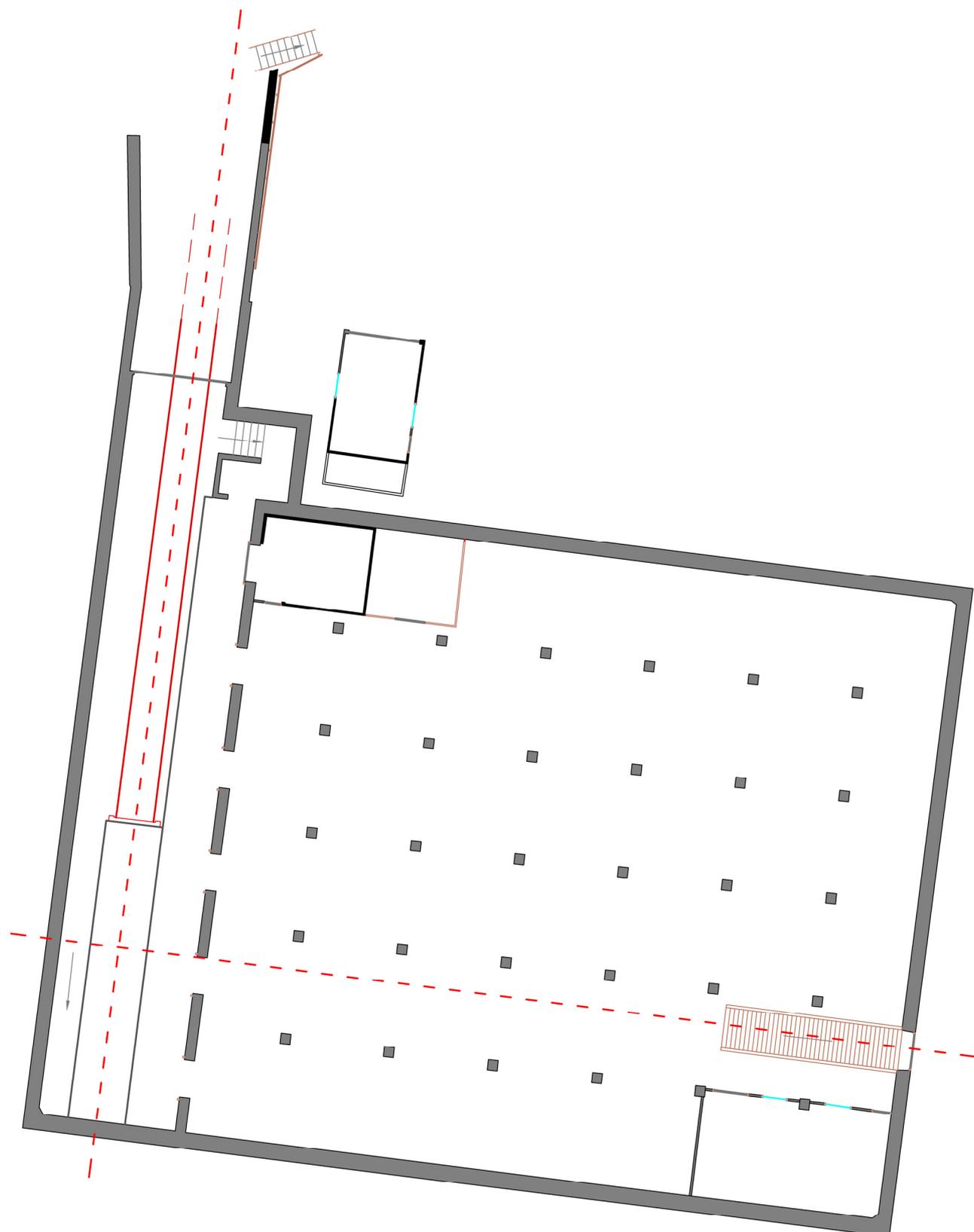


Figure 2: Site plan



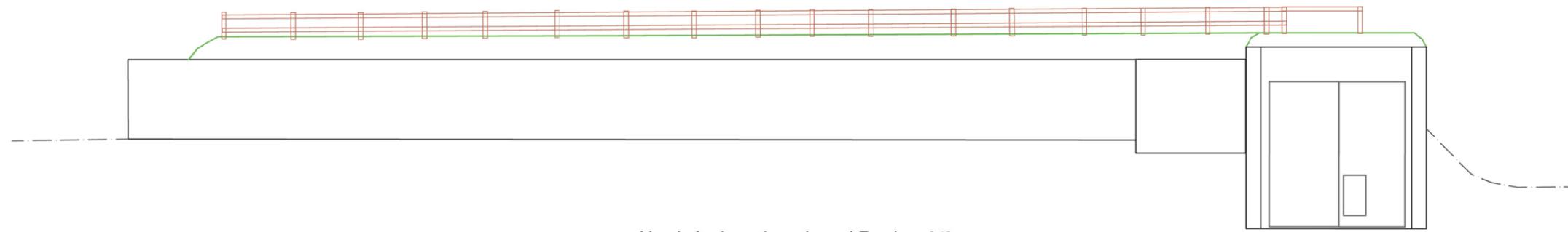
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- Cross-sections
- Metal
- Timber

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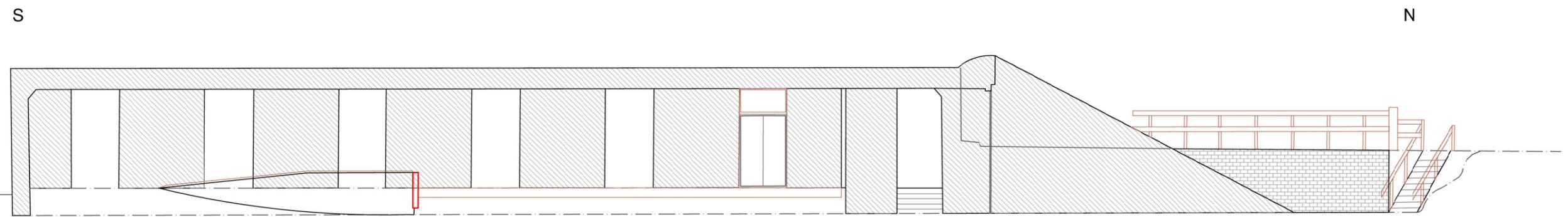


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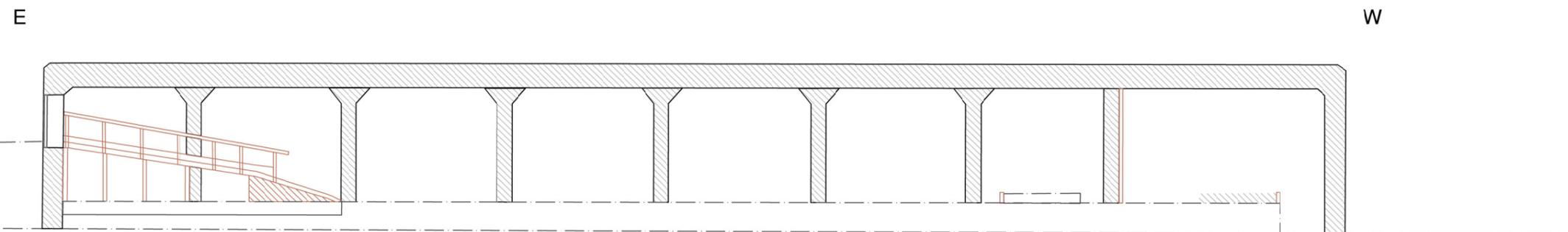
Figure 3: Plan of Bunker 9/3



North-facing elevation of Bunker 9/3



North-south cross-section of Bunker 9/3

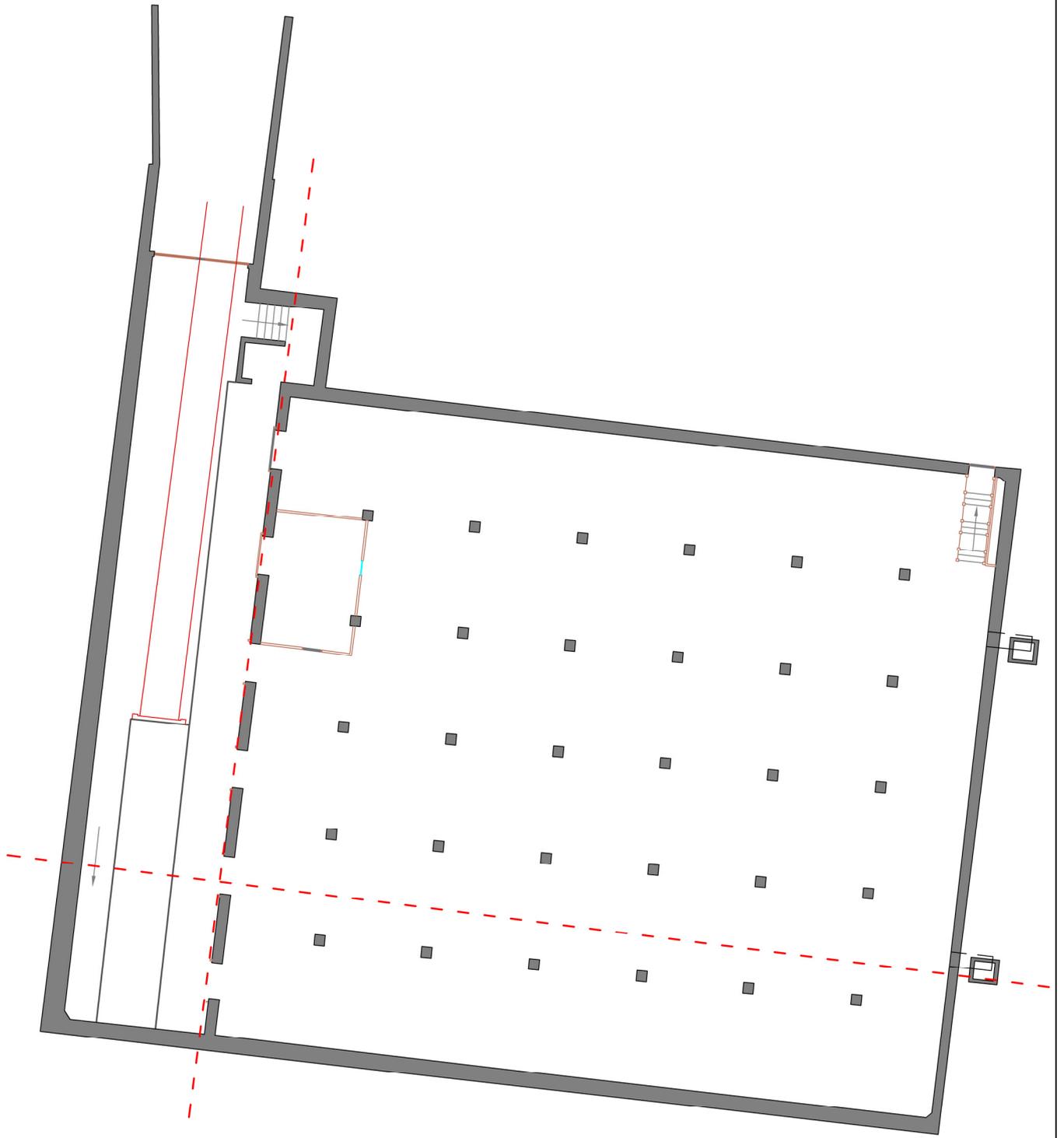


East-west cross-section of Bunker 9/3

- Walls
- Metal
- Wood

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Figure 4: Cross-sections and elevation of Bunker 9/3



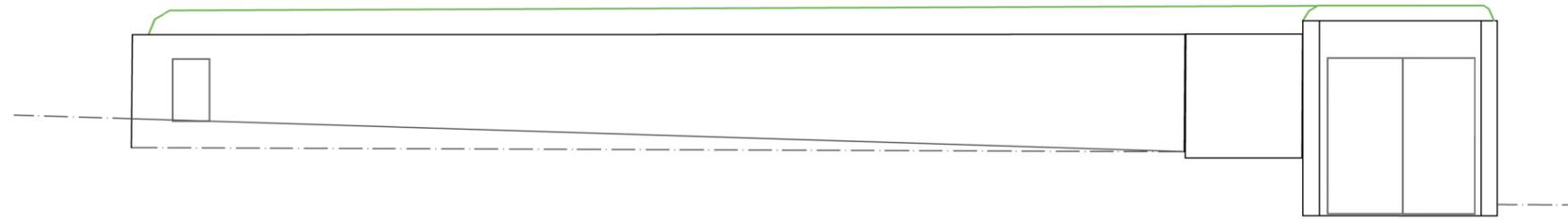
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- Walls
- Cross-sections
- Metal
- Timber

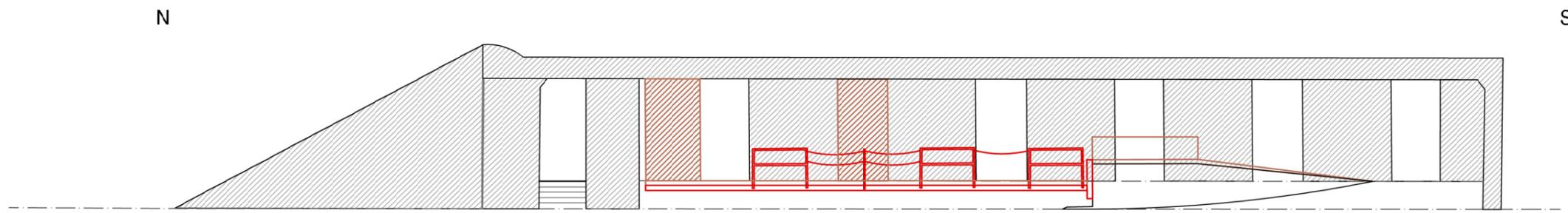
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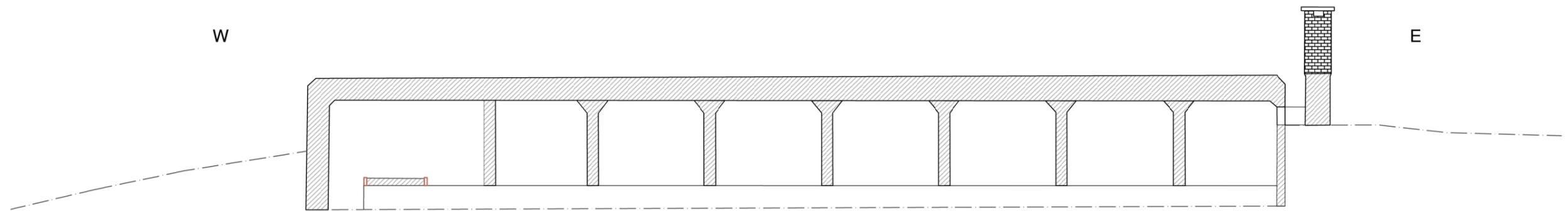
Figure 5: Plan of Bunker 9/5



North elevation of Bunker 9/5



North-south cross-section through Bunker 9/5

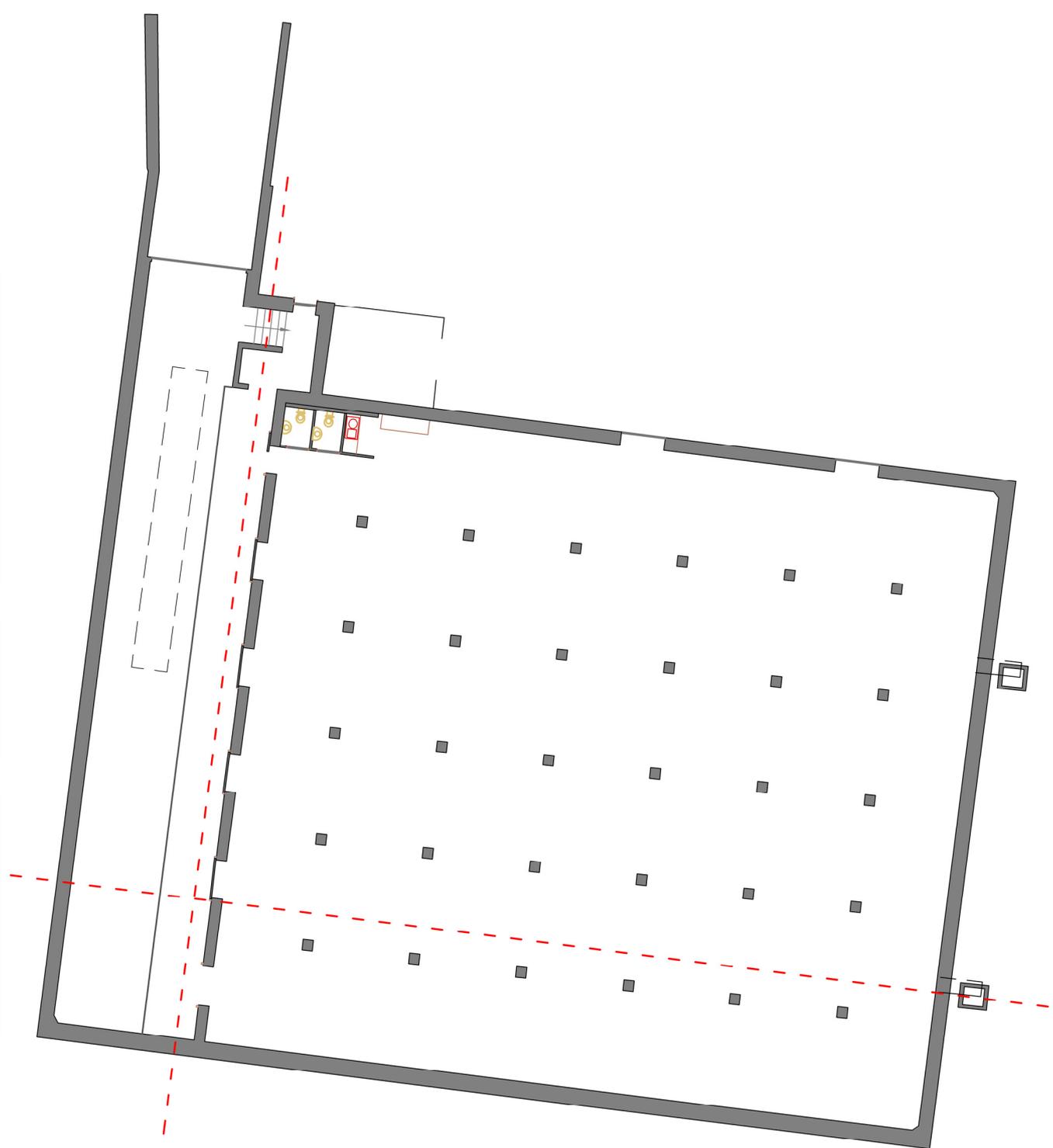


East-West cross-section through Bunker 9/5

- Walls
- Metal
- Wood

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1:150 @ A4

Figure 6: Cross-sections and elevation of Bunker 9/5



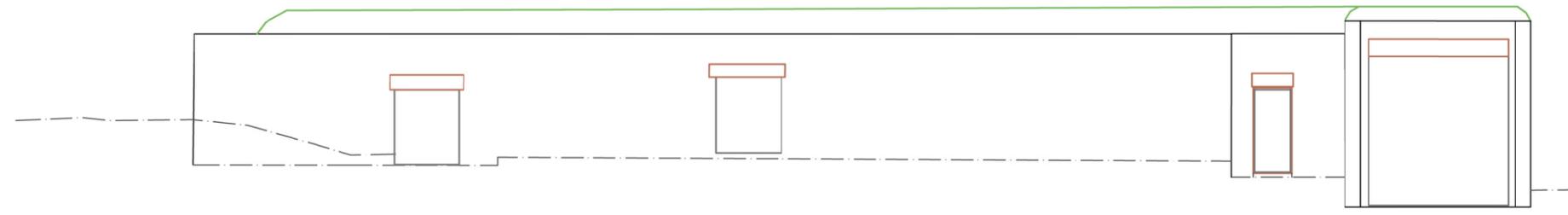
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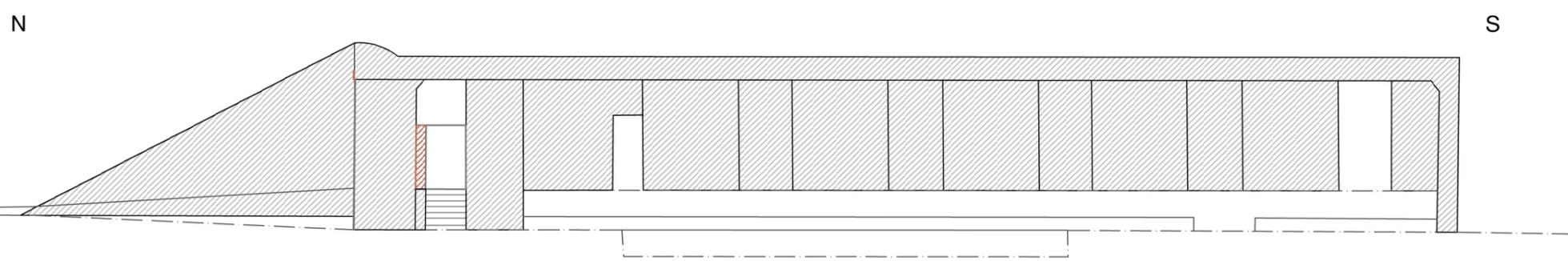
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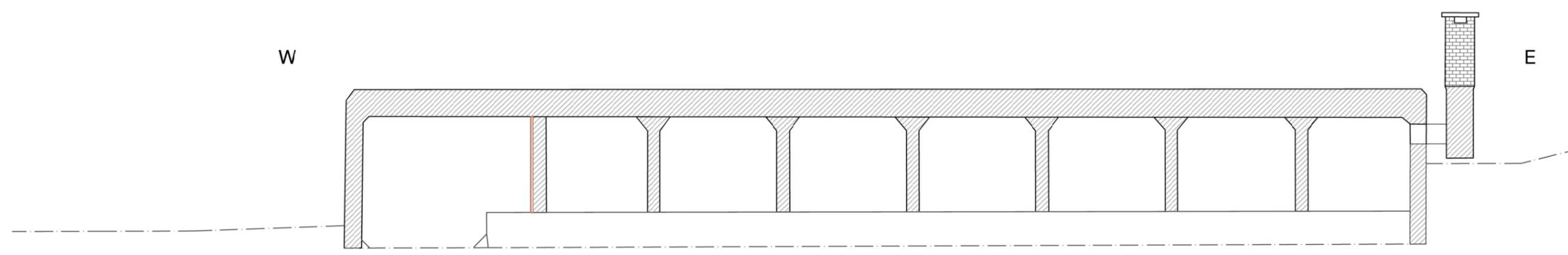
Figure 7: Plan of Bunker 9/7



North elevation of Bunker 9/7



North-south cross-section through Bunker 9/7



East-West cross-section through Bunker 9/7

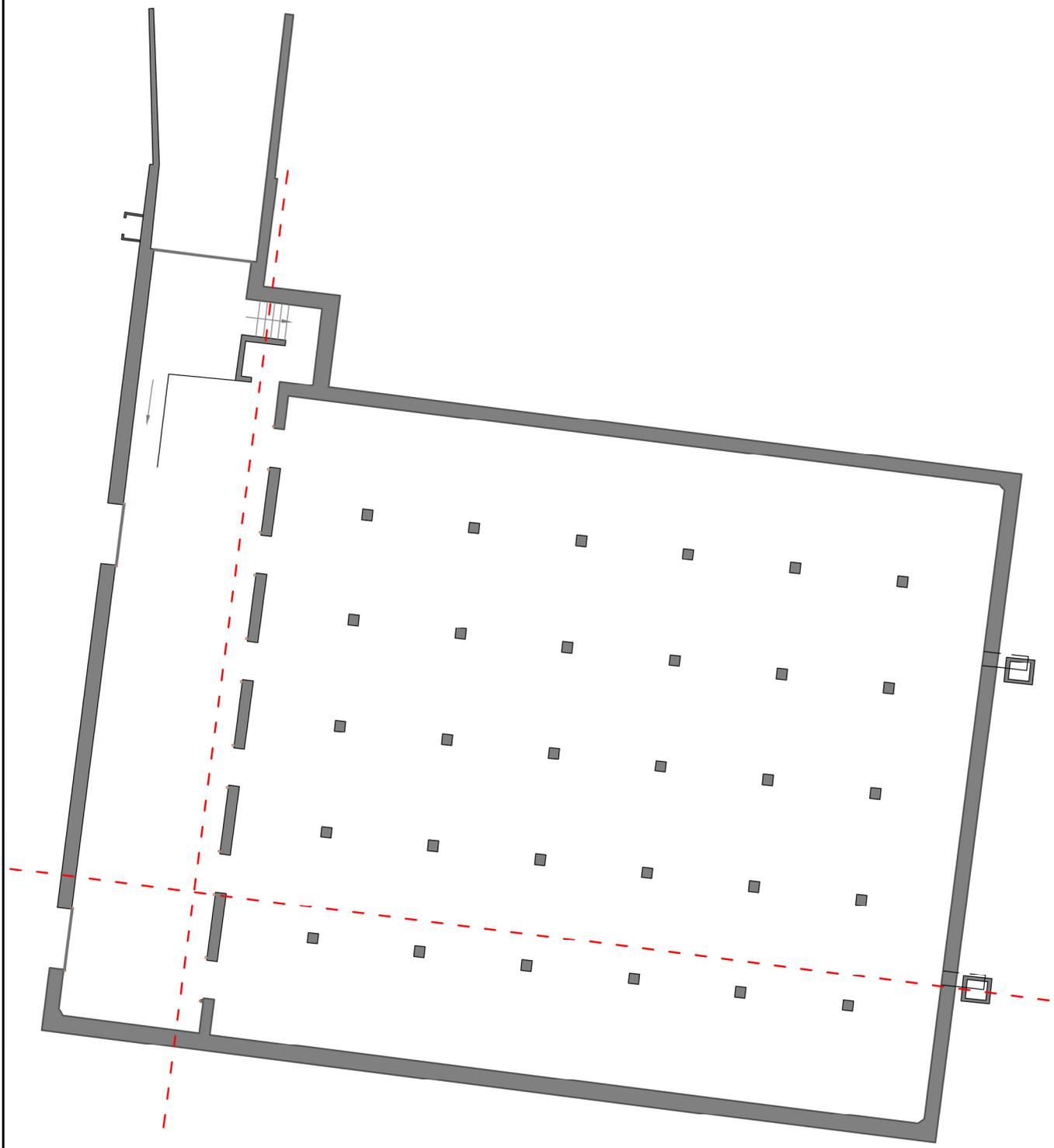
- Walls
- Metal
- Wood

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Figure 8: Cross-sections and elevation of Bunker 9/7



- Walls
- Cross-sections
- Metal
- Timber

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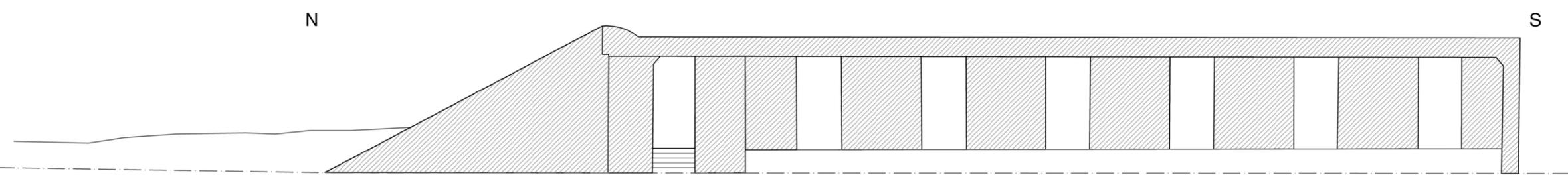


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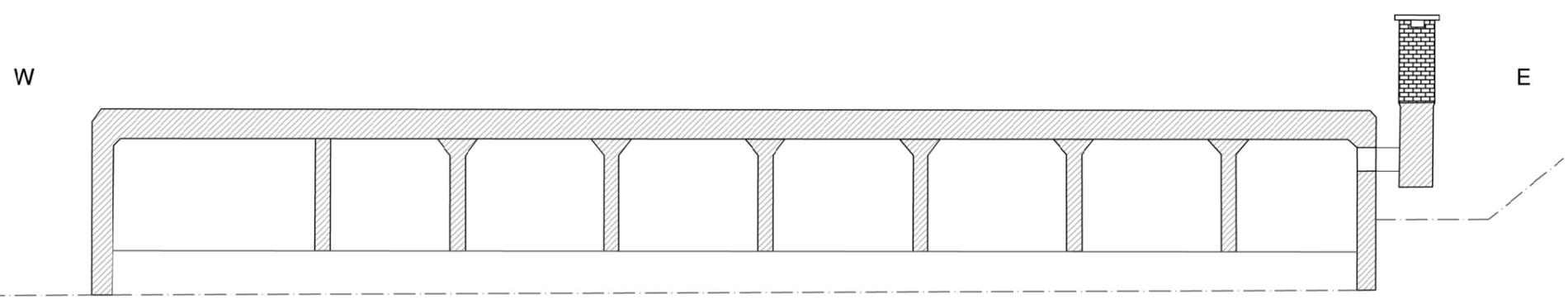
Figure 9: Plan of Bunker 9/9



West elevation of Bunker 9/9



North-south cross-section through Bunker 9/9



East-West cross-section through Bunker 9/9

- Walls
- Metal
- Wood

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Figure 10: Cross-sections and elevation of Bunker 9/9



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