ArcHeritage

FORMER OSBORN MUSHET WORKS,

100 PENISTONE ROAD, SHEFFIELD,

SOUTH YORKSHIRE

BUILDING RECORDING REPORT

by Mark Johnson

REPORT NUMBER 2010/5

ArcHeritage

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ABSTRACT

In January 2010 ArcHeritage carried out a programme of building recording, including measured survey and photography, at the former Osborn Mushet Works, 100 Penistone Road, Sheffield. Completed in 1943 in steel and concrete, the works was purpose built as a modern, efficient machine tools factory to increase production during World War II. Although subjected to some minor alterations over the years the shell of the factory remains much as it was originally built. Its wartime heritage is particularly displayed in the basement which formed a multi-entranced air raid shelter for the wider works complex and the pill-box-like structure on its roof. Built to a symmetrical design which reflects Art Deco influences the building was seen to be constructed of three component parts which may relate to an attempt to minimise damage in the event of bombing. The building has played a not insignificant role in the history and culture of 20th-century Sheffield.

1. INTRODUCTION

Between 18th – 22nd January 2010 ArcHeritage carried out a programme of building recording of the multi-storey building (sometimes known as the 'White Building') at the former Osborn Mushet works, 100 Penistone Road, Sheffield, South Yorkshire (NGR SK 3456 3886) (Figures 1, 2). Until recently the building, which is not listed and does not lie within a Conservation Area, housed a machine tool works. At the present time the building lies largely empty. The recording work was commissioned by St Modwen Developments Limited and follows the requirements of a Building Recording Brief (Detailed) issued by the South Yorkshire Archaeology Service (SYAS) and the Written Scheme of Investigation formulated by ArcHeritage. This programme of building recording follows on from an Archaeological Desk-based Assessment of the area of the entire site at 100 Penistone Road carried out by ARCUS, in February 2009 (ARCUS 2009).

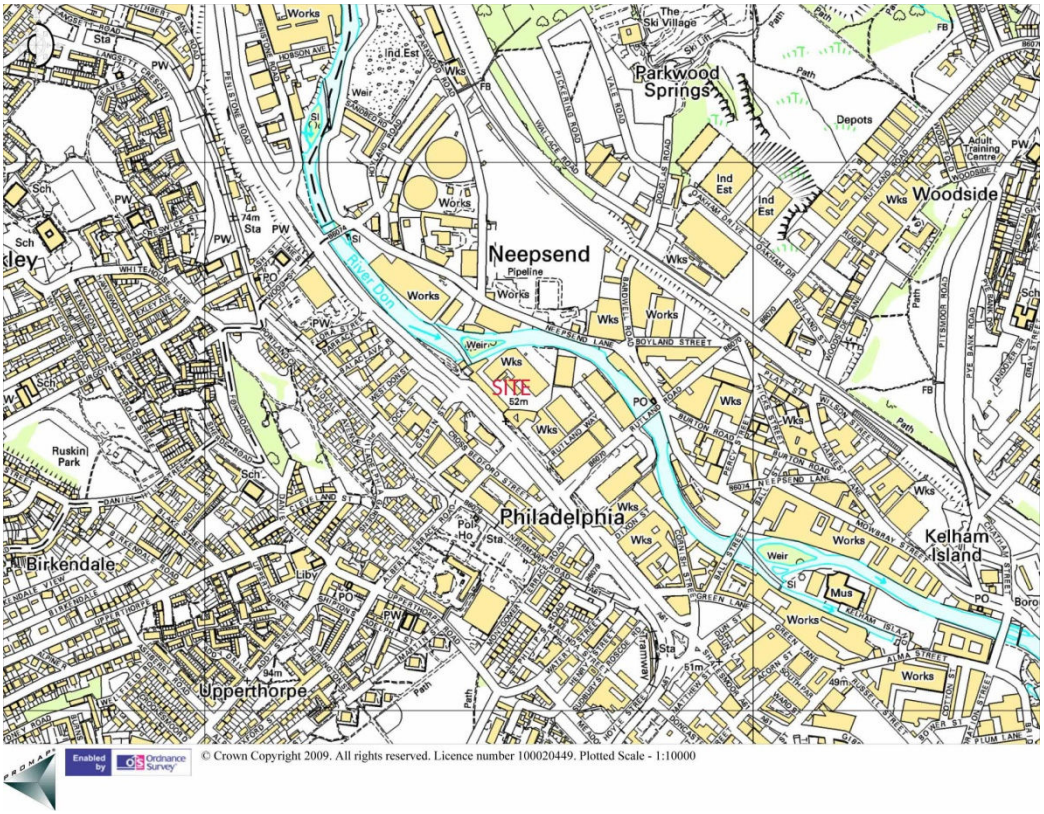


Figure 1 *Site location*

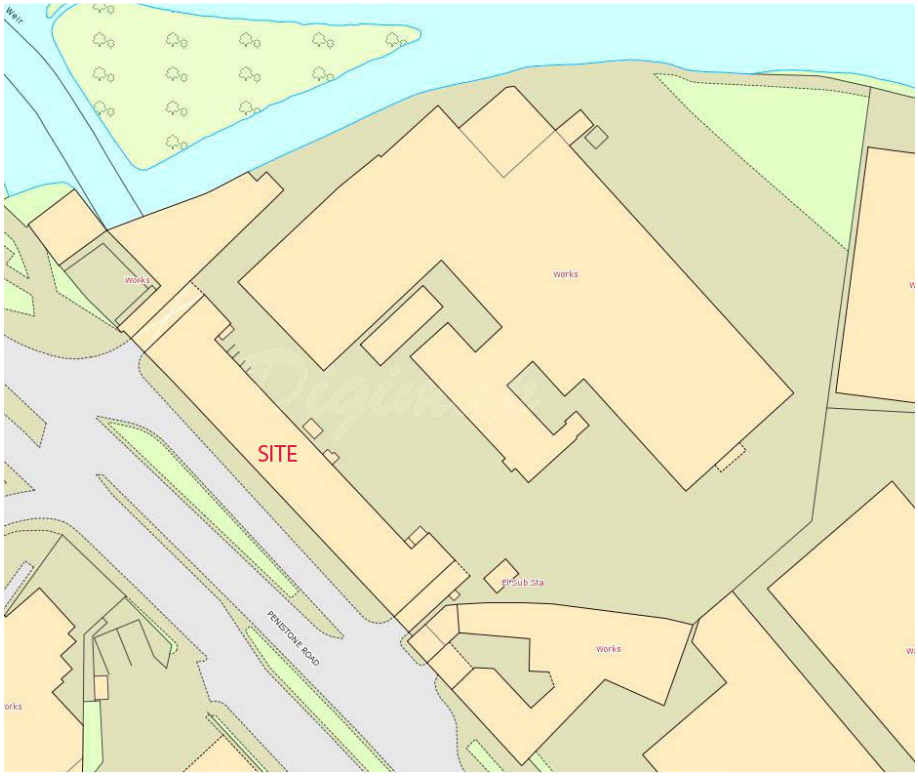


Figure 2 *Works location plan*

2. METHODOLOGY

This report describes the building as it stood during the programme of building recording; the level of recording equates broadly with Levels 3 – 4 of the English Heritage 'Guidance on the recording of Historic Buildings' (English Heritage 2006). As such this report is both descriptive and analytical. The report provides a detailed description of the building and is accompanied by a selection of photographs together with plans, elevations and cross sections. Although essentially of a single build, later alterations and additions to the structure are detailed in the text, where any available dating evidence is also noted, and are also highlighted and captioned on the drawings.

At the time of recording the building appeared structurally sound but had been stripped of its machinery and been subjected to a variety of depredations. Much of its internal fittings – heating, lighting, pipe-work etc had been removed and the basement flooded. The lifts had been blocked-up, some sanitary fittings had been smashed or removed and in some areas containing suspended ceilings and timber stud partitions these had been largely ripped down. The second and third floors in particular were infested with pigeons, both live and dead and there were areas of deep pigeon guano. The flooding of the unlit basement with several inches of oily water was considered particularly hazardous as below water obstructions, for example any pits, could not be identified. The need to exercise caution necessitated that recording in this area was minimal and restricted to those parts that could be accessed in safety.

During the recording a series of notes were made for each room or space, for each exterior elevation and for the building as a single entity. A similar approach was adopted with photography. The photographic recording comprised 35mm monochrome and 35mm slide, whilst medium format photography was used for elevations, selected overall and detail shots. Digital photography was used to provide both a general record and shots for inclusion in this report. The building survey was carried out with a reflectorless total station instrument in order to provide floor and roof plans for the building, elevations of all four sides and two sections, longitudinal and lateral, through the building.

3. LOCATION AND TOPOGRAPHY

The site is located to the north-east of Penistone road in a part of the city known as the Philadelphia area and lies approximately 1.5km north-west of Sheffield city centre. The 'White Building' is bounded to the west by the major route-way of Penistone Road, to the

north by the River Don and to the east and south by a number of low-level industrial buildings that form the complex of which the 'White Building' is part.

4. BRIEF HISTORICAL BACKGROUND

The desk-based assessment compiled by ARCUS found no evidence to suggest the presence of significant material remains prior to the 16th century, with the possible exception of stray finds, in the vicinity of the 100 Penistone Road site. It is known that within this wider area the 16th century water-powered Morton Wheels and their associated dam were located, possibly together with a later goit (water channel) leading from the mill dam (pond). Recent geotechnical trial pits revealed evidence for the mill dam and associated structures (Milsted 2010). In the early 18th century the Morton Wheels were listed as *'Cutler Wheeles'* and as such were likely to be water-powered grinding wheels. It is believed that these works were built by the Shrewsbury Estate with the specific purpose of being rented to cutlers. Further industrial development, including the construction of a new wheel, is known to have taken place in the 18th century together with what is likely to have been some domestic housing. Considerable development at the site is known to have occurred during the 19th century. This included parts of the Philadelphia steel-works and a series of terraced cottages and back-to-back houses. Cartographic evidence indicates that the goit became redundant and was in-filled during the late 19th century with the dam being in-filled a few years later. In the 20th century the site was purchased by the local steel company Samuel Osborn Ltd and the steel works was probably converted to produce Mushet steel. The extant buildings on the site today, with large areas of yards between, appear to all be of mid – late 20th-century origin and relate to a major re-organisation of the site that became primarily geared towards the manufacture of machine tools.

The particular building under study was completed in 1943 (Plate 1) as the Osborn Mushet Tools Building, part of the large Osborn steel and tool making company who in addition to their works in Sheffield and elsewhere in the country had a number of overseas subsidiaries (Seed 1952, 57). The Osborn company was founded by a native of Sheffield, Samuel, later Sir Samuel, Osborn, a deeply religious non-conformist, in 1851. From an early date Osborn began an association with Robert Mushet who in his steel works and laboratory in the Forest of Dean developed a *'self-hardening'* (actually air hardened) steel. Mushet's steel gained its advantage principally by the addition of small amounts of tungsten. The resultant and highly prized hard steel was ideally suited to the use of machine tools as such tools were harder than their rivals and could consequently operate at higher speeds, cut faster and had a

longer working life. Osborn's enterprise was further developed and expanded by members of his family until the later 20th century (Tweedale 1986, 56-62).

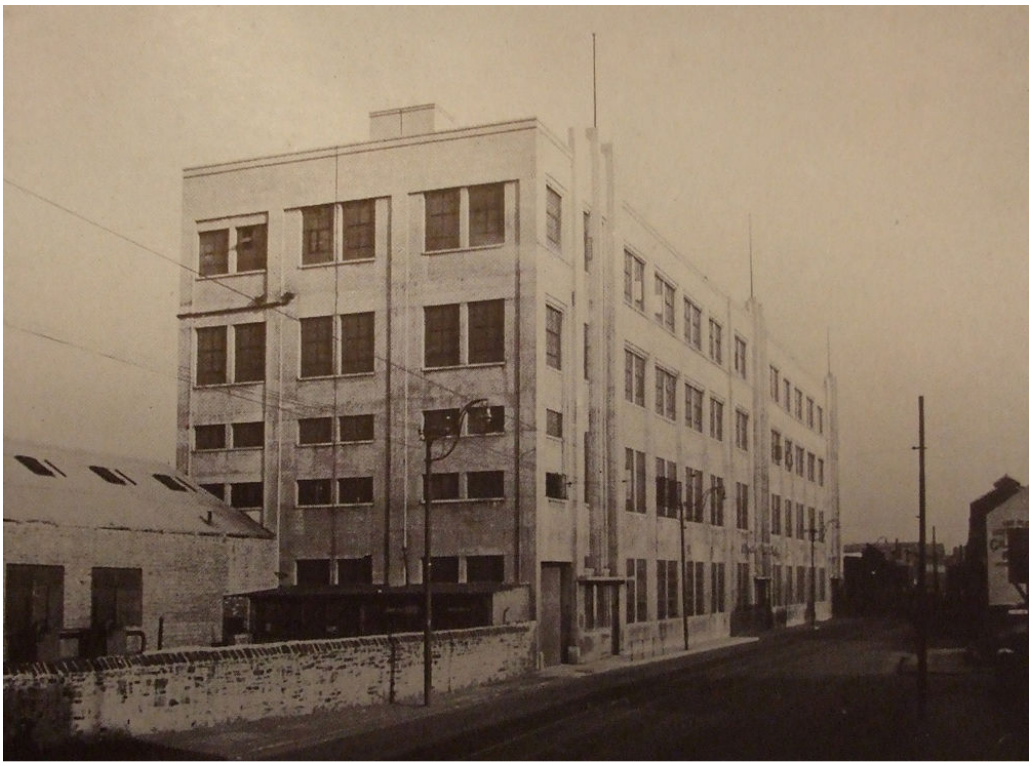


Plate 1 *Osborn Mushet Tools Building, as built*

It was hoped that original plans of the building may survive in the Sheffield City Archives. This repository does house plans for buildings and alterations at the works complex but all of these post-date World War II. Neither were any documents or press cuttings relating to the opening of the Osborn Mushet tools building found in either the City Archives or Sheffield Local Studies Centre. This apparent lack of fanfare is likely to relate to the circumstances of total war during the 1939 – 1945 period when the prevailing ethos in many aspects of work was 'keeping mum'. The backdrop of World War II is also reflected in aspects of the design of the building such as its air-raid shelter basement replete with multiple entrances and exterior blast doors as well as the observation structure on its roof. The construction of the building in three structurally separate elements could also relate to planning for war-time conditions as such separation may have been intended to limit the worst effects of bomb damage to one element of the building alone leaving the remainder largely intact. The materials originally used in the construction are steel and concrete. The building is comprised of a basement and four floors and is well lit by a regular pattern of predominantly large windows that provide an 'open feel' to the structure. Stylistically, the overall composition of the building with its clean straight lines and a certain emphasis on verticality

is reminiscent of the 'Art Deco' style. As such, this building must be considered a late example of this architectural genre.

It is known that the building was built for the manufacture of twist drills and engineer's small tools, with the Mushet steel being produced by Osborn's elsewhere. There was an enormous demand for such tools during the war years; a single Lancaster bomber, for example, required approximately 500,000 drilled holes during its manufacture. The war-time production by Osborn's of twist drills and engineers small tools increased five-fold over that of the immediate pre-war years (Seed 1952, 59). The Osborn company committed itself to the war effort by putting the national interest above that of the corporate. Its research facilities were placed at the disposal of the government, company members were loaned to government departments where their technical knowledge could be used to best advantage whilst the company's specialist knowledge was made freely available to other private firms. The war-work principally allotted to Osborn's was increased production of their peace-time products (Seed 1952, 58-60). The Osborn Mushet tools building needs to be considered within this context.

In the 1980s the Osborn Mushet tools building was taken over by Presto Tools and the factory continued tool production. More recently the enterprise became part of Hydra Clarkson tools with production at the site only ceasing in recent years.

5. THE BUILDING

5.1 EXTERIOR

5.1.1 SOUTH-WEST (FRONT) ELEVATION (FIGURE 3, PLATE 2)

The front façade, which permits public view of the building, is entirely symmetrical and slightly more ornate than the elevations to the rear and sides. Two simple part-glazed doors (upper halves of three rows of two panes) which originally provided access into the building are present towards either end of the building. These are located beneath a simple flat canopy in the lower portion of slightly projecting elements of the façade and are accessed via two simple steps. A centrally placed projection, with the same fenestration details as those towards the ends does not, and never has, contained a doorway despite the presence of a flat canopy. The single bays between the projecting elements and the ends of the building contain squared openings that provide pedestrian and vehicular access from front to back fully through the building.

The two sets of five bays between the façade projections have identical fenestration. The windows, which are all of steel frame, are slightly taller to the ground and first floor than those of the second and third floors. Those to the lower two floors are each of six rows of four panes (with the central parts opening inwards) whilst those of the upper floor are of five rows of four panes, again with inward opening elements. The three projecting elements contain three windows to each floor of identical detail to those of the two sets of five bays though are of half width. The windows of the single bays forming the ends of the building are identical to those of the five bays at second and third floor level though at first floor level are comprised of two shallow sets of windows the upper of which is at a slightly higher level than the other widows of this floor. This irregularity is owed to the presence of mezzanine floors at either end of the first floor. All windows, as throughout the building, have plain concrete sills.

The three projections provide the effect of verticality. This is achieved by the narrowness of their window openings and by their projecting above the roof parapet. This is enhanced by two projecting full height ribs to each element which form the highest parts of the building.

Whilst lacking elaborate detail its plainness is enhanced by the use of a few simple but bold elements. The two vertical ribs to each projection form the most evident of these. More subtle are the window surrounds to the second and third floors. Unlike their totally plain counterparts to the lower floors, and elsewhere in the building, these openings have surrounds of two plain squared orders. Further elaboration is provided by the simple moulding to the roof parapet. There is no rainwater or other exterior pipe-work to this elevation. The narrow joints between the three structural elements are visible in the front elevation.

Plate 2 *Front elevation of building*

5.1.2 NORTH-EAST (REAR) ELEVATION (FIGURE 3, PLATES 3, 4, 5)

The rear elevation lacks the near perfect symmetry and un-cluttered appearance of the front façade and allows some of the workings of the building to be seen. This is due to both the original design of, and subsequent alterations to, the fabric. The result is a composition of less obvious appeal but one of considerable practicality and still possessing grandeur of scale not at all out of place given its inwards aspect towards the heart of the industrial complex.

The ends of the building project backwards to form two short wings in which some of the internal space is occupied by toilets, some by factory floor whilst stairwells are located to the sides of these. The stairwells extend for the full height of the building. The somewhat cluttered appearance of these wings is owed partly to the tall, narrow windows of the toilets and their accompanying waste pipes that exit the building to down-pipes at a variety of angles. The larger windows of the ground and second floors, which functioned as workshop areas, match those of much of the main body of the building, whilst the mezzanine arrangement in the wings of the first floor has resulted in use of two bands shallow windows. That the windows of the stairwell, to both rear and side elevations, appear staggered in relation to the general lines of fenestration is owed to the practicalities of lighting between floors and the half-landings of the staircases.

Plate 3 *Rear elevation of building*

The central part of the elevation houses the central lift shaft, and to its north-west side the fire escape. Both of these elements project from the rear of the building whilst the former

also extends beyond the height of the roof parapet. The lift shaft is lit by five windows, each of three rows of two panes. The presence of windows in the shaft suggests that originally the lift itself (not accessible) may have had caged rather than solid sides. The fire escape extends from ground level to the roof and is comprised of eight sets of thirteen steps constructed of cast concrete with metal handrails. At the level of each floor a landing gives access, via a wooden door, to the interior spaces. The landings of the fire escape are secured, alternately, to the main wall of the building and to the side of the lift shaft. This arrangement has resulted in an irregularity of window widths in this area. Although entirely functional an arrangement the regularity of its angles and neatness of form gives the fire escape some visual appeal. Situated at roof level between the lift shaft and fire escape is a flat roofed concrete structure, housing water tanks, that was integral to the original build. This is lit to the rear elevation by a wide but shallow, window. At ground level and partially in front of the fire-escape is a free-standing structure, effectively a cube of concrete, without windows but accessed by two sets of steel double doors. This structure was originally the transformer room (caretaker, pers comm) and is believed to be original to the building.

Plate 4 *Fire escape to rear elevation of building*

The central parts of the rear elevation to either side of the lift and fire escape were originally identical to one another and contained large openings at first, second and third floor levels to both sides. Those to the north-west have been blocked over, as has that to the third floor at the south-east side. On the south-east side these are associated with a roof-top beam crane which permitted the movement of large and heavy loads in and out of the building. Although no remains of a crane are visible on the roof to the north-west side it is probable that there was one originally. The north-west openings were firstly partially blocked up and fitted with shallow steel framed windows of similar pattern to those elsewhere in the building. Subsequently, some of the windows were painted over and a series of three round vertically set chutes inserted between the first and second floors (Plate 5). These chutes were used for the rapid disposal of waste materials, the detritus being collected in bins/skips set at ground level below the chutes (caretaker, pers comm).

Plate 5 *Waste chutes to rear elevation of building*

The basement was accessed via four routes, those two to the north-west and that to the south-east being of identical form. These projecting entrances, like the rest of the building, were constructed of cast concrete, contained a flight of stairs and angled down sharply

towards the basement. The covering to the entrances was by doors fabricated from 10mm thick steel. These three entrances and their blast doors have the physical attributes of air-raid shelter entrances. The fourth opening, again an original feature, was a dog-leg stair arrangement with a wall to the side and was located towards the centre of the rear elevation. The wall and dog leg arrangement of this design again accord well with an entrance to an air-raid shelter.

Some free-standing machinery relating to dust extraction was present at the rear of the building at the time of recording and was linked to the building by tubular ducting through ground floor windows. External pipe-work to this, and the side elevations, is predominantly of cast iron with a few recent replacements in plastic. The narrow joints between the three structural elements are evident in the rear elevation though largely obscured by rainwater pipes.

5.1.3 SOUTH-EAST (SIDE) ELEVATION (FIGURE 3, PLATE 6)

The fenestration of the south-east elevation largely mirrors the arrangements of the rear of the south-east wing with a double arrangement of shallow windows to the first floor mezzanine though without the narrow windows of the toilets. The lowest set of windows, those at ground floor level, are again shallow and intended solely to provide light to the tunnel-like pedestrian and vehicular access that extends through the south-east wing from front to back. Within this passageway a large blocked opening, that formerly led into the factory, is present. The basal part of this former opening is flush with the factory ground floor and around 0.7m above the surface level of the passageway. A similar opening is extant at the north-west end of the building, though this is much closer to the exterior ground level. This discrepancy of height is owed to a gradual fall of the exterior ground surface in a north-west – south-east direction. Associated with the south-east opening is a hoist (beam crane) arrangement set immediately below the roof of the passageway which consists of a girder on which runs a ringed slider. This apparatus was formerly used to lift heavy material in and out of the ground floor of the factory. Within the passageway and immediately towards the frontage of the former opening are a set of windows, now painted over, that lit an office area in the southern corner area of the ground floor.

Plate 6 *Passage-way to SE side of building, looking SW*

5.1.4 NORTH-WEST (SIDE) ELEVATION (FIGURE 3)

The arrangements of the north-west elevation mirror almost exactly those of the south-east elevation. Within the passageway that leads from the front of the building to the back a large opening – the same as the blocked example at the opposite end of the building, is fitted with a modern roller door. No hoist apparatus is evident at this end, this perhaps being owed to the fact that factory floor level is very close to that of the adjacent passageway ground surface. Towards the frontage from the large opening windows are again present and provide additional light to this end of the factory. Between the large openings and windows a set of wooden double doors also provide access from the passageway to the factory. This arrangement, which may well be part of the original layout, is not mirrored at the south-east end. To the opposite side of the passageway, i.e. the north-west wall, there are high level windows, now painted over, providing light to the passageway as at the south-east end, whilst centrally placed in the same wall is a doorway, now fitted with a modern roller shutter, providing access to the north-west. This opening appears to be an original feature.

100 Penistone Road, Sheffield, elevations (* = basement access)

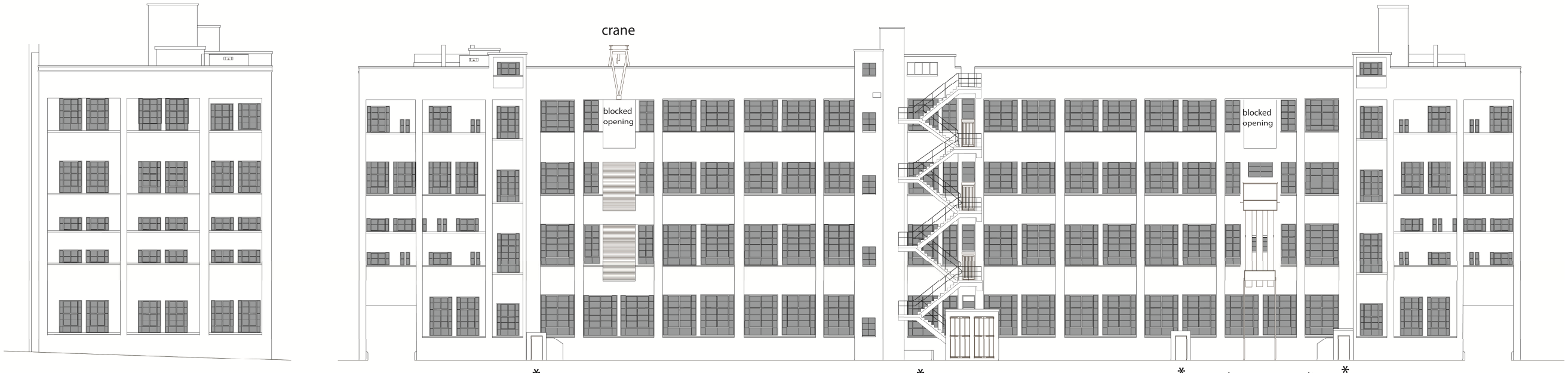


Figure 3 *Elevations*

5.2 INTERIOR

5.2.1 BASEMENT (FIGURE 4)

The basement is accessible via the stairwells at either end of the building and by four entrances at ground level to the rear of the building. The entrances at the rear have been described in *5.1 North-east (rear) elevation* above and are also considered in *6 Discussion* at the end of the text. The number, form and arrangement of entrances leave little doubt that the original primary intended function of the basement was to serve as an air raid shelter for the works (Plate 7). The two outer external entrances also have access to the base of the north-west and south-east main stairwells. At the time of recording the basement was partially flooded with oily water and on health and safety grounds was only superficially inspected from various points of access. The external walls, floor and ceiling are of cast concrete. To the ceiling a longitudinal beam of concrete extends between the central row of columns for length of the building whilst a series of lateral beams extend across the width of the building. The height of the basement is considerably less than that of the floors above. The row of central columns of the floors above mirrors that in the basement, as does the pattern of ceiling beams. The basement area is divided into a number of spaces by concrete walls, some extending between the columns and the external walls of the basement and others not. There are also a number of brick wall and breeze block wall divisions and these relate to the requirements of later usage. A number of the spaces are fitted with steel doors. Some equipment remains in the basement and this allows the function of some of the spaces to be identified. These include a boiler room (Plate 8) to the south-east of the open rear stair access point and a switch room (door signed as such) to the north-west of the same entrance. Given the proximity of the switch room to the external transformer room it is probable that this was the original function of this space. Opposite these two rooms two further spaces are occupied by oil storage tanks. A probable machine base is located to the north-west of the storage tanks.

100 Penistone Road, Sheffield, basement plan

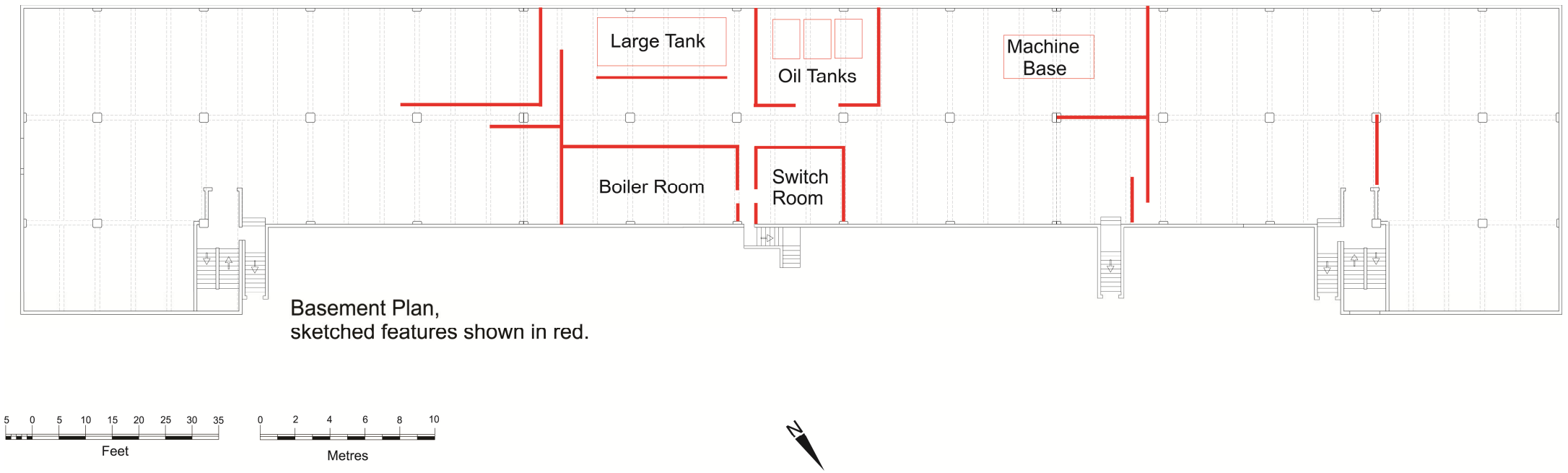


Figure 4 *Basement plan*

Plate 7 *Access to basement via one of 'air raid' entrances*

Plate 8 *View of boiler room in basement*

5.2.2 GROUND FLOOR (FIGURE 5)

The ground floor of the factory is somewhat shorter than that of the upper floors owing to the presence of the side passageways at this level.

Within the factory floor itself there is a row of twelve equally spaced internal columns that effectively create two aisles. The columns are some 550mm square with chamfered corners (Plate 9). Members of similar proportions are also present within the walls to the sides. These columns effectively divide the interior space of the building into a series of bays. Within the walls, and central to each bay width, smaller uprights some 300mm wide are present. The floors and ceiling of the ground floor are again of concrete. The roof is supported by a series of concrete beams. One of these extends longitudinally, between the columns, for the full length of the floor. Laterally, beams extend between the columns with a further two evenly spaced between each bay. It has already been noted that the building is constructed of three elements. The narrow joints between these elements are visible as narrow, partially in-filled seams that are visible in the walls, floors, columns and ceilings. At the point of juncture of these component parts, and nowhere else, two ceiling beams abut, being separated only by the seam.

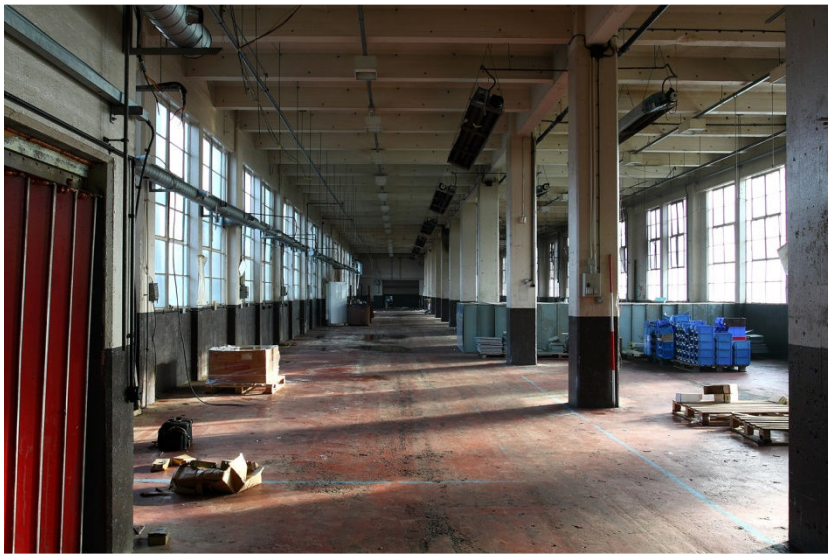


Plate 9 *Ground floor, looking SE*

The lower 1.2m of walling is solid whilst above this and extending fully between the vertical members of the walls are a series of steel framed windows of twenty four panes with centrally placed openings. The scale and number of windows enable large amounts of natural light to enter the floor. There was no evidence of fittings to cover the windows

although it seems reasonable to assume that some sort of black-out coverings will have been used when work was being carried out in darkness hours during World War II.

To the north-east side of both ends of the floor (the rear projecting wings of the building) the area is formed of further open space and lit to the north-east side by two windows of identical pattern to those of the long sides. Also within these wing areas to both ends are the stairwells and lift shafts. The stairwells, which are accessed via a set of double doors, ascend via a series of flights with half landings to both the upper floors; they also descend to the basement. The stairs leading down to the basement are accessed via a further set of double doors. The lift shafts project into the factory and have modern steel folding doors. These lift doors were secured closed at the time of survey and it was not possible to gain access to either the lifts or their shafts. A further lift is present on the same north-east side and is located slightly to the south-east of the central part of the building. This slight off-centre position is owed to the positioning of the external fire-escape. The door to the central lift is flush with the rear wall and the shaft itself is external. Again, this lift has a modern folding door and was not accessible.

Access to the outside is provided by two doors to the front towards either end, the large openings at either end (the south-east of which is blocked up) and by the double doors adjacent to the large opening at the north-west end. There is also a single door leading from either stairwell to the rear of the building. Finally, there is also a fire-escape door in the central part of the rear wall.

There are office areas to either end of the building. That to the western corner of the north-west end is a small arrangement of timber stud and glass and extends to only half the height of the ground floor. This office covers part of a window of the front elevation and is clearly an addition to the original building (Plate 10). It is possible that there was earlier office space at this end of the building, though no obvious indicators in the fabric can confirm this.

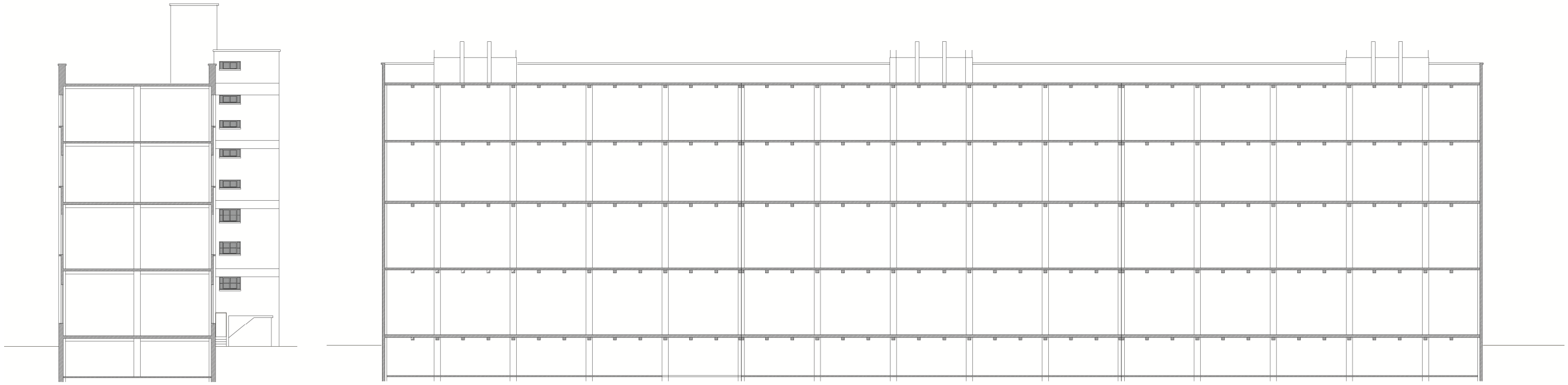
Plate 10 *Office to W corner of NW end of ground floor, looking W*

The office arrangement at the southern end of the floor is comprised of three rooms and a hallway giving access to the front door via two steps. These offices are of brick-work, possibly with some concrete. The larger southern office is lit by windows to the front and formerly to the side that lines the passage and may form a part of the original design. The smaller two offices to the other side of the hallway are separated by timber stud and glass though their walling to the north-west is of brick. The brickwork, and the two offices, are additions to the original plan. This is evident both by the use of materials and that by where the wall buts up to the front of the building it partly obscure a window (Plate 11). Although the external wall of the offices extend to the full height of the ground floor the office ceilings are suspended and of a hardboard-like material.

Plate 11 *Later walling at SE end of ground floor, looking SE*

A few electric light and gas heating fittings remain in the ground floor though these are all of recent date. Other fittings are comprised of gas piping, extraction ducts, cabling, electrical switchgear and a few brackets. Virtually all of this relates to recent usage. A regular pattern of small drilled holes within the ceiling beams are likely to have once supported cables or small diameter pipes.

100 Penistone Road, Sheffield, Sections and ground floor plan



Structural Cross-Sections

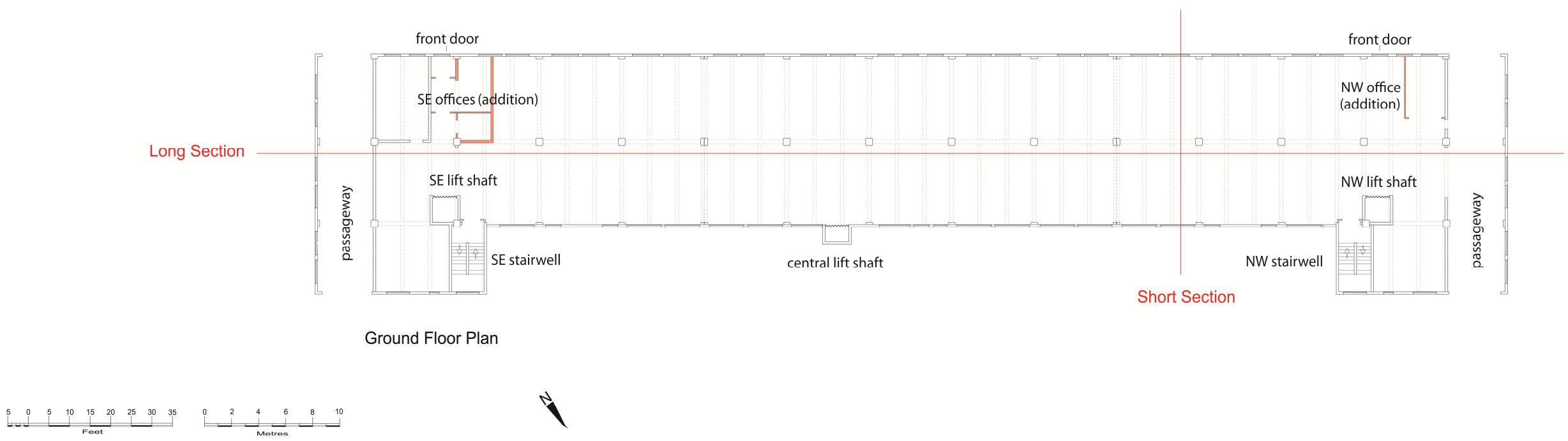


Figure 5 *Sections and ground floor plan*

5.2.3 FIRST FLOOR (FIGURE 6)

The first floor (Plate 12) is accessible via the stairwells to either end, by the three lifts, whilst a centrally placed fire escape door to the rear wall also provides access to the fire escape. Additionally, there is a large opening in the rear wall to the north-west of the south wing. This opening is presently covered by a modern steel roller door and provided access for the craning (by the roof mounted beam crane) in and out of materials. No ceiling mounted internal fittings for apparatus to drawing loads in and out of the building survived on this floor nor on the second floor, though such was present on the third. There had formerly been an identical opening in an identical location towards the north-west end of the floor. This was subsequently been blocked up with brickwork and a small steel framed window of six panes inserted. A vertical chute waste disposal system, serving the first and second floors, had also been inserted. Given that the chutes for this extend fully over the window it is probable that this represents an even later alteration.

Plate 12 *First floor, looking NW*

The walls, floor and ceiling and structural divisions into three elements were of identical structural characteristics and form to those already described for the ground floor (Plate 13). The central line of fourteen internal columns was also the same though there were an additional number owing to the floor extending over the ground floor side passages to either end. The window arrangements mirrored those of the ground floor save for that at the north-west and south-east ends where mezzanine floors, as part of the original building were present.

Plate 13 *Structural division within building, first floor looking WSW*

Toilet blocks were present within the wings and were accessed via doorways leading off from the stairwells. Each toilet block was identical and had a wall finish of plain tiles, contained four WC's, four urinals and three wash-basins. Whilst the wooden framed WC cubicles may be original to the building all the sanitary ware in the toilet blocks was of more recent date. Plastic windows had replaced the earlier window arrangement which was presumably of steel frame. Both were clearly intended for the use of males only whilst the absence of further toilets to the ground and second floors suggests that these served more than just the workers on the first floor.

The mezzanine at the north-west end extended fully across the width of the building and was of shuttered concrete like the rest of the building (Plate 14). The mezzanine was accessed via a wooden door at the top of a single flight of wooden steps with small landing that was aligned to the long axis of the building. There was also access to the mezzanine via a corridor leading to the stairwell. The south-western part of the mezzanine was divided into two large office spaces separated by full height timber stud partitions whilst a third smaller space also led off from the north-eastern of the offices. The two larger offices were lit by steel framed windows to the north-west and south-west sides whilst the sides facing into the factory floor were also fitted with steel framed windows. That part of the mezzanine within the north-east wing of the building contained a corridor providing access to the stairwell. Leading

off the corridor were three small rooms, two containing two WC's within cubicles, the third with three cubicle WC's. Although no door labelling was present such division of toilet arrangements would argue that facilities were being provided for both sexes and were presumably intended primarily for use by office workers on this end of the floor rather than by those on the factory floor. Floor surfacing within the mezzanine area was of a linoleum-type material in contrast to the plain concrete of the factory floor and their associated toilets. The area immediately below the mezzanine offices was also enclosed into a single long, narrow area and was lit by steel framed windows to the north-west and south-west sides which mirrored those of the mezzanine above. This lower room appears likely, latterly at least, to have or store-like functions as a modern tool rack was affixed to the north-west wall. This space was separated from the factory floor by a green painted steel and glass partition with three door openings. Although it cannot be determined with certainty, this partition may be an arrangement that post-dates the earliest use of the building.

Plate 14 *First floor mezzanine at NW end of building, looking NW*

The mezzanine at the south-east end again extended from the wing of the building as far as the central part of the factory floor and was of shuttered concrete like the rest of the building (Plate 15). Access to the mezzanine was via a single flight of wooden stairs, and from the stairwell via a corridor. This space was composed of three interconnected offices separated from one another by timber stud partitions, which may be a later insertion. Some recent secondary glazing was evident in the north-eastern of the offices. Below the mezzanine the space was open factory floor. In recent years a transformer, mounted on a base of concrete breeze blocks, had been set up. At the mezzanine level, and fully within the body of the wing

of the building, a corridor led from the offices to the stairwell. Leading from this corridor was a large toilet comprised of three WC cubicles and a wash-basins. These toilets are likely to have been for the use of the workers within the mezzanine offices. Floor surfacing in the south-east mezzanine was of a linoleum-type material.

All heating and lighting fittings to the first floor had been completely stripped out.

Plate 15 *First floor mezzanine at SE end of building, looking ESE*

5.2.4 SECOND FLOOR (FIGURE 6)

The second floor is accessible via the stairwells to either end, by the three lifts, whilst a centrally placed fire escape door to the rear wall also provides access to the fire escape. This was the most open of all the floors of the Osborn Mushet building. There were no offices, toilets or mezzanine arrangements, the entire space forming a vast open factory workspace (Plate 16). The walls, floor and ceiling and structural divisions into three elements were of identical structural characteristics and form to those already described for previous floors. The central line of fourteen internal columns mirrored the structural arrangements both above and below. The steel framed window layout of the large central workspace were the same as those to the floors above and below, though these to the second (and third) floor are of slightly lesser height that the two lower floors. The windows to the north-west and south-east ends were of identical form and size as those of the central workspace.

There is a large opening in the rear wall to the north-west of the south wing. This is presently fitted with a modern steel roller shutter. Like the example on the first floor this opening will have permitted the craning in and out, by the roof mounted beam crane, of materials. Again,

no ceiling mounted fittings related to this opening were present. An identical opening towards the north-west end of the floor had formerly been present. This had been blocked up with brickwork and a small high level steel framed six pane window inserted. A three tubed vertical chute waste disposal system capped with lids at floor level, which additionally served the first floor, had also been inserted into the former opening.

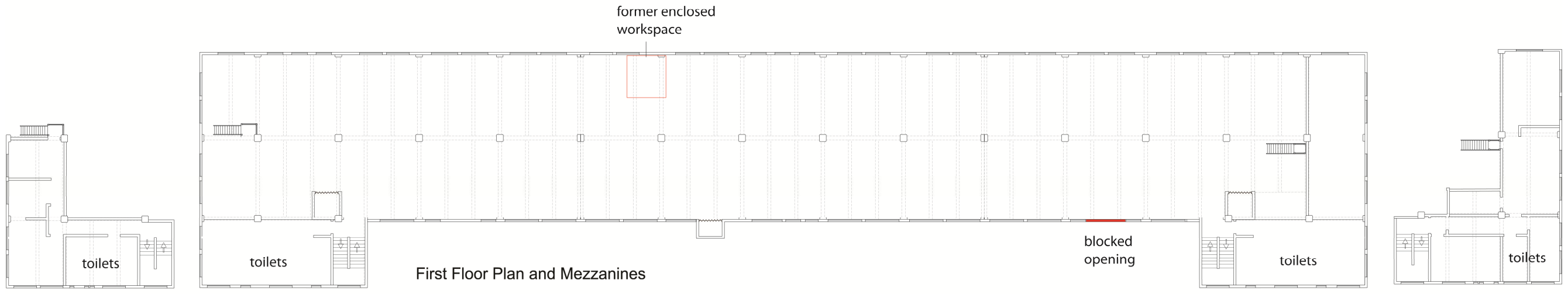
Plate 16 *Second floor, looking ESE*

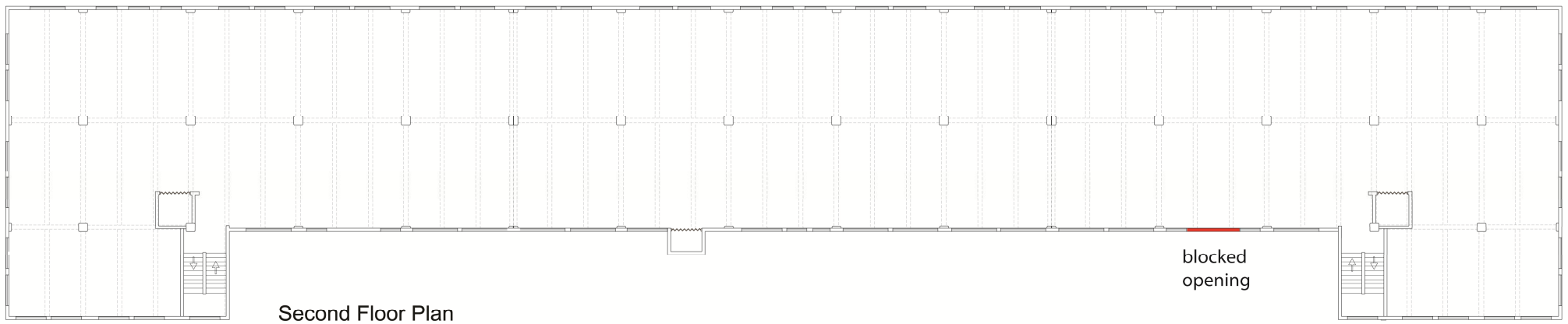
Some evidence was found to suggest the former presence of a small, around 3m square, enclosed workspace in the central part of the south-western side of the floor. The evidence for this consisted of vinyl floor tiles with surrounding metal trim (probably the base mounts for partition walling), a telephone point and paint marks on the wall. The latter suggests that the enclosed space extended to a height only half that of the factory floor (Plate 17).

Plate 17 *Second floor evidence for small enclosed space, looking W*

All fittings relating to heating and lighting had been removed though a few isolated pieces of electrical switch gear were present in places. A free-standing work bench/tool store constructed of wood was present at the north-west end of the building whilst a small number of draw units/desks were scattered elsewhere on the floor. At the south-east end of the floor two rectangular raised concrete settings may have formed the base for machines.

100 Penistone Road, Sheffield, First and second floor plans





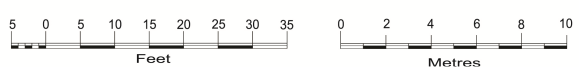


Figure 6 *First and second floor plans*

5.2.5 THIRD FLOOR (FIGURE 7)

The third floor is accessible via the stairwells to either end, by the three lifts, whilst a centrally placed fire escape door to the rear wall also provides access to the fire escape. This floor had been entirely refurbished, almost certainly since the 1970s, for use as a canteen together some offices at the south-east end. The conversion from former 'dirty' factory floor to 'clean' canteen and offices had involved extensive, but superficial building works. The walls and columns had been plastered and painted, and skirting boards affixed, though this re-surfacing extended only as high as an inserted suspended ceiling of white fibreboard-like material held in place by a lightweight steel framework secured by rods and wires. Secondary glazing of two panes had been affixed to the steel framed windows and carpet tiles, with a central area of quarry tiles, had been laid over the concrete floor. The central parts of the third floor had been sub-divided with timber-stud partitions into a series of small and large areas leading off a corridor on the north-eastern side of the floor. The smaller areas appear to relate to kitchen and kitchen stores. The fittings of this floor had been largely removed as had parts of the suspended ceilings and partitions. This disturbance hinders a full understanding of the layout of the canteen. It is uncertain, for example, whether or not the large area to the north served as dining and a recreational area or as an open plan office area.

The south-eastern part of the third floor was divided by a series of timber-stud partitions into an irregular pattern of five office spaces. These spaces were plastered, had suspended ceilings and had skirting boards fitted in the same manner as the remainder of the floor. Parts of an air carrier system control panel were mounted on a wall outside these offices and short stretches of associated metal pipe-work related to this could be traced elsewhere on this floor The location of these offices away from the factory floors suggest the possibility that the five offices may have related to administration and finance rather than technical and engineering matters.

The rear wings of the third floor were divided into a series of small spaces housing toilets that were accessed via a corridor from the stairwells. The pattern of fenestration to the rear elevation of the wings indicates that these parts of the floor have always served toilet functions. The lighting to the refurbished third floor was of strip lights whilst a gas boiler in the south-west central part of the floor fired the heating system. A series of wall mountings for radiators lined the walls though the radiators themselves had been removed.

In many places the suspended ceiling was no longer in place and through these gaps it was possible to see the original shell of the building. These observations showed that the walls, floor and ceiling and structural divisions into three elements were of identical structural

characteristics and form to those already described for lower floors whilst the central line of fourteen internal columns also mirrored the structural arrangements below. The steel framed window layout was the same as that of the second floor, excepting those to the rear north-east elevation.

There were originally large openings in the rear wall to the north-west and south-east of the floor matching those of the first and second floors that permitted the craning in and out of materials. Both of these openings had been blocked up, that to the south-east with breeze blocks and skimmed with plaster. This suggests that this opening was in use until the conversion and refurbishment of the third floor and that prior to this date the floor had functioned as a factory floor in the manner of the three other floors. Ceiling mounted fittings, presumably for a hoist-type arrangement and relating to this opening, were present (Plate 18).

Plate 18 *Third floor blocked opening with mounting for beam crane, looking N*

5.2.6 ROOF (FIGURE 7)

The roof of the building is of the flat-type with a surface of roof felt and is surrounded by a parapet wall some 1.42m tall and 0.18m thick (Plate 19). There is a gentle roof slope from front to back (south-west to north-east) whilst a regularly spaced series of small square apertures at the base of the rear wall permit rainwater to flow into hoppers atop a series of down-pipes. The parapet wall is plain excepting the three elevated and ribbed sections of the front façade. Central to each of these sections were two metal retaining clips for flagpoles. The sawn off remnants of parts of the flagpoles were still lying on the roof at the time of

recording though these were of a plastic material and not the originals visible in a photograph of circa 1943 which were presumably of wood.

Plate 19 *View of roof, NW lift shaft in foreground, looking ESE*

The shafts/mechanisms of the building's three lifts projected beyond roof level. The roof top structures of the south-east two of these (whose lifts ascended only to the third floor) housed the winding mechanisms, though only the south-easternmost of these was at all accessible. The third lift at the north-west end of the building operated as high as roof level, though again the doors to this were secured closed. As a consequence of this lift operating to a higher level than the other two lifts the structure housing its winding mechanism was of greater height. Butting up to the north-west side of the central lift shaft was a low structure, presently lacking doors and windows, that contained four large concrete water tanks. The water stored in these tanks almost certainly stored pumped water for general use within the building as a whole. A gap in the parapet wall immediately to the north-west of the water tank structure gave direct access to the fire escape.

A large stationary beam crane of girder construction lay towards the south-east end of the roof (Plate 20). This crane, which was powered by an electric motor, will originally have been used for the hoisting of large and heavy materials in and out of the large openings to the first, second and third floors of the rear façade. There were no traces on the roof surface of a similar crane to the north-west end of the roof. However, as an identical set of large openings were originally present to the first, second and third floors in this area it seems likely that there was once one here also.

Plate 20 *Beam crane on roof, looking NW*

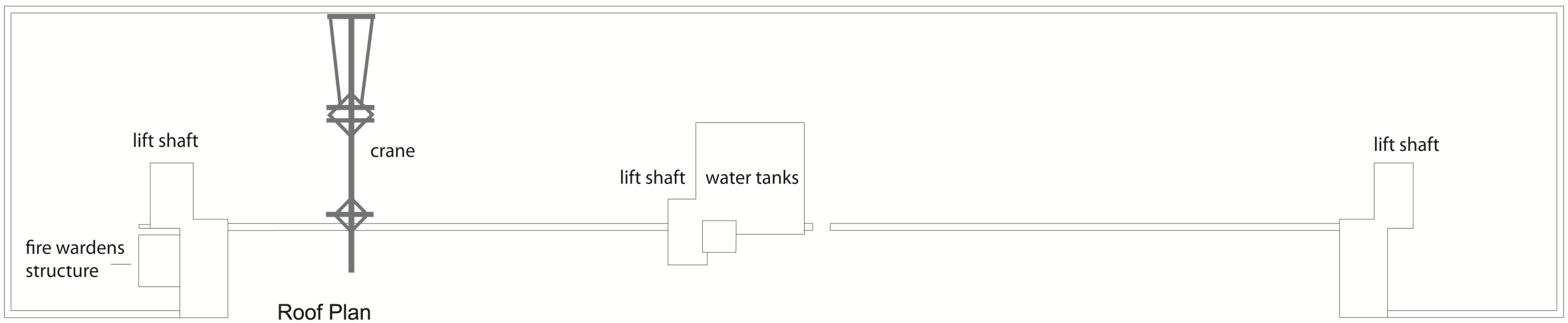
The most unusual structure on the roof lay close to the eastern corner where it butted up to the south-eastern side of the stairwell. This was constructed of brick and had a felt covered flat concrete roof and had the appearance of a World War II pillbox (Plate 21). The structure was accessed via a doorway to its south-west side that was shielded by a stub of brick walling butted up against the eastern corner of the lift shaft. This stub of walling appears to have served as a blast wall providing protection to the occupants of the structure. Two small externally splayed apertures were present at eye level, one to the south-east, the other to the north-east. Small metal fixtures or mountings were secured to the central lower parts of the apertures and although their precise function is uncertain they may have held some kind of optical device. It is tentatively suggested that this structure may have housed fire-watchers during World War II. There were wartime requirements for buildings where thirty or more people were employed or which were above a certain size to have fire-watchers. The role of these individuals was to extinguish fires, particularly those caused by incendiary bombs. The fixtures in the splayed apertures may suggest another role involving observation. It is interesting that the structure was not cast as an integral part of the original building; its inclusion may have been something of an afterthought.

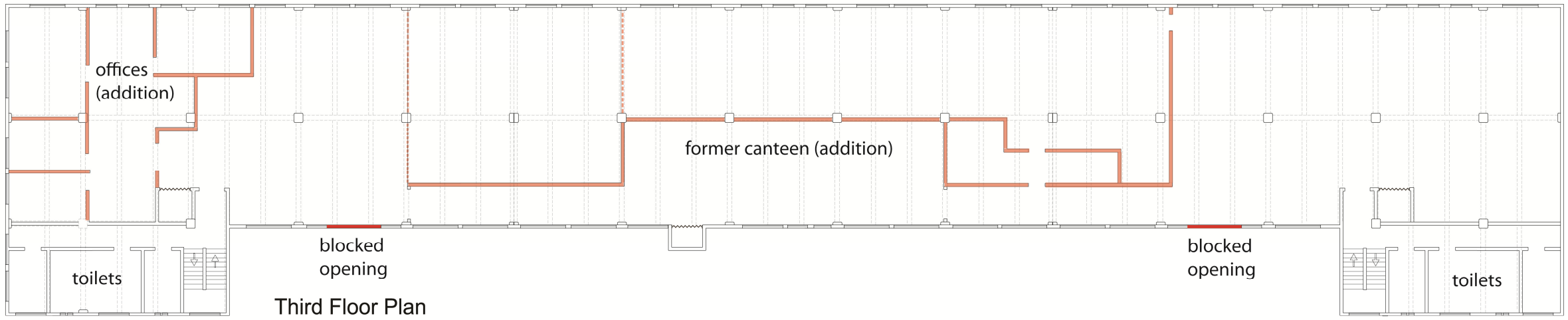
Plate 21 *View of brick-built observation structure on roof, looking NNW*

What are probably later elements on the roof were a series of metal (angle iron) fixings immediately behind the parapet wall and present to much of the four sides of the roof. These had been cut off just above roof level. The parts nearest the parapet were vertical members whilst those behind were 'raking' or angled (Plate 22). It seems probable that in the post war years these supported company signage.

Plate 22 *Mounts for signage on roof, looking NNE*

100 Penistone Road, Sheffield, Third floor and roof plans





5 0 5 10 15 20 25 30 35
Feet

0 2 4 6 8 10
Metres

N

Figure 7 *Third floor and roof plans*

6. DISCUSSION

The Osborn Mushet tools building resonates with the 20th-century history and culture of Sheffield. The shell of the building remains much as it was at its completion during World War II. No significant extensions have been added nor major deletions of original fabric taken place. This is especially true of the ground, first and second floors where alterations have been fairly minor. Such alterations on these floors are restricted to creations and expansions to office layouts, door replacements – including those to lifts and the blocking up of openings, and cosmetic alterations to toilet blocks. More substantial alteration has occurred on the third floor which in terms of function and working spaces bore little resemblance to earlier arrangements. In a structural sense however, such changes as suspended ceilings, stud partitions and surface coverings were little more than skin deep as their partial removal; has demonstrated. It is also necessary to bear in mid that the rationale for such alterations as took place within the building may have roots beyond its walls as this building was an integral part of a much larger complex in which individual elements were closely linked in terms of operational practices. As it presently stands the building is little more than an empty shell with little in the way of bases or pits for machinery. This lack of such obvious evidence relates in considerable degree to the nature of machinery employed in the manufacture of drills and small engineering tools which seldom requires floor or walling mounts. One cororally of this is that it is difficult to attribute specific work functions to particular floors and parts of the building. Much of this specific difficulty could be overcome by interviews with former employees.

The structure of the building is interesting on several counts. For one thing the neatness of its lines, symmetry and vertical ribbing to its three projecting elements of the front façade to some degree hark back to the Art Deco style. Equally, it can be conceded that the symmetry and clean lines are functional advantages in a factory in which production efficiency is paramount. Efficiency may have much to do with the provision of three lift access points and two large openings to each floor in addition to two stairwells. It is believed that movement of materials in and out of the factory would have been fairly constant with billets of Mushet Steel entering the building on all floors and after manufacturing process exiting as machine tools. The form of construction of the building is of concrete and steel. At the time of recording part of the surface concrete had spalled off the building in a small handful of places. Steel reinforcing bar was clearly present but no framework of girder steel was visible (Plate 23). Whether there is a bolted framework of girders is not known. Surface impressions on the concrete show indicate that plank shuttering had been used during the pouring of concrete. Casting in staged ‘lifts’ was also evident, particularly on vertical members such as columns.

Plate 23 *Detail of steel-reinforced concrete of building shell*

The war-time heritage of the building is quite marked in a number of aspects and is of some historical significance. The basement was almost certainly intended from the outset to function as an air-raid shelter for the works as a whole. This basement was accessible via six entrances, two within the stairwells that presumably gave rapid access to the occupants of the building and four externally – all to the rear of the building. One of the rear entrances was accessed via a winding flight of steps surrounded by a wall which could have given protection from blast. The other three had projecting entrances that were each covered by solid steel blast doors. The requirement for secure air-raid shelters was driven home in the city at an earlier point in the war when scores of people sheltering in a basement were killed by a direct hit on the building during one of the many air-raids on the city (Healy, 1993, 234-250). The building is lit by large windows and it may have been an intention of the design to minimise the necessity of use of artificial lighting to aid both prolonged daylight production and reduce power consumption. Comment has already been made detailing the physical form of the tripartite construction of the building and how this may, in the event of severe bomb damage, have served to minimize the effect on other parts of the building thereby enabling them to continue in operation and remain as vital contributors to the war effort. The pillbox-like brick-built structure on the roof with blast wall and externally splayed aperture seems likely to relate to fire-watcher activity but perhaps also involving some sort of observation role.

Finally, the building can claim some fame in the world of 'rock and roll'. The lead singer of the Sheffield originating band Def Leppard was apparently employed at the works. The following is taken from an interview published on the USA Today website on 21st January 2005: www.usatoday.com/community/chat/2001-02-06-**elliott**.htm

Interviewer: *I was wondering if you remember what it was like to be an ordinary guy working that crappy job at Osborn-Mushet tools or have you been an international star for so long that long that it seems like it happened to someone else?*

Joe Elliott: *No, I remember every bloody second of it. There are people in life happy with their lot, and I wasn't. That's why I ended up getting fired from there. I was playing cricket in the basement, and was asked to apply for redundancy.*

Comment from Joe Elliott: *I'll never forget. It's a damn good reason to keep on making music.*

7. ACKNOWLEDGEMENTS

Survey and building illustrations	Marcus Abbott
Photographs	Mike Andrews
Research and author	Mark Johnson
Editor	Martin Stockwell

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APPENDIX 1: PHOTOGRAPHIC LISTING

PHOTO #	DIRECTION	DETAILS
Monochrome 35mm print		
35M/F1/1-2	SE	Ground floor, N side of factory floor
35M/F1/3-5	SE	Ground floor, S side of factory floor
35M/F1/6-10	SW	Ground floor, office to W corner
35M/F1/11-13	NE	Ground floor, NW wing area
35M/F1/14-16	NW	Ground floor, N side of factory floor
35M/F1/17-18	NW	Ground floor, S side of factory floor
35M/F1/19-20	SE	Ground floor, inserted wall of offices at SE end
35M/F1/21-24	N	Ground floor, SE wing area
35M/F1/25-27	SW	Ground floor, SE front doorway and offices
35M/F1/28-30	N	Ground floor, Interior of large office in SE corner
35M/F1/31-33	W	Ground floor, detail of column
35M/F2/2-4	SE	First floor, N side of factory floor
35M/F2/5-7	SE	First floor, S side of factory floor
35M/F2/8-10	S	First floor, room below NW mezzanine
35M/F2/11-13	NW	First floor, N side of factory floor
35M/F2/14-16	NW	First floor, S side of factory floor
35M/F2/17-19	E	First floor, SE mezzanine arrangement
35M/F2/20-22	E	SE lift and stairwell entrance
35M/F2/23	-	Mis-shot
35M/F2/24-27	S	First floor, tool-rack to S wall
35M/F2/28-30	NW	First floor, Toilets to SE wing
35M/F2/31-33	NE	First floor, chute arrangement to N wall
35M/F2/34-36	N	First floor, NW mezzanine arrangement
35M/F3/2-4	N	First floor, south office of NW mezzanine
35M/F3/5-7	SW	First floor, central office of NW mezzanine
35M/F3/8	SE	First floor, small room of NW mezzanine
35M/F3/9-11	NE	First floor, toilets of NW mezzanine
35M/F3/12-17	N	Second floor, NW stairwell
35M/F3/18-20	NE	Second floor, NW wing area
35M/F3/21-23	SE	Second floor, S side of factory floor
35M/F3/24-26	SE	Second floor, N side of factory floor
35M/F3/27-29	E	Second floor, overall view of factory floor
35M/F3/30-32	W	Second floor, work/tool bench at NW end of factory
35M/F3/33-35	NE	Second floor, disposal chute arrangement
35M/F3/36	N	Second floor, SE wing area

35M/F4/5-7	NW	Second floor, S side of factory floor
35M/F4/8-10	NW	Second floor, N side of factory floor
35M/F4/11-19	N	Second floor, structural gap in building
35M/F4/20-22	NE	Second floor, SE mezzanine offices
35M/F4/23-25	E	Second floor, SE mezzanine toilets
35M/F4/26-27	NW	Roof, crane and SE lift shaft
35M/F4/28-29	NW	Roof, crane and SE lift shaft
35M/F4/30-32	SE	Roof, NW lift shaft and roof
35M/F4/33-34	NE	Roof, signage mounts
35M/F4/35-36	SE	Roof, water tanks
35M/F5/4-5	NE	Roof, mechanism of SE lift shaft
35M/F5/6-7	N	Roof, fire warden structure
35M/F5/8-10	W	Roof, central pediment and recumbent flagpole
35M/F5/11-13	W	Rear elevation
35M/F5/14-16	W	Rear and SE elevations
35M/F5/17-19	SW	Rear elevation, fire escape
35M/F5/20-22	N	Front elevation
35M/F5/23-26	NE	Front elevation, SE part
35M/F5/27-30	NE	Front elevation, NW part
35M/F5/31-33	NW	Third floor, interior
35M/F5/34-36	SE	Third floor, interior
35M/F6/1-4	S	Third floor, offices at SE end
35M/F6/5-7	SE	Third floor, offices at SE end
35M/F6/8-10	W	Third floor, offices at SE end
35M/F6/11-13	NW	Third floor, view of floor
35M/F6/14-16	SE	Third floor, NW lift shaft and floor
35M/F6/18-20	E	Third floor, internal partitions in central area
35M/F6/21-22	N	Third floor, steel reinforcing to roof beam
35M/F6/23	NE	Third floor, SE end, blocked opening and fittings
35M/F6/24-26	W	Third floor, former crane fitting with suspended ceiling below
35M/F6/27-28	SE	Third floor, part of air-carrier system
Monochrome medium format		
120M/F1/1	NE	Front elevation, SE part
120M/F1/2-4	NE	Front elevation, central part
120M/F1/5-6	NE	Front elevation, NW part
120M/F1/7	N	Front elevation, overall
120M/F1/8-9	NE	Front elevation, SE part
120M/F1/110-11	N	Front elevation, overall

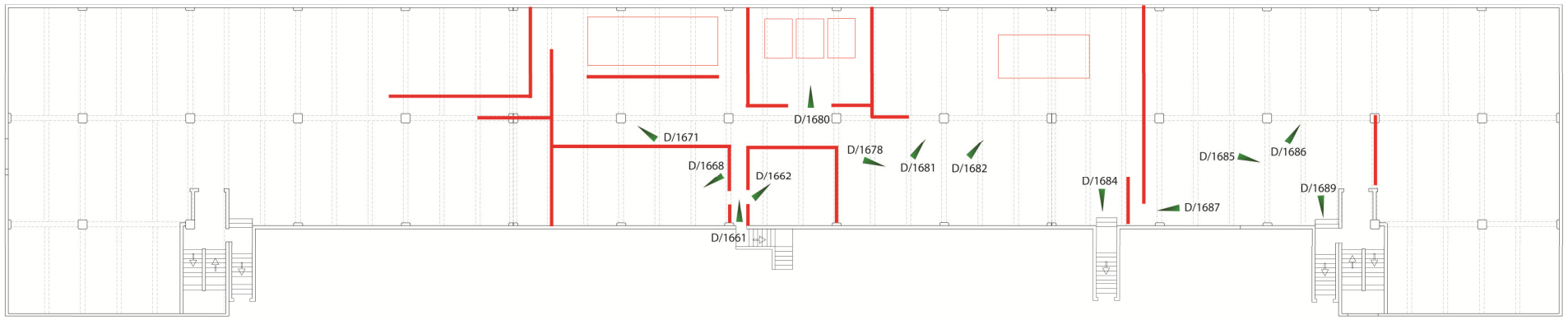
120M/F1/12-13	N	Front elevation, NW part
120M/F2/1-3	SE	Ground floor, N side of factory floor
120M/F2/4	NW	First floor, NW mezzanine
120M/F2/5-6	W	Roof, central pediment
120M/F2/7-8	NW	Roof, crane and SE lift shaft
120M/F2/9-10	N	Roof, fire warden structure
120M/F2/11-12	NW	Roof, beam crane
120M/F2/13-15	E	Front and NW elevations
120M/F3/1	NW	Second floor, south side of factory floor
120M/F3/2-4	W	Rear and SE elevations
120M/F3/5-7	NE	Second floor, NW wing
120M/F3/8	N	Second floor, N side of factory floor (SE end)
120M/F3/9	NW	First floor, S side of factory floor
120M/F3/10-11	SE	First floor, SE mezzanine
120M/F3/12	SE	Second floor, factory floor
120M/F3/13-14	SE	First floor, factory floor
120M/F3/15	SE	First floor, factory floor

PHOTO #	DIRECTION	DETAILS
Colour 35mm slide		
S/F1/2-4	SE	Ground floor, N side of factory floor
S/F1/5-7	SE	Ground floor, S side of factory floor
S/F1/8-11	SW	Ground floor, office to W corner
S/F1/12-15	NE	Ground floor, NW wing area
S/F1/16-18	NW	Ground floor, N side of factory floor
S/F1/19-21	NW	Ground floor, S side of factory floor
S/F1/22-23	SE	Ground floor, inserted wall of SE offices
S/F1/24-26	N	Ground floor, SE wing area
S/F1/27-29	SW	Ground floor, SE doorway and offices
S/F1/30-32	N	Ground floor, interior of large office
S/F1/33-36	W	Ground floor, detail of column
S/F2/2-4	SE	First floor, N side of factory floor
S/F2/5-7	SE	First floor, S side of factory floor
S/F2/8-10	S	First floor, NW room below mezzanine
S/F2/11-13	NW	First floor, N side of factory floor
S/F2/14-16	NW	First floor, S side of factory floor
S/F2/17-20	E	First floor, SE mezzanine arrangement
S/F2/21-23	E	First floor, SE lift and stairwell entrance
S/F2/24-27	SE	First floor, S side of SE end of factory floor
S/F2/28-30	S	First floor, tool rack to S wall
S/F2/32-34	NW	First floor, toilet to SE wing
S/F2/35-36	NE	First floor, chute arrangement to NW part of factory floor
S/F3/2	NE	First floor, chute arrangement to NW part of factory floor
S/F3/3-5	N	First floor, NW mezzanine arrangement
S/F3/6-8	N	First floor, NW mezzanine, S office
S/F3/9-11	SW	First floor, NW mezzanine, central office
S/F3/12	SE	First floor, NW mezzanine, small room
S/F3/13-15	NE	First floor, NW mezzanine, toilets
S/F3/16-18	NE	Second floor, NW wing area
S/F3/19-21	SE	Second floor, S side of factory floor
S/F3/22-24	SE	Second floor, N side of factory floor
S/F3/25-27	E	Second floor, overall view of factory floor
S/F3/28-30	W	Second floor, tool/work bench at NW end of factory floor
S/F3/31-32	NE	Second floor, chute arrangement
S/F3/33-35	W	Second floor, SE wing area
S/F3/36	NW	Second floor, S side of factory floor

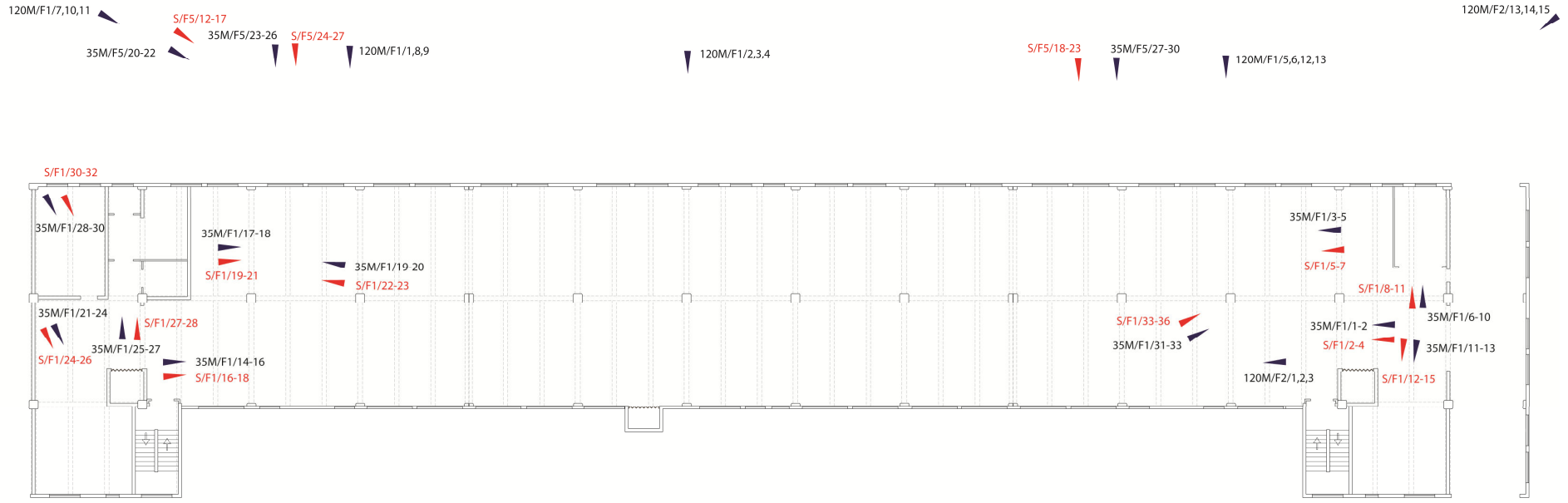
S/F4/1-3	NW	Second floor, S side of factory floor
S/F4/4-6	NW	Second floor, N side of factory floor
S/F4/8-10	N	Second floor, structural gap in building
S/F4/11-14	NE	First floor, view of SE mezzanine offices
S/F4/15-16	E	First floor, SE mezzanine toilets
S/F4/17-18	NW	Roof, beam crane & SE lift shaft
S/F4/19-20	NW	Roof, beam crane & SE lift shaft
S/F4/21-23	SE	Roof, NW lift shaft and roof
S/F4/24-26	NE	Roof, signage mounts
S/F4/27-28	SE	Roof, water tanks
S/F4/29-30	NE	Roof, electric fittings to central lift shaft
S/F4/31-32	NE	Roof, winding gear to SE lift shaft
S/F4/33-35	N	Roof, fire wardens structure
S/F4/36	W	Roof, central pediment & recumbent flagpole
S/F5/1-7	W	Rear elevation
S/F5/8-11	SW	Rear elevation, fire escape
S/F5/12-17	N	Front elevation
S/F5/18-23	NE	Front elevation, NW part
S/F5/24-27	NE	Front elevation, SE part
S/F5/28-29	NW	Third floor, Interior
S/F5/30-32	SE	Third floor, interior
S/F5/33-35	NW	Third floor, interior
S/F6/1-3	S	Third floor, offices at SE end
S/F6/4-6	SE	Third floor, offices at SE end
S/F6/6	W	Third floor, offices at SE end
S/F6/7	E	Third floor, internal partitions in central area
S/F6/8-10	NW	Third floor, view of floor
S/F6/11-12	SE	Third floor, NW lift shaft and floor
S/F6/13	W	Third floor, offices at SE end
S/F6/14	E	Third floor, Internal partitions in central area
S/F6/15	SE	Third floor, NW lift shaft and floor
S/F6/16	E	Third floor, Internal partitions in central area

PHOTO #	DIRECTION	DETAILS
Basement: digital		
D/1671	S	Basement, view from side of boiler room
D/1668	E	Basement, view into boiler room
D/1662	W	Basement, view into switch room
D/1680	SW	Basement, view of oil storage area
D/1678	NW	Basement, view into open area to NW of switch room
D/1681	W	Basement, view into partitioned area
D/1682	W	Basement, view into partitioned area
D/1684	NE	Basement, view to staircase with blast door at top
D/1687	SE	Basement, signage
D/1685	NW	Basement, machinery, inserted breeze block wall to rear
D/1686	W	Basement, detail of 1685
D/1689	NE	Basement, view of stairs with entrance to NE s/well to left
D/1661	SW	Basement, view of space arrangements from central entrance

APPENDIX 2: PHOTOGRAPHIC LOCATING PLANS

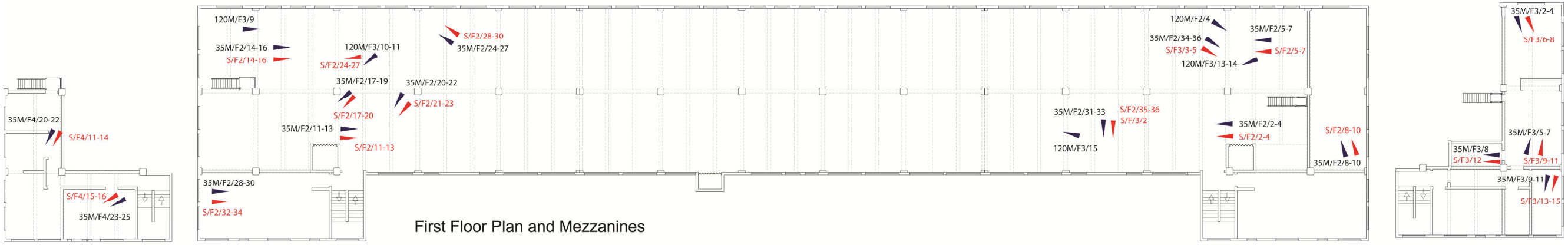


Basement Plan

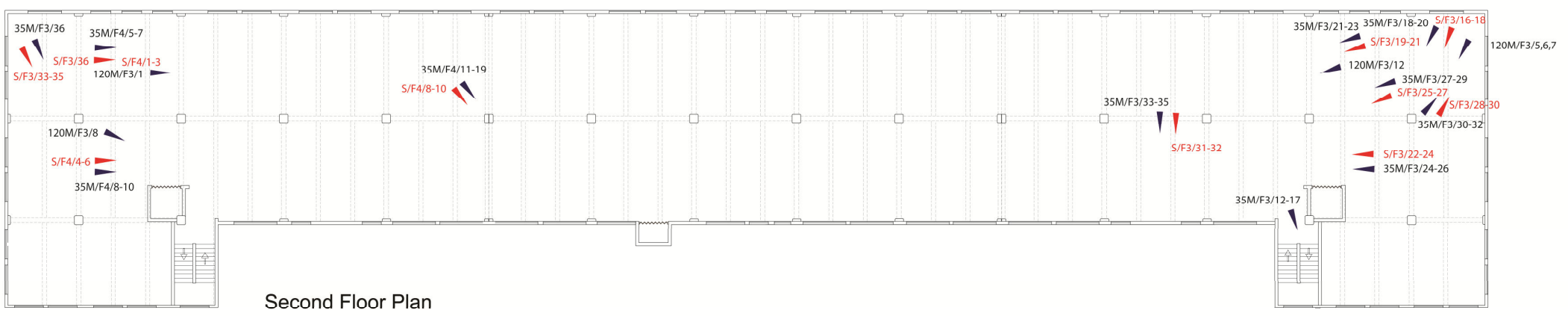


Ground Floor Plan

Figure 8 *Basement and ground floor*



First Floor Plan and Mezzanines



Second Floor Plan

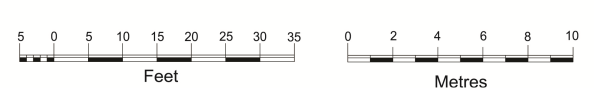
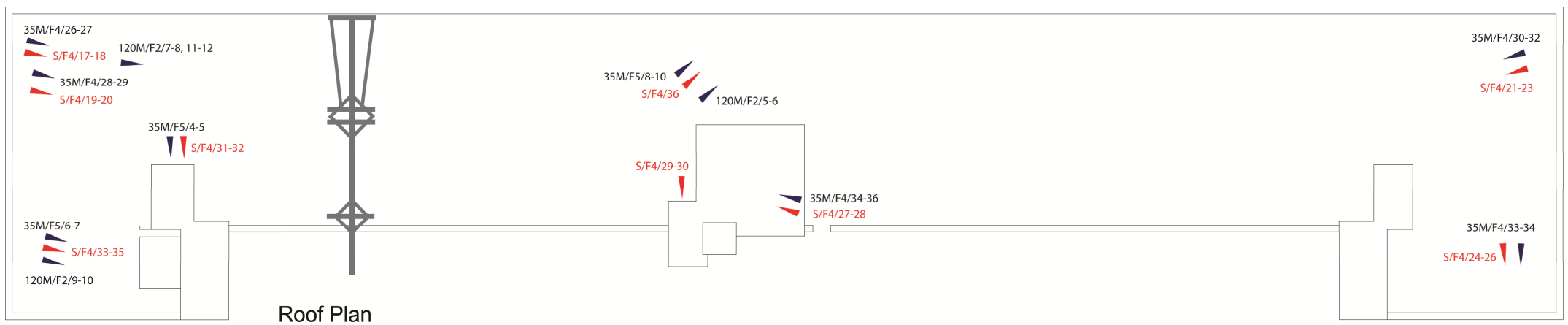
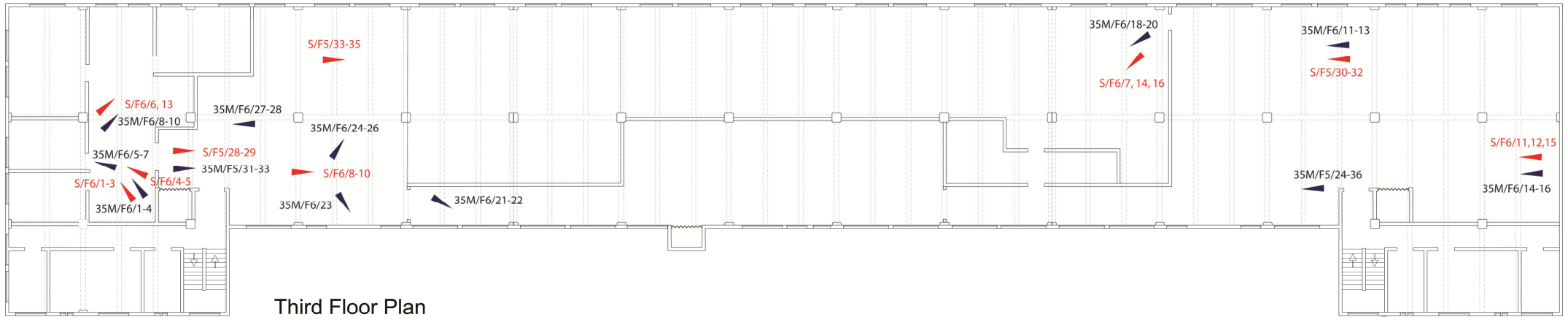


Figure 9 *First and second floors*





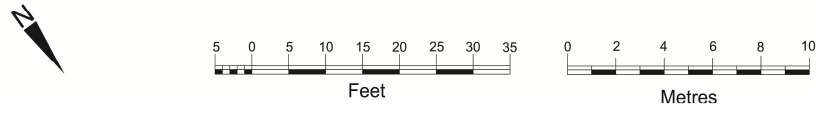


Figure 10 *Third floor and roof*