REPORT ON

THE CONDITION OF

THE GRANGE HOTEL

EAST PARADE

RHYL

DENBIGHSHIRE

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FOR

JAPA DEVELOPMENTS
VIA JPH ARCHITECTS
HOLYROOD HOUSE
RHYL
LL18 1BS

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1.0 BRIEF

1.1 This report was commissioned by Japa Developments through JPH Architects.

1.2 This report describes the form of construction adopted and condition of superstructure of this property following recent and severe fire damage. It is a general commentary and not an inventory of every single defect. Recommendations for repair/rebuilding are given in general terms at this stage, on the understanding that detailed specification of the works will be dealt with in due course.

1.3 This report is based upon a visual inspection of the buildings, affected. Unless stated otherwise within the report, there has been no physical testing of the building structure. Foundations have not been exposed. Our survey was restricted by the widespread presence of debris and the extremely unsafe condition of much of the western wing.

1.4 The inspection was carried out on Thursday 21st August 2008, when the weather was overcast.

1.5 A set of photographs are attached in Appendix A, which illustrate the extent and severity of damage.

2.0 THE PROPERTY

2.1 The property is a linked pair of close to identical Victorian villas, understood to have built around 1840 and having a Grade 2 listing. The style of construction is Tudor Gothic and the constructional form is consistent with the era of construction, being mainly masonry (mostly brickwork) load-bearing walls, dressed with ‘half timbering’ above first floor level, boarded timber

joist upper floors, and steeply pitched roof, with a slate cover, formed by a timber framework of rafters and purlins supported by timber trusses in some locations between load-bearing walls. The buildings are mainly 4 storeys including basement and living space in the roof. The basement becomes a lower ground floor at the rear of the building, with external ground levels reducing quite sharply through the width of the building from the higher promenade level at the front. There is a single storey link between the two originally separate villas and a two storey addition, mainly in dressed stonework, at the side of the western villa – which were, together with a two storey rear outrigger annexe to the western villa, added when the building was converted to a Hotel during the last century. The two storey side extension formed a lounge bar. The rear yard is enclosed by stone walling along the western boundary, linked to the bar or 'lodge' extension. There is an open forecourt behind low level render faced masonry walling at the front.

Details of layout are given by the drawings prepared by JPH Architects which accompany their submission on remediation scheme proposals, which should be read in conjunction with this report.

2.2 General

2.2.1 It should be noted that the site is heavily congested and there is a considerable mound of building rubble, piled to around 2 metres height across most of the rear yard. Collapsed masonry blocks much of the basement/lower ground floor of the western wing and the badly damaged condition of much of the remainder means that most of the western wing is inaccessible, so that only remote viewing of it is possible.

3.0 CIRCUMSTANCES OF FIRE

The property had been disused for some time and became a focus for trespassers who, we understand, caused a fire to start on the lower ground floor of the Tudor Lounge bar, the side extension to the western wing, around midnight on 19th March 2008. Because the hotel was officially unoccupied the fire was not detected for some time and by virtue of this and the form of construction, with a mainly timber inner core covered with flammable materials, it spread quickly through the whole of the western wing and burned until the following morning before being controlled by the North Wales Fire Service. Whilst the western wing has been severely and, we believe irreparably damaged, the eastern wing has sustained very much lesser damage, the most significant of which is probably water damage from the dousing of the main conflagration – and subsequent vandalism. The detachment of the eastern wing, connected only by a small ground storey link, prevented a damaging spread of fire into that section.

It is believed that the action of the fire service, albeit following one of their primary objectives to render the building as safe as possible, contributed to the severe extent of damage to the buildings. As well as water damage the need to vent and remove any obviously unstable sections has created the situation whereby the western wing is beyond the point of feasible restoration.

The lengthy period of burning and materials involved mean that the temperature of burning could well have reached up to 1000ºC.

4.0 DISTRESS

A. WESTERLY VILLA

The mid rear section of the westerly villa which was the origin of the fire at lower ground floor level in the Tudor Bar, has been completely destroyed. The devastation caused by the fire and operations to control it radiate from that point to attached structure so that the whole of the westerly villa is very severely damaged. Photographs are included in appendices to illustrate this damage, which is summarised as follows:-

(i) The roof over the westerly villa is completely destroyed. Remnants of the roof timber carcass remain – but these are badly charred and some hang dangerously – and are quite likely to lift and present a danger to the general public from flying debris during high wind.

(ii) The upper floors of this wing have been completely destroyed – the rear section is missing; the remainder badly charred and dangerous, or water damaged where remaining intact over a small proportion of this section of the building, at the front.

(iii) The masonry walls of the western villa which do remain are now largely unpropped. Many sections are distorted and loosening and cracking of masonry is widespread. This particularly where timbers are built into walling and are badly charred – or completely destroyed and have fallen or have been removed. The distortion includes cracking and crazing of brickwork above lintols, mainly of timbers but also steelwork which will have expanded during the fire and then contracted setting up stresses in the surrounding masonry.

Masonry is now largely in a dangerous condition and will be affected when the seasons change and high winds occur, in the exposed sea front location. Collapse of sections, which are largely unpropped through the building height, will inevitably occur.

(iv) The wall separating the bar or lodge, the addition to the original structure at the west end is distorted by the fire to the extent that a partial collapse of this has already occurred into the bar area – also damaging the flat roof of the lobby to the bar. This wall is therefore clearly dangerous.

(v) The rear outrigger facing the rear yard has suffered some damage by charring and smoke blackening, where it links to the new building mainly, and has been affected by Fire Service operations damaging materials at the building edges by impact. There is also some general water damage.

B. **EASTERLY VILLA**

1. The link corridor, at upper ground floor levels has suffered some damage by charring and is heavily smoke blackened, together with the lobby toilets, to the extent that it is beyond economic repair – and should be demolished at the same time as the western villa.

2. The main hall, staircase and corridor circulation spaces are heavily smoke damaged. In addition there is damage by vandalism and pilfering of building materials – including a feature roof light above the stairs.

3. The smoke damage extends to other areas, apart from the lower ground floor (basement) and there is water damage affecting several areas, mainly at upper floor level. The

damage to structure is mainly superficial. Apart from the staircase and main circulation space the smoke damage can be summarised as follows:-

(i) The Landlords quarters rooms (reference G9 to G14 on JPH drawings) have suffered smoke damage in varying degrees, the entrance lobby, first bedroom and sitting rooms (G7 to G9) being closest to the source of the fire have moderate damage. The remaining areas (G6 and G10 to G16) have lesser degrees of smoke damage, the rear bedrooms and bathrooms (G14 to G16) being largely unaffected.

(ii) The front bedrooms (G2 and G3) and their respective ensuites (G1 and G2) have moderate smoke damage.

(iii) On the first floor the staircase and landing areas (G5 and F7) are heavily smoke damaged. All bedrooms also have varying degrees of smoke damage (F5) being the worst affected as is the store room (F12). Bedrooms F2, F3, F9, F11 and F13 have light to moderate smoke damage, their associated ensuite bathrooms have light smoke damage.

We have not inspected the roof space of the easterly villa.

4. The exterior of the easterly villa is largely untouched by fire damage.

5.0 **DISCUSSION**

5.1 Building fires normally reach temperatures of the order of 1000ºc – and it is estimated that this will be the minimum temperature of the fire here, and possibly more, - we have not at this point seen a forensic report by the Fire Service, assuming that one has been prepared. This extreme temperature can affect the loadbearing capability of structural elements in a number of ways. Apart from the obvious effects such as charring and spalling, there can be permanent loss of strength of the remaining material, and expansion may cause damage in parts of the building not directly affected by the fire.

The general effects on the various materials in the building are as follows:-

a) **Timber**

Timber browns at 120-150ºC, blackens around 200-250ºC and evolves combustible vapours at about 300ºC. Above a certain temperature, 400-450ºC (or 300ºC if a flame is present), the surface of timber will ignite and char at a steady rate. A charred part of a section must be assumed to have lost all strength, but any timber beneath the charred layer may be assumed to have no significant loss of strength, because the thermal conductivity of timber is low. For most timber the charring rate is of the order of 20mm for every 30 minutes of burning. In this case, where the fire burned for several hours, the effects have been devastating over the western half of the building.

b) Brickwork

There can be a loss of compressive strength of brickwork subject to high temperature. All types of brick give much better performance if plaster is applied, this giving improved insulation and reduction of thermal shock. Masonry walls generally have good fire resistance, provided that the supporting structure can keep walls in place during the fire. However, if the walls become mainly cantilevers by loss of propping timber structure during fire, then thermal bowing or other distortion will occur. This has clearly occurred in this case, with detailed description of distress given in section 3, and illustrated by appended photographs.

c) **Steel**

(i) An often quoted rule for fire affected hot rolled structural steel is that if the steel is straight and there are no obvious distortions then the steel is steel fit for use. At 600ºC the yield strength of steel is equal to about 40% of its room temperature value; it follows therefore that any steel still remaining straight after the fire and which had been carrying an appreciable load was probably not heated beyond 600ºC, would not have undergone any metallurgical changes and will probably be fit for re-use. However, where the load in the fire was less than the full design load, and also with high strength steels, this cannot always be held to be true. In such cases it is recommended that hardness tests are carried out on the affected steel. In practice it is recommended that, in all instances, some hardness tests should be carried out.

(ii) Connections:

The tensile strength reduction for grade 4.6 bolts is similar to that for S275 steel. For grade 8.8 bolts, which are heat treated in manufacture, the residual strength reduction is more marked if the material temperature has exceeded 450ºC. The residual strength of these bolts falls to 80% and 60% after reaching temperatures of 600ºC and 800ºC respectively.

To err on the side of caution it is recommended that bolts should be tested to see if they show any loss of strength. Contraction of heated members after the fire can cause distortion of connections.

In this case there is limited steelwork within the remains of the westerly villa. Whatever there is left would not be fit for retention, even if repair of the building was a feasible option, which it is not.

5.2 The westerly villa and its appendages are beyond any economic or safe repair and furthermore should, we recommend, be demolished as soon as possible.

If not then natural weathering, particularly when strong winds arrive with the autumn, if not sooner, will cause uncontrolled progressive disintegration of the remaining structure. The walls are left in a dangerous condition and because of the weaknesses created by the fire, as described in section 3, cannot be propped safely – as any force applied risks collapse of walling and there is insufficient working space to clamp walls between lateral supports. In short, the building damage is too extreme and there would be unacceptably high risks to safety in attempting to retain

any structure – notwithstanding the fact that the cost of such exercise would prohibit its execution anyway.

5.3 The easterly villa is damaged beyond economic repair only over a very small area - at the link between it and the westerly villa. Otherwise, there is smoke damage, water damage and vandalism, which can be safely and economically repaired, as the underlying structure appears sound.

6.0 LIMITATIONS

6.1 We have not, except to the extent which may be noted in the report, carried out any tests or made any enquiries concerning particular materials, nor have we calculated any floor areas, loadings or re-appraised the original design criteria.

6.2 We have not carried out any investigations to determine whether High Alumina Cement or Asbestos was used during the construction of the building inspected and we are therefore unable to report that the property is free from risk in this respect.

6.3 In cases where Contractors or Consultants are instructed to carry out specialist inspections or tests, although every care will be taken in instructing these Contractors and Consultants, we cannot accept responsibility for their reports and shall not be liable for omission or error therein.

6.4 This report is made solely for the person or persons to whom it is addressed and no liability can be accepted to any third parties for the whole or part of its contents.

7.0 **CONCLUSION AND RECOMMENDATIONS**

Clearly there is a need for extensive remedial works, which are described in principle in Section 5.0 of this Report.

These are also described and illustrated by JPH Architects in the documents they have produced to support a scheme of remediation which, rightly, advocates the replacement of the western half of the building with a new building and the repair and refurbishment of the easterly villa.

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