

Report

314 The Terrace - Building Services Condition Assessment - Services

Prepared for Victoria University of Wellington

Prepared by Beca Ltd (Beca)

8 May 2015



Revision History

Revision N°	Prepared By	Description	Date
1	Ed Schmidt	Draft Issue to Client	16/01/2015
2	Steve Kemp	Draft Issue to Client	30/03/2015
3	Jake Bannatyne / Ed Schmidt	Issued for Client Review	02/04/15
4	Ed Schmidt	Structural Items Removed	08/05/2015
5			

Document Acceptance

Action	Name	Signed	Date
Prepared by	Ed Schmidt		08/05/2015
Reviewed by	Christopher Dunlop		08/05/2015
Approved by	Steve Kemp		08/05/2015
on behalf of	Beca Ltd		

© Beca 2015 (unless Beca has expressly agreed otherwise with the Client in writing).

This report has been prepared by Beca on the specific instructions of our Client. It is solely for our Client's use for the purpose for which it is intended in accordance with the agreed scope of work. Any use or reliance by any person contrary to the above, to which Beca has not given its prior written consent, is at that person's own risk.

Executive Summary

Building History & First Condition Assessment

The Ministry of Works original design drawings are dated 1954 and the building was opened in August 1957. The building is therefore 57 years old at the time of inspection.

Based on the site inspection observations and comparison with the Ministry of Works design drawings we confirm that only maintenance type work has generally been undertaken on the Building Services remaining within the building. (Both the rubbish incinerator and gas reticulation to the apartments have been removed/decommissioned.)

Modern day Building Services have a design life of 50 years and if the building is to be upgraded, Victoria University of Wellington expect to utilise the building for at least the next 50 years, we recommend that all existing Building Services be replaced as part of this building upgrade project.

Civil Works

The Civil works (stormwater, sewer, pavements and kerbs) are all showing signs of a poor maintenance history and if the building is to be upgraded to an expected 50 year life, then it is recommended that all existing civil works be replaced as part of the project.

Building Act Compliance

Where an alteration is made to the existing building or any specified system, the entire building is required to comply, as near as reasonably practicable with the requirements of the Building Code relating to means of escape from fire and access and facilities for people with disabilities.

Required amendments include:

- Sprinkler system throughout in accordance with NZS 4541
- Smoke detection and manual call points system in accordance with NZS 4512
- Fire hydrant system in accordance with NZS 4510
- Removal of electrical switchboards and similar from the safe path egress stairs
- Remedial fire stopping of all vertical and horizontal fire separations including safe path stairs, floors (including balconies) and the boundary of each apartment.

Ventilation

Ventilation of the building is primarily achieved through passive ventilation (operable windows) which does not require substantial modification to meet current code and Wellington City Council Chapter 13 Noise Insulation & Ventilation Rules requirements.

The combined Kitchen and Toilet extract systems associated with the apartments do not meet current code requirements and require complete replacement including new vertical risers which is expected to create structural issues. We recommend introduction of shared kitchen facilities as part of a building upgrade project to minimise the number of new vertical ducts required within the building.

Plumbing and Drainage

The existing internal building water supply, storm water system and soil stacks are showing signs of corrosion and should be fully replaced. The remainder of the existing gas system within the building should be fully removed as part of a building upgrade project.

Electrical Services

While the existing electrical supply to the building is considered appropriate for a multi dwelling apartment, the remainder of the installation requires replacement including repositioning of floor distribution boards which can no longer be located on intermediate landings within the north and south emergency escape stairwells.

Communications Services

The existing communications systems should be modernised including the install of a central MATV system as part of a building upgrade project.

Security Services

An electronic access control system should be installed to control all ground floor public access doors. All apartments could remain on a manual key lock system.

Fire Protection

A new active fire system is required under 'Section 112' to replace the existing system.

An upgraded fire services water supply is likely to be required for the upgraded building.

Contents

1	Introduction	1
2	Civil	2
2.1	Site Drainage Pipes	2
2.2	Water Supply	2
2.3	Pavement	2
2.4	Kerbing, Retaining Walls and Steps	3
3	Building Act Compliance - Fire	4
3.1	Introduction	4
3.2	Means of Escape	4
4	Ventilation	5
4.1	Ventilation General Description	5
4.2	Observations and Condition Status	6
5	Plumbing & Drainage	8
5.1	Description	8
5.2	Observations & Condition	9
6	Electrical Services	12
6.1	Electrical Supply	12
6.2	Main Switch Board (MSB)	12
6.3	Floor Supplies	12
6.4	Cable/Wiring Management	13
6.5	Lighting	13
6.6	Emergency lighting	13
6.7	Lightning Protection	13
7	Vertical Transportation	14
7.1	General	14
7.2	Condition	14
8	Communications	15
8.1	Description	15
8.2	Condition	15
9	Security	15
9.1	General	15
9.2	Condition	15
10	Fire Protection	16
10.1	Fire Hose Reel system	16
10.2	Fire Alarm System	16
10.3	New Sprinkler and Hydrant Systems – Water Supply	16
11	Conclusions	17
11.1	Introduction	17
11.2	Civil	17

11.3	Building Act Compliance	17
11.4	Ventilation	17
11.5	Plumbing & Drainage	18
11.6	Electrical	18
11.7	Vertical Transportation	18
11.8	Communications	18
11.9	Security	19
11.10	Fire Protection	19

Appendices

Appendix A

Property Condition Photographs
 Air Conditioning Photographs
 Air Conditioning Photographs (contd.)
 Plumbing and Draining Photographs
 Plumbing and Draining Photographs (contd.)
 Plumbing and Draining Photographs (contd.)
 Electrical Photographs
 Electrical Photographs (contd.)
 Vertical Transportation Photographs
 Communications Services Photographs
 Fire Protection Photographs
 Civil Photographs
 Civil Photographs (Cont)

Appendix B

Concept Design

- Refurbish building
- One extra bedroom added

1 Introduction

Beca Ltd (Beca) was appointed by Victoria University of Wellington to undertake a building condition audit and assist cost management assessment of 314 The Terrace, Wellington.

Our report is based on a non-invasive site inspection on 1 and 2 December 2014.

Our inspections were limited to sensory examinations of what we assessed to be typical parts of the building only where safe ready access existed at the time. Our inspections of the relevant aspects of the buildings as outlined above cannot guarantee that all possible facilities, defects, conditions and qualities are identified in this report. Our review has not extended to design calculations. No underground services, hazardous material, geotechnical or subsurface investigations were undertaken.

For a review of the structure and seismic assessment, refer to the separate '314 The Terrace Building Structure Condition and Detailed Seismic Assessment' report.

This report is of defined scope and is for reliance by Victoria University of Wellington only, and only for this commission. Beca should be consulted where any question regarding the interpretation or completeness of our inspection and reporting arises.

2 Civil

2.1 Site Drainage Pipes

2.1.1 Sanitary Sewer Pipes

It is not known what material the sanitary sewer pipes are made from however it is likely that the material is of earthenware construction as the storm water pipes are earthenware. If this is the case then the piping could easily be in a state of damage resulting in leaking pipes.

To confirm the material and condition of the site sanitary sewer pipes, further investigation (CCTV pipe condition inspection) is recommended.

2.1.2 Storm Water Pipes

The below ground storm water pipes are constructed of earthenware so given the age of the system then the piping could easily be in a state of damage resulting in leaking pipes.

To confirm the condition of the below ground storm water sewer pipes, further investigation (CCTV pipe condition inspection) is recommended.

However, outside sumps that were readily accessible were inspected and were found to be not maintained and therefore were filled with leaf debris and plant growth. (Refer image CV 01).

There are some areas of the storm water system that have above ground PVC pipes, many of these are broken and will need to be replaced (Refer image CV 02).

2.2 Water Supply

2.2.1 Incoming Water Supply

Based on historical drawings the building is serviced by a 65mm main of the council water main running along The Terrace. We have no information on the pipework material type at this location. However, on the basis that this water main was installed in the '1950's, we would expect the supply to the building to most likely be galvanized steel or alternatively asbestos cement. Given its age, whatever the material used, its life expectancy has probably been exceeded, or close to exceeding its useful life span and complete replacement is recommended.

Back flow prevention provisions on the incoming water supply to the building were not identified at the time of our inspection. Given the age of the installation it is likely that no backflow prevention has been provided on the incoming water supply. This will need to be provided as part of any upgrade works.

2.3 Pavement

2.3.1 Asphaltic Pavement Areas

The asphaltic pavement areas are in a poor state with a mismatch of different areas and poor transitional gradients. Many of asphaltic areas have lichen growing on them and joints between different areas have built up organic material allowing for plant growth to prosper. This is very evident around the joints which have opened up where the asphaltic pavement areas meet the concrete pavement areas. (Refer image CV 03).

With so many wide joints in the pavement areas it is highly likely that the water has infiltrated and caused damage to the subgrade. It is therefore recommended that all asphalt areas be removed and replaced as well as any substandard subgrade areas be reconstructed.

2.3.2 Concrete Pavement Areas

As with the asphaltic pavement areas the concrete pavement areas are also in a poor state. There are many uneven joints that now harbour organic material and are sustaining plant growth. (Refer image CV 04).

The concrete pavement needs to be replaced and likely the subgrade is in poor condition as a result of water infiltration through the joints.

2.4 Kerbing, Retaining Walls and Steps

2.4.1 Kerbing

The kerbing within the site is also in a poor state. Much of the kerbing is covered with lichen and filled up with organic matter. Joints adjacent to the kerbing have opened up to allow for plant growth to occur and in some cases the kerbing is completely broken into separate sections, in particular the nib kerbs surrounding the landscaping areas. (Refer image CV 05).

It is recommended that all kerbing be replaced.

2.4.2 Retaining Walls

The retaining walls, particularly at the north end of the site have been damaged overtime by root growth of the adjacent trees. (Refer image CV 06).

We recommend that they are replaced with new retaining walls. It would also be prudent to review the location of the walls with regard the trees to avoid root damage to the new walls in future.

The large crib wall at the back of the site is mostly covered with vegetation so it was difficult to assess its condition. However as it is more than 50 years old it is unlikely to last for another similar period of time.

2.4.3 Steps

Steps are in a very poor condition with concrete spalling and reinforcing steel exposed. (Refer images CV 07 and CV 08).

Many of the handrails are broken or completely missing. (Refer images CV 09).

Rather than repair the steps and handrails it is recommended that they are completely replaced.

3 Building Act Compliance - Fire

3.1 Introduction

Where an alteration is made to the existing building or any specified system, the entire building is required to comply, as near as reasonably practicable with the requirements of the Building Code relating to means of escape from fire and access and facilities for people with disabilities. This requirement is stated in Section 112 of the New Zealand Building Act 2004 and the requirements and subsequent works are commonly referred to simply as “Section 112”.

3.2 Means of Escape

Under Section 112 the following changes are considered to be applicable to the building:

- Provision of a sprinkler system throughout in accordance with NZS 4541
- Upgrade of the existing detection and alarm system to include smoke detection and manual call points throughout with localised “hush” facilities in accordance with NZS 4512 (commonly known as a Type 5 detection and alarm system)
- Removal of electrical switchboards and similar from the safe path egress stairs
- Remedial fire stopping of all vertical and horizontal fire separations including safe path stairs, floors (including balconies) and the boundary of each apartment
- Provision of a fire hydrant in both safe path stairs with outlets at each apartment entry level.

4 Ventilation

4.1 Ventilation General Description

The building is approximately 60 years old and contains (or did contain) basic ventilation systems consistent with installations around that time. Only limited modifications have been made to the systems concerned.

The living and sleeping areas within each apartment are naturally ventilated via opening windows on the east and west facades.

Central services risers, which pass through each apartment, run vertically from the ground floor to roof level. A roof top exhaust fan is fitted to the top of each of these risers to provide continuous common extract ventilation within each apartment by way of fixed grilles in the riser walls in the kitchen and bathroom areas.

A significant number of apartments have had window mounted manually controlled extract fans fitted at high level in one of the windows within the kitchen area. In some instances these are fitted in windows which discharge into the enclosed corridor area leading to the lift vestibule.

There are no central space heating systems installed within the building. There are gas connections and openings in the building fabric (now sealed off) within the living areas of each apartment which indicates that flued gas heaters were once fitted. It is believed that each apartment was heated by portable electric heaters.

There is evidence that each apartment originally contained a naturally ventilated food safe in the kitchen area as there are low and high level ventilation openings in the external wall adjacent the main entry door. Most of these openings have now been closed off, although some still remain active.

With the exception of the ground floor the lift vestibules are passively ventilated by passive louvres fitted within the windows on opposing walls of the lobby façade. The ground floor is passively ventilated from the adjacent building entrance lobby.

Passive ventilation grilles are fitted in the doors leading from the north and south egress stairs to the apartment access walkway which provide limited ventilation to the stairwell.

A rubbish chute is provided in the enclosed corridor leading into each lift vestibule which discharges into the ground floor rubbish room. This room could not be accessed at the time of our inspection but it is believed to be ventilated via a high level louvred window and a duct connection to the adjacent apartment toilet/kitchen extract riser shaft. Additional ventilation may be present if the flue associated with the old incinerator (presumably removed) is still open to roof level.

A single toilet adjacent the main switchboard room is ventilated by passive grilles into the entrance area lobby.

The ground floor storage area at the south end of the building is passively ventilated by high level ventilation louvres.

Sub-floor ventilation grilles have been installed on the east and west face of the building to provide ventilation to the void space below the ground floor. Refer image VENTILATION 10.

4.2 Observations and Condition Status

4.2.1 Apartment Outdoor Air Ventilation

The existing opening windows appear sufficient to meet code requirements for natural ventilation of the spaces concerned. However, the current functionality of the windows is uncertain and all windows are likely to need refurbishing (new stainless steel hinges, security locks, etc) to ensure correct operation. Additionally, most occupants are unlikely to leave their windows open to provide ventilation (particularly in the evening during inclement weather or noisy periods).

Normally a central outdoor air supply system would be installed to provide ventilation air to this type of building to eliminate reliance on opening windows. However, due to limited riser space and limited or no ceiling space to reticulate ductwork, the installation of this type of system would not be practicable. The windows should therefore be replaced with modern windows with trickle vents fitted.

Refer images VENTIALTION 01, 06.

4.2.2 Apartment Extract Systems

The roof top fans associated with the current central extract systems serving the apartments appear reasonably new. However, the system as it stands does not meet code requirements as it is not permitted to have a bathroom extract off the same system as a kitchen extract due to the risk of cross contamination. Intumescent fire dampers are fitted behind each grille but there are no volume control dampers fitted meaning the extract rates from each apartment cannot be controlled. The extract grilles themselves are in poor condition. New dedicated bathroom extract systems need to be installed within the existing services risers, including new fans, ducting, fire and balancing dampers and new grilles. Acoustics will also need to be considered to prevent cross-talk between apartments.

Refer image VENTIALTION 04.

A new separate kitchen extract system(s) will also need to be provided to serve the kitchen areas within the apartments. Noting that the required extract rates to successfully remove smells are reasonably high, the resulting size of a common extract system will most likely not fit within the existing services riser. Note that these risers are constructed in concrete and are likely to form an essential part of the building structure so cannot easily be changed. Additionally, apartment occupants would want individual control of this extract. As a result each apartment would need to be fitted with a proprietary extractor hood discharging to outside. This would replace the existing window mounted extract fans installed in many of the apartments, noting that the existing kitchen window would need to be replaced (in part) with a solid wall to create a fixing point for the hood. Kitchen extracts associated with apartments in the enclosed lobby areas would need to be extended to the nearest external wall. Smells from these exhausts could be an issue as they will discharge directly into the common open access way.

Refer images VENTIALTION 02, 03, 07, 08.

4.2.3 Other Ventilation Systems

The rooftop laundry areas are naturally ventilated by undercut doors and opening windows. A disused flue protruding through the roof, as well as capped gas connections, are present in each laundry area. These are believed to be the remains of gas fired water heating systems originally serving the laundries. The existing opening windows and undercut doors are sufficient to meet code requirements for natural ventilation of the laundry areas. However, the current functionality of the windows is uncertain and all windows are likely to need refurbishing (new stainless steel hinges, security locks, etc) to ensure correct operation.

The ventilation provided to the lift vestibules and is sufficient only for ventilation requirements. No temperature control of the space is provided.

Refer image VENTIALTION 09.

Due to the amount of glazing in the stairwells space temperatures are likely to get quite high in the summer months. A temperature controlled extract system at the top of the stairwell should be installed to limit space temperatures.

Refer image VENTIALTION 11.

The rubbish room needs to be fitted with a standalone mechanical ventilation system to ensure that sufficient air movement is obtained within the room at all times and is not connected to any of the apartment extract systems. The discharge needs to be at roof level to minimise the risk of objectionable odours reaching occupied areas.

The existing toilet in the ground floor back of house area will require a dedicated mechanical extract system as the current passive ventilation into the entrance lobby does not comply with current code requirements.

The ground level subfloor ventilation grilles are of metal construction and are in poor condition. These need to be replaced. Refer image VENTIALTION 10.

5 Plumbing & Drainage

5.1 Description

5.1.1 Water Supply

Domestic cold water is reticulated to each apartment via a 50mm water main running within the ground floor sub-floor space, which runs up to the roof then down each services riser in copper pipework. Water supply isolation for each apartment is provided within the hot water cylinder space within each apartment. There are no water storage tanks within the building.

Based on the apartments visited it is believed that each apartment had its own individual low pressure electric hot water cylinder to provide water to the bath/shower, hand basin and kitchen sink (all hot water cylinders appear to have been removed). A branch off the cold water supply to the cylinder provides cold water to the same fixtures plus the toilet cistern.

The rooftop laundry has cold water reticulated around the walls with taps for washing machines to connect to. Concrete tubs within the laundries are also provided with cold water supplies. There are the remains of localised hot water reticulation pipework within some of the laundries indicating that domestic hot water was produced within the laundries at one stage. There are also the remains of a modern gas fired hot water cylinder installation (no cylinder fitted) which served the central laundry.

A separate galvanised Fire Hose Reel (FHR) water supply system, fed from a 50mm water connection off the incoming water supply within the ground floor sub-floor space, is provided to serve hose reels throughout the building. The galvanised pipe rail provided along the common area access way on each level has been utilised to reticulate water to the hose reels along the access way.

5.1.2 Sanitary Sewer

The apartments are serviced by separate single stack systems for the soil (toilets), waste water (bath/whb/sink) and dry floor drain systems which run from the ground floor sub-floor space, up through the various services risers passing through each apartment to the roof where they terminate above the roof with a vermin proof vent cap. The floor drain and waste water stacks are in copper whilst the soil stack is in copper. Each apartment waste fixture is connected separately to the stacks. The floor drain system also takes overflows from the Hot Water Cylinder (HWC) and the toilet cistern.

The rooftop laundry wastes connect into the waste water stack at roof level. Refer image P & D 09.

From the base of the drainage stacks the drains run horizontally towards the west to outside the building where they connect to the site waste water system. Removable concrete covers are provided in the concreted area to the west of the building. It is thought that these provide access to the buried drainage connection points. A gully trap is located outside each vertical block of apartments on the west side of the building. A formed half channel to the side of the gully trap takes the waste from the dry floor drain system (to provide a visual indication of a plumbing issue within the building). A separate gully trap is provided outside the waste room on the ground floor to take waste water connections from the waste fixtures within the waste room. Refer image P&D 11.

5.1.3 Stormwater System

The stormwater system for the building is of the gravity type constructed almost entirely of 80mm bronze rain water outlets and galvanised steel downpipes. On the east side downpipes from the rooftop rain water outlets discharge onto the apartment balcony below, directly above the balcony rain water outlet. The downpipe off this outlet then drops vertically to the next balcony, again discharging over the balcony rain water outlet. This is repeated down to the ground floor where the last balcony downpipe offsets before dropping into the ground to connect to the site stormwater drainage system. Refer image P & D 07.

On the west side the downpipes from the rooftop rain water outlets run primarily encased within the building's concrete structure to ground level. They are only exposed at each apartment access corridor level. Rain water outlets are provided in the apartment access corridors, which connect to the downpipes within the concrete structure. Refer image P & D 08 & 10.

Downpipes from the external gutters on the laundry and lift motor room roof areas discharge onto the concrete roof above the level 5 apartments.

5.1.4 Natural Gas

A hot dip galvanised gas reticulation network runs within the ground floor sub-floor space then reticulates up the services risers passing through the centre of each Apartment. Each apartment appears to have originally been provided with a metered gas supply to serve a range and a wall heater within the living space. The tariff meter (and presumably regulator) was located within the kitchen joinery with a glazed viewing slot provided in the exterior wall to enable external reading of the meter. The galvanised incoming and reticulation pipework within each apartment remains (capped off) but the meters have all been removed. Refer image P & D 05.

Capped gas supply connections exist in the rooftop laundry rooms along with the remnant of some gas reticulation pipework. This indicates that some form of gas domestic hot water heating was installed at one stage. No tariff meters or appliances remain. Refer image P & D 14.

There appears to be no gas burning appliances remaining within the building so we would expect that the main incoming gas supply to the building has been isolated at some point by the service provider.

5.2 Observations & Condition

5.2.1 Water supply

Isolation valves for the building are believed to be housed in a concrete chamber to the west of the building. This chamber was locked at the time of our inspection but it is believed to contain several gate valves. Previous inspections of the site identified that these valves were in poor condition and needed to be replaced. There are also several water toby boxes in the paved area to the east of the building. The purpose of these tobies is uncertain.

The pipework reticulation beneath the building could not be checked at the time of our inspections. It is possible that some of these main pipe runs could have been run in galvanised steel. This type of pipework is prone to corrode internally with the build-up of rust scale restricting water flow. Any sections of galvanised pipework within the incoming water supply need to be replaced with modern materials to ensure water quality and flow.

The domestic hot and cold water reticulation within the apartments has been run in copper pipework which appears to be sound. There little sign of thermal insulation on the domestic hot water pipework, although a small amount of hemp thermal wrap remains on some of the hot water pipework within the hot water cylinder space. Thermal insulation on the hot water pipework needs to be installed.

Whilst all the hot water cylinders have been removed, the remaining pipework appears to have been designed for hot water cylinders with an integral open vented header tank. This would have precluded the installation of a shower within the apartments and would have provided very low water pressures elsewhere. Subsequent replacement of this type of cylinder with a low pressure cylinder appears to have taken place along with the installation of showers over the bath. However, this type of cylinder is designed to have an open vent off the top terminating 2 to 3 metres above the cylinder which could not be provided in this instance. Pressure relief valves appear to have been fitted to the top of the tanks to limit the pressure within the tanks. This type of installation is not ideal as these valves were prone to seizing causing excess pressure within the cylinder causing them to rupture. Reinstatement of the domestic hot water systems within the apartments should include a modern mains pressure hot water cylinder along with the appropriate valving and drainage.

Communal laundries and drying areas are not ideal in modern communal living, however for student accommodation they are acceptable. Domestic hot water should be provided within the laundries but proportioning costs to the various users is likely to be problematic.

The location of the main incoming water meter was not identified. There are no provisions for individual water metering to each apartment.

The FHR water supply system appears to have had some sections replaced with copper, indicating that the pipework has corroded internally. The entire FHR pipework reticulation should be replaced to avoid potential pipework failure in the future. Refer image FS 01.

5.2.2 Sanitary Sewer

The drainage stacks appear to be in reasonable condition but due to the type of installation (single stack systems) these can be difficult to extend/modify with limitations on pipe lengths and numbers of bends etc. Any significant modification to apartment layout would most likely mean that could mean a new stacks and separate venting would be required.

Cast iron drains are prone to corroding from the inside out and are unable to accommodate significant movement without fracturing. The existing cast iron soil stack should be replaced with modern materials. Refer image P & D 14.

Acoustics lagging of the existing stacks may need to be considered as the stacks currently run within the riser which is being used to provide extract ventilation to the apartments.

The current external gully traps are prone to damage and additional protection is needed. The associated drainage half channels need to be kept clear of debris to ensure correct operation. Refer image P&D 1

5.2.3 Stormwater System

Rain water outlet grates are typically not fitted on the balconies and a number of grates are missing elsewhere. This will allow the ingress of debris into the system which could eventually lead to system blockages.

The stormwater downpipes are showing signs of corrosion, particularly at the discharge points on the eastern balconies where the ends of the pipework in some locations completely corroded off. The internal condition of the downpipes is unknown but it is suspected that corrosion will be present.

The ground floor downpipes on the east face have been replaced with PVC pipework at some point. The offset present in these downpipes would have made them particularly prone to corrosion due to local scouring of the galvanising at the bends and ponding of water or build-up of debris in the horizontal section of pipework.

There is very limited support of the downpipes on the eastern face of the building other than where they pass through the balcony concrete floor structure. If a galvanised downpipe were to fail on the underside of the balcony due to corrosion then the downpipe could easily dislodge and fall to the ground below.

The entire stormwater system associated with the building should be replaced, noting that due to the large portion of it being cast into the structure any new system would have to run exposed on the outside face of the building.

Stormwater drainage for the area surrounding the building does not appear to have been maintained and many of the sumps are full of plant material/debris. Refer image P&D 11.

5.2.4 Natural gas

There is a potential risk of gas leaks within the existing gas galvanised pipework reticulation system as the pipework jointing materials used in the 1960's are not compatible with natural gas (originally town gas would have been reticulated). Over time these jointing materials can dry out potentially leading to leaks at the joints.

The original apartment gas meter location would also not comply with current standards as the meter/regulator needs to be within an externally ventilated enclosure and the meter/isolation valve needs to be accessible by the gas retailer. There is also a potential issue with the way the gas is reticulated to the apartments as the gas supplier would normally own/maintain the pipework up to the meter. They are generally reluctant to take ownership of reticulation pipework within a building as would need to be the case in this instance.

Should gas be wanted within the apartments in the future there would need to be a new reticulation system run within the building from meters located on the ground floor external to the building (separate gas reticulation pipework from the meters to each apartment). Refer image P & D 05.

6 Electrical Services

6.1 Electrical Supply

6.1.1 Description

The building is serviced with a low voltage supply from the Wellington Electric 11kV substation located on a separate title block contained within the overall property boundaries.

6.2 Main Switch Board (MSB)

6.2.1 Description

The building is provided with 2 x 400Amp low cable supplies feeding a Main Switchboard located with a purpose room on the northern end of the building.

The MSB is unusual by today's Standards in that it includes 2 No Main Switches which are located side by side to each other. Two further sub circuits each feed the North and South electrical riser and a 3rd sub circuits feed the lifts and building common services loads. Refer image E 01, 02 & 03.

6.2.2 Condition

The MSB has been recently refurbished with new Moldered Case Circuit Breakers along with new cubical covers and new single revenue metering cubical and would be considered in reasonable condition once switch function labeling and a new common services sub switchboard had been installed.

Problems however with the Floor Distribution Board locations within the building are expected to dictate that this MSB will have to be considerable enlarged and as a result it would be more cost effective to replace it entirely.

6.3 Floor Supplies

6.3.1 Description

Power cables are routed via the under floor space from the MSB to the North and South escape stair shaft with an electrical raiser and Floor Distribution boards located within cupboards on intermediate landings. Refer images E04 and 05.

6.3.2 Condition

Combustion materials are not permitted within escape stair shafts and a recent attempt has been made to isolate the switchboard from the shaft by enclosing the switchboard in a fire and smoke rated cupboard.

The cupboard is not of a type-tested design and as a result no recognised 'performance rating tag' has been applied and as a result recommends the floor riser and switchboard be relocated to a new position.

The floor switchboard and riser as observed were found to be in good working condition.

6.4 Cable/Wiring Management

6.4.1 General

It is assumed that cabling within the level G under floor space feeding the floor distribution boards are installed on cable trays and are of the PVC/PVC type.

Cables from the floor distribution boards to each apartment in the north half of the building are of the PYRO type and have been cast within the floor slab as part of the building construction process. Refer image E 05 bottom left corner.

It is noted that the apartments on the south side of the building are feed by new PVC insulated sub-mains installed within surface mounted conduits installed along the ceiling of the walkway to each apartment. Refer image E 06.

6.4.2 Condition

The floor distribution board cannot be retained within the stairwell and as a result all apartment cabling is to be replaced.

6.5 Lighting

6.5.1 General

The majority of luminaires within apartments are of the incandescent lamp with china hat type. Refer image E 09.

6.5.2 Condition

We recommend replacement with LED luminaires with reduced power consumption and extended service life.

6.6 Emergency lighting

6.6.1 General

Exit signs predominantly of the reflection type are provided at specific locations within the building.

No other emergency lighting luminaires were identified during the visit. Refer image E.

6.6.2 Condition

We recommend replacement with LED luminaires with reduced power consumption and extended service life.

6.7 Lightning Protection

6.7.1 General

No purpose lightning protection system was identified during the visit.

This observation is expected as only special purpose buildings are provided with Lightning Protection Systems within the Wellington region.

7 Vertical Transportation

7.1 General

A duplex pair of lifts are provided to service the apartment levels and to the roof/laundry level.

The lifts machine room rope traction units rated at 900kg 13 person. The lifts doors are 812mm wide. While the exact car size is unknown, at 13 person, it is likely the car meets the minimum requirements of NZS 4219. However, at 812mm wide the lifts doors do not meet the minimum requirements of NZS 4219.

The Lift Contractor advises that the speed of the existing lifts is only 0.5m/s, which is considered reasonable slow.

The lifts are the original units but were modernised in circa 1992.

Lift control stations are located on each landing. These units do not appear to have any indication of direction of travel, which is normally required.

Due to site conditions it was not possible to inspect the lift car or the lift shaft.

7.2 Condition

As noted above the lifts were upgraded in circa 1992 making the current lift controller approximately 20 years old. The lift motors, lift car and lift shaft equipment are original making approximately 60 years old. At this age upgrade of the lifts would normally be expected.

At the time of the inspection the lift system had been shut down and thus non-operational.

With respect to the condition of the lifts the lift Contractor has made the following comments based on pre building closure inspection.

- Controllers are becoming obsolete with some components no longer available.
- The condition of the shaft equipment is currently not good and will require repair before the lifts can be returned to service.
- Upon our last visit to site to conduct a brief inspection it was identified that one of the counterweight rail brackets had come away from the wall and had fallen through the roof of the lift car and was sitting on the floor of the car. The counterweight rails are not attached to the building structure so the counterweight is floating. As the building is closed and considered hazardous we have not undertaken further investigation.
- Car interior were reasonable although in the past they were regularly hosed out so flooring is in a poor condition.
- Machine room equipment has been shut down for some time so it is likely that there will be moisture taken up by the lift machines which will require rectification prior to operation. There is also the risk of failure of the electronic components.

8 Communications

8.1 Description

Beca understand that two communications system exist within the building although only the original copper system was found during the inspection.

Refer images C 01 to 03.

8.2 Condition

It is expected that the communications will be replaced as part of the building refurbishment process.

9 Security

9.1 General

A manual key lock system is generally installed though out the building.

9.2 Condition

It is expected that the key lock system will be replaced as part of the door refurbishment process.

10 Fire Protection

The following active fire safety systems were observed:

1. Fire hose reel system
2. Fire alarm system

10.1 Fire Hose Reel system

Refer Water Supply section 5.2 for a general description of the existing pipework, which is recommended for replacement.

Zinc plated mild steel hose reel assemblies are generally located outdoors; a good number of are in various states of damage due to corrosion. Refer image FS-01 in the appendix.

Due to the age of the system, it is not likely to be installed with a suitable backflow preventer, as required by the current code.

10.2 Fire Alarm System

The Fire Alarm System (FAS) includes:

- Zone index (mimic) integrated with a Firetronix control unit (rear accessed), including automatic brigade call-out facility. We understand that the panel is now obsolete, without readily available replacement parts. During our visit, the mimic indicated various defect/alarm conditions (see image FS-02 in the appendix), which is not surprising, given the current condition of the system.
- Heat detectors throughout, with the exception of smoke detectors within the egress stairs.
- Smoke detectors within apartment units, which appears to incorporate built-in sounders; it is not apparent if these are stand-alone devices which are not monitored by the mimic. These detectors operate to activate a local alarm via an un-supervised built-in sounder. This arrangement is not compliant with the current standard. See detector image FS-03 in the appendix.
- Manual call points within each unit, located at the main entrance.
- Sounders; the distribution of these sounders may not necessarily comply with the current requirements to achieve the minimum sound levels for sleeping spaces (i.e. some of the sounders are located outside the bedrooms).

In consideration of the life-safety function of the system, its replacement would be prudent if the building is expected to be re-occupied at some later stage.

10.3 New Sprinkler and Hydrant Systems – Water Supply

New Sprinkler and Hydrant systems are required for Building Act compliances and as a result a new upgraded water supply will be required.

A water supply flow test should be carried from the nearest street hydrant on The Terrace as Sprinkler demand is expected to be in the region of 1350l/min. A sprinkler booster pump would be required if the water supply is found to be inadequate

In addition to the flow described above, continue the test for a flow of 2850 L/min (1350 + 1500 Hydrant supply). If the mains pressure drops below 1bar, a fire-fighting water storage tank would also be required.

11 Conclusions

11.1 Introduction

Appendix B provides a summary of the works required under each trade (excluding structural engineering) to bring the structure (as reasonably as practicable) to current code compliance.

It is understood that Victoria University are also seeking advice on a number of uses for the building and the corresponding indicative scope of work required for the options.

We understand the options to be as follows:

Refurbishment of the existing building back to its original condition (as reasonable as practicable) and compliant with current codes (as reasonable as practicable).

One additional student bedroom per existing apartment within the current footprint and general structural arrangement.

11.2 Civil

The drainage services are most likely to be in poor condition as they are of earthenware material and what could be easily accessed was seen to be poorly maintained. Full replacement is therefore recommended to achieve a 50 year continued service.

Pavements, kerbs steps and retaining walls all need to be replaced and with the likelihood of water damage through infiltration of the degraded pavement surfacing then it is possible that the subgrade requires reconstruction also. Full replacement is therefore recommended to achieve a 50 year continued service.

11.3 Building Act Compliance

The refurbished building would need to comply, as near as reasonably practicable with the requirements of the Building Code relating to means of escape from fire and access and facilities for people with disabilities. Required amendments include:

- Sprinkler system throughout in accordance with NZS 4541
- Smoke detection and manual call points system in accordance with NZS 4512
- Fire hydrant system in accordance with NZS 4510.
- Removal of electrical switchboards and similar from the safe path egress stairs
- Remedial fire stopping of all vertical and horizontal fire separations including safe path stairs, floors (including balconies) and the boundary of each apartment.

11.4 Ventilation

The existing opening windows appear sufficient to meet code requirements for natural ventilation of the spaces concerned however all windows are likely to need refurbishing to ensure correct operation.

Normally a central outdoor air supply system including ducting within apartments would be installed to provide ventilation air to this type of building to eliminate reliance on opening windows. However, limited riser and ceiling void space to reticulate ductwork means this type of installation would not be practicable.

The present central extract systems serving the apartments do not meet code requirements as cross contamination is possible between shared bathroom and kitchen extract systems. A new separate kitchen extract system(s) will require new vertical ducts to be installed requiring penetrations through the building structure which is expected to be difficult to achieve.

We recommend consideration for rationalising the number of Kitchen extract systems / introduction of shared Kitchens between apartments as part of the building refurbishment process.

11.5 Plumbing & Drainage

The sizing of the existing water supply for the building is considered adequate for residential accommodation purposes but while the condition of piping could not be verified it is recommended that all water supply piping be replaced to achieve a 50 year continued service.

The sizing of the existing sanitary sewer for the building is considered adequate for residential purposes but while the condition of piping could not be verified it is recommended that all sewer piping be replaced to achieve a 50 year continued service.

The sizing and general arrangement of the existing stormwater system is showing signs of corrosion and the discharge arrangement onto the eastern balconies would be changed as part of a re-design process. It is recommended that all stormwater piping be replaced to achieve a 50 year continued service.

The natural gas systems have been largely removed from within the building and recommend complete removal as part of any building upgrade process.

11.6 Electrical

The sizing of the existing electrical supply for the building is considered adequate for residential purposes. The infrastructure system however including switchboards within emergency escape stairwells which need to be removed. New switchboards have recently been installed within each apartment which with minor modification could be reused.

It is recommended that the entire electrical installation (other than the electrical supply and possibly the apartment switchboards) be replaced to achieve a 50 year continued service.

11.7 Vertical Transportation

The lifts have been shut down for some time and as a result moisture is likely to have been taken up by the lift machines. While the control gear was upgraded about 20 years ago the remainder of the lift system is largely original.

It is recommended that the entire lift installation be replaced including widening of lift car / landing doors to achieve a 50 year continued service.

11.8 Communications

The existing copper communications cabling system enters the building within the north escape stairwell and needs to be removed. The coaxial communication system has been poorly installed. We recommend assessment of modern communication systems as appropriate for student accommodation and install within the building as part of a building upgrade project.

11.9 Security

The existing mechanical key lock system is no longer considered appropriate for public access doors to an apartment type building. We recommend install of an electronic locking system for public access doors along with a manual key lock system for each apartment as part of a building upgrade project.

11.10 Fire Protection

The existing active fire protection systems are considered largely non-compliant with modern day code requirements and recommend a full upgrade in accordance with the Building Act Section 112 requirements as listed within section 12.4 above.

Appendix A

Property Condition Photographs



Air Conditioning Photographs



VENTIATION 01- Typical opening window within apartments



VENTIATION 02 – Extract grille within apartment bathroom



VENTIATION 03 – Extract grille within apartment kitchen



VENTIATION 04 – Condition of intumescent fire damper behind apartment bathroom extract grille



VENTIATION 05 –Existing façade ventilation grilles into apartment kitchen (old food safe)



VENTIATION 06 -Typical retrofitted window mounted kitchen extract fan

Air Conditioning Photographs (contd.)



VENTIATION 07 – Roof mounted extract fans along roof



VENTIATION 08 – Typical extract riser ventilation fan installation.



VENTIATION 09 – Typical lift lobby ventilation louvers



VENTIATION 10 – Subfloor ventilation openings



VENTIATION 11 – Typical stair windows

Plumbing and Draining Photographs



P&D 01 – Remains of apartment domestic hot water system



P&D 02 – Pipework in riser



P&D 03 – Typical apartment bathroom



P&D 04 – Typical apartment kitchen



P & D 05 – Remains of gas meter installation within apartment kitchen



P & D 06 – Pipework in apartment mezzanine floor void

Plumbing and Draining Photographs (contd.)



P & D 07 – Drainage from apartment east side balcony



P & D08 – Apartment common area walkway drainage



P & D 09 – Typical roof level laundry



P & D 10 – West side storm water drainage



P & D 11 – West side gully trap and drainage channel



P & D 12 – East side stormwater at ground level.

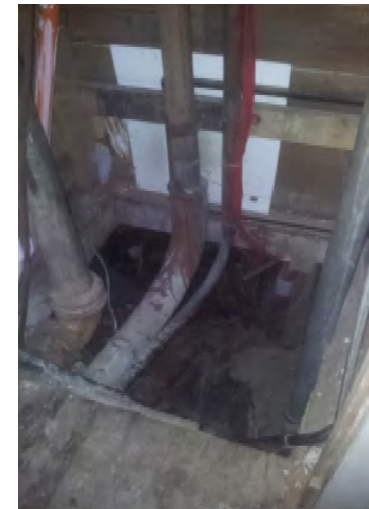
Plumbing and Draining Photographs (contd.)



P & D 13 – Typical drainage vents at roof level



P & D 14 – Remains of laundry central gas HWC installation



P & D 14 – Typical; pipework at base of drainage stack

Electrical Photographs



E 01 – Main Switchboard feeder cables into 2 separate switches



E 02 – MSB with feeds to North, South and Roof /Lift loads



E 03 – Existing new Revenue Meter



E 04 – Typical floor DB in escape stairwell with fire/smoke rated doors



E 05 – Typical floor distribution board with refurbished tap off main switch, Apartment meter positions with fused protection and PYRO sub-main feeders



E 06 – Typical power & communications distribution to apartments

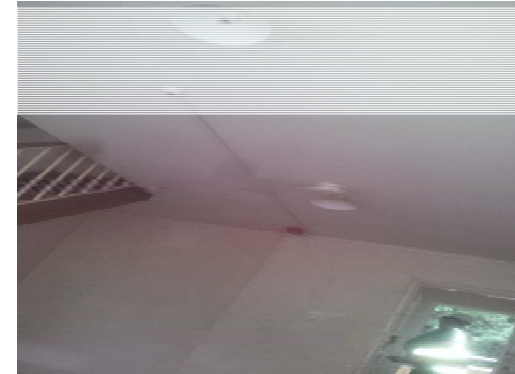
Electrical Photographs (contd.)



E 07 – Electrical Switchboard behind apartment entry door



E 08 – Typical power & communications outlets with wiring concealed behind wall linings.



E 09 – Typical apartment lighting



E 10 – Typical apartment external corridor lighting

E 11 – Typical corridor Exit signage

E 12 –

Vertical Transportation Photographs



VT 01 – Typical lift landing station



VT 02 Hatch in roof for access to LMR stair-



VT 03 – Stair to LMR

Communications Services Photographs



C 01 – Communications services connection



C 02 – Main Communications riser in north stair services shaft



C 03 – Typical corridor power & communications reticulation to apartments



C 04 – Typical communications connection above entry door to apartment

Fire Protection Photographs



FS 01 – Highly corroded mild steel hose reel assembly, located within the balcony.



FS 02 - Fire alarm mimic panel, indicating various alarm/defect conditions



FS 03 – Smoke detectors within residential units

Civil Photographs



CV 01 – Poorly maintained Stormwater Sump



CV 02 – Broken PVC Stormwater pipe



CV 03 Uneven asphaltic pavement



CV 04 - Uneven concrete pavement



CV 05 Broken kerbs



CV 06 Damaged retaining walls

Civil Photographs (Cont)



CV 07 – Degraded steps



CV 08 – Spalling on steps



CV 09 – Broken handrails

Appendix B

Concept Design

- Refurbish building
- One extra bedroom added

Concept Design – Refurbish Building

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Building Structure					
Investigation works	Shear Walls	To determine and confirm reinforcement content and details to shear walls.	Investigate longitudinal spine wall to understand reinforcing content and detailing		
Investigation works	Piles and ground beams	To determine the piling technique used, reinforcement content, concrete strengthes and pile integrity.	Investigate the piles and pile caps for both reinforcing content and strength of concrete		
Main Structure Strengthening works		Dependant on the investigation works to the existing reinforcement content and details, some additional strengthening maybe required to achieve 80 to 100%NBS	Strengthening works may be in the form of additional shear walls alongside the existing longitudinal spine wall. This may involve the introduction of additional 200mm thick reinforced concrete walling over the majority of the existing wall.		We note that the current score of the building is in excess of 50%NBS. Strengthening works is dependent on further investigation and testing of the existing structure.
Substructure Strengthening works		It is difficult to determine potential strengthening works required for the piling and ground beam arrangements. Should the piles and connections to the shear walls be found to be insufficient through intrusive investigations, strengthening works may be required.	Strengthening works if required, could be in the form of additional bored piles to the greywacke bedrock (between 6 and 14m below ground level) and additional pile cap provisions. Strengthening to the pile cap / ground beam and walls could be in the form of additional concrete works of steel angle bracketry forming connections between the two elements along the length of the walls (potentially both transverse and longitudinal walls).		We note that the current score of the building is in excess of 50%NBS. Strengthening works is dependent on further investigation and testing of the existing structure.

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Façade works (rehabilitation)		The facades are in very poor condition and considered unsafe and hazardous.	<p>Complete rehabilitation of concrete.</p> <p>Removal of corrosion and rust (clean back to bright steel)</p> <p>Breaking out damaged and spalled concrete</p> <p>Treatment of existing reinforcement</p> <p>Additional reinforcement</p> <p>Concrete repairs</p> <p>Coating system applied to façade</p>		
Façade works (complete replacement)		The facades are in very poor condition and considered unsafe and hazardous.	<p>Demolish existing façade</p> <p>Reconstruct façade using lightweight materials and in keeping with heritage intent of existing structure.</p> <p>Repair all corrosion and spalled concrete to main structure (concrete floor slabs and walls).</p> <p>Coating system applied to façade.</p>		The alternative is to provide a curtain walling system that covers the existing structure in full to prevent continual deterioration of the slab edges. We note that this is dependent on the heritage requirements of the façade replacement.
Civil					
Site Sanitary Sewer Pipes	To capture waste water from internal plumbing system and transfer it to the local wastewater system.	To completely replace site sanitary sewer system.			
Site Stormwater Pipes	To capture stormwater from internal plumbing system and the site paved areas and	To completely replace site stormwater system.			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
	transfer it to the local stormwater system.				
Site Water pipes	To deliver water from the local water reticulation system to the internal plumbing network.	Replace incoming water supply, including the addition of appropriate backflow preventer			May be able to incorporate with new water supply required for sprinkler system
Pavement	To provide pedestrian and vehicle access from the Terrace to the building and other amenity areas.	To replace all paved surface areas and repair sub-base accordingly should it prove to be unstable.			
Kerbing	To provide separation from landscaping areas and paved areas and to provide a kerb for drainage channels.	To replace all kerbing onsite.			
Retaining Walls	To retain areas of steep ground.	To replace concrete retaining walls at the North end of the site with new retaining walls and assess the condition and stability of the crib wall at the back of the site. (This crib wall is currently covered in vegetation so could not be assessed.			
Steps	To provide access around the site.	To replace all steps within the site with new steps.			
Building Act Compliance					
	Services related requirements.	Building Act requirements have been included within each building services discipline design.			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Ventilation Services					
Ventilation	Apartment passive outdoor air ventilation.	Ventilation to apartments provided by existing opening windows retained.		Replacement or refurbishment of existing timber framed windows	Modern apartment buildings would incorporate a mechanical ventilation system to eliminate reliance on opening windows. Space constraints likely to preclude installation of this system.
	Apartment kitchen and toilet extract systems.	New separate ducted kitchen and toilets extract systems required.	Systems to replace existing common ventilated riser shaft (15 No.) to include new rooftop fans, acoustically lined ducting (cross talk attenuation), balancing and fire dampers and new extract grilles. Toilet extract over main entrance lobby to also pickup toilet in ground floor back of house area.	New penetrations in riser walls for grilles. New roof plinth for fans.	
	Cooking hood extract.	Cooking hood to be provided over each cooktop.	Domestic style, ducted to outside.	Existing windows required to be modified (in part) to enable installation.	
	Common roof-top laundry ventilation.	Ventilation to laundry areas provided by existing opening windows retained		Existing window hardware to be replaced to ensure correct operation.	
	Egress stair ventilation	Temperature controlled high level extract to be fitted to north and south stairwells.	Rooftop extract fan (400l/s) with stand-alone controls.	New roof penetrations required.	
	Rubbish room extract	New ducted extract to be provided.	Rooftop extract (300l/s), ducted to ground floor rubbish room via existing services riser.	New wall louvre. New roof penetration for fan.	

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
			Passive make-up from outside.		
	Subfloor ventilation grilles		Replacement of all existing sub-floor ventilation grilles (like for like replacement).		
Plumbing and Drainage Services					
Plumbing	Building wide water reticulation	Replacement of all existing galv steel pipework on water supply and replacement of isolation valves on incoming water supplies.			Include new pressure regulation on supplies to each apartment.
	Domestic hot water to apartments	New hot water cylinders and insulation to existing pipework		Wall/ceiling lining removal may be required to access pipework	Modifications to existing pipework connections needed to accommodate modern HWC's (incl. new safe tray drain connection)
	Communal laundry	Addition of central water heating to serve the laundry areas.			
Waste water drainage	Main drainage stacks	Replacement of existing drainage stacks.			Includes horizontal runs in sub-floor space.
	Drainage stacks	Acoustic lagging to all stacks.			
	External gully traps	Upgrade/replacement of existing gully traps.			
Storm water drainage	Rooftop/balcony/access walkway drainage	Replacement of entire storm water system	Existing pipework built into structure.	Access to connect to existing rain water outlets	
Gas system		Removal of entire system if gas no longer required OR			Gas to serve any communal laundry

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
		replacement of entire system if to building is required.			hot water systems (high energy use) is recommended
Electrical Services					
Electrical Supply	New Main Switchboard providing electrical power to the building.	New Main Switchboard including 2x Main Switches, 1x South half of building sub-circuit, 1x Common Services sub-circuit with revenue meter and distribution board and 40x north end of building Apartment sub circuits with revenue meters.	New free standing MSB with sub circuits, whole of current revenue meters and single phase apartment sub-circuit breakers located on ground floor of building in area of existing MSB so that existing feeder cable from Wellington Electric 11kV substation do not have to be significantly repositioned.	Enlarged switchboard space required with 2 entry doors into MSB room and accessible to apartment meter reader.	
	New south end of building sub-circuit switchboard.	New DB-S with 35x south end of building Apartment sub circuits with revenue meters.	New free standing sub distribution board with sub circuits, whole of current revenue meters and single phase apartment sub-circuit breakers located on ground floor of building within in area of building identified as	Switchboard cupboard of 2.5m length x 600mm depth accessible to apartment meter reader.	
	Apartment distribution boards	Existing apartment distribution boards removed and put into storage for subsequent reinstall on site.			Recently upgraded surface mounted distribution board including mcb's and labelling.
Electrial Distribution	New sub main cables	New sub-main cables and cable trays installed within level G under floor space.	50m x 4C 185mm ² XLPE cable + 75mm ² ECC on 800mm wide cable tray from MSB to south distribution board.		
		New sub-main cables and cable tray installed in vertical riser shaft	400m x 3C 16mm ² PVC/PVC cable in above cable tray and	A new riser shaft in south east corner of Kitchen (existing shaft	

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
		to feed apartment distribution boards	then on 300mm wide riser tray to each apartment. 1000m 3C 25mm ² PVC/PVC cable installed as above. 1400m 3C 35mm ² PVC/PVC cable installed as above	location).	
Apartment Instalation	New apartment lighting and small power installation.	Reinstall existing apartment distribution boards	Storage and transportation of existing distribution boards and re install on site. Test and re-commission including lighting and small power installation.		
		Lighting installation	New lighting installation including LED surface mounted luminaires and concealed TPS wiring.	New wall linings to conceal wiring.	
		Small power installation	New small power installation including recessed socket outlets, permanent connection units and associated concealed TPS wiring.	New wall linings to conceal wiring.	
Vertical Transport Service					
Lifts	Lifts	Upgrade and modernisation of the existing lifts	Existing lifts to be removed and replaced with new units. The new units could be Machine-room-less lifts (MRL) or could retain the overhead lift motor room. The lift speed to be increased to say 1.0m/s or 1.5m/s depending on what speed can be accommodated within the existing pit.	The existing landing door opens will require re-cutting to allow a wider code compliant door to be installed.	

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Communications Services					
Copper communications system.	Traditional copper telephone system to the building and to each apartment..	New copper communications cabling system to building as the existing connection is located within the north emergency escape stair well.	New copper cabling system to each apartment.	Communications cabling riser up the building and then horizontal penetrations through each between apartment fire rated wall.	
Alternatively a fibre cabling system including high speed broadband communications services	Modern fibre communications system to the building and to each apartment.	New fibre based communications cabling system to building as the existing connection is located within the north emergency escape stair well.	New fibre cabling system to each apartment.	Communications cabling riser up the building and then horizontal penetrations through each between apartment fire rated wall.	
MATV system	MATV system providing TV services to each apartment.	New coaxial or fibre cabling system to each apartment from a central television aerial on the roof.	Coaxial or fibre cabling system to each apartment	Communications cabling riser up the building and then horizontal penetrations through each between apartment fire rated wall.	
Security Services					
Door controls.	Common areas access controlled doors.	Credential reader access controlled doors.	All public area ground floor access doors.	Doors with electric mortise locks, power transfer hinges and credential readers on the secure side of the door.	
	Individual Apartments	Manual key locks			
Fire Protection Services					
Fire alarm system	Automatic fire alarm notification	Type-5 fire alarm system to NZS 4512	Analogue addressable fire alarm system. Full smoke detector coverage		

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
			<p>within the residential units, i.e. detectors in every room, except the bathrooms. Include a hush button to deactivate the local smoke alarm for each unit.</p> <p>Manual call point within each residential unit.</p> <p>Speakers in every bedroom, bathroom and generally distributed elsewhere.</p>		
Fire sprinkler system	Automatic fire suppression	Full sprinkler coverage to NZS 4541	<p>Street mains connection, including a back-flow preventer.</p> <p>Diesel driven booster pump.</p> <p>Enhanced-safety sprinkler valve-set.</p> <p>Sprinklers throughout.</p> <p>Individual floor isolation valves and flow switches/test-drains.</p>	<p>Civil works associated with the street mains connection.</p> <p>Pump room construction.</p> <p>Extensive wall and floor penetrations to be allowed to accommodate pipework.</p>	
Building hydrant system	Fire-fighting facility	Charged hydrant risers to NZS 4510	<p>Risers to be provided to each egress stair.</p> <p>Dual outlet valves at each floor landing.</p>	<p>Floor penetrations to be allowed mainly within the stairwells; associated structural strengthening may be required to accommodate.</p>	

Concept Design – Refurbish Building with 1 Extra Bedroom

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Building Structure					
Investigation works	Shear Walls	To determine and confirm reinforcement content and details to shear walls.	Investigate longitudinal spine wall to understand reinforcing content and detailing		
Investigation works	Piles and ground beams	To determine the piling technique used, reinforcement content, concrete strengths and pile integrity.	Investigate the piles and pile caps for both reinforcing content and strength of concrete		
Main Structure Strengthening works		Dependant on the investigation works to the existing reinforcement content and details, some additional strengthening maybe required to achieve 80 to 100%NBS	Strengthening works may be in the form of additional shear walls alongside the existing longitudinal spine wall. This may involve the introduction of additional 200mm thick reinforced concrete walling over the majority of the existing wall.		We note that the current score of the building is in excess of 50%NBS. Strengthening works is dependent on further investigation and testing of the existing structure.
Substructure Strengthening works		It is difficult to determine potential strengthening works required for the piling and ground beam arrangements. Should the piles and connections to the shear walls be found to be insufficient through intrusive investigations, strengthening works may be required.	Strengthening works if required, could be in the form of additional bored piles to the greywacke bedrock (between 6 and 14m below ground level) and additional pile cap provisions. Strengthening to the pile cap / ground beam and walls could be in the form of additional concrete works of steel angle bracketry forming connections between the two elements along the length of the walls (potentially both transverse and longitudinal		We note that the current score of the building is in excess of 50%NBS. Strengthening works is dependent on further investigation and testing of the existing structure.

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
			walls).		
Façade works (rehabilitation)		The facades are in very poor condition and considered unsafe and hazardous.	<p>Complete rehabilitation of concrete.</p> <p>Removal of corrosion and rust (clean back to bright steel)</p> <p>Breaking out damaged and spalled concrete</p> <p>Treatment of existing reinforcement</p> <p>Additional reinforcement</p> <p>Concrete repairs</p> <p>Coating system applied to façade</p>		
Façade works (complete replacement)		The facades are in very poor condition and considered unsafe and hazardous.	<p>Demolish existing façade</p> <p>Reconstruct façade using lightweight materials and in keeping with heritage intent of existing structure.</p> <p>Repair all corrosion and spalled concrete to main structure (concrete floor slabs and walls).</p> <p>Coating system applied to façade.</p>		The alternative is to provide a curtain walling system that covers the existing structure in full to prevent continual deterioration of the slab edges. We note that this is dependant on the heritage requirements of the façade replacement.
Civil					
Site Sanitary Sewer Pipes	To capture waste water from internal plumbing system and transfer it to the local wastewater system.	No change to the 'refurbish building' arrangements.			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Site Stormwater Pipes	To capture stormwater from internal plumbing system and the site paved areas and transfer it to the local stormwater system.	No change to the 'refurbish building' arrangements.			
Site Water pipes	To deliver water from the local water reticulation system to the internal plumbing network.	No change to the 'refurbish building' arrangements.			
Pavement	To provide pedestrian and vehicle access from the Terrace to the building and other amenity areas.	No change to the 'refurbish building' arrangements.			
Kerbing	To provide separation from landscaping areas and paved areas and to provide a kerb for drainage channels.	No change to the 'refurbish building' arrangements.			
Retaining Walls	To retain areas of steep ground.	No change to the 'refurbish building' arrangements.			
Steps	To provide access around the site.	No change to the 'refurbish building' arrangements.			
Building Act Compliance					
VENTIATION Services					
Ventilation	Apartment passive outdoor air ventilation -	No change to the 'refurbished building' arrangements with the assumption that the additional			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
		bedroom would take the place of the existing lounge.			
	Apartment kitchen and toilet extract system.	No change to the 'refurbish building' arrangements.			
	Cooking hood extract	No change to the 'refurbish building' arrangements.			
	Common roof top laundry ventilation.	No change to the 'refurbish building' arrangements.			
	Egress stair ventilation.	No change to the 'refurbish building' arrangements.			
	Rubbish room extract	No change to the 'refurbish building' arrangements.			
	Subfloor ventilation	No change to the 'refurbish building' arrangements.			
Plumbing and Drainage Services					
Plumbing	Building wide water reticulation	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
	Domestic hot water to apartments	Increase the hot water cylinder by one size to cater for the extra person per apartment.			
	Communal laundry	Increase the communal hot water cylinder by two sizes to cater for the extra person per apartment.			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Waste water drainage	Main drainage stacks	No change to the 'refurbish building' arrangements.			
	Drainage stacks	No change to the 'refurbish building' arrangements.			
	External gully traps	No change to the 'refurbish building' arrangements.			
Storm water drainage	Rooftop/balcony/access walkway drainage	No change to the 'refurbish building' arrangements.			
Electrical Services					
Electrical Supply	New Main Switchboard providing electrical power to the building.	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
	New south end of building sub-circuit switchboard.	No change to the 'refurbish building' arrangements.			
	Apartment distribution boards	No change to the 'refurbish building' arrangements.			
	New sub main cables	No change to the 'refurbish building' arrangements.			
	New apartment lighting and small power installation.	No change to the 'refurbish building' arrangements.			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Vertical Transportation Service					
Lift services System		No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
Communications Services					
Copper communications system.	Traditional copper telephone system to the building and to each apartment..	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
Alternatively a fibre cabling system including high speed broadband communications services	Modern fibre communications system to the building and to each apartment.	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
MATV system	MATV system providing TV services to each apartment.	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			

Item Heading	Item Function	Design Description	Estimating Details	Builders Works	Comments
Security Services					
Door controls.	Common areas access controlled doors.	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
	Individual Apartments	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
Fire Protection Services					
Fire alarm system	Automatic fire alarm notification	No change to the 'refurbished building' arrangements with the assumption that the additional bedroom would take the place of the existing lounge.			
Fire sprinkler system	Automatic fire suppression	No change to the 'refurbish building' arrangements.			
Building hydrant system	Fire-fighting facility	No change to the 'refurbish building' arrangements.			