Appendix 4 - Structural Report

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Bluff Oyster and Food Festival
Bluff

Attn: Mr J Edminstin

Dear John

RE: STRUCTURAL REPORT
CLUB HOTEL 100 – 116 GORE STREET BLUFF

As requested, we have inspected the Club Hotel main building structure located at 100 – 116 Gore Street Bluff. The inspection covered the internal and external areas of the building including roof level where safe access was possible. We have previously reviewed the condition and reported on the veranda structure condition and provided our recommendations in our earlier report dated 8 July 2022 to Council. The following report summarises our findings and provides recommendations on the building and veranda. Photos of the typically observed conditions and noted defects are appended to this report.

BRIEF HISTORY

The Club Hotel as it is known today was originally four separate buildings on the site dating back from the 1880's and incorporated into the present Club Hotel over time from around 1903. After a serious fire back in 1903 the building was rebuilt and the heavily ornate façade rebuilt in its present form, incorporating all four original buildings. A further serious fire in 1914 required significant rebuild of the building structure but the previously rebuilt façade was retained and incorporated into the reconstruction.

BUILDING STRUCTURE DESCRIPTION

Effectively, the building is a two-storey unreinforced masonry brick building with numerous accommodation rooms on the upper floor with main bars, dining, and hotel service areas on the ground floor. A smaller more recent single storey concrete masonry block extension is along the rear of the site housing toilet and additional service areas. Along the full length of the street frontage there is a simple timber framed veranda supported via the main building and steel posts along the street side.

The present configuration of the building comprises of heavy timber trussed and sarked roof system supporting light metal roofing and supported on both perimeter masonry brick walls and first floor internal load bearing timber framed corridor and bedroom walls.

to be perpendicular to the wall with the wall supporting the floor. Over the years the ground floor has been extensively remodelled with large open spaces created by the removal of ground floor walls. Upstairs the room layout appears to have changed little with numerous small rooms created with timber framed walls around the perimeter and opening onto a central passageway. Only the original perimeter walls that formed each of the four original buildings are URM, the rest are timber framed and plasterboard lined. These walls would act to provide lateral restraint to the walls and roof and transfer loads to the timber first floor acting as a diaphragm. In turn this first-floor diaphragm would enable transfer of lateral loads to the ground floor walls, many of which no longer exist. Now replaced with concrete and steel beams supporting the first floor.

CONDITION REVIEW

The building has been closed for nearly two decades but there is evidence that squatters have been / or are still using some of the rooms on the upper floor level. The entire interior of the building's ground and first floor areas have been badly damaged by vandals. Many of the walls have linings either partially or fully removed, and sections of the first floor, and the ground floor are also missing where piping has been salvaged and flooring uplifted.
Every toilet pan and basin fixture appears to have been smashed and removed leaving open foul sewer drainage piping throughout the building.

The physical condition of the actual building structure is in a very poor state, primarily due to the extensive ingress of water over an extended period.

Many of the internal roof gutters and especially the internal gutter behind the tall front façade have completely rusted out and water from the extensive roof catchment is entering into the building whenever it rains. Additionally, none of the over flashings along the sides of these internal gutters, originally rebated into the brickwork exist anymore. Hence water pours in, down the side of the gutters as well and tracks down the brick face inside.
The result of this neglect after all this time is extensive deterioration of both the interior wall linings and framing, and also the bricks and particularly the lime mortar, which is gradually dissolving away leaving poorly supported brickwork. These, over flashings were originally recessed into a mortared bed joint into the brick but now the joint is open, and water is now also entering into the centre of the walls and weakening the mortar. This situation is particularly important for the front façade as it creates a very weak zone along the face beneath the heavy ornate upper parapet of the façade. In a seismic event this heavy upper façade is most likely to topple into the street. The façade already has a distinctive lean out onto the street. In this weakened condition it is possible that even a major windstorm event damaging the roof and any interconnection could be sufficient to lead to failure.
The continuing stability of the heavy ornate façade is highly reliant on the fixing of the roof structure and first floor walls to this wall. However, any restraint from these timber structural elements is likely to be minimal at best given the extent of damage to wall

linings and decay observed in the timber framing combined with minimal interconnection at best. Several areas along the roof behind the street façade are also missing the roof sheeting allowing further moisture inside the building. In several of the first-floor rooms along the street where roof leakage is extensive, significant vegetation is growing in the form of mosses / ferns etc.
These spaces were deemed too dangerous to even enter and inspect as the floor system is most probably badly decayed and rotten. Water damage is evident on many of the walls and ceilings with many areas of lining severely deteriorated and disintegrating and large areas of black mould developing.

The low parapets of the brick masonry walls of the various original brick buildings perpendicular, to the front façade have either no capping or over flashings and the bricks are exposed with both the bricks and the mortar showing signs of rapid deterioration from the effects of moisture ingress.
Water can enter the centre of the wall, from the exposed vertical mortar joints and track directly down inside the brick wall further deteriorating both the weak lime mortar and the bricks themselves.
Large water-stained patches are evident on internal walls where water is tracking down inside the building.

Several transverse timber framed walls above first floor, which had framing against the brick wall have completely rotted out removing whatever bracing may have been provided to the roof and these exterior walls.

The single storey concrete masonry building along the centre rear of the hotel complex has had large sections of the roof demolished and the interiors are badly deteriorated. The concrete floors in this area have allowed water to track back into the older original hotel area and consequently has rotted out the timber framing at ground floor in places. Both the front and rear walls have external steel fire escape walkways in poor condition, these rely on cantilevered steel framing fixed into the brickwork. The condition and actual capacity of these fixings into the deteriorated brickwork is questionable. Close scrutiny of these fixing was not possible, as they were deemed unsafe to use. As the building is derelict and uninhabited these fire escapes should be removed, as they present a hazard to persons around the exterior of the building and especially over the public footpath.
The front veranda structure is in very poor condition structurally and has been reported on previously in an earlier report for the Invercargill City Council in response to public notification of debris falling from the underside onto the footpath below. Consequently, public access beneath the veranda has been screened off and the veranda structure temporarily propped. The structure comprises of timber rafters and purlins supported on a stringer fixed to the face of the building and supported on an eaves beam and steel posts along the edge of the footpath. The roofing is corrugated metal roofing with various sheet cladding to the soffit namely fibre cement sheet and what appears to be some form of original fibrous plaster sheeting.

Timber to timber fixings are all nails that have either pulled out or corroded way resulting in unsound construction. Many of the timber elements also have rotten end sections and are no longer capable of retaining nail fixings. The timber eaves beam is also rotten in many places and no longer capable of supporting anything more than the self-weight of the roof structure. The steel support posts have all but corroded completely through as many act as the downpipe for the eaves gutter and hence have very limited capacity to support load. The linings on the soffit have been severely affected by the water leaking through the roofing over time. Consequently, the nail fixings have corroded through, and the fibrous plaster so badly softened by the moisture that the nails have pulled through the saturated sheeting. This has resulted in the noted fallen debris being reported previously by the public.
The condition of the veranda structure is so poor that it is likely most areas of it would not support any object falling from height off the building front façade. Our visual review of the top parapet structure and the front facade indicates that no loose material is visible at present that could represent an immediate risk. The greatest risk of items falling is the failure of the cantilevered fire escape with failure of the fixings. We have already commented above that in our opinion this fire escape should be removed from the building.

If the fire escape did fail, the retention of the veranda in its present state would not provide any protection from it falling and the veranda would simply collapse. In our opinion the veranda should be removed along with the fire escapes.

Conclusions

Under Section 123 of the Building Act 2004, the Club Hotel building in its current state would be described as an Insanitary Building and presents a significant health and safety risk to those who could be inside legally or otherwise, or to Fire & Emergency Services if they had to either fight a fire in the building or rescue someone injured from falling through a floor or collapsing structure.
The prolonged and ongoing state of disrepair has allowed significant water damage to numerous critical areas of the building. Which has affected and continues to affect the main structural elements i.e. timber roof structure, first floor timber walls and floors, the main brick walls and mortar, that provide both the vertical support and the lateral support for the building as a whole. Additionally, the continual ingress of moisture has led to the development of large areas of black mould on wall and ceiling areas that remain and the growth of interior vegetation both of which are offensive and a health hazard.
The vandalism has resulted in damage to most of all the sanitary fixtures leaving open foul sewer piping as access for vermin to utilize. The damage to many of the lateral resisting structural elements ie walls and floors would contribute to the likely failure of parts of the structure in a major natural hazard event.
Lack of support provided by these damaged structural elements, however minimal, to the front façade could lead to collapse of the front façade and the other thinner brick masonry walls around the perimeter.

Significant windstorm events which with climate change are likely to be more frequent and more severe, could be sufficient to collapse the weakened roof structure and create a rocking motion of the weakened and heavy overhanging parapet structure to the point that it topples.
As was evidenced recently further along Gore Street where failure of part of the roof structure during a high wind event was sufficient to bring about the collapse of the brick gable into the street.
The central main section of the Club Hotel front façade has a very heavy ornate and overhanging parapet and cornice which is already visibly leaning out into the street with significant open cracks to the present return walls, which form part of the main restraint back to the building. There are also several cracks in the parapets and upper front wall that indicate smaller sections of the parapet have separated and these have also moved outwards.

There are several large open tension type cracks at the outer face to the base of the ground floor columns adjacent to the main entry door. These cracks would be consistent with the stiffer upper floor wall sections and parapet rotating outwards and forcing the more flexible ground floor piers to rotate inwards at first floor level. The heavy steel cantilevered fire escape would also promote this type of inwards rotation also. This is a likely scenario because of the minimal number of remaining interior transverse walls at ground floor level do not prevent effective lateral movement of the first-floor level flexible timber floor acting as a diaphragm and therefore propping the front wall is ineffective.

Therefore, with the present degradation of the building structure to date and the likely ongoing further neglect to the building it is likely to undergo at least some partial collapse to areas in time if left in its present state.

The building presents a great risk to the public, emergency services should they need to access the building and neighbouring buildings, and under Section 121 of the Building Act 2004 the building should be considered a Dangerous Building. The most effective course for remediation of the risk would be complete demolition of the building.

The extent of long-term water damage and vandalism to the interior of the building and the resulting degradation of the unreinforced masonry is so extensive that the likelihood of undertaking effective remedial repairs and installing effective bracing and support to the roof structure, first floor and all the masonry brick walls over the entire structure would be extensive and prohibitively expensive.

As an aside several seismic assessments that been completed have indicated the building has a very low rating – approximately *14% NBS* and we would concur with this with our own analysis of the front wall under out of plane forces. This analysis indicates that with no support at roof level and supported at first floor level the theoretical rating

is *14%NBS* at best and assumes the wall and whatever fixing restraints are in good condition, (which they are not.) However, with no support at first floor the rating is *0%NBS* as it would effectively be a two-storey freestanding cantilever wall with heavy overhanging cornices and pediments, and an external fire escape cantilevered off the building face.

All of which provide an action that naturally tries to rotate the wall outward and would be on the verge of at least partial collapse. The situation is made worse by the fact that the ground floor comprises largely of entirely open areas that provide no restraint and effectively creates a 'soft storey' type building failure mechanism.
It is likely that the neighbouring buildings at either end of the Club Hotel building would be affected also by partial collapse.

RECOMMENDATIONS

Our recommendations are as follows:

- In the near term we would recommend that the existing front veranda is removed in conjunction with the various fire escapes around the building. Access into the building should also be effectively prevented by closing in the ground floor areas with metal sheeting and the reinstatement of at least the missing roofing iron and the various broken windows boarded up.

- In the medium-term our recommendation would be that the building should be demolished.
  Therefore, planning should be put in hand to enable demolition of the building to proceed. Part of this planning will require the input of Heritage New Zealand to approve the demolition of the heritage listed building and also how they may safely inspect and record areas of interest prior to and during the demolition process.

We trust this report is helpful and fulfils your requirements to move forward with the building complex. Please do not hesitate to contact the writer on 03 2187936 should you wish to discuss or clarify further any of the points raised in the report.

Yours sincerely

Kensington Consulting
///// Civil and Structural Engineers

Encl; Photo pages

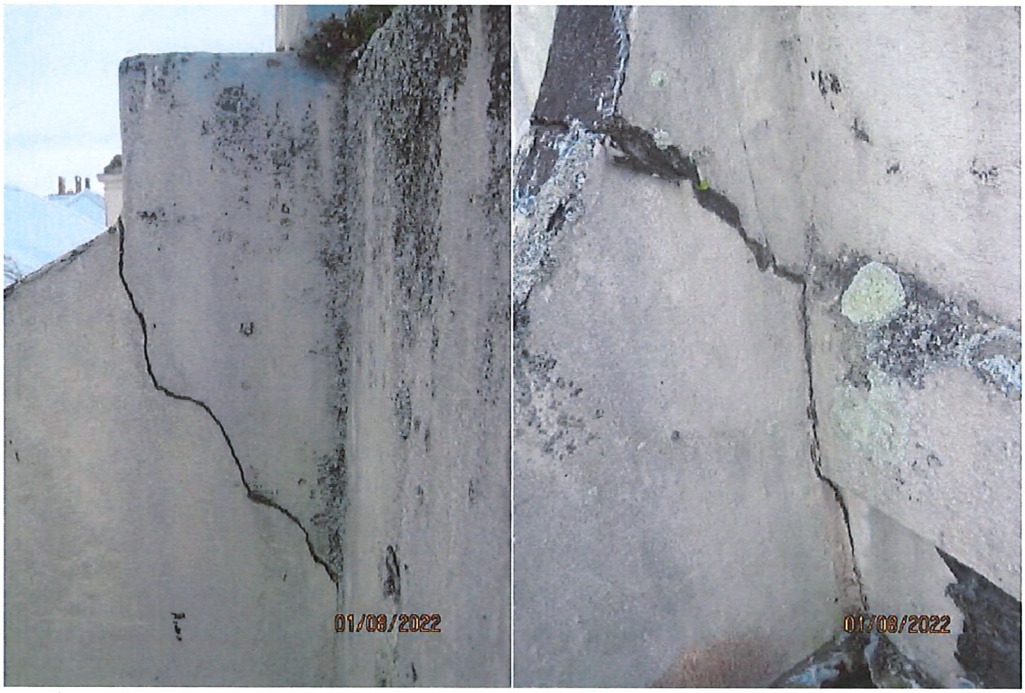
View of ornate front façade with veranda cordoned off, Note heavy parapet and cornice at roof level

View to rear of the building, with partially demolished roof to lower left Cantilevered fire escapes attached to buildings

Rear view of site showing single storey block masonry extension and roof partially demolished.

View behind main façade at roof level, the heavy parapet is leaning out approximately 75mm.

Similar view further to the west end, gutter corroded out and roof sheeting missing and open though to floor below. No cover flashing to gutter edges behind wall and open to below



Typical views of numerous open cracking in the brick walls tying back the main façade parapet

Large open cracks (15mm) extending deep into the walls supporting façade . Vegetation growing out of lower crack level

Typical condition of capping beam over pedestals showing crack and slight offset out towards the street.

Typical condition of another section of parapet that has cracked through and moved outward. Note flashing pulled away from the rear of the parapet also with the movement

Typical view that exists all around the building parapets with no over flashing to gutter edges and open brickwork mortar joints in poor condition

Typical condition of gutter behind façade, gutter rusted out, no over flashings to wall , deep recess extending into brick layer from missing overflashing allowing water inside the wall

Typical condition to north end of gutter with rusted out gutter the supporting timber framing of gutter is all rotten. Open edge to upstand edge of gutter allowing water to track down behind upstand into the building

Typical view of poor condition to top of parapets of original intertenancy walls showing open brickwork and joints allowing water to track inside the walls.

Missing gutter extension, rainhead and downpipes allowing water to flow back inside the building and also directly into the brick work layers.

Typical damage from vandalism to ground floor area, actual flooring has been removed. Area is being saturated from water entering above first floor

Typical water damage to ceilings, timber work and walls at first floor level. Other linings damaged by vandalism to the right of the photo

Typical view of upper floor area damage to floors and wall linings.

Water damaged and rotten timber wall framing to exterior wall, flooring and wall linings have also rotted away

Flooring removed at first floor level typical in many rooms. Typically there is no physical connection between the floor joists and the exterior brick walls to restrain the walls

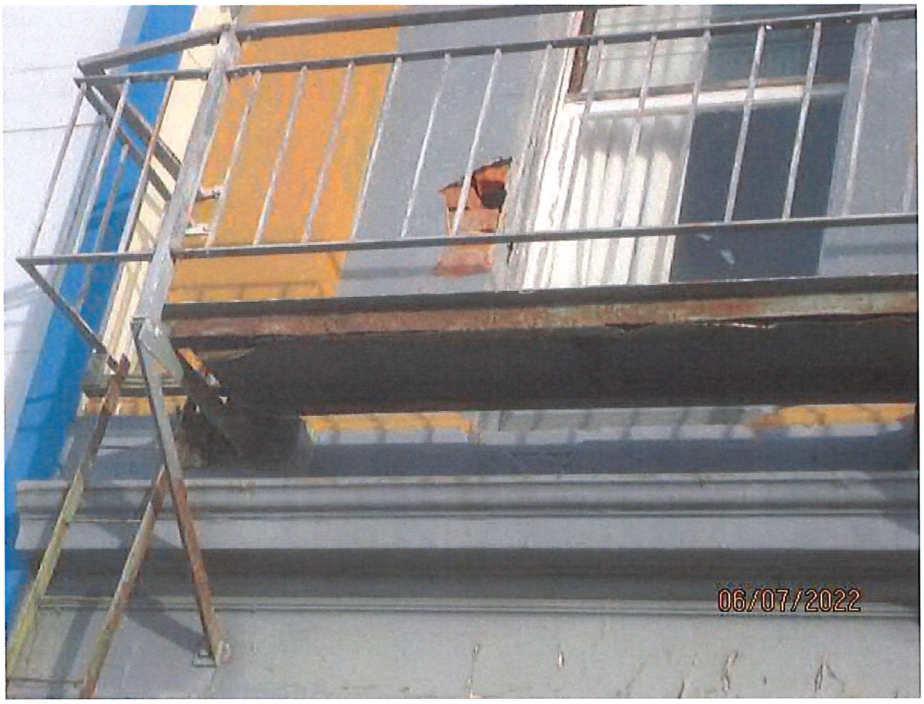
Typical damage to wall linings and the floor covered in moss from saturated flooring from water entering above. Condition of flooring and joists is likely to be deteriorated due to the saturated timber

Extent of water damage over time and buildup of vegetation in one of the rooms. Room was deemed to be dangerous to enter

Additional view to rest of the same room showing even heavier buildup of vegetation. There is black mould on the walls also

Condition of a brick opening punched through a ground floor masonry wall. No lintel or trimming frame to support wall loads from above. note areas of fire damaged brick from original fire in 1914.

Large open tension crack visible to the base of the column by ground floor main entry door



Typical exterior view of heavy steel fire escape at first floor level in poor condition and with fixings into the brick façade of unknown condition. Note also damage and spalled brick work to left of window. Extensive cracking in beam over lower openings visible at bottom of the photo.

View along front façade showing veranda in very poor condition and the corroded fire escape above.

View of soffit lining to veranda in poor condition and supporting timber framing.

Closeup view of damaged and collapsed soffit lining showing typical construction

Typical view of veranda post heavily corroded and in very poor condition and the supported beam above

View of a similar post in poor condition and badly rotten beam above

Water damage to soffit linings and outer main support beam in very condition also. Very poor condition to all nail fixings

Top of post has disintegrated, and the outer beam is carrying most of the load to adjacent posts. The rafter to beam nail fixings have all withdrawn from the timber. Connection to this area of roof is very poor and on the verge of collapse.