



# CONDITION SURVEY REPORT WELLINGTON CITY COUNCIL

August 2023



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ACKNOWLEDGEMENT OF SUBMISSION

This report was prepared by [redacted] and reviewed by [redacted]

Respectfully submitted by WT.

[redacted]	[redacted]
[redacted]	[redacted]
Building Surveying Manager	Building Surveyor

DATE	VERSION	AUTHOR(S)	REVIEWER(S)
1/05/2023	1 - Draft	[redacted]	[redacted]
25/08/2023	2 - Final	[redacted]	[redacted]



# RELIANCE STATEMENT

This Report is prepared for and is addressed to "the Parties" being:

- Wellington City Council

The purpose of this report is to provide pre-purchase technical due diligence to the client in accordance with the agreed scope of works.

WT Partnership also confirms that it is prepared to answer reasonable queries concerning this Report raised by the Parties.

This Report is strictly confidential to the Parties who agree that subject to paragraph 5 below; they will not disclose, show, copy, disseminate or give any other person or entity this report without WT Partnership's express written consent, which may be withheld in its absolute discretion. However, if a Party is required by law to disclose the Report, it may do so provided WT Partnership is advised in writing (as soon as practicable) after the legal obligation to disclose arises.

WT Partnership consents to this report being made available to each Party, their employees, directors, officers, affiliates and professional advisers and to disclosure by any Party to the extent required by law or regulation or where requested or required by any judicial or regulatory body.

It is the responsibility of the relevant Party to determine the suitability of the Report for its own purposes.

The Report is subject to the qualifications, assumptions and disclaimers expressed in it and the terms and conditions in the engagement letter.

The Report has been compiled from information provided to WT Partnership; however, WT Partnership does not warrant the accuracy of that information. If the information submitted to WT Partnership is inaccurate or incomplete, then it may invalidate the conclusions and advice in the Report.

Before placing any reliance upon the Report for any purpose, any Party should undertake their inquiries to ensure that there have been no material changes to the items discussed in the Report.



# EXECUTIVE SUMMARY

Begonia House glazing system is in poor condition and recommended for replacement. The structural frame is in fair condition and currently understood to be circa 70%NBS and capable of supporting the existing glazing system or a similar weight system with similar fenestration albeit that some isolated repairs are recommended.

Defects and damage are present to the rear staff room and drying room which require major repair or demolition. Similar defects were observed with the rear toilet block and walls at the rear of the central annex. The workshop walls and roofs are leaking and require further investigation to confirm if repair or replacement is required and similarly for the unused retail space to the rear of the central annex.

The heating system boilers are near to end of life and recommended for replacement along with the original heating and water supply pipework.

The electrical supply, controls, fixtures, fittings and lighting range in condition from moderate to good albeit that there appears to be some residual electrical supply cables which may require replacement.

There are age related deferred maintenance issues generally with Begonia House which require repair and a planned maintenance schedule to be developed.







## ELEVATIONS



E1 Front north elevation



E2 West Elevation



E3 South elevation showing the link workshop and staff rooms



E4 Boiler room and potting shed



E5 Two storey staff room and dry room space in the ground floor extension



E6 Link workshop



E7 Central annex events area



E8 Kitchen annex located on the east elevation



E9 Glass house toilet block

E10 South toilet block linked to the staff rooms



## 3 INTRODUCTION

THIS REPORT HAS BEEN COMMISSIONED BY WELLINGTON CITY COUNCIL (WCC). THE OBJECTIVE OF THE REPORT IS TO RECORD THE CONDITION OF THE PROPERTY INCLUDING DRAINS AND SERVICES, ASSESSES THE GLAZED CLADDING SYSTEM INSTALLED ON THE GREENHOUSE/CAFÉ, AND IDENTIFY REMEDIAL OPTIONS ALL IN ACCORDANCE WITH THE WCC SCOPE OF WORKS.

### 3.1 BRIEF DESCRIPTION

The report has been prepared by [REDACTED], on behalf of WT Advisory NZ Limited as per our Contract dated 14 March 2023.

General particulars of this report are as follows:

Building Surveyor	[REDACTED] – WT Partnership
Quantity Surveyor	TBC – WT Partnership
Structural Engineer	[REDACTED] – Powell Fenwick
Mechanical/Electrical Engineer	[REDACTED] – Powell Fenwick
Drainage Assessor and Underground Services Location	Drainage Doctor
Land Surveyor	[REDACTED] – Spencer Holmes Limited
Glazing System Assessors	[REDACTED] - ThermoSash
Inspection dates & weather	16 March 2023 and the weather was fine
Inspected by	All of the above
Other persons present	[REDACTED] – Wellington City Council

As per the agreed contract of service dated 14 March 2023, reporting was to include:

#### Condition Assessment

Full condition assessment of the existing structure, services, and an asbestos survey. Using the NAMs grading system to record the condition of the elements and components and providing budget estimates for remedial works.

#### Survey

Complete survey of the Begonia House and surrounds as shown in the map provided as Appendix D of the RFQ, including:

- existing structures (including staff depot and toilet buildings)
- vegetation / trees, lawns, roads, driveways (Topographical Survey)
- underground and above services, including camera location of underground services

### Specialist glazing review and design

The Begonia House Glazing System needs an upgrade to improve fixings and eliminate leaking. As part of this upgrade, we would like to explore the available glass technology that could be used to manage the climate.

A glazing specialist is required to complete a review of the existing glazing and confirm the glazing options available that meet building consent, seismic and heritage requirements.

The report has been split into three parts:

- The first (Section 3.0) summarise our findings.
- The second (Section 4.0) comprises a graded condition matrix of building elements.
- The third (Section 5.0) outlines additional works requiring attention.

The report is limited to the buildings noted above and no inspection of the surrounding grounds or landscaping has been undertaken. Inspections were restricted to a visual inspection completed from ground level, with roof areas viewed from the perimeter of the roof where accessible by ladder.

Our inspection has been undertaken on a purely visual basis. No invasive or destructive investigations have been undertaken in the course of the inspections.

No documentation in respect of previous repairs has been sighted and therefore no comment has been made on the original design or regulatory compliance. Comments have been restricted to the detailing and conditions observed during the inspection.

## 3.2 GENERAL INFORMATION

### History

WT understand that the history of the building is as follows:

- The original glass house was constructed circa 1960 with the end annexes and rear toilet extensions added circa 1988.
- Rear staffrooms, workshop and toilet blocks were constructed circa 1988 and also included installation of the ventilation system, electrically operated window sashes and the ceiling fans and electrical system located in the boiler room.
- Workshops and rear of the events centre and infill block between the staff room and toilet block constructed in 2002.
- Seismic strengthening works were conducted in 2012 along with some improvements to the glass walls and roof to provide a minimum of 70%NBS.
- A new electrical mains supply and distribution boards were installed in 2018 along with refurbishment of the rear toilet block.

Documents reviewed include:

- Connell Wagner Begonia House Glazing Report 2007
- Spencer Homes Limited Re-Roofing Works Gardeners Mess dated 2019
- Fibre Safe Asbestos Report 2019
- Begonia House Exterior Toilet Upgrade 2021
- Begonia House drawings dated 1960, 1988, 1990 and 2002.



## 4 BUILDING OBSERVATIONS AND ANALYSIS

THIS SECTION OF THE REPORT PROVIDES A BRIEF SUMMARY OF THE CONSTRUCTION AND CONDITION OF MAIN ELEMENTS TO EACH OF THE INSPECTED BUILDINGS.

### 4.1 GLASS HOUSE

Building A - The glass house consists of the tropical and temperate zoned with a central events area with back of house. The café is located in the east wing and there are two brick extensions to the rear public toilets and the boiler room/ potting shed. The events area extends at the rear and cuts across the road linking with the rear staff rooms, workshops and second public toilet block.

#### 3.1.1 GLAZING SYSTEM

The glazing system applied to the walls and roof of the glass house provides the main cladding system. A lantern smoke well is present which also appears to function as a heat sump with mechanical actuated windows for ventilation. The glazing system is defective and damaged and has reached the end of its economic life. An example of the defects and damage along with numerous failed historic repairs is as follows:

- Delaminating glass panels
- Slipped glazed units
- Lifted or deflected aluminium flashings
- Split aluminium cover moulds
- Failed and shrunken gaskets
- Missing gaskets
- Profiles not designed to take gaskets
- Extrusions with no coating or anodising
- Framing mullions/transoms deflected possibly because of failed support, fixings, or movement
- Gaps providing air leakage paths throughout
- The glazing appears to be a mix of laminated and annealed units which does not meet current building code requirements or best practice for safety glass.
- Defects and damage will, in all probability affect the system's capacity to comply with wind loading requirements
- The system does not appear suitable to be adapted to facilitate the installation of a new glazing system.

Defects and damage observed with some of the primary structural support elements as detailed in the structural engineer's site notes and annotated drawings as follows (also refer to Appendix A):

1. An isolated hip knee joint at portal had rusting delamination of stiffener plates (Grid 15 C)
2. Portal legs below garden level (Grid 15 C)
3. Brace not in detailed bay (Grids 10-11 and 14-15)
4. Wall bracing behind pungas could not be seen (Note)
5. Edge beam rusting between Grids 3-8 and 10-17
6. Brace moved. Portals not stiffened at roof brace. To be checked Grids 3-4 and 4-5
7. Joint rust not flaking Grid 8C
8. Joints look okay no sign of rusting Grid 8A, 10A and 10C
9. Grid 8 & 10 portals stiffened as detailed
10. Roof brace not in detailed bay. WCC has advised roof brace was intentionally moved to another bay and agreed to by Engineer at the time. PFC Structural Engineer commented that it should not affect the overall performance of the seismic upgrades.
11. 20 diameter rod wall brace placed Grid 4C-5C

12. Bent purlins (single) some rotten between Grids 14-16 A-B
13. Cracking to brick joints Grid 16A and E-17B and E
14. Brick move at door may have been hit Grids 3B-C and 8C-D
15. Rust and flaking paint Grid 10-17
16. Portal frame as detailed (no rusting) Grid 1B-C

### 3.1.2 ROOF COVERINGS

The roof of the main area of Begonia House is part of the external glazed façade. The roof consists of laminated glass with aluminium frame supported from the structural steel portal frames and steel and/or timber purlins. A lantern smoke well is present with mechanical actuated side lights for ventilation.

The rear extensions including the plantroom, workshop, stores, and 1988 toilet block extension are covered with standing seam roof sheets. The staff and changing room mansard type roof is covered with Decramastic tiles. The newer toilet block is covered with trapezoidal roof sheets.

### 3.1.3 ROOF DRAINAGE

The roofs are generally drained by pressed steel gutters to downpipes and terminate into surface gullies and sumps.

### 3.1.4 JOINERY

Aluminium external joinery and a mix of glazing types serves the glass house. Timber solid or louvre doors are installed to the toilets, kitchen and boiler room. Internal joinery units comprise of double aluminium door sets to the glass house some of which have been plated with stainless steel panels.

Rear windows are single glazed set-in aluminium frames.

### 3.1.5 INTERNAL LININGS

Internal wall and ceiling linings are provided in either painted plasterboard, particleboard or seratone.

### 3.1.6 FLOOR COVERINGS

Kitchen and toilets are lined with vinyl and the glass house concrete floor slab is lined with slate floor tiles.

### 3.1.7 FACILITIES

Toilet facilities whilst operational are dated and require refurbishment. Heating and hot water is generally provided from the three mains gas combination boilers via the original heating and water supply pipework. The electrical, lighting and fire systems have been upgraded albeit that the electrical supply cables appear original in some parts of the buildings. The kitchen facility is dated, and cookers fuelled from bottled LPG. The ventilation extract fans appear original from the 1988 refit.

## 4.2 BUILDING B – STAFF ROOMS, WORKSHOP AND REAR PUBLIC TOILET BLOCK

The rear ancillary buildings were constructed between 1988 and 2002 and interlinked into the original glass house.

### 3.2.1 WALLS

The rear retaining walls are constructed in either poured concrete or concrete blocks with timber framed gable and front elevation walls with brick veneers.

### 4.2.1 FLOORS

The buildings are supported from a concrete floor slab.

### 3.2.2 ROOF COVERINGS

The staff room area is two storeys with a first-floor mansard roof in timber frame with underlay and Decramastic roof tile cladding. The workshop has a flat roof with plywood sarking and a rubber membrane lining repaired with a coat of liquid plastic overcoat. The infill link roof between the staff room and toilet block is pitched and clad with Decramastic tiles and the rear toilet block has been reclad with powder coated corrugated iron.

### 3.2.3 ROOF DRAINAGE

Pressed metal or Upvc gutters provide drainage to downpipes.

### 3.2.4 JOINERY

The staff room joinery consists of anodised aluminium doors and windows. The workshop is fitted with a roller shutter door and timber pedestrian access door. All other buildings have timber doors and single glazed aluminium windows.

### 3.2.5 INTERNAL LININGS

Internal walls and ceilings are either lined with plasterboard, particleboard or seratone.

### 3.2.6 FLOOR COVERINGS

Toilets and the staff room are lined with vinyl with wall upstands.



## 5 CONDITION SCHEDULE

THE FOLLOWING SCHEDULE HAS BEEN PREPARED FOR WELLINGTON CITY COUNCIL AS AN ASSET MANAGEMENT SCHEDULE FOR THE PROPERTIES AT BEGONIA HOUSE. THIS SCHEDULE IDENTIFIES DEFECTS AND SHORTCOMINGS NOTED DURING OUR VISUAL INSPECTION OF THE BUILDINGS.

Assessment of all items has only been completed through site observations. Plans of the building, provided by WCC have been relied upon for estimating purposes.

Assumptions have been made in respect of wear and general aging of materials based on the observations from our inspection. Deterioration and aging of the fabric of a building will be subject to weather conditions, damage, general aging and levels of maintenance applied. Regular inspections are recommended, and this schedule updated accordingly.

This schedule is for guidance only and should not be used as an alternative to obtaining competitive quotations based on a fully itemised Scope of Works and Specification.

Refer to the below condition rating matrix for the definitions adopted by the Wellington City Council for grading the condition of a number of building asset component types.

The condition rating of building elements has been derived from assessing the building in its current form and use and maintaining its use into the future with similar repairing in similar materials. Should the existing glazing system be replaced with a heavier system, the structure will need to be re assessed for adequacy by an engineer.

**The Asset Rating System is based on the NAMS standard approach to visual condition assessment utilising the following:**

Rating	Tag	Description
1	Very Good	New or near new, in excellent to very good condition with no indicators of obsolescence. Only nominal maintenance required.
2	Good	In good condition with no sign of immediate or short-term obsolescence. Only normal maintenance is required.
3	Moderate	In fair condition, and there may be some signs of short to medium term obsolescence. Significant maintenance may be required to improve condition to 2.
4	Poor	In poor condition with significant signs of impending (short-term) obsolescence. Substantial maintenance is required to keep the asset serviceable.
5	Very Poor	In very poor condition or obsolete – the asset no longer provides an adequate level of service and/or immediate remedial action required to keep the asset in service.

## 5.1 BUILDING A – GLASS HOUSE, TOILETS, BOILER ROOM AND CAFE

ITEM	ELEMENT	ELEVATION	INSPECTION COMMENTS	ACTION REQUIRED	PHOTO REF	CONDITION RATING
<b>Structure</b>						
4.1.1	Structural frame	Glass house	Although WCC has advised that the entire structural frame including beneath the glass over the portals was cleaned down and repainted in 2012 with resin paints, there appears to have been a lack of appropriate maintenance over the years resulting in varying levels of corrosion and deflection in some of the members. The building has been seismically upgraded and complies with current standards. There is active corrosion therefore redecoration will have to be redone in a similar manner, particularly to the tropical zone. There will, in all probability, be some structural repairs required to replace corroded nuts, bolts and possibly some repairs to steel work following further structural assessment once the paint has been removed to affected elements fully exposed.	Strip back the painted finish to expose the frame. Treat all corrosion and repair elements which have been compromised resulting in a loss of structural strength. Re decorate with a paint specifically designed for steel elements located in high moisture areas.	1.1-1.11	3
4.1.2	Structural frame	Southwest tropical plants	Two roof purlins are deflected	Replace or strengthen the two purlins. Allow for steel elements to be painted as above.	1.12	3

4.1.3	Perimeter walls	Glass house	<p>The external concrete walls are clad with a soft facing brick veneer. Isolated damaged sill tiles, isolated areas of joint cracking are present, and a number of bricks have spalled. Spalling of the face is a natural weathering phenomenon that happens over time with this type of soft brick. This will be an expected ongoing issue over the life of the building and can be managed during normal maintenance regimes. Cracking of brick joints may be caused by incorrect or a lack of sufficient wall ties fastening the external skin (writhes) back into the concrete wall or corrosion and expansion of the wall ties. Alternative causes may include ground movement due to seismic events or simply clashing of the door joinery when opening and closing.</p>	<p>Grind out cracked mortar joints and repoint; cut out all cracked and spalled bricks and replace with new brick to match existing. Clean out or provide additional weep holes and replace damaged sill tiles. Intrusive investigation is required to confirm the cause of cracking to the brick joints and to determine an appropriate repairing methodology. For estimating purposes WT will allow for a standard repair which would include replacing a section of the wall with new bricks and ties. Where new doors are installed as part of the glazing scheme, these should be fitted with door closers which prevent clashing (soft close).</p>	1.13-1.30	3
4.1.4	Perimeter walls	West elevation, Glass house	<p>Water damaged mortar joints from damaged rainwater pipes which drain onto the aluminium sills and then down the face of the wall</p>	<p>Repair or reposition the downpipes away from the road. Grind out all soft mortar and repoint.</p>	1.31-1.32	3
4.1.5a	Perimeter walls	Rear ancillary buildings (store)	<p>The plywood faced timber framed perimeter wall is moisture damaged along the bottom plate and bottoms of the studs. Moisture from watering plants and</p>	<p>Replace the wall cladding and all decayed timber framing. Replace flashings to the roof junction.</p>	1.33-1.34	4



condensation runs down the rear of the Punga's and into the un flashed wall junction. The roof junction between the store and glasshouse, eaves junction and skylight are leaking contributing to the moisture damage.

4.1.5b		Boiler room & potting shed	Water run mark emitting from behind the lining sheets.	As above but also plasterboard		4
4.1.5c		Kitchen	The cladding to the external gas bottle store is damaged	Replace the cladding to the external gas bottle store		4
<b>Glazing System</b>						
4.1.6	Glazing system	All	The aluminium glazing beads are in poor condition with separation, splitting and some missing. The frame is poorly flashed resulting in water and air leakage. The frame is poorly sealed at wall junctions resulting in water ingress	Replace the frame with a new system	1.35-1.69	4
4.1.7	Glazing system	All	The glass panes or two sheets of glass laminated together to provide a safer glazing panel. The roof sheets do not have any horizontal joints and butt together, the bottom edges of the glass panels are delaminating, the glass is whitewashed on an annual basis. Several panels had slipped and were hanging loose.	Replace the glazing panels with a new system (laminated safety glass)	1.70-1.77	4

4.1.8	Glazing system	All	The rubber gaskets were shrunk, loose or missing resulting in water and air leakage	Replace the glazing gaskets	1.78-1.86	4
<b>Ancillary Building Roofs</b>						
4.1.9	Corrugated metal roof cladding	Toilet block, boiler room and store to South	The corrugated roof sheets are corroded and have reached the end of their economic design life. The skylights are leaking at the eaves due to a lack of flashings and there is an incorrect flashing where the roof abuts directly onto the glasshouse with no stepdown to create a moisture barrier.	Replace all corrugated roof cladding, flashings and water storage tank.	1.87-1.95	4
<b>External Joinery</b>						
4.1.10	Glazed aluminium framed double door units	Glass house	Holes in door mullions and transoms where ironmongery removed, door leaf's have slipped and are out of alignment, beads are missing, steel sub frames are corroding.	Replace the doors and frames (5no). Note while doors are of varying ages, all require replacement as they form part of the glazing system which is to be replaced in its entirety.	1.96-1.98	4
4.1.11	Glazed and painted timber rear doors	Rear elevation	Kitchen door joints are decayed, and the painted finish is dilapidated.  Other timber doors are in moderate condition.	Replace the kitchen door	1.99-1.101	4
4.1.12	Aluminium windows 1988	Toilets & kitchen	Open mitre joints, shrunk gaskets and temporary replacement beads screw fixed into frames.	Replace the windows	1.101-1.102	4
<b>Internal Walls and Ceilings</b>						

4.1.13	Timber frame and plasterboard or particleboard lining	Kitchen	The kitchen ceiling is damaged from water leaks from the glass roof above. Wear and tear damage to painted surfaces and wall linings.	The wall and ceiling bulkhead linings are worn, dirty and moisture damaged and require replacement.	1.103	3
4.1.14	Timber framed east external wall	Office area rear of the events space / temperate zone	Water ingress at the wall corner junction has damaged the wall linings and boxing in the corner.	The junction can be remediated when the glazing system is replaced. (Note timber wall frame replacement is probable in this location. The wall structure is recommended for further investigation to confirm the extent of any moisture damage. It could be prudent to demolish the link building and renew to a code compliant standard.)	1.104-1.106	4
4.1.15	Plastic coated plasterboard wall linings	Toilets	Plastic coated plasterboard wall linings are cracked and exceeded their economic design life	Replace the toilet wall and ceiling linings and investigate the wall framing for moisture damage. The works will as a consequence require removal of the fixtures and fittings. Refer to 4.1.32	1.107-1.112	4
<b>Floor</b>						
4.1.16	Glass house and ancillary buildings		The floor is a concrete slab. The temperate and tropical zones have a slate floor tile which is delaminating in isolated areas. The tiles are circa 30 years old, and the grout adhesive is failing. Due to the location and subjected	Either continue maintaining the floor tiles on a reactive basis or lift the tiles, clean off and relay with an acrylic flexible grout or replace the tiles. New expansion joints should be installed	1.113-1.115	3



		environmental conditions in the facility e.g., it being a wet area, grout should be of a type used in swimming pools. Without expansion joints there will be continued unmanaged expansion and contraction resulting in delamination or crack damage to the tiles. The tiles are generally in satisfactory condition however repairs are required to manage the cause of the delamination and movement.	during refurbishment along with a review of how the tiles are adhered to the slab foundation.		
4.1.17	Toilets	Floor tiles and upstands are installed in the toilets	Replace the floor tiles consequential to 4.1.15 and 4.1.32.	1.116	2
<b>Services</b>					
4.1.18	Alarm	PIR, cctv, alarm box and cctv monitors.	NA	1.117	2
4.1.19	Fire	Break glass, mains smoke detectors, sounders, automatic doors, final exit signs, fire zone map.	NA	1.118	2
4.1.20	Electrical	(a) Switches, sockets are in good condition. However, the electrical working is circa 1988 and nearing the end of its serviceable life.  (b) Audio system with several small speakers, installed in 2021.	Rewire recommended in the next 5 years unless already undertaken.  The audio system was installed to provide appropriate audio for current use. Budget cost to alter or replace the system to suit future needs should be allowed for.	1.119-1.122	3

4.1.21	Electrical		Kitchen electrical meter, fuse box and isolator switch. Appears to be in moderate condition	NA	1.123-1.125	3
4.1.22	Lighting		Fluorescent strip lights to the kitchen and café, LED surface mounted units. High level flood lighting LED units to tropical and temperate zones. Arrays of led spotlights to the events area,	NA	1.126-1.128	2
4.1.23	Heating	Rear of café kitchen	External wall mounted LPG boiler to the kitchen external wall, adjacent to the electrical meter cabinet.	The boiler enclosure was locked therefore the installation date is unknown. If older than 15 years, then replacement is recommended.	1.125	3-4
4.1.24	Heating		Glasshouses are heated by circulating flow and return pipes with fin radiators and metal covers around the perimeter of the tropical and temperate zones. The pipework appears to be circa 1960s and is at end of expected design life. The pond is heated from hot water pipes from the boiler room. New temperature sensors are present.	Replace the heating system.	1.126-1.138	4
4.1.25	Radiant Heaters		Wall mounted radiant heaters to the events area (5no)	NA	1.139	3
4.1.26	Hot water		Supplied from the main gas combination boilers which are 10-12 years old.	Gas combination boilers have a life expectancy of 10-15 years when they become uneconomical to repair and parts	1.140	3

				become obsolete and difficult to acquire. The boilers will require replacement within the next 3 years.		
4.1.27	IT	Staff Room	Small server box to staff room. In moderate condition	N/A		3
4.1.28	Ventilation and air conditioning	South roof	Kitchen air extract units (2no) 1988 therefore at the end of economic design life	Replace the ventilation unit	1.141	4
4.1.29	Ventilation and air conditioning	Tropical and temperate zones of the glasshouse	2 Large extract units roof mounted appears to be from 1988. The extract units whilst still operational are at end of life. Ceilings fans are present and are in moderate condition.	Replace the extract system.	1.142-1.143	4
4.1.30	Ventilation and air conditioning	Tropical and temperate zones of the glasshouse	Automated opening window sashes are present in the glass lantern and walls. The system is electrically operated and partially works as there are numerous defects with the actuators, sashes and winding gear.	Replace during glazing replacement	1.144	4
4.1.31	Ventilation and air conditioning	Kitchen	Kitchen air conditioning units (2no) 1988 Fujitsu Units at end of economic design life	Replace the air conditioning units	1.141	4
<b>Facilities</b>						
4.1.32	Toilets	Glass house Toilet block	The toilet blocks facilities have reached the end of economic life and are recommended for refurbishment.	Full refurbishment required	1.145	4



4.1.33	Water feature		The feature in the temperate zone (Wishing Well) was inoperable at the time of survey. As the feature is circa 60 years old, the water supply pipework is at the end of economic life as well as any original plant that may remain. Plant prevented access to the workings of the feature.	Feature requires repair	1.146	5
4.1.34	All original water supply pipework		The water supply pipework is circa 60 years old and has exceeded economic design life.	Replace all original water supply pipework.	1.147-1.148	4
<b>Drainage</b>						
4.1.35	Glass house gutters	All	Aluminium gutter joints are open and leaking through lack of expansion joints and some brackets are damaged.	Replace all gutters during glazing system replacement	1.149-1.159	4
4.1.36	External underground surface water and foul water systems		A number of defects and damage to the drainage systems was identified through cctv investigation of the pipework.	Defective and damaged sections of pipework, as a minimum require remediation or replacement (refer to the conclusions and recommendations and plans included at Appendix B		4
<b>Fixtures</b>						
4.1.37	Shade sails	Café	Shade sails to cafe to reduce heat and glare in the eatery area providing a more comfortable environment for staff and customers. The sails are in a good	Clean sails and implement maintenance regime of regular cleaning. Note, the need for shade sails may be mitigated should	1.160	2

condition with no obvious damage however birds were accessing between the glass and sails which increases the amount of dirt and debris and will result in a high level of maintenance (cleaning) of the inaccessible top face of the sails. Bird faeces can also accelerate deterioration of the sail fabric if not cleaned off.

glazing be replaced with low emissivity / solar control glazing options.

4.1.38	Kitchen fixtures	Café kitchen	Fixed cooking and sink facilities. Cookers, cold store, and mobile benches etc replaced several years ago and are in good condition. However, the original elements, fixtures and fittings are 1988 and will have attained their serviceable life and will require replacement including the extract system particularly if the kitchen is being relocated or layout changed.	Replace all original fixtures and fittings. Redevelopment of the kitchen will also require releveling the concrete floor to accept new floor linings, augmentation of the water supply pipes, hot water heating, air con and ventilation along with augmentation of the gas supply pipework. WCC to decide if the tenant fixtures and fittings are to remain or be reused or if the landlord prefer to maintain ownership of all kitchen facilities.	1.161	2-4
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## STRUCTURE



1.1 View from inside the tropical zone showing the steel portal frame, roof purlins and the lantern skylight



1.2 Concrete encased leg and light corrosion around the area of the drainage outlet.



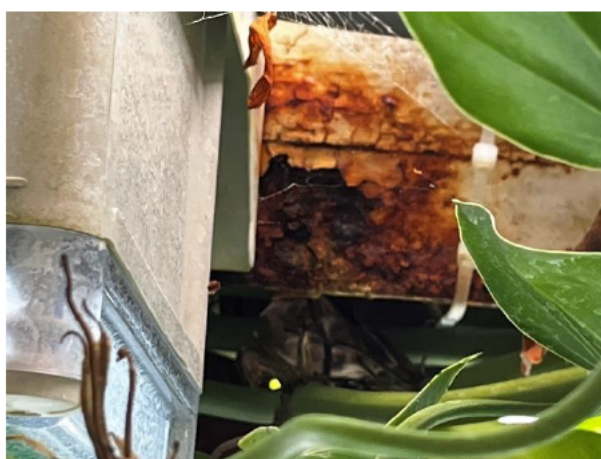
1.3 Example of surface corrosion



1.4 Corroded beam and damaged painted finish



1.5 Advanced corrosion in the steel beam above the door to the workshop

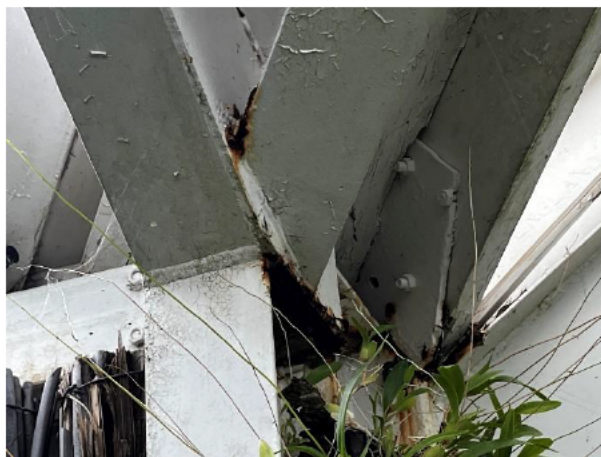


1.6 Advanced corrosion in a perimeter beam





1.7 Isolated areas of superficial corrosion on the steel portal frame leg



1.8 Advanced corrosion in a knee joints as detailed in photo 6 of the structural engineer's report



1.9 View of the central annex



1.10 Isolated surface corrosion on a perimeter beam



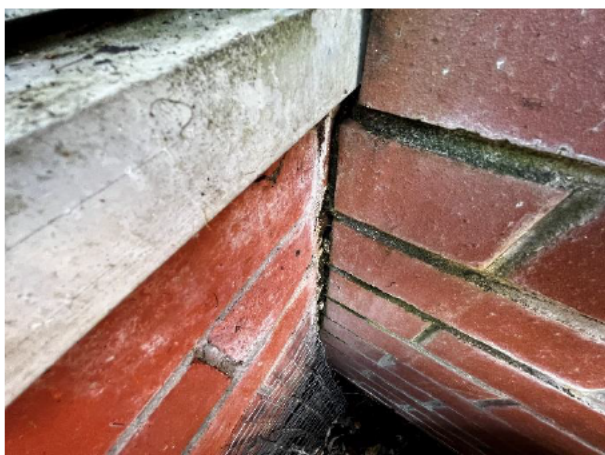
1.11 Corrosion in the lintol above the doors to the central annex back of house



1.12 Deflected timber purlin located on the southwest corner



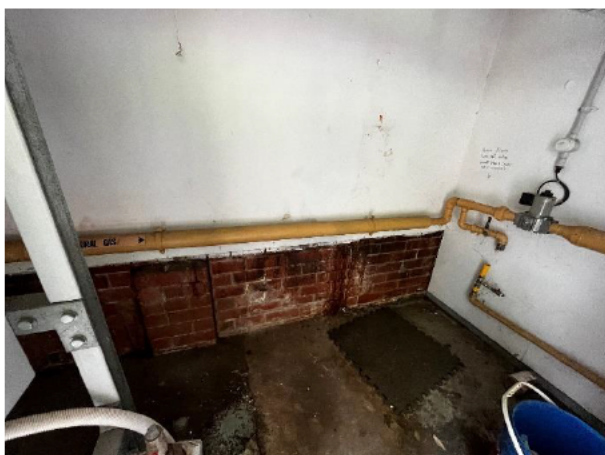
## PERIMETER WALLS



1.13 The walls are incorrectly jointed and lack appropriate weathertight seals between the workshop and glasshouse resulting in moisture ingress into the timber frame



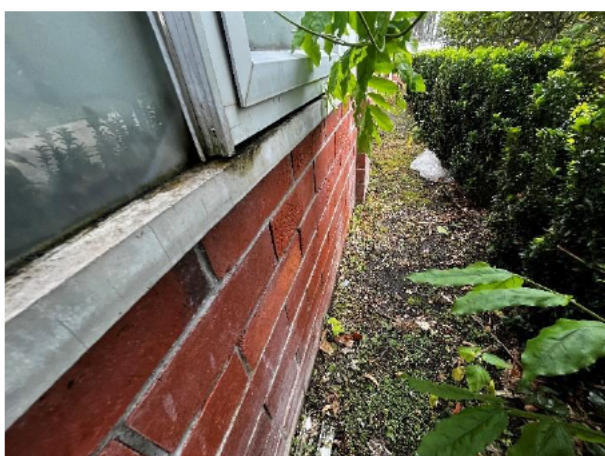
1.14 Surface of the bricks are spalling



1.15 Moisture damage to the wall lining of the boiler room/glasshouse



1.16 Cracking in the mortar joints located on the west elevation



1.17 Spalling bricks on the north elevation

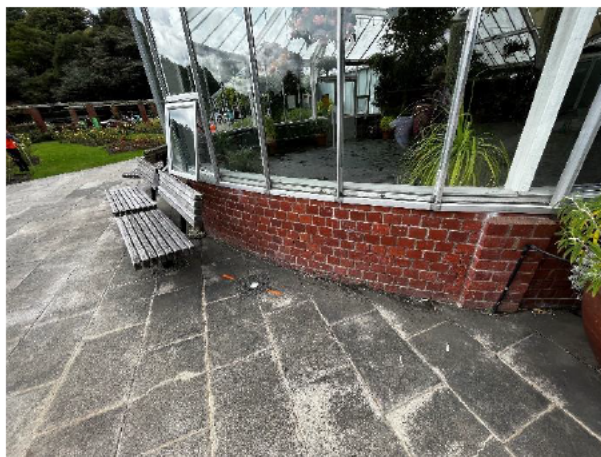


1.18 Damaged bricks located on the west elevation next to the door on the central annex





1.19 There is a tapering gap between the door and wall/glazing to the central annex and the cause of the movement is undetermined



1.20 Spalled brick in the central annex wall



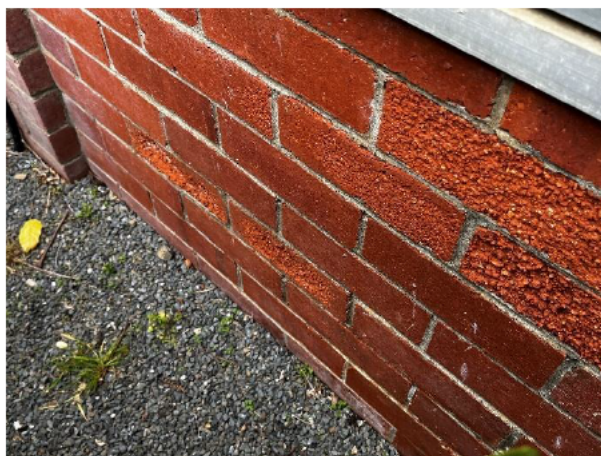
1.21 Cracked brick veneer



1.22 Close up view of the cracked veneer



1.23 Spalled bricks in the temperate zone brick veneer



1.24 As last photo





1.25 Spalled and degraded bricks to the door panel of the east annex note that the plaque states that the tea house was constructed circa 1981 and the joinery is therefore at end of life.



1.26 Example of unsealed penetrations through the veneer



1.27 Damaged sill and unsealed penetration



1.28 Gap between the barge and wall veneer creating a vermin access point



1.29 Spalled bricks in the rear wall veneer



1.30 Gap between the link wall and glass house creating a water access route into the wall frame.





1.31 West annex. Arrows indicate where the gutter downpipes drain onto the perimeter wall



1.32 Mortar joints have degraded where the downpipes terminate.



1.33 Potting shed located on the south elevation of the glass house



1.34 Moisture damaged timber frame and plywood substrate below the potting shed bench

## GLAZING SYSTEM

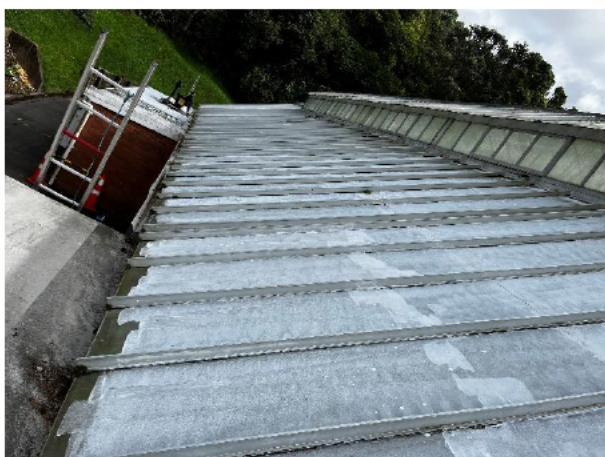


1.35 Rear annex extension roof



1.36 Corner junction is leaking into the roof frame below

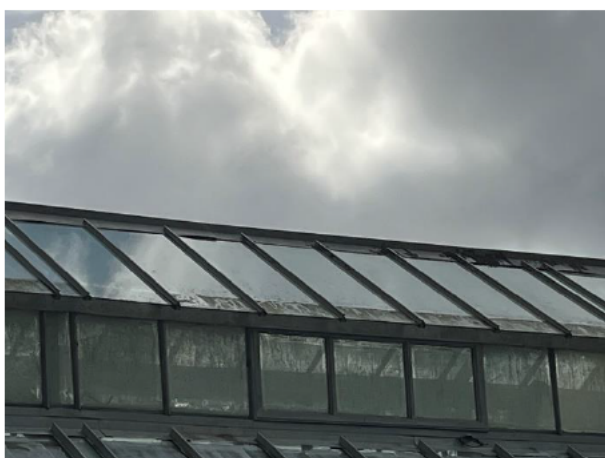




1.37 The bottom edges of the glazing panels are poorly sealed creating moisture ingress routes but also beads/sealant hold condensation on the inside of the wall



1.38 Glass panels butt together and are temporarily sealed with silicone. This is a high maintenance detail



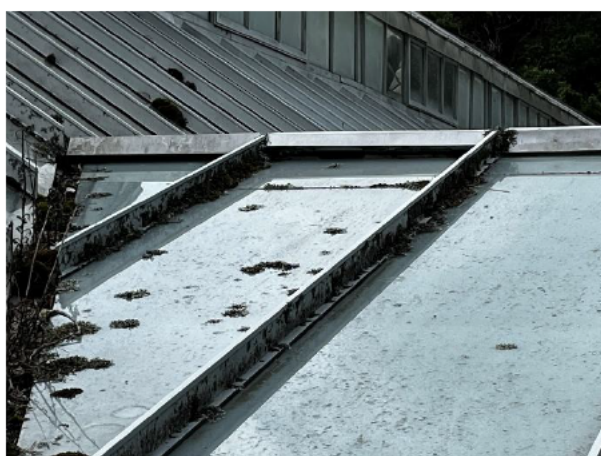
1.39 Ridge flashings are deflected in several locations



1.40 The link extension is incorrectly built into the glass house creating moisture ingress routes and damage



1.41 Apron flashings to the lantern have lifted



1.42 Ridge caps have lifted





1.43 Flashings have lifted



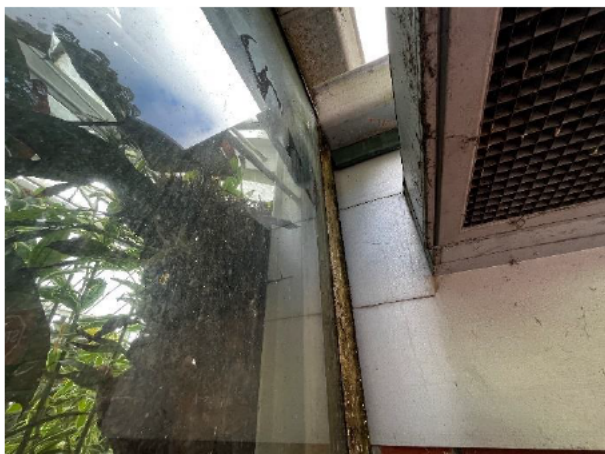
1.44 Unsealed bottom edges of the glazing panels



1.45 Vegetation growth in the valleys preventing drainage



1.46 Open mitre joints and corrosion



1.47 Decayed timber bead closing off the junction between the glass house and link workshop



1.48 This junction no longer performs a weathertight seal





1.49 Aluminium, glazing bead is split and dislodged



1.50 Aluminium, glazing bead is split and dislodged



1.51 Glazing beads are missing leaving one side of the glass panel insecure and the glazing panes are delaminating



1.52 Missing glazing bead



1.53 Lifted apron flashings



1.54 Plants growing through between the glass and frame





1.55 Damaged and poorly repaired sill



1.56 Downpipe cut short assume because the bottom section damaged by vehicles. Result is damage to the wall.



1.57 Glazing beads cut short or slipped



1.58 Glazing bead cut short



1.59 Glazing bead damaged and detached



1.60 Loose glazing Bead





1.61 Separation of the mullion from the transom



1.62 Flashing has deflected and lifted on the bottom corner junction with the cafe



1.63 Open mitre joint



1.64 Open mitre joint



1.65 Open mitre joint



1.66 Poorly sealed junction between the wall and glazing system creating a moisture ingress route





1.67 Impact damage to the window frame



1.68 Open and damaged mitre joint both sides



1.69 Arrow indicates where the sill was cut to form a curved shape. The joints are starting to lose adhesion.



1.70 Glazing joint sealant has failed resulting in damage to the kitchen ceiling



1.71 Southwest elevation



1.72 Slipped panes on the lantern





1.73 The glazing panels are whitewashed which requires regular high cost maintenance



1.74 Bottom edges of the laminated glass panel are delaminating



1.75 Delaminating pane



1.76 Open flashing and glazing joint between the roof and lantern



1.77 Delamination of the glazing panes



1.78 Gasket missing to base of glazing pane

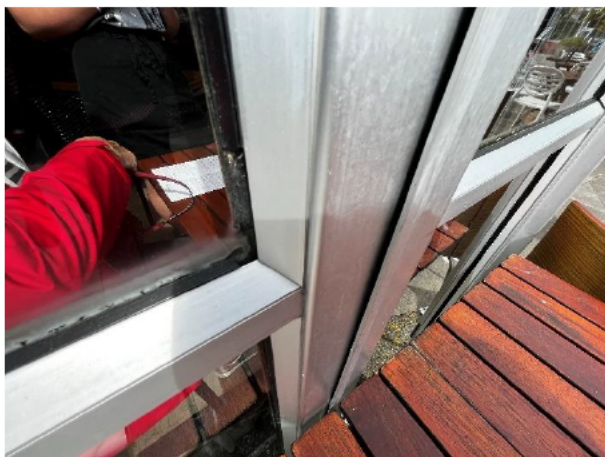




1.79 Internal gaskets have dropped



1.80 Gaskets have worked loose



1.81 Short gaskets and delaminating glass



1.82 Gaskets detached



1.83 Slipped gaskets and vegetation growth through deferred maintenance



1.84 Slipped and dislodged pane and gaskets





1.85 Gaskets have fallen out and condensation from the glasshouse roof is running into the wall frame



1.86 Glazing gaskets have worked loose

## BOILER ROOM, POTTING SHED AND TOILETS



1.87 Boiler room and potting shed



1.88 Corroded barge caps and apron flashings



1.89 Corroding edges to roof sheets and vegetation growth



1.90 Corroded back flashings





1.91 Internal damage to the potting shed skylight walls



1.92 Mould on the potting shed ceiling and moisture damaged cornice



1.93 Moisture staining along the plywood joint



1.94 Moisture damage to the bottom edge of the wall linings



1.95 Moisture damaged wall framing and substrate in the potting shed



## EXTERNAL JOINERY



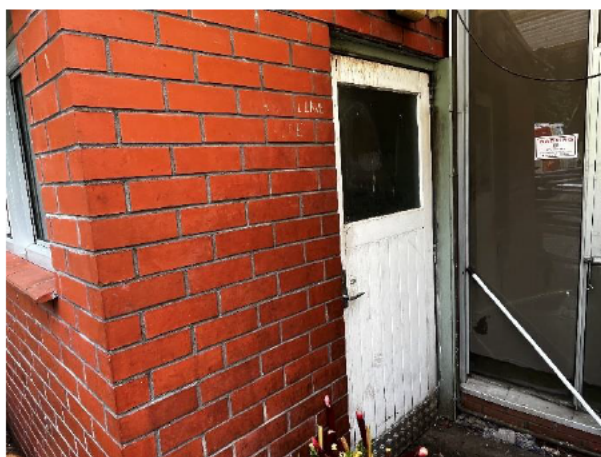
1.96 These double door joinery units are at end of life and recommended for replacement. The steel perimeter frames are corroded and either require repair or replacement



1.97 Doors are out of alignment and corrosion in the frame



1.98 Defective and damaged doors with corrosion in the steel frame



1.99 The timber door to the kitchen is in poor condition with open joints and decay



1.100 Door to the toilet block from the Glasshouse is in good condition



1.101 Door joinery to the toilets is in moderate condition but the aluminium joinery units are in poor condition.,





1.102 Windows are fastened shut and the perimeter sealant has failed

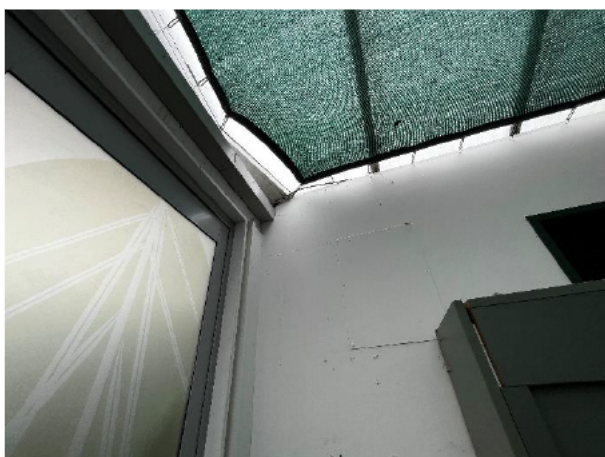
## INTERNAL WALLS AND CEILINGS



1.103 Water related damage to kitchen ceiling



1.104 Office area rear of events



1.105 Moisture ingress and cracking to wall lining



1.106 Moisture related dmaage

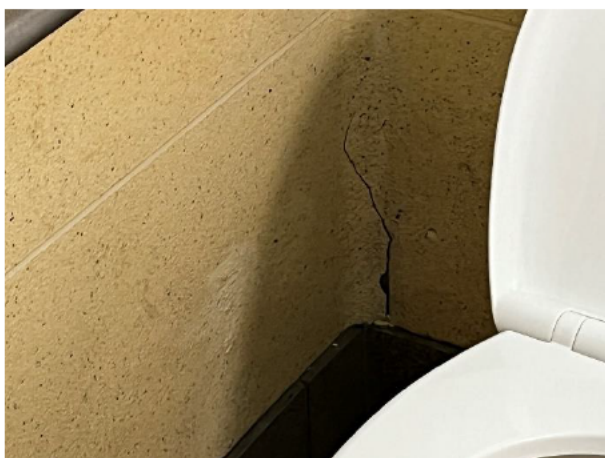




1.107 The toilet entrance wall, floor and ceiling linings and tiles are beyond economic life



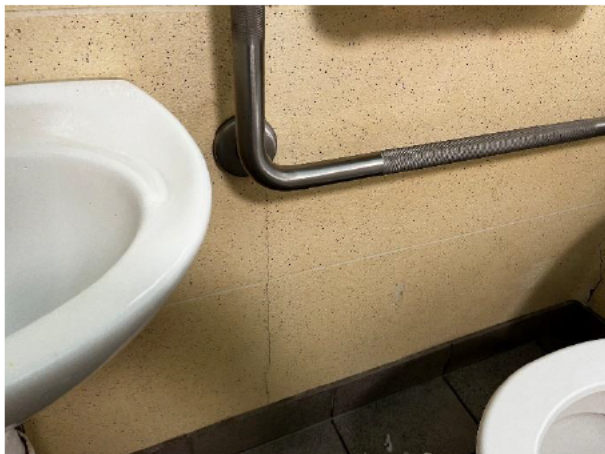
1.108 The sanitary ware is operable. The linings are dated and worn



1.109 Cracked and delaminating wall lining finish



1.110 Cracked wall board joint with moisture damage



1.111 Cracked wall board joint



1.112 Wall damage



## FLOOR



1.113 Delaminating floor tiles



1.114 Floor and planter box tiles are lifting in isolated area, are chipped throughout but remain serviceable though are becoming dated and unsightly



1.115 Floor and wall tiles



1.116 Floor tiles with upstands to toilets

## SERVICES

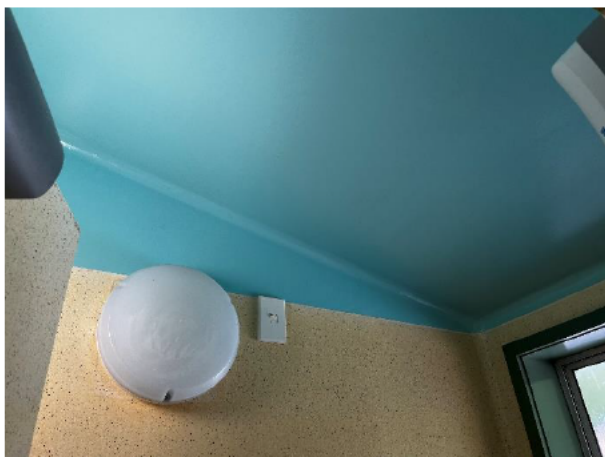


1.117 CCTV, PIR, and sounders are in good condition



1.118 Fire exit signs are in good condition





1.119 Electrical fittings are in moderate condition



1.120 Electrical fixtures and fittings range in condition between moderate and good



1.121 Electric switch array is constantly wet?



1.122 Ceiling fans and speakers



1.123 Electrical supply is present along the tree line, stage and to a lamppost and the underground position does not appear to have been confirmed.



1.124 Electrical switch gear we understand is circa 1988-1991. The heating and hot water supply pipework appears to be in moderate condition within the boiler room. WT understand the main electrical supply cable was replaced in 2021





1.125 Rear kitchen and toilets showing (a) hot water boiler and (b) electrical distribution board and (c) meter for the kitchens.



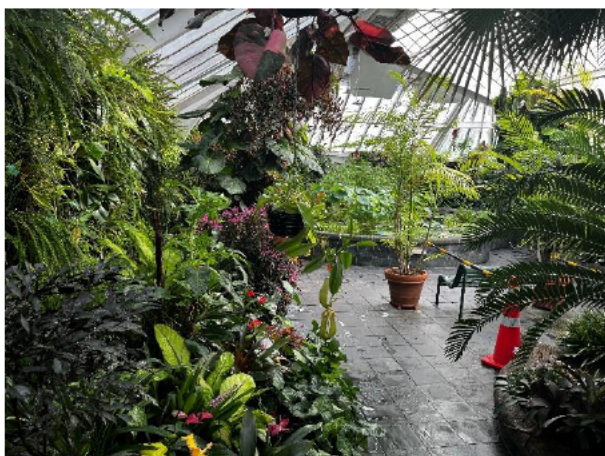
1.126 Lighting above the pond



1.127 Strip spots appear to be in moderate condition



1.128 Lighting and electrics are in moderate condition

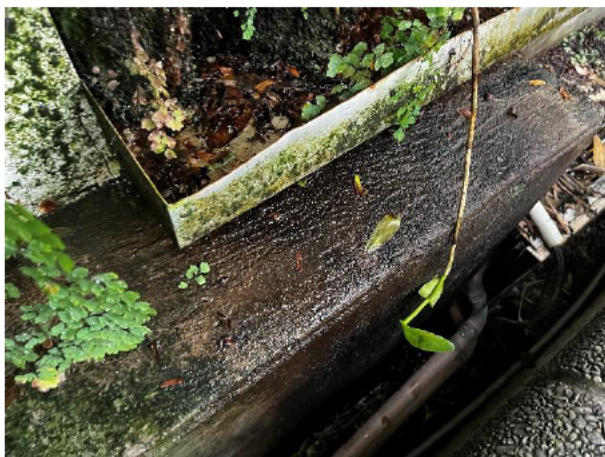


1.129 Tropical Zone



1.130 Heating units behind the planted areas and above the open drainage channel





1.131 Original heating supply pipes



1.132 Heating system and drainage channel



1.133 Corroded nuts and bolts from the radiator cover



1.134 Framework is corroding around the radiator covers



1.135 Radiator fins



1.136 Heating pipework and associated elements





1.137 Pipework and branch from the heating pipes in the temperate zone



1.138 Heating pipe branch in temperate zone



1.139 Radiant wall heaters



1.140 Condensing boilers are 10-12 years old and remain in an operable condition but are nearing end of economic life.



1.141 The (a) extract fans and (b) air conditioning pumps are at the end of economic life.

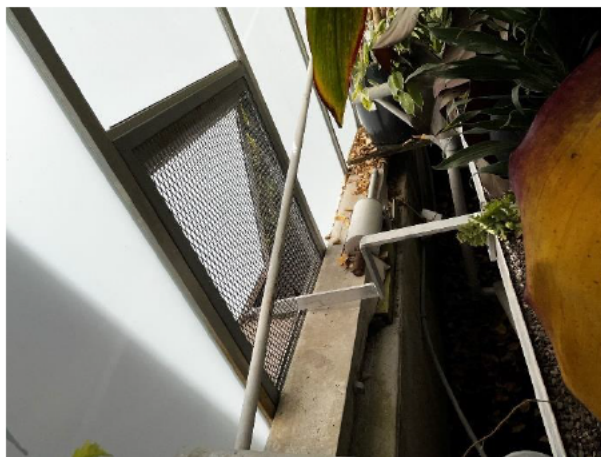


1.142 Air circulation fans are at the end of their design life





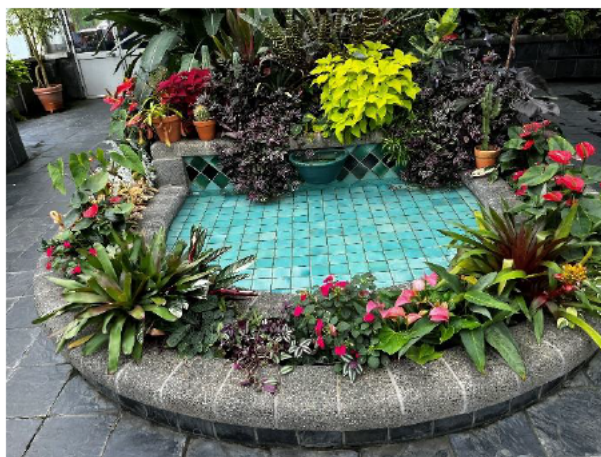
1.143 Air extraction units are at end of life



1.144 A disconnected window actuator



1.145 Sanitary remains operable but has reached end of economic life



1.146 View of the water feature (Wishing Well)



1.147 Grassed area and stage rear of the café



1.148 Water supplies are present along the tree line and the underground location has not been confirmed



## DRAINAGE



1.149 Gutter joints have failed



1.150 Gutters corroded through



1.151 Gutter fixings are corroded



1.152 Open gutter joints



1.153 Gutter brackets are corroded

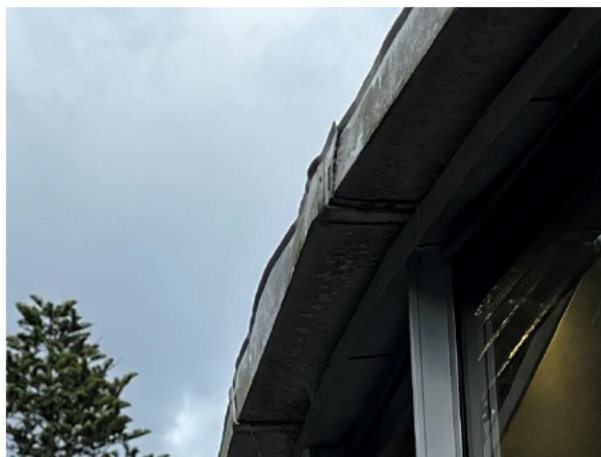


1.154 Corroded gutter brackets





1.155 Defective gutter joints



1.156 Damaged gutter with open joint



1.157 Corroded outlet



1.158 Gap between the gutter and rain head



1.159 Impact damaged gutters

## FIXTURES



1.160 Internal shade sails with dirt and bird droppings on sails



## 5.2 ANCILLIARY BUILDINGS – STAFF ROOM, WORKSHOP AND TOILET BLOCK

ITEM	ELEMENT	ELEVATION	INSPECTION COMMENTS	ACTION REQUIRED	PHOTO REF	CONDITION RATING
<b>Roofs</b>						
4.2.1	Mansard roof to the staff room	North and south	The timber framed mansard roof is clad with Decramastic tin tiles. This product appears to be an asbestos containing material. The painted timber barge boards are decaying at junctions and on the ends with peeling paint along the lengths. The roof cladding system has reached the end of its economic design life. Internal moisture damage was observed to ceilings, trims and wall linings. There have been numerous unsuccessful attempts at repair with sealant.	Replace the roof cladding system and create a new pitched roof over with large eaves. Straighten the walls and reclad with a new cavity-based system. Allow 20% frame replacement and 2 coats of Protim frame saver.	2.1-2.5	4
4.2.2	Workshop flat roof membrane	Link between Block A & B	The membrane has been coated with a liquid plastic type repair. The roof to roof and roof to wall junctions have been poorly applied/designed resulting in moisture ingress and damage to the roof substrate, drips, roof and wall framing and linings. Gaps are present between the roof membrane upstands and the wall at the toilet block gutter.	Replace the roof membrane and substrate. Install new flashings and create an eaves.	2.6-2.17	4
4.2.3	Toilet block roof cladding	Toilet block	A section of the infill link has recently been reclad with powder coated corrugated iron. The paper underlay has degraded along the eaves which can cause moisture to drain into the internal of the roof. The corrugated roof cladding over the toilet block has reached the end of its economic life.	Replace the roof cladding and 1 Velux skylight	2.18-2.22	4
4.2.4	Gutters	All	Generally, the gutters remain in a moderate condition with	Replace all gutters	2.23-2.25	4

some sections having been replaced.  
The gutter installed on the south elevation of the toilet block and east elevation of the workshop have corroded through. The gutters have generally attained the end of their design life.

## Walls

4.2.5	First floor staff room gable walls	East and west	Direct fixed fibre cement wall cladding system has numerous defects which are recognised to contribute to weathertightness failure. Fastening nails are working loose, joint strips are broken, there are limited gaps between the cladding sheets and adjoining roofs, limited joinery flashings and cracked or damaged panels. Elevated moisture levels were recorded in the first-floor walls. Internal moisture damage was observed to ceilings, trims and wall linings.	Reclad the building and allow 10% frame replacement and 2 coats of Protim frame saver to the timber frame.	2.26-2.31	4
4.2.6	Dividing wall between toilet block and staff storeroom	East	The direct fixed cladding has detached from the wall.	The internal timber frame is recommended for further investigation to confirm the extent of moisture damage. Allow 10% frame replacement and 2 coats of Protim frame saver to the timber frame.	2.32-2.33	3
4.2.7	Ground floor changing room	West	Timber framed walls with an internal plasterboard lining and external brick veneer. Externally the ground is raised and there is a hole in the wall on the southwest corner. The waterproof tanking system appears to have failed and the wall frame is substantially moisture damaged, surface	Demolish the changing room and replace the facility (excepting the retaining wall) including wall, ceiling and floor linings.	2.34-2.36	4



			mould growth, has lost structural strength and load bearing capacity.			
4.2.8	Rear external concrete wall	South	The vertical retaining wall junction between the workshop and the toilet block is unsealed and out of alignment. The joint tapers in width and has been incorrectly filled with expanding foam. Note that the majority of the joint is below ground level.	Excavate the ground to expose the junction and reseal repairing any damage to the tanking system as required.	2.37-2.39	3
4.2.9	Toilet block		There is an unsealed electrical cable penetration through the roof upstand into the wall. The particle board substrate has degraded around the penetration.	Relocate the cable and replace the damaged section of the wall lining. Note the membrane is being replaced at 4.2.2	2.40-2.43	3
			There is an open joint between the wall and roof along the front elevation.	Seal the junction with an insect/ventilation bead.		
			The South gable wall is partially retaining with soil above the dpc and weep holes.	The internal timber frame is recommended for inspection to confirm the extent of moisture damage, if any.		
4.2.10	Internal intermediate walls	Toilet block	The walls are generally lined with seratone which appears to be in moderate condition. Gaps were observed in some of the vinyl floor upstand corner joints which can create moisture ingress routes into the timber wall frame.	Further intrusive investigation to confirm the presence of moisture damage to the internal wall framing of the staff toilet block.	2.48-2.50	3
<b>Joinery</b>						
4.2.11	Roller Shutter Doors		Workshop	Programmed maintenance	2.51	3
4.2.12	Timber pedestrian doors		Mix of painted solid timber or louvred door sets. Timber door	Programmed maintenance	2.52	3

			with double glazed panes to the staff room.			
4.2.13	Aluminium doors and windows	Block B	Staff room are near end of life and are typical of those which leak. Units are from circa 1988.	Replace all aluminium joinery units.	2.53-2.54	4
<b>Facilities</b>						
4.2.14	Toilets blocks	South	The toilet blocks have recently undergone refurbishment and are generally in good condition. Inc hand dryers.	Programmed maintenance	2.55-2.60	2
4.2.15	Kitchen facility to staff room	Staff room	The kitchen remains usable though the units are starting to deteriorate	Replace the kitchen units and fittings in the next 3 years	2.61	3
<b>Services</b>						
4.2.16	Alarm	Block B	PIR, Keypad, control box, cctv	Programmed maintenance	2.62	2
4.2.17	Fire	Block B	Break glass, mains smoke detectors	Programmed maintenance	2.63-2.64	2
4.2.18	Electrical	Block B	Switches, sockets are in good condition. However, the electrical working is circa 1988 and nearing the end of its serviceable life.	Rewire recommended in the next 5 years unless already undertaken.	2.63	3
4.2.19	Electrical	Workshop	The main electrical incoming supply and distribution boards are located in the workshop. The supply cables and distribution boards are 5 years old and in very good condition.	Programmed maintenance and ensure that the water leaks in the adjoining room do not affect the system.	2.64-2.65	1
4.2.20	Lighting	Block B	Fluorescent strip lights and LED surface mounted to toilets, external bulkhead	Programmed maintenance	2.65-2.66	2
4.2.21	Heating	Staff room	Staff room has 1 electric bar wall heater	Programmed maintenance	2.66	3
4.2.22	Hot water	Staff and toilets	Electric hot water cylinder under the stairs of the depot	Note decay is present in the		NA



and a further under bench electric unit in the kitchenette to be removed.

timber framing to the adjacent external walls and all elements will require removal to facilitate repairs including water pipework.

4.2.23	IT	Staff room	Small server box to staff room	NA	2.67	2
4.2.24	Ventilation	Workshop	Workshop ducting and small inline heating unit	Programmed maintenance	2.68	3

## ROOFS



2.1 Staff room, toilets, and dry room



2.2 Dry room roof is deflected and worn. Presumed ACM.



2.3 Mansard roof with window.



2.4 There are numerous failed sealant repairs to prevent moisture ingress into the building.





2.5 Sealant repairs at the hip junction



2.6 Link Workshop



2.7 Link workshop flat roof with membrane lining and liquid plastic overlay



2.8 Gutters are corroded



2.9 Unsealed junction between the glasshouse and workshop fascia's



2.10 The drip edge has detached from the roof overhang





2.11 Roof framing has darkened and appears decayed



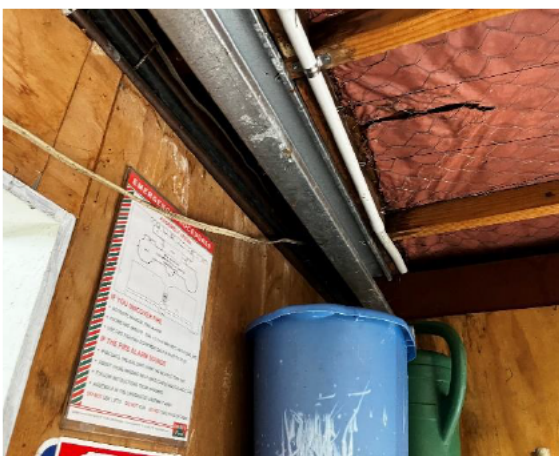
2.12 The membrane terminates level with the top edge of the roof upstand creating a moisture ingress route into the roof and wall framing



2.13 Decayed roof framing



2.14 Moisture stained roof framing and wall lining



2.15 Degraded roof underlay and mould growth and decayed timber elements



2.16 Decayed roof framing





2.17 Elevated moisture readings



2.18 Roof cladding reward of the central annex has recently been replaced. The flat roof membrane is perished and requires replacement



2.19 The roof junction flashing is poorly installed



2.20 The roof underlay has perished along the eaves



2.21 Gap between the wall and fascia providing a vermin access route into the roof space



2.22 Toilet block roof cladding has attained the end of its design life and is recommended for replacement





2.23 Gutter outlet is corroded through



2.24 Rear gutters are corroded



2.25 The gutters have perished

## WALLS



2.26 Direct fixed external wall cladding system is defective and damaged



2.27 Popped nail fixings, cracked boards, and damaged jointing strips





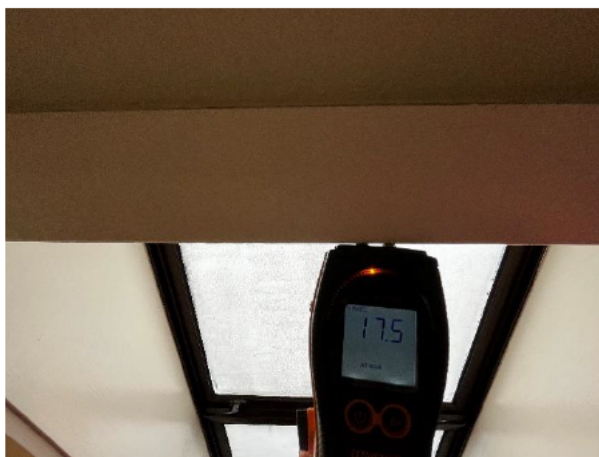
2.28 Moisture swollen trims at the upper door



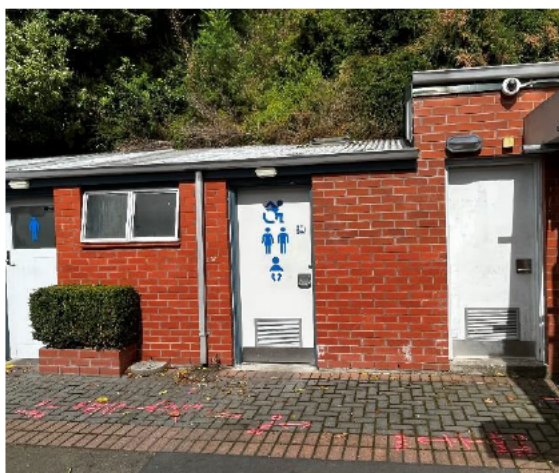
2.29 Moisture swollen trims below the upper door



2.30 The wall to ceiling junction is moisture damaged and staff informed that water penetrates when the wind blows from a norther direction



2.31 Elevated moisture levels were recorded in the staff room



2.32 Public toilets



2.33 Direct fixed wall cladding has detached and created a water ingress route into the roof and walls

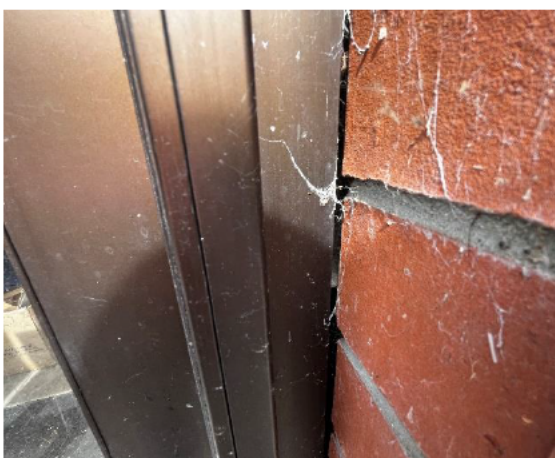




2.34 The building is set into the hillside and the gable and rear wall does not appear to have been adequately waterproofed, if at all



2.35 Hole in the brick veneer where the downpipe terminates



2.36 There are no seals between the door joinery and wall creating a moisture ingress route into the wall



2.37 Rear wall junctions appear to have been poorly detailed

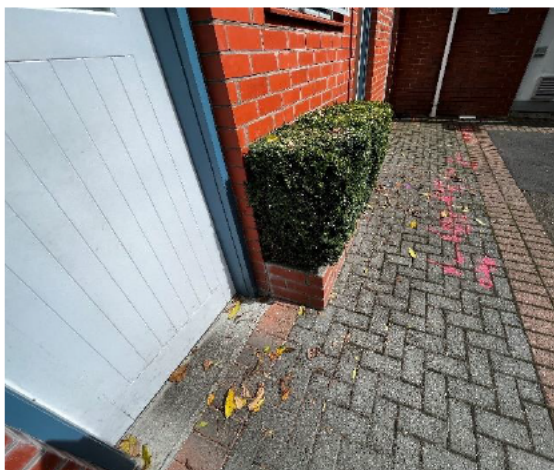


2.38 The junction is packed with timber and expanding foam



2.39 The corner wall junction has been infilled with expanding foam to create a weatherproof seal. Efflorescence and moisture staining was observed

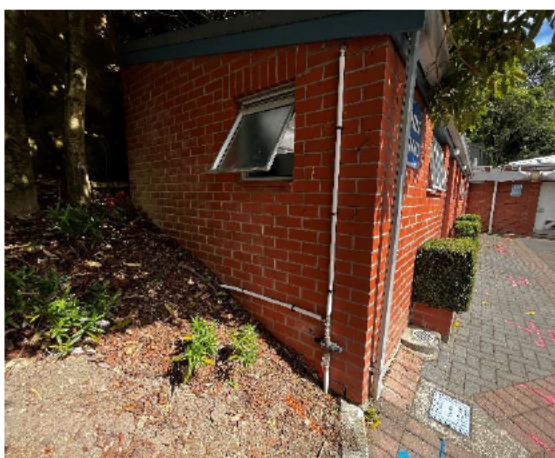




2.40 Shrub planters have closed off the wall weep holes potentially preventing drainage of water from the wall cavity



2.41 Unsealed obsolete penetration holes through the wall



2.42 There is bitumastic residue on the walls suggestive that the tanking system has been damaged and removed creating a moisture ingress route into the wall frame.



2.43 The gable to rear wall junction is missing mortar and appears to have been incorrectly waterproofed creating a moisture ingress route into the wall frame



2.44 Rear retaining brick and concrete wall junctions are poorly waterproofed resulting in moisture ingress



2.45 The damage is present around the perimeter of the room





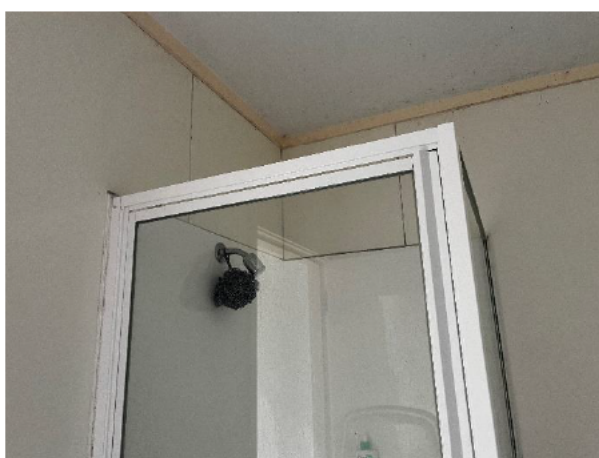
2.46 The timber wall frame below ground level is substantially decayed and disintegrated along the bottom plate and bottom of the studs



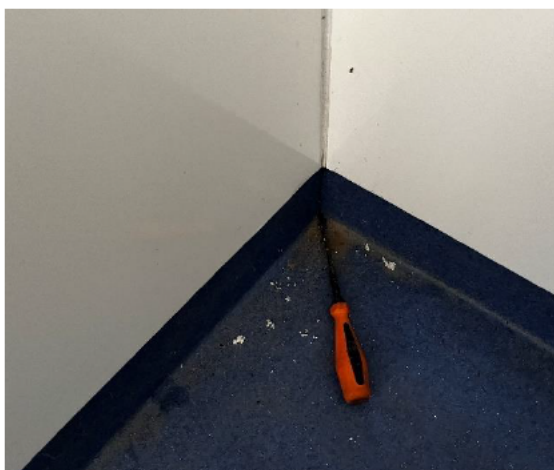
2.47 The dry room floor is saturated from external moisture engrossing into the dry side of the wall



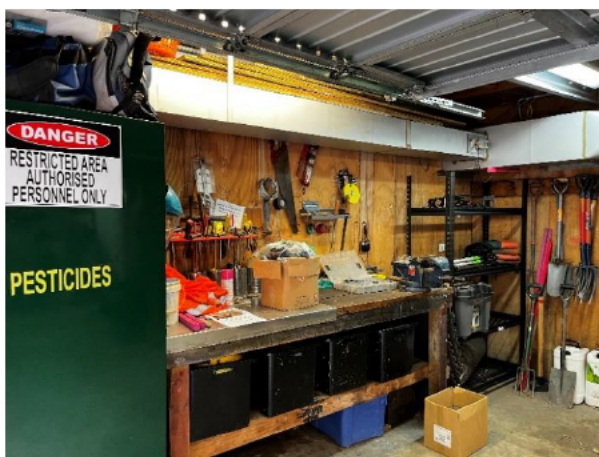
2.48 Facilities are generally in a moderate condition and the electrical and mechanical services are in good condition.



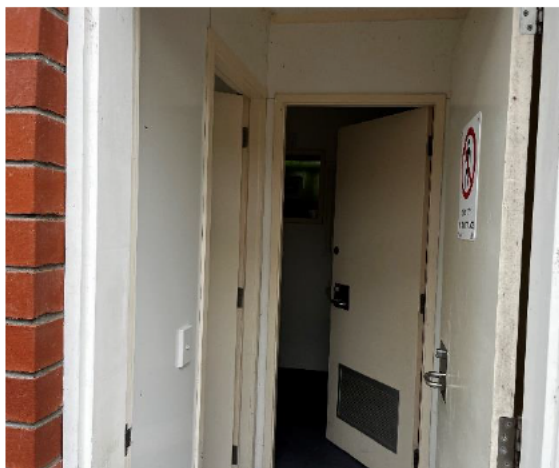
2.49 Shower cubicle appears to be in a moderate condition



2.50 Open joints in the corner upstands creating moisture ingress routes into the wall framing



2.51 Link Workshop with roller shutter



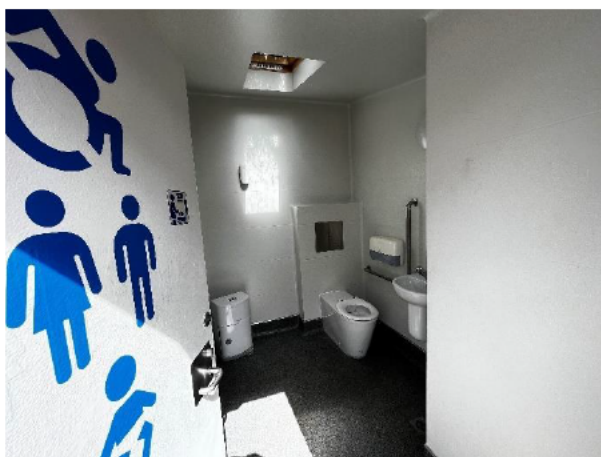
2.52 Staff toilets are dirty, and the painted finish is worn and is recommended for a repaint



2.53 Aluminium Joinery



2.54 Rear office moisture damaged window trims and frame



2.55 Internal elements and facilities - Toilets have been refurbished and are in good condition



2.56 Mechanical and electrical fittings are in good condition

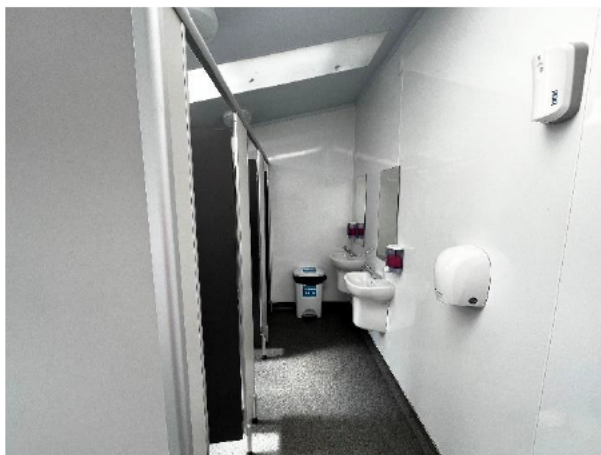


2.57 Male toilet door is showing signs of wear and tear

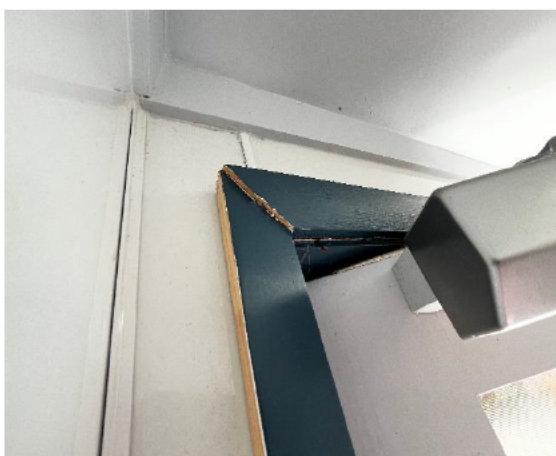




2.58 Refurbishment is in good condition. However, WT understand that the urinals are original but remain in a serviceable condition



2.59 Female toilets are in good condition

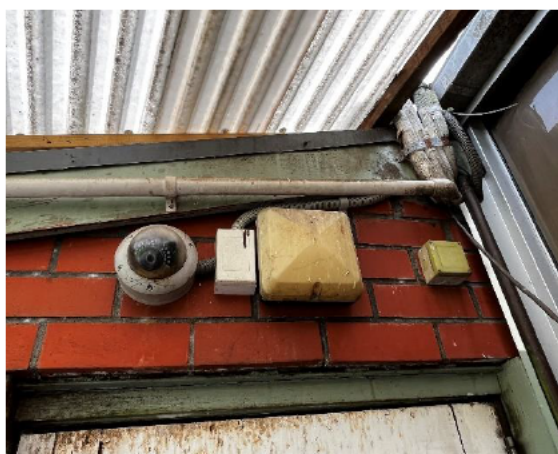


2.60 Minor maintenance issue with the door architrave

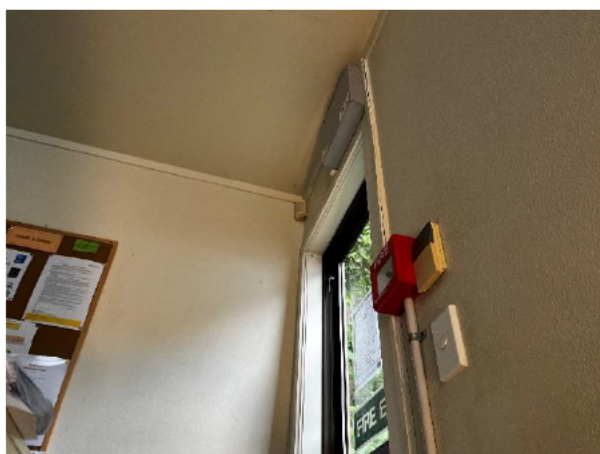


2.61 Staff room with kitchenette. Note that the floor dips in the corner next to the sink

## SERVICES



2.62 CCTV



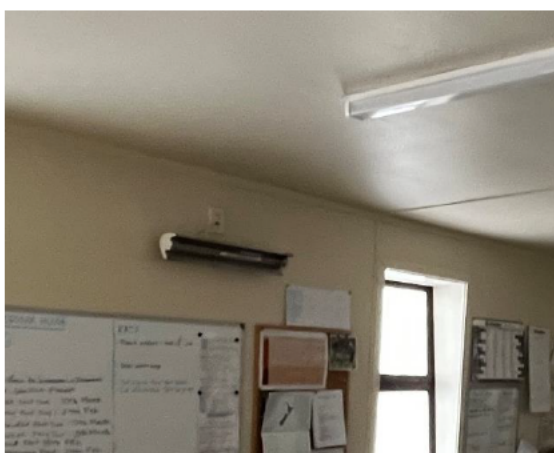
2.63 Break glass unit & electrical switches



2.64 New electrical incomings mains supply and distribution boards are in very good condition; Fire extinguisher



2.65 New distribution boards and supply



2.66 Electric bar heater



2.67 Small server box in staff room



2.68 Workshop ducted ventilation



## 6 ADDITIONAL OBSERVATIONS

THIS SECTION OUTLINES ANY ADDITIONAL OBSERVATIONS NOTED DURING THE INSPECTION

Particular focus on the following areas have been noted:

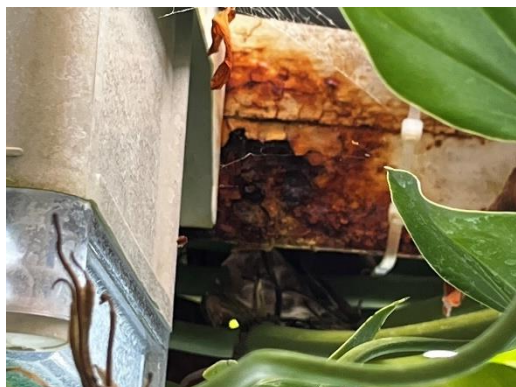
- Imminent health and safety concerns;
- Hazardous materials;
- Notable isolated defects



3.1 The coating of Decramastic tiles is known to contain asbestos



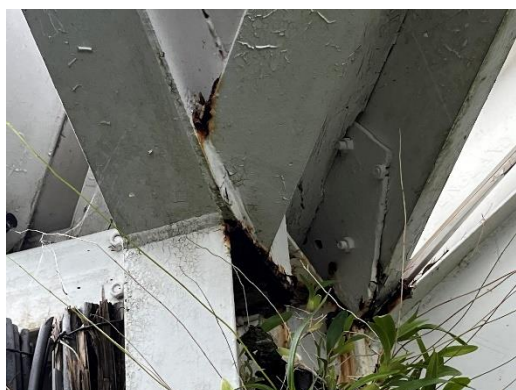
3.2 Decay and mould growth can be carcinogenic



3.3 Isolated deep corrosion in some steel frame members require sand blasting, engineer assessment to confirm appropriate repair



3.4 Deflected purlins to be strengthened



3.5 Knuckle/Knee joints to be investigated and repaired as per structural engineer's recommendations



3.6 All loose floor tiles to be lifted and relayed or replaced



3.7 Timber framing below the sills is moisture stained



3.8 Mock timber wall is water damaged



3.9 Internal windows sills are moisture damaged



## 7 CONCLUSIONS AND RECOMMENDATIONS

### SUMMARY OF FINDINGS

#### GLASSHOUSE

The glazed façade system is in poor condition, leaks air and allows water into the buildings. The system is thermally inefficient for a heated space. There is damage to isolated elements of the structural frame which require further investigation to confirm structural capacity and identify the correct repair (refer to Section 3).

The existing structure appears sufficient to support a new glazing system of a similar weight to the existing. However, the structural capacity of the supporting frame will need detailed assessment and design calculations to understand the required capacity to support a heavier glazing system and facilitation of any new plant or services.

Damage and defects observed to the structural frame which are recommended for repair to maintain the existing structural capacity is as follows:

- Steel portal legs would need checking and protected below soils level
- Grids 1-10 surface rusting in parts and flaking paint to be stripped back and repaired as directed by the engineer following further assessment
- Grids 10-17 surface rusting medium. Flaking members in in pool area. Some plates to be replaced/repared. (C/15 joint bad)
- All steel members to be cleaned back and repainted (Rust protection) as required
- Two damage or defective purlins to be replaced.
- Mortar cracking in brick wall joints to be repaired

The floor slab appears to be in a moderate condition notwithstanding that there is wear and tear to the slate floor tiles, some of which have lost adhesion and have lifted causing a trip hazard.

The concrete and brick low perimeter wall are in moderate condition. There is cracking through the brick veneer to the two side entrance doors to the tea house and central foyer which appear consequential to the doors clashing in the frames though other causes cannot be discounted.

Heating and ventilation systems have reached the end of their economic design life as well as some of the original residual electrical wiring supply cables. The majority of the electrical fittings including alarm, fire, lighting and power or controls are in moderate condition. However, some light fittings and cables are not appropriate for use in high humidity environments and will require replacement. A new lighting scheme can complement the building architecture and could include coloured lighting for displays and functions. Emergency signage lighting may need to be augmented.

The mains electrical supply will need to be assessed should the electrical demand for the building increase.

Upgrading of the communications system cabling to a CAT 6A would facilitate improvements to comms, security and CCTV.

While the audio system was installed in 2021, the system was installed to provide audio appropriate to current use. The system may require alteration of replacement to suit future needs.

WT understand that some of the fans are around 20 years old and are ready for replacement. The main electrical supply cables and distribution boards were replaced in 2018 and are in good condition and includes a new supply to the boiler room. The rear toilets facilities accessible from the glass house have attained their serviceable life and whilst operational will require upgrading.

### Plant Room and workshop

The standing seam roof has attained end of serviceable life, is corroding and has incorrectly installed flashings. The main glass house roof drains onto the plant room roof and water is penetrating through the roof junction. There is a section of the rear wall lined with a plasterboard lining with moisture staining around the bottom perimeter. It is unknown if the plasterboard panels are fastened to the timber frame or the glazing framing and further investigation is recommended to confirm the extent of damage, if any.

### Rear storage shed

The standing seam roof has attained end of serviceable life, is corroding and has incorrectly installed flashings. The main glass house roof drains onto the plant room roof and water is penetrating to roof junction. There is a section of the rear wall lined with a plywood with moisture staining and probable mould growth was observed over large areas. It is unknown to the plywood panels are fasted to timber frame or the glazing framing and further investigation is recommended to confirm the extent of damage.

The perimeter flashings have failed resulting in moisture ingress, staining and darkening of the roof joists and areas of the roof underlay have degraded. The vertical wall junction on the front elevation with the glass house is incorrectly sealed creating a moisture ingress route into the timber wall frame. Roof and wall framing will in all probability require replacement

### Staff Room

The east elevation extension wet room is partially below ground level. There are holes through the external brick veneer and an external tanking system was not observed. There is substantial moisture ingress through the wall resulting in advanced decay in the timber wall framing and damage to the plasterboard wall linings. Defects and damage was observed with the mansard roof cladding and window joinery junctions along with numerous failed temporary repairs. The junction between the concrete rear walls appears to be poorly formed and waterproofed resulting in moisture ingress.

### Rear toilet facilities

Constructed circa 2002 and renovated in 2021, the internal fitout is in good condition. However, defects with the external brick veneer and roof cladding require further investigation to confirm if the building performs in accordance with Clause B2 Durability and Clause E2 External moisture of the NZBC.

### Mechanical and Electrical

The electrical system, fixtures and fittings are in a moderate to good condition. However, parts of the electrical supply cabling appears to date from around 1980s and should be replaced.

The heating system for the hydro heating pipe system within the glasshouse is original and requires replacement. The heating boilers are nearing the end of their economic life and are recommended for replacement. However, the boiler room pipework appears to remain serviceable and may be retained.

### Drainage

Defects and damage were identified with the drainage system which are recommended for repair.

(refer to Appendix B)



## RECOMMENDATIONS

### GENERAL

Further investigation of the rear toilet blocks is recommended to confirm the extent of any weathertightness failure. If the timber wall framing is moisture damaged and given the extent of damage to the staff wet/drying room, then it may be more cost effective to demolish and rebuild the facilities. However, as a minimum, the buildings are recommended for refurbishment along with replacement of the glass house glazing system, staff room wall roof and wall cladding systems and kitchen facility. Refurbishment will provide a good opportunity to redesign the internal arrangement of the premises to provide community services which meet modern day use requirements and thermal efficiencies.

### GLASS HOUSE

Consideration could be given to replacing the current single glazing with new single glazing, with a coating / paint / or a frosted finish, however there would be a substantial cost for this exercise with very little thermal or environmental improvement and no it is unlikely the system would provide warranty or guarantee against water ingress, air infiltration, structural integrity, and no provision of producer statements or the like.

Replacing the existing glass house glazing system with a new similar weight system providing weather and air tightness would go some way in providing slight thermal efficiency improvements and reduced maintenance. There may also be some consequential structural strengthening required to the Main supporting structure.

More thermally efficient glazing systems generally are heavier systems, and a glass performance specification will be required to present base options which would need to be assessed by the structural engineer at concept design stage to ensure that the structure has the structural capacity to support the additional weight. Client guidance will be required to confirm the acceptable size and shape of the glazed units and supporting framework along with glass colour, reflectivity etc. The glazing manufacturer is reliant upon the clients guidance to understand if the design intent is to aesthetically remain as existing as many small, glazed units result in substantial fixings and framing whereas larger frames will be more cost / performance effective, less points of connection, but heavier total system weight and probably further strengthening in the main structural support system.

A new glazing system which will meet the WCC required carbon reduction targets may need to include, as a minimum, double glazed units with low emissivity glass, argon filled or similar, provide for external water drainage and internal condensation run off, be thermally broken, insulated, structurally glazed with self-cleaning glass to reduce access maintenance requirement. Background ventilation from opening bi-metallic trickle vents and purge ventilation for opening sashes, either operated from hand winders, telescopic poles, or motorised control from a keypad. ThermoSash Atrium Glazing System is an option in this range.

High end environmental heavy glazing systems such as those constructed utilising photovoltaic glass are a feasible will reduce energy bills and thus provide carbon reductions but are expensive and can prove cost prohibitive.

BIPV or Building Integrated Photovoltaics, are a specialty glass element. They are available in either transparent or translucent glass with integrated solar cells to convert clean electric solar energy into electricity. This means that power for a building could be produced within the roof, canopy, sky light or from the glazed vertical façade elements. The glass types can come in laminated and high performance specifications including IGUs as required, offering thermal insulation properties as well varying transparency levels, providing a shading element and reduction in solar gain.

The solar cells are embedded between two glass panes and a special resin is filled between the panes, securely wrapping the solar cells on all sides. Each individual cell has two electrical connections, which are linked to other cells in the module, to form a system which generates a direct electrical current.

There are several international projects around the world incorporating this technology setting a precedent for zero carbon power generation.

ThermoSash/Woods Glass are constantly reviewing offshore technologies and are seeing that the efficiencies and cost of this technology is becoming increasingly more feasible. If this type of high profile system proves to be a feasible option, a performance specification can be developed along with the structural and environmental engineers and WCC.

ThermoSash will collaborate with the client and conduct a base review of the potential glazing system options along with the structural and environmental engineers and agree environmental and seismic performance upgrades required for such a prestigious building. ThermoSash will also work with Heritage to work toward a design / engineered solution. Budget pricing can then be firmed up and system designs tweaked prior to procurement and appointment of the main contractors.

### **ANCILLARY BUILDINGS**

All ancillary buildings are recommended for further investigation to confirm the extent of moisture damage. Major refurbishment works are required to address the identified defects and damage. As a minimum, the side extension to the staff room may require demolition and rebuilding to remedy moisture damage. The mansard roof, walls and joinery units are recommended for replacement on a cavity based cladding system with new flashings and air seals.

The roof sheets and membranes to the glass house toilets and atrium including stores and workshops are recommended for replacement with new flashings, air seals and skylights. Damaged roof and wall framing is recommended for replacement with new internal linings as required.

If damage is confirmed to the rear toilet block walls (both blocks) along with the flank wall of the it may be prudent to consider replacement of all the ancillary buildings as opposed to refurbishment allowing for code compliant designs which will be difficult to achieve retaining the existing buildings.

### **MECHANICAL AND ELECTRICAL**

The electrical and lighting fixtures and fittings remain in a serviceable condition and the relatively new incoming electrical mains cable and distribution boards are in very good condition.

Some sections of the original electrical supply cables are dated and are recommended for replacement.

The mechanical plant such as heating and hot water system pipework are nearing or at the end of their economic design life. Ventilation extract has also attained its economic design life and replacement of the heating and ventilation systems is recommended. The ventilation of the space provided by actuated opening window sashes is defective and regularly fails. Replacement of the glazing system provides opportunity to consider managed zoned heating and ventilation systems which will aid in WCC achieving the desired carbon reduction levels with some of the below options offered for consideration.

Initial review of the heating bills indicate carbon emission reductions are attainable for electricity and heating using factors taken from the CEP 2020 workbook. Applied to provide three alternative energy sources to replace the natural gas heating system with an electric boiler, air source heat pump and a biomass boiler are as follows:



Month	Elec (kWh)			Gas (kWh)		
	2020	2021	2022	2020	2021	2022
Jan	2,934	2,522	2,495	12,704	24,416	25,307
Feb	2,803	2,458	2,618	11,684	26,349	27,108
Mar	3,068	2,834	2,690	-	26,921	32,617
Apr	2,668	2,588	1,846	56,563	40,398	34,031
May	3,243	2,810	2,113	30,717	42,977	184
Jun	3,839	3,163	2,339	43,712	42,583	16,935
Jul	4,516	3,389	3,012	48,883	47,470	55,932
Aug	3,442	2,388	3,027	35,697	35,243	58,179
Sep	3,010	2,340	2,676	39,517	45,740	49,242
Oct	2,844	2,517	2,935	42,184	36,155	49,460
Nov	2,677	2,196	2,240	29,709	29,640	35,247
Dec	2,492	2,607	2,157	24,610	28,429	31,148
<b>TOTAL</b>	<b>37,536</b>	<b>31,812</b>	<b>30,148</b>	<b>375,980</b>	<b>426,321</b>	<b>415,390</b>
Average carbon emissions factors						
Electricity (inc losses)	0.1101 kgCO <sub>2</sub> e/kWh			From CEP carbon workbook 2020		
Natural gas	0.195	kgCO <sub>2</sub> e/kWh				
Biomass: Industrial	0.0150	kgCO <sub>2</sub> e/kWh				

<b>Current emissions</b>	<b>4,132</b>	<b>3,502</b>	<b>3,319</b>	<b>73,316</b>	<b>83,133</b>	<b>81,001</b>	<b>kg CO2e</b>
<b>Replace Gas with:</b>							
<b>Elec boiler</b>				<b>41,392</b>	<b>46,934</b>	<b>45,730</b>	<b>kg CO2e</b>
<b>ASHP (COP2.5)</b>				<b>16,557</b>	<b>18,773</b>	<b>18,292</b>	<b>kg CO2e</b>
<b>Biomass</b>				<b>5,625</b>	<b>6,378</b>	<b>6,214</b>	<b>kg CO2e</b>
<b>Change to Prime Energy</b>	<b>0 kgCO2e/kWh</b>			<b>Toitu carbonzero certified</b>			

Greater detail and certainty can be developed during concept and detailed design stages for the redevelopment of the facility particularly with the replacement glazing system (Stage 2). Comparative energy modelling can be considered with the goal to achieve the 60-80 tCO<sub>2</sub>e reduction target noted in the RFQ, and allowing for a number of iterations and different sustainability initiatives to be considered with preferred option developed in greater detail.

Building simulation including assessment of peak loads, energy consumption and operational GHG emissions can be considered during the next stage of the design process. Optional are Green Star simulations, which compare the performance of a proposed building with a hypothetical reference model and it would be feasible to follow a similar methodology to compare the existing building operation with the proposed design and consider a number of sustainability improvements whilst acknowledging the project requirements of demonstrating reduced operational carbon emissions between 60 and 80 tCO<sub>2</sub>e, and can consider the impact of sustainability initiatives including:

- Glazing performance
- Mechanical services providing air conditioning and ventilation
- Domestic water fixtures
- Electrical services
- Services controls and monitoring

## DRAINAGE

Repair the damaged elements of the drainage system as follows and including clearing the grease from the kitchen sumps and pipework.

- Clean out the sumps and drainage pipes along the front of the glass house.
- Expose the buried chamber located at the plant room and augment to provide surface access.
- Clear the blockages at sump 6.



- Clear the drain between the downpipe and sump 7.
- Renew the damaged pipe full of silt and roots at sump 8.
- Replace the damaged pipe at sump 2.
- Replace the damaged pipe from SWMH1
- Replace damaged pipe from SSMH1
- Expose the buried chamber located at the side entrance to the kitchen and augment to provide surface access.
- Repair the pipe from sump 1 which has a displaced joint.

Remediate the drainage system, in accordance with the drainage plan included in Appendix A.

## **FACILITIES**

Replace the kitchen facility and kitchen glass house toilet facilities in the short term. If the ancillary building is to be retained, the new refurbished facilities provided in the rear toilets may need to be removed and replaced if the walls are confirmed to have weathertightness failure.

## **ACCESS**

Glazing access system is recommended for installation to facilitate future maintenance requirements. Alternately, consideration can be given to installing self-cleaning glass as part of the glazing system replacement scheme.

We trust this helps, and we welcome a meeting if you would like to discuss further.



# APPENDIX A

STRUCTURAL SITE NOTES



# SITE REPORT

## Structural



Job Name **Begonia House, Botanical Gardens, Wellington** Job No **221672**  
Date **16 March 2023** Time **10am**  
To **Wellington City Council**  
Attention  
Copies to **WT Partnership Limited** [redacted]@wtpartnership.co.nz  
Reason ☐ Construction Monitoring ☒ Client request ☐ Owner request  
☐ Contractor request ☐ Other (specify): [redacted]  
Engineer [redacted] Signature [redacted]

P 03 366 1777  
E engineering@pfc.co.nz  
W pfc.co.nz  
383 Colombo St, Sydenham  
Christchurch  
Level 2, 9 Duke St  
Queenstown  
PO Box 7110, Sydenham  
Christchurch

SR No: **SR01**

### Health & Safety (select one)

- ☐ Site Hazard Board reviewed and no unidentified issues to be communicated
- ☐ Site Hazard Board reviewed and issues identified below
- ☒ Site hazards assessed (no Hazard Board)
- ☐ Site hazards not assessed (provide comment below)

### Scope of engagement and purpose of site visit

To travel to site to:

- review existing and strengthened building structures, specifically to review the condition of the structure
- conduct a non invasive visual check of the structure for corrosion and location
- review the completed on site works and review against the completed strengthening documents
- summary of findings noting any defects and remedial works noted with photos to describe these observations

### Site notes shown on plan marked in blue


1. Hip knee at portal had rusting delamination of stiffener plates
2. Portal legs below garden level
3. Brace not in detailed bay
4. Wall bracing behind punga couldn't be seen
5. Edge beam rusting
6. Brace moved. Portals not stiffened at roof brace. To be checked
7. Joint rust not flaking
8. Joints look okay no sign of rusting
9. Grid 8 & 10 portals stiffened as detailed
10. Roof brace not in detailed bay
11. 20 diameter rod wall brace placed

12. Bent purlins (single) some rotten
13. Cracking to brick joints
14. Brick move at door may have been hit
15. Rust and flaking paint
16. Portal frame as detailed (no rusting)

### **General Notes**

- Steel portal legs would need checking and protected below soils level
- Grids 1-10 surface rusting in parts and flaking paint
- Grids 10-17 surface rusting medium. Flaking members in in pool area. Some plates to be replaced/repared. (C/15 joint bad)
- Steel members to be cleaned back and repainted (Rust protection) needed
- Some purlins to be replaced. Single purlins sagging
- Mortar cracking in brick wall joints

### **Photo locations on plan marked in red**

Photo	Comment
	<p><b>Photo 1</b></p> <p>End bay of bracing and struts fixed as detailed</p>





**Photo 2**

Hips in end bay over pool area showing signs of surface rust



**Photo 3**

Some of the portal legs have soil built up against them and they are showing signs of rusting

Not all of the portal legs could be seen due to planting and no access



**Photo 4**

Strengthening has been carried out on the portal legs as detailed



**Photo 5**

Soil built up around portal leg



**Photo 6**

Extreme rusting to portal knee joint in the Pool area, stiffener plates are rusting and are showing signs of delamination



**Photo 7**

Top area of strengthened portal frame with the roof bracing in the next bay





**Photo 8**

Rod roof bracing detail



**Photo 9**

High level members at portal strengthening



**Photo 10**

Portal knee at the centre area of the building no sign of rusting



**Photo 11**

Centre area of the buildings roof structure small areas of surface rusting



**Photo 12**

Knee joint with stiffener plates and edge beam signs of surface rusting



**Photo 13**

K-Frame bracing base signs of surface rusting





**Photo 14**

K-Frame knee joint as detailed, no signs of rusting but the paint is flaking



**Photo 15**

K-Frame middle brace and stiffener plates as detailed no signs of rusting, but paint is flaking



**Photo 16**

Roof bracing bay where the purlins are sagging



**Photo 17**

Sagging purlins in roof area over the pool and some of the purlins are showing signs of rot



**Photo 18**

Mortar joint cracking in the lower brick walls



**Photo 19**

Mortar joint cracking





**Photo 20**

Mortar joint cracking where some repairs have been carried out



**Photo 21**

Part front elevation



**Photo 22**

Centre of front elevation



**Photo 23**

Part front elevation



**Photo 24**

Rear area steel structure no signs of rusting



**Photo 25**

Rear area steel structure no signs of rusting





**Photo 26**

Rotten timber around some window frames



**Photo 27**

Stiffener plates at the portal knee as detailed



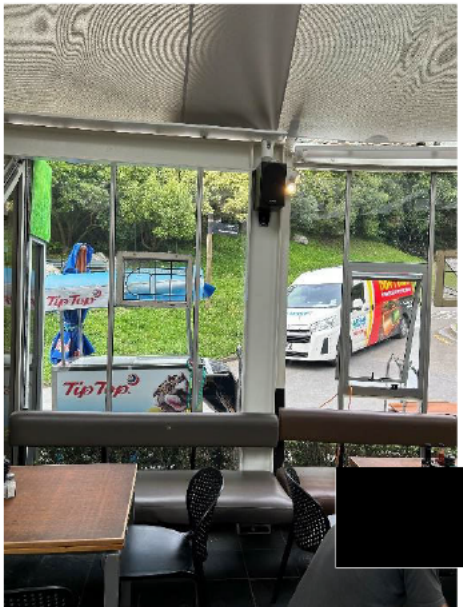
**Photo 28**

Stiffener plates at the portal knee and hip member to the centre atrium



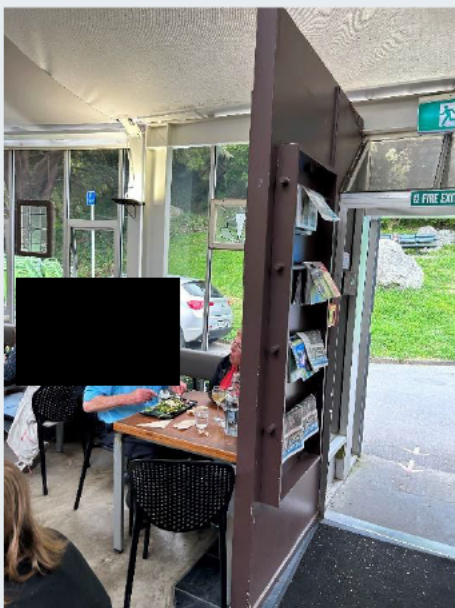
**Photo 29**

Extreme portal knee joint rusting as per photo 6



**Photo 30**

Portal at Grid 1 in the Café area as detailed and no signs of rusting



**Photo 31**

As for photo 30





**Photo 32**

Outside view at Grid 1 portal. Roof bracing can be seen through the roofing. The roof bracing can't be seen from the inside of the room due to ceiling coverings



**Photo 33**

Surface rusting at stiffener plate



**Photo 34**

Surface rusting on the portal leg



Copyright of this drawing is vested in Spencer Holmes Ltd.  
The Contractor shall verify all dimensions on site.

RESOURCES MANAGEMENT - IAN D BIANING - SURVEYING - STRUCTURAL - CIVIL - FIRE



→ - PHOTO  
Numbers

221672 SKI









# APPENDIX B

CCTV DRAINAGE SURVEY FINDINGS







# APPENDIX C

COST ESTIMATES FOR REMEDIAL WORK



Begonia House - Recommendations for existing building repairs		
Item	Scope	TOTAL
<b>Building A - Glass house, toilets, boiler room, café</b>		
1	STRUCTURE	\$ 296,680
2	GLAZING SYSTEM	\$ 3,306,000
3	ANCILLARY BUILDING ROOFS	\$ 12,000
4	EXTERNAL JOINERY	\$ 43,500
5	INTERNAL WALLS AND CEILING	\$ 48,750
6	FLOOR	\$ 11,500
7	SERVICES	\$ 1,064,000
8	FACILITIES	\$ 116,750
9	DRAINAGE	\$ 68,400
10	FIXTURES	\$ 128,000
11	EXTERNAL WORKS	\$ -
12	PRELIMINARIES AND GENERAL	\$ 1,793,079
13	CONSENTS, FEES, CONTINGENCIES AND ESCALATION	\$ 3,140,417
<b>BUILDING A - TOTAL</b>		<b>\$ 10,029,076</b>
<b>Building B - Ancillary buildings - Staff room, workshop and toilet block</b>		
1	ROOFS	\$ 206,200
2	WALLS	\$ 81,400
3	JOINERY	\$ 18,000
4	FACILITIES	\$ 7,500
5	SERVICES	\$ 76,550
6	EXTERNAL WORKS	\$ -
7	PRELIMINARIES AND GENERAL	\$ 137,413
8	CONSENTS, FEES, CONTINGENCIES AND ESCALATION	\$ 240,278
<b>BUILDING B - TOTAL</b>		<b>\$ 767,341</b>
<b>BUILDING A AND B - TOTAL</b>		<b>\$ 10,796,417</b>
<b>BUILDING A - OPTIONAL EXTRAS</b>		<b>\$ 3,234,490</b>
<b>BUILDING B - OPTIONAL EXTRAS</b>		<b>\$ 3,116,960</b>
<b>BUILDING A AND B - TOTAL (INCLUDING OPTIONAL EXTRAS)</b>		<b>\$ 17,147,867</b>

**CAPEX Schedule Budget Cost Clarifications****01. SCOPE**

This estimate is a Rough Order of Cost based on the scope of works identified within the WT Condition Survey Report. There is no design information in respect of the works required and therefore these costings contain some very broad assumptions.

**02. ESTIMATE ASSUMPTIONS**

Project specific clarifications:

- a) The estimate is based on current costs assuming that the works are competitively tendered.
- b) Rates are based on the work being packaged, programmed and undertaken in a co-ordinated manner allowing continuity of construction work.
- c) These works have not been fully scoped or designed. The estimated costs are therefore based on assumptions and interpretation of requirements which will need to be resolved to provide greater cost certainty. Please refer to the scope of works estimate details for a further clarifications of the scope of the works included.

**03. ESTIMATE EXCLUSIONS**

This estimate makes no allowance for the following:

- a) GST
- b) Asbestos or contaminated material disposal other than identified within the report
- c) Temporary accommodation
- d) Removal and reinstatement of plants within Begonia House
- e) Information Technology, hardware etc
- f) Fixtures, fittings, and equipment other than those stated
- g) Development contributions
- h) External works and landscaping
- i) Direct costs other than those specifically stated
- j) Finance charges
- k) Legal
- l) Any local or central Government taxes, duties, fees, rates or levies which are, or may become, payable.



Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
Building A - Glass house, toilets, boiler room, café										
Structure										
1.1	4.1.1	Structural frame	Strip back the painted finish to expose the frame. Treat all corrosion and repair elements which have been compromised resulting in a loss of structural strength. Redecorate with a paint specifically designed for steel elements located in high moisture areas.	Glass house	915	m2		Allows for 10% extra steel - refer 1.48 scope. Includes for internal access scaffold/mobiles.	\$ 250	\$ 228,750
1.2	4.1.2		Replace or strengthen the two deflected purlins. Allow for steel elements to be painted as above.	Southwest tropical plants	8	lm			\$ 460	\$ 3,680
1.3	4.1.3	Perimeter walls	Grind out cracked mortar joints and repoint; cut out all cracked and spalled bricks and replace with new brick to match existing. Clean out or provide additional weep holes and replace damaged sill tiles. For estimating purposes WT will allow for a standard repair which would include replacing a section of the wall with new bricks and ties.	Glass house	20	m2			\$ 600	\$ 12,000
1.4	4.1.4		Repair or reposition the downpipes away from the road. Grind out all soft mortar and repoint.	West elevation, Glass house	10	m2			\$ 200	\$ 2,000
1.5	4.1.5a		The plywood faced timber framed perimeter wall is moisture damaged along the bottom plate and bottoms of the studs. Replace the wall cladding and all decayed timber framing. Replace flashings to the roof junction.	Rear ancillary buildings (store)	42	m2			\$ 600	\$ 25,200
1.6	4.1.5b		As above but also replace plasterboard	Boiler room & potting shed	34	m2			\$ 675	\$ 22,950
1.7	4.1.5c		The cladding to the external gas bottle store requires replacement	Kitchen	7	m2			\$ 300	\$ 2,100
Glazing System										
1.8	4.1.6	Glazing system	Replace the frame with a new system (laminated safety glass)	All	1653	m2		Assumes existing structure can take new glazing weights with 10% additional steel included in 1.1 above	\$ 2,000	\$ 3,306,000
1.9	4.1.7		Replace the glazing panels with a new system	All	1653	m2			incl above	\$ -
1.10	4.1.8		Replace the glazing gaskets	All	1653	m2			\$ -	\$ -
Ancillary Building Roofs										
1.11	4.1.9	Roof	Replace all corrugated roof cladding, flashings and water storage tank.	Ancillary buildings - toilet block, boiler room and store to South	60	m2			\$ 200	\$ 12,000
External Joinery										
1.12	4.1.10	Glazed aluminium framed double door units	Replace the doors and frames	Glass house	7	No.			\$ 4,500	\$ 31,500
1.13	4.1.11	Glazed and painted timber rear doors	Replace the kitchen door. (Note other doors remain serviceable)	Rear elevation	1	No.			\$ 1,500	\$ 1,500
1.14	4.1.12	Aluminium windows 1988	Replace the windows	Toilets and kitchen	7	m2			\$ 1,500	\$ 10,500
Internal Walls and Ceilings										
1.15	4.1.13	Internal walls and ceiling	Timber frame and plasterboard or particleboard linings. The wall and ceiling bulkhead linings are worn, dirty and moisture damaged and require replacement.	Kitchen	30	m2			\$ 350	\$ 10,500
1.16	4.1.14	Timber framed east external wall	Water ingress at the wall corner junction has damaged the wall linings and boxing in the corner. The junction can be remediated when the glazing system is replaced. (Note timber wall frame replacement is probable in this location. The wall structure is recommended for further investigation to confirm the extent of any moisture damage. It could be prudent to demolish the link building and renew to a code compliant standard.)	Office area rear of the events space / temperate zone	9	m2			\$ 400	\$ 3,600
1.17	4.1.15	Plastic coated plasterboard wall linings	Replace the toilet wall and ceiling linings and investigate the wall framing for moisture damage. The works will as a consequence require removal of the fixtures and fittings. Refer to 4.1.32	Toilets	77	m2			\$ 450	\$ 34,650

Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
Building A - Glass house, toilets, boiler room, café										
Floor										
1.18	4.1.16	Floor	Lift the tiles, clean off and relay with an acrylic flexible grout or replace the tiles. New expansion joints should be installed during refurbishment along with a review of how the tiles are adhered to the slab foundation every 4m.	Glass house and ancillary buildings	20	m2	Allowance made to lift and relay 20m2 to address the actual delaminated tiles. General lifting and relaying on acrylic flexible grout with expansion joints is covered under Optional Extras	Allowed new tiles for this 20m2	\$ 425	\$ 8,500
1.19	4.1.17		Replace the floor tiles consequential to 4.1.15 and 4.1.32	Toilets	10	m2			\$ 300	\$ 3,000
Services										
1.20	4.1.20	Electrical	(a) Rewire recommended in the next 5 years unless already undertaken. (b) The audio system was installed to provide appropriate audio for current use. Budget cost to alter or replace the system to suit future needs should be allowed for.	Glass house	965	m2		Electrical \$225/m2, strip out & make good \$50/m2, audio system \$50/m2	\$ 325	\$ 313,625
1.21	4.1.23	Heating	External wall mounted LPG boiler to the kitchen external wall, adjacent to the electrical meter cabinet. If older than 15 years, then replacement is recommended. (Assume replacement required as no access to confirm date)	Rear of café kitchen	1	No.			\$ 8,000	\$ 8,000
1.22	4.1.24		Replace the heating system. (The heating system comprises circulating flow and return pipes with fin radiators and metal covers around the perimeter of the tropical and temperate zones. The pipework appears to be circa 1960s and is at end of expected design life. The pond is heated from hot water pipes from the boiler room. New temperature sensors are present.) Include the pond pumps etc.	Glass house	280	lm	Qty is for double pipe run for flow and return.		\$ 2,000	\$ 560,000
1.23	4.1.26	Hot water	<del>Gas combination boilers have a life expectancy of 10-15 years when they become uneconomical to repair and parts become obsolete and difficult to acquire. The boilers will require replacement within the next 3 years.</del>	<del>plant room and kitchen</del>	<del>1</del>	<del>No.</del>	<del>Same boiler as 4.1.19 above?</del>		<del>\$</del>	<del>\$</del>
1.24	4.1.28	Ventilation and air conditioning	Kitchen air extract units (2no) 1988 therefore at the end of economic design life. Replace the ventilation unit	Kitchen	2	No.			\$ 20,000	\$ 40,000
1.25	4.1.29		2 Large extract units roof mounted appears to be from 1988. The extract units whilst still operational are at end of life. Ceilings fans are present and are in moderate condition. Replace the extract system.	Tropical and temperate zones of the glasshouse	2	No.			\$ 25,000	\$ 50,000
1.26	4.1.30		Automated opening window sashes are present in the glass lantern and walls. The system is electrically operated and partially works as there are numerous defects with the actuators, sashes and winding gear. Replace during glazing replacement	Tropical and temperate zones of the glasshouse	85	m2			\$ 875	\$ 74,375
1.27	4.1.31		Kitchen air conditioning units (2no) 1988 Fujitsu Units at end of economic design life. Replace the air conditioning units	Kitchen	2	No.			\$ 9,000	\$ 18,000
Facilities										
1.28	4.1.32	Toilets	The toilet facilities have reached the end of economic life and are recommended for refurbishment.	Glass house Toilet block	18	m2		Note floor, wall and ceiling finishes included in 1.17 & 1.19. Allows for new sanitaryware and fittings to 5 bathrooms	\$ 3,250	\$ 58,500
1.29	4.1.33	Water feature	The feature in the temperate zone (Wishing Well) was inoperable at the time of survey. As the feature is circa 60 years old, the water supply pipework is at the end of economic life as well as any original plant that may remain. Feature requires repair		1	No.		Provisional sum allowed, pending scope.	\$ 10,000	\$ 10,000
1.30	4.1.34	All original water supply pipework	Replace all original water supply pipework.		965	m2		Potable water only, excludes any pipework associated with irrigation or the heating	\$ 50	\$ 48,250
Drainage										
1.31	4.1.35	Glass house gutters	Replace all gutters during glazing system replacement	Glass house	192	lm		Includes allowance for new downpipes	\$ 200	\$ 38,400
1.32	4.1.36	External underground surface water and foul water systems	Defective and damaged sections of pipework, as a minimum require remediation or replacement (refer to the conclusions and recommendations and plans included at Appendix B	Site	50	lm			\$ 600	\$ 30,000



Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
Building A - Glass house, toilets, boiler room, café										
Fixtures										
1.33	4.1.37	Shade sails	Clean sails and implement maintenance regime of regular cleaning.	Café	150	m2			\$ 20	\$ 3,000
1.34	4.1.38	Kitchen fixtures	Replace all original fixtures and fittings. Redevelopment of the kitchen will also require relevening the concrete floor to accept new floor linings, augmentation of the water supply pipes, hot water heating, air con and ventilation along with augmentation of the gas supply pipework. (Note the commercial cooker is owned by the tenant and the stainless steel sink and back splash remains in serviceable condition).	Café kitchen	1	No.		Extracts and air conditioning units included in 1.24 & 1.27, water heating included in 1.21, rewire incl in 1.20, water reticulation included in 1.30	\$ 125,000	\$ 125,000
External Works										
1.35		External Works	N/A	N/A	N/A	N/A	N/A		\$ -	\$ -
Preliminaries & General										
1.36		Scaffold and wrap	Due to nature of works and retaining internal finishes where applicable, allowance to fully tent structure for the duration of the works to enable roof and glazing replacements		2500	m2		Area allows full perimeter and roof area	\$ 140	\$ 350,000
1.37		Preliminaries & General	Main Contractor on-site preliminaries and general for the management of the works		15	%				\$ 816,837
1.38		Off-Site Overheads & Profit	Main Contractor off-site overheads and profit		10	%		Note this is higher than the WT ROC estimate due to the more complicated and piece-meal nature of the works		\$ 626,242
Consents, Fees, Contingencies & Escalation										
1.39		Design & Contract Contingency	Allowance for design development pre-construction and construction contingency for the works		10	%				\$ 688,866
1.40		Resource and Building Consents			1	%	All works require building consents			\$ 75,775
1.41		Development Contributions						Assumed not applicable		Excluded
1.42		Professional Fees			15	%				\$ 1,147,995
1.43		Project Contingency	Overall project contingency		7.50	%		Note this is higher than the WT ROC estimate due to the more complicated and piece-meal nature of the works		\$ 660,097
1.44		Escalation	Assumes start on site 2nd Qtr 2024, completion 2nd Qtr 2025		6	%				\$ 567,684
TOTAL										\$ 10,029,076

Optional Extras - Note figures include all P&G, Consents, Fees, Contingencies & Escalation										
Glazing System										
1.45		Glazing system	Option 1 - Replace with a similar system	Glass house	1653	m2		Included 1.08 & 1.26	\$ -	\$ -
1.46			Option 2 - Replace with a new double glazed system	Glass house	1653	m2		Extra value costs stated (i.e. in addition to 1.08 & 1.26)	\$ 552	\$ 912,456
1.47			Option 3 - Replace with a PV system	Glass house	1653	m2		Excluded - not available to get pricing or install in NZ	\$ -	\$ -
Structural										
1.48		Steel frame	Option 1 - Repairs only as above, circa 10% more steel	Glass house	965	m2	Consequential to 1.35	Included in 1.01	\$ -	\$ -
1.49			Option 2 - New double glazed, circa 35% more steel - Prov Sum	Glass house	965	m2	Consequential to 1.36	Extra value to 1.1. Allows for new portals and secondary framing (as per WT ROC Estimate 13-07-23)	\$ 708	\$ 683,606
1.50			Option 3 - New PV, circa 55% more steel - Prov Sum	Glass house	965	m2	Consequential to 1.37	Excluded - not available to get pricing or install in NZ		

Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
Building A - Glass house, toilets, boiler room, café										
Floor										
1.51	4.1.16		Lift the tiles, clean off and relay with an acrylic flexible grout or replace the tiles. New expansion joints should be installed during refurbishment along with a review of how the tiles are adhered to the slab foundation every 4m.	Glass house and ancillary buildings	620	m2	Allowance has been made to lift tiles assuming that there is an issue with the adhesive. Also make an allowance to lift and relay 10% to address the actual delaminated tiles.	Existing tiles re-used and re-laid, 10% replacement included. Note this is in addition to 1.18 above	\$ 488	\$ 302,312
Facilities & Services										
1.52		Kitchen facilities	New kitchen facilities in same location	Block A				Included in 1.34	\$ -	\$ -
1.53		Toilets	Demolish and replace toilet block, potting shed and boiler room	Block A	56	m2			\$ 18,400	\$ 1,030,400
1.54		Drainage and underground services	Replace all underground services to facilitate development of a new facilities block	Site	1	item	Option to remove the rear amenity spaces such as the toilet blocks, staff rooms, plant rooms and workshops etc and construct a new facility.	Cap off/removal of existing underground services - based on WT ROC estimate	\$ 110,400	\$ 110,400
1.55		Comms	Replace all comms and audio equipment consequential to works	Block A	965	m2			\$ 120	\$ 115,414
1.56		Fire	Replace fire alarm system consequential to works	Block A	965	m2		Type 4 alarm system	\$ 83	\$ 79,902



Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
Building B - Ancillary buildings - Staff room, workshop and toilet block										
Roofs										
2.1	4.2.1	Roofs	Mansard roof to the staff room. The timber framed mansard roof is clad with Decramastic tin tiles ( <b>PRESUMED ASBESTOS</b> ). This product appears to be an asbestos containing material. Replace the roof cladding system and create a new pitched roof over with large eaves. Straighten the walls and reclad with a new cavity-based system. Allow 20% frame replacement and 2 coats of Protim frame saver.	Staff and changing room	112	m2	52m2 roof; 52m2 mansard walls and 8 m2 of changing room decramastic tiles	Assumed non-friable Class B asbestos removal methodology (Allowed \$60,000 for asbestos removal)	\$ 1,500	\$ 168,000
2.2	4.2.2		Replace the roof membrane and substrate. Install new flashings and create an eaves.	Link between Block A & B	40	m2			\$ 400	\$ 16,000
2.3	4.2.3		Replace the roof cladding	Toilet block	90	m2			\$ 160	\$ 14,400
2.4	4.2.4		Replace all gutters	All	65	lm			\$ 120	\$ 7,800
Walls										
2.5	4.2.5	External walls	Direct fixed fibre cement wall cladding system. Reclad the building and allow 10% frame replacement and 2 coats of Protim frame saver to the timber frame.	First floor staff room gable walls	25	m2			\$ 450	\$ 11,250
2.6	4.2.6		The direct fixed cladding has detached from the wall. The internal timber frame is recommended for further investigation to confirm the extent of moisture damage. Allow 10% frame replacement and 2 coats of Protim frame saver to the timber frame.	Dividing wall between toilet block and staff storeroom	5	m2			\$ 450	\$ 2,250
2.7	4.2.7		Timber framed walls with an internal plasterboard lining and external brick veneer. Demolish the changing room and replace the facility (excepting the retaining wall) including wall, ceiling and floor linings and joinery	Ground floor changing room	13	m2			\$ 4,000	\$ 52,000
2.8	4.2.8		The vertical retaining wall junction between the workshop and the toilet block is unsealed and out of alignment. The joint tapers in width and has been incorrectly filled with expanding foam. Note that the majority of the joint is below ground level. Excavate the ground to expose the junction and reseal repairing any damage to the tanking system as required.	Rear external concrete wall	34	lm	34m of retaining wall		\$ 300	\$ 10,200
2.9	4.2.9		There is an unsealed electrical cable penetration through the roof upstand into the wall. The particle board substrate has degraded around the penetration. Relocate the cable and replace the damaged section of the wall lining. Note the membrane is being replaced at 4.2.2 There is an open joint between the wall and roof along the front elevation. Seal the junction with an insect/ventilation bead. The South gable wall is partially retaining with soil above the dpc and weep holes. The internal timber frame is recommended for inspection to confirm the extent of moisture damage, if any.	Toilet block	1  12  20	item  lm  lm		Rate is inclusive of all three items	\$ 3,000	\$ 3,000
2.10	4.2.10	Internal intermediate walls	Gaps were observed in some of the vinyl floor upstand corner joints which can create moisture ingress routes into the timber wall frame. Further intrusive investigation to confirm the presence of moisture damage to the internal wall framing of the staff and public toilet block.	Toilet block	12	lm		Allowed to cut back strip of vinyl for inspection and then recove and weld new vinyl upstand	\$ 225	\$ 2,700

Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
<b>Joinery</b>										
2.11	4.2.13	Aluminium doors and windows	Replace all aluminium joinery units.	Block B	12	m2			\$ 1,500	\$ 18,000
<b>Facilities</b>										
2.12	4.2.15	Kitchen facility to staff room	Replace the kitchen units and fittings in the next 3 years	Staff room	1	No.			\$ 7,500	\$ 7,500
<b>Services</b>										
2.13	4.2.18	Electrical	Rewire recommended in the next 5 years unless already undertaken.	Block B	242	m2			\$ 275	\$ 66,550
2.14	4.2.19	Electrical	The main electrical incoming supply and distribution boards are located in the workshop. Ensure that the water leaks in the adjoining room do not affect the system.	Block B	1	No.		Provisional sum for minor repairs to prevent water ingress	\$ 2,000	\$ 2,000
2.15	4.2.22	Hot water	Electric hot water cylinder under the stairs of the depot and a further under bench electric unit in the kitchenette to be removed. Note decay is present in the timber framing to the adjacent external walls and all elements will require removal to facilitate repairs including water pipework.	Staff and toilets	2	No.			\$ 4,000	\$ 8,000
<b>External Works</b>										
2.16		External Works	N/A	N/A	N/A	N/A	N/A		\$ -	\$ -
<b>Preliminaries &amp; General</b>										
2.17		Scaffold and wrap	Due to nature of works and retaining internal finishes where applicable, allowance to fully tent structure for the duration of the works to enable roof and glazing replacements		225	m2		Area allows full perimeter and roof area - mansard/link/toilet block roof replacement	\$ 120	\$ 27,000
2.18		Preliminaries & General	Main Contractor on-site preliminaries and general for the management of the works		15	%				\$ 62,498
2.19		Off-Site Overheads & Profit	Main Contractor off-site overheads and profit		10	%		Note this is higher than the WT ROC estimate due to the more complicated and piece-meal nature of the works		\$ 47,915



Begonia House - Recommendations for existing building repairs										
Item	Report Ref	Element	Scope	Location	Approx Qty	Unit	Surveyors Notes	QS Notes	Base Rate	TOTAL
<b>Consents, Fees, Contingencies &amp; Escalation</b>										
2.20		Design & Contract Contingency	Allowance for design development pre-construction and construction contingency for the works		10	%				\$ 52,706
2.21		Resource and Building Consents			1	%	All works require building consents			\$ 5,798
2.22		Development Contributions						Assumed not applicable		Excluded
2.23		Professional Fees			15	%				\$ 87,835
2.24		Project Contingency	Overall project contingency		7.50	%		Note this is higher than the WT ROC estimate due to the more complicated and piece-meal nature of the works		\$ 50,505
2.25		Escalation	Assumes start on site 2nd Qtr 2024, completion 2nd Qtr 2025		6	%				\$ 43,434
<b>TOTAL</b>										<b>\$ 767,341</b>

Optional Extras - Note figures include all P&G, Consents, Fees, Contingencies & Escalation										
<b>Facilities &amp; Services</b>										
2.26		Toilets, staff facilities	Demolish and replace public toilet block, staff rooms and workshop with a new facility	Block B	242	m2		Assumed the area is the GFA (not area on plan). Allowed for inclusion of a 'Changing Places Bathroom'.	\$ 12,880	\$ 3,116,960