

## **Stamford Park Conservatory Re-Inspection 25<sup>th</sup> July 2019**

### **Introduction**

This is a Victorian Style timber and iron framed Glass house. It was first constructed in and opened in October 1907 but subsequently completely rebuilt in 1982-84. It was later refurbished in May 2003. The building is made up of three parts with two outer wings, the North and South Houses, which are approximately 4m high to eaves, the roofs to which are each supported off four internal columns in a rectangular layout, which are circular cast iron, in the lower sections and timber square sections thereafter up to the roof purlin support detail. The four columns mark the lines of the purlin roof which support the higher raised ridge area. The roof structure to the North and South Houses is supported from these columns on timber purlins and by steel/ timber trusses at approximately 1.8m centres. The roof cladding is supported between the trusses by glazing bars supported at third points by steel angle sections at right angles, supported by the trusses. The outer line of support is provided by the timber glazed outer walls. There are hips and a part hexagonal plan support purlins arrangement to the roof structure at the front of the North and South Houses, supported off decorative metallic brackets from the columns.

The North and South houses are connected at the rear by a lower level Centre House section which is approximately 2.5m high to eaves. The outer sections of the building are supported from glazed timber support frameworks built off low level brickwork, ranging from 600mm to 2m in height depending on external ground levels.

The Central House roof is duo pitched with a raised central ridge and timber / metallic trusses, with two lines of timber purlins, one at each side, and at the root of the raised ridge. The trusses support the purlins at approximately 1.8m centres, with 3 sections of glazing panels between trusses, in turn supported off timber glazing bars supported by the steel angle sections at mid span.

Access into the building is from two doorways, one in each of the frontages to the North and South Houses.

There is a cellar area to the South House which is partly subterranean, and which has been refurbished with new floor to the South House over, although utilizing some of the original steel support sections.

### **Brief**

A survey was undertaken by this office in February 2015. The purpose of that inspection was to report on the condition of the timber framing supporting the building due to concerns expressed into its condition by the Park Supervisor.

Additional high level access for the survey was provided via a mobile high level platform, which was slightly limited due to the presence of the protecting fence at the front of the building. Even so the access was sufficient to enable ridges to the North and South Houses to be inspected and to enable the carrying out of the necessary making safe works.

The conclusions of the report that followed the survey included a recommendation that the Conservatory be closed to public access with immediate effect. It was requested that only limited access should be permitted for staff.

The report indicated that the support structure to the roof, which relies on the external timber vertical and rafter member sections (augmented by steel rods etc.), had been found to be suffering from rot in several critical areas, meaning that the roof structure was vulnerable to local collapse. The fixings from some of the steel rods and brackets appeared to be exposed in rotten rafter members above the roof line, in some areas, down the pitched roof of the building. The steel angle sections which are perpendicular to, and support, the roof glazing bar arrangement, were found to be variously in a poor state of support with many having lost contact at one end thereby leaving the glazing bars unsupported and vulnerable to failure. There was the added possibility that the angle sections could fall from their support in view of the loss of support at one end in some instances, and due to the condition of the supporting timbers.

The structure has remained in position since the inspection of 2015, with its doors closed to the public and with minimal maintenance.

The purpose of this inspection is to report on any further deterioration in the structure since the last inspection, and to comment on the suitability of the structure for future use.

### **Survey Findings, (Indicating additional deterioration since 2015 survey)**

#### **External;**

- 1) Sections of the roof glazing have slipped out of position in 2 areas on the South House on both the main roof slope and in lantern sections, with one section of glazing still perched in its slipped position just above eaves level.
- 2) Sections of the front guttering have distorted and no longer provide a positive drainage path for roof rainwater runoff, meaning the elevations will be subject to wetting during rainfall. Further vegetation infilling of the guttering is adding to this defect.
- 3) Sections of the vertical glazing on the Central House have been lost with missing glazing bars on the front elevation in several positions close to the North House.
- 4) The ridge line to the Central House appears to have dropped close to the interface with the North House.
- 5) The capping timber at the truss locations have further deteriorated on the main rafter slopes externally, with evidence of the metallic truss connections exposed.
- 6) The external cills have continued to deteriorate on the rear and side elevations particularly at interfaces where they provide support to the vertical support members.
- 7) Mid-height timber transom connections on the rear and North House side elevation show signs of timber decay, making them vulnerable to local failure in high winds.

#### **Internal;**

- 1) Further deterioration has been noted in the timber connections at cill level in the Central House where vertical support members are connected to the timber sole plates. This was particularly evident at the corner interface with the South House.
- 2) Further timber rot was identified in the mid height horizontal timber transoms in the South House, on the two side elevations, making this area vulnerable to failure.
- 3) A further missing section of roof glazing was identified in the South House on the South facing elevation slope that was not evident externally.
- 4) Timber glazing bars on the internal side elevation to the South House have completely rotted through close to the cill levels in at least two places leaving the vertical glazing vulnerable to being pulled away in any strong winds.
- 5) In the basement there is further evidence of lime leaching in the soffit of the South House floor between pre cast concrete floor units.

- 6) Original steel beams, in the basement and formerly supporting the floor construction are continuing to rust and expand causing distress to supporting masonry at bearings.

**Conclusions:**

The structural condition of the conservatory is continuing to deteriorate, with evidence of the dislodging of glazing on roofs and wall sections where the supporting timber frames and glazing bars having been compromised. Rotting finial details had been removed at the time of the previous inspection and temporary works undertaken to attempt to keep the building watertight. No works were undertaken to improve blockages in the roof drainage system, so this has continued to deteriorate and is now unlikely to be functioning properly, adding further to the deterioration of the supporting structural members.

Several of the main components of the timber vertical and horizontal supports to the external perimeter frames are showing significant deterioration meaning they will be vulnerable to local failures in the event that there are strong winds, or snowfall in the winter.

The condition of the timber sole plate along the tops of the low level walls gives rise to concerns where they provide support to the main vertical support members, due to the continuing rotting and deteriorated condition. This is increasing the possibility of localised collapse of the superstructure built upon it.

It is considered only a matter of time that larger sections of the building structure will begin to fail as the deteriorated condition results in localised collapses in the supporting elements to the building. This will result in the dislodging of glazing panels, making it more dangerous for access in to or around the building. The current condition of the external envelope of the building, with the already dislodged glazing panels, is likely to further exacerbate the prospect of wind damage.

Given the extensive deterioration of a large number of the structural members supporting the Conservatory, the overall structure is in danger of localised collapse particularly under adverse weather conditions. Due to the intricacy of the structural support it is unlikely to be cost effective to refurbish the structure, and so consideration should be given to a full rebuild as the better value for money option.