

T5255/JCT/krrt



## **Structural condition of**

### **Subscription Rooms**

On behalf of

### **Stroud Town Council**

**Report Issue:** 2  
**Author:** John Topp  
**Status:** Formal issue  
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**Revisions:** (2) cost guidance added

#### **Contents:**

**1.0**            **Brief**  
**2.0**            **Description**  
**3.0**            **Observations**  
**4.0**            **Observations from 2002 inspection**  
**5.0**            **Discussion**  
**6.0**            **Conclusion and cost guidance**

## **1.0 Brief.**

As instructed by Stroud Town Council, to undertake an inspection and report upon the structural condition of the Subscription Rooms, George Street, Stroud. In addition, to comment upon feasibility of a number of proposed alteration works.

The practice had previously inspected the building, and prepared a series of reports, on behalf of Stroud District Council in 2002.

Two inspections were undertaken by John Topp IEng AMIStructE AssocRICS. A general inspection on 7<sup>th</sup> August 2017, following rainfall, and an inspection of the interior of the main roof-space on 14<sup>th</sup> August 2017. The current inspection and reporting excludes mechanical, electrical, heating, sanitary and drainage services.

## **2.0 Description**

The Subscription Rooms is a Listed Building and is designated Grade II. It was listed on 1 May 1951, and has English Heritage Legacy ID: 415657.

The building frontage faces George Street, and is flanked by Bedford Street (NW) and Kendrick Street (SE), at postcode GL5 1AE. Ordnance Survey Grid Reference: SO 85107 05155.

The listing description is as follows:

*'1833 Architect Charles Baker of Painswick. Stone. 2 storeys. 5 windows. Central portion set forward slightly (3 windows with semi-circular heads), Modillion cornice and pediment. Porte cochere with Tuscan columns and balustraded balcony.'*

A significant phase of alteration work took place at the rear of the building C2000, which included the installation of spiral staircases, structural alterations to form the café area, plus the installation of extensive mechanical services and a new flat roof area above the rear brick wing.

## **3.0 Observations**

### **3.1 Roofs - externally**

- The flat roof situated to the rear (North-East) elevation of the main building is trapezoidal on plan and has a built-up roof system extending between the rear wall of the original building, and a modern parapet construction. This roof is situated above the lift motor room and dressing room 1. The roof area accommodates

ventilation/cooling plant and associated duct work, all bearing upon a galvanised steel framework set above flat roof level. The projecting enclosure of the lift over-run is also present. The flat roof level steps down twice from North to South, and at the southern end the steel framework cantilevers and 'cranks' up-slope off the intersecting hipped slated roof. The flat roof drainage 'cascades' down onto the lowest level and also takes discharge from the rear slope of the main roof. The surface water is intended to run away from the original building towards hopper outlets but ponding was noted on the middle and lower roofs.

- There is a hipped, slated intersecting roof which is situated above dressing room 2 and the office. The slate coverings are in poor order.
- The main roof is pitched to a ridge running North-West to South-East and is covered in natural slate. There are nominal stone-coped parapet walls to both gables with horizontal kneeler sections at the eaves. A chimney stack is incorporated into both gables at the apex and a further free-standing stack is situated above the rear wall. The slates are extensively weathered and there are numerous slipped, split and delaminating slates, in addition to a number of previous repairs. There is a distinct misalignment of the ridge tiles. The rear slope incorporates two aged roof lights and a zinc-clad ventilation turret. The edge of bituminised roofing felt is evident at the eaves and the rainwater goods are a mixture of original cast iron and replacement UPVC. There appears to be a sizeable gap at the eaves of the main roof at the southern end where a chimney stack appears to have been removed and not properly made-good.
- The high level section of the original rear wall is visible from flat roof level. There is clear outward movement of the masonry in the centre and southern end of this panel, with cracking evident through the bed joints. There is a mixture of pointing, indicating several phases of repair, and this would benefit from some further work including the removal of what appears to be grey, cementitious material incorporating coarse aggregate. The free-standing stack on the rear wall is rendered and is likely to be of brick construction. This is unpainted and appears to be in reasonable condition despite being rather slender.

## **3.2** Walls – externally

### **3.2.1** Front elevation.

- The front elevation incorporates the three-bay porch, described as a 'porte cochere' in the listing text. A porte cochere is technically a broad external lobby that can accommodate horse-drawn coaches, but it may never have been used for this purpose. I shall describe this as the 'porch'. The balcony perimeter is compound section iron or steel, supported on four leading edge columns and four half columns set against the main front wall of the building. There is the appearance of distortion of the soffit surface of the left-hand end of the beam adjacent to the front wall, adjacent to where a rainwater pipe is cut through. The distortion gives the appearance of a timber material. Close intrusive inspection would be required to confirm the nature of this.
- The main elevation has a gabled pediment in the centre, and the eaves cornice incorporates bird deterrent measures. Three arched windows to the ballroom and one rectangular sash window on each side at first floor level. In the ground storey there are four rectangular sash windows and the entrance door. There is some loss of detail on the carved semi-circular arched window heads. The jagged appearance in profile suggests that the uppermost coping stones are slightly decayed along the gable pediment.
- There is some slight opening of joints in the stonework directly above the left-hand ground floor rectangular window opening. There is also a crack above the right-hand reveal of the second to left window opening at ground floor. There is a crack through the left-hand end of the lintel over the entrance door and this has a metal plate let-in beneath it, probably as a repair. On the third window from the left there is a crack through the lintel approximately 450mm from the left-hand reveal. This can also be seen running through the cill in line with the left-hand reveal, and then through a repaired ashlar between the plinth and the sill. The movement on the left-hand window can be seen to have extended through the cill of the ground floor and has been previously repaired. Some subsequent hairline cracking is evident at the repair. On the right-hand side of the front elevation, the upper window is free from cracking in the surrounds. Historic repair noted below ground floor window.

### 3.2.2 Right-hand flank elevation.

- This is all ashlar stone. There is a cast-iron rainwater downpipe and lightning conductor adjacent to the front corner quoining. There is a projecting rectangular moulding (string course) coincident with first floor level, above which there are three blind windows. Two small pattress plates that may have been for the attachment of external decoration or the like.
- In the ground storey there is a blind window to the front side and two rectangular sash windows and a small casement. There are two modern air vent terminals just above the string course, a large vent towards the rear corner of the ashlar section just beneath that level, and then two vents just above plinth level. The footway rises to the NE. Note the 'ghosting' appearance of discolouration following recent rainfall, possibly indicating the line of flues within this wall thickness. This suggests that a flue is gathering from the triangular feature at ground floor level in the main office. This may be relevant in the context of future alteration proposals. There is some cracking evident at high level, running from the right-hand side of the chimney stack on the apex down the gable. You can trace this down roughly 2.0m below the kneeler masonry which would be about 1.0m below the eaves.
- As you move towards the rear you come to the brick section. This junction is coincident with the rear corner of the main building. This is a three-storey section. There is a fire escape door coincident with the pavement, which is above the general ground floor level in this area. This elevation has two shallow casement windows in the second storey, two tall rectangular sash windows in the first storey and one rectangular sash opening (with casements infilling) in the ground storey. The brickwork in English garden wall bond, with stone lintels. Note that there is a very small bearing to the lintel over the fire escape doorway but this forms part of the C2000 remodelling and may therefore have a separate form of support internally. A number of bricks have been replaced and there has been extensive 'patch' repointing, some of which appears to have been carried out with cement-based mortar. The half round gutters and down pipes have the appearance of cast iron.

### 3.2.3 Rear elevation.

- The brickwork of the rear corner between right flank and rear elevation is distorted. The first section of rear elevation is brickwork in English garden wall bond. In this panel there are two shallow casements in the second storey, two tall rectangular sashes in the first storey and two tall rectangular sash openings (with casement infill) in the ground storey. Lintels are stone. There is a change of wall direction on plan (this occurs in the café area) where a corbelled corner over-hang is present. Extensive patch repointing in this area. There is some replacement brickwork at low level on the right-hand side of this first panel. A nominal 'well' is formed against the building by a stone plinth against the carriageway. A manhole cover is located within.
- There is a straight joint between the brickwork and ashlar masonry on the elevation incorporating the café entrance. This has timber horizontal boarding at high level which is concealing the plant on the flat roof. Beneath this there is section which appears actually to be lined-out render rather than stone, then beneath that there is a further rendered panel across the entire second storey. There are three sash windows in this panel. The render is lined-out to give the appearance of being ashlar masonry. Beneath the rendered panel is ashlar masonry, the left hand side of which is brought to course. A straight joint exists approximately 1/3<sup>rd</sup> of the way across the glazed opening and then you can see some infilled pre-existing windows. There are numerous types of pointing types in the pre-existing wall.
- On this elevation there is a horizontal steel pattress terminal bar, and two pattress plates, where clearly movement has taken place in the past. These are tied through at second floor level. The pattress plate on the left-hand side as viewed, is actually through a lintel above a sash window to the first floor; the other one is in the spandrel panel between the first and second floor windows close to the corner. There is a vertical crack on this line from the second floor cill down to the head of the first floor lintel. There is some movement around the lintel perimeter and extending to the right-hand side through perpend. A further crack extends down through the string course and the stonework below.

#### **3.2.4** Left-hand flank elevation.

- This entire wall (original gable) is ashlar stone apart from the small wrap-around from the extension which is rendered. The stack on this gable contains a crack, which I can only see remotely with binoculars. At mid length of the gable parapet (rear slope) there is some significant staining and loss of stonework on the face. The 'ghosting' appearance of old flue lines is also apparent on this wall during the drying process.

The wall originally incorporated three blind windows in the first storey but one has had a small sash inserted. The old lintel at the head of this sash has cracked through the left-hand side which extends up through the masonry diagonally towards the corner of the flat roof. Beneath that window there is some cracking through the masonry spandrel panel and feature projection, down through the centre of the ground floor lintel which displays a previous repair but which has re-opened. In the ground storey there is one blind window towards the front and two rectangular sashes centre and rear. There is a definite indication of distortion of the bed joints at this rear corner with them dipping down over the last 3.0m. There is evidence of historic movement across the central sash windows with repaired, and slightly reopened, joints around the right-hand end of the lintel and beneath the ground floor cill. The remainder of the wall is in reasonable condition.

### **3.3** Internally

#### **3.3.1** Second floor

##### Dressing room 1

- At high level in the top right-hand corner on the rear elevation there is some active cracking. This tapers down from the top corner, down along the junction between the external wall and the cross-wall, which itself was once an external wall. From here it extends then leftwards along the ceiling, tapering but extending as a hairline crack all the way to the left-hand side of the room. There is hairline cracking generally evident in the ceiling but this seems to be following board joint lines. Note that there is a step in the plane of the wall indicating slight outward movement of the main wall panel relative to the cross-wall.

#### Lobby Fire escape 1

- There is clear evidence of water ingress through the flat roof coincident with the front wall of the lift shaft, close to the external wall. There is also some cracking evident here but that may be associated with the effects of the water ingress. No cracking of significance in the main wall around the window, but there is a sub-vertical crack through the plaster at the junction between the rear wall and the curved fire escape 1 partition.

### 3.3.2 First floor

#### Lobby Fire escape 1

- Fire escape stair is steel construction with pattern-plate treads and contrasting paint nosings. No significant cracking other than the vertical hairline at the junction between the curved wall and the original external wall at the window openings. Slight cracking along the junction between the lift shaft entrance door wall and the ceiling, and then running down against the external wall. Slight ceiling to wall cracking again along the rear wall and the ceiling up to the curved stair enclosure.

#### Inner lobby to Tech Store

- There is plaster cracking on the main rear wall of the original building which is on one side of this inner lobby.

#### Tech store

- Extensive cracking at junctions between the ceiling and the rear wall, and to wall plaster generally, but none of this suggests a significant structural problem.

#### Bar area.

- The bar accommodates a space partly within the tapered rear extension, and partly within the rectilinear rear wing beneath the hipped roof. There are signs of diagonal cracking at the junction between the rear wall and the cross-wall but nothing of structural significance on the ceiling or the down-stand beam. There is some very slight plaster cracking above the picture rail on the rear wall. The windows have been screwed shut here but the brickwork

appears to be between 330-450mm thick, therefore the form of construction is unconfirmed. Some slight ceiling cracking but nothing of significance. The floor boarding is noisy.

#### Fire escape 2

- There is only a nominal down-stand lintel above the door to the balcony. This appears to have rotated and has caused cracking between this and the ceiling. There is a significant area of de-bonded plaster on the flank wall in the curved section of the fire escape stair. It is not clear how this has been formed but it appears to be significantly out of plane with the main wall (approximately 150mm). It is possible that the inner face of the pre-existing wall was cut back to accommodate the escape stair.

#### Main stairs.

- The curved wall to the rear of the stair is a modern intervention. There is a deep bulkhead which is apparently the piano bridge which is running from the back of the stage area out to the original rear wall of the building. The ceiling of the piano bridge appears to be roughly coincident with the level of the ceiling to the main foyer area.

#### Ballroom and porch

- At the time of my first inspection, the Ballroom was inaccessible owing to presence of an exhibition/installation. I undertook a second inspection to access the roof void above the ballroom, but the room itself had no natural light and the installation remained in-situ. The porch roof was also inaccessible due to items being attached to the blackout curtains. The porch roof was therefore only inspected through an opening in the curtains. It did however appear as it was in 2002, with decking precluding an inspection of the deck beneath, which is thought to be lead covered. There is no indication of structural distress on the soffit or perimeter of the porch.

### 3.3.3 Ground floor

Fire escape 2 and exit.

- There is a crack at the junction between the original flank wall and the curved section, and this extends down to the fire exit door, exiting onto the flank elevation.

George Room

- This is on the right hand side when entering the building. There is what appears to be a damp stain at high level in the south-west corner on the flank wall. The walls are dry lined at low level. Skirting boards appear to be in reasonable order.
- The main support beam over this space appears to be supported on columns rather than masonry piers. Nothing of structural significance to report.

Store room

- In the store room behind the George Room, the partition wall to the WC is of lightweight construction. There is a substantial down-stand beam on what appears to be the corner of a chimney breast on the flank wall. The partition to the George Room is behind racking, but would be suitable for formation of an 'opening'. No evidence of cracking in the solid floor.

Tourist information centre.

- Situated to the left hand side when entering the building. The ceiling is in reasonable order except for a small section of cornice that is missing. Cross-wall between the entrance ramp and the TIC incorporates a glazed screen and doorway, and there is no cracking above these.

Main office

- Nothing of note structurally in the main office. Note the difference in height between the ceiling of the main office and the foyer, which is approximately 800mm.

Cafe/bar.

- There is a substantial compound section beam running across the top of the bar which appears to be supported on two circular hollow sections that appear to have been introduced C2000.

Entrance foyer

- Entrance hallway with a ramp and the stairs. The original stone skirting sections are still painted and are blistering as a result of dampness. There is some discolouration of the painted plaster surface immediately above this on both side walls, suggesting ongoing damp ingress.

### **3.4** Roof spaces

#### **3.4.1** Hipped roof above office/ dressing room 2

- The hipped roof structure comprises common rafters on two purlins per slope plus a ridge purlin, all extending from the rear wall of the main building, spanning onto a single steel truss on the line of the hip intersection. There are then two mono-pitched steel trusses running down to the corners of the building acting as hips, and two intermediate purlins on the hipped slope. The bottom chords of the steel trusses emerge into the rooms below.
- The underside of the roof incorporates reinforced bituminised sarking felt. Note that there is a vent terminal cut into the north slope. Staining of the common rafters is widespread particularly close to the original rear wall of the main building. Some purlin splitting but otherwise adequate.

#### **3.4.2** Main roof over ballroom

- This is a seven bay structure, divided by heavily engineered, braced double Queen post trusses:  
Principal rafters 220mm deep x 150mm wide.  
Queen posts 150mm deep x 70mm wide.  
The outer diagonals are 90mm deep x 150mm wide.  
Bottom chord is 310mm deep x 170mm wide.  
Trusses are set @ 3.1m approximate centres.

Purlins are 200mm deep x 130mm wide, and are @ approximately 2.2m centres, set perpendicular to the roof slope.

Common rafters are 100mm deep x 50mm wide @ 330mm centres.

- There are binders that are taken off the bottom edge of the trusses on hangers. Those are supporting the ceiling joists. The ceiling is set some distance below the truss chord level, and incorporates insulation, so is impossible to readily inspect. Furthermore, there is extensive plant and ductwork in addition to ad-hoc walkways. The walkways have no guarding and are not properly installed. There are some modern interventions with small channel sections supporting modern fittings the ceiling below.
- The trusses generally look to be in good order, despite the inevitable deflection which has manifested in the mis-aligned ridge. The trusses support three purlins equally spaced along each slope. There is no ridge purlin. There are diagonal stability braces, perpendicular to the trusses, in the gable bays from the collar of the Queen post down to the gable end wall roughly at ceiling level.
- The slates are under-drawn with reinforced bitumen sarking felt. It is important to note that several buckets are located within the roof space, suggesting occasional active leaks. Some disturbance of the sarking felt was noted adjacent to the north western gable and extensively beneath the intersecting pitch of the roof to the front gable pediment.
- Insides of the gable ends are exposed stone. There is some staining of the timberwork, particularly close to the gables, where the purlins are bedded into the walls. Some are bearing onto an embedded timber plate. Several purlin ends are 'softened' as a result of dampness. Valleys and common rafters are also stained.

#### **4.0 Observations from 2002 inspection**

It was interesting to note that the observations made in 2002 correlated well with those of the latest inspections. There are modest repairs and adaptations, but the fundamental flaws identified in 2002 remain present. The roof slating was in poor order at that time, although further deterioration has taken place. Comments were made regarding staining of roof timbers, torn sarking felt, and general slate degradation that still apply. Relatively high levels of dampness were identified in certain walls, in particular the walls flanking the entrance ramp. At that time, SDC had

obtained quotations for remedial works to include plaster replacement and treatment of the painted stone 'skirtings'. We were asked to comment on these proposals, but the staining referred to in 2002 is still present and it appears that these works were never undertaken.

## **5.0 Discussion**

The principal matters of concern are as follows.

### **5.1 Roof coverings**

The roof coverings have reached the end of their serviceable life. These have already been lifted and re-laid on sarking felt as some point in the life of the building, and it is only the presence of this felt that has prevented significant damage by water ingress over the last 20 years or so. Sarking felt is a secondary line of defence against water ingress, and has been routinely incorporated into roof construction for the last 80 years. Very few roof coverings (slates, tiles etc) are fully weather resistant under all circumstances. In particular, strong winds are capable of forcing rainwater beneath the coverings. The function of the sarking felt is to collect any modest quantities of wind-driven rain and transport these to the eaves, and safely out of the building envelope. The felt should not be relied upon in the long term to act as the main defence against water ingress. In this case, water was known to have been entering through the slates since at least our previous inspection 15 years ago, and continues to do so. I understand that leaks are known to the maintenance staff. This situation could continue, with patch repairs being undertaken in response to the manifestation of water ingress on internal surfaces, but this cannot be recommended as an appropriate approach in the medium or long term. The roof coverings to the main pitch roof (above the ballroom) and the rear hipped roof (above the office and dressing room 2, will require replacement in due course. In conjunction with a phase of temporary repairs, complete replacement may be deferred for up to 5 years, but it should be done as soon as possible to protect the fabric of the building. Replacement of the slates may take two forms.

1. Complete removal of slates, felt and battens. This is the most common form of repair, as it deals with any inherent problems with the battens and fixings, which are impossible to rule-out without intrusive investigation. This does however leave the roof void, and the ceilings below, vulnerable to weather ingress and damage during the period of replacement. Bearing in mind that we are dealing with a listed building some 185 years old, I

believe it appropriate to consider a temporary scaffold roof being required for this process.

2. To replace the slates and retain the existing felt and battens. Except for localised felt repairs, if the battens are found to be in a reasonable condition when exposed, it may be possible to avoid the cost of the temporary over-roof and rely upon the existing felt for temporary protection. This would entail some further intrusive investigations to be carried out prior to specifying the permanent repair works, and it may be that a timely phase of temporary 'patch' repairs would enable this to be assessed prior to specifying the main repairs and obtaining the necessary statutory consents.

The above does however lead to a 'range' of potential costs, but until further investigations are undertaken, I would suggest that the greater cost is assumed.

In addition to the extensive problems with the natural slate pitched roof coverings, damp staining is also evident locally above the second floor lift entrance. This indicates a problem with the flat roof coverings which were installed C2000. I am unable to identify the exact specification of these coverings without destructive investigation, but flat roof membranes from that period were generally given a working life-span to first major repair, of approximately 15 years. We are now at the expiration of that period, and consideration will need to be given to flat roof re-covering within the next 5-10 years, in addition to occasional repairs in response to any problems occurring in the interim.

## **5.2** Structural movement

Structural movement has been noted at a number of locations around the building, most of which appears to be related to differential foundation movement and is long-standing. Indeed, the deformations of masonry around windows etc was noted in our 2002 inspection, as was the cracking described in dressing room 1. Some of the cracking appears associated with some 'outward' movement of the external walls. This is again largely historic, as indicated by the long-standing lateral ties apparent on the rear elevation. It is however likely that the extensive structural interventions of the alterations in C2000 would have triggered some additional movement, and it is likely that the cracking in dressing room 1 took place at that time. Notwithstanding the above, a building of this type is likely to suffer ongoing occasional movement, but there is nothing to suggest that a

serious progressive problem exists with the structure. There are a number of repairs that should be considered, particularly where lintels have cracked. Additionally, there are repairs required to masonry elements such as gable copings etc. Pointing is variable in appearance and condition. Where cracks are present, these should be repaired to prevent water ingress, but there are also some areas of cement based mortar, which has the potential to accelerate degradation of the stone/brickwork in the long term. It is recommended that a phase of masonry and pointing repairs is undertaken within the next 1-3 years, and this should be coordinated with the roof repairs to make best use of access scaffolding.

### **5.3** Ballroom ceiling

This is an important element but it was not feasible to examine this during my inspection, as the ballroom windows were blacked-out for a long term exhibition/installation. Additionally, the upper surface of the ceiling is almost entirely concealed by plant, decking and insulation. In 2002, the ceiling was noted as being in good order, based upon an inspection of the soffit, but it was suggested that an inspection of the support structure and method of fixing would be beneficial and would require removal of the insulation ( at least in representative areas). We also recommended that the access walkways were to be replaced on health & safety grounds. As this is suspended plaster ceiling, I would have expected an assessment to have been made of its safety following the collapse of the Apollo Theatre ceiling in 2013, and the subsequent regulatory guidance by the Association of British Theatre Technicians / HSE. This would require a plaster 'specialist' to inspect the ceiling and determine the form of construction, associated risks, condition and inspection frequency. To date, I have not had sight of any documentation relating to the ceiling.

### **5.4** Dampness

The appearance and degree of dampness identified during my inspection is identical to that outlined in our 2002 notes, and those of the specialists engaged by SDC at that time. The remedial proposals described at that time have not been undertaken, but I do not consider that there has been any material effect upon the fabric of the structure, nor would I expect that this has affected the use of the building. As a result of the sensitivity of the listed status of the building, the remedial measures in respect of dampness would have been compromised, and I do not believe that

sufficient benefit would be gained to justify their implementation. I therefore suggest that the relatively modest levels of dampness are accepted as a feature of the building form and age.

## **5.5** Proposed alterations

The suggested alteration works presented to me at the time of the inspection included the following:

- a. Removal of wall between GF main office and WC's.
- b. Removal of wall between GF store and WC's.
- c. Formation of door opening and larger aperture into George Room.
- d. Removal of WC's and re-ordering of kitchen facilities.
- e. Removal of FF bar.
- f. Raise ceiling over main stairwell G-F.
- g. Reconfigure fire escape 2/ lobby at FF.
- h. Install glazed infill beneath porch roof and balustrading/decking to make porch roof accessible.

My comments on these proposals are as follows:

- a. to e. Are all feasible.
- f. Appears structurally feasible subject to the piano bridge no longer needing to function.
- g. This is rather complicated, hence the current compromised design. I believe the key to the worthwhile adaptation of this area would be to effectively remove a portion of the FF main rear wall (currently on your LHS when you enter the bar from the lobby at the top of the main stair). The wall above does not extend as far as the wall at FF level, so although removal would involve structural works to provide support to the second floor (support to existing beam over the bar), it would not entail heavy masonry support. This removal of approximately 600mm of wall, combined with infilling of the stairs in the gap behind the curved stair wall, would provide a substantially more generous space for the bar access.
- h. The porch roof was inaccessible during my inspections, but there is no reason to doubt the viability of providing access to this area, nor to the design and installation of a glazed enclosure beneath.

## **6.0 Conclusion and cost guidance**

Reference should be made to section 5 for details of my findings, but these may be summarised as follows:

The building is a substantial masonry structure, which has undergone some structural movement over a prolonged period since construction. Some of this remains active (within last 20years), but I would not recommend any significant structural interventions other than superficial repairs and stitching to maintain weather-tightness. The exception to this is the cracking of lintels to the front elevation window openings. It is recommended that these are monitored, and that specialist repair is likely to be required in due course.

The condition of the roof is however of concern. The roof coverings were displaying distress in 2002, and have further deteriorated. If the slates were not under-drawn with sarking felt, leaks would have manifested in numerous locations. The roof should be made weather-tight as a priority. The structure of the roof will require 'spot' repairs and treatment, but is fundamentally sound. The ballroom ceiling, which is suspended directly from the main roof structure, could not be inspected. This needs to be assessed by a plaster specialist, and then inspected on a regular cycle in accordance with the initial findings. Access arrangements within the main roof space need to be improved for safety reasons.

The floor structures were inaccessible, but no adverse conditions or distress was noted.

The following is budget cost guidance on the matters noted in the above report, and for the proposed alteration works. These are approximate only, and are based upon rates at 3<sup>rd</sup> qtr 2017. This guidance is to be used in consideration of liabilities for structural repairs only, and does not include costs associated with mechanical (heating and ventilation) and electrical installations, drainage etc. It is possible that the energy efficiency of the heating, ventilation and lighting systems could be significantly improved. All costs are estimated exclusive of VAT.

6.1) Slate roof repairs:

The scope of repair to the main slated roofs depends largely upon the temporary works requirements, as described in section 5.1. This results in a 'range' of costs as follows: £

1. Retain existing felt/battens (this may not be feasible)	
Working scaffold	18,140.00
Strip slates (and set-aside 40% to re-use)	9,200.00
Provide new Penrhyn slates (60%).	35,640.00
Re-lay salvaged slates	7,920.00
Leadwork etc	5,914.00
Preliminaries, overheads and profit	6,000.00
Professional fees	3,000.00
	<b>Total £ 85,814.00</b>
2. Temporary over-roof and replace felt/batten.	
Costs as above	85,814.00
Scaffold roof	13,500.00
Replace felt/batten	6,600.00
	<b>Total £ 105,914.00</b>

Range therefore circa £ 86 K to £ 106 K + vat

6.2) Flat roof repairs:

The flat roof requires immediate investigation and repair of localised (apparent) leak at an estimated cost of 1,100.00  
Followed by re-covering within the next 5-10 years at an estimated cost (including a provisional sum for working around plant) 10,800.00  
**Total £ 11,900.00**

6.3) Masonry repairs:

Whilst access scaffold is in-situ for roof repairs, to rake-out and re-point areas of cementitious pointing, re-point cracking, stitch and re-point cracked brickwork, repair copings etc **Total £ 26,600.00**

This does NOT represent a full re-pointing and stone cleaning exercise.

6.4) Roof access improvements

Provisional sum for improved walkway/lighting etc. **£ 6,000.00**

#### 6.5) Ballroom ceiling

Impossible to estimate costs ahead of inspection, but some provision should be made for specialist inspection, reporting and repairs.

Assumed provisional sum **£ 5,000.00**

There will also be an ongoing cost for re-inspection @ £ 900 + vat / 3 years.

#### 6.6) Proposed alteration works

Notes:

- It is very difficult to estimate these individually, as costs will vary greatly depending on the scope of the contract i.e the cost for an individual alteration will greatly exceed that of a 'package' of works.
- The costs only include for the structural alterations rather than fit-out and redecoration etc, the scope of which is unknown.
- The scope of work for items f. and g. is unknown, and the cost is therefore a provisional sum.
- The glazed enclosure beneath the porch is a specialist item, and I have not provided an estimate for this, as it could be misleading. The cost of a 'frameless' (structural glass) system would be far greater than a form of 'framed' curtain walling. The balustrading and decking cost is a provisional sum.

My estimates are as follows (adopting the same references as 5.5):

a.	Removal of wall between GF main office and WC's.	£ 4,500.00
b.	Removal of wall between GF store and WC's.	£ 1,700.00
c.	Formation of door opening and larger aperture into George Room.	£ 3,900.00
d.	Removal of WC's and re-ordering of kitchen facilities.	Non struct
e.	Removal of FF bar.	Non struct
f.	Raise ceiling over main stairwell G-F.	£ 2,800.00
g.	Reconfigure fire escape 2/ lobby at FF.	£ 12,000.0
h.	Install glazed infill beneath porch roof and balustrading/decking to make porch roof accessible. Provisional sum ONLY for decking and balustrade	£ 14,000.0

I trust that the above information is of assistance, but please do not hesitate should you require clarification.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'John Topp', is centered on a light blue rectangular background.

John Topp IEng AMIStructE AssocRICS

**O'Brien & Price (Stroud) Ltd**

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