

Prinkipo Orphanage Büyükkada-maden Mahallesi Istanbul

Structural Inspection

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Introduction

The building was originally constructed as a hotel and casino in 1898 but was not used as such and thence sold and operated as an orphanage from 1903 until 1964.

It is reputed to be the largest timber framed building in Europe but is currently empty and has not been occupied since the orphanage ceased operations.

The building is presently on the Europanostr list of seven most endangered historic structures 2019.

The building was inspected on the 11th March 2019.



North elevation showing six storeys and double jetty at upper floors.

Description.

The building is constructed on a site sloping west to east overlooking the sea and on a gentle rise north to south. This gives an Undercroft to most of the building but with the north end at ground level.

The structure is formed in timber frame, up to six storeys high, with vertical cross braced panels either side of windows apparently extending the full height of the structure to give stability in the plane of the external walls.



Bracing above and below windows.

Bracing to external wall visible through failed boarding.

Similarly, internal walls were noted, where visible, to be braced in a comparable manner with pairs of adjacent braces.



Pairs of braces in internal walls.

The panels over windows are also diagonally braced to transfer loads to the framing posts and provide additional lateral stability.

Principal joints were noted to be nailed with large iron nails. Carpentry joints were only noted to the plate in the Undercroft. Secondary joints were noted to be wire nails.

Floors are formed with common joists bearing on timber beams and internal walls. The walls are formed in studwork finished with lathes and lime plaster.

It is not clear how the floor structures are connected to the external walls.

The external elevations are finished with rebated close boarding externally and lathes and lime plaster internally.

External elevations were noted to be jettied and double jettied in some locations with supporting diagonal braces encased in a radiused coffering.

The roof, where available for safe inspection, was noted to be formed with shallow pitched common rafters supported on a braced purlin and with an elevated collar near the ridge.

The roof is finished with Marseilles pantiles with a traditional extended eaves supported on diagonal braces.

The Undercroft supports the ground floor with a masonry external wall envelope and a regular grid of brick piers.



Undercroft structure

There are a number of vertical masonry structures forming flues, and stair tower and a latrine tower, the latter two apparently added to the original structure.

The entrance hall, lobby and theatre have a grid of long span beams supported on timber posts all covered in coffering and panelling. The base of

these posts are visible in the Undercroft where they bear on the ground floor structure and masonry columns.



View of theatre with large span beams.

The other rooms available for inspection generally have domestic scale systems of beams and joists except for the kitchen which has a complex roof structure incorporating an extract system.

The visible and accessible structural members were noted not to exceed 200 mm x 200 mm for posts, braces and plates with joists of ***mm x 65 mm at 350 mm c/c. it is assumed that the longer span beams are of a larger section.

The structure originally has a ground floor terrace formed with steel beams and masonry jack arches with posts supporting on open roof to the east elevations.

A number of apparently boarded up window opening were noted. It is not clear if these were not installed as part of the original scheme or subsequently closed.



Condition.

The structure is considered to be in a dangerous condition. Much of the roof has been lost with elements collapsed onto the upper floors or suspended from wall heads. Some elements are evident on the ground around the structure. A number of fallen tiles were noted internally several floors below roof level.



Collapsed roof over internal upper corridor

Subsequent water ingress resulting in timber wet rot and a loss of lateral restraint previously provided by the roof has resulted in a failure and loss of some internal and external wall panels. This is particularly evident on the west elevation where roof and external wall failure has led to the loss of some floor elements leaving significant structure unsupported and hanging.

Sections of timber boarding and in particular the corner fillets have failed allowing water ingress and subsequent loss of structure. This is particularly evident on a number of external corners where the corner post has decayed completely.



South end of west elevation.

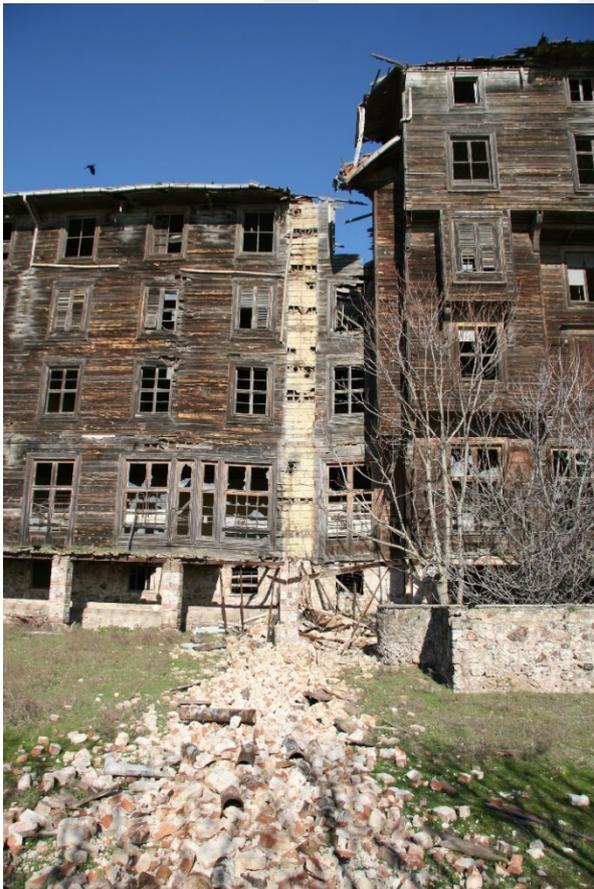
Some distortions in external framing are due to a loss of the lower plate but a number appear to be due to differential movements at ground level. These can be clearly seen on the west and east elevations.

A significant number of the braces supporting the single and double jettied sections were noted to be decayed, displaced or missing.

The east terrace and its protective roof is in poor condition with severe decay to some of the steel beams and the roof largely lost.



Steelwork to east terrace.



One of the masonry full height flues has recently failed and now lays where it fell.

The remaining masonry structures are in reasonable condition but it is not clear how the full height flues are restrained except by the flue connections.

The vast majority of the windows have lost their glass and therefore are not wind and rain resistant.



Discussion.

The structure is in a very vulnerable condition with the roof largely ineffective, both as restraint to the walls, and to keep out moisture.

Similarly, the windows are not effective.

The ensuing weather penetration has resulted in widespread wet rot and decay with consequential loss of competent structural members and connections.

Significant elements of structure are poorly or ineffective supported and currently in a precarious position and likely to fall without notice.

The external boarding is missing, decayed or displaced in numerous locations further allowing the penetration of wind and moisture.

The number of penetrations to the building leave the structure vulnerable to storm damage with wind able to penetrate the external envelope but, due to the internal layout with a central lateral corridor, not able to exit without increasing the internal pressure.

The principal structural form of the building, the vertical braced panels, are being significantly compromised by the decay to the timber elements. In some locations the form has been sufficiently lost to cause the loss of historic fabric. In other locations the loss is sufficient to cause concern as to the stability of localised elements and the probable loss of further elements of historic fabric. The further loss of localised elements may cause the additional loss of adjacent members and panels, the extent of which is not possible to predict.

There are two possible approaches to the repair of the structure.

Option 1 would be to erect a full scaffold enclosure and internal temporary support to protect the entire structure whilst repair details and methodology are discussed and agreed. This would give access internally and externally for

a full conservation repair scheme. An indicative sketch is attached as appendix A.

Option 2 would be to carry out temporary localised roof and external envelope repairs to prevent further water ingress and install temporary internal propping to stabilise the structure. Scaffolding would be required in the long term to enable a full repair scheme to be carried out.

Both options would require the use of a suitable crane to carefully remove dangerous high level dislocated and suspended structure.

Conclusion.

The building is considered to be dangerous and in a very vulnerable condition. The loss of large sections of the roof and the numerous penetrations of the elevations, including the windows, is allowing moisture unhindered access to large parts of the structure.

There are a number of areas of displaced and hanging structure at high level that may fall without notice.

The structure requires immediate stabilisation, protection, repair and conservation if the damage and loss of historic fabric is not to become irretrievable.

Recommendations.

We feel that option 1 is the appropriate approach to the repairs as it addresses the condition of the structure directly and will deliver a full structural solution without duplicating any permanent or temporary repairs.

We would therefore recommend the following outline methodology:

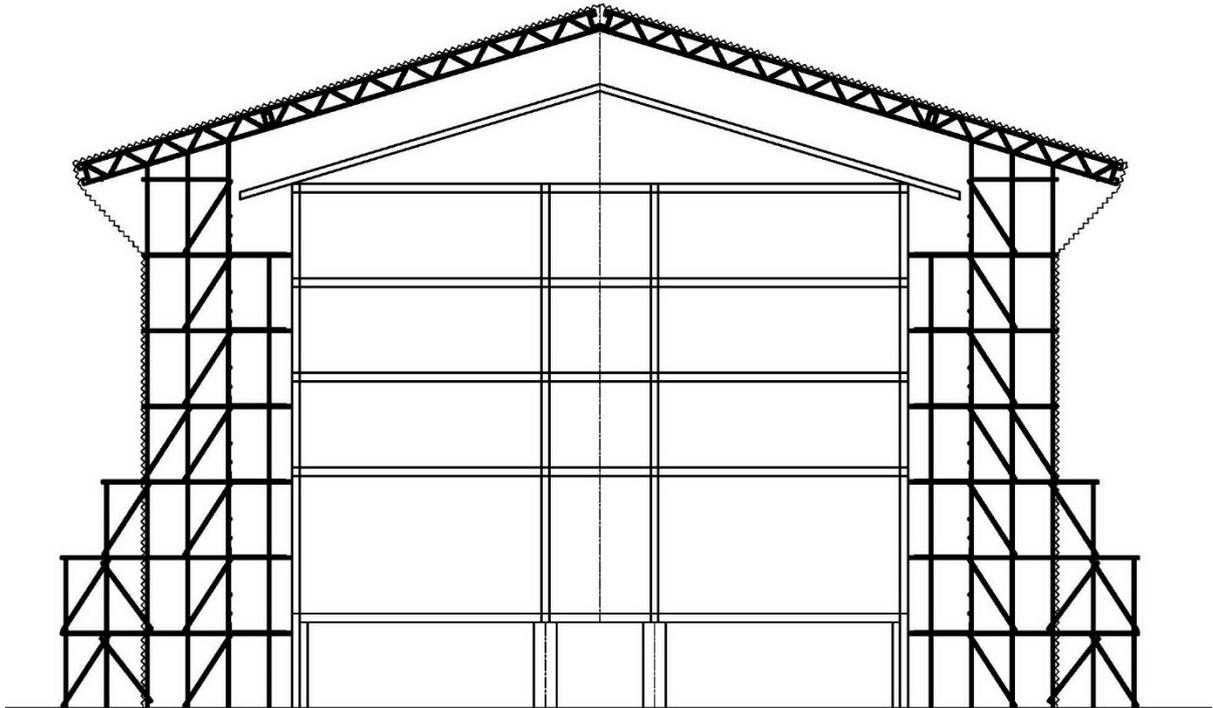
1. Carefully remove all trees and vegetation growing on or in contact with the structure.
2. Remove all debris from the ground around the structure to give a 15-metre clear zone and safe and unimpeded access and egress.
3. Using two cranes, one with a man basket, carefully remove dislocated and hanging structure at high level.
4. Carefully erect a scaffold enclosure for the whole structure. Scaffold to be designed to be self-supporting permanent structure capable of resisting the winds loads appropriate to the location. Scaffold to incorporate buttressing to the historic fabric in a number of locations but otherwise not to be in contact with the historic structure.
5. Commencing in the Undercroft and working up and on one floor at a time carefully remove all rubbish and debris and install temporary propping as required. Propping to have a defined and competent load path back to ground.
6. With the building safe carryout detailed analysis of the structure and prepare repair details and schedules.
7. Carry out structure repairs as appropriate upon completion of the items above.
8. This is likely to include the following:
 - 8.1 Careful recording and removal of the external boarding to give access to structural repairs. Sound boarding can be set aside for repair and reuse.

- 8.2 Replacement/repair of the major part of the roof structure.
- 8.3 Reconstruction of parts of the fifth and sixth floors to support the roof.
- 8.4 Repair of external structure as required including the replacement of decayed and missing members.
- 8.5 Overhaul of nailed joints and replacement of defective and decayed nails.
- 8.6 Replacement of missing and decayed jetty props.
- 8.7 Replacement of missing and decayed plates to lower level.
- 8.8 Repair/ replacement of defective internal beams and posts.
- 8.9 Repair/ replacement of defective internal joists and floor boards.
- 8.10 Replacement of missing internal joists and floor boards.
- 8.11 Repair and re-glazing of windows.
- 8.12 Re-fix external boards and replace missing boards. Consider reviewing existing detail to introduce a moisture membrane.
- 8.13 Review external cladding corner detail to try and prevent previous premature failure.
- 8.14 Repair masonry structures as appropriate.
- 8.15 Reconstruct fallen flue.

Appendix A

Indicative scaffold design.





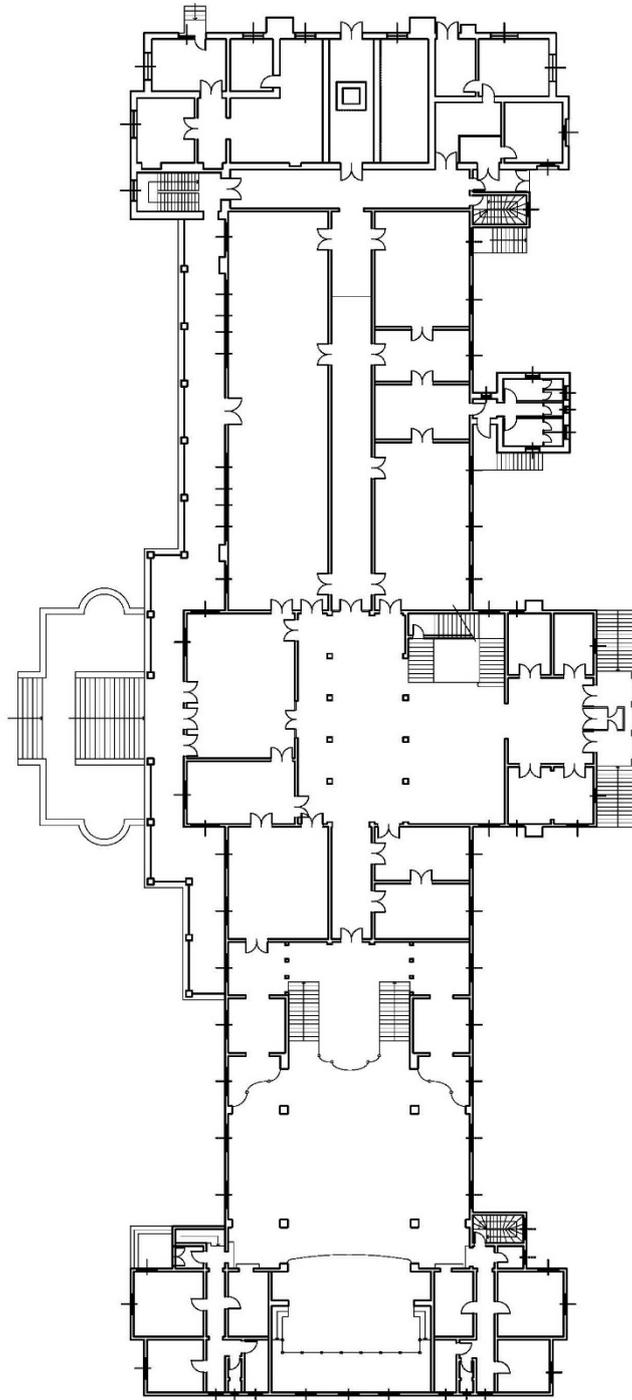
Indicative scaffold section.



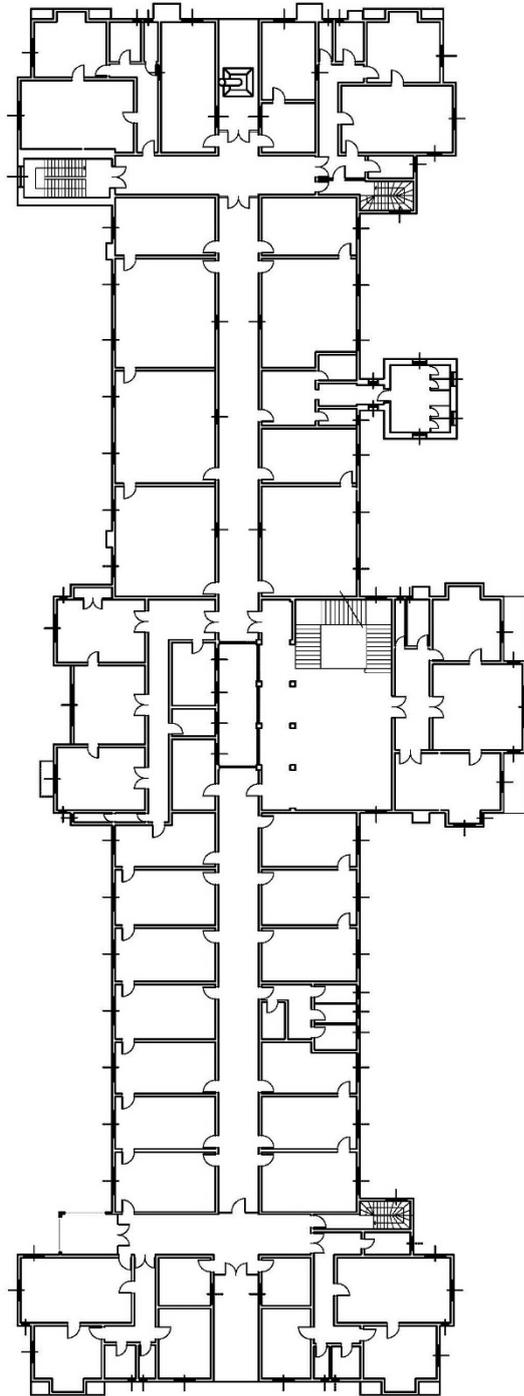
Appendix B

General Arrangement Plans





Ground Floor plan



Typical upper floor plan

Shown below are a number of current or recent historic and conservation projects.

The Tower of London

Hockley and Dawson are currently working on a number of projects at HM Tower of London, Hampton Court Palace and Kensington Palace for Historic Royal Palaces. The picture shows the recently completed White Tower Stairs.



Turners House

Sandycombe Lodge was built by 1813 to the designs of England's great landscape painter, J.M.W. Turner; working here as his own architect to create a quiet retreat for himself.

Recently completed repairs and conservation with Butler & Hegarty have been gained a number of awards for the quality and vision of the project which unusually included the removal of later additions to get back to Turners original vision.



The Masters House. Ledbury

The repairs presented a number of interesting technical difficulties in carrying out appropriate conservation and strengthening to the existing frame without significant interventions.

One solution was to install a cartridge over roof fabricated on the ground in timber cassettes filed with natural insulation and placed over the existing hall roof. This allowed the historic roof to be presented in its original form with minimum intervention to the original fabric.



Kew Pagoda

Built in 1762 by William Chambers the original dragons did not last very long. The recently completed project has reinstated the dragons to every level and included general repairs and conservation of this unusual structure.



Recent awards.

- 2018 RICS South East Residential Award – Old Byres, Hooe
- 2018 RICS Building Conservation – 14 Fournier Street
- 2018 RIBA London Conservation Award Turner's House
- 2018 RICS East – Conservation – Apple Tree Farmhouse
- 2018 UK Heritage Awards – Best Loos – Hampton Court Palace
- 2018 Civic Trust Conservation Commendation – Holy Sepulchre, Warminghurst
- 2017 RIBA East Award - St Albans Abbey
- 2017 RIBA National Award - St Albans Abbey
- 2017 RIBA East Conservation Award - St Albans Abbey
- 2017 Georgian Group – Highly Commended – Turners House
- 2017 RICS London Conservation Award –Queens House & Bell Tower, Tower of London
- 2017 Civic Trust Awards AABC Conservation Commendation - Hampton Court Base Court