ART504

Case Studies & Regional Work:

New Futures

Part 1

Condition Appraisal

Of

WHITCHURCH HOSPITAL

formerly

Cardiff City Asylum

CONTENTS

WITCHURCH HOSPITAL
APPRAISAL OF CURRENT CONDITION

1.0 INTRODUCTION

1.1 THE BRIEF

As part of a group resource project regarding Whitchurch Hospital, ART504 Case Studies & Regional Work: New Futures, October 2019, each group has been assigned a specific element e.g.

A. Context: The history of healthcare in Cardiff and Glamorgan.
B. Significance: Site history, both tangible and intangible.
C. Fabric 1: Site plans, photographs and survey.
D. Fabric 2: Appraisal of current condition, schedule of materials and energy use.
E. Risks and Opportunities: Current risks, planning framework and funding opportunities.
F. Precedent's: Critical analysis of relevant case studies, including but not limited to Hayes Point and Glenside.

Each group member then takes a subcategory, this report being Current Condition (Condition Report).

1.2 SCOPE & STRUCTURE OF THE REPORT

The condition survey was written by Paul Branford, based on a partial brief visual inspection made on the 24th of October 2019. The inspection was visual and did not involve any opening up of hidden voids and are based on observations made from the ground and areas that could be accessed by stairs and viewing platforms. Any area of concern requiring further investigation is referred to in the appropriate section of this report. Obvious evidence of woodworm activity or rot is noted, but it is not possible to comment on every timber element in the building. If reference is made to the presence of Asbestos, it should be noted that the inspection was not carried out by a qualified Asbestos surveyor and no further testing was undertaken.

The weather was fine, with slight drizzle but clear. During the inspection the external temperature was not recorded.

In attendance during the inspection were Dr Christopher Whitman, Phillip Mackie and fellow peers from Cardiff University, studying for MSc Sustainable Building Conservation.

The Hospital stands empty however retains fixtures and fittings.

A brief commentary is also made in connection with the 6 No octagonal pavilions to the rear elevations of the hospital.

1.3 STATUTORY STATUS

Refer to Appendix A

1.4 HISTORY

Refer to Appendix B

1.5 DESCRIPTION

The former "hospital" is positioned to the north of Cardiff, facing north-west. The Hospital is surrounded by large expanses of open green spaces, including parkland, forests and farmland to the north-west and west elevations. To the east and south elevations being predominantly urbanised. The river Taff being located approximately 225m from the southern elevations of the hospital.

Tarmacadam vehicular access approaches the hospital and bounds the front façade of the hospital (North-west). The site being encapsulated behind high galvanised steel palisade security fencing, with the added benefit of 24hr maned security. The open areas to the north west directly in front of the hospital appear to be maintained for community use.

The grounds within the security fencing surrounding the hospital buildings are considerably overgrown with vegetation, scattered rubble, storage facilities and general detritus, all reflecting the derelict nature of the hospital and site as a whole.

The grounds and buildings are generally laid over a level and flat site. Access was limited to a side entrance door to the west of the main entrance, once believed to be the finance/accounts offices.

The front elevation and entrance are constructed of bathstone, decoration briefly consists of bathstone pillars and capitals, cornices, open pediment etc, the remaining front façade uses ashlar bathstone with red brick side elevations. The remaining structure behind the front façade is built of red brick and buff bandings. A water tower and chimney are constructed with red brick, the water tower having Portland stone cornices and dentils etc. Roofs are generally pitched, and slate covered except for the water tower being domed and copper covered. Several additional roofs are covered in corrugated steel sheets and temporary covers. The layout follows a broad arrow plan/ echelon plan, which allows main administration through the centre and wards and corridors spreading out from this.

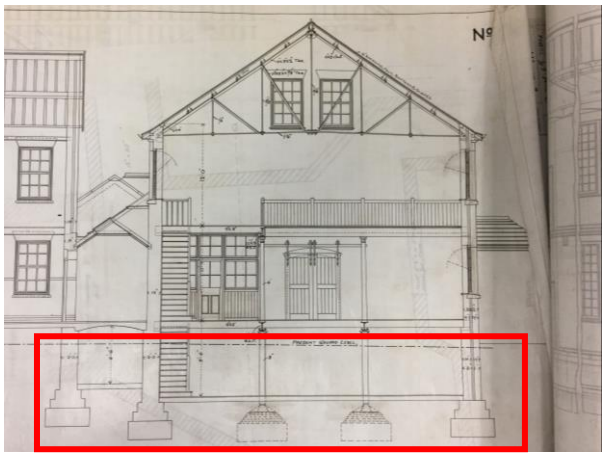
2.0 SUMMARY OF CONDITION

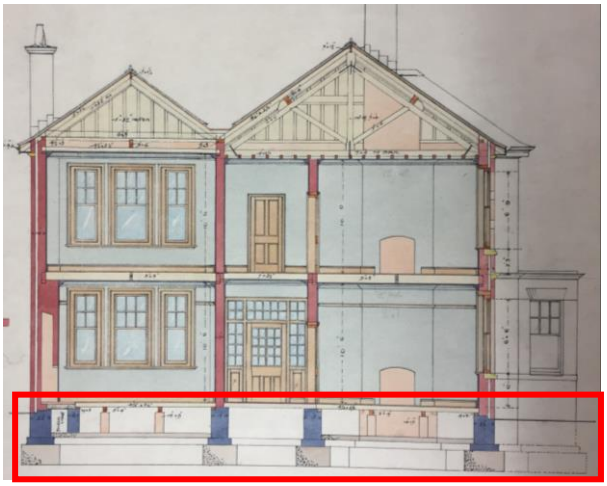
2.1 EXTERNAL CONDITION

2.1.1 STRUCTURE

FOUNDATIONS

Foundations are believed to be combination of concrete strip and corbelled brickwork. Conformation of this building element could not confirmed due to the inaccessible nature of the element, information has been taken from the original architect's drawings inset below, it is wise to assume there may have been site alterations to that shown on the drawings.





Images 2-3 Plans showing foundations construction. *(Oatley & Skinner, 1902)*

WALLS

External construction is generally a combination of red clay brick with decorative banding of buff bricks to all elevations. Bathstone has been used extensively throughout the front façade including the portico and reception areas by way of ashlar stone construction, quoins, plinths, pillars, decorative capitals, cornices, friezes, corbeling, dentils, open pediment and copings.

Mortar is assumed to be lime based however this has not been confirmed due to the limited site access. Window and door aperture openings are a combination of bathstone springers, voussoirs and keystone to the front elevations, and formed brick arched window heads and cast stone sills and threshold steps to all remaining elevations.

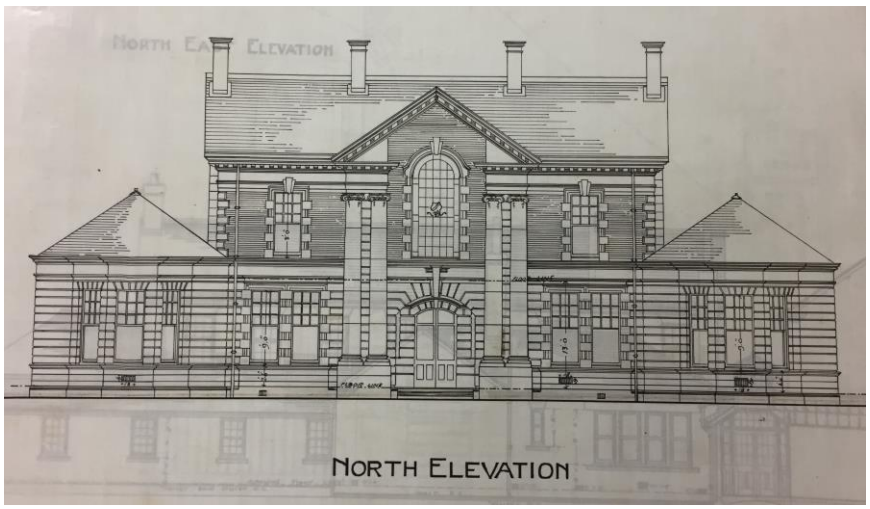


Image 4 North Elevation *(Oatley & Skinner, 1902)*

Image 5 North elevation showing the use of Bathstone, Image 6 Rear elevation using brick construction, source: Author's own 2020

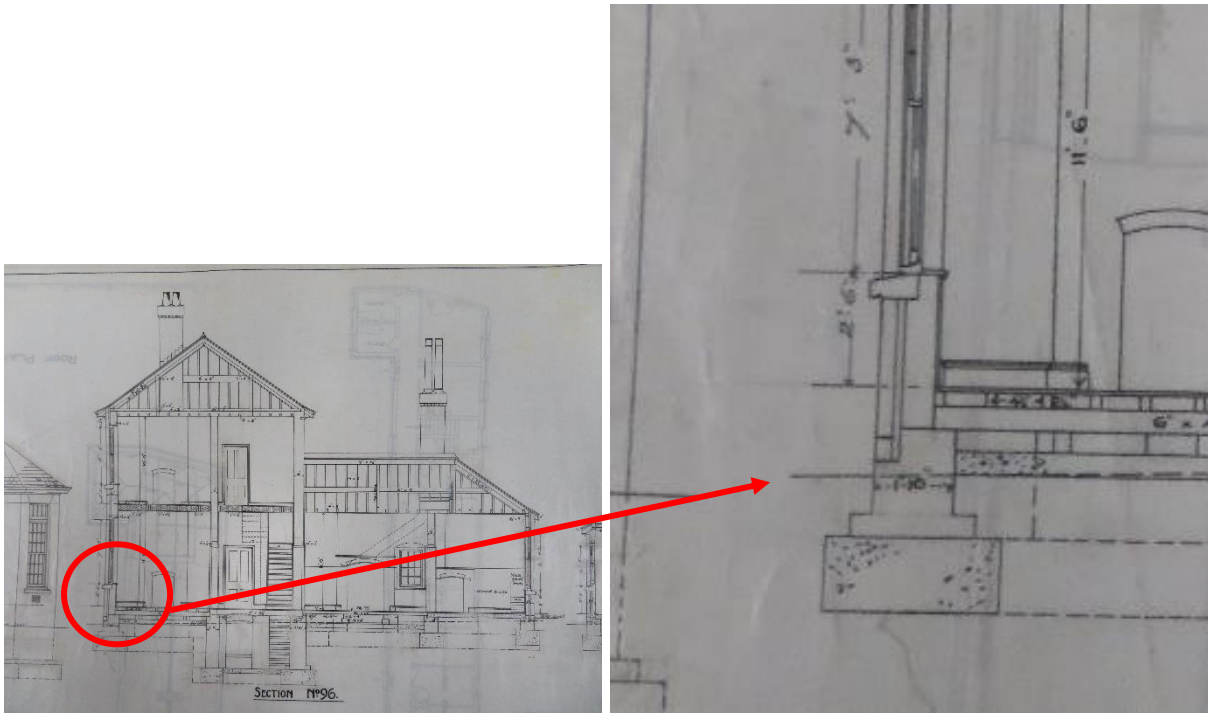


Image 7 & 8, Drawings showing the use of cavity construction (Oatley & Skinner, 1902)

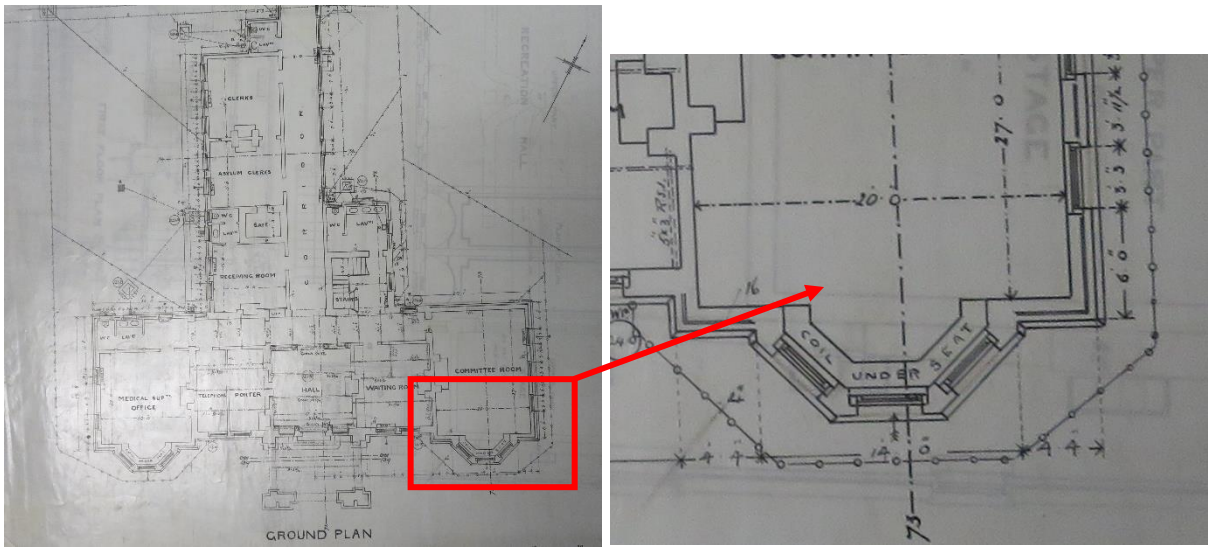


Image 9 & 10, Drawings showing the use of cavity construction (Oatley & Skinner, 1902)

Portland stone has been used predominantly in decoration to several building elements for buildings behind the mainly bathstone and red brick north elevation façade. In particular the decorative cornices, dentils and copings to the water tower.

Image 11 & 12, Water Tower Structure & Portland Stone Detail, source: Author's own 2020

ROOFS

Roof structures were not examined at the time of the guided tour, however from the external elevation viewing and the original drawings the majority of the roof structures are a combination of timber trusses and cut timber framed construction consisting of a range of purlins, rafters and trusses.

Image 13 & 14, General roof structures throughout the construction, source: Author's own 2020

Image 15 & 16, Timber roof construction, source: Author's own 2020

Roof structures did not present defects structurally or due to external roof covering failings, however whilst not inspected several roof areas were covered in plastic sheeting suggesting potential defects, these areas were not inspected due to the prohibited access. It is recommended that a full and systematic survey is undertaken to determine the condition of all roof structures.

Several of the roofs throughout the main hall, workshops and stores were wrought iron framed.

Image 17 & 18, Wrought Iron roof construction, source: Author's own 2020

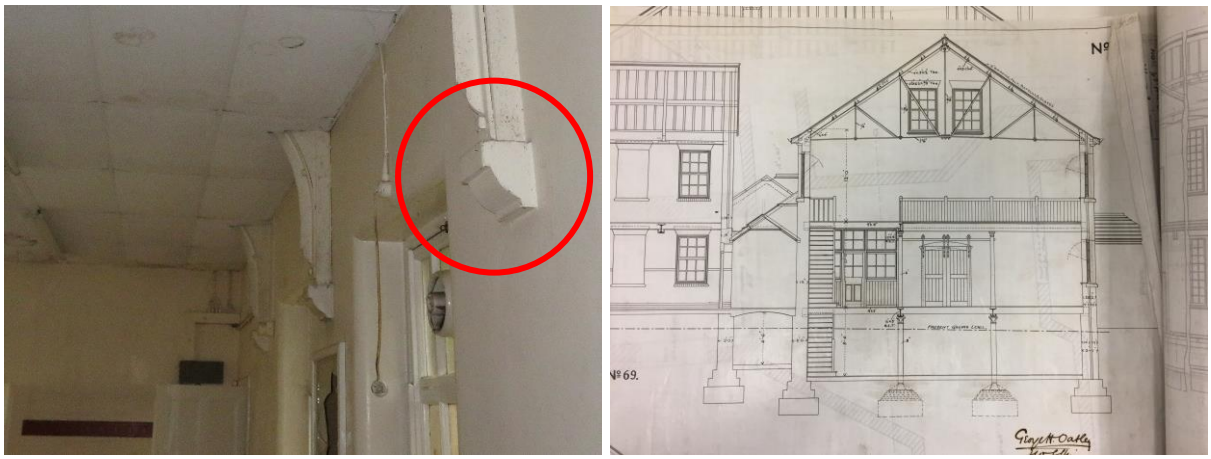
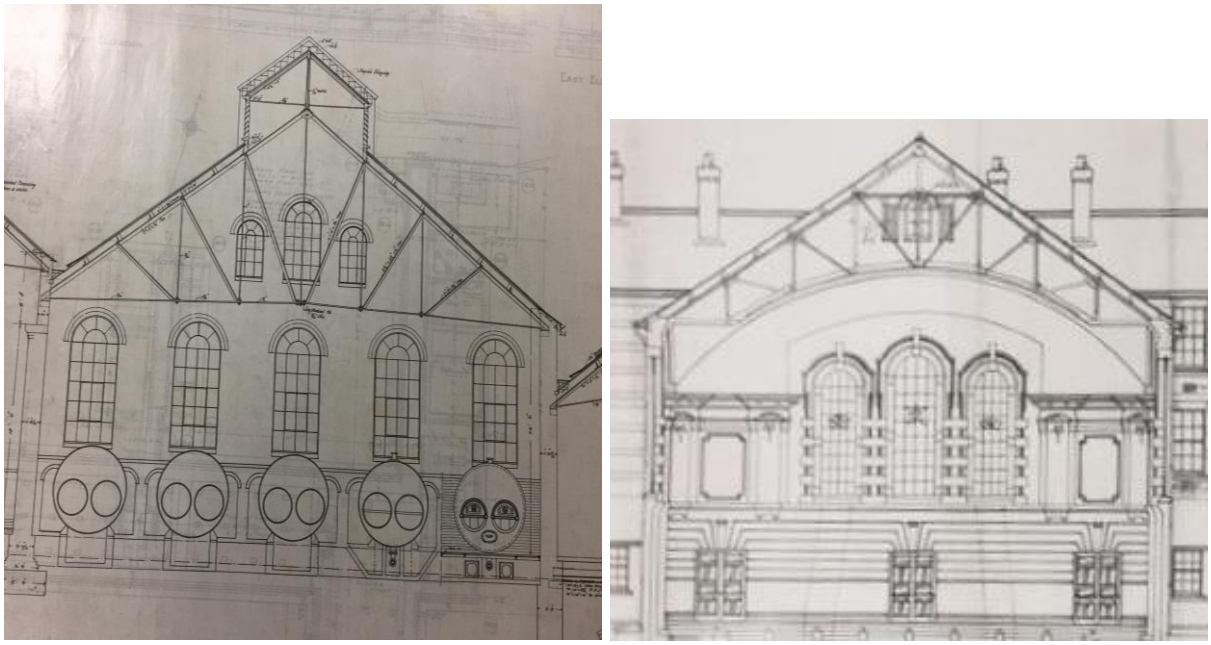


Image 19, Steel roof truss corbelled supports & Image 20, Architects plans showing wrought iron roof construction source: Author's own 2020 (Oatley & Skinner, 1902)



Images 21 & 22, Architects plans showing wrought iron roof construction source: Author's own 2020 (Oatley & Skinner, 1902)

At the time of the tour limited viewing opportunities did not present any areas of corrosion or defects that give cause for concern; however, it is advised that a full survey is carried out to determine the condition of all concealed materials.

WATER TOWER ROOF

The dome to the water tower is believed to be constructed with a lightweight steel frame construction with timber external framing providing fixing points for the copper weatherproof coverings. This assumption is taken from external photographs and architects' drawings. Although the construction cannot be confirmed until full access is provided it is not believed the construction details have deviated from the original architects plans.

Image 23, Copper clad domed roof of the water tower, source: Author's own 2020

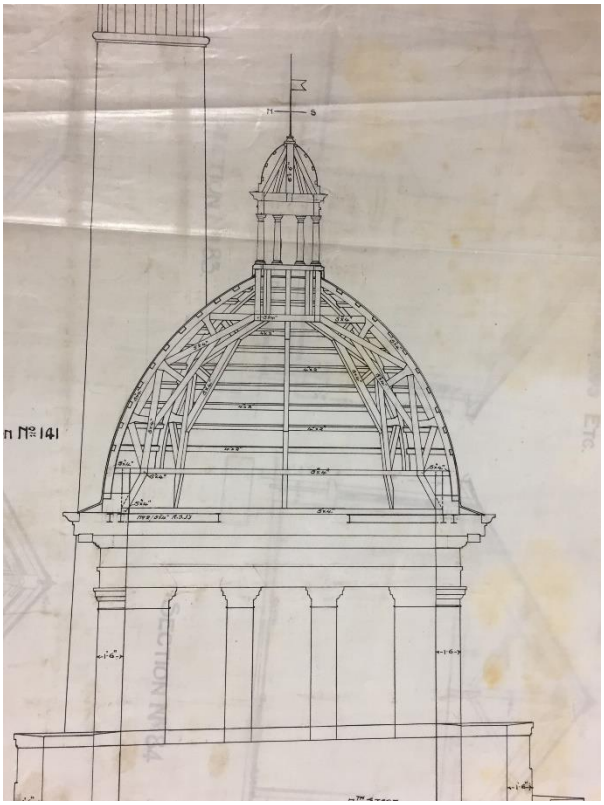


Image 24, Water tower roof structure, source: Author's own 2020 (Oatley & Skinner, 1902)

FLOORS

Floors throughout the ground floors are a combination of solid and suspended with the 1st floor being timber suspended. These areas have not all been inspected, as such comments made here are from a limited inspection only.

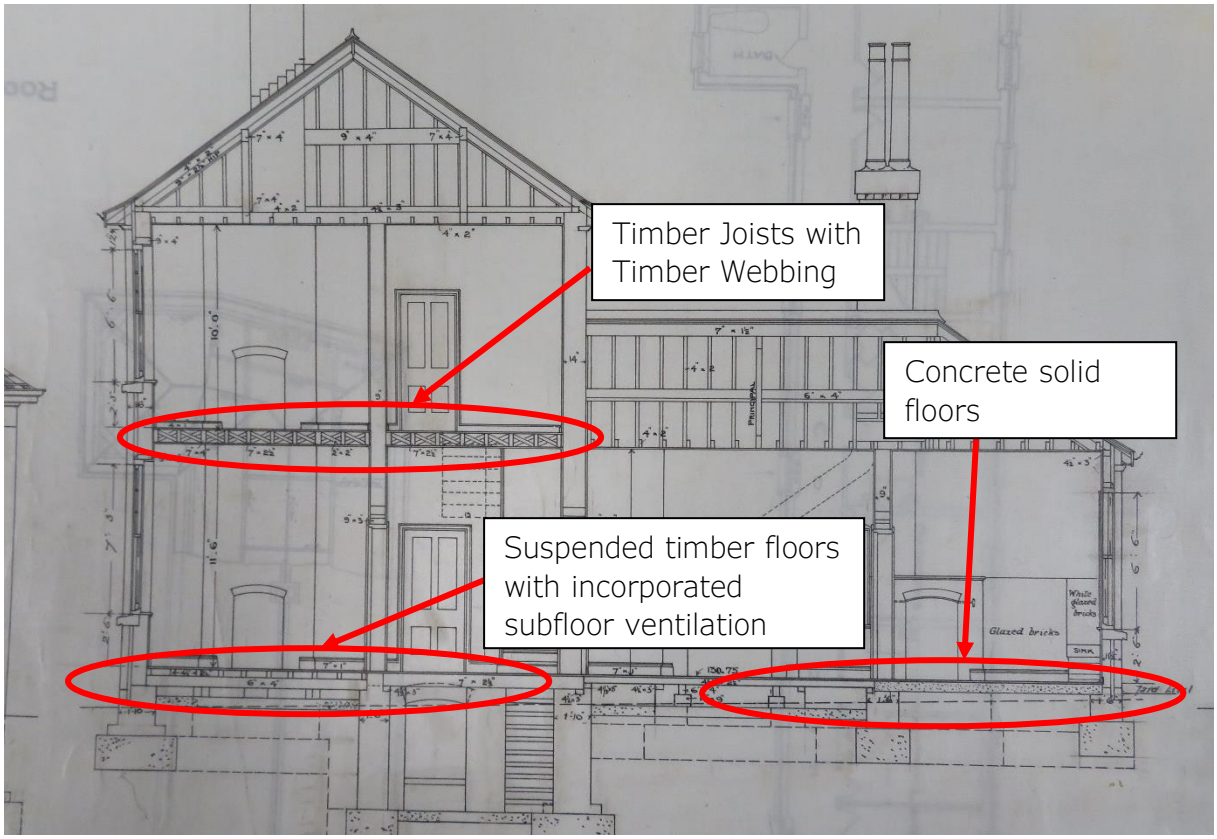


Image 25, Architects plans showing floor construction source: Author's own 2020 (Oatley & Skinner, 1902)

CEILINGS

Ceilings are believed to be generally suspended, mainly timber, with architectural drawings indicating several maybe a combination of concrete and iron, however this has not been confirmed.

Images 26 & 27, General internal roof construction source: Author's own 2020

2.1.2 ROOF COVERINGS

SLATE

Roof coverings throughout the entire building range are believed to be natural Welsh slate. It is assumed these coverings date from the original construction 1902 to 1908. Fixings could not be determined due to prohibited access; however, it is likely these are square cut nails secured into softwood timber sarking boards. The general condition of the roofs appear to be in reasonable condition and continue to provide a water tight covering.

Images 28 & 29, Slate roof covering used throughout construction, source: Author's own 2020

Several slates throughout the multiple roof elevations are damaged or missing. This would appear in the main to be due to vandalism post closure whilst additional areas appear to be a result of natural degradation. Natural defects within the slates over time are exposed to weather extremes, natural faults can be exposed to decades of freeze and thaw actions until eventual failure. Repairs and maintenance particularly that require tradesmen to gain access over roofing materials can lead to damaged slates, whilst the majority of these can be identified immediately some damage may go undetected for several years, by which time the ravages of time cause the damaged slates to fail, crack and slip.

Images 30 & 31, Slate roof covering defective areas, and temporary coverings, source: Author's own 2020

In several areas the evidence of lead theft is apparent, to gain access to these areas slate roof coverings have been trodden on and in areas slates have been crudely removed to enable access to the lead. This has led to extensive slate damage and exposed the underlying roof structure to moisture ingress. Over time this moisture ingress will lead to extensive decay of roof timbers, internal timbers, plasters, flooring and services.

Images 32 & 33, Damage caused by lead theft, source: Author's own 2020

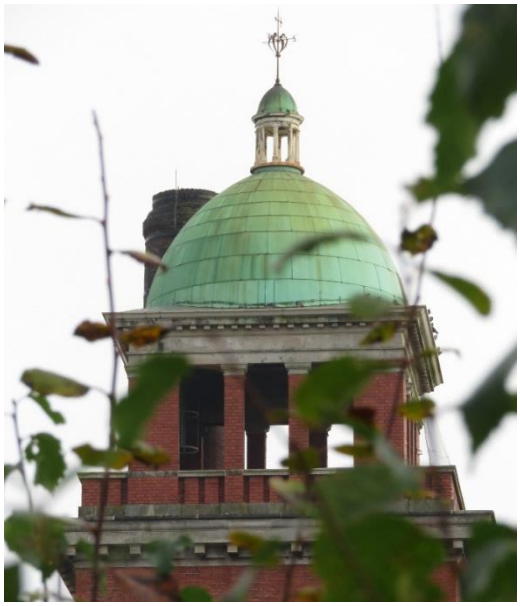
ACTION

It is recommended that a thorough investigation is carried out to all roof elevations to determine the extent of failures. Repairs are anticipated to require the careful removal of damaged slates and provided the underlying structure is of good, matching replacement slates can be installed. Fixings to be appropriate to the instalation access, these vary from copper clout nails to various forms of hooks dependant on the repair method.

Larger repairs including areas of vandalism are anticipated to require complete slate covering stripping to allow for timber roof structure repairs due to exposure to several years of moisture ingress. Assessment is required to determine the extent of structural repairs; however, it is assumed that timber sarking boards, and isolated trusses, rafters and wall plates would require extensive repair/replacement.

COPPER

The domed roof water tower is constructed with copper sheet with concealed fixings and folded seams. The copper carbonate which is the oxidisation of the copper giving the green colour provides a protective coating to the copper plate. This regulates the rate of corrosion of the material. Copper sheet is expected to have a functioning life expectancy of 100 years or more, many factors will affect this, the quality of the material, standard of workmanship when installing, weather exposure.



Images 34 & 35, Copper sheet coverings, source: Author's own 2020

From the visual inspection there appeared to be no obvious degradation of the material that would lead to internal defects; however, it is recommended that access be provided, and a thorough inspection be made of the roof coverings.

Lead has been used extensively throughout the roof elevations providing flashings, upstands etc. The lead viewed appeared to be in good functioning condition however all inspections were from ground level.

ACTION

A thorough close inspection of all these areas is advised to determine condition, defects and overall longevity of the material.

GLASS

Several roof lanterns and skylights installed throughout the buildings, framing of these range from timber sections to iron and steel frames. Glazing in these areas appeared to be in overall good condition.

Images 36 & 37, Areas of damage, source: Author's own 2020

Isolated areas of damage were present in several areas, these included loose panes due to degraded fixings, and broken panes due to time and possible impacts due to access etc.

Within the laboratory several panes were completely missing, this has allowed access to pigeons, and consequential the rooms below have suffered from quantities of guano.

ACTION

Glazing within these areas can be replaced and secured with putties, glazing bars and steel retaining clips as per original. Frames should be assessed prior to glazing replacement, with decayed sections replaced with like for like materials.

Due to the risks associated with bird droppings care is required whilst working within these areas. Further guidance can be found at:

https://www.hse.gov.uk/construction/healthrisks/hazardous-substances/harmful-micro-organisms/other-diseases.htm

CORRUGATED STEEL SHEET

Corugated steel sheets appear to have been installed in replacement of glazing to several areas. The condition of the sheeting appeared to be in good condition. Several sections would appear to have been a corrugated clear resin or fibreglass composition to perhaps allow natural light to be gained.

Images 38 & 39, Corrugated steel sheet coverings, source: Author's own 2020

The resin/fibreglass corrugated sheets appear to have weather considerably and degraded under UV light.

ACTION

These within the near future would require complete replacement.

PLASTIC SHEET

Several areas of plastic sheet have been used as a temporary roof covering, it is believed the original slate coverings have been removed for reasons unknown. It is not known how long this temporary sheeting has been in place, however, it is reasonable to assume that a quantity of timber degradation has occurred as a consequence.

Image 40, Temporary plastic sheet coverings, source: Author's own 2020

ASPHALT

Several flat roofs were present of the main wings of the once day rooms. Only external viewing was made here, and this was brief. Several amounts of building materials were scattered about, this attributed to the results of vandalism.

Image 41, Asphalt flat roof coverings, source: Author's own 2020

ACTION

Whilst there was damage to lead flashings etc the asphalt roofing material appeared to be in reasonable condition, however it is assumed that a complete replacement would be necessary as it is believed there is limited life expectancy remaining in the covering.

LEAD

All junctions of abutting roof materials and interfaces etc are of lead sheet. These areas include flashings including parapets and upstands and the like. In general, all lead flashings etc viewed appeared to be in good functional condition.

To the front elevation including the portico and the more decorative elevations, rainwater drainage is via lead box and valley gutters concealed behind parapet walls and copings.

Images 42 & 43, Lead coverings, source: Author's own 2020

Here lead has been lapped over the coping stone in an attempt it is assumed to prevent moisture ingress from damaged box gutters and flashings behind.

ACTION

Assessment of these lead repairs and underlying defects are required prior to determining the course of repair method. It is anticipated that the original lead used to line the box gutter including flashing have fractured possibly due to excessive lengths of lead, poor detailing, previous repairs and general degradation of the material.

Removal of the repair sections of lead are required to provide access to the original; box gutter and flashings. It is assumed that replacement of the lead sheet within the box gutter will be required. An assessment of the flashing to be taken upon inspection. All lead work to be carried out under the Lead Sheet Association Guidelines.

Several areas have suffered from lead theft, this has caused extensive damage to the abutting lead materials, slate coverings and timber roof structures beneath.

ACTION

Works here to form part of slate repairs. Damaged lead sections to be removed and replaced along with missing sections. All works to be carried out under the Lead Sheet Association Guidelines.

2.1.3 RAINWATER DISPOSAL

Rainwater is disposed of generally via cast iron OG style gutters, hoppers and downpipes. Gullies collect the rainwater and carry it away via assumed salt glazed drainage to collection tanks, water courses or sewage collection points. Over recent decades rainwater elements have been replaced with both aluminium and PVCu alternatives.

Several areas of damage can be observed about the hospital were significant damage has occurred. Damaged brackets and supporting structures have failed and in turn led to failure of the rainwater gutters. Additionally, missing and damaged sections fail to effectively carry water away from the fabric of the building allowing moisture to ingress at the heads of walls, run over external elevations including windows, whilst also splashing at the foot of external walls. All of these areas of moisture ingress accelerate material decay through decayed timbers, saturated brickwork which during freeze and thaw actions of the weather may lead to spalling of the brickwork, accelerated corrosion of ferrous wall ties and degraded mortar joints.

Excessive moisture at the base of walls can lead to foundation defects including under supported foundations were rainwater washes away subsoils and or soften supporting soils, both leading to structural damage of varying degrees. In several areas, vegetation has built up at discharge points preventing the effective discharge of rainwater. These areas of vegetation allow rainwater to overflow in these localised areas leading to similar damage as noted above with the addition of the extra loads placed upon brackets and supports, this increases the risk of support failure due to overloading.

Images 44 & 45, Defective RWG's, source: Author's own 2020

ACTION

It is advised that all vegetation and debris is removed from gutters, downpipes and gullies. Damaged and missing gutter and downpipe sections are replaced including any joint gaskets (putties etc). Ensure all supporting brackets are complete and secure including replacing damaged items as required. Additionally, ensure all supporting fascias both timber and stone are in good repair, damage to these areas require extensive works and the removal of large sections of RWG. Timber fascias to be replaced with suitably matching size and grade timbers. Stone repairs to be assessed, allow for isolated repairs and complete stone section replacement should damage severely compromise adjoining fabric.

Rainwater downpipes to an area abutting west corridor and the 2nd west wing has severely cracked and been expanded down the length of the pipe, this is due to blockages within the downpipe that have held a quantity of rainwater, this has consequentially frozen, the expanding rainwater has the fractured and expanded the pipe beyond viable repair. Additionally, fixing brackets have failed both in fixings and stability this has led to sections of downpipes dislodging, breaking the path of flow for rainwater to be delivered to gullies etc. As above failures like these increase the moisture deposited within building fabric and the base of walls, increasing the risk of building fabric failure.

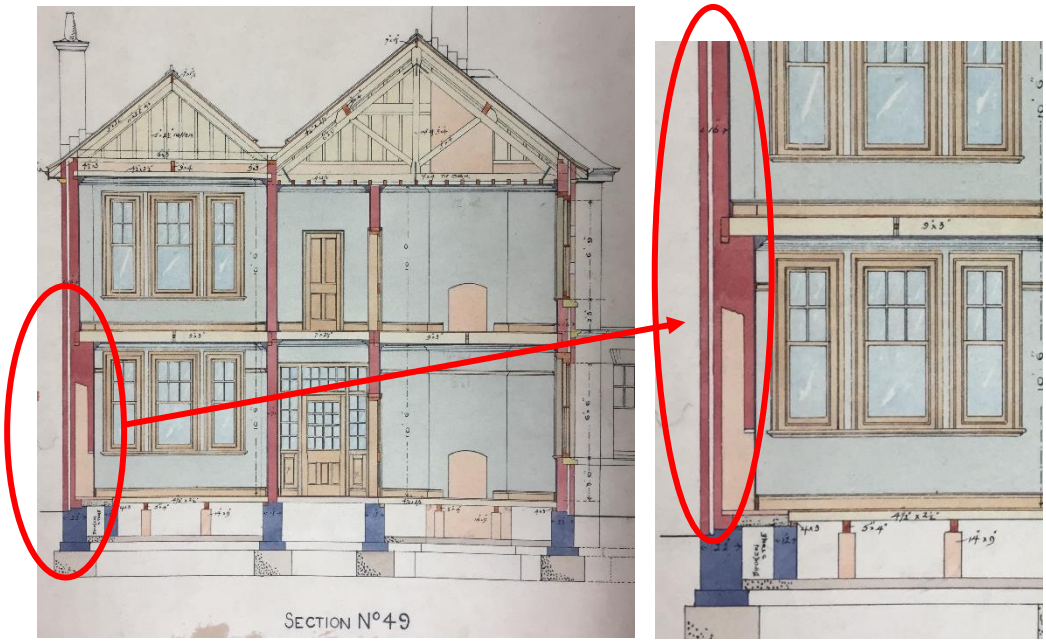
Image 46, Defective cast iron downpipe, source: Author's own 2020

ACTION

Complete replacement.

2.1.4 EXTERNAL WALLS

External masonry construction is cavity wall and generally a combination of red clay brick using Flemish, English and stretcher bonds with decorative banding of buff bricks to all elevations. Bathstone has been used extensively throughout the front façade including the portico and reception areas by way of ashlar stone construction, quoins, plinths, pillars, decorative capitals, cornices, friezes, corbeling, dentils, open pediment and copings.



Images 47 & 48, External wall construction source: Author's own 2020
(Oatley & Skinner, 1902)

Mortar is assumed to be lime based however this has not been confirmed due to the limited site access. Window and door aperture openings are a combination of bathstone springers, voussoirs and keystone to the front elevations, and formed brick arched window heads and cast stone sills and threshold steps to all remaining elevations.

The wall ties used could not be determined during the tour, however at the time of construction wall ties used were generally wrought iron or cast iron. Kept dry and away from exposed areas these ties perform there function well, however when moisture is present these ties can begin to corroded as corrosion takes place these metals expand in layers, resulting in the jacking of mortar joints from which they are bedded into. The corrosion exerts such a force likened to hydraulic pressures, these mortar joints expand allowing further moisture to ingress, at worst wall tie failure can distort whole elevations, jack roofs and in some cases as the corrosion degrades the connection between leaf's can lead to the failure of complete elevations.

Image 49, Airbricks incorporated into the construction ventilating the cavity, source: Author's own 2020 (Oatley & Skinner, 1902)

ACTION

At the time of the tour no cavity wall tie related defects were observed. It is recommended that cavity wall ties in exposed elevations are examined to determine the condition of the metals so these works can be factored into a planned preventative maintenance program.

The construction between the concrete strip foundations and DPC levels in the highlighted area abutting the west connecting corridor shows an area of rusticated and rubble sandstone. Throughout the viewed areas this appeared to be an isolated change in construction, however it is assumed there may well be additional areas of similar construction.

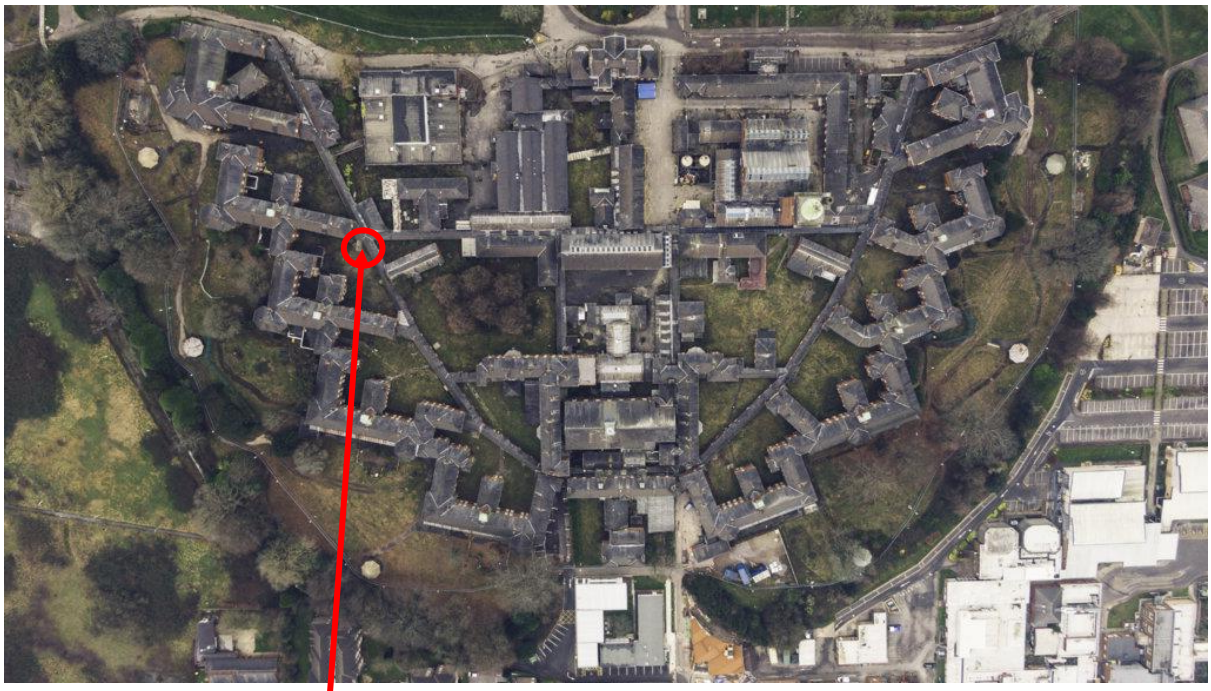


Image 50, Steel roof truss corbelled supports & Image 20, Architects plans showing wrought iron roof construction source: Author's own 2020 (Snooky, 2019)

Images 50 & 51, Below DPC construction material showing as rusticated stone, source: Author's own 2020

These works do not appear to be part of a previous repair and one can only assume this detail forms part of the original construction. The change in material may be attributed to the differing load due to storey height of the connecting corridors.

Evidence of salt migration can be seen in areas were RWG's are in a defective condition. Concentrated moisture ingress allowing soluble salts to migrate through masonry and evaporate on external façades, resulting in the white staining to the mortar joints.

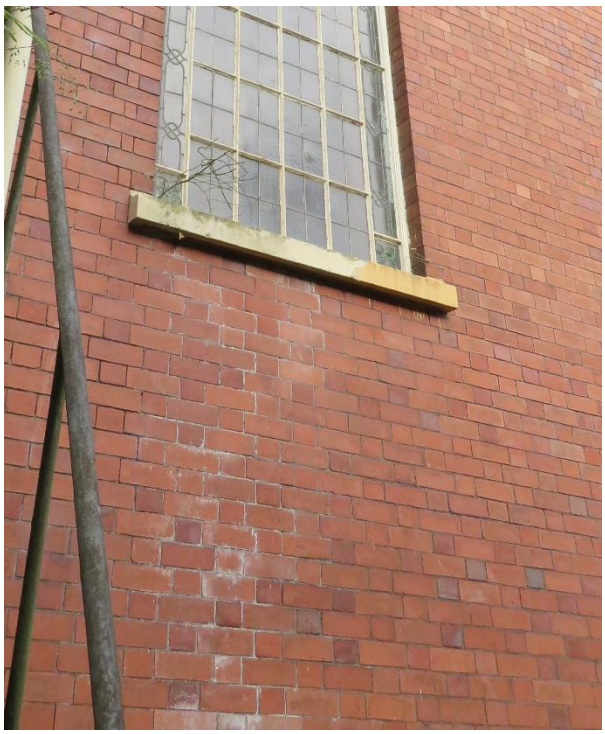


Image 52, Soluble salt migration, resulting in white staining, source: Author's own 2020

ACTION

Upon RWG's being repaired etc, the soluble salt staining can be gently brushed away, this may be required several times. Do not remove with pressure washers etc as this introduces large amounts of water into the building fabric under high pressure causing damage to surface and exacerbating the migration of soluble salts.


Images 53 & 54, North elevation showing bathstone construction with the water tower inset showing the use of Portland stone , source: Author's own 2020

The bath stone and Portland stone used throughout the front façade, portico and water tower etc. from the limited inspection presented no visual signs of decay or significant defects where identified.

The copings to the right of the portico has signs of previous repair and isolated stone degradation.


Images 55, Bathstone historic repairs & 56, An area of damage, source: Author's own 2020

ACTION

Repairs appear to be in good condition, additional areas noted require further investigation to determine the requirement for intervention.

The external wall to the south elevation of the store/workshops has an area of fractured brickwork a result of building/brickwork creep. The movement across the elevation measuring approximately 21.52 Lm to the courses of brickwork directly above the bituminous DPC course. Additionally, there are vertical cracks below the window aperture to the east gable of the store/workshop.

Images 56 & 57, Building creep showing on the south elevation of the stores building, source: Author's own 2020

Architects drawings show a difference in construction between the north and south elevations.

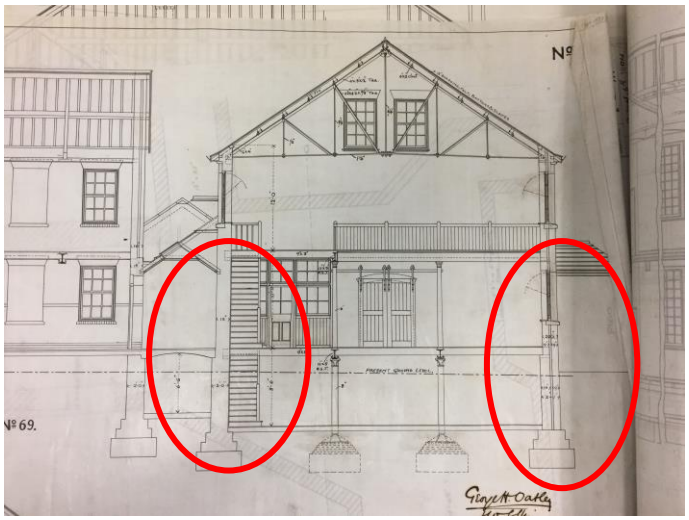


Image 58, Showing the differing construction types between the north and south external walls of the stores, source: Author's own 2020

Failing further investigation to determine all contributing factors the existing evidence shows that the front elevation has slipped approximately 40mm of the line of foundation. The implied loads relating to unknown factors cannot be known at this stage, however the presence of vertical cracks to the base of windows on the first floor gable walls suggests that only the front façade and partial areas of the flanking walls have moved. Evidence does suggest this is unlikely to relate to a foundation related issue. The DPC being bituminous can be seen to have expanded out of the joint, this a result of either the forces applied down through the masonry thus squeezing and compression of the DPC and or hot weather particularly as the façade faces south and has a large surface area combined with the abutting paving being black blue and heat absorbent. One or more of these factors could have resulted in the observed movement. A full investigation

of the building is required together with a period of monitoring to determine ongoing issues before a definitive diagnosis can be made.

ACTION

Following further investigation, several methods of restraint maybe applied. Generally, these are ties which span the front and rear securing them together or some form of buttress. At present limited inspection has been made and no determination can be made.

2.1.5 WINDOWS & DOORS

The classical Victorian arched window to the front entrance of the portico is believed to be wrought iron construction, with small single (assumed) cylinder glazing and putty securing. The limited tour time did not allow for a thorough inspection of all windows, there may well be additional wrought iron windows at Whitchurch hospital.

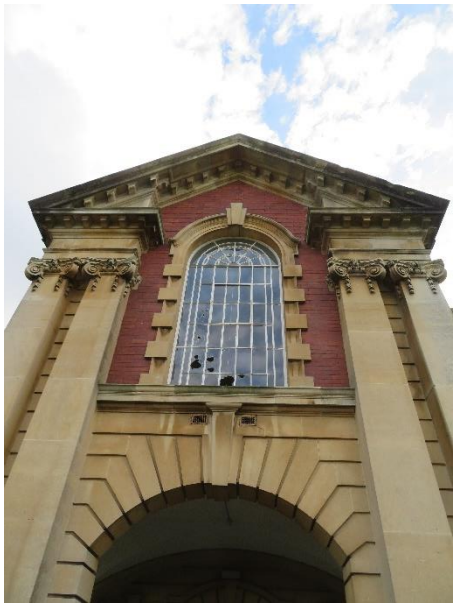


Image 59, North elevation wrought iron classical arched window, source: Author's own 2020

The centre hung casement may well be painted shut as would be suggested from ground floor viewing. Several panes of the glazing have been broken by what appears to be mindless vandalism. These broken panes allow rain and wind to freely enter the building creating internal damp environments, rain can ingress to internal elements of the window structure leading to eventual decay of the fabric. Corrosion in these areas may lead to the eventual loss of historic fabric.

ACTION

Carefully remove the build up of several decades of paint, Note the paints used here are highly likely to be lead based. Care is to be observed, further information relating to working safely with lead can be found at: https://www.hse.gov.uk/lead/

Appropriate re-decoration to be carried out after all existing paints have been removed.

The main hall windows are wrought ironed framed leaded lights, with stained decorative glazing. Glazing would appear to be crown or cylinder glass. Centre hung opening lights are present to each window.

Image 60, Wrought iron windows with partial stained glass decoration, source: Author's own 2020

The condition of the windows to the hall are relatively good condition with little to no visible damage present.

ACTION

Regular maintenance, operation of moving parts and decoration are required to maintain good condition.

The majority of external windows throughout including the lanterns and roof windows about the hospital and ancillary buildings are of softwood box framed horned sliding sashes, fixed framed and opening casements with single paned glass, assumed to once all be cylinder glass.

Images 61, 62, 63 & 64, showing the timber window designs found throughout the hospital, source: Author's own 2020

Whilst on the limited access tour the majority of glazing in all timber windows and several box frame sashes had experienced vandalism. This has led to the building as a whole being exposed to the ravages of the weather and wildlife. Decay had begun to set into the exposed timbers of the frames and sashes.

Images 65, 66, 67 & 68 , showing damage and decay to timber windows throughout, source: Author's own 2020

ACTION

A thorough inspection of all windows and frames are required to determine the extent of repairs. On findings during the tour repairs are expected to be lower frame and sill repairs/replacements using quality joinery grade like for like timbers, extensive lower sash frame repairs. All putty and damaged glass removed, and frames cleared of all paints prior to re-glazing and decoration. Allowance should be made to replace all sash cords etc.

2.2 INTERNAL CONDITION

2.2.1 INTERNAL CEILINGS & WALLS

Internal ceilings throughout are plastered, this assumed to be lime plaster over timber laths, however the composition could not be determined without further investigation. Throughout the hospital various coving and plaster details are present with more decoration being present to the main reception areas. These are believed to be a combination of mass produced and run in-situ and handmade sections.

Within the corridor to the southwest elevation the results of moisture ingress have caused material degradation as seen by decayed ceiling plasters, the decay here extends from roof structure saturation and assumed decay, timber lath decay and steel fixing corrosion and saturation of plasters. This results in the failure of ceiling fabric.

Image 69, Damage to ceilings due to water ingress, source: Author's own 2020

ACTION

Upon external sources of moisture entry being addressed and structural timbers replaced where required, remove all decayed plaster, timber lath, areas where fixing corrosion has occurred but lath and plaster are in good condition can be re-secured with proprietary fixings. Like for like laths can be secured with like for like fixings or a non-corrosive alternative and new matching lime plaster applied and finished as existing.

It is believed moisture ingress resulting from defective roof coverings are contributing to ceiling and decoration decay throughout the building particularly within the foyer and stairwell of the main entrance. Decoration within these areas are believed to be petrochemical based, these inhibit the transfer of moisture vapour. As a result over time moisture ingress be it through external defect or internal humidity builds up with plasters etc and causes the finishes to deboned resulting in peeling and flaking paint.

Condensation levels within the hospital are also high, resulting in paint finishes failing evident in areas of peeling and flaking paint, this is prominent in areas were modern petrochemical paints have been used. As above these paints restrict moisture vapour movement and cause considerable quantities of moisture to be held within materials, at which point the moisture held becomes so great as to blow the adhesion of the paint from the fabric to which it was held. Were more breathable paints have been used these affects are considerably lessened. Mould growth is present throughout the majority of the ceilings, this being a consequence of the high humidity and condensation.

Images 70, 71 & 72 showing the effects of moisture ingress and condensation, source: Author's own 2020

ACTION

A full investigation is required to determine roof leaks etc, additionally building ventilation is required to purge stale moisture laden air. Upon these results and a period of time an assessment to the remedial works required can be made.

Several suspended ceilings are present throughout with a drop in type composite ceiling tile.

Image 73, 74 & 75 Damage to believed asbestos suspended ceiling due to condensation, source: Author's own 2020

Ceiling tiles such as these are very similar in appearance to those that contain asbestos, as it is believed these tiles pre-date 1999 it is highly likely they are asbestos containing. Due to their degraded condition it is advised that testing be carried out to determine the presence of asbestos. Seek profesional guidance on the safe care and disposal of asbestos containing materials.

Several water stained and damaged areas are present within the suspended ceiling tiles, this is highly likely to be related to the condensation being experienced throughout these areas.

ACTION

It is recommended that all asbestos containing materials in particular damaged ceilings are completely removed to prevent the future release of dangerous particles. Further advice can be found at: https://www.hse.gov.uk/asbestos/

2.2.2 FLOORS

Floors throughout the ground floor are a combination of solid floors with terrazzo finishes, clay tiles, vinyl tiles, carpet, parquet and planked timber.

The main entrance and receptions rooms were laid to carpet, the underlying floor type material could not be determined. The landing area/foyer to the stairs leading to the first floor were laid to terrazzo. Where inspected; the corridors throughout were laid to vinyl tiles of varying designs and colours.

A room to the south of the main hall has been laid to timber parquet flooring.

The parquet flooring has been partially exposed to flood water, evidence would suggest this has been a result of ingress through an adjacent room (this room was not inspected). Moisture here has saturated the timber parquet allowing it to expand and exert great force across the entire floor area. It is assumed this has caused the floor to bow and buckle leading to the failure observed.

ACTION

Upon the external fabric being made weather tight and the adjoining room being inspected, and water related issues resolved the flooring can be cleaned and reinstated following a period of drying. There will be tiles that have decayed or been damaged during the period of ingress however on inspection there did not appear to be detrimental damage to the tiles overall. Tiles may be cleaned and reinstated. Once laid the entire surface can be sanded and sealed bringing the floor back into service.

Image 76 & 77, Damage to timber parquet flooring due to water ingress, source: Author's own 2020

The main hall is laid to planked timber set over a suspended floor. The condition and construction of the suspended floor could not be made due to access restrictions. Several additional floors throughout were timber planked with the addition of decorative inlay designs.

Image 78 & 79, showing timber flooring types, source: Author's own 2020

Floors to the 1st floor are believed to be concrete slabs to corridors and the like with timber suspended to all rooms, however this could not be determined due to the floor coverings and limited access. Floor coverings throughout 1st floor corridors were generally vinyl tiles and rooms off being laminate and carpet.

Image 80 & 81, showing laminate flooring to several rooms, source: Author's own 2020

2.2.3 FURNITURE, FIXTURES & FITTINGS

JOINERY

Joinery consist of soft and hardwood timber doors, door frames and architrave, timber wall panelling and reception desks to the main reception areas. To all remaining areas joinery consists of softwood panelled doors, composite doors with Georgian wire framed glazing, staircases and balustrades and stage construction within the main hall

Several of the doors throughout particularly within the main reception area are damaged, believed a result of vandalism.


Image 82 & 83, Damage to internal doors due to believed vandalism, source: Author's own 2020

ACTION

Full photographic documentation is advised prior to carrying out restoration of internal joinery particularly the highly decorative elements.

Whilst the overall condition of the timber work was in good condition, several isolated areas of moisture ingress, a consequence of damaged roofs, rainwater goods and windows have led to timber decay. In several areas the moisture ingress has been prolonged and resulted in the establishment of wet rot (variety believed to be Coniophora Puteana). Should the moist conditions continue within these areas the damage caused by the wet rot (variety believed to be Coniophora Puteana) will be extensive and may lead to structural compromise of abutting fabric.

Images 84, 85 & 86, Wet rot (Coniophora Puteana) at various stages, source: Author's own 2020

ACTION

Upon the source of moisture ingress being resolved, remove all materials affected by wet rot. The extent of material to be removed will depend on the extent of decay and conditions to which the timbers are installed.

Cup fungus (Peziza Domiciliana) is present within the main reception areas, this being a result of excessive moisture within the building fabric.

Image 87, Believed Cup Fungus (Peziza Domiciliana), source: Author's own 2020

ACTION

Remove the source of moisture and allow building fabric to dry. Remove any degraded materials and redecorate as required. Cup fungus (Peziza Domiciliana) is not detrimental to building fabric.

FIRE SURROUNDS AND INSERTS

Several rooms through the hospital contain various forms of fire surrounds and inserts. More lavish and decorative being contained within the front reception.

Images 88, 89 & 90, Various decorative fire surrounds and inserts, source: Author's own 2020

2.2.4 BUILDING SERVICES

Refer to Appendix C

2.3 BUILDINGS & OTHER STRUCTURES

Refer to Appendix D

2.4 OTHER

Refer to Appendix E

APPENDIX A, STATURTORY STATUS

Whitchurch Hospital formerly the Cardiff City Asylum is listed grade II and located to the north west of the city of Cardiff, benefiting from cleaner air and open countryside than that of the city.

The Cadw Listing Description for Whitchurch Hospital the former Cardiff City Asylum:

Exterior:

The hospital is built of red brick with yellow brick banding, Welsh slate roofs; the entrance block main elevation has ground floor and dressings of Bath stone. Developed form of 'broad arrow' or echelon plan widely used for large mental hospitals from later C19. Spine of administration and service blocks has, to each side, five two-storey ward blocks (roughly L-shaped) stepped back in echelon, and connected by curved corridor to rear, and cross corridors. Convex (south) side faces out to give sun and light to ward blocks; concave corridor thus encloses service blocks with entrance block facing north. Entrance block in Renaissance style. Two storeys, three bays with advanced gabled central bay with open porch below. Slate roof with weathered red brick end chimneys, and two smaller chimneys to ridge. First floor in brick with deep eaves band course (dentil cornice) and dressings in Bath stone; ground floor in horizontally channelled Bath stone. The windows are horned sashes with small panes to upper sash and single large pane below. Single first floor window to each outer bay has architrave with keystone and rusticated surround. Two ground floor windows to each outer bay. Advanced central bay has a broken pediment, end paired Ionic pilasters, large round-headed first floor window with keystone and rusticated surround, on ground floor open segmental arch to porch; returns have two windows to first floor (rusticated surrounds) with ground floor arches similar to front. Gable ends treated as pediments with projecting central stack. To each side of two-storey section, attached single storey pavilions, hipped roofs, banded Bath stone, semi-hexagonal bays to front, two windows to returns. Rear of entrance block in red brick and connects with body of hospital via corridor flanked by one- and two-storey office blocks. To east (left) of entrance, yard formed by L-shaped works and laundry blocks (mortuary block to north) has boiler houses (with prominent ridge ventilators) and 2-storey attached range. To rear of boiler houses is combined water tower and chimney. Top stage consists of copper dome with small lantern over open loggia (3 bays to each side), brick pillars with stone capitals and cornice. Freestone cornice and bandcourse, roundels, yellow brick bands. Attached chimney follows water tower up to cornice then becomes cylindrical chimney in brick. To west (right) of entrance, area between corridors has attached service buildings in matching materials. Disposed to either side of entrance are ten roughly L-shaped 2-storey ward blocks in red brick with yellow brick banding; red brick chimneys, slate roofs, small-pane horned sash glazing. Blocks connected to each other and/or to rear corridor to enclose small courtyards; to rear, each ward block has attached two-storey sanitary block and ventilation cupola in red brick with wooden louvres surmounted by small dome and pinnacle. Ward blocks are disposed almost symmetrically and are numbered 1 to 5 East and West respectively. Wards 1 (East and West) have two-storey splayed bays near inner angles. Ward 2 (West) has bay in same position but block 2 (East) has bay near centre of elevation. Wards 3 and 4 to each side have polygonal corner bays. Wards 5 to each side have two splayed bays to outer corners. Some ward blocks have, on south facing walls, modern single-storey shallow extensions in yellow brick with corrugated

roofing materials; some 2-storey extensions in red brick. Between Wards 1 (East and West), is 2-storey staff house connected by corridor to body of hospital, six windows with recessed central bay, and ground floor splayed bay-windows to outer bays. To rear of house, 2-storey physiotherapy and pharmacy departments. Behind these, other blocks include main recreation hall, largely obscured by adjacent buildings but with prominent louvre, and kitchens. A network of corridors forms courtyards with buildings attached to corridors for office, medical, and service uses.

Interior:

Most interiors remodelled and modernised (these were not available for inspection at resurvey January 2002 except for the entrance hall). Entrance block retains square hall, plain ceiling with cornice. Three bays to each side with Roman Doric engaged columns or pilasters. Panelled wood dado; to right, fireplace, to left, door to enquiry office. Entrance to hospital through screen wall with columns. Transverse corridor with classical detailing. To right, staircase hall to former boardroom area with wooden stair in style of circa 1700 six-panelled doors etc, offices modernised. Main recreation hall (approximately 15m by 30m) retains original interior. Segmentally vaulted ceiling with cross-ribs. Seven bays to sides, each with round-headed window; piers between windows have dentil cornice with cartouche and floral pendants. West end wall has triple blind window, taller central window flanked by lower windows treated as walls; dentil cornice continues from side window-piers; to each side round window with pediment and square architrave; three doorways with double-leaf doors. East end has stage with large segmental pedimented proscenium arch, to each side, cartouche with female head and swags; window to each side; below each window, square-headed doorway with double-leaf doors. Doors each lead to lobby with wooden staircase to rear stage area.

Reason for Designation:

Included as the best example in Wales of a large mental hospital using echelon plan form, and for its special architectural interest as the work of Oatley and Skinner

Reference Number: 11715 Easting: 314607 Northing: 180517

Listing Designation: Grade II

Date of Designation: 15/04/1994, (Amended) 31/05/2002

(Cadw, 2002)

APPENDIX B HISTORY

Built 1902 to 1908; officially opening 15 April 1908; originally known as 'Cardiff Lunatic Asylum' and later as 'Cardiff City Mental Hospital'. Architects Messrs Oatley and Skinner of Bristol. Building amongst most modern of its period, having provision for latest treatment methods, and also a large recreation hall, bakery, kitchen, boiler house, own fire station. Taken over by military 1914 - 1919 as 'Welsh Metropolitan War Hospital' (refurbished following war), and again during Second World War as 'Whitchurch Emergency Hospital'. *Taken over by Ministry of Health in July 1948.*

(British Listed Buildings, n.d.)

Image 1 Ariel view of the layout of Whitchurch Hospital (RCAHMW, 2007)

The former "hospital" is positioned to the north of Cardiff, facing north-west. Surrounded by large expanses of open green spaces, including parkland, forests and farmland to the north-west and west elevations. To the east and south elevations being predominantly urbanised. The river Taff being located approximately 225m from the southern elevations of the hospital.

On 5 July 1948, the hospital was taken over by the Ministry of Health as the National Health Service came into existence. The hospital continued to be well-used throughout the 1960s and '70s, even though many were now questioning the viability of large, outmoded institutions such as this.

Care in the community was considered preferable in many cases and, as a consequence, Whitchurch came to be seen by many as little more than a last ditch resort where containment was more important than care and treatment. It was an emotive point and the hospital retained many ardent supporters. Even so, it was clear that the physical environment - perfect, perhaps, in the 19th century - was somewhat limited for modern medical needs.

In the early years of the 21st century plans were made to close the old hospital with its echoing corridors and looming shadows. A combination of day care, specialised provision at nearby Llandough Hospital and a small, purpose-built set of wards on the site of the old Harvey Jones Adolescent Unit would be in the best interests of patients and staff.

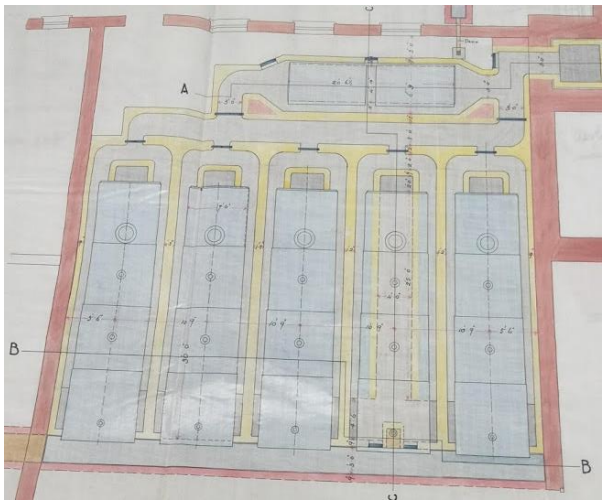
However, financial restrictions prevented the plans from going ahead and, for the moment at least, Whitchurch Hospital survives. It has a wonderful history - the task now is to make sure the future is equally as impressive.

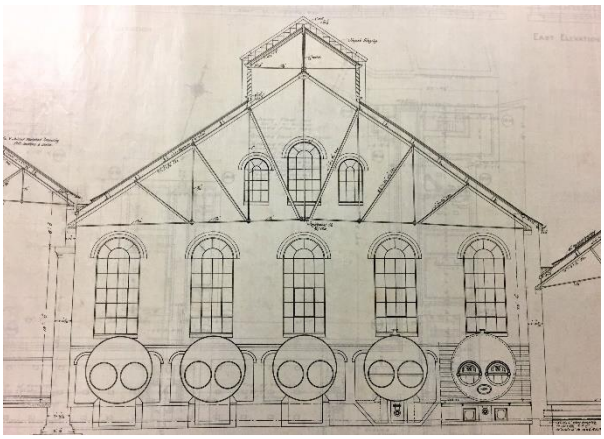
A phased closure of the hospital began in 2015 with the last patients leaving the site in April 2016. Non patient services remained onsite till early 2017 when the doors were locked for the final time. (Thomas, n.d.)

APPENDIX C – BUILDING SERVICES

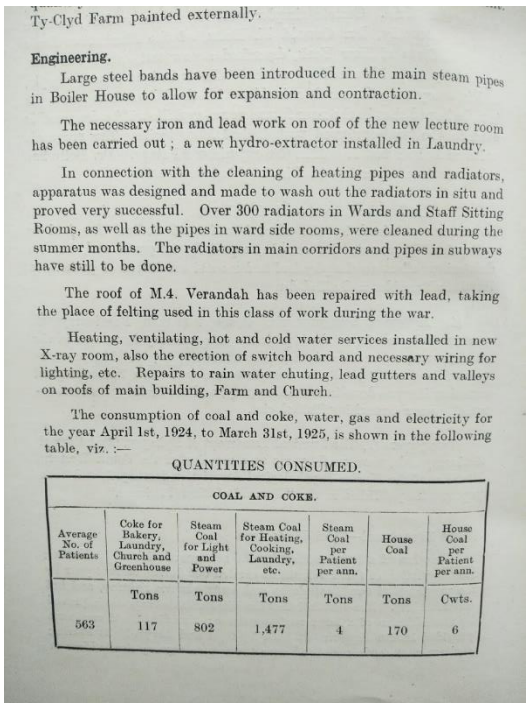
Electricity and heating are believed to have been originally powered via coal fired steam power tanks as per the architect's drawings and the extract from the City of Cardiff "The Mental Hospital" seventh annual report dated 1924. To the north-east elevation of the water tower the chimney tower is situated, this would have been used to allow flues gas to escape the coal fired chambers of the steam boilers.

In later years this is assumed to have been replaced with mains electricity and gas for heating.





Images 91 & 92, Architects drawings showing the boiler room construction, source: Author's own 2020 (Oatley & Skinner, 1902)



Ty-Clyd Farm painted externally.

Engineering.

Large steel bands have been introduced in the main steam pipes in Boiler House to allow for expansion and contraction.

The necessary iron and lead work on roof of the new lecture room has been carried out ; a new hydro-extractor installed in Laundry.

In connection with the cleaning of heating pipes and radiators, apparatus was designed and made to wash out the radiators in situ and proved very successful. Over 300 radiators in Wards and Staff Sitting Rooms, as well as the pipes in ward side rooms, were cleaned during the summer months. The radiators in main corridors and pipes in subways have still to be done.

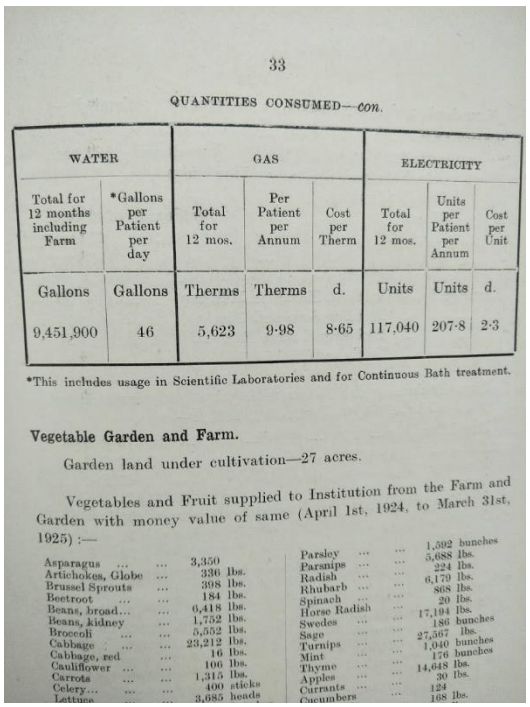
The roof of M.4. Verandah has been repaired with lead, taking the place of felting used in this class of work during the war.

Heating, ventilating, hot and cold water services installed in new X-ray room, also the erection of switch board and necessary wiring for lighting, etc. Repairs to rain water chuting, lead gutters and valleys on roofs of main building, Farm and Church.

The consumption of coal and coke, water, gas and electricity for the year April 1st, 1924, to March 31st, 1925, is shown in the following table, viz. :—

QUANTITIES CONSUMED.

COAL AND COKE.						
Average No. of Patients	Coke for Bakery, Laundry, Church and Greenhouse	Steam Coal for Light and Power	Steam Coal for Heating, Cooking, Laundry, etc.	Steam Coal per Patient per ann.	House Coal	House Coal per Patient per ann.
	Tons	Tons	Tons	Tons	Tons	Cwts.
563	117	802	1,477	4	170	6



33

QUANTITIES CONSUMED—*con.*

WATER		GAS			ELECTRICITY		
Total for 12 months including Farm	*Gallons per Patient per day	Total for 12 mos.	Per Patient per Annum	Cost per Therm	Total for 12 mos.	Units per Patient per Annum	Cost per Unit
Gallons	Gallons	Therms	Therms	d.	Units	Units	d.
9,451,900	46	5,623	9·98	8·65	117,040	207·8	2·3

*This includes usage in Scientific Laboratories and for Continuous Bath treatment.

Vegetable Garden and Farm.

Garden land under cultivation—27 acres.

Vegetables and Fruit supplied to Institution from the Farm and Garden with money value of same (April 1st, 1924, to March 31st, 1925) :—

Asparagus	3,350		Parsley	1,392 bunches
Artichokes, Globe	336 lbs.		Parsnips	5,688 lbs.
Brussel Sprouts	398 lbs.		Radish	224 lbs.
Beetroot	184 lbs.		Rhubarb	6,170 lbs.
Beans, broad	6,418 lbs.		Spinach	868 lbs.
Beans, kidney	1,752 lbs.		Horse Radish	20 lbs.
Broccoli	5,552 lbs.		Swedes	17,194 lbs.
Cabbage	23,212 lbs.		Sage	186 bunches
Cabbage, red	16 lbs.		Turnips	27,567 lbs.
Cauliflower	106 lbs.		Mint	1,040 bunches
Carrots	1,315 lbs.		Thyme	176 bunches
Celery	400 sticks		Apples	14,648 lbs.
Lettuce	3,685 heads		Currants	30 lbs.
			Cucumbers	124
				168 lbs.

Images 93 & 94, Showing quantities of fuels used over a 1 year period, source: Author's own 2020

(City of Cardiff, 1925)

2.2.4.1 ELECTRICS

A visual inspection of the areas toured identified both concealed electric services and surface mounted. Electrical services included power sockets, light switches and various form of lighting. Additionally, there appeared to be fire and alarm systems, however the limited access prevented the conformation of these. No tests were carried out on the electrical system due to the current state of the services etc.

Several areas including sockets and switches have been damaged throughout the building.

Images 95, 96,97, 98, 99 & 100, Showing the electrical services found throughout the hospital, source: Author's own 2020

ACTION

A full inspection to determine the condition prior to using any of the electrical services.

2.2.4.2 HEATING

The source of heating could not be determined due to access constraints, it is assumed the heat source is via gas powered boilers however this has not been confirmed.

Images 101 & 102, Showing the heating sources found within various rooms, source: Author's own 2020

ACTION

The complete system requires inspection and testing including repairs and replacement of necessary elements prior to commissioning.

2.2.4.3 WATER

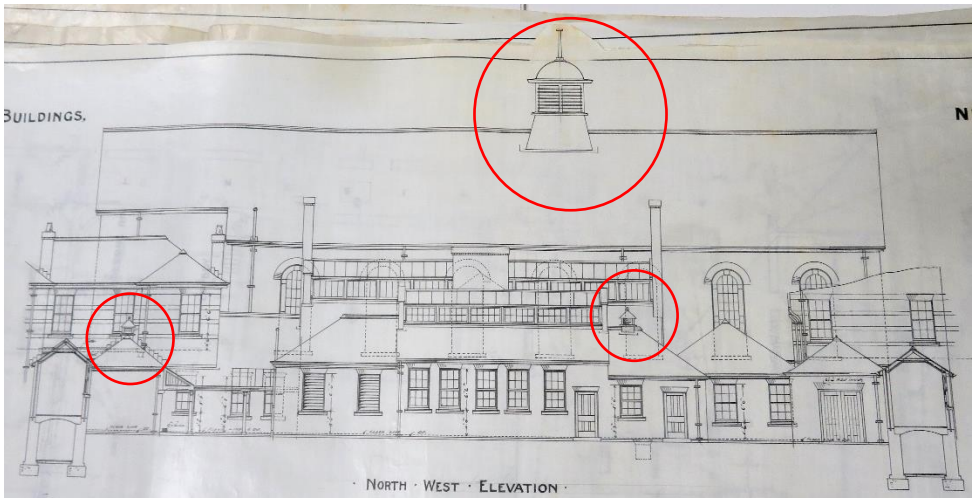
Upon opening in 1908 the hospital was supplied via water held in storage within the water tower, this is believed to have been taken from a well or stream in the immediate locality. In later years it is quite likely this was transferred to mains water; however, inspection of these service areas was not made available and so a determination could not be made.

ACTION

Full inspection of all water systems and supplies to completed prior to commissioning.

2.2.4.4 VENTILATION

Ventilation is believed to have been built into the fabric of the buildings as seen within the water tower and multiple cupolas about the roofs of the site.



Images 103, 104 & 105 showing the various forms of ventilation towers and copulas Image 106 taken from architects plans showing the ventilation arrangements, source: Author's own 2020

(Oatley & Skinner, 1902)

ACTIONS

It is highly likely that these ventilation cupolas and towers have become home to several species of wildlife, full investigation of these areas are required via an approved ecologist prior to recommendations being provided.

2.2.4.5 COMMUNICATION

Communication is by way of phone lines and integrated systems about the hospital. These were not inspected and only viewed briefly.

APPENDIX D - BUILDINGS & OTHER STRUCTURES

2.3.1 GROUNDS

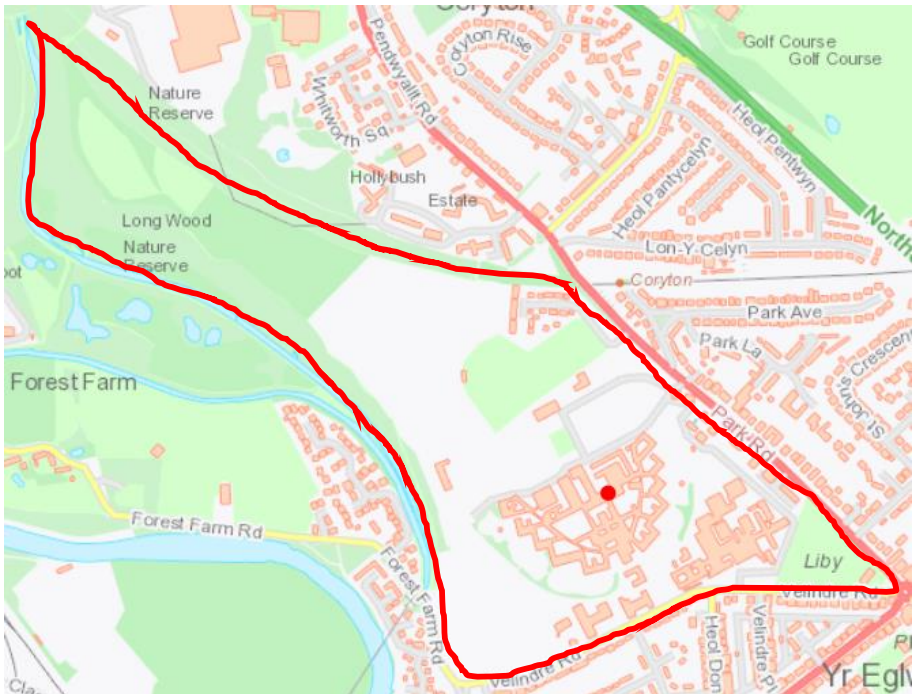
The overall area of the site is believed to be 120 acres with the hospital building footprint covering 4½ acres. The majority of the grounds to the north and west of the hospital remain open ground, encompassing fields, greens, and wooded areas.

Images 106, Ariel photograph of the hospital.

(RCAHMW, 2007)

2.3.2 BOUNDARIES

Boundaries are difficult to determine as the grounds have much altered during the twentieth century, plans of the boundaries to date could not to be determined or accessed.



Images 107, Plan showing the original extent of grounds of the hospital.

(Ordanace Survey, 2019) *(Boundary overlay source: Branford 2019)*

2.3.3 OTHER STRUCTURES

Other structures about the site includes a chapel to the north of the hospital intersected by open greens, and six octagonal timber shelters on the east south and west side of the garden surrounding Whitchurch Hospital. Construction in brief comprises of corrugated steel roofs, shaped and decorative valancing and a boarded ceiling. The roof is carried on pillars, the top halves of which are in the form of turned balusters with bases being cast iron. These are believed to date form the original construction date of the hospital 1902 to 1908. Their purpose is believed to be a sheltered area by which patients can be exposed to fresh air.

Image 108, Octagonal shelter, 1 of 6, source: Author's own 2020

ACTION

The octagonal shelters viewed appeared to be in surprisingly good condition considering the exposure to weather conditions. The protection offered by the cast iron bases to the foot of the timber pillars and the good condition of the roof have prolonged the life of the timber elements. A thorough clean and minor repairs are recommended prior to complete redecoration.

APPENDIX E – OTHER

2.4.1 ECOLOGICAL, ARBORICULTURAL CONSIDERATIONS

PIGEONS

On inspection there are several areas of pigeon waste, pigeons gaining access via broken windows and roof lanterns.

It is advised that further information and advice can be found at: https://www.hse.gov.uk/construction/healthrisks/hazardous-substances/harmful-micro-organisms/other-diseases.htm

BATS

There are several areas that are highly likely to be roosts for bats, whilst during the tour, a large proportion of the hospital was restricted and in so no evidence could be obtained to confirm residence. Further information can be found at: https://www.gov.uk/guidance/bats-protection-surveys-and-licences

TREES

Trees around the perimeter of the inner curtilage, these are considerable in height and stature however non were within a distance that would cause structural or safety concerns currently.

2.4.2 RISKS & HEALTH MATTERS

ASBESTOS

Throughout the hospital several areas believed to contain asbestos where noted, namely suspended ceilings believed to have been installed during the 1980's +/- 10 years. Vinyl flooring throughout, plasters to ceilings and it is assumed that service areas such as the boiler rooms are highly likely to contain quantities of asbestos containing materials. Further advice can be found at: https://www.hse.gov.uk/asbestos/

LEAD

Due to the age of the building it is assumed that all paint decorations to walls, ceiling and woodwork would contain lead-based paints to some degree.

Although not inspected it is highly likely that elements of the original water system are still installed, water was during the early part of the twentieth century was piped around via lead pipe work. The systems here were not examined, it is advised that all fresh water supplies be tested prior to use. Further advice can be found at: https://www.hse.gov.uk/lead/

PIGEONS

Several areas of pigeon guano were present within areas of the hospital, prior to carrying out works within these areas seek profesional advice, Further advice can be found at:

https://www.hse.gov.uk/construction/healthrisks/hazardous-substances/harmful-micro-organisms/other-diseases.htm

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