HL Structural Engineers

STRUCTURAL SURVEY REPORT

VICTORIA HALLS,

TALBOT STREET, GLOSSOP

CLIENT: HIGH PEAK BOROUGH COUNCIL

JOB NO: 148

REPORT REFERENCE: REP-S-001

REPORT ISSUE DATE: 20TH JULY 2014

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1. SCOPE OF THE STRUCTURAL SURVEY

HL Structural Engineers have been appointed by High Peak Borough Council to complete a structural survey of Victoria Halls.

The purpose of the survey is to provide The Client with information on the condition of the building to determine ongoing maintenance costs.

The survey and inspection aims are to:

- Provide advice on the condition of the structure;
- Describe identifiable structural defects;
- Make recommendations for further actions;

The survey undertaken involved an inspection of accessible areas of the building. Where it was not possible to inspect a particular element of structure this is identified in the relevant section of the report.

The survey was a visual only inspection and involved no intrusive opening up works. External elevations were surveyed from ground level with the use of binoculars. Internal spaces were inspected from floor level.

The limitations of this survey should be considered before making any decisions based on the information contained in this report.

If having read this report you have comments or questions please contact us to discuss these.

The details of the inspection are included in the table below.

Engineer's names	Chris Lydon MEng CEng MICE Mike Robinson CEng MICE Mike Woods MEng
Date of the inspection	04/07/2014
Weather conditions on day of inspection	Dry & mild
Address of the property inspected	Victoria Halls, Glossop
Property status when the inspection took place	Ground floor occupied as a library; first floor and lower ground floor unoccupied.

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2. DESCRIPTION OF THE EXISTING BUILDING

History

Victoria Hall, or Glossop library as it is known locally, was constructed in 1888 on land donated by Francis Edward Howard, the 2nd Lord of Glossop. The land was donated with the expressed condition that it must be used for a free library and public house, and has been used accordingly ever since. Architecturally the building has many gothic features, built in plan in the shape of a Latin cross, with a tower and patterned parapet walls surrounding the perimeter of the roof.

Current Description

The building is located to the north of Glossop with the building's long axis close to a north/south alignment.

The building has a Grade II listing.

The main entrance to the building provides access to the ground floor, which is currently occupied by Glossop Library. The main space accommodates book shelves and reading tables. Ancillary rooms accommodate toilets, offices and a library store.

Access to the first floor is provided by stairs, situated in wings on both sides of the building. The first floor is currently unoccupied and access has been restricted by High Peak Council because of the partial collapse of a plaster ceiling. The first floor comprises a large hall, stage and ancillary rooms. It was most recently occupied by an amateur dramatics organisation.

The building has a lower ground floor which is also currently unoccupied. As the building is located on sloping ground only part of this floor is below the external ground level. The space most recently accommodated a youth club, with pool tables, seating areas, kitchen, offices and other ancillary rooms. The lower ground floor can be accessed internally via a staircase or via doors in the south elevation.

A tower, which is situated above the east entrance wing, has four floor levels that can be accessed via a hatch in the first floor ceiling.

The building is constructed of loadbearing masonry external and internal walls. The external walls are constructed of a stone external face with brickwork internal skin. Internal loadbearing walls are generally solid brickwork. It is assumed that the external walls are solid, as the construction period

pre-dates the widespread introduction of cavity wall construction. The roof is a slate tiled timber pitched arrangement. Detailed descriptions of the external envelope structure and internal structures are included within Section 5 and Section 6 of this report.

3. GENERAL CONDITION SUMMARY

A description of the form of structure and identifiable defects are included in Sections 5 and 6. The following summary should be read in conjunction with Sections 5 and 6.

Overview

Whilst there are areas of localised cracking and movement, in general structural terms there does not appear to be any evidence of significant settlement or movement of the primary structure. The walls appear sound, the roof structure generally appears to be in reasonable condition and there was no visual evidence of any significant structural distress internally.

However there are a number of defects to the building which are almost all associated with water ingress or the action of water and frost. Past inappropriate building alterations have also possibly contributed to the general deterioration. The main observed defects, causes and possible remedial actions follow below.

External elevations

There are a number of areas of concern related to the external elevations;

Much of the external stonework has missing or hollow sounding sections. There are also several sections of missing and/or loose horizontal decorative stone banding. This defect presents a possible health and safety concern as much of the external walls are directly above public footpaths or door openings.

There are a small number of sections of cracked and loose parapet and adjacent stonework, particularly at the corners of the parapets. This is clearly seen from ground level and appears to be associated with the gutter channel and outfall pipework leaking.

There is a risk that sections of the cracked stonework could become loose and they are potentially at risk of falling from the building.

Roofs

There was limited access to the roof of the building; observations that could be made during the inspection were from ground level by binocular and also from the limited openings in the tower.

Generally the roof tiles appear to be in poor to fair condition. From the tower there is evidence of loose and missing tiles and also loose ridge tiles. There are areas where there appear to be newer tiles which may be evidence of earlier repair work.

Internal Dampness

There are many areas inside the building where there is visual evidence of water ingress and dampness. At all three floor levels there are areas of water damage to the ceilings. There are also areas on the lower ground floor level where there is evidence of water ingress in the walls and floors.

It should be noted that on the day of the inspection the weather was dry and there had been a long period with no significant rainfall. The consequence of the weather conditions was that there was no recent water ingress to observe.

There are several probable contributing factors causing the water ingress:-

In the upper parts of the building the water ingress is likely to be associated with the defective parapet gutter waterproofing, damaged roof tiles and blocked or defective outfall pipework.

Around the building perimeter the external paving has been built up and butted up to the external walls and there is no apparent attempt to seal the junction between wall and path. The external paths have also been built up to a level at or above the ventilation openings in the upper wall of the lower ground floor spaces.

On the south east corner there is a build-up of earth against the building. The dampness on the inside face of this wall indicates inadequate waterproofing/tanking.

At lower ground floor level external doors have poorly detailed thresholds thus potentially allowing water to flow into the building.

There were two rainwater gullies to the east (adjacent to the main entrance) and south (at the lower ground floor escape door) which are blocked with debris. The blocked outfalls may have resulted in water ingress to the building.

4. RECOMMENDATIONS

Consideration should be given to further investigations and suggested remedial works as described below. A detailed specification for investigations needs to be prepared in conjunction with other team members.

Stonework repairs

Before repairs are carried out a full assessment of the extent of the loose and friable stone should be carried out by a specialist. This assessment is likely to comprise a touching distance hammer test of all areas of stonework. As a Grade II listed building in a conservation area English Heritage and/or the local authority Conservation Officer should be consulted and methodology agreed for the inspection and resulting repairs.

Consideration should also be given to raking out the cement based mortar pointing and repointing with a softer lime based mortar.

As there is a risk of falling debris the full inspection should be carried out without delay and potentially defective sections fenced off at ground level in the interim.

The cracked parapets should be repointed and stitched, or possibly re-built following touching distance inspections.

Gutter and drainage repairs

All parapet gutters should be inspected and lead repaired where defective. The outfalls should be cleared and pipework checked for water tightness.

Consideration should be given to developing a planned maintenance regime. The roof, parapets and towers are currently accessed from ceiling hatches. This form of access is inadequate to complete maintenance and basic inspection tasks from and should be improved.

Ground level drainage gullies should be cleaned out and again a regime of continuing maintenance put in place to ensure that the drains are regularly cleared to prevent future problems.

Building Perimeter

The junction between paths and external wall should be sealed, either by the application of a flexible seal or the introduction of a slot drain (ACO or similar) at the wall/path junction. The earth to the south east corner should be dug out to expose the external wall of the lower ground floor, and a

waterproofing system applied to the wall. The space behind the wall should then be refilled with a granular fill to allow water to drain away from behind the wall more easily.

External doors

The two external doors to the south of the building should have a suitable threshold detail installed to prevent water ingress directly into the building.

Roof repairs

The roof should be fully inspected and any loose or missing tiles should be re-fixed. The displaced ridge tiles should also be re-fixed. The parapet walkway timber boarding should be checked for any damage or rot and repaired as necessary.

Trees

The trees to the south of the building may present future problems in respect of root damage to foundations and drains. The tree canopy also presents a potential hazard from falling branches. The tree canopy currently shades the building, which may contribute to areas of dampness.

The trees should be regularly pruned to restrict growth.

Timber Surveys

A specialist timber survey should be completed to establish if rot or insect infestation is affecting timber elements. The evidence of water damage suggests that there is likely to be concealed timber decay in some areas.

CCTV Surveys

Blocked surface water gullies should be cleared and the condition of the drainage network established by means of a CCTV camera survey.

First Floor Structure

The cracking to the ends of the downstand beams visible in the library ceiling should be investigated via intrusive opening up works.

5. EXTERNAL STRUCTURE

Limitations of Inspection

The survey was undertaken from ground level with no specialist access equipment used.

Elevations (Walls)

The external elevations are all of good quality stone construction with decorative parapet walls with a mix of stone balusters and plinths. The masonry is generally close jointed and appears to have been constructed with a black ash/lime mortar which has subsequently been re-pointed with cement based mortar. The external walls are around 2ft thick.

FIGURE 1 – EAST ELEVATION

The gap between the roof edge and parapet is a walk in gutter. There are two outfalls on each long external elevation, the outfall passes through the parapet wall to cast iron fall pipes. The fall pipes do not appear to be original as there is a cut slot in the external walls which is narrower than the fall pipes suggesting that the original fall pipes were a smaller diameter than those in place now.

On the external face of the building are horizontal stone string courses which protrude from the general elevation. These are generally at each floor level and project from the main elevation by several inches.

At the base of the external walls there is a wider section of wall forming a base plinth. At this level there are decorative vents which are believed to have been installed to provide ventilation to the lower ground floor spaces.

FIGURE 2 – WEST ELEVATION

Around the perimeter the external paving and paths are built directly up to the base of the external walls. The exception to this is at the south east corner where a grassed earth area abuts the external wall.

FIGURE 3 – NORTH ELEVATION

The corners of each external wall and the sides of window openings are constructed using large stone quoins built into the general external wall stonework.

There is a decorative section of external wall at first floor level around the main assembly hall section to the north end of the building. Two lightning conductors are fixed to the tower externally.

To the south are several large trees which spread at high level almost to within touching distance of the building. The elevation adjacent to the trees should be monitored. The tree canopy should be regularly pruned to limit growth.

FIGURE 4 –SOUTH ELEVATION ILLUSTRATING THE PROXIMITY OF TRESS IN THE SOUTH-WEST CORNER

The windows are all painted timber with an externally applied waterproofing seal. The windows are generally fixed light with an opening top pane. The window finishes are generally in a poor condition and require restoration in most instances. A timber specialist should be employed to determine the extent of any rot to the frames.

FIGURE 5 –TYPICAL EXAMPLE OF THE CONDITION OF WINDOW FRAMES

FIGURE 6 – TYPICAL EXAMPLE OF THE POINTING TO THE FACING STONEWORK. EARLIER LIME/ASH MORTAR IS EVIDENT BEHIND THE MOST RECENT REPOINTING.

A contributing factor to the damage to the face of the stonework is thought to be the historic remedial re-pointing. The original ash/lime mortar joints appear to have been re-pointed using a cement based mortar. This has resulted in the hard cement mortar effectively sealing the relatively porous original joints and preventing egress of moisture and moisture vapour. The moisture is then effectively trapped in the wall and the consequence of this is that the moisture tracks through the stonework. This action makes the stone more susceptible to frost action eventually causing the stone to fragment, become loose and fall from the building.

FIGURE 7 – TYPICAL EXAMPLE OF STONEWORK WITH A SPALLED FACE

It is not known when the walls were repointed but given the variable nature of the appearance of the re-pointing it is likely that this work was carried out at various times during the history of the building.

The reason for the re-pointing is not known but may have been carried out to change the appearance of the masonry walls. There is evidence of previous repairs to the external stonework. The appearance of the repairs is that of a very clean surface which appears to have been formed by the application of a mortar render.

FIGURE 8 - EVIDENCE OF PREVIOUS REPAIRS OF THE STONE BLOCKS.

All elevations have a decorative stone band course. Several sections of this course have broken off. The cause of this defect may also be associated with the pointing issue noted above but may also be the result of either an inadequate waterproofing or no waterproofing to the upper edge of the protruding section of stone banding. The upper edge of the protruding sections are close to horizontal and as such may trap water on the upper surface thus exposing the stone to frost action.

FIGURE 9 – EXAMPLE OF BROKEN BAND COURSE

There are a number of sections of cracked and loose parapet and adjacent stonework, particularly at the corners of the parapets. This can be clearly seen from ground level and appears to be associated with the gutter channel and outfall pipework. The cause of the cracking is therefore likely to be associated with either defective waterproofing or blocked outfalls.

The structure surrounding the channel may be corroding as a result of water ingress. This corrosion would likely 'push out' the stonework, resulting in the evident cracking.

FIGURE 10 – EXAMPLE OF LOOSE POINTING, OPEN JOINTS AND MOVEMENT IN STONEWORK AT PARAPET LEVEL. THIS DEFECT OCCURS IN MULTIPLE LOCATIONS.

There is a possible risk that sections of the cracked stonework could become loose and are potentially at risk of falling from the building. There are a number of other areas with loose or cracked joints which require repointing.

The damaged areas should undergo a touching distance inspection. It is likely that the mortar joints will require raking out before steel reinforcement is used to secure the stonework before repointing.

Water ingress from the parapet channel is clearly evident inside the building. Externally salt staining of the stonework is an indicator of trapped water egressing through the stone.

FIGURE 11 – EXAMPLE OF SALT STAINING IN THE STONEWORK AT PARAPET LEVEL

FIGURE 12 – EXAMPLE OF OPEN JOINTS AND LOOSE MORTAR AT THE PARAPET LEVEL OF THE TOWER

There are a small number of areas where settlement cracking is evident. The level of movement is considered to be not significant, and is usual for a building of this age. The cracks should be repointed and any future cracks monitored as part of a planned maintenance regime.

The cracking could also be attributable to damage from the nearby trees roots, or due to blocked and leaking drainage systems.

FIGURE 13 – EXAMPLE OF MINOR SETTLEMENT CRACKING

Rain and surface water gullies around the perimeter of the building were all found to be blocked with silt and leaves. These drainage systems should be cleaned (by jetting) and their condition should be confirmed via a CCTV camera survey.

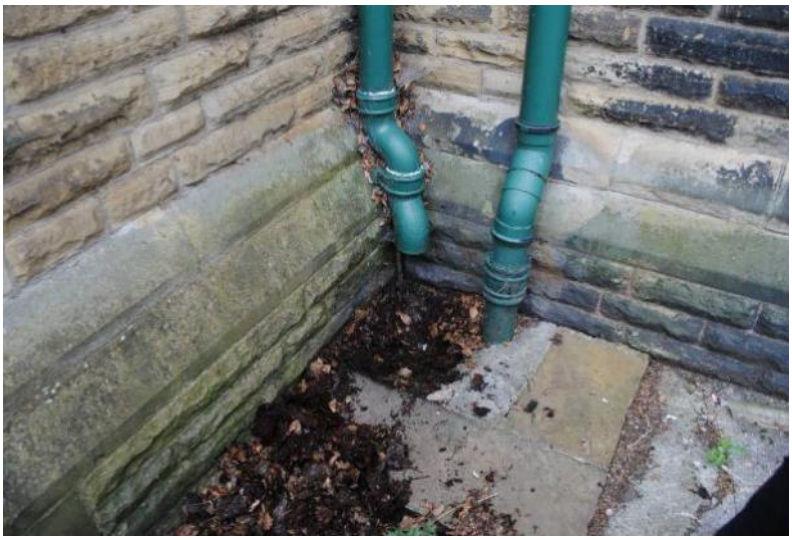

FIGURE 14 – EXAMPLE OF BLOCKED GULLEY

The doorway access to the lower ground floor has poor threshold detailing. The thresholds should be replaced to prevent surface water ingress to the lower ground floor.

FIGURE 15 – EXAMPLE OF ACCESS TO THE LOWER GROUND FLOOR. THE SURFACE WATER GULLEY IS BLOCKED, VEGETATION IS GROWING IN THE GULLEY AND THE DOOR THRESHOLD HAS FAILED.

FIGURE 16 – EXAMPLE OF SILTED UP GULLEY

The junction between the building and the external ground surfaces is poorly detailed and this is thought to contribute to damp issues in the basement.

A number of grilles provide ventilation to the lower ground floor. In a number of areas these grilles have been partially obstructed by the pavement construction.

The area most badly affected by water ingress at the lower ground floor coincides with a section of the external wall which retains a landscaped section of the grounds. It is suspected that this wall has inadequate waterproofing. The earth should be dug out to expose the external wall of the lower ground floor, a waterproofing system applied to the wall. The excavation behind the retaining wall should be refilled with a granular fill to allow water to drain away from the wall.

FIGURE 17 – PHOTOGRAPH ILLUSTRATING HOW THE EXTERNAL LOWER GROUND FLOOR WALL WHICH IS ACTING AS A RETAINING WALL. THE INTERNAL FACE OF THIS WALL IS DAMP.

FIGURE 18 – EXAMPLE OF POOR DETAILING BETWEEN PAVEMENT AND LIBRARY WALL

FIGURE 19 – EXAMPLE OF BLOCKED VENTILATION TO THE LOWER GROUND FLOOR

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Roof

The construction of each roof appears to be timber frames supporting timber battens, finished with slate roof tiles. As noted above the perimeter drainage is provided as a gutter behind the decorative parapet walls. The gutter is lead lined with a timber slatted walkway board. The various valleys of the pitched roof sections are also lead lined with limited access ladders fixed in the valleys. The horizontal and pitched roof ridges are finished with a decorative ridge tile.

It should be noted that the current provision of roof access is inadequate to complete inspection and maintenance tasks. A strategy to safely access, inspect and maintain the roof should be developed as part of the planned maintenance regime.

A number of localised repairs are required to tiles and coping elements. A touching distance inspection should be completed by a roofing contractor to determine the nature and extent of these repairs.

FIGURE 20 – EXAMPLE OF DAMAGED, LOOSE AND MISSING ROOF TILES.

FIGURE 21 –EXAMPLE OF DAMAGED ROOF TILES, SOME HAVE SLIPPED OUT OF PLACE.

FIGURE 22 – EXAMPLE OF LOOSE RIDGE TILES

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FIGURE 23 – EXAMPLE OF MOVEMENT AND CRACKING IN PARAPET WALL.

6. INTERNAL STRUCTURE

Limitations to inspection

The survey was a visual only inspection and involved no intrusive opening up works. A number of areas are known by the client to have asbestos flooring tiles, extra care and attention was taken to not disturb these areas.

Lower Ground Floor

The lower ground floor is accessed from the west side stair tower. There is finished accommodation to the south end of the building. The lower ground floor is currently unoccupied, but most recently housed a youth club with various play and meeting spaces, offices, kitchen and toilets. There is access to a sub-floor void under the main library. There is an external door at the south east corner of the lower ground floor space, this opens to a small paved area with steps up to the outside grassed area. There is no threshold between the door and the paved area. The walls are founded on shallow masonry foundations or directly onto rock.

The ceilings at this level are in a poor condition, with evidence of water ingress, and previously attempted repairs.

The majority of areas within the lower ground floor are damp. In some areas there is severe damp. Before the floor is reoccupied a new waterproofing system should be constructed (such as an insulated drained cavity system).

FIGURE 24 – EXAMPLE OF WATER INGRESS IN THE SHOWN BY DAMP BRICKWORK AND SALT STAINING

FIGURE 25 – MECHANICAL SYSTEMS BUILDER'S WORK HAVE BEEN POORLY COMPLETED. A LINTEL IS REQUIRED TO THIS PIPE OPENING.

FIGURE 26 – EXAMPLE OF MASONRY BUILT DIRECTLY ONTO ROCK WITHIN THE SUB-FLOOR VOID.

FIGURE 27 – SUB FLOOR VOID

FIGURE 28 – EXAMPLE OF PREVIOUS POOR QUALITY REPAIRS TO CEILINGS

FIGURE 29 – EXAMPLE OF DAMP WALLS

FIGURE 30 - FURTHER EVIDENCE OF DAMP. FLOOR HAS AN ASPHALT COVERING, WHICH SUGGESTS PAST INEFFECTIVE ATTEMPTS TO ADDRESS DAMP ISSUES.

FIGURE 31 – POORLY DETAILED PIPE SUPPORT STRUCTURE REQUIRES ADDRESSING

FIGURE 32 – EXAMPLE OF SOFT BRICKS IN DAMP WALL

FIGURE 33 - NO THRESHOLD

Ground Floor

The ground floor construction is timber with timber joists supporting timber floorboards. The joists are supported on masonry (mainly brickwork) sleeper walls founded on rock. The area below the ground floor is an accessible void. The floor of the void is unfinished earth. The void links to the occupied lower ground floor. The sleeper walls appear sound and are a one brick thick construction, the external walls to the lower ground floor space are generally stone faced with integral piers at regular centres providing lateral stability.

The ground floor of Glossop library is currently the only occupied floor. It is generally in good condition however there are a series of damaged areas of ceiling, the majority caused by water ingress. The locations of damage to the ceiling correlate with the locations of damage in the floor above.

FIGURE 34 - GENERAL LAYOUT OF LIBRARY SPACE.

There is some evidence of movement with cracking in the plastered finishes. The extent and magnitude of the cracking is not thought to be structurally significant.

The first floor beams downstand below the library plastered ceiling. There is hairline cracking in the plaster boxing out of the majority of these beams. The cracking may be attributable to deterioration of end of the beams (at the junction with the wall) causing swelling and cracking. Another reason for the cracking could be creep deflection under imposed loads of the long span beams causing the plaster to crack.

The seating of the beams should be exposed to confirm the condition.

FIGURE 35 – EXAMPLE OF PLYWOOD BOARD ATTACHED TO CEILING TO PROVIDE A TEMPORARY REPAIR

FIGURE 36 – EXAMPLE OF HAIRLINE CRACKING IN THE CEILING FINISHES

FIGURE 37 – EXAMPLE OF WATER INGRESS

FIGURE 38 – EXAMPLE OF WATER INGRESS

FIGURE 39 – EXAMPLE OF WATER DAMAGE TO CEILING.

FIGURE 40 – EXAMPLE OF WATER INGRESS DAMAGE

First Floor

The first floor is also timber construction but due to the larger span has primary timber beams spanning the full width of the building, they support the timber joists which carry the timber floor boards. The main first floor space is an open public assembly area with a stage at the south end of the room. The floor is reported to be finished with a separate, non-structural, sprung dance floor.

The main assembly space at first floor level has timber trusses with curved lower members and faceted upper sections. The trusses are supported on pedestals built into the external walls; the pedestals are likely to be stone.

The internal walls are generally all decorated, however in one location in the first floor hall the build-up of finishes was visible; the brickwork appears to have been rendered with a black ash mortar which was plastered with a paint finish. The overall thickness of the finishes is around 60mm.

FIGURE 41 – FIRST FLOOR ASSEMBLY HALL

Evidence of damage associated with water ingress is apparent throughout this level. Areas of the ceiling have partially collapsed. Urgent repairs are required to prevent further deterioration.

In a number of areas large numbers of dead insects were observed. A specialist timber surveyor should be instructed to assess the timber for rot and insect infestation.

FIGURE 42 - ROOF OF FIRST FLOOR HALL

FIGURE 43 – ASSEMBLY HALL STAGE

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FIGURE 44 – EXAMPLE OF STAINING. THE STAINING IS AT THE SAME LEVEL AS THE PARAPET GUTTER

FIGURE 45 – CRACKING IN PLASTER, THOUGHT TO BE ATTRIBUTABLE TO WATER INGRESS

FIGURE 46 - EXAMPLE OF WATER DAMAGE TO PLASTER

FIGURE 47 – PARTIALLY COLLAPSED CEILING ABOVE THE STAGE

FIGURE 48 – EXAMPLE OF WATER DAMAGE

FIGURE 49 – ACCESS TO THE TOWER

FIGURE 50 - WATER DAMAGE TO CEILING OF WOMEN'S BATHROOM.

FIGURE 51 - FURTHER WATER DAMAGE TO WALLS

Tower and stairs

At the east side of the building there is a tower which houses the entrance area at ground level. There are also toilets situated at first floor level. The upper part of the tower is accessed by ladder through a hatch in the toilet ceiling. The floor at the first floor ceiling level (second floor) is constructed of timber joists supporting a timber floor. Above second floor (also accessed via a hatch opening) is a third floor. The third floor is constructed of steel beams supporting a shallow arched concrete floor.

The tower walls are masonry up to the eaves level of the steeply pitched roof structure. There are vertical ties which appear to be steel rods which are located at each corner of the tower. The upper part of the rods are fixed to the base of the roof structure, and the lower end of the rods are located through holes cut into large stone slabs built into each corner of the tower walls. The end of the rods has a plate and bolt to the underside of the stone slabs. The rods appear to be intended to provide a pre-stressing force to the tower masonry, improving its flexural strength.

The roof drainage appears to collect at high level and then is routed into the tower before, via a drain channel, outfalling to external fall pipes to the SE and NW corners of the tower.

There is also a large diameter pipe and fan in the tower which appears to be a ventilation duct linked to the enclosed ceiling space in the main first floor assembly hall. Ducts are also located in the ceiling of the assembly hall. This appears to be either an air inlet or extract system to provide fresh air to the space.

Access to the tower is poor and during the survey it was decided unsafe to access the upper levels. Safe access to all levels should be arranged to allow a full inspection of the structure.

All surfaces in the tower are covered in pigeon fouling. The exposed surfaces of metal within the tower are all corroded. When safe access is arranged the surfaces should be rubbed down to establish the extent of the corrosion.

FIGURE 52 – EXAMPLE OF CORROSION TO STEELWORK

FIGURE 53 – TIMBER FLOOR COVERED IN PIGEON FOULING

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FIGURE 54 - TOWER STRUCTURE IS SECURED BY FOUR CAST IRON TIE BEAMS, HELD BY CONCRETE SUPPORTS.

FIGURE 55 – VIEW OF PARAPET GUTTER FROM THE TOWER

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