VALLEY SITE, RHYDYMWYN

SECURITY REPORT

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INTRODUCTION

1.0 INTRODUCTION

Purcell Miller Tritton was commissioned by the Department for Environment Food and Rural Affairs (DEFRA), to undertake a condition survey and security survey on and for the former MS Valley Site, Rhydymwyn, Flintshire, North Wales. Survey work was undertaken during November and December 2010.

Background work has included:

- Assessment of the on site documentary archive held at the Valley Site Visitor Centre, and documents held by the Rhydymwyn Valley History Society.
- Discussion with the on-site team to understand the day-to-day management and issues relating to the building and site, how the site operates and a profile of its use and users.
- Review of existing reports, including the Birmingham Archaeology Historic Environment Management Plan (2006). This report has been invaluable in providing background information.

1.1 The Format of the Report.

The report has been split into two distinct sections, the condition survey and the security survey and recommendations. The security survey, which follows this introduction, splits the site into the following sections:

- The Process Area
- The West Bank and pre WWII features.
- The Danger Area

Features other than buildings, such as fencing are covered under the relevant site areas.

A series of different systems have been used in the past to identify individual buildings. This report follows the methodology identified within the Birmingham Archaeology report, and uses the system known as the 'Carillion' or 'citex' numbering system, which are the most commonly used across the site. This allows ready cross-referencing with other reports and identification of individual buildings. Some of the pre-WWII features do not have these references, and consequently these are referred to by their SMR (scheduled monument record) numbers, identified by Birmingham Archaeology.

Refer to condition survey for building plans and elevations.

1.2 The Valley Site

The site occupies around 35 hectares of the Alyn Valley, to the south of the village of Rhydymwyn, Mold, Flintshire. Once part of the extensive Gwysaney Estate, the Parish of Rhydymwyn was established in 1865. Lead mining in the area is known to have been extensive, and a foundry associated with nearby mines is depicted on several early maps for the area. Following the closure of the foundry land use on the site was largely agricultural in character. During this period, the Ministry of Supply was reviewing options, nationwide, for the development of a chemical weapons production and storage facility. Rhydymwyn was identified as an option, and consequently purchased in 1939 for development as MS valley.

The site was bounded to the east by the Chester to Denbigh railway, and a rail network was developed within the site, with sidings adjoining the main line. The River Alyn was culverted to create a level site, and over 100 buildings were constructed to serve the site and its substantial workforce. A complex network of subterranean tunnels were constructed under the hillside to the west of the site to provide secure storage.

During World War II the plant produced ordnance containing mustard gas, and has important links with the development of the Atom Bomb through the 'tube alloys' project. In the immediate Post-War period the site was used to store German nerve gas. In the 1960's Britain determined to relinquish its chemical weapons, and the site became redundant. The site however remains on the international register of chemical weapons related sites. Subsequently the site became used as a buffer store for foodstuffs and emergency rations, finally closing in 1994. Subsequently a programme of demolition was undertaken, which involved the removal of some 75% of the original buildings.

The site is currently managed on behalf of DEFRA by Interserve, who have a permanent staff based on site. The site is also home to North-East Wales Wildlife (NEWW), who have a permanent base on the site, and manage the wildlife and ecological aspects.

Following the significance appraisal undertaken by Birmingham Archaeology, the key process buildings (45, 50, 59 and 65) were listed, and the danger area designated a scheduled monument. The official descriptions are included in the appendices of the report.

1.3 Security Report Summary

The security report, which follows this introduction, sets out the general and identifiable risks observed during three day long site visits to Rhydymwyn.

The observational non-intrusive survey covered the retained Valley Works and pre-WWII structures and included an accompanied site walk around. The access required to undertake this survey is not representative of public site access and this has been taken into account whilst preparing this report. This report sets out recommendations for actions relating to the security matters identified. The primary actions are included in the task matrix, prepared under a separate header.

The risks identified by the security survey are not exhaustive. The observations offered are considered with an awareness of current Health and Safety legislation in the construction industry but the groups controlling access to the site, NEWW, Friends of Rhydymwyn and Interserve, are recommended to undertake risk assessments relating specifically to their matters of business.

For the purposes of this security survey we have assumed that public access to the Rhydymwyn site will continue to be controlled. The background behind this assumption is expanded in the Birmingham Archaeological Report. Risk assessments and inductions should continue to be carried out by NEWW and the site management contractor, currently Interserve, when allowing people onto the site.

In this report we have defined people visiting the site into three main categories:

- Building Visitors are people intentionally approaching and entering the building being described.
- Site Users are people walking or driving around the site on the access routes or passing by a building being described on route to another destination.
- Intruders

Intruders are people who are accessing to the site without the approval of NEWW or site security.

Staff and Volunteers who have knowledge of the site and are employed in a specific task are covered in the Site User and Building Visitor Categories unless detailed separately.

This document identifies a broad range of security issues across the site.

Tailored and specific site inductions should be developed for the different groups of people using the site which identify the risks which they could encounter.

For example, NEWW should have in place an induction for volunteers, which reflects the risks identified in the areas of the site in which they are going to work. The site is too large for a general induction to be appropriate for occasional visitors. Another example is school parties where the responsible adults should be inducted on the risks specific to the area to be visited and the children told key things to be aware of.

The Birmingham Archaeological Report (BAR) recommended a programme of managed decline for a majority of the buildings. In the future management of the Rhydymwyn site this recommended course of action is in conflict with the Listing of the buildings and the safety of people accessing the site. The security report outlines issues of site security and risks posed by approaching and accessing the building structures as identified on site visits held in November 2010. This survey should not be held as relevant if the buildings' condition continues to decline.

1.3.1 Moving Around the Site

The vehicle and pedestrian routes around the site and the areas of hardstanding are becoming overgrown with moss, grass and brambles. The moss makes the surfaces slippery under foot and the grass and brambles create trip hazards. A programme of clearance of all of the paths would be onerous and expensive. An alternative would be designation of principal routes, which are cleared of vegetation and maintained. People accessing routes not designated as principal routes would need to understand the risks involved.

Broken glass poses a risk of injury to Building Visitors, Site Users, intruders and wildlife. We have detailed specific instances of broken glass in the security survey however the problem is site wide. The site, specifically the buildings and areas accessed by the public, should be cleared of visible pieces of broken glass. There are also discarded metal items across the Rhydymwyn site, including broken pieces of metal sheet, sections of fencing and items of historic interest. These pose a risk of injury to Building Visitors, Site Users, intruders and wildlife. External contractors could be engaged to collect, catalogue and discard or relocate loose metal items and clear the glass from across the site. However, this work could be undertaken by volunteers if they were suitably briefed and had the necessary personal protection equipment (PPE).

There are discarded gas canisters within Building 59 which require careful disposal. The Health and Safety Executive have prepared guidance on the use, storage and transportation of gas cylinders ("pressure receptacles") which should be understood and adhered to.

There are gas cylinders stored to the south of Building 12. These need to be stored, securely, in accordance with the HSE guidance. Refer to the relevant regulations for specific design and location details. The fuel storage tank to the south of Building 12 needs to conform with current regulations. There is concern that gas cylinders should not be stored within 2m of the fuel storage tank. A competent person will need to carry out risk assessments and confirm that the storage of these substances comply with the relevant regulations.

The Woodland Walk is a successful and, anecdotally, well appreciated part of the visitor experience at Rhydymwyn. There are inherent risks with climbing steep slopes and entering woodland that should be understood by Site Users. Sections of the Woodland Walk could be improved to reduce the risks posed to visitors. Where the path runs adjacent to the perimeter fence, the fence bracing obstructs the route. (See Fig. 1) The fence posts are rusty and pose an avoidable risk of injury to Site Users. As a minimum the fence posts should be maintained and repaired but consideration should be given to widening the path or rerouting the Woodland Walk to avoid the fence bracing. A section of the Woodland Walk bisects the access route between the Gunpowder Magazine Rooms - Buildings 133 & 134. Before access to Building 134 is encouraged the clash of pathways requires resolution.

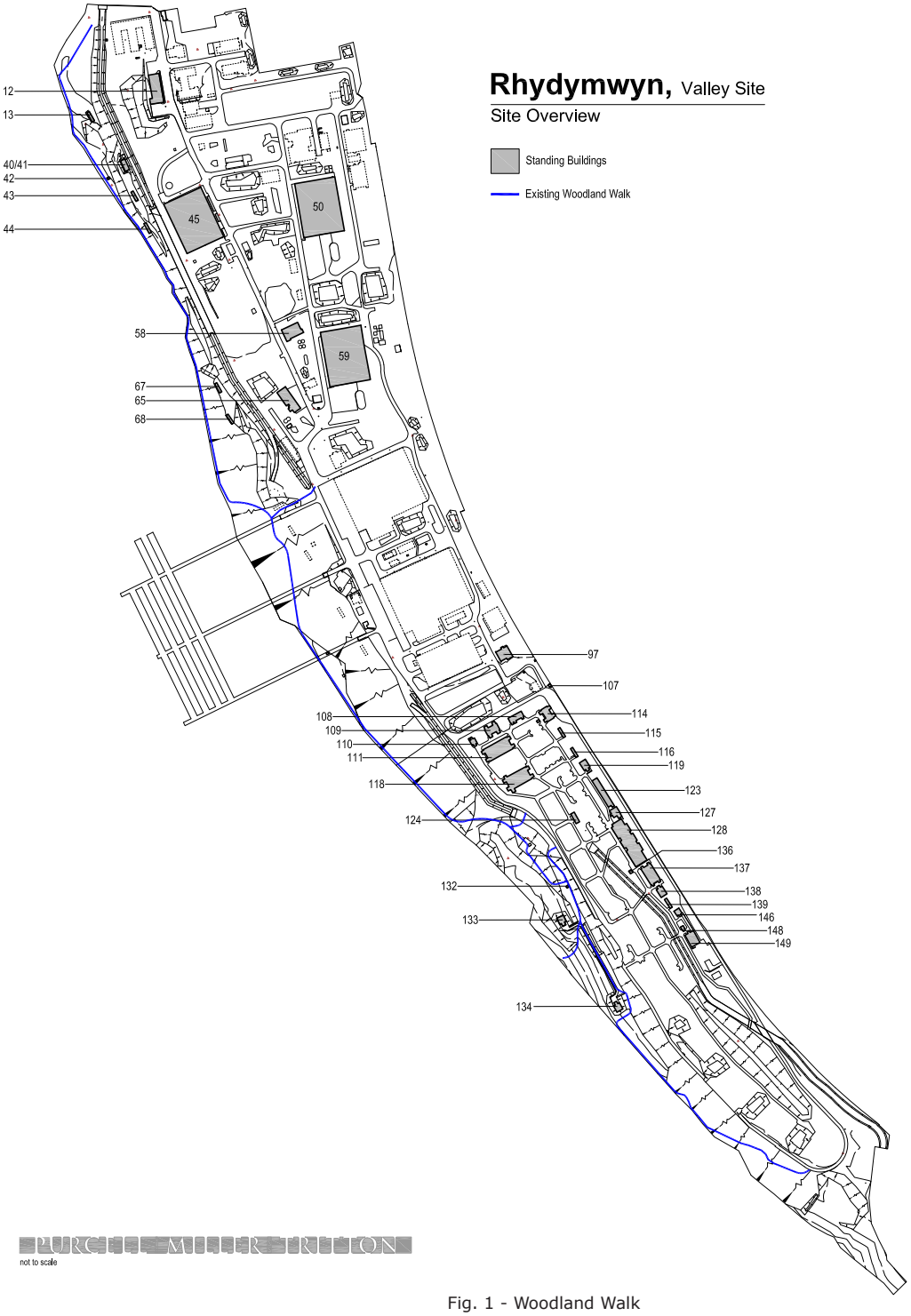

Fig. 1 - Woodland Walk

1.3.2 In and around the buildings

In a previous safety drive, detailed in the BAR, doors were removed from a majority of the buildings on the Rhydymwyn site. This allows access to a majority of the structures remaining on site.

The open doorways do not indicate a hierarchy in approaches to the buildings.

Where moss has covered the surface of the approach paths and building aprons, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the paths and at the building thresholds. Plants including grasses and brambles are impinging on the paths. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access. Entrances to some of the buildings including Building 45 (The Tube Alloys Project P6) are obstructed by sapling and semi mature tree growth. These trees also create trip hazards and restrict the light entering the building.

The masonry buildings across the site show evidence of high level structural cracking symptomatic of an original building technique, possibly the tying in of the concrete roof slab. Refer to the condition survey for further details. The cracks appear in the top courses of masonry and pose a risk to Building Visitors from small pieces of falling masonry both internally and in close proximity of the external elevations. The concrete frames of the larger buildings within the Process Area, Building 45, 50 & 59, are spalling externally and pose a risk to Building Visitors passing close to the external elevations from larger pieces of falling concrete. There is evidence of pieces of fallen concrete upto 150mm adjacent to Building 50. Consideration should be given to equipping Building Visitors and Site Users intending to walk in close proximity to the external elevations with suitable PPE including hard hats.

Building Visitors should take due care. The buildings identified as requiring immediate structural stabilization in the Condition Survey, Building 97, Building 111 and Building 128, are unsafe for people to access in the current condition and access to these buildings should be restricted. Site Users passing in close proximity of these buildings should do so with due care and appropriate PPE.

There are localized repairs required to areas of disturbed masonry on a number of buildings in the Danger Area including Building 110, 111 & 123. These minor stabilization works would reduce the risks posed to Building Visitors. The high level masonry cracking to the northwest corner Building 58, has deteriorated and there is a risk of larger pieces of masonry detaching. On a majority of the buildings, the concrete roof slabs are degrading at the perimeter. This damage poses a risk to Building Visitors approaching the building elevations from small pieces of falling concrete. The same applies where the roof slab in Building 127 is spalling internally.

Building 45 and 59 and have been used for storing pieces of equipment, signage and items of furniture. Items stored in the buildings create a potential fire load. There is a risk of arson associated with the large quantities of combustible material being stored where there is access to the buildings. There is a notable risk of arson for all structures, even inaccessible buildings such as Building 58 through the uncovered external ventilation openings. A fire engineer could advise on a suitable maximum fire load within the buildings. This could ameliorate potential conflict with a NEWW policy of creating varied habitats such as within Buildings 114, 119 & 136.

Uncovered floor voids within the plantrooms in Building 45, 50 & 59, and additionally within the main floor area of Building 45, pose a significant risk of injury to Building Visitors. These should be included within the specific inductions for these buildings. The low light levels in Building 45 increase the risks posed. The in filled manholes in Building 128 similarly pose a risk of injury to Building Visitors, increased by rusty metal projections at the rim. Access to Building 128 should be restricted. Across the site there are rusty metal projections from the external elevations on a majority of the buildings. There are also projections internally in a significant number of the buildings. Be aware that some of the projecting pieces of metal could be considered of historical significance and repairs and remedial woirks should be considered to ameliorate the risks proposed to Site Users and Building visitors. Site users and Building visitros should be made aware of the risk of injury from metal projections in site inductions.

Areas where a material which potentially was, or contained, asbestos was identified during our site visits are indicated in this report. Refer to the previous asbestos survey for the information on the prescence, location and proposed management strategies for asbestos on the site.

1.3.3 Arrival and Interpretation

On arrival access to the site is controlled from a manned reception point. Visitors, staff and volunteered associated with the different site user groups all enter the site through the main gate. A secondary fence line indicating the extent of access achievable could assist control of future public access to the site. For example a school group arriving on site could come and park in the car park and look at initial interpretation boards whilst waiting for representatives from NEWW to come and greet them. A low level fence and access gate beyond the carpark would delineate clearly the extent of unaccompanied access allowed. Refer to the 5 Year Plan for recommendations.

A designated hierarchy of access routes, as suggested above, would assist in creating cohesive interpretation across the site. Predetermined routes and a permanent system of wayfinding through interpretative boards and signage would assist in reducing the security risks posed to the public on accompanied visits to Rhydymwyn.

1.3.4 Security Risks to and posed by Intruders onto the site

As discussed in the Condition Survey, the trees growing from the blocked drains and trenches at the perimeters of the Valley Works buildings are causing extensive damage. The trees also provide opportunity for intruders to gain access to the building roofs. From the building roofs there is the obvious risk of falling. Within the larger buildings 50 and 59 the risk is exacerbated by concealed areas of potential weakness in the roof structure. A programme of maintenance and roof repair is required across the site.

There is physical and anecdotal evidence of people entering the site to steal cabling. There is surface mounted conduit within the plantrooms and at high level in the buildings in the Process Area. This poses a risk of temptation to intruders. The cabling has been terminated and removed in a majority of the buildings but this is not immediately apparent. Remedial works and repairs to the perimeter fencing are recommended. Additional works to the fencing should be considered where the fence is vulnerable to breach.

1.3.5 Site Responsibilities

The Birmingham Archaeology Report outlines the history of the site. In summary, the current site responsibilities as we understand them are:

DEFRA

Retained responsibility:

1. Perimeter and internal fencing including gates
2. Roads, boreholes, buildings, building slabs, culvert, bridges, DEFRA cable poles, ducts and manholes
3. Caverns
4. Security and security signage
5. Garden area outside of perimeter fence
6. Maintain by mowing approx. 4m adjacent to Antelope Industrial Estate and village
7. Management building and Building 12
8. External lighting
9. Flood security gates and controls
10. All utilities

DEFRA rights granted, EA flood defence channels, monitoring building and bridge over culvert

DEFRA employ Group 4 to manage the site. Anecdotally, they are currently retained on a 15-year contract.

NEWW

Areas of responsibility:

1. All grassland (excluding item 6 above) including areas over footprint of buildings
2. Woodland, woodland path and associated steps and boardwalk
3. Wetlands and ponds
4. Hides
5. NEWW offices and containers adjacent to Building 12

6. Marker posts for walks and public interpretation
7. External bench seating

DEFRA rights granted for use by NEWW:

- Management building meeting room, toilets and kitchen
- Building 12 (Field Study Centre) Education Area and Toilets located north end of building adjacent to NEWW accommodation
- All these facilities subject to prior approval from DEFRA and in emergency DEFRA needs override all others

In 2003, an order was placed with NEWW, previously known as DUWG, for services relating to the

Rhydymwyn site for 10 years.

Friends of Rhydymwyn

Responsibilities and rights of access undefined.

1.3.6 Conflict of Interested Parties

We understand that the Rhydymwyn site is unique. The programme of interests of the various agencies and interested parties are complex and similarly unique. The roles of the interested parties can come into conflict over the future management of the buildings and environment. A simple example would be the tree and ivy growth at the building perimeters. Anecdotally, this has been encouraged as local people had expressed a desire for the buildings to be concealed. The tree and ivy growth is threatening the future structural stability of the buildings. The Listing of the buildings identifies their historical significance and the desire to maintain the structures in situ. Other simpler and more complex issues are constantly at play across the Rhydymwyn site.

For the purposes of this report we have focused on the site security and issues relating to the risks posed by approaching and accessing the building structures. We have tried to deliver a balanced response to the various interested parties.

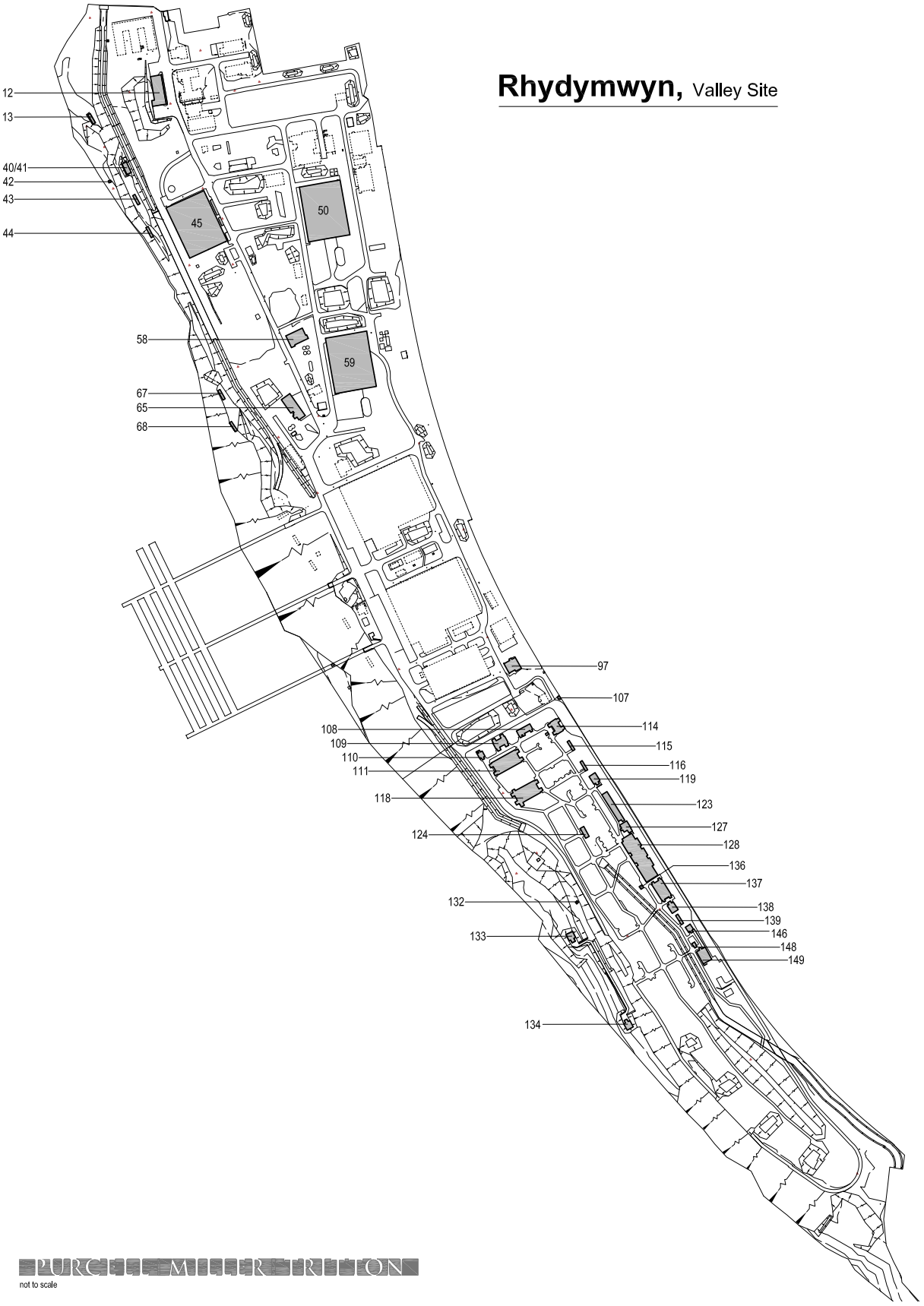

Fig. 2 - Citex numbering system

2

THE PROCESS AREA

2. THE PROCESS AREA

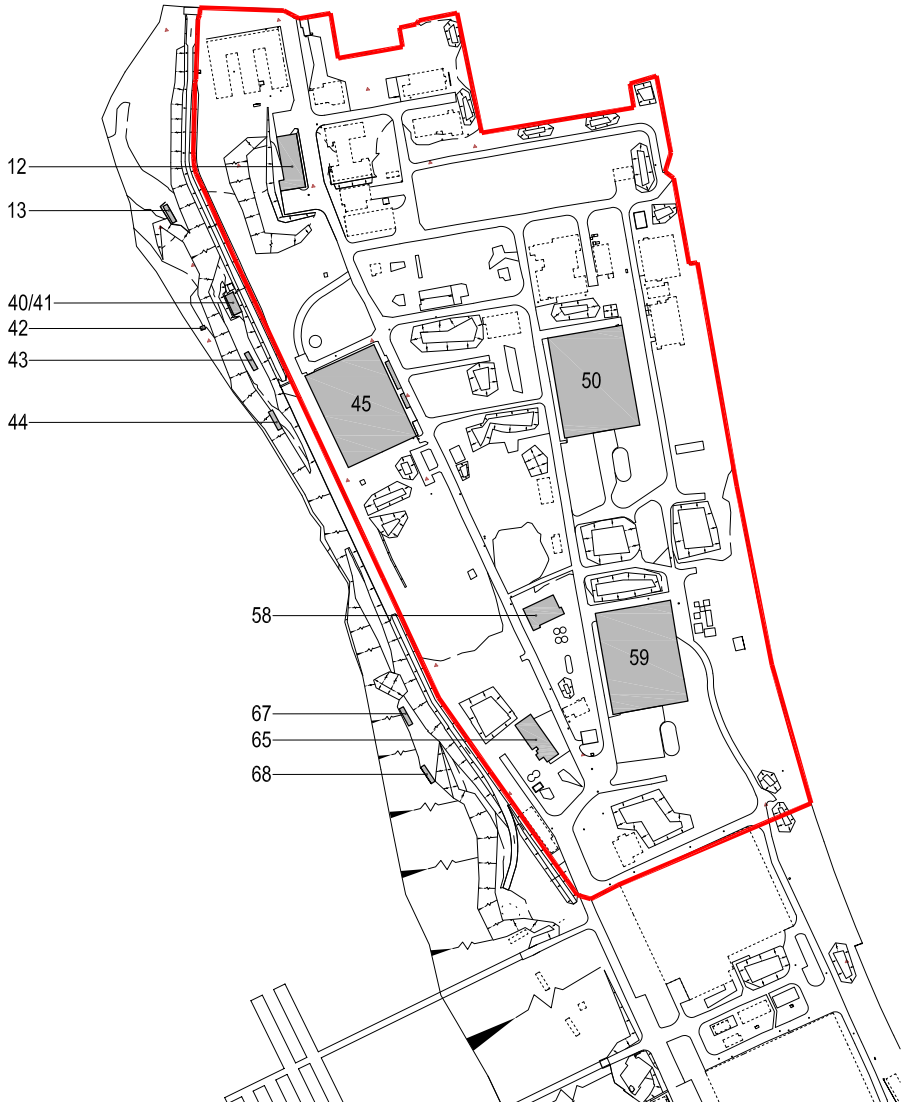

Fig. 3 - Buildings in the Process Area

2.1 Building 1, Visitor Centre (P6)

This building was purpose built as a site reception and visitor centre. The building is in a good state of repair and is in daily use. There is a manned reception point overlooking site entrance gate. The two staff security guards are employed by Interserve and offer a wealth of experience, taking overall responsibility for the site security.

2.2 Arrival

The current Rhydymwyn security strategy relies on staff consistency and observation. In the hands of the current employees, this is managed well. There are however a number of relatively minimal physical interventions, which could improve the ease of management of the site in future.

Recommendations:

Secondary low fence and gate or alternative access barrier to delineate the extent of the access

Directional signage

Interpretation / non visitor experience

2.3 Perimeter Fencing– included in SMR 98046

The Rhydymwyn site perimeter fence is the original 1942 Valley Works palisade fencing. The section of fencing bounding the residential properties to the north of the site shows extensive areas of localized corrosion. The corrosion is particularly prevalent at the junction of head rails and the support posts and on the post bracing members. The remainder of the perimeter fence in the Process Area shows localized areas of corrosion.

Within the Process Area and Charging Area, the fence is set back from the internal circulation routes and public access from outside the site is limited. A 4m mown strip is maintained adjacent to the Antelope Industrial Estate. The mown strip allows easy access to inspect the perimeter palisade fence on the eastern boundary.

In a residential property bordering the northern section of perimeter fence, a build up of grass cuttings in the corner of the garden reduces the effective height of the fence below 1500mm. This could create a potential access point to the site.

There is a localized area of fly tipping beyond a gate in the northern section of the perimeter fence. Fly tipping happens in unsupervised publicly accessible locations; the same conditions likely to encourage access to the site.

In the Antelope Fields industrial estate adjacent to the eastern perimeter fence there are low-level precast concrete walls within a builder's yard. These walls adjunct the northern railway gate and create a potential jumping-off point for accessing the site. Historically barbed wire has been used at such vulnerable points on the perimeter but here, as elsewhere on site, it is a limited deterrent.

The southern railway access gate is heavily corroded. Localized repairs are required to the gate and the section of adjacent fence.

The perimeter fence is vulnerable where it runs behind the Railway Defence Post (Railway Defence Post – SMR 98007). There are discarded pieces of cabling, outside the site, near the Railway Defence Post, indicating that the fence has previously been breached at this point. One of the fence slats is dislodged and corrosion to the base rail requires attention.

In Antelope Industrial Estate multi-stemmed trees are growing in close proximity to the boundary fence. The trees provide potential climb access to the site. To the south of the Process Area the land east to the site is woodland. In this area trees provide climb access over the fence at many points along the site perimeter.

Recommendations:

Suggest a programme of repairs to perimeter fencing

Repainting

Localized improvements in areas at risk of breach

2.4 Access and Circulation

The secondary vehicular routes and areas of concrete hard standing in the Process Area are becoming overgrown with moss. Where moss has covered the surface of the concrete, at the path edges and in low traffic areas, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing trip hazards.

Plants including grasses and brambles are impinging on the access routes and areas of hard standing. The brambles, and debris trapped by the canes, create potential trip hazards and restrict access.

There are ponds, waste tips, areas of uneven ground and unsafe locations within the site. Access to the areas off the paths should be covered in the site inductions of the Site Users, NEWW and Friends of Rhydymwyn, and covered generally in the induction given to Visitors and volunteers. For the purposes of this report, it is assumed that site inductions will undertaken and that children, vulnerable adults etc will be suitable supervised.

Recommendations:

Directional signage

Dedicated cleared walkways – painted or decked

Gathering points with interpretation

2.5 Building 12, Process Garage – SMR 98000

Building 12 is in daily use and is regularly maintained. The building structure and internal finishes appear to be in a good state of repair.

Access to Building 12 is via pedestrian doorways in east elevation and through bay doors in the north and south elevations. During the site opening hours, the roller shutter into the garage in the southern bay doorway and both the pedestrian entrances, are in regular use. The doors are not regularly kept locked. The main reception, and to a lesser extent NEWW offices, passively supervise the access route to Building 12, reducing the risk of targeted burglary during the site opening hours.

The Field Study Centre (northern end of Building 12) contains electrical AV hardware and an integrated PA system. Vehicles and equipment used in site maintenance are housed in the garage (southern end of Building 12). These items could entice burglars to attempt to access the site if it were known that the buildings were vulnerable. Passive supervision and regular use currently ameliorates this risk.

The delineation of space and responsibility around Building 12 is undefined. There is a pedestrian fire exit from the Field Study Centre in the west elevation. Externally, the escape route passes the northwest corner of Building 12 and the containers adjacent to the NEWW offices. A number of baths and assorted planters are stored in this area and unchecked these could cause congestion. Standing water in the baths could become polluted and cause a health risk to Building Visitors.

The fire escape path to the north of Building 12 is covered in leaf mold and where moss is growing on the surface of it is slippery under foot. The leaf mold could disguise small level changes and low-level obstructions concealing potential trip hazards along the path.

The area of hardstanding to the south of Building 12 is on a slope and at the edges, in areas of low traffic, moss is growing on the concrete. The moss is unstable and slippery under foot.

Loose gas canisters are currently being stored adjacent to the fixed gas tank on the hard standing south of Building 12. These could potentially pose a risk to Site Users and a more formal storage solution should be adopted.

There are loose sheets of rusty profiled metal stacked in the undergrowth to the south of Building 12.

Recommendations:

Keep the doors locked or install access code operated locks for sue during the day

Programme of maintenance for escape route and garage hardstanding

Appropriate gas cylinder storage

Directional signage / Orientation

Clear and maintain a suitably sized gathering Area

2.6 Building 45, The Tube Alloys Project (P6) - SMR 98004

2.6.1 Exterior

The river Alyn runs in a culvert approx 9m from the west elevation of Building 45.

There is pedestrian access around all elevations of the building. The main pedestrian and vehicular access route is approx. 4.5m away from the east elevation, separated from the building by the overgrown concrete loading plinth. A concrete pedestrian access path runs along the north elevation. The areas of the path within 1-2m of the building are overgrown with semi mature trees and undergrowth. The footpaths to the south and west are similarly set away from the building elevations but pass over unmade ground.

The concrete frame is spalling and there are areas of frost and water damage to the masonry panels on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed to Site Users from small pieces of falling masonry.

Prominent cracks in the north and south corners of the east elevation show evidence of decline in the building structure. Refer to Condition Survey for details. Remedial work is required to prevent a risk to Site Users and Building Visitors from future structural failings of Building 45

Surface water is collecting on the concrete path to the north of Building 45. Moss has covered the path surface and it is unstable and slippery under foot. The moss covers small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds.

The concrete loading plinth that runs the length of the east elevation of the building has been disturbed by tree roots and is unstable. The uneven surface is concealed by undergrowth.

Bay openings in the eastern facade are in filled with masonry leaving window openings. Alternate bay openings are surrounded externally by a metal frame. Externally there are hooks, items of ironmongery and bent sections of frame and hinges projecting below 2000mm. The risk of injury to the Site Users is currently low as the paths are set away from the building face.

On the eastern elevation rainwater goods to bay 5 are damaged. The exposed metal edges are rusty and could present risk of injury to the public and Site Users.

Trees adjacent to the north, south and west elevation are of sufficient size to allow potential climb access to the building roof.

The undergrowth between the plinth and the roadway adjacent to the southern bay is currently home to Lesser Bird's Nest, a rare plant. See fig. 4 This is not an exclusive incidence of the presence of a rare plant at Rhydymwyn but was drawn to our attention by NEWW when carrying out the survey. Due care should be taken to consulting NEWW on the proposed methodology for carrying

out the works recommended in the condition survey. If areas of important habitat can be protected this should be undertaken as part of the preliminary site set up.

2.6.2 Interior

Trees growing from the external drainage channel at the wall base obstruct access through doorways in the north and south elevation.

High-level cracks internally pose a risk to Building Visitors from small pieces of falling masonry. Water ingress and root penetration exacerbates future risk of falling masonry.

In the south elevation an existing opening has been internally in filled with a masonry panel. The in fill brickwork is not visibly keyed in to the opening. The stability of the panel should be confirmed.

Areas where there is risk of asbestos within Building 45 include loose profiled sheet stacked on the fl oor, pipe lagging & wall mounted electrical switchgear. Refer to the asbestos survey for information on the presence, location and proposed management strategies for asbestos on the site.

Pipework on the internal face of the north elevation has been disturbed from its brackets and is hanging loose. In places, the pipework falls below 2000m and additional brackets are required to secure it.

Internally there are loose cable, hooks, items of ironmongery and other rusted metal projections below 2000mm. In the low light conditions, these pose a risk to Building Visitors entering, exiting and navigating around the building. Verbal warnings should be given to Building Visitors and risks included in inductions.

The gantry within the building tower is currently inaccessible from the roof. The roof level doorway should be kept secured and the structural integrity of the gantry verified if access is required.

Internally, high-level ducting along the north and south elevation is supported on floor bearing brackets. One of the support posts shows signs of impact damage. Currently this presents low risk but care should be taken to prevent further damage.

The plant room is accessed from the south elevation. Internally there are uncovered open floor trenches approx 150mm in width and up to 600mm deep. Due care should be taken when entering the space.

The plant room is single storey and has an internal roof slab within Building 45. There are circular duct openings in the low-level roof into the plant room beneath.

There is a large quantity of furniture and other items stored within Building 45. As well as a fire risk, these create widespread trip hazards throughout the building.

The internal floor is uneven where drainage channels have been infilled with concrete and internal partitions removed. There are changes in level of upto 50mm. In the southwest corner of the building, there is an open service trench in the floor approx. 200mm wide and over 300mm deep. It is over 10m in length and concealed by stored items. Due care should be taken in the low light conditions.

Recommendations:

An ongoing programme of surveys and maintenance will be required to the high-level metalwork to the building elevations. This includes the support and fixings for the escape doors and grills for the access vents

Remedial structural works

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes

Site inductions for Building Visitors to cover identified as well as general risks

Clear items that are stored within the building

Lit areas / reconstruction / interpretation

Works required by the presence of the bats to be carried out under NEWW supervision

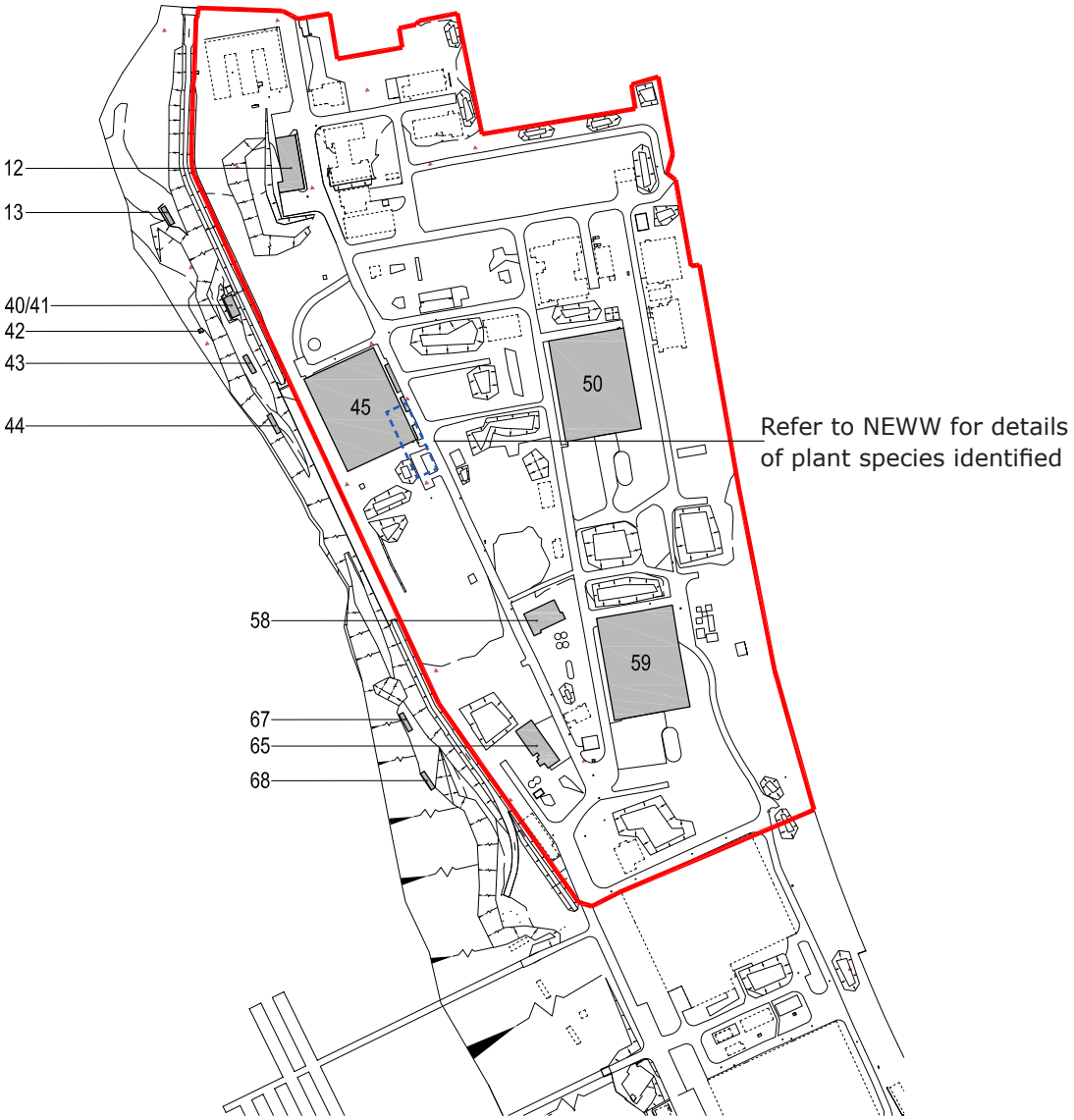

Fig. 4 - NEWW Site of Special Interest

2.7 Building 50, Pyro Building (P5) - SMR 98001

2.7.1 Exterior

There is pedestrian access along the north, east and west elevations of the building. The south elevation is overgrown with undergrowth with access restricted to a central area of concrete hardstanding. The main pedestrian and vehicular access route is approx. 4.5m away from the

west elevation, separated from the building by the overgrown concrete loading plinth. A secondary vehicular route passes to the east of Building 50. The approx. 10m strip between the roadway and the east elevation is overgrown with long grass, brambles and semi mature trees. A concrete pedestrian access path runs along the north elevation. There are semi-mature trees growing from the wall base and planters located against the face of the north elevation.

The concrete frame is spalling and there are areas of frost and water damage to the masonry panels on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by small pieces of falling masonry to Site Users but Visitors to Building 50 should be made aware. There are larger pieces of concrete, approx 75mm by 150mm, visible in the undergrowth along the western elevation, where they have fallen from the building frame.

Where moss has covered the surface of the path to the north of Building 50, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds.

Plants including grasses and brambles are impinging on the area of concrete hardstanding to the south of Building 50. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access. The access route is a slight slope and where moss has covered the concrete, it is unstable and slippery under foot.

The concrete loading plinth that runs the length of the west elevation of the building has been disturbed by tree roots and is unstable. The uneven surface is concealed by undergrowth.

Bay openings in the western facade are infilled with masonry and externally, alternate bays are surrounded by a metal frame. There are hooks, items of ironmongery and bent sections of frame and hinges projecting below 2000mm but the risk of injury to the Site Users is currently low as the paths are set away from the building face.

Trees adjacent to the north, south and east elevation are of sufficient size to allow potential climb access to the building roof.

Openings in the roof are covered by timber boarding which is visible from inside the building. These works were possibly carried out as part of the recent reroofing works. This currently presents a low risk to Building Visitors. However, if water penetration were to damage the boards, concealed weak spots to the roof could develop. Surveyors and contractors working on the roof, and intruders, would then be at risk of falling into the building.

2.7.2 Interior

High-level cracks internally pose a risk to Building Visitors from falling masonry. Water ingress to the east and west elevations, where the downpipes are damaged, exacerbates future risk of falling masonry.

There is a potential risk of asbestos within Building 50 in pipe lagging & wall mounted electrical switchgear and conduits in the plant room.

Inside Building 50, at the northerly end of the Toxic bay, there is a rusted metal strip leaning against the wall above 3000mm. Part of the strip is visible on the floor and the remainder, is unsecured. This could potentially fall, posing a risk to Building Visitors.

At the northern end of the Toxic bay, a chain from loading gear is wound round the support beam at ceiling level. A loop of the chain hangs below 2000mm. additionally; there are hooks, items of ironmongery and other rusted metal projecting from the walls below 2000mm. In the low light conditions, these pose a risk to Building Visitors entering, exiting and navigating around the Building. Verbal warnings should be given to Building Visitors and risks included in inductions.

The gantry within the building tower is currently inaccessible from the roof. The roof level doorway should be kept secured and the structural integrity of the gantry verified if access is required.

There is localized water ingress in Building 50. Where water penetrating the building has pooled it causes risks of slip and conceals level changes and uneven floor surface.

There are areas of broken glass on the floor within Building 50.

The plant room is accessed from the north elevation. Around the perimeter of the room there are uncovered open floor trenches approx 150mm in width and up to 600mm deep. Due care should be taken when entering the space. The plant room is single storey and has an internal roof slab within Building 50. There are circular duct openings in this low-level roof slab.

Pipework on the internal face of the north elevation is hanging loose where the brackets have corroded. Remedial work is required to secure it in place.

Recommendations:

Programme of maintenance to predetermined visitor routes and designated building approaches

An ongoing programme of surveys and maintenance will be required to the high-level metalwork to the building elevations. This includes the support and fixings for the escape doors and grills for the access vents

Programme of roof clearance / maintenance

Replacement of rainwater goods

Site inductions for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

An ongoing programme of surveys and maintenance will be required to the high-level metalwork to the building elevations. This includes the support and fixings for the escape doors and grills for the access vents

2.8 Building 58, Clothing Store (CS10) – SMR 98003

2.8.1 Exterior

Access to Building 58 is via a pedestrian path to the main entrance in the western elevation. The building is set back approximately 4.5m from the main vehicular site access route and stands in an area of brambles and nettles approx 1200mm high. Pedestrian access to the east elevation of the building is across 10m of overgrown unmade ground. The pedestrian path approaching the main entrance is over grown and covered with leaf mould. The leaf mould conceals level changes and potential trip hazards including a protruding root and a partially infilled drainage channel.

Because bats use Building 58 as a roost, NEWW have installed a temporary timber door and frame to restrict access to the building. The doors function in the intended capacity but could lead intruders to believe there are items of value within the building.

The original entrance and exit porches for Building 58 are 2700mm high and provide easy climb access to the roof. The Condition Survey details the likely condition of the roof. Fallen metal pipework is visible over the roof of the entrance porch and projects from the north elevation of the building. Due to the height and inaccessibility of the areas of the projections, these pose low risk to Site Users.

The porches and main building have horizontal cracks in the masonry at high level, usually two courses below the roof slab. The undergrowth surrounding the building reduces the risk to Site Us-

ers from pieces of falling masonry.

There are sections of the cast iron rainwater goods on Building 58 in place but the guttering does not connect to the downpipes. The remaining sections of guttering are fixed to the top two courses of brickwork, above the structural cracks. On the north elevation, where the head of downpipe is fixed to the brickwork, the bricks have become dislodged.

2.8.2 Interior

Due to the presence of bats, access to Building 58, and to the internal rooms within, is restricted by temporary timber doors fitted by NEWW. The risks posed to Building Visitors are reduced as they are likely to be accompanied by NEWW when entering the building.

Debris and broken glass on the floor create trip hazards and increase the risk of injury to Building Visitors. The doorways that are not locked closed are partially obstructed, which makes moving round the building by torchlight difficult. Of particular note is a section of hanging timber within the exit porch.

Where water penetrating the roof of Building B58 has pooled, it causes risks of slip and conceals level changes and uneven floor surface.

There is broken glass in the window frames. The windows are bricked up externally but accessible from within Building 58.

Internally there is a risk to Building Visitors from small pieces of falling masonry due to the high-level cracking. Root penetration from the ivy on the north elevation will exacerbate this risk in the future.

Recommendations:

Works required by the presence of the bats to be carried out under NEWW supervision

Bat signage to be larger and more prominent

Restrict access to Building 58 due to difficulty moving round internally or remedy

2.9 Building 59, Pyro Building (P4) – SMR 98002

2.9.1 Exterior

There is pedestrian access along all elevations of the building. The main pedestrian and vehicular access route is approx. 4.5m away from the west elevation, separated from the building by the overgrown concrete loading plinth. A secondary vehicular route passes to the east of Building 59. The approx. 10m strip between the roadway and the southeast corner of the building is overgrown with brambles and semi mature trees. An overgrown concrete pedestrian access path runs along the north elevation. There are semi-mature trees growing from the wall base and planters located against the face of both the north elevation, and the north end of the east elevation. There is a large area of asphalt hardstanding providing access to the south elevation of Building 59.

The concrete frame is spalling and there are areas of frost and water damage to the masonry panels on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by pieces of falling masonry but this is the most accessible of the large buildings so Site Users using the hardstanding area should be made aware.

Where moss has covered the surface of the path to the north of Building 59, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and

brambles are impinging on this path. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There are semi-mature trees growing from the drains at the base of the building walls. Where the branches cross the concrete loading plinth that runs the length of the west elevation of the building these create trip hazards. Where moss has covered the surface of the building apron to the west of Building 59, it is unstable and slippery under foot. At the building perimeter, the undergrowth conceals the uneven floor surface.

Where moss covers the thresholds in the north and south elevations it disguises small level changes that create potential trip hazards.

Bay openings in the western facade are infilled with masonry and externally alternate bays are surrounded by a metal frame. There are hooks, items of ironmongery, switch boxes and bent sections of frame and hinges projecting below 2000mm but the risk of injury to the Site Users is currently low as the paths are set away from the building face.

Trees adjacent to the south and east elevation will soon reach sufficient size to allow potential climb access to the building roof.

Openings in the roof are mainly covered by timber boarding which is visible from inside the building. Water penetration is visible in one of the openings in the Non-Toxic side of the building. Damage to the boards could develop into concealed weak spots on the roof. Surveyors and contractors working on the roof, and intruders, would be at risk of falling into the building.

One of the roof lights or vents in the Non-Toxic bay is not covered and there is considerable water ingress. Refer to the Condition Survey for further details on the likely cause and effect.

2.9.2 Interior

High-level cracks internally pose a risk to Building Visitors from small pieces of falling masonry. Water ingress in the Non-Toxic bay exacerbates the future risk of falling masonry.

Areas where we identified a potential risk of asbestos within Building 59 include pipe lagging, low-level vent covers, a pile of discarded strips and wall mounted electrical switchgear, both in the plant room.

At the northern end of Building 59, a chain from loading gear is wound round the support beam at ceiling level. A loop of the chain hangs below 2000mm. Additionally, there are hooks, items of ironmongery and other rusted metal projecting from the walls below 2000mm. In the low light conditions, these pose a risk to Building Visitors entering, exiting and navigating around the building. Verbal warnings should be given to Building Visitors and risks included in inductions.

Pipework on the internal face of the north elevation is hanging loose where it has been dislodged. The Pipework hangs below 2000mm and remedial work is required to secure it in place. There is a length of lagged pipework on floor by the south elevation. This is a potential trip hazard and there is a risk that the lagging may contain asbestos.

The gantry within the building tower is currently inaccessible from the roof. The roof level doorway should be kept secured and the structural integrity of the gantry verified if access is required.

There is water ingress in the Non Toxic bay of Building 59. Where water penetrating the building has pooled it causes risks of slip and conceals level changes and uneven floor surface.

There is a quantity of items stored within the Toxic bay of Building 59, creating a substantial fire load. Better light conditions, than in Building 45, mean these items create less of a trip hazard but risk of arson still applies.

There are two sheets of chipboard on the floor to the north of the Toxic bay of Building 59. These

create trip hazards and may conceal uneven floor conditions or floor voids beneath.

There is broken glass on the floor within Building 59 partially concealed by the standing water.

The plant room is accessed internally from the Non Toxic bay. Around the perimeter of the room and across the plantroom threshold there are uncovered open floor trenches approx 150mm in width and up to 600mm deep. Due care should be taken when entering the space.

The trenches contain pieces of metal, pipework and two gas canisters. Even empty gas canisters pose a risk of explosion and these should be disposed of appropriately.

This plantroom contains evidence of the original fit out. There are cabinets, switch gear and lengths of conduit in situ; all potentially contain asbestos. There are discarded strips of material on the floor that could also be asbestos.

The plant room is single storey and has an internal roof slab within Building 59. There are circular duct openings in this low-level roof slab opening into the externally accessed ante rooms.

Recommendations:

- Programme of maintenance to predetermined visitor routes and designated building approaches
- An ongoing programme of surveys and maintenance will be required to the high-level metal-work to the building elevations. This includes the support and fixings for the escape doors and grills for the access vents
- Programme of roof clearance / maintenance
- Replacement of rainwater goods
- Site inductions for Building Visitors to cover identified as well as general risks
- Secure or make safe the plantroom
- Removal of asbestos
- Clear items stored within building
- Safely dispose of the gas canisters
- Lit areas / reconstruction / interpretation

2.10 Building 65, Runcol Building (R3) – SMR 98002

Building 65 is set back from the main pedestrian and vehicular access route by approx. 7m. The building apron is an uneven concrete loading area, which has been further disturbed by tree routes. The apron is covered in leaf mould. This conceals potential trip hazards such as smaller level changes and low-level obstructions.

The building is approached from the southwest corner. Due to the remaining levels of contamination access to the building interior is currently restricted by a wire mesh grill. The BAR gives further details on the building's use and the likely contamination levels. On approaching doorway there is a distinctive odour.

The south elevation is overgrown with brambles and semi-mature trees apart from a built up area at the threshold of the doorway. The edges of this step are undefined, creating a trip hazard and encouraging Building Visitors to stand very close to the open doorway.

Recommend installing a solid steel door to the opening, which would further contain the contamination but still allow access to the building for maintenance. A glazed panel could allow visitors to see the building interior. Alternatively, a detailed interpretation board could be installed externally with historic and current photos of the building interior.

The concrete frame is spalling at high-level so Building Visitors should be warned of the risks of falling masonry. There are no footpaths adjacent to the north, west or south elevations of Building 65 reducing the risk posed to Site Users.

The west elevation of Building 65 is of interest to Building Visitors as the tank supports and externally accessible outriggers that are located there make evident the historic usage of the building and give insight into the workings of the site. Building Visitors would approach over unmade ground from the north. The undergrowth to the north and west of the building conceals uneven ground. At the northwest corner of the building, there is a broken concrete slab beneath the leaf mould, which forms a concealed projection and is unstable under foot. The leaf mould conceals floor voids and uneven ground along the west elevation.

A cantilevered concrete slab projects from the west elevation at first floor level. This slab is in poor condition with tree growth at the upper level and areas of spalling concrete. Fallen pieces of masonry are evident on the ground adjacent to the building. There is a risk to Building Visitors from falling masonry and PPE should be work when approaching the west elevation of Building 65.

Trees adjacent to the north and west elevations are of sufficient size to allow potential climb access to the building roof. The single storey outriggers, steps and projecting slabs give easy climb access to the low-level roof slabs. The Condition Survey details the likely condition of these roofs.

On the north elevation, a tree has outgrown a metal containment ring. The broken edges of the metal are rough and rusty posing a threat of injury to Building Visitors and wildlife.

In the south elevation there appears to be broken glass in the high-level window frame. Currently the undergrowth prevents access in this direction. If the undergrowth is cleared this would pose a risk to Building Visitors passing below.

Recommendations:

- Creation of an appropriate visitor route to the west facade
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Programme of roof clearance / maintenance / repair
- Replacement of rainwater goods
- Make safe the projecting floor slab
- Site inductions for Building Visitors to cover identified as well as general risks
- Install a steel door to reduce the risk of contamination posed to Building Visitors.
- Reconstruction / interpretation

2.11 Building 97, Electrical Substation (SS4) – SMR 98006

2.11.1 Exterior

Building 97 is located in an area of low undergrowth near the eastern secondary vehicular and pedestrian access route. Pedestrian access to the building is across 10m of overgrown unmade ground. The path approaching the main entrance in the west elevation is over grown. The grass, moss and leaf mould conceal level changes and potential trip hazards.

Because bats use Building 97 as a roost, NEWW have installed a temporary timber door and frame to restrict access to part of the building. The doors function in the intended capacity but could lead intruders to believe there are items of value within the building.

The building shows evidence of recent movement with extensive cracks in the north and south elevation including an area of recent areas of infil brickwork. Refer to the Condition Survey for further details. The porches and main building have horizontal cracks in the masonry at high level, usually two courses below the roof slab. The undergrowth immediately surrounding the building reduces the risk to Site Users from pieces of falling masonry but Building Visitors should wear PPE and enter the building with caution.

The west entrance and exit porches for Building 97 are 2700mm high and provide easy climb access to the stepped roof. A tree growing adjacent to the south elevation also creates a potential climb access point. The Condition Survey details the likely condition of the roof.

There is a rusted cowl over a duct opening in the high level roof slab which could allow intruders to fall into the space below. There is evidence water ingress in the southeast corner of the roof slab and large cracks are visible internally. There are Fallen metal pipework is visible on the building the roof of the entrance porch and projects from the north elevation of the building. Due to the height and inaccessibility of the areas of the projections, these pose low risk to Site Users.

The rainwater goods on Building 97 have been removed. The brackets are still in situ and project upto 150mm from the face of the building. These projections are below 1500mm in the historic location of the downpipes.

2.11.2 Interior

Due to the presence of bats and asbestos, access to one room of Building 97 is restricted by a temporary timber door. The door is within an access porch so Building Visitors would be within the building structure before their way is blocked.

Debris and broken glass on the floor create trip hazards in the internal spaces and increase the risk of injury to Building Visitors. An infilled service trench in the space accessed from the west elevation creates a potential trip hazard.

Where water penetrating the roof of Building B97 has pooled, it causes risks of slip and conceals level changes and uneven floor surface.

Internally there is a risk to Building Visitors from falling masonry due to the high-level cracking and potentially from future structural collapse.

Recommendations:

Restrict access or undertake stabilisation works or demolish

Provide signage warning of dangers of entering the building

Site inductions to be carried out prior to commencement of any works required by the presence of the bats.

Works required by the presence of the bats to be carried out under NEWW supervision.

Bat signage to be larger and more prominent

2.12 Railway Defence Post – SMR 98007

The Railway Defence Post is located on the eastern boundary of the site in an area of brambles over 1200mm high. Access from the pedestrian routes within the site is difficult, reducing the risk to Site Users or Building Visitors from falling masonry where the face of the brickwork is frost and water damaged at high level.

The perimeter fencing is damaged and vulnerable at the junction with the Railway Defence Post.

Recommendations:

- Programme of repairs to the perimeter fencing with localized improvements in areas vulnerable to breach

2.13 Underground Storage Caverns– SMR 98024

No access was granted for the purposes of this security survey. The risks posed to Site Users by the caverns are minimal as access is currently restricted to people holding licenses for working in enclosed spaces.

The caverns continue beyond the site boundaries and pass under neighbouring land and roads. A programme of ongoing maintenance and repair of the Underground Storage Caverns is required to ensure no risks are posed to the public.

The future potential development of the Underground Storage Caverns is addressed in the Five Year Plan prepared in conjunction with this report.

3

THE WEST BANK AND PRE-WORLD WAR II FEATURES

3. THE WEST BANK AND PRE-WORLD WAR II FEATURES

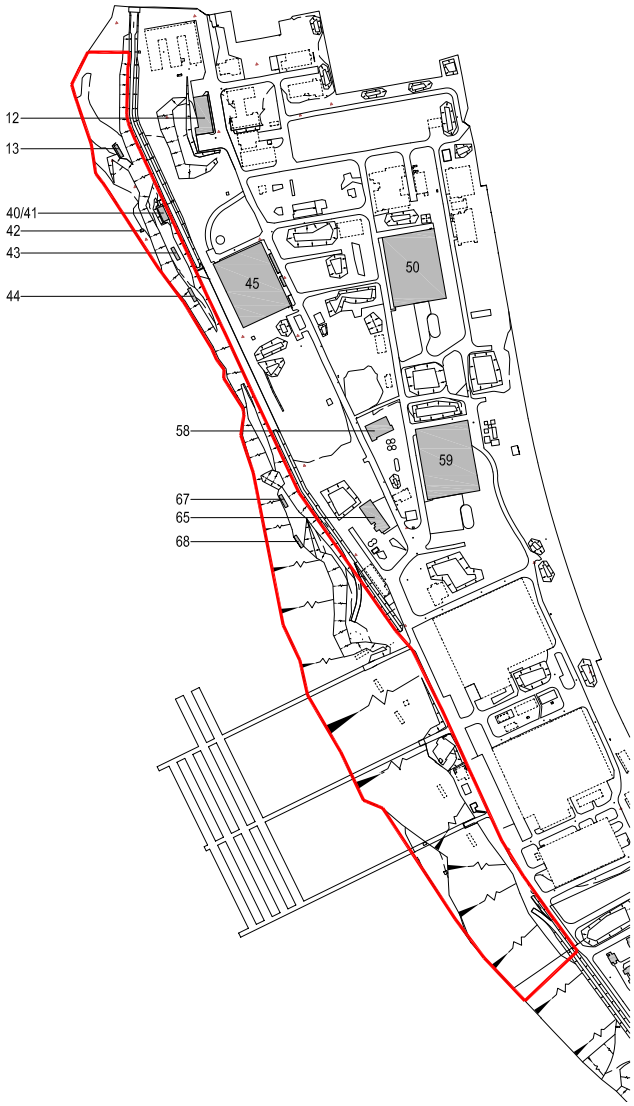

Fig. 5 - West bank buildings and survey area

3.1 Perimeter Fencing– included in SMR 98046

The western bank of the Rhydymwyn site is wooded and overgrown. NEWW maintain access to the western bank with the 'Woodland Walk'. There are informal footpaths and pedestrian access routes across the area. There is no vehicular access to the Western Bank.

The fencing bounding the western perimeter of the site has areas of localised corrosion. The corrosion is particularly prevalent at the junction of head rails and the support posts and on the post bracing members. Where the Woodland Walk runs adjacent to the perimeter fence, the post bracing members obstruct the path. Rust or rough edges to these bracing members pose a risk of injury to Site Users.

A panel of the fence adjacent to the Garden (**Garden** - SMR 98062) has tipped creating a potential access point to the site. The fence is set into the slope of the hill and in the Garden, a bank reduces the effective height of the fence to approx. 1500mm increasing the reach of breach.

Recommendations:

Suggest a programme of repairs to perimeter fencing

Repainting

Localised improvements in areas at risk of breach

3.2 Access and Circulation

Site Users on the Woodland Walk are supervised by NEWW staff and /or volunteers. The walk includes areas where the fence creates trip hazards, there are unprotected falls and uneven ground. These are acceptable risks as long as Site Users are adequately warned and supervised. Their general competency should be assessed by the NEWW staff prior to undertaking the walk.

Wire has been fixed into the timber treads to improve grip on one flight of steps. Similar improvements are required to the grip on the remainder of the timber steps.

3.3 Internal Fencing – included in SMR 98048

There is an unsecured gate in a low-level section of metal fence adjacent to Building 40/41. The fence is deterring pedestrian access on to the concrete slab roof of a building set into the bank. It also deters access to the canalized river beyond.

Recommendations:

Ensure that the gate is secured

3.4 Building 40/41, (SS8) Substation and Booster Pumphouse – SMR 98042/43

Due to the inaccessibility of the Valley Works structures on the western bank, falling pieces of masonry pose little risk to Site Users. However, cracks in the top courses of the brickwork do pose a risk to Building Visitors. Water ingress exacerbates the future risk from falling masonry.

Trees adjacent to the building allow climb access to the roof of Building 40/41. The Condition Survey details the likely condition of the roof. Projecting pipework is visible from a brickwork tank on the roof. Due to the height and inaccessibility of the areas of the projections, these pose low risk to Building Visitors.

Adjacent to the south facade an area of uneven ground is concealed by leaf mould. As with all buildings on the Rhydymwyn site, due care should be taken when visiting Building 40/41.

Internally, there is open pipework , broken concrete supports and debris which form potential trip hazards for Building Visitors.

Recommendations:

Programme of roof clearance / maintenance / repair

Replacement of rainwater goods

3.5 Building 42 Lookout Post, near Booster Pump House - SMR 98041

No security issues identified.

3.6 ARP Shelters, West Bank

Building 13 (9) - SMR 98044
Building 43 (10) – SMR 98040
Building 44 (11) – SMR 98039
Building 67 (12) – SMR 98038
Building 68 (13) – SMR 98037

The ARP shelters on the western bank are set away from the pedestrian paths and so falling pieces of masonry pose little risk to Site Users. However, cracks in the top courses of the brickwork do mean that there is a risk to Building Visitors. Water ingress and root penetration exacerbates the future risk from falling masonry.

Due to the inaccessibility of the ARP shelters any risk posed by the structure is limited to those who have specifically chosen to visit the buildings. As with all buildings on the Rhydymwyn site, due care should be taken when visiting the ARP shelters.

Internally, debris and plant growth form potential trip hazards for Building Visitors. The low light levels increase the risk of slipping or tripping inside the ARP shelters.

Adjacent to Building 44, there are profiled sheets buried in the leaf mould. These sheets may contain asbestos.

Trees growing adjacent to the ARP shelters allow potential climb access to the buildings' roofs. The ARP shelters, specifically Building 68, are set into side of the bank, which makes access to the building roofs easier.

Recommendations:

Check that sheet material was inspected for the recent asbestos survey

3.7 Pre-war industrial features.

To the western bank there are a range of features identified which pre-date the development of MS valley. Many of these features relate to the use of the site for mining during the 19th and early 20th centuries. These features do not have allocated building numbers and are therefore referred to by their SMR (scheduled monument record) numbers. These also allow cross-referencing with the Birmingham Archaeology documentation. Only those features readily identified within the boundary of the site (as defined by the wartime palisade fencing) and whose condition is relevant and likely to necessitate works, have been surveyed.

3.8 Foundry Wall - SMR 98049

The remaining section of the foundry retaining wall has tree and bush growth on the eastern face. The stones on the top of the wall are unstable and left unchecked the roots of the plants will undermine the stability of the wall further.

Recommendations:

Monitor condition of the wall and undertake maintenance as required

3.9 Revetment and Trackway - SMR 98050, 98051 & 98052.

There is a steep slope from the Trackway down to the river culvert to the east. Site Users on the Woodland Walk, are supervised NEWW staff and /or volunteers, but care should be taken to reduce the risk of falling.

3.10 SMR 98062 & 98072 Garden and Boundary Wall.

The remaining section of the boundary wall is overgrown. If left unchecked adjacent plant growth could undermine the stability of the wall.

Recommendations:

Monitor condition of the wall and undertake maintenance as required

4

BUILDINGS WITHIN THE DANGER AREA

4. BUILDINGS WITHIN THE DANGER AREA.

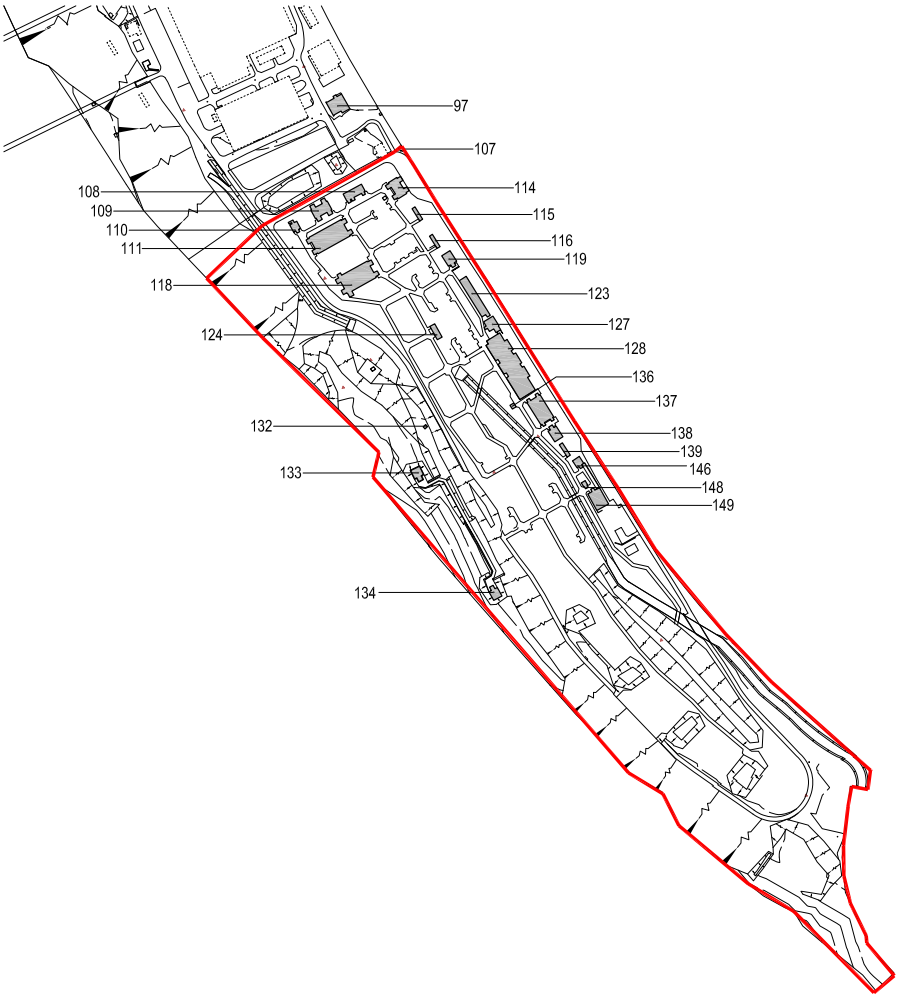

Fig. 6 - Buildings in the danger area

4.1 Perimeter Fencing– included in SMR 98046

The perimeter fence runs adjacent to the historic route of the railway line within the Danger Area. The route of the railway line route is currently used as a pedestrian and vehicular access route allowing inspection of the perimeter fence.

The fencing bounding the eastern perimeter of the site has areas of localised corrosion. The corrosion is particularly prevalent at the junction of head rails and the support posts and on the post bracing members.

In the Danger Area the fence separates the site from an area of woodland to the east. In this area trees provide climb access over the fence at many points along the site perimeter.

Recommendations:

Suggest a programme of repairs to perimeter fencing

Repainting

Localised improvements in areas at risk of breach

4.2 Roads and Clearways in the Danger Area – SMR 98045

To reduce the risk of explosion the historic pathways in the danger area are laid with a specific grade of asphalt known as Synthaprufe. Details of the asphalt composition can be found in BAR.

The pedestrian paths and concrete vehicular routes and areas of hardstanding in the Danger Area are becoming overgrown with moss. At the path edges and in low traffic areas, this is unstable and slippery under foot. Where moss has covered the surface of the historic asphalt it is particularly slippery. The moss and associated plant growth disguise small level changes and low-level obstructions concealing trip hazards.

The Danger Area is occasionally let to grazing and is consequently less overgrown than the Process and Charging Areas. The areas between the buildings and pathways are long grass. As detailed in BAR, the valley floor was levelled to create the Danger Area. In the areas between buildings, and in the footprint of demolished buildings, settlement has occurred and the long grass disguises an uneven floor surface. The Danger Area is appears misleadingly accessible and care should be taken when navigating between pathways.

The buildings in the Danger Area are single storey and mainly of uniform height. Low level entrance porches, approx. 2700mm allow climb access to all roof areas.

Recommendations:

Directional signage

Programme of maintenance to predetermined visitor routes and designated building approaches

Gathering points with interpretation

4.3 Internal Fencing – included in SMR 98048

4.3.1 Danger Area Fencing

The current fence line does not reflect the original boundary of the Danger Area. A section of the original palisade fencing is standing within the Danger Area to the north of Building 110. Any programme of fence maintenance and repairs should include this section for fencing.

4.3.2 Culvert containment

The river Alyn is fenced and culverted within the Danger Area. Where the river passes the line of the original Danger Area containment fencing there is a retained sluice gate. Both the gate and the chain holding it open show signs of localized corrosion.

At the north of the Danger Area the River Alyn is canalized with a low concrete wall and fence above. All sections of fence containment should be included in a programme of fence repairs.

Where the river passes into the culvert there is evidence of movement and pronounced cracks. Loose pieces of concrete and level changes form trip hazards. The woodlands walk passes over the culvert and potential trip hazards are concealed by grass and moss.

Cracking along the length of the canalised section of the Alyn and movement at the site of demolished historic bridges has allowed grasses and semi mature trees to establish themselves in the bank and plinth walls. These could potentially destabilise the bank and plinth if left unchecked.

At the south of the Valley Works site where the Alyn passes under the perimeter fence there is a retained sluice gate. Both the gate and the chain holding it open show signs of localised corrosion. Trees grow in close proximity to the fencing creating potential access points. There are no scramble out points in the canalised sections of the river so intruders or other Site Visitors who fall in the river cannot exit safely.

Recommendations

Provision of fixed ladders or other scramble outpoints within the canalised river section

Program of maintenance to predetermined visitor routes and designated building approaches

Localized stabilization works and/or repairs to culvert entrances. Refer to condition survey for details

Program of repairs to the fencing and sluice gates with localized improvements in areas vulnerable to breach

Removal of trees and undergrowth from bank and plinth walls

4.3.3 Free standing walls

Within the Danger Area there is a section of free standing wall to the south of Building 149. The wall has suffered extensive frost damage and loose bricks are becoming dislodged at each end. The wall poses a risk to Site Users from falling masonry. Due care should be taken when approaching this section of wall. As it falls within the Scheduled Monument a programme of stabilisation or repair should be considered. Refer to condition survey for details.

4.4 Building 107 Railway Gatehouse

4.4.1 Exterior

The Railway Gatehouse is located on the eastern boundary of the site in an area of brambles over 1200mm high. Access from the pedestrian routes within the Danger Area is difficult, reducing the risk to Site Users from falling masonry where the face of the brickwork is frost and water damaged at high level.

The perimeter fencing is vulnerable at the junction with the Railway Gatehouse.

4.4.2 Interior

Debris and broken glass on the floor create trip hazards and increase the risk of injury to Building Visitors. There is broken glass in the window frame in the north elevation. The windows are not bricked up and are accessible externally and from within Building 107.

Internally there is a risk to Building Visitors from small pieces of falling masonry due to the high-level cracking. Water ingress through the open windows will exacerbate this risk in the future.

Recommendations:

Programme of repairs to the perimeter fencing with localised improvements in areas vulnerable to breach

Programme of roof clearance / maintenance

Site inductions for Building Visitors to cover identified as well as general risks

4.5 Building 108, Munitions Building (40/41) - SMR 98009

4.5.1 Exterior

A pedestrian and vehicular access route is approx. 3m away from the north elevation of Building 108, separated from the building by the overgrown historic asphalt apron. A secondary pedestrian route passes to the south of the building and is separated from the building by the overgrown historic asphalt apron. There is pedestrian access to the east and west elevations over unmade ground. There are saplings and semi-mature trees growing from drainage channels at the wall base between the entrance porches on the north and south elevations.

There are high level cracks and areas of frost and water damage to the masonry on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

Where moss has covered the surface of the path to the south of Building 108, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There are semi-mature trees growing from the drains at the base of the building walls. If visitors were to approach these elevations the debris could create trip hazards.

Moss and grass covers the thresholds in the north and south elevations disguising small level changes that create potential trip hazards.

Where the downpipes have been removed the brackets projecting below 2000mm . Risk of injury to the Site Users is currently low due to the location of the projections.

A Tree adjacent to the west elevation allows potential climb access to the building roof.

4.5.2 Interior

High-level cracks in the masonry walls and degradation of the concrete roof slab pose a risk to Building Visitors from small pieces of falling masonry in both internal spaces.

The original flooring, probably lino, is lifting and cracking creating trip hazards. These trip hazards are exacerbated by debris on the floor concealing small obstructions and changes in level. There is glass from the original light fittings on the floor of the larger internal space increasing risk of injury to Building Visitors and wildlife.

The timber frame in one of the doorways shows sign of damage. There are small projections from the walls, fixings for signage etc, internally and externally. Due care should be taken when navigating around all of the buildings in the Danger Area.

There is broken glass in some of the in situ original light fittings.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Site inductions for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.6 Building 109, Weapons Receipt Store (14) - SMR 98010

4.6.1 Exterior

The East West pedestrian and vehicular access route is approx. 3m away from the north elevation of Building 109. An original pedestrian route passes to the south of the building and is separated from the building by the overgrown historic asphalt apron. A secondary pedestrian route passes to the south of the building and is separated from the building by the overgrown historic asphalt apron. There is pedestrian access to the east of the building from a modern concrete pedestrian pathway and to the west elevations over unmade ground. There are saplings and semi-mature trees growing from drainage channels at the wall base between the entrance porches on the north and south elevations.

There are high-level cracks and areas of frost and water damage to the masonry on all external elevations of the building. The distance the paths are set away from the main building elevations reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

Where moss has covered the surface of the path to the south of Building 109, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access. If visitors were to approach from the north and south the debris could create trip hazards.

There are semi-mature trees growing from the drains at the base of the building walls. Larger trees to the northwest corner and south elevation of the building could allow climb access to the building roof.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.6.2 Interior

High-level cracks in the masonry walls pose a risk to Building Visitors from small pieces of falling masonry in both the entrance lobbies and the main internal space.

There is loose masonry and remnants of a demolished pier in the northern access lobbies which create trip hazards. These trip hazards are exacerbated by debris on the floor concealing small obstructions and changes in level. There is glass from the original light fittings on the floor of the larger internal space increasing risk of injury to Building Visitors and wildlife.

The interior of Building 109 contains examples of original and post-war graffiti and decoration. This means this building is likely to attract a comparatively higher level of Building Visitors. One of the original retained light fittings has been dislodged and is hanging down to below 1500mm.

There is broken glass in some of the in situ light fittings and in other areas on the floor within the building.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.7 Building 110, Munitions Buildings (44) - SMR 98011

4.7.1 Exterior

Building 110 is directly accessible from the East West pedestrian and vehicular access route to the north and the original pedestrian access path to the south. The historic pedestrian pathway commences to the south of the building connecting the overgrown historic asphalt apron to Building 111 and the buildings to the east. There is pedestrian access to the east and to the west elevations over unmade ground. There are saplings and semi-mature trees growing from drainage channels at the base of the walls of both entrance porches.

The south porch shows evidence of extensive cracking, at both high level and the base of the wall. There is a risk to Building Visitors from falling masonry, and if left unchecked, collapse of the porch roof.

There are high-level cracks and areas of frost and water damage to the masonry on all external elevations of the building and the edge of the roof slab. The distance the paths are set away from the main building elevations reduces the risk posed by small pieces of falling masonry to Site Users but the buildings in the Danger Area are accessible so Site Users should be made aware.

Where moss has covered the surface of the path to the south of Building 110, it is unstable and slippery under foot. Moss and grass covers the thresholds in the north and south elevations disguising small level changes that create potential trip hazards.

There are semi-mature trees growing from the drains at the base of the building walls. There is a larger tree to the northwest corner of the building and trees along the north elevation, which could allow climb access to the building roof.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.7.2 Interior

High-level cracks in the masonry walls pose a risk to Building Visitors from small pieces of falling masonry in both the entrance lobbies and the main internal space.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.8 Building 111, Painting and Packing Buildings (13) - SMR 98012

4.8.1 Exterior

Building 111 is approached from the east and west from historic asphalt pedestrian paths. A path continues to the north of the building, set away from the building elevation by approximately 4 metres. The eastern and western building aprons are overgrown with deep tufted grass and small trees. There are door openings in the north and south façades allowing pedestrian access across the unmade ground. Moss and grass covers the thresholds in the east and west elevations disguising small level changes that create potential trip hazards.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

The roof covering on this building appears to be in particularly bad condition with damage visible at the roof edge on the north and south elevations. Refer to the condition survey for details. There are high-level cracks and areas of frost and water damage to the masonry and roof edge on all external elevations of the building. The distance the paths are set away from the main building elevations reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

There is a section of projecting loose pipework to the western end of the north elevation. Due care should be taken when approaching this area of the building.

There are metal straps projecting from the door openings on the east elevation and from the external doorways and the openings between the lobby and the internal space.

A multi stemmed tree to the south of the east elevation which could allow climb access onto both the upper and lower upper level roofs.

There is a large level changes on the approach to the south elevation of the building. The floor slab is visible at the entrance and appear to be cracking at the threshold. This creates unstable access which is partially obscured by grass overgrowth.

4.8.2 Interior

Masonry within the entrance lobby on the west facade has partially collapsed. The remaining masonry is not tied in at the head therefore, there is a risk of further collapse. This poses a risk to Building Visitors from falling masonry.

Within the northern entrance lobby there is a section of loose conduit hanging down from ceiling level, and loose pieces of metal cabling and plastic sheeting creating trip hazards. Moss overgrowth conceals potential trip hazard at all internal openings of Building 111.

This building shows signs of extensive water ingress. The floor is covered in wet mud and debris, which conceal potential trip hazards. Beneath the mud loose areas of the floor existing floor covering are lifting and there are shards of glass the floor.

Cow dung on the floor indicates that the building has been used as shelter by the grazing animals. The building is not suitable for this use in its current condition.

There is structural cracking evident, specifically to the corners of the roof slab. Refer to the condition survey for details. High-level cracks in the masonry walls pose a risk to Building Visitors from falling masonry. Further compromise to the roof slab could risk of building collapse. Refer to condition survey.

Recommendations:

Restrict access to Building 111 for both people and animals until essential repairs to and remedial support of the existing roof slab is undertaken

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Lit areas / reconstruction / interpretation

4.9 Building 114, Weapons Receipt Store (32) - SMR 98013

4.9.1 Exterior

The original pedestrian route passes to the west of the building and is separated from the building by the overgrown historic asphalt apron. The original route of the railway ran along the eastern site boundary in this location and the railway route has been replaced with a vehicular access route. The concrete apron to the east of the building has suffered movement and there are large pieces of disturbed concrete and raised areas of plinth. This creates a very uneven surface and extensive trip hazards. There is pedestrian access to the building across this surface.

Where moss has covered the surface of the paths to the east and west of Building 114, it is unstable and slippery under foot. The moss disguises the level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. There are shards of glass amongst the moss to the east of Building 114.

There are high-level cracks and areas of frost and water damage to the masonry on all external elevations of the building. Due to the proximity of the major paths to the building elevations there is a risk to Site Users from small pieces of falling masonry.

The floor plan of building 114 is the same as Building 109. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There are semi-mature trees growing from the drains at the base of the building walls. A larger tree adjacent to the west elevation allows potential climb access to the building roof.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.9.2 Interior

High-level cracks in the masonry walls and degradation of the concrete roof slab pose a risk to Building Visitors from small pieces of falling masonry in both internal spaces.

The original ventilation grills have been removed or corroded allowing water ingress to the building.

There is glass from the original light fittings on the floor of the larger internal space increasing risk of injury to Building Visitors and wildlife.

There is timber stored within the building, possibly as habitat creation by NEWW. This exacerbates the risk of arson.

There are small projections from the walls, lighting conduit, fixings for signage etc, internally and externally. Due care should be taken when navigating around all of the buildings in the Danger Area.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Carry out risk assessments prior to storing items or creating habitats within or in the proximity of the buildings.

Lit areas / reconstruction / interpretation

4.10 ARP Shelters – Danger Area
Building 115 (22) – SMR 98014
Building 116 (23) – SMR 98015
Building 139 (25) - SMR 98026

4.10.1 Exterior

The air raid shelters have the same plan and orientation, with an entrance to the south of the western elevation accessed from the historic asphalt path to the west and an entrance to the north of the eastern elevation accessed across made ground.

The air raid shelters are set in unmade ground with overgrown grass and brambles to the north, east and south. Therefore, although there is evidence of high level cracking and frost damage on all elevations, the risk posed to Site Users is only currently from the west elevation where the building apron joins the path.

The approach to the buildings from the west is overgrown with brambles and moss. These cause and conceal trip hazards respectively. Where the moss grows over the historic asphalt it is slippery underfoot.

There is no evidence of rainwater goods on the air raid shelters.

Semi mature trees at the building perimeter allow climb access to the air raid shelter roofs.

4.10.2 Interior

The air raid shelters are of simple robust construction and some of the original doors, door frames and cloth door curtains are in situ. Within Building 116 the original light fittings conduit and switch are still in place and amongst the debris is a newspaper and packing case. These fittings, fixtures and remnants are of great interest to Building Visitors and are quite evocative even in the current state.

There is high level cracking within the air raid shelters and localised areas of water ingress. There pose a risk to Building Visitors of small pieces of falling masonry and trip hazards on the internal floors.

The lack of light within the air raid shelters exacerbates the risk of slip/trip.

Recommendations

Programme of roof clearance / maintenance

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Consider making one or more of the air raid shelters water tight and introducing lighting / reconstruction / interpretation

4.11 Building 118, Painting and Packing (12) - SMR 98016

4.11.1 Exterior

Building 118 is similar in plan and setting to Building 111 however without evidence of such prolonged and extensive water ingress. There is localized water ingress in one area which needs attention to forestall the structural issues with Building 111 occurring here.

Other issues stated under Building 111 such as moss and grass covering the thresholds in the east and west elevations and projecting metal straps at the entrances are also found in Building 118.

Where the downpipes have been removed the brackets projecting below 2000mm . Risk of injury to the Site Users is currently low due to the location of the projections.

4.11.2 Interior

Floor level within Building 118 is substantially above the surrounding ground level (approx 600mm) so care should be taken when existing the building from the openings in the north and south elevation.

Cow dung on the floor indicates that the building has been used as shelter by the grazing animals. The building is not suitable for this use in its current condition.

There are loose bits of timber, bits of broken sheet metal, metal fencing and pieces of masonry within the mud on the floor. The mud on the floor, which is upto 100mm deep in places, partially conceals the debris forming potential trip hazards.

There is glass within the existing retained light fittings and within the mud on the floor.

High-level cracks in the masonry walls and degradation of the concrete roof slab pose a risk to Building Visitors from small pieces of falling masonry. Refer to the condition survey for details.

Recommendations:

Restrict access to Building 118 for both people and animals until the glass is cleared from the floor

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Lit areas / reconstruction / interpretation

4.12 Building 119, Emergency Washroom (O.6) - SMR 98017

4.12.1 Exterior

The North-South original pedestrian route passes to the west of the building and is separated from the building by unmade ground. The building is approached from the south from an overgrown

historic asphalt building apron. There are saplings and semi-mature trees growing from drainage channels at the wall base adjacent to the entrance porches on the south elevation.

There are high-level cracks and areas of frost and water damage to the masonry on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by small pieces of falling masonry to the north, east and west but the buildings in the Danger Area are accessible so Site Users should be made aware.

On the north elevation there is a low-level wall which allows climb access to the roof. Adjacent to the east elevation there are pieces of concrete with projecting reinforcement bars. These pose risk of injury to Site Users who approach across the unmade ground.

Where moss has covered the surface of the path to the south of Building 119, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas approaching the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

The south elevation has suffered extensive frost damage, refer to condition survey for details, this poses a risk to Building Visitors from falling masonry.

There are a number of metal projections from the south elevation and entrance lobbies these

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

The east wall of Building 119 has areas where the original external camouflage paint scheme is still evident.

4.12.2 Interior

High-level cracks in the masonry walls and cracking of the internal cementitious plaster pose a risk to Building Visitors from small pieces of falling masonry. There are small pieces of plaster evident on the floor.

Water pooling on the roof is causing structural damage to the building, refer to the condition survey for details. Water ingress into the building makes the floor is slippery and pooling water disguises small level changes that create potential trip hazards.

This is exacerbated by moss growing on the internal floors. There is also glass and metal debris on the floor creating trip hazards.

There is a pile of woody vegetation within the building, possibly habitat creation by NEWW, which exacerbates the risk to the building from arson.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Carry out risk assessments prior to storing items or creating habitats within or in the proximity of the buildings.

Lit areas / reconstruction / interpretation

4.13 Building 123, Office Blocks and WCs (30, 31, 33-35) - SMR 98019

4.13.1 Exterior

Building 123 is accessed from a historic asphalt path running North-South adjacent to the west elevation of the building. There are access doors to the north and south of the west elevation. A partially uncovered drainage channel runs along the building perimeter in the overgrown historic asphalt building apron. There are saplings and semi-mature trees growing from drainage channel, which allow climb access to the roof.

There are high-level cracks and areas of frost and water damage to the masonry on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by small pieces of falling masonry to the north, south and east but the buildings in the Danger Area are accessible so Site Users should be made aware.

The building is set in unmade ground with the main access route to the east over 10m away. The ground in this area is boggy and wet with much settlement. To the north of the building there are disturbed pieces of concrete which were probably once a concrete plinth/apron. The movement in this area has left holes up to200mm wide which could cause injury to Site Users approaching Building 123 from the north. This approach is currently overgrown with deep grass and brambles. Visitors should be discouraged from approaching Building 123 apart from along designated routes.

Where moss has covered the surface of the path to the west of Building 123, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the drainage channel.

The north elevation has suffered localized frost damage but this currently poses a limited risk to Building Visitors from falling masonry due to the inaccessibility of the north elevation.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.13.2 Interior

High-level cracks in the masonry pose a risk to Building Visitors from falling masonry. There are pieces of masonry evident on the floor.

Localised damage to the head of the south entrance doorway poses a risk to Building Visitors entering the building. Care should be taken or the north entrance door used until repairs has been carried out.

There are bits of glass, masonry and brambles forming trip hazards in most spaces within Building 123. These risks are partially ameliorated by the windows allowing better visibility in the internal spaces however due care should be taken whilst navigating the building.

Building Visitors should also be aware that there are small metal nails and switch plates projecting from some of the walls and doorways.

Recommendations:

- Programme of roof clearance / maintenance
- Replacement of rainwater goods
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.14 Building 124, Restrooms and WCs (42) - SMR 98020

4.14.1 Exterior

The building is accessed from a historic asphalt path running North-South adjacent to the west elevation of the building. There are access doors to the north and south of the west elevation and original and more recent window openings in all elevations. The path is overgrown with grass concealing level changes caused by the asphalt cracking.

There is a semi-mature tree growing from drainage channel at the base of the west elevation. This could allow climb access to the roof.

Building 124 is relatively accessible to all sides by pedestrians as the grass in this area is relatively short. Where the downpipes have been removed there are projecting brackets below 2000mm. Risk of injury to the Site Users is slightly higher on building as there is pedestrian access to all elevations.

There are pieces of fallen masonry and disturbed concrete in the grass to the north of the building, which form trip hazards.

4.14.2 Interior

High-level cracks in the masonry and degradation of the roof slab pose a risk to Building Visitors from falling masonry. There are pieces of masonry evident on the floor in the north lobby.

There are bits of glass, masonry, timber and sheet materials forming trip hazards in most spaces within Building 124. In the south internal room, there is sufficient mud on the floor for nettles to grow. This mud could conceal potential trip hazards.

Building Visitors should also be aware that there are small metal nails, tiles and post 1945 conduit and switch plates projecting from some of the walls and around doorways.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.15 Building 127, Messroom - SMR 98012

4.15.1 Exterior

Building 127 is accessed from a historic asphalt path running North-South adjacent to the west elevation of the building. There is also an access door in the south elevation but this is currently overgrown with brambles preventing access.

Building 127 is of notably different construction to the other buildings within the Danger Area. Refer to condition survey for details.

Where moss has covered the surface of the path to the west of Building 127, it is unstable and

slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the drainage channel.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.15.2 Interior

There is cracking in the masonry in the south facade and there are areas of where the concrete roof slab is spalling internally. These pose a risk to Building Visitors from falling masonry. There are pieces of masonry evident on the floor.

There is glass on the floor within Building 127 which poses a risk of injury to Building Visitors.. The risk of slip and trip are partially ameliorated by the windows allowing better visibility in the internal spaces however due care should be taken whilst navigating the building.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.16.1 Building 128, Changing Rooms (29, 36, 37 & 38) - SMR 98022

4.16.2 Exterior

Building 128 is currently accessed from a historic asphalt path running North-South adjacent to the west elevation of the building. The changing rooms are separate internal areas originally accessed through lobbies on the east and west elevations. Access to the lobbies on the east elevation would be across approx. 8m of unmade ground from the main North-South vehicle route and is not likely to be attempted.

The lobbies are of varied layout but are designed to segregate staff by gender and to separate contaminated staff, finishing their shifts, from their clean clothes and colleagues. This is apparent in the layout and internal designation of the spaces and makes the building interesting to visitors.

Where moss has covered the surface of the path to the west of Building 128, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the drainage channel.

A tree growing to the north of Building 128 allows climb access on to the roof.

A partially uncovered drainage channel runs along the building perimeter in the overgrown historic asphalt building apron. There are saplings and semi-mature trees growing from drainage channel, which allow climb access to the roof.

Where the downpipes have been removed from the western facade the brackets project below 2000mm. In most instances risk of injury to the Site Users is low due to the location of the projections. However, Building Visitors should be aware that there are brackets and metal projections at the south east corner of the building as these pose a threat of injury to people trying to access the south lobby.

There are high-level cracks and areas of frost and water damage to the masonry and roof slab on all external elevations of the building and entrance lobbies. Site Users should be made aware prior to passing Building 128 as some areas of damage are quire extensive. Refer to condition survey for details.

There is a historic asphalt apron between Buildings 128 and 137. This is partially overgrown with moss and brambles which create slip and trip hazards to this area.

4.16.3 Interior

High-level cracks in the masonry pose a risk to Building Visitors from falling masonry within the building lobbies. There are pieces of masonry evident on the floor throughout Building 128.

Moss growth in the lobbies makes the floor slippery and localised water ingress exacerbates the problem. There are also areas where mud is collecting which further conceals potential trip hazards and increases the risk of slipping.

There are rusting metal nails projecting at the head of the doorway into some of the changing rooms and sections of angle adjacent to the doorframes.

There are infilled drainage channels within two of the changing rooms. These are upto 200mm wide and in places they have not been completely infilled. Manholes in the building lobbies have been infilled with concrete leaving a 100mm deep depression. These are framed with metal and pose a potential risk of injury to Building Visitors.

There is loose sheet metal, sections of fencing panel, dislocated pieces of concrete and broken glass within the changing rooms. These pose a risk or trip and injury hazard to Building Visitors.

Recommendations:

Restrict access to Building Visitors until repairs to the building fabric have been undertaken and a programme of maintenance and remedial measures have been instigated.

Programme of roof clearance / maintenance

Replacement of rainwater goods

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.17 Building 132, Look Out Post – SMR 98041

No security issues identified other than to intruders or unsupervised Building Visitors climbing on the roof. The roof of Building 132 is easily accessible and covered in leaf mould.

There is an original communication mast on the roof which is of interest to Building Visitors.

Gunpowder Magazine Rooms and Associated Structures

Building 133 - Gunpowder Magazine Room (6) – SMR98034

Building 134- Gunpowder Magazine Room (7) – SMR98033

Magazine Defensive Structures - SMR 98067

Concrete Revetment at the base of the Magazines – SMR 98063 & SMR 98064

The Gunpowder Magazine Rooms are on the route of the Woodland Walk and are visited by a large proportion of visitors to the site. Though the Gunpowder Magazine Rooms are not a facility unique

to this site, they do evoke the military role of Valley Works. Due to their position on the western bank, outside the area of the Scheduled Monument, and the small scale of the individual buildings the Gunpowder Magazine Rooms offer an opportunity for reconstruction. Visitors would then be able to use the buildings as part of the education experience.

In the current state of repair there are risks posed to Building Visitors approaching and accessing the Gunpowder Magazine Rooms.

4.18 Building 133 - Gunpowder Magazine Room (6) – SMR98034

4.18.1 Exterior

The Gunpowder Magazine Rooms are currently approached by ascending the western bank from the Danger Area. This is via a new path and wooden steps avoiding the historic magazine steps (Steps to the Magazine - SMR 98069). The historic magazine steps are in poor condition and are partially concealed and inaccessible in the undergrowth adjacent to the tunnel entrance.

The new path joins the historic access path between the two magazine rooms. The path here is level and cut into the side of the western bank with a concrete drainage channel either side and a concrete revetment forming the blast protection. See plan Fig. 1 for details.

Approaching Building 133, the step across the drainage channel is currently navigated via a loose timber board. This board is unstable and prone to slip. The surface of the historic asphalt access path is covered in leaf mould which is decomposing and very slippery. This poses a significant risk to Building Visitors from slip or trip. The surface of the concrete revetment (Concrete Revetment at the base of the Magazines – SMR 98063 & SMR 98064) and drainage channels are covered in moss so offer no additional support. There are metal stumps projecting from the drainage channel upstands at regular intervals. These pose a risk of injury to Building Visitors.

The apron to Building 133 is similarly covered in decomposing leaf mould which poses a significant risk to Building Visitors from slip or trip. There are metal projections within the building apron, which pose a risk of injury to Building Visitors. These are concealed in the leaf mould so also create trip hazards.

The woodland around the Magazines is very dense and show evidence of recent and aged fallen boughs. The risk to Building Visitors and Site Users from falling boughs is significant and a programme of woodland management should be implemented. Currently access to the Magazines should be restricted during and following high winds.

Building 133 is approached from the south through a three-door entrance lobby. Unusually for the Valley Works site the Magazine doors are still in situ.

The concrete drainage channel surrounds the Magazine room. There is no access to the building from the north, east or west where the woodland banks slope down to the building perimeter. There is scramble access to these areas via another timber plank over the drainage channel. This is particularly unstable. There is debris and pieces of masonry in the banks surrounding the magazine.

There is an original metal switch/fuse box on the external east elevation. This is severely corroded and rusted metal projects upto 800mm into the building apron. These pose a significant risk of injury to Building Visitors.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Building Visitors is currently low due to the location of the projections but due care should be taken when approaching the building.

There is high-level cracking to the masonry and visible damage to the edge of the roof slab on all external elevations of the building. The distance the paths are set away from the building eleva-

tions reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

4.18.2 Interior

High-level cracks in the masonry pose a risk to Building Visitors from falling masonry.

Leaf mould in the lobbies makes the floor slippery and localised water ingress through the missing door panels exacerbates the problem. This conceals potential trip hazards and level changes at the entrance increasing the risk of slipping.

The retained doors restrict the light to the interior of the building so due care should be taken when entering Building 133. There are rusting metal projections in the lobby and loose items on the floor within the lobby and main space. These pose a risk or trip and injury hazard to Building Visitors.

Recommendations

- Programme of roof clearance / maintenance / repair
- Replacement of rainwater goods
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Specific inductions for Building Visitors to cover identified as well as general risks
- Woodland management and tree maintenance for area surrounding the buildings
- Reconstruction
- Interpretation

4.19 Building 143 - Gunpowder Magazine Room (7) – SMR98034

4.19.1 Exterior

The Gunpowder Magazine Rooms are currently approached by ascending the western bank from the Danger Area. This is via a new path and wooden steps avoiding the historic magazine steps (Steps to the Magazine - SMR 98069). The historic magazine steps are in poor condition and are partially concealed and inaccessible in the undergrowth adjacent to the tunnel entrance.

The new path joins the historic access path between the two magazine rooms. The path here is level and cut into the side of the western bank with a concrete drainage channel either side and a concrete revetment forming the blast protection. See plan fig. 1 for details.

Approaching Building 134, the step across the drainage channel is currently navigated via a loose timber board. This board is unstable and prone to slip. The surface of the historic asphalt access path is covered in leaf mould which is decomposing and very slippery. This poses a significant risk to Building Visitors from slip or trip. The surface of the concrete revetment (Concrete Revetment at the base of the Magazines – SMR 98063 & SMR 98064) and drainage channels are covered in moss so offer no additional support. There are metal stumps projecting from the drainage channel upstands at regular intervals. These pose a risk of injury to Building Visitors.

The path to Building 134 is currently blocked by the route Woodland Walk. An embankment has been formed which needs to scrambled over to gain access to Building 134.

The apron to Building 134 is covered in decomposing leaf mould which poses a significant risk to Building Visitors from slip or trip. There are metal projections within the building apron, which pose a risk of injury to Building Visitors. These are concealed in the leaf mould so also create trip hazards.

The woodland around the Magazines is very dense and show evidence of recent and aged fallen boughs. The risk to Building Visitors and Site Users from falling boughs is significant and a programme of woodland management should be implemented. Currently access to the Magazines should be restricted during and following high winds.

Building 134 is approached from the north through a three door entrance lobby. Unusually for the Valley Works site the Magazine doors are still in situ.

The concrete drainage channel surrounds the Magazine room. There is no access to the building from the south, east or west where the woodland banks slope down to the building perimeter. There is scramble access to these areas over the drainage channel. This is particularly unstable. There is debris and pieces of masonry in the banks surrounding the magazine.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Building Visitors is currently low due to the location of the projections but due care should be taken when approaching the building.

There is high-level cracking to the masonry and visible damage to the edge of the roof slab on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

There is an original communication mast on the roof which is of interest to Building Visitors.

4.19.2 Interior

High-level cracks in the masonry pose a risk to Building Visitors from falling masonry.
Leaf mould in the lobbies makes the floor slippery and localised water ingress through the missing door panels exacerbates the problem.

This conceals potential trip hazards and level changes at the entrance increasing the risk of slipping.

The retained doors restrict the light to the interior of the building so due care should be taken when entering Building 134. There are rusting metal projections in the lobby and loose items on the floor and stacked against the walls within the lobby and main space. These pose a risk or trip and injury hazard to Building Visitors.

Recommendations

- Programme of roof clearance / maintenance / repair
- Replacement of rainwater goods
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Specific inductions for Building Visitors to cover identified as well as general risks
- Woodland management and tree maintenance for area surrounding the buildings
- Reconstruction
- Interpretation

Gantry - SMR 98066
Railway associated with Magazine - SMR 98068

BAR suggests reinstatement of the access routes to the Gunpowder Magazine Rooms as an educational tool for the working of the Valley Works site. There are a few remaining concrete plinths

associated with railway and gantry. These pose no specific security risks in their current condition.

4.20 Building 136, Sawdust Store - SMR 98018

4.20.1 Exterior

Building 136 is a small single space building without an entrance lobby. The building is directly accessible from the North-South historic footpath running adjacent to the east elevation of the building. Moss has covered the surface of the path and it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards on the surface and at the building threshold. Plants including grasses and brambles are impinging on the doorway. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There is a semi mature tree growing from the drainage channel at the wall base adjacent to the west of the doorway.

Where moss has covered the surface of the path to the north and west of Building 146, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.20.2 Interior

High-level structural cracks and localised areas of damage to the masonry walls and cracking of the internal cementitious plaster pose a risk to Building Visitors from small pieces of falling masonry. There are small pieces of plaster evident on the floor.

There is a pile of vegetation stored within the building, possibly as habitat creation by NEWW. This exacerbates the risk of arson.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Carry out risk assessments prior to storing items or creating habitats within or in the proximity of the buildings.

Lit areas / reconstruction / interpretation

4.21 Building 137, Weapons Dispatch Store (22) - SMR 98023

4.21.1 Exterior

Building 137 is similar in layout to Building 111 and 118 with access via two opposing pairs of

entrance lobbies. Building 137 is accessed from the north and south from historic asphalt building aprons. A path continues to the west of the building, set away from the building elevation by approximately 4 metres. The north and south building aprons are overgrown with moss and brambles. There are saplings and semi mature trees growing from the drainage channel between the entrance lobbies.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

There are high-level cracks to the masonry all external elevations of the building. There are localised areas of repair but there appears to be more recent cracking adjacent to the repairs. Refer to the condition survey for details. The distance the paths are set away from the main building elevations reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

The east wall of Building 137 has areas where the original external camouflage paint scheme is still evident.

4.21.2 Interior

High-level cracks and spalling to the masonry, roof slab and internal columns pose a risk to Building Visitors from falling masonry within the building.

Moss growth internally makes the floor slippery and localised water ingress exacerbates the problem. There are also areas where mud is collecting which further conceals potential trip hazards and increases the risk of slipping.

The original flooring, probably lino, is lifting and cracking creating trip hazards. These trip hazards are exacerbated by debris on the floor concealing small obstructions and changes in level. There is glass and tangled wire on the floor of the large internal space increasing risk of injury to Building Visitors and wildlife.

Recommendations:

- Programme of roof clearance / maintenance
- Replacement of rainwater goods
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Specific induction for Building Visitors to cover identified as well as general risks
- Lit areas / reconstruction / interpretation

4.22 Building 138, Emergency Washroom (O.7)- SMR 98025

4.22.1 Exterior

The North-South original pedestrian route passes to the west of the building and is separated from the building by unmade ground. The building is approached from the north from an overgrown historic asphalt building apron. There are saplings and semi-mature trees growing from drainage channels at the wall base adjacent to the entrance porches on the north elevation.

There are high-level cracks and areas of frost and water damage to the masonry on all external elevations of the building. The distance the paths are set away from the building elevations reduces the risk posed by small pieces of falling masonry to the south, east and west but the buildings in the Danger Area are accessible so Site Users should be made aware. Building Visitors should note

that there is localised damage to the masonry in the north lobby which poses a risk of falling masonry.

Where moss has covered the surface of the apron to the north of Building 138, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas approaching the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There is a shallow metal projection adjacent to the entrance on the north elevation which poses a slight risk of injury to Building Visitors.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.22.2 Interior

High-level cracks in the masonry walls and cracking of the internal cementitious plaster pose a risk to Building Visitors from small pieces of falling masonry. There are small pieces of plaster evident on the floor.

Water ingress into the building makes the floor is slippery and mud disguises small level changes that create potential trip hazards. There is glass on the floor posing risk of injury to Building Visitors and wildlife.

Recommendations:

- Programme of roof clearance / maintenance
- Replacement of rainwater goods
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Specific induction for Building Visitors to cover identified as well as general risks
- Carry out risk assessments prior to storing items or creating habitats within or in the proximity of the buildings.
- Lit areas / reconstruction / interpretation

4.23 Building 146, Wood Waste and Box Room (28) - SMR 98027

4.23.1 Exterior

Building 146 is adjacent and physically connected to the railway platform to the east. The North-South historic footpath is approx. 4m away from the west elevation. An historic asphalt building apron connects the building to an access path to the south where there is pedestrian access into the entrance lobby. The north and west elevations are currently inaccessible to pedestrians over deep bramble and ground cover. There are saplings and brambles growing from drainage channels at the wall base adjacent to the entrance porch on the south elevation.

Where moss has covered the surface of the path to the south of Building 146, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There is high-level cracking to the masonry and visible damage to the edge of the roof slab on all external elevations of the building. The distance the paths are set away from the building eleva-

tions reduces the risk posed by small pieces of falling masonry but the buildings in the Danger Area are accessible so Site Users should be made aware.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

4.23.2 Interior

High-level cracks in the masonry walls and cementititous plaster pose a risk to Building Visitors from small pieces of falling masonry.

There is glass on the floor of the entrance lobby increasing risk of injury to Building Visitors and wildlife.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.24 Building 148, Smoke Book Store and Platform - SMR 98030

4.24.1 Exterior

The North-South historic footpath is approx. 2m away from the west elevation of Building 148. An historic asphalt building apron connects the building to an access path to the south where there is pedestrian access into the entrance lobby. Building 148 is located within the historic asphalt apron for the railway platform. Moss has covered the surface of the apron and it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards on the surface and at the building threshold. Plants including grasses and brambles are impinging on the apron. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

There is a large bush growing from drainage channel at the wall base adjacent to the entrance porch on the south elevation. This further obscures the level changes at the entrance.

Where moss has covered the surface of the path to the north and west of Building 146, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

There is a section of free standing wall adjacent to Building 148 which has extensive frost damage to the surface of the masonry. Due to the low level of the wall, approx. 1000mm, this poses a minor risk to Site Users from falling pieces of masonry.

There are access steps up to platform adjacent to Building 149. These are unstable and slippery

and unsafe to use in their current condition.

The railway platform has localised areas of damage to the historic asphalt by water and plant growth. Concrete blocks and patches of vegetation form trip hazards but the surface is relatively level and clear of moss.

The railway tracks have been removed from the full length of the site. Where the tracks have been lifted adjacent to the platform the concrete plinth has been disturbed and the ground is very uneven. Care should be taken when approaching the railway platform from the east.

4.24.2 Interior

High-level structural cracks and localised areas of damage to the masonry walls and cracking of the internal cementitious plaster pose a risk to Building Visitors from small pieces of falling masonry. There are small pieces of plaster evident on the floor.

Recommendations:

Programme of roof clearance / maintenance

Replacement of rainwater goods

Programme of maintenance to predetermined visitor routes and designated building approaches

Specific induction for Building Visitors to cover identified as well as general risks

Lit areas / reconstruction / interpretation

4.25 Building 149, ML Case and FuseBox Store - SMR 98031

4.25.1 Exterior

Building 149 is adjacent and physically connected to the railway platform to the east. The North-South historic footpath is approx. 2m away from the west elevation. An historic asphalt building apron connects the building to an access path to the north where there is pedestrian access into the entrance lobby. The south and west elevations are currently inaccessible to pedestrians over deep bramble and ground cover. There are saplings and semi mature trees growing from drainage channels at the wall base adjacent to the entrance porch on the north elevation.

Where moss has covered the surface of the path to the north and west of Building 146, it is unstable and slippery under foot. The moss disguises small level changes and low-level obstructions concealing potential trip hazards along the path and at the building thresholds. Plants including grasses and brambles are impinging on the path from the areas between the entrance porches. The brambles, and debris which gets trapped by the canes, create potential trip hazards and restrict access.

Where the downpipes have been removed the brackets projecting below 2000mm. Risk of injury to the Site Users is currently low due to the location of the projections.

There is evidence of masonry repairs being undertaken at Building149. Refer to condition survey for details.

4.25.2 Interior

High-level structural cracks and localised areas of damage to the masonry walls and cracking of the internal cementitious plaster pose a risk to Building Visitors from small pieces of falling masonry. There are small pieces of plaster evident on the floor.

Water ingress into the building makes the floor is slippery and mud disguises small level changes that create potential trip hazards.

Recommendations:

- Stabilize platform steps and clear and maintain platform approach from the west.
- Programme of roof clearance / maintenance
- Replacement of rainwater goods
- Programme of maintenance to predetermined visitor routes and designated building approaches
- Specific induction for Building Visitors to cover identified as well as general risks
- Lit areas / reconstruction / interpretation

Appendix A

Photographic Survey


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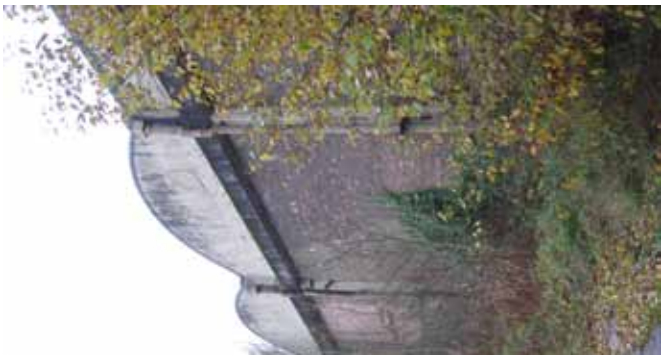

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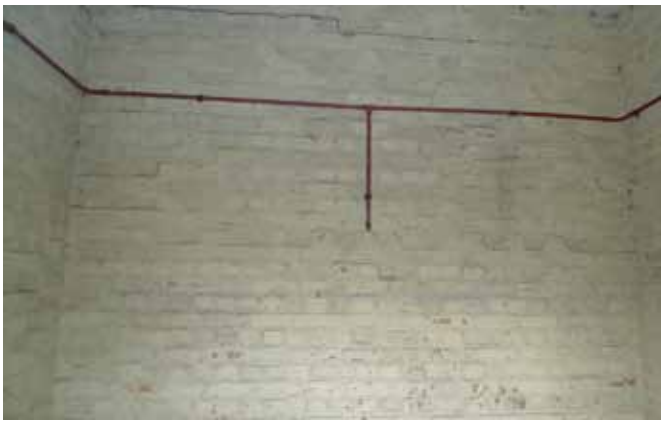
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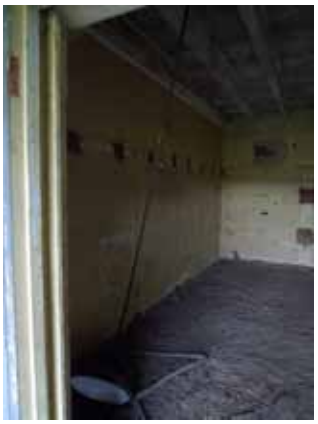
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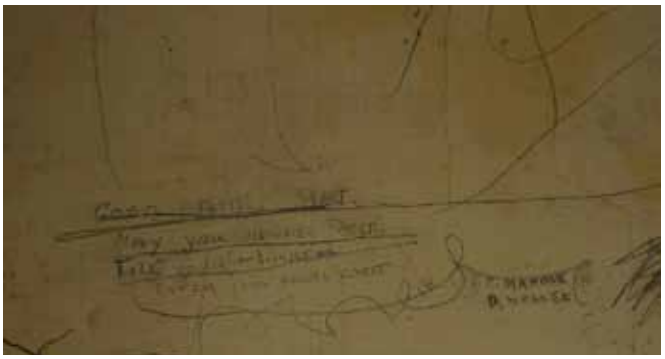

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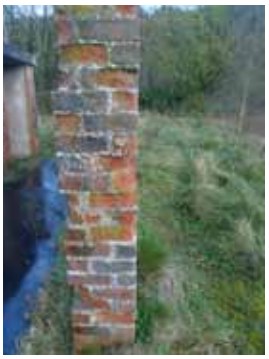
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