



Netley Chapel Tower – Structural Repairs and Conservation Design and Heritage Statement

**Royal Victoria Country Park
February 2025**

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1.0 Assessment of Heritage Significance

1.1 Description

Netley Chapel Tower, on the West front of Netley Chapel, is located within the Royal Victoria Country Park on Southampton Water, is suffering from increasing cracking to its brickwork structure, both internally and externally. Specialist investigations and analysis has identified structural issues of concern.

The brickwork to the area in question is of poor quality, possibly because it was originally constructed as part of the internal corridor wall, prior to the fire and subsequent demolition of the hospital within which it stood. It is possible that inferior bricks and workmanship would have been used for internal walls due to be plastered.

The brickwork in question is currently very friable and is regularly saturated, a situation exacerbated by its exposed location. It is likely that persistent saturation, combined with freeze thaw, has had a material effect on the integrity of the bricks, and as such the current understanding is that the saturated condition of the wall is likely to be a major contributing factor of the structural compression cracking being witnessed.

Netley Chapel is Grade II* listed and sits within the Grade II Registered Park and Garden setting of Royal Victoria Country Park.

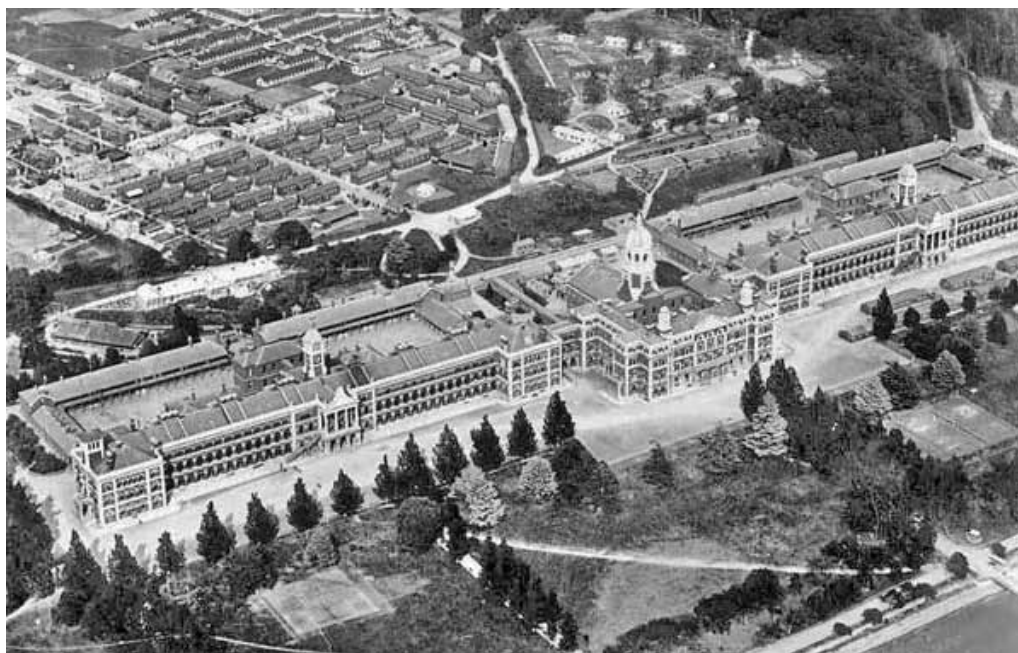


Figure 1 - Royal Victoria Hospital from the Air 1922

The listing description describes Netley Chapel as:

'Chapel in the grounds of the Royal Victoria Hospital (formerly listed as the Chapel of The Royal Victoria Hospital) SU 40 NE 8/160 9.4.74.

1856-63, by Mennie (War Department Surveyor). A large structure which once occupied an axial position at the rear of the enormously long-fronted military hospital, which faced Southampton Water. The hospital has been demolished, leaving the chapel with an unfinished wall on its south-west side. Classical treatment of simple rectangle with a tower making the former link to the main blocks. Eight bays to the sides, divided by pilasters supporting a blind arcade, within which are round-headed narrow windows; the Tuscan Order details are in stone, with keystones to the arcade, and a granite plinth, main walling in red brick (Flemish bond). North ("east-end") front of 1.3.1 windows, again with all the trimmings of a Roman Tuscan Order, with the gable treated as a pediment. The tower is massive, the square base rising above roof height; the

ornamental upper treatment starts with broaches, above which the tower becomes octagonal. Above a cornice, the stone structure has stepped back walling, which then supports a pavilion of open arches, within an architectural framework of keystone, architraves, pilasters and entablature on brackets; above this is a cupola surmounted by a classical finial. The building retains its status of a Royal Chapel.'

General Description:

The Chapel is a large classical structure, built between 1856-63, in red brick with Portland stone dressings and a slate roof. The nave is eight bays long divided by pilasters supporting a blind arcade within which are round headed narrow windows with the trimmings of a Roman Tuscan Order, and a gable pediment.



Figure 2 - The Chapel tower and the recently added café and pergola.

The tower is massive, the square base rising above roof height; the ornamental upper treatment starts with broaches, above which the tower becomes octagonal. Above a cornice, the Portland stone structure has stepped back walling, which then supports a pavilion of open arches, within an architectural framework of keystone, architraves, pilasters and entablature on brackets, surmounted by a copper clad dome, Portland stone lantern, and cupola.

1.2 Context

Royal Victoria Hospital is a site of local, regional, national and international significance. This is recognised in the level of heritage protection for the site which reflects its considerable historical importance. The Hospital was a personal project of Queen Victoria and when completed was the largest military hospital in the world. It became the centre for army medical research and training and treated more than 100,000 casualties from various major conflicts over a period of more than a century. The chapel originally occupied an axial position at the heart of the main hospital complex and is now the only part of the main hospital building which now remains standing, following demolition of the rest of the building in 1966.

An HLF project which completed in June 2018, contained significant improvements. Although no longer used for religious purposes, the chapel remains a substantial resource. These include a centre for educational events, exhibitions, concerts and weddings. The tower is a significant major landmark which can be seen from miles away both from land and sea. The views from the top of the tower give visitors an experience which informs them of the scale of the original complex.

The Chapel now stands in isolation at the centre of level lawns as part of the much wider landscape setting of Royal Victoria Country Park, owned and managed by Hampshire County Council. Royal Victoria Country Park is now a much loved community space, but was once the extensive grounds of the former hospital, with a number of other hospital buildings located around the site, a number of which still stand today. The Southampton landscape designer, William Bridgwater Page is thought to have laid out the grounds, which consisted of formal terraces and lawns leading from the main building down to the waterfront, surrounded by informal parkland. The main structure of the formal terracing still exists, as do the paths and roads.

Little is currently known of any other planting, other than what may be gathered from maps showing areas of trees and avenues. The main use of the park, as a place for rest and recuperation for wounded and traumatised soldiers, is in some way perpetuated by visitors to the site today. The tranquil setting of recreation grounds, woods and parkland overlooking the Solent still may provide people today with the health and wellbeing effects that were intended for returning soldiers in the past.

The foreshore forms part of the Lee-on-The-Solent to Itchen Estuary Site of Special Scientific Interest (SSSI), as well as Solent & Southampton Water Special Protection Area (SPA). The foreshore is also used for biodiversity education as an important place where interpretation can take place.

1.3 Historic Development

On 28 March 1854 Britain and France declared war on Russia, and for the next two years British and other troops fought against the Russian forces in the Crimean War. The large numbers of invalid soldiers returning from the Crimean War caused the War Department to begin preparing plans for a huge general military hospital. It was the Queen's Surgeon, James Clark, who first suggested Netley as a possible site for the new hospital. Since the Middle Ages Netley had been used as a mustering place, training ground and encampment for British troops so it already had a strong military association. A survey was then carried out by Captain Laffan of the War Department, who confirmed the site's suitability.

The foundation stone for the hospital was laid by Queen Victoria on 19 May 1856. Although a fine day, it was apparently windy and according to the 'Hampshire Independent' of 24th May it was too rough for the Queen to land on the jetty and the Royal Barge 'Fairy' was beached on the shingle for her to disembark. A loyal address was presented from the Corporation of Southampton. The Queen then examined the plans of the Hospital, and these were then deposited, together with the first Victoria Cross, a silver Crimea medal, complete with all four campaign bars, and coins of the realm, all in a copper casket. These were recovered after the demolition of the hospital in 1966.

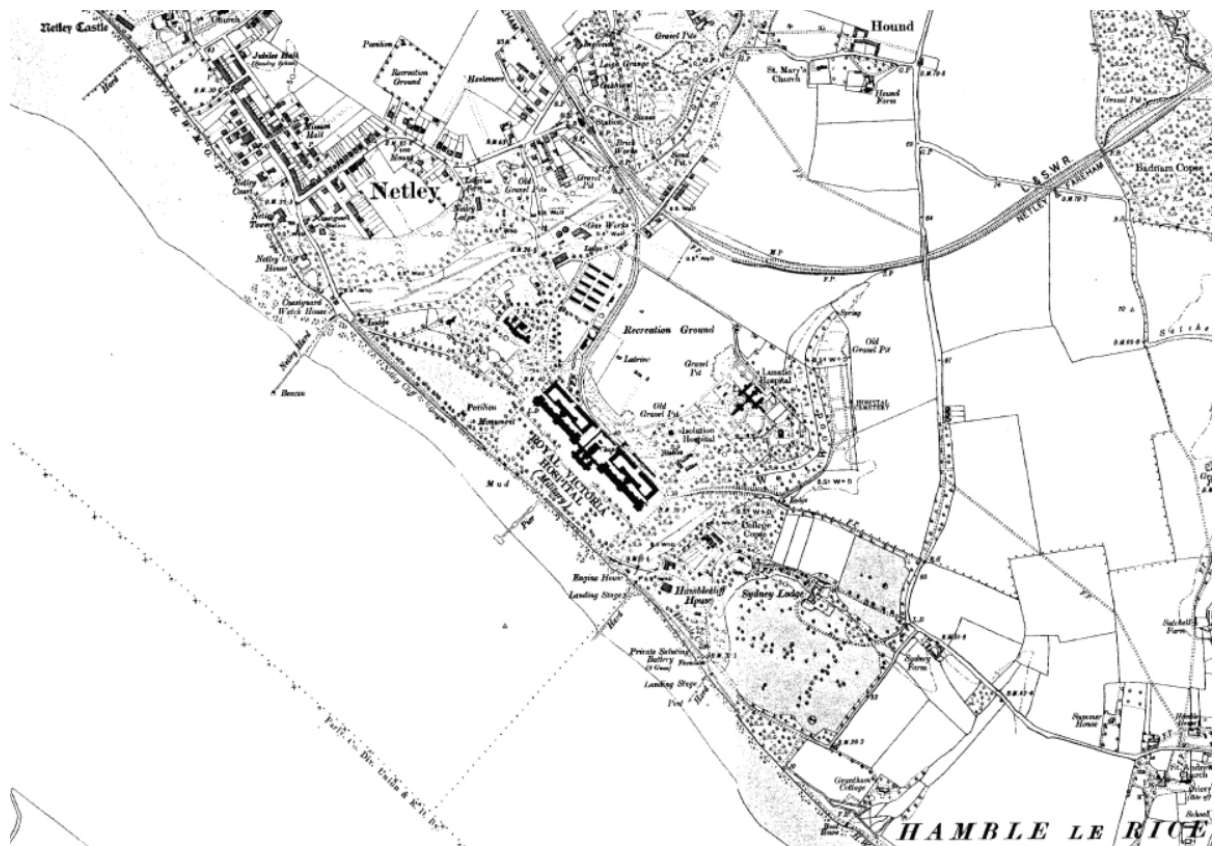


Figure 3 - Map of the Hospital in 1870



Figure 4 - Hospital train from the Boer War: 1901-2

Many of the men on the construction were living on the site, but about 100 were ferried from Woolston daily. Two railway locomotives were used during its construction, to drive machines for mixing mortar for the masons and bricklayers. After they had completed this work, their wheels were re-attached, and they were driven off site. The bricks used in the construction were locally made "Fareham Reds". These were used in constructing many important buildings across the Empire, often shipped out as ballast. They were also used in the construction of the Royal Albert Hall, built

at about the same time and sharing many architectural features with the former Hospital. The hospital opened in March 1863 having cost £350,000 to build, equivalent to around £50 million today.

Over the years from its construction to final demolition the hospital treated casualties from a number of wars fought worldwide, and consequently the hospital site underwent significant changes throughout its lifetime to deal with various changing needs of casualties and their injuries whether they be mental or physical. In the 1870's an officer's mess was constructed, together with the military lunatic asylum within walled grounds, both of which are still standing today. During the Second Boer War (1899-1902), the rail line was extended from Netley Station, allowing casualties to be brought directly to the rear of the hospital.



Figure 5 - Bringing the Wounded to Red Cross Huts

During the First and Second World Wars temporary huts were erected in the grounds to the north of the hospital building, bringing the accommodation available for patients up to several thousand at a time. These buildings were taken down after each war enabling the land to be returned to the recreational parkland of the hospital. The Grade II listed Empire Building was built in 1939-40 for the YMCA as a social centre, in order to aid the recovery of convalescing troops. Designed by Kenneth J. Lindy, this is a timber-frame building

clad in weather-boarding and cedar shingles. In plan it is T-shaped on plan originally with hall in the main range, billiard and quiet room in east cross-wing and a stair tower in each of the two angles.



Figure 6 - Netley Military Cemetery

The military cemetery was established soon after the construction of the hospital around 1870 and received casualties from all of the major conflicts up to the end of the Second World War. It contains around 3,500 graves, mainly military personnel but also wives, children and hospital staff. Among these graves are 636 First World War burials but only 35 from the Second World War. Following the Second World War the hospital continued to care for some casualties returning from overseas service. It also accommodated Hungarian refugees in 1956, but due to its high cost of maintenance, it gradually fell into disuse, and the main site closed in 1958.

In 1963 a large fire damaged much of the main building and in 1966 it was demolished, leaving only the central chapel. The chapel was originally scheduled for demolition, but was saved at the last moment as a monument to the hospital. A ceremony uncovered Queen Victoria's time capsule beneath the foundation stone on 7th December 1966. In 1979 the majority of the site was purchased by Hampshire County Council and now forms part of the 95-hectare Royal Victoria Country Park.

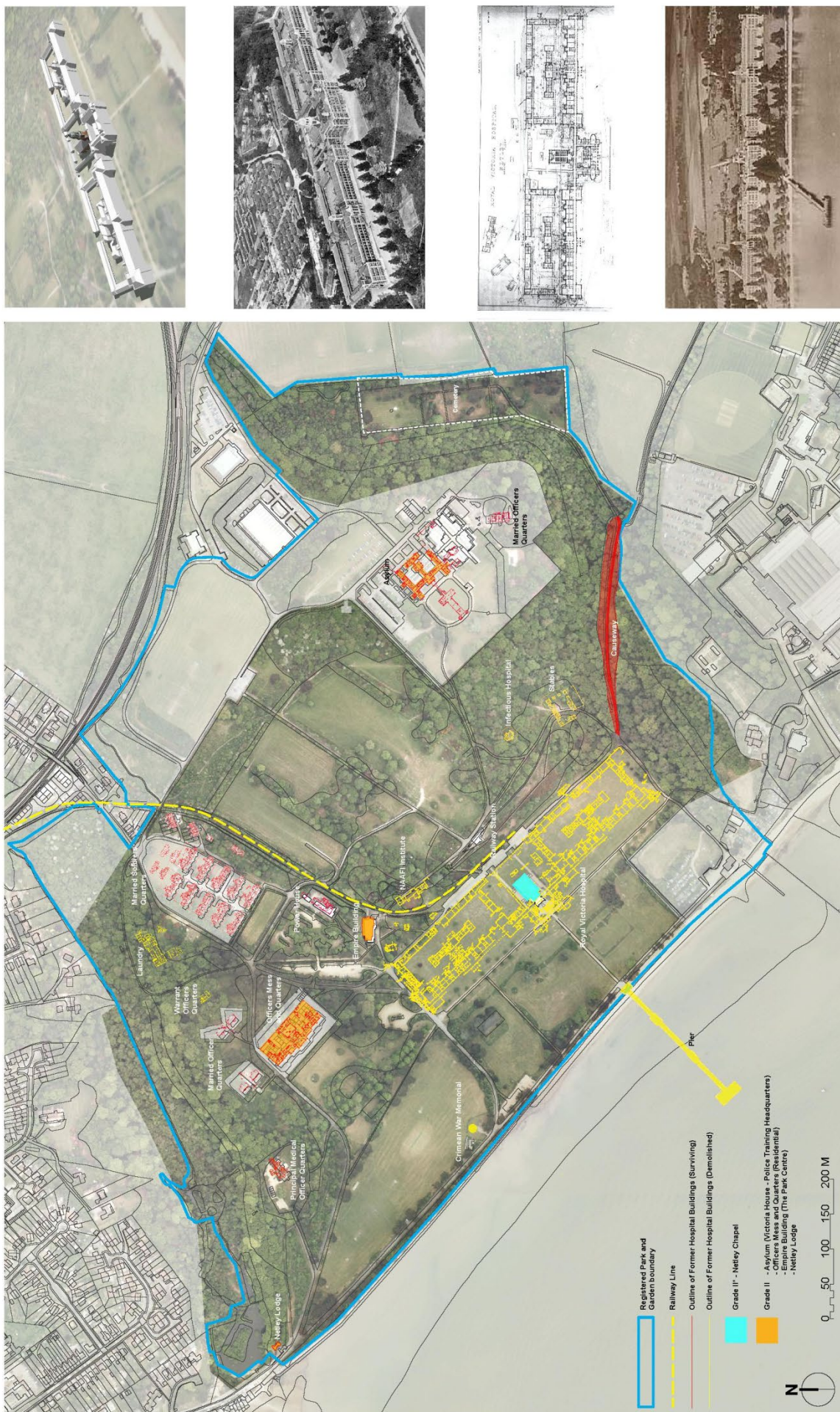


Figure 7 - Drawing showing the original hospital buildings.

Timeline and Key Events

1856	Foundation stone of Royal Victoria Military Hospital laid by Queen Victoria
1863	Royal Victoria Hospital opened in Netley, Southampton, and Army Medical School moved there with the Pathology Museum and Library
1863	8 th May: Queen Victoria visits the Hospital. Her first public appearance since Prince Albert's death
1898	Existing Army Hospital Corps and Medical Staff Corps merge and Royal Army Medical Corps founded
1900	Rail line from Southampton to Netley extended to the hospital at the suggestion of Queen Victoria
1902	Army Medical School transferred to London
1914	British Red Cross builds 'huttet hospital' for First World War casualties
1917	January: War Neuroses filmed at the Hospital
1918	June: Wilfred Owen arrives at the Hospital
1920-30s	Hospital used as tuberculosis sanatorium
1939-40	YMCA social centre built, now the Grade II listed Empire Building
1943	Doctors at the Hospital examine Rudolf Hess
1944	Transferred to US Forces
1945	Returned to British Forces
1945	German officers debriefed at Netley
1955	Pier demolished
1956	Hungarian refugees housed at Netley
1956	6,000 troops assemble prior to action during the Suez Crisis
1958	Main site closed
1963	Large fire damaged much of the Hospital building
1966	Military Hospital demolished leaving only the chapel
1973	Memorial dedicated to fallen Army Medical Department members in the Crimean War demolished
1979	Purchased by Hampshire County Council
1980	Royal Victoria Country Park opened
C1985	Octagonal staircase installed in Chapel tower to allow access to observation floor, and toilet block constructed at chapel entrance
2018	HLF project completed. To demolish the modern toilet block on the front southwest elevation and construction of an understated timber clad multi-purpose building to the side, providing toilets, café and offices. The chapel interior was restored to original colours and a new lift was provided in the Chapel tower in an original lift shaft, albeit with new openings added.

1.4 Heritage Significance

The principal significant historic feature of the Chapel is the site's association with military medicine. Spurred on by public and political concern over the treatment of military personnel during the Crimean War, the largest military hospital in the world was constructed. Despite the shortcomings in the design of the Hospital which were identified from the outset, major advances in treatment of both physical and mental illnesses were made, with tens of thousands of patients treated. This included combatants from several military campaigns, including the two World Wars.

It was the home of the Royal Army Medical Corps and was heavily involved in the early stages of development of professional nursing. The hospital represented an evolution in medical architecture and practice which would help change the face of the medical world. Being the only remaining part of the British Army's first purpose-built hospital, the Chapel and surrounding grounds are of local, regional, national and international significance.

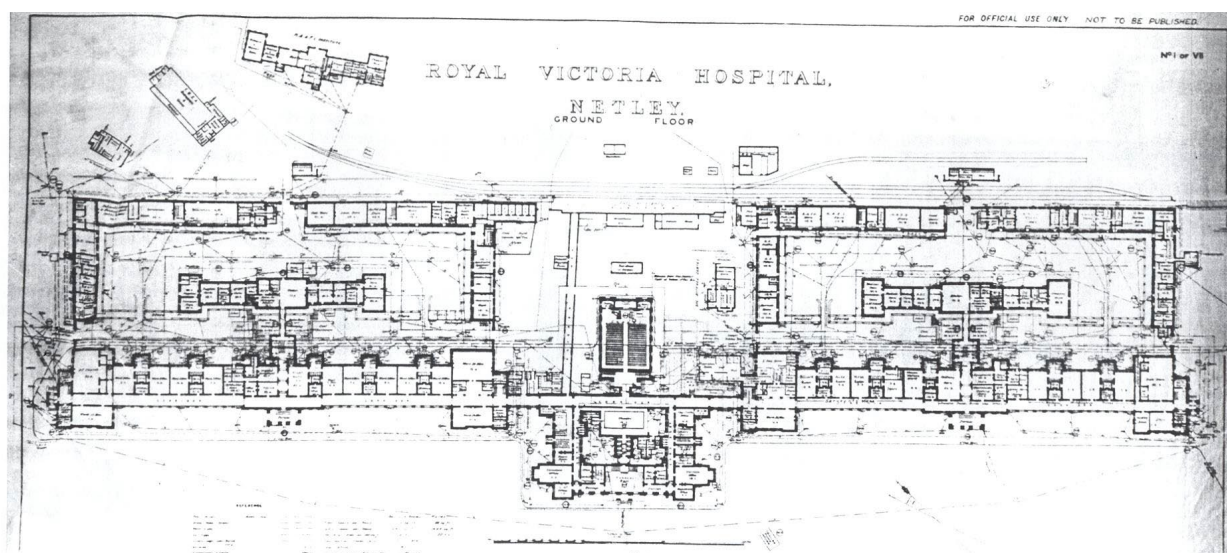


Figure 8 - Original Hospital Plan

Association with particular persons gives historical value a particular resonance, and the Royal Victoria Hospital is no exception, being closely linked to Queen Victoria, Florence Nightingale, Sir Almroth Wright, & Dr George Stewart Beaston to whom the stained-glass windows in the chapel were dedicated as a memorial. Queen Victoria laid the foundation stone in 1856, and the time capsule which she placed there was recovered in 1966. Her personal affection for the Hospital continued throughout her life. She visited repeatedly, awarding medals to patients (including three Victoria Crosses), knitting shawls for patients and reportedly paying for prosthetic limbs for amputees from her own money.



Figure 9 - Royal Victoria Hospital in the late 19th Century- Note Cupola of Chapel in its Original Context

The chapel's bold domed tower which dominates the landscape retains a unique aesthetic value, despite having had its adjacent complementary buildings demolished in 1966. The interior of the chapel contains examples of solid Victorian craftsmanship which have stood the test of time, each with aesthetic qualities of their own, e.g. ornate cast iron columns and railings, stained glass windows, and robust joinery.

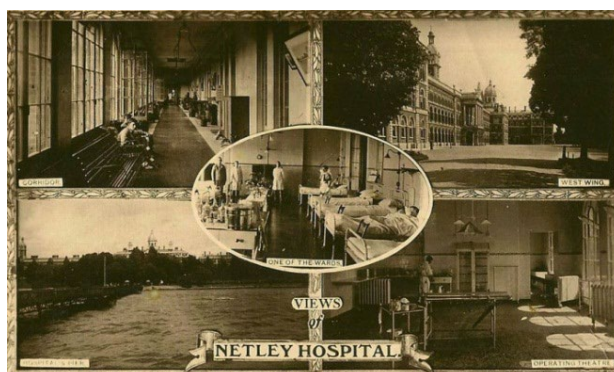


Figure 30 - Postcards of the Hospital

The landscaped grounds of the Hospital, including terraced lawns, woodlands and paths flanked by trees, are an English Heritage Registered Grade II Park & Garden, registered in 2002. These grounds were laid out to enhance the setting of the Hospital, and to allow the Hospital to be expanded in times of special need. Taken together, the Hospital and grounds form a rare example of a designed landscape created for the treatment and convalescent care of soldiers as well as a battlefield training ground for orderlies and ambulance crews.

2.0 Assessment of Impact

2.1 Background

The Chapel is open to the general public as a free to enter museum attraction with an opportunity to visit the top of the tower via a lift to the second floor and stair to the top.



Figure 4 - The North West Elevation of the Chapel showing the former toilet block.

In the 1980's the Chapel was converted into a Heritage Centre, for which a number of alterations and additions were made, including a new brick building on the front elevation to provide toilet facilities. As part of these works an exhibition was installed around the perimeter of the main chapel hall. In 2007 a significant amount of structural and repair work was undertaken to the tower by Hampshire County Council. Then in 2018 replacement of the toilets to the side to increase the prominence of the tower.

More recently, in 2022 a piece of brick fell from the first-floor window reveal onto the footpath leading to the main entrance. When comparing images from 2020, this was a new crack, and other known cracks were showing signs of further deterioration. In some instances, cracks on the external façade, aligned with cracks and plaster damage internally. In general, the cracks are on the south-west and south-east elevations.

A structural survey of the tower and subsequent crack monitoring highlighted the need for a protection and repair strategy. The aims and objectives of the project are:

- Short term, to protect the chapel tower from the elements and the winter wet / freeze / thaw conditions with a fully sheeted scaffold, whilst undertaking the essential works below.
- Masonry strengthening.
- Reduction of water ingress, through masonry and window.
- Alterations to increase the breathability and permeability of the internal surfaces.
- Increased ventilation, by incorporating louvres into the window openings.

Below is an extract from the structural survey report:-

"The cracks, which have instigated the current appraisal, have appeared more recently. This is consistent with the applied load being close to the brick's capacity such that small amounts of deterioration, due to elevated moisture content, freeze-thaw, salt mobilisation or temperature variation, may lead to equilibrium being disturbed in the wall. Cracks will of course provide new routes for moisture to penetrate the wall.

For this reason, it is also worth remembering that the distressed brickwork facing south-west, was not intended to be exposed to the weather. It was originally the internal wall along the corridor, the arch windows would have been for the lift shaft and a change in direction of the corridor.

The most significant cracks reported are orientated vertically on the brick piers and are close to the exposed faces. There are several plausible reasons for this. Firstly, the outer bricks are more exposed to the weather, and secondly load is likely concentrated near the edges due to the window arches. In these locations compression of the brickwork will necessarily lead to lateral dilation, which is unconfined at the window positions. The relationship between vertical compression and lateral dilation is controlled by Poisson's ratio.

Based on the postulated mechanisms for causing distress, it is reasonable to assume that the present condition of the structure will become worse over time. While the applied load will not change, the brickwork's exposure to the elements will continue, indeed the intensity of rainfall is predicted to increase. Eventually the brickwork will not have sufficient residual capacity to redistribute loads, which will lead to a more significant compromise of its stability and integrity.

It follows that since there are several factors that contribute to the condition of the wall, they will need to be addressed in different ways.

The pointing needs to be repaired with matching lime mortar to ensure that bricks are evenly bedded and so that moisture can escape without passing through the bricks. Lime mortars are flexible and will also help to accommodate movement without bricks cracking. Any cement mortar should be removed and replaced. It is important to make sure that the mortar is weaker than the bricks to mitigate the likelihood of bricks being cracked in the future.

Cracked bricks, and those that have begun to crumble shall be removed and replaced with suitable reclaimed or new bricks. Care must be taken not to use bricks that are too strong, as this will adversely affect the wall. Where the brickwork has become weaker and cracked by the moisture ingress it is proposed to enhance the brickwork stress and damaged brickwork integrity by installation of a proprietary stainless steel 'Cintec' anchor system. Whilst this would be an intrusive process and could uncover and disturb further flaws within the wall, the system is proven to offer a concealed mass brickwork enhancement.

With the Cintec installation it is envisaged that only the outer depth of brick, where damaged, would be replaced. The internal cracks would be lime grouted under light pressure to fill to some extent and restore an element of integrity and more important to re-provide moisture permeability.

On the interior face of the brickwork any impermeable coatings should be removed, for instance cement render and emulsion paint, to help the wall dry out. Wherever possible ventilation should be improved, and heating maintained to improve the drying process.

The methods and techniques for the masonry conservation repairs will reinstate the face permeability, and will better resist rainwater ingress, by replacement of damaged brick, repointing in lime mortars and removal of internal finishes, which will all aid drying through the depth of the wall over time.

Together the measures described above will help the brick release water and will restore, to an extent, the wall's ability to re-distribute load. This will improve the current margin of safety, though it is difficult to specify by how much. Nevertheless, since the structure has stood since 1863, its proportions should be sufficient providing the materials it is made of retain their properties".



Fig 12, South Elevation



Fig 13, West Elevation



Fig 14, North Elevation



Fig 15, East Elevation

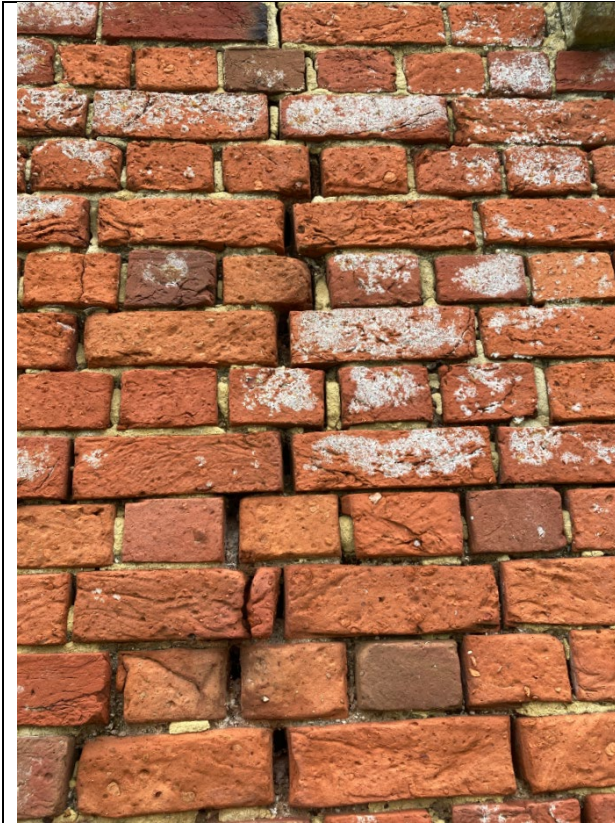


Fig 16, Failed brickwork pointing



Fig 17, Significant crack at window reveal

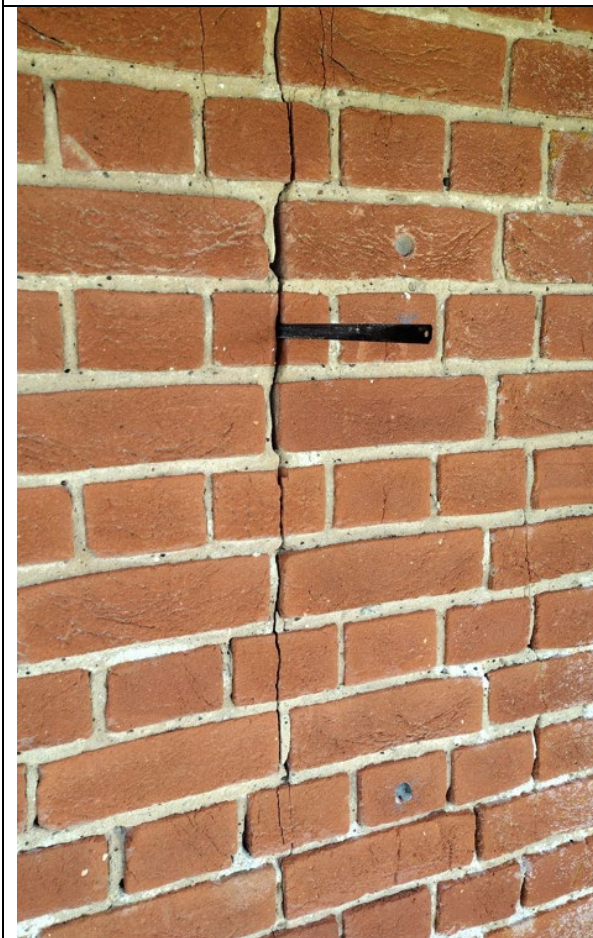


Fig 18, Significant crack in masonry panel between windows



Fig 19, Lift shaft significant cracks within window reveal.



Fig 20 Upper floor windows leaking



Fig 21 Staircase level windows leaking



Fig 22 Upper stonework pointing, and leadwork

2.2 Outline of Proposals

The proposals include:

- Bore holes through external walls to establish the core construction.
- Masonry reinforcement using Cintec anchors. To achieve an invisible repair, this would require removal of individual face bricks and in some case, removal of a section of plaster. The masonry is then cored drilled, and a steel bar enclosed in a mesh fabric sleeve is inserted into the hole which is injected with grout under low pressure. The outer face brick is then replaced.
- Further structural strengthening works including restraint straps at third floor level of the tower.
- Face brickwork repairs, full repointing using lime mortar, and the replacement of spalled, failed, cracked or delaminated brickwork external and internal.
- Internal masonry crack repairs and strengthening.
- Removal of internal finishes, plaster and decorations, to improve breathability of the masonry structure and to mitigate the ongoing deterioration of these finishes internally caused by trapped moisture. (including finishes to the lift shaft inner walls).
- Replacement of high-level modern aluminium windows,
- Replacement of decayed timber circular and half round windows at stairwell level.
- Incorporation of glazed-in and wall louvres into windows openings to add ventilation of the tower masonry.

Details of all the proposed works are on the drawings included with this application.

2.3 Impact of Proposals

1. Installation of Cintec anchors

- Impact on historic fabric: High
- Impact on setting of heritage asset: Low
- **Overall impact on significance: High**
- Extent of impact: High

Potential heritage benefits:

The process is a subtle solution to improve the structural integrity of the tower. The intrusive nature of installation and quantity of the stainless-steel bars drilled deep into the solid brickwork is considered a significant intervention on the fabric. However, the methodology of removing outer brick prior to the process and then reinstatement on completion, produces an invisible repair.

2. Internal third floor restraint straps

- Impact on historic fabric: Low
- Impact on setting of heritage asset: Low
- **Overall impact on significance: Low**
- Extent of impact: Low

Potential heritage benefits:

The restraint straps will provide further structural restraint to the mass masonry structure and intermediate floor. Being located at third floor level the straps will form part of the modern octagonal staircase installed circa 1985.

3. External masonry conservation brickwork and stone repointing and replacement

- Impact on historic fabric: Low
- Impact on setting of heritage asset: Low
- **Overall impact on significance: Low**
- Extent of impact: Low

Potential heritage benefits:

The structural report suggests the cause of the deterioration is due to environmental conditions, water ingress followed by freeze / thaw. The methods and materials for the external masonry conservation, will reduce water ingress and promote breathability and drying out of the fabric.

4. Internal removal of finishes

- Impact on historic fabric: Medium
- Impact on setting of heritage asset: Medium
- **Overall impact on significance: Medium**
- Extent of impact: Medium

Potential heritage benefits:

The removal of impermeable finishes to the inside face of the external walls will promote the fabric breathability and add to the natural drying process of the thick wall construction.

The loss of internal finishes including Victorian plaster and 170 years of applied decorations will leave un-plastered brickwork as a finished wall, which will be in contrast to the current decorated plaster and brickwork.

5. Replacement of aluminium windows at belfry level, incorporating louvres

- Impact on historic fabric: Medium
- Impact on setting of heritage asset: Low
- **Overall impact on significance: Low**
- Extent of impact: Low

Potential heritage benefits:

The existing belfry windows are of a relatively modern intervention and provide weather protection to the belfry openings. They are thought to have been installed during the 1985 refurbishment. They are in poor condition and leak significantly. The replacement windows will be similar, but more effective. One arch window-pane will become a louvre to promote high-level ventilation of the tower and aid drying out. Alternate windows have an external iron lattice as part of the original belfry, and these will be retained.

6. Replacement of decayed timber windows incorporating louvres

- Impact on historic fabric: Low
- Impact on setting of heritage asset: Low
- **Overall impact on significance: Low**
- Extent of impact: Low

Potential heritage benefits:

The stairwell windows are painted timber again thought to have been installed during the 1985 refurbishment. They are in poor condition and leak significantly, due to being exposed to the elements at high level. Being approximately 18m – 25m above ground level, future maintenance is very difficult. Therefore, aluminium frames are proposed as a product that will provide greatest longevity with minimum maintenance. One arch window-pane will become a louvre to promote ventilation of the tower and aid drying out.

3.0 Mitigation

The assessment of the impact of the proposed works has identified that the proposals will have a Low to Medium impact on the significance of the building.

It has been previously agreed that an application for Listed Building Consent for the temporary fully sheeted scaffold is not required. This scaffold will be erected as an enabling works package to provide shelter to the tower protecting the brickwork from the environmental conditions and allowing the structure to dry out ahead of the proposed repairs and conservation which will follow.

The structural analysis has suggested that contributing factors of the brickwork deteriorations are:

- The front wall facing south-west would have been built as an internal wall, and therefore a lower quality brick would have been selected.
- The constant exposure to climatic conditions causing saturation and then freeze / thaw.
- Loading from the mass brickwork construction, and the historic removal of the water tank iron support structure.

The condition of the brickwork, the increased cracks showing, and falling masonry are becoming an increased concern, and hazardous to staff and visitors using the building.

The proposals seek to

- Short term sheeted scaffold, to protect the structure from the elements.
- Structural ties to increase the load capacity of the brickwork, especially to the piers adjacent to the window openings.
- External brickwork repairs and conservation to reduce water ingress.
- The internal removal of finishes, will increase breathability, and aid the natural drying process of the thick wall construction.

On completion of these works the tower will have improved structural integrity and resistance to the weather, allowing the removal of the scaffold.