Aotearoa Fale Malae

100% Preliminary Design
Building Services Design
Features Report

Fale Malae Trust

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1 Overview

1.1 Scope

This report has been prepared for the Aotearoa Fale Malae project.

The purpose of this report is to provide an overview of the building services proposed in order to inform the 100% Preliminary Design. This report provides description of the following disciplines:

- Mechanical Services
- Electrical Services
- Information & Communications Technology (ICT)
- Security and Access Control
- Audio Visual Systems (AV)
- Hydraulic Services
- Vertical Transportation
- Sustainability
- Building Thermal Envelope
- Civil Services

This report should be read in conjunction with the 100% Preliminary Design packages as follows:

- Mechanical systems markups
- Hydraulic systems markups
- Electrical systems markups
- Preliminary Design ESD Report

1.2 Project Overview

The Fale Malae is a project that aims to celebrate Aotearoa New Zealand as an island nation in Te Moana Nui-a-Kiwa. This is a building that will be a place of belonging for Pasifika peoples, Tāngata Moana, but it is also for all the people of Whanganui-a-Tara, of Aotearoa, and of our Moana Nui. Te Whanganui-a-Tara will house the world first Fale Malae, a complex that is intended to embrace a contemporary expression of thousands of years of Pasifika culture. At the heart of Wellington's waterfront, it will enhance the vibrance of the city and create a dynamic, and inclusive space. Fale Malae will be able to host up to 300 people in a seating arrangement and 500 for a cocktail styled event. This Fale draws from the ancestral connection to Te Moana-Nui-A-Kiwa and will be a reminder of this genealogy for today and tomorrow.

1.3 Regulatory Requirements

Regulatory and local government requirements relevant to the design include:

- New Zealand Building Code

2 Mechanical

2.1 Design Standards

The mechanical services are designed to comply with the rules and regulations of the following:

- New Zealand Building Code – G4 Ventilation
- New Zealand and/or Australian Standards, as applicable

2.2 Key Assumptions and Decisions

2.2.1 Key Decisions

Table 2-1 Summary of Key Mechanical Decisions

Item	Description	Decision
AS 1668.2: 2012 Ventilation	New Zealand Building Code Clause G4 / Ventilation The commercial kitchen in the basement has an alternative discharge solution. This is because the ability to discharge at roof level, as is good practice, is not available because of the roof glazing architectural feature that runs the length of the building. Therefore, to allow a discharge at pavement level on the lagoon side of the building (above head height) or via a discharge 'well' on grids 12 / 13 and F. The kitchen extract shall include grease reduction treatment and odour control systems. The other kitchens in the building are assumed to be reheat only with ovens, microwave and possibly on-bench portable hob(s). The distance between outside-air intakes and exhaust-air discharges shall be a minimum of 6m. The Fale shall have mechanical systems to ensure that comfort is maintained through heating or cooling at all times. The Community Room & Café will be comfort cooled or heated by a hybrid variable refrigerant flow system. The circulation and public spaces are used as zones to allow air from conditioned spaces to transfer to basement rooms that have extract ventilation systems.	

2.3 Design Parameters

The mechanical systems are designed based on the following design criteria:

2.3.1 Ambient Design Conditions

Ambient Design Conditions	Summer Winter	23ºC DB / 18.4ºC WB 5ºC saturated	Based on 2.5% NIWA conditions for Kelburn Wellington, New Zealand

Table 2-2 Ambient Design Conditions

2.3.2 Internal Design Conditions

Ground Floor

Design Condition	Space	Heating/cooling setpoints	Design notes
Internal Design Conditions	Fale	20-24˚C	At the controlling temperature sensor Relative humidity likely to be limited to 70% when cooling is operational
Internal Design Conditions	Entry Lobby and circulation spaces	Minimum of 16˚C no maximum	At the controlling temperature sensor No mechanical cooling
Internal Design Conditions	Café	20-25˚C	At the controlling temperature sensor Relative humidity likely to be limited to 70% when cooling is operational
Internal Design Conditions	Community Room	20 - 24˚C	At the controlling temperature sensor Relative humidity likely to be limited to 70% when cooling is operational
Internal Design Conditions	Plate-up / Community kitchen and dishwashing		Not directly heated or cooled – extract only ventilation

Table 2-3 Ground Floor - Internal Design Conditions

Basement

Design Condition	Space	Heating/cooling setpoints	Design notes
Internal Design Conditions	Kitchen	Minimum of 16˚C no maximum	
Internal Design Conditions	Kitchen Office	Minimum of 18˚C no maximum	
Internal Design Conditions	WC	Minimum of 20 ˚C no maximum	Not directly heated or cooled
Internal Design Conditions	Stores		Unheated receives warmed transfer air
Internal Design Conditions	Circulation/stairs		Not directly heated or cooled
Internal Design Conditions	Plant rooms		Not directly heated or cooled – extract only ventilation

Table 2-4 Basement - Internal Design Conditions

2.3.3 Occupancy and Ventilation Rates

Space	Occupancy	Design notes
Fale	Up to 300 people	Based on 10l/s/person
Café	20 people	Outside-air based on 10l/s/person with. Should the occupancy exceed this number the additional O-A requirements will be met through natural ventilation through opening windows and doors
Community Room	70 people	One person per seat based on 10l/s/person

Table 2-5 Occupancy Rates

Space	Ventilation rate
Entry lobby & Circulation	Natural ventilation through entrance doors
Café	Spill-air into Plate-up / dishwash kitchen
Plate up/Comm Rm kitchen	Extract ventilation for ovens at 1,400l/s Tempered make-up 1,200l/s
Dishwashing	Extract and make-up ventilation included in the above
Stores	Extract ventilation at 3 air changes per hour
Plant rooms	Extract ventilation at 6 air changes per hour
Stairs and circulation	Transfer air from Fale or Community Room when those systems are operating
Basement commercial kitchen	Extract ventilation suitable for commercial kitchen 4,800l/s Tempered make-up 4,100l/s
Toilets	Extract ventilation 25l/s per sanitary fitting or 10 air changes per hour whichever is greatest
Undercroft	Natural ventilation via perforated doors
Lift	Opening for shaft ventilation

Table 2-6 Ventilation Rates

2.4 Building Systems

2.4.1 General and Facade

Grilles, louvres, and their plenums (self-draining) for air intake shall be supplied and installed as part of the building façade to ensure compliance with New Zealand Building Code Clause E2.

The need for fire and/or smoke dampers TBC.

In the Fale either the vertical glazed windows at high level and / or the skylights shall include motorised sections that shall allow natural or fan-assisted ventilation without the use of mechanical cooling. The motorised glazing shall be arranged as high as possible in the space to utilise stack effect and allow warmed stale air to exit the building.

2.4.2 Heating

The Fale via an on-slab heating system. The central core and Community Room shall not be provided with this system.

Heating hot water (HHW) from the remote heat pump shall be pumped to wall-mounted manifolds in the spaces that they serve. If the heating manifolds are located in the entries the on-slab pipes would provide background heating and overdoor heaters could be avoided

Pipes shall then be run out through the floor in a modular on-slab system that shall include insulation to limit heat loss to below. Overlaid onto the insulation / pipes shall be cement board(s) to accept the final floor material.

2.4.3 Floor Loads

The on-slab system shall be suitable to accommodate floor loads that includes that of a mobile elevated platform hoist that shall be used for maintaining high level fittings.

If the on-slab heating isn't run through the Entries (see section above), overdoor heaters shall be provided that shall either be electric type or fed from the HHW system.

2.4.4 Outside Air systems

Outside-air (O-A) will be drawn in through Webforge style security (high free area) grilles in the harbourside of the building. They are tucked away under the eaves. From here, plenums shall be installed that shall connect to ductwork running in the mezzanine plant room to the Fale air handling unit, Plate-up / dishwash kitchen hood system, Community room and Cafe fan coil units. The O-A air fan coil unit shall include a filters and heating coil fed from the HHW heat pump.

The Fale air handing unit (AHU) shall temper the O-A either by the thermal heat recovery wheel or by a HHW coil fed from the heat pump system. The make-up air fan coil unit serving the Community Room, Café and kitchen extract hood shall include a heating coil fed from the HHW heat pump.

The O-A to the basement kitchen shall be drawn in through a louvre in the south side of the building facing the lagoon. The system shall include filters, fan and a heating coil fed from the HHW heat pump.

All O-A intake ductwork shall be internally insulated to reduce noise transmission. The insulation shall be foil-faced insulation for ease of cleaning.

2.4.5 Fale

To supplement the on-slab heating and provide outside-air, a displacement ventilation shall be provided. This will deliver conditioned air at low level to the space. The air will be delivered at close to room temperature being up to 24˚C in winter and down to 18˚C in summer. Plant operation and speed shall be controlled by CO_2 sensors that allow O-A rates to be adjusted as an energy saving feature.

Assuming funds are available, the Fale AHU shall include thermal wheel heat recovery such as can be supplied by Swegon, VTS or BDT. It shall include a HHW coil and a chilled water (CHW) cooling coil.

Conditioned (filtered, heated, or cooled) supply-air shall be delivered though two internally insulated header ducts located in voids below the roof on either side of the central skylight. These ducts shall be segmented to accommodate the sloping roof. At each of ten locations three duct connections shall be made into the header duct and drop down to low level in the Fale. Each set of dropping ducts shall form a false column and shall terminate in displacement diffuser terminals on three sides being of nominal size 400mm wide and 1,800mm high. Conditioned air shall enter the Fale at very low velocity to maximise comfort.

Air shall be returned via a wall-mounted grille mounted as high as possible in the Fale. It shall connect to the mezzanine plant room and include acoustic treatment to limit breakout noise from the plant room. The return-air shall enter the AHU via acoustic plenums.

After heat recovery (where fitted) the stale air shall run to discharge plenums on the Jervois Quay side. The duct shall be internally insulated to limit noise transmission to outside. The duct shall be connected to Webforge style security (high free area) grilles in the Jervois Quay side of the building. They are tucked away under the eaves.

2.4.6 Community Room

The Community Room shall be served by a hybrid variable refrigerant flow (HVRF) system. This shall consist of an air-cooled condenser located in the remote outdoor plant zone and connected to a branch controller (BC). The BC shall also be located in the outdoor plant zone. From the BC water pipes shall be run through the basement to the fan coil unit serving the Community Room.

In the Community Room, the FCU shall deliver conditioned (filtered, heated, or cooled) supply-air to ceiling-mounted diffusers fed through the floor of the mezzanine plant room. The supply-air duct shall be internally insulated. Return-air shall pass through an attenuated opening in the mezzanine pant room back to the FCU.

The spill air from the room shall pass through an acoustically rated overdoor transfer grille. The spill air shall transfer down the public stairs and into the basement rooms where the extract systems require make-up air.

2.4.7 Heat Pumps

Two air-to-water heat pumps shall be located in the outdoor plant zone. One shall provide heating hot water (HHW) and the other, chilled water (CHW). The heat pumps shall be fitted with primary pumps that shall be piped to headers where secondary circulation pumps shall distribute the HHW and CHW to the building. Flexible connections may be required between the outdoor plant zone and the Fale building itself.

The HHW heat pump shall be piped to serve:

- The on-slab heating manifolds serving the Fale
- The Fale AHU
- The outside-air make up FCU serving the Community Room, Café and Plate-up / dishwash kitchen hood
- The basement kitchen make-up system
- The Entry overdoor heaters (if provided)

Preliminary sizing indicates that the HHW heat pump will require a heating output of approximately 80kW.

The CHW heat pump chiller shall be piped to serve:

- The Fale AHU

Preliminary sizing indicates that the CHW heat pump will require a cooling output of approximately 50kW.

Heat pumps shall be multistage with excellent turndown to allow for low heating demands in the case of only one space being occupied. Buffer tanks may be needed for this level of control.

2.4.8 Café ventilation

The Cafe shall be served by the HVRF system that also serves the Community Room. From the BC located in the outdoor plant zone water pipes shall be run through the basement to the fan coils unit located above the roof of the Plate-up / dishwash kitchen.

The FCU shall deliver conditioned (filtered, heated, or cooled) supply-air via sidewall grilles discharging into the Café. The supply-air ducts shall be internally insulated. Return-air shall pass through attenuated intakes hidden above the roof of the Plate-up / dishwash kitchen running back to the FCUs

The spill air from the Cafe shall pass through acoustically rated overdoor transfer grilles into the Entries.

The Plate-up / dishwash kitchen shall have a capture jet hood having both extract and make-up air supply. The extract hood shall be fitted with UV lamps / ozone to reduce odours. The extract system shall draw air through the hood and run to an extract fan located in the mezzanine plant room. Space in the ducts in the plant room shall be allowed for the future installation of an electrostatic cleaning unit.

The extract shall discharge to plenums like the one serving the Fale AHU but located on the Jervois Quay side. The duct may need to be internally insulated to limit noise transmission to outside and if so, would need to be lined for ease of cleaning. With a UV / ozone system fitted in the hood safety measures shall be taken to prevent ensure the discharges are safe to staff and the public.

It should be noted that grease and odour reduction devices can require significant maintenance, on a regular basis, to remain effective. If this solution is adopted a suitable operational budget will need to be allowed for.

The outside-air to the FCUs shall be supplemented by natural ventilation being openable windows and doors.

2.4.9 Basement kitchen ventilation

The commercial kitchen in the basement shall have extract hoods over the cooking lines and the dishwashing line. Cooking line extract hoods shall be capture jet type with direct connection from the tempered make-up air system.

Cooking line hoods shall also include grease reduction devices such as electrostatic filters. The extract hoods shall be fitted with UV lamps / ozone to reduce odours. Electrostatic filter units (two) shall be fitted before the extract fan in the undercroft. With a UV / ozone system fitted in the hood safety measures shall be taken to prevent ensure the discharges are safe to staff and the public.

The extract duct shall run through to the undercroft with a discharge plenum that shall allow a vertical discharge at the lagoon end. An alternative solution may be to a vertical discharge through a 'well' on the Jervois Quay side.

It should be noted that grease and odour reduction devices can require significant maintenance, on a regular basis, to remain effective. If this solution is adopted a suitable operational budget will need to be allowed for.

The make up to the kitchen shall be via a tempered-air system drawing in air through an external louvre located in the undercroft at the harbourside end of the of the lagoon. Make-up air shall be filtered and tempered with HHW and supplied to the capture jet extract hoods.

2.4.10 Toilet ventilation

The toilets shall be ventilated via an extract system that shall draw air into each cubicle through undercut doors. The extract fan shall be in the undercroft and discharge to the Jervois Quay end lagoon side discharge plenum. Make-up air to the toilet lobbies shall be via door-mounted transfer grilles.

2.4.11 Plant and storeroom ventilation

An extract ventilation system shall be provided to maintain a fresh environment in the plant rooms and basement store rooms. One plant room is located on the ground floor and the other is in the basement. The extract fan serving both plant rooms and the store room shall be located in, and discharge to, the undercroft. Make up air into the plant and store rooms shall be via door transfer grilles or in-ceiling transfer ducts should breakout noise be of concern.

2.4.12 Undercroft ventilation

The main doors shall allow exchange air into and out of the undercroft. This is required to ventilate air from condensers serving the basement kitchen including kitchen cool room condensers.

2.4.13 Kitchen office

The kitchen office in the basement shall be fitted with an extract fan that shall draw in corridor air via a door-mounted transfer grille to ventilate the room. The fan shall discharge room air to an adjacent corridor. The room shall be fitted with an electric convector heater.

2.5 Control Systems

The various mechanical systems will be controlled automatically to maintain comfort conditions (temperature and CO_2 levels). However, a user interface shall allow staff to decide how to operate the mechanical systems.

For example, in the shoulder seasons there will be the option to ventilate the Fale without the use of cooling. Thus, the operation of the heat pump chiller can be avoided. This would be achieved by operating the air handling unit and inhibiting the cooling together with allowing the high-level / skylight motorised glazing to open. Even better would be for the outside-air to enter via the opening doors and the AHU operation to be inhibited.

- Automatic controls shall be discrete standalone type thus avoiding the cost of a Building Management System.

- User interface controls shall be simple rotary switches and / or push-button timers.
- CO_2 control would allow fan speeds to be reduced when occupancies are low to reduce energy consumption.

The main HVAC systems shall shutdown as initiated by a signal from the fire protection systems.

3 Electrical

3.1 Design Standards

The following section outlines design standards, parameters and criteria that are applied to the electrical design.

- New Zealand Building Code
- AS/NZS 3000:2007 New Zealand Wiring Rules
- Electricity (Safety) Regulations 2009
- AS/NZS 1680:2:1 2008: Interior and workplace lighting - Specific applications - Circulation spaces and other general areas
- AS/NZS 1680.2.2:2008 – Interior and Workplace Lighting
- AS/NZS 2293.1-2005 Emergency Escape Lighting and Exit Signs for Buildings
- NZS 4219:2009 Seismic Performance of Engineering Systems in Building

3.2 Key Assumptions and Decisions

3.2.1 Key Decisions

Item	Key Decision	Decision
E1	confirmation of location of the external electrical substation and easement requirements	Outstanding, to be worked through in the next design phase

Table 3-1 Summary of Key Electrical Decisions

3.2.2 Key Assumptions

Item	Key Assumption	Decision
1	Commercial kitchen and café electrical loadings have been provided by the separate consultant (Allistair Cox, email 04 Jul 22). These figures (290kVA) are substantial based on the size of the kitchens and need to be confirmed. A diversity factor of 0.7 has been applied for indicative infrastructure sizing purposes for Concept Design.	

Table 3-2 Summary of Key Electrical Assumptions

3.3 Design Criteria

3.3.1 Maximum Demand Estimate

An estimated maximum demand calculation was prepared based on inputs from mechanical, hydraulics and the kitchen / café designer, as well as a rate per square meter basis for miscellaneous electrical services (small power & lighting). This will be further advanced during later design stages.

Based on the total area of the building, the max demand is estimated to be approx. 345kVA.

Item	Load Estimate (Diversified)
Mechanical / HVAC	75kVA
Hydraulic	25kVA
Café / Kitchen	205kVA
Electrical	40kVA
TOTAL	**345kVA**

Table 3-3 Demand Estimate

3.3.2 Main switchboard

The Main Switchboard (MSB) for the building is proposed to be located on the ground floor as shown on the layout plans, to avoid basement flooding risks. The MSB needs to be installed in a fire rated cupboard, with an indicative size of 2200W x 1800H x 400D.

The MSB will allow for a distribution frame for general lighting and small power final sub-circuits.

3.3.3 Local Distribution Boards

Local Distribution boards will be supplied to the Café and Commercial Kitchen, as well as potentially Mechanical Services Distribution Boards (to be confirmed).

Refer to the electrical power sketches for indicative Distribution Board spatial requirements.

3.3.4 Low Voltage Distribution

Underground conduits shall be provided and installed for cable reticulation into the new Main Switchboard (externally through into the basement at high level, then into the bottom of the MSB).

Low Voltage (LV) reticulation will be done by cabling from Main LV Switchboard (MSB) to small power and lighting circuits, with sub-mains to other Distribution Boards.

LV cabling will be installed throughout the building on a network of containment systems (cable trays, catenary wires). Interconnection between floors will be electrical risers.

All distribution boards are to have 25% spare capacity to spaces for future development.

The Commercial Kitchen and Cafés will be equipped with their own dedicated DBs, including emergency power isolation devices (Emergency Power Off).

3.3.5 Electrical Metering

An energy sub-metering system will be provided in all relevant distribution boards to ensure all energy is metered in the building. It will be possible to isolate consumption of common areas from tenant areas (e.g., main building from the Commercial Kitchen and Cafés).

3.3.6 General Power

Small power services shall be distributed throughout all areas of the building and shall include general power outlets, permanent connection outlets for fixed equipment and sub-circuit supplies as applicable.

3.3.7 Internal & External Lighting

Internal & external lighting and control will be provided to all areas of the building in the form of energy efficient LED luminaires. The lighting requirements will be confirmed with the client in the next design stage, however the following general strategies are proposed for key spaces:

Fale Meeting Space:

Given the architectural nature of the space, lighting will be selected to provide accent lighting to the internal envelope, while also ensuring the space remains usable for range of different types of functions.

The proposal is to maintain a warm / very warm colour temperature (2700K), with recessed down lighting located within the timber lattice to provide functional levels of lighting on the ground. This will be supplemented by uplights mounted on the structural columns designed to throw light across the ceiling cavity.

Lighting controls will be required to allow flexibility in types of usage, including separate controllability (on/off/dimming) to each of the down lights and column mounted uplights.

Requirements for additional wall mounted lighting is to be confirmed, particularly if wall mounted artwork is to be located within the space.

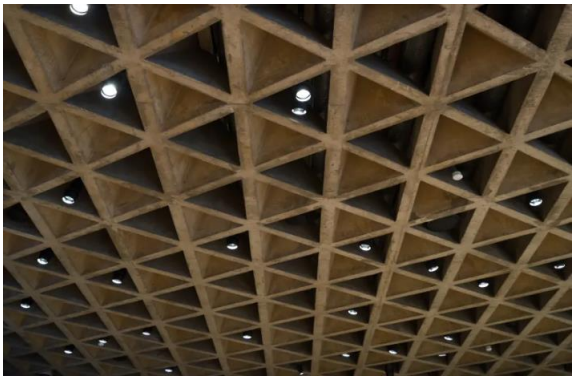

Figure 3-1 Example Installation – Downlighting - Yale University Art Gallery
(https://divisare.com/projects/342858-louis-kahn-xavier-de-jaureguiberry-yale-university-art-gallery**)**

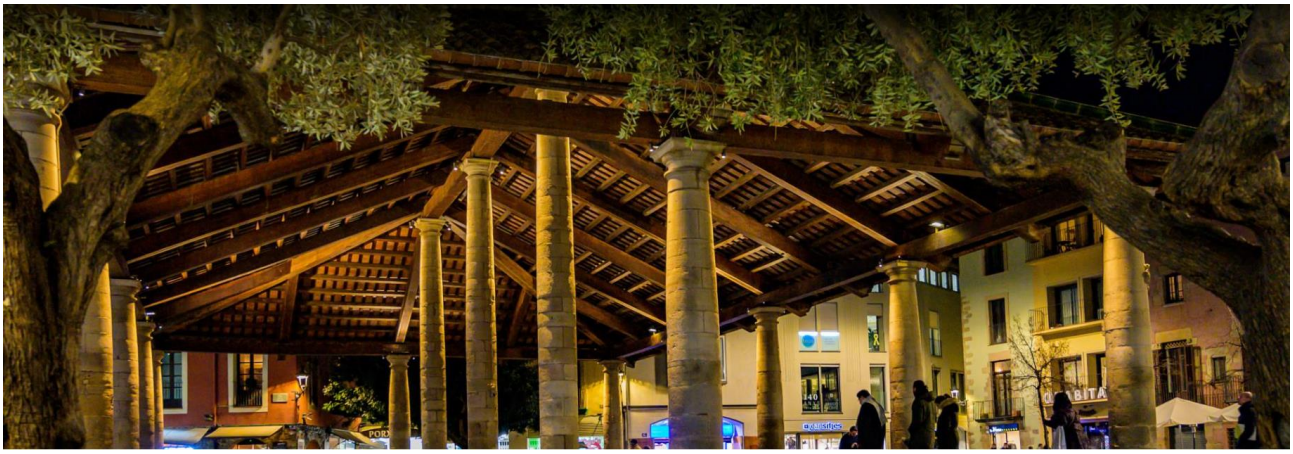

Figure 3-2 Example Installation - Uplighting - La Proxada and Granollers Town Hall (https://casambi.com/projects/la-porxada-and-granollers-town-hall/)

Downlighting:

Considering 'random' location across ceiling to replicate stars while providing usable levels of lighting within the space for different functions

Figure 3-3 Example Downlight - Directional Control (iGuzzini MN61)

Figure 3-4 Example Pendant Downlight (iGuzzini Laser ceiling)

Uplighting:

Figure 3-5 Example Uplight / Ceiling Washer (iGuzzini View Opti Linear)

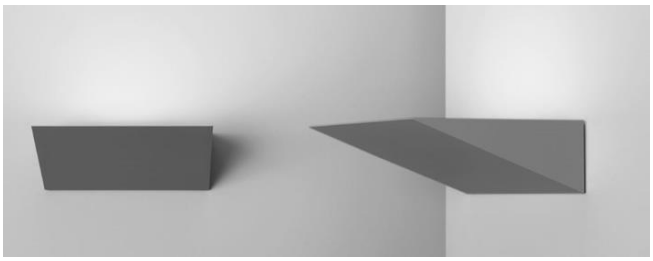

Figure 3-6 Example Uplight / Ceiling Washer (Fagerhult Wall 1 LED)

Community Room:

The general lighting strategy will be generally recessed or suspended linear extrusions, with supplementary task lighting for presentation walls / whiteboards. Additional lighting would be provided to provide ambient lighting when main lighting dimmed for presentations, etc.

Figure 3-7 Example suspended linear extrusion (Energylight Energyline 108)

Figure 3-8 Example recessed linear extrusion (Fagerhult Delta)

Café:

Design to be developed with the café tenant

External:

External lighting will be designed to cover pathways for wayfinding and safety, including security. The key strategy is to eliminate direct upward waste light through selection of fittings which are used to reflect against the building envelope…

The built landscape will use low level underbench / built structure LED strips to illuminate the grounds around the stairs and ramps generally, with potential use of handrail down lights to assist with clear wayfinding for public users of the building.

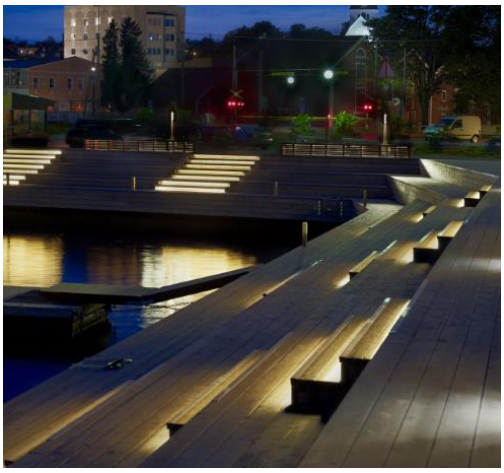

Figure 3-9 Underbench / Exterior Stair Accent Lighting (www.ljusarkitektur.com)

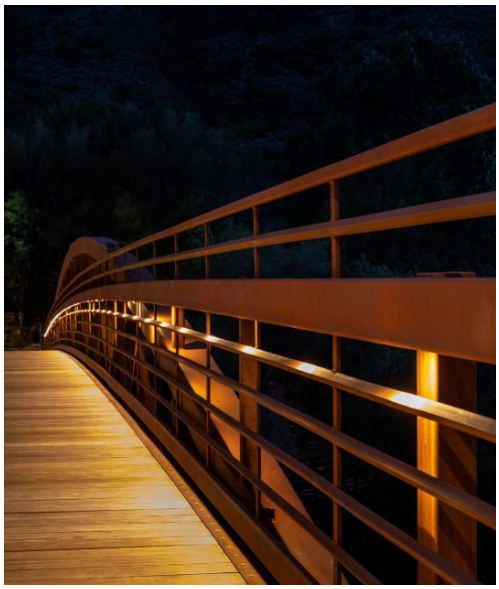

Figure 3-10 Handrail Lighting (https://www.klikusa.com/gallery/#modal)

Other Areas:

Services / Back of House Spaces

The illuminance levels will be as per the table below. These are generally as per the recommendation of *AS/NZS 1680* (indoor lighting). When no appropriate category exists, a recommendation has been made:

Table 3-4 Delivery Lighting Levels

Area	Maintained Illuminance (lux)	Calculation Plane	Additional Comments
Fale Meeting Room	400	Floor	'Warm' lighting, typically 2700K, with controllability / scene setting for different lighting types within the space
Community Room	400	Floor	'Cool' white lighting, typically 4000K, with controllability / scene setting for different lighting types within the space
Circulation areas / Stairs	160	Floor	
Food and Beverage (public areas)	500	Work plane	To be worked through with the café space operators
GF Kitchen (back of house)	500	Work plane	
Offices	320	Work plane	
Change rooms & ablutions	200	Floor	
Plant rooms	160	Work plane	
External area	TBC	Floor	Public area lighting levels will be developed with the project team in the design phase, including review of the CPTED requirements. 'Warm' lighting, typically 2700K, at main entrance ways.

3.3.8 Lighting Controls

Internal public facing areas will generally allow for flexible zoning of lighting controls with local dimmability, to be selected through pre-programme scenes on local lighting control panels (touch pad / buttons).

Back of house spaces will generally be local on/off control with motion sensors to maximise energy efficient operation of the building.

The type of controls will be developed through the next design phase, however will be looking to utilise “Casambi” as a flexible and user adjustable system

Figure 3-11 Examples Casambi iOS / Android Device App Controlled Lighting Control Panels

The further requirements for lighting control are generally summarise as follows:

Table 3-5 Summary of lighting control

Area	Control
Fale Meeting Room	“Casambi” lighting control system, including local lighting control panel with pre-programmed scenes
Community Room	“Casambi” lighting control system, including local lighting control panel with pre-programmed scenes
Cafe spaces	Local switch (on/off)
Offices	Local switch (on/off)
Changerooms and ablution areas	Motion sensors with override switch
Common areas (stairways)	Timeclock with override switching at the local DB
Internal corridors	Timeclock with override switching at the local DB
Plant rooms	Local switch (on/off)
External lighting	Photocell with switch override

Location of central switching needs to be confirmed with the architect during the next design phase.

Circulation area switching via timeclock to be confirmed by the client during the next design phase.

3.3.9 Emergency Lighting

The emergency lighting system will comply with the New Zealand Building Code which requires emergency egress lighting in the event of a utility mains supply failure due to fire or other reason. The egress routes will be determined in co-ordination with the fire engineering report.

Emergency lighting shall consider anti-panic performance for public areas, over and above minimum code requirements. Emergency light fittings will be selected to minimise energy consumption and to be as discrete as possible.

Installation of the emergency lighting system shall comply with AS/NZS 2293 and Clauses F6 and F8 of the New Zealand Building Code. Generally, the emergency lighting system may include the following fitting types:

- Single point LED small diameter recessed spotlights.

- Maintained illuminated LED EXIT signs
- Test facility at the Main Switchboard.

Figure 13 Recessed Emergency Spotlight

Figure 14 Maintained LED Exit Light (Blade type)

3.3.10 Earthing and Lightning Protection

Power System Earthing will be provided to comply with AS/NZS 3000.

A lightning protection study will be completed in accordance with *AS/NZS 1768 Lightning Protection* in the future design phases, however it is considered unlikely any additional lightning protection systems will be required.

3.3.11 Power Factor Correction

It is note anticipated that Power Factor Correction will be required.

3.3.12 Uninterruptible Power Supply (UPS)

A UPS is not a requirement for this contract.

Vertical transportation systems as well as electronic security and ICT systems should be specified with their own dedicated, built-in battery backup.

4 Information & Communications Technology (ICT)

4.1 Key Assumptions and Decisions

4.1.1 Key Decisions

Item	Key Decision	Decision
	N/A	

Table 4-1 Summary of Key ICT Decisions

4.1.2 Key Assumptions

Item	Key Assumption	Decision
1	All active ICT systems will be supplied by the client and are outside the delivery of the ICT scope of this project, including for communication, access control and security systems.	
2	No Building Management System (BMS) required for the building	
3	No Master Television System (MATV) required for the building. It is assumed all television services will be delivered via internet connected solutions.	
4	Access control requirements are to be developed with the client, however, are assumed to be required.	
5	It is assumed no duress alarm system will be required for the site.	
6	It is assumed a CCTV camera system will be required, scope to be determined with the client.	

Table 4-2 Summary of Key ICT Assumptions

4.2 Design Standards

The ICT services design and installation are based on the following standards:

- AS/NZS 3000, Wiring Rules.
- AS/NZS 11801-1, Information technology - Generic cabling for customer premises. Part 1: Generic requirements
- AS11801.2, Information technology - Generic cabling for customer premises, Part 2: Office premises
- AS 11801.6, Information technology – Generic Cabling for Customer premises – Part 6: Distributed building services.
- AS/NZS 3084, Telecommunications installations - Telecommunications pathways and spaces for commercial buildings.
- AS/NZS 3085, Telecommunications installations - Administration of Communications cabling systems.
- AS/NZS 1367, Coaxial cable and optical fibre systems for the RF distribution of analogue and digital television and sound signals in single and multiple dwelling installations.
- AS 2201, Intruder Alarm Systems, Parts 1 to 5 as appropriate.
- AS 4806, Closed Circuit Television (CCTV), Parts 1 to 3 as appropriate.

- NZS 4219, Seismic Restraint

4.3 Structured Cabling System (SCS)

A single vendor Structured Cabling System (SCS) solution will be provided, incorporating both the copper and fibre optic products. The SCS will support analogue and digital voice applications, data, local area network, wireless local area network, audio and video and low voltage devices for building control and management on a common cabling platform.

4.3.1 Structured Cabling System (SCS) Horizontal (Distribution) Cabling

The SCS will provide support for the analogue and digital communications systems in the building.

The key criteria for the SCS:

- To be provided complete with a 20-year warranty (minimum), incorporating the connectors, cables, mounting trays and patch panels.
- All ICT cabling to be Cat.6A F/UTP, Class EA shielded cabling system and cabling will be provided with RJ45 connectivity and in patch panels or CAT6A complaint IDC modules.
- Maintain separation between dissimilar cabling system in the ceiling space
- All ICT services to be secured within cable trays in riser spaces and main horizontal reticulation routes. This includes SCS & Security systems.
- All SCS cables are to be appropriately labelled and terminated in RJ45 sockets
- The services provided on the structured cabling system will include:
- Voice and Data
- Wireless access points
- CCTV cameras and monitors
- Electronic access control

The location of all telecommunications outlets will be agreed in future design phases.

4.3.2 Building Distributor

Given the size of the building, it is proposed a single building distributor is provided with external communication connection demarcation, and structured cabling and active systems as required located within a single communication rack.

The requirements (if any) for other active systems including entertainment / Audio / Visual and Broadcast systems are to be determined, including location of any equipment.

All main runs of tray / basket for ICT cable containment within the building will be provided by the electrical trade. Any supplementary branches to be installed as part of the ICT works.

4.3.3 Rack layouts

Rack layout diagrams will be developed in future design phases

4.3.4 Horizontal Cable Pathways

All horizontal cabling will be supported along its entire length from the Communications Cabinet to the telecommunications outlets. Cable basket will be used along all primary cable, and catenary wires will be used to support all cables leaving the primary pathway to the vertical cable containment for all distances greater than 3m.

Generally cabling installed in wall cavities will not be contained within specific supports (conduit) except where outlets are mounted on wall mounted trunking where conduit pathways between the ceiling void and trunking will be provided.

All applicable distance separations will be provided to other services cabling.

All horizontal cables use for the IP applications (Voice and data) will be Category 6A Shielded and support POE and POE+ requirements.

4.3.5 Telecommunications Outlet (TO) Distribution

All Telecommunications Outlets (TO's) would be fully shielded Category 6A outlets.

TO's will be terminated in 8P8C (RJ45) modular jacks. The jack will be connected in accordance with the T568A wiring pattern.

Telecommunication outlets will be provided for the following:

- Voice and Data
- Security access control panels
- Wireless access points
- CCTV
- BMS connectivity (assume nil, however, to be confirmed in future design phases)

4.3.6 Wireless Networking

The building will be supported by a wireless Local Area Network (LAN) providing support for building users throughout the building.

Wireless Access Point (WAP) telecommunication outlets will be installed in ceiling spaces and out of sight to reduce the risk or vandalism or interference.

Wireless APs will support the current wireless networking protocols up to 802.11ac wave-2 wireless networking (WiFi 5)

4.3.7 Networking Equipment and Configuration

Networking equipment, including the active switches and WAPs, will be provided and installed by the client – scope to be determine in future design phases.

4.4 Access Control System

4.4.1 Overview

The scope and requirements for access control to the building are to be developed. However, we assume at minimum a limited system will be required and recommend adoption of a Gallagher system.

4.4.2 Access Control & Security

The system will be fully compliant with the Gallagher Access Control System. Doors identified as having electronic access control will be fully monitored door sets.

The access system generally consists of the following:

- Proximity card readers on designated doors
- Mortise door locks
- Emergency break glass door release buttons
- Interface to the fire alarm system

Card Reader

Workstations (if required) to be supplied and configured and provided through this project.

Card Reader shall be Mifare Rev 1 (Gallagher T10), and card technology shall be Mifare DESfire EV1, or similar.

Server

A new access control server will be required to be delivered by the project.

Security Switch / Racks/ Patch Leads/ Patch Panels

Horizontal cabling solution including cabling, patch panel and RJ45 outlet shall be by the Comms Trade.

Network switches and local UPS (rack mounted) provided by client (to be confirmed).

Provision and installation of patch leads to be provided by the Communications Trade.

Software and Licences

Access control server, door and all associated licenses shall be provided as part of this project by Security Trade.

Interfaces to Other Systems

Security Trade to Interface to the following systems:

- Security Field Controller to Auto Door Controller
- Security Field Controller to Fire Panel

Access Controlled Doors

Access controlled doors that are part of a Fire Egress route are required to have a means of security system override to allow safe egress in the event of security system failure. This will be provided by free-handle egress on mortice locks. The security system may also release doors in response to Fire Alarm, which may allow faster egress but compromises security. In response to Fire Alarm, access-controlled doors will **remain locked**. Egress via means of Request-to-exit pushbutton as per normal use, and/or Emergency Break glass. This is subject to the approval of the fire engineer.

Refer to Architect door hardware schedule for associated door hardware.

- All access-controlled doors to have separate door position monitor, lock status monitor and door open too long (DOTL) monitors. Access Card readers to be based on a wired in system. Robust communications, centrally powered.

4.5 Intercom

It is assumed no intercom systems are required, to be confirmed with the client.

4.6 CCTV System

It is proposed that an IP-based CCTV solution comprising recording systems, vandal-resistant cameras, and ruggedized components suitable for installation in the internal and external building environment (as appropriate) be provided, using IP Sony or Axis cameras or equivalent.

CCTV Monitor/s will be provided by the Security contractor based on client requirements (to be determined). The size of the desk monitors to be 24”.

Switches will be installed and configured by the client ICT team and be CAT6a F/UTP cables from the Main Communication Rack to the cameras - by Comms Trade. Network switches to be provided by the client (to be confirmed), with a local rack mounted UPS provided by the security contractor.

Horizontal cabling solution including cabling, patch panels and RJ45 outlets shall be by the Comms Trade.

The installation of the camera and the fly leads between the camera and the RJ45 outlet provided by the Security Trade.

4.7 MATV

It is assumed no separate MATV system is required – all TV requirements will be delivered through internet connected options.

4.8 AV Systems

Audio Visual system requirements are to be developed.

5 Hydraulics

5.1 Key Assumptions

5.1.1 Key Assumptions

Item	Key Assumption	Decision
2.8.3	Sanitary drainage is to be pumped discharge from the site	Tank location
2.8.3	Grease trap	Grease trap type and location
2.8.4	Rainwater harvesting	Tank location

Table 5-1 Summary of Key ICT Assumptions

5.2 Design Standards

The hydraulic services are designed to comply with the rules and regulations of the following:

- New Zealand Building Codes E1, G12, G13
- New Zealand and/or Australian Standards, as applicable
- The relevant aspects of the Fire Engineering Report
- The relevant aspects of the Acoustic Report

5.3 Design Parameters

Item Proposed	Design Parameters
Design Standards	AS/NZS 3500
Sanitary Plumbing & Drainage	AS/NZS 3500.2
Roof / Stormwater Drainage	NZBC E1 AS1
Fixture Units for Sanitary Plumbing & Drainage	AS/NZS 3500.2
Hot & Cold Water	AS/NZS 3500.1 & AS/NZS 3500.4 Pipes sizes based on velocity. Maximum velocity in risers and service zones 1.5 m/s Maximum velocity in acoustically sensitive areas 1.0 m/s
Fixture Loading units for Hot & Cold-water services	AS/NZS 3500.1 & AS/NZS 3500.4

Table 5-2 Hydraulic Design Parameters

5.4 Systems

5.4.1 Domestic Cold Water Supply

A new metered Ø40mm incoming high-pressure cold-water supply, complete with back flow prevention, from the sitewide cold water supply to the building shall be provided by civil engineer.

A solenoid valve shall be provided on the incoming cold water supply to shut the cold water off should the sanitary pump fail.

Mains Pressure Cold Water (MPCW) shall be provided to all levels.

Cold water supply to plantroom for mechanical, complete with RPZD backflow prevention.

Main building isolation valve and pressure limiting valve in accessible locations shall be provided to maintain 300–350 kPa mains pressure.

Hose taps shall be located around the perimeter of the buildings at ground level in consultation with the architect.

All hose taps shall be anti-vandal, complete with antisiphon vacuum breaker backflow prevention devices.

5.4.2 Domestic Hot Water Supply and Generation

Hot water shall be generated via a centrally located heat pump hot water system.

The heat pump hot water system consists of

- 1 x Rheem 16kW air to water high efficiency heat pump.
- 1 x Rheem 300L stainless steel water storage cylinder, complete with 3.0 kW electrical back up.
- Associated primary circulating pumps and controller.

The heat pump is to be located in the heat pump compound, adjacent to the mechanical heat pumps.

The storage cylinder is to be located in the basement storage area.

Hot water is to be circulated throughout the building via flow and return pipework and will be circulated at a temperature not less than 60°C.

The installation shall include a rigid elevated platform for the storage cylinder, to provide sufficient clearance of safe tray and relief valve drainage piping.

The hot water cylinder shall be seismically restrained to the requirements of NZS4219.

Domestic hot water delivery temperatures to personal hygiene fixtures like Wash Hand Basins and Showers will be limited to 50°C and 39 – 45°C for accessible bathrooms, via Thermostatic Mixing Valves (TMV) to the requirements of the New Zealand Building Code.

All domestic hot water distribution pipework shall be thermally insulated to minimise energy losses.

5.4.3 Sanitary Plumbing & Drainage

Sanitary plumbing and drainage will be provided to convey wastewater from all plumbing fixtures via gravity to a sanitary holding tank where it is pumped to the site sewer drainage infrastructure provided by the civil trade.

Floor waste gullies provided to all wet areas.

Tundish provided in plantroom for mechanical.

The sanitary tank will be located under the basement store slab (TBC). Access is to be provided through the storeroom slab.

FASTFLO® PUMP SYSTEMS

Model	Pipe Size	Pump Type	Voltage
3000-50	50mm	Vortex/Grinder	1 PH/3 PH
3000-80	80mm	Vortex/Grinder	1 PH/3 PH
4000-50	50mm	Vortex/Grinder	1 PH/3 PH
4000-80	80mm	Vortex/Grinder	1 PH/3 PH

Table 5-3 Fastflo Pump System Sizing

Trade waste

Trade waste drainage with a grease trap shall be used for the commercial kitchen.

In -ground passive grease trap located under the basement store slab

GREASE TRAP MACTRAP

Sales code	Total volume (litres)	Treatment capacity (litres)	Length (mm)	Width (mm)	Height (mm)	Inlet invert	Outlet invert
MTPT500 (S) (A) (D)	700	515	1500	550	850	670	625

Table 5-4 Grease Trap

5.4.4 Stormwater Drainage

Downpipes will be provided to convey roof water from gutters into the detention tank located adjacent to the northern end of the building at ground floor level.

The detention tank will discharge into sitewide stormwater drainage system provided by the civil engineer.

Channel drains will be provided to convey ground level surface water around the building perimeter, with the surface water discharging into the sitewide stormwater drainage system after the stormwater tanks, provided by the civil engineer.

The design of the roof gutter and location of rainwater outlets is to be as per the architects' design drawings.

Figure 5-1 Rainwater Tank

5.4.5 Drainage Pipe Expansion Joints

The use a combination of ball swivel joints and expansion joints to the buildings sanitary and stormwater pipework to mitigate the risk of pipe separation following ground subsidence and movement.

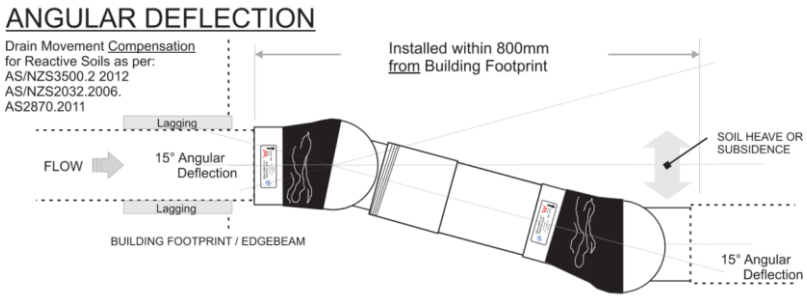

Figure 5-2 Angular Deflection Diagram

5.4.6 Water Conservation

Rainwater harvesting is to be used for the flushing of toilets and landscape watering.

5.4.7 Tapware and Fixtures

Tapware and fixtures are to be specified by the architect.

Fixture/Appliance	Flow Rate L/s
Water closet	0.10
Basin	0.10
Sink	0.10
Cleaners Sink	0.12
Dishwasher	0.20
Hose Tap (15mm)	0.20

Table 5-6 Flow Rates of Fixtures/Appliances

6 Vertical Transport

6.1 Overview

This section outlines the concepts and design criteria for the Vertical Transportation Services at the proposed Fale Malae building. Drivers for the Vertical Transport Specification will be sizing coordination, ESD, Code Compliance and user amenity. The following sections are included in the Vertical Transport section:

- System Description.
- Design Parameters.

6.1.1 General

The Vertical Transport systems for the Fale Malae shall include the following:

- 1 off 2000kg / 26 passengers Machine Room Less (MRL) Passenger / Goods Lift.

6.1.2 Design Parameters

This section outlines the concepts and design criteria that will be used for the active vertical transport services for Fale Malae.

- Lifts, Escalators and Moving Walks: BS EN81-20, 28 & 50.
- Non-domestic passenger & goods lifts: NZS 4332.
- Electrical work: AS/NZS 3000.
- The requirements of the Building Act – NZBC D2/AS1.
- The requirements of Health & Safety in Employment Act.
- Fixed Platforms, Ladders and Stairways: AS 1657.
- Earthquake loading: NZS 4203, 4219 & NZS 1170.5.
- Guidelines for Safe Working on New Lift Installations: AS/NZS 4431.
- NZS 4203 – Code of Practice or General Structure Design & Design Loadings for Buildings.
- AS/NZS 4121 – Design of Access and Use of Buildings and Facilities by Disabled Persons.
- NZS 4232 – Performance Criteria for Fire Resisting Enclosures.
- The requirement of Telecom (NZ).

All materials, apparatus and workmanship shall comply in Standards & Performance with the most recent revisions of the documents promulgated by Standards Association of New Zealand.

6.2 Equipment Schedules

Passenger / Goods Lift 1

Specification Item	Description
Type	Machine Room Less (MRL)
Class	Passenger / Goods
Rated Load	26 x passengers / 2000kg
Rated Speed	1.0 m/s
Machine Type	Gearless – direct drive featuring Permanent Magnet Synchronous AC Motor
Drive System	Solid State VVVF featuring active front end full line regeneration
Control System	Embedded control supporting event logging, error logging and on-board diagnostics
Control Cabinet Location	Upper level adjacent to lift landing doors
Travel	3920mm (nominal) - to be confirmed
Levels Served	Two (2) – Basement 01, Level 00 (Ground)
Levelling Accuracy	+/- 3mm
Entrances	
No. of Lift Well Openings	One (1)
Type of Car and Lift Well Doors	Two Panel Side Opening (2PSO)
Landing Door Jambs Finish	Satin finished 316 grade Stainless Steel
Landing Door Jamb Type	Full Depth
Landing Door Finish	Satin finished 316 grade Stainless Steel
Car Door Finish	Satin finished 316 grade Stainless Steel
Clear Door Opening	1450W x 2300H
Car Door Passenger Protection	Memco Panachrome 3D 154 beam light curtain
Door Sills	Car sills stainless steel. Landing sills machined aluminium
Car Interior Finishes	
Clear Car Inside - nominal	1700W x 2200D x 2500H
Car Finishes	As per Architect Instructions
Lighting	LED lighting throughout as per architect instructions. Lighting to extinguish after predetermined period of activity
Approximate Lift Well Dimensions – nominal	
Shaft Dimensions - internal	2575W x 2650D
Shaft Dimensions – external (assumes 250mm wall thickness)	

Approximate Pit Depth	1500mm.
Approximate Top Overrun (Headroom)	4300mm.
Appointments	
Type of Car and Landing Buttons	Dewhurst US95 dual illuminated throughout
Hall Lanterns	Dual chime, adjustable volume LED based arrival lanterns fully compliant to NZS4121-2001-DDA
Facilities for Persons with Disabilities	Fully compliant with NZS4121-2001-DDA
Landing Call Panels	One (1) riser per level.
Car Operating Panels	One (1) to each car side wall.
Car Position Indicator	15.6” / 193mm x 344mm full HD 1024 x 1024 LCD
Fire Service Control	To be provided as per requirements of NZS4332 / EN81-20
Emergency Communication	Provide “hands free” EN 81-28 compliant wireless dual sim / carrier 4G type.
Guide Shoe Type	As per supplier
Other	Exclusive service operation.
	Automated Rescue Device (ARD)
	Access control facilities incorporated into COP
	BMS interface
	3 off bump rails to each side and rear car wall
	1 x set of protective blankets. Installation of blankets shall not compromise NZS4121-2001-DDA compliance

Table 6-1 Lift Equipment Schedules

7 Sustainability

The project team will be continuing to ensure alignment with 'Aotearoa Fale Malae Project – Sustainability Guiding Principles' (04/08/22). At a high level these are as follows:

- Principle 1 - Reduced Environmental Impact

  Design, construct and manage a building that limits its environmental impact through material selection, low operational carbon & water reuse.

- Principle 2 - Prioritisation of Human Health & Wellbeing

  Design, construct and manage a building that is healthy and comfortable for its occupants by introducing biophilic design principles and providing excellent thermal/acoustic comfort and indoor air quality.

- Principle 3 - High Level of Durability & Adaptability

  Design, construct and manage a building that is durable, actively responds to climate change, and can operate over an extended lifetime.

- Principle 4 - High Level of Operational Usability

  Design, construct and manage a building that supports operational flexibility and efficiency and is fit for purpose for its current and any future uses.

- Principle 5 - Sustainable Site Integration

  Design, construct and manage a building that is sustainably integrated into the context of the Frank Kitts park redevelopment.

Please review the 100% Preliminary Design ESD Report which outlines how the current design performs against the principles above. As an overview, the key items to be captured as part of Preliminary costing review that are not captured in other section or disciplines include the following:

- Reduction/diversion of construction and demolition waste through waste sorting (e.g., engaging Waste Management).
- Efficient WELS ratings for pumping fixtures – at least one star from maximum available.
- Allowance for best practice universal design, including a 'Needs' analysis.
- Allowance for best practice operational waste system with at least five separate waste streams.
- The following principles are to be used as guidance in evaluating the most appropriate material selection:
  - No Redlist materials (no PVC etc.), targeting Declare Certified materials throughout.
  - Recycled or reused content to be maximised.
  - Low air polluting and off-gassing materials (i.e., low formaldehyde and low volatile organic compounds (VOC) content).
  - Low maintenance requirements over the lifecycle.
  - Extended service life.
  - Reduced embodied carbon, including cement replacements and timber structure where appropriate.
  - Products and suppliers with Environmental Product Declarations (EPD) preferred.
  - Products and suppliers with Third Party certification (AFRDI, SMaRT, GECA, ECNZ, Green Tag or ECS) preferred.
  - All timber products and suppliers with product stewardship (FSC/PEFC).

8 Building Thermal Envelope

8.1 Compliance Assessment

The new H1/VM2 standards apply to the Fale Malae Building. Aurecon conducted preliminary H1 modelling at 60% Preliminary Design and determined that compliance was not possible based on the proposed design and building envelope elements. Following discussion with project team, Aurecon developed a compliance pathway memo (Appendix A) that was sent to Wellington City Council before having a pre-application meeting to determine the appropriate H1 methodology and spaces within the building to include.

Aurecon then attended a pre-application meeting with WCC consenting offices. The outcome of this meeting confirmed that that the main Fale & Community spaces could be excluded from the H1 requirements because they are considered Assembly Service areas.

Therefore, to achieve compliance under H1/VM2 Aurecon propose the strategies outlined below.

The café and associated amenities and circulation is classed under H1 as commercial this means these areas of the building will need to achieve Building Code H1/AS2 Energy Efficiency compliance.

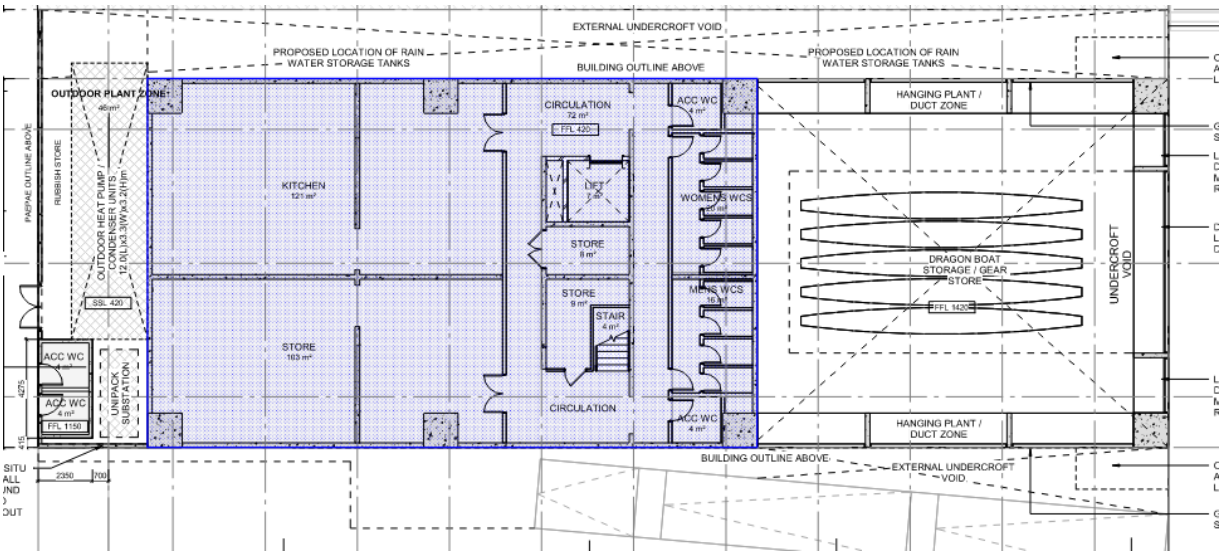

Figure 8-1 Basement Proposed H1 Thermal Envelope Line

- As the kitchen, store, circulation, core, and WC's will service the commercial café they are subject to H1 requirements.

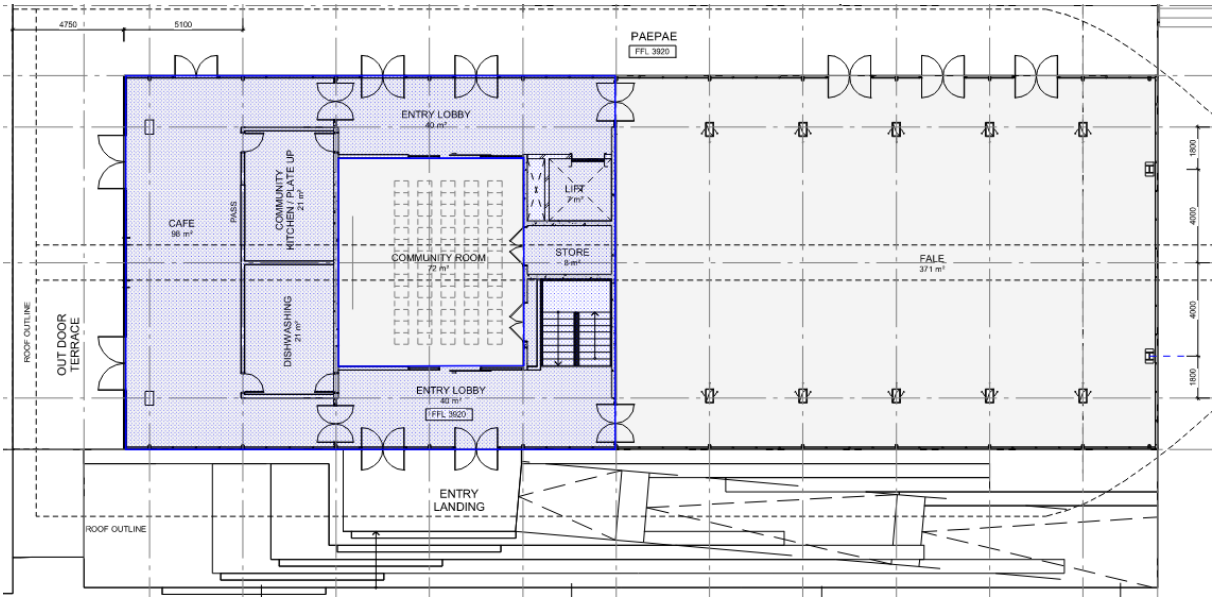

Figure 8-2 - Ground Floor Proposed H1 Thermal Envelope Line

As previously highlighted by Aurecon throughout the design to date, due to the amount of glass in the design the Fale Malae needs significant thermal performance to ensure compliance (even when using the excluding spaces considered Assembly Service).

Due to the high window-to-wall ratio (>50%) H1 compliance via the verification method H1/VM2 is required. Compliance is achieved by demonstrating that the energy use of the proposed building does not exceed the energy use of the computational reference building model. Therefore, the sum of the calculated annual heating load and annual cooling load of the proposed building shall not exceed the reference building.

Based on the proposed drawings and design intent to date, Aurecon have completed the preliminary H1/VM2 modelling to determine the thermal performance required to achieve H1 compliance. We propose the following thermal constructions for review and pricing before additional iterations are undertaken, however, we believe that with further refining of the model the minimum building performance required may impacted. We intent to undertake further iterative modelling early developed deign to determine the appropriate balance between performance cost and meeting complying with H1.

Table 8-1 Thermal Envelope Performance & H1 Modelling Summary

Structure	H1 Reference Model	Proposed Envelope Performance Features
Roof	R5	R6.5
Skylights	0.46	R1 (U1, Shading coefficient 0.3)
Windows and doors	R0.37 (Shading coefficient 0.8)	Café + Lobby: R0.77 (U1.3, Shading coefficient 0.5) Fale: R0.37 (Shading coefficient 0.8)
Window to wall ratio	50% (63.1% of glazed area above ground floor)	100% of glazed area above ground floor
Wall	R2.7	R3.4
Slab floor	R2.2	R2.2
Intertenancy walls	R1 (Accounting for acoustic treatment)	R1
Intertenancy floors/ceilings	R1	R2.2

Structure	H1 Reference Model	Proposed Envelope Performance Features
Heating/Cooling Loads		
H1 – Cooling Loads (MWh)	9.45	5.53
H1 – Heating Loads (MWh)	7.76	8.58
	17.21*	**14.11***

(*) The modelling is used to assess the energy performance of a proposed building by using a simulation of the building to predict its space heating loads and cooling loads. This is compared with the space heating loads and cooling loads of a reference building that is the same shape, dimensions, and orientation as the proposed building, but has building elements with construction R-values, and shading elements which differ. The results of the thermal modelling should not be construed as a guarantee of the actual energy use of the building.

8.1.1 H1 Modelling Findings - Building Envelope & Performance Recommendations

To achieve compliance under H1/VM2 Aurecon propose the following strategies:

- At the current width and length, the skylight needs to meet an insulative value of R1.0 with a shading coefficient of 0.3 – this would likely require the system to be triple glazed, thermally broken, and with a high-performance coating.
- The facade glazing elements need to have an insulative value of R0.77 for lobby and café sections with a shading coefficient of 0.3 – this would likely require the suite to be double glazed, thermally broken and gas filled, with a high-performance coating. For the fale façade glazing R0.37 is required – this would likely require the suite to be double glazed and potentially thermally broken.
- Reducing the highly glazed ground floor elevations may lower the performance required of the façade and skylight for H1 compliance and overall thermal performance. (This could potentially be achieved through reducing the skylight width to 1m from 1.5m, lowering the head hight of the glazing down to 2.5m and/or by adding some solid wall areas potentially between grid lines B & C and E & F on the southern elevation.
- Warm wall construction (R3.4) – including external slab edge and basement concrete wall insulation right down to the basement slab level.
- Insulating the ground floor slab system internally (R2.2). Confirmation required on space to include insulation (50mm XPS) above the slab.
- Warm wall roof system (R6.5) performance
- Thermally broken joinery. Window frames can have a large impact on overall performance - especially when performance and insulative value is high performing elsewhere within the envelope.
- Consider airtightness strategies within all building envelope decisions, integrate an airtightness strategy from the outset of preliminary design and plan to undertake airtightness testing during construction.
- Warm construction techniques, continuous insulation layers, and the use of vapour control/airtightness layers to the warm side of the insulation. This will be critical in the roof assembly.

9 Civil

9.1 Flood Level

Aurecon have conducted further modelling to establish a flood level that is best aligned with government guidance. The resulting level is 2.67m Wellington Vertical Datum (WVD) excluding 200mm freeboard allowance. This is 0.37m higher than the flood level sourced from Wellington Water. The section below outlines further discussion and methodology in establishing this level.

9.1.1 Initial Modelling

During early Preliminary Design Aurecon provided the design team with the standard practice Wellington Water compliance flood level for the site. For the assessment we used the ICM numerical model of CBD-South catchment provide by Wellington Water.

Please note the following assumptions that apply to this model (refer also to Wellington Water Stormwater Modelling Specifications):

- Model represents the current development within the catchment.
- The model adopts a 12hr nested rainfall for the 100-yr ARI (Average Recurrence Interval) design event.
- The model adopts a varying tidal boundary condition with the peak of the tide (i.e., 1.105mWVD) coinciding with the peak of catchment runoff.
  This boundary condition is based on Mean High Water Spring (MHWS = 0.855mWVD) tide plus an allowance for reduced barometric pressure (+0.25m).

Wellington Water requires the following allowances to predict the impact of climate change on stormwater flood risk:

- Design horizon: 2100
- 20% increase in rainfall intensity and volume
- 1m increase in sea level

Wellington water also recommends a 200mm freeboard to allow for:

- physical processes that may not have been allowed for
- uncertainties in the precision of the hydraulic modelling, and
- uncertainties in the prediction of physical processes.

9.1.2 Updated Modelling

Government guidance for flood level and climate projections outlines that, projections need to be used out to at least 100 years' time[1]. The guidance also states that sea level rise data should consider vertical land movement because of movement of tectonic plates. Due to the Wellington Water flood level not using the most up to date climate projections, guidance and timeframe, Aurecon have undertaken modelling of the flood levels for the Fale Malae site. The additional modelling followed Government guidance and the most up to date climate projections.

We have assessed the impact of climate change for the period up to 2124 using the information available to us. The updated modelling completed uses sea level rise and vertical land movement data from SSP5-8.5 at 2124 (**https://searise.takiwa.co**) and temperature increase/extreme rainfall from RCP8.5 climate change scenario at the latest period (2120) (Climate Change Projection for New Zealand, MfE, 2nd Edition, 2018).

Using this data, the following amendments have been made to the model boundary conditions:

- Increased tailwater level of 1.5m in the harbour based on NZ SeaRise (https://searise.takiwa.co) representing both sea level rise due to climate change and vertical land movement due to tectonic plate

[1] 'Interim guidance on use of new sea-level rise projections', MfE, 2022. & 'Coastal Hazards and Climate Change - Guidance for Local Government', MfE, 2017.

movements. This raised the peak tidal water level boundary condition from 1.1m WVD (for current climate conditions) to 2.6mWVD.

- Increased the rainfall assuming 3.8ºC temperature rise. The total 12hr rainfall depth increased from 123mm to 163mm (i.e., 33% increase).

The results are shown in the table below (refer image below for the respective locations):

Table 9-1 Updated Flood Level Modelling

Event	12hr Rainfall Depth	Peak Tidal Boundary Condition	Peak Flood Level Location A (1,748,920mE / 5,427,810mN)	Peak Flood Level Location B (1,748,930mE / 5,427,750mN)
Existing 100yr ARI	123 mm	1.10 mWVD	Not Run	Not Run
100yr ARI + 20%	147 mm	2.10 mWVD	2.32 mWVD	2.31 mWVD
100yr+3.8ºCC	163 mm	2.60 mWVD	2.67 mWVD	2.67 mWVD

The results show that the peak flood levels at the listed locations is 70mm above the tidal boundary condition adopted for the stormwater catchment flood model.

Please note:

- The modelled results are computed flood levels and do not include any freeboard.
- The tidal boundary condition does not include allowance for storm surge, wave run up, wave overtopping. The impact of these storm phenomena is expected to be significant for the esplanade, but the current location of the building means it has a very low probability of being affected by wave action.

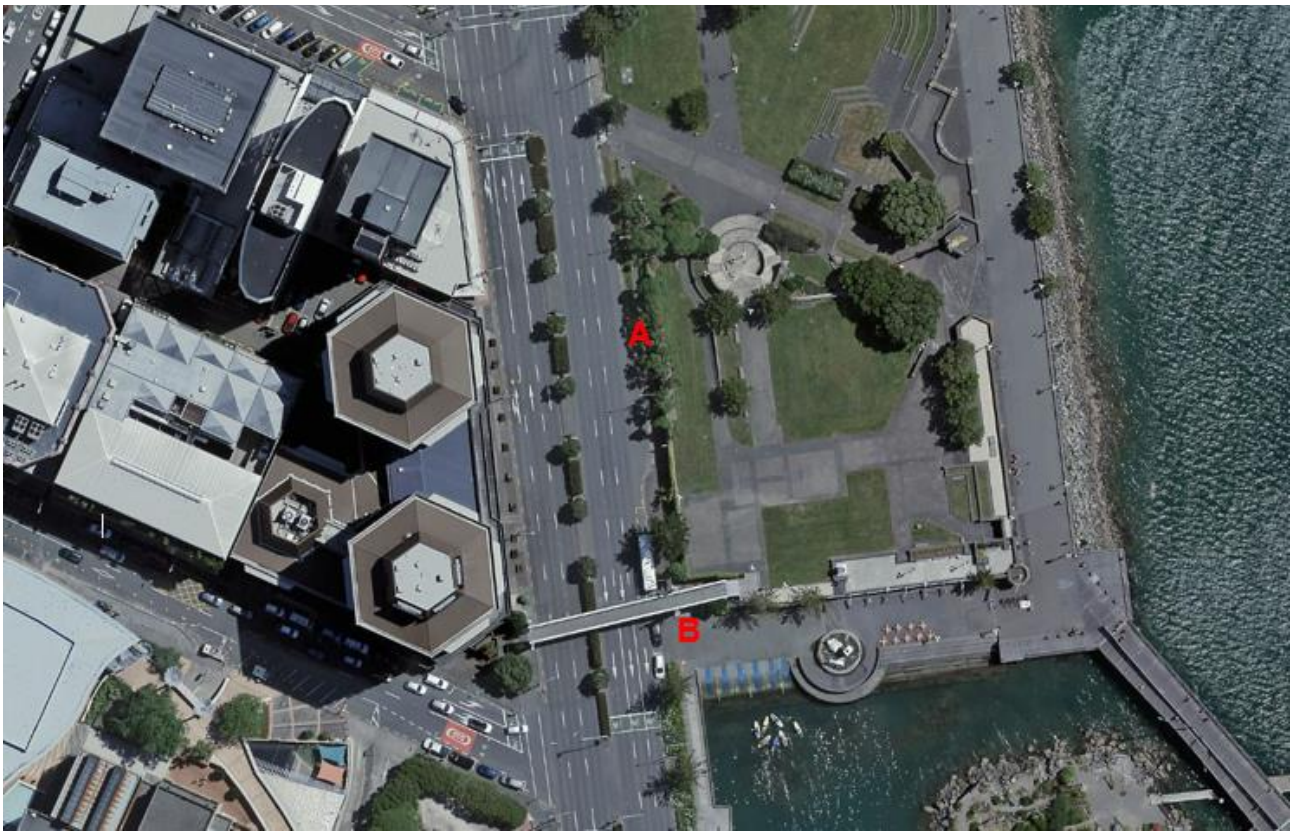

Figure 9-1 Flood Level Locations on Site

9.1.3 Resulting actions

- All relevant drawings must use the Wellington Vertical Datum as the ‘Datum’ and clearly note this on the drawings.

- Design team to determine adequate level of adaptation and mitigation against the updated 2,67m WVD flood level (100yr ARI + 3.8º CC).
- At least 200mm free board should be added to the 2,670mm WVD level.

9.1.4 Carpark flooding affects

It has been identified that the current car park floods during extreme events meaning there could be potential impacts once this is demolished and made a solid barrier to flood water. This change may lead to increased levels of flood water running down Jervois Quey post construction of the Fale Malae. From doing initial high-level analysis, Aurecon believe the change will not be critical, however, modelling can be undertaken at the next design stage to provide a more accurate illustration of the situation.

9.2 Three Waters Network

9.2.1 Site Description

The site is bounded by the Whairepo lagoon to the south, the Wellington harbour to the east, Frank Kitts Park to the north, and Jervois Quay to the west. The surrounding areas comprise commercial buildings and both foot and vehicle traffic.

The site currently accommodates a large underground carpark, small retail stores on the side of the harbour and children's playground (currently under construction). It is a busy area for commuters and those undertaking recreational activities, such as cycling and running.

The wider site is made up of grassed areas, raised planted trees, concrete footpaths, and stairs. The site is generally level (though raised above the surrounding promenade by the car park building on site). There is no vehicle access into the site as it is restricted to pedestrian access. Note that the adjacent section of Jervois Quay is classified as an Arterial Road and has an estimated annual average daily traffic flow of 22,000 vehicles (as per NZTA's ONRC ArcGIS tool).

Please refer to the civil services preliminary design drawing markup in the Appendices of this report in context of the comments in the following sections (Appendix B).

9.2.2 Water supply

Wellington Water (WWL) records for potable water are identified in Figure 9-2 below.

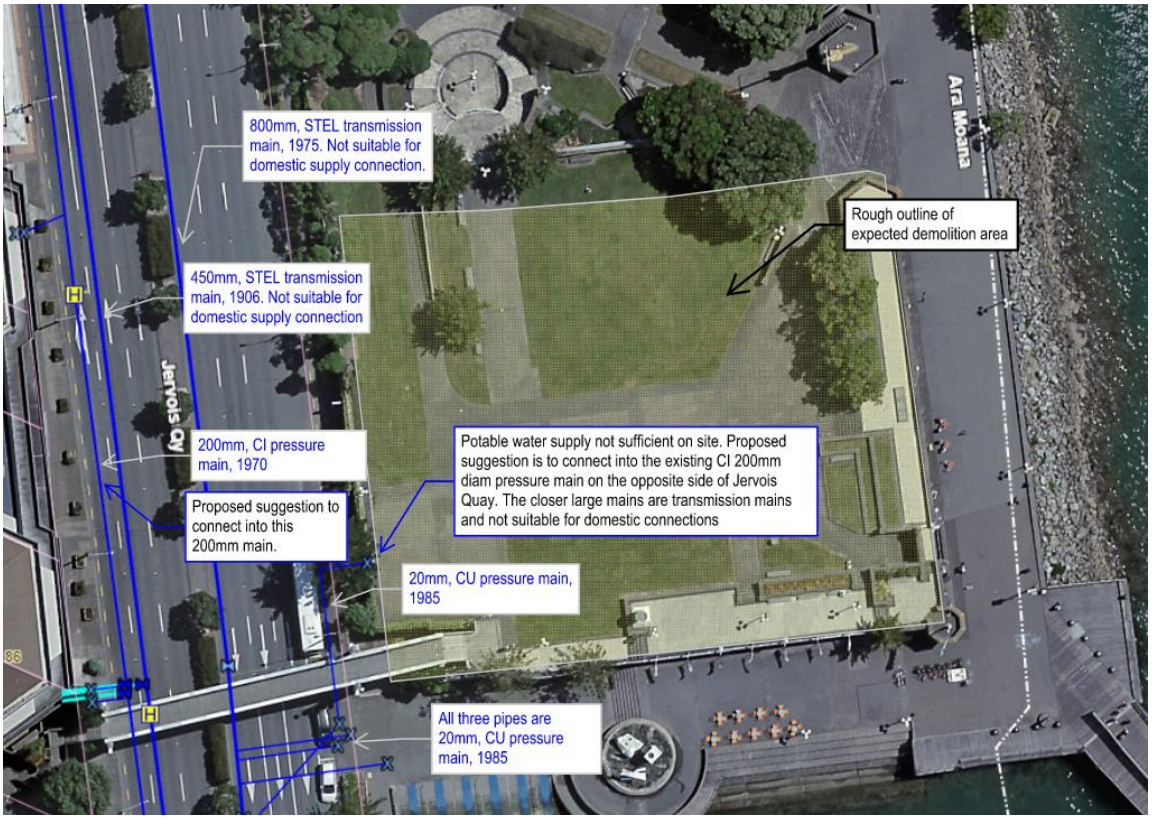

Figure 9-2 Council records of water infrastructure (Source: WWL's Regional Water Stormwater Wastewater App) with proposed solution included.

On the west side of Jervois Quay, there is an existing cast iron (CI) 200Ø pressurised main, running northbound parallel to Jervois Quay. There are also two transmission mains, a CI 450Ø and steel concrete lined (STEL) 800Ø, running northbound parallel to Jervois Quay. There is an existing Cu 20Ø service connection into the proposed building footprint location, as well as three additional 20Ø service connections south of the proposed site.

WWL's model shows that minimum pressure at the point of supply on the public main is expected to be between 80-85 m, which meets the level of service criteria for pressure (as per WWL's regional standard for water services Table 6-1). The model also indicates that fire flow capacity from the existing hydrants in the surrounding area are expected to be compliant with the NZ Fire code for up to FW4. However, the design flow required for the building is greater than the current capacity.

WWL have advised the following:

- Consultation with a Fire Engineer to identify fire requirements.
- Undertake pressure logging and hydrant flow testing to identify available capacity (this should be undertaken to inform if any boost pumps are required for fire flows).
- To connect into the existing CI 200Ø pressurised main on the west side of Jervois Quay if a new connection is required. The CI 450Ø and STEL 800Ø transmission mains are unsuitable for domestic connections.

Proposed Water Supply

The approximated peak potable water demand is 1.427 L/s. It is noted that further analysis of the peak potable water demand will be undertaken once architectural designs are developed.

Modelling using software 'Bentley FlowMaster' suggests that one of the existing Cu 20Ø service connections will not provide a sufficient flow rate to satisfy the approximated peak potable water demand of 1.47 L/s. One solution may be to connect into several of these existing Cu 20Ø service connections, to satisfy demand. However, this solution is unlikely to be suitable factoring in the expected flows for fire suppression systems assuming the building will be sprinklered.

The default water supply solution is to connect into the existing CI 200Ø pressurised main on the west side of Jervois Quay. This is likely to be a complicated and expensive solution, given that Jervois Quay's 6 lanes would require open trenching and there are a number of key services in the road.

An alternative design option is to install a new potable water pipe within the existing private wastewater lateral (see Figure 9-3), which will be abandoned once the car park and associated buildings are demolished and connect into the CI 200Ø pressurised main downstream. Further investigation is required to locate the existing wastewater lateral and determine its condition – this should be undertaken as a priority as survey investigations to date have not been able to locate this private WW pipe.

9.2.3 Wastewater

Figure 9-3 below illustrates the existing wastewater infrastructure on and around site and additional survey information.

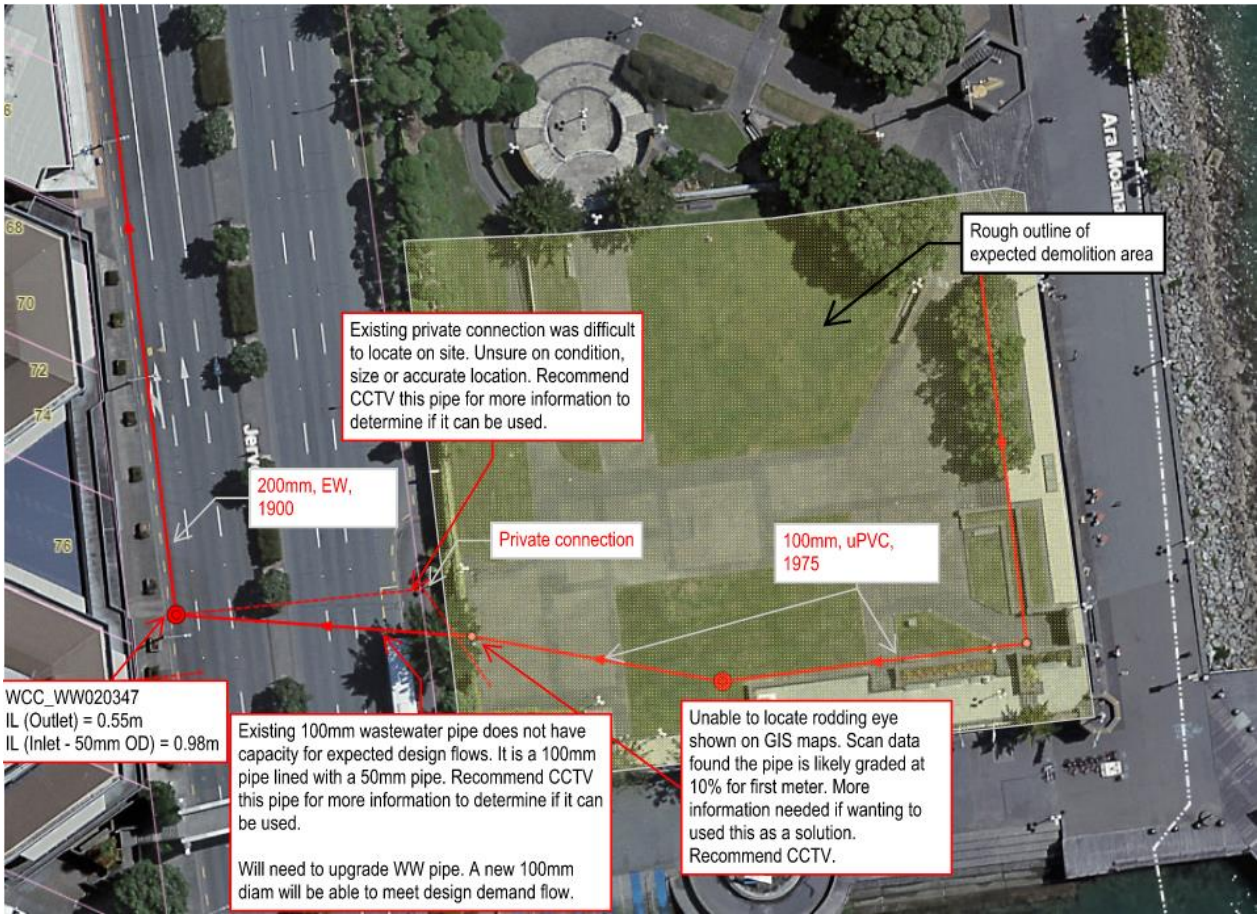

Figure 9-3 Council records of wastewater infrastructure (Source: WWL's Regional Water Stormwater Wastewater App) with

According to WWL's 'Regional Water Stormwater Wastewater App' there are two existing wastewater pipes associated with this site; a uPVC 100Ø wastewater gravity main running from the northeast corner of the site to the south and then to the west, connecting to a larger EW 200Ø gravity main on the west side of Jervois Quay, and a lateral which appears to connect to wastewater manhole WCC_WW020347 (located on the west side of Jervois Quay), which runs across Jervois Quay and whose upstream end is positioned on the western side of the site.

Sewer manhole WCC_WW020347 was scanned to identify the two existing pipes. The scan found what is believed to be the existing uPVC 100Ø wastewater gravity main and identified that it has been lined with a smaller 50Ø pipe. It's suspected that this 50Ø pipe is also uPVC. The condition and material type of this lined pipe is currently unknown, and further investigation would be required to determine this. WWL possess no record suggesting why this pipe may have been relined. There is evidence on the overlying road surface of subsidence, which is an indicator of a potential historical break in the original uPVC 100Ø.

A second lateral expected to terminate at wastewater manhole WCC_WW020347 was not found from survey.

Proposed Wastewater Design

The preferred option for Fale Malae's wastewater discharge is to reutilise the existing uPVC 100Ø wastewater gravity main. The feasibility to do so will depend in part on the depth of this existing gravity main, and depth of the proposed building foundation, and ability to pipe-burst the existing main to re-line. Approximated invert levels are identified in Figure 9-4 below.

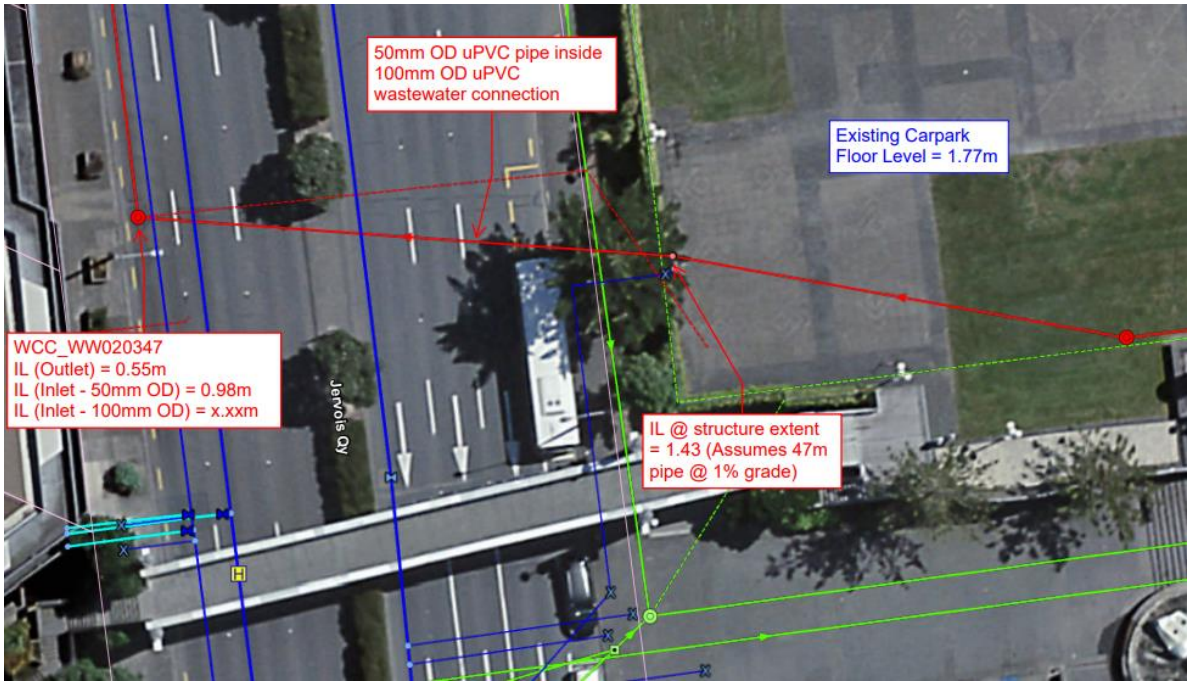

Figure 9-4. The approximated upstream and downstream invert levels of the existing uPVC 100Ø wastewater gravity main.

As per the current architectural drawings, the bottom of the foundation slab is at a depth of 2.43m, relative to the Jervois Quay ground surface. Note that this depth assumes that the architectural drawing's levels are measured relative to the Wellington Vertical Datum (WVD).

The approximated upstream invert level (relative to Jervois Quay ground surface) of the existing uPVC 100Ø wastewater gravity main is 1.43m. Comparatively, the bottom of the proposed basement slab is at a depth of 2.43m, 1 m deeper than the existing main. This suggests that the current infrastructure cannot accommodate a direct gravity connection from Fale Malae to the existing uPVC 100Ø wastewater gravity main. It will require a pump to get it to the existing network to then be gravity. Refer Section 5.4.3 for details as the building services design currently assumes a pump will be required.

If the chosen design option does involve use of the existing uPVC 100Ø wastewater gravity main, it is likely to require renewal because of capacity and condition constraints. It is recommended that a trenchless methodology, such as pipe bursting be utilised for renewal, to minimise disruption to Jervois Quay. This will require coordination with network utility operators to confirm that other existing services will not be damaged during works, which may require localised potholing and non-invasive service locating using GPR or similar.

At present, the architectural plans show that the basement of the Fale Malae building will comprise a kitchen, store, and dragon boat storage space. The ground floor will comprise a café, community room, community kitchen and presentation room.

The peak wastewater flow for the building was calculated on a 'fixture-basis's and was determined to be 4.56 L/s.

Using the 'Hydraulic design for drainage pipes' methodology defined by Appendix 1 of WWL's Regional Standard for Water Services (December 2021), the flow capacity of the 50Ø lined pipe (within the existing uPVC 100Ø gravity main) was determined to be 0.270 L/s, which is less than the peak demand of 4.56L/s. The existing 50Ø lined pipe will thus not provide sufficient wastewater flow capacity for Fale Male.

Using Bently FlowMaster, a new PVC/PE 100Ø wastewater gravity pipe will provide a flow capacity of 6.72 L/s, satisfying the PWWF demand of 4.56 L/s. Pipe requirements will be confirmed once the design flows are finalised, however it is considered appropriate that this new pipe could be installed using trenchless pipe-bursting along the existing pipe alignment to save on project costs.

We note that if the reuse of existing pipes for wastewater and potable water are not possible, then a combined services trench across Jervois Quay will be required. This should be factored into the project estimate.

9.2.4 Stormwater

Figure 9-5 below illustrates the existing stormwater infrastructure on and around site.

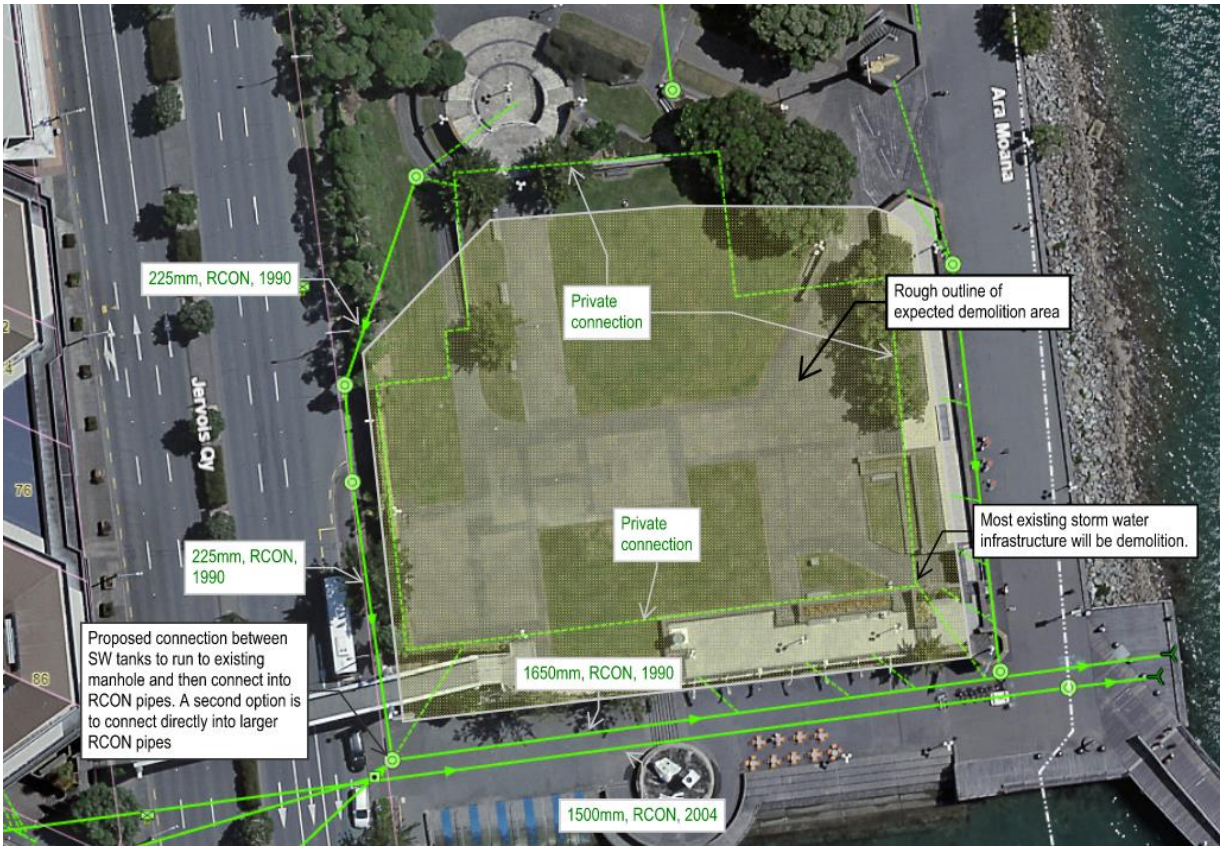

Figure 9-5. Council records of stormwater infrastructure and proposed location of connection into existing network (Source: WWL's Regional Water Stormwater Wastewater App).

There are private stormwater connections surrounding the proposed site location that connect into a large, reinforced concrete (RCON) 1650Ø main which discharges into Wellington harbour. There is also a RCON 225Ø main that runs southbound down Jervois Quay and connects into this larger 1650Ø main.

The current stormwater runoff for the site is approximately 20 L/s for an annual exceedance probability (AEP) of 1% and 13 L/s for AEP 10%. It's noted that much of the grassed, existing areas on site are situated above an underground carpark. While these areas will possess some degree of infiltration, their ability to absorb rainfall is limited.

Clause 4.4.2.1 of WWL's regional standard for water services states that the proposed system shall be designed to achieve hydraulic neutrality. WWL have also advised that the recommended minimum floor level is 2.4m 'above mean sea level' (AMSL). Refer to the above Section 9.1 which considers flood risk.

Proposed Stormwater Design

The present site is split approximately in half with regard to pervious and impervious surfaces. From the current architectural drawings, it seems that the entirety of the new building site and curtilage will be impervious. This will increase stormwater design peak discharge, which must be offset to uphold clause

4.4.2.1. Down-pipe discharge design is to be confirmed and threshold drainage will be confirmed in the next design stage.

The proposed design will have a stormwater runoff for AEP 1% of 30 L/s and 10% design event of 19 L/s. Compared to their existing, respective AEPs, AEP 1% and AEP 10% are forecast for a runoff increase of 10 L/s and 6 L/s, respectively. For clarity, the existing and forecast stormwater runoff AEP values are illustrated in Table 9-2 below.

We note that the area surrounding the Fale Malae building to the north and east is part of a WCC project which may involve changes to impervious areas and runoff. We have not considered these changes as we do not have sufficient information and are outside the scope of this project. However, at later stages of the design there may be efficiencies in solutions from coordinating with the adjacent project works.

Table 9-2 A summary of the rainfall runoffs for AEP 1% and AEP 10%, pre and post construction.

	Existing Design Runoff [L/s]	Proposed Design Runoff [L/s]	Change [L/s]
AEP 1%	20	30	10
AEP 10%	13	19	6

As per clause 4.4.2.1 of WWL's Regional Standard for Water Services (December 2021), this calculated increase must be off set to achieve hydraulic neutrality. To achieve this, it is proposed that all rainwater will be conveyed from Fale Malae's roof to modular rainwater tanks, situated within the building footprint. It is estimated that these rainwater tanks will provide a storage capacity of 20,000 L. The specific tank size, number and orifice size will be determined during the next phase of design work. Uses for captured rainfall are currently being explored. In extreme rainfall events overland flow paths to the harbour area can be facilitated.

9.2.5 Summary of Proposed three water design

The existing wastewater network does not have capacity for the design flow of Fale Malae, the proposed solution is to reline the existing 100Ø that is lined with a 50Ø and burst it with a new 100Ø. Due to the basement levels being lower than the existing network, pumping will be required to get the wastewater to be gravity fed into the existing network.

The current potable water supply is also insufficient for the higher demands from Fale Malae. The proposed solution is repurposing the existing private wastewater line as water supply. This pipe has currently proven difficult to locate.

Finally, the stormwater neutrality is to be achieved by onsite storage tanks. The overflow pipe from these tanks will connect into the existing manhole on the closest side to Jervois Quay and then connect into the large outfall pipes. Downpipe discharge design is to be confirmed and threshold drainage will be confirmed in the next design stage.

Refer to the Appendices for details of these proposed solutions (Appendix B).

9.2.6 Recommended next steps

The actions for further development on this project that would increase certainty of cost and approval would be:

- CCTV of the private sewer pipe to determine viability for connecting potable water and wastewater connection into existing infrastructure without significant trenching,
- Pressure testing of fire hydrants,
- Wastewater connection design methodology
- Confirming the location and invert level of manholes for the proposed solutions

9.3 Other utilities

There are other utilities within proximity to the proposed location of Fale Malae. Coordination with the utility providers will need to be factored into the cost in case of any relocations, stand overs or upgrading of the network. Utilities in the area are

- Wellington Electricity
  - 11kVs on the west side of Jervois Quay
  - Several cables not in use on both sides of Jervois Quay
  - 400V cables within proposed building footprint
  - Public streetlights and connections
- Chorus
  - Several lines into existing carpark area
  - Appears to have 14 cables running down east side of Jervois Quay
- Vodafone (One)
  - Connections on the west side of Jervois Quay
- Nova Energy
  - 63mm OD line on Harris Street unlikely to be of an impact to Fale Malae
- Powerco
  - Appears to have gas mains running on both sides of Jervois Quay.
  - These mains have been indicated to be low, medium, intermediate, and/or strategic pipes within the area. Locating these onsite will be completed at a later design phase.
- Wellington City Council
  - WCC owned duct running along Jervois Quay

Refer to appendices for the BeforeUDig information provided and general location of Fale Malae in relation to these utilities (Appendix C).

Appendix A H1 Pre-app Memo & Response

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Memorandum

To		From	**Aurecon**
Copy		Reference	**P522118**
Date	**2022-09-20**	Pages (including this page)	**4**
Subject	**Fale Malae – Proposed H1 Strategy**		

1 Summary

Aurecon seeks clarification on the H1 Compliance Pathway for the proposed Fale Malae Development. The proposed pathway has been based on the *'Using this acceptable solution'* section provided within both H1/AS1 and H1/AS2. The requirements provide the following guidance:

- *"In buildings containing both **industrial** and other classified uses, the non-industrial portion shall be treated separately according to its classified use. For example, in a building containing both **industrial** and **commercial** classified uses, the **commercial** area shall meet the relevant energy efficiency requirements of the Building Code".*

Based on the proposed intended space use it is Aurecon's understanding that both the Fale Space and Community Room would be considered Communal Non-Residential (assembly service) and as such are not subject to NZBC H1 requirements. Energy Efficiency Acceptable Solution H1/AS1 and H1/AS2 requirements only apply to Communal Non-Residential (***assembly care***).

2 Project Summary – Intended Usage

The proposed location for the building is Frank Kitts Park (subject to Wellington City Council landowner approval and resource consent), at the southwest corner of the park. The building will be owned and managed by the Fale Malae Trust. While the Trust, a not-for-profit entity, will need to ensure the building brings in adequate revenue to meet its operating expenses, the Fale Malae will primarily be a community space that will enhance and complement Wellington's waterfront as a landmark building of cultural significance.

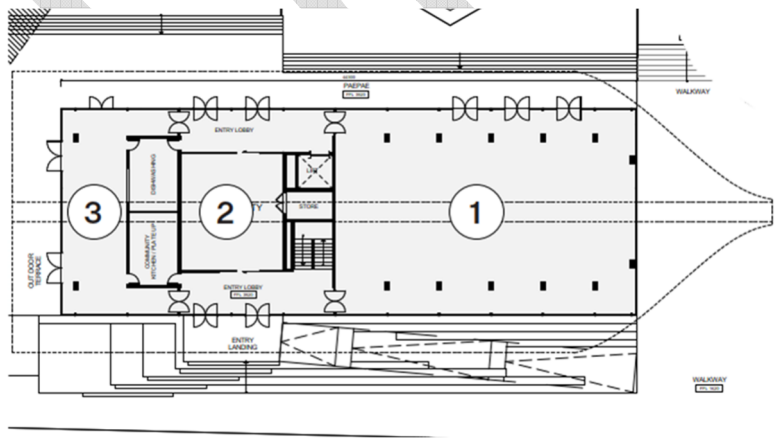


Figure 1 - Indicative Spatial Layout

- **1) Fale Space** (371m^2):
  - NZBC – Clause A1- Classified Uses

DRAFT

    - Communal Non-Residential: Assembly Service - applies to a building or use where limited care and service is provided. Examples: a church, cinema, clubroom, hall, museum, public swimming pool, stadium, theatre, or *whare runanga (the assembly house).*
  - Weekdays: performing arts and cultural events, diplomatic and government dinners, academic or professional conferences, graduation ceremonies and award events, lectures and presentations, satellite venue for large exhibitions/conferences potentially in conjunction with Takina or other nearby venues.
  - Weekends: arts and craft markets, special events venue (e.g. cultural and arts festivals), Pasifika gatherings/performances, Pacific art displays in collaboration with Te Papa, interactive displays about Pacific heritage, and an indoor space for the community to passively enjoy.

- **2) Community Room** (72m^2):
  - NZBC – Clause A1- Classified Uses
    - Communal Non-Residential: Assembly Service - applies to a building or use where limited care and service is provided. Examples: a church, cinema, *clubroom, hall,* museum, public swimming pool, stadium, theatre, or *whare runanga (the assembly house).*
  - Weekday usage during business hours: primary users would be education providers, government agencies, businesses and other organisations. Potential usage could include presentations, meetings, workshops, tutorials, break out area/supporting space for events in the Fale.
  - Weekday evenings and weekends: community group usage, art and education displays, waterfront events.

- **3) Café** (98m^2):
  - NZBC – Clause A1- Classified Uses
    - Commercial: Applies to a building or use in which any natural resources, goods, services or money are either developed, sold, exchanged or stored. Examples: an amusement park, auction room, bank, car-park, *catering facility, coffee bar*, computer centre, fire station, funeral parlour, hairdresser, library, office (commercial or government), Police station, post office, public laundry, radio station, restaurant, service station, shop, showroom, storage facility, television station or transport terminal.
  - North facing café with indoor and outdoor/paepae seating to provide an amenity for the park and waterfront.
  - Pasifika hospitality influence to add to the cultural richness of the waterfront.
  - Potential to be used for art displays or as a community space in off-peak season.

DRAFT

3 Impact of Clause A1 – Classified Uses

Based on the above classified use assessment we propose the following thermal envelope –

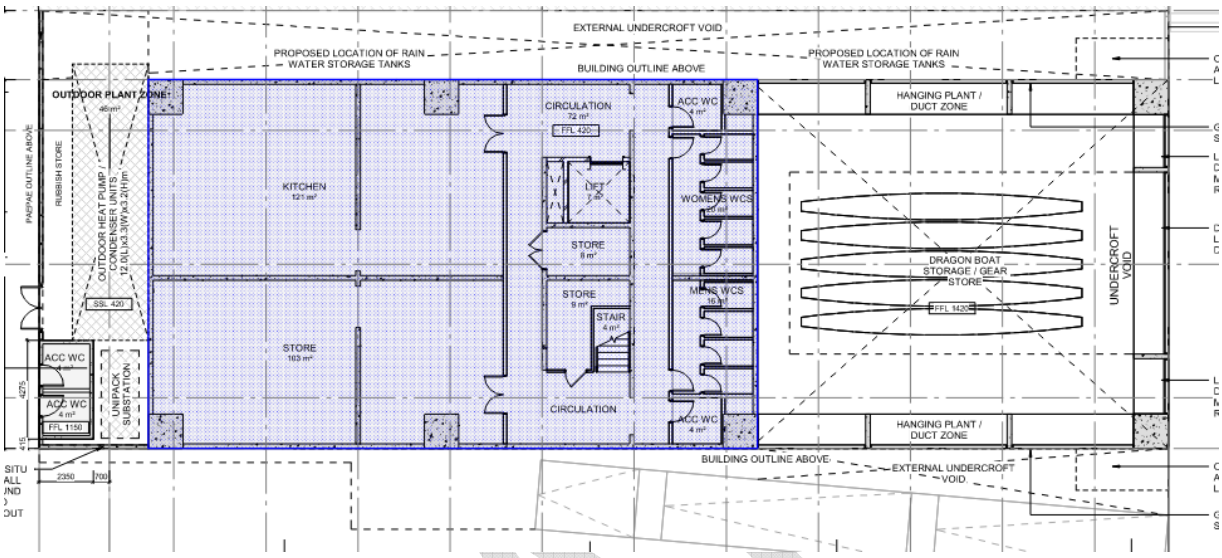


Figure 2 - Basement Proposed H1 Thermal Envelope Line

- As the kitchen, store, circulation, core, and WC's will service the commercial café it is our understanding that they are subject to H1 requirements.

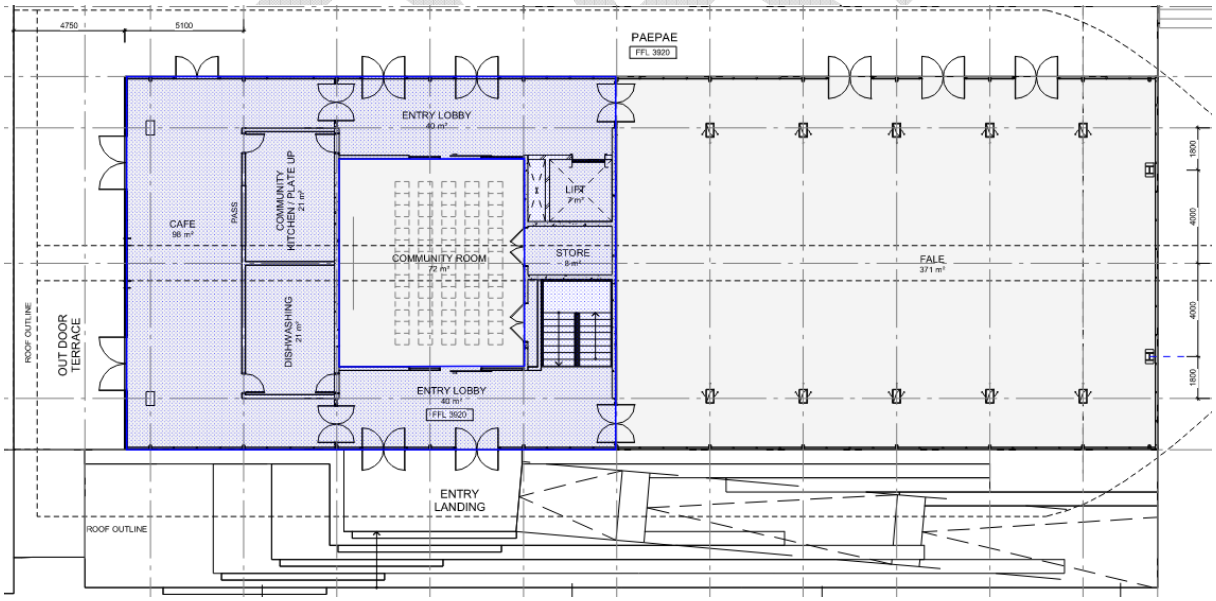


Figure 3 - Ground Floor Proposed H1 Thermal Envelope Line

As the entry lobby/circulation and core will service the café and allow users to access basement facilities it is our understanding that they are subject to H1 requirements.

4 Proposed Compliance Pathway

Based on the above Aurecon propose the following –

- The spaces subject to H! compliance (Café, Kitchen and supporting areas) spaces are greater than 300m^2, these areas must comply with *Acceptable Solution H1/AS2: Energy Efficiency for buildings greater than 300m^2.* However, due to the nature of the proposed high glazing percentage we recommend the use of the *Verification Method H1/VM2: Energy efficiency for buildings greater than 300m^2* (modelling approach).
- The verification of the design is achieved by demonstrating that the energy use of the proposed building design does not exceed the energy use of the reference building using computer modelling.
- The reference building is subject to the following R-values outlined in table 2.1.2.2B below

TABLE 2.1.2.2B: Minimum construction R-values for building elements that do not contain embedded heating systems

Paragraphs 2.1.2.2 b), 2.1.3.11

Building element	Construction R-values (m²·K/W)[1]					
	Climate zone 1	Climate zone 2	Climate zone 3	Climate zone 4	Climate zone 5	Climate zone 6
Roof	R3.5	R4.0	R5.0	R5.4	R6.0	R7.0
Wall	R2.2	R2.4	R2.7	R3.0	R3.0	R3.2
Floor	R2.2	R2.2	R2.2	R2.4	R2.5	R2.6
Windows and doors	R0.33	R0.33	R0.37	R0.37	R0.40	R0.42
Skylights	R0.42	R0.42	R0.46	R0.46	R0.49	R0.51

- As some adjoining spaces are not subject to H1 requirements, Aurecon wish to confirm the treatment of the Community Room and Fale Space's interaction with spaces within the proposed H1 thermal envelope.
  - Aurecon's understanding: the Community Room, and Fale Space are both conditioned and shall be modelled as no heat transfer between this space and any adjoining spaces.
    - D.1.8.1 - Walls and other surfaces that separate occupied units may be assumed to have no heat transfer.

END.

<u>Disclaimer:</u>

This review is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the contract documents.

This review does not relieve the contractor of their Contractual obligations nor their responsibilities of ensuring the work is complete, accurate and correct. Any amendment does not constitute an order or authority for a price variation to the contract.

Building consent pre-application meeting record

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

Service request:	521987
Please use this pre-application SR reference number when you are submitting your application for a building consent.	
Address:	Frank Kitts Park
Project description:	New build. The proposed Fale Malae will primarily be a community space that will enhance and complement Wellington's waterfront as a landmark building of cultural significance. Frank Kitts Park.
Date:	05/10/2022
Consenting officer:	Flora Hansen

Meeting Record

Note: The purpose of the pre-application meeting is to guide you in your building consent application.

Council staff will offer preliminary views during or following the meeting, based on the information you provide. We will assess your application in detail when you make your full application. The Council may change its view for example if you don't yet have, or don't provide, all of the relevant information. The Council does not make any warranty or assume any legal liability or responsibility for the accuracy, correctness, completeness or use of any information or views we give as part of the pre-application process.

You are responsible for getting your own professional building and legal advice, and for relying on that advice, when applying for consents, permits or licences.

The first two hours of the Council officers' time is free. After this you'll be charged $163.50 per hour for the time the Council officer/s spends relating to this meeting. If additional specialist advice is needed, this will also be charged. We'll send an invoice for the meeting and associated costs when required.

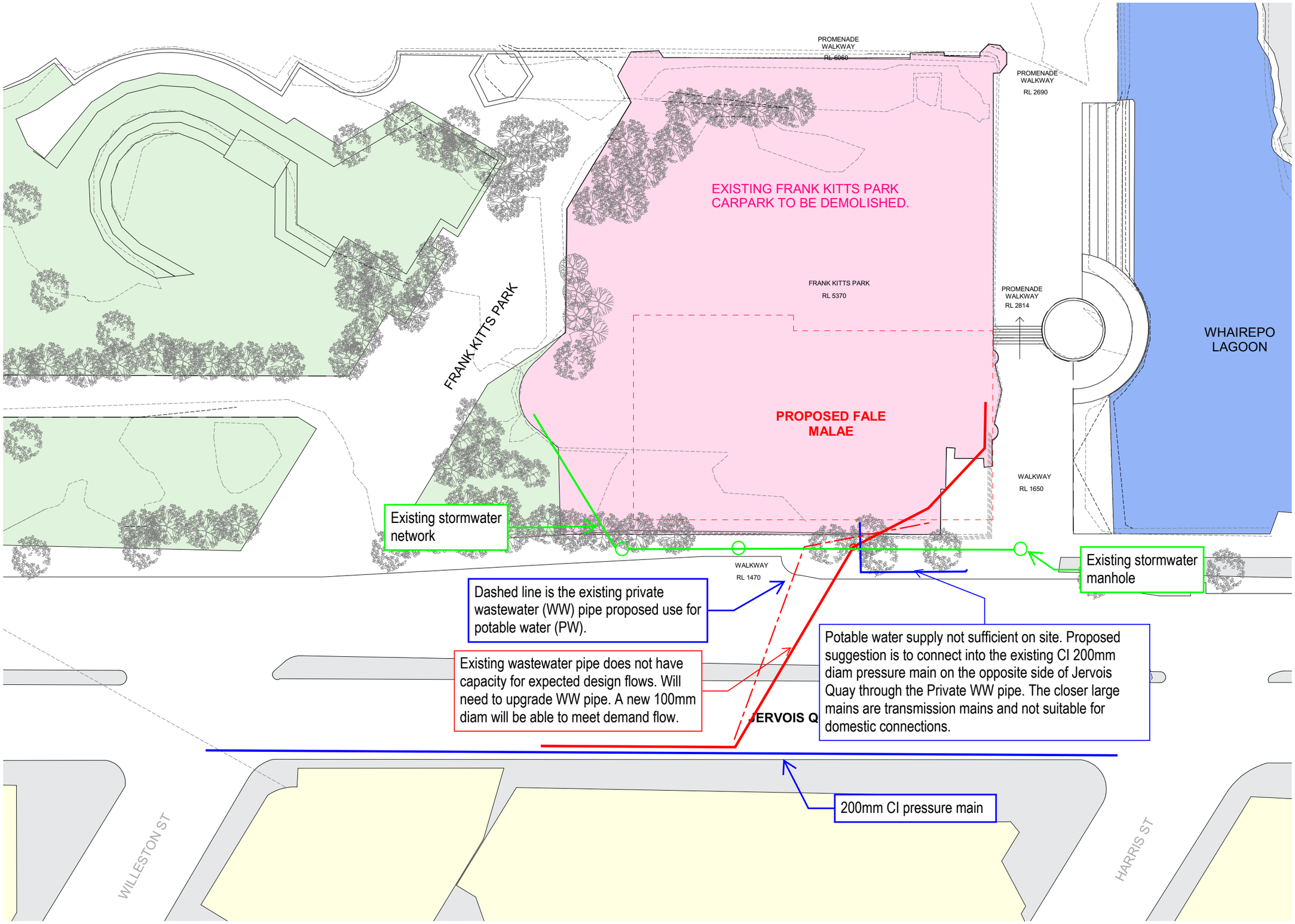
We may have to disclose any information you provide to us if another person requests it under the Local Government Official Information and Meetings Act 1987.

Participants	
Council:	Flora Hansen – Consenting Officer, Connor Hamill – Lead Consenting Officer
Designers / engineers:	Karl Wakelin – Aurecon, Rachel Haire – Aurecon, Benjamin Sawrey – Aurecon, Laura Cooke – Jasmax, Sophie Bishop - Jasmax

Site details, where relevant	
Wind zone:	Very High
Corrosion zone:	Zone D
Flooding:	Flooding layer to western boundary of site.
Current building warrant of fitness:	*Wellington BWoF Online Link* CS27497 – Frank Kitts Park Carpark (To be demolished)

Items discussed	
A1 - A3: Building classification:	*Building Code Clause A1* Discussed classified uses for purposes of H1 calculation. Fale/Community Room: Communal non-residential, Assembly service. Café: Commercial
H1: Energy efficiency:	Chosen compliance method: H1/VM2 – Amendment 1 Discussed Fale area not within thermal envelope as per H1/VM2 scope. Aurecon Questions Raised: For the purposes of H1/VM2, shall the Fale area be treated as heated/cooled space, or not at heated/cooled as it is outside the thermal envelope? WCC – *We are of the opinion that should Aurecon provide a set of modelling calculations from a suitably qualified person not including the Fale area, WCC may accept this proposal given a sound compliance methodology is provided. We note that we shall accept compliance to H1 via H1/VM2 based on expert opinion/supporting calculations/Producer statements.* For the purposes of H1/VM2, shall the roof eaves be treated as shading device? WCC – *We refer to H1/VM2 section D.1.11 which notes the definition of 'Shading' as ' Exterior attached shading such as fins and overhangs should be modelled as proposed in the proposed building but need not be modelled in the reference building.' It is assumed that an eave is an overhang.*
Other Items: Section 71: Natural Hazards	High level of overland flow to the adjacent street. Existing carpark currently displaces flooding. Aurecon note they are aware of this and are working with WCC to model the site flooding levels.

Appendix B Civil Markup of Architectural 60% Preliminary Design



RESERVED SPACE COUNCIL BC STAMP

1 | 1 : 250 Plan
A1-300 | EXISTING SITE PLAN

60% PRELIMINARY DESIGN ISSUE

Consultant Team
Dunning Thornton Consultants Ltd
Structural Engineers
Aurecon
COR Associates
Building Services Design

Client
Fale Malae Trust

JASMAX

Notes

Revisions
A 60% PRELIMINARY DESIGN ISSUE 08/09/2022

ARCHITECTURAL

Project Number: 221113
Fale Malae
Frank Kitts Park, Wellington

Sheet
EXISTING SITE PLAN
SCALE @ A1= 1 : 250

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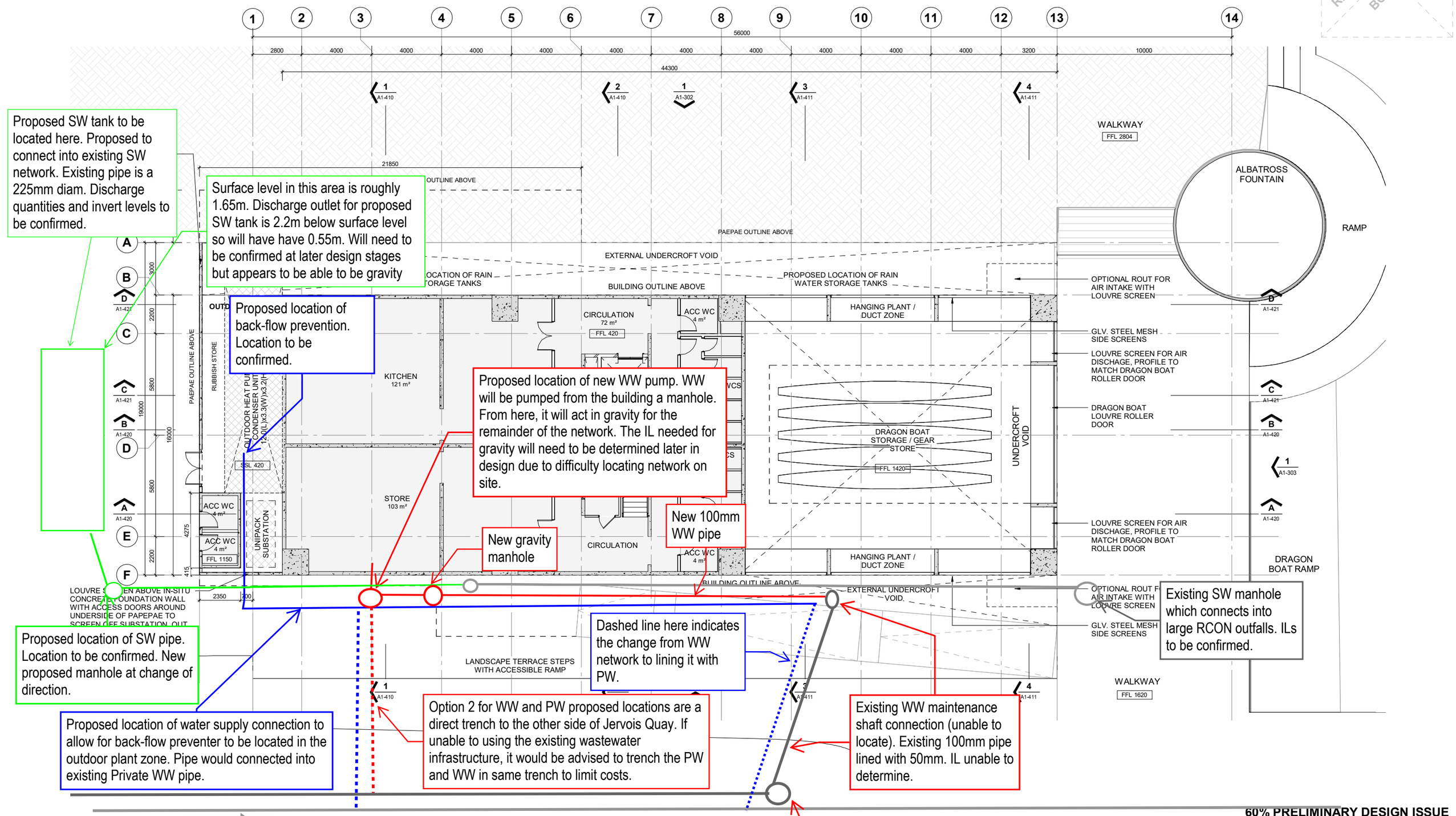
Drawing Number **A1-015** Revision **A**


Proposed SW tank to be located here. Proposed to connect into existing SW network. Existing pipe is a 225mm diam. Discharge quantities and invert levels to be confirmed.
Surface level in this area is roughly 1.65m. Discharge outlet for proposed SW tank is 2.2m below surface level so will have have 0.55m. Will need to be confirmed at later design stages but appears to be able to be gravity
Proposed location of back-flow prevention. Location to be confirmed.
Proposed location of new WW pump. WW will be pumped from the building a manhole. From here, it will act in gravity for the remainder of the network. The IL needed for gravity will need to be determined later in design due to difficulty locating network on site.
New 100mm WW pipe
New gravity manhole
Existing SW manhole which connects into large RCON outfalls. ILs to be confirmed.
Dashed line here indicates the change from WW network to lining it with PW.
Proposed location of SW pipe. Location to be confirmed. New proposed manhole at change of direction.
Proposed location of water supply connection to allow for back-flow preventer to be located in the outdoor plant zone. Pipe would connected into existing Private WW pipe.
Option 2 for WW and PW proposed locations are a direct trench to the other side of Jervois Quay. If unable to using the existing wastewater infrastructure, it would be advised to trench the PW and WW in same trench to limit costs.
Existing WW maintenance shaft connection (unable to locate). Existing 100mm pipe lined with 50mm. IL unable to determine.
Existing 200mm PW main
WCC_WW020347
IL (Outlet) = 0.55m
IL (Inlet - 50mm OD) = 0.98m
RESERVED SPACE COUNCIL BC STAMP
WALKWAY
FFL 2804
ALBATROSS FOUNTAIN
RAMP
PAEPAE OUTLINE ABOVE
EXTERNAL UNDERCROFT VOID
BUILDING OUTLINE ABOVE
PROPOSED LOCATION OF RAIN WATER STORAGE TANKS
OPTIONAL ROUT FOR AIR INTAKE WITH LOUVRE SCREEN
GLV. STEEL MESH SIDE SCREENS
LOUVRE SCREEN FOR AIR DISCHAGE, PROFILE TO MATCH DRAGON BOAT ROLLER DOOR
DRAGON BOAT LOUVRE ROLLER DOOR
HANGING PLANT / DUCT ZONE
CIRCULATION
72 m²
FFL 420
ACC WC
4 m²
KITCHEN
121 m²
STORE
103 m²
DRAGON BOAT STORAGE / GEAR STORE
FFL 1420
UNDERCROFT VOID
RUBBISH STORE
OUTDOOR HEAT PUMP CONDENSER UNIT
SSL 420
UNIPACK SUBSTATION
FFL 1150
DRAGON BOAT RAMP
LANDSCAPE TERRACE STEPS WITH ACCESSIBLE RAMP
WALKWAY
FFL 1620
60% PRELIMINARY DESIGN ISSUE
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Dunning Thornton Consultants Ltd
Structural Engineers
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Building Services Design
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Revisions
A PERLIMINARY DESIGN -
B 60% PRELIMINARY DESI
JASMAX
ARCHITECTURAL
Project
Number: 221113
Fale Malae
Frank Kitts Park, Wellington
Sheet
FLOOR PLAN - LEVEL B
SCALE @ A1= 1 : 100
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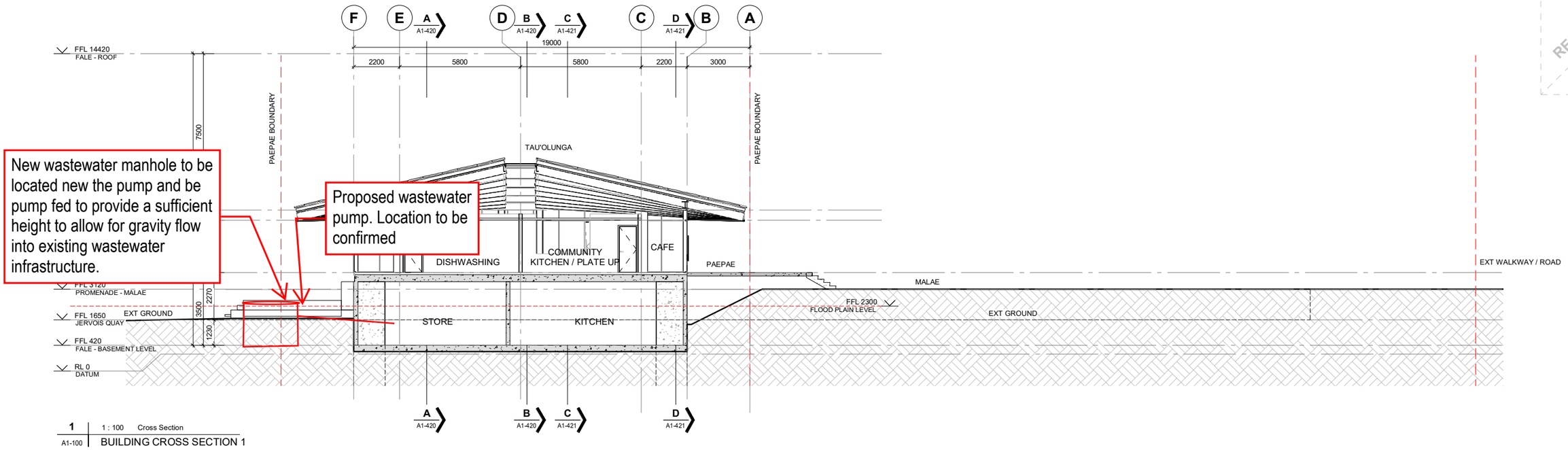
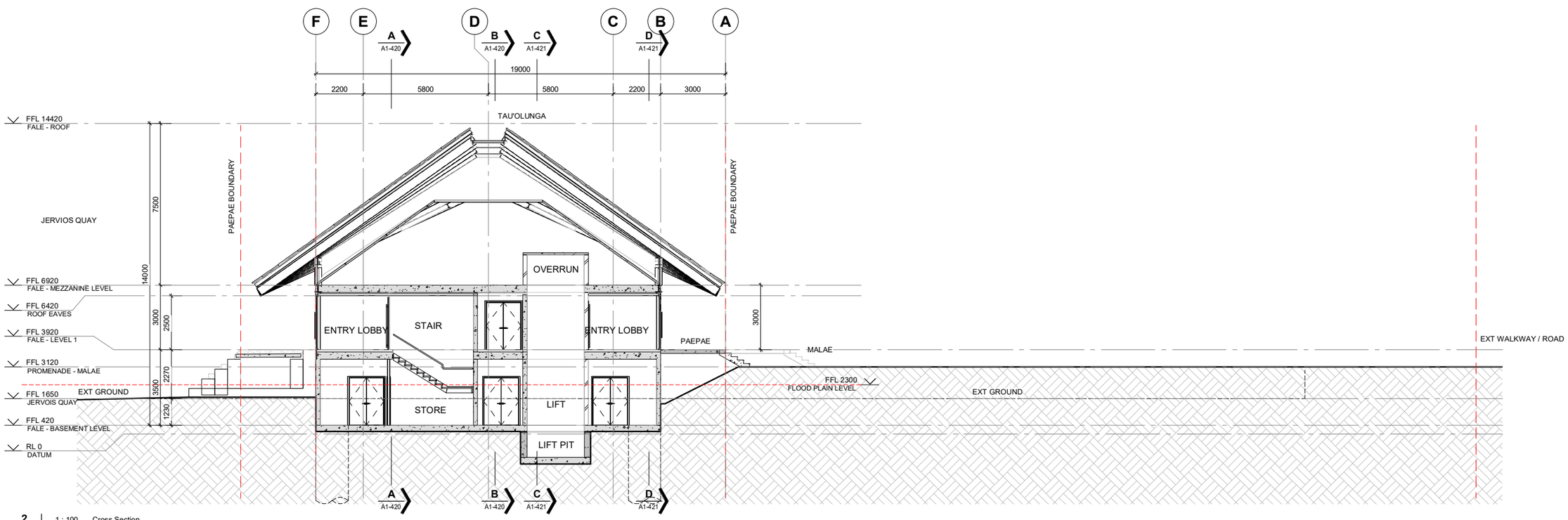
Drawing Number
A1-100
Revision
B



1 | 1 : 100 Cross Section
A1-100 | BUILDING CROSS SECTION 1



2 | 1 : 100 Cross Section
A1-100 | BUILDING CROSS SECTION 2

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Structural Engineers
Aurecon
COR Associates
Building Services Design

Client
Fale Malae Trust

JASMAX

Notes

Revisions

A	PERLIMINARY DESIGN - DRAFT WIP	26/07/2022
B	60% PRELIMINARY DESIGN ISSUE	08/09/2022

ARCHITECTURAL

Project Number: 221113
Fale Malae
Frank Kitts Park, Wellington

Sheet
BUILDING CROSS SECTIONS

SCALE @ A1= 1 : 100

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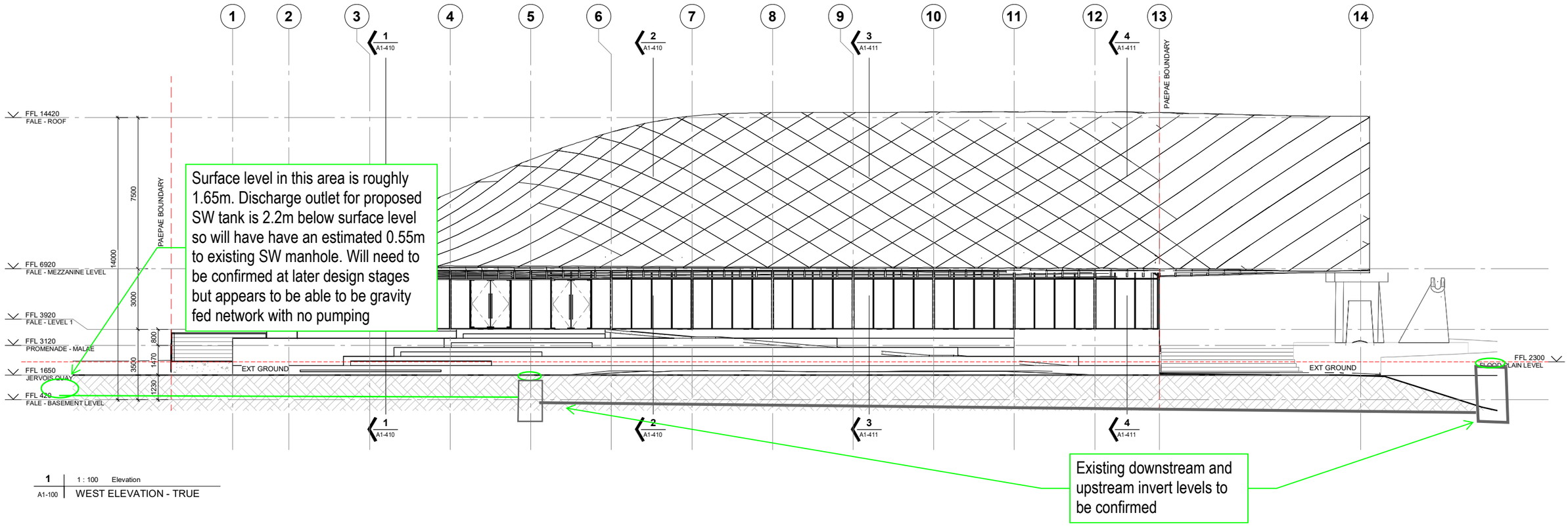
Drawing Number **A1-410** Revision **B**

RESERVED SPACE
COUNCIL
BC STAMP



1 | 1 : 100 Elevation
A1-100 | WEST ELEVATION - TRUE

60% PRELIMINARY DESIGN ISSUE

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Notes

Revisions

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Number: 221113
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WEST ELEVATION
SCALE @ A1= 1 : 100

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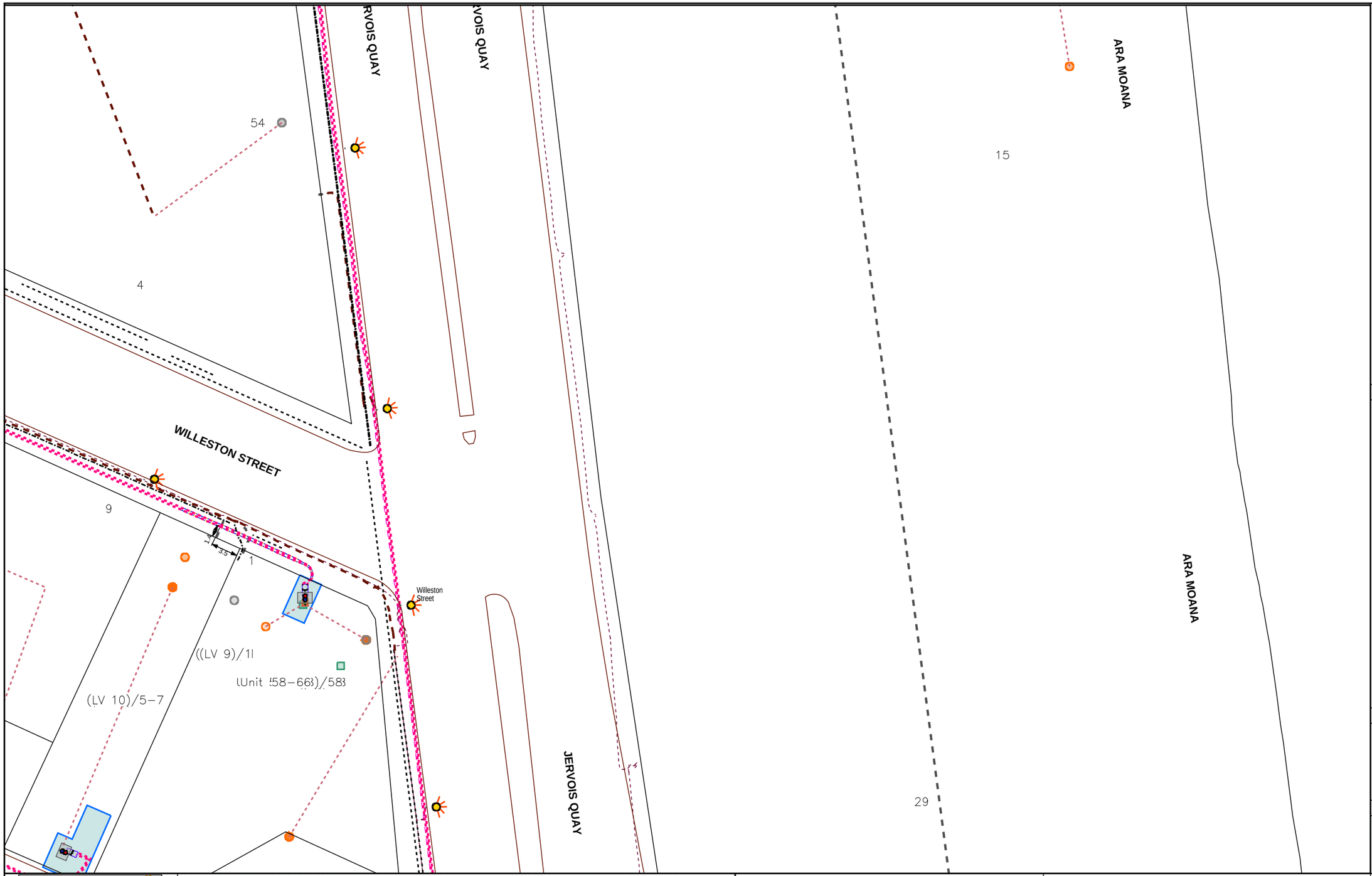
Drawing Number: A1-300
Revision: B

Appendix C Civil - Fale Malae BeforeUDig Combined Services



CABLE COLOUR CODE

CABLES IN USE

- 33,000 volt
- 11,000 volt
- 400 volt
- Public Light (Unsurveyed)
- Public Light (Surveyed)
- Auxiliary
- DC

CABLES NOT IN USE

- 33,000 volt
- 11,000 volt
- 400 volt
- Public Light
- Pilot / Fibre Optic
- DC

JOINTS & SEALING ENDS

- 33,000 volt
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- DC
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
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For underground service locations and obstruction plan requests call us on 0800 248 288. If you hit an electricity cable or overhead line call us immediately on 0800 248 148.
If you hit any gas pipeline call the Fire Service on 111.

Title: Jervois Quay	
Request Title:	
Company Name:	
Usage:	Request ID:
Request for:	Scale: 1:500
Customer Contact:	Printed by: extsias
Phone:	Date printed: 28/06/2022
Client Reference:	Page: of:

A3 ELECTRICITY OBSTRUCTION PLAN

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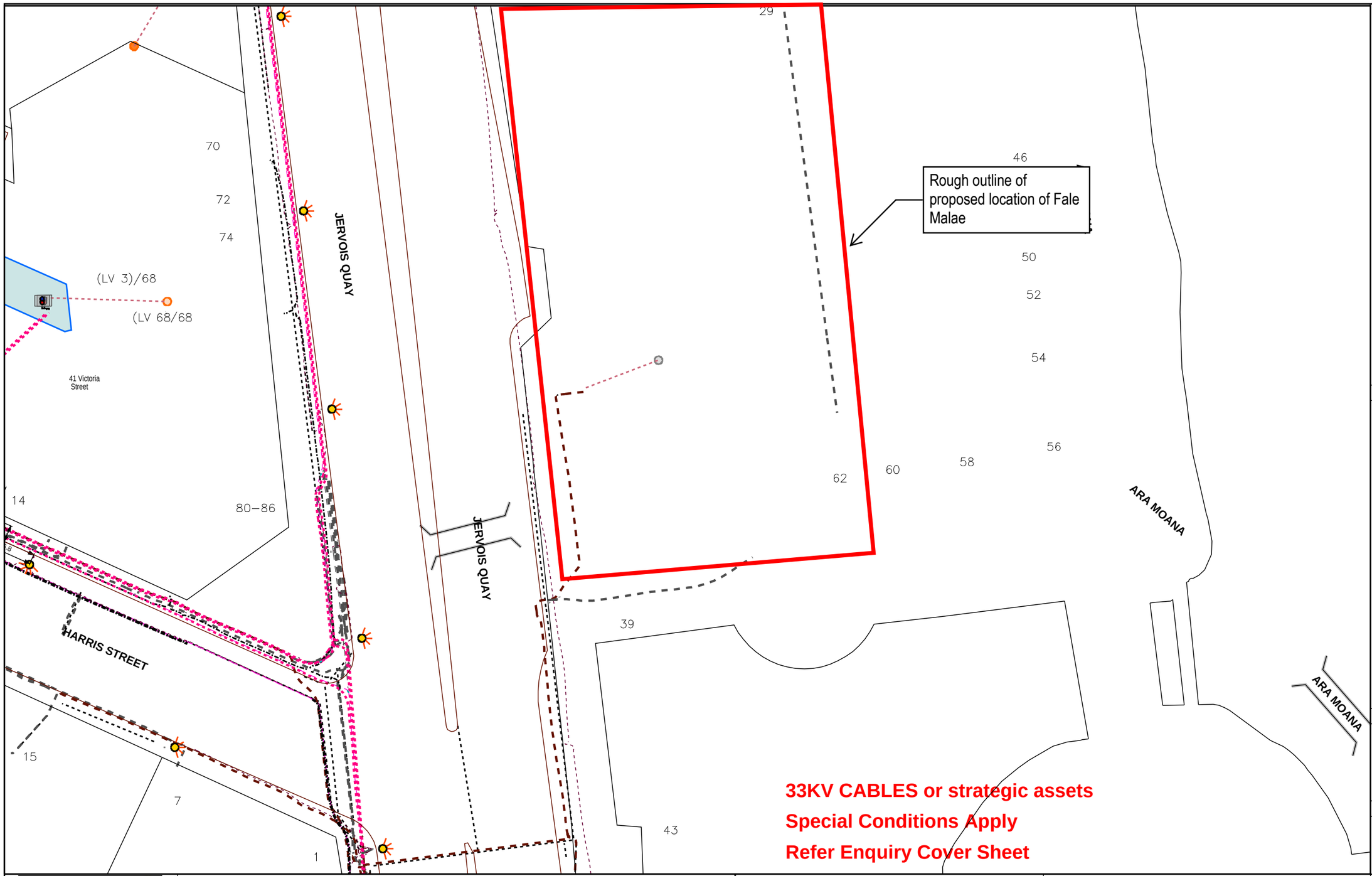

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- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
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33kV CABLES-SPECIAL CONDITIONS APPLY:33kV cables must be precisely located prior to excavation. Wellington Electricity offers a free location service that requires 2 working days notice.
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Title: Jervois Quay	
Request Title:	
Company Name:	
Usage:	Request ID:
Request for:	Scale: 1:500
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Client Reference:	Page: of:

A3 ELECTRICITY OBSTRUCTION PLAN

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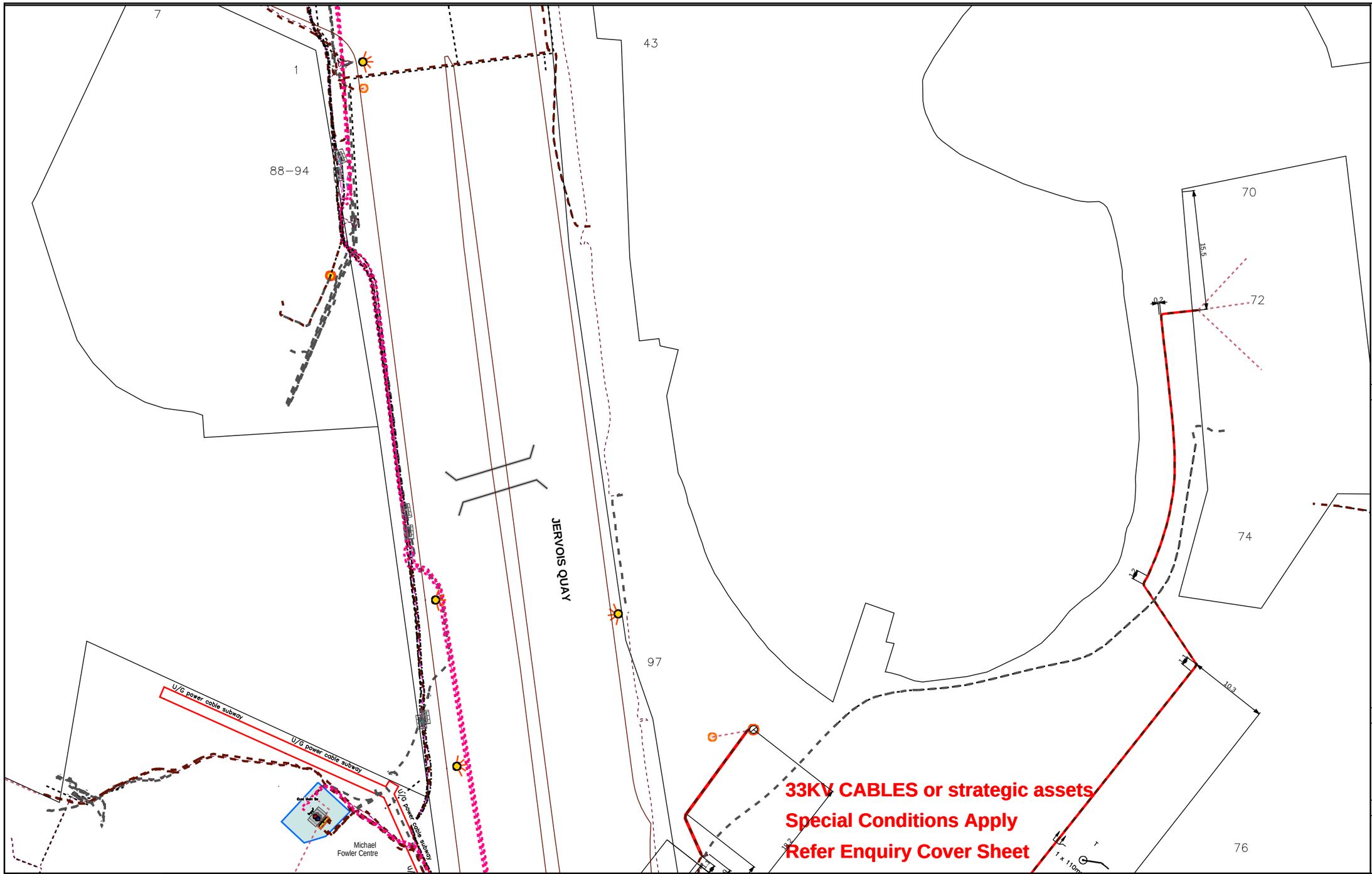

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- DRAIN
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- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

wellington electricity

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Request for:	Scale: 1:500
Customer Contact:	Printed by: extsias
Phone:	Date printed: 28/06/2022
Client Reference:	Page: of:

A3 ELECTRICITY OBSTRUCTION PLAN

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CHORUS

WARNING: Buried services are widespread and it should be assumed that they are present until it is proven otherwise.
Cables should be expected to be found at ANY depth. In most instances Chorus plans do NOT show house service feeds on private property.
Refer to cover letter provided with your request for additional information - use all plans provided in conjunction with each other
You are responsible for interpreting the information provided and should refer to Worksafe.govt.nz for the 'Guide for safety with underground services'
For assistance contact Chorus Network Protection on 0800 822 003 or if you suspect damage has occurred contact 0800 463 896 opt 2

N

Plan Name	BR55-3
Plan ID	167150
Version	GP
Current at	23/06/2022

DEL	CHKD	DATE	ISS	CHANGE
			1	
C J W		17.1.89	2	9/100mmP HARRIS ST
C J W	COL	22.7.91	3	9/100mmP KITTS PARK
FBL	FG	17.3.93	4	BR55/1 INST.
WBL	WBL	15.3.95	5	HARRIS ST RELINQUISH R29150 & PAD INSTL. 254
TNG	FGC	26.1.96	6	JERVOIS QUAY INST BR52/8: R2 BR55/1
BJD		15.6.98	7	25mmP SUB DUCT TO ROBERT JONES HSE.
APS		20.5.04	8	9/100mmP OVERLAID HARRIS ST
PMH		24.11.05	9	100mmP ADDED (TRNSFLD HNA509)
TRNSF		21.5.07	10	PRIORITY DUCTING (66140/30645)ALL
DWNR	RDN	05.09.11	11	LAY 1/50mmP,1/20mmP JERVOIS QUAY (84592)
TNG	DWNR	13.02.14	12	DUCT TEE 1 HARRIS ST UFB 20651.0007
KGH	DWNR	03.04.14	13	1/100mmP ADDED WILLESTON ST WN FFP925 (20651.0033)
JRR	UCG	10.07.20	14	50mmP & 20mmP ADDED 701 WAKEFIELD ST (27.3963)

DRAWN : A.G
CHKD : RGW
APPD : R T
DATE : 21.12.84

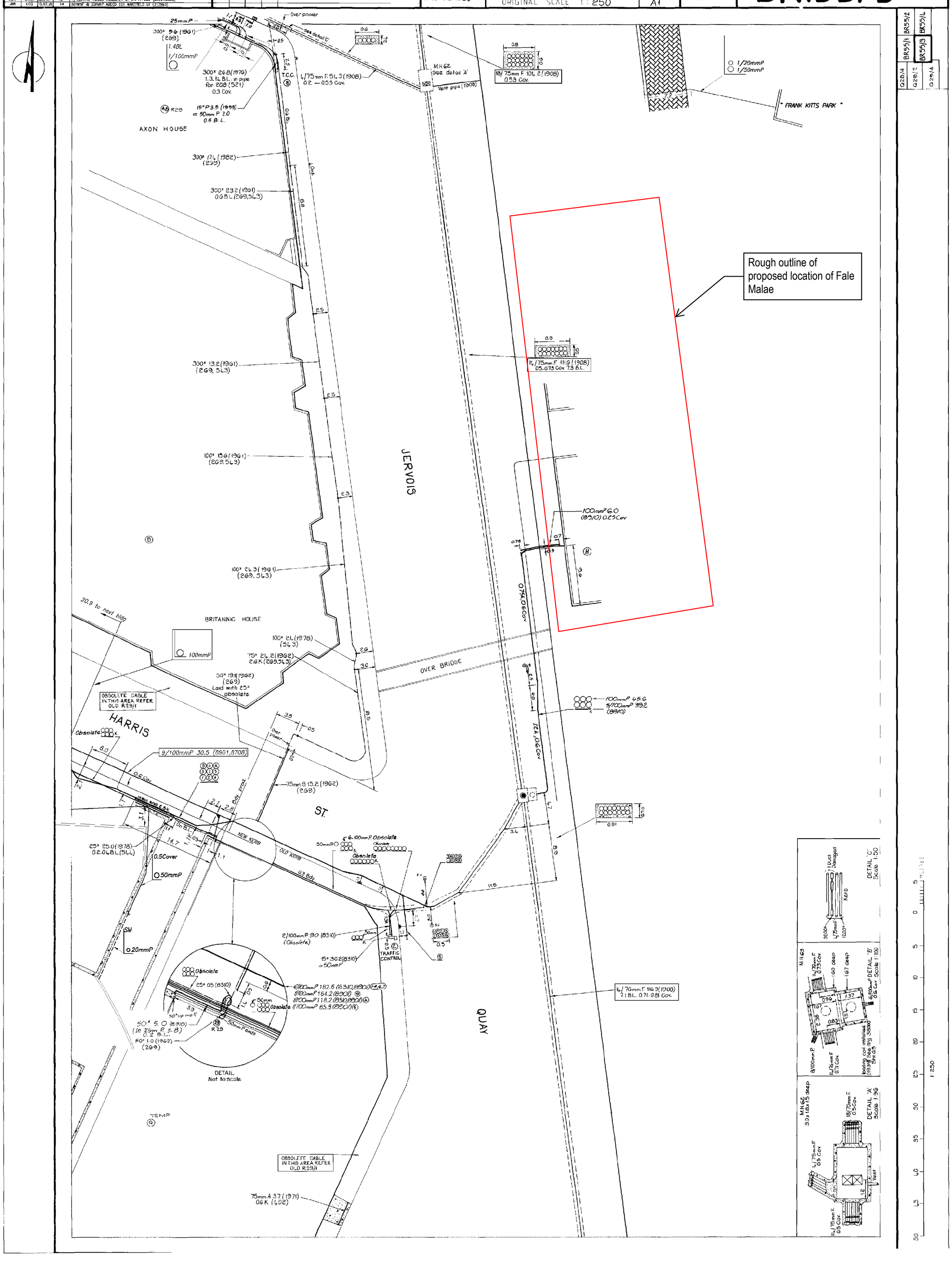
WELLINGTON
UNDERGROUND TELEPHONE CABLE SYSTEM

CAUTION
POSITIONAL MEASUREMENTS ARE SUBJECT TO REASONABLE TOLERANCE. COVER AT INSTALLATION WAS: ROADWAY 0.50m, FOOTWAY 0.35m. UNLESS SHOWN OTHERWISE. NOTE: COVER MAY HAVE CHANGED AND MUST BE CHECKED ON SITE.

ORIGINAL SCALE 1 : 250 A1

TELECOM DISTRICT MANAGER WELLINGTON

N2MG REF: R27-250/0.36.55
N2PO DRG. No: WN. L.0500
N2PO SHT. No: BR.55/3



Q28/4 BR55/1 Q29/12 BR55/2 BR55/3 BR55/4 Q29/4

CHORUS

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For assistance contact Chorus Network Protection on 0800 822 003 or if you suspect damage has occurred contact 0800 463 896 opt 2

N

Plan Name	BR55-1
Plan ID	167211
Version	GV
Current at	23/06/2022

BR. 55-1

03 AUG 1998

13 JUL 1999

22 JUN 1999

DEL	CHKD	DATE	ISS	CHANGE
			1	
BRW	[illegible]	6.8.99	2	50° TO POSTAL CENTRE ADD. CHEWS LANE
APS		20.2.04	29	9/100mmP OVERLAID HARRIS ST
HG		5.4.04	30	TL28/944 ADDED HARRIS ST GOODER H12/988
KGH	KGH	9.12.4	31	DUCT FORMATION CHANGES VICTORIA STREET (AREVA)
PMH		24.11.05	32	100mmP ADDED (TINSFLD HNA609)
EL		05.04.06	33	R28/0 HNC 9635
AM		22.4.07	34	BR55/3 REMOVED (86181 00156)
KGH	UC	16.07.07	35	100mmP's ADDED CHEWS LANE (TS7417)
AN		2.11.07	36	3/100mmP ADDED VICTORIA ST (86111 00115)
JHR		7.4.09	37	MH JHL158 AND TP47/261 ADDED 86107-00143
DWNR	DWNR	7.6.11	38	54 VICTORIA ST 100mmP (70708)
JD	DWNR	20/09/13	39	NEW DUCT TEE'S & MH ADDED ALONG CHEWS LANE & VICTORIA ST (20662.0011)
PD	DWNR	26.07.14	40	DUCT BREAKS ADDED (142778)

DEL	CHKD	DATE	ISS	CHANGE
AE	DWNR	23.03.16	41	50mmP & F-AB724 ADDED 15 HARRIS STREET (JT183692)
YUTH	DWNR	7.04.18	42	REMOVED TL28/944 AND BR55/P (224710)
JDR	UCC	10.07.20	43	50mmP ADDED 101 WAKEFIELD ST (273863)
PN	PMC	15.6.93	.B	VICTORIA ST: INST BR55/4 in T.C.C.
PN	PMC	19.8.93	.C	CHEWS LANE: lay 8/100mmP Ass
BJD	RGC	12.4.94	21	2/100mm P T&S DIVERTED INTO MH 392
BJD		3.6.99	22	100mm P DUCT DIVERSION 20 29 INTO BNZ
BJD	RGC	4.6.99	23	SUB DUCT INTO WILLBANK HSE VICTORIA ST.
WS		5.7.99	24	BR.LADDER BATTERY T/NB
WS		13.11.03	25	BR55/4 SHIFTED GOODER H11/209
BRW		13.11.03	26	FIBRE PRIORITY BOXES ADDED VICTORIA ST (237387)
APS		4.12.03	27	FIBRE PRIORITY BOXES ADDED HARRIS ST
APS		22.1.04	28	100mm LAID ACROSS RD FROM MH74. CABLES OVERLAID

DRAWN : AG
CHKD : BRW
APPD : RT
DATE : 5.2.85

WELLINGTON
UNDERGROUND TELEPHONE CABLE SYSTEM

CAUTION
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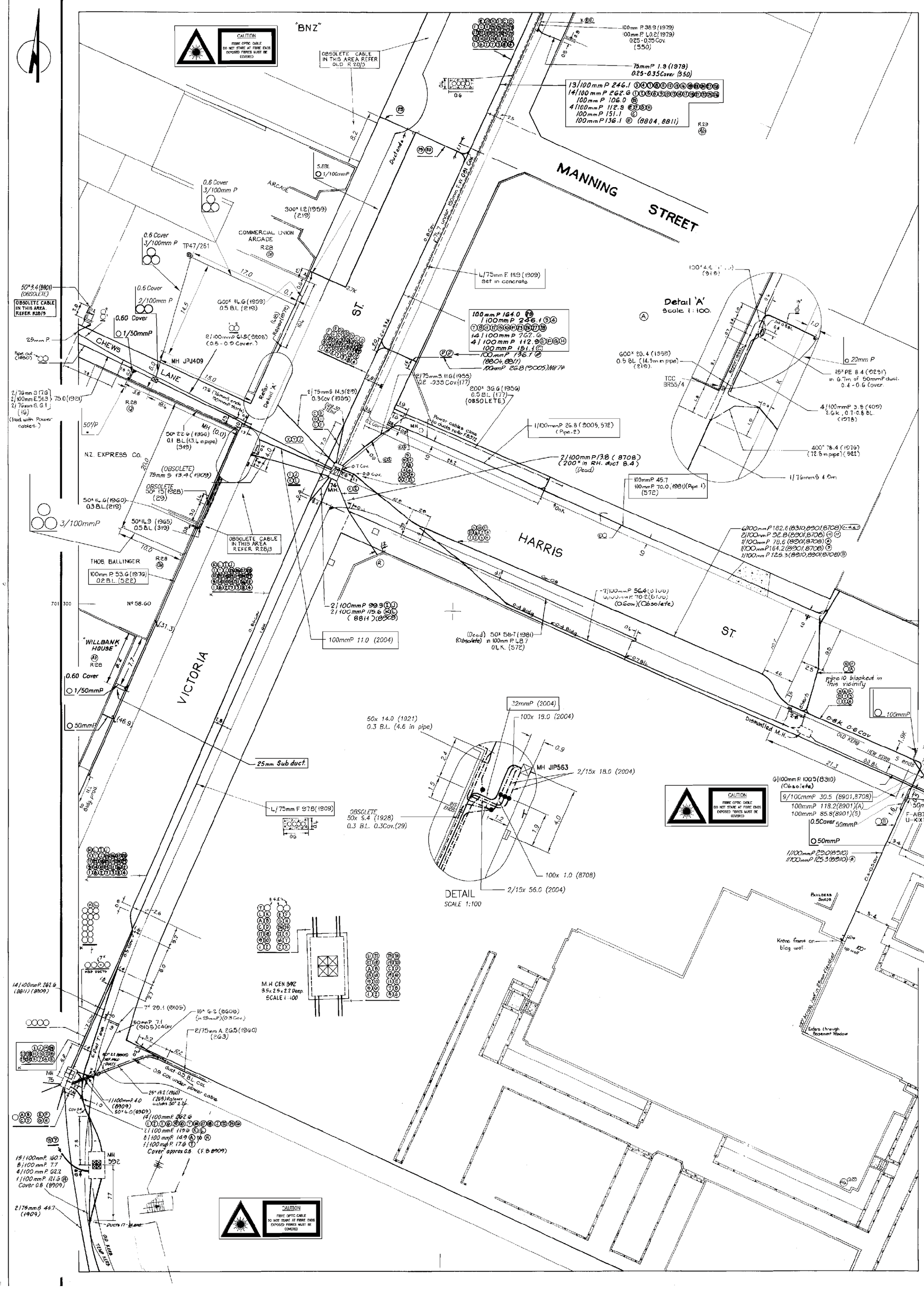
ORIGINAL SCALE 1:250 A1

TELECOM DISTRICT MANAGER WELLINGTON

NZMG REF: R27-250/036.55
NZPO DRG. No: WN. 40500
NZPO SHT. No: BR.55/1

Q28/2	BQ55/3	BQ55/4	
Q28/4	BR55/1	BR55/2	
	Q29/2	BR55/3	BR55/4
	Q29/4		



CHORUS

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In most instances Chorus plans do NOT show house service feeds on private property.
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For assistance contact Chorus Network Protection on 0800 822 003 or if you suspect damage has occurred contact 0800 463 896 opt 2

N

Plan Name	Gold
Plan ID	
Version	
Current at	23/06/2022

CHORUS

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N

Plan Name	Gold
Plan ID	
Version	
Current at	23/06/2022

CHORUS

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N

Plan Name	Gold
Plan ID	
Version	
Current at	23/06/2022

CHORUS

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Plan Name	BR55-2
Plan ID	305030
Version	AS
Current at	23/06/2022

DEL	CHKD	DATE	ISS	CHANGE
BJD		17.12.99	28	DUCT DIVERSION WILLESTON ST
BJD		23.3.01	29	TRENCH DETAILS CHANGED LAMBTON QUAY
PJC		5.7.01	30	MICRO CELL CABINET ADDED VICTORIA/WILLESTON
15		9.7.01	31	GASSEN ADDED GOODER 92/426
BRW		22.10.03	32	PRIORITY BOXES ADDED CUSTOMHOUSE, LAMBTON QY'S, WILLIS ST
BRW		1.11.03	33	PRIORITY BOXES ADDED WILLESTON & VICTORIA ST'S (237387)
APS		15.12.03	34	FIBRE PRIORITY BOX ADDED HUNTER ST
APS		11.3.04	35	MH381 AND 2/100mmP REMOVED
KGH	GOODER	9.12.04	36	DUCT FORMATION CHANGES VICTORIA St (AREVA)
APS	DOWNER	17.12.4	37	DUCT "C" BROKEN ADDED HUNTER ST
PMH		17.10.06	38	PRIORITY BOX ADDED WN0133
KGH	UG	17.03.08	39	PRIORITY BOXES ADDED CUSTOMHOUSE QUAY (DOWNER)
APS	DWNR	21.5.13	40	MH JOD701 & JPJ006 ADDED CUSTOMHOUSE QUAY (20662.0011)
JG	DWNR	20/6/13	41	NEW MH JOD721 ADDED ALONG WILLISTON ST. (20662.0011)

DEL	CHKD	DATE	ISS	CHANGE
GT	DWNR	18.12.13	42	DUCT BREAK LAMBTON QUAY (140851)
PD	DWNR	26.03.14	43	DUCT BREAK ADDED 99 CUSTOM-HOUSE QUAY (JT142123)
KGH	DWNR	01.04.14	44	DUCT TEES ADDED CUSTOMHOUSE QUAY & VICTORIA ST WN FFP925 (20661.0035)
SRL	DOWNER	30.05.22	45	F-ACV931 REPOSITIONED 11 VICTORIA STREET (280015)

DRAWN : AG
CHKD : BRW
APPR : RT
DATE : 14.12.84

WELLINGTON
UNDERGROUND TELEPHONE CABLE SYSTEM

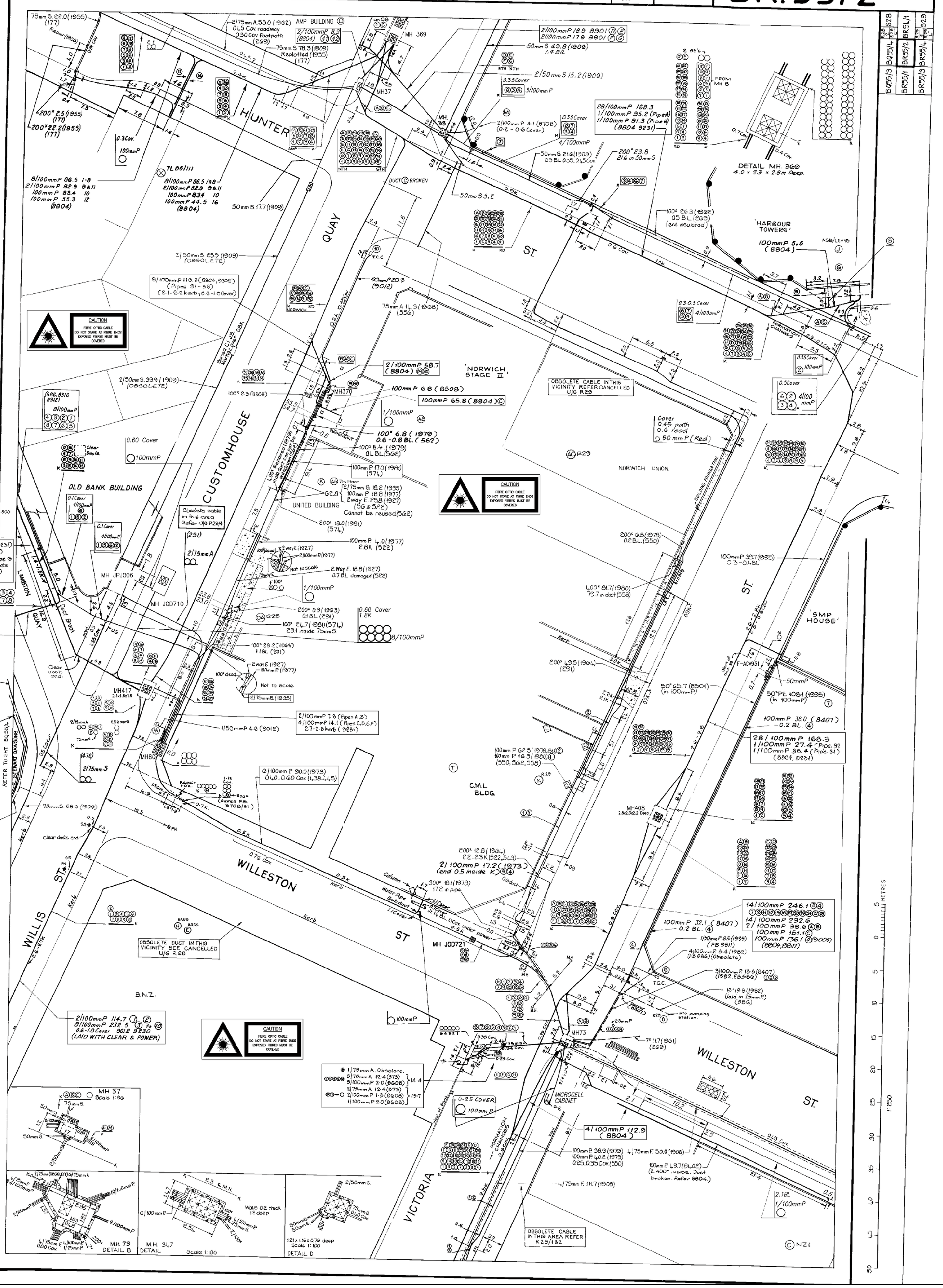
CAUTION
POSITIONAL MEASUREMENTS ARE SUBJECT TO REASONABLE TOLERANCE. COVER AT INSTALLATION WAS: ROADWAY 0.90m - FOOTWAY 0.35m - UNLESS SHOWN OTHERWISE. NOTE: COVER MAY HAVE CHANGED AND MUST BE CHECKED ON SITE.

ORIGINAL SCALE 1:250 A1

TELECOM DISTRICT MANAGER WELLINGTON

NZMG REF: R 27-250/030.55
NZPO DRG. No: WN. 40500
NZPO SHT. No: BR.55/2

BQ55/3	BQ55/4	BR55/1
BR55/2	BR55/3	BR55/4
BR55/5	BR55/6	BR55/7



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CHORUS

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N

Plan Name	BN53
Plan ID	264653
Version	HO
Current at	23/06/2022

DEL	CHKD	DATE	ISS	CHANGE
GOODER	KGH	31.03.03	1	TRANSFERRED FROM AM/FM
PMH		08.12.06	2	2/100mmP ADDED HNA 2020
AN		16.04.07	3	50mmP ADDED (86181 00106)
KGH	DWNR	02.11.15	4	UFB WN FFP106 ADDED (20766.0401)
CHENG	DWNR	12.11.15	5	UFB WN FFP228 ADDED
NC	DWNR	25.08.16	6	ADDED 50mm DUCT GOING TO 342 TINAKORI RD (198341)
EVE	DWNR	27.08.16	7	ADDED 50mmP EASDALE ST (187757)
BC	UCG	12.07.17	8	AERIAL FEED TO F-AXX567 ADDED #4 EASDALE ST (25966)
WDI	VS	08.05.18	9	DROP EXTENDED FROM POLE #100 BOLTON ST (VS5686833)
TMG	DWNR	7.8.19	10	12 EASDALE ST ADD HANDHOLD JT238275

DEL	CHKD	DATE	ISS	CHANGE

WELLINGTON

UNDERGROUND TELEPHONE CABLE SYSTEM

CAUTION

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ORIGINAL SCALE: 1:2000 A1

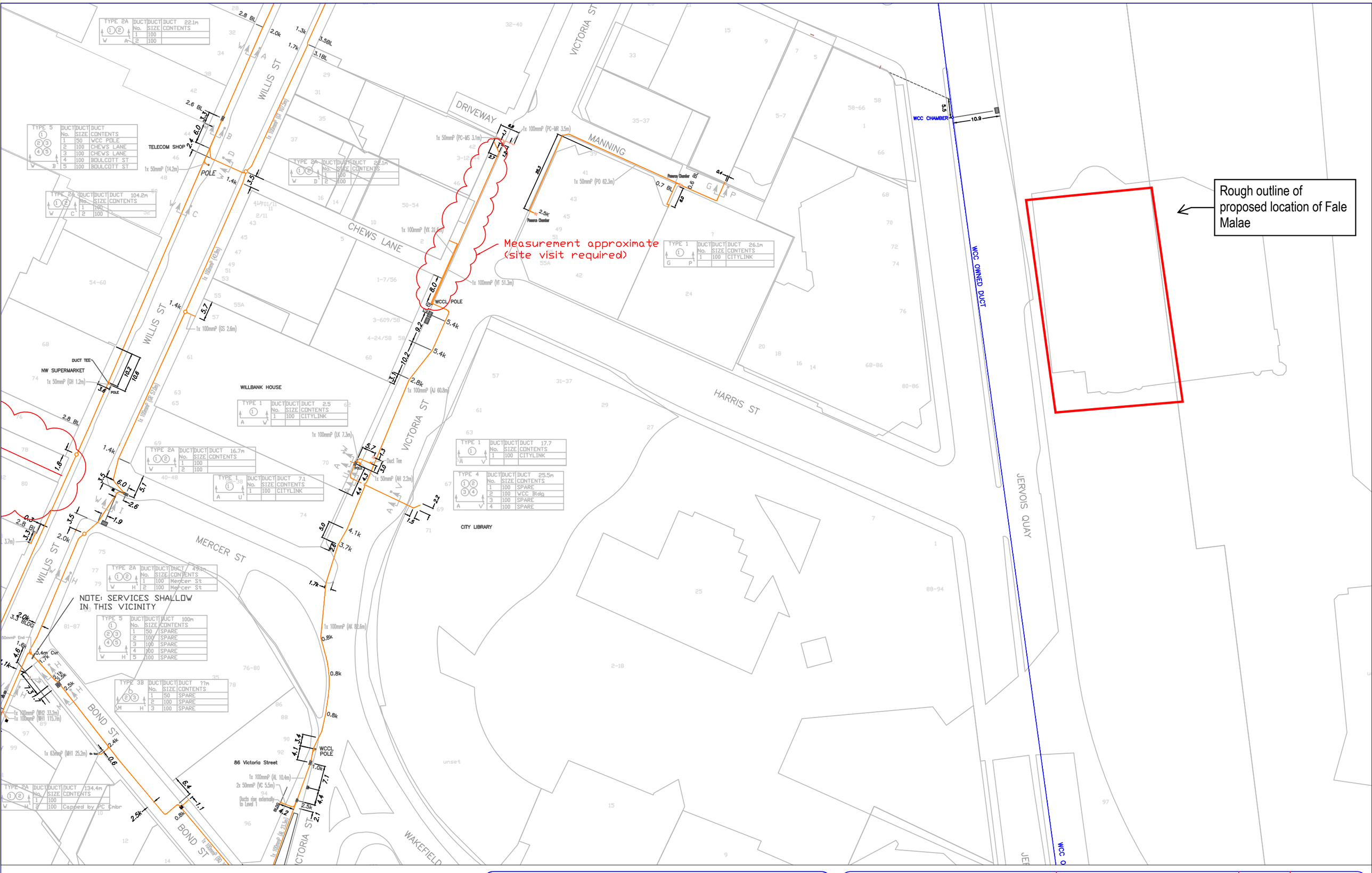
TELECOM CORPORATION OF NEW ZEALAND LTD.

NZMG REF:

R27-20

TCNZ SHT. No.

BN53



THESE PLANS ARE VALID FOR 3 MONTHS FROM THE DATE ON THIS PLAN AND ARE SUBJECT TO THE ACCOMPANYING "VITAL DAT LTD. SERVICE PLANS TERMS AND CONDITIONS"

CAUTION

POSITIONAL MEASUREMENTS ARE SUBJECT TO REASONABLE TOLERANCE. COVER AT INSTALLATION WAS : ROADWAY 0.5m FOOTWAY 0.35m UNLESS SHOWN OTHERWISE. NOTE : COVER MAY HAVE CHANGED AND MUST BE CHECKED ON SITE.

Vital

ORIGINAL SCALE:	ISSUE	ORIG. SIZE
FILE:		A3
DATE	NUMBER	SHEET
23.06.2022	Jervois Quay	1

Jervois Quay Wellington Central

June 23, 2022
Nova Energy Map Viewer
Copyright © 2012 Nova Energy

0 20 40 80 m

1:1,128
(Scale dependent on A3 printout)

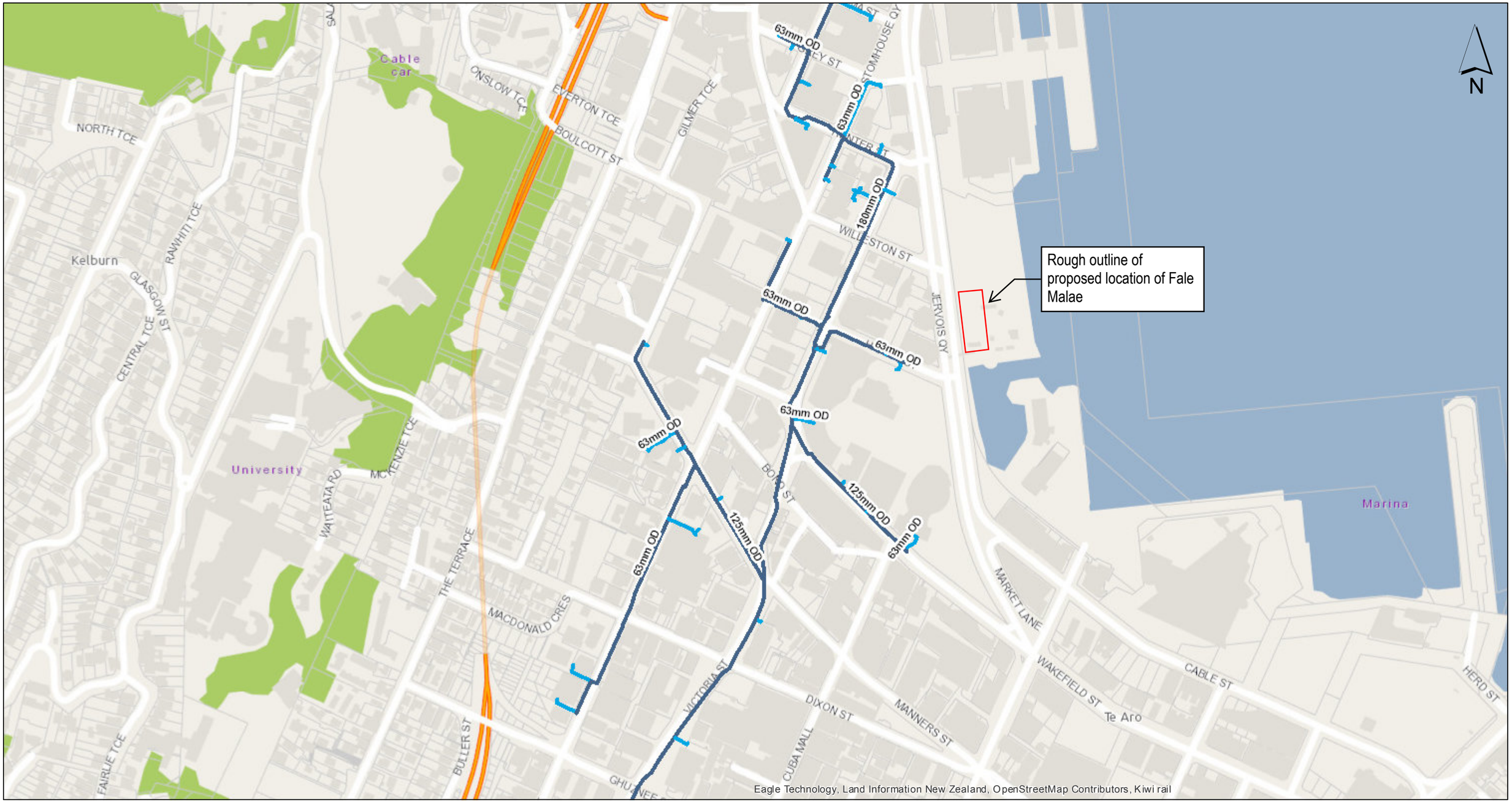
Valve — MAIN — SERVICE — Crossing
BYPASS — FUTURE — Connector

The information displayed has been taken from the Nova Energy databases. It is made available in good faith but its accuracy or completeness is not guaranteed. Other data has been compiled from a variety of sources and its accuracy may vary. All works in the vicinity of Nova Energy pipelines require a Works Agreement Form. Powerco/Vector may have assets in this area and should be contacted.

|p| 04 232 3795 **|m|** 027 837 6920 **|e|** plans@novaenergy.co.nz **|a|** Unit 1, 98 Main Rd, Tawa, PO Box 10 141, Wellington 6143 **|w|** www.novaenergy.co.nz

24 Hr Emergency No. 0800 NOVA 111 (0800 668 211)

Jervois Quay Wellington Central



June 23, 2022

Nova Energy Map Viewer

Copyright © 2012 Nova Energy

0 80 160 320 m

1:4,513

(Scale dependent on A3 printout)

Crossing Pipe — MAIN — SERVICE — BYPASS — FUTURE — Pipe Abandoned

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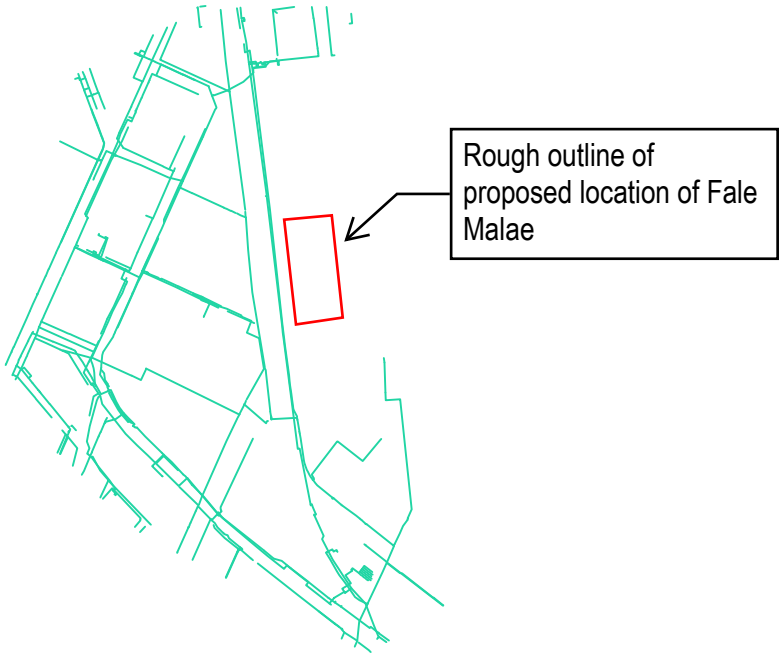
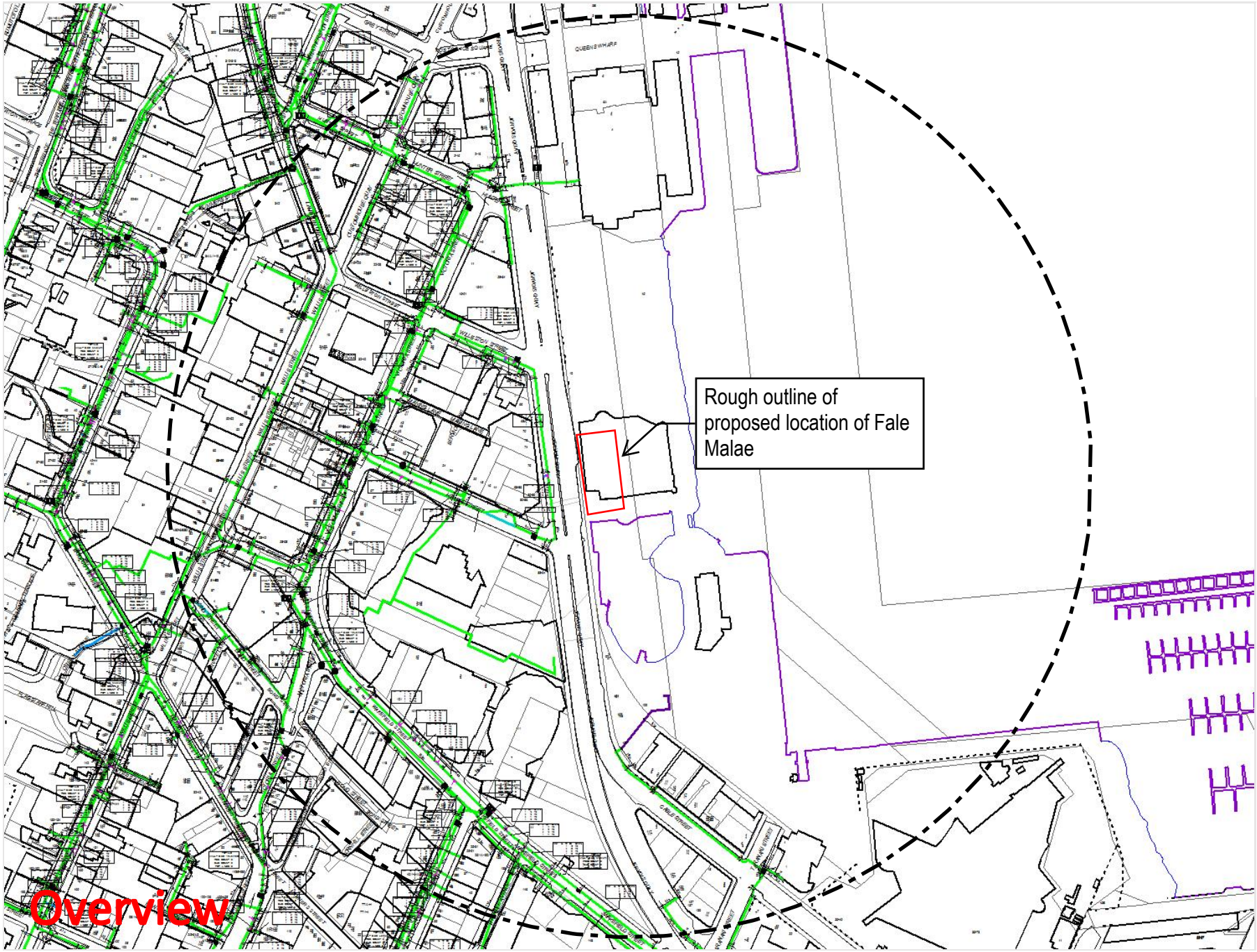
24 Hr Emergency No. 0800 NOVA 111 (0800 668 211)

Powerco's BeforeUDig information was supplied by a CAD drawing. Snapshot of Powerco's CAD file of gas main.

This drawing showed there are gas mains in the vicinity of the Fale Malae to be considered.



Sequence No: 10444969
Job No: 2044636
Location: Jervois Quay, Wellington Central, 6011



Legend

- Existing Vodafone network cables, marked as:
  - "Vodafone"
  - "ex Clear"
  - "ex Saturn, ex TelstraSaturn"
  - "ex TelstraClear or TCL"
- Proposed, or 'as stated'
- Infrastructure owned by others

Abbreviations Key

ES/EOS	Edge of Seal
PP	Power Pole: Circle with line centre line
F/L	Fence line: Yellow line with dashed black line

N

Scale: 1:3928
Expires: 20 Jul 2022

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Vodafone NZ Ltd nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

Document prepared by

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