KENSINGTON CONSULTING
///// Civil and Structural Engineers

21158

November 16, 2021

Invercargill City Council
Private Bag 90104
INVERCARGILL

Attention: Ms C Horton
Parks & Recreation Planner

Dear Cassandra

RE: SANDY POINT WATER SKI CLUB BUILDING & RAMP REPORT

As requested, we have inspected the main water ski club building and the two foreshore access ramps located on the Oreti River at Sandy Point. No internal inspection was made of the foreshore viewing tower structure as access was not possible at this stage and only limited comment is provided further on in this report.
No consent documentation or any construction documents have been found for this complex.

The general layout of the site is shown in the aerial photo in Fig 1. Below.

Fig. 1 site layout showing buildings and ramp locations

CLUB BUILDING

GENERAL DESCRIPTION

The original club building was constructed in the early 1960s we believe and comprises a single storey area to the east end and a more recent 1974 two-storey addition to the west end with double garages under, but only one operable door.
Photos are appended relating to the various areas as noted below.
The single storey portion comprises of masonry block walls with a shallow pitch timber rafter roof structure spanning to a light steel lattice truss ridge support. The floor comprises of concrete slab on grade construction. The single storey layout is a large central lounge area with adjacent large kitchen lean-to area to the rear which has been an addition to the original building. The lounge area also has an old open fireplace. Toilets and changing facilities are located to the west end of this section of the building. Internal main walls are 200mm / 90mm concrete masonry block.
To the southeast corner of the building is a small lean-to storage area also using concrete masonry block walls with simple timber rafters over.

The two-storey portion of the building to the west comprises concrete masonry block walls to the ground floor perimeter, supporting timber floor structure at first floor level. The first floor joists are supported on a combination of masonry and timber beams and walls located across the space internally.
Above first floor the entire space is a completely open lounge area with conventional timber framed walls supporting a timber trussed roof. The timber framed walls appear to be lined with gib internally and externally with a vertical profiled cement fibre sheet cladding. Window joinery is all aluminium. A small door exists in the east wall to give access over the roof and may have formed part of a fire escape.

The ground floor space is treated as storage and part garage with one door opening permanently walled off and the other a roller door to the exterior. Internal stairs and steps allow access between the garage, adjacent original single storey lounge area and the upstairs spaces.
Based on the buildings being in good condition and the assumption they were constructed to the standard methods of construction at that time we have undertaken a quick Initial Seismic Assessment of the facility and can confirm that the building is not considered to be an Earthquake Prone Building. However the assessment relies heavily on a structurally sound and well tied together roof structure supporting the walls which in its present condition is not the case.

CONDITION

The original single storey external masonry block walls are in reasonable condition for their age. The river facing frontage is also covered with split concrete veneer over the masonry wall behind.

The roof structure is a very flat pitch and the roof area around the fireplace chimney and the rear kitchen has suffered significant water damage over the years from lack of maintenance. The roof between the main lounge and the lean-to kitchen roof addition is separated by the original guttering, which has become an internal gutter with the kitchen roof being installed.

As a consequence, the roofing and the roof structure has rotted out and both the rafters and the ceilings have partially collapsed. As a minimum this area of roof structure requires to be replaced. The tray roofing is also in very poor condition with numerous holes visible and other areas patched and is in need of replacement.
Similar damage has occurred along the roof edges in the toilet / changing room areas from corroded holes through the roofing damaging the timber roof structure below.

Until these areas are made structurally sound and waterproof, this portion of the building should not be used.
In reality, the entire roof should be replaced and repitched as a trussed roof spanning full width, thereby eliminating the open fireplace chimney and the internal gutter. The condition of the open fireplace is questionable and should be eliminated as part of any future use or redevelopment to prevent the possibility of fire breaking out.

Given the age of the original single storey building it is most likely that the masonry blocks will only have vertical reinforcing bars adjacent to openings and a bond beam at top level along the wall. The observed cracking to mortar joints in some areas would support the assumption that the walls have little horizontal reinforcing and are likely to be only partially filled or totally unfilled. This was the typical construction detail for these type of wall at that time. Any open joints should be cleaned out and repointed and the walls recoated in a suitable flexible coating system formulated for sealing concrete masonry substrate.

The two-storey portion of the building is in reasonable condition for its age and has reached the point of needing repainting and general tidy up. Some of the aluminium window glazing also needs attention as the sliding windows do not shut properly and the glazing gaskets to the glass require replacement.

As mentioned previously the small egress door onto the adjacent roof of the single storey building is a timber door and is breaking down with exposure to the weather and moisture. Water is also entering at sill level and damaging the interior framing, linings' and trims in this area. The stud framing may be in poor condition and requiring replacement, however this could not be established conclusively without removal of the wall lining. From the exterior no form of head or jamb flashings could be observed.

The painted Anaglypta type paper coating system used on the walls in the upstairs lounge has separated from the wall lining in several locations and has insects and debris spilling out onto the floor. It is possible that these areas may have holes, or the lining has gaps, although none were felt when touched. This requires further investigation.

The ceiling of the upper lounge area comprises of soft board type ceiling tiles and is in good condition.

At the ground floor level, the masonry blockwork and first floor support beams are in good condition. The soffit lining of the first floor is part gib board, mainly to the rear and the other areas are MDF board. As such, there is little fire rating provided to the underside of the first floor. The timber support beams and the bottom plate for the floor joist support are not protected by any form of gib board fire lining either. The underside of the stairs has gib board full length. The space under the stairs has been utilised to provide the pump and pressure tank for the water supply drawn from the large storage tank outside.

The stairway does not have any smoke control door system at ground floor. There are generally no alarms, manual call points, exit signage or emergency lighting within the building with the exception being a smoke detector at the head of the stair well.
Egress from the upper floor is only available directly via the single stair flight and out though the single storey building to exit via the single front door. A large timber sliding door capable of providing vehicle or boat access is located on the eastern end of the single storey building and does not provide a suitable egress route. However, this door has been significantly damaged by vandals sufficient to enable access into the building. This damaged door needs to be either repaired or replaced.

Externally the building requires all barge boards and fascia's repaired and repainted. The lower-level spouting's all need replaced.
The roof and spouting's of the two-storey area require closer inspection and either repaired or replaced as necessary. The ground floor level around the rear and the end of the building is either above or at floor slab level, particularly the area behind the kitchen extension. It is recommended that the present ground level is lowered below slab edge level and extended a distance back to control surface water runoff and prevent it from seeping into the building.

The condition of the two storage tanks is unknown and these storage tanks should be emptied, inspected, cleaned out, disinfected, and refilled if the system is to be reused. First flush type fittings should be placed on all the incoming supply pipes to remove debris from the system. Weathertight, lockable tank access lids are also required.

RAMPS

GENERAL DESCRIPTION

There are currently two ramps extending from approximately spring high tide level out to below low water. They are of differing ages and the older easterly located ramp beside the viewing tower is relatively narrow and steeper than the ramp located further to the west. Both ramps are constructed of poured insitu unreinforced concrete slabs founded on the gravelly sand of the shoreline. Refer to Fig 1 aerial photo for the locations.

CONDITION

The smaller east ramp is in poor condition with major slumping of broken slabs along both sides with extensive open cracks the length of the ramp. The lower end of the ramp is also extensively cracked with large gaping cracks and steeper slumped slabs just at the end with a drop off into the deeper water. Refer to the appended photos for details.

This ramp slab sits higher above the surrounding present beach level. Originally it was probably constructed on a higher beach profile and over time the beach has receded to its current flatter and lower slope. The resulting erosion and scour of the material from under the upstream and downstream slab edges has seen these slabs slump downwards along each side. The end result is, the present situation, with a central higher slab and the outer edge slab along both sides lower. Similarly, the lower end slabs have been scoured out significantly, allowing the lower slabs to pull apart and drop into the deeper water leaving large gaping cracks across the lower region. These large open cracks allow further scour action to propagate further under the slabs and the process keeps on repeating. The lower concrete areas in the main tidal zone are also very slippery with the marine growth and the round aggregate exposed. The steepness of these slabs is difficult to walk on especially with the marine growth build-up and is also likely to be an issue for a vehicle trying to launch or retrieve a boat.

In our opinion this ramp presents a significant risk to users in its present state, both to people and vehicles and should either, be removed, or completely replaced if it is deemed that two ramps are required.

The more recent ramp located further to the west is significantly longer and wider. It is also placed at a profile matching the existing beach profile and almost fully embedded in the sand. It has been well made and in good condition for its age. It comprises of two large strips of slabs poured with a central joint. There are some horizontal cracks across, but these are more likely shrinkage cracks in the unreinforced concrete slabs.

The lower upstream edge of the slab is subject to scour, particularly on an outgoing tide when the river is also in flood. Historical scour has been addressed by placing additional mass concrete to the upstream edge and along the lower edge to prevent sudden drop off from the

ramp at low tide. However, it was observed that on the upstream edge a large open void exists that has allowed ongoing scour action to extend back under the lower slab area. The depth can be probed up to 2m, which reduces support for this lower slab and its ability to support heavy wheel loads. It is recommended that additional fibre concrete is pumped back under this slab from the upstream edge at low tide to provide support for the slab and infill the upstream void between slabs in the existing concrete to limit potential future scour.

The lower tidal area of this ramp is also very slippery from the build-up of fine marine growth mainly due to lack of use. This should be water blasted clean prior to being used and when in use growth will more than likely be significantly reduced by wheel action from boat trailers and vehicles.

In our opinion this ramp is satisfactory for ongoing use. The minor clean and regrouting of the minor scoured lower slab area will enhance its life.

CONCLUSIONS

BUILDINGS

The single storey original ski club building in its present condition is considered structurally unsafe to use until the water damaged roof areas and roofing are repaired. Once repaired the building is considered safe for use. The condition of the fireplace and chimney in the lounge space is unknown and should be removed to reduce potential future roof leakage issues and the inherent potential damage that could be created from open fire use.

The two-storey part of the building is considered structurally safe for use, but the fire safety aspects need to be fully reviewed regarding egress, smoke control, fire spread, warning systems and signage. At present the upstairs area only has one stair egress which exits in the lounge space at ground floor and the single exit. Until this lower building area is made safe and the fire safety issues are resolved the two-storey portion is also not usable.

RAMPS

The larger western end ramp is considered safe to use after a waterblast clean. The smaller badly cracked eastern end ramp is a safety hazard to both people and vehicles that may use it, and in our opinion, should either be removed, or totally rebuilt if it is deemed necessary to still provide two ramps.

RECOMMENDATIONS

BUILDING

- The single storey building needs extensive roof structure repairs to the kitchen, lounge and toilet areas as a minimum. It is highly recommended that the entire roof is replaced with a new pitched trussed roof over the space with new roofing. At the same time the fireplace and chimney would be removed, and the internal gutter system eliminated.
- Kitchen cabinetry and appliances are significantly water damaged and likely to require replacement.
- The vandalised external sliding door to the east needs to be either repaired or replaced. Thought should be given to proving an additional exit door out of this space.
- The stair access to the upstairs lounge needs a smoke stop lobby at ground floor level.
- Alternative permanent additional egress required from the top floor.
- Windows at top floor all need repaired and refurbished.
- Interior paint work throughout needs to be redone.
- Fire rating of underside first floor throughout is required.

- A full fire report is required to cover fire safety, detection, warning systems and signage which all need to be addressed and installed throughout the building complex.
- Upstairs, the roof level egress door needs replaced or removed and blocked up and water damage to wall framing reviewed and repaired.
- Damage and insect infected wall linings upstairs requires further investigation and repair as necessary.
- All external spouting needs to be replaced.
- All fascia's and barge boards require to be painted. Some areas may also require replacement.
- The ground level around the rear and the sides of the building requires to be lowered below interior slab level and extended back some distance to prevent dampness entering through under the masonry block walls.
- It is recommended that if the complex is going to be made available for use, then the present water tank storage requires emptying, inspection, cleaning and disinfection before refilling. A secure lockable access lid system is also required. It is highly recommended that roof water downpipes supplying the tanks have a 'first flush" system installed on each supply pipe to ensure any debris build-up in the spouting is removed before entering the tanks.
- A complete review of the electrical, plumbing and drainage systems including septic tank and field disposal system is highly recommended after such a long period of inactivity. As potential damage from rodents, insects and water ingress could have significantly affected some of these services over time.

RAMPS

The following are our recommendation relating to the ramps.

- The smaller eastern ramp is badly cracked, and the sides and end slabs badly slumped. This is considered a safety hazard to users and should be removed. If a second ramp is deemed a requirement, then it should be replaced with a new redesigned ramp.
- The larger ramp to the west requires a water blast clean of the marine growth within the tidal zone as a minimum and can then be used.
- It is highly recommended that the void beneath the lower end slab below low water is filled with pumped fibre concrete to prevent further scour and possible slab failure in the future.

VIEWING TOWER

While the interior of the tower could not be accessed for review the external walls of the lower concrete support structure were inspected. One area has developed a complete hole through the concrete wall, created by the corroded reinforcing expansion that has spalled off the concrete both sides and the reinforcing has eventually completely disappeared. Other potential corrosion sites may exist in the other walls also.
The roof cladding edges where visible from the ground are also in poor condition.

It is our recommendation that this tower structure is demolished, and the ground reinstated to match the existing surrounds.

We trust this summary report of our findings on the buildings and the ramps is of assistance with your future planning for the facility.

Please contact the writer should you wish to discuss or clarify any of the items noted in the report. We would be pleased to meet and discuss the report and its recommendations if this is helpful.

Yours faithfully
Kensington Consulting

Darryl Kensington
Director

Encl: Photos

View of club rooms from NE corner

View of two storey western end masonry block lower walls and fibre cement sheeting to upper level

End view showing masonry block lower and fibre cement sheeting upper cladding.

Rear view showing similar arrangement, with water tank and gutter requiring cleaning out.

Exterior view to rear of toilets, with smaller tank. Note extensive vegetation needs cleared out and spouting replaced.

Typical view of rear wall to kitchen block. Spouting needs replaced as it has corroded away and the vegetation requires clearing along the rear wall.

View of lower level lean-to storage shed, again no spouting and vegetation requires clearing out

Typical condition of old viewing tower with corroded reinforcing and general deterioration of the cladding, typically at the ends.

Typical spalled concrete and gaping hole left from the corrosion of the reinforcing requiring fixing.

Typical view of single storey very flat tray roof in poor condition along the edges with numerous patches and gutter requiring cleaning and possibly replacement.

Very poor condition of roofing along internal gutter between lounge and kitchen lean-to roof to the right. Chimney structure is central in the gutter with unknown detailing about the flashings and drainage works.

Typical view of main lounge area, open fireplace to the left photo and collapsed ceiling

View of east end to lounge showing fireplace to right of photo, damaged sliding door in the centre rear. Rafters are supported by light steel truss through the centre.

Corroded roof and water damage above fireplace. Three rafters have rotted out and have collapsed downwards.

Typical damage to kitchen ceiling roof in same area with extensive damage to the roof structure.

Closeup view of damage to roof above the rear kitchen wall

Similar view at the internal kitchen wall.

Ceiling damage above toilets for corroded roofing, which appears to have been sealed on the exterior but the interior has not been repaired

Upstairs lounge looking back towards the stair lobby

View towards front river face with large windows and door out to roof on right of photo.

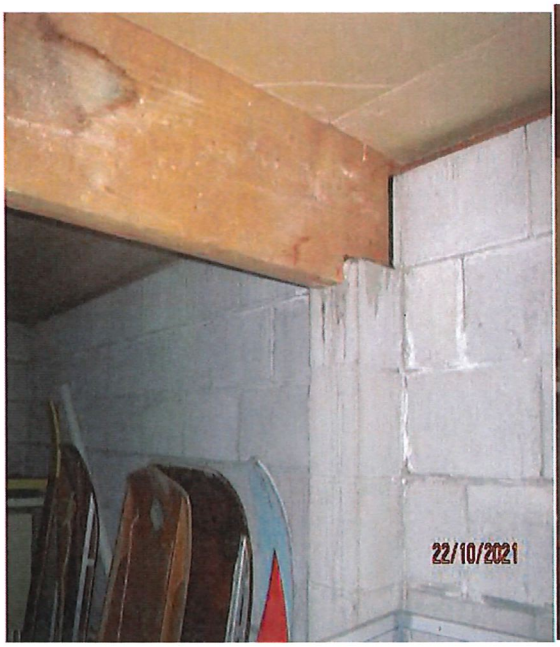
Windows in poor condition, do not close and moisture is affecting the timberwork

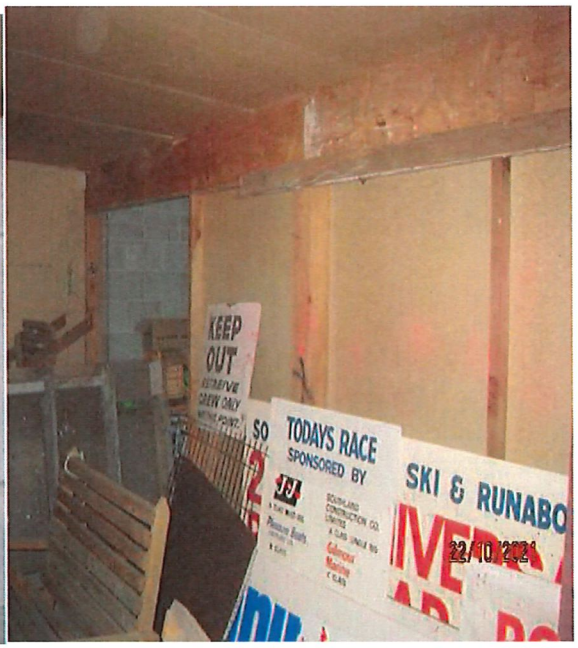
Buildup of insect infestation behind lifted wallpaper requires further investigation.

Water damage evident from around the external door jamb and sill, resulting from no external flashings.

Typical ground floor storage area, masonry block walls supporting the timber first floor structure

Concrete masonry support beam for first floor nearer the front part of the space.





Additional views of the timber first floor support beam and wall support not firerated or adequately tied into the structure.

Interior view of small lean-to building to the SE corner showing typical condition of roof system and masonry block walls.

View down main western ramp in good condition for its age

Upstream side view of main ramp. Viewing tower and other ramp visible in the centre rear of the photo.

Slumped upstream slab at the end of the ramp showing scour hole which extends along under end of the slab requiring to be grout filled.

View up the smaller and steeper eastern end ramp showing extensive cracking and slumping to concrete slabs.

side view of slab showing slumping with extent of foreshore erosion over time.

Lower end of ramp with steep drop-off and wide cracks. Very slippery due to marine growth and polished rounded aggregate.

Steep ends to slab from slumping in two directions

Large open cracks in the concrete. Typical