

TE MANAWATAKI O TE PAPA PRELIMINARY DESIGN AND COST REPORT

7 DECEMBER 2022





WILLIS BOND

CONTENTS

1	Executive summary
2	Masterplan progression
3	Precinct
4	Mana whenua engagement
5	Library and Community Hub
6	Civic Whare, Exhibition and Museum (CWEM)
7	Site A landscaping
8	Masonic Park
9	Willow Street
10	Baycourt
11	Art Gallery
12	Sustainability
13	Programme update
14	Cost overview
15	Risks

03
04
06
07
10
20
34
38
40
43
45
46
47
50
54

EXECUTIVE SUMMARY

Willis Bond, in partnership with Tauranga City Council (TCC), is pleased to present the Te Manawataki o Te Papa Design and Cost update report 28 November 2022.

Following the issue of the May 2022 Enhanced Costing Report, the architectural, engineering, sustainability and contractor teams have been working closely with key stakeholders to progress design across the Te Manawataki o Te Papa precinct. Input has been received from mana whenua, council steering groups, subject matter experts and end users to curate a precinct that is consistent with the masterplan adopted by TCC in May 2022 that the city will be proud of and should revitalise the CBD.

The Enhanced Costing Report delivered in May 2022 presented a precinct-wide cost of \$303.4 million. Following report issuance, the Strand and waterfront areas with an allocated budget of \$32.9m have been moved to a separate project. As such, the designs and costings presented reflect the redefined scope from the eastern edge of Masonic Park to the Durham Street eastern curb edge with an adjusted TCC-approved cost of \$270.5m

The May 2022 report presented several enhancement options in addition to the base design. A number of enhancements were adopted by TCC, including mass timber buildings with a targeted 6 Green Star sustainability rating, premium façade finishings and a canopy along the southern edge of Masonic Park.

The focus of our study was therefore to identify savings within the precinct in order to afford the Council approved enhancements.

DESIGN PROCESS

Sustainability is at the forefront of design progression. The Library and Community Hub, and Civic Whare, Exhibition and Museum (CWEM) buildings are targeting 6 Green Star, a rating reflecting world leadership in sustainability. The precinct buildings are also aiming for WELL certification. To achieve these aspirations, both have adopted a mass timber hybrid structure for both buildings. The use of timber in construction has very low embedded carbon and plays a key role in creating a better built environment for our future.

Mana whenua consultation and input has shaped the site-wide cultural narrative, with multiple in-person workshops held to inform this report. The cultural advisory group will advise on the design of key cultural elements across the precinct as design progresses.

Different areas are at different stages of design based on the assumed programme. Masonic Park has been progressed through preliminary design and is currently in developed design. Preliminary design has been completed on the Library and Community Hub building, with the CWEM and Site A landscaping part way through preliminary design (to be completed February 2023).

PROGRAMME

Since the May 2022 enhanced costing report there have been changes made to the programme across the precinct. Due to the relatively low complexity of the landscaping area in Masonic Park and aspirations to accelerate construction where possible, this has been accelerated to commence construction in mid-2023.

Further investigation into the ground conditions under the CWEM building has seen the previously assumed 12-month settlement period removed. This allows the CWEM building to potentially commence construction mid-2024. The main contractor will continue to review this assumption against market capacity.

Item	Completion date	Total cost (millions)	GFA (sqm)
Site A establishment hoardings, earthworks & HV transformer	2024	\$7.00 m	
Durham Street footpath	2024	\$0.15 m	
Masonic Park	2024	\$9.00 m	
Art Gallery	2024	\$1.50 m	
Library and Community Hub	2025	\$91.50 m	5,613
Wharf Street footpath	2025	\$1.55 m	
Baycourt	2025	\$11.00 m	
Willow Street	2025	\$8.30 m	
Site A lanscaping	2026-27	\$17.25m	
Exhibition + Museum	2027	\$110.55 m	5,790
Civic Whare	2027	\$15.50 m	581
Hamilton Street Footpath	2027	\$1.65 m	
Total		\$274.95 m	

Task Name	Start	Finish	2023	2024	2
PROGRAMME	MAY-22	JAN-27			
SITEWORKS	Oct-23	Apr-24			
LIBRARY	Apr-22	Nov-25			
CWEM	Jul-22	Jan-27			
WILLOW ST	Oct-25	Jan-27			
MASONIC PARK	Jul-23	Jun-24			
BAYCOURT	Jan-25	Dec-25			
ART GALLERY	Nov-23	Jul-24			



Preliminary Design and Cost Report, December 2022

2. MASTERPLAN PROGRESSION

The masterplan design has progressed in line with adopted enhancements, Council and stakeholder feedback and onhoing engineering investigations. There has been focus on the integration of buildings and site-wide landscape levels throughout this process.

TE MANAWATAKI O TE PAPA PRELIMINARY DESIGN SCOPE

The area considered in the preliminary design scope is outlined below (orange) and is referred to (and costed) as 'Site A'. Since the enhanced costings pack, 'Site C' (Strand and Waterfront) has been removed from the Willis Bond scope.

TAURANGA CIVIC MASTERPLAN (NOV 2022)



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2. MASTERPLAN PROGRESSION COMPARISON

TAURANGA CIVIC MASTERPLAN (MAY 2022)



PRECINCT

The Te Manawataki o Te Papa precinct is envisaged to operate as a campus that shares spaces and works together. The buildings within the precinct will share certain design elements to articulate clear wayfinding and create a sense of place.

MASTERPLAN CONTEXT

The Te Manawataki o Te Papa masterplan draws on the key concepts of Wai (water), from puna (spring) to moana (sea). The activity of people is also fundamental to this civic space. Both of these concepts weave together to form a cohesive and robust conceptual basis for all aspects of the precinct.

BUILDING ARCHITECTURE

The Library and Community Hub and CWEM buildings are being designed by separate architects who are each working to a single masterplan concept, collaboratively progressing elements of the buildings that speak to each other. The vision is the buildings will be related, but not identical.

Across the precinct will be clear wayfinding, particularly within the through-site link that connects both buildings and the landscape to the wider city. We envisage an entrance design that is similar across both buildings including the use of similar patterns or colours.

LANDSCAPING

The landscape architects have worked collaboratively to develop a paving and planting strategy across the site which talks to the wider city and other projects TCC is undertaking. The planting palette will primarily be a mix of native and exotic species to provide changes in colour and texture through the seasons. The paving will feature a mix of aggregate concrete and pavers (natural stone).

SUSTAINABILITY

One of the key changes across the precinct since the last costing update is the inclusion of mass timber structures. The Library and Community Hub and CWEM buildings are both targeting a 6 Green Star rating along with WELL certification.

To achieve these aspirations, both buildings have adopted a mass timber hybrid structure featuring a mix of cross laminated timber (CLT) and traditional steel and concrete methodologies. The use of timber in construction has very low embedded carbon, is in alignment with all 17 of the UN Sustainable Development Goals and has a key role in creating a better built environment for our future.

SITE CONNECTIVITY

The site has a main pedestrian route east to west, along with the through site line north to south.

The buildings are designed to interrelate to each other, with key connections reflected below. The Civic Whare sits in the metaphorical heart of the precinct.

Masterplan Concept



Ngāhere (forest)

Puna (spring)



Wai (water)

Landing







MANA WHENUA ENGAGEMENT

The last few months have seen the Design Teams work in collaboration with mana whenua to develop a series of cultural design outcomes which feature across the Civic Precinct.

PRELIMINARY DESIGN ENGAGEMENT

Throughout the preliminary design process, TCC has led the engagement process with mana whenua. Warren and Mahoney (WaM) were engaged as the cultural advisor for the site-wide cultural design development. In collaboration with mana whenua and TCC, WaM prepared a narrative and guideline for the design process. Members from each design team attended multiple in person workshops throughout the PD phase with Mana Whenua. Te Kahui Toi will lead the design of key cultural elements across the precinct as design progresses.

DEVELOPED CIVIC WHARE BUILDING FORM

The current Civic Whare design is an evolution of Studio Pacific Architecture (SPA)'s original concept. The main evolution is the footprint changing from a rectangular to an elliptical shape and the gabled form roof changing to a curved portal. This is to reflect the various ipu (or vessels) which have been discussed with mana whenua. The evolved building features two oculi. The building features a green roof, as well as key internal spaces such as the Ātea a Tū and Ātea a Rongo.

Mana whenua have highlighted the importance of providing a visual connection from the Civic Whare through to the moana (ocean). For this reason, the Civic Whare's main building frontage (and external courtyard) is directly oriented towards the waterfront.

A water feature sits directly outside the Civic Whare. This design outcome speaks to the concept of 'Te Mana o te Wai', the significance of water. The water feature will include a manea stone to be touched and interacted with by visitors.

To the south of the Civic Whare is a waharoa, where prospective manuhiri (guests) may be formally welcomed onto the Civic Whare site. This waharoa is currently realised as two pou whenua, which are located to the south of the external courtyard.

LIBRARY AND COMMUNITY HUB

Te Manawataki o Te Papa Library and Community Hub embodies three key conceptual drivers that nurture, protect and celebrate the people of Tauranga through activities of learning, connecting and relaxing. Site wide narratives speak of wai and a process of shaping the whenua, as it flows through the site towards to the moana. The Library and Community Hub sit within the landscape as a place of safety and sustenance, its edges informed by the flow of water around and through it. As a reference to past and present occupation of the site (Ahi Kaa), a metophical home fire sits in the heart of the building.

A gesture of warmth and gathering, this fire underpins the organisational, material, and wayfinding strategies throughout the spaces. Themes of growth and nurturing are reflected in the building's skin, external appearance and interior activities. The concept of Paparanga Ngahere is manifest both externally in facade patterns and colours, as well as internally through variance in spatial and light qualities. The building and its spaces are an abstract representation of the forest's many layers.

EXHIBITION AND MUSEUM

The exhibition and museum building forms are conceptually reflective of Māori vessels used to store precious belongings, with the buildings suspended in floating volumes above the landscape. The vessel forms step with the geometry to respond to the natural topography of the site. The support and circulation spaces sit below the vessels and either read as solid forms cut into the landscape or are glazed to allow the landscape to flow in.

The atea and Community space acts as a living room for the city, at the heart of the civic precinct. An evolution of the traditional or colonial 'museum grand foyer', the primary entrance is translated to a dual indoor and outdoor space connected with nature, humble, welcoming, and inclusive of all.

A range of cladding design options are being explored to reflect a woven visual language that is loosely suggestive of kete. The materials proposed for the building (such as terracotta) have natural origins, low carbon emissions, or are made up of highly recycled material to support the good stewardship of the land the project sits on.

WIDER LANDSCAPE DESIGN DEVELOPMENT

There are several water features that are located across the precinct, reflecting historical springs in the area and the significance of wai to the precinct.

POU WHENUA

There are several pou whenua located across the precinct, one will pass through several thresholds (or conceptual waharoa) as they journey from the waterfront through to the Civic Whare. The first of these thresholds is located near the eastern boundary of Masonic Park. The next conceptual waharoa is located between the CWEM, Library and Te Kahui Toi.

NEXT STEPS

As we progress through developed and detailed design, continual mana whenua engagement will take place, including involvement of Te Kahui Toi. Specific design elements of the buildings and or landscape (such as the thresholds at the site entrance) will be assigned to Te Kahui Toi who will design these features directly in conjunction with the architects.



Community Hub buildings, with a final waharoa at the southern entrance to the atea. These will be a combination of contemporary and more traditional structures, with design to be progressed with

Proposed ātea design

4. MANA WHENUA ENGAGEMENT SITE WIDE CULTURAL STRATEGY

The coordinated site-wide cultural strategy, or 'plan on a page', was created from the engagement process as the briefing document to guide design.

Design teams presented back the design progress at mid-phase and end of phase workshops to ensure mana whenua were integrated into the journey. This is a template to set the overall narrative and general themes of Te Manawataki o Te Papa.

The cultural strategy showcases how we have arrived at a collective cultural vision with mana whenua (framed on the 4 pillars of Te Papa) and how we have turned the shared vision into a design strategy. The key idea to explore is weaving, concepts about tauhere (bind our hearts with ties of love), rangitāmiro (twisting the fibres together for strength), and paihere (unity). Enabling references to the metaphors of weaving and what we can achieve as design outputs with descriptors such as - rhythm, bindings, pūriri roots and branches, veil, filtering and permeability.











8

4. MANA WHENUA ENGAGEMENT - PLAN ON A PAGE

NGĀ MUKA I THE FIBRES The beating heart of Te Papa

MAI KI UTA KI TAI | FROM LAND TO SEA

TEPAPA KAINGAOTE IWI CONTINUOUS OCCUPATION Physical/ mental/ spiritual/ family wellbeing, understanding, education, protocols, hosting visitors

TE PAPA MANAWA WHENUA LIFE CYCLE OF WATER The inherent connection we have with water and its high importance as an esteemed treasure

TE PAPA HOU KURA

PROSPEROUS AND SUSTAINING The value and wellbeing of the environment, custodianship, and responsibility to care



KIA RANGITĂMIROTIA NGĂWEU O TE TAUHERE | LET THE FIBRES OF THE ROPE TWIST TOGETHER

MANIFEST CULTURAL INCLUSIVITY

The site-wide plan should ensure that mana whenua can see themselves in the precinct and enable mana whenua and their role as kaitiaki of Te Papa. The plan should provide an experience and narrative relevant to Tauranga Moana, its communities and its visitors.

ECONOMIES OF MANA

The plan should create an optimal visitor environment and experience. The visitor experience should be infomative, educational, sensorial and ensure frequent return visits. The Masterplan is to optimise the arrangement of the core threads of the Te Manawataki o Te Papa - Cultural and Community Hub, Civic Whare, Landscape and public amenity (preserve, interpret, display) but also adapt and broaden its spatial and technological framework for future needs.

To become 'culturally aligned' in our site-wide approach that brings 'our sense of place and our sense of process, together. Here we have provided unifying ideas on which we build a series of insights:

		ĀPITI HONO TĀTAI HONO BIN	DING TOGETHER	
Ö TĀTOU TAONGA TUKU IHO OUR TAONGA + OUR ECO-SYSTEM Celebrating the culture, spirit and place of Te Papa - that is celebrating and integrating features of water resource (wai + whenua).	Ö TĀTOU ARA MĪHARO OUR WAYS OF INNOVATION A development of this scale is able to continue the urban development of Tauranga contributing to the urban character of the city and improving the quality of citizens lives in the process. A 'fully connected precinct' will be one that provides an excellent range of urban spaces, clear and legible entry sequence and high levels of comfort, security and protection.	Ö TĀTOU HONONGA OUR PLACE OF CONNECTION The Civic Whare is the precinct's iho and the space for hononga relationships to develop. Through our various design wānanga with Tangata Whenua and TCC, core spaces such as the Atea a Tu a Rongo and the Gathering Space have been considered in scale, without compromising the general tikanga which has been shared in previous wananga.	Ö TĀTOU AHUATANGA KATOA OUR COLLECTIVE IDENTITY + OUR COLLECTIVE PRESENCE Generating experiences + procession through the site and place - telling the deep story of place and connecting with the unique characteristics of our community.	Ō TĀTOU AHUREA OUR ORI CULTURI Connecting natural envir the story of anchorage of where they of interface an story-telling
	PLACE			
			PEOPLE	
				PAS
Provision of wharewaka at waterfront	Passive/natural ventilation stack effect 	Recognition of Te Tiriti O Waitangia designed element	Building/pla	ce names
FLOW	IPU / HUE	BINDINGS	RHYTHM	Visual conne
Integrated water collection systemutilise grey water to feed mara kai		Building(s) interior de idenity of Tangata W	esign can also reflect henua	from Civic W
PUNA (SPRINGS) Engineered timber as p	primary structural solution	Building form and facade articulation	Te here
planting of na	tive flora + fauna	TERING	Library - Puriri Tree concept Civic Wharenui - vessels/waka/hue	
Te Mana o Te Wai water features throughout site	ri.	LERING	Museum and exhibition - vessels/kete	

NGĀ WEU | UNIFYING THREADS Specific project language which relate across site-wide engagement

TUKUTUKU I THE FRAMEWORK

Three intricately bound connections support the unifying threads below

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PRESENCE + LEGIBILITY

The site-wide plan should aspire to express a clear idenity and presence within its urban and national context and aspire to enhance connectivity to the sea. The plan reflects and promotes our unique Tauranga Moana culture and identity within the environment. Approachability, accessibility, and legibility should be fully optimised.

ATANGA **IGINS AND**

people, the ronment and place - a safe of the many can connect and nd create shared

Ō TĀTOU PANONITANGA OUR CHANGING MODES

Precinct and civic space requirements are changing constantly and places & spaces are adapting to new modes of interaction from increasingly diverse groups of people. Adaptability is a core requirement for successful spaces and places.

ections to moana Vhare

A + NGA HERE

enga strategy

The civic whare could house existing taonga and support neighbouring museum with celebration / preservation of rawa maori

VEIL

The Civic Whare is a public amenity, providing community facilities that connect people

9

TIDAL MOVEMENTS

5. LIBRARY & COMMUNITY HUB

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5. LIBRARY & COMMUNITY HUB KEY FEATURES

GFA: 5,613m²

The Library and Community Hub is a multi-purpose facility that incorporates an integrated customer services function and provides for community activities beyond simply a traditional library.

People will gather, play and learn, community groups will access meeting spaces and the public will engage with customer service representatives. The Library and Community Hub building will feature a mass timber hybrid structure targeting a 6 Green Star rating. Exposed timber will be visible in many parts of the building including an internal timber staircase across all levels. The building will include a library, archive, community space (with secure after-hours access), customer services functions, terrace, café, and kiosk providing iSite and site wide ticketing functionality.



5. LIBRARY & COMMUNITY HUB DESIGN PROGRESSION

The preliminary design stage of the Library and Community Hub not only focused on progressing design but required integration of enhancements that were selected following the previous costing stage whilst remaining within the original site-wide budget. The Library and Community Hub now aims to achieve a 6 Green Star rating featuring a mass timber hybrid structure.

ARCHITECTURE PROGRESSION

SPA has progressed the Library and Community Hub design based on the concept design established during the 2021 masterplan refresh process and incorporates customer service functions. The enhanced costings phase resulted in several changes to the Library and Community Hub building to achieve a higher sustainability rating and include several additional enhancements under the same cost budget.

Changes to design following the enhanced costing phase in July 2022:

Hybrid timber structure (aiming to achieve a 6 Green Star rating)

Removal of the upper floor, an overall 442m² **GFA** reduction

Reduction of the Archive floor area

Integration of Customer Service area

Kiosk footprint increased to allow for the iSite including central ticketing and refreshments

Relocation of partial community hub space to the adjacent CWEM building

Throughout the preliminary design phase, SPA completed strategic and functional briefings, spatial zoning and programming and testing on collections and functional areas. SPA engaged in

several workshops with mana whenua to further develop the cultural narrative and co-design of the building.Progression of the facade has been a focus during this design stage. The preliminary design for the Library and Community Hub was completed in late November.

Key focus areas for SPA were:

Refining assumptions to align with precinct-wide cost targets

Briefing data sheets

Indicative finishes strategy

Ongoing mana whenua engagement

Façade design progression

Sustainability targets

Consultant team coordination

INTERIOR AND PLANNING

The ground floor of the Library and Community Hub will feature the café and 'homefire' with the concept that as you move up through the building you move from a public, active space to a quiet reflective area. Children's and young adults' will be on the first floor including an open terrace space, leading up to fiction, non-fiction and research space on the top floor. Throughout the building the 'homefire' will be replicated on each floor that is activated by the open central staircase.

Zoning plans:











5. LIBRARY & COMMUNITY HUB

FAÇADE

The facade design is centred around the concept of a canopy or trees surrounding the 'homefire' within the building, sitting alongside the water flow or river that runs down the site shaping the building and splitting away the kiosk from the main structure.

During the enhanced costings and refreshed masterplan stages the facade design of the Library and Community Hub was largely a placeholder. Subsequently there has been significant work completed during the preliminary design phase to progress the facade.

The concept of the 'canopy' design and natural feel of the trees and shaping of the building is based on three principles:

Wai: Flow nourishes and shapes the whenua

Ahi Kaa: A space emerges to sustain people

Paparanga Ngahere: A place to nurture community activity and growth



The proposed facade reinforces the strong building form by establishing a cohesive (continuous) language around the whole building. Flexibility within the unitised curtain wall system allows for opaque or open panels as required for the variable programmatic functions within. Design narratives of paparanga ngahere and ahi kaa are reflected in the façade composition and reinforce building performance, daylighting, and outlook objectives. The raupongo pattern represents the ponga leaf that signifies growth and the acquisition of knowledge through learning and education.

FAÇADE SYSTEM

The façade system can generally be considered as split between ground floor shop front glazing and upper

floors consisting of a mix of transparent glass and prefinished opaque panels. The glass colour is to be further developed, with the ratio of solid to glazing varying from more open to more closed as you progress up the building levels. The top of the panels extend past the roof level and are shaped to create movement on the building's skyline.

Service areas at ground level, with little public interface consist of more standard wall assemblies with panelised wall linings. The street level canopy in part provides a break between systems, however in some locations there is a suggestion of overlap. Such as at the kiosk and archive/pataka areas. The intention is also that the western side of the façade, which faces the laneway, will be simplified.

PANEL COMPOSITION

The solid panels are flat but give a sense of three dimensional form through their tapered shape and opportunity to vary colour and finish between adjacent panels. Solid panels consist of an outer prefinished skin, internal insulation and a back pan that is also acting as the internal wall lining. The glazing panels at the two main entrances are recessed back from the façade line a little to add relief to these small sections of façade. In this respect the two entrances have a more expressed structure and articulation than the rest of the façade.

PRECINCT VISION

Whist the Community Hub and CWEM buildings are being design by seperate architecture firms, it is envisioned the buildings are related. The design teams are currently exploring how to incorporate common aspects between the buildings through colour, the through-site link, entrance way design to ensure that the buildings speak to each other and the landscape in a cohesive manner.







5. LIBRARY & COMMUNITY HUB FLOOR PLANS

Ground







5. LIBRARY & COMMUNITY HUB FLOOR PLANS

Level 1



Level 2



CIVIL ENGINEERING

This section sets out key civil engineering assumptions for the Community Hub building. Full details are available within the supporting 'Beca – Preliminary Design Features Report'.

Earthworks

Deep RAP piles are proposed as well as a 600mm thick raft under the footings, resulting in a depth of excavation under the buildings of 1.2m - 1.4m plus the piles. This is more than previously assumed as the Library and Community Hub building was initially thought to be located partially on infilled sea and natural soils. After a geotechnical investigation was carried out, it was discovered that there is a liquefaction hazard and poor founding soils present across the entire building footprint.

At this stage it is assumed 80% of the cut is cut to waste. However, Beca will continue to investigate where the existing site material is suitable under the central plaza area.

Proposed Stormwater Management

A new reticulated system will be provided throughout the new civic spaces. This will incorporate the stormwater from the Library and Community Hub, CWEM and the plaza. The Library and Community Hub building will be piped to rainwater tanks for reuse or through to a piped network connecting to the existing Willow Street stormwater system. The plaza area will be treated via rain gardens before being discharged to the stormwater network.

The overall stormwater management system shall be designed to accommodate and contain flows from a 1-in-100yr rainfall event while considering the effects of climate change on rainfall and sea level as of the year 2130, with the primary conveyance system being designed to accommodate flows from a 1-in-10vr design rainfall in accordance with the Tauranga City Council's Infrastructure Development Code (IDC).

The existing Wharf Street stormwater will likely require relocation within the Wharf Street footpath to enable construction.

Proposed Sanitary Sewer

The connection is proposed to be made to an existing manhole along Wharf Street. To allow a gravity connection from the building, the new sewer connection will run down Wharf Street to the existing manhole near the Wharf / Willow intersection. There will be additional connections to Willow Street for the Library kitchen and kiosk. Network capacity assessments have not been undertaken at this stage and it is assumed the capacity is adequate as the building use is similar to the previous building in that location.

Proposed Water Supply

Metering will be provided at the boundary, and backflow protection will be required for both the fire and potable water connections. The firewater will have a double-check valve in an underground chamber, and the potable water will require an above-ground RPZ in a lockable cage. Both these will be positioned in the laneway behind the Library and Community Hub building. During detailed design, we will investigate TCC requirements for double-check to be above ground.

Proposed Power Supply

Power supply will be provided from the existing HV supply in the street with a new transformer located within the building. The transformer room will require a level vehicle access from the laneway behind the building. The existing power in Wharf Street is likely to require temporary

relocation or protection during construction. This is under review with PowerCo.

Proposed Telecommunications

Telecommunications supply will be taken from existing reticulation in the street. The existing Chorus cables that service Baycourt will require protection or relocation during construction due to temporary works.

Landscaping and Pavements

Conceptually, concrete roads and footpaths are proposed for Willow Street and the Site A pavements. Plaza areas will be a mixture of exposed aggregate concrete and stone pavers as indicated on the Landscape Plans. A design life of 50 years will be applied to the design of all pavements.

STRUCTURAL ENGINEERING

This section sets out key civil engineering assumptions for the Community Hub building. Full details are available within the supporting Dunning Thornton 'Preliminary Design Report'.

Loading Assumptions

Dunning Thornton's structural design assumes the followina:

- Importance level is IL2 Normal Structures
- Design Life 50 Years

Seismic

Eccentric Braced Frames (EBF) will be used to brace the building for seismic events. The EBF frames in this building are proposed to be designed for ductility (μ =3). This means that seismic energy is dissipated in the frames. No structural damage in a serviceability limit state event (SLS = 1/25 year). Potential for repairable damage in an ultimate limit state event (ULS=1/500year).

Foundations

The site is subject to potential liquefaction and

lateral spread induced by seismic actions. Based on recommendations from the Geotechnical Engineer (CMW) the building is proposed to be founded on a ground improvement system (RAPS) with supplementary tension only rigid inclusions. The benefits of this solution are that the RAP system acts to suppress liquefaction under the footings and is more resilient to lateral movement. CMW has provided information regarding potential building settlement under different levels of seismic shaking. Based on this, the risk of damage to the structure due to vertical settlement in a 1/100year seismic event is very low. Structural and geotechnical assumptions will be subject to a peer review process.

Wind

Lateral loads from wind pressures on the building façade are also braced by the EBF system. The bracing system stiffness is sized such that there is a low likelihood of adverse comments from wind movement and no non-structural damage to building fabric.

Lightweight floor structures sch as CLT (cross laminated timber) are susceptible to perception of vibration induced by people walking on them. The preliminary design has been benchmarked against guidance documents to assess the potential vibration against performance standards. The floor has been designed such that there is a low likelihood of adverse comments. We note that previously a batten and cradle flooring system was assumed for levels 1 and 2 of the building which has since been omitted by the design team.

Structural Fire

The structure is designed to achieve a 60-minute fire rating through the inherent resilience of the wood. In general, wood components have been

Floor Vibration

STRUCTURAL ENGINEERING CONTINUED

designed to char. This char protects the interior wood allowing this to support the required live loads in the fire condition. CLT floors and core walls need to achieve an integrity rating as well as the structural rating. This is achieved through screw clamping and glue sealing of the joints. All steelwork is to be protected with a plasterboardbased fire rated system.

BUILDING SERVICES

This section sets out key building services assumptions for the Community Hub building. Full details are available within the supporting 'Beca – Preliminary Design Features Report'.

Ventilation and Air Conditioning

Beca have provided TCC with recommendations for each of the different spaces within the Community Hub building. Beca recommends a combination of options to be used throughout the building, with specific requirements for the temperature-controlled archive spaces. The building will feature a combination of FCU 4-pipe, standalone split systems and VAV with HHW

Archive Areas

The ground floor archive collections and archive workroom are treated as a 'Cool' storage room only. This requires tight temperature and humidity control as per the archive room requirements client brief. The room shall be maintained between 15 to 16 °C with the relative humidity to remain between the range of 30-50%. Additionally, the archive room mechanical HVAC equipment is to remain operational 24 / 7 even in the event of a fire elsewhere in the building. Back-up power to the archive room is provided by a generator located on the ground floor mezzanine level.

Staff Workspace, Flexi Space, Staffroom and all Meeting Rooms

The L01 staff workspace and flexi space shall be served by a local chilled and hot water fan-coil units (FCU) per HVAC zone.

The L01 staff workspace meeting rooms shall be served by a single local chilled and hot water fan-coil unit (FCU) per meeting room. A temperature sensor can be provided in each room, if closer temperature control is required for individual meeting rooms, a multi-zone FCU can be provided which has multiple fans that can control the supply air volume to each room.

Community Space and Lobby

The ground floor community space and lobby may be used at different times of the day and are multipurpose spaces with varying internal load requirements and after-hours operation. Beca recommend serving these two areas by local chilled and hot water fan-coil units (FCU) per HVAC zone.

The L01 Sensory and Maker's space may be used at different times of the day and are multi-purpose spaces with varying internal load requirements which may have requirements for after-hours operation. Beca recommend serving these two areas by local chilled and hot water fan-coil units (FCU) per HVAC zone.

The L01 Children's Activity space may be used at different times of the day with varying internal load requirements and may have requirements for afterhours operation. Beca recommend serving this area by local chilled and hot water fan-coil units (FCU) per HVAC zone.

Quiet Room

The L02 quiet room may be used at different times of the day with varying internal load requirements and may have requirements for after-hours operation. Beca recommend serving this area by a local chilled and hot

water fan-coil unit (FCU). The room has a south facing façade and is small enough to only require one local FCU to serve the entire room. This assumption can be further validated during the next design phase.

iSite Kiosk

The ground floor iSite kiosk space is detached from the main library building and is more practical to be served by local chilled and hot water fan-coil units (FCU). The chiller and heating water pipework can be reticulated from the main building to the kiosk FCUs via the canopy ceiling void which stretched between the two buildings.

After-hours Operation

Areas such as the ground floor community area that require after hours HVAC operation shall be provided with manual push buttons, utilise the occupancy sensors or activated from the Building Management System (BMS) web browser from authorised building personnel.

Building Management System Control

A BMS will be provided within the building to control the mechanical systems and to monitor all building services systems (including water and air quality). A metering system will be provided to monitor the various energy and water uses in the building and enable identification and tuning of operational energy.

The standalone BMS will automatically control and monitor the following systems and equipment:

- Monitoring and control of the HVAC system -Chillers, Heat Pumps, AHUs, Fans, Pumps, Valves etc.
- Interface with the lighting control system.
- Monitoring of the plumbing system including water meters.

 BMS will have web based remote access capability. After hours BMS control via push buttons or through a web portal.

Electricity Incoming Power Supply

programme.

The new Library and Community Hub building transformer may also be required to supply some local buildings and street lighting, which is currently being finalised by Powerco.

Standby Generation

There is currently provision for a back-up generator for the Library and Community Hub building. The generator will be sized to accommodate the power requirements for the Archive plant equipment and life safety systems. There is also the option to include the Comms Room services on generator back-up.

Meterina

Metering and automatic monitoring systems will be provided to meter all energy common uses and major uses, and each energy source. The strategy will align with the approach outlined by CIBSE TM39: Building

Data logging, 2 years at a 10-minute sampling interval.

Through consultation with Powerco it has been established that the Library and Community Hub building will likely require a dedicated high voltage room to house the required high voltage transformer, switches, and low voltage distribution fuses. A high voltage room is currently located on the existing site within the footprint of the proposed Library and Community Hub building. Powerco and TCC have identified a location within the site where temporary high voltage equipment can be located. This will enable all equipment located within the existing room to be relocated for the duration of the project, then relocated into the Library and Community Hub's high voltage room at the appropriate stage during the construction

BUILDING SERVICES CONTINUED

Energy Metering and GreenStar, to enable monitoring and targeting of energy and carbon efficiency during the building's operation by metering and monitoring building services systems, large equipment uses, and relevant departments or functions.

Photovoltaic (PV) Provision (enhancement)

PV panels can be located on the roof of the Library and Community Hub building. The extent of the PV panel system array has been assessed during preliminary design and costed as a project enhancement. This could assist in offsetting the carbon consumed through the grid and support GreenStar certification initiatives for the building

Communications and Security

The communications network will be designed to serve both the council business and public areas of the building. This includes the Main Communications Room (MCR) on the ground floor which will house the building distributor and Communications Floor Distribution Room (FD) located in appropriately-sized riser rooms on all levels.

Access control

The access control system will be an expansion of existing Inner Range integrated system located in the existing TCC designated data center and will monitor the main entrance/exit points of the building, back of house and delivery / service doors, goods and passenger lifts, plant room, core stairways, staff only areas, archive areas, main communications room and distributor cupboards and duress alarms.

Entry points to the building shall be access controlled with card readers. The access control system will support multiple site codes and photo ID card functionality. Access control system to be battery backed up for a minimum of 16 hours.

CCTV

The CCTV system shall be an expansion of the existing Geutebruck system, monitored centrally from TTOC.

Plumbing and Drainage

A single connection is intended be made to the potable water mains along the Laneway on the western side of the building. This connection will be complete with appropriate backflow prevention as well as a water meter. Water taken from the town's main will be boosted by a domestic booster pump set, controlled by a variable speed drive (VSD), and located in plant room on the ground floor. We recommend an N+1 pumping arrangement is provided ensuring that should a single pump fail, 100% of the building demand will still be met. A check water meter will be installed on the discharge side of the pump set to monitor this major water use.

Hot Water Plant

Hot water plant for the toilets and staff kitchen will be located on the rooftop within the roof plant and made up of internal and external plant spaces. The hot water plant will utilise heat-pump hot water heaters to charge local storage vessels. Heat-pump technology is recommended over fuel gas heating, because of improved energy efficiency and less CO2 emissions.

It is proposed that where hot water is required to small remote facilities such as the kitchenette on ground level, electrical hot water cylinders can be utilised. It is strongly recommended that these water heaters are provided near the fixtures which they serve as to avoid the need for providing a circulating hot water system.

Flushing Water System

A rainwater harvesting system will be installed to contribute to achieving 6 Green Star rating. This will provide non-potable water to the toilet facilities within the building and irrigation to the wider precinct.

The rainwater harvesting system will be installed with a sectional steel tank located on the ground floor complete with booster pump and filtration system. The plant size indicated on the drawings is indicative and will be dependent on the raw rainwater collection area and the irrigation requirements which determines the final size of the tank. A check water meter will be installed on the discharge side of the pump set to monitor this major water use.

The flushing water system will make use of cisterns for the flushing of water closets.

Stormwater Drainage System

The development will be provided with a Stormwater Drainage System designed in accordance with the New Zealand Building Code. Where appropriate, the Institute of Plumbing will be consulted.

Stormwater Reuse

It is proposed that the stormwater retained within the sectional steel tank on ground floor be used for flushing of water closets and urinals.

Vertical Transportation

Comparable libraries around New Zealand typically use 1,000kg lifts. Based on discussions with the Tauranga library team we understand the lifts will be used for goods movements and therefore Beca recommends larger 1,275kg lifts are provided.

A lift hoist will also be required between the mezzanine floor and the ground floor for moving books between the archive space and the reading area. The Library team are required to confirm the size of the trolley this hoist would need to accommodate before an exact size can be determined.

Actual car and shaft dimensions will vary between

manufacturers, but most manufacturers can adjust their 'standard' arrangements to suit specific site constraints provided these are advised at the time of tender. Beca recommends the lifts contract be tendered and awarded early (during the Developed Design

Fire Protection

The building will be provided with an Automatic Fire Sprinkler System. The fire service attendance point has been agreed with FENZ to be on the south side near the Stair 2 entry on Wharf Street, which will contain the sprinkler and hydrant system inlets as well as the Zone Index panel.

Sprinkler protection will be provided throughout all areas of the development unless specifically permitted by either the standard or as noted below for the archive room and workrooms, or the Sprinkler System Certifier (SSC).

A fire alarm control unit will be located within the fire protection plant room on the Ground Level to serve the fire detection and alarm system. The fire alarm control unit will be capable of automatic signalling to a remote receiving centre which will automatically inform the fire service. A fire interfaces control panel will be co-located with the main fire panel to enable the manual control of the interfaced systems (e.g. air handling unit shut down, archives room/workroom HVAC, fire curtains, fire door magnetic holders, etc.) by the fire service as required.

Special Hazard Systems

The Archive and Archive Work Rooms are to be protected by automatic Gaseous Fire Extinguishing Systems (without sprinkler suppression). These

stage) so final dimensions that suit the successful supplier's machines can be confirmed and they can give input into the structural design prior to the concrete of the lift pits in the foundations and the cores being planned.

systems will comply with the requirements of the Code of Practice for Gaseous Fire Protection systems and be total flooding systems.

FIRE ENGINEERING

This section sets out key fire engineering assumptions for the Community Hub building. Full details are available within the supporting 'Beca – Preliminary Design Features Report'.

The building is primarily to be constructed of mass timber elements (e.g. CLT floors and LVL/glulam columns/beams). Mass timber buildings present challenges in terms of structural fire resistance due to exposed burning timber surfaces increasing the fire severity (when compared to traditional noncombustible construction).

Methodology

As recommended by the consultant team, TCC has opted for a design solution which has each floor level as a separate firecell, to avoid substantial fire-rated board encapsulation of the exposed mass timber elements. This enables the C/AS2 prescriptive design process to be used, subject to agreement with TCC building consenting team.

Each of the levels, including the Mezzanine Level will form an individual firecell. Around the main void circulation stair, fire curtains are to be provided around the open stairs on Level 01 and 02.

A minimum 60-minute fire resistance rating (FRR) is to be provided for all fire separations and structural members (except for specific rooms such as the transformer, archive rooms and archive workroom, etc.). The cladding system needs to be fire stopped at the CLT floor edges to maintain the level-by-level fire separations.

In the costing undertaken, we have assumed 50% fire-rated board encapsulation under the CLT floors

is not required by the building consent stakeholders to lock-in C/AS2. This assumption is required to be proved early in the next design phase through discussions with TCC and FENZ.

The fire engineering provisions outlined in this preliminary design are expected to be the minimum requirements for compliance.

Fire Spread / Boundary

The Library and Community Hub is contained within a TCC owned city block. The surrounding streets are wide enough that there are no external fire spread issues identified to date requiring special mitigation.

The adjacent buildings on the same site (Baycourt) and the future Museum/Exhibition/Civic Whare Building are similarly far-enough away, without exitways or sleeping in close proximity.

Mechanical

HVAC systems shall be designed to minimise fire and smoke spread, via shut-down interfaces and fire dampers at fire separations. To maintain the archive room and the archive workroom climate controls, their HVAC systems will continue to operate until either of their gas flood system activate.

In-duct smoke detectors will be provided to main AHUs (interfaced to shutdown individual AHUs, not cause evacuation).

TRAFFIC / SERVICING

This section sets out key traffic and servicing assumptions for the Community Hub building that have been provided by Stantec, the traffic engineer engaged on the project.

A city-wide traffic management plan is currently being prepared by TCC which will inform the strategy for the Te Manawataki o Te Papa precinct as a whole. Currently it is assumed that general pick up and drop off related to the Library and Community Hub will occur on Wharf Street.

There is a service lane on the western side of the building where the loading dock / servicing bay is located. Courier vans and daily deliveries will service the building from this laneway which is shared by the Baycourt building. The current assumption is that rubbish trucks will not be able to turnaround inside this

Internal Timber Staircase



WILLIS BOND

laneway and therefore the rubbish strategy is for (residential sized) wheely bins to be placed onto the Wharf Street kerbside for pick up.

The laneway is of a suitable width that even while trucks are loading/unloading at the Baycourt service dock, there will be sufficient room for the vehicles to continue servicing the Library and Community Hub.

6. CIVIC WHARE, EXHIBITION AND MUSEUM (CWEM)

WILLIS BOND

Te Manawataki o Te Papa — Prelimina

MUSEUM

Preliminary Design and Cost Report, December 2022 20

6. CWEM BUILDING OVERVIEW

The Civic Whare, Exhibition and Museum (CWEM) building aims to achieve a 6 Green Star rating through the use of a hybrid mass timber structure.

The Civic Whare design is flexible to allow for the dual functionality of a formal council chamber and ceremonial marae for welcoming, hosting and facilitating meetings at the heart of the precinct. The Exhibition area is a multi-purpose space that can cater to events ranging from international art exhibitions and large-scale events down to local community exhibitions. The Museum display spaces are located on the first floor and will contain the 'Bay of Plenty Stories' and 'Discovery' Centre.

MUSEUM

The Museum is located at the corner of Hamilton and Willow Streets with entrances off both streets. The ground floor contains the public functions of the Museum and staff workspaces. The active uses and social functions open out onto Willow Street creating interest in the public realms of the lower plaza. The public functions include a museum kai area, serving as a public reheat food area. This will be supported by lounge and café seating. The Museum retail is located close to the entrance with a strong presence on Willow Street to enable it to stand alone and cater to the retail requirements of the art and culture sector in Tauranga. School groups and parents with young children can be accommodated with the BYO self-catering room.

The display spaces are located on the first floor and will contain the 'Bay of Plenty Stories' and 'Discovery' Centre. The space has been designed to maximise flexibility and ease of security with one controlled access point to the public spaces. This space meets high performance requirements with high temperature and humidity control and very limited natural light that can be blacked out with ease. The active spaces and exhibits for younger generations have been positioned to the south of the display space to allow an active connection and views back to the civic heart of the precinct.

EXHIBITION AND EVENTS

The Exhibition space is located on Level 2 and is accessed from the main circulation spine with visual connection and, if needed to operate independentl, an entrance from the Sculpture Garden and Durham Street. This is a multi-purpose space that can cater to several different events, ranging from international art exhibitions and large-scale events to smaller local community exhibitions. It will complement the adjoining museum and nearby library and art gallery. It has an overall area of circa 800m² split into two key spaces of 500m² and 300m². These spaces can be used as one continuous space, for a single blockbuster show, or can be divided up with the use of operable walls into smaller individual spaces as required.

CIVIC WHARE

The Civic Whare is located at the heart of the precinct opening directly on to the ātea with views and orientation to the moana. The form is distinctive and reflects a modern interpretation of traditional Māori design principles. The design is flexible to allow for the dual functionality of a formal council chamber and ceremonial marae for welcoming, hosting and facilitating meetings. The internal layout is complemented by a flat floor with moveable partition walls to allow flexibility.

COMMUNITY ROOM

Leading from the main public plaza or ātea space on Level 1 is a 180m² flexible, bookable space which can host events or regular community groups. The space overlooks the central atrium and is accessed off the main circulation of the museum. When not booked privately it can be used for overflow or specific museum exhibits as its prominent location offers a teaser to entice more visitors to the museum display space.

KITCHEN

On Level 1, adjacent to the Back of House (BOH) area is a commercial kitchen with dedicated dry and cold stores to service the events hosted within the building, or potentially across the wider site. Food is stored and prepared in the catering kitchen and distributed via the BOH clean corridor and FOH to kitchenettes before they are served within the main spaces. The exhibition level (Level 2) has a dedicated plating kitchen and staging area to enable multiple full-service banquet events.





6. CWEM DESIGN PROGRESSION

WaM, architect for the CWEM building, was appointed mid-2022. The design has been progressed to an early preliminary design level, with input from key stakeholders and subject matter experts. The CWEM building will feature a mass timber hybrid structure and aims to achieve a 6 Green Star rating.

ARCHITECTURE PROGRESSION

WaM has progressed the CWEM into early preliminary design. As the CWEM will be developed after the Library and Community Hub, it is slightly less progressed with preliminary design to be completed in February 2023. During the recent design phases WaM has advanced the building design through:

- Evolution of the general building design, particularly in relation to the width of exhibition spaces to provide improved functionality and flexibility.
- Aspirational and functional briefing workshops with key stakeholders, subject matter experts, and client groups.
- Development of key design principles to guide and inform the project's success factors.
- Simplification of the building general arrangement, particularly in section, to reduce overall number of floors, use of ramps, and consolidating vertical circulation.
- Co-ordination with external landscaping, particularly levels, in response to these simplifications.
- Mana Whenua consultation and co-design for the CWEM building, Civic Whare, and site-wide, to develop the cultural narrative for the project.
- Attendance in the Sydney Precedent Tour 26-29 September, with specific focus on banquet, function, and exhibition spaces and mass timber precedents.

MUSEUM AND EXHIBITION

Museum and Exhibition functional advice, review, and approval has been provided by Neil Anderson, (TCC's external subject matter expert). The design team has worked closely with Neil to present, review, and discuss these key functional spaces - including back of house provisions and flows.

Key design moves:

- The number of floors and level changes reduced, simplifying structure, circulation, and massing. This unlocks clearer expression of Exhibition and Museum masses as 'vessels' housing Tauranga's events and taonga.
- By enlarging the Museum footprint all exhibition space is proposed to be combined into a single floor. This reduces the height of the Eastern wing of the building by one floor, reducing bulk and overshadowing to public outdoor space to the south.
- The external ātea is raised by 500mm to allow a level and barrier-free connection to the CWEM circulation space. The ground level through-site link and overall floor level is lowered by 1,150mm to better relate and connect to the external lower amphitheatre.
- The through-site link to Hamilton St is moved West allowing enlargement of the Museum floor plate, and Key Move 2.
- Introduction of mass timber structure.

CIVIC WHARE

Through the design process WaM investigated three key potential design moves being he tāhuhu, he hue and he waka. Through mana whenua engagement and commissioner feedback a hybrid approach was created that represents a contemporary and natural



form within the precinct. A key design feature of the Civic Whare is the oculus or skylight that provides natural light and the curved form of the structure that opens to the atea providing a direct line of sight down to the moana.

6. CWEM FAÇADE

The expression of the façade is inspired by the articulation of Māori vessels that were used to store precious taonga. The traditional vessels are highly decorated, and the articulation on each face of the carved object relayed repetition, rhythm, depth and a play of light. This quality is brought into the articulation of the façades of the vessels and provides a reference for articulation.

CONCEPT

The building vessels open up and taper towards the sky. The vessel forms step with the geometry to respond to the natural topography of the site. The support spaces and circulation are 'of the land' either reading as solid forms or glazed to allow the landscape in.

The continuation of the patterns onto the underside have inspired the curved edges and patterning of the ceilings.

NATURAL MATERIALS

WaM has put forward materials with natural origins, low carbon emissions, or high recycled content, to support the good stewardship of the land the project sits on. Materials considered are of and from the land and speak to the site's connection with nature. Modular or tiled materials are well suited to curves and geometry that reflect the idea of being carved by water, and materials or modules that

South elevation

provide texture and help to further emphasise this movement while giving grain and breaking up scale on façades that must for functional reasons be largely solid.

The images below are of the Wakahuia (treasure box), a collection piece from the Tauranga Heritage Collection, and a hinaki (eel / fish trap).

FACADE

These qualities are proposed to be expressed using a façade module of terracotta baguettes that vary in spacing along a horizontal grain with the continuation of the patterns on to the underside continuing to form the ceilings. These volumes need controlled levels of natural light and so narrow and long windows are placed to maximise views. The lower level and public spaces are very transparent with a glazing system supported on timber with external timber articulation.



Wakahuia (treasure box) a collection piece from Tauranga Heritage Collection.



Hīnaki (traditional eel/ fish trap)



6. CWEM FLOOR PLANS

Ground Floor



WILLOW STREET

6. CWEM FLOOR PLANS

Level 1



6. CWEM FLOOR PLANS





6. CWEM EXHIBITION CONFIGURATION

The exhibition space has been developed to allow for a flexible space that can be split into two separate spaces or used as one large 820m² space that features a 5m wide connection.

The exhibition space will be serviced by a goods lift as well as access through the doors on the western side of the building for large events. This floor also includes a 30m² catering kitchen, passenger lifts and toilets.



6. CWEM - CIVIC WHARE



6. CWEM **CIVIC WHARE FORMATS**

Council Chambers Format | 70 Pax



Conference Format | 162 Pax

ènme 21 M irculation / Re Entry

Whaikōrero Format | 90 Pax



Breakout Format | 26 Pax



Gathering Format | 64 Pax





CIVIL ENGINEERING

This section sets out key civil engineering assumptions for the CWEM. Full details are available within the supporting 'Beca - Concept Design Report'.

Earthworks

The earthworks concept has not changed from the feasibility report. The buildings are roughly the same size, however, CWEM is both higher and lower (in different portions). This will increase both the cut and fill requirements.

At this stage it is assumed 80% of the cut is cut to waste. However, Beca will investigate whether the existing site material is suitable under the central plaza area.

Proposed Stormwater Management

A new reticulated system will be provided throughout the new civic spaces (Site A). This will incorporate the stormwater from the CWEM building and the plaza.

Proposed Sanitary Sewer

The connection is proposed to be 150mm in diameter and connection will be made to the existing 150 PVC main in Hamilton Street with a new manhole.

Network capacity assessments have not been undertaken at this stage and will be further investigated during the preliminary design stage.

Proposed Water Supply

Metering will be provided at the boundary and backflow protection will be required for both the fire connection and the potable water connection. The Fire water will have a double check valve in an underground chamber in the footpath. The potable water will require an above ground RPZ in a lockable cage. As preliminary design progresses it will be confirmed if this is housed inside the building, or on the boundary in the footpath.

The existing water supply along Hamilton Street will require relocation to allow for temporary works during construction.

Proposed Power Supply

Power supply will be provided from the existing HV supply in the street with a new transformer located within the building. The transformer room will require a level vehicle access.

Proposed Telecommunications

Comms supply will be taken from existing reticulation in the street. The existing Tauranga Fibre Optic and Chorus cables will require protection or relocation during construction due to temporary works.

STRUCTURAL ENGINEERING

This section sets out key civil engineering assumptions for the CWEM. Full details are available within the supporting Dunning Thornton 'Revised Concept Report'.

Museum (Importance Level 3)

Timber Hybrid - Timber Gravity system (columns, beams, core walls & flooring), Steel/Reinforced Concrete Bracing system.

Seismic

The reinforced concrete stair core and eccentric Braced Frames (EBF) are used to brace the building for seismic events. These systems are very commonly used for this purpose in New Zealand and internationally. The bracing elements in this building are proposed to be designed for ductility (μ =3). This means that seismic energy is dissipated in the frames. No structural damage in a serviceability limit state event (SLS = 1/25 year). Potential for repairable damage in an ultimate limit state event

(ULS=1/500year). Beca will explore the option to delete the RC core and replace with 2 EBF frames during preliminary design.

Wind

Lateral loads from wind pressures on the building façade are also braced by the EBF system. The bracing system stiffness is sized such that there is a low likelihood of adverse comments from wind movement and no non-structural damage to building fabric.

Floor Vibration

Lightweight floor structures are susceptible to perception of vibration induced by people walking on them. The concept design has been benchmarked against guidance documents to assess the potential vibration against performance standards. As with wind induced movement, the perception of these movements differs per person. The floor (including batten and cradle raised floor) has been designed such that there is a low likelihood of adverse comments.

Structural Fire

The structure is designed to achieve a 60 minute fire rating through the inherent resilience of the wood. In general wood components have been designed to char. This char protects the interior wood allowing this to support the required live loads in the fire condition. CLT floors and core walls need to achieve an integrity rating as well as the structural rating. This is achieved through screw clamping and glue sealing of the joints. All steelwork is to be protected with a plasterboard-based fire rated system.

Foundations

Foundation design is based on site investigations under the supervision of CMW Geoscience. Shallow reinforced concrete ground beams on ground improvements (RAP) are proposed. Where tension capacity is required, a strand reinforced concrete inclusion is proposed.

Wind

Lateral loads from wind pressures on the building facade are also braced by the seismic bracing system. The bracing system stiffness is sized such that there is a low likelihood of adverse comments from wind movement and no non-structural damage to building fabric.

Long-span L1 floor structures are susceptible to perception of vibration induced by people walking on them. The concept design has been benchmarked against guidance documents to assess the potential vibration against performance standards. As with wind induced movement, the perception of these movements differs per person. The floor has been designed such that there is a low likelihood of adverse comments.

Exhibition / Civic Whare (Importance Level 3)

Due to the gradient of the site, a large portion of the Exhibition area is buried. The optimal structure is considered to be a combination of a largely conventional steel / concrete structure at ground floor (Reinforced Slab on grade) with composite floor beams and flooring to L2. A timber roof structure with Steel Bracing system is proposed.

Seismic

Reinforced concrete walls and concentric steel bracing frames (CBF) are used for seismic bracing. This system is very commonly used for this purpose in New Zealand and internationally. The walls and braced frames in this building are proposed to be designed for nominal ductility (µ=1.25). No structural damage in a serviceability limit state event (SLS = 1/25 year). Potential for minor repairable damage in an ultimate limit state event (ULS=1/500year). Consideration to be given to inclusion of ductile detailing during Preliminary design.

Floor Vibration

STRUCTURAL ENGINEERING CONTINUED

Structural Fire

The structure is designed to achieve a 60 minute fire rating through:

- Inherent resilience of steel members / concrete filled tubes.
- Intumescent coatings / plasterboard linings.
- The inherent resilience of the wood.

In general wood components have been designed to char. This char protects the interior wood allowing this to support the required fire loads. CLT floors and core walls need to achieve an integrity rating as well as the structural rating. This is achieved through screw clamping and glue sealing of the joints. Where steel and timber are required to interface all steelwork, these will need to be encapsulated with plasterboard.

Foundations

Foundation design is based on site investigations under the supervision of CMW Geoscience. Shallow reinforced concrete ground beams on ground improvements (RAP) are proposedWhere tension capacity is required, a strand reinforced concrete inclusion is proposed.

BUILDING SERVICES

This section sets out key building services assumptions for the CWEM. Full details are available within the supporting 'Beca – Concept Design Report'.

Ventilation and Air Conditioning

Two to three air cooled chillers/heat pumps will be located on the exhibition roof around the building core to provide chilled / heating hot

water to the exhibition and museum. The heat pumps will utilise lower GWP refrigerants and heat recovery options will be explored.

The portion of the roof supporting this plant should be provisioned as a concrete plant slab to house the air source chillers/heat pumps open to the air above with a provision for louvred walls for aesthetics. All other supplementary systems such as pumps and buffer tanks will be located in an enclosed area of the roof plant.

The main exhibition spaces are divided into three main areas (two large exhibition spaces, one medium space) and circulation areas. From discussions with the Te Papa touring team, exhibition areas (large and medium) will require tight temperature and humidity control, therefore the spaces will be served by a minimum of three ~2,300 l/s variable air volume (VAV) air handling units (AHUs) with chilled water-cooling coils, humidifiers and heat recovery. The AHUs shall be located in an enclosed mezzanine plant room on L2 in the exhibition building. The circulation spaces will either be served via a dedicated AHU or naturally ventilated. This shall be explored during the next design phase.

Similar to the main exhibition spaces, it is recommended that the museum space can provide tight temperature and humidity control. The main museum spaces will be served via a minimum of three ~2,000 l/s AHUs with chilled water-cooling coils, humidifiers and heat recovery. The AHUs shall be located in an enclosed mezzanine plant room on L1 in the museum building.

The Civic Whare space is the only area with external openings on the eastern face. To provide natural/ assisted ventilation, it would require ventilation stacks (celestial vents) integrated into the roof. A mixed mode ventilation solution will be provided for this

space. The vents would include direction motorised louvres to enable release of heat from the "lee" side of the stack via wind effect and buoyancy. This strategy will require further review and consultation in the next design stage.

BMS Control

A Building Management System (BMS) will be provided within the building to control the mechanical systems and to monitor all building services systems (including water and air quality). A metering system will be provided to monitor the various energy and water uses in the building and enable identification and tuning of operational energy.

The standalone BMS will automatically control and monitor the following systems and equipment:

- Monitoring and control of the HVAC system Chillers, Heat Pumps, AHUs, Fans, Pumps, Valves etc.
- Interface with the lighting control system and monitoring of the plumbing system including water meters.
- BMS will have web-based remote access capability. Tenant access will be limited to read-only.
- After hours BMS control via push buttons or through a web portal.
- Data logging, two years at a 10-minute sampling interval. Fire alarm interface.
- The BMS will have the capability to expand to control and trend tenant equipment.

Wider BMS control to be developed further during preliminary design.

Electricity

Incoming Power Supply Consultation has been undertaken with the local electrical utility company Powerco and with their nominated high voltage contractor. Through this consultation it has been established that the CWEM building will require a dedicated high voltage room to house the required high voltage transformer, high voltage switches, and low voltage distribution fuses. It is a requirement of Powerco that this room be located on the perimeter of the building and have direct access from the street. This is to aid installation and maintenance of the equipment, to enable unimpeded 24-hour access to the room, and to reduce any required easements for the underground cables that enter the building from the adjacent street.

A high voltage room is currently located on the existing site within the footprint of the proposed CWEM building. Powerco and TCC have approved a temporary site in the nearby road reserve where temporary high voltage equipment can be located, this will enable all equipment located within the existing room to be relocated for the duration of the project. Then at the completion of the project it will be relocated into the CWEM's high voltage room. The design, staging and planning of the relocation of existing high voltage equipment, the provision of temporary transformers for construction supply, and the relocation of temporary equipment into the finished building are all to undertaken by Powerco in consultation with the wider team.

The new CWEM building transformer may be required to also supply some local buildings and street lighting. This is at Powerco's discretion and is currently being finalised. The load for the CWEM building is currently estimated at 500kVA, this load figure has been provided to Powerco to calculate any additional loads and finalise the transformer size.

BUILDING SERVICES CONTINUED

Standby Generation

There is currently no provision for a backup generator for the CWEM building. It is recommended that a plug-in connection point is provided for a mobile containerised generator.

Metering

The electrical metering strategy is to be designed to target Green Star requirements. Generally, this requires metering at the main incoming supply and separate metering of small power and lighting sections of local distribution boards.

Photovoltaic (PV) Provision

PV panels can be located on the roof of the CWEM building, with the estimated cost noted as an enhancement in the costings presented. The extent of the PV panel system array will be assessed during preliminary design. This will assist in offsetting the carbon consumed through the grid and support Green Star certification initiatives for the building.

Lightning Protection

A lightning protection system shall account for direct strikes (onto the structure) and indirect strikes (strikes close to the building) both in relation to direct damage and through the result of electromagnetic pulses and over-voltage transients entering the building through service lines and destroying electronic equipment

Communication and Security

The communications network shall be designed to serve both the council business and public areas of the building. This includes the Main Communications Room (MCR) on the ground floor and Communications Floor Distribution Room (FD) located in appropriately-sized riser cupboard on all levels, serving the museum and exhibition sides

of the building. The communications multi-mode fibre backbone will be provided from the MCR to each FD. Horizontal structured cabling solutions will utilise a Cat6A cabling solution from each FD.

As there is no building back-up generator, each pertinent communications rack will require an in-rack UPS to maintain system operation and controlled power-down of the network. Required uptime to be confirmed.

Outlets will be provided to serve all building systems including; general comms outlets, wireless access points, audio visual systems, museum systems, exhibition systems, security systems, HVAC and other building services control systems

Entry points to the building shall be access controlled with card readers.

The access control system will support multiple site codes and photo ID card functionality. The access control system will be battery backed up for a minimum of 16 hours.

CCTV

The CCTV system shall be an expansion of the existing Geutebruck system, monitored centrally from TTOC and will provide coverage of the following areas:

- Entry/exit points of the building
- Locker area
- Passenger and Goods lift
- Internal and external public area
- Main Communications Room
- Camera resolution shall be minimum HD 720p
- Cameras to be recorded for 30 days at full resolution at an average of 10fps

Plumbing and Drainage

Interface with Network Utility Operator

It is proposed that a single connection be made to the

150mm potable water mains along Hamilton Street. This connection will be complete with appropriate backflow prevention as well as a water meter. The water connection as well as any associated valves and other devices will form part of the civil scope of works. The backflow prevention device will be installed in a lockable enclosure above or below ground, or in a lockable enclosure in the building façade that is accessible by TCC staff members. This is to be finalised during subsequent design stages.

Potable Water Supply

Water taken from the town's main will be boosted by a domestic booster pump set, controlled by a variable speed drive (VSD), and located in a plant room on the ground floor. We recommend an N+1 pumping arrangement is provided to ensure that, should a single pump fail, 100% of the building demand will still be met. The number of pumps will be selected to ensure that the highest demands, as well as the lowest demands, can both be met with the arrangement.

Hot Water Plant

Hot water plant for the toilet/kitchen facilities shall be located within the roof top plant made up of internal and external plant spaces. The hot water plant will utilise heat pump hot water heaters to charge local storage vessels. Heat-pump technology is recommended over fuel gas heating, because of improved energy efficiency and less CO2 emissions. The water supply will be reticulated to the facilities over all floors (including end of trip facility, kitchen and beverage area) and will require a pumped return water loop due to the distance between the hot water production and point of use. Some small remote facilities may utilise local electrical hot water cylinders.

Rainwater Harvesting System

A rainwater harvesting system is proposed to contribute to achieving a 6 Green Star rating. This will

The rainwater harvesting system shall be installed with a sectional steel tank located on L00 complete with booster pump and filtration system. The plant size indicated on the drawings is indicative and will be dependent on the raw rainwater collection area.

Vertical Transportation

Exhibition

Two 1,275kg (17 person) through lifts at 1.6m/s will achieve adequate performance to shift the full exhibition population (assumed 500 people) over an hour period. If one lift failed the performance would be poor.

movements.

For improved user experience we recommend the stairs are designed to be a main route for people movement. If the stairs are not used for this function then Beca would recommend larger lifts to improve user experience.

It is assumed the kitchen on L1 that services the exhibition/catering kitchen will utilise the goods lift to move food/kitchen equipment between the floors.

provide non-potable water to the toilet facilities within the exhibition and museum building and irrigation to the wider precinct.

Based on the civil review there is no requirement for a stormwater attenuation and detention tank.

The recommendation from the Te Papa touring team is for a 2.4m (W) x 5.5m (D) x 3.0m (H) lift. This requires a lift shaft of 6.8m x 3.6m. However, the goods lift size will be dependent on what access is provided from level ground to the exhibition space. Assuming any large items (e.g. cars) could be supplied via level ground it may be viable to use a 2,500kg goods lift with a shaft size of 2.7m (W) 3.0m (D). For concept pricing Beca recommend, the larger lift is allowed for until additional briefing is provided on the goods

BUILDING SERVICES CONTINUED

Museum

The two lifts within the exhibition space will be shared with the museum. These will provide adequate performance, however, if there is a large function/exhibition with significant people movement from Willow St then there will be a reduction in performance for the museum users.

It is assumed that able-bodied people will use the museum stairs to transfer between the floors. This will further improve the lift performance. If the stairs are not designed to be the main route for people movement then an additional lift may be required.

Fire Protection

Automatic Fire Sprinkler System

The building will be provided with an Automatic Fire Sprinkler System. The fire service attendance point shall be located on Hamilton Street, which will contain the sprinkler and hydrant system inlets as well as the zone index panel. Sprinkler protection will be provided throughout all areas of the development unless specifically permitted by either the standard, or the Sprinkler System Certifier (SSC).

The Building Code does not require fire hose reels or extinguishers for this building and as such, hand operated fire-fighting equipment is not required, however, is recommended adjacent main central plant and risk areas (e.g. for rubbish/waste room, electrical plant rooms, HVAC plant rooms, fire pump rooms, etc.).

Fire Detection and Alarm System

A fire alarm control unit will be provided, located within the fire protection plant room on the ground level to serve the fire detection and alarm system. The fire alarm control unit will be capable of automatic signaling to a remote receiving centre which will automatically inform the fire service of the status of the fire detection and alarm system.

Transformer Room

Sprinkler protection can be omitted from the transformer room. In lieu of sprinkler protection, the transformer room will be housed within a fire rated enclosure having a Fire Resistance Rating (FRR) of at least 120/120/120. If the transformer is an oil-filled transformer, it is recommended that the room be of masonry construction with suitable provision for bunding and explosion venting. Fire detection within the enclosure will be by linear heat detection.

The above fire protection and alarm provisions are consistent with similar projects of this scale.

FIRE ENGINEERING

This section sets out key fire engineering assumptions for the CWEM. Full details are available within the supporting 'Beca-Concept Design Report'.

Fire Design Methodology

The CWEM building will be designed using the Verification Method (C/VM2) as this approach is the most suitable design methodology based on experience with similar buildings containing interconnected levels. This involves fire/smoke and evacuation modelling calculations to demonstrate occupants can evacuate safety prior to untenable conditions occurring.

The C/VM2 design framework also involves the Fire Engineering Brief (FEB) process with consultation from relevant stakeholders from the Prelim/Developed design phases (including FENZ, TCC consenting team and an independent peer reviewer).

The benefits of using the C/VM2 fire design methodology is that interconnected floor and stair voids can be modelled as unenclosed, while escape route locations and sizes are customised to the configuration and space occupancy numbers present. The methodology also reduces the number of fire separations, as well as increasing design and construction flexibility plus reduces costs.

To meet the occupant tenability criteria, with open voids and unenclosed circulation stairs between levels, sprinklers will be required throughout. Smoke detection is also likely to be required throughout the building (except in spaces where they will be susceptible to spurious alarms).

Asset Protection Features

The fire engineering provisions outlined in this concept design are aimed to be the minimum requirements for compliance with the Building Code. No direction has been received to date to provide asset protection features to safeguard exhibitions or artifacts stored within the building. Automatic sprinkler protection and early warning smoke detection are expected to mitigate potential fire risk within the building.

Further consultation with TCC will be required in subsequent design stages on the suitability of fire protection systems within the building, and whether these require enhancement (i.e. using high-sensitivity smoke detection, dry-pipe sprinkler systems, etc.) to protect artifacts and taonga stored within the building. Similarly, it may

Multiple events can occur simultaneously in the building, and it is possible to host an event in one part of the building, while other areas of the building are open to normal day-to-day use. However, when events are hosted, the building operator will need to ensure than the building occupancy does not exceed 1,000 people. This is generally not expected to be restrictive on the building but could restrict the scale of hosting large multi-stage concerts, trade shows or expos.

The overnight sleeping facility could accommodate up to 40 people sleeping, which is comparable to similar facilities (e.g. Wellington's Zealandia Wildlife Sanctuary). TCC wishes to allow for sleeping in the Civic Whare, which will have the smallest design and cost impact on the space. Sleeping in the Civic Whare would likely take place in within the Atea Gather, however the sleeping group would have access to the complete Civic Whare space, including free access / egress to outside via the Atea a Tu space.

be desirable or cost effective to fire or smokeseparate certain areas of the building, such as switchboard rooms, the commercial kitchen, electric bike parking, plant rooms, etc. to reduce potential impacts of a fire on the building's taonga.

Museum School Class Sleepovers

7. SITE A LANDSCAPING

EVHIBITION

MUSEUM



7. SITE A LANDSCAPING PROJECT **OVERVIEW**

Through preliminary design, the Site A Landscaping design, led by Studio Pacific has built upon the language and conceptual approach of the refreshed masterplan. Taking cues from the flow of wai (water) from puna (spring) to moana (sea), this movement shapes spaces to dwell in and move through. The design re-establishes the green corridor from ngahere (forest) to moana (sea) that once existed, nurturing ecosystems and connecting the people of Tauranga with nature.

Nestled within the green are a series of terraces that provide places for recreation and respite. The terraces navigate the slope from Durham St to Willow Street, engaging seamlessly with the buildings to create a campus-like environment where people can move freely through the site. The terraces are connected by a ribbon of paths meandering through the landscape creating an accessible processional route to the Civic Whare.

The lower terrace is shaped by terraced steps and lawn creating an amphitheatre focusing on the central stage. The mid-terrace provides a throughsite link between the Library and Community Hub and Museum, and is framed by areas for outdoor dining and relaxing. The ātea engages both the Civic Whare and level one of the Exhibition, providing a platform for powhiri and events. The sculpture garden sits in the upper terrace, framed by green creating an outdoor room as an extension of the Exhibition spaces. It also provides key connections to Baycourt and Durham Street.

KEY CHANGES SINCE THE APRIL 2022 DESIGN UPDATE ARE:

- Increased sculpture garden extent
- Inclusion of potential permanent stage and shade structure in the amphitheatre (costed as an enhancement)
- Rationalisation of key site levels relative to the new building floor heights
- Combined sequence of 1:12/1:20 grade accessible ramps to transition the terraces (inclusion of strategically placed handrails where necessary)

- Increased extent of green through the site and in turn rationalisation of paving extents
- Inclusion of the waharoa to the ātea
- Relocation of the 'building waharoa' (adj. Willow St) off the buildings and into the landscape
- Inclusion of a mauri stone water feature
- Adjustments to the service lane design to maintain serviceability of Baycourt
- Planting palette as primarily native supplemented with exotic species

SITE LEVELS

The extensive slope of Site A from Durham Street to Willow Street presents challenges to the landscaping design. Creating a civic space that is inviting and accessible to all users has been a key driver for the project. To achieve this, a series of ramps at both 1:12 grade (with handrails) and 1:20 grade have been designed to allow people to get from Willow Street to the Civic Whare level. An external lift then allows access from the Civic Whare to Baycourt and Durham Street where a final ramp provides access to the upper floor of the Exhibition building and sculpture garden.

PAVING STRATEGY

A 'base case' paving option is costed that represents a similar strategy to what was costed in May 2022. This option consists of a 75% to 25% split of concrete to stone pavers. General feedback through the design has been that, if possible from a cost perspective, a higher percentage of pavers should be targeteded.

RLB has also costed a below-the-line premium option, representing 67% stone pavers as an enhancement to the base case.

WHARF STREET AND HAMILTON STREET

The footpaths of Wharf Street and Hamilton Street are included within the Site A landscaping scope. Since May 2022, these have been scaled back to largely concrete and some paving at building entrances. The savings that have been made from scaling back the finish of these locations is helping to allow for the premium elements elsewhere in the precinct such as the mass timber hybrid structures and 6 Green Star features.

AMPHITHEATRE

The amphitheatre is the primary civic space within Site A and has a strong relationship with Willow Street and the east-west connection through Masonic Park to the waterfront. The terraced steps and gently sloped lawn frame the central stage area allowing for larger events to take place and provides multiple areas to meet with friends or relax during the day.

SCULPTURE GARDEN

The sculpture garden provides a more contemplative and passive setting. It takes cues from the conceptual theme of ngahere (forest) - creating an outdoor room that is framed by trees. This space is seen as a key educational opportunity for school groups. highlighting plants used for rongoā (medicinal plants), raranga (weaving), kai (food), and their inherent links with maramataka (lunar calendar).

PLANTING

The planting palette will be developed to reflect the transect that once existed within the wider site, from coastal edge to inland coastal forest. The mix will be a range of native and exotic species to provide colour and textural change through the seasons.



THROUGH-SITE LINK

A through-site-link has been created at the midlevel terrace between the CWEM and Library and Community Hub buildings. This link provides northsouth connectivity between Hamilton and Wharf Streets, continuing through to Waihirere Lane.

7. **SITE A LANDSCAPING**



EXHIBITION



7. SITE A LANDSCAPING PLANS



Hardscape

	P01 - 300x150 stone pavers
	P02 - 150x150 flamed stone setts
	P03 - 100x100 cropped face stone setts
$\langle \langle \rangle \rangle$	P04 - 450x200 @ 45* cut stone pavers
++	P05 - 2.4m x 0.7m grid in-situ concrete
	P06 - In-situ concrete sandblast finish
	P07 - Ashpalt
	P08 - Hoggin
724	Paving on podium

Furniture

	F02 - Platform seat to concrete wall
	F06 - Timber platform (stage)
	F07 - Linear seating element
රාංගෙ	L03 - City lightpole

Preliminary Design and Cost Report, December 2022 37

8. MASONIC PARK

WILLIS BOND

- 115



8. MASONIC PARK DESIGN PROGRESSION

Masonic Park has been developed through preliminary design and into developed design by Landlab. The key design move through this process is an increase in soft landscaping whilst retaining the view shaft from the ātea down to the moana.

SOFT VS HARD LANDSCAPING

Masonic Park has seen changes in soft and hard landscaping proportions with the soft area being increased from 389m² (17%) to 834m² (36%) and the paved area reduced from 1,950m² (83%) to 1,505m² (64%). Two options have been costed, option one being a lower cost base case consisting of 100% aggregate concrete and option two being 100% paved with granite and quartz.

CANOPY

A canopy has been added to Masonic Park since the May costings, running along the southern side of the Masonic Park providing a sheltered walkway that integrates the waterfront with 'Site A' and links up the accessible route through the precinct. This canopy is referred to as an 'arbour', being constructed of steel posts with a timber roof structure featuring a wire system for plants to climb and grow throughout. The canopy is being refined throughout design process

The canopy is stepped to follow the natural ground plane and allow for continued servicing to the Art Gallery building.

WATER FEATURE 'SPRINGS'

Masonic Park will feature a number of small 'springs' that are also articulated across the road on the waterfront site. These springs are being further developed with the concept that they may interact with the surrounding environment in ways such as filling up / emptying of water depending on the current rainfall or tidal pattern.

ARCHAEOLOGICAL SITE

We have engaged with the Heritage NZ team who suggested engagement with an archaeological expert to assess the value of the bakery foundation feature in Masonic Park and determine whether this needs to be protected. Ken Phillips, a well known independent archaeologist is currently engaged and has completed a desktop review of the site. Ken is currently working with Landlab on potential treatments for the site with the aim to prepare a formal recommendation back to Heritage NZ. The design is currently being refined.

UPDATED DESIGN ELEMENTS

Increase of green area across site

Canopy / arbor

Water feature 'springs' design developed

Archaeological site - addition of bridges and glass viewing panels

Lineal seating elements now include timber inserts with armrests

Light poles include luminaires for various activities

Willow Street Plan





9. WILLOW STREET

Willow Street has been progressed into developed design based on a 'multi-use' concept that allows for authorised vehicle access, parking and loading with automated bollards to control different street 'modes'.

Willow Street, designed by Landlab, will feature automatic bollards at each end of the street to allow for multiple modes while providing for all current servicing to remain and ensure access for emergency vehicles. The street can then be used in street mode (bollards down) or pedestrian mode (bollards up) depending on requirements and can easily be interchanged for certain reasons such as an event in the Site A amphitheatre (modes pictured overleaf).

SOFT VS HARD LANDSCAPING

Willow Street has seen changes in soft andhard landscaping proportions with the soft area being increased from 156m² (7%) to 309m² (13%) and the paved area reduced from 2,161m² (93%) to 2,008m² (87%).

DESIGN ELEMENTS:

Carriageway reduced to 5m wide "10km speed zone"

Automated Bollards added to control traffic and access to Masonic Park

Large furniture platforms design updated

Trees moved to western side, gardens on eastern side now function as rain gardens.

Pedestrian access added to rain gardens

Light poles include luminaires for various activities

TRAFFIC MANAGEMENT STRATEGY

TCC is working through a city-wide traffic management strategy that currently assumes Willow Street will provide for authorised vehicles only in its 'typical' mode, with the use of automatic bollards that can allow increased traffic movements when required.

The final outcome for Willow Street has not been decided, meaning that the design team is currently assuming site-wide pick up and drop off locations are outside of Willow Street. The exact locations for new bus stops, as part of the future strategy, are also unknown at this stage.



9. WILLOW STREET **PLANS**

3D Section - Willow Street

Willow Street Diagram



9. WILLOW STREET SHARED ZONE DESIGN MODES

Scenario A - Street Mode

Vehicle Access, Parking + Loading, 10km/ph



Scenario B - Managed Access

Authorised Vehicle Access Only and Parking Loading 10km/ph

The Strand/Durham Street



MUSEU MMUNITY HUB





Scenario C - Pedestrian Mode

No Vehicle Access, No Parking Loading, Vehicles Diverted to



10. BAYCOURT

Warren and Mahoney is undertaking early design investigations into a Baycourt refurbishment. The design is being considered alongside Site B, comprising a potential performance venue, convention centre, and hotel.

SCOPE OF WORKS

The below diagrams consider potential refurbishment works, however, the scope of works are yet to be confirmed and will be considered alongside Site B design progression. Potential works include:

- A new exterior lift and walkway to provide accessibility up the site. This may involve reinstatement of an external walkway.
- Exterior façade upgrades that are complementary to the future precinct development.

- Potential upgrade to interior lobbies, toilets and acoustic treatments.
- Canopy extension.
- Potential for roofing upgrades and added insulation.

Initial investigations support no structural seismic building upgrades being required. The total budget for Baycourt upgrade works is currently \$11 million.



10. BAYCOURT PROPOSED UPGRADES



11. **ART GALLERY**

Warren and Mahoney has completed a feasibility report on the Art Gallery, identifying potential (re)development options that could be undertaken. Cost estimates are currently being worked through to understand the level of refurbishment targeted in the \$1.5 million budget allowance.

KEY OBJECTIVES

- Improving the function of the Gallery through the orientation and placement of entries and functions that relate to the building's facade.
- Integrating the Gallery into the wider Te Manawataki o Te Papa precinct to exploit the marriage value of this community asset contributing to the complete precinct.

Investigations have been undertaken to consider both a base case scheme, where the entrance is repositioned onto Masonic Park, and future development options sitting outside this project scope.

BASE CASE SCHEME

- Key focus is to create a building entrance to engage with Masonic Park and the wider Te Manawataki o Te Papa site.
- Existing feature stair and loading location retained in this scheme.
- Review of internal layout to optimise efficiency and improve adjacencies and flows.
- Enhance the presence, visibility, and identity of the art gallery within the cultural precinct.
- Consideration of storage functions and the ____ ability to move or share off-site facilities.

FUTURE DEVELOPMENT OPTIONS

- This exercise looks at future options for the art gallery, supporting feasibility investigations and ensuring base case work does not prejudice further development.
- Opportunities from potential acquisition of adjacent properties explored.
- Potential relocation of current loading access to Wharf St, and activation of additional frontage on Masonic Park.
- Potential increase of ground floor footprint (loading bay access lane and existing entry corner of Willow Street and Wharf Street).

- Additional floor area to Level One to support operations (e.g. upper-level events space and amenity through roof terraces or additional staff or gallery areas).
- Consider façade enhancement (but not replacement).
- Improvements to overall customer journey and experience through more significant ground floor replanning, including removal/ relocation of feature stair in entry gallery.

Baseline Scheme - Building Footprint Expansion 3D Views



Baseline Scheme - Key Moves



KEY MOVE 1

Move centre of gravity. Re-orientate building entry to connect to Masonic Park and the civic precinct

KEY MOVE 2

Loadin

F

Blur the

Entry

threshold

Entrance activates Masonic Park

Atrium

Galler

Willow Street

Blur the threshold





Ground Floor Plans

KEY MOVE 3

Jewel Box Pop out jewel box amplification

12. SUSTAINABILITY

All buildings within the precinct will feature a hybrid mass timber structure and the aim to achieve a 6 Green Star rating and WELL certification. NDY has been engaged to help achieve the sustainability goals for the site and has registered both buildings with Green Star for Design and As Built.

SUSTAINABILITY CERTIFICATION:

- The project has been registered with Green Star Design and As Built, with two separate registrations for the Library and Community Hub and CWEM buildings.
- The project aspires to target a 6 Green Star rating on both of these buildings which is the highest designation under Green Star in New Zealand, representing world leadership in sustainability.

KEY PROJECT SUSTAINABILITY TARGETS (PRELIMINARY STAGE):

- The use of timber in construction has very low embedded carbon, is in alignment with all 17 of the UN Sustainable Development Goals and has a key role in creating a better built environment for our future.
- 50% increase in outdoor air, to provide high indoor air quality to occupants.
- Highly efficient building envelope and services' design to reduce GHG emission and peak electricity demand.

- Bicycle parking and 'end-of-trip' facilitates to encourage sustainable and active transport.
- Rainwater collection and use along with water efficient fixtures.
- Cultural, community and ecological value improvement of the site. Transformation from low value, primarily hard stand site with dilapidated structures to a flourishing community space with significant landscaping, natural and drought-tolerant species, celebration of people and place.
- Targeting materials with reduced upfront and whole of life carbon impacts. Prioritisation of responsible building materials such as structural steel and timber.
- Construction and demolition waste aim of 70% diverted from landfill (local capability pending).
- Mitigation of light pollution to night sky and neighbouring buildings.
- Potential rooftop photovoltaic (PV) cells on both buildings, reducing the buildings' overall energy consumption, GHG emissions and maximum electricity demand.

PRELIMINARY STAGE SUSTAINABILITY ACTIVITIES:

- Presentation of sustainability opportunities and an optioneering activity to establish the set objectives for the project.
- Development of the Green Star and WELL pathway and coordination with preliminary stage design credits/features.
- Parametric modelling activities on both buildings to optimise the buildings' form and façade.
- optimisation of a multiple indoor environmental quality metrics.
- Preliminary stage hot spot carbon assessment of building form and structural systems across both buildings.



13. **PROGRAMME UPDATE**

DESIGN PROGRAMME

The Te Manawataki o Te Papa design programme has been split into three workstreams:

Library & Community Hub

CWEM and Site A Landscaping

Masonic Park and Willow Street

LIBRARY & COMMUNITY HUB

The Outline Plan of Works submission for the Library and Community Hub is scheduled to be submitted in December 2022.

Following approval of the Preliminary Design cost estimate and engagement of consultants for future design and construction monitoring stages within December 2022, the Developed Design stage will commence January 2023. Design will be completed by November 2023 having allowed five months for Developed Design and six months for Detailed Design.

Main contractor site establishment/site works are to commence November 2023, following PowerCo HV line relocation works, agreement to construction contractor and early pricing approvals by TCC. Construction of the Library and Community Hub building is programmed to commence January 2024 with a completion date of November 2025.

Early Pricing Approval

In order to meet TCC programme aspirations, consent and tender packages will need to be broken up with costs agreed and committed to by TCC ahead of the final full tendered pricing.

These packages would include site-wide earthworks, enabling works, civil, sub-structure and inground services, architecture, building services, superstructure and façade. Early pricing approval would be required for both the site-wide earthworks and the enabling works, civil, sub-structure and inground services

Four weeks has been allowed for each work package in order for TCC to review pricing, resolve tags/clarifications, agree final value, agree construction contract terms and instruct works. Full tender pricing for complete design will be available in February/March 2024.

COMMUNITY HUB CRITICAL PATH

HV Line Relocation

A HV line intersecting the site needs to be relocated prior to earthworks commencing. This work also includes the supply of builder's power for use by the main contractor.

Engagement has been undertaken to date with PowerCo to progress this workstream, with PowerCo working to have removed the HV line and provided temporary power by September 2023. This timing is critical to begin site work earthworks on programme.

Earthworks:

The Earthworks sit on critical path as there are a number of design, compliance and commercial considerations and milestones to be met to allow site works to commence November 2023.

Structural Design and Procurement

Given the aspiration for mass timber and tight timeframes, the procurement of timber must run in parallel with design and compliance. This is both to mitigate procurement risk (approx. 12 months lead time required for timber) and price risk. Through early engagement with the market and input from timber suppliers throughout developed and detailed design (sizing of elements, cost considerations, availability of materials etc), we hope to mitigate these risks where possible.

The project team is currently drafting the proposed approach with respect to this early engagement and how best to ensure competitive tension between prospective suppliers. Without having a final tender price from suppliers to compare given the current design stage, it would be ideal to select the preferred supplier and include them within the design development. This would require tendering the project on a schedule of rates approach to later be applied to final quantities rather than against a completed design.

Any delays to these critical path workstreams would likely result in material programme implications.

CWEM AND SITE A LANDSCAPING

The Outline Plan of Works submission for the CWEM and Site A landscaping is scheduled to be submitted February 2023.

The CWEM building has undertaken a significant redesign since the enhanced costing stage. For this reason, the design programme (including the Site A landscaping) lags the Library and Community Hub. The Preliminary Design milestone for the CWEM building is February 2023 with a final design completion milestone of January 2024. Six months has been allowed for Developed design and six months for Detailed Design.

Following the issuance of the May 2022 Enhanced Costing report, there have been two key updates influencing programme:

- It has been confirmed the previously anticipated settlement period (12 months) for earthworks is not required, removing this critical path item.
- The redesign of the CWEM building is highly integrated. This aligns with a single building construction approach, rather than staggering the Exhibition and Museum construction, resulting in a shorter total construction time.

Taking the above into account, a fast-tracked programme is presented with CWEM commencing in August 2024. Construction of the CWEM building is programmed for 30 months with a completion date

of February 2027. This assumption also accelerates associated landscaping and roading upgrades. A more conservative programme is displayed in the hashed line, with construction commencing 12 months later in August 2025.

MASONIC PARK

The Resource Consent submission for the CWEM and Site A landscaping is scheduled to be submitted December 2022.

The design for Masonic Park is ahead of the Library and Community Hub and CWEM buildings. We anticipate a design completion April 2023. Masonic Park is subject to a Resource Consent rather than an Outline Plan of Works, we believe more risk is associated with this process given the potential for design changes.

To achieve a mid-2023 commencement date, detailed design for Masonic Park would need to be undertaken in parallel to the Resource Consent process. This is a risk in terms of additional costs for redesign and potential for programme delays should the consenting process require material changes to documentation.

We expect tendered pricing to be available to TCC within June 2023.

The accelerated programme has a significant risk in local market capacity to deliver the two projects concurrently. The earlier commencement date will require some early works packages, however, to a lesser extent than the Library and Community Hub. LT McGuinness will continue to review this programme assumption in relation to market capacity and sequencing with the balance of the precinct.

The Site A landscaping, that spans the plaza between both the Library and Community Hub and CWEM building, will be designed in parallel to the CWEM milestones to allow for coordination and interfacing of final designs. The construction of this work will occur alongside building construction, with the southern side commencing first alongside the Library and Community Hub.

13. PROGRAMME UPDATE UPDATED PROGRAMME

			2023	2024	2025	2026	2027	2028
Task Name	Start	Finish	D J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D <mark>J</mark>	F M A M J J A S O N D
PROGRAMME	MAY-22	JAN-27						
SITEWORKS	Oct-23	Apr-24						
Site A civil works	Oct-23	Apr-24						
LIBRARY	Apr-22	Nov-25						
Design	Apr-22	Nov-23						
Consents	Dec-22	Jan-24						
Procurement	Aug-23	Jan-24						
Construction	Jan-24	Nov-25						
HV line relocation	May-22	Sep-23						
Completion	Nov-25	Nov-25						
CWEM	Jul-22	Jan-27						
Design	Jul-22	Jan-24						
Consents	Feb-23	Mar-24						
Procurement	Mar-24	Aug-24						
Construction	Aug-24	Jan-27					الأدار عالد إندار عالم إندار عا	
Completion	Jan-27	Jan-27					الأداما والمتعاملية المتعاد	
WILLOW STREET	Oct-25	Jan-27					-	
Construction - pt 1	Oct-25	Feb-26						
Construction - pt 2	Oct-26	Jan-27						
Completion	Jan-27	Jan-27						
MASONIC PARK	Jul-23	Jun-24						
Construction	Jul-23	Jun-24						
Completion	Jun-24	Jun-24						
BAYCOURT	Jan-25	Dec-25						
Construction	Jan-25	Dec-25						
Completion	Dec-25	Dec-25						
ART GALLERY	Nov-23	Jul-24						
Construction	Nov-23	Jul-24						
Completion	Jul-24	Jul-24						

— — Conservative CWEM programme

13. PROGRAMME UPDATE PROCESS TO DATE



14. COST OVERVIEW

NZD in thousands	Site A Civil Establishment	Durham St footpath	Masonic Park	Art Gallery	Library & Community Hub	Wharf St footpath	Baycourt	Willow Street	Site A Lanscaping	Exhibition & Musuem	Civic Whare	Hamilton St footpath	Total
Construction & Infrastructure Cost	4,535	100	5,630	840	59,420	940	6,565	4,810	10,290	70,100	9,410	930	173,570
Escalation	310	10	360	75	6,250	110	810	920	1,630	9,350	1,510	185	21,520
VE savings										-1,750			
Total construction cost	4,845	110	5,990	915	65,670	1,050	7,375	5,730	11,920	77,700	10,920	1,115	195,090
Direct costs	870	25	1,230	230	14,080	192	1,575	1,155	2,380	16,650	2,400	225	41,012
FF&E	-	-	100	100	3,500	-	1,000	-	-	5,800	750	-	11,250
Contingency	1,285	15	1,680	255	8,250	308	1,050	1,415	2,950	10,400	1,430	310	29,348
Total cost	7,000	150	9,000	1,500	91,500	1,550	11,000	8,300	17,250	110,550	15,500	1,650	274,950
GFA*	-	-	-	-	5,613	-	-	-	-	5,790	581	-	
construction cost (\$/m²)	-	-	-	-	10,404	-	-	-	-	11,969	15,852	-	
Estimated completion date	2024	2,024	2024	2024	2025	2025	2025	2026 - 2028	2028	2028	2028	2028	2028
Contingency (%)	22%	10%	10%	20%	10%	10%	10%	23%	10%	10%	10%	10%	12%
Escalation (%)	7%	7%	6.5%	8%	10.5%	11%	12.5%	15 - 23%	16%	16%	16%	20%	12%
May 2022 cost presented	7,000	2,900	9,400	1,500	88,200	3,125	11,000	8,950	15,700	104,200	15,400	3,125	270,500
Variance	-	-2,750	-400	-	3,300	-1,575	-	-650	1,550	6,350	100	-1,475	4,450

* Note GFA values include plant area is included

14. COST OVERVIEW OVERVIEW

ENHANCEMENTS

Several below the line enhancement options have been costed but assumed to sit outside of the core precinct requirements. These are presented below for consideration.

Item	Cost premium
PV solar panels across Community Hub and CWEM roofs	\$1.20 m
Accessible terrace and pavilion added to Exhibition roof	\$3.50 m
Museum green roof	\$1.75 m
Replace concrete detail across civic plaza, Willow Street and Masonic Park with granite paving	\$3.15 m

CONTINGENCY AND ESCALATION

A contingency figure of \$29.35 million, or 11% of total cost, is allowed for. This is a conservative allowance to account for future design progression and discoveries. The contingency allowance will decrease as design progresses and key assumptions are firmed.

An escalation allowance of \$21.52 million, or 8% of total cost, is provided. The % allowance per project varies based on estimated construction commencement date and duration.

FF&E

\$11.25 million FF&E allowance is held across the site. This budget has been benchmarked against similar projects including exhibition, conference and university type campus "hub" buildings. All fixed furniture, fixed seating, signage, and site wide waharoa costs are included within the separate construction cost estimates. It is noted the supply of significant artwork, sculptures, or exhibition specific fitout requirements are excluded from cost estimates.

PROGRAMME

The current costs are based on the CWEM and associated landscaping commencing 12 months earlier than previously programmed. During the preliminary design stage, CMW (geotechnical engineer) investigated the prior assumption that the ground underneath CWEM required a 12-month settlement period. Through further information on the ground conditions and the construction approach being adopted, this settlement period is not required. LT McGuinness will continue to review this programme assumption in relation to market capacity and sequencing with the balance of the precinct.

Item	Completion date	Contingency %	Contingency \$	Escalation %	Escalation \$
Site A establishment hoardings, earthworks & HV transformer	2024	22%	\$1.29 m	7%	\$0.31 m
Durham Street footpath	2024	15%	\$0.02 m	7%	\$0.01 m
Masonic Park	2024	10%	\$1.68 m	6.5%	\$0.36 m
Art Gallery	2024	20%	\$0.26 m	8%	\$0.08 m
Community Hub	2025	10%	\$8.25 m	10.5%	\$6.25 m
Wharf Street footpath	2025	10%	\$0.31 m	11%	\$0.11 m
Baycourt	2025	10%	\$1.05 m	12.5%	\$0.81 m
Willow Street	2025	23%	\$1.42 m	14%	\$0.92 m
Site A landscaping	2026-27	10%	\$2.95 m	14%	\$1.63 m
Exhibition + Museum	2027	10%	\$10.40 m	14%	\$9.35 m
Civic Whare	2027	10%	\$1.43 m	14%	\$1.51 m
Hamilton Street Footpath	2027	10%	\$0.31 m	20%	\$0.19 m
Total			\$29.35 m		\$21.52 m

VALUE ENGINEERING (VE) SAVINGS

Within the current cost summary there is a line item for 'VE savings' relating to \$1.75m of savings to the CWEM building. The CWEM building design is at an earlier stage than the Library and Community Hub and presents further opportunities to reduce the construction cost of the building and seek efficiencies within the current design without requiring material changes to the structure of the building. The main contractor is confident these savings can be achieved as design progresses.

14. COST OVERVIEW COST **CHANGES**

The Enhanced Costing Report delivered in May 2022 presented a precinct wide cost of \$303.4 million. Following report issuance, The Strand and waterfront areas have been moved to a separate project. As such, the designs and costings presented reflect the redefined scope from the eastern edge of Masonic Park to the Durham Street eastern curb edge.

The May 2022 report presented several enhancement options in addition to the base design. A number of enhancements were adopted by Tauranga City Council, including mass timber buildings with a targeted 6 Green Star sustainability rating, premium façade finishings and a canopy along the southern edge of Masonic Park.

A journey has been undertaken to step back and reassess the precinct, find targeted cost savings, and reach a design that incorporates mass timber and world leading sustainability aspirations.

A summary of design evolution of each precinct aspect and the cost impact is provided below.

SITE A CIVIL ESTABLISHMENT

Civil establishment fees include hoardings, earthworks and HV transformer costs. The scope remains largely in line with prior design.

LIBRARY & COMMUNITY HUB \$3.3 million cost increase

The Library and Community Hub building has reduced in size by 311m². The reduction in area has been driven by the removal of the upper floor, offset slightly by an increased floor plate. In addition, the archive area has been reduced, with the cold storage requirements moved off site. The form of the building has reminded the same, with a curved face fronting the civic plaza.

Extensive consultation with the Library, Archive and customer service teams along with key stakeholders has refined the briefing requirements and optimised the internal building layout.

The structure of the building has fundamentally changed, with a shift from traditional steel and concrete construction to a mass timber structure. The façade has been defined across the period, with a unitised curtain wall system proposed comprising of clear and opaque panels.

SITE A LANDSCAPING \$1.55 million cost increase

The civic plaza is a complex area required to navigate the steep gradient of the site. Design progression has increased the ramping requirements across the site.

Part of the cost increase is the introduction of waharoa across the landscaping. The two contemporary waharoa framing the site entrance from Willow Street were previously affixed to the buildings and therefore within building budgets. These are now proposed to be within the landscaping, resulting in a \$500,000 construction cost moving to the civic plaza budget.

There has also been the addition of a stage and pavilion to the site a landscaping since the Enhanced Costing Report. The stage and pavilion has become a focal point of the amphitheatre in the current landscaping design and incurs a \$450,000 total additional cost.

EXHIBITION AND MUSEUM \$6.35 million cost increase

The Exhibition and Museum building has reduced in area by 550m². Fundamental changes to prior design include the removal of the Museum upper floor, widening of the Exhibition area, introduction of a flexible community area, increased servicing and loading areas and rationalisation of levels.

The structure of the building has fundamentally changed. The lower floor of the Exhibition space has is buried into the landscaping, which is suited to a traditional steel and concrete construction. The upper floor of the Exhibition and the Museum have been redesigned to a mass timber structure.

The façade has been defined across the period with a horizontal terracotta baguette system being explored.

CIVIC WHARE \$0.10 million cost increase

The Civic Whare building has reduced in area by 131m². The building design has increased in complexity, with the building shape evolving to a curved form with two oculi proving natural lighting to the building. A green roof has also been introduced. These design enhancements have been largely offset by the area reduction achieved.

WHARF ST HAMILTON ST DURHAM ST& WILLOW ST \$6.45 million cost saving

The project scope extends to the curb edge of the surrounding footpaths. A review of the scope has enabled a number of savings to be made, including a refinement of landscaping and finishing strategy.

Durham Street will berefurbished as part of Site B works, with an allowance for asphalt make good of any footpath damage.

The base case option for Willow Street is largely similar to the Enhanced Costing Report with further investigation into paving options (base case 100% concrete) and the use of the street being reduced to managed access. The proportion of soft landscaping has increased, reducing total cost.

MASONIC PARK

\$0.40 million cost increase

The greenery in Masonic Park has increased significantly, with soft area increasing from 17% in the prior design to 36% of site coverage. Savings through increased soft areas and reduced escalation from an accelerated start date have been offset by the introduction of a canopy to the southern side of the site (\$1.5 million total cost), which was previously a below the line enhancement item.

ART GALLERY & BAYCOURT

The Art Gallery and Baycourt refurbishment allowances of \$1.5 million and \$11.0 million respectively have remained the same. Work is progressing in parallel to this report to define the scope of these works.

14. COST OVERVIEW ESCALATION

The construction industry is seeing significant escalation, which is expected to continue in the near term. The escalation forecast used is produced by RLB directors across New Zealand in conjunction with economists from the NZIER (New Zealand Institute for Economic Research). It is important to note that the forecast does not differentiate between regions or building types.

Non-residential construction cost inflation in the September 2022 quarter rose 1.5%, compared to the previous quarterly increase of 3.6%. This brings the annual construction cost inflation to 10.5% for the year to September 2022, slightly below the record high 10.9% increase for the year to June 2022.

RLB forecasts annual cost inflation will remain at its current peak for the September guarter but beyond that, expects an easing in capacity constraints in the construction sector will drive an easing in construction cost inflation. The relaxation of immigration and border restrictions will also help to alleviate labour shortages along with signs that shipping and global supply chain disruptions are lessening. However, these constraints will take time to be resolved and RLB estimates annual nonresidential cost inflation to remain elevated at 5.4% at the end of 2023.

Whilst recent escalation has been high, there appear to be signs in the market that this may be slowing down. For example, the world container index has decreased 72% in the year to November 2022 contributing



Further supporting a drop in escalation, the Reserve Bank of New Zealand (RBNZ) has forecast the New Zealand economy (like may economies around the world) to enter a recession in 2023.

Considering the above, Willis Bond expects construction costs to stabilise or decrease in the near to medium term. The escalation figures held for this projects are significant, with opportunities to reduce total project cost if escalation is below market expectations.

Non-residential building cost escalation CGPI-NRB index, annual % change



ESCALATION ALLOWANCE

WILLIS BOND

Escalation is calculated in two parts for each area.

- 1. Escalation from September 2022 to the approximate tender date using quarterly forecasts; plus
- 2. Escalation from tender date to completion x 40%

Ref: RLB



UNPRECEDENTED ESCALATION

Recent construction cost escalation has been unprecedented.

This graph shows the historical trendline for non-residential construction cost in New Zealand against actual. In the year to September 2022, costs escalated by 10.5%.

HISTORICAL LEARNINGS

Analysing the post 2008 GFC construction cost data points, construction cost peaked in Q3 2008 and troughed in Q3 2010, -1% down from the peak. The recovery back to the peak level occurred in Q3 2011, 36 months following the peak of costs.

The current circumstances of COVID19, supply chain shortages, the cost of fuel and the war in Ukraine presents a different set of factors to those faced in 2008. This data does, however, suggest that an easing of cost escalation is likely which supports the RLB forecast commentary and a case for reduced escalation assumptions in the costing of current developments.

-0.25

-0.4% -0.6%

-0.8%

-1.0%

-1.2% -1.4%

to significantly cheaper shipping costs (for 40ft containers). The recent inflation coupled with a reduction in property values New Zealand wide may present a situation where supply is able to catch back up to a reducing demand and help to



15. **RISKS**

COMMERCIAL

Client scope creep - potential for cost and programme implications if the scope expands to include items outside of the current scope of work in this report.

Client briefing changes - to the current preliminary design and cost update set would be subject to potential cost and time implications to incorporate either via construction costs or consultant variations.

Funding – risks around obtaining the required level of funding for the entire Te Manawataki o Te Papa precinct.

Geotech & building structure requirements, if sizing and extent of ground improvements differs from geotechnical advice to date this could have significant cost and time implications.

Façade design & interface with structure still being worked through and costed on a 'design intent' basis. Cost risk should RLB's estimate not be sufficient.

Earthworks - Cut/fill presents a risk should additional quantities be required above those estimated from investigations to date.

Civil mains / network upgrades - mains repair / improvement not anticipated as local network considered sufficient.

H1 compliance – thermal requirements changing / modelling of thermal comfort may drive changes to façade design.

Plan provision / sizing may increase due to the design development or changes in brief / requirements.

Tenant fitouts (exclusions from current scope), additional structure/loading capacity for displays outside of the current preliminary design and cost update documentation.

Main Contractor Hard Fitout - any fitout changes / base build modifications as a result of tenant fitout requirements.

Design development from the enhanced costings milestone could result in cost over runs that both increase cost and programme risk for value engineering and subsequent TCC approval.

Deign development from the preliminary design and cost update pricing could result in additional details or scope and cost implications may arise that were unable to be foreseen or not captured within the initial pricing by RLB.

Consultant budget allowance - Consultant fee budget is carried within the RLB pricing estimate benchmarked against other civic projects, however, civic projects are unique and additional consultant input may be required.

Escalation has been forecasted but is at risk to market conditions, any potential changes in programme will have an impact on escalation.

Internal fitout scope – further work required to understand the internal fitout requirements of these specialist buildings, potential cost risk associated.

DESIGN

Sustainability - 6 Greenstar rating was considered for the design and cost update pricing, TCC has since indicated an investigation also into the WELL certification. Any additional initiatives carry potential implications on cost and programme.

PROGRAMME

PowerCo's HV line relocation and builders power supply is a programme risk. LT McGuinness requires temporary power prior to September 2023

Consultant resource capacity to design in parallel across the precinct and resource capacity possibly stretched during construction phase leading to slow response to RFI's. Low capacity could result in overall delays to the programme.

Sub contractor market - Significant amount of large-scale projects currently underway within the Tauranga market resulting in subcontractor pressures (cost, time implications).

Mana Whenua engagement - Additional requests and requirements from Mana Whenua being captured within design and cost.

Construction durations have been benchmarked where possible, however, as design progresses more is known with respect to site specific challenges and constraints.

Client approvals - there is no allowance within the programme for 'pens down' periods beyond the design and cost update for further design or cost approval milestones.

Discovery of soil contamination (asbestos, metals etc.) would result in programme delays and additional costs to the project beyond current allowances in project cost estimate and programme.

Archaeological findings would result in programme delays and additional costs to the project beyond current allowances in project cost estimate and programme.

COMPLIANCE

Outline Plan of Works (OPW) - Community Hub and CWEM buildings are subject to OPW approval.

PROCUREMENT

Structure / plant / materials procurement - delays caused by procurement have programme and cost implications.

Early procurement - TCC would need to approve costs / spend money ahead of full / final pricing being known for the Community Hub building to commence works in 2023. Potential for delays should pricing not be approved in timely manner.

COVID 19

chain.

CONSTRUCTION

Projects in parallel - potential for surrounding works to impact TMOTP construction through works on the waterfront, traffic network or utilities upgrades.

Traffic congestion around site – neighbour delivery disruption, site loading zone disruptions and potential for complaints from neighbours.

Resource Consent – Masonic Park and Willow Street are subject to a Resource Consent, additional risk of how to approach Willow Street from a traffic perspective.

Programme provides tight deadlines for agreeing contracts between stages. Potential for delays should this not be an efficient process.

Mass timber procurement strategy for Community Hub (critical path - with commencement Jan-24) to be agreed to mitigate potential programme implications (long leads / no availability etc).

Global environment - Covid-19 and ongoing unknown impacts in 2023 and beyond, geo-political impacts on NZ / construction industry / supply